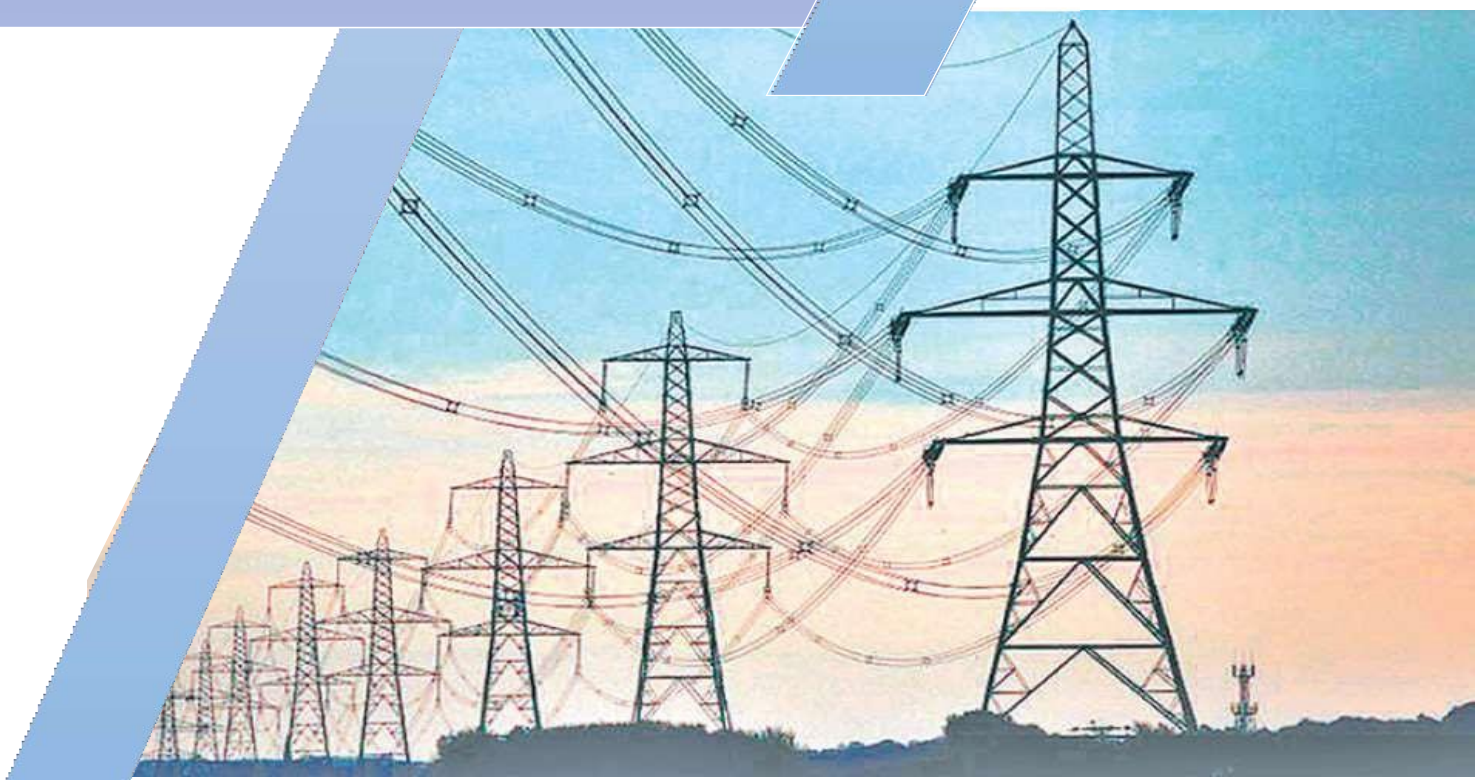
WEST SETI CORRIDOR

400kV Transmission Line Project



Project Detail

1. About Company

Government of Nepal (GoN) has established the Rastriya Prasaran Grid Company Limited (RPGCL) on 17 June 2015 as a National level Transmission Company. The company is registered under the Company Act (2063) and aims to develop, expand and operate national transmission system. The company has mandate to function as an independent Transmission System Operator (TSO) that owns the transmission assets and provides open access transmission services to all stakeholders. Its main shareholders are eight ministries of GoN and the Nepal Electricity Authority (NEA). The company's authorized capital is NRs. 25 billion and paid-up capital NRs 10 billion. The company's corporate office is located at Buddhanagar, Kathmandu. The Secretary of the Ministry of Energy, Water Resources and Irrigation (MoEWRI) chairs the RPGCL board.

