Appendix 8

Sewage Collection System

Appendix 8 Sewerage Collection system

8.1.1 Flow Calculation Sheets of Trunk sewers

Alternatives A,B-1,B-2,B-3,B-4

(1) Flow Calculation

Alternative A

Trunk Sewer Unit flow 440 L/p/d n= 0.013

Area	Pipe No.	Down No.	Area	Each Population	Cumulative Population	Flow (m3/h)	Flow (m3/s) (a)	Pipe Diameter	Slope (‰)	Velocity (m/s)	Flow Capacity (b)	Ratio (b/a)	Pipe Length	Cumulative Length
Greater	1	3	306.0	82,262	82,262	1,508	0.42	900	1.3	1.026	0.65	1.55	214	
Tirana	2	3	1770.4	257,654	257,654	4,724	1.31	1350	1.2	1.292	1.85	1.41	189	403
	3	4	51.9	5,192	345,108	6,327	1.76	1500	1.1	1.327	2.35	1.34	910	1,313
	4	5	143.5	2,293	347,401	6,369	1.77	1500	1.1	1.327	2.35	1.33	496	1,808
	5	6	33.3	11,694	359,095	6,583	1.83	1500	1.1	1.327	2.35	1.28	189	1,997
	6	7	1420.7	302,558	661,653	12,130	3.37	2000	0.9	1.454	4.57	1.36	586	2,583
	7	9	169	11,306	672,960	12,338	3.43	2000	0.9	1.454	4.57	1.33	1156	3,739
	8	9	1102	101,368	101,368	1,858	0.52	1350	1.0	1.179	1.69	3.25	1131	1,131
	9	11	410.4	32,050	806,378	14,784	4.11	2200	0.9	1.549	5.89	1.43	1133	6,003
	10	11	614.6	19,821	19,821	363	0.10	500	1.5	0.745	0.15	1.5	927.2	927
	11	12	78.4	1,253	827,452	15,170	4.21	2200	0.9	1.549	5.89	1.4	1444	8,374
	12	13	241.3	6,008	833,460	15,280	4.24	2200	0.9	1.549	5.89	1.39	1867.5	10,241
	13	20	209.7	3,351	836,811	15,342	4.26	2200	0.9	1.549	5.89	1.38	2549	12,790
	14	15	652.7	44,502	44,502	816	0.23	1350	1.0	1.179	1.69	7.35	1096	1,096
	15	16	262.7	17,911	62,413	1,144	0.32	1350	1.0	1.179	1.69	5.28	727	1,824
	16	17	39.3	2,680	65,093	1,193	0.33	1350	1.0	1.179	1.69	5.12	1473	3,297
	17	18	650.9	44,379	109,472	2,007	0.56	1350	1.0	1.179	1.69	3.02	821	4,118
	18	19	82.9	5,652	115,124	2,111	0.59	1350	1.0	1.179	1.69	2.86	678	4,796
	19		86.5	5,898	121,022	2,219	0.62						856	
	20		948	42,167	1,000,000	18,333	5.09							
			9,274.2	1,000,000										

(1) Flow Calculation

Alternative A

Trunk Sewer

Area	Pipe No.	Down No.	Level Upstream	length to lowest point	Level lowest	Level Dwnstream	D+t (mm)	Invert level (up-middle-down)			Covering Depth (up-middle-down)			Adjusting height (m)
Greater	1	3	91.1	0.0	91.1	93.6	975	85.10	85.10	84.82	5.0	5.0	7.8	
Tirana	2	3	91.4	0.0	91.4	93.6	1,740	84.70	84.70	84.47	5.0	5.0	7.4	0.1
	3	4	93.6	910.0	85.6	85.6	1,885	79.75	78.75	78.75	12.0	5.0	5.0	4.7
	4	5	85.6	495.5	83.0	83	1,885	76.63	76.08	76.08	7.1	5.0	5.0	2.1
	5	6	83.0	189.2	82.5	82.5	1,885	75.86	75.65	75.65	5.3	5.0	5.0	0.2
	6	7	82.5	585.7	82.2	82.2	2,435	74.83	74.30	74.3	5.2	5.5	5.5	0.8
	7	9	82.2	1156.2	73.3	73.3	2,435	66.38	65.34	65.34	13.4	5.5	5.5	7.9
	8	9	74.0	167.0	67.0	73.3	1,740	60.40	60.23	59.27	11.9	5.0	12.3	
	9	11	73.3	1132.5	65.1	65.1	2,635	59.25	58.23	58.23	11.4	4.2	4.2	
	10	11	73.2	927.2	65.1	65.1	542	60.76	59.37	59.37	11.9	5.2	5.2	6.9
	11	12	65.1	420	59	57.3	2,635	51.11	50.73	49.81	11.4	5.6	4.9	7.1
	12	13	57.3	1806	51	52.8	2,635	45.09	43.46	43.41	9.6	4.9	6.8	4.7
	13	20	52.8	2549.0	43.2	43.2	2,635	37.99	35.70	35.7	12.2	4.9	4.9	5.4
	14	15	56.1	1867.5	50.2	50.2	1,740	44.60	42.92	42.92	9.8	5.5	5.5	
	15	16	50.2	0.0	50.2	51.0	1,740	42.90	42.90	40.61	5.6	5.6	8.7	
	16	17	51.0	0.0	45.0	45.0	1,740	38.29	38.29	38.29	11.0	5.0	5.0	2.3
	17	18	45.0	1096.4	44.0	44.0	1,740	38.27	37.17	37.17	5.0	5.1	5.1	
	18	19	44.0	727.1	41.0	41.0	1,740	34.85	34.12	34.12	7.4	5.1	5.1	2.3
	19		41.0	0.0	41.0	43.2	1,740	34.10	34.10	32.63	5.2	5.2	8.8	
	20		43.2			43.2								

(2) Flow Calculation
Alternative B-1

Trunk Sewer Unit flow 440 L/p/d n= 0.013

Area	Pipe No.	Down No.	Area	Each Population	Cumulative Population	Flow (m3/h)	Flow (m3/s) (a)	Pipe Diameter	Slope (‰)	Velocity (m/s)	Flow Capacity (b)	Ratio (b/a)	Pipe Length	Cumulative Length
Greater Tirana	1	3	306.0	82,262	82,262	1,508	0.42	900	1.3	1.026	0.65	1.55	214	
	2	3	1770.4	257,654	257,654	4,724	1.31	1350	1.2	1.292	1.85	1.41	189	403
	3	4	51.9	5,192	345,108	6,327	1.76	1500	1.1	1.327	2.35	1.34	910	1,313
	4	5	143.5	2,293	347,401	6,369	1.77	1500	1.1	1.327	2.35	1.33	496	1,808
	5	6	33.3	11,694	359,095	6,583	1.83	1500	1.1	1.327	2.35	1.28	189	1,997
	6	7	1420.7	302,558	661,653	12,130	3.37	2000	0.9	1.454	4.57	1.36	586	2,583
	7	9	169	11,307	672,960	12,338	3.43	2000	0.9	1.454	4.57	1.33	1156	3,739
	8	9	1102	101,368	101,368	1,858	0.52	1350	1.0	1.179	1.69	3.25	1131	1,131
	9	10	427.6	32,863	807,190	14,798	4.11	2200	0.9	1.549	5.89	1.43	854	5,724
	10	11	448.2	7,162	814,353	14,930	4.15	2200	0.9	1.549	5.89	1.42	1511	7,235
	11	STP(K)	372.9	15,959	830,312	15,222	4.23							7,235
	14	15	652.7	44,502	44,502	816	0.23	1350	1.0	1.179	1.69	7.35	1096	1,096
	15	16	262.7	17,911	62,413	1,144	0.32	1350	1.0	1.179	1.69	5.28	727	1,824
	16	17	39.3	2,680	65,093	1,193	0.33	1350	1.0	1.179	1.69	5.12	1473	3,297
	17	18	650.9	44,379	109,472	2,007	0.56	1350	1.0	1.179	1.69	3.02	821	4,118
	18	19	82.9	5,652	115,124	2,111	0.59	1350	1.0	1.179	1.69	2.86	678	4,796
	19	20	86.5	5,898	121,022	2,219	0.62						856	5,653
	20	STP(B)	1,253.7	48,667	169,689	3,111	0.86						0	5,653
			9,274.2	1,000,000										

(2) Flow Calculation

Alternative B-1

Trunk Sewer

Area	Pipe No.	Down No.	Level Upstream	length to lowest point	Level lowest	Level Dwnstream	D+t (mm)	Invert level (up-middle-down)			Covering Depth (up-middle-down)			Adjusting height (m)
Greater	1	3	91.1	0.0	91.1	90.6	975	85.10	85.10	84.82	5.0	5.0	4.8	
Tirana	2	3	91.4	0.0	91.4	90.6	1,740	84.70	84.70	84.47	5.0	5.0	4.4	0.1
	3	4	90.6	910.0	85.6	85.6	1,885	79.75	78.75	78.75	9.0	5.0	5.0	4.7
	4	5	85.6	495.5	83.0	83	1,885	76.63	76.08	76.08	7.1	5.0	5.0	2.1
	5	6	83.0	189.2	82.5	82.5	1,885	75.86	75.65	75.65	5.3	5.0	5.0	0.2
	6	7	82.5	585.7	82.2	82.2	2,435	75.33	74.80	74.8	4.7	5.0	5.0	0.3
	7	9	82.2	1156.2	73.3	73.3	2,435	66.88	65.84	65.84	12.9	5.0	5.0	7.9
	8	9	74.0	167.0	67.0	73.3	1,740	60.40	60.23	59.27	11.9	5.0	12.3	
	9	10	73.3	505.0	71.0	73.2	2,635	59.25	58.80	58.48	11.4	9.6	12.1	
	10	11	73.2	0	73.2	95	2,635	58.46	58.46	57.1	12.1	12.1	35.3	
	11	STP(K)	95			95		57.08		57.08	37.9	0.0	37.9	
	14	15	56.1	1096.4	50.2	50.2	1,740	44.60	43.50	43.5	9.8	5.0	5.0	
	15	16	50.2	0.0	50.2	51.0	1,740	43.48	43.48	42.75	5.0	5.0	6.5	
	16	17	51.0	1473.2	45.0	45.0	1,740	39.73	38.26	38.26	9.5	5.0	5.0	3
	17	18	45.0	821.3	44.0	44.0	1,740	38.04	37.22	37.22	5.2	5.0	5.0	0.2
	18	19	44.0	678.4	41.0	41.0	1,740	34.90	34.22	34.22	7.4	5.0	5.0	2.3
	19	20	41.0	0.0	41.0	43.0	1,740	34.20	34.20	34.2	5.1	5.1	7.1	
	20	STP(B)	43.0			0.0					43.0	0.0	0.0	

(3) Flow Calculation

Alternative B-2

Trunk Sewer Unit flow 440 L/p/d n= 0.013

Area	Pipe No.	Down No.	Area	Each Population	Cumulative Population	Flow (m3/h)	Flow (m3/s) (a)	Pipe Diameter	Slope (‰)	Velocity (m/s)	Flow Capacity (b)	Ratio (b/a)	Pipe Length	Cumulative Length
Greater Tirana	1	3	306.0	82,262	82,262	1,508	0.42	900	1.3	1.026	0.65	1.55	214	
	2	3	1770.4	257,654	257,654	4,724	1.31	1350	1.2	1.292	1.85	1.41	189	403
	3	4	51.9	5,192	345,108	6,327	1.76	1500	1.1	1.327	2.35	1.34	910	1,313
	4	5	143.5	2,293	347,401	6,369	1.77	1500	1.1	1.327	2.35	1.33	496	1,808
	5	6	33.3	11,694	359,095	6,583	1.83	1500	1.1	1.327	2.35	1.28	189	1,997
	6	7	1420.7	302,558	661,653	12,130	3.37	2000	0.9	1.454	4.57	1.36	586	2,583
	7	9	169	11,307	672,960	12,338	3.43	2000	0.9	1.454	4.57	1.33	1156	3,739
	8	9	1102	101,368	101,368	1,858	0.52	1350	1.0	1.179	1.69	3.25	1131	1,131
	9	10	427.6	32,863	807,190	14,798	4.11	2200	0.9	1.549	5.89	1.43	1275	6,145
	10	STP(TKP)	821.1	23,121	830,312	15,222	4.23	2200	0.9	1.549	5.89	1.39	1511	7,656
	14	15	652.7	44,502	44,502	816	0.23	1350	1.0	1.179	1.69	7.35	1096	1,096
	15	16	262.7	17,911	62,413	1,144	0.32	1350	1.0	1.179	1.69	5.28	727	1,824
	16	17	39.3	2,680	65,093	1,193	0.33	1350	1.0	1.179	1.69	5.12	1473	3,297
	17	18	650.9	44,379	109,472	2,007	0.56	1350	1.0	1.179	1.69	3.02	821	4,118
	18	19	82.9	5,652	115,124	2,111	0.59	1350	1.0	1.179	1.69	2.86	678	4,796
	19	20	86.5	5,898	121,022	2,219	0.62						856	5,653
	20	STP(B)	1,253.7	48,667	169,689	3,111	0.86						0	5,653
			9,274.2	1,000,000										

(3) Flow Calculation
Alternative B-2

Trunk Sewer

Area	Pipe No.	Down No.	Level Upstream	length to lowest point	Level lowest	Level Dwnstream	D+t (mm)	Invert level (up-middle-down)			Covering Depth (up-middle-down)			Adjusting height (m)
Greater	1	3	91.1	0.0	91.1	90.6	975	89.93	89.93	89.65	0.2	0.2	0.0	0.2
Tirana	2	3	91.4	0.0	91.4	90.6	1,740	89.13	89.13	88.9	0.5	0.5	0.0	0.5
	3	4	90.6	910.0	85.6	85.6	1,885	84.68	83.68	83.68	4.0	0.0	0.0	4.2
	4	5	85.6	495.5	83.0	83	1,885	81.66	81.11	81.11	2.1	0.0	0.0	2
	5	6	83.0	189.2	82.5	82.5	1,885	80.79	80.58	80.58	0.3	0.0	0.0	0.3
	6	7	82.5	585.7	82.2	82.2	2,435	80.26	79.73	79.73	-0.2	0.0	0.0	0.3
	7	9	82.2	1156.2	73.3	73.3	2,435	71.91	70.87	70.87	7.9	0.0	0.0	7.8
	8	9	74.0	167.0	67.0	73.3	1,740	65.46	65.29	64.33	6.8	0.0	7.2	6.8
	9	10	73.3	505.0	71.0	65.0	2,635	63.51	63.06	62.36	7.2	5.3	0.0	0.8
	10	STP(TKP)	65.0	0		0								
	14	15	56.1	1096.4	50.2	50.2	1,740	44.60	43.50	43.5	9.8	5.0	5.0	
	15	16	50.2	0.0	50.2	51.0	1,740	43.48	43.48	42.75	5.0	5.0	6.5	
	16	17	51.0	1473.2	45.0	45.0	1,740	39.73	38.26	38.26	9.5	5.0	5.0	3
	17	18	45.0	821.3	44.0	44.0	1,740	38.04	37.22	37.22	5.2	5.0	5.0	0.2
	18	19	44.0	678.4	41.0	41.0	1,740	34.90	34.22	34.22	7.4	5.0	5.0	2.3
	19	20	41.0	0.0	41.0	43.0	1,740	34.20	34.20	34.2	5.1	5.1	7.1	
	20	STP(B)	43.0			0.0					43.0	0.0	0.0	

(4) Flow Calculation

Alternative B-3

Trunk Sewer Unit flow 440 L/p/d n= 0.013

Area	Pipe No.	Down No.	Area	Each Population	Cumulative Population	Flow (m3/h)	Flow (m3/s) (a)	Pipe Diameter	Slope (‰)	Velocity (m/s)	Flow Capacity (b)	Ratio (b/a)	Pipe Length	Cumulative Length
Greater	1	3	306.0	82,262	82,262	1,508	0.42	900	1.2	0.986	0.63	1.5	214	214
Tirana	2	3	1770.4	257,654	257,654	4,724	1.31	1350	1.1	1.237	1.77	1.35	189	403
	3	4	51.9	5,192	345,108	6,327	1.76	1500	1	1.265	2.24	1.27	910	1,313
	7	6	169	11,307	11,307	207	0.06	1350	1.1	1.237	1.77	29.5	586	586
	6	5	1420.7	302,558	313,865	5,754	1.6	1500	1	1.265	2.24	1.4	413	999
	5	4	33.3	11,694	325,559	5,969	1.66	1500	1	1.265	2.24	1.35	995	1,994
	8	9	1102	101,368	101,368	1,858	0.52	1350	0.8	1.055	1.51	2.9	1131	1,131
	9	11	427.6	32,863	134,231	2,461	0.68	1350	0.8	1.055	1.51	2.22	1130	2,261
	10	11	456.3	5,909	140,140	2,569	0.71	1350	0.8	1.055	1.51	2.13	750	750
	11(PS)	4	206.5	17,212	157,352	2,885	0.8	*800*		1.6	0.80	1.0	2750	5,761
	4	12	143.5	2,293	830,312	15,222	4.23	2200	0.7	1.366	5.19	1.23	1880	10,948
	12		158.3											
	14	15	652.7	44,502	44,502	816	0.23	1350	1.0	1.179	1.69	7.35	1096	1,096
	15	16	262.7	17,911	62,413	1,144	0.32	1350	1.0	1.179	1.69	5.28	727	1,824
	16	17	39.3	2,680	65,093	1,193	0.33	1350	1.0	1.179	1.69	5.12	1473	3,297
	17	18	650.9	44,379	109,472	2,007	0.56	1350	1.0	1.179	1.69	3.02	821	4,118
	18	19	82.9	5,652	115,124	2,111	0.59	1350	1.0	1.179	1.69	2.86	678	4,796
	19	20	86.5	5,898	121,022	2,219	0.62	1350	1.0	1.179	1.69	2.73	856	5,653
	20	STP(B)	1,253.7	48,667	169,689	3,111	0.86						0	5,653
			9,274.2	1,000,000	1,000,000									16,600

(4) Flow Calculation
Alternative B-3

Trunk Sewer

Area	Pipe No.	Down No.	Level Upstream	length to lowest point	Level lowest	Level Dwnstream	D+t (mm)	Invert level (up-middle-down)			Covering Depth (up-middle-down)			Adjusting height (m)
Greater	1	3	91.1	0.0	91.1	90.6	975	90.13	90.13	89.87	0.0	0.0	-0.2	
Tirana	2	3	91.4	0.0	91.4	90.6	1,740	89.65	89.65	89.44	0.0	0.0	-0.6	0.2
	3	4	90.6	910.0	85.0	85.0	1,885	84.02	83.11	83.11	4.7	0.0	0.0	5.4
	7	6	82.2	0	82.2	82.9	1,935	80.27	80.27	79.62	0.0	0.0	1.3	
	6	5	82.9	413.0	84.6	84.6	1,935	79.60	79.19	79.19	1.4	3.5	3.5	
	5	4	84.6	995.0	85.0	85.0	1,885	79.17	78.18	78.18	3.5	4.9	4.9	
	8	9	74.0	167.0	67.0	73.3	1,740	65.36	65.23	64.46	6.9	0.0	7.1	6.9
	9	11	73.3	505.0	71.0	73.2	1,785	64.44	64.04	63.54	7.1	5.2	7.9	
	10	11	73.2	0	73.2	67	1,785	66.62	66.62	66.02	4.8	4.8	-0.8	4.8
	11(PS)	4	67	0	67.0	85	866	*66.00*	*66.00*	*66*	2.0	2.0	2.0	
	4	12	85.0	1880.0	95.0	95.0	1,885	78.16	76.84	76.84	5.0	16.3	16.3	
	12		95.0											
	14	15	56.1	1096.4	50.2	50.2	1,740	49.56	48.46	48.46	4.8	0.0	0.0	4.8
	15	16	50.2	0.0	50.2	51.0	1,740	48.44	48.44	47.71	0.0	0.0	1.6	
	16	17	51.0	1473.2	45.0	45.0	1,740	44.69	43.22	43.22	4.6	0.0	0.0	3
	17	18	45.0	821.3	44.0	44.0	1,740	43.10	42.28	42.28	0.2	0.0	0.0	0.1
	18	19	44.0	678.4	41.0	41.0	1,740	39.96	39.28	39.28	2.3	0.0	0.0	2.3
	19	20	41.0	0.0	41.0	43.0	1,740	39.26	39.26	38.4	0.0	0.0	2.9	
	20	STP(B)	43.0			0.0					43.0	0.0	0.0	

(5) Flow Calculation
Alternative B-4

Trunk Sewer Unit flow 440 L/p/d n= 0.013

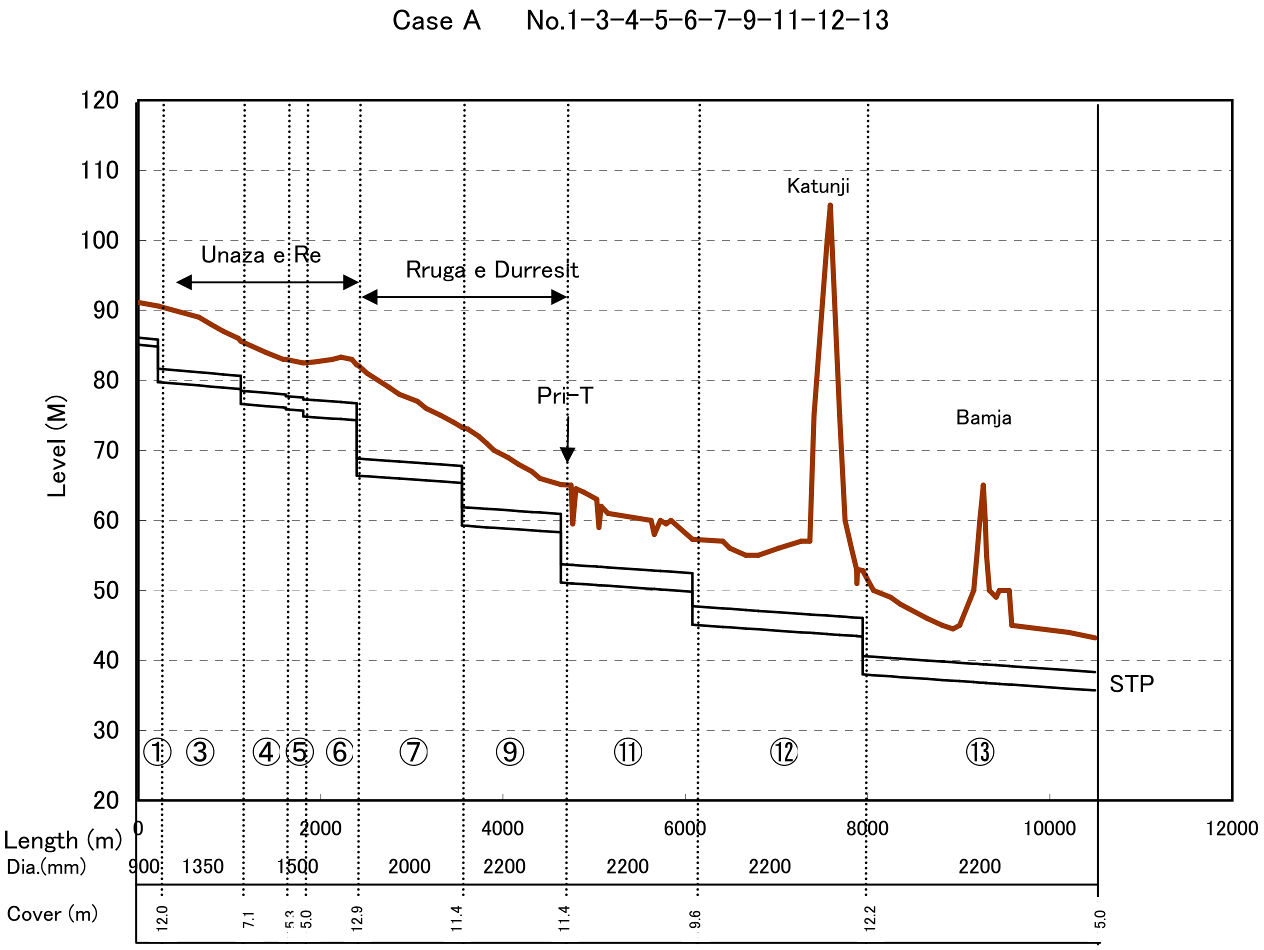
Area	Pipe No.	Down No.	Area	Each Population	Cumulative Population	Flow (m3/h)	Flow (m3/s) (a)	Pipe Diameter	Slope (‰)	Velocity (m/s)	Flow Capacity (b)	Ratio (b/a)	Pipe Length	Cumulative Length
Greater	1	3	306.0	82,262	82,262	1,508	0.42	900	1.2	0.986	0.63	1.5	214	214
Tirana	2	3	1770.4	257,654	257,654	4,724	1.31	1350	1.1	1.237	1.77	1.35	189	189
	3	5	51.9	5,192	345,108	6,327	1.76	1500	1	1.265	2.24	1.27	1300	1,703
	5	12	33.3	11,694	356,802	6,541	1.82	1500	1	1.265	2.24	1.23	350	2,053
	7	6	169	11,307	11,307	207	0.06	1350	1.1	1.237	1.77	29.5	586	586
	6	12	1420.7	302,558	313,865	5,754	1.6	1500	1	1.265	2.24	1.4	350	936
	12	13			670,667	12,296	3.42	2000	0.7	1.282	4.03	1.18	1600	2,989
	13	STP （Tirana)			670,667	12,296	3.42	2000	0.7	1.282	4.03	1.18		2,989
	8	9	1102	101,368	101,368	1,858	0.52	1350	0.8	1.055	1.51	2.9	1131	1,131
	9	11	427.6	32,863	134,231	2,461	0.68	1350	0.8	1.055	1.51	2.22	854	1,985
	4	12	143.5	2,293	2,293	42	0.01	1350	0.7	0.987	1.41	141	1880	1,880
	10	11	614.6	5,909	8,203	150	0.04	1350	0.8	1.055	1.51	37.75	1511	3,391
	11	STP (Kashar)	206.5	17,212	159,645	2,927	0.81							
	14	15	652.7	44,502	44,502	816	0.23	1350	1.0	1.179	1.69	7.35	1096	1,096
	15	16	262.7	17,911	62,413	1,144	0.32	1350	1.0	1.179	1.69	5.28	727	1,824
	16	17	39.3	2,680	65,093	1,193	0.33	1350	1.0	1.179	1.69	5.12	1473	3,297
	17	18	650.9	44,379	109,472	2,007	0.56	1350	1.0	1.179	1.69	3.02	821	4,118
	18	19	82.9	5,652	115,124	2,111	0.59	1350	1.0	1.179	1.69	2.86	678	4,796
	19	20	86.5	5,898	121,022	2,219	0.62						856	5,653
	20	STP(B)	1,253.7	48,667	169,689	3,111	0.86						0	5,653
			9,274.2	1,000,000	1,000,000									8,642

(5) Flow Calculation
Alternative B-4

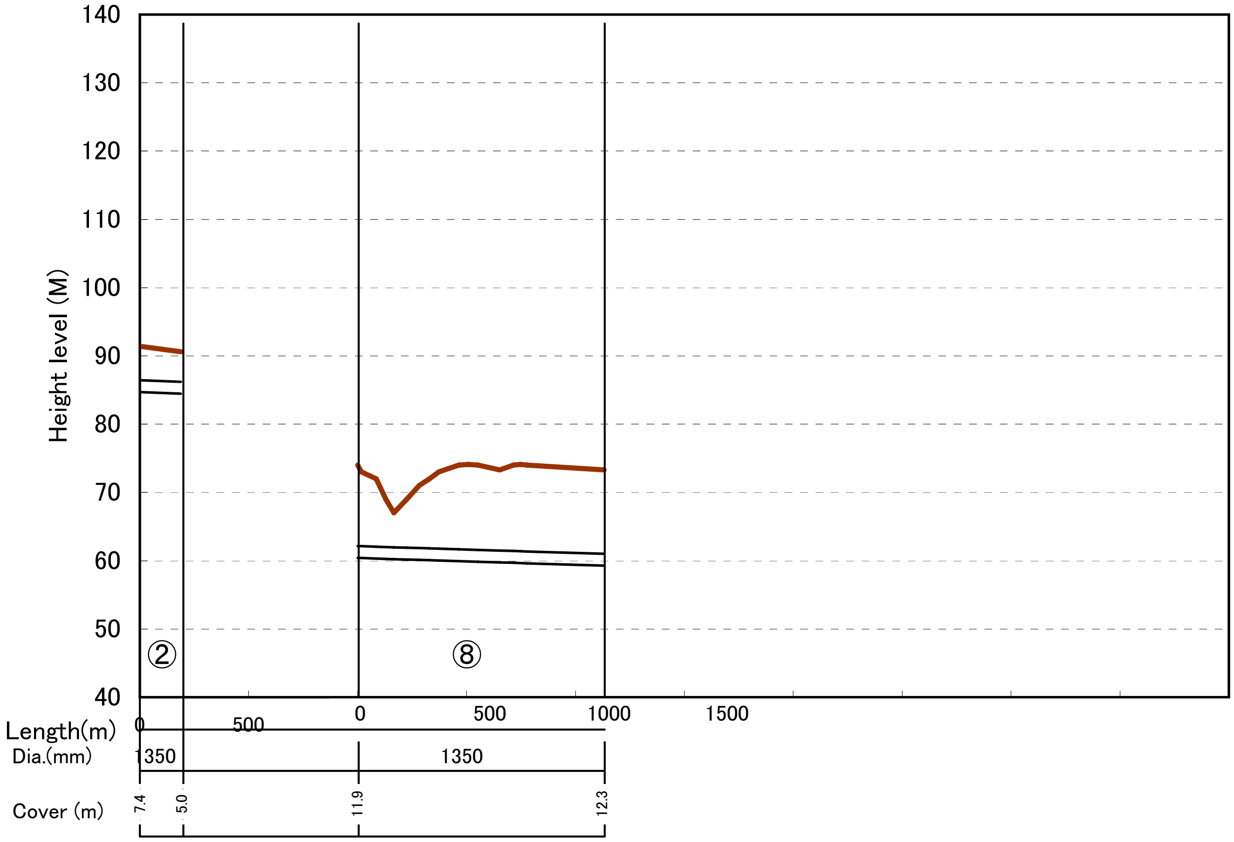
Trunk Sewer

Area	Pipe No.	Down No.	Level Upstream	length to lowest point	Level lowest	Level Dwnstream	D+t (mm)	Invert level (up-middle-down)			Covering Depth (up-middle-down)			Adjusting height (m)
Greater	1	3	91.1	0.0	91.1	90.6	975	90.13	90.13	89.87	0.0	0.0	-0.2	
Tirana	2	3	91.4	0.0	91.4	90.6	1,740	89.65	89.65	89.44	0.0	0.0	-0.6	0.2
	3	5	90.6	690.0	84.0	84.6	1,885	82.82	82.13	81.52	5.9	0.0	1.2	6.6
	5	12	84.6	60	82.0	87.0	1,885	79.43	79.37	79.08	3.3	0.7	6.0	
	7	6	82.2	0	82.2	82.9	1,740	80.46	80.46	79.82	0.0	0.0	1.3	
	6	12	82.9	350.0	87.0	87.0	1,885	79.80	79.45	79.45	1.2	5.7	5.7	
	12	13	87.0	0	87.0	102.0	2,435	79.06	79.06	77.94	5.5	5.5	21.6	
	13	STP (Tirana)	102.0											
	8	9	74.0	167.0	67.0	73.3	1,740	65.46	65.33	64.56	6.8	-0.1	7.0	6.8
	9	11	73.3	505.0	71.0	73.2	1,740	64.54	64.14	63.86	7.0	5.1	7.6	
	4	12	85.0	1880.0	73.2	73.2	1,740	72.76	71.44	71.44	10.5	0.0	0.0	10.5
	10	11	73.2	0	73.2	67	1,740	66.52	66.52	65.31	4.9	4.9	-0.1	4.9
	11	STP (Kashar)	67	0	67.0	85								
	14	15	56.1	1096.4	50.2	50.2	1,740	49.56	48.46	48.46	4.8	0.0	0.0	4.8
	15	16	50.2	0.0	50.2	51.0	1,740	48.44	48.44	47.71	0.0	0.0	1.6	
	16	17	51.0	1473.2	45.0	45.0	1,740	44.69	43.22	43.22	4.6	0.0	0.0	3
	17	18	45.0	821.3	44.0	44.0	1,740	43.10	42.28	42.28	0.2	0.0	0.0	0.1
	18	19	44.0	678.4	41.0	41.0	1,740	39.96	39.28	39.28	2.3	0.0	0.0	2.3
	19	20	41.0	0.0	41.0	43.0	1,740	39.26	39.26	39.26	0.0	0.0	2.0	
	20	STP(B)	43.0			0.0					43.0	0.0	0.0	

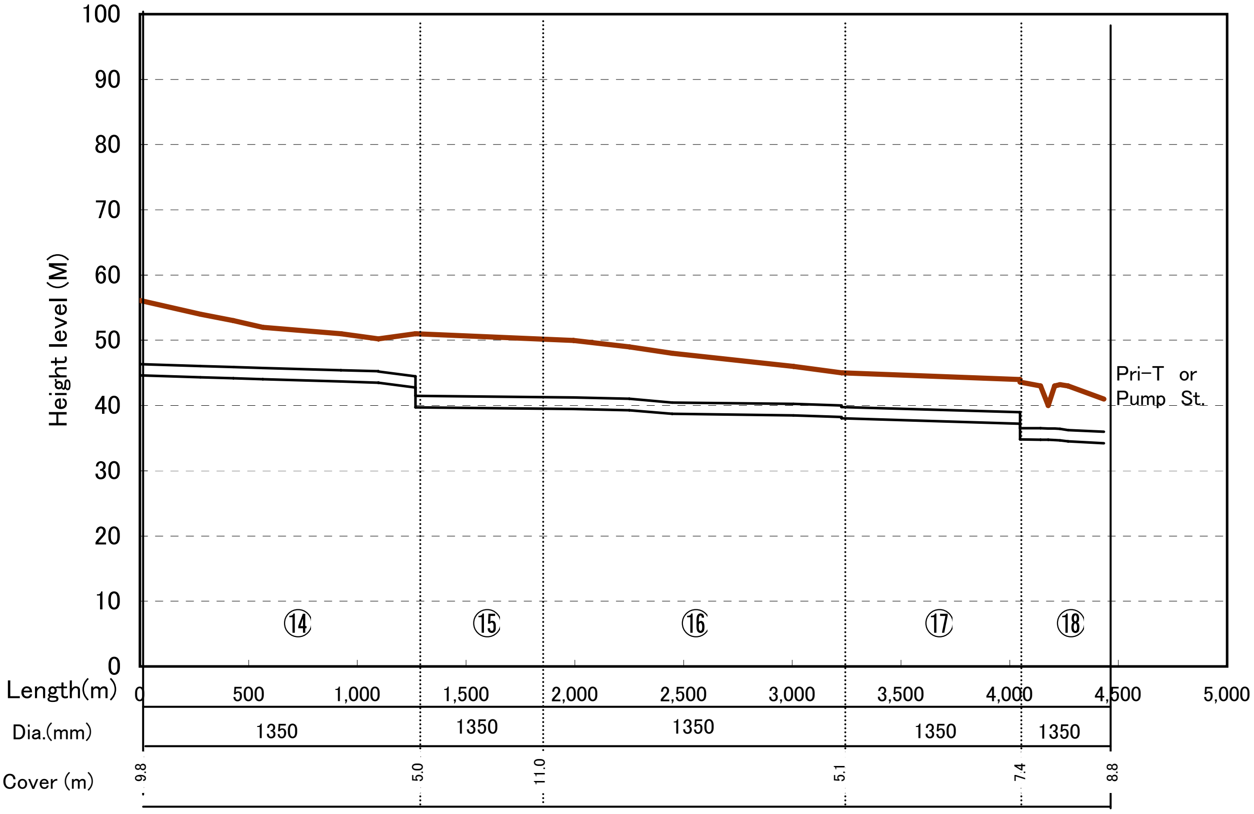
8.1.2 Profiles of Alternatives A & B for comparison



