

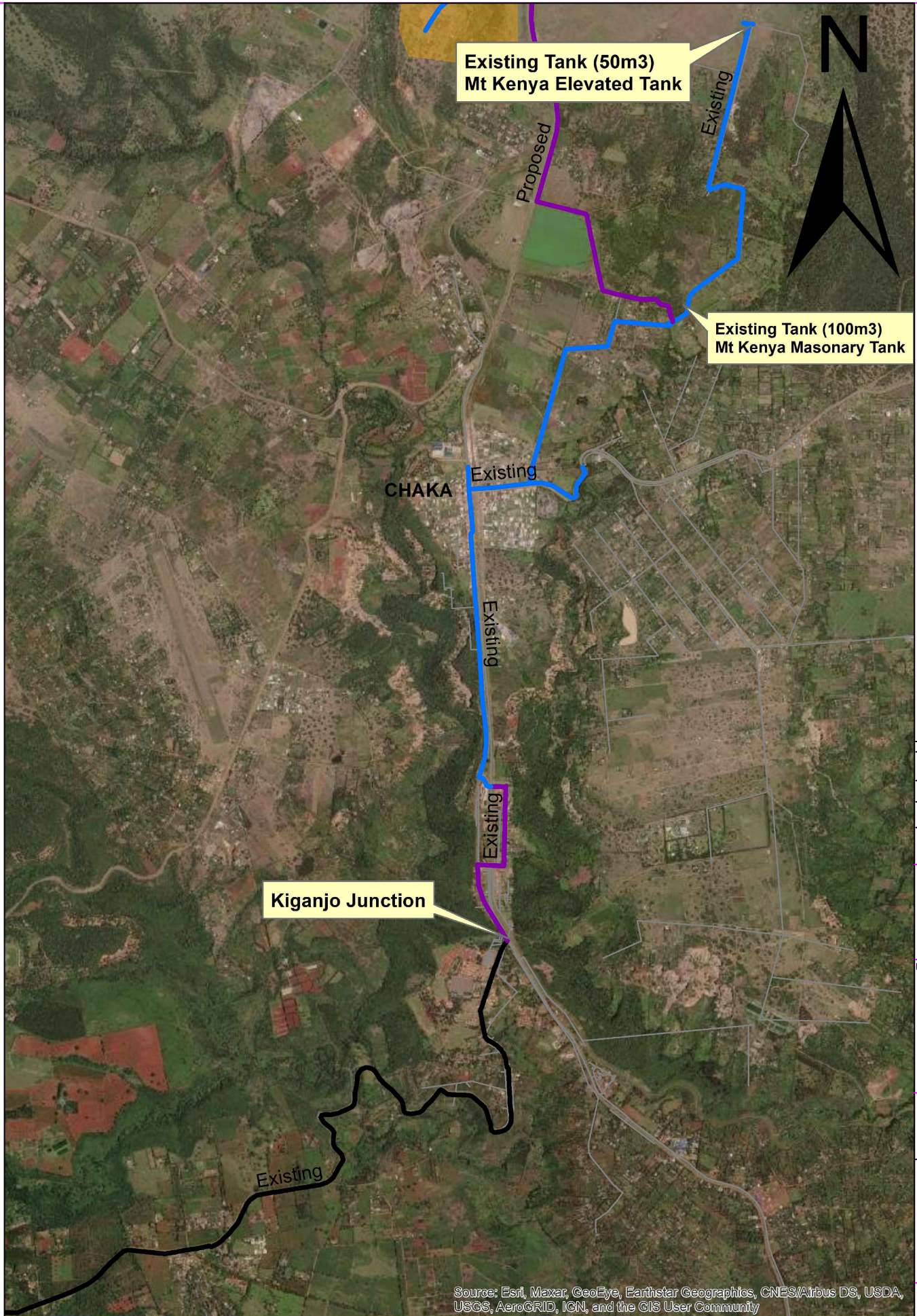
Legend

Water Network

Pipe Diameter

- 50
- 90
- 110
- 160
- 250
- Supply Area

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LOCATION MAP OF BARAKA CHAKA/TAGWA AREA

ISSUED FOR CONSTRUCTION

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

CLIENT:
TANA WATER WORKS DEVELOPMENT AGENCY
 P.O BOX 1292 - 10100, NYERI, KENYA

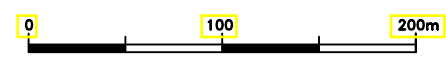
ENGINEERS:
TANA WATER WORKS DEVELOPMENT AGENCY
 P.O BOX 1292 - 10100, NYERI, KENYA

PROJECT TITLE:
BARAKA - CHAKA PIPELINE EXTENSION

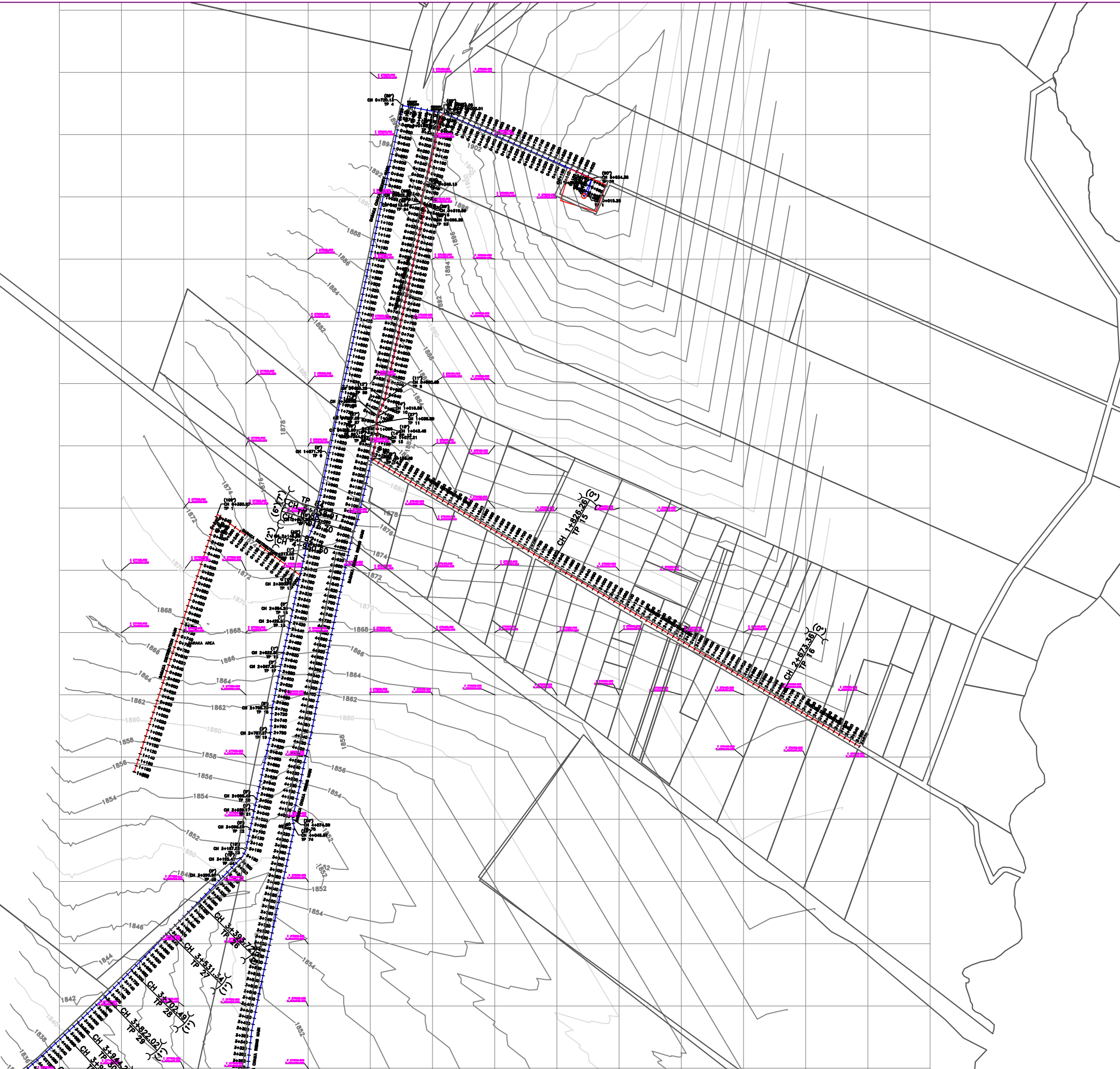
CONTRACT NAME.
CONSTRUCTION OF BARAKA - CHAKA WATER EXTENSION PROJECT, NYERI COUNTY

DRAWING TITLE:
LOCATION MAP OF BARAKA - CHAKA PROJECT AREA

Designed by: B.M.K	Drawn by: A.M.M
Checked by: J.T	Approved by: E.W
Scale: H- 1:4000, V- 1:400	Date: MARCH 2022



DRG No. **LAYOUT MAP/001**



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT TWO METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 200 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS
 - ELECTRIC POST
 - CULVERT
 - GATE
 - TEMPORARY STRUCTURES
 - BUILDINGS
 - KeNHA / KeRRA ROAD BEACON
 - PROPOSED TREATED WATER MAINS
 - TP10 TRAVERSE POINT & No.
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - RIVER/STREAM
 - V.J. VIKING JOHNSON
 - GV GATE VALVE
 - SV-01 SECTIONAL VALVE & No.
 - WO-01 WASHOUT VALVE & No.
 - LAV-01 AIR VALVE & No.
 - WM WATER METER
 - PROPOSED MASONRY CHAMBER
 - DIRECTION (SLOPE MIN. OR 1 IN n)

ISSUED FOR CONSTRUCTION

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

CLIENT:

TANA WATER WORKS DEVELOPMENT AGENCY
 P.O BOX 1292 - 10100,
 NYERI, KENYA

ENGINEERS:

TANA WATER WORKS DEVELOPMENT AGENCY
 P.O BOX 1292 - 10100,
 NYERI, KENYA

PROJECT TITLE:

BARAKA - CHAKA PIPELINE EXTENSION

CONTRACT NAME.

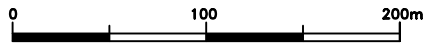
CONSTRUCTION OF BARAKA - CHAKA WATER EXTENSION PROJECT, NYERI COUNTY

DRAWING TITLE:

LOCATION MAP OF BARAKA - CHAKA PROJECT AREA

Designed by: B.M.K	Drawn by: A.M.M
Checked by: J.T	Approved by: E.W
Scale: H- 1:4000, V- 1:400	Date: MARCH 2022
DRG No. LAYOUT MAP/002	

LOCATION MAP OF BARAKA CHAKA/TAGWA AREA



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT TWO METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 200 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS
 - ELECTRIC POST
 - CULVERT
 - GATE
 - TEMPORARY STRUCTURES
 - BUILDINGS
 - KeNHA / KeRRA ROAD BEACON
 - PROPOSED TREATED WATER MAINS
 - TP10 TRAVERSE POINT & No.
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - RIVER/STREAM
 - V.J. VIKING JOHNSON
 - GV GATE VALVE
 - SV-01 SECTIONAL VALVE & No.
 - WO-01 WASHOUT VALVE & No.
 - LAV-01 AIR VALVE & No.
 - WM WATER METER
 - PROPOSED MASONRY CHAMBER
 - DIRECTION (SLOPE MIN. OR 1 IN n)

ISSUED FOR CONSTRUCTION

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

CLIENT:

TANA WATER WORKS DEVELOPMENT AGENCY
P.O BOX 1292 - 10100,
NYERI, KENYA

ENGINEERS:

TANA WATER WORKS DEVELOPMENT AGENCY
P.O BOX 1292 - 10100,
NYERI, KENYA

PROJECT TITLE:

BARAKA - CHAKA PIPELINE EXTENSION

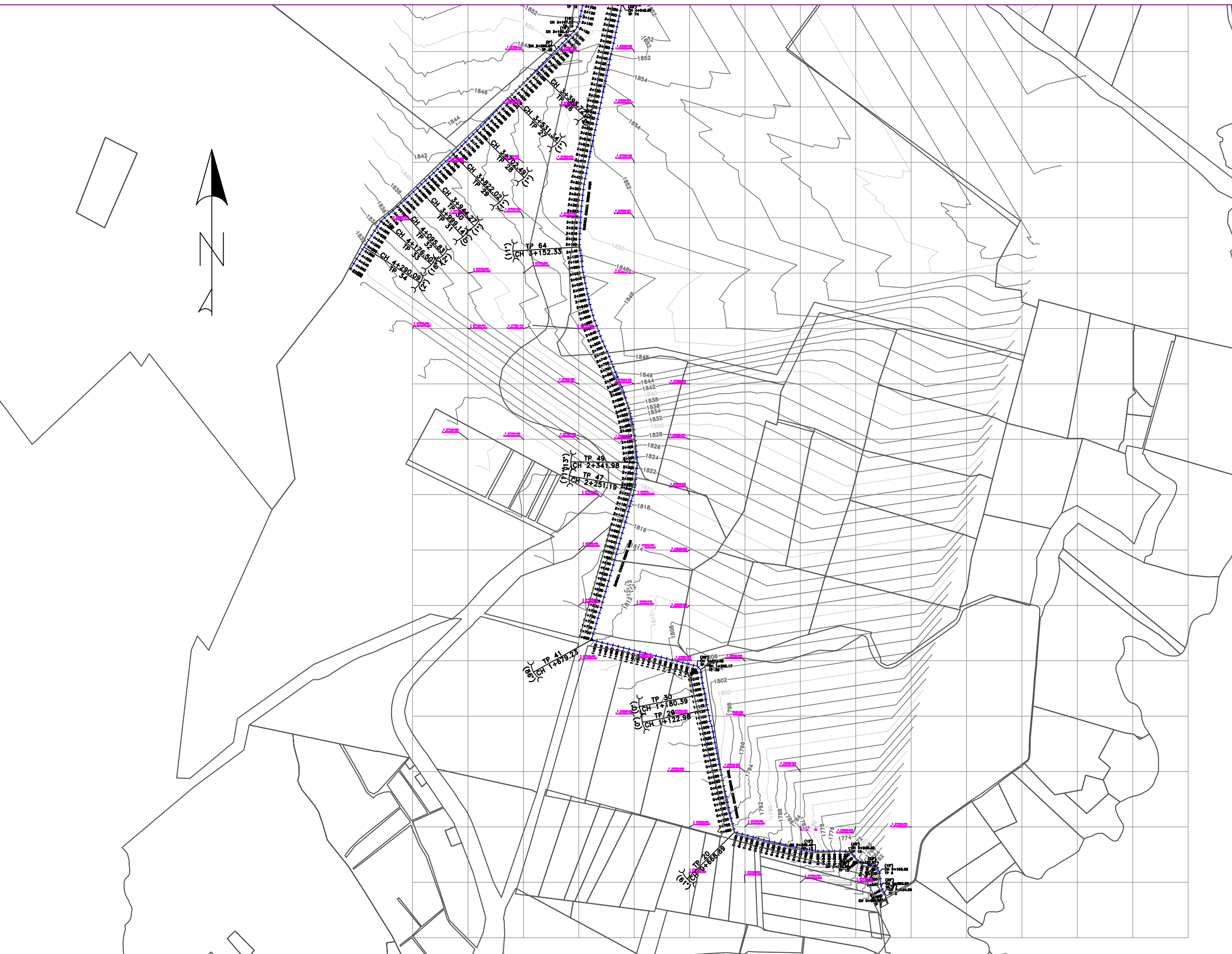
CONTRACT NAME.

