



NEPAL ELECTRICITY AUTHORITY
Transmission Directorate
Grid Development Department
New Modi Lekhnath 132kV Transmission Line Project

Kharipati
Kathmandu, Nepal
Phone : 977-1-6614606

Letter Ref. No. 074/75-

Date: 22nd Sept, 2017

To,

✓ All Prospective Bidders

Subject: Issuance of Clarification-1 and Addendum-1

Ref: Package ML2: Procurement of Plant Design, Supply and Installation of Laha Chowk 132 kV Substation, New Modi 132 kV Switching Station and 132 kV Line Bay expansion at Lekhnath Substation (IFB No: ML/SS/ /074/75- 1)

Dear Sirs/Madams,

In reference to the captioned Tender Published on 1 September, 2017, we are hereby attaching the clarification-1 sought by the bidders pursuant to clause 7.1 and addendum-1 pursuant to clause 8.1 of Volume-1 of the bidding Documents.

It is hereby requested you all to acknowledge the receipt of the same.

With regards


Roshan Agrawal
Project Manager

NEPAL ELECTRICITY AUTHORITY

Transmission Directorate

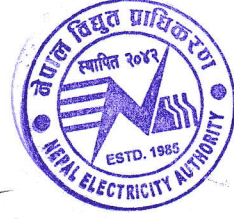
Grid Development Department

New Modi-Lekhnath 132 kV Transmission Line Project

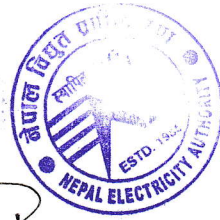
IFB No. ML/SS/074/75-01 : Procurement of Plant Design, Supply and Installation of Laha Chowk 132 kV Substation, New Modi 132 kV Switching Station and 132 kV Line Bay Expansion at Lekhnath Substation

Clarification : Resolving to the Pre-Bid Queries

S.No	Description/Clause of Reference for the required clarification	Bidder's Request	NEA Response
1	Volume II, Chapter 1-Project Specification Requirement, Cl. No. 1.1.2	Associated Transmission System: The following transmission system is envisaged under New Modi-Lekhnath 132kV Transmission Line Project. Transmission Lines 1. New Modi - Laha Chowk - Lekhnath 132 kV D/C Lines: 42.2 km (along with OPGW) Substations 1. Construction of 132/33/11kV New Substation at Laha Chowk 2. Construction of 132 kV Modi Switching Station 3. Extension 2 nos. of 132 kV Line Bays at Lekhnath Substation As per Bill of Quantity, there is no line items for Transmission Line. Kindly Confirm the scope.	Refer Volume II, Chapter 1-Project Specification Requirement, Subtitle 2.0 Scope
2	Volume II, Chapter 1-Project Specification Requirement, Cl. No. 2.3 & Volume I(B) Section IV : Bid Price Schedule No. 3 Design Services	The complete design (unless specified otherwise in specification elsewhere) and detailed engineering shall be done by the Contractor based on conceptual tender drawings. As per Project Specification Requirement complete design is in scope of Contractor but as per Bill of Quantity Design Services is Not Applicable. Kindly Clarify	The bidder shall consider the prices for design in their price for equipment and services and no separate payment for design services shall be provided.
3	Volume II, Chapter 1- Project Specification Requirement, Cl. No. 3.0 Specific Exclusions	The following items of work are specifically excluded from the scope of the specifications for all substations: a) Employer's quarters, site office and stores. b) Cutting and Clearing of trees and bushes in yard Kindly Confirm that these are not in Bidder's scope.	Confirmed
4	Volume II, Chapter 14- Technical Specification of C & R Panel	There is no details available for the following items. 1. 132 kV Buscoupler CRP 2. 33/11 kV Transformer CRP 3. 33 kV Bus Sectionalizer CRP 4. Revenue Energy Meter (Chapter 1) Kindly provide.	Refer Annexure-I; Item No. A Refer Annexure-I; Item No. B Refer Annexure-I; Item No. C For 4. Revenue Energy Meter, Refer to Volume II; Chapter I; Annexure III; Specification for Revenue Meter & Metering (Instrument) Transformer