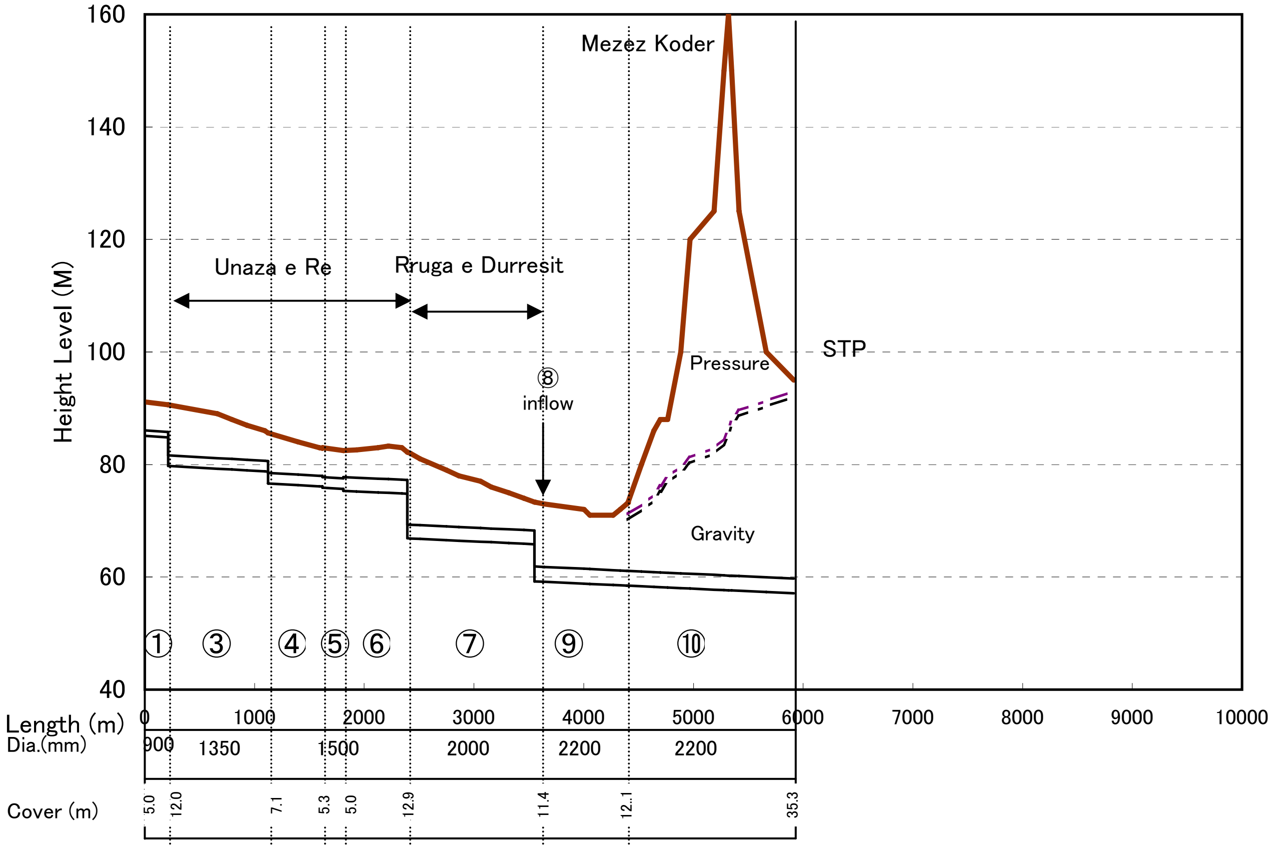
Case A & B No.2 No.8



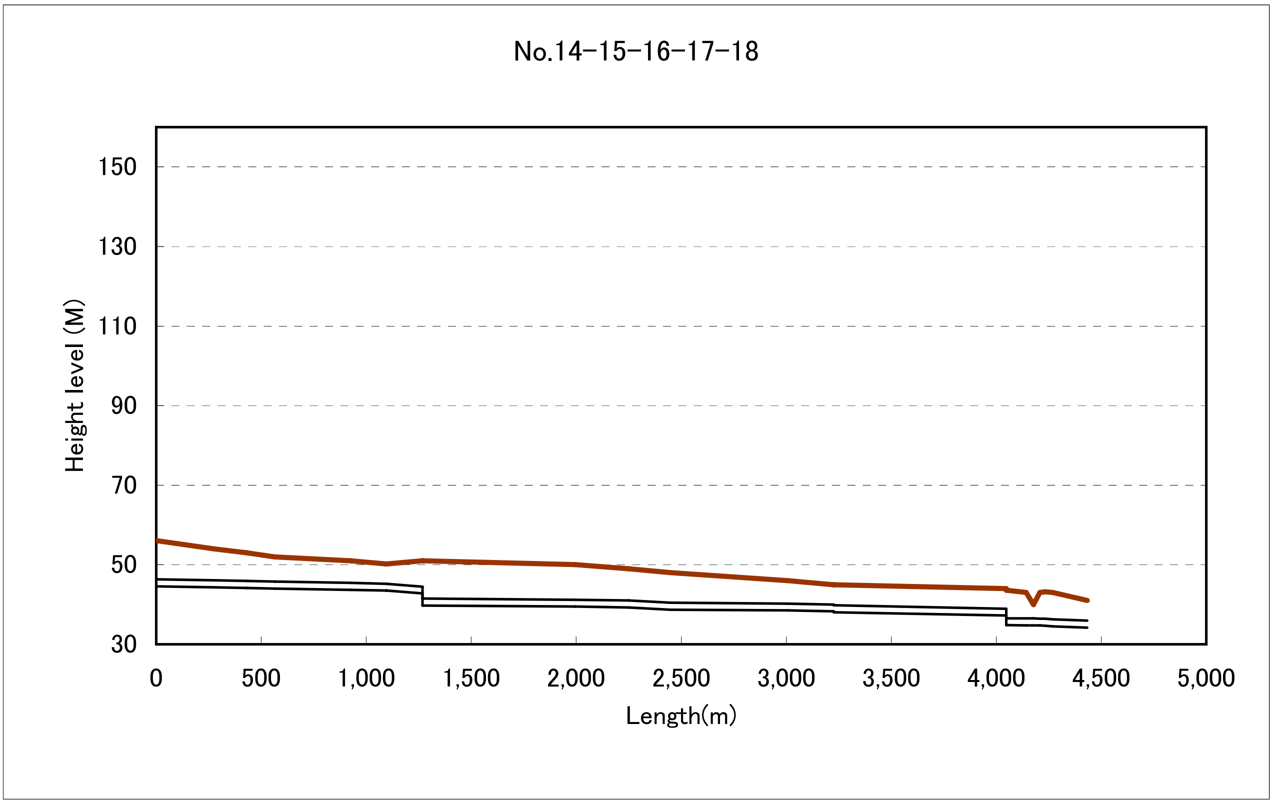
Case A&B No.14-15-16-17-18



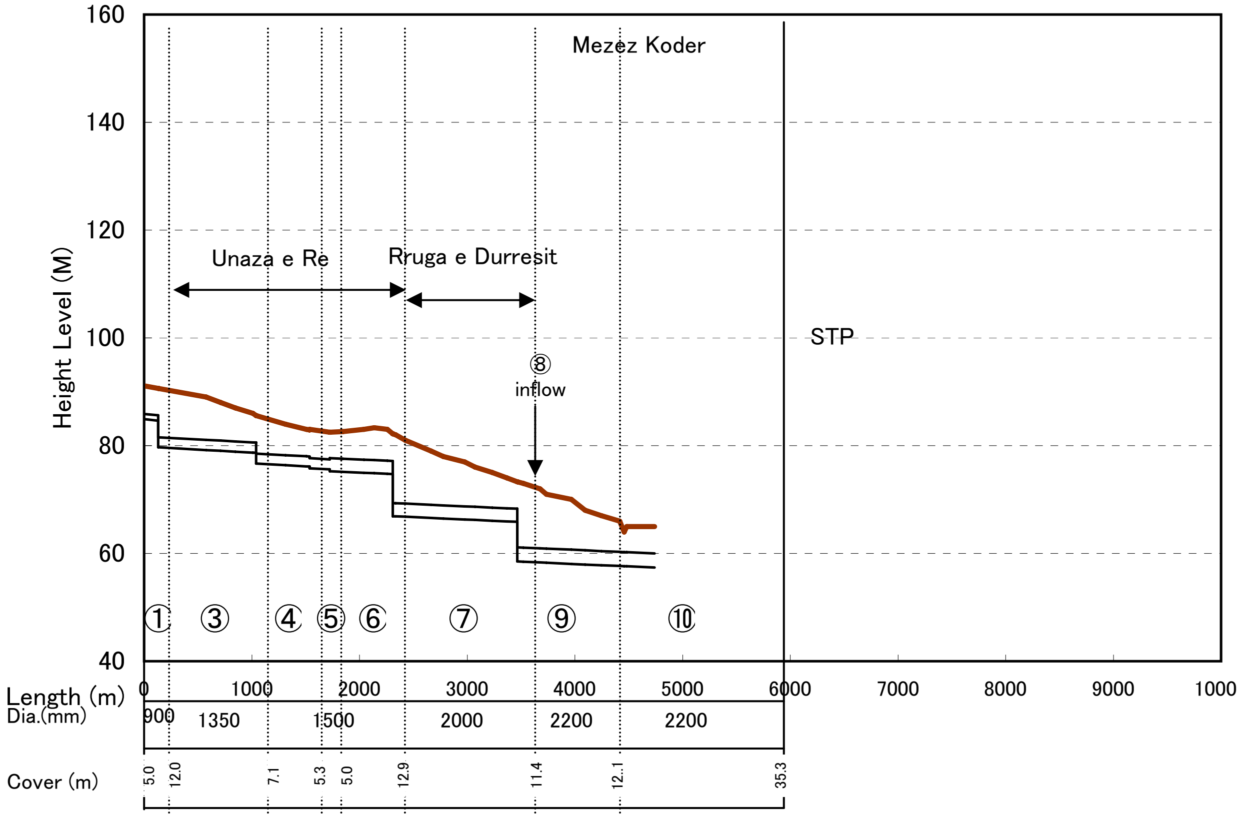
Case B No.1–3–4–5–6–7–9–10–11



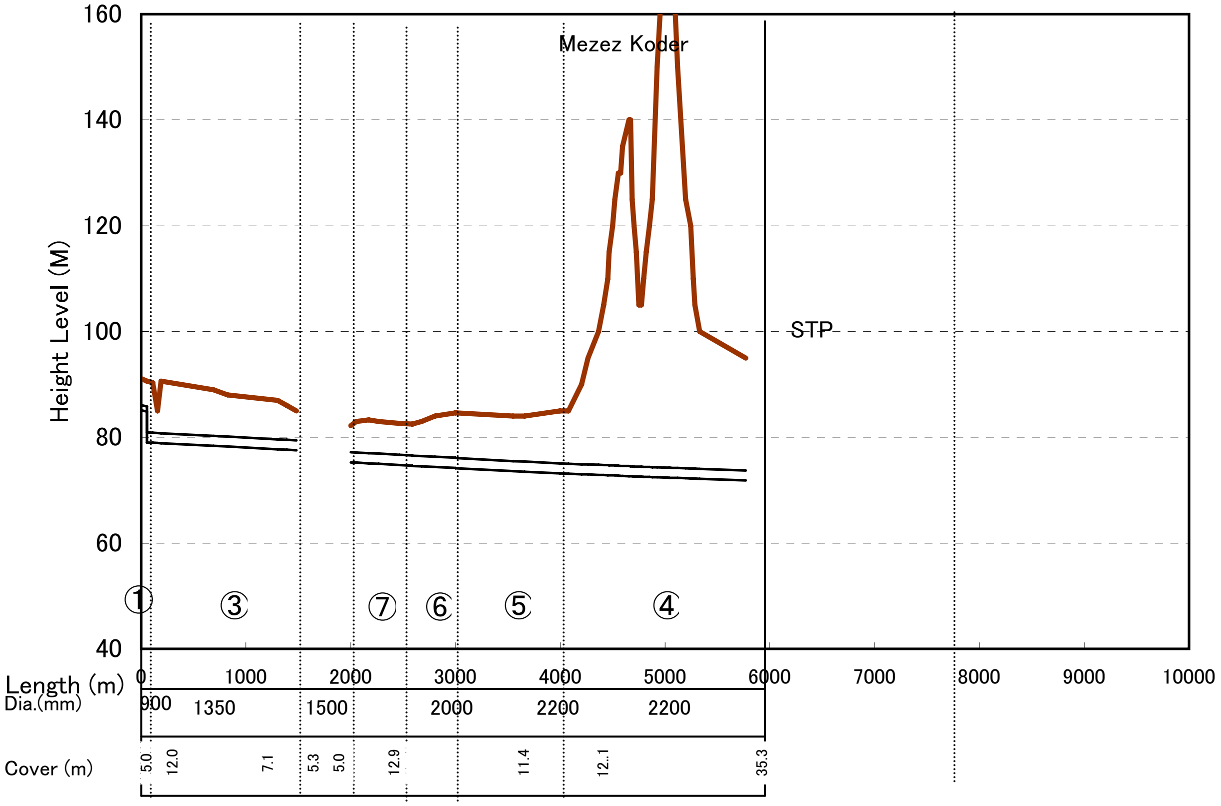
No.14–15–16–17–18



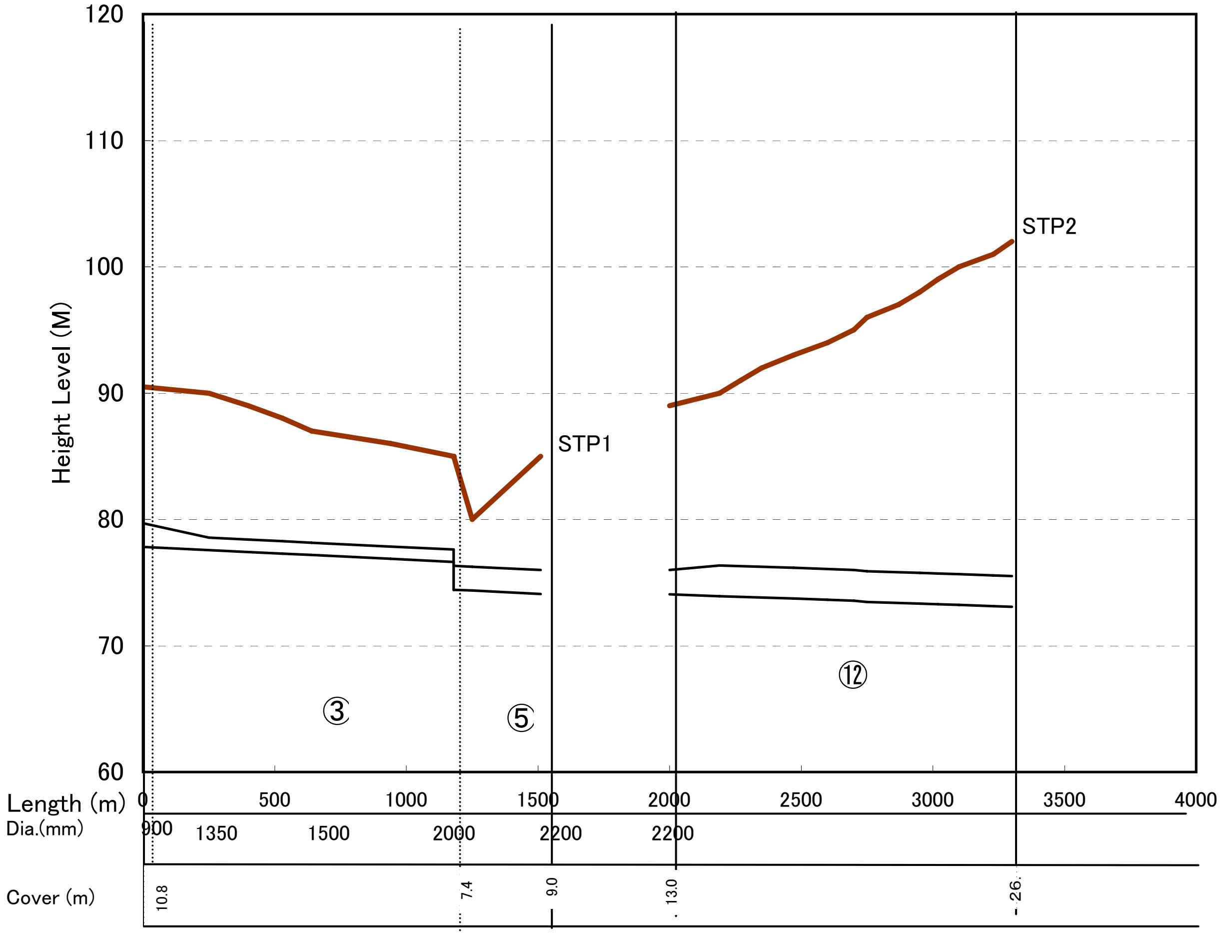
Case B-2 No.1-3-4-5-6-7-9-10-11



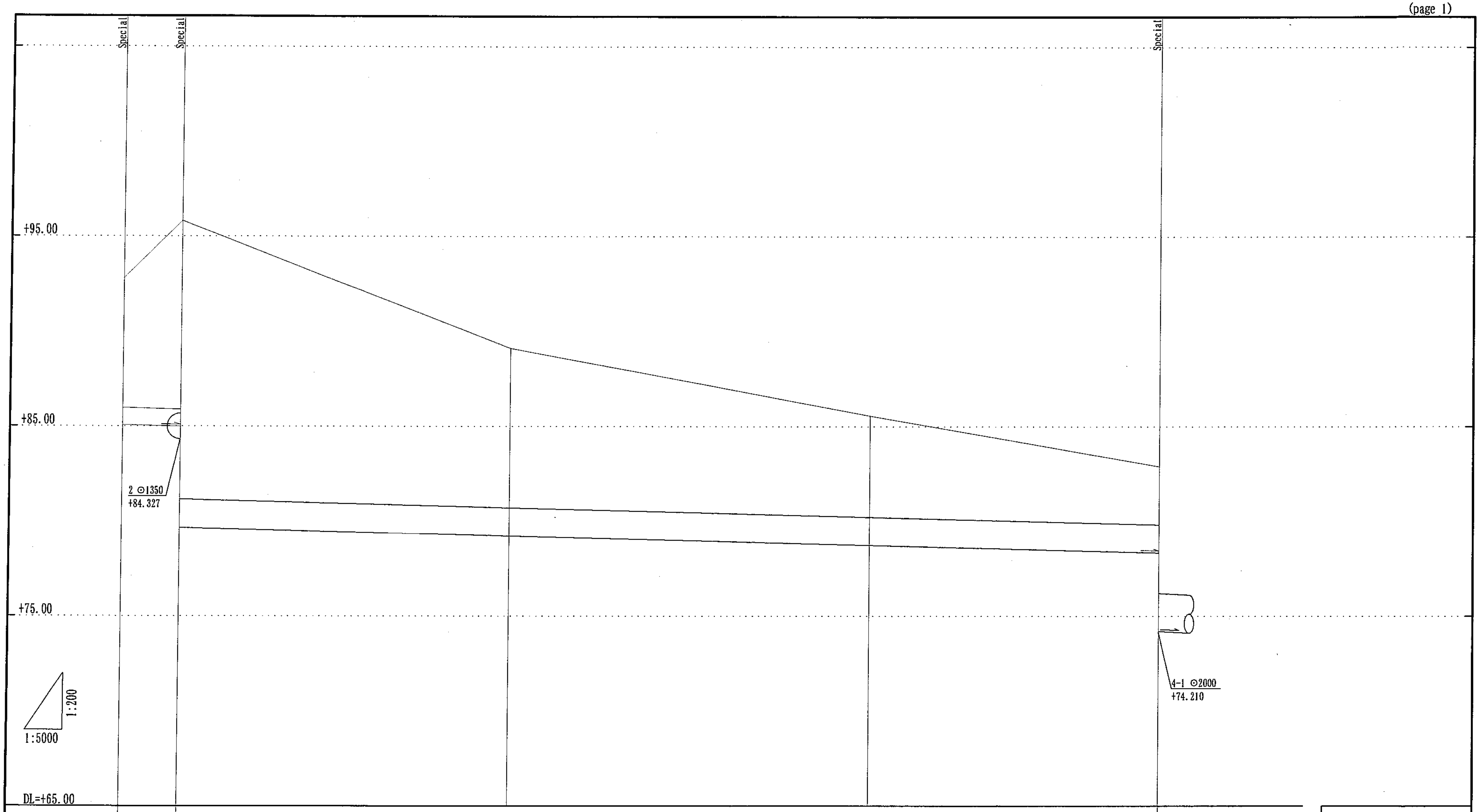
Case B-3 No.1-3-4-5-6-7-9-10



Case B-4　No.3-5 12-13



Appendix 8.1.3 Profiles of B-3 routes (B-3a,B-3b,B-3c,B-3d)



Sewer Line No.	①		③		
Diam(mm)	⊙900		⊙1500		
Slope(‰)	1.2		1.0		
Length(m)	76.00		1306.00		
Ground Elevation(m)	92.79	95.80	89.10	85.56	82.90
Earth Cover(m)	6.79	9.89 14.59	8.33	5.27	3.00
Invert Elevation(m)	85.070	84.979 79.656	79.216	78.736	78.350
Cu. Length(m)	0.00	76.00	516.00	996.00	1382.00

PipeList

①	③		

B-3a

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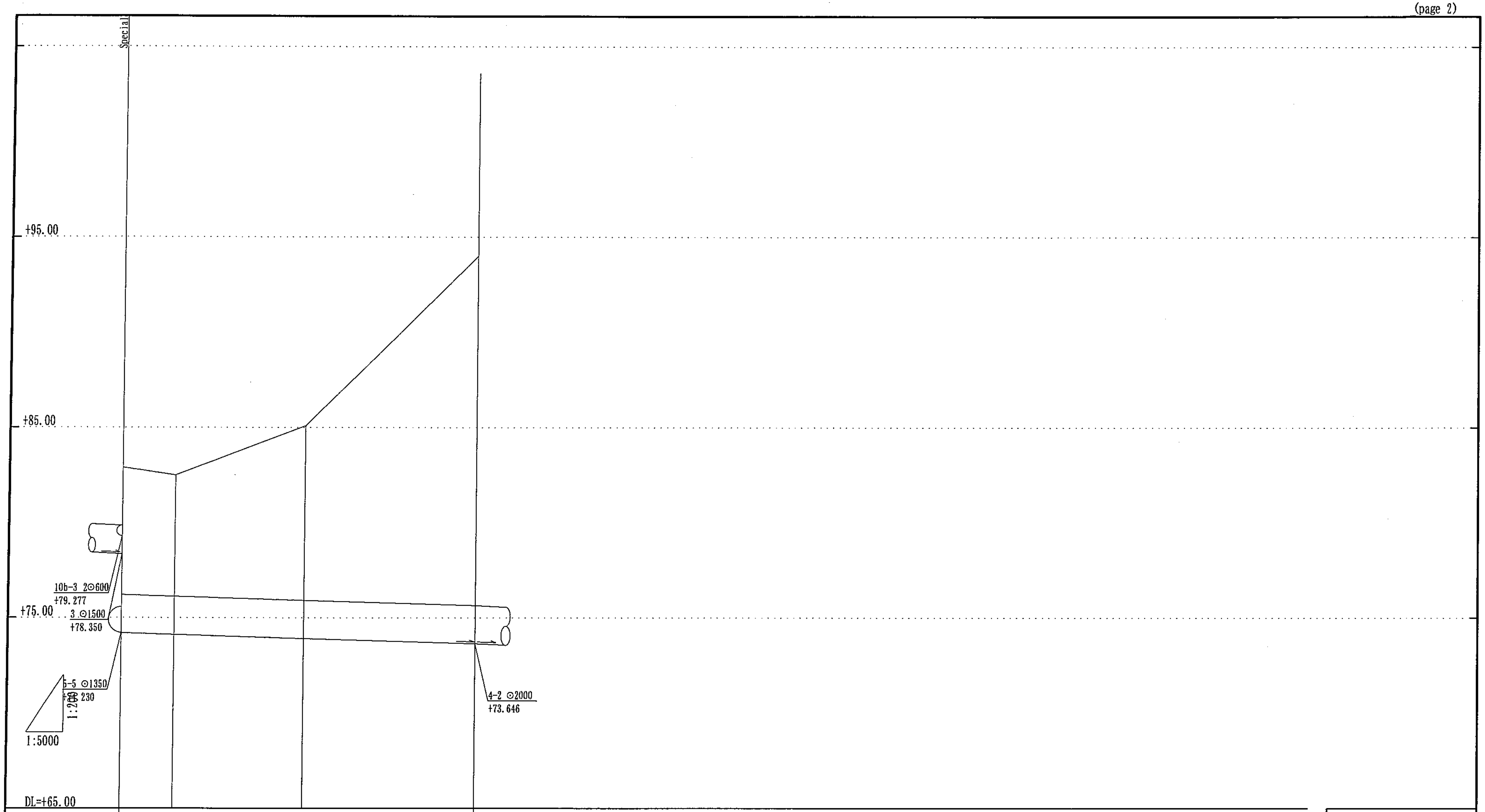
A3J_ITW:2006-03-22 B3A_02_FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:14

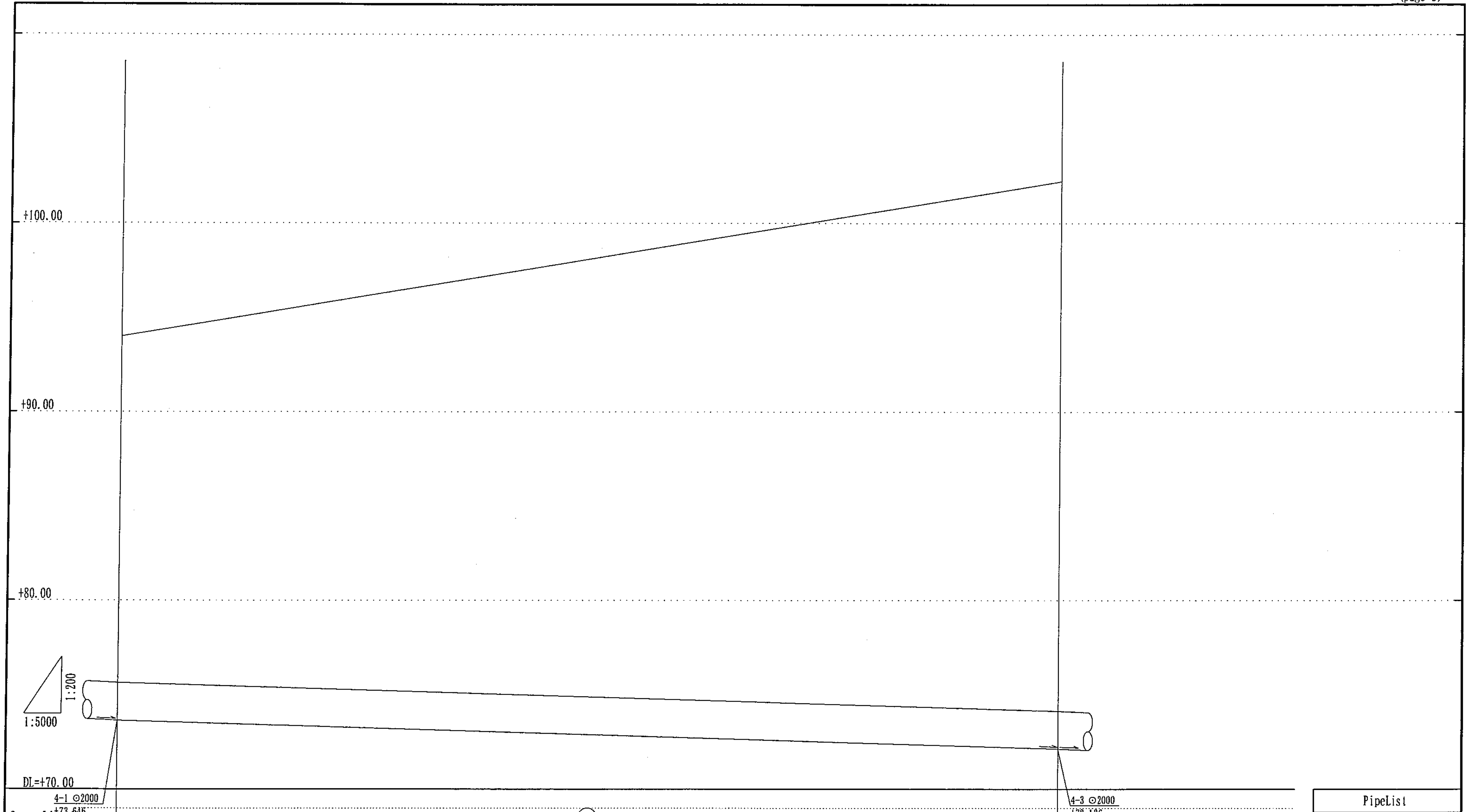


Sewer Line No.	(4-1)			
Diam(mm)	⊙2000			
Slope(‰)	1.2			
Length(m)	470.00			
Ground Elevation(m)	82.90	82.49	85.10	94.00
Earth Cover(m)	6.63	6.30	9.12	18.29
Invert Elevation(m)	74.210	74.126	73.920	73.646
Cu. Length(m)	1382.00	1452.00	1624.00	1852.00

PipeList			
(4-1)			

B-3a 2/11

A3J_ITW:2006-03-22 B3A_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:14



Sewer Line No.	④-②	
Diam(mm)	⊙2000	
Slope(‰)	1.2	
Length(m)	1258.00	
Ground Elevation(m)	94.00	102.22
Earth Cover(m)	18.29	28.02
Invert Elevation(m)	73.646	72.136
Cu. Length(m)	1852.00	3110.00

PipeList			
④-②			

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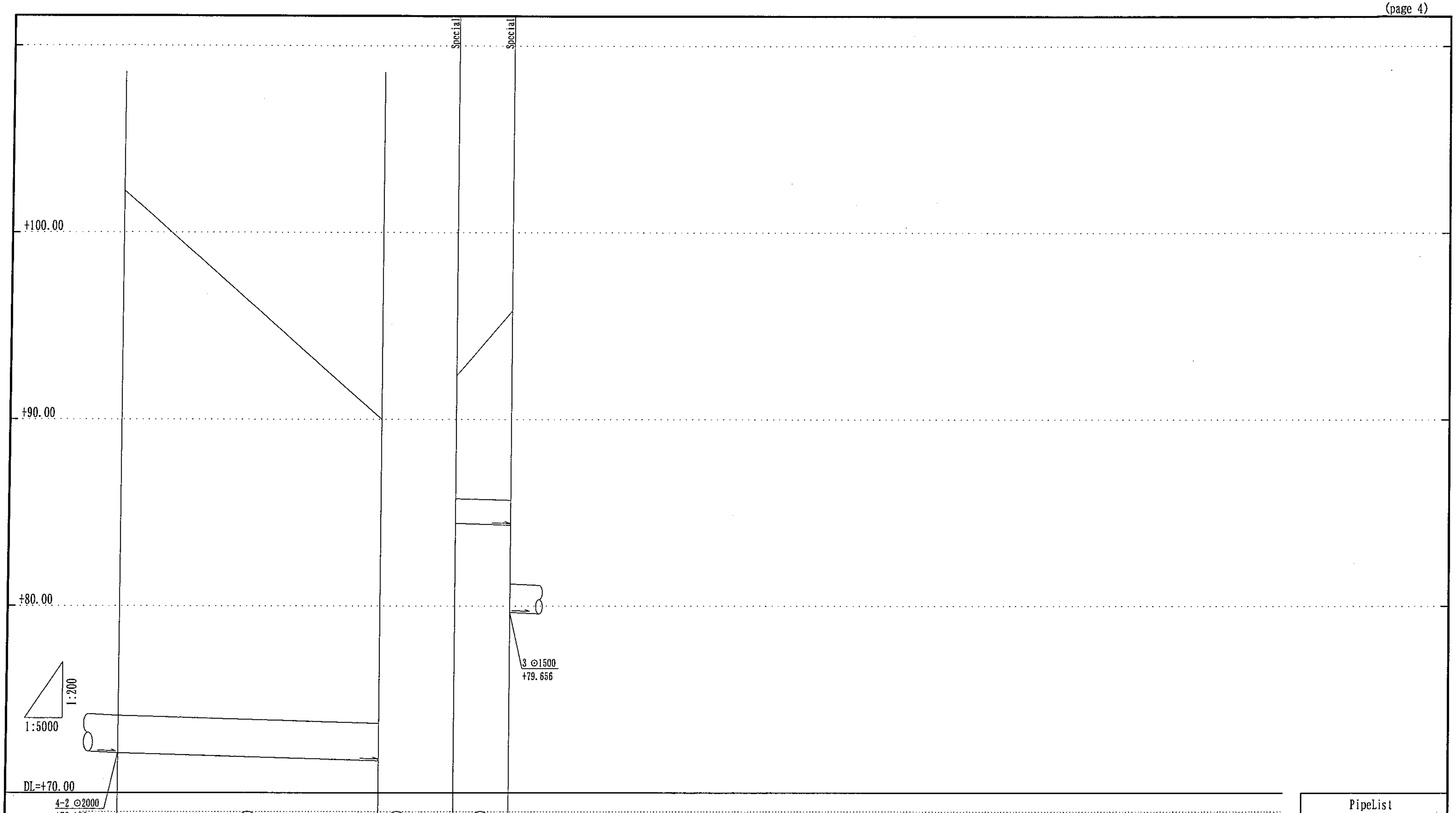
A3J_ITW:2006-03-22 B3A_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:14



Sewer Line No.		(4-3)		⑪		②	
Diam(mm)		⊙2000				⊙1350	
Slope(‰)		1.2				1.1	
Length(m)		353.00				75.00	
Ground Elevation(m)	102.22		90.00		92.34		95.80
Earth Cover(m)	28.02		16.23		6.54		10.08
Invert Elevation(m)	72.136		71.712		84.410		84.327
Cu. Length(m)	3110.00		3463.00		0.00		75.00

PipeList			
(4-3)	②		

B-3a

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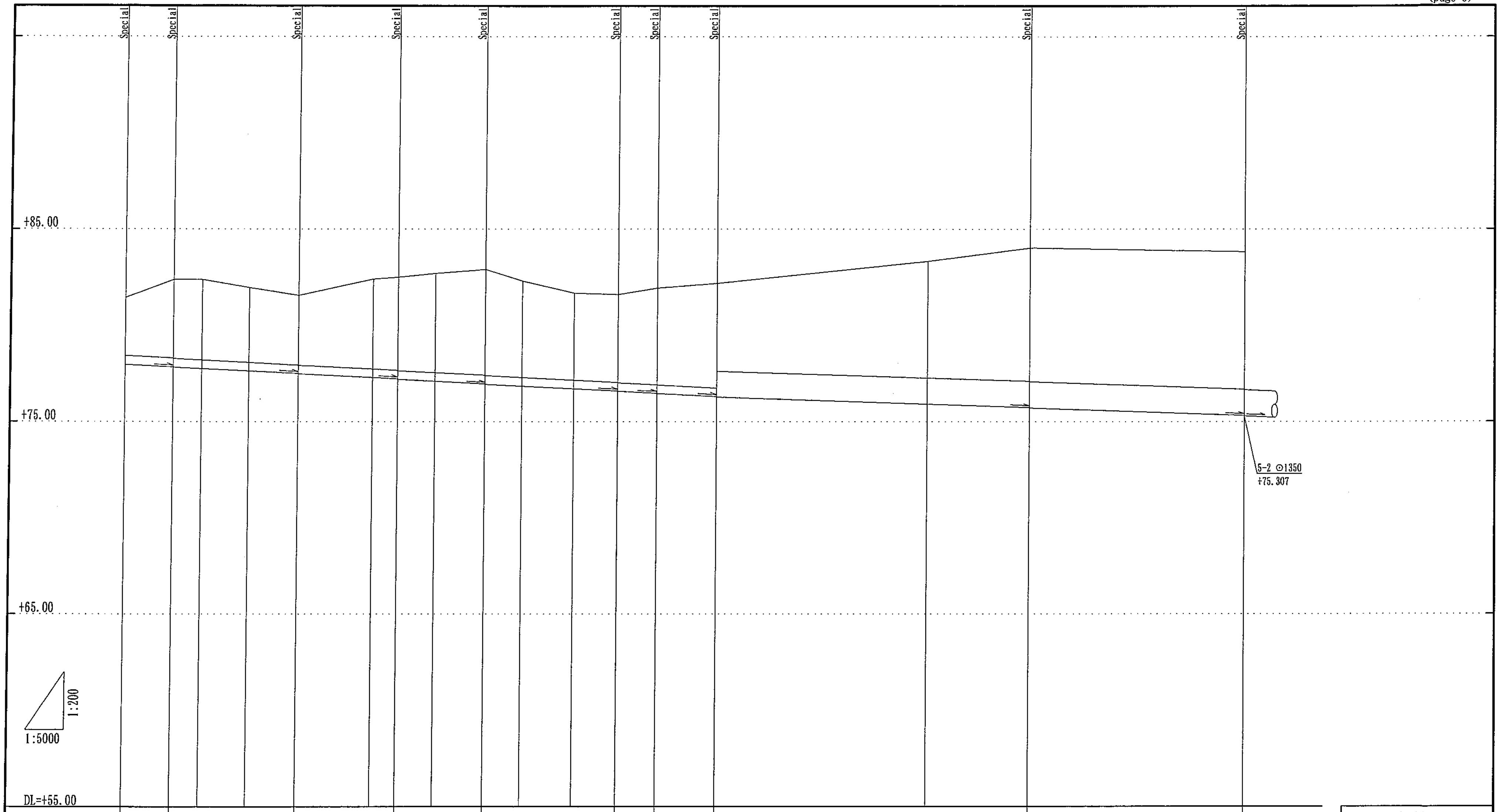
A3J_ITW:2006-03-22 B3A_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:14



Sewer Line No.	(7-1)	(7-2)	(7-3)	(7-4)	(7-5)	(7-6)	(7-7)	(6-1)	(5-1)
Diam(mm)	⊙450	⊙450	⊙450	⊙450	⊙450	⊙450	⊙450	⊙1350	⊙1350
Slope(‰)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.3	1.4
Length(m)	63.00	165.00	130.00	115.00	174.00	51.00	79.00	411.00	282.00

Cu. Length(m)	Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)
0.00	81.44	3.00	77.970
63.00	82.38	4.07 4.09	77.844 77.824
101.00	82.38	4.16	77.748
163.00	81.97	3.88	77.624
228.00	81.57	3.61 3.63	77.494 77.474
325.00	82.40	4.65	77.280
358.00	82.50	4.82 4.84	77.214 77.194
407.00	82.70	5.13	77.096
473.00	82.89	5.46 5.48	76.964 76.944
522.00	82.29	4.97	76.846
590.00	81.67	4.49	76.710
647.00	81.60	4.53 4.55	76.596 76.576
698.00	81.93	4.99 5.01	76.474 76.454
777.00	82.19	5.42 4.52	76.296 76.276
1054.00	83.34	6.03	75.916
1188.00	84.01	6.87 6.89	75.742 75.722
1470.00	83.83	7.11	75.327

PipeList			
(7-1)	(7-2)	(7-3)	(7-4)
(7-5)	(7-6)	(7-7)	(6-1)
(5-1)			

B-3a

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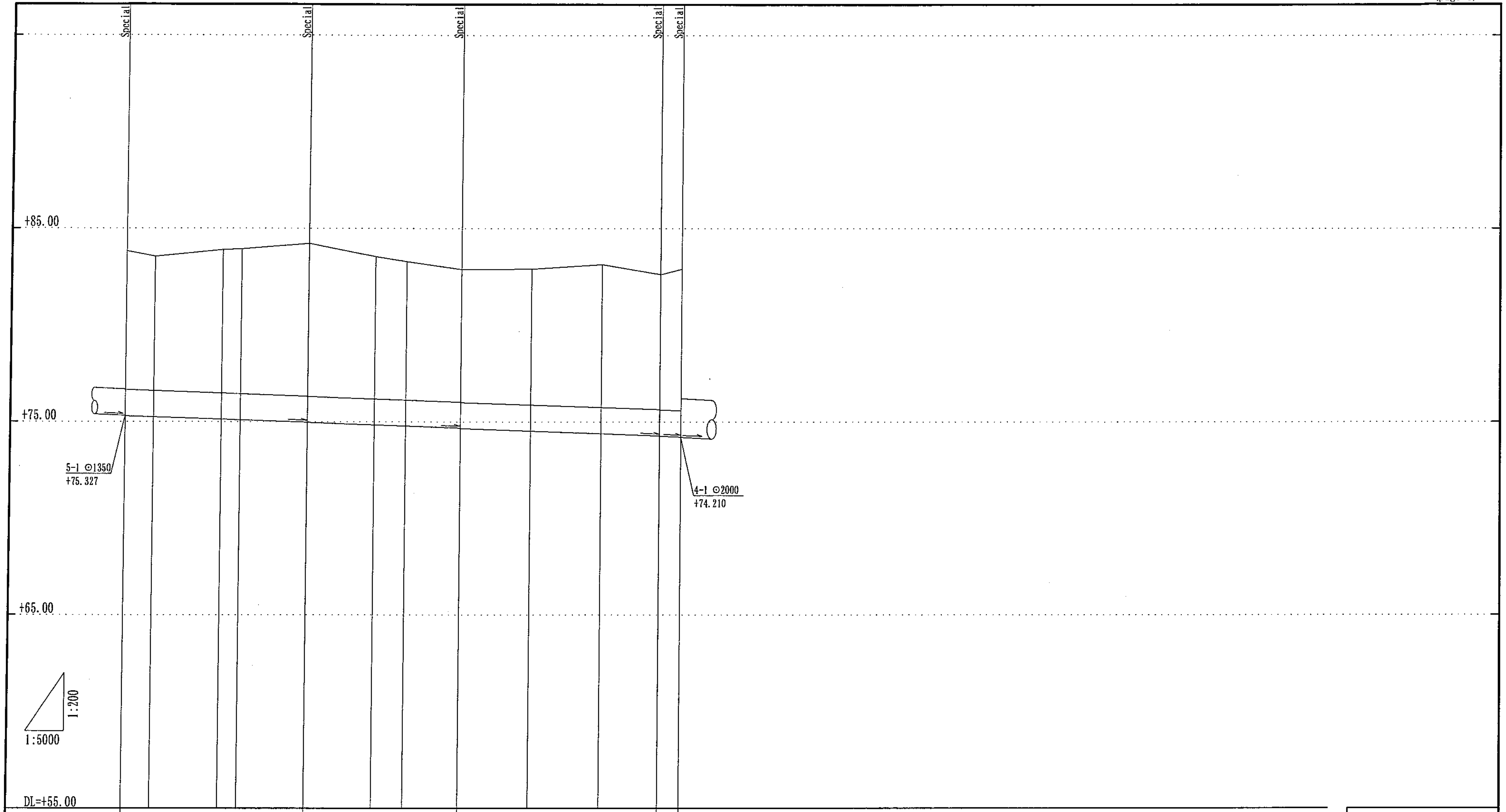
A3J_ITW:2006-03-22 B3A_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:14



Sewer Line No.	⑤-②	⑤-③	⑤-④	⑤-⑤
Diam(mm)	⊙1350	⊙1350	⊙1350	⊙1350
Slope(‰)	1.4	1.4	1.4	1.4
Length(m)	238.00	201.00	260.00	28.00

Cu. Length(m)	Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)
1470.00	83.83	7.13	75.307
1507.00	83.53	6.88	75.255
1595.00	83.90	7.37	75.132
1620.00	83.95	7.46	75.097
1708.00	84.23	7.86 7.88	74.974 74.954
1796.00	83.54	7.31	74.831
1837.00	83.27	7.10	74.773
1909.00	82.88	6.81 6.83	74.673 74.653
2000.00	82.90	6.98	74.526
2092.00	83.13	7.34	74.397
2169.00	82.62	6.94 6.96	74.289 74.269
2197.00	82.90	7.28	74.230

