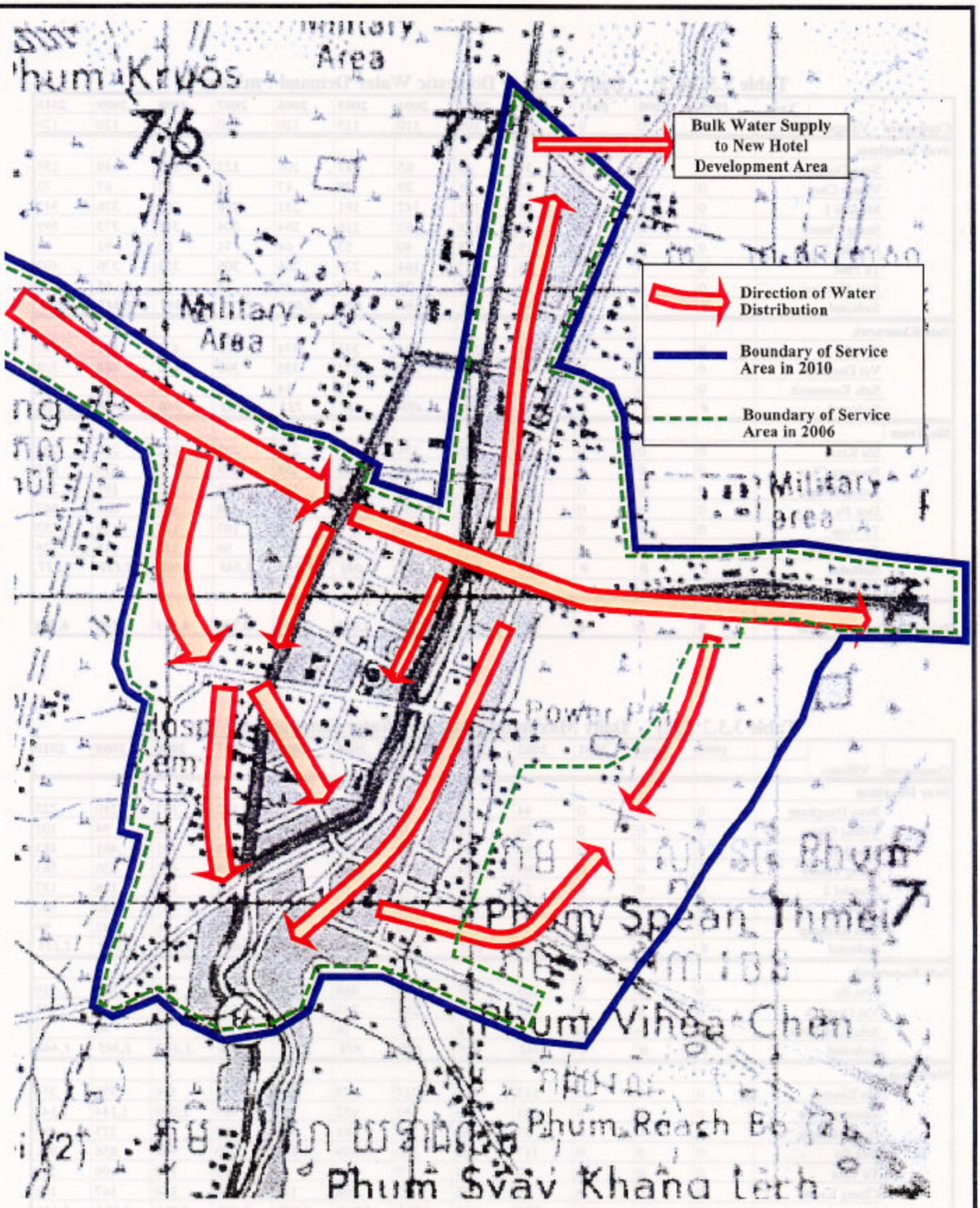


The Study on Water Supply System for Siem Reap Region in Cambodia	Figure 3.3.1 Major Flow Direction in the Service Area
Japan International Cooperation Agency	

Table 3.3.2(1/2) Daily Average Domestic Water Demand : m3/day

Communes	Villages	Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
		LPCD	0	0	0	100	105	110	115	120	120	120	120	120
Svay Dangkum														
	Svay Dangkum		0	0	0	31	46	65	87	105	122	139	149	159
	Vihear Chen		0	0	0	14	21	29	39	47	54	62	67	72
	Mundol 1		0	0	0	68	101	142	191	231	266	305	326	342
	Stung Thmey		0	0	0	77	116	162	218	264	304	348	373	399
	Mundol 2		0	0	0	19	28	40	53	64	74	85	91	97
	Ta Phul		0	0	0	78	117	164	220	266	306	351	376	402
	Sala Kanseng		0	0	0	14	20	28	38	46	53	61	65	70
	Subtotal		***0***	***0***	***0***	***300***	***450***	***630***	***846***	***1,023***	***1,179***	***1,352***	***1,447***	***1,541***
Sala Kamraeuk														
	Wat Bo		0	0	0	144	202	264	331	374	403	432	432	432
	Vat Domnak		0	0	0	94	143	202	274	335	390	452	488	528
	Sala Kamraeuk		0	0	0	4	6	8	11	14	49	56	61	66
	Subtotal		***0***	***0***	***0***	***242***	***350***	***475***	***617***	***723***	***842***	***940***	***981***	***1,026***
Sla Kram														
	Sla Kram		0	0	0	80	118	154	193	218	235	252	252	252
	Banteay Chas		0	0	0	164	245	344	462	558	679	779	810	810
	Boeng Donpa		0	0	0	40	61	85	114	138	159	182	195	209
	Dok Po		0	0	0	83	128	184	254	316	468	551	606	667
	Ta Vein		0	0	0	0	0	0	0	0	107	127	139	153
	Chong Kaosu		0	0	0	25	37	51	69	84	96	110	118	126
	Subtotal		***0***	***0***	***0***	***392***	***588***	***818***	***1,092***	***1,314***	***1,745***	***2,001***	***2,121***	***2,217***
Domestic Demand Total			**0**	**0**	**0**	**935**	**1,388**	**1,923**	**2,555**	**3,061**	**3,766**	**4,293**	**4,549**	**4,784**

Table 3.3.2 (2/2) Daily Maximum Domestic Water Demand : m3/day

Communes	Villages	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Svay Dangkum													
	Svay Dangkum	0	0	0	44	65	92	123	149	172	197	210	225
	Vihear Chen	0	0	0	20	29	41	55	67	77	88	94	101
	Mundol 1	0	0	0	96	143	201	270	326	376	431	461	483
	Stung Thmey	0	0	0	109	164	229	308	372	429	492	526	563
	Mundol 2	0	0	0	27	40	56	75	91	105	120	128	137
	Ta Phul	0	0	0	110	165	231	310	375	432	495	530	567
	Sala Kanseng	0	0	0	19	29	40	54	65	75	86	92	99
	Subtotal	***0***	***0***	***0***	***424***	***635***	***890***	***1,195***	***1,445***	***1,665***	***1,909***	***2,042***	***2,175***
Sala Kamraeuk													
	Wat Bo	0	0	0	203	285	373	468	529	569	610	610	610
	Vat Domnak	0	0	0	133	202	285	387	473	551	638	690	745
	Sala Kamraeuk	0	0	0	6	8	12	16	20	69	79	86	93
	Subtotal	***0***	***0***	***0***	***342***	***495***	***670***	***871***	***1,021***	***1,189***	***1,327***	***1,385***	***1,448***
Sla Kram													
	Sla Kram	0	0	0	113	166	217	273	308	332	356	356	356
	Banteay Chas	0	0	0	231	346	485	652	788	959	1,099	1,144	1,144
	Boeng Donpa	0	0	0	57	86	120	161	195	224	257	275	295
	Dok Po	0	0	0	117	180	260	359	446	660	778	856	941
	Ta Vein	0	0	0	0	0	0	0	0	152	179	196	216
	Chong Kaosu	0	0	0	35	52	73	98	118	136	156	167	178
	Subtotal	***0***	***0***	***0***	***554***	***830***	***1,155***	***1,542***	***1,855***	***2,463***	***2,825***	***2,994***	***3,130***
Domestic Demand Total		**0**	**0**	**0**	**1,320**	**1,960**	**2,715**	**3,607**	**4,321**	**5,317**	**6,061**	**6,422**	**6,753**