2. Scope of the project

Rastriya Prasaran Grid Company Limited, RPGCL, has proposed a West Seti Corridor 400 kV Double Circuit Transmission Line Project with associated substations for construction through Public-Private Partnership (PPP) model.

Bajhang - Banlek (West Seti) - Dododhara 400kV double circuit line is of about total 145 km length with 60 km ACSR quad Moose Conductor in Bajhang – Banlek (West Seti) section and 85 km ACSR quad Moose Conductor in West Seti (Banlek) – Dododhara section. This Transmission line project is one of the biggest power carriers of far western region in Zone -1.

This transmission line project is proposed to evacuate around 2500 MW of power from number of hydropower projects. The transmission line originates from Chainpur substation at Bajhang District to Dododhara Substation of Kailali district including major 2 substations i.e. a. Chainpur substation and b. Banlek (West Seti) substation. The major generations in this zone and its connecting substations are tabulated below along with their estimated operation date.

Project Detail

Table 1: Proposed list of Hydropower connecting with West Seti 400 kV Transmission Line

S.N.	Company Name	Project Name	Capacity (MW)	RCOD	MOU date (Grid Connection)
1	Chilime H/P Company Ltd.	Seti Nadi-3 HPP	87.00	2088/89	18 July, 2022
2	Chainpur Seti Company Ltd.	Chainpur Seti HPP	210.00	2088/89	23 Aug, 2024
3	Samridhhi Energy Ltd	Bajhang Upper Seti HPP	216.00	2088/89	15 Dec,2023
4	Omega Energy Pvt Ltd	Sunigad HPP with Upper	25.05	2087/88	28 Aug, 2022
5	Sun Star Pvt. Ltd	Super Seti HPP	46.00	2090/91	28 Aug, 2023
6	Badi Malika Pvt Ltd	Badi Malika HPP	60.00	-	-
7	Nyadi Pvt Ltd	Nyadi HPP	60.00	-	-
8	Bajhang Cluster HEP	Bajhang Cluster HEP	21.92	-	-
9	Mata Malika Pvt. Ltd	Malumela Seti Nadi HEP	72.00	2091/92	1 July, 2025
10	Surma Sarowar Pvt. Ltd	Mahakali Seti HEP	54.00	2091/92	1 July, 2025
11	Tapowan HPPL	Tapowan Seti PROR HEP	72.00	-	-
12	Shivanya Energy Pvt. Ltd	Kalangad A HEP	9.84	-	-
13	Hydro Hills Pvt. Ltd	Super Sunigad HEP	12.00	-	-
14	Danfe Energy Dev. Group	Lower Sunigad HEP	4.00	-	-
15	Milestone Energy Pvt. Ltd	Ghatganga PROR HEP	51.50	-	-
16	Seti Saipal H/P Pvt. Limited	Syanban Khola HEP	31.50	-	-
17	Vision Power Partner Pvt. Ltd	Super Kalanga Khola HEP	16.00	-	-
18	Surma Shakti Pvt. Limited	Lower Seti (Bajhang) HEP	9.60	-	-
19	Kalanga Hydro Pvt. Ltd	Kalanga H/P Pvt. Limited	15.33	-	-
20	Sanigad Hydro Pvt. Ltd	Upper Kalangad HEP	38.46	-	-
21	Bungal Hydro Limited	Sanigad HEP	10.70	-	-
22	Urja Energy Pvt. Limited	Lower Sannigad Khola	3.00	-	-
23	Saipal Venture Pvt. Ltd	Talkotgadhi HEP	6.10	-	-
24	Best H/P Company Ltd	Super Sunigad HEP	24.80	-	-
25	Bagthala Hyro Pvt. Limited	Lower Kalangad HEP	8.00	-	-
26	Subharambha Energy Pvt. Ltd	Middle Kalangagad HEP	7.03	-	-
27	Vidhyut Utpadan Company Ltd	Mugu Karnali Storage HEP	1902.00	-	-
28	Balanch Hub	Balanch Hub	300.00	-	-
29	NHPC Limited, India	West Seti HEP	800.00	2092/93	13 May 2024
30	Department of Electricity Development (DoED)	Budi Ganga HEP	20.00	-	-

