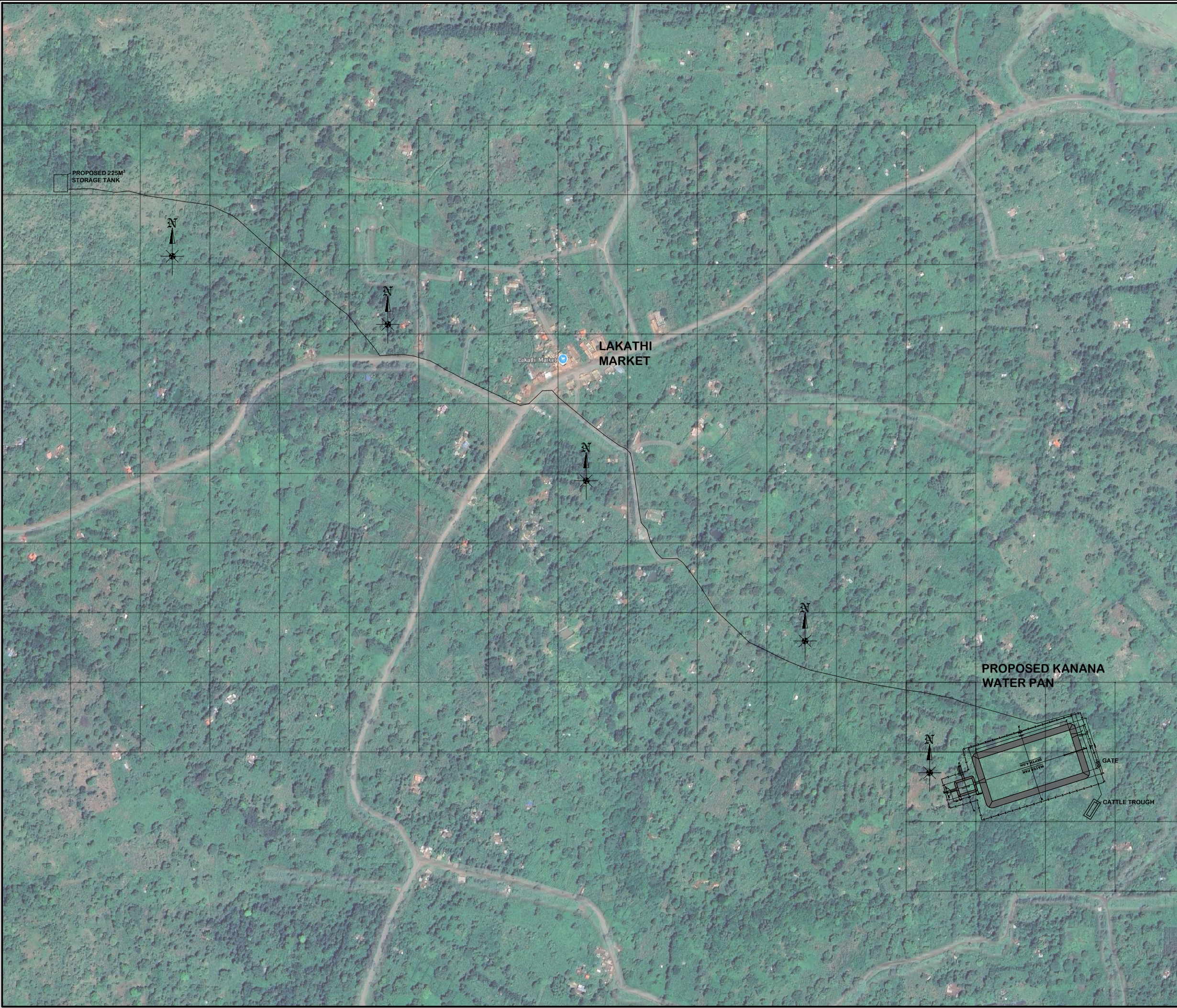




- NOTES
1. ALL LEVELS ARE IN METERS ABOVE SEA LEVEL.
 2. GROUND AND INVERT LEVEL SHOWN ARE AS SHOWN ON DRAWING UNLESS OTHERWISE INDICATED ON SITE BY THE ENGINEER.
 3. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 0.8m. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
 4. ALL BENDS ARE HORIZONTAL UNLESS OTHERWISE STATED.

LEGEND:

- PROPOSED PIPELINE
- EXISTING GROUND PROFILE
- HYDRAULIC GRADIENT LINE
- - - - - FENCE
- - - - - K.P.L.C. POWER LINE
- PIPE INVERT PROFILE
- OD — OUTER DIAMETER
- PN — NOMINAL PRESSURE
- ▨ — BUILDINGS
- ⊕ — AIR VALVE
- ⊕ — WASHOUT
- ⊕ — SECTIONAL VALVE
- ⊕ — BREAK PRESSURE TANK

R E V I S I O N S					
REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:
CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:

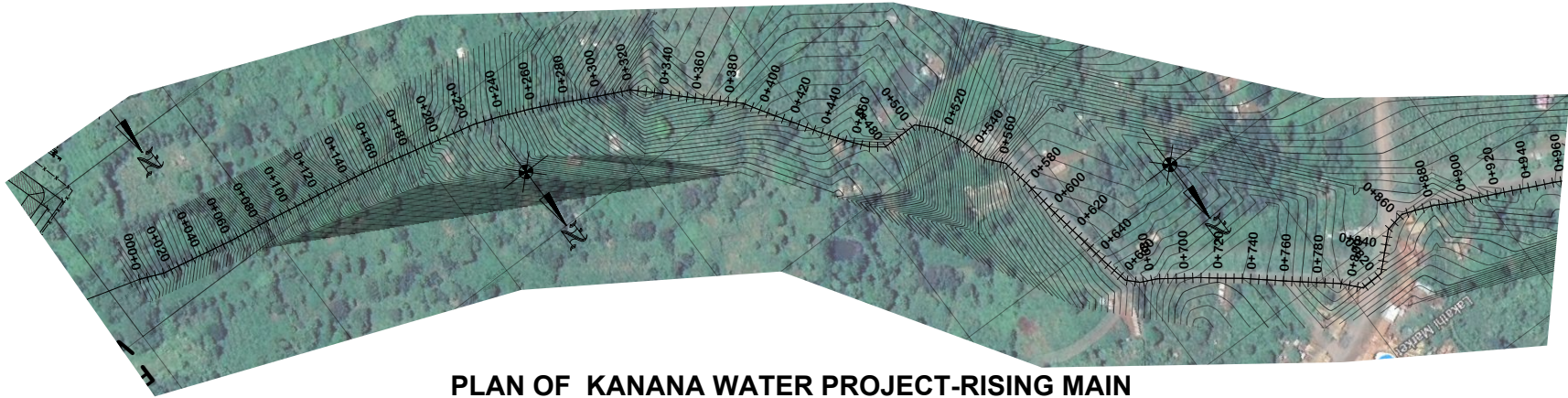


CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

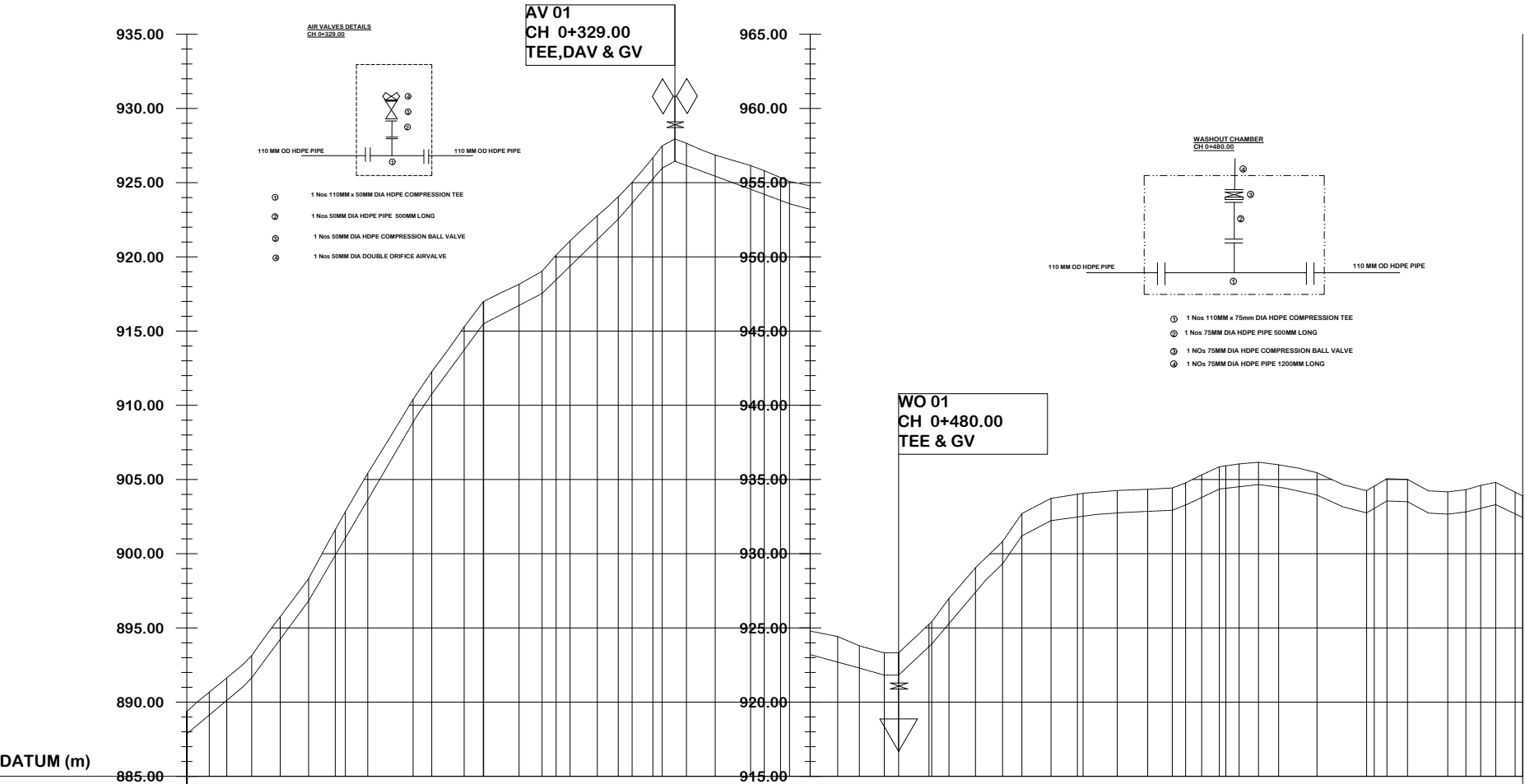
DRG No. **TWWDA/KWP/LM/01**
SHEET No. **SHEET 1 OF 22**

DRAWING TITLE:
KANANA WATER PROJECT LAYOUT PLAN

Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026



PLAN OF KANANA WATER PROJECT-RISEING MAIN



TYPE & SIZE OF PIPE	OD 10 mm HDPE PIPE (PN 12.5)	OD 110 mm HDPE PIPE (PN 10)																																													
DESIGN FLOW RATE (m3/s)	Q=0.0072M³/S																																														
CHAINAGE																																															
EXISTING GROUND LEVEL (m)	889.37	889.07	891.07	892.76	895.37	898.05	901.61	905.09	908.35	911.52	914.31	917.97	919.11	921.24	923.07	925.03	927.45	927.51	926.74	926.15	925.34	924.79	924.36	923.60	923.36	925.24	927.74	929.89	932.33	933.61	934.01	934.21	934.31	934.41	935.13	935.92	936.15	935.92	935.49	934.62	934.55	935.01	934.22	934.29	934.77	933.89	
TRENCH BOTTOM LEVELS (m)	887.87	889.54	891.26	893.84	896.55	899.89	903.31	906.73	910.02	912.80	915.50	916.53	917.60	919.55	921.50	923.62	925.95	926.03	925.29	924.55	923.81	923.20	922.66	922.10	921.86	923.74	926.06	928.39	930.83	932.11	932.47	932.70	932.82	932.91	933.61	934.41	934.41	934.64	934.41	933.98	933.13	933.05	933.51	932.72	932.79	933.26	932.44
DEPTH OF PIPE INVERT (m)	1.50	1.527	1.500	1.534	1.501	1.72	1.783	1.624	1.500	1.508	1.50	1.441	1.511	1.692	1.566	1.40	1.497	1.475	1.448	1.600	1.53	1.586	1.702	1.500	1.500	1.50	1.679	1.500	1.500	1.500	1.54	1.509	1.493	1.497	1.512	1.51	1.506	1.502	1.506	1.496	1.50	1.500	1.500	1.500	1.507	1.45	
HYDRAULIC GRADIENT LEVEL(m)	997.87	997.65	997.43	997.21	996.99	996.80	996.61	996.42	996.23	996.04	995.85	995.66	995.48	995.29	995.10	994.91	994.72	994.53	994.34	994.16	993.97	993.78	993.59	993.40	993.21	993.02	992.84	992.65	992.46	992.27	992.08	991.89	991.70	991.52	991.33	991.14	990.95	990.76	990.57	990.38	990.20	990.01	989.82	989.63	989.44	989.25	
SLOPE OF PIPE (H:V)		37.65	6.06	38.37	72.56	10.47	34.68	39.66	51.80	29.70	6.32	33.32	38.92	47.08	16.77	9.64	22.29	36.57	11.26	13.07	79.60	29.80	79.72	32.77	10.66	27.06	26.48	64.48	65.17	45.11	48.15	73.80	0.80	11.41	12.12	12.96	72.18	20.48	46.46								

KANANA WATER PROJECT-RISEING MAIN (1)

0+000.00 - 0+900.00

- NOTES
1. ALL LEVELS ARE IN METERS ABOVE SEA LEVEL.
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 4. ALL BENDS ARE HORIZONTAL UNLESS OTHERWISE STATED.

