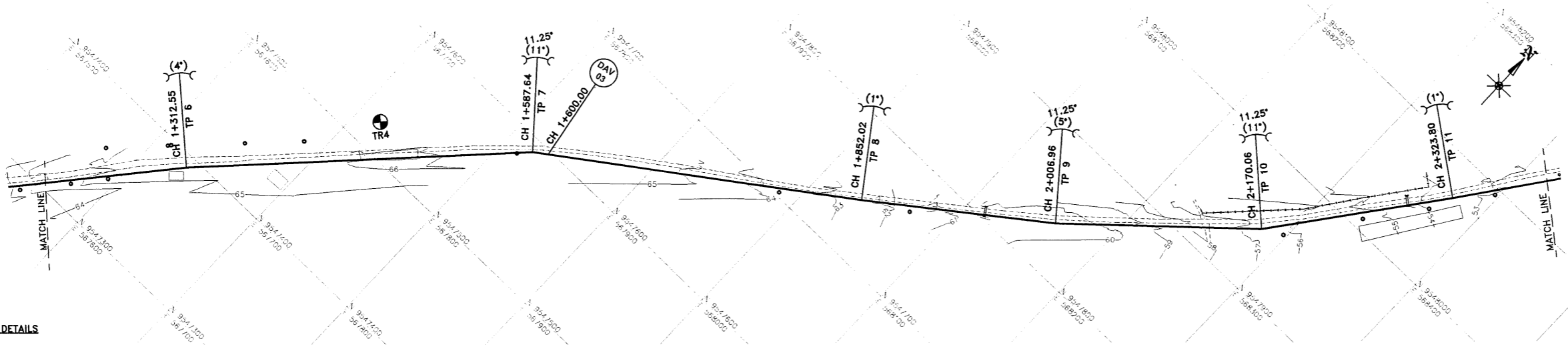
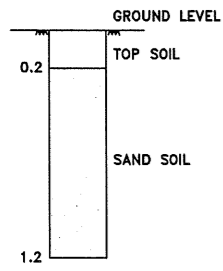


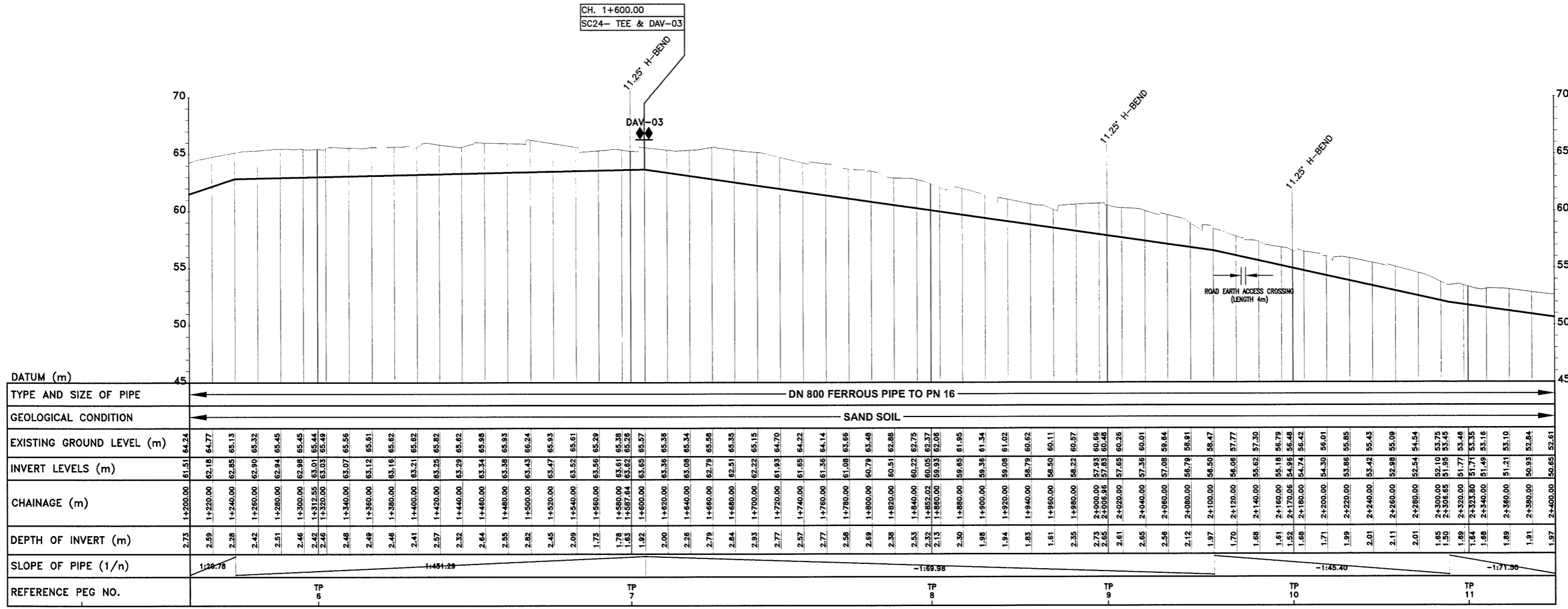
- NOTES:**
- CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 - GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 - GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 - MINIMUM PIPELINE SLOPES TO BE 1:500
 - DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 - ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - SV-01 SECTIONAL VALVE & No.
 - WO-01 WASHOUT VALVE & No.
 - DAV-01 DOUBLE ORIFICE AIR VALVE & No.
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - PERIMETER WALL



TRIAL HOLE TR4 DETAILS



PLAN



LONGITUDINAL SECTION

REVISIONS	SIGN	DATE	APPROVED

THE CHIEF EXECUTIVE OFFICER
COAST WATER SERVICES BOARD
 P.O. BOX 90417 - 80100
 MOMBASA, KENYA

DESIGN CONSULTANT:
MIBP MANGAT I.B. PATEL (MIBP) LIMITED
 P.O. BOX 48674, 00100-GPO,
 NAIROBI, KENYA
 E-MAIL: mibp.nairobi@mibpp.com
 TEL: +254-2-2710500

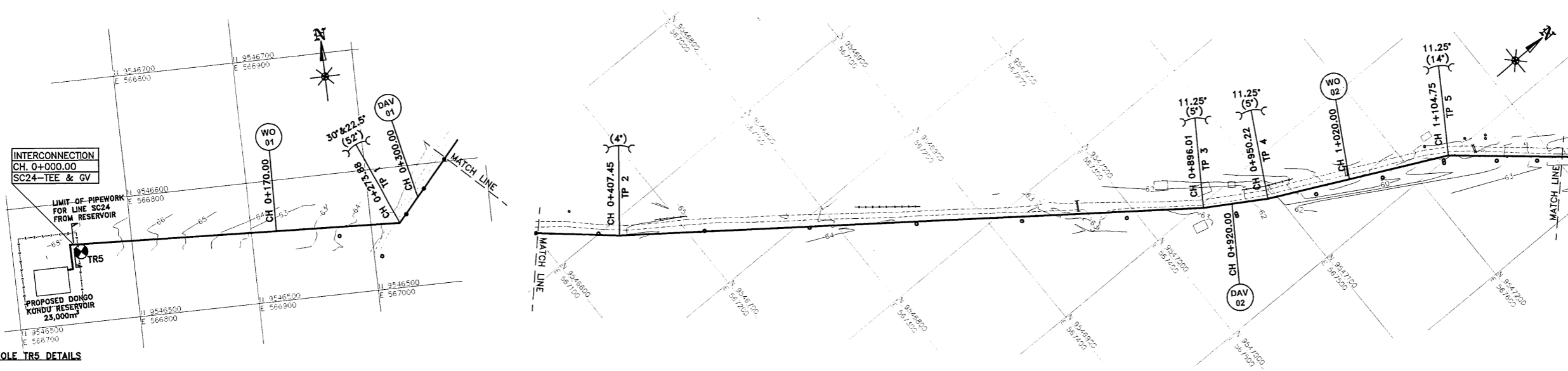
PROJECT NAME:
WaSSIP-AF/WSDP

CONTRACT NAME:
WATER DISTRIBUTION WORKS FOR
MOMBASA WATER SUPPLY AND
SANITATION COMPANY LTD.
(MOWASSCO)

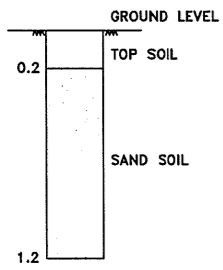
MOMBASA SOUTH MAINLAND

DRAWING TITLE:
LINE SC24
PLAN & LONGITUDINAL SECTION
(CH 1+200.00 - 2+400.00)
SHEET 4 OF 9

Designed by: O.J.O. Drawn by: T.K.N
 Checked by: E.I.M. Approved by: R.S.R
 Scale: H- 1:4000, V- 1:400 Date: NOVEMBER 2018
 DRG No. M410/MO/SM/SC24/04 REV. 0

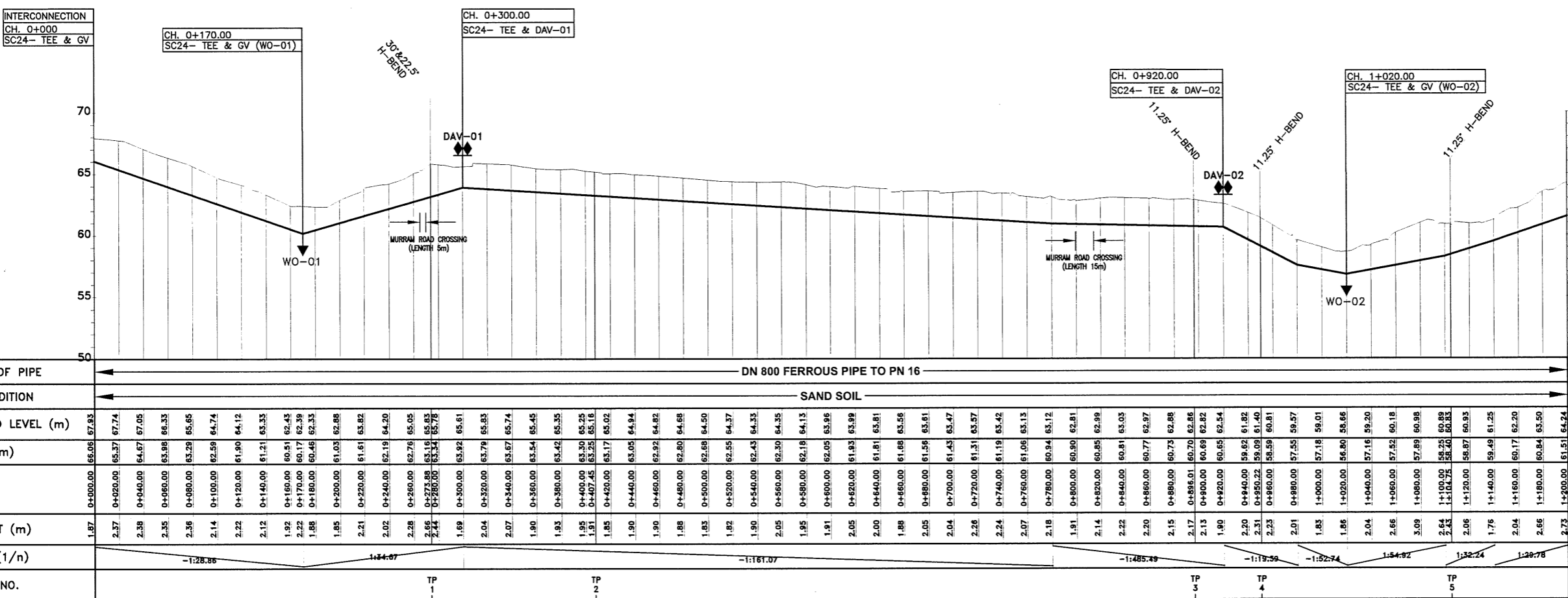


TRIAL HOLE TR5 DETAILS



PLAN

- NOTES:**
- CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 - GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 - GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 - MINIMUM PIPELINE SLOPES TO BE 1:500
 - DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 - ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 - FOR FITTING DETAILS AT CH. 0+000.00, SEE DRG. NO. M410/MO/SM/SC24/01-02
- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - SV-01 SECTIONAL VALVE & No.
 - WO-01 WASHOUT VALVE & No.
 - DAV-01 DOUBLE ORIFICE AIR VALVE & No.
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - PERIMETER WALL



LONGITUDINAL SECTION

REVISIONS	SIGN	DATE	APPROVED

THE CHIEF EXECUTIVE OFFICER
 COAST WATER SERVICES BOARD
 P.O. BOX 90417 - 80100
 MOMBASA, KENYA

DESIGN CONSULTANT:
MIBP MANGAT I.B. PATEL (MIBP) LIMITED
 P.O. BOX 48674, 00100-GPO,
 NAIROBI, KENYA
 E-MAIL: mibp.nairobi@mibpp.com
 TEL: +254-2-2710500

PROJECT NAME:
WaSSIP-AF/WSDP

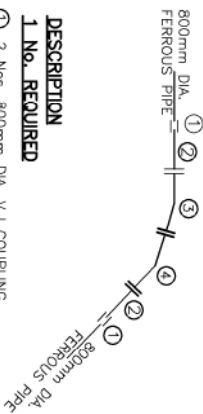
CONTRACT NAME:
 WATER DISTRIBUTION WORKS FOR
 MOMBASA WATER SUPPLY AND
 SANITATION COMPANY LTD.
 (MOWASSCO)

