

**NGCOBO EXTENSION 11 - INTERNAL SERVICES**  
**BILL 1 : INTERNAL CIVIL ENGINEERING SERVICES**  
**SECTION 1 : GENERAL**

**BILL OF QUANTITIES**

| ITEM                   | PAYMENT REFERS                    | DESCRIPTION  | UNIT | QUANTITY | RATE R | AMOUNT R |
|------------------------|-----------------------------------|--|------|----------|--------|----------|
| 1.1                    | <b>1200A/<br/>PSA/ PSAB<br/>3</b> | <b>FIXED-CHARGE ITEMS</b>  |      |          |        |          |
| 1.1.1                  | 8.3.1                             | Contractual Requirements - to include all insurances and guarantees required.  | Sum  | 1        |        |          |
| 1.1.2                  | <b>8.3.2</b>                      | <b>Establish Facilities on the Site :</b>  |      |          |        |          |
| 1.1.2.1                |                                   | <b>i) Facilities for Engineer</b>  |      |          |        |          |
| 1.1.2.1.1              |                                   | a) Offices: 1 furnished room with furniture to accommodate 10 people. Locable toilet facility to be provided for the sole use of the Engineer. | Sum  | 1        |        |          |
| 1.1.2.1.2              |                                   | b) Nameboard (2 No.)   | Sum  | 1        |        |          |
| 1.1.2.1.3              |                                   | c) Survey Equipment  | Sum  | 1        |        |          |
| 1.1.2.1.4              | c4.1.6.1(vii)                     | e) Computer Equipment  | Sum  | 1        |        |          |
| 1.1.2.2                | <b>8.3.2.2</b>                    | <b>ii) Facilities for Contractor</b>   |      |          |        |          |
| 1.1.2.2.1              |                                   | a) Office and storage sheds  | Sum  | 1        |        |          |
| 1.1.2.2.2              |                                   | b) Ablution and latrine facilities   | Sum  | 1        |        |          |
| 1.1.2.2.3              |                                   | c) Tools and equipment   | Sum  | 1        |        |          |
| 1.1.2.2.4              |                                   | d) Water supplies,electric power and communications  | Sum  | 1        |        |          |
| 1.1.2.2.5              | 8.3.3                             | e) Other fixed-charge obligations  | Sum  | 1        |        |          |
| 1.1.2.2.6              | PSA8.3.4                          | f) Remove Engineer's and Contractor's site establishment on completion   | Sum  | 1        |        |          |
| 1.2                    | <b>1200A/<br/>PSA8.2.2</b>        | <b>TIME-RELATED ITEMS</b>  |      |          |        |          |
| 1.2.1                  | 8.4.1                             | Contractual Requirements   | Sum  | 1        |        |          |
| 1.2.2                  | 8.4.2                             | Operate and maintain facilities on the site:   |      |          |        |          |
| 1.2.2.1                | 8.4.2.1                           | i) Facilities for Engineer for duration of construction  |      |          |        |          |
| 1.2.2.1.1              |                                   | a) Offices: 1 furnished room with furniture to accommodate 10 people. Toilet facility to be provided.  | Sum  | 1        |        |          |
| 1.2.2.1.2              |                                   | b) Nameboard   | Sum  | 1        |        |          |
|                        |                                   | c) Survey Equipment  | Sum  | 1        |        |          |
|                        |                                   | d) Cellphone allowance for the ER at R500 per month  | Sum  | 1        |        |          |
|                        | c4.1.6.1(vii)                     | e) Computer Equipment  | Sum  | 1        |        |          |
| 1.2.2.2                | 8.4.2.2                           | ii) Facilities for Contractor for duration of construction, except where otherwise stated  |      |          |        |          |
| 1.2.2.2.1              |                                   | a) Ablution and latrine facilities   | Sum  | 1        |        |          |
| 1.2.2.2.2              |                                   | b) Tools and equipment   | Sum  | 1        |        |          |
| 1.2.2.2.3              |                                   | c) Water supplies, electric power and communications   | Sum  | 1        |        |          |
| <b>CARRIED FORWARD</b> |                                   |  |      |          |        |          |

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| ITEM  | PAYMENT REFERS           | DESCRIPTION   | UNIT | QUANTITY | RATE R    | AMOUNT R  |
|---|--------------------------|---|------|----------|-----------|-----------|
|   |                          | <b>BROUGHT FORWARD</b>  |      |          |           |           |
| 1.2.2.2.4   | 8.4.3                    | d) Supervision for duration of the contract.  | Sum  | 1        |           |           |
| 1.2.2.2.5   | 8.4.4                    | e) Company and head office overhead costs   | Sum  | 1        |           |           |
| 1.2.2.2.6   | 8.4.5                    | f) Other time related obligations   | Sum  | 1        |           |           |
| 1.2.2.3   | 8.4.6                    | Community liaison officer (CLO) at R3500 per month  | Sum  | 1        |           |           |
| <b>1.3</b>  | <b>8.7<br/>PSA 8.5</b>   | <b>DAYWORKS</b>   |      |          |           |           |
| 1.3.1   |                          | i) Labour   | PSum | 50000    | 1.00      | 50 000.00 |
| 1.3.1.1   |                          | ii) Percentage adjustment to item 1.3.1 for labour  | %    | 50000    |           |           |
| 1.3.2   |                          | iii) Materials  | PSum | 50000    | 1.00      | 50 000.00 |
| 1.3.2.1   |                          | iv) Percentage adjustment to item 1.3.2 for materials   | %    | 50000    |           |           |
| 1.3.3   |                          | v) Plant  | PSum | 50000    | 1.00      | 50 000.00 |
| 1.3.3.1   |                          | vi) Percentage adjustment to item 1.3.3 for plant   | %    | 50000    |           |           |
| 1.3.4   | PSA 8.9                  | Allow provisional sum for additional density testing, where ordered by Engineer   | PSum | 50000    | 1.00      | 50 000.00 |
| 1.3.4.1   |                          | Overhead charges and profit on 1.3.4  | %    | 50000    |           |           |
| <b>1.4</b>  | <b>8.8</b>               | <b>TEMPORARY WORKS</b>  |      |          |           |           |
| 1.4.1   | 8.8.5                    | Land Survey Act   |      |          |           |           |
| 1.4.1.1   |                          | Search for and record tri- gonometrical survey beacons, bench marks and plot boundary pegs, and expose on completion of Works                                   | Sum  | 1        |           |           |
| 1.4.1.2   |                          | Protect beacons, etc., located under item 1.4.1.1 and reposition or re-establish, as ordered, the same by a Registered Land Surveyor on completion of the Works | Sum  | 1        |           |           |
| <b>1.5</b>  | <b>PSA 5.7/<br/>8.10</b> | <b>HEALTH AND SAFETY CONSTRUCTION &amp; ENVIRONMENTAL REGULATIONS</b>   |      |          |           |           |
| 1.5.1   |                          | i) All fixed cost and obligations to comply with the OH&S Act   | Sum  | 1        |           |           |
| 1.5.2   |                          | ii) Time related obligations to comply with the OH&S Act  | Sum  | 1        |           |           |
| 1.6.1   |                          | i) All fixed costs and obligation to comply with the Environmental Management Plan  | Sum  | 1        |           |           |
| 1.6.2   |                          | ii) Time related obligations to comply with the Environmental Management Plan   | Sum  | 1        |           |           |
| 1.7   | PSA 8.9                  | Allow provisional sum for density testing, where ordered by Engineer  | Sum  | 1        | 50 000.00 | 50 000.00 |
| 1.7.1   | 8.5                      | Overhead charges and profit on 1.7  | %    | 50000    |           |           |
| <b>TOTAL FOR SECTION 1 CARRIED FORWARD TO SUMMARY</b> |                          |   |      |          |           |           |

BILL 1 : INTERNAL CIVIL ENGINEERING SERVICES

SECTION 2 : SITE CLEARANCE

| ITEM   | PAYMENT REFERS | DESCRIPTION   | UNIT | QUANTITY | RATE R | AMOUNT R |
|--|----------------|---|------|----------|--------|----------|
| 2.1  | PSC 8.2.1      | Clear and grub (haul included) of proposed development site | ha   | 90       |        |          |
| TOTAL FOR SECTION 2 CARRIED FORWARD TO SUMMARY |                |   |      |          |        |          |

