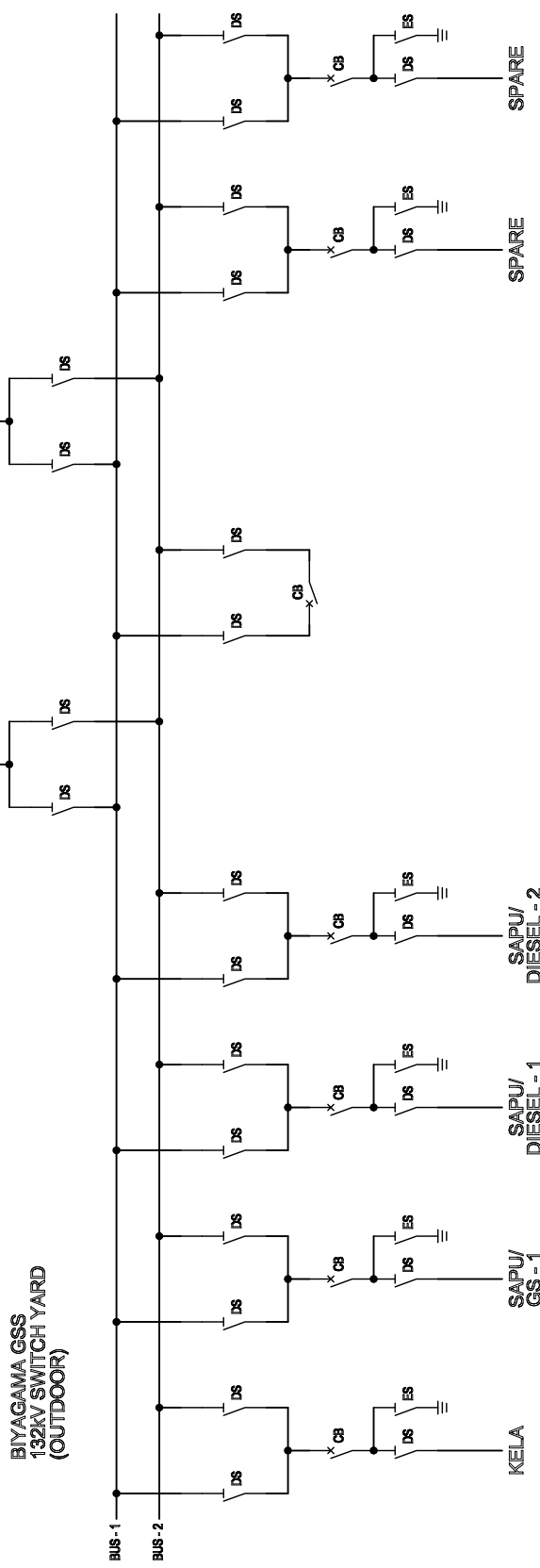


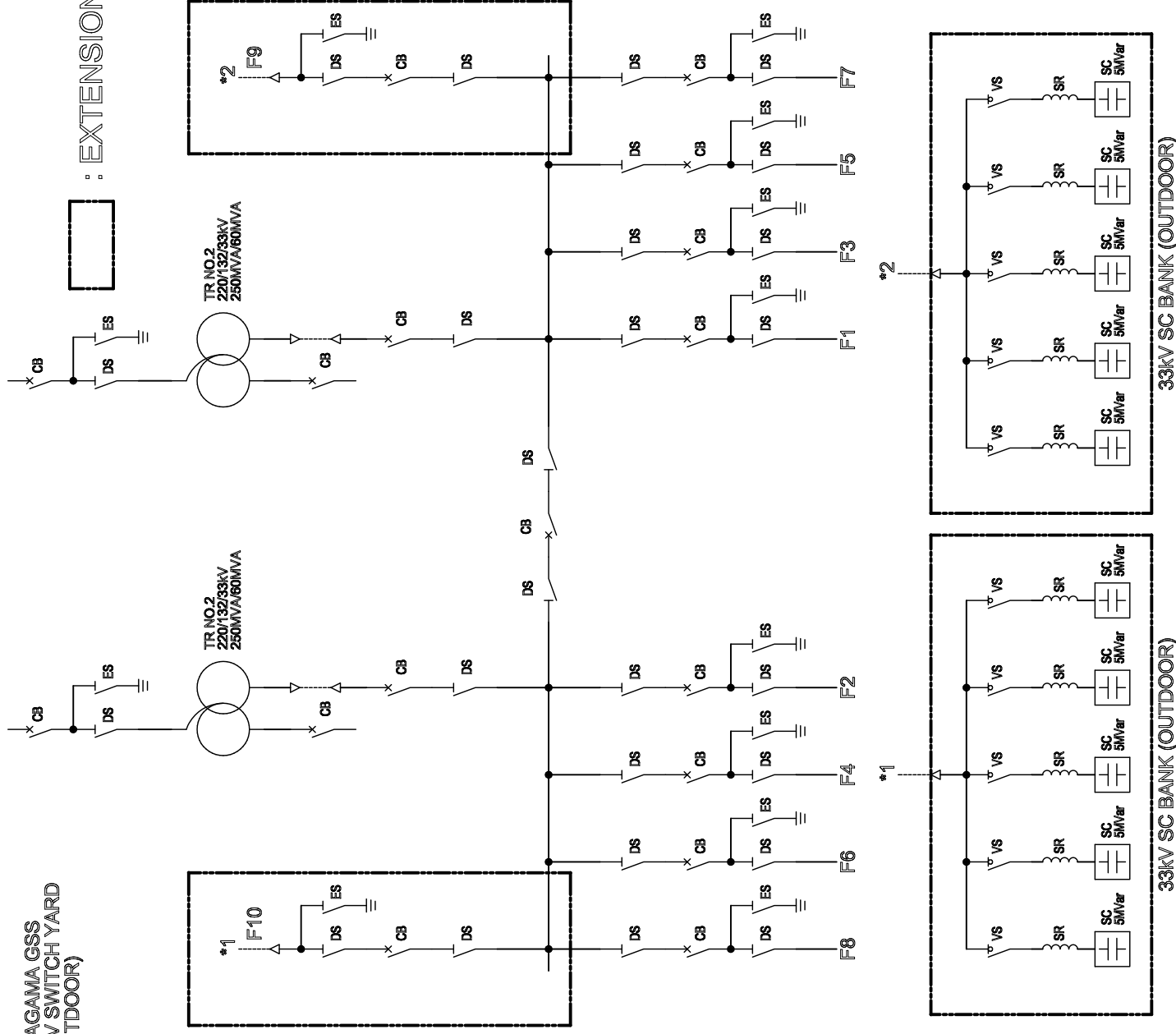
BIYAGAMA GSS
220KV SWITCH YARD
(OUTDOOR)



BIYAGAMA GSS
132KV SWITCH YARD
(OUTDOOR)

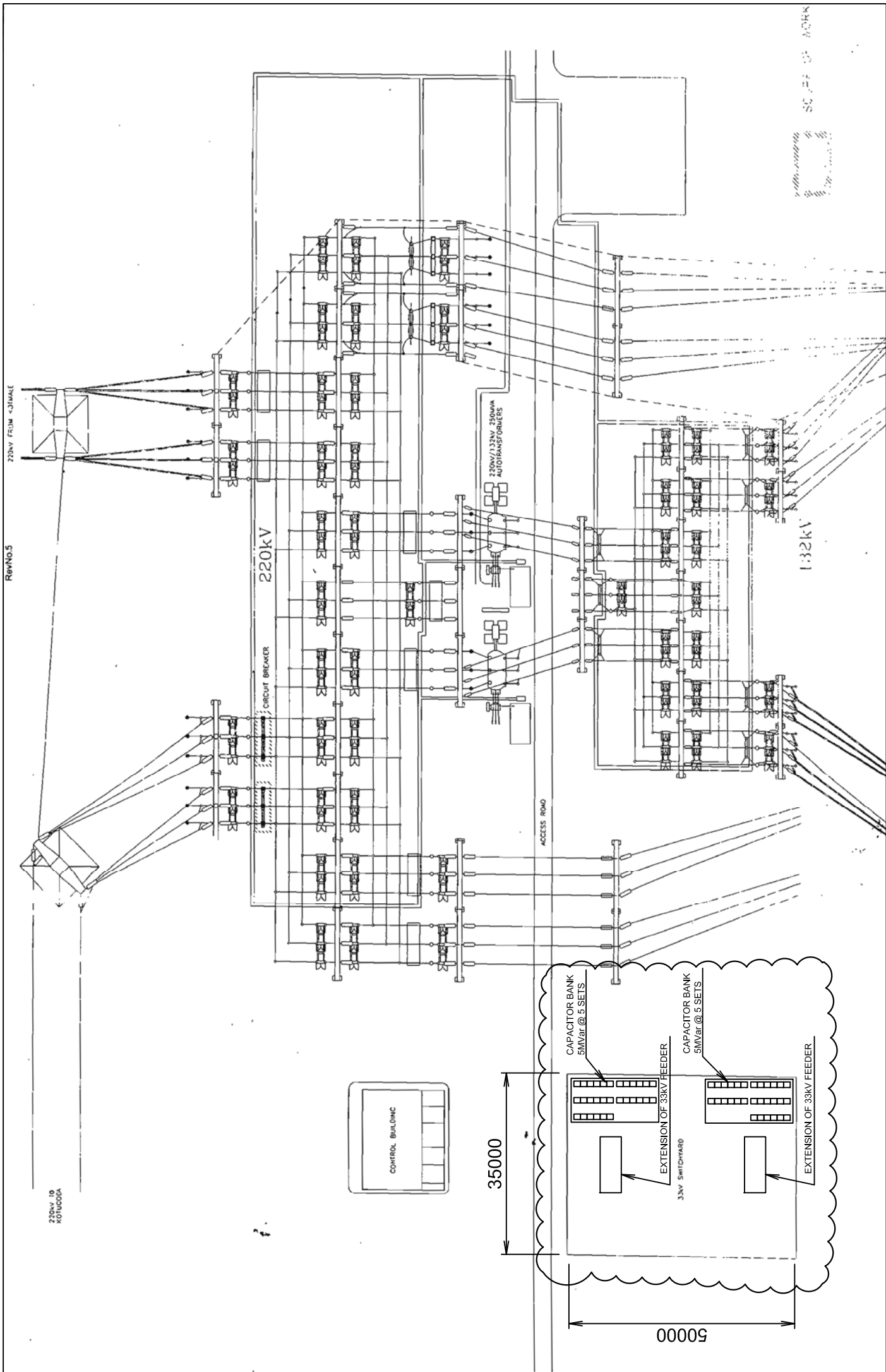
BIYAGAMA GSS
33kV SWITCH YARD
(OUTDOOR)

: EXTENSION SCOPE



33kV SC BANK (OUTDOOR)

33kV SC BANK (OUTDOOR)



220kV/132kV 250MVA AUTO TRANSFORMERS

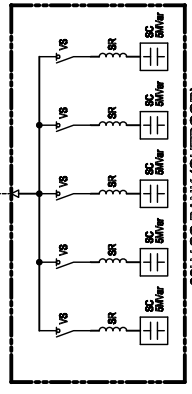
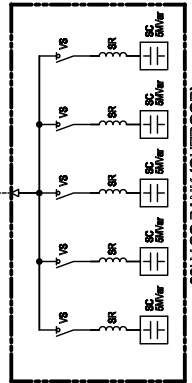
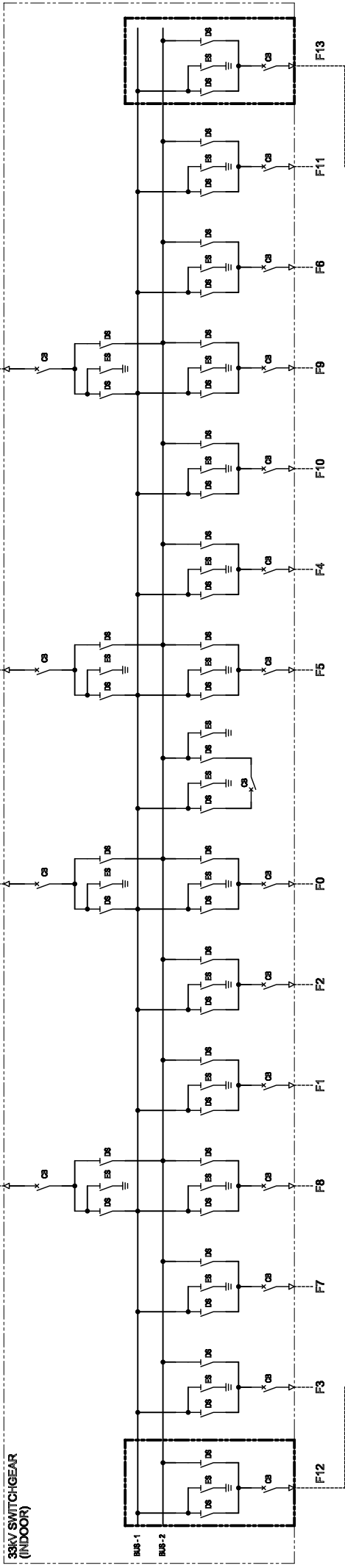
PROJECT SCOPE OF GSS EXTENSION AREA

