

## **ANNEXURE A**

# TRANSNET SOC LIMITED (REGISTRATION NO. 1990/000900/30) Trading as Transnet Freight Rail (hereinafter referred to as TFR)

#### **BLE/52440**

## **Project Specification**

## THE MODIFICATION AND REPLACEMENT OF ASBESTOS WATER RETICULATION AT WORCESTER MARSHALLING YARD AND FACILITIES

#### 1. Scope of Work:

The work required shall be to replace and modify the water reticulation of approximately 2500m at Worcester Marshalling Yard and Facilities.

The work shall be carried out in accordance with this specification and the drawings with special reference to the South African Bureau of Standards (SABS) 1200. The particular SABS 1200 sections to consider are DB; L; LB and LD. Furthermore, the Code of Practice SABS 0120 and Special report number 35 "Pipe Laying Principles" published by HMSO to British Codes of Practice must be followed.

Only skilled and competent artisans shall take charge of the lying and jointing of the works. This incumbent shall be **registered with PIRB** plumbing industry registration board.

## Class of pipe to be used:

The water pipe shall be:

- Modified mPVC with the manufacturing and testing procedures complying with SABS 966/1976 to class 9 (9 bar) including fittings to suit.
- High Density Polyethylene (HDPE) Pipe shall have a density of not less than 0,949 grams /cm<sup>3</sup> and shall be manufactured in accordance with SABS Specification number 533 including HDPE type compression fittings to suite (nylon insert fittings will not be permitted).
- Mild Steel Pipe and fittings shall be galvanised mild steel of medium class solid drawn seamless
  with screw ends including galvanising both inside and outside complying with SABS 62 "steel pipe
  and pipe fittings....for screwing to ISO.R7 pipe thread." The water fittings shall be malleable cast-

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iron fittings to SABS 509. The joints shall be sealed with jointing compound and hemp to give a water tight joint. Any exposed joint shall be sealed with "Denso" tape or other approved means.

The pipes shall be fixed to the walls/culvert with clamps as "O-Line" systems using channel trunking as "Olistrut" (OL1000) 300mm long channel complete with SS series clamps to suit pipe size, including nuts and bolts and all components shall be hot dipped galvanised to SABS 943 medium duty. The anchor bolts to each channel shall be 10mm diameter by 80mm expansion bolt and fixed into the solid section of the concrete wall.

 "Polycop" piping shall be the standard domestic pipe as approved by "JASWIC" and including compression fittings to suit.

#### 2. Site Establishment:

No facilities will be necessary for the employer's (TFR) staff but an office/room with a table and chair will be necessary for the documents, drawings, the daybook (diary) and site instruction book for reference and engineering input.

The facilities for the contractor shall be at the contractor's discretion but shall not be less than that as prescribed by law and to ensure that the standards required are met.

#### 3. Excavations:

The contractor must allow for clearance of the site to be excavated to a width associated to the depth required for proper excavation of the pipe. Excavate to reduced levels to suit layout as indicated on the plan or as per the site instruction if deviated from the drawings and to optimum depth and width. Any over excavation shall be to the contractor costs. Allow for the necessary de-watering and shoring to ensure that no collapse of the trenches shall occur especially when working near to the track. Further allow for barriers and caution tape along the trench to caution and protect the employer's and patrons.

The water line shall be laid as follows:

• The water pipe shall at all times be between 900mm and 1 200mm from the finished ground level and to the top of the pipe. The water line shall be sleeved where it crosses the rail track and this sleeve pipe shall have a clearance of not greater than 20mm between the water pipe and sleeve pipe to prevent pipe movement. The sleeve pipe shall extend one metre beyond the end of the sleeper.

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#### 4 The installation of the pipes:

Brief notes on the SABS 1200 that relate to the installing of pipe. The drawing references are annexed as Drawing A.

#### 4.1 **Excavations:**

- Pipe trenches shall be excavated to a depth suitable for the provision of adequate cover over the crown of the pipe, and to specified or allowed width SABS 12000 DB C1.5.2.
- The sides of trenches shall be as near vertical as possible for a height at least the full diameter of the pipe, plus the specific depth of selected fill blanket over the pipe, SABS 1200DB 1.5.4.
- Trench bottom: material unsuitable for the bottom of the trench shall be excavated, refilled with selected material and compacted, SABS 1200DB C1.5.5.
- It is important that the trench is not opened too far in advance of the pipe laying operation. Where possible, pipes must be back-filled immediately after laying, with the joints left open for testing.
- It is recommended that the depth of cover, from the top of the pipe to the ground surface, be not less than 0,9m for the water line.

## 4.2 Bedding

- Bedding and fill shall be selected granular material. The trench bed must be free of all stone or hard projections, which are likely to cause damage to the pipe, SABS 1200LB C1.2.3 & SABS 1200LB C1.3.3.
- mPVC pipe shall be supported on a continuous bed of selected granular material of compacted depth at least 100mm, and covering the full width of the trench, SABS 1200LB C1.5.3 & SABS DWG LB-2.
  - i) Selected granular material shall be material of granular, non-cohesive nature, graded between 0,6mm and 19mm, is free draining and has the specified compact ability, SABS 1200LB C1.3.1.

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- ii) Compaction density for bedding cradle shall be 90% modified AASHTO, SABS 1200LB C1.5.1.1.4.
- iii) Additional selected granular material shall be placed around the pipe in layers of approximately 100mm, SABS DWG LB-3 and compacted to the specified density, to a height of 100mm above the crown of the pipe.

## See Drawing A for reference.

#### 4.3 Fill Blanket:

- The fill blanket shall be the specified density (90% modified AASHTO) up to a depth of at least 300mm above the crown of the pipeline, SABS 1200LB C1.5.1.4 & 1200LB C1.5.3.
- Particular care should be taken at all times to prevent damage, deflection or displacement of the pipeline.

## See Drawing A for reference.

## 4.4 Back-filling

• Selected fill material shall be used and shall be free of vegetation, lumps and stones or any other foreign particles of diameter exceeding 30mm.

## See Drawing A for reference,

## 4.5 Minimum Cover

• Design the level to provide a minimum crown depth cover over the top of the pipeline of 900mm for the water line. For further notes see clause 4.1 above.

## 4.6 Rule of Thumb Test for Suitability of Soil as a Backfill Material

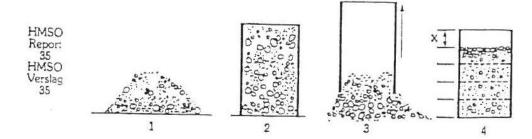
| STEP 1 | Make a representative sample by quartering.                                     |
|--------|---|
| STEP 2 | Take a 250mm length of 160mm diameter pipe. Fill it loosely with sample.        |
| STEP 3 | Lift pipe off loose filling.  |
| STEP 4 | Tamp filling back into pipe about 60mm at a time using a metal rammer with 37mm |
|        | diameter head. Tamp until no further compaction can be obtained. Measure X.     |
|        |   |

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## Conclusion:



#### Conclusion:

If X = 25mm or less – the soil is suitable.

If X = 26mm to 75mm – the material can be used only with extra care in compacting

backfill, but not in wet conditions.

If X = 76mm or over – the material is unsuitable.

 Backfill of pipe trenches shall commence after the pipe has been laid and firmly bedded in the bedding cradle, and the selected fill blanket placed and compacted as specified, SABS 1200DB C1.5.6.1.

**Note:** Pipe must be back-filled immediately after laying; leaving the joints exposed for testing. The pipeline must be laid directly on the prepared bedding in the trench, and any temporary supports, bricks or other foreign, hard bodies must be removed.

## 4.7 Compaction

- Back-filling shall be in layers of not exceeding 300mm (after compaction) and the material compacted to 90% modified AASHTO density, SABS 1200DB C1.5.7.1.
- In areas of road traffic loads, trenches shall be back-filled in layers not exceeding 150mm (after compaction) and the material compacted to 93% modified AASHTO density (cohesive soils) and to 98% in the case of non-cohesive soils, SABS 1200DB C1.5.7.2.

**Note:** Concrete encasing of horizontal mPVC pipelines is not recommended, as it converts a flexible pipeline into a long, un-reinforced concrete beam of negligible flexural strength, likely to fracture with minor ground movement, SABS 0120 C1.4. If en-casing of concrete is required and the traffic loading is high then reinforcing of this section will be considered.

| • | Where protection is needed, a reinforced concrete pipe sleeve should be used – as under roads. | Under    |
|---|--|----------|
|   | concrete slabs or raft foundations, a minimum compacted cushion of 75mm fill between the crow  | n of the |

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pipe and soffit of the slab should be provided. Where a pipe passes through a ground beam or footing, a lintel, relieving arch, or similar device, should be used to provide a minimum of 50mm clearance, SABS HMSO 35.6.

#### 4.8 Joints

• Flexible joints are available for all types of pipe and should be used in preference to rigid joints. They allow the pipeline to flex in the event of soil movements and also allow for thermal change, SABS 1200LD C1.3.2 & SABS 0120 C1.5.

## 5 Manholes (Valve)

## 5.1 Installation:

Fill step cavities, prior to installation, with 20 MPa concrete, ensuring that all of the voids have been filled.

## 5.2 Excavation:

The trench bottom should be excavated to allow a minimum of 100mm of suitable bedding to be placed below the channels. The trench width should be as narrow as practical, with appropriate allowances made for the compaction equipment to be used.

## 5.3 Jointing:

The pipes in the chamber need to be jointed with a rubberised seal between the water line and the walls of the chamber to allow movement.

## 5.4 Bedding:

- Encase the benched base with 10 MPa concrete.
- Ensure that all of the voids have been filled. Fill concrete to 75mm above the sockets. Allow a 10mm gap between the inner ribs of the socket and the concrete, to allow for future connections and flexibility of the manhole.

