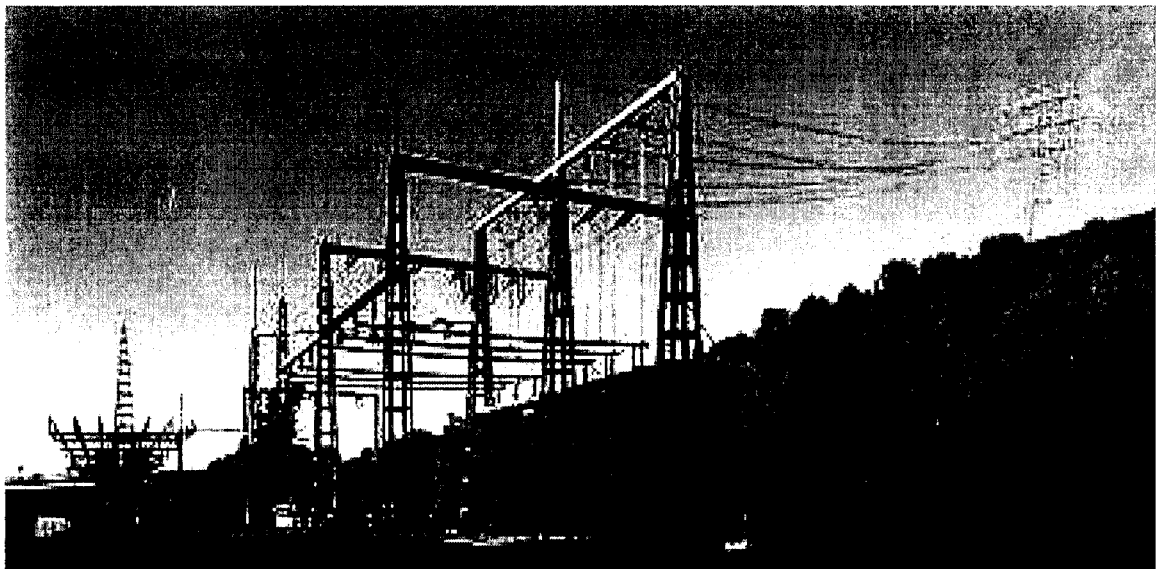
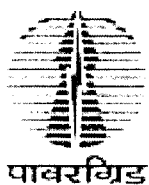


**DETAILED PROJECT REPORT FOR**  
**CONSTRUCTION OF 132 KV SWITCHING STATION AT TENGA AND 132 KV**  
**S/C DIKSHI –TENGA SWITCHING STN AND 132 KV D/C TENGA**  
**SWITCHING STN -NECHIPU TRANSMISSION LINES**

*CONSULTANCY SERVICES TO M/S DEVI ENERGIES, HYDERABAD FOR PREPARATION OF DPR*



PREPARED BY



पावरग्रिड

**POWER GRID CORPORATION OF INDIA LIMITED**  
(A Government of India Enterprise)

APRIL, 2017

## PREAMBLE

*This proposal covers the*

**“DETAILED PROJECT REPORT FOR 132 KV SWITCHING STATION AT TENGA AND 132 KV S/C DIKSHI – TENGA SWITCHING STN AND 132 KV D/C TENGA SWITCHING STN - NECHIPU TRANSMISSION LINES - CONSULTANCY SERVICES TO DEVI ENERGIES, HYDERABAD**

The total estimated cost of the project based on **December 2016 price level is as follows:**

|              |                              | (Rs. in crores) |
|--------------|------------------------------|-----------------|
|              |                              | Total cost      |
| 1.           | Sub-Station System           | <b>50.97</b>    |
| 2.           | Interest during Construction | 0.00            |
| <b>TOTAL</b> |                              | <b>50.97</b>    |

Note: \* Funding to be decided by DEVI ENERGIES. IDC has not been considered.

Note: POWERGRID Consultancy fee to be decided by BDD.

## **ANNEXURES**

| <b><u>Annexure. No.</u></b> | <b><u>Description</u></b>                                             |
|-----------------------------|-----------------------------------------------------------------------|
|                             | <i>Abstract Cost Estimate - Summary</i>                               |
|                             | <i>Abstract Cost Estimate - Preliminary &amp; General Civil Works</i> |
|                             | <i>Abstract Cost Estimate – Transmission Line</i>                     |
|                             | <i>Abstract Cost Estimate – Substation</i>                            |

### **EXHIBITS**

| <b><i>Exhibit No.</i></b> | <b><i>Description</i></b>                |
|---------------------------|------------------------------------------|
| 1.0                       | General Arrangement Drawing - Substation |
| 2.0                       | Single Line Diagram- Sub-station.        |

DETAILED PROJECT REPORT FOR  
CONSTRUCTION OF 132 KV SWITCHING STATION AT TENGA AND  
132 KV S/C DIKSHI -TENGA SWITCHING STN AND 132 KV D/C  
TENGA SWITCHING STN -NECHIPU TRANSMISSION LINES

CONSULTANCY SERVICES TO DEVI ENERGIES, HYDERABAD

1. CONTEXT / BACKGROUND

Dikshi Hydro Electric project (3X8 MW) was implemented by Devi Energies Pvt Ltd on Build, own, operate and transfer (BOOT) basis for 50 years. 132 KV Single Circuit transmission line exists from Balipara ( Assam) to Khuppi, West Kameng Dt, Arunachal Pradesh. Department Of Power (DOP), Govt of Arunachal Pradesh had earlier planned to construct 132 Double Circuit (D.C) transmission line from Khuppi to Tawang via Bomdila with a 132/33 KV Sub-Stations, one at Bomdila and another at Tawang. The Proposed 132 KV D.C transmission line could be a life line for West Kameng & Tawang Districts. Earlier, Devi Energies Pvt Ltd was allotted bay in proposed 132/33 KV sub- station at Bomdila for power evacuation of Dikshi HEP.

2. JUSTIFICATION:

Due to various reasons, proposed 132 KV D/C Transmission Line has not been taken off posing a great threat for stable Grid availability in West Kameng District & Tawang Districts, apart from creating bottlenecks for evacuation infrastructure for ongoing Hydro Power Projects in Kameng basin in general and Dikshi Hydro Electric Project (Dikshi HEP) in particular. The proposed 132 KV D.C transmission line by taking LILO connection from a nearby point at Nechipu Village on 132 KV S.C Balipara- Khuppi Transmission Line will be constructed up to Tenga Village which can be extended upto Bomdila and further to Tawang. 132KV S.C transmission line is planned from Dikshi HEP from Tenga Switching Station for evacuation of power.

### 3. SCOPE OF WORK:

Following are the present scope of work:

132 KV switching station at Tenga: Switching station without transformers and shall be operating only at a single voltage level shall serve as distribution station. Main bus with Moose ACSR conductor fault level 31.5kA.

#### 132 KV Bays

- Dikshi HEP Feeder
- Balipara Feeder
- Khuppi Feeder
- Future feeder (from 400 Kv Assam s/s)

132 KV S/C Dikshi – Tenga switching station transmission line: Appx 10.5 KM, Single circuit transmission line with Single ACSR Panther conductor. OPGW is considered along the transmission line. Since most of the part of transmission line passing through hilly area, benching and tower footing is also considered.

132 KV D/C Tenga switching station - Nechipu transmission line: Appx 21.5 KM, Double circuit transmission line with double ACSR Panther conductor. OPGW is considered along the transmission line. Since most of the part of transmission line passing through hilly area, benching and tower footing is also considered.

### 4. TECHNOLOGY FEATURES

#### 4.1 Salient features of 132KV Switching station Equipment and facilities

Design and specification of substation equipment are to be governed by the following factors:

## Insulation Coordination

The following insulation levels are proposed to be adopted for 145 KV systems :

|    |                                                                                      | 145 KV             |
|----|--------------------------------------------------------------------------------------|--------------------|
| a. | Impulse withstand voltage for<br>- Transformer and reactors<br>- for Other Equipment | 550 kVP<br>650 kVP |
| b. | Minimum creepage distance                                                            | 3625               |
| c. | Max. fault current                                                                   | 31.5 kA            |
| d. | Duration of fault                                                                    | 1 Sec              |
| e. | Corona extinction voltage                                                            | 92kV rms           |

To control the steady state, transient and dynamic overvoltage to specified levels, compensation equipment shall be provided.

### Steady State Stability

The Steady State Stability is the ability of a system, to return/remains in the state of equilibrium when subjected to small or gradual changes of disturbances. The steady state stability limit is the maximum power that can flow through some lines in the system when the entire or part of the system to which the stability limit refers is subjected to a small disturbance without loss of its stability.

The steady state stability is usually quantified by measuring the relative angular displacement (also called as swing curve) between the two buses (nodes) in a network when a small disturbance is applied somewhere into the system.

In an integrated power system consisting of large number of generator, load and line etc., a maximum relative angular separation of about 30 deg. between the two buses may be assumed to be acceptable (safest) limit for maintaining the steady state stability of the system. Angular separation for different alternatives have been studied and found to be in order.

### Substation Equipment

The switchgear shall be designed and specified to withstand operating conditions and duty requirements.

### Circuit Breakers

Circuit breakers shall in general comply to IEC-62271-1 & 62271-100 and shall be of SF6 Type. The rated break time shall not exceed 60 ms for 145 KV circuit breakers and the total break time shall not exceed 65ms. Since generally 132kv CBs are gang operated type i.e; one drive will control the 3 phases. The short line fault capacity shall be same as the rated capacity and this is proposed to be achieved without use of opening resistors.

### Isolators

The isolators shall comply to IEC 62271-102 in general. Isolators shall be motor operated. Earth switches are provided at various locations to facilitate maintenance. Main blades and earth blades shall be interlocked and interlock shall be fail safe type. All earth switches shall be manual operated type.

### Current Transformers

Current Transformers shall comply with IEC 60044-1 in general. All ratios shall be obtained by secondary taps. Current transformers shall have five secondaries, four for protection and one for metering. Accuracy class for protection core shall be PS and for metering core shall be 0.2S. The burden and knee point voltage shall be in accordance with the requirements of the system including possible feeds for telemetry.

### Capacitor Voltage Transformers/ Voltage Transformers

Voltage transformers shall comply to IEC 60044-2 & IEC-6044-5 in general. These shall have three secondaries out of which two shall be used for protection and one for metering. Accuracy class for protection core shall be 3 P and for metering core shall be 0.2. The voltage transformers on lines shall be suitable for Carrier Coupling. The Capacitance of CVT Shall be 4400/8800 pF depending on PLCC requirements.

## STANDARD PRACTICE FOR CONTROL, PROTECTION & SUBSTATION AUTOMATION

### Control Room

Substation control room would be provided to house substation automation system for station level control along with its peripheral telemetry equipment and record-

ing equipment, AC & DC distribution boards, DC batteries, etc. Air conditioning will be provided in the building as functional requirements.

#### Protection & Control

The state of art protection system based on numerical technology has been provided to minimize the damage to the equipment in the event of fault for Transmission lines and Bus bars. These protective relays are with self-diagnostic feature and conforming to latest IEC 61850 for communication purposes for communicating the detailed list of events recorded by these relays in the event of fault or any abnormal conditions. Normally all these relays are equipped with in built fault recorder which can record the analogue as well as digital information for analysis of fault.

#### Transmission Lines

132 kV lines shall have MAIN-I numerical distance protection with carrier aided inter-tripping feature. All lines shall also have Directional Back up Over current & Earth Fault Protection scheme.

132kV Lines shall also be provided with distance to fault locators to identify the location of fault on transmission lines. Fault locator feature as in-built feature of distance protection relay is acceptable.

132kV lines are not generally provided with over voltage protection; however they are provided with under voltage relay. 132kV Lines are not generally provided with Auto-reclosing facility.

These lines shall also be provided with distance to fault locators to identify the location of fault on transmission lines.

#### Local Breaker Back up Protection

This shall be provided for each of 132kV breakers and will be connected to de-energize the affected stuck breaker from both sides.

### Time synchronization equipment

Time synchronization equipment complete in all respect including antenna, cable, processing equipment required to receive time signal through GPS or from National Physical Laboratory(NPL) through INSAT shall be provided.

### Substation Automation System

For all the new substations, state of art Substation Automation System (SAS) conforming to IEC-61850 has been provided. The distributed architecture has been used for Substation Automation system where the controls are provided through bay control unit (BCU) and bay control units are provided bay wise for voltage level 132kV and above. All bay control units as well as protection units are normally connected through an optical fiber high speed network. The control and monitoring of substation elements such as circuit breaker, disconnector, resetting of relays etc. are being done from Human Machine Interface (HMI) from the control room. SAS is equipped with the facility of remote operation. By providing remote HMI and suitable communication link, the substation can be controlled from a remote location. The functions of control, annunciation, disturbance recording, event logging and measurement of electrical parameters shall be integrated in Substation Automation System. The Automation System shall be provided with the facility of communication and control for remote end operation.

### Control Concept

All the EHV breakers in substation/switching stations shall be controlled and synchronized from the switchyard control room. Each breaker would have two sets of trip circuits which would be connected to separate DC supplies for greater reliability. All the isolators shall have control from remote/local whereas the earth switches shall have local control only.

Provision of Both remote manual & Auto-sequence operation of Bus Transfer, feeder shutdown & feeder normalization shall be provided through SAS.

## SALIENT FEATURES OF TRANSMISSION LINES

The salient features of the proposed transmission lines are given here under:

The primary consideration for design and estimation of transmission line is walk over survey, which is based upon topographical map of India. Type of terrain, crossings etc. to be encountered by the transmission line has been taken into consideration while estimating the quantities.

### 132KV AC Transmission Lines

#### Wind Zone

The Basic Impulse Level for 132 KV transmission line will be 650 KVp. The weight of tower will vary in an ascending order from wind zone 1 to wind zone 6 as the transverse load on the tower considered owing to the wind pressure increases in the same pattern. The identification of wind zone is based on the wind zone map given in IS: 875 (part-I) 1987 and the past experience in the region.

The transmission lines fall under wind zone - 5 (50 m/s) as per IS: 875 and it shall be designed accordingly.

#### Design Criteria

The design parameters proposed to be adopted for the transmission line are generally based on the report of standardization committee of CEA and stipulations of relevant Indian Standards. Single conductor has been considered for the design of transmission lines as per requirements of the identified system.

#### Line Configuration

The 132 kV S/C and D/C (With both circuit as well as single strung conductors) transmission lines shall have vertical configuration of phase.

#### Towers & Foundations

Self-supporting latticed bolted steel towers, fabricated from structural steel angle section shall be used. Tower components and bolts & nuts shall be hot dip galvanized.

Normally, the following four types of double circuit tower shall be used in these lines.

- i) DA type suspension towers for upto 2 degree angle of deviation.
- ii) DB type tension towers for upto 15 degree angle of deviation.
- iii) DC type tension towers for upto 30 degree angle of deviation.
- iv) DD type tension towers for upto 60 degree angle of deviation and suitable for dead end condition. These may also be used for terminal locations.

The standard extension normally used for various types of towers are as follows:

DA & DD : 3m, 6m, 9m, 18m, 25m

DB & DC : 3m, 6m, 9m

In addition to the above, special towers, for major river crossing, power line crossing and the places where the terrain is particularly different, such as approach to the sub-station, etc. shall also be used. All towers shall be designed in accordance with latest edition of IS-802 and considering necessary improvements and reinforcements evolved as per suggestions/recommendations of CEA's expert committee based on the experience of previous tower failures in the country.

Structural steel sections used in towers shall be of High Tensile (HT) steel & Mild Steel (MS) of requisite quality as per IS-2062 or equivalent International Standards.

#### Foundations

Tower Foundations are generally pad & chimney type and typically classified as Dry, Wet, Partially submerged (PS), Fully Submerged (FS), Wet Black Cotton (WBC), Sandy, Dry Fissured Rock (DFR), Wet Fissured Rock (WFR), Submerged Fissured Rock (SFR), Hard Rock etc. depending upon type of soil encountered and designed accordingly based on relevant Indian standards and CBIP guidelines. For river crossing locations & soils having poor bearing capacity, wherever required, pile/well type foundations are used.

Types of soil encountered by the transmission lines are generally mixed dry, wet, wet black cotton type in the plain terrain and dry fissured rock, wet fissured rock & hard rock in the hilly terrain. The requirements of the foundations are considered in accordance with the type of soil.

## Revetment and Benching

For hilly and undulating stretch, wherever the line is passing through, revetment and benching shall be provided as per site conditions.

### Conductors

Conventional ACSR type conductors have been considered based on system requirements as these are most common type of conductors with proven technology having low cost & easy availability.

For 132kV lines single 'Panther' ACSR conductor (30/3.00 mm Aluminium & 7/3.00mm steel) of overall diameter of 21.00 mm has been considered.

### Earthwire/OPGW

OPGW shall be used on both the lines to meet the requirements of Power System Communication. Optical Fibre technology provides an efficient telecommunication network to support their various applications requiring higher speed & bandwidth. Shielding angles of 20 deg is considered for transmission lines. For single circuit transmission lines 30 degree shielding angle shall be adopted.

### Grounding

The tower footing resistance shall be kept below 10 ohms. Pipe type or counterpoise earthing shall be used to bring the tower footing resistance down to acceptable level.

### Insulator and Hardware Fittings

The following types of insulator strings along with hardware fittings shall be used :  
132kV AC TRANSMISSION LINES WITH ACSR PANTHER CONDUCTOR

| S.No | Type of String        | *Size of Composite Insulator (Core dia x Nominal length) (mm) | Minimum Creepage Distance (mm) per unit | No. of individual Units per String (Nos.) | Electro-Mechanical Strength of Insulator Unit (kN) | Mechanical Strength of Insulator String along with Hardware Fittings (kN) |
|------|-----------------------|---------------------------------------------------------------|-----------------------------------------|-------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------|
| a)   | Single 'I' Suspension | 18 x 1450                                                     | 4495                                    | 1x1                                       | 70                                                 | 70                                                                        |

|    |                       |           |      |     |     |     |
|----|-----------------------|-----------|------|-----|-----|-----|
| b) | Double 'I' Suspension | 18 x 1450 | 4495 | 1x2 | 70  | 140 |
| c) | Single Tension        | 18 x 1595 | 4495 | 1x1 | 120 | 120 |
| d) | Double Tension        | 18 x 1595 | 4495 | 1x2 | 120 | 240 |

Item (a) and (c) are mostly used for suspension and tension towers respectively. Item (b) and (d) are used in river crossing towers and river crossing anchor towers and long valley crossing spans.

Suitable hardware fittings shall be used for attachment of the insulators with the tower at one end and also for supporting the conductors at the other end. Grading rings/arcing horn shall be used for improving corona and RIV performance as well as to improve the voltage distribution across the insulator discs.

#### Line Accessories

##### i) Mid span compression joint for conductor

Mid span compression joint suitable for conductor shall be used for joining two lengths of conductor. The minimum slipping strength of the joint after compression shall not be less than 95 % of the UTS of conductor / earthwire.

##### ii) Repair sleeve for conductor

Repair sleeve shall be used only for repairing not more than two strands broken in the outer layer of conductor. It shall be of compression type in two parts with provision of seat sliding of keeper piece.

