

1 Introduction

A high-investment project such as a railway line needs a project preparation study in order to establish its viability. One important input to the study is an estimate of the possible passenger transport demand that will use the service. Such estimate needs information on current passenger demand trends as well as vehicle traffic volumes along the proposed alignment of the service.

This proposal describes the scope of work and the corresponding cost of services for the traffic surveys to be undertaken, in connection with the project.

2 Survey Methodology

The traffic count and occupancy surveys were conducted in the south of FTI/NAIA areas focusing on the SLEX/ Skyway Corridor. The surveys conducted are:

1. Manual Classified Vehicle Counts on Skyway, SLEX and Service Roads; and
2. Vehicle Occupancy Counts at selected survey points of (1) above in the inbound (towards Metro Manila) direction only.

2.1 Survey Location and Duration

The surveys were conducted at the locations shown in Table 2.1, for a period of 18 hours from 05:00 to 23:00 on Tuesday, 23 April 2013 and Thursday, 25 April 2013. Traffic volumes were counted in both northbound and southbound directions. The vehicle occupancy survey was conducted for a period of 12 hours from 06:00 to 18:00 hours on the same day with the traffic count.

Figures 2.1 and 2.2 show the overall location of the stations while Table 2.1 presents the survey schedule of each station while

2.2 Vehicle Types Recorded

The surveys were conducted manually in both directions of travel. All vehicles (100% sample) passing a survey station were counted. For high volume roads manual counters were used. Data were recorded in 30-minute intervals. Table 2.2 shows the vehicle type classification and vehicle occupancy sampling method.

Figure 2.1: Location of Survey Stations (SLEX & Service Roads)

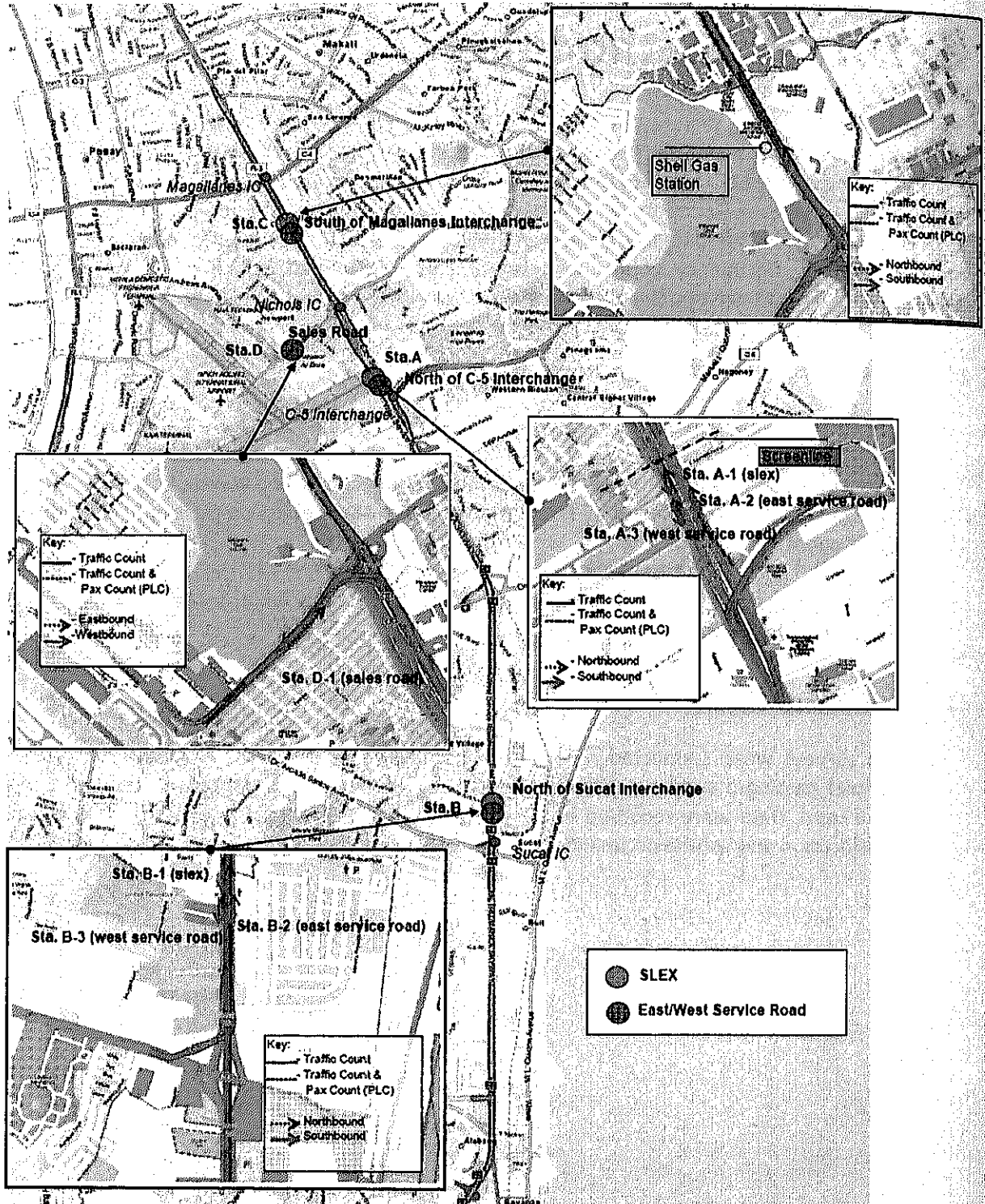


Figure 2.2: Location of Survey Stations (Skyway)

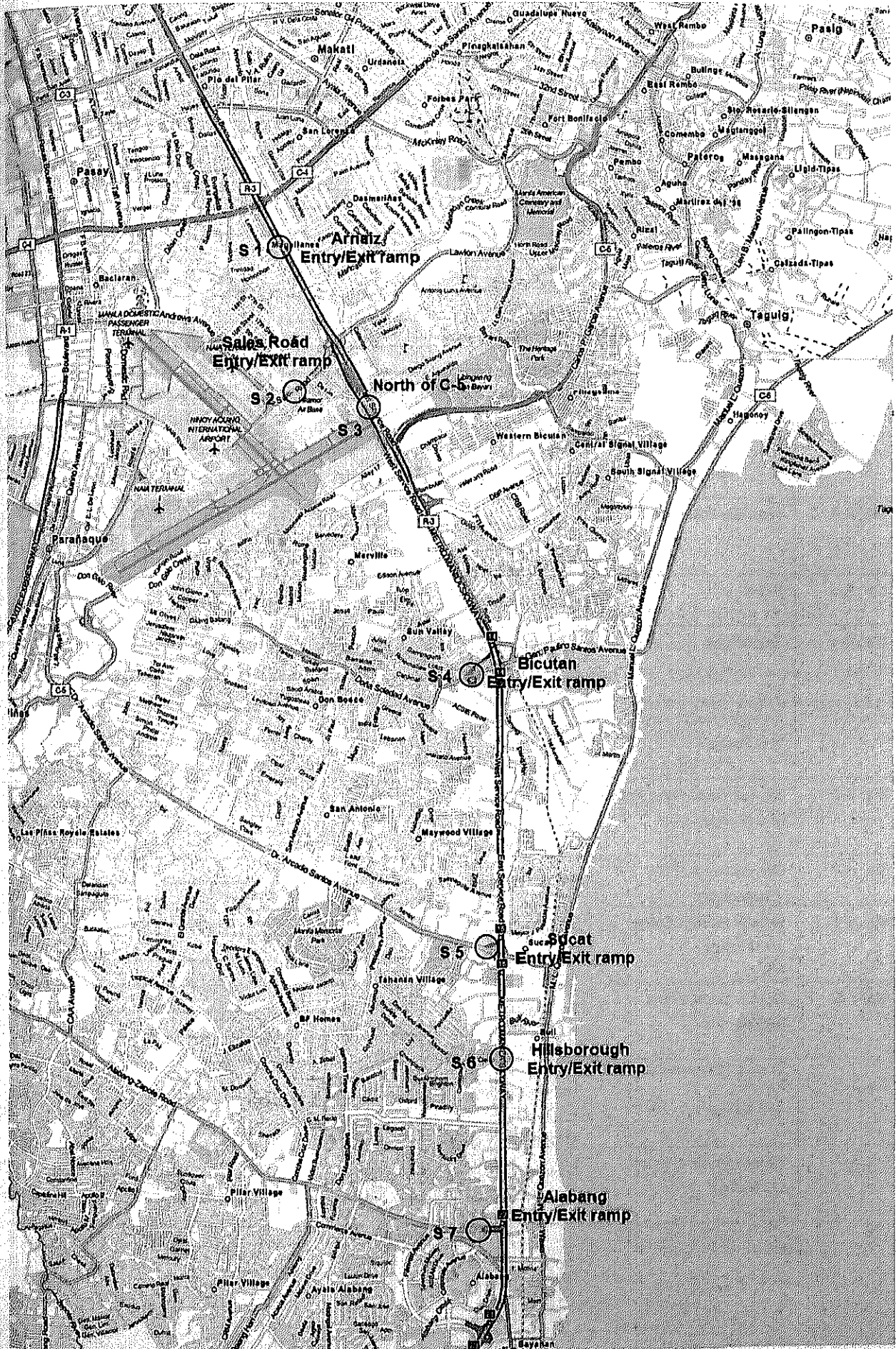


Table 2.1: Location of Survey Stations and Schedule

Station	Station Name/Location	Type of Surveys	Directions	Tuesday (April 23)		Thursday (April 25)		Survey Duration
				AM Shift	PM Shift	AM Shift	PM Shift	
Sta. A-1	SLEX (Screenline)	Traffic Counting	NB			√	√	24 Hrs
			SB			√	√	24 Hrs
		Vehicle Occupancy	NB			√	√	12 Hrs
Sta. A-2	East Service Road (Screenline)	Traffic Counting	NB			√	√	24 Hrs
			SB			√	√	24 Hrs
		Vehicle Occupancy	NB			√	√	12 Hrs
Sta. A-3	West Service Road (Screenline)	Traffic Counting	NB			√	√	24 Hrs
			SB			√	√	24 Hrs
		Vehicle Occupancy	NB			√	√	12 Hrs
Sta. B-1	SLEX	Traffic Counting	NB	√	√			18 Hrs
			SB	√	√			18 Hrs
		Vehicle Occupancy	NB	√	√			12 Hrs
Sta. B-2	East Service Road	Traffic Counting	NB	√	√			18 Hrs
			SB	√	√			18 Hrs
		Vehicle Occupancy	NB	√	√			12 Hrs
Sta. B-3	West Service Road	Traffic Counting	NB	√	√			18 Hrs
			SB	√	√			18 Hrs
		Vehicle Occupancy	NB	√	√			12 Hrs
Sta. C-1	SLEX	Traffic Counting	NB			√	√	24 Hrs
			SB			√	√	24 Hrs
Sta. D-1	Sales Road	Traffic Counting	EB	√	√			18 Hrs
			WB	√	√			18 Hrs
		Vehicle Occupancy	NB	√	√			12 Hrs
Sta. S-1	Skyway Arnaiz Entry/ Exit Ramps	Traffic Counting	NB			√	√	18 Hrs
			SB			√	√	18 Hrs
		Vehicle Occupancy	NB			√	√	12 Hrs
Sta. S-2	Skyway Sales Road Entry/ Exit Ramps	Traffic Counting	NB			√	√	18 Hrs
			SB			√	√	18 Hrs
		Vehicle Occupancy	NB			√	√	12 Hrs
Sta. S-3	Skyway North of C-5 (Screenline)	Traffic Counting	NB			√	√	24 Hrs
			SB			√	√	24 Hrs
Sta. S-4	Skyway Bicutan Entry/ Exit Ramps	Traffic Counting	NB			√	√	18 Hrs
			SB			√	√	18 Hrs
		Vehicle Occupancy	NB			√	√	12 Hrs
Sta. S-5	Skyway Sucat Entry/ Exit Ramps	Traffic Counting	NB			√	√	18 Hrs
			SB			√	√	18 Hrs
		Vehicle Occupancy	NB			√	√	12 Hrs
Sta. S-6	Skyway Hillsborough Entry/ Exit Ramps	Traffic Counting	NB			√	√	18 Hrs
			SB			√	√	18 Hrs
		Vehicle Occupancy	NB			√	√	12 Hrs
Sta. S-7	Skyway Alabang Entry/ Exit Ramps	Traffic Counting	NB			√	√	18 Hrs
			SB			√	√	18 Hrs
		Vehicle Occupancy	NB			√	√	12 Hrs

Table 2.2: Vehicle Type Classification and Vehicle Occupancy Recorded

No.	Vehicle Type Description	Vehicle Occupancy
1	Private Car/ Sedan/ SUV/ Open Back Pickup (single or twin cabin) and Taxi / Airport Taxi	All Occupants Including Driver (minimum 10% sample)
2	Private or Public Van, AUV & FX (Seats 8 to 18)	All Occupants Excluding Driver (minimum 10% sample)
3	All Sizes of Jeepney	All Occupants Excluding Driver (minimum 10% sample)
4	Public Bus	All Occupants Excluding Driver (minimum 10% sample)
5	Delivery vehicles, 2-Axle trucks, 2+ or more Axle Trucks / Goods Vehicles, Container Trucks/ Other Vehicles like construction, Concrete Mixer/ Military, Police, Fire Engines (No Occupancy Survey)	Not Required

Vehicle Occupancy was recorded for at least 10% of all passing vehicles in the northbound direction (towards Metro Manila), for four (4) vehicle types in 30- minute intervals. In case of buses, bus seating capacity and % occupancy was recorded and later converted to the actual on-board passengers depending on bus capacity. Where a vehicle had dark windows, surveyor recorded occupancy of a similar size vehicle with clear windows. The occupancy surveys were conducted during day light hours from 6:00 to 18:00 (12-hours).

2.3 **Survey Staffing**

Adequate survey staffing is essential for quality and accuracy of data. In view of this, no person counted more than one lane and 2 vehicle types at any one time. For vehicle occupancy surveys, one surveyor was deployed for not more than two vehicle types. No staff surveyed for more than 45 minutes in each hour. No staff worked for more than one 9-hour shift.

Annex B shows the survey forms used for the survey.

3 Survey Results

Summary tables of all surveys conducted are presented here. Detailed data are shown in the subsection below.

3.1 VEHICLE COUNT SURVEY

Table 3.1-2 to 3.1.16 shows the traffic volume by direction, by vehicle type for all stations. The tables are arranged, as summarized below. The survey results are shown in **Annex A**.

Table 3.1-1: Summary of Traffic Count Data

Station Code	Station Name	Duration	Northbound (On-Ramp)	Southbound (Off-Ramp)	Total
Sta. A-1	SLEX (North of C-5 Access Ramp)	24-Hrs	28,873	32,815	61,688
Sta. A-2	East Service Road (Screenline)	24-Hrs	25,573	16,573	42,268
Sta. A-3	West Service Road (Screenline)	24-Hrs	15,937	12,160	28,097
Sta. B-1	SLEX	18-Hrs	36,740	44,614	81,354
Sta. B-2	East Service Road	18-Hrs	4,989	3,966	8,955
Sta. B-3	West Service Road	18-Hrs	7,153	9,368	16,521
Sta. C-1	SLEX	24-Hrs	58,692	55,738	114,430
Sta. D-1	Sales Road	18-Hrs	22,774	25,564	48,338
Sta. S-1	Skyway - Arnaiz (Entry/Exit Ramps)	18-Hrs	(10,727)	(10,361)	21,088
Sta. S-2	Skyway -Sales Road (Entry/Exit Ramps)	18-Hrs	(15,340)	(15,293)	30,633
Sta. S-3	Skyway - North of C-5 (Screenline)	24-Hrs	24,487	23,491	47,978
Sta. S-4	Skyway - Bicutan Entry/Exit Ramps	18-Hrs	(4,323)	(5,683)	10,008
Sta. S-5	Skyway - Sucat Entry/Exit Ramps	18-Hrs	(5,140)	(3,872)	9,012
Sta. S-6	Skyway - Hillsborough Entry/Exit Ramps	18-Hrs	(9,887)	(8,046)	17,933
Sta. S-7	Skyway Alabang Entry/Exit Ramps	18-Hrs	(5,364)	(4,993)	10,337

Table 3.1-2: Manual Classified Count: Station A-1: SLEX (North of C-5 Access Ramp)

Station Code: A-1
 Station Name: SLEX (North of C-5 Access Ramp)
 Date: 04/25/2013
 Weather: Fine

Time Period	NORTHBOUND							SOUTHBOUND						
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total		
05:00 - 05:30	164	43	7	61	117	392	146	57	18	53	225	499		
05:30 - 06:00	344	67	19	105	76	611	233	101	34	85	271	724		
06:00 - 06:30	498	87	17	125	65	792	423	115	63	97	134	633		
06:30 - 07:00	599	92	26	112	48	877	589	118	83	94	93	977		
07:00 - 07:30	707	79	28	101	47	962	498	160	94	91	104	947		
07:30 - 08:00	578	85	22	89	73	847	502	160	95	83	75	915		
08:00 - 08:30	485	86	20	66	57	714	486	146	96	90	81	899		
08:30 - 09:00	429	88	3	65	51	636	519	133	93	102	109	956		
09:00 - 09:30	370	102	9	61	91	633	518	146	83	94	124	965		
09:30 - 10:00	374	90	11	44	123	642	506	173	67	104	183	1033		
10:00 - 10:30	392	77	8	53	264	794	339	121	31	58	184	733		
10:30 - 11:00	419	77	10	38	206	750	395	126	31	63	232	847		
11:00 - 11:30	406	101	7	49	236	799	399	146	25	67	224	861		
11:30 - 12:00	338	72	5	38	156	609	384	134	28	74	238	858		
12:00 - 12:30	372	59	1	42	150	624	410	143	22	58	219	852		
12:30 - 13:00	367	61	1	43	133	605	405	120	29	70	198	822		
13:00 - 13:30	337	80	3	63	173	656	420	122	25	77	164	808		
13:30 - 14:00	398	91	9	62	195	755	503	114	28	63	146	854		
14:00 - 14:30	570	104	4	60	199	937	382	85	17	61	133	678		
14:30 - 15:00	568	132	6	71	208	985	478	95	17	77	166	833		
15:00 - 15:30	547	151	8	89	264	1,059	478	137	30	81	196	912		
15:30 - 16:00	415	106	6	65	180	772	322	66	35	51	112	586		
16:00 - 16:30	430	103	7	69	142	751	420	112	33	64	88	717		
16:30 - 17:00	498	143	9	73	127	850	417	108	25	63	103	716		
17:00 - 17:30	520	122	11	81	95	829	400	102	33	66	97	698		
17:30 - 18:00	511	137	18	91	97	854	479	152	38	77	58	804		
18:00 - 18:30	418	128	16	80	104	746	471	114	35	124	65	809		
18:30 - 19:00	458	120	18	59	65	720	458	33	43	13	51	598		
19:00 - 19:30	397	131	13	83	98	722	338	152	29	63	63	645		
19:30 - 20:00	302	111	8	92	70	583	389	73	26	86	70	644		
20:00 - 20:30	268	99	10	92	50	519	397	78	21	89	47	631		
20:30 - 21:00	240	69	6	73	60	448	413	93	38	73	79	696		
21:00 - 21:30	273	66	3	69	148	559	375	75	27	85	29	591		
21:30 - 22:00	209	42	2	41	238	532	432	69	32	87	76	696		
22:00 - 22:30	211	33	1	57	338	640	460	84	26	48	83	704		
22:30 - 23:00	263	64	1	56	234	618	317	37	32	35	92	513		
23:00 - 23:30	108	43	1	41	118	311	253	59	19	39	398	768		
23:30 - 00:00	181	39	1	29	98	348	275	47	23	34	267	644		
00:00 - 00:30	79	44	2	29	106	260	204	48	20	22	190	464		
00:30 - 01:00	74	18	0	23	90	205	176	13	13	18	169	369		
01:00 - 01:30	72	22	0	12	110	216	174	30	20	14	234	477		
01:30 - 02:00	46	13	0	14	97	170	66	12	10	17	42	147		
02:00 - 02:30	48	17	0	20	93	178	81	23	13	14	129	260		
02:30 - 03:00	42	17	1	30	108	198	80	34	10	14	62	200		
03:00 - 03:30	53	19	2	44	110	228	78	29	15	15	245	382		
03:30 - 04:00	50	37	1	43	112	243	89	32	11	32	184	348		
04:00 - 04:30	84	38	1	60	139	322	128	32	14	36	218	428		
04:30 - 05:00	105	45	3	75	144	372	98	51	7	63	211	430		
Total	15,617	3,650	365	2,938	6,303	28,873	16,803	4,410	1,657	2,984	6,961	32,215		

See Location Map below:

Figure 3.1-1: Location Map: Station A-1: SLEX (North of C-5 Access Ramp)

Sta. A - North of C-5 Ramp

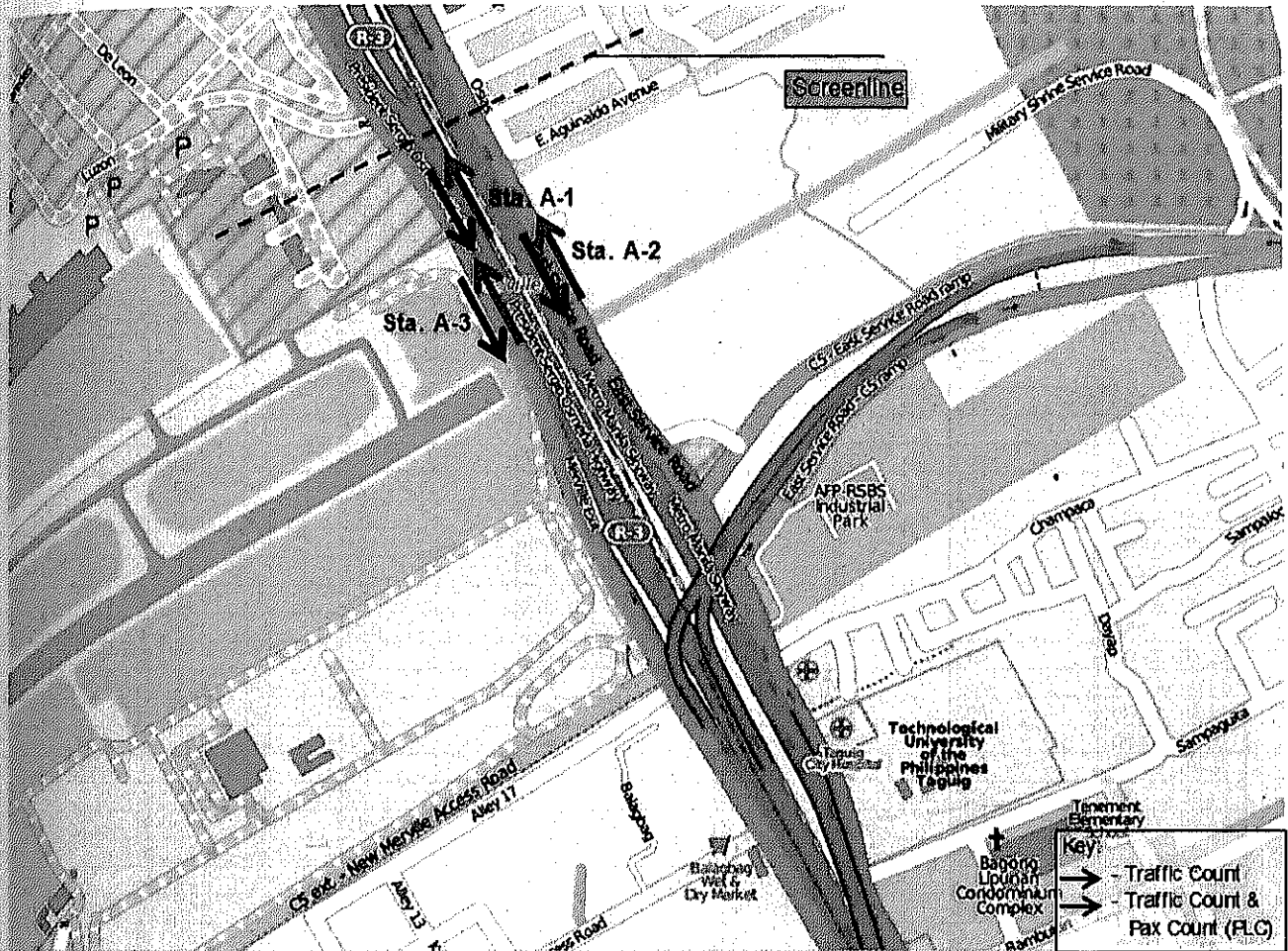


Table 3.1-3: Manual Classified Count: Station A-2: East Service Road

Station Code: A-2
 Station Name: East Service Road
 Date: 04/25/2013
 Weather: Fine

Time Period	NORTHBOUND										SOUTHBOUND									
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Air	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Air port Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total								
05:00 - 05:30	80	30	93	7	46	256	53	8	12	2	35	110								
05:30 - 06:00	269	30	93	20	88	500	146	30	55	17	48	296								
06:00 - 06:30	403	50	120	19	71	663	203	41	74	15	54	387								
06:30 - 07:00	496	44	117	14	56	727	205	87	97	15	54	458								
07:00 - 07:30	501	52	127	13	47	740	169	42	100	7	46	364								
07:30 - 08:00	557	55	129	13	51	805	181	42	91	11	41	366								
08:00 - 08:30	566	57	120	11	68	822	259	35	97	18	62	471								
08:30 - 09:00	481	59	80	7	74	701	122	40	86	8	56	312								
09:00 - 09:30	639	81	77	11	107	915	271	50	92	23	55	491								
09:30 - 10:00	574	72	79	12	122	859	164	50	86	13	96	409								
10:00 - 10:30	502	77	79	14	136	808	143	52	81	10	128	414								
10:30 - 11:00	504	58	64	8	131	765	152	56	73	14	120	415								
11:00 - 11:30	499	57	69	11	129	765	129	45	53	5	130	361								
11:30 - 12:00	423	57	56	9	121	666	175	47	67	10	142	441								
12:00 - 12:30	292	44	69	6	106	517	211	46	60	5	116	438								
12:30 - 13:00	408	63	83	7	94	655	164	40	72	4	104	384								
13:00 - 13:30	401	60	63	5	104	633	172	37	75	37	116	437								
13:30 - 14:00	366	62	63	15	113	619	246	39	63	9	97	454								
14:00 - 14:30	420	74	66	15	113	688	197	30	47	6	91	371								
14:30 - 15:00	368	64	63	7	131	633	281	32	47	9	82	451								
15:00 - 15:30	449	76	72	11	139	747	211	36	43	8	69	367								
15:30 - 16:00	393	49	69	18	99	628	314	41	47	5	78	485								
16:00 - 16:30	380	79	80	14	91	644	201	45	56	8	62	372								
16:30 - 17:00	456	50	96	15	74	691	219	39	50	8	44	360								
17:00 - 17:30	399	53	98	11	75	636	220	55	78	13	50	416								
17:30 - 18:00	391	44	88	13	60	596	289	42	86	12	48	477								
18:00 - 18:30	404	62	113	19	64	662	315	58	82	14	60	529								
18:30 - 19:00	394	56	102	10	55	617	232	46	54	27	57	416								
19:00 - 19:30	343	46	81	14	66	550	269	35	76	10	33	423								
19:30 - 20:00	343	55	84	14	62	558	265	35	78	10	39	427								
20:00 - 20:30	294	52	88	23	61	518	259	32	55	12	41	399								
20:30 - 21:00	305	47	62	14	57	485	240	21	36	9	30	336								
21:00 - 21:30	226	39	50	13	55	383	245	45	59	7	40	396								
21:30 - 22:00	231	33	49	10	65	388	205	3	45	12	40	305								
22:00 - 22:30	209	31	39	11	96	386	230	2	17	4	37	290								
22:30 - 23:00	159	12	34	3	125	333	106	4	13	8	45	176								
23:00 - 23:30	146	13	29	5	83	276	202	15	49	23	194	483								
23:30 - 00:00	143	31	25	5	75	279	161	13	24	11	137	346								
00:00 - 00:30	144	13	15	6	71	249	137	19	18	15	126	313								
00:30 - 01:00	119	11	21	2	87	240	121	9	5	13	87	233								
01:00 - 01:30	75	10	17	3	98	203	110	10	6	2	41	169								
01:30 - 02:00	48	13	19	4	74	158	66	3	6	6	35	116								
02:00 - 02:30	133	16	15	3	101	268	69	6	10	5	54	144								
02:30 - 03:00	105	18	17	5	95	240	69	8	24	11	44	156								
03:00 - 03:30	105	13	20	12	91	241	66	4	12	3	65	150								
03:30 - 04:00	98	22	27	21	94	262	49	3	15	2	86	153								
04:00 - 04:30	112	29	29	15	100	285	47	3	16	3	180	249								
04:30 - 05:00	121	39	45	25	83	313	68	2	18	3	81	172								
Total	15,474	2,158	3,194	543	4,204	25,573	8,628	1,483	2,506	502	3,576	16,695								