## 5.5 Primary Back-filling (up to 200mm from the mouth of the chamber):

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- Back-fill with a dry material, provided that it will compact properly around the chamber, and is free
  from stones larger than 25mm or clay lumps larger than 75mm. Backfill could be hand or
  mechanically compacted in 250mm layers to 87 percent, modified AASHTO density. If the excavated
  material is not suitable for back-filling selected material should be used as directed.
- A 75mm concrete surround is only necessary in areas carrying wheeled traffic, i.e. roads, or when the manhole is at such a depth that external pressures necessitate this. No hard materials, such as bricks or stones, should be placed under the pipe for temporary support.

#### 5.6 Concrete Lintel:

Install a pre-cast concrete lintel at the mouth of the chamber, ensuring that the top of the lintel is flush with the top of the chamber. A cast-in-situ lintel may be formed of 35 MPa reinforced concrete 150mm wide x 200mm high. Two 8mm reinforcing bars are to be placed in the centre of the lintel, 50mm apart.

#### 5.7 Cover Slab and Lid:

Place cover slab, adaptor slab, spacers and frame and lid in position. Use a 3:1 cement mortar mix to join these components. The cover slap must conform to the South African Bureau of Standards Specification No. 1294-1981.

## 5.8 Final Back-filling:

Complete back-filling as for primary back-filling. Slope the back-filling away from the lid. The lid should protrude approximately 100mm above the ground.

#### 6 Water Reticulation:

Provide a diameter\_200mm mPVC water line from the municipal connection and lead in trench to connect to the diameter 160mm water ring main and other branch lines. The water line shall be laid between 900 and 1200mm from the finished ground level. The pipe and fittings shall be manufactured in accordance with SABS 966/1976 and laid in accordance with SABS 1200 L.

#### 6.1 Meter:

Provide and install the meter (which is a combination type meter above diameter 40mm). Meter below diameter 40mm shall be low flow sensitive meters.

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- As H4000 combination Elster by Kent Metering (Pty) lid.
- As Multi-Jet Fan Wheel Water Meter Optima by Kent Metering (Pty) lid.

#### 6.2 Valves and valve box:

#### **6.2.1 Valves**

The valve shall comply with SABS 664 class 16 "waterworks gate valve" non-rising spindle with cap top. The minimum specifications shall be as given below:

Body/Bonnet/Stuffing Box/Gate/Hand-wheel
 Cast Iron to BS 1452 grade 220

Spindle Bronze to BS 2872 grade 114

• Spindle nut/Gate Seat/Body Seat Bronze to BS 1400 grade LG2

Gland packing Graphite asbestos

Gasket Rubber

The operation shall be for 16 bar (1,6MPa) pressure rating. The valve shall be fitted with a table "D" flange for easy maintenance.

Provide and install valve chamber as per **Drawing B**.

#### 6.2.2 Air Valves

Provide air valves as per Vent-o-mat series RBX type DN50 complete with 50mm ball-o-stop and piping as per the manufacturers recommendation.

#### 6.2.3 Fire Hydrants valve: above ground

The above ground fire hydrant valves shall be gun metal type complete to SABS standards. It shall be complete viz. leading from a FH type Tee (flanged with table D flange) leading to a dia. 100mm valve and then a dia. 100 GL pipe complete with elbow and T piece at head. The head shall be fitted with 2 x vandal proof FH as given by others.

#### 6.2.4 Fire Hydrants valves: (below ground)

The below ground fire hydrant shall be C.I. Fire Hydrant Valve – UNI – FLO (DN 65mm) complete.

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## 6.3 Anchoring:

Pipes must be anchored at all change of direction, at valves, all stop ends and reducers. Concrete anchor blocks are most commonly used at all anchor points. Anchors points on the pipeline should be protected by means of a layer of plastic sheeting.

It is essential that mPVC pipes are backfilled immediately after each pipe is installed, in order to contain the expansion and contraction that would occur in an open trench. Immediate backfilling restricts expansion and contraction to each individual pipe length where it is catered for by the "LYNG" socket.

All anchor blocks should be extended onto the socket area of the fitting that is being Note: anchored, and should be keyed into the sides and bottom of the trench. (see diagram on Drawings C & D)

## 6.4 Denso-tape:

Prepare and wrap all exposed pipe water pipes with Denso-tape complete with this tape all as per the manufacturers requirements.

#### 7 TESTING:

#### **7.1 WATER:**

The water line shall be tested as per the SABS 1200 L and to the nominal test for a period of not exceeding 1 hour, to hydraulic pressure equal to 1,25 times the maximum working pressure of the pipe under test. The allowable leakage rate shall be as based on ISO recommendations DP 4191.

The allowable tolerance shall be as per clause 6 of the SABS 1200 L.

The pipe shall be disinfected in accordance with clause 5 of the SABS 1200 L and shall be flushed clean followed by 0,15 grams per litre of calcium hypochlorite allowed to slowly fill the pipe line and repeated until the water complies with requirements of portable water.

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## **ANNEXURE B**

## TRANSNET SOC LIMITED (REGISTRATION NO. 1990/000900/30) Trading as Transnet Freight Rail (hereinafter referred to as TFR)

## THE MODIFICATION AND REPLACEMENT OF WATER RETICULATION AT WORCESTER **MARSHALLING YARD AND FACILITIES**

## BLE/52440

## SCHEDULE OF RATES AND PRICES

All costs are to be inclusive of all accommodation, expenses for the labourers and supervisors, but shall exclude VAT.

The Contender is required to insert rates for the following items, extend and total:-

| Item No.  | Description                      | Unit | Quantity | Rate  | Total |
|-----------|----------------------------------|------|----------|-------|-------|
| 4         | DAYMORK BATES                    |      |          |       |       |
| <u>1.</u> | DAYWORK RATES Section 1          |      |          |       |       |
| 1.1       | Labour                           |      |          |       |       |
| 1.1.1     | Site Agent (Foreman)             | hr   | 8        |       |       |
| 1.1.2     | Assistant Foreman                | hr   | 8        |       |       |
| 1.1.3     | Artisan                          | hr   | 8        |       |       |
| 1.1.4     | Trade-hand                       | hr   | 8        |       |       |
| 1.1.5     | Assistant Office Duty            | hr   | 8        |       |       |
| 1.1.6     | Labour                           | hr   | 8        |       |       |
| 1.1.7     | Driver Class 2                   | hr   | 8        |       |       |
| 1.1.8     | Material Handling costs (10%)    | item | %        | >>>>> |       |
|           | TOTAL (not to be carried forward | d)   | ı        |       |       |

| SCHEDULE OF RATES AND QUANTITIES: |   |                |          |      |       |  |
|-----------------------------------|---|----------------|----------|------|-------|--|
| Item No.                          | Description   | Unit           | Quantity | Rate | Total |  |
|                                   |   |                |          |      |       |  |
|                                   |   |                |          |      |       |  |
| 2.                                | <u>P&amp;G</u>  | %              | Amount   |      |       |  |
| 2.1.1                             | Site establish cost   | item           | 1        |      |       |  |
| 2.1.2                             | Daily costs (P&G) 84 see Part A.7                           | days           |          |      |       |  |
| 2.1.3                             | Site de-establish cost                                      | item           | 1        |      |       |  |
| 3.                                | EARTHWORKS  |                |          |      |       |  |
| 3.1                               | Site clearing up to 150mm deep                              | `m²            | 500      |      |       |  |
| 3.2                               | Cut tarmac  | ,m             | 200      |      |       |  |
| 3.3                               | Remove existing tar and dump at suitable site (radius 40km) | M <sup>2</sup> | 200      |      |       |  |

| 3.4  | Excavate in all material with      |                |      |  |
|------|------------------------------------|----------------|------|--|
|      | machine for pipe with 900mm        |                |      |  |
|      | cover.                             | М              | 2500 |  |
| 3.5  | Excavate in all material with      |                |      |  |
|      | machine for pipe with 600mm        |                |      |  |
|      | cover.                             | М              | 300  |  |
| 3.6  | Extra over – intermediate material | Мз             | 800  |  |
| 3.7  | Extra over – hard rock             | Мз             | 200  |  |
| 3.8  | Extra over – boulders              | Мз             | 100  |  |
| 3.9  | Hand excavations full occupation   | Мз             | 200  |  |
| 3.10 | Hand excavation – disruptive 40%   | Мз             | 200  |  |
| 3.11 | Services crossing                  | Item           | 90   |  |
| 3.12 | Services alongside trench          | m              | 600  |  |
| 3.13 | Hand excavations (restricted )     | M <sub>3</sub> | 200  |  |
| 3.14 | Hand excavation (under tracks)     | M <sub>3</sub> | 100  |  |
| 3.15 | Load spoil excavation material and |                |      |  |
|      | dump on site radius 400m           | m³             | 400  |  |
| 3.16 | Load, spoil excavation material to |                |      |  |
|      | dump; radius 40 km.                | m³             | 50   |  |
|      |                                    |                |      |  |
| 4.   | REPAIR TO ROADS                    |                |      |  |
| 4.1  | Imported selected gravel G3        | m³             | 100  |  |
| 4.2  | Placing & comp G3 - 150mm layer    | m²             | 100  |  |
| 4.3  | Prime area for premix              | m <sup>2</sup> | 100  |  |
| 4.5  | Premix asphalt - 30mm              | m <sup>2</sup> | 100  |  |
| 4.7  | Single seal (chip and spray)       | m²             | 30   |  |
| 4.8  | Double seal                        | m²             | 30   |  |
| 4.9  | Cape seal (chip, spray & slurry)   | m²             | 30   |  |
| 4.10 | Slurry seal                        | m²             | 30   |  |
|      |                                    |                |      |  |
|      | TOTAL CARRIED FORWARD              |                |      |  |

