

3-47

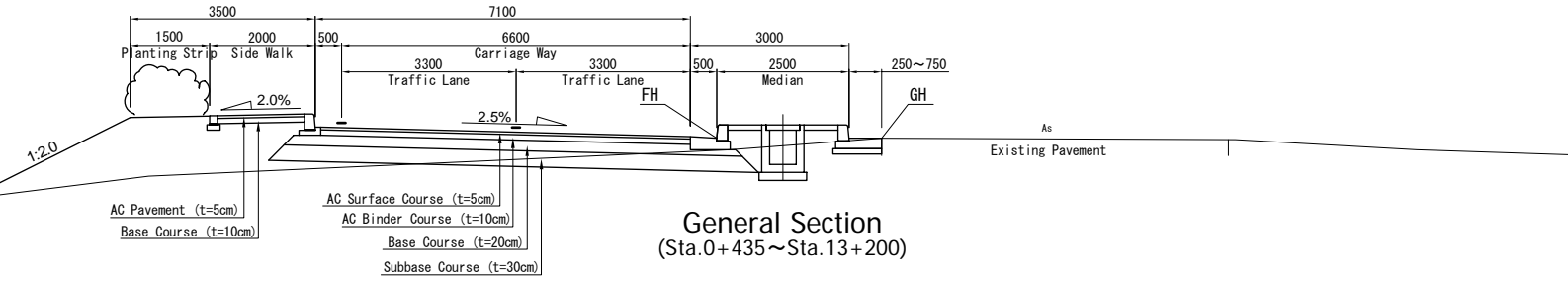
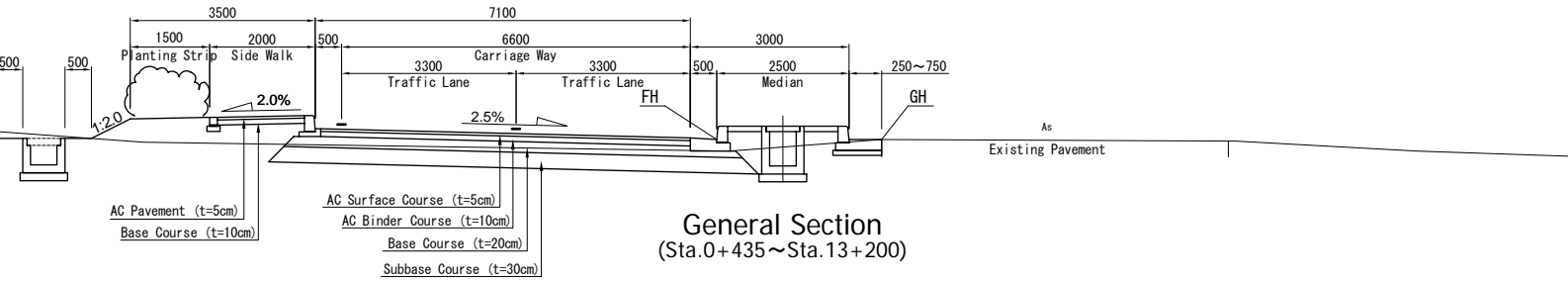
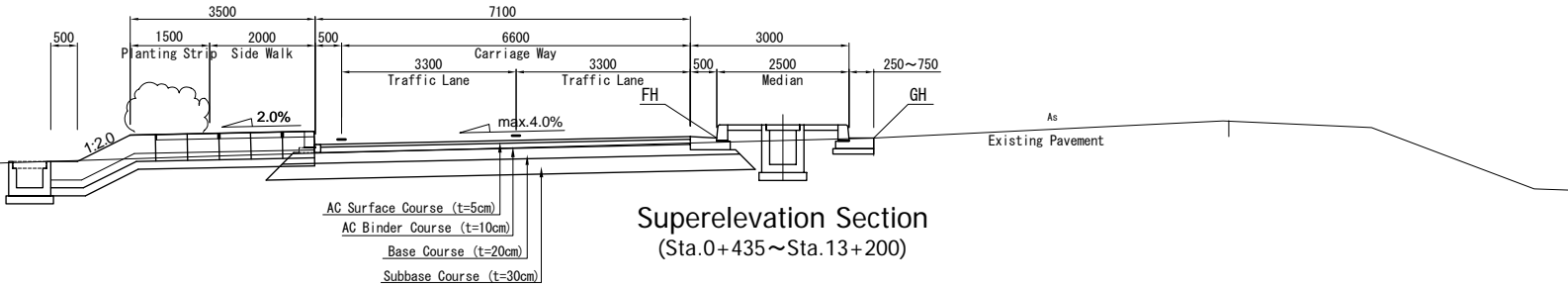
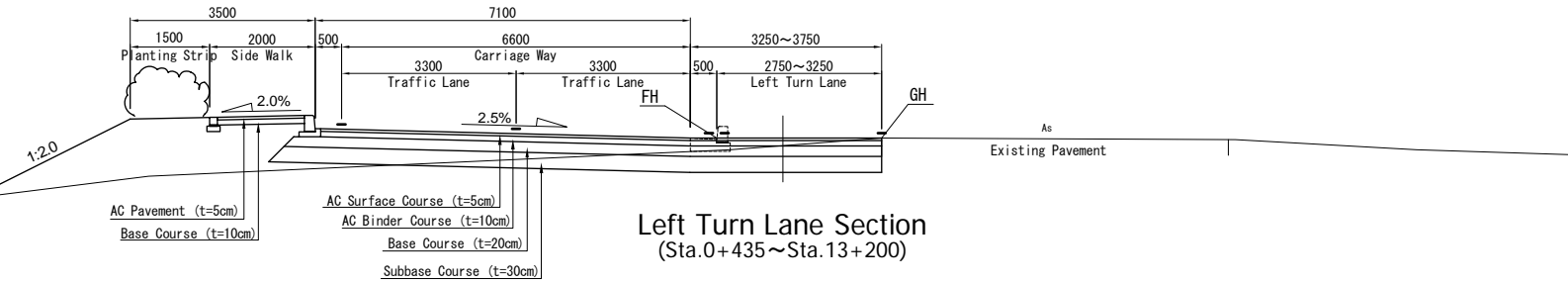
MINISTRY OF PUBLIC WORKS

JAPAN INTERNATIONAL  
COOPERATION AGENCY  
KATAHIRA & ENGINEERS INTERNATIONAL  
YACHIYO ENGINEERING CO.,LTD.

THE PREPARATORY SURVEY ON  
THE PROJECT FOR  
RECONSTRUCTION OF  
SOMALIA DRIVE IN MONROVIA

TITLE :  
TYPICAL CROSS SECTION (1)  
(Sta.0+12.500~Sta.0+400)

Drawing No.	TC-1
SCALE	A1:1/ 50 A3:1/100
DATE	SEP. 2012



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YACHIYO ENGINEERING CO.,LTD.

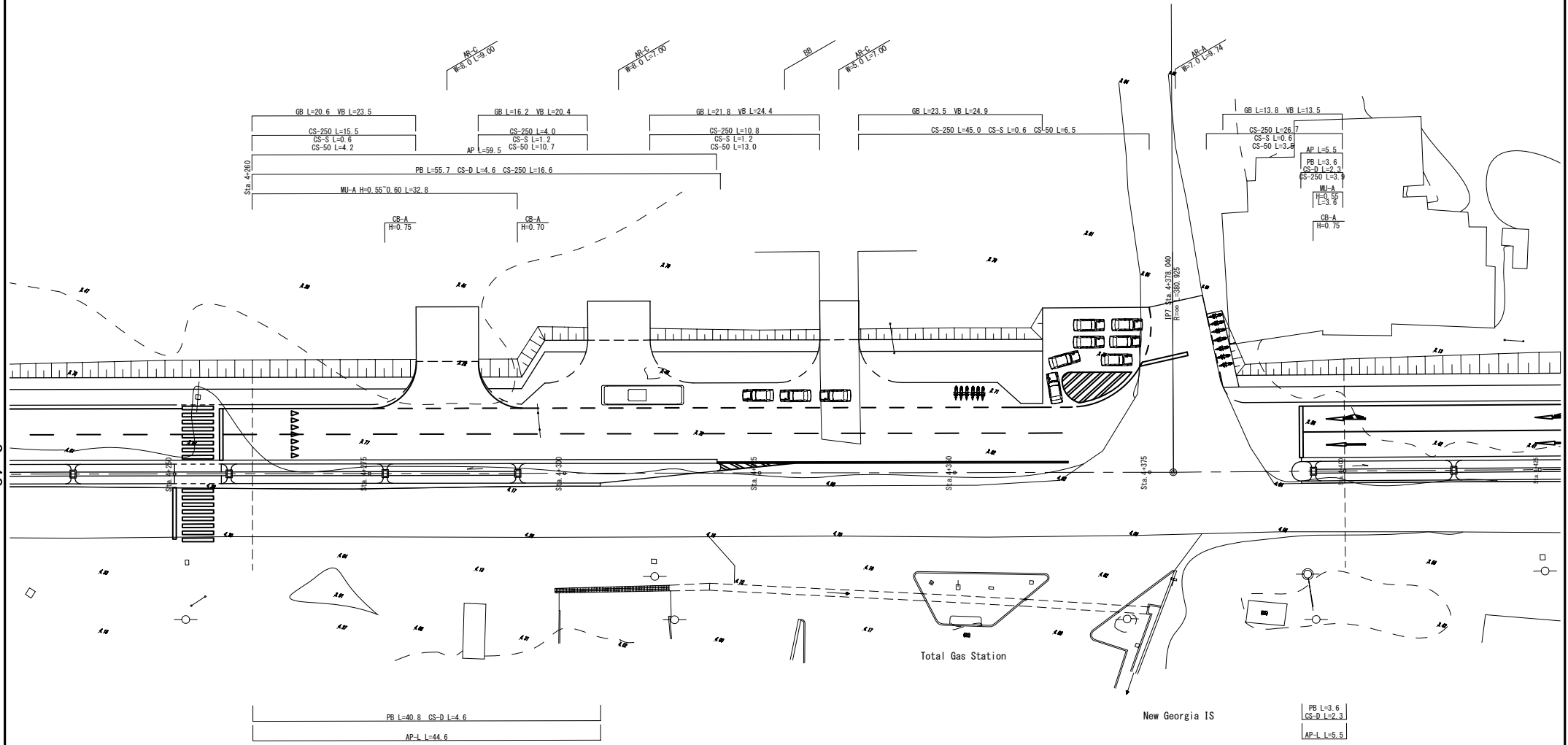
THE PREPARATORY SURVEY ON  
THE PROJECT FOR  
RECONSTRUCTION OF  
SOMALIA DRIVE IN MONROVIA

TITLE :  
TYPICAL CROSS SECTION (2)  
(2LANE:Sta.0+400~Sta.13+200)

Drawing No.	TC-2
SCALE	A1:1/ 50 A3:1/100
DATE	SEP. 2012



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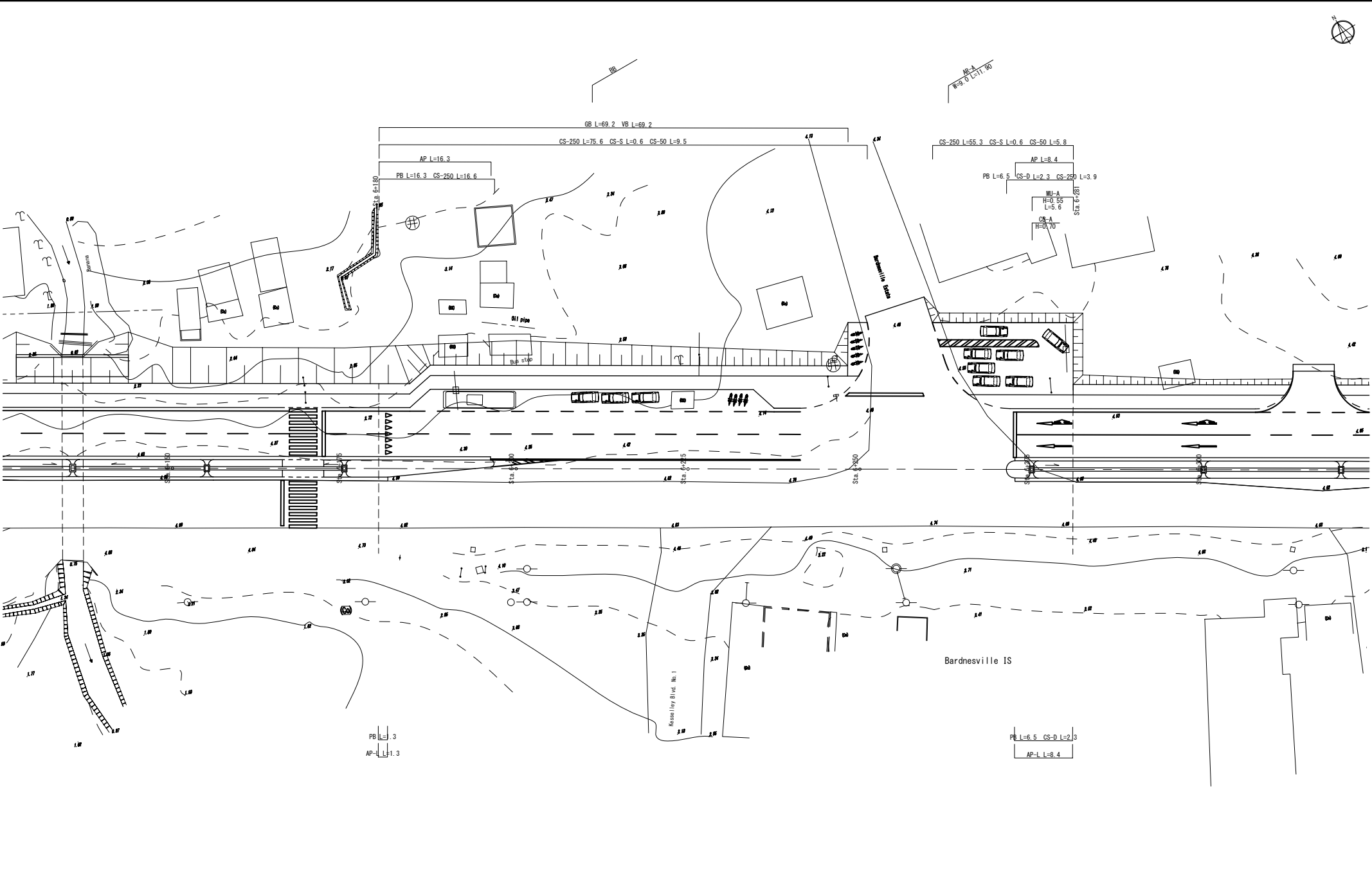
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YACHIYO ENGINEERING CO.,LTD.

THE PREPARATORY SURVEY ON  
THE PROJECT FOR  
RECONSTRUCTION OF  
SOMALIA DRIVE IN MONROVIA

TITLE :  
PLAN OF INTERSECTION DRAWING  
(NEW GEORGIA I.S.)

Drawing No.	IS-1
SCALE	A1:1/250 A3:1/500
DATE	SEP. 2012



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KATAHIRA & ENGINEERS INTERNATIONAL  
YACHIYO ENGINEERING CO.,LTD.

THE PREPARATORY SURVEY ON  
THE PROJECT FOR  
RECONSTRUCTION OF  
SOMALIA DRIVE IN MONROVIA

TITLE :  
PLAN OF INTERSECTION DRAWING  
(BARDNESVILLE I.S.)

Drawing No.	IS-2
SCALE	A1:1/250 A3:1/500
DATE	SEP. 2012



AB-0  
W.E. 0 L=10.00

BB

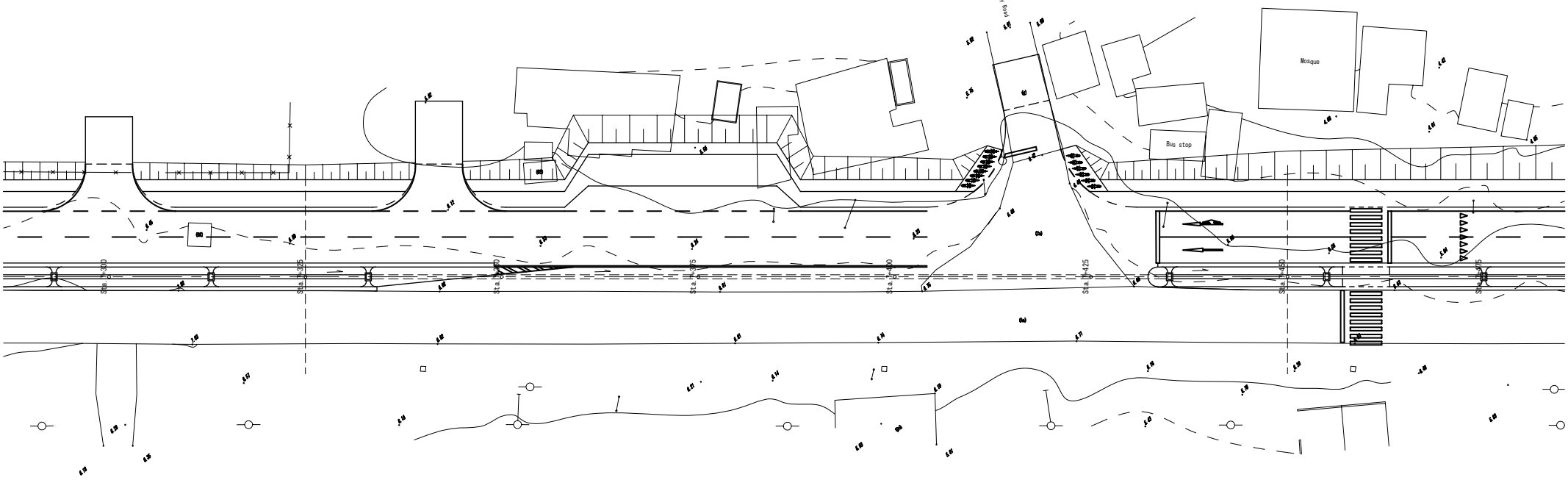
AB-1  
W.E. 0 L=10.70

GB L=13.6 VB L=16.5  
 CS-250 L=8.5 CS-S L=0.6  
 CS-50 L=4.2  
 AP L=24.1  
 PR L=22.2 CS-D L=2.3 CS-250 L=16.6  
 MJ-A H=0.55 L=7.6  
 CS-A  
 H=1.15

GB L=68.5 VB L=70.4  
 CS-250 L=67.2 CS-S L=1.2 CS-50 L=10.1  
 RC500-360 L=101.2

GB L=23.9 VB L=22.8  
 CS-250 L=30.7 CS-S L=0.6 CS-50 L=5.8  
 AP L=16.5  
 PR L=14.6 CS-D L=2.3 CS-250 L=3.9  
 MJ-B H=0.97 L=14.6  
 CS-A  
 H=1.15

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Chicken Soup IS

PR L=7.2 CS-D L=2.3  
 AP-L L=9.1

PR L=14.6 CS-D L=2.3  
 AP-L L=16.5

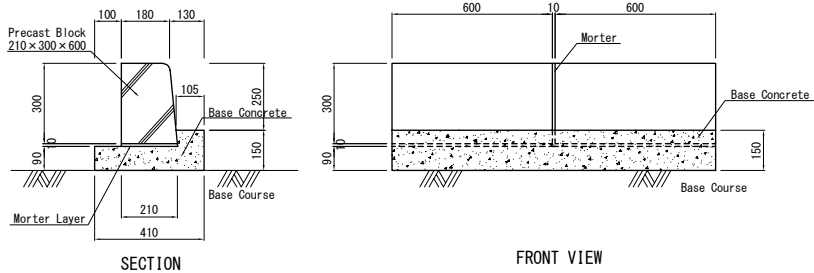
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 COOPERATION AGENCY  
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 YACHIYO ENGINEERING CO.,LTD.

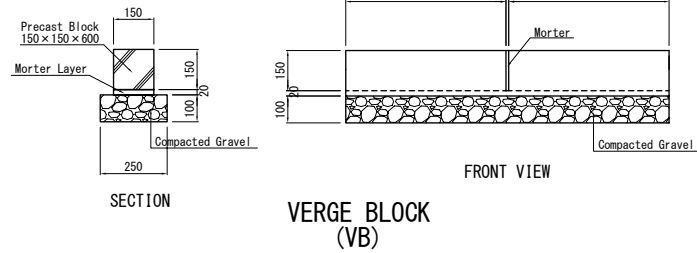
THE PREPARATORY SURVEY ON  
 THE PROJECT FOR  
 RECONSTRUCTION OF  
 SOMALIA DRIVE IN MONROVIA

TITLE :  
 PLAN OF INTERSECTION DRAWING  
 (CHICKEN SOUP I.S.)

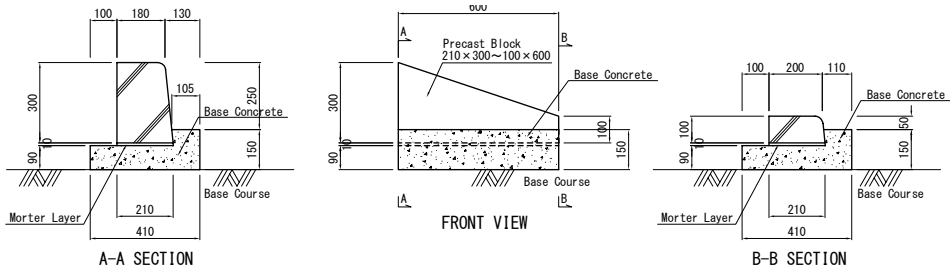
Drawing No.	IS-3
SCALE	A1:1/250 A3:1/500
DATE	SEP. 2012



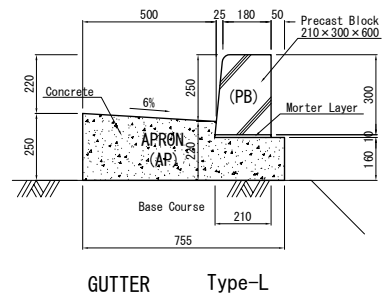
CURB STONE FOR SIDE WALK OR MEDIAN (CS-250)



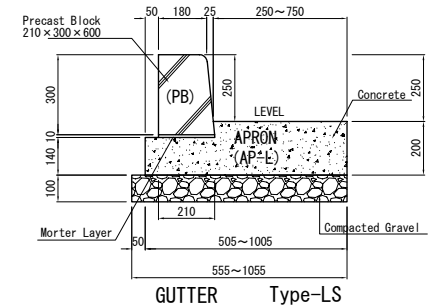
VERGE BLOCK (VB)



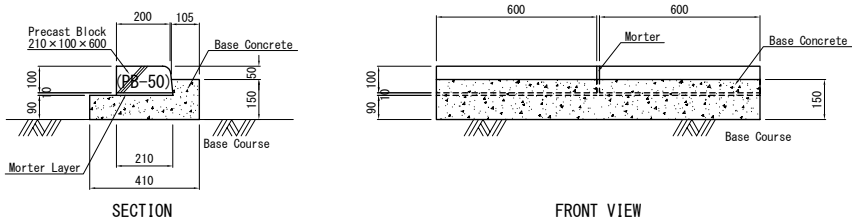
CURB STONE FOR SIDE WALK (CS-S)



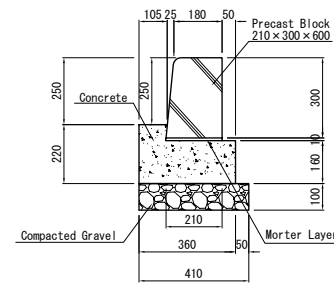
GUTTER Type-L



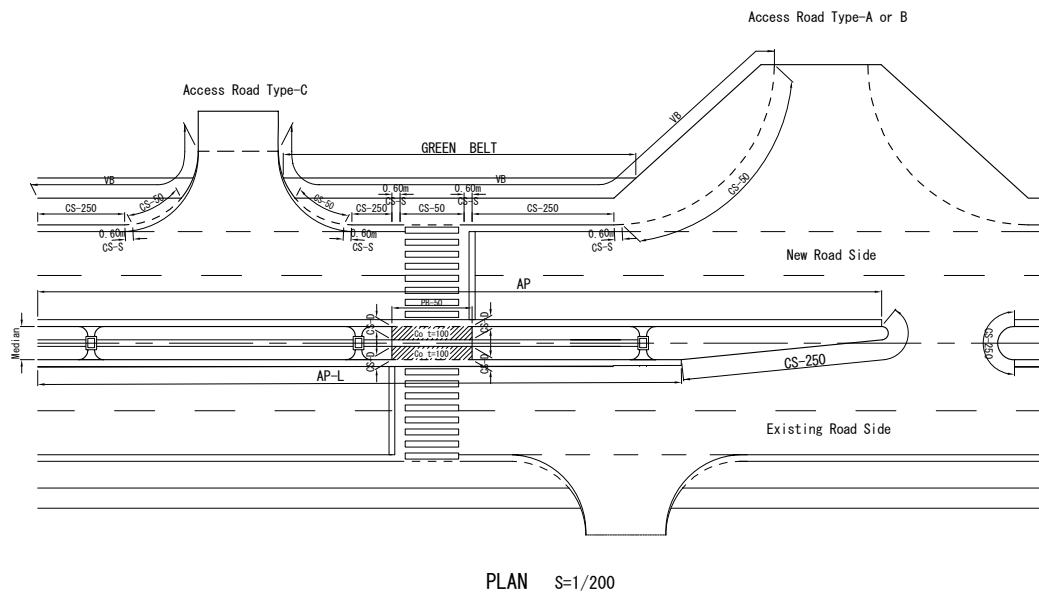
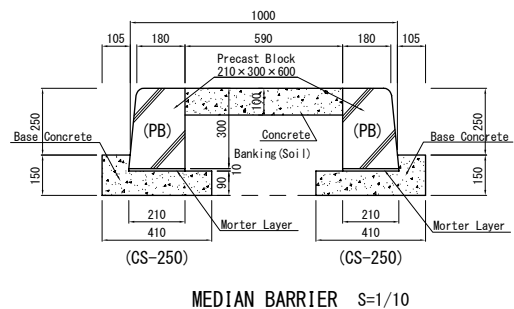
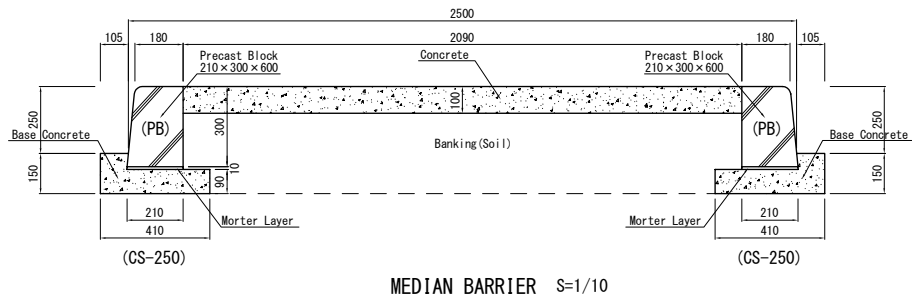
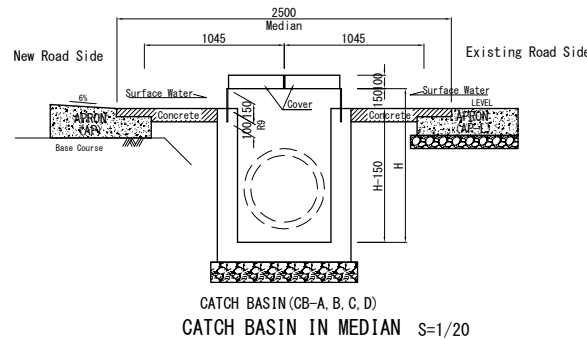
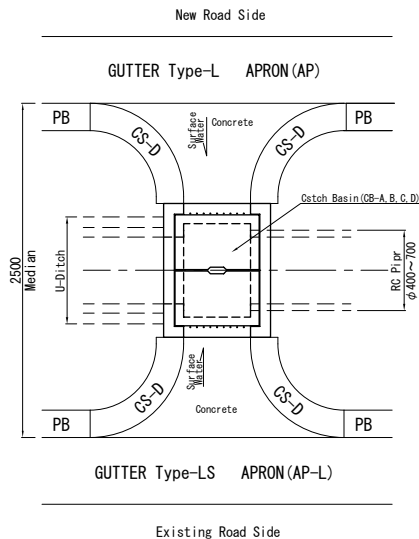
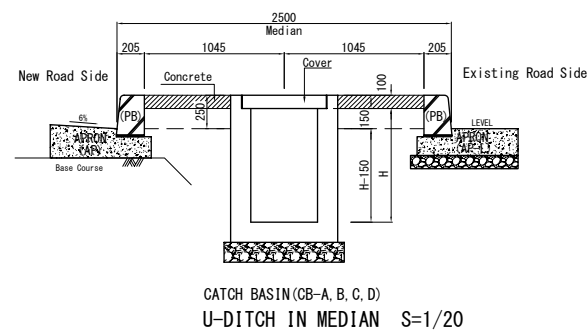
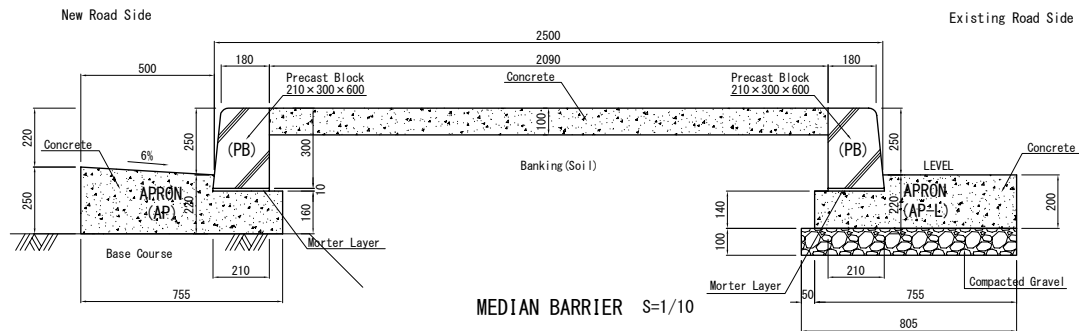
GUTTER Type-LS



