DEENDAYAL PORT AUTHORITY
ISO 9001:2008 | ISO 14001 | ISPS Compliant Port

Office of Executive Engineer (Electrical),
Ground Floor, Nirman Building, New Kandla,
Kutch, Pin Code 370210.

No.: EL/AC/2831 Date: 08/05/2025

Expression Of Interest (EOI)

DPA intends to invite Expression of Interest for the work of "**Shifting of 11KV Double Circuit SIPC feeder, due to widening of the Road to 6 Lanes at DPA Kandla.**".

(This EOI is issued to elicit Expression of Interest from the parties and does not constitute any binding commitment from the Deendayal Port Authority to proceed with the work or invite any or all the parties in the subsequent bidding process.)

Executive Engineer (Electrical), DPA invites the Expression of Interest for the work of "**Shifting of 11KV Double Circuit SIPC feeder, due to widening of the Road to 6 Lanes at DPA Kandla**" from the reputed firms from those who have executed similar work in Government/public sectors and other leading private organizations. The Expression of Interest documents containing details of Scope of Work and Technical Specifications are enclosed herewith.

The interested firms are requested to submit their Expression of Interest for the said work in BOQ format as enclosed at Annexure I. The completed Expression of Interest (EOI) shall be submitted to the office of the undersigned on or before 21/05/2025. A soft copy of EOI is also acceptable through e-mail Id. anantrao.kumthekar@deendayalport.gov.in & deepak.hazra@deendayalport.gov.in

-sd/
Executive Engineer (E)
Deendayal Port Authority

SCOPE OF WORK & TECHNICAL SPECIFICATIONS

The scope of work envisages the following. The New Line is to be erected Parallel to New Proposed Road, the area is Marshy land, thereby Reclamation as per site situation, is to be done for complete line, prior to erection of 11KV overhead line, check survey etc.are to be conducted, thereafter two parallel new lines are to be erected with complete materials. The above work is to be done under Engineer-in- charge. After completion of line work Electrical Inspector's visit is to be arrange by Contractor, even liasoning work is in the scope of contractor, however the fees will be borne by DPA, and same should be energized safely. The sag, spans and line erection/installation guidelines must be maintained as per PGVCL norms. If any live 11kV line is crossing on the way, same is to be attended by contractor in terms of liasoning with PGVCL, for fruitful result, the approximate length of line is 4.5Km (Dual line). Whereas in some region single line will run as per site requirement, for execution of above work all tools & tackels, Machinery i.e. DG Set, Excavator, Rollers, Tractors etc. are to be arrange by Contractor. After completion of site work contractor has to clean the site in neat & tidy way.

TECHNICAL SPECIFICATION FOR PART-A

Technical Specification No.1:

Supply, Installation, Testing and commissioning of 11KV overhead line with 100mm2 DOG AAAC Conductor with RSJ 9mtr pole having 23kg/m weight (Approximate span of 30m)

Supply, Installation, testing and commissioning of 11kv line with 100 mm2 AAAC conductor(Dog) with RSJ 9mtr pole having 23kg/m weight (approximate span-30 mtr). This includes supply at site & stringing of stranded AAAC conductor code name DOG of size 100sqmm as per Indian Standard Title International Standard IS:398 (Part-IV) Aluminium Alloy IEC : 208-1966 stranded conductor BS-3242-1970 IS : 9997-1988 Aluminium Alloy Redraw Rods IEC 104-1987 IS : 1778-1980 Reels and Drums for bare conductors BS:1559-1949 in a minimum length of 2000meters length in wooden drum, the conductor manufacturing batch shall be of 2024-25 or latest and same shall be submitted along with necessary documents & same is to be string on HT pin and strain insulators, binding on insulators, jumpering, the jointing in HT line will be done by twisting sleeve joints as per standard practice. Care must be taken in handling the conductor to protect against cuts, scratches or kinks. The conductor must not be drawn over hard surface ground, where it is liable to be damaged. AAAC conductors must be drawn on wooden or aluminium pulley only. Wastage and cutting should be avoided as far as possible.