S.No	Description/Clause of Reference for the required clarification	Bidder's Request	NEA Response
5	Volume I(B), Section IV : Bid Price Schedule	Line item for 11kV HT Switchgear is not available in price sheet. SLD is also not available. Kindly provide.	Refer Volume I(B), Section IV : Bid Price Schedule; A. Laha Chowk Substation; Item No. 1.6.7, 1.6.8 & 1.6.9 and for Specification Refer Volume II, Chapter 14- Control Relay and Protection Panels
6	Volume II, Section - 12, Power Cables and Control Cables	Technical Specification of 132kV & 11kV Cables are not available. Kindly provide.	For 11 kV Cables Refer Addendum-I, S.No: 5. along with Chapter-10, Clause 2.0; And for 132 kV Cables Refer Annexure-II
7	Volume I(A), 2.7 Bidder's proposed manufacturer / Subcontractors & Volume-II Chapter 2: General Technical Requirement, Cl No. 9.2	The Bidder shall also submit the type test certificates for each of the above mentioned items. The type tests conducted earlier should have either been conducted in accredited laboratory (accredited based on IEC Guide 25/17025 or EN 45001 by the national accreditation body of the country where laboratory is located). The type test reports shall not be earlier than 5 years. & In case of instrument transformers, the following type tests should have been conducted within 10 (ten) years prior to the originally Scheduled date of bid opening. i) Lightning Impulse Test ii) Switching Impulse Test iii) Multiple Chopped Impulse Test (For CT) iv) Chopped Impulse Test (For CVT) Kindly confirm that type test certificate of all equipment in last 10 years are acceptable.	Refer Addendum I; S.No: 1
8	Section 3 - Evaluation and Qualification Criteria, 2.4.2 Specific Construction Experience (a) Contracts of Similar Size and Nature	The Bidder as a Prime Contractor must have successfully or substantially completed substations on turnkey basis of at least 2(Two) numbers of 110kV or higher voltage class each with Contract amount of at least USD 5.8 Million within last 10(Ten) years. a) Each Partner must meet 25% of the requirement. b) One Partner must meet 40% of the requirement. Please Clarify is it in terms of value i.e. min. 25% of 5.8MUSD of one project and 40% of 5.8MUSD of other project.	Confirmed
9	Section 3 - Evaluation and Qualification Criteria, 2.4.2 Specific Construction Experience (b) Construction Experience in Key Activities (i)	At least one Substation of Voltage level 110kV or higher having Power Transformer of capacity not less than 30 MVA. a) Each Partner must meet 25% of the requirement. b) One Partner must meet 40% of the requirement. Does it mean of 25% of 30 MVA and 40% of 30 MVA	Any one partner can meet the specified requirement
10	Section 3 - Evaluation and Qualification Criteria, 2.4.2 Specific Construction Experience (b) Construction Experience in Key Activities (ii)	Should have completed/Substantially completed one Substation of Voltage Level 110 kV or higher outside the bidders home country. a) Each Partner must meet 25% of the requirement. b) One Partner must meet 40% of the requirement. One Substation of Voltage level 110 kV or higher outside the bidders home country- how the 25% and 40% is segregated?	Any one partner can meet the specified requirement



S.No	Description/Clause of Reference for the required clarification	Bidder's Request	NEA Response
11	Clause 4.1 & Volume-II, Section-VI, Chapter-I, Page-11	Altitude above sea level : 1735 m (Lumle) & 740 m (Lekhnath) Since Lumle is near to New Modi & Laha Chowk substation, hence we understand that New Modi & LahaChowk Substations are at Altitude level of 1735m and Lekhnath is 740m from MSL. Kindly Confirm.	Refer Addendum I; S.No:2
12	Clause 4.1 & Volume-II, Section-VI, Chapter-I, Page-11	Altitude above sea level : 1735 m (Lumle) & 740 m (Lekhnath) Since substation sites are at different altitude levels, hence Kindly confirm that all the substations should be designed as per highest altitude level and suitable equipment at all substations are to be supplied as per highest altitude level.	Refer Addendum I; S.No: 2 for Substation's Altitude Level. Altitude below 1000m as per our specification and above 1000m with necessary altitude correction factor that shall be applicable as per IEC or part thereof
13	Volume-I(B) Bid Price Schedule, Schedule No. 1 Item No. A 1.9.10 & Item No. B 1.9.7	11 kV Line (Including steel Tubular, Poles, Cross arm, Clamps, Nut, Bolts, ACSR Dog Conductor, Insulators, Hardware, etc.) as per NEA's Construction Standard to complete the specified scope of works all accessories complete Kindly provide the detailed BOQ of items which are to be supplied to execute the 11 kV Overhead Line work.	Bidder's are requested to visit site and find out themselves the detailed estimation of items required to execute the 11kV Overhead line works.
14	Volume-I(B) Bid Price Schedule, Schedule No. 1 & 2; Main Equipment	12 kV VCB Switchgears Panel are not described in Price Schedule under main equipment portion, however spares are listed in Spare Parts. Kindly include 12kV Switchgear in Main price schedule if required as per project scope.	Refer Volume (B), Section IV : Bid Price Schedule; A. LahaChowk Substation; Item No. 1.6.7, 1.6.8 & 1.6.9 AND for Specification Refer Volume II, Chapter 14- Control Relay and Protection Panels
15	Volume-I (A) Section-3, EQC; Clause 2.7	We understand that listed equipment are to be type tested and type test report shall not be earlier than the 5 years. However as per Volume II, Chapter 2 General Technical Requirement Clause 9.2 the instrument transformers are to be type tested within last 10 years and other equipment within last 15 years. Kindly clarify which statement is to be followed.	Refer Addendum I; S.No: 1
16	General	Kindly provide the soil investigation and resistivity reports of all the 3 Substation Locations.	Soil investigation and Soil Resistivity Test is in the scope of Contractor.
17	General	Kindly provide the Detailed / Exact Substation layout plan for all the 3 Locations	The complete design (unless specified otherwise in specification elsewhere) and detailed engineering shall be done by the Contractor based on conceptual tender drawings. Drawings enclosed with tender drawings are for information only. However civil drawings shall be developed by the contractor as per his design.
18	Price Schedule No. 1; 1.7/1.7.2	Earthing of Substation with conductors, electrode grounding materials and accessories to complete the specified scope of works Kindly provide Switchyard area for the bays under present scope and also provide Soil resistivity for earth mat estimation.	For the area estimation of Grounding System, Bidder's are requested to visit site or take an idea from provided Layout Plan Drawings. The soil resistivity test is in the scope of Contractor. To complete the specified scope of work, Refer Volume-II, Chapter 19, Clause 7.0
19	Layout Plan of Laha Chowk Substation; DWG NO. 2; Plot Plan	Kindly confirm Phase to Phase distance / bay width and also provide exact plot plan with defined area for the bays under present scope.	Annexure-V is attached as typical sectional drawings. The complete design and detailed engineering shall be done by the Contractor with employer's approval after the contract has been awarded.