See Location Map below:

Table 3.1-4: Manual Classified Count: Station A-3: West Service Road

Station Code: A-3
 Station Name: West Service Road
 Date: 04/25/2013
 Weather: Fine

Time Period	NORTHBOUND							SOUTHBOUND						
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total		
05:00 - 05:30	104	45	20	1	44	214	97	35	23	0	29	184		
05:30 - 06:00	199	58	41	1	39	338	103	35	29	1	28	196		
06:00 - 06:30	318	139	52	0	43	552	1	1	1	0	1	4		
06:30 - 07:00	327	176	56	0	30	589	0	0	0	0	0	0		
07:00 - 07:30	458	188	55	0	47	748	0	0	0	0	0	0		
07:30 - 08:00	486	165	44	1	23	719	0	0	0	0	0	0		
08:00 - 08:30	408	131	41	0	43	623	0	0	0	0	0	0		
08:30 - 09:00	320	89	30	0	39	478	0	0	0	0	0	0		
09:00 - 09:30	312	132	28	0	40	512	0	0	0	0	0	0		
09:30 - 10:00	261	91	33	0	70	455	52	40	19	0	20	131		
10:00 - 10:30	230	95	24	0	33	382	157	70	43	0	37	307		
10:30 - 11:00	239	103	26	1	56	425	144	70	19	0	46	279		
11:00 - 11:30	230	107	29	0	58	424	140	83	37	0	45	305		
11:30 - 12:00	192	81	25	0	22	320	150	82	26	0	43	304		
12:00 - 12:30	186	111	30	0	45	372	178	85	29	0	37	319		
12:30 - 13:00	237	100	33	0	37	407	173	49	28	0	37	287		
13:00 - 13:30	258	109	25	0	42	434	163	66	32	1	40	302		
13:30 - 14:00	215	113	25	0	45	398	174	62	23	0	41	300		
14:00 - 14:30	232	123	24	0	42	421	145	57	16	0	30	248		
14:30 - 15:00	212	109	33	0	51	405	190	69	19	0	47	325		
15:00 - 15:30	185	99	28	0	46	358	172	99	24	0	25	320		
15:30 - 16:00	168	125	20	0	44	357	212	85	24	2	40	363		
16:00 - 16:30	149	107	23	0	29	308	174	86	24	0	30	314		
16:30 - 17:00	180	108	35	0	29	352	217	83	19	0	23	347		
17:00 - 17:30	203	119	38	0	30	390	230	71	18	0	20	339		
17:30 - 18:00	217	107	44	0	30	398	335	106	21	0	25	487		
18:00 - 18:30	161	89	43	0	24	317	289	104	30	0	15	438		
18:30 - 19:00	173	83	40	0	22	318	334	105	28	0	26	493		
19:00 - 19:30	159	66	32	0	25	282	272	102	29	0	13	416		
19:30 - 20:00	140	69	37	0	18	264	342	84	21	0	30	477		
20:00 - 20:30	132	69	36	0	30	267	259	83	23	0	23	388		
20:30 - 21:00	122	38	29	0	34	223	350	80	28	0	25	483		
21:00 - 21:30	151	59	28	0	31	269	331	76	25	1	25	458		
21:30 - 22:00	132	41	21	0	37	231	293	59	28	0	22	402		
22:00 - 22:30	139	41	19	2	36	237	221	35	22	0	26	394		
22:30 - 23:00	170	35	19	2	37	263	102	8	8	0	30	148		
23:00 - 23:30	103	29	12	0	42	186	303	67	16	0	55	441		
23:30 - 00:00	138	34	11	0	60	243	172	25	14	0	42	253		
00:00 - 00:30	92	23	8	0	36	159	180	38	7	0	41	266		
00:30 - 01:00	103	26	9	0	34	172	191	23	9	1	39	263		
01:00 - 01:30	81	23	9	0	37	150	149	18	6	0	44	217		
01:30 - 02:00	63	8	5	0	31	107	100	8	14	0	39	161		
02:00 - 02:30	57	8	4	0	43	112	124	25	6	0	33	188		
02:30 - 03:00	60	19	5	0	40	124	86	18	7	0	50	161		
03:00 - 03:30	53	22	6	0	39	120	71	15	4	0	39	129		
03:30 - 04:00	59	25	8	0	44	136	67	15	8	0	30	120		
04:00 - 04:30	65	25	11	0	50	151	70	18	6	0	39	133		
04:30 - 05:00	112	38	23	2	52	227	87	24	16	0	31	158		
Total	8,991	3,800	1,277	10	1,859	15,937	7,600	2,364	829	6	1,361	12,160		

See Location Map below:

Figure 3.1-3: Location Map: Station A-3: West Service Road

Sta. A - North of C-5 Ramp

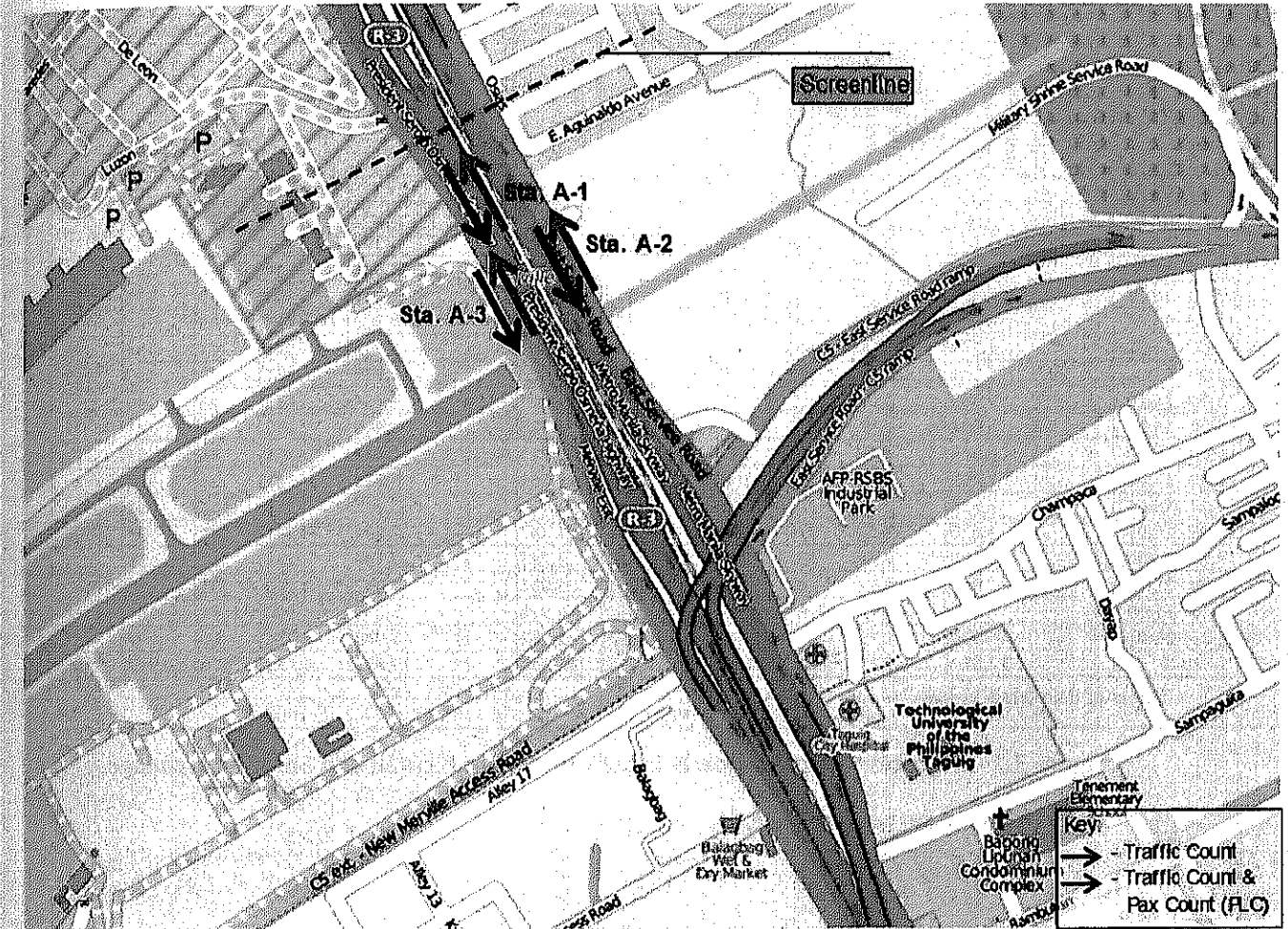


Table 3.1-5: Manual Classified Count: Station B-1: SLEX (between Bicutan and Sucat Interchanges)

Station Code: B-1
 Station Name: SLEX (Bet. Bicutan IC and Sucat IC)
 Date: 04/23/2013
 Weather: Fine

Time Period	NORTHBOUND						SOUTHBOUND					
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total
05:00 - 06:00	547	51	25	208	249	1,080	475	346	31	206	726	1,784
06:00 - 07:00	1,040	211	28	231	108	1,618	1,233	769	57	341	362	2,763
07:00 - 08:00	1,547	208	33	104	105	1,997	1,197	793	54	102	200	2,346
08:00 - 09:00	1,290	177	25	179	110	1,781	1,515	514	76	153	205	2,463
09:00 - 10:00	1,435	281	9	178	316	2,219	1,313	703	53	152	341	2,563
10:00 - 11:00	1,202	215	12	97	728	2,254	1,282	474	45	160	520	2,481
11:00 - 12:00	1,145	115	6	94	631	1,991	1,123	500	43	134	621	2,421
12:00 - 13:00	1,050	176	11	118	473	1,828	1,179	367	35	150	477	2,206
13:00 - 14:00	1,345	119	9	143	389	2,005	1,454	473	32	136	387	2,463
14:00 - 15:00	1,612	225	8	130	550	2,525	1,609	262	31	149	445	2,496
15:00 - 16:00	1,426	259	6	150	578	2,419	1,621	271	36	152	399	2,479
16:00 - 17:00	1,706	353	12	168	429	2,668	1,728	341	21	182	452	2,714
17:00 - 18:00	1,770	355	15	187	328	2,655	2,165	323	114	203	192	2,997
18:00 - 19:00	1,610	277	27	182	290	2,386	2,302	278	88	183	109	2,960
19:00 - 20:00	1,485	288	23	179	250	2,225	3,186	226	47	158	112	3,723
20:00 - 21:00	947	198	24	182	285	1,636	1,772	170	51	195	131	2,319
21:00 - 22:00	889	198	18	130	680	1,915	1,235	100	44	144	199	1,722
22:00 - 23:00	634	101	7	103	693	1,538	1,048	63	20	97	451	1,679
Total	22,680	3,807	298	2,763	7,192	36,740	27,437	6,973	878	2,997	6,329	44,611

See Location Map below:

Figure 3.1-4: Location Map: Station B-1: SLEX (between Bicutan and Sucat Interchanges)

Sta. B - North of Sucat Interchange

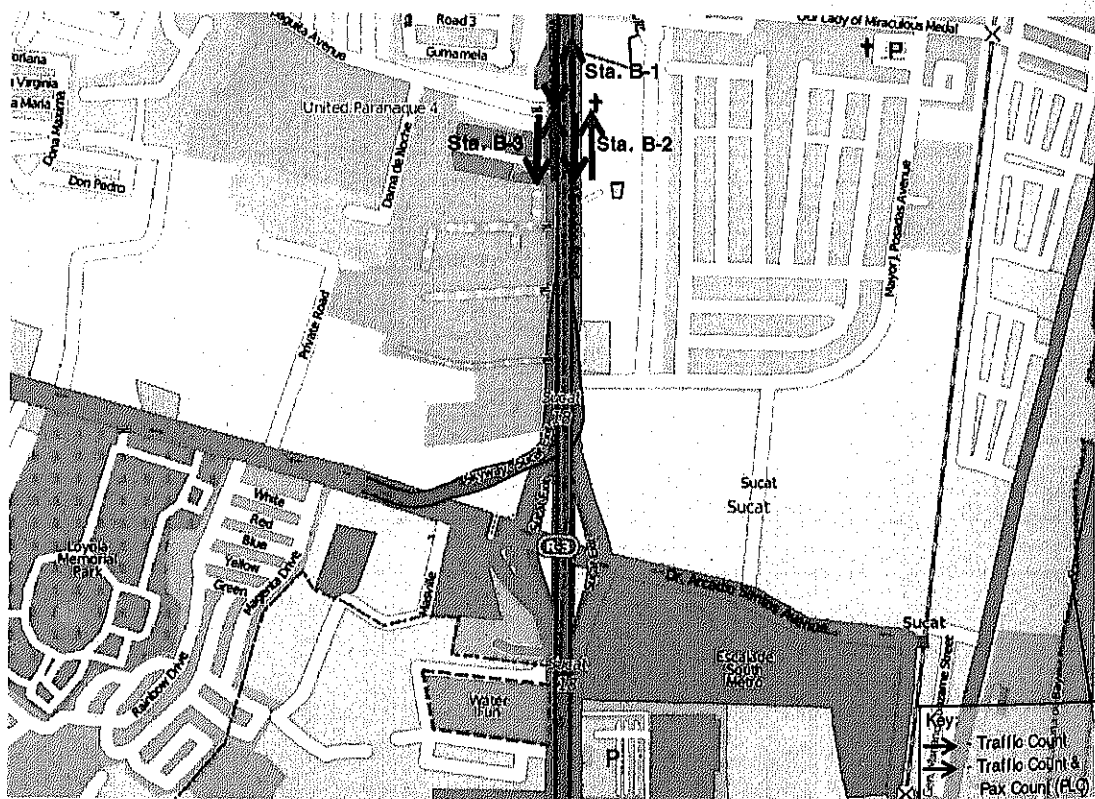


Table 3.1-6: Manual Classified Count: Station B-2: East Service Road

Station Code: B-2
 Station Name: East Service Road
 Date: 04/23/2013
 Weather: Fine

Time Period	NORTHBOUND							SOUTHBOUND						
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Air port Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Air port Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total		
05:00 - 06:00	38	22	79	0	49	188	23	17	92	0	19	151		
06:00 - 07:00	77	45	138	0	36	296	37	30	102	0	9	178		
07:00 - 08:00	103	43	124	2	50	322	45	23	127	0	19	214		
08:00 - 09:00	98	37	118	0	59	312	65	34	97	0	25	221		
09:00 - 10:00	69	33	90	0	76	268	70	31	75	0	37	213		
10:00 - 11:00	52	23	86	0	110	271	44	37	73	0	41	195		
11:00 - 12:00	66	31	99	0	106	302	41	35	66	0	47	189		
12:00 - 13:00	82	27	89	1	110	309	50	28	87	0	67	232		
13:00 - 14:00	67	35	79	0	83	264	51	63	83	0	75	272		
14:00 - 15:00	110	40	108	0	107	365	56	36	69	0	82	243		
15:00 - 16:00	54	40	111	0	93	298	59	31	79	0	76	245		
16:00 - 17:00	64	33	94	0	84	275	86	38	100	1	54	279		
17:00 - 18:00	68	40	117	0	50	275	107	43	113	1	46	310		
18:00 - 19:00	58	32	123	0	29	242	84	21	80	0	27	212		
19:00 - 20:00	42	47	113	2	37	241	75	21	110	0	25	231		
20:00 - 21:00	56	25	103	0	36	220	62	31	112	0	26	231		
21:00 - 22:00	49	26	71	0	57	203	56	21	81	0	21	179		
22:00 - 23:00	56	78	86	0	118	338	45	23	73	0	30	171		
Total	1,209	657	1,828	5	1,290	4,989	1,056	563	1,619	2	726	3,966		

See Location Map below:

Figure 3.1-5: Location Map: Station B-2: East Service Road

Sta. B - North of Sucat Interchange

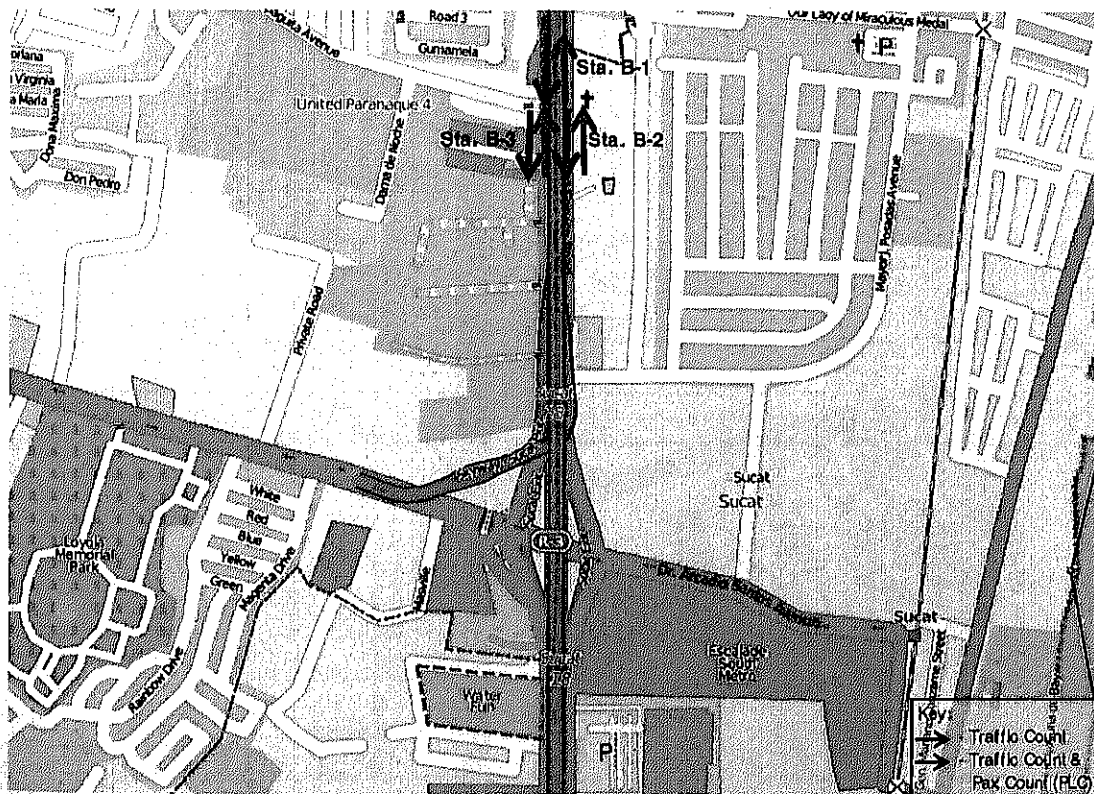


Table 3.1-7: Manual Classified Count: Station B-3: West Service Road

Station Code: B-3
 Station Name: West Service Road
 Date: 04/23/2013
 Weather: Fine

Time Period	NORTHBOUND							SOUTHBOUND						
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total		
05:00 - 06:00	195	40	97	1	121	454	285	34	71	2	153	545		
06:00 - 07:00	271	69	88	1	68	497	382	38	109	0	112	641		
07:00 - 08:00	283	35	92	1	72	483	277	32	105	4	51	469		
08:00 - 09:00	285	44	113	0	74	516	252	48	104	1	73	478		
09:00 - 10:00	275	42	69	1	96	483	244	62	78	0	69	453		
10:00 - 11:00	190	37	49	0	98	374	285	51	58	0	148	542		
11:00 - 12:00	185	36	47	0	91	359	248	60	65	0	144	517		
12:00 - 13:00	169	29	65	0	67	330	227	44	61	0	183	515		
13:00 - 14:00	170	44	69	0	108	391	212	56	52	3	125	448		
14:00 - 15:00	178	38	55	0	141	412	230	47	47	0	140	464		
15:00 - 16:00	170	31	75	2	94	372	255	46	61	3	112	477		
16:00 - 17:00	187	39	88	0	67	381	259	47	82	2	142	532		
17:00 - 18:00	191	32	97	1	68	389	340	42	84	0	108	574		
18:00 - 19:00	212	32	92	2	60	398	418	33	71	1	72	595		
19:00 - 20:00	167	30	89	0	44	330	417	33	83	2	80	615		
20:00 - 21:00	151	31	69	1	65	317	393	43	67	1	97	601		
21:00 - 22:00	181	29	58	0	102	370	329	21	62	1	69	482		
22:00 - 23:00	128	15	40	0	114	297	252	26	45	0	97	420		
Total	3,588	653	1,352	10	1,550	7,153	5,305	763	1,305	20	1,975	9,368		

See Location Map below:

Figure 3.1-6: Location Map: Station B-3: West Service Road

Sta. B - North of Sucat Interchange

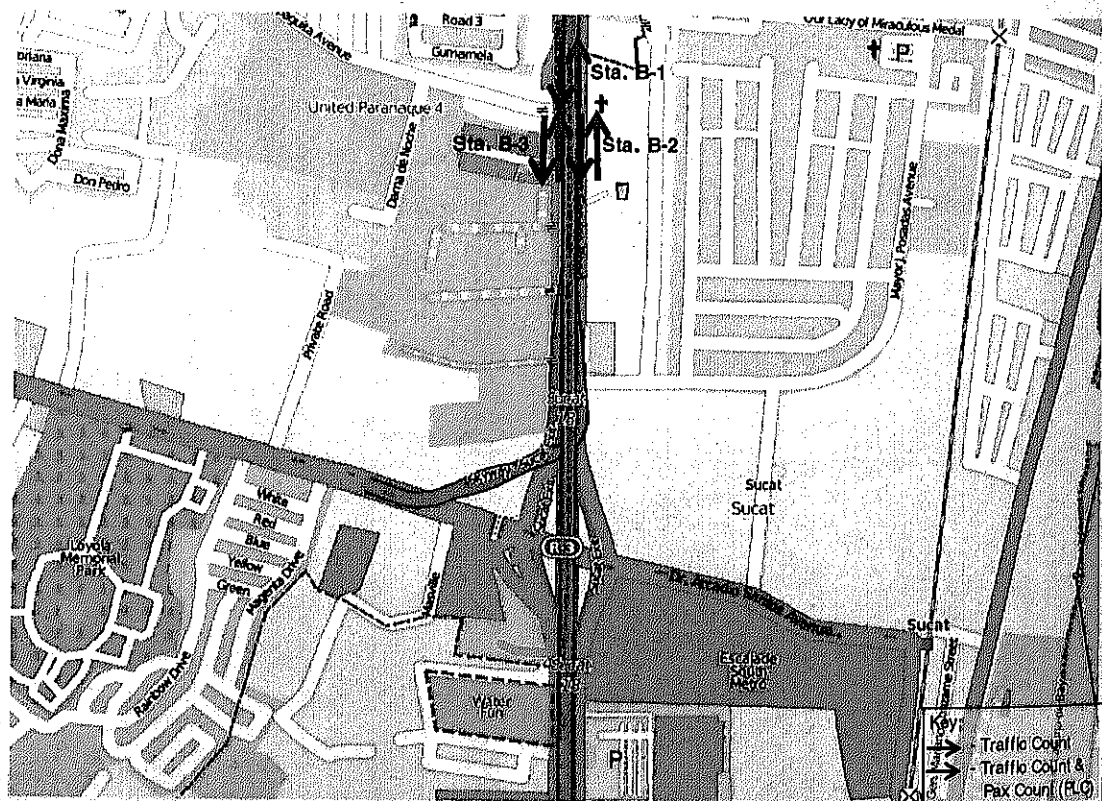


Table 3.1-8: Manual Classified Count: Station C-1: SLEX (North of Nichols Interchange)

Station Code: C-1
 Station Name: SLEX (North of Nichols IC)
 Date: 04/25/2013
 Weather: Fine