CURB STONE FOR SIDE WALK OR CROSS WALK (CS-50)

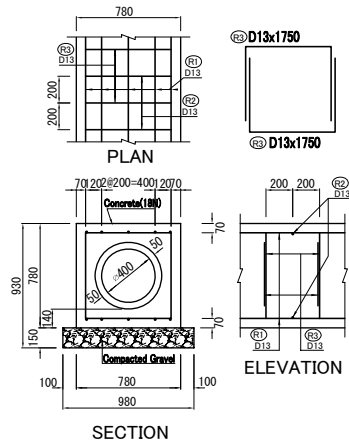


CURB STONE FOR CATCH BASIN OR CROSS WALK IN MEDIAN (CS-D)

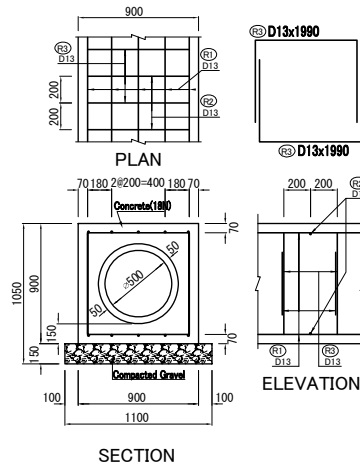




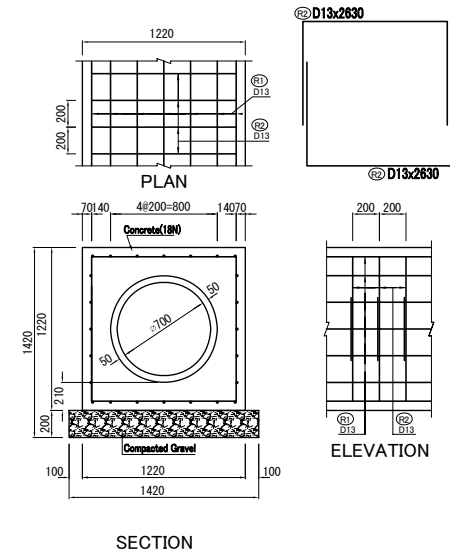




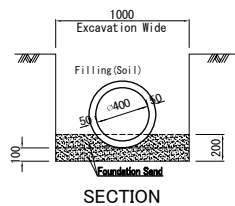
RC PIPE  $\phi$  400(Co.360° Base)  
(RC400-360)



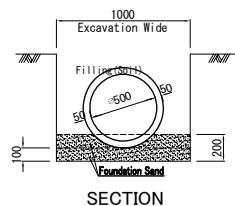
RC PIPE  $\phi$  500(Co.360° Base)  
(RC500-360)



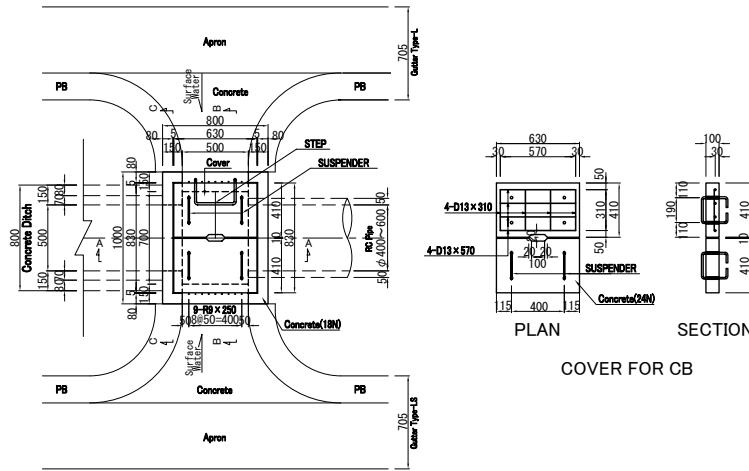
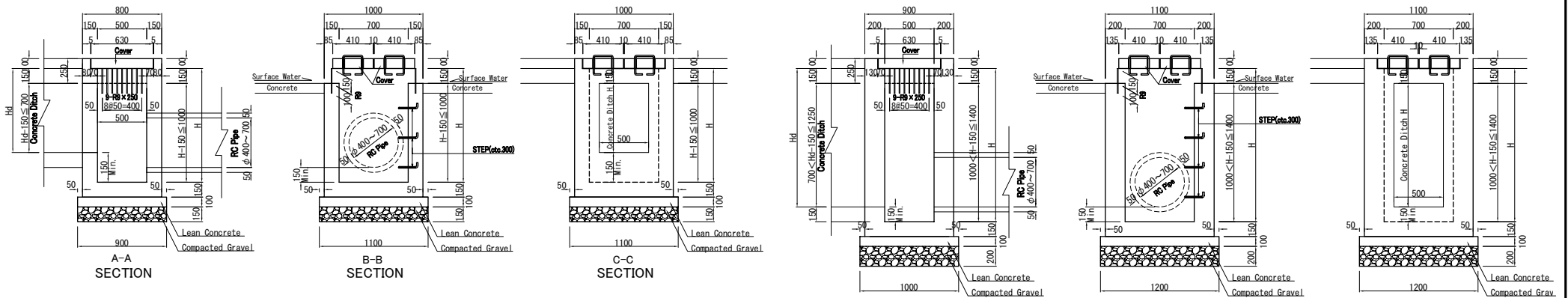
RC PIPE  $\phi$  700(Co.360° Base)  
(RC700-360)



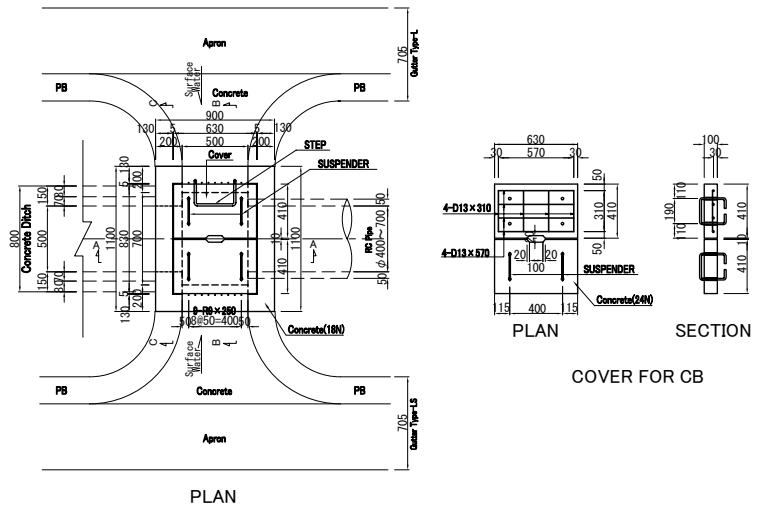
RC PIPE  $\phi$  400(Sand Base)  
(RC400-SB)



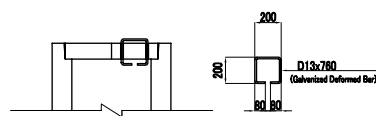
RC PIPE  $\phi$  500(Sand Base)  
(RC500-SB)



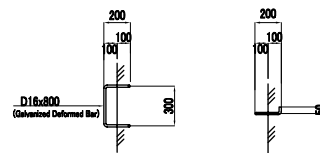
CATCH BASIN( $H \leq 1150$ )  
(CB-A)



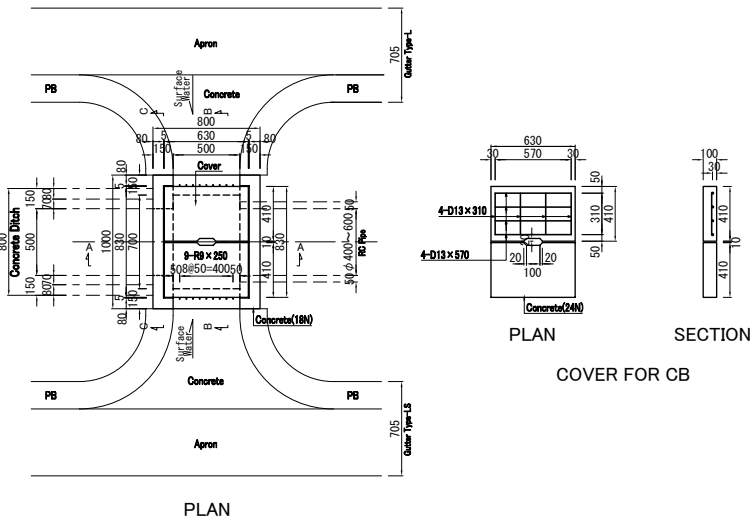
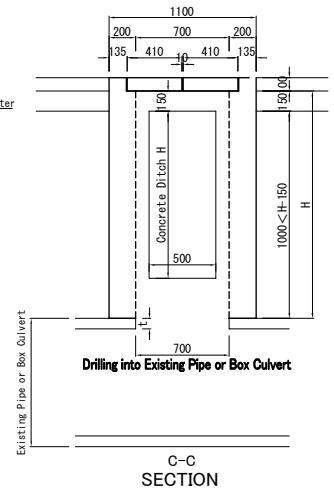
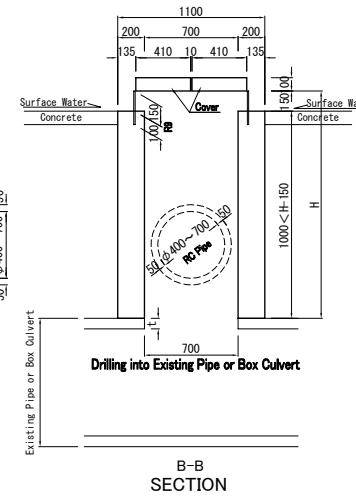
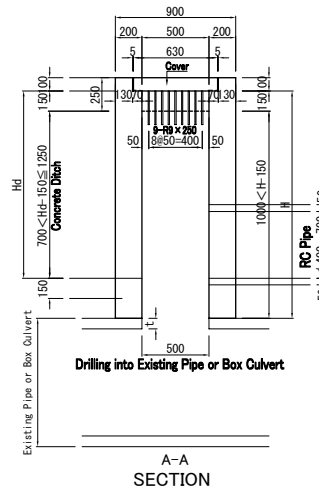
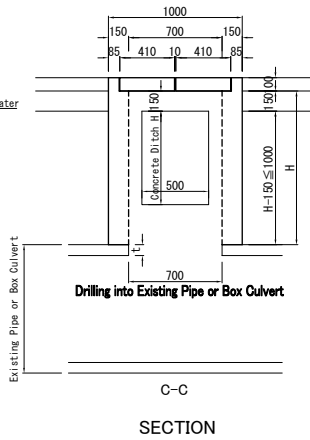
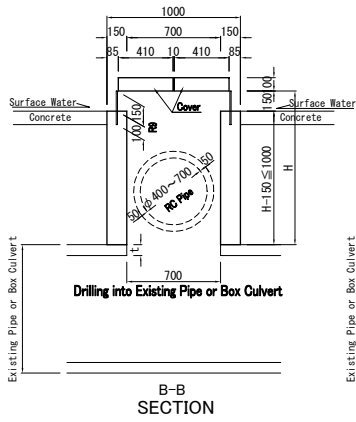
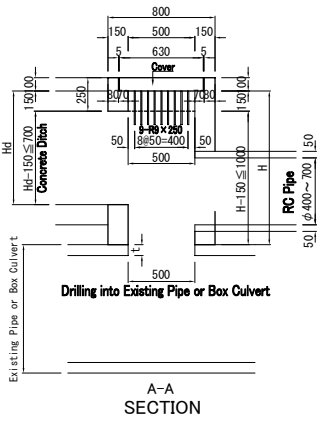
CATCH BASIN( $1150 < H \leq 1550$ )  
(CB-B)



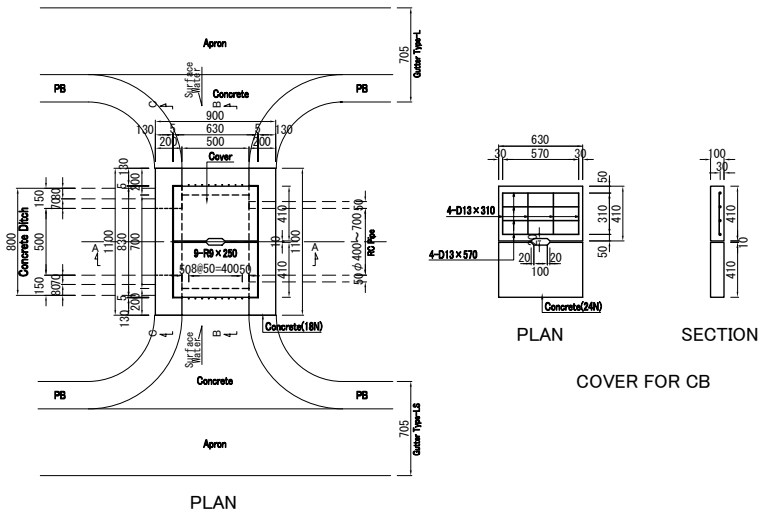
DETAIL OF SUSPENDER



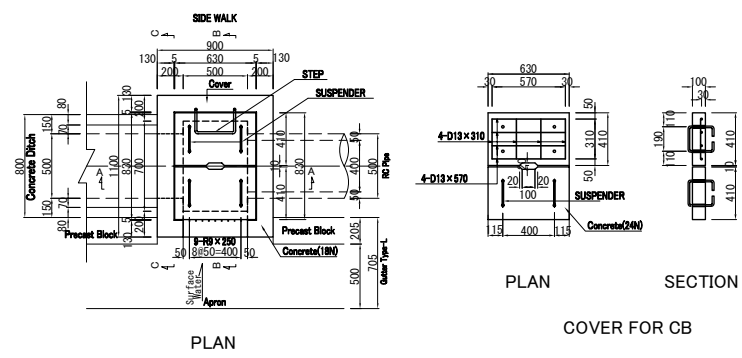
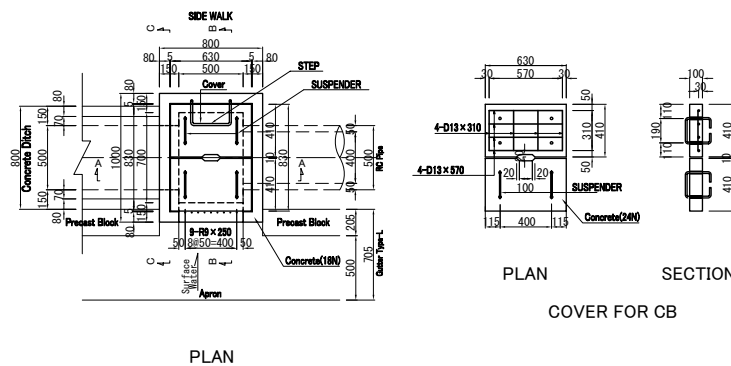
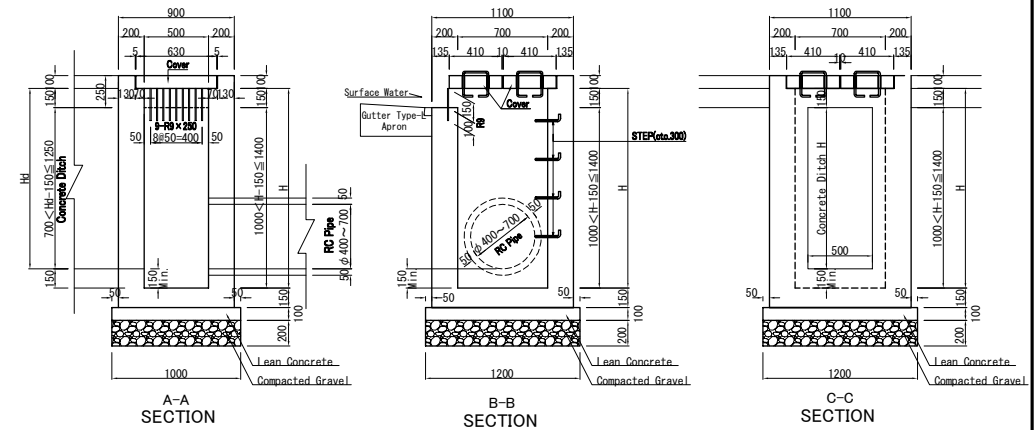
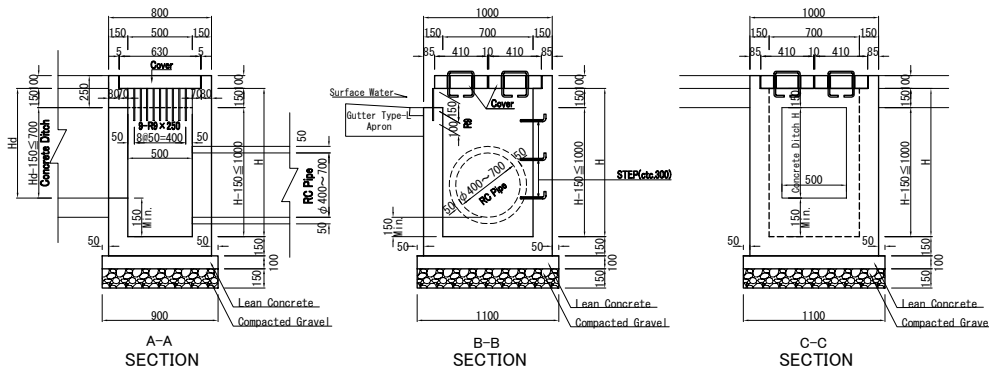
DETAIL OF STEP



CATCH BASIN( $H \leq 1150$ )  
(CB-C)



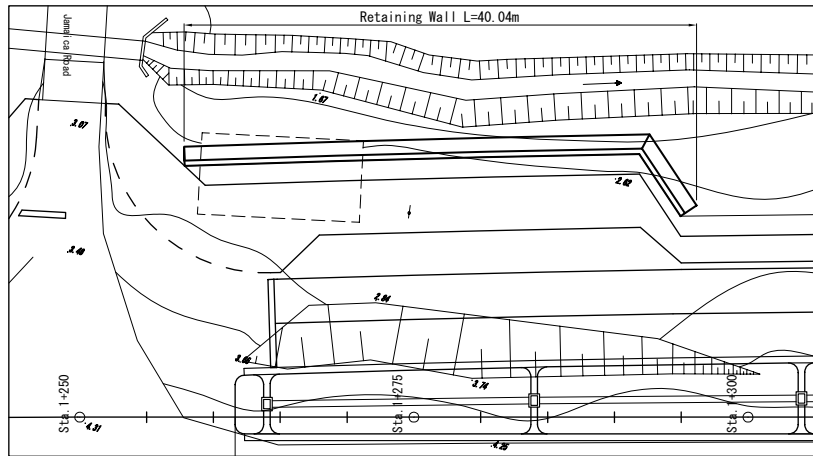
CATCH BASIN( $1150 < H$ )  
(CB-D)



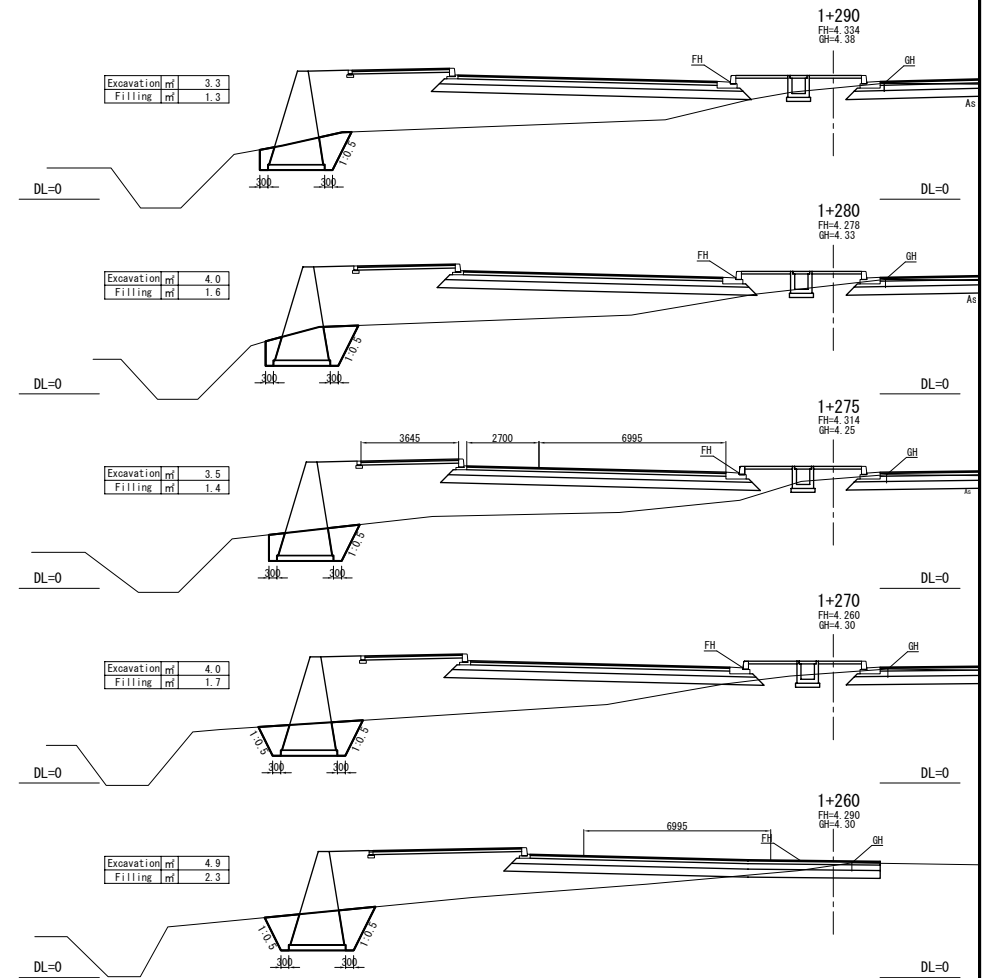
CATCH BASIN( $H \leq 1150$ )  
(CB-E)

CATCH BASIN( $1150 < H \leq 1550$ )  
(CB-F)

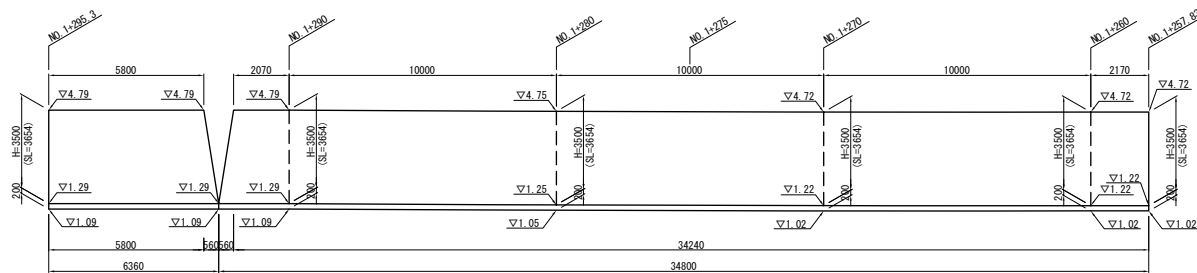
MINISTRY OF PUBLIC WORKS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL YACHIYO ENGINEERING CO.,LTD.	THE PREPARATORY SURVEY ON THE PROJECT FOR RECONSTRUCTION OF SOMALIA DRIVE IN MONROVIA	TITLE :	Drawing No.	DS-5
			DRAINAGE STRUCTURES	SCALE	1/20
				DATE	SEP. 2012



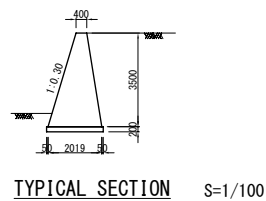
PLAN S=1/200



EARTHWORK PLANNING S=1/100



DEVELOPMENT VIEW S=1/100



TYPICAL SECTION S=1/100

RETAINING WALL (RW)

MINISTRY OF PUBLIC WORKS

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KATAHIRA & ENGINEERS INTERNATIONAL  
YACHIYO ENGINEERING CO.,LTD.

