



INVITATION FOR BIDS (IFB)

FOR

Design, Supply, Installation, Testing and Commissioning of Electro-Mechanical Equipment

(EM PACKAGE)

Single-Stage: Two-Envelope Bidding Procedure

March 2023

Document Information

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Revision

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INVITATION FOR BIDS (IFB) / NOTICE INVITING TENDER (NIT) (National Open Competitive Bidding)

Contract Title: Design, Supply, Installation, Testing and Commissioning of Electro-Mechanical Equipment (EM Package) for Keyi Hydropower Project (23 MW) in Arunachal Pradesh

IFB No: *KEYI-W002-EM*

IFB issued on: *22nd March 2023*

Section 6: Employer's Requirements

Volume number	Contents	Section No./ Name
Volume-1	Invitation for Bids	Section 0: Invitation for Bids
	Bidding Procedures and Bidding Forms	Section 1: Instructions to Bidders
		Section 2: Bid Data Sheet
		Section 3: Evaluation, Eligibility and Qualification Criteria
		Section 4: Bidding Forms for Technical Bid
		Section 5: Bidding Forms for Price Bid
	Employer's Requirements	Section 6: Employer's Requirements (the contents of this Section include by reference the contents of Volume-2 and Volume -3)
	Conditions of Contract and Contract Form	Section 7: General Conditions of Contract
		Section 8: Special Conditions of Contract
		Section 9: Contract Forms
Volume-2	Technical Specifications	Part-I: Technical Specification for E & M Equipment
		Part-II: Technical Data Sheet
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A. Scope of Supply of Plant and Services (Also referred to as Scope of Work)

The Scope of Supply of Plant and Services (also referred to as the Scope of Work) for the Facilities and main permanent Works to be executed, for the Keyi Hydro Electric Project- 23 MW (2 x 11.5 MW) include but is not restricted to the following:

A1. Electro- Mechanical Equipment

1	Horizontal shaft Francis turbines with all accessories and associated auxiliary equipment.	Two (2) sets
2	Digital governors with OPU system (common) & all accessories and associated auxiliary equipment.	Two (2) sets
3	Main inlet Valves with all accessories and associated auxiliary equipment	Two (2) sets
4	Cooling water system, Drainage System and Dewatering Systems and Low pressure compressed system with all accessories.	(1) Lot
5	1 Horizontal axis synchronous generators with brushless excitation system, lube oil system, LAVT, NGT, Excitation transformer and all accessories & associated auxiliary equipment.	Two (2) sets
6	Three phase generator step-up transformers of 11/132 KV, 15 MVA capacity each with all accessories and associated equipment.	Two (2) sets
7	11 kV XLPE Single core Power cables	One set
8	132 kV switchyard equipment with all accessories and associated equipment.	One set
9	Optical line terminal equipment (OLTE)	One (1) Lot
10	11/0.415 KV / 500 KVA Station auxiliary transformers for PH, 100 KVA auxiliary transformer 11/0.415 KV for Intake power supply & 11 KV line from PH to intake	Two (2) + One (1)
11	Fire detection & fire fighting system with all accessories for whole power plant.	One (1) set
12	Ventilation and air conditioning system with all accessories.	One (1) set
13	Lubricating & Insulation oil handling and Filtration system with all accessories.	One (1)
14	40 T/10T EOT Overhead travelling crane for Power House & Valve House.	One (1)
15	11 kV switchgear panels	One (1) Lot
16	0.433 kV switchgear panels.	One (1) Lot for PH & Intake

17	110 V DC Battery with battery chargers, DCDB and accessories for PH 24 V Ni-Cd DC Battery system DCDB and accessories for intake	Two (2) sets One (1) set
18	Public Address system	One (1) Lot
19	Protection system for all units, generator transformers & Station auxiliary transformers and 132 kV Bus & Outgoing feeders.	Two (2) sets of generating equipment
20	Supervisory Control and Data Acquisition System (SCADA System).	One (1) set
21	Illumination system for PH, switchyard, intake with emergency lighting.	One set
22	Earth mat for Power House and Switchyard & intake	One set
23	Complete cabling system for power, control & instrumentation cables for power house, switchyard and other functional areas.	One (1) set
24	One DG sets 375 KVA for power House and One DG set 100 KVA for intake	One (1) + One (1)
25	One (1) set of spare parts, tools & tackles.	One (1) set

A2. Any other Plant, Installation Services, work/equipment required for meeting the functional requirements of the Facilities shall be deemed to be included in the Scope of Work.

A3. The Scope of Work shall also include and cover provision of all labour, plant, materials, services and performance of all works necessary for:

1. Detailed Specifications
2. Detailed Design & detailed drawings
3. General arrangement and assembly drawings
4. Quality Assurance and Quality control plans
5. Turbine Model Testing
6. Manufacturing
7. Shop Assembly and testing
8. Site Storage Manuals
9. Erection, Testing and commissioning procedures and method statements
10. Operation and Maintenance Manuals
11. Painting and Packing
12. Inland Transportation, insurance another incidental costs for the delivery of the Plant & Equipment to Project site.

13. Delivery FOR (final destination Site basis) of all Electro-mechanical Plant & Machinery including all necessary embedded parts, spares and Installation and Other Services including other works not shown or specified but reasonably implied or necessary for proper completion and functioning of Works in accordance with the Employer's Requirements /Contract including any revisions and amendments thereto as may be mutually agreed to by the Employer and the Contractor. Any requirements of work whether requested by the Employer or otherwise and whether specifically described in the Contract or not but are necessary or required for the proper completion and functioning of the Works in accordance with the Contract including remedying of any gaps and deficiencies in the Works shall not be deemed to be any change in the scope of work, and shall not entitle the Contractor for any payment over and above Contract Price.

B. Technical Specifications

This section is contained in Volume-II of Bidding Document.

General Design Obligations

The Contractor shall be deemed to have scrutinized, prior to the Base Date, the Employer's Requirements (including design criteria and calculations, if any). The Contractor shall be responsible for the design of the Works and for the accuracy of such Employer's Requirements (including design criteria and calculations), except as stated below.

The Employer shall not be responsible for any error, inaccuracy or omission of any kind in the Employer's Requirements as originally included in the Contract and shall not be deemed to have given any representation of accuracy or completeness of any data or information, except as stated below. Any data or information received by the Contractor, from the Employer or otherwise, shall not relieve the Contractor from his responsibility for the design and execution of the Works.

However, the Employer shall be responsible for the correctness of the following portions of the Employer's Requirements and of the following data and information provided by (or on behalf of) the Employer:

1. Portions, data and information which are stated in the Contract as being immutable or the responsibility of the Employer,
2. Definitions of intended purposes of the Works or any parts thereof,
3. Criteria for the testing and performance of the completed Works, and
4. Portions, data and information which cannot be verified by the Contractor, except as otherwise stated in the contract.

C. Drawings

This section is contained in Volume-III of Bidding Document

D. Supplementary Information

Training of the Employer's Personnel

Training in the Contractor's Premises

The Contractor shall in pursuance of provisions of technical specification or as specified elsewhere, provide training to the Employer's Personnel preferably on power plant Operation and Maintenance and in Contractor's factories, of similar technique and shall arrange the relevant agreement with the Employer.

The following training provision is estimated only for the purpose of Bid. If the Bidder expects any variation in man-days required for completing the training, he shall offer his recommended schedule as the Alternative. The Bidder shall also indicate tentative time, place and details of training of various equipment's in his Bid.

Training Provision	No. of Engineers	Days (only of Training) (Eight Hours per day)	Man Days
High Level Delegation (CAT I) (To assess the facility and training programme prior to commencement of training)	2	3	6
Middle & Lower Level Delegation (CAT II & CAT III) Turbine, Governor and other Turbine accessories.	2	8	16
Generators, Excitation System and other generator accessories.	2	8	16
Computerized Control System and Protection System	2	5	10
Total		24	48

Note:

- (i) The Employer reserves the right to increase the number of Engineers for a particular Training and/or add any Training, if desired at a later date.

- (ii) The above schedule is tentative and subject to modification and adjustment based on the actual time required for various trainings to be conducted as intimated by the manufacturer and as agreed by the Employer.
- (iii) The training shall be performed in the English language. The training programme shall be included in the Time Schedule and be subject to the Employer's approval.

Shop tests to be attended by the Employer

The Bidder shall also identify in the Time Schedule; the key test and inspection items to be witnessed by the Engineer including the addendum at the Contract negotiation.

For such key tests and inspection items, at least twenty one (21) days advance notification before the execution shall be made as the confirmation by the Contractor to the Employer.

The Employer shall inform the Contractor in due time of his decision to attend any of the last mentioned inspection and test, which shall not cause interruption or disturbance to the workshop manufacturing.

The Employer reserves the right to be present himself or his authorized representative at his own cost in the Contractor's workshop during the manufacture of special equipment/ Plant and any shop tests by the manufacturer. The Contractor shall not be entitled to any extra compensation by reason thereof.

The shop testing has been detailed in the technical specifications of each equipment/ Plant. The prices for the testing shall be included in FOR prices of the equipment/ Plant. Generally, two persons shall be attending the shop testing with exception of type testing of transformers, model test, controls for which the employer may depute three officials.

The Contractor shall perform the in-house test (i.e. rehearsal of shop test) before the attendance of the Engineer, and shall submit the test results to the Employer one (1) week in advance before calling the employer's representative/Engineer.

E. Project Features

1.	Location		
	State	:	Arunachal Pradesh
	District	:	Lower Subansiri
	Village	:	Pistana
	Access	:	135 km from Itanagar
2.	Geographical Coordinates		
	Diversion site		
	Longitude	:	93° 39' 0.42" E
	Latitude	:	27° 29' 43.09" N
	Powerhouse site		
	Longitude	:	93° 39' 16.64" E
	Latitude	:	27° 28' 43.35" N
3.	Hydrology		
	Name of stream	:	Keyi
	Type of stream	:	Perennial
	Catchment area	:	259.60 km ²
	Max discharge -10 Daily	:	37.42 m ³ /s
	Min discharge-10 Daily	:	3.23 m ³ /s
	50 year flood at diversion site	:	1273 m ³ /s
	500 year flood at diversion site	:	1800 m ³ /s
	100 year flood at powerhouse site	:	4331m ³ /s
	For 90% dependable year		
	Max discharge – 10 Daily	:	38.45 m ³ /s
	Min discharge- 10 Daily	:	4.63 m ³ /s
	For 75% dependable year		
	Max discharge – 10 Daily	:	34.22 m ³ /s
	Min discharge- 10 Daily	:	3.16 m ³ /s
	For 50% dependable year		

	Max discharge – 10 Daily	:	43.64 m ³ /s
	Min discharge- 10 Daily	:	7.25 m ³ /s
4.	Temporary River Diversion		
	25 years dry season design flood	:	390 m ³ /s
	Diameter of Diversion Tunnel	:	7.5 m, Horseshoe shaped
	Length of Diversion Tunnel	:	195.41 m
	Top of upstream coffer dam	:	904.6 m
	Top of downstream coffer dam	:	896.0m
	Invert of diversion inlet	:	893.0 m
	Invert of diversion outlet	:	891.50 m
5.	Diversion Structure		
	Type	:	Gated barrage
	Average riverbed level	:	892.50 m
	Crest level of barrage bays	:	893.50 m
	Bridge deck level	:	904.50 m
	Barrage Bays		
	No. of bays	:	2
	Width of each Bay	:	8.0 m
	Thickness of piers	:	2.5 m
	Clear width of barrage bays	:	16 m
	Type and height of gate	:	Radial Gate of 9.1 m high
	Under Sluice Bay		
	No. of under sluice bays	:	1
	Width of each bay	:	8.0 m
	Crest level of under sluice Bay	:	El. 892.50 m
	Clear width of under sluice bays	:	8 m
	Type and height of gate	:	Radial Gates, 10.1m high.
	Energy Dissipation System		Hydraulic jump type stilling basin
	Length of basin from toe of sloping glacis in barrage bay	:	37 m
	Length of basin from toe of sloping glacis in sluice bay	:	37 m
	Total width of basin	:	29 m
	Cistern level	:	El. 889.0 m