Table 3.3.3 (1/2) Hourly Maximum Domestic Water Demand : m3/day

Communes	Villages	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Svay Dangkum													
	Svay Dangkum	0	0	0	52	79	110	148	179	206	236	253	270
	Vihear Chen	0	0	0	24	35	49	66	80	92	106	113	121
	Mundol 1	0	0	0	115	172	241	323	391	451	517	553	579
	Stung Thmey	0	0	0	131	196	275	369	447	515	590	631	676
	Mundol 2	0	0	0	32	48	67	90	109	126	144	154	165
	Ta Phul	0	0	0	132	198	277	372	450	519	595	636	681
	Sala Kanseng	0	0	0	23	34	48	65	78	90	103	111	118
	Subtotal	***0***	***0***	***0***	***509***	***762***	***1,068***	***1,434***	***1,734***	***1,998***	***2,291***	***2,451***	***2,610***
Sala Kamraeuk													
	Wat Bo	0	0	0	244	342	447	561	634	683	732	732	732
	Vat Domnak	0	0	0	160	242	343	465	568	661	765	827	894
	Sala Kamraeuk	0	0	0	7	10	14	19	24	82	95	103	111
	Subtotal	***0***	***0***	***0***	***410***	***594***	***804***	***1,045***	***1,226***	***1,426***	***1,593***	***1,662***	***1,738***
Sla Kram													
	Sla Kram	0	0	0	136	199	261	327	370	398	427	427	427
	Banteay Chas	0	0	0	278	416	583	782	946	1,151	1,319	1,372	1,372
	Boeng Donpa	0	0	0	69	103	144	193	234	269	309	330	354
	Dok Po	0	0	0	141	216	312	430	535	792	934	1,027	1,130
	Ta Vein	0	0	0	0	0	0	0	0	182	214	236	259
	Chong Kaosu	0	0	0	42	62	87	117	142	163	187	200	214
	Subtotal	***0***	***0***	***0***	***664***	***996***	***1,386***	***1,850***	***2,226***	***2,956***	***3,390***	***3,593***	***3,756***
Domestic Demand Total		**0**	**0**	**0**	**1,584**	**2,352**	**3,258**	**4,328**	**5,186**	**6,380**	**7,273**	**7,706**	**8,104**

Table 3.3.3 (2/2) Hourly Maximum Domestic Water Demand : l/sec

Communes	Villages	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Svay Dangkum													
	Svay Dangkum	0.00	0.00	0.00	0.61	0.91	1.27	1.71	2.07	2.38	2.73	2.92	3.13
	Vihear Chen	0.00	0.00	0.00	0.27	0.41	0.57	0.77	0.93	1.07	1.22	1.31	1.40
	Mundol 1	0.00	0.00	0.00	1.33	1.99	2.79	3.74	4.53	5.22	5.98	6.40	6.71
	Stung Thmey	0.00	0.00	0.00	1.52	2.27	3.18	4.27	5.17	5.96	6.83	7.31	7.82
	Mundol 2	0.00	0.00	0.00	0.37	0.55	0.78	1.04	1.26	1.45	1.67	1.78	1.91
	Ta Phul	0.00	0.00	0.00	1.53	2.29	3.21	4.31	5.21	6.00	6.88	7.36	7.88
	Sala Kanseng	0.00	0.00	0.00	0.27	0.40	0.56	0.75	0.91	1.04	1.20	1.28	1.37
	Subtotal	***0.00***	***0.00***	***0.00***	***5.89***	***8.82***	***12.36***	***16.59***	***20.07***	***23.13***	***26.51***	***28.37***	***30.21***
Sala Kamraeuk													
	Wat Bo	0.00	0.00	0.00	2.82	3.95	5.18	6.49	7.34	7.91	8.47	8.47	8.47
	Vat Domnak	0.00	0.00	0.00	1.85	2.80	3.96	5.38	6.57	7.65	8.86	9.58	10.35
	Sala Kamraeuk	0.00	0.00	0.00	0.08	0.12	0.16	0.22	0.27	0.95	1.10	1.19	1.29
	Subtotal	***0.00***	***0.00***	***0.00***	***4.75***	***6.87***	***9.31***	***12.09***	***14.18***	***16.51***	***18.43***	***19.24***	***20.11***
Sla Kram													
	Sla Kram	0.00	0.00	0.00	1.58	2.31	3.02	3.79	4.28	4.61	4.94	4.94	4.94
	Banteay Chas	0.00	0.00	0.00	3.21	4.81	6.74	9.05	10.95	13.32	15.27	15.88	15.88
	Boeng Donpa	0.00	0.00	0.00	0.79	1.19	1.67	2.24	2.71	3.12	3.57	3.82	4.09
	Dok Po	0.00	0.00	0.00	1.63	2.51	3.61	4.98	6.19	9.17	10.81	11.89	13.08
	Ta Vein	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.10	2.48	2.73	3.00
	Chong Kaosu	0.00	0.00	0.00	0.48	0.72	1.01	1.35	1.64	1.89	2.16	2.32	2.48
	Subtotal	***0.00***	***0.00***	***0.00***	***7.69***	***11.53***	***16.05***	***21.41***	***25.77***	***34.21***	***39.23***	***41.58***	***43.47***
Domestic Demand Total		**0.00**	**0.00**	**0.00**	**18.33**	**27.22**	**37.71**	**50.10**	**60.02**	**73.84**	**84.18**	**89.19**	**93.80**

Table 3.3.4 Domestic Water Demand Distribution to Each Node (Ratio in %)