## BILL 1 : INTERNAL CIVIL ENGINEERING SERVICES

## SECTION 3 : ROADWORKS - INTERNAL ROADS: 5m WIDE &amp; ACCESS ROUTE

| ITEM            | PAYMENT REFERS                                | DESCRIPTION  | UNIT           | QUANTITY | RATE R | AMOUNT R |
|-----------------|---|--|----------------|----------|--------|----------|
| <b>3.1</b>      | <b>1200 C</b>                                 | <b>SITE CLEARANCE</b>  |                |          |        |          |
| 3.1.1           | PSC 8.2.1                                     | Clear and grub road reserve width 16m - 20m  | ha             | 13.5     |        |          |
| 3.1.2           | PSC 8.2.10                                    | Remove topsoil to a depth of 150mm and spoil or stockpile as designated by the engineer.   | m <sup>2</sup> | 35863    |        |          |
| <b>3.2</b>      | <b>1200 DM</b>                                | <b>EARTHWORKS (ROADS, SUBGRADE and WEARING COURSE)</b>   |                |          |        |          |
| 3.2.1           | 8.3.4<br>PSD 8.1.4<br>PSD 8.3.6<br>PSDM 8.3.6 | Cut to fill in all materials other than hard rock and compact to 90% Mod.AASHTO maximum density.   | m <sup>3</sup> | 5630     |        |          |
| 3.2.2           | 8.3.4<br>PSD 8.3.6                            | Borrow to fill and compact to 90% Mod.AASHTO maximum density.  | m <sup>3</sup> | 2884     |        |          |
| 3.2.3           | 8.3.6<br>PSD 8.3.6                            | Extra-over item 3.2.1 & 3.2.2 inclusive for excavating and breaking down hard material.  | m <sup>3</sup> | 987      |        |          |
| 3.2.4           | 8.3.7<br>PSD 8.3.6<br>PSDM 8.3.7              | Cut to spoil to designated area within boundaries of the site from   |                |          |        |          |
| 3.2.4.1         |   | i) Soft excavation   | m <sup>3</sup> | 1647     |        |          |
| 3.2.4.2         |   | ii) Hard excavation  | m <sup>3</sup> | 232      |        |          |
| 3.2.4.3         |   | iii) Boulder excavation Class A  | m <sup>3</sup> | 116      |        |          |
| 3.2.4.4         |   | iv) Boulder excavation Class B   | m <sup>3</sup> | 111      |        |          |
|                 |   | <b>Treatment of Roadbed</b>  |                |          |        |          |
|                 | 8.3.3   | Road-bed preparation and compaction of material  |                |          |        |          |
| 3.2.5           |   | Scarify insitu layer to a depth of 150mm, and compact to 93% Mod. AASHTO maximum density.  | m <sup>3</sup> | 5973     |        |          |
| <b>3.3</b>      |   | <b>SELECTED SUBGRADE</b>   |                |          |        |          |
| 3.3.1           | 8.3.5   | Construct G7 Gravel Sugrade with material from commercial sources and compact to 95 % Mod.AASHTO maximum density. (Provisional)                                | m <sup>3</sup> | 6600     |        |          |
| <b>3.4</b>      |   | <b>GRAVEL SURFACING WEARING COURSE</b>   |                |          |        |          |
| 3.4.1           | 8.3.16  | Construct 150mm thick gravel wearing course to TRH 20 specification using 'G7' material from commercial sources and compact to 95% Mod.AASHTO maximum density. | m <sup>3</sup> | 5973     |        |          |
|                 | <b>SANS 1200DM 8.3.13</b>                     | <b>SURFACE FINISHES</b>  |                |          |        |          |
| 3.4.2           |   | Topsoiling 1m wide   | m <sup>2</sup> | 20000    |        |          |
| 3.4.3           |   | Levelling and grassing 1m wide strip   | m <sup>2</sup> | 20000    |        |          |
| CARRIED FORWARD |   |  |                |          |        |          |

BILL 1 : INTERNAL CIVIL ENGINEERING SERVICES

SECTION 3 : ROADWORKS - INTERNAL ROADS: 5m WIDE & ACCESS ROUTE

| ITEM   | PAYMENT REFERS | DESCRIPTION   | UNIT           | QUANTITY | RATE R | AMOUNT R |
|--|----------------|---|----------------|----------|--------|----------|
| 3.5  | 1200GA         | BROUGHT FORWARD<br><b>CONCRETE (SMALL WORKS)</b><br>For causeway crossings over the Cefane and Engcobo rivers |                |          |        |          |
|  | 8.2            | FORMWORK<br>Permanent formwork:   |                |          |        |          |
| 3.5.1  |                | 900 mm dia. corrugated iron void formers  | m              | 100      |        |          |
| 3.5.2  |                | 900 mm dia corrugated iron bevelled ends to suit 1:2 slopes   | No             | 20       |        |          |
|  |                | Temporary formwork  |                |          |        |          |
| 3.5.3  |                | Shuttering to ends of road slab   | m <sup>2</sup> | 30       |        |          |
|  | 8.3            | STEEL REINFORCEMENT FOR STRUCTURES<br>To Road Surface and aprons:   |                |          |        |          |
| 3.5.4  |                | Mild steel bars   | t              | 2        |        |          |
| 3.5.4  |                | Welded steel fabric   | kg             | 7000     |        |          |
|  | 8.4            | CONCRETE FOR STRUCTURES   |                |          |        |          |
| 3.5.5  |                | Class 15/19 Blinding layer and fill around void formers   | m <sup>3</sup> | 500      |        |          |
|  |                | Class 25/19 structural concrete   |                |          |        |          |
| 3.5.6  |                | Road Slab 200mm thick, smooth floated   | m <sup>3</sup> | 160      |        |          |
| 3.5.7  |                | Approach slabs (inlet and outlet) 150mm thick, smooth floated   | m <sup>3</sup> | 100      |        |          |
| 3.5.8  |                | 200x300x846 mm cast insitu concrete bollards  | m <sup>3</sup> | 5        |        |          |
| 3.6  | 1200DK         | <b>GABIONS AND PITCHING</b>   |                |          |        |          |
| 3.6.1  | 8.2.1 (a)      | Surface preparation for bedding of gabions with approved fill or rock   | m <sup>2</sup> | 1100     |        |          |
|  | 8.2.2          | Gabions   |                |          |        |          |
| 3.6.2  |                | Galvanised gabion boxes, 1mx1mx1m, Mesh Type 80 with 2,7mm Class A Galvanised wire                            | m <sup>3</sup> | 270      |        |          |
| 3.6.3  |                | Galvanised gabion mattresses, 6mx2mx0.3m dp, Mesh Type 60 with 2,2mm Class A Galvanised wire                  | m <sup>3</sup> | 350      |        |          |
|  | 8.2.4          | Geotextile  |                |          |        |          |
| 3.6.4  |                | Filter Fabric (AG150 - Minimum Energy Absorption - 4,0 kN/m):   | m <sup>2</sup> | 1100     |        |          |
| TOTAL FOR SECTION 3 CARRIED FORWARD TO SUMMARY |                |   |                |          |        |          |

BILL 1 : INTERNAL CIVIL ENGINEERING SERVICES

SECTION 4 : ROADWORKS - INTERNAL ROADS: 3m WIDE

| ITEM  | PAYMENT REFERS                                | DESCRIPTION  | UNIT           | QUANTITY | RATE R | AMOUNT R |
|---|---|--|----------------|----------|--------|----------|
| <b>4.1</b>  | <b>1200 C</b>                                 | <b>SITE CLEARANCE</b>  |                |          |        |          |
| 4.1.1   | PSC 8.2.1                                     | Clear and grub road reserve width 10m  | ha             | 13.5     |        |          |
| 4.1.2   | PSC 8.2.10                                    | Remove topsoil to a depth of 150mm and spoil or stockpile as designated by the engineer.   | m <sup>2</sup> | 40448    |        |          |
| <b>4.2</b>  | <b>1200 DM</b>                                | <b>EARTHWORKS (ROADS, SUBGRADE and WEARING COURSE)</b>   |                |          |        |          |
| 4.2.1   | 8.3.4<br>PSD 8.1.4<br>PSD 8.3.6<br>PSDM 8.3.6 | Cut to fill in all materials other than hard rock and compact to 90% Mod.AASHTO maximum density.   | m <sup>3</sup> | 9438     |        |          |
| 4.2.2   | 8.3.4<br>PSD 8.3.6                            | Borrow to fill and compact to 90% Mod.AASHTO maximum density.  | m <sup>3</sup> | 4045     |        |          |
| 4.2.3   | 8.3.6<br>PSD 8.3.6                            | Extra-over item inclusive for excavating and breaking down hard material.  | m <sup>3</sup> | 1888     |        |          |
| 4.2.4   | 8.3.7<br>PSD 8.3.6<br>PSDM 8.3.7              | Cut to spoil to designated area within boundaries of the site from   |                |          |        |          |
| 4.2.4.1   |   | i) Soft excavation   | m <sup>3</sup> | 3236     |        |          |
| 4.2.4.2   |   | ii) Hard excavation  | m <sup>3</sup> | 404      |        |          |
| 4.2.4.3   |   | iii) Boulder excavation Class A  | m <sup>3</sup> | 202      |        |          |
| 4.2.4.4   |   | iv) Boulder excavation Class B   | m <sup>3</sup> | 202      |        |          |
| <b>4.3</b>  |   | <b>TREATMENT OF ROAD-BED</b>   |                |          |        |          |
|   | 8.3.3   | Road-bed preparation and compaction of material  |                |          |        |          |
| 4.3.1   |   | Scarify insitu layer to a depth of 150mm, and compact to 93% Mod. AASHTO maximum density.  | m <sup>3</sup> | 6067     |        |          |
| <b>4.4</b>  |   | <b>SELECTED SUBGRADE</b>   |                |          |        |          |
| 4.4.1   | 8.3.5   | Construct G7 Gravel Sugrade with material from commercial sources and compact to 95 % Mod.AASHTO maximum density. (Provisional)                                | m <sup>3</sup> | 6700     |        |          |
| <b>4.5</b>  |   | <b>GRAVEL SURFACING WEARING COURSE</b>   |                |          |        |          |
| 4.5.1   | 8.3.16  | Construct 150mm thick gravel wearing course to TRH 20 specification using 'G7' material from commercial sources and compact to 95% Mod.AASHTO maximum density. | m <sup>3</sup> | 6067     |        |          |
|   | <b>SANS 1200DM 8.3.13</b>                     | <b>SURFACE FINISHES</b>  |                |          |        |          |
| 4.5.2   |   | Topsoiling 1m wide   | m <sup>2</sup> | 20000    |        |          |
| 4.5.3   |   | Levelling and grassing 1m wide strip   | m <sup>2</sup> | 20000    |        |          |
| <b>TOTAL FOR SECTION 4 CARRIED FORWARD TO SUMMARY</b> |   |  |                |          |        |          |

