

CONTROL POINTS (WGS84, e33)			
NAME	Y	X	Z
BM1	-3 024 028,202	-43 846,418	95,950
BM2	-3 024 091,283	-43 725,074	77,230
BM3	-3 023 727,296	-43 814,280	88,271
BM4	-3 023 997,262	-43 948,756	85,213
BM5	-3 023 775,898	-43 887,850	93,881

COORDINATES			
POINT	Y	X	LEVEL
EL1	-3023719,222	-43833,968	93,047
EL2	-3023719,222	-43837,968	93,265
EL3	-3023723,622	-43837,968	93,532
EL4	-3023723,622	-43833,968	93,295

COORDINATES			
POINT	Y	X	LEVEL
PF1	-3023713,141	-43819,719	88,110
PF2	-3023713,141	-43830,344	91,316
PF3	-3023737,141	-43830,344	90,995
PF4	-3023737,141	-43814,844	88,974
PF5	-3023719,141	-43814,844	88,747

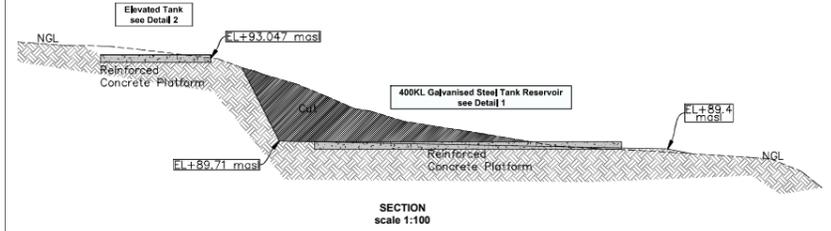
COORDINATES			
POINT	Y	X	LEVEL
IL1	-3023688,228	-43883,238	93,601
IL2	-3023690,464	-43870,522	93,601
IL3	-3023689,112	-43853,502	93,601
IL4	-3023713,461	-43829,431	91,089
IL5	-3023688,638	-43880,907	93,601
IL6	-3023694,070	-43848,763	93,601
IL7	-3023695,815	-43847,024	93,601
OL1	-3023732,199	-43833,950	93,118
OL2	-3023741,487	-43832,709	91,492
OL3	-3023743,800	-43820,516	89,624
OL4	-3023736,241	-43816,279	89,094
OL5	-3023732,294	-43827,507	90,715

COORDINATES			
POINT	Y	X	LEVEL
RE1	-3023724,242	-43823,206	90,155
RE2	-3023731,269	-43819,149	89,329
RE3	-3023716,862	-43827,409	90,946

**LEGEND**

- 800 CL12 HDPE Connection Main (INLET)
- 800 CL12 HDPE Connection Main (OUTLET)
- AV Air Valve
- SV Scour Valve
- IV Isolation Valve
- Earth V-Drain
- Reinforced Concrete Platform
- Platform (Cut/Fill)
- Stone Pitching
- Benchmark
- Existing Building

- GENERAL NOTES**
- Do not scale this drawing. Work to figure by dimensions, only. Any discrepancies to be brought to the Engineers attention prior to implementation of any work.
  - Minimum concrete cube strength @ 28 days for blinding layer is to be 15MPa minimum concrete cube strength @ 28 days for walls, floor slabs, roof slabs, columns, foundations and external non-water retaining structure is to be 30MPa.
  - Concrete cover specifications are to be in accordance with the contract document design specifications.
  - Minimum cover to reinforcing all concrete members 25mm top & bottom.  
PWJ - partial wall vertical joint  
PFJ - partial floor joint
  - Engineer to inspect all reinforcement prior to casting concrete.
  - 20x20mm chamfer on all exposed concrete edges unless otherwise noted.
  - All steel flanges to S.A.B.S. 1123/77 table 1000/3 unless otherwise indicated.
  - Brick work:
    - All exposed external brickwork satin red facebrick.
    - All internal brickwork to be clay commons, plastered and painted acrylic pva white.
    - Outer face of internal brickwork skin to be bagged and bitumen painted.
    - Brickforce at windowsill level and wall plate level all around building.
    - N.B: 4 course brickforce above windows and doors.
    - DPC at floor and windowsill levels.
  - Plaster:
    - Cement plaster 12mm thick to internal vertical brick walls.
  - Painting:
    - Prepare and apply two coats bitumen paint on brick skin including working around wire ties.
    - Prepare and apply one coat plaster primer and two coats approved pva acrylic paint to internal walls, fibre cement fascia and barge board.
    - Clean with spirits of salts solution and apply two coats silicone-based brick dressing in strict accordance with the manufacturer's instructions to external face brick walling.
    - Prepare and apply one coat plaster primer and one coat universal undercoat and one coat approved eggshell enamel paint on fibre cement sills.
    - Eth and apply one coat zinc primer, one undercoat and two finishing coats approved universal gloss enamel paint on steel sashes, frames, and burglar bars.
    - Prepare, stop and apply two coats approved varnish on hardwood doors and frames.
    - prepare, knot prime stop, and apply one coat pink wood primer, one undercoat and two coats approved universal eggshell enamel paint on general surfaces of eaves timbers.
  - All steel pipe specials to be rilsan lined and coated to specifications.
  - All buried steel pipework & bolted connections to be 'denso' wrapped to specifications.
  - All puddle pipes to be tape wrapped to specifications.
  - All bolts & nuts to be hot dip galvanised, unless otherwise indicated.
  - All construction activities shall be executed to the Engineer's approval.
  - Setting out & final positioning of all steel pipework, including puddle pipes, to be confirmed by contractor on site, prior to fabrication and installation.



Project Manager **TSI CONSULTING ENG.**

Urban Planners

Architects

Quantity Surveyors

Structural Engineers **TSI CONSULTING ENG.**

Civil Engineers **TSI CONSULTING ENG.**

Electrical Engineers

Mechanical Engineers

Landscape Architects

Contractor

CLIENT

**KWAZULU-NATAL PROVINCE**  
HEALTH  
REPUBLIC OF SOUTH AFRICA

IMPLEMENTING AGENT

**KWAZULU-NATAL PROVINCE**  
HEALTH  
REPUBLIC OF SOUTH AFRICA

PROJECT

**MSELENI HOSPITAL:**  
**72 HOUR WATER STORAGE TANK**

**TSI Consulting Engineers (Pty) Ltd**

TSI Consulting Engineers (Pty) Ltd  
PO Box 902  
KwaZulu  
4700

Tel :  
Fax :  
Email : [info@tsiconsulting.co.za](mailto:info@tsiconsulting.co.za)

DRAWING

**GENERAL LAYOUT**

STAGE **DETAIL DESIGN**

CLIENT'S SIGNATURE

DRAWING USAGE

APPROVED

Client: \_\_\_\_\_  
TSI Engineers (Pty) Ltd

Drawn by Date: \_\_\_\_\_  
Checked by Date: \_\_\_\_\_

Date Drawn: 2023/04/12  
Print Date: 2023/04/12

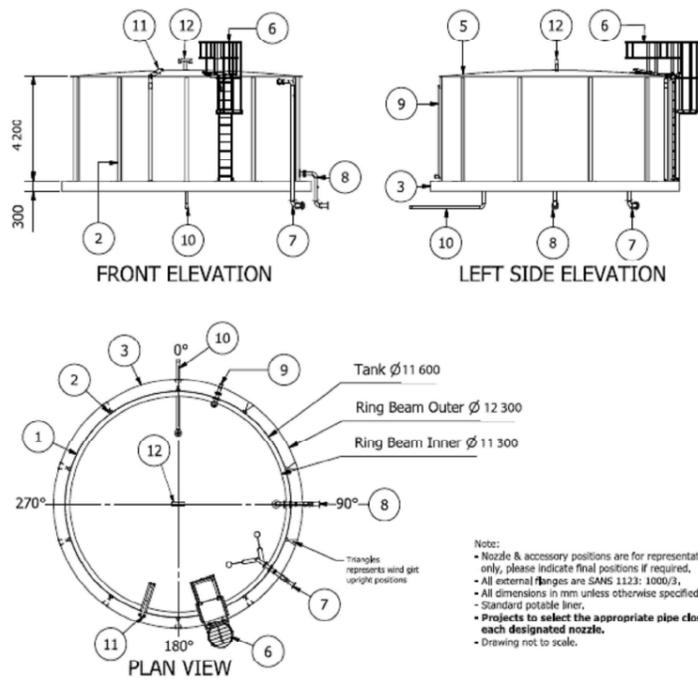
Scale: 1:100 @ A0 SIZE

Project No: TBC

Revision: **1001** Status: **TENDER**

**FOR TENDER**



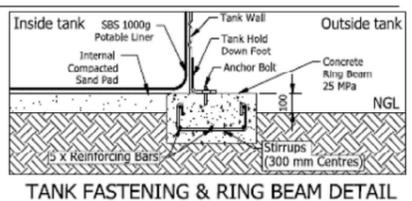
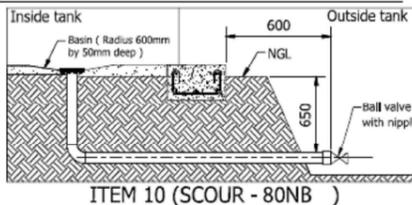
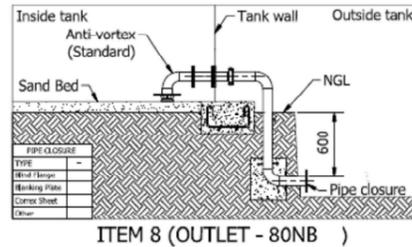
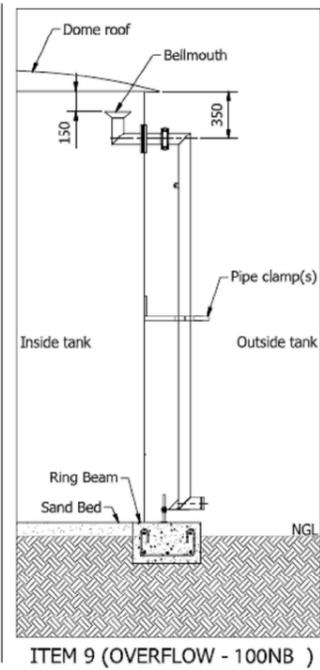
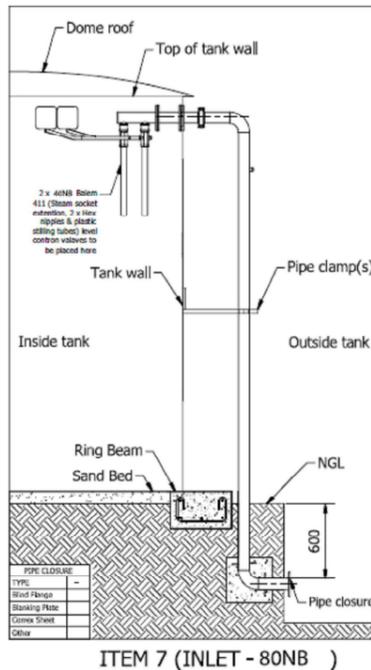
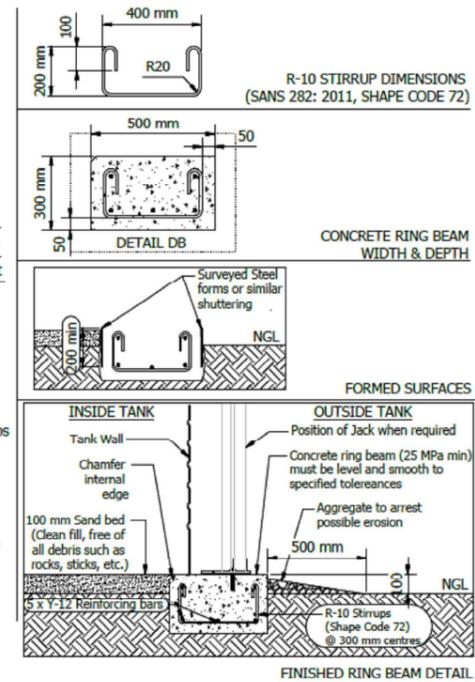
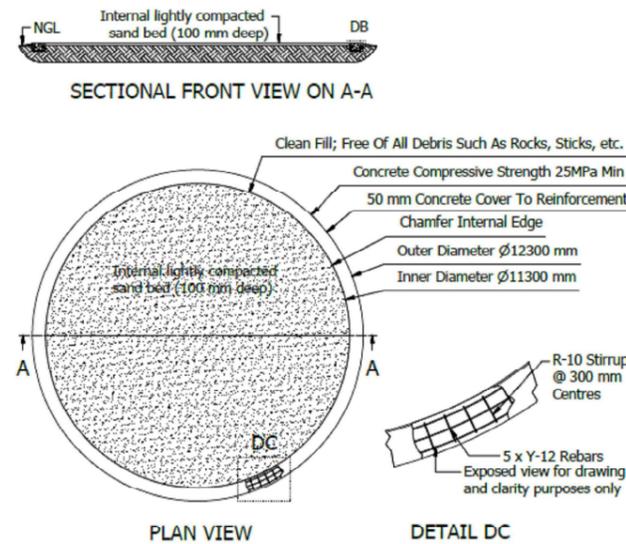


ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	Tank Wall Panels	Zincalume Steel Panels, Steel Grade G300, with AZ150 Heavy Duty Coating.
2	17	Wind Girts	Wind Girts are made from 2.4 mm hot dipped galvanised sheet metal. Punched and bent into profile.
3	1	Concrete Ring Beam	Reinforced, 25MPa min.
4	1	Truss Set (not shown)	Made from SHS (300 MPa min) and EA steel. Hot dipped galvanised after fabrication.
5	1	Dome Roof	Zincalume corrugated sheets, 0.47 mm thick, Grade G550, with AZ150 coating.
6	1	Tank Access	Fixed, internal & external ladders, safety cage, platform, access hatch and hand rails.
7	1	Inlet - 80NB	Internal dual valve adaptor, 2 x Balm 411 float control valves (2 x Steam socket extensions, 2 x hex nipples & 2 x plastic stalling tubes), external downpipe (terminates below ground), ext flange complete with pipe closure & pipe damp(s).
8	1	Outlet - 80NB	Internal anti-vortex (Standard), external downpipe (terminates below ground), ext flange complete with pipe closure.
9	1	Overflow - 100NB	Internal bellmouth, external downpipe with grooved termination complete with pipe damp(s).
10	1	Scour - 80NB	Internal flange, external threaded female socket with nipple and ball valve.
11	1	Water Level Indicator	5 Rings
12	2	Ventilator	Static, 76 x 76 SHS.

TANK & PROJECT DETAILS				
QUOTE No.	PROJECT	TANK MODEL	GROSS	EFFECTIVE
183519	Mseleni Hospital	ST17/04	445 kl	

TANK & ACCESSORIES GA - ST17/04

ST17 CONCRETE RING BEAM - NOT TO SCALE



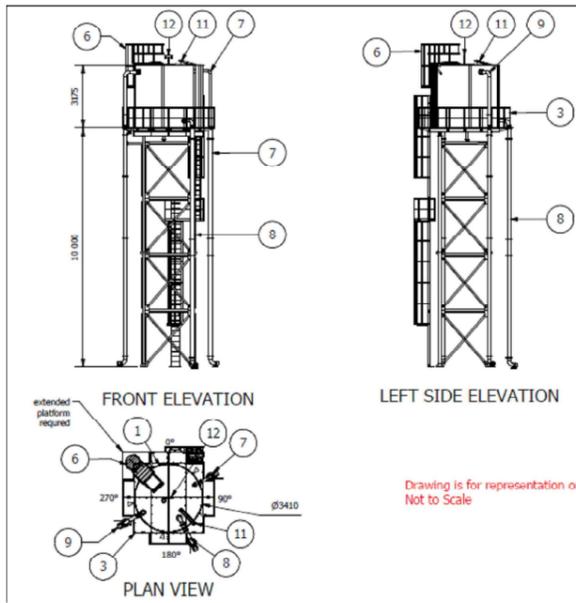
ITEM 7 (INLET - 80NB)

ITEM 9 (OVERFLOW - 100NB)

TANK FASTENING & RING BEAM DETAIL

Project Manager	TSI CONSULTING ENG.
Urban Planners	
Architects	
Quantity Surveyors	
Structural Engineers	TSI CONSULTING ENG.
Civil Engineers	TSI CONSULTING ENG.
Electrical Engineers	
Mechanical Engineers	
Landscape Architects	
Contractor	
CLIENT	
IMPLEMENTING AGENT	
PROJECT	<b>MSELENI HOSPITAL</b> <b>72 HOUR WATER STORAGE TANK</b>
	TSI Consulting Engineers (Pty) Ltd PO Box 902 KwaZulu 4700 Tel : Fax : Email : info@tsiconsulting.co.za
DRAWING	
	<b>DETAILS 1: 400KL RESERVOIR</b>
STAGE	<b>DETAIL DESIGN</b>
CLIENT'S SIGNATURE	.....
DRAWING USAGE	.....
APPROVED	Client: _____ Team: _____
Drawn by Date	TSI Engineers (Pty) Ltd 2023/04/12
Checked by Date	2023/04/12
Scale	NTS @ A1 SIZE
Project No.	TBC
Date Drawn	2023/04/12
Print Date	2023/04/12
Layout ID	1003
Revision	00
Status	TENDER

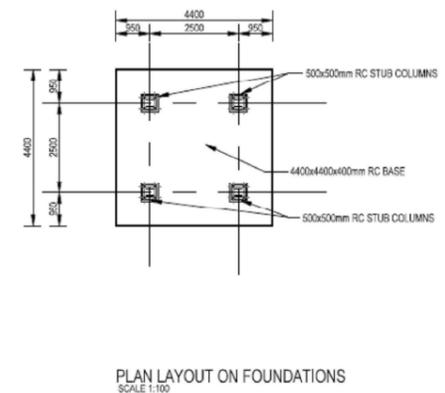
FOR TENDER



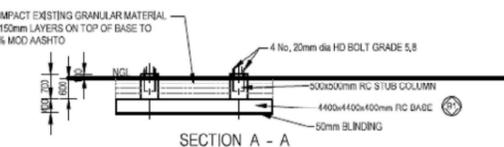
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	Tank Wall Panels	Zincalume Steel Panels, Steel Grade G300, with AZ150 Heavy Duty Coating.
2	5	Wind Girts/Uprights & Covers	Wind Girts are made from 2.4 mm hot dipped galvanized sheet metal. Punched and bent into profile.
3	1	Elevated Tower	ET05-03-10m
4	1	Truss Set (Not Shown)	Made from SHS (300 MPa) and EA steel. Hot dip galvanized after fabrication
5	1	Dome Roof	Zincalume corrugated sheets, 0.47 mm thick, Grade G550, with AZ150 coating.
6	1	Tank Access - 600 mm	Fixed, c/w internal & external ladders, safety cage, platform, access hatch & hand rails.
7	1	Inlet - 50NB (Special)	Internal threaded female socket c/w Balen 411 float control valve, external downpipe with groove termination above tower floor, downpipe to ground level.
8	1	Outlet - 80NB (Special)	Internal anti-vortex (standard), groove termination above tower floor, downpipe to ground level c/w geared butterfly valve.
9	1	Overflow - 80NB (Special)	Internal bell mouth, external downpipe with groove termination above tower floor, downpipe to ground level.
10	1	Scour - 80NB (Special)	Internal flange, external flange c/w geared butterfly valve (with special extension handle) & spool piece.
11	1	Water Level Indicator	Mechanical (true read type)
12	1	Ventilator	Static, 75 x 75 SHS.

**Note:**  
 - Nozzle & accessory positions are for representation only, final positions still to be determined.  
 - All external flanges are SANS 1122: 1000/3.  
 - All dimensions in mm unless otherwise specified.  
 - Potable liner to be installed.  
 - Projects to select the appropriate pipe closure for each designated nozzle.  
 - Special installation requirement - Refer to Engineering Department for briefing @ time of installation.  
 - Inlet, outlet & overflow/scour downpipes include pipe clamps that attach to tower.  
 - Quoted for 15 x ET05-03-10m  
 - Platform extension required.

TANK AND ACCESSORIES GA - 15 x ET05-03-10m

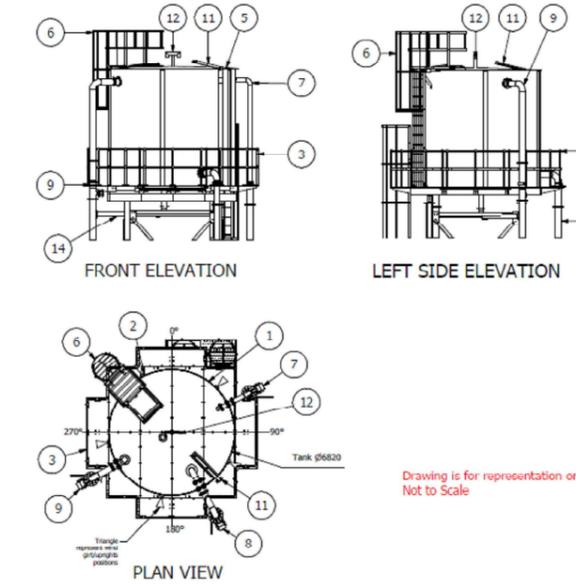


PLAN LAYOUT ON FOUNDATIONS  
SCALE: 1:100



SECTION A - A

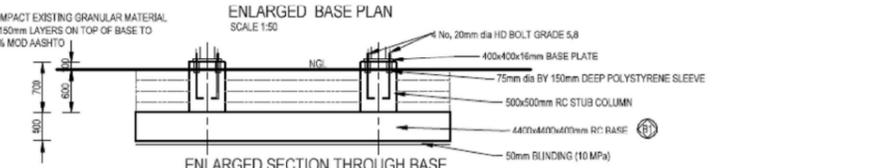
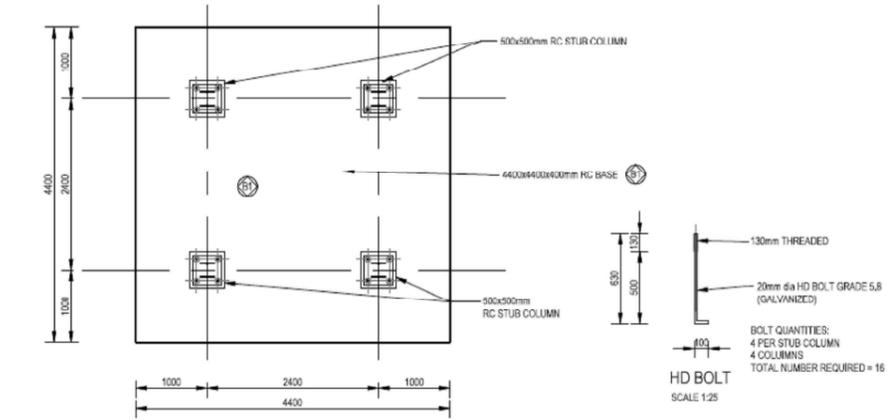
- FOUNDATION NOTES AND GUIDELINES:**
- This document contains minimum required dimensions and guidelines and is not to be used for construction unless officially issued by an approved engineer or company representative.
  - SBS is not responsible for any loss or damage caused by incorrectly designed or built foundations and stub columns.
  - Foundation sizes shown are for geographic areas which do not experience wind speeds exceeding 43 m/s (155 km/h). Should wind speeds in excess of this be expected, then special designs must be prepared.
  - It is very important for the client to ensure that foundation conditions comply to the following minimums.
    - Safe bearing capacity should equal or exceed 100 kPa
    - The founding material must be stable.
    - The founding material must be uniform across all bases.
  - Should there be any doubt about the stability or strength of the foundations, site specific professional engineering advice must be sought.
  - In areas with corrosive soil conditions, special protective measures should be used.
  - Foundation dimensions are typical and provided for costing purposes only. Final foundation dimensions may vary depending on soil conditions, climatic conditions, etc.
  - Founding trenches to be inspected by the engineer prior to fixing reinforcing.
  - Reinforcing to be inspected by the engineer prior to pouring concrete.
  - Concrete cover = 50mm
  - Concrete strength at 28 days = 25 MPa
  - Tolerances:
    - Horizontal dimensions between bases +10mm to -10mm
    - Top of RC Stub columns -5mm to +5mm
  - Polystyrene void former on HD Bolts to be removed prior to installation of structure.
  - Base plates and HD Bolt void formers to be grouted up with non-shrink grout once tank structure is installed and leveled and prior to filling the tank.