	End Sill Level	:	El. 891.0 m
6.	Power Intake		
	Type	:	Side Intake
	Invert Level of Intake	:	El. 894.50 m
	Size of trash Rack	:	2 nos. 3.5 m (W) x 7.6 m (H)
	Intake Stop Log	:	1 no. Vertical lift Gate (3.5 m (W) x 3.5 m (H))
	Intake Service Gate	:	1 no. Vertical lift Gate (3.5 m (W) x 3.5 m (H))
7.	Feeder Tunnel		
	Shape	:	Horseshoe shaped
	Concrete lining thickness	:	250 mm
	Diameter	:	3.5 m
	Length	:	311.5 m
	Adit to Feeder Tunnel		
	Shape	:	D-shaped
	Diameter	:	4.0 m
	Length	:	65 m
8.	Desilting Chamber		
	Size	:	95 m x 12m x 13.85 m
	Size of particle removed	:	0.25 mm
	Transition length (upstream)	:	25.5 m
	Transition length (downstream)	:	12.75 m
	Material	:	Reinforced Cement Concrete
	Silt flushing tunnel size	:	3.5 m dia., D-shaped
	Silt flushing tunnel length	:	204.67 m
	Silt flushing steel pipe dia.	:	1.25 m
9.	Head Race Tunnel		
	Shape	:	Horseshoe shaped

	Diameter	:	3.5 m
	Length	:	1342.9 m
	Design discharge	:	20.50 m ³ /s
	Concrete lining thickness	:	250 mm
10.	Surge Shaft		
	Shape	:	Circular
	Diameter	:	7.5 m with gate groove (equivalent to 7.3 m)
	Height (above orifice slab)	:	25.6 m
	Maximum upsurge level	:	912.37 m
	Minimum down-surge level	:	893.26 m
	Orifice size	:	2.6 m x 0.5 m gate groove and additional circular orifice of 0.85 diameter
11.	Pressure Shaft		
	Shape	:	Circular
	Diameter	:	2.6 m
	Total length	:	150.499 m
	Steel lined length	:	143.23 m
	Thickness of liner	:	10 mm
12.	Main Penstock		
	Shape	:	Circular
	Material	:	ASTM 537 CLASS 2
	Diameter	:	2.6 m
	Length	:	6.79 m
13.	Branch Penstock		
	Shape	:	Circular
	Material	:	ASTM 537 CLASS 2
	Number	:	2
	Diameter	:	1.85 m

	Length	:	171.76 m
14.	Powerhouse		
	Type	:	Surface
	Size (Lx W x H)	:	49.51 m (L) x 12.1 m (W) x 31.32 m (H)
	Gross head	:	129.78 m
	Design head	:	125.48 m
	Centre line of penstock at MIV	:	767.90 m
	Machine hall level	:	768.50 m
	Service bay level	:	782.00 m
	Auxiliary bay control room floor level	:	782.00 m
	Auxiliary bay office/conference room floor level	:	778.00 m
15.	Tailrace		
	Type	:	Box channel
	Unit tailrace		
	Width	:	4.0 m
	Height	:	4.24 m
	Length	:	16.2 m
	Combine Tailrace		
	Width	:	7.5 m
	Height	:	4.24 m to 1.75 m
	Length	:	17.1 m
16.	E&M Equipment		
	Turbines		
	Type	:	Horizontal axis Francis
	No. & Capacity	:	2 x 11.5 MW (at generator terminal)
	Rated net head	:	125.48 m
	Speed	:	600 rpm
	Overloading	:	10%

	Generators		
	Type	:	Horizontal shaft alternating current synchronous type.
	No. & Capacity	:	2 x 11.5 MW
	Power factor	:	0.85 (lagging)
	Overloading	:	10%
	Transformer		
	Type and Numbers	:	2 nos-11/132 kV, 15 MVA, YNd11, ONAN (Oil Natural, Air Natural)
17.	Power Generation		
	Installed capacity	:	23 MW
	Energy at 90% Dependable year with 95% machine availability	:	118.83 Gwh
18.	Transmission Line		
	Voltage	:	132kV
	No. of transmission lines	:	Single circuit transmission line
	Length	:	15 km to New Zero (Yachuli) substation

F. Certificates

1. Form of Completion Certificate

Contract: [. . . *.insert name of contract and contract identification details. . . .*]

Date:

Certificate No.:

To: [. . . *.insert name and address of contractor. . . .*]

Dear Ladies and/or Gentlemen,

Pursuant to GCC Clause 25 of the General Conditions of the Contract entered into between yourselves and the Employer dated [. . . *.insert date. . . .*], relating to the [. . . *.brief description of the Facilities . . .*], we hereby notify you that the following part(s) of the Facilities was (were) complete on the date specified below, and that, in accordance with the terms of the Contract, the Employer hereby takes over the said part(s) of the Facilities, together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below.

1. Description of the Facilities or part thereof: [. . . *.description . . .*]
2. Date of Completion: [. . . *.date . . .*]

However, you are required to complete the outstanding items listed in the attachment hereto as soon as practicable.

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defect Liability Period.

Very truly yours,

[. . . *.Signature . . .*]
Project Manager

2. Form of Operational Acceptance Certificate

Contract: [. . . .insert name of contract and contract identification details. . . .]

Date:

Certificate No.:

To: [. . . .insert name and address of contractor. . . .]

Pursuant to GCC Subclause 25.3 (Operational Acceptance) of the General Conditions of the Contract entered into between yourselves and the Employer dated [. . .date. . .], relating to the [. . .brief description of the facilities. . .], we hereby notify you that the Functional Guarantees of the following part(s) of the Facilities were satisfactorily attained on the date specified below.

1. Description of the Facilities or part thereof: [. . .description . . .]
2. Date of Operational Acceptance: [. . .date . . .]

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defect Liability Period.

Very truly yours,

[. . .Signature . . .]

Project Manager

G. Change Orders

1. Change Order Procedure

- 1.1 General
- 1.2 Change Order Log
- 1.3 References for Changes

2. Change Order Forms

- 2.1 Request for Change Proposal
- 2.2 Estimate for Change Proposal
- 2.3 Acceptance of Estimate
- 2.4 Change Proposal
- 2.5 Change Order
- 2.6 Pending Agreement Change Order
- 2.7 Application for Change Proposal

1. Change Order Procedure

1.1 General

This section provides samples of procedures and forms for implementing changes in the Facilities during the performance of the Contract in accordance with GCC Clause 39 (Change in the Facilities) of the General Conditions.

1.2 Change Order Log

The Contractor shall keep an up-to-date Change Order Log to show the current status of Requests for Change and Changes authorized or pending. Entries of the Changes in the Change Order Log shall be made to ensure that the log is up-to-date. The Contractor shall attach a copy of the current Change Order Log in the monthly progress report to be submitted to the Employer.

1.3 References for Changes

- (1) Request for Change as referred to in GCC Clause 39 shall be serially numbered CR-X-nnn.
- (2) Estimate for Change Proposal as referred to in GCC Clause 39 shall be serially numbered CN-X-nnn.
- (3) Acceptance of Estimate as referred to in GCC Clause 39 shall be serially numbered CA-X-nnn.
- (4) Change Proposal as referred to in GCC Clause 39 shall be serially numbered CP-X-nnn.
- (5) Change Order as referred to in GCC Clause 39 shall be serially numbered CO-X-nnn.

Note:

- (a) Requests for Change issued from the Employer's Home Office and the Site representatives of the Employer shall have the following respective references:

Home Office CR-H-nnn

Site CR-S-nnn

- (b) The above number "nnn" is the same for Request for Change, Estimate for Change Proposal, Acceptance of Estimate, Change Proposal and Change Order.

2. Change Order Forms

2.1 Request for Change Proposal Form

[*Employer's letterhead*]

To: [*Contractor's name and address*]
Attention: [*Name and title*]

Date:

Contract Name: [*Contract name*]
Contract Number: [*Contract number*]

Dear Ladies and/or Gentlemen:

With reference to the captioned Contract, you are requested to prepare and submit a Change Proposal for the Change noted below in accordance with the following instructions within [*number*] days of the date of this letter [or on or before (*date*)].

1. Title of Change: [*Title*]
2. Change Request No./Rev.: [*Number*]
3. Originator of Change:
 Employer: [Name]
 Contractor (by Application for Change Proposal No. [Number Refer to Annex 6.2.7])
4. Brief Description of Change: [*Description*]
5. Facilities and/or Item No. of equipment related to the requested Change: [*Description*]
6. Reference drawings and/or technical documents for the request of Change:
 Drawing No./Document No. Description
7. Detailed conditions or special requirements on the requested Change: [*Description*]
8. General Terms and Conditions:
 - (a) Please submit your estimate showing what effect the requested Change will have on the Contract Price.
 - (b) Your estimate shall include your claim for the additional time, if any, for completing the requested Change.
 - (c) If you have any opinion that is critical to the adoption of the requested Change in connection with the conformability to the other provisions of the Contract or the safety of the Plant or Facilities, please inform us in your proposal of revised provisions.
 - (d) Any increase or decrease in the work of the Contractor relating to the services of its personnel shall be calculated.
 - (e) You shall not proceed with the execution of the work for the requested Change until we have accepted and confirmed the amount and nature in writing.

[*Employer's name*]

[*Signature*]

[*Name of signatory*]

[*Title of signatory*]

2.2 Estimate for Change Proposal Form

[*Contractor's letterhead*]

To: [*Employer's name and address*]

Date:

Attention: [*Name and title*]

Contract Name: [*Contract name*]

Contract Number: [*Contract number*]

Dear Ladies and/or Gentlemen:

With reference to your Request for Change Proposal, we are pleased to notify you of the approximate cost to prepare the below-referenced Change Proposal in accordance with GCC Subclause 39.2.1 of the General Conditions. We acknowledge that your agreement to the cost of preparing the Change Proposal, in accordance with GCC Subclause 39.2.2, is required before estimating the cost for change work.

1. Title of Change: [*Title*]
2. Change Request No./Rev.: [*Number*]
3. Brief Description of Change: [*Description*]
4. Scheduled Impact of Change: [*Description*]
5. Cost for Preparation of Change Proposal: [*insert costs, which shall be in the currencies of the contract*]

(a)	Engineering	(Amount)
(i)	Engineer _____ hours (hrs) x _____ rate/hr = _____	
(ii)	Draftsperson _____ hrs x _____ rate/hr = _____	
	Sub-total _____ hrs	_____
	Total Engineering Cost	_____
(b)	Other Cost	_____
	Total Cost (a) + (b)	_____

[*Contractor's name*]

[*Signature*]

[*Name of signatory*]

[*Title of signatory*]

2.3 Acceptance of Estimate Form

[*Employer's letterhead*]

To: [*Contractor's name and address*]

Date:

Attention: [*Name and title*]

Contract Name: [*Contract name*]

Contract Number: [*Contract number*]

Dear Ladies and/or Gentlemen:

We hereby accept your Estimate for Change Proposal and agree that you should proceed with the preparation of the Change Proposal.

1. Title of Change: [*Title*]
2. Change Request No./Rev.: [*Request number/revision*]
3. Estimate for Change Proposal No./Rev.: [*Proposal number/revision*]
4. Acceptance of Estimate No./Rev.: [*Estimate number/revision*]
5. Brief Description of Change: [*Description*]
6. Other Terms and Conditions: In the event that we decide not to order the Change accepted, you shall be entitled to compensation for the cost of preparing the Change Proposal described in your Estimate for Change Proposal mentioned in para. 3 above in accordance with GCC Clause 39 of the General Conditions.