S.No	Description/Clause of Reference for the required clarification	Bidder's Request	NEA Response
20	Layout Plan of Laha Chowk Substation; DWG NO. 2; Plot Plan	Kindly provide the distance between Control Room Building to switchyard (Bay under Present Scope) to estimate Cable Length.	Will be finalized after the submission of design drawing by the Contractor and approval by the employer
21	Layout Plan of Laha Chowk Substation; DWG NO. 2; Control Room Building	Kindly Provide Control Room Building architectural drawing.	Control Room Building Design is in Contractor's Scope
22	Layout Plan of Laha Chowk Substation; DWG NO. 2; 11/0.4kV 200kVA LT Transformer	Kindly provide 2 Nos. Station Transformer Location in Substation Layout Plan drawing to estimate cable length	The complete design (unless specified otherwise in specification elsewhere) and detailed engineering shall be done by the Contractor based on conceptual tender drawings. Drawings enclosed with tender drawings are for information only. However civil drawings shall be developed by the contractor as per his design.



(Handwritten signature/initials)

NEPAL ELECTRICITY AUTHORITY

Transmission Directorate

Grid Development Department

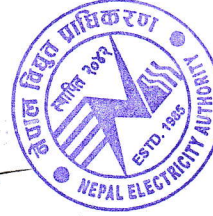
New Modi-Lekhnath 132 kV Transmission Line Project

IFB No. ML/SS/074/75-01 : Procurement of Plant Design, Supply and Installation of Laha Chowk 132 kV Substation, New Modi 132 kV Switching Station and 132 kV Line Bay Expansion at Lekhnath Substation

ADDENDUM-1

In accordance with the ITB 8.1 of the Bidding Document for the " Procurement of Plant Design, Supply and Installation of Laha Chowk 132 kV Substation, New Modi 132 kV Switching Station and 132 kV Line Bay Expansion at Lekhnath Substation (Single Stage Two Envelope Bidding) (IFB No: ML/SS/074-75-01)", following amendments have been made in the bidding Document.

S.No	Description/Clause of Reference for the required clarification	As in the Bidding Documents	To Be Replaced as
1	Volume-II Chapter 2: General Technical Requirement, Cl No. 9.2	The test reports submitted shall be of the tests conducted within last 15 (fifteen) years prior to the originally Scheduled date of bid opening. In case the test reports are of the test conducted earlier than 15 (fifteen) years prior to the originally Scheduled date of bid opening, the contractor shall repeat these test(s) at no extra cost to the purchaser. In case of instrument transformers, the following type tests should have been conducted within 10 (ten) years prior to the originally Scheduled date of bid opening. i) Lightning Impulse Test ii) Switching Impulse Test iii) Multiple Chopped Impulse Test (For CT) iv) Chopped Impulse Test (For CVT) In case the test reports are of these tests (equipment / material) as mentioned above are conducted earlier than 10 (ten) years prior to the originally Scheduled date of bid opening, the contractor shall repeat these test(s) at no extra cost to the purchaser.	Replace by: The test reports submitted shall be of the tests conducted within last 5 (five) years prior to the originally Scheduled date of bid opening. In case the test reports are of the test conducted earlier than 5 (five) years prior to the originally Scheduled date of bid opening, the contractor shall repeat these test(s) at no extra cost to the purchaser. In case of instrument transformers, the following type tests should have been conducted within 10 (ten) years prior to the originally Scheduled date of bid opening. i) Lightning Impulse Test ii) Switching Impulse Test iii) Multiple Chopped Impulse Test (For CT) iv) Chopped Impulse Test (For CVT) In case the test reports are of these tests (equipment / material) as mentioned above are conducted earlier than 10 (ten) years prior to the originally Scheduled date of bid opening, the contractor shall repeat these test(s) at no extra cost to the purchaser.
2	Volume-II, Chapter-1, Section-VI, Clause 4.1, Page-11	Altitude above sea level : 1735 m (Lumle) & 740 m (Lekhnath)	Replace By: Altitude above sea level: New Modi Substation @995m ; Laha Chowk Substation @1092m and Lekhnath Substation @740m