- LEGEND:
- PROPOSED PIPELINE
 - EXISTING GROUND PROFILE
 - HYDRAULIC GRADIENT LINE
 - FENCE
 - K.P.L.C POWER LINE
 - PIPE INVERT PROFILE
 - OD — OUTER DIAMETER
 - PN — NOMINAL PRESSURE
 - BUILDINGS
 - AIR VALVE
 - WASHOUT
 - SECTIONAL VALVE
 - BREAK PRESSURE TANK

REVISIONS					
REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:
CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:

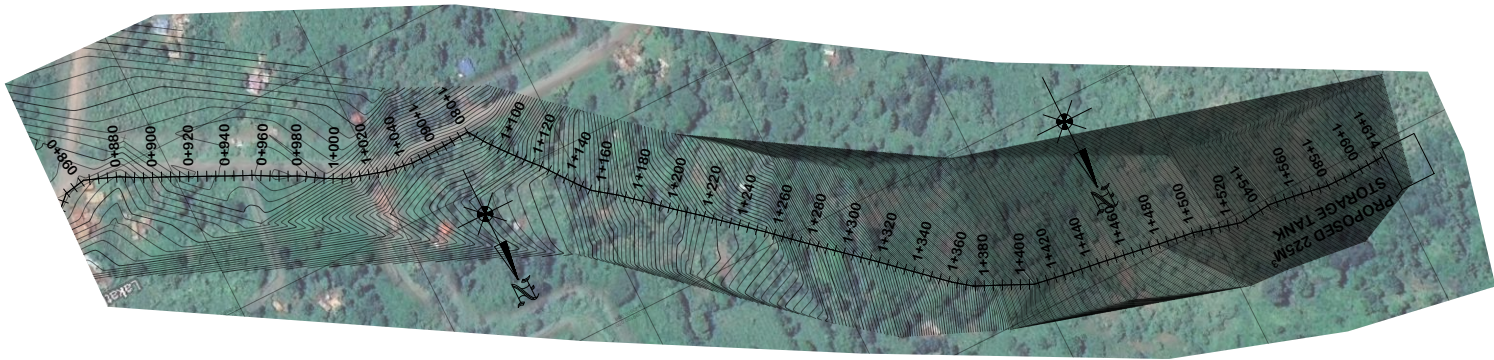


CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

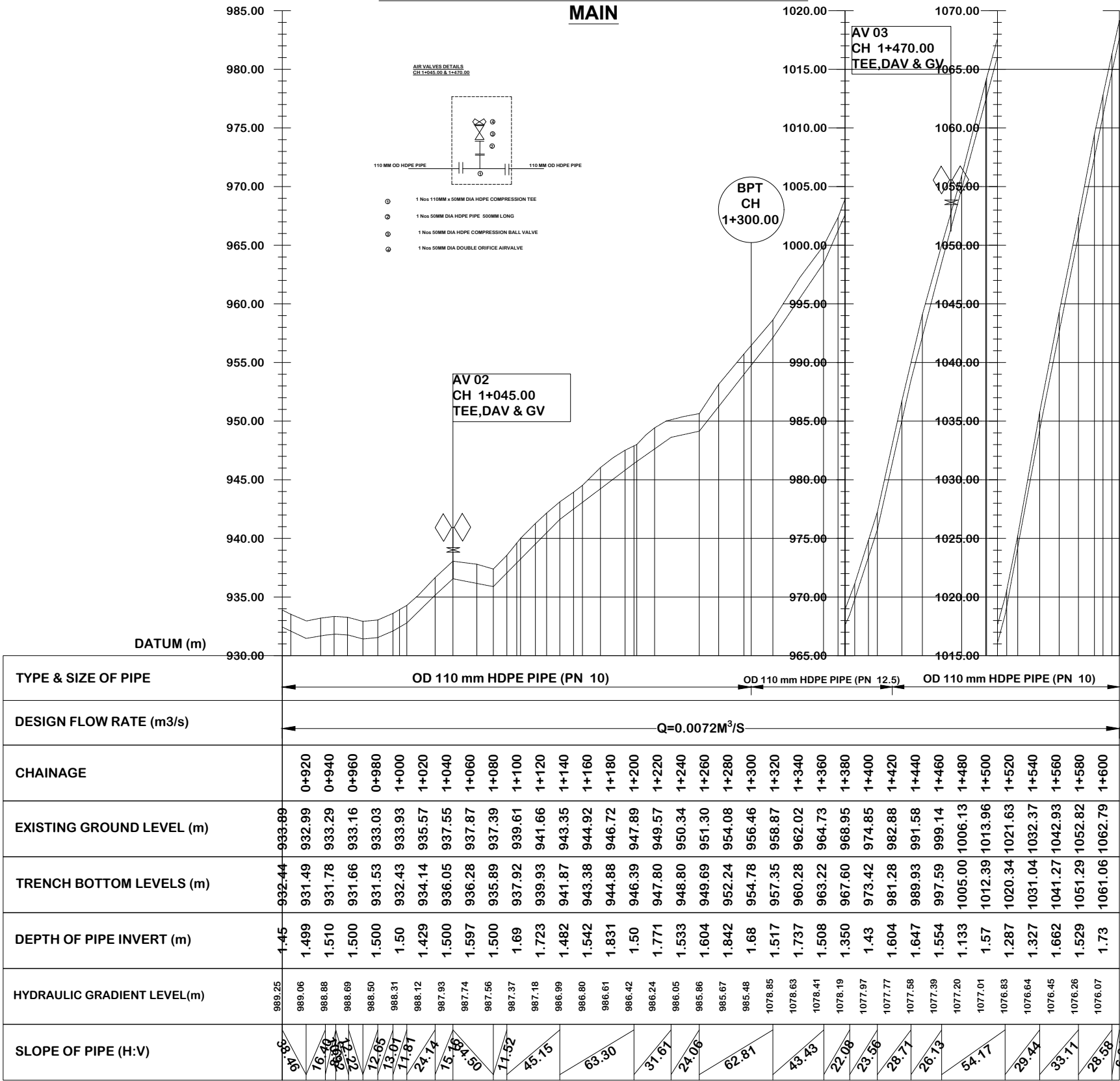
DRG No. **TWWD/KWP/WRM/01**
SHEET No. **SHEET 2 OF 22**

DRAWING TITLE:
PLAN & LONGITUDINAL SECTION OF KANANA WATER PROJECT-RISEING MAIN (0+000 TO 0+900.00)

Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026



PLAN OF KANANA WATER PROJECT-RISING
MAIN



KANANA WATER PROJECT-RISING MAIN (2)
0+900.00 - 1+614.03

- NOTES
1. ALL LEVELS ARE IN METERS ABOVE SEA LEVEL.
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- LEGEND:**
- PROPOSED PIPELINE
 - EXISTING GROUND PROFILE
 - HYDRAULIC GRADIENT LINE
 - FENCE
 - K.P.L.C POWER LINE
 - PIPE INVERT PROFILE
 - OD — OUTER DIAMETER
 - PN — NOMINAL PRESSURE
 - BUILDINGS
 - AIR VALVE
 - WASHOUT
 - SECTIONAL VALVE
 - BREAK PRESSURE TANK

R E V I S I O N S					
REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:

CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:



CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

DRG No. **TWWD/KWP/WRM/02**

SHEET No. **SHEET 3 OF 22**

DRAWING TITLE:

PLAN & LONGITUDINAL SECTION OF KANANA WATER PROJECT-RISING MAIN (0+900 TO 1+614.03)

Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026

PROPOSED KANANA WATER PAN

- NOTES
1. ALL LEVELS ARE IN METERS ABOVE SEA LEVEL.
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- PROPOSED PIPELINE
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- HYDRAULIC GRADIENT LINE
- FENCE
- K.P.L.C POWER LINE
- PIPE INVERT PROFILE
- OD — OUTER DIAMETER
- PN — NOMINAL PRESSURE
- BUILDINGS
- AIR VALVE
- WASHOUT
- SECTIONAL VALVE
- (BPT) — BREAK PRESSURE TANK

REVISIONS

REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:

CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:



CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

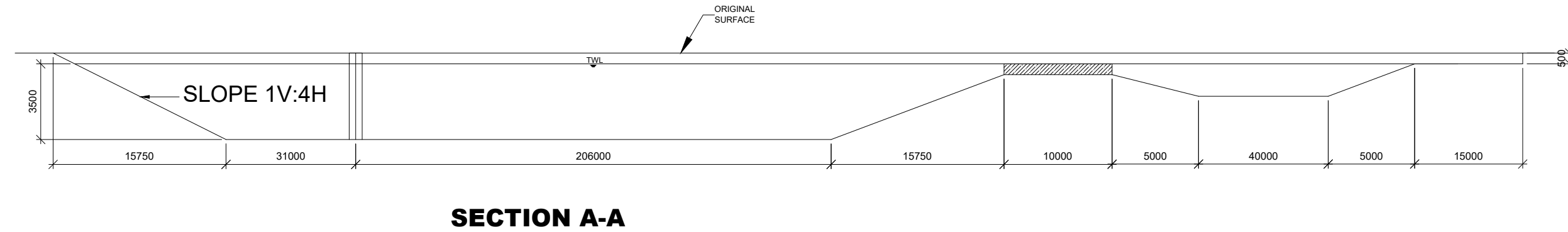
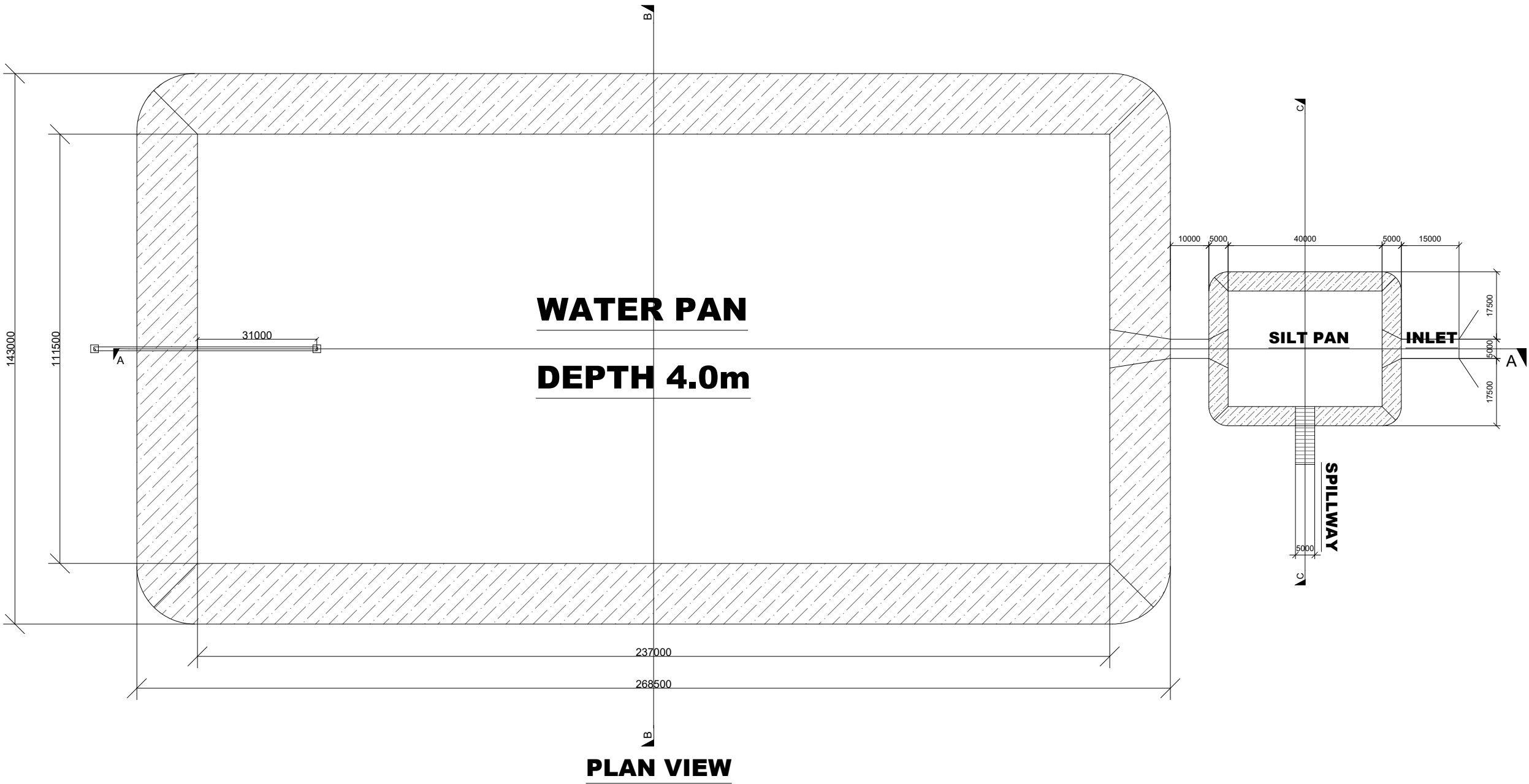
DRG No. **TWWDA/KWP/WP/01**

SHEET No. **SHEET 4 OF 22**

DRAWING TITLE:

**KANANA WATER PROJECT-WATER PAN
LAYOUT**

Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026



- NOTES
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS STATED OTHERWISE
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REVISIONS					
REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:

CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:



CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

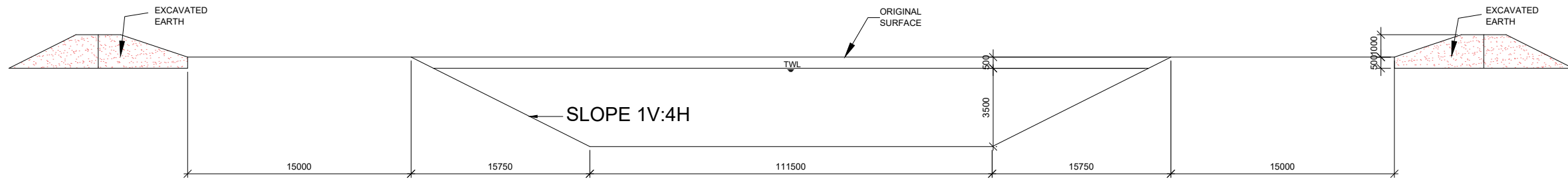
DRG No. **TWWDA/KWP/WP/02**

SHEET No. **SHEET 5 OF 22**

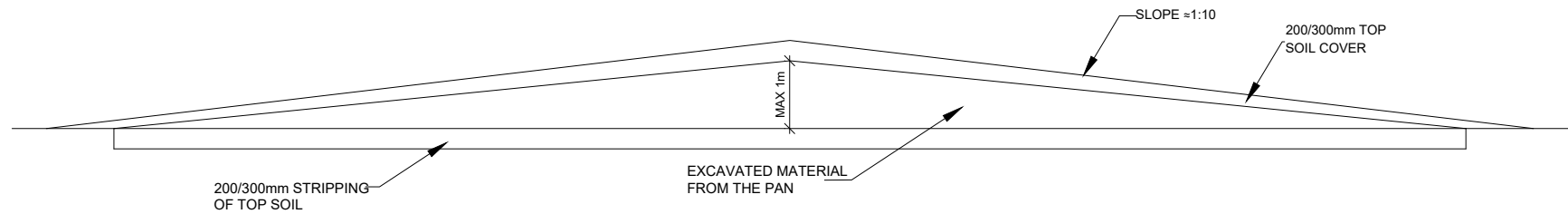
DRAWING TITLE:

KANANA WATER PAN - PLAN VIEW AND SECTIONAL VIEWS

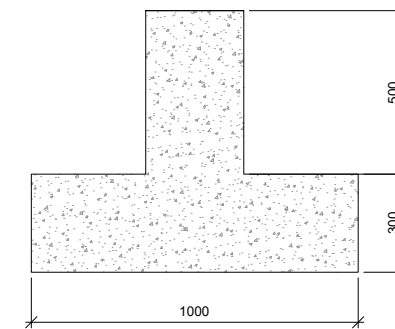
Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026