Time Period	NORTHBOUND						SOUTHBOUND					
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./ All Trucks/ Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./ All Trucks/ Special Vehicles	Total
05:00 - 05:30	445	105	72	79	196	897	361	138	80	75	319	973
05:30 - 06:00	667	245	167	183	252	1,514	542	206	119	113	319	1,299
06:00 - 06:30	657	245	130	109	154	1,295	486	178	144	87	159	1,054
06:30 - 07:00	985	366	170	163	170	1,854	629	267	140	130	106	1,272
07:00 - 07:30	702	270	135	102	126	1,335	650	204	145	76	111	1,186
07:30 - 08:00	682	270	90	100	84	1,226	773	204	219	114	111	1,421
08:00 - 08:30	353	222	74	76	95	820	678	237	131	100	124	1,270
08:30 - 09:00	474	227	82	84	124	991	692	182	156	96	140	1,266
09:00 - 09:30	566	230	57	80	154	1,087	659	242	146	121	163	1,331
09:30 - 10:00	641	233	91	68	276	1,309	676	272	142	100	244	1,434
10:00 - 10:30	799	459	108	56	411	1,833	667	209	139	76	347	1,438
10:30 - 11:00	826	419	136	50	359	1,790	703	232	104	76	382	1,497
11:00 - 11:30	486	270	92	35	301	1,184	712	284	105	77	367	1,545
11:30 - 12:00	420	194	69	49	254	986	645	207	98	90	369	1,409
12:00 - 12:30	699	282	94	50	279	1,404	733	189	93	71	334	1,420
12:30 - 13:00	700	387	123	54	267	1,531	743	170	112	78	330	1,433
13:00 - 13:30	741	262	83	68	270	1,424	719	356	119	84	300	1,578
13:30 - 14:00	715	167	87	72	337	1,378	839	317	115	68	240	1,579
14:00 - 14:30	1,224	404	191	80	320	2,219	734	160	67	73	256	1,290
14:30 - 15:00	1,143	395	107	75	321	2,041	885	212	98	79	261	1,535
15:00 - 15:30	993	467	113	97	367	2,037	896	198	84	85	240	1,503
15:30 - 16:00	984	472	102	90	320	1,968	781	172	108	65	159	1,285
16:00 - 16:30	963	371	98	88	239	1,759	694	246	99	74	138	1,251
16:30 - 17:00	683	186	134	89	208	1,300	686	293	90	79	140	1,288
17:00 - 17:30	729	354	142	84	175	1,484	719	164	101	75	130	1,189
17:30 - 18:00	1,012	303	119	116	165	1,715	827	196	125	81	100	1,329
18:00 - 18:30	790	281	129	94	171	1,465	780	172	114	71	88	1,225
18:30 - 19:00	672	295	130	83	147	1,327	777	147	113	95	92	1,224
19:00 - 19:30	868	231	87	93	143	1,422	749	145	125	73	78	1,170
19:30 - 20:00	982	185	94	98	127	1,486	679	211	104	94	99	1,187
20:00 - 20:30	893	173	137	116	136	1,455	659	242	104	103	97	1,205
20:30 - 21:00	674	146	71	78	84	1,053	625	173	96	76	61	1,031
21:00 - 21:30	739	89	53	76	158	1,115	749	156	96	103	91	1,195
21:30 - 22:00	604	139	70	70	305	1,188	767	209	105	98	118	1,297
22:00 - 22:30	495	141	36	83	436	1,191	761	200	79	63	209	1,312
22:30 - 23:00	385	53	53	44	344	879	388	57	46	54	172	717
23:00 - 23:30	460	66	64	52	322	964	392	73	52	58	582	1,157
23:30 - 00:00	417	96	31	36	190	770	499	72	49	47	361	1,028
00:00 - 00:30	291	93	28	24	179	615	496	66	41	41	269	913
00:30 - 01:00	280	108	32	26	188	634	361	69	35	40	236	741
01:00 - 01:30	310	75	21	21	189	616	351	51	42	16	185	645
01:30 - 02:00	205	58	21	22	218	524	266	73	36	25	203	603
02:00 - 02:30	168	47	18	16	205	454	276	42	36	21	195	570
02:30 - 03:00	188	68	28	38	225	547	265	49	33	21	246	614
03:00 - 03:30	148	54	28	47	194	471	246	58	26	18	244	592
03:30 - 04:00	209	112	43	49	187	600	256	70	41	38	292	697
04:00 - 04:30	224	125	36	76	275	736	239	74	47	45	304	709
04:30 - 05:00	222	133	60	106	278	799	269	96	56	60	350	831
Total	29,513	10,573	4,136	3,545	10,925	58,692	28,979	8,240	4,555	3,503	10,461	55,738

See Location Map below:

Figure 3.1-7: Location Map: Station C-1: SLEX (North of Nichols Interchange)

Sta. C - North of Nichols Interchange

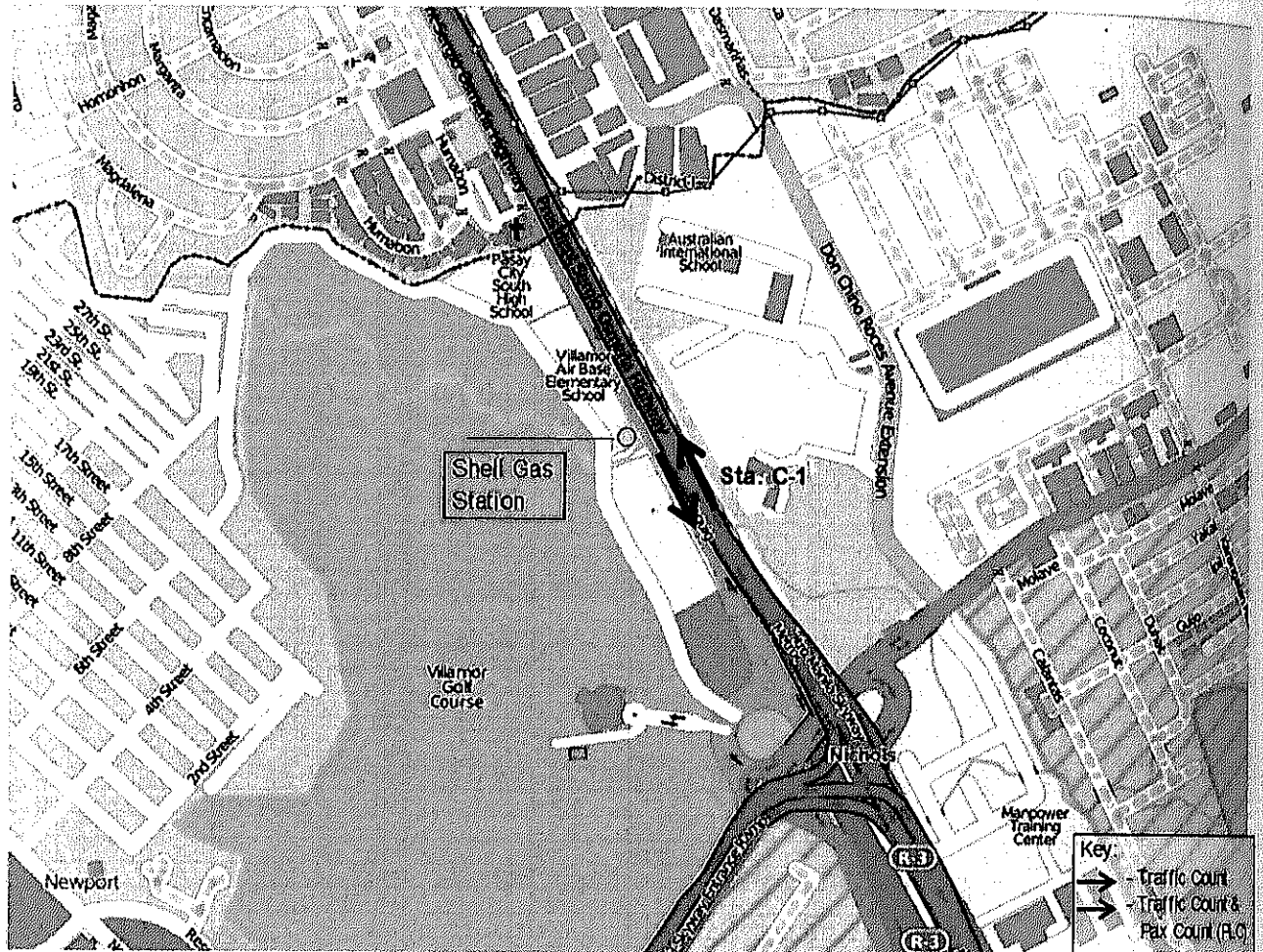


Table 3.1-9: Manual Classified Count: Station D-1: Sales Road

Station Code: D-1
 Station Name: Sales Road
 Date: 04/23/2013
 Weather: Fine

Time Period	NORTHBOUND								SOUTHBOUND							
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Air	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total				
05:00 - 06:00	767	271	21	9	116	1,184	883	470	33	8	87	1,481				
06:00 - 07:00	601	319	46	10	58	1,034	908	424	36	3	57	1,428				
07:00 - 08:00	516	482	56	4	43	1,101	1,034	349	59	5	77	1,524				
08:00 - 09:00	364	521	40	2	60	987	1,131	289	7	3	97	1,527				
09:00 - 10:00	257	486	25	4	72	844	1,049	186	1	1	108	1,345				
10:00 - 11:00	664	400	66	5	174	1,309	1,002	547	18	5	157	1,729				
11:00 - 12:00	616	573	41	1	122	1,353	1,065	240	19	3	137	1,464				
12:00 - 13:00	751	214	73	6	114	1,158	1,086	436	17	3	132	1,674				
13:00 - 14:00	770	400	35	0	151	1,356	933	448	23	3	127	1,534				
14:00 - 15:00	859	246	35	0	160	1,300	995	532	29	1	178	1,735				
15:00 - 16:00	975	398	43	1	114	1,531	819	247	38	1	108	1,213				
16:00 - 17:00	974	335	40	1	93	1,443	855	427	39	2	77	1,400				
17:00 - 18:00	1,152	361	49	2	86	1,650	812	488	44	3	74	1,421				
18:00 - 19:00	1,003	299	39	2	63	1,406	775	377	29	1	37	1,219				
19:00 - 20:00	951	362	34	5	67	1,419	772	309	27	3	64	1,175				
20:00 - 21:00	850	279	33	4	66	1,232	869	349	21	6	56	1,301				
21:00 - 22:00	945	290	25	4	85	1,349	815	347	18	4	62	1,246				
22:00 - 23:00	804	237	10	1	66	1,118	732	347	10	3	56	1,148				
Total	13,819	6,473	711	61	1,710	22,774	16,535	6,812	468	58	1,691	25,564				

See Location Map below:

Figure 3.1-8: Location Map: Station D-1: Sales Road

Sta. D - Sales Road (At-grade)

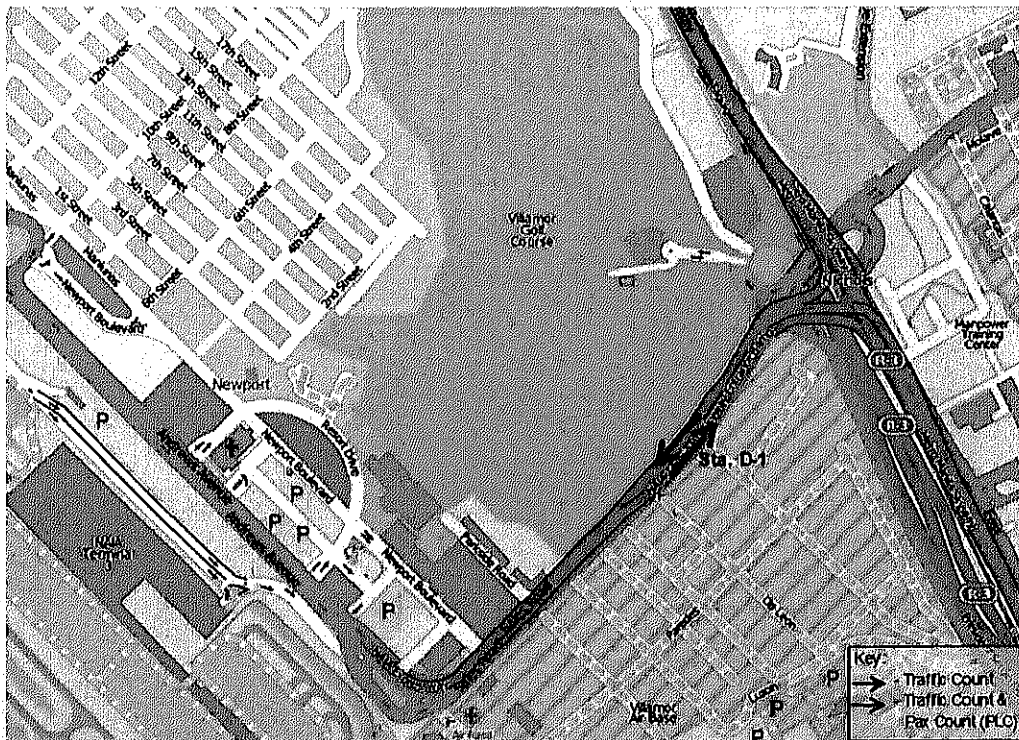


Table 3.1-10: Manual Classified Count: Station S-1: Skyway - Arnaiz Entry/Exit Ramps

Station Code: S-1
 Station Name: Skyway Arnaiz Entry/Exit Ramps
 Date: 04/25/2013
 Weather: Fine

Time Period	OFF-RAMP							ON-RAMP						
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Air port Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Air port Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total		
05:00 - 06:00	83	4	0	0	0	87	95	6	0	1	102			
06:00 - 07:00	524	73	0	0	0	597	273	32	0	0	305			
07:00 - 08:00	1,418	212	0	1	6	1,637	284	72	0	2	358			
08:00 - 09:00	1,562	174	0	0	1	1,737	310	66	0	0	376			
09:00 - 10:00	1,158	123	0	0	9	1,290	348	46	0	0	394			
10:00 - 11:00	587	62	0	0	5	654	330	26	0	0	356			
11:00 - 12:00	486	66	0	0	5	557	318	34	0	0	352			
12:00 - 13:00	332	38	0	0	2	372	362	30	0	0	392			
13:00 - 14:00	346	38	0	0	5	389	373	39	2	1	415			
14:00 - 15:00	353	54	0	0	11	418	374	45	0	0	419			
15:00 - 16:00	325	22	0	0	2	349	554	45	0	0	599			
16:00 - 17:00	351	44	0	0	10	405	541	75	0	0	616			
17:00 - 18:00	391	51	0	0	8	450	926	119	1	1	1,047			
18:00 - 19:00	491	75	0	1	9	576	1,093	147	1	2	1,243			
19:00 - 20:00	419	92	0	0	2	513	1,110	127	0	0	1,237			
20:00 - 21:00	296	64	0	0	6	366	689	68	0	0	757			
21:00 - 22:00	175	18	0	0	1	194	794	73	0	0	867			
22:00 - 23:00	124	11	0	0	1	136	442	22	0	0	464			
Total	9,421	1,221	0	2	83	10,727	9,216	1,072	4	7	10,361			

See Location Map below:

Figure 3.1-9: Location Map: Station S-1: Skyway - Arnaiz Entry/Exit Ramps

Sta. S-1 - Skyway Arnaiz Entry/Exit Ramps

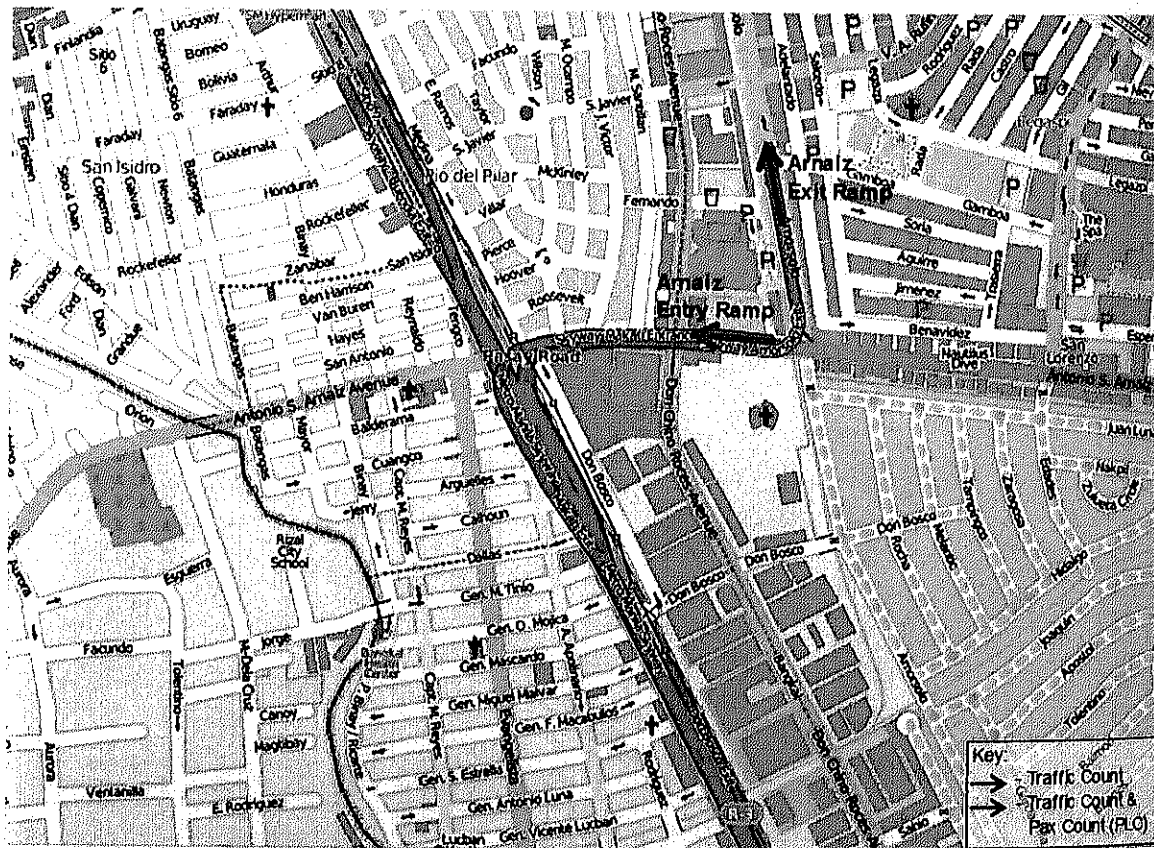


Table 3.1-11: Manual Classified Count: Station S-2: Skyway - Sales Road Entry/Exit Ramps

Station Code: S-2
 Station Name: Skyway Sales Road Entry/Exit Ramps
 Date: 04/25/2013
 Weather: Fine

Time Period	ON-RAMP							OFF-RAMP						
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total		
05:00 - 06:00	207	169	0	3	8	387	240	137	0	18	5	400		
06:00 - 07:00	306	312	0	2	11	631	302	240	0	27	8	577		
07:00 - 08:00	751	438	0	2	11	1,202	364	278	3	15	9	669		
08:00 - 09:00	756	407	1	0	8	1,172	443	328	1	12	11	795		
09:00 - 10:00	602	385	1	0	33	1,021	475	340	0	9	20	844		
10:00 - 11:00	503	337	0	0	34	874	432	350	0	13	18	813		
11:00 - 12:00	479	332	0	2	31	844	431	388	0	7	18	844		
12:00 - 13:00	436	315	1	0	15	767	465	282	0	8	15	770		
13:00 - 14:00	392	315	0	1	16	724	473	356	2	14	20	865		
14:00 - 15:00	319	345	1	1	32	698	535	401	6	10	27	979		
15:00 - 16:00	415	364	0	1	23	803	500	395	6	5	13	919		
16:00 - 17:00	410	371	0	1	19	801	572	398	1	7	8	986		
17:00 - 18:00	575	561	0	4	23	1,163	559	480	0	4	17	1,060		
18:00 - 19:00	475	435	1	3	9	923	625	484	0	7	19	1,135		
19:00 - 20:00	753	369	1	1	7	1,131	501	498	0	3	17	1,019		
20:00 - 21:00	401	334	4	0	10	749	581	420	1	4	22	1,028		
21:00 - 22:00	237	221	0	2	6	466	457	453	0	6	19	935		
22:00 - 23:00	631	342	1	2	8	984	359	281	0	7	8	655		
Total	8,648	6,352	11	25	304	15,340	8,314	6,509	20	176	274	15,293		

See Location Map below:

Figure 3.1-10: Location Map: Station S-2: Skyway - Sales Road Entry/Exit Ramps

Sta. S-2 - Skyway Sales Road Entry/Exit Ramps

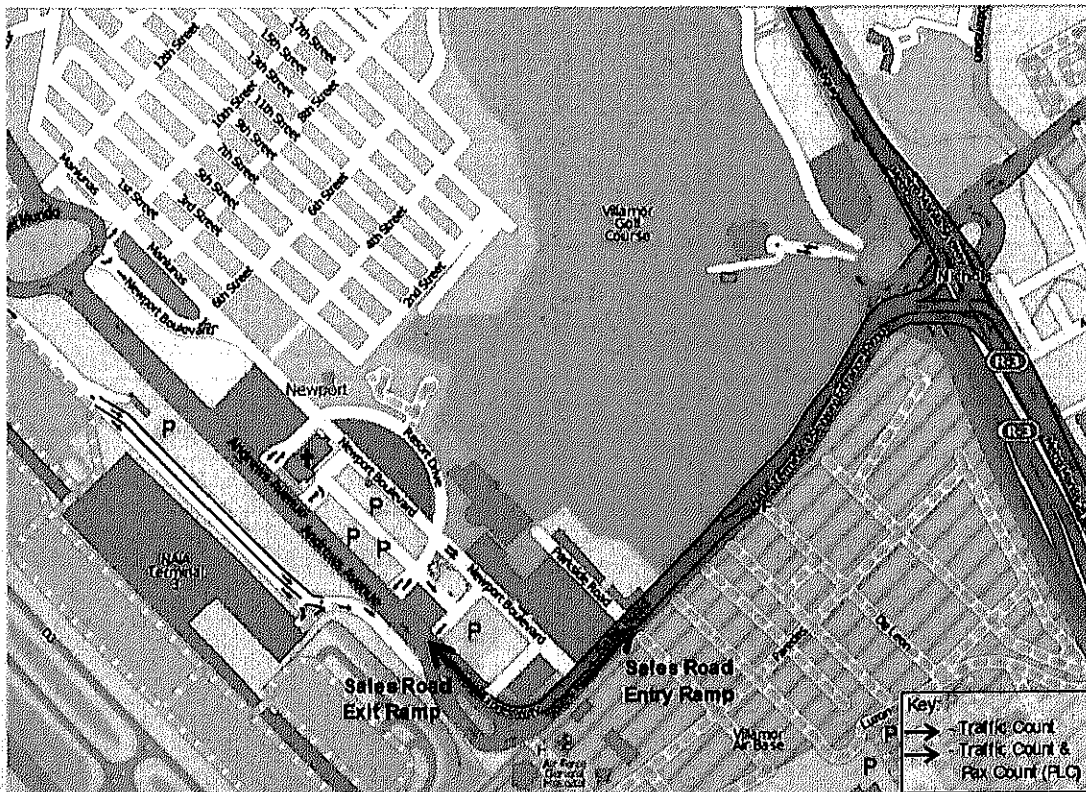


Table 3.1-12: Manual Classified Count: Station S-3: Skyway-North of C-5 (Screenline)

Station Code: S-3
 Station Name: Skyway North of C-5 (Screenline)
 Date: 04/25/2013
 Weather: Fine

Time Period	NORTHBOUND (AT-GRADE)						SOUTHBOUND (AT-GRADE)					
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total
05:00 - 05:30	92	8	3	28	6	137	68	13	0	15	7	102
05:30 - 06:00	183	14	8	46	8	259	114	24	1	26	12	177
06:00 - 06:30	383	62	17	65	10	537	224	25	0	36	8	293
06:30 - 07:00	681	97	15	74	8	875	307	30	1	35	6	379
07:00 - 07:30	942	176	18	73	7	1,216	304	32	0	35	9	380
07:30 - 08:00	1,351	219	27	77	5	1,679	294	52	0	26	4	376
08:00 - 08:30	1,251	164	30	70	5	1,520	292	53	1	28	8	383
08:30 - 09:00	1,164	164	28	58	12	1,426	346	69	1	44	3	463
09:00 - 09:30	883	116	35	49	13	1,096	392	56	0	38	8	494
09:30 - 10:00	684	119	9	29	5	846	306	51	2	39	12	410
10:00 - 10:30	741	129	9	55	20	954	284	39	1	33	7	364
10:30 - 11:00	609	89	6	35	14	753	290	65	3	39	16	413
11:00 - 11:30	695	91	7	26	12	831	422	32	2	45	18	519
11:30 - 12:00	511	67	9	39	10	636	395	42	10	39	24	510
12:00 - 12:30	342	54	10	20	5	431	339	56	7	32	21	455
12:30 - 13:00	480	58	15	28	8	589	362	27	6	32	27	454
13:00 - 13:30	472	65	9	34	23	603	297	19	2	16	8	342
13:30 - 14:00	537	80	6	40	17	680	336	60	7	26	13	442
14:00 - 14:30	542	67	9	36	25	679	400	53	10	24	19	506
14:30 - 15:00	513	87	9	42	20	671	412	60	7	28	11	518
15:00 - 15:30	471	63	9	32	19	594	475	56	7	27	12	577
15:30 - 16:00	408	85	4	28	15	540	501	64	6	38	17	626
16:00 - 16:30	437	64	6	35	15	557	512	69	10	26	16	633
16:30 - 17:00	436	69	7	30	15	557	550	54	7	20	10	641
17:00 - 17:30	390	70	6	33	16	515	645	55	11	32	9	752
17:30 - 18:00	392	70	7	18	8	495	686	79	9	34	12	820
18:00 - 18:30	434	81	10	26	15	566	958	104	15	46	13	1,136
18:30 - 19:00	502	99	11	29	11	652	988	83	12	54	10	1,147
19:00 - 19:30	439	91	15	33	8	586	866	89	13	43	15	1,028
19:30 - 20:00	370	71	14	29	21	505	969	113	14	58	17	1,171
20:00 - 20:30	300	47	10	22	8	387	902	101	9	59	14	1,085
20:30 - 21:00	260	39	6	22	6	333	749	71	8	39	12	879
21:00 - 21:30	247	35	8	18	3	311	792	96	6	41	12	947
21:30 - 22:00	220	29	7	20	5	281	724	71	8	39	15	857
22:00 - 22:30	182	32	3	23	3	243	632	43	1	32	10	718
22:30 - 23:00	121	14	1	8	3	147	597	38	3	22	2	662
23:00 - 23:30	103	14	2	9	3	131	592	62	6	22	6	688
23:30 - 00:00	90	8	1	7	4	110	223	18	3	13	3	260
00:00 - 00:30	68	6	0	4	7	85	180	8	2	13	5	208
00:30 - 01:00	50	8	0	2	2	62	133	17	0	11	1	162
01:00 - 01:30	43	3	1	3	3	53	98	10	0	5	1	114
01:30 - 02:00	25	4	0	1	0	30	64	2	0	2	1	69
02:00 - 02:30	25	7	0	6	0	38	61	2	0	5	3	71
02:30 - 03:00	27	4	0	4	1	36	45	3	1	4	1	54
03:00 - 03:30	20	2	0	4	2	28	33	3	0	6	2	44
03:30 - 04:00	48	7	0	10	0	65	43	6	1	4	4	58
04:00 - 04:30	52	8	0	10	1	71	39	7	0	6	0	52
04:30 - 05:00	64	9	2	12	4	91	44	1	0	5	4	54
Total	19,280	2,965	409	1,402	431	24,487	19,285	2,183	213	1,342	468	23,491

See Location Map below:

Figure 3.1-11: Location Map: Station S-3: Skyway-North of C-5 (Screenline)

Sta. S-3 - Skyway North of C-5 (Screenline)



Table 3.1-13: Manual Classified Count: Station S-4: Skyway-Bicutan Entry/Exit Ramps

Station Code: S-4
 Station Name: Skyway Bicutan Entry/Exit Ramps
 Date: 04/25/2013
 Weather: Fine

Time Period	ON-RAMP						OFF-RAMP					
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total
05:00 - 06:00	62	5	6	1	1	75	42	6	5	1	11	63
06:00 - 07:00	274	44	21	6	5	350	51	16	3	1	6	77
07:00 - 08:00	601	97	39	3	6	746	99	61	7	0	2	169
08:00 - 09:00	672	79	49	3	4	807	117	55	1	0	1	174
09:00 - 10:00	333	51	20	5	6	415	101	36	3	0	10	150
10:00 - 11:00	219	31	13	2	5	270	128	35	3	0	10	176
11:00 - 12:00	180	22	9	0	2	213	150	23	11	0	6	190
12:00 - 13:00	141	20	29	1	7	198	180	30	10	0	9	229
13:00 - 14:00	100	24	12	1	7	144	162	19	10	1	6	198
14:00 - 15:00	96	27	12	2	3	140	199	18	8	0	11	236
15:00 - 16:00	93	21	7	0	3	124	177	28	10	0	7	222
16:00 - 17:00	90	27	9	0	7	133	281	20	15	1	13	330
17:00 - 18:00	91	28	15	0	4	138	441	46	30	0	11	528
18:00 - 19:00	165	27	15	1	0	208	541	70	40	1	8	660
19:00 - 20:00	108	22	13	0	6	149	545	77	31	0	8	661
20:00 - 21:00	72	11	10	1	2	96	536	63	15	0	10	624
21:00 - 22:00	56	4	8	1	0	69	515	44	7	0	6	572
22:00 - 23:00	42	5	1	1	1	50	404	11	3	1	3	422
Total	3,395	545	288	28	69	4,325	4,669	658	212	6	138	5,683