| SCHEDULI | OF RATES AND QUANTITIES:            |      |          |      |       |
|----------|-------------------------------------|------|----------|------|-------|
|          |                                     |      |          |      |       |
| Item No. | Description                         | Unit | Quantity | Rate | Total |
|          | TOTAL BROUGHT FORWARD               |      |          |      |       |
|          |                                     |      |          |      |       |
| 6.       | BACKFILLING (PIPE TRENC             | HES) |          |      |       |
| 6.1      | BACKFILL:                           |      |          |      |       |
| 6.1.2    | Back fill pipe trenches as per SABS | _    |          |      |       |
|          | 1200 up to 1m deep                  | m³   | 1500     |      |       |
| 6.2      | BEDDING                             |      |          |      |       |
| 6.2.2    | Dia. 150mm all around pipes         | m'   | 1450     |      |       |
| 6.2.3    | Dia. 100mm all around pipes         | m'   | 884      |      |       |
| 6.2.4    | Dia. 80mm all around pipes          | m'   | 200      |      |       |
| 6.2.5    | Dia. < 50mm                         | 'm   | 200      |      |       |
| 7.       | WATER PIPES mPVC class 16           |      |          |      |       |
|          | Lay/joint complete:                 |      |          |      |       |
| 7.1      | 50mm diameter                       | m'   | 200      |      |       |
| 7.2      | 75mm diameter                       | m'   | 100      |      |       |

| 7.3    | 90mm diameter                 | 'm              | 100      |   |  |
|--------|-------------------------------|-----------------|----------|---|--|
| 7.4    | 110mm diameter                | `m              | 1450     |   |  |
| 7.5    | 160mm diameter                | `m              | 884      |   |  |
|        |                               |                 |          |   |  |
| 8      | WATER PIPES HDPE type 4       | class 16        |          |   |  |
|        | Lay/joint complete:           |                 |          |   |  |
| 8.1    | 40mm diameter                 | `m              | 50       |   |  |
| 8.2    | 50mm diameter                 | `m              | 50       |   |  |
| 8.3    | 63mm diameter                 | `m              | 50       |   |  |
| 8.4    | 75mm diameter                 | `m              | 300      |   |  |
| 8.5    | 100m diameter                 | `m              | 100      |   |  |
|        |                               |                 |          |   |  |
| 9      | WATER PIPES as Polycop (de    | <u>omestic)</u> |          |   |  |
|        | Lay/joint complete:           |                 |          |   |  |
| 9.1    | 15mm diameter                 | `m              | 50       |   |  |
| 9.2    | 22mm diameter                 | `m              | 110      | 1 |  |
| 9.3    | 28mm diameter                 | `m              | 120      |   |  |
| 9.4    | 35mm diameter                 | `m              | 20       |   |  |
| 9.5    | 42mm diameter                 | `m              | 50       |   |  |
|        |                               |                 |          |   |  |
| 10     | WATER PIPE Galvanised Iron    | (G.I mediu      | ım duty) |   |  |
| 10.1   | Lay/joint complete            | 4               |          |   |  |
| 10.1.1 | 20mm diameter                 | `m              | 10       |   |  |
| 10.1.2 | 25mm diameter                 | `m              | 10       |   |  |
| 10.1.3 | 32mm diameter                 | 'm              | 10       |   |  |
| 10.1.4 | 40mm diameter                 | <b>'m</b>       | 10       |   |  |
| 10.1.5 | 50mm diameter                 | <b>'</b> m      | 10       |   |  |
| 10.1.6 | 80mm diameter                 | ,m              | 10       |   |  |
| 10.1.7 | 100mm diameter                | `m              | 20       |   |  |
| 10.1.8 | 150mm diameter                | `m              | 10       |   |  |
| 10.2   | Denso tape wrapped around pip |                 |          |   |  |
| 10.2.1 | 80mm diameter                 | `m              | 12       |   |  |
| 10.2.2 | 100mm diameter                | `m              | 12       |   |  |
|        |                               |                 |          |   |  |
|        | TOTAL CARRIED FORWARD         |                 |          |   |  |

| SCHEDULI | E OF RATES AND QUANTITIES:                   |      |          |      |       |
|----------|--|------|----------|------|-------|
|          |  | _    |          |      | T     |
| Item No. | Description                                  | Unit | Quantity | Rate | Total |
|          | TOTAL BROUGHT FORWARD                        |      |          |      |       |
|          |  |      |          |      |       |
| 11       | FITTINGS mPVC for class 16                   |      |          |      |       |
|          | Extra over pipeline                          |      |          |      |       |
| 11.1     | 90° Bends including anchor                   |      |          |      |       |
|          | block  |      |          |      |       |
| 11.1.1   | 50mm diameter                                | item | 2        |      |       |
| 11.1.2   | 75mm diameter                                | item | 2        |      |       |
| 11.1.3   | 90mm diameter                                | item | 2        |      |       |
| 11.1.4   | 110mm diameter                               | item | 20       |      |       |
| 11.1.5   | 160mm diameter                               | item | 20       |      |       |
|          |  |      |          |      |       |
| 11.2     | 45 <sup>0</sup> Bends including anchor block |      |          |      |       |

| 11.2.1  | 75mm diameter                | item | 2  |   |  |
|---------|------------------------------|------|----|---|--|
| 11.2.2  | 90mm diameter                | item | 2  |   |  |
| 11.2.3  | 110mm diameter               | item | 2  |   |  |
| 11.2.4  | 160mm diameter               | item | 6  |   |  |
| 11.2.5  | 160mm diameter               | item | 6  |   |  |
|         |                              |      |    |   |  |
| 11.3    | Tee including anchor block   |      |    |   |  |
| 11.3.1  | 50*50*50mm                   | item | 2  |   |  |
| 11.3.2  | 75*75*75mm                   | item | 2  |   |  |
| 11.3.3  | 90*90*90mm                   | item | 2  |   |  |
| 11.3.4  | 110*110*110mm                | item | 8  |   |  |
| 11.3.5  | 160*160*110mm                | item | 6  |   |  |
| 11.3.6  | 160*160*160mm                | item | 6  | _ |  |
| 11.3.9  | 150*150*100 FH Tee – Table D | item | 18 |   |  |
| 11.3.10 | 100*100*100 FH Tee – Table D | item | 4  |   |  |
|         |                              |      |    | 1 |  |
| 11.4    | FITTINGS mPVC for class 16   |      |    |   |  |
|         | Reducers including anchor    |      |    |   |  |
| 11.4.2  | 160*110mm                    | item | 6  |   |  |
| 11.4.3  | 160*50mm                     | item | 8  |   |  |
| 11.4.4  | 110*90mm                     | item | 2  |   |  |
| 11.4.5  | 110*75mm                     | item | 2  |   |  |
| 11.4.6  | 110*50mm                     | item | 8  |   |  |
|         |                              |      |    |   |  |
| 11.5    | SG Iron Saddle               |      | •  |   |  |
| 11.5.1  | 160*40mm                     | item | 5  |   |  |
| 11.5.2  | 110*40mm                     | item | 5  |   |  |
|         | TOTAL CARRIED FORWARD        |      |    |   |  |

| SCHEDULE | OF RATES AND QUANTITIES:     |      |          |      |       |
|----------|------------------------------|------|----------|------|-------|
|          |                              |      |          |      |       |
| Item No. | Description                  | Unit | Quantity | Rate | Total |
|          | TOTAL BROUGHT FORWARD        |      |          |      |       |
|          |                              |      |          |      |       |
| 12       | FITTINGS for Galvanised Pipe |      |          |      |       |
|          | Extra over pipeline          |      |          |      |       |
|          |                              |      |          |      |       |
| 12.1     | 90 <sup>0</sup> Bends        |      |          |      |       |
| 12.1.1   | 20mm diameter                | item | 4        |      |       |
| 12.1.2   | 25mm diameter                | item | 4        |      |       |
| 12.1.3   | 32mm diameter                | item | 4        |      |       |
| 12.1.4   | 40mm diameter                | item | 25       |      |       |
| 12.1.5   | 50mm diameter                | item | 20       |      |       |
| 12.1.6   | 80mm diameter                | item | 16       |      |       |
| 12.1.7   | 100mm diameter               | item | 15       |      |       |
| 12.1.8   | 150m diameter                | item | 6        |      |       |
|          |                              |      |          |      |       |
| 12.2     | Tees                         |      |          |      |       |

| 12.2.3   | 160*160*100mm                    | item | 8  |   |  |
|----------|----------------------------------|------|----|---|--|
| 12.2.4   | 160*100*100mm                    | item | 10 |   |  |
| 12.2.5   | 100*100*100mm                    | item | 2  |   |  |
| 12.2.6   | 100*100*50mm                     | item | 5  |   |  |
| 12.2.7   | 80*80*80mm                       | item | 8  |   |  |
| 12.2.8   | 50*50*50mm                       | item | 10 |   |  |
| 12.2.9   | 40*40*40mm                       | item | 5  |   |  |
| 12.2.10  | 32*32*32mm                       | item | 2  |   |  |
| 12.2.11  | 25*25*25mm                       | item | 2  |   |  |
| 12.2.12  | 20*20*20mm                       | item | 2  |   |  |
|          |                                  |      |    |   |  |
| 12.3     | Reducing socket                  |      |    |   |  |
| 12.3.2   | 150*100mm                        | item | 10 |   |  |
| 12.3.3   | 100*80mm                         | item | 8  |   |  |
| 12.3.4   | 80*50mm                          | item | 6  |   |  |
| 12.3.5   | 50*40mm                          | item | 4  | 1 |  |
| 12.3.6   | 40*32mm                          | item | 2  |   |  |
| 12.3.7   | 32*25mm                          | item | 2  |   |  |
| 12.3.8   | 25*20mm                          | item | 2  |   |  |
|          |                                  |      |    |   |  |
| 12.4     | Table "D" Flange                 |      |    |   |  |
|          | Including nuts bolts and gasket. | 4    | )  |   |  |
| 12.4.2   | 150mm                            | item | 6  |   |  |
| 12.4.3   | 100mm                            | item | 6  |   |  |
| 12.4.4   | 80mm                             | item | 2  |   |  |
|          | TOTAL CARRIED FORWARD            |      |    |   |  |
| CCHEDIII | E OF DATES AND QUANTITIES.       |      |    |   |  |