CONSTRUCTION OF BARAKA - CHAKA WATER EXTENSION PROJECT, NYERI COUNTY

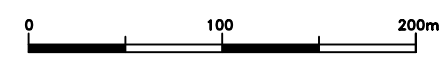
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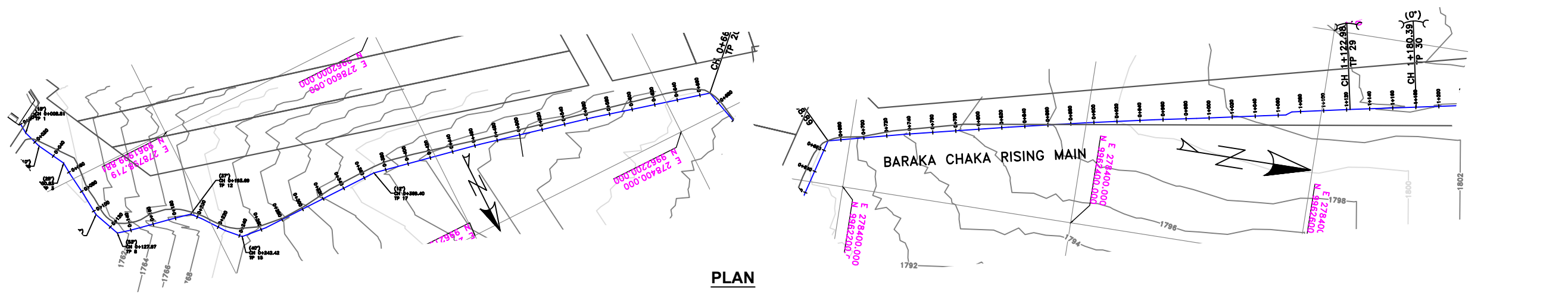
LOCATION MAP OF BARAKA - CHAKA PROJECT AREA

Designed by: B.M.K	Drawn by: A.M.M
Checked by: J.T	Approved by: E.W
Scale: H- 1:4000, V- 1:400	Date: MARCH 2022
DRG No. LAYOUT MAP/003	

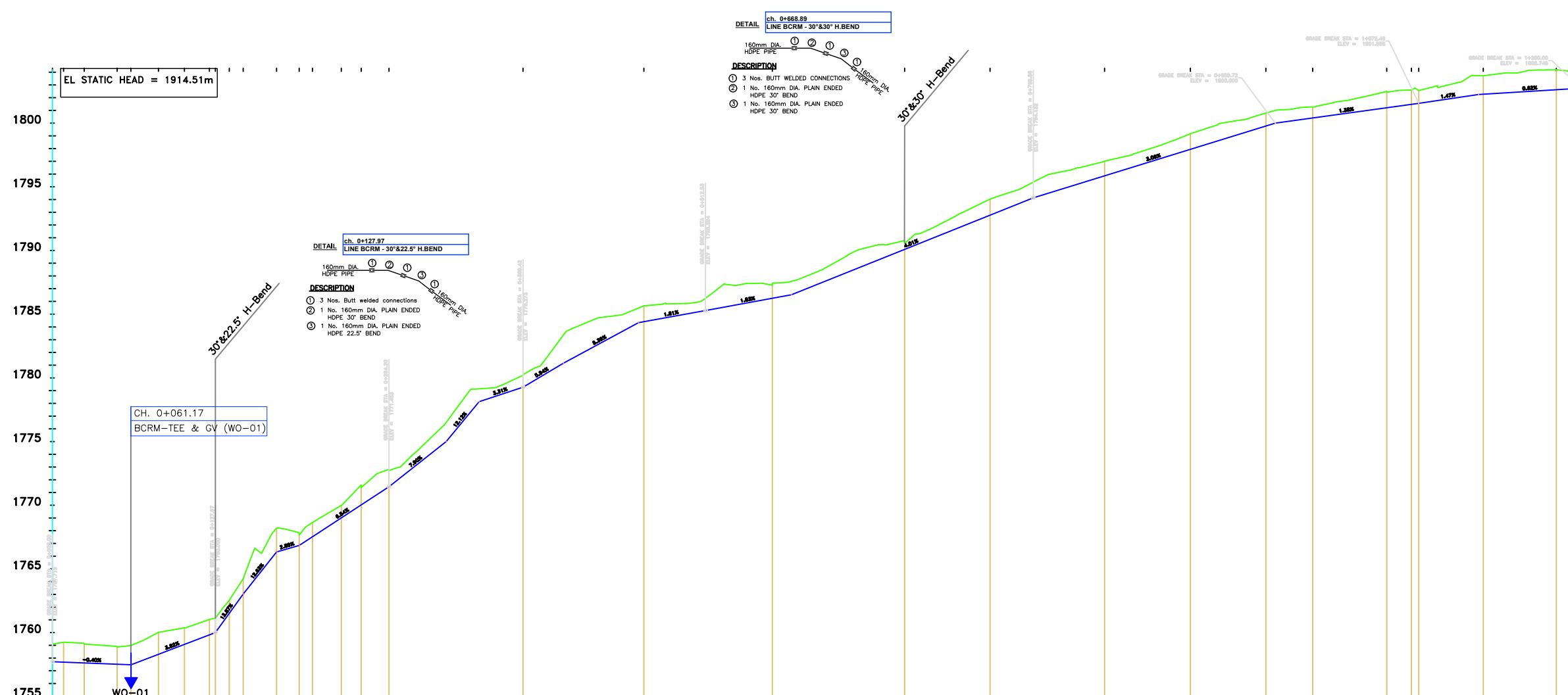


LOCATION MAP OF BARAKA CHAKA/TAGWA AREA



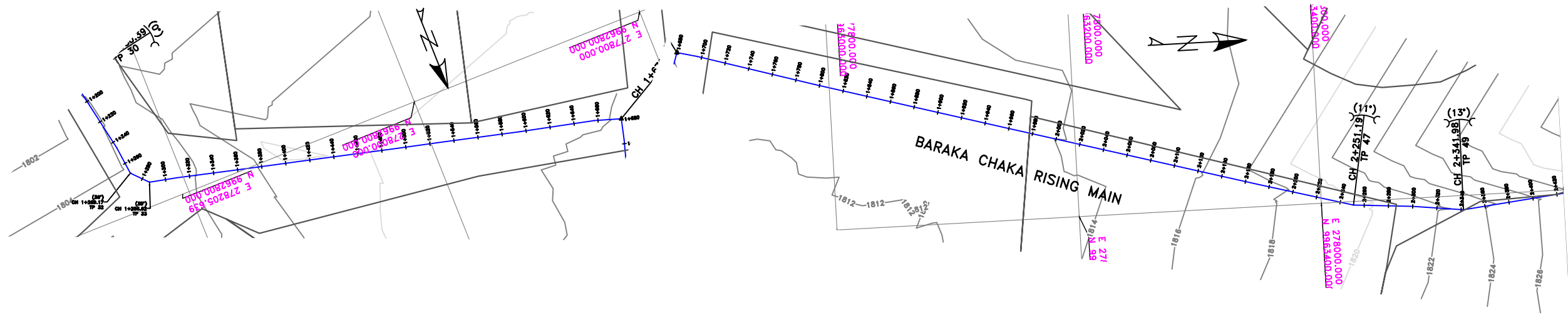


PLAN

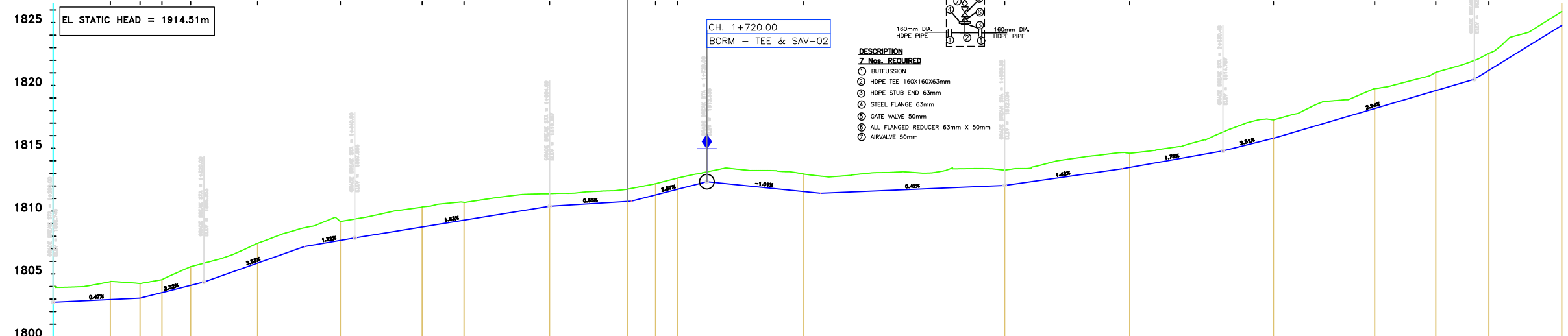
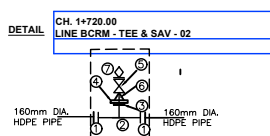
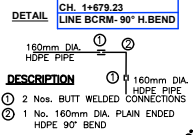


LONGITUDINAL SECTION

DATUM (m)	EPOXY COATED CEMENT LINE 160MM DIA. PH 40																160mm DIA. HDPE PIPE PH 16																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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GEOLOGICAL CONDITION																	TYPE 'BLACK COTTON SOIL'																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
EXISTING GROUND LEVEL (m)	1755.08	1755.24	1755.16	1755.99	1756.87	1757.49	1758.05	1758.57	1759.37	1760.03	1760.24	1760.53	1760.71	1760.83	1760.97	1761.35	1761.92	1762.70	1763.69	1764.24	1764.58	1765.00	1765.50	1766.24	1767.17	1768.25	1769.42	1770.71	1772.12	1773.69	1775.42	1777.30	1779.32	1781.48	1783.74	1786.12	1789.58	1794.06	1799.57	1806.15	1813.88	1822.75	1832.75	1843.94	1856.37	1870.04	1884.94	1901.11	1918.57	1937.32	1957.46	1978.97	2001.75	2025.81	2051.16	2077.81	2105.75	2135.00	2165.56	2197.44	2230.64	2265.16	2301.00	2338.16	2376.64	2416.44	2457.56	2500.00	2543.76	2588.84	2635.32	2683.20	2732.48	2783.16	2835.24	2888.72	2943.60	3000.00	3058.24	3118.32	3180.24	3244.00	3309.60	3377.04	3446.32	3517.44	3590.40	3665.20	3741.84	3820.32	3900.64	3982.80	4066.80	4152.64	4240.32	4330.84	4424.24	4519.44	4616.44	4715.24	4815.84	4918.24	5022.44	5128.44	5236.24	5345.84	5457.24	5570.44	5685.44	5802.24	5920.84	6041.24	6163.44	6287.44	6413.24	6540.84	6670.24	6801.44	6934.44	7069.24	7205.84	7344.24	7484.44	7626.44	7770.24	7915.84	8063.24	8212.44	8363.44	8515.84	8670.44	8827.24	8986.44	9148.24	9312.44	9479.24	9648.44	9820.44	9995.24	10172.84	10353.24	10536.44	10721.44	10908.44	11107.44	11308.44	11511.44	11716.44	11923.44	12132.44	12343.44	12556.44	12781.44	13008.44	13247.44	13488.44	13741.44	14006.44	14283.44	14572.44	14873.44	15186.44	15511.44	15848.44	16197.44	16558.44	16931.44	17316.44	17713.44	18122.44	18543.44	18976.44	19421.44	19878.44	20347.44	20828.44	21321.44	21826.44	22343.44	22872.44	23413.44	23966.44	24531.44	25108.44	25707.44	26328.44	26971.44	27626.44	28293.44	28972.44	29663.44	30366.44	31081.44	31808.44	32547.44	33308.44	34091.44	34896.44	35723.44	36572.44	37443.44	38336.44	39251.44	40188.44	41147.44	42128.44	43131.44	44156.44	45203.44	46272.44	47363.44	48476.44	49611.44	50768.44	51947.44	53148.44	54371.44	55616.44	56883.44	58172.44	59483.44	60816.44	62171.44	63548.44	64947.44	66368.44	67811.44	69276.44	70763.44	72272.44	73803.44	75356.44	76931.44	78528.44	80147.44	81788.44	83451.44	85136.44	86843.44	88572.44	90323.44	92096.44	93891.44	95708.44	97547.44	99408.44	101291.44	103196.44	105123.44	107072.44	109043.44	111036.44	113051.44	115088.44	117147.44	119228.44	121331.44	123456.44	125603.44	127772.44	129563.44	131376.44	133211.44	135068.44	136947.44	138848.44	140771.44	142716.44	144683.44	146672.44	148683.44	150716.44	152771.44	154848.44	156947.44	159068.44	161211.44	163376.44	165563.44	167772.44	169996.44	172236.44	174491.44	176761.44	179047.44	181349.44	183667.44	185991.44	188331.44	190687.44	193059.44	195447.44	197851.44	200271.44	202707.44	205159.44	207627.44	210111.44	212611.44	215127.44	217659.44	220207.44	222771.44	225351.44	227947.44	230559.44	233187.44	235831.44	238491.44	241167.44	243859.44	246567.44	249291.44	252031.44	254787.44	257559.44	260347.44	263151.44	265971.44	268807.44	271659.44	274527.44	277411.44	280311.44	283227.44	286159.44	289107.44	292071.44	295051.44	298047.44	301059.44	304087.44	307131.44	310191.44	313267.44	316359.44	319467.44	322591.44	325731.44	328887.44	332059.44	335247.44	338451.44	341671.44	344907.44	348159.44	351427.44	354711.44	358011.44	361327.44	364659.44	368007.44	371371.44	374751.44	378147.44	381559.44	384987.44	388431.44	391891.44	395367.44	398859.44	402367.44	405891.44	409431.44	412987.44	416559.44	420147.44	423751.44	427371.44	431007.44	434659.44	438327.44	442011.44	445711.44	449427.44	453159.44	456907.44	460671.44	464451.44	468247.44	472059.44	475887.44	479731.44	483591.44	487467.44	491359.44	495267.44	499191.44	503131.44	507087.44	511059.44	515047.44	519051.44	523071.44	527107.44	531159.44	535227.44	539311.44	543411.44	547527.44	551659.44	555807.44	559971.44	564151.44	568347.44	572559.44	576787.44	581031.44	585291.44	589567.44	593859.44	598167.44	602491.44	606831.44	611187.44	615559.44	619947.44	624351.44	628771.44	633207.44	637659.44	642127.44	646611.44	651111.44	655627.44	660159.44	664707.44	669271.44	673851.44	678447.44	683059.44	687687.44	692331.44	696991.44	701667.44	706359.44	711067.44	715791.44	720531.44	725287.44	730059.44	734847.44	739651.44	744471.44	749307.44	754159.44	759027.44	763911.44	768811.44	773727.44	778659.44	783607.44	788571.44	793551.44	798547.44	803559.44	808587.44	813631.44	818691.44	823767.44	828859.44	833967.44	839091.44	844231.44	849387.44	854559.44	859747.44	864951.44	870171.44	875407.44	880659.44	885927.44	891211.44	896511.44	901827.44	907159.44	912507.44	917871.44	923251.44	928647.44	934059.44	939487.44	944931.44	950391.44	955867.44	961359.44	966867.44	972391.44	977931.44	983487.44	989059.44	994647.44	1000251.44	1006071.44	1011907.44	1017759.44	1023627.44	1029511.44	1035411.44	1041327.44	1047259.44	1053207.44	1059171.44	1065151.44	1071147.44	1077159.44	1083187.44	1089231.44	1095291.44	1101367.44	1107459.44	1113567.44	1119691.44	1125831.44	1131987.44	1138159.44	1144347.44	1150551.44	1156771.44	1163007.44	1169259.44	1175527.44	1181811.44	1188111.44	1194427.44	1200759.44	1207107.44	1213471.44	1219851.44	1226257.44	1232679.44	1239117.44	1245571.44	1252041.44	1258527.44	1265029.44	1271547.44	1278081.44	1284631.44	1291197.44	1297779.44	1304377.44	1310991.44	1317621.44	1324267.44	1330929.44	1337607.44	1344301.44	1351011.44	1357737.44	1364479.44	1371237.44	1378011.44	1384801.44	1391607.44	1398429.44	1405267.44	1412121.44	1419091.44	1426077.44	1433079.44	1440097.44	1447131.44	1454181.44	1461247.44	1468329.44	1475427.44	1482541.44	1489671.44	1496817.44	1503979.44	1511157.44	1518351.44	1525561.44	1532787.44	1540029.44	1547287.44	1554551.44	1561831.44	1569127.44	1576439.44	1583767.44	1591111.44	1598471.44	1605847.44	1613239.44	1620647.44	1628071.44	1635511.44	1642967.44	1650439.44	1657927.44	1665431.44	1672951.44	1680487.44	1688039.44	1695607.44	1703191.44	1710791.44	1718407.44	1726039.44	1733687.44	1741351.44	1749031.44	1756727.44	1764439.44	1772167.44	1779911.44	1787671.44	1795447.44	1803239.44	1811047.44	1818871.44	1826711.44	1834567.44	1842439.44	1850327.44	1858231.44	1866151.44	1874087.44	1882039.44	1890007.44	1898001.44	1906011.44	1914037.44	1922079.44	1930137.44	1938211.44	1946301.44	1954407.44	1962529.44	1970667.44	1978821.44	1986991.44	1995177.44	2003379.44	2011597.44	2019831.44	2028081.44	2036347.44	2044629.44	2052927.44	2061241.44	2069571.44	2077917.44	2086279.44	2094657.44	2103051.44	2111461.44	2119887.44	2128329.44	2136787.44	2145261.44	2153751.44	2162257.44	2170779.44	2179317.44	2187871.44	2196441.44	2205027.44	2213629.44	2222247.44	2230881.44	2239531.44	2248197.44	2256879.44	2265577.44	2274291.44	2283021.44	2291767.44	2300529.44	2309307.44	2318101.44	2326911.44	2335737.44	2344579.44	2353437.44	2362311.44	2371201.44	2380107.44	2389029.44	2397967.44	2406921.44	2415891.44	2424877.44	2433879.44	2442897.44	2451931.44	2460981.44	2470047.44	2479129.44	2488227.44	2497341.44	2506471.44	2515617.44	2524779.44	2533957.44	2543151.44	2552361.44	2561587.44	2570829.44	2580087.44	2589361.44	2598651.44	2607957.44	2617279.44	2626617.44	2635971.44	2645341.44	2654727.44	2664129.44	2673547.44	2682981.44	2692431.44	2701897.44	2711379.44	2720877.44	2730391.44	2739921.44	2749467.44	2759029.44	2768607.44	2778201.44	2787811.44	2797437.44	2807079.44	2816737.44	2826411.44	2836101.44	2845807.44	2855529.44	2865267.44	2875021.44	2884791.44	2894577.44	2904379.44	2914197.44	2924031.44	2933881.44	2943747.44	2953629.44	2963527.44	2973441.44	2983371.44	2993317.44	3003279.44	3013257.44	3023251.44	3033261.44	3043287.44	3053329.44	3063387.44	3073451.44	3083531.44	3093627.44	3103739.44	3113867.44	3124011.44	3134171.44	3144347.44	3154539.44	3164747.44	3174971.44	3185211.44	3195467.44	3205739.44	3216027.44	3226331.44	3236651.44	3246987.44	3257339.44	3267707.44	3278091.44	3288491.44	3298907.44	3309339.44	3319787.44	3330251.44	3340731.44	3351227.44	3361739.44	3372267.44	3382811.44	3393371.44	3403947.44	3414539.44	3425147.44	3435771.44	3446411.44	3457067.44	3467739.44	3478427.44	3489131.44	3499851.44	3510587.44	3521339.44	3532107.44	3542891.44	3553691.44	3564507.44	3575339.44	3586187.44	3597051.44	3607931.44	3618827.44	3629739.44	3640667.44	3651611.44	3662571.44	3673547.44	3684539.44	3695547.44	3706571.44	3717611.44	3728667.44	3739739.44	3750827.44	3761931.44	3773051.44	3784187.44	3795339.44	3806507.44	3817691.44	3828891.44	3840107.44	3851339.44	3862587.44	3873851.44	3885131.44	3896427.44	3907739.44	3919067.44	3930411.44	3941771.44	3953147.44	3964539.44	3975947.44	3987371.44	3998811.44	4010267.44	4021739.44	4033227.44	4044731.44	4056251.44	4067787.44	4079339.44	4090907.44	4102491.44	4114091.44	4125707.44	4137339.44	4148987.44	4160651.44	4172331.44	4184027.44	4195739