BIYAGAMA GS

KELANIYA - 1 BIYAGAMA - 2
 KELANIYA - 2 BIYAGAMA - 1

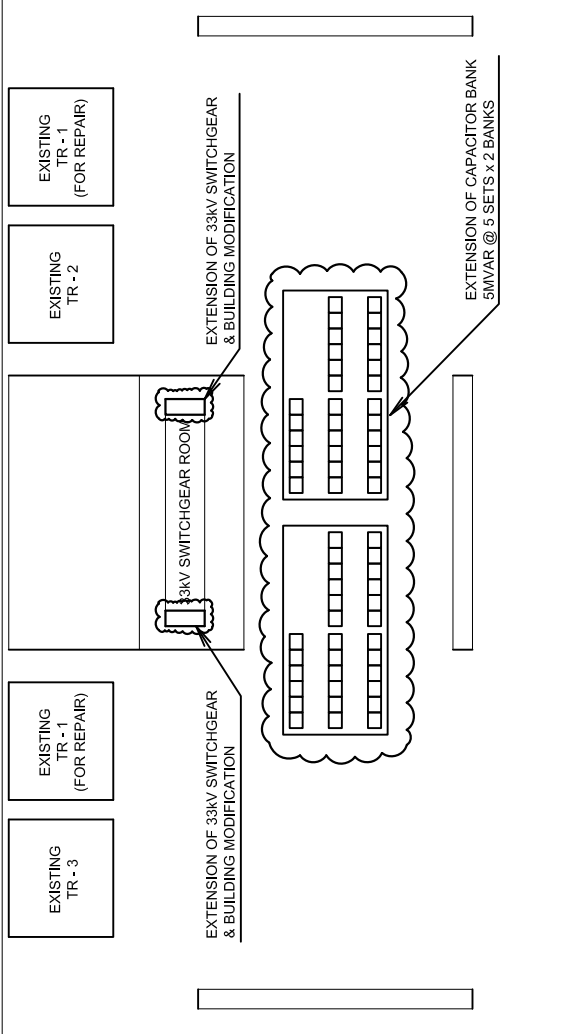
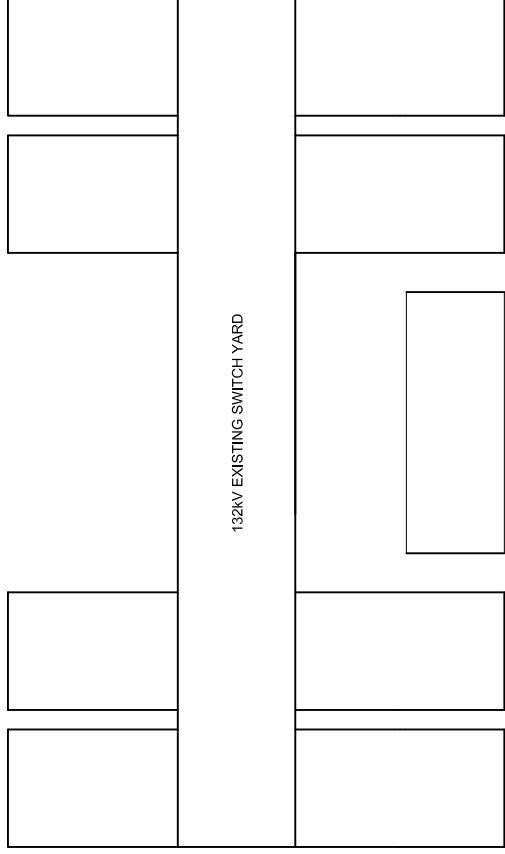
132KV SWITCH YARD
 (OUTDOOR)

☐ : EXTENSION SCOPE

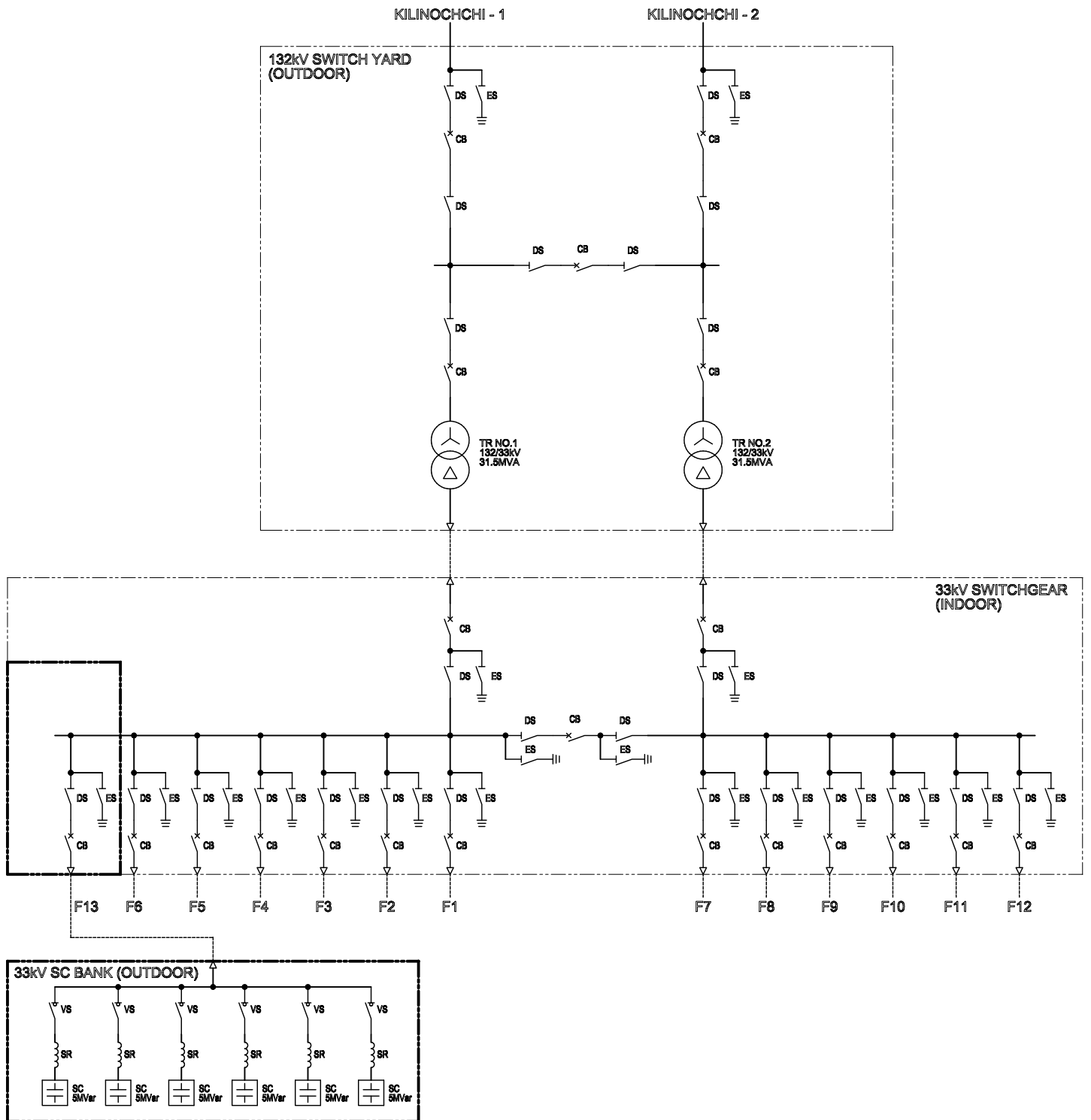


80000

92000



 : PROJECT SCOPE OF GSS EXTENTION AREA



125000

Riv 2

: PROJECT SCOPE OF GSS EXTENSION AREA



33KV GANTRIES
WASTE WATER PIT CONNECTION OF CAPACITOR BANK FOR EXTENSION 33KV FEEDER @ 1 PANEL

GENERATOR ROOM

CAPACITOR BANK 50Mvar @ 3 SETS

CAR PARK

CONTROL BUILDING

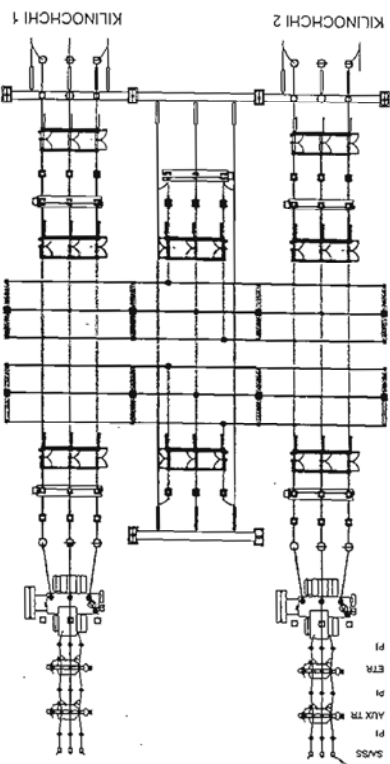
ACCESS ROAD

GATE



GUARD HOUSE

ROAD

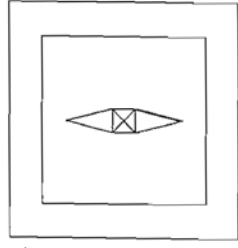


Circle is Indoor
Substation
SAFES
PI
ALX TR
PI
PI

PATH

105000

33KV GANTRIES



KATUNAYAKA

PUTTALAMA

132kV SWITCH YARD (OUTDOOR)

BUS - 1

BUS - 2

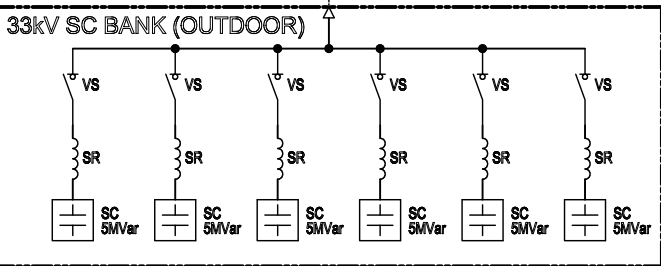
TR NO.1
132/33kV
31.5MVA

TR NO.2
132/33kV
31.5MVA

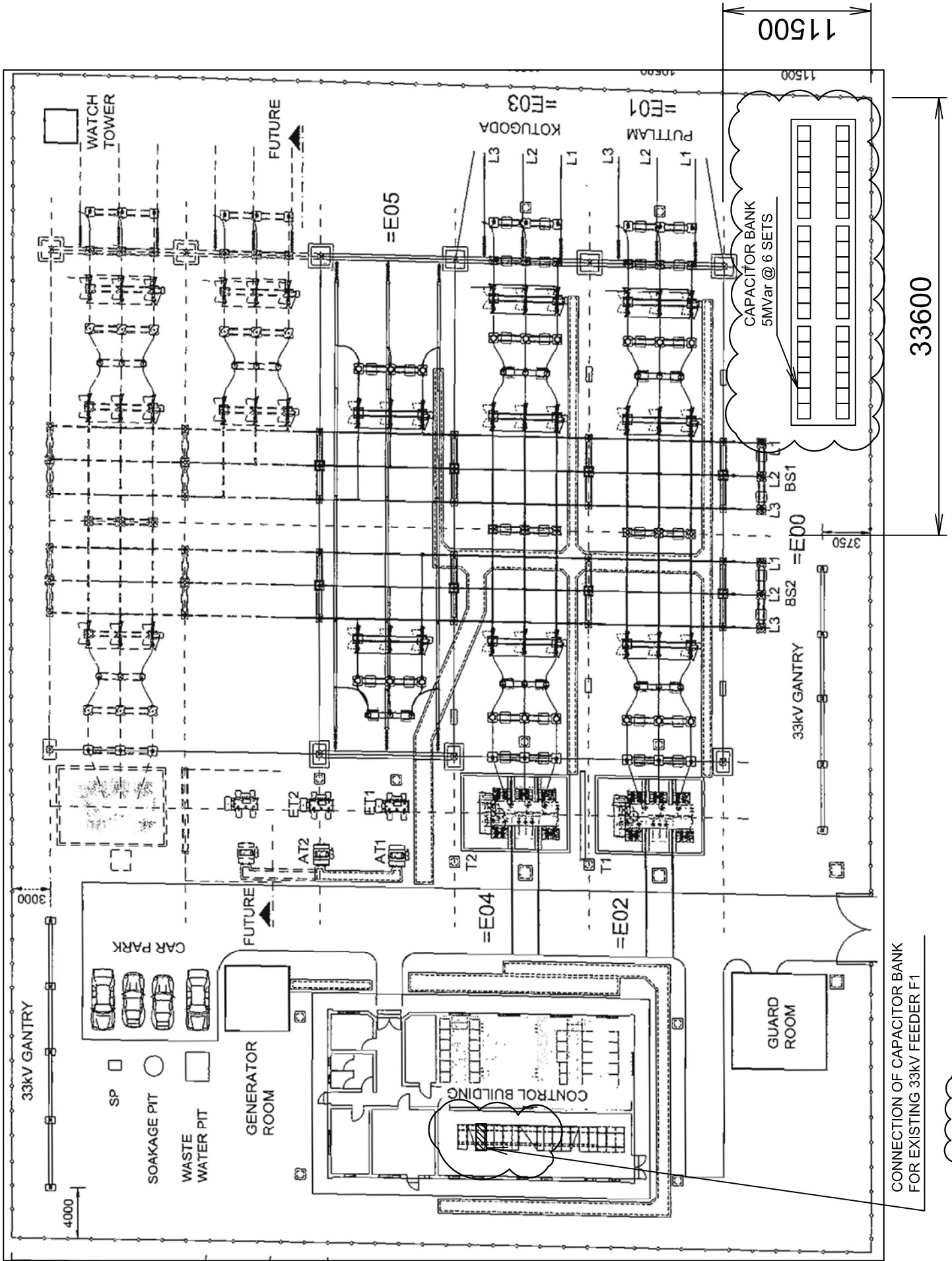
33kV SWITCHGEAR (INDOOR)