| Description                    | Unit   | Quantity  | Rate   | Total                          |  |  |  |
|--------------------------------|--|---|--|--------------------------------|--|--|--|
| TOTAL BROUGHT FORWARD          |  |   |  |                                |  |  |  |
|                                |  |   |  |                                |  |  |  |
| FITTINGS HDPE - type 4 class 9 |  |   |  |                                |  |  |  |
| Extra over pipeline            |  |   |  |                                |  |  |  |
|                                |  |   |  |                                |  |  |  |
| 90 <sup>0</sup> Bends          |  |   |  |                                |  |  |  |
| 40mm diameter                  | item   | 2   |  |                                |  |  |  |
| 50mm diameter                  | item   | 3   |  |                                |  |  |  |
| 63mm diameter                  | item   | 5   |  |                                |  |  |  |
| 75mm diameter                  | item   | 10  |  |                                |  |  |  |
|                                |  |   |  |                                |  |  |  |
| Tees                           |  |   |  |                                |  |  |  |
| 40*40*40mm                     | item   | 8   |  |                                |  |  |  |
| 50*50*50mm                     | item   | 8   |  |                                |  |  |  |
| 63*63*63mm                     | item   | 2   |  |                                |  |  |  |
| 75*75*75mm                     | item   | 2   |  |                                |  |  |  |
|                                |  |   |  |                                |  |  |  |
| Reducer                        |  |   |  |                                |  |  |  |
| 75*63mm                        | item   | 2   |  |                                |  |  |  |
| 63*50mm                        | item   | 2   |  |                                |  |  |  |
| 50*40mm                        | item   | 2   |  |                                |  |  |  |
|                                |  |   |  |                                |  |  |  |
| FITTINGS for Polycop (Conex)   |  |   |  |                                |  |  |  |
| Extra over pipeline            |  |   |  |                                |  |  |  |
|                                |  |   |  |                                |  |  |  |
|                                | FITTINGS HDPE - type 4 class 9 Extra over pipeline  90° Bends 40mm diameter 50mm diameter 63mm diameter 75mm diameter 75mm diameter  Tees 40*40*40mm 50*50*50mm 63*63*63mm 75*75*75mm  Reducer 75*63mm 63*50mm 50*40mm  FITTINGS for Polycop (Conex) | FITTINGS HDPE - type 4 class 9 Extra over pipeline  90° Bends 40mm diameter item 50mm diameter item 63mm diameter item 75mm diameter item 75mm diameter item 75mm diameter item 63*63*63mm item 63*63*63mm item 75*75*75mm item  Reducer 75*63mm item 63*50mm item 50*40mm item | ### Company of Conex   FITTINGS for Polycop (Conex)    ### FITTINGS HDPE - type 4 class 9      Extra over pipeline | FITTINGS HDPE - type 4 class 9 |  |  |  |

| 14.1   | Elbows                |      |    |   |  |
|--------|-----------------------|------|----|---|--|
| 14.1.1 | 15mm diameter         | item | 23 |   |  |
| 14.1.2 | 22mm diameter         | item | 25 |   |  |
| 14.1.3 | 28mm diameter         | item | 15 |   |  |
| 14.1.4 | 35mm diameter         | item | 10 |   |  |
| 14.1.5 | 42mm diameter         | item | 8  |   |  |
|        |                       |      |    |   |  |
| 14.2   | Tees                  |      |    |   |  |
| 14.2.1 | 42*42*42mm            | item | 20 |   |  |
| 14.2.2 | 35*35*35mm            | item | 20 |   |  |
| 14.2.3 | 28*28*28mm            | item | 15 |   |  |
| 14.2.4 | 22*22*22mm            | item | 15 |   |  |
| 14.2.5 | 15*15*15mm            | item | 10 |   |  |
|        |                       |      |    |   |  |
| 14.3   | Reducers              |      |    |   |  |
| 14.3.1 | 42*35mm               | item | 4  | 7 |  |
| 14.3.2 | 42*22mm               | item | 10 |   |  |
| 14.3.3 | 35*28mm               | item | 2  |   |  |
| 14.3.4 | 28*22mm               | item | 2  |   |  |
| 14.3.5 | 22*15mm               | item | 6  |   |  |
|        | TOTAL CARRIED FORWARD |      |    |   |  |

| SCHEDULE | OF RATES AND QUANTITIES:      |          |          |      |       |
|----------|-------------------------------|----------|----------|------|-------|
|          |                               |          |          |      | T     |
| Item No. | Description                   | Unit     | Quantity | Rate | Total |
|          | TOTAL BROUGHT FORWARD         |          |          |      |       |
|          |                               |          |          |      |       |
| 14.4     | Holderbats for 'Polycop' pipe |          |          |      |       |
| 14.4.1   | 15mm diameter                 | item     | 12       |      |       |
| 14.4.2   | 22mm diameter                 | item     | 15       |      |       |
| 14.4.3   | 28mm diameter                 | item     | 5        |      |       |
| 14.4.4   | 35mm diameter                 | item     | 4        |      |       |
| 14.4.5   | 42mm diameter                 | item     | 3        |      |       |
|          |                               |          |          |      |       |
| 15       | ADAPTERS -straight.           |          |          |      |       |
|          | Extra over pipeline           |          |          |      |       |
| 15.1     | .mPVC to HDPE                 |          |          |      |       |
| 15.1.1   | 160*75mm                      | item     | 3        |      |       |
| 15.1.2   | 110*63mm                      | item     | 4        |      |       |
| 15.1.3   | 110*50mm                      | item     | 15       |      |       |
| 15.1.4   | 110*40mm                      | item     | 10       |      |       |
| 15.1.5   | 90*50mm                       | item     | 2        |      |       |
| 15.1.6   | 75*50mm                       | item     | 4        |      |       |
| 15.1.7   | 50*40mm                       | item     | 4        |      |       |
|          |                               |          |          |      |       |
| 15.2     | .mPVC to G.I (Table "D")      |          |          |      |       |
| 15.2.1   | 150*160mm                     | item     | 10       |      |       |
| 15.2.2   | 110*100mm                     | item     | 12       |      |       |
| 15.2.3   | 90*80mm                       | item     | 2        |      |       |
| 15.2.4   | 75*80mm                       | item     | 2        |      |       |
| 15.2.6   | 63*50mm                       | item     | 2        |      |       |
| 15.2.7   | 50*50mm                       | item     | 2        |      |       |
|          |                               |          |          |      |       |
| 15.3     | HDPE to G.I threaded (screw   | ) joint. |          |      |       |

| 15.3.1 | 75*80mm                           | item | 6 |  |
|--------|-----------------------------------|------|---|--|
| 15.3.2 | 63*50mm                           | item | 6 |  |
| 15.3.3 | 5o*50mm                           | item | 6 |  |
| 15.3.3 | 50*40mm                           | item | 6 |  |
| 15.4   | Polycop to G.I threaded joint m/f |      |   |  |
| 15.4.1 | 15*20mm                           | item | 2 |  |
| 15.4.2 | 22*20mm                           | item | 2 |  |
| 15.4.3 | 22*25mm                           | item | 1 |  |
| 15.4.4 | 28*25mm                           | item | 4 |  |
| 15.4.5 | 35*32mm                           | item | 4 |  |
| 15.4.6 | 42*40mm                           | item | 4 |  |
|        |                                   |      |   |  |
|        | TOTAL CARRIED FORWARD             |      |   |  |

