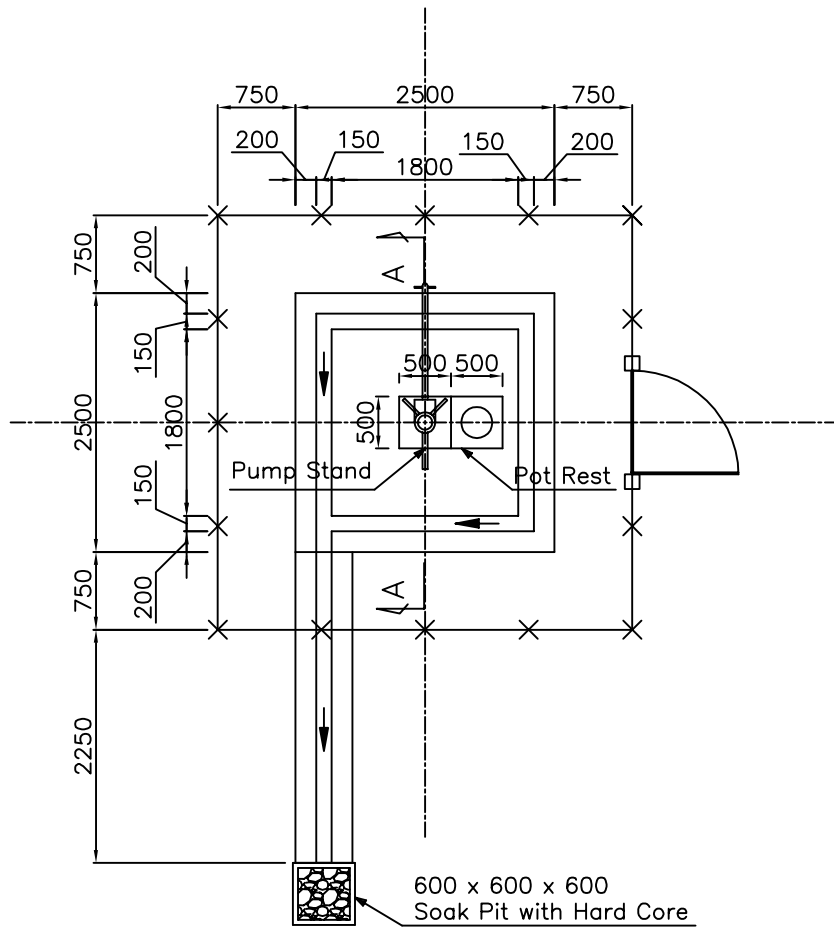


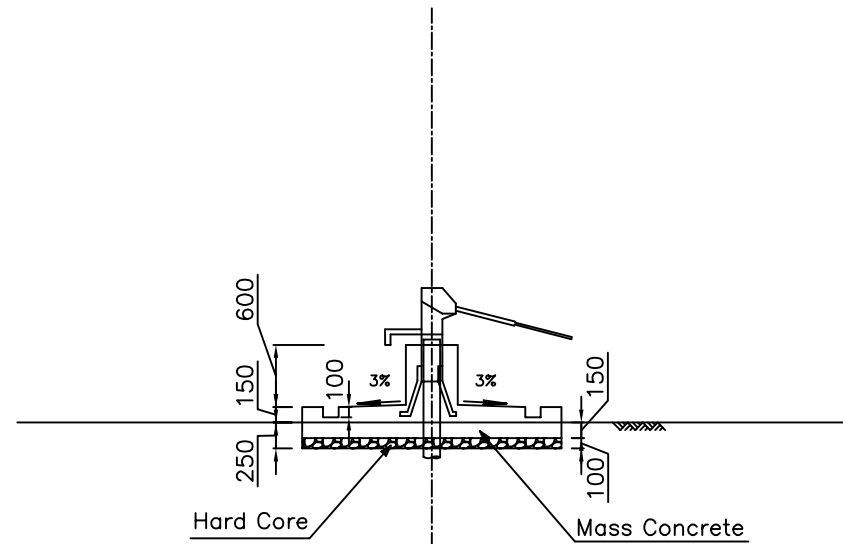
Appendix-5 Other Relevant Data

- 5.1 Basic Design Drawings***
- 5.2 Results of Water Quality Survey***
- 5.3 Selection of Project Target Communities***
- 5.4 Social Survey Results***
- 5.5 Result of Electrical Sounding Survey in Target Communities***
- 5.6 Route Map of Target Communities (Spring)***
- 5.7 Results of Groundwater Potential Assessment***
- 5.8 Pump Type Selection***
- 5.9 Database of Existing UNICEF Borehole***
- 5.10 Specification for Ethiopian Drinking Water Quality Guilelines***

5.1
Basic Design Drawings

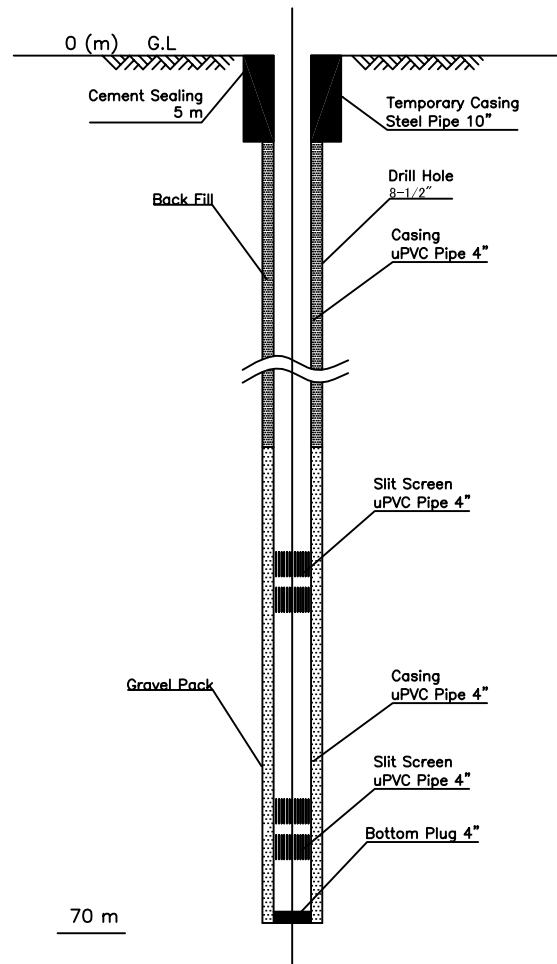


Plane




Section

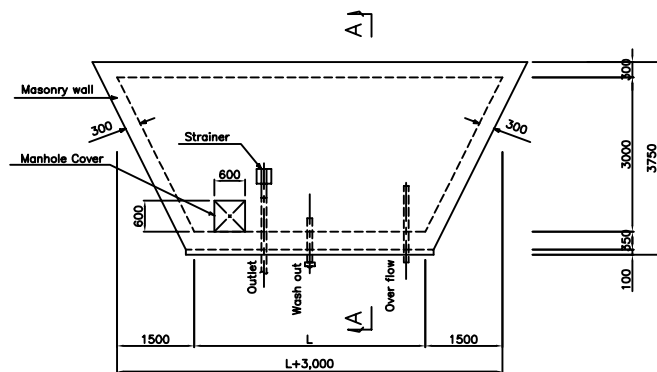
OWNER : JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PROJECT NAME : THE BASIC DESIGN STUDY ON THE PROJECT FOR WATER SUPPLY IN SOUTHERN NATIONS, NATIONALITIES AND PEOPLE'S REGIONAL STATE IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	CONSULTING ENGINEERS : NIPPON KOEI CO.,LTD.	DRAWING TITLE : Hand Pump Apron		
			SCALE S=1:50	DATE February 2005	DRAWING NO. SW-1.1



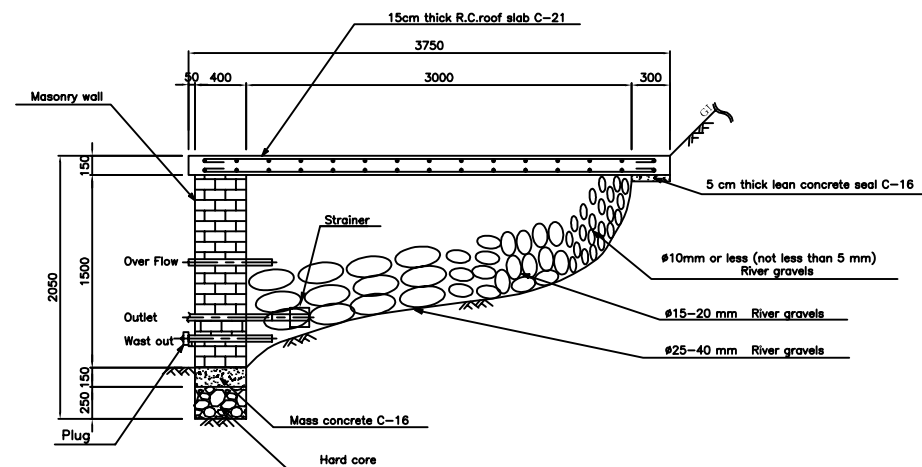
Standard Figure of Borehole Structure

OWNER : JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PROJECT NAME : THE BASIC DESIGN STUDY ON THE PROJECT FOR WATER SUPPLY IN SOUTHERN NATIONS, NATIONALITIES AND PEOPLE'S REGIONAL STATE IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	CONSULTING ENGINEERS :  NIPPON KOEI CO.,LTD.	DRAWING TITLE : Borehole Structure		
			SCALE None	DATE February 2005	DRAWING NO. SW-1.2

Types	L (mm)
I	2,500
II	3,500
III	4,500



S=1:50



A-A

S=1:20

OWNER :
JAPAN INTERNATIONAL
COOPERATION AGENCY (JICA)

PROJECT NAME :
THE BASIC DESIGN STUDY ON THE PROJECT
FOR WATER SUPPLY IN SOUTHERN NATIONS,
NATIONALITIES AND PEOPLE'S REGIONAL STATE
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

CONSULTING ENGINEERS :
 NIPPON KOEI CO.,LTD.