Node Number	Communes and Villages															
	Svay Dangkum							Sala Kamraeuk			Sla Kram					
	Svay Dangkum	Vihear Chen	Mundol1	Stung Thmey	Mundol2	Ta Phul	Saka Kanseng	Wat Bo	Vat Domnak	Sala Kamraeuk	Sla Kram	Banteay Chas	Boeng Donpa	Dok Po	Ta Vein	Chong Kaosu
00																
1								8.4			16.7					
2								8.4			16.7					
3								8.4								
4								8.4	6.3							
5									6.3							
6									6.3							
7									6.3							
8									6.3							
9								8.3			16.7					
10								8.3								
11								8.3								
12								8.3	6.3							
13									6.3							
14									6.3							
15									6.2							
16									6.2							
17									6.2							
18									6.2							
19					3.8											
20													14.2			
21													14.3			
22													14.3			
23											16.7					
24					3.8											
25					3.8											
26					3.8											
27					3.8											
28			6.2		3.8											
29			6.2													
30			6.3													
31			6.2													
32			6.2													
33			6.3													
34			6.3													
35	12.5	33.0	6.3													
36			6.2													
37			6.2													
38			6.3													
39			6.3													
40	12.5		6.3													
41	12.5		6.3													
42	12.5		6.2													
43	12.5		6.2		7.8											
44					7.8											
45					3.8											
46					7.7											
47					7.7											
48					3.8											
49					7.7											
50					3.8											
51					7.7	20.0										
52					3.8											
53							33.0									
54									6.2							
55													14.3			
56								8.3			16.5	16.7				
101																
102																
103																
104						20.0	33.0									
105						20.0	34.0									
106				10.0		20.0										
107				30.0	7.8	20.0										
108	12.5			30.0												
109	12.5			30.0	7.8											
110	12.5	33.0														
111		34.0														
112									6.2							
113									6.2							
114										60.0						
115								8.3	6.2							
116													14.3			
117													14.3			
118													14.3			
119											16.7					
120												16.7				
121												16.7				
122														34.0		34.0
123														33.0		33.0
124														33.0		33.0
125								8.3							16.7	
126								8.3				16.7			16.7	
127												16.6			16.7	
128												16.6			16.7	
129															16.6	
130										40.0					16.6	
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table 3.3.5 Domestic Water Demand Distribution (Hourly Peak Demand Base in l/sec)

	Communes and Villages																Total
	Svay Dangkum							Sala Kamraeuk			Sla Kram						
Water Demand in Each	3.130	1.400	6.710	7.820	1.910	7.880	1.370	8.470	10.350	1.290	4.940	15.880	4.090	13.080	3.000	2.480	93.800
Node Number	Svay Dangkum	Vihear Chen	Mundol 1	Stung Thmey	Mundol 2	Ta Phul	Saka Kanseng	Wat Bo	Vat Domnak	Sala Kamraeuk	Sla Kram	Banteay Chas	Boeng Donpa	Dok Po	Ta Vein	Chong Kaosu	
00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.711	0.000	0.000	0.825	0.000	0.000	0.000	0.000	0.000	1.536
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.711	0.000	0.000	0.825	0.000	0.000	0.000	0.000	0.000	1.536
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.711	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.711
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.711	0.652	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.364
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.652	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.652
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.652	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.652
7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.652	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.652
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.652	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.652
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.703	0.000	0.000	0.825	0.000	0.000	0.000	0.000	0.000	1.528
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.703	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.703
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.703	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.703
12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.703	0.652	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.355
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.652	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.652
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.652	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.652
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.642	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.642
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.642	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.642
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.642	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.642
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.642	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.642
19	0.000	0.000	0.000	0.000	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.073
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.581	0.000	0.000	0.000	0.581
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.585	0.000	0.000	0.000	0.585
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.585	0.000	0.000	0.000	0.585
23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.825	0.000	0.000	0.000	0.000	0.000	0.825
24	0.000	0.000	0.000	0.000	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.073
25	0.000	0.000	0.000	0.000	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.073
26	0.000	0.000	0.000	0.000	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.073
27	0.000	0.000	0.000	0.000	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.073
28	0.000	0.000	0.416	0.000	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.489
29	0.000	0.000	0.416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.416
30	0.000	0.000	0.423	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.423
31	0.000	0.000	0.416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.416
32	0.000	0.000	0.416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.416
33	0.000	0.000	0.423	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.423
34	0.000	0.000	0.423	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.423
35	0.391	0.462	0.423	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.276
36	0.000	0.000	0.416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.416
37	0.000	0.000	0.416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.416
38	0.000	0.000	0.423	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.423
39	0.000	0.000	0.423	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.423
40	0.391	0.000	0.423	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.814
41	0.391	0.000	0.423	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.814
42	0.391	0.000	0.416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.807
43	0.391	0.000	0.416	0.000	0.149	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.956
44	0.000	0.000	0.000	0.000	0.149	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.149
45	0.000	0.000	0.000	0.000	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.073
46	0.000	0.000	0.000	0.000	0.147	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.147
47	0.000	0.000	0.000	0.000	0.147	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.147
48	0.000	0.000	0.000	0.000	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.073
49	0.000	0.000	0.000	0.000	0.147	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.147
50	0.000	0.000	0.000	0.000	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.073
51	0.000	0.000	0.000	0.000	0.147	1.576	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.723
52	0.000	0.000	0.000	0.000	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.073
53	0.000	0.000	0.000	0.000	0.000	0.000	0.452	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.452
54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.642	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.642
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.585	0.000	0.000	0.000	0.585
56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.703	0.000	0.000	0.815	2.652	0.000	0.000	0.000	0.000	4.170
101	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
102	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
103	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
104	0.000	0.000	0.000	0.000	0.000	1.576	0.452	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.028
105	0.000	0.000	0.000	0.000	0.000	1.576	0.466	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.042
106	0.000	0.000	0.000	0.782	0.000	1.576	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.358
107	0.000	0.000	0.000	2.346	0.149	1.576	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.071
108	0.391	0.000	0.000	2.346	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.737
109	0.391	0.000	0.000	2.346	0.149	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.886
110	0.391	0.462	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.853
111	0.000	0.476	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.476
112	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.642	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.642
113	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.642	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.642
114	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.774	0.000	0.000	0.000	0.000	0.000	0.000	0.774
115	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.703	0.642	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.345
116	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.585	0.000	0.000	0.000	0.585
117	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.585	0.000	0.000	0.000	0.585
118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.585	0.000	0.000	0.000	0.585
119	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.825	0.000	0.000	0.000	0.000	0.000	0.825
120	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.652	0.000	0.000	0.000	0.000	2.652
121	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.652	0.000	0.000	0.000	0.000	2.652
122	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.447	0.000	0.843	5.290
123	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.316	0.000	0.818	5.135
124	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.316	0.000	0.818	5.135
125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.703	0.000	0.000	0.000	0.000	0.000	0.000	0.501	0.000	1.204
126	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.703	0.000	0.000	0.000	2.652	0.000	0.000	0.501	0.000	3.856
127	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.636	0.000	0.000	0.501	0.000	3.137
128	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.636	0.000	0.000	0.501	0.000	3.137
129	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.498	0.000	0.498
130	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.516	0.000	0.000	0.000	0.000	0.498	0.000	1.014
Total	**3.130**	**1.400**	**6.710**	**7.820**	**1.910**	**7.880**	**1.370**	**8.470**	**10.350**	**1.290**	**4.940**	**15.880**	**4.090**	**13.080**	**3.000**	**2.480**	**93.800**

Table 3.3.6 (1/3) Non-Domestic Daily Average Water Demand : (m^3/day)

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Special Water Demand	0	0	0	63	86	111	139	156	175	195	201	207
Hotel Water Demand	0	0	0	629	718	821	875	909	944	979	1,014	1,048
Bulk Supply to New Hotel Area	0	0	0	0	266	575	737	841	946	1,050	1,154	1,258
Restaurant Water Demand	0	0	0	109	171	244	283	309	334	360	386	411
Total	0	0	0	801	1,240	1,751	2,034	2,216	2,399	2,584	2,754	2,925

Table 3.3.6 (2/3) Non-Domestic Daily Maximum Water Demand : (m^3/day)