[*Employer's name*]

[*Signature*]

[*Name of signatory*]

[*Title of signatory*]

2.4 Change Proposal Form

[*Contractor's letterhead*]

To: [*Employer's name and address*]

Date:

Attention: [*Name and title*]

Contract Name: [*Contract name*]

Contract Number: [*Contract number*]

Dear Ladies and/or Gentlemen:

In response to your Request for Change Proposal No. [Number], we hereby submit our proposal as follows:

1. Title of Change: [*Name*]
2. Change Proposal No./Rev.: [*Proposal number / revision*]
3. Originator of Change: Employer: [*Name*] / Contractor: [*Name*]
4. Brief Description of Change: [*Description*]
5. Reasons for Change: [*Reason*]
6. Facilities and/or Item No. of Equipment related to the requested Change: [*Facilities*]
7. Reference drawings and/or technical documents for the requested Change:
[*Drawing/Document No./Description*]
8. Estimate of increase/decrease to the Contract Price resulting from the Change Proposal:

Amount

[*insert amounts in the currencies of the*

Contract]

- | | | |
|-----|--------------------------------------|-------|
| (a) | Direct material | _____ |
| (b) | Major construction equipment | _____ |
| (c) | Direct field labor (Total hrs) | _____ |
| (d) | Subcontracts | _____ |
| (e) | Indirect material and labor | _____ |
| (f) | Site supervision | _____ |
| (g) | Head office technical staff salaries | _____ |

Process engineer	_____ hrs @ _____ rate/hr	_____
Project engineer	_____ hrs @ _____ rate/hr	_____
Equipment engineer	_____ hrs @ _____ rate/hr	_____
Procurement	_____ hrs @ _____ rate/hr	_____
Draftsperson	_____ hrs @ _____ rate/hr	_____
Total	_____ hrs	

(h) Extraordinary costs (computer, travel, etc.) _____

(i) Fee for general administration, % of Items _____

(j) Taxes and customs duties _____

Total lump sum cost of Change Proposal [Sum of items (a) to (j)]

Cost to prepare Estimate for Change Proposal [Amount payable if Change is not
accepted]

9. Additional time for Completion required due to Change Proposal
10. Effect on the Functional Guarantees
11. Effect on the other terms and conditions of the Contract
12. Validity of this Proposal: within [Number] days after receipt of this Proposal by the Employer
13. Other terms and conditions of this Change Proposal:
 - (a) You are requested to notify us of your acceptance, comments or rejection of this detailed Change Proposal within [Number] days from your receipt of this Proposal.
 - (b) The amount of any increase and/or decrease shall be taken into account in the adjustment of the Contract Price.
 - (c) Contractor's cost for preparation of this Change Proposal: [. . . insert amount. This cost shall be reimbursed by the employer in case of employer's withdrawal or rejection of this Change Proposal without default of the contractor in accordance with GCC Clause 39 of the General Conditions . . .]

[Contractor's name]
[Signature]
[Name of signatory]
[Title of signatory]

2.5 Change Order Form

[*Employer's letterhead*]

To: [*Contractor's name and address*]

Date:

Attention: [*Name and title*]

Contract Name: [*Contract name*]

Contract Number: [*Contract number*]

Dear Ladies and/or Gentlemen:

We approve the Change Order for the work specified in the Change Proposal (No. [*number*]), and agree to adjust the Contract Price, Time for Completion, and/or other conditions of the Contract in accordance with GCC Clause 39 of the General Conditions.

1. Title of Change: [*Name*]
2. Change Request No./Rev.: [*Request number / revision*]
3. Change Order No./Rev.: [*Order number / revision*]
4. Originator of Change: Employer: [*Name*] / Contractor: [*Name*]
5. Authorized Price:
Ref. No.: [*Number*] Date: [*Date*]
Foreign currency portion [*Amount*] plus Local currency portion [*Amount*]
6. Adjustment of Time for Completion
None Increase [*Number*] days Decrease [*Number*] days
7. Other effects, if any

Authorized by: _____
Employer

Date: _____

Accepted by: _____
Contractor

Date: _____

2.6 Pending Agreement Change Order Form

[*Employer's letterhead*]

To: [*Contractor's name and address*]

Date:

Attention: [*Name and title*]

Contract Name: [*Contract name*]

Contract Number: [*Contract number*]

Dear Ladies and/or Gentlemen:

We instruct you to carry out the work in the Change Order detailed below in accordance with GCC Clause 39 of the General Conditions.

1. Title of Change: [*Name*]
2. Employer's Request for Change Proposal No./Rev.: [*number/revision*] dated: [*date*]
3. Contractor's Change Proposal No./Rev.: [*number / revision*] dated: [*date*]
4. Brief Description of Change: [*Description*]
5. Facilities and/or Item No. of equipment related to the requested Change: [*Facilities*]
6. Reference Drawings and/or technical documents for the requested Change:
[*Drawing / Document No. / Description*]
7. Adjustment of Time for Completion:
8. Other change in the Contract terms:
9. Other terms and conditions:

[*Employer's name*]

[*Signature*]

[*Name of signatory*]

[*Title of signatory*]

2.7 Application for Change Proposal Form

[*Contractor's letterhead*]

To: [*Employer's name and address*]

Date:

Attention: [*Name and title*]

Contract Name: [*Contract name*]

Contract Number: [*Contract number*]

Dear Ladies and/or Gentlemen:

We hereby propose that the work mentioned below be treated as a Change in the Facilities.

1. Title of Change: [*Name*]
2. Application for Change Proposal No./Rev.: [*Number / revision*] dated: [*Date*]
3. Brief Description of Change: [*Description*]
4. Reasons for Change:
5. Order of Magnitude Estimation (amount in the currencies of the Contract): [*Amount*]
6. Scheduled Impact of Change:
7. Effect on Functional Guarantees, if any:
8. Appendix:

[*Contractor's name*]

[*Signature*]

[*Name of signatory*]

[*Title of signatory*]

H. Personnel Requirements

Using Form PER - 1 and PER - 2 in Section 4 (Bidding Forms for Technical Bid), the Bidder must demonstrate that it has personnel who meet the following requirements:

No specific requirement is applicable. The Bidder is required to complete the specified Forms with the details of Key Personnel he has with qualifications and experience commensurate with the requirement of successfully completing the Works in the event of award.

Using Form EXP-4 in Section 4 (Bidding Forms for Technical Bid), the Bidder must demonstrate that it has ESHS personnel who meet the following requirements:

No specific requirement is applicable. The Bidder is required to complete the specified Forms with the details of Key Personnel as determined by the ESHSMP and other safeguard management plans, commensurate with the requirement of successfully completing the Works in the event of award

I. Equipment Requirements

Using Form EQU in Section 4 (Bidding Forms), the Bidder must demonstrate that it has the key equipment listed below:

No specific requirement is applicable. The Bidder is required to complete the specified Forms with the details of the key equipment he has with details thereof, commensurate with the requirement of successfully completing the Works in the event of award

J. Environmental, Social, Health and Safety Management Requirement

1. Security Management

1.1 General

- (a) The Contractor shall assume responsibility for security of those parts of the Site on which the Contractor is required to undertake the Works, including, if applicable, any offices, accommodation and other facilities provided by the Contractor.
- (b) Unless otherwise stated in the Contract, the Contractor shall allow Authorised Persons access to, and shall be responsible for keeping unauthorised persons off, the Site.
- (c) Without prejudice to the right of the Authorised Persons to enter the Site, the Employer will, from time to time, provide the Contractor, for information purposes only, with the number of Authorised Persons and their names.
- (d) The Contractor shall provide necessary and appropriate safeguards within the Site for the protection of the Works and all persons and other property related thereto, including lights and barriers, guard service, controlled access and other measures developed or required to prevent vandalism, theft and accident.
- (e) The Contractor shall issue procedures for the security of the Works and to define actions to be followed by the Authorised Persons.

1.2 Access to the Site

- (a) With respect to the Site, the Contractor shall not allow the ingress or egress of personnel, equipment, vehicles or material except at points designated and controlled by the Contractor.
- (b) The Contractor shall ensure, by means of an identification procedure, that access to the Site for personnel will be limited to the specific areas necessary for the performance of their respective duties. Authorised Persons shall be provided with permits to permit entry to such specific areas.

1.3 Site Rules

- (a) In respect of the Contractor's Personnel, the Contractor shall ensure that the following items and activities are not permitted within the Site:
 - guns or arms of any type;
 - drugs;
 - dwellings other than in designated accommodation areas;
 - gambling or political activities;
 - anti-social, discriminatory or harassing behaviour;

- sleeping while at work;
 - attending work while under the influence of alcohol or drugs;
 - smoking in prohibited areas;
 - interfering with works and equipment of Other Contractors without prior consent;
 - entering or exiting out of scheduled hours without authorisation;
 - collecting money without authorisation;
 - hunting, fishing or setting traps in any areas within 20 km of any part of the Site without written authorisation by the appropriate Government Authority; and
 - cutting or removing trees, logs or forest products without authorization by the appropriate Government Authority.
- (a) The Contractor shall ensure that Authorised Persons and any authorised visitors to the Site are advised that the above activities are not permitted within the Site.
- (b) The Contractor shall implement procedures that will detail the mechanisms to ensure compliance with the Site rules, including provision of environmental training in accordance with Clause 3 (*Environment Management*).
- (c) Contractor's Personnel who break the Site rules may be dismissed at the request of the Employer.

2. Health and Safety Management

2.1 General Requirements

This Clause 2 (*Health and Safety Management*) describes the Employer's minimum general health and safety requirements that shall be observed by the Contractor at all times, with a very high degree of diligence and care.

- (a) The Contractor shall, at its own cost, take full responsibility for:
 - (i) prevention of unhealthy or unsafe conditions and practices;
 - (ii) promotion, implementation and control of healthy and safe working procedures and practices for all phases of the Works;
 - (iii) provision of a safe working environment for the Contractor's Personnel, visitors, Employer's Personnel and, where relevant, the public; and
 - (iv) execution of the Works in a safe, workmanlike manner, in accordance with good safe working practices and in compliance with the requirements of the Contract.
- (b) Nothing specified in this Clause 2 (*Health and Safety Management*) shall relieve the Contractor of any health and safety obligations or responsibility required under the Contract or under applicable Laws.
- (c) The Contractor shall take all necessary health and safety precautions with respect to the Works in order to provide a safe environment for the Contractor's Personnel, the Employer's Personnel and other personnel, including the public.
- (d) If the required or approved safety measures have not been implemented, the Employer shall not be obliged to attend inspections of any working area at the Site, and any delay to the Works caused by the Contractor's breach of any health and safety obligations shall be the full responsibility of the Contractor.

2.2 Standards, Guidelines and Applicable Laws

With respect to health and safety for all aspects of the Works, the Contractor shall comply with all applicable Laws and Government Authority regulations, including the following:

- (a) ILO "Code of Practice: Safety and Health in Construction";
- (b) ILO "Training Manual: Safety, Health and Welfare on Construction Sites";
- (c) IFC "Performance Standards on Environmental and Social Sustainability";
- (d) IFC "Guidance Notes: Performance Standards on Environmental and Social Sustainability";
- (e) IFC "Environmental, Health and Safety (EHS) Guidelines"; and

- (f) Any other applicable legal requirements and guidelines enforced in the Country with respect to health and safety.

2.3 Health and Safety Management

2.3.1 Health and Safety Policy

- (a) The Contractor shall, in the form of a health and safety policy statement ("**Health and Safety Policy**"), state its target, commitment and strategy with regard to safety aspects of the Contract.
- (b) The Health and Safety Policy prepared by the Contractor shall be signed by the chairman of the board of directors of the Contractor.
- (c) The Contractor's Health and Safety Policy shall be displayed in a prominent position within the Contractor's offices on the Site, and the Contractor shall implement and enforce the Health and Safety Policy throughout the term of the Contract.
- (d) The Health and Safety Management Plan described in Sub-Clause 2.3.3 (*Health and Safety Management Plan*) shall be used as a means of implementing the Contractor's Health and Safety Policy.

2.3.2 Safety Personnel and Roles

- (a) The Contractor shall appoint personnel adequately experienced in health and safety management (the "**Safety Manager**"), licensed, certified and qualified according to nationally/ internationally recognized standards , to oversee and manage the health and safety aspects of the Works on Site.
- (b) The Safety Manager shall carry out regular and random checks of all parts of the Site where the Contractor is undertaking activities pursuant to the Contract.
- (c) Particular attention shall be given by the Safety Manager to safety aspects such as lighting, handrails (especially around all dangerous openings, access stairs), toe plates, ventilation of enclosed spaces, removal of construction waste, orderly storing and stacking of construction equipment and materials, and general cleanliness of the Works.
- (d) The Safety Manager shall have the authority to stop work if the work is being carried out in an unsafe manner or method.

2.3.3 Health and Safety Management Plan

- (a) The Contractor shall prepare the Health and Safety Management Plan for the purposes of managing, monitoring, controlling and reporting the health and safety aspects on the Contract, and which shall address the matters described in this Sub-Clause 2.3.3 (*Health and Safety Management Plan*).