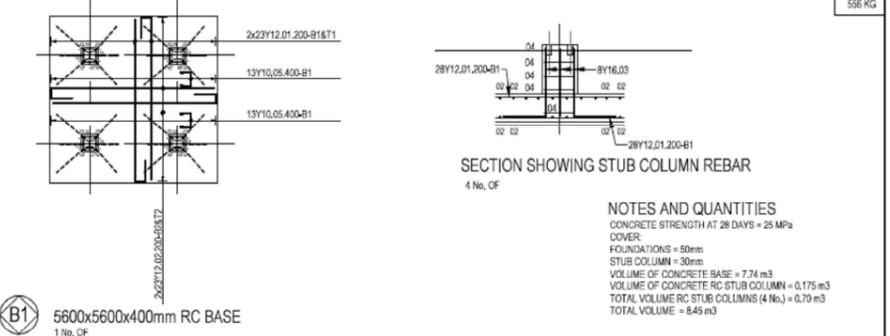
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	Tank Wall Panels	Zincalume Steel Panels, Steel Grade G300, with AZ150 Heavy Duty Coating.
2	5	Wind Girts/Uprights & Covers	Wind Girts are made from 2.4 mm hot dipped galvanized sheet metal. Punched and bent into profile.
3	1	Elevated Tower	ET05-03-10m
4	1	Truss Set (Not Shown)	Made from SHS (300 MPa) and EA steel. Hot dip galvanized after fabrication
5	1	Dome Roof	Zincalume corrugated sheets, 0.47 mm thick, Grade G550, with AZ150 coating.
6	1	Tank Access - 600 mm	Fixed, c/w internal & external ladders, safety cage, platform, access hatch & hand rails.
7	1	Inlet - 50NB (Special)	Internal threaded female socket c/w Balen 411 float control valve, external downpipe with groove termination above tower floor, downpipe to ground level.
8	1	Outlet - 80NB (Special)	Internal anti-vortex (standard), groove termination above tower floor, downpipe to ground level c/w geared butterfly valve.
9	1	Overflow - 80NB (Special)	Internal bell mouth, external downpipe with groove termination above tower floor, downpipe to ground level.
10	1	Scour - 80NB (Special)	Internal flange, external flange c/w geared butterfly valve (with special extension handle) & spool piece.
11	1	Water Level Indicator	Mechanical (true read type)
12	1	Ventilator	Static, 75 x 75 SHS.

**Note:**  
 - Nozzle & accessory positions are for representation only, final positions still to be determined.  
 - All external flanges are SANS 1122: 1000/3.  
 - All dimensions in mm unless otherwise specified.  
 - Potable liner to be installed.  
 - Projects to select the appropriate pipe closure for each designated nozzle.  
 - Special installation requirement - Refer to Engineering Department for briefing @ time of installation.  
 - Inlet, outlet & overflow/scour downpipes include pipe clamps that attach to tower.  
 - Platform extension required.

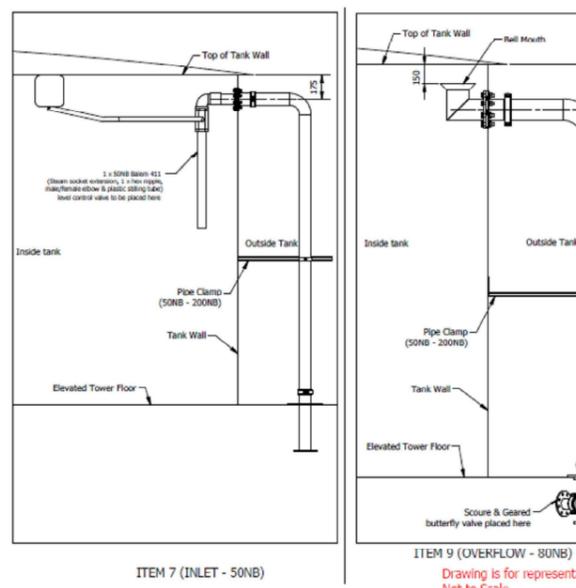
TANK AND ACCESSORIES GA - ST05-03-10m



Quantity	No. of	Bar size	Bar Mark	Total Length	Tot. No.	Shape Code	A	B	C	D	E	DIAGRAM	MASS (KG)
1	46	Y12	01	5300	46	36	4300	300					217
1	46	Y12	02	5250	46	38	4300	275					215
4	8	Y16	03	1500	32	37	1000						81
4	5	Y10	04	1900	20	60	440	440					24
1	26	Y10	05	1200	26	72	300	400					19
													595 KG



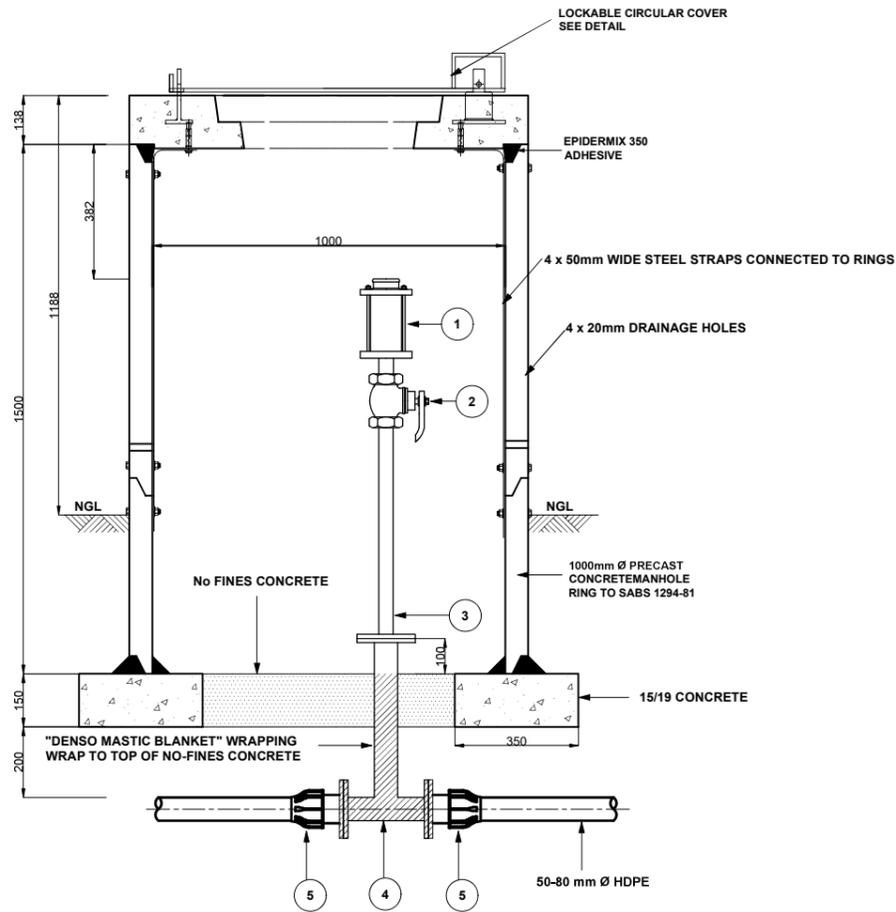
**NOTES AND QUANTITIES**  
 CONCRETE STRENGTH AT 28 DAYS = 25 MPa  
 COVER:  
 FOUNDATIONS = 50mm  
 STUB COLUMN = 30mm  
 VOLUME OF CONCRETE BASE = 7.74 m<sup>3</sup>  
 VOLUME OF CONCRETE RC STUB COLUMN = 0.175 m<sup>3</sup>  
 TOTAL VOLUME RC STUB COLUMNS (4 No.) = 0.70 m<sup>3</sup>  
 TOTAL VOLUME = 8.45 m<sup>3</sup>



ITEM 7 (INLET - 50NB)  
 ITEM 9 (OVERFLOW - 80NB)  
 ITEM 8 (OUTLET - 80NB)  
 ITEM 10 (SCOUR - 80NB)

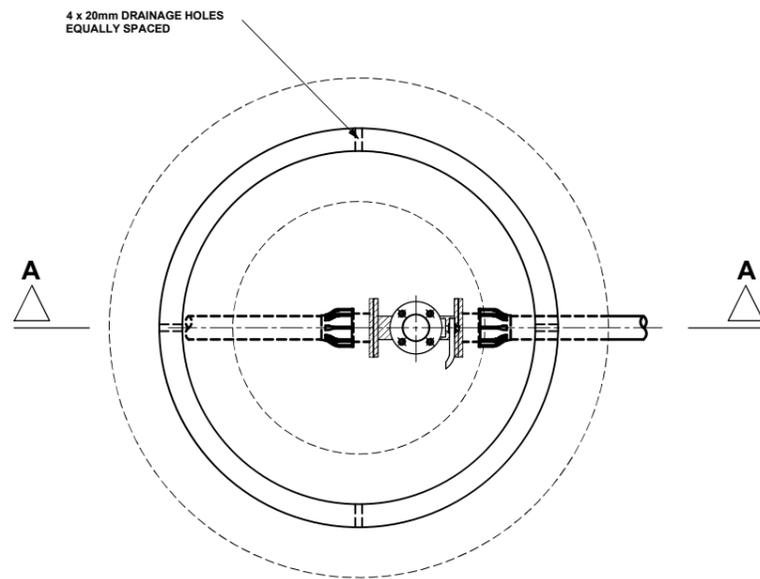
**Project Manager** TSI CONSULTING ENG.  
**Urban Planners**  
**Architects**  
**Quantity Surveyors**  
**Structural Engineers** TSI CONSULTING ENG.  
**Civil Engineers** TSI CONSULTING ENG.  
**Electrical Engineers**  
**Mechanical Engineers**  
**Landscape Architects**  
**Contractor**  
**CLIENT**  
 KWAZULU-NATAL PROVINCE  
 HEALTH  
 REPUBLIC OF SOUTH AFRICA  
**IMPLEMENTING AGENT**  
 KWAZULU-NATAL PROVINCE  
 HEALTH  
 REPUBLIC OF SOUTH AFRICA  
**PROJECT**  
**MSELENI HOSPITAL**  
**72 HOUR WATER STORAGE TANK**  
**TSI Consulting Engineers (Pty) Ltd**  
 TSI Consulting Engineers (Pty) Ltd  
 PO Box 902  
 Kokstad  
 4700  
 Tel :  
 Fax :  
 Email : info@tsiconsulting.co.za  
**DRAWING**  
**DETAILS 2: 20KL ELEVATED TANK**  
**STAGE** DETAIL DESIGN  
**CLIENT'S SIGNATURE**  
**DRAWING USAGE**  
**APPROVED** Client  
 TSI Engineers (Pty) Ltd  
 Drawn by Date  
 Checked by Date  
 2023/04/12  
 2023/04/12  
 Scale NTS @ A1 SIZE  
 Project No. TBC  
 Date Drawn 2023/04/12  
 Print Date 2023/04/12  
**Layout ID** 1004  
**Revision** 00  
**Status** TENDER

FOR TENDER



FITTINGS SCHEDULE FOR PIPES

ITEM No.	DIA.	DESCRIPTION	No. OFF
①	25 (50)	VENT-O-MAT AIR VALVE 025-RBX-16-1-1 OR 050-RBX-16-1-1	1
②	25 (50)	GLEN BALL VALVE	1
③	25 (50)	GMS STRAIGHT, THREADED ONE END, FLANGED ONE END 600mm, CONFIRM LENGTH ON SITE	1
④	50	EQUAL TEE, FLANGED ALL ENDS. T 450mm LONG	1
⑤	50	COMPRESSION FLANGE ADAPTER	2
⑥	50-80	COMPRESSION REDUCER	2



NOTES

- The Contractor shall excavate each trench such that the width conforms to the requirements of Subclause 5.2 of SABS 1200 DB or as shown in the drawing.
- The Contractor shall prepare the trench bottom in accordance with the requirements of SABS 1200 DB, apply bedding and fill according to SABS 1200 LB awing LB-2
- No bedding shall be laid until the Engineer has approved the trench, measured the depth if necessary, and authorized pipe laying to proceed.
- In the placing of bedding, all voids under the overhang of the pipes shall be filled and the compaction shall be carried out uniformly on each side of the pipe so as not to cause any lateral or vertical displacement of the pipe.
- Bedding shall be carried out as pipe laying proceeds, and shall be completed before the acceptance test is carried out.
- Pipes and fittings shall be fitted with spigot and socket rubber ring joints and shall comply with the relevant requirements of SABS 966.
- The degree of compaction attained for bedding (other than concrete and the material over the top of the pipeline) shall be 90 % of modified AASHTO maximum density (see 6.1).
- The Engineer may order density tests to be carried out to determine the density and grading of the bedding.
- The tests may be carried out by the sand replacement method or, where the grading of the bedding is such that the particle size is not less than 0,075 mm and not more than 2 mm, by use of a dynamic cone penetrometer. If the density is below that specified, the Engineer may order removal and recompaction.
- As the work proceeds, pipelines shall be tested in convenient lengths by means of test equipment supplied by the Contractor. Each test shall be carried out in the presence of the Engineer or his representative.
- The Contractor shall be responsible for carrying out all tests and for all expenses incurred in this connection.
- The hydraulic test shall be repeated until the Engineer is satisfied that the section under test complies with the said requirement.