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Special Water Demand	0	0	0	89	122	157	196	220	247	275	283	292
Hotel Water Demand	0	0	0	1,164	1,327	1,518	1,618	1,683	1,747	1,811	1,875	1,940
Bulk Supply to New Hotel Area	0	0	0	0	491	1,064	1,364	1,557	1,750	1,942	2,135	2,328
Restaurant Water Demand	0	0	0	201	316	451	524	571	619	666	714	761
Total	0	0	0	1,453	2,257	3,190	3,701	4,031	4,362	4,694	5,007	5,321

Table 3.3.6 (3/3) Non-Domestic Hourly Maximum Water Demand : (l/sec)

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Special Water Demand	0.000	0.000	0.000	1.236	1.696	2.182	2.716	3.058	3.427	3.821	3.937	4.057
Hotel Water Demand	0.000	0.000	0.000	16.162	18.436	21.086	22.476	23.369	24.262	25.154	26.046	26.939
Bulk Supply to New Hotel Area	0.000	0.000	0.000	0.000	5.685	12.310	15.785	18.017	20.249	22.480	24.712	26.944
Restaurant Water Demand	0.000	0.000	0.000	2.788	4.389	6.267	7.274	7.933	8.592	9.251	9.910	10.569
Total	0.000	0.000	0.000	20.186	30.205	41.845	48.252	52.377	56.530	60.705	64.605	68.510

Table 3.3.7 Non Domestic Water Demand Distribution to Each Node (Ratio in %)

Node Number	Hotel Water Demand	Bulk Water Supply to New Hotel Area	Restaurant Water Demand	Special Use Water Demand
00				
1	3.3		1.25	
2			1.25	
3			1.25	
4	3.3		1.25	
5			1.25	
6	3.3		1.25	
7			1.25	
8			1.25	2.30
9			1.25	2.30
10			1.25	
11			1.25	
12	3.3		1.25	
13	3.3		1.25	
14			1.25	
15	3.3		1.25	
16			1.25	
17			1.25	
18			1.25	
19			1.25	2.35
20	3.3		1.25	2.30
21			1.25	2.30
22			1.25	
23			1.25	
24			1.25	2.30
25			1.25	2.30
26			1.25	2.35
27			1.25	2.35
28			1.25	2.35
29			1.25	2.35
30			1.25	2.35
31			1.25	2.35
32	3.3		1.25	2.35
33			1.25	2.35
34	3.3		1.25	
35			1.25	2.30
36			1.25	2.30
37	3.3		1.25	2.30
38			1.25	2.30
39			1.25	
40			1.25	
41	3.3		1.25	2.35
42	3.3		1.25	2.35
43	3.3		1.25	2.35
44	3.3		1.25	2.35
45			1.25	2.35
46	3.3		1.25	2.35
47	3.3		1.25	2.35
48			1.25	2.35
49	3.3		1.25	2.35
50			1.25	2.35
51	3.3		1.25	2.35
52			1.25	2.35
53	3.3		1.25	2.35
54			1.25	
55			1.25	2.30
56	3.3		1.25	
101	3.4		1.25	
102	3.4		1.25	
103	3.4		1.25	
104	3.4		1.25	
105	3.4		1.25	
106	3.4		1.25	
107	3.4		1.25	
108			1.25	
109			1.25	
110			1.25	
111			1.25	
112			1.25	
113			1.25	2.30
114			1.25	2.30
115			1.25	2.30
116			1.25	2.30
117		100.00	1.25	2.30
118	3.6		1.25	2.30
119			1.25	
120	3.3		1.25	2.30
121	3.3		1.25	2.30
122			1.25	2.30
123			1.25	2.30
124			1.25	
125				
126				
127				
128				
129				
130				
Total	**100.0**	**100.0**	**100.0**	**100.00**

Table 3.3.8 Non Domestic Water Demand Distribution (Hourly Peak Demand Base in l/sec)

Node Number	Hotel Water Demand	Bulk Water Supply to New Hotel Area	Restaurant Water Demand	Special Use Water Demand	Total
00	0.000	0.000	0.000	0.00	0.000
1	0.889	0.000	0.132	0.00	1.021
2	0.000	0.000	0.132	0.00	0.132
3	0.000	0.000	0.132	0.00	0.132
4	0.889	0.000	0.132	0.00	1.021
5	0.000	0.000	0.132	0.00	0.132
6	0.889	0.000	0.132	0.00	1.021
7	0.000	0.000	0.132	0.00	0.132
8	0.000	0.000	0.132	0.09	0.226
9	0.000	0.000	0.132	0.09	0.226
10	0.000	0.000	0.132	0.00	0.132
11	0.000	0.000	0.132	0.00	0.132
12	0.889	0.000	0.132	0.00	1.021
13	0.889	0.000	0.132	0.00	1.021
14	0.000	0.000	0.132	0.00	0.132
15	0.889	0.000	0.132	0.00	1.021
16	0.000	0.000	0.132	0.00	0.132
17	0.000	0.000	0.132	0.00	0.132
18	0.000	0.000	0.132	0.00	0.132
19	0.000	0.000	0.132	0.10	0.228
20	0.889	0.000	0.132	0.09	1.115
21	0.000	0.000	0.132	0.09	0.226
22	0.000	0.000	0.132	0.00	0.132
23	0.000	0.000	0.132	0.00	0.132
24	0.000	0.000	0.132	0.09	0.226
25	0.000	0.000	0.132	0.09	0.226
26	0.000	0.000	0.132	0.10	0.228
27	0.000	0.000	0.132	0.10	0.228
28	0.000	0.000	0.132	0.10	0.228
29	0.000	0.000	0.132	0.10	0.228
30	0.000	0.000	0.132	0.10	0.228
31	0.000	0.000	0.132	0.10	0.228
32	0.889	0.000	0.132	0.10	1.117
33	0.000	0.000	0.132	0.10	0.228
34	0.889	0.000	0.132	0.00	1.021
35	0.000	0.000	0.132	0.09	0.226
36	0.000	0.000	0.132	0.09	0.226
37	0.889	0.000	0.132	0.09	1.115
38	0.000	0.000	0.132	0.09	0.226
39	0.000	0.000	0.132	0.00	0.132
40	0.000	0.000	0.132	0.00	0.132
41	0.889	0.000	0.132	0.10	1.117
42	0.889	0.000	0.132	0.10	1.117
43	0.889	0.000	0.132	0.10	1.117
44	0.889	0.000	0.132	0.10	1.117
45	0.000	0.000	0.132	0.10	0.228
46	0.889	0.000	0.132	0.10	1.117
47	0.889	0.000	0.132	0.10	1.117
48	0.000	0.000	0.132	0.10	0.228
49	0.889	0.000	0.132	0.10	1.117
50	0.000	0.000	0.132	0.10	0.228
51	0.889	0.000	0.132	0.10	1.117
52	0.000	0.000	0.132	0.10	0.228
53	0.889	0.000	0.132	0.10	1.117
54	0.000	0.000	0.132	0.00	0.132
55	0.000	0.000	0.132	0.09	0.226
56	0.889	0.000	0.132	0.00	1.021
101	0.916	0.000	0.132	0.00	1.048
102	0.916	0.000	0.132	0.00	1.048
103	0.916	0.000	0.132	0.00	1.048
104	0.916	0.000	0.132	0.00	1.048
105	0.916	0.000	0.132	0.00	1.048
106	0.916	0.000	0.132	0.00	1.048
107	0.916	0.000	0.132	0.00	1.048
108	0.000	0.000	0.132	0.00	0.132
109	0.000	0.000	0.132	0.00	0.132
110	0.000	0.000	0.132	0.00	0.132
111	0.000	0.000	0.132	0.00	0.132
112	0.000	0.000	0.132	0.00	0.132
113	0.000	0.000	0.132	0.09	0.226
114	0.000	0.000	0.132	0.09	0.226
115	0.000	0.000	0.132	0.09	0.226
116	0.000	0.000	0.132	0.09	0.226
117	0.000	26.940	0.132	0.09	27.166
118	0.970	0.000	0.132	0.09	1.195
119	0.000	0.000	0.132	0.00	0.132
120	0.889	0.000	0.132	0.09	1.115
121	0.889	0.000	0.132	0.09	1.115
122	0.000	0.000	0.132	0.09	0.226
123	0.000	0.000	0.132	0.09	0.226
124	0.000	0.000	0.132	0.00	0.132
125	0.000	0.000	0.000	0.00	0.000
126	0.000	0.000	0.000	0.00	0.000
127	0.000	0.000	0.000	0.00	0.000
128	0.000	0.000	0.000	0.00	0.000
129	0.000	0.000	0.000	0.00	0.000
130	0.000	0.000	0.000	0.00	0.000
Total	**26.9**	**26.9**	**10.6**	**4.1**	**68.5**