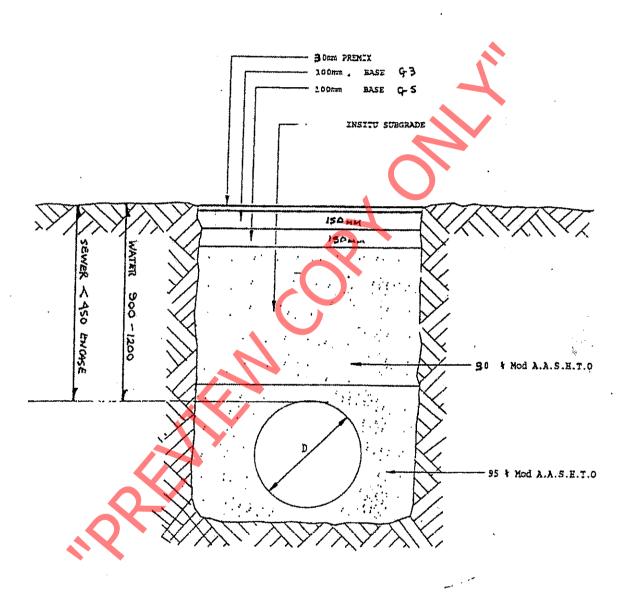
| SCHEDU     | LE OF RATES AND QUANTITI  | ES:            |               |             |           |
|------------|---|----------------|---------------|-------------|-----------|
| Item No.   | Description   | Unit           | Quantity      | Rate        | Total     |
|            | TOTAL BROUGHT FORWARD   |                |               |             |           |
| 16         | METERS, VALVES, ETC.  |                |               |             |           |
| 16.1       | Meters  |                |               |             |           |
| Complete w | with connection to the reticulation system                          | em as instruct | ted. Valve bo | x elsewhere | specified |
| 16.1.1     | 160/150*40mm Combination type                                       | item           | 4             |             |           |
| 16.1.2     | 110/100*40mm Combination  | item           | 3             |             |           |
| 16.1.3     | 80mm combination  | item           | 1             |             |           |
| 16.1.4     | 75/80mm combination   | item           | 1             |             |           |
| 16.1.5     | 50mm combination  | item           | 1             |             |           |
| 16.1.6     | 40mm bulk   | item           | 1             |             |           |
| 16.1.7     | 25/28mm bulk  | item           | 1             | 7           |           |
| 16.1.8     | 15mm bulk   | item           | 1             |             |           |
| 16.2       | Gate Valves — to SABS standards.                                    |                |               |             |           |
| 16.2.2     | 160/150mm   | item           | 15            |             |           |
| 16.2.3     | 110/100mm   | item           | 20            |             |           |
| 16.2.4     | 80/75mm   | item           | 4             |             |           |
| 16.2.5     | 63mm  | item (         | 4             |             |           |
| 16.2.6     | 50mm  | item           | 5             |             |           |
| 16.2.7     | 40mm  | item           | 5             |             |           |
| 16.2.8     | 32mm  | item           | 1             |             |           |
| 16.2.9     | 28/25mm   | item           | 5             |             |           |
| 16.2.10    | 22/20mm   | item           | 5             |             |           |
| 16.2.11    | 15mm (stop cock)  |                | 1             |             |           |
|            |   | item           | 1             |             |           |
| 16.3       | Taps, hydrants and fittings   |                |               |             |           |
| 16.3.1     | 22mm Garden tape  | item           | 15            |             |           |
| 16.3.2     | 22mm Wall Plate Elbow including                                     |                |               |             |           |
|            | screw fixing (brass) to wall.                                       | item           | 15            |             |           |
| 16.3.3     | Provide from Table D flange as shown                                | item           | 15            |             |           |
|            | on the drawings a dia.100 spindle valve complete with valve box and |                |               |             |           |
|            | lead with 100mm GI pipe to Fire                                     |                |               |             |           |
|            | Hydrants x 2 complete with bend and                                 |                |               |             |           |
|            | dia. 100mm Tee and including 400mm                                  |                |               |             |           |
|            | * 400mm * 400mm concrete anchor at                                  |                |               |             |           |
|            | ground level to secure pipe.  |                |               |             |           |
| 16.3.3     | Fire Hydrant (tamper proof/ above                                   |                |               |             |           |
|            | ground) 78mm gunmetal diameter screw inlet and 64 mm outlet. SABS   |                | 4.0           |             |           |
|            | approved. (supply and install)                                      | item           | 10            |             |           |
|            | approved. (Suppry and instan)                                       |                |               |             |           |
| 16.3.4     | Concrete stand and fix (bolt) fibreglass                            |                |               |             |           |
| 13101 F    | box for hose and equipment (box hose                                |                |               |             |           |
|            | and equipment to be supplied by                                     |                |               |             |           |
|            | others).  | item           | 30            |             |           |
|            |   | 1              |               |             |           |
|            | TOTAL CARRIED FORWARD   |                |               |             |           |

| SCHEDUI  | LE OF RATES AND QUANTITIES:   |                          |                            |               |       |
|--|---|--------------------------|----------------------------|---------------|-------|
| Item No.   | Description   | Unit                     | Quantity                   | Rate          | Total |
|  | TOTAL BROUGHT FORWARD   |                          |                            |               |       |
|  |   |                          | T                          |               | 1     |
| 16.3.5   | Fit fire hydrant only (fire hydrant   | •.                       | 1.5                        |               |       |
|  | supplied by others) – above ground.   | item                     | 15                         |               |       |
| 16.3.6   | Supply and fit underground fire   | item                     | 5                          |               |       |
| 160=   | hydrant as UNI-FLO DN 65  |                          |                            |               |       |
| 16.3.7   | Fire Hydrant indicator poles supply plant 600mm into ground. 3m high and  |                          |                            |               |       |
|  | fit indicator. Indicator to be supplied   |                          |                            |               |       |
|  | by others.  | item                     | 30                         | <u> </u>      |       |
| 16.4   | Non-return Valve  | Item                     | 30                         |               |       |
| 16.4.2   | 160mm   | item                     | 1                          |               |       |
| 16.4.3   | 110mm   | item                     | 1 .                        |               |       |
| 16.4.4   | 80mm  | item                     | 1                          |               |       |
| 16.4.5   | 50mm  | item                     |                            |               |       |
|  |   |                          |                            |               |       |
| 16.5   | Signal Air Valve  |                          |                            |               |       |
| 16.5.1   | Provide and install a 50mm signal   | item                     | 3                          |               |       |
|  | air-valves complete with ball-o-  |                          |                            |               |       |
|  | stop  |                          |                            |               |       |
| 16.6   | Brackets:   |                          | *                          |               |       |
| 16.6.1   | Galvanised Iron Bracket   |                          |                            |               |       |
| Provide 'O   | listrut' OL1000 galvanised channel (30  | 0mm long) v              | vith SS – Ser              | ies pipe clan | nps   |
|  | rith nuts and bolts including fixing to co  |                          |                            |               |       |
| bolts  |   |                          |                            |               |       |
| 16.6.1.1   | 76mm  | item                     | 10                         |               |       |
| 16.6.1.2   | 89mm  | item                     | 30                         |               |       |
| 16.6.1.3   | 114mm   | item                     | 50                         |               |       |
| 16.6.1.4   | 166mm   | item                     | 50                         |               |       |
| 16.6.1.4   | 166mm   |                          |                            |               |       |
|  |   | item                     | 50                         |               |       |
| 1660   | G III De d  | item                     | 50                         |               |       |
| 16.6.2   | Saddles and fasteners:  | item                     | 50                         |               |       |
|  | Purpose made with expansion bolts.  |                          |                            |               |       |
| 16.6.2.1   | Purpose made with expansion bolts. 76mm   | item                     | 10                         |               |       |
| 16.6.2.1<br>16.6.2.2   | Purpose made with expansion bolts.  76mm  89mm  | item<br>item             | 10 30                      |               |       |
| 16.6.2.1<br>16.6.2.2<br>16.6.2.3   | Purpose made with expansion bolts. 76mm 89mm 114mm  | item<br>item<br>item     | 10<br>30<br>50             |               |       |
| 16.6.2.1<br>16.6.2.2   | Purpose made with expansion bolts.  76mm  89mm  | item<br>item             | 10 30                      |               |       |
| 16.6.2.1<br>16.6.2.2<br>16.6.2.3<br>16.6.2.4                                   | Purpose made with expansion bolts. 76mm 89mm 114mm 166mm  | item<br>item<br>item     | 10<br>30<br>50             |               |       |
| 16.6.2.1<br>16.6.2.2<br>16.6.2.3   | Purpose made with expansion bolts. 76mm 89mm 114mm 166mm Wall mounted bracket & saddle  | item<br>item<br>item     | 10<br>30<br>50             |               |       |
| 16.6.2.1<br>16.6.2.2<br>16.6.2.3<br>16.6.2.4<br>16.6.3                         | Purpose made with expansion bolts. 76mm 89mm 114mm 166mm  | item item item item      | 10<br>30<br>50             |               |       |
| 16.6.2.1<br>16.6.2.2<br>16.6.2.3<br>16.6.2.4                                   | Purpose made with expansion bolts.  76mm  89mm  114mm  166mm  Wall mounted bracket & saddle  Purpose made with expansion bolts.             | item<br>item<br>item     | 10<br>30<br>50<br>50       |               |       |
| 16.6.2.1<br>16.6.2.2<br>16.6.2.3<br>16.6.2.4<br>16.6.3.1                       | Purpose made with expansion bolts.  76mm  89mm  114mm  166mm  Wall mounted bracket & saddle  Purpose made with expansion bolts.  76mm       | item item item item      | 10<br>30<br>50<br>50       |               |       |
| 16.6.2.1<br>16.6.2.2<br>16.6.2.3<br>16.6.2.4<br>16.6.3<br>16.6.3.1<br>16.6.3.2 | Purpose made with expansion bolts.  76mm  89mm  114mm  166mm  Wall mounted bracket & saddle  Purpose made with expansion bolts.  76mm  89mm | item item item item item | 10<br>30<br>50<br>50<br>50 |               |       |

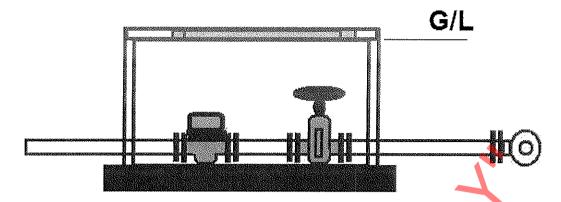
| Item No. | Description  | Unit | Quantity | Rate | Total |
|----------|--|------|----------|------|-------|
|          | TOTAL BROUGHT FORWARD  |      |          |      |       |
| 16.7     | Valve Chamber  |      |          |      |       |
| 16.7.1   | Build a valve chamber as per specification (detail J) for pipe greater than 75mm.  | item | 10       |      |       |
| 16.7.2   | Build stop cock box for pipe less that 75mm in half brick wall and provide 115mm diameter x 102mm type 7 cast iron cover and frame (SABS 558) to suit including 100mm foundation and plaster and bedding of C.I. frame.                    | item | 5        |      |       |
| 16.8     | Meter chambers   |      |          |      |       |
| 16.8.1   | Provide meter box for 150 x 40 combination meter 600 x 600mm complete with 450 x 600mm type 14C cast iron cover and frame including one brick wall (500mm high) laid on 100 foundation and bed CI. Cast frame in cement mortar and finish. | item |          | 1>.  |       |
|          | Meter Chambers   |      |          |      |       |
| 16.8.2   | Ditto but for 90 to 70mm meters with 375x300x150mm type 10C cast iron meter box to suit.   | item | 2        |      |       |
| 16.8.3   | Ditto but for 50 to 15mm meters with 300x200x150mm type 10A cast iron meter box to suit.   | item | 4        |      |       |
| 16.9     | Ducting  |      |          |      |       |
| 16.9.1   | 110mm PVC ducting laid under the track, between sleepers, including encasing in concrete with a 100mm cover all round total length 2m and allow for 45° splay cut at both ends with neat benching to finish the concrete. (concrete 20MPa) | item | 8        |      |       |
| 16.11    | Pipe indicator:  |      |          |      |       |
| 16.11.1  | Install a concrete culver over storm water channel to carry pipe culvert supplied by others including levelling and bedding on a concrete founding 400mm deep  | item | 30       |      |       |
| 16.10    | Pipe indicator:  |      |          |      |       |
| 16.10.1  | Provide indicators where directed using 600mm x 160 PVC pipe planted vertically and filled with concrete and finished with a arrow and size of pipe.   | item | 30       |      |       |