PipeList

⑤-②	⑤-③	⑤-④	⑤-⑤

B-3a

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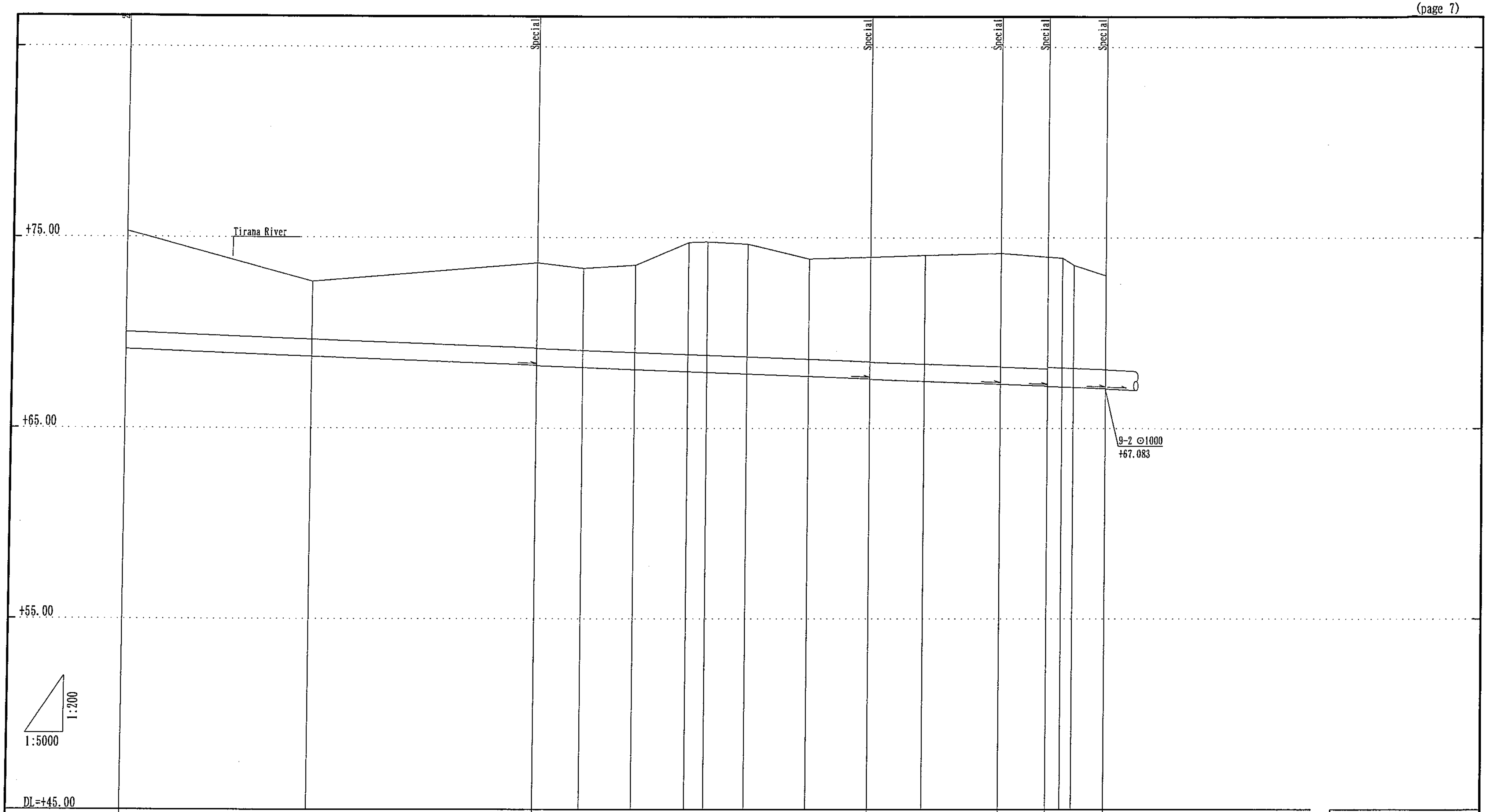
A3J_ITW:2006-03-22 B3A_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:14

A3J_ITW:2006-03-22   B3A_02.FIG:2006/6/14/16:12   ALBANIA.INI:2006/6/8/9:57   Print:2006/6/14/16:14



Sewer Line No.	(8-1)	(8-2)	(8-3)	(8-4)	(9-1)
Diam(mm)	⊙900	⊙900	⊙900	⊙900	⊙1000
Slope(‰)	1.5	1.5	1.5	1.5	1.2
Length(m)	545.00	443.00	172.00	63.00	77.00

Ground Elevation(m)	75.29	73.80	72.67	73.65	73.37	73.57	74.74	74.78	74.65	73.88	73.98	74.09	74.19	73.98	73.94	73.57	73.01
Earth Cover(m)	5.25	3.97	3.00	4.43 4.45	4.26	4.56	5.84	5.92	5.87	5.22	5.44 5.46	5.68	5.93 5.95	5.84 5.75	5.73	5.38	4.87
Invert Elevation(m)	69.111	68.901	68.740	68.293 68.273	68.180	68.076	67.971	67.934	67.854	67.731	67.608 67.588	67.480	67.330 67.310	67.215 67.195	67.172	67.154	67.103
Cu. Length(m)	0.00	140.00	247.00	545.00	607.00	676.00	746.00	771.00	824.00	906.00	988.00	1060.00	1160.00	1223.00	1242.00	1257.00	1300.00

PipeList			
(8-1)	(8-2)	(8-3)	(8-4)
(9-1)			

B-3a

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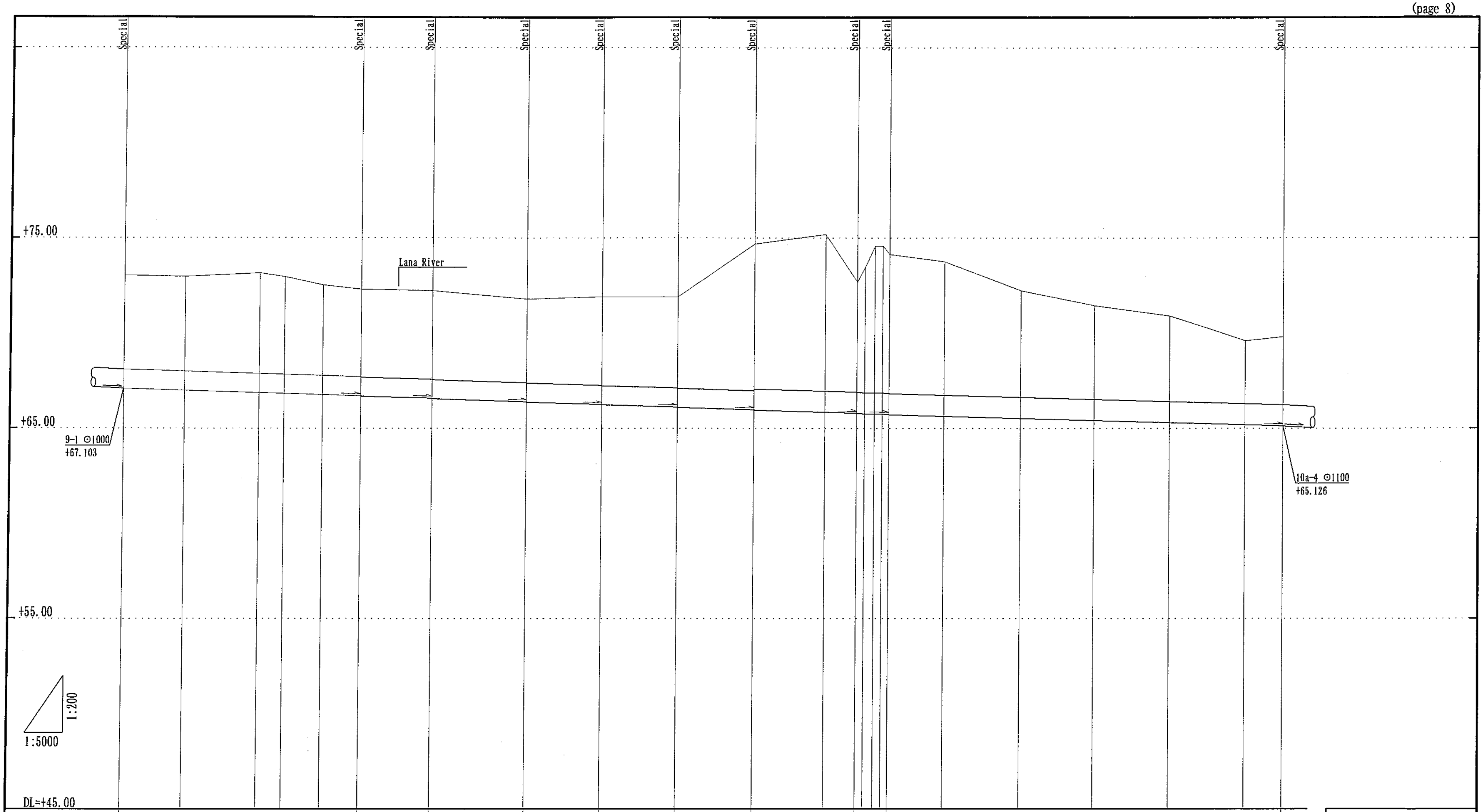

Sewer Line No.	⑨-2	⑨-3	⑨-4	⑨-5	⑨-6	⑨-7	10a-1	10a-2	10a-3
Diam(mm)	⊙1000	⊙1000	⊙1000	⊙1000	⊙1000	⊙1000	⊙1100	⊙1100	⊙1100
Slope(‰)	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1
Length(m)	315.00	95.00	126.00	100.00	100.00	102.00	137.00	42.00	523.00

Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)	Cu. Length(m)
73.01	4.89	67.083	1300.00
72.97	4.95	66.986	1381.00
73.13	5.23	66.866	1481.00
72.93	5.07	66.826	1514.00
72.51	4.71	66.765	1565.00
72.29	4.55 4.57	66.705 66.685	1615.00
72.26	4.60	66.625	1665.00
72.23	4.62 4.64	66.571 66.551	1710.00
71.78	4.35 4.37	66.400 66.380	1836.00
71.90	4.61 4.63	66.260 66.240	1936.00
71.90	4.75 4.77	66.120 66.100	2036.00
74.69	7.68 7.60	65.978 65.958	2138.00
75.19	8.20	65.853	2233.00
72.69	5.75 5.77	65.807 65.787	2275.00
73.47	6.56	65.776	2285.00
74.57	7.67	65.762	2298.00
74.56	7.67	65.751	2308.00
74.12	7.24 7.26	65.741 65.721	2317.00
73.74	6.96	65.641	2390.00
72.23	5.57	65.528	2492.00
71.44	4.88	65.421	2590.00
70.90	4.45	65.311	2690.00
69.60	3.26	65.201	2790.00
69.80	3.52	65.146	2840.00

PipeList

⑨-2	⑨-3	⑨-4	⑨-5
⑨-6	⑨-7	10a-1	10a-2
10a-3			

B-3a

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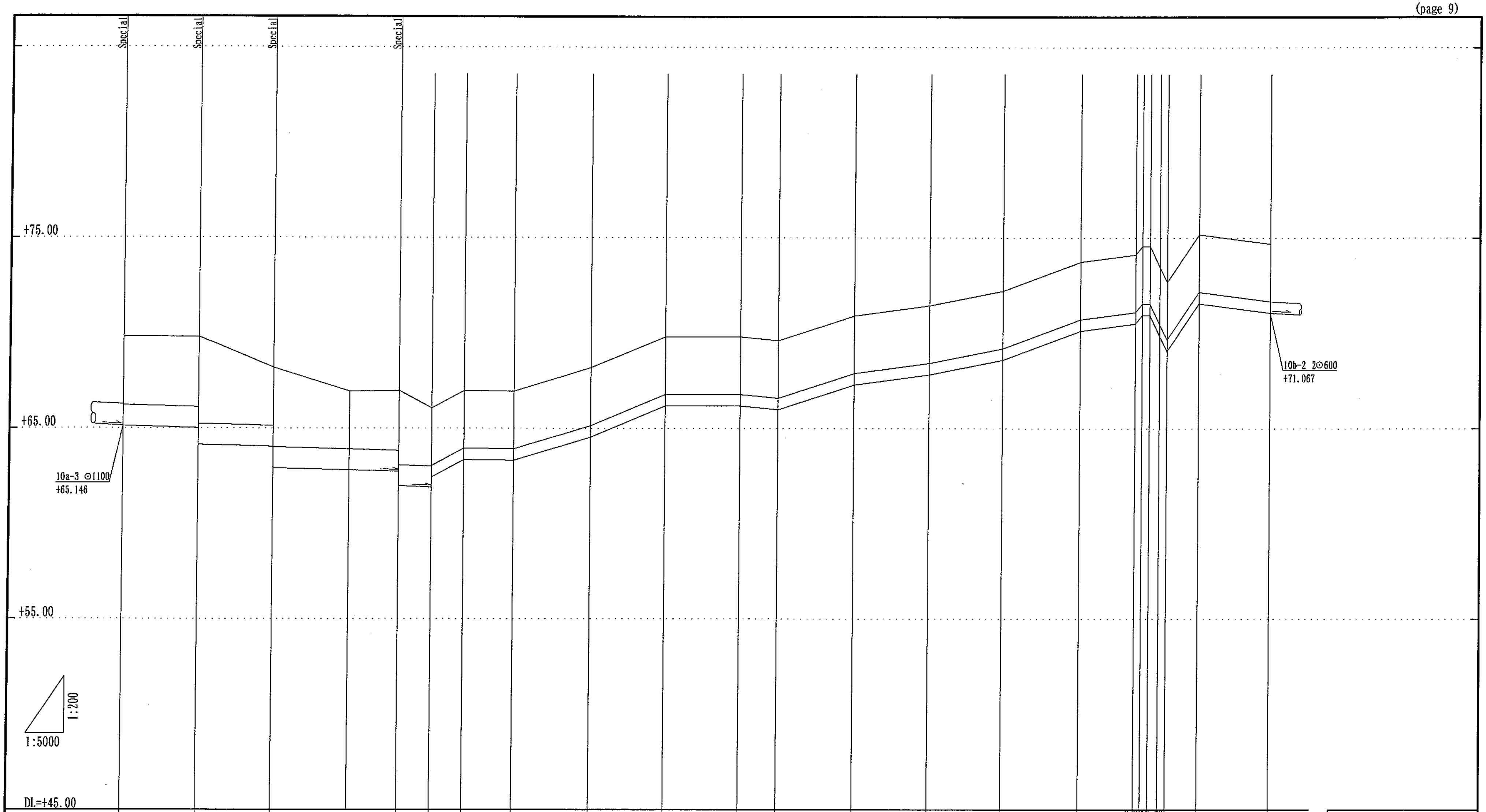
A3J_ITW:2006-03-22 B3A_02.FIG:2006/6/14/16:19 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:19

A3J_ITW:2006-03-22 B3A_02.FIG:2006/6/14/16:19 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:19

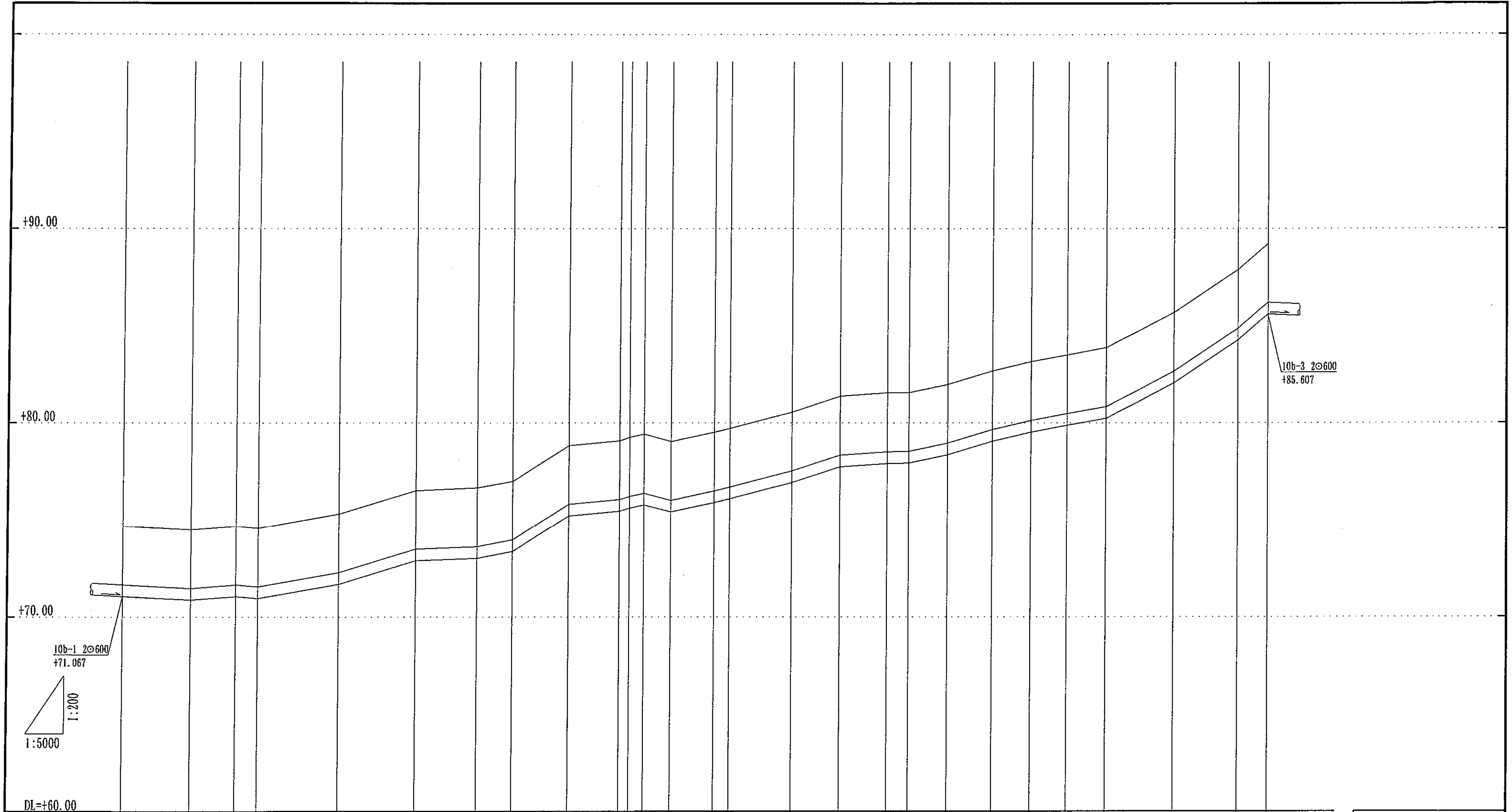


Length between stations	100.00	99.00	167.00		43.00	66.00	101.00	99.00	
Sewer Line No.			(10a-4)		(10a-5)				
Diam(mm)			⊙1100		⊙1100				
Slope(‰)			1.1		1.1				
Length(m)			366.00		43.00				
Ground Elevation(m)	69.80	69.80	68.17	66.95	66.98	66.06	66.98	66.95	68.17
Earth Cover(m)	3.54	3.65 4.52	3.00 4.11	3.00	3.10 3.87	3.00 3.00	3.00	3.00	3.00
Invert Elevation(m)	65.126	65.016 64.144	64.035 62.926	62.815	62.742 61.972	61.925 62.437	63.357	63.327	64.547
Cu. Length(m)	2840.00	2940.00	3039.00	3140.00	3206.00	3249.00	3292.00	3358.00	3459.00

Length between stations	100.00	50.00	100.00	100.00	98.00	102.00	73.00	9.00	10.00	13.00	10.00	42.00	95.00	
Sewer Line No.				(10b-1)										
Diam(mm)				2⊙600										
Slope(‰)				Press										
Length(m)				1111.00										
Ground Elevation(m)	69.80	69.80	69.60	70.90	71.44	72.23	73.74	74.12	74.56	74.57	73.47	72.69	75.19	74.69
Earth Cover(m)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Invert Elevation(m)	66.177	66.177	65.977	67.277	67.817	68.607	70.117	70.497	70.937	70.947	69.847	69.067	71.567	71.067
Cu. Length(m)	3558.00	3658.00	3708.00	3808.00	3908.00	4006.00	4108.00	4181.00	4190.00	4200.00	4213.00	4223.00	4265.00	4360.00

PipeList			
(10a-4)	(10a-5)	(10b-1)	
B-3a			9/11

A3J_ITW:2006-03-22 B3A_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:14



88.00	58.00	29.00	106.00	100.00	79.00	46.00	73.00	66.00	13.00	19.00	35.00	56.00	20.00	80.00	63.00	62.00	28.00	50.00	58.00	50.00	47.00	51.00	88.00	83.00	39.00

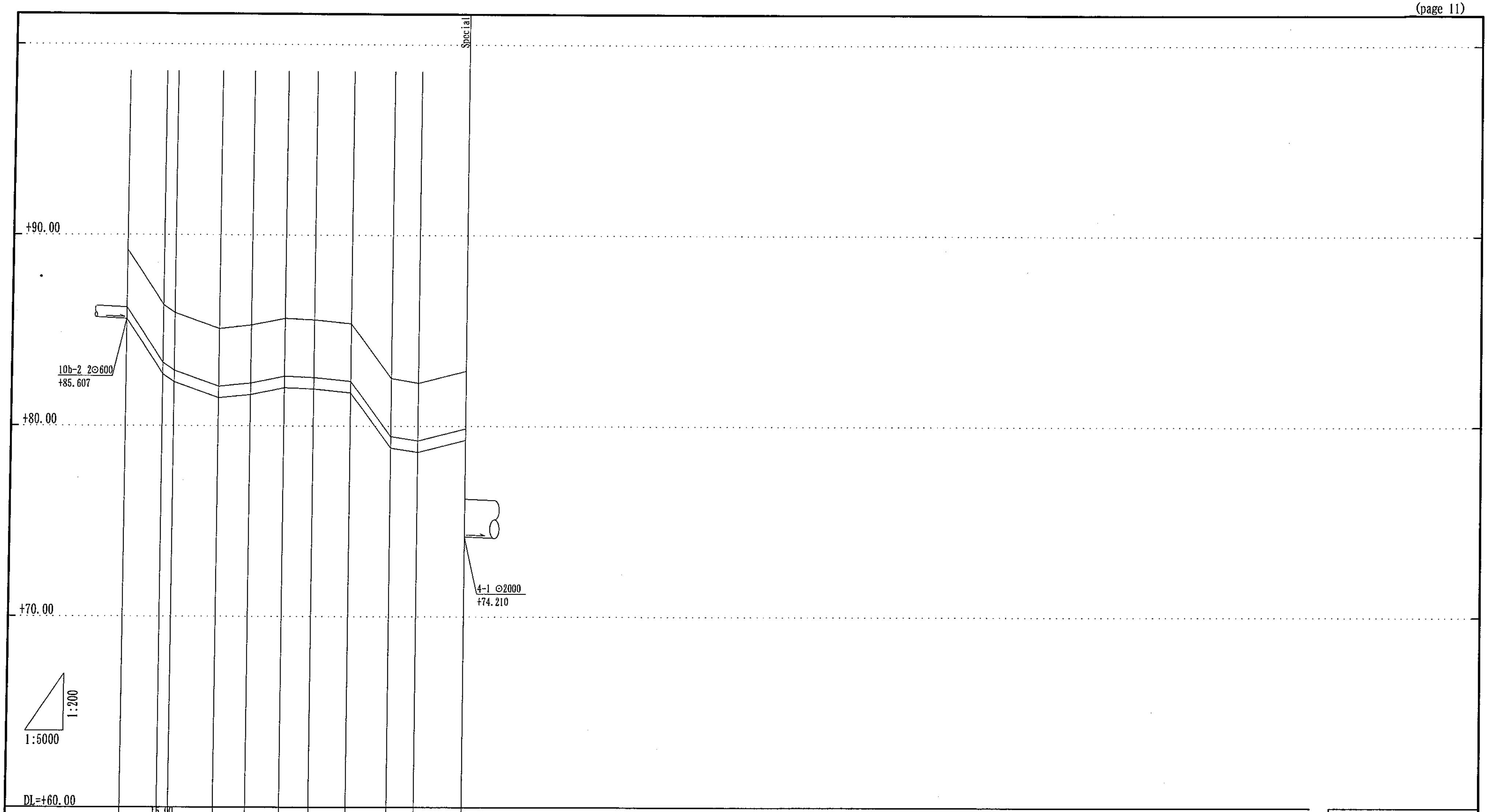
Sewer Line No. (10b-2)
Diam(mm) 2⊙600
Slope(‰) Press
Length(m) 1487.00

Ground Elevation(m)	74.69	74.50	74.69	74.58	75.31	76.52	76.65	77.00	78.85	79.08	79.25	79.41	79.04	79.52
Earth Cover(m)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Invert Elevation(m)	71.067	70.877	71.067	70.957	71.687	72.897	73.027	73.377	75.227	75.457	75.627	75.787	75.417	75.897
Cu. Length(m)	4360.00	4448.00	4506.00	4535.00	4641.00	4741.00	4820.00	4866.00	4939.00	5005.00	5018.00	5037.00	5072.00	5128.00

Ground Elevation(m)	79.72	80.56	81.37	81.55	81.56	81.99	82.68	83.15	83.50	83.87	85.68	87.88	89.23
Earth Cover(m)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Invert Elevation(m)	76.097	76.937	77.747	77.927	77.937	78.367	79.057	79.527	79.877	80.247	82.057	84.257	85.607
Cu. Length(m)	5148.00	5228.00	5291.00	5353.00	5381.00	5431.00	5489.00	5539.00	5586.00	5637.00	5725.00	5808.00	5847.00

PipeList
(10b-2)

B-3a 10/11



	48.00	15.00	60.00	43.00	45.00	39.00	49.00	54.00	36.00	63.00

Sewer Line No. ⑩b-3 (10b-3)
Diam(mm) 2⊙600
Slope(‰) Press
Length(m) 452.00

Ground Elevation(m)	89.23	86.33	85.92	85.09	85.27	85.63	85.57	85.36	82.49	82.26	82.90
Earth Cover(m)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Invert Elevation(m)	85.607	82.707	82.297	81.467	81.647	82.007	81.947	81.737	78.867	78.637	79.277
Cu. Length(m)	5847.00	5895.00	5910.00	5970.00	6013.00	6058.00	6097.00	6146.00	6200.00	6236.00	6299.00

PipeList

10b-3			

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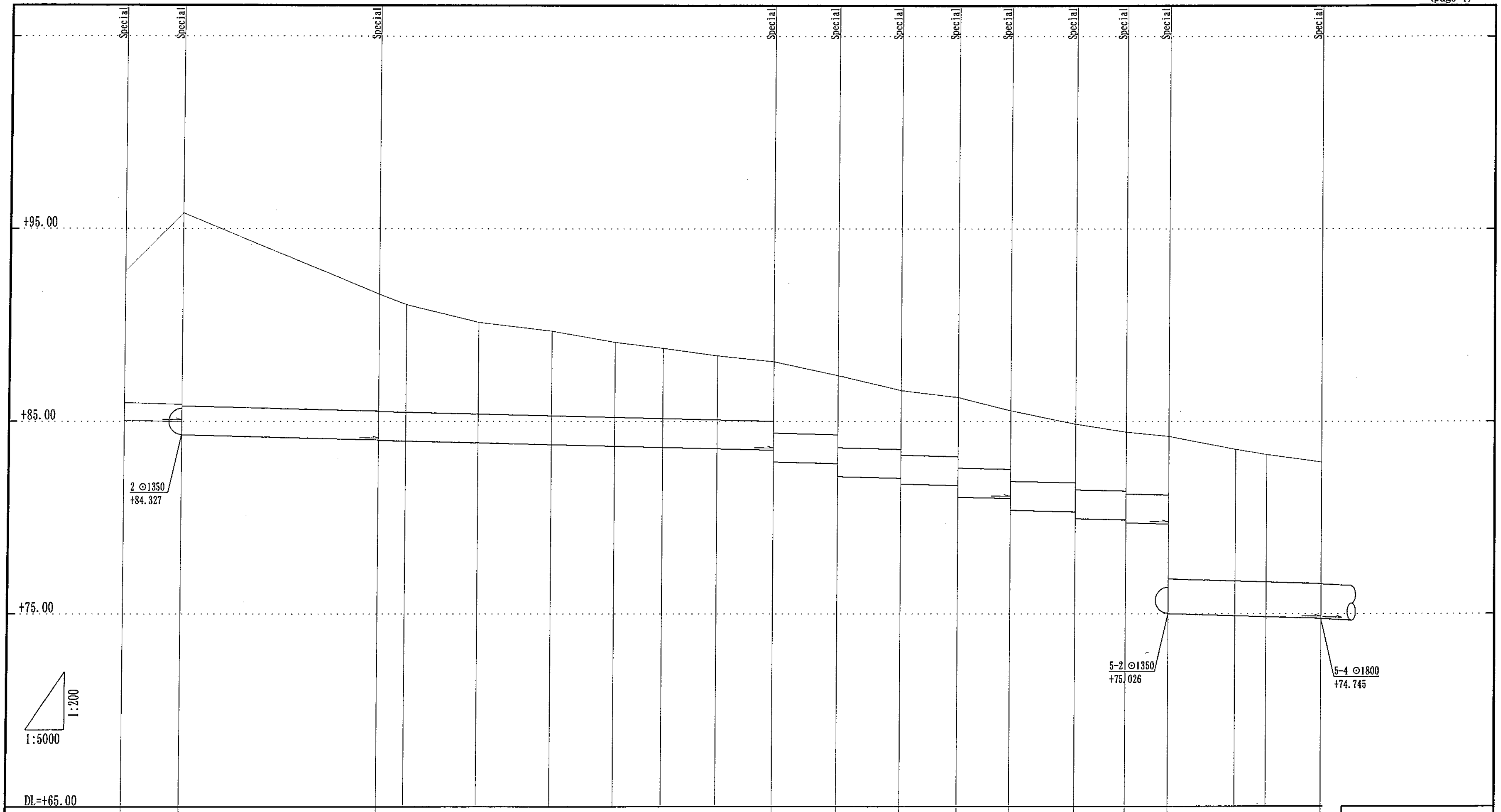
A3J_ITW:2006-03-22 B3A_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:14



				84.00 82.00 76.00 69.00	85.00 66.00 56.00	
Sewer Line No.	①	(3-1)	(3-2)	(3-3)	(3-4)	(5-3)
Diam(mm)	⊙900	⊙1500	⊙1500	⊙1500	⊙1500	⊙1800
Slope(‰)	1.2	1.0	1.0	1.0	1.0	1.2
Length(m)	76.00	258.00	519.00	311.00	207.00	201.00

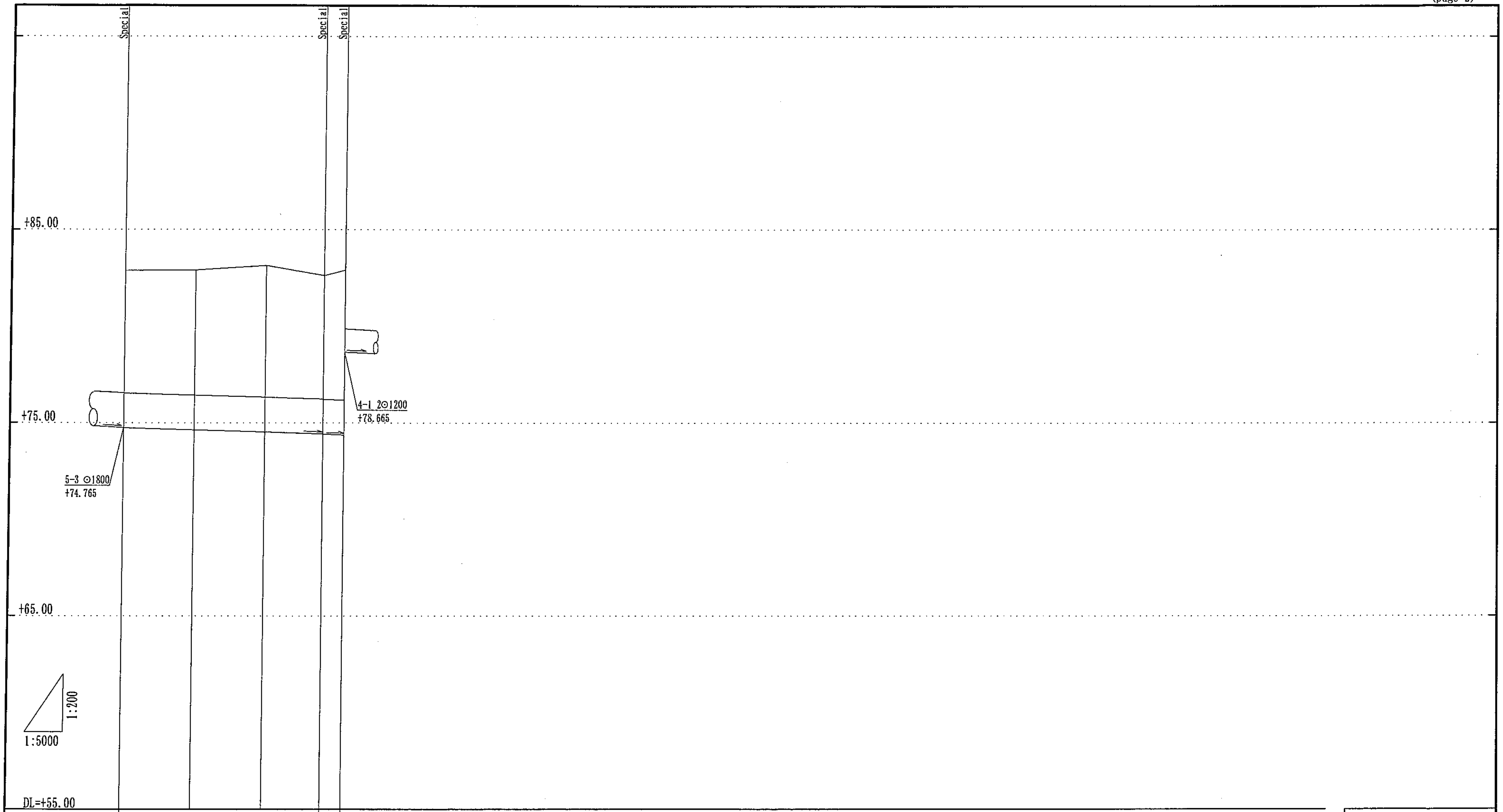
Ground Elevation(m)	92.79	95.80	91.61	91.06	90.14	89.69	89.10	88.79	88.39	88.10	87.37
Earth Cover(m)	6.79	9.89 9.94	6.01 6.03	5.52	4.69	4.34	3.83	3.58	3.26	3.04 3.65	3.00 3.69
Invert Elevation(m)	85.070	84.979 84.307	84.049 84.029	83.993	83.898	83.802	83.719	83.656	83.584	83.510 82.904	82.820 82.132
Cu. Length(m)	0.00	76.00	334.00	370.00	465.00	561.00	644.00	707.00	779.00	853.00	937.00

Ground Elevation(m)	86.60	86.24	85.56	84.86	84.45	84.23	83.54	83.27	82.88
Earth Cover(m)	3.00 3.28	3.00 3.61	3.00 3.62	3.00 3.34	3.00 3.16	3.00 7.37	6.79	6.56	6.26
Invert Elevation(m)	82.050 81.766	81.690 81.079	81.010 80.395	80.310 79.966	79.900 79.736	79.680 75.006	74.900	74.851	74.765
Cu. Length(m)	1019.00	1095.00	1164.00	1249.00	1315.00	1371.00	1459.00	1500.00	1572.00

PipeList			
①	(3-1)	(3-2)	(3-3)
(3-4)	(5-3)		

B-3b	1/10

A3J_ITW:2006-03-22 B3B_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:12



Sewer Line No.	(5-4)			(5-5)	
Diam(mm)	⊙1800			⊙1800	
Slope(‰)	1.2			1.2	
Length(m)	260.00			28.00	
Ground Elevation(m)	82.88	82.90	83.13	82.62	82.90
Earth Cover(m)	6.28	6.41	6.75	6.33 6.35	6.67
Invert Elevation(m)	74.745	74.636	74.525	74.433 74.413	74.379
Cu. Length(m)	1572.00	1663.00	1755.00	1832.00	1860.00

PipeList			
(5-4)	(5-5)		

B-3b

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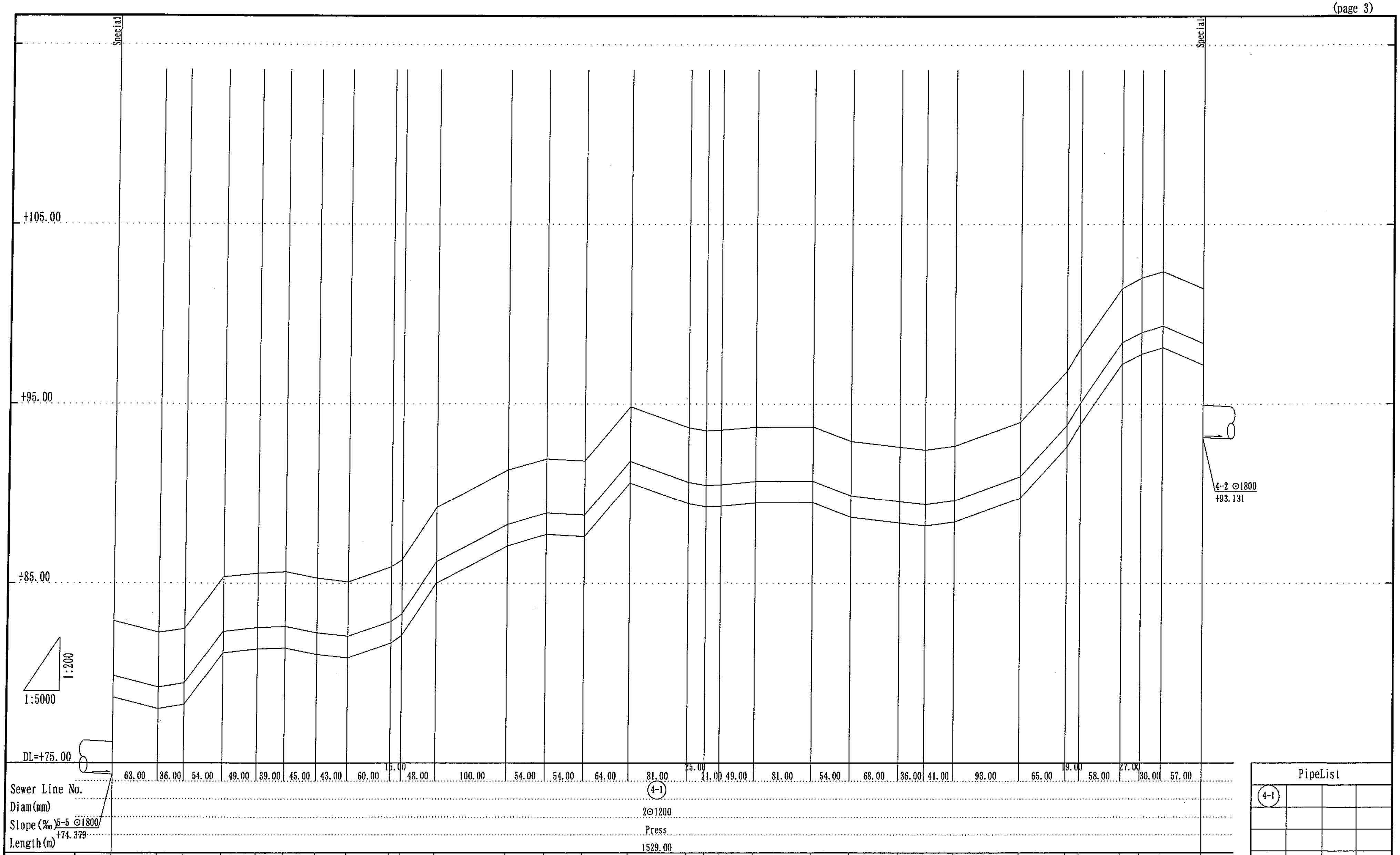
A3J_ITW:2006-03-22 B3B_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:12

A3J_ITW:2006-03-22 B3B_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:12



Sewer Line No. (4-1)
Diam(mm) 2⊙1200
Slope(‰) Press
Length(m) 1529.00

Cu. Length(m)	Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)
1860.00	82.90	3.00	78.665
1923.00	82.26	3.00	78.025
1959.00	82.49	3.00	78.255
2013.00	85.36	3.00	81.125
2062.00	85.57	3.00	81.335
2101.00	85.63	3.00	81.395
2146.00	85.27	3.00	81.035
2189.00	85.09	3.00	80.855
2249.00	85.92	3.00	81.685
2264.00	86.33	3.00	82.095
2312.00	89.23	3.00	84.995
2412.00	91.31	3.00	87.075
2466.00	91.95	3.00	87.715
2520.00	91.83	3.00	87.595
2584.00	94.84	3.00	90.605
2665.00	93.68	3.00	89.445
2690.00	93.50	3.00	89.265
2711.00	93.54	3.00	89.305
2760.00	93.71	3.00	89.475
2841.00	93.73	3.00	89.495
2895.00	92.91	3.00	88.675
2963.00	92.60	3.00	88.365
2999.00	92.44	3.00	88.205
3040.00	92.66	3.00	88.425
3133.00	94.00	3.00	89.765
3198.00	96.83	3.00	92.595
3217.00	98.10	3.00	93.865
3275.00	101.45	3.00	97.215
3302.00	102.02	3.00	97.785
3332.00	102.38	3.00	98.145
3389.00	101.42	3.00	97.185

PipeList
(4-1)