PLAN



DATUM (m)	1914.51m																																																																							
TYPE OF PIPE AND SIZE	160mm DIA. HDPE PIPE PN 10																																																																							
GEOLOGICAL CONDITION	TYPE 'BLACK COTTON SOIL'																																																																							
EXISTING GROUND LEVEL (m)	1804.00	1803.97	1803.97	1804.37	1804.35	1804.31	1804.23	1804.42	1804.34	1805.16	1805.56	1805.85	1806.44	1807.34	1808.09	1808.68	1809.33	1809.17	1809.37	1809.75	1810.12	1810.21	1810.50	1810.68	1810.88	1811.16	1811.35	1811.58	1811.70	1811.80	1811.88	1812.76	1812.83	1813.07	1813.10	1813.05	1813.36	1813.36	1813.53	1814.02	1814.31	1814.55	1814.66	1814.66	1814.91	1814.91	1815.23	1815.62	1816.29	1816.66	1817.29	1817.28	1817.51	1818.26	1818.79	1819.28	1819.76	1819.88	1820.38	1821.08	1821.62	1821.99	1821.99	1823.86	1824.82	1825.88						
INVERT LEVELS (m)	1802.74	1802.84	1802.93	1802.96	1803.03	1803.07	1803.34	1803.51	1803.65	1804.08	1804.35	1805.06	1805.76	1806.47	1807.18	1807.52	1807.67	1807.87	1808.19	1808.52	1808.74	1809.04	1809.17	1809.28	1809.49	1809.82	1810.14	1810.22	1810.54	1810.67	1810.79	1811.28	1811.56	1811.66	1811.74	1812.36	1812.65	1812.93	1813.21	1813.36	1813.55	1813.89	1814.24	1814.60	1814.79	1815.03	1815.53	1815.89	1816.07	1816.66	1817.25	1817.83	1818.16	1818.42	1819.01	1819.59	1820.18	1820.49	1820.49	1821.98	1822.31	1823.55	1824.78									
CHAINAGE (m)	1+200.00	1+220.00	1+245.00	1+245.52	1+260.00	1+269.17	1+280.00	1+286.62	1+300.00	1+309.38	1+320.00	1+340.00	1+360.00	1+380.00	1+400.00	1+420.00	1+428.51	1+440.00	1+460.00	1+480.00	1+500.00	1+520.00	1+540.00	1+560.00	1+580.00	1+600.00	1+620.00	1+640.00	1+660.00	1+680.00	1+700.00	1+740.00	1+760.00	1+780.00	1+800.00	1+820.00	1+840.00	1+860.00	1+880.00	1+900.00	1+920.00	1+940.00	1+960.00	1+980.00	2+000.00	2+020.00	2+040.00	2+050.48	2+060.00	2+080.00	2+100.00	2+120.00	2+130.48	2+140.00	2+160.00	2+170.48	2+180.00	2+200.00	2+220.00	2+240.00	2+251.19	2+260.00	2+280.00	2+300.00	2+320.00	2+330.48	2+340.00	2+360.00	2+380.00	2+400.00		
DEPTH OF INVERT (m)	1.25	1.13	1.44	1.42	1.29	1.16	1.08	1.03	1.31	1.48	1.50	1.38	1.66	1.62	1.50	1.81	1.50	1.50	1.56	1.81	1.98	1.98	1.92	1.40	1.38	1.35	1.20	0.99	0.99	0.84	0.84	0.98	0.88	0.88	0.79	1.24	1.30	1.42	1.40	1.36	1.27	1.38	1.44	1.38	1.54	1.29	1.18	1.02	1.36	0.89	1.22	1.50	1.64	1.76	1.48	1.44	1.60	1.54	1.45	1.80	1.45	1.48	1.48	1.37	1.45	1.44	1.50	1.48	1.48	1.55	1.08	1.10
SLOPE OF PIPE (H/V)	1:182.23	1:213.04	1:36.61	1:38.51	1:58.19	1:61.48	1:58.97	-1:99.27	1:236.86	1:78.42	1:56.20	1:36.81	1:34.04	1:16.22																																																										
REFERENCE PEG NO.	TP 30	TP 31	TP 32	TP 33	TP 34	TP 35	TP 36	TP 37	TP 38	TP 39	TP 40	TP 41	TP 42	TP 43	TP 44	TP 45	TP 46	TP 47	TP 48	TP 49																																																				

LONGITUDINAL SECTION

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT TWO METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 200 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS
 - ELECTRIC POST
 - CULVERT
 - GATE
 - TEMPORARY STRUCTURES
 - BUILDINGS
 - KeNHA / KeRRA ROAD BEACON
 - PROPOSED TREATED WATER RISING MAIN
 - TP10 TRAVERSE POINT & No.
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - RIVER/STREAM
 - V.J. VIKING JOHNSON
 - GV GATE VALVE
 - SV-01 SECTIONAL VALVE & No.
 - WO-01 WASHOUT VALVE & No.
 - LAV-01 AIR VALVE & No.
 - WM WATER METER
 - PROPOSED MASONRY CHAMBER
 - DIRECTION (SLOPE MIN. OR 1 IN n)

ISSUED FOR CONSTRUCTION

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

CLIENT:
TANA WATER WORKS DEVELOPMENT AGENCY
 P.O BOX 1292 - 10100,
 NYERI, KENYA

ENGINEERS:
TANA WATER WORKS DEVELOPMENT AGENCY
 P.O BOX 1292 - 10100,
 NYERI, KENYA

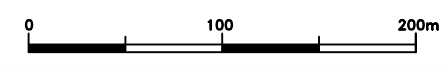
PROJECT TITLE:
BARAKA - CHAKA PIPELINE EXTENSION

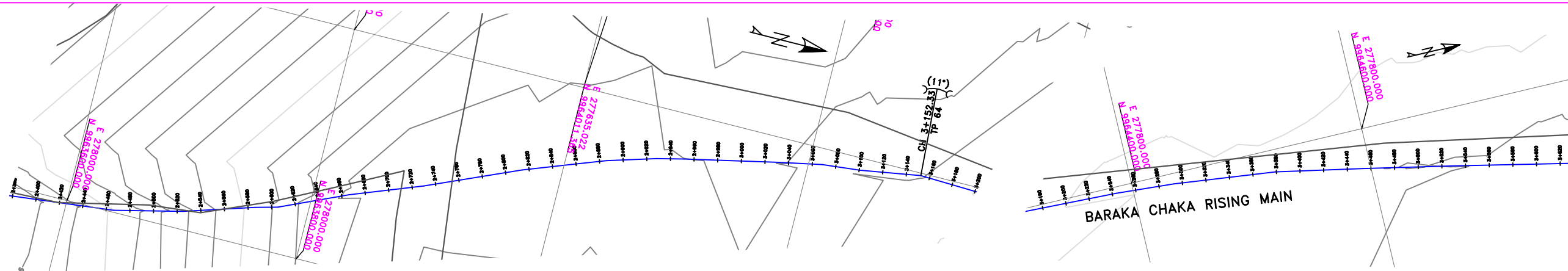
CONTRACT NAME.
CONSTRUCTION OF BARAKA - CHAKA WATER EXTENSION PROJECT, NYERI COUNTY

DRAWING TITLE:
BARAKA - CHAKA RISING MAIN PLAN & LONGITUDINAL SECTION

CH. 1+200.00 - 2+400.00
SHEET 2 OF 6

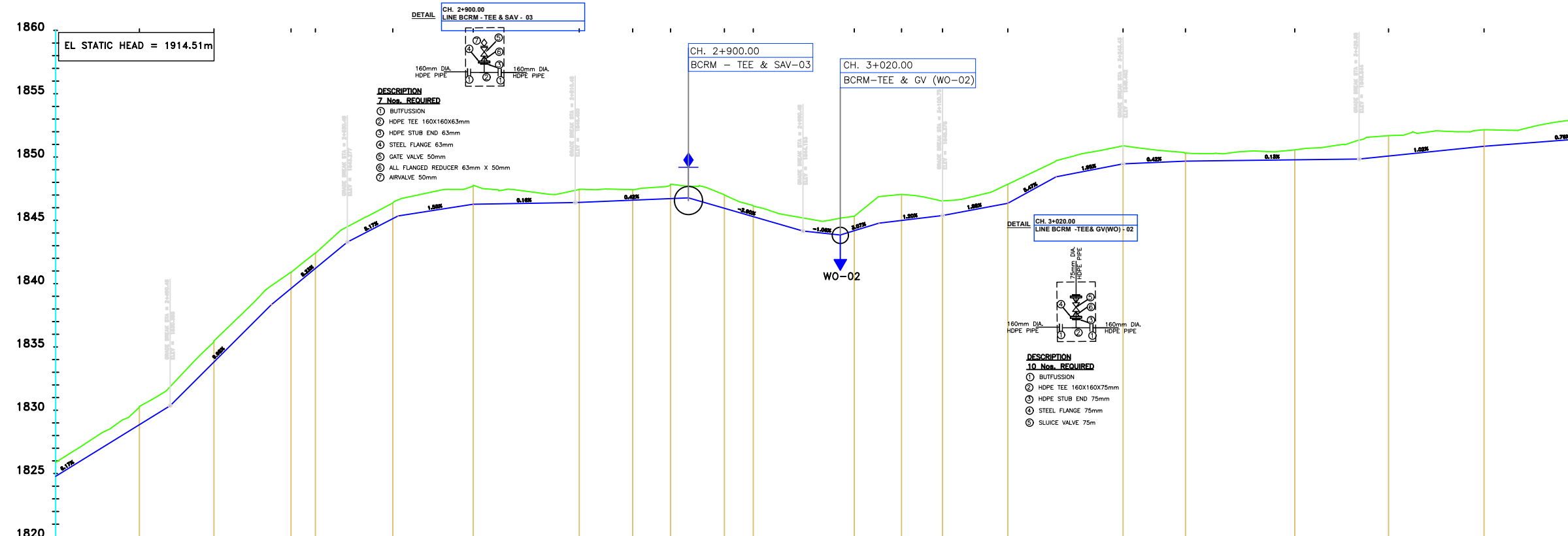
Designed by: B.M.K	Drawn by: A.M.M
Checked by: J.T	Approved by: E.W
Scale: H: 1:4000, V: 1:400	Date: MARCH 2022
DRG No. BC/RM/002	



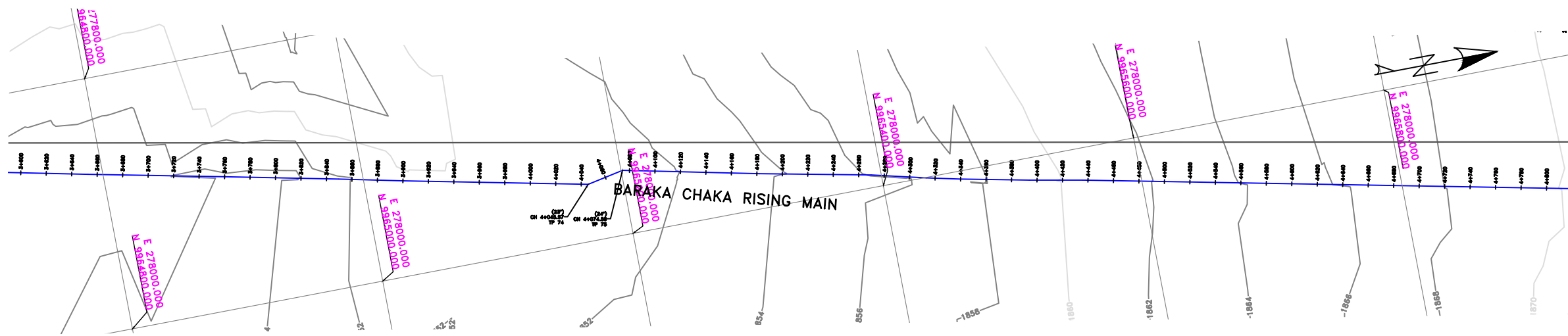


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 - WM WATER METER
 - PROPOSED MASONRY CHAMBER
 - DIRECTION (SLOPE MIN. OR 1 IN n)

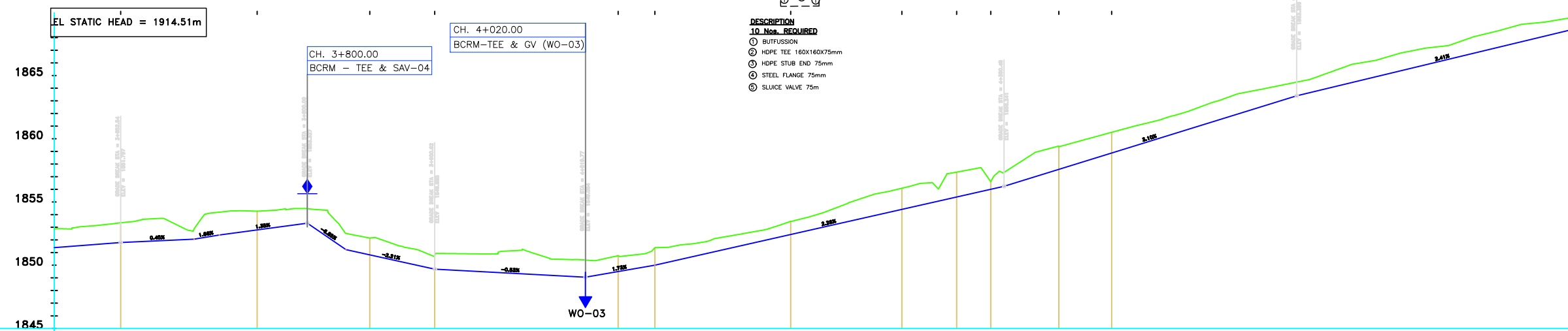
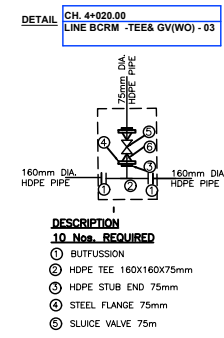
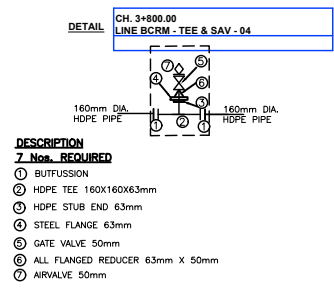