MOMBASA SOUTH MAINLAND

DRAWING TITLE:
 LINE SC24
 PLAN & LONGITUDINAL SECTION
 (CH 0+000.00 - 1+200.00)
 SHEET 3 OF 9

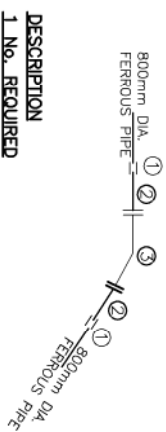
Designed by: O.J.O Drawn by: T.K.N
 Checked by: E.I.M Approved by: R.S.R
 Scale: H-1:4000, V-1:400 Date: NOVEMBER 2018
 DRG No. M410/MO/SM/SC24/03 REV. 0

CH. 0+273.88
LINE SC24 - 30° & 22.5° BEND



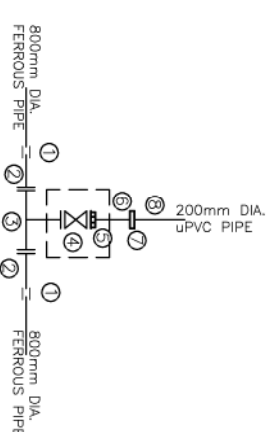
- DESCRIPTION**
1 No. REQUIRED
- ① 2 Nos. 800mm DIA. V.J COUPLING
 - ② 2 Nos. 800mm DIA. FLANGED SPIGOT FERROUS PIPE 1200mm LONG
 - ③ 1 No. 800mm DIA. 30° ALL FLANGED FERROUS BEND
 - ④ 1 No. 800mm DIA. 22.5° ALL FLANGED FERROUS BEND

CH. 2+530.22
LINE SC24 - 45° BEND



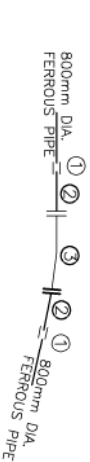
- DESCRIPTION**
1 No. REQUIRED
- ① 2 Nos. 800mm DIA. V.J COUPLING
 - ② 2 Nos. 800mm DIA. FLANGED SPIGOT FERROUS PIPE 1200mm LONG
 - ③ 1 No. 800mm DIA. 45° ALL FLANGED FERROUS BEND

CH. 0+170.00 & 1+020.00
LINE SC24 - TEE & GV (WO) - 01 & 02



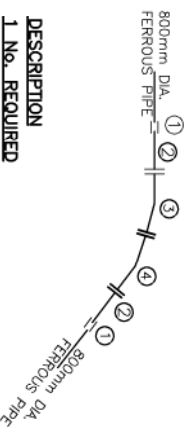
- DESCRIPTION**
2 Nos. REQUIRED
- ① 2 Nos. 800mm DIA. V.J COUPLING
 - ② 2 Nos. 800mm DIA. FLANGED SPIGOT FERROUS PIPE 1200mm LONG
 - ③ 1 No. 800x200mm DIA. ALL FLANGED FERROUS INVERTED TEE
 - ④ 1 No. 200mm DIA. ALL FLANGED GATE VALVE
 - ⑤ 1 No. 200mm DIA. V.J FLANGE ADAPTER
 - ⑥ 1 No. 200mm DIA. PLAIN ENDED FERROUS PIPE 1200mm LONG
 - ⑦ 1 No. 200mm DIA. V.J. STEPPED COUPLING
 - ⑧ 1 No. 200mm DIA. uPVC CLASS "B" PIPE (LENGTH TO SUIT ON SITE)

CH. 0+896.01, 0+860.22, 1+104.75, 1+587.64, 2+006.96
2+170.06
LINE SC24 - 11.25° H BEND



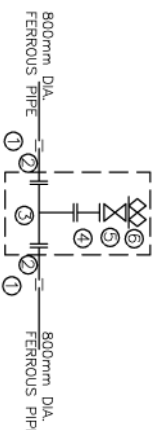
- DESCRIPTION**
14 Nos. REQUIRED
- ① 2 Nos. 800mm DIA. V.J COUPLING
 - ② 2 Nos. 800mm DIA. FLANGED SPIGOT FERROUS PIPE 1200mm LONG
 - ③ 1 No. 800mm DIA. 11.25° ALL FLANGED FERROUS BEND

CH. 2+544.94
LINE SC24 - 22.5° & 1125° BEND



- DESCRIPTION**
1 No. REQUIRED
- ① 2 Nos. 800mm DIA. V.J COUPLING
 - ② 2 Nos. 800mm DIA. FLANGED SPIGOT FERROUS PIPE 1200mm LONG
 - ③ 1 No. 800mm DIA. 22.5° ALL FLANGED FERROUS BEND
 - ④ 1 No. 800mm DIA. 11.25° ALL FLANGED FERROUS BEND

CH. 0+300.00, 0+920.00, 1+800.00
LINE SC24 - TEE & DAY - 01, 02, 03



- DESCRIPTION**
4 Nos. REQUIRED
- ① 2 Nos. 800mm DIA. V.J COUPLING
 - ② 2 Nos. 800mm DIA. FLANGED SPIGOT FERROUS PIPE 1200mm LONG
 - ③ 1 No. 800x400mm DIA. ALL FLANGED FERROUS TEE
 - ④ 1 No. 150mm DIA. SPECIAL ALL FLANGED PIPE 325mm LONG WITH FLANGE TO SUIT 400mm DIA. TEE ON ONE END AND NORMAL FLANGE ON THE OTHER END
 - ⑤ 1 No. 150mm DIA. ALL FLANGED GATE VALVE WITH BUILT IN ISOLATING VALVE
 - ⑥ 1 No. 150mm DIA. DOUBLE ORIFICE AIR VALVE

NOTES:

1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
4. MINIMUM PRELIMINE SLOPES TO BE 1:500
5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
7. FOR FITTING DETAILS AT CH. 0+000.00 SEE DRG. NO. M410/MO/MS/SC24/01-02

LEGEND:

- V.J. V.KING JOHNSON
- GV GATE VALVE
- FH FIRE HYDRANT
- WO-01 WASHOUT VALVE & No.
- DAY-01 DOUBLE ORIFICE AIR VALVE & No.
- WM WATER METER
- PROPOSED MASONRY CHAMBER

REVISIONS		SN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

THE CHIEF EXECUTIVE OFFICER
COAST WATER SERVICES BOARD
P.O. BOX 904/17 - 80100
MOMBASA, KENYA

DESIGN CONSULTANT:
MIBP MANGAT IB PATEL (MIBP) LIMITED
P.O BOX 487/4, 00100-GPO,
NAIROBI, KENYA
E-MAIL: mibp.nairobi@mibp.com
TEL: +254-2-2710500

PROJECT NAME:
WASSIP-A/FWSDP
CONTRACT NAME:
WATER DISTRIBUTION WORKS FOR
MOMBASA WATER SUPPLY AND
SANITATION COMPANY LTD.
(MOWASSCO)

MOMBASA SOUTH MAINLAND

DRAWING TITLE:

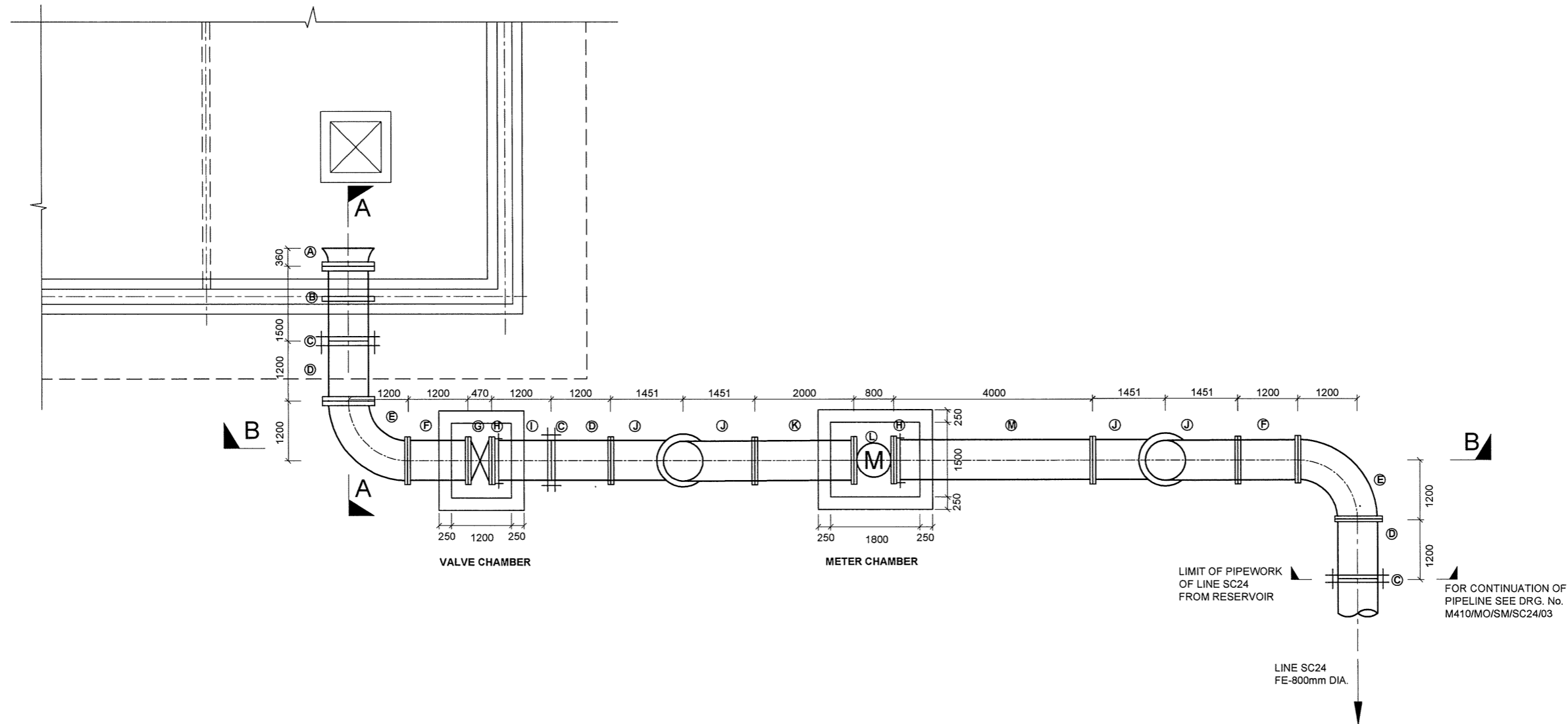
LINE SC24
FITTING DETAILS

SHEET 8 OF 9

Designed by: O.J.O
Checked by: E.I.M
Scale: H-1:4000, V-1:400
Date: NOVEMBER 2018

Drawn by: T.K.N
Approved by: R.S.R
DRG No. **M410/MO/MS/SC24/08** REV. 0

**PROPOSED DONGO KUNDU RESERVOIR
(23,000m³)**



**OUTLET PIPEWORK DETAILS
PLAN**

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED
2. ALL PIPE DIAMETERS INDICATED ARE NOMINAL SIZES
3. THIS DRAWING IS TO BE USED FOR OUTLET PIPEWORK DETAILS ONLY
4. CONCRETE WORK: ALL REINFORCED CONCRETE TO BE CLASS 25/20 EXCEPT WHERE OTHERWISE SPECIFIED
5. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRG. NO. M410/MO/SM/SC24/02
6. PROPOSED DONGO KUNDU RESERVOIR IS IN THE DESIGN STAGE
7. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT

REVISIONS	SIGN	DATE	APPROVED
BY	CHECKED		
BY	CHECKED		
BY	CHECKED		
BY	CHECKED		
BY	CHECKED		

FOR CONTINUATION OF PIPELINE SEE DRG. No. M410/MO/SM/SC24/03

THE CHIEF EXECUTIVE OFFICER
COAST WATER SERVICES BOARD
P.O. BOX 90417 - 80100
MOMBASA, KENYA

DESIGN CONSULTANT:
MIBP MANGAT I.B PATEL (MIBP) LIMITED
P.O BOX 48674,00100-GPO,
NAIROBI, KENYA
E-MAIL: mibp.nairobi@mibpp.com
TEL: +254-2-2710500

PROJECT NAME:
WaSSIP-AF/WSDP

CONTRACT NAME:
WATER DISTRIBUTION WORKS FOR MOMBASA WATER SUPPLY AND SANITATION COMPANY LTD. (MOWASSCO)

MOMBASA SOUTH MAINLAND

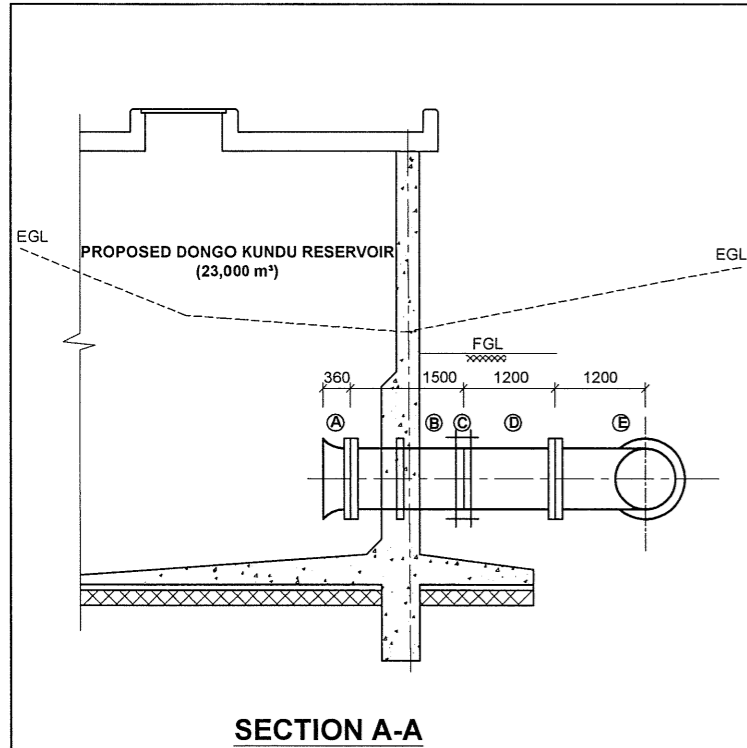
DRAWING TITLE:
**DONGO KUNDU RESERVOIR
(CAPACITY 23,000m³)
OUTLET PIPEWORK PLAN DETAILS
SHEET 1 OF 9**