##### iii) Vibration damper for conductor

Stockbridge vibration dampers shall be used to reduce the maximum dynamic strain caused by aeolian vibrations to a value of 150 micro-strain.

#### River Crossings

Special towers may be used for major river crossings where the span is more than 600 mtrs with anchor towers on either end of river crossing span.

Power line, Railway line, Road and P&T line crossing

The transmission lines shall be crossing power lines, railway lines roads and P&T lines for which suitable extensions of towers shall be used.

The standard extension normally used for various types of towers are as follows:

A/DA & D/DD : 3m, 6m, 9m, 18m, 25m

B/DB & C/DC : 3m, 6m, 9m

In addition to the above body extension, suitable leg/Chimney extensions shall also be provided in the hilly terrain, wherever required, to reduce the benching.

## 5. PROJECT COST ESTIMATE AND FUNDING ARRANGEMENT

### PROJECT COST ESTIMATE

5.1.1 The estimated cost of the project based on December 2016 price level is as follows:

|       |                                         | (Rs. in crores) |
|-------|-----------------------------------------|-----------------|
|       |                                         | Total cost      |
| 1.    | Transmission System & Switching Station | 50.97           |
| 2.    | Interest during Construction            | NIL             |
| TOTAL |                                         | 50.97           |

The abstract cost estimate for the scheme is given at ANNEXURE - 1.0. The break-up of the cost estimate for civil works, Transmission lines & substations are given at ANNEXURES - 1.1, 1.2 & 1.3 respectively.

The detailed cost estimates for the civil works for Transmission Lines and Substations have been given at ANNEXURES - 1.1.1, 1.1.2 and 1.1.3.

### BASIS OF COST ESTIMATE

Unit rates for 132 kV Substation Works and 132 kV transmission line works have been considered from *Schedule of Rates* (which has been prepared based on latest LOAs/Bid prices/Raw material prices) for December 2016 Price level.

The cost estimate is inclusive of Excise Duty which has been considered @ 12.5% and CST @ 2% (as funding for supply of equipment is proposed to be done through domestic borrowings/bonds/External Commercial borrowings). F&I @ 8% have been considered in the Estimate for NER area. Also, Entry Tax has been considered @ 4% in the state of Arunachal Pradesh.

#### Funding arrangement

Funding is to be decided by M/s Devi Energies.

#### Interest during Construction

Since funding is to be decided by M/s Devi Energies, IDC is not considered.

#### PROJECT OVERHEADS

The following overheads have been charged on to the cost of the transmission system as a percentage of the equipment cost:

##### For Switching station

- |    |               |       |
|----|---------------|-------|
| i) | Contingencies | 3.00% |
|----|---------------|-------|

DISCLAIMER NOTE TO DPR:

1. The consultancy for preparation of DPR for 132 KV switching station and 132 KV transmission lines in Arunachal Pradesh is a separate isolated consultancy being offered by POWERGRID as Consultant on the request of DEVI Energies Hyderabad and should not be construed in the capacity of Central Transmission Utility (CTU).
2. This consultancy has no direct relation with Connectivity/Long Term Access for Inter State Transmission System (ISTS). The Transmission System finalized with consent of regional beneficiaries as per Connectivity/Long Term Access Policy may or may not contain the Transmission System under the subject consultancy services.
3. The cost estimate does not include consultancy fees which shall be extra as per the agreement to be signed between POWERGRID & DEVI ENERGIES, HYDERABAD.

# ANNEXURES

## ANNEXURE-1.0

**ABSTRACT COST ESTIMATE (B  
A SE COST)**

**CONSTRUCTION OF 132KV SWITCHING STATION ATTENGA AND 132**

**KVS/CDIKSHI-  
TENGA SWITCHING STN AND 132KVD/CTENGA SWITCHING STN-  
NECHIPUT TRANSMISSION LINES**

**COST UPDATED TO DECEMBER 2016 PRICE LEVEL**

| Sr. No. | DESCRIPTION                                                        | AMOUNT<br>(Rs. in Crs.) |
|---------|--------------------------------------------------------------------|-------------------------|
| A       | Preliminary Survey & Soil Investigation (Annex.-1.1)               | 0.18                    |
| B       | Land acquisition for S/Stn, R&R & other Compensation (Annex. -1.1) | 0.41                    |
| C       | <b>Cost of compensation for Trans .Lines</b>                       |                         |
|         | i) Compensation towards Crop, and land                             | 6.93                    |
| D       | <b>Civil Works (Annex.1.1)</b>                                     |                         |
|         | i) Infrastructure for substations                                  | 0.33                    |
|         | ii) Non Residential Buildings                                      | 0.30                    |
|         | iii) Colony for Trans .Lines and S/stn                             | 0.00                    |
| E       | <b><u>Equipment (Supply &amp; Erection) Cost</u></b>               |                         |
|         | a) Transmission Lines (Annexure 1.1)                               | 23.27                   |
|         | b) Sub-Stations (Annex -1.2)                                       | 18.07                   |
| F       | <b>Sub Total A to E</b>                                            | <b>49.50</b>            |
| G       | Contingencies @ 3% of F                                            | 1.47                    |
| H       | <b>TOTAL COST</b>                                                  | <b>50.97</b>            |
| I       | POWER GRID CONSULTANCY FEES PLUS SERVICE TAX THEREON               | TO BE ADDED BY BDD      |
| J       | <b>TOTAL PROJECT COST INCL CONSULTANCY FEES</b>                    | <b>50.97</b>            |
| K       | Interest During Construction (IDC)                                 | NIL                     |
|         | <b>GRAND TOTAL</b>                                                 | <b>50.97</b>            |

**1.0 TAXES & DUTIES**

a) T&amp;D considered as per budget for FY 2016-17

2.0 IDC has not been considered as funding is to be decided by M/s Devi Energies.

3.0 The above cost has been prepared at Dec 2016 price level. However taxes and duties have been considered as per FY 2016-17

**ANNEXURE - 1.0**

**ABSTRACT COST ESTIMATE**  
**(BASE COST)**

**CONSTRUCTION OF 132 KV SWITCHING STATION AT TENGA AND 132 KV S/C DIKSHI –TENGA SWITCHING STN AND 132 KV D/C TENGA SWITCHING STN -NECHIPU TRANSMISSION LINES**

*(CONSULTANCY SERVICES TO DEVI ENERGIES )*

**COST UPDATED TO DECEMBER 2016 PRICE LEVEL**

| Sr. No. | DESCRIPTION                                                         | AMOUNT<br>(Rs. in Crs.) |
|---------|---------------------------------------------------------------------|-------------------------|
| A       | Preliminary Survey & Soil Investigation (Annex.- 1.1)               | 0.18                    |
| B       | Land acquisition for S/Stn, R&R & other Compensation (Annex. - 1.1) | 0.41                    |
| C       | <b>Cost of compensation for Trans. Lines</b>                        |                         |
|         | i) Compensation towards Crop, and land                              | 6.93                    |
| D       | <b>Civil Works (Annex. 1.1)</b>                                     |                         |
|         | i) Infrastructure for substations                                   | 0.33                    |
|         | ii) Non Residential Buildings                                       | 0.30                    |
|         | iii) Colony for Trans. Lines and S/stn                              | 0.00                    |
| E       | <b><u>Equipment (Supply &amp; Erection) Cost</u></b>                |                         |
|         | a) Transmission Lines (Annexure 1.1)                                | 23.27                   |
|         | b) Sub-Stations (Annex.-1.2)                                        | 18.07                   |
| F       | <b>Sub Total A to E</b>                                             | <b>49.50</b>            |
| G       | Contingencies @ 3% of F                                             | 1.47                    |
| H       | <b>TOTAL COST</b>                                                   | <b>50.97</b>            |
| I       | POWERGRID CONSULTANCY FEES PLUS SERVICE TAX THEREON                 | TO BE ADDED BY BDD      |
| J       | <b>TOTAL PROJECT COST INCL CONSULTANCY FEES</b>                     | <b>50.97</b>            |
| K       | Interest During Construction(IDC)                                   | NIL                     |
|         | <b>GRAND TOTAL</b>                                                  | <b>50.97</b>            |

**1.0 TAXES & DUTIES**

a) T&D considered as per budget for FY 2016-17

2.0 IDC has not been considered as funding is to be decided by M/s Devi Energies.

3.0 The above cost has been prepared at Dec 2016 price level. However taxes and duties have been considered as per FY 2016-17

| ANNEXURE-1.1<br>All figures in Rs.Lakhs                                                                                                                       |                                                             |                                               |                                  |                                    |                |                                  |        |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|----------------------------------|------------------------------------|----------------|----------------------------------|--------|---------------|
| ABSTRACT COST ESTIMATE                                                                                                                                        |                                                             |                                               |                                  |                                    |                |                                  |        |               |
| PRELIMINARY & GENERAL CIVIL WORKS                                                                                                                             |                                                             |                                               |                                  |                                    |                |                                  |        |               |
| PROJ: CONSTRUCTION OF 132KV SWITCHINGSTATION AT TENGA AND 132KV S/C DIKSHI-TENGA SWITCHINGSTN AND 132 KV D/C TENGA SWITCHING STN-NECHIPU TRANSMISSION LINES   |                                                             |                                               |                                  |                                    |                |                                  |        |               |
| Sl.No.                                                                                                                                                        | Line/Substation                                             | Survey&<br>Soil Investigation                 | Crop<br>and land<br>compensation | Forest<br>compensation<br>incl.NPV | Colony         | Total<br>Cost                    |        |               |
| A. Transmission Line                                                                                                                                          |                                                             |                                               |                                  |                                    |                |                                  |        |               |
| 1.0                                                                                                                                                           | 132KV S/C Dikshi-Tenga switching station transmission line  | 2.63                                          | 225.65                           | 0.00                               | 0.00           | 228.28                           |        |               |
| 2.0                                                                                                                                                           | 132KV D/C Tenga switching station-Nechipu transmission line | 5.38                                          | 468.13                           | 0.00                               | 0.00           | 473.50                           |        |               |
| Subtotal                                                                                                                                                      |                                                             | 8.00                                          | 693.79                           | 0.00                               | 0.00           | 701.78                           |        |               |
| ANNEXURE-1.1                                                                                                                                                  |                                                             |                                               |                                  |                                    |                |                                  |        |               |
| ABSTRACTCOSTESTIMATE                                                                                                                                          |                                                             |                                               |                                  |                                    |                |                                  |        |               |
| PRELIMINARY & GENERAL CIVIL WORKS                                                                                                                             |                                                             |                                               |                                  |                                    |                |                                  |        |               |
| PROJ: CONSTRUCTION OF 132KV SWITCHING STATION AT TENGA AND 132KV S/C DIKSHI-TENGA SWITCHING ST N AND 132KV D/C TENGA SWITCHING STN-NECHIPU TRANSMISSION LINES |                                                             |                                               |                                  |                                    |                |                                  |        |               |
| Sl.No.                                                                                                                                                        | Substation                                                  | Preliminary<br>Survey & Soil<br>Investigation | Land<br>Cost                     | R&R<br>Cost                        | Infrastructure | Non-<br>Residential<br>Buildings | Colony | Total<br>Cost |
| (Rs.inLakhs)                                                                                                                                                  |                                                             |                                               |                                  |                                    |                |                                  |        |               |
| B. Substations                                                                                                                                                |                                                             |                                               |                                  |                                    |                |                                  |        |               |
| 1.0                                                                                                                                                           | Establishment of 132KV switching station at Tenga           | 10.00                                         | 41.00                            |                                    | 33.00          | 30.00                            |        | 114.00        |
| Subtotal                                                                                                                                                      |                                                             | 10.00                                         | 41.00                            | 0.00                               | 33.00          | 30.00                            | 0.00   | 114.00        |

**ANNEXURE-1.1.1****DETAILS OF PRELIMINARY WORKS AND LAND & COMPENSATION  
FOR TRANSMISSION LINES****PRELIMINARY WORKS**

|                                                                                                                                                                    | LINE<br>LENGTH<br>(Km.) | RATE PER<br>KM<br>(Rupees) | AMOUNT<br>(Rs Lakhs) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------|----------------------|
| <b>Preliminary survey &amp; soil investigation:</b>                                                                                                                |                         |                            |                      |
| <b>CONSTRUCTION OF 132 KV SWITCHING STATION AT TENGA AND 132 KV S/C DIKSHI –TENGA SWITCHING STN AND 132 KV D/C TENGA SWITCHING STN -NECHIPU TRANSMISSION LINES</b> |                         |                            |                      |
| 1.0 132KV S/C Dikshi–Tenga switching station<br>Transmission line                                                                                                  | 10.5                    | 25.000                     | 2.63                 |
| 2.0 132KV D/C Tenga switching station-Nechipu<br>Transmission line                                                                                                 | 21.5                    | 25.000                     | 5.38                 |

**ANNEXURE-1.1.2****LAND & CROP COMPENSATION**

|                                                                                                                                                                    | LINE<br>LENGTH<br>(Km.) | RATE PER<br>KM<br>(Rupees) | AMOUNT<br>(Rs Lakhs) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------|----------------------|
| <b>CONSTRUCTION OF 132 KV SWITCHING STATION AT TENGA AND 132 KV S/C DIKSHI –TENGA SWITCHING STN AND 132 KV D/C TENGA SWITCHING STN -NECHIPU TRANSMISSION LINES</b> |                         |                            |                      |
| <b>132KV S/C Dikshi–Tenga switching station transmission line</b>                                                                                                  |                         |                            |                      |
| i) Cost of Crop & tree compensation                                                                                                                                | 10.50                   | 655.392                    | 66.85                |
| ii) Cost of Land compensation for tower base and ROW corridor (Detail sat<br>for Transmission line<br>ANNEXURE-<br>1.1.2(a))                                       |                         |                            | 158.80               |
| <b>Total Cost of Crop &amp; Land compensation</b>                                                                                                                  |                         |                            | <b>225.65</b>        |
| <b>132KV D/C Tenga switching station-Nechipu transmission line</b>                                                                                                 |                         |                            |                      |
| i) Cost of Crop compensation                                                                                                                                       | 21.50                   | 655.392                    | 134.35               |
| ii) Cost of Land compensation for tower base and ROW corridor (Detail sat<br>For Transmission line<br>ANNEXURE-<br>1.1.2(a))                                       |                         |                            | 333.79               |
| <b>Total Cost of Crop &amp; Land compensation</b>                                                                                                                  |                         |                            | <b>468.14</b>        |
| <b>Total Cost of compensation towards Crop &amp; Land</b>                                                                                                          |                         |                            | <b>693.79</b>        |



**ANNEXURE - 1.1.3**

**DETAILS OF CIVIL WORKS CONSIDERED FOR 132 KV SWITCHING STATION AT TENGA**

| SL. NO                                      | DESCRIPTION                              | NOS  | AREA (SQ.M.) | RATE PER SQ.M.(Rs.) | AMOUNT (RS LAKHS) (Rounded off) |
|---------------------------------------------|------------------------------------------|------|--------------|---------------------|---------------------------------|
| <b><u>PRELIMINARY WORKS</u></b>             |                                          |      |              |                     |                                 |
| 1                                           | Survey & Soil investigation              | L S  |              |                     | 10.00                           |
|                                             | PRELIMINARY WORKS                        |      |              |                     | <b>10.00</b>                    |
| <b><u>INFRASTRUCTURE FOR SUBSTATION</u></b> |                                          |      |              |                     |                                 |
| 1.                                          | Leveling / Site Surfacing                | L S  |              |                     | Included in S/S civil works     |
| 2                                           | Boundary wall / Fencing                  | L S  |              |                     | Included in S/S civil works     |
| 3.                                          | Roads & Drainage                         | L S  |              |                     | Included in S/S civil works     |
| 4.                                          | Water Supply                             | L S  |              |                     | 11.00                           |
| 5                                           | Power Supply                             | L.S. |              |                     | 16.50                           |
| 6                                           | Rain Water Harvesting                    | L S  |              |                     | 5.50                            |
|                                             | <b>TOTAL - INFRASTRUCTURE</b>            |      |              |                     | <b>33.00</b>                    |
| <b><u>NON - RESIDENTIAL BUILDINGS</u></b>   |                                          |      |              |                     |                                 |
| 1                                           | STORE (INCL ELECTRICITY) and FFPH        |      |              |                     | 25.00                           |
| 2                                           | MAIN GATE AND SECURITY HUT               |      |              |                     | Included in S/S civil works     |
| 3                                           | ADMINISTRATIVE BUILDING                  |      |              |                     | Included in S/S civil works     |
| 4                                           | EXTERNAL ELECTRIFICATION                 |      |              |                     | 5.00                            |
|                                             | <b>TOTAL - NON-RESIDENTIAL BUILDINGS</b> |      |              |                     | <b>30.00</b>                    |