BILL 1 : INTERNAL CIVIL ENGINEERING SERVICES

SECTION 5 : STORMWATER DRAINAGE (Internal)

| ITEM            | PAYMENT REFERS               | DESCRIPTION   | UNIT           | QUANTITY | RATE R | AMOUNT R |
|-----------------|------------------------------|---|----------------|----------|--------|----------|
| 5.1             | 1200 DA                      | <b>EXCAVATION</b>   |                |          |        |          |
|                 |                              | <b>GRAVEL SIDE DRAINS</b>   |                |          |        |          |
| 5.1.1           | 8.3.2                        | Excavate in all materials for gravel side drains for fill in road prism and compact base of drain to 90% Mod.AASHTO maximum density for depths up to 0.7m deep.   | m <sup>3</sup> | 8000     |        |          |
| 5.1.2           | 8.3.2                        | Excavate in all materials for gravel side drains and spoil for depths up to 0.7m.   | m <sup>3</sup> | 8000     |        |          |
| 5.1.3           | PSDA 8.3.9                   | Provide grass berms   | no             | 800      |        |          |
| 5.1.4           | PSDA 8.3.10                  | Line channel with grass sods  | no             | 1000     |        |          |
| 5.1.5           | 1200 DK 8.2.5                | Supply all materials and labour and construct light stone pitching through POS, Lined V Drains Stormwater Servitudes as per Dwg No J28267/TD001   | m <sup>2</sup> | 2844     |        |          |
| 5.2             | 1200 GA                      | <b>CONCRETE ROAD CROSSINGS</b>  |                |          |        |          |
| 5.2.1           | PSGA 8.1.4                   | (a) Construction of Concrete Crossover Drain (20MPa/19mm) complete, including excavation, trimming of sides, compaction and supply, placing compaction and finishing of concrete, as per Dwg No. J28267/TD001                 | no             | 11       |        |          |
| 5.2.2           | PSGA 8.1.4                   | (b)i) Construction of Concrete Dished drain at Intersection complete, including excavation, trimming of sides, compaction and supply, placing compaction and finishing of concrete, as per Dwg No. J28267/TD001               | no             | 7        |        |          |
| 5.2.3           | PSGA 8.1.4                   | (b)ii) Construction of Concrete Link Drain through SW-SERVITUDES or P.O.S complete, including excavation, trimming of sides, compaction and supply, placing compaction and finishing of concrete, as per Dwg No. J28267/TD001 | no             | 29       |        |          |
| 5.2.4           | PSGA 8.1.5                   | Extra Over Items 5.2.1, 5.2.2, and 5.2.3 above for additional (20MPa/19mm) concrete, for lengths greater than those indicated on Typical Detail Dwg No. J28267/TD001  | m <sup>3</sup> | 10       |        |          |
| 5.3             | 1200DB                       | <b>STORMWATER PIPES AND STRUCTURES</b>  |                |          |        |          |
|                 | 8.3.2 PSD 8.3.2(b) PSD 8.3.6 | Excavate in all materials for trenches backfill and compact, incl. dispose of surplus materials for pipes:  |                |          |        |          |
| 5.3.1           |                              | (a) From 600 mm diameter upto 750 mm diameter for depths over and up to   |                | 0        |        |          |
| 5.3.1.1         |                              | i) 0.0 m      1.5 m   | m              | 377      |        |          |
| 5.3.1.2         |                              | ii) 1.5 m      2.0 m  | m              | 377      |        |          |
| CARRIED FORWARD |                              |   |                |          |        |          |

**NGCOBO EXTENSION 11 - INTERNAL SERVICES**  
**BILL 1 : INTERNAL CIVIL ENGINEERING SERVICES**  
**SECTION 5 : STORMWATER DRAINAGE (Internal)**

**BILL OF QUANTITIES**

| ITEM            | PAYMENT REFERS            | DESCRIPTION  | UNIT           | QUANTITY | RATE R | AMOUNT R  |
|-----------------|---------------------------|--|----------------|----------|--------|-----------|
| 5.3.1.3         |                           | BROUGHT FORWARD<br>iii) 2.0 m      2.5 m   | m              | 188      |        |           |
| 5.3.2           |                           | (b)From 900 mm diameter upto 1050 mm diameter for depths over and up to  |                |          |        |           |
| 5.3.2.1         |                           | i) 0.0 m      1.5 m  | m              | 116      |        |           |
| 5.3.2.2         |                           | ii) 1.5 m      2.0 m   | m              | 578      |        |           |
| 5.3.2.3         |                           | iii) 2.0 m      2.5 m  | m              | 462      |        |           |
| 5.3.3           | 8.3.2                     | b) Extra over Items 5.3.1 and 5.3.2 for (prov)   |                | 0        |        |           |
|                 |                           | i) Hard rock excavation  | m <sup>3</sup> | 500      |        |           |
| <b>5.4</b>      | <b>1200 LB PSLB 8.1.3</b> | <b>PROVISION OF BEDDING</b>  |                |          |        |           |
| 5.4.1           | 8.2.1                     | From trench (Within 0.5Km)   |                |          |        |           |
| 5.4.1.1         | PSLB 8.1.7                | i) Selected bedding material   | m <sup>3</sup> | 806      |        |           |
| 5.4.1.2         |                           | ii) Selected fill material   | m <sup>3</sup> | 1825     |        |           |
| 5.4.2           | 8.2.2.2                   | Imported from borrow pit on site or off site.  |                |          |        |           |
| 5.4.2.1         | PSLB 8.1.7                | i) Selected bedding material   | m <sup>3</sup> | 65       |        |           |
| 5.4.2.2         |                           | ii) Selected fill material   | m <sup>3</sup> | 203      |        |           |
| 5.4.3           | 8.2.2.3                   | Imported from commercial sources   |                |          |        |           |
| 5.4.3.1         | PSLB 8.1.7                | i) Selected bedding material   | m <sup>3</sup> | --       |        | Rate Only |
| 5.4.3.2         |                           | ii) G7 fill material for backfill under roads  | m <sup>3</sup> | 148      |        |           |
| 5.4.4           | 8.2.3                     | Concrete bedding (Provisional)   | m <sup>3</sup> | 5        |        |           |
| <b>5.5</b>      | <b>1200LE</b>             | <b>PIPES</b>   |                |          |        |           |
| 5.6             | 8.2.1                     | Supply, handle, lay, bed, as per Dwg No. J28267/TD001 for pipes under roadways, concrete pipes with ogee joints                            |                |          |        |           |
| 5.6.1           |                           | i) 600mm DIA Class 75D   | m              | 94       |        |           |
| 5.6.2           |                           | ii) 750mm DIA Class 75D  | m              | 25       |        |           |
| 5.6.3           |                           | iii) 900mm DIA Class 75D   | m              | 57       |        |           |
| 5.6.4           |                           | iv) 1050mm DIA Class 75D   | m              | 42       |        |           |
| 5.7             | 8.2.1                     | Supply, handle, lay, bed in class C bedding, as per Dwg No. J28267/TD001 for pipes not under roadways, concrete pipes with ogee joints.    |                |          |        |           |
| 5.7.1           |                           | i) 600mm DIA Class 25D   | m              | 507      |        |           |
| 5.7.2           |                           | ii) 750mm DIA Class 25D  | m              | 346      |        |           |
| 5.7.3           |                           | iii) 900mm DIA Class 25D   | m              | 767      |        |           |
| 5.7.4           |                           | iv) 1050mm DIA Class 25D   | m              | 289      |        |           |
| 5.8             | <b>PSLE 8.2.8</b>         | <b>MANHOLES and OUTLET STRUCTURES (Headwalls)</b><br><br>a) Construct Manhole/Junction Box as per Dwg.J28267/TD 002 for depths up to 2.0m. |                |          |        |           |
| CARRIED FORWARD |                           |  |                |          |        |           |

NGCOBO EXTENSION 11 - INTERNAL SERVICES  
 BILL 1 : INTERNAL CIVIL ENGINEERING SERVICES  
 SECTION 5 : STORMWATER DRAINAGE (Internal)