- ALL DIMENSIONS IN MILLIMETRES
- CONCRETE TO BE CLASS 15/19 UNLESS OTHERWISE SPECIFIED
- COVER TO REINFORCEMENT TO BE 40mm
- AIR VALVE TO BE POSITIONED ABOVE NGL
- ALL FLANGES TO MINIMUM 1 600 kPA OR TO SUIT PIPE CLASS
- ALL THREADS TO BSP STANDARDS
- ALL BURIED FITTINGS AND HINGES TO BE WRAPPED IN "DENSO MASTIC BLANKET" TAPE
- ALL STEEL COMPONENTS INCLUDING BOLTS GALVANISED TO ISO 1461 : 2000
- ALL WELDS TO BE FULL PENETRATION TO BS 534 AND FILLET WELD TO BE 80% OF WALL THICKNESS OR WITH A MINIMUM OF 5mm

Project Manager	
Urban Planners	
Architects	
Quantity Surveyors	-
Structural Engineers	- TSI CONSULTING ENG.
Civil Engineers	- TSI CONSULTING ENG.
Electrical Engineers	
Mechanical Engineers	
Landscape Architects	-
Contractor	



PROJECT  
**MSELENI HOSPITAL:  
 72 HOUR WATER STORAGE TANK**



TSI Consulting Engineers (Pty) Ltd  
 PO Box 902  
 Kokstad  
 4700

DRAWING  
**DETAIL: AIR VALVE DETAILS FOR 50-80 DIA**

STAGE **DESIGN DEVELOPMENT**  
 CLIENT'S SIGNATURE .....  
 DRAWING USAGE .....

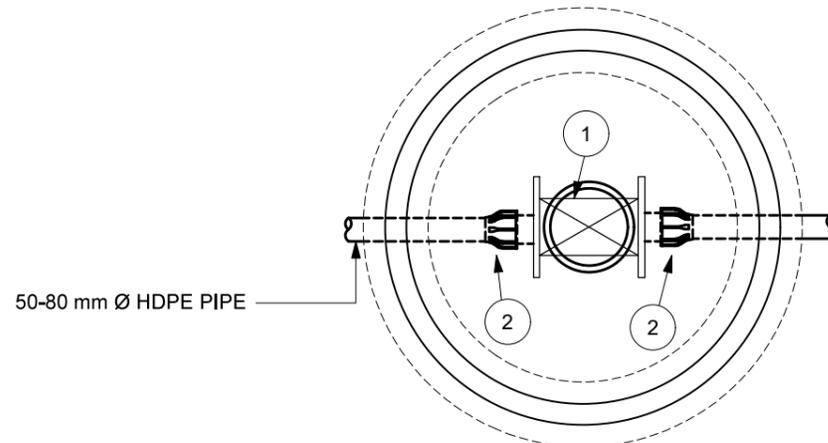
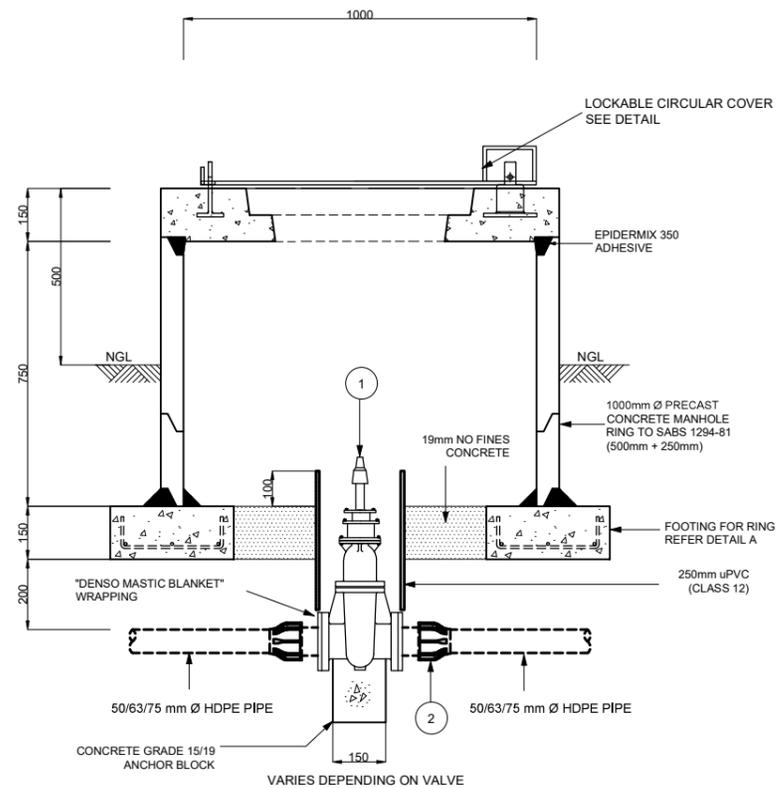
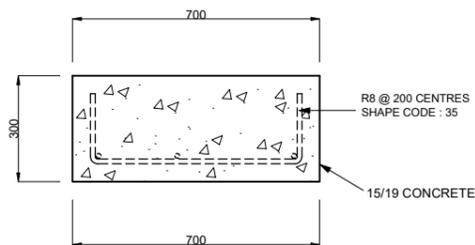
APPROVED	Client	Project No.
	Tenant	<b>MSEL001</b>
Drawn by	Date	Date Drawn:
TSI CONSULTING ENGINEERS		2023/03/22
Checked by	Date	Print date:
		2023/03/22
Scale:	1:100, 1:50	@ A1 SIZE

Layout ID	Revision	Status
<b>1005</b>	<b>00</b>	<b>FOR TENDER</b>

**FITTINGS SCHEDULE FOR PIPES**

ITEM No.	DIA.	DESCRIPTION	No. OFF
①	75-80	GATE VALVE CLASS 16	1
②	50-80	* COMPRESSION FLANGE ADAPTER FOR HDPE PIPES	1

\*1. SIZE AND TYPE OF ISOLATING VALVE IN ACCORDANCE WITH DETAILS SHOWN ON LAYOUT DRAWING  
 \*2. DIAMETER OF CONNECTING PIPE WORK AND FITTINGS TO SUIT SIZE OF ISOLATING VALVE.



**NOTES**

- The Contractor shall excavate each trench such that the width conforms to the requirements of Subclause 5.2 of SABS 1200 DB or as shown in the drawing.
- The Contractor shall prepare the trench bottom in accordance with the requirements of SABS 1200 DB, apply bedding and fill according to SABS 1200 LB awing LB-2
- No bedding shall be laid until the Engineer has approved the trench, measured the depth if necessary, and authorized pipe laying to proceed.
- In the placing of bedding, all voids under the overhang of the pipes shall be filled and the compaction shall be carried out uniformly on each side of the pipe so as not to cause any lateral or vertical displacement of the pipe.
- Bedding shall be carried out as pipe laying proceeds, and shall be completed before the acceptance test is carried out.
- Pipes and fittings shall be fitted with spigot and socket rubber ring joints and shall comply with the relevant requirements of SABS 966.
- The degree of compaction attained for bedding (other than concrete and the material over the top of the pipeline) shall be 90 % of modified AASHTO maximum density (see 6.1).
- The Engineer may order density tests to be carried out to determine the density and grading of the bedding.
- The tests may be carried out by the sand replacement method or, where the grading of the bedding is such that the particle size is not less than 0,075 mm and not more than 2 mm, by use of a dynamic cone penetrometer. If the density is below that specified, the Engineer may order removal and recompaction.
- As the work proceeds, pipelines shall be tested in convenient lengths by means of test equipment supplied by the Contractor. Each test shall be carried out in the presence of the Engineer or his representative.
- The Contractor shall be responsible for carrying out all tests and for all expenses incurred in this connection.
- The hydraulic test shall be repeated until the Engineer is satisfied that the section under test complies with the said requirement.

- ALL DIMENSIONS IN MILLIMETRES
- CONCRETE TO BE CLASS 15/19 UNLESS OTHERWISE SPECIFIED
- COVER TO REINFORCEMENT TO BE 40mm
- AIR VALVE TO BE POSITIONED ABOVE NGL
- ALL FLANGES TO MINIMUM 1 600 KPA OR TO SUIT PIPE CLASS
- ALL THREADS TO BSP STANDARDS
- ALL BURIED FITTINGS AND HINGES TO BE WRAPPED IN "DENSO MASTIC BLANKET" TAPE
- ALL STEEL COMPONENTS INCLUDING BOLTS GALVANISED TO ISO 1461 : 2009
- ALL WELDS TO BE FULL PENETRATION TO BS 534 AND FILLET WELD TO BE 80% OF WALL THICKNESS OR WITH A MINIMUM OF 5mm

Project Manager
Urban Planners
Architects
Quantity Surveyors
Structural Engineers - TSI CONSULTING ENG.
Civil Engineers - TSI CONSULTING ENG.
Electrical Engineers
Mechanical Engineers
Landscape Architects
Contractor



**PROJECT**  
**MSELENI HOSPITAL:**  
**72 HOUR WATER STORAGE TANK**



TSI Consulting Engineers (Pty) Ltd  
 PO Box 902  
 Kokstad  
 4700

**DRAWING**  
**DETAIL: 50-80 DIA ISOLATION VALVE TYPICAL DETAILS**

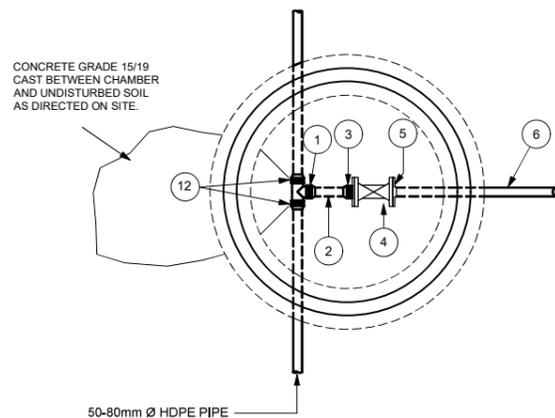
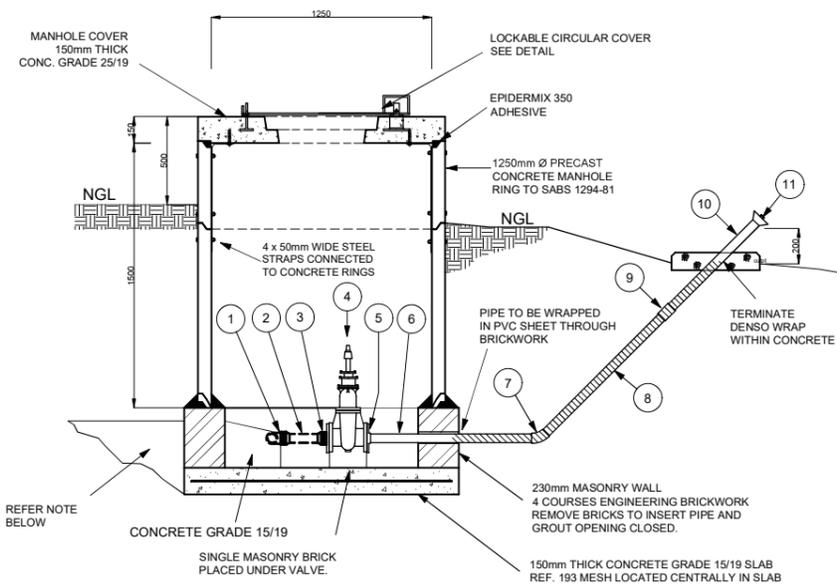
**STAGE DESIGN DEVELOPMENT**  
 CLIENT'S SIGNATURE .....  
 DRAWING USAGE .....