## ANNEXURE 1.2

All figures in RS. Lakhs

**ABSTRACT COST ESTIMATE**  
**TRANSMISSION LINES**

**PREPARATION OF DETAILED PROJECT REPORT FOR**  
**CONSTRUCTION OF 132 KV SWITCHING STATION AT TENGGA AND 132 KV S/C DIKSHI**  
**-TENGGA SWITCHING STN AND 132 KV D/C TENGGA SWITCHING STN -NECHIPU**  
**TRANSMISSION LINES**

| WBS Element                        | CS-2016013-01-01                               | CS-2016013-01-02                        |                |
|------------------------------------|------------------------------------------------|-----------------------------------------|----------------|
|                                    |                                                |                                         | (Rs. In Lakhs) |
| WBS Desc                           | 132KV S/C Dikshi<br>Tenga Switching<br>Station | 132KV D/C Switching<br>Station- Nechipu | TOTAL          |
| Line Length (in KM)                | 10.50                                          | 21.50                                   |                |
| Wind Zone                          | 5                                              | 5                                       |                |
| Tower Steel                        | 105.90                                         | 300.12                                  | 406.03         |
| Conductor                          | 36.04                                          | 147.54                                  | 183.59         |
| Earthwire                          | 0.00                                           | 0.00                                    | 0.00           |
| Insulator                          | 6.28                                           | 23.77                                   | 30.05          |
| Hardware Fittings                  | 5.68                                           | 21.45                                   | 27.13          |
| Conductor & E'wire Accessories     | 3.56                                           | 13.69                                   | 17.25          |
| OPGW                               | 37.12                                          | 46.48                                   | 83.60          |
| <b>Sub-Total - Supply Cost</b>     | <b>194.59</b>                                  | <b>553.05</b>                           | <b>747.64</b>  |
| Freight, Insurance & Taxes         | 44.27                                          | 125.82                                  | 170.09         |
| Entry Tax                          | 9.55                                           | 27.15                                   | 36.71          |
| Erection                           | 49.44                                          | 110.36                                  | 159.80         |
| Stringing                          | 29.27                                          | 85.62                                   | 114.89         |
| Civil Works                        | 347.59                                         | 750.47                                  | 1098.06        |
| <b>Sub-Total</b>                   | <b>674.72</b>                                  | <b>1652.47</b>                          | <b>2327.19</b> |
| Equipment Cost per Km              | 64.26                                          | 76.86                                   |                |
| River crossing pile/open cast      | 0.00                                           | 0.00                                    | 0.00           |
| Total Equipment Cost               | 674.72                                         | 1652.47                                 | 2327.19        |
| Cost per Km                        | 64.26                                          | 76.86                                   |                |
| Preliminary & Gen. Civil Works     | 228.28                                         | 473.50                                  | 701.78         |
| <b>Total for Transmission Line</b> | <b>903.00</b>                                  | <b>2125.97</b>                          | <b>3028.97</b> |
| <b>Total Cost per Km</b>           | <b>86.00</b>                                   | <b>98.88</b>                            |                |

| ANNEXURE 12.1                                                     |               |                    |                                          |          |       |            |              |              |            |            |            |           |                    |
|-------------------------------------------------------------------|---------------|--------------------|------------------------------------------|----------|-------|------------|--------------|--------------|------------|------------|------------|-----------|--------------------|
| COST BREAKUP OF TRANSMISSION LINE                                 |               |                    |                                          |          |       |            |              |              |            |            |            |           |                    |
| PROJECT: CONSULTANCY SERVICES TO DEVI ENERGIES                    |               |                    |                                          |          |       |            |              |              |            |            |            |           |                    |
| TRANSMISSION LINE 132 KV S/C DIKSHI - TENGA SWITCHING STATION T/L |               |                    |                                          |          |       |            |              |              |            |            |            |           |                    |
| LINE LENGTH 10.5 KM WIND ZONE WZ 5 TERRAIN NER (Amount in Rs.)    |               |                    |                                          |          |       |            |              |              |            |            |            |           |                    |
| (50M/SEC)                                                         |               |                    |                                          |          |       |            |              |              |            |            |            |           |                    |
| Activity Description                                              | Activity Type | Component/Services | Description                              | Quantity | Unit  | Price      | Total Price  | Excise Duty  | CST        | F&I        | Entry Tax  | Ere/Civil | Total              |
| 1                                                                 | 2             | 3                  | 4                                        | 5        | 6     | 7          | 8=5x7        | 9            | 10         | 11         | 12         | 13        | 14=8+9+10+11+12+13 |
| WBSE Element : CS-2016013-01-01-01                                |               |                    |                                          |          |       |            |              |              |            |            |            |           |                    |
| FABRICATION AND SUPPLY                                            | T1            | 1000013391         | HT STEEL-NORMAL TOWER                    | 2        | MT    | 70743.00   | 141,486.00   | 17,685.75    | 3,183.44   | 11,318.88  | 6,946.96   | 0         | 180,621.03         |
| FABRICATION AND SUPPLY                                            | T1            | 1000015274         | M/S STEEL-NORMAL TOWER                   | 136.35   | MT    | 68,022.00  | 9,274,799.70 | 1,159,349.96 | 208,682.99 | 741,983.98 | 455,392.67 | 0         | 11,840,209.30      |
| FABRICATION AND SUPPLY                                            | T1            | 1000013472         | HEXAGONAL BOLT & NUTS                    | 7        | MT    | 79,963.00  | 559,741.00   | 69,967.63    | 12,594.17  | 44,779.28  | 27,483.28  | 0         | 714,565.36         |
| EARTHING OF TOWERS                                                | T1            | 1000034137         | PIPE WITH ROD TYPE EARTHING              | 10       | SET   | 4,778.75   | 47,787.50    | 5,973.44     | 1,075.22   | 3,823.00   | 2,346.37   | 0         | 61,005.52          |
| EARTHING OF TOWERS                                                | T1            | 1000010003         | COUNTERPOISE EARTHING (120M)             | 28       | EA    | 7,847.00   | 219,716.00   | 27,464.50    | 4,943.61   | 17,577.28  | 10,788.06  | 0         | 280,489.45         |
| EARTHING OF TOWERS                                                | T1            | 1000019717         | SHIELDWIRE EARTHING COUNTERPOISE TYPE    | 1        | EA    | 16,680.00  | 16,680.00    | 2,085.00     | 375.3      | 1,334.40   | 818.99     | 0         | 21,293.69          |
| TOWER ACCESSORIES                                                 | T1            | 1000032562         | DANGER PLATE-132 KV                      | 38       | EA    | 241        | 9,158.00     | 1,144.75     | 206.06     | 732.64     | 449.66     | 0         | 11,691.10          |
| TOWER ACCESSORIES                                                 | T1            | 1000015969         | NUMBER PLATE-132KV                       | 38       | EA    | 241        | 9,158.00     | 1,144.75     | 206.06     | 732.64     | 449.66     | 0         | 11,691.10          |
| TOWER ACCESSORIES                                                 | T1            | 1000017508         | PHASE PLATE (SET OF 3)                   | 38       | SET   | 233        | 8,854.00     | 1,106.75     | 199.22     | 708.32     | 434.73     | 0         | 11,303.02          |
| TOWER ACCESSORIES                                                 | T1            | 1000009119         | CIRCUIT PLATE (SET OF TWO)               | 19       | SET   | 275        | 5,225.00     | 653.13       | 117.56     | 418        | 256.55     | 0         | 6,670.24           |
| TOWER ACCESSORIES                                                 | T1            | 1000030679         | ANTI-CLIMBING DEVICES-BARBED WIRE        | 38       | SET   | 7,839.00   | 297,882.00   | 37,235.25    | 6,702.35   | 23,830.56  | 14,626.01  | 0         | 380,276.16         |
| CONDUCTOR AND EARTHWIRE                                           | T2            | 1000030861         | ACSR PANTHER CONDUCTOR (KM)              | 32       | KM    | 112,629.00 | 3,604,328.00 | 450,516.00   | 81,092.88  | 288,330.24 | 176,962.68 | 0         | 4,501,029.60       |
| INSULATOR                                                         | T4            | 1000033771         | COMPOSITE INSULATOR-132KV, 90KN (LI1595) | 261      | SET   | 2,408.00   | 628,488.00   | 78,561.00    | 14,140.98  | 50,279.04  | 30,858.76  | 0         | 802,327.78         |
| HARDWARE FITTINGS                                                 | T5            | 1000019815         | SINGLE TENSION STRING-132KV PANTHER      | 240      | SET   | 2,367.00   | 568,080.00   | 71,010.00    | 12,781.80  | 45,446.40  | 27,892.73  | 0         | 725,210.93         |
| CONDUCTOR AND E/W ACCESSORIES                                     | T6            | 1000015514         | MID SPAN COMP JOINT-ACSR PANTHER         | 21       | EA    | 605        | 12,705.00    | 1,588.13     | 285.86     | 1,016.40   | 623.82     | 0         | 16,219.20          |
| CONDUCTOR AND E/W ACCESSORIES                                     | T6            | 1000018444         | REPAIR SLEEVE-ACSR PANTHER               | 7        | EA    | 204        | 1,428.00     | 178.5        | 32.13      | 114.24     | 70.11      | 0         | 1,822.98           |
| CONDUCTOR AND E/W ACCESSORIES                                     | T6            | 1000022433         | VIBRATION DAMPER-ACSR PANTHER            | 471      | EA    | 725        | 341,475.00   | 42,684.38    | 7,683.19   | 27,318.00  | 16,766.42  | 0         | 435,926.99         |
| SURVEY                                                            | A1            | 100001243          | CHECK SURVEY                             | 10.5     | KM    | 7,498.00   | 0            | 0            | 0          | 0          | 0          | 0         | 125,966.40         |
| SURVEY                                                            | A1            | 100002672          | DETAIL SURVEY, PROFILE & TOWER SPOTTING  | 10.5     | KM    | 20,751.00  | 0            | 0            | 0          | 0          | 0          | 0         | 348,616.80         |
| SOIL INVESTIGATION                                                | A1            | 100001245          | SOIL INVESTIGATION - FISSIONED ROCK      | 7        | EA    | 31,121.00  | 0            | 0            | 0          | 0          | 0          | 0         | 348,555.20         |
| SOIL INVESTIGATION                                                | A1            | 100001246          | SOIL INVESTIGATION - HARD ROCK           | 3        | EA    | 62,749.00  | 0            | 0            | 0          | 0          | 0          | 0         | 301,195.20         |
| WORK ASSOCIATED WITH TOWER FOUNDATION                             | A6            | 100001263          | STUB-NORMAL TOWERS USING TEMPLATE        | 9        | MT    | 7,199.00   | 0            | 0            | 0          | 0          | 0          | 0         | 103,665.60         |
| WORK ASSOCIATED WITH TOWER FOUNDATION                             | A6            | 100001262          | REINFORCEMENT STEEL                      | 19       | MT    | 53,346.00  | 0            | 0            | 0          | 0          | 0          | 0         | 1,621,718.40       |
| WORK ASSOCIATED WITH TOWER FOUNDATION                             | A6            | 100001261          | LEAN CONCRETE (1:1.5:6)                  | 25       | M3    | 6,721.00   | 0            | 0            | 0          | 0          | 0          | 0         | 268,840.00         |
| WORK ASSOCIATED WITH TOWER FOUNDATION                             | A6            | 100001260          | CONCRETING (1:1.5:3)                     | 193      | M3    | 9,011.00   | 0            | 0            | 0          | 0          | 0          | 0         | 2,782,596.80       |
| WORK ASSOCIATED WITH TOWER FOUNDATION                             | A6            | 100001259          | EXCAVATION- HARD ROCK                    | 15       | M3    | 1,656.00   | 0            | 0            | 0          | 0          | 0          | 0         | 39,744.00          |
| WORK ASSOCIATED WITH TOWER FOUNDATION                             | A6            | 100001257          | EXCAVATION- DRY FISSIONED ROCK           | 941      | M3    | 734        | 0            | 0            | 0          | 0          | 0          | 0         | 1,105,110.40       |
| ERECTOR                                                           | A5            | 100001248          | NORMAL TOWER ERECTION                    | 135      | MT    | 10,852.00  | 0            | 0            | 0          | 0          | 0          | 0         | 2,344,032.00       |
| BENCHING                                                          | AA            | 100001252          | BENCHING-EXCEPT FISSIONED/HARDROCK/SANDY | 2,131    | 82 M3 | 282        | 0            | 0            | 0          | 0          | 0          | 0         | 961,874.93         |
| BENCHING                                                          | AA            | 100001253          | BENCHING- FISSIONED ROCK                 | 9,948    | 47 M3 | 657        | 0            | 0            | 0          | 0          | 0          | 0         | 10,457,831.66      |
| BENCHING                                                          | AA            | 100001254          | BENCHING- HARD ROCK                      | 2,131    | 80 M3 | 1,325.00   | 0            | 0            | 0          | 0          | 0          | 0         | 4,519,418.13       |
| INSTALLATION OF EARTHING OF TOWERS                                | A5            | 100001270          | TOWER EARTHING-COUNTERPOISE 120M         | 28       | EA    | 9,172.00   | 0            | 0            | 0          | 0          | 0          | 0         | 410,905.60         |
| INSTALLATION OF EARTHING OF TOWERS                                | A5            | 100002202          | SHIELDWIRE EARTHING-COUNTERPOISE         | 1        | EA    | 11,305.00  | 0            | 0            | 0          | 0          | 0          | 0         | 18,088.00          |
| INSTALLATION OF EARTHING OF TOWERS                                | A5            | 100004331          | PIPE TYPE INCLUDING ROD EARTHING         | 10       | SET   | 6,541.00   | 0            | 0            | 0          | 0          | 0          | 0         | 14,044.80          |
| INSTALLATION OF TOWER ACCESSORIES                                 | A5            | 100001278          | CIRCUIT PLATE (SET OF 2) INSTALLATION    | 19       | SET   | 254        | 0            | 0            | 0          | 0          | 0          | 0         | 14,044.80          |
| INSTALLATION OF TOWER ACCESSORIES                                 | A5            | 100001277          | ANTI-CLIMBING DEVICES INSTALLATION       | 38       | EA    | 2,690.00   | 0            | 0            | 0          | 0          | 0          | 0         | 163,552.00         |
| INSTALLATION OF TOWER ACCESSORIES                                 | A5            | 100001276          | PHASE PLATE (SET OF 3) INSTALLATION      | 38       | SET   | 231        | 0            | 0            | 0          | 0          | 0          | 0         | 104,656.00         |
| INSTALLATION OF TOWER ACCESSORIES                                 | A5            | 100001275          | NUMBER PLATE INSTALLATION                | 38       | EA    | 231        | 0            | 0            | 0          | 0          | 0          | 0         | 7,721.60           |
| INSTALLATION OF TOWER ACCESSORIES                                 | A5            | 100001274          | DANGER PLATE INSTALLATION                | 38       | EA    | 231        | 0            | 0            | 0          | 0          | 0          | 0         | 163,552.00         |
| PROTECTION OF TOWER FOOTING                                       | AB            | 100001264          | TWR FOOTING PROT-RUBBLE STONE            | 1,928    | 00 M3 | 3,717.00   | 0            | 0            | 0          | 0          | 0          | 0         | 14,044.80          |
| PROTECTION OF TOWER FOOTING                                       | AB            | 100001267          | TWR FOOTING PROT-M15 CONCRETE FOR COVER  | 16       | M3    | 7,991.00   | 0            | 0            | 0          | 0          | 0          | 0         | 11,466,201.60      |
| PROTECTION OF TOWER FOOTING                                       | AB            | 100001268          | TWR FOOTING PROT-BACKFILLING/GAP LEVEL   | 3,780    | 00 M3 | 203        | 0            | 0            | 0          | 0          | 0          | 0         | 204,569.60         |
| STRINGING                                                         | AC            | 1000033741         | STRINGING-132KV ACS/C-PANTHER & OPGW     | 10.5     | KM    | 174,229.00 | 0            | 0            | 0          | 0          | 0          | 0         | 1,227,744.00       |
|                                                                   |               |                    |                                          |          |       |            |              |              |            |            |            |           | 2,927,047.20       |

| ANNEXURE 1.2.1                          |               |                                                 |                                          |          |                     |            |               |              |            |              |                 |               |               |    |    |                         |
|-----------------------------------------|---------------|-------------------------------------------------|------------------------------------------|----------|---------------------|------------|---------------|--------------|------------|--------------|-----------------|---------------|---------------|----|----|-------------------------|
| COST BREAKUP OF TRANSMISSION LINE       |               |                                                 |                                          |          |                     |            |               |              |            |              |                 |               |               |    |    |                         |
| PROJECT:                                |               | CONSULTANCY SERVICES TO DEVI ENERGIES           |                                          |          | WIND ZONE WZ 5      |            |               | TERRAIN      |            |              | NER             |               |               |    |    |                         |
| TRANSMISSION LINE                       |               | 132 KV S/C DIKSHI - TENGA SWITCHING STATION T/L |                                          |          | LINE LENGTH 10.5 KM |            |               | (50M/SEC)    |            |              | (Amount in Rs.) |               |               |    |    |                         |
| Activity Description                    | Activity Type | Component/S<br>enclaves                         | Description                              | Quantity | Unit                | Price      | Total Price   | Excise Duty  | CST        | F&I          | Entry Tax       | Ere/Civil     | Total         |    |    |                         |
|                                         |               |                                                 |                                          | 2        | 3                   | 4          | 5             | 6            | 7          | 8=5x7        | 9               | 10            | 11            | 12 | 13 | 14=8+9+10+11<br>1+12+13 |
| Supply-OPGW Cable & associated HW       | T8            | 1000030947                                      | 24F OPGW-WITH STEEL TUBE DESIGN          | 10.5 KM  |                     | 140,195.00 | 1,472,047.50  | 184,005.94   | 33,121.07  | 117,763.80   | 72,277.53       |               | 1,879,215.84  |    |    |                         |
| Supply-OPGW Cable & associated HW       | T8            | 1000010558                                      | DEAD END TENSION CLAMP-24 FIBRE OPGW     | 2 EA     |                     | 3,637.00   | 7,254.00      | 906.75       | 163.22     | 580.32       | 356.17          |               | 9,260.46      |    |    |                         |
| Supply-OPGW Cable & associated HW       | T8            | 1000031039                                      | TENSION ASSEMBLY SPLICING-24F OPGW       | 4 SET    |                     | 7,372.00   | 29,488.00     | 3,686.00     | 663.48     | 2,359.04     | 1,447.86        |               | 37,644.38     |    |    |                         |
| Supply-OPGW Cable & associated HW       | T8            | 1000017489                                      | PASSING TENSION CLAMP-24 FIBRE OPGW      | 34 EA    |                     | 7,254.00   | 246,636.00    | 30,829.50    | 5,549.31   | 19,730.88    | 12,109.83       |               | 314,855.52    |    |    |                         |
| Supply-OPGW Cable & associated HW       | T8            | 1000022417                                      | VIBRATION DAMPER-24 FIBRE OPGW           | 140 EA   |                     | 859        | 120,260.00    | 15,032.50    | 2,705.85   | 9,620.80     | 5,904.77        |               | 153,523.92    |    |    |                         |
| Supply-OPGW Cable & associated HW       | T8            | 1000010817                                      | DOWN LEAD CLAMP ASSY-24 FIBRE OPGW       | 128 EA   |                     | 387        | 49,536.00     | 6,192.00     | 1,114.56   | 3,962.88     | 2,432.22        |               | 63,237.66     |    |    |                         |
| Supply-OPGW Cable & associated HW       | T8            | 1000014198                                      | JOINT BOX-24 FIBRE OPGW                  | 4 EA     |                     | 10,964.00  | 43,856.00     | 5,482.00     | 986.76     | 3,508.48     | 2,153.33        |               | 55,985.57     |    |    |                         |
| Supply-OPGW Cable & associated HW       | T8            | 1000037545                                      | 24F IDWSM/J APPROACH CABLE               | 2 KM     |                     | 123,654.00 | 123,654.00    | 15,456.75    | 2,782.22   | 9,892.32     | 6,071.41        |               | 157,856.70    |    |    |                         |
| Supply-OPGW Cable & associated HW       | T8            | 1000013927                                      | INSTALLATION HARDWARE SET FOR ABOVE 24 F | 2 SET    |                     | 225,111.00 | 450,222.00    | 56,277.75    | 10,130.00  | 36,017.76    | 22,105.90       |               | 574,753.41    |    |    |                         |
| Installation-OPGW Cable & associated HW | AI            | 1000022882                                      | SERVICE APPROACH CABLING: 24 FIBRE (KM)  | 2 KM     |                     | 0          | 0             | 0            | 0          | 0            | 0               |               | 0             |    |    |                         |
| Installation-OPGW Cable & associated HW | AI            | 170000265                                       | SERVICE OH 24 F JOINT BOX                | 4 EA     |                     | 115,371.00 | 0             | 0            | 0          | 0            | 0               |               | 369,187.20    |    |    |                         |
| Installation-OPGW Cable & associated HW | AI            | 170000356                                       | SERVICE FODP: INDOOR TYPE 2: 96 F        | 1 EA     |                     | 33,341.00  | 0             | 0            | 0          | 0            | 0               |               | 213,382.40    |    |    |                         |
| Spares-OPGW & associated HW             | T8            | 1000030947                                      | 24F OPGW-WITH STEEL TUBE DESIGN          | 5 KM     |                     | 140,195.00 | 700,975.00    | 87,621.88    | 15,771.94  | 56,078.00    | 34,417.87       |               | 146,376.00    |    |    |                         |
| Spares-OPGW & associated HW             | T8            | 1000010558                                      | DEAD END TENSION CLAMP-24 FIBRE OPGW     | 2 EA     |                     | 3,637.00   | 7,254.00      | 906.75       | 163.22     | 580.32       | 356.17          |               | 9,260.46      |    |    |                         |
| Spares-OPGW & associated HW             | T8            | 1000031039                                      | TENSION ASSEMBLY SPLICING-24F OPGW       | 2 SET    |                     | 7,372.00   | 14,744.00     | 1,843.00     | 331.74     | 1,179.52     | 723.93          |               | 18,822.19     |    |    |                         |
| Spares-OPGW & associated HW             | T8            | 1000017489                                      | PASSING TENSION CLAMP-24 FIBRE OPGW      | 15 EA    |                     | 7,254.00   | 108,810.00    | 13,601.25    | 2,448.23   | 8,704.80     | 5,342.57        |               | 138,906.85    |    |    |                         |
| Spares-OPGW & associated HW             | T8            | 1000022417                                      | VIBRATION DAMPER-24 FIBRE OPGW           | 67 EA    |                     | 859        | 57,593.00     | 7,194.13     | 1,294.94   | 4,604.24     | 2,825.85        |               | 73,472.16     |    |    |                         |
| Spares-OPGW & associated HW             | T8            | 1000010817                                      | DOWN LEAD CLAMP ASSY-24 FIBRE OPGW       | 84 EA    |                     | 387        | 32,508.00     | 4,063.50     | 731.43     | 2,600.64     | 1,596.14        |               | 41,499.71     |    |    |                         |
| Spares-OPGW & associated HW             | T8            | 1000014198                                      | JOINT BOX-24 FIBRE OPGW                  | 2 EA     |                     | 10,964.00  | 21,928.00     | 2,741.00     | 493.38     | 1,754.24     | 1,076.66        |               | 27,993.28     |    |    |                         |
| Spares-OPGW & associated HW             | T8            | 1000037545                                      | 24F IDWSM/J APPROACH CABLE               | 1 KM     |                     | 225,111.00 | 225,111.00    | 28,138.88    | 5,065.00   | 18,008.88    | 11,052.95       |               | 287,376.70    |    |    |                         |
| Spares-OPGW & associated HW             | T8            | 1000013927                                      | INSTALLATION HARDWARE SET FOR ABOVE 24 F | 1 SET    |                     | 0          | 0             | 0            | 0          | 0            | 0               |               | 0             |    |    |                         |
| GRAND TOTAL                             |               |                                                 |                                          |          |                     |            | 19,458,627.70 | 2,432,328.50 | 437,819.17 | 1,556,690.22 | 955,418.62      | 42,630,731.12 | 67,471,615.24 |    |    |                         |

