

7.4.3 Study on Improvement of Collection System

Table 7.4.1 Study on Existing Sewer Improvement (Existing Sewer Evaluation : For Combined System)

Sanitary Sewage Flow
Sanitary Sewage per Capita = 440 liter/day (Hourly Maximum)

Storm Water Flow
Rainfall Intensity Formula = 2750 (Return Period : 4 Year)
For Main Pipe ($D \geq 500$)
 $t + 17$
Rainfall Intensity Formula = 2520 (Return Period : 2.5 Year)
For Small Pipe ($D \leq 400$)
 $t + 17$
Runoff Coefficient = 0.5
Inlet Time = 5 min
Assumed Average Velocity = 1.5 m/sec

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity				Existing Pipe Specification				Capacity	
		Increment	Increment	Total	Sanitary Sewage	Storm Water	Remain Sewage	Q ₁ (m ³ /s)	D (mm)	I(%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge	
3001	3008	725	24.00	24.00	0.043	3.045		3.088	400	18.2	2.24	0.281	1097%	NG	
3002	3004	275	5.80	5.80	0.010	0.883		0.893	400	17.8	2.21	0.278	322%	NG	
3003	3004	108	0.35	0.35	0.001	0.053		0.053	400	12.9	1.88	0.236	23%	OK	
3004	3007	42	0.10	6.25	0.011	0.936		0.947	400	57.1	3.96	0.498	190%	NG	
3005	3006	203	1.43	1.43	0.003	0.206		0.209	300	9.8	1.35	0.095	219%	NG	
3006	3007	130	0.45	1.88	0.003	0.256		0.259	400	49.2	3.68	0.462	56%	OK	
3007	3008	25	0.03	8.16	0.015	1.199		1.213	400	2.0	0.74	0.093	1305%	NG	
3008	3009	82	1.57	33.73	0.060	4.156		4.216	500	6.7	1.57	0.308	1368%	NG	
3009	3011	215	8.12	41.85	0.075	4.786		4.860	600	13.9	2.56	0.724	671%	NG	
3010	3011	152	1.14	1.14	0.002	0.168		0.170	400	12.4	1.85	0.232	73%	OK	
3011	3013	66	0.20	43.19	0.077	4.838		4.914	600	21.2	3.16	0.893	550%	NG	
3012	3013	149	0.90	0.90	0.002	0.133		0.135	400	7.3	1.42	0.178	75%	OK	
3013	3017	58	1.48	45.57	0.081	5.016		5.097	500	10.3	1.95	0.383	1331%	NG	
3014	3015	221	2.25	2.25	0.004	0.321		0.325	300	20.3	1.95	0.138	236%	NG	
3015	3016	278	4.27	6.52	0.012	0.906		0.917	400	3.4	0.97	0.122	752%	NG	
3016	3017	180	2.94	9.46	0.017	1.225		1.242	400	2.7	0.86	0.108	1149%	NG	
3017	3021	352	7.25	62.28	0.111	6.163		6.273	800	13.9	3.10	1.558	403%	NG	
3018	3019	227	2.42	2.42	0.004	0.377		0.382	500	2.0	0.86	0.169	226%	NG	
3019	3020	558	15.68	18.10	0.032	2.252		2.284	600	11.9	2.37	0.670	341%	NG	
3020	3021	308	2.50	20.60	0.037	2.307		2.344	600	2.9	1.17	0.331	709%	NG	
3021	3025	132	0.60	83.48	0.149	7.951		8.100	600	3.0	1.19	0.336	2407%	NG	
3022	3023	120	1.05	1.05	0.002	0.158		0.160	400	12.5	1.85	0.232	69%	OK	
3023	3024	268	1.93	2.98	0.005	0.433		0.438	500	19.0	2.65	0.520	84%	OK	
3024	3025	93	0.13	3.11	0.006	0.399		0.404	600	20.4	3.10	0.877	46%	OK	
3025	3026	63	0.30	86.89	0.155	8.134		8.289	600	7.9	1.93	0.546	1519%	NG	
3026	3027	190	2.50	89.39	0.159	7.959		8.118	800	24.7	4.13	2.076	391%	NG	
3027	3029	71	0.20	89.59	0.160	7.830		7.990	600	18.3	2.94	0.831	961%	NG	
Exs. Outlet								-7.511							
InFlow Area	3028		4.05	4.05	0.007	-		0.007							
	3028	543	7.00	11.05	0.020	0.955	0.039	1.014	800	14.7	3.19	1.603	63%	OK	
Exs. Outlet								-0.955							
	3029	3032	256	3.20	103.84	0.185	0.493	0.370	1.047	800	15.2	3.24	1.629	64%	OK
New Outlet								-0.493							
	3030	3031	402	5.91	5.91	0.011	0.852		0.862	400	11.4	1.77	0.222	388%	NG
	3031	3032	305	5.28	11.19	0.020	1.429		1.449	600	19.0	2.99	0.845	171%	NG
New Outlet								-1.390							
	3032	3039	370	3.85	118.88	0.212	0.563	0.423	1.198	800	7.2	2.23	1.121	107%	NG
New Outlet								-0.563							
	3033	3035	142	0.92	0.92	0.002	0.149		0.151	500	2.0	0.86	0.169	89%	OK
	3034	3035	83	0.81	0.81	0.001	0.124		0.125	400	2.0	0.74	0.093	135%	NG
	3035	3036	85	0.94	2.67	0.005	0.416		0.421	400	10.7	1.71	0.215	196%	NG
	3036	3038	169	1.35	4.02	0.007	0.582		0.589	500	8.2	1.74	0.342	172%	NG
	3037	3038	278	1.60	1.60	0.003	0.223		0.226	500	10.4	1.96	0.385	59%	OK
	3038	3039	166	1.15	6.77	0.012	0.917		0.929	600	28.9	3.69	1.043	89%	OK
New Outlet								-0.893							

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity			Existing Pipe Specification					Capacity	
		Increment	Increment	Total	Sanitary Sewage	Storm Water	Remain Sewage	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge	
3039	3041	113	0.65	126.30	0.225	0.098	0.450	0.772	800	10.9	2.75	1.382	56%	OK	
New Outlet								-0.098							
3040	3041	155	1.46	1.46	0.003	0.216		0.218	400	27.7	2.76	0.347	63%	OK	
New Outlet								-0.210							
3041	3062	365	2.30	130.06	0.232	0.337	0.463	1.031	800	2.8	1.39	0.699	148%	NG	
New Outlet								-0.337							
3042	3044	410	5.20	5.20	0.009	0.747		0.756	600	13.4	2.51	0.710	107%	NG	
3043	3044	98	0.77	0.77	0.001	0.117		0.118	400	2.0	0.74	0.093	127%	NG	
3044	3045	221	2.45	8.42	0.015	1.109		1.124	500	9.9	1.91	0.375	300%	NG	
3045	3052	454	11.51	19.93	0.035	2.232		2.268	600	12.3	2.41	0.681	333%	NG	
3046	3048	263	4.73	4.73	0.008	0.726		0.734	400	2.0	0.74	0.093	789%	NG	
3047	3048	167	2.87	2.87	0.003	0.459		0.464	400	4.7	1.14	0.143	324%	NG	
3048	3050	58	0.70	8.30	0.015	1.238		1.253	400	2.0	0.74	0.093	1348%	NG	
3049	3050	272	1.83	1.83	0.003	0.256		0.259	400	9.5	1.62	0.204	127%	NG	
3050	3051	173	1.42	11.55	0.021	1.604		1.625	400	2.0	0.74	0.093	1747%	NG	
3051	3052	77	0.29	11.84	0.021	1.598		1.619	600	2.0	0.97	0.274	590%	NG	
3052	3055	174	1.46	33.23	0.059	3.526		3.585	600	2.0	0.97	0.274	1307%	NG	
3053	3054	118	0.43	0.43	0.001	0.065		0.065	400	2.0	0.74	0.093	70%	OK	
3054	3055	98	0.35	0.78	0.001	0.112		0.113	500	6.7	1.57	0.308	37%	OK	
3055	3060	12	0.01	34.02	0.061	3.599		3.660	600	2.0	0.97	0.274	1334%	NG	
3056	3059	287	2.82	2.82	0.005	0.427		0.432	500	13.2	2.21	0.434	100%	OK	
3057	3059	203	1.29	1.29	0.002	0.186		0.188	500	17.2	2.52	0.495	38%	OK	
3058	3059	111	0.46	0.46	0.001	0.069		0.070	400	2.0	0.74	0.093	76%	OK	
3059	3060	235	1.18	5.75	0.010	0.790		0.800	600	8.8	2.04	0.577	139%	NG	
3060	3061	114	0.45	40.22	0.072	4.107		4.179	600	2.0	0.97	0.274	1524%	NG	
3061	3062	348	8.47	48.69	0.087	4.503		4.590	600	6.7	1.78	0.503	912%	NG	
New Outlet								-4.329							
3062	3075	514	9.30	188.05	0.335	1.282	0.670	2.287	800	3.6	1.58	0.794	288%	NG	
New Outlet								-1.282							
3063	3065	256	1.33	1.33	0.002	0.188		0.190	600	7.8	1.92	0.543	35%	OK	
3064	3065	216	1.32	1.32	0.002	0.189		0.192	600	8.3	1.98	0.560	34%	OK	
3065	3067	86	0.75	3.40	0.006	0.503		0.509	600	2.0	0.97	0.274	186%	NG	
3066	3067	232	2.02	2.02	0.004	0.314		0.317	600	9.0	2.06	0.582	54%	OK	
3067	3075	372	2.20	7.62	0.014	0.973		0.987	600	11.2	2.30	0.650	152%	NG	
New Outlet								-0.946							
3068	3070	416	4.63	4.63	0.008	0.665		0.673	500	2.0	0.86	0.169	399%	NG	
3069	3070	285	3.24	3.24	0.006	0.491		0.497	400	2.8	0.88	0.111	449%	NG	
3070	3072	176	1.12	8.99	0.016	1.201		1.217	500	2.1	0.88	0.173	704%	NG	
3071	3072	114	0.68	0.68	0.001	0.102		0.103	400	9.6	1.62	0.204	51%	OK	
3072	3074	100	0.41	10.08	0.018	1.296		1.314	500	2.9	1.04	0.204	644%	NG	
3073	3074	127	0.86	0.86	0.002	0.129		0.130	400	14.9	2.02	0.254	51%	OK	
3074	3075	574	3.36	14.30	0.025	1.513		1.538	500	7.1	1.62	0.318	484%	NG	
New Outlet								-1.462							
3075	3077	415	0.15	210.12	0.374	0.020	0.748	1.142	800	2.0	1.18	0.593	193%	NG	
Exs. Outlet								-0.020							
3076	3077	220	1.93	1.93	0.003	0.302		0.306	500	9.0	1.82	0.357	86%	OK	
Exs. Outlet								-0.295							
3077	3079	270	2.80	214.85	0.383	0.428	0.765	1.575	800	2.0	1.18	0.593	266%	NG	
New Outlet								-0.428							
3078	3079	533	5.32	5.32	0.009	0.728		0.738	300	2.0	0.61	0.043	1711%	NG	
New Outlet								-0.709							
3079	3085	233	0.76	220.93	0.393	0.108	0.787	1.288	800	2.0	1.18	0.593	217%	NG	
New Outlet								-0.108							
3080	3082	134	0.47	0.47	0.001	0.070		0.071	200	10.4	1.06	0.033	213%	NG	
3081	3082	70	1.43	1.43	0.003	0.240		0.242	400	2.0	0.74	0.093	260%	NG	

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3082	3084	47	0.21	2.11	0.004	0.336		0.340	400	2.0	0.74	0.093	365%	NG
3083	3084	212	1.68	1.68	0.003	0.263		0.266	500	2.0	0.86	0.169	158%	NG
3084	3085	70	0.21	4.00	0.007	0.609		0.616	500	2.0	0.86	0.169	365%	NG
New Outlet								-0.594						
3085	3104	421	3.12	228.05	0.406	0.446	0.812	1.664	1000	5.8	2.32	1.822	91%	OK
New Outlet								-0.446						
3086	3087	290	2.72	2.72	0.005	0.412		0.417	300	6.8	1.13	0.080	522%	NG
3087	3092	95	0.30	3.02	0.005	0.402		0.407	400	27.3	2.74	0.344	118%	NG
3088	3089	52	0.36	0.36	0.001	0.056		0.056	300	2.0	0.61	0.043	131%	NG
3089	3092	220	1.25	1.61	0.003	0.225		0.228	400	20.8	2.39	0.300	76%	OK
3091	3092	199	5.17	5.17	0.009	0.816		0.825	300	3.0	0.75	0.053	1557%	NG
3092	3096	344	4.64	14.44	0.026	1.832		1.858	500	4.9	1.35	0.265	701%	NG
3093	3095	327	1.95	1.95	0.003	0.291		0.294	300	2.0	0.61	0.043	683%	NG
3094	3095	290	2.15	2.15	0.004	0.326		0.330	300	6.8	1.13	0.080	413%	NG
3095	3096	267	0.30	4.40	0.008	0.588		0.595	400	5.4	1.22	0.153	388%	NG
3096	3097	191	0.38	19.22	0.034	2.280		2.314	600	9.9	2.16	0.611	379%	NG
3097	3100	30	0.02	19.24	0.034	2.254		2.288	600	2.0	0.97	0.274	834%	NG
3098	3099	91	0.34	0.34	0.001	0.052		0.052	300	2.0	0.61	0.043	121%	NG
3099	3100	251	1.24	1.58	0.003	0.214		0.217	600	8.8	2.04	0.577	38%	OK
3100	3103	93	0.78	21.60	0.038	2.455		2.494	800	2.0	1.18	0.593	420%	NG
3101	3102	230	1.92	1.92	0.003	0.298		0.302	300	2.0	0.61	0.043	699%	NG
3102	3103	239	2.20	4.12	0.007	0.579		0.586	600	8.9	2.05	0.580	101%	NG
3103	3104	101	0.82	26.54	0.047	2.921		2.969	800	2.0	1.18	0.593	500%	NG
New Outlet								-2.827						
3104	3107	257	2.41	257.00	0.458	0.370	0.915	1.742	1000	2.0	1.37	1.076	162%	NG
New Outlet								-0.370						
3105	3106	187	1.49	1.49	0.003	0.236		0.239	800	2.1	1.21	0.608	39%	OK
3106	3107	210	1.82	3.31	0.006	0.479		0.485	500	2.0	0.86	0.169	287%	NG
New Outlet								-0.467						
3107	3109	667	11.60	271.91	0.484	1.507	0.968	2.959	1000	3.1	1.70	1.335	222%	NG
New Outlet								-1.507						
3108	3109	193	2.23	2.23	0.004	0.353		0.357	500	5.1	1.37	0.269	133%	NG
New Outlet								-0.345						
3109	3113	456	4.93	279.07	0.497	0.695	0.994	2.185	1000	2.0	1.37	1.076	203%	NG
New Outlet								-0.695						
3110	3112	491	2.69	2.69	0.005	0.374		0.378	600	5.2	1.57	0.444	85%	OK
3111	3112	181	4.18	4.18	0.007	0.665		0.673	400	7.7	1.45	0.182	369%	NG
3112	3113	489	4.41	11.28	0.020	1.310		1.330	600	2.0	0.97	0.274	485%	NG
New Outlet								-1.269						
3113	3127	20	0.50	290.85	0.518	0.000	1.036	1.554	1000	2.0	1.37	1.076	144%	NG
Exs. Outlet								0.000						
3114	3116	579	3.68	3.68	0.007	0.495		0.501	500	4.6	1.30	0.255	196%	NG
3115	3116	67	0.44	0.44	0.001	0.068		0.069	400	8.9	1.56	0.196	35%	OK
3116	3118	68	0.32	4.44	0.008	0.581		0.589	600	10.2	2.19	0.619	95%	OK
3117	3118	70	1.40	1.40	0.002	0.235		0.237	400	2.0	0.74	0.093	255%	NG
3118	3121	199	2.38	8.22	0.015	1.000		1.015	1000x500	2.0	1.32	0.594	171%	NG
3119	3120	268	3.27	3.27	0.006	0.500		0.505	400	6.3	1.32	0.166	305%	NG
3120	3121	213	3.16	6.43	0.011	0.900		0.911	500	7.9	1.71	0.336	271%	NG
3121	3125	232	2.40	17.05	0.030	1.915		1.946	500	9.7	1.89	0.371	524%	NG
3122	3124	276	2.60	2.60	0.005	0.396		0.400	400	9.4	1.61	0.202	198%	NG
3123	3124	124	1.80	1.80	0.003	0.294		0.297	400	3.2	0.94	0.118	251%	NG
3124	3125	208	0.81	5.21	0.009	0.726		0.736	400	2.0	0.74	0.093	791%	NG
3125	3126	500	4.58	26.84	0.048	2.595		2.643	400	10.3	1.68	0.211	1252%	NG
3126	3127	1009	0.00	26.84	0.048	2.022		2.070	600	3.2	1.23	0.348	595%	NG
Exs. Outlet								-1.926						

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3127	3152	97	0.05	317.74	0.566	-	1.131	1.697						
Exs. Outlet														
3128	3129	254	2.27	2.27	0.004	0.350		0.354	300	8.2	1.24	0.088	403%	NG
3129	3131	71	1.33	3.60	0.006	0.537		0.544	400	2.0	0.74	0.093	584%	NG
3130	3131	201	1.00	1.00	0.002	0.145		0.146	400	8.9	1.56	0.196	75%	OK
3131	3136	122	1.40	6.00	0.011	0.849		0.859	500	2.0	0.86	0.169	509%	NG
3132	3133	124	0.60	0.60	0.001	0.090		0.091	300	9.6	1.34	0.095	96%	OK
3133	3135	95	0.40	1.00	0.002	0.143		0.145	400	9.4	1.61	0.202	72%	OK
3134	3135	149	1.16	1.16	0.002	0.187		0.189	400	2.6	0.85	0.107	177%	NG
3135	3136	20	0.05	2.21	0.004	0.342		0.346	400	2.0	0.74	0.093	372%	NG
3136	3141	287	4.10	12.31	0.022	1.557		1.579	600	9.4	2.11	0.597	265%	NG
3137	3138	328	3.02	3.02	0.005	0.451		0.456	500	8.5	1.77	0.348	131%	NG
3138	3140	138	0.60	3.62	0.006	0.508		0.515	600	2.0	0.97	0.274	188%	NG
3139	3140	122	4.10	4.10	0.007	0.669		0.677	400	7.3	1.42	0.178	379%	NG
3140	3141	68	0.39	8.11	0.014	1.110		1.125	800	2.0	1.18	0.593	190%	NG
3141	3142	120	0.43	20.85	0.037	2.528		2.565	800	2.0	1.18	0.593	432%	NG
3142	3148	281	1.25	22.10	0.039	2.440		2.479	800	6.9	2.19	1.101	225%	NG
3143	3144	159	1.39	1.39	0.002	0.204		0.207	300	16.9	1.78	0.126	164%	NG
3144	3145	302	1.76	3.15	0.006	0.444		0.450	400	8.9	1.56	0.196	229%	NG
3145	3147	248	5.98	9.13	0.016	1.166		1.183	500	6.5	1.55	0.304	389%	NG
3146	3147	185	0.70	0.70	0.001	0.102		0.103	600	4.3	1.42	0.401	26%	OK
3147	3148	497	7.44	17.27	0.031	1.863		1.894	600	4.6	1.47	0.416	456%	NG
3148	3151	367	1.19	40.56	0.072	3.922		3.994	1000	4.6	2.07	1.626	246%	NG
3149	3150	218	0.70	0.70	0.001	0.100		0.102	300	15.1	1.68	0.119	86%	OK
3150	3151	404	3.47	4.17	0.007	0.551		0.559	400	2.7	0.86	0.108	517%	NG
3151	3152	430	2.30	47.03	0.084	4.055		4.139	1000	2.0	1.37	1.076	385%	NG
Exs. Outlet								-3.887						
3152	3154	43	0.06	364.83	0.650	-	1.299	1.949						
3153	3154	464	1.32	1.32	0.002	0.185		0.188	400	2.0	0.74	0.093	202%	NG
Exs. Outlet								-0.181						
3154	3157	22	0.01	366.16	0.652	-	1.304	1.956						
3155	3156	537	3.38	3.38	0.006	0.461		0.467	300	8.3	1.25	0.088	529%	NG
3156	3157	480	3.45	6.83	0.012	0.783		0.796	400	2.0	0.74	0.093	856%	NG
Exs. Outlet								-0.759						
3157	3164	181	0.70	373.69	0.665	-	1.331	1.996						
3158	3159	175	1.41	1.41	0.003	0.225		0.228	300	2.8	0.72	0.051	448%	NG
3159	3161	149	0.81	2.22	0.004	0.331		0.335	400	3.3	0.95	0.119	281%	NG
3160	3161	169	1.25	1.25	0.002	0.200		0.202	400	2.0	0.74	0.093	217%	NG
3161	3163	194	5.50	8.97	0.016	1.232		1.248	600	2.0	0.97	0.274	455%	NG
3162	3163	150	2.50	2.50	0.004	0.403		0.407	400	2.0	0.74	0.093	438%	NG
3163	3164	189	0.80	12.27	0.022	1.567		1.589	600	4.2	1.41	0.399	399%	NG
Exs. Outlet								-1.524						
3164	3170	439	3.70	389.66	0.694	-	1.388	2.081						
3165	3166	479	4.05	4.05	0.007	0.567		0.574	300	9.1	1.31	0.093	620%	NG
3166	3167	106	0.56	4.61	0.008	0.618		0.626	300	2.0	0.61	0.043	1452%	NG
3167	3168	144	1.18	5.79	0.010	0.735		0.745	800	4.3	1.73	0.870	86%	OK
3168	3169	137	0.97	6.76	0.012	0.817		0.829	800	2.0	1.18	0.593	140%	NG
3169	3170	392	0.00	6.76	0.012	0.717		0.729	800	13.0	3.00	1.508	48%	OK
Exs. Outlet								-0.693						
3170	To STP	930	0.00	396.42	0.706	-	1.412	2.118						
4001	4002	24	5.70	5.70	0.010	0.976		0.986	200	41.6	2.13	0.067	1474%	NG
4002	4003	64	2.90	8.60	0.015	1.428		1.443	300	46.8	2.96	0.209	690%	NG