DRAWING TITLE :
Spring Capping

SCALE
S=1:50
S=1:20

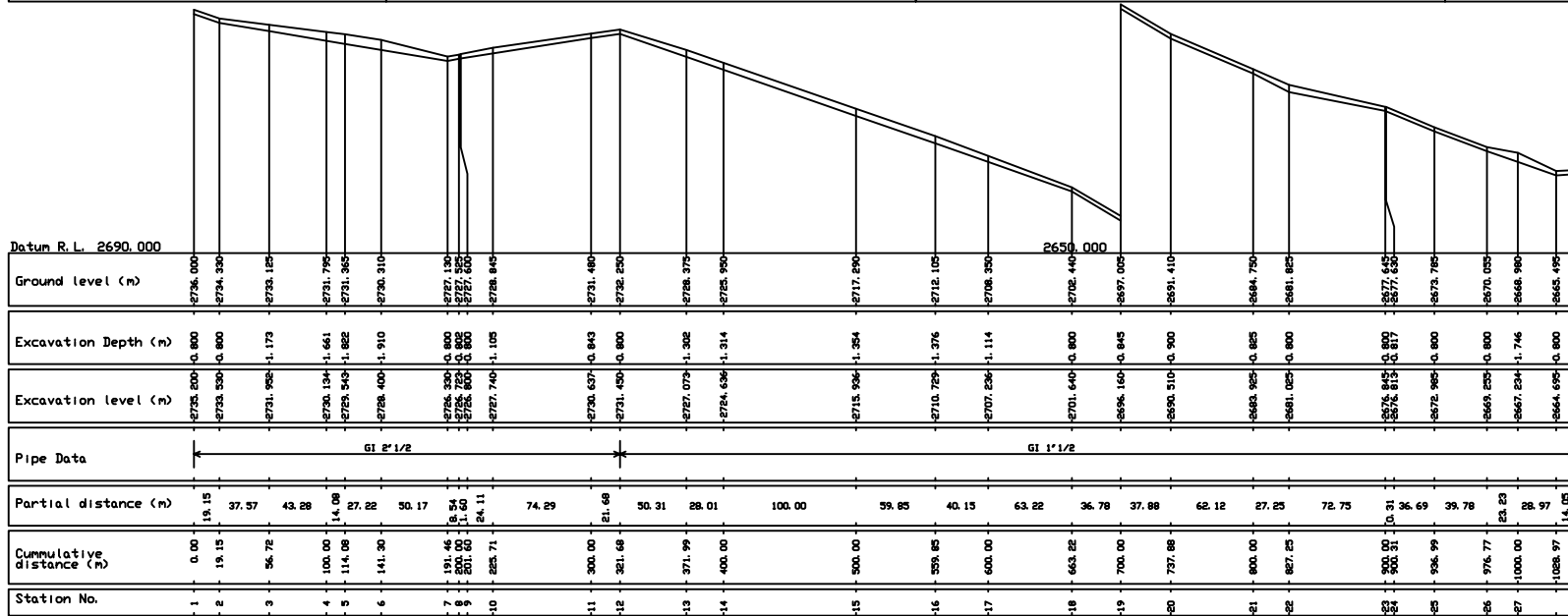
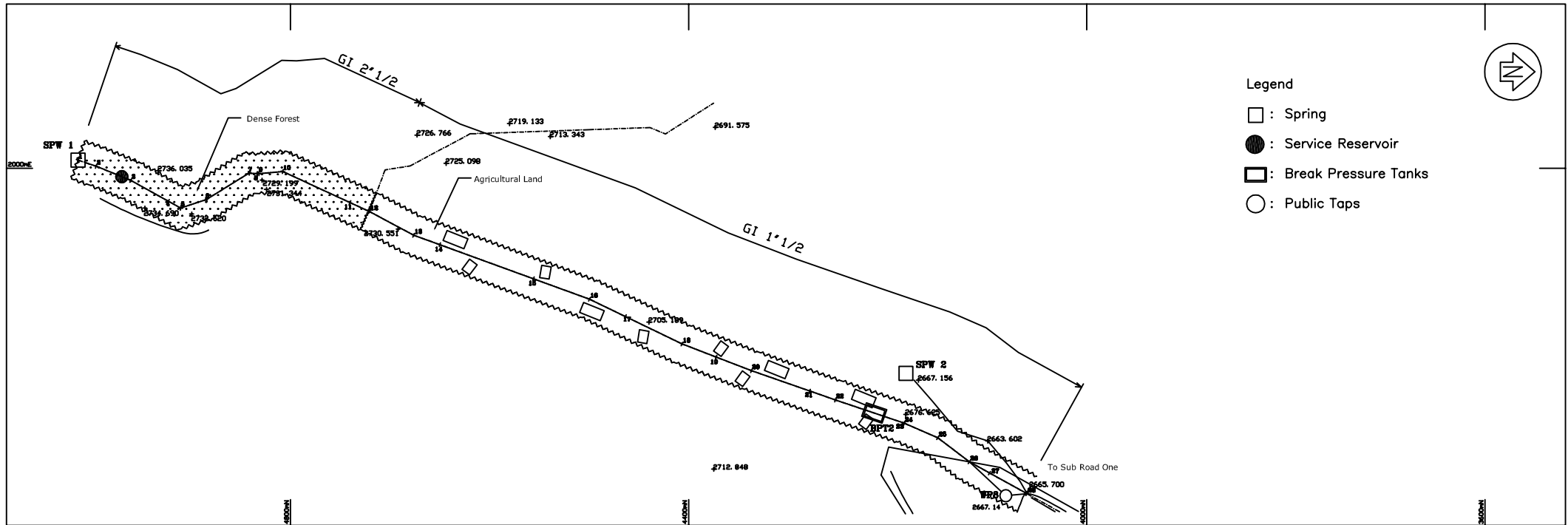
DATE
February 2005

DRAWING NO.
SF-1.1



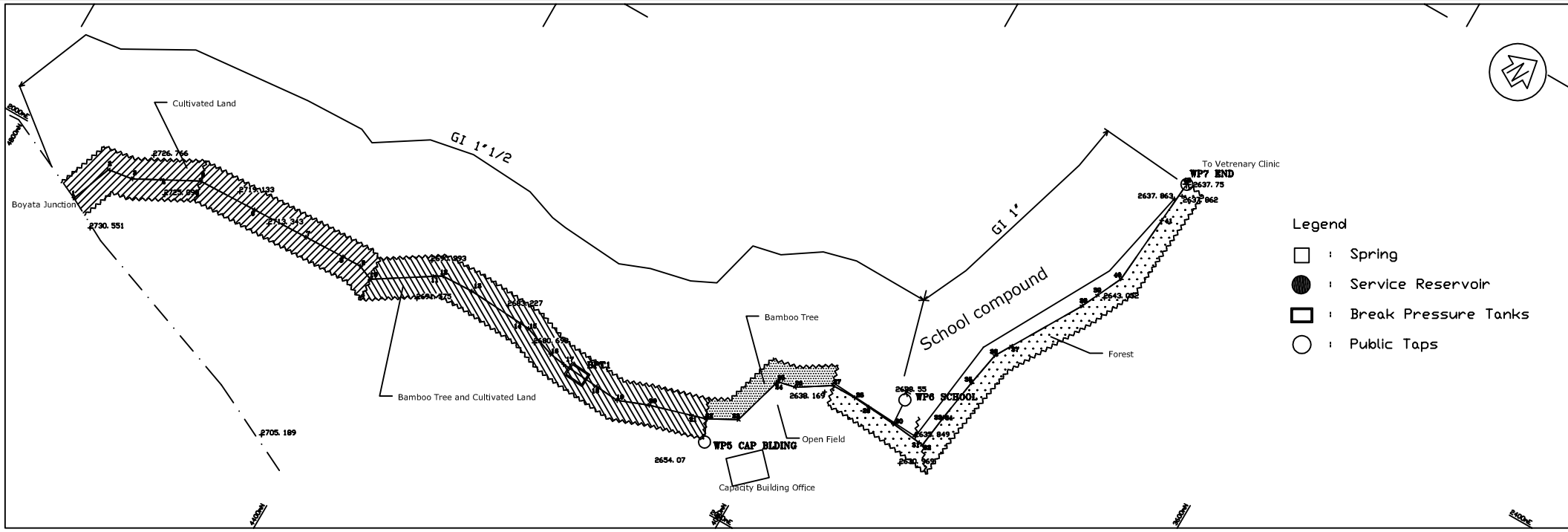
Legend

- : Spring
- : Service Reservoir
- ▣ : Break Pressure Tanks
- : Public Taps

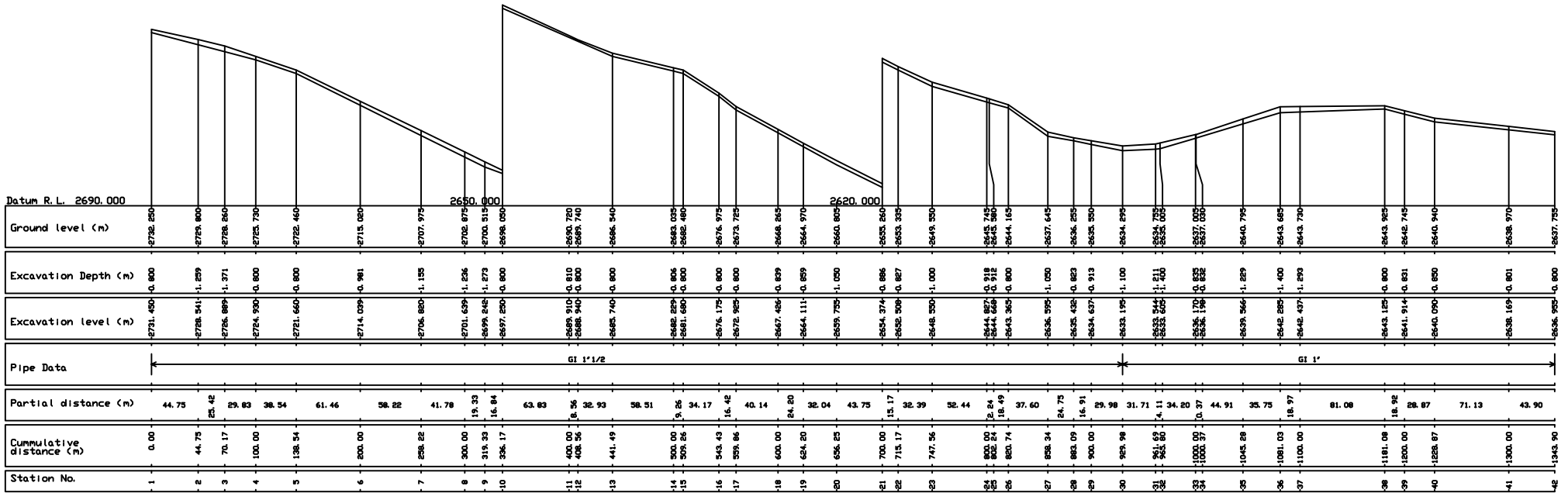


Longitudinal section between 0.00 and 1043.02 line2 to Kechi

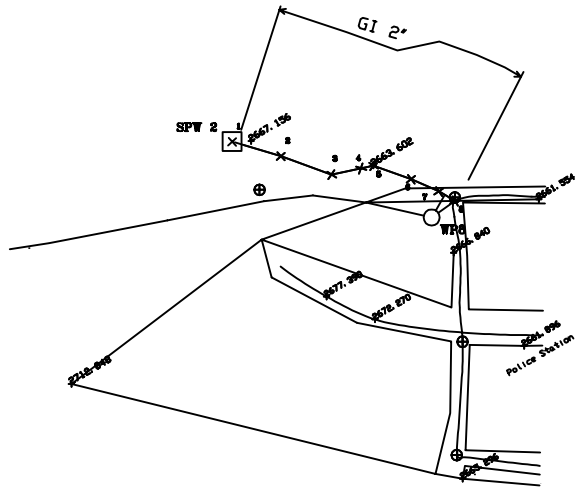
OWNER : JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PROJECT NAME : THE BASIC DESIGN STUDY ON THE PROJECT FOR WATER SUPPLY IN SOUTHERN NATIONS, NATIONALITIES AND PEOPLE'S REGIONAL STATE IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	CONSULTING ENGINEERS : NIPPON KOEI CO., LTD.	DRAWING TITLE : Kechi 1/5 (Topographical Drawing)	
			SCALE : V=1:500 H=1:2,000	DATE : February 2005
			DRAWING NO. SF-2.1	