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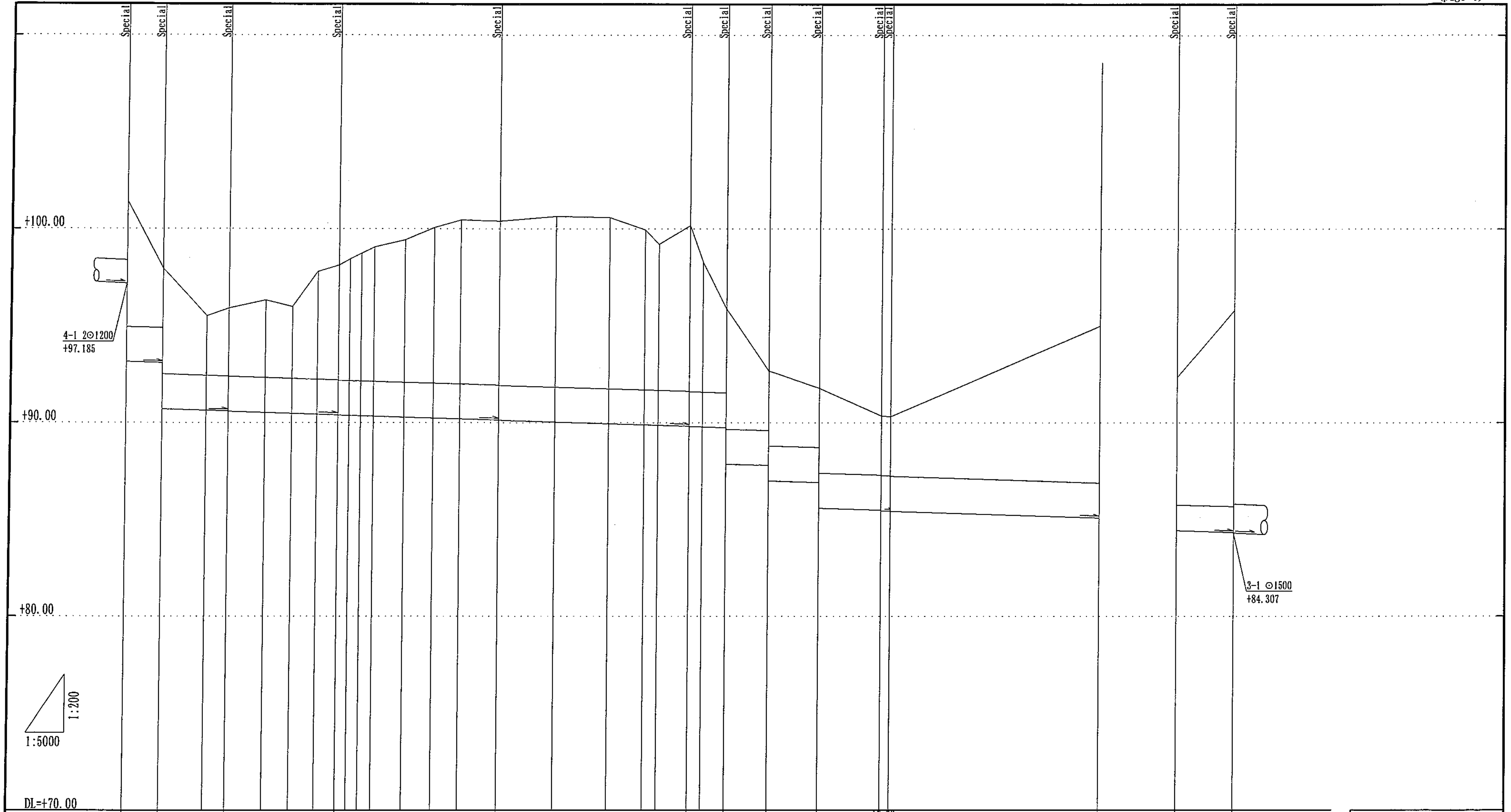

Sewer Line No.	Diam(mm)	Slope(‰)	Length(m)
(4-2)	⊙1800	1.2	47.00
(4-3)	⊙1800	1.2	87.00
(4-4)	⊙1800	1.2	143.00
(4-5)	⊙1800	1.2	210.00
(4-6)	⊙1800	1.2	248.00
(4-7)	⊙1800	1.2	48.00 56.00 66.00 81.00 12.00 263.00
(4-8)	⊙1800	1.2	273.00
⑪			
②	⊙1350	1.1	75.00

Cu. Length(m)	Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)
3389.00	101.42	6.43	93.131
3436.00	97.93	3.00 5.37	93.075 90.705
3494.00	95.49	3.00	90.635
3523.00	95.89	3.43 3.45	90.601 90.581
3571.00	96.31	3.93	90.523
3606.00	95.98	3.64	90.481
3639.00	97.80	5.50	90.442
3666.00	98.12	5.86 5.88	90.409 90.389
3680.00	98.45	6.22	90.372
3695.00	98.74	6.53	90.354
3712.00	99.06	6.87	90.334
3752.00	99.41	7.27	90.286
3790.00	100.05	7.96	90.240
3825.00	100.46	8.41	90.198
3876.00	100.40	8.41 8.43	90.137 90.117
3949.00	100.64	8.76	90.029
4019.00	100.59	8.79	89.945
4065.00	99.94	8.20	89.890
4083.00	99.21	7.49	89.869
4124.00	100.17	8.50 8.52	89.819 89.799
4141.00	98.28	6.65	89.779
4172.00	95.85	4.25 6.13	89.741 87.862
4228.00	92.65	3.00 3.80	87.795 86.994
4294.00	91.77	3.00 4.31	86.915 85.602
4375.00	90.36	3.00 3.04	85.505 85.469
4387.00	90.31	3.00 3.02	85.455 85.435
4660.00	95.00	8.04	85.107
0.00	92.34	6.54	84.410
75.00	95.80	10.08	84.327

PipeList

(4-2)	(4-3)	(4-4)	(4-5)
(4-6)	(4-7)	(4-8)	②

B-3b

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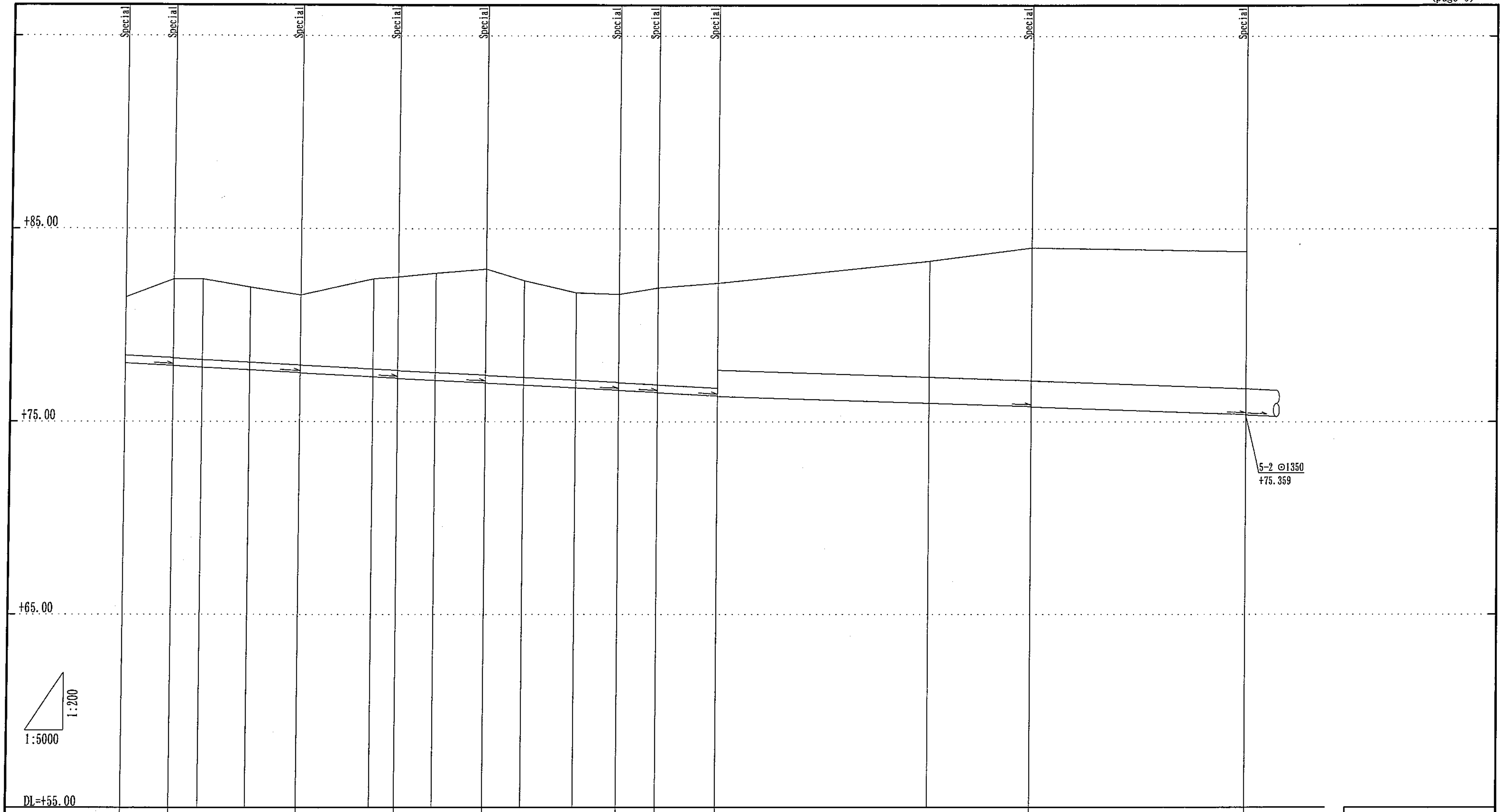
A3J_ITW:2006-03-22 B3B_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:12



Sewer Line No.	Diam(mm)	Slope(‰)	Length(m)
⑺-1 (7-1)	⊙400	2.0	63.00
7-2	⊙400	2.0	165.00
7-3	⊙400	2.0	130.00
7-4	⊙400	2.0	115.00
7-5	⊙400	2.0	174.00
7-6	⊙400	2.0	51.00
7-7	⊙400	2.0	79.00
6-1	⊙1350	1.3	411.00
5-1	⊙1350	1.4	282.00

Cu. Length(m)	Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)
0.00	81.44	3.00	78.022
63.00	82.38	4.07 4.09	77.896 77.876
101.00	82.38	4.16	77.800
163.00	81.97	3.88	77.676
228.00	81.57	3.61 3.63	77.546 77.526
325.00	82.40	4.65	77.332
358.00	82.50	4.82 4.84	77.266 77.246
407.00	82.70	5.13	77.148
473.00	82.89	5.46 5.48	77.016 76.996
522.00	82.29	4.97	76.898
590.00	81.67	4.49	76.762
647.00	81.60	4.53 4.55	76.648 76.628
698.00	81.93	4.99 5.01	76.526 76.506
777.00	82.19	5.42 4.47	76.348 76.328
1054.00	83.34	5.98	75.968
1188.00	84.01	6.82 6.84	75.794 75.774
1470.00	83.83	7.06	75.379

PipeList			
7-1	7-2	7-3	7-4
7-5	7-6	7-7	6-1
5-1			

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A3J_ITW:2006-03-22 B3B_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:12

Sewer Line No. ⑤-②

Sewer Line No.	(5-2)				
Diam(mm)	⊙1350				
Slope(‰)	1.4				
Length(m)	238.00				
Ground Elevation(m)	83.83	83.53	83.90	83.95	84.23
Earth Cover(m)	7.08	6.83	7.32	7.41	7.81
Invert Elevation(m)	75.359	75.307	75.184	75.149	75.026
Cu. Length(m)	1470.00	1507.00	1595.00	1620.00	1708.00

PipeList			
(5-2)			

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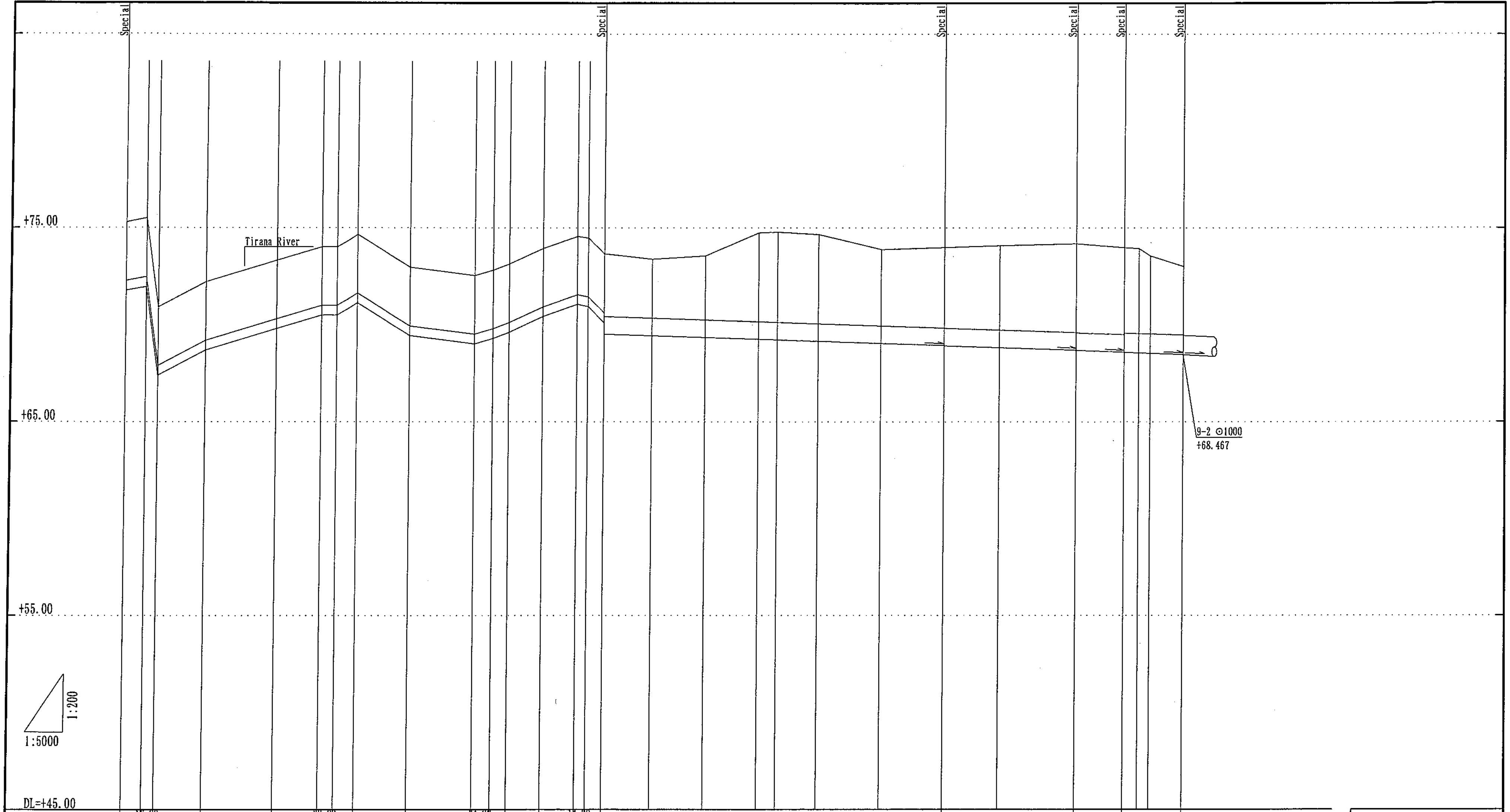
A3J_ITW:2006-03-22 B3B_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:12



Length between stations (m)
26.00
16.00
62.00
93.00
59.00
20.00
26.00
68.00
85.00
24.00
21.00
44.00
45.00
14.00
21.00

Sewer Line No.	⑧-1	⑧-2	⑧-3	⑧-4	⑨-1
Diam (mm)	2⊙500	⊙900	⊙900	⊙900	⊙1000
Slope (‰)	Press	1.3	1.3	1.3	1.2
Length (m)	624.00	443.00	172.00	63.00	77.00

Cu. Length (m)	Ground Elevation (m)	Earth Cover (m)	Invert Elevation (m)
0.00	75.29	3.00	71.770
26.00	75.49	3.00	71.970
42.00	70.92	3.00	67.400
104.00	72.22	3.00	68.700
154.00	72.81	3.00	69.291
197.00	73.32	3.00	69.800
256.00	74.02	3.00	70.500
276.00	74.02	3.00	70.500
302.00	74.66	3.00	71.140
370.00	72.97	3.00	69.450
455.00	72.53	3.00	69.010
479.00	72.81	3.00	69.290
500.00	73.14	3.00	69.620
544.00	73.93	3.00	70.410
589.00	74.57	3.00	71.050
603.00	74.47	3.00	70.950
624.00	73.65	3.00 3.20	70.130 69.521
686.00	73.37	3.00	69.440
755.00	73.57	3.29	69.351
825.00	74.74	4.55	69.260
850.00	74.78	4.62	69.227
903.00	74.65	4.56	69.158
985.00	73.88	3.90	69.052
1067.00	73.98	4.11 4.13	68.945 68.925
1139.00	74.09	4.33	68.831
1239.00	74.19	4.56 4.58	68.701 68.681
1302.00	73.98	4.45 4.37	68.599 68.579
1321.00	73.94	4.35	68.556
1336.00	73.57	4.00	68.538
1379.00	73.01	3.49	68.487

PipeList

⑧-1	⑧-2	⑧-3	⑧-4
⑨-1			

B-3b

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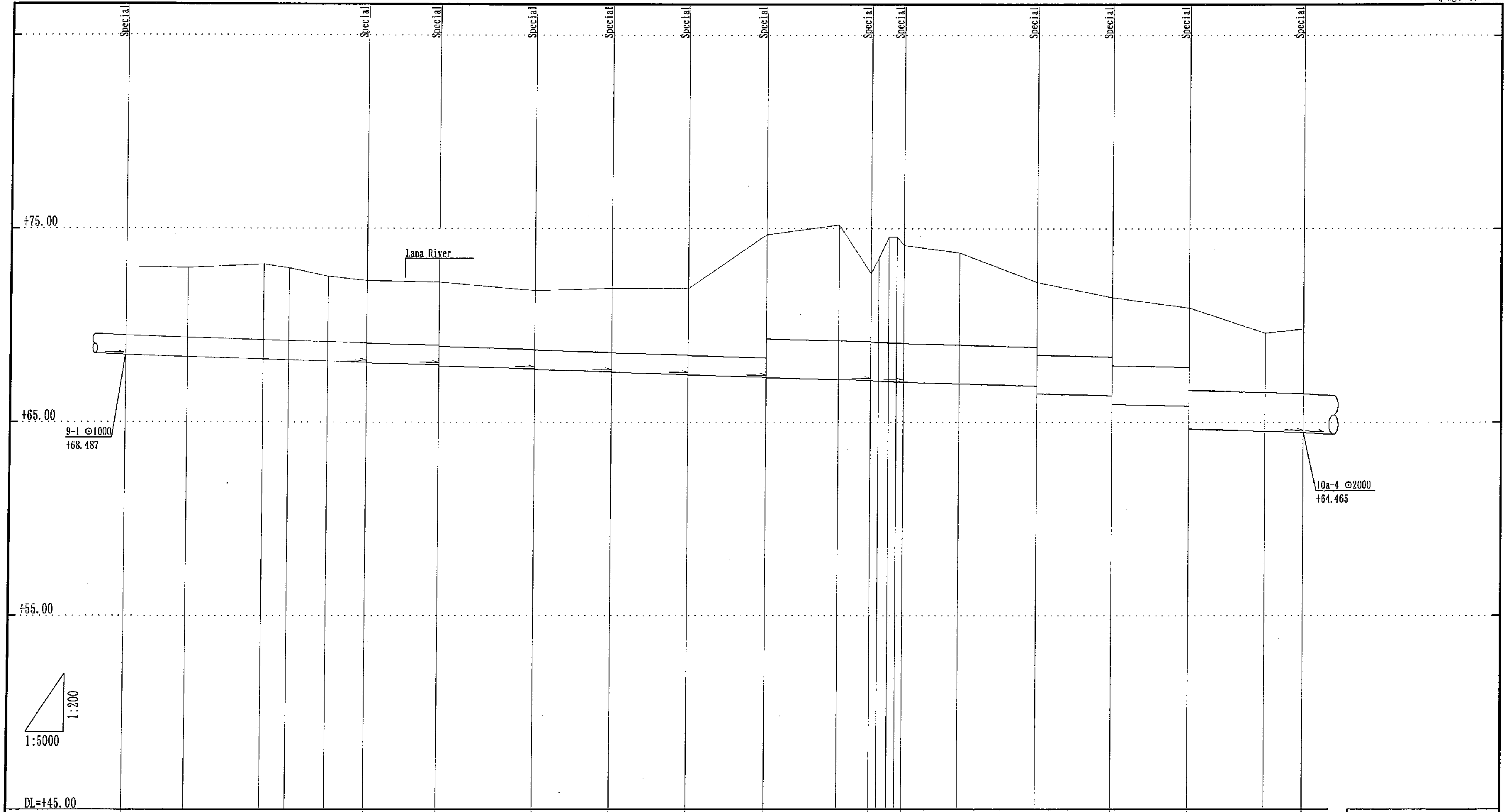
A3J_ITW:2006-03-22 B3B_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:12



Sewer Line No.	9-2	9-3	9-4	9-5	9-6	9-7	10a-1	10a-2	10a-3
Diam(mm)	⊙1000	⊙1000	⊙1000	⊙1000	⊙1000	⊙1000	⊙2000	⊙2000	⊙2000
Slope(‰)	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1
Length(m)	315.00	95.00	126.00	100.00	100.00	102.00	137.00	42.00	523.00 175.00 98.00 100.00 150.00

Cu. Length(m)	Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)
1379.00	73.01	3.51	68.467
1460.00	72.97	3.57	68.370
1560.00	73.13	3.85	68.250
1593.00	72.93	3.69	68.210
1644.00	72.51	3.33	68.149
1694.00	72.29	3.17 3.19	68.089 68.069
1744.00	72.26	3.22	68.009
1789.00	72.23	3.24 3.30	67.955 67.896
1915.00	71.78	3.00 3.02	67.745 67.725
2015.00	71.90	3.26 3.28	67.605 67.585
2115.00	71.90	3.40 3.42	67.465 67.445
2217.00	74.69	6.33 5.33	67.323 67.303
2312.00	75.19	5.93	67.198
2354.00 2364.00 2377.00 2387.00 2396.00	72.69 73.47 74.57 74.56 74.12	3.48 3.50 4.29 5.40 5.40 4.97 4.99	67.152 67.132 67.121 67.107 67.096 67.086 67.066
2469.00	73.74	4.69	66.986
2571.00	72.23	3.30 3.68	66.873 66.488
2669.00	71.44	3.00 3.43	66.380 65.950
2769.00	70.90	3.00 4.19	65.840 64.650
2869.00	69.60	3.00	64.540
2919.00	69.80	3.26	64.485

PipeList

9-2	9-3	9-4	9-5
9-6	9-7	10a-1	10a-2
10a-3			

B-3b

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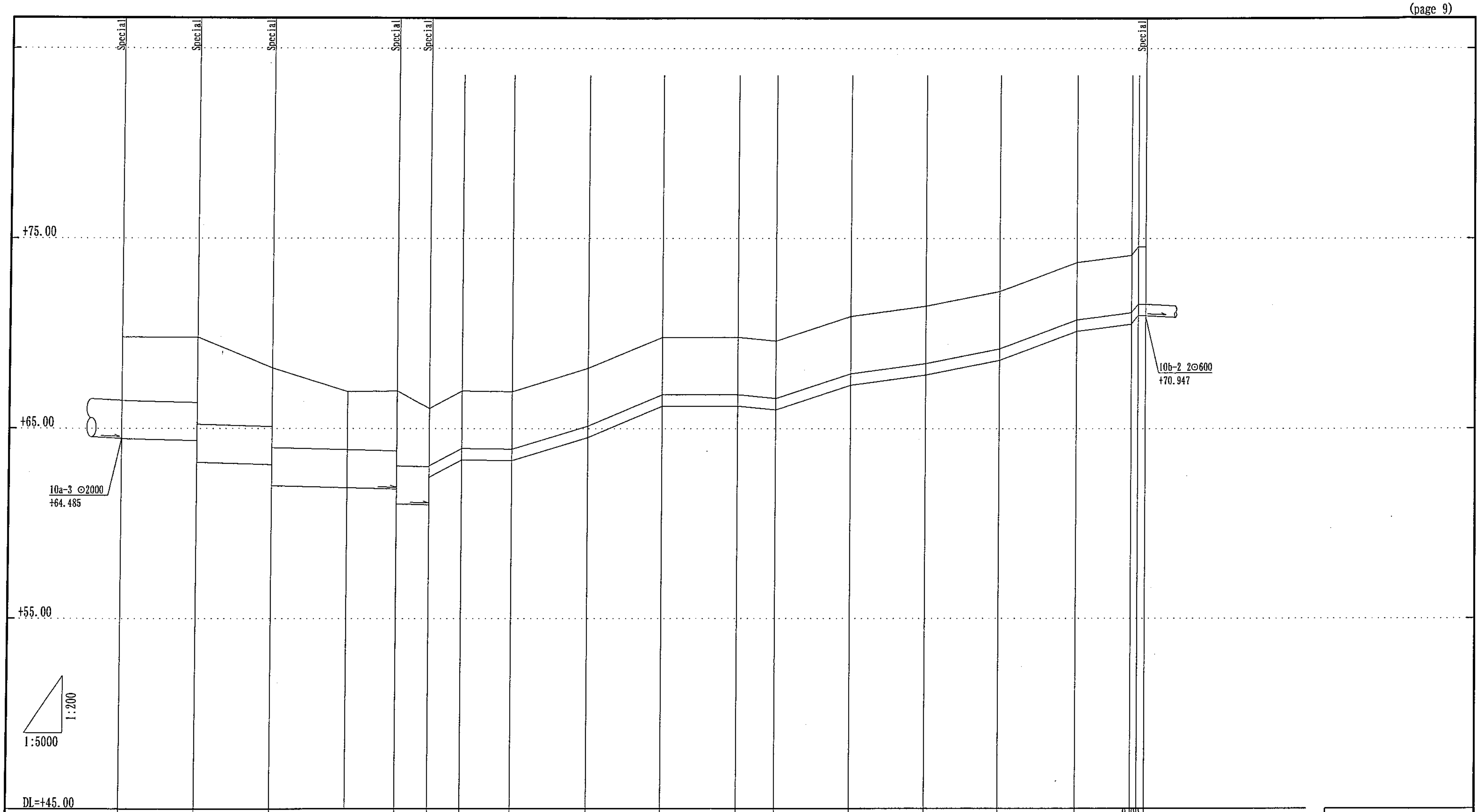
A3J_ITW:2006-03-22 B3B_02.FIG:2006/6/14/16:21 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:22

A3J_ITW:2006-03-22 B3B_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:12



100.00	99.00	167.00		43.00	66.00	101.00	99.00	100.00	50.00	100.00	100.00	98.00	102.00	73.00	9.00	10.00

Sewer Line No.	10a-4	10a-5	10b-1
Diam(mm)	⊙2000	⊙2000	2⊙600
Slope(‰)	1.1	1.1	Press
Length(m)	366.00	43.00	951.00

Ground Elevation(m)	69.80	69.80	68.17	66.95	66.98	66.06	66.98	66.95	68.17	69.80	69.80	69.60	70.90	71.44	72.23	73.74	74.12	74.56	74.57
Earth Cover(m)	3.28	3.39 4.52	3.00 4.11	3.00	3.10 3.87	3.00 3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Invert Elevation(m)	64.465	64.355 63.219	63.110 62.001	61.890	61.817 61.047	61.000 62.437	63.357	63.327	64.547	66.177	66.177	65.977	67.277	67.817	68.607	70.117	70.497	70.937	70.947
Cu. Length(m)	2919.00	3019.00	3118.00	3219.00	3285.00	3328.00	3371.00	3437.00	3538.00	3637.00	3737.00	3787.00	3887.00	3987.00	4085.00	4187.00	4260.00	4269.00	4279.00

PipeList			
10a-4	10a-5	10b-1	

B-3b

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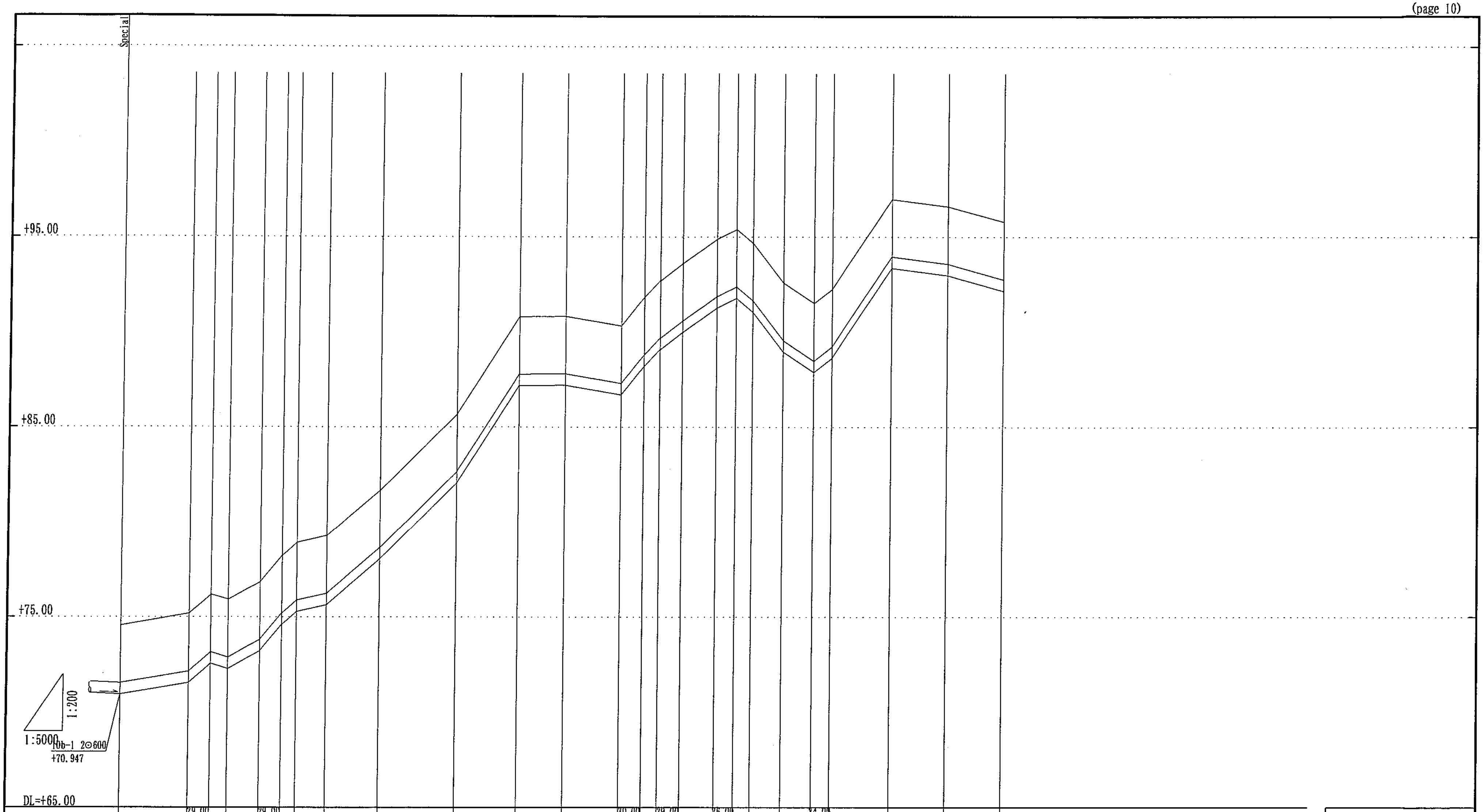
A3I_TW:2006-03-22 B3B_02.FIG:2006/6/14/16:12 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:12



Segment lengths (m): 90.00 | 29.00 | 23.00 | 42.00 | 29.00 | 20.00 | 40.00 | 70.00 | 100.00 | 82.00 | 62.00 | 74.00 | 30.00 | 21.00 | 29.00 | 45.00 | 26.00 | 22.00 | 41.00 | 41.00 | 24.00 | 79.00 | 74.00 | 74.00

Sewer Line No. ⑩b-2 → ⑪
Diam(mm) 2⊙600
Slope(‰) Press
Length(m) 1167.00

Ground Elevation(m)	74.57	75.17	76.18	75.91	76.84	78.22	78.91	79.27	81.68	85.68	90.80	90.82	90.33	91.81	92.70	93.61	94.88	95.40	94.66	92.58	91.51	92.24	96.98	96.60	95.79
Earth Cover(m)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Invert Elevation(m)	70.947	71.547	72.557	72.287	73.217	74.597	75.287	75.647	78.057	82.057	87.177	87.197	86.707	88.187	89.077	89.987	91.257	91.777	91.037	88.957	87.887	88.617	93.357	92.977	92.167
Cu. Length(m)	4279.00	4369.00	4398.00	4421.00	4463.00	4492.00	4512.00	4552.00	4622.00	4722.00	4804.00	4866.00	4940.00	4970.00	4991.00	5020.00	5065.00	5091.00	5113.00	5154.00	5195.00	5219.00	5298.00	5372.00	5446.00

PipeList

(10b-2)

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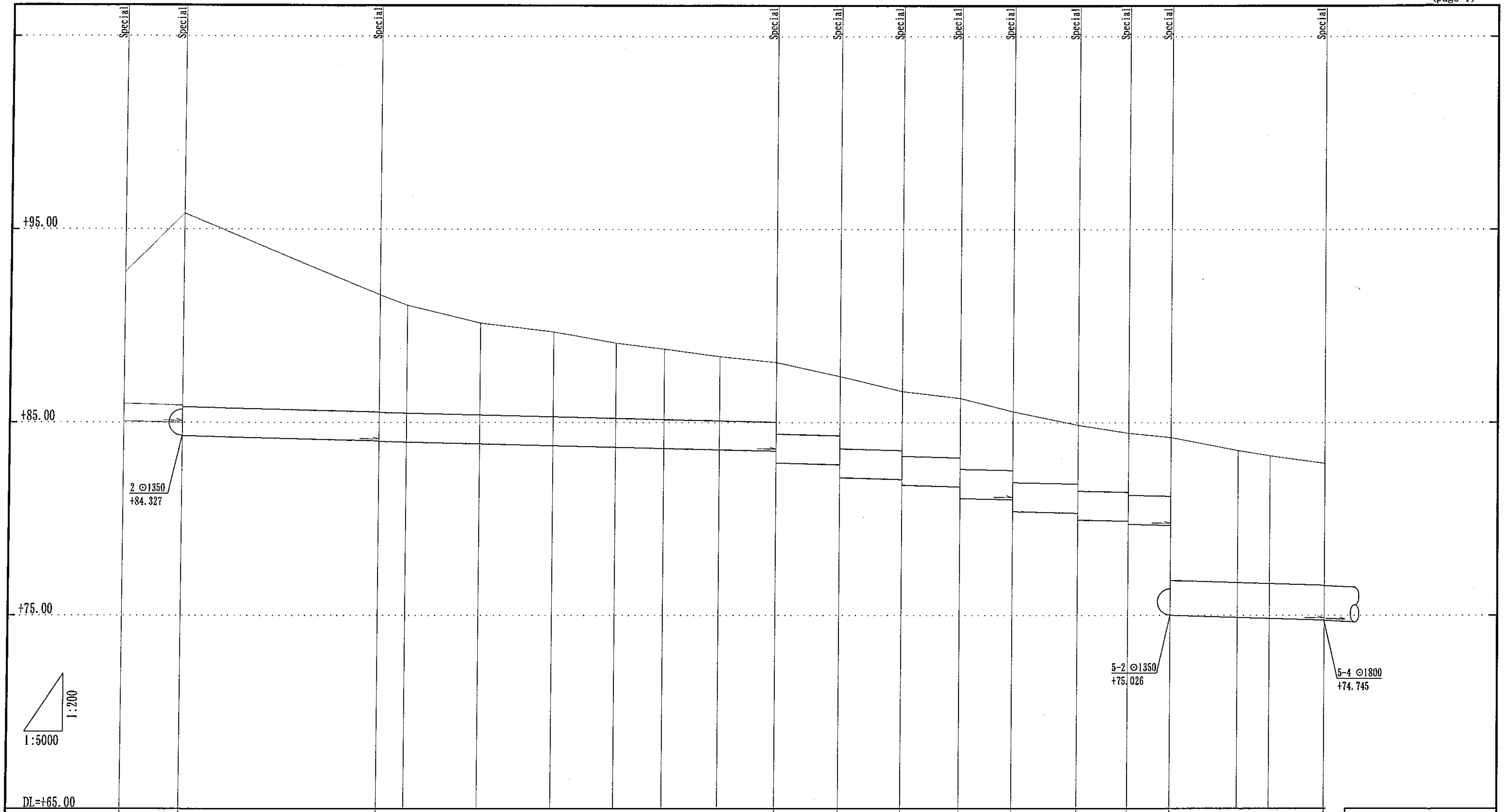
A3J_ITW:2006-03-22 B3C_02.FIG:2006/6/14/16:10 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:10



				84.00 82.00 76.00 69.00	85.00 66.00 56.00	
Sewer Line No.	①	(3-1)	(3-2)	(3-3)	(3-4)	(5-3)
Diam(mm)	⊙900	⊙1500	⊙1500	⊙1500	⊙1500	⊙1800
Slope(‰)	1.2	1.0	1.0	1.0	1.0	1.2
Length(m)	76.00	258.00	519.00	311.00	207.00	201.00

Ground Elevation(m)	92.79	95.80	91.61	91.06	90.14	89.69	89.10	88.79	88.39	88.10	87.37	86.60	86.24	85.56	84.86	84.45	84.23	83.54	83.27	82.88
Earth Cover(m)	6.79	9.89 9.94	6.01 6.03	5.52	4.69	4.34	3.83	3.58	3.26	3.04 3.65	3.00 3.69	3.00 3.28	3.00 3.61	3.00 3.62	3.00 3.34	3.00 3.16	3.00 7.37	6.79	6.56	6.26
Invert Elevation(m)	85.070	84.979 84.307	84.049 84.029	83.993	83.898	83.802	83.719	83.656	83.584	83.510 82.904	82.820 82.132	82.050 81.766	81.690 81.079	81.010 80.395	80.310 79.966	79.900 79.736	79.680 75.006	74.900	74.851	74.765
Cu. Length(m)	0.00	76.00	334.00	370.00	465.00	561.00	644.00	707.00	779.00	853.00	937.00	1019.00	1095.00	1164.00	1249.00	1315.00	1371.00	1459.00	1500.00	1572.00

PipeList			
①	(3-1)	(3-2)	(3-3)
(3-4)	(5-3)		