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity			Existing Pipe Specification					Capacity	
		Increment	Increment	Total		Sanitary Sewage	Storm Water	Remain Sewage	Q ₁ (m ³ /s)	D (mm)	I (‰)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge
Shkoza	4003			14.60	-	0.033	-	-	0.033						
4003	4004	837	13.00	21.60	0.071	2.554	-	-	2.625	400	8.0	1.48	0.186	1411%	NG
4004	4006	46	0.35	21.95	0.071	2.556	-	-	2.627	300	73.1	3.70	0.262	1005%	NG
InFlow Area	4005		10.78	10.78	0.019	-	-	-	0.019						
4005	4006	637	4.60	4.60	0.027	0.604	-	-	0.630	300	17.5	1.81	0.128	493%	NG
4006	4007	34	0.25	26.80	0.099	3.083	-	-	3.182	300	11.7	1.48	0.105	3041%	NG
New Outlet									-2.886						
4007	4011	295	2.42	29.22	0.103	0.365	0.206	-	0.674	400	8.1	1.49	0.187	360%	NG
4009	4010	147	0.72	0.72	0.001	0.107	-	-	0.108	300	10.2	1.38	0.098	111%	NG
4010	4011	538	11.78	12.50	0.022	1.613	-	-	1.635	400	15.7	2.08	0.261	625%	NG
4011	4012	74	2.68	44.40	0.129	2.211	0.258	-	2.598	400	7.6	1.44	0.181	1436%	NG
Exs. Outlet									-2.211						
4012	4013	162	2.25	46.65	0.133	0.361	0.266	-	0.760	400	9.2	1.59	0.200	380%	NG
Exs. Outlet									-0.361						
4013	4015	156	1.56	48.21	0.136	0.251	0.271	-	0.658	400	5.1	1.18	0.148	444%	NG
4014	4015	377	2.17	2.17	0.004	0.290	-	-	0.294	400	15.6	2.07	0.260	113%	NG
4015	4017	266	2.68	53.06	0.144	0.917	0.288	-	1.349	400	12.0	1.82	0.229	590%	NG
New Outlet									-0.917						
4016	4017	913	12.80	12.80	0.022	1.523	0.044	-	1.590	800	22.8	3.97	1.996	80%	OK
New Outlet									-1.523						
4017	4024	154	0.88	66.74	0.168	0.130	0.336	-	0.633	800	20.1	3.73	1.875	34%	OK
New Outlet									-0.130						
4018	4021	313	5.26	5.26	0.009	0.788	-	-	0.797	300	17.2	1.79	0.127	630%	NG
4019	4020	68	1.00	1.00	0.002	0.168	-	-	0.169	300	2.0	0.61	0.043	393%	NG
4020	4021	260	1.03	2.03	0.004	0.278	-	-	0.281	300	19.8	1.92	0.136	207%	NG
4021	4022	57	0.35	7.64	0.013	1.110	-	-	1.123	400	24.8	2.61	0.328	342%	NG
4022	4023	36	0.53	8.17	0.014	1.169	-	-	1.183	400	55.5	3.90	0.490	241%	NG
New Outlet									-1.140						
InFlow Area	4023		4.01	4.01	0.007	-	-	-	0.007						
4023	4024	446	4.60	12.77	0.029	1.543	0.058	-	1.631	400	9.1	1.58	0.199	821%	NG
New Outlet									-1.543						
4024	4025	170	0.88	80.39	0.198	0.129	0.397	-	0.724	800	10.5	2.70	1.357	53%	OK
New Outlet									-0.129						
InFlow Area	4025		7.30	7.30	0.013	-	-	-	0.013						
4025	4028	196	0.97	81.36	0.213	0.140	0.426	-	0.779	800	22.4	3.94	1.980	39%	OK
New Outlet									-0.140						
Student's	4026		29.50	-	0.028	-	-	-	0.028						
4026	4027	976	12.24	12.24	0.049	1.425	-	-	1.474	400	30.2	2.88	0.362	407%	NG
New Outlet									-1.328						
4027	4028	305	1.50	13.74	0.051	0.207	0.103	-	0.361	500	7.5	1.67	0.328	110%	NG
New Outlet									-0.207						
InFlow Area	4028		14.00	14.00	0.024	-	-	-	0.024						
4028	4054	183	0.85	95.95	0.290	0.124	0.580	-	0.994	800	2.0	1.18	0.593	168%	NG
New Outlet									-0.124						
4029	4030	52	1.41	1.41	0.002	0.218	-	-	0.221	300	57.6	3.28	0.232	95%	OK
4030	4031	215	1.92	3.33	0.006	0.509	-	-	0.515	400	6.9	1.38	0.173	297%	NG
4031	4036	178	0.78	4.11	0.007	0.584	-	-	0.591	500	2.0	0.86	0.169	350%	NG
4032	4033	77	0.65	0.65	0.001	0.099	-	-	0.100	200	87.0	3.08	0.097	104%	NG
4033	4034	153	0.88	1.53	0.003	0.218	-	-	0.220	300	23.5	2.10	0.148	148%	NG

No.	Down	Length (m)		Area (ha)		Sewage Quantity			Existing Pipe Specification				Capacity	
		Stream	Increment	Increment	Total	Sanitary Sewage	Storm Water	Remain Sewage	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂
4034	4035	169	4.18	5.71	0.010	0.826		0.836	400	20.1	2.35	0.295	283%	NG
4035	4036	55	0.27	5.98	0.010	0.846		0.856	500	12.7	2.17	0.426	201%	NG
4036	4045	343	2.64	12.73	0.022	1.574		1.596	500	29.5	3.30	0.648	246%	NG
4037	4038	175	2.49	2.49	0.004	0.365		0.369	300	18.2	1.85	0.131	282%	NG
4038	4041	89	0.67	3.16	0.005	0.444		0.450	400	26.9	2.72	0.342	132%	NG
4039	4040	119	0.88	0.88	0.002	0.132		0.134	300	47.0	2.97	0.210	64%	OK
4040	4041	50	0.10	0.98	0.002	0.157		0.158	400	2.0	0.74	0.093	170%	NG
4041	4042	210	0.76	4.90	0.008	0.686		0.694	400	19.5	2.31	0.290	239%	NG
4042	4045	10	0.01	4.91	0.009	0.684		0.693	500	3.4	1.12	0.220	315%	NG
New Outlet								-0.667						
4043	4044	119	0.55	0.55	0.001	0.083		0.084	300	42.5	2.82	0.199	42%	OK
4044	4045	259	0.81	1.36	0.002	0.182		0.184	400	16.9	2.15	0.270	68%	OK
New Outlet								-0.177						
4045	4053	231	1.43	20.43	0.035	0.222	0.071	0.328	500	4.3	1.26	0.247	133%	NG
4046	4047	168	1.02	1.02	0.002	0.163		0.165	300	2.3	0.66	0.047	353%	NG
4047	4048	161	1.24	2.26	0.004	0.336		0.340	400	2.0	0.74	0.093	365%	NG
4048	4050	423	9.14	11.40	0.020	1.432		1.452	500	30.2	3.34	0.656	221%	NG
New Outlet								-1.393						
4049	4050	197	0.88	0.88	0.002	0.127		0.129	500	31.4	3.41	0.670	19%	OK
New Outlet								-0.124						
4050	4051	253	2.78	15.06	0.026	0.428	0.052	0.506	400	7.1	1.40	0.176	288%	NG
Exs. Outlet								-0.428						
4051	4052	354	6.88	21.94	0.038	1.015	0.076	1.129	400	2.8	0.88	0.111	1021%	NG
InFlow Area	4052		21.39	21.39	0.037	-		0.037						
4052	4053	404	8.05	29.99	0.089	1.876	0.178	2.143	600	9.9	2.16	0.611	351%	NG
4053	4054	70	0.30	50.72	0.125	2.039	0.250	2.415	600	4.2	1.41	0.399	606%	NG
New Outlet								-2.039						
4054	4056	115	0.31	146.98	0.415	0.047	0.831	1.293	800	2.0	1.18	0.593	218%	NG
New Outlet								-0.047						
4055	4056	265	2.53	2.53	0.004	0.388		0.392	500	8.6	1.78	0.350	112%	NG
New Outlet								-0.379						
4056	4060	99	0.34	149.85	0.420	0.052	0.841	1.313	800	2.0	1.18	0.593	221%	NG
New Outlet								-0.052						
4057	4059	62	0.50	0.50	0.001	0.077		0.078	400	2.0	0.74	0.093	84%	OK
4058	4059	58	1.22	1.22	0.002	0.206		0.208	400	2.0	0.74	0.093	224%	NG
4059	4060	279	7.64	9.36	0.016	1.386		1.402	500	14.9	2.35	0.461	304%	NG
New Outlet								-1.353						
4060	4062	25	0.03	159.24	0.437	0.005	0.873	1.315	800	2.0	1.18	0.593	222%	NG
Exs. Outlet								-0.005						
4061	4062	712	4.94	4.94	0.009	0.631		0.640	400	5.7	1.25	0.157	407%	NG
Exs. Outlet								-0.614						
4062	4064	88	0.27	164.45	0.446	0.041	0.892	1.378	800	2.0	1.18	0.593	232%	NG
New Outlet								-0.041						
4063	4064	258	2.07	2.07	0.004	0.318		0.321	600	2.0	0.97	0.274	117%	NG
New Outlet								-0.310						
4064	4068	93	0.31	166.83	0.450	0.047	0.900	1.397	800	2.0	1.18	0.593	236%	NG
Exs. Outlet								-0.047						
4065	4068	461	3.64	3.64	0.006	0.513		0.519	600	3.6	1.30	0.368	141%	NG
Exs. Outlet								-0.500						
4068	4070	168	0.80	171.27	0.458	0.117	0.915	1.490	800	2.0	1.18	0.593	251%	NG
New Outlet								-0.117						

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity			Existing Pipe Specification				Capacity	
		Increment	Increment	Total	Sanitary Sewage	Storm Water	Remain Sewage	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge
4069	4070	77	0.38	0.38	0.001	0.058		0.059	400	5.1	1.18	0.148	40%	OK
New Outlet								-0.057						
4070	4078	179	1.02	172.67	0.460	0.149	0.920	1.529	800	5.9	2.02	1.015	151%	NG
New Outlet								-0.149						
4071	4073	155	1.15	1.15	0.002	0.170		0.172	800	6.4	2.10	1.056	16%	OK
4072	4073	58	0.28	0.28	0.000	0.043		0.044	400	2.0	0.74	0.093	47%	OK
4073	4075	176	1.21	2.64	0.005	0.392		0.397	500	10.7	1.99	0.391	102%	NG
4074	4075	94	0.45	0.45	0.001	0.068		0.069	400	5.3	1.21	0.152	46%	OK
4075	4077	74	0.40	3.49	0.006	0.503		0.509	600	8.1	1.95	0.551	92%	OK
4076	4077	334	1.20	1.20	0.002	0.163		0.166	500	8.9	1.81	0.355	47%	OK
4077	4078	94	0.58	5.27	0.009	0.732		0.741	800	2.0	1.18	0.593	125%	NG
New Outlet								-0.714						
4078	4102	191	1.83	179.77	0.472	0.290	0.945	1.707	800	7.9	2.34	1.176	145%	NG
New Outlet								-0.290						
4079	4080	107	1.37	1.37	0.002	0.226		0.228	400	2.0	0.74	0.093	245%	NG
4080	4082	256	2.72	4.09	0.007	0.601		0.608	400	7.7	1.45	0.182	334%	NG
4081	4082	165	0.95	0.95	0.002	0.140		0.141	800	13.9	3.10	1.558	9%	OK
4082	4085	174	1.18	6.22	0.011	0.848		0.859	800	10.3	2.67	1.342	64%	OK
4083	4084	80	0.64	0.64	0.001	0.098		0.099	400	32.5	2.99	0.376	26%	OK
4084	4085	189	3.11	3.75	0.007	0.573		0.579	500	2.0	0.86	0.169	343%	NG
4085	4087	182	1.07	11.04	0.019	1.406		1.425	600	2.0	0.97	0.274	519%	NG
4086	4087	158	3.57	3.57	0.006	0.573		0.579	800	10.1	2.64	1.327	44%	OK
4087	4091	78	0.26	14.87	0.026	1.838		1.864	800	2.0	1.18	0.593	314%	NG
4090	4091	162	1.27	1.27	0.002	0.204		0.206	800	2.0	1.18	0.593	35%	OK
4091	4097	96	0.43	16.57	0.029	1.984		2.013	800	2.0	1.18	0.593	339%	NG
4092	4094	157	1.16	1.16	0.002	0.171		0.173	800	9.5	2.56	1.287	13%	OK
4093	4094	69	0.31	0.31	0.001	0.048		0.048	600	37.6	4.21	1.190	4%	OK
4094	4096	97	0.39	1.86	0.003	0.286		0.290	800	2.0	1.18	0.593	49%	OK
4095	4096	87	0.24	0.24	0.000	0.037		0.037	800	2.0	1.18	0.593	6%	OK
4096	4097	178	1.28	3.38	0.006	0.482		0.488	500	2.0	0.86	0.169	289%	NG
4097	4099	215	2.23	22.18	0.038	2.470		2.508	600	5.9	1.67	0.472	531%	NG
4098	4099	190	2.50	2.50	0.004	0.396		0.401	500	7.3	1.64	0.322	124%	NG
4099	4101	68	0.35	25.03	0.043	2.724		2.767	1000	2.9	1.64	1.288	215%	NG
4100	4101	177	1.10	1.10	0.002	0.160		0.162	400	11.2	1.75	0.220	74%	OK
4101	4102	174	1.27	27.40	0.048	2.828		2.876	1000	2.0	1.37	1.076	267%	NG
New Outlet								-2.733						
4102	4104	73	0.29	207.46	0.520	0.045	1.041	1.606	800	11.6	2.83	1.423	113%	NG
Exs. Outlet								-0.045						
4103	4104	361	2.90	2.90	0.005	0.426		0.431	400	2.4	0.81	0.102	423%	NG
Exs. Outlet								-0.416						
4104	4110	420	2.80	213.16	0.530	0.401	1.060	1.991	800	3.8	1.62	0.814	245%	NG
New Outlet								-0.401						
4105	4106	62	0.54	0.54	0.001	0.083		0.084	500	12.9	2.18	0.428	20%	OK
4106	4107	243	4.91	5.45	0.009	0.820		0.829	600	18.5	2.95	0.834	99%	OK
4107	4110	627	4.81	10.26	0.008	1.209		1.218	800	4.7	1.80	0.905	135%	NG
New Outlet								-1.193						
4108	4109	384	5.70	5.70	0.010	0.828		0.838	500	2.3	0.92	0.181	464%	NG
4109	4110	99	0.67	6.37	0.011	0.875		0.886	600	2.0	0.97	0.274	323%	NG
New Outlet								-0.853						
4110	4118	95	0.35	230.14	0.550	0.053	1.100	1.704	1000	2.0	1.37	1.076	158%	NG
New Outlet								-0.053						
4111	4112	152	1.46	1.46	0.003	0.216		0.218	800	34.2	4.87	2.448	9%	OK
Inflow Area	4112		8.38	8.38	0.015	-		0.015						
4112	4113	358	9.88	11.34	0.034	1.564		1.598	800	13.9	3.10	1.558	103%	NG
Exs. Outlet								-1.495						

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity			Existing Pipe Specification				Capacity	
		Increment	Increment	Total	Sanitary Sewage	Storm Water	Remain Sewage	Q ₁ (m ³ /s)	D (mm)	I(‰)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge
4113	4114	177	3.39	14.73	0.040	0.539	0.080	0.660	500	2.2	0.90	0.177	373%	NG
4114	4115	325	8.68	23.41	0.055	1.670		1.725	500	11.9	2.10	0.412	418%	NG
4115	4117	166	0.74	24.15	0.056	1.664		1.721	500	2.0	0.86	0.169	1019%	NG
4116	4117	289	1.68	1.68	0.003	0.255		0.258	200	2.4	0.51	0.016	1607%	NG
4117	4118	80	0.36	26.19	0.060	1.872		1.932	500	5.1	1.37	0.269	718%	NG
New Outlet								-1.752						
InFlow Area	4118		4.10	4.10	0.007	.		0.007						
4118	4120	447	8.80	265.13	0.633	1.245	1.265	3.142	1000	4.2	1.98	1.555	202%	NG
New Outlet								-1.245						
4119	4120	150	0.82	0.82	0.001	0.121		0.123	400	6.6	1.35	0.170	72%	OK
New Outlet								-0.118						
Selita	4120		35.60	-	0.044	-		0.044						
4120	4122	583	2.62	268.57	0.683	0.351	1.365	2.399	1000	6.6	2.48	1.948	123%	NG
New Outlet								-0.351						
4121	4122	223	2.72	2.72	0.005	0.424		0.429	300	14.7	1.66	0.117	365%	NG
New Outlet								-0.415						
4122	4132	234	4.20	275.49	0.695	0.652	1.389	2.736	1000	2.0	1.37	1.076	254%	NG
Exs. Outlet								-0.652						
4123	4124	110	1.10	1.10	0.002	0.181		0.183	300	2.7	0.71	0.050	365%	NG
4124	4125	548	6.00	7.10	0.012	0.926		0.938	400	6.9	1.38	0.173	541%	NG
4125	4129	368	4.50	11.60	0.020	1.327		1.347	500	18.4	2.61	0.512	263%	NG
4126	4127	473	6.90	6.90	0.012	0.965		0.977	400	9.0	1.57	0.197	495%	NG
4127	4128	341	7.50	14.40	0.025	1.774		1.799	300	7.6	1.19	0.084	2139%	NG
4128	4129	197	1.50	15.90	0.028	1.829		1.857	400	11.6	1.78	0.224	830%	NG
4129	4131	130	0.80	28.30	0.049	3.106		3.155	400	37.6	3.21	0.403	782%	NG
4130	4131	435	5.90	5.90	0.010	0.841		0.851	400	33.5	3.03	0.381	224%	NG
4131	4132	213	0.90	35.10	0.061	3.604		3.665	400	2.0	0.74	0.093	3941%	NG
Exs. Outlet								-3.482						
4132	To STP	0	0.00	310.59	0.755		1.511	2.266	1000	2.0	1.37	1.076	211%	NG

Table 7.4.2 Study on Existing Sewer Improvement (Combined Case-1 : New Combined Sewer)

Sanitary Sewage Flow

Sanitary Sewage per Capita = 440 liter/day (Hourly Maximum)

Storm Water Flow

Rainfall Intensity Formula = $\frac{2750}{t + 17}$ (Return Period : 4 Year)

For Main Pipe ($D \geq 500$)

Rainfall Intensity Formula = $\frac{2520}{t + 17}$ (Return Period : 2.5 Year)

For Small Pipe ($D \leq 450$)

Runoff Coefficient = 0.5

Inlet Time = 5 min

Assumed Average Velocity = 1.5 m/sec

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity			Planned Pipe Specification					Capacity	
		Increment	Increment	Total	Total	Sanitary Sewage	Storm Water	Remain Sewage	$Q_1(m^3/s)$	D (mm)	I (%)	V (m/s)	$Q_2(m^3/s)$	Q_1/Q_2	Existing New
3001	3008	725	24.00	24.00	0.043	3.045			3.088	1,000	18.2	4.12	3.236	95%	New
3002	3004	275	5.80	5.80	0.010	0.883			0.893	700	17.8	3.21	1.235	72%	New
3003	3004	108	0.35	0.35	0.001	0.053			0.053	400	12.9	1.88	0.236	23%	Existing
3004	3007	42	0.10	6.25	0.011	0.936			0.947	600	57.1	5.19	1.467	65%	New
3005	3006	203	1.43	1.43	0.003	0.206			0.209	450	9.8	1.77	0.282	74%	New
3006	3007	130	0.45	1.88	0.003	0.256			0.259	400	49.2	3.68	0.462	56%	Existing
3007	3008	25	0.03	8.16	0.015	1.199			1.213	1,100	2.0	1.45	1.378	88%	New
3008	3009	82	1.57	33.73	0.060	4.156			4.216	1,400	6.7	3.13	4.818	87%	New
3009	3011	215	8.12	41.85	0.075	4.786			4.860	1,300	13.9	4.29	5.694	85%	New
3010	3011	152	1.14	1.14	0.002	0.168			0.170	400	12.4	1.85	0.232	73%	Existing
3011	3013	66	0.20	43.19	0.077	4.838			4.914	1,200	21.2	5.02	5.677	87%	New
3012	3013	149	0.90	0.90	0.002	0.133			0.135	400	7.3	1.42	0.178	75%	Existing
3013	3017	58	1.48	45.57	0.081	5.016			5.097	1,400	10.3	3.88	5.973	85%	New
3014	3015	221	2.25	2.25	0.004	0.321			0.325	450	20.3	2.55	0.406	80%	New
3015	3016	278	4.27	6.52	0.012	0.906			0.917	900	3.4	1.66	1.056	87%	New
3016	3017	180	2.94	9.46	0.017	1.225			1.242	1,000	2.7	1.59	1.249	99%	New
3017	3021	352	7.25	62.28	0.111	6.163			6.273	1,400	13.9	4.50	6.927	91%	New
3018	3019	227	2.42	2.42	0.004	0.377			0.382	700	2.0	1.08	0.416	92%	New
3019	3020	558	15.68	18.10	0.032	2.252			2.284	1,000	11.9	3.33	2.615	87%	New
3020	3021	308	2.50	20.60	0.037	2.307			2.344	1,300	2.9	1.96	2.602	90%	New
3021	3025	132	0.60	83.48	0.149	7.951			8.100	2,000	3.0	2.65	8.325	97%	New
3022	3023	120	1.05	1.05	0.002	0.158			0.160	400	12.5	1.85	0.232	69%	Existing
3023	3024	268	1.93	2.98	0.005	0.433			0.438	500	19.0	2.65	0.520	84%	Existing
3024	3025	93	0.13	3.11	0.006	0.399			0.404	600	20.4	3.10	0.877	46%	Existing
3025	3026	63	0.30	86.89	0.155	8.134			8.289	1,700	7.9	3.86	8.761	95%	New
3026	3027	190	2.50	89.39	0.159	7.959			8.118	1,400	24.7	6.00	9.236	88%	New
3027	3029	71	0.20	89.59	0.160	7.830			7.990	1,500	18.3	5.41	9.560	84%	New
Exs. Outlet									-7.511						
InFlow Area		3028	4.05	4.05	0.007	-			0.007						
3028	3029	543	7.00	11.05	0.020	0.955	0.039		1.014	800	14.7	3.19	1.603	63%	Existing
Exs. Outlet									-0.955						
3029	3032	256	3.20	103.84	0.185	0.493	0.370		1.047	800	15.2	3.24	1.629	64%	Existing
New Outlet									-0.493						
3030	3031	402	5.91	5.91	0.011	0.852			0.862	700	11.4	2.57	0.989	87%	New
3031	3032	305	5.28	11.19	0.020	1.429			1.449	800	19.0	3.63	1.825	79%	New
New Outlet									-1.390						
3032	3039	370	3.85	118.88	0.212	0.563	0.423		1.198	900	7.2	2.41	1.533	78%	New
New Outlet									-0.563						
3033	3035	142	0.92	0.92	0.002	0.149			0.151	500	2.0	0.86	0.169	89%	Existing
3034	3035	83	0.81	0.81	0.001	0.124			0.125	450	2.0	0.80	0.127	98%	New
3035	3036	85	0.94	2.67	0.005	0.416			0.421	600	10.7	2.25	0.636	66%	New
3036	3038	169	1.35	4.02	0.007	0.582			0.589	700	8.2	2.18	0.839	70%	New
3037	3038	278	1.60	1.60	0.003	0.223			0.226	500	10.4	1.96	0.385	59%	Existing
3038	3039	166	1.15	6.77	0.012	0.917			0.929	600	28.9	3.69	1.043	89%	Existing
New Outlet									-0.893						