See Location Map below:

Figure 3.1-12: Location Map: Station S-4: Skyway Bicutan Entry/Exit Ramps

Sta. S-4 - Skyway Bicutan Entry/Exit Ramps

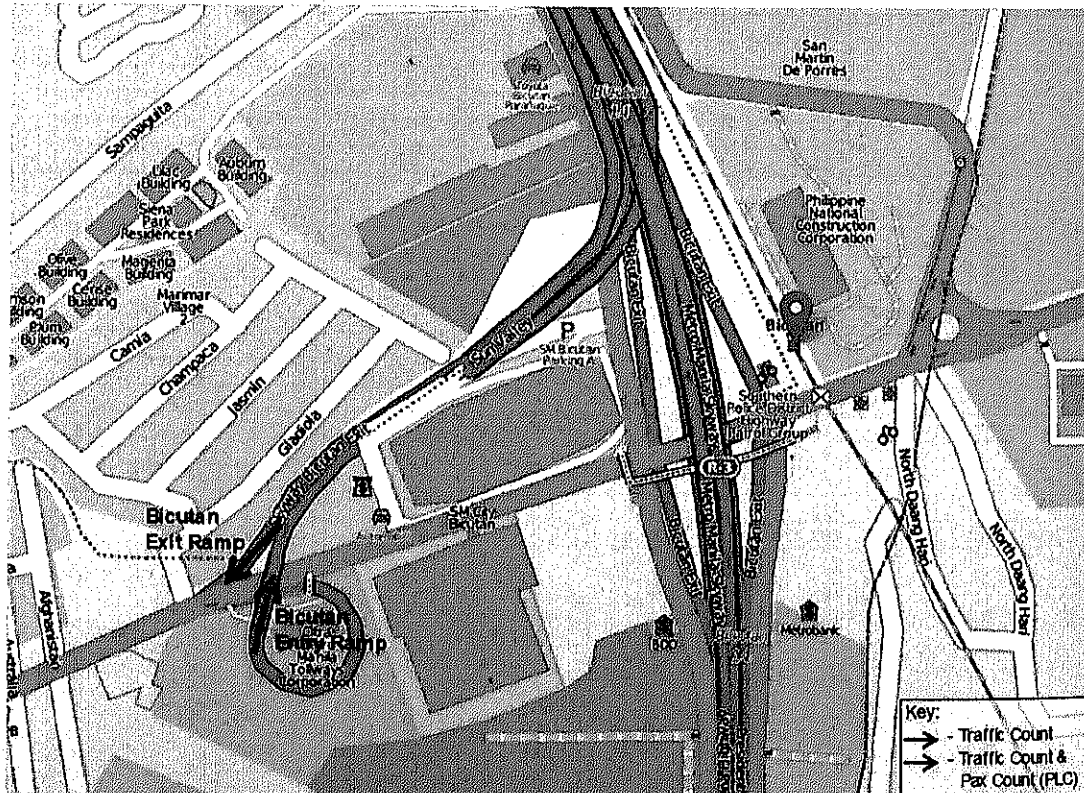


Table 3.1-14: Manual Classified Count: Station S-5: Skyway-Sucac Entry/Exit Ramps

Station Code: S-5
 Station Name: Skyway Sucac Entry/Exit Ramps
 Date: 04/25/2013
 Weather: Fine

Time Period	ON-RAMP							OFF-RAMP						
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Air port Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./ All Trucks/ Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Air port Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./ All Trucks/ Special Vehicles	Total		
05:00 - 06:00	72	8	0	0	3	83	14	8	0	1	1	24		
06:00 - 07:00	284	27	3	0	3	317	31	12	0	2	0	45		
07:00 - 08:00	850	94	6	0	4	954	29	3	0	0	1	33		
08:00 - 09:00	600	40	3	0	3	646	74	17	0	0	6	97		
09:00 - 10:00	423	34	3	0	7	467	62	16	0	0	2	80		
10:00 - 11:00	354	40	3	1	8	406	109	16	0	0	6	131		
11:00 - 12:00	232	40	1	0	2	275	105	11	0	0	2	118		
12:00 - 13:00	194	20	0	0	3	217	109	29	0	0	8	146		
13:00 - 14:00	179	14	0	0	4	197	122	28	0	0	7	157		
14:00 - 15:00	234	36	0	0	11	281	150	17	4	1	8	180		
15:00 - 16:00	188	23	0	0	4	215	191	14	0	0	5	210		
16:00 - 17:00	208	30	0	0	0	238	194	18	0	0	4	216		
17:00 - 18:00	184	22	1	0	4	211	352	48	4	0	8	412		
18:00 - 19:00	188	12	0	0	0	200	372	72	2	2	4	452		
19:00 - 20:00	151	11	0	0	0	162	358	66	2	0	7	433		
20:00 - 21:00	100	14	0	2	0	116	337	68	1	1	4	411		
21:00 - 22:00	79	8	0	0	0	87	355	38	0	0	2	395		
22:00 - 23:00	61	7	0	0	0	68	299	31	0	1	1	332		
Total	4,581	480	20	3	56	5,140	3,263	512	13	8	76	3,872		

See Location Map below:

Figure 3.1-13: Location Map: Station S-5: Skyway-Sucac Entry/Exit Ramps

Sta. S-5 - Skyway Sucac Entry/Exit Ramps

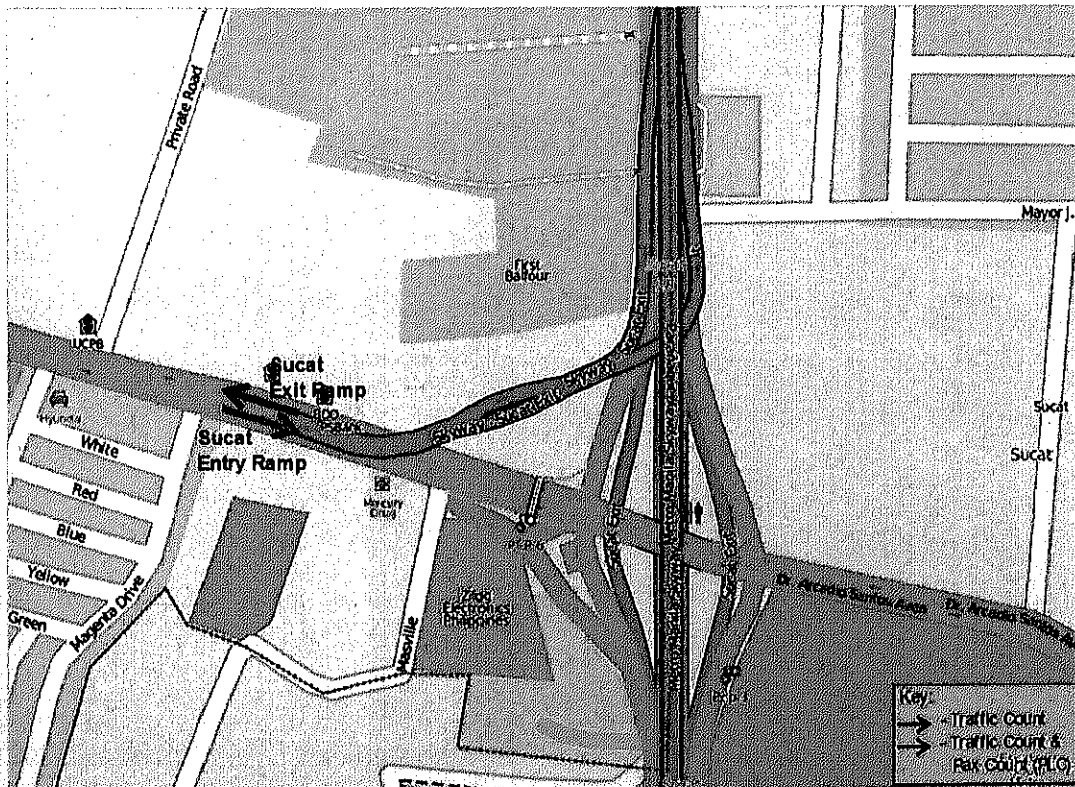


Table 3.1-15: Manual Classified Count: Station S-6: Skyway-Hillsborough Entry/Exit Ramps

Station Code: S-6
 Station Name: Skyway Hillsborough Entry/Exit Ramps
 Date: 04/25/2013
 Weather: Fine

Time Period	ON-RAMP									OFF-RAMP								
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total						
05:00 - 06:00	117	22	6	77	15	237	51	26	0	29	2	108						
06:00 - 07:00	328	64	16	159	16	583	266	87	0	64	9	426						
07:00 - 08:00	667	132	23	179	12	1,013	240	54	0	57	6	357						
08:00 - 09:00	608	121	17	116	16	878	217	87	0	68	3	378						
09:00 - 10:00	467	120	16	96	23	722	250	92	1	87	4	434						
10:00 - 11:00	420	103	9	81	25	638	232	90	0	76	11	409						
11:00 - 12:00	329	62	10	66	17	484	241	131	0	86	19	477						
12:00 - 13:00	295	52	7	61	12	427	280	98	1	71	21	471						
13:00 - 14:00	474	104	10	93	24	705	255	85	0	54	18	412						
14:00 - 15:00	429	87	7	59	22	604	215	132	1	64	12	424						
15:00 - 16:00	416	102	15	66	19	618	237	84	1	62	14	398						
16:00 - 17:00	382	75	7	81	19	564	252	118	1	54	8	433						
17:00 - 18:00	402	86	10	69	19	586	267	194	2	80	3	546						
18:00 - 19:00	444	99	8	67	19	637	293	234	1	101	3	632						
19:00 - 20:00	289	80	10	55	17	451	329	154	2	96	12	553						
20:00 - 21:00	227	59	9	47	8	350	487	104	1	123	17	731						
21:00 - 22:00	127	39	8	45	11	230	379	51	4	90	9	531						
22:00 - 23:00	99	19	4	32	6	160	202	33	0	43	8	288						
Total	6,520	1,426	192	1,449	300	9,887	4,693	1,854	15	1,305	179	6,044						

See Location Map below:

Figure 3.1-14: Location Map: Station S-6: Skyway-Hillsborough Entry/Exit Ramps

Sta. S-6 - Skyway Hillsborough Entry/Exit Ramps

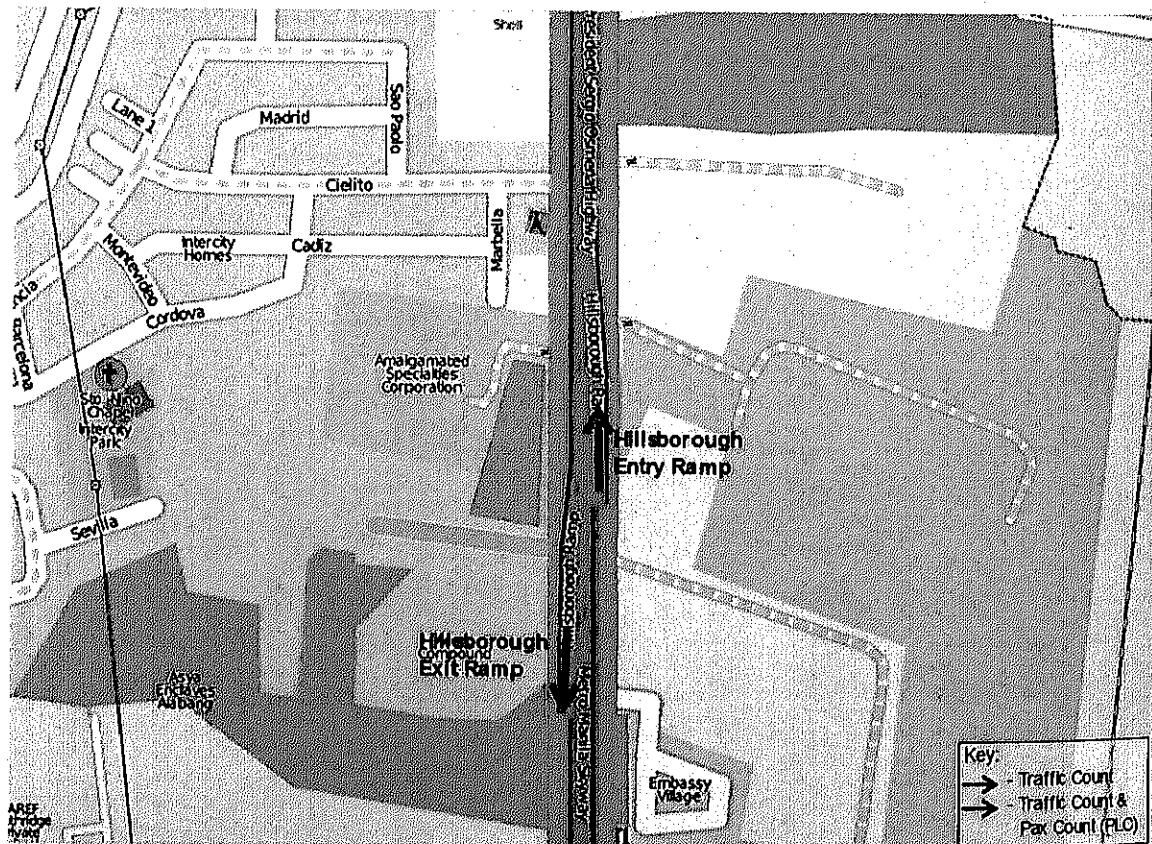


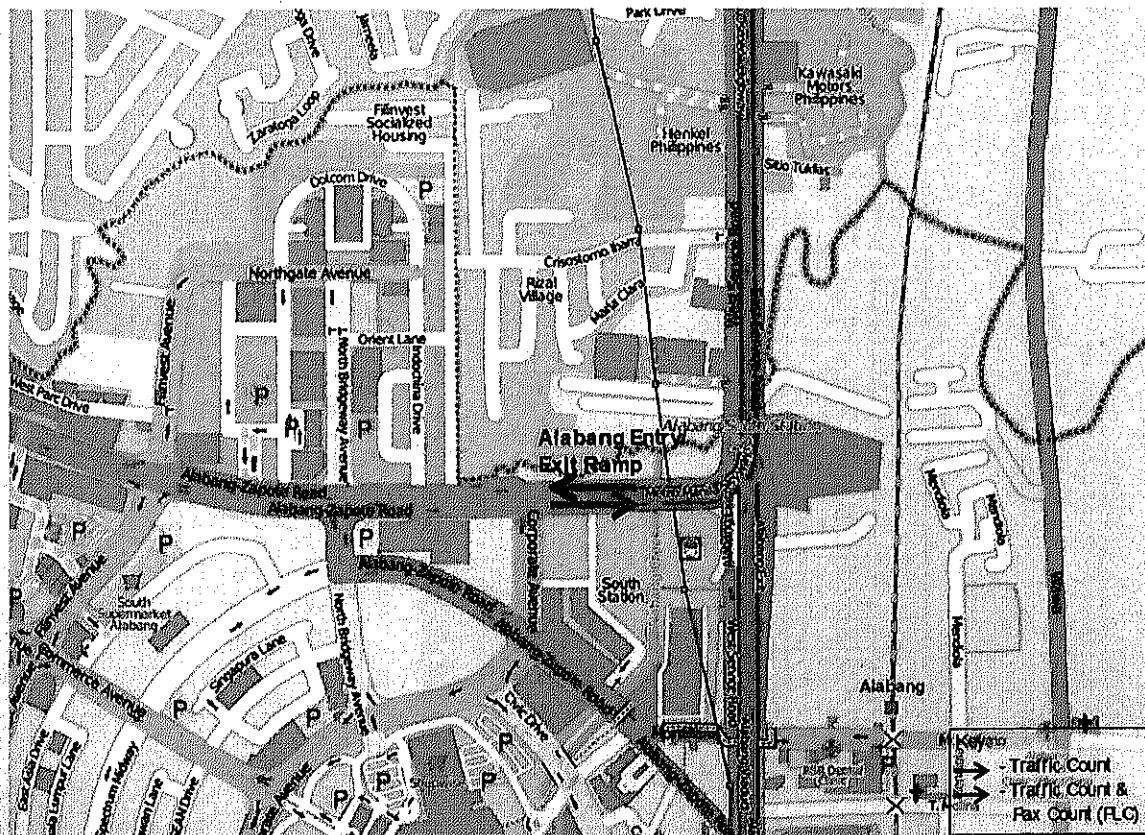
Table 3.1-16: Manual Classified Count: Station S-7: Skyway-Alabang Entry/Exit Ramps

Station Code: S-7
 Station Name: Skyway Alabang Entry/Exit Ramps
 Date: 04/25/2013
 Weather: Fine

Time Period	ON-RAMP							OFF-RAMP						
	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total	Private Car/Sedan/SUV/Pick-Up/Jeep (Owner Type)/Taxi/Airport Taxi	Private or Public Van (Seats 8 to 19)	Jeepney (Seats 20+)	ALL BUSES	Delivery Veh./All Trucks/Special Vehicles	Total		
05:00 - 06:00	47	34	0	0	3	84	20	23	0	1	2	46		
06:00 - 07:00	168	200	0	0	0	368	34	56	0	1	3	94		
07:00 - 08:00	315	289	1	0	1	606	44	80	0	0	0	124		
08:00 - 09:00	274	197	0	0	2	473	45	75	0	0	0	120		
09:00 - 10:00	184	176	0	0	1	361	80	82	0	0	0	162		
10:00 - 11:00	177	133	0	0	2	312	72	71	0	0	1	144		
11:00 - 12:00	106	139	0	1	5	251	129	52	0	0	1	182		
12:00 - 13:00	143	159	0	1	2	305	102	73	0	2	2	179		
13:00 - 14:00	361	168	0	0	2	531	85	107	0	0	3	195		
14:00 - 15:00	209	117	0	0	6	332	175	106	0	2	5	288		
15:00 - 16:00	180	83	0	0	5	268	170	138	0	1	1	310		
16:00 - 17:00	164	94	0	0	3	261	208	143	0	0	4	355		
17:00 - 18:00	148	87	0	0	9	244	199	218	0	2	1	420		
18:00 - 19:00	123	182	0	0	7	312	341	308	0	0	4	653		
19:00 - 20:00	115	136	0	0	3	254	288	262	0	1	4	555		
20:00 - 21:00	90	95	0	0	2	187	245	230	0	2	0	477		
21:00 - 22:00	66	72	0	0	0	138	178	234	0	0	4	416		
22:00 - 23:00	35	42	0	0	0	77	171	100	0	1	1	273		
Total	2,905	2,403	1	2	53	5,364	2,586	2,358	0	13	36	4,993		

See Location Map below:

Figure 3.1-15: Location Map: Station S-7: Skyway-Alabang Entry/Exit Ramps
 Sta. S-7 - Skyway Alabang Entry/Exit Ramps



3.2 VEHICLE OCCUPANCY SURVEY

Table 3.2-2 to 3.2.14 shows the vehicle occupancy and sample size gathered, by vehicle type for all stations. The tables are arranged, as summarized below.

Table 3.2.1: Summary of Vehicle Occupancy Count Result

Station Code	Station Name	Direction	Private Cars	Private/ Public Vans (seats 8 to 19)	Jeepneys (Seats 20+)	All Buses
Sta. A-1	SLEX (North of C-5 Access Ramp)	Northbound	1.8	2.4	22.2	45.0
Sta. A-2	East Service Road (Screenline)	Northbound	1.8	2.7	16.4	30.9
Sta. A-3	West Service Road (Screenline)	Northbound	1.6	1.9	17.2	2.0
Sta. B-1	SLEX	Northbound	1.7	5.5	17.0	44.5
Sta. B-2	East Service Road	Northbound	1.8	2.4	8.1	0.0
Sta. B-3	West Service Road	Northbound	1.5	2.7	10.9	1.7
Sta. D-1	Sales Road	Eastbound	1.7	2.6	6.2	31.2
Sta. S-1	Skyway Arnalz Entry/Exit Ramps	On-Ramp	1.6	2.5	0.0	10.0
Sta. S-2	Skyway Sales Road Entry/Exit Ramps	On-Ramp	2.0	2.6	1.0	24.9
Sta. S-4	Skyway Bicutan Entry/Exit Ramps	On-Ramp	1.4	14.5	24.1	11.7
Sta. S-5	Skyway Sucat Entry/Exit Ramps	On-Ramp	1.9	10.9	21.0	0.0
Sta. S-6	Skyway Hillsborough Entry/Exit Ramps	On-Ramp	1.4	2.8	22.6	51.3
Sta. S-7	Skyway Alabang Entry/Exit Ramps	On-Ramp	1.5	4.1	10.0	8.0

Table 3.2-2: Vehicle Occupancy Count: Station A-1: SLEX (North of C-5 Access Ramp)

Station Code: A-1
 Station Name: Slex (North of C-5 Access Ramp)
 Date: 04/25/2013 (Thursday)
 Weather: Fine
 Direction: SLEX - Northbound

Time	SLEX - NORTHBOUND											
	Vehicle Type 1			Vehicle Type 2			Vehicle Type 3			Vehicle Type 4		
	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy
0600-0630	372	665	1.8	84	237	2.8	17	378	22.2	96	4,590	47.8
0630-0700	372	687	1.8	86	230	2.7	23	490	21.3	88	4,365	49.6
0700-0730	372	677	1.8	71	184	2.6	22	484	22.0	82	4,140	50.5
0730-0800	372	636	1.7	77	196	2.5	19	420	22.1	81	4,245	52.4
0800-0830	372	649	1.7	80	245	3.1	17	369	21.7	62	3,315	53.5
0830-0900	371	684	1.8	81	241	3.0	3	62	20.7	60	3,120	52.0
0900-0930	288	496	1.7	96	276	2.9	8	175	21.9	55	2,850	51.8
0930-1000	328	546	1.7	88	201	2.3	11	251	22.8	40	1,935	48.4
1000-1030	319	532	1.7	75	187	2.5	7	159	22.7	44	2,340	53.2
1030-1100	307	564	1.8	71	189	2.7	9	201	22.3	33	1,785	54.1
1100-1130	348	599	1.7	97	274	2.8	7	157	22.4	40	2,115	52.9
1130-1200	294	488	1.7	68	133	2.0	5	111	22.2	33	1,605	48.6
1200-1230	220	349	1.6	54	107	2.0	1	23	23.0	37	1,650	44.6
1230-1300	293	495	1.7	58	126	2.2	1	23	23.0	33	1,382	41.9
1300-1330	317	528	1.7	71	174	2.5	3	67	22.3	37	1,102	29.8
1330-1400	313	509	1.6	82	165	2.0	9	201	22.3	62	2,054	33.1
1400-1430	371	684	1.8	90	166	1.8	4	90	22.5	59	1,987	33.7
1430-1500	372	673	1.8	119	290	2.4	6	136	22.7	58	2,100	36.2
1500-1530	372	639	1.7	144	275	1.9	8	180	22.5	71	2,628	37.0
1530-1600	372	720	1.9	101	207	2.0	5	117	23.4	58	2,274	39.2
1600-1630	372	769	2.1	88	176	2.0	7	163	23.3	68	2,316	34.1
1630-1700	372	650	1.7	137	302	2.2	9	207	23.0	57	2,479	43.5
1700-1730	372	602	1.6	110	218	2.0	11	251	22.8	71	3,241	45.6
1730-1800	372	609	1.6	103	254	2.5	17	372	21.9	79	3,600	45.6
Total	8,233	14,450	1.8	2,131	5,053	2.4	229	5,087	22.2	1,404	63,218	45.0

Vehicle Type: 1 - Private Car/SUV/Pick-Up/Jeep (Owner Type)/Taxi, 2 - Private or Public Van, 3 - Jeepney, 4 - All Buses, and 5 - All Trucks

Time	SLEX - NORTHBOUND			
	% Vehicle Sampled			
	Type 1	Type 2	Type 3	Type 4
0600-0630	75%	97%	100%	77%
0630-0700	62%	93%	88%	79%
0700-0730	53%	90%	79%	81%
0730-0800	64%	91%	86%	91%
0800-0830	77%	93%	85%	94%
0830-0900	86%	92%	100%	92%
0900-0930	78%	94%	89%	90%
0930-1000	88%	98%	100%	91%
1000-1030	81%	97%	88%	83%
1030-1100	73%	92%	90%	87%
1100-1130	86%	96%	100%	82%
1130-1200	87%	94%	100%	87%
1200-1230	59%	92%	100%	88%
1230-1300	80%	95%	100%	77%
1300-1330	94%	89%	100%	59%
1330-1400	79%	90%	100%	100%
1400-1430	65%	87%	100%	98%
1430-1500	65%	90%	100%	82%
1500-1530	68%	95%	100%	80%
1530-1600	90%	95%	83%	89%
1600-1630	87%	85%	100%	99%
1630-1700	75%	96%	100%	78%
1700-1730	72%	90%	100%	88%
1730-1800	73%	75%	94%	87%
Total	74%	92%	92%	85%

Table 3.2-3: Vehicle Occupancy Count: Station A-2: East Service Road

Station Code: A-2
 Station Name: East Service Road
 Date: 04/25/2013 (Thursday)
 Weather: Fine
 Direction: East Service Road – Northbound

Time	EAST SERVICE ROAD - NORTHBOUND											
	Vehicle Type 1			Vehicle Type 2			Vehicle Type 3			Vehicle Type 4		
	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy
0600-0630	372	691	1.9	40	140	3.5	111	2,002	18.0	18	792	44.0
0630-0700	372	671	1.8	44	165	3.8	105	2,175	20.7	13	592	45.5
0700-0730	372	665	1.8	51	256	5.0	109	2,275	20.9	11	595	54.1
0730-0800	372	650	1.7	48	236	4.9	119	2,550	21.4	13	616	47.4
0800-0830	372	671	1.8	51	191	3.7	108	2,225	20.6	10	363	36.3
0830-0900	372	617	1.7	57	140	2.5	71	1,408	19.8	6	285	47.5
0900-0930	372	702	1.9	79	213	2.7	71	1,363	19.2	10	332	33.2
0930-1000	372	630	1.7	69	228	3.3	73	1,362	18.7	9	218	24.2
1000-1030	372	604	1.6	73	198	2.7	73	1,364	18.7	14	348	24.9
1030-1100	372	622	1.7	54	122	2.3	59	1,036	17.6	5	216	43.2
1100-1130	372	695	1.9	54	127	2.4	63	947	15.0	9	258	28.7
1130-1200	372	724	1.9	54	127	2.4	51	860	16.9	9	293	32.6
1200-1230	287	534	1.9	41	92	2.2	61	902	14.8	6	197	32.8
1230-1300	352	670	1.9	49	146	3.0	82	1,163	14.2	7	260	37.1
1300-1330	342	655	1.9	56	98	1.8	59	937	15.9	4	139	34.0
1330-1400	365	666	1.8	56	128	2.3	60	978	16.3	6	97	16.2
1400-1430	372	716	1.9	70	162	2.3	62	742	12.0	14	277	19.8
1430-1500	332	609	1.8	61	116	1.9	59	744	12.6	6	119	19.8
1500-1530	372	717	1.9	64	143	2.2	68	856	12.6	8	179	22.4
1530-1600	372	748	2.0	48	94	2.0	64	738	11.5	16	243	15.2
1600-1630	372	737	2.0	75	187	2.5	76	844	11.1	14	209	14.9
1630-1700	372	722	1.9	49	85	1.7	89	944	10.6	11	234	21.3
1700-1730	372	709	1.9	52	103	2.0	91	1,016	11.2	9	215	23.9
1730-1800	341	632	1.9	43	91	2.1	79	1,063	13.5	10	249	24.9
Total	8,715	16,057	1.8	1,338	3,588	2.7	1,863	30,494	16.4	238	7,346	30.9