DATUM (m)	1820																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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EXISTING GROUND LEVEL (m)	1825.88	1827.14	1828.39	1829.66	1830.23	1831.08	1832.87	1833.81	1835.91	1836.87	1839.87	1839.84	1840.50	1842.01	1842.42	1843.74	1844.50	1845.00	1846.03	1846.37	1846.87	1847.29	1847.45	1847.77	1847.48	1847.45	1847.19	1847.14	1847.37	1847.44	1847.45	1847.65	1847.85	1847.70	1847.36	1847.02	1846.47	1846.12	1845.91	1845.37	1845.19	1845.02	1845.17	1845.32	1846.05	1846.87	1846.98	1847.05	1846.94	1846.83	1846.76	1846.27	1847.85	1848.21	1848.17	1849.70	1849.98	1850.42	1850.67	1850.46	1850.27	1850.28	1850.27	1850.44	1850.42	1850.88	1850.74	1851.01	1851.34	1851.59	1851.69	1851.71	1851.92	1852.03	1852.07	1852.16	1852.13	1852.22	1852.66	1852.88																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
INVERT LEVELS (m)	1824.78	1826.01	1827.25	1828.48	1829.86	1831.08	1833.31	1835.51	1837.71	1839.91	1842.11	1844.31	1846.51	1848.71	1850.91	1853.11	1855.31	1857.51	1859.71	1861.91	1864.11	1866.31	1868.51	1870.71	1872.91	1875.11	1877.31	1879.51	1881.71	1883.91	1886.11	1888.31	1890.51	1892.71	1894.91	1897.11	1899.31	1901.51	1903.71	1905.91	1908.11	1910.31	1912.51	1914.71	1916.91	1919.11	1921.31	1923.51	1925.71	1927.91	1930.11	1932.31	1934.51	1936.71	1938.91	1941.11	1943.31	1945.51	1947.71	1949.91	1952.11	1954.31	1956.51	1958.71	1960.91	1963.11	1965.31	1967.51	1969.71	1971.91	1974.11	1976.31	1978.51	1980.71	1982.91	1985.11	1987.31	1989.51	1991.71	1993.91	1996.11	1998.31	2000.51	2002.71	2004.91	2007.11	2009.31	2011.51	2013.71	2015.91	2018.11	2020.31	2022.51	2024.71	2026.91	2029.11	2031.31	2033.51	2035.71	2037.91	2040.11	2042.31	2044.51	2046.71	2048.91	2051.11	2053.31	2055.51	2057.71	2059.91	2062.11	2064.31	2066.51	2068.71	2070.91	2073.11	2075.31	2077.51	2079.71	2081.91	2084.11	2086.31	2088.51	2090.71	2092.91	2095.11	2097.31	2099.51	2101.71	2103.91	2106.11	2108.31	2110.51	2112.71	2114.91	2117.11	2119.31	2121.51	2123.71	2125.91	2128.11	2130.31	2132.51	2134.71	2136.91	2139.11	2141.31	2143.51	2145.71	2147.91	2150.11	2152.31	2154.51	2156.71	2158.91	2161.11	2163.31	2165.51	2167.71	2169.91	2172.11	2174.31	2176.51	2178.71	2180.91	2183.11	2185.31	2187.51	2189.71	2191.91	2194.11	2196.31	2198.51	2200.71	2202.91	2205.11	2207.31	2209.51	2211.71	2213.91	2216.11	2218.31	2220.51	2222.71	2224.91	2227.11	2229.31	2231.51	2233.71	2235.91	2238.11	2240.31	2242.51	2244.71	2246.91	2249.11	2251.31	2253.51	2255.71	2257.91	2260.11	2262.31	2264.51	2266.71	2268.91	2271.11	2273.31	2275.51	2277.71	2279.91	2282.11	2284.31	2286.51	2288.71	2290.91	2293.11	2295.31	2297.51	2299.71	2301.91	2304.11	2306.31	2308.51	2310.71	2312.91	2315.11	2317.31	2319.51	2321.71	2323.91	2326.11	2328.31	2330.51	2332.71	2334.91	2337.11	2339.31	2341.51	2343.71	2345.91	2348.11	2350.31	2352.51	2354.71	2356.91	2359.11	2361.31	2363.51	2365.71	2367.91	2370.11	2372.31	2374.51	2376.71	2378.91	2381.11	2383.31	2385.51	2387.71	2389.91	2392.11	2394.31	2396.51	2398.71	2400.91	2403.11	2405.31	2407.51	2409.71	2411.91	2414.11	2416.31	2418.51	2420.71	2422.91	2425.11	2427.31	2429.51	2431.71	2433.91	2436.11	2438.31	2440.51	2442.71	2444.91	2447.11	2449.31	2451.51	2453.71	2455.91	2458.11	2460.31	2462.51	2464.71	2466.91	2469.11	2471.31	2473.51	2475.71	2477.91	2480.11	2482.31	2484.51	2486.71	2488.91	2491.11	2493.31	2495.51	2497.71	2499.91	2502.11	2504.31	2506.51	2508.71	2510.91	2513.11	2515.31	2517.51	2519.71	2521.91	2524.11	2526.31	2528.51	2530.71	2532.91	2535.11	2537.31	2539.51	2541.71	2543.91	2546.11	2548.31	2550.51	2552.71	2554.91	2557.11	2559.31	2561.51	2563.71	2565.91	2568.11	2570.31	2572.51	2574.71	2576.91	2579.11	2581.31	2583.51	2585.71	2587.91	2590.11	2592.31	2594.51	2596.71	2598.91	2601.11	2603.31	2605.51	2607.71	2609.91	2612.11	2614.31	2616.51	2618.71	2620.91	2623.11	2625.31	2627.51	2629.71	2631.91	2634.11	2636.31	2638.51	2640.71	2642.91	2645.11	2647.31	2649.51	2651.71	2653.91	2656.11	2658.31	2660.51	2662.71	2664.91	2667.11	2669.31	2671.51	2673.71	2675.91	2678.11	2680.31	2682.51	2684.71	2686.91	2689.11	2691.31	2693.51	2695.71	2697.91	2700.11	2702.31	2704.51	2706.71	2708.91	2711.11	2713.31	2715.51	2717.71	2719.91	2722.11	2724.31	2726.51	2728.71	2730.91	2733.11	2735.31	2737.51	2739.71	2741.91	2744.11	2746.31	2748.51	2750.71	2752.91	2755.11	2757.31	2759.51	2761.71	2763.91	2766.11	2768.31	2770.51	2772.71	2774.91	2777.11	2779.31	2781.51	2783.71	2785.91	2788.11	2790.31	2792.51	2794.71	2796.91	2799.11	2801.31	2803.51	2805.71	2807.91	2810.11	2812.31	2814.51	2816.71	2818.91	2821.11	2823.31	2825.51	2827.71	2829.91	2832.11	2834.31	2836.51	2838.71	2840.91	2843.11	2845.31	2847.51	2849.71	2851.91	2854.11	2856.31	2858.51	2860.71	2862.91	2865.11	2867.31	2869.51	2871.71	2873.91	2876.11	2878.31	2880.51	2882.71	2884.91	2887.11	2889.31	2891.51	2893.71	2895.91	2898.11	2900.31	2902.51	2904.71	2906.91	2909.11	2911.31	2913.51	2915.71	2917.91	2920.11	2922.31	2924.51	2926.71	2928.91	2931.11	2933.31	2935.51	2937.71	2939.91	2942.11	2944.31	2946.51	2948.71	2950.91	2953.11	2955.31	2957.51	2959.71	2961.91	2964.11	2966.31	2968.51	2970.71	2972.91	2975.11	2977.31	2979.51	2981.71	2983.91	2986.11	2988.31	2990.51	2992.71	2994.91	2997.11	2999.31	3001.51	3003.71	3005.91	3008.11	3010.31	3012.51	3014.71	3016.91	3019.11	3021.31	3023.51	3025.71	3027.91	3030.11	3032.31	3034.51	3036.71	3038.91	3041.11	3043.31	3045.51	3047.71	3049.91	3052.11	3054.31	3056.51	3058.71	3060.91	3063.11	3065.31	3067.51	3069.71	3071.91	3074.11	3076.31	3078.51	3080.71	3082.91	3085.11	3087.31	3089.51	3091.71	3093.91	3096.11	3098.31	3100.51	3102.71	3104.91	3107.11	3109.31	3111.51	3113.71	3115.91	3118.11	3120.31	3122.51	3124.71	3126.91	3129.11	3131.31	3133.51	3135.71	3137.91	3140.11	3142.31	3144.51	3146.71	3148.91	3151.11	3153.31	3155.51	3157.71	3159.91	3162.11	3164.31	3166.51	3168.71	3170.91	3173.11	3175.31	3177.51	3179.71	3181.91	3184.11	3186.31	3188.51	3190.71	3192.91	3195.11	3197.31	3199.51	3201.71	3203.91	3206.11	3208.31	3210.51	3212.71	3214.91	3217.11	3219.31	3221.51	3223.71	3225.91	3228.11	3230.31	3232.51	3234.71	3236.91	3239.11	3241.31	3243.51	3245.71	3247.91	3250.11	3252.31	3254.51	3256.71	3258.91	3261.11	3263.31	3265.51	3267.71	3269.91	3272.11	3274.31	3276.51	3278.71	3280.91	3283.11	3285.31	3287.51	3289.71	3291.91	3294.11	3296.31	3298.51	3300.71	3302.91	3305.11	3307.31	3309.51	3311.71	3313.91	3316.11	3318.31	3320.51	3322.71	3324.91	3327.11	3329.31	3331.51	3333.71	3335.91	3338.11	3340.31	3342.51	3344.71	3346.91	3349.11	3351.31	3353.51	3355.71	3357.91	3360.11	3362.31	3364.51	3366.71	3368.91	3371.11	3373.31	3375.51	3377.71	3379.91	3382.11	3384.31	3386.51	3388.71	3390.91	3393.11	3395.31	3397.51	3399.71	3401.91	3404.11	3406.31	3408.51	3410.71	3412.91	3415.11	3417.31	3419.51	3421.71	3423.91	3426.11	3428.31	3430.51	3432.71	3434.91	3437.11	3439.31	3441.51	3443.71	3445.91	3448.11	3450.31	3452.51	3454.71	3456.91	3459.11	3461.31	3463.51	3465.71	3467.91	3470.11	3472.31	3474.51	3476.71	3478.91	3481.11	3483.31	3485.51	3487.71	3489.91	3492.11	3494.31	3496.51	3498.71	3500.91	3503.11	3505.31	3507.51	3509.71	3511.91	3514.11	3516.31	3518.51	3520.71	3522.91	3525.11	3527.31	3529.51	3531.71	3533.91	3536.11	3538.31	3540.51	3542.71	3544.91	3547.11	3549.31	3551.51	3553.71	3555.91	3558.11	3560.31	3562.51	3564.71	3566.91	3569.11	3571.31	3573.51	3575.71	3577.91	3580.11	3582.31	3584.51	3586.71	3588.91	3591.11	3593.31	3595.51	3597.71	3599.91	3602.11	3604.31	3606.51	3608.71	3610.91	3613.11	3615.31	3617.51	3619.71	3621.91	3624.11	3626.31	3628.51	3630.71	3632.91	3635.11	3637.31	3639.51	3641.71	3643.91	3646.11	3648.31	3650.51	3652.71	3654.91	3657.11	3659.31	3661.51	3663.71	3665.91	3668.11	3670.31	3672.51	3674.71	3676.91	3679.11	3681.31	3683.51	3685.71	3687.91	3690.11	3692.31	3694.51	3696.71	3698.91	3701.11	3703.31	3705.51	3707.71	3709.91	3712.11	3714.31	3716.51	3718.71	3720.91	3723.11	3725.31	3727.51	3729.71	3731.91	3734.11	3736.31	3738.51	3740.71	3742.91	3745.11	3747.31	3749.51	3751.71	3753.91	3756.11	3758.31	3760.51	3762



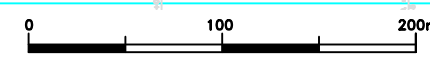
- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT TWO METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 200 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS
 - ELECTRIC POST
 - CULVERT
 - GATE
 - TEMPORARY STRUCTURES
 - BUILDINGS
 - KenHA / KeRRA ROAD BEACON
 - PROPOSED TREATED WATER RISING MAIN
 - TP10 TRAVERSE POINT & No.
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - RIVER/STREAM
 - V.J. VIKING JOHNSON
 - GV GATE VALVE
 - SV-01 SECTIONAL VALVE & No.
 - WO-01 WASHOUT VALVE & No.
 - LAV-01 AIR VALVE & No.
 - WM WATER METER
 - PROPOSED MASONRY CHAMBER
 - DIRECTION (SLOPE MIN. OR 1 IN n)



TYPE OF PIPE AND SIZE	160mm DIA. HDPE PIPE PN 16		160mm DIA. HDPE PIPE PN 16	
GEOLOGICAL CONDITION	TYPE "BLACK COTTON SOIL"			
EXISTING GROUND LEVEL (m)	1852.88	1853.03	1853.21	1853.43
INVERT LEVELS (m)	1851.40	1851.55	1851.80	1851.83
CHAINAGE (m)	3+600.00	3+620.00	3+640.00	3+660.00
DEPTH OF INVERT (m)	1.48	1.48	1.51	1.60
SLOPE OF PIPE (H/V)	1:130.90	1:221.49	1:66.33	1:74.18
REFERENCE PEG NO.	TP 70	TP 71	TP 72	TP 73

LONGITUDINAL SECTION



ISSUED FOR CONSTRUCTION

REVISIONS	BY	DATE	APPROVED
	CHECKED		
	CHECKED		
	CHECKED		
	CHECKED		

CLIENT:
TANA WATER WORKS DEVELOPMENT AGENCY
 P.O BOX 1292 - 10100,
 NYERI, KENYA

ENGINEERS:
TANA WATER WORKS DEVELOPMENT AGENCY
 P.O BOX 1292 - 10100,
 NYERI, KENYA

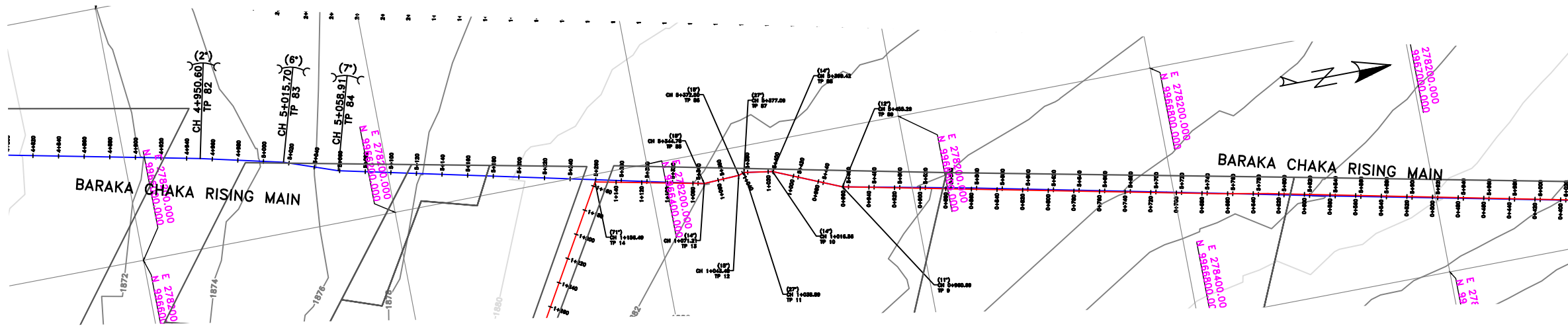
PROJECT TITLE:
BARAKA - CHAKA PIPELINE EXTENSION