Project Detail

Project Location

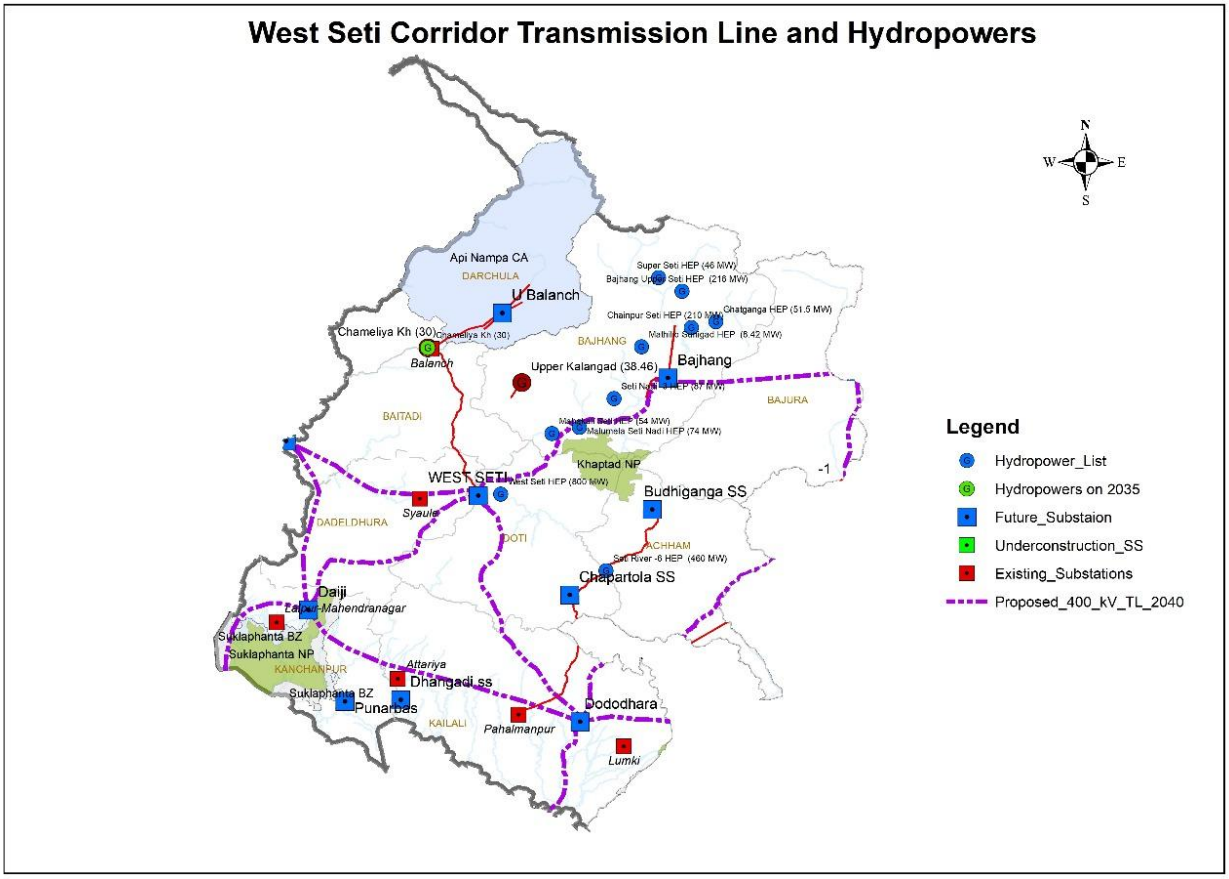


Figure 1: Project Location

Project Highlights

Table: 2 Project Highlights

Project Name	West Seti Corridor 400 kV Transmission Line Project
Location	Bajhang, Doti, Dadeldhura, and Kailali
Proponent	Rastriya Prasaran Grid Company Limited
Transmission Line	400 kV Double Circuit with Quad Moose 60 km Length from Bajhang to Banlek (West Seti), Doti and 400 kV Double Circuit with Quad Moose 85 km Length from West Seti (Banlek) to Dododhara, Kailali
Substation	2 No. of 400/132 kV GIS Substations at Bajhang & Doti
Estimated Project Cost	NRs. 20 Arab (Approx.)
Commissioning Schedule	2088/89

Project Route/Alignment