BILL OF QUANTITIES

| ITEM  | PAYMENT REFERS | DESCRIPTION  | UNIT           | QUANTITY | RATE R | AMOUNT R |
|---|----------------|--|----------------|----------|--------|----------|
| 5.8.1   |                | BROUGHT FORWARD<br>i) 1.0 - 1.5m Depth   | no             | 2        |        |          |
| 5.8.2   |                | ii) 1.5 - 2.0m Depth   | no             | 5        |        |          |
| 5.8.3   |                | b) Construct Side Inlet Manholes Type B as per Dwg. J28267/TD 002<br>i) 1.0 - 1.5m Depth                                 | no             | 10       |        |          |
| 5.8.4   |                | ii) 1.5 - 2.0m Depth   | no             | 23       |        |          |
| 5.8.5   |                | c) Construct complete as per Dwg No. J28267/TD002<br>(i) Outlet headwalls for pipe sizes up to 750 mm diameter           | no             | 10       |        |          |
| 5.8.6   |                | (ii) Outlet headwalls for pipe sizes greater than 750 mm diameter up to 1200   | no             | 7        |        |          |
| <b>5.9</b>  | <b>1200 DK</b> | <b>STONE PITCHING</b>  |                |          |        |          |
| 5.9.1   | 8.2.5          | Supply all materials and labour and construct light stone pitching at inlets and/or outlets where instructed by Engineer | m <sup>2</sup> | 5000     |        |          |
| <b>TOTAL FOR SECTION 5 CARRIED FORWARD TO SUMMARY</b> |                |  |                |          |        |          |

**NGCOBO EXTENSION 11 - INTERNAL SERVICES**  
**BILL 1 : INTERNAL CIVIL ENGINEERING SERVICES**  
**SECTION 6 : SEWER RETICULATION (INTERNAL)**

**BILL OF QUANTITIES**

| ITEM                   | PAYMENT REFERS                         | DESCRIPTION  | UNIT           | QUANTITY | RATE R | AMOUNT R |
|------------------------|--|--|----------------|----------|--------|----------|
| <b>6.1</b>             | <b>1200 DB</b>                         | <b>SITE CLEARANCE</b>  |                |          |        |          |
| 6.1.1                  | 8.3.1                                  | Clear and grub 3m strip for erf connections ONLY to approved areas off Site irrespective of haul distance.   | m              | 27629    |        |          |
| <b>6.2</b>             |  | <b>EXCAVATION</b>  |                |          |        |          |
|                        | 8.3.2<br>PSD 8.3.2<br>(b) PSD<br>8.3.6 | (a) Excavate in all materials for trenches, backfill, compact and dispose of surplus material, for pipes from 160mm to 250mm in diameter for depths: |                |          |        |          |
| 6.2.1                  |  | i) 0,0 m                      1,0 m  | m              | 1350     |        |          |
| 6.2.2                  |  | ii) 1,0 m                      2,0 m   | m              | 16000    |        |          |
| 6.2.3                  |  | iii) 2.0 m                      3.0 m  | m              | 850      |        |          |
|                        | 8.3.2                                  | (b) Extra-over items 5.2.1.1 to 5.2.1.4 inclusive for (provisional):   |                |          |        |          |
| 6.2.4                  |  | i) Hard rock excavation  | m <sup>3</sup> | 5000     |        |          |
| 6.2.5                  | 8.3.2                                  | (c) Excavate and dispose of unsuitable material from trench bottom (Provisional)   | m <sup>3</sup> | 1500     |        |          |
| <b>6.3</b>             |  | <b>EXCAVATION ANCILLARIES</b>  |                |          |        |          |
|                        | 8.3.3.3                                | Compaction in road reserves  |                |          |        |          |
| 6.3.1                  |  | i) Compaction to a minimum of 98% Mod. AASHTO density in all material  | m <sup>3</sup> | 960      |        |          |
|                        | 8.3.4                                  | Shore trench:<br>Exceeding    but not exceeding  |                |          |        |          |
| 6.3.2                  |  | i) 1,5 m                      2,0 m  | m              | 5500     |        |          |
| 6.3.3                  |  | ii) 2.0 m                      3.0 m   | m              | 5350     |        |          |
| <b>6.4</b>             | <b>1200 LB<br/>PSLB 8.1.3</b>          | <b>PROVISION OF BEDDING</b>  |                |          |        |          |
|                        | 8.2.1                                  | Available from trench within 0,5 km (Subclause 3.4.1)  |                |          |        |          |
| 6.4.1                  | PSLB 8.1.7                             | i) Selected granular material  | m <sup>3</sup> | 3500     |        |          |
| 6.4.2                  |  | ii) Selected fill material   | m <sup>3</sup> | 1500     |        |          |
|                        | 8.2.2.2                                | Available from Borrow Pits on or off site  |                |          |        |          |
| 6.4.3                  | PSLB 8.1.7                             | i) Selected granular material  | m <sup>3</sup> | 500      |        |          |
| 6.4.4                  |  | ii) Selected fill material   | m <sup>3</sup> | 500      |        |          |
|                        | 8.2.2.3                                | Imported from Commercial sources (Provisional)   |                |          |        |          |
| 6.4.5                  | PSLB 8.1.7                             | i) Selected granular material  | m <sup>3</sup> | 500      |        |          |
| 6.4.6                  | 8.2.3                                  | Concrete bedding (Provisional)   | m <sup>3</sup> | 500      |        |          |
| <b>6.5</b>             | <b>1200 LD</b>                         | <b>PIPEWORK</b>  |                |          |        |          |
|                        | PSLD 8.2.1                             | Supply, lay, joint, bed and test sewer pipes complete with couplings   |                |          |        |          |
| 6.5.1                  |  | (i) 160 mm diameter mainCore uPVC (Class 34)   | m              | 17710    |        |          |
| 6.5.2                  |  | (ii) 200 mm diameter mainCore uPVC (Class 34)  | m              | 372      |        |          |
| <b>CARRIED FORWARD</b> |  |  |                |          |        |          |

NGCOBO EXTENSION 11 - INTERNAL SERVICES  
 BILL 1 : INTERNAL CIVIL ENGINEERING SERVICES  
 SECTION 6 : SEWER RETICULATION (INTERNAL)

BILL OF QUANTITIES

| ITEM   | PAYMENT REFERS | DESCRIPTION  | UNIT           | QUANTITY | RATE R | AMOUNT R |
|--|----------------|--|----------------|----------|--------|----------|
| 6.6  | PSLD 8.2.3     | BROUGHT FORWARD<br><b>MANHOLES</b><br>Precast concrete manholes complete incl. Type 2A cover and frames as detailed on dwg J28267/TD101 over and up to |                |          |        |          |
| 6.6.1  |                | i) 1.0 m                      1.5 m  | No.            | 150      |        |          |
| 6.6.2  |                | ii) 1.5 m                      2.0 m   | No.            | 90       |        |          |
| 6.6.3  |                | iii) 2.0 m                      3.0 m  | No.            | 80       |        |          |
| 6.7  | PSLD 8.2.1     | <b>ERF CONNECTIONS</b><br>Supply, lay, joint, bed and test sewer erf connction for:  |                |          |        |          |
| 6.7.1  |                | 110 mm diameter uPVC sewer pipe  | No             | 1870     |        |          |
| 6.7.2  |                | Extra over Item 6.7.1 for excavating, supplying, bedding and laying 110mm diameter uPVC sewer pipes to house connections longer than 1m                | m              | 3000     |        |          |
| 6.7.7  | 8.2.8          | <b>SUNDRIES</b><br>Construct anchor blocks in 20 MPa concrete.   | m <sup>3</sup> | 50       |        |          |
| 6.7.8  | PSLD 8.2.11    | Connect to existing sewer  | m <sup>3</sup> | 2        |        |          |
| TOTAL FOR SECTION 6 CARRIED FORWARD TO SUMMARY |                |  |                |          |        |          |

**NGCOBO EXTENSION 11 - INTERNAL SERVICES**  
**BILL 1 : INTERNAL CIVIL ENGINEERING SERVICES**  
**SECTION 7 : WATER RETICULATION (INTERNAL)**