S.No	Description/Clause of Reference for the required clarification	As in the Bidding Documents	To Be Replaced as
3	Volume II, Chapter-10 Power Cables and Control Cables; Clause 2.0.2	2.0.2 The cable shall be of 33 kV EHV grade, single core, unarmored, stranded compacted Copper conductor, core screening by a layer of semiconducting tape followed by a layer of semiconducting compound, cross linked polyethylene (XLPE) dry cured insulation, insulation screening with semiconducting compound extruded directly over the insulation, longitudinal sealing by a layer of non-woven tape with water swellable absorbent over insulation screen, followed by radial sealing (Metal sheath of Lead/aluminum alloy 'E'), metallic screening by concentric layer of plain copper wire followed by an open helix of HDPE sheathed & graphite coated and conforming to the technical particulars of specification.	Replace By: The cable shall be of 11 kV EHV grade, single core, unarmored, stranded compacted Copper conductor, core screening by a layer of semiconducting tape followed by a layer of semiconducting compound, cross linked polyethylene (XLPE) dry cured insulation, insulation screening with semiconducting compound extruded directly over the insulation, longitudinal sealing by a layer of non-woven tape with water swellable absorbent over insulation screen, followed by radial sealing (Metal sheath of Lead/aluminum alloy 'E'), metallic screening by concentric layer of plain copper wire followed by an open helix of copper & overall HDPE sheathed & graphite coated and conforming to the technical particulars of specification.
4	Volume I(B), Bid Price Schedule, Price Schedule No.1, 2, 4A & 4B; A. Laha Chowk Substation, Item No. 1.6.6	1.6.6 33 kV Bus Sectionalizer Control and Relay Panel complete with all accessories as per specification Quantity: 1 Nos.	Replace By: 1.6.6 33 kV Bus Sectionalizer Control and Relay Panel complete with all accessories as per specification Quantity: 0(Zero) Nos.
5	Volume I(B), Bid Price Schedule, Price Schedule No.4B; A. Laha Chowk Substation, Item No. 1.8.3	1.8.3 12 kV, 600 sq. mm 3 x single core XLPE Copper Power Cable including Straight Joints with Accessories complete from LV sides of 33/11 kV Power Transformers to indoor 11 kV Switchgear Room as per Drawings Quantity: 600 m	Replace By: 1.8.3 12 kV, 600 sq. mm 3 x single core XLPE Copper Power Cable including Straight Joints with Accessories complete from LV sides of 33/11 kV Power Transformers to indoor 11 kV Switchgear Room as per Drawings Quantity: 300 m
6	Volume I(B), Bid Price Schedule, Price Schedule No.4B; A. Laha Chowk Substation, Item No. 1.8.5	1.8.5 12 kV, 300 sq. mm single core XLPE Aluminium Power Cable including Straight Joints with Accessories complete for 4 nos. of Outgoing Distribution Feeders as specified Quantity: 500 m	Replace By: 1.8.5 12 kV, 300 sq. mm single core XLPE Aluminium Power Cable including Straight Joints with Accessories complete for 4 nos. of Outgoing Distribution Feeders as specified Quantity: 600 m
7	Volume I(B), Bid Price Schedule, Price Schedule No.1, 2, 4A & 4B; A. Laha Chowk Substation, Item No. 1.9.9	1.9.9 11 kV Power Fuse with Support Structure for connection of Station Transformer from 33/11kV Transformer Incomer, 400V Main Switchboard, 400V ACDB, 400V MLDB, 400V Emergency LDB. Quantity: 500 m	Replace By: 1.9.9 11 kV 3 core XLPE Cable and 11 kV Power Fuse with Support Structure for connection of Station Transformer from 33/11kV Transformer Incomer, 400V Main Switchboard, 400V ACDB, 400V MLDB, 400V Emergency LDB.
8	Volume I(B), Bid Price Schedule, Price Schedule No.1, 2, 4A & 4B; B. New Modi Switching Substation, Item No. 1.9.6	1.9.9 11 kV Power Fuse with Support Structure for connection of Station Transformer from 33/11kV Transformer Incomer, 400V Main Switchboard, 400V ACDB, 400V MLDB, 400V Emergency LDB.	Replace By: 1.9.9 11 kV 3 core XLPE Cable and 11 kV Power Fuse with Support Structure for connection of Station Transformer from 33/11kV Transformer Incomer, 400V Main Switchboard, 400V ACDB, 400V MLDB, 400V Emergency LDB.
9	Volume II, Chapter-7 Instrument Transformer; Table 2: Item No. 12: Accuracy Class	12. Accuracy Class 132kV: Class X, 5P20 for protection and 0.2 for metering 33kV: 5P20 for protection and 0.2 for metering	Replace By: 12. Accuracy class 132kV: Class PS for protection and 0.2 for metering 33kV: Class PS for protection and 0.2 for metering

S.No	Description/Clause of Reference for the required clarification	As in the Bidding Documents	To Be Replaced as
10	Volume II, Chapter 22: Technical Data Sheet (Guaranteed Technical Particulars); Item No: 13	12. 11KV XLPE Cable 11KV single Core 11KV Single Core	Replace By: 13. 132kV & 11kV XLPE Cable 132kV Single Core 11kV Single Core
11	Volume I(A), Section IV	Manufacturer's Authorization Letter not attached.	Manufacturer's Authorization Letter attached as in the Annexure-III
12	Volume III, Section 9	Appendix-8-Functional Guarantees	Functional Guarantees Form attached in Annexure-IV
13	ITB 18.1, Section-2, Bid Data Sheet	The Bid Validity Period Shall be: One Hundred and Twenty(120) Days	Replace by: The Bid Validity Period Shall be: One Hundred and Fifty(150) Days
14	Volume II, Chapter 14, Clause 24.1	24.1. Single bus bar protection scheme shall be provided for each main bus and transfer bus (as applicable) for 132 KV voltage levels. Bus bar protection for each busbar shall incorporate a main protection feature.	Replace By: 24.1. Double bus Single breaker protection scheme shall be provided for each main bus for 132 KV voltage levels. Bus bar protection for each busbar shall incorporate a main protection and check feature.