|          | TOTAL BROUGHT FORWARD  |          |    |  |    |
|----------|--|----------|----|--|----|
| 16.7     | Valve Chamber  |          |    |  |    |
| 16.7.1   | Build a valve chamber as per specification (detail J) for pipe greater than 75mm.  | item     | 10 |  |    |
| 16.7.2   | Build stop cock box for pipe less that 75mm in half brick wall and provide 115mm diameter x 102mm type 7 cast iron cover and frame (SABS 558) to suit including 100mm foundation and plaster and bedding of C.I. frame.                                | item     | 5  |  |    |
| 16.8     | Meter chambers   |          |    |  |    |
| 16.8.1   | Provide meter box for 150 x 40 combination meter 600 x 600mm complete with 450 x 600mm type 14C cast iron cover and frame including one brick wall (500mm high) laid on 100 foundation and bed CI. Cast frame in cement mortar and finish.             | item     |    | \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ |    |
|          | Meter Chambers   |          |    |  |    |
| 16.8.2   | Ditto but for 90 to 70mm meters with 375x300x150mm type 10C cast iron meter box to suit.   | item     | 2  |  |    |
| 16.8.3   | Ditto but for 50 to 15mm meters with 300x200x150mm type 10A cast iron meter box to suit.   | item     | 4  |  |    |
| 16.9     | Ducting  |          |    |  |    |
| 16.9.1   | 110mm PVC ducting laid under the track, between sleepers, including encasing in concrete with a 100mm cover all round total length 2m and allow for 45 <sup>0</sup> splay cut at both ends with neat benching to finish the concrete. (concrete 20MPa) | item     | 8  |  |    |
| 16.11    | Pipe indicator:  |          |    |  |    |
| 16.11.1  | Install a concrete culvert over storm water channel to carry pipe culvert supplied by others including levelling and bedding on a concrete founding 400mm deep   | item     | 30 |  |    |
| 16.10    | Pipe indicator:  |          |    |  |    |
| 16.10.1  | Provide indicators where directed using 600mm x 160 PVC pipe planted vertically and filled with concrete and finished with a arrow and size of pipe.   | item     | 30 |  |    |
| GRAND T  | OTAL (to be carried forward to ).  | <b>R</b> |    |  |    |
| SIGNED A | T on this  | day o    | of | 2013                                   | ·. |

# DRAWING A TYPICAL CROSS SECTION DETAIL

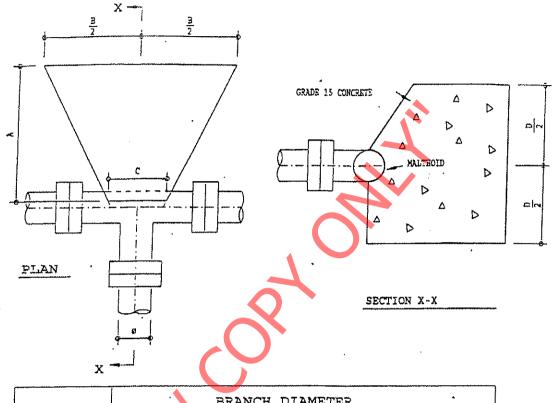


SECTION TROUGH PIPE CROSSING



1.50m. x 1.50m. 1brick wall, plastered on outside and bagged on the inside with a 1m.x1m. Blue Fibre Manhole cover placed on a 75mm. x 25mpa foundation.

## THRUST BLOCKS FOR T-PIECES



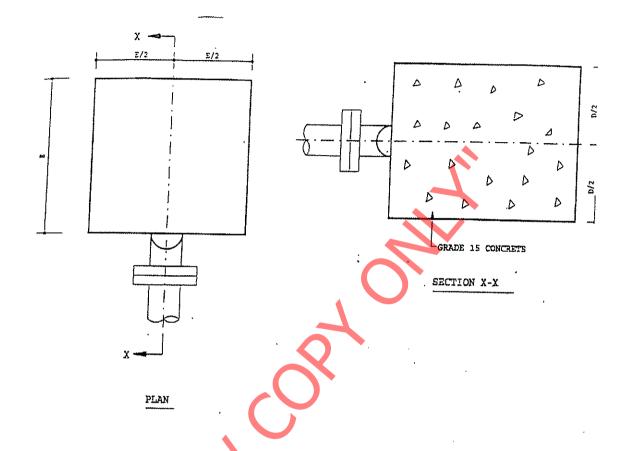
|     |      | BRANCH DI | AMETER | •     |
|-----|------|-----------|--------|-------|
|     | 1000 | 150ø      | 225ø   | 300∅  |
| A   | 4000 | 500ø      | 1000ø  | 1500ø |
| В   | 600ø | 800ø      | 1500ø  | 2200ø |
| c 🔨 | 2000 | 300ø      | 4000   | 500€  |
| D   | 500ø | 600ø      | 700æ   | 8000  |

#### NOTES

- 1. These dimensions and the form of the block are intended as a guide only. The final shape is to be determined on site.
- Where possible the block is to be cast against , undisturbed insitu material.
- 3. The couplings must remain flexible and removable.
- Thrust blocks for pipes larger than 300s to be individually designed.

## Drawing "D"

## THRUST BLOCKS FOR END CAPS



|   | 100 ø | 150 ø | 225 Ø | 300 ø |
|---|-------|-------|-------|-------|
| D | 500   | 600   | . 700 | 800   |
| Ε | 500   | 800   | 1400  | 1900  |
|   |       |       |       |       |

#### NOTES

- 1. Dimensions given are minimum sizes
- 2. Block is to be cast against undisturbed material.
- 3. The couplings must remain flexible and removable

## TRANSNET LIMITED

(Registration no. 1990/000900/30)

## SAFETY ARRANGEMENTS AND PROCEDURAL COMPLIANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993) AND APPLICABLE REGULATIONS

#### 1. General

- 1.1 The Contractor and Transnet Limited (hereinafter referred to as "Transnet") are individual employers, each in its own right, with their respective duties and obligations set out in the Occupational Health and Safety Act, Act 85 of 1993 (the Act) and applicable Regulations.
- 1.2 The Contractor accepts, in terms of the General Conditions of Contract and in terms of the Act, his obligations as an employer in respect of all persons in his employ, other persons on the premises or the Site or place of work or on the work to be executed by him, and under his control. He shall, before commencement with the execution of the contract work, comply with the provisions set out in the Act, and shall implement and maintain a Health and Safety Plan as described in the Construction Regulations, 2003 and as approved by Transnet, on the Site and place of work for the duration of the Contract.
- 1.3 The Contractor accepts his obligation to complying fully with the Act and applicable Regulations notwithstanding the omission of some of the provisions of the Act and the Regulations from this document.
- 1.4 Transnet accepts, in terms of the Act, its obligations as an employer of its own employees working on or associated with the site or place of work, and the Contractor and Technical Officer or his deputy shall at all times, co-operate in respect of the health and safety management of the site, and shall agree on the practical arrangements and procedures to be implemented and maintained during execution of the Works.
- 1.5 In the event of any discrepancies between any legislation and this specification, the applicable legislation will take precedence.

## 2. Definitions

- 2.1 In this Specification any word or expression to which a meaning has been assigned in the Construction Regulations, shall have the meaning so assigned to it, unless the context otherwise indicates: -
- 2.2 The work included in this Contract shall for the purposes of compliance with the Act be deemed to be "Construction Work", which, in terms of the Construction Regulations, 2003 means any work in connection with: -
  - (a) the erection, maintenance, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure;

- (b) the installation, erection, dismantling or maintenance of fixed plant where such work includes the risk of a person falling;
- (c) the construction, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; or
- (d) the moving of earth, clearing of land, the making of an excavation, piling, or any similar type of work;
- 2.3 "competent person" in relation to construction work, means any person having the knowledge, training and experience specific to the work or task being performed: Provided that where appropriate qualifications and training are registered as per the South African Qualifications Authority Act, 1995 these qualifications and training shall be deemed to be the required qualifications and training;
- 2.4 "contractor" means principal contractor and "subcontractor" means contractor as defined by the Construction Regulations, 2003.
- 2.5 **"fall protection plan"** means a documented plan, of all risks relating to working from an elevated position, considering the nature of work undertaken, and setting out the procedures and methods applied to eliminate the risk;
- 2.6 "health and safety file" means a file, or other record in permanent form, containing the information required to be kept on site in accordance with the Act and applicable Regulations;
- 2.7 **"Health and Safety Plan"** means a documented plan which addresses the hazards identified and include safe work procedures to mitigate, reduce or control the hazards identified;
- 2.8 **"Risk Assessment"** means a programme to determine any risk associated with any hazard at a construction site, in order to identify the steps needed to be taken to remove, reduce or control such hazard;
- 2.9 "the Act" means the Occupational Health and Safety Act No. 85 of 1993.