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity			Planned Pipe Specification				Capacity	
		Increment	Increment	Total	Sanitary Sewage	Storm Water	Remain Sewage	Q ₁ (m ³ /s)	D (mm)	I(‰)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Existing New
3039	3041	113	0.63	126.30	0.225	0.098	0.450	0.772	800	10.9	2.75	1.382	56%	Existing
New Outlet								-0.098						
3040	3041	155	1.46	1.46	0.003	0.216		0.218	400	27.7	2.76	0.347	63%	Existing
New Outlet								-0.210						
3041	3062	365	2.30	130.06	0.232	0.337	0.463	1.031	1,000	2.8	1.62	1.272	81%	New
New Outlet								-0.337						
3042	3044	410	5.20	5.20	0.009	0.747		0.756	700	13.4	2.79	1.074	70%	New
3043	3044	98	0.77	0.77	0.001	0.117		0.118	450	2.0	0.80	0.127	93%	New
3044	3045	221	2.45	8.42	0.015	1.109		1.124	800	9.9	2.62	1.317	85%	New
3045	3052	454	11.51	19.93	0.035	2.232		2.268	1,000	12.3	3.39	2.662	85%	New
3046	3048	263	4.73	4.73	0.008	0.726		0.734	900	2.0	1.27	0.808	91%	New
3047	3048	167	2.87	2.87	0.005	0.459		0.464	700	4.7	1.65	0.635	73%	New
3048	3050	58	0.70	8.30	0.015	1.238		1.253	1,100	2.0	1.45	1.378	91%	New
3049	3050	272	1.83	1.83	0.003	0.256		0.259	450	9.5	1.75	0.278	93%	New
3050	3051	173	1.42	11.55	0.021	1.604		1.625	1,200	2.0	1.54	1.742	93%	New
3051	3052	77	0.29	11.84	0.021	1.598		1.619	1,200	2.0	1.54	1.742	93%	New
3052	3055	174	1.46	33.23	0.059	3.526		3.585	1,600	2.0	1.87	3.760	95%	New
3053	3054	118	0.43	0.43	0.001	0.065		0.065	400	2.0	0.74	0.093	70%	Existing
3054	3055	98	0.35	0.78	0.001	0.112		0.113	500	6.7	1.57	0.308	37%	Existing
3055	3060	12	0.01	34.02	0.061	3.599		3.660	1,600	2.0	1.87	3.760	97%	New
3056	3059	287	2.82	2.82	0.005	0.427		0.432	500	13.2	2.21	0.434	100%	Existing
3057	3059	203	1.29	1.29	0.002	0.186		0.188	500	17.2	2.52	0.495	38%	Existing
3058	3059	111	0.46	0.46	0.001	0.069		0.070	400	2.0	0.74	0.093	76%	Existing
3059	3060	235	1.18	5.75	0.010	0.790		0.800	700	8.8	2.26	0.870	92%	New
3060	3061	114	0.45	40.22	0.072	4.107		4.179	1,700	2.0	1.94	4.403	95%	New
3061	3062	348	8.47	48.69	0.087	4.503		4.590	1,400	6.7	3.13	4.818	95%	New
New Outlet								-4.329						
3062	3075	514	9.30	188.05	0.335	1.282	0.670	2.287	1,200	3.6	2.07	2.341	98%	New
New Outlet								-1.282						
3063	3065	256	1.33	1.33	0.002	0.188		0.190	600	7.8	1.92	0.543	35%	Existing
3064	3065	216	1.32	1.32	0.002	0.189		0.192	600	8.3	1.98	0.560	34%	Existing
3065	3067	86	0.75	3.40	0.006	0.503		0.509	800	2.0	1.18	0.593	86%	New
3066	3067	232	2.02	2.02	0.004	0.314		0.317	600	9.0	2.06	0.582	54%	Existing
3067	3075	372	2.20	7.62	0.014	0.973		0.987	800	11.2	2.78	1.397	71%	New
New Outlet								-0.946						
3068	3070	416	4.63	4.63	0.008	0.665		0.673	900	2.0	1.27	0.808	83%	New
3069	3070	285	3.24	3.24	0.006	0.491		0.497	800	2.8	1.39	0.699	71%	New
3070	3072	176	1.12	8.99	0.016	1.201		1.217	1,100	2.1	1.49	1.416	86%	New
3071	3072	114	0.68	0.68	0.001	0.102		0.103	400	9.6	1.62	0.204	51%	Existing
3072	3074	100	0.41	10.08	0.018	1.296		1.314	1,100	2.9	1.75	1.663	79%	New
3073	3074	127	0.86	0.86	0.002	0.129		0.130	400	14.9	2.02	0.254	51%	Existing
3074	3075	574	3.36	14.30	0.025	1.513		1.538	1,000	7.1	2.57	2.018	76%	New
New Outlet								-1.462						
3075	3077	415	0.15	210.12	0.374	0.020	0.748	1.142	1,100	2.0	1.45	1.378	83%	New
Exs. Outlet								-0.020						
3076	3077	220	1.93	1.93	0.003	0.302		0.306	500	9.0	1.82	0.357	86%	Existing
Exs. Outlet								-0.295						
3077	3079	270	2.80	214.85	0.383	0.428	0.765	1.575	1,200	2.0	1.54	1.742	90%	New
New Outlet								-0.428						
3078	3079	533	5.32	5.32	0.009	0.728		0.738	900	2.0	1.27	0.808	91%	New
New Outlet								-0.709						
3079	3085	233	0.76	220.93	0.393	0.108	0.787	1.288	1,100	2.0	1.45	1.378	93%	New
New Outlet								-0.108						
3080	3082	134	0.47	0.47	0.001	0.070		0.071	300	10.4	1.40	0.099	72%	New
3081	3082	70	1.43	1.43	0.003	0.240		0.242	600	2.0	0.97	0.274	88%	New

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity			Planned Pipe Specification					Capacity	
		Increment	Increment	Total	Sanitary Sewage	Storm Water	Remain Sewage	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Existing	New
3082	3084	47	0.21	2.11	0.004	0.336		0.340	700	2.0	1.08	0.416	82%	New	
3083	3084	212	1.68	1.68	0.003	0.263		0.266	600	2.0	0.97	0.274	97%	New	
3084	3085	70	0.21	4.00	0.007	0.609		0.616	900	2.0	1.27	0.808	76%	New	
New Outlet								-0.594							
3085	3104	421	3.12	228.05	0.406	0.446	0.812	1.664	1,000	5.8	2.32	1.822	91%	Existing	
New Outlet								-0.446							
3086	3087	290	2.72	2.72	0.005	0.412		0.417	600	6.8	1.79	0.506	82%	New	
3087	3092	95	0.30	3.02	0.005	0.402		0.407	450	27.3	2.96	0.471	87%	New	
3088	3089	52	0.36	0.36	0.001	0.056		0.056	350	2.0	0.68	0.065	86%	New	
3089	3092	220	1.25	1.61	0.003	0.225		0.228	400	20.8	2.39	0.300	76%	Existing	
3091	3092	199	5.17	5.17	0.009	0.816		0.825	900	3.0	1.56	0.992	83%	New	
3092	3096	344	4.64	14.44	0.026	1.832		1.858	1,100	4.9	2.28	2.167	86%	New	
3093	3095	327	1.95	1.95	0.003	0.291		0.294	700	2.0	1.08	0.416	71%	New	
3094	3095	290	2.15	2.15	0.004	0.326		0.330	600	6.8	1.79	0.506	65%	New	
3095	3096	267	0.30	4.40	0.008	0.588		0.595	700	5.4	1.77	0.681	87%	New	
3096	3097	191	0.38	19.22	0.034	2.280		2.314	1,000	9.9	3.04	2.388	97%	New	
3097	3100	30	0.02	19.24	0.034	2.254		2.288	1,400	2.0	1.71	2.632	87%	New	
3098	3099	91	0.34	0.34	0.001	0.052		0.052	350	2.0	0.68	0.065	80%	New	
3099	3100	251	1.24	1.58	0.003	0.214		0.217	600	8.8	2.04	0.577	38%	Existing	
3100	3103	93	0.78	21.60	0.038	2.455		2.494	1,400	2.0	1.71	2.632	95%	New	
3101	3102	230	1.92	1.92	0.003	0.298		0.302	700	2.0	1.08	0.416	73%	New	
3102	3103	239	2.20	4.12	0.007	0.579		0.586	700	8.9	2.27	0.874	67%	New	
3103	3104	101	0.82	26.54	0.047	2.921		2.969	1,500	2.0	1.79	3.163	94%	New	
New Outlet								-2.827							
3104	3107	257	2.41	257.00	0.458	0.370	0.915	1.742	1,200	2.0	1.54	1.742	100%	New	
New Outlet								-0.370							
3105	3106	187	1.49	1.49	0.003	0.236		0.239	800	2.1	1.21	0.608	39%	Existing	
3106	3107	210	1.82	3.31	0.006	0.479		0.485	800	2.0	1.18	0.593	82%	New	
New Outlet								-0.467							
3107	3109	667	11.60	271.91	0.484	1.507	0.968	2.959	1,400	3.1	2.13	3.279	90%	New	
New Outlet								-1.507							
3108	3109	193	2.23	2.23	0.004	0.353		0.357	600	5.1	1.55	0.438	82%	New	
New Outlet								-0.345							
3109	3113	456	4.93	279.07	0.497	0.695	0.994	2.185	1,400	2.0	1.71	2.632	83%	New	
New Outlet								-0.695							
3110	3112	491	2.69	2.69	0.005	0.374		0.378	600	5.2	1.57	0.444	85%	Existing	
3111	3112	181	4.18	4.18	0.007	0.665		0.673	700	7.7	2.11	0.812	83%	New	
3112	3113	489	4.41	11.28	0.020	1.310		1.330	1,100	2.0	1.45	1.378	96%	New	
New Outlet								-1.269							
3113	3127	20	0.50	290.85	0.518	0.000	1.036	1.554	1,200	2.0	1.54	1.742	89%	New	
Exs. Outlet								0.000							
3114	3116	579	3.68	3.68	0.007	0.495		0.501	700	4.6	1.63	0.627	80%	New	
3115	3116	67	0.44	0.44	0.001	0.068		0.069	400	8.9	1.56	0.196	35%	Existing	
3116	3118	68	0.32	4.44	0.008	0.581		0.589	600	10.2	2.19	0.619	95%	Existing	
3117	3118	70	1.40	1.40	0.002	0.235		0.237	600	2.0	0.97	0.274	86%	New	
3118	3121	199	2.38	8.22	0.015	1.000		1.015	1,000	2.0	1.37	1.076	94%	New	
3119	3120	268	3.27	3.27	0.006	0.500		0.505	700	6.3	1.91	0.735	69%	New	
3120	3121	213	3.16	6.43	0.011	0.900		0.911	800	7.9	2.34	1.176	77%	New	
3121	3125	232	2.40	17.05	0.030	1.915		1.946	1,000	9.7	3.01	2.364	82%	New	
3122	3124	276	2.60	2.60	0.005	0.396		0.400	600	9.4	2.11	0.597	67%	New	
3123	3124	124	1.80	1.80	0.003	0.294		0.297	600	3.2	1.23	0.348	85%	New	
3124	3125	208	0.81	5.21	0.009	0.726		0.736	900	2.0	1.27	0.808	91%	New	
3125	3126	500	4.58	26.84	0.048	2.595		2.643	1,100	10.3	3.30	3.136	84%	New	
3126	3127	1009	0.00	26.84	0.048	2.022		2.070	1,200	3.2	1.95	2.205	94%	New	
Exs. Outlet								-1.926							

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity				Planned Pipe Specification				Capacity	
		Increment	Increment	Total		Sanitary Sewage	Storm Water	Remain Sewage	Q ₁ (m ³ /s)	D (mm)	I(‰)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Existing New
3127	3152	97	0.05	317.74		0.566	-	1.131	1.697						
Exs. Outlet															
3128	3129	254	2.27	2.27		0.004	0.350		0.354	600	8.2	1.97	0.557	63%	New
3129	3131	71	1.33	3.60		0.006	0.537		0.544	800	2.0	1.18	0.593	92%	New
3130	3131	201	1.00	1.00		0.002	0.145		0.146	400	8.9	1.56	0.196	75%	Existing
3131	3136	122	1.40	6.00		0.011	0.849		0.859	1,000	2.0	1.37	1.076	80%	New
3132	3133	124	0.60	0.60		0.001	0.090		0.091	300	9.6	1.34	0.095	96%	Existing
3133	3135	95	0.40	1.00		0.002	0.143		0.145	400	9.4	1.61	0.202	72%	Existing
3134	3135	149	1.16	1.16		0.002	0.187		0.189	500	2.6	0.98	0.192	98%	New
3135	3136	20	0.05	2.21		0.004	0.342		0.346	700	2.0	1.08	0.416	83%	New
3136	3141	287	4.10	12.31		0.022	1.557		1.579	900	9.4	2.76	1.756	90%	New
3137	3138	328	3.02	3.02		0.005	0.451		0.456	600	8.5	2.00	0.565	81%	New
3138	3140	138	0.60	3.62		0.006	0.508		0.515	800	2.0	1.18	0.593	87%	New
3139	3140	122	4.10	4.10		0.007	0.669		0.677	700	7.3	2.06	0.793	85%	New
3140	3141	68	0.39	8.11		0.014	1.110		1.125	1,100	2.0	1.45	1.378	82%	New
3141	3142	120	0.43	20.85		0.037	2.528		2.565	1,400	2.0	1.71	2.632	97%	New
3142	3148	281	1.25	22.10		0.039	2.440		2.479	1,100	6.9	2.70	2.566	97%	New
3143	3144	159	1.39	1.39		0.002	0.204		0.207	400	16.9	2.15	0.270	77%	New
3144	3145	302	1.76	3.15		0.006	0.444		0.450	600	8.9	2.05	0.580	78%	New
3145	3147	248	5.98	9.13		0.016	1.166		1.183	900	6.5	2.29	1.457	81%	New
3146	3147	185	0.70	0.70		0.001	0.102		0.103	600	4.3	1.42	0.401	26%	Existing
3147	3148	497	7.44	17.27		0.031	1.863		1.894	1,100	4.6	2.21	2.100	90%	New
3148	3151	367	1.19	40.56		0.072	3.922		3.994	1,500	4.6	2.71	4.789	83%	New
3149	3150	218	0.70	0.70		0.001	0.100		0.102	300	15.1	1.68	0.119	86%	Existing
3150	3151	404	3.47	4.17		0.007	0.551		0.559	800	2.7	1.37	0.689	81%	New
3151	3152	430	2.30	47.03		0.084	4.055		4.139	1,700	2.0	1.94	4.403	94%	New
Exs. Outlet									-3.887						
3152	3154	43	0.06	364.83		0.650	-	1.299	1.949						
3153	3154	464	1.32	1.32		0.002	0.185		0.188	600	2.0	0.97	0.274	68%	New
Exs. Outlet									-0.181						
3154	3157	22	0.01	366.16		0.652	-	1.304	1.956						
3155	3156	537	3.38	3.38		0.006	0.461		0.467	600	8.3	1.98	0.560	83%	New
3156	3157	480	3.45	6.83		0.012	0.783		0.796	900	2.0	1.27	0.808	98%	New
Exs. Outlet									-0.759						
3157	3164	181	0.70	373.69		0.665	-	1.331	1.996						
3158	3159	175	1.41	1.41		0.003	0.225		0.228	600	2.8	1.15	0.325	70%	New
3159	3161	149	0.81	2.22		0.004	0.331		0.335	600	3.3	1.25	0.353	95%	New
3160	3161	169	1.25	1.25		0.002	0.200		0.202	600	2.0	0.97	0.274	74%	New
3161	3163	194	5.50	8.97		0.016	1.232		1.248	1,100	2.0	1.45	1.378	91%	New
3162	3163	150	2.50	2.50		0.004	0.403		0.407	700	2.0	1.08	0.416	98%	New
3163	3164	189	0.80	12.27		0.022	1.567		1.589	1,100	4.2	2.11	2.005	79%	New
Exs. Outlet									-1.524						
3164	3170	439	3.70	389.66		0.694	-	1.388	2.081						
3165	3166	479	4.05	4.05		0.007	0.567		0.574	600	9.1	2.07	0.585	98%	New
3166	3167	106	0.56	4.61		0.008	0.618		0.626	900	2.0	1.27	0.808	77%	New
3167	3168	144	1.18	5.79		0.010	0.735		0.745	800	4.3	1.73	0.870	86%	Existing
3168	3169	137	0.97	6.76		0.012	0.817		0.829	1,000	2.0	1.37	1.076	77%	New
3169	3170	392	0.00	6.76		0.012	0.717		0.729	800	13.0	3.00	1.508	48%	Existing
Exs. Outlet									-0.693						
3170	To STP	930	0.00	396.42		0.706	-	1.412	2.118						
4001	4002	24	5.70	5.70		0.010	0.976		0.986	600	41.6	4.43	1.253	79%	New
4002	4003	64	2.90	8.60		0.015	1.428		1.443	700	46.8	5.21	2.005	72%	New

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity				Planned Pipe Specification				Capacity	
		Increment	Increment	Total	Sanitary Sewage	Storm Water	Remain Sewage	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Existing	New
Shkoza	4003			14.60	0.033	-		0.033							
	4003	4004	837	13.00	0.071	2.554		2.625	1,100	8.0	2.91	2.765	95%	New	
	4004	4006	46	0.35	0.071	2.556		2.627	800	73.1	7.11	3.574	74%	New	
InFlow Area	4005			10.78	0.019	-		0.019							
	4005	4006	637	4.60	0.027	0.604		0.630	600	17.5	2.87	0.811	78%	New	
	4006	4007	34	0.25	0.099	3.083		3.182	1,100	11.7	3.52	3.345	95%	New	
New Outlet								-2.886							
	4007	4011	295	2.42	0.103	0.365	0.206	0.674	700	8.1	2.17	0.835	81%	New	
	4009	4010	147	0.72	0.001	0.107		0.108	350	10.2	1.53	0.147	73%	New	
	4010	4011	538	11.78	0.022	1.613		1.635	800	15.7	3.30	1.659	99%	New	
	4011	4012	74	2.68	0.129	2.211	0.258	2.598	1,100	7.6	2.84	2.699	96%	New	
Exs. Outlet								-2.211							
	4012	4013	162	2.25	0.133	0.361	0.266	0.760	700	9.2	2.31	0.889	85%	New	
Exs. Outlet								-0.361							
	4013	4015	156	1.56	0.136	0.251	0.271	0.658	700	5.1	1.72	0.662	99%	New	
	4014	4015	377	2.17	0.004	0.290		0.294	450	15.6	2.24	0.356	82%	New	
	4015	4017	266	2.68	0.144	0.917	0.288	1.349	800	12.0	2.88	1.448	93%	New	
New Outlet								-0.917							
	4016	4017	913	12.80	0.022	1.523	0.044	1.590	800	22.8	3.97	1.996	80%	Existing	
New Outlet								-1.523							
	4017	4024	154	0.88	0.168	0.130	0.336	0.633	800	20.1	3.73	1.875	34%	Existing	
New Outlet								-0.130							
	4018	4021	313	5.26	0.009	0.788		0.797	600	17.2	2.85	0.806	99%	New	
	4019	4020	68	1.00	0.002	0.168		0.169	600	2.0	0.97	0.274	62%	New	
	4020	4021	260	1.03	0.004	0.278		0.281	400	19.8	2.33	0.293	96%	New	
	4021	4022	57	0.35	0.013	1.110		1.123	700	24.8	3.79	1.459	77%	New	
	4022	4023	36	0.53	0.014	1.169		1.183	600	55.5	5.12	1.448	82%	New	
New Outlet								-1.140							
InFlow Area	4023			4.01	0.007	-		0.007							
	4023	4024	446	4.60	0.029	1.543	0.058	1.631	900	9.1	2.71	1.724	95%	New	
New Outlet								-1.543							
	4024	4025	170	0.88	0.198	0.129	0.397	0.724	800	10.5	2.70	1.357	53%	Existing	
New Outlet								-0.129							
InFlow Area	4025			7.30	0.013	-		0.013							
	4025	4028	196	0.97	0.213	0.140	0.426	0.779	800	22.4	3.94	1.980	39%	Existing	
New Outlet								-0.140							
Student's	4026			29.50	0.028	-		0.028							
	4026	4027	976	12.24	0.049	1.425		1.474	700	30.2	4.18	1.609	92%	New	
New Outlet								-1.328							
	4027	4028	305	1.50	0.051	0.207	0.103	0.361	600	7.5	1.88	0.532	68%	New	
New Outlet								-0.207							
InFlow Area	4028			14.00	0.024	-		0.024							
	4028	4034	183	0.85	0.290	0.124	0.580	0.994	1,000	2.0	1.37	1.076	92%	New	
New Outlet								-0.124							
	4029	4030	52	1.41	0.002	0.218		0.221	300	57.6	3.28	0.232	95%	Existing	
	4030	4031	215	1.92	0.006	0.509		0.515	700	6.9	2.00	0.770	67%	New	
	4031	4036	178	0.78	0.007	0.584		0.591	800	2.0	1.18	0.593	100%	New	
	4032	4033	77	0.65	0.001	0.099		0.100	250	87.0	3.57	0.175	57%	New	
	4033	4034	153	0.88	0.003	0.218		0.220	350	23.5	2.32	0.223	99%	New	

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity			Planned Pipe Specification					Capacity	
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4034	4035	169	4.18	5.71	0.010	0.826		0.836	600	20.1	3.08	0.871	96%		New
4035	4036	55	0.27	5.98	0.010	0.846		0.856	700	12.7	2.71	1.043	82%		New
4036	4045	343	2.64	12.73	0.022	1.574		1.596	800	29.5	4.52	2.272	70%		New
4037	4038	175	2.49	2.49	0.004	0.365		0.369	450	18.2	2.42	0.385	96%		New
4038	4041	89	0.67	3.16	0.005	0.444		0.450	450	26.9	2.94	0.468	96%		New
4039	4040	119	0.88	0.88	0.002	0.132		0.134	300	47.0	2.97	0.210	64%	Existing	
4040	4041	50	0.10	0.98	0.002	0.157		0.158	500	2.0	0.86	0.169	94%		New
4041	4042	210	0.76	4.90	0.008	0.686		0.694	600	19.5	3.03	0.857	81%		New
4042	4045	10	0.01	4.91	0.009	0.684		0.693	800	3.4	1.53	0.769	90%		New
New Outlet								-0.667							
4043	4044	119	0.55	0.55	0.001	0.083		0.084	300	42.5	2.82	0.199	42%	Existing	
4044	4045	259	0.81	1.36	0.002	0.182		0.184	400	16.9	2.15	0.270	68%	Existing	
New Outlet								-0.177							
4045	4053	231	1.43	20.43	0.035	0.222	0.071	0.328	600	4.3	1.42	0.401	82%		New
4046	4047	168	1.02	1.02	0.002	0.163		0.165	500	2.3	0.92	0.181	91%		New
4047	4048	161	1.24	2.26	0.004	0.336		0.340	700	2.0	1.08	0.416	82%		New
4048	4050	423	9.14	11.40	0.020	1.432		1.452	700	30.2	4.18	1.609	90%		New
New Outlet								-1.393							
4049	4050	197	0.88	0.88	0.002	0.127		0.129	500	31.4	3.41	0.670	19%	Existing	
New Outlet								-0.124							
4050	4051	253	2.78	15.06	0.026	0.428	0.052	0.506	600	7.1	1.83	0.517	98%		New
Exs. Outlet								-0.428							
4051	4052	354	6.88	21.94	0.038	1.015	0.076	1.129	1,000	2.8	1.62	1.272	89%		New
InFlow Area	4052		21.39	21.39	0.037	-		0.037							
4052	4053	404	8.05	29.99	0.089	1.876	0.178	2.143	1,000	9.9	3.04	2.388	90%		New
4053	4054	70	0.30	50.72	0.125	2.039	0.250	2.415	1,200	4.2	2.23	2.522	96%		New
New Outlet								-2.039							
4054	4056	115	0.31	146.98	0.415	0.047	0.831	1.293	1,100	2.0	1.45	1.378	94%		New
New Outlet								-0.047							
4055	4056	265	2.53	2.53	0.004	0.388		0.392	600	8.6	2.01	0.568	69%		New
New Outlet								-0.379							
4056	4060	99	0.34	149.85	0.420	0.052	0.841	1.313	1,100	2.0	1.45	1.378	95%		New
New Outlet								-0.052							
4057	4059	62	0.50	0.50	0.001	0.077		0.078	400	2.0	0.74	0.093	84%	Existing	
4058	4059	58	1.22	1.22	0.002	0.206		0.208	600	2.0	0.97	0.274	76%		New
4059	4060	279	7.64	9.36	0.016	1.386		1.402	800	14.9	3.21	1.614	87%		New
New Outlet								-1.353							
4060	4062	25	0.03	159.24	0.437	0.005	0.873	1.315	1,100	2.0	1.45	1.378	95%		New
Exs. Outlet								-0.005							
4061	4062	712	4.94	4.94	0.009	0.631		0.640	700	5.7	1.82	0.700	91%		New
Exs. Outlet								-0.614							
4062	4064	88	0.27	164.45	0.446	0.041	0.892	1.378	1,100	2.0	1.45	1.378	100%		New
New Outlet								-0.041							
4063	4064	258	2.07	2.07	0.004	0.318		0.321	700	2.0	1.08	0.416	77%		New
New Outlet								-0.310							
4064	4068	93	0.31	166.83	0.450	0.047	0.900	1.397	1,200	2.0	1.54	1.742	80%		New
Exs. Outlet								-0.047							
4065	4068	451	3.64	3.64	0.006	0.513		0.519	700	3.6	1.44	0.554	94%		New
Exs. Outlet								-0.500							
4068	4070	168	0.80	171.27	0.458	0.117	0.915	1.490	1,200	2.0	1.54	1.742	86%		New
New Outlet								-0.117							