Designed by: D.E.N Drawn by: D.E.N

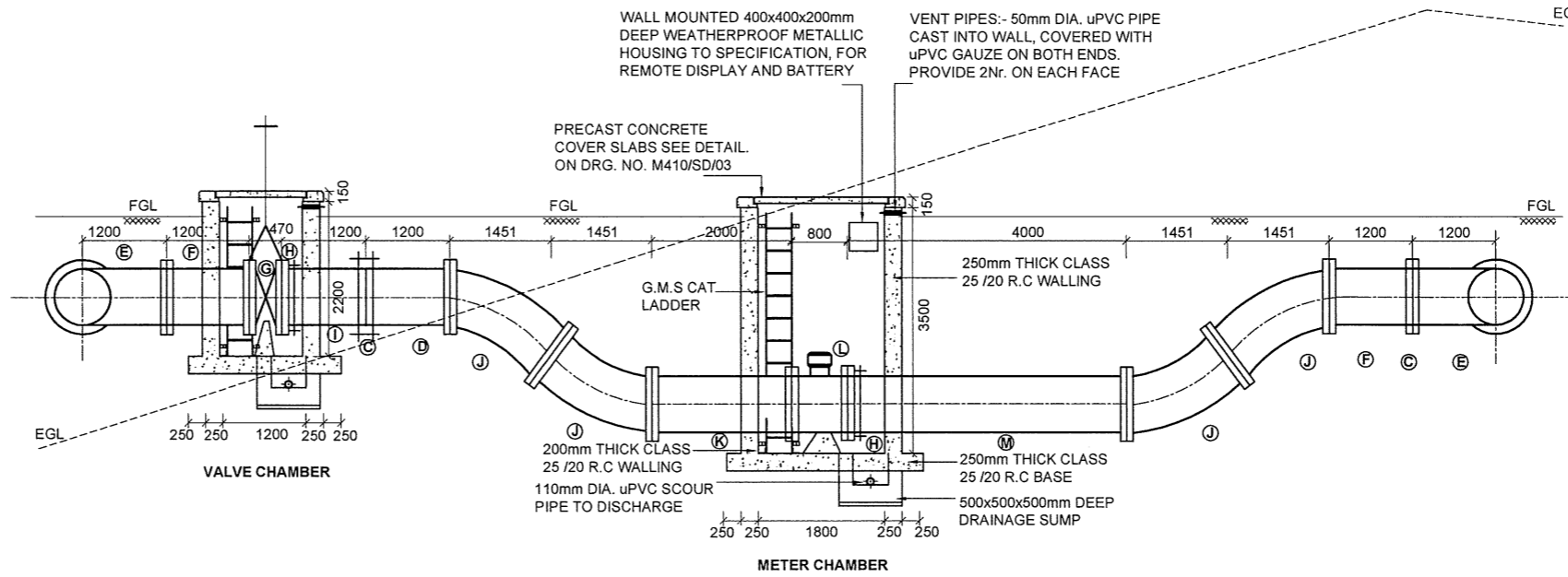
Checked by: E.I.M Approved by: R.S.R

Scale: 1:100 Date: NOV 2018

DRG No. M410/MO/SM/SC24/01 REV. 0



SECTION A-A



SECTION B-B

**OUTLET PIPES AND FITTINGS SCHEDULE AT CH. 0+000.00 OF LINE SC24
(APPROVED LINED FERROUS PIPES & FITTINGS)**

ITEM NO.	DESCRIPTION	DIA. (mm)	LENGTH (mm)	QUANTITY (No.)
(A)	FLANGED BELLMOUTH	800	360	1
(B)	FLANGED SPIGOT PIPE WITH PUDDLE FLANGE AT 650mm FROM FLANGED END	800	1500	1
(C)	V.J. COUPLING	800	-	3
(D)	FLANGED SPIGOT PIPE	800	1200	3
(E)	ALL FLANGED 90° BEND	800Ø	1200	2
(F)	ALL FLANGED PIPE	800	1200	2
(G)	ALL FLANGED GATE VALVE(EURO 20 SERIES,TYPE 23, SAINT GOBAIN PAM OR APPROVED EQUIVALENT)	800	470	1
(H)	FLANGE ADAPTOR	800	-	2
(I)	PLAIN ENDED PIPE	800	1200	1
(J)	ALL FLANGED 45° BEND	800Ø	850	4
(K)	ALL FLANGED PIPE	800	2000	1
(L)	ALL FLANGED BATTERY POWERED ELECTROMAGNETIC WATER METER, COMPLETE WITH LED DISPLAY AND ITS REQUISITE FITTINGS	800	800	1
(M)	FLANGED SPIGOT PIPE	800	4000	1

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED
- ALL PIPE DIAMETERS INDICATED ARE NOMINAL SIZES
- THIS DRAWING IS TO BE USED FOR OUTLET PIPEWORK DETAILS ONLY
- CONCRETE WORK: ALL REINFORCED CONCRETE TO BE CLASS 25/20 EXCEPT WHERE OTHERWISE SPECIFIED
- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRG. NO. M410/MO/SM/SC24/01
- ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT

REVISIONS	SIGN	DATE	APPROVED
	BY		
	CHECKED		
	BY		
	CHECKED		
	BY		
	CHECKED		
	BY		
	CHECKED		

THE CHIEF EXECUTIVE OFFICER
COAST WATER SERVICES BOARD
 P.O. BOX 90417 - 80100
 MOMBASA, KENYA

DESIGN CONSULTANT:
MIBP MANGAT I.B PATEL (MIBP) LIMITED
 P.O BOX 48674,00100-GPO,
 NAIROBI, KENYA
 E-MAIL: mibp.nairobi@mibpp.com
 TEL: +254-2-2710500

PROJECT NAME:
WaSSIP-AF/WSDP

CONTRACT NAME:
WATER DISTRIBUTION WORKS FOR MOMBASA WATER SUPPLY AND SANITATION COMPANY LTD. (MOWASSCO)

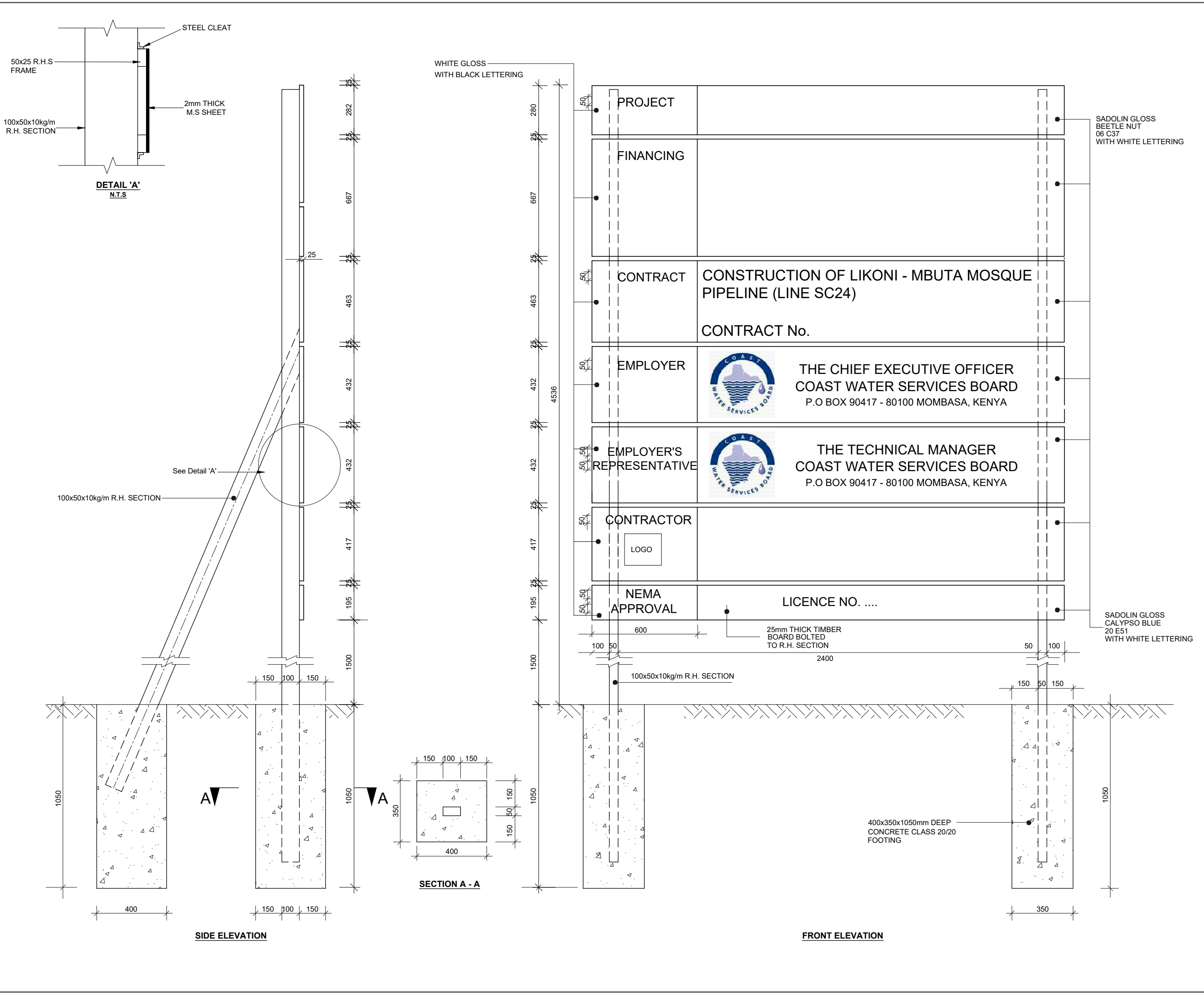
MOMBASA SOUTH MAINLAND

DRAWING TITLE:
DONGO KUNDU RESERVOIR (CAPACITY 23,000m³)
OUTLET PIPEWORK SECTIONS SHEET 2 OF 9

Designed by: D.E.N Drawn by: D.E.N
 Checked by: E.I.M Approved by: R.S.R
 Scale: 1:100 Date: NOV 2018

DRG No. M410/MO/SM/SC24/02 REV. 0

STANDARD DRAWINGS



NOTES:
 1. FINAL WORDING ON SIGN BOARD TO BE DECIDED AND APPROVED IN CONSULTATION WITH THE EMPLOYER PRIOR TO FABRICATION OF THE SIGN BOARD
 2. DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED

REVISIONS		SIGN	DATE	APPROVED
BY	CHECKED			
BY	CHECKED			
BY	CHECKED			
BY	CHECKED			
BY	CHECKED			

THE CHIEF EXECUTIVE OFFICER
COAST WATER SERVICES BOARD
 P.O. BOX 90417 - 80100
 MOMBASA, KENYA

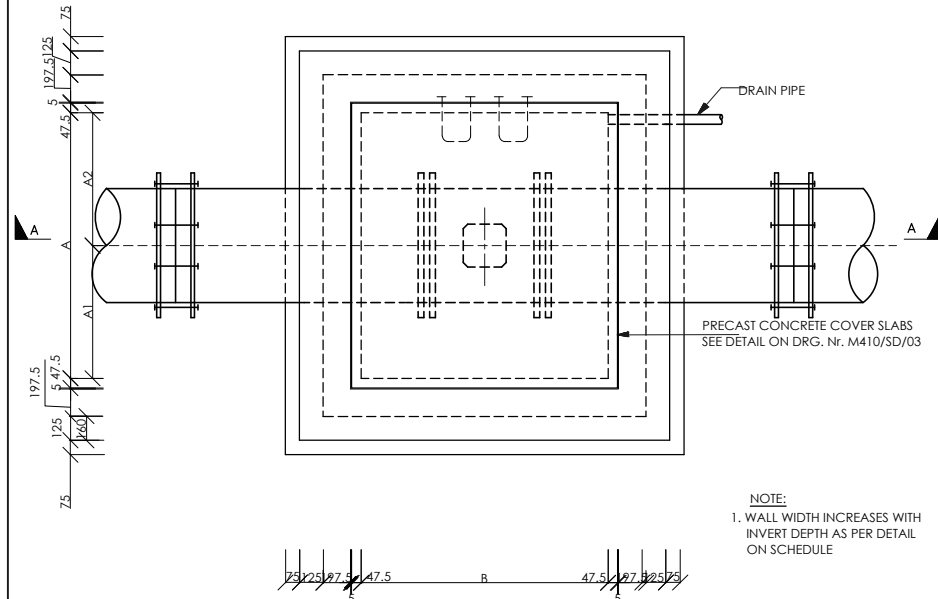
DESIGN CONSULTANT:
MIBP MANGAT I.B. PATEL (MIBP) LIMITED
 CONSULTING ENGINEERS
 P.O. BOX 48674, 00100-GPO,
 NAIROBI, KENYA
 E-MAIL: mibp.nairobi@mibpp.com
 TEL: +254-2-2710500

CONTRACT NAME:
CONSTRUCTION OF LIKONI - MBUTA MOSQUE PIPELINE (SC24)