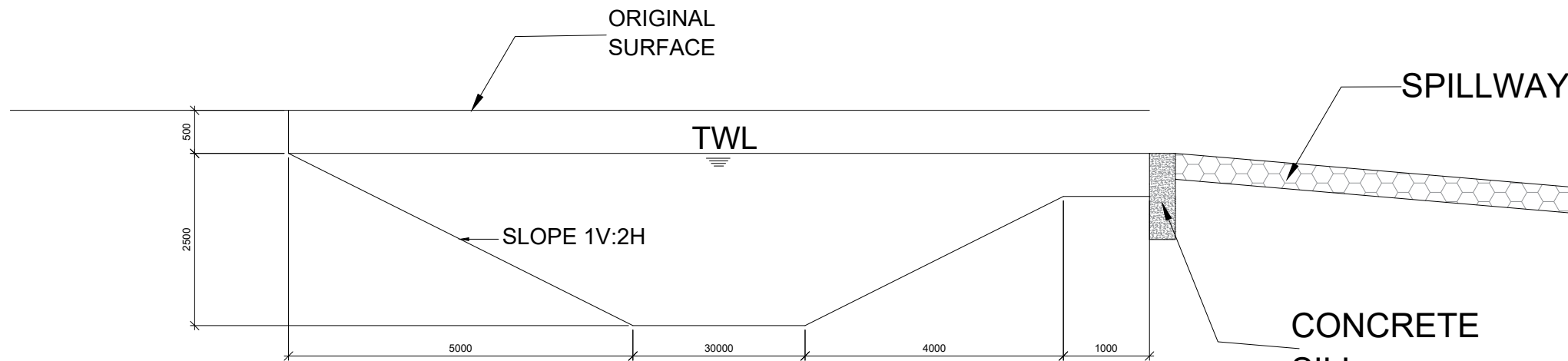
SECTION B-B



HEAPED EXCAVATED MATERIAL

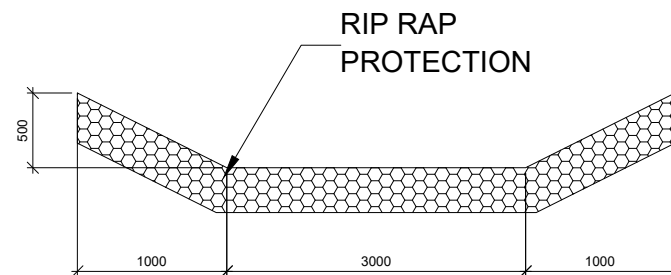


CONCRETE SILL

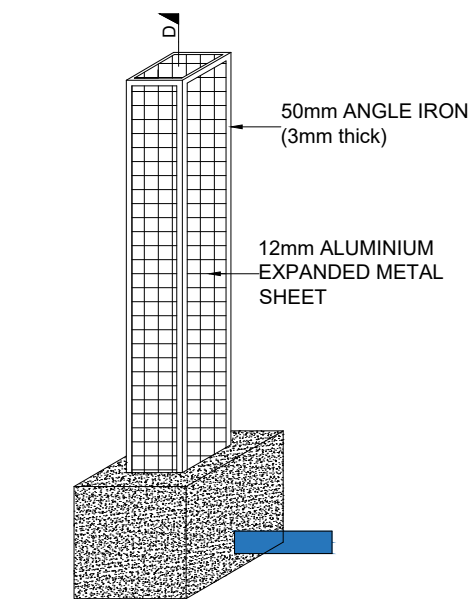


SILT TRAP DETAILS

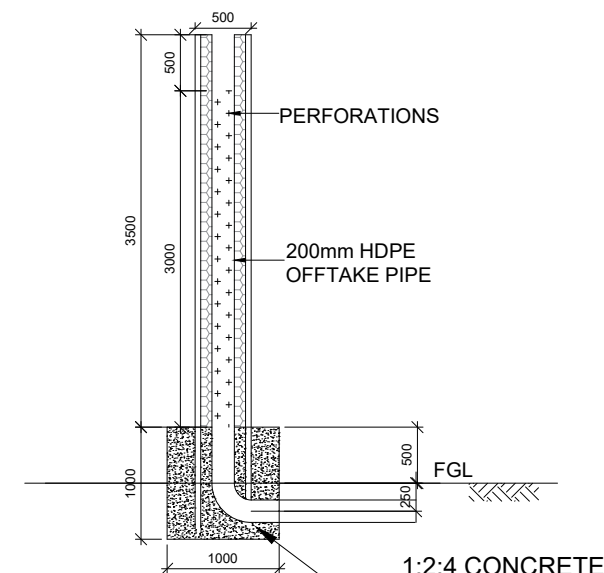
SECTION C-C



INLET



INTAKE STRUCTURE



SECTION D-D

- NOTES
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS STATED OTHERWISE
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REVISIONS					
REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:
CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:

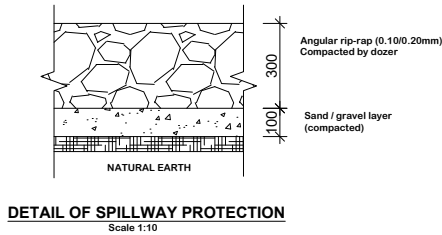
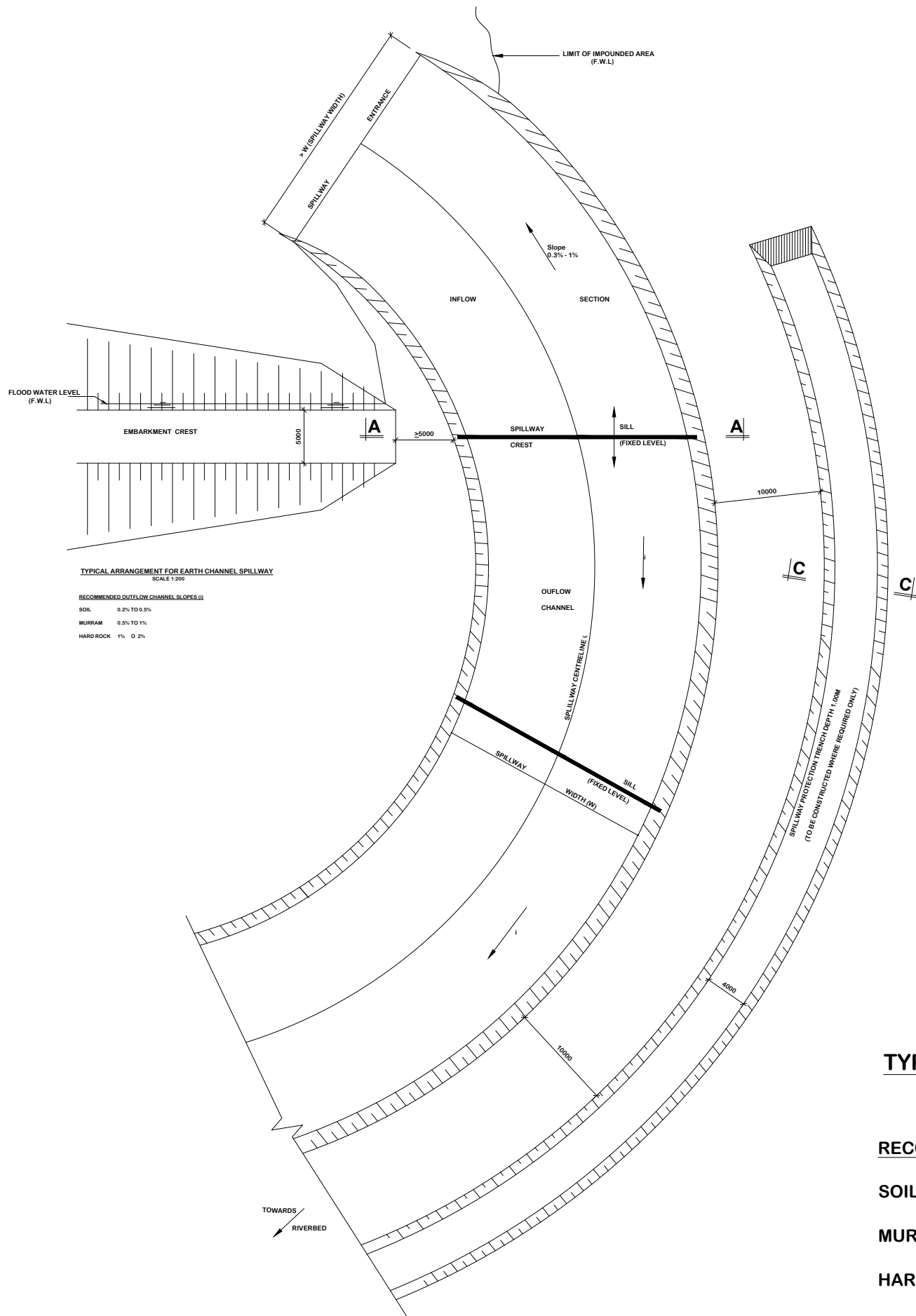


CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

DRG No. **TWWDA/KWP/WP/03**
SHEET No. **SHEET 6 OF 22**

DRAWING TITLE:
KANANA WATER PAN - SECTIONAL VIEWS, INLET, SPILLWAY AND INTAKE DETAILS

Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026



TYPICAL ARRANGEMENT FOR EARTH CHANNEL SPILLWAY
SCALE 1:200

RECOMMENDED OUTFLOW CHANNEL SLOPES (i)

SOIL	0.2% TO 0.5%
MURRAM	0.5% TO 1%
HARD ROCK	1% O 2%

- NOTES
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS STATED OTHERWISE
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REVISIONS

REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:

CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:



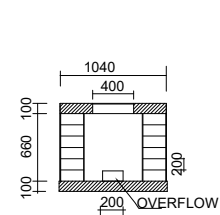
CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

DRG No. TWWDA/KWP/WP/04

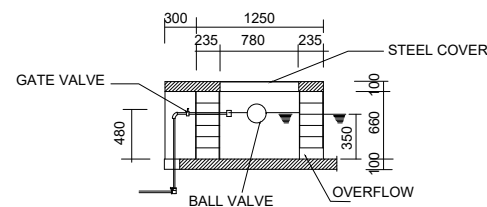
SHEET No. SHEET 7 OF 22

DRAWING TITLE:
KANANA WATER PAN - SPILLWAY DETAILS

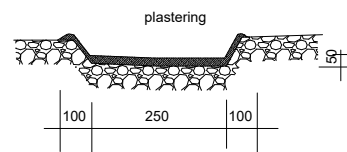
Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026



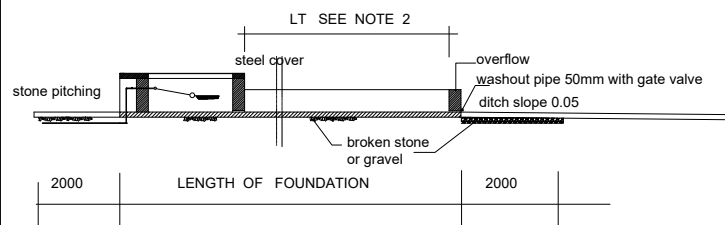
SECTION F - F



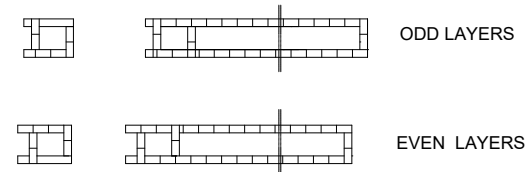
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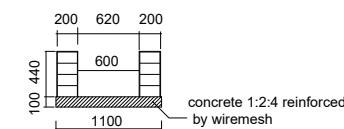
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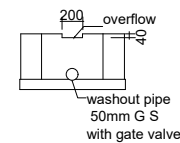
SECTION A - A



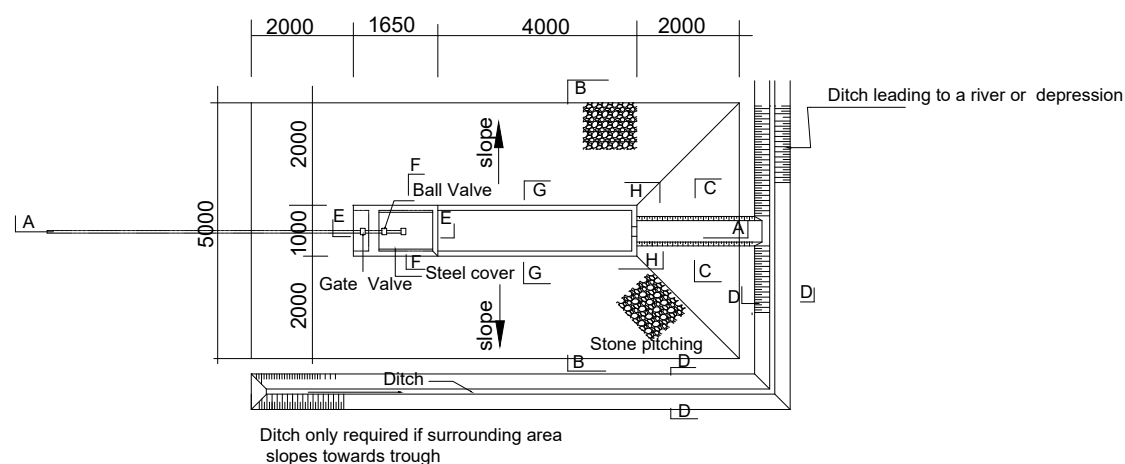
BLOCK LAYING



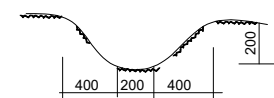
SECTION G - G



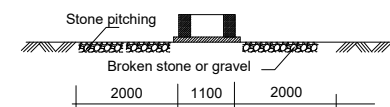
SECTION H - H



PLAN OF CATTLE TROUGH



SECTION D - D



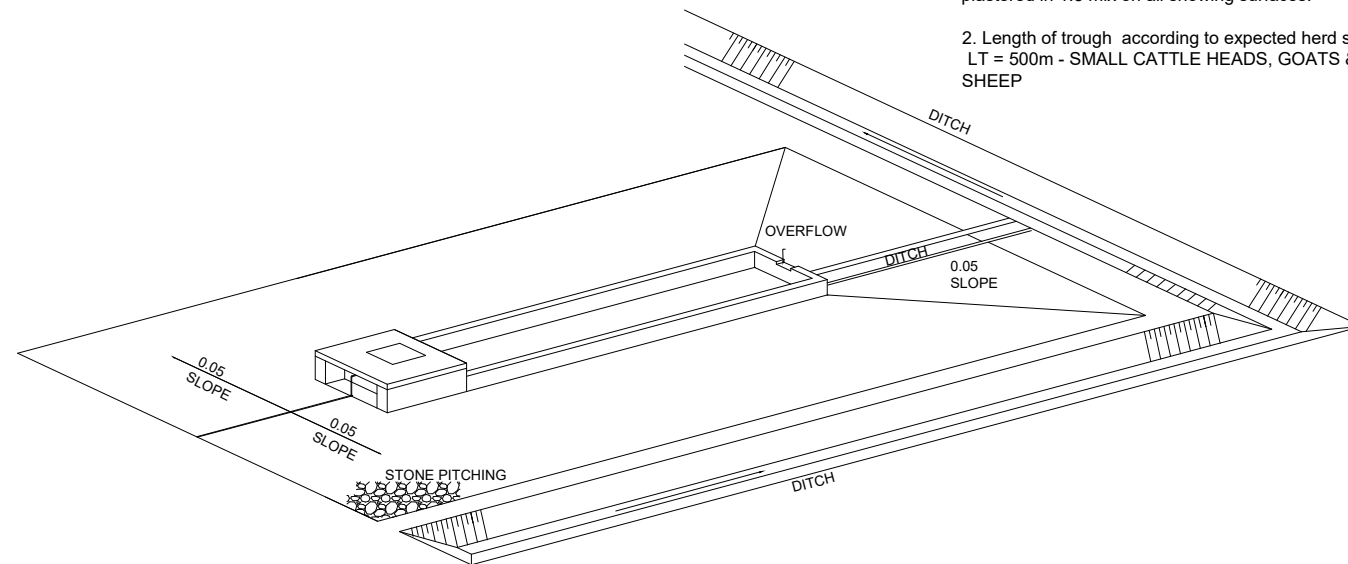
SECTION B - B

Required Fittings

1. 2 no 50mm Elbows
2. 2 no 50mm gate valve
3. 1 no 50mm ball valve

NOTE

1. Structure in 400x200x100mm cement blocks plastered in 1:3 mix on all showing surfaces.
2. Length of trough according to expected herd size.
LT = 500m - SMALL CATTLE HEADS, GOATS & SHEEP



ISOMETRIC VIEW

- NOTES
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS STATED OTHERWISE
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 5. ALL BENDS ARE HORIZONTAL UNLESS OTHERWISE STATED.