- (b) Within twenty-eight (28) days of the Commencement Date and in any event prior to commencement of any part of the Works, the Contractor shall submit, for the Employer's review and approval, the Health and Safety Management Plan.
- (c) For the purposes of the Health and Safety Management Plan, a reference to the Contractor includes the Contractor's Personnel, Subcontractors, advisors, consultants, vendors, suppliers and visitors or any other person or entity which is in relation with the Contractor.
- (d) The Health and Safety Management Plan shall cover and detail the following health and safety requirements as a minimum in order to comply with the requirements of the Contract, all applicable Laws and Best Industry Practice:
 - (i) The Contractor's Health and Safety Policy, as required in accordance with Sub-Clause 2.3.1 (*Health and Safety Policy*).
 - (ii) List of relevant standards, Laws, and guidelines relevant to the Works, and all permits, approvals and licenses required to undertake activities with respect to the Works.
 - (iii) Structure, roles and responsibilities of the Contractor's Personnel in charge of the health and safety aspects of the Works.
 - (iv) Health and safety aspects relating to human resources, including the following:
 - Site safety induction and register of induction;
 - issue of a health and safety handbook to all Contractor's Personnel;
 - provision and maintenance of personal protective equipment;
 - communication;
 - health and safety training;
 - evacuation training;
 - procedure for ensuring the Contractor's Personnel are medically fit for work, including medical examinations, and hours of work; and
 - sanctions for not complying with health and safety requirements.
 - (v) Risk assessment and management, including procedures for risks assessments and job safety analysis.
 - (vi) Safety practices and procedures, in accordance with Sub-Clause 2.5 (*Safe Work Practices and Procedures*).
 - (vii) Accident, incident and emergency procedures, including the following:
 - investigation of incidents and injuries;
 - Emergency Response Plan; and
 - emergency equipment and rescue teams.
 - (viii) Monitoring, review and reporting of performance of health and safety obligations, including the following:

- objectives, goals and performance indicators;
 - health and safety inspections;
 - internal and external audits;
 - corrective action and non-conformance reporting; and
 - reporting of health and safety performance.
- (e) The Contractor shall manage the implementation of the Health and Safety Management Plan and shall review the Health and Safety Management Plan on a regular basis. The Health and Safety Management Plan may be updated or revised, at the Contractor's cost, subject to the Employer's review and approval, or as instructed by the Employer in order to ensure that the Health and Safety Management Plan continues to provide appropriate guidance during the term of the Contract.
- (f) The Employer will monitor and review the Contractor's performance of its health and safety obligations and may undertake formal safety audits of the Contractor's performance of its health and safety obligations.

2.3.4 Health and Safety Handbook

- (a) The Contractor shall develop a health and safety handbook, at the same time as the Health and Safety Management Plan.
- (b) The health and safety handbook shall be a brief document which summarizes the key aspects of the health and safety induction, including the Emergency Response Plan, location of first-aid stations, medical clinic, health and safety personnel contact details, and significant hazards likely to be encountered on the Site.
- (c) A copy of the health and safety handbook shall be given to all Contractor's Personnel at their respective health and safety induction prior to their performance of any part of the Works.

2.3.5 Hazard Identification, Risk Assessments and Risk Control (HIRARC), and Job Safety Analysis (JSA)

- (a) The Contractor shall undertake hazard identification, risk assessments and risk control (HIRARC) of each aspect of the Works to identify all activities that are deemed to be of high safety risk.
- (b) For each high safety risk activity to be performed, the Contractor shall undertake and document a job safety analysis (JSA) before starting the relevant work. The job safety analysis shall be undertaken by the Safety Manager and relevant supervision staff with respect to the work for which the job safety analysis applies.
- (c) All job safety analyses shall be documented on a job safety analysis form to be provided by the Contractor and submitted to the Employer for review and approval. All completed job safety analysis forms shall be approved and signed by the Contractor's Safety Manager.

- (d) All job safety analyses shall consider the nature, timing, extent and conditions of the work activity being analysed, including whether the work is to be done at night, over multiple shifts, or under adverse weather conditions.
- (e) If any of the assumptions made with respect to an original job safety analysis change or are found to be inappropriate, the related work shall be suspended until the job safety analysis is reviewed, amended, approved and reissued. The work shall not resume until the approved revised job safety analysis has been reissued.

2.3.6 Emergency Response Planning and Training

2.3.6.1 *Emergency Response Plan*

- (a) The Contractor shall, within twenty-eight (28) days from the Commencement Date, submit for the Employer's review and approval, a comprehensive emergency response plan (the "**Emergency Response Plan**"), in accordance with the requirements of the "Performance Standards on Environmental and Social Sustainability (2012)" published by the International Finance Corporation as well as in alignment with the Employer's Emergency Response Plan.
- (b) The Emergency Response Plan shall be revised and/or updated as necessary to reflect any relevant changed circumstances at the Site, or, without relieving the Contractor of any of its obligations or responsibilities under the Contract, as instructed by the Employer. Revisions and/or updates of the Emergency Response Plan shall be submitted no later than twenty-eight (28) days from the date of identification of relevant changed circumstances at the Site or from the date of the Employer's instruction.
- (c) The Contractor shall constitute an Emergency Response Team for the site, by identifying and designating emergency response duties to their select on-site personnel.
- (d) The Emergency Response Plan shall detail procedures and plans the Contractor intends to implement with respect to managed responses to emergency situations at the Site, and shall demonstrate that the Contractor has the facilities and personnel required to implement the approved Emergency Response Plan.
- (e) The Emergency Response Plan shall address the following incident categories:
 - (i) health emergencies (including epidemics);
 - (ii) medical emergencies;
 - (iii) rescue procedures;
 - (iv) evacuation procedures, (medical emergency, civil unrest and other emergency incidents);
 - (v) failure of or damage to any part of the Works;
 - (vi) fires and firefighting;
 - (vii) natural disasters (including floods, earthquakes, etc.);

- (viii) environmental emergencies (including, pollution of waterways, spillage of hazardous materials, etc.);
 - (ix) biological or radiological hazards;
 - (x) major disruptions or failure to communications, hardware, software, and other business related aspects of the Site.
- (f) The Emergency Response Plan shall include the following:
 - (i) emergency response organization (chain of command and reporting), including all relevant position titles and contact details;
 - (ii) procedures for immediate actions;
 - (iii) procedures for follow-up, corrective and mitigation actions;
 - (iv) complete lists of relevant equipment available for use in emergency situations;
 - (v) procedures for reporting incidents to the Employer, the relevant Government Authority, including local authorities, as applicable;
 - (vi) procedures for informing the local population in cases of release of hazardous substances and/or pollutants;
 - (vii) procedures for reporting irregular events and near-misses; and
 - (viii) programme for training of designated emergency response staff.
- (g) The Contractor shall be responsible for the proper instruction and training of the Contractor's Personnel with respect to the Contractor's obligations and the requirements of the Emergency Response Plan.
- (h) The Contractor shall have the ultimate responsibility, in the event of an emergency situation, for properly stopping the work activities at the affected areas of the Site, and, under the Contractor's supervision, the subsequent evacuation of all affected personnel to a designated (and pre-defined) safe assembly location. The Contractor shall also be responsible for the undertaking and recording of head-counts of the Contractor's Personnel following any such evacuation.

2.3.6.2 Emergency Response Training

- (a) The Contractor shall perform, in conjunction with the Employer, emergency response training drills as frequently as specified in the approved Emergency Response Plan.
- (b) Each emergency response training drill shall be monitored and recorded by the Contractor. Any discrepancies or non-compliances with the relevant emergency response procedure shall be identified, documented and analysed by the Contractor.
- (c) The Contractor shall prepare and submit to the Employer a detailed report on each emergency response training drill. Such reports shall detail any non-compliances with the relevant emergency response procedure, including any related corrective and/or preventive actions to be taken with respect to such non-compliances. Preventive actions

may include appropriate amendments to the relevant emergency response procedure and/or additional training of the Contractor's Personnel.

2.3.6.3 Emergency Response Equipment

- (a) Contractor shall have the necessary equipment for personal safety and fire safety for their working area,
- (b) The Contractor shall rely on and identify the Emergency Response Equipment of their Employer to respond to any emergency situation. The identification of necessary on-site emergency equipment of the Employer will be undertaken while preparing the Emergency Response Plan.
- (c) The Contractor shall ensure that the fire extinguishers are refilled as necessary and shall employ trained personnel in fire safety and first aid for emergency response.

2.3.6.4 Emergency Response Teams

- (a) Prior to the commencement of work, the Contractor shall train identify and designate personnel for Emergency Response Team. e emergency response team members shall be trained in fire safety and first aid response to render in case of emergency.
- (b) A third of the permanent staff on site shall be trained and certified on first aid and fire safety such that a sufficient number of emergency response team members are available to respond to any emergency situation at any time. The emergency response teams shall be available and effective for the whole duration of the Works.
- (c) The Contractor shall submit the details of the proposed emergency response team organisation to the Employer for its review and approval.

2.3.7 Health and Safety Inspections

- (a) The Safety Manager shall make at least one health and safety inspection per week on the Contractor's work on Site and report thereon to the Employer. The Employer, acting alone or jointly with the Contractor, may also make health and safety inspections of the Contractor's Site works at any time.
- (b) Any non-compliances with the health and safety requirements of the Contract that are detected during health and safety inspections shall be documented and informed to the Employer, and corrected by the Contractor as soon as possible or by any specific deadline instructed by the Employer.

2.3.8 Health and Safety Audits

- (a) Audits shall be undertaken to confirm the Contractor's compliance with the health and safety requirements of the Contract, and particularly the Health and Safety Management Plan.

- (b) The Contractor shall conduct internal health and safety audits on the Site, in accordance with the Health and Safety Management Plan.
- (c) The health and safety audits shall be in addition to the health and safety inspections carried out in accordance with Sub-Clause 2.3.7 (*Health and Safety Inspections*) above.
- (d) The Employer may perform up to two external audits per year of the health, safety and environmental aspects of the Works. The first external audit will be performed any time after the commencement of the Contractor's works at the Site.
- (e) All non-conformities found during the conduct of internal and external audits of the health and safety aspects of the Works shall be documented and corrected by the Contractor as soon as possible or by a reasonable deadline set by the Employer.

2.3.9 Accidents and Incidents

- (a) The Contractor shall develop an accident and incident reporting and investigation procedure as part of the Health and Safety Management Plan or alternatively adopt the accident and incident reporting procedure of the Employer.
- (b) The Contractor shall provide a comprehensive report to the Employer with respect to each accident, incident, or near-miss in accordance with Sub-Clause 2.3.10 (*Health and Safety Reporting*) below.
- (c) The Contractor shall prepare and maintain at the Site, an accident and incident report book. Such report book shall be available for inspection at all reasonable times by the Employer.
- (d) The Contractor shall, in addition to providing accident and incident reports to the Employer, provide details to the Contractor's Personnel of all serious accidents or incidents with respect to the Works.

2.3.10 Health and Safety Reporting

- (a) The Contractor shall provide the following information on a weekly and monthly basis as part of the weekly and monthly progress reports to the Employer:
 - (i) number of hours actually worked by the Contractor's Personnel;
 - (ii) number working days lost due to injury;
 - (iii) number and nature of lost time injuries;
 - (iv) accident frequency and accident severity rates;
 - (v) number and nature of any near misses;
 - (vi) current status of any injured personnel, damaged property or environmental damage;
 - (vii) status of the implementation and outcomes of corrective and/or preventive actions undertaken as a result of health and safety inspections, risk assessments, audits, or investigations of any accidents or incidents; and

- (viii) status of health and safety audits undertaken and audit reports.
- (b) The Contractor shall report all accidents and incidents to the Employer as soon as possible following any accident or incident occurring at the Site or in connection with the Works. The initial report shall be provided to the Employer not more than two (2) hours following the respective accident, incident or serious near miss. The Contractor's initial report shall be followed by a formal accident/incident investigation report, in a format acceptable to the Employer, within twenty-four (24) hours of occurrence of any accident or incident. Subsequent more detailed reports may be required by the Employer depending on the nature or seriousness of the accident or incident.
- (c) In the event of any serious or fatal accident, the Contractor shall, in addition notify the Employer immediately. The Contractor shall also leave unchanged the conditions existing at the place of the accident so that the relevant Government Authorities may proceed with their investigations to ascertain the causes of the accident and carry out any of their statutory duties.
- (d) The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Employer may reasonably require.

2.4 Health and Safety Obligations for Personnel

2.4.1 Health and Safety Induction

- (a) The Contractor shall provide to all Contractor's Personnel, the Employer's Personnel and any other personnel attending the Site, a formal health and safety induction briefing. The health and safety induction brief shall be provided by the Contractor's Safety Manager or an appropriately skilled and qualified Contractor's Personnel. Participation in a health and safety induction briefing shall be a prerequisite for access to the Site by any person.
- (b) The health and safety induction briefing shall be a formal presentation, of the health and safety practices and procedures that must be understood and followed by all personnel at the Site.
- (c) The Contractor shall maintain, at the Site, attendance records for each health and safety induction conducted by the Contractor. Such induction records shall be available for inspection by the Employer at all reasonable times.