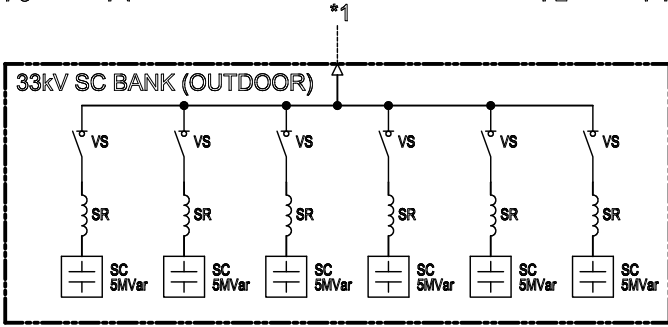
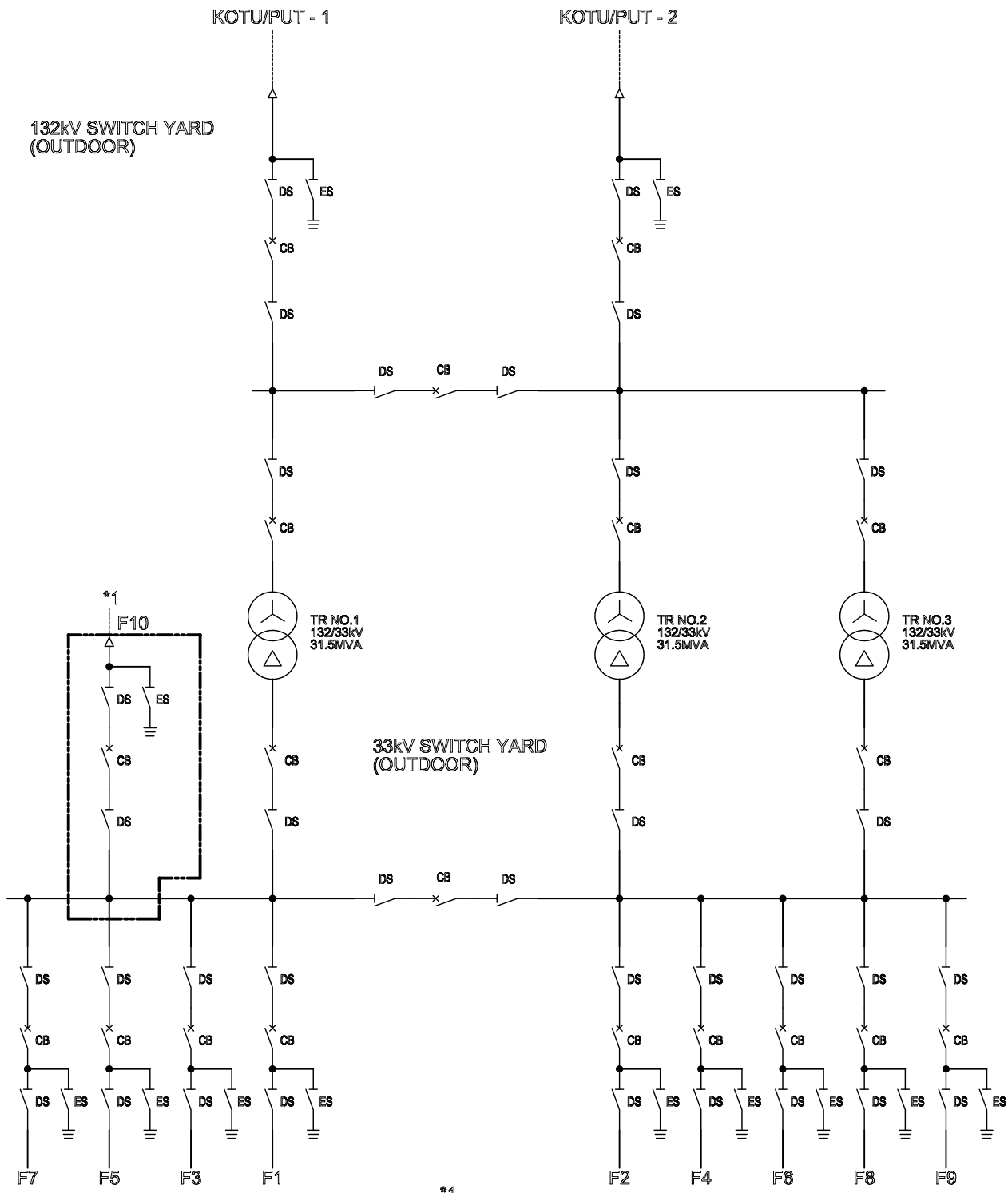
36kV DEG SET - 1

36kV DEG SET - 2



 : EXTENSION SCOPE

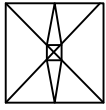




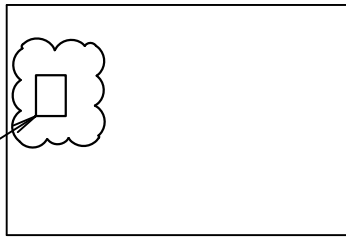
: EXTENSION SCOPE

80000

00008



EXTENSION OF CONTROL & PROTECTION PANEL



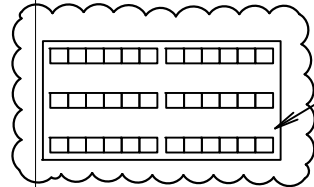
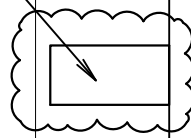
132kV EXISTING SWITCH YARD

EXISTING TR - 1

EXISTING TR - 2


EXISTING TR - 3

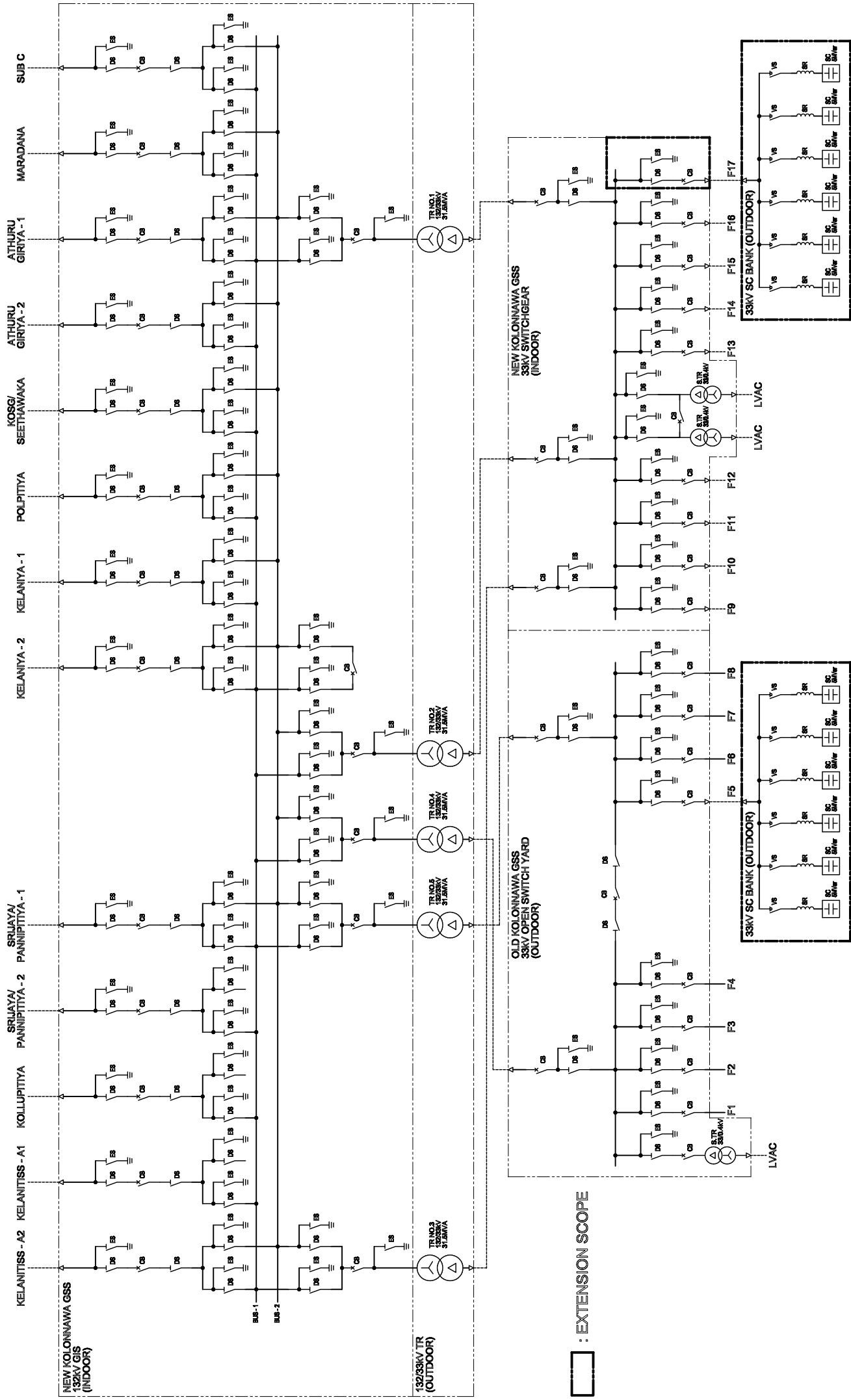
EXTENSION OF 33kV SWITCH YARD

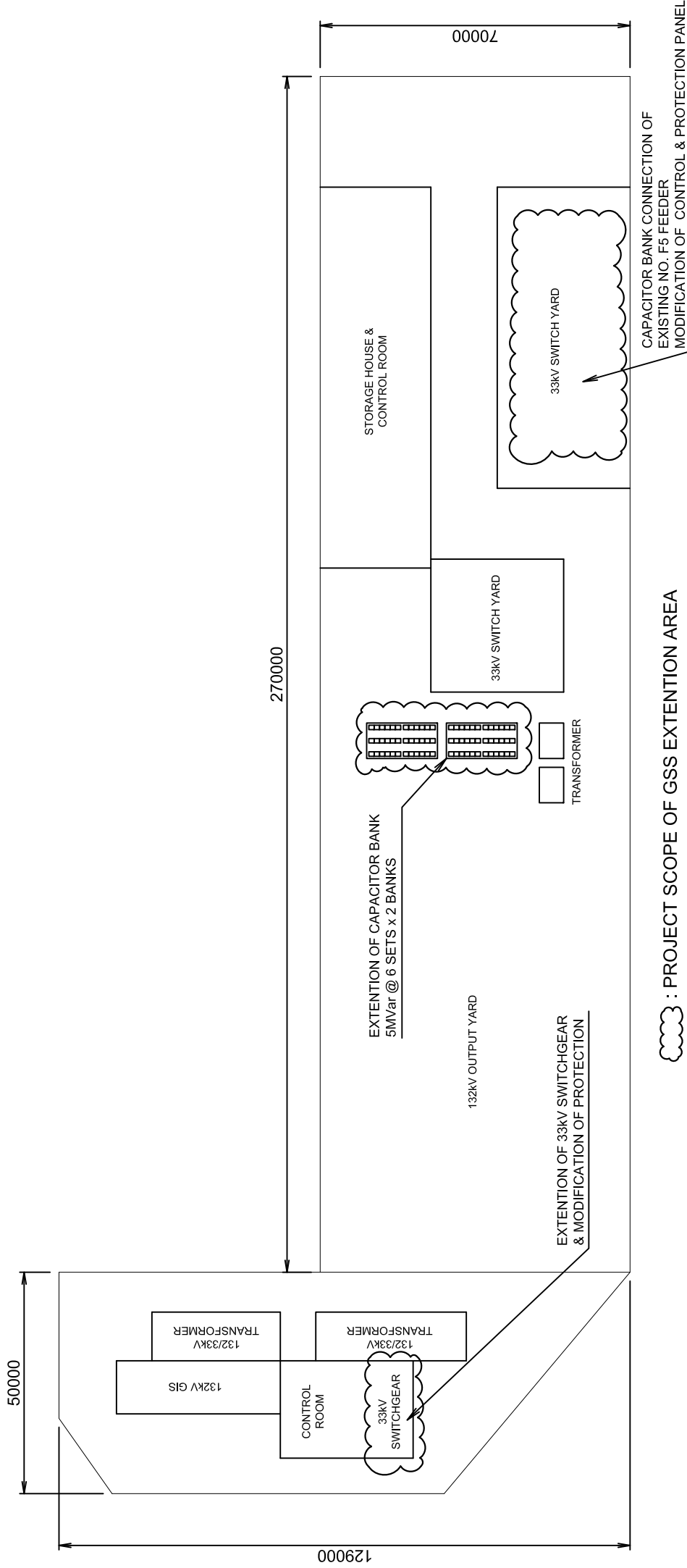


33kV EXISTING SWITCH YARD

EXTENSION OF CAPACITOR BANK
5MVAR @ 6 SETS

 : PROJECT SCOPE OF GSS EXTENTION AREA





☁ : PROJECT SCOPE OF GSS EXTENSION AREA

Attachment-4 Environmental Checklist: 14. Power Transmission and Distribution Lines; New Habarana-Veyangoda TL Project (1/4)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
1 Permits and Explanation	(1) EIA and Environmental Permits	① Have EIA reports been officially completed?	CEB submitted IEE report to PAA on July 6, 2011. It followed appropriate steps stipulated by the relevant Sri Lanka laws and regulations.
		② Have EIA reports been approved by authorities of the host country's government?	TEC (Technical Evaluation Committee) is currently appraising the report and will issue an official approval by end of JU
		③ Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?	There were comments made by relevant authorities and IEE report was being revised accordingly
		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?	There is no other environmental permits required prior to the project approval in Sri Lanka.
2 Mitigation Measures	(2) Explanation to the Public	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?	IEE report is not mandatory to hold public consultations, but CEB notified project's outline and held some unofficial meeting with affected people
		② Are proper responses made to comments from the public and regulatory authorities?	Comments of affected people were being reflected into the IEE report.
	(1) Water Quality	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? If water quality degradation is anticipated, are adequate measures considered?	No negative impact is expected as almost of all project area is planned in flat area.
		(1) Protected Areas	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?
(2) Ecosystem		① Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?	No ecological valuable habitats such as tropical rain forest.
		② Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?	No protected area for elephants which are being designated as endangered species by IUCN, but the project area is planned in elephants- roaming area.
		③ If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	No specific mitigation measures to avoid adverse impacts to roaming-elephants. Effective countermeasures should be planned by CEB.
		④ Are adequate measures taken to prevent disruption of migration routes and habitat fragmentation of wildlife, and livestock?	No specific mitigations to avoid adverse impacts to roaming-elephants. No needed mitigations for other wildlife.