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity			Planned Pipe Specification				Capacity	
		Increment	Increment	Total	Sanitary Sewage	Storm Water	Remain Sewage	Q ₁ (m ³ /s)	D (mm)	I(‰)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Existing New
4069	4070	77	0.38	0.38	0.001	0.058		0.059	400	5.1	1.18	0.148	40%	Existing
New Outlet								-0.057						
4070	4078	179	1.02	172.67	0.460	0.149	0.920	1.529	1,000	5.9	2.34	1.838	83%	New
New Outlet								-0.149						
4071	4073	155	1.15	1.15	0.002	0.170		0.172	800	6.4	2.10	1.056	16%	Existing
4072	4073	58	0.28	0.28	0.000	0.043		0.044	400	2.0	0.74	0.093	47%	Existing
4073	4075	176	1.21	2.64	0.005	0.392		0.397	600	10.7	2.25	0.636	62%	New
4074	4075	94	0.45	0.45	0.001	0.068		0.069	400	5.3	1.21	0.152	46%	Existing
4075	4077	74	0.40	3.49	0.006	0.503		0.509	600	8.1	1.95	0.551	92%	Existing
4076	4077	334	1.20	1.20	0.002	0.163		0.166	500	8.9	1.81	0.355	47%	Existing
4077	4078	94	0.58	5.27	0.009	0.732		0.741	900	2.0	1.27	0.808	92%	New
New Outlet								-0.714						
4078	4102	191	1.83	179.77	0.472	0.290	0.945	1.707	1,000	7.9	2.71	2.128	80%	New
New Outlet								-0.290						
4079	4080	107	1.37	1.37	0.002	0.226		0.228	600	2.0	0.97	0.274	83%	New
4080	4082	256	2.72	4.09	0.007	0.601		0.608	700	7.7	2.11	0.812	75%	New
4081	4082	165	0.95	0.95	0.002	0.140		0.141	800	13.9	3.10	1.558	9%	Existing
4082	4085	174	1.18	6.22	0.011	0.848		0.859	800	10.3	2.67	1.342	64%	Existing
4083	4084	80	0.64	0.64	0.001	0.098		0.099	400	32.5	2.99	0.376	26%	Existing
4084	4085	189	3.11	3.75	0.007	0.573		0.579	800	2.0	1.18	0.593	98%	New
4085	4087	182	1.07	11.04	0.019	1.406		1.425	1,200	2.0	1.54	1.742	82%	New
4086	4087	158	3.57	3.57	0.006	0.573		0.579	800	10.1	2.64	1.327	44%	Existing
4087	4091	78	0.26	14.87	0.026	1.838		1.864	1,300	2.0	1.63	2.164	86%	New
4090	4091	162	1.27	1.27	0.002	0.204		0.206	800	2.0	1.18	0.593	35%	Existing
4091	4097	96	0.43	16.57	0.029	1.984		2.013	1,300	2.0	1.63	2.164	93%	New
4092	4094	157	1.16	1.16	0.002	0.171		0.173	800	9.5	2.56	1.287	13%	Existing
4093	4094	69	0.31	0.31	0.001	0.048		0.048	600	37.6	4.21	1.190	4%	Existing
4094	4096	97	0.39	1.86	0.003	0.286		0.290	800	2.0	1.18	0.593	49%	Existing
4095	4096	87	0.24	0.24	0.000	0.037		0.037	800	2.0	1.18	0.593	6%	Existing
4096	4097	178	1.28	3.38	0.006	0.482		0.488	800	2.0	1.18	0.593	82%	New
4097	4099	215	2.23	22.18	0.038	2.470		2.508	1,200	5.9	2.65	2.997	84%	New
4098	4099	190	2.50	2.50	0.004	0.396		0.401	600	7.3	1.86	0.526	76%	New
4099	4101	68	0.35	25.03	0.043	2.724		2.767	1,400	2.9	2.06	3.171	87%	New
4100	4101	177	1.10	1.10	0.002	0.160		0.162	400	11.2	1.75	0.220	74%	Existing
4101	4102	174	1.27	27.40	0.048	2.828		2.876	1,500	2.0	1.79	3.163	91%	New
New Outlet								-2.733						
4102	4104	73	0.29	207.46	0.520	0.045	1.041	1.606	900	11.6	3.06	1.947	82%	New
Exs. Outlet								-0.045						
4103	4104	361	2.90	2.90	0.005	0.426		0.431	700	2.4	1.18	0.454	95%	New
Exs. Outlet								-0.416						
4104	4110	420	2.80	213.16	0.530	0.401	1.060	1.991	1,200	3.8	2.13	2.409	83%	New
New Outlet								-0.401						
4105	4106	62	0.54	0.54	0.001	0.083		0.084	500	12.9	2.18	0.428	20%	Existing
4106	4107	243	4.91	5.45	0.009	0.820		0.829	600	18.5	2.95	0.834	99%	Existing
4107	4110	627	4.81	10.26	0.008	1.209		1.218	900	4.7	1.95	1.241	98%	New
New Outlet								-1.193						
4108	4109	384	5.70	5.70	0.010	0.828		0.838	900	2.3	1.36	0.865	97%	New
4109	4110	99	0.67	6.37	0.011	0.875		0.886	1,000	2.0	1.37	1.076	82%	New
New Outlet								-0.853						
4110	4118	95	0.35	230.14	0.550	0.053	1.100	1.704	1,200	2.0	1.54	1.742	98%	New
New Outlet								-0.053						
4111	4112	152	1.46	1.46	0.003	0.216		0.218	800	34.2	4.87	2.448	9%	Existing
InFlow Area	4112		8.38	8.38	0.015	-		0.015						
4112	4113	358	9.88	11.34	0.034	1.564		1.598	900	13.9	3.35	2.131	75%	New
Exs. Outlet								-1.495						

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity				Planned Pipe Specification				Capacity	
		Increment	Increment	Total		Sanitary Sewage	Storm Water	Remain Sewage	Q ₁ (m ³ /s)	D (mm)	I (‰)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Existing New
4113	4114	177	3.39	14.73		0.040	0.539	0.080	0.660	900	2.2	1.33	0.846	78%	New
4114	4115	325	8.68	23.41		0.055	1.670		1.725	900	11.9	3.10	1.972	87%	New
4115	4117	166	0.74	24.15		0.056	1.664		1.721	1,200	2.0	1.54	1.742	99%	New
4116	4117	289	1.68	1.68		0.003	0.255		0.258	600	2.4	1.06	0.300	86%	New
4117	4118	80	0.36	26.19		0.060	1.872		1.932	1,100	5.1	2.32	2.205	88%	New
New Outlet									-1.752						
InFlow Area	4118		4.10	4.10		0.007	-		0.007						
4118	4120	447	8.80	265.13		0.633	1.245	1.265	3.142	1,400	4.2	2.48	3.818	82%	New
New Outlet									-1.245						
4119	4120	150	0.82	0.82		0.001	0.121		0.123	400	6.6	1.35	0.170	72%	Existing
New Outlet									-0.118						
Selita	4120		35.60	-		0.044	-		0.044						
4120	4122	583	2.62	268.57		0.683	0.351	1.365	2.399	1,100	6.6	2.64	2.509	96%	New
New Outlet									-0.351						
4121	4122	223	2.72	2.72		0.005	0.424		0.429	500	14.7	2.33	0.457	94%	New
New Outlet									-0.415						
4122	4132	234	4.20	275.49		0.695	0.652	1.389	2.736	1,500	2.0	1.79	3.163	86%	New
Exs. Outlet									-0.652						
4123	4124	110	1.10	1.10		0.002	0.181		0.183	500	2.7	1.00	0.196	93%	New
4124	4125	548	6.00	7.10		0.012	0.926		0.938	800	6.9	2.19	1.101	85%	New
4125	4129	368	4.50	11.60		0.020	1.327		1.347	800	18.4	3.57	1.794	75%	New
4126	4127	473	6.90	6.90		0.012	0.965		0.977	800	9.0	2.50	1.257	78%	New
4127	4128	341	7.50	14.40		0.025	1.774		1.799	1,000	7.6	2.66	2.089	86%	New
4128	4129	197	1.50	15.90		0.028	1.829		1.857	900	11.6	3.06	1.947	95%	New
4129	4131	130	0.80	28.30		0.049	3.106		3.155	900	37.6	5.52	3.512	90%	New
4130	4131	435	5.90	5.90		0.010	0.841		0.851	600	33.5	3.97	1.122	76%	New
4131	4132	213	0.90	35.10		0.061	3.604		3.665	1,600	2.0	1.87	3.760	97%	New
Exs. Outlet									-3.482						
4132	To STP	0	0.00	310.59		0.755		1.511	2.266	1,400	2.0	1.71	2.632	86%	New

Table 7.4.3 Study on Existing Sewer Improvement (Combined Case-2 : Supplementary Combined Sewer)

Sanitary Sewage Flow

Sanitary Sewage per Capita = 440 liter/day (Hourly Maximum)

Storm Water Flow

Rainfall Intensity Formula = 2750 (Return Period : 4 Year)

For Main Pipe ($D \geq 500$) $t + 17$

Rainfall Intensity Formula = 2520 (Return Period : 2.5 Year)

For Small Pipe ($D \leq 450$) $t + 17$

Runoff Coefficient = 0.5

Inlet Time = 5 min

Assumed Average Velocity = 1.5 m/sec

No.	Down	Length (m)	Area (ha)	Sewage	Existing Pipe Specification				Supplementary Pipe Specification				Total
	Stream	Increment	Total	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₂ (m ³ /s)
3001	3008	725	24.00	3.088	400	18.2	2.24	0.281	1,000	18.2	4.12	3.236	3.517
3002	3004	275	5.80	0.893	400	17.8	2.21	0.278	600	17.8	2.90	0.820	1.098
3003	3004	108	0.35	0.053	400	12.9	1.88	0.236					
3004	3007	42	6.25	0.947	400	57.1	3.96	0.498	400	57.1	3.96	0.498	0.995
3005	3006	203	1.43	0.209	300	9.8	1.35	0.095	350	9.8	1.50	0.144	0.240
3006	3007	130	1.88	0.259	400	49.2	3.68	0.462					
3007	3008	25	8.16	1.213	400	2.0	0.74	0.093	1,100	2.0	1.45	1.378	1.471
3008	3009	82	33.73	4.216	500	6.7	1.57	0.308	1,300	6.7	2.98	3.955	4.264
3009	3011	215	41.85	4.860	600	13.9	2.56	0.724	1,200	13.9	4.06	4.592	5.316
3010	3011	152	1.14	0.170	400	12.4	1.85	0.232					
3011	3013	66	43.19	4.914	600	21.2	3.16	0.893	1,100	21.2	4.74	4.505	5.398
3012	3013	149	0.90	0.135	400	7.3	1.42	0.178					
3013	3017	58	45.57	5.097	500	10.3	1.95	0.383	1,300	10.3	3.69	4.898	5.281
3014	3015	221	2.25	0.325	300	20.3	1.95	0.138	350	20.3	2.16	0.208	0.346
3015	3016	278	6.52	0.917	400	3.4	0.97	0.122	900	3.4	1.66	1.056	1.178
3016	3017	180	9.46	1.242	400	2.7	0.86	0.108	1,000	2.7	1.59	1.249	1.357
3017	3021	352	62.28	6.273	800	13.9	3.10	1.558	1,300	13.9	4.29	5.694	7.252
3018	3019	227	2.42	0.382	500	2.0	0.86	0.169	600	2.0	0.97	0.274	0.443
3019	3020	558	18.10	2.284	600	11.9	2.37	0.670	900	11.9	3.10	1.972	2.642
3020	3021	308	20.60	2.344	600	2.9	1.17	0.331	1,200	2.9	1.86	2.104	2.434
3021	3025	132	83.48	8.100	600	3.0	1.19	0.336	2,000	3.0	2.65	8.325	8.662
3022	3023	120	1.05	0.160	400	12.5	1.85	0.232					
3023	3024	268	2.98	0.438	500	19.0	2.65	0.520					
3024	3025	93	3.11	0.404	600	20.4	3.10	0.877					
3025	3026	63	86.89	8.289	600	7.9	1.93	0.546	1,700	7.9	3.86	8.761	9.307
3026	3027	190	89.39	8.118	800	24.7	4.13	2.076	1,290	24.7	5.42	6.130	8.206
3027	3029	71	89.59	7.990	600	18.3	2.94	0.831	1,400	18.3	5.17	7.959	8.790
Exs. Outlet				-7.511									
InFlow Area	3028		4.05	0.007									
3028	3029	543	11.05	1.014	800	14.7	3.19	1.603					
Exs. Outlet				-0.955									
3029	3032	256	103.84	1.047	800	15.2	3.24	1.629					
New Outlet				-0.493									
3030	3031	402	5.91	0.862	400	11.4	1.77	0.222	600	11.4	2.32	0.656	0.878
3031	3032	305	11.19	1.449	600	19.0	2.99	0.845	600	19.0	2.99	0.845	1.691
New Outlet				-1.390									
3032	3039	370	118.88	1.198	800	7.2	2.23	1.121	300	7.2	1.16	0.082	1.203
New Outlet				-0.563									
3033	3035	142	0.92	0.151	500	2.0	0.86	0.169					
3034	3035	83	0.81	0.125	400	2.0	0.74	0.093	300	2.0	0.61	0.043	0.136
3035	3036	85	2.67	0.421	400	10.7	1.71	0.215	400	10.7	1.71	0.215	0.430
3036	3038	169	4.02	0.589	500	8.2	1.74	0.342	450	8.2	1.62	0.258	0.599
3037	3038	278	1.60	0.226	500	10.4	1.96	0.385					
3038	3039	166	6.77	0.929	600	28.9	3.69	1.043					
New Outlet				-0.893									

No.	Down Stream	Length (m)		Area (ha)	Sewage $Q_1(m^3/s)$	Existing Pipe Specification				Supplementary Pipe Specification				Total $Q_2(m^3/s)$
		Increment	Total			D (mm)	I (%)	V (m/s)	$Q_2(m^3/s)$	D (mm)	I (%)	V (m/s)	$Q_2(m^3/s)$	
3039	3041	113	126.30	0.772		800	10.9	2.75	1.382					
New Outlet				-0.098										
3040	3041	155	1.46	0.218		400	27.7	2.76	0.347					
New Outlet				-0.210										
3041	3062	365	130.06	1.031		800	2.8	1.39	0.699	700	2.8	1.27	0.489	1.187
New Outlet				-0.337										
3042	3044	410	5.20	0.756		600	13.4	2.51	0.710	250	13.4	1.40	0.069	0.778
3043	3044	98	0.77	0.118		400	2.0	0.74	0.093	250	2.0	0.54	0.027	0.119
3044	3045	221	8.42	1.124		500	9.9	1.91	0.375	700	9.9	2.39	0.920	1.295
3045	3052	454	19.93	2.268		600	12.3	2.41	0.681	900	12.3	3.16	2.010	2.692
3046	3048	263	4.73	0.734		400	2.0	0.74	0.093	900	2.0	1.27	0.808	0.901
3047	3048	167	2.87	0.464		400	4.7	1.14	0.143	600	4.7	1.49	0.421	0.565
3048	3050	58	8.30	1.253		400	2.0	0.74	0.093	1,100	2.0	1.45	1.378	1.471
3049	3050	272	1.83	0.259		400	9.5	1.62	0.204	250	9.5	1.18	0.058	0.261
3050	3051	173	11.55	1.625		400	2.0	0.74	0.093	1,200	2.0	1.54	1.742	1.835
3051	3052	77	11.84	1.619		600	2.0	0.97	0.274	1,100	2.0	1.45	1.378	1.652
3052	3055	174	33.23	3.585		600	2.0	0.97	0.274	1,600	2.0	1.87	3.760	4.034
3053	3054	118	0.43	0.065		400	2.0	0.74	0.093					
3054	3055	98	0.78	0.113		500	6.7	1.57	0.308					
3055	3060	12	34.02	3.660		600	2.0	0.97	0.274	1,600	2.0	1.87	3.760	4.034
3056	3059	287	2.82	0.432		500	13.2	2.21	0.434					
3057	3059	203	1.29	0.188		500	17.2	2.52	0.495					
3058	3059	111	0.46	0.070		400	2.0	0.74	0.093					
3059	3060	235	5.75	0.800		600	8.8	2.04	0.577	450	8.8	1.68	0.267	0.844
3060	3061	114	40.22	4.179		600	2.0	0.97	0.274	1,700	2.0	1.94	4.403	4.678
3061	3062	348	48.69	4.590		600	6.7	1.78	0.503	1,400	6.7	3.13	4.818	5.322
New Outlet				-4.329										
3062	3075	514	188.05	2.287		800	3.6	1.58	0.794	1,100	3.6	1.95	1.853	2.647
New Outlet				-1.282										
3063	3065	256	1.33	0.190		600	7.8	1.92	0.543					
3064	3065	216	1.32	0.192		600	8.3	1.98	0.560					
3065	3067	86	3.40	0.509		600	2.0	0.97	0.274	600	2.0	0.97	0.274	0.549
3066	3067	232	2.02	0.317		600	9.0	2.06	0.582					
3067	3075	372	7.62	0.987		600	11.2	2.30	0.650	500	11.2	2.04	0.401	1.051
New Outlet				-0.946										
3068	3070	416	4.63	0.673		500	2.0	0.86	0.169	800	2.0	1.18	0.593	0.762
3069	3070	285	3.24	0.497		400	2.8	0.88	0.111	700	2.8	1.27	0.489	0.599
3070	3072	176	8.99	1.217		500	2.1	0.88	0.173	1,000	2.1	1.40	1.100	1.272
3071	3072	114	0.68	0.103		400	9.6	1.62	0.204					
3072	3074	100	10.08	1.314		500	2.9	1.04	0.204	1,000	2.9	1.64	1.288	1.492
3073	3074	127	0.86	0.130		400	14.9	2.02	0.254					
3074	3075	574	14.30	1.538		500	7.1	1.62	0.318	900	7.1	2.40	1.527	1.845
New Outlet				-1.462										
3075	3077	415	210.12	1.142		800	2.0	1.18	0.593	800	2.0	1.18	0.593	1.186
Exs. Outlet				-0.020										
3076	3077	220	1.93	0.306		500	9.0	1.82	0.357					
Exs. Outlet				-0.295										
3077	3079	270	214.85	1.575		800	2.0	1.18	0.593	1,000	2.0	1.37	1.076	1.669
New Outlet				-0.428										
3078	3079	533	5.32	0.738		300	2.0	0.61	0.043	900	2.0	1.27	0.808	0.851
New Outlet				-0.709										
3079	3085	233	220.93	1.288		800	2.0	1.18	0.593	900	2.0	1.27	0.808	1.401
New Outlet				-0.108										
3080	3082	134	0.47	0.071		200	10.4	1.06	0.033	250	10.4	1.24	0.061	0.094
3081	3082	70	1.43	0.242		400	2.0	0.74	0.093	500	2.0	0.86	0.169	0.262

No.	Down	Length (m)	Area (ha)	Sewage	Existing Pipe Specification				Supplementary Pipe Specification				Total	
	Stream	Increment	Total	Q ₁ (m³/s)	D (mm)	I (%)	V (m/s)	Q ₂ (m³/s)	D (mm)	I (%)	V (m/s)	Q ₂ (m³/s)		Q ₂ (m³/s)
	3082	3084	47	2.11	0.340	400	2.0	0.74	0.093	600	2.0	0.97	0.274	0.367
	3083	3084	212	1.68	0.266	500	2.0	0.86	0.169	450	2.0	0.80	0.127	0.296
	3084	3085	70	4.00	0.616	500	2.0	0.86	0.169	800	2.0	1.18	0.593	0.762
New Outlet				-0.594										
	3085	3104	421	228.05	1.664	1000	5.8	2.32	1.822					
New Outlet				-0.446										
	3086	3087	290	2.72	0.417	300	6.8	1.13	0.080	600	6.8	1.79	0.506	0.586
	3087	3092	95	3.02	0.407	400	27.3	2.74	0.344	250	27.3	2.00	0.098	0.442
	3088	3089	52	0.36	0.056	300	2.0	0.61	0.043	200	2.0	0.47	0.015	0.058
	3089	3092	220	1.61	0.228	400	20.8	2.39	0.300					
	3091	3092	199	5.17	0.825	300	3.0	0.75	0.053	900	3.0	1.56	0.992	1.045
	3092	3096	344	14.44	1.858	500	4.9	1.35	0.265	1,000	4.9	2.14	1.681	1.946
	3093	3095	327	1.95	0.294	300	2.0	0.61	0.043	600	2.0	0.97	0.274	0.317
	3094	3095	290	2.15	0.330	300	6.8	1.13	0.080	500	6.8	1.59	0.312	0.392
	3095	3096	267	4.40	0.595	400	5.4	1.22	0.153	600	5.4	1.60	0.452	0.606
	3096	3097	191	19.22	2.314	600	9.9	2.16	0.611	900	9.9	2.83	1.800	2.411
	3097	3100	30	19.24	2.288	600	2.0	0.97	0.274	1,300	2.0	1.63	2.164	2.438
	3098	3099	91	0.34	0.052	300	2.0	0.61	0.043	200	2.0	0.47	0.015	0.058
	3099	3100	251	1.58	0.217	600	8.8	2.04	0.577					
	3100	3103	93	21.60	2.494	800	2.0	1.18	0.593	1,300	2.0	1.63	2.164	2.757
	3101	3102	230	1.92	0.302	300	2.0	0.61	0.043	600	2.0	0.97	0.274	0.317
	3102	3103	239	4.12	0.586	600	8.9	2.05	0.580	200	8.9	0.98	0.031	0.610
	3103	3104	101	26.54	2.969	800	2.0	1.18	0.593	1,400	2.0	1.71	2.632	3.225
New Outlet				-2.827										
	3104	3107	257	257.00	1.742	1000	2.0	1.37	1.076	900	2.0	1.27	0.808	1.884
New Outlet				-0.370										
	3105	3106	187	1.49	0.239	800	2.1	1.21	0.608					
	3106	3107	210	3.31	0.485	500	2.0	0.86	0.169	700	2.0	1.08	0.416	0.584
New Outlet				-0.467										
	3107	3109	667	271.91	2.959	1000	3.1	1.70	1.335	1,100	3.1	1.81	1.720	3.055
New Outlet				-1.507										
	3108	3109	193	2.23	0.357	500	5.1	1.37	0.269	350	5.1	1.08	0.104	0.373
New Outlet				-0.345										
	3109	3113	456	279.07	2.185	1000	2.0	1.37	1.076	1,100	2.0	1.45	1.378	2.454
New Outlet				-0.695										
	3110	3112	491	2.69	0.378	600	5.2	1.57	0.444					
	3111	3112	181	4.18	0.673	400	7.7	1.45	0.182	600	7.7	1.91	0.540	0.722
	3112	3113	489	11.28	1.330	600	2.0	0.97	0.274	1,000	2.0	1.37	1.076	1.350
New Outlet				-1.269										
	3113	3127	20	290.85	1.554	1000	2.0	1.37	1.076	800	2.0	1.18	0.593	1.669
Exs. Outlet				0.000										
	3114	3116	579	3.68	0.501	500	4.6	1.30	0.255	500	4.6	1.30	0.255	0.511
	3115	3116	67	0.44	0.069	400	8.9	1.56	0.196					
	3116	3118	68	4.44	0.589	600	10.2	2.19	0.619					
	3117	3118	70	1.40	0.237	400	2.0	0.74	0.093	500	2.0	0.86	0.169	0.262
	3118	3121	199	8.22	1.015	1000x500	2.0	1.32	0.594	800	2.0	1.18	0.593	1.187
	3119	3120	268	3.27	0.505	400	6.3	1.32	0.166	600	6.3	1.72	0.486	0.652
	3120	3121	213	6.43	0.911	500	7.9	1.71	0.336	700	7.9	2.14	0.824	1.159
	3121	3125	232	17.05	1.946	500	9.7	1.89	0.371	900	9.7	2.80	1.781	2.152
	3122	3124	276	2.60	0.400	400	9.4	1.61	0.202	400	9.4	1.61	0.202	0.405
	3123	3124	124	1.80	0.297	400	3.2	0.94	0.118	500	3.2	1.09	0.214	0.332
	3124	3125	208	5.21	0.736	400	2.0	0.74	0.093	900	2.0	1.27	0.808	0.901
	3125	3126	500	26.84	2.643	400	10.3	1.68	0.211	1,000	10.3	3.10	2.435	2.646
	3126	3127	1009	26.84	2.070	600	3.2	1.23	0.348	1,100	3.2	1.84	1.749	2.096
Exs. Outlet				-1.926										