2.4.2 Health and Safety Training

- (a) The Contractor shall be responsible for the health and safety of the Contractor's Personnel and shall ensure that all the Contractor's Personnel on the Site are adequately trained to undertake their respective tasks. As part of this process, the Health and Safety Management Plan shall incorporate a health and safety training plan for the Contractor's Personnel. The health and safety training plan shall also include a training register, including health and safety training, equipment operator training, and other relevant training required to undertake the Works.

- (b) Specific health and safety training shall include the following:
- (i) First-Aid Training - each foreman or work crew leader in control of twenty (20) or more workmen shall be trained in first-aid, and shall possess a certificate to that effect, within three (3) months of appointment.
 - (ii) Toolbox Talks –the Contractor shall implement regular “toolbox” information sessions with the Contractor's Personnel to provide information and training with respect to specific hazards related to the Works.
 - (iii) Training Handouts –in addition to the Health and Safety Handbook, the Contractor shall provide the Contractor's Personnel with training handouts that provide information on specific hazards related to the Works.

2.4.3 Health, Medical and First-Aid Facilities

- (a) The Contractor shall rely on the Site welfare and health and medical facilities arranged by the Employer as necessary for the duration of the Works.
- (b) The Contractor shall have own first aid kits available at the site in the numbers as required by regulations.

2.4.4 Contractor's Health and Safety Obligations

- (a) The Contractor shall be responsible for the safety of all the Contractor's Personnel and other persons authorized to access the Site, and shall take all reasonable measures necessary to ensure the health and safety of such personnel, including the following:
 - (i) Provision of appropriate safety and emergency regulations for the prevention of fire, gas leakage, traffic accidents, etc.
 - (ii) Provision of personal protective equipment pursuant to Sub-Clause 2.4.5 (*Provision of Personal Protective Equipment*) below.
 - (iii) Provision of first-aid kits at all working areas at the Site.
 - (iv) Provision of secure and safe access-ways to any part of the Site, including temporary roadways, footways, guards and fences as may be necessary for the protection of owners and occupiers of adjacent property, the public and others.
 - (v) Provision and maintenance of suitable lighting to ensure that relevant working and transit areas of the Site are adequately illuminated at all times.
 - (vi) Housekeeping of all work and transit areas to keep such areas free from all dangerous structures or hazards, waste, pollutants or other similar substances.
 - (vii) Provision of appropriate warning signs and notices, in English and the language(s) of the Country, in appropriate locations and quantities, with respect to any hazards or dangers that may exist at particular areas of the Site.

- (b) The Contractor shall ensure that all the Contractor's Personnel are fully conversant with the Contractor's health and safety obligations and requirements under the Contract and with respect to the applicable Laws.

2.4.5 Provision of Personal Protective Equipment

- (a) Approved safety equipment shall be worn by all persons at all times whilst at the Site and in the vicinity of any work activity.
- (b) The Contractor shall provide appropriate and well maintained personal protective equipment (PPE) to all personnel authorized to be in the vicinity of the Contractor's work activities at the Site. Such personnel shall include the Contractor's Personnel, the Employer's Personnel and authorized visitors to the Site. PPE to be issued to each person shall be appropriate to the work activities being undertaken and role and proximity to such work activities.
- (c) Personal protective equipment to be provided by the Contractor shall include the following:
 - (i) high visibility, reflective vest or shirt;
 - (ii) safety helmet (to BS EN 397);
 - (iii) safety footwear - rubber or leather boots or shoes with protective steel toe caps and steel sole inserts, or FRP toe for electricians (to BS EN ISO 20345);
 - (iv) ear protectors (to BS EN 352 or equivalent);
 - (v) dust masks;
 - (vi) safety gloves (in accordance with the activities to be performed);
 - (vii) sun block protection for all surface workers exposed to daily UV radiation;
 - (viii) insect repellent;
 - (ix) mosquito netting for sleeping accommodation;
 - (x) safety goggles with UV and impact protection (dark lenses for daytime use), to BS EN 165, BS EN 166, BS EN 167, BS EN 168, BS EN 169 as relevant
 - (xi) if applicable to the Works, dust masks and respirators with filters, in accordance with the pollutants existing at the jobsite (to BS EN 149, BS EN 405, BS EN 140, BS EN 146, BS EN 136 as relevant);
 - (xii) if applicable to the Works, ropes, slings, pulleys, fall arrest systems, harnesses and other lifting tackle.
- (d) All personal protective equipment shall be of certified quality, and in accordance with the relevant specified Standard or equivalent.
- (e) Personal protective equipment shall always be kept in good working condition and replaced when damaged or no longer effective. Without prejudice to the Contractor's obligations relating to health and safety, if so requested by the Employer, the Contractor shall promptly replace any safety equipment that has become worn, broken or damaged in any way.

- (f) The Contractor shall provide personnel with appropriate training in the use of all relevant personal protective equipment before such personnel shall be permitted to enter working areas at the Site. The Contractor shall also enforce the use of personal protective equipment and compliance with all relevant standards of the Country with respect to health and safety.
- (g) In addition to the above requirements for personal protective equipment, particular parts of the Works may require the use of other specific personal protective equipment in accordance with the job safety analysis done by the Contractor with respect to such parts of the Works, and shall include:
 - (i) Vibration - exposure to hand/arm vibration or whole body vibration shall be controlled by the choice of equipment, installation of dampening pads or devices, and by limiting the duration of exposure. Limits for vibration, duration and the action values shall be in accordance with those published by ACGIH (*American Conference of Governmental Industrial Hygienists*).
 - (ii) Chemical hazards –exposure to chemical hazards shall be minimized by the use of alternative materials or by the implementation of measures to avoid or control the use and release of chemicals into the working environment. Where chemical hazards or irritants or toxic substances may come in contact with the skin or clothing, the Contractor's Personnel shall be provided with and shall wear appropriate protective clothing, gloves, aprons, splash suits, face shields, goggles, etc.
 - (iii) Welding and hot-work - Contractor's Personnel involved with welding or hot-work shall be provided with and shall wear appropriate protective clothing, gloves, welder goggles, etc. A welding and/or hot-work permit system shall be implemented and enforced.
 - (iv) Working at heights - Contractor's Personnel working on steep slopes or otherwise subject to possible falls from height shall be provided with fall prevention/protection measures, which shall include the installation of guardrails, mid-rails and toe boards; proper use and training in the use of scaffolding and ladders; and the use of full body safety harness with shock absorbing lanyards, restraints or lifelines.
 - (v) Working in confined spaces - Contractor's Personnel working in confined spaces shall have been inducted in the safety procedures required for working in confined spaces and shall, if necessary, be issued with additional communication and personal protective equipment, such as hand-held torches, pit-light helmets, noxious gas detection devices, breathing apparatus, two-way radios, a supply of drinking water and first-aid kits.
- (h) Some occupations and activities (such as office administrative personnel and visitors) may not require the use of some or all of the aforesaid personal protective equipment. In such cases, any exemption from any use of personal protective equipment shall be notified by the Contractor and approved by the Employer.

- (i) If the Contractor fails to provide the requisite personal protective equipment to the personnel on the Site, the Employer may elect to do so, on the Contractor's behalf, and the cost of procuring such equipment shall be a debt recoverable from the Contractor.

2.4.6 Roster of Workers

The Contractor shall maintain at the Site, an up-to-date roster (list) of all of the Contractor's Personnel with the following information for each individual:

- name;
- identification card number;
- age;
- position or job assigned;
- starting date;
- area where working; and
- health and safety induction training course certificate number.

2.4.7 Coordination with Employer's Personnel

The Contractor shall coordinate the participation of the Employer's health and safety personnel in all agreed joint inspections to be made by the Contractor and Subcontractors of their respective working areas at the Site.

2.4.8 Transport of Labour

- (a) The Contractor shall provide and be responsible for the safe vehicular transport of all the Contractor's Personnel between the Contractor's accommodation areas and/or established collection points and work areas at the Site, and vice versa.
- (b) The Contractor shall provide sufficient transport, properly fitted out for the safe transport of the Contractor's Personnel in a form acceptable to the Employer.
- (c) The transport shall provide for safe entry and egress, prevent persons jumping or climbing over the sides of transport, and shall be fitted with seating for all personnel being transported. Under no circumstances shall the Contractor's Personnel be transported on flatbed trucks, dump trucks, rail or similar vehicles which do not comply with the requirements of this Sub-Clause 2.4.8 (*Transport of Labour*).
- (d) Weatherproof covers shall be available for use at all times on the personnel transport vehicles.
- (e) The Contractor shall prevent overloading of personnel transport vehicles, and suitable crush barriers shall be provided at main loading and unloading points.

2.4.9 Intolerable Acts and Replacement of Unsatisfactory Personnel

- (a) The Contractor's Personnel at the Site shall comply with the requirements of the Contract with respect to health and safety, and in particular the specific requirements of Sub-Clause 2.5 (*Safe Work Practices and Procedures*) below.
- (b) The Contractor shall remove immediately from the Site any of the Contractor's Personnel who do not comply with the health and safety requirements of the Contract, do not have the necessary skills for the assigned tasks, whose conduct is detrimental to the performance of the Works, or whose behaviour is detrimental to his own safety or the safety of other personnel on the Site.

2.5 Safe Work Practices and Procedures

2.5.1 General

- (a) The Contractor shall develop and update as necessary a set of safety procedures and practices ("**Safety Practices and Procedures**") that shall be submitted for the Employer's review and approval. The Safety Practices and Procedures shall form part of the Health and Safety Management Plan.
- (b) The Safety Practices and Procedures shall include the necessary forms to be completed for various events, and shall include the following:
 - (i) Safety training, including health and safety induction processes, communication policies, specific safety training, training registers, and use of personal protective equipment.
 - (ii) Emergency Response Plan and procedures, including first-aid and medical facilities, fire prevention and fire-fighting, responses to hazardous material spills, emergency responses and evacuations.
 - (iii) Reporting and formal investigation of near misses, incidents and accidents.
 - (iv) The storage, transport, handling, use and spill prevention of hazardous materials, such as radioactive material, chemicals, flammable materials, gas bottles, wastes and residues, oil, filters, fuel, and any other materials that may cause injury, illness or require special personal protective equipment.
 - (v) Working at height, the use, maintenance and storage of lifting and rigging equipment, elevated work platforms suspended from cranes (particularly work baskets and work buckets), and assembly and disassembly of scaffolding.
 - (vi) Working in a confined space.
 - (vii) Use, inspection, maintenance and lock-out/tag of electrical systems and appliances, hand tools and machinery.
 - (viii) Driving/operation, maintenance and traffic management of vehicles, construction equipment, and machinery, including pre-start checklists, inspection, operation, maintenance and control of vehicular movements.
 - (ix) Operation of fixed and mobile cranes.

- (x) Permits to work.
 - (xi) Hot-work, including welding work.
 - (xii) Safety aspects related to supply, operation and maintenance of the Site facilities, including security and access and access control through means of identification cards, site passes, security checks, booking systems, potable water, chemical toilets and overall health, welfare and hygiene of personnel.
- (c) The Safety Practices and Procedures shall be taught to the Contractor's Personnel during safety induction, toolbox talks, safety presentations, work method statements, and supervisors' instructions.

2.5.2 Health and Safety Work Permits

- (a) A health and safety work permit system, designed to protect the Contractor's Personnel, the environment and the Works, shall be developed and implemented by the Contractor. In case the Contractor does not have a work permit system, the work permit system of the Employer as applicable shall be adopted.
- (b) Health and safety work permits shall be completed prior to undertaking the relevant work, to ensure that the work is undertaken by adequately trained personnel, with correct equipment, is planned and carried out to appropriate safe methods, and with a specific emergency procedure.
- (c) Health and safety work permits may be required with respect to applicable Laws, or where the Contractor deems the activities to be high risk and/or warrants a work permit to control the work activity, in accordance with the Health and Safety Management Plan.
- (d) Unless otherwise agreed with the Employer, health and safety work permit requirements shall be applied for the following work activities:
 - (i) heavy lifts and lifts in tandem;
 - (ii) entry into confined spaces;
 - (iii) hot-work;
 - (iv) energizing of electrical equipment;
 - (v) work at heights; and
 - (vi) handling of radioactive material and work with radiography and gamma radiography.