Table 3.3.9 Total Water Discharge at Each Node in Year 2010 Hourly Peak Base in l/sec

Node Number	Water Discharge for Domestic Water Demand	Water Discharge for Non-Domestic Water Demand	Total Water Discharge at Each Node
00	0.000	0.000	0.000
1	1.536	1.021	2.558
2	1.536	0.132	1.669
3	0.711	0.132	0.844
4	1.364	1.021	2.385
5	0.652	0.132	0.784
6	0.652	1.021	1.673
7	0.652	0.132	0.784
8	0.652	0.226	0.878
9	1.528	0.226	1.753
10	0.703	0.132	0.835
11	0.703	0.132	0.835
12	1.355	1.021	2.376
13	0.652	1.021	1.673
14	0.652	0.132	0.784
15	0.642	1.021	1.663
16	0.642	0.132	0.774
17	0.642	0.132	0.774
18	0.642	0.132	0.774
19	0.073	0.228	0.300
20	0.581	1.115	1.695
21	0.585	0.226	0.810
22	0.585	0.132	0.717
23	0.825	0.132	0.957
24	0.073	0.226	0.298
25	0.073	0.226	0.298
26	0.073	0.228	0.300
27	0.073	0.228	0.300
28	0.489	0.228	0.716
29	0.416	0.228	0.644
30	0.423	0.228	0.650
31	0.416	0.228	0.644
32	0.416	1.117	1.533
33	0.423	0.228	0.650
34	0.423	1.021	1.444
35	1.276	0.226	1.501
36	0.416	0.226	0.642
37	0.416	1.115	1.531
38	0.423	0.226	0.648
39	0.423	0.132	0.555
40	0.814	0.132	0.946
41	0.814	1.117	1.931
42	0.807	1.117	1.924
43	0.956	1.117	2.073
44	0.149	1.117	1.266
45	0.073	0.228	0.300
46	0.147	1.117	1.264
47	0.147	1.117	1.264
48	0.073	0.228	0.300
49	0.147	1.117	1.264
50	0.073	0.228	0.300
51	1.723	1.117	2.840
52	0.073	0.228	0.300
53	0.452	1.117	1.569
54	0.642	0.132	0.774
55	0.585	0.226	0.810
56	4.170	1.021	5.191
101	0.000	1.048	1.048
102	0.000	1.048	1.048
103	0.000	1.048	1.048
104	2.028	1.048	3.076
105	2.042	1.048	3.090
106	2.358	1.048	3.406
107	4.071	1.048	5.119
108	2.737	0.132	2.869
109	2.886	0.132	3.018
110	0.853	0.132	0.985
111	0.476	0.132	0.608
112	0.642	0.132	0.774
113	0.642	0.226	0.867
114	0.774	0.226	1.000
115	1.345	0.226	1.570
116	0.585	0.226	0.810
117	0.585	27.166	27.750
118	0.585	1.195	1.780
119	0.825	0.132	0.957
120	2.652	1.115	3.766
121	2.652	1.115	3.766
122	5.290	0.226	5.516
123	5.135	0.226	5.360
124	5.135	0.132	5.267
125	1.204	0.000	1.204
126	3.856	0.000	3.856
127	3.137	0.000	3.137
128	3.137	0.000	3.137
129	0.498	0.000	0.498
130	1.014	0.000	1.014
Total	**93.800**	**68.510**	**162.310**

Using calculated water discharge and pipeline data, hydraulic analysis is executed and the results of the analysis is shown on Table 3.3.10.

Proposed future distribution network which was confirmed by its capacity and rationality is shown on Figure 3.3.2 and network diagram which shows pipe diameter and length is shown on Figure 3.3.3. As shown on these figures, most of the new pipeline will be installed under the Stage 1, additional pipeline will be installed under the Stage 2 to cover newly expanded service area. Service area is separated by the Siem Reap River and eastern and western service area will be connected by two new pipe bridge.

Length of the proposed distribution network is as shown in Table 3.3.11.

Table 3.3.11 Length of Distribution Pipeline by Diameter

Dia (mm)	Stage 1		Stage 2	Remaining Existing Pipelines (m)	Total (m)
	New Installation (m)	Replacement (m)	New Installation (m)		
500	7,450	-	-	-	7,450
450	710	-	-	-	710
400	-	166	-	-	166
350	-	254	-	-	254
300	-	230	-	-	230
250	360	900	-	509	1,769
200	2,630	92	-	354	3,076
150	765	1,169	410	1,964	4,308
100	1,860	3,499	1,100	3,005	9,464
75	3,250	-	1,800	-	5,050
Total	**17,025**	**6,310**	**3,310**	**5,832**	**32,477**

As shown on Table 3.3.11 and Figures 3.3.2 and 3.3.3, diameters of selected existing pipelines for the replacement are calculated and confirmed. Total length and diameter range for the pipe replacement will be 6.3 km and 400 mm to 100 mm. Remaining existing pipelines which will not be replaced under the Stage 1 will be totally 5.8 km. It should be noted that this does not mean the remaining pipelines are in good condition. Remaining pipelines were also installed from the 1960's and they should also be repaired or replaced gradually after completion of the Stage 1 by the Waterworks using own fund or donor's assistance.