Figure 2 Transmission Line alignment from Chainpur substation, Bajhang to Banlek substation, Doti

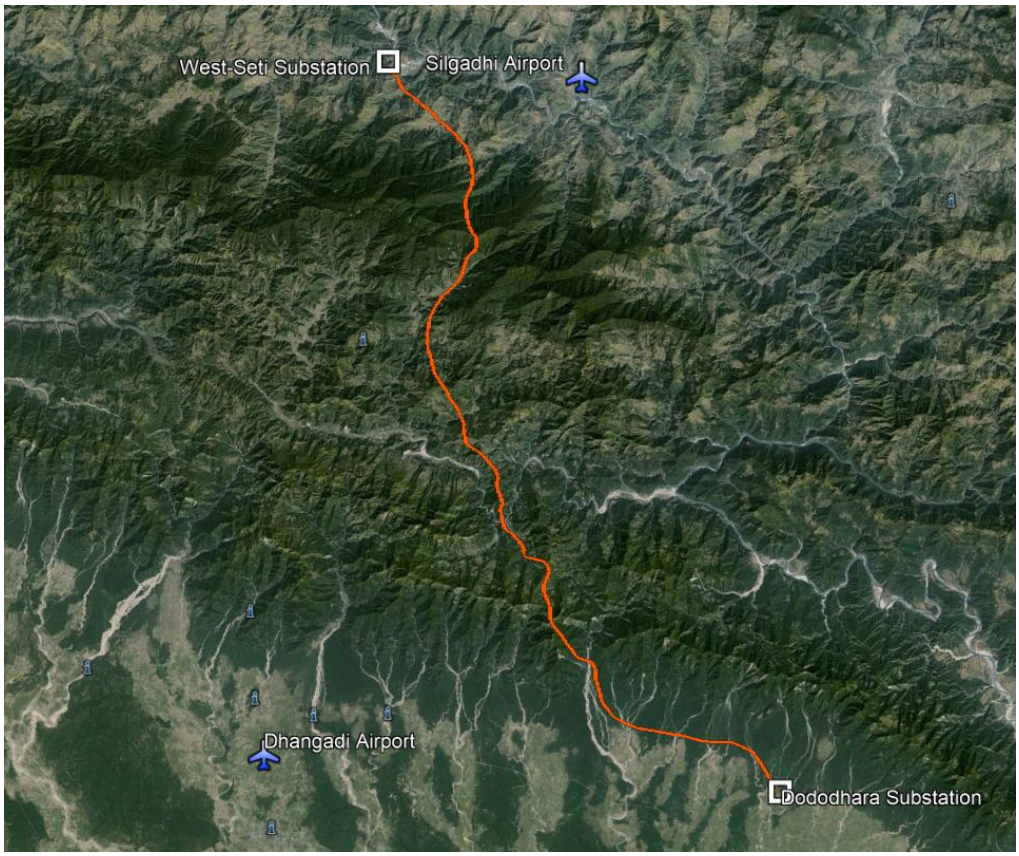


Figure 3 Transmission Line alignment from Banlek substation, Doti to Dododhara substation, Kailali

3. Transmission Line

The Bajhang – Banlek (West Seti) - Dododhara (Kailali) 400kV Double Circuit West Seti Corridor Transmission Line project shall be contributing to sustainable, economic and reliable power evacuation from the power produced in the West Seti Corridor by enhancing the efficient transmission of electricity, improving line voltage, reducing technical grid losses and thus enhancing the reliability of the electricity supply.