THE PREPARATORY SURVEY ON  
THE PROJECT FOR  
RECONSTRUCTION OF  
SOMALIA DRIVE IN MONROVIA

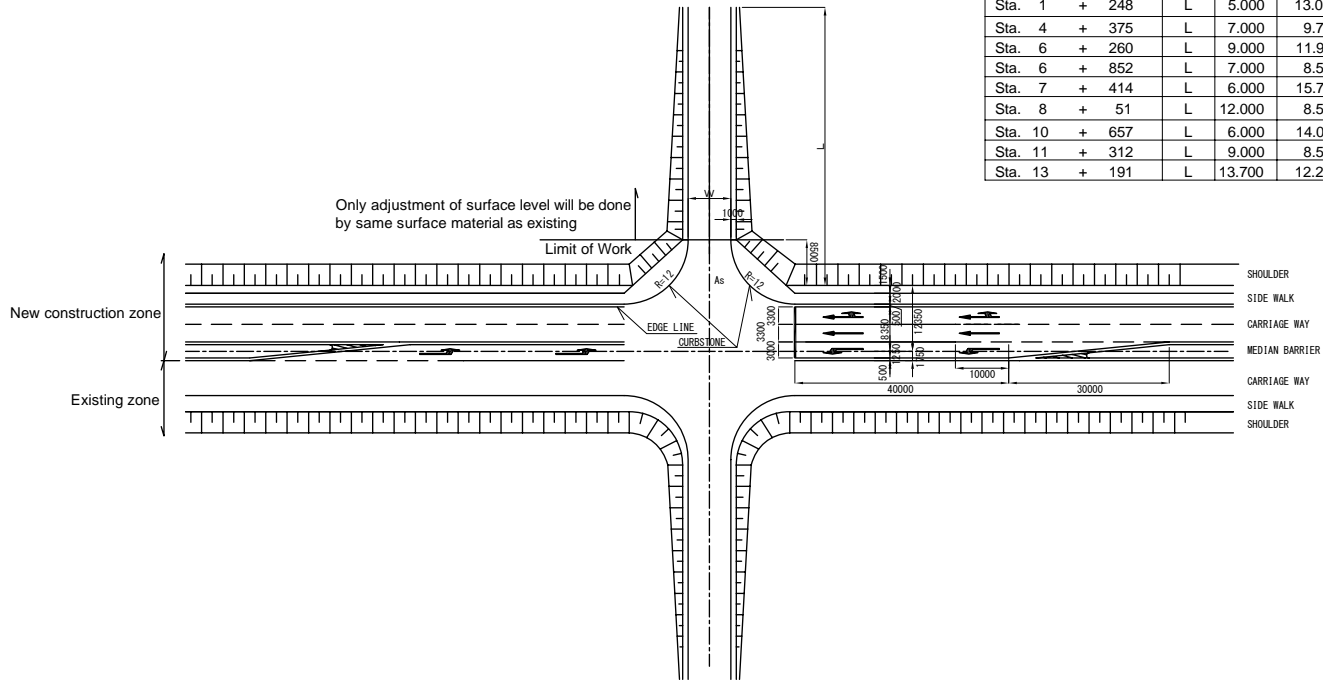
TITLE :  
RETAINING WALL  
(STA. 1+257.844-STA. 1+294.944)

Drawing No.	RW-1
SCALE	As Shown
DATE	SEP. 2012

TYPE-A S=1/1000

INTERSECTION TYPE-A

TYPE-A		( m )	
Station	L or R	W	L
Sta. 1 + 248	L	5.000	13.000
Sta. 4 + 375	L	7.000	9.740
Sta. 6 + 260	L	9.000	11.900
Sta. 6 + 852	L	7.000	8.500
Sta. 7 + 414	L	6.000	15.700
Sta. 8 + 51	L	12.000	8.500
Sta. 10 + 657	L	6.000	14.080
Sta. 11 + 312	L	9.000	8.500
Sta. 13 + 191	L	13.700	12.200



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THE PREPARATORY SURVEY ON  
THE PROJECT FOR  
RECONSTRUCTION OF  
SOMALIA DRIVE IN MONROVIA

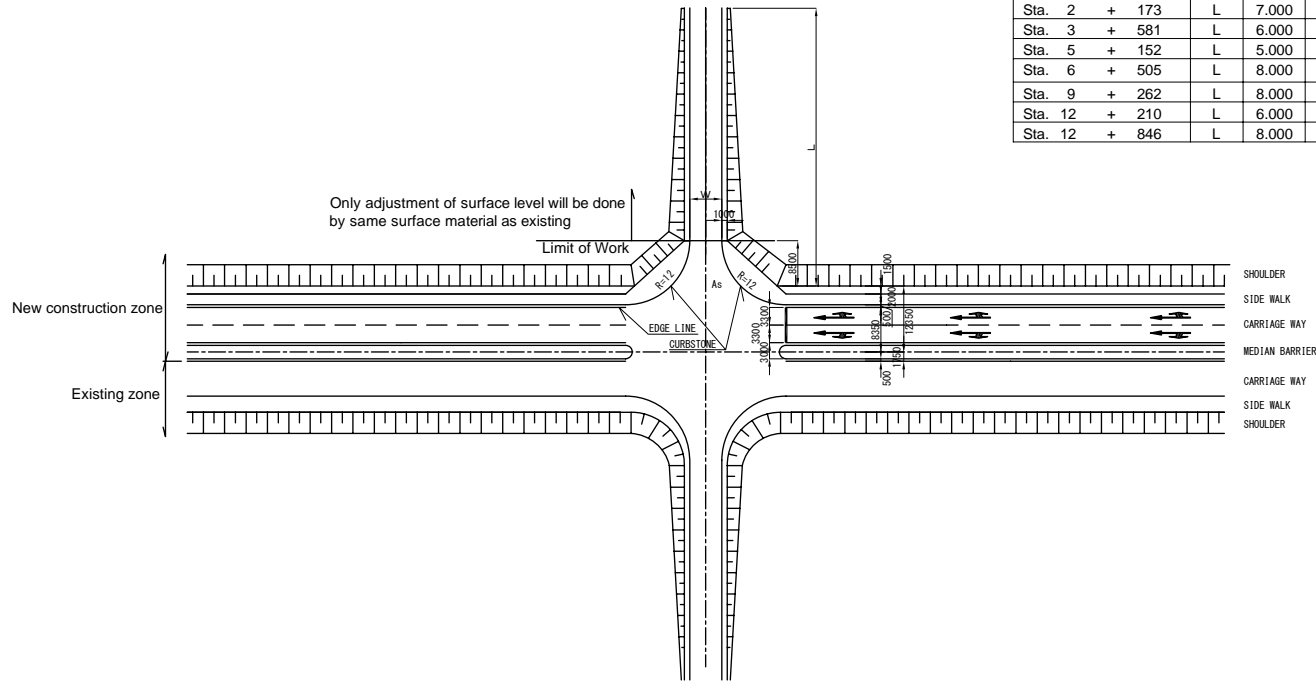
TITLE :  
ACCESS ROAD TYPE-A

Drawing No.	AR-1
SCALE	A1:S=1/500 A3:S=1/1000
DATE	SEP. 2012

TYPE-B S=1/1000

INTERSECTION TYPE-B

TYPE-B		(m)	
Station	L or R	W	L
Sta. 1 + 554	R	10.000	17.000
Sta. 2 + 173	L	7.000	8.500
Sta. 3 + 581	L	6.000	8.500
Sta. 5 + 152	L	5.000	8.500
Sta. 6 + 505	L	8.000	11.000
Sta. 9 + 262	L	8.000	8.500
Sta. 12 + 210	L	6.000	11.310
Sta. 12 + 846	L	8.000	14.500



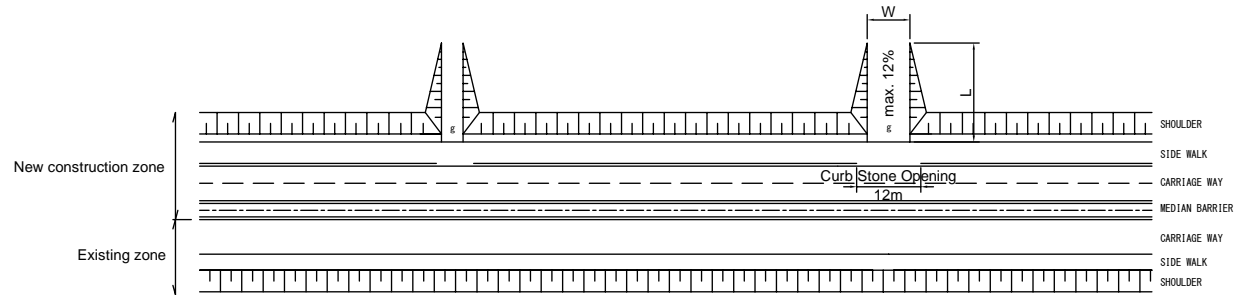
3-61





TYPE-D S=1/1000  
FOR LARGE SIZE VEHICLE

ENTRANCE



TYPE-D (m)				
Station	L or R	W	L	
Sta. 0 + 86	L	6.000	8.900	
Sta. 0 + 117	L	6.000	8.300	
Sta. 0 + 168	L	6.000	7.300	
Sta. 0 + 193	L	6.000	6.900	
Sta. 0 + 218	L	6.000	6.200	
Sta. 0 + 774	L	5.000	9.000	
Sta. 0 + 820	L	5.000	11.000	
Sta. 0 + 861	L	5.000	11.000	
Sta. 1 + 114	L	5.000	11.000	
Sta. 1 + 145	L	5.000	11.000	
Sta. 1 + 196	L	5.000	11.000	
Sta. 1 + 513	L	5.000	11.000	
Sta. 1 + 562	L	8.000	11.000	
Sta. 1 + 635	L	5.000	11.000	
Sta. 1 + 715	L	5.000	11.000	
Sta. 1 + 785	L	5.000	11.000	
Sta. 1 + 950	L	5.000	11.000	
Sta. 0 + 79	R	6.000	3.700	
Sta. 0 + 129	R	6.000	6.100	
Sta. 0 + 149	R	6.000	5.500	
Sta. 0 + 169	R	6.000	5.700	
Sta. 0 + 188	R	6.000	5.100	
Sta. 0 + 235	R	5.000	5.000	
Sta. 0 + 253	R	7.000	3.000	

TYPE-D (m)				
Station	L or R	W	L	
Sta. 1 + 356	R	4.000	12.000	
Sta. 1 + 528	R	5.000	11.000	
Sta. 2 + 338	L	5.000	11.000	
Sta. 2 + 558	L	5.000	11.000	
Sta. 3 + 690	L	5.000	11.000	
Sta. 3 + 890	L	5.000	11.000	
Sta. 7 + 529	L	5.000	11.000	
Sta. 8 + 370	L	5.000	11.000	
Sta. 8 + 487	L	5.000	11.000	
Sta. 8 + 760	L	5.000	10.000	
Sta. 9 + 89	L	5.000	4.000	
Sta. 9 + 500	L	4.000	11.000	
Sta. 9 + 656	L	5.000	11.000	
Sta. 9 + 810	L	4.000	11.000	
Sta. 9 + 940	L	4.000	11.000	
Sta. 10 + 266	L	4.000	3.000	
Sta. 10 + 366	L	4.000	11.000	
Sta. 11 + 190	L	4.000	7.000	
Sta. 11 + 571	L	4.000	11.000	
Sta. 11 + 718	L	5.000	6.000	
Sta. 11 + 836	L	5.000	4.000	
Sta. 12 + 370	L	3.000	11.000	

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YACHIYO ENGINEERING CO.,LTD.

THE PREPARATORY SURVEY ON  
THE PROJECT FOR  
RECONSTRUCTION OF  
SOMALIA DRIVE IN MONROVIA

TITLE :

ACCESS ROAD TYPE-D

Drawing No.

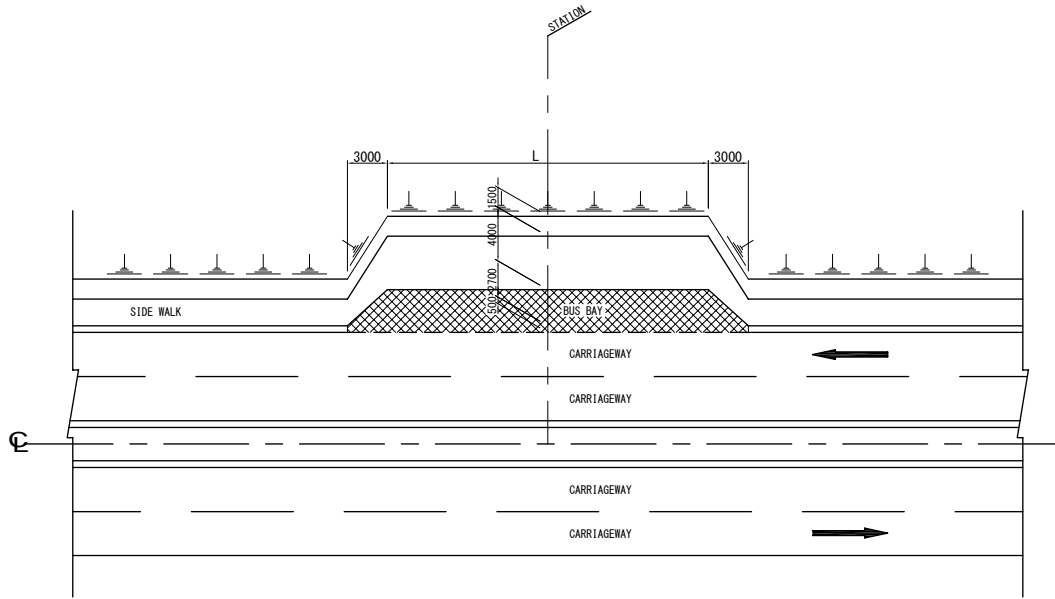
AR-4

SCALE

A1:S=1/500  
A3:S=1/1000

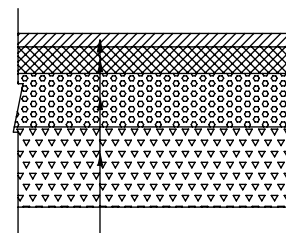
DATE

SEP. 2012



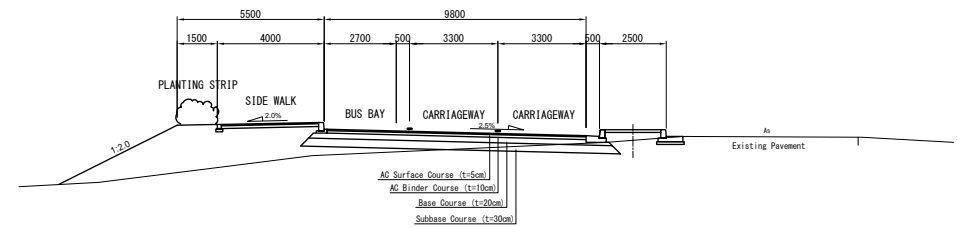
SCHEDULE OF BUS BAY

No.	BUS STOP NAME	Left Side	Right Side	REMARK
		L (m)	L (m)	
1	Freeport/Old Plank Field		24	
2	CEMCO/Doe Community	24	24	
3	Jamaica Road/Slaughter House	24	24	
4	Battery Factory	24	24	
5	THI/Topoe Village	24	24	
6	Sethi Brothers/Iron Factory	24	24	
7	New Georgia Junction	58	24	
8	Supermarket Junction	24	24	
9	Bardnersville Estate Junction	47	24	
10	Former LPRC Refinery Junction	24	24	
11	Chiken Soup Factory Junction	24	24	
12	Stephen Tolbert Estate	24	24	
13	New Hope Junction	24	24	
14	St. Francis Junction	24	24	
15	Lone Star Gas Station	24	24	
16	Neezoe Junction	24	24	
17	72nd Junction	24	24	
18	Plank Field	24	24	
TOTAL		17	18	



AC Surface Course (t=5cm)  
 AC Binder Course (t=10cm)  
 Base Course (t=20cm)  
 Subbase Course (t=30cm)

PAVEMENT TYPE S=1/20



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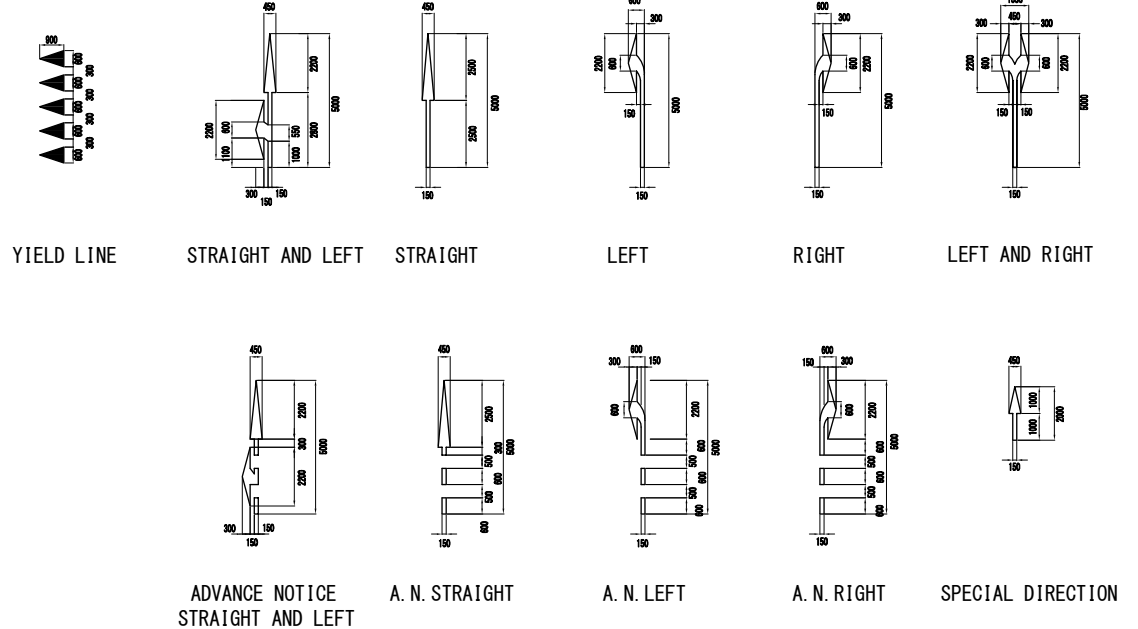
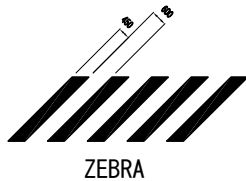
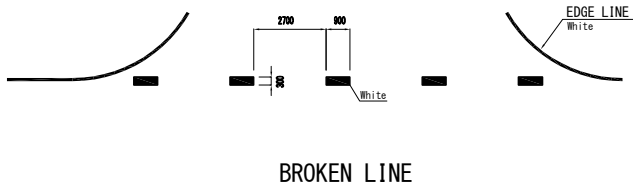
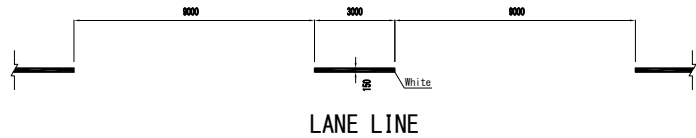
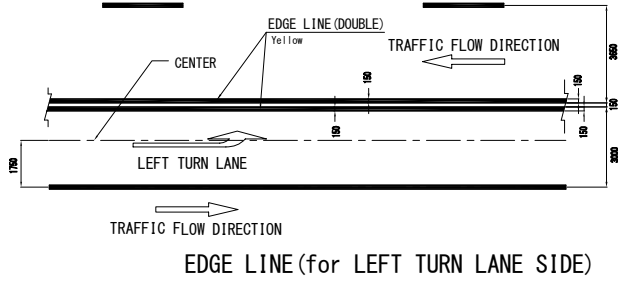
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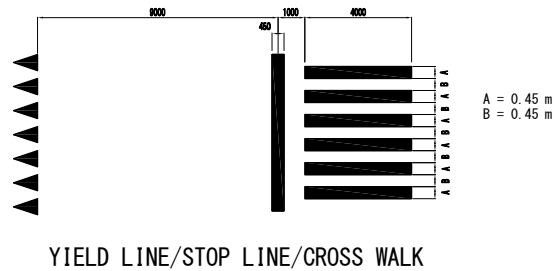
TITLE :  
 BUS BAY DETAIL

Drawing No.	BB-1
SCALE	As Shown
DATE	SEP. 2012



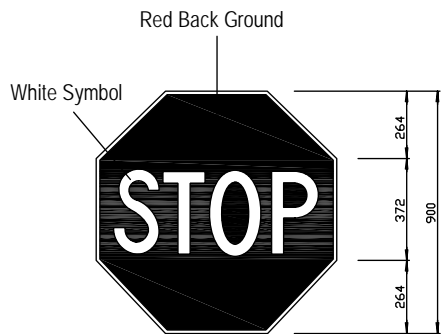


DIRECTIONAL ARROWS

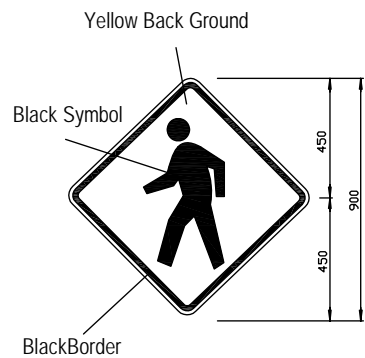


SCHEDULE OF CROSS WALK

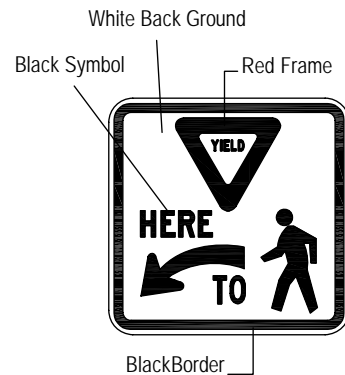
No.	Sta.
1	0+565.5
2	2+272
3	2+568
4	3+561
5	4+253
6	5+491
7	6+169
8	6+484
9	6+605
10	7+000
11	7+460
12	9+208
13	9+882
14	10+452
15	11+369
16	11+903
17	12+555



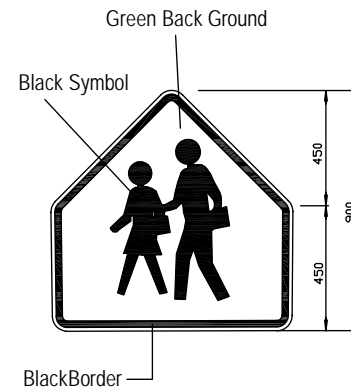
R1-1



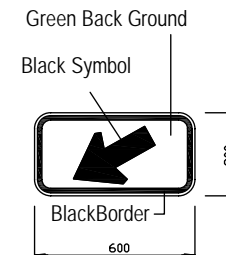
W11-2



R1-5



S1-1

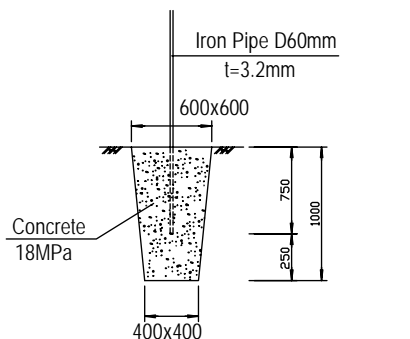


W16-7P

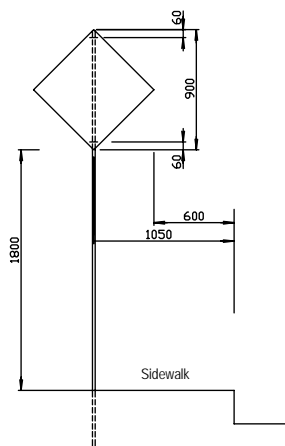
ROAD SIGN S=1/20

ROAD SIGN SCHEDULE

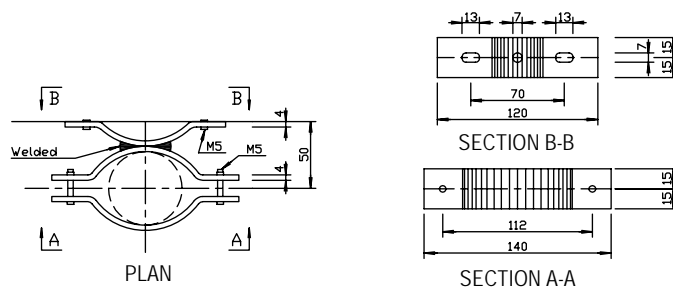
Location	Side	Sign Board	Remarks	Location	Side	Sign Board	Remarks
0+100	Right	W11-2		7+390	Left	W11-2	
0+650	Left	R1-5		7+414	Left Road	R1-1	type-A IS
0+675	Left	W11-2		7+460	Left	R1-5	
1+248	Left Road	R1-1	type-A IS	8+051	Left Road	R1-1	type-A IS
1+300	Left	W11-2		8+180	Left	W11-2	
2+173	Left Road	R1-1	type-B IS	9+210	Left	R1-5	
2+250	Left	R1-5		9+262	Left Road	R1-1	type-B IS
2+560	Left	S1-1,W16-7		9+340	Left	W11-2	
3+520	Left	R1-5		9+900	Left	S1-1,W16-7	
3+581	Left Road	R1-1	type-B IS	9+980	Left	W11-2	
3+670	Left	W11-2		10+450	Left	R1-5	
4+280	Left	R1-5		10+657	Left Road	R1-1	type-A IS
4+375	Left Road	R1-1	type-A IS	10+700	Left	W11-2	
5+480	Left	R1-5		11+312	Left Road	R1-1	type-A IS
6+180	Left	R1-5		11+360	Left	R1-5	
6+260	Left Road	R1-1	type-A IS	11+780	Left	W11-2	
6+505	Left Road	R1-1	type-B IS	11+910	Left	R1-5	
6+525	Left	R1-5		12+210	Left Road	R1-1	type-B IS
6+600	Left	S1-1,W16-7		12+550	Left	R1-5	
7+000	Left	R1-5		12+640	Left	W11-2	
6+852	Left Road	R1-1	type-A IS	12+846	Left Road	R1-1	type-B IS
7+390	Left	W11-2		13+191	Left Road	R1-1	