- Legend
- : Spring
 - : Service Reservoir
 - : Break Pressure Tanks
 - : Public Taps



Longitudinal section between 0.00 and 1343.90 line1 to school



Legend

- : Spring
- : Service Reservoir
- ▣ : Break Pressure Tanks
- : Public Taps

Datum R.L. 2650.000	
Ground level (m)	2668.300, 2666.300, 2665.640, 2663.300, 2663.600, 2663.000, 2664.515, 2665.700
Excavation Depth (m)	0.800, 0.800, 0.800, 1.300, 0.800, 1.300, 0.816, 0.800
Excavation level (m)	2667.500, 2665.52, 2664.840, 2662.000, 2662.800, 2661.700, 2663.689, 2664.900
Pipe Data	GI 2"
Partial distance (m)	37.73, 39.99, 22.28, 10.63, 29.68, 22.63, 11.91
Cummulative distance (m)	0.00, 37.73, 77.72, 100.00, 109.63, 139.31, 161.94, 175.85
Station No.	1, 2, 3, 4, 5, 6, 7, 8
Chainage	0.00, 37.73, 77.72, 100.00, 109.63, 139.31, 161.94, 175.85
Hz scale	1: 2000
Vt scale	1: 500

Longitudinal section between 0.00 and 175.85 SWP2

OWNER :

JAPAN INTERNATIONAL
COOPERATION AGENCY (JICA)

PROJECT NAME :

THE BASIC DESIGN STUDY ON THE PROJECT
FOR WATER SUPPLY IN SOUTHERN NATIONS,
NATIONALITIES AND PEOPLE'S REGIONAL STATE
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

CONSULTING ENGINEERS :



NIPPON KOEI CO.,LTD.

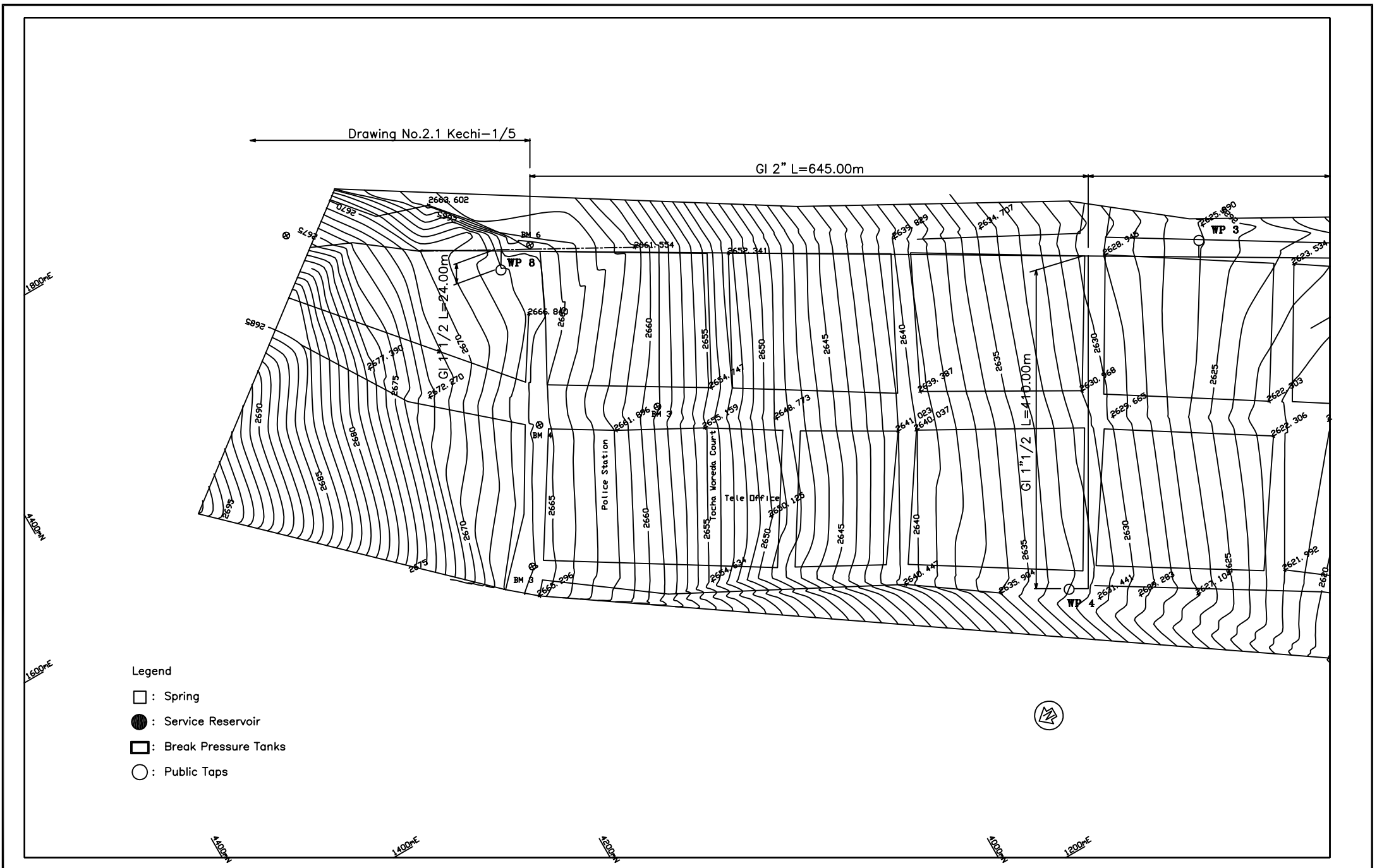
DRAWING TITLE :


Kechi 3/5 (Topographical Drawing)

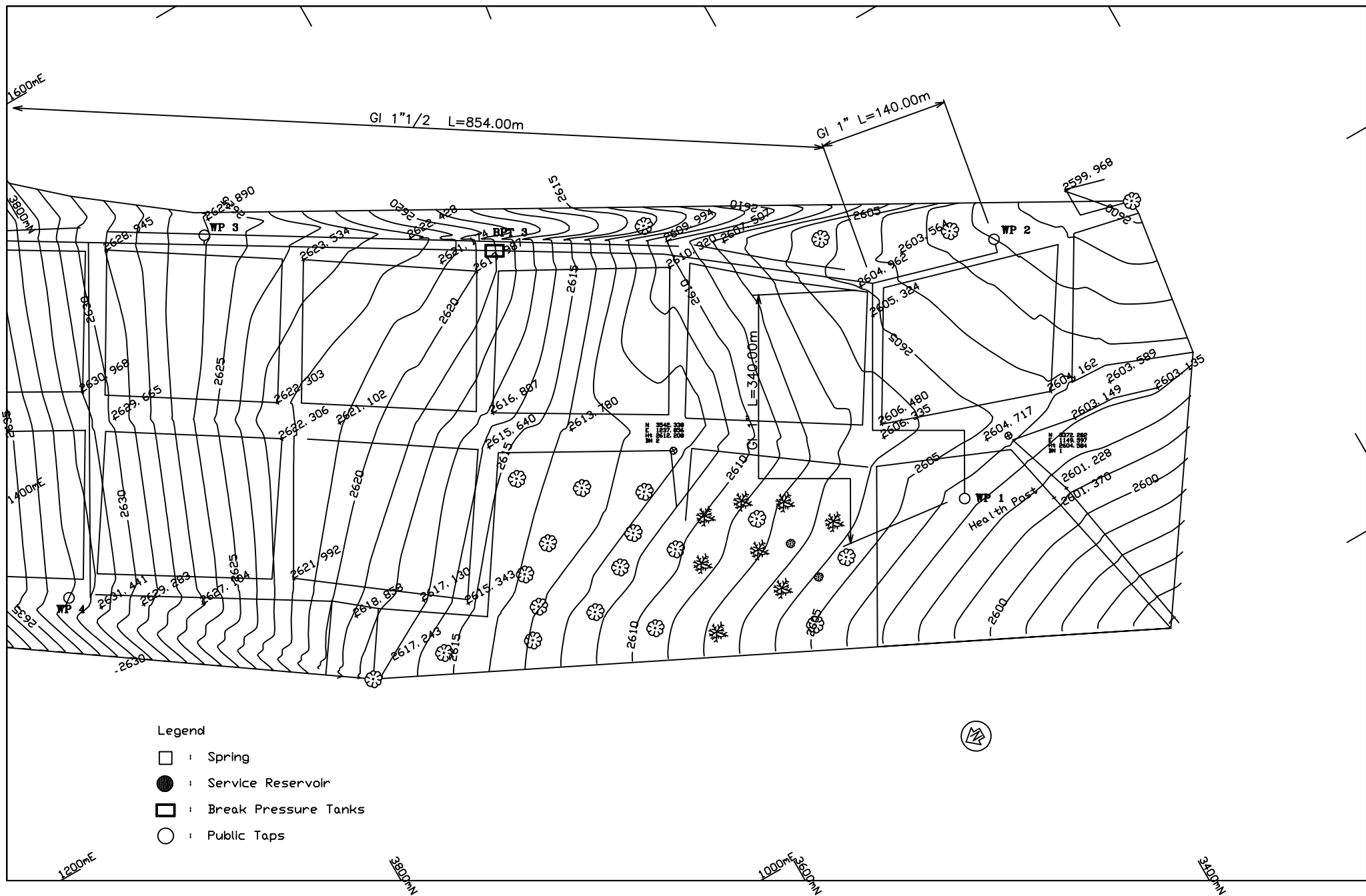
SCALE Vt=1:500
Hz=1:2,000

DATE
February 2005

DRAWING NO.
SF-2.3

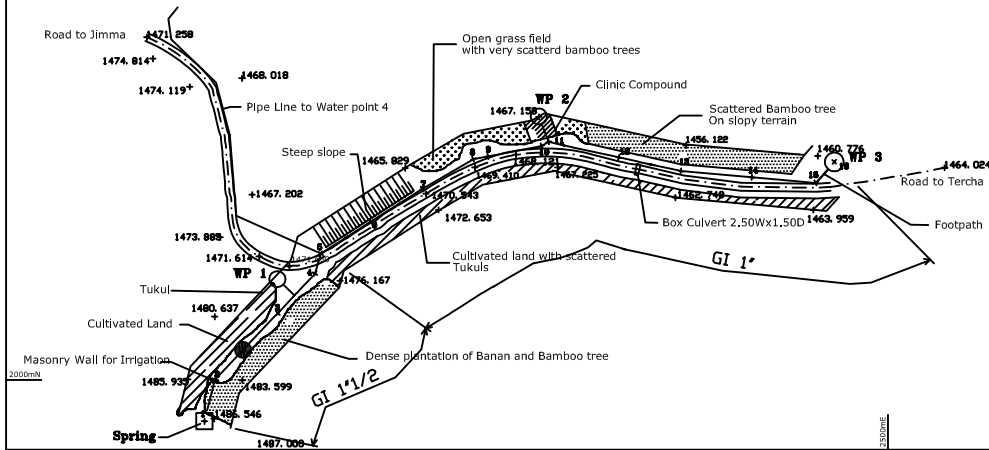


<p>OWNER :</p> <p>JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)</p>	<p>PROJECT NAME :</p> <p>THE BASIC DESIGN STUDY ON THE PROJECT FOR WATER SUPPLY IN SOUTHERN NATIONS, NATIONALITIES AND PEOPLE'S REGIONAL STATE IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA</p>	<p>CONSULTING ENGINEERS :</p> <p> NIPPON KOEI CO.,LTD.</p>	<p>DRAWING TITLE :</p> <p>Kechi 4/5 (Topographical Drawing)</p> <table border="1"> <tr> <td data-bbox="1534 1492 1713 1564"> <p>SCALE</p> <p>1:2,000</p> </td> <td data-bbox="1713 1492 1892 1564"> <p>DATE</p> <p>February 2005</p> </td> <td data-bbox="1892 1492 2206 1564"> <p>DRAWING NO.</p> <p>SF-2.4</p> </td> </tr> </table>	<p>SCALE</p> <p>1:2,000</p>	<p>DATE</p> <p>February 2005</p>	<p>DRAWING NO.</p> <p>SF-2.4</p>
<p>SCALE</p> <p>1:2,000</p>	<p>DATE</p> <p>February 2005</p>	<p>DRAWING NO.</p> <p>SF-2.4</p>				