Table 3.3.10 Results of Hydraulic Analysis (1/4)

Nos of nodes 89
Nos of pipes 112

NODE

NO	Type	Q l/sec	WL m	GL m	EH m
0	1	-162.310	49.00	14.00	35.00
1	0	2.558	34.74	14.50	20.24
2	0	1.669	34.59	14.80	19.79
3	0	0.844	32.72	14.00	18.72
4	0	2.385	32.14	13.70	18.44
5	0	0.784	30.84	13.80	17.04
6	0	1.673	30.35	13.70	16.65
7	0	0.784	30.27	13.60	16.67
8	0	0.878	30.19	13.50	16.69
9	0	1.753	34.88	14.50	20.38
10	0	0.835	33.02	14.30	18.72
11	0	0.835	33.00	14.30	18.70
12	0	2.376	32.26	14.00	18.26
13	0	1.673	30.66	13.90	16.76
14	0	0.784	30.64	13.90	16.74
15	0	1.663	30.35	13.90	16.45
16	0	0.774	30.29	13.90	16.39
17	0	0.774	30.29	13.90	16.39
18	0	0.774	30.08	13.50	16.58
19	0	0.300	35.22	14.10	21.12
20	0	1.695	34.67	14.10	20.57
21	0	0.810	33.94	14.50	19.44
22	0	0.717	33.95	14.50	19.45
23	0	0.957	34.19	14.90	19.29
24	0	0.298	35.23	14.20	21.03
25	0	0.298	35.23	13.90	21.33
26	0	0.300	35.24	13.90	21.34
27	0	0.300	35.24	13.90	21.34
28	0	0.716	30.30	14.00	16.30
29	0	0.644	30.30	14.00	16.30
30	0	0.650	30.30	14.10	16.20
31	0	0.644	30.33	14.10	16.23
32	0	1.533	30.35	14.20	16.15
33	0	0.650	30.38	14.20	16.18
34	0	1.444	30.33	14.10	16.23
35	0	1.501	30.25	13.90	16.35
36	0	0.642	30.34	14.10	16.24
37	0	1.531	30.49	14.10	16.39
38	0	0.648	30.48	14.10	16.38
39	0	0.555	30.43	14.10	16.33
40	0	0.946	30.44	14.10	16.34
41	0	1.931	31.16	14.10	17.06
42	0	1.924	31.81	14.10	17.71
43	0	2.073	32.13	14.10	18.03
44	0	1.266	35.33	14.10	21.23
45	0	0.300	35.30	13.90	21.40
46	0	1.264	35.46	14.00	21.46
47	0	1.264	35.64	13.90	21.74
48	0	0.300	35.31	14.50	20.81
49	0	1.264	35.98	13.60	22.38
50	0	0.300	35.27	14.20	21.07
51	0	2.840	36.39	13.40	22.99
52	0	0.300	36.09	14.10	21.99
53	0	1.569	36.35	14.30	22.05
54	0	0.774	30.19	13.80	16.39

Table 3.3.10 Results of Hydraulic Analysis (2/4)

NO	Type	Q	WL	GL	EH
		l/sec	m	m	m
55	0	0.810	34.08	14.60	19.48
56	0	5.191	34.24	14.60	19.64
101	0	1.048	42.78	14.00	28.78
102	0	1.048	41.26	14.00	27.26
103	0	1.048	39.76	14.00	25.76
104	0	3.076	38.27	13.90	24.37
105	0	3.090	37.70	13.90	23.80
106	0	3.406	37.01	13.80	23.21
107	0	5.119	36.50	13.70	22.80
108	0	2.869	33.68	13.50	20.18
109	0	3.018	32.86	13.50	19.36
110	0	0.985	29.92	13.20	16.72
111	0	0.608	29.93	12.70	17.23
112	0	0.774	29.59	13.00	16.59
113	0	0.867	29.88	12.90	16.98
114	0	1.000	27.65	12.60	15.05
115	0	1.570	31.72	13.00	18.72
116	0	0.810	33.51	15.00	18.51
117	0	27.750	31.40	15.80	15.60
118	0	1.780	31.78	15.10	16.68
119	0	0.957	34.26	13.40	20.86
120	0	3.766	32.68	14.60	18.08
121	0	3.766	31.52	14.60	16.92
122	0	5.516	30.96	14.80	16.16
123	0	5.360	30.13	14.80	15.33
124	0	5.267	29.72	15.00	14.72
125	0	1.204	31.78	12.80	18.98
126	0	3.856	33.13	13.00	20.13
127	0	3.137	32.38	13.00	19.38
128	0	3.137	31.26	13.00	18.26
129	0	0.498	31.55	13.20	18.35
130	0	1.014	27.21	12.60	14.61
201	0	0.000	35.31	14.10	21.21
202	0	0.000	35.24	14.00	21.24

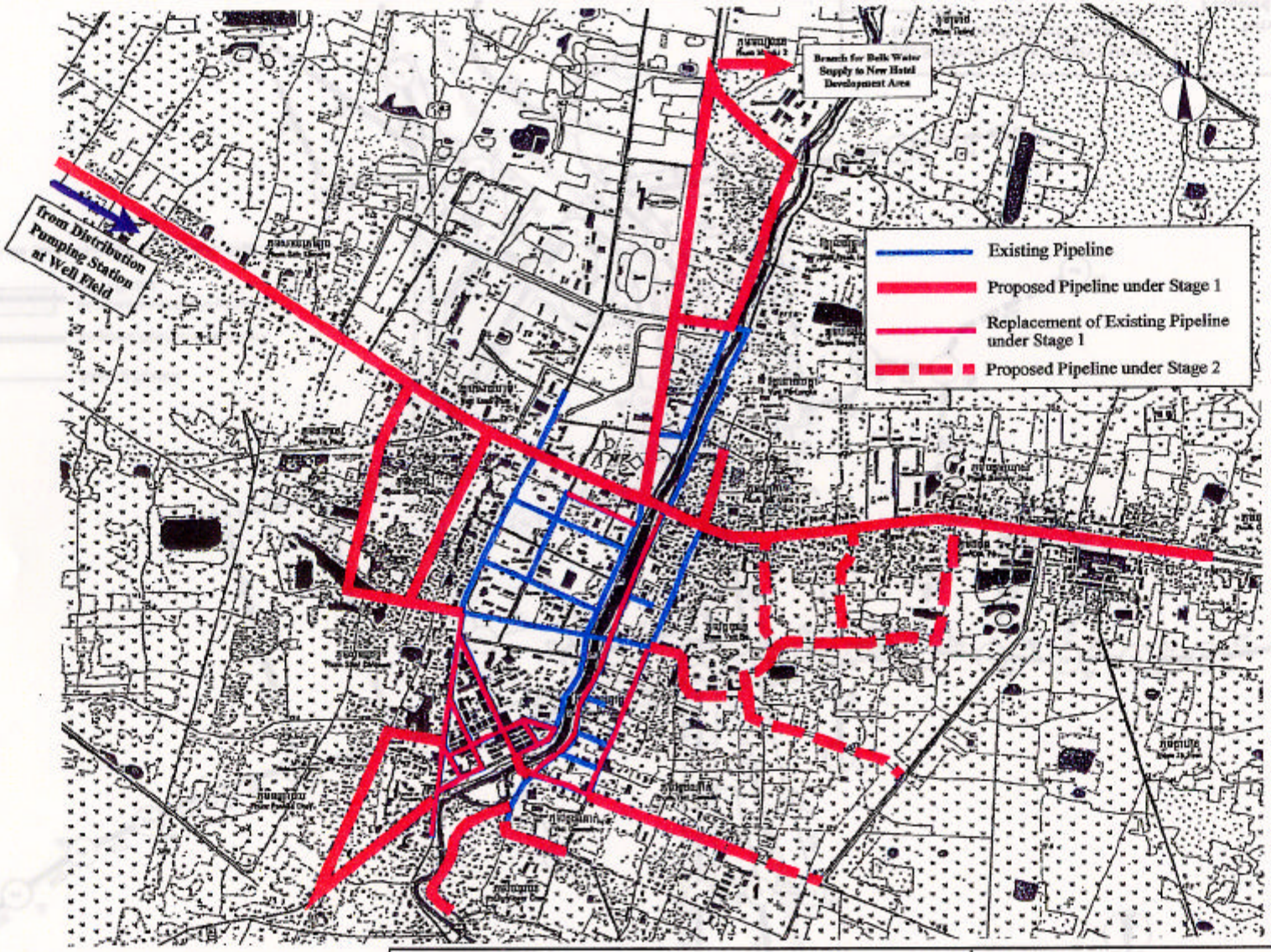
Table 3.3.10 Results of Hydraulic Analysis (3/4)