FOUNDATION DETAIL S=1/40

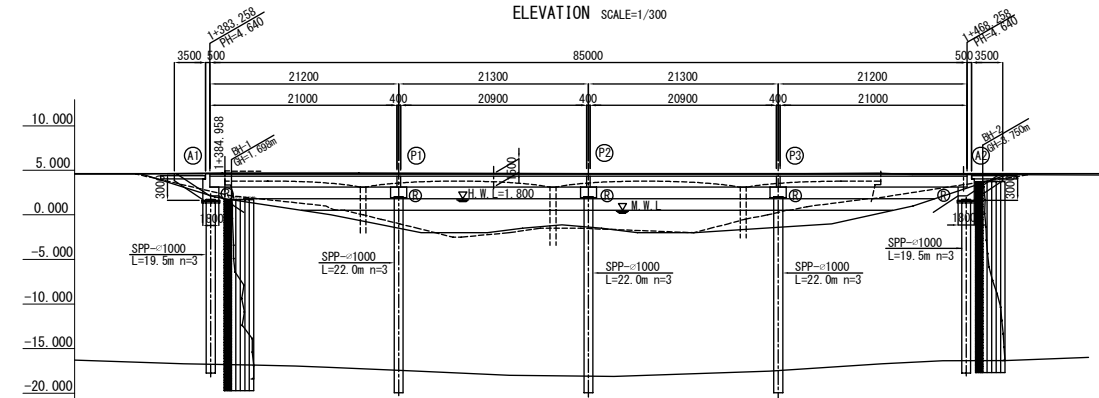


SIGN POST DETAIL S=1/40

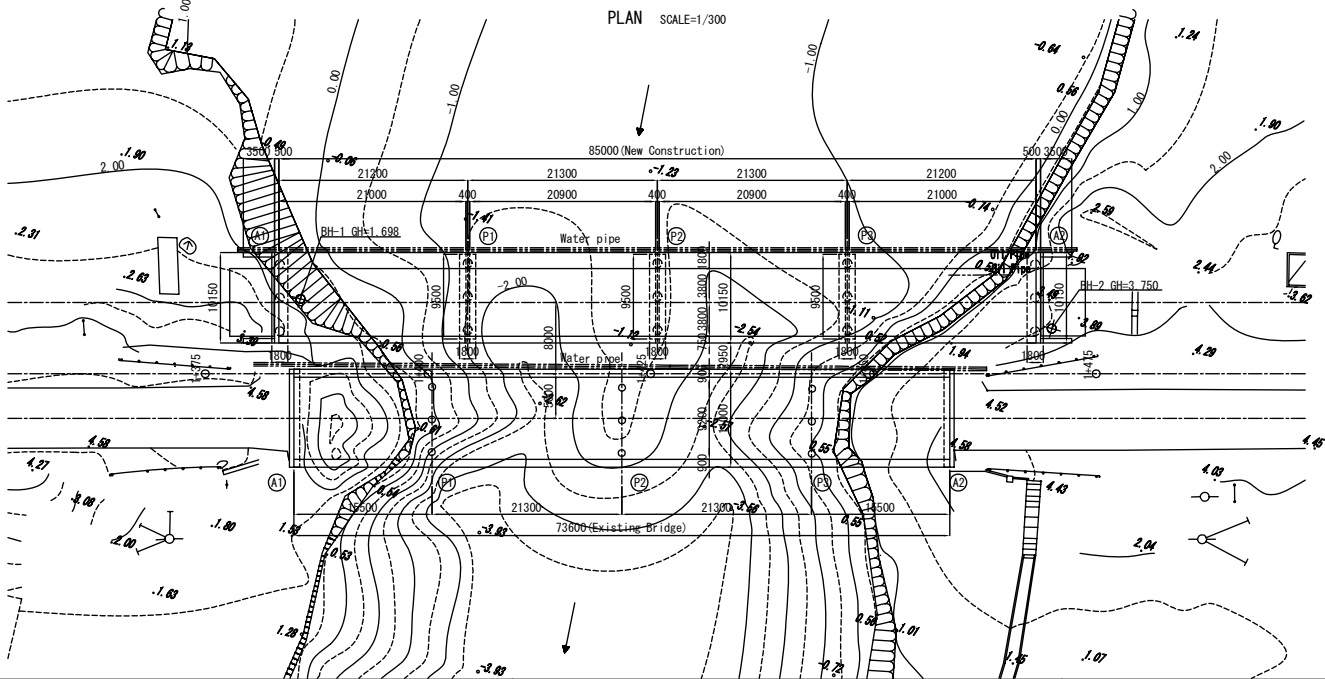


FIXING DETAIL S=1/4

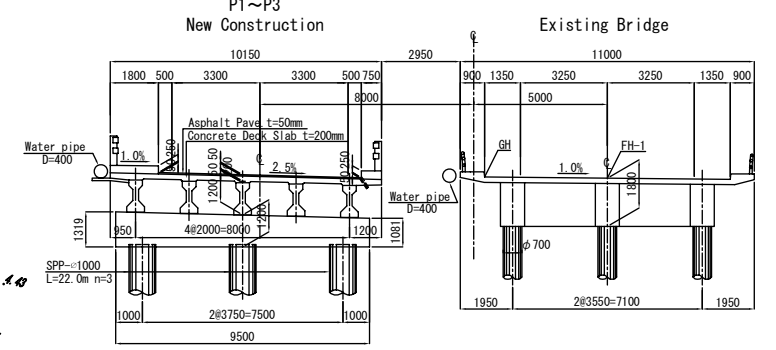
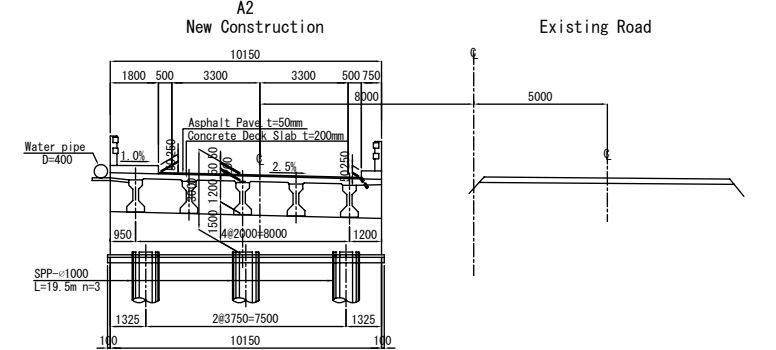
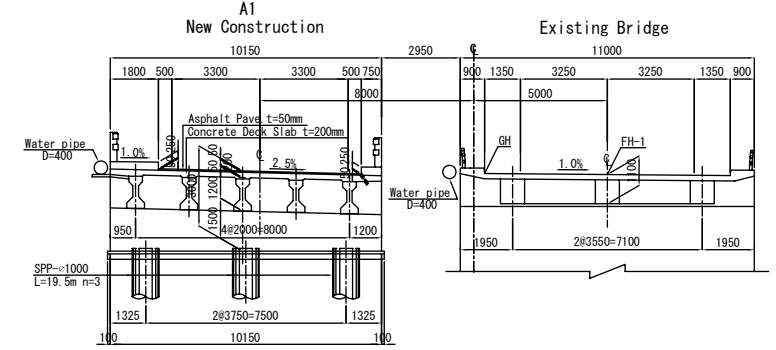
# GENERAL VIEW OF STOCKTON BRIDGE (STEP-1)



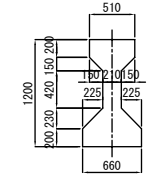
VERTICAL ALIGNMENT (Existing Road)	LEVEL
PROPOSED HEIGHT	4.64
GROUND LEVEL	4.58 + 4.64 0.00 + 4.64 1.50 + 4.64 0.90 + 4.64 4.40 + 4.64
STATION	+1-375 + 4.64 +1-400 + 4.64 +1-425 + 4.64 +1-450 + 4.64 +1-475 + 4.64



BRIDGE CROSS SECTION SCALE=1/100



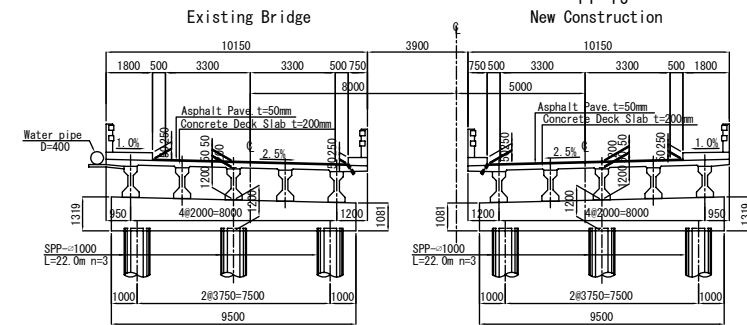
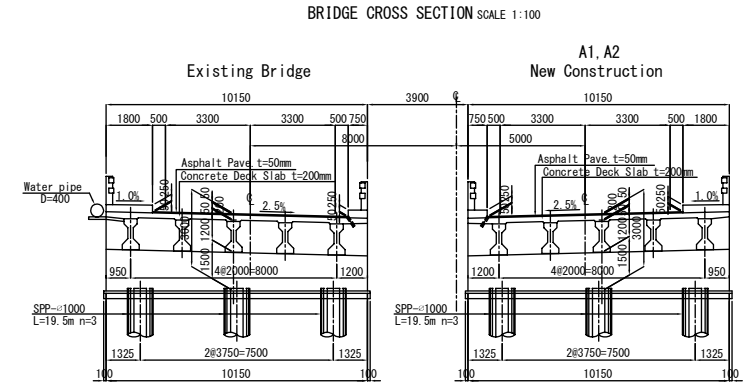
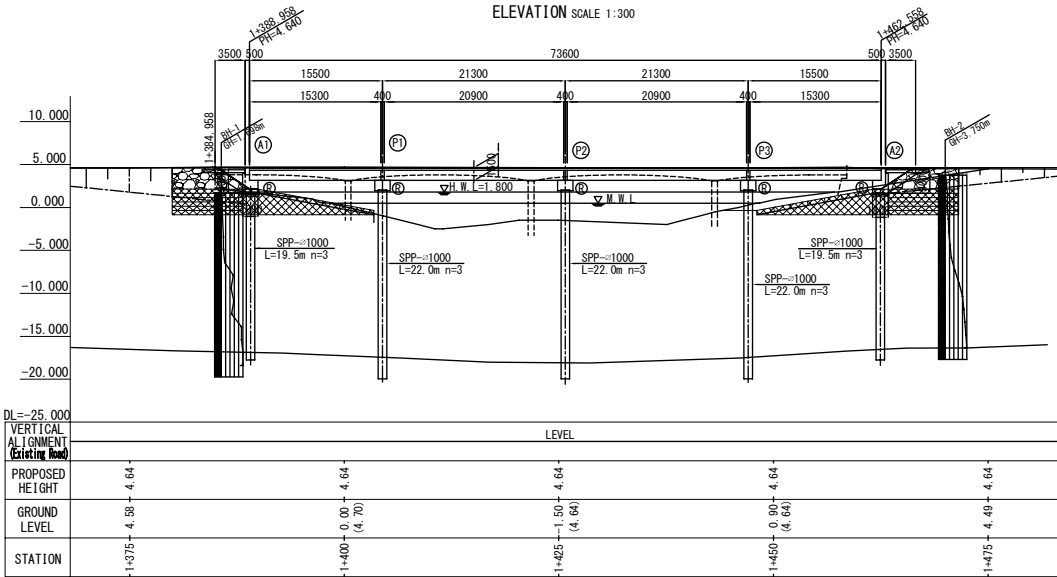
Detail of PC Girder SCALE=1/30



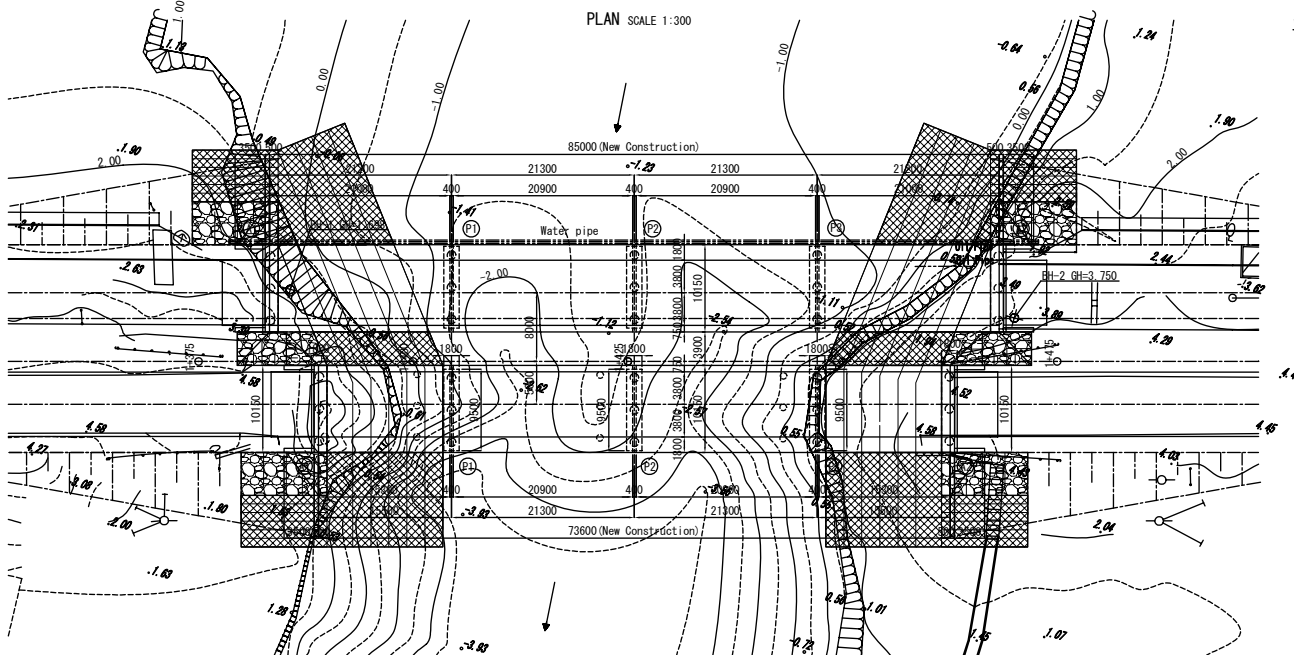
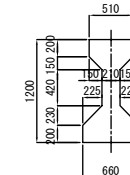
3-68

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			Drawing No. BR-1 SCALE As Shown DATE SEP. 2012

# GENERAL VIEW OF STOCKTON BRIDGE (STEP-2)



DETAIL SCALE 1:30



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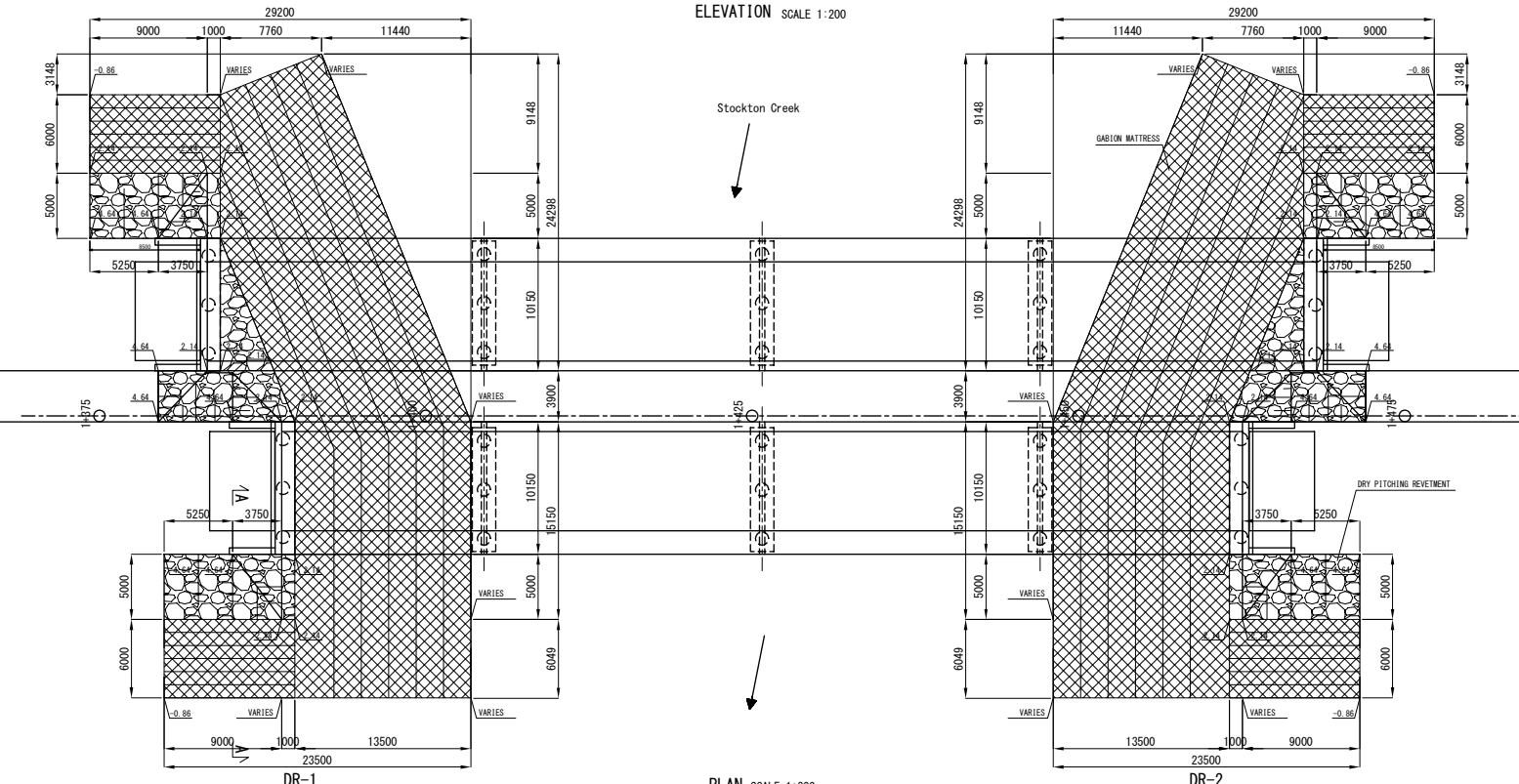
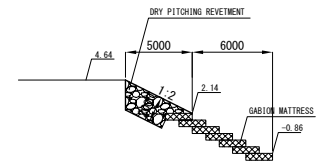
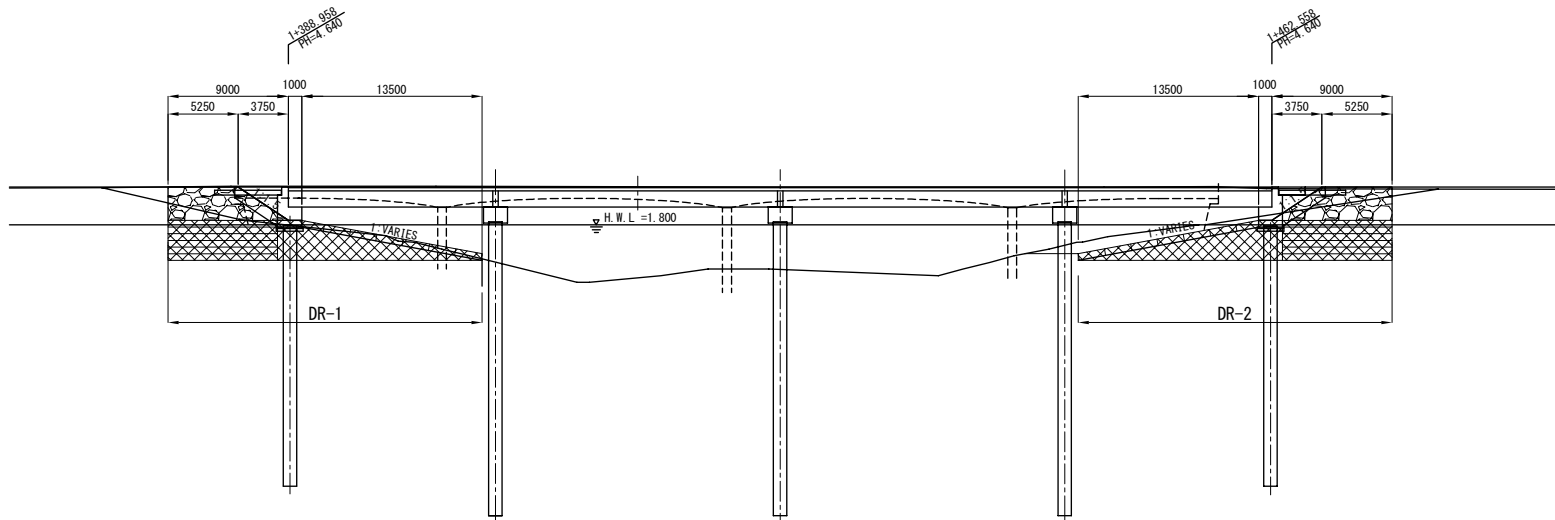
THE PREPARATORY SURVEY ON  
THE PROJECT FOR  
RECONSTRUCTION OF  
SOMALIA DRIVE IN MONROVIA

TITLE :  
GENERAL VIEW OF STOCKTON BRIDGE

Drawing No.	BR-2
SCALE	As Shown
DATE	SEP. 2012



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THE PREPARATORY SURVEY ON  
THE PROJECT FOR  
RECONSTRUCTION OF  
SOMALIA DRIVE IN MONROVIA

TITLE :  
RIVER PROTECTION  
OF STOCKTON BRIDGE

Drawing No.	DR-1
SCALE	As Shown
DATE	SEP. 2012

### 3-2-4 施工計画／調達計画

#### 3-2-4-1 施工方針／調達方針

本計画が実施される場合の基本事項は次のとおりである。

- 本計画は、日本政府と「リ」国政府で本計画に係る無償資金協力の交換公文が締結された後、日本政府の無償資金協力に従って実施される。
- 本計画の主管官庁及び実施機関は公共事業省（MPW）である。
- 本計画の詳細設計、入札関連業務および施工監理業務に係るコンサルタント業務は、日本のコンサルタントが「リ」国とのコンサルタント契約を締結し実施する。
- 本計画の道路工事は、入札参加資格審査の合格者による入札の結果、選定された日本業者により、「リ」国との工事契約を締結し実施する。

本計画の施工にあたっての基本方針は次のとおりである。

- 建設資機材および労務調達は「リ」国の最も安価な価格からの現地調達とする。現地で調達できない場合は、所要の品質供給能力が確保される範囲で最も経済的となる第三国または本邦からの調達とする。
- 施工方法および工事工程は、現地の気象、地形、地質および各道路工事に影響が及ぶ自然条件に合致したものとする。
- 可能な限り特殊機材や技術を必要としない一般的な工法を計画する。
- 適切な工事仕様および施工管理基準を設定するとともに、この基準を満足する建設業者の現場管理組織、コンサルトの施工監理組織を計画する。
- 工事中の作業員および第三者に対する安全確保を徹底する。特に環境配慮およびAIDS/HIVの教育を行う。
- 対象道路南側にはラムサール条約に登録しているメシュラド湿地があり、工事による既存側溝や河川への水質汚染や増水時期の土砂流出を防止するとともに、アスファルトプラント、土砂採集および碎石調達に関しては環境影響を軽減する処置を考慮する等、環境保全に努める。
- 建設廃棄物に関しては、「リ」国政府指定の処理又は廃棄場所に適切に投棄する。

#### 3-2-4-2 施工上／調達上の留意事項

施工計画および施工方法等の策定においては、第三者および施工に従事する者への安全確保を第一とするとともに、道路利用者、沿道住民等への環境負荷低減を考慮した計画、工法の選定でなければならない。

##### 道路現況に対する留意点

対象道路の舗装状態は、近年の経済上昇に伴う交通量の増加による損傷が激しい。対象道路はモンロビア中心部と東部地域を結ぶ重要幹線であり、朝夕の混雑時には交通が集中して深刻な渋滞を引き起こし、通勤、通学、通院といった市民生活に多大な支障を来している。

したがって、施工計画は道路利用者への安全および交通の確保、また沿道住民に対する環境影響負荷低減を勘案した計画の立案が肝要である。

### 既存道路沿線施設に対する留意点

本計画はモンロビアの主要幹線道路の整備であり、対象道路はモンロビア住民の重要な生活道路とモンロビア中心部へのアクセス道路としての役割を担っている。都市地域内の道路であり、住宅・商業施設等への補償を最小とする条件から、道路占有に制約が設けられている。よって工事に当たっては、現況の安全な交通確保を最優先とし、工事中の全面的な交通遮断は避けなければならない。

なお、道路沿線には学校や教会が多数あり、周辺住民に対して十分な環境配慮を行いながら施工を進める必要がある。

### 気象状況における留意点

モンロビアは、海岸性の熱帯モンスーン気候に分類され、乾季（11月～4月）と雨季（5月～10月）がある。乾季は雨が少なく乾燥している。しかし雨季には、年間平均降雨量約6,900mmのほとんどが降る異常な降水量であり、人の活動に大きな支障が出るほどである。年平均気温は摂氏約23℃で年間を通じた変動はあまり大きくない。

「リ」国側より収集した対象道路付近の降水量データについて、下記に示す。

モンロビア年間平均 月平均降水量(mm)		雨量データ(mm)			
		2008年	2009年	2010年	2011年
1月	30.2	0.0	45.4	16.0	59.5
2月	89.0	223.3	5.2	73.1	54.4
3月	125.5	57.5	49.4	305.1	90.1
4月	172.9	137.1	23.4	363.8	167.3
5月	558.1	434.7	381.0	889.0	527.8
6月	1,489.6	784.0	1,510.6	1,481.5	2,182.4
7月	767.3	1,431.4	18.3	1,076.1	543.2
8月	1,108.2	1,089.7	668.7	1,597.8	1,076.4
9月	1,234.7	1,392.3	1,044.6	1,167.1	1,334.9
10月	912.1	886.9	1,104.6	842.9	813.8
11月	324.2	204.2	465.2	144.7	482.6
12月	110.1	143.2	22.1	262.5	12.6
平均降雨量/年 (2008-2011)	6,921.9	6,784.3	5,338.5	8,219.6	7,345.0