CONTRACT NAME.
CONSTRUCTION OF BARAKA - CHAKA WATER EXTENSION PROJECT, NYERI COUNTY

DRAWING TITLE:
BARAKA - CHAKA RISING MAIN PLAN & LONGITUDINAL SECTION

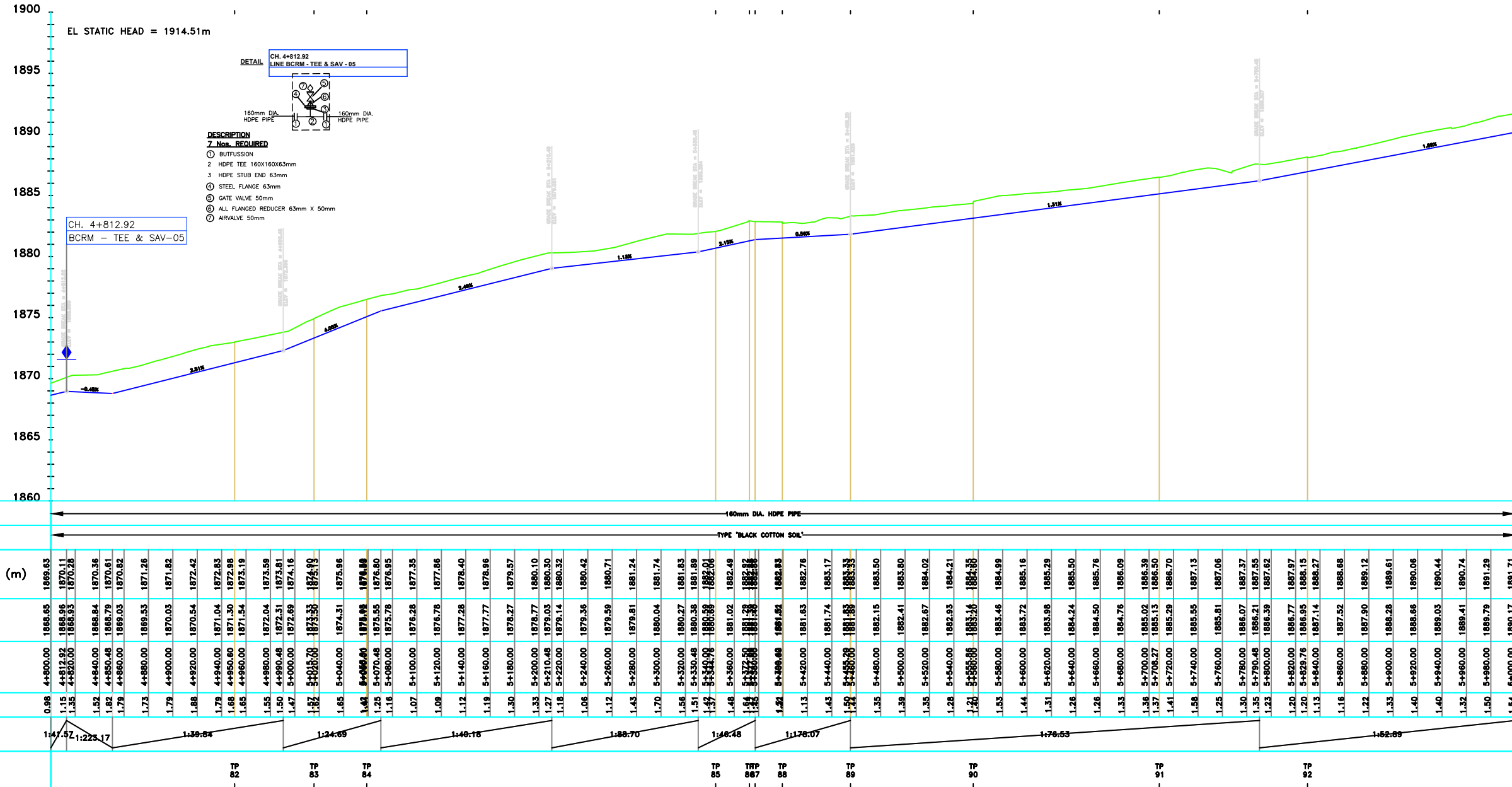
CH. 3+600.00 - 4+800.00
SHEET 4 OF 6

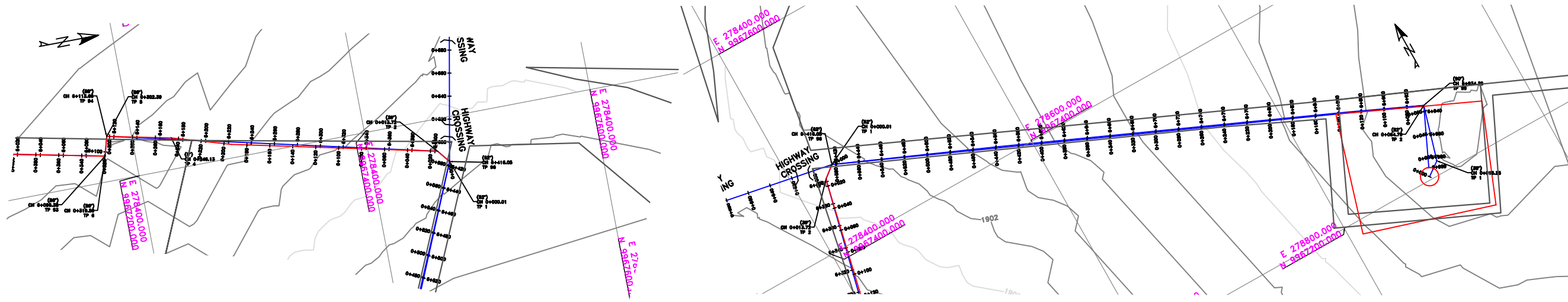
Designed by: B.M.K	Drawn by: A.M.M
Checked by: J.T	Approved by: E.W
Scale: H- 1:4000, V- 1:400	Date: MARCH 2022
DRG No. BC/RM/004	



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT TWO METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 200 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS
 - ELECTRIC POST
 - CULVERT
 - GATE
 - TEMPORARY STRUCTURES
 - BUILDINGS
 - KeNHA / KeRRA ROAD BEACON
 - PROPOSED TREATED WATER RISING MAIN
 - TP10 TRAVERSE POINT & No.
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - RIVER/STREAM
 - V.J. VIKING JOHNSON
 - GV GATE VALVE
 - SV-01 SECTIONAL VALVE & No.
 - WO-01 WASHOUT VALVE & No.
 - LAV-01 AIR VALVE & No.
 - WM WATER METER
 - PROPOSED MASONRY CHAMBER
 - DIRECTION (SLOPE MIN. OR 1 IN n)





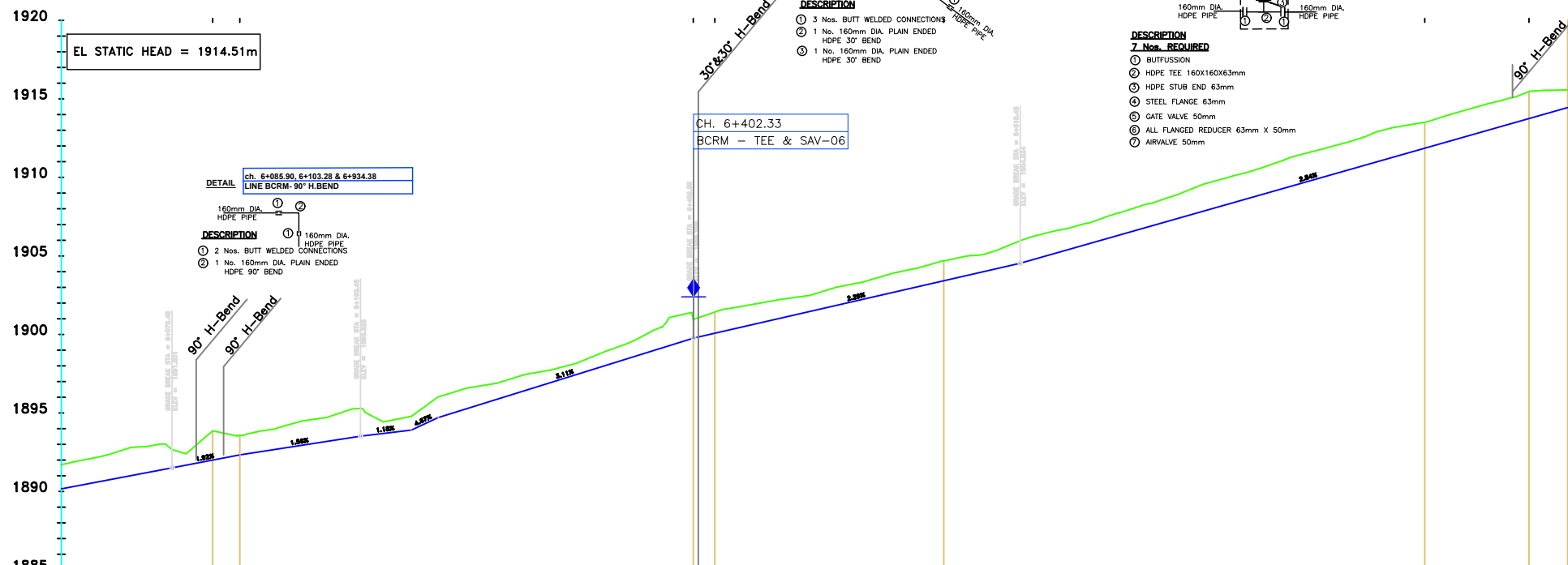
PLAN

DETAIL CH. 6+405.56
LINE BCRM - 30° & 30° H. BEND

DETAIL CH. 6+403.33
LINE BCRM - TEE & SAV - 06

DESCRIPTION
 ① 3 Nos. BUTT WELDED CONNECTIONS
 ② 1 No. 160mm DIA. PLAIN ENDED HDPE 30° BEND
 ③ 1 No. 160mm DIA. PLAIN ENDED HDPE 30° BEND

DESCRIPTION
7 Nos. REQUIRED
 ① BUTTFUSION
 ② HDPE TEE 160X160X63mm
 ③ HDPE STUB END 63mm
 ④ STEEL FLANGE 63mm
 ⑤ GATE VALVE 50mm
 ⑥ ALL FLANGED REDUCER 63mm X 50mm
 ⑦ AIRVALVE 50mm



DATUM (m)	1885																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
TYPE OF PIPE AND SIZE	160mm DIA. HDPE PIPE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
GEOLOGICAL CONDITION	TYPE 'BLACK COTTON SOIL'																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
EXISTING GROUND LEVEL (m)	1891.71	1892.12	1892.97	1892.96	1892.67	1892.45	1893.75	1893.56	1893.69	1894.11	1894.58	1895.08	1895.28	1894.89	1894.78	1895.02	1896.61	1896.98	1899.41	1900.39	1904.84	1904.55	1905.97	1906.28	1906.74	1907.30	1907.95	1908.55	1909.28	1909.92	1910.48	1911.17	1911.73	1912.27	1912.97	1913.38	1913.51	1913.88	1914.46	1915.00	1915.47	1915.52	1915.58																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
INVERT LEVELS (m)	1890.17	1890.55	1890.92	1891.30	1891.68	1892.05	1892.43	1892.81	1893.19	1893.57	1893.95	1894.33	1894.71	1895.09	1895.47	1895.85	1896.23	1896.61	1896.99	1897.37	1897.75	1898.13	1898.51	1898.89	1899.27	1899.65	1900.03	1900.41	1900.79	1901.17	1901.55	1901.93	1902.31	1902.69	1903.07	1903.45	1903.83	1904.21	1904.59	1904.97	1905.35	1905.73	1906.11	1906.49	1906.87	1907.25	1907.63	1908.01	1908.39	1908.77	1909.15	1909.53	1909.91	1910.29	1910.67	1911.05	1911.43	1911.81	1912.19	1912.57	1912.95	1913.33	1913.71	1914.09	1914.47	1914.85	1915.23	1915.61	1915.99	1916.37	1916.75	1917.13	1917.51	1917.89	1918.27	1918.65	1919.03	1919.41	1919.79	1920.17	1920.55	1920.93	1921.31	1921.69	1922.07	1922.45	1922.83	1923.21	1923.59	1923.97	1924.35	1924.73	1925.11	1925.49	1925.87	1926.25	1926.63	1927.01	1927.39	1927.77	1928.15	1928.53	1928.91	1929.29	1929.67	1930.05	1930.43	1930.81	1931.19	1931.57	1931.95	1932.33	1932.71	1933.09	1933.47	1933.85	1934.23	1934.61	1934.99	1935.37	1935.75	1936.13	1936.51	1936.89	1937.27	1937.65	1938.03	1938.41	1938.79	1939.17	1939.55	1939.93	1940.31	1940.69	1941.07	1941.45	1941.83	1942.21	1942.59	1942.97	1943.35	1943.73	1944.11	1944.49	1944.87	1945.25	1945.63	1946.01	1946.39	1946.77	1947.15	1947.53	1947.91	1948.29	1948.67	1949.05	1949.43	1949.81	1950.19	1950.57	1950.95	1951.33	1951.71	1952.09	1952.47	1952.85	1953.23	1953.61	1953.99	1954.37	1954.75	1955.13	1955.51	1955.89	1956.27	1956.65	1957.03	1957.41	1957.79	1958.17	1958.55	1958.93	1959.31	1959.69	1960.07	1960.45	1960.83	1961.21	1961.59	1961.97	1962.35	1962.73	1963.11	1963.49	1963.87	1964.25	1964.63	1965.01	1965.39	1965.77	1966.15	1966.53	1966.91	1967.29	1967.67	1968.05	1968.43	1968.81	1969.19	1969.57	1969.95	1970.33	1970.71	1971.09	1971.47	1971.85	1972.23	1972.61	1972.99	1973.37	1973.75	1974.13	1974.51	1974.89	1975.27	1975.65	1976.03	1976.41	1976.79	1977.17	1977.55	1977.93	1978.31	1978.69	1979.07	1979.45	1979.83	1980.21	1980.59	1980.97	1981.35	1981.73	1982.11	1982.49	1982.87	1983.25	1983.63	1984.01	1984.39	1984.77	1985.15	1985.53	1985.91	1986.29	1986.67	1987.05	1987.43	1987.81	1988.19	1988.57	1988.95	1989.33	1989.71	1990.09	1990.47	1990.85	1991.23	1991.61	1991.99	1992.37	1992.75	1993.13	1993.51	1993.89	1994.27	1994.65	1995.03	1995.41	1995.79	1996.17	1996.55	1996.93	1997.31	1997.69	1998.07	1998.45	1998.83	1999.21	1999.59	1999.97	2000.35	2000.73	2001.11	2001.49	2001.87	2002.25	2002.63	2003.01	2003.39	2003.77	2004.15	2004.53	2004.91	2005.29	2005.67	2006.05	2006.43	2006.81	2007.19	2007.57	2007.95	2008.33	2008.71	2009.09	2009.47	2009.85	2010.23	2010.61	2010.99	2011.37	2011.75	2012.13	2012.51	2012.89	2013.27	2013.65	2014.03	2014.41	2014.79	2015.17	2015.55	2015.93	2016.31	2016.69	2017.07	2017.45	2017.83	2018.21	2018.59	2018.97	2019.35	2019.73	2020.11	2020.49	2020.87	2021.25	2021.63	2022.01	2022.39	2022.77	2023.15	2023.53	2023.91	2024.29	2024.67	2025.05	2025.43	2025.81	2026.19	2026.57	2026.95	2027.33	2027.71	2028.09	2028.47	2028.85	2029.23	2029.61	2029.99	2030.37	2030.75	2031.13	2031.51	2031.89	2032.27	2032.65	2033.03	2033.41	2033.79	2034.17	2034.55	2034.93	2035.31	2035.69	2036.07	2036.45	2036.83	2037.21	2037.59	2037.97	2038.35	2038.73	2039.11	2039.49	2039.87	2040.25	2040.63	2041.01	2041.39	2041.77	2042.15	2042.53	2042.91	2043.29	2043.67	2044.05	2044.43	2044.81	2045.19	2045.57	2045.95	2046.33	2046.71	2047.09	2047.47	2047.85	2048.23	2048.61	2048.99	2049.37	2049.75	2050.13	2050.51	2050.89	2051.27	2051.65	2052.03	2052.41	2052.79	2053.17	2053.55	2053.93	2054.31	2054.69	2055.07	2055.45	2055.83	2056.21	2056.59	2056.97	2057.35	2057.73	2058.11	2058.49	2058.87	2059.25	2059.63	2060.01	2060.39	2060.77	2061.15	2061.53	2061.91	2062.29	2062.67	2063.05	2063.43	2063.81	2064.19	2064.57	2064.95	2065.33	2065.71	2066.09	2066.47	2066.85	2067.23	2067.61	2067.99	2068.37	2068.75	2069.13	2069.51	2069.89	2070.27	2070.65	2071.03	2071.41	2071.79	2072.17	2072.55	2072.93	2073.31	2073.69	2074.07	2074.45	2074.83	2075.21	2075.59	2075.97	2076.35	2076.73	2077.11	2077.49	2077.87	2078.25	2078.63	2079.01	2079.39	2079.77	2080.15	2080.53	2080.91	2081.29	2081.67	2082.05	2082.43	2082.81	2083.19	2083.57	2083.95	2084.33	2084.71	2085.09	2085.47	2085.85	2086.23	2086.61	2086.99	2087.37	2087.75	2088.13	2088.51	2088.89	2089.27	2089.65	2090.03	2090.41	2090.79	2091.17	2091.55	2091.93	2092.31	2092.69	2093.07	2093.45	2093.83	2094.21	2094.59	2094.97	2095.35	2095.73	2096.11	2096.49	2096.87	2097.25	2097.63	2098.01	2098.39	2098.77	2099.15	2099.53	2099.91	2100.29	2100.67	2101.05	2101.43	2101.81	2102.19	2102.57	2102.95	2103.33	2103.71	2104.09	2104.47	2104.85	2105.23	2105.61	2105.99	2106.37	2106.75	2107.13	2107.51	2107.89	2108.27	2108.65	2109.03	2109.41	2109.79	2110.17	2110.55	2110.93	2111.31	2111.69	2112.07	2112.45	2112.83	2113.21	2113.59	2113.97	2114.35	2114.73	2115.11	2115.49	2115.87	2116.25	2116.63	2117.01	2117.39	2117.77	2118.15	2118.53	2118.91	2119.29	2119.67	2120.05	2120.43	2120.81	2121.19	2121.57	2121.95	2122.33	2122.71	2123.09	2123.47	2123.85	2124.23	2124.61	2124.99	2125.37	2125.75	2126.13	2126.51	2126.89	2127.27	2127.65	2128.03	2128.41	2128.79	2129.17	2129.55	2129.93	2130.31	2130.69	2131.07	2131.45	2131.83	2132.21	2132.59	2132.97	2133.35	2133.73	2134.11	2134.49	2134.87	2135.25	2135.63	2136.01	2136.39	2136.77	2137.15	2137.53	2137.91	2138.29	2138.67	2139.05	2139.43	2139.81	2140.19	2140.57	2140.95	2141.33	2141.71	2142.09	2142.47	2142.85	2143.23	2143.61	2143.99	2144.37	2144.75	2145.13	2145.51	2145.89	2146.27	2146.65	2147.03	2147.41	2147.79	2148.17	2148.55	2148.93	2149.31	2149.69	2150.07	2150.45	2150.83	2151.21	2151.59	2151.97	2152.35	2152.73	2153.11	2153.49	2153.87	2154.25	2154.63	2155.01	2155.39	2155.77	2156.15	2156.53	2156.91	2157.29	2157.67	2158.05	2158.43	2158.81	2159.19	2159.57	2159.95	2160.33	2160.71	2161.09	2161.47	2161.85	2162.23	2162.61	2162.99	2163.37	2163.75	2164.13	2164.51	2164.89	2165.27	2165.65	2166.03	2166.41	2166.79	2167.17	2167.55	2167.93	2168.31	2168.69	2169.07	2169.45	2169.83	2170.21	2170.59	2170.97	2171.35	2171.73	2172.11	2172.49	2172.87	2173.25	2173.63	2174.01	2174.39	2174.77	2175.15	2175.53	2175.91	2176.29	2176.67	2177.05	2177.43	2177.81	2178.19	2178.57	2178.95	2179.33	2179.71	2180.09	2180.47	2180.85	2181.23	2181.61	2181.99	2182.37	2182.75	2183.13	2183.51	2183.89	2184.27	2184.65	2185.03	2185.41	2185.79	2186.17	2186.55	2186.93	2187.31	2187.69	2188.07	2188.45	2188.83	2189.21	2189.59	2189.97	2190.35	2190.73	2191.11	2191.49	2191.87	2192.25	2192.63	2193.01	2193.39	2193.77	2194.15	2194.53	2194.91	2195.29	2195.67	2196.05	2196.43	2196.81	2197.19	2197.57	2197.95	2198.33	2198.71	2199.09	2199.47	2199.85	2200.23	2200.61	2200.99	2201.37	2201.75	2202.13	2202.51	2202.89	2203.27	2203.65	2204.03	2204.41	2204.79	2205.17	2205.55	2205.93	2206.31	2206.69	2207.07	2207.45	2207.83	2208.21	2208.59	2208.97	2209.35	2209.73	2210.11	2210.49	2210.87	2211.25	2211.63	2212.01	2212.39	2212.77	2213.15	2213.53	2213.91	2214.29	2214.67	2215.05	2215.43	2215.81	2216.19	2216.57	2216.95	2217.33	2217.71	2218.09	2218.47	2218.85	2219.23	2219.61	2219.99	2220.37	2220.75	2221.13	2221.51	2221.89	2222.27	2222.65	2223.03	2223.41	2223.79	2224.17	2224.55	2224.93	2225.31	2225.69	2226.07	2226.45	2226.83	2227.21	2227.59	2227.97	2228.35	2228.73	2229.11	2229.49	2229.87	2230.25	2230.63	2231.01	2231.39	2231.77	2232.15	2232.53	2232.91	2233.29	2233.67	2234.05	2234.43	2234.81	2235.19	2235.57	2235.95	2236.33	2236.71	2237.09	2237.47	2237.85	2238.23	2238.61	2238.