REVISIONS

REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:

CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:



CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

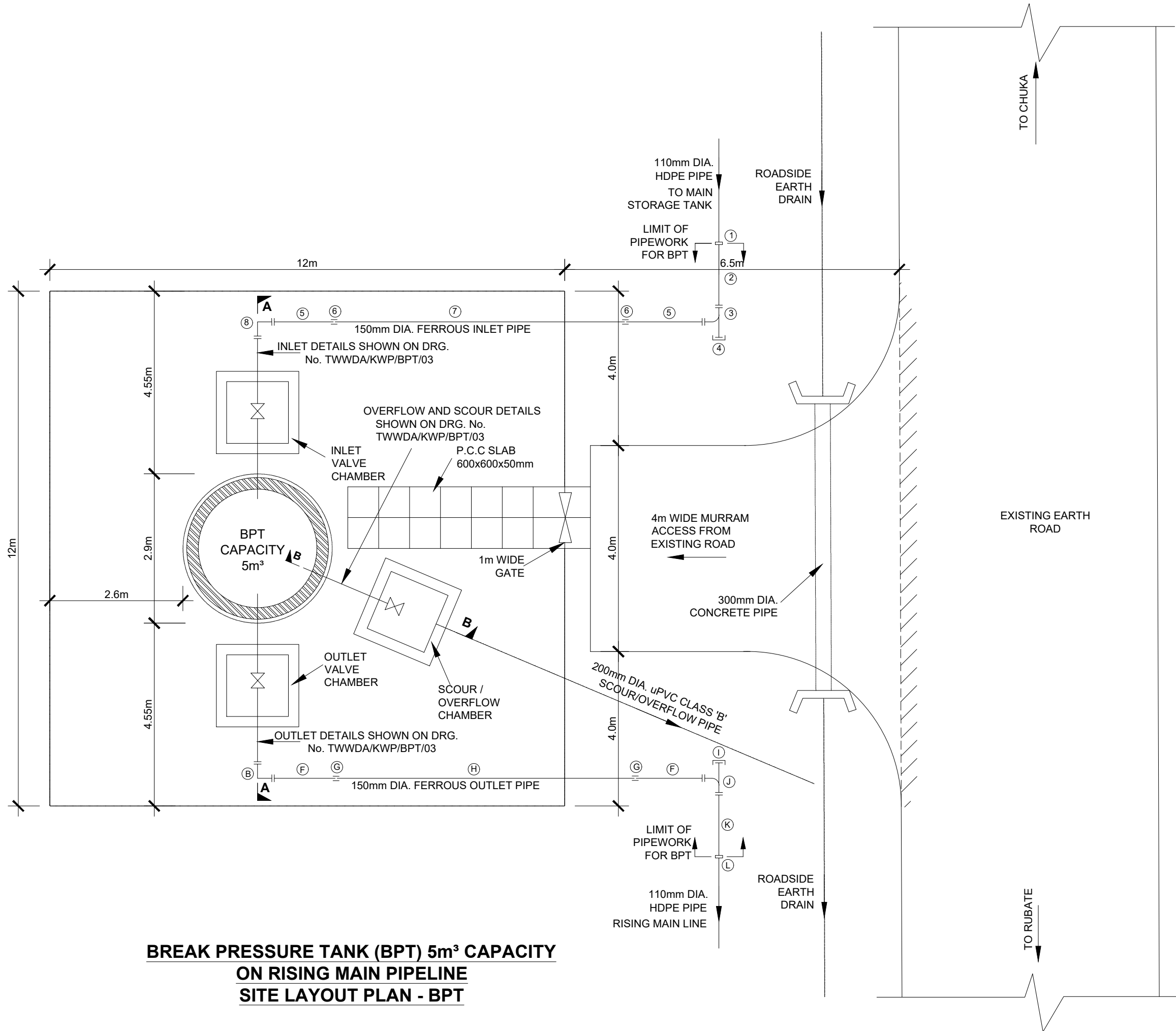
DRG No. **TWWDA/KWP/06**

SHEET No. **SHEET 9 OF 22**

DRAWING TITLE:

KANANA WATER PAN - WATER TROUGH
ISOMETRIC AND SECTIONAL VIEWS

Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026



- NOTES**
1. DIMENSIONS IN METERS UNLESS OTHERWISE SPECIFIED
 2. ALL PIPE DIAMETERS INDICATED ARE NOMINAL SIZES.
 3. SETTING OUT AND LEVELS TO BE APPROVED BY THE PROJECT MANAGER PRIOR TO COMMENCEMENT OF CONSTRUCTION.
 4. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRG. NO. TWWDA/BPT/02&03
 5. FOR BREAK PRESSURE TANK DETAILS SEE DRG NO. TWWDA/KWP/BPT/02
 6. FOR DETAILS OF INLET, OUTLET & SCOUR/OVERFLOW PIPEWORK, SEE DRG. NO. TWWDA/KWP/BPT/02&03
 7. ONLY FIGURED DIMENSIONS TO BE TAKEN FROM THIS DRAWING

LEGEND

- CHAINLINK FENCE
- GRAVITY MAIN
- SCOUR / OVERFLOW PIPE
- EARTH DRAIN
- GATE VALVE
- CHAMBER
- CULVERT WITH HEAD WALLS

REVISIONS

REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:

CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:



CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

DRG No. TWWDA/KWP/BPT/01

SHEET No. SHEET 10 OF 22

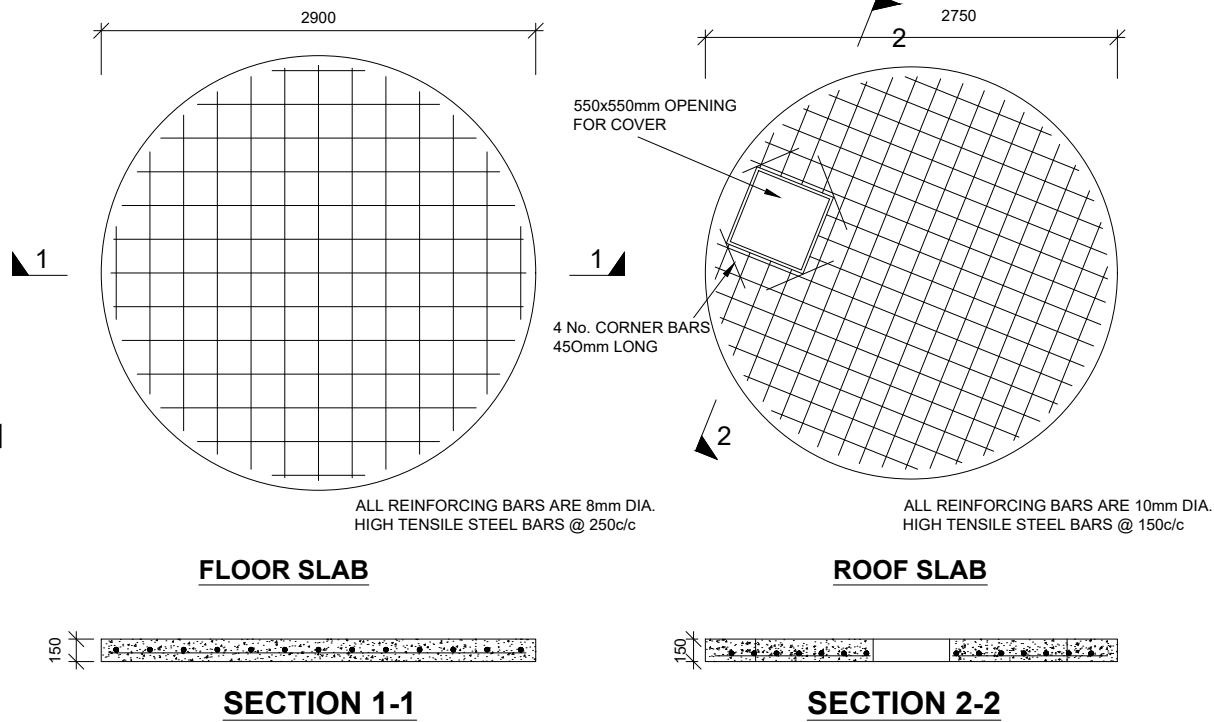
DRAWING TITLE:

