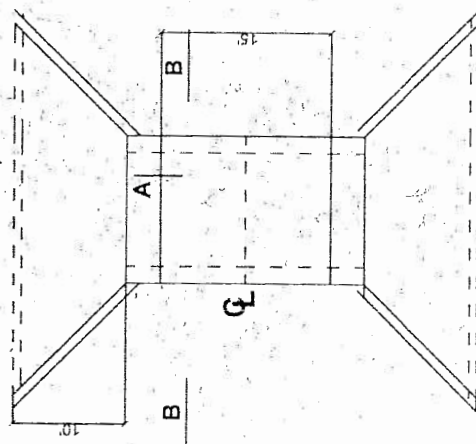


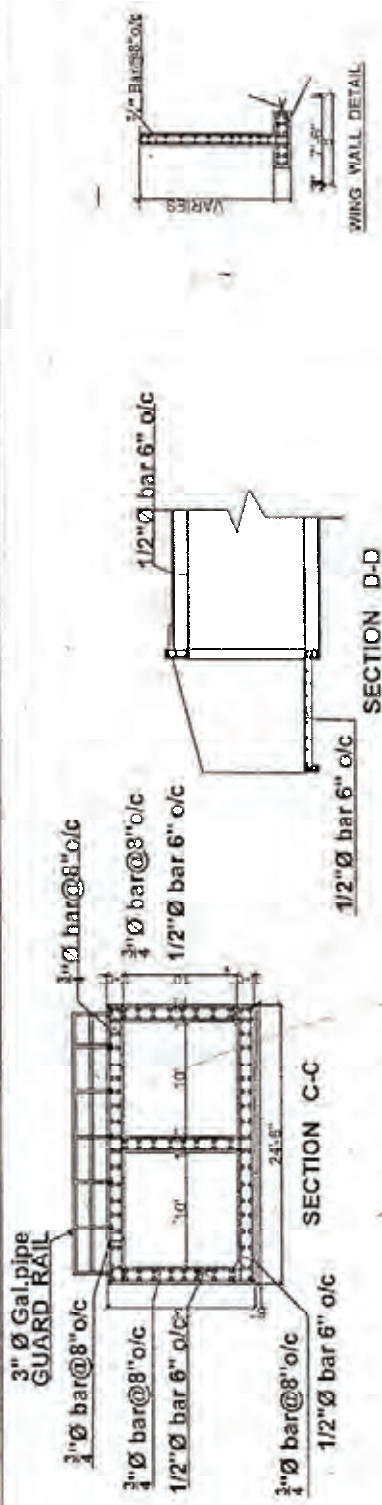
WING WALL DETAIL

**TECHNICAL SPECIFICATION (AASHTO)**

- CONCRETE STRESS @ 28 DAYS 3000 PSI
- STEEL YIELD STRESS = 36000 PSI
- CONCRETE COVER = 3 inches
- MINIMUM STEEL LAP = 30 inches
- SOIL PRESSURE (MIN.) = 3000 PSI
- MIX RATIO 1:1 1/2: 2
- COARSE AGGREGATE 1/4" - 1/2"
- BLINDING COARSE MIX RATIO 1:3:4

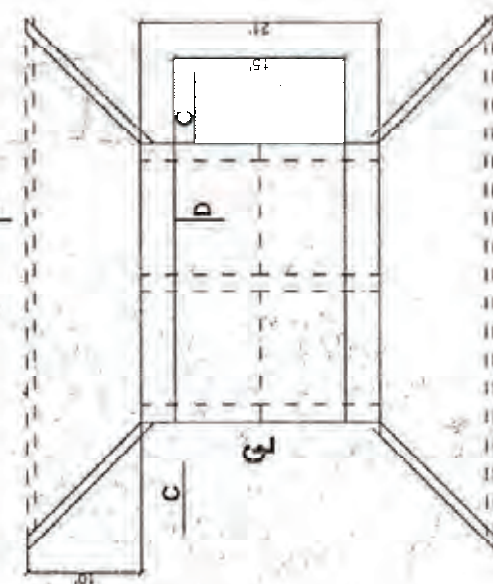


<b>MINISTRY OF PUBLIC WORKS</b>	
PROJECT	SINGLE BOX CULVERT
LOCATION	FEEDER ROADS
DESIGNED BY :	L.SASAY Chief Eng./TSB
APPROVED BY	DATE 12/02/10



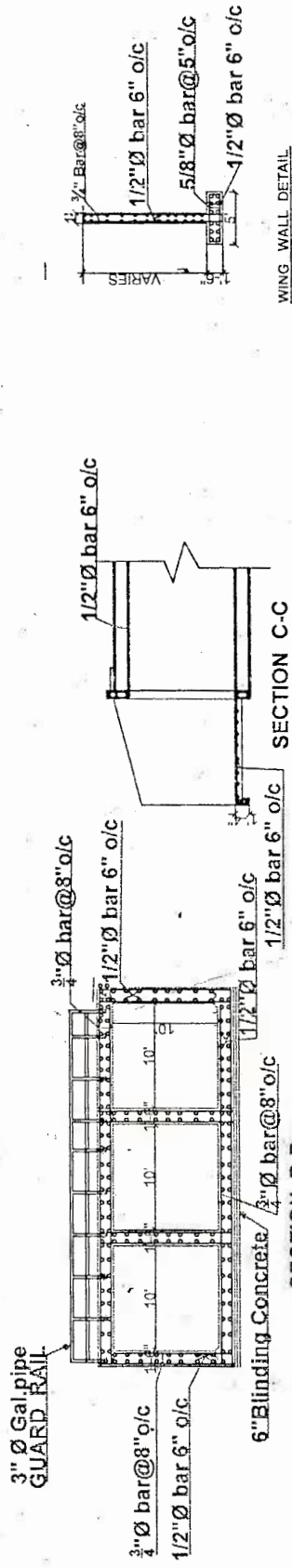
WING WALL DETAIL

- TECHNICAL SPECIFICATION (AASHTO)**
- CONCRETE STRESS @ 28 DAYS 3000 PSI
  - STEEL YIELD STRESS 43600 PSI
  - CONCRETE COVER = 3 inches
  - MINIMUM STEEL LAP = 30 inches
  - SOIL PRESSURE (MIN.) = 3000 PSI
  - MIX RATIO 1:1 1/2:2
  - COARSE AGGREGATE X-2"
  - BLINDING COARSE MIX RATIO 1:3:4