APPROVED	Client	Project No
	Tenant	MSEL001
Drawn by	Date	Date Drawn
TSI CONSULTING ENGINEERS		2023/03/22
Checked by	Date	Print date
		2023/03/22
Scale:	1:100, 1:50	@ A1 SIZE

Layout ID	Revision	Status
1006	00	FOR TENDER

FITTINGS SCHEDULE FOR PIPES

ITEM No.	DIA.	DESCRIPTION	No. OFF
①	50	50 Ø EQUAL TEE, HDPE COMPRESSION FITTING	1
②	50	HDPE STRAIGHT PIPE, CLASS 10 220mm LONG	1
③	50	FLANGE ADAPTOR HDPE COMPRESSION FITTING	1
④	50	WATERWORKS GATE VALVE TO SABS 664	1
⑤	50	FLANGE ADAPTOR FOR THREADED GMS PIPE	1
⑥	50	GMS STRAIGHT PIPE, THREADED BOTH ENDS 900mm LONG, CONFIRM LENGTH ON SITE	1
⑦	50	GMS ELBOW, FOR THREADED GMS PIPE	1
⑧	50	GMS STRAIGHT PIPE, THREADED BOTH ENDS 1120mm LONG, CONFIRM LENGTH ON SITE	1
⑨	50	COUPLING, FOR THREADED GMS PIPE	1
⑩	50	GMS STRAIGHT PIPE THREADED BOTH ENDS 800mm, CONFIRM LENGTH ON SITE	1
⑪	50	JET DISPERSER	1
⑫	50-80	COMPRESSION REDUCER	2



NOTES

- The Contractor shall excavate each trench such that the width conforms to the requirements of Subclause 5.2 of SABS 1200 DB or as shown in the drawing.
- The Contractor shall prepare the trench bottom in accordance with the requirements of SABS 1200 DB, apply bedding and fill according to SABS 1200 LB awing LB-2
- No bedding shall be laid until the Engineer has approved the trench, measured the depth if necessary, and authorized pipe laying to proceed.
- In the placing of bedding, all voids under the overhang of the pipes shall be filled and the compaction shall be carried out uniformly on each side of the pipe so as not to cause any lateral or vertical displacement of the pipe.
- Bedding shall be carried out as pipe laying proceeds, and shall be completed before the acceptance test is carried out.
- Pipes and fittings shall be fitted with spigot and socket rubber ring joints and shall comply with the relevant requirements of SABS 966.
- The degree of compaction attained for bedding (other than concrete and the material over the top of the pipeline) shall be 90 % of modified AASHTO maximum density (see 6.1).
- The Engineer may order density tests to be carried out to determine the density and grading of the bedding.
- The tests may be carried out by the sand replacement method or, where the grading of the bedding is such that the particle size is not less than 0,075 mm and not more than 2 mm, by use of a dynamic cone penetrometer. If the density is below that specified, the Engineer may order removal and recompaction.
- As the work proceeds, pipelines shall be tested in convenient lengths by means of test equipment supplied by the Contractor. Each test shall be carried out in the presence of the Engineer or his representative.
- The Contractor shall be responsible for carrying out all tests and for all expenses incurred in this connection.
- The hydraulic test shall be repeated until the Engineer is satisfied that the section under test complies with the said requirement.

- ALL DIMENSIONS IN MILLIMETRES
- CONCRETE TO BE CLASS 15/19 UNLESS OTHERWISE SPECIFIED
- COVER TO REINFORCEMENT TO BE 40mm
- AIR VALVE TO BE POSITIONED ABOVE NGL
- ALL FLANGES TO MINIMUM 1 600 kPA OR TO SUIT PIPE CLASS
- ALL THREADS TO BSP STANDARDS
- ALL BURIED FITTINGS AND HINGES TO BE WRAPPED IN "DENSO MASTIC BLANKET" TAPE
- ALL STEEL COMPONENTS INCLUDING BOLTS GALVANISED TO ISO 1461 : 2000
- ALL WELDS TO BE FULL PENETRATION TO BS 534 AND FILLET WELD TO BE 80% OF WALL THICKNESS OR WITH A MINIMUM OF 5mm

Project Manager	
Urban Planners	
Architects	
Quantity Surveyors	-
Structural Engineers	- TSI CONSULTING ENG.
Civil Engineers	- TSI CONSULTING ENG.
Electrical Engineers	
Mechanical Engineers	
Landscape Architects	-
Contractor	



PROJECT  
**MSELENI HOSPITAL:  
 72 HOUR WATER STORAGE TANK**



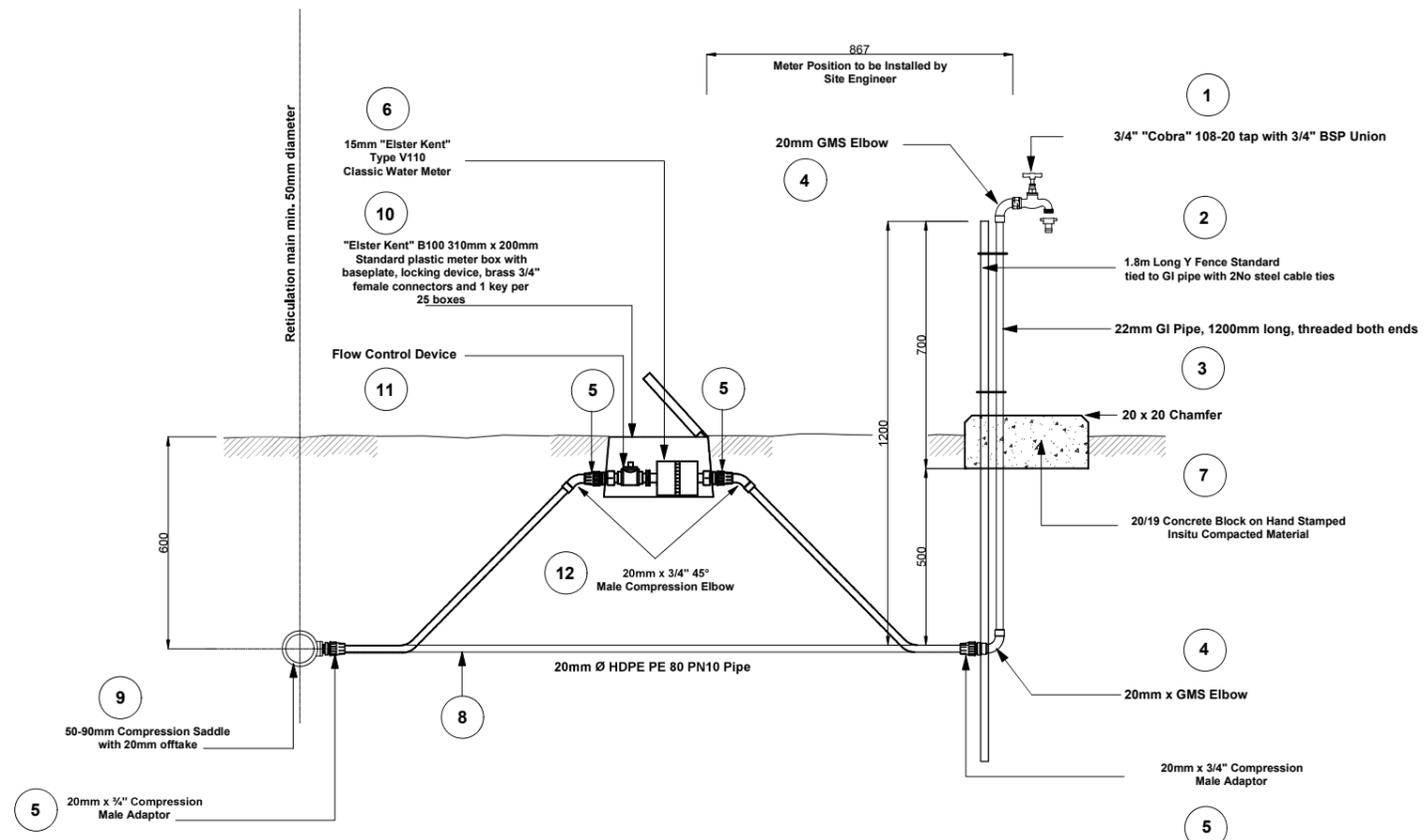
TSI Consulting Engineers (Pty) Ltd  
 PO Box 902  
 Kokstad  
 4700

DRAWING  
**DETAIL: 50-80 DIA SCOUR VALVE TYPICAL  
 DETAILS**

STAGE **DESIGN DEVELOPMENT**  
 CLIENT'S SIGNATURE .....  
 DRAWING USAGE .....

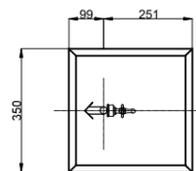
APPROVED	Client	Project No
	Tenant	<b>MSEL001</b>
Drawn by Date		Date Drawn
TSI CONSULTING ENGINEERS		2023/03/22
Checked by Date		Print date
		2023/03/22
Scale: 1:100, 1:50	@ A1 SIZE	

Layout ID	Revision	Status
<b>1007</b>	<b>00</b>	<b>FOR TENDER</b>



FITTINGS SCHEDULE

ITEM	DESCRIPTION	No. OFF
1	3/4" "COBRA" 108-20 TAP WITH 3/4" BSP UNION	1
2	1800mm LONG Y FENCE STANDARD TIE TO GALVANISED IRON PIPE WITH No. 2 CABLE TIES	1
3	22mm GALVANISED IRON PIPE 1200mm LONG, THREADED BOTH ENDS	1
4	20mm GMS ELBOW	2
5	20mm x 3/4" COMPRESSION MALE ADAPTOR	4
6	15mm "ELASTER" TYPE V110 CLASSIC WATER METER	1
7	20/19 CONCRETE BLOCK ON HAND STAMPED INSITU COMPACTED MATERIAL	1
8	20mm Ø HDPE PE 80 PN10 PIPE	10m
9	50/63/75/90mm COMPRESSION SADDLE WITH 20mm OFFTAKE	1
10	"ELSTER KENT" B100 310mm x 200mm STANDARD PLASTIC METER BOX WITH BASEPLATE, LOCKING DEVICE, BRASS 3/4" FEMALE CONNECTORS AND 1 KEY PER 25 BOXES	1
11	FLOW CONTROL DEVICE ("SMARTFLO")	1
12	20mm x 3/4" 45° MALE COMPRESSION ELBOW	2



- NOTES**
- The Contractor shall excavate each trench such that the width conforms to the requirements of Subclause 5.2 of SABS 1200 DB or as shown in the drawing.
  - The Contractor shall prepare the trench bottom in accordance with the requirements of SABS 1200 DB, apply bedding and fill according to SABS 1200 LB awing LB-2
  - No bedding shall be laid until the Engineer has approved the trench, measured the depth if necessary, and authorized pipe laying to proceed.
  - In the placing of bedding, all voids under the overhang of the pipes shall be filled and the compaction shall be carried out uniformly on each side of the pipe so as not to cause any lateral or vertical displacement of the pipe.
  - Bedding shall be carried out as pipe laying proceeds, and shall be completed before the acceptance test is carried out.
  - Pipes and fittings shall be fitted with spigot and socket rubber ring joints and shall comply with the relevant requirements of SABS 966.
  - The degree of compaction attained for bedding (other than concrete and the material over the top of the pipeline) shall be 90 % of modified AASHTO maximum density (see 6.1).
  - The Engineer may order density tests to be carried out to determine the density and grading of the bedding.
  - The tests may be carried out by the sand replacement method or, where the grading of the bedding is such that the particle size is not less than 0,075 mm and not more than 2 mm, by use of a dynamic cone penetrometer. If the density is below that specified, the Engineer may order removal and recompaction.
  - As the work proceeds, pipelines shall be tested in convenient lengths by means of test equipment supplied by the Contractor. Each test shall be carried out in the presence of the Engineer or his representative.
  - The Contractor shall be responsible for carrying out all tests and for all expenses incurred in this connection.
  - The hydraulic test shall be repeated until the Engineer is satisfied that the section under test complies with the said requirement.