**BILL OF QUANTITIES**

| ITEM                   | PAYMENT REFERS                         | DESCRIPTION   | UNIT           | QUANTITY | RATE R | AMOUNT R  |
|------------------------|--|---|----------------|----------|--------|-----------|
| <b>7.1</b>             | <b>1200 DB</b>                         | <b>EXCAVATION</b>   |                |          |        |           |
|                        | 8.3.2<br>PSD 8.3.2<br>(b)<br>PSD 8.3.6 | (a) Excavate in all materials for trenches, backfill, compact and dispose of surplus material, for pipes from 75mm to 250mm in diameter for depths: |                |          |        |           |
| 7.1.1                  |  | ii) 1,0 m                      2.00 m   | m              | 20000    |        |           |
|                        |  | (b) Extra-over item 6.2.1 incl. for excavation in: (provisional)  |                |          |        |           |
| 7.1.2                  |  | i) Hard rock excavation   | m <sup>3</sup> | 4000     |        |           |
| 7.1.3                  |  | (c)Excavate and dispose of unsuitable material from trench bottom (Provisional)   | m <sup>3</sup> | 3300     |        |           |
| <b>7.2</b>             | <b>1200 LB<br/>PSLB 8.1.3</b>          | <b>PROVISION OF BEDDING</b>   |                |          |        |           |
|                        | 8.2.1                                  | Available from trench within 0,5 km (Subclause 3.4.1)   |                |          |        |           |
| 7.2.1                  | PSLB 8.1.7                             | i) Selected granular material   | m <sup>3</sup> | 1850     |        |           |
| 7.2.2                  |  | ii) Selected fill material  | m <sup>3</sup> | 4500     |        |           |
|                        | 8.2.2.2                                | Available from borrow pits on or off site.  |                |          |        |           |
| 7.2.3                  | PSLB 8.1.7                             | i) Selected granular material   | m <sup>3</sup> | 500      |        |           |
| 7.2.4                  |  | ii) Selected fill material  | m <sup>3</sup> | 500      |        |           |
|                        | 8.2.2.3                                | Imported from Commercial sources (Provisional)  |                |          |        |           |
| 7.2.5                  | PSLB 8.1.7                             | i) Selected granular material   | m <sup>3</sup> | 500      |        |           |
| 7.2.6                  | 8.2.3                                  | Concrete bedding (Provisional)  | m <sup>3</sup> | 500      |        |           |
| <b>7.3</b>             | <b>1200 L</b>                          | <b>PIPEWORK</b>   |                |          |        |           |
|                        | PSL 8.2.1                              | Supply, lay, bed, disinfect and test pipes complete with couplings. uPVC Class 9.   |                |          |        |           |
| 7.3.1                  |  | i) 250mm dia  | m              | 250      |        |           |
| 7.3.2                  |  | ii) 200mm dia   | m              | 450      |        |           |
| 7.3.3                  |  | iii) 160mm dia  | m              | 1000     |        |           |
| 7.3.4                  |  | iv) 110mm dia   | m              | 6500     |        |           |
| 7.3.5                  |  | v) 75mm dia   | m              | 11500    |        |           |
| <b>7.4</b>             |  | <b>SPECIALS AND FITTINGS</b>  |                |          |        |           |
|                        | 8.2.2                                  | Supply, lay, bed and joint specials and fittings, incl. cut pipes to length where required.<br><br>uPVC FITTINGS BENDS Class9                       |                |          |        |           |
| 7.4.1                  |  | i) 200mm dia 45 deg   | no             | 5        |        |           |
| 7.4.2                  |  | ii) 200mm dia 22,5 deg  | no             | 5        |        |           |
| 7.4.3                  |  | iii) 200mm dia 11,5 deg   | no             | 5        |        |           |
| 7.4.4                  |  | iv) 200mm dia 90 deg  | no             | --       |        | Rate Only |
| 7.4.5                  |  | v) 160mm dia 45 deg   | no             | 4        |        |           |
| 7.4.6                  |  | vi) 160mm dia 22,5 deg  | no             | 12       |        |           |
| 7.4.7                  |  | vii) 160mm dia 11,5 deg   | no             | 10       |        |           |
| <b>CARRIED FORWARD</b> |  |   |                |          |        |           |

**NGCOBO EXTENSION 11 - INTERNAL SERVICES**  
**BILL 1 : INTERNAL CIVIL ENGINEERING SERVICES**  
**SECTION 7 : WATER RETICULATION (INTERNAL)**

**BILL OF QUANTITIES**

| ITEM            | PAYMENT REFERS | DESCRIPTION  | UNIT | QUANTITY | RATE R | AMOUNT R  |
|-----------------|----------------|--|------|----------|--------|-----------|
| 7.4.8           |                | BROUGHT FORWARD<br>viii) 160mm dia 90 deg  | no   | --       |        | Rate Only |
| 7.4.9           |                | viv) 110mm dia 45 deg  | no   | 12       |        |           |
| 7.4.10          |                | x) 110mm dia 22,5 deg  | no   | 20       |        |           |
| 7.4.11          |                | xi) 110mm dia 11,5 deg   | no   | 5        |        |           |
| 7.4.12          |                | xii) 110mm dia 90 deg  | no   | 5        |        |           |
| 7.4.13          |                | xiii) 75mm dia 45deg   | no   | 10       |        |           |
| 7.4.14          |                | xiv) 75mm dia 22.5deg  | no   | 10       |        |           |
| 7.4.15          |                | xv) 75mm dia 11.5deg   | no   | 4        |        |           |
| 7.4.16          |                | xvi) 75mm dia 90deg  | no   | 8        |        |           |
| 7.5             |                | CI FITTINGS<br>EQUAL TEES  |      |          |        |           |
| 7.5.1           |                | i) 200 x 200   | no   | 4        |        |           |
| 7.5.2           |                | ii) 160 x 160  | no   | 1        |        |           |
| 7.5.3           |                | iii) 110 x 110   | no   | 35       |        |           |
| 7.5.4           |                | iv) 75 x 75  | no   | --       |        | Rate Only |
| 7.5.5           |                | REDUCINGS TEES<br>i) 200 x 160   | no   | 20       |        |           |
| 7.5.6           |                | ii) 160 x 110  | no   | 12       |        |           |
| 7.5.7           |                | iii) 110 x 75  | no   | 5        |        |           |
| 7.5.8           |                | iv) 200 x 75 (Hydrant)   | no   | 24       |        |           |
| 7.5.9           |                | v) 160 x 75 (Hydrant)  | no   | 12       |        |           |
| 7.5.10          |                | vi) 200 x 75 (Hydrant)   | no   | 49       |        |           |
| 7.5.11          |                | REDUCERS<br>i) 200 x 160   | no   | 4        |        |           |
| 7.5.12          |                | ii) 160 x 110  | no   | 4        |        |           |
| 7.5.13          |                | iii) 200 x 110   | no   | 3        |        |           |
| 7.5.14          |                | END CAPS<br>i) 200   | no   | --       |        | Rate Only |
| 7.5.15          |                | ii) 160  | no   | --       |        | Rate Only |
| 7.5.16          |                | iii) 110   | no   | 4        |        |           |
| 7.5.17          |                | iv) 75   | no   | 4        |        |           |
| 7.6             |                | <b>VALVES</b>  |      |          |        |           |
|                 | 8.2.3          | Supply, install on concrete support, joint, incl cut pipes where necessary, test : Resilient seal valves, double socketed, anti-clockwise closing, with capped top and non-rising spindle class 10 |      |          |        |           |
| 7.6.1           |                | i) 200mm dia   | no   | 20       |        |           |
| 7.6.2           |                | ii) 160mm dia  | no   | 16       |        |           |
| 7.6.3           |                | iii) 110mm dia   | no   | 70       |        |           |
| CARRIED FORWARD |                |  |      |          |        |           |

**NGCOBO EXTENSION 11 - INTERNAL SERVICES**  
**BILL 1 : INTERNAL CIVIL ENGINEERING SERVICES**  
**SECTION 7 : WATER RETICULATION (INTERNAL)**

**BILL OF QUANTITIES**

| ITEM  | PAYMENT REFERS        | DESCRIPTION   | UNIT           | QUANTITY | RATE R | AMOUNT R |
|---|-----------------------|---|----------------|----------|--------|----------|
| 7.6.4   | 8.2.3                 | BROUGHT FORWARD<br>iv) 75mm dia   | no             | 12       |        |          |
| 7.6.5   |                       | Supply, install on concrete support, joint, incl cut pipes where necessary, test : Sluice Type Hydrant Valves   | no             | 24       |        |          |
| 7.6.6   |                       | ii) 160mm dia   | no             | 12       |        |          |
| 7.6.7   |                       | iii) 110mm dia  | no             | 49       |        |          |
| 7.7   |                       | ANCILLARIES   |                |          |        |          |
|   | 8.2.11                | Anchor/Trust blocks and pedestals   |                |          |        |          |
| 7.7.1   |                       | i) Concrete class 20Mpa/19mm  | m <sup>3</sup> | 15       |        |          |
|   | 8.2.13                | VALVE CHAMBERS AND MANHOLES:  |                |          |        |          |
| 7.7.2   |                       | i) Valve chamber  | no             | 118      |        |          |
| 7.7.3   |                       | ii) Hydrant chamber inclusive of 70mm underground type hydrant with 104mm bayonet lug connections and 300mm long flanged CI distance piece complete as per drawing J28267/TD201.  | no             | 85       |        |          |
| 7.8   | 1200 LF<br>PSLF 8.2.1 | <b>ERF CONNECTIONS (WATER)</b><br>Various erf connections complete as per drawing J28267/TD201. Rate to include for supply of all material, all excavation, connecting to the water main, laying in light sandy material, jointing, backfilling, testing and completing the service connection. |                |          |        |          |
| 7.8.1   |                       | i) Single erf connections, on same side of the road complete  | no             | 18       |        |          |
| 7.8.2   |                       | ii) Single erf connections on opposite side of the 3m road complete   | no             | 83       |        |          |
| 7.8.3   |                       | iii) Single erf connections on opposite side of the 5m road complete  | no             | 22       |        |          |
| 7.8.4   |                       | iv) Double erf connections, on same side of the road complete   | no             | 70       |        |          |
| 7.8.5   |                       | v) Double erf connections on opposite side of the 3m road complete  | no             | 332      |        |          |
| 7.8.6   |                       | vi) Double erf connections on opposite side of the 5m road complete   | no             | 88       |        |          |
| 7.8.7   | PSLF 8.2.4            | Meters complete with couplings, ball valve and stop tap (supply only)   | no             | 1854     |        |          |
| <b>TOTAL FOR SECTION 7 CARRIED FORWARD TO SUMMARY</b> |                       |   |                |          |        |          |