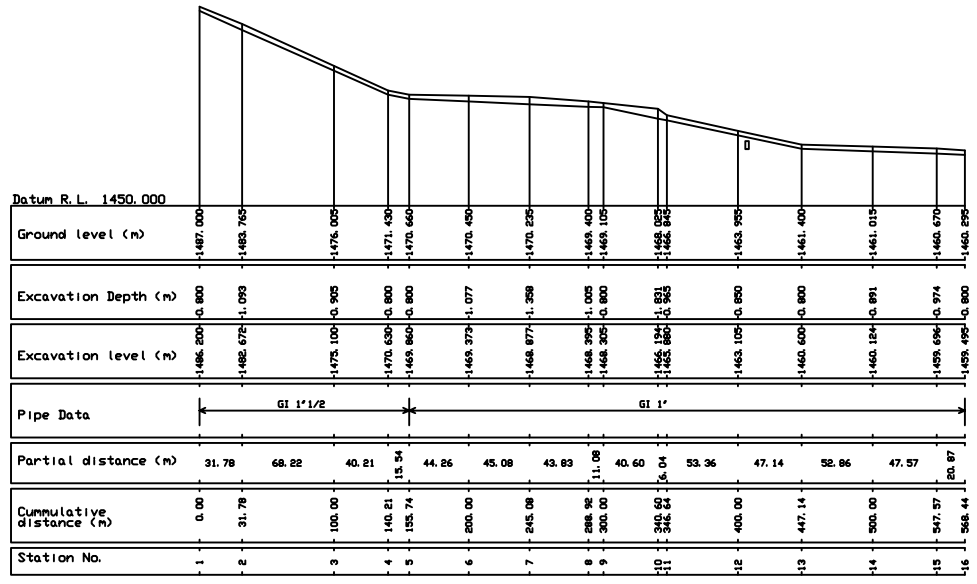


- Legend
- : Spring
 - : Service Reservoir
 - : Break Pressure Tanks
 - : Public Taps

OWNER : JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PROJECT NAME : THE BASIC DESIGN STUDY ON THE PROJECT FOR WATER SUPPLY IN SOUTHERN NATIONS, NATIONALITIES AND PEOPLE'S REGIONAL STATE IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	CONSULTING ENGINEERS :  NIPPON KOEI CO.,LTD.	DRAWING TITLE : Kechi 5/5 (Topographical Drawing)		
			SCALE 1:2,000	DATE February 2005	DRAWING NO. SF-2.5

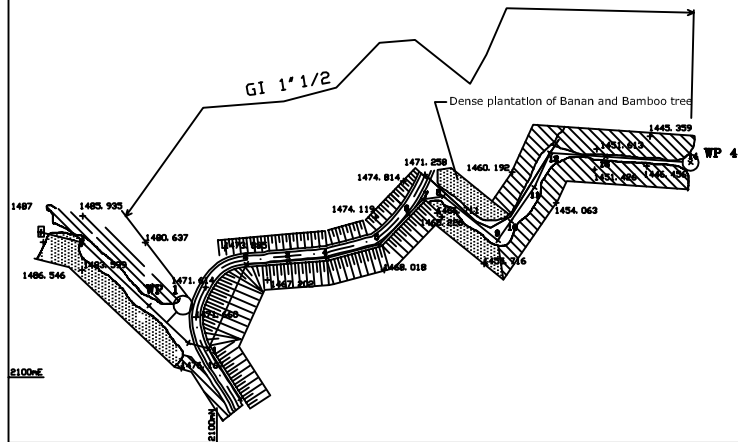


- Legend**
- : Spring
 - : Service Reservoir
 - ▭ : Break Pressure Tanks
 - : Public Taps



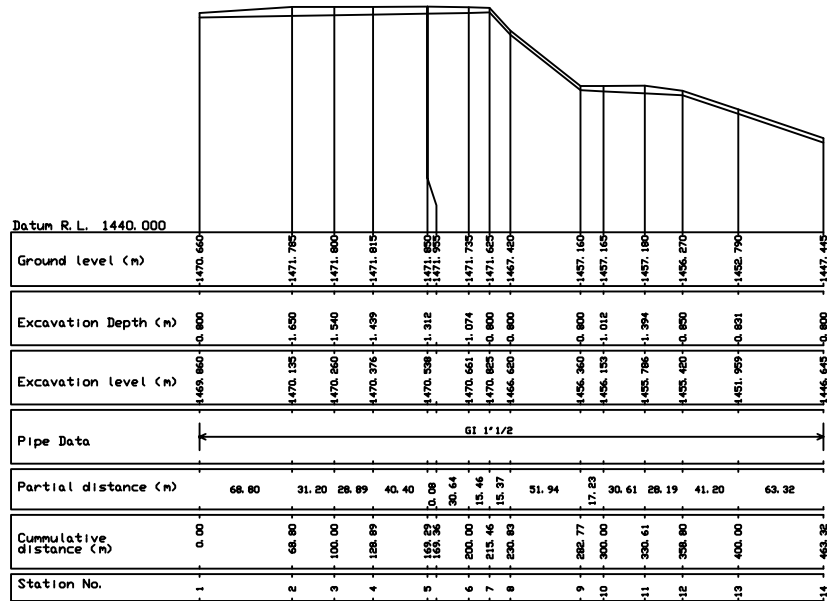
Longitudinal section between 0.00 and 568.44 line 1

OWNER : JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PROJECT NAME : THE BASIC DESIGN STUDY ON THE PROJECT FOR WATER SUPPLY IN SOUTHERN NATIONS, NATIONALITIES AND PEOPLE'S REGIONAL STATE IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	CONSULTING ENGINEERS : NIPON KOEI CO., LTD.	DRAWING TITLE : Waruma Kessa 1/2 (Topographical Drawing)		
			SCALE Vt=1:500 Hz=1:2,000	DATE February 2005	DRAWING NO. SF-2.6



Legend

- : Spring
- : Service Reservoir
- : Break Pressure Tanks
- : Public Taps



Longitudinal section between 0.00 and 463.32 Line 2

OWNER :

JAPAN INTERNATIONAL
COOPERATION AGENCY (JICA)

PROJECT NAME :

THE BASIC DESIGN STUDY ON THE PROJECT
FOR WATER SUPPLY IN SOUTHERN NATIONS,
NATIONALITIES AND PEOPLE'S REGIONAL STATE
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

CONSULTING ENGINEERS :

NIPPON KOEI CO.,LTD.

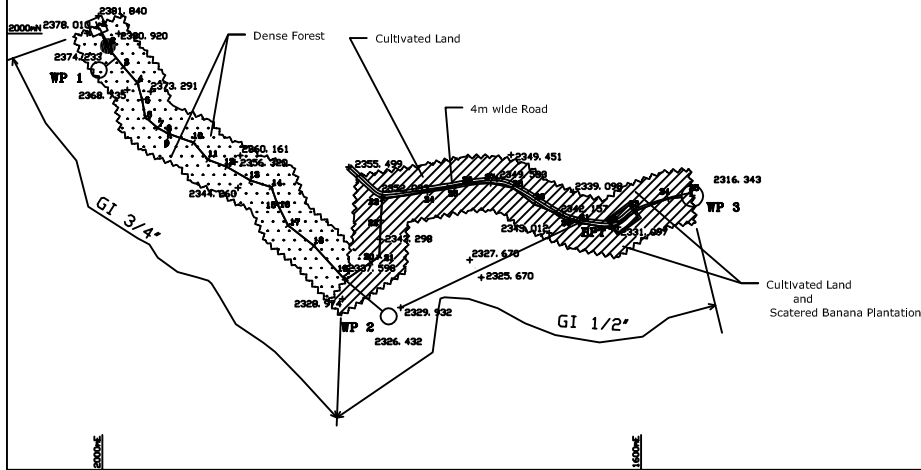
DRAWING TITLE :

Waruma Kessa 2/2 (Topographical Drawing)