2.5.3 Areas and Zones

- (a) The Contractor shall install hard protections, fences or other equivalent equipment at working areas on the Site whenever working in excavations, lifting maneuvers, working at heights, and at working areas where any hazardous activities are being carried out.
- (b) The protections and fences erected by the Contractor shall restrict unauthorized access into these working areas. In such working areas, the Contractor shall establish a procedure to ensure that

persons entering the relevant working area have been adequately informed of the particular hazards of the working area, and are adequately protected from those hazards.

2.5.4 Lighting and Power

2.5.4.1 General

All lighting and power circuits shall be fitted with earth-leakage protection facilities. Any circuit where the earth-leakage protection facility is malfunctioning shall be repaired immediately or removed from the relevant working area.

2.5.4.2 Lighting

The Contractor shall provide and maintain, during the execution of the Works, adequate lighting systems for the working and transit areas, as approved by the Employer.

2.5.4.3 Electrical

- (a) All equipment and appliances shall be electrically earthed, and the effectiveness of such earthing shall be periodically checked by the Contractor's specialized personnel.
- (b) Energised electrical equipment, appliances and circuits shall be clearly labelled with warning signs.
- (c) Locking-out and tagging-out devices shall be used during servicing or maintenance of electrical facilities.
- (d) All electrical leads, cables and hand-held power tools shall be checked regularly for frayed and exposed cables and replaced if damaged.
- (e) Electrical leads, cables, extension leads, junction boxes and distribution boxes shall be protected from damage, including damage from traffic, and replaced if damaged.

2.5.5 Fire Precautions

- (a) The Contractor shall develop and implement appropriate fire prevention measures for all relevant areas of the Works.
- (b) The Contractor shall provide, equip and maintain adequate fire-fighting facilities, including fire extinguishers, and associated trained fire-fighting personnel for all relevant areas of the Works.

2.5.6 Hazardous Materials

2.5.6.1 Hazardous Equipment and Materials

- (a) The Contractor shall prepare and implement an appropriate code of practice for identification, recording and handling of all hazardous equipment and materials to be brought to and used on the Site.

- (b) The Contractor shall identify and keep records of all hazardous equipment and materials at the Site during performance of the Works. Newly created hazards or new hazardous equipment or materials brought to the Site shall be added to the record. The Employer shall be granted access to such records at all reasonable times.
- (c) The Contractor shall regularly check the storage areas for Contractor's Equipment, transport vehicles and hazardous materials, for spillages and leaks. The Contractor shall make adequate provisions, to the satisfaction of the Employer, to prevent spillages of hazardous materials from entering natural water-courses or areas outside the Site.

2.5.6.2 *Storage of Hazardous Materials, including Flammable Materials, Liquids and Gases*

- (a) The storage of hazardous materials, including flammable materials, liquids and gases, shall be in accordance with the requirements of Sub-Clause 3.8 (*Control of Soil, Water and Air Pollution*) below.
- (b) The Contractor's Personnel in charge of or handling flammable materials shall have specific training in handling such materials, and in fire prevention and suppression.

2.5.6.3 *Radiological Hazards*

- (a) The Contractor shall introduce and maintain a strict regime of measures for the prevention and control of exposure to radiation which exists on, or are introduced to the Site, as required by the relevant Government Authority or international organisations.
- (b) The Contractor shall maintain up-to-date records of people and sources to ascertain that valid permits and authorizations for the movement, installation and handling of radiation sources, in accordance with relevant Laws, are in proper place at all times.
- (c) The Contractor, prior to any movement, installation or handling of each radioactive source, shall submit to the Employer copies of all permits issued by the relevant Government Authority.

2.5.6.4 *Signage, Labelling and Hazard Codes*

- (a) Hazards and areas forming a danger to the safety of personnel on the Site shall be clearly marked and labelled. Labels and signage shall be clear and in accordance with international standards, and, with respect to hazardous materials, shall detail fire-fighting requirements for the particular hazardous material.
- (b) Copies of hazard coding systems shall be displayed at all entrances to the Site and working, office and accommodation areas at the Site.

2.5.7 Safety of the Public

- (a) Where the public could be exposed to danger by any of the Contractor's Site activities, the Contractor shall close off such access and erect suitable warning and "no trespassing" signs in the English and the language(s) of the Country.
- (b) Where shown on the Employer's Design Drawings or instructed by the Employer, the Contractor shall provide alternative safe access routes to enable the public to safely bypass the danger area. The cost of such alternative accesses shall be borne by the Contractor.

2.5.8 Scaffolding, Falsework and Formwork

- (a) Scaffolding, falsework and formwork shall comply with relevant standards of the Country or international standards.
- (b) Portable and fixed access ladders shall be wooden or steel ladders, sufficiently strong, be of suitable size for the intended use, and shall comply with relevant standards.
- (c) Wooden ladders shall have the steps fixed to the longitudinal posts by assembly. The use of ladders with steps nailed or wired along the longitudinal posts shall not be permitted.

2.5.9 Sanitary and Hygiene Requirements and Disease Prevention

- (a) The Contractor shall comply, in all respects, with the rules, regulations and instructions of the relevant Government Authority as regards sanitary and hygiene requirements in connection with the performance of the Works.
- (b) In the event of any outbreak of disease of an epidemic nature, the Contractor shall immediately report such occurrence to the Employer and the relevant Government Authorities, and shall comply with any regulations or orders and requirements as may be made by the relevant Government Authorities or the local and international health, medical or sanitary authorities with respect to disease prevention and control.

2.5.10 Traffic Management

The Contractor shall comply with the traffic management plan of the Employer as applicable to the work site.

3. Environment Management

The Contractor shall comply with the Environment Management Plan of the Employer as applicable to the work site.

3.1 General

3.2 Environment Management Guidelines and Applicable Laws

- (a) The Contractor shall comply with all environmental Laws that apply to the Works and all other Laws, including legal requirements issued by any Government Authority with respect to environmental management.
- (b) In addition, the Contractor shall comply with specific requirements, including requirements to comply with the conditions of environmental approval for the Works. These requirements include:
 - (i) Employer's Environmental and Social Impact Assessment (ESIA);
 - (ii) Employer's Environmental Protection and Management Plan (EPMP);
 - (iii) IFC "Performance Standards on Environmental and Social Sustainability";
 - (iv) IFC "Guidance Notes: Performance Standards on Environmental and Social Sustainability";
 - (v) IFC Environmental, Health, and Safety (EHS) Guidelines; and
 - (vi) ISO 14001:2015 "Environment Management Systems Standard".

3.3 Contractor's Environmental Management Supervision

- (a) The Safety Manager of the Contractor shall also act as environmental manager ("**Environmental Manager**"), and shall have the authority to administer and be responsible for the implementation of, and ensure compliance with the Environment Management Plan.

3.4 Environment Management Plan

3.4.1 General

- (a) The Contractor shall develop an Environment Management Plan (EMP) referring to the Employer EMP document as applicable to their work site which shall be implemented on the Site.
- (b) The Contractor shall submit, within twenty-eight (28) days of the Commencement Date, the draft Environment Management Plan for review and approval by the Employer.
- (c) The approved Environment Management Plan shall be binding on the Contractor and all Subcontractors.
- (d) The Environment Management Plan shall follow the structure and approach of an environment management system based on ISO 14001, and which shall include the following content:
 - (i) Environment management system:

- introduction;
 - scope of the environment management system; and
 - structure of the environment management system.
- (ii) Contractor's Environmental Policy pursuant to Sub-Clause 3.4.2 (*Contractor's Environmental Policy*).
- (iii) Planning:
- identification of the parts of the Works that have the potential to impact the environment;
 - identification of statutory requirements, including necessary approvals and licenses; and
 - environmental management targets and objectives.
- (iv) Implementation and Operation:
- resources, roles, responsibilities and authority;
 - competence, training and awareness;
 - communication;
 - documentation;
 - control of documents;
 - emergency preparedness and response;
 - schedule for environment management, pursuant to Sub-Clause 3.4.4 (*Environmental Management Schedule*);
 - Environmental Procedures Manual pursuant to Sub-Clause 3.4.3 (*Environmental Management Procedures*), as applicable to their area of work from the list below:
 - (1) preservation of flora and fauna, pursuant to Sub-Clause 3.6 (*Preservation of Flora and Fauna*);
 - (2) soil erosion and sediment control, pursuant to Sub-Clause 3.7 (*Soil Erosion and Sediment Control*);
 - (3) pollution control, pursuant to Sub-Clause 3.8 (*Control of Soil, Water and Air Pollution*);
 - (4) emission, dust and noise control, pursuant to Sub-Clause 3.9 (*Emission, Dust and Noise Control*);
 - (5) energy conservation, pursuant to Sub-Clause 3.10 (*Energy Conservation*);
 - (6) water conservation, pursuant to Sub-Clause 3.11 (*Water Conservation*);
 - (7) contamination of land, pursuant to Sub-Clause 3.12 (*Contamination of Land*);
 - (8) off-site waste, pursuant to Sub-Clause 3.13 (*Off-Site Waste*);

- (v) Checking:
 - monitoring and measurement of environmental performance;
 - audits;
 - corrective action management; and
 - environmental reporting.
- (e) The Contractor shall manage the Environment Management Plan, and shall review it on a regular basis and update or revise it as necessary, to the Employer's approval.
- (f) The process of review and update of the Environment Management Plan is to ensure that the Environment Management Plan continues to give appropriate guidance throughout the term of the Contract and incorporates new elements to address subjects in greater depth where new environmental issues are identified during implementation of the Works.

3.4.2 Contractor's Environmental Policy

- (a) As part of the Contractor's Environment Management Plan, the Contractor shall, in the form of an environmental policy statement (the "**Environmental Policy**"), state its target, management commitment, and strategy for the environmental issues with respect to the Works. The Environmental Policy shall be fully supported by the Contractor's senior management and shall be signed by the chairman of the board of directors of the Contractor.
- (b) The Environmental Policy shall be displayed in a prominent position within the Contractor's offices on the Site and communicated to all the Contractor's Personnel. The Environmental Policy shall be displayed and communicated in both the English and the language(s) of the Country.
- (c) The Contractor's management shall define the Contractor's Environmental Policy and ensure that such policy complies with the following requirements:
 - (i) is appropriate to the nature, scale and environmental impacts of the Contractor's activities, products or services with respect to the Works;
 - (ii) includes a commitment to continual improvement and prevention of pollution;
 - (iii) includes a commitment to comply with the relevant environmental Laws, and with other requirements to which the Contractor subscribes;
 - (iv) provides the framework for setting and reviewing environmental objectives and targets;
 - (v) is documented, implemented, maintained and communicated to all the Contractor's Personnel; and
 - (vi) is available to the public.
- (d) The Contractor's Environmental Policy shall include all related requirements set out in ISO 14001.

3.4.3 Environmental Management Procedures

- (a) As part of the Environment Management Plan, the Contractor shall provide an Environmental Procedures Manual for the Employer's review and approval. The Environmental Procedures Manual shall include all necessary environmental procedures to ensure the Contractor's compliance with all environmental management requirements under the Contract and applicable Laws.
- (b) Each environmental management procedure shall be prepared in a format acceptable to the Employer, and which shall include the following content:
 - (i) purpose and scope;
 - (ii) timing;
 - (iii) responsibilities; and
 - (iv) procedure.
- (c) Also, each environmental management procedure shall detail related document control information, including issue, review, revision and approval dates, and descriptions of the revisions made.
- (d) The Contractor shall identify environmental issues by phase of the Works, Site area and subject, and identify the Contractor's Personnel responsible for supervision of the implementation of the respective environmental management procedures, and communicate the needs of new procedures or modifications to the environmental management procedures in use.

3.4.4 Environmental Management Schedule

- (a) The Contractor shall provide a schedule of environment management activities, as part of the Environment Management Plan. The schedule of environment management activities shall address all environmental related activities required for the Works and shall include schedules for the following:
 - (i) internal audits;
 - (ii) regular environmental compliance inspections;
 - (iii) environmental management training;
 - (iv) environmental compliance monitoring; and
 - (v) environmental compliance reporting.
- (b) The schedule of environment management activities shall include activities, dates, personnel involved and the environmental manager responsible, together with a narrative describing the environmental management activities.

- (c) The schedule of environment management activities shall be adjusted as required to suit the findings of audits, inspections and other relevant activities to ensure compliance with the environmental management requirements of the Contract and the applicable Laws.