DRAWING TITLE:
**STANDARD DRAWING
 PROJECT SIGNBOARD DETAILS**

Designed by: S.C.K	Drawn by: P.G.M
Checked by: E.I.M	Approved by: R.S.R
Scale: 1:20	Date: MAY 2019
DRG No. M410/SD/01	REV. 0

TYPICAL AIR VALVE CHAMBER

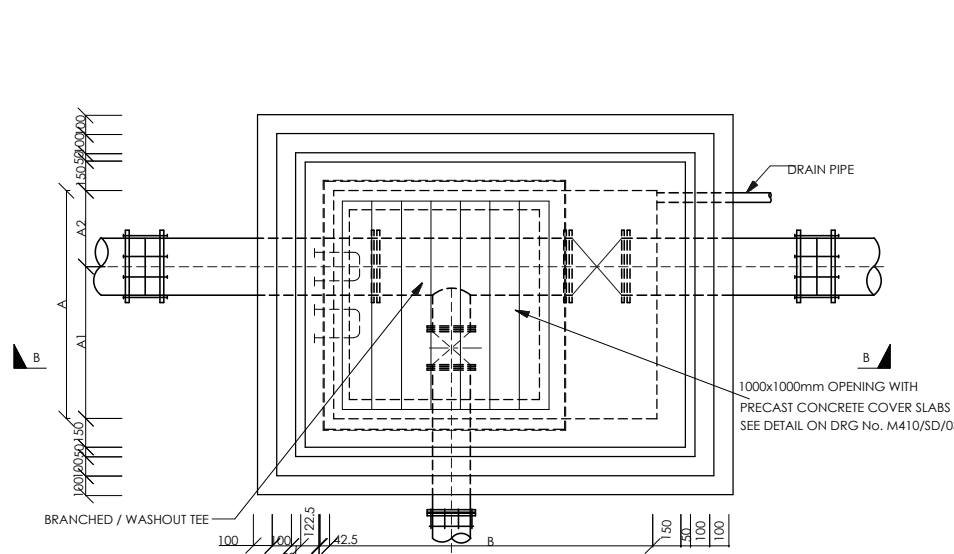


PLAN OF CHAMBER

SCALE 1:40

NOTE:
1. WALL WIDTH INCREASES WITH INVERT DEPTH AS PER DETAIL ON SCHEDULE

TYPICAL VALVE CHAMBER DETAILS AT JUNCTIONS / WASHOUT VALVE (DEPTH > 1.0m)

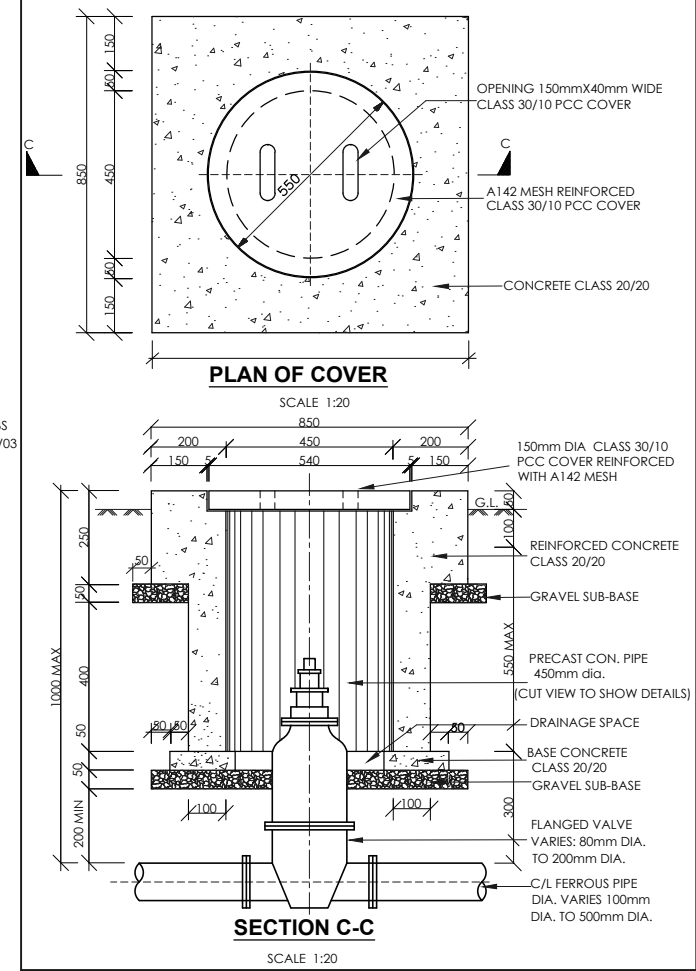


PLAN OF CHAMBER

SCALE 1:40

NOTE:
1. WALL WIDTH INCREASES WITH INVERT DEPTH AS PER DETAIL ON SCHEDULE

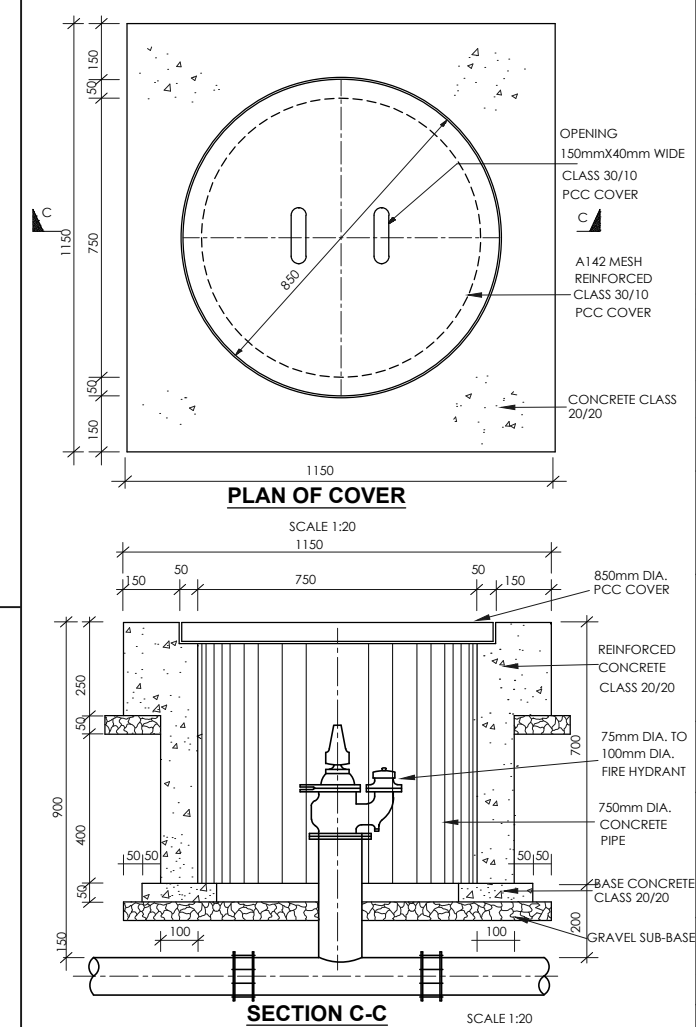
TYPICAL VALVE BOX DETAIL FOR WASHOUT / VALVE (DEPTH < 1.0m)



SECTION C-C

SCALE 1:20

TYPICAL VALVE BOX DETAIL FOR FIRE HYDRANT



PLAN OF COVER

SCALE 1:20

1150

SECTION C-C

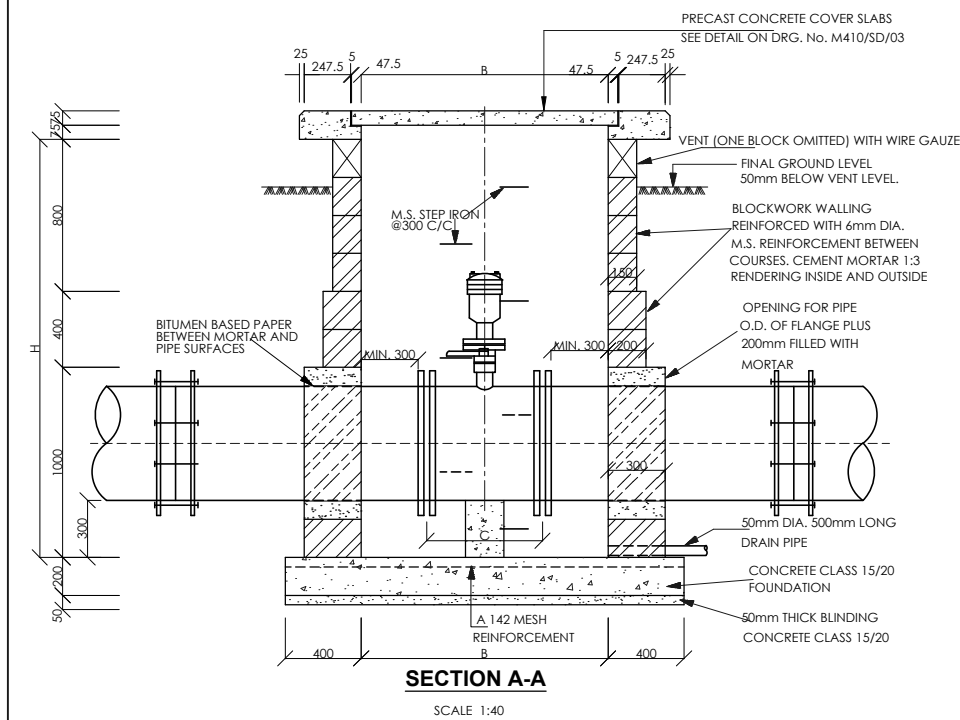
SCALE 1:20

NOTES

1. DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS OTHERWISE STATED

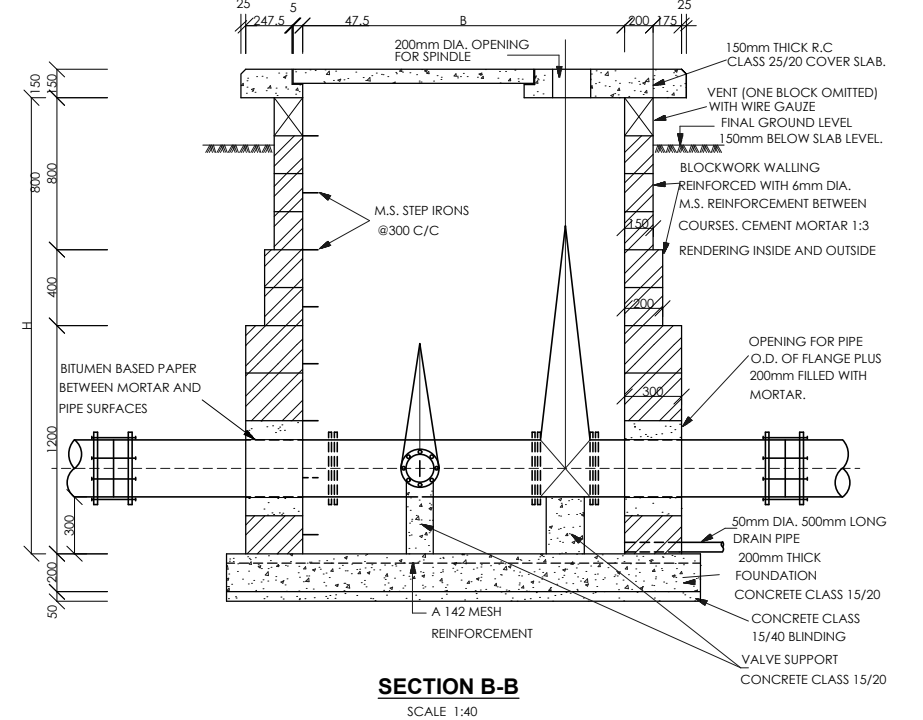
ABBREVIATIONS

- P.C.C. - PRECAST CONCRETE
- MM - MILLIMETERS
- O.D. - OUTSIDE DIAMETER
- M.S. - MILD STEEL
- DIA. - DIAMETER
- NO. - NUMBER
- R.C. - REINFORCED CONCRETE
- c/c - CENTRE TO CENTRE



SECTION A-A

SCALE 1:40



SECTION B-B

SCALE 1:40

CONSTRUCTION DETAILS FOR VALVE CHAMBERS

MAINS DIAMETER (mm)	PLAN SIZE OF CHAMBER (INTERNAL DIMENSIONS) A(mm) x B(mm)
100	1200 x 1200
150	1200 x 1200
200	1400 x 1200
250	1500 x 1200
300	1500 x 1200
350	1800 x 1200
400	1800 x 1200
450	1800 x 1400
500	1800 x 1400

CHAMBER SIZE SCHEDULE FOR VARIOUS PIPE SIZES

INVERT DEPTHS (mm)	HEIGHT OF WALL (mm)	WALL WIDTH (mm)
0 - 800	800	150 - MASONRY WALL
800 - 1200	400	200 - MASONRY WALL
1200 - 2400	1200	300 - MASONRY WALL
2400 - 3000	600	350 - MASONRY WALL
DEPTH MORE THAN 3000		300mm REINFORCED CONCRETE (CLASS 25/20) WALL

CHAMBER DEPTHS & WALL THICKNESS SCHEDULE

REVISIONS		SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

THE CHIEF EXECUTIVE OFFICER
COAST WATER SERVICES BOARD
P.O. BOX 90417 - 80100
MOMBASA, KENYA

DESIGN CONSULTANT:
MIBP MANGAT I.B. PATEL (MIBP) LIMITED
P.O. BOX 48674, 00100-GPO,
NAIROBI, KENYA
E-MAIL: mibp.nairobi@mibpp.com
TEL: +254-2-2710500