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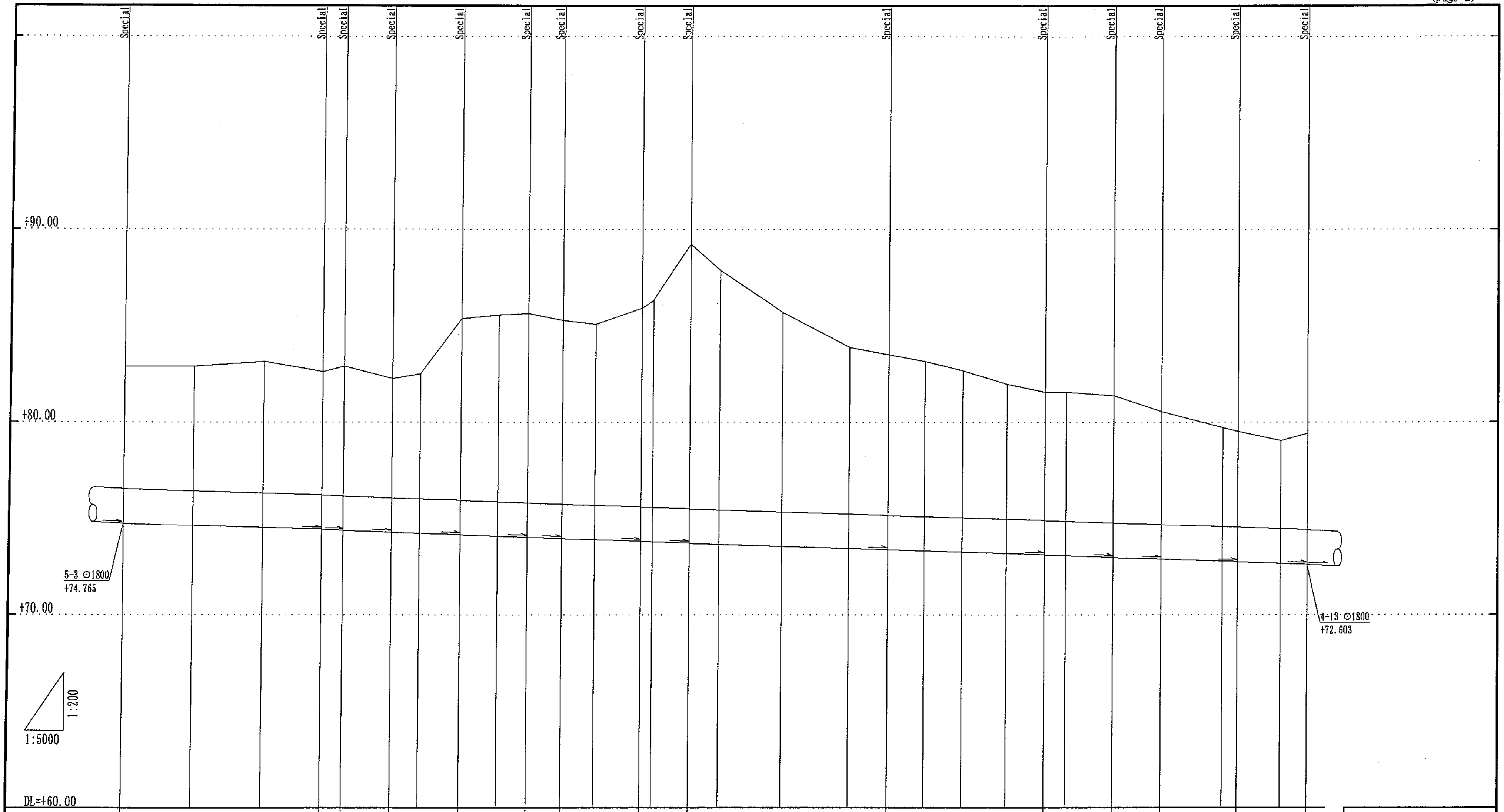
A3I_ITW:2006-03-22 B3C_02.FIG:2006/6/14/16:10 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:10



Sewer Line No.	(5-4)	(5-5)	(4-1)	(4-2)	(4-3)	(4-4)	(4-5)	(4-6)	(4-7)	(4-8)	(4-9)	(4-10)	(4-11)	(4-12)
Diam(mm)	⊙1800	⊙1800	⊙1800	⊙1800	⊙1800	⊙1800	⊙1800	⊙1800	⊙1800	⊙1800	⊙1800	⊙1800	⊙1800	⊙1800
Slope(‰)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Length(m)	260.00	28.00	63.00	90.00	88.00	45.00	103.00	63.00	261.00	205.00	90.00	63.00	100.00	91.00

Ground Elevation(m)	82.88	82.90	83.13	82.62	82.90	82.26	82.49	85.36	85.57	85.63
Earth Cover(m)	6.28	6.41	6.75	6.33 6.35	6.67 6.69	6.12 6.14	6.42	9.35 9.37	9.64	9.75 9.77
Invert Elevation(m)	74.745	74.636	74.525	74.433 74.413	74.379 74.359	74.283 74.263	74.220	74.155 74.135	74.076	74.029 74.009
Cu. Length(m)	1572.00	1663.00	1755.00	1832.00	1860.00	1923.00	1959.00	2013.00	2062.00	2101.00

Ground Elevation(m)	85.27	85.09	85.92	86.33	89.23	87.88	85.68	83.87	83.50	83.15
Earth Cover(m)	9.46 9.48	9.35	10.25 10.27	10.70	13.66 13.68	12.38	10.28	8.57	8.26 8.28	7.99
Invert Elevation(m)	73.955 73.935	73.883	73.811 73.791	73.773	73.715 73.695	73.648	73.549	73.443	73.382 73.362	73.306
Cu. Length(m)	2146.00	2189.00	2249.00	2264.00	2312.00	2351.00	2434.00	2522.00	2573.00	2620.00

Ground Elevation(m)	82.68	81.99	81.56	81.55	81.37	80.56	79.72	79.52	79.04	79.41
Earth Cover(m)	7.58	6.96	6.59 6.61	6.63	6.53 6.55	5.81 5.83	5.09	4.91 4.93	4.52	4.93
Invert Elevation(m)	73.246	73.176	73.116 73.096	73.062	72.988 72.968	72.892 72.872	72.776	72.752 72.732	72.665	72.623
Cu. Length(m)	2670.00	2728.00	2778.00	2806.00	2868.00	2931.00	3011.00	3031.00	3087.00	3122.00

PipeList

(5-4)	(5-5)	(4-1)	(4-2)
(4-3)	(4-4)	(4-5)	(4-6)
(4-7)	(4-8)	(4-9)	(4-10)
(4-11)	(4-12)		

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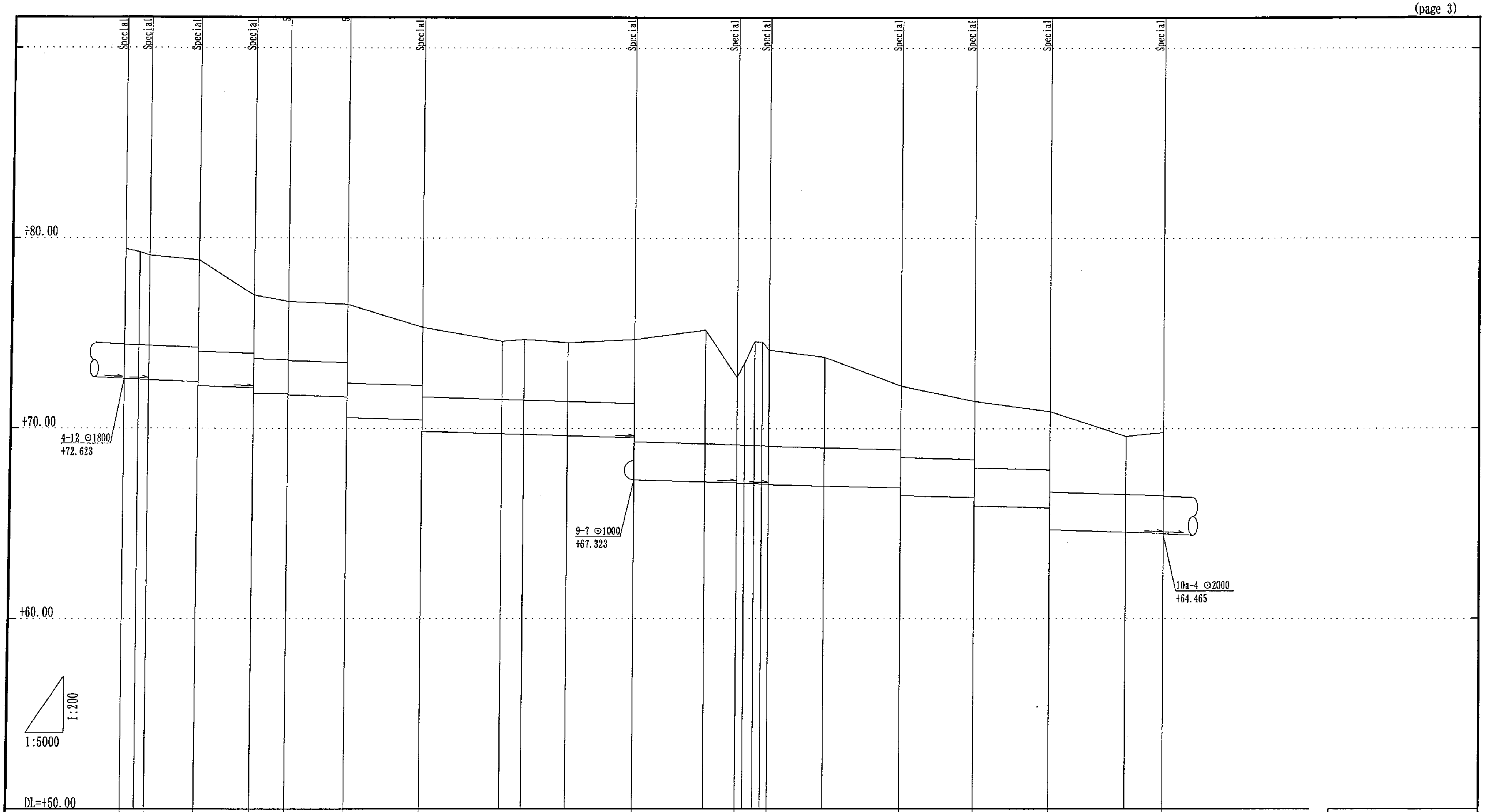
A3J_ITW:2006-03-22 B3C_02.FIG:2006/6/14/16:10 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:10



66.00	73.00	46.00	79.00	100.00	281.00	175.00	98.00	100.00	150.00

Sewer Line No.	4-13	4-14	4-15	10a-1	10a-2	10a-3
Diam(mm)	⊙1800	⊙1800	⊙1800	⊙2000	⊙2000	⊙2000
Slope(‰)	1.2	1.2	1.2	1.1	1.1	1.1
Length(m)	32.00	139.00	506.00	137.00	42.00	523.00

Ground Elevation(m)	79.41	79.25	79.08	78.85	77.00	76.65	76.52	75.31	74.58	74.69	74.50	74.69
Earth Cover(m)	4.95	4.82	4.66 4.68	4.53 4.76	3.00 3.30	3.00 3.04	3.00 4.09	3.00 3.60	3.00	3.15	3.03	3.32 5.33
Invert Elevation(m)	72.603	72.580	72.565 72.545	72.466 72.233	72.145 71.850	71.795 71.760	71.665 70.575	70.455 69.852	69.725	69.690	69.620	69.515 67.303
Cu. Length(m)	3122.00	3141.00	3154.00	3220.00	3293.00	3339.00	3418.00	3518.00	3624.00	3653.00	3711.00	3799.00

Ground Elevation(m)	75.19	72.69	73.47	74.57	74.56	74.12	73.74	72.23	71.44	70.90	69.60	69.80
Earth Cover(m)	5.93	3.48	3.50	4.29	5.40	5.40 4.97 4.99	4.69	3.30 3.68	3.00 3.43	3.00 4.19	3.00	3.26
Invert Elevation(m)	67.198	67.152	67.132	67.121	67.107	67.096 67.086 67.066	66.986	66.873 66.488	66.380 65.950	65.840 64.650	64.540	64.485
Cu. Length(m)	3894.00	3936.00	3946.00	3959.00	3969.00	3978.00	4051.00	4153.00	4251.00	4351.00	4451.00	4501.00

PipeList

4-13	4-14	4-15	10a-1
10a-2	10a-3		

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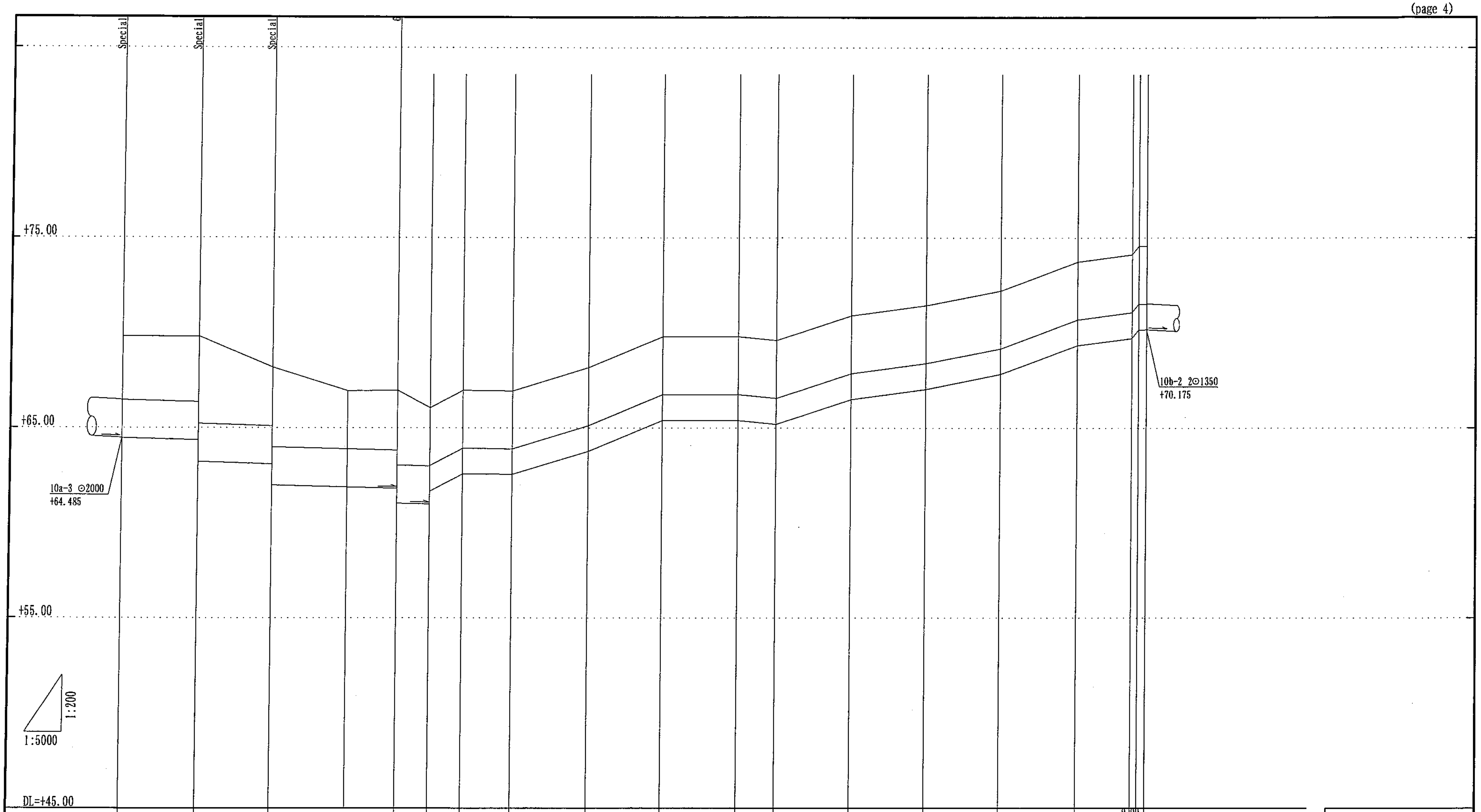

Sewer Line No.	Diam(mm)	Slope(‰)	Length(m)
10a-4	⊙2000	1.1	366.00
10a-5	⊙2000	1.1	43.00
10b-1	2⊙1350	Press	951.00

Distance (m)	Cu. Length(m)	Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)
	4501.00	69.80	3.28	64.465
100.00	4601.00	69.80	3.39 4.52	64.355 63.219
99.00	4700.00	68.17	3.00 4.11	63.110 62.001
	4801.00	66.95	3.00	61.890
167.00	4867.00	66.98	3.10 3.87	61.817 61.047
	4910.00	66.06	3.00 3.00	61.000 61.665
43.00	4953.00	66.98	3.00	62.585
66.00	5019.00	66.95	3.00	62.555
101.00	5120.00	68.17	3.00	63.775
99.00	5219.00	69.80	3.00	65.405
100.00	5319.00	69.80	3.00	65.405
50.00	5369.00	69.60	3.00	65.205
100.00	5469.00	70.90	3.00	66.505
100.00	5569.00	71.44	3.00	67.045
98.00	5667.00	72.23	3.00	67.835
102.00	5769.00	73.74	3.00	69.345
73.00	5842.00	74.12	3.00	69.725
9.00	5851.00	74.56	3.00	70.165
10.00	5861.00	74.57	3.00	70.175

PipeList

(10a-4) (10a-5) (10b-1)

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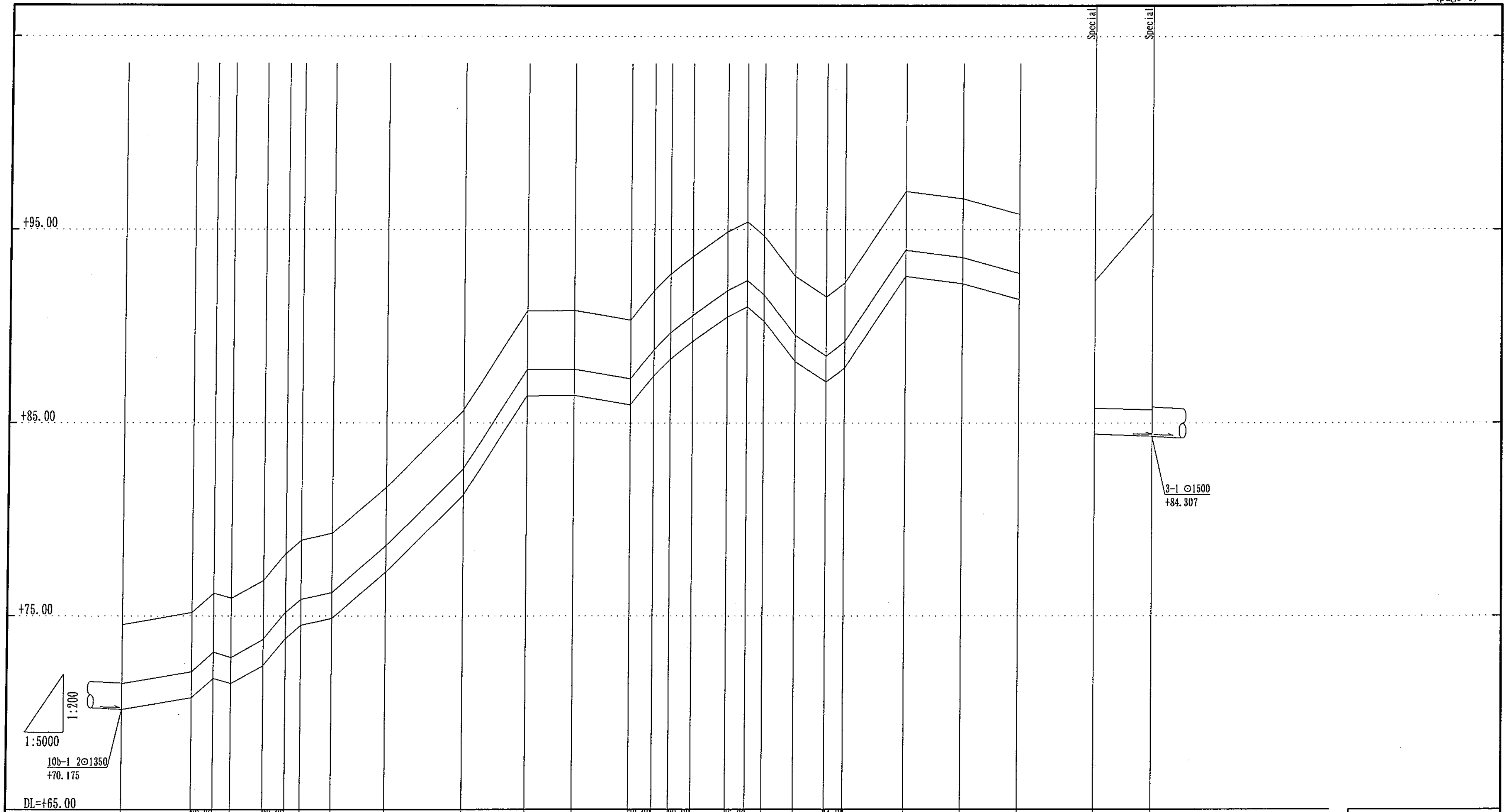
A3J_ITW:2006-03-22 B3C_02.FIG:2006/6/14/16:10 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:10

A3J_JTW:2006-03-22 B3C_02.FIG:2006/6/14/16:10 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:10



Sewer Line No.: (10b-2) — Diam (mm): 2⊙1350 — Slope (‰): Press — Length (m): 1167.00

Sewer Line No.: (11)

Sewer Line No.: (2) — Diam (mm): ⊙1350 — Slope (‰): 1.1 — Length (m): 75.00

Ground Elevation (m)	Earth Cover (m)	Invert Elevation (m)	Cu. Length (m)	Distance to next (m)
74.57	3.00	70.175	5861.00	90.00
75.17	3.00	70.775	5951.00	29.00
76.18	3.00	71.785	5980.00	23.00
75.91	3.00	71.515	6003.00	42.00
76.84	3.00	72.445	6045.00	29.00
78.22	3.00	73.825	6074.00	20.00
78.91	3.00	74.515	6094.00	40.00
79.27	3.00	74.875	6134.00	70.00
81.68	3.00	77.285	6204.00	100.00
85.68	3.00	81.285	6304.00	82.00
90.80	3.00	86.405	6386.00	62.00
90.82	3.00	86.425	6448.00	74.00
90.33	3.00	85.935	6522.00	30.00
91.81	3.00	87.415	6552.00	21.00
92.70	3.00	88.305	6573.00	29.00
93.61	3.00	89.215	6602.00	45.00
94.88	3.00	90.485	6647.00	26.00
95.40	3.00	91.005	6673.00	22.00
94.66	3.00	90.265	6695.00	41.00
92.58	3.00	88.185	6736.00	41.00
91.51	3.00	87.115	6777.00	24.00
92.24	3.00	87.845	6801.00	79.00
96.98	3.00	92.585	6880.00	74.00
96.60	3.00	92.205	6954.00	74.00
95.79	3.00	91.395	7028.00	
92.34	6.54	84.410	0.00	
95.80	10.08	84.327	75.00	

PipeList

(10b-2)	(2)		

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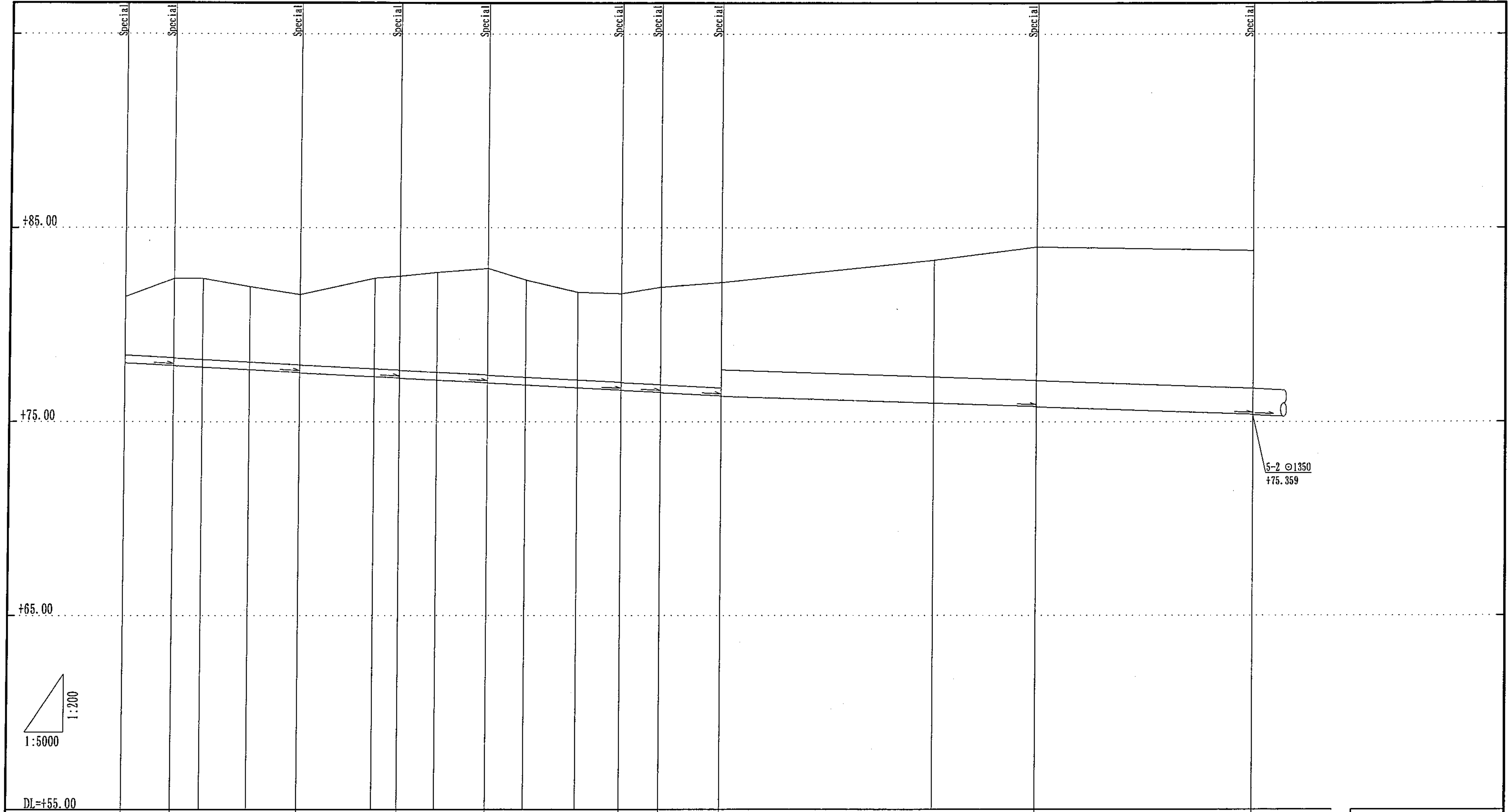

Sewer Line No.	(7-1)	(7-2)	(7-3)	(7-4)	(7-5)	(7-6)	(7-7)	(6-1)	(5-1)
Diam(mm)	⊙400	⊙400	⊙400	⊙400	⊙400	⊙400	⊙400	⊙1350	⊙1350
Slope(‰)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.3	1.4
Length(m)	63.00	165.00	130.00	115.00	174.00	51.00	79.00	411.00	282.00

Ground Elevation(m)	81.44	82.38	82.38	81.97	81.57	82.40	82.50	82.70	82.89
Earth Cover(m)	3.00	4.07 4.09	4.16	3.88	3.61 3.63	4.65	4.82 4.84	5.13	5.46 5.48
Invert Elevation(m)	78.022	77.896 77.876	77.800	77.676	77.546 77.526	77.332	77.266 77.246	77.148	77.016 76.996
Cu. Length(m)	0.00	63.00	101.00	163.00	228.00	325.00	358.00	407.00	473.00

Ground Elevation(m)	82.29	81.67	81.60	81.93	82.19	83.34	84.01	83.83
Earth Cover(m)	4.97	4.49	4.53 4.55	4.99 5.01	5.42 4.47	5.98	6.82 6.84	7.06
Invert Elevation(m)	76.898	76.762	76.648 76.628	76.526 76.506	76.348 76.328	75.968	75.794 75.774	75.379
Cu. Length(m)	522.00	590.00	647.00	698.00	777.00	1054.00	1188.00	1470.00

PipeList			
(7-1)	(7-2)	(7-3)	(7-4)
(7-5)	(7-6)	(7-7)	(6-1)
(5-1)			

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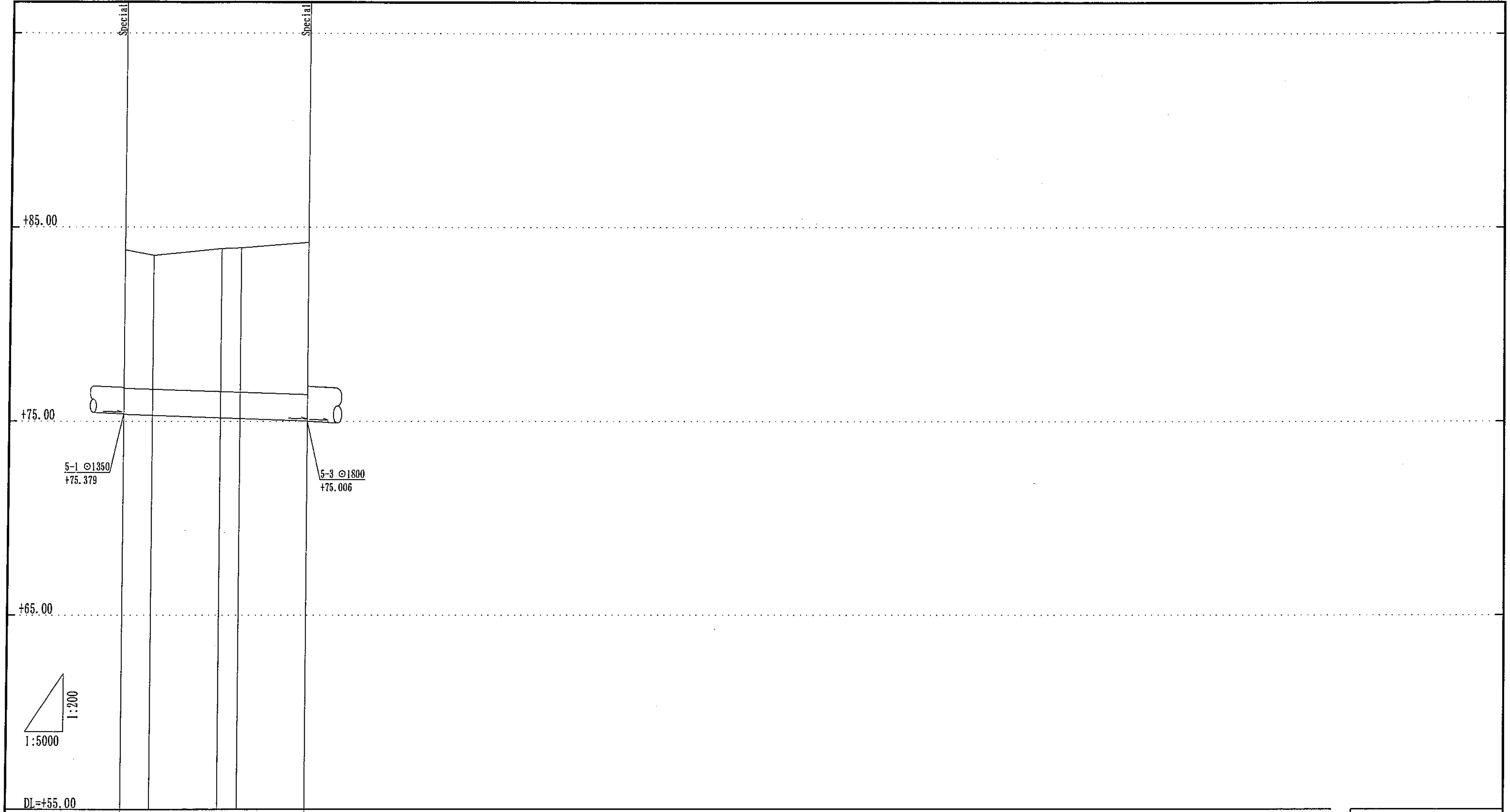
A3J_ITW:2006-03-22 B3C_02.FIG:2006/6/14/16:10 ALBANIA.IN1:2006/6/8/9:57 Print:2006/6/14/16:10



Sewer Line No.	(5-2)				
Diam(mm)	⊙1350				
Slope(‰)	1.4				
Length(m)	238.00				
Ground Elevation(m)	83.83	83.53	83.90	83.95	84.23
Earth Cover(m)	7.08	6.83	7.32	7.41	7.81
Invert Elevation(m)	75.359	75.307	75.184	75.149	75.026
Cu. Length(m)	1470.00	1507.00	1595.00	1620.00	1708.00

PipeList

(5-2)

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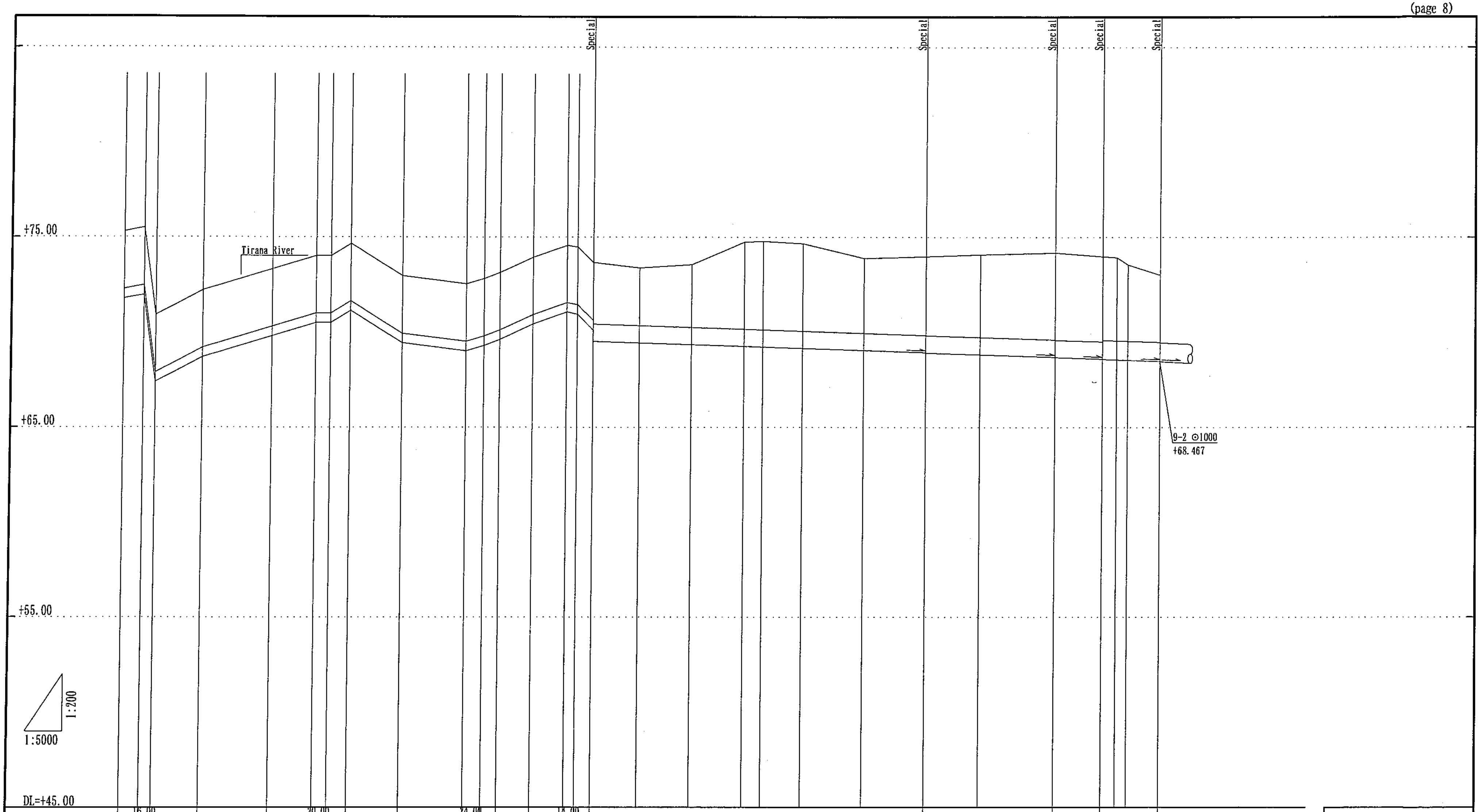
A3J_ITW:2006-03-22 B3C_02.FIG:2006/6/14/16:10 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:10

A3J_ITW:2006-03-22 B3C_02.FIG:2006/6/14/16:10 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:10



26.00 16.00 62.00 93.00 59.00 20.00 26.00 68.00 85.00 24.00 21.00 44.00 45.00 14.00 21.00

Sewer Line No.	Diam(mm)	Slope(‰)	Length(m)
⑧-1 (8-1)	2⊙500	Press	624.00
(8-2)	⊙900	1.3	443.00
(8-3)	⊙900	1.3	172.00
(8-4)	⊙900	1.3	63.00
(9-1)	⊙1000	1.2	77.00

Cu. Length(m)	Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)
0.00	75.29	3.00	71.770
26.00	75.49	3.00	71.970
42.00	70.92	3.00	67.400
104.00	72.22	3.00	68.700
154.00	72.81	3.00	69.291
197.00	73.32	3.00	69.800
256.00	74.02	3.00	70.500
276.00	74.02	3.00	70.500
302.00	74.66	3.00	71.140
370.00	72.97	3.00	69.450
455.00	72.53	3.00	69.010
479.00	72.81	3.00	69.290
500.00	73.14	3.00	69.620
544.00	73.93	3.00	70.410
589.00	74.57	3.00	71.050
603.00	74.47	3.00	70.950
624.00	73.65	3.00 3.20	70.130 69.521
686.00	73.37	3.00	69.440
755.00	73.57	3.29	69.351
825.00	74.74	4.55	69.260
850.00	74.78	4.62	69.227
903.00	74.65	4.56	69.158
985.00	73.88	3.90	69.052
1067.00	73.98	4.11 4.13	68.945 68.925
1139.00	74.09	4.33	68.831
1239.00	74.19	4.56 4.58	68.701 68.681
1302.00	73.98	4.45 4.37	68.599 68.579
1321.00	73.94	4.35	68.556
1336.00	73.57	4.00	68.538
1379.00	73.01	3.49	68.487

PipeList			
(8-1)	(8-2)	(8-3)	(8-4)
(9-1)			

B-3c

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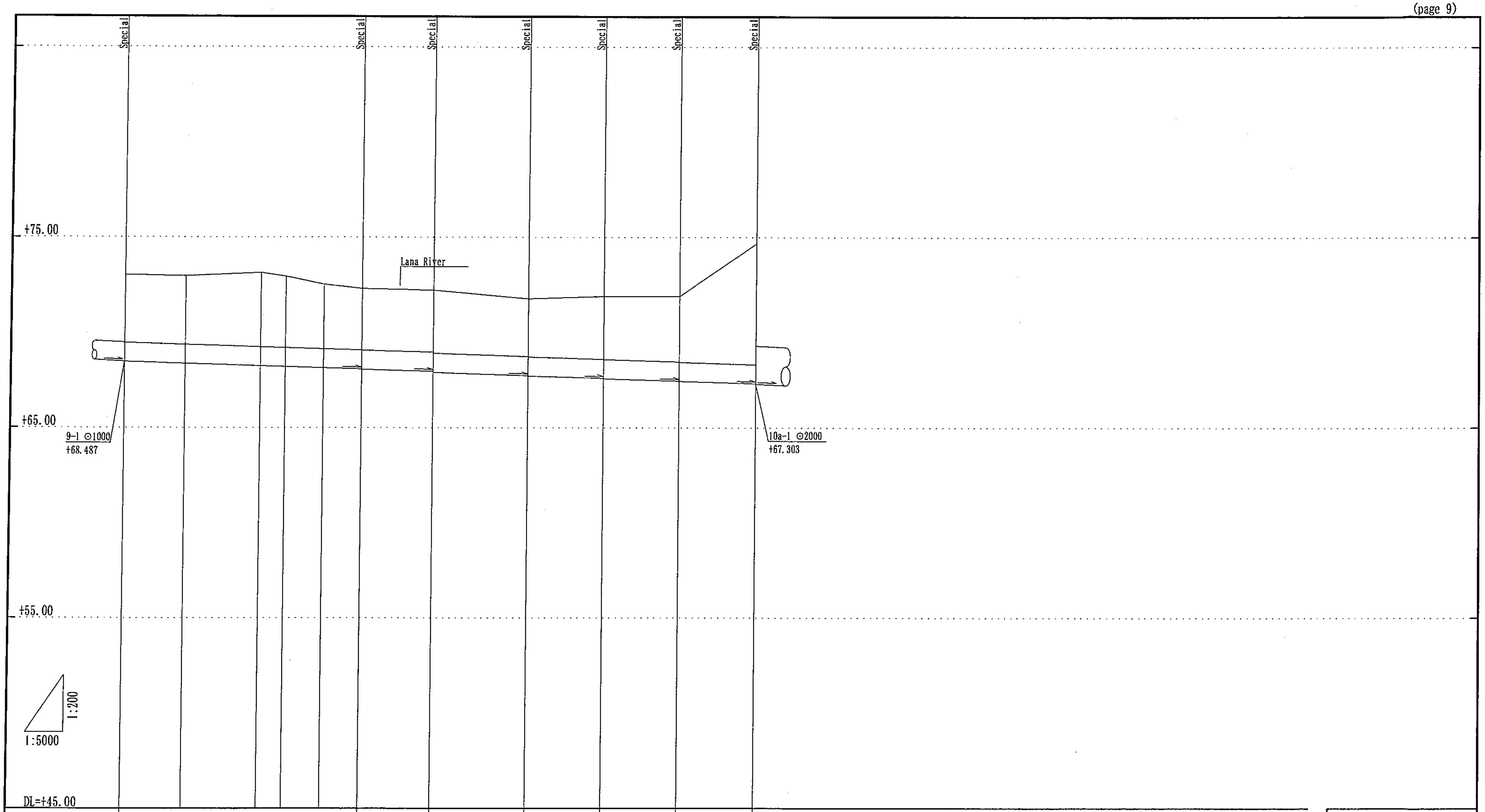