**BREAK PRESSURE TANK ON RISING MAIN PIPELINE
(CAPACITY 5m³)LAYOUT PLAN**

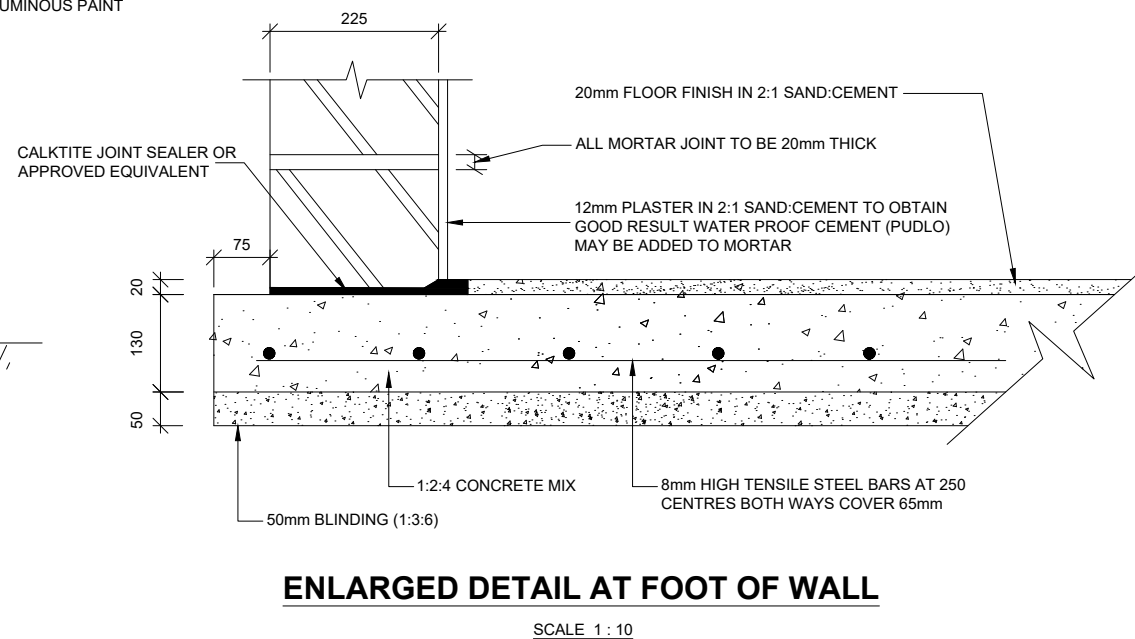
Designed by: A.K.W Drawn by: A.K.W

Checked by: E.W.W/K.N.G Approved by: D.M.N

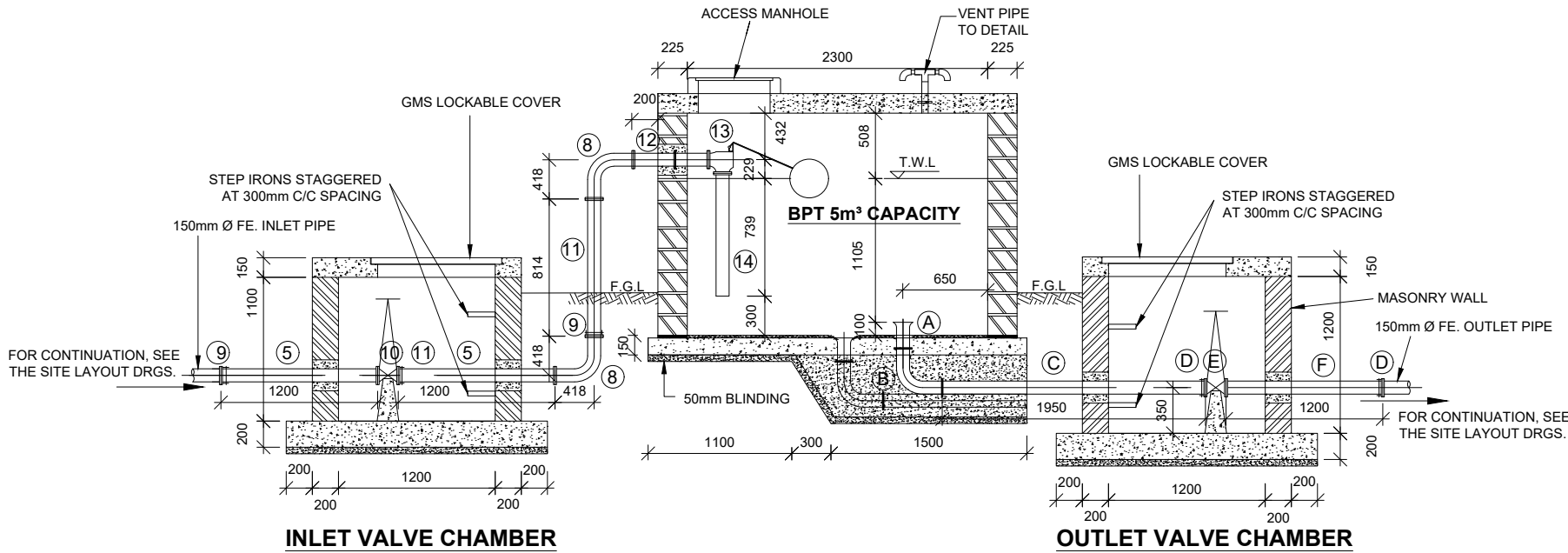
Scale: 1 : 2000 Date: JUNE 2026



SCALE 1 : 50

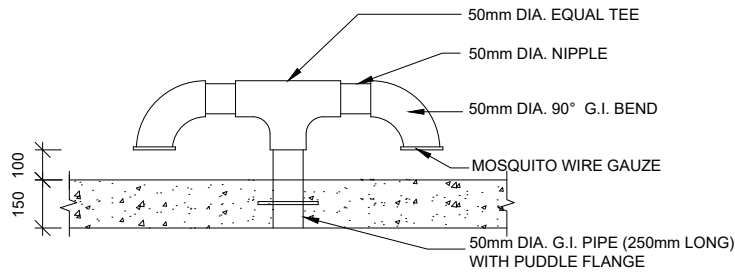


Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026

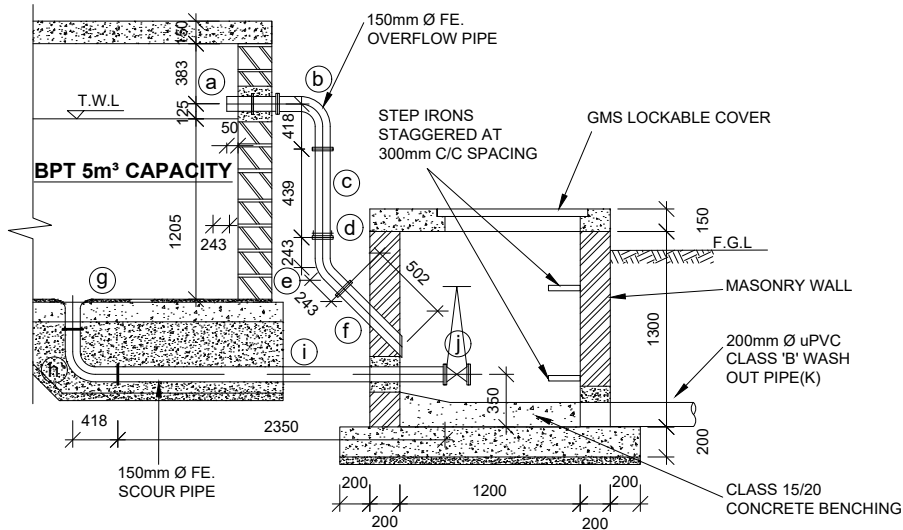


SECTION A-A INLET & OUTLET PIPEWORK DETAILS

SCALE 1 : 50



VENT PIPE DETAIL N.T.S.



OVERFLOW & WASHOUT CHAMBER SECTION B-B OVERFLOW & WASHOUT PIPEWORK DETAILS

SCALE 1 : 50

BPT Nos. 1 & 2 OVERFLOW AND SCOUR PIPEWORK DETAILS APPROVED LINED FERROUS PIPES AND FITTINGS 2 Nos. REQUIRED OVERFLOW PIPE WORK

- 150mm DIA. FLANGED SPIGOT PIPE 425mm LONG WITH A PUDDLE FLANGE AT 162.5mm FROM THE SPIGOT END.....1 Nr.
- 150mm DIA. ALL FLANGED 90° BEND1 Nr.
- 150mm DIA. FLANGED SPIGOT PIPE 439mm LONG (CUT TO SUIT ON SITE).....1 Nr.
- 150mm DIA. FLANGE ADAPTOR1 Nr.
- 150mm DIA. ALL FLANGED 45° BEND1 Nr.
- 150mm DIA. FLANGED SPIGOT PIPE 502mm LONG WITH A SPIGOT END BEVELLED (CUT TO SUIT ON SITE).....1 Nr.

WASHOUT/SCOUR PIPE WORK

- 150mm DIA. FLANGED BELLMOUTH1 Nr.
- 150mm DIA. ALL FLANGED 90° BEND1 Nr.
- 150mm DIA. DOUBLE FLANGED PIPE 2350mm LONG1 Nr.
- 150mm DIA. ALL FLANGED GATE VALVE TO EURO 20 SERIES, TYPE 23 OR APPROVED EQUIVALENT.....1 Nr.
- 200mm DIA. uPVC CLASS 'B' PIPE 10000mm LONG.1 Nr.

BPT Nos.1 & 2 INLET PIPEWORK DETAILS- 2Nos. REQUIRED APPROVED LINED FERROUS PIPES AND FITTINGS

- 150mm DIA. COUPLING.1 Nr.
- 150mm DIA. FLANGED SPIGOT PIPE 1200mm LONG1 Nr.
- 150 x 150mm DIA. ALL FLANGED RADIAL TEE1 Nr.
- 150mm DIA. BLANK FLANGE1 Nr.
- 150mm DIA. FLANGED SPIGOT PIPE 1200mm LONG4 Nr.
- 150mm DIA. COUPLING2 Nr.
- 150mm DIA. PLAIN ENDED PIPE 8m LONG(CUT TO SUIT ON SITE)....1 Nr.
- 150mm DIA. ALL FLANGED 90° BEND3 Nr.
- 150mm DIA. FLANGE ADAPTOR3 Nr.
- 150mm DIA. ALL FLANGED GATE VALVE1 Nr.
- 150mm DIA. FLANGED SPIGOT PIPE 814mm LONG (CUT TO SUIT ON SITE).....1 Nr.
- 150mm DIA. DOUBLE FLANGED PIPE 575mm LONG WITH A PUDDLE FLANGE AT 262mm FROM ONE END.....1 Nr.
- 150mm DIA. ALL FLANGED FLOAT VALVE TO SERIES 1042 BIWATER CATALOGUE OR APPROVED EQUIVALENT.....1 Nr.
- 150mm DIA. FLANGED SPIGOT FERROUS PIPE 739mm LONG.....1 Nr.

BPT Nos.1 & 2 OUTLET PIPEWORK DETAILS - 2 Nos. REQUIRED APPROVED LINED FERROUS PIPES AND FITTINGS

- 150mm DIA. FLANGED BELLMOUTH1 Nr.
- 150mm DIA. ALL FLANGED 90° BEND2 Nr.
- 150mm DIA. FLANGED SPIGOT PIPE 1950mm LONG (CUT TO SUIT ON SITE).....1 Nr.
- 150mm DIA. FLANGE ADAPTOR2 Nr.
- 150mm DIA. ALL FLANGED GATE VALVE1 Nr.
- 150mm DIA. FLANGED SPIGOT PIPE 1200mm LONG3 Nr.
- 150mm DIA. COUPLING2 Nr.
- 150mm DIA. PLAIN ENDED PIPE 8m LONG(CUT TO SUIT ON SITE)....1 Nr.
- 150mm DIA. BLANK FLANGE1 Nr.
- 150 x 150mm DIA. ALL FLANGED RADIAL TEE1 Nr.
- 150mm DIA. FLANGED SPIGOT PIPE 1200mm LONG1 Nr.
- 150mm DIA. COUPLING1 Nr.

NOTES:

- ALL PIPE, FITTINGS AND VALVE DIAMETER ARE NOMINAL DIAMETERS & OF CLASS NP 16
- OTHER PIPES AND FITTINGS ARE SHOWN ON THE SITE LAYOUT PLANS ON DRG. NO. TWWDA/KWP/BPT/01
- ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED
- ONLY FIGURED DIMENSIONS TO BE TAKEN FROM THIS DRAWING
- PIPE AND FITTINGS DIMENSIONS ARE BASED ON STEEL PIPES AND FITTINGS AS MADE BY ASP (K) LTD.
- VALVES DIMENSIONS ARE BASED ON EURO 20 SERIES, TYPE 23 (SHORT FACE TO FACE TYPE VALVES) AS MADE BY PONT-A-MOUSSON (SAINT GOBAIN PAM).

ABBREVIATIONS

- T.W.L - TOP WATER LEVEL
- F.G.L - FINISHED GROUND LEVEL
- G.I - GALVANISED IRON
- R.C - REINFORCED CONCRETE
- M.S - MILD STEEL
- BPT - BREAK PRESSURE TANK
- FE. - FERROUS

REVISIONS

REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:

CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:



CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

DRG No. TWWDA/KWP/BPT/03

SHEET No. SHEET 12 OF 22

DRAWING TITLE:

BREAK PRESSURE TANK ON RISING MAIN PIPELINE
(CAPACITY 5m³)-PIPEWORK DETAILS

Designed by: A.K.W

Drawn by: A.K.W

Checked by: E.W.W/K.N.G

Approved by: D.M.N

Scale: 1 : 2000

Date: JUNE 2026

- NOTES:**
- 1) All dimensions are in millimeters unless otherwise shown
 - 2) Drawing to be read in conjunction with the relevant general arrangement drawing
 - 3) All roof covers and frames to be galvanised before painting
 - 4) All steel manhole covers to be painted after fabrication with two coats of red-oxide paint
 - 5) Pipe diameters shown on this drawing are indicative only. Actual drawing are shown on the relevant general arrangement drawing

REVISIONS					
REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:

CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:



CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

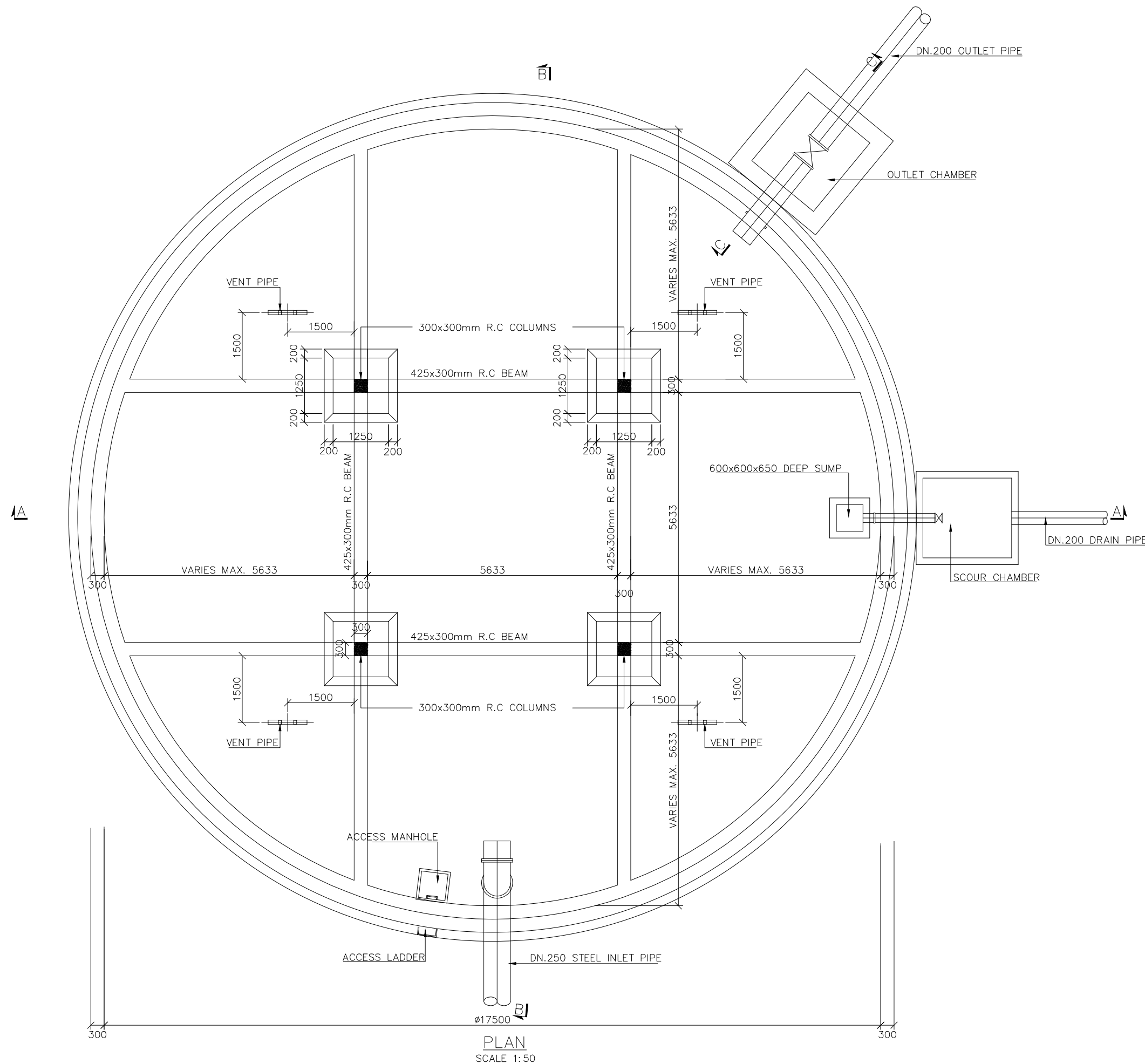
DRG No. **TWWDA/KWP/CWT/01**

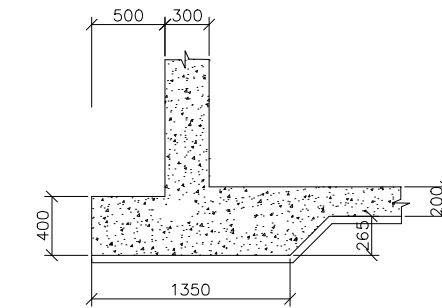
SHEET No. **SHEET 13 OF 22**

DRAWING TITLE:

STORAGE TANK
(CAPACITY 225m³)-LAYOUT PLAN

Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026





100mm DIA. EQUAL TEE

100mm DIA. NIPPLE

100mm DIA. 90° G.I. BEND

MOSQUITO WIRE GAUGE WITH CLAMP

100mm DIA. G.I. PIPE (LONG) WITH FLANGE

300 Varies Max. 5633 300 5633 300 Varies Max. 5633 300

25x25mm DRIP ALL ROUND

2225.23

2224.50 TWL

2224.10

25x6 G.I. FLAT CLAMP

300x300 R.C. COLUMN

3000

275

150

TOP OF WALL TROWELLED SMOOTH ALL ROUND AND PROVIDED WITH 3 COATS OF BITUMINOUS PAINT AS APPROVED BY R.E.

300x300 R.C. COLUMN

300 THICK R.C. WALL

CEMENT/SAND SCREEN 1:3 MIX LAID TO FALL AT 1:120

2221.50

200

200 1250 200 200 200 1250 200 200 1350 300

DN.250 INLET PIPE

300

1750

[illegible]

Technical drawing of a roof access detail, showing a trapezoidal access cover with various structural and safety components. The drawing includes the following labels and dimensions:

- FRAME BEDDED ON GROUT.
- FRAME MADE FROM 76X76mm ANGLE.
- STEEL BRACKET FOR PADLOCK.
- RAGBOLTS POSITIONS.
- REPEATS COVER ABOUT
- 10mm ϕ BAR FIXED TO ACCESS HATCH.
- RUBBER GROMMET FIXED TO BAR TO PREVENT LATERAL MOVEMENT OF COVER.
- ACCESS COVER FABRICATED FROM 4mm THICK MILD STEEL PLATE AND PAINTED TO REQUIREMENTS.