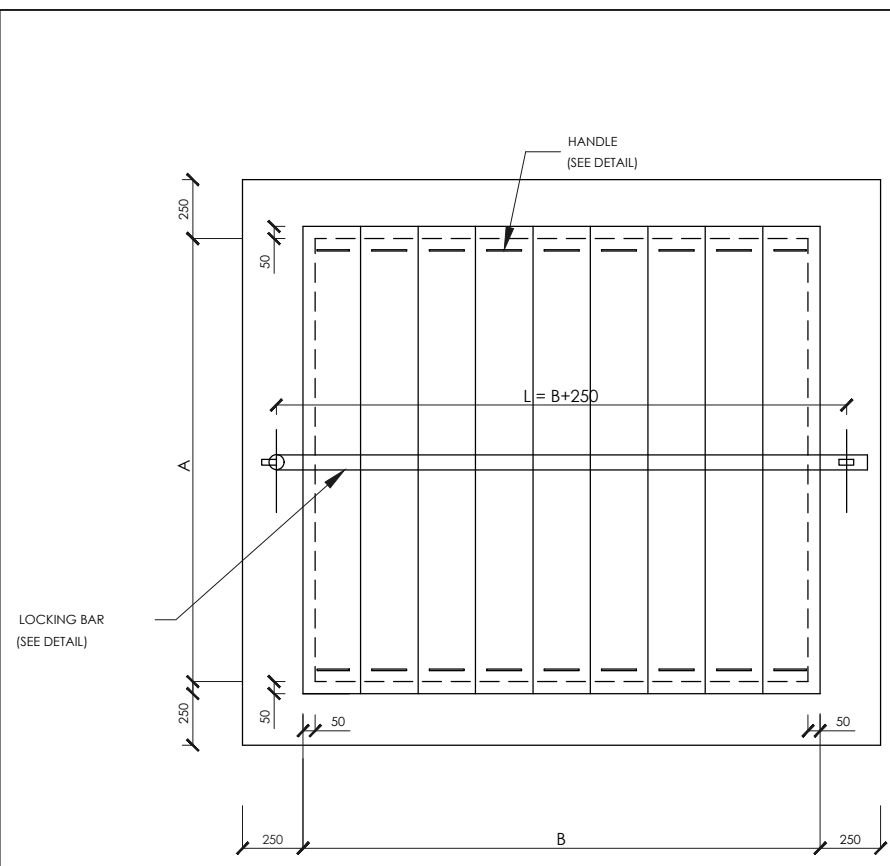
CONTRACT NAME:
CONSTRUCTION OF LIKONI - MBUTA
MOSQUE PIPELINE (SC24)

DRAWING TITLE:
STANDARD DRAWING
DETAILS OF VALVE CHAMBER

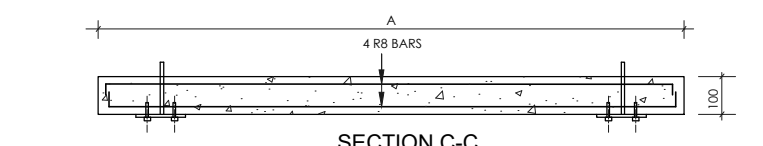
Designed by: S.C.K
Checked by: E.I.M
Scale: AS INDICATED

Drawn by: P.G.M
Approved by: R.S.R
Date: MAY 2019

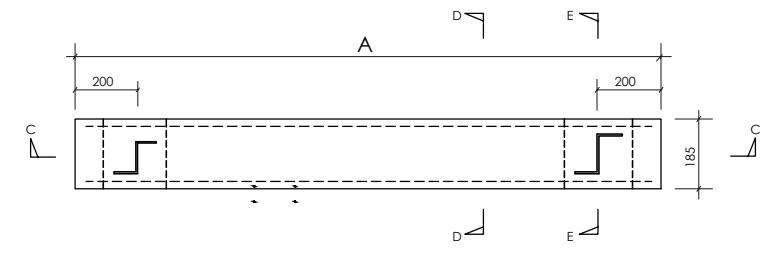
DRG No. M410/SD/02 REV. 0



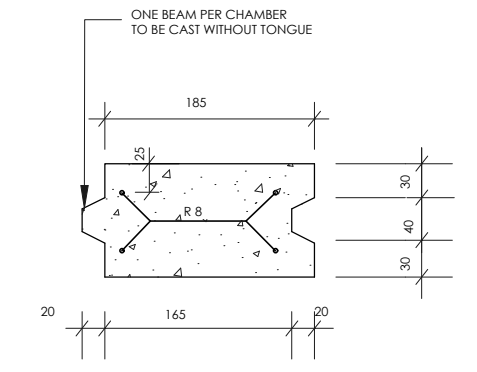
COVER FOR AIR VALVE CHAMBERS
SCALE A1 - 1:10
A3 - 1:20



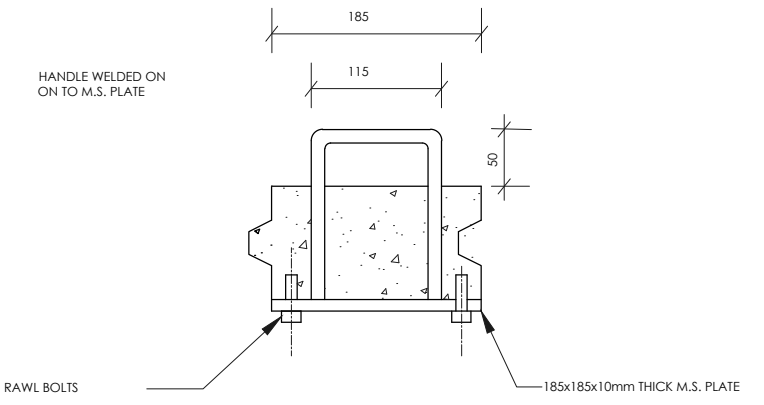
SECTION C-C
SCALE A1 - 1:10
A3 - 1:20



PLAN

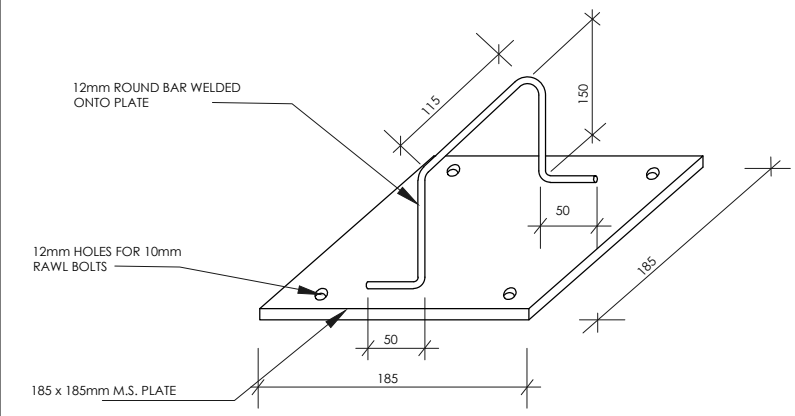


SECTION D-D
NTS

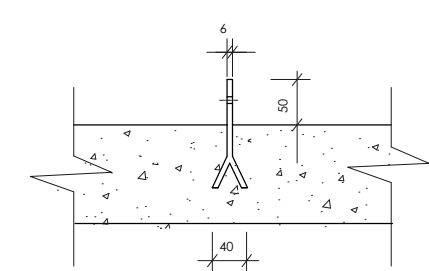
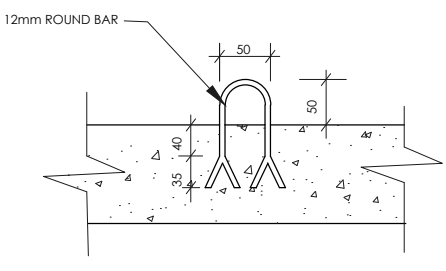
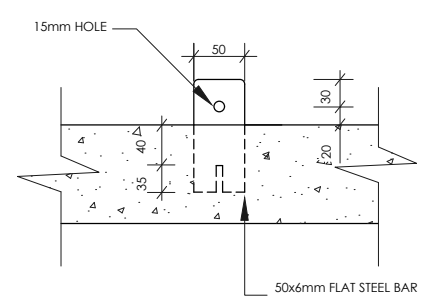


SECTION E-E
NTS

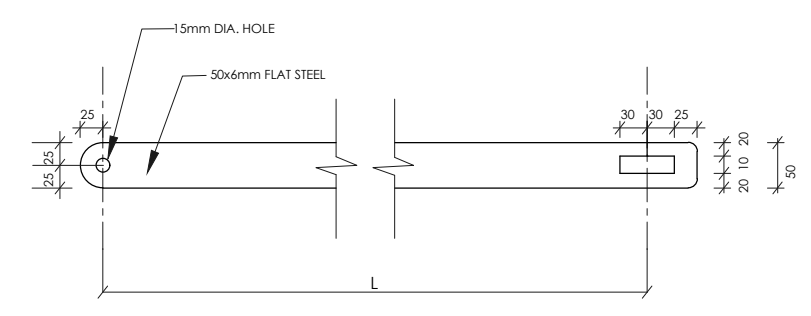
DETAIL OF PRECAST CONCRETE COVER SLAB



DETAIL OF HANDLE
NTS



SECTIONS



DETAILS OF LOCKING BAR
NTS

COVER SIZE SCHEDULE

CHAMBER INTERNAL DIMENSIONS (mm)	SIZE OF COVER A (mm) x B (mm)
1200 X 1200	1300 X 1300
1200 X 1200	1300 X 1300
1400 X 1200	1500 X 1500
1500 X 1200	1600 X 1300
1500 X 1200	1600 X 1300
1800 X 1200	1900 X 1300
1800 X 1200	1900 X 1300
1400 X 1400	1500 X 1500
1400 X 1200	1500 X 1300

NOTES

1. ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE STATED.

ABBREVIATIONS

M.S. = MILD STEEL.
mm - MILLIMETER
Dia. - DIAMETER
NTS - NOT TO SCALE
Nr. - NUMBER

REVISIONS		SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

THE CHIEF EXECUTIVE OFFICER
COAST WATER SERVICES BOARD
P.O. BOX 90417 - 80100
MOMBASA, KENYA

DESIGN CONSULTANT:
MIBP MANGAT LB PATEL (MIBP) LIMITED
P.O BOX 48674,00100-GPO,
NAIROBI, KENYA
E-MAIL: mibp.nairobi@mibpp.com
TEL: +254-2-2710500

CONTRACT NAME:
CONSTRUCTION OF LIKONI - MBUTA MOSQUE PIPELINE (SC24)

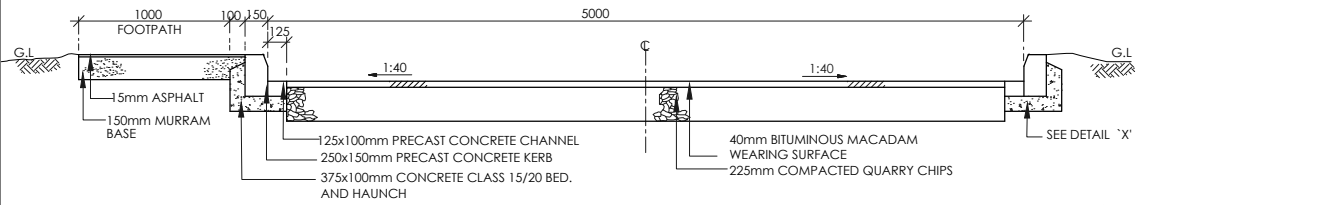
DRAWING TITLE:
STANDARD DRAWING
DETAILS OF PRECAST CONCRETE COVERS FOR VALVE CHAMBERS

Designed by: S.C.K Drawn by: P.G.M
Checked by: E.I.M Approved by: R.S.R

Scale: AS INDICATED Date: MAY 2019

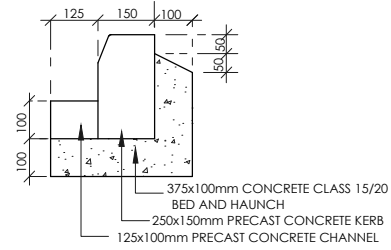
DRG No. **M410/SD/03** REV. 0

TYPICAL BITUMINOUS ROAD DETAILS



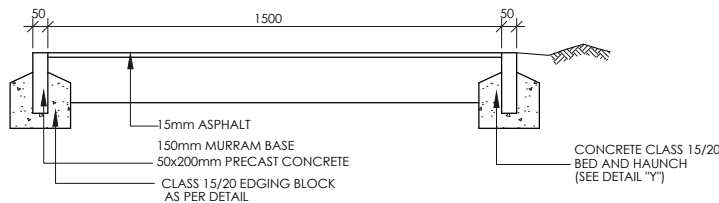
TYPICAL SECTION OF BITUMINOUS ROAD

SCALE 1:50



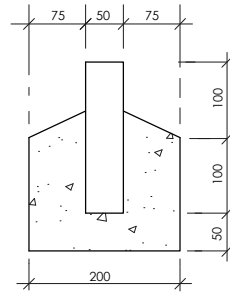
DETAIL 'X'