PLAN

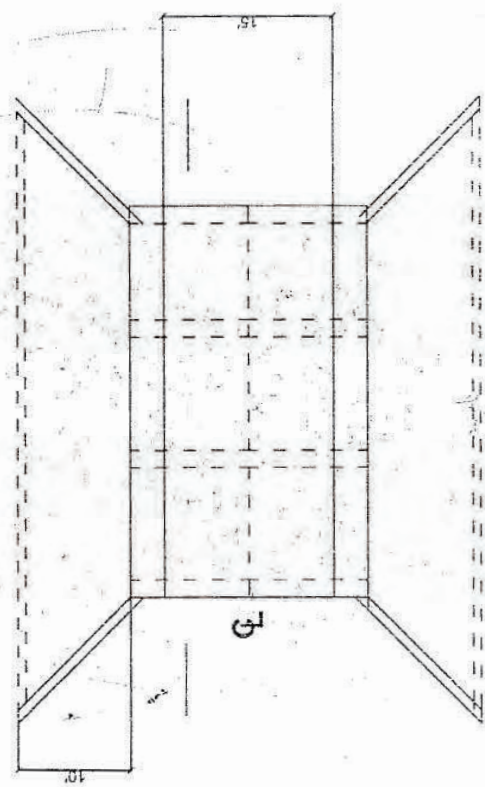
<b>MINISTRY OF PUBLIC WORKS</b>	
PROJECT	SINGLE BOX CULVERT
LOCATION	FEEDER ROADS
DESIGNED BY	L-SASAY Chief Eng./TSE
APPROVED BY	DATE 12/02/10



WING WALL DETAIL

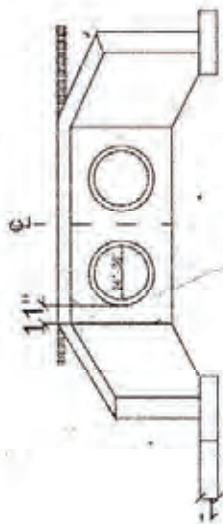
**TECHNICAL SPECIFICATION (AASHTO)**

- CONCRETE STRESS @ 28 DAYS 3000 PSI
- STEEL YIELD STRESS = 36000 PSI
- CONCRETE COVER = 3 inches
- MINIMUM STEEL LAP = 30 inches
- SOIL PRESSURE (MIN.) = 3000 PSI
- MIX RATIO 1: 1 1/2: 2
- COARSE AGGREGATE 1/2", 3/4"
- BLINDING COARSE MIX RATIO 1:3:4

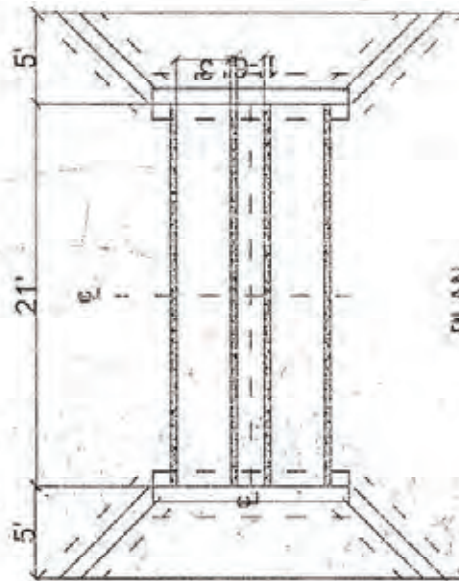


PLAN

<b>MINISTRY OF PUBLIC WORKS</b>	
PROJECT	SINGLE BOX CULVERT
LOCATION	FEEDER ROADS
DESIGNED BY :	L.SASAY Chief Eng./TSB
APPROVED BY	DATE 12/02/10



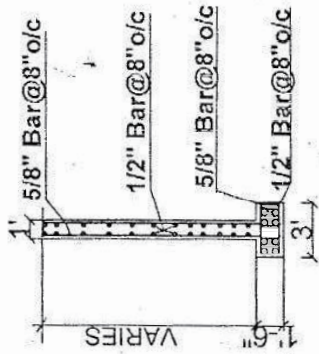
ELEVATION



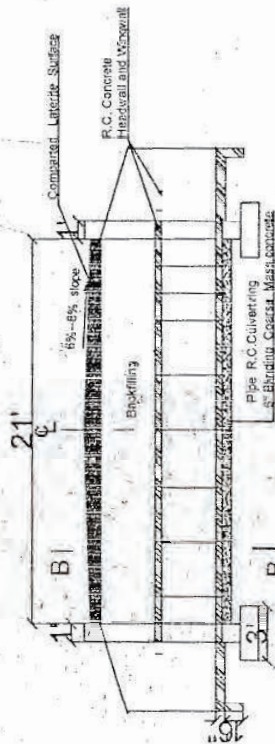
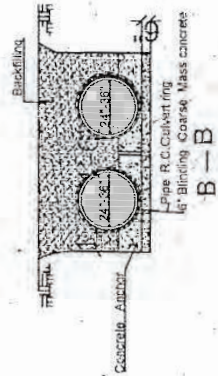
PLAN

<b>MINISTRY OF PUBLIC WORKS</b>	
PROJECT	TYPICAL R.C. CULVERT
LOCATION	FEEDER ROAD.
DESIGNED BY :	L. SASAY Chief Eng. JTSB
APPROVED BY :	DATE 12/02/10