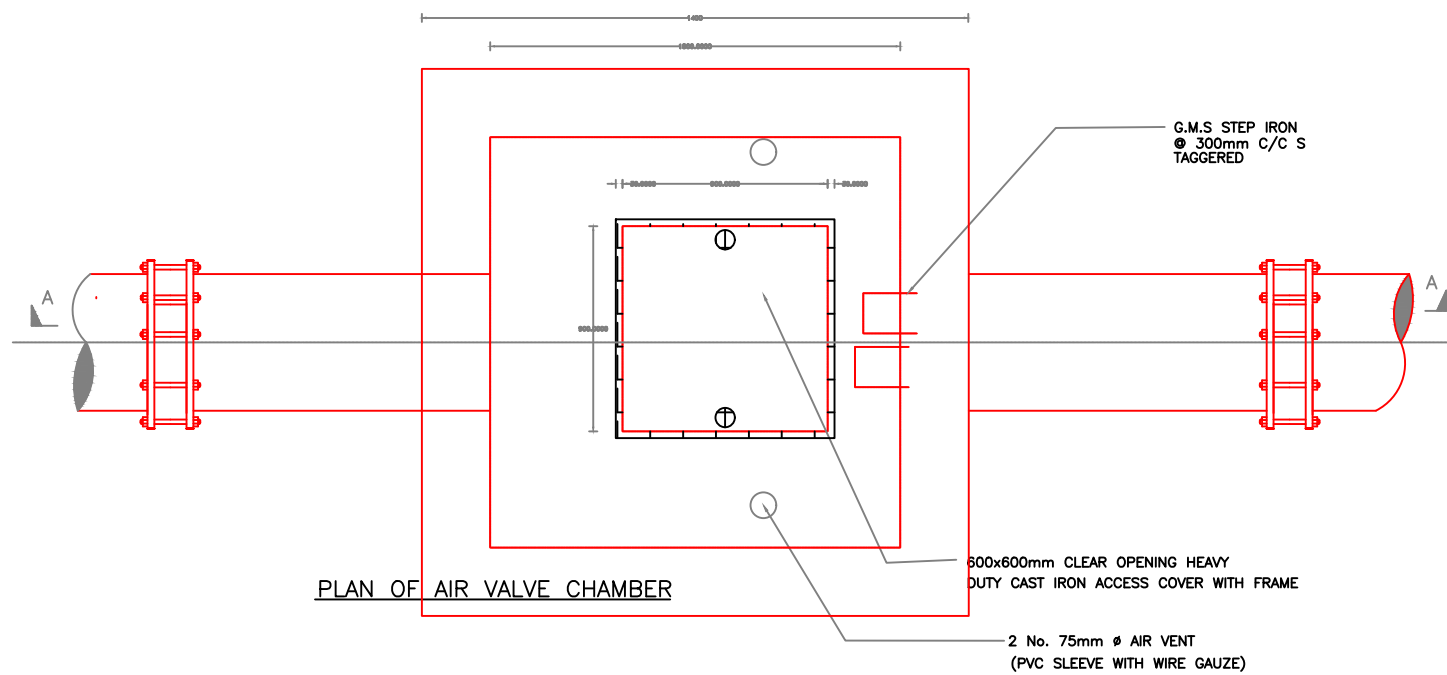
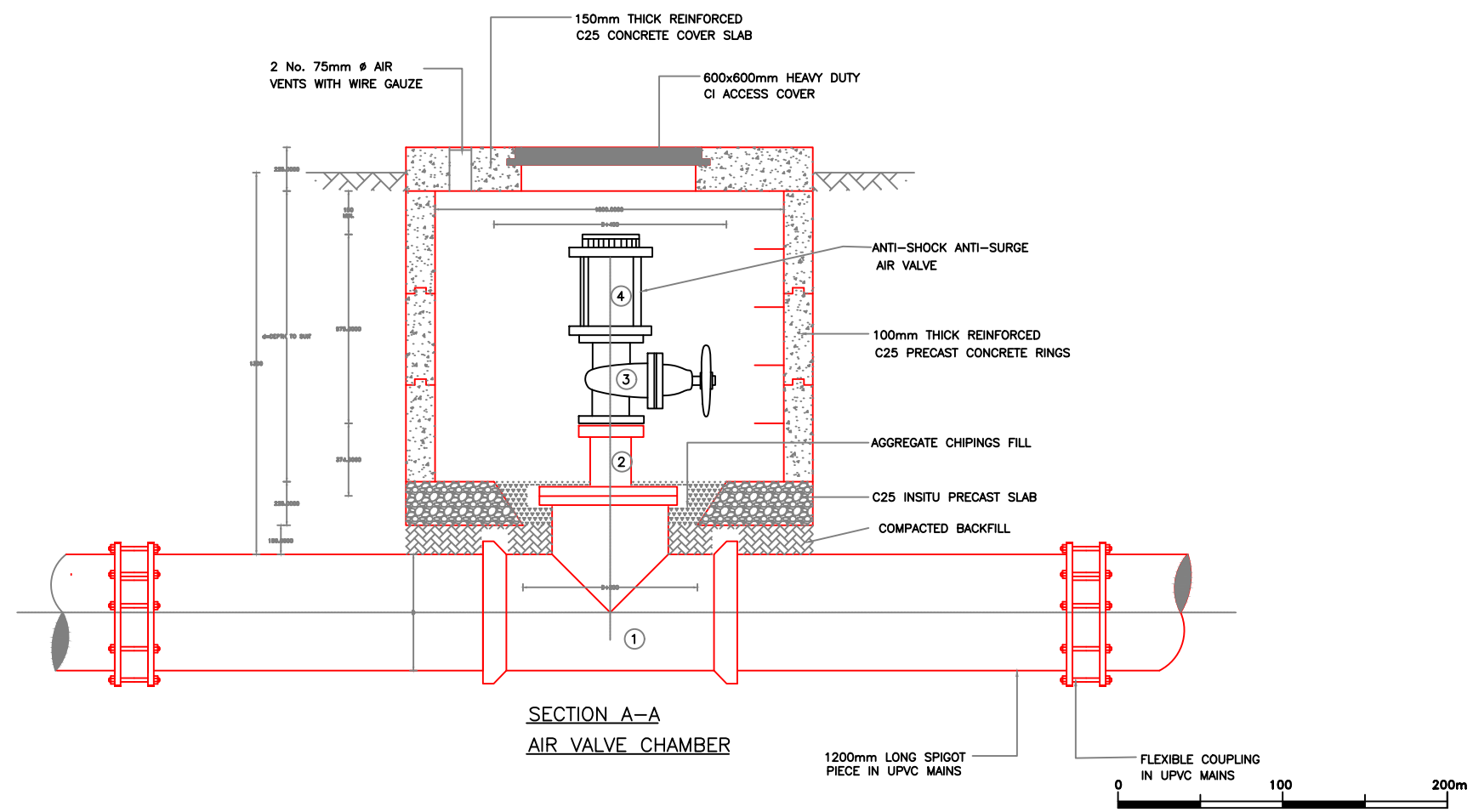


TABLE OF AIR VALVE BRANCH AND FITTINGS

MAIN SIZE (mm)	AIR VALVE BRANCH Ø (mm)	AIR VALVE TEE (1)	FLANGED REDUCER (2)	VALVE (3)	AIR VALVE (4)
100	25	100X50	50X25	25	25
150	50	150X50	50X50	50	50
200	50	200X100	100X50	50	50
250	80	250X150	150X80	80	80
300	80	300X150	150X80	80	80
350	80	350X150	150X80	80	80
400	100	400X200	200X100	100	100
450	100	450X200	200X100	100	100
500	100	500X250	250X100	100	100
600	150	600X300	300X150	150	150
700	150	700X350	350X150	150	150
800	200	800X400	400X200	200	200
900	200	900X450	450X200	200	200




ISSUED FOR CONSTRUCTION

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

CLIENT:

TANA WATER WORKS DEVELOPMENT AGENCY
 P.O BOX 1292 - 10100,
 NYERI, KENYA

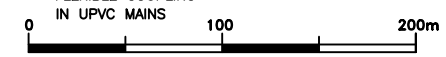
ENGINEERS:

TANA WATER WORKS DEVELOPMENT AGENCY
 P.O BOX 1292 - 10100,
 NYERI, KENYA

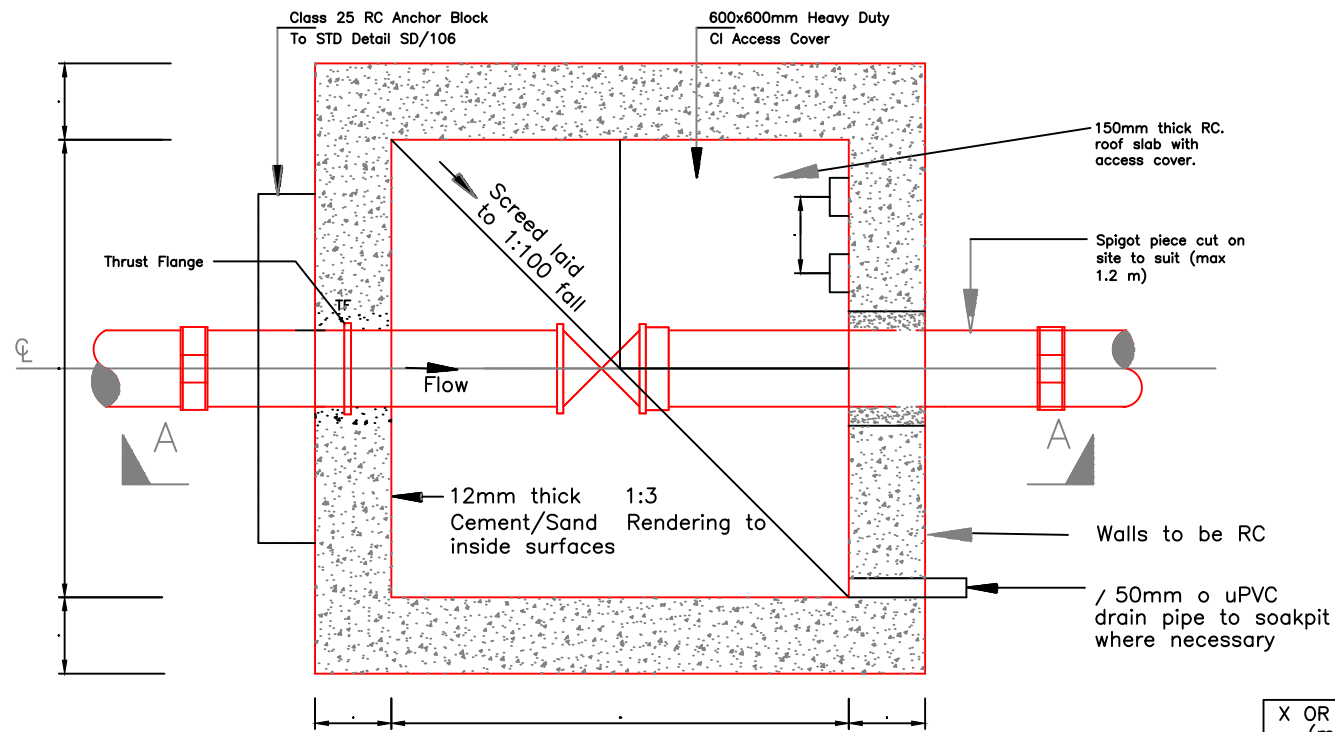
PROJECT TITLE:
BARAKA - CHAKA PIPELINE EXTENSION

CONTRACT NAME.
CONSTRUCTION OF BARAKA - CHAKA WATER EXTENSION PROJECT, NYERI COUNTY

DRAWING TITLE:
AIRVALVE CHAMBER DRAWING

Designed by: B.M.K	Drawn by: A.M.M
Checked by: J.T	Approved by: E.W
Scale: H- 1:4000, V- 1:400	Date: MARCH 2022
DRG No. FITTINGS/001.	