Not more than 2% sag will be accepted in the materials account. The sag and spans and line erection/installation guidelines must be maintained as per PGVCL

norms. Any 11kV line crossing on the way while installation is also in the scope of the contractor and has to be executed as per the standard practice/norms of PGVCL with necessary accessories. This also includes painting with two coat of metal epoxy primer and three coat of epoxy grey paint, thereafter numbering the poles in 100mm round dia. This also includes planting the pole to 1/6th height in the ground with proper application of rubberized paint & strengthening with cement concrete and above ground level muffing is to be done. The quality of cement concrete and muffing method shall be as per Technical Specification no.1 of this document. The muffing type and method may be done as per the site requirement as per the instructions of Engineer-in- Charge in the case of special requirements as per the site.

The cross arms insulators must be so fixed that neither tilt nor bend from position. The rate quoted should be for three conductors along the route length kilometer as per Annexure-I Bill of Quantities. The sagging should be uniform for all conductors and uneven sagging will not be allowed. The ground clearance and line to line clearances, etc. have to be maintained as per latest IE Rules.

The land is soft, muddy type marshy land where poles are to be erected after excavation for erection of poles, a PCC carpet of 50mm thick shall be provided at the bottom and cured before erection of poles.

The vegetation below/parallel to the line shall be removed by the contractor. The contractor shall prepare the drawing of the line work (5 copies) and shall submit all the required documents which are required for getting clearance from CEA. However, the submission, uploading of documents and payment of statutory charges are in the scope of DPA.

The below table indicates tentative (but not limited) items to be used for 1km of 11kV line for reference:

SR	PARTICULARS (for per km route length)	UNIT	QTY
1	9 MTR RSJ POLE (minimum 116mmX100mm)23kg/m	NO.	35.00
2	11KV V CROSS ARM. (From Angle of 65X65X6) MS with Hot Dip Galvanization	NO.	35.00
3	Side clamp (65x65X6 MS Angle With Hot Galvanization)	NO.	70.00
4	HT TOP fittings (angle from 65x65X6 M.S -150MM) with Hot Dip Galvanization	NO.	35.00
5	(a) Anchor rod	NO.	4.00
6	(b) Turn buckle -	NO.	4.00

7	(c) Eye Bolt -(16mmX590 mm Round Bar).	NO.	4.00
8	(d) Stay wire- 7/12	KG	13.60
9	(e) HT Guy Insulator -	NO.	4.00
10	(f) Guy Clamp -	SET	5.00
11	(a) GI Wire No. 8 From Pole Top to Earthing Coil	KG	48.00
12	(b) Rigid PVC Pipe -20mm dia (1.5 Mtr) -	NO.	35.00
13	(c) Earthing Bolt	NO	35.00
14	(d) Earthing Coil (GI Wire No 8)	NO	35.00
15	Barbed wire	Mtr.	35.00
16	CAUTION & DANGER BOARD.	NO.	35.00
17	(a)22 KV Pin Insulator	No	105.00
18	(b) 22 KV GI Pin	No	105.00
19	(a) 11 KV Ball & Socket Type Comp(Polymer) Insulator(Long Rod)	NO.	24.00
20	(b) 11 KV Disc. Hardware with Hot Dip Galvanization	Set	24.00
21	AL.ALLOY CONDUCTOR 100 MM2 SIZE.	KM.	3.09
22	(a) M.S. Bolts & Nuts 65x16mm with Hot Dip Galvanization	KG	1.60
23	(b) M.S. Bolts & Nuts 180x16mm with Hot Dip Galvanization	KG	35.60
24	(b) P.G. Clamp for 'DOG' Connectors 100 sq.mm	No	12.00
25	(c) Alu. Binding wire	KG	0.90
26	(d) HT Tape	Mtr	08.00

Note: Above table is just for reference and summarizes minimum requirement of materials for the 1km Route length. Actual quantity may be envisaged for total route length as per Annexure-I Bill of Quantities using reference the above table. Any item with MS has to be Hot Dip Galvanized.