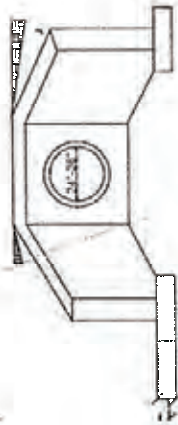




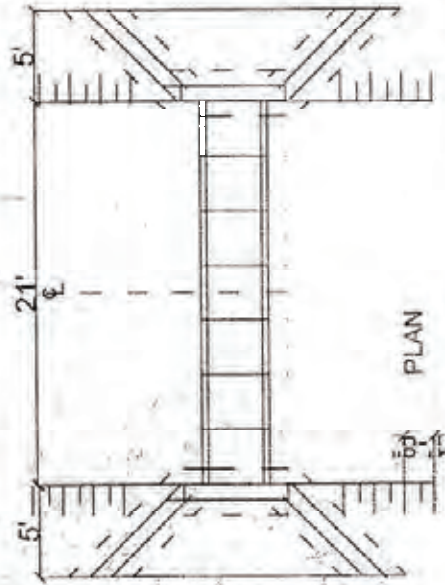
WING WALL DETAIL



<b>MINISTRY OF PUBLIC WORKS</b>	
PROJECT	TYPICAL R.C. CULVERT
LOCATION	FEEDER ROADS
DESIGNED BY :	L. SASAY Chief Eng./TSB
APPROVED BY :	DATE 12/02/10

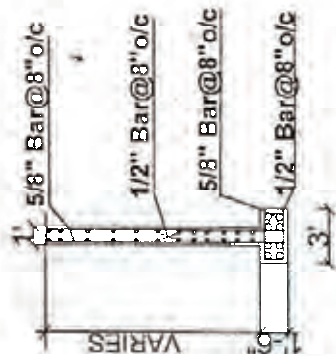


ELEVATION

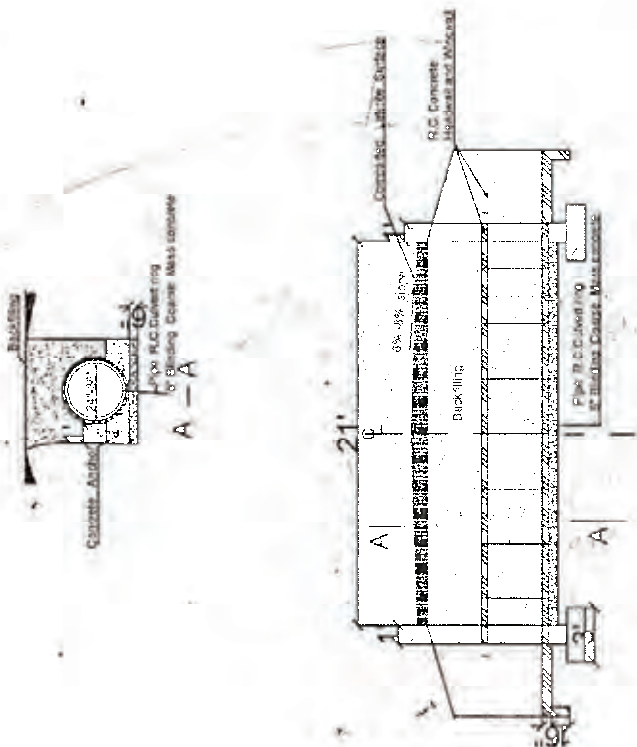


PLAN

<b>MINISTRY OF PUBLIC WORKS</b>	
PROJECT	TYPICAL R.C. CULVERT
LOCATION	FEEDER ROADS.
DESIGNED BY :	L. SASAY Chief Eng./TSE
APPROVED BY :	DATE 12/02/10



WING WALL DETAIL



<b>MINISTRY OF PUBLIC WORKS</b>	
PROJECT	TYPICAL R.C. CULVERT
LOCATION	FEEDER ROADS
DESIGNED BY :	L. SASAY Chief Eng./TSB
APPROVED BY :	DATE 12/02/10

6. 現地再委託見積もり

AZIMUTH LAND SURVEY and MAPPING

QUOTATION  
FOR  
~~TOPOGRAPHIC~~ ~~GEOTECHNICAL~~ SURVEY  
FOR  
PREPARATORY SURVEY  
ON  
THE PROJECT FOR RECONSTRUCTION OF BRIDGES  
ON  
MISSING LINK  
IN  
THE REPUBLIC OF LIBERIA

Bill of Quantity

Item	Unit	Quantity	Rate (USD)	Amount (USD)
MOB & DEMOBILISE	L.S	1,0	150	4,500
- River Profile survey	M	2,200	3.00	6,600
- Road Cross Section	point	110	3.00	330
- River Cross Section	point	11	50.00	550
- Plan Survey	m2	143,000	0.32	45,760
- BM Installation	Point	11	92.36	1,016
Drawing & Data				
- Drawings	L.S	1,0		5,350
<b>TOTAL</b>				<b>64,106</b>

Monrovia, 27th March 2010

Sign *Abah R. Kaimara*





# EarthCons, Inc.

P. O. Box 2198  
 Warren Street/Camp Johnson Road  
 Monrovia, Liberia  
 Phone: (231) 4 713 338/5 620 440  
 Email: earthconslib@yahoo.com  
 Website: http://www.earthcons.com

**QUOTATION  
 FOR  
 TOPOGRAPHIC SURVEY  
 FOR  
 PREPARATORY SURVEY  
 ON  
 THE PROJECT FOR RECONSTRUCTION OF BRIDGES  
 ON  
 MISSING LINK  
 IN  
 THE REPUBLIC OF LIBERIA**