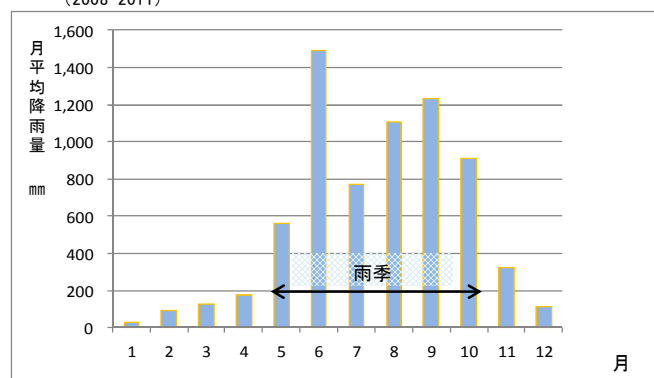


図 3.2-4 モンロビア年間降水量データ

地質は、エダイナ砂岩層、ペインズビル砂岩層、河成沖積層で構成されている。

工事は乾季の約6ヶ月間で集中して行う。特に舗装工事は、雨の日には施工が困難であるために、十分な余裕を持って施工計画を検討する。

### 周辺住民および工事関係者への安全配慮

既存道路と接続部を施工する際は、どうしても一部既存道路占有が必要であるため、仮設の車道と歩道を道路用地内に確保し、円滑な交通流の確保を図る。

#### ①周辺住民への安全配慮

- 工事ヤードを明確にし、工事関係者以外の立ち入り禁止措置を実施する。
- 資材運搬車両へ安全教育により、交通事故防止対策を実施する。

#### ②工事関係者への安全配慮

- 大型建設機械を使用するため、建設機械への見張り員を配置し接触事故防止を行う。

#### ③環境への配慮

- 既設舗装や既設橋梁の撤去処理について、環境に負担が掛からず適正な処理を実施する。
- 土取場の選定については実施機関と協議の上、周辺環境に対して影響の少ない箇所を選定する。
- 振動および騒音が生じる工種の実施は、早朝および夜間を避け行う。
- 工事車両による粉塵対策（散水等）を実施する。
- 関係者への環境情報の提供、掲示、教育、特に労働安全衛生、自然環境保護、保健（マラリア予防、性関連感染症の予防、AID/HIV 対策等）の教育を実施する。

### 3-2-4-3 施工区分／調達・据付区分

日本と「リ」国の両国政府が分担すべき事項は、表 3.2-15 のとおりである。

表 3.2-15 両国政府の負担区分

項 目	内 容	負担区分		備 考
		日本	リベリア	
資 機 材 調 達	資機材の調達・搬入	○		
準 備 工	工事に必要な用地の確保		○	現場事務所、資機材置場、作業場等
	商店移転措置		○	
	土取場・土捨場の確保		○	
	廃材捨場の確保		○	
	上記以外の準備工	○		
工事障害物の撤去	地中架空障害物の移設		○	
	既存樹木の撤去・移植		○	
本 体 工 事	道路工事	○		
付 帯 工 事	埋設管工事		○	
	交通安全施設	○		

### 3-2-4-4 施工監理計画／調達監理計画

日本のコンサルタントが「リ」国政府とのコンサルタント業務契約に基づき、詳細設計業務、入札関連業務および施工監理業務の実施にあたる。

#### (1) 詳細設計業務

コンサルタントが実施する実施設計業務の主要内容は次のとおりである。

##### 詳細設計

- 「リ」国実施機関との着手協議、詳細設計、現地調査
- 詳細設計、図面作成
- 資材調達計画、事業費積算

詳細設計業務の所要期間は、以下のとおりである。

- コンサルタント契約認証後 3.0 ヶ月

#### (2) 入札関連業務

入札公示から工事契約までの期間に行う業務の主要項目は次のとおりである。

- 入札図書の作成（上記詳細設計期間と並行して作成）
- 入札公示
- 入札業者の事前資格審査
- 入札実施
- 入札書の評価
- 契約促進業務

入札関連業務の所要期間は、以下のとおりである。

- コンサルタント契約認証後 3.0 ヶ月

#### (3) 施工監理業務

コンサルタントは、施工業者が工事契約および施工計画に基づき実施する工事の施工監理を行う。その主要項目は次のとおりである。

- 測量関係の照査・承認
- 施工計画の照査・承認
- 品質管理
- 工程管理
- 出来形管理
- 安全管理
- 出来高検査および引き渡し業務

施工監理業務には常駐管理技術者 1 名と補助技術者 1 名を配置する。

工事施工においては、施工業者の安全管理者と協議、協力しながら事故の発生を未然に防ぐよう監理を行う。

### 3-2-4-5 品質管理計画

コンクリートの品質管理計画を表 3.2-16 に、土工および舗装工の品質管理計画を表 3.2-17 に示す。

表 3.2-16 コンクリート工の品質管理計画

項目	試験項目	試験方法 (仕様書)	試験頻度
セメント	セメントの物性試験	AASHTO M85	試験練り前に 1 回、その後コンクリート 500m <sup>3</sup> 打設毎に 1 回あるいは原材料が変わった時点
細骨材	コンクリート用細骨材の物性試験	AASHTO M6	試験練り前に 1 回、その後 500m <sup>3</sup> 毎に 1 回あるいは供給場所が変わった時点*
	ふるい分け試験	AASHTO T27	毎月 1 回
粗骨材	コンクリート用粗骨材の物性試験	AASHTO M80	試験練り前に 1 回、その後 500m <sup>3</sup> 毎に 1 回あるいは供給場所が変わった時点*
	ふるい分け試験	AASHTO T27	毎月 1 回
水	水質基準試験	AASHTO T26	試験練り前に 1 回
コンクリート	スランプ試験	AASHTO T119	2 回/日
	エア量試験	AASHTO T121	2 回/日
	圧縮強度試験	AASHTO T22	各打設毎に 6 本の供試体、1 回の打設数量が大きい場合には 75 m <sup>3</sup> 毎に 6 本の供試体 (7 日強度 - 3 本、28 日強度 - 3 本)
	温度	-	2 回/日
	塩分濃度試験	-	2 回/日

表 3.2-17 土工および舗装工の品質管理計画

項目	試験項目	試験方法 (仕様書)	試験頻度
盛土工	現場密度試験	AASHTO T191	500m <sup>3</sup> 毎
路床工/ 路盤工	締め固め試験	AASHTO T180	試験施工前および材料変更時
	修正 CBR	AASHTO T193	試験施工前および材料変更時
	現場密度試験	AASHTO T191	1,000 m <sup>2</sup> につき 2 回
アスファルト 舗装工	骨材のふるい分け試験	AASHTO T27	試験施工前および材料変更時
	骨材のすり減り抵抗試験	AASHTO T96	試験施工前および材料変更時
	合材の密度試験	AASHTO T166	1,000 m <sup>2</sup> につき 1 回
	合材の温度測定	-	トラック 1 台毎

### 3-2-4-6 資機材等調達計画

#### (1) 建設資材調達計画

現地で調達および生産できる主要資材は、盛土材、砂、骨材、路盤材、生コン（現場生産も含む）、木材等で「リ」国内での調達が可能である。

資材の調達方針は次のとおりである。

- 恒常的に輸入品が市場に供給されている場合は、これを調達する。
- 現地調達が不可能なものは、第三国または日本から調達とする。調達先は品質、価格、調達の可能性および納期を勘案し決定する。

主要資材の調達区分を表 3.2-18 に示す。

表 3.2-18 主要建設資材調達計画

項 目	調 達 区 分			調 達 先 等
	現 地	日本国	第三国	
構造物用資材				
砕石（基礎砕石材共）	○			
セメント	○			
砂（コンクリート用）	○			
路盤材	○			
生コン	○			
アスファルト合材用砕石	○			
ストレートアスファルト			○	
鉄筋：D9～D32	○			輸入品
型鋼			○	
混和材（コンクリート用）	○			
割石（練石積）	○			
PVCパイプ：D=150～200	○			
RCパイプ：D=300～700	○			
型枠用木材	○			
橋梁桁型枠用鋼板			○	
支保工（木材）、足場用丸太	○			
燃料、油脂類	○			
マーキング用油着ペイント			○	
各種ペイント	○			
道路標識	○			

## (2) 建設機械調達計画

建設機械の調達方針は以下のとおりである。

- 現地建設業者が所有している一般的な機種、モデルの建設機械はこれをリースする。ただし、リースが高価な場合は、使用期間を算定し第三国からの調達（購入による損料）を経済比較して調達方法を決定する。
- 現地調達が困難な機械は第三国または日本からの調達とする。

主要工事中建設機械の調達区分を表 3. 2-19 に示す。

表 3. 2-19 工事中建設機械調達区分整理表

機械名	仕様	賃借/ 購入	調 達 区 分			調達理由	輸送 ルート
			現 地	第三国	日本国		
バックホウ	0. 28m3	賃借	○			経済性	
バックホウ	0. 5m3	〃	○			〃	
バックホウ	0. 8m3	購入		○		〃	
ブルドーザー	15t	賃借	○			〃	
ブルドーザー	21t	〃	○			〃	
モーターグレーダ	3. 7m	〃	○			〃	
タイヤローラ	8-20t	〃	○			〃	
振動ローラ	0. 5-0. 6t	購入		○		〃	
振動ローラ	0. 8-1. 1t	〃		○		〃	
ホイールローダ	2. 3m3	賃借	○			〃	
ホイールローダ	3. 1m3	〃	○			〃	
アスファルトフィニッシャー	2. 4-6. 0m	購入			○	調達が困難であるため	
散水車	6. 0kl	〃		○		経済性	
ダンプトラック	10 t	〃		○		〃	
トラッククレーン	4. 8-4. 9t	賃借	○			〃	
トラッククレーン	20 t	購入		○		〃	
トラッククレーン	35 t	賃借	○			〃	
トレーラー	20t	〃	○			〃	
トレーラー	30t	〃	○			〃	
場所杭機 全周回転式	Φ 1, 200	購入			○	調達が困難であるため	
コンクリートプラント	30m3/h	〃		○		経済性	
アスファルトプラント	50t/h	〃		○		〃	
発電発電機	250KVA	賃借	○			〃	
発電発電機	35KVA	購入		○		〃	
発電発電機	60KVA	〃		○		〃	
コンプレッサー	3. 5-3. 7m3	賃借	○			〃	





### 3-3 相手国側負担事業の概要

本計画が実施される場合の「リ」国政府の分担事項は以下のとおりである。

- 本計画の実施上必要な資料／情報の提供
- 工事のために必要な現場事務所、資材置き場、作業場等の用地の提供
- 工事に必要な土取場、土捨場、産廃捨て場用地の確保
- 本計画に関し日本に口座を開設する銀行の手数料の負担
- 本計画の資機材輸入の免税措置、通関手続きおよび速やかな国内輸送のための措置
- 本計画に従事する日本人および実施に必要な物品／サービス購入の際の課税免除
- 本計画に従事する日本人が「リ」国へ入国および滞在するために必要な法的措置
- 本計画を実施するために必要な許認可の取得または発行（EIA 承認済、建設許可、工事中の交通規制等の許可、迂回路の設置許可、河川内工事許可、土工事許可）
- プロジェクト実施に支障となる水道管及びその他埋設管、広告看板等の移設
- 道路建設後の適切な使用および維持管理
- 本計画実施において住民または第三者と問題が生じた場合、その解決への協力
- 両国の分担取り決めの基づく本計画実施上必要となる経費のうち、日本国の無償資金協力によるもの以外の経費の負担
- 工事中のサイトの安全確保

### 3-4 プロジェクトの運営・維持管理計画

#### (1) 運営・維持管理の体制

対象道路は、公共事業省（MPW）により維持管理される。維持管理能力については、体制、保有機械、技術力、予算とも十分とは言い難い。モンロビア市内の道路維持管理について、幹線道路である1級道路は良く整備されているが、補助幹線である2級道路については、未舗装区間が多く一部整備を実施している箇所もあるが、大部分は整備が実施されていない。本プロジェクトを通して、道路の運営・維持管理能力を高める必要がある。

#### (2) 維持管理業務の内容

必要な維持管理業務は次のとおりである。

- 定期的維持・補修
- 路面・排水施設・道路付属物等の点検・清掃
- 不定期的維持・補修
- 舗装クラックのシーリング、パッチング、路面表示の再塗装、その他破損個所の補修

#### (3) 現状の維持管理業務の実施状況と留意点

現状の維持管理業務の実施状況は次のとおりである。

- ソマリアドライブの既存車道、舗装の補修は比較的良好に実施されている。
- 排水施設の清掃が計画的に実施されていない。モンロビアの至る所で排水清掃実施状況を見かけたが、詰まったままで長年機能を失っている箇所や、雨の後の冠水箇所も見受けられる。

事業効果を十分に発現・持続させるため、道路の維持管理を十分に行い、常に良好な走行条件を保つとともに、施設の耐久性の向上を図ることが重要であり、特に次の点に留意する必要がある。

- 定期的に点検を行い、施設の状況を把握しておくこと。
- 清掃、特に排水施設の清掃を十分に行うこと。
- 維持管理に必要な予算を確保すること。

### 3-5 プロジェクトの概算事業費

#### 3-5-1 協力対象事業の概算事業費

##### (1) 日本側負担経費

本プロジェクトは、我が国の無償資金協力の取り決めに従って実施され、事業費は本プロジェクトに対する交換公文締結前に決定される。

##### (2) 「リ」国側負担経費 1,545,000 US\$ (約124.3百万円)

① 移転補償費 (人)	860,000 US\$	(約69.2百万円)
② ユーティリティー移設費	600,000 US\$	(約48.3百万円)
③ 環境アセスメント対策費	60,000 US\$	(約 4.8百万円)
④ 銀行手数料	25,000 US\$	(約 2.0百万円)

##### (3) 積算条件

- ① 積算時点：平成24年 6月
- ② 為替交換レート：1 US\$ = 80.52円
- ③ 施工期間：詳細設計・工事の期間は、実施工程に示したとおり。
- ④ その他：日本国政府の無償資金協力の制度を踏まえて行うこととする。なお、本事業は予備的経費を想定した案件となっている。但し、予備的経費の可否及びその率については外務省によって別途決定される。

### 3-5-2 運営・維持管理費

本プロジェクトで改修される道路の定期点検・日常維持管理および補修は公共事業省(MPW)により実施される。

維持管理に必要な年間の費用は、91,150 US\$ と見込まれる。その内訳を表 3.5-1 に示す。

表 3.5-1 主な維持管理項目と年間費用

単位：US\$

#### 1. 定期点検

施設名	点検項目	巡回の頻度	点検人員	使用資機材	所要数量	単価	金額
舗装 路肩・法面 路面標示 排水施設	クラック、不陸、ポットホール等	12回/年 所要日数 1日/回	4名	スコップ、 ハンマー、 カマ、バリケード 小型トラック	延48人日/年	37.5/日	1,800
	雨水による侵食、 崩壊等 損傷、変形、汚れ、 剥離 障害物の有無				延12台・日/年 =96時間・台/年 (1日8時間)	75.0/時	7,200
					小計		9,000

#### 2. 日常維持管理

施設名	点検項目	巡回の頻度	点検人員	使用資機材	所要数量	単価	金額
清掃 排水施設 舗装 路肩 路面標示	土砂、障害物の撤去	4回/年 所要日数 4日/回	10名	スコップ、 ハンマー、 カマ、バリケード  小型トラック (5台) (第1日・4日のみ 2日間)	延160人日/年	90.0/人・日	14,400
	清掃 草刈り、清掃 清掃				延20台/年 =200時間・台/ 日 (1日10時間)	80.0/時・台	6,000
					小計		20,400

定期点検・清掃合計

29,400

#### 3. 補修

施設名	実施項目	補修の頻度	単価 (年・km当たり)	対象道路 区間
舗装 路肩／法面 排水施設 道路付帯施設 他 躯体	ポットホールのパッチング等	5年に1回	2,200	13km 2車線換算
	破損部分の補修	5年に1回	300	
	破損部分の補修	2年に1回	1,800	
	破損部分の補修	5年に1回	150	
	破損部分の補修	10年に1回	300	
		小計	4,750	61,750

合計

91,150

## 第4章 プロジェクトの評価

### 4-1 事業実施のための前提条件

相手国分担事業がスケジュール通りに実施されること。  
相手国分担事業の詳細は「3-3 相手国分担事業の概要」に示す。

### 4-2 プロジェクト全体計画達成のために必要な相手方投入（負担）事項

以下に、プロジェクトの効果を十分に発現・持続させるための「リ」国が取り組むべき課題を示す。

- ①維持管理を十分に行うこと。特に排水施設の清掃は道路の早期劣化を防ぐために重要である。
- ②長期的な維持管理プログラムに従った道路維持管理予算を確保し、人材育成を行うこと。

### 4-3 外部条件

現在、モンロビア首都圏からギニア国境までの国際回廊としての道路整備事業が、世界銀行予算で実施されている。本プロジェクト道路は、モンロビアの主要港であるフリーポートとギニア国境までの国際回廊を結ぶ幹線道路である。本プロジェクトより先に実施しているギニア国境までの道路計画との相乗効果より、国際回廊として効率的な交通・物流改善が期待される。

### 4-4 プロジェクトの評価

#### 4-4-1 妥当性

以下から、我が国の無償資金協力により協力事業を実施することは妥当であると判断する。

- ①プロジェクトの直接受益者は道路利用者および周辺地域住民 30 万人であり、間接受益者はモンロビア首都圏 120 万人であり、その数が多数である。
- ②「リ」国が独自の資金と人材・技術で運営・維持管理を行うことができ、過度に高度な技術を必要としない。
- ③本事業は、国家計画「リベリア貧困削減戦略」のなかの重要課題の一つである基本インフラ再建の一環を担う。また、モンロビア首都圏の人口は急激な勢いで増加しており、渋滞対策における緊急性も高い。
- ④環境社会面で道路改修効果後の交通事故対策について、交通安全施設、交差点改良、歩道等の対策を十分に講じている。
- ⑤我が国の無償資金協力の制度により、特段の困難なくプロジェクトの実施が可能である。

#### 4-4-2 有効性

##### ① 定量的効果

期待される効果項目	基準値 (2012年)	目標値 (2019年)
● ピーク時の通行所要時間 (L=13.2 km)	60分	20分
● 民間バス運賃の追加料金の低減 (レッドライト付近～モンロビア中心部までの往復料金)	20～30 リベリアドル	0

##### ② 定性的効果

###### ● 歩行者等の安全確保

歩道の新設とともに縁石によって歩車道を分離することによって歩行者等の安全が確保され、交通事故数が減少する。

###### ● 排水施設の整備による維持管理頻度の低減

排水施設の整備により雨水の侵入による路盤破壊が防げ、維持管理頻度が低減する。

###### ● バスベイ等による交通の円滑化

バス等の乗降が頻繁に行われている箇所にバスベイ等を設置することによって乗降客の安全が確保されると同時に、円滑な交通に寄与する。

## <<資 料>>

1. 調査団員氏名・所属 .....	A- 1
2. 調査日程 .....	A- 2
3. 関係者(面会者)リスト.....	A- 6
4. 討議議事録 (M/D) .....	A- 8
5. テクニカルノート .....	A-39
6. 環境許可書.....	A-41
7. 収集資料リスト.....	A-44
8. 技術資料.....	A-45



## 1. 調査団員氏名、所属

### (1) 第1次現地調査 (2012年1月18日～2012年3月30日)

- 業務主任／道路計画 山宿 壮 (片平エンジニアリング インターナショナル (KEI))
- 道路設計 I / 埋設物調査 村上 啓一 (KEI)
- 道路設計 II / 排水計画 三宅 清孝 (八千代エンジニアリング (YEC))
- 橋梁設計 青木 康司 (KEI)
- 自然条件調査 土屋 俊秋 (KEI)
- 環境配慮／社会配慮 I 向井 潔 (KEI)
- 社会配慮 II 柴田 護 (YEC)
- 施工・調達計画／積算 藤原 英勝 (KEI)
- 業務調整／自然条件調査補助 鷹島 一久 (KEI)

### (2) 第2次現地調査 (2012年3月31日～2012年6月3日)

- 団長 芦野 誠 (JICA 経済基盤開発部)
- 計画管理 福沢 大輔 (JICA 経済基盤開発部)
- 協力企画 櫻井 理 (JICA ガーナ事務所)
- 業務主任／道路計画 山宿 壮 (KEI)
- 道路設計 I / 埋設物調査 村上 啓一 (KEI)
- 道路設計 II / 排水計画 三宅 清孝 (YEC)
- 橋梁設計 青木 康司 (KEI)
- 環境配慮／社会配慮 I 向井 潔 (KEI)
- 社会配慮 II 柴田 護 (YEC)
- 施工・調達計画／積算 藤原 英勝 (KEI)

### (3) 第3次現地調査 (2012年10月6日～2012年10月16日、10月22日～10月29日)

- 業務主任／道路計画 山宿 壮 (KEI)
- 環境配慮／社会配慮 I 向井 潔 (KEI)

### (4) 概略設計概要説明調査 (2012年11月25日～2012年12月8日)

- 団長 芦野 誠 (JICA 経済基盤開発部)
- 計画管理 金子 祐太郎 (JICA 経済基盤開発部)
- 環境社会配慮 植松 京子 (JICA 審査部)
- 業務主任／道路計画 山宿 壮 (KEI)
- 道路設計 I / 埋設物調査 村上 啓一 (KEI)

2. 調査工程  
第1次現地調査（2012年1月18日～3月30日）

Schedule of Preparatory Survey Team for Somalia Drive re-construction project-1st Term (18,January, 2012-30,March, 2012)

Name			Mr.Tsuyoshi YAMAJUKU	Mr.Keiichi MURAKAMI	Mr.Kiyotaka MIYAKE	Mr.Yasushi AOKI	Mr.Toshiaki TSUCHIYA	Mr.Kiyoshi MUKAI	Mr.Mamoru SHIBATA	Mr.Hidekatsu FUJIWARA	Mr.Kazuhisa TAKASIMA
Position			Chief Consultant / Road Planner. (Katahira & Engineers International)	Road Designer 1/ Burial things investigator. (Katahira & Engineers International)	Road Designer 2/ Drainage Designer. (Yachiyo Engineering Co.LTD)	Bridge Designer. (Katahira & Engineers International)	Natural Condition Surveyor. (Katahira & Engineers International)	Environment Specialist / Social Specialist 1. (Katahira & Engineers International)	Social Specialist 2. (Yachiyo Engineering Co.LTD)	Construction, Procurement Planner / Cost Estimator. (Katahira & Engineers International)	Office of liaison / Natural Condition Survey assistant. (Katahira & Engineers International)
No.	Date	Day									
1	18-Jan-12	Wed	Narita → Amsterdam					Narita → Amsterdam	Narita → Amsterdam		
2	19-Jan-12	Thu	Amsterdam → Accra					Amsterdam → Accra	Amsterdam → Accra		
3	20-Jan-12	Fri	Visit to EOJ, JICA					Visit to EOJ, JICA	Visit to EOJ, JICA		
4	21-Jan-12	Sat	Accra → Monrovia					Accra → Monrovia	Accra → Monrovia		
5	22-Jan-12	Sun	Meeting with Investigation team Site Survey					Meeting with Investigation team Site Survey	Meeting with Investigation team Site Survey		Narita → Frankfurt → Brussels
6	23-Jan-12	Mon	Meeting with MPW					Meeting with MPW	Meeting with MPW		Brussels → Monrovia
7	24-Jan-12	Tue	Meeting with GIZ, WB, MCC					Meeting with GIZ, WB, MCC	Meeting with GIZ, WB, MCC		Meeting with MPW
8	25-Jan-12	Wed	Meeting with MOT, Land Commission					Meeting with MOT, Land Commission	Meeting with MOT, Land Commission		Meeting with MCC / Site survey
9	26-Jan-12	Thu	Kickoff Meeting					Kickoff Meeting	Kickoff Meeting		Meeting with MOT, Land Commission
10	27-Jan-12	Fri	Site Survey					Site Survey	Site Survey		Site Survey
11	28-Jan-12	Sat	Site Survey					Site Survey	Site Survey		Site Survey
12	29-Jan-12	Sun	Meeting with Investigation team Site Survey					Meeting with Investigation team Site Survey	Meeting with Investigation team Site Survey		Meeting with Investigation team Site Survey
13	30-Jan-12	Mon	Site Survey					Site Survey	Site Survey		Site Survey
14	31-Jan-12	Tue	Meeting with Local Consultant					Meeting with Local Consultant	Meeting with Local Consultant		Site Survey
15	01-Feb-12	Wed	Site Survey					Site Survey	Site Survey		Site Survey
16	02-Feb-12	Thu	Site Survey					Site Survey	Site Survey		Site Survey
17	03-Feb-12	Fri	Site Survey					Site Survey	Site Survey		Site Survey
18	04-Feb-12	Sat	Site Survey					Site Survey	Site Survey		Site Survey
19	05-Feb-12	Sun	Meeting with Investigation team Site Survey					Meeting with Investigation team Site Survey	Meeting with Investigation team Site Survey		Meeting with Investigation team Site Survey
20	06-Feb-12	Mon	Site Survey					Meeting with Local Consultant	Meeting with Local Consultant		Site Survey
21	07-Feb-12	Tue	Meeting with EU					Meeting with Local Consultant	Meeting with Local Consultant		Site Survey
22	08-Feb-12	Wed	Site Survey					Site Survey	Site Survey		Site Survey
23	09-Feb-12	Thu	Meeting with MPW					Site Survey	Site Survey		Site Survey
24	10-Feb-12	Fri	Meeting with MPW					Meeting with MPW	Meeting with MPW		Site Survey
25	11-Feb-12	Sat	Site Survey					Site Survey	Site Survey		Site Survey
26	12-Feb-12	Sun	Meeting with Investigation team Site Survey					Meeting with Investigation team Site Survey	Meeting with Investigation team Site Survey		Meeting with Investigation team Site Survey
27	13-Feb-12	Mon	Site Survey					Meeting with Local Consultant	Meeting with Local Consultant		Site Survey
28	14-Feb-12	Tue	Meeting with LWSC					Site Survey	Site Survey		Site Survey
29	15-Feb-12	Wed	Meeting with MPW					Meeting with Local Consultant	Meeting with Local Consultant		Site Survey
30	16-Feb-12	Thu	Meeting with Local Contractor					Meeting with Local Consultant	Meeting with Local Consultant		Site Survey
31	17-Feb-12	Fri	Site Inspection with MPW					Site Inspection with MPW	Site Inspection with MPW		Site Survey
32	18-Feb-12	Sat	Meeting with Local Contractor	Narita → Frankfurt → Brussels				Site Survey	Site Survey		Site Survey
33	19-Feb-12	Sun	Meeting with Investigation team Site Survey	Brussels → Monrovia				Meeting with Investigation team Site Survey	Meeting with Investigation team Site Survey		Meeting with Investigation team Site Survey
34	20-Feb-12	Mon	AM Visit to JICA PM-Site Survey					Site Survey	Site Survey		Site Survey
35	21-Feb-12	Tue	Stake holder meeting					Stake holder meeting	Stake holder meeting		Site Survey
36	22-Feb-12	Wed	AM Visit to JICA PM-Monrovia → Accra					AM Visit to JICA PM-Monrovia → Accra	AM Visit to JICA PM-Monrovia → Accra		Site Survey
37	23-Feb-12	Thu	Report Preparation					Report Preparation	Report Preparation		Site Survey
38	24-Feb-12	Fri	Visit to EOJ, JICA					Visit to EOJ, JICA	Visit to EOJ, JICA		Site Survey
39	25-Feb-12	Sat	AM-Report Preparation PM-Accra →					AM-Report Preparation PM-Accra →	AM-Report Preparation PM-Accra →		Report Preparation
40	26-Feb-12	Sun	→ Amsterdam →	Meeting with Investigation team Site Survey				→ Amsterdam →	→ Amsterdam →		Meeting with Investigation team Site Survey
41	27-Feb-12	Mon	→ Narita	Site Survey				→ Narita	→ Narita		Report Preparation
42	28-Feb-12	Tue		Site Survey							Report Preparation
43	29-Feb-12	Wed		Site Survey							Site Survey
44	01-Mar-12	Thu		Site Survey	Narita → Frankfurt → Brussels			Site Survey			Site Survey
45	02-Mar-12	Fri		Site Survey	Brussels → Monrovia			Site Survey			Site Survey
46	03-Mar-12	Sat		Site Survey				Site Survey			Site Survey
47	04-Mar-12	Sun		Meeting with Investigation team Site Survey	Meeting with Investigation team Site Survey			Meeting with Investigation team Site Survey			Meeting with Investigation team Site Survey
48	05-Mar-12	Mon		Site Survey	Site Survey			Site Survey			Site Survey
49	06-Mar-12	Tue		Site Survey	Site Survey			Site Survey			Site Survey
50	07-Mar-12	Wed		Site Survey	Site Survey			Site Survey			Site Survey
51	08-Mar-12	Thu		Site Survey	Site Survey			Site Survey			Site Survey
52	09-Mar-12	Fri		Site Survey	Site Survey			Site Survey			Site Survey
53	10-Mar-12	Sat		Site Survey	Site Survey			Site Survey			Site Survey
54	11-Mar-12	Sun		Meeting with Investigation team Site Survey	Meeting with Investigation team Site Survey			Meeting with Investigation team Site Survey			Meeting with Investigation team Site Survey
55	12-Mar-12	Mon		Site Survey	Site Survey			Site Survey			Site Survey
56	13-Mar-12	Tue		Site Survey	Site Survey			Site Survey			Site Survey
57	14-Mar-12	Wed		Site Survey	Site Survey			Site Survey			Site Survey
58	15-Mar-12	Thu		Site Survey	Site Survey			Site Survey			Site Survey
59	16-Mar-12	Fri		Site Survey	Site Survey			Site Survey			Site Survey
60	17-Mar-12	Sat		Site Survey	Site Survey			Report Preparation			Report Preparation
61	18-Mar-12	Sun		Meeting with Investigation team Site Survey	Meeting with Investigation team Site Survey			AM-Report Preparation PM-Monrovia →			Meeting with Investigation team Site Survey
62	19-Mar-12	Mon		Site Survey	Site Survey			→ Brussels → Frankfurt →			AM-Report Preparation PM-Monrovia →
63	20-Mar-12	Tue		Site Survey	Site Survey						→ Brussels → Frankfurt →
64	21-Mar-12	Wed		Site Survey	Site Survey			→ Narita			→ Narita
65	22-Mar-12	Thu		Meeting with MPW	Meeting with MPW						Site Survey
66	23-Mar-12	Fri		Meeting with MPW	Meeting with MPW						Meeting with MPW
67	24-Mar-12	Sat		Site Survey	Site Survey						Site Survey
68	25-Mar-12	Sun		Meeting with Investigation team Site Survey	Meeting with Investigation team Site Survey						Meeting with Investigation team Site Survey
69	26-Mar-12	Mon		Meeting with MPW	Meeting with MPW						Report Preparation
70	27-Mar-12	Tue		Report Preparation	Report Preparation						Report Preparation
71	28-Mar-12	Wed		AM-Report Preparation PM-Monrovia →	AM-Report Preparation PM-Monrovia →						AM-Report Preparation PM-Monrovia →
72	29-Mar-12	Thu		→ Brussels → Frankfurt →	→ Brussels → Frankfurt →						→ Brussels → Frankfurt →
73	30-Mar-12	Fri		→ Narita	→ Narita						→ Narita