| COST BREAKUP OF TRANSMISSION LINE                        |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
|----------------------------------------------------------|---------------|-------------|-----------------------------------------|----------|------|------------|---------------|--------------|------------|--------------|------------|-----------|---------------|
| ANNEXURE 1.2.2                                           |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| CONSULTANCY SERVICES TO DEVI ENERGIES                    |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| 132 KV D/C SWITCHING STATION - NECHIPU TRANSMISSION LINE |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| TERRAIN                                                  |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| WZ 5                                                     |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| LINE LENGTH 21.5 KM                                      |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| (50M/SEC)                                                |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| NER                                                      |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| WIND ZONE                                                |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| Excise Duty                                              |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| F&I                                                      |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| Entry Tax                                                |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| Total                                                    |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| 14=8+9+10+11+12+13                                       |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| WBS Element : OS-2016013-01-02-01                        |               |             |                                         |          |      |            |               |              |            |              |            |           |               |
| Activity Description                                     | Activity Type | Component/S | Description                             | Quantity | Unit | Price      | Total Price   | Excise Duty  | CST        | F&I          | Entry Tax  | Ere/Civil | Total         |
| FABRICATION AND SUPPLY                                   | T1            | 1000013391  | HT STEEL-NORMAL TOWER                   | 123.22   | MT   | 70,743.00  | 8,716,952.46  | 1,089,619.06 | 196,131.43 | 697,356.20   | 428,002.37 |           | 11,128,061.51 |
| FABRICATION AND SUPPLY                                   | T1            | 1000015274  | MS STEEL-NORMAL TOWER                   | 269.67   | MT   | 68,022.00  | 18,343,492.74 | 2,292,936.59 | 412,728.59 | 1,467,479.42 | 900,665.49 |           | 23,417,302.83 |
| EARTH-ING OF TOWERS                                      | T1            | 1000013472  | HEXAGONAL BOLT & NUTS                   | 21.2     | MT   | 79,963.00  | 1,695,215.60  | 211,901.95   | 38,142.35  | 135,617.25   | 83,235.09  |           | 2,164,112.24  |
| EARTH-ING OF TOWERS                                      | T1            | 1000010003  | COUNTERPOISE EARTHING (120MM)           | 64       | EA   | 7,847.00   | 502,208.00    | 62,776.00    | 11,299.68  | 40,176.64    | 24,658.41  |           | 641,118.73    |
| EARTH-ING OF TOWERS                                      | T1            | 1000034137  | PIPE WITH ROD TYPE EARTHING             | 9        | SET  | 4,778.75   | 43,008.75     | 5,376.09     | 967.7      | 3,440.70     | 2,111.73   |           | 54,904.97     |
| TOWER ACCESSORIES                                        | T1            | 1000019717  | SHIELDWIRE EARTHING COUNTERPOISE TYPE   | 3        | EA   | 16,680.00  | 50,040.00     | 6,255.00     | 1,125.90   | 4,003.20     | 2,456.96   |           | 63,681.06     |
| TOWER ACCESSORIES                                        | T1            | 1000023562  | DANGER PLATE-132 KV                     | 73       | EA   | 241        | 17,593.00     | 2,199.13     | 395.84     | 1,407.44     | 863.82     |           | 22,459.22     |
| TOWER ACCESSORIES                                        | T1            | 1000015969  | NUMBER PLATE (SET OF 3)                 | 146      | SET  | 233        | 34,018.00     | 4,252.25     | 765.41     | 1,407.44     | 863.82     |           | 22,459.22     |
| TOWER ACCESSORIES                                        | T1            | 1000017508  | PHASE PLATE (SET OF 3)                  | 73       | EA   | 375        | 30,075.00     | 2,509.38     | 451.69     | 1,606.00     | 985.68     |           | 43,427.38     |
| CONDUCTOR AND EARTHWIRE                                  | T1            | 1000009119  | CIRCUIT PLATE (SET OF TWO)              | 73       | SET  | 7,839.00   | 572,247.00    | 71,530.88    | 12,875.56  | 45,779.76    | 28,097.33  |           | 25,627.75     |
| INSULATOR                                                | T2            | 1000030861  | ANTI-CLIMBING DEVICES-BARBED WIRE       | 131      | KM   | 112,629.00 | 14,754,369.00 | 1,844,299.88 | 331,973.98 | 1,180,351.92 | 724,440.99 |           | 730,330.52    |
| HARDWARE FITTINGS                                        | T4            | 1000033771  | ACSR PANTHER CONDUCTOR (KM)             | 987      | SET  | 2,408.00   | 2,376,696.00  | 297,087.00   | 53,475.66  | 190,135.68   | 116,695.77 |           | 18,835,465.76 |
| CONDUCTOR ACCESSORIES                                    | T5            | 1000019815  | COMPOSITE INSULATOR-132KV, 90KN (11595  | 906      | SET  | 2,367.00   | 2,144,502.00  | 268,062.75   | 48,251.30  | 171,560.16   | 105,395.05 |           | 3,034,090.11  |
| CONDUCTOR ACCESSORIES                                    | T6            | 1000015514  | SINGLE TENSION STRING-132KV PANTHER     | 83       | EA   | 605        | 50,215.00     | 6,276.88     | 1,129.84   | 4,017.20     | 2,465.56   |           | 2,737,671.25  |
| CONDUCTOR ACCESSORIES                                    | T6            | 1000018444  | REPAIR SLEEVE-ACSR PANTHER              | 26       | EA   | 204        | 5,304.00      | 663          | 119.34     | 424.32       | 260.43     |           | 64,104.47     |
| CONDUCTOR ACCESSORIES                                    | T6            | 1000022432  | VIBRATION DAMPER-ACSR PANTHER           | 1,812.00 | EA   | 725        | 1,313,700.00  | 164,212.50   | 29,558.25  | 105,096.00   | 64,502.67  |           | 6,771.09      |
| SURVEY                                                   | A1            | 100001243   | CHECK SURVEY                            | 21.5     | KM   | 7,498.00   | 0             | 0            | 0          | 0            | 0          |           | 1,677,069.42  |
| SOIL INVESTIGATION                                       | A1            | 100002672   | DETAIL SURVEY, PROFILE & TOWER SPOTTING | 21.5     | KM   | 20,751.00  | 0             | 0            | 0          | 0            | 0          |           | 257,931.20    |
| SOIL INVESTIGATION                                       | A1            | 100001244   | SOIL INVEST EXCEPT FISSURED/HARD ROCK   | 4        | EA   | 18,639.00  | 0             | 0            | 0          | 0            | 0          |           | 357,931.20    |
| SOIL INVESTIGATION                                       | A1            | 100001245   | SOIL INVESTIGATION - FISSURED ROCK      | 5        | EA   | 31,121.00  | 0             | 0            | 0          | 0            | 0          |           | 713,834.40    |
| SOIL INVESTIGATION                                       | A6            | 100001246   | SOIL INVESTIGATION - HARD ROCK          | 4        | EA   | 63,749.00  | 0             | 0            | 0          | 0            | 0          |           | 119,289.60    |
| WORK ASSOCIATED WITH TOWER FOUNDATIO                     | A6            | 100001263   | STUB-NORMAL TOWERS USING TEMPLATE       | 23       | MT   | 7,199.00   | 0             | 0            | 0          | 0            | 0          |           | 248,968.00    |
| WORK ASSOCIATED WITH TOWER FOUNDATIO                     | A6            | 100001262   | REINFORCEMENT STEEL                     | 74       | MT   | 53,346.00  | 0             | 0            | 0          | 0            | 0          |           | 401,593.60    |
| WORK ASSOCIATED WITH TOWER FOUNDATIO                     | A6            | 100001261   | LEAN CONCRETE (1:3:6)                   | 128      | M3   | 6,721.00   | 0             | 0            | 0          | 0            | 0          |           | 401,593.60    |
| WORK ASSOCIATED WITH TOWER FOUNDATIO                     | A6            | 100001260   | CONCRETING (1:1.5:3)                    | 968      | M3   | 9,011.00   | 0             | 0            | 0          | 0            | 0          |           | 364,933.20    |
| WORK ASSOCIATED WITH TOWER FOUNDATIO                     | A6            | 100001259   | EXCAVATION - HARD ROCK                  | 17       | M3   | 1,556.00   | 0             | 0            | 0          | 0            | 0          |           | 6,316,166.40  |
| WORK ASSOCIATED WITH TOWER FOUNDATIO                     | A6            | 100001258   | EXCAVATION - WET FISSURED ROCK          | 215      | M3   | 747        | 0             | 0            | 0          | 0            | 0          |           | 1,376,460.80  |
| WORK ASSOCIATED WITH TOWER FOUNDATIO                     | A6            | 100001257   | EXCAVATION - DRY FISSURED ROCK          | 4,018.00 | M3   | 734        | 0             | 0            | 0          | 0            | 0          |           | 13,956,236.80 |
| WORK ASSOCIATED WITH TOWER FOUNDATIO                     | A6            | 100001256   | EXCAVATION - WET SOIL                   | 1,983.00 | M3   | 240        | 0             | 0            | 0          | 0            | 0          |           | 45,043.20     |
| WORK ASSOCIATED WITH TOWER FOUNDATIO                     | A6            | 100001255   | EXCAVATION - DRY SOIL                   | 466      | M3   | 214        | 0             | 0            | 0          | 0            | 0          |           | 256,968.00    |
| ERECTOR                                                  | A5            | 100001248   | NORMAL TOWER ERECTION                   | 387      | MT   | 10,852.00  | 0             | 0            | 0          | 0            | 0          |           | 356,968.00    |
| INSTALLATION OF EARTHING OF TOWERS                       | A5            | 100001270   | TOWER EARTHING-COUNTERPOISE 120M        | 64       | EA   | 9,172.00   | 0             | 0            | 0          | 0            | 0          |           | 4,718,739.20  |
| INSTALLATION OF EARTHING OF TOWERS                       | A5            | 100002203   | SHIELDWIRE EARTHING-COUNTERPOISE        | 3        | EA   | 11,305.00  | 0             | 0            | 0          | 0            | 0          |           | 761,472.00    |
| INSTALLATION OF EARTHING OF TOWERS                       | A5            | 100004331   | PIPE TYPE INCLUDING ROD EARTHING        | 9        | SET  | 6,541.00   | 0             | 0            | 0          | 0            | 0          |           | 159,558.40    |
| INSTALLATION OF TOWER ACCESSORIES                        | A5            | 100001274   | DANGER PLATE INSTALLATION               | 73       | EA   | 231        | 0             | 0            | 0          | 0            | 0          |           | 6,719,558.40  |
| INSTALLATION OF TOWER ACCESSORIES                        | A5            | 100001275   | NUMBER PLATE INSTALLATION               | 73       | EA   | 231        | 0             | 0            | 0          | 0            | 0          |           | 939,212.80    |
| INSTALLATION OF TOWER ACCESSORIES                        | A5            | 100001276   | PHASE PLATE (SET OF 3) INSTALLATION     | 146      | SET  | 231        | 0             | 0            | 0          | 0            | 0          |           | 54,264.00     |
| INSTALLATION OF TOWER ACCESSORIES                        | A5            | 100001277   | ANTI-CLIMBING DEVICES INSTALLATION      | 73       | EA   | 2,690.00   | 0             | 0            | 0          | 0            | 0          |           | 94,190.40     |
| INSTALLATION OF TOWER ACCESSORIES                        | A5            | 100001278   | CIRCUIT PLATE (SET OF 2) INSTALLATION   | 73       | SET  | 254        | 0             | 0            | 0          | 0            | 0          |           | 314,192.00    |
| STRINGING                                                | AC            | 100003717   | STRINGING-132KV AC D/C PANTHER & OPG    | 215      | KM   | 248,898.00 | 0             | 0            | 0          | 0            | 0          |           | 29,667.20     |
| BENCH'NG                                                 | AA            | 100001152   | BENCHING EXCEPT FISSURED/HARD ROCK/SA   | 5,349.00 | M3   | 282        | 0             | 0            | 0          | 0            | 0          |           | 8,562,091.20  |
| BENCH'NG                                                 | AA            | 100001353   | BENCHING - FISSURED ROCK                | 24,963   | M3   | 657        | 0             | 0            | 0          | 0            | 0          |           | 2,413,468.80  |
| PROTECTION OF TOWER FOOTING                              | AB            | 100001364   | TWR FOOTING PROT-RUBBLE STONE           | 1,056.00 | M3   | 3,375.00   | 0             | 0            | 0          | 0            | 0          |           | 26,241,589.15 |
| PROTECTION OF TOWER FOOTING                              | AB            | 100001367   | TWR FOOTING PROT-M15 CONCRETE FOR CO    | 13       | M3   | 7,991.00   | 0             | 0            | 0          | 0            | 0          |           | 11,340,537.20 |
| PROTECTION OF TOWER FOOTING                              | AB            | 100001268   | TWR FOOTING PROT-BACKFILLING/GAP LEVE   | 2,307    | M3   | 203        | 0             | 0            | 0          | 0            | 0          |           | 6,280,243.20  |
|                                                          |               |             |                                         |          |      |            |               |              |            |              |            |           | 166,212.80    |
|                                                          |               |             |                                         |          |      |            |               |              |            |              |            |           | 749,313.60    |

| COST BREAKUP OF TRANSMISSION LINE       |             |                                                          |                                         |         |            |                |              |              |              |              |                |                | ANNEXURE 1.2.2     |
|-----------------------------------------|-------------|----------------------------------------------------------|-----------------------------------------|---------|------------|----------------|--------------|--------------|--------------|--------------|----------------|----------------|--------------------|
| PROJ                                    |             | CONSULTANCY SERVICES TO DEVI ENERGIES                    |                                         |         |            |                |              |              |              |              |                |                |                    |
| TRANSMISSION LINE                       |             | 132 KV DIC SWITCHING STATION - NECHIPU TRANSMISSION LINE |                                         |         |            |                |              |              |              |              |                |                |                    |
|                                         |             | LINE LENGTH 21.5 KM                                      |                                         |         |            | WIND ZONE WZ 5 |              |              |              | TERRAIN      |                | NER            |                    |
|                                         |             | (50M/SEC)                                                |                                         |         |            |                |              |              |              |              |                |                |                    |
| Activity Description                    | Component/S | Description                                              | Quantity                                | Unit    | Price      | Total Price    | Excise Duty  | CST          | F&I          | Entry Tax    | Ere/Civil      | Total          |                    |
| 1                                       | 2           | 3                                                        | 4                                       | 5       | 6          | 7              | 8=5x7        | 9            | 10           | 11           | 12             | 13             | 14=8+9+10+11+12+13 |
| WBS Element : CS-2016013-01-02-01       |             |                                                          |                                         |         |            |                |              |              |              |              |                |                | 2+13               |
| Supply-OPGW Cable & associated HW       | T8          | 1000030947                                               | 24F OPGW-WITH STEEL TUBE DESIGN         | 21.5 KM | 140,195.00 | 3,014,192.50   | 376,774.06   | 67,819.33    | 241,135.40   | 147,996.85   | 0              | 3,847,918.15   |                    |
| Supply-OPGW Cable & associated HW       | T8          | 1000010558                                               | DEAD END TENSION CLAMP-24 FIBRE OPGW    | 2 EA    | 3,627.00   | 7,254.00       | 906.75       | 163.22       | 580.32       | 356.17       | 0              | 9,160.46       |                    |
| Supply-OPGW Cable & associated HW       | T8          | 1000031039                                               | TENSION ASSEMBLY SPLICING-24F OPGW      | 7 SET   | 7,372.00   | 51,604.00      | 6,450.50     | 1,161.09     | 4,128.32     | 2,533.76     | 0              | 65,877.67      |                    |
| Supply-OPGW Cable & associated HW       | T8          | 1000017489                                               | PASSING TENSION CLAMP-24 FIBRE OPGW     | 66 EA   | 7,254.00   | 478,764.00     | 59,845.50    | 10,772.19    | 38,301.12    | 23,507.31    | 0              | 611,190.12     |                    |
| Supply-OPGW Cable & associated HW       | T8          | 1000022417                                               | VIBRATION DAMPER-24 FIBRE OPGW          | 287 EA  | 859        | 246,533.00     | 30,816.63    | 5,546.99     | 19,722.64    | 12,104.77    | 0              | 314,724.03     |                    |
| Supply-OPGW Cable & associated HW       | T8          | 1000010817                                               | DOWN LEAD CLAMP ASSY-24 FIBRE OPGW      | 194 EA  | 387        | 75,078.00      | 9,384.75     | 1,689.26     | 6,006.24     | 3,686.33     | 0              | 95,844.57      |                    |
| Supply-OPGW Cable & associated HW       | T8          | 1000014198                                               | JOINT BOX-24 FIBRE OPGW                 | 7 EA    | 10,964.00  | 76,748.00      | 9,593.50     | 1,726.83     | 6,139.84     | 3,768.33     | 0              | 97,976.50      |                    |
| Supply-OPGW Cable & associated HW       | T8          | 1000023471                                               | OPGW FODP, INDOOR, 96F                  | 2 EA    | 123,654.00 | 247,308.00     | 30,913.50    | 5,564.43     | 19,784.64    | 12,142.82    | 0              | 315,713.39     |                    |
| Supply-OPGW Cable & associated HW       | T8          | 1000037545                                               | 24F (DWSM) APPROACH CABLE               | 2 KM    | 225,111.00 | 450,222.00     | 56,277.75    | 10,130.00    | 36,017.76    | 22,105.90    | 0              | 574,753.41     |                    |
| Supply-OPGW Cable & associated HW       | T8          | 1000013927                                               | INSTALLATION HARDWARE SET FOR ABOVE 2   | 2 SET   | 0          | 0              | 0            | 0            | 0            | 0            | 0              | 0              |                    |
| Installation-OPGW Cable & associated HW | AI          | 100002882                                                | SERVICE APPROACH CABLING: 24 FIBRE (KM) | 2 KM    | 115,371.00 | 0              | 0            | 0            | 0            | 0            | 0              | 0              |                    |
| Installation-OPGW Cable & associated HW | AI          | 170000265                                                | SERVICE OH 24 F JOINT BOX               | 7 EA    | 33,341.00  | 0              | 0            | 0            | 0            | 0            | 0              | 0              |                    |
| Installation-OPGW Cable & associated HW | AI          | 170000356                                                | SERVICE FODP: INDOOR TYPE 2, 96 F       | 2 EA    | 91,485.00  | 0              | 0            | 0            | 0            | 0            | 0              | 0              |                    |
| TOTAL                                   |             |                                                          |                                         |         |            | 55,304,963.05  | 6,913,120.41 | 1,244,361.70 | 4,424,397.05 | 2,715,473.69 | 94,645,007.15  | 165,247,322.98 |                    |
| GRAND TOTAL FOR TRANSMISSION LINES      |             |                                                          |                                         |         |            | 74,763,590.75  | 9,345,448.91 | 1,682,180.87 | 5,981,087.27 | 3,670,892.31 | 137,275,738.27 | 232,718,938.22 |                    |