Attachment-4 Environmental Checklist: 14. Power Transmission and Distribution Lines; New Habarana-Veyangoda TL Project (2/4)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
3 Natural Environment		<p>⑤ Is there a possibility that improved access by the project will cause impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystem 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 in undeveloped areas, is there a possibility that the new development will result in extensive loss of natural environments?</p> <p>① Is there a soft ground on the route of power transmission lines 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>There are no adverse effects anticipated to destruction of forest and its ecosystem.</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
	(3) Topography and Geology	<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>There is no resettlement caused by project.</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
4 Social Environment		<p>① Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?</p>	<p>There is some anticipated cases that Right of Way of 35m concerning transmission lines causes remove, cut or prune trees in the home garden of 46 houses with 179 residents in the RoW.</p>

Attachment-4 Environmental Checklist: 14. Power Transmission and Distribution Lines; New Habarana-Veyangoda TL Project (3/4)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
	(2) Living and Livelihood	<p>② 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>③ Is there a possibility that installation of structures, such as power line towers will cause a radio interference? If significant radio interference is anticipated, are adequate measures considered?</p>	<p>Adequate public health education will be introduced by the Consultants and Contractor involved for project implementation.</p> <p>There is no case anticipated that the development of 220kV transmission lines and towers cause radio interferences within Right of Way.</p>
	(3) Heritage	<p>① 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>The project won't give negative impacts to local heritages.</p>
	(4) Landscape	<p>① Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?</p>	<p>The project won't give negative impacts to local landscape.</p>
	(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 impacts on the 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>There admitted no ethnic minorities and indigenous people living in the project area.</p> <p>There admitted no ethnic minorities and indigenous people living in the project area.</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 Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?</p>	<p>CEB will prepare counter measures, instruct contractors to implement them in the Construction Technical Specifications, and monitor and manage the contractors. Since the existing road is the only road to other areas, it is necessary to plan the operation process carefully to avoid traffic jams.</p> <p>Introduction of alien species including domestic plants should be strictly controlled at construction sites and work camps.</p> <p>Forest fires should be carefully avoided at all costs at the work camps. It is also important that workers avoid collecting fire woods. Poaching by workers should be strictly controlled.</p> <p>Job opportunities and skill development opportunities will be appreciated.</p> <p>Affirmative actions among local people, however, must be taken in order to do no harm to the local societies. Further stakeholder meetings will be appreciated to inform them in the whole process of project implementation.</p> <p>Education program on hygiene, health and safety will be conducted by contractors to raise workers' awareness and behavior change.</p> <p>IEE report is being compiled with adequate monitoring program.</p>
5 Others			

Attachment-4 Environmental Checklist: 14. Power Transmission and Distribution Lines; New Habarana-Veyangoda TL Project (4/4)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
	(2) Monitoring	<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>Monitoring program including IEE report seems to be appropriate</p> <p>Without budget for implementation of each monitoring, other items are being cleared in IEE report.</p>
6 Note	Note on Using Environmental Checklist	<p>① If necessary, the impacts to transboundary or global issues should be confirmed, (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>CEA shows the monitoring formats by issuing "Guidance for Implementing the EIA Process" based on NEA.</p> <p>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.

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.

Attachment 5-1 (1) Economic Cost Estimation of Candidate 1 (without Japan's Technique)

New Habarana - Veyangoda 220 kV Transmission Line (without Japan's Technique) (LKR million)

Cost Item	Distribution														
	2013				2014				2015				Total		
	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total
Estimated base cost for construction	2,912.0	411.3	3,323.3	2,496.0	352.5	2,848.6	2,704.0	381.9	3,085.9	8,112.1	1,145.7	9,257.8			
Construction of New Habarana SWS	788.0	77.9	865.9	675.4	66.8	742.2	731.7	72.3	804.0	2,195.1	217.0	2,412.1			
Construction of connection line from Koltmale - New Anuradhapura TL	8.7	1.5	10.2	7.4	1.3	8.7	8.1	1.4	9.5	24.2	4.2	28.4			
Construction of New New Habarana - Veyangoda 220kV TL	2,062.3	221.2	2,283.5	1,767.7	189.6	1,957.3	1,915.0	205.4	2,120.4	5,744.9	616.3	6,361.2			
Augmentation of Veyangoda GS	36.1	5.6	41.7	31.0	4.8	35.8	33.6	5.2	38.8	100.7	15.6	116.3			
Construction of 1.5 km quadruple 132 kV tower line to carry 132 kV circuits from Ukuwela and Valachenai to New Habarana	16.9	2.2	19.2	14.5	1.9	16.4	15.7	2.1	17.8	47.2	6.2	53.4			
Physical Contingencies	291.2	41.1	332.3	249.6	35.3	284.9	270.4	38.2	308.6	811.2	114.6	925.8			
Sub-total 1	3,203.2	452.4	3,655.6	2,745.6	387.8	3,133.4	2,974.4	420.1	3,394.5	8,923.3	1,260.3	10,183.6			
Administrative cost		45.2	45.2		38.8	38.8		42.0	42.0		126.0	126.0			
Total Before Levies	3,203.2	497.6	3,700.9	2,745.6	426.6	3,172.2	2,974.4	462.1	3,436.5	8,923.3	1,386.3	10,309.6			
Levies		128.1	128.1		109.8	109.8		119.0	119.0		356.9	356.9			
Sub-total 2	3,203.2	625.8	3,829.0	2,745.6	536.4	3,282.0	2,974.4	581.1	3,555.5	8,923.3	1,743.2	10,666.5			
Price Escalation	299.1	117.4	416.5	347.0	138.2	485.2	477.1	192.9	670.0	1,123.2	448.5	1,571.7			
Grand Total	3,502.3	743.2	4,245.5	3,092.6	674.6	3,767.2	3,451.5	774.0	4,225.5	10,046.5	2,191.8	12,238.2			
Financial Cost (Grand Total - Price Escalation)	3,203.2	625.8	3,829.0	2,745.6	536.4	3,282.0	2,974.4	581.1	3,555.5	8,923.3	1,743.2	10,666.5			
Economic Cost	3,203.2	434.6	3,637.8	2,745.6	372.5	3,118.1	2,974.4	403.6	3,378.0	8,923.3	1,210.7	10,134.0			

(Note)

1. Share rate of material and Labor by work item:

Construction of New Habarana SWS

Construction of connection line from Koltmale - New Anuradhapura TL

Construction of New New Habarana - Veyangoda 220kV TL

Augmentation of Veyangoda GS

Construction of 1.5 km quadruple 132 kV tower line to carry 132 kV circuits from Ukuwela and Valachenai to New Habarana

2. Allocated rate of FC and LC:

For material:

For the others:

75 (%) Material

25 (%) Labor

75 (%) Material

25 (%) Labor

75 (%) Material

25 (%) Labor

75 (%) Material

25 (%) Labor

3. Physical Contingencies:

4. Administrative Cost:

5. Income Tax of Labor:

6. Net Profit:

7. Price escalation:

For FC Portion:

For LC Portion:

10.0 (%)

10.0 (%)

5.0 (%)

10.0 (%)

Based on the estimation by CEB.

According to the Personal Income Tax Law by Ministry of Finance and Planning Sri Lanka.

of the net offering amount of the works to be proposed by contractors.

Based on the similar projects in CEB.

Based on the 2010 Annual Report by Ministry of Finance and Planning Sri Lanka.

Based on the data of external trade.

0.95809

Standard conversion factor (SCF):

Based on the data of external trade.

Attachment 5-1 (2) Economic Cost Estimation of Candidate 1 (with Japan's Technique)

New Habarana - Veyangoda 220 kV Transmission Line (with Japan's Technique)

(LKR million)

Cost Item	Distribution														
	2013				2014				2015				Total		
	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total
Estimated base cost for construction	3,473.3	411.3	3,884.6	2,977.1	352.5	3,329.6	3,225.2	381.9	3,607.1	9,675.6	1,145.7	10,821.3			
Construction of New Habarana SWS	788.0	77.9	865.9	675.4	66.8	742.2	731.7	72.3	804.0	2,195.1	217.0	2,412.1			
Construction of connection line from Koltmale - New Anuradhapura TL	8.7	1.5	10.2	7.4	1.3	8.7	8.1	1.4	9.5	24.2	4.2	28.4			
Construction of New New Habarana - Veyangoda 220kV TL	2,623.5	221.2	2,844.8	2,248.7	189.6	2,438.4	2,436.1	205.4	2,641.6	7,308.4	616.3	7,924.7			
Augmentation of Veyangoda GS	36.1	5.6	41.7	31.0	4.8	35.8	33.6	5.2	38.8	100.7	15.6	116.3			
Construction of 1.5 km quadruple 132 kV tower line to carry 132 kV circuits from Ukuwela and Valachenai to New Habarana	16.9	1.9	18.8	14.5	1.9	16.4	15.7	2.1	17.8	47.2	6.2	53.4			
Physical Contingencies	347.3	41.1	388.5	297.7	35.3	333.0	322.5	38.2	360.7	967.6	114.6	1,082.1			
Sub-total 1	3,820.6	452.4	4,273.0	3,274.8	387.8	3,662.6	3,547.7	420.1	3,967.8	10,643.2	1,260.3	11,903.4			
Administrative cost		45.2	45.2		38.8	38.8		42.0	42.0		126.0	126.0			
Total Before Levies	3,820.6	497.6	4,318.3	3,274.8	426.6	3,701.4	3,547.7	462.1	4,009.8	10,643.2	1,386.3	12,029.5			
Levies		152.8	152.8		131.0	131.0		141.9	141.9		425.7	425.7			
Sub-total 2	3,820.6	650.5	4,471.1	3,274.8	557.5	3,832.4	3,547.7	604.0	4,151.7	10,643.2	1,812.0	12,455.2			
Price Escalation	356.7	122.1	478.8	413.9	143.7	557.6	569.1	200.5	769.5	1,339.6	466.2	1,805.9			
Grand Total	4,177.3	772.5	4,949.9	3,688.7	701.2	4,389.9	4,116.8	804.5	4,921.3	11,982.8	2,278.3	14,261.1			
Financial Cost (Grand Total - Price Escalation)	3,820.6	650.5	4,471.1	3,274.8	557.5	3,832.4	3,547.7	604.0	4,151.7	10,643.2	1,812.0	12,455.2			
Economic Cost	3,820.6	434.6	4,255.2	3,274.8	372.5	3,647.3	3,547.7	403.6	3,951.3	10,643.2	1,210.7	11,853.8			

(Note)

1. Share rate of material and Labor by work item:

Construction of New Habarana SWS

Construction of connection line from Koltmale - New Anuradhapura TL

Construction of New New Habarana - Veyangoda 220kV TL

Augmentation of Veyangoda GS

Construction of 1.5 km quadruple 132 kV tower line to carry 132 kV circuits from Ukuwela and Valachenai to New Habarana

2. Allocated rate of FC and LC:

For material:

For the others:

75 (%) Material

25 (%) Labor

75 (%) Material

25 (%) Labor

75 (%) Material

25 (%) Labor

75 (%) Material

25 (%) Labor

3. Physical Contingencies:

4. Administrative Cost:

5. Income Tax of Labor:

6. Net Profit:

7. Price escalation:

For FC Portion:

For LC Portion:

10.0 (%)

10.0 (%)

5.0 (%)

10.0 (%)

3.02 (%)

5.90 (%)

Based on the estimation by CEB.

According to the Personal Income Tax Law by Ministry of Finance and Planning Sri Lanka.

of the net offering amount of the works to be proposed by contractors.

Based on the similar projects in CEB.

Based on the 2010 Annual Report by Ministry of Finance and Planning Sri Lanka.

Based on the data of external trade.

0.95809

Standard conversion factor (SCF):

Attachment 5-1 (3) Economic Cost Estimation of Candidate 2 (without Japan's Technique)

Cost Item	Distribution												Total		
	2011						2012							2013	
	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total		LC	Sub-total
Estimated base cost for construction	950.5	467.8	1,418.4	1,425.8	701.7	2,127.5	1,544.6	760.2	2,304.8	3,920.9	1,929.8	5,850.7			
Reconstruction of Polpitiya – Kiribathkumbura TL	294.4	105.8	400.3	441.7	158.7	600.4	478.5	171.9	650.4	1,214.6	436.5	1,651.1			
Reconstruction of Kiribathkumbura – Ukuwela TL	169.3	60.8	230.2	254.0	91.3	345.2	275.1	98.9	374.0	698.5	251.0	949.4			
Reconstruction of Ukuwela – Habarana TL	465.1	167.1	632.2	697.6	250.7	948.3	755.7	271.6	1,027.3	1,918.4	689.5	2,607.9			
Removal of existing transmission line	0.0	13.4	13.4	0.0	20.1	20.1	0.0	21.8	21.8	0.0	55.4	229.8			
Conversion of existing Habarana SS	21.7	3.7	25.4	32.5	5.5	38.0	35.2	6.0	41.2	89.5	15.1	104.6			
Physical Contingencies	95.1	46.8	141.8	142.6	70.2	212.8	154.5	76.0	230.5	392.1	193.0	585.1			
Sub-total 1	1,045.6	514.6	1,560.2	1,568.4	771.9	2,340.3	1,699.1	836.2	2,535.3	4,313.0	2,122.8	6,435.8			
Administrative cost		51.5	51.5		77.2	77.2		83.6	83.6		212.3	212.3			
Total Before Levies	1,045.6	566.1	1,611.6	1,568.4	849.1	2,417.5	1,699.1	919.9	2,618.9	4,313.0	2,335.1	6,648.0			
Levies		41.8	41.8		62.7	62.7		68.0	68.0		172.5	172.5			
Sub-total 2	1,045.6	607.9	1,653.5	1,568.4	911.8	2,480.2	1,699.1	987.8	2,686.9	4,313.0	2,507.6	6,820.6			
Price Escalation	31.6	35.9	67.4	96.2	110.8	206.9	158.6	185.4	344.0	286.4	332.0	618.4			
Grand Total	1,077.1	643.8	1,720.9	1,664.5	1,022.6	2,687.1	1,857.7	1,173.2	3,030.9	4,599.4	2,839.6	7,438.9			
Financial Cost (Grand Total - Price Escalation)	1,045.6	607.9	1,653.5	1,568.4	911.8	2,480.2	1,699.1	987.8	2,686.9	4,313.0	2,507.6	6,820.6			
Economic Cost	1,045.6	494.4	1,539.9	1,568.4	741.5	2,309.9	1,699.1	803.3	2,502.4	4,313.0	2,039.2	6,352.2			

(Note)

- Share rate of material and Labor by work item:
Reconstruction of Polpitiya – Kiribathkumbura TL
Material 75 (%)
Labor 25 (%)
 - Reconstruction of Kiribathkumbura – Ukuwela TL
Material 75 (%)
Labor 25 (%)
 - Reconstruction of Ukuwela – Habarana TL
Material 75 (%)
Labor 25 (%)
 - Removal of existing transmission line
Material 75 (%)
Labor 25 (%)
 - Conversion of existing Habarana SS
Material 75 (%)
Labor 25 (%)
- Allocated rate of FC and LC:
For material:
FC 75 (%)
LC 25 (%)
For the others:
FC 0 (%)
- Physical Contingencies: 10.0 (%)
 - Administrative Cost: 10.0 (%)
 - Income Tax of Labor: 5.0 (%)
 - Net Profit: 10.0 (%)
 - Price escalation:
For FC Portion: 3.02 (%)
For LC Portion: 5.90 (%)
 - Standard conversion factor (SCF): 0.95809
- Based on the estimation by CEB.
According to the Personal Income Tax Law by Ministry of Finance and Planning Sri Lanka.
of the net offering amount of the works to be proposed by contractors.
Based on the similar projects in CEB. Based on the 2010 Annual Report by Ministry of Finance and Planning Sri Lanka.
Based on the data of external trade.