3.1 Section: 1 Bajhang – Banlek (West Seti) Section

The stretch of Transmission line starts from proposed Chainpur Substation at Jayaprithvi Municipality of Bajhang district and terminates at proposed Banlek (West Seti) Substation at Shikhar Municipality of Doti District. The length of this section of transmission line is around 60 km. This section passes through the hilly terrain.

3.2 Section: 2 West Seti (Banlek) - Dododhara Section

The stretch of Transmission line starts from proposed West Seti Substation at Shikhar Municipality of Doti District and terminates at proposed Dododhara Substation at Kailali district. The length of this section of transmission line is around 85 km. This section passes through the hilly terrain.

Table 3: Basic Technical Parameter of Transmission Line

SN	Features	Description
a)	Voltage	400 kV
b)	Circuit	Double Circuit
c)	Peak	2 Nos. (OPGW and Ground wire)
d)	Conductor	ACSR Moose
e)	No. of Sub conductors	4 Nos. (from West Seti to Dododhara) and 4 Nos (from Bajhang to West Seti)
f)	Spacing	457mm
g)	Configuration	Square
h)	Right of Way	46m (23 m on either side of centre)
i)	Starting Point	Chainpur Substation, Bajhang
j)	End Point	Dododhara Substation

Table 4: Technical Parameter of Conductor and Earthwire

S.N.	DESCRIPTION	CONDUCTOR	Earth Wire
a)	Type	ACSR MOOSE	EW
b)	Overall Diameter	31.77 mm	10.98 mm
c)	Cross Sectional Area	597.0 Sq. mm	73.646 Sq. mm
d)	Unit Weight	2.004 kg/m	0.583 kg/m
e)	Ultimate Tensile Strength	16432 kg	6972 kg
f)	Co-efficient of Thermal Expansion	0.0000193Deg. C	0.0000115/Deg.C
g)	Modulus of Elasticity	703400 kg/sq. cm	1936100 kg/sq.cm

4. Associated Substations

The scope of West Seti Corridor 400 kV transmission line consists of construction of two 400/132 kV High Voltage GIS substations as follows:

4.1 Chainpur Substation, Bajhang

Around 14 Hectare (282 Ropani) of land is acquired for the construction of the Chainpur substation. The substation is proposed at near Jayaprithvi Municipality of Bajhang district of Sudur Paschim Province (Latitude: 29°30'54.73"N, Longitude: 81°14'10.32"E) and expected to evacuate power from the Seti Nadi-3 HPP (87 MW), Chainpur Seti HPP (210 MW), Bajhang Upper Seti HPP (216 MW) as well as other nearby HPP with the total amounting to over 513 MW by the year 2031.

New 400/132kV GIS (Gas Insulated Substation) type is proposed at Chainpur substation. Four 53.33 MVA, 400/132 kV, 1-phase autotransformers are proposed at Chainpur substation. Following is the main scope of the Chainpur Substation.

- 400 kV Switchyard: 400 kV switching scheme will be one and half Breaker type. Details of bays are as below:
  i. 400 kV Line bays: 4 (Four) numbers (3 Lines + 1 Spare)
  ii. 400 kV Transformer Bay: 2 (Two) number
  iii. 400 kV Auxiliary bus: 1 (One) number, for connection of spare unit in place of any other unit of transformer bank.