3.5 Environmental Management Documents, Reporting and Auditing

3.5.1 Environmental Records

- (a) The Contractor shall produce and maintain formal records of environmental matters as requested by their Employer and as required in Section 3.5.2 that demonstrate compliance with the requirements of the Contract and applicable environmental Laws, and implementation of the Environment Management Plan.

3.5.2 Environmental Reporting

- (a) The Contractor shall provide the following environmental information as part of the Contractor's monthly progress reports with respect to the Works:
 - (i) Description of any and all environmental emergencies or incidents occurring during the reporting period, including details of any follow-up and/or remedial action taken in response to such events;
 - (ii) Summary of environmental monitoring and inspection activities undertaken during the reporting period;
 - (iii) Status of the implementation and outcomes of corrective actions undertaken during the reporting period as a result of environmental monitoring, inspections or audits;
 - (iv) Summary of cumulative environmental non-compliances to date, including details of the date of opening and date of closing of each such non-compliance, and highlighting any aged non-compliances, i.e. non-compliances that remain open for longer than thirty (30) days; and
 - (v) Status of environmental audits and related audit reports.
- (b) The Contractor shall immediately advise the Employer of any significant environmental emergency, incident or non-compliance. The Contractor shall follow-up such advice with a detailed report within twenty-four (24 hours) of the event, including provision of details of the corrective actions being implemented to mitigate any impacts on the environment.

3.5.3 Environmental Audits

The Employer will monitor and review the Contractor's performance of its environmental obligations and shall be entitled to undertake formal audits of the Contractor's performance of its environmental obligations to ensure the Contractor's compliance with the Environment Management Plan, and with the environmental management requirements of the Contract.

3.6 Preservation of Flora and Fauna

- (a) The Contractor shall not destroy, remove or clear trees, timber, scrub and other flora to an extent greater than that approved by the Employer, as being necessary for the performance of the Works, nor use such materials in the performance of the Works.
- (b) The Contractor shall ensure that all works are undertaken in a manner that minimizes the impact on the local flora and fauna and shall take such measures as may be necessary to prevent the Contractor's Personnel from hunting and fishing, disturbing, capturing or destroying, and trading in wildlife or parts of these and any such flora and fauna as may be protected by relevant Laws.
- (c) There shall be no feeding of native animals.
- (d) If, in the opinion of the Contractor, a particular animal species becomes a pest by virtue of its nature, population numbers or other factors, the Contractor may apply to the Employer for a control program to be initiated. Such application shall be in writing and shall contain justifications as to why a control program is needed. The Contractor shall be responsible for obtaining necessary approvals from the relevant Government Authorities or local authorities and for undertaking any such animal control program in accordance with the Environment Management Plan.
- (e) The Contractor will be held liable, and shall indemnify the Employer against any consequences for any act or omission which causes or allows to be caused a breach of this Sub-Clause 3.6 (*Preservation of Flora and Fauna*).

3.7 Soil Erosion and Sediment Control**3.7.1 General**

- (a) As part of the implementation of the Contractor's Environment Management Plan, the Contractor shall take all necessary measures to minimize soil erosion induced by its activities and the subsequent increased siltation and sediments load in any natural water-course within the Site or in the vicinity of the Site.
- (b) To this end, the Contractor shall take any or all of the following measures:
 - (i) Control the surface run-off by:
 - construction of stabilized diversion or perimeter cut-off drains to intercept run-off from undisturbed areas and to divert run-off around the Site;
 - installation of stabilized interceptor and collector drains;
 - construction of sedimentation retention ponds; and
 - construction of gabion weir structures.
 - (ii) Limit movement of vehicles and the Contractor's Equipment.

- (iii) Minimize the disturbed area exposed by:
 - staging operations;
 - progressive stabilization of each portion of the Works as soon as relevant portions of the Works have been completed; and
 - provision of topsoils, re-vegetation, sodding, grassing or other treatments to disturbed areas.
- (c) All diverted and pumped water shall be discharged at locations from which it cannot re-enter the Works and in a manner which does not cause erosion, pollution or nuisance to Land Owners, Other Contractors or other persons within or adjacent to the Site.

3.7.2 Water Quality Standards

- (a) The Contractor shall submit a water quality monitoring procedure which is to be implemented on the Site, as part of the Environment Management Plan.
- (b) The water quality monitoring procedure shall specify the methods the Contractor will use to monitor and meet the water quality standards, in accordance with the applicable IFC Environmental, Health, and Safety (EHS) Guidelines, together with measures which are necessary or appropriate to prevent or mitigate potential or actual impact on the quality of water, which are not foreseen or which are greater than those anticipated, and which can be attributed to activities of the Contractor, in order to minimize the impact of the Works on the local environment and water supply.
- (c) The water quality monitoring procedure proposed by the Contractor shall be subject to the Employer's review and approval.

3.8 Control of Soil, Water and Air Pollution

3.8.1 General

The Contractor shall design, construct, maintain and operate suitable pollution control facilities to prevent air pollution, dust, and discharge of water containing polluting matters or visible suspended materials into rivers, streams or existing drainage systems. Such polluting matters include dust, refuse, garbage, cement, concrete, sewage effluent, industrial waste, oil and other petroleum products. The Contractor shall carry out the following to the extent possible:

3.8.2 Waste Management

- (a) The Contractor shall be responsible for collecting and disposing of garbage, rubbish and waste from its work activities, accommodation, amenities, workshops, stores, offices, public areas and other facilities at the Site.

- (b) Particular care shall be taken to avoid spreading of solid waste materials at the Site. The waste handling procedures shall be designed with an ecological, an aesthetic and a hygienic perspective.
- (c) The Contractor shall develop and implement a detailed waste management procedure for collection, transport, handling, storage and/or disposal of waste, which shall be based on relevant international standards, including IFC General EHS Guidelines: Environmental – Waste Management, and which shall include the following requirements:
 - (i) Waste from work activities shall be collected at least daily, and shall be disposed of at designated waste disposal areas at the Site.
 - (ii) Waste collection containers shall be placed at regular intervals within the Site. These containers shall be marked with clear labels for "organic", "paper" and "other waste" for sorting of collected waste.
 - (iii) Garbage collections shall be made daily, and the services shall be continued until completion and final Taking Over of the Works by the Employer.
 - (iv) Garbage shall be disposed at designated sites, located above the 20-year flood levels of adjacent water-courses and at least 2 km from the nearest village.
 - (v) The waste disposal areas shall include facilities for sorting waste to ensure that recyclable and hazardous waste is stored separately, and not dumped into the land-fill site(s).
 - (vi) The waste disposal area land-fill sites shall be protected from contaminating groundwater by an impermeable membrane or clay. Leachate shall be collected and properly treated in accordance with the specified water quality requirements before being released into water courses.
 - (vii) Once a week the Contractor's waste disposal sites shall be compacted and covered with soil.
 - (viii) At completion of the Works, the Contractor's waste disposal sites shall be covered with at least 1.5 m of soil.
- (d) A report on environment management and monitoring for each waste disposal site shall be prepared by the Contractor and submitted to the Employer.

3.8.3 Hazardous Material and Chemical Store, Waste Handling and Spillage Management

- (a) Hazardous materials and chemicals that may be used during the work include fuel and oils, paints, solvents, acids and concrete additives.
- (b) The Contractor shall develop, and submit to the Employer for approval, detailed plans for transport, handling and storage of all such hazardous materials and for the collection and handling of the corresponding wastes, which shall be based on relevant international standards, including IFC General EHS Guidelines: Environmental – Hazardous Materials Management.

- (c) The Contractor shall develop and implement a detailed hazardous waste management procedure for collection, transport, handling, storage and/or disposal of hazardous waste, which shall include the following requirements:
- (i) Conditions for handling and storage of fuel and other chemicals to prevent accidental pollution and injury. The storage facilities shall be suitable and an approved facility, remote from entry and exit points into the Site, offices and other buildings at the Site. The storage facilities shall have spark-proof fittings and fixtures where necessary, with natural or passive floor and ceiling level ventilation and explosion venting, and shall be equipped with fire extinguishing devices, and made of materials able to withstand flame impingement.
 - (ii) Facilities for collection of waste oil products. The locations for machinery and vehicle repair, maintenance and washing shall be equipped with concrete floors and provided with oil skimmers/separators and oil collection facilities. Drainage from fuel storage and machinery maintenance areas shall be treated to remove oil and/or fuel. The oil collected in this manner should be disposed of pursuant to paragraph (v) below or reused safely.
 - (iii) Diesel fuel shall be stored in standard skid tanks within a covered, concrete bunded area, which can hold 110 % of the volume of the total capacity of the skid tank. The fuel storage tanks shall be located at least 100 meters away from any water-course.
 - (iv) The Contractor shall establish and implement a standard procedure for loading the diesel fuel into the skid tank to prevent any diesel spillage and soil contamination.
 - (v) Spent oil or used oil generated from the workshop maintenance yard is categorized as a scheduled waste. This scheduled waste shall be stored in containers, with proper bunds, which are able to prevent spillage or leakage of the waste oil into the environment. The containers of the scheduled waste shall be clearly labelled for identification and warning purposes.
 - (vi) The Contractor shall engage a licensed Subcontractor to collect, transport and dispose of all the scheduled waste (spent oil) generated by the Contractor and its Subcontractors at the Site.
 - (vii) The oil waste shall not be allowed to be used for uncontrolled burning or heating in the villages or the labour camps at the Site. Oil shall not be allowed to be spread on roads or dumpsites as a means of dust control.
 - (viii) Soil contaminated by fuel or oil leakage shall be removed and placed in approved waste disposal areas.
 - (ix) Flammable materials, liquids and gases shall be kept away from sources of naked flames or other sources of ignition, as well as away from ventilation intake vents.
 - (x) Containers shall be bonded and earthed, and provided with floor level mechanical ventilation.

3.8.4 Wastewater Management

- (a) The Contractor shall supply and install wastewater treatment facilities for processing and disposal of sewage from the Contractor's accommodation, amenities, workshops, stores, offices and other buildings and facilities provided by the Contractor within the Site.
- (b) The Contractor's wastewater treatment facilities shall be based on relevant international standards, including IFC General EHS Guidelines: Environmental – Wastewater and Ambient Water Quality.
- (c) The Contractor shall also install, operate and maintain temporary toilet facilities at the Site for its Personnel. The temporary toilet facilities shall be complete with adequate closets, urinals and hand-basins, septic tanks, absorption trenches or other sewage disposal installations. At least one chemical portable toilet shall be installed for each 20 personnel employed by the Contractor.
- (d) Wastewater from the accommodation and offices areas within the Site shall be collected, treated and disposed of in an appropriate and environmentally sound manner. Sanitary (black) water and grey water (used household water) shall be kept separate.
- (e) Grey water shall be infiltrated in the ground at sites with soils of suitable filtering capacity and a minimum 500 m away from any water-courses and water supply springs in the area.
- (f) Sanitary (black) water shall be treated by compact treatment units or by septic tanks before infiltration in the ground, at a minimum 500 m away from any water-courses and water supply springs in the area.

3.9 Emission, Dust and Noise Control**3.9.1 Emission and Dust Control**

- (a) As part of the Contractor's Environment Management Plan, the Contractor shall prepare an emission and dust control procedure and take measures to keep airborne dust and emissions to a minimum level.
- (b) The emission and dust control procedure shall be based on international standards for ambient concentrations of particulate matter, including IFC General EHS Guidelines: Environmental - Air Emissions and Ambient Air Quality. The emission and dust control procedure shall identify all relevant places for emissions and dust control and monitoring. This includes roads, earthworks, waste burning sites and other relevant areas at the Site.
- (c) The Contractor shall have available, at the Site, approved particulate matter measuring equipment and shall take regular measurements as directed by the Employer.
- (d) The IFC General EHS Guidelines: Environmental - Air Emissions and Ambient Air Quality for the particulate matter are as follows:

	Averaging Period	Guideline value ($\mu\text{g}/\text{m}^3$)
Particulate Matter (PM ₁₀)	24 hours	50
Particulate Matter (PM _{2.5})	24 hours	25

3.9.2 Noise Control

- (a) The Contractor shall prepare and implement a noise emission and control procedure, and shall implement measures to reduce noise during implementation of the Works.
- (b) In addition to complying with the requirements under this Sub-Clause 3.9.2 (*Noise Control*), the Contractor shall comply with the requirements of BS 5228 (*Code of practice for noise and vibration control on construction and open sites*).
- (c) The Contractor shall have available, at the Site, an approved noise level meter and shall take regular measurements of noise levels at the locations where the Contractor is undertaking the Works, or as directed by the Employer, including at villages being affected by the Contractor's work traffic.
- (d) The Contractor shall take the provisions required to assure that noise from its activities on the Site are within the limits of the IFC General EHS Guidelines: Environmental - Noise Management, as shown in the table below.