Vehicle Type: 1 - Private Car/SUV/Pick-Up/Jeep (Owner Type)/Taxi, 2 - Private or Public Van, 3 - Jeepney, 4 - All Buses, and 5 - All Trucks

Time	East Service Road - NORTHBOUND			
	% Vehicle Sampled			
	Type 1	Type 2	Type 3	Type 4
0600-0630	92%	80%	93%	95%
0630-0700	75%	100%	90%	93%
0700-0730	74%	98%	86%	85%
0730-0800	67%	87%	92%	100%
0800-0830	66%	89%	90%	91%
0830-0900	77%	97%	89%	86%
0900-0930	58%	98%	92%	91%
0930-1000	65%	96%	92%	75%
1000-1030	74%	95%	92%	100%
1030-1100	74%	93%	92%	63%
1100-1130	75%	95%	91%	82%
1130-1200	88%	95%	91%	100%
1200-1230	98%	93%	88%	100%
1230-1300	86%	78%	99%	100%
1300-1330	85%	93%	94%	80%
1330-1400	100%	90%	95%	40%
1400-1430	89%	95%	94%	93%
1430-1500	90%	95%	94%	86%
1500-1530	83%	84%	94%	73%
1530-1600	95%	98%	93%	89%
1600-1630	98%	95%	95%	100%
1630-1700	82%	98%	93%	73%
1700-1730	93%	98%	93%	82%
1730-1800	87%	98%	90%	77%
Total	80%	93%	92%	85%

Table 3.2-4: Vehicle Occupancy Count: Station A-3: West Service Road

Station Code: A-3
 Station Name: West Service Road
 Date: 04/25/2013 (Thursday)
 Weather: Fine
 Direction: West Service Road – Northbound

Time	West Service Road - NB											
	Vehicle Type 1			Vehicle Type 2			Vehicle Type 3			Vehicle Type 4		
	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy
0600-0630	317	485	1.5	110	173	1.6	51	890	17.5	0	0	0.0
0630-0700	289	430	1.5	149	229	1.5	47	912	19.4	0	0	0.0
0700-0730	372	562	1.5	155	265	1.7	47	903	19.2	0	0	0.0
0730-0800	372	610	1.6	124	213	1.7	39	818	21.0	0	0	0.0
0800-0830	351	521	1.5	124	256	2.1	36	716	19.9	0	0	0.0
0830-0900	297	416	1.4	76	166	2.2	28	520	18.6	0	0	0.0
0900-0930	279	423	1.5	93	163	1.8	27	541	20.0	0	0	0.0
0930-1000	250	390	1.6	67	136	2.0	31	603	19.5	0	0	0.0
1000-1030	228	360	1.6	92	161	1.8	23	460	20.0	0	0	0.0
1030-1100	236	396	1.7	97	202	2.1	26	483	18.6	1	2	2.0
1100-1130	225	363	1.6	98	217	2.2	29	460	15.9	0	0	0.0
1130-1200	186	316	1.7	62	125	2.0	24	369	15.4	0	0	0.0
1200-1230	186	277	1.5	95	166	1.7	24	427	17.8	0	0	0.0
1230-1300	217	340	1.6	94	182	1.9	31	445	14.4	0	0	0.0
1300-1330	247	401	1.6	97	189	1.9	25	412	16.5	0	0	0.0
1330-1400	212	360	1.7	93	234	2.5	22	337	15.3	0	0	0.0
1400-1430	228	360	1.6	106	174	1.6	20	305	15.3	0	0	0.0
1430-1500	210	355	1.7	93	175	1.9	26	340	13.1	0	0	0.0
1500-1530	182	302	1.7	95	209	2.2	26	263	10.1	0	0	0.0
1530-1600	149	249	1.7	110	192	1.7	20	306	15.3	0	0	0.0
1600-1630	148	257	1.7	94	206	2.2	22	343	15.6	0	0	0.0
1630-1700	180	290	1.6	105	185	1.8	33	494	15.0	0	0	0.0
1700-1730	199	366	1.8	117	238	2.0	37	599	16.2	0	0	0.0
1730-1800	186	300	1.6	101	177	1.8	42	721	17.2	0	0	0.0
Total	5,746	9,129	1.6	2,447	4,633	1.9	736	12,667	17.2	1	2	2.0

Vehicle Type: 1 - Private Car/SUV/Pick-Up/ Jeep (Owner Type)/Taxi, 2 - Private or Public Van, 3 - Jeepney, 4 - All Buses, and 5 - All Trucks

Time	West Service Road - NORTHBOUND			
	% Vehicle Sampled			
	Type 1	Type 2	Type 3	Type 4
0600-0630	100%	79%	98%	0%
0630-0700	88%	85%	84%	0%
0700-0730	81%	82%	85%	0%
0730-0800	77%	75%	89%	0%
0800-0830	86%	95%	88%	0%
0830-0900	93%	85%	93%	0%
0900-0930	89%	70%	96%	0%
0930-1000	96%	74%	94%	0%
1000-1030	99%	97%	96%	0%
1030-1100	99%	94%	100%	100%
1100-1130	98%	92%	100%	0%
1130-1200	97%	77%	96%	0%
1200-1230	100%	86%	80%	0%
1230-1300	92%	94%	94%	0%
1300-1330	96%	89%	100%	0%
1330-1400	99%	82%	88%	0%
1400-1430	98%	86%	83%	0%
1430-1500	99%	85%	79%	0%
1500-1530	98%	96%	93%	0%
1530-1600	89%	88%	100%	0%
1600-1630	99%	88%	96%	0%
1630-1700	100%	97%	94%	0%
1700-1730	98%	98%	97%	0%
1730-1800	86%	94%	95%	0%
Total	92%	87%	92%	50%

Table 3.2-5: Vehicle Occupancy Count: Station B-1: SLEX (between Bicutan and Sucat Interchanges)

Station Code: B-1
 Station Name: SLEX (Bet. Bicutan IC and Sucat IC)
 Date: 04/23/2013 (TUESDA)
 Weather: Fine
 Direction: SLEX-NORTHBOUND

Time	SLEX - NORTHBOUND											
	Vehicle Type 1			Vehicle Type 2			Vehicle Type 3			Vehicle Type 4		
	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy
0600-0700	291	522	1.8	135	1,229	9.1	19	292	15.4	108	5,592	51.8
0700-0800	325	576	1.8	180	1,702	9.5	27	424	15.7	82	3,840	46.8
0800-0900	324	583	1.8	141	948	6.7	20	332	16.6	79	3,623	45.9
0900-1000	333	611	1.8	193	1,355	7.0	8	116	14.5	144	6,357	44.1
1000-1100	292	516	1.8	191	1,094	5.7	9	149	16.6	76	3,292	43.3
1100-1200	264	420	1.6	104	424	4.1	4	77	19.3	77	3,547	46.1
1200-1300	314	464	1.5	163	489	3.0	8	132	16.5	88	3,750	42.6
1300-1400	315	493	1.6	108	384	3.6	7	131	18.7	122	5,410	44.3
1400-1500	303	455	1.5	159	564	3.5	8	163	20.4	105	4,155	39.6
1500-1600	316	489	1.5	175	674	3.9	6	94	15.7	122	5,245	43.0
1600-1700	314	515	1.6	194	876	4.5	10	194	19.4	131	5,521	42.1
1700-1800	293	515	1.8	204	927	4.5	15	288	19.2	136	6,175	45.4
Total	3,684	6,159	1.7	1,947	10,666	5.5	141	2,392	17.0	1,270	56,507	44.5

Vehicle Type: 1 - Private Car/SUV/Pick-Up/Jeep (Owner Type)/Taxi, 2 - Private or Public Van, 3 - Jeepney, 4 - All Buses, and 5 - All Trucks

Time	SLEX - NORTHBOUND			
	% Vehicle Sampled			
	Type 1	Type 2	Type 3	Type 4
0600-0700	28%	64%	68%	47%
0700-0800	21%	87%	82%	79%
0800-0900	25%	80%	80%	44%
0900-1000	23%	69%	89%	81%
1000-1100	24%	89%	75%	78%
1100-1200	23%	90%	67%	82%
1200-1300	30%	93%	73%	75%
1300-1400	23%	91%	78%	85%
1400-1500	19%	71%	100%	81%
1500-1600	22%	68%	100%	81%
1600-1700	18%	55%	83%	78%
1700-1800	17%	57%	100%	73%
Total	22%	72%	81%	71%

Table 3.2-6: Vehicle Occupancy Count: Station B-2: East Service Road

Station Code: B-2
 Station Name: East Service Road
 Date: 04/23/2013 (TUESDAY)
 Weather: Fine
 Direction: East Service Road - NORTHBOUND

Time	EAST SERVICE ROAD - NORTHBOUND											
	Vehicle Type 1			Vehicle Type 2			Vehicle Type 3			Vehicle Type 4		
	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy
0600-0700	76	131	1.7	17	39	2.3	129	1,282	9.9	0	0	0.0
0700-0800	102	158	1.5	28	63	2.3	119	1,335	11.2	0	0	0.0
0800-0900	74	119	1.6	24	46	1.9	117	936	8.0	0	0	0.0
0900-1000	69	126	1.8	24	67	2.8	88	732	8.3	0	0	0.0
1000-1100	50	92	1.8	17	47	2.8	85	523	6.2	0	0	0.0
1100-1200	64	132	2.1	22	62	2.8	97	599	6.2	0	0	0.0
1200-1300	62	122	2.0	19	50	2.6	87	710	8.2	0	0	0.0
1300-1400	53	109	2.1	19	51	2.7	76	651	8.6	0	0	0.0
1400-1500	64	128	2.0	33	81	2.5	104	555	5.3	0	0	0.0
1500-1600	52	92	1.8	28	57	2.0	104	725	7.0	0	0	0.0
1600-1700	45	87	1.9	24	65	2.7	87	711	8.2	0	0	0.0
1700-1800	57	124	2.2	36	70	1.9	112	999	8.9	0	0	0.0
Total	768	1,420	1.8	291	698	2.4	1,205	9,758	8.1	0	0	0.0

Vehicle Type: 1 - Private Car/SUV/Pick-Up/Jeep (Owner Type)/Taxi, 2 - Private or Public Van, 3 - Jeepney, 4 - All Buses, and 5 - All Trucks

Time	East Service Road - NORTHBOUND			
	% Vehicle Sampled			
	Type 1	Type 2	Type 3	Type 4
0600-0700	99%	38%	93%	0%
0700-0800	99%	65%	96%	0%
0800-0900	76%	65%	99%	0%
0900-1000	100%	73%	98%	0%
1000-1100	96%	74%	99%	0%
1100-1200	97%	71%	98%	0%
1200-1300	76%	70%	98%	0%
1300-1400	79%	54%	96%	0%
1400-1500	58%	83%	96%	0%
1500-1600	96%	70%	94%	0%
1600-1700	70%	73%	93%	0%
1700-1800	84%	90%	96%	0%
Total	84%	68%	96%	0%

Table 3.2-7: Vehicle Occupancy Count: Station B-3: West Service Road

Station Code: B-3
 Station Name: West Service Road
 Date: 04/23/2013 (TUESDAY)
 Weather: Fine
 Direction: West Service Road - NORTHBOUND

Time	West Service Road - NORTHBOUND											
	Vehicle Type 1			Vehicle Type 2			Vehicle Type 3			Vehicle Type 4		
	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy
0600-0700	269	365	1.4	52	149	2.9	77	1,044	13.6	1	1	1.0
0700-0800	279	412	1.5	31	71	2.3	70	1,135	16.2	0	0	0.0
0800-0900	281	435	1.5	32	65	2.0	90	886	9.8	0	0	0.0
0900-1000	269	420	1.6	39	118	3.0	52	511	9.8	0	0	0.0
1000-1100	182	267	1.5	36	74	2.1	39	473	12.1	0	0	0.0
1100-1200	179	279	1.6	35	86	2.5	31	298	9.6	0	0	0.0
1200-1300	162	239	1.5	29	78	2.7	60	469	7.8	0	0	0.0
1300-1400	163	260	1.6	41	90	2.2	57	500	8.8	0	0	0.0
1400-1500	156	251	1.6	35	73	2.1	50	490	9.8	0	0	0.0
1500-1600	159	244	1.5	28	75	2.7	64	537	8.4	2	4	2.0
1600-1700	140	242	1.7	32	81	2.5	77	661	8.6	0	0	0.0
1700-1800	155	244	1.6	25	162	6.5	93	1,247	13.4	0	0	0.0
Total	2,394	3,658	1.5	415	1,122	2.7	760	8,251	10.9	3	5	1.7

Vehicle Type: 1 - Private Car/SUV/Pick-Up/Jeep (Owner Type)/Taxi, 2 - Private or Public Van, 3 - Jeepney, 4 - All Buses, and 5 - All Trucks

Time	West Service Road - NORTHBOUND			
	% Vehicle Sampled			
	Type 1	Type 2	Type 3	Type 4
0600-0700	99%	75%	88%	100%
0700-0800	99%	89%	76%	0%
0800-0900	99%	73%	80%	0%
0900-1000	98%	93%	75%	0%
1000-1100	96%	97%	80%	0%
1100-1200	97%	97%	66%	0%
1200-1300	96%	100%	92%	0%
1300-1400	96%	93%	83%	0%
1400-1500	88%	92%	91%	0%
1500-1600	94%	90%	85%	100%
1600-1700	75%	82%	88%	0%
1700-1800	81%	78%	96%	0%
Total	94%	87%	84%	50%

Table 3.2-8: Vehicle Occupancy Count: Station D-1: Sales Road

Station Code: D-1
 Station Name: Sales Road
 Date: 04/23/2013 (TUESDAY)
 Weather: Fine
 Direction: Sales Road (At-grade) - EB

Time	Sales Road (At-grade) - EB											
	Vehicle Type 1			Vehicle Type 2			Vehicle Type 3			Vehicle Type 4		
	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy
0600-0700	170	293	1.7	148	353	2.4	19	112	5.9	7	174	24.9
0700-0800	204	349	1.7	175	446	2.5	24	134	5.6	3	122	40.7
0800-0900	162	289	1.8	108	264	2.4	7	25	3.6	1	45	45.0
0900-1000	143	244	1.7	119	224	1.9	0	0	0.0	0	0	0.0
1000-1100	224	379	1.7	152	360	2.4	12	77	6.4	3	122	40.7
1100-1200	154	258	1.7	119	286	2.4	15	82	5.5	1	2	2.0
1200-1300	216	393	1.8	150	369	2.5	17	93	5.5	5	189	37.8
1300-1400	244	426	1.7	169	409	2.4	24	113	4.7	0	0	0.0
1400-1500	155	277	1.8	115	321	2.8	26	149	5.7	0	0	0.0
1500-1600	157	289	1.8	92	275	3.0	32	245	7.7	1	1	1.0
1600-1700	247	411	1.7	154	512	3.3	17	133	7.8	1	2	2.0
1700-1800	233	425	1.8	138	367	2.7	15	120	8.0	1	60	60.0
Total	2,309	4,033	1.7	1,639	4,186	2.6	208	1,283	6.2	23	717	31.2

Vehicle Type: 1 - Private Car/SUV/Pick-Up/Jeep (Owner Type)/Taxi, 2 - Private or Public Van, 3 - Jeepney, 4 - All Buses, and 5 - All Trucks

Time	Sales Road (At-grade) - EASTBOUND			
	% Vehicle Sampled			
	Type 1	Type 2	Type 3	Type 4
0600-0700	28%	46%	41%	70%
0700-0800	40%	36%	43%	75%
0800-0900	45%	21%	18%	50%
0900-1000	56%	24%	0%	0%
1000-1100	34%	38%	18%	60%
1100-1200	25%	21%	37%	100%
1200-1300	29%	70%	23%	83%
1300-1400	32%	42%	69%	0%
1400-1500	18%	47%	74%	0%
1500-1600	16%	23%	74%	100%
1600-1700	25%	46%	43%	100%
1700-1800	20%	38%	31%	50%
Total	27%	35%	38%	64%

Table 3.2-9: Vehicle Occupancy Count: Station S-1: Skyway Arnaiz Entry/Exit Ramps

Station Code: S-1
 Station Name: Skyway Arnaiz Entry/Exit Ramps
 Date: 04/25/2013 (THURSDAY)
 Weather: Fine
 Direction: Skyway (Off-Ramp) - NORTHBOUND

Time	Skyway (Off-Ramp) - NORTHBOUND											
	Vehicle Type 1			Vehicle Type 2			Vehicle Type 3			Vehicle Type 4		
	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy
0600-0700	273	433	1.6	32	54	1.7	0	0	0.0	0	0	0.0
0700-0800	282	455	1.6	72	135	1.9	0	0	0.0	1	10	10.0
0800-0900	307	475	1.5	66	118	1.8	0	0	0.0	0	0	0.0
0900-1000	343	520	1.5	46	109	2.4	0	0	0.0	0	0	0.0
1000-1100	327	527	1.6	26	60	2.3	0	0	0.0	0	0	0.0
1100-1200	315	534	1.7	34	62	1.8	0	0	0.0	0	0	0.0
1200-1300	325	533	1.6	30	68	2.3	0	0	0.0	0	0	0.0
1300-1400	342	592	1.7	32	64	2.0	0	0	0.0	0	0	0.0
1400-1500	349	602	1.7	44	88	2.0	0	0	0.0	0	0	0.0
1500-1600	321	528	1.6	20	33	1.7	0	0	0.0	0	0	0.0
1600-1700	347	595	1.7	43	81	1.9	0	0	0.0	0	0	0.0
1700-1800	372	597	1.6	47	380	8.1	0	0	0.0	0	0	0.0
Total	3,903	6,391	1.6	492	1,252	2.5	0	0	0.0	1	10	10.0

Vehicle Type: 1 - Private Car/SUV/Pick-Up/ Jeep (Owner Type)/Taxi, 2 - Private or Public Van, 3 - Jeepney, 4 - All Buses, and 5 - All Trucks

Time	Skyway (Off-Ramp) - NORTHBOUND			
	% Vehicle Sampled			
	Type 1	Type 2	Type 3	Type 4
0600-0700	100%	100%	0%	0%
0700-0800	99%	100%	0%	50%
0800-0900	99%	100%	0%	0%
0900-1000	99%	100%	0%	0%
1000-1100	99%	100%	0%	0%
1100-1200	99%	100%	0%	0%
1200-1300	90%	100%	0%	0%
1300-1400	92%	82%	0%	0%
1400-1500	93%	98%	0%	0%
1500-1600	58%	44%	0%	0%
1600-1700	64%	57%	0%	0%
1700-1800	40%	39%	0%	0%
Total	78%	78%	0%	25%

Table 3.2-10: Vehicle Occupancy Count: Station S-2: Skyway Sales Road Entry/Exit Ramps

Station Code: S-2
 Station Name: Skyway Sales Road Entry/Exit Ramps
 Date: 04/25/2013 (THURSDAY)
 Weather: Fine
 Direction: Skyway (On-Ramp) - EASTBOUND

Time	Skyway (On-Ramp) - EASTBOUND											
	Vehicle Type 1			Vehicle Type 2			Vehicle Type 3			Vehicle Type 4		
	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy
0600-0700	301	504	1.7	137	402	2.9	0	0	0.0	1	1	1.0
0700-0800	372	671	1.8	237	849	3.6	0	0	0.0	1	1	1.0
0800-0900	372	695	1.9	224	668	3.0	1	1	1.0	0	0	0.0
0900-1000	372	721	1.9	225	472	2.1	0	0	0.0	0	0	0.0
1000-1100	372	706	1.9	263	657	2.5	0	0	0.0	0	0	0.0
1100-1200	372	749	2.0	189	485	2.6	0	0	0.0	1	2	2.0
1200-1300	372	716	1.9	129	367	2.8	0	0	0.0	0	0	0.0
1300-1400	372	754	2.0	171	364	2.1	0	0	0.0	0	0	0.0
1400-1500	193	387	2.0	124	263	2.1	0	0	0.0	0	0	0.0
1500-1600	224	471	2.1	148	321	2.2	0	0	0.0	0	0	0.0
1600-1700	243	607	2.5	178	426	2.4	0	0	0.0	1	30	30.0
1700-1800	372	825	2.2	252	589	2.3	0	0	0.0	3	140	46.7
Total	3,937	7,806	2.0	2,277	5,863	2.6	1	1	1.0	7	174	24.9

Vehicle Type: 1 - Private Car/SUV/Pick-Up/ Jeep (Owner Type)/Taxi, 2 - Private or Public Van, 3 - Jeepney, 4 - All Buses, and 5 - All Trucks

Time	Skyway (On-Ramp) - EASTBOUND			
	% Vehicle Sampled			
	Type 1	Type 2	Type 3	Type 4
0600-0700	98%	44%	0%	50%
0700-0800	50%	54%	0%	50%
0800-0900	49%	55%	100%	0%
0900-1000	62%	58%	0%	0%
1000-1100	74%	78%	0%	0%
1100-1200	78%	57%	0%	50%
1200-1300	85%	41%	0%	0%
1300-1400	95%	54%	0%	0%
1400-1500	61%	36%	0%	0%
1500-1600	54%	41%	0%	0%
1600-1700	59%	48%	0%	100%
1700-1800	65%	45%	0%	75%
Total	66%	51%	25%	50%

Table 3.2-11: Vehicle Occupancy Count: Station S-4: Skyway Bicutan Entry/Exit Ramps

Station Code: S-4
 Station Name: Skyway Bicutan Entry/Exit Ramps
 Date: 04/25/2013 (THURSDAY)
 Weather: Fine
 Direction: Skyway (On-Ramp) - NORTHBOUND

Time	Skyway (On-Ramp) - NORTHBOUND											
	Vehicle Type 1			Vehicle Type 2			Vehicle Type 3			Vehicle Type 4		
	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy
0600-0700	269	389	1.4	44	523	11.9	21	465	22.1	6	20	3.3
0700-0800	372	511	1.4	94	1,359	14.5	39	876	22.5	3	75	25.0
0800-0900	372	512	1.4	74	1,169	15.8	46	1,100	23.9	2	60	30.0
0900-1000	331	455	1.4	49	744	15.2	20	474	23.7	2	2	1.0
1000-1100	213	310	1.5	30	475	15.8	13	317	24.4	2	2	1.0
1100-1200	177	264	1.5	22	281	12.8	9	223	24.8	0	0	0.0
1200-1300	139	200	1.4	13	181	13.9	26	646	24.8	1	1	1.0
1300-1400	93	151	1.6	24	383	16.0	12	308	25.7	1	60	60.0
1400-1500	91	143	1.6	27	394	14.6	12	308	25.7	2	2	1.0
1500-1600	84	129	1.5	21	290	13.8	7	185	26.4	0	0	0.0
1600-1700	90	157	1.7	27	357	13.2	9	233	25.9	0	0	0.0
1700-1800	86	131	1.5	28	431	15.4	15	385	25.7	0	0	0.0
Total	2,317	3,352	1.4	453	6,587	14.5	229	5,520	24.1	19	222	11.7

Vehicle Type: 1 - Private Car/SUV/Pick-Up/Jeep (Owner Type)/Taxi, 2 - Private or Public Van, 3 - Jeepney, 4 - All Buses, and 5 - All Trucks

Time	Skyway (On-Ramp) - NORTHBOUND			
	% Vehicle Sampled			
	Type 1	Type 2	Type 3	Type 4
0600-0700	98%	100%	100%	100%
0700-0800	62%	97%	100%	100%
0800-0900	55%	94%	94%	67%
0900-1000	99%	96%	100%	40%
1000-1100	97%	97%	100%	100%
1100-1200	98%	100%	100%	0%
1200-1300	99%	65%	90%	100%
1300-1400	93%	100%	100%	100%
1400-1500	95%	100%	100%	100%
1500-1600	90%	100%	100%	0%
1600-1700	100%	100%	100%	0%
1700-1800	95%	100%	100%	0%
Total	80%	96%	97%	83%

Table 3.2-12: Vehicle Occupancy Count: Station S-5: Skyway Sucat Entry/Exit Ramps

Station Code: S-5
 Station Name: Skyway Sucat Entry/Exit Ramps
 Date: 04/25/2013 (Thursday)
 Weather: Fine
 Direction: Skyway (On-Ramp) – NORTHBOUND

Time	Skyway (On-Ramp) - NORTHBOUND											
	Vehicle Type 1			Vehicle Type 2			Vehicle Type 3			Vehicle Type 4		
	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy
0600-0700	239	438	1.8	24	344	14.3	2	22	11.0	0	0	0.0
0700-0800	323	563	1.7	80	1,210	15.1	6	138	23.0	0	0	0.0
0800-0900	310	585	1.9	39	409	10.5	3	67	22.3	0	0	0.0
0900-1000	284	522	1.8	27	350	13.0	3	68	22.7	0	0	0.0
1000-1100	241	462	1.9	34	271	8.0	3	58	19.3	0	0	0.0
1100-1200	129	250	1.9	27	258	9.6	1	25	25.0	0	0	0.0
1200-1300	132	236	1.8	12	67	5.6	0	0	0.0	0	0	0.0
1300-1400	130	252	1.9	10	41	4.1	0	0	0.0	0	0	0.0
1400-1500	138	275	2.0	27	233	8.6	0	0	0.0	0	0	0.0
1500-1600	137	284	2.1	22	137	6.2	0	0	0.0	0	0	0.0
1600-1700	188	386	2.1	23	228	9.9	0	0	0.0	0	0	0.0
1700-1800	161	359	2.2	18	176	9.8	0	0	0.0	0	0	0.0
Total	2,412	4,612	1.9	343	3,724	10.9	18	378	21.0	0	0	0.0

Vehicle Type: 1 - Private Car/SUV/Pick-Up/Jeep (Owner Type)/Taxi, 2 - Private or Public Van, 3 - Jeepney, 4 - All Buses, and 5 - All Trucks

Time	Skyway (On-Ramp) - NORTHBOUND			
	% Vehicle Sampled			
	Type 1	Type 2	Type 3	Type 4
0600-0700	84%	89%	67%	0%
0700-0800	38%	85%	100%	0%
0800-0900	52%	98%	100%	0%
0900-1000	67%	79%	100%	0%
1000-1100	68%	85%	100%	0%
1100-1200	56%	68%	100%	0%
1200-1300	68%	60%	0%	0%
1300-1400	73%	71%	0%	0%
1400-1500	59%	75%	0%	0%
1500-1600	73%	96%	0%	0%
1600-1700	90%	77%	0%	0%
1700-1800	88%	82%	0%	0%
Total	61%	82%	90%	0%