	NO(u)	NO(d)	Dia mm	Length m	C	dH m	Q l/sec	V m/sec	I o/oo
1	1	2	300	74	120		48.25	0.68	1.96
2	2	56	250	100	120		41.12	0.84	3.54
3	2	3	100	311	110		4.50	0.57	6.03
4	3	4	100	141	110		3.66	0.47	4.11
5	4	12	150	148	110		-4.45	-0.25	-0.82
6	12	10	150	170	120		-12.19	-0.69	-4.50
7	10	11	100	92	110		0.84	0.11	0.27
8	10	9	150	325	120		-13.86	-0.78	-5.70
9	9	1	300	64	120		50.81	0.72	2.16
10	9	19	300	92	120		-68.84	-0.97	-3.78
11	19	20	250	237	120		32.91	0.67	2.35
12	20	55	250	313	120		29.11	0.59	1.87
13	20	21	100	495	110		2.11	0.27	1.48
14	21	22	100	64	110		-0.74	-0.09	-0.22
15	22	23	100	318	110		-1.46	-0.19	-0.75
16	23	9	100	360	110		-2.42	-0.31	-1.91
17	19	24	250	99	110		-4.20	-0.09	-0.06
18	24	25	250	85	110		-3.79	-0.08	-0.05
19	25	26	250	120	110		-3.22	-0.07	-0.04
20	26	27	250	113	110		-3.52	-0.07	-0.04
21	27	45	150	265	110		-2.11	-0.12	-0.21
22	45	44	150	166	110		-2.09	-0.12	-0.20
23	44	46	150	127	110		-5.06	-0.29	-1.04
24	46	47	150	113	110		-6.32	-0.36	-1.57
25	47	49	150	92	110		-10.09	-0.57	-3.72
26	49	51	150	88	110		-11.35	-0.64	-4.63
27	51	53	150	336	110		1.57	0.09	0.12
28	51	52	400	166	120		98.15	0.78	1.80
29	52	19	350	254	120		97.85	1.02	3.42
30	24	50	100	262	120		-0.71	-0.09	-0.17
31	25	48	100	265	110		-0.86	-0.11	-0.28
32	48	47	100	163	110		-2.50	-0.32	-2.04
33	50	48	100	92	110		-1.01	-0.13	-0.38
34	48	45	100	237	110		0.33	0.04	0.05
35	27	202	250	92	110		-1.70	-0.03	-0.01
36	202	201	150	438	110		-1.70	-0.10	-0.14
37	201	44	150	191	110		-1.70	-0.10	-0.14
38	28	29	200	85	110		-0.72	-0.02	-0.01
39	29	30	200	269	110		-1.36	-0.04	-0.02
40	30	31	100	95	120		-0.90	-0.12	-0.26
41	31	36	100	92	120		-0.71	-0.09	-0.17
42	30	36	100	106	120		-1.11	-0.14	-0.38
43	31	32	100	85	120		-0.83	-0.11	-0.23
44	36	37	100	85	120		-2.46	-0.31	-1.68
45	32	37	150	95	120		-6.64	-0.38	-1.46
46	37	42	150	360	120		-10.92	-0.62	-3.67
47	37	38	100	113	120		0.29	0.04	0.03
48	33	38	100	88	120		-1.98	-0.25	-1.13
49	38	41	100	180	120		-3.79	-0.48	-3.74
50	33	34	100	92	120		1.33	0.17	0.54
51	38	39	100	88	120		1.45	0.18	0.63
52	34	39	100	92	120		-1.88	-0.24	-1.02
53	39	40	100	57	120		-0.98	-0.12	-0.31
54	34	35	100	92	120		1.77	0.22	0.91
55	35	40	100	155	120		-2.10	-0.27	-1.26
56	40	41	100	170	120		-4.03	-0.51	-4.18

Table 3.3.10 Results of Hydraulic Analysis (4/4)

	NO(u)	NO(d)	Dia mm	Length m	C	dH m	Q l/sec	V m/sec	I o/oo
57	41	42	150	219	120		-9.75	-0.55	-2.98
58	42	43	200	92	120		-22.60	-0.72	-3.47
59	35	54	100	304	120		0.77	0.10	0.20
60	4	5	100	244	120		4.58	0.58	5.30
61	5	6	100	131	120		3.79	0.48	3.74
62	6	7	100	85	120		1.88	0.24	1.02
63	7	8	100	99	120		1.65	0.21	0.80
64	12	13	100	226	120		5.36	0.68	7.09
65	13	14	100	78	110		0.78	0.10	0.24
66	13	15	100	134	120		2.90	0.37	2.28
67	6	15	100	127	110		0.24	0.03	0.03
68	15	16	100	99	120		1.48	0.19	0.65
69	16	7	100	152	110		0.55	0.07	0.12
70	16	17	100	120	120		0.15	0.02	0.01
71	17	8	100	205	120		1.24	0.16	0.47
72	17	18	100	110	110		2.41	0.31	1.90
73	0	101	500	4,050	120		162.31	0.83	1.54
74	101	102	500	1,000	120		161.26	0.82	1.52
75	102	103	500	1,000	120		160.21	0.82	1.50
76	103	104	500	1,000	120		159.17	0.81	1.48
77	104	105	500	400	120		156.09	0.79	1.43
78	105	106	450	300	120		153.00	0.96	2.30
79	106	107	450	330	120		123.79	0.78	1.56
80	107	51	450	80	120		113.91	0.72	1.33
81	106	108	200	750	120		25.81	0.82	4.44
82	107	109	100	640	120		4.76	0.61	5.68
83	108	109	200	230	120		22.94	0.73	3.57
84	109	43	200	180	120		24.67	0.79	4.08
85	35	110	75	290	120		0.93	0.21	1.13
86	110	111	75	550	120		-0.05	-0.01	-0.01
87	35	111	75	540	120		0.66	0.15	0.60
88	18	112	75	600	120		0.77	0.18	0.80
89	18	113	75	200	120		0.87	0.20	0.99
90	8	114	75	540	120		2.01	0.46	4.70
91	32	17	150	95	120		4.28	0.24	0.65
92	4	115	75	250	120		1.15	0.26	1.66
93	55	21	100	200	120		1.57	0.20	0.73
94	55	116	250	360	120		26.73	0.54	1.60
95	116	117	200	470	120		25.92	0.82	4.47
96	117	118	100	390	120		-1.83	-0.23	-0.97
97	118	21	100	630	120		-3.61	-0.46	-3.42
98	2	119	75	280	120		0.96	0.22	1.19
99	56	120	200	330	120		26.70	0.85	4.73
100	120	121	200	370	120		21.33	0.68	3.12
101	121	122	200	300	120		16.14	0.51	1.86
102	122	123	150	240	120		10.63	0.60	3.49
103	123	124	150	430	120		5.27	0.30	0.95
104	56	126	150	410	120		9.23	0.52	2.69
105	120	127	100	400	120		1.60	0.20	0.76
106	121	128	100	430	120		1.42	0.18	0.61
107	126	127	100	270	120		3.25	0.41	2.81
108	127	128	75	320	120		1.71	0.39	3.48
109	126	125	75	260	120		2.12	0.48	5.19
110	115	125	75	240	120		-0.42	-0.10	-0.26
111	125	129	75	650	120		0.50	0.11	0.35
112	114	130	75	330	120		1.01	0.23	1.32