**ABSTRACT COST ESTIMATE****SUBSTATIONS**

All figures in Rs. Lakhs

CONSTRUCTION OF 132 KV SWITCHING STATION AT TENGA AND 132 KV S/C DIKSHI –TENGA SWITCHING STN AND 132 KV D/C TENGA SWITCHING STN -NECHIPU TRANSMISSION LINES

|    | WBS Element                    | CS-2016013-02-01                  |                  |
|----|--------------------------------|-----------------------------------|------------------|
|    | Description                    | 132 KV SWITCHING STATION AT TENGA | TOTAL            |
| 1  | HVDC Equipment                 | 0                                 |                  |
| 2  | Transformer                    | 11.5776                           | 11.5776          |
| 3  | Reactor                        | 0                                 | 0                |
| 4  | 765 KV GIS Equipment           | 0                                 | 0                |
| 5  | 765 KV AIS Equipment           | 0                                 | 0                |
|    | a- Circuit Breaker             | 0                                 | 0                |
|    | b- Isolator                    | 0                                 | 0                |
|    | c- Current Transformer         | 0                                 | 0                |
|    | d- Capacitive Voltage Transfor | 0                                 | 0                |
|    | e- Lightning Arrestor          | 0                                 | 0                |
| 6  | 400 KV GIS Equipment           | 0                                 | 0                |
| 7  | 400 KV AIS Equipment           | 0                                 | 0                |
|    | a- Circuit Breaker             | 0                                 | 0                |
|    | b- Isolator                    | 0                                 | 0                |
|    | c- Current Transformer         | 0                                 | 0                |
|    | d- Capacitive Voltage Transfo  | 0                                 | 0                |
|    | e- Lightning Arrestor          | 0                                 | 0                |
| 8  | 220 KV GIS Equipment           | 0                                 | 0                |
| 9  | 220 KV AIS Equipment           | 0                                 | 0                |
|    | a- Circuit Breaker             | 0                                 | 0                |
|    | b- Isolator                    | 0                                 | 0                |
|    | c- Current Transformer         | 0                                 | 0                |
|    | c- Capacitive Voltage Transfor | 0                                 | 0                |
|    | e- Lightning Arrestor          | 0                                 | 0                |
| 10 | 132 KV GIS Equipment           | 0                                 | 0                |
| 11 | 132 KV AIS Equipment           | 145.0204                          | 145.0204         |
|    | a- Circuit Breaker             | 50.0825                           | 50.0825          |
|    | b- Isolator                    | 31.8596                           | 31.8596          |
|    | c- Current Transformer         | 29.683                            | 29.683           |
|    | d- Capacitive Voltage Transfor | 25.2198                           | 25.2198          |
|    | e- Lightning Arrestor          | 8.1756                            | 8.1756           |
| 12 | 72.5 KV AIS Equipment          | 0                                 | 0                |
| 13 | 33 KV AIS Euiipment            | 0                                 | 0                |
| 14 | 72.5 KV GIS Equipment          | 0                                 | 0                |
| 15 | 33 KV GIS Euiipment            | 0                                 | 0                |
| 16 | Control and Relay Panels       | 84.4032                           | 84.4032          |
| 17 | PLCC Equipment                 | 19.4519                           | 19.4519          |
| 18 | Voice and Data Connectivity    | 0                                 | 0                |
| 19 | Switchyard Erection            | 1153.642                          | 1153.642         |
|    | a- Equipment Structure         | 156.1412                          | 156.1412         |
|    | b- Other Equipment (Busbar mat | 34.1612                           | 34.1612          |
|    | c- Equipment Civil Works       | 934.5024                          | 934.5024         |
|    | d- Erection                    | 28.8373                           | 28.8373          |
| 20 | Substation Auxillaries         | 331.1025                          | 331.1025         |
| 21 | Substation Spare               | 61.7565                           | 61.7565          |
|    | <b>SUBSTATION TOTAL</b>        | <b>1806.9541</b>                  | <b>1806.9541</b> |
| 22 | Custom Duty (Plus 2 % Handlin  | 0                                 | 0                |
| 23 | Overheads Payable to SEB       | 0                                 | 0                |
| 24 | Preliminary and General civil  | 114                               | 114              |
|    | <b>Grand Total</b>             | <b>1920.9541</b>                  | <b>1920.9541</b> |

COST BREAKUP OF TRANSMISSION LINE

PROJ TRANSMISSION LINE CONSULTANCY SERVICES TO DEVI ENERGIES 132 KV SWITCHING STATION AT TENGA

ANNEXURE 1.3.1  
All figures in RS.

| Activity Description           | Activity Type | Component/Services | Description                                | Quantity | Unit | Price        | Total Price  | Excise Duty | CST       | F&I        | Entry Tax  | Ere/Civil | Total              |
|--------------------------------|---------------|--------------------|--------------------------------------------|----------|------|--------------|--------------|-------------|-----------|------------|------------|-----------|--------------------|
|                                |               |                    |                                            |          |      |              |              |             |           |            |            |           |                    |
| 1                              | 2             | 3                  | 4                                          | 5        | 6    | 7            | 8=5x7        | 9           | 10        | 11         | 12         | 13        | 14=8+9+10+11+12+13 |
| WBS Element : CS-2016013-02-01 |               |                    |                                            |          |      |              |              |             |           |            |            |           |                    |
| LT Transformer                 | S1            | 1000031070         | 100KVA, 11/0.433KV, 3PH TRANSFORMER        | 1        | TA   | 906,911.00   | 906,911.00   | 113,363.88  | 20,405.50 | 72,552.88  | 44,529.33  | 0         | 1,157,752.58       |
| 145KV Equipments               | S4            | 1000028343         | 145KV, 1250A, 31.5KA, CB, 1-PH/3 PH A/R    | 3        | EA   | 1,307,705.00 | 3,923,115.00 | 490,389.38  | 88,270.09 | 313,849.20 | 197,621.95 | 0         | 5,008,748.61       |
| 145KV Equipments               | S4            | 1000000977         | 145KV, 600A, 31.5KA, 1-PH CI-120% RATING   | 9        | FA   | 258,331.00   | 2,325,159.00 | 270,644.88  | 52,316.08 | 186,012.72 | 114,165.31 | 0         | 2,968,257.98       |
| 145KV Equipments               | S4            | 1000000991         | 145KV, 8800PH, 1PH CVT                     | 9        | FA   | 219,505.00   | 1,975,545.00 | 246,943.13  | 44,449.76 | 158,043.60 | 96,999.26  | 0         | 2,521,580.75       |
| 145KV Equipments               | S4            | 1000000992         | 145KV, 1250A, 31.5KA, 3PH DB ISOLATOR+1E/S | 3        | FA   | 374,381.00   | 1,123,143.00 | 140,392.88  | 25,270.77 | 89,851.44  | 55,146.32  | 0         | 1,433,804.35       |
| 145KV Equipments               | S4            | 1000000943         | 145KV, 1250A, 31.5KA, 3PH DB ISOLATOR      | 4        | EA   | 293,919.00   | 1,135,676.00 | 141,959.50  | 25,552.71 | 90,854.08  | 55,761.69  | 0         | 1,449,803.98       |
| 145KV Equipments               | S4            | 1000020416         | SURGE ARRESTER, 1-PH, 120KV                | 9        | FA   | 67,858.00    | 610,722.00   | 76,340.25   | 13,741.25 | 48,857.76  | 29,986.45  | 0         | 779,647.71         |
| 145KV Equipments               | S4            | 1000017683         | PORTABLE DISCHARGE ROD                     | 6        | FA   | 22,484.00    | 134,904.00   | 16,863.00   | 3,035.34  | 10,792.32  | 6,623.79   | 0         | 1,72,718.45        |
| 145KV Equipments               | S4            | 1000000609         | 11KV, 630A, 25KA 3PH DB ISOLATOR           | 1        | EA   | 69,062.00    | 69,062.00    | 8,632.75    | 1,553.90  | 5,524.96   | 3,390.94   | 0         | 88,164.55          |
| 145KV Equipments               | S4            | 1000020427         | SURGE ARRESTER, 1-PH, 120KV                | 3        | EA   | 9,899.00     | 29,697.00    | 3,712.13    | 668.18    | 2,375.76   | 1,458.12   | 0         | 37,931.19          |
| 145KV Equipments               | S4            | 1000030534         | 11KV 3P HORN GAP FUSE-SUPPORT STRUCTURE    | 1        | EA   | 32,880.00    | 32,880.00    | 4,110.00    | 739.8     | 2,630.40   | 1,614.41   | 0         | 41,975.62          |
| Substation Auxiliaries         | S7            | 1000004313         | 415V MAIN SWITCHBOARD                      | 1        | SET  | 1,315,544.00 | 1,315,544.00 | 164,443.00  | 29,599.74 | 105,243.57 | 64,593.21  | 0         | 1,679,471.47       |
| Substation Auxiliaries         | S7            | 1000000564         | 110 V DDB                                  | 1        | SET  | 2,309,846.00 | 2,309,846.00 | 288,730.75  | 51,915.54 | 184,787.68 | 113,413.44 | 0         | 2,948,749.40       |
| Substation Auxiliaries         | S7            | 1000037512         | 415V MLDB W/O LIGHTING T/F                 | 2        | SET  | 597,176.00   | 1,194,352.00 | 149,294.00  | 26,872.92 | 95,548.16  | 58,647.68  | 0         | 1,524,709.76       |
| Substation Auxiliaries         | S7            | 1000000572         | 415V FIDB W/O LIGHTING T/F                 | 1        | SET  | 2,502,779.00 | 2,502,779.00 | 312,847.78  | 56,312.53 | 200,272.32 | 127,886.45 | 0         | 3,195,067.67       |
| Substation Auxiliaries         | S7            | 1000004765         | 110V, 200 AH BATTERY                       | 2        | SET  | 342,545.00   | 342,545.00   | 42,818.13   | 7,707.26  | 27,403.60  | 16,818.96  | 0         | 437,292.95         |
| Substation Auxiliaries         | S7            | 1000000580         | 48V, 200Ah Battery                         | 2        | SET  | 47,669.00    | 85,538.00    | 10,911.25   | 19,245.11 | 68,027.04  | 41,997.10  | 0         | 1,391,924.49       |
| Substation Auxiliaries         | S7            | 1000004774         | 110V, 60A/60A BATTERY CHARGER              | 2        | EA   | 111,322.00   | 111,322.00   | 13,915.25   | 2,504.75  | 8,905.76   | 5,465.91   | 0         | 147,113.67         |
| Substation Auxiliaries         | S7            | 1000004774         | 48V, 60A/60A BATTERY CHARGER               | 2        | EA   | 237,372.00   | 466,744.00   | 58,343.00   | 10,501.74 | 37,339.57  | 22,917.13  | 0         | 595,841.39         |
| Substation Auxiliaries         | S7            | 1000037510         | HIGH WALL TYPE SPHIT AC 2 IR               | 6        | FA   | 65,516.00    | 393,096.00   | 49,137.00   | 8,844.66  | 31,447.68  | 19,301.01  | 0         | 581,034.10         |
| Substation Auxiliaries         | S7            | 1000000956         | 145KV, 1PH, VOLTAGE TRANSFORMER            | 3        | EA   | 102,651.00   | 307,953.00   | 38,494.13   | 6,928.94  | 24,636.24  | 15,120.40  | 0         | 446,810.00         |
| Relay & Protection Panel       | S5            | 1000000738         | 145KV, 1PH BUS POST INSULATOR (BPI)        | 3        | EA   | 1,031,570.00 | 3,094,560.00 | 386,820.00  | 69,627.60 | 247,564.80 | 151,942.90 | 0         | 4,196,669.30       |
| Relay & Protection Panel       | S5            | 1000000812         | 132KV CB RELAY PANEL WITH A/R-SAS          | 3        | FA   | 999,937.00   | 2,999,811.00 | 374,976.38  | 67,495.75 | 239,984.88 | 147,790.77 | 0         | 3,820,538.72       |
| Relay & Protection Panel       | S5            | 1000021642         | 132KV LINE PROTECTION PANEL SAS            | 1        | FA   | 218,793.00   | 218,793.00   | 27,345.13   | 4,972.84  | 17,503.41  | 10,742.74  | 0         | 279,312.24         |
| Relay & Protection Panel       | S5            | 1000032686         | TIME SYNCHRONISATION EQUIPMENT             | 1        | SFT  | 298,398.00   | 298,398.00   | 37,299.75   | 6,713.96  | 23,871.84  | 14,651.34  | 0         | 380,934.89         |
| Relay & Protection Panel       | S5            | 1000010638         | SPECIAL RELAY TEST KIT                     | 6        | EA   | 253,955.00   | 1,523,730.00 | 190,466.25  | 34,283.93 | 121,898.40 | 74,815.14  | 0         | 1,945,193.72       |
| Relay & Protection Panel       | S5            | 1000012073         | DIGITAL PROTECTION COUPPLER                | 1        | EA   | 12,173.00    | 12,173.00    | 1,521.63    | 273.89    | 973.84     | 597.69     | 0         | 15,540.05          |
| Relay & Protection Panel       | S5            | 1000012073         | FIRE EXTINGUISHER-FOAM TYPE 50.            | 1        | SET  | 700,070.00   | 700,070.00   | 87,508.75   | 15,751.58 | 56,005.60  | 34,373.44  | 0         | 893,709.36         |
| Relay & Protection Panel       | S5            | 1000012073         | FIRE DETECTION & ALARM SYST-CRB-132KV      | 1        | SET  | 4,450.00     | 4,450.00     | 7,156.25    | 388.13    | 1,380.00   | 846.98     | 0         | 7,207.13           |
| Relay & Protection Panel       | S5            | 1000014547         | FIRE EXTINGUISHER DCP 5KG                  | 2        | EA   | 46,292.00    | 92,584.00    | 11,573.00   | 2,083.14  | 7,408.72   | 4,545.87   | 0         | 118,192.73         |
| Relay & Protection Panel       | S5            | 1000014548         | LIGHTING PANEL TYPE ACP-2                  | 3        | EA   | 44,210.00    | 132,630.00   | 16,578.75   | 2,984.18  | 10,610.40  | 6,517.13   | 0         | 169,311.46         |
| Relay & Protection Panel       | S5            | 1000014549         | LIGHTING PANEL TYPE ACP-3                  | 8        | EA   | 9,657.00     | 77,256.00    | 21,778.25   | 3,911.09  | 13,906.08  | 8,534.86   | 0         | 221,906.77         |
| Relay & Protection Panel       | S5            | 1000014549         | LIGHTING FIXTURE TYPE SF3                  | 153      | EA   | 18,662.00    | 2,855,286.00 | 356,910.75  | 64,243.94 | 228,422.88 | 140,194.54 | 0         | 3,645,098.11       |
| Relay & Protection Panel       | S5            | 1000001050         | 15A, 240V, 2POL, 3PIN O/D RECEPTACLE (RO)  | 153      | EA   | 2,218.00     | 13,386.00    | 1,663.50    | 299.43    | 1,064.64   | 653.42     | 0         | 16,988.99          |
| Relay & Protection Panel       | S5            | 1000021984         | TYPE A LIGHTING POLE                       | 153      | EA   | 13,956.00    | 2,135,268.00 | 266,908.50  | 48,043.53 | 170,821.44 | 104,841.66 | 0         | 2,795,883.54       |
| Relay & Protection Panel       | S5            | 1000009644         | CONTROL ROOM BUILDING ILLUMINATION (SOM)   | 125      | M2   | 602          | 75,250.00    | 9,406.25    | 1,693.13  | 6,020.00   | 3,694.78   | 0         | 96,044.15          |
| Relay & Protection Panel       | S5            | 1000031850         | SECURITY ROOM ILLUMINATION INCL CONDUIT    | 25       | M2   | 602          | 15,050.00    | 1,881.25    | 338.63    | 1,204.00   | 738.96     | 0         | 19,712.83          |
| Relay & Protection Panel       | S5            | 1000025538         | SELF SUPPORTED ALUMINIUM LADDER            | 2        | EA   | 46,047.00    | 92,094.00    | 11,511.75   | 2,077.12  | 7,367.52   | 4,521.87   | 0         | 117,567.20         |
| Relay & Protection Panel       | S5            | 1000032055         | 40MM MS RODKIM                             | 12       | KM   | 486,970.00   | 5,843,640.00 | 72,745.50   | 13,094.19 | 45,557.12  | 28,574.43  | 0         | 742,935.24         |
| Relay & Protection Panel       | S5            | 1000020078         | FOUNDATION BOLT 20MM                       | 204      | EA   | 584          | 119,136.00   | 14,892.00   | 2,680.56  | 9,530.88   | 5,845.58   | 0         | 152,089.02         |
| Relay & Protection Panel       | S5            | 1000012369         | FOUNDATION BOLT 50MM DIA                   | 124      | EA   | 2,849.00     | 353,276.00   | 44,159.50   | 7,948.71  | 28,267.08  | 17,345.85  | 0         | 450,992.14         |
| Relay & Protection Panel       | S5            | 1000015954         | NON STD LATTICE STRUCTURE MS STEEL         | 43       | MT   | 95,587.00    | 4,152,441.00 | 519,155.13  | 93,447.92 | 332,259.28 | 203,924.13 | 0         | 5,302,027.46       |
| Relay & Protection Panel       | S5            | 1000015952         | NON STD PIPE STRUCTURE                     | 24       | MT   | 72,857.00    | 1,748,568.00 | 218,571.00  | 39,342.78 | 139,885.44 | 85,854.69  | 0         | 2,332,221.91       |
| Relay & Protection Panel       | S5            | 1000011229         | ERECTION H/W-132KV SM BUS WORK-2 BAYS      | 1        | SET  | 1,279,637.00 | 1,279,637.00 | 159,954.63  | 28,791.83 | 102,370.96 | 62,830.18  | 0         | 1,633,584.59       |
| Relay & Protection Panel       | S5            | 1000011231         | ERECTION H/W-132KV SM LINE BAY             | 3        | SET  | 1,279,637.00 | 3,838,911.00 | 479,863.88  | 86,375.50 | 307,112.88 | 188,490.53 | 0         | 4,900,753.78       |