SCALE 1:20



TYPICAL SECTION OF FOOTPATH

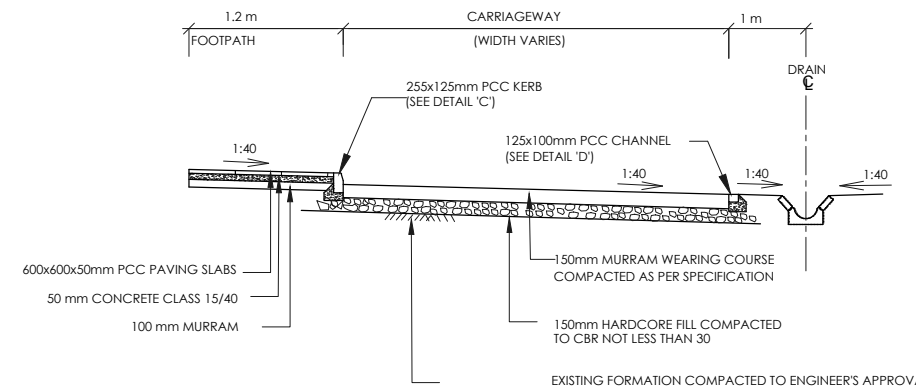
SCALE 1:25



DETAIL 'Y'

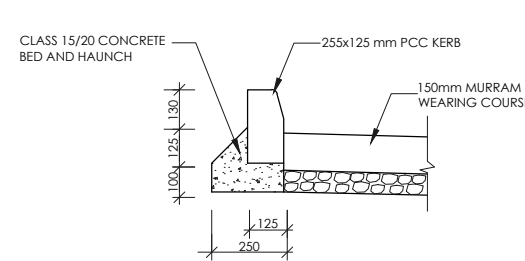
SCALE 1:10

TYPICAL MURRAM ROAD DETAILS



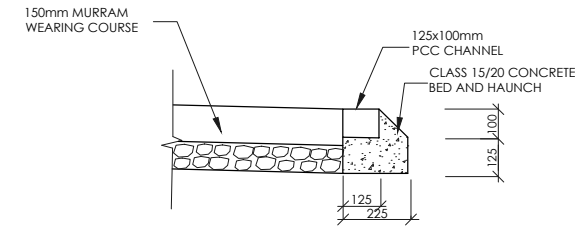
TYPICAL SECTION OF MURRAM ROAD

SCALE 1:50



DETAIL 'C'
TYPICAL DETAIL OF KERB

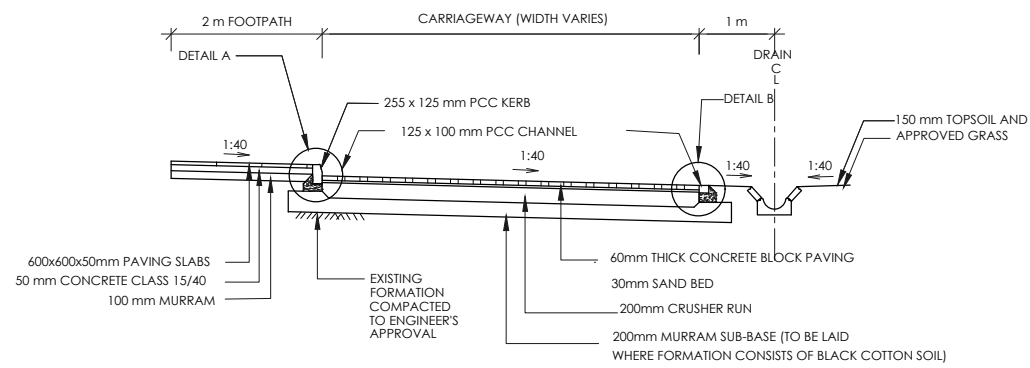
SCALE 1:25



DETAIL 'D'
TYPICAL DETAIL OF CHANNEL

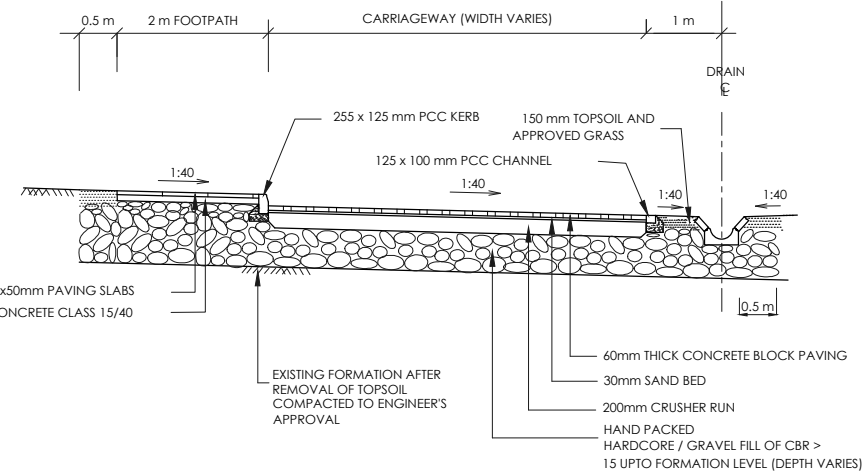
SCALE 1:25

TYPICAL CONCRETE BLOCKS SURFACE ROAD DETAILS



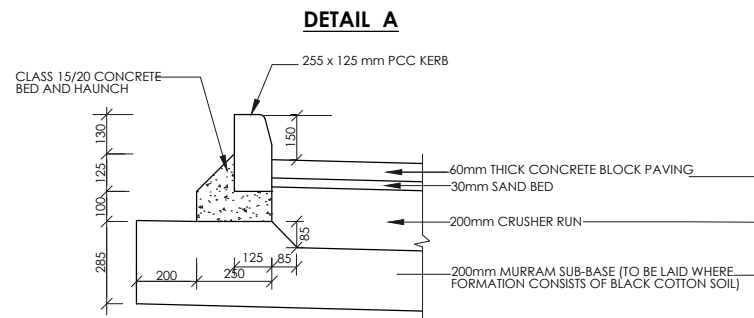
TYPICAL CROSS SECTION FOR CARRIAGEWAY IN CUT

SCALE 1:100



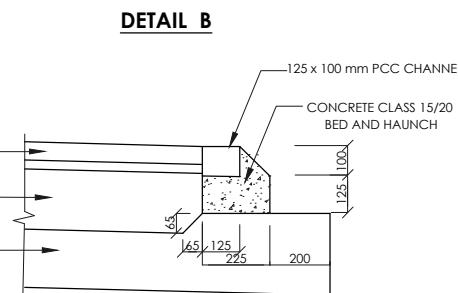
TYPICAL CROSS SECTION FOR CARRIAGEWAY IN FILL

SCALE 1:100



DETAIL OF KERB

SCALE 1:25



DETAIL OF CHANNEL

SCALE 1:25

NOTE

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED

ABBREVIATIONS

CL - CENTRE LINE

mm - MILLIMETER

G.L. - GROUND LEVEL

m - METER

PCC - PRECAST CEMENT CONCRETE

REVISIONS	SIGN	DATE	APPROVED
BY	CHECKED		
BY	CHECKED		
BY	CHECKED		
BY	CHECKED		
BY	CHECKED		

THE CHIEF EXECUTIVE OFFICER
COAST WATER SERVICES BOARD
P.O. BOX 90417 - 80100
MOMBASA, KENYA

DESIGN CONSULTANT:
MIBP MANGAT I.B PATEL (MIBP) LIMITED
P.O BOX 48674,00100-GPO,
NAIROBI, KENYA
E-MAIL: mibp.nairobi@mibpp.com
TEL: +254-2-2710500

CONTRACT NAME:
CONSTRUCTION OF LIKONI - MBUTA MOSQUE PIPELINE (SC24)

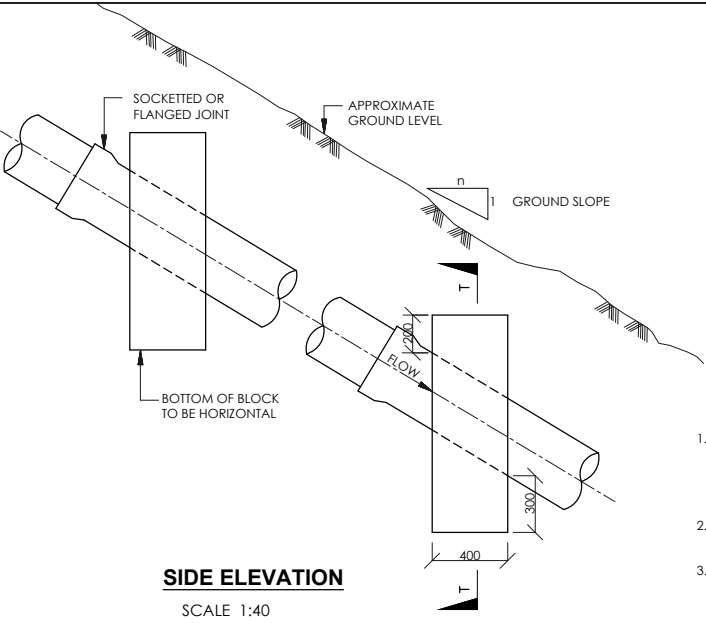
DRAWING TITLE:
STANDARD DRAWING
TYPICAL ROAD CROSS SECTION
DETAILS

Designed by: S.C.K Drawn by: P.G.M

Checked by: E.I.M Approved by: R.S.R

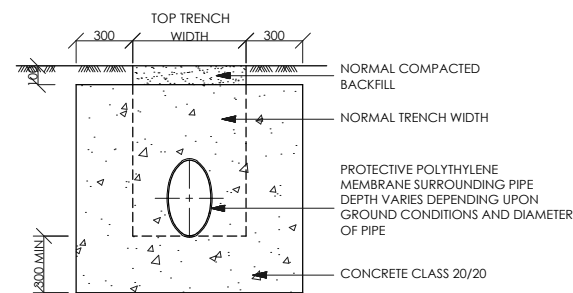
Scale: AS INDICATED Date: MAY 2019

DRG No.M410/SD/04 REV. 0



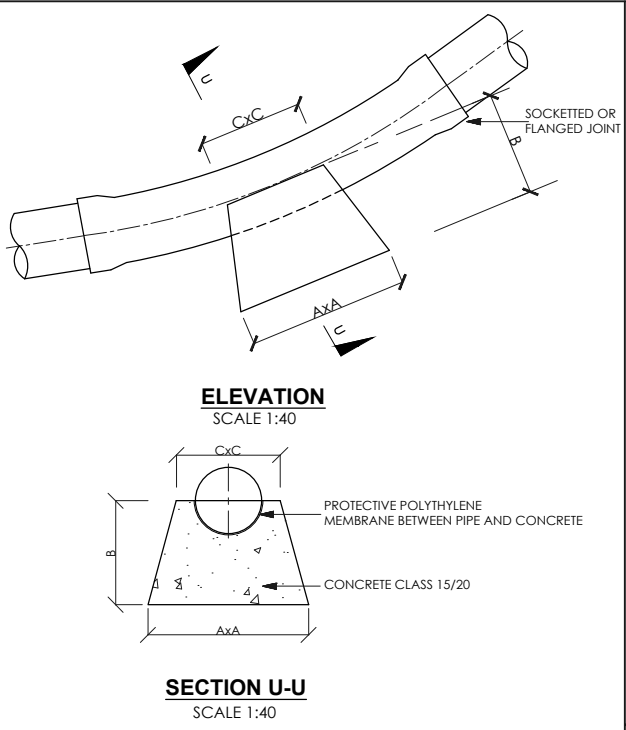
RANGE OF GROUND SLOPE (1:n)	MAXIMUM DISTANCE BETWEEN ANCHOR BLOCKS (m)
1:8 - 1:6	36
1:6 - 1:5	24
1:5 - 1:4	18
1:4 - 1:2	12
>1:2	EVERY PIPE LENGTH TO BE ANCHORED (BASED ON PIPE LENGTH OF 6m)

- NOTES**
- SAME ARRANGEMENT CAN BE USED AS SUPPORTS FOR PIPES LAID IN VERY SOFT GROUND BUT BLOCKS TO BE CAST ON SOUND ROCK OR HARD STRATUM
 - SOCKETTED JOINT TO BE LAID WITH SOCKET FACING UPSTREAM OF GRADE
 - ANCHOR BLOCK TO BE CONSTRUCTED ON LOWER SIDE OF JOINT

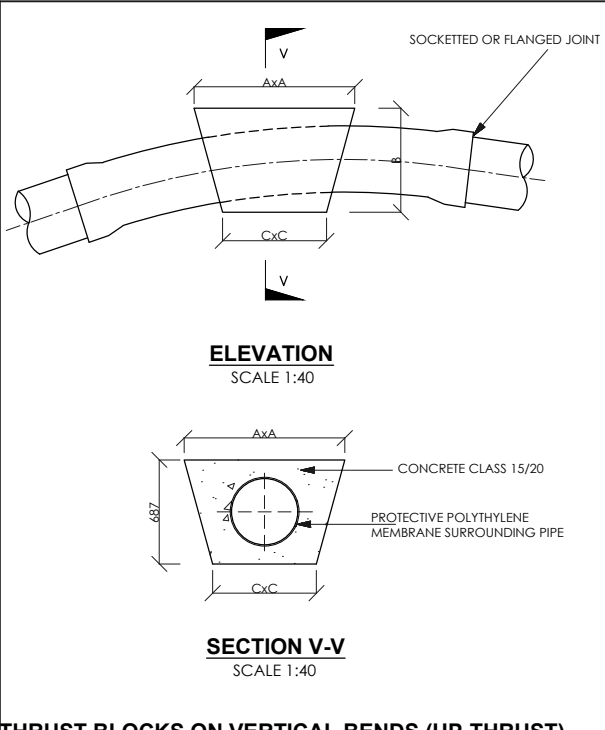


SECTION T-T
SCALE 1:40

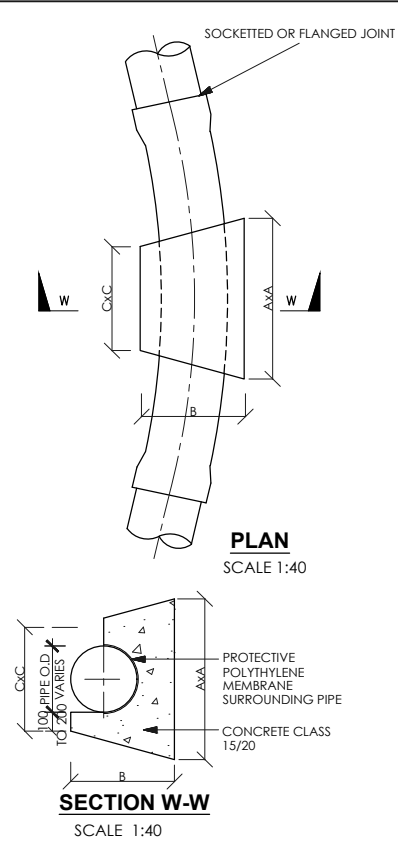
ANCHOR BLOCK FOR STEEP GRADIENTS (SLOPES>1:6)