No.	Down Stream	Length (m)	Area (ha)		Sewage $Q_1(m^3/s)$	Existing Pipe Specification				Supplementary Pipe Specification				Total $Q_2(m^3/s)$
			Increment	Total		D (mm)	I (%)	V (m/s)	$Q_2(m^3/s)$	D (mm)	I (%)	V (m/s)	$Q_2(m^3/s)$	
3127	3152	97	317.74	1.697										
Exs. Outlet														
3128	3129	254	2.27	0.354	300	8.2	1.24	0.088	500	8.2	1.74	0.342	0.429	
3129	3131	71	3.60	0.544	400	2.0	0.74	0.093	800	2.0	1.18	0.593	0.686	
3130	3131	201	1.00	0.146	400	8.9	1.56	0.196						
3131	3136	122	6.00	0.859	500	2.0	0.86	0.169	900	2.0	1.27	0.808	0.977	
3132	3133	124	0.60	0.091	300	9.6	1.34	0.095						
3133	3135	95	1.00	0.145	400	9.4	1.61	0.202						
3134	3135	149	1.16	0.189	400	2.6	0.85	0.107	400	2.6	0.85	0.107	0.214	
3135	3136	20	2.21	0.346	400	2.0	0.74	0.093	600	2.0	0.97	0.274	0.367	
3136	3141	287	12.31	1.579	600	9.4	2.11	0.597	800	9.4	2.55	1.282	1.878	
3137	3138	328	3.02	0.456	500	8.5	1.77	0.348	350	8.5	1.40	0.135	0.482	
3138	3140	138	3.62	0.515	600	2.0	0.97	0.274	600	2.0	0.97	0.274	0.549	
3139	3140	122	4.10	0.677	400	7.3	1.42	0.178	600	7.3	1.86	0.526	0.704	
3140	3141	68	8.11	1.125	800	2.0	1.18	0.593	800	2.0	1.18	0.593	1.186	
3141	3142	120	20.85	2.565	800	2.0	1.18	0.593	1,300	2.0	1.63	2.164	2.757	
3142	3148	281	22.10	2.479	800	6.9	2.19	1.101	900	6.9	2.36	1.501	2.602	
3143	3144	159	1.39	0.207	300	16.9	1.78	0.126	300	16.9	1.78	0.126	0.252	
3144	3145	302	3.15	0.450	400	8.9	1.56	0.196	450	8.9	1.69	0.269	0.465	
3145	3147	248	9.13	1.183	500	6.5	1.55	0.304	800	6.5	2.12	1.066	1.370	
3146	3147	185	0.70	0.103	600	4.3	1.42	0.401						
3147	3148	497	17.27	1.894	600	4.6	1.47	0.416	1,000	4.6	2.07	1.626	2.041	
3148	3151	367	40.56	3.994	1000	4.6	2.07	1.626	1,200	4.6	2.34	2.646	4.272	
3149	3150	218	0.70	0.102	300	15.1	1.68	0.119						
3150	3151	404	4.17	0.559	400	2.7	0.86	0.108	700	2.7	1.25	0.481	0.589	
3151	3152	430	47.03	4.139	1000	2.0	1.37	1.076	1,500	2.0	1.79	3.163	4.239	
Exs. Outlet				-3.887										
3152	3154	43	364.83	1.949										
3153	3154	464	1.32	0.188	400	2.0	0.74	0.093	450	2.0	0.80	0.127	0.220	
Exs. Outlet				-0.181										
3154	3157	22	366.16	1.956										
3155	3156	537	3.38	0.467	300	8.3	1.25	0.088	600	8.3	1.98	0.560	0.648	
3156	3157	480	6.83	0.796	400	2.0	0.74	0.093	900	2.0	1.27	0.808	0.901	
Exs. Outlet				-0.759										
3157	3164	181	373.69	1.996										
3158	3159	175	1.41	0.228	300	2.8	0.72	0.051	500	2.8	1.02	0.200	0.251	
3159	3161	149	2.22	0.335	400	3.3	0.95	0.119	500	3.3	1.10	0.216	0.335	
3160	3161	169	1.25	0.202	400	2.0	0.74	0.093	450	2.0	0.80	0.127	0.220	
3161	3163	194	8.97	1.248	600	2.0	0.97	0.274	1,000	2.0	1.37	1.076	1.350	
3162	3163	150	2.50	0.407	400	2.0	0.74	0.093	700	2.0	1.08	0.416	0.509	
3163	3164	189	12.27	1.589	600	4.2	1.41	0.399	1,000	4.2	1.98	1.555	1.954	
Exs. Outlet				-1.524										
3164	3170	439	389.66	2.081										
3165	3166	479	4.05	0.574	300	9.1	1.31	0.093	600	9.1	2.07	0.585	0.678	
3166	3167	106	4.61	0.626	300	2.0	0.61	0.043	800	2.0	1.18	0.593	0.636	
3167	3168	144	5.79	0.745	800	4.3	1.73	0.870						
3168	3169	137	6.76	0.829	800	2.0	1.18	0.593	600	2.0	0.97	0.274	0.867	
3169	3170	392	6.76	0.729	800	13.0	3.00	1.508						
Exs. Outlet				-0.693										
3170	To STP	930	396.42	2.118										
4001	4002	24	5.70	0.986	200	41.6	2.13	0.067	600	41.6	4.43	1.253	1.319	
4002	4003	64	8.60	1.443	300	46.8	2.96	0.209	600	46.8	4.70	1.329	1.538	

No.	Down Stream	Length (m)		Area (ha)	Sewage Q ₁ (m ³ /s)	Existing Pipe Specification				Supplementary Pipe Specification				Total Q ₂ (m ³ /s)
		Increment	Total			D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	
Shkoza	4003		-		0.033									
	4003	4004	837	21.60	2.625	400	8.0	1.48	0.186	1,100	8.0	2.91	2.765	2.951
	4004	4006	46	21.95	2.627	300	73.1	3.70	0.262	700	73.1	6.51	2.505	2.767
InFlow Area	4005		10.78	0.019										
	4005	4006	637	4.60	0.630	300	17.5	1.81	0.128	600	17.5	2.87	0.811	0.939
	4006	4007	34	26.80	3.182	300	11.7	1.48	0.105	1,100	11.7	3.52	3.345	3.450
New Outlet					-2.886									
	4007	4011	295	29.22	0.674	400	8.1	1.49	0.187	600	8.1	1.95	0.551	0.739
	4009	4010	147	0.72	0.108	300	10.2	1.38	0.098	200	10.2	1.05	0.033	0.131
	4010	4011	538	12.50	1.635	400	15.7	2.08	0.261	800	15.7	3.30	1.659	1.920
	4011	4012	74	44.40	2.598	400	7.6	1.44	0.181	1,100	7.6	2.84	2.699	2.880
Exs. Outlet					-2.211									
	4012	4013	162	46.65	0.760	400	9.2	1.59	0.200	600	9.2	2.08	0.588	0.788
Exs. Outlet					-0.361									
	4013	4015	156	48.21	0.658	400	5.1	1.18	0.148	700	5.1	1.72	0.662	0.810
	4014	4015	377	2.17	0.294	400	15.6	2.07	0.260	200	15.6	1.30	0.041	0.301
	4015	4017	266	53.06	1.349	400	12.0	1.82	0.229	800	12.0	2.88	1.448	1.676
New Outlet					-0.917									
	4016	4017	913	12.80	1.590	800	22.8	3.97	1.996					
New Outlet					-1.523									
	4017	4024	154	66.74	0.633	800	20.1	3.73	1.875					
New Outlet					-0.130									
	4018	4021	313	5.26	0.797	300	17.2	1.79	0.127	600	17.2	2.85	0.806	0.932
	4019	4020	68	1.00	0.169	300	2.0	0.61	0.043	450	2.0	0.80	0.127	0.170
	4020	4021	260	2.03	0.281	300	19.8	1.92	0.136	350	19.8	2.13	0.205	0.341
	4021	4022	57	7.64	1.123	400	24.8	2.61	0.328	600	24.8	3.42	0.967	1.295
	4022	4023	36	8.17	1.183	400	55.5	3.90	0.490	500	55.5	4.53	0.889	1.380
New Outlet					-1.140									
InFlow Area	4023		4.01	0.007										
	4023	4024	446	12.77	1.631	400	9.1	1.58	0.199	900	9.1	2.71	1.724	1.923
New Outlet					-1.543									
	4024	4025	170	80.39	0.724	800	10.5	2.70	1.357					
New Outlet					-0.129									
InFlow Area	4025		7.30	0.013										
	4025	4028	196	81.36	0.779	800	22.4	3.94	1.980					
New Outlet					-0.140									
Student's	4026		-	0.028										
	4026	4027	976	12.24	1.474	400	30.2	2.88	0.362	700	30.2	4.18	1.609	1.971
New Outlet					-1.328									
	4027	4028	305	13.74	0.361	500	7.5	1.67	0.328	250	7.5	1.05	0.052	0.379
New Outlet					-0.207									
InFlow Area	4028		14.00	0.024										
	4028	4034	183	95.95	0.994	800	2.0	1.18	0.593	700	2.0	1.08	0.416	1.009
New Outlet					-0.124									
	4029	4030	52	1.41	0.221	300	57.6	3.28	0.232					
	4030	4031	215	3.33	0.515	400	6.9	1.38	0.173	600	6.9	1.80	0.509	0.682
	4031	4036	178	4.11	0.591	500	2.0	0.86	0.169	800	2.0	1.18	0.593	0.762
	4032	4033	77	0.65	0.100	200	87.0	3.08	0.097	200	87.0	3.08	0.097	0.194
	4033	4034	153	1.53	0.220	300	23.5	2.10	0.148	250	23.5	1.86	0.091	0.240

No.	Down Stream	Length (m)		Area (ha)	Sewage Q ₁ (m³/s)	Existing Pipe Specification				Supplementary Pipe Specification				Total Q ₂ (m³/s)
		Increment	Total			D (mm)	I (‰)	V (m/s)	Q ₂ (m³/s)	D (mm)	I (‰)	V (m/s)	Q ₂ (m³/s)	
4034	4035	169	5.71	0.836	400	20.1	2.35	0.295	600	20.1	3.08	0.871	1.166	
4035	4036	55	5.98	0.856	500	12.7	2.17	0.426	600	12.7	2.45	0.693	1.119	
4036	4045	343	12.73	1.596	500	29.5	3.30	0.648	600	29.5	3.73	1.055	1.703	
4037	4038	175	2.49	0.369	300	18.2	1.85	0.131	400	18.2	2.24	0.281	0.412	
4038	4041	89	3.16	0.450	400	26.9	2.72	0.342	300	26.9	2.24	0.158	0.500	
4039	4040	119	0.88	0.134	300	47.0	2.97	0.210						
4040	4041	50	0.98	0.158	400	2.0	0.74	0.093	400	2.0	0.74	0.093	0.186	
4041	4042	210	4.90	0.694	400	19.5	2.31	0.290	500	19.5	2.69	0.528	0.818	
4042	4045	10	4.91	0.693	500	3.4	1.12	0.220	700	3.4	1.40	0.539	0.759	
New Outlet				-0.667										
4043	4044	119	0.55	0.084	300	42.5	2.82	0.199						
4044	4045	259	1.36	0.184	400	16.9	2.15	0.270						
New Outlet				-0.177										
4045	4053	231	20.43	0.328	500	4.3	1.26	0.247	350	4.3	0.99	0.095	0.343	
4046	4047	168	1.02	0.165	300	2.3	0.66	0.047	450	2.3	0.86	0.137	0.183	
4047	4048	161	2.26	0.340	400	2.0	0.74	0.093	600	2.0	0.97	0.274	0.367	
4048	4050	423	11.40	1.452	500	30.2	3.34	0.656	600	30.2	3.77	1.066	1.722	
New Outlet				-1.393										
4049	4050	197	0.88	0.129	500	31.4	3.41	0.670						
New Outlet				-0.124										
4050	4051	253	15.06	0.506	400	7.1	1.40	0.176	600	7.1	1.83	0.517	0.693	
Exs. Outlet				-0.428										
4051	4052	354	21.94	1.129	400	2.8	0.88	0.111	1,000	2.8	1.62	1.272	1.383	
InFlow Area	4052		21.39	0.037										
4052	4053	404	29.99	2.143	600	9.9	2.16	0.611	900	9.9	2.83	1.800	2.411	
4053	4054	70	50.72	2.415	600	4.2	1.41	0.399	1,200	4.2	2.23	2.522	2.921	
New Outlet				-2.039										
4054	4056	115	146.98	1.293	800	2.0	1.18	0.593	900	2.0	1.27	0.808	1.401	
New Outlet				-0.047										
4055	4056	265	2.53	0.392	500	8.6	1.78	0.350	250	8.6	1.12	0.055	0.404	
New Outlet				-0.379										
4056	4060	99	149.85	1.313	800	2.0	1.18	0.593	900	2.0	1.27	0.808	1.401	
New Outlet				-0.052										
4057	4059	62	0.50	0.078	400	2.0	0.74	0.093						
4058	4059	58	1.22	0.208	400	2.0	0.74	0.093	450	2.0	0.80	0.127	0.220	
4059	4060	279	9.36	1.402	500	14.9	2.35	0.461	700	14.9	2.94	1.131	1.593	
New Outlet				-1.353										
4060	4062	25	159.24	1.315	800	2.0	1.18	0.593	900	2.0	1.27	0.808	1.401	
Exs. Outlet				-0.005										
4061	4062	712	4.94	0.640	400	5.7	1.25	0.157	700	5.7	1.82	0.700	0.857	
Exs. Outlet				-0.614										
4062	4064	88	164.45	1.378	800	2.0	1.18	0.593	900	2.0	1.27	0.808	1.401	
New Outlet				-0.041										
4063	4064	258	2.07	0.321	600	2.0	0.97	0.274	350	2.0	0.68	0.065	0.340	
New Outlet				-0.310										
4064	4068	93	166.83	1.397	800	2.0	1.18	0.593	900	2.0	1.27	0.808	1.401	
Exs. Outlet				-0.047										
4065	4068	461	3.64	0.519	600	3.6	1.30	0.368	450	3.6	1.08	0.172	0.539	
Exs. Outlet				-0.500										
4068	4070	168	171.27	1.490	800	2.0	1.18	0.593	1,000	2.0	1.37	1.076	1.669	
New Outlet				-0.117										

No.	Down Stream	Length (m)		Area (ha)	Sewage $Q_1(m^3/s)$	Existing Pipe Specification				Supplementary Pipe Specification				Total $Q_2(m^3/s)$
		Increment	Total			D (mm)	I (%)	V (m/s)	$Q_2(m^3/s)$	D (mm)	I (%)	V (m/s)	$Q_2(m^3/s)$	
4069	4070	77	0.38	0.059		400	5.1	1.18	0.148					
New Outlet				-0.057										
4070	4078	179	172.67	1.529		800	5.9	2.02	1.015	700	5.9	1.85	0.712	1.727
New Outlet				-0.149										
4071	4073	155	1.15	0.172		800	6.4	2.10	1.056					
4072	4073	58	0.28	0.044		400	2.0	0.74	0.093					
4073	4075	176	2.64	0.397		500	10.7	1.99	0.391	200	10.7	1.08	0.034	0.425
4074	4075	94	0.45	0.069		400	5.3	1.21	0.152					
4075	4077	74	3.49	0.509		600	8.1	1.95	0.551					
4076	4077	334	1.20	0.166		500	8.9	1.81	0.355					
4077	4078	94	5.27	0.741		800	2.0	1.18	0.593	500	2.0	0.86	0.169	0.762
New Outlet				-0.714										
4078	4102	191	179.77	1.707		800	7.9	2.34	1.176	600	7.9	1.93	0.546	1.722
New Outlet				-0.290										
4079	4080	107	1.37	0.228		400	2.0	0.74	0.093	500	2.0	0.86	0.169	0.262
4080	4082	256	4.09	0.608		400	7.7	1.45	0.182	600	7.7	1.91	0.540	0.722
4081	4082	165	0.95	0.141		800	13.9	3.10	1.558					
4082	4085	174	6.22	0.859		800	10.3	2.67	1.342					
4083	4084	80	0.64	0.099		400	32.5	2.99	0.376					
4084	4085	189	3.75	0.579		500	2.0	0.86	0.169	700	2.0	1.08	0.416	0.584
4085	4087	182	11.04	1.425		600	2.0	0.97	0.274	1,100	2.0	1.45	1.378	1.652
4086	4087	158	3.57	0.579		800	10.1	2.64	1.327					
4087	4091	78	14.87	1.864		800	2.0	1.18	0.593	1,100	2.0	1.45	1.378	1.971
4090	4091	162	1.27	0.206		800	2.0	1.18	0.593					
4091	4097	96	16.57	2.013		800	2.0	1.18	0.593	1,200	2.0	1.54	1.742	2.335
4092	4094	157	1.16	0.173		800	9.5	2.56	1.287					
4093	4094	69	0.31	0.048		600	37.6	4.21	1.190					
4094	4096	97	1.86	0.290		800	2.0	1.18	0.593					
4095	4096	87	0.24	0.037		800	2.0	1.18	0.593					
4096	4097	178	3.38	0.488		500	2.0	0.86	0.169	700	2.0	1.08	0.416	0.584
4097	4099	215	22.18	2.508		600	5.9	1.67	0.472	1,100	5.9	2.50	2.376	2.848
4098	4099	190	2.50	0.401		500	7.3	1.64	0.322	300	7.3	1.17	0.083	0.405
4099	4101	68	25.03	2.767		1000	2.9	1.64	1.288	1,100	2.9	1.75	1.663	2.951
4100	4101	177	1.10	0.162		400	11.2	1.75	0.220					
4101	4102	174	27.40	2.876		1000	2.0	1.37	1.076	1,300	2.0	1.63	2.164	3.240
New Outlet				-2.733										
4102	4104	73	207.46	1.606		800	11.6	2.83	1.423	400	11.6	1.78	0.224	1.646
Exs. Outlet				-0.045										
4103	4104	361	2.90	0.431		400	2.4	0.81	0.102	700	2.4	1.18	0.454	0.556
Exs. Outlet				-0.416										
4104	4110	420	213.16	1.991		800	3.8	1.62	0.814	1,000	3.8	1.88	1.477	2.291
New Outlet				-0.401										
4105	4106	62	0.54	0.084		500	12.9	2.18	0.428					
4106	4107	243	5.45	0.829		600	18.5	2.95	0.834					
4107	4110	627	10.26	1.218		800	4.7	1.80	0.905	600	4.7	1.49	0.421	1.326
New Outlet				-1.193										
4108	4109	384	5.70	0.838		500	2.3	0.92	0.181	900	2.3	1.36	0.865	1.046
4109	4110	99	6.37	0.886		600	2.0	0.97	0.274	900	2.0	1.27	0.808	1.082
New Outlet				-0.853										
4110	4118	95	230.14	1.704		1000	2.0	1.37	1.076	900	2.0	1.27	0.808	1.884
New Outlet				-0.053										
4111	4112	152	1.46	0.218		800	34.2	4.87	2.448					
InFlow Area	4112		8.38	0.015										
4112	4113	358	11.34	1.598		800	13.9	3.10	1.558	250	13.9	1.43	0.070	1.628
Exs. Outlet				-1.495										

No.	Down Stream	Length (m)		Area (ha)		Sewage $Q_1(m^3/s)$	Existing Pipe Specification				Supplementary Pipe Specification				Total $Q_2(m^3/s)$
		Increment	Total				D (mm)	I (‰)	V (m/s)	$Q_2(m^3/s)$	D (mm)	I (‰)	V (m/s)	$Q_2(m^3/s)$	
4113	4114	177	14.73	0.660	500	2.2	0.90	0.177	800	2.2	1.23	0.618	0.795		
4114	4115	325	23.41	1.725	500	11.9	2.10	0.412	800	11.9	2.87	1.443	1.855		
4115	4117	166	24.15	1.721	500	2.0	0.86	0.169	1,200	2.0	1.54	1.742	1.911		
4116	4117	289	1.68	0.258	200	2.4	0.51	0.016	600	2.4	1.06	0.300	0.316		
4117	4118	80	26.19	1.932	500	5.1	1.37	0.269	1,000	5.1	2.18	1.712	1.981		
New Outlet				-1.752											
InFlow Area	4118		4.10	0.007											
4118	4120	447	265.13	3.142	1000	4.2	1.98	1.555	1,100	4.2	2.11	2.005	3.560		
New Outlet				-1.245											
4119	4120	150	0.82	0.123	400	6.6	1.35	0.170							
New Outlet				-0.118											
Selita	4120		-	0.044											
4120	4122	583	268.57	2.399	1000	6.6	2.48	1.948	600	6.6	1.76	0.498	2.445		
New Outlet				-0.351											
4121	4122	223	2.72	0.429	300	14.7	1.66	0.117	450	14.7	2.17	0.345	0.462		
New Outlet				-0.415											
4122	4132	234	275.49	2.736	1000	2.0	1.37	1.076	1,200	2.0	1.54	1.742	2.818		
Exs. Outlet				-0.652											
4123	4124	110	1.10	0.183	300	2.7	0.71	0.050	450	2.7	0.93	0.148	0.198		
4124	4125	548	7.10	0.938	400	6.9	1.38	0.173	700	6.9	2.00	0.770	0.943		
4125	4129	368	11.60	1.347	500	18.4	2.61	0.512	700	18.4	3.26	1.255	1.767		
4126	4127	473	6.90	0.977	400	9.0	1.57	0.197	700	9.0	2.28	0.877	1.075		
4127	4128	341	14.40	1.799	300	7.6	1.19	0.084	1,000	7.6	2.66	2.089	2.173		
4128	4129	197	15.90	1.857	400	11.6	1.78	0.224	900	11.6	3.06	1.947	2.170		
4129	4131	130	28.30	3.155	400	37.6	3.21	0.403	900	37.6	5.52	3.512	3.915		
4130	4131	435	5.90	0.851	400	33.5	3.03	0.381	450	33.5	3.28	0.522	0.902		
4131	4132	213	35.10	3.665	400	2.0	0.74	0.093	1,600	2.0	1.87	3.760	3.853		
Exs. Outlet				-3.482											
4132	To STP	0	310.59	2.266	1000	2.0	1.37	1.076	1,100	2.0	1.45	1.378	2.454		

Table 7.4.4 Study on Existing Sewer Improvement (Separate Case-1 : New Storm Sewer)

Storm Water Flow

Rainfall Intensity Formula	=	2750	(Return Period : 4 Year)
For Main Pipe ($D \geq 500$)	=	$t + 17$	
Rainfall Intensity Formula	=	2520	(Return Period : 2.5 Year)
For Small Pipe ($D \leq 450$)	=	$t + 17$	
Runoff Coefficient	=	0.5	
Inlet Time	=	5 min	
Assumed Average Velocity	=	1.5 m/sec	