| COST BREAKUP OF TRANSMISSION LINE     |               |                    |                                            |          |      |              |              |             |           |            |           |           |                    |
|---------------------------------------|---------------|--------------------|--------------------------------------------|----------|------|--------------|--------------|-------------|-----------|------------|-----------|-----------|--------------------|
| CONSULTANCY SERVICES TO DEVI ENERGIES |               |                    |                                            |          |      |              |              |             |           |            |           |           |                    |
| 132 KV SWITCHING STATION AT TENGA     |               |                    |                                            |          |      |              |              |             |           |            |           |           |                    |
| ANNEXURE 1.3.1                        |               |                    |                                            |          |      |              |              |             |           |            |           |           |                    |
| All figures in RS.                    |               |                    |                                            |          |      |              |              |             |           |            |           |           |                    |
| Activity Description                  | Activity Type | Component/Services | Description                                | Quantity | Unit | Price        | Total Price  | Excise Duty | CST       | F&I        | Entry Tax | Ere/Civil | Total              |
| 1                                     | 2             | 3                  | 4                                          | 5        | 6    | 7            | 8=5x7        | 9           | 10        | 11         | 12        | 13        | 14=8+9+10+11+12+13 |
| WBS Element : CS-2016013-02-01        |               |                    |                                            |          |      |              |              |             |           |            |           |           |                    |
| Foundation H/W                        | S9            | 1000011212         | ERECTION H/W 11KV SEB SUPPLY               | 1        | SFT  | 156,283.00   | 156,283.00   | 19,535.38   | 3,516.37  | 12,502.64  | 7,673.50  | 0         | 199,510.88         |
| Cables                                | S7            | 1000000444         | 1.1KV XLPE POWER CABLE                     | 1        | LS   | 0            | 0            | 0           | 0         | 0          | 0         | 0         | 0                  |
| Cables                                | S7            | 1000000443         | 1.1KV PVC POWER CABLE                      | 1        | LS   | 0            | 0            | 0           | 0         | 0          | 0         | 0         | 0                  |
| Cables                                | S7            | 1000000442         | 1.1KV PVC CONTROL CABLE                    | 1        | LS   | 0            | 0            | 0           | 0         | 0          | 0         | 0         | 0                  |
| Cables                                | S7            | 1000031951         | 1.1KV 3.5CX300SQMM XLPE POWER CABLE(KM)    | 1.5      | KM   | 1,152,528.00 | 1,728,792.00 | 216,099.00  | 38,897.82 | 138,303.36 | 84,883.69 | 0         | 2,206,975.87       |
| Cables                                | S7            | 1000031910         | 1.1KV 1CX120SQMM PVC POWER CABLE(KM)       | 0.5      | KM   | 178,699.00   | 89,349.50    | 11,168.69   | 2,010.36  | 7,147.96   | 4,387.06  | 0         | 114,063.57         |
| Cables                                | S7            | 1000031957         | 1.1KV 3.5CX70SQMM PVC POWER CABLE(KM)      | 3        | KM   | 178,699.00   | 536,097.00   | 67,017.13   | 12,062.18 | 47,887.76  | 26,322.36 | 0         | 684,381.43         |
| Cables                                | S7            | 1000031953         | 1.1KV 3.5CX35SQMM PVC POWER CABLE(KM)      | 1        | KM   | 178,699.00   | 178,699.00   | 22,337.38   | 4,020.73  | 14,295.92  | 8,774.12  | 0         | 228,127.14         |
| Cables                                | S7            | 1000031976         | 1.1KV 4CX160SQMM PVC POWER CABLE(KM)       | 1.5      | KM   | 81,360.00    | 122,040.00   | 15,255.00   | 2,745.90  | 9,763.20   | 5,992.16  | 0         | 155,776.26         |
| Cables                                | S7            | 1000031933         | 1.1KV 2CX160SQMM PVC POWER CABLE(KM)       | 0.5      | KM   | 81,360.00    | 40,680.00    | 5,085.00    | 915.3     | 3,254.40   | 1,997.39  | 0         | 51,952.09          |
| Cables                                | S7            | 1000031985         | 1.1KV 4CX65SQMM PVC POWER CABLE(KM)        | 3        | KM   | 81,360.00    | 244,080.00   | 30,510.00   | 5,491.80  | 19,526.40  | 11,984.33 | 0         | 311,567.53         |
| Cables                                | S7            | 1000031943         | 1.1KV 2CX65SQMM PVC POWER CABLE(KM)        | 6        | KM   | 59,093.00    | 354,558.00   | 44,310.75   | 7,977.56  | 28,364.64  | 17,408.80 | 0         | 457,628.74         |
| Cables                                | S7            | 1000031993         | 1.1KV 7CX2.5SQMM PVC CONTROL CABLE(KM)     | 5        | KM   | 74,176.00    | 370,880.00   | 46,360.00   | 8,344.80  | 29,670.40  | 18,210.21 | 0         | 473,465.41         |
| Cables                                | S7            | 1000031887         | 1.1KV 10CX2.5SQMM PVC CONTROL CABLE(KM)    | 1        | KM   | 166,230.00   | 166,230.00   | 20,778.75   | 3,740.18  | 13,208.40  | 8,161.89  | 0         | 242,209.22         |
| Cables                                | S7            | 1000031904         | 1.1KV 14CX2.5SQMM PVC CONTROL CABLE(KM)    | 3        | KM   | 213,937.00   | 641,811.00   | 80,226.38   | 14,440.75 | 51,344.88  | 31,512.92 | 0         | 819,335.92         |
| Cables                                | S7            | 1000031908         | 1.1KV 19CX2.5SQMM PVC CONTROL CABLE(KM)    | 3        | KM   | 300,891.00   | 902,673.00   | 112,834.13  | 20,370.14 | 72,211.84  | 44,321.24 | 0         | 1,192,352.35       |
| Cables                                | S7            | 1000031927         | 1.1KV 27CX2.5SQMM PVC CONTROL CABLE(KM)    | 3.5      | KM   | 391,544.00   | 1,370,404.00 | 171,300.50  | 30,834.09 | 109,632.37 | 67,286.84 | 0         | 1,749,457.75       |
| Automation System                     | S8            | 1000018700         | S/S AUTOMATION FOR AUXILIARY SYSTEM        | 1        | SET  | 1,076,229.00 | 1,076,229.00 | 134,528.63  | 24,215.15 | 86,098.32  | 52,842.84 | 0         | 345,878.17         |
| Automation System                     | S8            | 1000000814         | 132KV S/S AUTOMATION SYSTEM MAIN BAY       | 3        | EA   | 533,240.00   | 1,599,720.00 | 193,965.00  | 35,993.70 | 127,977.60 | 78,546.25 | 0         | 2,042,202.55       |
| Mandatory Spares                      | S5            | 1000030152         | SPARE 14.5KV BPI                           | 1        | EA   | 14,573.00    | 14,573.00    | 1,821.63    | 327.89    | 1,165.84   | 715.53    | 0         | 18,603.89          |
| 145KV Equipment-Service               | AG            | 1000000555         | 145KV, 600A, 31.5KA, 1PH CT-120% RATING    | 9        | EA   | 10,241.00    | 0            | 0           | 0         | 0          | 0         | 0         | 92,169.00          |
| 145KV Equipment-Service               | AG            | 100000559          | 145KV, 8800PE, 1PH CVT                     | 9        | EA   | 10,241.00    | 0            | 0           | 0         | 0          | 0         | 0         | 92,169.00          |
| 145KV Equipment-Service               | AG            | 100000565          | 145KV 1250A, 31.5KA, 3PH DB ISOLATOR - E/S | 3        | FA   | 18,323.00    | 0            | 0           | 0         | 0          | 0         | 0         | 54,969.00          |
| 145KV Equipment-Service               | AG            | 100000567          | 145KV, 1250A, 31.5KA, 3PH DB ISOLATOR      | 3        | EA   | 18,323.00    | 0            | 0           | 0         | 0          | 0         | 0         | 73,292.00          |
| 145KV Equipment-Service               | AG            | 100000587          | SURGE ARRESTER 1PH 120KV                   | 9        | EA   | 6,593.00     | 0            | 0           | 0         | 0          | 0         | 0         | 59,355.00          |
| 145KV Equipment-Service               | AG            | 100001904          | 145KV, 1PH VOLTAGE TRANSFORMER             | 3        | FA   | 5,672.00     | 0            | 0           | 0         | 0          | 0         | 0         | 11,016.00          |
| 145KV Equipment-Service               | AG            | 100001908          | 145KV, 1PH BUS POST INSULATOR (BPI)        | 3        | FA   | 5,672.00     | 0            | 0           | 0         | 0          | 0         | 0         | 11,016.00          |
| 145KV Equipment-Service               | AG            | 100002254          | 145KV, 1250A, 31.5KA, CB FOR 1PH/3PH A/R   | 3        | FA   | 22,243.00    | 0            | 0           | 0         | 0          | 0         | 0         | 10,047.60          |
| 145KV Equipment-Service               | AG            | 100000712          | 11KV, 630A, 25KA, 3PH DB ISOLATOR          | 1        | EA   | 4,628.00     | 0            | 0           | 0         | 0          | 0         | 0         | 66,729.00          |
| 145KV Equipment-Service               | AG            | 100000713          | SURGE ARRESTER 1PH 9KV                     | 3        | EA   | 4,628.00     | 0            | 0           | 0         | 0          | 0         | 0         | 4,628.00           |
| 11KV Equipment-Service                | AG            | 100003723          | 11KV HORN GAP FUSE - SUPPORT STR (3PH)     | 1        | SET  | 1,876.00     | 0            | 0           | 0         | 0          | 0         | 0         | 5,628.00           |
| 11KV Equipment-Service                | AG            | 100002773          | 100KVA, 11/0.433KV, 3PH TRANSFORMER        | 1        | SET  | 1,876.00     | 0            | 0           | 0         | 0          | 0         | 0         | 1,876.00           |
| 3FC Service                           | AG            | 100000891          | DIGITAL PROTECTION COUPLER                 | 1        | EA   | 28,874.00    | 0            | 0           | 0         | 0          | 0         | 0         | 28,874.00          |
| Relay & Protection Panel-Service      | AG            | 100000744          | 132KV CB RELAY PANEL WITH A/R-SAS          | 6        | FA   | 11,323.00    | 0            | 0           | 0         | 0          | 0         | 0         | 67,538.00          |
| Relay & Protection Panel-Service      | AG            | 100000746          | 132KV LINE PROTECTION PANEL SAS            | 3        | FA   | 10,115.00    | 0            | 0           | 0         | 0          | 0         | 0         | 57,938.00          |
| Relay & Protection Panel-Service      | AG            | 100001891          | TIME SYNCHRONISATION EQUIPMENT             | 3        | EA   | 12,218.00    | 0            | 0           | 0         | 0          | 0         | 0         | 30,345.00          |
| Relay & Protection Panel-Service      | AG            | 100002286          | SPECIAL RELAY TEST KIT                     | 1        | EA   | 1,174.00     | 0            | 0           | 0         | 0          | 0         | 0         | 36,654.00          |
| Automation System-Service             | AG            | 100000773          | 132KV S/S AUTOMATION SYSTEM-MAIN BAY       | 1        | FA   | 0            | 0            | 0           | 0         | 0          | 0         | 0         | 1,174.00           |
| Automation System-Service             | AG            | 100000783          | S/S AUTOMATION FOR AUXILIARY SYSTEM        | 3        | EA   | 3,332.00     | 0            | 0           | 0         | 0          | 0         | 0         | 9,996.00           |
| Structure & Main Earthing-Service     | AG            | 100003103          | 20MM MS ROD (KM)                           | 1.7      | SET  | 13,466.00    | 0            | 0           | 0         | 0          | 0         | 0         | 13,466.00          |
| Structure & Main Earthing-Service     | AG            | 100002255          | 24MM DIA FOUNDATION BOLT - ERECTION        | 204      | EA   | 46           | 0            | 0           | 0         | 0          | 0         | 0         | 147,364.80         |
| Structure & Main Earthing-Service     | AG            | 100001677          | 36MM DIA FOUNDATION BOLT - ERECTION        | 124      | FA   | 277          | 0            | 0           | 0         | 0          | 0         | 0         | 9,384.00           |
| Structure & Main Earthing-Service     | AG            | 100001247          | VON-STD DIAPHRAGM STRUCTURE ERECTION       | 24       | MT   | 5,281.00     | 0            | 0           | 0         | 0          | 0         | 0         | 27,528.00          |
| Structure & Main Earthing-Service     | AG            | 100001210          | VON STD LATTICE STR MS STEEL - ERECTION    | 43       | MI   | 7,537.00     | 0            | 0           | 0         | 0          | 0         | 0         | 126,744.00         |
| Fire Protection System-Service        | AH            | 100000973          | FIRE EXTINGUISHER FOAM 1TYP 50L            | 1        | EA   | 1,846.00     | 0            | 0           | 0         | 0          | 0         | 0         | 1,846.00           |
| Fire Protection System-Service        | AH            | 100002048          | FIRE DETECTION & ALARM SVST CRB-132KV      | 1        | SET  | 144,582.00   | 0            | 0           | 0         | 0          | 0         | 0         | 144,582.00         |
| Fire Protection System-Service        | AH            | 100002752          | FIRE EXTINGUISHER DCP TYPE 5KG             | 5        | EA   | 429          | 0            | 0           | 0         | 0          | 0         | 0         | 2,145.00           |
| Fire Protection System-Service        | AH            | 100004818          | 15KVA DKG SET                              | 1        | SET  | 33,062.41    | 0            | 0           | 0         | 0          | 0         | 0         | 33,062.41          |