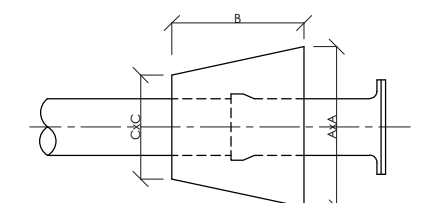
THRUST BLOCKS ON VERTICAL BENDS (DOWN-THRUST)



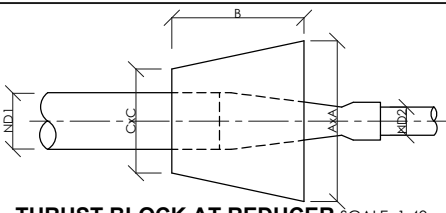
THRUST BLOCKS ON VERTICAL BENDS (UP-THRUST)



THRUST BLOCK ON HORIZONTAL BENDS AND TEES



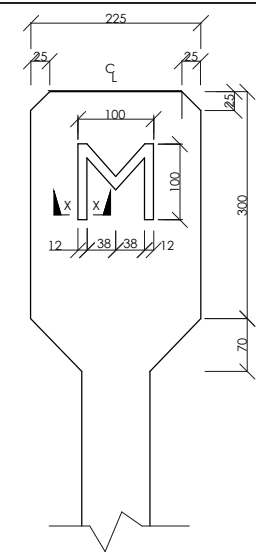
THRUST BLOCK AT CAPPED ENDS
SCALE 1:40



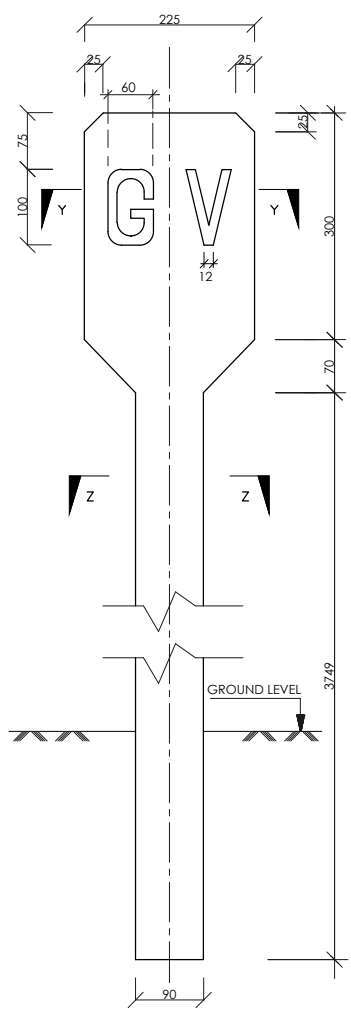
THRUST BLOCK AT REDUCER
SCALE 1:40

(ND) NOMINAL DIAMETER (mm)	THRUST BLOCK DIMENSIONS AxBxC(m), CONCRETE VOLUME (m³)						
	11 1/4° BENDS	22 1/2° BENDS	30° BENDS	45° BENDS	CAPPED ENDS & 90° TEES	90° BENDS	REDUCERS ND=ND1-ND2
80	0.2x0.2x0.2 (0.01m³)	0.25x0.2x0.2 (0.01m³)	0.25x0.2x0.2 (0.01m³)	0.3x0.2x0.2 (0.02m³)	0.35x0.2x0.2 (0.02m³)	0.4x0.2x0.2 (0.02m³)	0.35x0.2x0.2 (0.02m³)
100	0.2x0.2x0.2 (0.01m³)	0.3x0.2x0.2 (0.02m³)	0.35x0.2x0.2 (0.02m³)	0.4x0.2x0.2 (0.02m³)	0.45x0.25x0.25 (0.04m³)	0.55x0.3x0.3 (0.06m³)	0.45x0.25x0.25 (0.04m³)
150	0.3x0.25x0.25 (0.02m³)	0.4x0.25x0.25 (0.03m³)	0.5x0.3x0.3 (0.05m³)	0.5x0.3x0.3 (0.06m³)	0.65x0.35x0.35 (0.10m³)	0.8x0.4x0.35 (0.16m³)	0.65x0.35x0.35 (0.10m³)
200	0.4x0.3x0.3 (0.04m³)	0.55x0.35x0.35 (0.08m³)	0.6x0.4x0.4 (0.11m³)	0.75x0.4x0.4 (0.15m³)	0.85x0.45x0.4 (0.20m³)	1.0x0.5x0.4 (0.29m³)	0.85x0.45x0.4 (0.20m³)
250	0.5x0.35x0.35 (0.07m³)	0.65x0.4x0.4 (0.12m³)	0.75x0.45x0.45 (0.18m³)	0.9x0.45x0.45 (0.23m³)	1.1x0.55x0.45 (0.39m³)	1.2x0.6x0.45 (0.50m³)	1.1x0.55x0.45 (0.39m³)
300	0.55x0.45x0.45 (0.12m³)	0.8x0.5x0.5 (0.23m³)	0.9x0.5x0.5 (0.27m³)	1.1x0.6x0.5 (0.44m³)	1.25x0.65x0.5 (0.59m³)	1.5x0.75x0.5 (0.94m³)	1.25x0.65x0.5 (0.59m³)
350	0.6x0.5x0.5 (0.16m³)	0.85x0.55x0.55 (0.29m³)	1.0x0.55x0.55 (0.36m³)	1.2x0.6x0.55 (0.53m³)	1.4x0.7x0.55 (0.80m³)	1.6x0.8x0.55 (1.20m³)	1.4x0.7x0.55 (0.80m³)
400	0.7x0.6x0.6 (0.26m³)	0.95x0.6x0.6 (0.38m³)	1.1x0.6x0.6 (0.47m³)	1.3x0.65x0.6 (0.67m³)	1.6x0.8x0.6 (1.20m³)	1.8x0.9x0.6 (1.60m³)	1.6x0.8x0.6 (1.20m³)
450	0.8x0.65x0.65 (0.35m³)	1.1x0.65x0.65 (0.53m³)	1.3x0.65x0.65 (0.69m³)	1.5x0.75x0.65 (1.0m³)	1.8x0.9x0.65 (1.7m³)	2.0x1.0x0.65 (2.2m³)	1.8x0.9x0.65 (1.7m³)
500	0.9x0.7x0.7 (0.46m³)	1.2x0.7x0.7 (0.68m³)	1.4x0.7x0.7 (0.86m³)	1.7x0.85x0.7 (1.5m³)	2.0x1.0x0.7 (2.3m³)	2.3x1.2x0.7 (3.5m³)	2.0x1.0x0.7 (2.3m³)
600	1.1x0.8x0.8 (0.74m³)	1.5x0.8x0.8 (1.2m³)	1.7x0.9x0.8 (1.6m³)	2.0x1.0x0.8 (2.3m³)	2.3x1.2x0.8 (3.6m³)	2.7x1.4x0.8 (5.6m³)	2.3x1.2x0.8 (3.6m³)

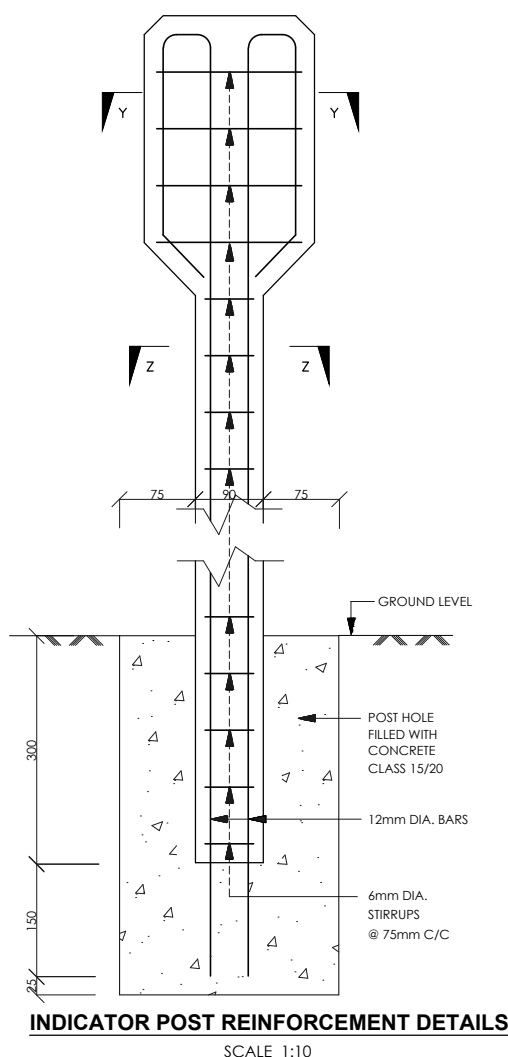
NOTE:- THE ABOVE VALUES APPLY FOR SOCKETTED uPVC AND FLANGED OR COUPLED LINED STEEL PIPES SUBJECT TO A WORKING PRESSURE HEAD OF 12 BAR



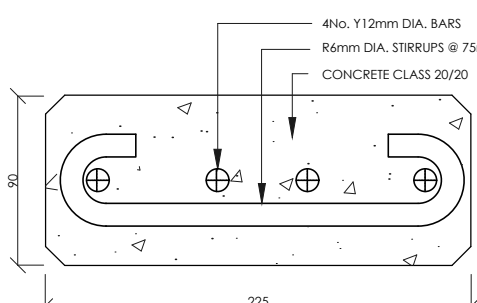
BULK METER POST
SCALE 1:10



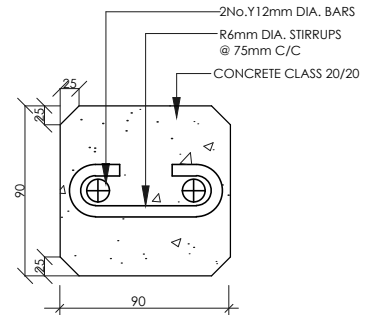
GATE VALVE INDICATOR POST
SCALE 1:10



INDICATOR POST REINFORCEMENT DETAILS
SCALE 1:10



SECTION Y-Y
SCALE 1:4



SECTION Z-Z
SCALE 1:4

SECTION X-X
N.T.S.

NOTE:-
ALL DETAILS TO BE SAME AS GATE VALVE BUT THE SIGN TO BE CHANGED AS INDICATED

- NOTES**
- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED
 - ANCHOR BLOCKS TO BE INSTALLED FOR PIPES LAID AT SLOPES EXCEEDING 1:6 SLOPE
 - THRUST BLOCKS TO BE INSTALLED AT ALL HORIZONTAL AND VERTICAL BENDSCAPPED ENDS, TEES, TAPERS AND GATE VALVES
 - DETAILS FOR ALL INDICATOR POSTS TO BE AS FOR GATE VALVE BUT LETTERING TO BE AS FOLLOWS:
- | FOR | USE |
|-------------|-----|
| GATE VALVE | GV |
| AIR VALVE | AV |
| WASHOUT | WO |
| WATER MAIN | WM |
| BULK METER | M |
| Y- JUNCTION | Y |
5. ALL INDICATOR POSTS TO BE PAINTED WITH 2 COATS BLUE OIL BASED PAINT AND WHITE LETTERING TO ENGINEER'S APPROVAL

ABBREVIATIONS

- MM - MILLIMETERS
- ND - NOMINAL DIAMETER
- Dia - DIAMETER
- c/c - CENTRE TO CENTRE
- No. - NUMBER
- OD - OUTSIDE DIAMETER
- uPVC - UNPLASTICISED POLYVINYL CHLORIDE
- m - METRE
- CL - CENTRE LINE
- GV - GATE VALVE
- AV - AIR VALVE
- WO - WASH OUT
- WM - WATER MAIN
- M - BULK METER
- m³ - CUBIC METER

REVISIONS				SIGN	DATE	APPROVED

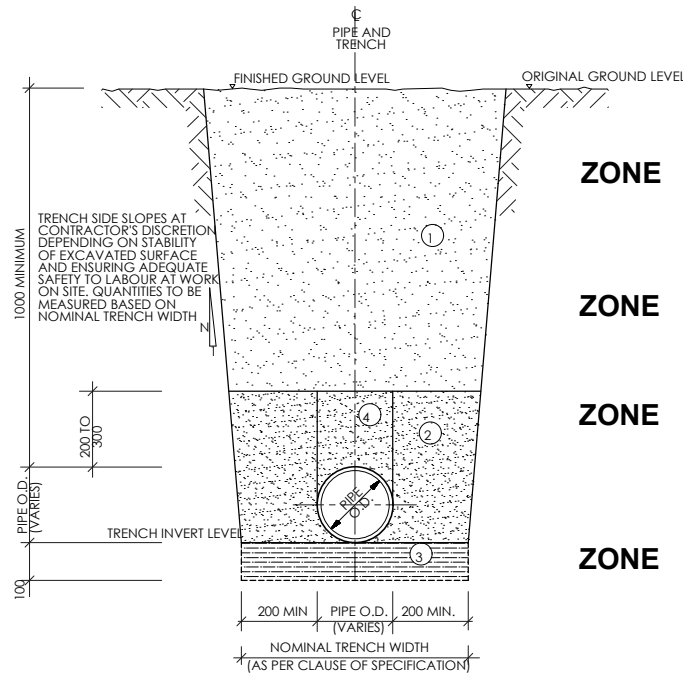
THE CHIEF EXECUTIVE OFFICER
COAST WATER SERVICES BOARD
P.O. BOX 90417 - 80100
MOMBASA, KENYA