EOJ:Embassy of Japan  
EPA:Environmental Protection Agency

MPW:Ministry of Public Works  
MOT:Ministry of Transport

GIZ:Deutsche Gesellschaft für Internationale Zusammenarbeit  
MCC:Monrovia City Corporation  
LWSC:Liberia Water and Sewer Corporation

第2次現地調査（2012年3月31日～6月3日）

Schedule of Preparatory Survey Team for Somalia Drive re-construction project - 2nd Term (31, March, 2012-3, June, 2012)

Name			Mr.Makoto ASHINO	Mr.Daisuke FUKUZAWA	Mr.Tsuyoshi YAMAJUKU	Mr.Keiichi MURAKAMI	Mr.Kiyotaka MIYAKE	Mr.Yasushi AOKI	Mr.Kiyoshi MUKAI	Mr.Mamoru SHIBATA	Mr.Hidekatsu FUJIWARA
Position			Leader (Japan International Cooperation Agency)	Project Coordinator (Japan International Cooperation Agency)	Chief Consultant / Road Planner. (Katahira & Engineers International)	Road Designer 1/ Burial things investigator. (Katahira & Engineers International)	Road Designer 2/ Drainage Designer. (Yachiyo Engineering Co.LTD)	Bridge Designer. (Katahira & Engineers International)	Environment Specialist / Social Specialist 1. (Katahira & Engineers International)	Social Specialist 2. (Yachiyo Engineering Co.LTD)	Construction, Procurement Planner / Cost Estimator. (Katahira & Engineers International)
No.	Date	Day									
1	31-Mar-12	Sat									
2	01-Apr-12	Sun									
3	02-Apr-12	Mon									
4	03-Apr-12	Tue									
5	04-Apr-12	Wed									
6	05-Apr-12	Thu									
7	06-Apr-12	Fri									
8	07-Apr-12	Sat									
9	08-Apr-12	Sun									
10	09-Apr-12	Mon									
11	10-Apr-12	Tue									
12	11-Apr-12	Wed									
13	12-Apr-12	Thu									
14	13-Apr-12	Fri									
15	14-Apr-12	Sat									
16	15-Apr-12	Sun									
17	16-Apr-12	Mon									
18	17-Apr-12	Tue									
19	18-Apr-12	Wed									
20	19-Apr-12	Thu									
21	20-Apr-12	Fri									
22	21-Apr-12	Sat									
23	22-Apr-12	Sun									
24	23-Apr-12	Mon									
25	24-Apr-12	Tue									
26	25-Apr-12	Wed									
27	26-Apr-12	Thu									
28	27-Apr-12	Fri									
29	28-Apr-12	Sat									
30	29-Apr-12	Sun									
31	30-Apr-12	Mon									
32	01-May-12	Tue									
33	02-May-12	Wed									
34	03-May-12	Thu									
35	04-May-12	Fri									
36	05-May-12	Sat									
37	06-May-12	Sun									
38	07-May-12	Mon									
39	08-May-12	Tue									
40	09-May-12	Wed									
41	10-May-12	Thu									
42	11-May-12	Fri									
43	12-May-12	Sat									
44	13-May-12	Sun									
45	14-May-12	Mon									
46	15-May-12	Tue									
47	16-May-12	Wed									
48	17-May-12	Thu									
49	18-May-12	Fri									
50	19-May-12	Sat									
51	20-May-12	Sun									
52	21-May-12	Mon									
53	22-May-12	Tue									
54	23-May-12	Wed									
55	24-May-12	Thu									
56	25-May-12	Fri									
57	26-May-12	Sat									
58	27-May-12	Sun									
59	28-May-12	Mon									
60	29-May-12	Tue									
61	30-May-12	Wed									
62	31-May-12	Thu									
63	01-Jun-12	Fri									
64	02-Jun-12	Sat									
65	03-Jun-12	Sun									

EOJ:Embassy of Japan

MPW:Ministry of Public Works

NTA:National Transit Authority

EPA:Environmental Protection Agency

MOT:Ministry of Transport

**Schedule of Preparatory Survey Team for Somalia Drive re-construction project  
3rd time Survey (6,October, 2012-28,October, 2012)**

Name			Mr.Tsuyoshi YAMAJUKU	Mr.Kiyoshi MUKAI
Position			Chief Consultant / Road Planner. (Katahira & Engineers International)	Environment Specialist / Social Specialist 1. (Katahira & Engineers International)
No.	Date	Day		
1	06-Oct-12	Sat		Narita → Frankfurt → Brussels
2	07-Oct-12	Sun		Brussels → Monrovia
3	08-Oct-12	Mon		Meeting with MPW, WB and Local Consultant
4	09-Oct-12	Tue		Meeting with EPA, MPW and Local Consultant
5	10-Oct-12	Wed		Meeting with EPA, MPW and Local Consultant
6	11-Oct-12	Thu		Meeting with EPA, MPW and Local Consultant
7	12-Oct-12	Fri		Meeting with MPW and WB, Site Survey
8	13-Oct-12	Sat		Report Preparation
9	14-Oct-12	Sun		AM: Report Preparation PM: Monrovia →
10	15-Oct-12	Mon		→ Brussels → Frankfurt →
11	16-Oct-12	Tue		→ Narita
1	22-Oct-12	Mon	Narita → Europe	
2	23-Oct-12	Tue	Europe → Monrovia	
3	24-Oct-12	Wed	Meeting with MPW	
4	25-Oct-12	Thu	Meeting with MPW, Site investigation	
5	26-Oct-12	Fri	AM:Meeting with MPW , PM:Monrovia →	
6	27-Oct-12	Sat	→ Europe →	
7	28-Oct-12	Sun	→ Narita	

**MPW:Ministry of Public Works**

概略設計概要説明調査（2012年11月25日～12月9日）

Schedule of Preparatory Survey Team for Somalia Drive re-construction project - DBD (25,November, 2012-9,December, 2012)

Name			Mr.Makoto ASHINO	Mr.Yutaro KANEKO	Ms. Kyoko Uematsu	Mr.Tsuyoshi YAMAJUKU	Mr.Keiichi MURAKAMI
Position			Leader (Japan International Cooperation Agency)	Project Coordinator (Japan International Cooperation Agency)	Environmental and Social Considerations (Japan International Cooperarion Agency)	Chief Consultant / Road Planner. (Katahira & Engineers International)	Road Designer 1/ Burial things investigator. (Katahira & Engineers International)
No.	Date	Day					
1	25-Nov-12	Sun			Tokyo→Frankfurt→Brussels →Monrovia	Narita → Amsterdam	
2	26-Nov-12	Mon			Meeting with EPA	Amsterdam → Accra	Tokyo → Paris
3	27-Nov-12	Tue			Meeting with MPW	Visit to JICA in Accra	Paris → Monrovia
4	28-Nov-12	Wed			Meeting with MPW	Accra → Monrovia (KQ)	Meeting with MPW, WB
5	29-Nov-12	Thu			Meeting Investigation team, Site survey with MPW		
6	30-Nov-12	Fri			Meeting with EPA	Meeting with MPW	
7	01-Dec-12	Sat			Site Survey	Site Survey	
8	02-Dec-12	Sun	Tokyo→Frankfurt→Brussels→Monrovia			Meeting with Investigation team , Site Survey	
9	03-Dec-12	Mon	Site Survey, Meeting with MPW			Site Survey, Meeting with MPW	
10	04-Dec-12	Tue	Meeting with MPW, Stakeholder Meeting			Meeting with MPW, Stakeholder Meeting	
11	05-Dec-12	Wed	AM:Meetg with MPW , PM:Signing of MD			AM:Meetg with MPW , PM:Signing of MD	
12	06-Dec-12	Thu	Monrovia→Accra→			Site Survey	
13	07-Dec-12	Fri	→London→			AM:Meeting with MPW , PM:Monrovia →	
14	08-Dec-12	Sat	→Tokyo			→ Amsterdam →	→ Paris →
15	09-Dec-12	Sun				→ Narita	→ Tokyo

EOJ:Embassy of Japan

MPW:Ministry of Public Works

EPA:Environmental Protection Agency

MOT:Ministry of Transport

### 3. 関係者（面会者）リスト

#### 在ガーナ日本大使館

- 特命全権大使 : 二階 尚人
- 参事官 : 望月 寿信
- 一等書記官 : 斉藤 俊亮

#### JICA ガーナ事務所

- ガーナ事務所 所長 : 稲村 次郎
- ガーナ事務所 次長 : 木藤 耕一
- ガーナ事務所 次長 : 相良 冬木
- ガーナ事務所 次長 : 佐藤 仁
- 所員 : 白倉 紀
- 所員 : 福原 一郎
- 企画調査員 : 櫻井 理

#### JICA リベリア フィールド事務所

- 企画調査員 : 三浦 慕
- カントリーマネージャー : 大草 真紀

#### Ministry of Public Works

- Minister : ATTY. Samuel Kofi Woods, II
- Deputy Minister for Technical services : Mr. Victor B. Smith
- Acting Assistant Minister : Mr. Edsel Edward Smith
- Technical Assistant, Office of the Minister : Mr. I. Richmond W. K. Harding
- Head Engineer : Mr. A. D. E. Jackson
- Chef Engineer : Mr. Lasana Sesay
- Environmental Consultant : Prof. David L. Wiles, M. Phil
- Program Director : Mr. A. G. Beckley
- Deputy Program Director : Mr. Emmanuel K. Baker

#### Ministry of Transport

- Minister : Hon. Willard A. Russell, I
- Technical assistant Minister : Mr. Gabriel S. Tarplah
- Sr. Research/Policy Officer : Mr. D. Erasmulr Grngar
- Sr. Research/Policy Advisor : Mr. Julius D. Dennis, Jr

#### City Government of Monrovia

- Mayor, Chairman : Ms. Mary T. Broh

### **Environmental Protection Agency of Liberia**

- Executive Director : Ms. Anyaa Vahiri
- Deputy Executive Director : Mr. Nathaniel T. Blama
- Assistant Manager : Mr. Varney L. Conneh
- Supervisor, Environmental Quality & Standard : Mr. Earl A.R. Neblett
- Statistician : Sete F. Marshall

### **Land Commission**

- Chairman : PhD. Cecil T.O. Brandy
- Vice Chairman : Mr. Walter Y. Wisner
- Adm. Assistant / Land Commission : Ms. Daniel Warner

### **National Transit Authority**

- Quality Control Manager : Mr. E. Cosby Pelham
- Internal Audit Manager : Mr. Edmond Forh Forh
- Financial Comptroller / CFO : Mr. J. Willy Moore ESQ

### **Liberia Water & Sewer Corporation**

- Managing Director : Mr. Nortu Jappah
- Deputy Managing Director for Technical Service : Mr. Elmos B. Glay

### **Liberia Institute of Statistics &**

#### **Geo-Information Services**

- Director General : PhD T. Edward Liberty
- Sr. Demographer : Ms. Dorothy D. Johnson

### **World Bank**

- Senior Highway Engineer Transport Section : Mr. Kulwinder Singh Rao
  - Sr. Operations Officer : Ms. Coleen R. Littlejohn
  - Urban Development Specialist : Ms. Jenny Hasselsten
- Africa Region Urban and Water Unit (ERTWU)

### **GIZ**

- Project Manager for Capacity Building for the : Ms. Claudia Hermes  
Transport Sector in Liberia
- Road Maintenance Advisor : Mr. Walter Frankenberger

4. 討議議事録 (M/D)

(1) 概略設計概要説明 (2012年12月5日)

Minutes of Discussions  
on  
the Preparatory Survey  
on  
the Project for Reconstruction of Somalia Drive in Monrovia  
in  
the Republic of Liberia

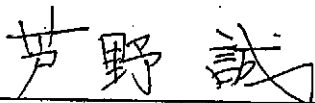
(Explanation on Draft Final Report)

In April 2012, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey Teams on the Project for Reconstruction of Somalia Drive in Monrovia to the Republic of Liberia. Through the discussions, field surveys and technical examination in Japan, JICA finally prepared a Draft Final Report of the study.

In order to explain and consult with the concerned officials of the Government of the Republic of Liberia on the contents of the Draft Final Report, JICA dispatched the Preparatory Survey Team headed by Mr. Makoto Ashino (hereinafter referred to as "the Team") to Republic of Liberia scheduled to stay from November 26 to December 6, 2012.

As a result of the discussions, both sides confirmed the main item described in the attached sheets.

Monrovia, December 5, 2012



Makoto Ashino  
Leader, Preparatory Survey Team  
Japan International Cooperation Agency



Victor B. Smith  
Deputy Minister for Technical Services  
Ministry of Public Works



Yancon-Dargbe Nimley  
Assistant Minister for Economic  
Cooperation & Integration  
Ministry of Planning & Economic Affairs



## ATTACHMENT

### 1. Project Component

After the explanation of the contents of the Draft Final Report by the Team, Liberian side agreed in principle to the project contents below.

- Expansion of the Somalia Drive (from Sta. 0+0125 to Sta. 13+000) from 2-lanes to 4-lanes (Construction of new additional 2-lane roads) including necessary facilities such as pedestrian walkway, traffic signs etc.
- Construction and rehabilitation of Stockton Bridge (Totally 4-lane).

### 2. Cost Estimation

- 2-1. Both sides agreed that the Project Cost Estimation as attached in Annex- 1 should never be duplicated nor disclosed to any third parties before the signing of all the contract(s) with contractor(s) for the Project.
- 2-2. The Team explained to Liberian side that the rough estimate of the Project Cost described in Annex- 1 includes the contingency, however, the final Project Cost including the contingency described in E/N would be appraised by the Government of Japan. The contingency would cover the additional cost due to natural disaster, unexpected natural conditions, etc.

### 3. Japan's Grant Aid Scheme

Liberian side understood the Japan's Grant Aid scheme and the necessary measures to be taken by the recipient country as explained by the Team and described in Annex-3, Annex-4 and Annex-5 of the Minutes of Discussions signed on August 31, 2011.

Liberian side also understood that the Preparatory Survey Team is not in the position to guarantee implementation of the Project, this position is the responsibility of the Government of Japan.

### 4. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to Liberian side around February, 2013.

### 5. Environmental and Social Considerations

#### General

#### 5-1. Environmental Guidelines and Environmental Category

The Team explained that "JICA Guidelines for Environmental and Social Considerations dated April 2004" (hereinafter referred to as "the Environmental Guidelines") is applied to the Project.

The Team further explained that the Project is categorized as "A" in accordance with the



Environmental Guidelines, because the project falls into the road sector located in a sensitive area (adjacent to the Mesurado Wetland registered under the Ramsar Convention) and is likely to have significant adverse impact due to its characteristic (large-scale involuntary resettlement) under the Environmental Guidelines.

The environmental and social considerations including major impacts and mitigation measures for the Project are summarized in the Environmental Checklist (Annex-2).

#### **5-2. Consultations with stakeholders**

The Team confirmed that the Ministry of Public Works (hereinafter referred to as "MPW") has conducted public consultations regarding the Environmental Impact Assessment (the EIA) and the Resettlement Action Plan (the RAP) in the Project area at scoping stage and draft report's preparation stage.

MPW assured to continue consultations and information disclosure with stakeholders including Project Affected Persons (PAPs).

#### **5-3. Information Disclosure**

MPW assured that as soon as the EIA (including the RAP) is approved by the Environmental Protection Agency (hereinafter referred to as "EPA"), MPW will disclose the approved EIA report and the RAP written in English, which is an official language of Liberia, at the offices of MPW, EPA, Monrovia City Corporation (hereinafter referred to as "MCC"), Paynesville City Corporation (hereinafter referred to as "PCC") and administrative buildings in New Georgia and Gardnersville, and at the same time, it will post summary of the RAP, which includes the key impacts, entitlements and grievance procedures, on each community center in the affected area.

MPW also assured that it will notify the disclosure of the EIA report and the RAP on local newspapers prior to the disclosure and that the EIA report and the RAP will be available for photocopying for anyone who is interested in.

#### **5-4. Monitoring for Environmental and Social considerations**

##### **5-4-1. Environmental Monitoring**

MPW and the Team confirmed that environmental monitoring will be conducted by the Infrastructure Implementation Unit of MPW (hereinafter referred to as "MPW/IIU") in accordance with the Monitoring Plan described in the EIA report.

MPW agreed to submit the results of the monitoring to JICA Liberia field office on a quarterly basis during construction. After the completion of the Project, MPW confirmed it will submit the monitoring result to JICA Liberia field office semiannually for two (2) years.

The monitoring form to be submitted to JICA is Annex- 3 for construction stage and Annex- 4 for operation stage. Monitoring items shall be reviewed if necessary, under agreement between MPW and JICA.



#### **5-4-2. Internal Monitoring of RAP Implementation**

MPW and the Team confirmed that internal monitoring will be conducted by RAP Implementation Committee, together with MPW/IIU, based on the RAP.

MPW agreed to submit the result of the internal monitoring to JICA Liberia field office on a quarterly basis until the completion of RAP implementation.

The monitoring form to be submitted to JICA is Annex- 5.

#### **5-4-3. External Monitoring of RAP Implementation**

MPW confirmed external monitoring on involuntary resettlement including the status of livelihood restoration will be conducted for at least three (3) times in 2 years after the completion of RAP implementation by an independent agency hired by MPW. Criteria and indicators for external monitoring are envisaged in the RAP (Table 15.2).

MPW agreed to check the external monitoring reports submitted from the agency and send it to JICA Liberia field office as soon as each report is finalized.

#### **5-4-4. Extension of Monitoring Report period**

In case JICA finds that there is a remaining issue that needs to be addressed (e.g. insufficient restoration of livelihood of displaced PAPs and/or there is a need for improvement in a situation with respect to environmental/social considerations after the agreed monitoring period, JICA may request to extend the period of monitoring and reporting until JICA confirms the issues have been properly addressed and solved in accordance with the agreement between MPW and JICA.

### **Environmental considerations**

#### **5-5. Requirement of EIA under Liberian legislation**

Liberian legislation "Environmental Impact Assessment Procedural Guidelines (2006)" stipulates that EIA shall be conducted and approved by EPA for the Project.

MPW explained that it submitted the EIA report including the RAP to EPA in October 2012, and the EIA will be approved by December 10, 2012.

MPW stated that as soon as the EIA is approved, it will submit to JICA a photocopy of the approval letter and the approved EIA report including the RAP.

#### **5-6. Required Permission**

MPW explained that no other environmental official permission is required as long as construction and operation comply with the contents of the EIA. However, if any other permission is required for the Project, MPW ensures that contractor(s) for civil works follow appropriate procedures to acquire the permits.

#### **5-7. Consideration of Alternatives**

MPW confirmed that the Project design including construction of Stockton Bridge and repair of Double Bridge is proposed considering the impact on Mesurado wetland located on the south of the Project road, magnitude of involuntary resettlement, project cost,



construction period, technical aspect, economic impact, etc.

### **5-8. Environmental Mitigation Measures**

MPW assured that possible negative impacts during construction and operation phase will be mitigated to appropriate level. Mitigation measures to be taken for the Project include but not limited to the ones described in the EIA.

Regarding the situation of storm water channel which is clogged by garbage, MPW is committed to work with relevant authorities to do the followings;

- Improve the drainages which lead collected storm water into Mesurado Wetland before the completion of the Project road and at its own cost,
- Continuously facilitate anti-littering campaign for local people held by EPA, MCC and PCC, and
- Monitor the condition of storm water discharge every two (2) weeks, and take timely appropriate measures accordingly during the operation stage.

In Addition, regarding the garbage dumped and accumulated along the road, MPW agreed to monthly monitor the garbage around the road, and take measures accordingly in collaboration with MCC and PCC to maintain the best sanitary condition.

MPW and the Team assured that cost for conducting environmental mitigation measures and monitoring activities during construction phase (US\$ 54,000) is included in the Project cost, and cost for conducting environmental monitoring activities (US\$ 60,000 for the first two (2) years) and additional necessary budget during operation and maintenance phase will be allocated by MPW.

### **Social consideration**

#### **5-9. Scale of Resettlement**

MPW explained that the scale of resettlement is as the followings;

- Number of PAPs; 918
- Number of structures to be affected; 449  
(Commercial; 424, Residential; 11, Unclassified: 14)
- Number of the structures' owners; 456

#### **5-10. Resettlement Action Plan**

MPW confirmed that resettlement will be implemented in accordance with the RAP. MPW also confirmed that PAPs will be compensated in accordance with the entitlement matrix (Annex- 6). Such compensation policy has been explained to PAPs and agreed through satisfactory stakeholder consultations.

The RAP will be updated following the detailed asset survey to be conducted by MPW before implementation of RAP, taking into account the followings.

- The information of 89 structures' owners out of 456 who were absent during RAP preparation in 2012 will be followed up.
- Compensation rates mentioned in the entitlement matrix will be updated/recalculated

**List of Annexes**

- Annex-1 Project Cost Summary
- Annex-2 Environmental Checklist
- Annex-3 Environmental Monitoring Form for Construction Stage
- Annex-4 Environmental Monitoring Form for Operation Stage
- Annex-5 Monitoring Form for Resettlement
- Annex-6 Entitlement Matrix
- Annex-7 Implementation Schedule of Resettlement
- Annex-8 Responsibility Matrix

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### Project Cost Summary

#### (1) Japanese Contribution

The Project will be implemented in accordance with the Japan's Grand Aid scheme and the cost will be determined before concluding the Exchange of Note for the Project.

#### (2) Liberia Contribution

Cost Summary of Liberia Contribution

Item	Amount US\$
1. Land acquisition and relocation of house	860,000
2. Utility Relocation Cost	600,000
3. Environmental Monitoring Cost	60,000
4. Advising Commission (Bank Charges)	25,000
Total	1,545,000

#### (3) Condition of Estimation

- ① Estimation Month/Year : June 2012
- ② Foreign Exchange Rate : US\$ 1.00 = 80.52 Yen (Exchange rate of Japanese Yen against American dollar)
- ③ Construction Period : Schedule of detailed design and construction supervision is shown in the schedule of implementation
- ④ Others : The project is to be carried out based on the Japanese Government's grant aid scheme.