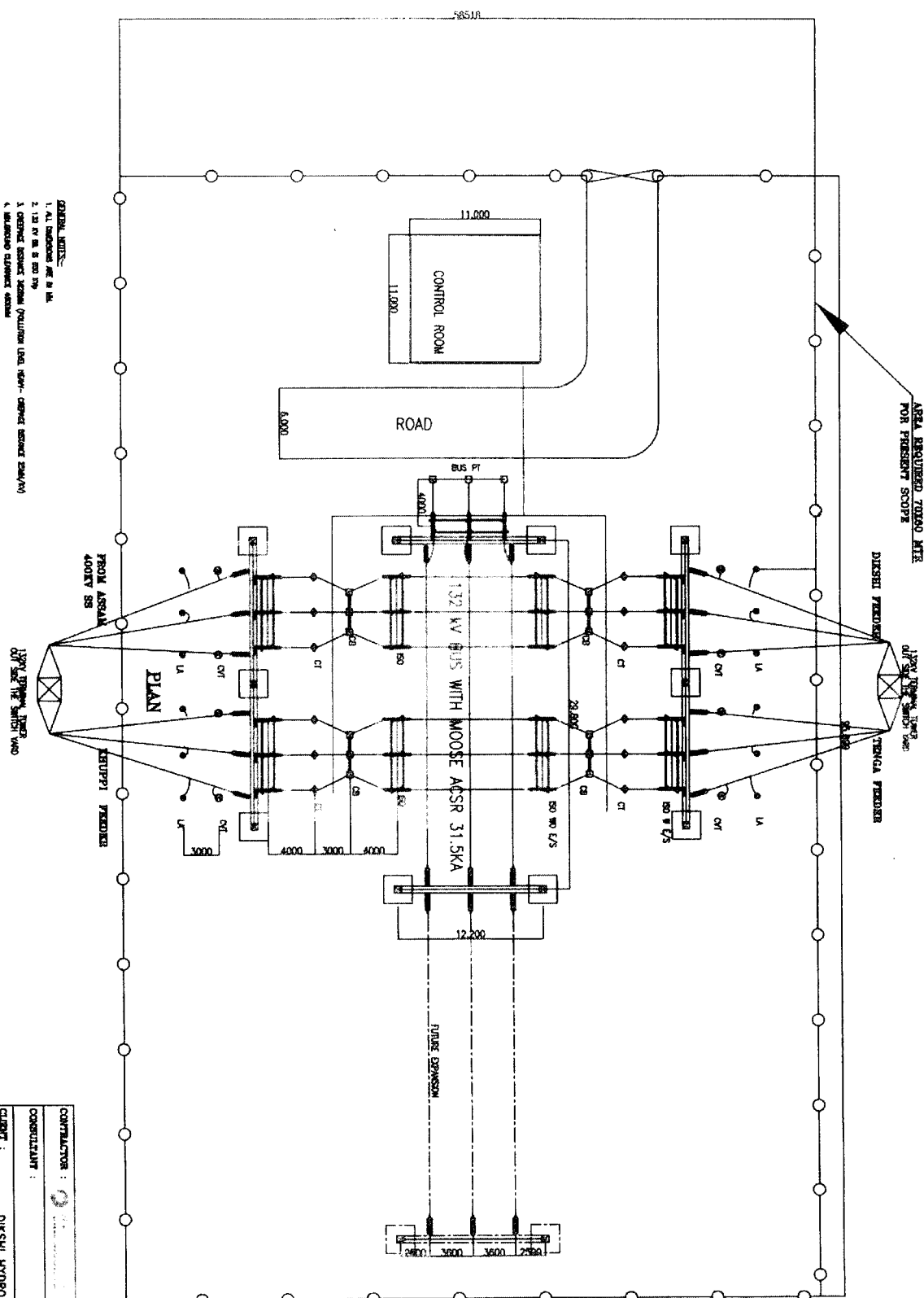
| PROJ TRANSMISSION LINE          |               | COST BREAKUP OF TRANSMISSION LINE |                                            |          |      |              |             |             |     |     |           | ANNEXURE 1.3.1     |                    |
|---------------------------------|---------------|-----------------------------------|--------------------------------------------|----------|------|--------------|-------------|-------------|-----|-----|-----------|--------------------|--------------------|
|                                 |               | 132 KV SWITCHING STATION AT TENGA |                                            |          |      |              |             |             |     |     |           | All figures in RS. |                    |
| Activity Description            | Activity Type | Component/Services                | Description                                | Quantity | Unit | Price        | Total Price | Excise Duty | CST | F&I | Entry Tax | Ere/Civil          | Total              |
| 1                               | 2             | 3                                 | 4                                          | 5        | 6    | 7            | 8=6x7       | 9           | 10  | 11  | 12        | 13                 | 14=8+9+10+11+12+13 |
| WBS Element : CS-20160113-02-01 |               |                                   |                                            |          |      |              |             |             |     |     |           |                    |                    |
| Substation Auxiliaries Service  | AH            | 100004817                         | 415V ELDB W/O LIGHTING T/H                 | 1        | SET  | 5,083.00     | 0           | 0           | 0   | 0   | 0         | 5,083.00           | 5,083.00           |
| Substation Auxiliaries Service  | AH            | 100004816                         | 415V MLEB W/O LIGHTING T/H                 | 1        | SET  | 3,453.00     | 0           | 0           | 0   | 0   | 0         | 3,453.00           | 3,453.00           |
| Substation Auxiliaries Service  | AH            | 100000960                         | HIGH WALL TYPE SPLIT AC-2 TR               | 6        | FA   | 8,793.00     | 0           | 0           | 0   | 0   | 0         | 52,758.00          | 52,758.00          |
| Substation Auxiliaries Service  | AH            | 100000950                         | 48V, 60A/60A BATTERY CHARGER               | 2        | EA   | 21,356.00    | 0           | 0           | 0   | 0   | 0         | 42,712.00          | 42,712.00          |
| Substation Auxiliaries Service  | AH            | 100000944                         | 110V, 60A/60A BATTERY CHARGER              | 2        | EA   | 19,368.00    | 0           | 0           | 0   | 0   | 0         | 38,736.00          | 38,736.00          |
| Substation Auxiliaries Service  | AH            | 100000974                         | 48V, 200 AH BATTERY                        | 1        | SET  | 26,939.00    | 0           | 0           | 0   | 0   | 0         | 26,939.00          | 26,939.00          |
| Substation Auxiliaries Service  | AH            | 100000916                         | 110V, 200 AH BATTERY                       | 2        | SET  | 21,145.00    | 0           | 0           | 0   | 0   | 0         | 42,290.00          | 42,290.00          |
| Substation Auxiliaries Service  | AH            | 100000904                         | 110 V DCDB                                 | 2        | SET  | 12,275.00    | 0           | 0           | 0   | 0   | 0         | 24,550.00          | 24,550.00          |
| Substation Auxiliaries Service  | AH            | 100000895                         | 415V ACDB                                  | 1        | SFT  | 16,114.00    | 0           | 0           | 0   | 0   | 0         | 16,114.00          | 16,114.00          |
| Substation Auxiliaries Service  | AH            | 100000894                         | 415V MAIN SWITCHBOARD                      | 1        | SET  | 13,150.00    | 0           | 0           | 0   | 0   | 0         | 13,150.00          | 13,150.00          |
| Erection H/W Service            | AG            | 100002023                         | ERECTION H/W-132KV SM LINE-BAY             | 3        | SET  | 110,007.00   | 0           | 0           | 0   | 0   | 0         | 330,021.00         | 330,021.00         |
| Erection H/W Service            | AG            | 100002027                         | FRECTION H/W-132KV SM BUS WORK-2 BAYS      | 1        | SET  | 110,007.00   | 0           | 0           | 0   | 0   | 0         | 110,007.00         | 110,007.00         |
| Erection H/W Service            | AG            | 100002039                         | ERECTION H/W-11KV SEB SUPPLY               | 25       | M2   | 7,814.00     | 0           | 0           | 0   | 0   | 0         | 195,350.00         | 195,350.00         |
| Illumination System Service     | AH            | 100002910                         | SECURITY ROOM ILLUMINATION INCL CONDUIT    | 125      | M2   | 161          | 0           | 0           | 0   | 0   | 0         | 20,125.00          | 20,125.00          |
| Illumination System Service     | AH            | 100001890                         | CONTROL ROOM BUILDING (EXT) ILLUMINATION   | 153      | EA   | 8,166.00     | 0           | 0           | 0   | 0   | 0         | 1,249,398.00       | 1,249,398.00       |
| Illumination System Service     | AH            | 100001051                         | TYPE A1 LIGHTING POLE                      | 6        | EA   | 372          | 0           | 0           | 0   | 0   | 0         | 2,232.00           | 2,232.00           |
| Illumination System Service     | AH            | 100001021                         | 15A, 240V, 2POLE 3P+N, O/D RECEPTACLE (RO) | 2        | FA   | 2,201.00     | 0           | 0           | 0   | 0   | 0         | 4,402.00           | 4,402.00           |
| Illumination System Service     | AH            | 100001022                         | LIGHTING PANEL TYPE ACP-2                  | 3        | FA   | 2,201.00     | 0           | 0           | 0   | 0   | 0         | 6,603.00           | 6,603.00           |
| Illumination System Service     | AH            | 100001043                         | LIGHTING FIXTURE TYPE SF3                  | 18       | FA   | 1,121.00     | 0           | 0           | 0   | 0   | 0         | 20,178.00          | 20,178.00          |
| Illumination System Service     | AH            | 100001037                         | LIGHTING FIXTURE TYPE SC                   | 153      | EA   | 3,616.56     | 0           | 0           | 0   | 0   | 0         | 553,333.68         | 553,333.68         |
| Cables Service                  | AH            | 100002182                         | 1.1KV PVC CONTROL CABLE                    | 1        | LS   | 0            | 0           | 0           | 0   | 0   | 0         | 0                  | 0                  |
| Cables Service                  | AH            | 100002181                         | 1.1KV PVC POWER CABLE                      | 1        | LS   | 0            | 0           | 0           | 0   | 0   | 0         | 0                  | 0                  |
| Cables Service                  | AH            | 100002180                         | 1.1KV XLPE POWER CABLE                     | 1        | LS   | 0            | 0           | 0           | 0   | 0   | 0         | 0                  | 0                  |
| Cables Service                  | AM            | 100001714                         | STONE SPREADING EXCLUDING PCC              | 2,000.00 | M2   | 47           | 0           | 0           | 0   | 0   | 0         | 94,000.00          | 94,000.00          |
| Cables Service                  | AM            | 100001713                         | ANTWEED TREATMENT                          | 2,000.00 | M2   | 29           | 0           | 0           | 0   | 0   | 0         | 58,000.00          | 58,000.00          |
| Cables Service                  | AM            | 100001701                         | SECURITY HUT - CIVIL WORK                  | 25       | M2   | 3,373.00     | 0           | 0           | 0   | 0   | 0         | 84,325.00          | 84,325.00          |
| Cables Service                  | AM            | 100001697                         | CAR PARKING (RCARS) - CIVIL WORK           | 40       | M2   | 3,373.00     | 0           | 0           | 0   | 0   | 0         | 134,920.00         | 134,920.00         |
| Cables Service                  | AM            | 100001683                         | CR BUILDING - CIVIL WORK                   | 125      | M2   | 14,431.00    | 0           | 0           | 0   | 0   | 0         | 1,803,875.00       | 1,803,875.00       |
| Cables Service                  | AM            | 100001472                         | RCC FRAMED MASONRY BOUNDARY WALL           | 400      | M    | 15,507.00    | 0           | 0           | 0   | 0   | 0         | 6,202,800.00       | 6,202,800.00       |
| Cables Service                  | AM            | 100001470                         | SITE LEVELLING F/W WITH BORROWED EARTH     | 2,750.00 | M3   | 627          | 0           | 0           | 0   | 0   | 0         | 1,724,250.00       | 1,724,250.00       |
| Cables Service                  | AM            | 100001469                         | SOIL INVESTIGATION-SS                      | 2,500.00 | M3   | 627          | 0           | 0           | 0   | 0   | 0         | 1,567,500.00       | 1,567,500.00       |
| Cables Service                  | AM            | 100001433                         | INTERLOCKING PAVF BLOCK                    | 1        | LOT  | 1,164,226.00 | 0           | 0           | 0   | 0   | 0         | 1,164,226.00       | 1,164,226.00       |
| Cables Service                  | AM            | 100001718                         | EXTERNAL WATER SUPPLY 80MM DIA PIPE        | 150      | M2   | 644          | 0           | 0           | 0   | 0   | 0         | 96,600.00          | 96,600.00          |
| Cables Service                  | AM            | 100001723                         | EXTERNAL WATER SUPPLY 50MM DIA PIPE        | 300      | M    | 732          | 0           | 0           | 0   | 0   | 0         | 219,600.00         | 219,600.00         |
| Cables Service                  | AM            | 100001740                         | SEPTIC TANK AND SOAKPIT FOR CRH            | 1        | EA   | 447          | 0           | 0           | 0   | 0   | 0         | 134,106.00         | 134,106.00         |
| Cables Service                  | AM            | 100002360                         | STONE AGGREGATE OF GRADING 63MM            | 150      | M3   | 1,511.00     | 0           | 0           | 0   | 0   | 0         | 226,650.00         | 226,650.00         |
| Cables Service                  | AM            | 100002361                         | MAIN GATE                                  | 1        | EA   | 742,513.00   | 0           | 0           | 0   | 0   | 0         | 742,513.00         | 742,513.00         |
| Cables Service                  | AM            | 100002362                         | SUMP PIT                                   | 1        | EA   | 413,314.00   | 0           | 0           | 0   | 0   | 0         | 413,314.00         | 413,314.00         |
| Cables Service                  | AM            | 100002488                         | SEPTIC TANK & SOAKPIT FOR SECURITY ROOM    | 1        | EA   | 349,227.00   | 0           | 0           | 0   | 0   | 0         | 349,227.00         | 349,227.00         |
| Cables Service                  | AM            | 100004463                         | STONE MASONRY RETAINING WALL CM 1:6        | 372      | M3   | 6,568.00     | 0           | 0           | 0   | 0   | 0         | 2,443,296.00       | 2,443,296.00       |
| Cables Service                  | AM            | 100001415                         | DRAIN SECTION D-D EXCLUDING R/F CONCRETE   | 500      | M    | 6,432.00     | 0           | 0           | 0   | 0   | 0         | 3,216,000.00       | 3,216,000.00       |
| Cables Service                  | AM            | 100001414                         | DRAIN SECTION C-C EXCLUDING R/F CONCRETE   | 1,500.00 | M    | 4,513.00     | 0           | 0           | 0   | 0   | 0         | 6,769,500.00       | 6,769,500.00       |
| Cables Service                  | AM            | 100001413                         | DRAIN SECTION B-B EXCLUDING R/F CONCRETE   | 2,000.00 | M    | 2,976.00     | 0           | 0           | 0   | 0   | 0         | 5,952,000.00       | 5,952,000.00       |
| Cables Service                  | AM            | 100001412                         | DRAIN SECTION A-A EXCLUDING R/F CONCRETE   | 2,000.00 | M    | 1,818.00     | 0           | 0           | 0   | 0   | 0         | 3,636,000.00       | 3,636,000.00       |
| Cables Service                  | AM            | 100001410                         | DEWATERING PUMP 3 HP                       | 2        | EA   | 30,826.00    | 0           | 0           | 0   | 0   | 0         | 61,652.00          | 61,652.00          |
| Cables Service                  | AM            | 100001408                         | HUME PIPE (NP3)-600MM DIA                  | 50       | M    | 5,942.00     | 0           | 0           | 0   | 0   | 0         | 297,100.00         | 297,100.00         |
| Cables Service                  | AM            | 100001407                         | HUME PIPE (NP3)-450MM DIA                  | 50       | M    | 2,979.00     | 0           | 0           | 0   | 0   | 0         | 148,950.00         | 148,950.00         |

| COST BREAKUP OF TRANSMISSION LINE                                          |                                      |                    |             |           |      |                                   |             |             |          |           |           |               |                    |
|----------------------------------------------------------------------------|--------------------------------------|--------------------|-------------|-----------|------|-----------------------------------|-------------|-------------|----------|-----------|-----------|---------------|--------------------|
| ANNEXURE 1.3.1<br>All figures in RS.                                       |                                      |                    |             |           |      |                                   |             |             |          |           |           |               |                    |
| CONSULTANCY SERVICES TO DEVI ENERGIES<br>132 KV SWITCHING STATION AT TENGA |                                      |                    |             |           |      |                                   |             |             |          |           |           |               |                    |
| TRANSMISSION LINE                                                          |                                      |                    |             |           |      |                                   |             |             |          |           |           |               |                    |
| Activity Description                                                       | Activity Type                        | Component/Services | Description | Quantity  | Unit | Price                             | Total Price | Excise Duty | CST      | F&I       | Entry Tax | Ere/Civil     | Total              |
| 1                                                                          | 2                                    | 3                  | 4           | 5         | 6    | 7                                 | 8=6x7       | 9           | 10       | 11        | 12        | 13            | 14=8+9+10+11+12+13 |
| WBS Element : CS-2016013-02-01                                             | Civil Work                           | AM                 | 100001405   | 50        | M    | 1,725.00                          | 0           | 0           | 0        | 0         | 0         | 86,250.00     | 86,250.00          |
|                                                                            | Civil Work                           | AM                 | 100001405   | 50        | M    | 1,519.00                          | 0           | 0           | 0        | 0         | 0         | 75,950.00     | 75,950.00          |
|                                                                            | Civil Work                           | AM                 | 100001399   | 50        | M    | 626                               | 0           | 0           | 0        | 0         | 0         | 31,300.00     | 31,300.00          |
|                                                                            | Civil Work                           | AM                 | 100001382   | 18,360.00 | M2   | 1,072.00                          | 0           | 0           | 0        | 0         | 0         | 19,681,970.00 | 19,681,970.00      |
|                                                                            | Civil Work                           | AM                 | 100001331   | 6         | MT   | 69,677.00                         | 0           | 0           | 0        | 0         | 0         | 418,062.00    | 418,062.00         |
|                                                                            | Civil Work                           | AM                 | 100001329   | 85        | MT   | 55,990.00                         | 0           | 0           | 0        | 0         | 0         | 4,759,150.00  | 4,759,150.00       |
|                                                                            | Civil Work                           | AM                 | 100001328   | 150       | M3   | 2,834.00                          | 0           | 0           | 0        | 0         | 0         | 425,100.00    | 425,100.00         |
|                                                                            | Civil Work                           | AM                 | 100001327   | 2,332.00  | M3   | 7,127.00                          | 0           | 0           | 0        | 0         | 0         | 16,620,164.00 | 16,620,164.00      |
|                                                                            | Civil Work                           | AM                 | 100001326   | 98        | M3   | 4,868.00                          | 0           | 0           | 0        | 0         | 0         | 477,064.00    | 477,064.00         |
|                                                                            | Civil Work                           | AM                 | 100001325   | 3,368.00  | M3   | 3,749.00                          | 0           | 0           | 0        | 0         | 0         | 12,626,632.00 | 12,626,632.00      |
|                                                                            | Civil Work                           | AM                 | 100001324   | 1,980.00  | M3   | 262                               | 0           | 0           | 0        | 0         | 0         | 518,760.00    | 518,760.00         |
|                                                                            | Spares-145KV CB                      | SS                 | 1000001033  | 1         | FA   | 295,565.00                        | 295,565.00  | 36,945.63   | 6,650.21 | 23,645.20 | 14,517.24 | 0             | 377,138.28         |
|                                                                            | Spares-145KV CB                      | SS                 | 1000013182  | 1         | FA   | 274,615.00                        | 274,615.00  | 34,326.88   | 6,178.84 | 21,969.20 | 13,483.60 | 0             | 350,573.51         |
|                                                                            | Spares-145KV CB                      | SS                 | 1000013076  | 1         | SET  | 70,278.00                         | 70,278.00   | 8,784.75    | 1,581.26 | 5,622.24  | 3,450.65  | 0             | 89,716.89          |
|                                                                            | Spares-145KV CB                      | SS                 | 1000009188  | 1         | FA   | 21,592.00                         | 21,592.00   | 2,699.00    | 485.82   | 1,727.36  | 1,060.17  | 0             | 27,564.35          |
|                                                                            | Spares-145KV CB                      | SS                 | 1000021429  | 2         | EA   | 39,118.00                         | 78,236.00   | 9,779.50    | 1,760.31 | 6,258.88  | 3,841.39  | 0             | 99,876.08          |
|                                                                            | Spares-145KV CB                      | SS                 | 1000015545  | 2         | FA   | 26,840.00                         | 53,680.00   | 6,710.00    | 1,207.80 | 4,294.40  | 2,635.69  | 0             | 68,527.89          |
|                                                                            | Spares-145KV CB                      | SS                 | 1000031779  | 1         | EA   | 35,069.00                         | 35,069.00   | 4,383.63    | 789.05   | 2,803.52  | 1,721.89  | 0             | 44,769.09          |
|                                                                            | Spares-145KV CB                      | SS                 | 1000018386  | 1         | SET  | 44,495.00                         | 44,495.00   | 5,561.88    | 1,001.14 | 3,559.60  | 2,184.70  | 0             | 56,802.32          |
|                                                                            | Spares-145KV CB                      | SS                 | 1000017836  | 1         | SET  | 34,278.00                         | 34,278.00   | 4,284.75    | 771.26   | 2,742.24  | 1,683.05  | 0             | 43,753.29          |
|                                                                            | Spares-145KV CB                      | SS                 | 1000006906  | 1         | SET  | 28,802.00                         | 28,802.00   | 3,600.25    | 648.05   | 2,204.16  | 1,414.18  | 0             | 36,768.63          |
|                                                                            | Spares-145KV CB                      | SS                 | 1000021850  | 2         | FA   | 21,592.00                         | 43,184.00   | 5,398.00    | 971.64   | 3,454.72  | 2,120.33  | 0             | 55,128.69          |
|                                                                            | Cables-breakup-service               | AG                 | 1000030000  | 1         | KM   | 28,363.00                         | 0           | 0           | 0        | 0         | 0         | 28,363.00     | 28,363.00          |
|                                                                            | Cables-breakup-service               | AG                 | 100002997   | 3         | KM   | 25,527.00                         | 0           | 0           | 0        | 0         | 0         | 76,581.00     | 76,581.00          |
|                                                                            | Cables-breakup-service               | AG                 | 100002986   | 1.5       | KM   | 7,801.45                          | 0           | 0           | 0        | 0         | 0         | 38,290.50     | 38,290.50          |
|                                                                            | Cables-breakup-service               | AG                 | 100002971   | 3         | KM   | 7,801.00                          | 0           | 0           | 0        | 0         | 0         | 23,404.35     | 23,404.35          |
|                                                                            | Cables-breakup-service               | AG                 | 100002968   | 1         | KM   | 7,801.00                          | 0           | 0           | 0        | 0         | 0         | 7,801.00      | 7,801.00           |
|                                                                            | Cables-breakup-service               | AG                 | 100002965   | 1.5       | KM   | 10,923.00                         | 0           | 0           | 0        | 0         | 0         | 16,384.50     | 16,384.50          |
|                                                                            | Cables-breakup-service               | AG                 | 100002954   | 6         | KM   | 25,527.00                         | 0           | 0           | 0        | 0         | 0         | 153,162.00    | 153,162.00         |
|                                                                            | Cables-breakup-service               | AG                 | 100002954   | 5         | KM   | 21,556.00                         | 0           | 0           | 0        | 0         | 0         | 107,780.00    | 107,780.00         |
|                                                                            | Cables-breakup-service               | AG                 | 100002952   | 0.5       | KM   | 25,527.00                         | 0           | 0           | 0        | 0         | 0         | 12,763.50     | 12,763.50          |
|                                                                            | Cables-breakup-service               | AG                 | 100002946   | 0.5       | KM   | 38,290.00                         | 0           | 0           | 0        | 0         | 0         | 19,145.00     | 19,145.00          |
|                                                                            | Cables-breakup-service               | AG                 | 100002932   | 0.5       | KM   | 7,801.00                          | 0           | 0           | 0        | 0         | 0         | 3,900.50      | 3,900.50           |
|                                                                            | Cables-breakup-service               | AG                 | 100002930   | 3.5       | KM   | 35,454.00                         | 0           | 0           | 0        | 0         | 0         | 124,089.00    | 124,089.00         |
|                                                                            | Cables-breakup-service               | AG                 | 100002927   | 1         | KM   | 35,454.00                         | 0           | 0           | 0        | 0         | 0         | 106,362.00    | 106,362.00         |
|                                                                            | Cables-breakup-service               | AG                 | 100002920   | 1         | KM   | 31,199.00                         | 0           | 0           | 0        | 0         | 0         | 93,597.00     | 93,597.00          |
|                                                                            | Spares-145KV Isolator                | SS                 | 1000000275  | 2         | EA   | 206,812.00                        | 413,624.00  | 51,703.00   | 9,306.54 | 33,089.92 | 20,308.94 | 0             | 528,032.40         |
|                                                                            | Spares-145KV Isolator                | SS                 | 100000977   | 4         | SET  | 20,255.00                         | 81,020.00   | 10,127.50   | 1,822.95 | 6,481.60  | 3,978.08  | 0             | 103,410.13         |
|                                                                            | Spares-145KV Isolator                | SS                 | 1000009566  | 2         | SET  | 34,219.00                         | 68,438.00   | 8,554.75    | 1,539.86 | 5,475.04  | 3,360.31  | 0             | 87,367.95          |
|                                                                            | Spares-145KV Isolator                | SS                 | 1000014560  | 4         | SET  | 3,026.00                          | 12,104.00   | 1,513.00    | 272.34   | 968.32    | 594.31    | 0             | 15,451.97          |
|                                                                            | Spares-145KV Isolator                | SS                 | 1000021490  | 6         | EA   | 13,770.00                         | 82,620.00   | 10,327.50   | 1,858.95 | 6,609.60  | 4,056.64  | 0             | 105,472.69         |
|                                                                            | Spares-145KV Isolator                | SS                 | 1000031780  | 6         | EA   | 9,705.00                          | 58,230.00   | 7,278.75    | 1,310.18 | 4,658.40  | 2,859.09  | 0             | 74,336.42          |
|                                                                            | Spares-145KV Isolator                | SS                 | 1000031546  | 2         | EA   | 22,410.00                         | 44,820.00   | 5,602.50    | 1,008.45 | 3,585.60  | 2,200.66  | 0             | 57,217.21          |
|                                                                            | SPARE-145 KV CT, CVT & PT            | SS                 | 1000000991  | 1         | FA   | 219,505.00                        | 219,505.00  | 27,438.13   | 4,938.86 | 17,560.40 | 10,777.70 | 0             | 286,220.09         |
|                                                                            | SPARE-145 KV CT, CVT & PT            | SS                 | 100000977   | 1         | EA   | 600A, 31.5KA, 1-PH CT 120% RATING | 258,351.00  | 32,293.88   | 5,812.90 | 20,668.08 | 12,685.03 | 0             | 329,810.89         |
|                                                                            | SPARE-145 KV CT, CVT & PT            | SS                 | 1000009558  | 1         | EA   | 102,651.00                        | 102,651.00  | 12,831.38   | 2,309.65 | 8,212.08  | 5,040.16  | 0             | 131,944.27         |
|                                                                            | Spares-120KV Surge Arrestor & 9KV sa | SS                 | 1000020416  | 1         | EA   | 67,858.00                         | 67,858.00   | 8,482.25    | 1,526.81 | 5,428.64  | 3,331.83  | 0             | 86,577.57          |
|                                                                            | Spares-120KV Surge Arrestor & 9KV sa | SS                 | 1000020440  | 5         | EA   | 24,130.00                         | 120,650.00  | 3,016.25    | 547.93   | 1,930.40  | 1,184.78  | 0             | 30,864.36          |
|                                                                            | Spares-220KV Surge Arrestor & 9KV sa | SS                 | 1000020422  | 1         | FA   | 9,899.00                          | 9,899.00    | 1,237.38    | 222.73   | 791.92    | 486.04    | 0             | 12,637.06          |