ROOF ACCESS DETAILS

SCALE 1:10

Technical drawing of a concrete upstand for a door frame. The drawing shows a cross-section of the upstand with dimensions and labels.

Labels and Dimensions:

- SLOTTED HOLE CUT IN 'L' FRAME AT 45° TO RECEIVE 10mm Ø BAR.** (Pointing to the slot in the frame)
- 12mm Ø HOLE FOR PADLOCK.** (Pointing to the hole on the left side)
- RAGBOLTS 10mm Ø x100mm LONG FOR FIXING TO CONCRETE UPSTAND.** (Pointing to the bolts)
- 80** (Height of the top flange)
- 15** (Thickness of the top flange)
- 65** (Height of the main body)
- 10** (Thickness of the base)
- 300** (Total height of the upstand)
- 150** (Width of the left side)
- 750** (Total width of the upstand)
- 150** (Width of the right side)

Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026

1800				
REPUBLIC OF KENYA MINISTRY OF WATER, SANITATION AND IRRIGATION				400
CONTRACT	CONSTRUCTION OF KANANA WATER PROJECT		200	40
PROJECT FINANCIER	GOVERNMENT OF KENYA			200
EMPLOYER	CHIEF EXECUTIVE OFFICER TANA WATER WORKS DEVELOPMENT AGENCY			200
ENGINEER	CHIEF MANAGER, TECHNICAL SERVICES TANA WATER WORKS DEVELOPMENT AGENCY			200
CONTRACTOR			200	40
	FIGHT AIDS Know AIDS for No AIDS		200	40
	PAMOJA TUKOMESHE CORONA		200	40
1250				

NOTES

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

2. THE BOARD TO BE HIGH QUALITY BLOCKBOARD WITH HARDWOOD LIPPING ALL ROUND

NOTES

REVISIONS

REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:

CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:



CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

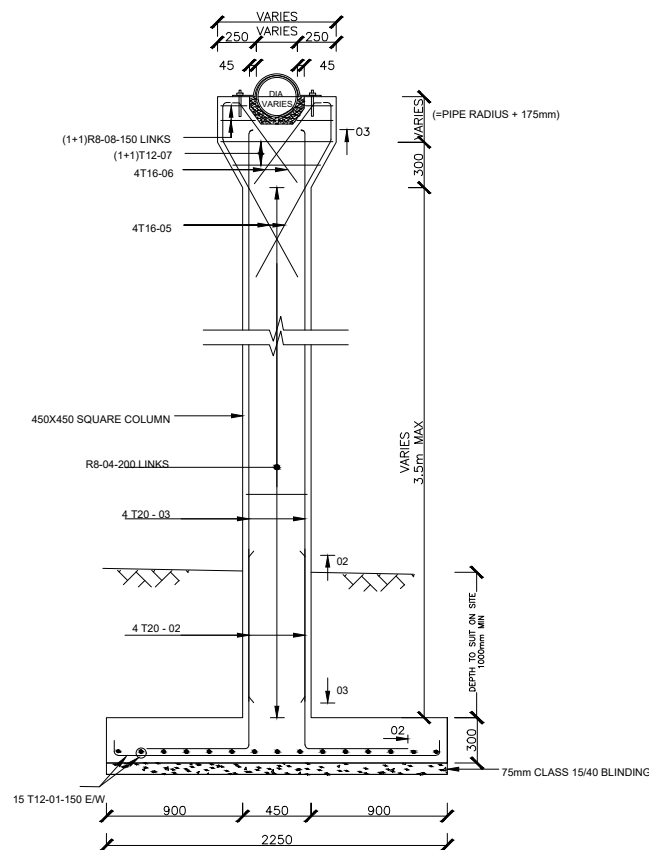
DRG No. TWWDA/KWP/STD/01

SHEET No. SHEET 15 OF 22

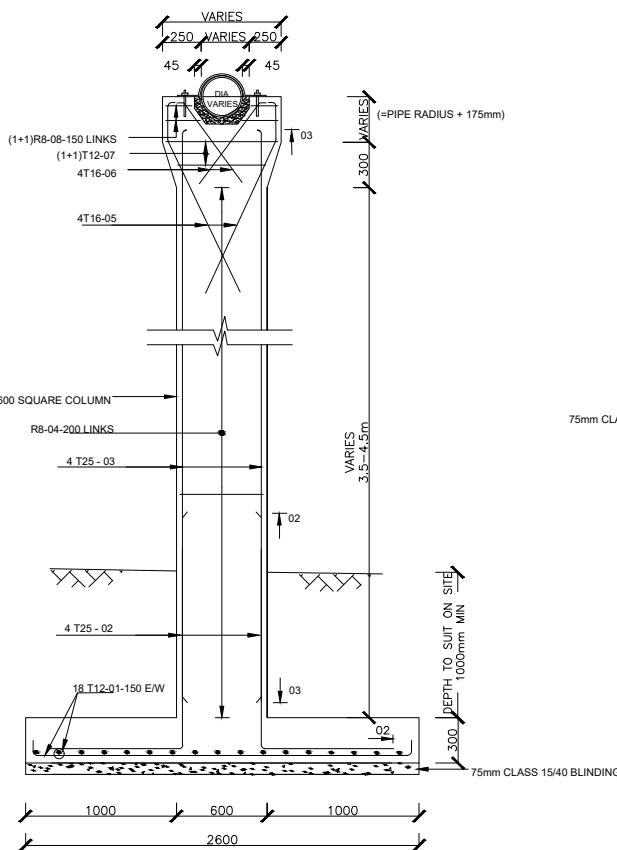
DRAWING TITLE:

STANDARD DRAWINGS:
PROJECT SIGN BOARD

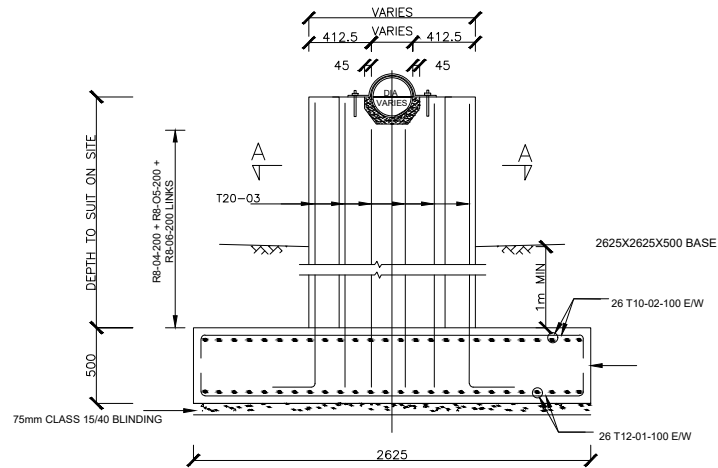
Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026



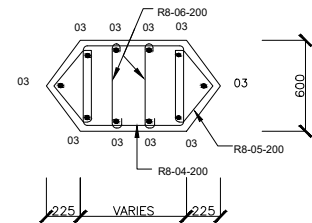
PIER TYPE 'A'
(HEIGHT UPTO 3.5m)
SCALE 1:40



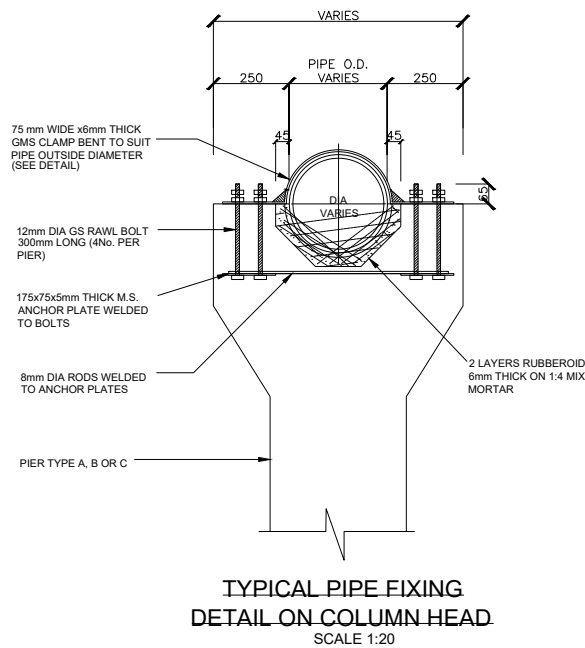
PIER TYPE 'B'
(HEIGHT 3.5-4.5m)
SCALE 1:40



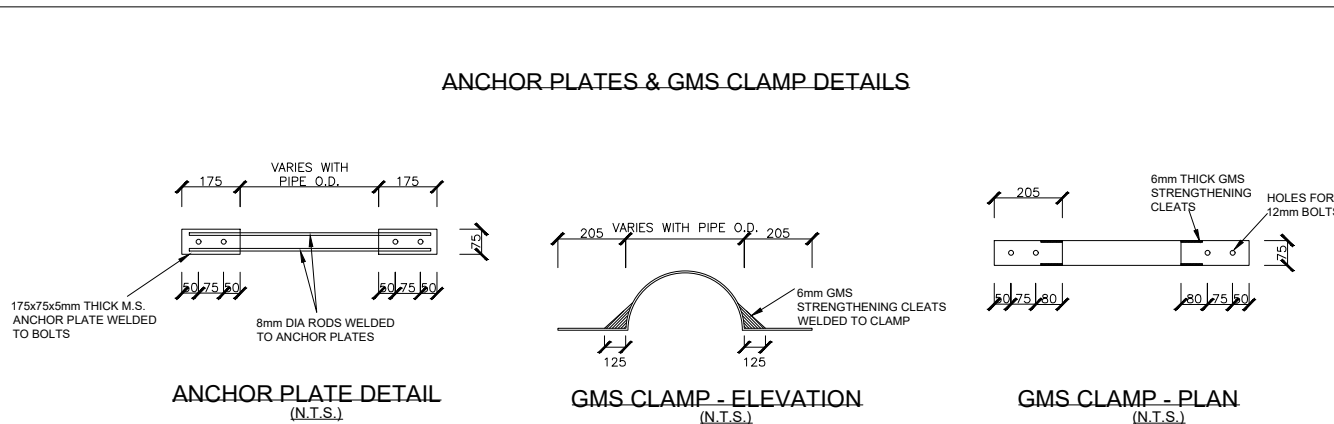
PIER TYPE 'C' (4m HIGH MAX)
(TO BE USED AT RIVER CROSSINGS)
SCALE 1:40



SECTION A-A
PIER TYPE 'C' (4m HIGH MAX)
(TO BE USED AT RIVER CROSSINGS)
SCALE 1:40



TYPICAL PIPE FIXING
DETAIL ON COLUMN HEAD
SCALE 1:20



NOTES

- PROGRAMME, METHOD OF CONSTRUCTION AND SETTING OUT OF WORK TO BE APPROVED BY THE ENGINEER BEFORE COMMENCEMENT OF WORK
- DESIGN CRITERIA:
 - DESIGN CODES B.S. 8007 & B.S. 8110
 - UNIFORM NON-COMPRESSIBLE FOUNDATION WITH BEARING CAPACITY 80kN/m²
- CONCRETE:
 - CEMENT TO BE ORDINARY PORTLAND CEMENT TO B.S. 12
 - CONCRETE AGGREGATE TO COMPLY WITH B.S. 882
 - WATER IN CONCRETE MIXES TO B.S. 3148
 - CONCRETE CLASSES TO BE AS FOLLOWS:-
MASS CONCRETE FILL AND BLINDING MIX, CLASS 15/40
REINFORCED CONCRETE, CLASS 25/20
 - MINIMUM COVER TO ALL REINFORCEMENT TO BE 40mm UNLESS AS SPECIFIED BELOW FOR BUILDINGS:
MEMBERS OF BUILDINGS:
- SLABS - 20 mm
- BEAMS - 25 mm
- COLUMNS - 40 mm
- FOUNDATIONS & FOOTINGS - 50 mm
 - WALLS/COLUMNS SHOULD BE POURED, IF POSSIBLE, IN A FULL HEIGHT POUR AS SOON AS POSSIBLE AFTER THE BASE HAS BEEN CONCRETED (2 TO 3 DAYS)
- REINFORCEMENT:
 - REINFORCEMENT TO BE HIGH YIELD SQUARE TWISTED BARS TO B.S. 4461
 - BENDING DIMENSIONS TO B.S. 4466
 - THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL SPACER BLOCKS, CHAIRS AND TYING WIRE
 - EXAMPLE: 16 T12 - 07 - 150
SIGNIFIES 16 No. HIGH TENSILE 12mm DIA. BARS IDENTIFICATION MARK 07 AT 150mm CENTRE TO CENTRE SPACING
- JOINTS:
 - THE POSITION AND NUMBER OF INTERMEDIATE JOINTS TO BE AS DIRECTED BY THE ENGINEER OR AS SHOWN IN THE DRAWINGS.
BEFORE PLACING FRESH CONCRETE THE OLD SURFACE SHALL BE ROUGHENED AND ALL LAFTANCE AND LOOSE MATERIAL REMOVED. THE SURFACE SHALL BE THOROUGHLY WETTED BUT EXCESS WATER SHOULD BE REMOVED SO THAT THE CONSTRUCTION JOINTS ARE IN A SATURATED BUT SURFACE DRY CONDITION
 - ALL WALL/COLUMN BASE CONNECTIONS SHOULD HAVE 100mm KICKER UNLESS OTHERWISE SPECIFIED
 - THE uPVC WATER STOP SHALL BE 200mm WIDE UNLESS OTHERWISE SPECIFIED
 - JOINT FILLER TO B.S. 5292 AND TO BE APPROVED BY THE ENGINEER

REVISIONS

REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:

CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:



CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

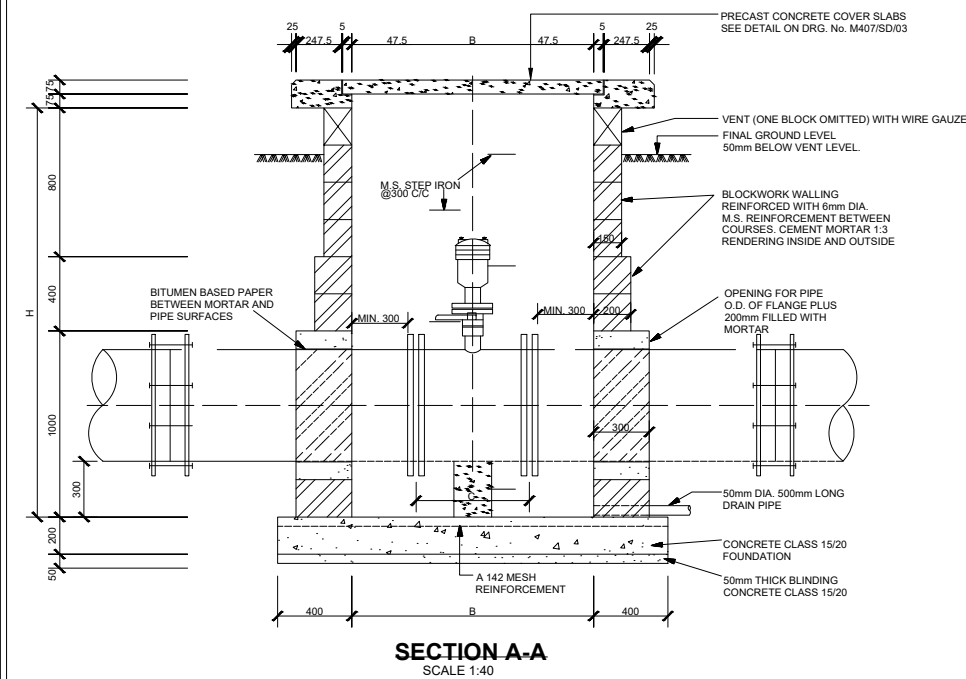
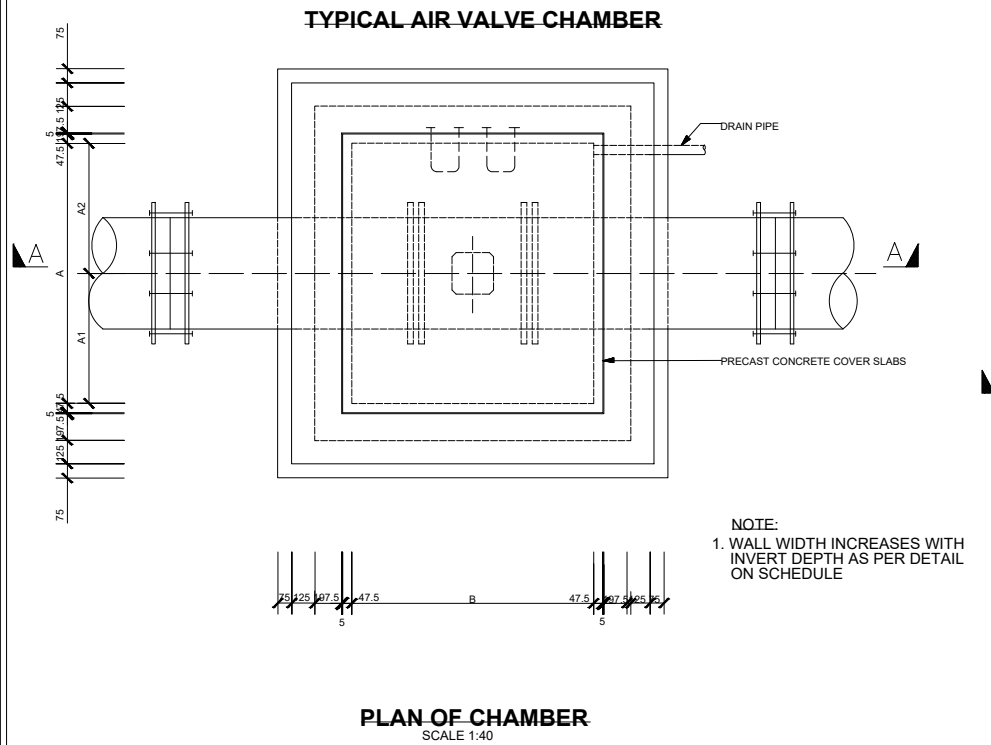
DRG No. **TWWDA/KWP/STD/03**

SHEET No. **SHEET 17 OF 22**

DRAWING TITLE:

STANDARD DRAWINGS: DETAILS OF PIERS FOR
PIPE AERIAL CROSSINGS

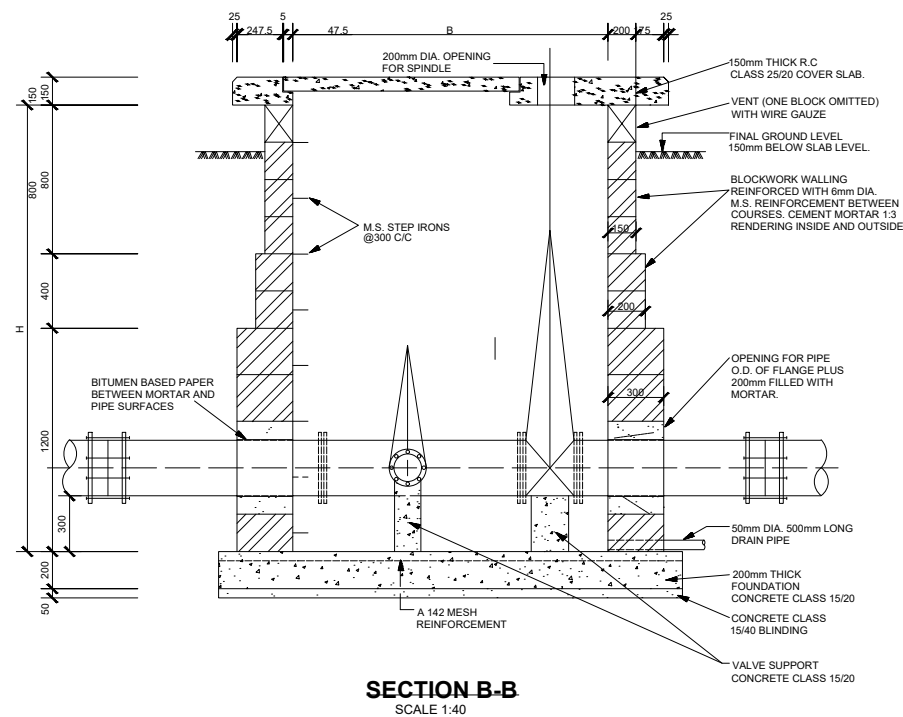
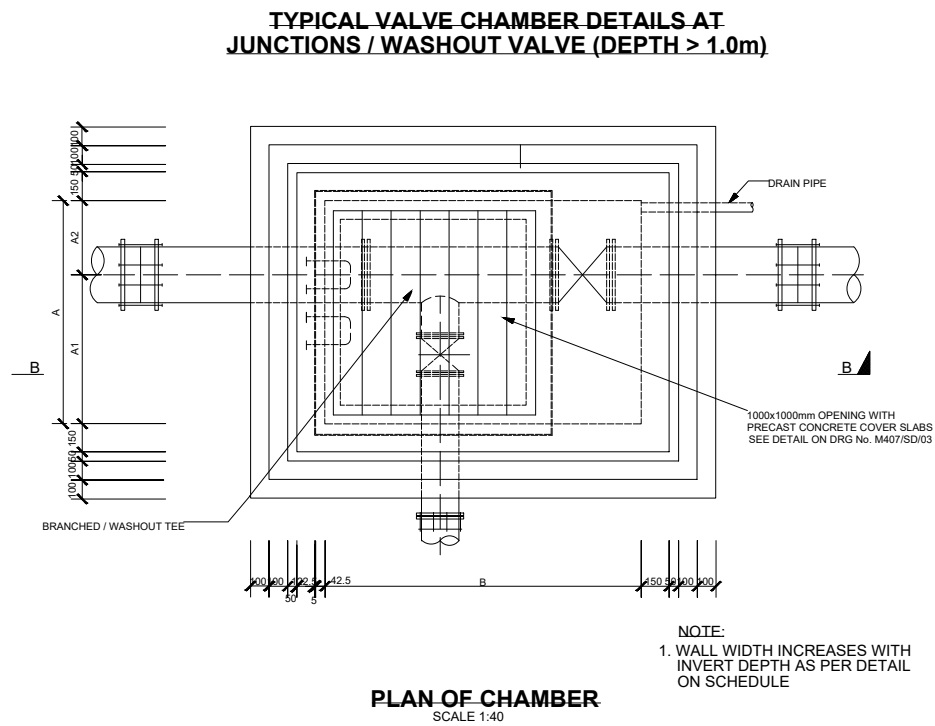
Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026



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 SCHDULE

SECTION C-C

SCALE 1:20

NOTES :

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED

ABBREVIATIONS

M.S. = MILD STEEL

mm = MILIMETER

Dia. = DIAMETER

NTS = NOT TO SCALE

Nr. = NUMBER

REVISIONS

REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:

CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:



CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

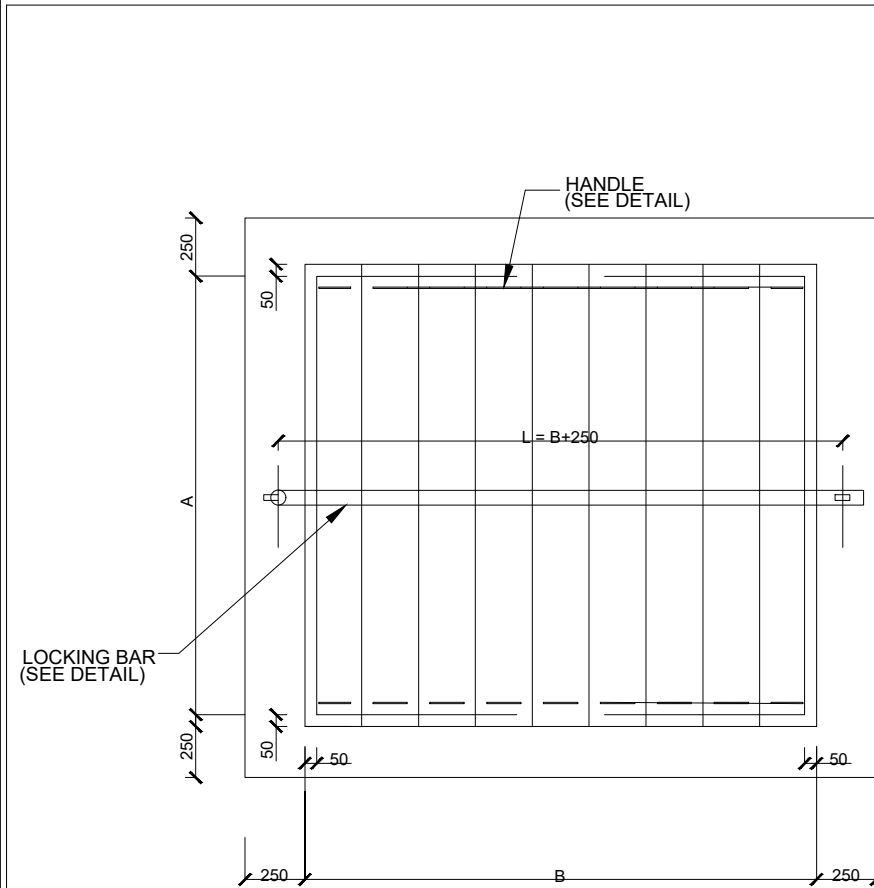
DRG No. **TWWDA/KWP/STD/04**

SHEET No. **SHEET 18 OF 22**

DRAWING TITLE:

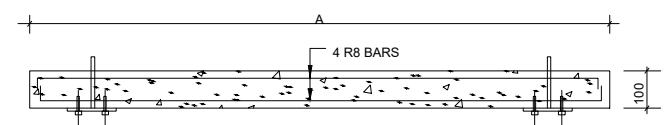
STANDARD DRAWINGS: DETAILS OF VALVE CHAMBERS

Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026



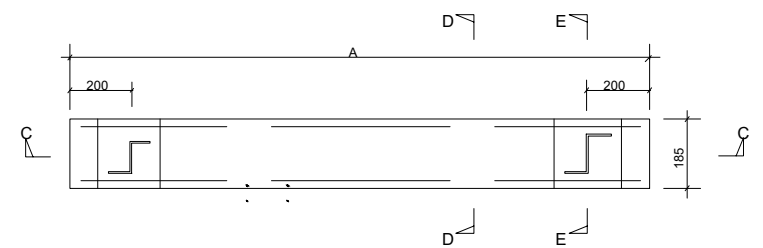
COVER FOR AIR VALVE CHAMBERS

SCALE A1 - 1:10
A3 - 1:20

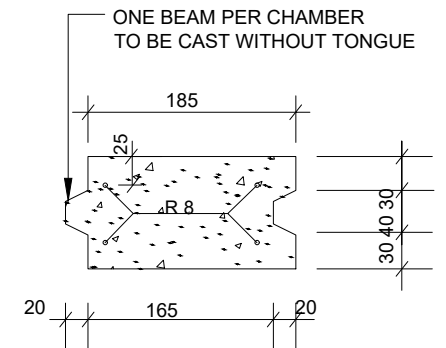


SECTION C-C

SCALE A1 - 1:10
A3 - 1:20

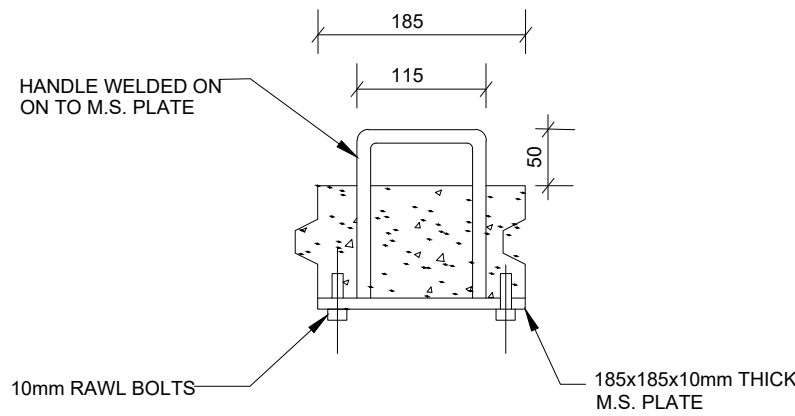


PLAN



SECTION D-D

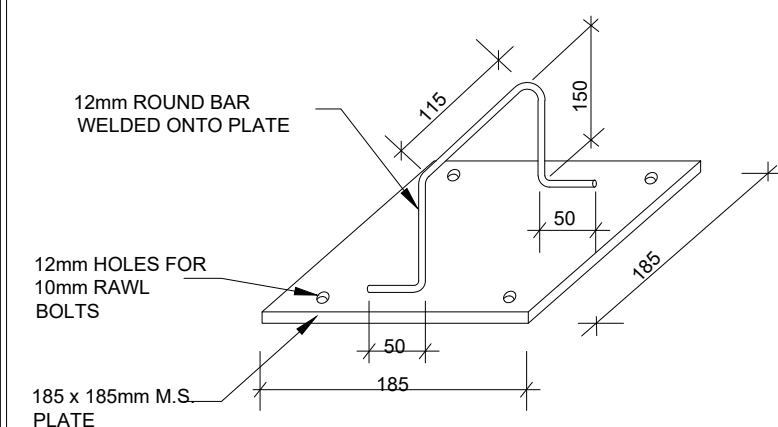
NTS



SECTION E-E

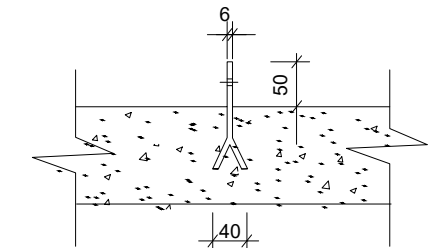
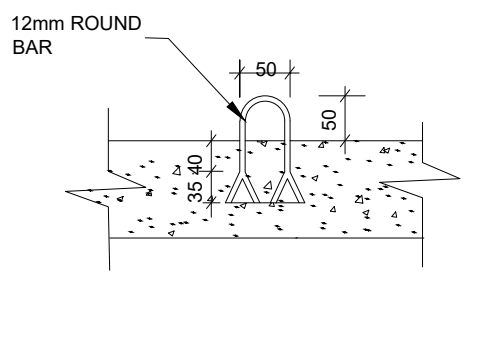
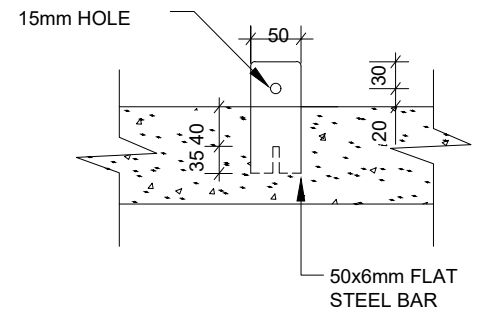
NTS