Annexure – I

A. 132 kV BUS COUPLER PROTECTION PANEL

The 132 kV Bus coupler panel shall consist of the following:

S.No	Description	132 kV
1.	Non-Directional back up over current and E/F Relay with non-directional high set	1 Set
2.	Local Breaker Back up Protection	1 Set/As built in Numerical Overcurrent Relay
	Three phase trip relays	3no.
3.	Bay Control Unit	1 No
4.	Red indicating lamp	1 no. for each Circuit breaker
5.	Red indicating lamp	1 no. for each isolator
6.	Green indicating lamp	1 no. for each Circuit breaker
7.	Green indicating lamp	1 no. for each isolator
8.	White indicating lamp (DC healthy lamp)	2 nos for each feeder
9.	Annunciation windows with associated annunciation relays	18 nos for each feeder
10.	Push button for alarm Accept/reset/lamp test	3 nos for each control panel
11.	DC Change over relay	1 no
12.	Local/Remote selector switch	1 no
13.	Breaker Control Switch	1 no
14.	Isolator control Switch	1 No each for isolator
15.	CB close multiplication relay	1 no
16.	CB Trip multiplication relay	1 no as per scheme requirement
17.	DC Supervision relays	2 nos
18.	Trip Circuit Supervision relays	2 nos
19.	Any other item required for successful	1 lot



	completion of the scheme	
20.	Flag relays, aux. relays, timers, trip relays etc. As per scheme requirements. (Acceptable as part of BCU)	Lot
21.	Complete Bus bar Protection scheme as per Chapter 14, Clause 24	1 Set

B. 33/11kV TRANSFORMER CONTROL & PROTECTION RELAY PANEL

The protection panel for 33/11kV Transformer shall consist of the following equipments.

S.No.	Description	33kV Side	11kV
1	Transformer Differential protection scheme	1 no	NIL
2	Restricted Earth fault protection scheme	1 no	1 no
3	Directional back up over current and E/F Relay With non-directional high set feature	1set	Nil
4	Non-Directional back up over current and E/F Relay with non-directional high set feature (Part of 11kV BCU is acceptable)	NIL	1 Set
5	Over fluxing protection scheme	Nil	1No.
6	Over load protection scheme	1No.	Nil
7	Three phase trip relays	2No.	2No.
8	Trip supervision relay	2No.	2No.
9	Scheme requirements including transformer Alarms and trip function	Lot	Lot
10	Disturbance Recorder	1No.	Nil
11	Revenue Energy meter (As per T.S. Chapter-1)	1No.	1No.
12	Flag Relays/Aux. Relays for wiring Transformer auxiliary protection contacts such as Buchholz, Oil Temperature, Winding Temperature, PRV, OLTC Buchholz etc. as per scheme requirements	As required	

C. 33 kV Bus Sectionalizer CRP

Not Applicable. Removed from the Scope.



[Handwritten signature]

Annexure-II: Technical Specification of 132kV XLPE Cables

Reference Documents and Standards

The cables and accessories shall comply with the current issues of IEC standards and documents detailed in this specification and other standards as appropriate.

IEC 60228	Conductor for insulated cable
IEC 60229	Tests cable over sheaths
IEC 60230	Impulse tests on cables and their accessories
IEC 60270	Partial discharge measurements
IEC 60287	Calculation of continuous current carrying capacity.
IEC 60502	Power cables with extruded insulation and their accessories
	IEC 60840 Test for power cables with extruded insulation for rated voltage above 30 kV up to 150 kV
IEEE 48	Test procedures and requirements for high-voltage cable
IEEE 404	Joints for use with solid dielectric cables rated voltage 5kV -138kV

SERVICE

All 132 kV cable circuits shall be installed by direct burial at an average depth of 1.0 M. Cable ends shall be terminated with porcelain termination at both ends. The terminations shall be suitable for outdoor installation in heavily polluted atmosphere and shall be rated completely weather proof through the cable sealing ends.

Cable joints shall be suitable for underground installation with uncontrolled backfill and Chances of flooding by water. Cable joints shall have adequate mechanical protection features.

PERFORMANCE REQUIREMENTS

Operating Conditions

The cable and accessories shall be suitable for use under the following conditions

a) Nominal system voltage	132 kV
b) Highest system voltage	145 kV
c) System frequency	50 Hz
d) System Earthing	Solidly Earthed
e) Impulse level	650 kV
f) Maximum earth fault current	31.5 kA
g) Maximum duration of fault current	3 Second
h) Maximum continuous conductor temperature	90° C
i) Maximum conductor temperature under short circuit	250° C
j) Average ambient air temperature	40° C
k) Maximum ground temperature (Trench)	30° C
l) Soil Thermal receptivity (ground level)	120° C com/watt



The current rating of the cable in trenches shall be determined by the calculation method given in IEC 60287.

TECHNICAL REQUIREMENTS

132 kV XLPE CABLE General Requirements

The cable shall be manufactured either by the vertical continuous vulcanization (VCV) or MDCV extrusion and dry curing process ensuring circularity and concentricity of the extruded layers around the conductor. The details of process of curing to be adopted shall be mentioned during the offer.

The manufacturing process shall be consigned to eliminate irregularities like protrusions voids and contamination etc. to ensure the long term reliability of the cable.