SCALE
Vt=1:500
Hz=1:2,000

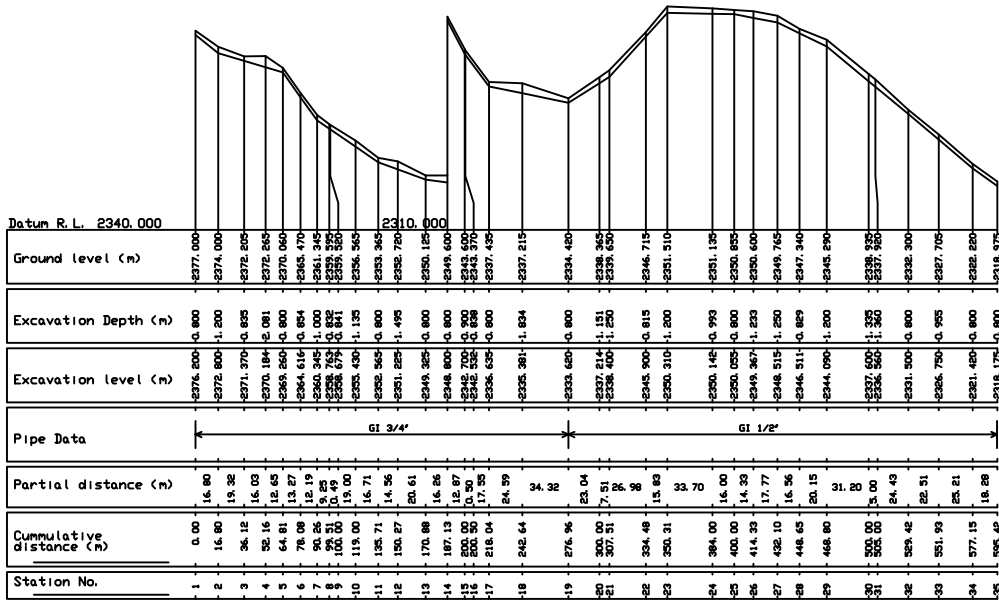
DATE
February 2005

DRAWING NO.
SF-2.7



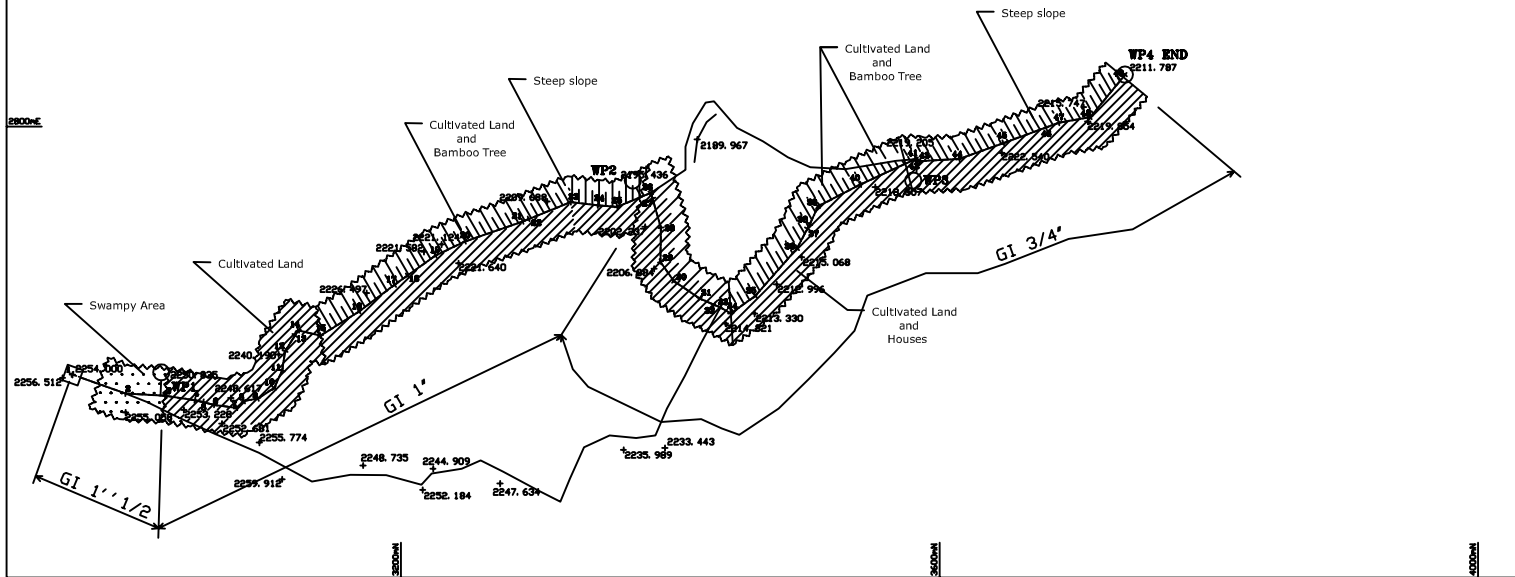
Legend

- : Spring
- : Service Reservoir
- ▣ : Break Pressure Tanks
- : Public Taps



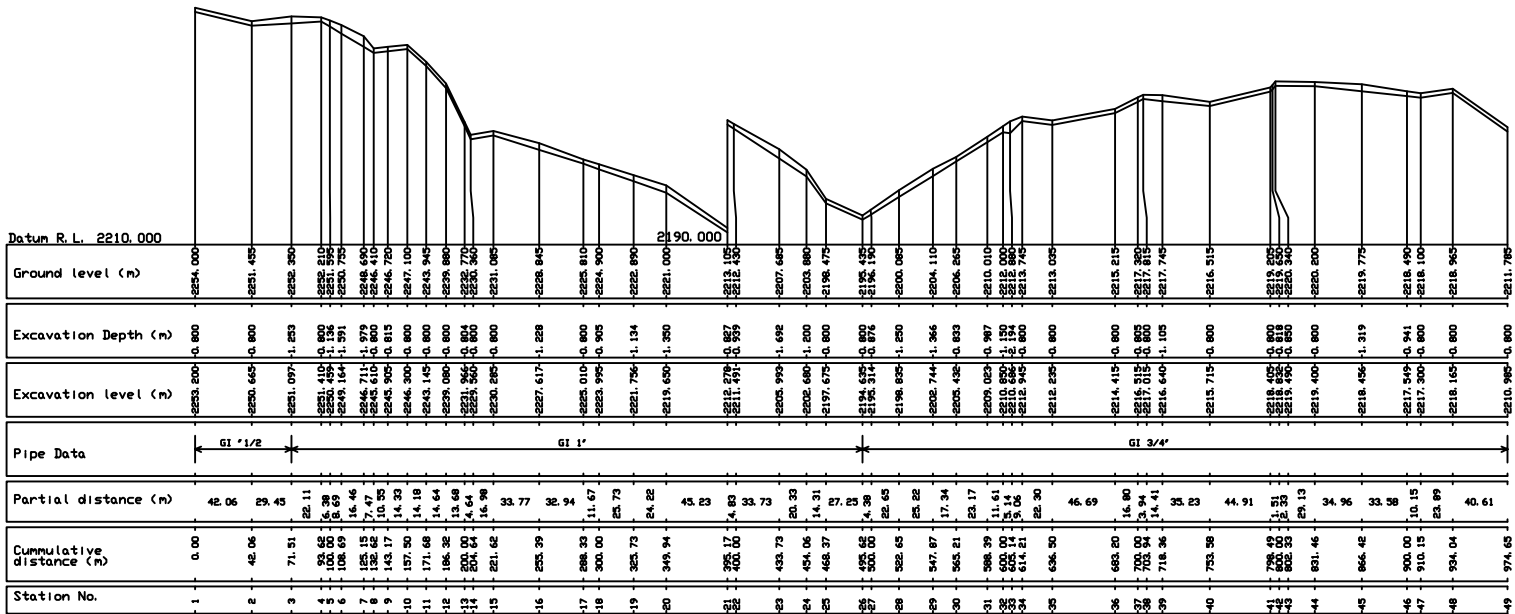
Longitudinal section between 0.00 and 595.42

<p>OWNER:</p> <p style="text-align: center;">JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)</p>	<p>PROJECT NAME:</p> <p style="text-align: center;">THE BASIC DESIGN STUDY ON THE PROJECT FOR WATER SUPPLY IN SOUTHERN NATIONS, NATIONALITIES AND PEOPLE'S REGIONAL STATE IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA</p>	<p>CONSULTING ENGINEERS :</p> <p style="text-align: center;"> NIPPON KOEI CO.,LTD.</p>	<p>DRAWING TITLE:</p> <p style="text-align: center;">Arusi Bale 1/1 (Topographical Drawing)</p>						
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">SCALE</td> <td style="width: 50%;">DATE</td> </tr> <tr> <td style="text-align: center;">Vt=1:500 Hz=1:2,000</td> <td style="text-align: center;">February 2005</td> </tr> </table>	SCALE	DATE	Vt=1:500 Hz=1:2,000	February 2005	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 100%;">DRAWING NO.</td> </tr> <tr> <td style="text-align: center;">SF-2.8</td> </tr> </table>	DRAWING NO.	SF-2.8
SCALE	DATE								
Vt=1:500 Hz=1:2,000	February 2005								
DRAWING NO.									
SF-2.8									