Technical Specification No. 2:

Supply, Installation, Testing and commissioning of 11KV overhead line with 100mm2 AAAC Conductor with RSJ 11mtr pole (Approximate span of 30m)

Supply, Installation, testing and commissioning of 11kv line with 100 mm2 AAAC conductor (Dog) with RSJ 11mtr pole having 23kg/m weight (approximate span-30 mtr at road crossing). The above pole is to be erected at road crossing which can provide max height with stay sets, C-channels, Clamps etc. for mechanical stability. This includes muffing etc at site. stringing of stranded AAAC conductor code name DOG of size 100sqmm as per Indian Standard Title International Standard IS:398 (Part-IV) Aluminum Alloy IEC: 208-1966 stranded conductor BS-3242-1970 IS: 9997-1988. This also includes painting with two coat of metal epoxy primer and three coat of epoxy grey paint, thereafter numbering the poles in 100mm round dia & as per standard practice GETCO/PGVCL.

Technical Specification No. 3:

Supply, Installation, Testing and commissioning of Cement Concreting of 1:2:4 ratio mixtures for Poles / Guys including CC for Poles and Guys as per site requirement.

The work includes concreting with one part of cement, two parts of specified quality sand and four parts of grit (1:2:4) the required grade of sand, cement, grit for CC should be approve by Civil Department, DPA. The mixture should be prepared on GI sheet and should be free from the dust. Cement river sand and metal should be used by contractor at his own cost. Concrete for muffing of poles and stay rods should be cement one part, sand two parts and four parts of Metal (1:2:4). Cement, sand and metal will be supervise from the Civil Department, DPA and work execution will also be in their scope regarding cement concrete. The concrete shall be used in above proportion and should be thoroughly mixed at least three times in dry state before potable water is added and as far possible a fairly wet mixture must be used after which vibrator is to be insert in wet concrete for setting of CC. All concrete must be mixed on watertight platform. In any case, the work finishing coat of cement plaster should be applied on outer surface of the smooth.

One finishing coat of cement plaster should be applied on outer surface of the muffing. The concrete block, when slightly dried, should be kept wet continuously for period of 10 days. If the concreting work is not found as per the specifications and quality, the same is liable to be rejected. The cement concreting work and muffing has to be done in the presence of Civil Engineering Department, DPA representative only and work done in his absence will be rejected and no payment made thereof. The cement, sand, metal grit shall be procured by the contractor prior to approval of Civil Engineering Department, DPA. The normal size of concreting/muffing of pole will be minimum 2m height x 1m dia per pole and size of concreting/muffing for stay will be minimum 1.2mx0.6mx0.6m or as directed by Civil Engineering Department, DPA. The concreting of poles, Double pole structures and guys is included in this work.

Technical Specification No. 4:

supply, installation of additional stay set for 9mtr/11 mtr RSJ pole. Work comprises of anchor rod, turn buckle, eye bolt etc.

The work includes the supply, installation of additional stay set for 9mtr/11mtr RSJ pole. Work comprises of anchor rod, turn buckle, eye bolt and

excavation of suitable pit 4' deep, fixing of stay clamp on pole, binding of GI stay wire. These additional guy sets are over and above the guys sets that are already included as a part of items under Annexure-I Bill of Quantities item no.1 as per Technical Specification no.1 and item no.4 as per Technical Specification no.4. The location of these additional guy sets will be decided as per the site conditions as per the decision of Engineer-in-Charge Deendayal Port Authority.

The stay insulators must be inserted in the stay wire on all stays as per standard practice of PGVCL/GETCO. The wrapping of the Guy wire strands at both ends. The stay insulator must be in proper appearance as per standard practice with good workmanship. The stay should be tension and straight to withstand in cyclone or storm of 200 Kmph, the item includes refilling by cement concrete mix of ratio 1:2:4 as per standard practice.