No.	Down Stream	Length (m)		Area (ha)		Storm Water Quantity		Planned Pipe Specification				Capacity	
		Increment	Total	Increment	Total	Time	$Q_1(m^3/s)$	D (mm)	I (%)	V (m/s)	$Q_2(m^3/s)$	Q_1/Q_2	Judge
3001	3008	725	725	24.00	24.00	13.1	3.045	1000	18.2	4.12	3.236	94%	OK
3002	3004	275	275	5.80	5.80	8.1	0.883	700	17.8	3.21	1.235	71%	OK
3003	3004	108	108	0.35	0.35	6.2	0.053	250	12.9	1.38	0.068	78%	OK
3004	3007	42	317	0.10	6.25	8.5	0.936	600	57.1	5.19	1.467	64%	OK
3005	3006	203	203	1.43	1.43	7.3	0.206	400	9.8	1.64	0.206	100%	OK
3006	3007	130	333	0.45	1.88	8.7	0.256	350	49.2	3.36	0.323	79%	OK
3007	3008	25	358	0.03	8.16	9.0	1.199	1100	2.0	1.45	1.378	87%	OK
3008	3009	82	807	1.57	33.73	14.0	4.156	1400	6.7	3.13	4.818	86%	OK
3009	3011	215	1022	8.12	41.85	16.4	4.786	1300	13.9	4.29	5.694	84%	OK
3010	3011	152	152	1.14	1.14	6.7	0.168	400	12.4	1.85	0.232	72%	OK
3011	3013	66	1088	0.20	43.19	17.1	4.838	1200	21.2	5.02	5.677	85%	OK
3012	3013	149	149	0.90	0.90	6.7	0.133	400	7.3	1.42	0.178	74%	OK
3013	3017	58	1146	1.48	45.57	17.7	5.016	1400	10.3	3.88	5.973	84%	OK
3014	3015	221	221	2.25	2.25	7.5	0.321	450	20.3	2.55	0.406	79%	OK
3015	3016	278	499	4.27	6.52	10.5	0.906	900	3.4	1.66	1.056	86%	OK
3016	3017	180	679	2.94	9.46	12.5	1.225	1000	2.7	1.59	1.249	98%	OK
3017	3021	352	1498	7.25	62.28	21.6	6.163	1400	13.9	4.50	6.927	89%	OK
3018	3019	227	227	2.42	2.42	7.5	0.377	700	2.0	1.08	0.416	91%	OK
3019	3020	558	785	15.68	18.10	13.7	2.252	1000	11.9	3.33	2.615	86%	OK
3020	3021	308	1093	2.50	20.60	17.1	2.307	1300	2.9	1.96	2.602	89%	OK
3021	3025	132	1630	0.60	83.48	23.1	7.951	2000	3.0	2.65	8.325	96%	OK
3022	3023	120	120	1.05	1.05	6.3	0.158	350	12.5	1.70	0.164	96%	OK
3023	3024	268	388	1.93	2.98	9.3	0.433	500	19.0	2.65	0.520	83%	OK
3024	3025	93	481	0.13	3.11	10.3	0.399	450	20.4	2.56	0.407	98%	OK
3025	3026	63	1693	0.30	86.89	23.8	8.134	1700	7.9	3.86	8.761	93%	OK
3026	3027	190	1883	2.50	89.39	25.9	7.959	1400	24.7	6.00	9.236	86%	OK
3027	Exs. Outlet	71	1954	0.20	89.59	26.7	7.830	1400	18.3	5.17	7.959	98%	OK
3028	Exs. Outlet	543	543	7.00	7.00	11.0	0.955	700	14.7	2.92	1.124	85%	OK
Exs. Outlet	Lana River	-	1954	-	96.59	26.7	8.442	1900	5.0	3.31	9.385	90%	OK
3029	New Outlet	256	256	3.20	3.20	7.8	0.493	600	15.2	2.68	0.758	65%	OK
3030	3031	402	402	5.91	5.91	9.5	0.852	700	11.4	2.57	0.989	86%	OK
3031	New Outlet	305	707	5.28	11.19	12.9	1.429	800	19.0	3.63	1.825	78%	OK
New Outlet	Lana River	-	707	-	14.39	12.9	1.838	1100	5.0	2.30	2.186	84%	OK
3032	New Outlet	370	370	3.85	3.85	9.1	0.563	700	7.2	2.04	0.785	72%	OK
3033	3035	142	142	0.92	0.92	6.6	0.149	500	2.0	0.86	0.169	88%	OK
3034	3035	83	83	0.81	0.81	5.9	0.124	450	2.0	0.80	0.127	97%	OK
3035	3036	85	227	0.94	2.67	7.5	0.416	600	10.7	2.25	0.636	65%	OK
3036	3038	169	396	1.35	4.02	9.4	0.582	700	8.2	2.18	0.839	69%	OK
3037	3038	278	278	1.60	1.60	8.1	0.223	450	10.4	1.83	0.291	77%	OK
3038	New Outlet	166	562	1.15	6.77	11.2	0.917	600	28.9	3.69	1.043	88%	OK
New Outlet	Lana River	-	562	-	10.62	11.2	1.438	1000	5.0	2.16	1.696	85%	OK
3039	New Outlet	113	113	0.65	0.65	6.3	0.098	300	10.9	1.43	0.101	97%	OK
3040	New Outlet	155	155	1.46	1.46	6.7	0.216	350	27.7	2.52	0.242	89%	OK
New Outlet	Lana River	-	155	-	2.11	6.7	0.340	600	5.0	1.54	0.435	78%	OK
3041	New Outlet	365	365	2.30	2.30	9.1	0.337	700	2.8	1.27	0.489	69%	OK
3042	3044	410	410	5.20	5.20	9.6	0.747	700	13.4	2.79	1.074	70%	OK
3043	3044	98	98	0.77	0.77	6.1	0.117	450	2.0	0.80	0.127	92%	OK
3044	3045	221	631	2.45	8.42	12.0	1.109	800	9.9	2.62	1.317	84%	OK

No.	Down Stream	Length (m)		Area (ha)		Storm Water Quantity		Planned Pipe Specification				Capacity	
		Increment	Total	Increment	Total	Time	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge
3045	3052	454	1085	11.51	19.93	17.1	2.232	1000	12.3	3.39	2.662	84%	OK
3046	3048	263	263	4.73	4.73	7.9	0.726	900	2.0	1.27	0.808	90%	OK
3047	3048	167	167	2.87	2.87	6.9	0.459	700	4.7	1.65	0.635	72%	OK
3048	3050	58	321	0.70	8.30	8.6	1.238	1100	2.0	1.45	1.378	90%	OK
3049	3050	272	272	1.83	1.83	8.0	0.256	450	9.5	1.75	0.278	92%	OK
3050	3051	173	494	1.42	11.55	10.5	1.604	1200	2.0	1.54	1.742	92%	OK
3051	3052	77	571	0.29	11.84	11.3	1.598	1200	2.0	1.54	1.742	92%	OK
3052	3055	174	1259	1.46	33.23	19.0	3.526	1600	2.0	1.87	3.760	94%	OK
3053	3054	118	118	0.43	0.43	6.3	0.065	350	2.0	0.68	0.065	99%	OK
3054	3055	98	216	0.35	0.78	7.4	0.112	350	6.7	1.24	0.119	94%	OK
3055	3060	12	1271	0.01	34.02	19.1	3.599	1600	2.0	1.87	3.760	96%	OK
3056	3059	287	287	2.82	2.82	8.2	0.427	500	13.2	2.21	0.434	98%	OK
3057	3059	203	203	1.29	1.29	7.3	0.186	350	17.2	1.99	0.191	97%	OK
3058	3059	111	111	0.46	0.46	6.2	0.069	400	2.0	0.74	0.093	75%	OK
3059	3060	235	522	1.18	5.75	10.8	0.790	700	8.8	2.26	0.870	91%	OK
3060	3061	114	1385	0.45	40.22	20.4	4.107	1700	2.0	1.94	4.403	93%	OK
3061	New Outlet	348	1733	8.47	48.69	24.3	4.503	1400	6.7	3.13	4.818	93%	OK
New Outlet	Lana River	-	1733	-	50.99	24.3	4.716	1500	5.0	2.83	5.001	94%	OK
3062	New Outlet	514	514	9.30	9.30	10.7	1.282	1000	3.6	1.83	1.437	89%	OK
3063	3065	256	256	1.33	1.33	7.8	0.188	450	7.8	1.58	0.251	75%	OK
3064	3065	216	216	1.32	1.32	7.4	0.189	400	8.3	1.51	0.190	100%	OK
3065	3067	86	342	0.75	3.40	8.8	0.503	800	2.0	1.18	0.593	85%	OK
3066	3067	232	232	2.02	2.02	7.6	0.314	500	9.0	1.82	0.357	88%	OK
3067	New Outlet	372	714	2.20	7.62	12.9	0.973	700	11.2	2.55	0.981	99%	OK
3068	3070	416	416	4.63	4.63	9.6	0.665	900	2.0	1.27	0.808	82%	OK
3069	3070	285	285	3.24	3.24	8.2	0.491	800	2.8	1.39	0.699	70%	OK
3070	3072	176	592	1.12	8.99	11.6	1.201	1100	2.1	1.49	1.416	85%	OK
3071	3072	114	114	0.68	0.68	6.3	0.102	350	9.6	1.49	0.143	71%	OK
3072	3074	100	692	0.41	10.08	12.7	1.296	1100	2.9	1.75	1.663	78%	OK
3073	3074	127	127	0.86	0.86	6.4	0.129	350	14.9	1.85	0.178	72%	OK
3074	New Outlet	574	1266	3.36	14.30	19.1	1.513	900	7.1	2.40	1.527	99%	OK
New Outlet	Lana River	-	1266	-	31.22	19.1	3.303	1300	5.0	2.57	3.411	97%	OK
3075	Exs. Outlet	415	415	0.15	0.15	9.6	0.020	250	2.0	0.54	0.027	74%	OK
3076	Exs. Outlet	220	220	1.93	1.93	7.4	0.302	500	9.0	1.82	0.357	85%	OK
Exs. Outlet	Lana River	-	415	-	2.08	9.6	0.299	600	5.0	1.54	0.435	69%	OK
3077	New Outlet	270	270	2.80	2.80	8.0	0.428	800	2.0	1.18	0.593	72%	OK
3078	New Outlet	533	533	5.32	5.32	10.9	0.728	900	2.0	1.27	0.808	90%	OK
New Outlet	Lana River	-	533	-	8.12	10.9	1.112	900	5.0	2.01	1.279	87%	OK
3079	New Outlet	233	233	0.76	0.76	7.6	0.108	450	2.0	0.80	0.127	85%	OK
3080	3082	134	134	0.47	0.47	6.5	0.070	300	10.4	1.40	0.099	71%	OK
3081	3082	70	70	1.43	1.43	5.8	0.240	600	2.0	0.97	0.274	87%	OK
3082	3084	47	181	0.21	2.11	7.0	0.336	700	2.0	1.08	0.416	81%	OK
3083	3084	212	212	1.68	1.68	7.4	0.263	600	2.0	0.97	0.274	96%	OK
3084	New Outlet	70	282	0.21	4.00	8.1	0.609	900	2.0	1.27	0.808	75%	OK
New Outlet	Lana River	-	282	-	4.76	8.1	0.724	800	5.0	1.86	0.935	77%	OK
3085	New Outlet	421	421	3.12	3.12	9.7	0.446	600	5.8	1.65	0.467	96%	OK
3086	3087	290	290	2.72	2.72	8.2	0.412	600	6.8	1.79	0.506	81%	OK
3087	3092	95	385	0.30	3.02	9.3	0.402	450	27.3	2.96	0.471	85%	OK
3088	3089	52	52	0.36	0.36	5.6	0.056	350	2.0	0.68	0.065	85%	OK
3089	3092	220	272	1.25	1.61	8.0	0.225	400	20.8	2.39	0.300	75%	OK
3091	3092	199	199	5.17	5.17	7.2	0.816	900	3.0	1.56	0.992	82%	OK
3092	3096	344	729	4.64	14.44	13.1	1.832	1100	4.9	2.28	2.167	85%	OK
3093	3095	327	327	1.95	1.95	8.6	0.291	700	2.0	1.08	0.416	70%	OK
3094	3095	290	290	2.15	2.15	8.2	0.326	600	6.8	1.79	0.506	64%	OK
3095	3096	267	594	0.30	4.40	11.6	0.588	700	5.4	1.77	0.681	86%	OK
3096	3097	191	920	0.38	19.22	15.2	2.280	1000	9.9	3.04	2.388	95%	OK
3097	3100	30	950	0.02	19.24	15.6	2.254	1400	2.0	1.71	2.632	86%	OK
3098	3099	91	91	0.34	0.34	6.0	0.052	350	2.0	0.68	0.065	79%	OK

No.	Down Stream	Length (m)		Area (ha)		Storm Water Quantity		Planned Pipe Specification				Capacity	
		Increment	Total	Increment	Total	Time	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge
3099	3100	251	342	1.24	1.58	8.8	0.214	450	8.8	1.68	0.267	80%	OK
3100	3103	93	1043	0.78	21.60	16.6	2.455	1400	2.0	1.71	2.632	93%	OK
3101	3102	230	230	1.92	1.92	7.6	0.298	700	2.0	1.08	0.416	72%	OK
3102	3103	239	469	2.20	4.12	10.2	0.579	600	8.9	2.05	0.580	100%	OK
3103	New Outlet	101	1144	0.82	26.54	17.7	2.921	1500	2.0	1.79	3.163	92%	OK
New Outlet	Lana River	-	1144	-	29.66	17.7	3.265	1300	5.0	2.57	3.411	96%	OK
3104	New Outlet	257	257	2.41	2.41	7.9	0.370	700	2.0	1.08	0.416	89%	OK
3105	3106	187	187	1.49	1.49	7.1	0.236	600	2.1	1.00	0.283	84%	OK
3106	New Outlet	210	397	1.82	3.31	9.4	0.479	800	2.0	1.18	0.593	81%	OK
New Outlet	Lana River	-	397	-	5.72	9.4	0.828	800	5.0	1.86	0.935	89%	OK
3107	New Outlet	667	667	11.60	11.60	12.4	1.507	1100	3.1	1.81	1.720	88%	OK
3108	New Outlet	193	193	2.23	2.23	7.1	0.353	600	5.1	1.55	0.438	81%	OK
New Outlet	Lana River	-	667	-	13.83	12.4	1.797	1100	5.0	2.30	2.186	82%	OK
3109	New Outlet	456	456	4.93	4.93	10.1	0.695	900	2.0	1.27	0.808	86%	OK
3110	3112	491	491	2.69	2.69	10.5	0.374	600	5.2	1.57	0.444	84%	OK
3111	3112	181	181	4.18	4.18	7.0	0.665	700	7.7	2.11	0.812	82%	OK
3112	New Outlet	489	980	4.41	11.28	15.9	1.310	1100	2.0	1.45	1.378	95%	OK
New Outlet	Lana River	-	980	-	16.21	15.9	1.882	1100	5.0	2.30	2.186	86%	OK
3113	Exs. Outlet	20	20	0.00	0.00	5.2	0.000	200	2.0	0.47	0.015	0%	OK
3114	3116	579	579	3.68	3.68	11.4	0.495	700	4.6	1.63	0.627	79%	OK
3115	3116	67	67	0.44	0.44	5.7	0.068	300	8.9	1.29	0.091	74%	OK
3116	3118	68	647	0.32	4.44	12.2	0.581	600	10.2	2.19	0.619	94%	OK
3117	3118	70	70	1.40	1.40	5.8	0.235	600	2.0	0.97	0.274	86%	OK
3118	3121	199	846	2.38	8.22	14.4	1.000	1000	2.0	1.32	0.594	168%	NG
3119	3120	268	268	3.27	3.27	8.0	0.500	700	6.3	1.91	0.735	68%	OK
3120	3121	213	481	3.16	6.43	10.3	0.900	800	7.9	2.34	1.176	76%	OK
3121	3125	232	1078	2.40	17.05	17.0	1.915	1000	9.7	3.01	2.364	81%	OK
3122	3124	276	276	2.60	2.60	8.1	0.396	600	9.4	2.11	0.597	66%	OK
3123	3124	124	124	1.80	1.80	6.4	0.294	600	3.2	1.23	0.348	84%	OK
3124	3125	208	484	0.81	5.21	10.4	0.726	900	2.0	1.27	0.808	90%	OK
3125	3126	500	1578	4.58	26.84	22.5	2.595	1100	10.3	3.30	3.136	83%	OK
3126	Exs. Outlet	1009	2587	0.00	26.84	33.7	2.022	1200	3.2	1.95	2.205	92%	OK
Exs. Outlet	Lana River	-	2587	-	26.84	33.7	2.022	1100	5.0	2.30	2.186	93%	OK
3128	Exs. Outlet	254	254	2.27	2.27	7.8	0.350	600	8.2	1.97	0.557	63%	OK
3129	3131	71	325	1.33	3.60	8.6	0.537	800	2.0	1.18	0.593	91%	OK
3130	3131	201	201	1.00	1.00	7.2	0.145	400	8.9	1.56	0.196	74%	OK
3131	3136	122	447	1.40	6.00	10.0	0.849	1000	2.0	1.37	1.076	79%	OK
3132	3133	124	124	0.60	0.60	6.4	0.090	300	9.6	1.34	0.095	95%	OK
3133	3135	95	219	0.40	1.00	7.4	0.143	400	9.4	1.61	0.202	71%	OK
3134	3135	149	149	1.16	1.16	6.7	0.187	500	2.6	0.98	0.192	97%	OK
3135	3136	20	239	0.05	2.21	7.7	0.342	700	2.0	1.08	0.416	82%	OK
3136	3141	287	734	4.10	12.31	13.2	1.557	900	9.4	2.76	1.756	89%	OK
3137	3138	328	328	3.02	3.02	8.6	0.451	600	8.5	2.00	0.565	80%	OK
3138	3140	138	466	0.60	3.62	10.2	0.508	800	2.0	1.18	0.593	86%	OK
3139	3140	122	122	4.10	4.10	6.4	0.669	700	7.3	2.06	0.793	84%	OK
3140	3141	68	534	0.39	8.11	10.9	1.110	1100	2.0	1.45	1.378	81%	OK
3141	3142	120	854	0.43	20.85	14.5	2.528	1400	2.0	1.71	2.632	96%	OK
3142	3148	281	1135	1.25	22.10	17.6	2.440	1100	6.9	2.70	2.566	95%	OK
3143	3144	159	159	1.39	1.39	6.8	0.204	400	16.9	2.15	0.270	76%	OK
3144	3145	302	461	1.76	3.15	10.1	0.444	600	8.9	2.05	0.580	77%	OK
3145	3147	248	709	5.98	9.13	12.9	1.166	900	6.5	2.29	1.457	80%	OK
3146	3147	185	185	0.70	0.70	7.1	0.102	400	4.3	1.09	0.137	74%	OK
3147	3148	497	1206	7.44	17.27	18.4	1.863	1100	4.6	2.21	2.100	89%	OK
3148	3151	367	1573	1.19	40.56	22.5	3.922	1400	4.6	2.59	3.987	98%	OK
3149	3150	218	218	0.70	0.70	7.4	0.100	300	15.1	1.68	0.119	85%	OK
3150	3151	404	622	3.47	4.17	11.9	0.551	800	2.7	1.37	0.689	80%	OK
3151	Exs. Outlet	430	2003	2.30	47.03	27.3	4.055	1700	2.0	1.94	4.403	92%	OK
Exs. Outlet	Lana River	-	2003	-	49.30	27.3	4.251	1500	5.0	2.83	5.001	85%	OK

No.	Down Stream	Length (m)		Area (ha)		Storm Water Quantity		Planned Pipe Specification				Capacity	
		Increment	Total	Increment	Total	Time	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge
3153	Exs. Outlet	464	464	1.32	1.32	10.2	0.185	600	2.0	0.97	0.274	68%	OK
	Exs. Outlet Lana River	-	464	-	1.32	10.2	0.170	450	5.0	1.27	0.202	84%	OK
3155	3156	537	537	3.38	3.38	11.0	0.461	600	8.3	1.98	0.560	82%	OK
3156	Exs. Outlet	480	1017	3.45	6.83	16.3	0.783	900	2.0	1.27	0.808	97%	OK
	Exs. Outlet Lana River	-	1017	-	10.21	16.3	1.171	900	5.0	2.01	1.279	92%	OK
3158	3159	175	175	1.41	1.41	6.9	0.225	600	2.8	1.15	0.325	69%	OK
3159	3161	149	324	0.81	2.22	8.6	0.331	600	3.3	1.25	0.353	94%	OK
3160	3161	169	169	1.25	1.25	6.9	0.200	600	2.0	0.97	0.274	73%	OK
3161	3163	194	518	5.50	8.97	10.8	1.232	1100	2.0	1.45	1.378	89%	OK
3162	3163	150	150	2.50	2.50	6.7	0.403	700	2.0	1.08	0.416	97%	OK
3163	Exs. Outlet	189	707	0.80	12.27	12.9	1.567	1100	4.2	2.11	2.005	78%	OK
	Exs. Outlet Lana River	-	707	-	12.27	12.9	1.567	1000	5.0	2.16	1.696	92%	OK
3165	3166	479	479	4.05	4.05	10.3	0.567	600	9.1	2.07	0.585	97%	OK
3166	3167	106	585	0.56	4.61	11.5	0.618	900	2.0	1.27	0.808	76%	OK
3167	3168	144	729	1.18	5.79	13.1	0.735	800	4.3	1.73	0.870	84%	OK
3168	3169	137	866	0.97	6.76	14.6	0.817	1000	2.0	1.37	1.076	76%	OK
3169	Exs. Outlet	392	1258	0.00	6.76	19.0	0.717	700	13.0	2.74	1.054	68%	OK
	Exs. Outlet Lana River	-	1258	-	6.76	19.0	0.717	800	5.0	1.86	0.935	77%	OK
4001	4002	24	24	5.70	5.70	5.3	0.976	600	41.6	4.43	1.253	78%	OK
4002	4003	64	88	2.90	8.60	6.0	1.428	700	46.8	5.21	2.005	71%	OK
4003	4004	837	925	13.00	21.60	15.3	2.554	1100	8.0	2.91	2.765	92%	OK
4004	4006	46	971	0.35	21.95	15.8	2.556	800	73.1	7.11	3.574	72%	OK
4005	4006	637	637	4.60	4.60	12.1	0.604	600	17.5	2.87	0.811	74%	OK
4006	New Outlet	34	1005	0.25	26.80	16.2	3.083	1100	11.7	3.52	3.345	92%	OK
	New Outlet Brook	-	1005	-	26.80	16.2	3.083	1300	5.0	2.57	3.411	90%	OK
4007	4011	295	295	2.42	2.42	8.3	0.365	600	8.1	1.95	0.551	66%	OK
4009	4010	147	147	0.72	0.72	6.6	0.107	350	10.2	1.53	0.147	73%	OK
4010	4011	538	685	11.78	12.50	12.6	1.613	800	15.7	3.30	1.659	97%	OK
4011	Exs. Outlet	74	759	2.68	17.60	13.4	2.211	1100	7.6	2.84	2.699	82%	OK
	Exs. Outlet Brook	-	759	-	17.60	13.4	2.211	1200	5.0	2.44	2.760	80%	OK
4012	Exs. Outlet	162	162	2.25	2.25	6.8	0.361	500	9.2	1.84	0.361	100%	OK
	Exs. Outlet Brook	-	162	-	2.25	6.8	0.361	600	5.0	1.54	0.435	83%	OK
4013	4015	156	156	1.56	1.56	6.7	0.251	500	5.1	1.37	0.269	93%	OK
4014	4015	377	377	2.17	2.17	9.2	0.290	450	15.6	2.24	0.356	81%	OK
4015	New Outlet	266	422	2.68	6.41	9.7	0.917	700	12.0	2.64	1.016	90%	OK
4016	New Outlet	913	913	12.80	12.80	15.1	1.523	800	22.8	3.97	1.996	76%	OK
	New Outlet Lana River	-	913	-	19.21	15.1	2.286	1200	5.0	2.44	2.760	83%	OK
4017	New Outlet	154	154	0.88	0.88	6.7	0.130	300	20.1	1.94	0.137	95%	OK
4018	4021	313	313	5.26	5.26	8.5	0.788	600	17.2	2.85	0.806	98%	OK
4019	4020	68	68	1.00	1.00	5.8	0.168	500	2.0	0.86	0.169	99%	OK
4020	4021	260	328	1.03	2.03	8.6	0.278	400	19.8	2.33	0.293	95%	OK
4021	4022	57	385	0.35	7.64	9.3	1.110	700	24.8	3.79	1.459	76%	OK
4022	4023	36	421	0.53	8.17	9.7	1.169	600	55.5	5.12	1.448	81%	OK
4023	New Outlet	446	867	4.60	12.77	14.6	1.543	900	9.1	2.71	1.724	90%	OK
	New Outlet Brook	-	867	-	13.65	14.6	1.650	1000	5.0	2.16	1.696	97%	OK
4024	Exs. Outlet	170	170	0.88	0.88	6.9	0.129	350	10.5	1.55	0.149	86%	OK
	Exs. Outlet Brook	-	170	-	0.88	6.9	0.129	400	5.0	1.17	0.147	88%	OK
4025	New Outlet	196	196	0.97	0.97	7.2	0.140	300	22.4	2.05	0.145	97%	OK
	New Outlet Brook	-	196	-	0.97	7.2	0.140	400	5.0	1.17	0.147	95%	OK
4026	New Outlet	976	976	12.24	12.24	15.8	1.425	700	30.2	4.18	1.609	89%	OK
	New Outlet Brook	-	976	-	12.24	15.8	1.425	1000	5.0	2.16	1.696	84%	OK