Table 3.2-13: Vehicle Occupancy Count: Station S-6: Skyway - Hillsborough Entry/Exit Ramps

Station Code: S-6
 Station Name: Skyway Hillsborough Entry/Exit Ramps
 Date: 04/25/2013 (THURSDAY)
 Weather: Fine
 Direction: Skyway (On-Ramp) - NORTHBOUND

Time	Skyway (On-Ramp) - NORTHBOUND											
	Vehicle Type 1			Vehicle Type 2			Vehicle Type 3			Vehicle Type 4		
	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy
0600-0700	322	397	1.2	53	131	2.5	12	272	22.7	123	6,330	51.3
0700-0800	372	491	1.3	104	341	3.3	20	458	22.9	168	9,630	57.3
0800-0900	372	538	1.4	94	514	5.5	15	345	23.0	114	6,009	52.7
0900-1000	372	554	1.5	95	342	3.6	12	276	23.0	83	4,008	48.3
1000-1100	348	583	1.7	83	166	2.0	8	184	23.0	60	3,030	50.5
1100-1200	277	461	1.7	48	105	2.2	9	207	23.0	57	2,567	45.0
1200-1300	238	353	1.5	41	94	2.3	6	138	23.0	40	2,027	50.7
1300-1400	372	449	1.2	79	161	2.0	9	207	23.0	68	3,324	48.9
1400-1500	314	434	1.4	72	149	2.1	6	117	19.5	55	2,578	46.9
1500-1600	265	407	1.5	92	175	1.9	14	295	21.1	57	2,580	45.3
1600-1700	288	355	1.2	63	137	2.2	6	138	23.0	64	3,156	49.3
1700-1800	346	437	1.3	76	180	2.4	8	184	23.0	54	3,115	57.7
Total	3,886	5,459	1.4	900	2,495	2.8	125	2,821	22.6	943	48,354	51.3

Vehicle Type: 1 - Private Car/SUV/Pick-Up/Jeep (Owner Type)/Taxi, 2 - Private or Public Van, 3 - Jeepney, 4 - All Buses, and 5 - All Trucks

Time	Skyway (On-Ramp) - NORTHBOUND			
	% Vehicle Sampled			
	Type 1	Type 2	Type 3	Type 4
0600-0700	98%	83%	75%	77%
0700-0800	56%	79%	87%	94%
0800-0900	61%	78%	88%	98%
0900-1000	80%	79%	75%	86%
1000-1100	83%	81%	89%	74%
1100-1200	84%	77%	90%	86%
1200-1300	81%	79%	86%	66%
1300-1400	78%	76%	90%	73%
1400-1500	73%	83%	86%	93%
1500-1600	64%	90%	93%	86%
1600-1700	75%	84%	86%	79%
1700-1800	86%	88%	80%	78%
Total	74%	81%	85%	84%

Table 3.2-14: Vehicle Occupancy Count: Station S-7: Skyway-Alabang Entry/Exit Ramps

Station Code: S-7
 Station Name: Skyway Alabang Entry/Exit Ramps
 Date: 04/25/2013 (THURSDAY)
 Weather: Fine
 Direction: Skyway (On-Ramp) - NORTHBOUND

Time	Skyway (On-Ramp) - NORTHBOUND											
	Vehicle Type 1			Vehicle Type 2			Vehicle Type 3			Vehicle Type 4		
	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy	No. of Vehicles	No. of Passengers	Average Occupancy
0600-0700	99	156	1.6	117	555	4.7	0	0	0.0	0	0	0.0
0700-0800	153	216	1.4	150	1,064	7.1	1	10	10.0	0	0	0.0
0800-0900	242	332	1.4	127	690	5.4	0	0	0.0	0	0	0.0
0900-1000	163	211	1.3	97	276	2.8	0	0	0.0	0	0	0.0
1000-1100	101	145	1.4	93	239	2.6	0	0	0.0	0	0	0.0
1100-1200	64	88	1.4	80	216	2.7	0	0	0.0	1	1	1.0
1200-1300	67	108	1.6	78	242	3.1	0	0	0.0	1	15	15.0
1300-1400	102	145	1.4	80	252	3.2	0	0	0.0	0	0	0.0
1400-1500	72	103	1.4	68	158	2.3	0	0	0.0	0	0	0.0
1500-1600	128	206	1.6	43	97	2.3	0	0	0.0	0	0	0.0
1600-1700	126	195	1.5	45	180	4.0	0	0	0.0	0	0	0.0
1700-1800	102	156	1.5	53	212	4.0	0	0	0.0	0	0	0.0
Total	1,419	2,061	1.5	1,031	4,181	4.1	1	10	10.0	2	16	8.0

Vehicle Type: 1 - Private Car/SUV/Pick-Up/ Jeep (Owner Type)/Taxi, 2 - Private or Public Van, 3 - Jeepney, 4 - All Buses, and 5 - All Trucks

Time	Skyway (On-Ramp) - NORTHBOUND			
	% Vehicle Sampled			
	Type 1	Type 2	Type 3	Type 4
0600-0700	59%	59%	0%	0%
0700-0800	49%	52%	100%	0%
0800-0900	88%	64%	0%	0%
0900-1000	89%	55%	0%	0%
1000-1100	57%	70%	0%	0%
1100-1200	60%	58%	0%	100%
1200-1300	47%	49%	0%	100%
1300-1400	28%	48%	0%	0%
1400-1500	34%	58%	0%	0%
1500-1600	71%	52%	0%	0%
1600-1700	77%	48%	0%	0%
1700-1800	69%	61%	0%	0%
Total	58%	56%	100%	100%

3.3 Incident during the Survey

The survey was conducted smoothly with no untoward incident occurring. Skyway O & M Corporation, the operator of South Luzon Express (SLEX) gave its support to the survey team.

APPENDIX B: Geotechnical Conditions

1 MAGALLANES – NICHOLS

SUBSURFACE SOIL EXPLORATION METRO MANILA SKYWAY, STAGE 1 (Sta. 5+123.300 to 7+325.000)

1.1 INTRODUCTION

This report embodies a brief factual information on the Field Boring Test and Laboratory Tests concluded along portion of the Metro Manila Skyway Project, Stage 1 from Sta. 5 + 123.300 to 7+325.000 which covers the alignment from Magallanes to Nichols along South Luzon Expressway.

This portion of the project is covered by Boreholes A-29 to A-48 as shown in the attached drawings.

1.2 GENERAL GEOLOGICAL CONDITIONS

1.2.1 Geological Setting

The Metro Manila area is bordered by the Manila Bay on the west, tidal flats extensively developed in to fishponds on the Northwest, the Central Luzon Valley on the North, the foothills of the Sierra Madre mountain range on the Northeast and the East, the Laguna de Bay on the Southeast and a narrow neck of flat land on the sound.

Metro Manila is located at the southern tip of an apron of a wide delta at the eastern shore of the Manila Bay. This delta is part of lowlands with elevations of less than 4 meter above mean sea level, which are composed of alluvial deposits originating from distributories and marine currents, and which overlay tuffaceous formations originating from the Quaternary period. The tuffaceous formations are exposed at an elevation of about 10 m. at the eastern part of the delta, and are locally known as Guadalupe Tuff.

1.2.2 Geological History

The Central Luzon Valley was formed during the late-Mesozoic and Cenozoic times as part of a North-South oriented eugeosyncline which was filled largely with tuffaceous and volcanic sediments, and minor chalk limestone. Orogenic action from the late-Cretaceous to the middle-Miocene resulted in the development in the east of the folded mountain range of the Sierra Madre and in the West of the folded and thrust mountains of Zambales. By the end of the Miocene epoch, the eugeosyncline had been reduced to an intermontane trough, in extent approximating the present Central Luzon Valley. With the rather rapid sedimentation of which took place during the late-Miocene, a relatively constant depositional area was maintained through gradual subsidence, occasional orogenic isostatic movement and post platform tectonic activities.

During the Quaternary and recent times, numerous eustatic changes in sea level resulted in the gradual emergence of the Central Luzon Valley and the change in depositional environment from marine to continental. The withdrawal of the sea from the Central Luzon

Valley was accomplished by uplifting associated with tectonic action. The uplifting caused the Manila Bay and Laguna de Bay, once a continuous arm of the sea, to become separated by the Land area which now comprises Pasig, Cainta and Tagaytay.

1.2.3 Geological Formation

1) Quaternary Alluvium

Quaternary alluvium, comprising sediments of gravel, sand, silt and clay.

Shells and other organic materials encountered in the boring samples confirm that these sediments were at least partly deltaic in origin and were deposited in a marine environment. These alluvial sediments are overlaying the Guadalupe Tuff Formation.

2) Guadalupe Tuff Formation

The Quaternary Guadalupe Tuff Formation originates from the Pleistocene period, and is composed of pyroclastic and sedimentary units which crop out the Project. The upper member of the Guadalupe Tuff Formation (Diliman Tuff) consists of thin to medium-bedded, fine grained vitric tuffs and welded volcanic breccias with a subordinate amount of tuffaceous, fine to medium grained sandstone and siltstone; the lower member (Alat Conglomerate) is a thick sequence of massive conglomerate, silty mudstone and tuffaceous sandstone.

1.2.4 Site Geology

The General area of the existing South Expressway from Magallanes Commercial Center in Makati to Taguig is basically underlain by Tuff ("Adobe") rocks collectively known as the Guadalupe Formation. These tuffaceous sedimentaries are essentially ancient Volcanic sand and ash ejecta deposited in a shallow marine environment during past geologic times.

According to Gervasio, the Guadalupe Formation is composed of a thick intercalation of Lithified Volcanic Ash, Lapili and Crystal Tuff generally compacted or slightly cemented by precipitated silica and (or) clay. The sedimentary beds consisting the formation display a regional dip of 5° to 10° to the West (to the direction of Manila Bay). In addition, the Tuff rocks are characteristically highly-weathered and fractured as can be observed in the extracted rock cores. However, the preferred fracture orientation is generally horizontal correlative to the bedding planes to the Tuff beds.

The Tuff ("Adobe") rocks are widespread and can be noted to be exposed as far North to Novaliches and South towards the Cavite area. It is typical of the Tuff rock to be overlain by variably thick layers of uncontrolled overburden fill materials composed of mixtures of sand, silt and clay with variable amounts of imported gravel and sandstones/ siltstone fragments. These shallow layers of overburden fills are then underlain by floodplain soils composed generally clay and silt exhibiting variable plasticity and consistency and sometimes grades into more stiff or dense residual or saprolitic soils as these are in place weathering and degradation by products of the Tuff rocks.

Presence of variably thick layers of overburden fills and floodplain soils are indicated in some the Boreholes drilled along Stage 1 for the Project.

Particularly Boreholes BH-A30, 33, 34, 35 and 37, the underlying Tuff rocks within influence Boreholes are characteristically soft and friable due possibly to the poor cementation that the Tuff beds have undergone during the ancient past. Weak and fractured rock zones are also indicated by the relatively low Rock Quality Designators (RQD). The Tuff rocks are composed of intercalations of brown to grayish brown fine to coarse Tuff (Siltstone) and gray sandy Tuff (Sandstone). The presence of variable amounts of Tuff pebbles within the fine Tuff matrix impart pebbly or conglomeratic texture.

1.2.5 Groundwater

Groundwater Table (GWT) measurements 24 hours after completion of each Borehole indicate variable depths shallowest at BH-A45 to within 3.0 m depth and deepest at BH-A30 to within 20.7 m depth. These highly fluctuating depths indicate that the measures GWT levels are possibly entrapped drilling water that have yet to seep through the underlying Tuff rock. Borehole BH-A31 was dry when GWT measurement was made 24 hours after its completion.

It is important to note that some portion of the existing South Expressway from the Magallanes Commercial to Taguig is easily inundated during periods of sustained heavy rains. This should be anticipated by the Contractor and for the project and would have to prepare for this eventuality.

1.3 FIELD AND LABORATORY TEST PROCEDURES

Field Boring Test were performed by the drilling crew of the Philippines Geoanalytics, Inc. on November 25, 1995 to April 08, 1996. Four (4) complete sets of the following drilling rigs were utilized for the drilling works:

- * Banseok Hydraulic Rotary Drilling Rig and Accessories
- * Tone Tas Hydraulic Rotary Drilling Rig and Accessories
- * Acker Hydraulic Rotary Drilling Rig and Accessories
- * Explorer Mechanical Rotary Drilling Rig and Accessories

1.3.1 Drilling Procedure

The boreholes were advanced by Wash boring and Rotary Drilling using NQ Triple core barrels to the maximum boring depths. Standard Penetration Tests were conducted at every 1.5 meter interval or oftener with change in formation of Consistency/ Density. When necessary more particularly within shallow soil layers, NW standpipe casing was used to prevent collapse of the Borehole walls. Standard Penetration Tests were also performed within the underlying Tuff rock when Nil RQD values are being obtained. This is to check soil stiffness.

The Standard Penetration Tests consists of driving a Standard Split Spoon Sampler of 5.08 cm ("2 O.D.) diameter in three successive 15 cm. (6") intervals using a drop hammer of 64 kg (140 lbs.) weight from a height of 76 cm (30"). The number of blows to penetrate 15 cm. are recorded successively until the seating interval is penetrated. The first interval blow counts from the second and third intervals are added to give what is known as the N-value which is measure of the density or consistency of the underlying soils. In order to eliminate operator error and enable repeatability of results, a free fall automatic hammer of the "PILCON" type was used for this project. Undisturbed samples were taken in soft to stiff soil deposits for strength testing and determination of consolidation characteristics. Coring

using NQ Triple Core Barrels was resorted to in order to penetrate the underlying Tuff ("Adobe") rock.

1.3.2 Laboratory Test Procedure

Laboratory Tests on extracted Borehole samples are in accordance with the Standards of the American Society for Testing and Materials (ASTM). The Borehole samples were tested with the tests schedules provided by the Client Representative.

The following laboratory tests and their brief description were carried out on soil samples obtained from the site:

- 1) Classification of Soils for Engineering Purposes
(United Soil Classification System)
ASTM D 2487 – 93

This Standard describes as system for classifying mineral and organo-mineral soils for engineering purposed based on laboratory determination of particle size characteristics, liquid limit and plasticity index.

- 2) Particle Size Analysis of Soils
ASTM D 422 – 63

Soil was passed through a series of sieves, the weight of soil retained on each sieve determined and recorded. For each sample analyzed, a gradation curve was drawn based on the percent finder by weight.

- 3) Liquid Limit of Soils
ASTM D 4318-95

Is the water content expressed a percentage of the weight of the oven-dried soil, at the boundary between the liquid and plastic states.

- 4) Plastic Limit and Plasticity of Soils
ASTM D 4318-95

The plastic limit of a soil is the water content, expressed as a percentage of the mass of the over-dried soil, at the boundary between the plastic and semi-solid states.

- 5) Laboratory Determination of Moisture Content of Soils
ASTM D 2216 – 92

This test method covers the laboratory determination of the water (moisture) content of soil, rock and similar materials by mass. The water contact of material is defined as the ration expressed as a percentage of the weight of water in a given mass of soil to the weight of the solid particles.

- 6) Unconfined Compressive Strength of Intact Rock Cores
ASTM D 2938 – 95

This method covers the determination of the Uniaxial Comprehensive strength of intact rocks cores by a strain controlled application of load.

- 7) Specific Gravity of Soils
ASTM D 854 – 92

This test used to determine the specific gravity of soils.

1.4 RESULTS AND OBSERAVTIONS

1.4.1 Phase 1-A (Sta. 5+123.300 – 6+088.000)

The completed Boreholes along Sta. 5+123.300 to 6+088.000 are widely spaced from 50.0 to 160 meters. As such, it is highly possible that subsurface soil conditions particularly the depths to bedrock between Boreholes may vary from those detected within influence Boreholes completed.

Thus, the results of the Field Boring and Laboratory tests performed on extracted Boreholes depict subsurface conditions specifically within each Borehole location.

The depths indicated herein were reckoned from the Borehole collars at existing ground line at time of borings.

The completed Boreholes reveal variable depths to the underlying Tuff ("Adobe") rock as indicated in the summary below;

INFLUENCE BOREHOLE	DEPTHS TO TUFF BEDROCK
BH-A29	-1.13 m
BH-A30	-6.00m
BH-A31	-1.48m
BH-A32	-1.33m
BH-A33	-7.75m
BH-A34	-4.50m
BH-A35	-3.20m
BH-A36	-1.30m
BH-A37	-9.80m

Notes:

- 2. The indicated depth of Tuff bedrock also corresponds to the thickness of overburden soils Within Borehole influence area.*
- 3. Depths to Tuff bedrock reckoned from Borehole Collars at existing ground line of borings.*

The shallow layers approximately 1.13m to 1.48m thick of sapprolitic soils detected in Boreholes BH-A29, BH-A31, BH-A32 and BH-A36 are composed of slit, sandy lean clay (CL) and clayey silt with Tuff fragments. These possess hard consistency as indicated by Refusal (+50 blows/ft) N-Values. These are immediately underlain by the underlying Tuff ("Adobe") rock.

Skyway Project – GTF at 10m Depth

BEARING LOAD (kN) for F=1

Pile Lengths
(m):

Diameters:

	0.6m	0.9m	1.2m	1.5m	1.8m	2.0m	2.2m	2.5m
Lnet _k	Q _{0,k}	Q _{1,k}	Q _{2,k}	Q _{3,k}	Q _{4,k}	Q _{5,k}	Q _{6,k}	Q _{7,k}
16	4517	6602	11644	16186	21381	25207	29323	36040
18	5150	7441	12883	17718	23199	27212	31512	38499
20	5809	8313	14173	19314	25094	29302	33794	41065
22	6505	9236	15539	21005	27102	31518	36216	43788
24	7238	10207	16979	22787	29220	33857	38772	46665
26	7983	11194	18440	24597	31373	36233	41369	49587

UPLIFT LOAD (kN) for F=1

Pile Lengths
(m):

Diameters:

	0.6m	0.9m	1.2m	1.5m	1.8m	2.0m	2.2m	2.5m
Lnet _k	P _{0,k}	P _{1,k}	P _{2,k}	P _{3,k}	P _{4,k}	P _{5,k}	P _{6,k}	P _{7,k}
16	3320	4475	6857	8707	10612	11912	13235	15266
18	3980	5362	8205	10409	12674	14218	15789	18197
20	4666	6282	9604	12175	14813	16610	18437	21234
22	5390	7253	11079	14035	17066	19128	21223	24428
24	6150	8073	10607	16087	10408	21768	24144	27776
26	6922	9308	14197	17967	21825	24446	27106	31170

ASSUMED DATA:

=====

Pile:

B=4

Embedment

wp = 24 Pile Unit Weight

Soil Layer Data:

Col 4 - factor

zw = 2 Water Table Depth

Col 0 - unit weight

Col 5 - factor

Col 1 - effective cohesion

Col 6 - cap on skin

Col 2 - effective friction angle

Col 7 - cap on end

(Degrees)

ww = 10 Unit weight of water

Col 3 - k

Col 8 - layer thickness

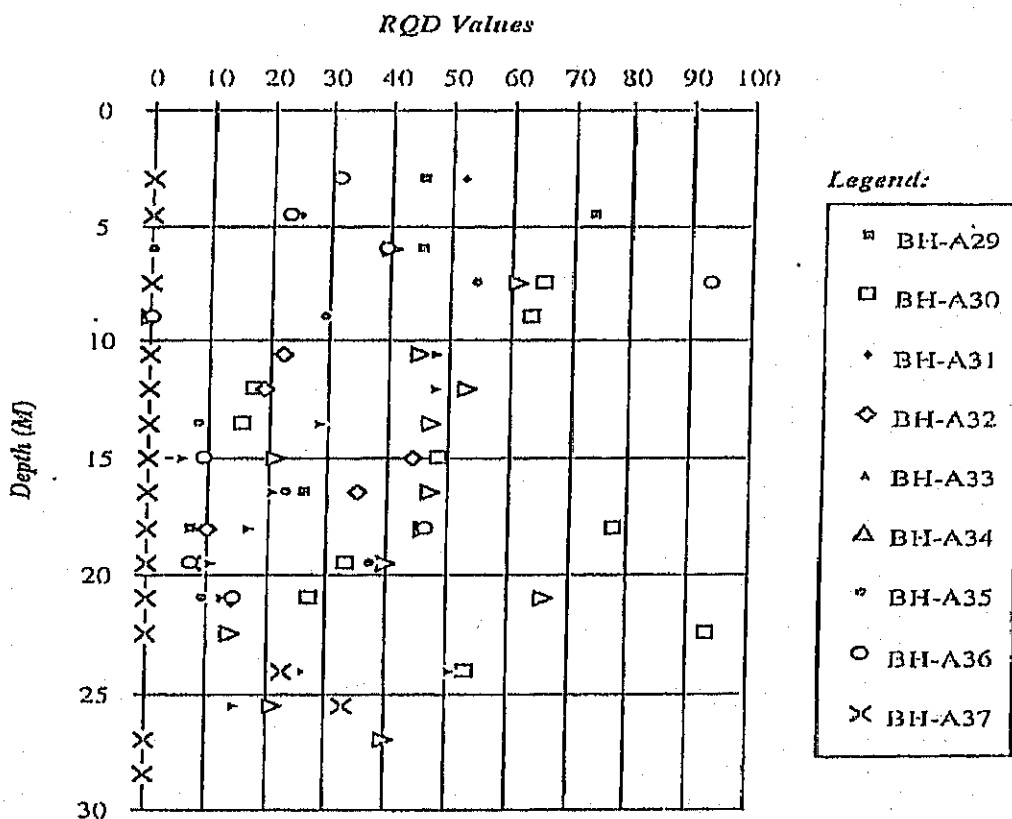
F = 1 Factor of Safety

$$S = \begin{bmatrix} 18 & 25 & 10 & 0.8 & 0.55 & 1 & 50 & 200 & 6 \\ 19 & 75 & 26 & 0.8 & 0.55 & 1 & 100 & 2000 & 4 \\ 20 & 100 & 33 & 0.8 & 0.55 & 1 & 200 & 5000 & 34 \end{bmatrix}$$

Presence of relatively thick layers of overburden and floodplain clays (3.20m to 7.75m thick) are indicated in Boreholes **BH-A30**, **BH-A33**, **BH-A34**, and **BH-A35**. These are composed of low plasticity silts (ML) and highly plastic silts (MH) and clay (CH) that possess variable consistency with N-Values ranging from Nil (Pressed) to 43 blows/ft. Verify soft to medium stiff clays (CH) with N-Values from Nil (Pressed) to only 9 blows/ft were detected in **BH-A30** at - 1.50m to - 1.95m depth, in **BH-A33** at - 3.0m to -3.90m depth and in **BH-A35** at - 1.05m to - 1.50m depth.

In Borehole **BH-A37**, approximately 9.0m thick of medium stiff to very stiff elastic silt (MH) and fat clay (CH) layers were detected. These possess N-Values from 8 to 26 blow/ft. The upper 3.40m depth is underlain by very dense overburden thick overburden soils of variable consistency and degraded rock condition in this particular Borehole is possibly due to the influence effects of the nearby *Maricaban Creek*.

The results of borings indicate generally very poor to fair Tuff rocks immediately underlying the overburden soils. This is indicated by Rock Quality Designators (RQD) with the mean RQD of only 21%. However, it is typical of the underlying Tuff rock at site to have localized resistant layers as revealed by relatively high RQD values (71% to 100%) at some depth zones as depicted by Boreholes **BH-A29**, **BH-A30** and **BH-A36**. This can be observed in the plot of the Rock Quality Designators (% RQD) against depth (m) presented in the *RQD Scatter Chart* below:



It is also typical of the underlying Tuff rock to have highly-degraded zones as Standard Penetration Tests attempted reveal N-Values of 63 blows/ft. to Refusal (+50 blows/ft). These highly degraded rock zones were detected in BH-A29, BH-A31, BH-A32, BH-A34, BH-35 and BH-A37. Degraded rock character is likewise indicated by Nil RQD values.

Using Bieniawski's Geomechanics^{2]} Classification the underlying Tuff rock possess a total Rock Mass Rating (RMR) of 43 which is within *Class III* or *Fair* Rock mass quality.

The results of some intact core samples subjected to Unconfined Compression Test indicate Rock q_u values from 1.91 to 40.4 kg/cm² (0.19 to 3.96 MPa) with a mean Rock q_u of 19.946 kg/cm² (1.96 MPa) and Standard Deviation of 13.089 kg/cm² (1.28 MPa). The relatively high standard deviation indicates variabilities in strength of the underlying Tuff rock.

The average Rock Unit Weight (γ_{wet}) is about 1.545 gm/cc.

In the case of the anticipated Bored Piling works for the structure foundation the mean Rock q_u of 19.946 kg/cm² (1.96 MPa) indicates relatively soft rock character that can be easily penetrated by Bored Piling tools for Rock. However, the fracture rock character and the presence of weak rock zones indicate the need for Bentonite sealing of Borehole walls to prevent collapse or Borehole casing installed.

^{2]} Goodman R.E. "Introduction to Rock Mechanics" 2nd Ed. John Wiley & Sons NYNY 1989 pp 43 to 46

1.4.2 Phase 1-B (Sta. 6+088.00 to 7+325.500)

The results of the completed borings along this section reveal the presence of shallow overburden soil layers (1.18 to 4.95 meters thick) for most of the Boreholes except Borehole BH-A39 where overburden soil is relatively thick extending down to 14.69 meters depth.

The depths to the underlying Tuff ("Adobe") rock within influence Borehole completed is as summarized below:

INFLUENCE BOREHOLE	THICKNESS OF OVERBURDEN SOIL (m)
BH-A38	4.50m
BH-A39	14.69m
BH-A40	3.45m
BH-A41	1.18m
BH-A42	1.50m
BH-A43	1.50m
BH-A44	3.50m
BH-A45	4.95m
BH-A46	1.43m
BH-A47	1.30m
BH-A48	1.50m

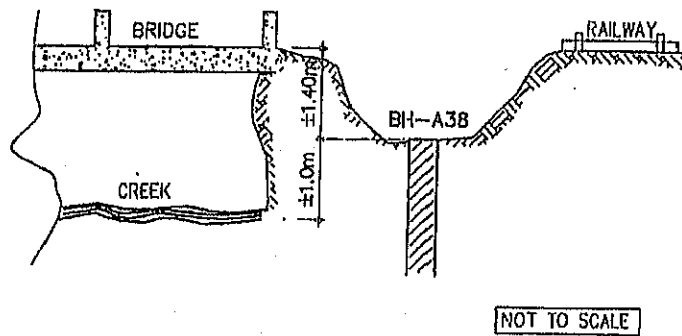
Notes:

The indicated depth of Tuff bedrock also corresponds to the thickness of overburden soils within Borehole influence area.

Depths to Tuff bedrock reckoned from Borehole Collars at existing groundline of borings.

The overburden soils are composed of shallow layers of uncontrolled Fill materials, floodplain clays and saprolitic or residual layers derived from in-place weathering and degradation of the underlying Tuff rock.