## Environmental Checklist

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) Y (b) N (c) - (d) -	(a) EIA/RAP reports were prepared. (b) EIA/RAP reports are under review by EPA. EIA license will be issued by December 2012. (c) Still unknown. (d) No license and/or permission is required except for EIA license issued by EPA. No construction work will not start until EPA approval which means EIA license (approval) of the Project is granted.
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a) Y (b) Y	(a) At the stage of EIA/RAP preparation, sufficient stakeholder meetings were taken place and consensus/understanding from local stakeholders and authorities concerned to the Project was obtained. (b) Opinions raised from local resident were reflected to the Project design including Resettlement Action Plan (RAP) as much as possible.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) 5 alternatives including zero-action were examined with social and environmental considerations and most suitable alternative was selected.
	(1) Air Quality	(a) Is there a possibility that air pollutants emitted from the project related sources, such as vehicles traffic will affect ambient air quality? Does ambient air quality comply with the country's air quality standards? Are any mitigating measures taken? (b) Where industrial areas already exist near the route, is there a possibility that the project will make air pollution worse?	(a) Y (b) N	(a) Since the Project is to expand the existing road, the volume of traffic is expected to increase. However the total of emission volume from the traffic is going to decrease or be almost same as the zero-action due to speed-up of travel speed. Also ambient air quality is expected to be under Draft standard of ambient air quality in Liberia and that of WHO. (b) It is expected that ambient air quality will not exceed the standard above. However mitigation measures as follows will be taken, (1) periodical monitoring surveys for ambient air quality, (2) promotion of lead-free gasoline, (3) promotion of crackdown against ill-serviced vehicles.

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**Environmental Checklist**

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
2 Pollution Control	(2) Water Quality	(a) Is there a possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water areas? (b) Is there a possibility that surface runoff from roads will contaminate water sources, such as groundwater? (c) Do effluents from various facilities, such as parking areas/service areas comply with the country's effluent standards and ambient water quality standards? Is there a possibility that the effluents will cause areas not to comply with the country's ambient water quality standards?	(a) Y (b) Y (c) -	(a) It is possible. However it is expected that the water quality degradations in downstream water areas will be limited based on reasons that (1) large-scaled earth cutting and filling are not planned, (2) appropriate slope protections such as vegetation is taken. (b) It is expected that spilled oil on the road is flown out by rain water and contaminate groundwater etc. However it is also expected that the impact is limited based on reasons that (1) the amount of spilled oil on the road is a little, (2) crackdowns against ill-serviced vehicles is promoted. (c) No parking area/service is designed in the Project components. 35 bus stops in total are designed to be installed along the Project road, however no factor affecting water quality is expected.
	(3) Wastes	(a) Are wastes generated from the project facilities, such as parking areas/service areas, properly treated and disposed of in accordance with the country's regulations?	(a) -	(a) No parking area/service is designed in the Project components. Wastes arising from road maintenance/cleaning works and in/outside of ROW are disposed by MPW, those arising from cleaning works are disposed by Monrovia City Corporation (MCC). Swage are collected by the Liberia water and sewage corporation (LWSC).
2 Pollution Control	(4) Noise and Vibration	(a) Do noise and vibrations from the vehicle and train traffic comply with the country's standards?	(a) Y/N	(a) Draft standard for noise has been prepared but that for vibration does not exist. Therefore as for noise, Draft standard in Liberia and International Financial Corporation(IFC) standard and as for vibration Ghana standard are used to evaluate the current level in the Project site. Regarding noise, based on the baseline survey, 3 out of 4 survey points are over Draft Liberian standard and IFC standard. Regarding vibration, based on the baseline survey, most of points are below standard in Ghana. As mitigation measures in operation phase, (1) planted trees in green belt will be maintained well, (2) crackdown against ill-serviced vehicles is promoted, (3) crackdown against over-loaded vehicles is promoted, (4) periodical monitoring surveys for noise and vibration are done.
	(1) Protected Areas	(a) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N	(a) The Project road is close to the Mesurado Wetland designated as Ramsar Convention however no direct impact is expected. However, as the possibility of indirect affect still exists, monitoring survey for ambient air quality, water quality, noise & vibration and ecosystem along the Project road will be conducted.

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## Environmental Checklist

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
3 Natural Environment	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem? (d) Are adequate protection measures taken to prevent impacts, such as disruption of migration routes, habitat fragmentation, and traffic accident of wildlife and livestock? (e) Is there a possibility that installation of roads will cause impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystems due to introduction of exotic (non-native invasive) species and pests? Are adequate measures for preventing such impacts considered? (f) In cases the project site is located at undeveloped areas, is there a possibility that the new development will result in extensive loss of natural environments?	(a) N (b) N (c) - (d) N (e) N (f) N	(a) According to discussions with EPA who manages the Mesurado Wetland, it was confirmed that primeval forest, tropical rain forests, ecologically valuable habitats were not encompassed in the Project area. In addition, no mangrove is confirmed along the Project road including ROW. (b) According to discussions with EPA, it was confirmed that the protected habitats of endangered species by GoL and/or international treaties and conventions were not encompassed in the Project area. (c) Significant ecological impacts are not anticipated however in order to mitigate the impacts, the followings measures will be taken. (1) Trees which do not affect road structures in ROW remain. (2) Green belt is installed along the entire road length. (3) Monitoring surveys for ecosystem are conducted. (d) Since the Project road is situated in sub-industrial and residential area, measures such as disruption of migration routes, habitat fragmentation and traffic accident of wildlife and livestock are not necessary. (e) As a part of the Project, about 50 trees will be cut however trees co-habiting with surrounding nature is forested. (f) The Project site is already utilized as sub-industrial and residential area, therefore extensive loss of natural environment is not expected causing new area development.
	(3) Hydrology	(a) Is there a possibility that alteration of topographic features and installation of structures, such as tunnels will adversely affect surface water and groundwater flows?	(a) N	(a) Piers for new bridge will be constructed in Stockton Creek however type of piers and its construction method affecting water flow less is introduced.
3 Natural Environment	(4) Topography and Geology	(a) Is there any soft ground on the route that may cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides, where needed? (b) Is there a possibility that civil works, such as cutting and filling will cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides? (c) Is there a possibility that soil runoff will result from cut and fill areas, waste soil disposal sites, and borrow sites? Are adequate measures taken to prevent soil runoff?	(a) N (b) N (c) Y	(a) Since the existing road passes through relatively flat area, slope failures are less likely to happen. Also based on the geological survey, no soft ground area confirmed. (b) Large-scaled civil works are not expected. (c) It is possible. Protection measures against earth cutting and filling are appropriate slope and hydraulic seeding works. Also it was confirmed that waste soil disposal sites and borrow sites were maintained well.

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## Environmental Checklist

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Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
4 Social Environment	(1) Resettlement	(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement? (b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement? (c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? (d) Are the compensations going to be paid prior to the resettlement? (e) Are the compensation policies prepared in document? (f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples? (g) Are agreements with the affected people obtained prior to resettlement? (h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan? (i) Are any plans developed to monitor the impacts of resettlement? (j) Is the grievance redress mechanism established?	(a) Y (b) Y (c) Y (d) Y (e) Y (f) Y (g) Y (h) Y (i) Y (j) Y	(a) 918 Project Affected Persons (PAPs) (456 owner of structure) occupying 449 commercial and residential structures would be affected within 75 feet (or 22.86m) of the ROW. In order to minimize the involuntary resettlement, 5 alternatives were examined and most suitable alternatives was selected. (b) At the stage of RAP preparation, 9 stakeholder meetings were taken place and appropriate explanation on compensation and resettlement assistance was given to PAPs. (c) Resettlement cost study was carried out and appropriate resettlement cost was calculated based on the study. (d) RAP states that the compensations is going to be paid prior to the resettlement. (e) Compensation policies are shown in RAP and RAP will be disclosed to public after EPA approval. (f) Vulnerable groups are given particular attention and it is mentioned in RAP. (g) Based on the 8 stakeholder meetings, agreements from PAPs are expected to be obtained. However there are some unidentified PAPs, therefore MPW keeps trying to find out the PAPs by using mass medias and local communities. (h) Organizational framework with MPW's initiative to properly implement resettlement has been established. Also budget necessary will be allocated. (i) Monitoring surveys are expected to be implemented properly by both internal and external organizations. (j) Grievance redress mechanism is established by reference to past project implemented by World Bank.

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## Environmental Checklist

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
4 Social Environment	(2) Living and Livelihood	<p>(a) Where roads are newly installed, is there a possibility that the project will affect the existing means of transportation and the associated workers? Is there a possibility that the project will cause significant impacts, such as extensive alteration of existing land uses, changes in sources of livelihood, or unemployment? Are adequate measures considered for preventing these impacts?</p> <p>(b) Is there any possibility that the project will adversely affect the living conditions of the inhabitants other than the target population? Are adequate measures considered to reduce the impacts, if necessary?</p> <p>(c) Is there any possibility that diseases, including infectious diseases, such as HIV will be brought due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary?</p> <p>(d) Is there any possibility that the project will adversely affect road traffic in the surrounding areas (e.g., increase of traffic congestion and traffic accidents)?</p> <p>(e) Is there any possibility that roads will impede the movement of inhabitants?</p> <p>(f) Is there any possibility that structures associated with roads (such as bridges) will cause a sun shading and radio interference?</p>	<p>(a) N (b) N (c) Y (d) Y (e) N (f) N</p>	<p>(a) Since the Project is to expand the existing road, the existing means of transport is not expected to be affected.</p> <p>(b) The Project does not affect the local resident on living and livelihood except for PAPs above.</p> <p>(c) Diseases including infectious diseases are expected to be brought due to immigration of workers associated with the project. Workers involving the Project are educated by contractor.</p> <p>(d) The Project is expected to contribute mitigating traffic congestion however it is expected to affect traffic accidents because travel speed will be up.</p> <p>(e) Since the Project is to expand the existing road, the movement of inhabitants will not be impeded.</p> <p>(f) Since the Project road passes through almost ground level except for the bridges, a sun shading and radio interference does not be caused.</p>
	(3) Heritage	<p>(a) Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?</p>	<p>(a) N</p>	<p>(a) No archaeological, historical, cultural, and religious heritage does exist along the Project road.</p>
	(4) Landscape	<p>(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?</p>	<p>(a) N</p>	<p>(a) No significant impact is expected.</p>
	(5) Ethnic Minorities and Indigenous Peoples	<p>(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples?</p> <p>(b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources to be respected?</p>	<p>(a) - (b) -</p>	<p>(a) No ethnic minority and indigenous people does exist.</p> <p>(b) Same above.</p>

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## Environmental Checklist

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
4 Social Environment	(6) Working Conditions	<p>(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project?</p> <p>(b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials?</p> <p>(c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.?</p> <p>(d) Are appropriate measures being taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?</p>	<p>(a) Y</p> <p>(b) Y</p> <p>(c) Y</p> <p>(d) Y</p>	<p>(a) Construction plan is in accordance with Labor Law of Liberia.</p> <p>(b) (c) As tangible measures, safety equipments are installed to prevent accidents. As intangible measures, suitable construction implementation plan for securing safety based on construction safety plan will be prepared. Also it is stated that appropriate education is provided to construction workers and related persons. Moreover monitoring is done to confirm if mentioned above is kept.</p> <p>(d) In order to prevent accidents, safety equipments will be installed. Also appropriate safety education to construction workers, security guards and traffic control staff are mobilized.</p>

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## Environmental Checklist

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
5 Others	(1) Impacts during Construction	<p>(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?</p> <p>(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?</p> <p>(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?</p>	<p>(a) Y</p> <p>(b) Y</p> <p>(c) Y</p>	<p>(a) Mitigation measures against pollution during construction are as follows. Regarding noise and vibration, (1) for the purpose of alleviate traffic congestion, existing 2-lane road is expanded into 4-lane road, (2) the number of surface layer joint on new additional 2-lane road is decreased as many as possible, (3) low-noise construction machineries are used. (4) construction machineries are used properly, also regular maintenance work is implemented. (5) green belt is constructed and trees are planted in the green belt, (6) construction work is done only daytime around schools and clinics, (7) monitoring is carried out regularly (8) in case night work is implemented, advance notice is given and permission is obtained. (9) crackdown against ill-serviced vehicles are promoted. Regarding water quality, (1) waste water from construction site is not discharged into the rivers directly. (2) construction machinery is not washed in the rivers. (3) during bridge construction, oil fence and anti-water pollution net are used. Regarding dust and emission, (1) construction machinery is used properly without unnecessary idling. Also regular maintenance work is implemented. (2) sprinkling of water is carried out regularly during dry season. (3) in case of placing backfilling and excavated soil temporarily, the soil is covered by anti-scattering sheets. (4) monitoring is carried out regularly. (5) lead free gasoline is used for construction machinery and vehicles. Regarding construction waste, (1) construction waste is recycled as much as possible. (2) in case recycle is not available, the waste is disposed in appropriate facilities.</p> <p>(b) As mitigation measures against natural environment, (1) trees which do not affect road structures in ROW remain. (2) green belt is installed along the entire road length. (3) ecosystem monitoring is conducted in Stockton Creek and Warner Creek.</p> <p>(c) As mitigation measures against social environment, (1) the poor is given priority to get construction works. (2) movable vendors are allowed to operate in ROW where construction work is not disturbed. (3) traffic control staff is allocated to smooth the traffic and avoid accidents (4) temporal busbays are installed in order to secure means of transport for local resident.</p>
5 Others	(2) Monitoring	<p>(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?</p> <p>(b) What are the items, methods and frequencies of the monitoring program?</p> <p>(c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?</p> <p>(d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?</p>	<p>(a) Y</p> <p>(b) Y</p> <p>(c) Y</p> <p>(d) Y</p>	<p>(a) Monitoring program for the environmental items was developed and stated in EIA report.</p> <p>(b) Monitoring items, methods and frequencies were determined in consideration of personnel, budget etc. of MPW/IIU.</p> <p>(c) MPW establishes IIU who is in charge of EIA issue. IIU applies budget necessary for the Project implementation in the next fiscal year.</p> <p>(d) EIA/RAP report states format and frequency of the reports.</p>

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## Environmental Checklist

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
6 Note	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry Projects checklist should also be checked (e.g., projects including large areas of deforestation). (b) Where necessary, pertinent items described in the Power Transmission and Distribution Lines checklist should also be checked (e.g., projects including installation of power transmission lines and/or electric distribution facilities).	(a) N (b) N	(a) No large areas of deforestation is expected in the Project. (b) No installation of power transmission lines and/or electric distribution facilities is expected in the Project.
	Note on Using Environmental Checklist	(a) If necessary, the impacts to transboundary or global issues should be confirmed, if necessary (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) Y	(a) As transboundary or global issues, global warming arising from CO2 emission is expected. However the volume of CO2 emitted from traffic will decrease a bit or be the same level as Zero-option.

1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made.

In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).

2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

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As of YYYY/MM/DD

Vegetation

		Submission of Monitoring Report	Number of trees planted	
			Young Trees	Old Trees
1	2013 (3rd qtr)	YYYY/MM/DD		
2	2013 (4th qtr)	YYYY/MM/DD		
3	2014 (1st qtr)	YYYY/MM/DD		
		YYYY/MM/DD		
		YYYY/MM/DD		
		YYYY/MM/DD		
		YYYY/MM/DD		
		YYYY/MM/DD		

Complaint

	Complaint received	Complaint resolved	Type of Complaint
1	YYYY/MM/DD	YYYY/MM/DD	
2	YYYY/MM/DD	YYYY/MM/DD	
3	YYYY/MM/DD	YYYY/MM/DD	
	YYYY/MM/DD	YYYY/MM/DD	
	YYYY/MM/DD	YYYY/MM/DD	
	YYYY/MM/DD	YYYY/MM/DD	
	YYYY/MM/DD	YYYY/MM/DD	
	YYYY/MM/DD	YYYY/MM/DD	
	YYYY/MM/DD	YYYY/MM/DD	

HIV/AIDS and other Sexually Transmitted Diseases <Campaign>

	Date	Place	Number of Safety Measures		Number of Participants		
			Contraceptive	Condoms	Male	Female	Total
1	YYYY/MM/DD						
2	YYYY/MM/DD						
3	YYYY/MM/DD						
	YYYY/MM/DD						
	YYYY/MM/DD						
	YYYY/MM/DD						
	YYYY/MM/DD						
	YYYY/MM/DD						

Accident

	Date	Place	Number of persons Injured		Type of Accident	Measure taken
			Project's Employee	Non-employee		
1	YYYY/MM/DD					
2	YYYY/MM/DD					
3	YYYY/MM/DD					
	YYYY/MM/DD					
	YYYY/MM/DD					
	YYYY/MM/DD					
	YYYY/MM/DD					
	YYYY/MM/DD					

Sanitary Situation (Garbage along the road)

<Monitoring Frequency> Monthly

	Date	Situation Observed	Measure Taken
1	YYYY/MM/DD		
2	YYYY/MM/DD		
3	YYYY/MM/DD		
	YYYY/MM/DD		
	YYYY/MM/DD		
	YYYY/MM/DD		
	YYYY/MM/DD		
	YYYY/MM/DD		

Air Quality, Water Quality, Noise & Vibration

Item	Parameter	Location	Result	Standard	Remarks
Air Quality	PM10 (average 24h)	[A]		100 µg/m <sup>3</sup> (National) 50 µg/m <sup>3</sup> (WHO)	
		[B]			
		[C]			
	SO <sub>2</sub> (average 24h)	[A]		80 µg/m <sup>3</sup> (National) 20 µg/m <sup>3</sup> (WHO) (average 24h)	
		[B]			
		[C]			
	NO <sub>2</sub> (average 24h)	[A]		80 µg/m <sup>3</sup> (National) (average 24h)	
		[B]			
		[C]			
	CO (average 8h)	[A]		2,000 mg/m <sup>3</sup> (National) 1,000 mg/m <sup>3</sup> (WHO)	
		[B]			
		[C]			
Noise	Noise Level (Day Time 06:01 – 22:00)	[A]		50 dB (National, Residential Building)	
		[B]		45 dB (National, Hospital, School Area)	
		[C]		60 dB (National, Residential + Industry or small production)	
		[D]		50 dB (National, Mixed Residential Building)	
	Noise Level (Night Time 22:01 – 06:00)	[A]		35 dB (National, Residential Building)	
		[B]		35 dB (National, Hospital, School Area)	
		[C]		50 dB (National, Residential + Industry or small production)	
		[D]		35 dB (National, Mixed Residential Building)	
Vibration	Vibration Level (Day Time 06:01 – 22:00)	[A]		55 dB (Ghana, Residential Building)	
		[B]		55 dB (Ghana, Hospital, School Area)	
		[C]		65 dB (Ghana, Residential + Industry or small production)	
		[D]		60 dB (Ghana, Mixed Residential Building)	
	Vibration Level (Night Time 22:01 – 06:00)	[A]		48 dB (Ghana, Residential Building)	
		[B]		50 dB (Ghana, Hospital, School Area)	
		[C]		60 dB (Ghana, Residential + Industry or small production)	
		[D]		55 dB (Ghana, Mixed Residential Building)	
Water Quality	pH	[A]		6.5-8.5 (National, WHO)	
		[B]			
		[C]			
	Temperature	[A]			
		[B]			
		[C]			
	me	[A]		No Color (National)	
		[B]			
		[C]			
	Odor	[A]		No Odor (National)	
		[B]			
		[C]			
	SS	[A]		30 mg/L (WHO)	
		[B]			
		[C]			
	COD	[A]		30-50 mg/L (WHO)	
		[B]			
		[C]			
DO	[A]		< 5.0 mg/L (National, WHO)		
	[B]				
	[C]				
E. Coll	[A]				
	[B]				
	[C]				
Oil & Grease	[A]		0.1 mg/L (National, WHO)		
	[B]				
	[C]				

WHO: World Health Organization

\*\*Remarks; Past trend and current status including remedial measures if necessary

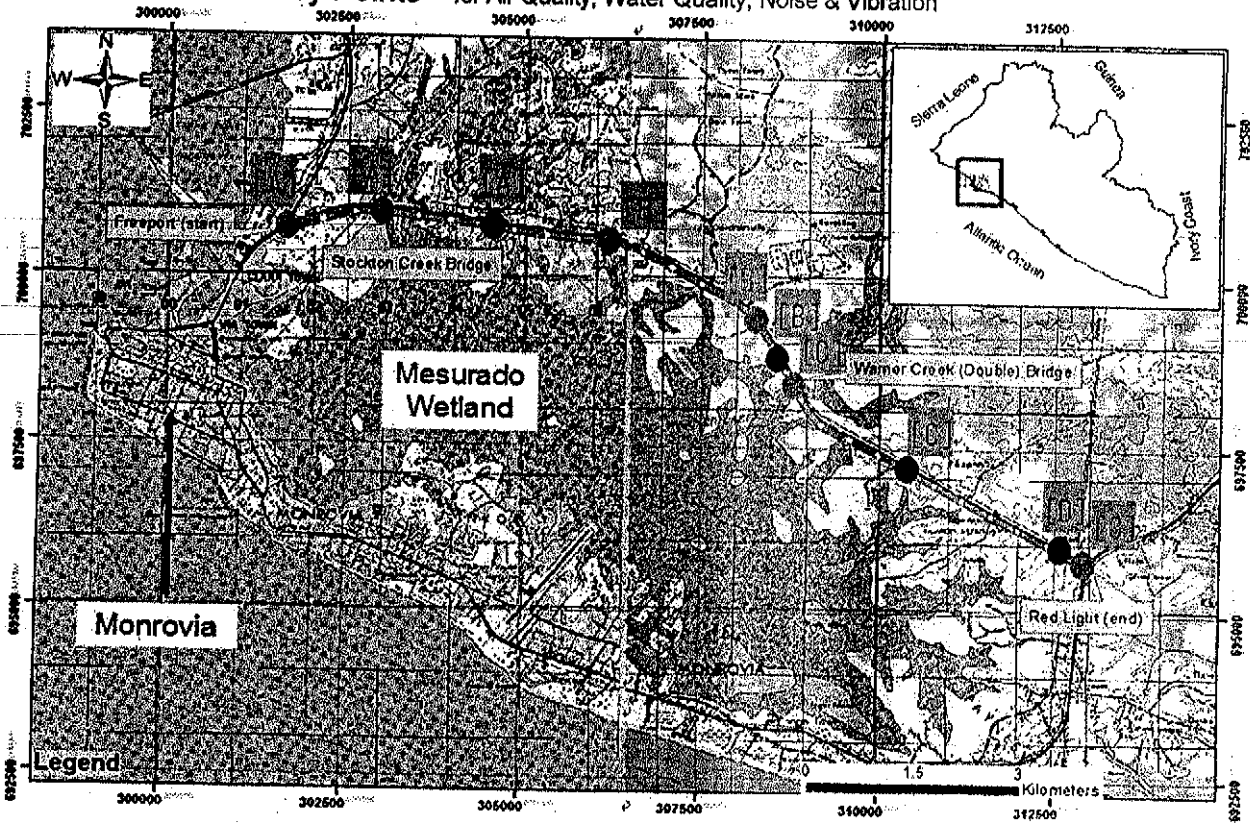
<Monitoring Frequency>

Air Quality, Noise & Vibration; Every three (3) months

Water Quality; Every six (6) months



< Location of Survey Points > for Air Quality, Water Quality, Noise & Vibration



Legend) ● : Air Quality      ● : Water Quality      ● : Noise & Vibration

Coordinates of each Survey Points

Survey Point	North - N West - W	Coordinates		
		Air Quality	Water Quality	Noise & Vibration
[A]	N	15° 04'	6° 18' 57.07"	6° 18' 33.90"
	W	10° 47' 33.54"	10° 43' 41.07"	10° 43' 28.35"
[B]	N	6° 19'	6° 20' 23.73"	6° 19' 06.11"
	W	10° 44' 02.20"	10° 46' 49.52"	10° 43' 42.61"
[C]	N	6° 17'	6° 20' 18.83"	6° 20' 21.85"
	W	10° 41' 27.29"	10° 46' 45.99"	10° 47' 15.87"
[D]	N	-	-	6° 17' 44.72"
	W	-	-	10° 41' 07.62"

Ecosystem <Visual observation of animals>

	Location	Date of Survey	Creatures Found	Threaten to Ecosystem (if any)	Root Cause	Measure Taken
1	Stockton Creek	2013 (Latter Half)				
		Warner Creek				
2	Stockton Creek	2014 (First Half)				
		Warner Creek				
3	Stockton Creek	2014 (Latter Half)				
		Warner Creek				
	Stockton Creek					
	Warner Creek					
	Stockton Creek					
	Warner Creek					

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As of YYYY/MM/DD

Submission of Monitoring Report		
1	2015 (First Half)	YYYY/MM/DD
2	2015 (Latter Half)	YYYY/MM/DD
3	2016 (First Half)	YYYY/MM/DD
4	2016 (Latter Half)	YYYY/MM/DD

**Complaint**

	Complaint received	Complaint resolved	Type of Complaint
1	YYYY/MM/DD	YYYY/MM/DD	
2	YYYY/MM/DD	YYYY/MM/DD	
3	YYYY/MM/DD	YYYY/MM/DD	
	YYYY/MM/DD	YYYY/MM/DD	
	YYYY/MM/DD	YYYY/MM/DD	
	YYYY/MM/DD	YYYY/MM/DD	
	YYYY/MM/DD	YYYY/MM/DD	
	YYYY/MM/DD	YYYY/MM/DD	
	YYYY/MM/DD	YYYY/MM/DD	

**HIV/AIDS and other Sexually Transmitted Diseases** <Campaign>

	Date	Place	Number of Safety Measures Distributed		Number of Participants		
			Contraceptive	Condom	Male	Female	Total
1	YYYY/MM/DD						
2	YYYY/MM/DD						
3	YYYY/MM/DD						
	YYYY/MM/DD						
	YYYY/MM/DD						
	YYYY/MM/DD						
	YYYY/MM/DD						
	YYYY/MM/DD						

**Sanitary Situation** <Garbage along the road>

<Monitoring Frequency> Monthly

	Date	Situation Observed	Measure Taken
1	YYYY/MM/DD		
2	YYYY/MM/DD		
3	YYYY/MM/DD		
	YYYY/MM/DD		
	YYYY/MM/DD		
	YYYY/MM/DD		
	YYYY/MM/DD		
	YYYY/MM/DD		