## 3. Procedural Compliance

- 3.1 The Contractor who intends to carry out any construction work shall, before carrying out such work, notify the Provincial Director in writing if the construction work:-
  - (a) includes the demolition of a structure exceeding a height of 3 metres; or
  - (b) includes the use of explosives to perform construction work; or
  - (c) includes the dismantling of fixed plant at a height greater than 3m,

and shall also notify the Provincial Director in writing when the construction work exceeds 30 days or will involve more than 300 person days of construction work and if the construction work:-

(a) includes excavation work deeper than 1m; or

- (b) includes working at a height greater than 3 metres above ground or a landing.
- 3.2 The notification to the Provincial Director shall be on a form similar to Annexure A of the Construction Regulations, 2003, also shown in Annexure 1 of this Specification. The Contractor shall ensure that a copy of the completed notification form is kept on site for inspection by an inspector, Technical Officer or employee.
- 3.3 The Contractor shall, in accordance with the Act and applicable Regulations, make all the necessary appointments of competent persons in writing on a form similar to Annexure 2 of this Specification and deliver copies thereof to the Technical Officer. Copies should also be retained on the health and safety file.
- 3.4 Subcontractors shall also make the above written appointments and the Contractor shall deliver copies thereof to the Technical Officer.
- 3.5 In the case of a self-employed Contractor or any subcontractor who has the appropriate competencies and supervises the work himself, the appointment of a construction supervisor in terms of regulation 6.1 of the Construction Regulations, 2003 will not be necessary. The Contractor shall in such a case execute and sign a declaration, as in Annexure 3, by which he personally undertakes the duties and obligations of the "Chief Executive Officer" in terms of section 16(1) of the Act.
- 3.6 The Contractor shall, before commencing any work, obtain from the Technical Officer an access certificate as in Annexure 4 executed and signed by him, permitting and limiting access to the designated site or place of work by the Contractor and any subcontractors under his control.
- 3.7 Procedural compliance with Act and Regulations, as above, shall also apply to any subcontractors as employers in their own right. The Contractor shall furnish the Technical Officer with full particulars of such subcontractors and shall ensure that they comply with the Act and Regulations and Protekon's safety requirements and procedures.

## 4. Special Permits

Where special permits are required before work may be carried out such as for hotwork, isolation permits, work permits and occupations, the Contractor shall apply to the Technical Officer or the relevant authority for such permits to be issued. The Contractor shall strictly comply with the conditions and requirements pertaining to the issue of such permits.

## 5. Health and Safety Programme

- 5.1 The Tenderer shall, with his tender, submit a Health and Safety Programme setting out the practical arrangements and procedures to be implemented by him to ensure compliance by him with the Act and Regulations and particularly in respect of: -
  - (i) The provision, as far as is reasonably practical, of a working environment that is safe and without risk to the health of his employees and subcontractors in terms of section 8 of the Act;

- (ii) the execution of the contract work in such a manner as to ensure in terms of section 9 of the Act that persons other than those in the Contractor's employment, who may be directly affected by the contract work are not thereby exposed to hazards to their health and safety;
- (iii) ensuring, as far as is reasonably practical, in terms of section 37 of the Act that no employee or subcontractor of the Contractor does or omits to do any act which would be an offence for the Contractor to do or omit to do.
- 5.2 The Contractor's Health and Safety Programme shall be based on a risk assessment in respect of the hazards to health and safety of his employees and other persons under his control that are associated with or directly affected by the Contractor's activities in performing the contract work and shall establish precautionary measures as are reasonable and practical in protecting the safety and health of such employees and persons.
- 5.3 The Contractor shall cause a risk assessment contemplated in clause 5.2 above to be performed by a competent person, appointed in writing, before commencement of any Construction Work and reviewed during construction. The Risk Assessments shall form part of the Health and Safety programme to be applied on the site and shall include at least the following:
  - (a) The identification of the risks and hazards that persons may be exposed to;
  - (b) the analysis and evaluation of the hazards identified;
  - (c) a documented Health and Safety Plan, including safe work procedures to mitigate, reduce or control the risks identified;
  - (d) a monitoring and review plan.
- 5.4 The Health and Safety Plan shall include full particulars in respect of: -
  - (a) The safety management structure to be instituted on site or place of work and the names of the Contractor's health and safety representatives and members of safety committees where applicable;
    - (b) the safe working methods and procedures to be implemented to ensure the work is performed in compliance with the Act and Regulations;
  - (c) the safety equipment, devices and clothing to be made available by the Contractor to his employees;
  - (d) the site access control measures pertaining to health and safety to be implemented;
  - (e) the arrangements in respect of communication of health and safety related matters and incidents between the Contractor, his employees, subcontractors and the Technical Officer with particular reference to the reporting of incidents in compliance with Section 24 and General Administrative Regulation 8 of the Act and with the pertinent clause of the General Conditions of Contract forming part of the Contract and

- (f) the introduction of control measures for ensuring that the Safety Plan is maintained and monitored for the duration of the Contract.
- 5.4 The Health and Safety programme shall be subject to the Technical Officer's approval and he may, in consultation with the Contractor, order that additional and/or supplementary practical arrangements and procedures be implemented and maintained by the Contractor or that different working methods or safety equipment be used or safety clothes be issued which, in the Technical Officer's opinion, are necessary to ensure full compliance by the Contractor with his obligations as an employer in terms of the Act and Regulations. The Technical Officer or his deputy shall be allowed to attend meetings of the Contractor's safety committee as an observer.
- 5.5 The Contractor shall take reasonable steps to ensure that each subcontractor's Health and Safety Plan is implemented and maintained on the construction site: Provided that the steps taken, shall include periodic audits at intervals mutually agreed to between the them, but at least once every month.
- 5.6 The Contractor shall stop any subcontractor from executing any construction work, which is not in accordance with the Contractor's, and/or subcontractor's Health and Safety Plan for the site or which poses a threat to the health and safety of persons.
- 5.7 The Contractor shall ensure that a copy of the Health and Safety Plan is available on site for inspection by an inspector, Technical Officer, agent, subcontractor, employee, registered employee organisation, health and safety representative or any member of the health and safety committee.
- 5.8 The Contractor shall consult with the health and safety committee or, if no health and safety committee exists, with a representative group of employees, on the development, monitoring and review of the Risk Assessment.
- 5.9 The Contractor shall ensure that all employees under his control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the Risk Assessment.
- 5.10 The Contractor shall ensure that all subcontractors are informed regarding any hazard as stipulated in the Risk Assessment before any work commences, and thereafter at such times as may be determined in the Risk Assessment.
- 5.11 The Contractor shall ensure that all visitors to a construction site undergoes health and safety induction pertaining to the hazards prevalent on the site and shall be provided with the necessary personal protective equipment.

## 6. Fall Protection Plan

6.1 In the event of the risk and hazard identification, as required in terms of clause 5.3 of this Specification, revealing risks relating to working from an elevated position the contractor shall cause the designation of a competent person, responsible for the preparation of a fall protection plan;

- 6.2 The Contractor shall implement, maintain and monitor the fall protection plan for the duration of Contract. The Contractor shall also take such steps to ensure the continued adherence to the fall protection plan.
- 6.3 The fall protection plan shall include:-
  - (a) A Risk Assessment of all work carried out from an elevated position;
  - (b) the procedures and methods to address all the identified risks per location;
  - (c) the evaluation of the employees physical and psychological fitness necessary to work at elevated positions;
  - (d) the training of employees working from elevated positions; and
  - (e) the procedure addressing the inspection, testing and maintenance of all fall protection equipment.

## 7. Hazards and Potential Hazardous Situations

The Contractor and the Technical Officer shall immediately notify one another of any hazardous or potentially hazardous situations which may arise during performance of the Contract by the Contractor or any subcontractor and, in particular, of such hazards as may be caused by the design, execution and/or location and any other aspect pertaining to the contract work.

## 8. Health and Safety File

- 8.1 The Contractor shall ensure that a health and safety file is opened and kept on site and shall include all documentation required as per the Act and applicable regulations, and made available to an inspector, the Technical Officer, or subcontractor upon request.
- 8.2 The Contractor shall ensure that a copy of the both his Health and Safety Plan as well as any subcontractor's Health and Safety Plan is available on request to an employee, inspector, contractor or the Technical Officer.
- 8.3 The Contractor shall hand over a consolidated health and safety file to the Technical Officer upon completion of the Construction Work and shall in addition to documentation mentioned in the Act and applicable Regulations include a record of all drawings, designs, materials used and other similar information concerning the completed structure.

## OCCUPATIONAL HEALTH AND SAFETY ACT, 1993

## **Regulation 3(1) of the Construction Regulations**

## NOTIFICATION OF CONSTRUCTION WORK

|   | Name and postal address of principal contractor:   |
|---|--|
|   | Name and tel. no of principal contractor's contact person:   |
| ] | Principal contractor's compensation registration number:   |
|   | Name and postal address of client:   |
|   | Name and tel no of client's contact person or agent:   |
| ] | Name and postal address of designer(s) for the project:  |
| , | Name and tel. no of designer(s) contact person:  |
|   | Name and telephone number of principal contractor's construction supervisor on site appointed in terms of regulation 6(1). |
|   | Name/s of principal contractor's construction sub-ordinate supervisors on site appointed in terms of regulation 6(2).      |
|   | Exact physical address of the construction site or site office:  |
|   | Nature of the construction work:   |
|   |  |
|   |  |
|   | Expected commencement date:  |
|   | Expected completion date:  |

|       |                       | actors on the construction site accoun |          |
|-------|-----------------------|--|----------|
| 13.   | Name(s) of contractor | rs already chosen.                     |          |
|       |                       |  |          |
|       |                       |  |          |
|       |                       |  |          |
| Princ | cipal Contractor      | 2                                      | Date     |
| Clien | t                     |  | <br>Date |

- \* THIS DOCUMENT IS TO BE FORWARDED TO THE OFFICE OF THE DEPARTMENT OF LABOUR **PRIOR TO COMMENCEMENT** OF WORK ON SITE.
- \* <u>ALL PRINCIPAL CONTRACTORS</u> THAT QUALIFY TO NOTIFY MUST DO SO EVEN IF ANOTHER PRINCIPAL CONTRACTOR ON THE SAME SITE HAD DONE SO PRIOR TO THE COMMENCEMENT OF WORK.