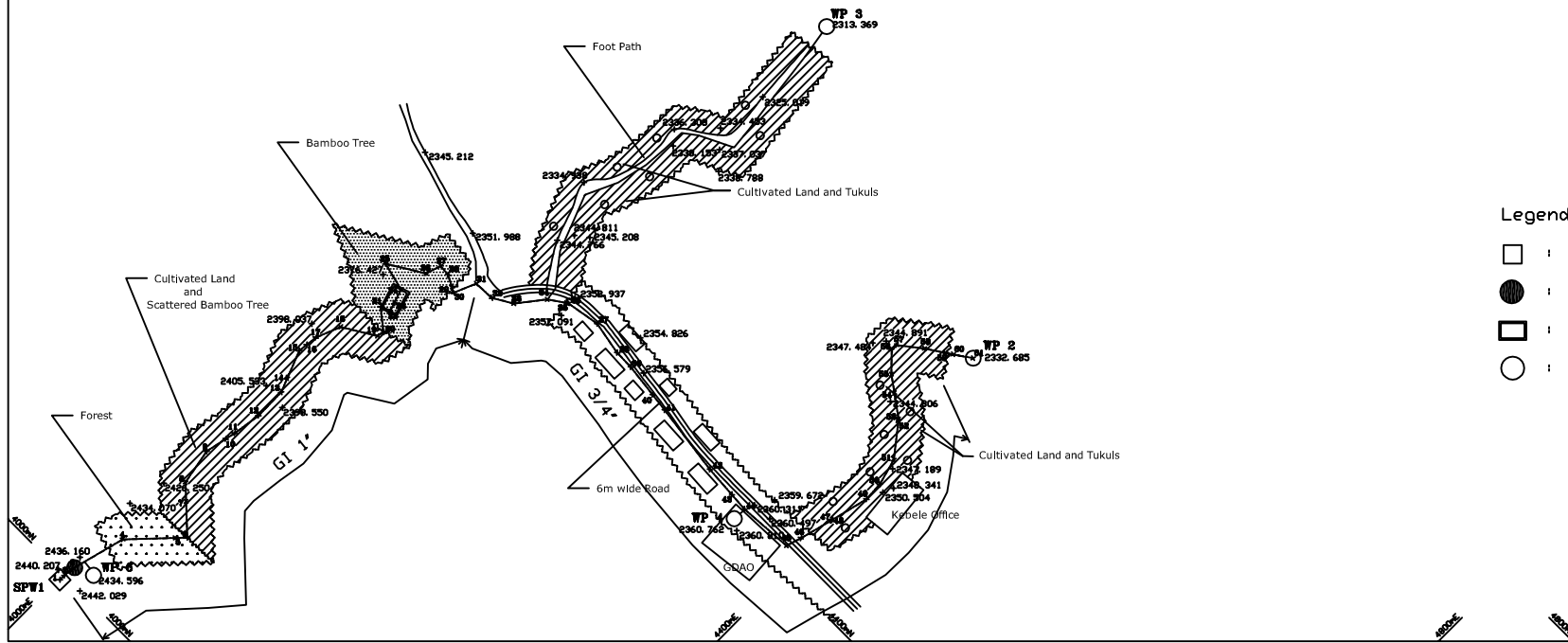
Legend

- : Spring
- : Service Reservoir
- ▣ : Break Pressure Tanks
- : Public Taps

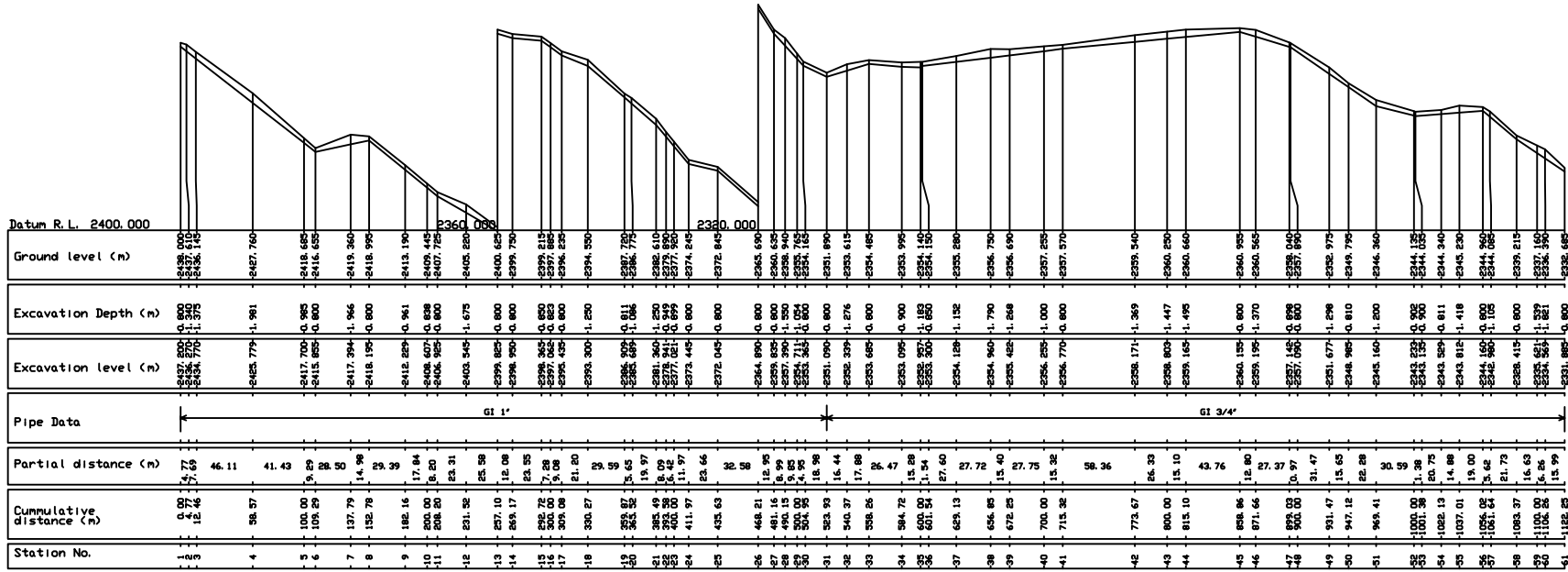


Longitudinal section between 0.00 and 974.65 Option 1

OWNER : JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PROJECT NAME : THE BASIC DESIGN STUDY ON THE PROJECT FOR WATER SUPPLY IN SOUTHERN NATIONS, NATIONALITIES AND PEOPLE'S REGIONAL STATE IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	CONSULTING ENGINEERS : NIPPON KOEI CO., LTD.	DRAWING TITLE : Arusi Bale 1/1 (Topographical Drawing)	
			SCALE V=1:500 H=1:2,000	DATE February 2005
			DRAWING NO. SF-2.9	

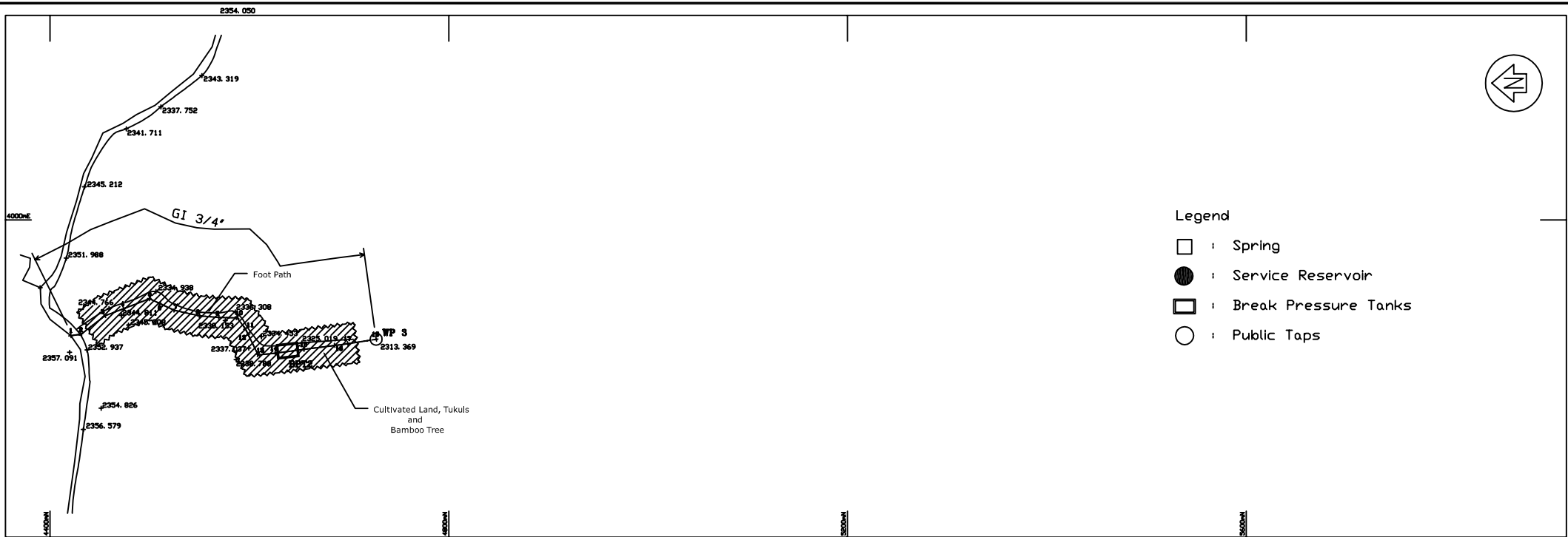


- Legend**
- : Spring
 - : Service Reservoir
 - : Break Pressure Tanks
 - : Public Taps

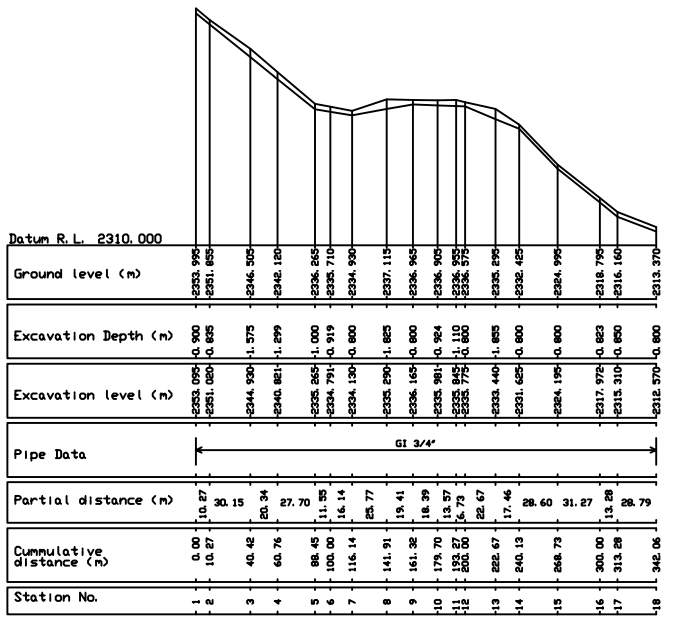


Longitudinal section between 0.00 and 1122.25 line1

OWNER : JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PROJECT NAME : THE BASIC DESIGN STUDY ON THE PROJECT FOR WATER SUPPLY IN SOUTHERN NATIONS, NATIONALITIES AND PEOPLE'S REGIONAL STATE IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	CONSULTING ENGINEERS : NIPPON KOEI CO., LTD.	DRAWING TITLE : Gudumu (Soso) 1/3 (Topographical Drawing)	
			SCALE Vt=1:500 Hz=1:2,000	DRAWING NO. February 2005 SF-2.10

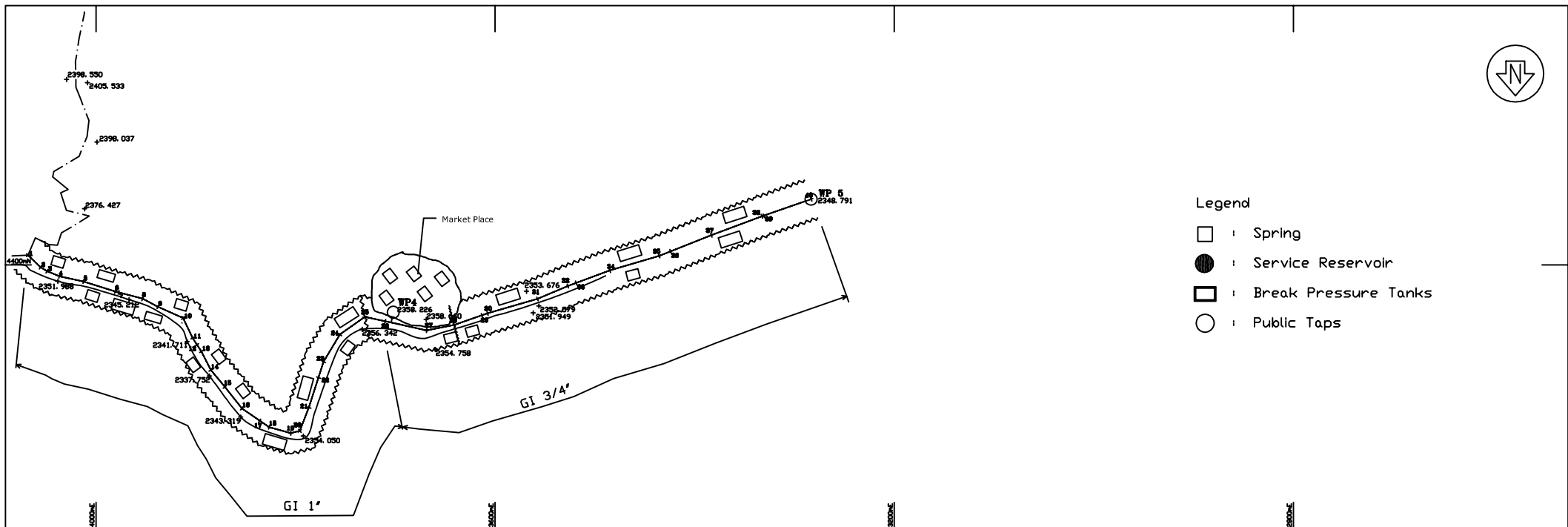


- Legend
- : Spring
 - : Service Reservoir
 - ▭ : Break Pressure Tanks
 - : Public Taps