Receptor	One Hour L _{eq} (dBA)	
	Day time (07:00–22:00)	Night time (22:00-07:00)
Residential; institutional; educational	55	45
Industrial; commercial	70	70

- (e) The Contractor shall provide ear protectors to all the Contractor's Personnel in locations where the noise level is frequently above 85 dB.

3.10 Energy Conservation

- (a) The Contractor shall prepare and implement an effective energy conservation procedure, to minimize the energy used in the implementation of the Works.
- (b) The energy conservation procedure shall cover all aspects of the Contractor's operations under the Contract and shall comply with IFC General EHS Guidelines: Environmental - Energy Conservation.

3.11 Water Conservation

- (a) The Contractor shall prepare and implement an effective water conservation procedure to minimize water usage in the implementation of the Works.
- (b) The water conservation procedure shall cover all aspects of the Contractor's operations under the Contract and shall comply with IFC General EHS Guidelines: Environmental - Water Conservation.

3.12 Contamination of Land

- (a) The Contractor shall prepare and implement an effective procedure for prevention of land contamination.
- (b) The land contamination prevention procedure shall cover all aspects of the Contractor's operations under the Contract and shall comply with IFC General EHS Guidelines: Environmental - Contaminated Land.

3.13 Off-Site Waste

- (a) The Contractor shall prepare and implement an effective procedure for management of off-Site waste.
- (b) The off-Site waste management procedure shall cover all aspects of the Contractor's operations under the Contract.

4. Social Responsibility and Community Relations

4.1 General

- (a) The Contractor shall seek to be a good corporate citizen in all aspects of its operations and activities. In particular, the Contractor shall comply with the principles set out by the United Nations Global Compact (www.unglobalcompact.org) ("**UN Global Compact Principles**"), with particular focus in the areas of:
- (i) human rights;
 - (ii) labour;
 - (iii) environment; and
 - (iv) anti-corruption.
- (b) To this end, the Contractor shall develop a series of operating principles under the broad heading of corporate social responsibility to serve in setting the direction to the Contractor's Personnel in all aspects of their work under the Contract. These principles shall be based on the requirements outlined in Sub-Clause 4.2 (*Corporate Social Responsibility Principles*);

4.2 Corporate Social Responsibility Principles

4.2.1 General

- (a) The Contractor shall value the principles of accountability, honesty and integrity, and shall execute the Contract in a manner which ensures:
- (i) fair treatment of all stakeholders;
 - (ii) transparency in all business policies and practices;
 - (iii) high standards in health, safety, environment and sustainability; and
 - (iv) ethical business practices throughout all operations.
- (b) The corporate social responsibility operating principles developed by the Contractor shall incorporate the 10 key principles of the UN Global Compact Principles. These 10 principles are:
- (i) Human Rights:
 - Principle 1 - Businesses should support and respect the protection of internationally proclaimed human rights; and
 - Principle 2 - Ensure that they are not complicit in human rights abuses.
 - (ii) Labour:
 - Principle 3 - Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
 - Principle 4 - Elimination of all forms of forced and compulsory labour;

- Principle 5 - Effective abolition of child labour; and
 - Principle 6 - Elimination of discrimination in respect of employment and occupation.
- (iii) Environment:
- Principle 7 - Businesses should support a precautionary approach to environmental challenges;
 - Principle 8 - Undertake initiatives to promote greater environmental responsibility; and
 - Principle 9 - Encourage the development and diffusion of environmentally friendly technologies.
- (iv) Anti-corruption:
- Principle 10 - Businesses should work against corruption in all its forms, including extortion and bribery.
- (c) The Contractor shall develop specific principles relevant to the Works, in accordance with the specific requirements of the following provisions of this Sub-Clause 4.2 (*Corporate Social Responsibility Principles*).

4.2.2 Human Rights

- (a) The Contractor shall develop principles and objectives with respect to human rights. The development of human rights initiatives implemented on the Works shall be in accordance with the 1948 Universal Declaration of Human Rights ("UDHR"). The UDHR is codified in international law through two 1966 treaties: The International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights. These treaties comprise the following aspects relevant to the Contractor's Work.
- (b) International Covenant on Civil and Political Rights:
- (i) Right of self-determination - This right allows peoples to determine their political status and their place in the international community. It includes the right of peoples to develop and progress in social, economic and cultural terms, to dispose of their land's natural resources and wealth, and not to be deprived of their own means of subsistence.
 - (ii) Right to life - The right to life entails the right not to be deprived of life arbitrarily or unlawfully, and the right to have one's life protected.
 - (iii) Right not to be subjected to slavery, servitude or forced labour - The right to freedom from servitude covers other forms of dominance, egregious economic exploitation, and degradation of human beings, which might arise, for example, in the context of the trafficking of workers, serfdom and debt bondage.

- (iv) Right to freedom of movement - It allows people who are lawfully in a country to move freely throughout the country, to choose where to live within the country, and to leave the country.
 - (v) Right to privacy - This right protects people against arbitrary, unreasonable or unlawful interference with their privacy, family, home or correspondence, as well as attacks on their honour and reputation.
 - (vi) Rights to freedom of thought, conscience and religion - The right to freedom of thought, conscience, and religion encompasses a person's freedom to choose, practise and observe his or her chosen religion or belief.
 - (vii) Rights to freedom of opinion and expression – The right protects each person to hold opinions free from outside interference.
 - (viii) Rights to freedom from war propaganda, and freedom from incitement to racial, religious or national hatred. This Article requires the prohibition of war propaganda and the prohibition of any advocacy of national, racial or religious hatred that amounts to incitement to discrimination, hostility or violence.
 - (ix) Right to freedom of assembly - The right to assemble and gather together peacefully is protected, subject only to those restrictions that are imposed by law as necessary to protect the interests of national security, public safety, public order, public health or morals, or the protection of the rights and freedoms of others.
 - (x) Right to freedom of association - Protects the right to form or join all types of association, such as political parties, religious societies, sporting and other recreational clubs, non-governmental organisations and trade unions.
 - (xi) Rights of minorities - This Article recognizes the rights of members of ethnic, religious or linguistic minorities to enjoy their own culture, to practise their religion, and to speak their language.
- (c) International Covenant on Economic, Social and Cultural Rights:
- (i) Right to work - The right to work recognizes the right of everyone to the opportunity to make their living by work which they freely choose or accept.
 - (ii) Right to enjoy just and favourable conditions of work - The right to enjoy just and favourable working conditions has various components, which are all highly relevant to the actions of companies as they concern the treatment of employees.
 - (iii) Right to form trade unions and join the trade union, and the right to strike. This Article concerns the right of everyone to form trade unions and to join the trade union of his or her choice, subject to the union's own membership rules.
 - (iv) Right to a family life - According to this Article the widest possible protection and assistance should be given to the family, particularly during its establishment, and while it is responsible for the care and education of dependent children.

- (v) Right to an adequate standard of living - Guarantees the right to an adequate standard of living, including adequate food, clothing, housing and continuous improvement of living conditions. It has also been interpreted as including access to sufficient water and sanitation.
- (vi) Right to health - Recognizes the right to the highest attainable standard of physical and mental health.
- (vii) Rights to take part in cultural life - Guarantees the right to take part in the cultural life of society.

4.3 Community Relations¹

- (a) The Employer will be responsible for the overall management of community relations and communications with the local communities with respect to the Project and the Works. The Contractor shall fully cooperate with the Employer in this regard, including assigning a designated Community Relations Officer for liaison and coordination with the Employer and the local community with respect to the Contractor's activities that affect the local community.
- (b) The Contractor shall ensure that all Contractor's Personnel respect the local culture and religious beliefs.
- (c) Complaints or grievances received by the Contractor from members or representatives of local communities shall be fully documented by the Contractor and immediately forwarded to the Employer for any necessary follow-up action. The Contractor shall fully cooperate with the Employer to ensure that such complaints or grievances are treated with the utmost importance and resolved as quickly as possible. The Contractor shall provide and maintain a book for the recording of the details of each complaint or grievance received by the Contractor, and which shall include the following details with respect to each such complaint or grievance:
 - (i) Date and time of receipt the complaint or grievance;
 - (ii) Nature, type, date and time of the activity or issue giving rise to the complaint or grievance
 - (iii) Name, address and contact details of the person advising of the complaint/grievance;
 - (iv) Details of the means of communication of the complaint/grievance.

¹ The section on Community Relations may need to be expanded to include references to any related ESIA and/or SAP documents with respect to the project.

5. Engagement of Staff and Labour

5.1 General

- (a) The Contractor shall comply with the provisions contained this Clause 5 (*Engagement of Staff and Labour*), with regard to the engagement and welfare of all the Contractor's Personnel.
- (b) The Contractor's policies and procedures with respect to employees shall comply with labour and occupational health and safety Laws.
- (c) The Contractor shall maintain equal employment opportunity recruitment practices that are fair, equitable and promote diversity.
- (d) The Contractor shall ensure that all the Contractor's Personnel engaged in the Works meet the minimum age for labour.
- (e) In particular, the Contractor shall develop procedures that:
 - (i) respect human rights;
 - (ii) respect diversity;
 - (iii) provide fair assessment and treatment of staff;
 - (iv) support diverse working styles;
 - (v) maintain and enhance skills and capabilities of staff;
 - (vi) optimize human resources and development;
 - (vii) ensure occupational health and safety standards are met, and give consideration to its employees' health; and
 - (viii) protect its employees' personal data.

5.2 Labour Laws

- (a) The Contractor shall comply with all the relevant labour Laws applicable to the Contractor's Personnel, including Laws relating to their employment, health, safety, welfare, immigration and emigration, and shall allow them all their legal rights.
- (b) The Contractor shall require the Contractor's Personnel to obey all applicable Laws, including those concerning health, safety and environmental protection.
- (c) The Contractor shall be solely responsible for the industrial relations of the Contractor's Personnel, including obtaining the required residential and work permits, visas and any other clearances (if any) required pursuant to the applicable Laws.
- (d) The Contractor shall recognize the freedom of the Contractor's Personnel to be members of trade unions recognized by the relevant ministry in the Country.
- (e) The Contractor shall not employ labour below the minimum age required by Law on the Works for any purpose whatsoever.

5.3 Rates of Wages

- (a) The Contractor shall pay rates of wages, observe working hours, conditions of labour, and other conditions of employment, which are not lower than those established for the trade or industry than those applying generally in, and/or as stated in, applicable labour Laws, and other relevant Laws as are applicable.
- (b) If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor.

5.4 Employment of Local Persons

- (a) The Contractor shall, in the execution of the Works (and shall procure that its Subcontractors shall), maximize the employment of Local Persons.
- (b) Without limiting the provisions of this Clause 5 (*Engagement of Staff and Labour*), the Parties agree that:
 - (i) foreign manpower engaged by the Contractor in relation to the Works shall be limited only to engineers, supervisors and other personnel with special skills required specifically for the purposes of the Works and shall only be employed in connection with the Works, where such manpower and/or skills are not reasonably available within the Country; and
 - (ii) all unskilled workers employed in connection with the execution of the Works shall be citizens of the Country, unless the Contractor can show that in any particular trade or skill, citizens of the Country are not available in the numbers required in order to perform the Works.

5.5 Discrimination

- (a) The Contractor shall provide equal opportunities in the employment of staff and labour, and shall not discriminate, or cause to be discriminated against any person due to racial, ethnic, religious, gender or age reasons or grounds.
- (b) The Contractor shall establish gender balanced targets within all recruitment documents and hiring plans to ensure that there are equal opportunities at all levels in the work force.

5.6 Prohibition of Forced or Compulsory Labour

The Contractor shall not employ forced or compulsory labour in any form. Forced or compulsory labour consists of all work or service, not voluntarily performed, that is extracted from an individual under threat of force or penalty.

5.7 Working Hours

The Contractor shall, in all dealings with the Contractor's Personnel in connection with the Works, have due regard to all recognized days of rest, local festivals, religious holidays, other customs and normal working hours, unless:

- (a) otherwise stated in the Contract;
- (b) the Employer gives consent; or
- (c) the work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Employer.