Attachment 5-1 (4) Economic Cost Estimation of Candidate 2 (with Japan's Technique)

(LKR million)

Cost Item	Distribution													
	2011						2012						Total	
	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total		
Estimated base cost for construction	1,221.4	467.8	1,689.3	1,832.2	701.7	2,533.9	1,984.9	760.2	2,745.1	5,038.5	1,929.8	6,968.3		
Reconstruction of Polpitiya – Kiribathkumbura TL	380.3	105.8	486.2	570.5	158.7	729.2	618.1	171.9	790.0	1,568.9	436.5	2,005.4		
Reconstruction of Kiribathkumbura – Ukuwela TL	218.7	60.8	279.6	328.1	91.3	419.3	355.4	98.9	454.3	902.2	145.5	1,153.2		
Reconstruction of Ukuwela – Habarana TL	600.7	167.1	767.8	901.1	250.7	1,151.8	976.1	271.6	1,247.7	2,477.9	689.5	3,167.4		
Removal of existing transmission line	0.0	13.4	13.4	0.0	20.1	20.1	0.0	21.8	21.8	0.0	55.4	55.4		
Conversion of existing Habarana SS	21.7	3.7	25.4	32.5	5.5	38.0	35.2	6.0	41.2	89.5	15.1	104.6		
Physical Contingencies	122.1	46.8	168.9	183.2	70.2	253.4	198.5	76.0	274.5	503.8	193.0	696.8		
Sub-total 1	1,343.6	514.6	1,858.2	2,015.4	771.9	2,787.3	2,183.3	836.2	3,019.6	5,542.3	2,122.8	7,665.1		
Administrative cost		51.5	51.5		77.2	77.2		83.6	83.6		212.3	212.3		
Total Before Levies	1,343.6	566.1	1,909.7	2,015.4	849.1	2,864.5	2,183.3	919.9	3,103.2	5,542.3	2,335.1	7,877.4		
Levies		53.7	53.7		80.6	80.6		87.3	87.3		221.7	221.7		
Sub-total 2	1,343.6	619.8	1,963.4	2,015.4	929.7	2,945.1	2,183.3	1,007.2	3,190.5	5,542.3	2,556.8	8,099.1		
Price Escalation	40.6	36.6	77.1	123.6	112.9	236.5	203.8	189.0	392.8	368.0	338.5	706.5		
Grand Total	1,384.2	656.4	2,040.6	2,139.0	1,042.7	3,181.6	2,387.2	1,196.2	3,583.4	5,910.3	2,895.3	8,805.6		
Financial Cost (Grand Total - Price Escalation)	1,343.6	619.8	1,963.4	2,015.4	929.7	2,945.1	2,183.3	1,007.2	3,190.5	5,542.3	2,556.8	8,099.1		
Economic Cost	1,343.6	494.4	1,837.9	2,015.4	741.5	2,756.9	2,183.3	803.3	2,986.7	5,542.3	2,039.2	7,581.5		

(Note)

- Share rate of material and Labor by work item:
Reconstruction of Polpitiya – Kiribathkumbura TL
Material 75 (%)
Labor 25 (%)
 - Reconstruction of Kiribathkumbura – Ukuwela TL
Material 75 (%)
Labor 25 (%)
 - Reconstruction of Ukuwela – Habarana TL
Material 75 (%)
Labor 25 (%)
 - Removal of existing transmission line
Material 75 (%)
Labor 25 (%)
 - Conversion of existing Habarana SS
Material 75 (%)
Labor 25 (%)
- Physical Contingencies: 10.0 (%)
 - Administrative Cost: 10.0 (%)
 - Income Tax of Labor: 5.0 (%)
 - Net Profit: 10.0 (%)
 - Price escalation:
For FC Portion: 3.02 (%)
For LC Portion: 5.90 (%)
 - Standard conversion factor (SCF): 0.95809
- Based on the estimation by CEB.
According to the Personal Income Tax Law by Ministry of Finance and Planning Sri Lanka.
of the net offering amount of the works to be proposed by contractors.
Based on the similar projects in CEB. Based on the 2010 Annual Report by Ministry of Finance and Planning Sri Lanka.
Based on the data of external trade.

Attachment 5-1 (5) Economic Cost Estimation of Candidate 3

Augmentation of GS and Installation of Reactive Power Compensation Devices

(LKR million)

Cost Item	Distribution														
	2012				2013				2014				Total		
	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total
Estimated base cost for construction	234.0	37.4	271.4	2,808.0	448.2	3,256.2	234.0	37.4	271.4	3,276.0	522.9	3,798.9			
(A) Augmentation of Colombo A Grid Substation	18.8	1.8	20.6	225.5	22.2	247.7	18.8	1.8	20.6	263.1	25.9	289.0			
		0.6	0.6		7.4	7.4		0.6	0.6		8.6	8.6			
(B) Construction of Kalutara 132/33 kV Grid Substation	65.2	16.9	82.0	782.0	202.3	984.3	65.2	16.9	82.0	912.3	236.0	1,148.3			
		5.6	5.6		67.4	67.4		5.6	5.6		78.7	78.7			
(C) Augmentation of Madampe Grid Substation	32.6	2.5	35.1	391.7	29.6	421.3	32.6	2.5	35.1	457.0	0.0	457.0			
		0.8	0.8		9.9	9.9		0.0	0.0		0.0	0.0			
(D) Installation of Reactive Power Compensation Devices	117.4	6.8	124.2	1,408.8	82.1	1,490.9	117.4	6.8	124.2	1,643.6	95.8	1,739.4			
		2.3	2.3		27.4	27.4		2.3	2.3		31.9	31.9			
Physical Contingencies	23.4	3.7	27.1	280.8	44.8	325.6	23.4	3.7	27.1	327.6	52.3	379.9			
Sub-total 1	257.4	41.1	298.5	3,088.8	493.0	3,581.8	257.4	41.1	298.5	3,603.6	575.2	4,178.8			
Administrative cost		4.1	4.1		49.3	49.3		4.1	4.1		57.5	57.5			
Total Before Levies	257.4	45.2	302.6	3,088.8	542.3	3,631.1	257.4	45.2	302.6	3,603.6	632.7	4,236.3			
Levies		10.3	10.3		123.6	123.6		10.3	10.3		144.1	144.1			
Sub-total 2	257.4	55.5	312.9	3,088.8	665.9	3,754.7	257.4	55.5	312.9	3,603.6	776.9	4,380.5			
Price Escalation	15.8	6.7	22.5	288.4	125.0	413.3	32.5	14.3	46.8	336.7	146.0	482.7			
Grand Total	273.2	62.2	335.4	3,377.2	790.8	4,168.0	289.9	69.8	359.7	3,940.3	922.8	4,863.1			
Financial Cost. (Grand Total - Price Escalation)	257.4	55.5	312.9	3,088.8	665.9	3,754.7	257.4	55.5	312.9	3,603.6	776.9	4,380.5			
Economic Cost	257.4	39.5	296.9	3,088.8	473.6	3,562.4	257.4	36.6	294.0	3,603.6	549.7	4,153.3			

(Note)

1. Share rate of material and Labor by work item:

(A) Augmentation of Colombo A Grid Substation

(B) Construction of Kalutara 132/33 kV Grid Substation

(C) Augmentation of Madampe Grid Substation

(D) Installation of Reactive Power Compensation Devices

75 (%) Material
25 (%) Labor
75 (%) Material
25 (%) Labor
75 (%) Material
25 (%) Labor
75 (%) Material
25 (%) Labor

3. Physical Contingencies:

4. Administrative Cost:

5. Income Tax of Labor:

6. Net Profit:

7. Price escalation:

For FC Portion:

For LC Portion:

8. Standard conversion factor (SCF):

10.0 (%)

10.0 (%)

5.0 (%)

10.0 (%)

3.02 (%)

5.90 (%)

0.95809

Based on the estimation by CEB.

According to the Personal Income Tax Law by Ministry of Finance and Planning Sri Lanka.

of the net offering amount of the works to be proposed by contractors.

Based on the similar projects in CEB. Based on the 2010 Annual Report by Ministry of Finance and Planning Sri Lanka.

Based on the data of external trade.

2. Allocated rate of FC and LC:

For material:

For the others:

75 (%) FC

25 (%) LC

0 (%) FC

Attachment 5-1 (6) Economic Cost Estimation of Candidate 4

Distribution Project Package in NWP of Region 1

Cost Item	Distribution													
	2011				2012				2013				Total	
	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	LC	Sub-total
Estimated base cost for construction	184.7	68.9	253.6	277.0	103.4	380.4	23.1	8.6	31.7	484.7	181.0	665.7		
North Western Province (NWP)	184.7	51.7	236.4	277.0	77.6	354.5	23.1	6.5	29.5	484.7	135.7	620.5		
Material														
Labour	17.2	17.2	17.2	25.9	25.9	25.9	2.2	2.2	2.2	2.2	45.2	45.2		
Physical Contingencies	18.5	6.9	25.4	27.7	10.3	38.0	2.3	0.9	3.2	48.5	18.1	66.6		
Sub-total 1	203.1	75.8	279.0	304.7	113.8	418.4	25.4	9.5	34.9	533.2	199.1	732.3		
Administrative cost		7.6	7.6		11.4	11.4		0.9	0.9		19.9	19.9		
Total Before Levies	203.1	83.4	286.5	304.7	125.1	429.8	25.4	10.4	35.8	533.2	219.0	752.2		
Levies		8.1	8.1		12.2	12.2		1.0	1.0		21.3	21.3		
Sub-total 2	203.1	91.5	294.7	304.7	137.3	442.0	25.4	11.4	36.8	533.2	240.3	773.5		
Price Escalation	6.1	5.4	11.5	18.7	16.7	35.4	2.4	2.1	4.5	27.2	24.2	51.4		
Grand Total	209.3	96.9	306.2	323.4	154.0	477.4	27.8	13.6	41.4	560.4	264.5	824.9		
Financial Cost (Grand Total - Price Escalation)	203.1	91.5	294.7	304.7	137.3	442.0	25.4	11.4	36.8	533.2	240.3	773.5		
Economic Cost	203.1	72.8	276.0	304.7	109.3	414.0	25.4	9.1	34.5	533.2	191.2	724.4		

(Note)

1. Share rate of material and Labor by work item:
North Western Province (NWP)

75 (%) Material
25 (%) Labor

3. Physical Contingencies:

10.0 (%)

4. Administrative Cost:

10.0 (%)

Based on the estimation by CEB.

5. Income Tax of Labor:

5.0 (%)

According to the Personal Income Tax Law
by Ministry of Finance and Planning Sri Lanka.

6. Net Profit:

10.0 (%)

of the net offering amount of the works
to be proposed by contractors.

7. Price escalation:

3.02 (%)

For FC Portion:

5.90 (%)

Based on the similar projects in CEB.
Based on the 2010 Annual Report
by Ministry of Finance and Planning Sri Lanka.

2. Allocated rate of FC and LC:

For material:

75 (%) FC

For the others:

25 (%) LC

0 (%) FC

8. Standard conversion factor (SCF):

0.95809

Based on the data of external trade.

Attachment 5-1 (7) Economic Cost Estimation of Candidate 5

Distribution Project Package in WPN of Region 2

Cost Item	Distribution													
	2011				2012				2013				Total	
	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	LC	Sub-total
Estimated base cost for construction	202.0	67.3	269.3	303.0	101.0	404.0	25.3	8.4	33.7	530.3	176.8	707.0		
Material	202.0	50.5	252.5	303.0	75.8	378.8	25.3	6.3	31.6	530.3	132.6	662.8		
Labour		16.8	16.8		25.3	25.3		2.1	2.1		44.2	44.2		
Physical Contingencies	20.2	6.7	26.9	30.3	10.1	40.4	2.5	0.8	3.4	53.0	17.7	70.7		
Sub-total 1	222.2	74.1	296.3	333.3	111.1	444.4	27.8	9.3	37.0	583.3	194.4	777.7		
Administrative cost		7.4	7.4		11.1	11.1		0.9	0.9		19.4	19.4		
Total Before Levies	222.2	81.5	303.7	333.3	122.2	455.5	27.8	10.2	38.0	583.3	213.9	797.1		
Levies		8.9	8.9		13.3	13.3		1.1	1.1		23.3	23.3		
Sub-total 2	222.2	90.4	312.6	333.3	135.5	468.8	27.8	11.3	39.1	583.3	237.2	820.5		
Price Escalation	6.7	5.3	12.0	20.4	16.5	36.9	2.6	2.1	4.7	29.7	23.9	53.7		
Grand Total	228.9	95.7	324.6	353.7	152.0	505.7	30.4	13.4	43.8	613.0	261.1	874.1		
Financial Cost (Grand Total - Price Escalation)	222.2	90.4	312.6	333.3	135.5	468.8	27.8	11.3	39.1	583.3	237.2	820.5		
Economic Cost	222.2	71.2	293.4	333.3	106.7	440.0	27.8	8.9	36.7	583.3	186.8	770.0		

(Note)

1. Share rate of material and Labor by work item:
Western Province North (WPN)

	Material	Labor		
3. Physical Contingencies:	75 (%)		10.0 (%)	
4. Administrative Cost:	25 (%)		10.0 (%)	Based on the estimation by CEB.
5. Income Tax of Labor:			5.0 (%)	According to the Personal Income Tax Law by Ministry of Finance and Planning Sri Lanka.
6. Net Profit:			10.0 (%)	of the net offering amount of the works to be proposed by contractors.
7. Price escalation: For FC Portion: For LC Portion:	75 (%) 25 (%) 0 (%)	FC LC FC	3.02 (%) 5.90 (%)	Based on the similar projects in CEB. Based on the 2010 Annual Report by Ministry of Finance and Planning Sri Lanka.
8. Standard conversion factor (SCF):			0.95809	Based on the data of external trade.