Sewer Line No.	Diam (mm)	Slope (‰)	Length (m)
(9-2)	⊙1000	1.2	315.00
(9-3)	⊙1000	1.2	95.00
(9-4)	⊙1000	1.2	126.00
(9-5)	⊙1000	1.2	100.00
(9-6)	⊙1000	1.2	100.00
(9-7)	⊙1000	1.2	102.00

Cu. Length (m)	Ground Elevation (m)	Earth Cover (m)	Invert Elevation (m)
1379.00	73.01	3.51	68.467
1460.00	72.97	3.57	68.370
1560.00	73.13	3.85	68.250
1593.00	72.93	3.69	68.210
1644.00	72.51	3.33	68.149
1694.00	72.29	3.17 3.19	68.089 68.069
1744.00	72.26	3.22	68.009
1789.00	72.23	3.24 3.30	67.955 67.896
1915.00	71.78	3.00 3.02	67.745 67.725
2015.00	71.90	3.26 3.28	67.605 67.585
2115.00	71.90	3.40 3.42	67.465 67.445
2217.00	74.69	6.33	67.323

PipeList

(9-2)	(9-3)	(9-4)	(9-5)
(9-6)	(9-7)		

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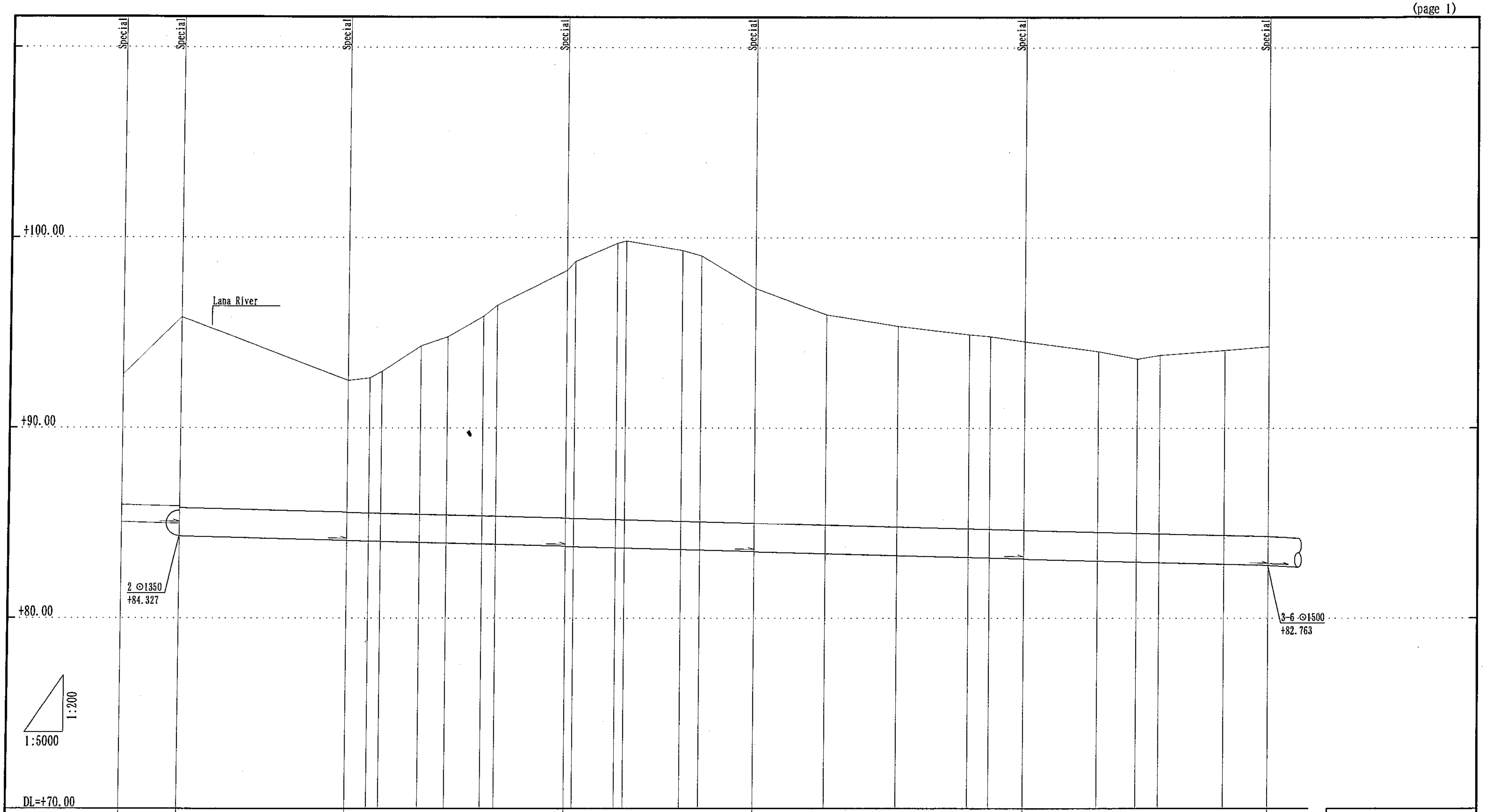
A3J_ITW:2006-03-22 B3C_02.FIG:2006/6/14/16:10 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:10

A3J_ITW:2006-03-22 2B3D_01.FIG:2006/6/14/16:7 ALBANIA.IN1:2006/6/8/9:57 Print:2006/6/14/16:7



Sewer Line No.	①	(3-1)	(3-2)	(3-3)	(3-4)	(3-5)
Diam(mm)	⊙900	⊙1500	⊙1500	⊙1500	⊙1500	⊙1500
Slope(‰)	1.2	1.0	1.0	1.0	1.0	1.0
Length(m)	76.00	223.00	289.00	250.00	358.00	324.00

Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)	Cu. Length(m)
92.79	6.79	85.070	0.00
95.80	9.89 9.94	84.979 84.307	76.00
95.20	9.38	84.267	116.00
92.48	6.85 6.87	84.084 84.064	299.00
92.62	7.04	84.035	328.00
92.97	7.40	84.019	344.00
94.29	8.77	83.968	395.00
94.78	9.30	83.933	430.00
95.86	10.42	83.886	477.00
96.44	11.02	83.868	495.00
98.28	12.96 12.98	83.775 83.755	588.00
98.73	13.44	83.744	599.00
99.71	14.47	83.688	655.00
99.83	14.60	83.676	667.00
99.31	14.16	83.602	741.00
99.03	13.90	83.577	766.00
97.31	12.26 12.28	83.505 83.485	838.00
95.95	11.01	83.390	933.00
95.34	10.50	83.295	1028.00
94.90	10.15	83.200	1123.00
94.80	10.08	83.172	1151.00
94.54	9.86 9.88	83.127 83.107	1196.00
94.02	9.46	83.009	1294.00
93.62	9.11	82.957	1346.00
93.81	9.33	82.927	1376.00
94.09	9.70	82.841	1462.00
94.27	9.94	82.783	1520.00

PipeList

①	(3-1)	(3-2)	(3-3)
(3-4)	(3-5)		

B-3d
case.2

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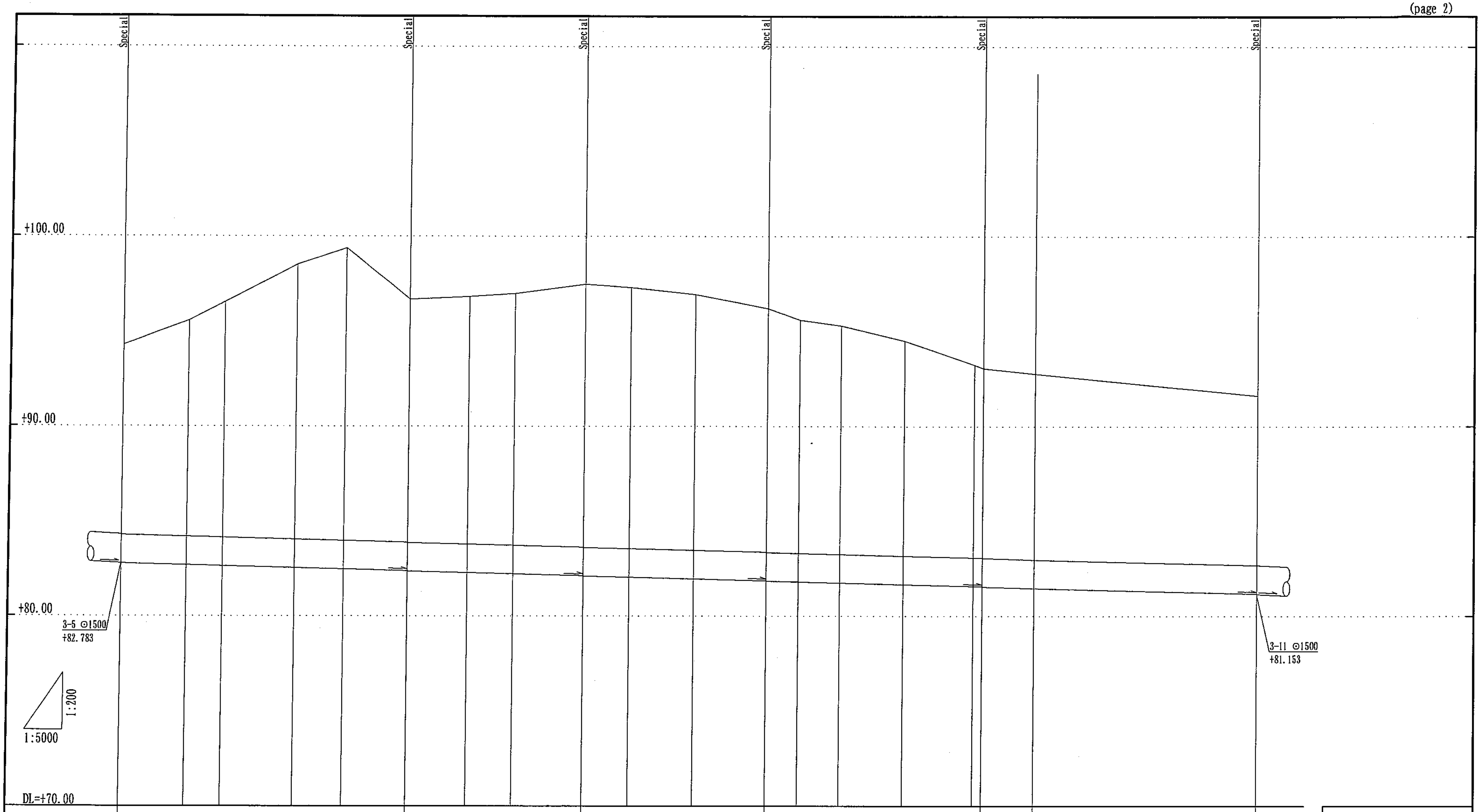

	69.00	296.00

Sewer Line No.	(3-6)	(3-7)	(3-8)	(3-9)	(3-10)
Diam(mm)	⊙1500	⊙1500	⊙1500	⊙1500	⊙1500
Slope(‰)	1.0	1.0	1.0	1.0	1.0
Length(m)	380.00	234.00	244.00	287.00	365.00

Ground Elevation(m)	94.27	95.55	96.53	98.52	99.38	96.68	96.83	96.98	97.47	97.29	96.94	96.21	95.60	95.30	94.49	93.23	93.05	92.78	91.62
Earth Cover(m)	9.96	11.32	12.35	14.44	15.36	12.75 12.77	13.00	13.21	13.79 13.81	13.69	13.43	12.80 12.82	12.25	12.00	11.28	10.11	9.94 9.96	9.76	8.90
Invert Elevation(m)	82.763	82.677	82.629	82.532	82.467	82.383 82.363	82.283	82.222	82.129 82.109	82.048	81.962	81.865 81.845	81.802	81.747	81.663	81.570	81.558 81.538	81.469	81.173
Cu. Length(m)	1520.00	1606.00	1654.00	1751.00	1816.00	1900.00	1980.00	2041.00	2134.00	2195.00	2281.00	2378.00	2421.00	2476.00	2560.00	2653.00	2665.00	2734.00	3030.00

PipeList			
(3-6)	(3-7)	(3-8)	(3-9)
(3-10)			

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case. 2
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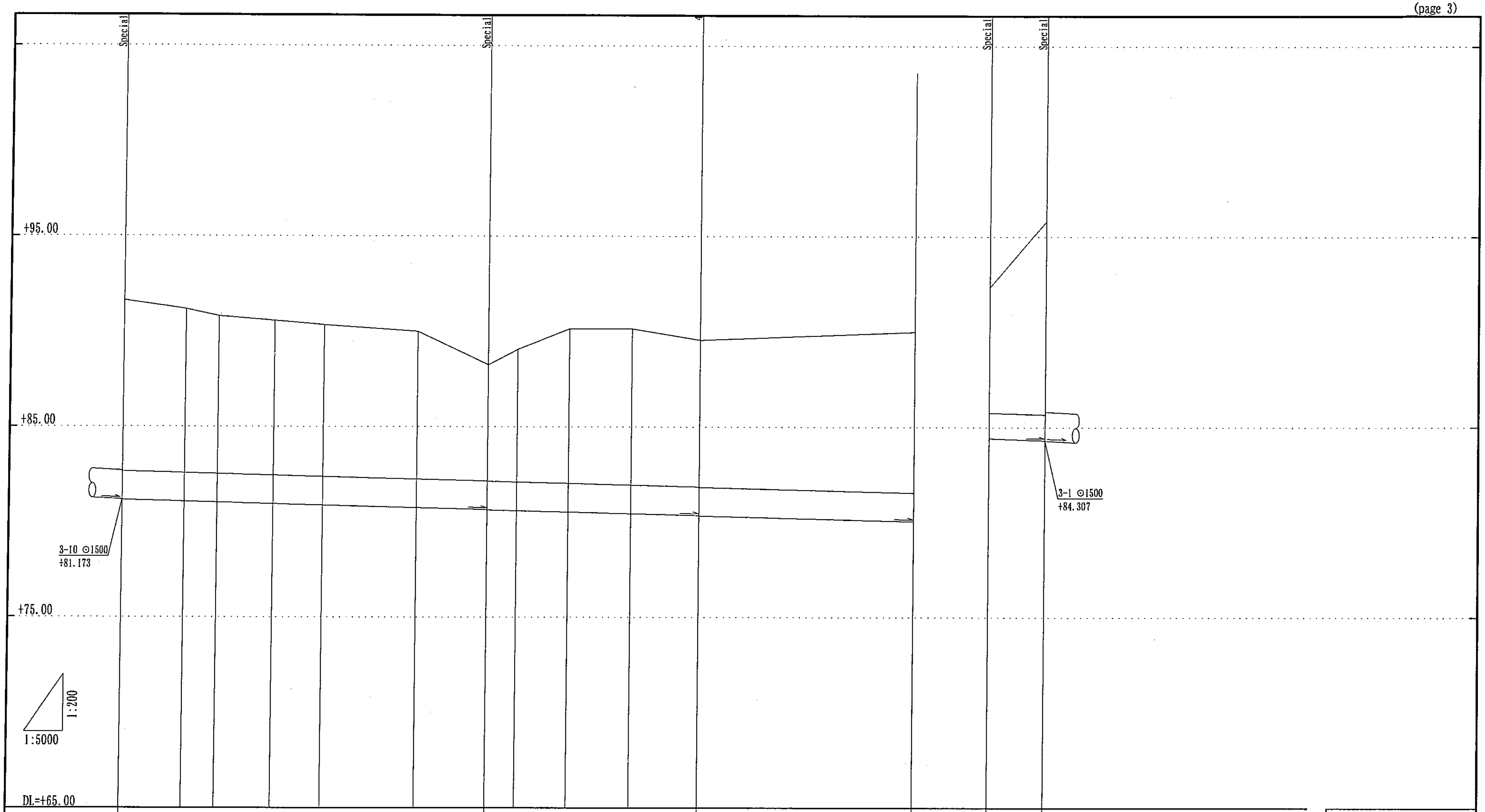
A3J_ITW:2006-03-22
2B3D_01.FIG:2006/6/14/16:7
ALBANIA.INI:2006/6/8/9:57
Print:2006/6/14/16:7



Sewer Line No.	③-11	③-12	③-13	⑪	②
Diam(mm)	⊙1500	⊙1500	⊙1500		⊙1350
Slope(‰)	1.0	1.0	1.0		1.1
Length(m)	484.00	281.00	284.00		75.00

Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)	Cu. Length(m)
91.62	8.92	81.153	3030.00
91.16	8.54	81.071	3112.00
90.79	8.21	81.027	3156.00
90.55	8.05	80.953	3230.00
90.35	7.91	80.887	3296.00
90.00	7.69	80.763	3420.00
88.26	6.04 6.06	80.669 80.649	3514.00
89.06	6.90	80.610	3553.00
90.14	8.05	80.542	3621.00
90.14	8.13	80.459	3704.00
89.57	7.65 7.67	80.368 80.348	3795.00
90.00	8.39	80.064	4079.00
92.34	6.54	84.410	0.00
95.80	10.08	84.327	75.00

PipeList

③-11	③-12	③-13	②

B-3d
case.2

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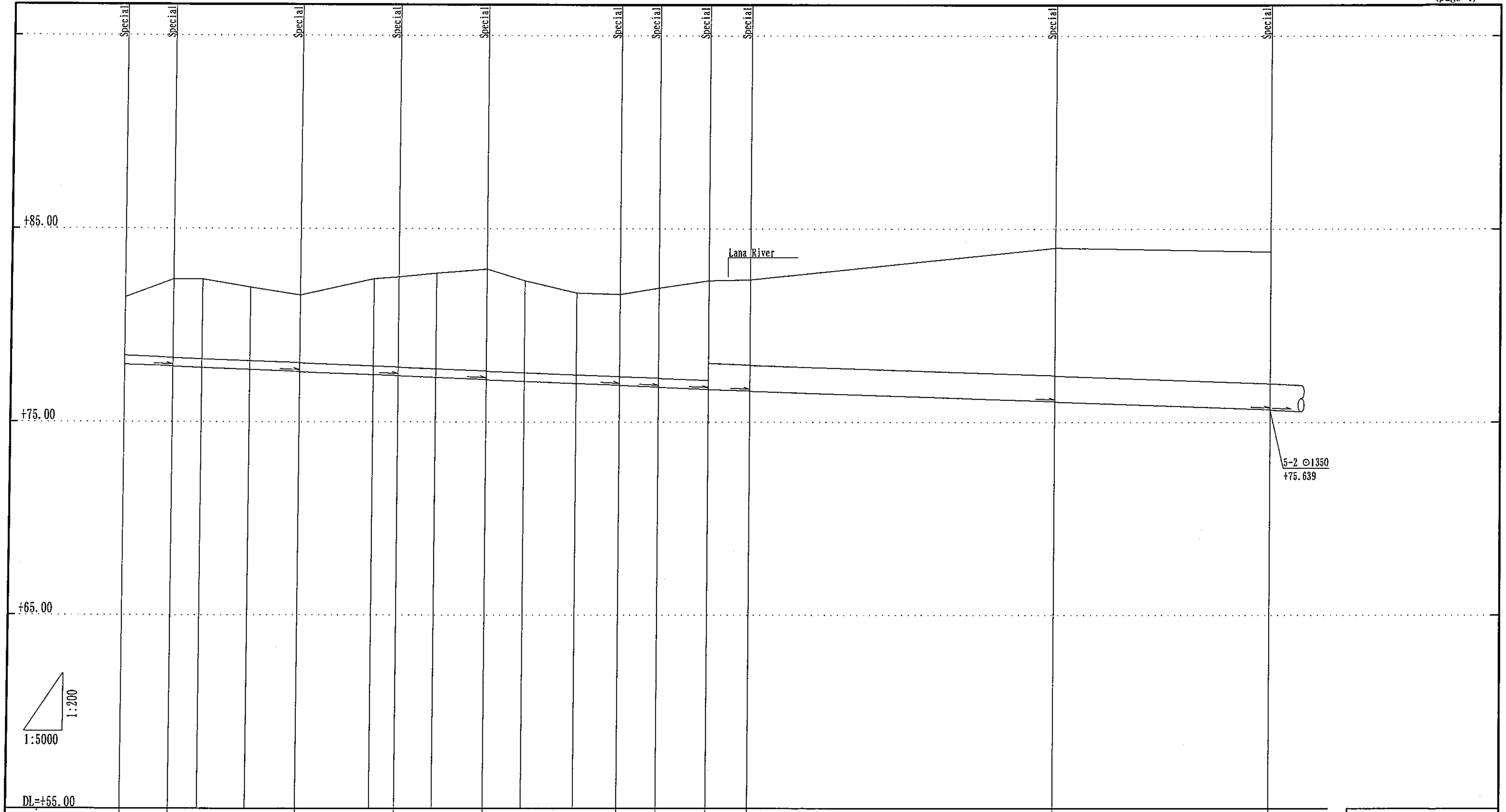
A3J_ITW:2006-03-22 2B3D_01.PIG:2006/6/14/16:7 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:7



Sewer Line No.	(7-1)	(7-2)	(7-3)	(7-4)	(7-5)	(7-6)	(7-7)	(6-1)	(6-2)	(5-1)
Diam(mm)	⊙450	⊙450	⊙450	⊙450	⊙450	⊙450	⊙450	⊙1350	⊙1350	⊙1350
Slope(‰)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.3	1.3	1.4
Length(m)	63.00	165.00	130.00	115.00	174.00	51.00	65.00	54.00	399.00	282.00

Cu. Length(m)	Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)
0.00	81.44	3.00	77.970
63.00	82.38	4.04 4.06	77.875 77.855
101.00	82.38	4.11	77.798
163.00	81.97	3.80	77.705
228.00	81.57	3.49 3.51	77.607 77.587
325.00	82.40	4.49	77.441
358.00	82.50	4.64 4.66	77.392 77.372
407.00	82.70	4.93	77.298
473.00	82.89	5.22 5.24	77.199 77.179
522.00	82.29	4.72	77.105
590.00	81.67	4.20	77.003
647.00	81.60	4.21 4.23	76.918 76.898
698.00	81.93	4.64 4.66	76.821 76.801
763.00	82.31	5.14 4.23	76.703 76.683
788.00	82.33	4.29	76.650
817.00	82.36	4.35 4.37	76.613 76.593
1216.00	84.01	6.54 6.56	76.074 76.054
1498.00	83.83	6.78	75.659

PipeList

(7-1)	(7-2)	(7-3)	(7-4)
(7-5)	(7-6)	(7-7)	(6-1)
(6-2)	(5-1)		

B-3d
case.2

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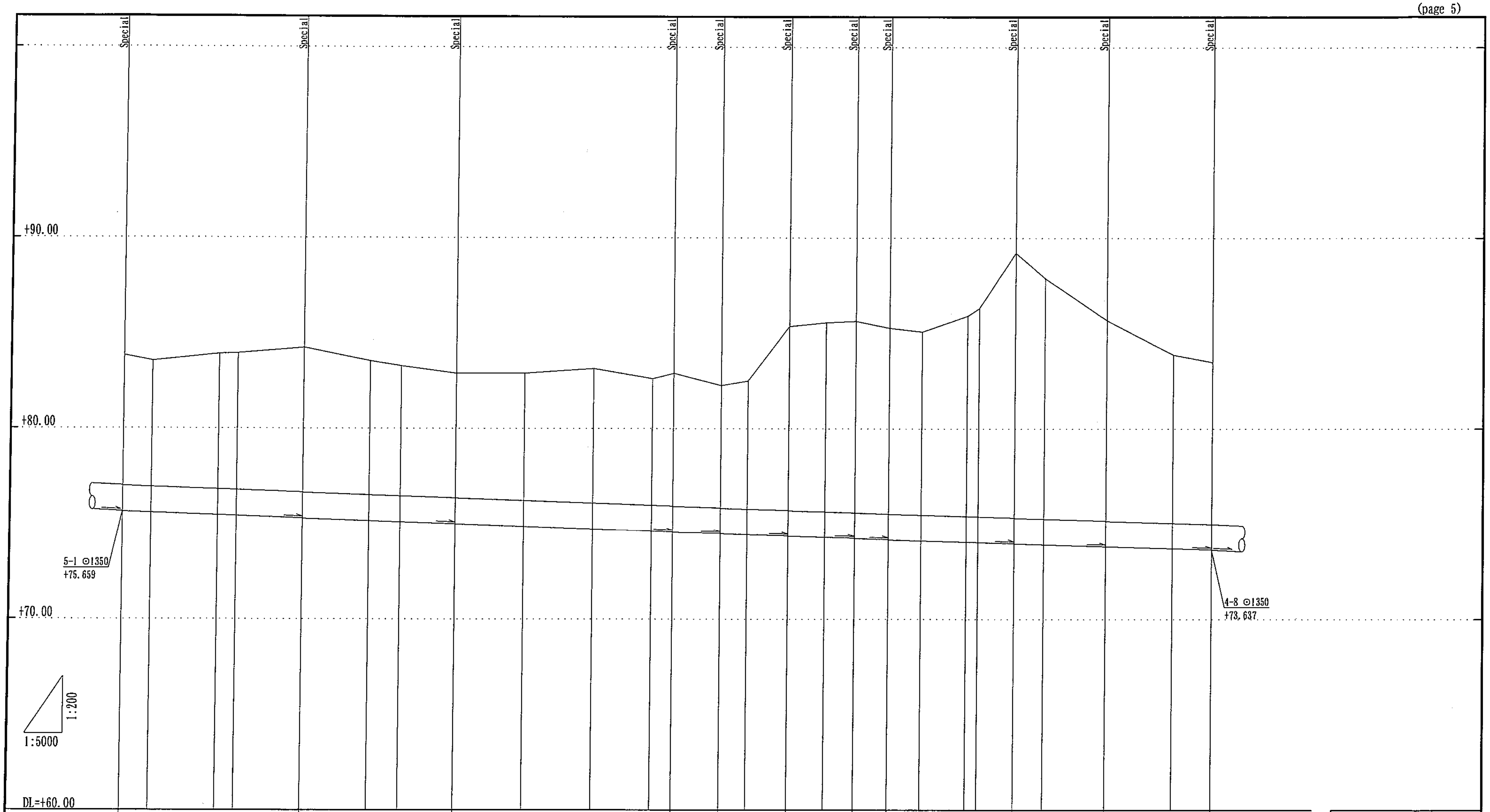
A3J_ITW:2006-03-22 2B3D_01.FIG:2006/6/14/16:7 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:7



Sewer Line No.	⑤-②	⑤-③	⑤-④	④-①	④-②	④-③	④-④	④-⑤	④-⑥	④-⑦
Diam(mm)	⊙1350	⊙1350	⊙1350	⊙1350	⊙1350	⊙1350	⊙1350	⊙1350	⊙1350	⊙1350
Slope(‰)	1.4	1.4	1.4	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Length(m)	238.00	201.00	288.00	63.00	90.00	88.00	45.00	166.00	122.00	139.00

Cu. Length(m)	Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)
1498.00	83.83	6.80	75.639
1535.00	83.53	6.55	75.587
1623.00	83.90	7.04	75.464
1648.00	83.95	7.13	75.429
1736.00	84.23	7.53 7.55	75.306 75.286
1824.00	83.54	6.98	75.163
1865.00	83.27	6.77	75.105
1937.00	82.88	6.48 6.50	75.005 74.985
2028.00	82.90	6.65	74.858
2120.00	83.13	7.01	74.729
2197.00	82.62	6.60	74.621
2225.00	82.90	6.92 6.94	74.582 74.562
2288.00	82.26	6.37 6.39	74.493 74.473
2324.00	82.49	6.66	74.433
2378.00	85.36	9.59 9.61	74.374 74.354
2427.00	85.57	9.88	74.300
2466.00	85.63	9.98 10.00	74.257 74.237
2511.00	85.27	9.69 9.71	74.187 74.167
2554.00	85.09	9.58	74.120
2614.00	85.92	10.47	74.054
2629.00	86.33	10.90	74.037
2677.00	89.23	13.85 13.87	73.984 73.964
2716.00	87.88	12.56	73.921
2799.00	85.68	10.46 10.48	73.830 73.810
2887.00	83.87	8.76	73.713
2938.00	83.50	8.45	73.657

PipeList

⑤-②	⑤-③	⑤-④	④-①
④-②	④-③	④-④	④-⑤
④-⑥	④-⑦		

B-3d
case.2

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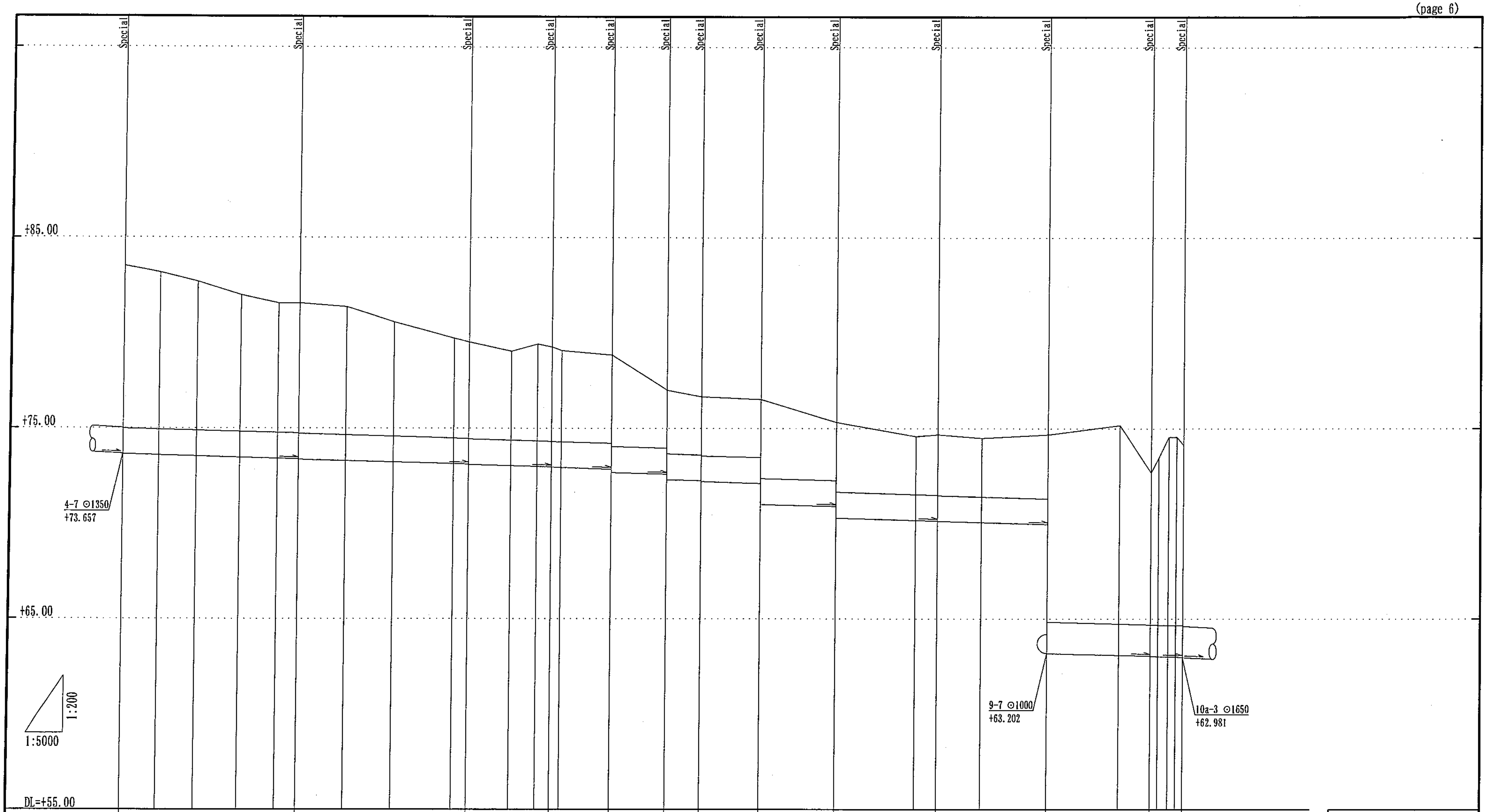
A3J_ITW:2006-03-22 2B3D_01.FIG:2006/6/14/16:7 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:7



Sewer Line No.	Diam (mm)	Slope (‰)	Length (m)
4-8	⊙1350	1.1	233.00
4-9	⊙1350	1.1	225.00
4-10	⊙1350	1.1	110.00
4-11	⊙1350	1.1	79.00
4-12	⊙1350	1.1	73.00
4-13	⊙1350	1.1	225.00 46.00 79.00 100.00
4-14	⊙1350	1.1	135.00
4-15	⊙1350	1.1	146.00
10a-1	⊙1650	0.9	137.00
10a-2	⊙1650	0.9	42.00

Cu. Length (m)	Ground Elevation (m)	Earth Cover (m)	Invert Elevation (m)
2938.00	83.50	8.47	73.637
2985.00	83.15	8.17	73.585
3035.00	82.68	7.76	73.530
3093.00	81.99	7.13	73.466
3143.00	81.56	6.75	73.411
3171.00	81.55	6.77 6.79	73.381 73.361
3233.00	81.37	6.68	73.293
3296.00	80.56	5.94	73.223
3376.00	79.72	5.19	73.135
3396.00	79.52	5.01 5.03	73.113 73.093
3452.00	79.04	4.61	73.031
3487.00	79.41	5.02	72.993
3506.00	79.25	4.88 4.90	72.972 72.952
3519.00	79.08	4.75	72.938
3585.00	78.85	4.59 4.77	72.865 72.685
3658.00	77.00	3.00 3.30	72.605 72.306
3704.00	76.65	3.00 3.04	72.255 72.212
3783.00	76.52	3.00 4.10	72.125 71.025
3883.00	75.31	3.00 3.61	70.915 70.302
3989.00	74.58	3.00	70.185
4018.00	74.69	3.14 3.16	70.153 70.133
4076.00	74.50	3.04	70.069
4164.00	74.69	3.32 9.81	69.972 63.182
4259.00	75.19	10.39	63.096
4301.00	72.69	7.93	63.059
4311.00	73.47	7.95	63.039
4324.00	74.57	8.74	63.030
4334.00	74.56	9.85	63.018
4343.00	74.12	9.85 9.42	63.009 63.001

PipeList

4-8	4-9	4-10	4-11
4-12	4-13	4-14	4-15
10a-1	10a-2		

B-3d
case.2

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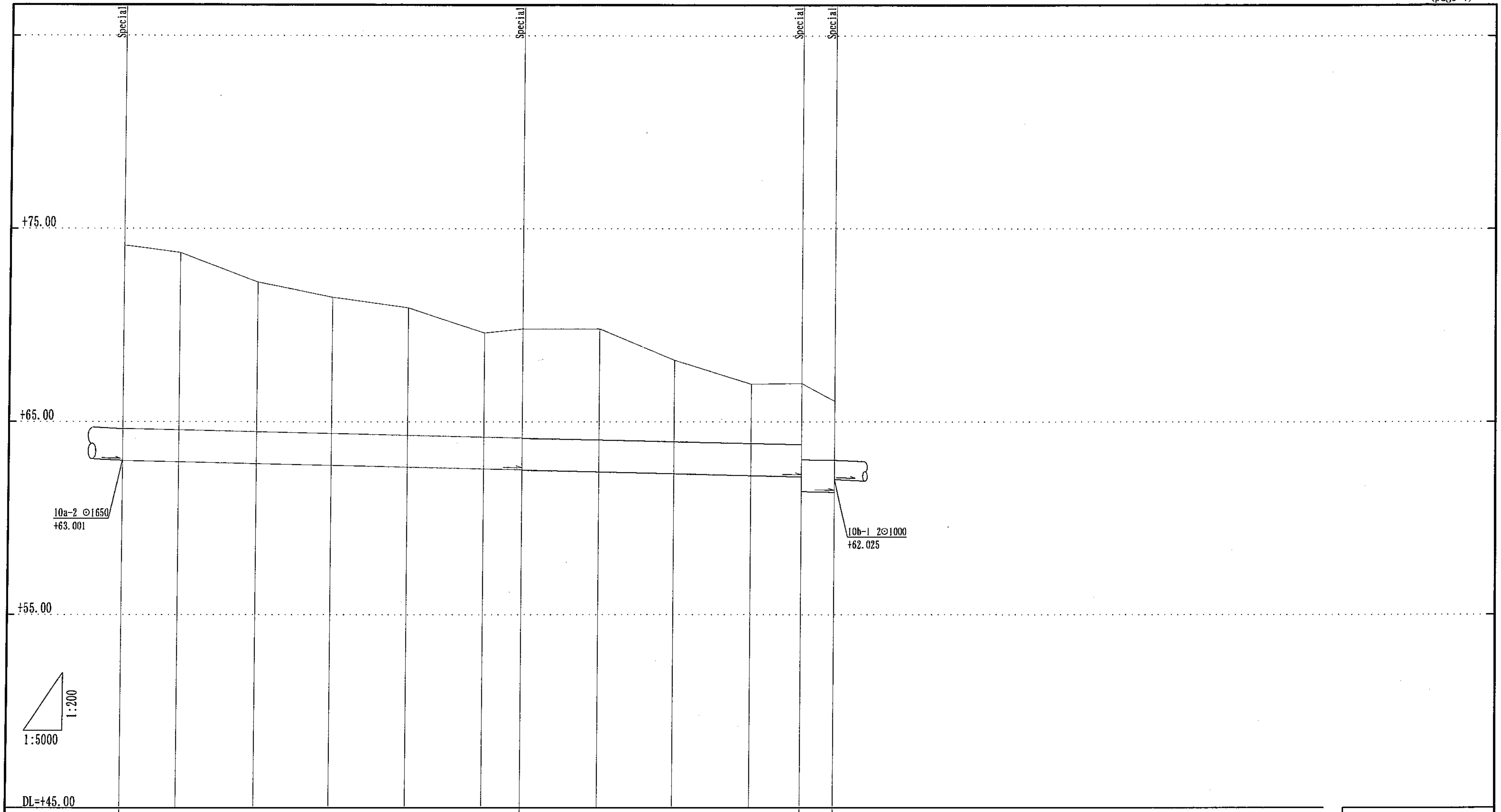
A3J_ITW:2006-03-22 2B3D_01.FIG:2006/6/14/16:7 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:7



Sewer Line No.	10a-3						10a-4					10a-5	
Diam(mm)	⊙1650						⊙1650					⊙1650	
Slope(‰)	0.9						0.9					0.9	
Length(m)	523.00						366.00					43.00	
Ground Elevation(m)	74.12	73.74	72.23	71.44	70.90	69.60	69.80	69.80	68.17	66.95	66.98	66.06	
Earth Cover(m)	9.44	9.13	7.71	7.01	6.56	5.35	5.59 5.61	5.70	4.16	3.03	3.12 3.88	3.00	
Invert Elevation(m)	62.981	62.915	62.823	62.735	62.645	62.555	62.510 62.490	62.400	62.311	62.220	62.161 61.399	61.360	
Cu. Length(m)	4343.00	4416.00	4518.00	4616.00	4716.00	4816.00	4866.00	4966.00	5065.00	5166.00	5232.00	5275.00	