Longitudinal section between 0.00 and 342.06 line2

OWNER : JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PROJECT NAME : THE BASIC DESIGN STUDY ON THE PROJECT FOR WATER SUPPLY IN SOUTHERN NATIONS, NATIONALITIES AND PEOPLE'S REGIONAL STATE IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	CONSULTING ENGINEERS : NIPPON KOEI CO.,LTD.	DRAWING TITLE : Gudumu (Soso) 2/3 (Topographical Drawing)		
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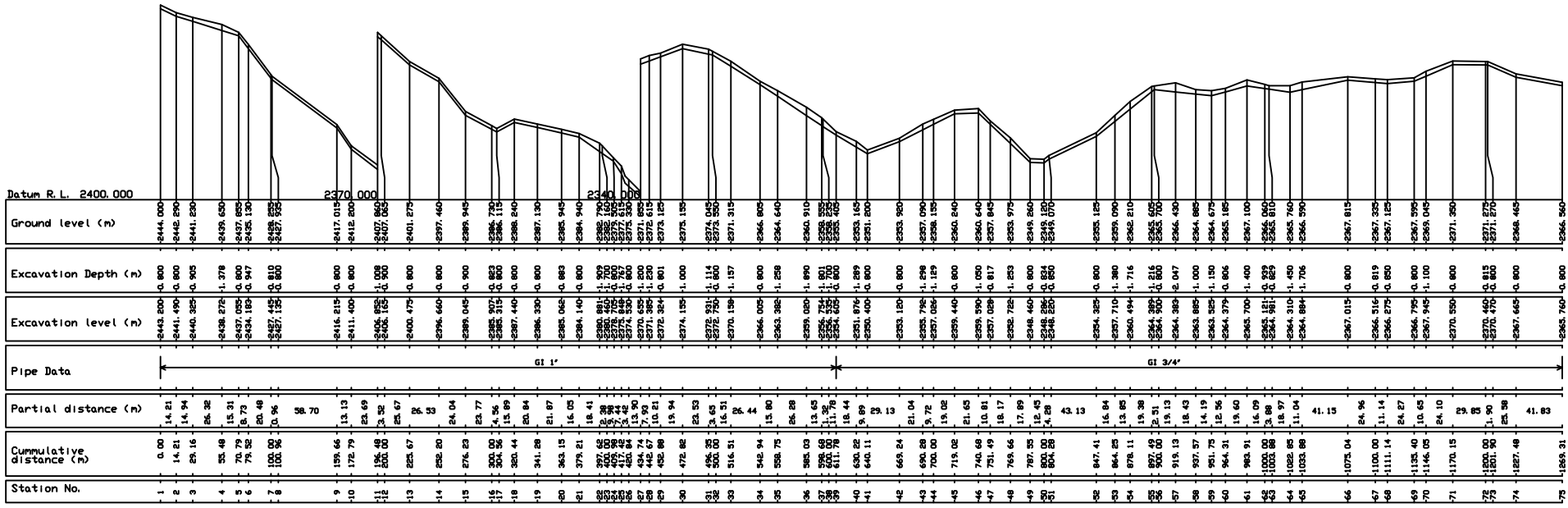
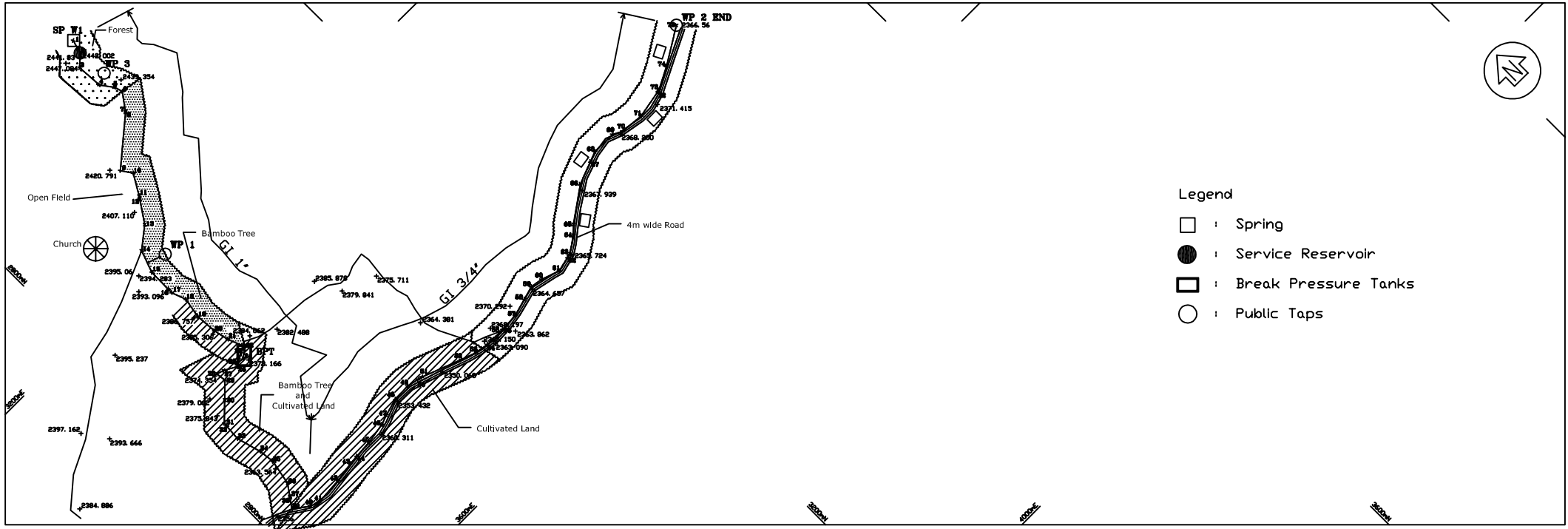


Legend

- : Spring
- : Service Reservoir
- : Break Pressure Tanks
- : Public Taps

Datum R. L. 2330.000	
Ground level (m)	2351.890 2351.880 2353.115 2352.995 2348.995 2347.615 2347.095 2345.415 2341.740 2345.865 2345.855 2342.400 2338.825 2337.980 2342.475 2347.128 2345.660 2353.010 2354.120 2355.825 2348.825 2356.810 2357.255 2356.570 2357.305 2356.945 2354.425 2353.125 2350.630 2352.675 2349.510 2349.575 2348.820 2347.010 2346.060 2347.830 2346.650 2346.165 2346.455 2346.375 2348.790
Excavation Depth (m)	-0.800 -0.800 -0.800 -1.647 -0.900 -0.850 -1.000 -0.800 -0.800 -1.242 -1.198 -0.800 -0.800 -1.300 -1.300 -0.840 -1.611 -1.026 -1.249 -0.800 -1.649 -0.800 -2.119 -0.800 -0.800 -1.047 -0.850 -0.814 -0.800 -2.045 -0.864 -0.950 -0.800 -1.259 -1.177 -0.850 -0.814 -0.900
Excavation level (m)	2351.090 2351.080 2353.115 2351.348 2348.095 2346.765 2346.095 2344.615 2340.940 2344.615 2344.659 2341.600 2337.025 2336.680 2341.635 2345.514 2347.634 2351.651 2353.325 2354.176 2355.249 2355.814 2355.814 2356.800 2356.697 2356.325 2356.570 2356.258 2356.095 2353.631 2353.125 2350.630 2349.046 2348.625 2347.480 2346.801 2346.653 2346.165 2345.611 2346.375 2347.990
Pipe Data	GI 1" / GI 3/4"
Partial distance (m)	17.38 7.96 13.49 84.74 33.33 36.60 84.69 17.38 27.68 22.22 18.04 18.15 80.74 28.89 22.03 27.01 31.56 21.55 11.78 22.37 9.27 25.02 31.56 31.56 16.63 31.90 30.90 49.49 21.96 11.34 31.13 31.13 88.88 33.33 16.01 16.01 16.18 16.18 99.99 16.83 36.04 51.60 12.36 43.72 54.29 1.99 50.21
Cumulative distance (m)	0.00 17.38 25.34 39.43 63.17 100.00 184.69 142.06 169.74 187.78 205.82 223.97 233.24 258.26 289.82 321.38 342.93 374.49 406.05 437.61 469.17 500.73 532.29 563.85 595.41 626.97 658.53 690.09 721.65 753.21 784.77 816.33 847.89 879.45 911.01 942.57 974.13 1005.69
Station No.	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

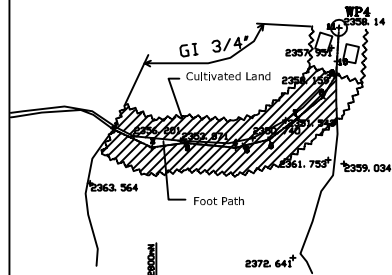
Longitudinal section between 0.00 and 950.21 line3