2. Allocated rate of FC and LC:

For material:

For the others:

Attachment 5-1 (8) Economic Cost Estimation of Candidate 6

Distribution Project Package in CP of Region 2

Cost Item	Distribution														
	2011				2012				2013				Total		
	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total
Estimated base cost for construction	929.7	309.9	1,239.6	1,394.6	464.9	1,859.4	116.2	38.7	155.0	2,440.5	813.5	3,254.0			
Western Province North (WPN)	929.7	232.4	1,162.1	1,394.6	348.6	1,743.2	116.2	29.1	145.3	2,440.5	610.1	3,050.6			
Material															
Labour		77.5	77.5		116.2	116.2		9.7	9.7		203.4	203.4			
Physical Contingencies	93.0	31.0	124.0	139.5	46.5	185.9	11.6	3.9	15.5	244.1	81.4	325.4			
Sub-total 1	1,022.7	340.9	1,363.6	1,534.0	511.3	2,045.4	127.8	42.6	170.4	2,684.6	894.9	3,579.4			
Administrative cost		34.1	34.1		51.1	51.1		4.3	4.3		89.5	89.5			
Total Before Levies	1,022.7	375.0	1,397.7	1,534.0	562.5	2,096.5	127.8	46.9	174.7	2,684.6	984.3	3,668.9			
Levies		40.9	40.9		61.4	61.4		5.1	5.1		107.4	107.4			
Sub-total 2	1,022.7	415.9	1,438.6	1,534.0	623.8	2,157.9	127.8	52.0	179.8	2,684.6	1,091.7	3,776.3			
Price Escalation		30.9	55.4	94.1	75.8	169.8		11.9	21.7	136.9	110.1	247.0			
Grand Total	1,053.6	440.4	1,494.0	1,628.1	699.6	2,327.7	139.8	61.7	201.5	2,821.4	1,201.8	4,023.2			
Financial Cost (Grand Total - Price Escalation)	1,022.7	415.9	1,438.6	1,534.0	623.8	2,157.9	127.8	52.0	179.8	2,684.6	1,091.7	3,776.3			
Economic Cost	1,022.7	327.5	1,350.2	1,534.0	491.2	2,025.2	127.8	40.9	168.8	2,684.6	859.6	3,544.2			

(Note)

1. Share rate of material and Labor by work item:
Western Province North (WPN)

75 (%)	Material	3. Physical Contingencies:	10.0 (%)	
25 (%)	Labor	4. Administrative Cost:	10.0 (%)	Based on the estimation by CEB.
		5. Income Tax of Labor:	5.0 (%)	According to the Personal Income Tax Law by Ministry of Finance and Planning Sri Lanka.
		6. Net Profit:	10.0 (%)	of the net offering amount of the works to be proposed by contractors.
		7. Price escalation: For FC Portion: For LC Portion:	3.02 (%) 5.90 (%)	Based on the similar projects in CEB. Based on the 2010 Annual Report by Ministry of Finance and Planning Sri Lanka.
		8. Standard conversion factor (SCF):	0.95809	Based on the data of external trade.

2. Allocated rate of FC and LC:

For material:

75 (%) FC

25 (%) LC

0 (%) FC

For the others:

Attachment 5-1 (9) Economic Cost Estimation of Candidate 7

Distribution Project Package in WPS-2 of Region 3

Cost Item	Distribution													
	2011				2012				2013				Total	
	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	LC	Sub-total
Estimated base cost for construction	216.6	72.2	288.8	324.9	108.3	433.1	27.1	9.0	36.1	568.5	189.5	758.0		
Material	216.6	54.1	270.7	324.9	81.2	406.1	27.1	6.8	33.8	568.5	142.1	710.6		
Labour	18.0	18.0	18.0	27.1	27.1	27.1	2.3	2.3	2.3	2.3	47.4	47.4		
Physical Contingencies	21.7	7.2	28.9	32.5	10.8	43.3	2.7	0.9	3.6	56.9	19.0	75.8		
Sub-total 1	238.2	79.4	317.6	357.3	119.1	476.5	29.8	9.9	39.7	625.4	208.5	833.8		
Administrative cost	7.9	7.9	7.9	7.9	11.9	11.9	1.0	1.0	1.0	1.0	20.8	20.8		
Total Before Levies	238.2	87.4	325.6	357.3	131.0	488.4	29.8	10.9	40.7	625.4	229.3	854.6		
Levies	9.5	9.5	9.5	14.3	14.3	14.3	1.2	1.2	1.2	1.2	25.0	25.0		
Sub-total 2	238.2	96.9	335.1	357.3	145.3	502.7	29.8	12.1	41.9	625.4	254.3	879.7		
Price Escalation	7.2	5.7	12.9	21.9	17.7	39.6	2.8	2.3	5.1	31.9	25.6	57.5		
Grand Total	245.4	102.6	348.0	379.3	163.0	542.2	32.6	14.4	46.9	657.2	280.0	937.2		
Financial Cost (Grand Total - Price Escalation)	238.2	96.9	335.1	357.3	145.3	502.7	29.8	12.1	41.9	625.4	254.3	879.7		
Economic Cost	238.2	76.3	314.5	357.3	114.4	471.8	29.8	9.5	39.3	625.4	200.2	825.6		

(Note)

1. Share rate of material and Labor by work item:
Western Province South-2 (WPS-2)

75 (%) Material
25 (%) Labor

3. Physical Contingencies:

10.0 (%)

Material

4. Administrative Cost:

10.0 (%)

Based on the estimation by CEB.

Labor

5. Income Tax of Labor:

5.0 (%)

According to the Personal Income Tax Law
by Ministry of Finance and Planning Sri Lanka.

75 (%) FC

6. Net Profit:

10.0 (%)

of the net offering amount of the works
to be proposed by contractors.

25 (%) LC

7. Price escalation:

3.02 (%)

Based on the similar projects in CEB.

0 (%) FC

For FC Portion:

5.90 (%)

Based on the 2010 Annual Report
by Ministry of Finance and Planning Sri Lanka.

2. Allocated rate of FC and LC:

For material:

75 (%) FC

For the others:

25 (%) LC

0 (%) FC

8. Standard conversion factor (SCF):

0.95809

Based on the data of external trade.

Attachment 5-1 (10) Economic Cost Estimation of Candidate 8

Candidate 6. Region 3 Distribution Project Package in Sabaragamuwa

Cost Item	Distribution													
	2011				2012				2013				Total	
	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC
Estimated base cost for construction	245.1	81.7	326.9	367.7	122.6	490.3	30.6	10.2	40.9	643.5	214.5	858.0		
Sabaragamuwa														
Material	245.1	61.3	306.4	367.7	91.9	459.6	30.6	7.7	38.3	643.5	160.9	804.4		
Labour		20.4	20.4		30.6	30.6		2.6	2.6		53.6	53.6		
Physical Contingencies	24.5	8.2	32.7	36.8	12.3	49.0	3.1	1.0	4.1	64.4	21.5	85.8		
Sub-total 1	269.7	89.9	359.5	404.5	134.8	539.3	33.7	11.2	44.9	707.9	236.0	943.8		
Administrative cost		9.0	9.0		13.5	13.5		1.1	1.1		23.6	23.6		
Total Before Levies	269.7	98.9	368.5	404.5	148.3	552.8	33.7	12.4	46.1	707.9	259.5	967.4		
Levies		10.8	10.8		16.2	16.2		1.3	1.3		28.3	28.3		
Sub-total 2	269.7	109.7	379.3	404.5	164.5	569.0	33.7	13.7	47.4	707.9	287.9	995.7		
Price Escalation	8.1	6.5	14.6	24.8	20.0	44.8	3.1	2.6	5.7	36.1	29.0	65.1		
Grand Total	277.8	116.1	393.9	429.3	184.5	613.8	36.9	16.3	53.1	743.9	316.9	1,060.8		
Financial Cost (Grand Total - Price Escalation)	269.7	109.7	379.3	404.5	164.5	569.0	33.7	13.7	47.4	707.9	287.9	995.7		
Economic Cost	269.7	86.3	356.0	404.5	129.5	534.0	33.7	10.8	44.5	707.9	226.7	934.5		

(Note)

1. Share rate of material and Labor by work item:

Sabaragamuwa

75 (%)	Material
25 (%)	Labor

3. Physical Contingencies:

10.0 (%)

Based on the estimation by CEB.

4. Administrative Cost:

10.0 (%)

According to the Personal Income Tax Law by Ministry of Finance and Planning Sri Lanka.

5. Income Tax of Labor:

5.0 (%)

of the net offering amount of the works to be proposed by contractors.

6. Net Profit:

10.0 (%)

7. Price escalation:

For FC Portion:

3.02 (%)

For LC Portion:

5.90 (%)

Based on the similar projects in CEB. Based on the 2010 Annual Report by Ministry of Finance and Planning Sri Lanka.

2. Allocated rate of FC and LC:

For material:

75 (%) FC

For the others:

25 (%) LC

0 (%) FC

0.95809

8. Standard conversion factor (SCF):

Based on the data of external trade.

Attachment 5-1 (11) Economic Cost Estimation of Candidate 9

Candidate 7 Region 4 Distribution Project Package in WPS-1

Cost Item	Distribution														
	2011				2012				2013				Total		
	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total
Estimated base cost for construction	123.4	41.1	164.6	185.1	61.7	246.9	15.4	5.1	20.6	324.0	108.0	432.0			
Material	123.4	30.9	154.3	185.1	46.3	231.4	15.4	3.9	19.3	324.0	81.0	405.0			
Labour		10.3	10.3		15.4	15.4		1.3	1.3		27.0	27.0			
Physical Contingencies	12.3	4.1	16.5	18.5	6.2	24.7	1.5	0.5	2.1	32.4	10.8	43.2			
Sub-total 1	135.8	45.3	181.0	203.7	67.9	271.5	17.0	5.7	22.6	356.4	118.8	475.2			
Administrative cost		4.5	4.5		6.8	6.8		0.6	0.6		11.9	11.9			
Total Before Levies	135.8	49.8	185.6	203.7	74.7	278.3	17.0	6.2	23.2	356.4	130.7	487.1			
Levies		5.4	5.4		8.1	8.1		0.7	0.7		14.3	14.3			
Sub-total 2	135.8	55.2	191.0	203.7	82.8	286.5	17.0	6.9	23.9	356.4	144.9	501.3			
Price Escalation	4.1	3.3	7.4	12.5	10.1	22.5	1.6	1.3	2.9	18.2	14.6	32.8			
Grand Total	139.9	58.5	198.3	216.1	92.9	309.0	18.6	8.2	26.8	374.6	159.5	534.1			
Financial Cost (Grand Total - Price Escalation)	135.8	55.2	191.0	203.7	82.8	286.5	17.0	6.9	23.9	356.4	144.9	501.3			
Economic Cost	135.8	43.5	179.2	203.7	65.2	268.9	17.0	5.4	22.4	356.4	114.1	470.5			

(Note)

1. Share rate of material and Labor by work item:
Western Province South 1 (WPS-1)

75 (%)	Material
25 (%)	Labor

3. Physical Contingencies:

10.0 (%)

4. Administrative Cost:

10.0 (%)

Based on the estimation by CEB.

5. Income Tax of Labor:

5.0 (%)

According to the Personal Income Tax Law by Ministry of Finance and Planning Sri Lanka.

6. Net Profit:

10.0 (%)

of the net offering amount of the works to be proposed by contractors.

7. Price escalation:

3.02 (%)

For FC Portion:

5.90 (%)

Based on the similar projects in CEB. Based on the 2010 Annual Report by Ministry of Finance and Planning Sri Lanka.

2. Allocated rate of FC and LC:

For material:

75 (%)

For LC:

25 (%)

For the others:

0 (%)

8. Standard conversion factor (SCF):

0.95809

Based on the data of external trade.