BILL 2 : PUMP STATION

SECTION 1 : SEWER PUMP STATIONS

| ITEM            | PAYMENT REFERS | DESCRIPTION   | UNIT           | QUANTITY | RATE R | AMOUNT R |
|-----------------|----------------|---|----------------|----------|--------|----------|
| 1.1             | SANS 1200D     | As specified in SANS 1200D and in project specification<br><b>EARTHWORKS</b>  |                |          |        |          |
|                 |                | EXCAVATION  |                |          |        |          |
| 1.2             | 8.3.1.2        | Remove topsoil to nominal depth 150mm, stockpile, and maintain  | m <sup>2</sup> | 500      |        |          |
| 1.3             | 8.3.2(a)       | Excavate in all materials and place within freehaul distance for levelling site   | m <sup>3</sup> | 400      |        |          |
|                 | 8.3.3          | <b>RESTRICTED EXCAVATION</b>  |                |          |        |          |
| 1.3.1           |                | Excavate in all materials for structures and use material for backfill or embankments or dispose of and level on designated areas as instructed | m <sup>3</sup> | 600      |        |          |
| 1.3.2           | 8.3.5          | Extra excavation in all material to provide working space for outside formwork  | m <sup>2</sup> | 230      |        |          |
| 1.3.3           | 8.3.9          | Extra over item 7.1.1 for backfill or fill material against structures compacted to 93% mod AASHTO density as per PSD 5.2.3                     | m <sup>3</sup> | 500      |        |          |
| 1.3.4           |                | Backfill and compact with stabilized backfill under valve chamber in layers not exceeding 95% Mod AASHTO density.                               | m <sup>3</sup> | 100      |        |          |
| 1.4             |                | <b>POND LAYERWORKS</b>  |                |          |        |          |
|                 |                | Treatment of insitu material  |                |          |        |          |
| 1.4.1           |                | Scarify insitu layer to a depth of 150mm and compact to a minimum of 93% Mod AASHTO density   | m <sup>3</sup> | 40       |        |          |
|                 | 1200ME         | Selected Layer  |                |          |        |          |
| 1.4.2           |                | Construct 150mm G7 gravel selected layer and compact to a minimum of 95% Mod AASHTO density   | m <sup>3</sup> | 40       |        |          |
|                 | SANS 1200G     | <b>CONCRETE (STRUCTURAL)</b>  |                |          |        |          |
|                 |                | As specified in SANS 1200G and in the project specification   |                |          |        |          |
| 1.5             | 8.2            | <b>FORMWORK</b>   |                |          |        |          |
| 1.5.1           | 8.2.2          | Smooth - straight, vertical   | m <sup>2</sup> | 410      |        |          |
| 1.5.2           | 8.2.2          | To siffit slabs   | m <sup>2</sup> | 60       |        |          |
| 1.5.3           | 8.7            | Box out holes/ form voids   | No             | 6        |        |          |
| 1.6             | 8.3            | <b>REINFORCEMENT</b>  |                |          |        |          |
| 1.6.1           | 8.3.1          | Mild steel bars   | t              | 10       |        |          |
| 1.6.2           | 8.3.1          | High tensile steel bars   | t              | 28       |        |          |
| 1.6.3           | 8.3.2          | High tensile welded mesh  |                |          |        |          |
| 1.6.4           |                | Ref 193 welded mesh in standard 6.0m x 2.4m   | m <sup>2</sup> | 420      |        |          |
| 1.7             | 8.4            | <b>STRENGTH CONCRETE</b>  |                |          |        |          |
|                 |                | Class 15/19 mass concrete   |                |          |        |          |
| CARRIED FORWARD |                |   |                |          |        |          |

## BILL 2 : PUMP STATION

## SECTION 1 : SEWER PUMP STATIONS

| ITEM            | PAYMENT REFERS   | DESCRIPTION  | UNIT           | QUANTITY | RATE R | AMOUNT R  |
|-----------------|------------------|--|----------------|----------|--------|-----------|
| 1.7.1           | 8.4.2            | BROUGHT FORWARD<br>In blinding layers nominally 50mm thick   | m <sup>3</sup> | 10       |        |           |
| 1.7.2           | 8.4.3            | Class 35/19 reinforced concrete with ordinary portland cement for water retaining structures   | m <sup>3</sup> | 250      |        |           |
| 1.8             | 8.4.4            | <b>UNFORMED SURFACE FINISHES</b>   |                |          |        |           |
| 1.8.1           | 8.4.4(a)         | Broom finish to floor  | m <sup>2</sup> | 508      |        |           |
| 1.9             |                  | <b>MISCELLANEOUS</b>   |                |          |        |           |
| 1.9.1           |                  | Supply, deliver and install as indicated on the drawing 75mm diameter uPVC cable ducting   | Sum            | 1        |        |           |
| 1.9.2           |                  | Supply, deliver and cast into pump station roof slab, 900mm x 600mm standard Basaans Type 9E lockable manhole hinged cover and frame               | No             | 8        |        |           |
| 1.10            |                  | Supply, fabricate and cast into pump station roof slab an HDG Frame and lid as detailed on drawing   | No             | 4        |        |           |
| 1.11            |                  | Supply, deliver and install 300 x 300 mm S/S Gereg Wall mounted sluice gates with rising spindle with neoprene J-seals and adjustable wedges       | No             | 6        |        |           |
| 1.12            | 1200HA<br>8.3.1  | Supply, deliver and install HDG I-254x146x31 crawl beam and columns as per the drawings  | t              | 2        |        |           |
| 1.13            |                  | Proof test crawl beam to 1.0 ton and supply test certificate to the Engineer. Also allow for painting the maximum allowable load on the crawl beam | No             | 2        |        |           |
| 1.14            |                  | Supply deliver and install a 1 ton rated yale chain hoist model YALELIFT 360.  | No             | 2        |        |           |
| 1.15            | 1200 LD<br>8.2.3 | Manholes complete with Type 4 cover and frame, for depths<br>over and up to  |                |          |        |           |
| 1.15.1          |                  | 1.0m 1.5 m   | No.            | --       |        | Rate Only |
| 1.15.2          |                  | 1.5 m 2.0 m  | No.            | 2        |        |           |
| 1.2             |                  | <b>STILLING CHAMBER</b>  |                |          |        |           |
|                 | SANS<br>1200D    | As specified in SANS 1200D and in project specification  |                |          |        |           |
| 1.2.1           |                  | <b>EARTHWORKS</b><br>EXCAVATION  |                |          |        |           |
| 1.2.2           | 8.3.1.2          | Remove topsoil to nominal depth 150mm, stockpile, and maintain   | m <sup>2</sup> | 50       |        |           |
|                 | 8.3.3            | RESTRICTED EXCAVATION  |                |          |        |           |
| 1.2.2.1         |                  | Excavate in all materials for structures and use material for backfill or embankments or dispose of and level on designated areas as instructed    | m <sup>3</sup> | 30       |        |           |
| CARRIED FORWARD |                  |  |                |          |        |           |

BILL 2 : PUMP STATION

SECTION 1 : SEWER PUMP STATIONS

| ITEM            | PAYMENT REFERS | DESCRIPTION  | UNIT           | QUANTITY | RATE R | AMOUNT R  |
|-----------------|----------------|--|----------------|----------|--------|-----------|
|                 |                | <b>BROUGHT FORWARD</b>   |                |          |        |           |
| 1.2.2.2         | 8.3.5          | Extra excavation in all material to provide working space for outside formwork   | m <sup>2</sup> | 50       |        |           |
| 1.2.2.3         | 8.3.9          | Extra over item 1.2.2.1 for backfill or fill material against structures compacted to 93% mod AASHTO density as per PSD 5.2.3        | m <sup>3</sup> | 100      |        |           |
|                 | SANS 1200G     | <b>CONCRETE (STRUCTURAL)</b>   |                |          |        |           |
|                 |                | As specified in SANS 1200G and in the project specification  |                |          |        |           |
| 1.2.3           | 8.2            | <b>FORMWORK</b>  |                |          |        |           |
| 1.2.3.1         | 8.2.2          | Smooth - straight, vertical  | m <sup>2</sup> | 90       |        |           |
| 1.2.3.2         | 8.2.2          | To siffit slabs  | m <sup>2</sup> | 11       |        |           |
| 1.2.3.3         | 8.7            | Box out holes/ form voids  | No             | 6        |        |           |
| 1.2.4           | 8.3            | <b>REINFORCEMENT</b>   |                |          |        |           |
| 1.2.4.1         | 8.3.1          | Mild steel bars  | t              | 0.4      |        |           |
| 1.2.4.2         | 8.3.1          | High tensile steel bars  | t              | 2        |        |           |
| 1.2.4.3         | 8.3.2          | High tensile welded mesh   |                |          |        |           |
| 1.2.4.4         |                | Ref 193 welded mesh in standard 6.0m x 2.4m  | m <sup>2</sup> | 12       |        |           |
| 1.2.5           | 8.4            | <b>STRENGTH CONCRETE</b>   |                |          |        |           |
|                 |                | Class 15/19 mass concrete  |                |          |        |           |
| 1.2.5.1         | 8.4.2          | In blinding layers nominally 50mm thick  | m <sup>3</sup> | 12       |        |           |
| 1.2.5.2         | 8.4.3          | Class 35/19 reinforced concrete with ordinary portland cement for water retaining structures   | m <sup>3</sup> | 16       |        |           |
| 1.2.6           | 8.4.4          | <b>UNFORMED SURFACE FINISHES</b>   |                |          |        |           |
| 1.2.6.1         | 8.4.4(a)       | Broom finish to floor  | m <sup>2</sup> | 24       |        |           |
| 1.2.7           |                | <b>MISCELLANEOUS</b>   |                |          |        |           |
| 1.2.7.1         |                | Supply, deliver and cast into pump station roof slab, 900mm x 600mm standard Basaans Type 9E lockable manhole hinged cover and frame | No             | 4        |        |           |
| 1.3             | 1200 LD 8.2.3  | Manholes complete with Type 4 cover and frame over existing 450mm diameter sewer line, for depths over and up to                     |                |          |        |           |
| 1.3.1           |                | 2.0 m 2.5 m  | No.            | 6        |        |           |
| 1.4             | 1200DB         | <b>EARTHWORKS : (PIPE TRENCHES)</b>  |                |          |        |           |
|                 |                | As specified in SABS 1200DB and in the Project Specifications  |                |          |        |           |
|                 | 8.3.2          | a) Excavate in all materials for trenches, backfill, compact and dispose of surplus material, for pipes:                             |                |          |        |           |
|                 |                | <b>iii) 300mm diameter for depths:</b>   |                |          |        |           |
| 1.4.1           |                | a) 0m up to and including 1m   | m              | --       |        | Rate Only |
| CARRIED FORWARD |                |  |                |          |        |           |