- 132kV Switchyard: 132 kV switching scheme will be double main bus (DM) type. Details of bays are as below:
  i. 132 kV line bays: 6 (Six) numbers. (5 Lines + 1 Spare)
  ii. 132kV Transformer Bay: 2 (Two) numbers
  iii. 132kV Bus coupler bay: 1 (One) number and
  iv. 132 kV Auxiliary bus: 1 (One) number, for connection of spare unit in place of any other unit of transformer bank)
- One bank of 53.33MVA, 400/132 kV, 1-phase autotransformers: 4 (3+1Spare) number

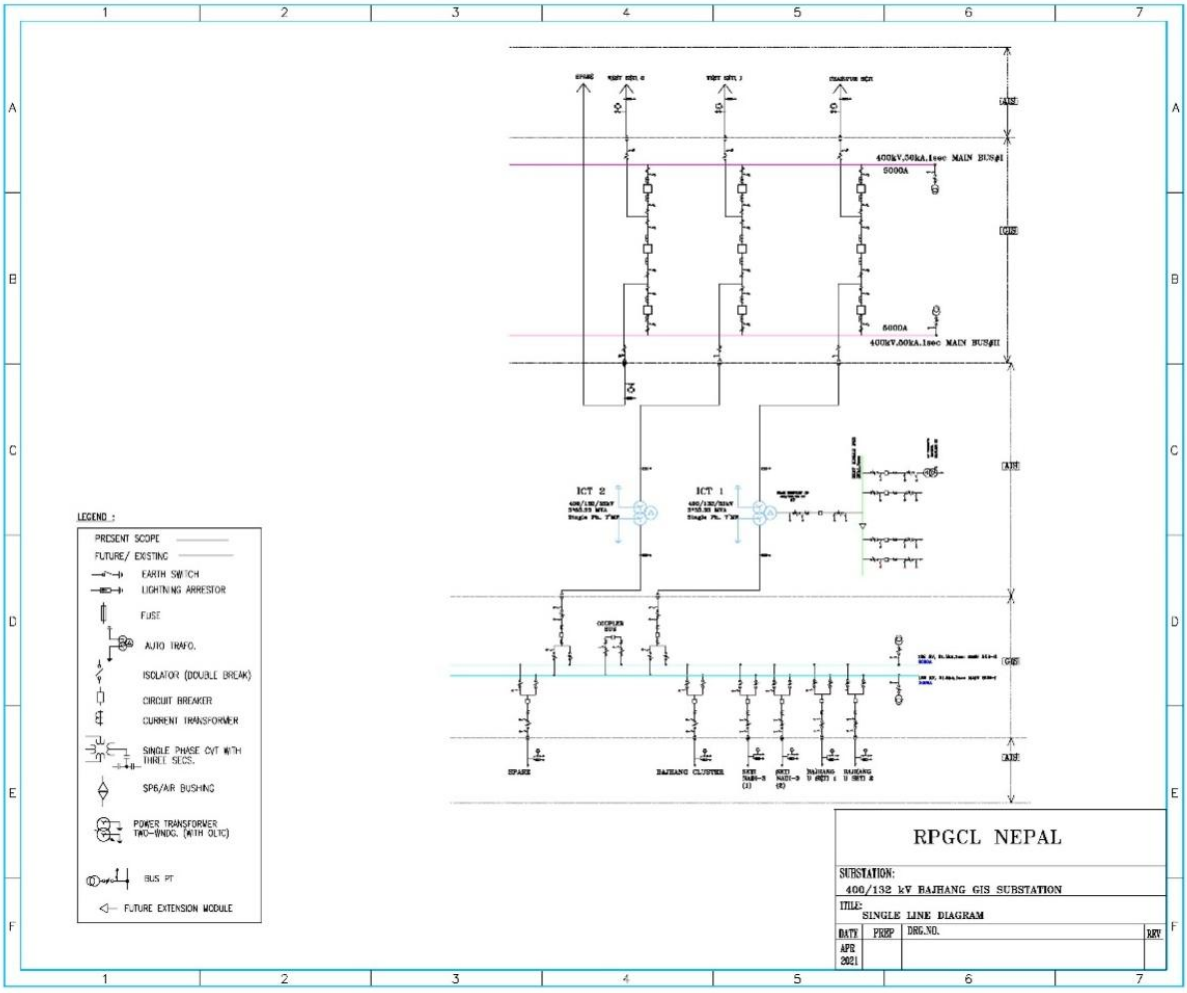


Figure 4: Single Line Diagram of Bajhang Substation

4.2 Banlek (West Seti) Sub Station

Around 7 Hectare (142 ropani) of private land is required for the West Seti substation. About 90% land acquisition has been completed with coordination from District Administration Office, Doti and remaining land acquisition process is ongoing.

The substation is proposed at near Shikhar Municipality of Doti district of Sudur Paschim Province (Latitude: 29°17'43.30"N, Longitude: 80°46'6.29"E) and expected to evacuate power from the West Seti HP Project as well as other nearby HPP with the total amounting to over 800 MW by the year 2035. The reduced level of the substation area is approximately 700 m from mean sea level. Paddy, Wheat are the main agricultural crops in substation area. The proposed substation plot area is approx. 280m x 240m.

Figure 5: Banlek substation (West Seti) location

New 400/132kV GIS (Gas Insulated Substation) type is proposed at Banlek (West Seti) substation. Seven 53.33 MVA, 400/132/33kV, 1-phase autotransformers are proposed at Banlek (West Seti) substation. Following is the main scope of the West Seti Substation.

- 400 kV Switchyard: 400 kV switching scheme will be One and Half Breaker type. Details of bays are as below:
  - iv. 400 kV Line bays: 11 (Eleven) numbers (10 line + 1 Spare)
  - v. 400 kV Transformer Bay: 1 (One) number

vi. 400kV Tie bays: 6 (Six)

vii. 400 kV Auxiliary bus: 1 (One) number, for connection of spare unit in place of any other unit of transformer bank.

- 132kV Switchyard: 132 kV switching scheme will be double main bus (DM) type. Details of bays are as below:

viii. 132 kV line bays: 3 (Three) numbers. (2 Line + 1 Spare)

ix. 132kV Transformer Bay: 1 (One) number

x. 132kV Bus coupler bay: 1 (One) number and

xi. 132 kV Auxiliary bus: 1 (One) number, for connection of spare unit in place of any other unit of transformer bank)