PipeList			
10a-3	10a-4	10a-5	

B-3d
case.2
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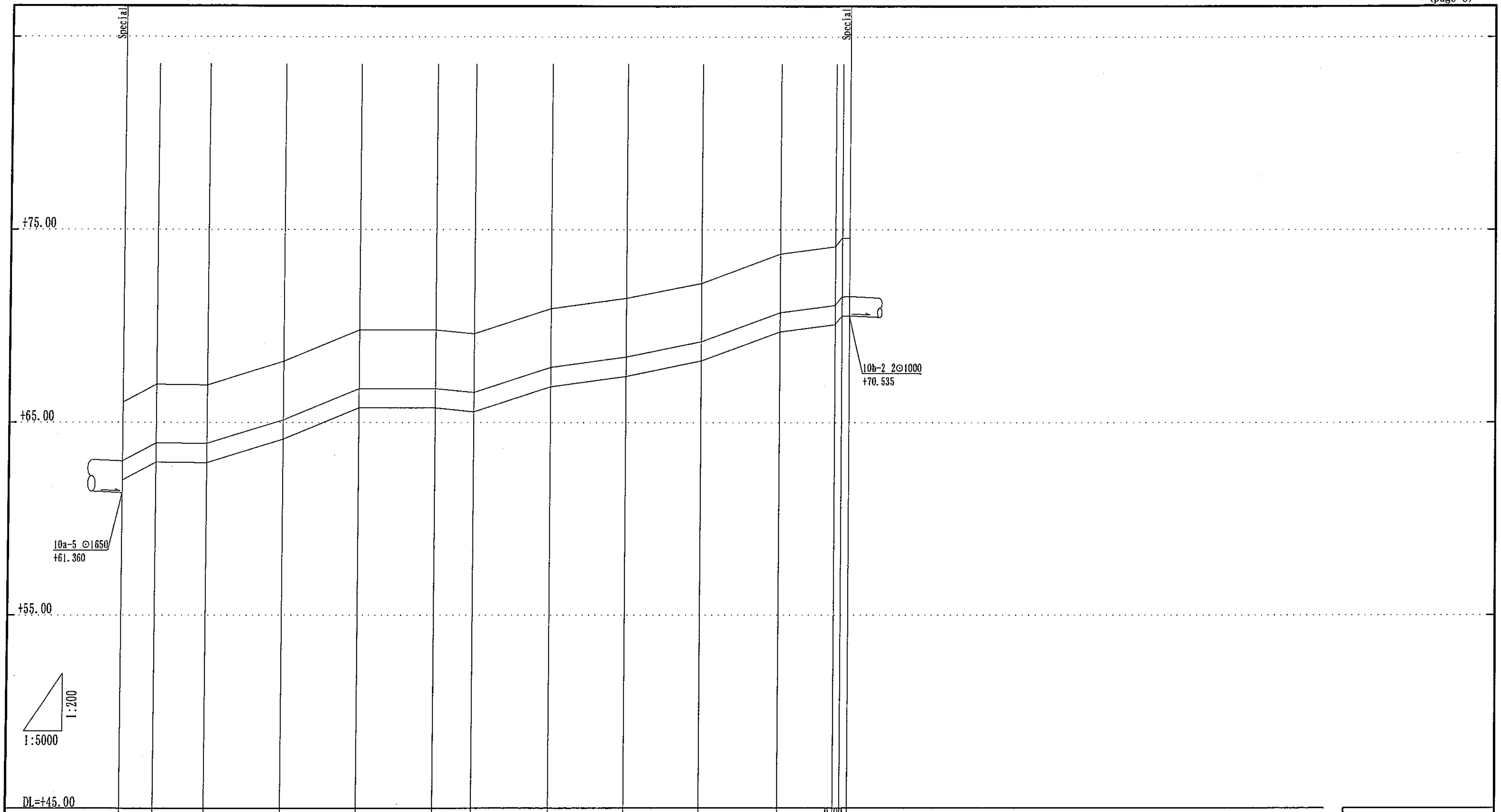
A3J_ITW:2006-03-22 2B3D_01.FIG:2006/6/14/16:27 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:27



	43.00	66.00	101.00	99.00	100.00	50.00	100.00	100.00	98.00	102.00	73.00	9.00	10.00	
Ground Elevation(m)	66.06	66.98	66.95	68.17	69.80	69.80	69.60	70.90	71.44	72.23	73.74	74.12	74.56	74.57
Earth Cover(m)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Invert Elevation(m)	62.025	62.945	62.915	64.135	65.765	65.765	65.565	66.865	67.405	68.195	69.705	70.085	70.525	70.535
Cu. Length(m)	5275.00	5318.00	5384.00	5485.00	5584.00	5684.00	5734.00	5834.00	5934.00	6032.00	6134.00	6207.00	6216.00	6226.00

Sewer Line No.	(10b-1)
Diam(mm)	2⊙1000
Slope(‰)	Press
Length(m)	951.00

PipeList

(10b-1)

B-3d
case.2

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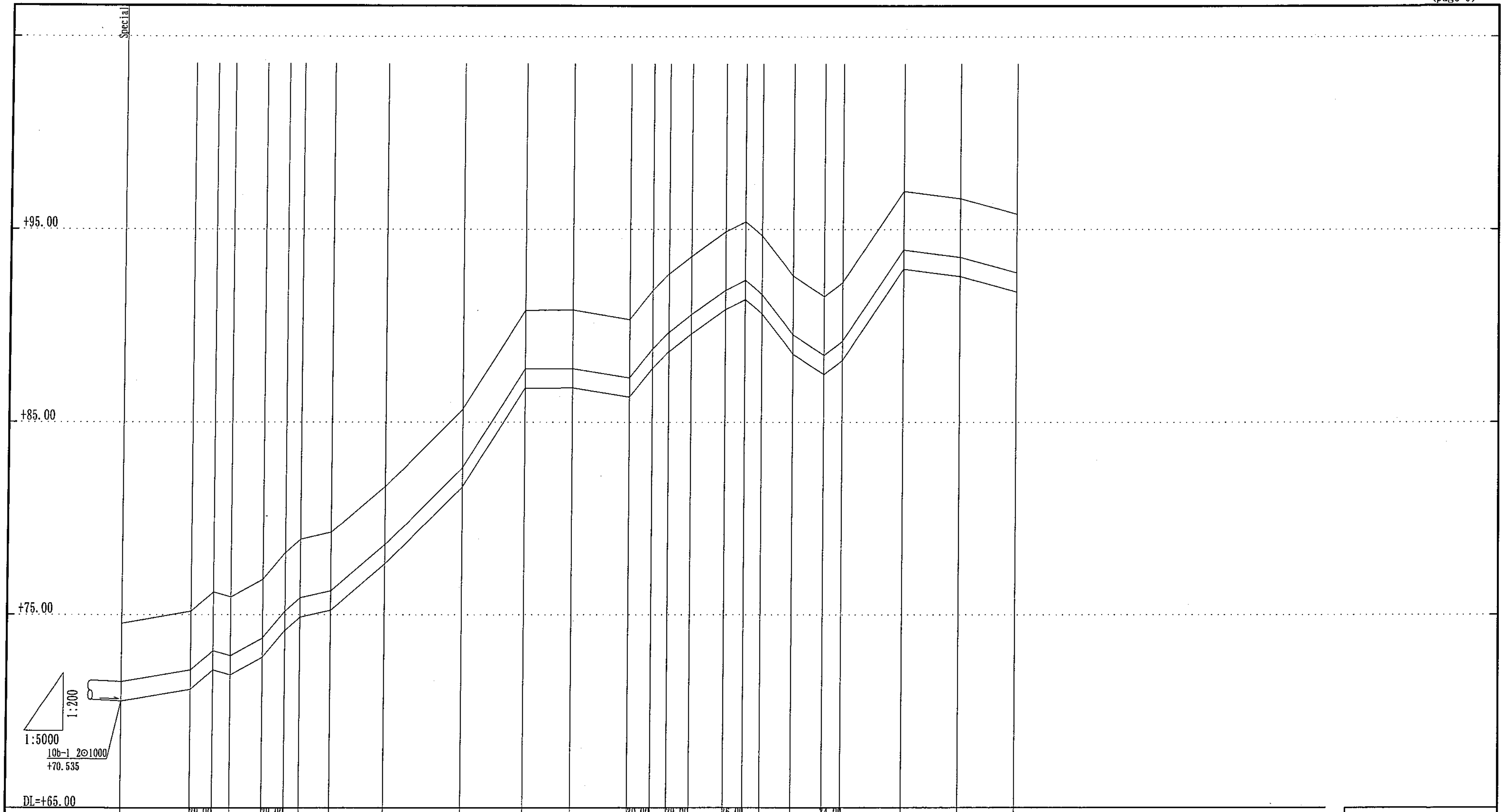
A3J_ITW:2006-03-22 2B3D_DI.FIG:2006/6/14/16:7 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:7



90.00 | 29.00 | 23.00 | 42.00 | 29.00 | 20.00 | 40.00 | 70.00 | 100.00 | 82.00 | 62.00 | 74.00 | 30.00 | 21.00 | 29.00 | 45.00 | 26.00 | 22.00 | 41.00 | 41.00 | 24.00 | 79.00 | 74.00 | 74.00

Sewer Line No. (10b-2) ⑪
Diam(mm) 2⊙1000
Slope(‰) Press
Length(m) 1167.00

Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)	Cu. Length(m)
74.57	3.00	70.535	6226.00
75.17	3.00	71.135	6316.00
76.18	3.00	72.145	6345.00
75.91	3.00	71.875	6368.00
76.84	3.00	72.805	6410.00
78.22	3.00	74.185	6439.00
78.91	3.00	74.875	6459.00
79.27	3.00	75.235	6499.00
81.68	3.00	77.645	6569.00
85.68	3.00	81.645	6669.00
90.80	3.00	86.765	6751.00
90.82	3.00	86.785	6813.00
90.33	3.00	86.295	6887.00
91.81	3.00	87.775	6917.00
92.70	3.00	88.665	6938.00
93.61	3.00	89.575	6967.00
94.88	3.00	90.845	7012.00
95.40	3.00	91.365	7038.00
94.66	3.00	90.625	7060.00
92.58	3.00	88.545	7101.00
91.51	3.00	87.475	7142.00
92.24	3.00	88.205	7166.00
96.98	3.00	92.945	7245.00
96.60	3.00	92.565	7319.00
95.79	3.00	91.755	7393.00

PipeList
(10b-2)

B-3d
case.2
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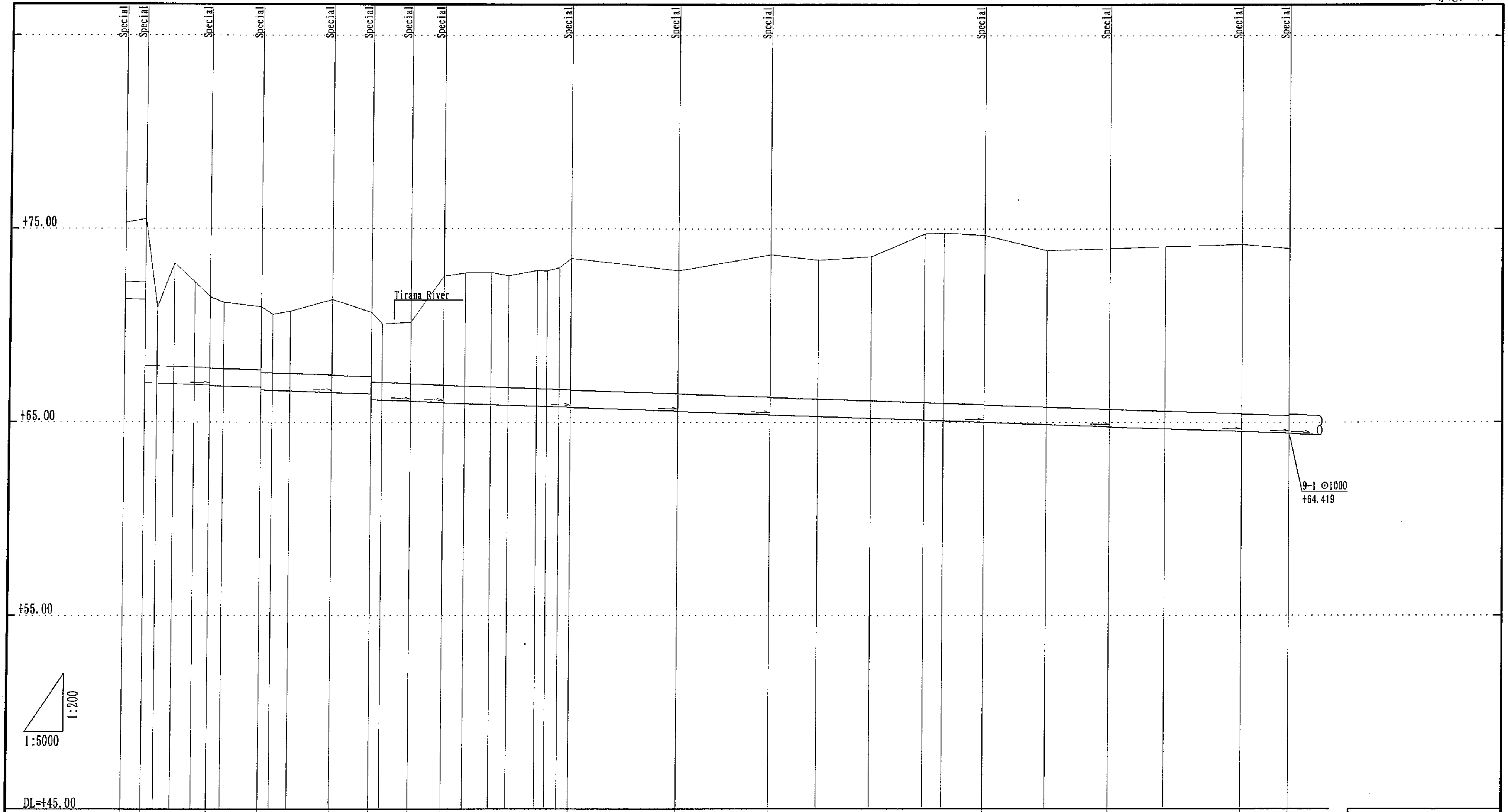
A3J_ITW:2006-03-22 2B3D_01.FIG:2006/6/14/16:7 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:7



	26.00 85.00	67.00 93.00	51.00 51.00								
Sewer Line No.	⑧-1	⑧-2	⑧-3	⑧-4	⑧-5	⑧-6	⑧-7	⑧-8	⑧-9	⑧-10	⑧-11
Diam (mm)	⊙900	⊙900	⊙900	⊙900	⊙900	⊙900	⊙900	⊙900	⊙900	⊙900	⊙900
Slope (‰)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Length (m)	111.00	160.00	102.00	43.00	166.00	140.00	121.00	279.00	164.00	172.00	63.00

Ground Elevation (m)	Earth Cover (m)	Invert Elevation (m)	Cu. Length (m)
75.29	3.00	71.360	0.00
75.49	3.23 7.55	71.326 67.011	26.00
70.92	3.00	66.990	42.00
73.21	5.32	66.962	64.00
72.22	4.36	66.926	91.00
71.46	3.63 3.65	66.900 66.880	111.00
71.18	3.39	66.857	129.00
70.93	3.21	66.793	178.00
70.57	3.34 3.00	66.660 66.640	193.00
70.72	3.18	66.611	216.00
71.32	3.85 3.87	66.539 66.519	271.00
70.66	3.28	66.453	322.00
70.07	3.57	66.158	336.00
70.11	3.00 3.06	66.140 66.120	351.00
70.16	3.14 3.16	66.092 66.072	373.00
72.53	5.58 5.60	66.016 65.996	416.00
72.71	5.82	65.960	444.00
72.72	5.88	65.915	478.00
72.57	5.76	65.885	501.00
72.84	6.07	65.837	538.00
72.83	6.08	65.820	551.00
72.98	6.25	65.800	567.00
73.46	6.75 6.77	65.780 65.760	582.00
72.81	6.30 6.32	65.578 65.558	722.00
73.65	7.32 7.34	65.401 65.381	843.00
73.37	7.14	65.300	905.00
73.57	7.43	65.211	974.00
74.74	8.69	65.120	1044.00
74.78	8.76	65.087	1069.00
74.65	8.70 8.72	65.018 64.998	1122.00
73.88	8.06	64.891	1204.00
73.98	8.27 8.29	64.785 64.765	1286.00
74.09	8.49	64.671	1358.00
74.19	8.72 8.74	64.541 64.521	1458.00
73.98	8.61	64.439	1521.00

PipeList			
⑧-1	⑧-2	⑧-3	⑧-4
⑧-5	⑧-6	⑧-7	⑧-8
⑧-9	⑧-10	⑧-11	

B-3d
case. 2

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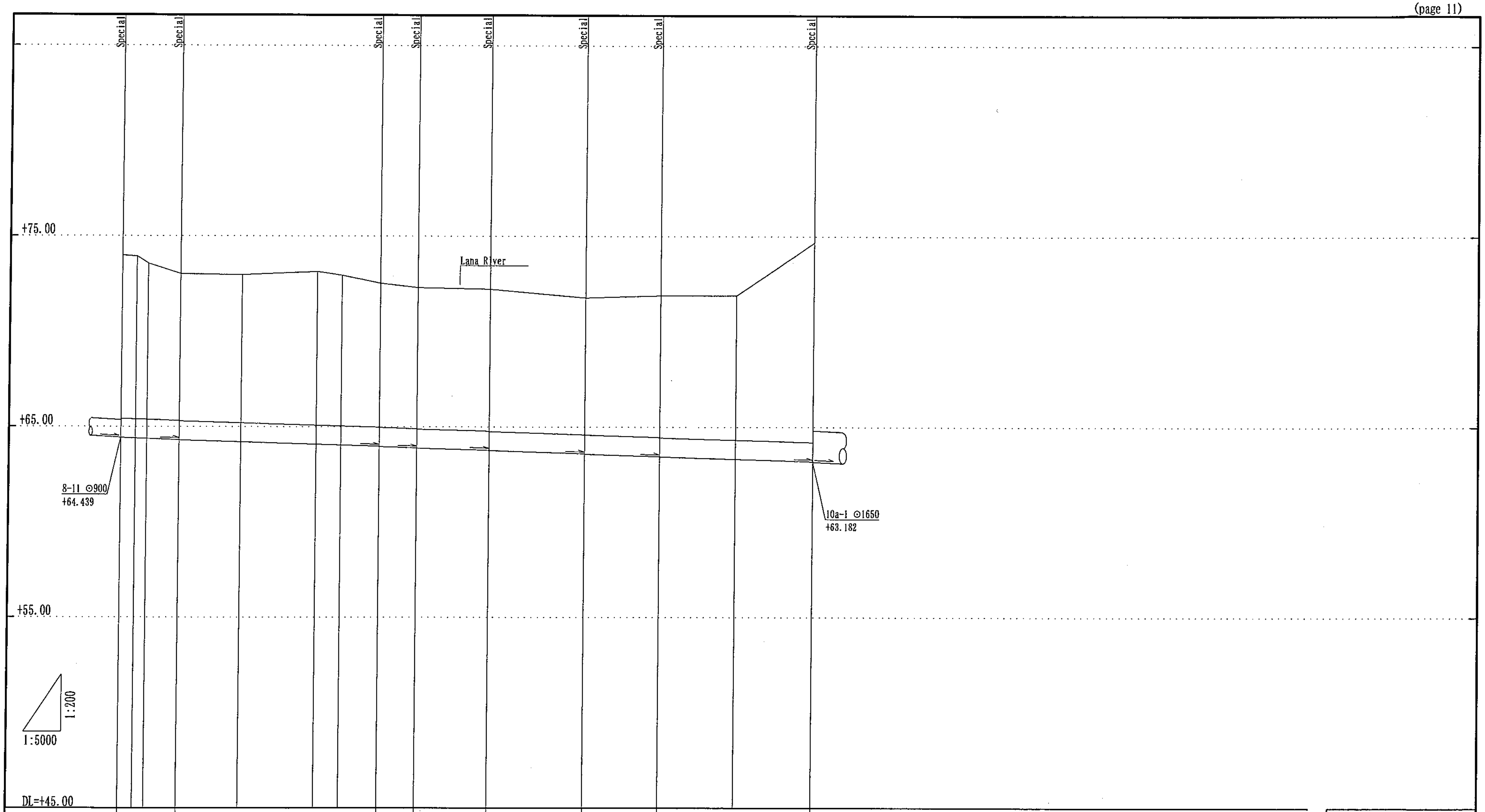
A3I_ITW:2006-03-22 2B3D_01.FIG:2006/6/14/16:11 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:11



Sewer Line No.	⑨-1	⑨-2	⑨-3	⑨-4	⑨-5	⑨-6	⑨-7
Diam(mm)	⊙1000	⊙1000	⊙1000	⊙1000	⊙1000	⊙1000	⊙1000
Slope(‰)	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Length(m)	77.00	265.00	50.00	95.00	126.00	100.00	202.00

Cu. Length(m)	Ground Elevation(m)	Earth Cover(m)	Invert Elevation(m)
1521.00	73.98	8.53	64.419
1540.00	73.94	8.51	64.396
1555.00	73.57	8.16	64.378
1598.00	73.01	7.65 7.67	64.327 64.307
1679.00	72.97	7.73	64.210
1779.00	73.13	8.01	64.090
1812.00	72.93	7.85	64.050
1863.00	72.51	7.49 7.51	63.989 63.969
1913.00	72.29	7.35 7.37	63.909 63.889
1968.00	72.26	7.40	63.823
2008.00	72.23	7.42 7.44	63.775 63.755
2134.00	71.78	7.14 7.16	63.604 63.584
2234.00	71.90	7.40 7.42	63.464 63.444
2334.00	71.90	7.54	63.324
2436.00	74.69	10.45	63.202

PipeList

⑨-1	⑨-2	⑨-3	⑨-4
⑨-5	⑨-6	⑨-7	

B-3d
case.2

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A3J_ITW:2006-03-22 2B3D_01.FIG:2006/6/14/16:7 ALBANIA.INI:2006/6/8/9:57 Print:2006/6/14/16:7

8.1.4 Flow calculation

8.1.4 Flow calculation

(1) Trunk Sewer B-3a

Unit flow 440 L/p/d n= 0.013 Invert level connection Minimum covering 3 ｍ

Area	Pipe No.	Down No.	Area	Each Population	Cumulative Population	Flow (m3/h)	Flow (m3/s) (a)	Pipe Diameter	Slope (‰)	Velocity (m/s)	Flow Capacity (b)	Ratio (b/a)	Pipe Length	Cumulative Length	Level Upstream	length to lowest point	Level lowest	Level Dwnstream	Crown-Invert level (mm)	Invert Level (up-middle-down)			Cover depth (up-middle-down)			Adjust ment	Method
Central	1	3	306.0	82,262	82,262	1,508	0.42	900	1.2	0.986	0.63	1.5	214	214	91.2	0.0	91.1	90.6	930	**84.97**	84.97	84.71	5.3	5.2	5.0	2.3	Jacking
Tirana	2	3	1770.4	257,654	257,654	4,724	1.31	1350	1.1	1.237	1.77	1.35	189	403	91.4	0.0	91.4	90.6	1,395	**84.41**	84.41	84.2	5.6	5.6	5.0	2.6	Jacking
	3	4	51.9	5,192	345,108	6,327	1.76	1500	1.0	1.265	2.24	1.27	1310	1,713	90.6	1310.0	84.5	84.5	1,550	79.28	77.97	77.97	9.8	5.0	5.0	4.9	Shield
	7-1	7-2	169	11,307	11,307	207	0.06	450	2.0	0.802	0.13	2.17	65	65	82.2	0	82.2	83.3	418	**78.78**	78.78	78.65	3.0	3.0	4.2		Jacking
	7-2	7-3						450	2.0				160	225	83.3	160	82.6	82.6	418	78.63	78.31	78.31	4.3	3.9	3.9		
	7-3	7-4						450	2.0				145	370	82.6	0	82.6	83.3	418	78.29	78.29	78	3.9	3.9	4.9		
	7-4	7-5						450	2.0				100	470	83.3	0	83.3	83.5	418	77.98	77.98	77.78	4.9	4.9	5.3		
	7-5	7-6						450	2.0				180	650	83.5	180	82.3	82.3	418	77.76	77.40	77.4	5.3	4.5	4.5		
	7-6	7-7						450	2.0				75	725	82.3	0	82.3	82.5	418	77.38	77.38	77.23	4.5	4.5	4.9		
	7-7	6-1						450	2.0				75	800	82.5	0	82.5	82.9	418	77.21	77.21	77.06	4.9	4.9	5.4		Jacking
	6-1	0	1420.7	302,558	313,865	5,754	1.6	1350	1.3	1.344	1.92	1.2	403	1,203	82.9	403.0	84.6	84.6	1,395	78.53	78.01	78.01	3.0	5.2	5.2	0.1	Shield
	5-1	5-2	33.3	11,694	325,559	5,969	1.66	1350	1.4	1.395	2	1.2	280	1,483	84.6	280.0	84.2	84.2	1,395	77.99	77.60	77.6	5.2	5.2	5.2		Jacking
	5-2	5-3						1350	1.4				245	1,728	84.2	245.0	84.3	84.3	1,395	77.58	77.24	77.24	5.2	5.7	5.7		
	5-3	5-4						1350	1.4				195	1,923	84.3	195.0	84.4	84.4	1,395	77.22	76.95	76.95	5.7	6.1	6.1		
	5-4	5-5						1350	1.4				245	2,168	84.4	245.0	84.5	84.5	1,395	76.93	76.59	76.59	6.1	6.5	6.5		
	5-5	4						1350	1.4				35	2,203	84.5	35.0	84.5	84.5	1,395	76.57	76.52	76.52	6.5	6.6	6.6		
Paskquan	8-1	8-2	1102	101,368	101,368	1,858	0.52	*900*	1.5	1.102	0.70	1.4	550	550	74.0	135.0	67.8	72.8	930	**64.87**	64.87	64.87	8.2	2.0	7.0	5.2	Jacking
	8-2	8-3						*900*	*1.5*				455	1,005	72.8	455.0	74.1	74.1	930	64.85	64.17	64.17	7.0	9.0	9.0		Jacking
	8-3	8-4						*900*	*1.5*				180	1,185	74.1	180.0	73.8	73.8	930	64.15	63.88	63.88	9.0	9.0	9.0		Jacking
	8-4	9-1						*900*	*1.5*				65	1,250	73.8	65.0	73.8	73.8	930	63.86	63.76	63.76	9.0	9.1	9.1		Jacking
Tirana	9-1	9-2	427.6	32,863	134,231	2,461	0.68	1000	1.2	1.057	0.83	1.22	85	1,335	73.8	85.0	73.2	73.2	1,035	63.74	63.64	63.64	9.0	8.5	8.5		Jacking
	9-2	9-3						1000	1.2				350	1,685	73.2	350.0	72.0	72.0	1,035	63.62	63.20	63.2	8.5	7.8	7.8		Jacking
	9-3	9-7						1000	1.2				70	1,755	72.0	35.0	*70.0*	73.8	1,035	63.18	63.14	63.1	7.8	5.8	9.7		Jacking Crossing Lana River
	9-4	9-5						1000	1.2				100	1,855	72.0	100.0	72.0	72.0	1,035	63.08	62.96	62.96	7.9	8.0	8.0		Jacking
	9-5	9-6						1000	1.2				100	1,955	72.0	100.0	72.0	72.0	1,035	62.94	62.82	62.82	8.0	8.1	8.1		Jacking
	9-6	9-7						1000	1.2				100	2,055	72.0	100.0	73.8	73.8	1,035	62.80	62.68	62.68	8.2	10.1	10.1		Jacking
	9-7	10a-1						1000	1.2				125	2,180	73.8	125.0	74.5	74.5	1,035	63.08	62.93	62.93	9.7	10.5	10.5		Jacking
Kashar	10a-1	10a-2	456.3	5,909	140,140	2,569	0.71	1100	1.1	1.079	1.03	1.45	140	2,320	74.5	140	73.9	73.9	1,035	62.91	62.76	62.76	10.6	10.1	10.1		Jacking
	10a-2	10a-3						1100	1.1				50	2,370	73.9	50.0	73.5	73.5	1,035	62.74	62.69	62.69	10.1	9.8	9.8		Jacking
	10a-3	10a-4						1100	1.1				515	2,885	73.5	515	71.0	71	1,035	62.67	62.10	62.1	9.8	7.9	7.9		Jacking
	10a-4	10a-5						1100	1.1				370	3,255	71.0	370	67.8	67.8	1,035	62.08	61.67	61.67	7.9	5.1	5.1		Jacking
	10a-5	10b(PS)						1100	1.1				50	3,305	67.8	50	67.0	67	1,035	61.65	61.60	61.6	5.1	4.4	4.4		Jacking
	10b(PS)	4	206.5	17,212	157,352	2,885	0.8	*600*	0.0	1.6	0.90	1.1	2710	6,015	67	0	67.0	85	623	*62.08*	62.08	62.08	3.0	3.0	3.0		2lines Pressurised
	4	11	143.5	2,293	830,312	15,222	4.23	2000	1.2	1.679	5.27	1.25	2085	4,288	84.5	2085.0	84.9	84.9	2,060	**62.06**	59.56	59.56	20.4	23.3	23.3		
Kamza	14-1	14-2	652.7	44,502	44,502	816	0.23	700	2.0	1.076	0.41	1.78	75	75	56.1	75.0	56.1	56.1	725	**52.38**	52.23	52.23	3.0	3.1	3.1		
	14-2	14-3						700	2.0				40	115	56.1	40.0	55.8	55.8	725	52.11	52.03	52.03	3.3	3.0	3.0	0.1	
	14-3	14-4						700	2.0				380	495	55.8	0.0	55.8	53.7	725	50.71	50.71	49.95	4.4	4.4	3.0	1.3	
	14-4	14-5						700	2.0				110	605	53.7	0.0	53.7	52.9	725	49.43	49.43	49.21	3.5	3.5	3.0	0.5	
	14-5	15-1						700	2.0				600	1,205	52.9	600.0	50.2	50.2	725	47.69	46.49	46.49	4.5	3.0	3.0	1.5	
	15-1	15-2	262.7	17,911	62,413	1,144	0.32	800	1.7	1.085	0.55	1.72	185	1,390	50.2	0.0	50.2	51.3	825	46.37	46.37	46.06	3.0	3.0	4.4	0.1	
	15-2	15-3						800	1.7				265	1,655	51.3	0.0	51.3	51.5	825	46.04	46.04	45.59	4.4	4.4	5.1		
	15-3	16-1						800	1.7				290	1,945	51.5	0.0	51.5	51.0	825	45.57	45.57	45.08	5.1	5.1	5.1		
	16-1	17-1	39.3	2,680	65,093	1,193	0.33	1350	0.9	1.087	1.56	4.73	1473	3,418	51.0	1473.0	45.0	45.0	1,395	41.86	40.61	40.61	7.7	3.0	3.0	3.2	Shield

8.1.4 Flow calculation

(1) Trunk Sewer B-3a Unit flow 440 L/p/d n= 0.013 Invert level connection Minimum covering 3 ｍ

Area	Pipe No.	Down No.	Area	Each Population	Cumulative Population	Flow (m3/h)	Flow (m3/s) (a)	Pipe Diameter	Slope (‰)	Velocity (m/s)	Flow Capacity (b)	Ratio (b/a)	Pipe Length	Cumulative Length	Level Upstream	length to lowest point	Level lowest	Level Dwnstream	Crown-Invert level (mm)	Invert Level (up-middle-down)			Cover depth (up-middle-down)			Adjustment	Method
	17-1	17-2	650.9	44,379	109,472	2,007	0.56	1000	1.3	1.101	0.86	1.54	110	3,528	45.0	110.0	44.8	44.8	1,035	40.29	40.15	40.15	3.7	3.6	3.6	0.3	
	17-2	17-6						1000	1.3				410	3,938	44.8	410.0	43.4	43.4	1,035	39.33	38.80	38.8	4.4	3.6	3.6	0.8	
	17-3	18-1						1000	1.3				50	3,988	43.4	50.0	43.2	43.2	1,035	38.58	38.52	38.52	3.8	3.6	3.6	0.2	Jacking
	17-4	18-2						1000	1.3				720	4,708	43.2	720.0	43.5	43.5	1,035	38.50	37.56	37.56	3.7	4.9	4.9		
	17-5	18-3						1000	1.3				55	4,763	43.5	0.0	43.5	43.6	1,035	37.54	37.54	37.47	4.9	4.9	5.1		
	17-6	18-1						1000	1.3				60	4,823	43.6	60.0	43.6	43.6	1,035	37.54	37.46	37.46	5.0	5.1	5.1		
	18-1	18-2	82.9	5,652	115,124	2,111	0.59	1000	1.3	1.101	0.86	1.46	290	5,113	43.6	0.0	43.7	43.7	1,035	37.44	37.44	37.06	5.1	5.2	5.6	0	Jacking
	18-2	18-3						1000	1.3				400	5,513	43.7	400.0	41.3	41.3	1,035	35.84	35.32	35.32	6.8	4.9	4.9	1.2	
	18-3	19-1						1000	1.3				140	5,653	41.3	140.0	41.0	41.0	1,035	35.20	35.02	35.02	5.1	4.9	4.9	0.1	
	19-1	20	86.5	5,898	121,022	2,219	0.62						856	6,509	41.0	0.0	41.0	41.0		35.00	35.00	35	6.0	6.0	6.0		
			7,862.2	951,334	#REF!								18,525	**12,524**													

8.1.4 Flow calculation

(1) Trunk Sewer B-3b Unit flow 440 L/p/d n= 0.013 Invert level connection Minimum covering 3 m

Area	Pipe No.	Down No.	Area	Each Population	Cumulative Population	Flow (m3/h)	Flow (m3/s) (a)	Pipe Diameter	Slope (‰)	Velocity (m/s)	Flow Capacity (b)	Ratio (b/a)	Pipe Length	Cumulative Length	Level Upstream	length to lowest point	Level lowest	Level Dwnstream	Crown-Invert level (mm)	Invert Level (up-middle-down)			Cover depth (up-middle-down)			Adjustment	Method
Central	1	3-1	306.0	82,262	82,262	1,508	0.42	900	1.2	0.986	0.63	1.5	214	214	91.2	0.0	91.1	90.6	930	**85.07**	85.07	84.81	5.2	5.1	4.9	2.2	Jacking
Tirana	2	3-1	1770.4	257,654	257,654	4,724	1.31	1350	1.1	1.237	1.77	1.35	189	403	91.4	0.0	91.4	90.6	1,395	**84.41**	84.41	84.2	5.6	5.6	5.0	2.6	Jacking
	3-1	3-2	51.9	5,192	345,108	6,327	1.76	1500	1.0	1.265	2.24	1.27	280	683	90.6	280.0	90.0	90.0	1,550	84.18	83.90	83.9	4.9	4.5	4.5		Jacking
	3-2	3-3						1500	1.0				480	1,163	90.0	480.0	88.5	88.5	1,550	83.88	83.40	83.4	4.6	3.5	3.5		
	3-3	3-4						1500	1.0				315	1,478	88.5	315.0	86.2	86.2	1,550	81.98	81.67	81.67	5.0	3.0	3.0	1.4	
	3-4	5-3						1500	1.0				210	1,688	86.2	210.0	84.3	84.3	1,550	79.95	79.74	79.74	4.7	3.0	3.0	1.7	
	7-1	7-2	169	11,307	11,307	207	0.06	400	2.0	0.741	0.09	1.5	65	65	82.2	0	82.2	83.3	418	**78.78**	78.78	78.65	3.0	3.0	4.2		Jacking
	7-2	7-3						400	2.0				160	225	83.3	160	82.6	82.6	418	78.63	78.31	78.31	4.3	3.9	3.9		
	7-3	7-4						400	2.0				145	370	82.6	0	82.6	83.3	418	78.29	78.29	78	3.9	3.9	4.9		
	7-4	7-5						400	2.0				100	470	83.3	0	83.3	83.5	418	77.98	77.98	77.78	4.9	4.9	5.3		
	7-5	7-6						400	2.0				180	650	83.5	180	82.3	82.3	418	77.76	77.40	77.4	5.3	4.5	4.5		
	7-6	7-7						400	2.0				75	725	82.3	0	82.3	82.5	418	77.38	77.38	77.23	4.5	4.5	4.9		
	7-7	6-1						400	2.0				75	800	82.5	0	82.5	82.9	418	77.21	77.21	77.06	4.9	4.9	5.4		Jacking
	6-1	0	1420.7	302,558	313,865	5,754	1.6	1350	1.3	1.344	1.92	1.2	403	1,203	82.9	403.0	84.6	84.6	1,395	78.53	78.01	78.01	3.0	5.2	5.2	0.1	Jacking
	5-1	5-2	33.3	11,694	325,559	5,969	1.66	1350	1.4	1.395	2	1.2	280	1,483	84.6	280.0	84.2	84.2	1,395	**80.21**	79.81	79.81	3.0	3.0	3.0		Jacking
	5-2	5-3						1350	1.4				245	1,728	84.2	245.0	84.3	84.3	1,395	79.79	79.45	79.45	3.0	3.5	3.5		
	5-3	5-4		16,886	670,667	12,296	3.42	1800	1.2	1.565	3.98	1.16	195	3,611	84.3	195.0	84.4	84.4	1,855	79.43	79.20	79.2	3.0	3.3	3.3		
	5-4	5-5						1800	1.2				245	3,856	84.4	245.0	84.5	84.5	1,855	79.18	78.89	78.89	3.4	3.8	3.8		
	5-5	4-1						1800	1.2				35	3,891	84.5	35.0	84.5	84.5	1,855	78.87	78.83	78.83	3.8	3.8	3.8		
	4-1	4-2	143.5	2,293	672,960	12,338	3.43	1200		1.6	3.62	1.06	1520	5,411	84.5	1520.0	84.5	84.5	1,240	78.81	78.81	78.81	2.0	2.0	2.0		2lines Pressurised
	4-2	4-3					3.43	1800	1.2	1.565	3.98	1.16	70	5,481	84.5	70.0	84.1	84.1	1,855	78.79	78.71	78.71	3.9	3.5	3.5		
	4-3	4-4						1800	1.2				80	5,561	84.1	80.0	84.5	84.5	1,855	78.69	78.59	78.59	3.6	4.1	4.1		
	4-4	4-5						1800	1.2				140	5,701	84.5	140.0	84.5	84.5	1,855	78.57	78.40	78.4	4.1	4.2	4.2		
	4-5	4-6						1800	1.2				200	5,901	84.5	200.0	86.0	86.0	1,855	78.38	78.14	78.14	4.3	6.0	6.0		
	4-6	4-7						1800	1.2				250	6,151	86.0	0.0	86.0	88.0	1,855	78.12	78.12	77.82	6.0	6.0	8.3		Jacking
	4-7	4-8						1800	1.2				240	6,391	88.0	240.0	86.0	86.0	1,855	77.80	77.51	77.51	8.3	6.6	6.6		
	4-8	11STP						1800	1.2				270	6,661	86.0	270.0	85.0	85.0	1,855	77.49	77.17	77.17	6.7	6.0	6.0		
Paskquan	8-1	8-2	1102	101,368	101,368	1,858	0.52	*500*	0.0	1.5	0.58	1.1	625	625	74.0	625.0	72.8	72.8	520	**69.28**	69.28	69.28	4.2	3.0	3.0	1.2	2lines Pressurised
	8-2	8-3					0.52	900	1.3	1.026	0.65	1.25	455	1,080	72.8	455.0	74.1	74.1	930	68.86	68.27	68.27	3.0	4.9	4.9	0.4	
	8-3	8-4						900	1.3				180	1,260	74.1	180.0	73.8	73.8	930	68.25	68.02	68.02	4.9	4.9	4.9		
	8-4	9-1						900	1.3				65	1,325	73.8	65.0	73.8	73.8	930	68.00	67.92	67.92	4.9	5.0	5.0		
Tirana	9-1	9-2	427.6	32,863	134,231	2,461	0.68	1000	1.2	1.057	0.83	1.22	85	1,410	73.8	85.0	73.2	73.2	1,035	67.90	67.80	67.8	4.9	4.4	4.4		Jacking
	9-2	9-3						1000	1.2				350	1,760	73.2	350.0	72.0	72.0	1,035	67.48	67.06	67.06	4.7	3.9	3.9	0.3	
	9-3	9-7						1000	1.2				70	1,830	72.0	35.0	*70.0*	73.8	1,035	66.14	66.10	66.06	4.8	2.9	6.7	0.9	Jacking Crossing Lana River
	9-4	9-5						1000	1.2				100	1,930	72.0	100.0	72.0	72.0	1,035	66.04	65.92	65.92	4.9	5.0	5.0		
	9-5	9-6						1000	1.2				100	2,030	72.0	100.0	72.0	72.0	1,035	65.90	65.78	65.78	5.1	5.2	5.2		
	9-6	9-7						1000	1.2				100	2,130	72.0	100.0	73.8	73.8	1,035	65.76	65.64	65.64	5.2	7.1	7.1		
	9-7	10a-1						1000	1.2				125	2,255	73.8	125.0	74.5	74.5	1,035	66.04	65.89	65.89	6.7	7.6	7.6		
Kashar	10a-1	10a-2	456.3	5,909	140,140	2,569	0.71	2000	1.1	1.607	5.05	7.11	140	2,395	74.5	140	73.9	73.9	2,060	65.87	65.72	65.72	6.6	6.1	6.1		
	10a-2	10a-3						2000	1.1				50	2,445	73.9	50.0	73.5	73.5	2,060	65.70	65.65	65.65	6.1	5.8	5.8		
	10a-3	10a-4						2000	1.1				515	2,960	73.5	515	71.0	71	2,060	65.63	65.06	65.06	5.8	3.9	3.9		
	10a-4	10a-5						2000	1.1				370	3,330	71.0	370	67.8	67.8	2,060	62.24	61.83	61.83	6.7	3.9	3.9	2.8	
	10a-5	10b(PS)						2000	1.1				50	3,380	67.8	50	67.0	67	2,060	61.11	61.06	61.06	4.6	3.9	3.9	0.7	
	10b(PS)	11STP	206.5	17,212	157,352	2,885	0.8	*600*	0.0	1.6	0.90	1.1	2000	5,380	67	0	67.0	85	623	61.04	61.04	61.04	2.0	2.0	2.0		2lines Pressurised