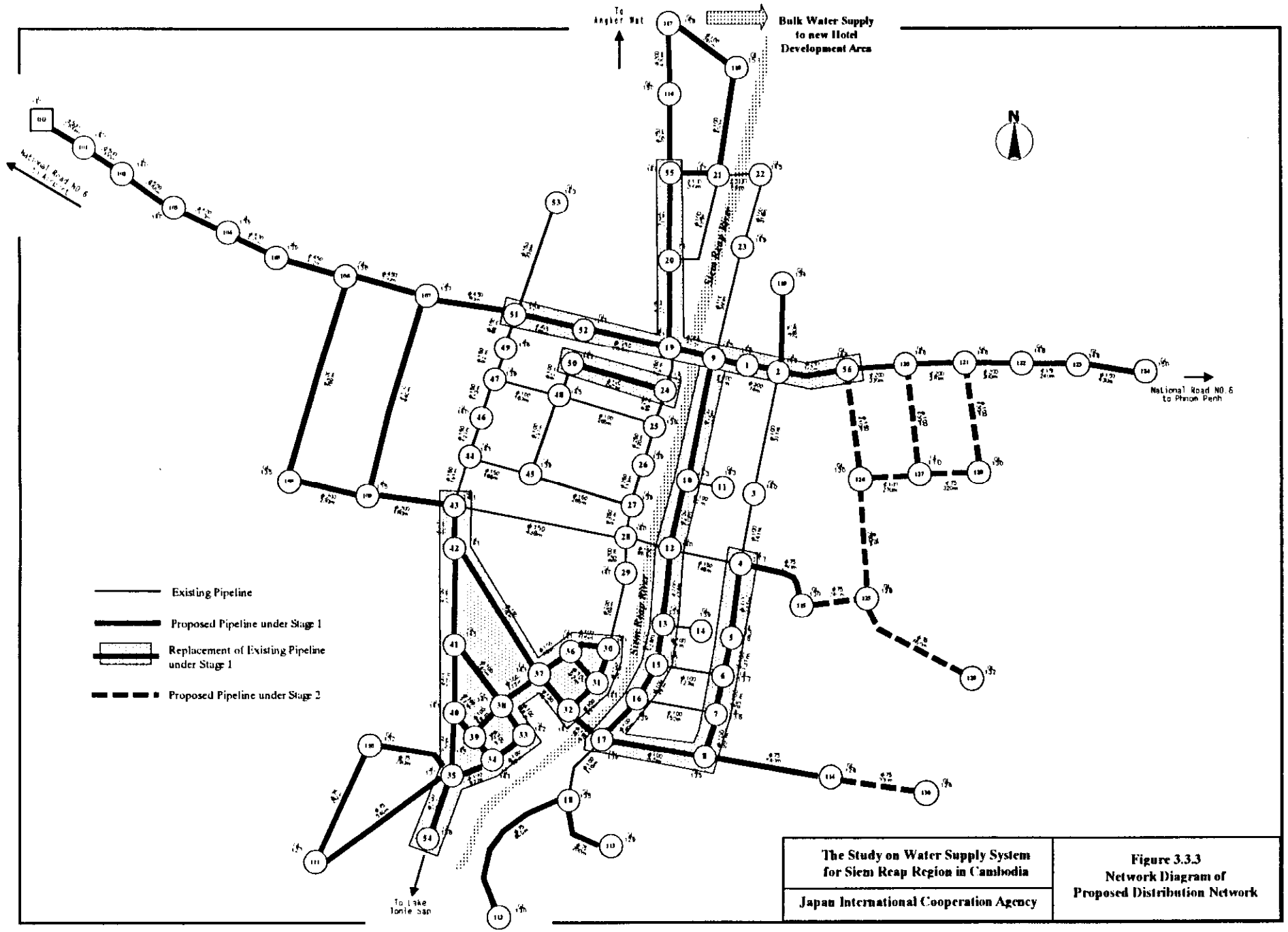
End



The Study on Water Supply System for Siem Reap Region in Cambodia

Japan International Cooperation Agency

Figure 3.3.2
Proposed Distribution Network



The Study on Water Supply System for Siem Reap Region in Cambodia	Figure 3.3.3 Network Diagram of Proposed Distribution Network
Japan International Cooperation Agency	

Pipe material should be considered separately for the trunk main of which diameter is more than 200 mm and secondary main of which diameter is less than 150 mm.

For the trunk main, DIP is recommended from the following advantages.

- Easy installation work comparing with Steel Pipe (SP) under rainy weather condition and high groundwater level
- Quick and easier installation even by unskilled labor using push-on or mechanical joint.
- Easier maintenance and repair comparing with SP.
- High resistance against corrosion comparing with SP.

Even though DIP has disadvantages such as its weight, heavier than SP, DIP is a recommendable pipe material because of its high reliability.

For the secondary main, PVC or PE is recommendable. Recently, Siem Reap Waterworks started to use PVC for repairing ACP line. In Phnom Penh, PE is prevailing as a material for the secondary main.

3.3.3 Service Mains

It is recommended that tapping for connection is allowed from distribution pipe of which diameter is smaller than 150 mm. It will require parallel pipe installation along with larger diameter, more than 200 mm, to install connection. Required length of service main will be calculated from the length of distribution trunk main more than 200 mm.

Table 3.3.12 Length of Trunk Main Required Parallel Service Main

Diameter (mm)	Existing (m)	Stage 1 (m)	Stage 2 (m)	Total (m)
450	-	710	-	710
400	-	166	-	166
350	-	254	-	254
300	-	230	-	230
250	509	1,260	-	1,769
200	354	2,722	-	3,076
Total	**863**	**5,342**	**0**	**6,205**

In the Table above, pipe diameter 500 mm is excluded because these pipe line will be installed along the National Road No. 6 and there will be no house connection in the area except hotel water supply. Hotel water supply will be branched by using T-fittings, therefore service main will not be required.

Total length of service main will be about 6,200 m and diameter will be 50 mm and 75 mm. Length of each diameter is assumed to be same and the length will be 3,100 m each. Pipe material of the service main, PVC or PE is also recommendable.

3.3.4 House Connection

Future increase of house connection is estimated as shown on Table 3.3.13. Domestic house connection is calculated from future served population by dividing average family size 5.7. Number of connection for hotels and guest houses are estimated based on the room numbers required in future.

Table 3.3.13 Number of Connections

Year	House Connection (Domestic)	Connection for Hotels	Connection for Guest Houses	Total Number of Connections	Incremental Connection
2002	1,640	21	83	1,744	1,354
2003	2,320	32	137	2,489	745
2004	3,067	43	204	3,314	826
2005	3,898	48	244	4,190	875
2006	4,475	50	272	4,797	607
2007	5,506	53	301	5,860	1,063
2008	6,276	56	330	6,662	803
2009	6,650	59	358	7,067	405
2010	6,994	61	387	7,442	375

Installation of new connection is recommended to be conducted by licensed plumber and contractor and details will be discussed in the following section.