Project Manager
Urban Planners
Architects
Quantity Surveyors
Structural Engineers - TSI CONSULTING ENG.
Civil Engineers - TSI CONSULTING ENG.
Electrical Engineers
Mechanical Engineers
Landscape Architects
Contractor



PROJECT  
**MSELENI HOSPITAL:  
72 HOUR WATER STORAGE TANK**



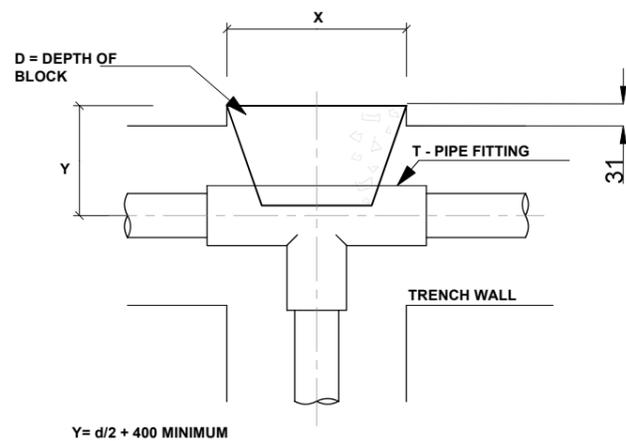
TSI Consulting Engineers (Pty) Ltd  
PO Box 902  
Kokstad  
4700

DRAWING  
**DETAIL: YARD TAP DETAILS WITH FLOW CONTROLLER**

STAGE **DESIGN DEVELOPMENT**  
CLIENT'S SIGNATURE .....  
DRAWING USAGE .....

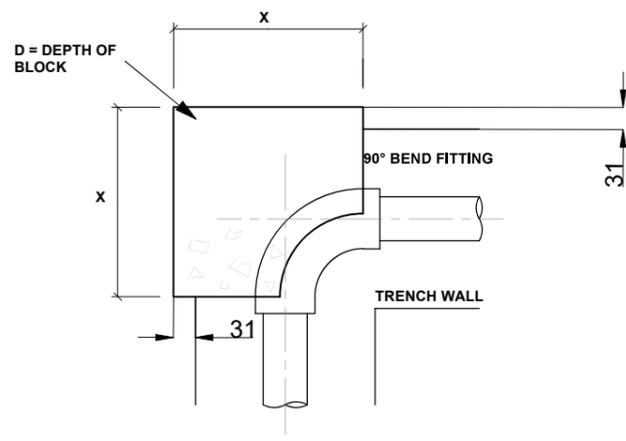
APPROVED	Client	Project No
	Tenant	MSEL001
Drawn by	Date	Date Drawn
TSI CONSULTING ENGINEERS		2023/03/22
Checked by	Date	Print date
		2023/03/22
Scale	1:100, 1:50	@ A1 SIZE

Layout ID	Revision	Status
1008	00	FOR TENDER



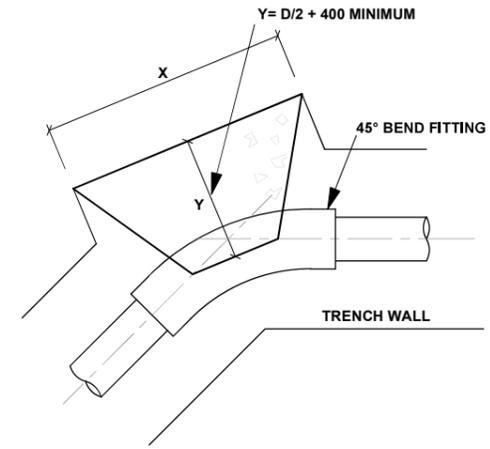
**TEE CONNECTION THRUST BLOCK FOR PRESSURE PIPELINE**

PIPE (mm)	X (mm)	D (mm)
50	300	150
75	300	150
80	400	200
110	500	250
160	600	300



**90° BEND THRUST BLOCK FOR PRESSURE PIPELINE**

PIPE (mm)	X (mm)	D (mm)
50	560	225
75	560	225
80	650	300
110	730	375
160	825	450

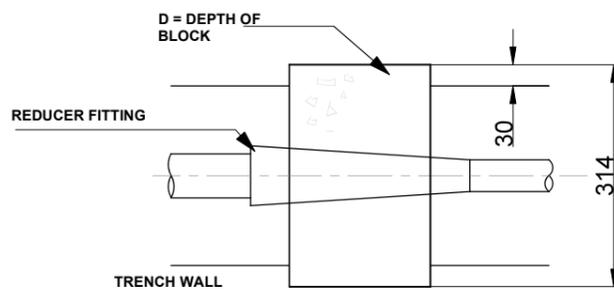


**45°/22.5° BEND THRUST BLOCK FOR PRESSURE PIPELINE**

PIPE (mm)	X (mm)	D (mm)
50	300	150
75	300	150
80	400	200
110	500	250
160	600	300

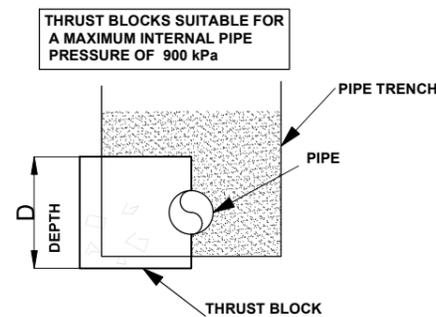
**NOTES**

- The Contractor shall excavate each trench such that the width conforms to the requirements of Subclause 5.2 of SABS 1200 DB or as shown in the drawing.
- The Contractor shall prepare the trench bottom in accordance with the requirements of SABS 1200 DB, apply bedding and fill according to SABS 1200 LB awing LB-2
- No bedding shall be laid until the Engineer has approved the trench, measured the depth if necessary, and authorized pipe laying to proceed.
- In the placing of bedding, all voids under the overhang of the pipes shall be filled and the compaction shall be carried out uniformly on each side of the pipe so as not to cause any lateral or vertical displacement of the pipe.
- Bedding shall be carried out as pipe laying proceeds, and shall be completed before the acceptance test is carried out.
- Pipes and fittings shall be fitted with spigot and socket rubber ring joints and shall comply with the relevant requirements of SABS 966.
- The degree of compaction attained for bedding (other than concrete and the material over the top of the pipeline) shall be 90 % of modified AASHTO maximum density (see 6.1).
- The Engineer may order density tests to be carried out to determine the density and grading of the bedding.
- The tests may be carried out by the sand replacement method or, where the grading of the bedding is such that the particle size is not less than 0,075 mm and not more than 2 mm, by use of a dynamic cone penetrometer. If the density is below that specified, the Engineer may order removal and recompaction.
- As the work proceeds, pipelines shall be tested in convenient lengths by means of test equipment supplied by the Contractor. Each test shall be carried out in the presence of the Engineer or his representative.
- The Contractor shall be responsible for carrying out all tests and for all expenses incurred in this connection.
- The hydraulic test shall be repeated until the Engineer is satisfied that the section under test complies with the said requirement.



**REDUCER CONNECTION THRUST BLOCK FOR PRESSURE PIPELINE**

PIPE (mm)	X (mm)	D (mm)
80	700	300
110	700	300
160	700	300



**TYPICAL SECTION**

- BACKSIDE OF THRUST BLOCK TO BE ON UNDISTURBED GROUND.
- CONCRETE GRADE 15/19 FOR ALL THRUST BLOCKS.
- d = PIPE Ø

Project Manager	
Urban Planners	
Architects	
Quantity Surveyors	-
Structural Engineers	- TSI CONSULTING ENG.
Civil Engineers	- TSI CONSULTING ENG.
Electrical Engineers	
Mechanical Engineers	
Landscape Architects	-
Contractor	



**PROJECT**  
**MSELENI HOSPITAL:**  
**72 HOUR WATER STORAGE TANK**



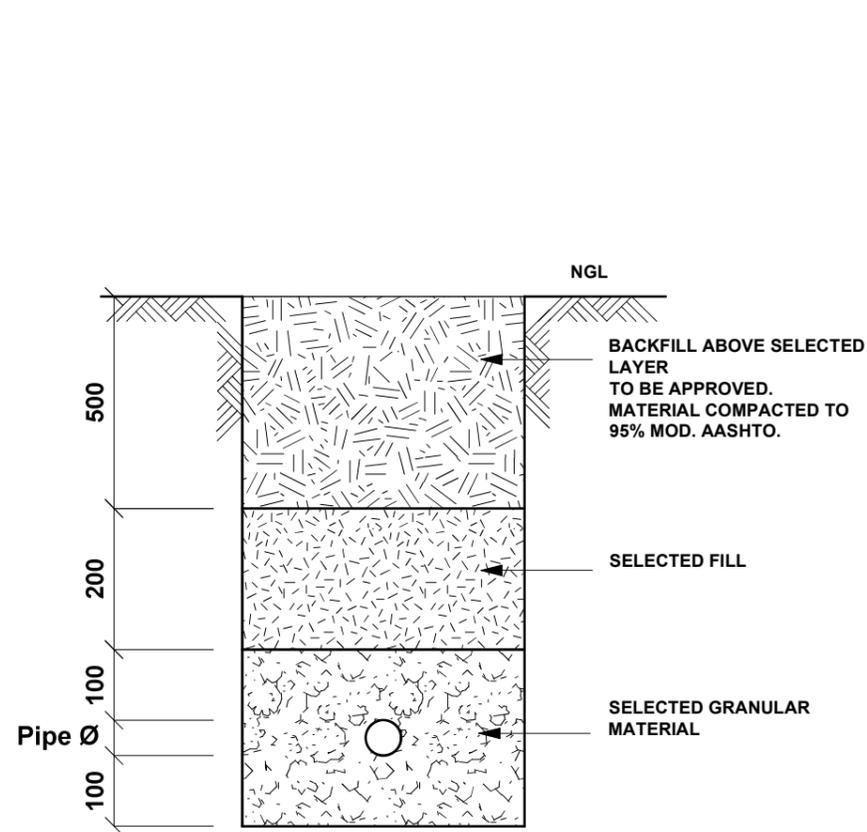
TSI Consulting Engineers (Pty) Ltd  
 PO Box 902  
 Kokstad  
 4700

**DRAWING**  
**DETAIL: THRUST BLOCK**

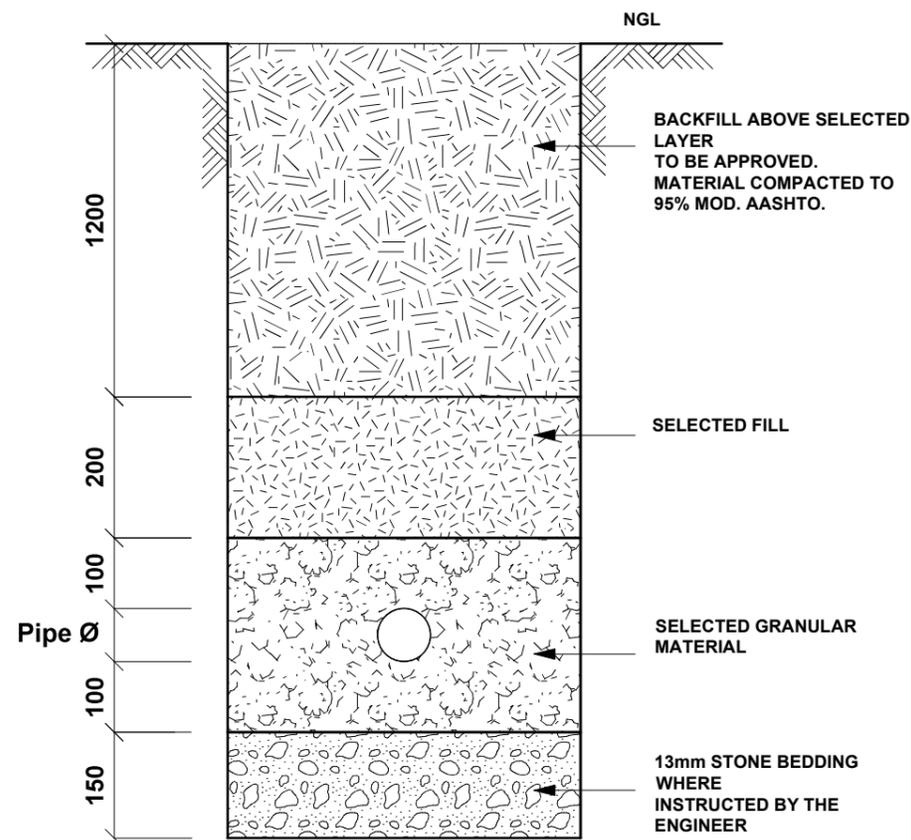
**STAGE DESIGN DEVELOPMENT**  
 CLIENT'S SIGNATURE .....  
 DRAWING USAGE .....