**Bill of Quantity**

tem	Unit	Quantity	Rate (USD)	Amount (USD)
MOB & DEMOBILISE	L.S	1,0	2,250.00	2,250.00
- River Profile survey	M	2,200	3.50	7,700.00
- Road Cross Section	Point	110	10.00	1,100.00
- River Cross Section	Point	11	10.00	110.00
- Plan Survey	m2	143,000	0.75	107,250.00
- BM Installation	Point	11	250.00	2,750.00
Drawing & Data				
- Drawings	L.S	1,0	2,200.00	2,200.00
<b>TOTAL</b>				<b>123,360.00</b>

*EarthCons, Inc.*  
*P. O. Box 2198*  
*Warren St./Camp Johnson Rd*  
*Monrovia, Liberia*  
*Geological, Mining, Environmental, Fabrication and C/P- Technical Consultancy*

**QUOTATION**  
**FOR**  
~~Topographic~~ **GEOTECHNICAL SURVEY**  
**FOR**  
**PREPARATORY SURVEY**  
**ON**  
**THE PROJECT FOR RECONSTRUCTION OF BRIDGES**  
**ON**  
**MISSING LINK**  
**IN**  
**THE REPUBLIC OF LIBERIA**

Bill of Quantity *BDIMAH ENGINEERING Inc.*

Item	Unit	Quantity	Rate (USD)	Amount (USD)
MOB & DEMOBILISE	L.S	1,0		\$10,820.00
- River Profile survey	M	2,200	\$6.00	\$13,200.00
- Road Cross Section	point	110	\$25.00	\$2,750.00
- River Cross Section	point	11	\$1,000.00	\$11,000.00
- Plan Survey	m2	143,000	\$0.15	\$21,450.00
- BM Installation	Point	11	\$200.00	\$2,200.00
Drawing & Data				
- Drawings	L.S	1,0		\$4,500.00
<b>TOTAL</b>				<b>\$65,920.00</b>

Monrovia, 29<sup>th</sup> March 2010

Sign

*BDimah*  
*BDimah Engineering Inc.*

**QUOTATION**  
 FOR  
 TOPOGRAPHIC & GEOTECHNICAL SURVEY  
 FOR  
 PREPARATORY SURVEY  
 ON  
 THE PROJECT FOR RECONSTRUCTION OF BRIDGES  
 ON  
 MISSING LINK  
 IN  
 THE REPUBLIC OF LIBERIA

**Bill of Quantity**

*CSA and ASSOCIATES*

Item	Unit	Quantity	Rate (USD)	Amount (USD)
MOB & DEMOBILISE	L.S	1,0		21,600.00
- River Profile survey	M	2,200	2500.00	27,500.00
- Road Cross Section	point	110	750.00	8500.00
- River Cross Section	point	11	750.00	8500.00
- Plan Survey	m2	143,000	1500.00	16,150.00
- BM Installation	Point	11	750.00	8500.00
Drawing & Data				
- Drawings	L.S	1,0	2500.00	2500.00
<b>TOTAL</b>				<b>72,000</b>

Monrovia, 29<sup>th</sup> March 2010

Sign

*[Handwritten Signature]*  
 STEVE D. PAUL

077073400

-5-




# EarthCons, Inc.

P. O. Box 2198  
 Warren Street/Camp Johnson Road  
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 Phone: (231) 4 713 338/5 620 440  
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 Website: http://www.earthcons.com

**GEOTECHNICAL SURVEY  
 FOR  
 PREPARATORY SURVEY  
 ON  
 THE PROJECT FOR RECONSTRUCTION OF BRIDGES  
 ON  
 MISSING LINK  
 IN  
 THE REPUBLIC OF LIBERIA**

**BILL OF QUANTITY**

Item	Unit	Qty.	Rate (US\$)	Amount (US\$)
Mobilization and Demobilization	L.S.	1	20,000.00	20,000.00
Drilling (20 boreholes)				
Drilling Through ordinary soils	m	200	175.00	35,000.00
Drilling Through hard soils/rocks	m	100	200.00	20,000.00
Standard Penetration test	m	200	10.00	2,000.00
Specific Gravity	nos.	20	30.00	600.00
Natural Moisture Content	nos.	20	30.00	600.00
Atterberg Limits	nos.	20	180.00	3,600.00
Sieve Analysis	nos.	20	150.00	3,000.00
Unconfined Compression test	nos.	20	150.00	3,000.00
Report	L.S.	1	10,000.00	10,000.00
<b>Total</b>				<b>97,800.00</b>

  
 EarthCons, Inc.  
 P. O. Box 2198  
 Warren St./Camp Johnson Rd  
 Monrovia, Liberia

*A Wholly Liberian Geological, Mining, Environmental, Petroleum and Geo-Technical Consultancy*