If stays are not required to be concreted, second option is a pre casted cement concrete block may be made by contractor will have to transport at his own cost to the site of work and will have to use for fixing of anchor rod at site. The work includes all material and labour and to the entire satisfaction of Engineer-in-charge.

The below table indicates tentative items to be used per pole for supply, installation of addition stay set of 11kV line as per PGVCL norms:

SR	PARTICULARS	UNIT	QTY
1	(a) Anchor rod - 1 No.	NO.	2.00
2	(b) Turn buckle - 1 No.	NO.	2.00
3	(c) Eye Bolt - 1No (16mmX590 mm Round Bar).	NO.	2.00
4	(d) Stay wire- 7/12	KG	6.80
5	(e) HT Guy Insulator - 1 No.	NO.	2.00
6	(f) Guy Clamp - 1 Set.	SET	2.00

Note: Above table is just for reference and summarizes minimum requirement of materials for the one guy set. Actual quantity may be envisaged as per Annexure- I Bill of Quantities using reference the above table. Any item with MS has to be Hot Dip Galvanized.

Technical Specification No. 5:

Supply and Installation, Testing and commissioning of DP Structure with 11KV AB Switch & D O Fuse on (9/11mtr RSJ POLE)

The work involves Supply, Installation, Testing and commissioning of DP structure with, 12KV A.B. Switch, vertical mounting, 3 pole, 50HZ, 400Amp Rated Short Time

Withstand Current for one second 16Ka rms, Rated Peak Withstand Current 40Ka peak for one second and as per IEC 61109 or latest amended up to date along with its operating pipe with handle with polymer insulators of 22KV, H.G Fuse on 9/11 MTR RSJ POLE hot dipped all accessories of pole. The Double pole structures have to be firmly installed on the site and also includes painting with two coat of metal epoxy primer and three coat of epoxy grey paint. Double pole structure should be solidly earthed from two points with individual earthing and a 'Danger' sign board should be provided on the Double Pole structure and anticlimbing device as instructed by Engineer in Charge. Apart from same MS fencing angle fencing duly grouted in ground with PCC along with iron mess having door opening for DP structure is also to be provided of size 4mtr x 4mtrx 2mtr height for safety purpose with epoxy painting to complete structure.

The below table shows tentative items (but not limited) to be used for this work. The same may be used for reference. However, the bidder is suggested to visit the site for ascertaining actual requirement of items.

SR.	PARTICULARS (For One DOUBLE POLE STRUCTURE WITH 11 KV A.B.SWITCH & DO FUSE ON 9/11 MTR RSJ POLE)	UNIT	QTY
1	9/11 MTR RSJ POLE (minimum 116mmX100mm) ,23kg/m	NO.	2
2	M.S. Angle Top FABRI.65x65x6mm - 2750mm MS with Hot Dip Galvanization	NO.	2
3	M.S. Angle 11 KV A.B. Switch - Fabri 65x65x6mm-2750mm	NO.	4
4	M.S. Angle Fabri. 65x65x6mm - 2750mm for cross bracing	NO.	4
5	11 KV A.B. SWITCH 400 AMP.	SET	1
6	Side Clamps for mounting A.B Switch (M.S Flat of size 50X6)	NO.	16
7	(a) Anchor rod	NO.	4
8	(b) Turn buckle -	NO.	4
9	(c) Eye Bolt (16mmX590 mm Round Bar)	NO.	4
10	(d) Stay wire- 7/12	KG	11.2
11	(e) HT Guy Insulator -	NO.	4
12	(f) Guy Clamp -	SET	4
13	(a) GI Wire No. 8 From Pole Top to Earthing Coil	KG	2.32