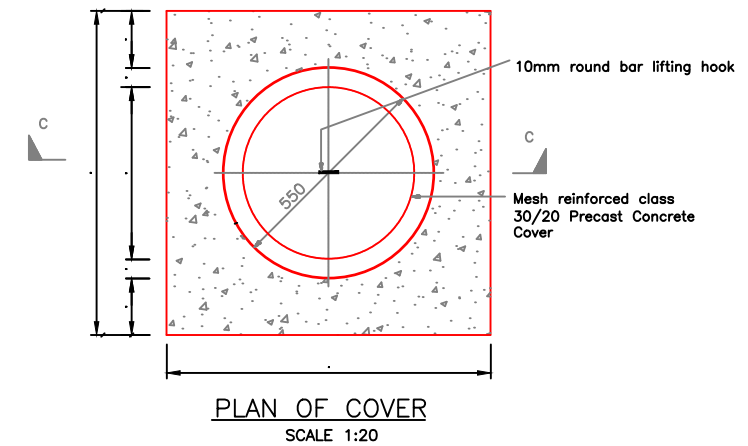




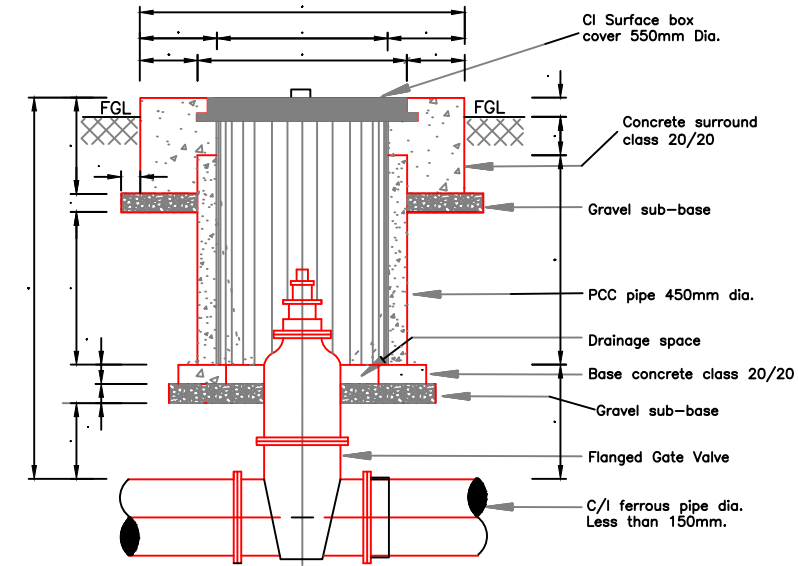
PLAN OF CHAMBER
1:20
(Cover omitted for clarity)

X OR Y (mm)	(mm)
A	1200
B	1500
C	1800
D	2100
E	2500
F	3000

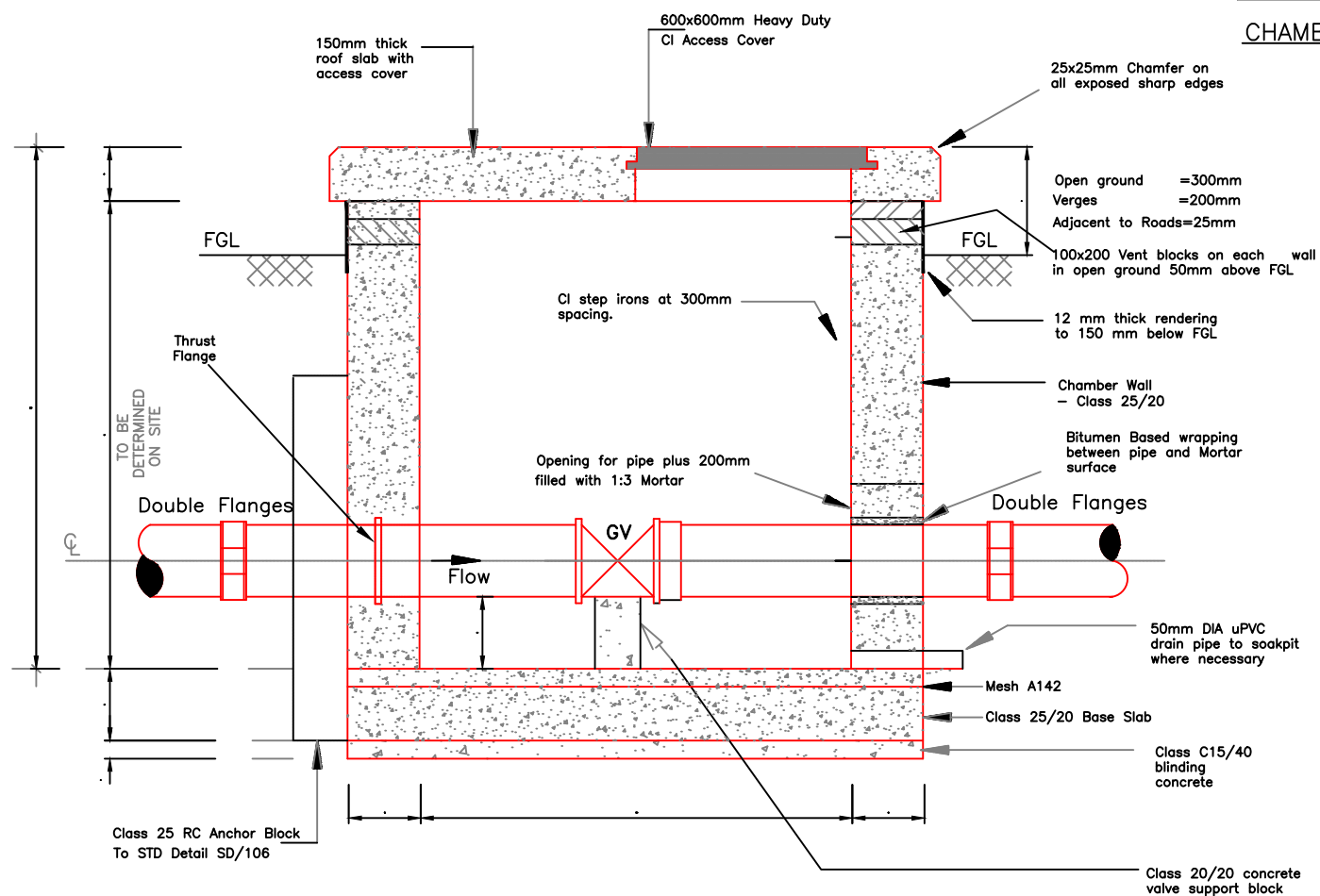
CHAMBER DIMENSIONS



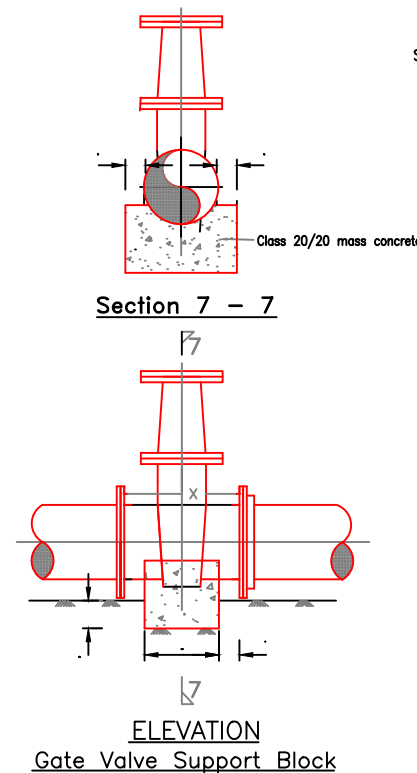
PLAN OF COVER
SCALE 1:20



GATE VALVE SURFACE BOX
SECTION C-C
SCALE 1:20



GATE VALVE CHAMBER
SECTION A-A
SCALE 1:20

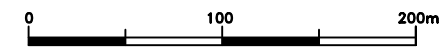


Section 7 - 7

ELEVATION
Gate Valve Support Block

MAIN SIZE (mm)	GATE VALVE DIAMETER (mm)
100	100
150	150
200	200
250	250
300	300
350	300
400	300
500	400
600	500
700	600
800	600

GATE VALVE DIAMETER



ISSUED FOR CONSTRUCTION

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

CLIENT:
TANA WATER WORKS DEVELOPMENT AGENCY
P.O BOX 1292 - 10100,
NYERI, KENYA

ENGINEERS:
TANA WATER WORKS DEVELOPMENT AGENCY
P.O BOX 1292 - 10100,
NYERI, KENYA

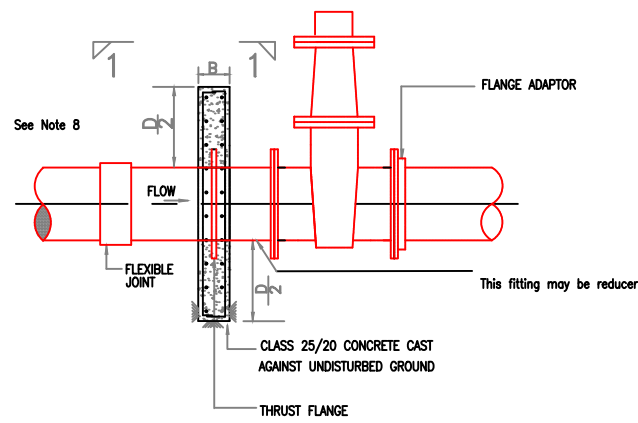
PROJECT TITLE:
BARAKA - CHAKA PIPELINE EXTENSION

CONTRACT No.
CONSTRUCTION OF BARAKA - CHAKA WATER EXTENSION PROJECT, NYERI COUNTY

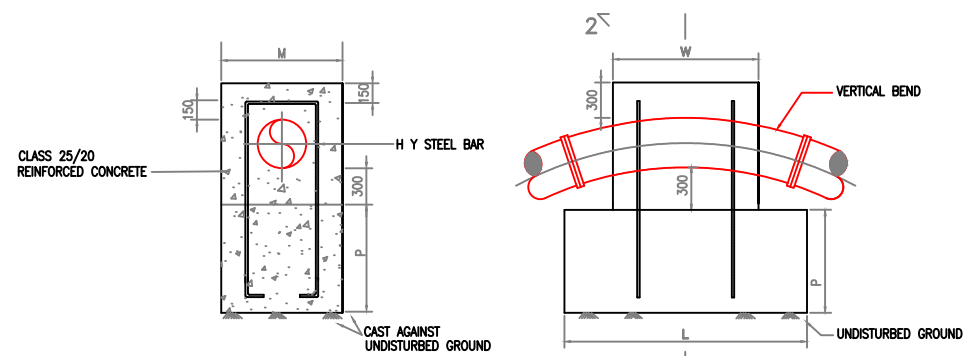
DRAWING TITLE:
GATE VALVE CHAMBER DRAWING

Designed by: B.M.K
Checked by: J.T
Scale: H- 1:4000, V- 1:400
DRG No. **FITTINGS/002**

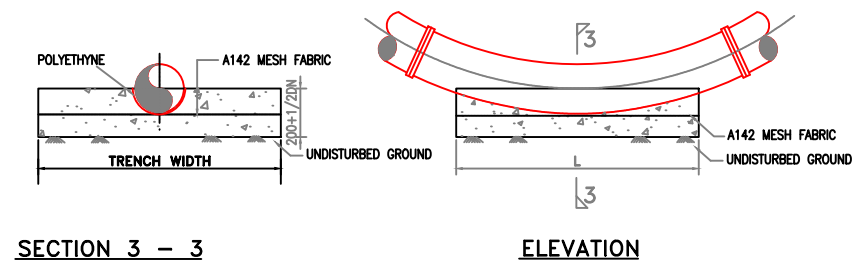
Drawn by: A.M.M
Approved by: E.W
Date: **MARCH 2022**



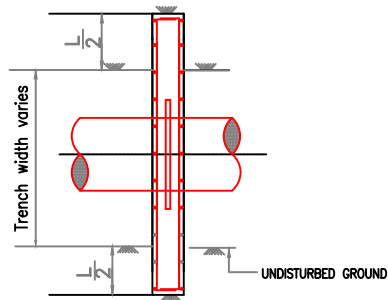
**ELEVATION
ANCHOR BLOCK
FOR GATE VALVES**



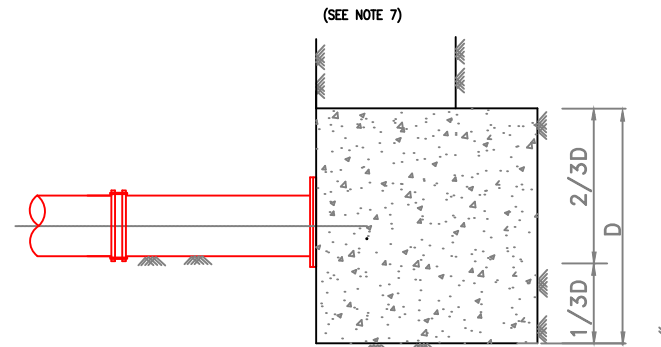
**SECTION 2 - 2
UPTHRUST THRUST
UPVERTICAL BENDS - TYPICAL**



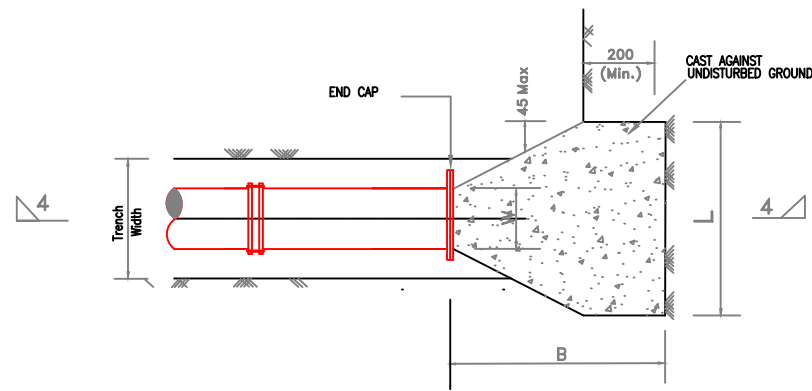
**SECTION 3 - 3
DOWTHRUST VERTICAL
BENDS - TYPICAL**



SECTION 1 - 1



Section 4 - 4



**Plan
Thrust Block for Blank Ends**

(SEE NOTE 7)

TEST HEAD (m)	PIPE DIA (mm)	D (m)	L (m)	B (m)	CONCRETE VOL (m ³)
100	600	1.6	2.6	1.2	3.1
	500	1.4	2.2	1.1	2.1
	450	1.2	2.0	1.0	1.5
	400	1.2	1.6	0.8	1.0
	350	1.0	1.5	0.8	0.7
	300	1.0	1.2	0.7	0.5
	250	0.8	1.0	0.5	0.3
	200	0.6	0.8	0.5	0.2
	150	0.5	0.6	0.5	0.1
	100	0.5	0.6	0.5	0.1

TABLE OF ANCHOR BLOCKS FOR BLANK ENDS

TABLE 4

BLOCK TYPE	D (m)	L (m)	B (mm)	MAIN STEEL	DISTRIBUTION STEEL
A	0.6	1.4	200	Y10 - 150	Y10 - 150
B	0.8	1.6	300	Y10 - 150	Y10 - 150
C	1.0	1.8	300	Y12 - 150	Y10 - 150
D	1.2	2.0	400	Y12 - 150	Y12 - 150
E	1.4	2.6	500	Y12 - 150	Y12 - 150
F	1.6	3.2	500	Y12 - 150	Y12 - 150

**DETAILS OF ANCHOR BLOCKS FOR GATE VALVES AND TAPERS
(CLASS '25/20' CONCRETE)**

TABLE OF THRUST BLOCKS FOR TAPERS

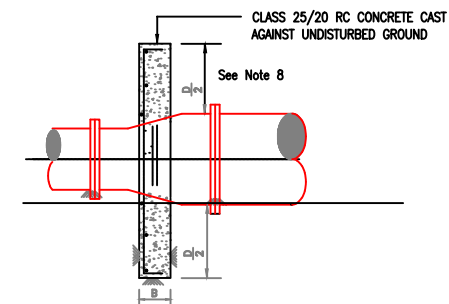
MAIN SIZE (mm)	TAPER (SMALLER SIZE) mm											
	100 m HEAD TEST PRESSURE											
	800	700	600	500	450	400	350	300	250	200	150	100
800	—	D	E	F	—	F	—	E	—	—	—	—
700	—	—	D	E	—	F	F	E	—	—	—	—
600	—	D	D	C	D	D	E	E	—	—	—	—
500	—	B	C	—	B	C	C	D	—	—	—	—
450	—	—	B	—	—	B	C	C	D	—	—	—
400	—	—	—	—	—	—	A	B	C	C	—	—
350	—	—	—	—	—	—	—	A	B	B	C	—
300	—	—	—	—	—	—	—	—	A	B	B	—
250	—	—	—	—	—	—	—	—	—	A	A	B
200	—	—	—	—	—	—	—	—	—	—	A	A
150	—	—	—	—	—	—	—	—	—	—	—	A