No.	Down Stream	Length (m)		Area (ha)		Storm Water Quantity		Planned Pipe Specification				Capacity	
		Increment	Total	Increment	Total	Time	Q ₁ (m ³ /s)	D (mm)	I (% _s)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge
4027	New Outlet	305	305	1.50	1.50	8.4	0.207	450	7.5	1.55	0.247	84%	OK
	New Outlet Brook	-	305	-	1.50	8.4	0.226	500	5.0	1.36	0.267	84%	OK
4028	New Outlet	183	183	0.85	0.85	7.0	0.124	450	2.0	0.80	0.127	97%	OK
4045	4053	231	231	1.43	1.43	7.6	0.222	500	4.3	1.26	0.247	90%	OK
4051	4052	354	354	6.88	6.88	8.9	1.015	1000	2.8	1.62	1.272	80%	OK
4052	4053	404	758	8.05	14.93	13.4	1.876	1000	9.9	3.04	2.388	79%	OK
4053	New Outlet	70	828	0.30	16.66	14.2	2.039	1200	4.2	2.23	2.522	81%	OK
	New Outlet Lana River	-	828	-	17.51	14.2	2.144	1100	5.0	2.30	2.186	98%	OK
4029	4030	52	52	1.41	1.41	5.6	0.218	300	57.6	3.28	0.232	94%	OK
4030	4031	215	267	1.92	3.33	8.0	0.509	600	6.9	1.80	0.509	100%	OK
4031	4036	178	445	0.78	4.11	9.9	0.584	800	2.0	1.18	0.593	98%	OK
4032	4033	77	77	0.65	0.65	5.9	0.099	250	87.0	3.57	0.175	57%	OK
4033	4034	153	230	0.88	1.53	7.6	0.218	350	23.5	2.32	0.223	98%	OK
4034	4035	169	399	4.18	5.71	9.4	0.826	600	20.1	3.08	0.871	95%	OK
4035	4036	55	454	0.27	5.98	10.0	0.846	700	12.7	2.71	1.043	81%	OK
4036	4045	343	797	2.64	12.73	13.9	1.574	700	29.5	4.13	1.589	99%	OK
4037	4038	175	175	2.49	2.49	6.9	0.365	450	18.2	2.42	0.385	95%	OK
4038	4041	89	264	0.67	3.16	7.9	0.444	450	26.9	2.94	0.468	95%	OK
4039	4040	119	119	0.88	0.88	6.3	0.132	300	47.0	2.97	0.210	63%	OK
4040	4041	50	169	0.10	0.98	6.9	0.157	500	2.0	0.86	0.169	93%	OK
4041	4042	210	474	0.76	4.90	10.3	0.686	600	19.5	3.03	0.857	80%	OK
4042	New Outlet	10	484	0.01	4.91	10.4	0.684	800	3.4	1.53	0.769	89%	OK
4043	4044	119	119	0.55	0.55	6.3	0.083	250	42.5	2.50	0.123	67%	OK
4044	New Outlet	259	378	0.81	1.36	9.2	0.182	350	16.9	1.97	0.190	96%	OK
	New Outlet Brook	-	484	-	6.27	10.4	0.874	800	5.0	1.86	0.935	93%	OK
4046	4047	168	168	1.02	1.02	6.9	0.163	500	2.3	0.92	0.181	90%	OK
4047	4048	161	329	1.24	2.26	8.7	0.336	700	2.0	1.08	0.416	81%	OK
4048	New Outlet	423	752	9.14	11.40	13.4	1.432	700	30.2	4.18	1.609	89%	OK
4049	New Outlet	197	197	0.88	0.88	7.2	0.127	300	31.4	2.42	0.171	74%	OK
	New Outlet Brook	-	752	-	12.28	13.4	1.543	1000	5.0	2.16	1.696	91%	OK
4050	Exs. Outlet	253	253	2.78	2.78	7.8	0.428	600	7.1	1.83	0.517	83%	OK
	Exs. Outlet Brook	-	253	-	2.78	7.8	0.428	600	5.0	1.54	0.435	98%	OK
4054	New Outlet	115	115	0.31	0.31	6.3	0.047	350	2.0	0.68	0.065	71%	OK
4055	New Outlet	265	265	2.53	2.53	7.9	0.388	600	8.6	2.01	0.568	68%	OK
	New Outlet Lana River	-	265	-	2.84	7.9	0.436	700	5.0	1.70	0.654	67%	OK
4056	New Outlet	99	99	0.34	0.34	6.1	0.052	350	2.0	0.68	0.065	79%	OK
4057	4059	62	62	0.50	0.50	5.7	0.077	400	2.0	0.74	0.093	83%	OK
4058	4059	58	58	1.22	1.22	5.6	0.206	600	2.0	0.97	0.274	75%	OK
4059	New Outlet	279	341	7.64	9.36	8.8	1.386	800	14.9	3.21	1.614	86%	OK
	New Outlet Lana River	-	341	-	9.70	8.8	1.436	1000	5.0	2.16	1.696	85%	OK
4060	Exs. Outlet	25	25	0.03	0.03	5.3	0.005	200	2.0	0.47	0.015	32%	OK
4061	Exs. Outlet	712	712	4.94	4.94	12.9	0.631	700	5.7	1.82	0.700	90%	OK
	Exs. Outlet Lana River	-	712	-	4.97	12.9	0.635	700	5.0	1.70	0.654	97%	OK
4062	New Outlet	88	88	0.27	0.27	6.0	0.041	300	2.0	0.61	0.043	95%	OK
4063	New Outlet	258	258	2.07	2.07	7.9	0.318	700	2.0	1.08	0.416	76%	OK
	New Outlet Lana River	-	258	-	2.34	7.9	0.359	600	5.0	1.54	0.435	82%	OK
4064	Exs. Outlet	93	93	0.31	0.31	6.0	0.047	350	2.0	0.68	0.065	72%	OK
4065	Exs. Outlet	461	461	3.64	3.64	10.1	0.513	700	3.6	1.44	0.554	93%	OK
	Exs. Outlet Lana River	-	461	-	3.95	10.1	0.557	700	5.0	1.70	0.654	85%	OK
4068	New Outlet	168	168	0.80	0.80	6.9	0.117	450	2.0	0.80	0.127	92%	OK
4069	New Outlet	77	77	0.38	0.38	5.9	0.058	300	5.1	0.98	0.069	84%	OK
	New Outlet Lana River	-	168	-	1.18	6.9	0.173	450	5.0	1.27	0.202	86%	OK

No.	Down Stream	Length (m)		Area (ha)		Storm Water Quantity		Planned Pipe Specification				Capacity	
		Increment	Total	Increment	Total	Time	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge
4070	New Outlet	179	179	1.02	1.02	7.0	0.149	400	5.9	1.27	0.160	93%	OK
4071	4073	155	155	1.15	1.15	6.7	0.170	450	6.4	1.43	0.227	75%	OK
4072	4073	58	58	0.28	0.28	5.6	0.043	350	2.0	0.68	0.065	66%	OK
4073	4075	176	331	1.21	2.64	8.7	0.392	600	10.7	2.25	0.636	62%	OK
4074	4075	94	94	0.45	0.45	6.0	0.068	300	5.3	1.00	0.071	97%	OK
4075	4077	74	405	0.40	3.49	9.5	0.503	600	8.1	1.95	0.551	91%	OK
4076	4077	334	334	1.20	1.20	8.7	0.163	400	8.9	1.56	0.196	83%	OK
4077	New Outlet	94	499	0.58	5.27	10.5	0.732	900	2.0	1.27	0.808	91%	OK
New Outlet	Lana River	-	499	-	6.29	10.5	0.874	800	5.0	1.86	0.935	93%	OK
4078	New Outlet	191	191	1.83	1.83	7.1	0.290	500	7.9	1.71	0.336	86%	OK
4079	4080	107	107	1.37	1.37	6.2	0.226	600	2.0	0.97	0.274	82%	OK
4080	4082	256	363	2.72	4.09	9.0	0.601	700	7.7	2.11	0.812	74%	OK
4081	4082	165	165	0.95	0.95	6.8	0.140	350	13.9	1.79	0.172	81%	OK
4082	4085	174	537	1.18	6.22	11.0	0.848	700	10.3	2.44	0.939	90%	OK
4083	4084	80	80	0.64	0.64	5.9	0.098	250	32.5	2.18	0.107	91%	OK
4084	4085	189	269	3.11	3.75	8.0	0.573	800	2.0	1.18	0.593	97%	OK
4085	4087	182	719	1.07	11.04	13.0	1.406	1200	2.0	1.54	1.742	81%	OK
4086	4087	158	158	3.57	3.57	6.8	0.573	600	10.1	2.18	0.616	93%	OK
4087	4091	78	797	0.26	14.87	13.9	1.838	1300	2.0	1.63	2.164	85%	OK
4090	4091	162	162	1.27	1.27	6.8	0.204	600	2.0	0.97	0.274	74%	OK
4091	4097	96	893	0.43	16.57	14.9	1.984	1300	2.0	1.63	2.164	92%	OK
4092	4094	157	157	1.16	1.16	6.7	0.171	400	9.5	1.62	0.204	84%	OK
4093	4094	69	69	0.31	0.31	5.8	0.048	200	37.6	2.02	0.063	75%	OK
4094	4096	97	254	0.39	1.86	7.8	0.286	700	2.0	1.08	0.416	69%	OK
4095	4096	87	87	0.24	0.24	6.0	0.037	300	2.0	0.61	0.043	85%	OK
4096	4097	178	432	1.28	3.38	9.8	0.482	800	2.0	1.18	0.593	81%	OK
4097	4099	215	1108	2.23	22.18	17.3	2.470	1200	5.9	2.65	2.997	82%	OK
4098	4099	190	190	2.50	2.50	7.1	0.396	600	7.3	1.86	0.526	75%	OK
4099	4101	68	1176	0.35	25.03	18.1	2.724	1400	2.9	2.06	3.171	86%	OK
4100	4101	177	177	1.10	1.10	7.0	0.160	400	11.2	1.75	0.220	73%	OK
4101	New Outlet	174	1350	1.27	27.40	20.0	2.828	1500	2.0	1.79	3.163	89%	OK
New Outlet	Lana River	-	1350	-	29.23	20.0	3.017	1300	5.0	2.57	3.411	88%	OK
4102	Exs. Outlet	73	73	0.29	0.29	5.8	0.045	250	11.6	1.30	0.064	70%	OK
4103	Exs. Outlet	361	361	2.90	2.90	9.0	0.426	700	2.4	1.18	0.454	94%	OK
Exs. Outlet	Lana River	-	361	-	3.19	9.0	0.469	700	5.0	1.70	0.654	72%	OK
4104	New Outlet	420	420	2.80	2.80	9.7	0.401	700	3.8	1.48	0.570	70%	OK
4105	4106	62	62	0.54	0.54	5.7	0.083	300	12.9	1.55	0.110	76%	OK
4106	4107	243	305	4.91	5.45	8.4	0.820	600	18.5	2.95	0.834	98%	OK
4107	New Outlet	627	932	4.81	10.26	15.4	1.209	900	4.7	1.95	1.241	97%	OK
4108	4109	384	384	5.70	5.70	9.3	0.828	900	2.3	1.36	0.865	96%	OK
4109	New Outlet	99	519	0.67	6.37	10.8	0.875	1000	2.0	1.37	1.076	81%	OK
New Outlet	Lana River	-	932	-	19.43	15.4	2.290	1200	5.0	2.44	2.760	83%	OK
4110	New Outlet	95	95	0.35	0.35	6.1	0.053	350	2.0	0.68	0.065	81%	OK
4113	4114	177	177	3.39	3.39	7.0	0.539	800	2.2	1.23	0.618	87%	OK
4114	4115	325	502	8.68	12.07	10.6	1.670	900	11.9	3.10	1.972	85%	OK
4115	4117	166	668	0.74	12.81	12.4	1.664	1200	2.0	1.54	1.742	96%	OK
4116	4117	289	289	1.68	1.68	8.2	0.255	600	2.4	1.06	0.300	85%	OK
4117	New Outlet	80	748	0.36	14.85	13.3	1.872	1100	5.1	2.32	2.205	85%	OK
New Outlet	Lana River	-	748	-	15.20	13.3	1.916	1100	5.0	2.30	2.186	88%	OK
4111	4112	152	152	1.46	1.46	6.7	0.216	350	34.2	2.80	0.269	80%	OK
4112	Exs. Outlet	358	510	9.88	11.34	10.7	1.564	900	13.9	3.35	2.131	73%	OK
Exs. Outlet	Brook	-	510	-	11.34	10.7	1.564	1000	5.0	2.16	1.696	92%	OK
4118	New Outlet	447	447	8.80	8.80	10.0	1.245	1000	4.2	1.98	1.555	80%	OK
4119	New Outlet	150	150	0.82	0.82	6.7	0.121	400	6.6	1.35	0.170	71%	OK
New Outlet	Lana River	-	447	-	9.62	10.0	1.361	1000	5.0	2.16	1.696	80%	OK
4120	New Outlet	583	583	2.62	2.62	11.5	0.351	600	6.6	1.76	0.498	71%	OK

No.	Down Stream	Length (m)		Area (ha)		Storm Water Quantity		Planned Pipe Specification				Capacity	
		Increment	Total	Increment	Total	Time	$Q_1(m^3/s)$	D (mm)	I (%)	V (m/s)	$Q_2(m^3/s)$	Q_1/Q_2	Judge
4121	New Outlet	223	223	2.72	2.72	7.5	0.424	500	14.7	2.33	0.457	93%	OK
	New Outlet Lana River	-	583	-	5.34	11.5	0.716	800	5.0	1.86	0.935	77%	OK
4122	Exs. Outlet	234	234	4.20	4.20	7.6	0.652	900	2.0	1.27	0.808	81%	OK
4123	4124	110	110	1.10	1.10	6.2	0.181	500	2.7	1.00	0.196	92%	OK
4124	4125	548	658	6.00	7.10	12.3	0.926	800	6.9	2.19	1.101	84%	OK
4125	4129	368	1026	4.50	11.60	16.4	1.327	800	18.4	3.57	1.794	74%	OK
4126	4127	473	473	6.90	6.90	10.3	0.965	800	9.0	2.50	1.257	77%	OK
4127	4128	341	814	7.50	14.40	14.0	1.774	1000	7.6	2.66	2.089	85%	OK
4128	4129	197	1011	1.50	15.90	16.2	1.829	900	11.6	3.06	1.947	94%	OK
4129	4131	130	1156	0.80	28.30	17.8	3.106	900	37.6	5.52	3.512	88%	OK
4130	4131	435	435	5.90	5.90	9.8	0.841	600	33.5	3.97	1.122	75%	OK
4131	Exs. Outlet	213	1369	0.90	35.10	20.2	3.604	1600	2.0	1.87	3.760	96%	OK
	Exs. Outlet Lana River	-	1369	-	39.30	20.2	4.035	1400	5.0	2.70	4.156	97%	OK

Table 7.4.5 Study on Existing Sewer Improvement (Separate Case-2 : New Sanitary Sewer)

Sanitary Sewage Flow
Sanitary Sewage per Capita = 440 liter/day (Hourly Maximum)

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity		Planned Pipe Specification				Capacity	
		Increment	Total	Increment	Total	Population	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge
3001	3008	725	725	24.00	24.00	8,391	0.043	250	18.2	1.63	0.080	53%	OK
3002	3004	275	275	5.80	5.80	2,028	0.010	200	17.8	1.39	0.044	24%	OK
3003	3004	108	108	0.35	0.35	122	0.001	200	12.9	1.19	0.037	2%	OK
3004	3007	42	317	0.10	6.25	2,185	0.011	200	57.1	2.49	0.078	14%	OK
3005	3006	203	203	1.43	1.43	500	0.003	200	9.8	1.03	0.032	8%	OK
3006	3007	130	333	0.45	1.88	657	0.003	200	49.2	2.32	0.073	5%	OK
3007	3008	25	358	0.03	8.16	2,853	0.015	250	2.0	0.54	0.027	55%	OK
3008	3009	82	807	1.57	33.73	11,793	0.060	350	6.7	1.24	0.119	50%	OK
3009	3011	215	1022	8.12	41.85	14,632	0.075	350	13.9	1.79	0.172	43%	OK
3010	3011	152	152	1.14	1.14	399	0.002	200	12.4	1.16	0.036	6%	OK
3011	3013	66	1088	0.20	43.19	15,100	0.077	300	21.2	1.99	0.141	55%	OK
3012	3013	149	149	0.90	0.90	315	0.002	200	7.3	0.89	0.028	6%	OK
3013	3017	58	1146	1.48	45.57	15,933	0.081	350	10.3	1.54	0.148	55%	OK
3014	3015	221	221	2.25	2.25	787	0.004	200	20.3	1.49	0.047	9%	OK
3015	3016	278	499	4.27	6.52	2,280	0.012	250	3.4	0.71	0.035	33%	OK
3016	3017	180	679	2.94	9.46	3,307	0.017	250	2.7	0.63	0.031	54%	OK
3017	3021	352	1498	7.25	62.28	21,775	0.111	400	13.9	1.95	0.245	45%	OK
3018	3019	227	227	2.42	2.42	846	0.004	200	2.0	0.47	0.015	29%	OK
3019	3020	558	785	15.68	18.10	6,328	0.032	250	11.9	1.32	0.065	50%	OK
3020	3021	308	1093	2.50	20.60	7,202	0.037	350	2.9	0.82	0.079	46%	OK
3021	3025	132	1630	0.60	83.48	29,187	0.149	600	3.0	1.19	0.336	44%	OK
3022	3023	120	120	1.05	1.05	367	0.002	200	12.5	1.17	0.037	5%	OK
3023	3024	268	388	1.93	2.98	1,042	0.005	200	19.0	1.44	0.045	12%	OK
3024	3025	93	481	0.13	3.11	1,087	0.006	200	20.4	1.49	0.047	12%	OK
3025	3026	63	1693	0.30	86.89	30,379	0.155	500	7.9	1.71	0.336	46%	OK
3026	3027	190	1883	2.50	89.39	31,253	0.159	400	24.7	2.60	0.327	49%	OK
3027	3029	71	1954	0.20	89.59	31,323	0.160	400	18.3	2.24	0.281	57%	OK
InFlow Area	3028			4.05	4.05	1,416	0.007						
3028	3029	543	543	7.00	11.05	3,863	0.020	200	14.7	1.27	0.040	49%	OK
3029	3032	256	2210	3.20	103.84	36,305	0.185	450	15.2	2.21	0.351	53%	OK
3030	3031	402	402	5.91	5.91	2,066	0.011	200	11.4	1.11	0.035	30%	OK
3031	3032	305	707	5.28	11.19	3,912	0.020	200	19.0	1.44	0.045	44%	OK
3032	3039	370	2580	3.85	118.88	41,564	0.212	600	7.2	1.84	0.520	41%	OK
3033	3035	142	142	0.92	0.92	322	0.002	200	2.0	0.47	0.015	11%	OK
3034	3035	83	83	0.81	0.81	283	0.001	200	2.0	0.47	0.015	10%	OK
3035	3036	85	227	0.94	2.67	934	0.005	200	10.7	1.08	0.034	14%	OK
3036	3038	169	396	1.35	4.02	1,406	0.007	200	8.2	0.95	0.030	24%	OK
3037	3038	278	278	1.60	1.60	559	0.003	200	10.4	1.06	0.033	9%	OK
3038	3039	166	562	1.15	6.77	2,367	0.012	200	28.9	1.77	0.056	22%	OK
3039	3041	113	2693	0.65	126.30	44,158	0.225	500	10.9	2.01	0.395	57%	OK
3040	3041	155	155	1.46	1.46	510	0.003	200	27.7	1.74	0.055	5%	OK
3041	3062	365	3058	2.30	130.06	45,473	0.232	700	2.8	1.27	0.489	47%	OK
3042	3044	410	410	5.20	5.20	1,818	0.009	200	13.4	1.21	0.038	24%	OK
3043	3044	98	98	0.77	0.77	269	0.001	200	2.0	0.47	0.015	9%	OK
3044	3045	221	631	2.45	8.42	2,944	0.015	200	9.9	1.04	0.033	46%	OK
3045	3052	454	1085	11.51	19.93	6,968	0.035	250	12.3	1.34	0.066	54%	OK
3046	3048	263	263	4.73	4.73	1,654	0.008	200	2.0	0.47	0.015	57%	OK
3047	3048	167	167	2.87	2.87	1,003	0.005	200	4.7	0.72	0.023	23%	OK
3048	3050	58	321	0.70	8.30	2,902	0.015	250	2.0	0.54	0.027	56%	OK
3049	3050	272	272	1.83	1.83	640	0.003	200	9.5	1.02	0.032	10%	OK
3050	3051	173	494	1.42	11.55	4,038	0.021	300	2.0	0.61	0.043	48%	OK
3051	3052	77	571	0.29	11.84	4,140	0.021	300	2.0	0.61	0.043	49%	OK
3052	3055	174	1259	1.46	33.23	11,618	0.059	450	2.0	0.80	0.127	47%	OK
3053	3054	118	118	0.43	0.43	150	0.001	200	2.0	0.47	0.015	5%	OK
3054	3055	98	216	0.35	0.78	273	0.001	200	6.7	0.85	0.027	5%	OK
3055	3060	12	1271	0.01	34.02	11,894	0.061	450	2.0	0.80	0.127	48%	OK
3056	3059	287	287	2.82	2.82	986	0.005	200	13.2	1.20	0.038	13%	OK

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity		Planned Pipe Specification				Capacity	
		Increment	Total	Increment	Total	Population	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge
3057	3059	203	203	1.29	1.29	451	0.002	200	17.2	1.37	0.043	5%	OK
3058	3059	111	111	0.46	0.46	161	0.001	200	2.0	0.47	0.015	6%	OK
3059	3060	235	522	1.18	5.75	2,010	0.010	200	8.8	0.98	0.031	33%	OK
3060	3061	114	1385	0.45	40.22	14,062	0.072	450	2.0	0.80	0.127	56%	OK
3061	3062	348	1733	8.47	48.69	17,023	0.087	400	6.7	1.36	0.171	51%	OK
3062	3075	514	3572	9.30	188.05	65,748	0.335	700	3.6	1.44	0.534	60%	OK
3063	3065	256	256	1.33	1.33	465	0.002	200	7.8	0.92	0.029	8%	OK
3064	3065	216	216	1.32	1.32	462	0.002	200	8.3	0.95	0.030	8%	OK
3065	3067	86	342	0.75	3.40	1,189	0.006	200	2.0	0.47	0.015	41%	OK
3066	3067	232	232	2.02	2.02	706	0.004	200	9.0	0.99	0.031	12%	OK
3067	3075	372	714	2.20	7.62	2,664	0.014	200	11.2	1.10	0.035	39%	OK
3068	3070	416	416	4.63	4.63	1,619	0.008	200	2.0	0.47	0.015	56%	OK
3069	3070	285	285	3.24	3.24	1,133	0.006	200	2.8	0.55	0.017	33%	OK
3070	3072	176	592	1.12	8.99	3,143	0.016	250	2.1	0.56	0.027	58%	OK
3071	3072	114	114	0.68	0.68	238	0.001	200	9.6	1.02	0.032	4%	OK
3072	3074	100	692	0.41	10.08	3,524	0.018	250	2.9	0.65	0.032	56%	OK
3073	3074	127	127	0.86	0.86	301	0.002	200	14.9	1.27	0.040	4%	OK
3074	3075	574	1266	3.36	14.30	5,000	0.025	250	7.1	1.02	0.050	51%	OK
3075	3077	415	3987	0.15	210.12	73,464	0.374	800	2.0	1.18	0.593	63%	OK
3076	3077	220	220	1.93	1.93	675	0.003	200	9.0	0.99	0.031	11%	OK
3077	3079	270	4257	2.80	214.85	75,118	0.383	800	2.0	1.18	0.593	64%	OK
3078	3079	533	533	5.32	5.32	1,860	0.009	200	2.0	0.47	0.015	64%	OK
3079	3085	233	4490	0.76	220.93	77,244	0.393	800	2.0	1.18	0.593	66%	OK
3080	3082	134	134	0.47	0.47	164	0.001	200	10.4	1.06	0.033	3%	OK
3081	3082	70	70	1.43	1.43	500	0.003	200	2.0	0.47	0.015	17%	OK
3082	3084	47	181	0.21	2.11	738	0.004	200	2.0	0.47	0.015	25%	OK
3083	3084	212	212	1.68	1.68	587	0.003	200	2.0	0.47	0.015	20%	OK
3084	3085	70	282	0.21	4.00	1,399	0.007	200	2.0	0.47	0.015	48%	OK
3085	3104	421	4911	3.12	228.05	79,733	0.406	700	5.8	1.83	0.704	58%	OK
3086	3087	290	290	2.72	2.72	951	0.005	200	6.8	0.86	0.027	18%	OK
3087	3092	95	385	0.30	3.02	1,056	0.005	200	27.3	1.72	0.054	10%	OK
3088	3089	52	52	0.36	0.36	126	0.001	200	2.0	0.47	0.015	4%	OK
3089	3092	220	272	1.25	1.61	563	0.003	200	20.8	1.51	0.047	6%	OK
3091	3092	199	199	5.17	5.17	1,808	0.009	200	3.0	0.57	0.018	51%	OK
3092	3096	344	729	4.64	14.44	5,049	0.026	250	4.9	0.85	0.042	62%	OK
3093	3095	327	327	1.95	1.95	682	0.003	200	2.0	0.47	0.015	24%	OK
3094	3095	290	290	2.15	2.15	752	0.004	200	6.8	0.86	0.027	14%	OK
3095	3096	267	594	0.30	4.40	1,538	0.008	200	5.4	0.77	0.024	32%	OK
3096	3097	191	920	0.38	19.22	6,720	0.034	250	9.9	1.21	0.059	58%	OK
3097	3100	30	950	0.02	19.24	6,727	0.034	350	2.0	0.68	0.065	52%	OK
3098	3099	91	91	0.34	0.34	119	0.001	200	2.0	0.47	0.015	4%	OK
3099	3100	251	342	1.24	1.58	552	0.003	200	8.8	0.98	0.031	9%	OK
3100	3103	93	1043	0.78	21.60	7,552	0.038	350	2.0	0.68	0.065	59%	OK
3101	3102	230	230	1.92	1.92	671	0.003	200	2.0	0.47	0.015	23%	OK
3102	3103	239	469	2.20	4.12	1,440	0.007	200	8.9	0.98	0.031	24%	OK
3103	3104	101	1144	0.82	26.54	9,279	0.047	400	2.0	0.74	0.093	51%	OK
3104	3107	257	5168	2.41	257.00	89,855	0.458	900	2.0	1.27	0.808	57%	OK
3105	3106	187	187	1.49	1.49	521	0.003	200	2.1	0.48	0.015	18%	OK
3106	3107	210	397	1.82	3.31	1,157	0.006	200	2.0	0.47	0.015	40%	OK
3107	3109	667	5835	11.60	271.91	95,068	0.484	800	3.1	1.46	0.734	66%	OK
3108	3109	193	193	2.23	2.23	780	0.004	200	5.1	0.75	0.024	17%	OK
3109	3113	456	6291	4.93	279.07	97,571	0.497	900	2.0	1.27	0.808	62%	OK
3110	3112	491	491	2.69	2.69	941	0.005	200	5.2	0.75	0.024	20%	OK
3111	3112	181	181	4.18	4.18	1,461	0.007	200	7.7	0.92	0.029	26%	OK
3112	3113	489	980	4.41	11.28	3,944	0.020	300	2.0	0.61	0.043	47%	OK
3113	3127	20	6311	0.50	290.85	101,690	0.518	1000	2.0	1.37	1.076	48%	OK
3114	3116	579	579	3.68	3.68	1,287	0.007	200	4.6	0.71	0.022	29%	OK
3115	3116	67	67	0.44	0.44	154	0.001	200	8.9	0.98	0.031	3%	OK
3116	3118	68	647	0.32	4.44	1,552	0.008	200	10.2	1.05	0.033	24%	OK
3117	3118	70	70	1.40	1.40	489	0.002	200	2.0	0.47	0.015	17%	OK
3118	3121	199	846	2.38	8.22	2,874	0.015	250	2.0	1.32	0.594	2%	OK
3119	3120	268	268	3.27	3.27	1,143	0.006	200	6.3	0.83	0.026	22%	OK