BILL 2 : PUMP STATION

SECTION 1 : SEWER PUMP STATIONS

| ITEM   | PAYMENT REFERS | DESCRIPTION   | UNIT           | QUANTITY | RATE R | AMOUNT R |
|--|----------------|---|----------------|----------|--------|----------|
|  |                | BROUGHT FORWARD   |                |          |        |          |
| 1.4.2  |                | c) Over 2m up to and including 3m   | m              | 16       |        |          |
| 1.4.3  |                | ii) Hard rock excavation  | m <sup>3</sup> | 4        |        |          |
| 1.4.4  |                | c) Excavation and dispose of unsuitable material in trench bottom           | m <sup>3</sup> | 4        |        |          |
| 1.4.5  | PSDB 8.3.2     | <b>d) Extra over item 8.1.1 to 8.1.10 for hand excavations where orderd</b> | m <sup>3</sup> | 4        |        |          |
|  | 8.3.3          | Excavation ancillaries  |                |          |        |          |
|  | 8.3.3.1        | Make up deficiency in backfill material                                     |                |          |        |          |
| 1.4.6  |                | a) From other necessary excavations on site                                 | m <sup>3</sup> | 8        |        |          |
|  | 8.2.2.2        | From trench excavations   |                |          |        |          |
| 1.4.7  |                | a) Selected granular material   | m <sup>3</sup> | 6        |        |          |
| 1.4.8  |                | b) Selected fill material   | m <sup>3</sup> | 3        |        |          |
|  | 8.2.2.3        | From commercial or off-site sources   |                |          |        |          |
| 1.4.9  |                | a) Selected granular material   | m <sup>3</sup> | 6        |        |          |
| 1.4.10   |                | b) Selected fill material   | m <sup>3</sup> | 3        |        |          |
| 1.5  | 1200 LD        | SEWER   |                |          |        |          |
|  |                | As specified in SANS 1200LD and in the Project Specification                |                |          |        |          |
|  | PSLD 8.2.1     | Supply, lay, joint and bed on bedding for flexible pipes and test:          |                |          |        |          |
|  |                | a) UPVC sewer pipes as specified complete with joints for:                  |                |          |        |          |
| 1.5.1  |                | iii) 300mm Ø  | m              | 16       |        |          |
| TOTAL FOR SECTION 1 CARRIED FORWARD TO SUMMARY |                |   |                |          |        |          |

BILL 2 : PUMP STATION

SECTION 2 : SEWER RISING MAIN 1& 2

| ITEM            | PAYMENT REFERS  | DESCRIPTION   | UNIT           | QUANTITY | RATE R | AMOUNT R |
|-----------------|-----------------|---|----------------|----------|--------|----------|
| 2.1             | SANS 1200DB     | <b>EARTHWORKS (PIPE TRENCHES)</b>   |                |          |        |          |
|                 |                 | <b>Excavation</b>   |                |          |        |          |
|                 | 8.3.2 PSDB 1    | a) Excavate in all materials for trenches, backfill compact and dispose of surplus or unsuitable material for pipes up to and including 75mm dia. for depths: |                |          |        |          |
| 2.1.1           |                 | exceeding 0.00m up to 1.0m  | m              | 100      |        |          |
| 2.1.2           |                 | exceeding 1.0m up to 2.0m   | m              | 2265     |        |          |
| 2.1.3           |                 | Extra over items 6.1.1 to 6.1.2 for excavation in hard rock material  | m <sup>3</sup> | 210      |        |          |
| 2.1.4           | 8.3.2(c)        | Excavate and dispose of unsuitable material in trench bottom  | m <sup>3</sup> | 120      |        |          |
|                 | 8.3.3(a)        | Excavation Ancillaries  |                |          |        |          |
|                 | 8.3.3.1         | Make up deficiency in backfill material   |                |          |        |          |
| 2.1.5           |                 | From other necessary excavation on site   | m <sup>3</sup> | 330      |        |          |
| 2.2             | SANS 1200LB     | <b>BEDDING</b>  |                |          |        |          |
|                 | PSLB            | <b>As specified in SANS 1200LB and the project specification</b>  |                |          |        |          |
|                 | 8.2.2           | Provision of bedding by importation   |                |          |        |          |
|                 | 8.2.2.2         | <b>From trench excavation</b>   |                |          |        |          |
| 2.2.1           |                 | Selected granular material  | m <sup>3</sup> | 50       |        |          |
| 2.2.2           |                 | Selected fill material  | m <sup>3</sup> | 50       |        |          |
|                 | 8.2.2.3         | <b>From commercial or off site sources</b>  |                |          |        |          |
| 2.2.3           |                 | Selected granular material  | m <sup>3</sup> | 740      |        |          |
| 2.2.4           |                 | Selected fill material  | m <sup>3</sup> | 350      |        |          |
| 2.3             | SANS 1200L      | <b>MEDIUM PRESSURE PIPELINES</b>  |                |          |        |          |
|                 |                 | <b>As specified in SANS 1200L and in Project specification</b>  |                |          |        |          |
| 2.3.1           |                 | uPVC Pipes  |                |          |        |          |
|                 | 8.2.1 PSL 8.2.1 | Supply, lay, bed with bedding for flexible pipes and test uPVC Class 9 pipes complete with couplings  |                |          |        |          |
| 2.3.1.1         |                 | 250mm diameter class 9 uPVC pressure pipes  | m              | 2365     |        |          |
| 2.3.2           |                 | Anchor/Thrust Blocks and Pedestals  |                |          |        |          |
| 2.3.2.1         |                 | Thrust Blocks   | m <sup>3</sup> | 8        |        |          |
| 2.4             |                 | <b>VALVES</b>   |                |          |        |          |
| 2.4.1           |                 | 50mm Flanged "SAAR" A.R.I. D-026 combination airvalve for sewage  | No             | 4        |        |          |
| 2.5             |                 | <b>VALVE CHAMBERS</b>   |                |          |        |          |
|                 |                 | Provide all materials and construct chambers complete   |                |          |        |          |
| CARRIED FORWARD |                 |   |                |          |        |          |

BILL 2 : PUMP STATION

SECTION 2 : SEWER RISING MAIN 1& 2

| ITEM   | PAYMENT REFERS | DESCRIPTION  | UNIT | QUANTITY | RATE R | AMOUNT R |
|--|----------------|--|------|----------|--------|----------|
| 2.5.1  |                | BROUGHT FORWARD<br>Precast chamber and cover slab for air valves | No   | 4        |        |          |
| TOTAL FOR SECTION 2 CARRIED FORWARD TO SUMMARY |                |  |      |          |        |          |