From Proconsult in Ghana

QUOTATION FOR GEOTECHNICAL INVESTIGATION FOR ELEVEN (11) BRIDGES IN LIBERIA

Number	Item Description	Unit	Quantity	Rate (\$)	Amount (\$)
<b>A GENERAL ITEMS AND PROVISIONAL SUMS</b>					
A1	Establish on site all plant, equipment and services and remove same at the end of field work. Item includes clearing of various sites prior to commencement of field work.	SUM			92,750.00
A2	Provide vehicle for the transportation of workers to site and movement of equipment between points (with fuel)	Day	40	250.00	10,000.00
				Sub-Total	102,750.00
<b>B PERCUSSION DRILLING</b>					
B1	Move Drilling Rig and equipment to site of each borehole and set up	No.	24	35.00	840.00
B2	Advance borehole between existing ground level to depths not exceeding 10m	m	240	35.00	8,400.00
B3	Advance borehole in Rock	note	24	52.00	1,248.00
				Sub-Total	10,488.00
<b>C IN-SITU TESTING</b>					
C1	Extra over Item B2 and B3 for performance of SPT at 1.0m interval	No.	192	14.00	2,688.00
<b>D SAMPLING</b>					
D1	Small Disturbed samples	No.	160	8.00	1,280.00
D2	Undisturbed samples	No.	12	8.00	108.00
				Sub-Total	4,076.00
<b>E LABORATORY TESTING</b>					
E1	Moisture content	No.	192	8.00	1,536.00
E2	Liquid and plastic limit	No.	192	16.00	3,072.00
E3	Particle size distribution by wet sieving	No.	192	17.00	3,264.00
<b>F Chemical Test</b>					
F1	Sulphate Content	No.	12	25.00	300.00
F2	Chloride Content	No.	12	25.00	300.00
F3	pH	No.	12	25.00	300.00
<b>G Strength Test</b>					
G1	Conduct Quick Unconsolidated Triaxial test	No.	5	80.00	400.00
G2	Conduct One-dimensional Consolidation test	No.	5	120.00	600.00
				Sub-Total	1,000.00
<b>H Site Supervision And Reporting</b>					
H1	Project Engineer	Day	20	600.00	12,000.00
H2	Compilation of field and laboratory test results, analysis and recommendation.	Sum			1,000.00
H3	Reproduction of Report, 4%.	Sum			250.00
					13,250.00

SUMMARY OF BILL OF QUANTITIES		
A	General items and provisional sums	102,750.00
B	Percussion Drilling	10,488.00
C-D	Field sampling and testing	4,076.00
E-G	Laboratory testing	9,822.00
H	Site supervision and Reporting	13,250.00
	<b>SUB TOTAL</b>	<b>140,386.00</b>
	<b>ADD 12% AS TAX</b>	<b>16,846.32</b>
	<b>GRAND TOTAL</b>	<b>US\$ 157,232.32</b>

**SCHEDULE OF PAYMENT**

70% of Contract Amount should be paid as mobilisation for the field work  
30% of the remaining should be paid after submission of final report

7. 環境チェックリスト

Environmental Checklist: 15. Roads and Railways (1)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
1 Permits and Explanation	(1) EIA and Environmental Permits	<p>① Have EIA reports been officially completed?</p> <p>② Have EIA reports been approved by authorities of the host country's government?</p> <p>③ Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?</p> <p>④ In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?</p>	<p>① EIA procedure is not required for this projects.</p> <p>② It is no necessary to conduct EIA procedure for reconstruction work of bridge.</p> <p>③ N/A</p> <p>④ EMP procedure which covers summary of impact, mitigation measures, monitoring program and responsibility is required to get Environmental approval by EPA before start of reconstruction works.</p>
	(2) Explanation to the Public	<p>① Are contents of the project and the potential impacts adequately explained to the public based on appropriate procedures, including information disclosure? Is understanding obtained from the public?</p> <p>② Are proper responses made to comments from the public and regulatory authorities?</p>	<p>① Before implementation of work explanation meeting will be hold in each community of reconstruction Bridges.</p> <p>② N/A</p>
2 Mitigation Measures	(1) Air Quality	<p>① Is there a possibility that air pollutants emitted from various sources, such as vehicle traffic will affect ambient air quality? Does ambient air quality comply with the country's ambient air quality standards?</p> <p>② Where industrial areas already exist near the route, is there a possibility that the project will make air pollution worse?</p>	<p>① Project bridge on secondary and feeder class road and traffic volume is very small, so that emission from vehicle is small and ambient air quality will be keep air quality standard.</p> <p>② There is no industrial area near project site so that composit pollution will not occur.</p>
	(2) Water Quality	<p>① 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?</p> <p>② Is there a possibility that surface runoff from roads will contaminate water sources, such as groundwater?</p> <p>③ Do effluents from various facilities, such as stations and 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 that do not comply with the country's ambient water quality standards?</p>	<p>① Earth moving activity is only approach road filling and there is no possibility of run off in dry season works.</p> <p>② Bridge planning height is designed over one meter above high water level, but approach road is under water in rainy season. Escape prevention such as stone masonry method will be applied.</p> <p>③ There is no facilities such as parking area so that there is no effluent from traffic.</p>
	(3) Noise and Vibration	<p>① Do noise and vibrations from vehicle and train traffic comply with the country's standards?</p>	<p>① In ternity class road there is some houses near the road, but impact of noise and vibration is small because of low speed vehicles.</p>
3 Natural Environment	(1) Protected Areas	<p>① 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?</p>	<p>① The project sites are not located in protected area. Distance from Ramsar convention area is over two kilometer and water is not connected directory by somaria drive road, so that no impact is considered.</p>

**Environmental Checklist: 15. Roads and Railways (2)**

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
3 Natural Environment	(2) Ecosystem	<p>① Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?</p> <p>② Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?</p> <p>③ If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?</p> <p>④ Are adequate protection measures taken to prevent impacts, such as disruption of migration routes, habitat fragmentation, and traffic accident of wildlife and livestock?</p> <p>⑤ 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?</p> <p>⑥ In cases where the project site is located at undeveloped areas, is there a possibility that the new development will result in extensive loss of natural environments?</p>	<p>① Project bridge across wetland but not located in mangrove forest.</p> <p>②</p> <p>③</p> <p>④</p> <p>⑤ Reconstruction of bridges do not cause destruction of forest, poaching, desertification, reduction in wetland area, and disturbance of ecosystems.</p> <p>⑥ Project site is existing development area so that extensive loss of natural environments are not anticipated.</p>
	(3) Hydrology	<p>① Is there a possibility that alteration of topographic features and installation of structures, such as tunnels will adversely affect surface water and groundwater flows?</p>	<p>① Bridge design includes calculation refer to discharge of water by catchment area and participation with recorded high water level so that proper aperture is considered.</p>
	(4) Topography and Geology	<p>① Is there a soft ground on the route that may cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides, where needed?</p> <p>② 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?</p> <p>③ 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?</p>	<p>① Bridges constructed in wetland area so that proper basement designe will be considered based on boring test result.</p> <p>② Bridge approach filling will be designed with stone massory and wing (abutment) to prevent water runoff.</p> <p>③</p>