Raw materials used for manufacture of cable shall be of highest quality and it shall meet material standards mentioned in IEC 60840. The materials shall be clean and packed in moisture and dust proof packing. Material received by manufacturer should be checked / tested to confirm that it meets material specification.

Loading of the extruder in the manufacturing plant shall be performed entirely closed and dust proof environment. Contamination shall be avoided by use of a fully enclosed material handling system. The use of special means like pressurized air etc for transport of granules shall as far as practicable be avoided.

All three layers (conductor screen, XLPE insulation and insulation screen) shall be extruded in one simultaneous triple extrusion process through common triple cross head. The extruder and triple cross head shall be designed to prevent stagnation of materials to eliminate hot spots and ensure smoothness of the conductor screen and core screen surfaces.

The cross linking curing and cooling shall be carried out in one operation and shall be a dry curing process under high pressure to eliminate the formation of voids in the insulation and contaminants in the dielectric.

Process conditions such as curing and cooling temperatures production speed etc. shall be closely monitored during manufacture to ensure a good degree of cross linking through the whole insulation.

Cable Construction

The cable shall have stranded compacted round copper conductor taped with semi conducting tapes conductor screening with extruded semi conducting thermosetting compound layer with completely dry cured XLPE insulation, adequate insulation screening including extruded semi conducting thermosetting compound layer, taped with semi conducting water swell able tape, extruded corrugated Aluminum sheathed and overall extruded termite repellent black PE sheathed with outer conducting layer obtained by simultaneous extrusion with PE sheath.



Conductor

The conductor shall be stranded compacted round copper conductor complying the requirement of flexibility clause 12-2 of IEC 60228.

The wires shall be made of high conductivity copper and shall be stranded mid compacted. The copper / aluminum used for the conductor shall be of highest purity.

The nominal area of conductor shall be 1200 sq. mm for both the circuits.

The minimum number of wires in conductor and max dc resistance of conductor shall be as per table II of IEC 602283

Conductor Screen

The conductor screen shall consist of an extruded layer of thermosetting semi conducting compound and shall be continuous and cover the whole surface of the conductor. The screen shall be firmly bonded to XLPE insulation.

The minimum thickness of conductor screen shall be 1.0 mm (approx.)

A non-gyroscopic semi conducting tape may be applied to the conductor under extruded layer. The outer surface of the conductor screen shall be circular and free from irregularities.

Insulation

The insulation shall be cross linked polyethylene (XLPE). The insulation material shall comply with the requirement of Table - iv of IEC 60840.

The insulation shall be applied by extrusion and vulcanization to form a compact homogeneous body free from micro voids and contaminants.

The nominal thickness shall be decided by the manufacturer which shall not result the voltage stress at conductor screen surface more than 6.5 kV/mm at normal operating voltage

Insulation Screen

The insulation screen shall consist of an extruded layer of thermosetting semi conducting compound and shall be continuous and cover the whole surface area of insulation. It shall be firmly bonded to the insulation.

The minimum thickness of insulation screen shall be 0.8mm.



Longitudinal Water Barrier

The under sheath water barrier shall consist of a semi conducting moisture swelling layer covering the whole surface area of the insulation screen. The barrier shall restrict longitudinal water penetration under the metallic sheath.

The minimum thickness of water swell able tape shall be 0.3mm

Metal Sheath

The metallic sheath shall be of extruded Corrugated Aluminum as per relevant IEC 60840.

The metallic sheath shall be extruded using a continuous screw press and shall be free from all extrusion defects.

The nominal thickness of corrugated Aluminum sheath shall be as per the recommendation of IEC 60840 and shall be so designed to carry the specified earth fault current of 31.5 kA for 3 Seconds.

Outer sheath

The outer sheath shall consist of an extruded layer of black medium density polyethylene with an outer conductive layer.

The nominal thickness of outer sheath shall not be less than the value calculated as per the recommendation of IEC 60502

The outer sheath shall be of sufficient hardness to discourage termite attacks. The properties of outer sheath material shall be as per IEC 60840.

Marking on outer sheath

The following particulars shall be marked on cable outer sheath at suitable regular intervals.

- a) Manufacture's name and / or trade name
- b) Voltage grade viz. 76/132 kV
- c) Cable size (No. of core x conductor cross section)
- d) Year of manufacture
- e) Purchaser's name i.e. DPDC.

The spacing between one set of marking and line beginning of the next on the legend shall not exceed 150mm.



Sealing and Drumming

Immediately after the works and tests both ends of every length of cable shall be sealed by means of heat shrinkable end caps.

Cables shall be wound on metallic drums. All the drums shall be arranged to take a round spindle and is lagged with strong closely fitting wooden battens so as to prevent damage to the cable.

Each drum shall bear an identification number permanently stenciled or branded on the outside of the flange. Particulars of the cable i.e. voltage grade conductor size length gross weight net weight, direction of rolling and name of manufacturer and year of manufacture etc. shall be clearly marked on one flange of the drum.

Standard drum length shall be 500 meters. A tolerance of $\pm 3\%$ will be permissible on standard drum length

However exact drum length shall be advised to successful bidder after award of contract. Exact drum length shall be decided by joint route survey with purchaser's engineer and contractors engineer after award of contract.