## (COMPANY LETTER HEAD)

## OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993):

| SECTION/REGULATION:  |
|--|
| REQUIRED COMPETENCY:   |
| In terms of I,   |
| representing the Employer) do hereby appoint   |
| As the Competent Person on the premises at   |
| (physical address) to assist in compliance with the Act and the applicable Regulations.                      |
| Your designated area/s is/are as follows:-   |
|  |
|  |
| Date :   |
| Signature :-   |
| Designation :-   |
| ACCEPTANCE OF DESIGNATION  |
| I, do hereby accept this Designation and acknowledge that I understand the requirements of this appointment. |
| Date :   |
| Signature :-   |
| Designation :-   |

## (COMPANY LETTER HEAD)

## OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993):

## **DECLARATION**

| In terms of the above Act I,                       | am personally assuming the duties                                |
|--|--|
| and obligations as Chief Executive Officer, define | ed in Section 1 of the Act and in terms of Section 16(1), I will |
|  | e duties and obligations of the Employer as contemplated in the  |
| above Act are properly discharged.                 |  |
|  |  |
|  |  |
|  |  |
| Signature :-                                       |  |
| Signature  |  |
| Date :   |  |
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## (LETTER HEAD OF BUSINESS DIVISION OR UNIT OF TRANSNET LIMITED)

## SITE ACCESS CERTIFICATE

| Access to:                                     | (Area)  |
|--|---|
| Name of Contractor/Builder :-                  |   |
| Contract/Order No.:                            |   |
| The contract works site/area described abov    | re are made available to you for the carrying out of associated works   |
| In terms of your contract/order with (company) |   |
|  | nsible for the control and safety of the Works Site, and for persons  |
| and Safety Act, 1993 (Act 85 of 1993) as an    | ible for compliance with the requirements of the Occupational Health<br>nended, and all conditions of the Contract pertaining to the site of the<br>tract documents including the plans of the site or work areas forming |
| Signed : TECHNICAL OFFICER                     | Date :  |
| ACKNO  | WLEDGEMENT OF RECEIPT   |
|  | I,  do hereby acknowledge and accept the duties  f the site/area of Work in terms of the Occupational Health and  |
| Safety Act; Act 85 of 1993.                    |   |
| Name :   | Designation:  |
| Signatura :                                    | Data :  |

#### TRANSNET

## Transnet Supplier Declaration/Application



The Financial Director or Company Secretary

Transnet Vendor Management has received a request to load your company on to the Transnet vendor database. Please furnish us with the following to enable us to process this request:

- 1. Complete the "Supplier Declaration Form" (SDF) on page 2 of this letter
- 2. Original cancelled cheque OR letter from the bank verifying banking details (with bank stamp)
- 3. **Certified** copy of Identity document of Shareholders/Directors/Members (where applicable)
- 4. **Certified** copy of certificate of incorporation, CM29 / CM9 (name change)
- 5. **Certified** copy of share Certificates of Shareholders, CK1 / CK2 (if CC)
- 6. A letter with the company's letterhead confirming physical and postal addresses
- 7. Original or certified copy of SARS Tax Clearance certificate and Vat registration certificate
- 8. A signed letter from the Auditor / Accountant confirming most recent annual turnover and percentage black ownership in the company **AND/OR** BBBEE certificate and detailed scorecard from an accredited rating agency (SANAS member).

NB:

- Failure to submit the above documentation will delay the vendor creation process.
- Where applicable, the respective Transnet business unit processing your application may request further information from you. E.g. proof of an existence of a Service/Business contract between your business and the respective Transnet business unit etc.

#### **IMPORTANT NOTES:**

- a) If your annual turnover is less than R5 million, then in terms of the DTI codes, you are classified as an Exempted Micro Enterprise (EME). If your company is classified as an EME, please include in your submission, a signed letter from your Auditor / Accountant confirming your company's most recent annual turnover is less than R5 million and percentage of black ownership and black female ownership in the company AND/OR BBBEE certificate and detailed scorecard from an accredited rating agency (e.g. permanent SANAS Member), should you feel you will be able to attain a better BBBEE score.
- b) If your annual turnover is between R5 million and R35million, then in terms of the DTI codes, you are classified as a Qualifying Small Enterprise (QSE) and you claim a specific BBBEE level based on any 4 of the 7 elements of the BBBEE score-card, please include your BEE certificate in your submission as confirmation of your status.
  - NB: BBBEE certificate and detailed scorecard should be obtained from an accredited rating agency (e.g. permanent SANAS Member).
- c) <a href="If your annual turnover is in excess of R35million">If your annual turnover is in excess of R35million</a>, then in terms of the DTI codes, you are classified as a Large Enterprise and you claim a specific BEE level based on all seven elements of the BBBEE generic score-card. Please include your BEE certificate in your submission as confirmation of your status.

  NB: BBBEE certificate and detailed scorecard should be obtained from an accredited rating agency (permanent SANAS Member).
- d) To avoid PAYE tax being automatically deducted from any invoices received from you, you must also contact the Transnet person who lodged this request on your behalf, so as to be correctly classified in terms of Tax legislation.
- e) Unfortunately, <u>No payments can be made to a vendor until</u> the vendor has been registered, and no vendor can be registered until the vendor application form, together with its supporting documentation, has been received and processed.
- f) Please return the completed Supplier Declaration Form (SDF) together with the required supporting documents mentioned above to the Transnet Official who is intending to procure your company's services/products in order that he/she should complete and Internal Transnet Departmental Questionnaire before referring the matter to the appropriate Transnet Vendor Master Office.

#### Regards.

Transnet Vendor/Supplier Management .Contact person Carol tell: 021 940-3846 fax 021 940-3883.





# **Supplier Declaration Form**

| Company Trading Name |                |                |                                 |          |     |                |                       |               |     |
|----------------------|----------------|----------------|---------------------------------|----------|-----|----------------|-----------------------|---------------|-----|
| Company Regis        |                |                |                                 |          |     |                |                       |               |     |
| Company Registr      | ation Number   | Or ID Numbe    | r If A Sole P                   | roprieto | or  |                |                       |               |     |
| Form of entity       | CC             | Trust          | Pty Lt                          | d        | Liı | mited Pai      | rtnership             | Sole Proprie  | tor |
| VAT number (if I     | egistered)     |                |                                 |          |     |                |                       |               |     |
| Company Telepl       | none Number    |                |                                 |          |     |                |                       |               |     |
| Company Fax N        | umber          |                |                                 |          |     |                |                       |               |     |
| Company E-Mai        | l Address      |                |                                 |          |     |                |                       |               |     |
| Company Webs         | ite Address    |                |                                 |          |     |                |                       |               |     |
| Bank Name            |                |                | Bank Account Number             |          |     |                |                       |               |     |
| Postal               |                |                |                                 |          |     |                |                       |               |     |
| Address              |                |                |                                 |          |     |                | Co                    | ode           |     |
| Physical             |                |                |                                 |          |     |                | 0-                    | al a          |     |
| Address              |                |                |                                 |          |     |                | Co                    | ode           |     |
| Contact Person       |                |                |                                 |          |     | $\overline{}$  |                       |               |     |
| Designation          |                |                |                                 |          |     | $\overline{}$  |                       |               |     |
| Telephone            |                |                |                                 |          |     |                |                       |               |     |
| Email                |                |                |                                 |          |     |                |                       |               |     |
| Annual Turnover F    | • •            | ancial Year)   | cial Year)   < R5 Million       |          |     | R5-35 million  |                       | > R35 million |     |
| Does Your Comp       | any Provide    |                | Products                        |          |     | Services       |                       | Both          |     |
| Area Of Delivery     |                |                | National                        |          | П   | Provincial     |                       | Local         |     |
| Is Your Company      |                |                |                                 |          |     | Public Private |                       | Private       |     |
| Does Your Comp       | any Have A Ta  | x Directive C  | r IRP30 Cer                     | tificate |     | Yes No         |                       | No            |     |
| Main Product Or      | Service Suppli | ed (E.G.: Stat | d (E.G.: Stationery/Consulting) |          |     |                |                       |               |     |
| BEE Ownership        | Details        |                |                                 |          |     |                |                       |               |     |
| % Black Ownership    | )              | % Black wome   | n ownership                     |          |     |                | ed person/s<br>ership |               |     |
| Does your comp       | any have a Bi  | E certificate  |                                 | Yes      | s   | No             |                       |               |     |
| What is your bro     | ad based BEE   | status (Lev    | el 1 to 9 / U                   | nknowi   | n)  |                |                       |               |     |
| How many perso       | onnel does the | firm employ    | P                               | ermane   | ent | t Part time    |                       |               |     |
| Transnet Contac      | t Person       |                |                                 |          |     |                |                       |               |     |
| Contact number       |                |                |                                 |          |     |                |                       |               |     |
| Transnet operati     | ng division    |                |                                 |          |     |                |                       |               |     |
| Duly Authorise       | d To Sign For  | And On Be      | half Of Firn                    | n / Org  | jan | nisation       |                       |               |     |
| Name                 |                |                |                                 |          | De  | esignation     |                       |               |     |
| Signature            |                |                |                                 |          | Da  | ate            |                       |               |     |
| Stamp And Sig        | nature Of Coi  | nmissioner     | Of Oath                         |          |     |                |                       |               |     |
| Name                 |                |                |                                 |          | Da  | ate            |                       |               |     |
| Signature            |                |                |                                 |          | T   | alenhone No    |                       |               |     |

NB: Please return the completed Supplier Declaration Form (SDF) together with the required supporting documents mentioned above to the Transnet Official who is intending to procure your company's services/products.

Transnet Vendor/Supplier Management .Contact person Carol tell: 021 940-3846 fax 021 940-3883