8.1.4 Flow calculation

(1) Trunk Sewer B-3b Unit flow 440 L/p/d n= 0.013 Invert level connection Minimum covering 3 ｍ

Area	Pipe No.	Down No.	Area	Each Population	Cumulative Population	Flow (m3/h)	Flow (m3/s) (a)	Pipe Diameter	Slope (‰)	Velocity (m/s)	Flow Capacity (b)	Ratio (b/a)	Pipe Length	Cumulative Length	Level Upstream	length to lowest point	Level lowest	Level Dwnstream	Crown-Invert level (mm)	Invert Level (up-middle-down)			Cover depth (up-middle-down)			Adjust ment	Method
Kamza	14-1	14-2	652.7	44,502	44,502	816	0.23	700	2.0	1.076	0.41	1.78	75	75	56.1	75.0	56.1	56.1	725	**52.38**	52.23	52.23	3.0	3.1	3.1		
	14-2	14-3						700	2.0				40	115	56.1	40.0	55.8	55.8	725	52.11	52.03	52.03	3.3	3.0	3.0	0.1	
	14-3	14-4						700	2.0				380	495	55.8	0.0	55.8	53.7	725	50.71	50.71	49.95	4.4	4.4	3.0	1.3	
	14-4	14-5						700	2.0				110	605	53.7	0.0	53.7	52.9	725	49.43	49.43	49.21	3.5	3.5	3.0	0.5	
	14-5	15-1						700	2.0				600	1,205	52.9	600.0	50.2	50.2	725	47.69	46.49	46.49	4.5	3.0	3.0	1.5	
	15-1	15-2	262.7	17,911	62,413	1,144	0.32	800	1.7	1.085	0.55	1.72	185	1,390	50.2	0.0	50.2	51.3	825	46.37	46.37	46.06	3.0	3.0	4.4	0.1	
	15-2	15-3						800	1.7				265	1,655	51.3	0.0	51.3	51.5	825	46.04	46.04	45.59	4.4	4.4	5.1		
	15-3	16-1						800	1.7				290	1,945	51.5	0.0	51.5	51.0	825	45.57	45.57	45.08	5.1	5.1	5.1		
	16-1	16-2	39.3	2,680	65,093	1,193	0.33	800	1.7	1.085	0.55	1.67	310	2,255	51.0	310.0	49.2	49.2	825	45.06	44.53	44.53	5.1	3.8	3.8		Jacking
	16-2	16-3						800	1.7				370	2,625	49.2	370.0	48.1	48.1	825	44.51	43.88	43.88	3.9	3.4	3.4		
	16-3	16-4						800	1.7				55	2,680	48.1	0.0	48.1	48.2	825	43.86	43.86	43.77	3.4	3.4	3.6		
	16-4	16-5						800	1.7				110	2,790	48.2	110	47.9	47.9	825	43.75	43.56	43.56	3.6	3.5	3.5		
	16-5	16-6						800	1.7				130	2,920	47.9	0.0	47.9	48.5	825	43.54	43.54	43.32	3.5	3.5	4.4		
	16-6	16-7						800	1.7				130	3,050	48.5	130	47.5	47.5	825	43.30	43.08	43.08	4.4	3.6	3.6		Jacking
	16-7	16-8						800	1.7				110	3,160	47.5	0.0	47.5	47.6	825	43.06	43.06	42.87	3.6	3.6	3.9		
	16-8	16-9						800	1.7				50	3,210	47.6	50.0	47.0	47.0	825	42.85	42.77	42.77	3.9	3.4	3.4		
	16-9	16-10						800	1.7				330	3,540	47.0	330.0	46.0	46.0	825	42.75	42.19	42.19	3.4	3.0	3.0		
	16-10	17-1						800	1.7				150	3,690	46.0	150.0	45.0	45.0	825	41.47	41.22	41.22	3.7	3.0	3.0	0.7	Jacking
	17-1	17-2	650.9	44,379	109,472	2,007	0.56	1000	1.3	1.101	0.86	1.54	110	3,800	45.0	110.0	44.8	44.8	1,035	40.90	40.76	40.76	3.1	3.0	3.0	0.3	
	17-2	17-6						1000	1.3				410	4,210	44.8	410.0	43.4	43.4	1,035	39.94	39.41	39.41	3.8	3.0	3.0	0.8	
	17-3	18-1						1000	1.3				50	4,260	43.4	50.0	43.2	43.2	1,035	39.19	39.13	39.13	3.2	3.0	3.0	0.2	Jacking
	17-4	18-2						1000	1.3				720	4,980	43.2	720.0	43.5	43.5	1,035	39.11	38.17	38.17	3.1	4.3	4.3		
	17-5	18-3						1000	1.3				55	5,035	43.5	0.0	43.5	43.6	1,035	38.15	38.15	38.08	4.3	4.3	4.5		
	17-6	18-1						1000	1.3				60	5,095	43.6	60.0	43.6	43.6	1,035	38.15	38.07	38.07	4.4	4.5	4.5		
	18-1	18-2	82.9	5,652	115,124	2,111	0.59	*500*	0.0	1.5	0.58	1.0	290	5,385	43.6	155.0	40.7	43.7	520	**40.08**	40.08	40.08	3.0	0.1	3.1		2lines Pressurised
	18-2	18-3					0.59	900	1.7	1.173	0.75	1.27	400	5,785	43.7	400.0	42.3	42.3	930	40.06	39.38	39.38	2.7	2.0	2.0		
	18-3	19-1						900	1.7				140	5,925	42.3	140.0	42.0	42.0	930	39.36	39.12	39.12	2.0	2.0	2.0		
	19-1	20	86.5	5,898	121,022	2,219	0.62						*856*	6,781	42.0	0.0	42.0	41.5		39.10	39.10	39.1	2.9	2.9	2.4		
			7,862.2	968,220									17,966	**18,822**													

8.1.4 Flow calculation

(1) Trunk Sewer B-3c Unit flow 440 L/p/d n= 0.013 Invert level connection Minimum covering 3 m

Area	Pipe No.	Down No.	Area	Each Population	Cumulative Population	Flow (m3/h)	Flow (m3/s) (a)	Pipe Diameter	Slope (‰)	Velocity (m/s)	Flow Capacity (b)	Ratio (b/a)	Pipe Length	Cumulative Length	Level Upstream	length to lowest point	Level lowest	Level Dwnstream	Crown-Invert level (mm)	Invert Level (up-middle-down)			Cover depth (up-middle-down)			Adjustment	Method
Central	1	3-1	306.0	82,262	82,262	1,508	0.42	900	1.2	0.986	0.63	1.5	214	214	91.2	0.0	91.1	90.6	930	**85.07**	85.07	84.81	5.2	5.1	4.9	2.2	Jacking
Tirana	2	3-1	1770.4	257,654	257,654	4,724	1.31	1350	1.1	1.237	1.77	1.35	189	403	91.4	0.0	91.4	90.6	1,395	**84.41**	84.41	84.2	5.6	5.6	5.0	2.6	Jacking
	3-1	3-2	51.9	5,192	345,108	6,327	1.76	1500	1.0	1.265	2.24	1.27	280	683	90.6	280.0	90.0	90.0	1,550	84.18	83.90	83.9	4.9	4.5	4.5		Jacking
	3-2	3-3						1500	1.0				480	1,163	90.0	480.0	88.5	88.5	1,550	83.88	83.40	83.4	4.6	3.5	3.5		
	3-3	3-4						1500	1.0				315	1,478	88.5	315.0	86.2	86.2	1,550	81.98	81.67	81.67	5.0	3.0	3.0	1.4	
	3-4	5-3						1500	1.0				210	1,688	86.2	210.0	84.3	84.3	1,550	79.95	79.74	79.74	4.7	3.0	3.0	1.7	
	7-1	7-2	169	11,307	11,307	207	0.06	400	2.0	0.741	0.09	1.5	65	65	82.2	0	82.2	83.3	418	**78.78**	78.78	78.65	3.0	3.0	4.2		Jacking
	7-2	7-3						400	2.0				160	225	83.3	160	82.6	82.6	418	78.63	78.31	78.31	4.3	3.9	3.9		
	7-3	7-4						400	2.0				145	370	82.6	0	82.6	83.3	418	78.29	78.29	78	3.9	3.9	4.9		
	7-4	7-5						400	2.0				100	470	83.3	0	83.3	83.5	418	77.98	77.98	77.78	4.9	4.9	5.3		
	7-5	7-6						400	2.0				180	650	83.5	180	82.3	82.3	418	77.76	77.40	77.4	5.3	4.5	4.5		
	7-6	7-7						400	2.0				75	725	82.3	0	82.3	82.5	418	77.38	77.38	77.23	4.5	4.5	4.9		
	7-7	6-1						400	2.0				75	800	82.5	0	82.5	82.9	418	77.21	77.21	77.06	4.9	4.9	5.4		Jacking
	6-1	0	1420.7	302,558	313,865	5,754	1.6	1350	1.3	1.344	1.92	1.2	403	1,203	82.9	403.0	84.6	84.6	1,395	78.63	78.11	78.11	2.9	5.1	5.1		Jacking
	5-1	5-2	33.3	11,694	325,559	5,969	1.66	1350	1.4	1.395	2	1.2	280	1,483	84.6	280.0	84.2	84.2	1,395	**80.21**	79.81	79.81	3.0	3.0	3.0		Jacking
	5-2	5-3						1350	1.4				245	1,728	84.2	245.0	84.3	84.3	1,395	79.79	79.45	79.45	3.0	3.5	3.5		
	5-3	5-4		16,886	670,667	12,296	3.42	1800	1.2	1.565	3.98	1.16	195	3,611	84.3	195.0	84.4	84.4	1,855	79.43	79.20	79.2	3.0	3.3	3.3		
	5-4	5-5						1800	1.2				245	3,856	84.4	245.0	84.5	84.5	1,855	79.18	78.89	78.89	3.4	3.8	3.8		
	5-5	4-1						1800	1.2				35	3,891	84.5	35.0	84.5	84.5	1,855	78.87	78.83	78.83	3.8	3.8	3.8		
	4-1	4-2	143.5	2,293	672,960	12,338	3.43	1800	1.2	1.565	3.98	1.16	30	3,921	84.5	30.0	84.5	84.5	1,855	78.81	78.77	78.77	3.8	3.9	3.9		
	4-2	4-3						1800	1.2				110	4,031	84.5	110.0	84.1	84.1	1,855	78.75	78.62	78.62	3.9	3.6	3.6		
	4-3	4-4						1800	1.2				80	4,111	84.1	80.0	84.5	84.5	1,855	78.60	78.50	78.5	3.6	4.1	4.1		
	4-4	4-5						1800	1.2				65	4,176	84.5	65.0	84.5	84.5	1,855	78.48	78.40	78.4	4.2	4.2	4.2		
	4-5	4-6						1800	1.2				120	4,296	84.5	120.0	86.0	86.0	1,855	78.38	78.24	78.24	4.3	5.9	5.9		
	4-6	4-7						1800	1.2				80	4,376	86.0	0.0	86.0	88.0	1,855	78.22	78.22	78.12	5.9	5.9	8.0		Jacking
	4-7	4-8						1800	1.2				280	4,656	88.0	280.0	86.0	86.0	1,855	78.10	77.76	77.76	8.0	6.4	6.4		
	4-8	4-9						1800	1.2				200	4,856	86.0	200.0	83.0	83.0	1,855	77.74	77.50	77.5	6.4	3.6	3.6		
	4-9	4-10						1800	1.2				75	4,931	83.0	75.0	82.0	82.0	1,855	77.28	77.19	77.19	3.9	3.0	3.0	0.2	
	4-10	4-11						1800	1.2				60	4,991	82.0	60.0	82.0	82.0	1,855	77.17	77.10	77.1	3.0	3.0	3.0		
	4-11	4-12						1800	1.2				110	5,101	82.0	110.0	81.0	81.0	1,855	76.28	76.15	76.15	3.9	3.0	3.0	0.8	
	4-12	4-13						1800	1.2				85	5,186	81.0	85.0	80.0	80.0	1,855	75.23	75.13	75.13	3.9	3.0	3.0	0.9	
	4-13	4-14						1800	1.2				45	5,231	80.0	45.0	79.5	79.5	1,855	74.71	74.66	74.66	3.4	3.0	3.0	0.4	
	4-14	4-15						1800	1.2				115	5,346	79.5	115.0	78.0	78.0	1,855	73.24	73.10	73.1	4.4	3.0	3.0	1.4	
	4-15	10a-1						1800	1.2				525	5,871	78.0	525.0	74.5	74.5	1,855	70.28	69.65	69.65	5.9	3.0	3.0	2.8	
Paskquan	8-1	8-2	1102	101,368	101,368	1,858	0.52	*500*	0.0	1.5	0.58	1.1	625	625	74.0	625.0	72.8	72.8	520	**70.28**	70.28	70.28	3.2	2.0	2.0	0.2	2lines Pressurised
	8-2	8-3					0.52	900	1.3	1.026	0.65	1.25	455	1,080	72.8	455.0	74.1	74.1	930	69.86	69.27	69.27	2.0	3.9	3.9	0.4	
	8-3	8-4						900	1.3				180	1,260	74.1	180.0	73.8	73.8	930	69.25	69.02	69.02	3.9	3.9	3.9		
	8-4	9-1						900	1.3				65	1,325	73.8	65.0	73.8	73.8	930	69.00	68.92	68.92	3.9	4.0	4.0		
Tirana	9-1	9-2	427.6	32,863	134,231	2,461	0.68	1000	1.2	1.057	0.83	1.22	85	1,410	73.8	85.0	73.2	73.2	1,035	68.90	68.80	68.8	3.9	3.4	3.4		Jacking
	9-2	9-3						1000	1.2				350	1,760	73.2	350.0	72.0	72.0	1,035	68.38	67.96	67.96	3.8	3.0	3.0	0.4	
	9-3	9-7						1000	1.2				70	1,830	72.0	35.0	*70.0*	73.8	1,035	67.04	67.00	66.96	3.9	2.0	5.8	0.9	Jacking Crossing Lana River
	9-4	9-5						1000	1.2				100	1,930	72.0	100.0	72.0	72.0	1,035	66.94	66.82	66.82	4.0	4.1	4.1		
	9-5	9-6						1000	1.2				100	2,030	72.0	100.0	72.0	72.0	1,035	66.80	66.68	66.68	4.2	4.3	4.3		
	9-6	9-7						1000	1.2				100	2,130	72.0	100.0	73.8	73.8	1,035	66.66	66.54	66.54	4.3	6.2	6.2		
	9-7	10a-1						1000	1.2				125	2,255	73.8	125.0	74.5	74.5	1,035	66.94	66.79	66.79	5.8	6.7	6.7		
Kashar	10a-1	10a-2	456.3	5,909	813,100	14,907	4.14	2000	1.1	1.607	5.05	1.22	140	8,266	74.5	140	73.9	73.9	2,060	66.77	66.62	66.62	5.7	5.2	5.2		
	10a-2	10a-3						2000	1.1				50	8,316	73.9	50.0	73.5	73.5	2,060	66.60	66.55	66.55	5.2	4.9	4.9		
	10a-3	10a-4						2000	1.1				515	8,831	73.5	515	71.0	71	2,060	66.53	65.96	65.96	4.9	3.0	3.0		
	10a-4	10a-5						2000	1.1				370	9,201	71.0	370	67.8	67.8	2,060	63.14	62.73	62.73	5.8	3.0	3.0	2.8	
	10a-5	10b(PS)						2000	1.1				50	9,251	67.8	50	67.0	67	2,060	62.01	61.96	61.96	3.7	3.0	3.0	0.7	
	10b(PS)	11STP	206.5	17,212	830,312	15,222	4.23	*1350*	0.0	1.6	4.58	1.1	2850	12,101	67	0	67.0	85	1,395	61.94	61.94	61.94	2.0	2.0	2.0		2lines Pressurised

8.1.4 Flow calculation

(1) Trunk Sewer B-3c Unit flow 440 L/p/d n= 0.013 Invert level connection Minimum covering 3 m

Area	Pipe No.	Down No.	Area	Each Population	Cumulative Population	Flow (m3/h)	Flow (m3/s) (a)	Pipe Diameter	Slope (‰)	Velocity (m/s)	Flow Capacity (b)	Ratio (b/a)	Pipe Length	Cumulative Length	Level Upstream	length to lowest point	Level lowest	Level Dwnstream	Crown-Invert level (mm)	Invert Level (up-middle-down)			Cover depth (up-middle-down)			Adjustment	Method
Kamza	14-1	14-2	652.7	44,502	44,502	816	0.23	700	2.0	1.076	0.41	1.78	75	75	56.1	75.0	56.1	56.1	725	**52.38**	52.23	52.23	3.0	3.1	3.1		
	14-2	14-3						700	2.0				40	115	56.1	40.0	55.8	55.8	725	52.11	52.03	52.03	3.3	3.0	3.0	0.1	
	14-3	14-4						700	2.0				380	495	55.8	0.0	55.8	53.7	725	50.71	50.71	49.95	4.4	4.4	3.0	1.3	
	14-4	14-5						700	2.0				110	605	53.7	0.0	53.7	52.9	725	49.43	49.43	49.21	3.5	3.5	3.0	0.5	
	14-5	15-1						700	2.0				600	1,205	52.9	600.0	50.2	50.2	725	47.69	46.49	46.49	4.5	3.0	3.0	1.5	
	15-1	15-2	262.7	17,911	62,413	1,144	0.32	800	1.7	1.085	0.55	1.72	185	1,390	50.2	0.0	50.2	51.3	825	46.37	46.37	46.06	3.0	3.0	4.4	0.1	
	15-2	15-3						800	1.7				265	1,655	51.3	0.0	51.3	51.5	825	46.04	46.04	45.59	4.4	4.4	5.1		
	15-3	16-1						800	1.7				290	1,945	51.5	0.0	51.5	51.0	825	45.57	45.57	45.08	5.1	5.1	5.1		
	16-1	16-2	39.3	2,680	65,093	1,193	0.33	800	1.7	1.085	0.55	1.67	310	2,255	51.0	310.0	49.2	49.2	825	45.06	44.53	44.53	5.1	3.8	3.8		Jacking
	16-2	16-3						800	1.7				370	2,625	49.2	370.0	48.1	48.1	825	44.51	43.88	43.88	3.9	3.4	3.4		
	16-3	16-4						800	1.7				55	2,680	48.1	0.0	48.1	48.2	825	43.86	43.86	43.77	3.4	3.4	3.6		
	16-4	16-5						800	1.7				110	2,790	48.2	110	47.9	47.9	825	43.75	43.56	43.56	3.6	3.5	3.5		
	16-5	16-6						800	1.7				130	2,920	47.9	0.0	47.9	48.5	825	43.54	43.54	43.32	3.5	3.5	4.4		
	16-6	16-7						800	1.7				130	3,050	48.5	130	47.5	47.5	825	43.30	43.08	43.08	4.4	3.6	3.6		Jacking
	16-7	16-8						800	1.7				110	3,160	47.5	0.0	47.5	47.6	825	43.06	43.06	42.87	3.6	3.6	3.9		
	16-8	16-9						800	1.7				50	3,210	47.6	50.0	47.0	47.0	825	42.85	42.77	42.77	3.9	3.4	3.4		
	16-9	16-10						800	1.7				330	3,540	47.0	330.0	46.0	46.0	825	42.75	42.19	42.19	3.4	3.0	3.0		
	16-10	17-1						800	1.7				150	3,690	46.0	150.0	45.0	45.0	825	41.47	41.22	41.22	3.7	3.0	3.0	0.7	Jacking
	17-1	17-2	650.9	44,379	109,472	2,007	0.56	1000	1.3	1.101	0.86	1.54	110	3,800	45.0	110.0	44.8	44.8	1,035	40.90	40.76	40.76	3.1	3.0	3.0	0.3	
	17-2	17-6						1000	1.3				410	4,210	44.8	410.0	43.4	43.4	1,035	39.94	39.41	39.41	3.8	3.0	3.0	0.8	
	17-3	18-1						1000	1.3				50	4,260	43.4	50.0	43.2	43.2	1,035	39.19	39.13	39.13	3.2	3.0	3.0	0.2	Jacking
	17-4	18-2						1000	1.3				720	4,980	43.2	720.0	43.5	43.5	1,035	39.11	38.17	38.17	3.1	4.3	4.3		
	17-5	18-3						1000	1.3				55	5,035	43.5	0.0	43.5	43.6	1,035	38.15	38.15	38.08	4.3	4.3	4.5		
	17-6	18-1						1000	1.3				60	5,095	43.6	60.0	43.6	43.6	1,035	38.15	38.07	38.07	4.4	4.5	4.5		
	18-1	18-2	82.9	5,652	115,124	2,111	0.59	*500*	0.0	1.5	0.58	1.0	290	5,385	43.6	155.0	40.7	43.7	520	**40.08**	40.08	40.08	3.0	0.1	3.1		2lines Pressurised
	18-2	18-3					0.59	900	1.7	1.173	0.75	1.27	400	5,785	43.7	400.0	42.3	42.3	930	40.06	39.38	39.38	2.7	2.0	2.0		
	18-3	19-1						900	1.7				140	5,925	42.3	140.0	41.0	41.0	930	38.36	38.12	38.12	3.0	2.0	2.0	1	
	19-1	20	86.5	5,898	121,022	2,219	0.62						*856*	6,781	41.0	0.0	41.0	41.0		38.00	38.00	38	3.0	3.0	3.0	0.1	
			7,862.2	968,220									18,026	**18,882**													

8.1.4 Flow calculation

(1) Trunk Sewer B-3d Unit flow 440 L/p/d n= 0.012 Invert level connection Minimum covering 2 m

Area	Pipe No.	Down No.	Area	Each Population	Cumulative Population	Flow (m3/h)	Flow (m3/s) (a)	Pipe Diameter	Slope (‰)	Velocity (m/s)	Flow Capacity (b)	Ratio (b/a)	Pipe Length	Cumulative Length	Level Upstream	length to lowest point	Level lowest	Level Dwnstream	Crown-Invert level (mm)	Invert Level (up-middle-down)			Cover depth (up-middle-down)			Adjustment	Method
Central	1	3-1	306.0	82,262	82,262	1,508	0.42	900	1.2	1.068	0.68	1.62	214	214	92.3	0.0	91.1	93.5	930	**88.17**	88.17	87.91	3.2	2.0	4.6	1.2	Jacking
Tirana	2	3-1	1770.4	257,654	257,654	4,724	1.31	1350	1.1	1.34	1.92	1.47	189	403	92.7	0.0	91.4	93.5	1,395	**88.01**	88.01	87.8	3.3	2.0	4.3	1.3	Jacking
	3-1	3-2	51.9	5,192	345,108	6,327	1.76	1500	1.0	1.37	2.42	1.38	280	683	93.47	280.0	93.0	93.0	1,550	87.78	87.50	87.5	4.1	3.9	3.9		Jacking LanaRiver, Ring Road
	3-2	3-3						1500	1.0				290	973	93.0	290.0	98.3	98.3	1,550	87.48	87.19	87.19	3.9	9.5	9.5		Jacking
	3-3	3-4						1500	1.0				250	1,223	98.3	250.0	97.3	97.3	1,550	87.17	86.92	86.92	9.6	8.8	8.8		Jacking
	3-4	3-5						1500	1.0				360	1,583	97.3	360.0	94.5	94.5	1,550	86.90	86.54	86.54	8.9	6.4	6.4		Jacking
	3-5	3-6						1500	1.0				325	1,908	94.5	325.0	94.3	94.3	1,550	86.52	86.20	86.2	6.4	6.5	6.5		Jacking
	3-6	3-7						1500	1.0				335	2,243	94.3	335.0	96.7	96.7	1,550	86.18	85.85	85.85	6.5	9.3	9.3		Jacking
	3-7	3-8						1500	1.0				255	2,498	96.7	255.0	97.5	97.5	1,550	85.83	85.58	85.58	9.3	10.3	10.3		Jacking
	3-8	3-9						1500	1.0				240	2,738	97.5	240.0	96.2	96.2	1,550	85.56	85.32	85.32	10.4	9.3	9.3		Jacking
	3-9	3-10						1500	1.0				355	3,093	96.2	355.0	93.2	93.2	1,550	85.30	84.95	84.95	9.4	6.7	6.7		Jacking
	3-10	3-11						1500	1.0				305	3,398	98.2	305.0	92.2	92.2	1,550	84.93	84.63	84.63	11.7	6.1	6.1		Jacking
	3-11	3-12						1500	1.0				305	3,703	92.2	305.0	90.6	90.6	1,550	84.61	84.31	84.31	6.1	4.7	4.7		
	3-12	3-13						1500	1.0				380	4,083	90.6	380.0	90.1	90.1	1,550	84.29	83.91	83.91	4.7	4.7	4.7		
	3-13	11						1500	1.0				275	4,358	90.1	275.0	90.0	90.0	1,550	83.89	83.62	83.62	4.7	4.8	4.8		
	7-1	7-2	169	11,307	11,307	207	0.06	450	1.5	0.752	0.12	2	55	55	81.4	0	81.4	82.1	418	**78.98**	78.98	78.9	2.0	2.0	2.8		Jacking High way
	7-2	7-3						450	1.5				65	65	82.1	65	82.4	82.4	418	78.88	78.78	78.78	2.8	3.2	3.2		
	7-3	7-4						450	1.5				130	130	82.4	0	82.4	81.6	418	78.76	78.76	78.57	3.2	3.2	2.6		
	7-4	7-5						450	1.5				245	245	81.6	0	81.6	82.9	418	78.55	78.55	78.18	2.6	2.6	4.3		
	7-5	7-6						450	1.5				175	175	82.9	175	81.9	81.9	418	78.16	77.90	77.9	4.3	3.6	3.6		
	7-6	7-7						450	1.5				65	65	81.9	0	81.9	82.2	418	77.88	77.88	77.78	3.6	3.6	4.0		
	7-7	6-1						450	1.5				65	60	82.2	0	82.2	82.2	418	77.76	77.76	77.66	4.0	4.0	4.1		Jacking Ring road
	6-1	6-2	1420.7	302,558	313,865	5,754	1.6	1350	1.3	1.456	2.08	1.3	50	110	82.2	25.0	77.0	82.4	1,395	74.04	74.01	73.98	6.8	1.6	7.0	3.6	Jacking Lana River
	6-2	5-1						1350	1.3				400	400	82.4	0.0	82.4	84.0	1,395	73.96	73.96	73.44	7.0	7.0	9.2		Jacking
	5-1	5-2	33.3	11,694	325,559	5,969	1.66	1350	1.4	1.511	2.16	1.3	225	625	84.0	225.0	83.8	83.8	1,395	73.42	73.11	73.11	9.2	9.3	9.3		Jacking Narrow road
	5-2	5-3						1350	1.4				250	875	83.8	250.0	84.8	84.8	1,395	73.09	72.74	72.74	9.3	10.7	10.7		Jacking
	5-3	5-4						1350	1.4				200	1,075	84.8	200.0	82.9	82.9	1,395	72.72	72.44	72.44	10.7	9.1	9.1		Jacking
	5-4	5-5						1350	1.4				75	1,150	82.9	75.0	82.9	82.9	1,395	72.42	72.32	72.32	9.1	9.2	9.2		Jacking
	5-5	4-1						1350	1.4				175	1,325	82.9	175.0	82.6	82.6	1,395	72.30	72.06	72.06	9.2	9.2	9.2		Jacking
Paskquan	8-1	8-2	158.3	101,368	101,368	1,858	0.52	900	1.3	1.112	0.71	1.4	85	85	70.9	85.0	71.2	71.2	930	**67.97**	67.97	67.97	2.0	2.3	2.3		
	8-2	8-3						900	1.3				140	225	71.2	0.0	71.2	71.3	930	67.95	67.95	67.77	2.3	2.3	2.6		
	8-3	8-4						900	1.3				105	330	71.3	105.0	70.1	70.2	930	67.35	67.21	67.21	3.0	2.0	2.1	0.4	Jacking TiranaRiver
	8-4	8-5						900	1.3				25	355	70.1	55.0	70.1	72.5	930	67.19	67.12	67.16	2.0	2.0	4.4		
	8-5	8-6						900	1.3				170	525	72.5	0.0	72.5	73.5	930	67.14	67.14	66.92	4.5	4.4	5.6		Jacking
	8-6	8-7						900	1.3				135	660	73.5	135.0	72.8	72.8	930	66.90	66.72	66.72	5.6	5.2	5.2		Jacking
	8-7	8-8						900	1.3				110	770	72.8	0.0	72.8	73.7	930	66.70	66.70	66.56	5.2	5.2	6.2		Jacking
	8-8	8-9						900	1.3				270	1,040	73.7	0.0	73.7	74.7	930	66.54	66.54	66.19	6.2	6.2	7.5		Jacking
	8-9	8-10						900	1.3				170	1,210	74.7	170.0	74.0	74.0	930	66.17	65.95	65.95	7.6	7.1	7.1		Jacking
	8-10	8-11						900	1.3				180	1,390	74.0	0.0	74.2	74.2	930	65.93	65.93	65.70	7.1	7.3	7.6		Jacking
	8-11	9-1						900	1.3				50	1,440	74.2	50.0	74.0	74.0	930	65.68	65.62	65.62	7.6	7.5	7.5		Jacking

8.1.4 Flow calculation

(1) Trunk Sewer B-3d Unit flow 440 L/p/d n= 0.012 Invert level connection Minimum covering 2 m

Area	Pipe No.	Down No.	Area	Each Population	Cumulative Population	Flow (m3/h)	Flow (m3/s) (a)	Pipe Diameter	Slope (‰)	Velocity (m/s)	Flow Capacity (b)	Ratio (b/a)	Pipe Length	Cumulative Length	Level Upstream	length to lowest point	Level lowest	Level Dwnstream	Crown-Invert level (mm)	Invert Level (up-middle-down)			Cover depth (up-middle-down)			Adjustment	Method
Tirana	9-1	9-2	427.6	32,863	134,231	2,461	0.68	1000	1.2	1.146	0.9	1.32	85	1,525	74.0	85.0	73.2	73.2	1,035	65.60	65.50	65.5	7.4	6.7	6.7		Jacking Highway
	9-2	9-3						1000	1.2				265	1,790	73.2	265.0	72.0	72.0	1,035	65.48	65.16	65.16	6.7	5.8	5.8		Jacking
	9-3	9-7						1000	1.2				55	1,845	72.0	35.0	*70.0*	73.8	1,035	65.14	65.10	65.07	5.8	3.9	7.7		Jacking Crossing Lana River
	9-4	9-5						1000	1.2				95	1,940	72.0	95.0	72.0	72.0	1,035	65.05	64.94	64.94	5.9	6.0	6.0		Jacking
	9-5	9-6						1000	1.2				125	2,065	72.0	125.0	72.0	72.0	1,035	64.92	64.77	64.77	6.0	6.2	6.2		Jacking
	9-6	9-7						1000	1.2				100	2,165	72.0	100.0	73.8	73.8	1,035	64.75	64.63	64.63	6.2	8.1	8.1		Jacking
	9-7	10a-1						1000	1.2				200	2,365	73.8	200.0	74.7	74.7	1,035	65.05	64.81	64.81	7.7	8.9	8.9		Jacking
	4-1	4-2	143.5	2,293	327,852	6,011	1.67	1350	1.1	1.34	1.92	1.15	30	30	82.6	30.0	82.9	82.9	1,395	72.04	72.01	72.01	9.2	9.5	9.5		Jacking
	4-2	4-3						1350	1.1				60	90	82.9	60.0	82.3	82.3	1,395	71.99	71.92	71.92	9.5	9.0	9.0		Jacking
	4-3	4-4						1350	1.1				110	200	82.3	110.0	85.4	85.4	1,395	71.90	71.78	71.78	9.0	12.2	12.2		Jacking
	4-4	4-5						1350	1.1				65	265	85.4	65.0	85.6	85.6	1,395	71.76	71.69	71.69	12.2	12.5	12.5		Jacking
	4-5	4-6						1350	1.1				155	420	85.6	155.0	86.3	86.3	1,395	71.67	71.50	71.5	12.5	13.4	13.4		Jacking
	4-6	4-7						1350	1.1				145	565	86.3	0.0	86.3	85.7	1,395	71.48	71.48	71.32	13.4	13.4	13.0		Jacking
	4-7	4-8						1350	1.1				135	700	85.7	135.0	83.5	83.5	1,395	71.30	71.15	71.15	13.0	11.0	11.0		Jacking
	4-8	4-9						1350	1.1				235	935	83.5	235.0	81.5	81.5	1,395	71.13	70.87	70.87	11.0	9.2	9.2		Jacking
	4-9	4-10						1350	1.1				225	1,160	81.5	225.0	79.5	79.5	1,395	70.85	70.60	70.6	9.3	7.5	7.5		Jacking
	4-10	4-11						1350	1.1				120	1,280	79.5	120.0	79.3	79.3	1,395	70.58	70.45	70.45	7.5	7.5	7.5		Jacking
	4-11	4-12						1350	1.1				80	1,360	79.3	80.0	78.9	78.9	1,395	70.43	70.34	70.34	7.5	7.2	7.2		Jacking
	4-12	4-13						1350	1.1				70	1,430	78.9	70.0	77.0	77.0	1,395	70.32	70.24	70.24	7.2	5.4	5.4		Jacking
	4-13	4-14						1350	1.1				230	1,660	77.0	230.0	75.3	75.3	1,395	70.22	69.97	69.97	5.4	3.9	3.9		
	4-14	4-15						1350	1.1				135	1,795	75.3	135.0	74.7	74.7	1,395	69.95	69.80	69.8	4.0	3.5	3.5		
	4-15	10a-1						1350	1.1				145	1,940	74.7	55.0	74.7	74.7	1,395	69.78	69.72	69.62	3.5	3.6	3.7		
Kashar	10a-1	10a-2	456.3	5,909	467,992	8,580	2.38	1650	0.9	1.385	2.96	1.24	165	2,530	74.7	165	74.6	74.6	1,700	64.79	64.64	64.64	8.2	8.3	8.3		Jacking
	10a-2	10a-3						1650	0.9				50	2,580	74.6	50.0	71.4	71.4	1,700	64.62	64.58	64.58	8.3	5.1	5.1		
	10a-3	10a-4						1650	0.9				515	3,095	71.4	515	69.6	69.6	1,700	64.56	64.10	64.1	5.1	3.8	3.8		
	10a-4	10a-5						1650	0.9				370	3,465	69.6	370	67.0	67	1,700	63.68	63.35	63.35	4.2	2.0	2.0	0.4	
	10a-5	10b(PS)						1650	0.9				50	3,515	67.0	50	66.1	66.1	1,700	62.43	62.39	62.39	2.9	2.0	2.0	0.9	
	10b(PS)	11STP	206.5	17,212	485,204	8,895	2.47	*1000*	0.0	1.6	2.52	1.0	2850	6,365	66.1	0	66.1	97.3	1,035	**63.07**	63.07	63.07	2.0	2.0	2.0		2lines Pressurised
Kamza	14-1	14-2	652.7	44,502	44,502	816	0.23	700	2.0	1.166	0.45	1.96	75	75	56.1	75.0	56.1	56.1	725	**53.38**	53.23	53.23	2.0	2.1	2.1		
	14-2	14-3						700	2.0				40	115	56.1	40.0	55.8	55.8	725	53.11	53.03	53.03	2.3	2.0	2.0	0.1	
	14-3	14-4						700	2.0				380	495	55.8	0.0	55.8	53.7	725	51.71	51.71	50.95	3.4	3.4	2.0	1.3	
	14-4	14-5						700	2.0				110	605	53.7	0.0	53.7	52.9	725	50.43	50.43	50.21	2.5	2.5	2.0	0.5	
	14-5	15-1						700	2.0				600	1,205	52.9	600.0	50.2	50.2	725	48.69	47.49	47.49	3.5	2.0	2.0	1.5	
	15-1	15-2	262.7	17,911	62,413	1,144	0.32	800	1.7	1.175	0.59	1.84	185	1,390	50.2	0.0	50.2	51.3	825	47.37	47.37	47.06	2.0	2.0	3.4	0.1	
	15-2	15-3						800	1.7				265	1,655	51.3	0.0	51.3	51.5	825	47.04	47.04	46.59	3.4	3.4	4.1		
	15-3	16-1						800	1.7				290	1,945	51.5	0.0	51.5	51.0	825	46.57	46.57	46.08	4.1	4.1	4.1		
	16-1	16-2	39.3	2,680	65,093	1,193	0.33	800	1.7	1.175	0.59	1.79	310	2,255	51.0	310.0	49.2	49.2	825	46.06	45.53	45.53	4.1	2.8	2.8		Jacking
	16-2	16-3						800	1.7				370	2,625	49.2	370.0	48.1	48.1	825	45.51	44.88	44.88	2.9	2.4	2.4		
	16-3	16-4						800	1.7				55	2,680	48.1	0.0	48.1	48.2	825	44.86	44.86	44.77	2.4	2.4	2.6		
	16-4	16-5						800	1.7				110	2,790	48.2	110	47.9	47.9	825	44.75	44.56	44.56	2.6	2.5	2.5		
	16-5	16-6						800	1.7				130	2,920	47.9	0.0	47.9	48.5	825	44.54	44.54	44.32	2.5	2.5	3.4		
	16-6	16-7						800	1.7				130	3,050	48.5	130	47.5	47.5	825	44.30	44.08	44.08	3.4	2.6	2.6		Jacking
	16-7	16-8						800	1.7				110	3,160	47.5	0.0	47.5	47.6	825	44.06	44.06	43.87	2.6	2.6	2.9		
	16-8	16-9						800	1.7				50	3,210	47.6	50.0	47.0	47.0	825	43.85	43.77	43.77	2.9	2.4	2.4		
	16-9	16-10						800	1.7				330	3,540	47.0	330.0	46.0	46.0	825	43.75	43.19	43.19	2.4	2.0	2.0		
	16-10	17-1						800	1.7				150	3,690	46.0	150.0	45.0	45.0	825	42.47	42.22	42.22	2.7	2.0	2.0	0.7	Jacking

8.1.4 Flow calculation

(1) Trunk Sewer B-3d

Unit flow 440 L/p/d n= 0.012 Invert level connection Minimum covering 2 m

Area	Pipe No.	Down No.	Area	Each Population	Cumulative Population	Flow (m3/h)	Flow (m3/s) (a)	Pipe Diameter	Slope (‰)	Velocity (m/s)	Flow Capacity (b)	Ratio (b/a)	Pipe Length	Cumulative Length	Level Upstream	length to lowest point	Level lowest	Level Dwnstream	Crown-Invert level (mm)	Invert Level (up-middle-down)			Cover depth (up-middle-down)			Adjust ment	Method
	17-1	17-2	650.9	44,379	109,472	2,007	0.56	1000	1.3	1.192	0.94	1.68	110	3,800	45.0	110.0	44.8	44.8	1,035	41.90	41.76	41.76	2.1	2.0	2.0	0.3	
	17-2	17-6						1000	1.3				410	4,210	44.8	410.0	43.4	43.4	1,035	40.94	40.41	40.41	2.8	2.0	2.0	0.8	
	17-3	18-1						1000	1.3				50	4,260	43.4	50.0	43.2	43.2	1,035	40.19	40.13	40.13	2.2	2.0	2.0	0.2	Jacking
	17-4	18-2						1000	1.3				720	4,980	43.2	720.0	43.5	43.5	1,035	40.11	39.17	39.17	2.1	3.3	3.3		
	17-5	18-3						1000	1.3				55	5,035	43.5	0.0	43.5	43.6	1,035	39.15	39.15	39.08	3.3	3.3	3.5		
	17-6	18-1						1000	1.3				60	5,095	43.6	60.0	43.6	43.6	1,035	39.15	39.07	39.07	3.4	3.5	3.5		
	18-1	18-2	82.9	5,652	115,124	2,111	0.59	*500*	0.0	1.5	0.58	1.0	290	5,385	43.6	155.0	40.7	43.7	520	**38.98**	38.98	38.98	4.1	1.2	4.2	2.1	2lines Pressurised
	18-2	18-3					0.59	900	1.7	1.271	0.81	1.37	400	5,785	43.7	400.0	42.3	42.3	930	38.96	38.28	38.28	3.8	3.1	3.1		
	18-3	19-1						900	1.7				140	5,925	42.3	140.0	41.0	41.0	930	38.26	38.02	38.02	3.1	2.1	2.1		
	19-1	20	86.5	5,898	121,022	2,219	0.62	900	1.7	1.271	0.81	1.31	*856*	6,781	41.0	0.0	41.0	41.0	930	38.00	38.00	36.54	2.1	2.1	3.5		
			6,918.5	951,334									20,763	**13,146**													