Joints

The dielectric design of the joint shall be optimized. The electric stress distribution along the interface between the insulator and the cable shall take into account the dimensions of the joint and the cable and the dielectric permittivity of the insulation. The material of insulator shall have good thermo mechanical behavior.

The materials used in the assembly of the joint shall be compatible with the material of the insulator and the cable insulation.

The conductor shall be connected by means of an approved arrangement. The tensile strength of the connector shall meet the requirements of the copper conductor.

The joints shall be of remolded construction. This design shall comprise a one price factory tested synthetic rubber joint with all stress management element provided during the molded process in the factory.

Outdoor Termination

The terminations shall be porcelain compost type of insulators suitable for outdoor installation in heavily polluted atmosphere. It should be resistant to UV exposure. The termination stress control shall be by means of electrometric stress cone.

The stress cone design shall inhibit possible mechanical stress and deformation of the cable insulator surface during operation and be also capable of accommodating minor radial and longitudinal movement without detriment of the dielectric stresses in the insulation shield.

Supply and installation including foundations of structures for supporting of 132 kV cable Termination shall be included in the scope of the bidder.



Annexure-III

Manufacturer's Authorization

Date: [insert date (as day, month and year) of bid submission]

ICB No.: [insert number of bidding process]

To: [insert complete name of the employer]

WHEREAS

We [insert complete name of the manufacturer or manufacturer's authorized agent] , who are official manufacturers or agent authorized by the Manufacturer of [insert type of goods manufactured] , having factories at [insert full address of manufacturer's factories], do hereby authorize [insert complete name of the bidder] to submit a bid [] the purpose of which is to provide the following goods, manufactured by us [insert name and / Insert IFB NO and Description of Bid or brief description of the goods] , and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 27 of the General Conditions of Contract, with respect to the goods offered by the above firm.

Signed: [insert signature(s) of authorized representative(s) of the manufacturer]

Name: [insert complete name(s) of authorized representative(s) of the manufacturer]

Title: [insert title]

Duly authorized to sign this Authorization on behalf of [insert complete name of the manufacturer]

Dated on _____ day of _____, _____ [insert date of signing]

-- Note -- The bidder shall require the manufacturer to fill out this form in accordance with the instructions indicated. This letter of authorization should be signed by a person with the proper authority to sign documents that are binding on the manufacturer. The bidder shall include it in its bid, if so indicated in the BDS.



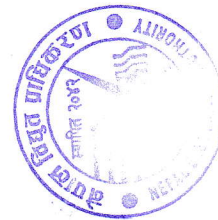
Annexure-IV: Functional Guarantee Form

S.No.	Required Functional Guarantee	Value of Functional Guarantee of the Proposed Plant and Equipment		
		No Load Loss (KW)	Load Loss (KW) at 75 Deg C	Auxiliary Loss (KW) at 75 Deg C
1	132/33 kV, 24/30 MVA Three phase Power Transformer			
2	33/11 kV, 6/8 MVA Three Phase Power Transformer			
3	11/0.4 kV, 200 kVA Three Phase Station Transformer			

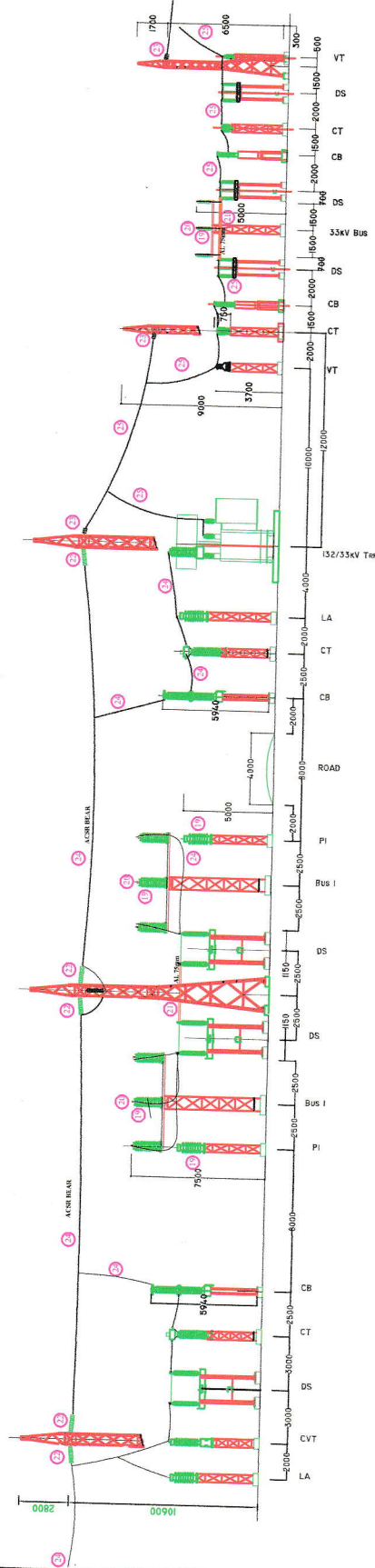


[Handwritten signature]