Attachment 5-2 (1) EIRR Calculation of Candidate 1 (without Japan's Technique)

New Habarana - Veyangoda 220 kV Transmission Line (without Japan's Technique)

Year in order	Year	Cost (LKR million)			Benefit (LKR million)					Cash balance	
		Construction cost		O&M cost	Total cost	Benefit due to loss- reduction	External cost saving				Total benefit
		FC	LC				Due to CO ₂ reduction	Due to NO _x reduction	Due to SO _x reduction		
1	2013	3,203.2	434.6	36.4	3,674.2						-3,674.2
2	2014	2,745.6	372.5	67.6	3,185.7						-3,185.7
3	2015	2,974.4	403.6	101.3	3,479.3						-3,479.3
4	2016			101.3	101.3	585.5	144.0	2.2	110.8	842.4	741.0
5	2017			101.3	101.3	622.9	153.2	2.3	117.8	896.2	794.9
6	2018			101.3	101.3	1,325.9	163.0	2.4	125.4	1,616.7	1,515.4
7	2019			101.3	101.3	1,410.6	173.4	2.6	133.4	1,720.0	1,618.7
8	2020			101.3	101.3	2,307.4	184.5	2.8	141.9	2,636.6	2,535.2
9	2021			101.3	101.3	2,454.9	196.3	2.9	151.0	2,805.0	2,703.7
10	2022			101.3	101.3	2,611.7	208.8	3.1	160.6	2,984.3	2,883.0
11	2023			101.3	101.3	2,778.6	222.2	3.3	170.9	3,175.0	3,073.6
12	2024			101.3	101.3	2,956.2	236.4	3.5	181.8	3,377.9	3,276.5
13	2025			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
14	2026			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
15	2027			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
16	2028			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
17	2029			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
18	2030			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
19	2031			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
20	2032			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
21	2033			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
22	2034			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
23	2033			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
24	2034			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
25	2035			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
26	2036			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
27	2037			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
28	2038			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
29	2039			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
30	2040			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
31	2041			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
32	2042			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
33	2043			101.3	101.3	3,145.1	251.5	3.8	193.4	3,593.7	3,492.4
Total		8,923.3	1,210.7	3,245.5	13,379.4	83,099.9	6,962.2	104.4	5,355.6	95,522.1	82,142.7
In the condition of discount rate at:				10.0%							
Net present value (NPV):					9,304.8					18,589.7	9,284.9
Economic internal rate of return (EIRR):											17.42%
B/C ratio:											2.00

(Note)

Unit price of emission gas:

By gas	ton per GWh	Price per ton	Price per GWh
	(ton)	(LKR)	(LKR million)
CO ₂	697	1,600	1.1152
NO _x	0.87	19,200	0.016728
SO _x	17.87	48,000	0.857846

Based on the estimation by "Clean development mechanism simplified project design document for small-scale project activities (SSC-CDM-PDD) Version 02" issued by UN-FCCC.

Attachment 5-2 (2) EIRR Calculation of Candidate 1 (with Japan's Technique)

New Habarana - Veyangoda 220 kV Transmission Line (with Japan's Technique)

Year in order	Year	Cost (LKR million)				Benefit (LKR million)					Cash balance
		Construction cost		O&M cost	Total cost	Benefit due to loss-reduction	External cost saving			Total benefit	
		FC	LC				Due to CO ₂ reduction	Due to NO _x reduction	Due to SO _x reduction		
1	2013	3,820.6	434.6	42.6	4,297.8						-4,297.8
2	2014	3,274.8	372.5	79.0	3,726.4						-3,726.4
3	2015	3,547.7	403.6	118.5	4,069.8						-4,069.8
4	2016			118.5	118.5	929.8	160.0	2.4	123.1	1,215.4	1,096.8
5	2017			118.5	118.5	989.3	170.3	2.6	131.0	1,293.0	1,174.5
6	2018			118.5	118.5	1,052.5	181.1	2.7	139.3	1,375.7	1,257.1
7	2019			118.5	118.5	1,119.7	192.7	2.9	148.2	1,463.6	1,345.0
8	2020			118.5	118.5	3,461.1	205.0	3.1	157.7	3,826.9	3,708.4
9	2021			118.5	118.5	3,682.3	218.1	3.3	167.8	4,071.5	3,952.9
10	2022			118.5	118.5	3,917.6	232.1	3.5	178.5	4,331.7	4,213.1
11	2023			118.5	118.5	4,167.9	246.9	3.7	189.9	4,608.4	4,489.9
12	2024			118.5	118.5	4,434.3	262.7	3.9	202.1	4,902.9	4,784.4
13	2025			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
14	2026			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
15	2027			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
16	2028			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
17	2029			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
18	2030			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
19	2031			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
20	2032			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
21	2033			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
22	2034			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
23	2033			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
24	2034			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
25	2035			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
26	2036			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
27	2037			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
28	2038			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
29	2039			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
30	2040			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
31	2041			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
32	2042			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
33	2043			118.5	118.5	4,717.6	279.5	4.2	215.0	5,216.2	5,097.7
Total		10,643.2	1,210.7	3,796.3	15,650.1	122,824.4	7,737.5	116.1	5,951.9	136,629.9	120,979.8
In the condition of discount rate at:				10.0%							
Net present value (NPV):					10,884.0					25,894.6	15,010.7
Economic internal rate of return (EIRR):											19.29%
B/C ratio:											2.38

(Note)

Unit price of emission gas:

By gas	Ton per GWh	Price per ton (LKR)	Price per GWh (LKR million)
CO ₂	697	1,600	1.1152
NO _x	0.87	19,200	0.016728
SO _x	17.87	48,000	0.857846

Based on the estimation by "Clean development mechanism simplified project design document for small-scale project activities (SSC-CDM-PDD) Version 02" issued by UN-FCCC.

Attachment 5-2 (3) EIRR Calculation of Candidate 2 (without Japan's Technique)

Polpitiya - Habarana TL Reconstruction (without Japan's Technique)

Year in order	Year	Cost (LKR million)				Benefit (LKR million)					Cash balance
		Construction cost		O&M cost	Total cost	Benefit due to loss-reduction	External cost saving			Total benefit	
		FC	LC				Due to CO ₂ reduction	Due to NO _x reduction	Due to SO _x reduction		
1	2011	1,045.6	494.4	15.4	1,555.3						-1,555.3
2	2012	1,568.4	741.5	38.5	2,348.4						-2,348.4
3	2013	1,699.1	803.3	63.5	2,565.9						-2,565.9
4	2014			63.5	63.5	563.5	35.2	0.5	27.1	626.3	562.8
5	2015			63.5	63.5	599.6	37.4	0.6	28.8	666.3	602.8
6	2016			63.5	63.5	637.9	39.8	0.6	30.6	708.9	645.4
7	2017			63.5	63.5	678.6	42.4	0.6	32.6	754.2	690.7
8	2018			63.5	63.5	722.0	45.1	0.7	34.7	802.4	738.9
9	2019			63.5	63.5	768.1	47.9	0.7	36.9	853.7	790.1
10	2020			63.5	63.5	817.2	51.0	0.8	39.2	908.2	844.7
11	2021			63.5	63.5	869.4	54.3	0.8	41.7	966.2	902.7
12	2022			63.5	63.5	925.0	57.7	0.9	44.4	1,028.0	964.5
13	2023			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
14	2024			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
15	2025			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
16	2026			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
17	2027			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
18	2028			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
19	2029			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
20	2030			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
21	2031			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
22	2032			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
23	2033			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
24	2034			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
25	2035			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
26	2036			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
27	2037			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
28	2038			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
29	2039			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
30	2040			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
31	2041			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
32	2042			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
33	2043			63.5	63.5	984.1	61.4	0.9	47.2	1,093.7	1,030.2
Total		4,313.0	2,039.2	2,023.1	8,375.3	27,247.4	1,700.4	25.5	1,308.0	30,281.4	21,906.1
In the condition of discount rate at:				10.0%							
Net present value (NPV):					5,688.9					5,644.8	-44.1
Economic internal rate of return (EIRR):											9.90%
B/C ratio:											0.99

(Note)

Unit price of emission gas:

By gas	Ton per GWh	Price per ton (LKR)	Price per GWh (LKR million)
CO ₂	697	1,600	1.1152
NO _x	0.87	19,200	0.016728
SO _x	17.87	48,000	0.857846

Based on the estimation by "Clean development mechanism simplified project design document for small-scale project activities (SSC-CDM-PDD) Version 02" issued by UN-FCCC.

Attachment 5-2 (4) EIRR Calculation of Candidate 2 (with Japan's Technique)

Polpitiya - Habarana TL Reconstruction (with Japan's Technique)

Year in order	Year	Cost (LKR million)				Benefit (LKR million)					Cash balance
		Construction cost		O&M cost	Total cost	Benefit due to loss- reduction	External cost saving			Total benefit	
		FC	LC				Due to CO ₂ reduction	Due to NO _x reduction	Due to SO _x reduction		
1	2011	1,343.6	494.4	18.4	1,856.3						-1,856.3
2	2012	2,015.4	741.5	45.9	2,802.9						-2,802.9
3	2013	2,183.3	803.3	75.8	3,062.5						-3,062.5
4	2014			75.8	75.8	657.5	41.0	0.6	31.6	730.7	654.9
5	2015			75.8	75.8	699.5	43.7	0.7	33.6	777.4	701.6
6	2016			75.8	75.8	744.2	46.4	0.7	35.7	827.0	751.2
7	2017			75.8	75.8	791.7	49.4	0.7	38.0	879.9	804.1
8	2018			75.8	75.8	842.3	52.6	0.8	40.4	936.1	860.3
9	2019			75.8	75.8	896.2	55.9	0.8	43.0	995.9	920.1
10	2020			75.8	75.8	953.4	59.5	0.9	45.8	1,059.6	983.8
11	2021			75.8	75.8	1,014.3	63.3	0.9	48.7	1,127.3	1,051.5
12	2022			75.8	75.8	1,079.2	67.3	1.0	51.8	1,199.3	1,123.5
13	2023			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
14	2024			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
15	2025			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
16	2026			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
17	2027			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
18	2028			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
19	2029			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
20	2030			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
21	2031			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
22	2032			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
23	2033			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
24	2034			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
25	2035			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
26	2036			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
27	2037			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
28	2038			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
29	2039			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
30	2040			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
31	2041			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
32	2042			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
33	2043			75.8	75.8	1,148.1	71.6	1.1	55.1	1,276.0	1,200.1
Total		5,542.3	2,039.2	2,414.6	9,996.1	31,788.7	1,983.8	29.8	1,526.0	35,328.3	25,332.1
In the condition of discount rate at:				10.0%							
Net present value (NPV):					6,841.8					7,461.2	619.3
Economic internal rate of return (EIRR):											10.93%
B/C ratio:											1.09

(Note)

Unit price of emission gas:

By gas	Ton per GWh	Price per ton (LKR)	Price per GWh (LKR million)
CO ₂	697 (ton)	1,600	1.1152
NO _x	0.87	19,200	0.016728
SO _x	17.87	48,000	0.857846

Based on the estimation by "Clean development mechanism simplified project design document for small-scale project activities (SSC-CDM-PDD) Version 02" issued by UN-FCCC.

Attachment 5-2 (5) EIRR Calculation of Candidate 3

Augmentation of GS and Installation of Reactive Power Compensation Devices

Year in order	Year	Cost (LKR million)				Benefit (LKR million)				Cash balance	
		Construction cost		O&M cost	Total cost	Benefit due to loss-reduction	External cost saving				Total benefit
		FC	LC				Due to CO ₂ reduction	Due to NO _x reduction	Due to SO _x reduction		
1	2012	257.4	39.5	3.0	299.8						-299.8
2	2013	3,088.8	473.6	38.6	3,601.0						-3,601.0
3	2014	257.4	39.5	41.6	338.4						-338.4
4	2015			41.6	41.6	1,678.3	104.7	1.6	80.6	1,865.2	1,823.6
5	2016			41.6	41.6	1,785.6	111.4	1.7	85.7	1,984.4	1,942.8
6	2017			41.6	41.6	1,899.7	118.6	1.8	91.2	2,111.2	2,069.6
7	2018			41.6	41.6	2,021.1	126.1	1.9	97.0	2,246.1	2,204.5
8	2019			41.6	41.6	2,150.2	134.2	2.0	103.2	2,389.6	2,348.1
9	2020			41.6	41.6	2,150.2	142.8	2.1	109.8	2,404.9	2,363.4
10	2021			41.6	41.6	2,150.2	151.9	2.3	116.8	2,421.2	2,379.6
11	2022			41.6	41.6	2,150.2	161.6	2.4	124.3	2,438.5	2,397.0
12	2023			41.6	41.6	2,150.2	171.9	2.6	132.2	2,456.9	2,415.4
13	2024			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
14	2025			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
15	2026			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
16	2027			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
17	2028			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
18	2029			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
19	2030			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
20	2031			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
21	2032			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
22	2033			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
23	2034			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
24	2034			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
25	2035			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
26	2036			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
27	2037			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
28	2038			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
29	2039			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
30	2040			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
31	2041			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
32	2042			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
33	2043			41.6	41.6	2,150.2	182.9	2.7	140.7	2,476.5	2,435.0
Total		3,603.6	552.5	1,330.0	5,486.1	63,290.1	5,064.1	76.0	3,895.4	72,325.6	66,839.5
In the condition of discount rate at:				10.0%							
Net present value (NPV):					3,797.2					16,380.9	12,583.6
Economic internal rate of return (EIRR):											36.02%
B/C ratio:											4.31

(Note)

Unit price of emission gas:

By gas	Ton per GWh	Price per ton	Price per GWh
	(ton)	(LKR)	(LKR million)
CO ₂	697	1,600	1.1152
NO _x	0.87	19,200	0.016728
SO _x	17.87	48,000	0.857846

Based on the estimation by "Clean development mechanism simplified project design document for small-scale project activities (SSC-CDM-PDD) Version 02" issued by UN-FCCC.

Attachment 5-2 (6) EIRR Calculation of Candidate 4

Distribution Project Package in NWP of Region 1

Year in order	Year	Cost (LKR million)			Benefit (LKR million)					Cash balance	
		Construction cost		O&M cost	Total cost	Benefit due to loss-reduction	External cost saving				Total benefit
		FC	LC				Due to CO ₂ reduction	Due to NO _x reduction	Due to SO _x reduction		
1	2011	203.1	72.8	6.9	282.9						-282.9
2	2012	304.7	109.3	17.2	431.2						-431.2
3	2013	25.4	9.1	18.1	52.6						-52.6
4	2014			18.1	18.1	235.0	14.7	0.2	11.3	261.2	243.1
5	2015			18.1	18.1	250.1	15.6	0.2	12.0	277.9	259.8
6	2016			18.1	18.1	266.0	16.6	0.2	12.8	295.7	277.6
7	2017			18.1	18.1	283.0	17.7	0.3	13.6	314.6	296.4
8	2018			18.1	18.1	301.1	18.8	0.3	14.5	334.7	316.5
9	2019			18.1	18.1	301.1	20.0	0.3	15.4	336.8	318.7
10	2020			18.1	18.1	301.1	21.3	0.3	16.4	339.1	321.0
11	2021			18.1	18.1	301.1	22.6	0.3	17.4	341.5	323.4
12	2022			18.1	18.1	301.1	24.1	0.4	18.5	344.1	326.0
13	2023			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
14	2024			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
15	2025			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
16	2026			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
17	2027			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
18	2028			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
19	2029			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
20	2030			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
21	2031			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
22	2032			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
23	2033			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
24	2034			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
25	2035			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
26	2036			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
27	2037			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
28	2038			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
29	2039			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
30	2040			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
31	2041			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
32	2042			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
33	2043			18.1	18.1	301.1	25.6	0.4	19.7	346.8	328.7
Total		533.2	191.2	585.6	1,310.0	8,863.5	709.2	10.6	545.5	10,128.9	8,818.9
In the condition of discount rate at:				10.0%							
Net present value (NPV):					781.3					2,294.1	1,512.8
Economic internal rate of return (EIRR):											27.07%
B/C ratio:											2.94

(Note)

Unit price of emission gas:

By gas	Ton per GWh	Price per ton (LKR)	Price per GWh (LKR million)
CO ₂	697	1,600	1.1152
NO _x	0.87	19,200	0.016728
SO _x	17.87	48,000	0.857846

Based on the estimation by "Clean development mechanism simplified project design document for small-scale project activities (SSC-CDM-PDD) Version 02" issued by UN-FCCC.