**Environmental Checklist: 15. Roads and Railways (3)**

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
4 Social Environment	(1) Resettlement	<p>① Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</p> <p>② Is adequate explanation on relocation and compensation given to affected persons prior to resettlement?</p> <p>③ Is the resettlement plan, including proper compensation, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</p> <p>④ Does the resettlement plan pay particular attention to vulnerable groups or persons, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?</p> <p>⑤ Are agreements with the affected persons obtained prior to resettlement?</p> <p>⑥ Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</p> <p>⑦ Is a plan developed to monitor the impacts of resettlement?</p>	<p>① So that this project is reconstruction of Bridges there is no resettlement on project site. No resettlement is confirmed based on site survey.</p> <p>② N/A</p> <p>③ N/A</p> <p>④ N/A</p> <p>⑤ N/A</p> <p>⑥ N/A</p>
	(2) Living and Livelihood	<p>① Where roads or railways are newly installed, is there a possibility that the project will affect the existing means of transportation and the associated workers?</p> <p>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>② Is there a possibility that the project will adversely affect the living conditions of inhabitants other than the affected inhabitants? Are adequate measures considered to reduce the impacts, if necessary?</p> <p>③ Is there a possibility that diseases, including communicable diseases, such as HIV will be introduced due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary?</p> <p>④ Is there a possibility that the project will adversely affect road traffic in the surrounding areas (e.g., by causing increases in traffic congestion and traffic accidents)?</p> <p>⑤ Is there a possibility that roads and railways will cause impede the movement of inhabitants?</p> <p>⑥ Is there a possibility that structures associated with roads (such as bridges) will cause a sun shading and radio interference?</p> <p>⑦ Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage sites? Are adequate measures considered to protect these sites in accordance with the country's laws?</p>	<p>① N/A</p> <p>② N/A</p> <p>③ N/A</p> <p>④ N/A</p> <p>⑤ N/A</p> <p>⑥ N/A</p>
	(3) Heritage	<p>① Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?</p>	<p>① N/A</p>
	(4) Landscape	<p>① Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?</p>	<p>① N/A</p>



**Environmental Checklist: 15. Roads and Railways (4)**

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
4 Social Environment	(5) Ethnic Minorities and Indigenous Peoples	<p>① Where ethnic minorities and indigenous peoples are living in the rights-of-way, are considerations given to reduce the impacts on culture and lifestyle of ethnic minorities and indigenous peoples?</p> <p>② Does the project comply with the country's laws for rights of ethnic minorities and indigenous peoples?</p>	<p>① N/A ② N/A</p>
	(1) Impacts during Construction	<p>① Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?</p> <p>② If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?</p> <p>③ If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?</p> <p>④ If necessary, is health and safety education (e.g., traffic safety, public health) provided for project personnel, including workers?</p>	<p>① Construction working is limited only one or two days in dry season, impact of air pollutants are also limited in short period. Bridge basement is planned by cast-in-place concrete pile method may cause noise, but it is limited within one day, so the impact is very limited. ② N/A ③ N/A ④ N/A</p>
5 Others		<p>① Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?</p> <p>② Are the items, methods and frequencies included in the monitoring program judged to be appropriate?</p> <p>③ Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?</p> <p>④ 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>① N/A ② N/A ③ N/A ④ N/A</p>
	Reference to Checklist of Other Sectors	<p>① Where necessary, pertinent items described in the Forestry Projects checklist should also be checked (e.g., projects including large areas of deforestation).</p> <p>② 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).</p>	<p>① N/A ② N/A</p>
6 Note	Note on Using Environmental Checklist	<p>① 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).</p>	<p>① N/A</p>

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 made, if necessary.

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.

## MONITORING FORM

### 1. Responses/Actions to Comments and Guidance from Government Authorities and the Public

Monitoring Item	Monitoring Results during Report Period

### 2. Mitigation Measures

#### - Air Quality (Emission Gas / Ambient Air Quality)

Item	Unit	Measured Value (Max.)	National Standards (Tentative)	WHO Standards	Standards for monitoring	Remarks			
						Detail of location	No. of monitoring points	Frequency	duration
Construction									
Number of Grievances				-		Near the Bridges	7	6 times At the stage of demolition, excavation, pile driving, concrete mixing, erection of structure, paving	each construction stage such as demolish, excavation, pile driving, concrete mixing, erection of structure, paving

#### - Water Quality (Effluent/Wastewater/Ambient Water Quality)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	National Standards For class 3	Standards for monitoring	Remarks			
						Detail of location	No. of monitoring points	Frequency	duration
During boring construction in the River/Wet land									
color				-		both sides of river/wetland at Bridge location	14	3 times Before construction During construction of pile driving After completion	excavation/pile driving work in the river
odor									

## - Noise / Vibration

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	GHANA's Standards	WHO Standards	Standards for monitoring	Remarks			
							Detail of location	No. of monitoring points	Frequency	duration
Construction										
Noise Levels (L <sub>eq</sub> )	dB(A)			70(Light industrial commercial area)	70(commercial area) 55(residential)	70	Nearest residence from Bridge Location	7	at least one time during construction stages of pile driving.	During construction
Operation										
Noise Levels (L <sub>eq</sub> )	dB(A)			70(Light industrial commercial area)	70(commercial area) 55(residential)	70	On ROW at Nearest residence from Bridge Location	7	Once a month	For one years, For 5 consecutive days (covering work days)

## 3. Social Environment

## Traffic volume

operation		parameter	location
Transportation condition		Traffic volume (12 hr) Number of traffic accidents	7 locations at bridges
			7
			Every three months
			For 12 months, For 1 day (covering work days)

## - Socio-Economic

Monitoring parameter	Monitoring Results during Report Period
Construction Period Major parameters : consisting of - grievances - compensation for cultivations	Before and during construction

**4. Reporting period to JICA**

- (1) During construction, Contractor will conduct Daily Monitoring. EPA will conduct Environmental Monitoring and will submit the result to MPW, and MPW will submit it with project status report to JICA every three months.
- (2) During operation period, EPA will implement Environmental Monitoring and will submit Monitoring Form to JICA annually for one years.