APPROVED	Client	Project No
	Tenant	MSEL001
Drawn by Date	TSI CONSULTING ENGINEERS	Date Drawn
Checked by Date		2023/03/22
Scale: 1:100, 1:50	@ A1 SIZE	Print date:
		2023/03/22

Layout ID	Revision	Status
1009	00	FOR TENDER



**BEDDING DETAIL FOR RETICULATION PIPES UP TO 75mm Ø COVER 800mm**



**BEDDING DETAIL FOR SECONDARY BULK PIPELINES 50mm Ø TO 160mm Ø COVER 1500mm**

**NOTES**

- The Contractor shall excavate each trench such that the width conforms to the requirements of Subclause 5.2 of SABS 1200 DB or as shown in the drawing.
- The Contractor shall prepare the trench bottom in accordance with the requirements of SABS 1200 DB, apply bedding and fill according to SABS 1200 LB awing LB-2
- No bedding shall be laid until the Engineer has approved the trench, measured the depth if necessary, and authorized pipe laying to proceed.
- In the placing of bedding, all voids under the overhang of the pipes shall be filled and the compaction shall be carried out uniformly on each side of the pipe so as not to cause any lateral or vertical displacement of the pipe.
- Bedding shall be carried out as pipe laying proceeds, and shall be completed before the acceptance test is carried out.
- Pipes and fittings shall be fitted with spigot and socket rubber ring joints and shall comply with the relevant requirements of SABS 966.
- The degree of compaction attained for bedding (other than concrete and the material over the top of the pipeline) shall be 90 % of modified AASHTO maximum density (see 6.1).
- The Engineer may order density tests to be carried out to determine the density and grading of the bedding.
- The tests may be carried out by the sand replacement method or, where the grading of the bedding is such that the particle size is not less than 0,075 mm and not more than 2 mm, by use of a dynamic cone penetrometer. If the density is below that specified, the Engineer may order removal and recompaction.
- As the work proceeds, pipelines shall be tested in convenient lengths by means of test equipment supplied by the Contractor. Each test shall be carried out in the presence of the Engineer or his representative.
- The Contractor shall be responsible for carrying out all tests and for all expenses incurred in this connection.
- The hydraulic test shall be repeated until the Engineer is satisfied that the section under test complies with the said requirement.

- ALL DIMENSIONS IN MILLIMETRES
- CONCRETE TO BE CLASS 15/19 UNLESS OTHERWISE SPECIFIED
- COVER TO REINFORCEMENT TO BE 40mm
- AIR VALVE TO BE POSITIONED ABOVE NGL
- ALL FLANGES TO MINIMUM 1 600 kPA OR TO SUIT PIPE CLASS
- ALL THREADS TO BSP STANDARDS
- ALL BURIED FITTINGS AND HINGES TO BE WRAPPED IN "DENSO MASTIC BLANKET" TAPE
- ALL STEEL COMPONENTS INCLUDING BOLTS GALVANISED TO ISO 1461 : 2000
- ALL WELDS TO BE FULL PENETRATION TO BS 534 AND FILLET WELD TO BE 80% OF WALL THICKNESS OR WITH A MINIMUM OF 5mm

Project Manager
Urban Planners
Architects
Quantity Surveyors
Structural Engineers - TSI CONSULTING ENG.
Civil Engineers - TSI CONSULTING ENG.
Electrical Engineers
Mechanical Engineers
Landscape Architects
Contractor



**PROJECT**  
**MSELENI HOSPITAL:**  
**72 HOUR WATER STORAGE TANK**



TSI Consulting Engineers (Pty) Ltd  
 PO Box 902  
 Kokstad  
 4700

**DRAWING**  
**DETAIL: TYPICAL BEDDING**

**STAGE DESIGN DEVELOPMENT**  
 CLIENT'S SIGNATURE .....  
 DRAWING USAGE .....

APPROVED	Client	Project No
	Tenant	MSEL001
Drawn by	Date	Date Drawn
TSI CONSULTING ENGINEERS		2023/03/22
Checked by	Date	Print date
		2023/03/22
Scale:	1:100, 1:50	@ A1 SIZE

Layout ID	Revision	Status
1010	00	FOR TENDER

**NOTES**

- 1: THESE UNITS TO BE PROVIDED FOR MAN HOLES AND WHERE EVER ELSE ORDERED BY ENGINEER.
- 2: ALL COMPONENTS TO BE MILD STEEL HOT DIPPED GALVANISED.
- 3: 14 Ø HOLE IN ITEM B TO SUIT ABUS PADLOCK.
- 4: ASSEMBLY TO BE PLACED CENTRALLY ACROSS MANHOLE/OPENING.
- 5: ALL CORNERS TO BE 10mm Ø RADIUS AS SHOWN.
- 6: ALL DIMENSIONS IN MILLIMETERS.

Project Manager
Urban Planners
Architects
Quantity Surveyors -
Structural Engineers - <b>TSI CONSULTING ENG.</b>
Civil Engineers - <b>TSI CONSULTING ENG.</b>
Electrical Engineers
Mechanical Engineers
Landscape Architects -
Contractor

CLIENT



IMPLEMINTING AGENT



PROJECT

**MSELENI HOSPITAL:  
72 HOUR WATER STORAGE TANK**



TSI Consulting Engineers (Pty) Ltd  
PO Box 902  
Kokstad  
4700

DRAWING

**DETAIL: LOCKING BAR**

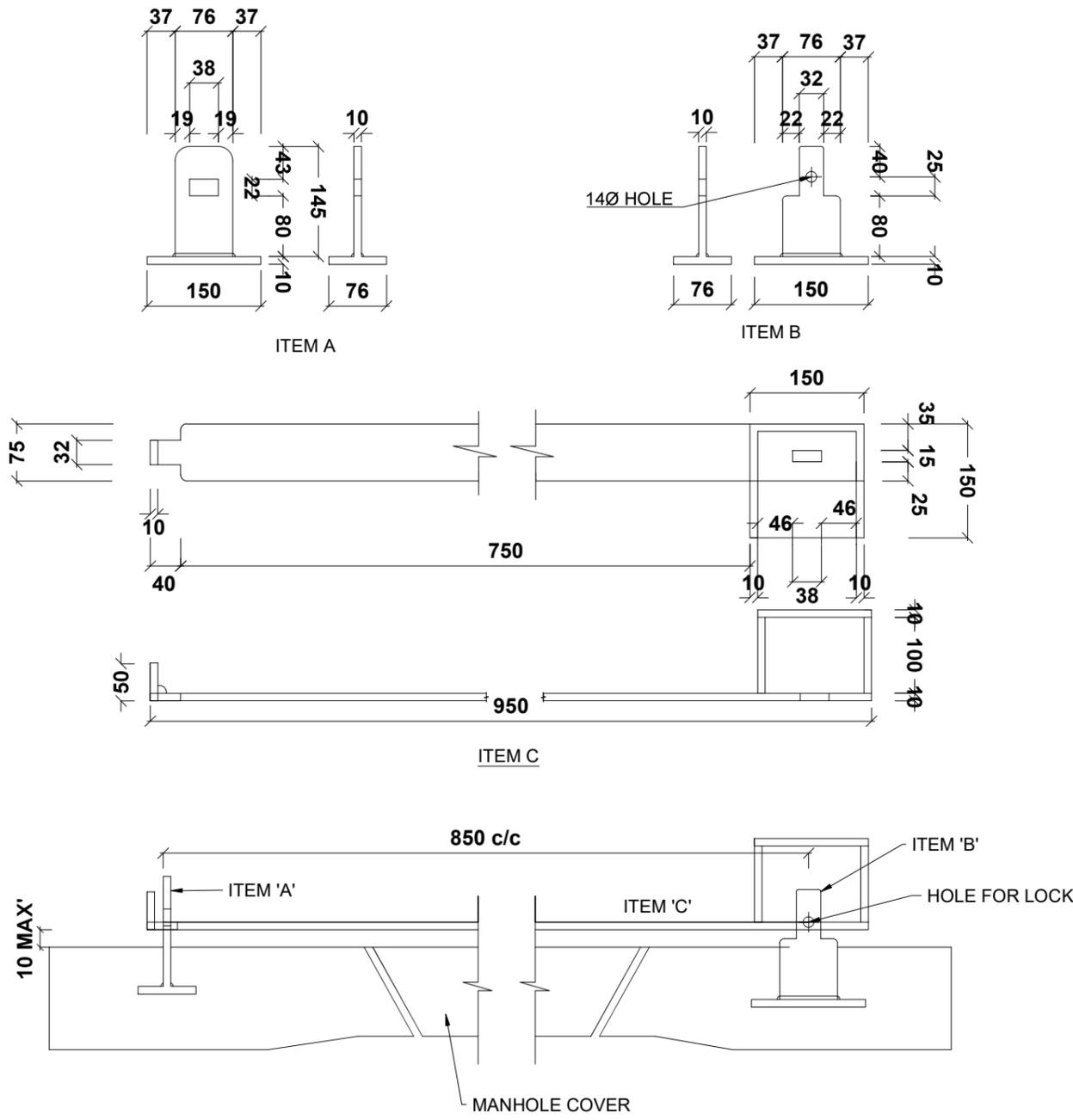
STAGE **DESIGN DEVELOPMENT**

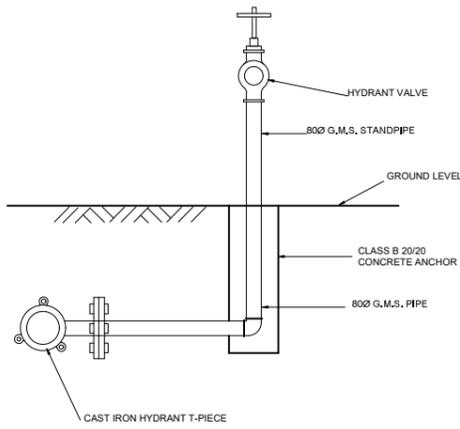
CLIENT'S SIGNATURE .....

DRAWING USAGE .....