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity		Planned Pipe Specification				Capacity	
		Increment	Total	Increment	Total	Population	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge
3120	3121	213	481	3.16	6.43	2,248	0.011	200	7.9	0.93	0.029	39%	OK
3121	3125	232	1078	2.40	17.05	5,961	0.030	250	9.7	1.19	0.058	52%	OK
3122	3124	276	276	2.60	2.60	909	0.005	200	9.4	1.01	0.032	15%	OK
3123	3124	124	124	1.80	1.80	629	0.003	200	3.2	0.59	0.019	17%	OK
3124	3125	208	484	0.81	5.21	1,822	0.009	250	2.0	0.54	0.027	35%	OK
3125	3126	500	1578	4.58	26.84	9,384	0.048	300	10.3	1.39	0.098	49%	OK
3126	3127	1009	2587	0.00	26.84	9,384	0.048	350	3.2	0.86	0.083	58%	OK
3127	3152	97	6408	0.05	317.74	111,091	0.566						
3128	3129	254	254	2.27	2.27	794	0.004	200	8.2	0.95	0.030	14%	OK
3129	3131	71	325	1.33	3.60	1,259	0.006	200	2.0	0.47	0.015	43%	OK
3130	3131	201	201	1.00	1.00	350	0.002	200	8.9	0.98	0.031	6%	OK
3131	3136	122	447	1.40	6.00	2,098	0.011	250	2.0	0.54	0.027	40%	OK
3132	3133	124	124	0.60	0.60	210	0.001	200	9.6	1.02	0.032	3%	OK
3133	3135	95	219	0.40	1.00	350	0.002	200	9.4	1.01	0.032	6%	OK
3134	3135	149	149	1.16	1.16	406	0.002	200	2.6	0.53	0.017	12%	OK
3135	3136	20	239	0.05	2.21	773	0.004	200	2.0	0.47	0.015	27%	OK
3136	3141	287	734	4.10	12.31	4,304	0.022	250	9.4	1.17	0.057	38%	OK
3137	3138	328	328	3.02	3.02	1,056	0.005	200	8.5	0.96	0.030	18%	OK
3138	3140	138	466	0.60	3.62	1,266	0.006	200	2.0	0.47	0.015	44%	OK
3139	3140	122	122	4.10	4.10	1,433	0.007	200	7.3	0.89	0.028	26%	OK
3140	3141	68	534	0.39	8.11	2,835	0.014	250	2.0	0.54	0.027	54%	OK
3141	3142	120	854	0.43	20.85	7,290	0.037	350	2.0	0.68	0.065	57%	OK
3142	3148	281	1135	1.25	22.10	7,727	0.039	300	6.9	1.14	0.081	49%	OK
3143	3144	159	159	1.39	1.39	486	0.002	200	16.9	1.36	0.043	6%	OK
3144	3145	302	461	1.76	3.15	1,101	0.006	200	8.9	0.98	0.031	18%	OK
3145	3147	248	709	5.98	9.13	3,192	0.016	200	6.5	0.84	0.026	62%	OK
3146	3147	185	185	0.70	0.70	245	0.001	200	4.3	0.68	0.021	6%	OK
3147	3148	497	1206	7.44	17.27	6,038	0.031	300	4.6	0.93	0.066	47%	OK
3148	3151	367	1573	1.19	40.56	14,181	0.072	400	4.6	1.12	0.141	51%	OK
3149	3150	218	218	0.70	0.70	245	0.001	200	15.1	1.28	0.040	3%	OK
3150	3151	404	622	3.47	4.17	1,458	0.007	200	2.7	0.54	0.017	44%	OK
3151	3152	430	2003	2.30	47.03	16,443	0.084	500	2.0	0.86	0.169	50%	OK
3152	3154	43	6451	0.06	364.83	127,555	0.650						
3153	3154	464	464	1.32	1.32	462	0.002	200	2.0	0.47	0.015	16%	OK
3154	3157	22	6473	0.01	366.16	128,020	0.652						
3155	3156	537	537	3.38	3.38	1,182	0.006	200	8.3	0.95	0.030	20%	OK
3156	3157	480	1017	3.45	6.83	2,388	0.012	250	2.0	0.54	0.027	46%	OK
3157	3164	181	6654	0.70	373.69	130,653	0.665						
3158	3159	175	175	1.41	1.41	493	0.003	200	2.8	0.55	0.017	15%	OK
3159	3161	149	324	0.81	2.22	776	0.004	200	3.3	0.60	0.019	21%	OK
3160	3161	169	169	1.25	1.25	437	0.002	200	2.0	0.47	0.015	15%	OK
3161	3163	194	518	5.50	8.97	3,136	0.016	250	2.0	0.54	0.027	60%	OK
3162	3163	150	150	2.50	2.50	874	0.004	200	2.0	0.47	0.015	30%	OK
3163	3164	189	707	0.80	12.27	4,290	0.022	250	4.2	0.79	0.039	56%	OK
3164	3170	439	7093	3.70	389.66	136,237	0.694						
3165	3166	479	479	4.05	4.05	1,416	0.007	200	9.1	1.00	0.031	23%	OK
3166	3167	106	585	0.56	4.61	1,612	0.008	200	2.0	0.47	0.015	56%	OK
3167	3168	144	729	1.18	5.79	2,024	0.010	200	4.3	0.68	0.021	48%	OK
3168	3169	137	866	0.97	6.76	2,363	0.012	250	2.0	0.54	0.027	45%	OK
3169	3170	392	1258	0.00	6.76	2,363	0.012	200	13.0	1.19	0.037	32%	OK
3170	To STP	930	8023	0.00	396.42	138,600	0.706						
4001	4002	24	24	5.70	5.70	1,941	0.010	200	41.6	2.13	0.067	15%	OK
4002	4003	64	88	2.90	8.60	2,928	0.015	200	46.8	2.26	0.071	21%	OK
Shkoza	4003			14.60	-	6,560	0.033						
4003	4004	837	925	13.00	21.60	13,914	0.071	350	8.0	1.36	0.131	54%	OK
4004	4006	46	971	0.35	21.95	14,033	0.071	250	73.1	3.28	0.161	44%	OK
InFlow Area	4005			10.78	10.78	3,670	0.019						
4005	4006	637	637	4.60	15.38	5,236	0.027	200	17.5	1.38	0.043	62%	OK
4006	4007	34	1005	0.25	37.58	19,354	0.099	400	11.7	1.79	0.225	44%	OK
4007	4011	295	1300	2.42	40.00	20,178	0.103	400	8.1	1.49	0.187	55%	OK
4009	4010	147	147	0.72	0.72	245	0.001	200	10.2	1.05	0.033	4%	OK
4010	4011	538	685	11.78	12.50	4,256	0.022	200	15.7	1.31	0.041	53%	OK

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity		Planned Pipe Specification				Capacity	
		Increment	Total	Increment	Total	Population	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge
4011	4012	74	1374	2.68	55.18	25,346	0.129	450	7.6	1.56	0.248	52%	OK
4012	4013	162	1536	2.25	57.43	26,112	0.133	450	9.2	1.72	0.274	49%	OK
4013	4015	156	1692	1.56	58.99	26,643	0.136	500	5.1	1.37	0.269	50%	OK
4014	4015	377	377	2.17	2.17	739	0.004	200	15.6	1.30	0.041	9%	OK
4015	4017	266	1958	2.68	63.84	28,294	0.144	450	12.0	1.96	0.312	46%	OK
4016	4017	913	913	12.80	12.80	4,358	0.022	200	22.8	1.58	0.050	45%	OK
4017	4024	154	2112	0.88	77.52	32,951	0.168	400	20.1	2.35	0.295	57%	OK
4018	4021	313	313	5.26	5.26	1,791	0.009	200	17.2	1.37	0.043	21%	OK
4019	4020	68	68	1.00	1.00	340	0.002	200	2.0	0.47	0.015	12%	OK
4020	4021	260	328	1.03	2.03	691	0.004	200	19.8	1.47	0.046	8%	OK
4021	4022	57	385	0.35	7.64	2,601	0.013	200	24.8	1.64	0.052	26%	OK
4022	4023	36	421	0.53	8.17	2,781	0.014	200	55.5	2.46	0.077	18%	OK
InFlow Area	4023			4.01	4.01	1,365	0.007						
4023	4024	446	867	4.60	16.78	5,713	0.029	250	9.1	1.16	0.057	51%	OK
4024	4025	170	2282	0.88	95.18	38,963	0.198	500	10.5	1.97	0.387	51%	OK
InFlow Area	4025			7.30	7.30	2,485	0.013						
4025	4028	196	2478	0.97	103.45	41,779	0.213	450	22.4	2.68	0.426	50%	OK
Student's	4026			29.50	-	5,420	0.028						
4026	4027	976	976	12.24	12.24	9,587	0.049	250	30.2	2.11	0.104	47%	OK
4027	4028	305	1281	1.50	13.74	10,098	0.051	350	7.5	1.31	0.126	41%	OK
InFlow Area	4028			14.00	14.00	4,766	0.024						
4028	4054	183	2661	0.85	132.04	56,932	0.290	700	2.0	1.08	0.416	70%	OK
4029	4030	52	52	1.41	1.41	480	0.002	200	57.6	2.51	0.079	3%	OK
4030	4031	215	267	1.92	3.33	1,134	0.006	200	6.9	0.87	0.027	21%	OK
4031	4036	178	445	0.78	4.11	1,399	0.007	200	2.0	0.47	0.015	48%	OK
4032	4033	77	77	0.65	0.65	221	0.001	200	87.0	3.08	0.097	1%	OK
4033	4034	153	230	0.88	1.53	521	0.003	200	23.5	1.60	0.050	5%	OK
4034	4035	169	399	4.18	5.71	1,944	0.010	200	20.1	1.48	0.046	21%	OK
4035	4036	55	454	0.27	5.98	2,036	0.010	200	12.7	1.18	0.037	28%	OK
4036	4045	343	797	2.64	12.73	4,334	0.022	200	29.5	1.79	0.056	39%	OK
4037	4038	175	175	2.49	2.49	848	0.004	200	18.2	1.41	0.044	10%	OK
4038	4041	89	264	0.67	3.16	1,076	0.005	200	26.9	1.71	0.054	10%	OK
4039	4040	119	119	0.88	0.88	300	0.002	200	47.0	2.26	0.071	2%	OK
4040	4041	50	169	0.10	0.98	334	0.002	200	2.0	0.47	0.015	12%	OK
4041	4042	210	474	0.76	4.90	1,668	0.008	200	19.5	1.46	0.046	19%	OK
4042	4045	10	484	0.01	4.91	1,672	0.009	200	3.4	0.61	0.019	44%	OK
4043	4044	119	119	0.55	0.55	187	0.001	200	42.5	2.15	0.068	1%	OK
4044	4045	259	378	0.81	1.36	463	0.002	200	16.9	1.36	0.043	6%	OK
4045	4053	231	1028	1.43	20.43	6,955	0.035	300	4.3	0.90	0.064	56%	OK
4046	4047	168	168	1.02	1.02	347	0.002	200	2.3	0.50	0.016	11%	OK
4047	4048	161	329	1.24	2.26	769	0.004	200	2.0	0.47	0.015	27%	OK
4048	4050	423	752	9.14	11.40	3,881	0.020	200	30.2	1.81	0.057	35%	OK
4049	4050	197	197	0.88	0.88	300	0.002	200	31.4	1.85	0.058	3%	OK
4050	4051	253	1005	2.78	15.06	5,127	0.026	250	7.1	1.02	0.050	52%	OK
4051	4052	354	1359	6.88	21.94	7,469	0.038	350	2.8	0.80	0.077	49%	OK
InFlow Area	4052			21.39	21.39	7,282	0.037						
4052	4053	404	1763	8.05	51.38	17,492	0.089	400	9.9	1.65	0.207	43%	OK
4053	4054	70	1833	0.30	72.11	24,549	0.125	500	4.2	1.25	0.245	51%	OK
4054	4056	115	2776	0.31	204.46	81,587	0.415	900	2.0	1.27	0.808	51%	OK
4055	4056	265	265	2.53	2.53	861	0.004	200	8.6	0.97	0.030	14%	OK
4056	4060	99	2875	0.34	207.33	82,564	0.420	900	2.0	1.27	0.808	52%	OK
4057	4059	62	62	0.50	0.50	170	0.001	200	2.0	0.47	0.015	6%	OK
4058	4059	58	58	1.22	1.22	415	0.002	200	2.0	0.47	0.015	14%	OK
4059	4060	279	341	7.64	9.36	3,187	0.016	200	14.9	1.27	0.040	41%	OK
4060	4062	25	2900	0.03	216.72	85,761	0.437	900	2.0	1.27	0.808	54%	OK
4061	4062	712	712	4.94	4.94	1,682	0.009	200	5.7	0.79	0.025	35%	OK
4062	4064	88	2988	0.27	221.93	87,534	0.446	900	2.0	1.27	0.808	55%	OK
4063	4064	258	258	2.07	2.07	705	0.004	200	2.0	0.47	0.015	24%	OK
4064	4068	93	3081	0.31	224.31	88,345	0.450	900	2.0	1.27	0.808	56%	OK
4065	4068	461	461	3.64	3.64	1,239	0.006	200	3.6	0.63	0.020	32%	OK
4068	4070	168	3249	0.80	228.75	89,856	0.458	900	2.0	1.27	0.808	57%	OK
4069	4070	77	77	0.38	0.38	129	0.001	200	5.1	0.75	0.024	3%	OK

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity		Planned Pipe Specification				Capacity	
		Increment	Total	Increment	Total	Population	Q ₁ (m ³ /s)	D (mm)	I (%)	V (m/s)	Q ₂ (m ³ /s)	Q ₁ /Q ₂	Judge
4070	4078	179	3428	1.02	230.15	90,333	0.460	700	5.9	1.85	0.712	65%	OK
4071	4073	155	155	1.15	1.15	392	0.002	200	6.4	0.84	0.026	8%	OK
4072	4073	58	58	0.28	0.28	95	0.000	200	2.0	0.47	0.015	3%	OK
4073	4075	176	331	1.21	2.64	899	0.005	200	10.7	1.08	0.034	13%	OK
4074	4075	94	94	0.45	0.45	153	0.001	200	5.3	0.76	0.024	3%	OK
4075	4077	74	405	0.40	3.49	1,188	0.006	200	8.1	0.94	0.030	20%	OK
4076	4077	334	334	1.20	1.20	409	0.002	200	8.9	0.98	0.031	7%	OK
4077	4078	94	499	0.58	5.27	1,794	0.009	200	2.0	0.47	0.015	62%	OK
4078	4102	191	3619	1.83	237.25	92,750	0.472	700	7.9	2.14	0.824	57%	OK
4079	4080	107	107	1.37	1.37	466	0.002	200	2.0	0.47	0.015	16%	OK
4080	4082	256	363	2.72	4.09	1,392	0.007	200	7.7	0.92	0.029	25%	OK
4081	4082	165	165	0.95	0.95	323	0.002	200	13.9	1.23	0.039	4%	OK
4082	4085	174	537	1.18	6.22	2,118	0.011	200	10.3	1.06	0.033	32%	OK
4083	4084	80	80	0.64	0.64	218	0.001	200	32.5	1.88	0.059	2%	OK
4084	4085	189	269	3.11	3.75	1,277	0.007	200	2.0	0.47	0.015	44%	OK
4085	4087	182	719	1.07	11.04	3,758	0.019	300	2.0	0.61	0.043	44%	OK
4086	4087	158	158	3.57	3.57	1,215	0.006	200	10.1	1.05	0.033	19%	OK
4087	4091	78	797	0.26	14.87	5,062	0.026	300	2.0	0.61	0.043	60%	OK
4090	4091	162	162	1.27	1.27	432	0.002	200	2.0	0.47	0.015	15%	OK
4091	4097	96	893	0.43	16.57	5,641	0.029	350	2.0	0.68	0.065	44%	OK
4092	4094	157	157	1.16	1.16	395	0.002	200	9.5	1.02	0.032	6%	OK
4093	4094	69	69	0.31	0.31	106	0.001	200	37.6	2.02	0.063	1%	OK
4094	4096	97	254	0.39	1.86	633	0.003	200	2.0	0.47	0.015	22%	OK
4095	4096	87	87	0.24	0.24	82	0.000	200	2.0	0.47	0.015	3%	OK
4096	4097	178	432	1.28	3.38	1,151	0.006	200	2.0	0.47	0.015	40%	OK
4097	4099	215	1108	2.23	22.18	7,551	0.038	300	5.9	1.05	0.074	52%	OK
4098	4099	190	190	2.50	2.50	851	0.004	200	7.3	0.89	0.028	16%	OK
4099	4101	68	1176	0.35	25.03	8,521	0.043	350	2.9	0.82	0.079	55%	OK
4100	4101	177	177	1.10	1.10	374	0.002	200	11.2	1.10	0.035	6%	OK
4101	4102	174	1350	1.27	27.40	9,328	0.048	400	2.0	0.74	0.093	51%	OK
4102	4104	73	3692	0.29	264.94	102,177	0.520	700	11.6	2.59	0.997	52%	OK
4103	4104	361	361	2.90	2.90	987	0.005	200	2.4	0.51	0.016	31%	OK
4104	4110	420	4112	2.80	270.64	104,117	0.530	800	3.8	1.62	0.814	65%	OK
4105	4106	62	62	0.54	0.54	184	0.001	200	12.9	1.19	0.037	3%	OK
4106	4110	243	305	4.91	5.45	1,855	0.009	200	18.5	1.42	0.045	21%	OK
4107	4109	627	627	4.81	4.81	1,638	0.008	200	4.7	0.72	0.023	37%	OK
4108	4109	384	384	5.70	5.70	1,941	0.010	200	2.3	0.50	0.016	63%	OK
4109	4110	99	4211	0.67	6.37	2,169	0.011	200	2.0	0.47	0.015	75%	OK
4110	4118	95	4306	0.35	282.17	108,043	0.550	1000	2.0	1.37	1.076	51%	OK
4111	4112	152	152	1.46	1.46	497	0.003	200	34.2	1.93	0.061	4%	OK
InFlow Area	4112			8.38	8.38	2,853	0.015						
4112	4113	358	510	9.88	19.72	6,714	0.034	250	13.9	1.43	0.070	49%	OK
4113	4114	177	687	3.39	23.11	7,868	0.040	350	2.2	0.71	0.068	59%	OK
4114	4115	325	1012	8.68	31.79	10,823	0.055	300	11.9	1.49	0.105	52%	OK
4115	4117	166	1178	0.74	32.53	11,075	0.056	450	2.0	0.80	0.127	44%	OK
4116	4117	289	289	1.68	1.68	572	0.003	200	2.4	0.51	0.016	18%	OK
4117	4118	80	1258	0.36	34.57	11,769	0.060	350	5.1	1.08	0.104	58%	OK
InFlow Area	4118			4.10	4.10	1,396	0.007						
4118	4120	447	4753	8.80	329.64	124,203	0.633	900	4.2	1.84	1.171	54%	OK
4119	4120	150	150	0.82	0.82	279	0.001	200	6.6	0.85	0.027	5%	OK
Selita	4120			35.60	-	8,660	0.044						
4120	4122	583	5336	2.62	333.08	134,035	0.683	800	6.6	2.14	1.076	63%	OK
4121	4122	223	223	2.72	2.72	926	0.005	200	14.7	1.27	0.040	12%	OK
4122	4132	234	5570	4.20	340.00	136,390	0.695	1000	2.0	1.37	1.076	65%	OK
4123	4124	110	110	1.10	1.10	374	0.002	200	2.7	0.54	0.017	11%	OK
4124	4125	548	658	6.00	7.10	2,417	0.012	200	6.9	0.87	0.027	45%	OK
4125	4129	368	1026	4.50	11.60	3,949	0.020	200	18.4	1.42	0.045	45%	OK
4126	4127	473	473	6.90	6.90	2,349	0.012	200	9.0	0.99	0.031	38%	OK
4127	4128	341	814	7.50	14.40	4,902	0.025	250	7.6	1.06	0.052	48%	OK
4128	4129	197	1011	1.50	15.90	5,413	0.028	250	11.6	1.30	0.064	43%	OK
4129	4131	130	1156	0.80	28.30	9,635	0.049	250	37.6	2.35	0.115	43%	OK
4130	4131	435	435	5.90	5.90	2,009	0.010	200	33.5	1.91	0.060	17%	OK

No.	Down Stream	Length (m)		Area (ha)		Sewage Quantity		Planned Pipe Specification				Capacity	
		Increment	Total	Increment	Total	Population	$Q_1(m^3/s)$	D (mm)	I (‰)	V (m/s)	$Q_2(m^3/s)$	Q_1/Q_2	Judge
4131	4132	213	1369	0.90	35.10	11,950	0.061	450	2.0	0.80	0.127	48%	OK
4132	To STP	0	5570	0.00	375.10	148,340	0.755	1100	2.0	1.45	1.378	55%	OK