DESIGN CONSULTANT:
MIBP MANGAT I.B. PATEL (MIBP) LIMITED
P.O BOX 48674,00100-GPO,
NAIROBI, KENYA
E-MAIL: mibp.nairobi@mibpp.com
TEL: +254-2-2710500

CONTRACT NAME:
CONSTRUCTION OF LIKONI - MBUTA MOSQUE PIPELINE (SC24)

DRAWING TITLE:
STANDARD DRAWINGS
THRUST BLOCKS, ANCHOR BLOCKS AND INDICATOR POST DETAILS

Designed by: S.C.K	Drawn by: P.G.M
Checked by: E.I.M	Approved by: R.S.R
Scale: AS INDICATED	Date: MAY 2019
DRG No. M410/SD/05	REV. 0

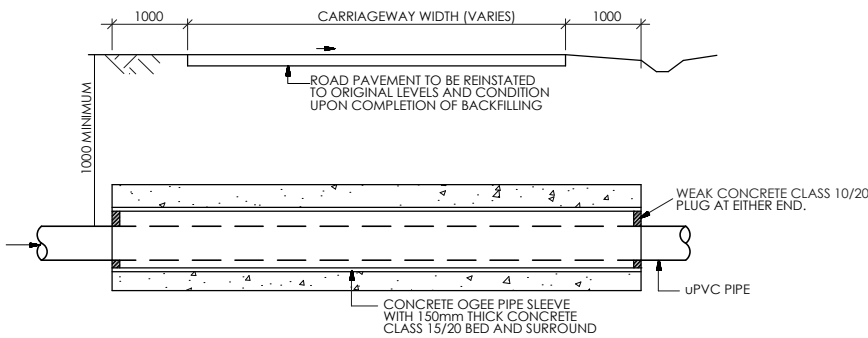


NOTES

- ZONE 1** SOIL TO BE USED MAY INCLUDE FREE-DRAINING COARSE SAND, GRAVEL, LOAM AND SOIL OF A FRIABLE NATURE. PARTICAL SIZE NOT TO EXCEED 20mm. BACKFILL IN LAYERS NOT EXCEEDING 300mm UPTO FINISHED GROUND LEVEL, EACH LAYER BEING WELL COMPACTED TO LIMIT VOIDS. MECHANICAL COMPACTION EQUIPMENT MAY BE USED IF APPROVED BY ENGINEER.
- ZONE 2** BACKFILL WITH SOIL APPROVED BY THE ENGINEER, IN LAYERS NOT EXCEEDING 200mm. THOROUGHLY COMPACT SOIL, TAMPING EQUALLY ON EITHER SIDE AND ALONG LOWER EDGE OF PIPE. ONLY HAND TAMPING TO BE USED
- ZONE 3** IF ROCK SHARP PROJECTIONS, TREE ROOTS OR OTHER UNSUITABLE MATERIAL IS ENCOUNTERED AT TRENCH INVERT LEVEL, A FURTHER 100mm DEPTH OF MATERIAL IS TO BE EXCAVATED. BACKFILL WITH SOIL APPROVED BY THE ENGINEER UPTO TRENCH INVERT LEVEL. THOROUGHLY COMPACT SOIL BY HAND TO GIVE A UNIFORM GRADIENT ALONG PIPE TRENCH, LEAVING RECESSES FOR PIPE JOINTS.
- ZONE 4** SIMILAR REQUIREMENTS TO ZONE 2 EXCEPT NO EXCESS TAMPING IS PERMITTED OVER PIPE.

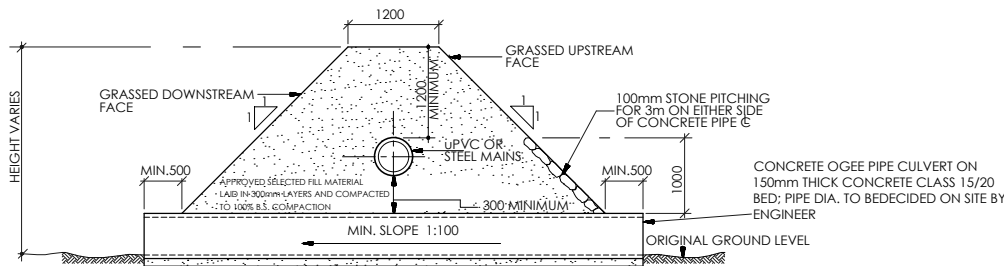
TYPICAL TRENCH DETAIL FOR RETICULATION PIPES (uPVC OR C/L FERROUS PIPES)

SCALE 1:100



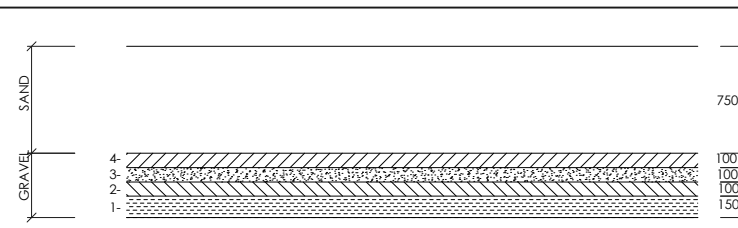
TYPICAL ROAD PIPE CROSSING DETAIL FOR HDPE PIPES

SCALE A1-1: 100



TYPICAL DETAIL OF PIPE CROSSING SEASONAL STREAM / DRAINAGE DITCH

SCALE 1 : 100

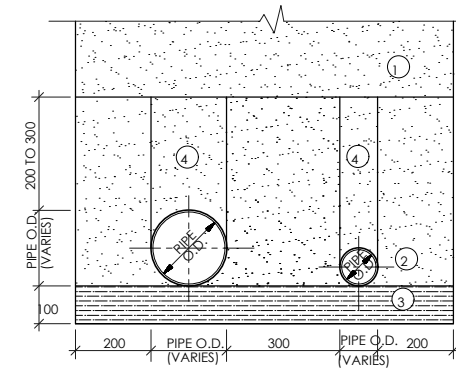


LAYER	1	2	3	4
DEPTH (mm)	150	100	100	100
PASSING SQUARE MESH	38mm (1 1/2")	20mm (3/4")	12mm (1/2")	5mm (3/16")
RETAINED	20mm (3/4")	12mm (1/2")	5mm (3/16")	2mm (3/32")

TOP SAND LAYER 750mm EFFECTIVE SIZE 0.7mm UNIFORMITY COEFFICIENT 1.5

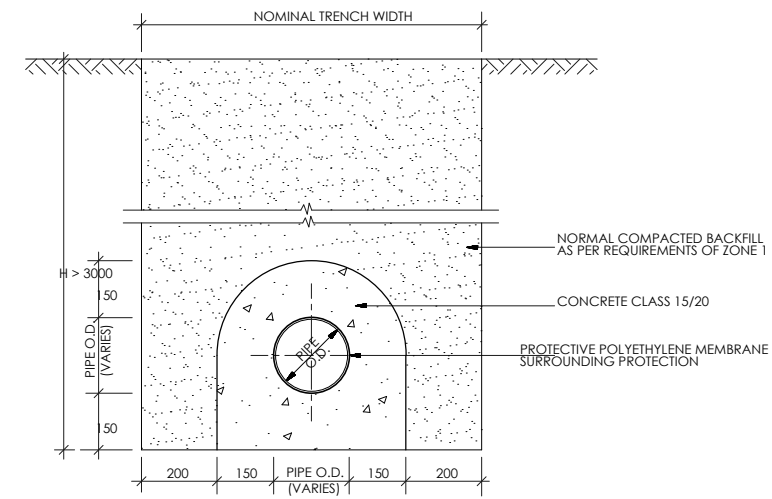
DETAILS OF FILTER MEDIA IN RAPID SAND FILTERS

NTS



TWIN PIPES IN SINGLE TRENCH

SCALE 1:20



CONCRETE PROTECTION TO uPVC PIPES LAID AT DEPTHS GREATER THAN 3.0m

SCALE 1: 20

PIPE DIAMETER SCHEDULES

HDPE WATER PRESSURE PIPES TO KS. 06-149: PART 2, 2000			WALL THICKNESS (mm)							
NOMINAL OUTSIDE DIAMETER (mm)	CORRESPONDING OUTSIDE DIAMETER AS PER KS. 06-149: PART 2, 2000 (mm)		PN = 6 BAR		PN = 10 BAR		PN = 12.5 BAR		PN = 16 BAR	
	MIN.	MAX.	CLASS 'B'	CLASS 'C'	CLASS 'D'	CLASS 'E'	MIN.	MAX.	MIN.	MAX.
63	63	63.3	1.70	2.1	2.70	3.2	3.40	3.9	4.30	4.9
75	75	75.3	2.00	2.4	3.30	3.8	4.00	4.6	5.10	5.8
90	90	90.3	2.40	2.8	3.90	4.5	4.80	5.5	6.10	6.9
110	110	110.4	2.90	3.4	4.80	5.5	5.90	6.7	7.50	8.5
125	125	125.4	3.30	3.8	5.40	6.1	6.70	7.6	8.50	9.6
140	140	140.4	3.70	4.3	6.00	6.8	7.50	8.5	9.50	10.7
160	160	160.5	4.20	4.8	7.00	7.9	8.60	9.7	10.80	12.1
200	200	200.6	4.80	5.5	7.80	8.8	9.70	10.9	12.20	13.6
225	225	225.7	5.40	6.1	8.80	9.9	10.90	12.2	13.70	15.3
250	250	250.8	6.00	6.8	9.80	11.0	12.10	13.5	15.30	17.0
280	280	280.9	6.70	7.6	10.90	12.2	13.50	15.1	17.10	19.0
315	315	316.0	7.50	8.5	12.30	13.7	15.20	16.9	19.20	21.3

UPVC PIPE PRESSURE CLASSES			
CLASS 'B'	CLASS 'C'	CLASS 'D'	CLASS 'E'
6 BAR	10 BAR	12.5 BAR	16 BAR
60m HEAD OF WATER	90m HEAD OF WATER	20m HEAD OF WATER	150m HEAD OF WATER

PN = NOMINAL PRESSURE

BITUMEN LINED STEEL PIPES TO TO B.S. 534:1981	
NOMINAL INTERNAL DIAMETER (mm)	CORRESPONDING OUTSIDE PIPE DIAMETER AS PER B.S. 534: 1981 (mm)
50	60.3
65	76.1
80	88.9
100	114.3
125	139.7
150	168.3
175	193.7
200	219.1
225	244.5
250	273.0
300	323.9
350	355.6
400	406.4
450	457.0
500	508.0
550	559.0
600	610.0

DUCTILE IRON PIPES TO B.S. 4772:1980	
NOMINAL INTERNAL DIAMETER (mm)	CORRESPONDING OUTSIDE PIPE DIAMETER AS PER B.S. 477: 1980(mm)
50 *	66 *
65 *	82 *
80	98
100	118
125 *	144 *
150	170
200	222
250	274
300	326
350	378
400	429
450	480
500	532
600	635

* NOT IN B.S. 4772: DATA FROM HALBERGER HUTTE TABLES

NOTES

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED

ABBREVIATIONS

- O.D. - Outside Diameter
- uPVC - Unplasticised Polyvinyl Chloride
- C or C/L - Centre line
- mm - Millimeter
- m - Meter
- > - Greater Than
- KS - Kenya Standard
- B.S. - British Standard
- SRN - Standard Reference Number
- MIN - Minimum

REVISIONS				SIGN	DATE	APPROVED
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					

**THE CHIEF EXECUTIVE OFFICER
COAST WATER SERVICES BOARD**
P.O. BOX 90417 - 80100
MOMBASA, KENYA

DESIGN CONSULTANT:
MIBP MANGAT I.B. PATEL (MIBP) LIMITED
P.O. BOX 48674, 00100-GPO,
NAIROBI, KENYA
E-MAIL: mibp.nairobi@mibpp.com
TEL: +254-2-2710500

CONTRACT NAME:
**CONSTRUCTION OF LIKONI - MBUTA
MOSQUE PIPELINE (SC24)**

DRAWING TITLE:
**STANDARD DRAWINGS
TYPICAL TRENCH AND PIPE
CROSSING FOR WATER PIPES**

Designed by: S.C.K	Drawn by: P.G.M
Checked by: E.I.M	Approved by: R.S.R
Scale: AS INDICATED	Date: MAY 2019
DRG No. M410/SD/06	REV. 0

NOTE

ALL DIMENSIONS SHOWN ABOVE ARE BASED ON THE CURRENT RELEVANT KENYAN OR BRITISH STANDARDS AND ARE FOR THE TENDERER'S INFORMATION. TENDERERS ARE FREE TO QUOTE FOR PIPES TO ANY OTHER APPROVED EQUIVALENT SRN NUMBER. THE TENDERER'S ATTENTION IS ALSO DRAWN TO CLAUSE 36 OF PREAMBLE TO THE BILL OF QUANTITIES, REGARDING ALTERNATIVE PIPE AND JOINTING TYPES.