**TABLE OF ANCHOR BLOCKS FOR GATE VALVES AND TAPERS
(CLASS '25' CONCRETE)
FOR DIMENSIONS (See table 4)**

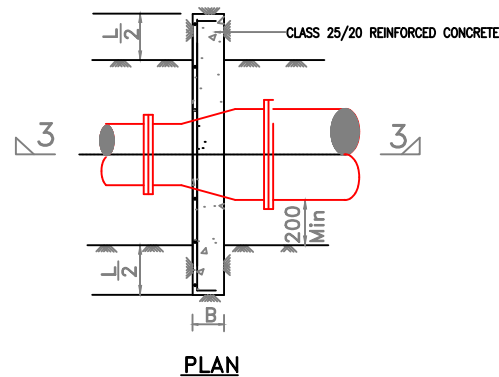
TABLE 1

MAIN SIZE (mm)	BLOCK TYPE	
	100m Head	160m Head
600	E	E
500	D	E
450	D	D
400	C	D
350	C	C
300	B	C
250	B	B
200	A	A
150	A	A
100	A	A

Table of Anchor Blocks For Gate Valves



**SECTION 3 - 3
THRUST BLOCKS FOR TAPERS**



PLAN

ISSUED FOR CONSTRUCTION

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

CLIENT:
TANA WATER WORKS DEVELOPMENT AGENCY
P.O BOX 1292 - 10100,
NYERI, KENYA

ENGINEERS:
TANA WATER WORKS DEVELOPMENT AGENCY
P.O BOX 1292 - 10100,
NYERI, KENYA

PROJECT TITLE:
BARAKA - CHAKA PIPELINE EXTENSION

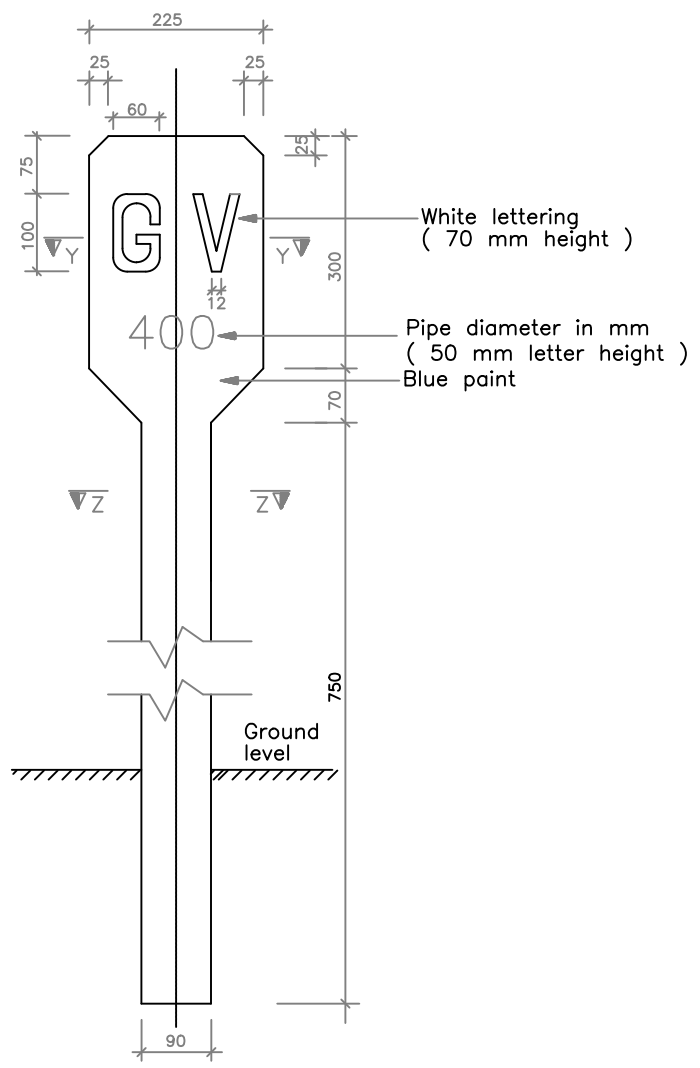
CONTRACT No.
CONSTRUCTION OF BARAKA - CHAKA WATER EXTENSION PROJECT, NYERI COUNTY

DRAWING TITLE:

ANCHOR AND THRUST BLOCK DRAWING

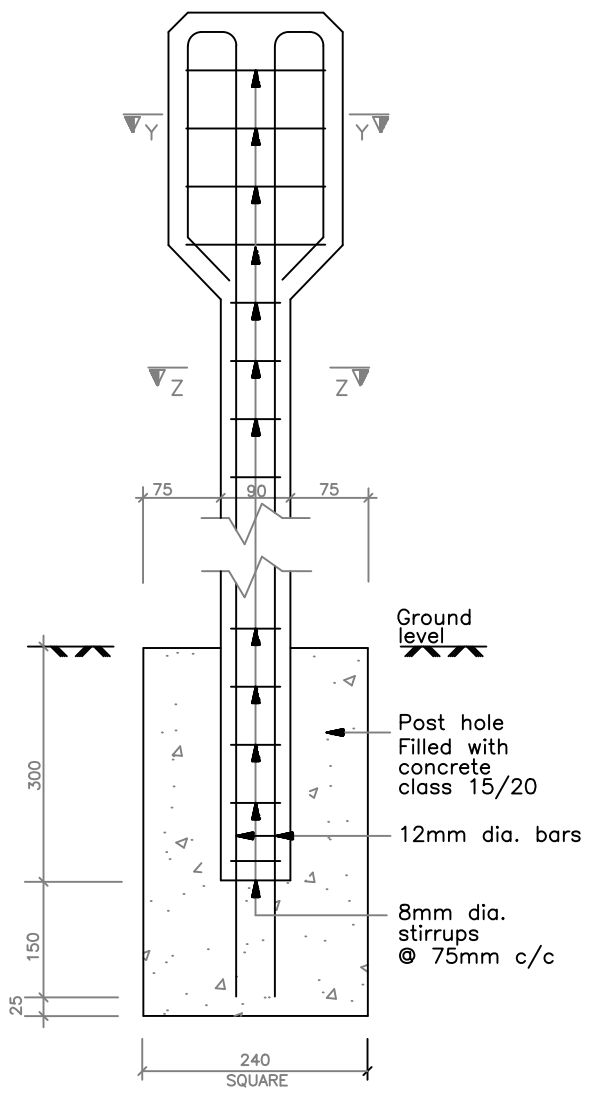
Designed by: B.M.K Drawn by: A.M.M
Checked by: J.T Approved by: E.W
Scale: H- 1:4000, V- 1:400 Date: MARCH 2022
DRG No. FITTINGS/003





GATE VALVE INDICATOR POST

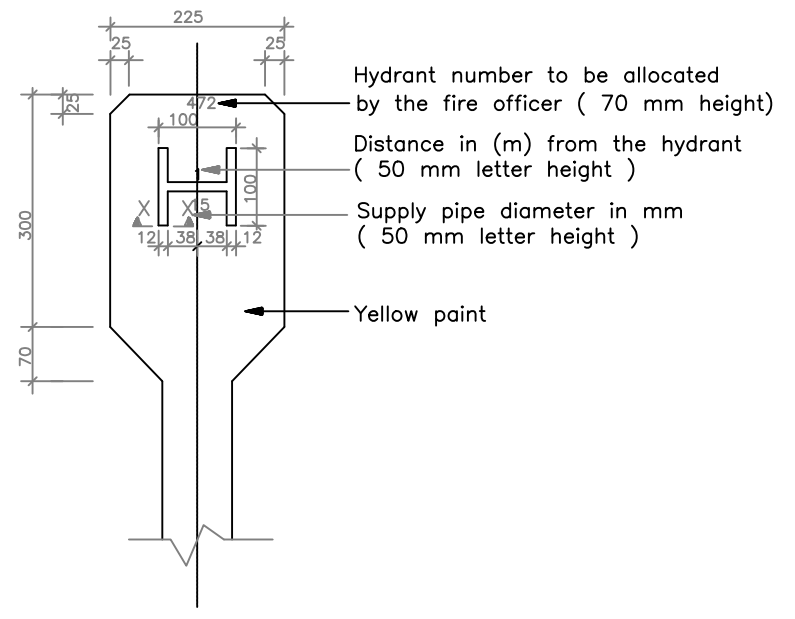
SCALE 1:10



INDICATOR POST REINFORCEMENT

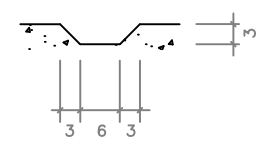
DETAILS

SCALE 1:10



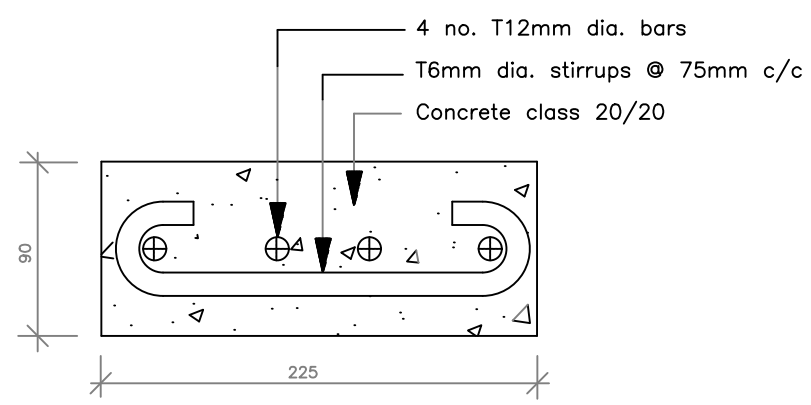
FIRE HYDRANT POST

SCALE 1:10



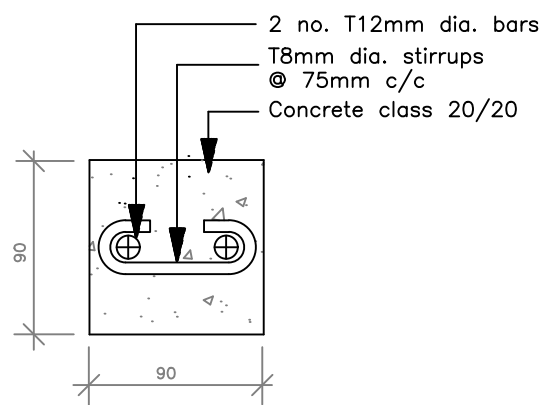
SECTION X-X

N.T.S.



SECTION Y-Y

SCALE 1:4



SECTION Z-Z


SCALE 1:4

ISSUED FOR CONSTRUCTION

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

CLIENT:

TANA WATER WORKS DEVELOPMENT AGENCY
 P.O BOX 1292 - 10100,
 NYERI, KENYA

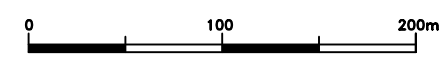
ENGINEERS:

TANA WATER WORKS DEVELOPMENT AGENCY
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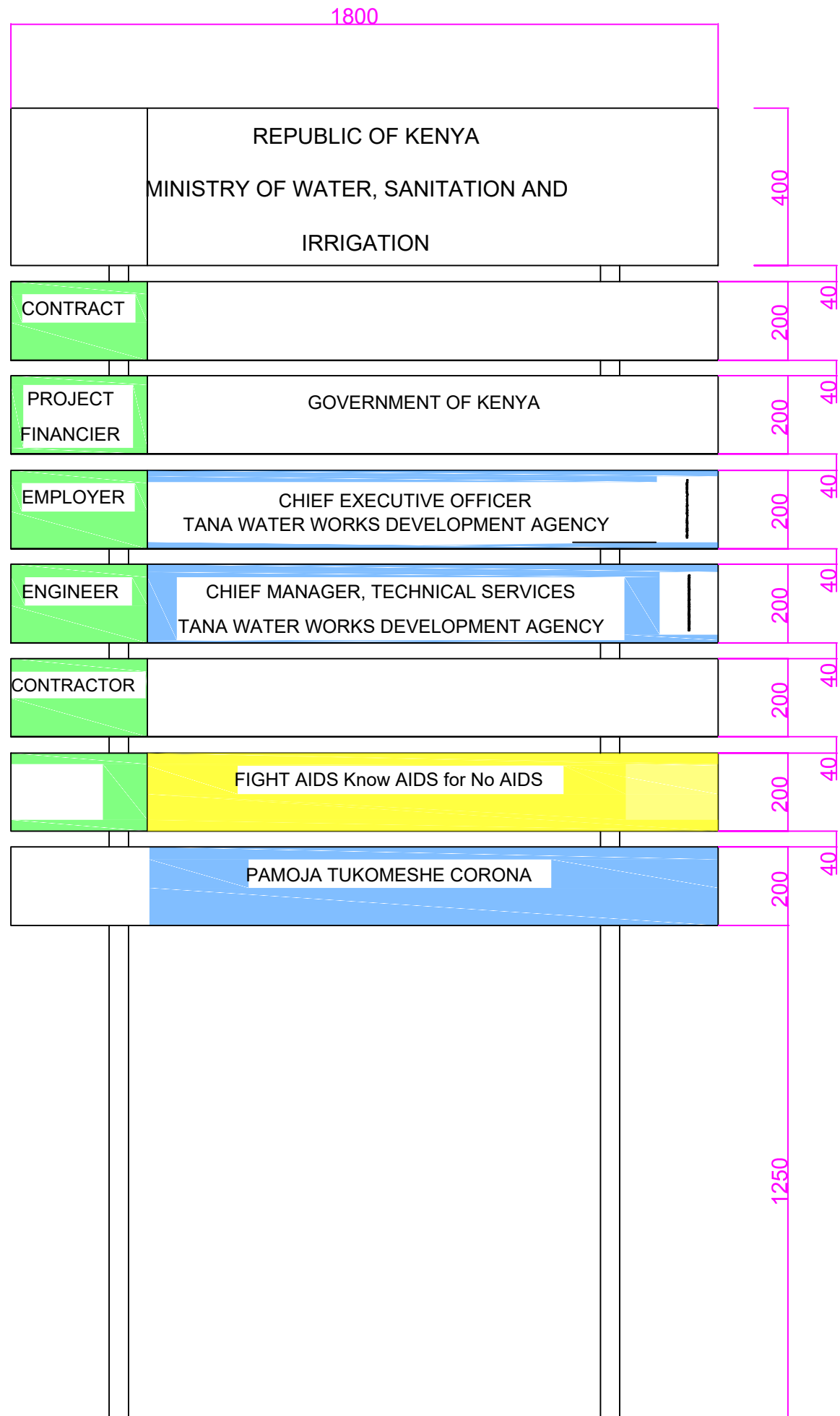
PROJECT TITLE:
BARAKA - CHAKA PIPELINE EXTENSION

CONTRACT NAME.
CONSTRUCTION OF BARAKA - CHAKA WATER EXTENSION PROJECT, NYERI COUNTY

DRAWING TITLE:
MARKER POST DRAWING

Designed by: B.M.K	Drawn by: A.M.M
Checked by: J.T	Approved by: E.W
Scale: H- 1:4000, V- 1:400	Date: MARCH 2022
DRG No.	FITTINGS/004





NOTES


1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
2. THE BOARD TO BE HIGH QUALITY BLOCKBOARD WITH HARDWOOD LIPPING ALL ROUND

ISSUED FOR CONSTRUCTION

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

CLIENT:

TANA WATER WORKS DEVELOPMENT AGENCY
 P.O BOX 1292 - 10100,
 NYERI, KENYA

ENGINEERS:

TANA WATER WORKS DEVELOPMENT AGENCY
 P.O BOX 1292 - 10100,
 NYERI, KENYA

PROJECT TITLE:
BARAKA - CHAKA PIPELINE EXTENSION

CONTRACT NAME.
CONSTRUCTION OF BARAKA - CHAKA WATER EXTENSION PROJECT, NYERI COUNTY

DRAWING TITLE:
SIGN POST DRAWING

Designed by: B.M.K	Drawn by: A.M.M
Checked by: J.T	Approved by: E.W
Scale: H- 1:4000, V- 1:400	Date: MARCH 2022

DRG No. **SIGNPOST/001**