**Drainage Situation**

<Monitoring Frequency> Every two (2) weeks

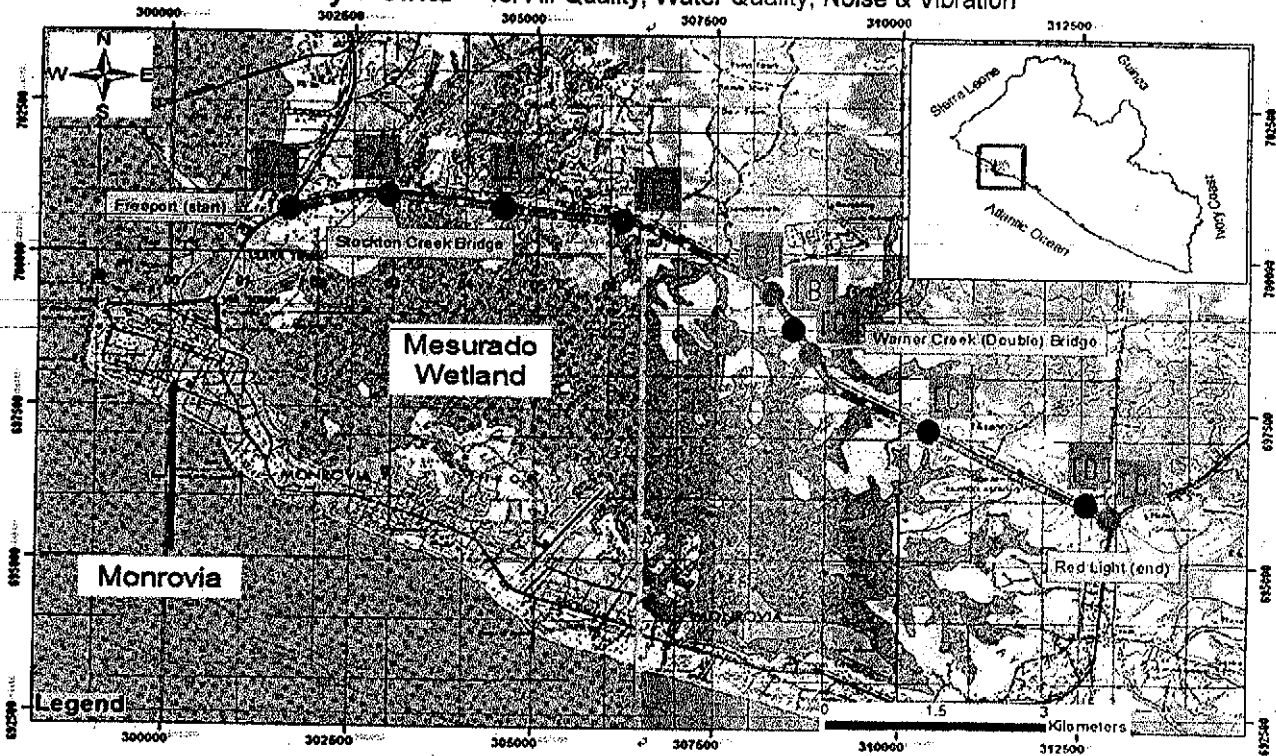
	Date	Situation Observed	Measure Taken
1	YYYY/MM/DD		
2	YYYY/MM/DD		
3	YYYY/MM/DD		
	YYYY/MM/DD		
	YYYY/MM/DD		
	YYYY/MM/DD		
	YYYY/MM/DD		
	YYYY/MM/DD		

**Air Quality, Water Quality, Noise & Vibration**

Item	Parameter	Location	Result	Standard	Remarks	
Air Quality	PM10 (average 24h)	[A]		100 µg/m <sup>3</sup> (National) 50 µg/m <sup>3</sup> (WHO)		
		[B]				
		[C]				
	SO <sub>2</sub> (average 24h)	[A]		80 µg/m <sup>3</sup> (National) 20 µg/m <sup>3</sup> (WHO) (average 24h)		
		[B]				
		[C]				
	NO <sub>2</sub> (average 24h)	[A]		80 µg/m <sup>3</sup> (National) (average 24h)		
		[B]				
		[C]				
	CO (average 8h)	[A]		2,000 mg/m <sup>3</sup> (National) 1,000 mg/m <sup>3</sup> (WHO)		
		[B]				
		[C]				
Noise	Noise Level (Day Time: 06:01 – 22:00)	[A]		50 dB (National, Residential Building)		
		[B]		45 dB (National, Hospital, School Area)		
		[C]		60 dB (National, Residential + industry or small production)		
		[D]		50 dB (National, Mixed Residential Building)		
	Noise Level (Night Time: 22:01 – 06:00)	[A]		35 dB (National, Residential Building)		
		[B]		35 dB (National, Hospital, School Area)		
		[C]		50 dB (National, Residential + industry or small production)		
		[D]		35 dB (National, Mixed Residential Building)		
Vibration	Vibration Level (Day Time: 06:01 – 22:00)	[A]		55 dB (Ghana, Residential Building)		
		[B]		55 dB (Ghana, Hospital, School Area)		
		[C]		65 dB (Ghana, Residential + Industry or small production)		
		[D]		60 dB (Ghana, Mixed Residential Building)		
	Vibration Level (Night Time: 22:01 – 06:00)	[A]		48 dB (Ghana, Residential Building)		
		[B]		50 dB (Ghana, Hospital, School Area)		
		[C]		60 dB (Ghana, Residential + industry or small production)		
		[D]		55 dB (Ghana, Mixed Residential Building)		
Water Quality	pH	[A]		6.5-8.5 (National, WHO)		
		[B]				
		[C]				
	Temperature	[A]				
		[B]				
		[C]				
	me	[A]		No Color (National)		
		[B]				
		[C]				
	Odor	[A]		No Odor (National)		
		[B]				
		[C]				
	SS	[A]		30 mg/L (WHO)		
		[B]				
		[C]				
	COD	[A]		30-50 mg/L (WHO)		
		[B]				
		[C]				
DO	[A]		< 5.0 mg/L (National, WHO)			
	[B]					
	[C]					
E. Coll	[A]					
	[B]					
	[C]					
Oil & Grease	[A]		0.1 mg/L (National, WHO)			
	[B]					
	[C]					

WHO: World Health Organization\*Remarks; Past trend and current status including remedial measures if necessary  
 <Monitoring Frequency> Every six (6) months

< Location of Survey Points > for Air Quality, Water Quality, Noise & Vibration



Regend) ● : Air Quality      ● : Water Quality      ● : Noise & Vibration

Coordinates of each Survey Points

Survey Point	North N		Coordinates		
	West W		Air Quality	Water Quality	Noise & Vibration
[A]	N	6°20'15.61"	6°18'57.07"	6°18'33.90"	
	W	10°47'	10°43'41.07"	10°43'28.35"	
[B]	N	6°19'36.61"	6°20'23.73"	6°19'06.11"	
	W	10°47'	10°46'49.52"	10°43'42.61"	
[C]	N	6°17'33.10"	6°20'18.83"	6°20'21.85"	
	W	10°41'27.29"	10°46'45.99"	10°47'15.87"	
[D]	N	-	-	6°17'44.72"	
	W	-	-	10°41'07.52"	

Ecosystem <Visual observation of animals>

	Location	Date of Survey	Creatures Found	Threaten to Ecosystem (if any)	Root Cause	Measure Taken
1	2015 (First Half)	Stockton Creek YYYY/MM/DD				
		Warner Creek YYYY/MM/DD				
2	2015 (Latter Half)	Stockton Creek YYYY/MM/DD				
		Warner Creek YYYY/MM/DD				
3	2016 (First Half)	Stockton Creek YYYY/MM/DD				
		Warner Creek YYYY/MM/DD				
4	2016 (Latter Half)	Stockton Creek YYYY/MM/DD				
		Warner Creek YYYY/MM/DD				

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As of YYYY/MM/DD

**Progress of Compensation for Affected Structure**

Item	Total Number of Structures	Payment of Compensation	Vacation of Land	(Expected) Date of Completion
Concrete Flat/Zinc Roof	107	0%	0%	YYYY/MM
Concrete Storey/Zinc Roof	3	0%	0%	YYYY/MM
Container (with some development)	130	0%	0%	YYYY/MM
Fence-barb wire	8	0%	0%	YYYY/MM
Fence-concrete/barb wire	7	0%	0%	YYYY/MM
Fuel Stations	50	0%	0%	YYYY/MM
Kiosk	47	0%	0%	YYYY/MM
Mud Bricks/Zinc Roof	12	0%	0%	YYYY/MM
Round Poles/Zinc Roof	20	0%	0%	YYYY/MM
Zinc/Mat Round	10	0%	0%	YYYY/MM
Zinc/Plywood Round	45	0%	0%	YYYY/MM
Other (Well, Bus Stop etc.)	10	0%	0%	YYYY/MM
<b>TOTAL</b>	<b>449</b>	<b>0</b>	<b>0</b>	<b>YYYY/MM</b>

**Progress of Assistance**

Item	Total Number of Households	Payment of Assistance	(Expected) Date of Completion
Compensation for Loss of Income (US\$ 100)	431	0%	YYYY/MM
Relocation Assistance for Container (US\$ 250)	130	0%	YYYY/MM
Relocation Assistance for Residential Structure (US\$ 250)	11	0%	YYYY/MM
Transportation Assistance for Residential Structure (US\$ 100)	25	0%	YYYY/MM
Transportation Assistance for Others (US\$ 100)	25	0%	YYYY/MM
Assistance to Vulnerable People (US\$ 50)	92	0%	YYYY/MM

**Procedures**

Procedure	Date
<b>Institutional Arrangement</b>	
Establishment of RAP Implementation Committee	YYYY/MM/DD
Establishment of Grievance Redress Committee	YYYY/MM/DD
<b>Detailed Asset Survey and Compensation Estimation</b>	
Start of Survey	YYYY/MM/DD
Completion of Survey	YYYY/MM/DD
<b>RAP Budget</b>	
Submission	YYYY/MM/DD
Approval	YYYY/MM/DD

**Submission of Monitoring Report**

<b>Internal Monitoring</b>	
2013 (1st qtr)	YYYY/MM/DD
2013 (2nd qtr)	YYYY/MM/DD
2013 (3rd qtr)	YYYY/MM/DD
2013 (4th qtr)	YYYY/MM/DD
2014 (1st qtr)	YYYY/MM/DD
<b>External Monitoring</b>	
1st	YYYY/MM/DD
2nd	YYYY/MM/DD
3rd	YYYY/MM/DD

**Grievance Redress**

Outline of Grievance and Remarks (if any)	Grievance received	Grievance resolved
1	YYYY/MM/DD	YYYY/MM/DD
2	YYYY/MM/DD	YYYY/MM/DD
3	YYYY/MM/DD	YYYY/MM/DD
	YYYY/MM/DD	YYYY/MM/DD
	YYYY/MM/DD	YYYY/MM/DD

**Public Consultation**

Agenda	Place	Number of Participants	Date
1			YYYY/MM/DD
2			YYYY/MM/DD
3			YYYY/MM/DD
			YYYY/MM/DD
			YYYY/MM/DD

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**ENTITLEMENT MATRIX FOR PROJECT AFFECTED PERSONS**

#	Type of Loss	Entitled Persons (Beneficiaries)	Entitlement (Compensation Package)	Implementation Issues/Guidelines
1	Loss of Land	Legal Owner of Land	Replacement Cost	<ul style="list-style-type: none"> <li>✓ Assessment of quantity and quality of land</li> <li>✓ Assessment of Market Value</li> <li>✓ Assessment of Cash Compensation</li> <li>✓ Updating of titles of the affected persons</li> <li>✓ Payment of Cash Compensation</li> <li>✓ Affected Persons will be fully informed of the entitlements and the procedures regarding payments</li> <li>✓ Advance notice to vacate</li> </ul>
		Illegal Occupant of Land	No Compensation for Land	<ul style="list-style-type: none"> <li>✓ Cash compensation for assets such as structures and standing trees.</li> <li>✓ Advance notice to vacate</li> </ul>
2	Loss of Structures	Owner of Structure	Replacement Cost	<ul style="list-style-type: none"> <li>✓ Assessment of quality of structures</li> <li>✓ Assessment of Market Value</li> <li>✓ Assessment of Cash Compensation</li> <li>✓ Payment of Cash Compensation</li> <li>✓ In addition, US\$ 250 for relocation assistance and US\$ 100 for transportation assistance will be provided per Project Affected Household (PAH) for Residential Structure</li> <li>✓ Affected Persons will be fully informed of the entitlements and the procedures regarding payments</li> <li>✓ Permission to continue business within ROW which does not destruct road facilities</li> <li>✓ Advance notice to vacate</li> </ul>
		Owner of Container	US\$ 250 per PAH	<ul style="list-style-type: none"> <li>✓ Payment of Cash Compensation (US\$ 250 per PAH which is sufficient to rent a forklift to relocate container from original position to another)</li> <li>✓ No compensation for container itself, because containers will not be demolished</li> <li>✓ Additional assistances such as relocation</li> <li>✓ Permission to continue business within ROW which does not destruct road facilities</li> <li>✓ Advance notice to vacate</li> </ul>

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PAH

PAH

PAH

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#	Type of Loss	Entitled Persons (Beneficiaries)	Entitlement (Compensation Package)	Implementation Issues/Guidelines
3	Loss of Income	Owner of Business	US\$ 100 per PAH	<ul style="list-style-type: none"> <li>✓ Payment of Assistance (US\$ 100 per PAH for loss of business income during the period of relocation or demolition of the structures)</li> <li>✱ All PAHs operating businesses in Project area wish to continue operating within ROW out of the proposed road facilities such as carriageways, greenbelt, and sidewalk. Therefore US\$ 100 per PAH is sufficient to compensate loss of business income during the period of relocation or demolition of the structures. The period between the relocation and restart of the business is anticipated as 7 days.</li> <li>✓ Affected Persons will be fully informed of the entitlements and the procedures regarding payments</li> <li>✓ Advance notice to vacate</li> </ul>
		Wage Earners	Assistance for Loss of Wage	<ul style="list-style-type: none"> <li>✓ Assessment of income loss</li> <li>✓ 3 month cash hand-out worth of wages paid, if employment is lost by the Project.</li> </ul>
4	Loss of Accommodation	Vulnerable Persons	US\$ 50 per PAH, Special Measures and Assistance	<ul style="list-style-type: none"> <li>✓ Assessment of Loss</li> <li>✓ Assessment of Assistance</li> <li>✓ Payment of Cash Assistance</li> <li>✓ Affected Persons will be fully informed of the entitlements and the procedures regarding payments</li> <li>✓ Provision of materials to help them build a higher standard replacement unit, assistance to acquire vocational training or income generating scheme. (done on a case-by-case basis)</li> <li>✓ Additional assistances such as transportation, etc.</li> <li>✓ Advance notice to vacate</li> </ul>
		Tenants	Special Assistance	<ul style="list-style-type: none"> <li>✓ Re-imbursement of remaining worth of lease or tenancy deposit</li> <li>✓ Moving assistance such as house replacement, assistance of rent for 3-month period and moving cost</li> <li>✓ Advance notice to vacate</li> </ul>

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### Implementation Schedule of Resettlement

Resettlement activities to be conducted by Liberian Government are described as following table:

Activity	Calendar YR	2012												2013											
	JP Fiscal-YR	24						25						26											
	Responsible Agency	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12								
1. Approval of RAP	EPA				■																				
2. Stakeholder Meeting	MPW				■		■																		
3. Detailed Asset Survey and Compensation Estimation	MPW				■	■																			
4. RAP Budget																									
- Submission	MPW					■																			
- Approval	MPW						■																		
5. Resettlement																									
- Contracting for Compensation	MPW							■																	
- Compensation Payment	MPW							■																	
- Relocation of PAPs	MPW							■	■	■	■														
6. Completion of Relocation	MPW																								
7. Grievance Redressing	MPW																								
8. Site Clearing for Alignment ROW	MPW																								
9. Possible Bidding Date	-																								
10. Possible Date of the Commencement of Construction																									

Notes: 1. Abbreviations:

- YR - Year
  - JP - Japan
  - EPA - Environmental Protection Agency
  - MPW - Ministry of Public Works
  - PAPs - Project Affected Persons
  - JICA - Japan International Cooperation Agency
2. JICA will provide technical support for the RAP Activities.

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**Project for Reconstruction of Somalia Drive in Monrovia  
in the Republic of Liberia**

**Responsibility Matrix**

Items	Target Date	Responsible Agency					
		GOJ	ROL	MPW	EPA	Contractor	
1. Project Scope	• Road Construction	End of May, 2016	⊙				
	• Reconstruction of Stockton Bridge	End of May, 2016	⊙				
	• Repair of Double Bridge	End of May, 2016	⊙				
2. Project ROW and Permits/Clearances	• Secure Budget for ROW & RAP	End of February, 2013			⊙		
	• Project ROW Acquisition	Beginning of August, 2013			⊙	○	
	• Project Site Preparation and Clearance (removal of existing buildings, trees, obstacles, removal/relocation of utilities, etc.)	Mid of August, 2013		○	⊙	○	
	• Clearance for Temporary Construction Yard	Before Construction			⊙		
	• Permits for Disposal Area, etc.	Before Construction			⊙		
3. RAP	• RAP Approval	Beginning of December, 2012			○	⊙	
	• Detailed Asset Survey and Compensation Estimation	Mid of January, 2013			⊙	○	
	• RAP Budget (Preparation & Approval)	End of February, 2013		○	⊙	○	
	• Compensation Agreement with PAPs	Mid of March, 2013			⊙	○	
	• Payment of Compensation	Mid of March, 2013			⊙	○	
	• Relocation of PAPs	June, 2013			⊙	○	
	• RAP Monitoring	During RAP activities until two (2) years after Resettlement			⊙	○	
4. EIA	• EIA Approval	Beginning of December, 2012			○	⊙	
	• Monitoring for Environmental and Social Consideration	Before, During Construction			⊙	○	⊙
		After Construction			⊙	○	
5. Bank Arrangement	• Bank Account and Bank Charges for Grant (Commission for Banking Arrangement and Authorization to Pay)	Before and during Construction		⊙	○		
6. Tax Exemption and Clearances	• Customs clearance and tax exemption for imported items related to project	During Construction		⊙	○		
	• Tax exemption of Japanese nationals from customs duties, internal taxes and other fiscal levies for the supply of products and services	During Construction		⊙	○		

- Notes:**
- ⊙ - Major role/responsibility
  - - Secondary role/responsibility
  - GOJ - Government of Japan
  - ROL - Republic of Liberia
  - MPW - Ministry of Public Works, ROL
  - EPA - Environmental Protection Agency, ROL

4. 討議議事録 (M/D)  
(2) 第2次現地調査 (2012年4月19日)

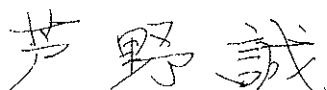
Minutes of Discussions  
on the Preparatory Survey (Outline Design)  
on the Project for Reconstruction of Somalia Drive in Monrovia  
in the Republic of Liberia

In response to the request from the Government of the Republic of Liberia (hereinafter referred to as "Liberia"), the Government of Japan decided to conduct a Preparatory Survey on the Project for Reconstruction of Somalia Drive in Monrovia (hereinafter referred to as "the Project"), and entrusted the Survey to Japan International Cooperation Agency (hereinafter referred to as "JICA").


JICA sent the Preparatory Survey Team for the Outline Design (hereinafter referred to as "the Team") to Liberia. The Team is headed by Mr. Makoto ASHINO, Senior Advisor to the Director General, Economic Infrastructure Department, JICA, and is scheduled to stay in the country from January 21 to June 1, 2012.

The Team held a series of discussions with the officials concerned of the Government of Liberia and conducted a field survey in the Project area. In the course of the discussions, both sides have confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

Monrovia, April 19, 2012



Makoto Ashino  
Leader  
Preparatory Survey Team  
Japan International Cooperation Agency



Victor B. Smith  
Deputy Minister for Technical Services  
Ministry of Public Works



Yancon -- Dargbe Nimley  
Assistant Minister for Economic Cooperation  
& Integration  
Ministry of Planning & Economic Affairs

## ATTACHMENT

### 1. Objective of the Project

The objective of the Project is to satisfy increasing transportation demand and contribute to the reduction of traffic jam in Greater Monrovia, through the Reconstruction of Somalia Drive.

### 2. Items Requested by the Government of Liberia

2-1. After the discussions with the Team, the items described below were requested by the Liberian side.

- Expansion of the Somalia Drive (from the Free Port junction to the Red Light junction) from 2-lanes to 4-lanes. (New additional 2-lane roads)
- Rehabilitation of existing Stockton Bridge (4-lane).
- Repair of existing Double Bridge (4-lane).
- Improvement of existing road junctions.
- Installation of bus stop and car parking.
- Installation of pedestrian walkway.
- Installation of curb stones.
- Installation of traffic signs and road marking.
- Installation of pedestrian crossings.

JICA will assess the appropriateness of the request through the Preparatory Survey and will report the findings to the Government of Japan. Implementation and components of the Project will be decided by the Government of Japan.

2-2. Both sides confirmed that the designing of the Red Light junction is not included as a Project component.


2-3. The Liberian side requested that the designing of existing road of Somalia Drive be considered in the overall design.

### 3. Environmental and Social Considerations

3-1. The Team explained the outline of JICA Guidelines for Environmental and Social Considerations (April 2004) (hereinafter referred to as "the JICA Guidelines") to the Liberian side. The Liberian side understood the concept of the JICA Guidelines and confirmed to conduct the necessary procedure.

3-2. The Liberian side confirmed that MPW shall conduct necessary procedure concerning Environmental Impact Assessment (EIA) based on the law of Liberia and acquire EIA License from Environment Protection Agency (EPA) and submit it to JICA Liberia Field Office by the middle of October 2012.

3-3. Regarding the Project Affected Persons (PAPs) within the Project sites, the Liberian



side agreed to secure the appropriate budget to be allocated for resettlement and compensation and secure the land before the implementation of the Project. In this regard a Resettlement Action Plan (RAP) will be prepared and approved by the responsible authorities beforehand and MPW will take necessary measures to PAPs according to RAP in close communication with JICA.

3-4. The Liberian side agreed that Project Affected Persons (PAPs) shall be sufficiently compensated and supported to improve standard of living, income opportunities and production levels, or at least to restore them to pre-project levels.

#### 4. Schedule of the Study

4-1. The Team will continue further studies in Liberia until June 1, 2012.

4-2. JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to Liberia in order to explain its contents around October 2012.

4-3. If the contents of the report is accepted in principle by the Liberian side, JICA will complete the final report in English and send it to Liberia around February 2013.

#### 5. Other Relevant Issues

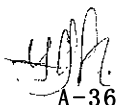
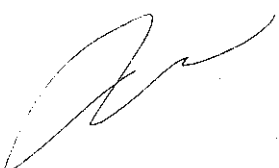
5-1. The Liberian side confirmed that the following undertaking should be taken by the Liberian side at the Liberian expenses.

- (1) To acquire the land for the Project site shown by the Team.
- (2) Removal/Relocation of existing utilities (water lines, power cable, telecommunication lines, etc.) including the underground facilities, advertisement boards and small gas stations within the Project site to designated area or out of the Project site.
- (3) Compensation for the PAPs (Project Affected Persons).
- (4) Securing of the temporary yard for the Project.
- (5) Securing site for borrowing pit, quarry and disposal area.
- (6) Necessary assistance for tax exemption and custom clearance for project related equipment, materials and facilities.

5-2. Both sides confirmed that all the agreements in the Minutes of Discussions of the preceding Preparatory Survey signed on August 31, 2011 continue to be valid.

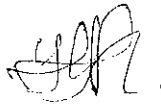
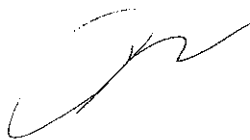
5-3. Regarding the Free Port junction, the Team will continue further studies until the end of May 2012 in order to decide whether or not its improvement should be one of the project components.

5-4. The Liberian side shall share necessary data with the Team including the design of existing Double Bridge by the middle of May, 2012.

  
A-36

5-5. Regarding existing Double Bridge, the Team will continue further studies including X-ray survey and discuss measures with the Liberian side. When it turns out that there is no severe damage to the structure, the Team will consider simple repairs for the pavement, handrail and slab, which will not be warranty against defects to the bridge.

Annex : List of Attendants

A handwritten signature in black ink, appearing to be 'SFA'.A handwritten signature in black ink, appearing to be 'Jr'.A handwritten mark or signature in black ink, appearing to be '10/15'.

## List of Attendants

## 1. Ministry of Public Works

Victor B. Smith	Deputy Minister for Technical services
Edsel Edward Smith	Assistant Minister for Technical services
William L. Slour	Assistant Minister for Operations/Construction
Akindele George Beckley	Program Director/IIU
Bindu Brewer	Act. National Zoning Officer

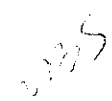
## 2. Ministry of Planning and Economic Affairs

Yancon-Dargbe Nimley	Assistant Minister for Economic Cooperation & Integration
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## 3. JICA

Makoto Ashino	Team Leader
Osamu Sakurai	Team Member
Daisuke Fukuzawa	Team Member
Shitau Miura	Country Manager, JICA Liberia Office
Tsuyoshi Yamajuku	Chief Consultant





## 5. テクニカルノート

### Technical Note

#### The Preparatory Survey on the Project for Reconstruction of Somalia Drive in Monrovia

Ministry of Public Works (MPW) and JICA Survey Team made technical discussions about design criteria of the project. The both parties confirmed and understood on the following matters.

#### Design Criteria

##### General

- Design Speed: MPW request to select appropriate design speed between 60 and 80km/hr based on the consideration of roadside condition.
- Maximum Superelevation: 4% for urban is acceptable.
- Cross Fall: 2.5% is acceptable.
- Pavement Type: Asphalt Concrete is acceptable.
- Pavement Design Period: JICA team proposes 10 years for pavement design but MPW requests 20 years. It will be discussed in Japan.
- Standard Axle Load: 11.5 ton for ECOWAS standard is adopted.
- Red light junction is not included in JICA project. The end point of JICA project shall be Sta. 13+000.
- MPW requests at least three (3) design options with adequate drainage provisions as well as the associated cost estimates for implementation.
- MPW and JICA team will review and agree on the design option to be implemented.

##### Cross Section

- Mountup Median Separator: 2.5 m is acceptable.
- Lane Width 3.25 m is requested to 3.65 by MPW.
- Pavement Width: 7.5 m is acceptable.
- Sidewalk: JICA team proposes flat sidewalk 4.0 m width but MPW requests mountup sidewalk 2.0 m. It shall be studied with comparative options including drainage system.
- Green belt: 1.5 m is acceptable.

##### Bridge

- Live Load: Equivalent with AASHTO HS-20 is acceptable. MPW additionally requests to analyze military tank load.
- Carriage Way: 7.5 m include shoulder as same with road section is acceptable.
- Seismic Coefficient:  $K_h=0.1$  as minimum value
- High Water Level: 1.3 m below (Stockton Br.) and 1.5 m below (Double Br.) from existing girder

- Navigation Clearance: Existing span is kept (Stockton Br. 21 m, Double Br. 25 m).

#### ROW

- Construction limit set for the project is approximately 75 feet from the median centerline.

#### Other Requests

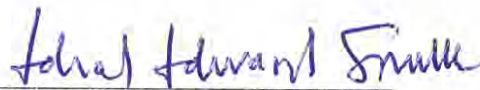
- MPW requests to make design for completed 4-lane road. JICA team may accept the request after the discussion with JICA head office.
- MPW requests to carry out cost estimation for completed 4-lane road and it will be discussed in Japan.

Noted by

30 May 2012



Keiichi Murakami  
Road Designer  
JICA Preparatory Survey Team



Edsel Edward Smith  
Assistant Minister for Technical Services  
Ministry of Public Works