The near surface Tuff bedrock in BH-A40, BH-A41, BH-A42, BH-A43, BH-A46, BH-A47 and BH-A48 are overlain by approximately 1.18m to 1.50m thick hard silt/silty clay and fat clay with relatively high N-values that range from 32 blows/ft to Refusal (+50 blows/ft). In the case of Boreholes BH-A38, BH-A44 and BH-A45, the overburden soils approximately 3.45m to 4.95m thick are composed of hard saprolitic soils in BH-A45 with Refusal (+50 blows/ft) blow counts and floodplain clays (CH/CL) and clayey sand (SC) in BH-A38 and BH-A44 that possess N-values that range from Nil to about 40 blows/ft. The soft clay (CH) layer with N-values from Nil to 4 blows/ft was detected in BH-A38 at -1.50m to -1.95m depth. It should be noted that BH-A38 was drilled approximately 1.4m below top of deck of the existing Maricaban Bridge as illustrated in the Sketch below:

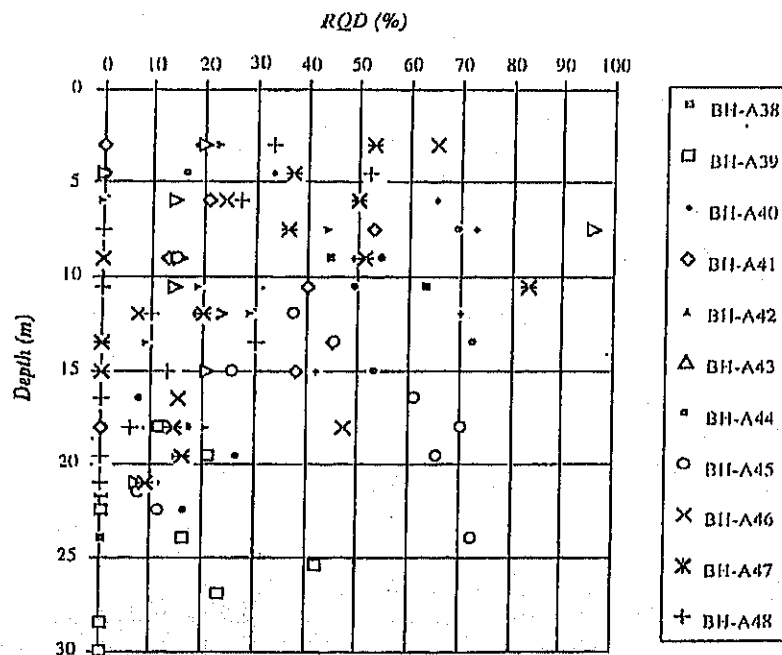


Relatively thick (*approximately 14.69m thick*) overburden soils was detected in **BH-A39** before the underlying Tuff rock was reached. The overburden soils are composed of *5.0m thick* fat clay (**CH**) that possess low N-values of only **5 blows/ft to 9 blows/ft**. These are, in turn, underlain by stiff to hard fat clay (**CH**) lean clay (**CL**) and elastic silt (**MH**) saprolitic soils with higher N-values that range from **12 blows/ft to 37 blows/ft**. These overburden clays and silts are basically high plastic with Plasticity Indices (**PI**) of 25 to 53.

The overburden soils within influence Boreholes **BH-A38** to **BH-A48** are immediately underlain by Tuff rock layers belonging to the so called *Guadalupe Formation*. The Tuff rocks are composed of intercalation of Tuffaceous Claystone, Ash Tuff, Fine to Coarse Tuff and Tuffaceous Sandstone beds exhibiting variabilities in weathering resistance and degrees of cementation.

Highly degraded rock zone where Standard Penetration Tests were performed are indicated in **BH-A47** starting from -12.0m to -16.75m depth. N-values of **41 blows/ft to Refusal (+50 blows/ft)** were obtained indicative of soft rock character but essentially hard soil (**ML**) consistency. Nil RQD Values were obtained during coring runs within this depth zone.

Rock condition is generally very poor to fair as indicated by Rock Quality Designators (**RQD**) from Nil to 96%. The *mean RQD* Value was computed to be **22%**. The relatively low RQD Values reflect variably weathered and fractured rock condition. The plot of the Rock Quality Designators (**RQD** in %) against Depth (in meters) is presented in the RQD Scatter Chart below;



The RQD Scatter Chart shows widely dispersed plots of Rock Quality Designators (RQD) indicative of the highly variable rock quality. In addition, the chart also reveals the presence of localized resistant rock layers in BH-A38, BH-A40, BH-A43, BH-A44, BH-A45, BH-A46 and BH-A47 as indicated by dispersed plots within the 50% to 100% range at variable depth. This is typical of the underlying Tuff rock of the *Guadalupe Formation*.

Using *Bieniawski's* Geomechanics classification²¹, the underlying Tuff rocks for the Stage 1B of the Project possess a total Rock Mass Rating (RMR) of 47 which is within *Class III* or *Fair* Rock Mass Quality.

Unconfined Compression Test (UCT) performed on some intact rock cores extracted reveal *Rock qu* values from 2.95 kg/sq.cm (0.29 MPa) to 69.2 kg/sq cm (6.79 MPa) indicative of relatively soft rock character. Statical analysis of the UCT results indicate a *mean Rock qu* of 23.003 kg/sq.cm (2.26 MPa) and standard deviation of 20.186 kg/sq.cm. The average rock wet unit (*γ_{wet}*) is 1.69 gm/cc. The relatively high standard deviation of the UCT results indicates variabilities in degrees of cementation that the underlying Tuff rocks have been subjected to in the past. The soft rock character is also evidenced by the friable and relatively weak rock cores extracted.

As the case in Stage 1A for the Project, Bored Piling Works at Stage 1B would be undertaken with ease due the relatively soft Tuff Rock. The need for protecting the Borehole Walls from collapse should be anticipated as fractured and weak rock zones were detected. Installation of Borehole casings or sealing of Borehole walls by Bentonite may be undertaken for this purpose.

The final logs for Boreholes BH-A38 to BH-A48 comprising the Stage 1 Phase 1B of the project are included in the *Attachments for this report*. These logs embody the results of the Field Tests and Laboratory Tests on selected Borehole samples.

²¹ Goodman R.E. "Introduction to Rock Mechanics", 2nd Ed. John Wiley & Sons NYNY 1989 pp. 43 to 46

2 MALOLOS – CALOOCAN

LITHOLOGIC CHARACTER OF STRATUM AND GEOLOGICAL STRUCTURE

2.1 Lithologic Character of Stratum

The stratum belongs to Quaternary System along the whole line and major genetic types are: alluvium, marine accumulation, volcanic deposit and artificial accumulation, including the abandoned railway and highway embankment.

2.2 Geologic Structure

The Philippines is one of the countries with the most active tectogenetic movement. Magnitude 7.8 earthquake occurred on Luzon Island on 16th July, 1990; Pinatubo Volcanic Eruption erupted on 14th June, 1991. Both caused disasters. The line is about 110km far away from Luzon earthquake epicenter, 60km far away from Pinatubo Volcanic crater.

The northeast border of Luzon Central Plain is the major fault of Philippines, in southeast-northwest direction, passing through Luzon Island. It is the boundary line among Luzon Central Plain, Cordillera Central and Caraballo Mountain. There are frequent seismic activities along this fault. The above-mentioned Luzon Earthquake was caused by this fault. The railway line is parallel with and far away (about 60km) from this fault. There is another developed West Marikina Valley Faults about 15 ~ 20km away (southeast) from the start point of the railway, which caused Magnitude 6~7 earthquake in 1853.

Luzon Central Plain is a large flat territory, resulting from the filling of the geosynclinal basin existing between Sierra Madre and Zambales range, since the early tertiary until now. The upper filling materials of Luzon Basin are of Quaternary age. In the studied area, recent alluvial deposits (Holocene) cover an older geological unit (Pleistocene) of volcanic-sedimentary origin, known as "Guadalupe Formation." Guadalupe Formation is horizontally deposited in the area, it is geologically very young, and though light tectonic suffering in show.

2.3 Evaluation and Treatment of Special Soil

2.3.1 Soft soil

Major lithology includes puddle soil, sludge, peat soil, gray, grayish black and black, fluid plastic~soft plastic, distributed in section of:

- 1) Km.81+109~Km.81+545, lithology is puddle clay and peat soil, top plate elevation: 0.4~5.28m, bottom plate elevation: -0.4~-12.82m, maximum thickness: 7.6m, plunges to the river bed of Tullahan River.
- 2) Km.75+840~Km.77+236.50, lithology is puddled clay, top plate elevation: 1.64~-1.30m, bottom plate elevation: 0.21~-4.46m, partly mixed with lenticles of silt and silty clay.

- 3) Km.74+945~Km.75+050, lithology is puddle silty clay, distributed in the pools on the right of the existing line, thickness: 0.7~1.0m.
- 4) Km.72+716~Km.74+780, lithology is puddled clay, top plate elevation: 1.0~-1.73m, bottom plate elevation: 1.0~2.54m, maximum thickness: 1.9m.
- 5) Km.71+397~Km.71+815, lithology is puddled clay, top plate elevation: 2.4~0.5m, bottom plate elevation: 2.33~0.1m, maximum thickness: 0.8m.
- 6) Km.68+925~Km.70+095, lithology is puddled silty clay, top plate elevation of upper layer soft soil: 2.65~1.32m, bottom plate elevation: 2.33~-1.37m, maximum thickness: 3.6m. Under layer soft soil is in form of lenticle, only distributed in 0.5-Jd-043 hole, thickness: 2.7m.
- 7) Km.67+673~Km.68+650, lithology is puddle silty clay, normal thickness: 1.8m, plunges to the side with greater mileage, top and bottom plate elevation: range : 2.75~-6.55m.
- 8) Km.65+046~Km.66+999, among which Km.65+618 lithology is sludge, top and bottom plate elevation: -4.22~-9.52m, other sections lithology is puddled silty clay, puddled clay, top plate elevation: 2.80~-1.07m, bottom plate elevation: -1.07~-10.74m, mixed with fine sand, silt, clay layer.
- 9) Km.63+670~Km.64+910, main lithology is puddled silty clay, top plate elevation: -0.13~-2.84m, bottom plate elevation: -0.65~-8.32m, sludge only distributed in 05-Zd-159 hole in the section.
- 10) Km.59+319.50~Km.63+545.15, in the sections Km.62+565~ Km.63+545.15, Km.59+319.50~Km.60+640 and 05-Zd-171 hole is sludge, other sections are puddle silty clay, sludge top plate elevation: 0.54~-5.07m, bottom plate elevation: -5.64~-12.22m; puddled silty clay top plate elevation: 0.76~-3.96m, bottom plate elevation: -4.44~-5.66m.
- 11) Km.51+345.68~Km. 59+236.5, sludge continuously distributed in the section, top and bottom plate elevation: range: 1.31~-13.33m, puddled silty clay interruptedly distributed in surface layer, top and bottom plate elevation: range: 5.12~-3.99m. The maximum thickness of soil in this section: 13.3m.

The above soft soil is with large void ration, high water content and high compressibility. The engineering performance is poor and corresponding treatment shall be taken. The physical and mechanical statistic indexes are shown in Table 3.4-1, including puddled soil of alluvial layer, sludge and puddled soil of marine accumulation layer of Holocene.

2.3.2 Fills

- 1) Artificial soil: distributed in existing embankment, mainly contains fine round gravels and silty clay, filled when the existing railway built.
- 2) Miscellaneous fills: widely distributed on both sides of the abandoned railway, mainly constituted with construction rubbish and domestic garbage, especially in the section of Km.80+570~81+540. The maximum depth of garbage is 5.4m. This soil shall be treated.

2.3.3 Clay (Swelling clay)

Mainly distributed in section of Km.68+540~Km.74+650, Km.63+250~ Km.66+150, Km.60+000~Km.62+150. Main lithology is clay, with grayish yellow and grayish green stripes. The soil is fine with soapy feeling, free swelling rate is $F_s=41.3\sim 73.0\%$. Because of high groundwater level, low variation of water content in clay and small swelling and shrinkage deformation, it has minor impact on this project.

2.3.4 Totally Weathered Claystone

In volcanic deposit layer of upper and mid Pleistocene (Q_{2-3}^{vl}), the totally weathered tuff claystone layer (W_4) of Guadalupe Formation is mainly constituted with clay grain and silt grain, which will become soft when meeting water and the engineering geology is poor. During survey, sounding and drilling tests were performed at some typical points in retaining wall worksite of section Km.81+540~Km.82+050. Test results are shown in Table 3.4-2 and Table 3.4-3.

According to the above data analysis, totally weathered claystone has large void ratio, medium compressibility, and sounding tip resistance is large. The structural strength is high and basic bearing capacity reaches 200kPa. It can be bearing layer of retaining wall, culverts and civil works, as for bridge foundation, pile foundation should be adopted.

Table 3.4-1
Physical Mechanics Index of Puddle Soil of Alluvium Layer, Sludge and Puddled Soil of Marine Accumulation Layer of Holocene

Index	Natural Water Content (ω %)		Natural Density γ (kN/m ³)		Natural Void Ratio e		Liquidity limit ω_L (%)		Liquidity Index I_L		Compression Coefficient $\delta_{0.1-0.2}$ (1/MPa)		Compression Modulus $E_{S0.1-0.2}$ (MPa)		Direct fast shear		Unconsolidated undrained shear		Organic Content W_u (%)		Unconfined compressive strength q_u (kPa)		Tip resistance of CPT q_c (MPa)								
	Statistics number	Average value	Maximum value	Minimum value	Standard value	Statistics number	Average value	Maximum value	Minimum value	Standard value	Statistics number	Average value	Maximum value	Minimum value	Standard value	Internal friction angle ($^\circ$)	Cohesion (kPa)	Internal friction angle ($^\circ$)	Cohesion (kPa)	Statistics number	Average value	Maximum value	Minimum value	Standard value	Statistics number	Average value	Maximum value	Minimum value	Standard value		
Puddled soil of alluvium layer	41	43.43	84.5	22.1	47.4	205	17.4	205	15.5	0.897	25.3	45.2	1.0	1.43	0.26	1.25	3.1	10	4.4	9	6.13	81.0	0.56	5	81.0	0.62	1825	0.62			
	41	17.4	18.8	15.5	17.4	205	1.40	205	1.15	1.79	205	0.88	2.58	1.70	9.81	25.5	7.35	125	7.3	6.07	6.07	54.26	87.0	12.2	12.2	28.0	47.6	820	0.622		
	41	41	41	41	41	41	41	41	41	41	41	21	21	21	18	18	18	18	18	4	4	4	4	4	4	4	4	4	4		
	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	
	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	
Sludge of marine accumulation layer	82	47.74	80.4	52.3	49.5	16.9	16.9	16.9	16.9	16.9	16.9	0.94	2.78	1.82	13.28	31.74	17.04	11.25	11.25	4.75	4.75	72.54	98.0	38.0	62.9	62.9	62.9	62.9	62.9		
	82	16.9	18.4	14.8	16.9	1.39	2.288	84.2	31.9	0.58	1.25	2.33	6.31	1.76	4.88	59	38	1.17	11.25	4.75	72.54	98.0	38.0	62.9	62.9	62.9	62.9	62.9	62.9		
	82	82	82	82	82	82	82	82	82	82	82	55	55	55	38	38	38	38	38	2	2	13	13	13	13	13	13	13	13		
	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	
	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	
Puddled soil of marine alluvium layer	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	
	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41

TABLE 3.4-2
Physical Mechanics Index of Totally Weathered
Tuff Claystone of Retaining Wall

Index Item	Natural water ratio ω (%)	National density γ kN/m ³	Natural void ratio e	Liquidity Limit ω_L %	Liquidity index I_L	Compression coefficient	Compression modulus	Direct fast shear	
						a 0.1-0.2 (1/MPa)	Es 0.1-0.2 (MPa)	Internal friction angle Φ q (°)	Cohesion Cq (kPa)
Statistics number	10	8	8	10	10	8	8	8	8
Average value	31.77	17.82	1.05	45.17	0.32	0.34	7.00	23.85	70.63
Maximum value	45.9	18.7	1.4	69.1	0.5	0.7	12.9	36.5	137.0
Minimum value	24.5	16.6	0.8	38.4	0.0	0.1	3.0	11.2	38.0
Standard value	35.3	17.8	1.167	45.2	0.40	0.45	4.92	18.6	50.1

Table 3.4-3
Table of Layer Comparison of Sounding and Drilling In Tuff Claystone Totally Weathered
Layer for Retaining Wall

Drilling mileage	Depth (m)	Sounding mileage	Depth (m)	Tip resistance q_c (MPa)
Km. 82+050 left 9.0m	4.0-10.5	Km. 81 + 950 right 5m	8.0-12.0	7.43
Km. 81 + 883	6.2-10.4	Km. 81 + 890 right 9m	6.2-15.1	5.32
Km. 81 + 750	3.5-10.0	Km. 81 + 820 right 5m	5.1-8.1	4.83
Km. 81 + 545 right 5.0m	2.8-4.8	Km. 81 + 679 right 4m	2.7-9.0	3.83
		Km. 81 + 610 left 9m	3.0-7.6	4.05

2.4 Evaluation and Treatment Measures of Unfavorable Geology

This line locates in areas with high earthquake intensity and seismic liquefaction is liable to occur in surface and lower silt, silty, fine and medium sand layer. Treatment measures shall be taken correspondingly. Soft soil with poor bearing capacity is liable to quaked sinking and differential deformation to buildings, which shall be emphasized in design and construction.

2.5 Evaluation and Treatment Measures of Geologic Condition at Guiguinto River Area, Soft Soil Subgrade at Km.51+345.68 to Km.63+545.15

This section is divided into two sections by Guiguinto River. It is in North Luzon Alluvial Plain, which is flat in landform. There are plenty of buildings along the line. The surface is constituted with artificial accumulation layer of Holocene (Q_4^{ml}), the lower layer is constituted with sludge, puddled soil, clay, silty clay, silt, fine sand, medium sand, fine round gravel in alluvium deposit and marine accumulation (Q_4^{al+tm}) layer of Holocene. The bottom layer is constituted with tuff claystone,

tuff silt sandstone, tuff sandstone of volcanic deposit of upper and mid Pleistocene (Q_{2-3}^{vl}), totally weathered~strongly weathered.

Main physical mechanical indexes (Direct fast shear) of soft soil layer are:

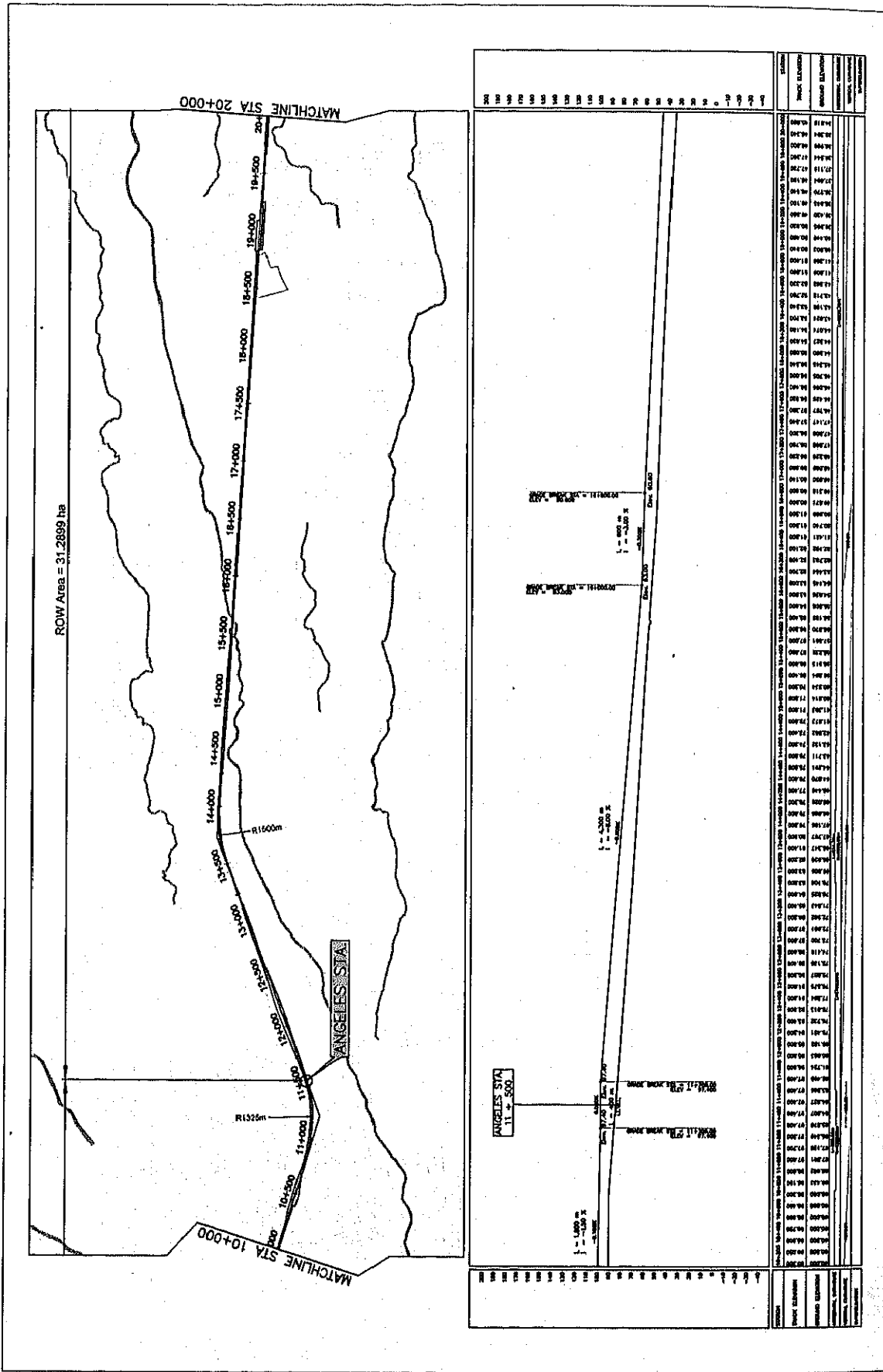
Sludge: $\gamma = 15.5 \text{ kN/m}^3$; $C = 14.7 \sim 16.3 \text{ kPa}$; $\phi = 3.1^\circ \sim 5.5^\circ$;

Puddled Clay: $\gamma = 17.5 \text{ kN/m}^3$; $C = 23 \text{ kPa}$; $\phi = 4.7^\circ$;

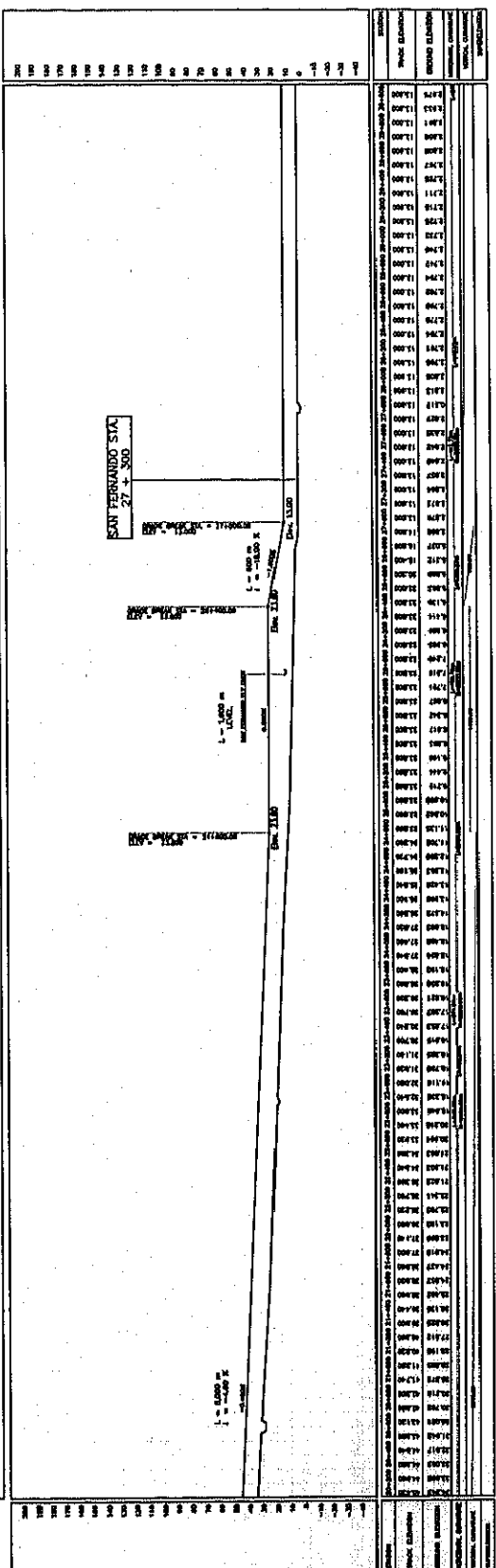
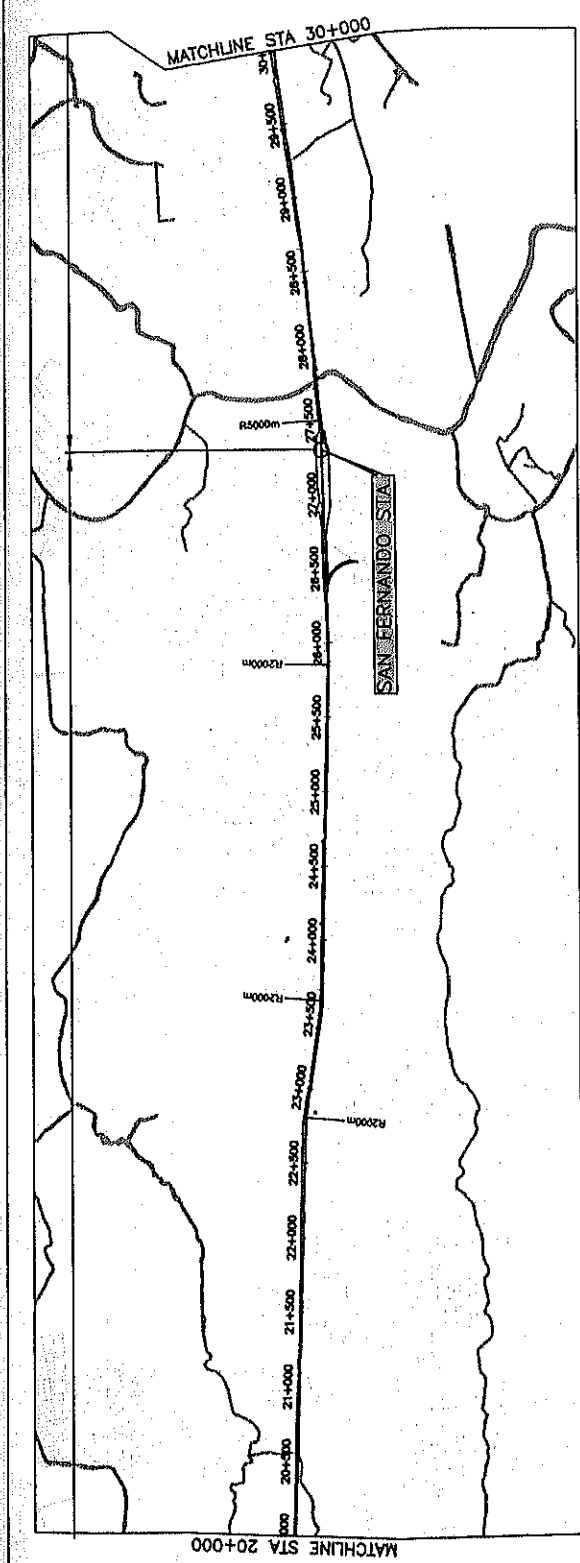
Puddled Silty Clay: $\gamma = 15.5 \sim 17.8 \text{ kN/m}^3$; $C = 17.3 \sim 41.8 \text{ kPa}$; $\phi = 5.2^\circ \sim 12.8^\circ$

Soft soil with poor engineering property is liable to quaked sinking and shall be treated. There is artificial soil in the site and miscellaneous soil is mainly constituted with construction rubbish and domestic garbage and need to be treated.