DETAIL OF PRECAST CONCRETE COVER SLAB

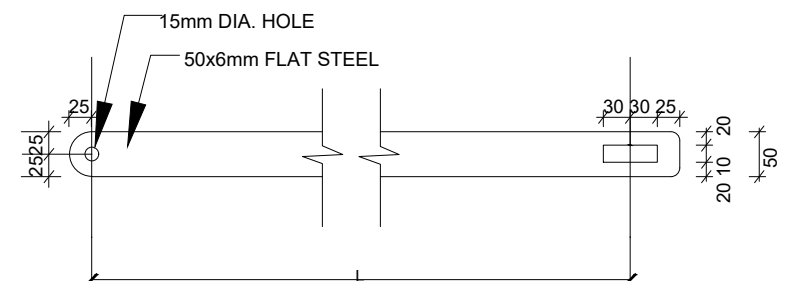


DETAIL OF HANDLE

NTS



SECTIONS



PLAN

DETAILS OF LOCKING BAR

NTS

COVER SIZE SCHDULE

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 = MILIMETER

Dia. = DIAMETER

NTS = NOT TO SCALE

Nr. = NUMBER

REVISIONS

REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:

CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:



CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

DRG No. **TWWDA/KWP/STD/05**

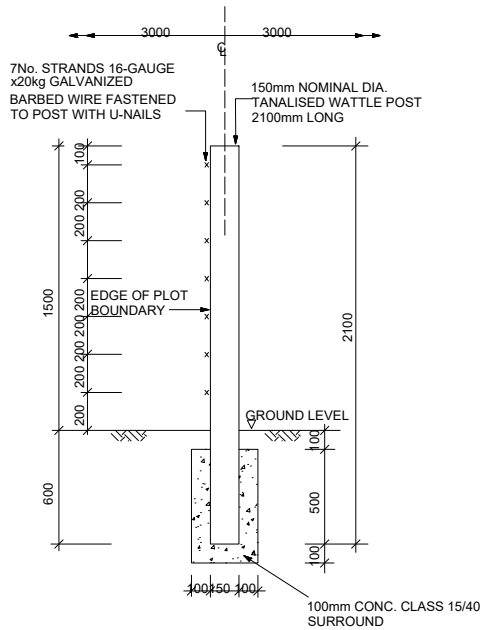
SHEET No. **SHEET 19 OF 22**

DRAWING TITLE:

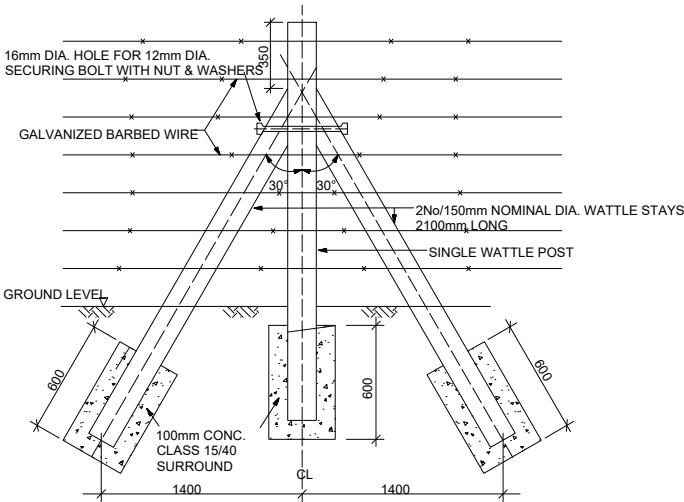
STANDARD DRAWINGS: DETAILS OF PRECAST
CONCRETE COVERS FOR VALVE CHAMBERS

Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026

DETAILS OF WATTLE POSTS FOR BARBED WIRE FENCE



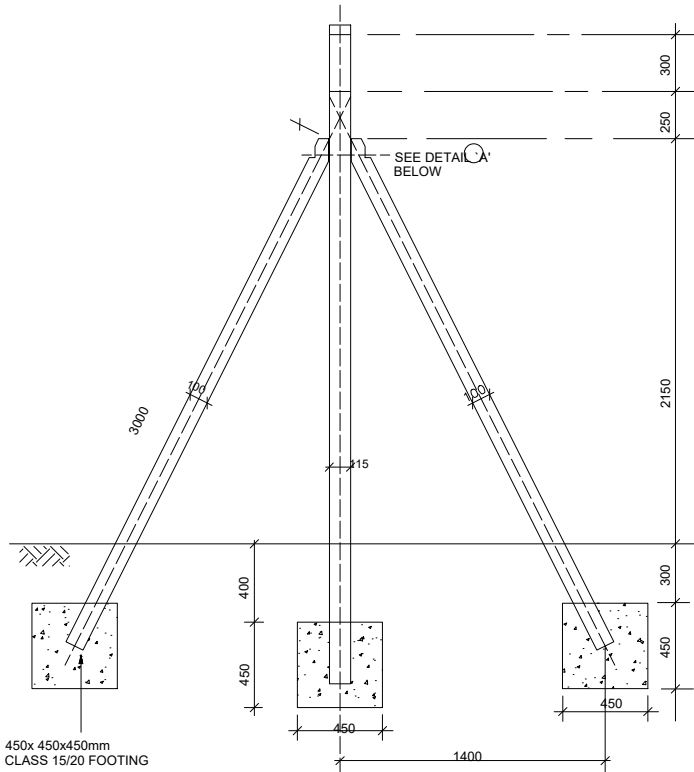
TYPICAL END ELEVATION - SINGLE POST
(TO BE AT 3.0m CENTRES)
(NTS)



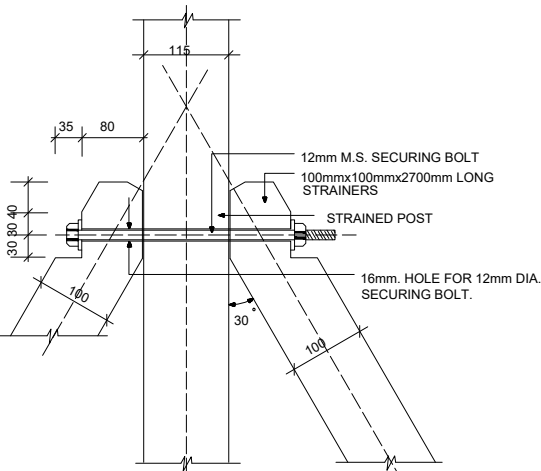
TYPICAL FRONT ELEVATION - STAYED POST
(STAYS TO BE PROVIDED AT 30.0m c/c AND AT
CORNERS
(NTS)

- NOTES
- a) ALL CORNER POSTS AND EVERY 10th SINGLE POST TO HAVE 2No. STAYS
 - b) POSTS TO BE AT 3000mm CENTRES
 - c) TOP OF ALL POSTS TO BE KEPT IN UNIFORM LINE
 - d) EXTENT OF FENCING IS SHOWN ON THE LAYOUT PLAN
 - e) N.T.S = NOT TO SCALE

DETAILS OF PRECAST CONCRETE POSTS FOR CHAIN LINK FENCE

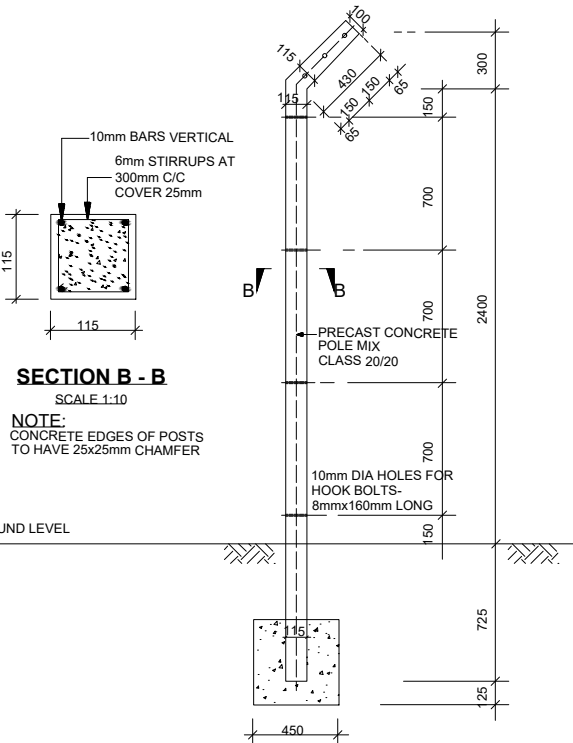


DETAILS OF STRAINING POST FOR
CHAIN LINK FENCE AT 33.3m Cts.
SCALE 1:40

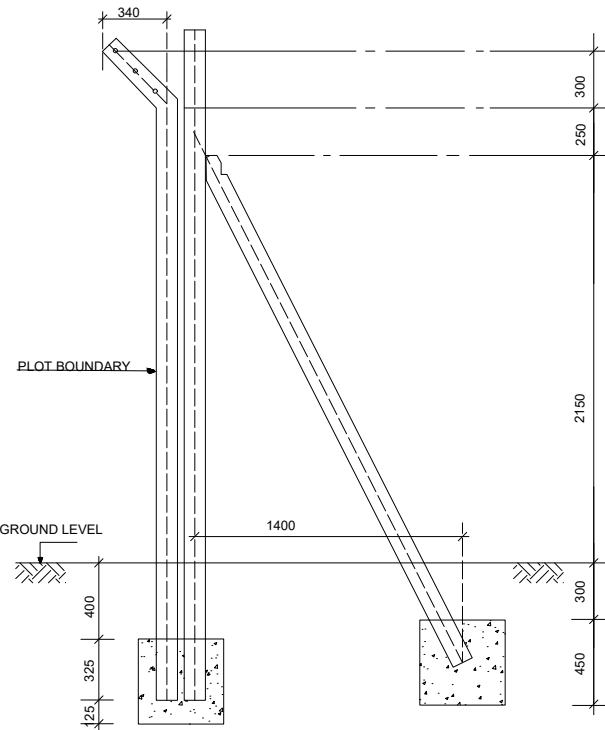


DETAIL A
SCALE 1:10

- NOTES
- a) APPROXIMATELY EVERY 10th POST AND ALL CORNER POST TO BE STRAINED
 - b) POST TO BE AT 3300mm CENTRES
 - c) TOP OF ALL POSTS TO BE KEPT IN UNIFORM LINE.



DETAILS OF SINGLE P.C.C.
POST AT 3.30m Cts.
SCALE 1:40



DETAILS OF CORNER POSTS
SCALE 1:40

- NOTES :
- a. Concrete mixes to be as follows:
 - POSTS CLASS 20/20
 - STRAINER POSTS CLASS 20/20
 - FOUNDATION BLOCK CLASS 15/20
 - b. CHAIN LINK TO BE GAUGE 12 GALVANISED STEEL WIRE
 - c. STRAINING WIRES TO BE 12 GAUGE GALVANISED STEEL PLAIN WIRE
 - d. WIRES ON CRANK TO BE 12 GAUGE GALVANISED STEEL BARBED WIRE
 - e. ALL STRUCTURAL OPENING DIMENSIONS TO BE CONFIRMED ON SITE BEFORE COMMENCING ANY FABRICATION
 - f. STRAINING WIRES TO BE FIXED TO POST WITH GALVANISED HOOK BOLTS 8mm DIA. X 60mm LONG
 - g. WHERE POST ENCROACHES ON PRIVATE LAND THE FENCE SHOULD BE ERECTED WITH CRANK POINTING INTO THE SITE
 - h. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED
 - i. ALL EXPOSED CONCRETE EDGES OF POSTS TO HAVE 25X25 mm CHAMFER

- ABBREVIATIONS
- C/C = CENTRE TO CENTRE
- Cts. = CENTRES
- M.S. = MILD STEEL
- P.C.C = PRECAST CEMENT CONCRETE
- CONC. = CONCRETE
- Mm = MILLIMETER
- Upvc = UNPLASTICISED POLYVINYL CHLORIDE
- Dia. = DIAMETER
- Kg = KILOGRAMME
- C = CENTRE LINE
- M = METRE
- NTS = NOT TO SCALE
- Nr. = NUMBER

REVISIONS					
REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

PROPOSED PROJECT:
CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:



CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA

DRG No. **TWWDA/KWP/STD/06**
SHEET No. **SHEET 20 OF 22**

DRAWING TITLE:
STANDARD DRAWINGS:
DETAILS OF FENCING POSTS

Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026



Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026



NOTES :

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED

ABBREVIATIONS

M.S. = MILD STEEL

mm = MILIMETER

Dia. = DIAMETER

NTS = NOT TO SCALE

Nr. = NUMBER

R E V I S I O N S					
REV	DESCRIPTION	DESIGNATION	DATE	CHECKED BY	APPROVED BY

CLIENT:



**TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA**

PROPOSED PROJECT:

CONSTRUCTION OF KANANA WATER PROJECT

CIVIL/ STRUCTURAL ENGINEERS:



**CHIEF MANAGER TECHNICAL SERVICES
TANA WATER WORKS DEVELOPMENT AGENCY
MAJI HOUSE, BADEN POWELL ROAD
P.O.Box 1292 - 10100
NYERI, KENYA**

DRG No. **TWWDA/KWP/STD/08**

SHEET No. SHEET 22 OF 22

DRAWING TITLE:

**STANDARD DRAWINGS:
DETAILS OF GATE (SHEET 2 OF 2)**

Designed by: A.K.W	Drawn by: A.K.W
Checked by: E.W.W/K.N.G	Approved by: D.M.N
Scale: 1 : 2000	Date: JUNE 2026