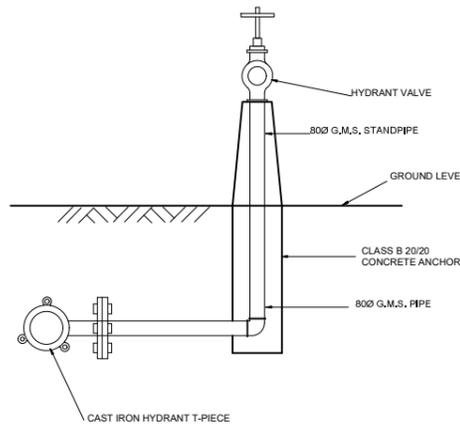
APPROVED	Client	Project No
	Tenant	<b>MSEL001</b>
Drawn by	Date	Date Drawn
TSI CONSULTING ENGINEERS		2023/03/22
Checked by	Date	Print date
		2023/03/22
Scale:	1:100, 1:50	@ A1 SIZE

Layout ID	Revision	Status
<b>1011</b>	<b>00</b>	<b>FOR TENDER</b>

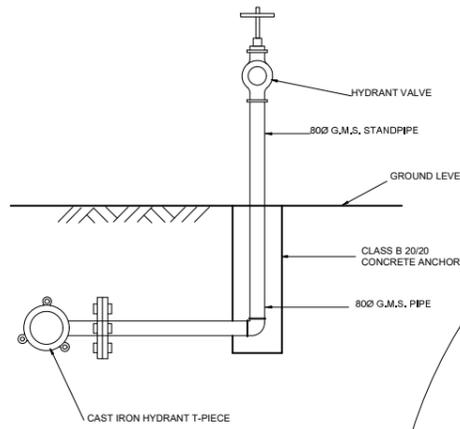




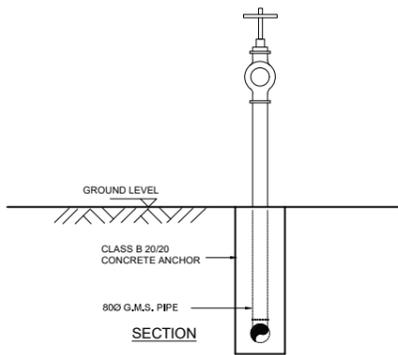
ELEVATION



ELEVATION

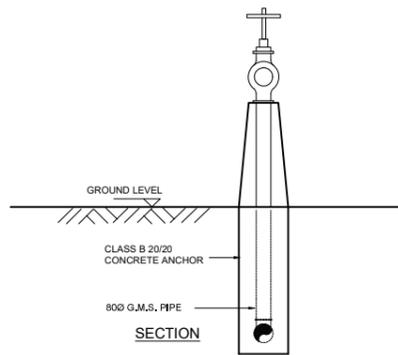


ELEVATION



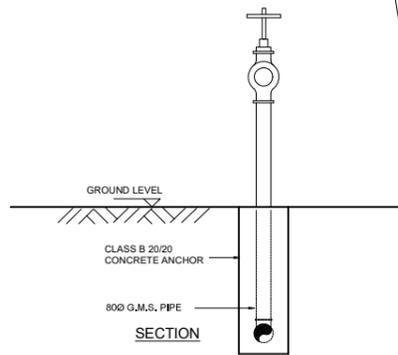
SECTION

NOTE: G.M.S. PIPEWORK UNDER GROUND TO BE PLASTERED, WRAPPED WITH DENSO TAPE OR SIMILAR APPROVED.



SECTION

NOTE: G.M.S. PIPEWORK UNDER GROUND TO BE PLASTERED, WRAPPED WITH DENSO TAPE OR SIMILAR APPROVED.



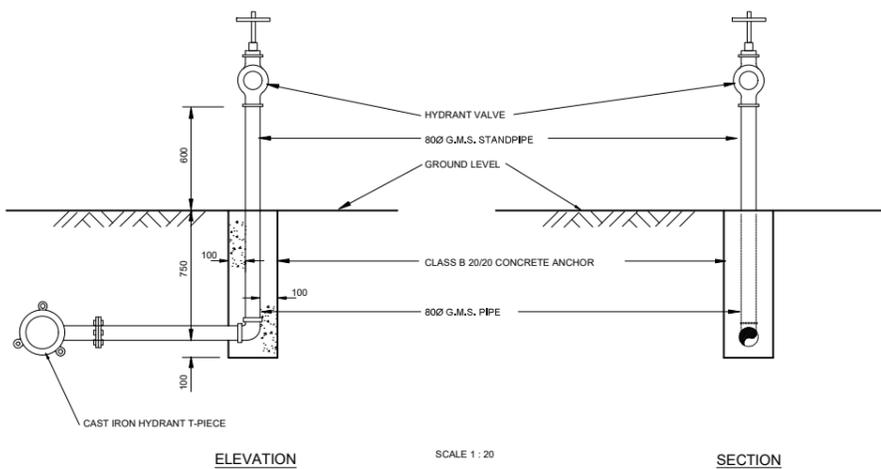
SECTION

NOTE: G.M.S. PIPEWORK UNDER GROUND TO BE PLASTERED, WRAPPED WITH DENSO TAPE OR SIMILAR APPROVED.

TYPICAL DETAIL OF FIRE HYDRANT

TYPICAL DETAIL OF FIRE HYDRANT WITH CONCRETE SURROUND

TYPICAL DETAIL OF FIRE HYDRANT



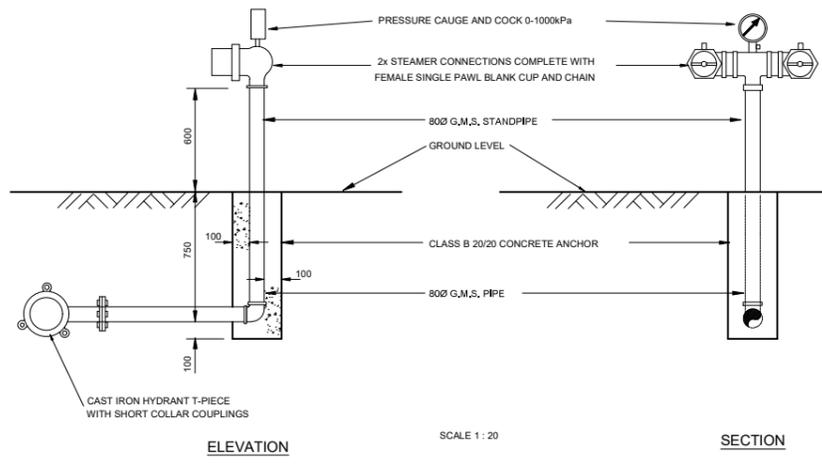
ELEVATION

SCALE 1:20

SECTION

TYPICAL DETAIL OF FIRE HYDRANT

NOTE: G.M.S. PIPEWORK UNDER GROUND TO BE PLASTERED, WRAPPED WITH DENSO TAPE OR SIMILAR APPROVED.

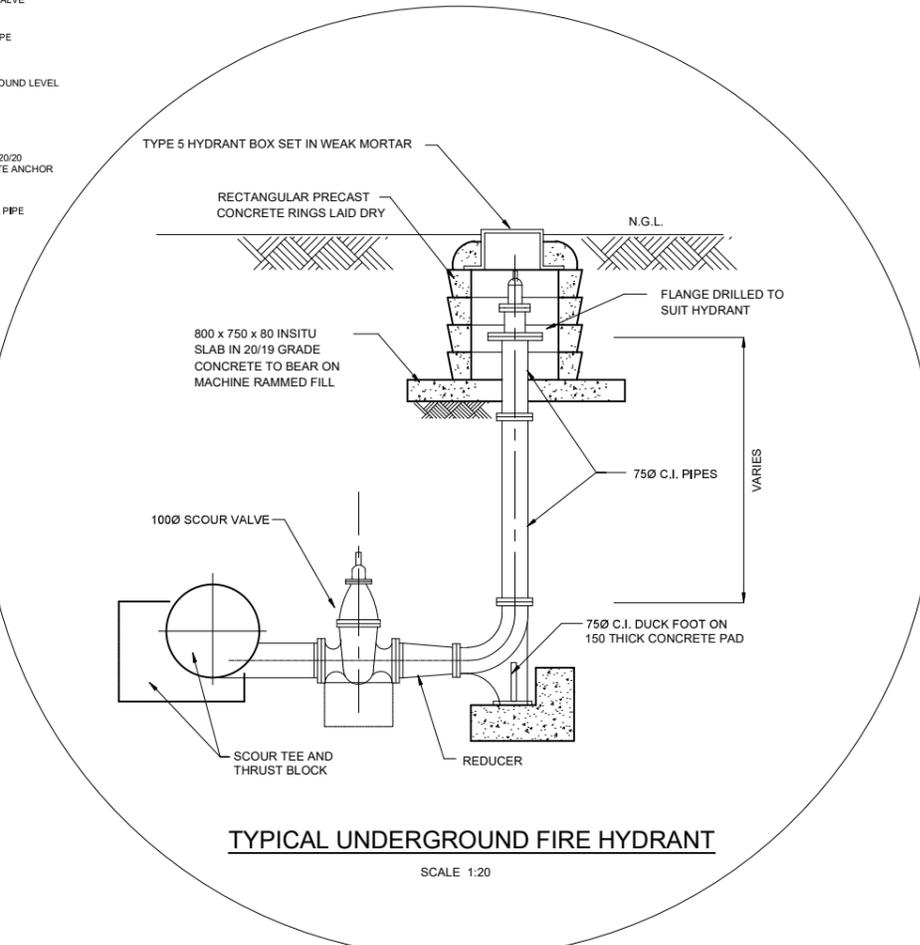


ELEVATION

SCALE 1:20

SECTION

TYPICAL DETAIL OF TWIN BOOSTER



TYPICAL UNDERGROUND FIRE HYDRANT

SCALE 1:20

NOTES

- The Contractor shall excavate each trench such that the width conforms to the requirements of Subclause 5.2 of SABS 1200 DB or as shown in the drawing.
- The Contractor shall prepare the trench bottom in accordance with the requirements of SABS 1200 DB, apply bedding and fill according to SABS 1200 LB awing LB-2
- No bedding shall be laid until the Engineer has approved the trench, measured the depth if necessary, and authorized pipe laying to proceed.
- In the placing of bedding, all voids under the overhang of the pipes shall be filled and the compaction shall be carried out uniformly on each side of the pipe so as not to cause any lateral or vertical displacement of the pipe.
- Bedding shall be carried out as pipe laying proceeds, and shall be completed before the acceptance test is carried out.
- Pipes and fittings shall be fitted with spigot and socket rubber ring joints and shall comply with the relevant requirements of SABS 966.
- The degree of compaction attained for bedding (other than concrete and the material over the top of the pipeline) shall be 90 % of modified AASHTO maximum density (see 6.1).
- The Engineer may order density tests to be carried out to determine the density and grading of the bedding.
- The tests may be carried out by the sand replacement method or, where the grading of the bedding is such that the particle size is not less than 0,075 mm and not more than 2 mm, by use of a dynamic cone penetrometer. If the density is below that specified, the Engineer may order removal and recompaction.
- As the work proceeds, pipelines shall be tested in convenient lengths by means of test equipment supplied by the Contractor. Each test shall be carried out in the presence of the Engineer or his representative.
- The Contractor shall be responsible for carrying out all tests and for all expenses incurred in this connection.
- The hydraulic test shall be repeated until the Engineer is satisfied that the section under test complies with the said requirement.

Project Manager
Urban Planners
Architects
Quantity Surveyors
Structural Engineers - TSI CONSULTING ENG.
Civil Engineers - TSI CONSULTING ENG.
Electrical Engineers
Mechanical Engineers
Landscape Architects
Contractor

CLIENT

IMPLEMENTING AGENT

PROJECT

**MSELENI HOSPITAL:  
72 HOUR WATER STORAGE TANK**

TSI Consulting Engineers (Pty) Ltd  
PO Box 902  
Kokstad  
4700

DRAWING

**DETAIL: FIRE HYDRANTS**

STAGE **DESIGN DEVELOPMENT**

CLIENT'S SIGNATURE .....

DRAWING USAGE .....

APPROVED	Client	Project No
	Tenant	MSEL001
Drawn by	Date	Date Drawn
TSI CONSULTING ENGINEERS		2023/03/22
Checked by	Date	Print date
		2023/03/22
Scale:	1:20	@ A1 SIZE

Layout ID	Revision	Status
1012	00	FOR TENDER