14	(b) Rigid PVC Pipe -20mm dia (1.5 Mtr) -	NO.	2
15	(c) Earthing Bolt	NO.	2
16	(d) Earthing Coil (GI Wire No 8)	NO.	2
17	(a) 11 KV Porcelain Disc Insulator	NO.	12
18	(b) 11KV Disc. Hardware	SET	6
19	11 KV COMPOSITE POLYMERIC D O FUSE	NO.	3
20	(a) M.S.Bolts & Nuts 65x16mm	KG	7.2
21	(b) M.S.Bolts & Nuts 180x16mm	KG	2.49
22	(c) P.G.Clamp for 'Dog' Conductor	NO.	9
23	(d) Binding tape HT for jumpering	MTR	20
24	(e) Alu. Binding wire	KG	0.5

Note: Above table is just for reference and summarizes minimum requirement of materials for one DP structure with 11KV A.B. Switch & D.O. Fuse on 9/11 MTR RSJ poles. Actual quantity may be envisaged for as per Annexure-I Bill of Quantities using reference the above table. Any item with MS has to be Hot Dip Galvanized.

Technical Specification No. 6:

This includes supply at site 11KV grade, 3 core x 300 sq.mm Aluminium conductor, XLPE(E) insulated armoured cable confirming to IS: 7098 (Part-II) 1985 with up to date amendments and of approved make with ISI mark. The manufacturer shall produce TYPE TEST certificate with similar size of cable, which shall not be more than 3 years old. The cable shall have marking/embossing at the interval of every meter showing its progressive length. During the cable inspection, the manufacturer shall show the relevant ROUTINE TESTS to inspecting authority or otherwise the manufacturer shall produce the routine test certificate during supply of cable at site. The rate shall inclusive of all taxes, excise duty, packing, forwarding, insurance, transportation and unloading at site of work etc.

The insulation shall withstand mechanical and thermal stress under steady state and transient operating conditions. The extrusion method should give very smooth interface between semi-conducting screen and insulation. The insulation of the cable shall be of high standard quality generally conforming to IS: 7098 (Part – II) – 1985 and any latest amendment to it.

Cable Parameters :

				11 KV
(i)	Voltage grade (Uo / U)	KV	:	6.35 / 11
(ii)	Cores (Nos)		:	3
(iii)	Nominal system voltage	KV	:	11
(iv)	Highest system voltage	KV	:	12
(v)	System frequency	Hz	:	50
(vi)	Variation in frequency	%	:	± 3
(vii)	(a) Maximum allowable temp. of conductor during continuous normal operation at rated full load current. ^{0}C		:	90
	(b) Maximum allowable temp. under short circuit condition ^{0}C		:	250
(viii)	1.2/50 microsecond lightning impulse withstand voltage wave value. KVp		:	75
(ix)	5 Min, Power frequency withstand voltage KV rms		:	17
(x)	System earthling			Effectively Earthed

The purchaser reserves the right to ask for documentary evidence of the purchase of various materials, (to be used for the manufacture of cable) as per checking of quality control. Quality Assurance plans shall be submitted.

The bidder shall have to submit, well in advance, the test certificates for the following routine test for approval prior to inspection of the materials for the complete lot offered for inspection at a time. (a) Conductor resistance test (b) Partial discharge test (c) High-voltage test for 5 minutes [as per Clause 19.7.2 of IS: 7098 (Part-II) – 1985].

Technical Specification No. 7:

Laying of Double circuit (three parallel cables) 3CX300 Sq.mm XLPE(E) Cable through Hard/Soft Soil Excavation and laying through separate Half Round Pipe (2 Nos.) 6" inner Diameter and 1 Meter length. The work includes laying of 3Cx300 sq.mm underground cable. For any length of cable that extends beyond the standard drum length of the cable, such extension has to be done with proper cable joining kits and techniques as per latest IE standards with excellent workmanship. All the cable ends that terminate at pole structures should be brought out from the ground only in HDPE pipes of appropriate size carrying single individual cable inside each HDPE pipe. The cable end should be terminated as per standard practice as per IE rules with best workmanship. Tagging of the cables with precise nomenclature is mandatory.