Longitudinal section between 0.00 and 1269.31 option 1 line 1

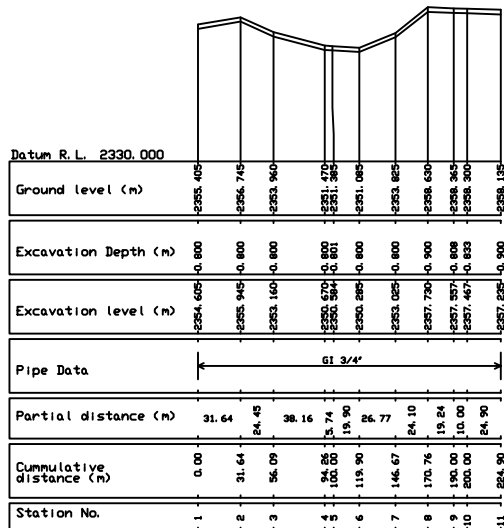


3600-E



Legend

- : Spring
- : Service Reservoir
- : Break Pressure Tanks
- : Public Taps



Longitudinal section between 0.00 and 224.90 option 1 line 2

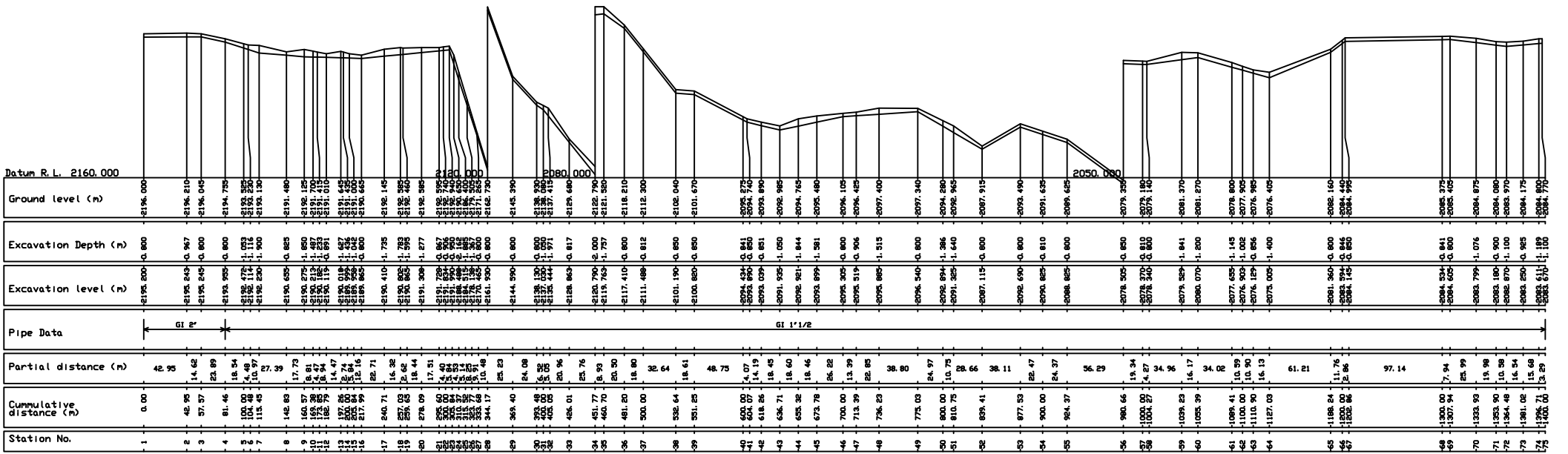
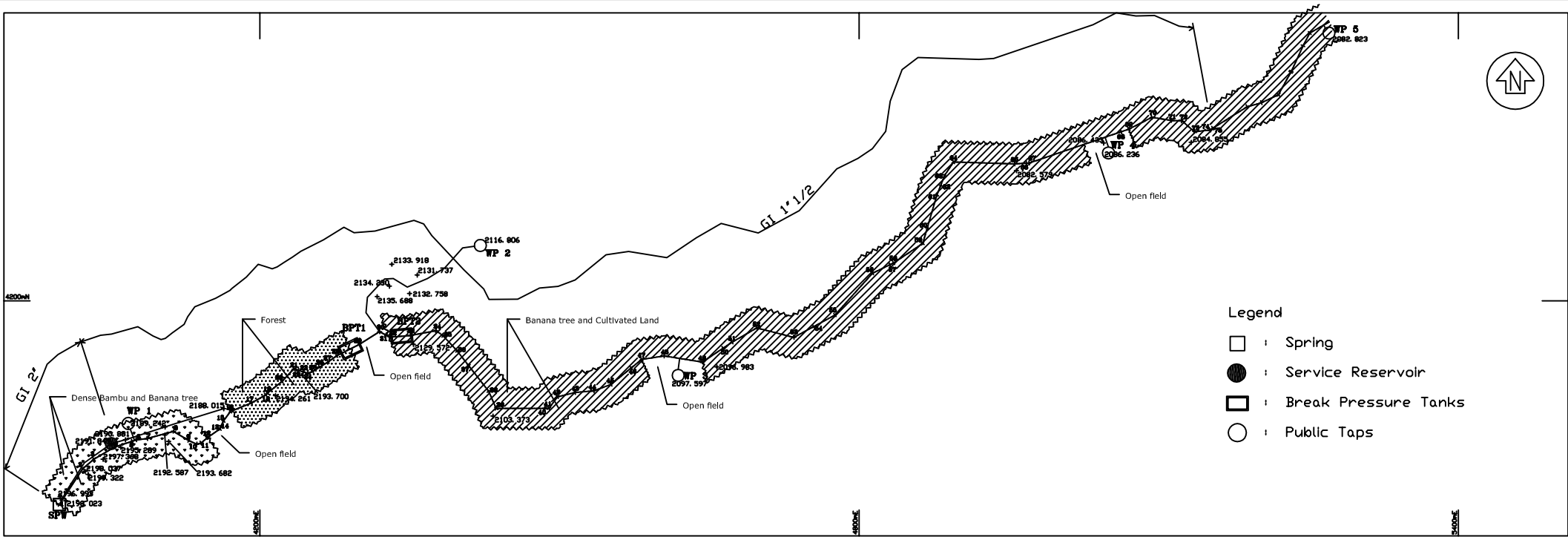
OWNER :
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

PROJECT NAME :
THE BASIC DESIGN STUDY ON THE PROJECT FOR WATER SUPPLY IN SOUTHERN NATIONS, NATIONALITIES AND PEOPLE'S REGIONAL STATE IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

CONSULTING ENGINEERS :
 NIPPON KOEI CO., LTD.

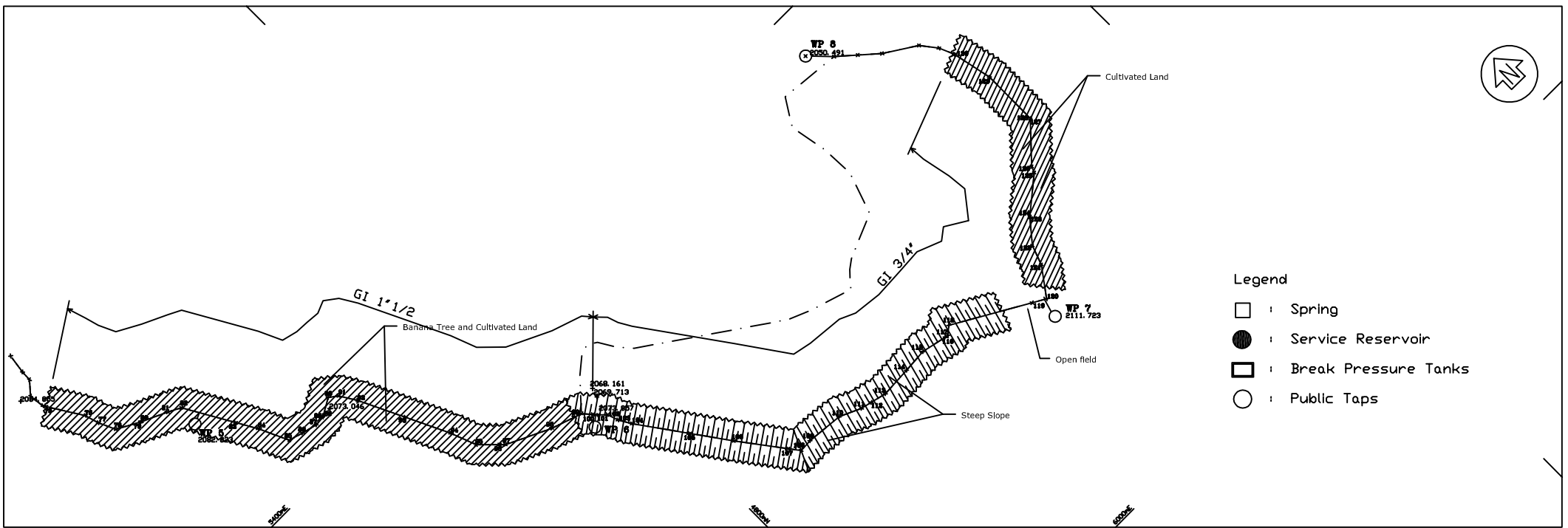
DRAWING TITLE :
Gudumu (Urgmo) 2/2 (Topographical Drawing)

SCALE Vt=1:500 Hz=1:2,000	DATE February 2005	DRAWING NO. SF-2.14
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Longitudinal section between 0.00 and 1400.00 op1line1

OWNER: JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PROJECT NAME: THE BASIC DESIGN STUDY ON THE PROJECT FOR WATER SUPPLY IN SOUTHERN NATIONS, NATIONALITIES AND PEOPLE'S REGIONAL STATE IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA	CONSULTING ENGINEERS: NIPPON KOEI CO., LTD.	DRAWING TITLE: Ofa (Yoge) 1/4 (Topographical Drawing)	
			SCALE Vt=1:500 Hz=1:2,000	DATE February 2005
			DRAWING NO. SF-2.15	



Legend

- : Spring
- : Service Reservoir
- : Break Pressure Tanks
- : Public Taps

Station No.	Ground Level (m)	Excavation Depth (m)	Excavation level (m)	Partial distance (m)	Cumulative distance (m)
75	2083.70	-1.100	2084.80	40.41	1400.00
76	2084.250	-0.801	2085.051	14.97	1440.41
77	2084.285	-0.800	2085.085	18.81	1485.38
78	2086.200	-0.800	2087.000	25.81	1474.19
79	2086.750	-0.844	2087.594	31.14	1500.00
80	2086.750	-0.850	2087.600	27.97	1531.14
81	2084.440	-1.073	2085.513	14.44	1543.54
82	2082.825	-0.800	2083.625	6.46	1543.54
83	2081.610	-0.827	2082.437	23.54	1600.00
84	2081.100	-0.800	2081.900	33.33	1623.54
85	2082.200	-0.800	2083.000	38.34	1626.92
86	2080.750	-1.332	2079.418	16.05	1672.26
87	2077.825	-1.207	2079.032	10.06	1688.31
88	2074.800	-1.025	2075.825	19.05	1698.37
89	2073.410	-0.800	2074.210	13.05	1700.00
90	2069.680	-0.804	2070.484	10.44	1713.05
91	2067.145	-1.400	2068.545	15.94	1725.48
92	2065.085	-0.800	2065.885	50.57	1749.43
93	2066.645	-1.146	2065.499	48.19	1800.00
94	2068.130	-1.474	2066.656	28.33	1848.19
95	2068.090	-0.800	2067.290	23.48	1876.52
96	2069.115	-0.829	2068.286	35.99	1900.00
97	2068.375	-0.850	2069.225	49.22	1905.99
98	2072.495	-1.312	2071.183	33.32	1935.20
99	2074.255	-1.273	2072.982	11.48	1968.92
100	2074.255	-0.800	2073.455	22.86	2000.00
101	2074.255	-0.800	2073.455	11.88	2014.50
102	2073.125	-0.800	2072.325	38.08	2026.39
103	2072.510	-0.800	2071.710	14.64	2041.02
104	2070.815	-0.800	2069.015	38.98	2080.00
105	2076.325	-0.825	2075.500	44.95	2144.95
106	2080.325	-0.800	2079.525	38.05	2183.00
107	2086.500	-1.710	2084.790	13.28	2200.00
108	2087.940	-1.928	2086.012	13.29	2213.28
109	2088.275	-1.000	2087.275	38.08	2226.57
110	2092.475	-0.795	2091.680	22.96	2264.65
111	2095.725	-1.247	2094.478	11.39	2276.04
112	2097.045	-1.229	2095.816	16.70	2280.00
113	2098.975	-1.200	2097.775	31.71	2316.70
114	2099.180	-0.803	2098.377	23.03	2348.41
115	2100.825	-1.432	2099.393	36.94	2372.44
116	2100.225	-0.872	2099.353	28.96	2400.00
117	2098.720	-0.850	2097.870	10.50	2410.50
118	2096.225	-1.005	2095.220	44.27	2454.77
119	2108.420	-0.823	2107.597	46.45	2500.00
120	2111.300	-0.800	2110.500	34.78	2513.21
121	2107.525	-1.229	2106.296	21.21	2549.99
122	2104.695	-0.800	2103.895	28.80	2571.20
123	2096.225	-1.005	2095.220	10.65	2580.00
124	2094.225	-0.800	2093.425	16.69	2596.69
125	2081.625	-0.800	2080.825	46.45	2643.14
126	2074.710	-0.819	2073.891	20.21	2700.00
127	2074.710	-0.800	2073.910	38.73	2700.00
128	2076.725	-0.800	2075.925	41.56	2741.56
129	2072.075	-1.800	2070.275		2800.00

Longitudinal section between 1400.00 and 2800.00 opiline1