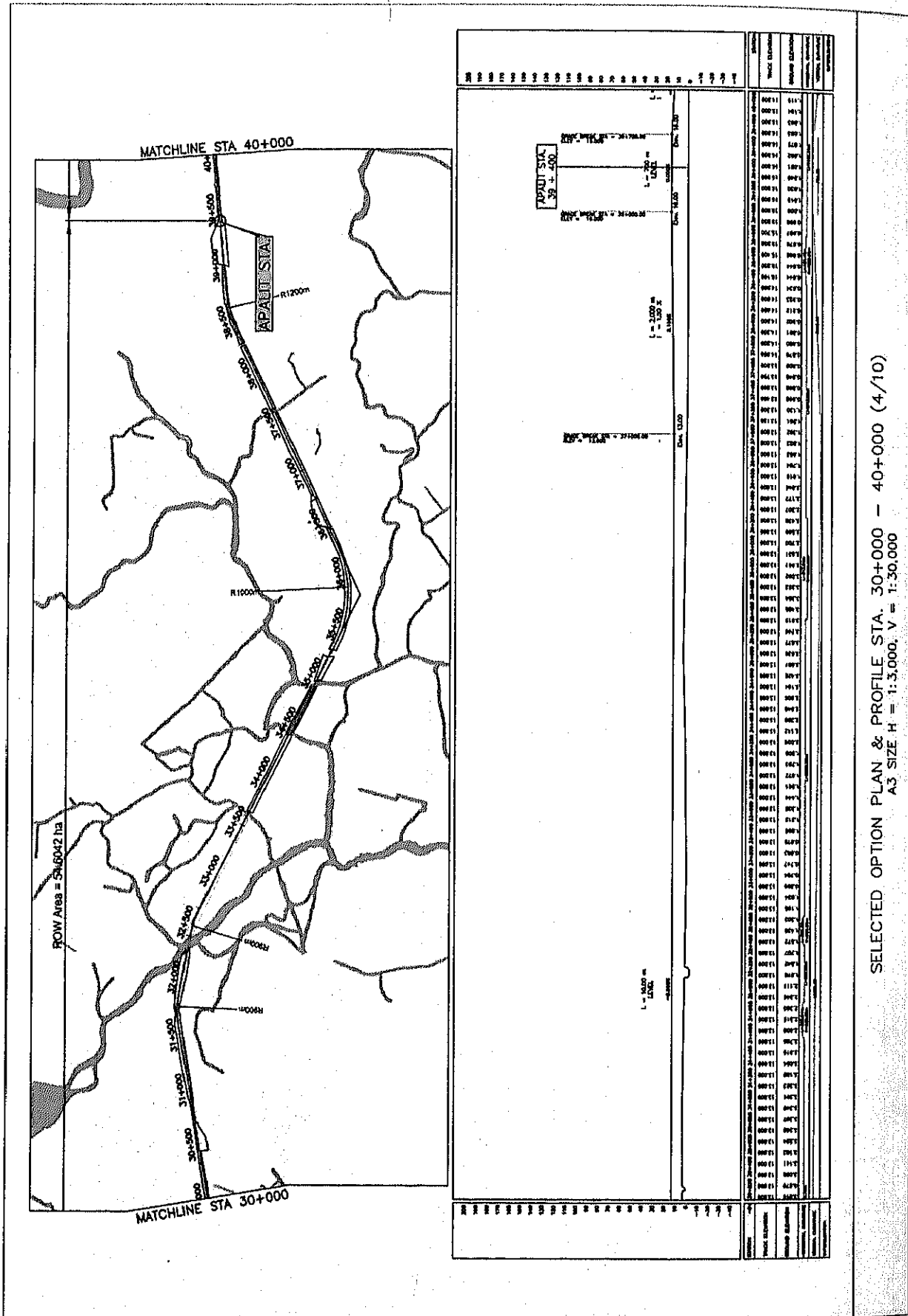
The seismic peak ground acceleration of this section is $\geq 0.4g$ (earthquake basic intensity $\geq IX$). Seismic liquefaction is liable to occur in surface and lower silt, silty, fine and medium sand layer. Treatment measures shall be taken correspondingly.



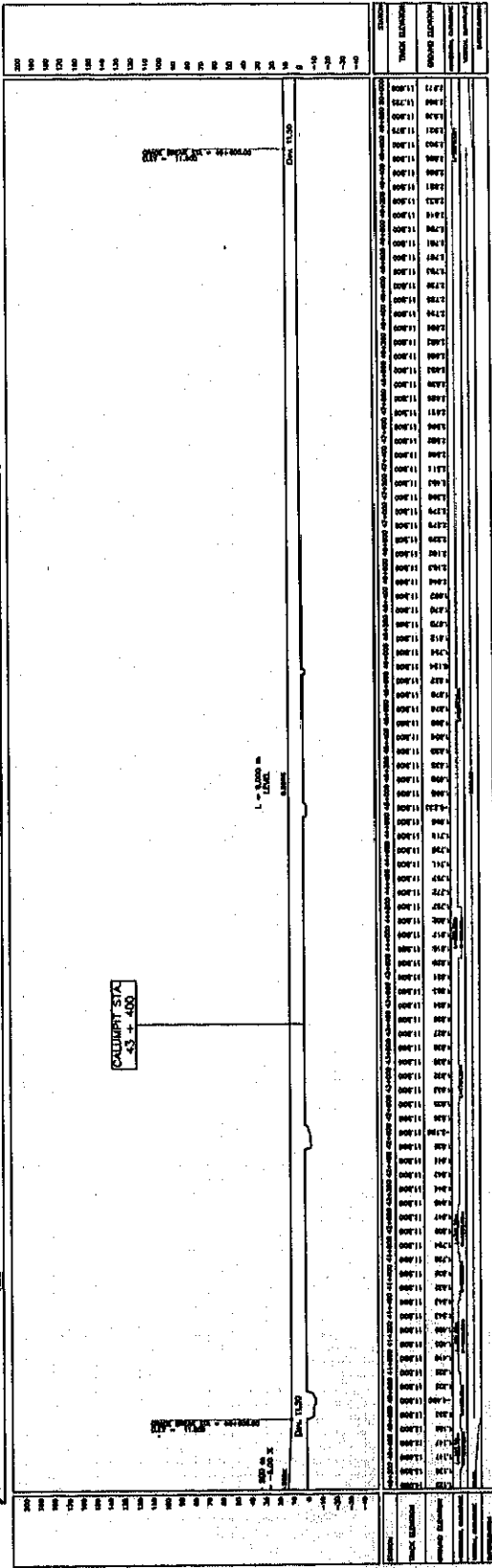
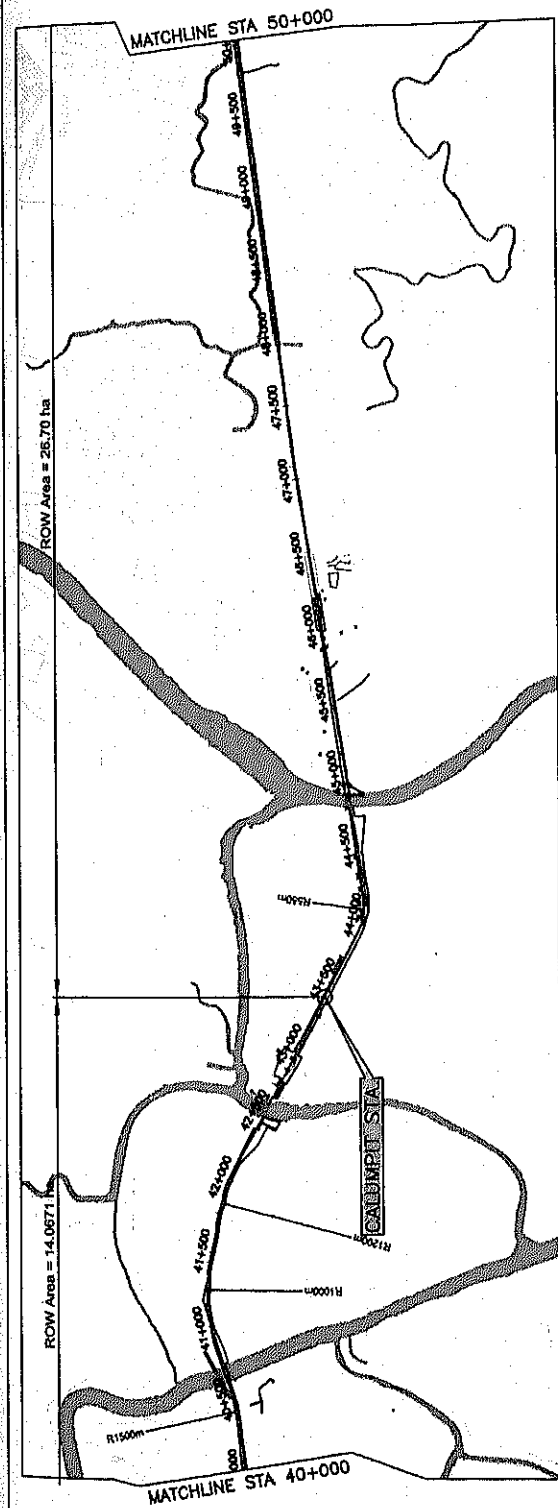
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 A3 SIZE H = 1:3,000, V = 1:50,000



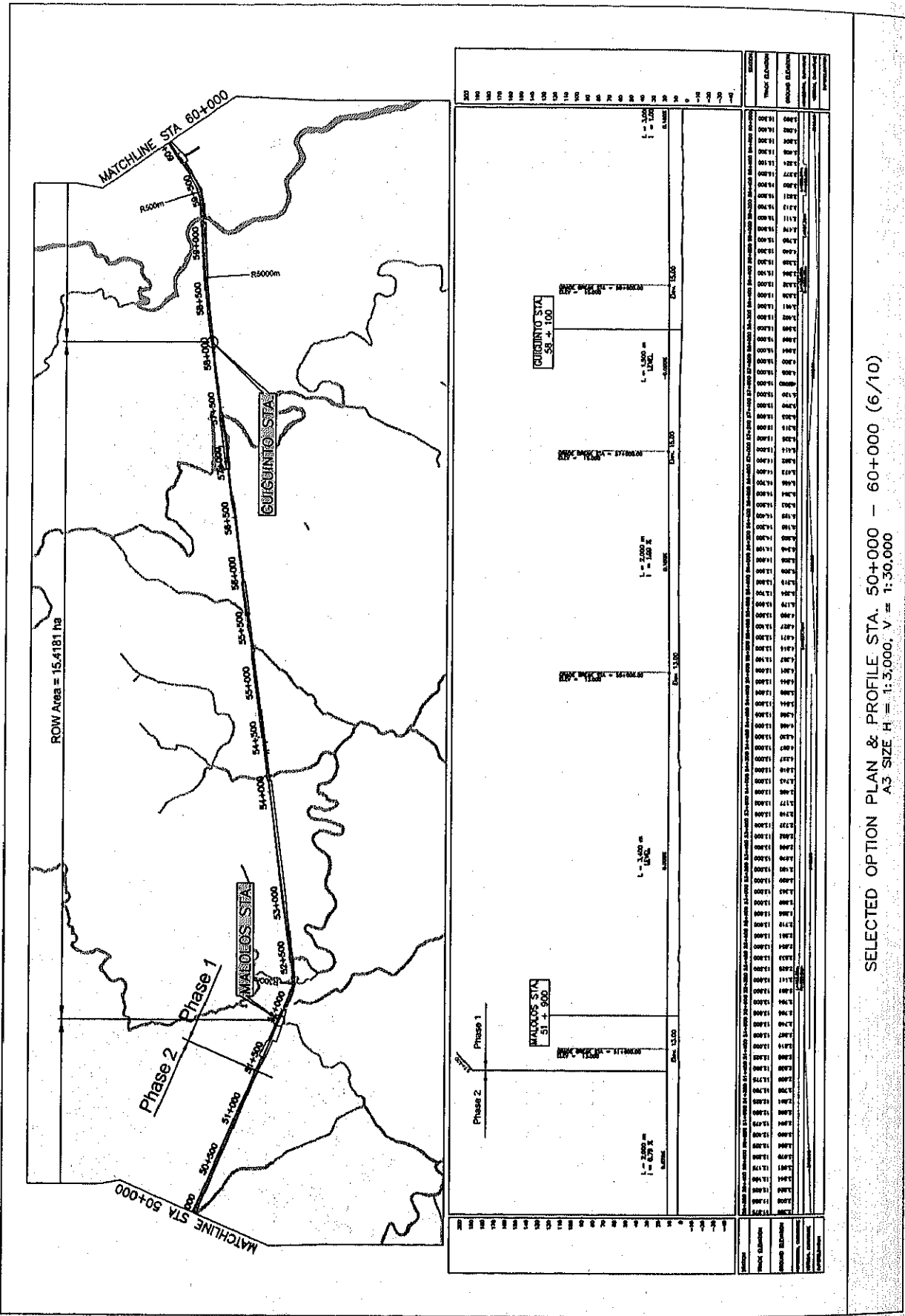
SELECTED OPTION PLAN & PROFILE STA. 20+000 - 30+000 (3/10)
 A3 SIZE H = 1:3,000, V = 1:30,000



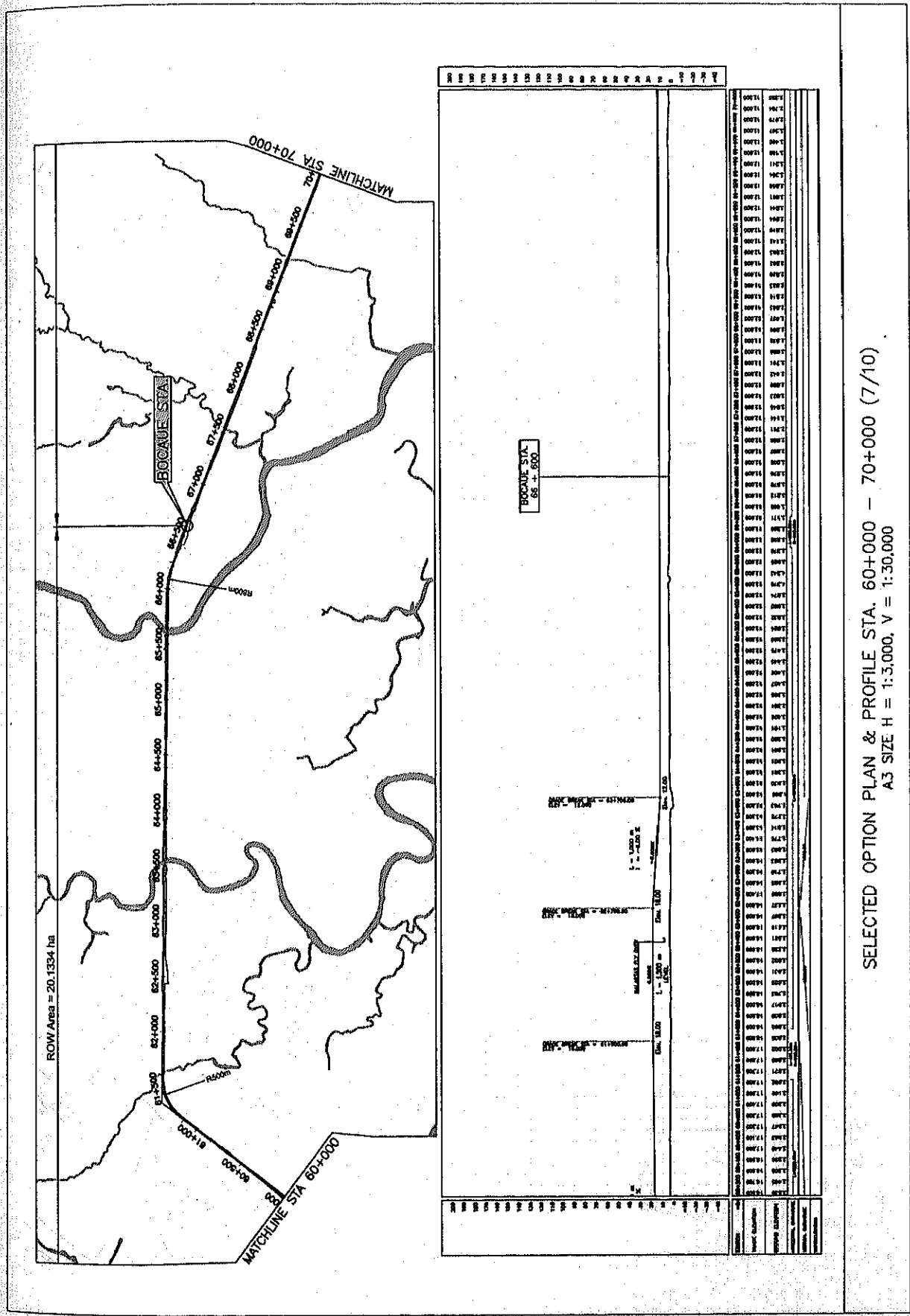
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 AS SIZE H = 1:3,000, V = 1:30,000



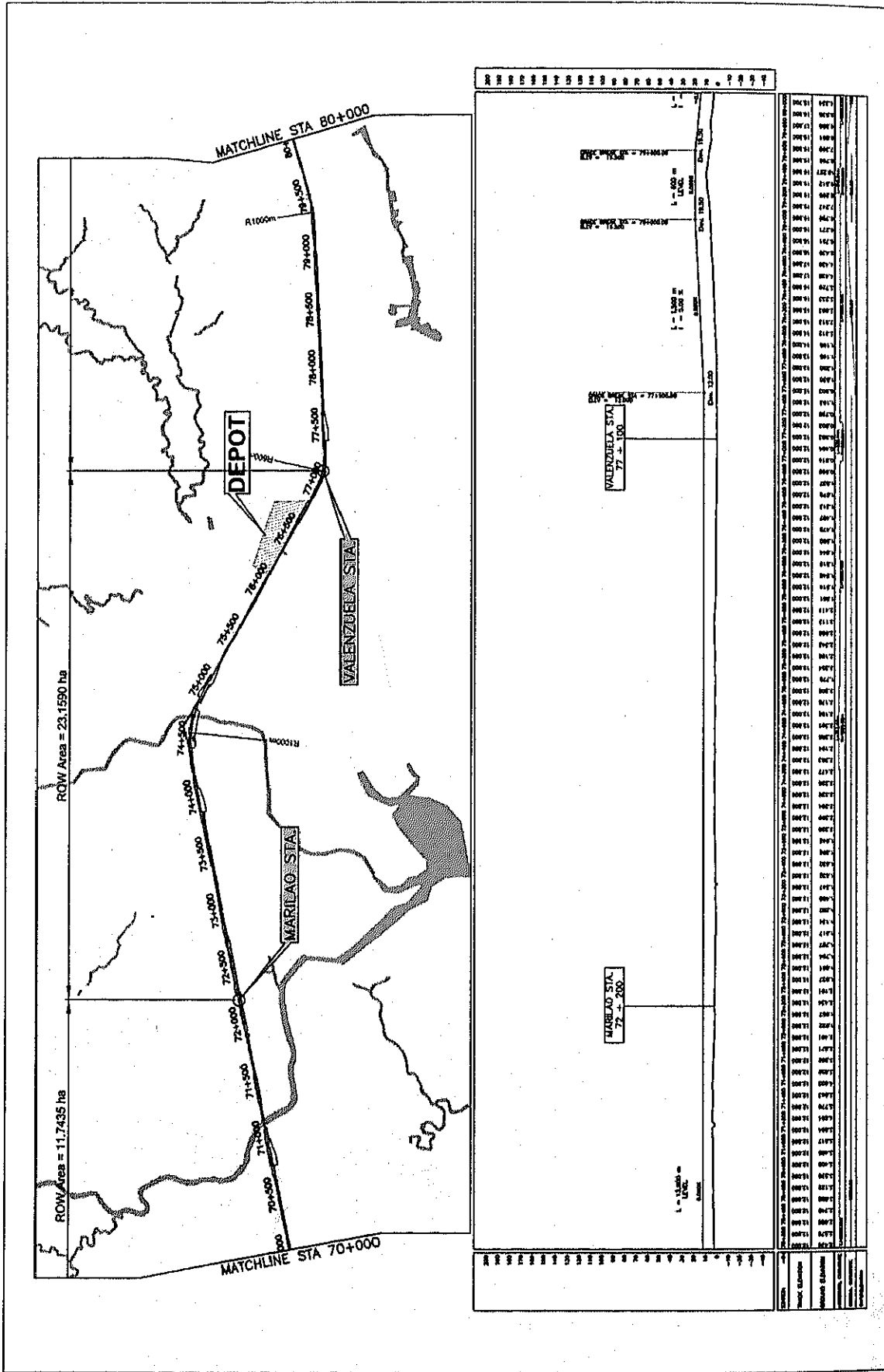
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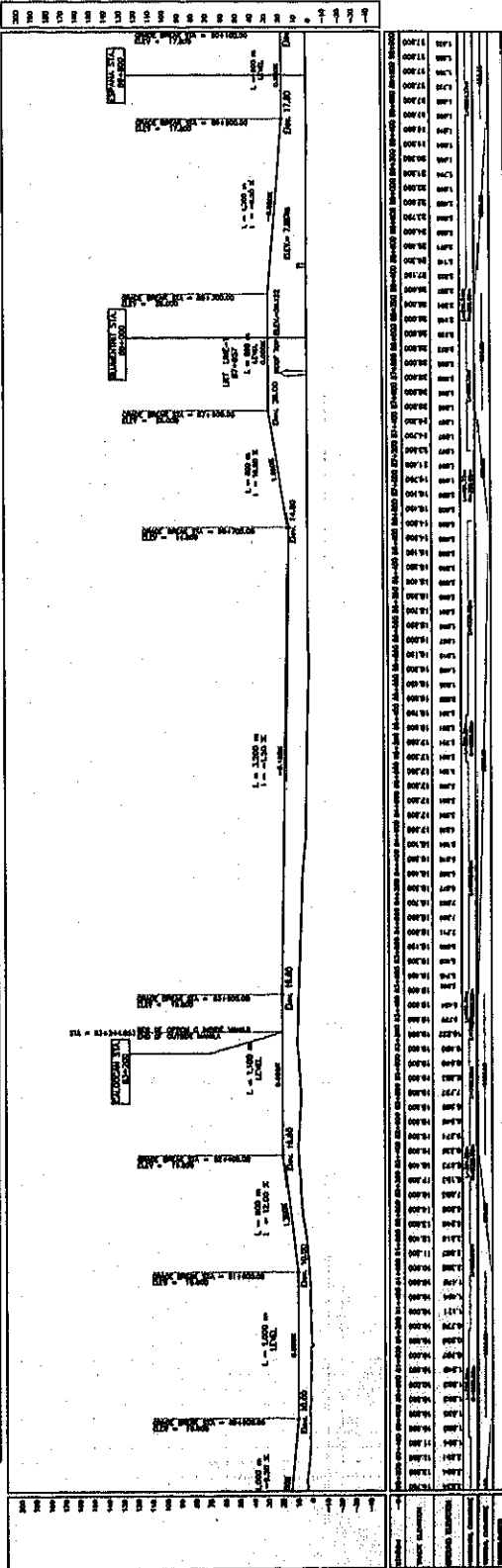
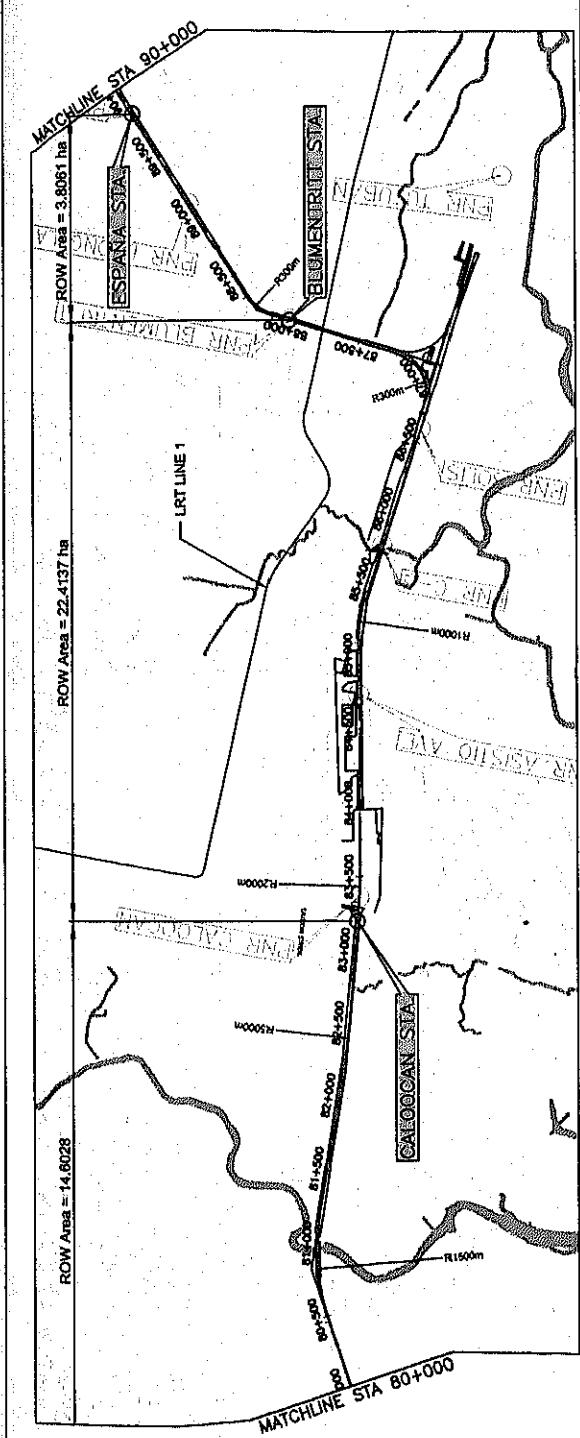
SELECTED OPTION PLAN & PROFILE STA. 50+000 - 60+000 (6/10)
 A3 SIZE H = 1:3,000; V = 1:30,000



SELECTED OPTION PLAN & PROFILE STA. 60+000 - 70+000 (7/10)
 A3 SIZE H = 1:3,000, V = 1:30,000



SELECTED OPTION PLAN & PROFILE STA. 70+000 - 80+000 (8/10)
 A3 SIZE H = 1:3,000, V = 1:30,000



SELECTED OPTION PLAN & PROFILE STA. 80+000 - 90+000 (9/10)
 A3 SIZE H = 1:3,000, V = 1:30,000