- Two banks of 400/132 kV, 53,33MVA, 1 phase Transformer: 7 (6+1Spare) number

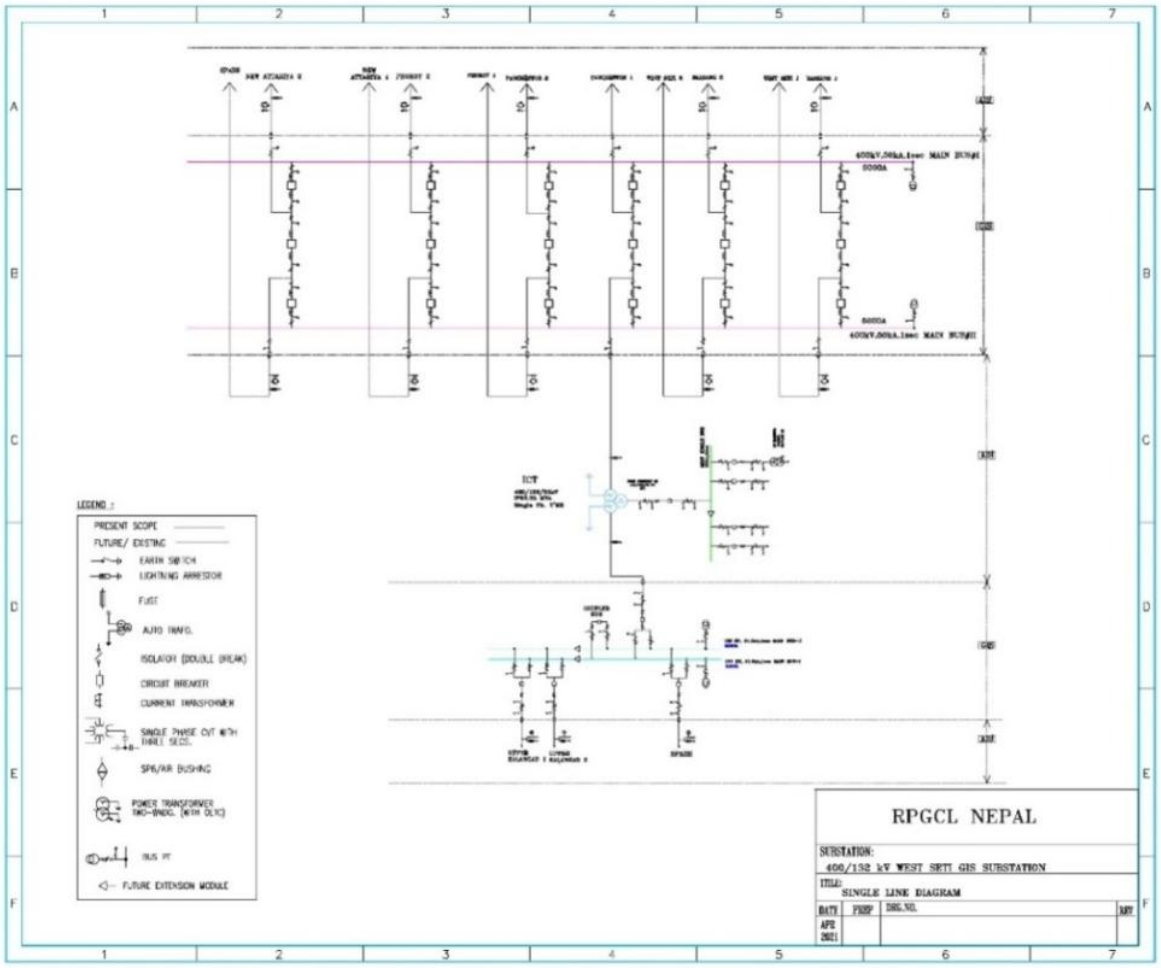


Figure 6: Single Line Diagram of West Seti Substation

The West Seti substation can be approached from Seti highway. The route follows the Mahakali Highway till Syaule Bazzar, Dadeldhura from Attariya, Kailali onwards the location is accessible via Seti highway. The West Seti Substation is proposed at, Shikhar Municipality-10, Doti which is around 1 km from the Highway along the recently constructed rural earthen road connecting highway to Banlek Village.

Figure 7: Banleki Substation area as seen in Google Earth

5. Detail Engineering of the Transmission Line

Rastriya Prasaran Grid Company Limited (RPGCL) completed the Detailed Engineering and Environmental Study of West Seti Corridor 400 kV Transmission Line Project including transmission line from Chainpur-Banlek and Banlek-Dododhara along with two substations at Chainpur and Banlek.

6. Project Execution

The exploration of construction modality of West Seti Corridor 400kV Transmission Line on Public-Private Partnership (PPP) model is under discussion. Construction period is proposed as 5 years, the details of which is included in the table below.

Table 5: Proposed Schedule

S.N.	Task Name	Year 1		Year 2		Year 3		Year 4		Year 5	
		Half 1	Half 2	Half 1	Half 2	Half 1	Half 2	Half 1	Half 2	Half 1	Half 2
1	Chainpur-Banlek and Banlek-Dododhara Transmission Line + Chainpur & Banlek Substation Bidding/Procurement Phase										
2	Chainpur-Banlek and Banlek-Dododhara Transmission Line + Chainpur & Banlek Substation Post Bidding Phase										
2a	Survey & Associated Activities										
2b	Basic Engineering										
2c	Land Acquisition and Forest Clearance										
	Submission of Design, Drawing and GTP of Line Material										
2 d	Proto-type Tower Testing										
2 e	Manufacturing and Supply of Equipment / Materials										
2 f	Civil, Installation and Commissioning Work										