9. 建設業者リスト (ランク A、B)

CONSTRUCTION COMPANY CERTIFICATE CATEGORY "A" 2009

DATE	COMPANY	CONTACT	CERTIFICATE NO.	AMOUNT USD
JULY 04, '09	Finda Architecture & Construction Company. Monee Creek, Paynesville, Liberia.	06527941	A	100.00
"	Kasthom Company, Inc. Barnesville Junction, Somalia Drive, Gardnerville.	06904834/06522196	A	100.00
"	Monrovia General Constructors. JY Somalia Drive, Gardnerville.	06517343	A	100.00
"	Perfect Construction & Maintenance Company. Freeway Somalia Drive, Gardnerville.		A	1200.00
"	ADI Constructors. Center Street/ Immigration, Monrovia, Liberia.	06571571	A	650.00
"	Denmark Silion Derick JC.	INCOMPLETE		NONE
"	Vega Group, Inc. Randall Street, Monrovia, Liberia.	06899266	A	650.00
"	Bittar Construction Company. U.N. Drive, Buzzy Quarter, Monrovia, Liberia.	06510442/06510108	A	1200.00
"	Moweh Liberia LTD. Benson Street, Adjacent People's Building.	06519042/077519042	A	100.00
"	Mensah Construction Company Liberia, LTD. Sinkor, Monrovia, Liberia.	06512289	A	100.00
August 26	West Construction Company, RCT Engineering. 5 <sup>th</sup> Street, Sinkor.	06255954	A	900.00
September 03	Sawyer & Associates. Buzzy Quarter/ UN Drive, Liberia.	06517423/06839215	A	100.00
September 10	Sam Shawki Fawaz Entrepreneur, Inc. (SSF) Bong Mine Pier, Bushrod Island Liberia.	06513865/06483698	A	650.00
	C. J. Construction, Inc. Mamba Point, Queen Building, UN Drive, Montovia.	06437480	A	650.00



	Koman Enterprises, Inc. Adjacent Catholic School, Somalia Drive Gardnerville, Liberia.	077361888	A	650.00
October 06	Phonicia Architecture & Construction. Mamba Point, Monrovia, Liberia.	069333339/058933333	A	1,200.00
October 16	Peace Glory Lawac. Randall/ UN Drive Junction, Monrovia, Liberia.		A	100.00
	Eocom, Inc. Jamaica Road, Bushrod Island, Liberia.	06515400/06543343	A	100.00
	Pealat Liberia, Inc.	06644508	A	100.00
✓	Boimah Engineering	077549266	A/E	100.00
	AEP Consultants		A/E	100.00
	Afrique Construction & Maintenance Company	06519607	A	100.00
	Techsuit Liberia Inc.		A	100.00
	Borbor Nyumah Construction Company	06636027	A	100.00
	Resma Engineering Services, Inc	06510191	A	100.00
	Qingdao construction Group (LIB) LTD	05924392	A	100.00
	Odebrecht Construction Company	077917947	A	2,500.00
	Odebrecht Services External LTD.	077767296	A	2,500.00
	B. L. Harbert Liberia LTD.	047516734	A	4,250.00
	UNICON Construction Liberia Inc.	06510799	A	100.00
	Musons Group, Inc.	06517769	A	100.00
	Top International Engineering Liberia LTD.	077398960/06692587	A	1,200.00
	Engineering Construction Services (ECS)	06551643/06544836	A	100.00
	DE SIMONE Liberia LTD	06514351/077511434	A	4,250.00
	Liberia Reconstruction Development Company (LRDC)	06531419	A	650.00
	Riders Inc.	06929609	A	1,200.00
	Bittar Const. Co LTD	06510108/06510442	A	1,200.00
	Genesis Liberia, Inc	06552785/06525903	A	100.00
	West Construction, Inc.	06255954	A	900.00
	Beztkon Engineering Company. Inc.	06130458	A	100.00
✓	Crossroads Enterprises, Inc.	06558737/06562129	A	100.00

Jamu Resources, Inc.	06467195	A	650.00
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CONSTRUCTION COMPANY CERTIFICATE CATEGORY "B", 2009

DATE	COMPANY	CONTACT	CERTIFICATE NO.	AMOUNT USD
05/01/09	Sam Shawki Fawaz Enterprises Inc. Bong Mines Pier, Bushrod Island, Liberia	06513865/06483698	B	500.00
	Team Liberia Construction Inc. Bushrod Island, Montserrado County, Liberia	06557261/06478431	B	75.00
	Richard Engineering.	06514899	B	75.00
	Dixon Group Inc. UN. Drive Mamba Point.	06660072/05660072	B	1,050.00
	Dala Construction Company (DALECO). Jamaica Road, Bushrod Island, Liberia.	06510126/06511688	B	450.00
	Top Stars Inc. Topoe Village, Gardnersville, Somalia Drive	06561797/065553113	B	100.00
	Bashir Business Center, Inc. Clara Town, Bushrod Island, Liberia.	04700070/04744999	B	500.00
	Win Builders & Material Supply. UN. Drive, Buzzy Quarters, Monrovia Liberia.		B	75.00
	Urban Builders Inc. 15 <sup>th</sup> Broad Street, Monrovia Liberia.	06533705/06546240	B	75.00
	Jay Engineering & Construction Company. Carey & Clay Street, Monrovia, Liberia.	06527799/06552046	B	75.00
	Caspian Hollings Company. Congo Town, Liberia.	06221441	B	75.00
	GAP International Liberia, Inc. Jamaica Road, Around Boatwain School, Bushrod Island, Liberia.	077510126/06511688	B	75.00
	Global construction. Somalia, Drive, GTZ, Gardnersville, Liberia.	06539129/06554862	B	75.00
	Quality Engineering & Standard Technology, Inc. (QUEST). Deport Road Junction, Paynesville.	06535913/05670274	B	75.00
	S. & Z. Corporation, Liberia, Inc. Clay & Benson Street, Monrovia, Liberia.	06632984/06561285	B	75.00
JUNE 24, '09	General Fabrication & Construction Business Corporation. UN Drive Buzzy Quarter.	06933934/06523450/065553139	B	75.00
	Khoury Construction Industry. Clara Town, Monrovia.	06510051	B	1050.00
	KAHA International Construction Company. New Georgia,	06512847/0683115	B	75.00