BILL 2 : PUMP STATION

SECTION 3 : SEWAGE PUMPS - ELECTRO AND MECHANICAL

| ITEM            | PAYMENT REFERS | DESCRIPTION  | UNIT | QUANTITY | RATE R | AMOUNT R  |
|-----------------|----------------|--|------|----------|--------|-----------|
| 3.1             |                | <b>PUMP STATION</b>  |      |          |        |           |
| 3.1.1           |                | <b>GENERAL ITEMS</b>   |      |          |        |           |
|                 |                | <b>Preliminary and General</b>   |      |          |        |           |
| 3.1.1.1         |                | <b>Contractual Items</b>   |      |          |        |           |
| 3.1.1.2         | PSSP9          | Allowance for twelve (12) months Maintenance Period during defects Liability   | Sum  | 1        |        |           |
| 3.1.1.3         | PSSP7.3        | Provision of Electrical Compliance Certificate   | Sum  | 1        |        |           |
| 3.1.1.4         | PSSP8.1        | Provision of Operating Instructions and Record Drawings  | Sum  | 1        |        |           |
| 3.1.2           |                | <b>MECHANICAL EQUIPMENT</b>  |      |          |        |           |
| 3.1.2.1         | PSTD4          | <b>Pumpsets (Provisional)</b>  |      |          |        |           |
|                 | PSSP2.3        | Pumpsets: (Duty/Standby Pumps)   | No   | 2        |        |           |
| 3.1.2.2         |                | <b>Pumps (Provisional)</b>   |      |          |        |           |
| 3.1.2.3         |                | S/S Foot fixed to pump for non fixed placing in the sump. Foot to be sized to ensure effective suction of sewage into the pump                                       | No   | 4        |        |           |
| 3.1.2.4         |                | Lifting chain, Stainless Steel rated up to 1000kg  | m    | 10       |        |           |
| 3.1.2.5         | PSSP2.4        | Alternative Pump:-   |      | 0        |        |           |
| 3.1.2.5.1       |                | State Make & Model.....  | No   | --       |        | Rate Only |
|                 |                | State Rotational Speed..... RPM  |      |          |        |           |
| 3.1.2.6         | PSSP4          | <b>Piping:</b>   |      |          |        |           |
| 3.1.2.6.1       |                | 250mm diameter Truco 25 bar reinforced flexible rubber hose with quick coupling designed for 16 bar pressure to connect truco pipe to cast in GMS puddle flange pipe | m    | 24       |        |           |
| 3.1.2.6.2       |                | 250mm diameter quick coupling designed for 16 bar pressure to connect truco pipe to cast in GMS puddle flange pipe   | No   | 4        |        |           |
|                 | PSSP4.3        | Hot Dipped Galvanised piping - flanged to SANS 1123 - Table 10   |      |          |        |           |
|                 |                | Delivery Side Piping etc, as per Drawing No J28267 TD020 and TD030   |      |          |        |           |
| 3.1.2.7         |                | 664mm long 250mm diameter HDG flanged at one end with quick coupling fitting on the other end puddle pipe  | No   | 4        |        |           |
| 3.1.2.8         |                | 250mm diameter flanged HDG 90 degree bend  | No   | 6        |        |           |
| 3.1.2.9         |                | 500mm Long x 250mm diameter GMS flanged straight pipe  | No   | 2        |        |           |
| 3.1.2.10        |                | 250mm diameter HDG cross special   | No   | 2        |        |           |
| 3.1.2.11        |                | 1122mm Long x 150mm diameter HDG flanged at one end only puddle pipe   | No   | 2        |        |           |
| CARRIED FORWARD |                |  |      |          |        |           |

BILL 2 : PUMP STATION

SECTION 3 : SEWAGE PUMPS - ELECTRO AND MECHANICAL

| ITEM            | PAYMENT REFERS   | DESCRIPTION  | UNIT | QUANTITY | RATE R     | AMOUNT R   |
|-----------------|------------------|--|------|----------|------------|------------|
| 3.1.2.12        |                  | BROUGHT FORWARD<br>205mm long x 250mm x 150mm diameter HDG flanged reducer   | No   | 4        |            |            |
| 3.1.2.13        |                  | 295mm long x 250mm diameter HDG flanged at one end only straight pipe  | No   | 2        |            |            |
| 3.1.2.14        |                  | 600mm long x 250mm diameter HDG flanged at one end only straight puddle pipe   | No   | 4        |            |            |
| 3.1.2.15        |                  | 540mm long x 250mmØ flanged steel/uPVC adaptor   | No   | 2        |            |            |
| 3.1.2.16        |                  | 250mm diameter klamflex coupling   | No   | 2        |            |            |
| 3.1.2.17        | PSSP6            | <b>Valves:<br/>Class 16 valves:-</b>   |      |          |            |            |
| 3.1.2.18        |                  | 250mm diameter flanged AVK gate valve with rising stem   | No   | 4        |            |            |
| 3.1.2.19        |                  | 250mm diameter AVK flanged ball check valve series 53/35 PN16  | No   | 4        |            |            |
| 3.1.2.20        |                  | 150mm diameter flanged AVK gate valve with rising stem   | No   | 2        |            |            |
| 3.1.2.21        |                  | <b>Sundries:</b>   |      |          |            |            |
| 3.1.2.22        |                  | All joint sets, anchors and fixing not measured  | Sum  | 1        |            |            |
| 3.1.2.23        | PSSP8.2<br>PSSP9 | Commissioning and testing of all mechanical equipment  | Sum  | 1        |            |            |
| 3.1.2.24        | PSSP9            | Hand-over to the Client, including demonstrating all operational aspects   | Sum  | 1        |            |            |
| 3.1.2.25        | PSSP8.1          | Maintenance & Operational Manuals  | Sets | 1        |            |            |
| 3.1.2.26        |                  | 150mm diameter flanged in-line macerator; 2.2kW motor standard; 25-1 reducer; tungstor carbideface seal cartridges; 120mm diameter cutters: sea; working pressure up to 6.0 bars | No   | 2        |            |            |
| 3.1.3           |                  | <b>ELECTRICAL EQUIPMENT</b>  |      |          |            |            |
| 3.1.3.1         |                  | <b>Low Voltage Cables:</b><br>Low Voltage (600 / 1000V) Cables, including terminations Supply, delivery & installation of PVC/SWA/PVC cables                                     |      |          |            |            |
| 3.1.3.2         |                  | Main Electricity installation includes new 200kVA transformer installation complete including supply and installation (nominated sub-contractor)                                 | PSum | 1        | 450 000.00 | 450 000.00 |
| 3.1.3.3         |                  | Overhead charges and profit on item 3.2.3.2  | %    | 450000   |            |            |
| 3.1.3.4         | PSSP7.2          | Mains Power Supply from Supply Point kiosk into switchboard including trenching, cable route makers etc.   | Psum | 1        | 110 000.00 | 110 000.00 |
| 3.1.3.5         | PSSP7.5          | Signal Cables to float switches in sump, in 1,5 squ. 4-core and in 20mm galv steel conduit   | m    | 30       |            |            |
| 3.1.3.6         |                  | <b>Switchboard:</b>  |      |          |            |            |
| CARRIED FORWARD |                  |  |      |          |            |            |

BILL 2 : PUMP STATION

SECTION 3 : SEWAGE PUMPS - ELECTRO AND MECHANICAL

| ITEM   | PAYMENT REFERS | DESCRIPTION   | UNIT | QUANTITY | RATE R     | AMOUNT R   |
|--|----------------|---|------|----------|------------|------------|
| 3.1.3.7  | PSSP7.1        | BROUGHT FORWARD<br>Electrical Switchboard containing all control switchgear, pump starters and instrumentation  | Sum  | 2        |            |            |
| 3.1.3.8  | PPSP7.1        | Supply and install Telemetry system to control the pumping sequence between two pump stations   | PSum | 1        | 220 000.00 | 220 000.00 |
| 3.1.3.9  |                | Overhead charges and profit on item 3.1.3.8   | %    | 220000   |            |            |
| 3.1.3.10                                       |                | <b>Float Switches:</b>  |      |          |            |            |
| 3.1.3.11                                       | PSSP7.5        | Supply and install float switch in sumps.   | No   | 8        |            |            |
| 3.1.3.12                                       |                | <b>Testing &amp; Commissioning</b>  |      |          |            |            |
| 3.1.3.13                                       | PSSP8.2        | Allow for testing & commissioning of electrical plant.  | Sum  | 1        |            |            |
| 3.1.3.14                                       | PSSP8.2        | Allow for demonstrating operation of electrical equipment & completed installation to the Client  | Sum  | 1        |            |            |
| 3.1.3.15                                       |                | <b>Earthing:</b>  |      |          |            |            |
| 3.1.3.16                                       | PMS7.1         | Earthing to standards laid down in terms of OHS Act   | Sum  | 1        |            |            |
| 3.2  | <b>PSMM</b>    | <b>ANCILLARY WORKS / FENCING</b>  |      |          |            |            |
| 3.2.1  | PSMM 8.5 (a)   | Security  |      |          |            |            |
|  |                | Supply, install and make good fencing to perimeter of pump station, including concrete bases, gates etc. See attached drawing No. J28267C/TD080 Fencing details | PSum | 1        | 250 000.00 | 250 000.00 |
| 3.2.2  | PSMM 8.5 (b)   | Overhead charges and profit on item 3.2.1   | %    | 250000   |            |            |
| TOTAL FOR SECTION 3 CARRIED FORWARD TO SUMMARY |                |   |      |          |            |            |

**BILL 1 : INTERNAL CIVIL ENGINEERING SERVICES**

| <b>SECTION</b> | <b>DESCRIPTION</b>                                 | <b>AMOUNT<br/>R</b> |
|----------------|--|---------------------|
| 1              | GENERAL  | R                   |
| 2              | SITE CLEARANCE                                     | R                   |
| 3              | ROADWORKS - INTERNAL ROADS: 5m WIDE & ACCESS ROUTE | R                   |
| 4              | ROADWORKS - INTERNAL ROADS: 3m WIDE                | R                   |
| 5              | STORMWATER DRAINAGE (Internal)                     | R                   |
| 6              | SEWER RETICULATION (INTERNAL)                      | R                   |
| 7              | WATER RETICULATION (INTERNAL)                      | R                   |
|                | <b>TOTAL BILL 1</b>                                | R                   |

**BILL 2 : PUMP STATION**

| SECTION | DESCRIPTION                           | AMOUNT<br>R |
|---------|---------------------------------------|-------------|
| 1       | SEWER PUMP STATIONS                   | R           |
| 2       | SEWER RISING MAIN 1& 2                | R           |
| 3       | SEWAGE PUMPS - ELECTRO AND MECHANICAL | R           |
|         | TOTAL BILL 2                          | R           |