Annexure-V
SECTIONAL DRAWINGS

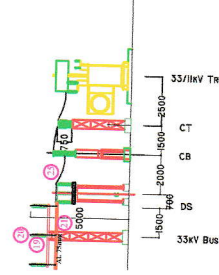


B



132kV LINE BAY, 132/33kV TRANSFORMER BAY & 33kV INCOMER SECTION

19	Bus Post Insulator	Ceramic Single Stack
20	Tubular Main Bus	AL, D=100mm, d= 8 / 6mm
21	Tubular Interconnection Main Bus	AL, D=75mm, d= 4mm
22	Tension Insulator Set for 132kV	120kN, Ceramic, Disk type
23	Tension Insulator Set for 33kV	70kN, Ceramic, Disk type
24	ACSR Conductor	3 Nos
25	ACSR Conductor	ACSR Bear
26	Earth Wire	7/61.7 Sq.mm Galvanized



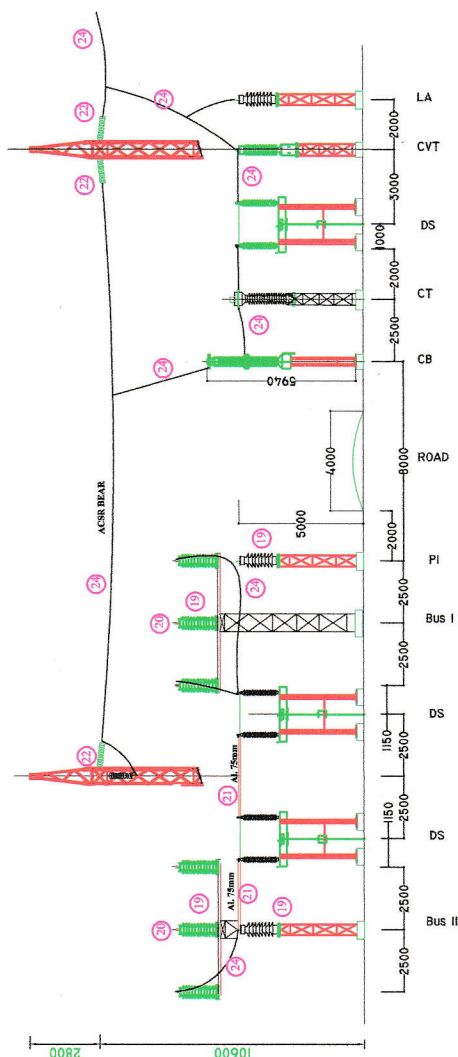
33/11kV TRANSFORMER BAY SECTION

NEPAL ELECTRICITY AUTHORITY
TRANSMISSION DIRECTORATE
GRID DEVELOPMENT DEPARTMENT
NEW MODI LEKNATH 132kV TRANSMISSION LINE PROJECT

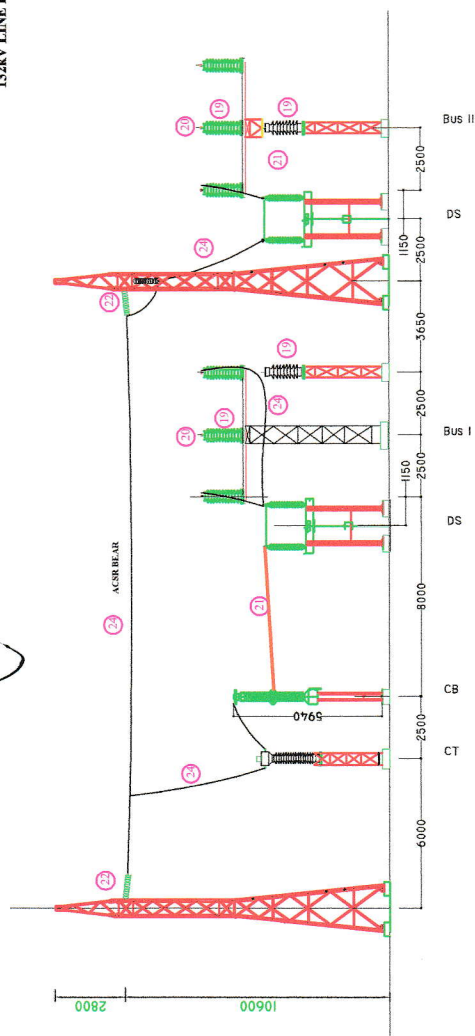
TYPICAL SECTIONAL DIAGRAM FOR
LAHA CHOWK SUBSTATION &
NEW MODI SUBSTATION

DWG NO.1

SCALE
Not in Scale



132kV LINE BAY SECTION



132kV BUS COUPLER BAY SECTION

19	Bus Post Insulator	Ceramic Single Stack
20	Tubular Main Bus	AL, D=100mm, d= 8 / 6mm
21	Tubular Interconnection Main Bus	AL, D=75mm, d= 4mm
22	Tension Insulator Set for 132kV	120kN, Ceramic, Disk type
23	Tension Insulator Set for 33kV	110kN, Ceramic, Disk type
24	ACSR Conductor	3 Nos
25	ACSR Conductor	ACSR Bear
26	Earth Wire	ACSR Bear
		7/61.7 Sq.mm Galvanized



Handwritten signature or mark.

TYPICAL SECTIONAL DIAGRAM FOR
LAHA CHOWK SUBSTATION &
NEW MODI SUBSTATION

NEPAL ELECTRICITY AUTHORITY
TRANSMISSION DIRECTORATE
GRID DEVELOPMENT DEPARTMENT
NEW MODI LEKHNATH 132kV TRANSMISSION LINE PROJECT

DWG NO.2

SCALE
Not in Scale