	Caldwell.					
	Arno Constructors Company. Weaver Avenue, Paynesville City, Liberia.	06515704	B			75.00
	Engineering & Architecture Builders, Inc. Keyma Town, Paynesville, Liberia.	06550471	B			75.00
	Venture Liberia, Inc. Benson Street, Monrovia, Liberia.	077270319/077790650	B			75.00
	Anisul Realty & Investment Company, Inc. Monrovia, Liberia	INCOMPLETE				NONE
	Alpha Omega Holdings, Inc	INCOMPLETE				NONE
	Hasrol Contractors & Traders	INCOMPLETE				NONE
July 17	Builders Construction Company	INCOMPLETE				NONE
	Wazni Trading	INCOMPLETE				NONE
JULY 24	Montanpolie Corporation, Inc. Opp. Gardnerville Market, Liberia.	06549732	B			75.00
	Steven Liberia Limited. Phonic Complex, Clara Town, Liberia.	06810952	B			75.00
	Phoncia Architecture & Const. Co. Mamba Point, Monrovia, Liberia.	05893333/06933339	B			
	Safeway Industrial Construction Company. Edi Building Benson Street, Monrovia, Liberia.	06519719/06811200	B			75.00
	Afrique Construction & Maintenance Company. Ashmun/Johnson Streets, Monrovia, Liberia.	06519607	B			75.00
August 20	Liberia Engineering Associates, LTD. ELWA, Old Road Hospital, Paynesville.	077233378	B			75.00
August 21	Tutex Wood Management Construction.	06510912	B			75.00
August 25	Starz LLC, Inc. Air field, Shark's Junction, Sinkor.	077518175	B			75.00
September 02	Halabi International Builders. Sinkor, Monrovia	06549255	B			1,050.00
	Tarwarken Construction Company. Jamaica Road, Monrovia, Liberia.	06517255/06600665	B			75.00
September 10	Swag Engineering & Construction Company, Inc. Watch Tower Road, Paynesville, Liberia.	06513019/06550856	B			75.00

September 21	Pacific Construction Company. Stephen Tolbert Estate, Gardnerville.	06528938/06556638	B	75.00
:	Atlantic Engineering & Construction Company. Tele com, Paynesville, Liberia.	06513359/06512870	B	75.00
October 06	B & Son Transport/ Construction Services. 156 Carey Street & Johnson Street, Monrovia, Liberia.	06568896/06833687	B	75.00
	Lowary Group Incorporated. Robert Field Highway, Liberia.	077556969	B	75.00
October 28	Bezaleez Turkey Contractors		B	75.00
	Construction Material Center	06419052	B	75.00
	Cape Resources, Inc.	06511311	B	75.00
	Lendeh Services, Inc.	06448473	B	75.00
	KKHALIL & SONS	06510056/05452245	B	1,050.00
	West Africa International Services, Inc.	065117689	B	75.00



10. 収集資料リスト

調査名：リベリア国 ミッシングリンク橋梁復旧計画（その1）準備調査

番号	資料の名称	形態 図書・ビデオ 地図・写真等	オリジナル・コピー	発行機関	発行年
1	Annual Data	電子データ	コピー	公共事業省	2010
2	Draft Technical Specification and Working Drawing 2010	電子データ	コピー	公共事業省	2010
3	MPW Mobile Equipment Division Vehicle/Equipment Update March 2010	電子データ	コピー	公共事業省	2010
4	MPW Highway maintenance/Operations Proposed Budget Description 2010/2011	電子データ	コピー	公共事業省	2010
5	Motor Vehicle Department Land and Rail	電子データ	コピー	交通省	2010
6	Infrastructure Implementation Unit Monthly Status Report For Feb. 2010	電子データ	コピー	公共事業省	2010
7	STRIDES in Geography (Form2)	電子データ	コピー、電子データ	Liberia National Police	2007-2010
8	List of Health Facilities in Liberia	電子データ	コピー	厚生・社会福祉省	-
9	A system in Transition the 2007/2008 National School Census Report	電子データ	コピー	教育省	2008
10	2008/2009 School Year	電子データ	電子データ	教育省	2009
11	General and Core Rates of Inflation	電子データ	コピー	Liberia Central Bank	2010
12	2008 Population and Housing Census Results	電子データ	コピー	LISGIS	2008
13	Labor Law & An Act to Amend	電子データ	コピー	労働省	2007

番号	資料の名称	形態 図書・ビデオ 地図・写真等	オリジナル・コピー	発行機関	発行年
14	学校病院分布マップ	電子データ	電子データ	LISGIS	2010
15	降雨データ (1980年まで)	電子データ	コピー	土地資源エネルギー省	-
16	降雨データ (2004-2010)	電子データ	電子データ	UNMIL	2010
17	Greater Monrovia MAP	電子データ	電子データ	公共事業省	-
18	Construction Company Certificate Category "A" 2009	電子データ	コピー	公共事業省	2009
19	Construction Company Certificate Category "B" 2009	電子データ	コピー	公共事業省	2009