Attachment 5-2 (7) EIRR Calculation of Candidate 5

Distribution Project Package in WPN of Region 2

Year in order	Year	Cost (LKR million)			Benefit (LKR million)					Cash balance	
		Construction cost		O&M cost	Total cost	Benefit due to loss-reduction	External cost saving				Total benefit
		FC	LC				Due to CO ₂ reduction	Due to NO _x reduction	Due to SO _x reduction		
1	2011	222.2	71.2	7.3	300.7						-300.7
2	2012	333.3	106.7	18.3	458.4						-458.4
3	2013	27.8	8.9	19.3	55.9						-55.9
4	2014			19.3	19.3	140.2	8.8	0.1	6.7	155.8	136.6
5	2015			19.3	19.3	149.2	9.3	0.1	7.2	165.8	146.5
6	2016			19.3	19.3	158.7	9.9	0.1	7.6	176.4	157.1
7	2017			19.3	19.3	168.9	10.5	0.2	8.1	187.7	168.4
8	2018			19.3	19.3	179.7	11.2	0.2	8.6	199.7	180.4
9	2019			19.3	19.3	179.7	11.9	0.2	9.2	200.9	181.7
10	2020			19.3	19.3	179.7	12.7	0.2	9.8	202.3	183.0
11	2021			19.3	19.3	179.7	13.5	0.2	10.4	203.7	184.5
12	2022			19.3	19.3	179.7	14.4	0.2	11.0	205.3	186.0
13	2023			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
14	2024			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
15	2025			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
16	2026			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
17	2027			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
18	2028			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
19	2029			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
20	2030			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
21	2031			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
22	2032			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
23	2033			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
24	2034			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
25	2035			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
26	2036			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
27	2037			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
28	2038			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
29	2039			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
30	2040			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
31	2041			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
32	2042			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
33	2043			19.3	19.3	179.7	15.3	0.2	11.8	206.9	187.7
Total		583.3	186.8	622.5	1,392.5	5,287.9	423.1	6.3	325.5	6,042.9	4,650.4
In the condition of discount rate at:				10.0%							
Net present value (NPV):					830.5					1,368.6	538.1
Economic internal rate of return (EIRR):											16.70%
B/C ratio:											1.65

(Note)

Unit price of emission gas:

By gas	Ton per GWh	Price per ton (LKR)	Price per GWh (LKR million)
CO ₂	697	1,600	1.1152
NO _x	0.87	19,200	0.016728
SO _x	17.87	48,000	0.857846

Based on the estimation by "Clean development mechanism simplified project design document for small-scale project activities (SSC-CDM-PDD) Version 02" issued by UN-FCCC.

Attachment 5-2 (8) EIRR Calculation of Candidate 6

Distribution Project Package in CP of Region 2

Year in order	Year	Cost (LKR million)				Benefit (LKR million)					Cash balance
		Construction cost		O&M cost	Total cost	Benefit due to loss-reduction	External cost saving			Total benefit	
		FC	LC				Due to CO ₂ reduction	Due to NO _x reduction	Due to SO _x reduction		
1	2011	929.7	309.9	31.0	1,270.6						-1,270.6
2	2012	1,394.6	464.9	77.5	1,936.9						-1,936.9
3	2013	116.2	38.7	81.4	236.3						-236.3
4	2014			81.4	81.4	373.6	23.3	0.3	17.9	415.2	333.9
5	2015			81.4	81.4	397.5	24.8	0.4	19.1	441.8	360.4
6	2016			81.4	81.4	422.9	26.4	0.4	20.3	470.0	388.7
7	2017			81.4	81.4	449.9	28.1	0.4	21.6	500.0	418.7
8	2018			81.4	81.4	478.7	29.9	0.4	23.0	532.0	450.6
9	2019			81.4	81.4	478.7	31.8	0.5	24.4	535.4	454.1
10	2020			81.4	81.4	478.7	33.8	0.5	26.0	539.0	457.7
11	2021			81.4	81.4	478.7	36.0	0.5	27.7	542.9	461.5
12	2022			81.4	81.4	478.7	38.3	0.6	29.4	547.0	465.6
13	2023			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
14	2024			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
15	2025			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
16	2026			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
17	2027			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
18	2028			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
19	2029			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
20	2030			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
21	2031			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
22	2032			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
23	2033			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
24	2034			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
25	2035			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
26	2036			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
27	2037			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
28	2038			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
29	2039			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
30	2040			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
31	2041			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
32	2042			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
33	2043			81.4	81.4	478.7	40.7	0.6	31.3	551.3	470.0
Total		2,440.5	813.5	2,630.3	5,884.3	14,090.2	1,127.4	16.9	867.2	16,101.7	10,217.4
In the condition of discount rate at:				10.0%							
Net present value (NPV):					3,509.6					3,646.8	137.3
Economic internal rate of return (EIRR):										10.46%	
B/C ratio:										1.04	

(Note)

Unit price of emission gas:

By gas	Ton per GWh	Price per ton	Price per GWh
	(ton)	(LKR)	(LKR million)
CO ₂	697	1,600	1.1152
NO _x	0.87	19,200	0.016728
SO _x	17.87	48,000	0.857846

Based on the estimation by "Clean development mechanism simplified project design document for small-scale project activities (SSC-CDM-PDD) Version 02" issued by UN-FCCC.

Attachment 5-2 (9) EIRR Calculation of Candidate 7

Distribution Project Package in WPS-2 of Region 3

Year in order	Year	Cost (LKR million)			Benefit (LKR million)					Cash balance	
		Construction cost		O&M cost	Total cost	Benefit due to loss-reduction	External cost saving				Total benefit
		FC	LC				Due to CO ₂ reduction	Due to NO _x reduction	Due to SO _x reduction		
1	2011	216.6	72.2	7.2	296.0						-296.0
2	2012	324.9	108.3	18.0	451.2						-451.2
3	2013	27.1	9.0	19.0	55.0						-55.0
4	2014			19.0	19.0	179.9	11.2	0.2	8.6	199.9	181.0
5	2015			19.0	19.0	191.4	11.9	0.2	9.2	212.7	193.7
6	2016			19.0	19.0	203.6	12.7	0.2	9.8	226.3	207.3
7	2017			19.0	19.0	216.6	13.5	0.2	10.4	240.7	221.8
8	2018			19.0	19.0	230.5	14.4	0.2	11.1	256.1	237.2
9	2019			19.0	19.0	230.5	15.3	0.2	11.8	257.8	238.8
10	2020			19.0	19.0	230.5	16.3	0.2	12.5	259.5	240.5
11	2021			19.0	19.0	230.5	17.3	0.3	13.3	261.4	242.4
12	2022			19.0	19.0	230.5	18.4	0.3	14.2	263.3	244.4
13	2023			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
14	2024			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
15	2025			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
16	2026			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
17	2027			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
18	2028			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
19	2029			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
20	2030			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
21	2031			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
22	2032			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
23	2033			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
24	2034			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
25	2035			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
26	2036			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
27	2037			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
28	2038			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
29	2039			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
30	2040			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
31	2041			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
32	2042			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
33	2043			19.0	19.0	230.5	19.6	0.3	15.1	265.4	246.5
Total		568.5	189.5	612.7	1,370.7	6,783.3	542.8	8.1	417.5	7,751.7	6,381.0
In the condition of discount rate at:				10.0%							
Net present value (NPV):					817.5					1,755.7	938.1
Economic internal rate of return (EIRR):										21.04%	
B/C ratio:										2.15	

(Note)

Unit price of emission gas:

By gas	Ton per GWh	Price per ton (LKR)	Price per GWh (LKR million)
CO ₂	697	1,600	1.1152
NO _x	0.87	19,200	0.016728
SO _x	17.87	48,000	0.857846

Based on the estimation by "Clean development mechanism simplified project design document for small-scale project activities (SSC-CDM-PDD) Version 02" issued by UN-FCCC.

Attachment 5-2 (10) EIRR Calculation of Candidate 8

Distribution Project Package in Sabaragamuwa of Region 3

Year in order	Year	Cost (LKR million)			Benefit (LKR million)					Cash balance	
		Construction cost		O&M cost	Total cost	Benefit due to loss-reduction	External cost saving				Total benefit
		FC	LC				Due to CO ₂ reduction	Due to NO _x reduction	Due to SO _x reduction		
1	2011	269.7	86.3	8.9	364.9						-364.9
2	2012	404.5	129.5	22.3	556.3						-556.3
3	2013	33.7	10.8	23.4	67.9						-67.9
4	2014			23.4	23.4	105.2	6.6	0.1	5.0	116.9	93.5
5	2015			23.4	23.4	111.9	7.0	0.1	5.4	124.4	101.0
6	2016			23.4	23.4	119.1	7.4	0.1	5.7	132.3	108.9
7	2017			23.4	23.4	126.7	7.9	0.1	6.1	140.8	117.4
8	2018			23.4	23.4	134.8	8.4	0.1	6.5	149.8	126.4
9	2019			23.4	23.4	134.8	8.9	0.1	6.9	150.7	127.4
10	2020			23.4	23.4	134.8	9.5	0.1	7.3	151.7	128.4
11	2021			23.4	23.4	134.8	10.1	0.2	7.8	152.8	129.5
12	2022			23.4	23.4	134.8	10.8	0.2	8.3	154.0	130.6
13	2023			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
14	2024			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
15	2025			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
16	2026			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
17	2027			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
18	2028			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
19	2029			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
20	2030			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
21	2031			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
22	2032			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
23	2033			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
24	2034			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
25	2035			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
26	2036			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
27	2037			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
28	2038			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
29	2039			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
30	2040			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
31	2041			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
32	2042			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
33	2043			23.4	23.4	134.8	11.5	0.2	8.8	155.2	131.8
Total		707.9	226.7	755.4	1,689.9	3,966.5	317.4	4.8	244.1	4,532.7	2,842.8
In the condition of discount rate at:				10.0%							
Net present value (NPV):					1,007.9					18.7	
Economic internal rate of return (EIRR):										10.22%	
B/C ratio:										1.02	

(Note)

Unit price of emission gas:

By gas	Ton per GWh	Price per ton (LKR)	Price per GWh (LKR million)
CO ₂	697	1,600	1.1152
NO _x	0.87	19,200	0.016728
SO _x	17.87	48,000	0.857846

Based on the estimation by "Clean development mechanism simplified project design document for small-scale project activities (SSC-CDM-PDD) Version 02" issued by UN-FCCC.

Attachment 5-2 (11) EIRR Calculation of Candidate 9

Distribution Project Package in WPS-1 of Region 4

Year in order	Year	Cost (LKR million)			Benefit (LKR million)					Cash balance		
		Construction cost		O&M cost	Total cost	Benefit due to loss-reduction	External cost saving				Total benefit	
		FC	LC				Due to CO ₂ reduction	Due to NO _x reduction	Due to SO _x reduction			
1	2011	135.8	43.5	4.5	183.7						-183.7	
2	2012	203.7	65.2	11.2	280.1						-280.1	
3	2013	17.0	5.4	11.8	34.2						-34.2	
4	2014			11.8	11.8	114.5	7.1	0.1	5.5	127.3	115.5	
5	2015			11.8	11.8	121.9	7.6	0.1	5.9	135.4	123.7	
6	2016			11.8	11.8	129.7	8.1	0.1	6.2	144.1	132.3	
7	2017			11.8	11.8	137.9	8.6	0.1	6.6	153.3	141.5	
8	2018			11.8	11.8	146.8	9.2	0.1	7.0	163.1	151.3	
9	2019			11.8	11.8	146.8	9.7	0.1	7.5	164.1	152.4	
10	2020			11.8	11.8	146.8	10.4	0.2	8.0	165.2	153.5	
11	2021			11.8	11.8	146.8	11.0	0.2	8.5	166.4	154.7	
12	2022			11.8	11.8	146.8	11.7	0.2	9.0	167.7	155.9	
13	2023			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
14	2024			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
15	2025			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
16	2026			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
17	2027			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
18	2028			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
19	2029			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
20	2030			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
21	2031			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
22	2032			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
23	2033			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
24	2034			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
25	2035			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
26	2036			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
27	2037			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
28	2038			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
29	2039			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
30	2040			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
31	2041			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
32	2042			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
33	2043			11.8	11.8	146.8	12.5	0.2	9.6	169.0	157.3	
Total		356.4	114.1	380.3	850.9	4,319.6	345.6	5.2	265.9	4,936.2	4,085.4	
In the condition of discount rate at:				10.0%								
Net present value (NPV):					507.5					1118.0		610.5
Economic internal rate of return (EIRR):												21.50%
B/C ratio:												2.20

(Note)

Unit price of emission gas:

By gas	Ton per GWh	Price per ton	Price per GWh
	(ton)	(LKR)	(LKR million)
CO ₂	697	1,600	1.1152
NO _x	0.87	19,200	0.016728
SO _x	17.87	48,000	0.857846

Based on the estimation by "Clean development mechanism simplified project design document for small-scale project activities (SSC-CDM-PDD) Version 02" issued by UN-FCCC.