| COST BREAKUP OF TRANSMISSION LINE     |               |            |                                          |   |     |            |            |               |              |              |              |              |                    |
|---------------------------------------|---------------|------------|------------------------------------------|---|-----|------------|------------|---------------|--------------|--------------|--------------|--------------|--------------------|
| CONSULTANCY SERVICES TO DEVI ENERGIES |               |            |                                          |   |     |            |            |               |              |              |              |              |                    |
| 132 KV SWITCHING STATION AT TENGA     |               |            |                                          |   |     |            |            |               |              |              |              |              |                    |
| ANNEXURE 13.1                         |               |            |                                          |   |     |            |            |               |              |              |              |              |                    |
| All figures in RS.                    |               |            |                                          |   |     |            |            |               |              |              |              |              |                    |
| TRANSMISSION LINE                     |               |            |                                          |   |     |            |            |               |              |              |              |              |                    |
| Activity Description                  | Activity Type | 2          | 3                                        | 4 | 5   | 6          | 7          | 8=5x7         | 9            | 10           | 11           | 12           | 13                 |
| 1                                     |               |            |                                          |   |     |            |            |               |              |              |              |              |                    |
| WBS Element - CS-2016013-02-01        |               |            |                                          |   |     |            |            |               |              |              |              |              | 14=8+9+10+11+12+13 |
| Spare-110V Battery Charger            | SS            | 1000031776 | CONTR. CARDS-110V BATTERY CHARGER        | 1 | SET | 47,736.00  | 47,736.00  | 5,967.00      | 1,074.06     | 3,818.88     | 2,343.84     | 0            | 60,939.78          |
| Spare-110V Battery Charger            | SS            | 1000031790 | RELAYS-110V BATTERY CHARGER              | 1 | SET | 628        | 628        | 78.5          | 14.13        | 50.24        | 30.83        | 0            | 301,704.8          |
| Spare-110V Battery Charger            | SS            | 1000031789 | RECTIFIER T/F-110V BATTERY CHARGER       | 1 | FA  | 103,144.00 | 103,144.00 | 12,893.00     | 2,320.74     | 8,251.52     | 5,064.37     | 0            | 131,617,363        |
| Spare-110V Battery Charger            | SS            | 1000031793 | THYRISTOR/DIODE-110V BATTERY CHARGER     | 1 | SET | 7,957.00   | 7,957.00   | 994.63        | 179.03       | 636.56       | 390.69       | 0            | 10,151,91          |
| Spare-110V Battery Charger            | SS            | 1000031797 | THYRISTOR FUSE-110V BATTERY CHARGER      | 6 | SET | 2,443.00   | 14,658.00  | 1,837.25      | 379.81       | 1,172.64     | 719.71       | 0            | 18,174.00          |
| Spare-48V Battery Charger             | SS            | 1000009601 | CONTR. CARDS-48V BATTERY CHARGER         | 1 | SET | 23,637.00  | 23,637.00  | 2,954.63      | 531.83       | 1,890.96     | 1,160.58     | 0            | 30,174.99          |
| Spare-48V Battery Charger             | SS            | 1000018399 | RELAYS-48V BATTERY CHARGER               | 1 | SET | 961        | 961        | 120.13        | 21.62        | 76.88        | 47.19        | 0            | 1,276.81           |
| Spare-48V Battery Charger             | SS            | 1000018327 | RECTIFIER T/F-48V BATTERY CHARGER        | 1 | EA  | 21,250.00  | 21,250.00  | 2,656.25      | 478.13       | 1,700.00     | 1,043.38     | 0            | 27,121.75          |
| Spare-48V Battery Charger             | SS            | 1000071628 | THYRISTOR/DIODE-48V BATTERY CHARGER      | 1 | SET | 8,766.00   | 8,766.00   | 1,095.75      | 197.24       | 701.28       | 430.41       | 0            | 11,150.68          |
| Spare-48V Battery Charger             | SS            | 1000021603 | THYRISTOR FUSE-48V BATTERY CHARGER       | 6 | SET | 1,627.00   | 9,762.00   | 1,220.25      | 219.65       | 780.96       | 479.31       | 0            | 22,462.17          |
| Spare-2G Set                          | SS            | 1000019579 | SELF STARTER ASSLY-DG SET                | 1 | FA  | 89,018.00  | 89,018.00  | 11,127.25     | 2,002.91     | 7,121.44     | 4,370.78     | 0            | 113,640.38         |
| Spare-5G Set                          | SS            | 1000006556 | AVR CARD DG SET                          | 1 | EA  | 29,034.00  | 29,034.00  | 3,629.25      | 653.27       | 2,327.72     | 1,425.57     | 0            | 37,064.80          |
| Spare-RELAY & PROT PANEL (AUTOMA      | SS            | 1000031064 | NUMERICAL DISTANCE RELAY                 | 1 | SET | 274,173.00 | 274,173.00 | 34,271.63     | 6,168.89     | 21,933.84    | 13,461.89    | 0            | 350,069.25         |
| Spare-RELAY & PROT PANEL (AUTOMA      | SS            | 1000017773 | POWER SUPPLY MODUL FOR B/B PROTECTION    | 1 | SET | 70,785.00  | 70,785.00  | 8,848.13      | 1,592.66     | 5,662.80     | 3,475.54     | 0            | 90,364.13          |
| Spare-RELAY & PROT PANEL (AUTOMA      | SS            | 100007634  | BAY UNIT MODULE-BUS BAR PROTECTION       | 1 | FA  | 198,548.00 | 198,548.00 | 24,818.50     | 4,467.93     | 15,883.84    | 9,748.71     | 0            | 251,446.38         |
| Spare-RELAY & PROT PANEL (AUTOMA      | SS            | 1000030545 | DIRECTIONAL-O/C & E/F RELAY              | 1 | FA  | 160,132.00 | 160,132.00 | 20,016.50     | 3,602.97     | 12,810.56    | 7,862.48     | 0            | 204,424.51         |
| Spare-RELAY & PROT PANEL (AUTOMA      | SS            | 1000010638 | DIGITAL PROTECTION COUPLER               | 1 | EA  | 253,955.00 | 253,955.00 | 31,744.38     | 5,713.99     | 20,316.40    | 12,469.19    | 0            | 324,198.95         |
| Spare-SUBSTATION AUTOMATION SYS       | SS            | 100007627  | BAY CONTROL UNIT (BID) OF EACH TYPE      | 1 | FA  | 824,328.00 | 824,328.00 | 103,041.00    | 18,547.38    | 65,946.24    | 40,474.50    | 0            | 1,051,337.22       |
| Spare-SUBSTATION AUTOMATION SYS       | SS            | 1000011373 | FTTH/RTT CARD                            | 1 | SET | 194,118.00 | 194,118.00 | 24,264.75     | 4,367.66     | 15,529.44    | 9,531.19     | 0            | 247,811.04         |
| Spare-LT T/F                          | SS            | 1000016629 | OTI & WTI WITH SENSING DEVICE-LT T/F     | 1 | FA  | 39,425.00  | 39,425.00  | 4,928.13      | 887.06       | 3,154.00     | 1,935.17     | 0            | 50,329.96          |
| Spare-LT T/F                          | SS            | 1000017815 | PRESSURE RELIEF VENT DIAPHRAGM (AUX T/F) | 1 | EA  | 6,473.00   | 6,473.00   | 809.13        | 145.64       | 517.84       | 317.82       | 0            | 9,263.43           |
| Spare-LT T/F                          | SS            | 1000019765 | SILICAGEL BREATHER-LT T/F                | 1 | FA  | 3,321.00   | 3,321.00   | 415.13        | 74.72        | 265.68       | 163.06       | 0            | 4,239.59           |
| Spare-LT T/F                          | SS            | 1000019680 | SET OF VALVES-LT T/F                     | 1 | SET | 9,129.00   | 9,129.00   | 1,141.13      | 205.4        | 730.32       | 448.23       | 0            | 11,604.08          |
| Spare-LT T/F                          | SS            | 1000007920 | BUCHHOLZ RELAY-LT T/F                    | 1 | FA  | 9,019.00   | 9,019.00   | 1,127.38      | 202.93       | 721.52       | 442.83       | 0            | 11,511.66          |
| Training                              | AG            | 100002670  | TRAINING AT SITE SY EQUIPMENT(S) DAYS    | 2 | TAG | 170,700.00 | 170,700.00 | 0             | 0            | 0            | 0            | 241,400.00   | 241,400.00         |
| Training                              | AG            | 100002671  | TRAINING AT SITE-PROT & AUTOM(DAYS)      | 3 | TAG | 29,160.00  | 29,160.00  | 0             | 0            | 0            | 0            | 87,480.00    | 87,480.00          |
| TOTAL SUBSTATION                      |               |            |                                          |   |     |            |            | 64,275,215.50 | 8,034,402.15 | 1,446,192.49 | 5,142,017.24 | 3,155,913.07 | 98,641,687.24      |
| PROJECT TOTAL - SUBSTATIONS           |               |            |                                          |   |     |            |            | 64,275,215.50 | 8,034,402.15 | 1,446,192.49 | 5,142,017.24 | 3,155,913.07 | 180,695,427.35     |

# EXHIBITS

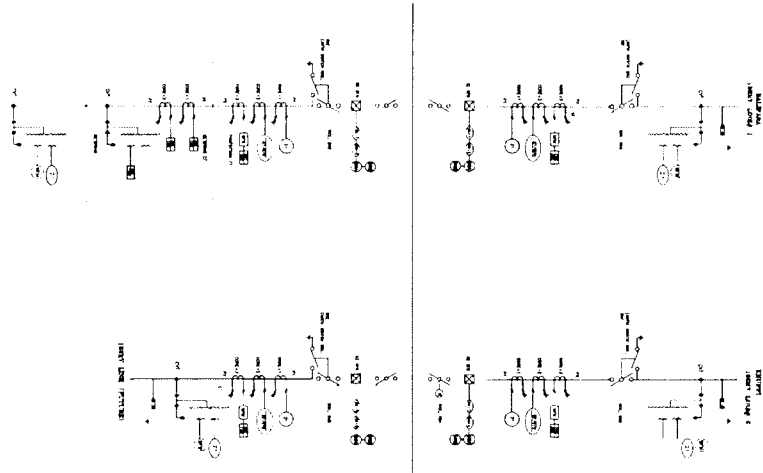
- GENERAL NOTES:-**
1. ALL DIMENSIONS ARE IN MM.
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  3. EXISTING EXISTING EXISTING (EXISTING LINE 132KV - EXISTING EXISTING EXISTING)
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|---------------|---------------------------------------|
| CONTRACTOR :  | DEVI ENERGIES PVT LTD                 |
| CONSULTANT :  | DEVI ENERGIES PVT LTD                 |
| CLIENT :      | DIKSHI HYDRO ELECTRIC PROJECT 3X8MW   |
| PROJECT :     | 132 KV SWITCHING STATION AT TENGA (V) |
| DESCRIPTION : | QA DRAWING AND PLAN LAYOUT            |

JOB NO. \_\_\_\_\_

|     |                |
|-----|----------------|
| 23  | OVERFLOW RELAY |
| 24  | OVERFLOW RELAY |
| 25  | OVERFLOW RELAY |
| 26  | OVERFLOW RELAY |
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| 28  | OVERFLOW RELAY |
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| 99  | OVERFLOW RELAY |
| 100 | OVERFLOW RELAY |

[illegible]

132KV LINE FROM DIPL HYDRO

| APPLICATION NO. | LINE PROJECT   | DATE | OFFICE | ACTIVITY CLASS |
|-----------------|----------------|------|--------|----------------|
| 1               | 900-900-150/1A |      |        | PR             |
| 2               | 900-900-150/1A |      |        | PR             |
| 3               | 900-900-150/1A | 201A |        | 2.25           |

| APPLICATION | PG<br>(K) | SEC<br>(V) | DITHY-<br>T (V) | ACTIVATY<br>CLASH |
|-------------|-----------|------------|-----------------|-------------------|
| COND-1      | 1.8E-3    | 1.10V-3    | 1.00            | 37                |
| COND-2      | 1.8E-3    | 1.10V-3    | 1.60            | 63                |

| VOLTAGE<br>(V <sub>PM</sub> ) | MODULUS DEVIATION<br>CURRENT (A) | CLASS |
|-------------------------------|----------------------------------|-------|
| 100                           | 10                               | III   |

| RAISED CEMENT<br>(%) | SETTING TIME<br>CURETIME (hA) | DURATION OF<br>BTC (SEC) |
|----------------------|-------------------------------|--------------------------|
| 1000                 | 31.8                          | 2                        |

| TEST OF ABILITY TO PERFORM | REPORT TIME<br>CURRENT (A) | DURATION OF<br>STG. (SEC.) |
|----------------------------|----------------------------|----------------------------|
| 600                        | 31.6                       | 3                          |

| INITIAL MOISTURE<br>PERCENT (%) | SUPPORT TENSILE<br>STRENGTH (KN) | DURATION OF<br>TEST (SEC.) |
|---------------------------------|----------------------------------|----------------------------|
| 0.00                            | 31.6                             | 9                          |

| APPLICATION | PM (IN)    | RMC (V)     | CUTPOINT (IN) | ACCURACY CLASS | COMPUTATION METHOD |
|-------------|------------|-------------|---------------|----------------|--------------------|
| MEETING     | 1.00 / .25 | 1.037 / .25 | 50            | 0.2            | —                  |
| PROTECTION  | 1.50 / .5  | 1.150 / .5  | 50            | SP             | —                  |

| APPLICANT | CASE NO. | INDEX  | REVISED | ACCIDENT CLASS |
|-----------|----------|--------|---------|----------------|
| METROPCO  | 1        | 300/1A | 3A      | 0.2B           |
| METROPCO  | 2        | 300/1A | 3A      | 0.2B           |

| APPLICATION | CORRECTION | TIME (H) | REC. TIME (H) | CHARGE (V/L) | ACIDITY CLASS |
|-------------|------------|----------|---------------|--------------|---------------|
| REFINED     | 1          | 184.5    | 3107.5        | 30           | 0.2           |
| REFINED     | 2          | 183.5    | 3107.5        | 30           | 0.2           |

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THE FOLLOWING ARE COMMENTS.

- [illegible]

DIKSHI HYDRO ELECTRICAL POWER PLANT

DEV1 ENERGIES PVT LTD

## 132KV SW STN SINGLE LINE DIAGRAM

[illegible]