This includes laying of double circuit 3 core x 300Sq.mm HT armoured aluminium Conductor XLPE(E) Cable of 11KV Grade (excluding supply of cable) through excavation of trench 0.75-meter-wide and 1-meter-deep in soft/hard soil. Each cable should be placed inside RCC Half Round Pipe of 6" inner Dia and 1 Meter length and such RCC Half Round Pipes must be placed in such a fashion so as to provide support under the cable with one half and covering over the

cable with the other half. The same trench would be used to place two circuits & one spare (cables) side by side in horizontal fashion and these cables would run through three RCC pipes individually. The minimum distance between such RCC pipes throughout the route length should be 0.3m.

The bed of 50mm of river sand shall be provided in the bottom of the excavated trench. The RCC Pipe shall be laid/cover by river sand. This includes filling of gaps by fresh river sand and filling the trench up to at least 400mm height from bottom by fresh river sand. The remaining filling of the trench shall be done with the excavated stuff & should be watered and rammed properly to its original position. The excess excavated stuff shall be disposed off from the Site of work and spread in low lying areas as directed by Engineer in Charge or his nominee. The contractor shall provide heat shrinkable straight through joints of relevant size of approved make if the laying of cable shall be more than standard drum length. This includes all labour and material as directed by Engineer-in-Charge. Such cable joints shall be under the scope of work of the contractor at no extra cost or obligation from DPA. Such cable joining work is completely to be done by the contractor at his own cost. Measurement will be considered as single length only.

Cable laying, shall include the route marker, cable tagging, dressing, removing the old unused cable if any, appropriate size of glands & ferrule work as per requirement.

Technical Specification No.8:

Laying of Double circuit (three parallel cables) 3CX300 Sq.mm XLPE(E) Cable through RCC Road/Road/Rail Crossing by through HDD method and by Putting Suitable HDPE pipe(110mm inner dia.,PE – 100 Pipe, IS – 4984) in between Crossing.

This includes Laying 3 core x 300 Sq.mm 11kV XLPE cable by putting suitable diameter HDPE pipe, through road/Rail/RCC crossing at a depth of minimum 1.5 meters from Ground level and gradually the depth will be reduced at both sides finally it will come to 1 meter from ground level. If the Road/RCC crossing length more than length of HDPE coil pipe can be used of suitable size, so that pushing and pulling of cable within such pipes is unaffected and fuss free & then lay across the Rail/Road crossing. Single cable shall be passed through one pipe and after crossing of three length of cable, measurement will be considered as single length only, the excavated stuff shall be disposed off from the Site of work and spread in low laying area.

In case of Rail Crossing, firm shall put earthing across rail track, both end, their own cost as per IE rule & act. The HDPE pipe should be laid using Horizontal Boring using Horizontal auguring machine for all the Road/Railway/RCC crossings.

Cable lying, which shall include the route marker, cable tagging, dressing, removing the old unused cable from the route, appropriate size of glands & ferrule work as per requirement etc.

Technical Specification No.9:

Supply, fixing and testing of Outdoor Cable Termination kit for 11kV 300sqmm XLPE Cable.

This includes supply of heat shrink outdoor end Termination kit on HT (11 KV) 3CX300 Sq.mm (E) cable the rate shall be inclusive of all taxes, including transportation loading & unloading at site, the jointing kit shall be of fresh batch of 2024-25 for both end for all three phases.

HT Joint shall be carried out precisely on cable. This work includes all labour and material as directed by Engineer-in-Charge. The Heat Shrinkable Outdoor Termination offered shall be complete with all parts necessary for their effective and trouble-free operation. The Heat Shrinkable Outdoor Termination offered shall conform to the relevant standards and be of high quality, sturdy, robust and of good design and workmanship complete in all respects and capable to perform continuous and satisfactory operations in the actual service conditions at site and shall have sufficiently long life in service as per statutory requirements. The Heat Shrinkable Outdoor Termination offered

The outdoor cable termination is to be mandatorily used for 11kV 300 sqmm XLPE cables termination. The cable termination at pole structures should be done with HDPE pipe of suitable diameter and as per standard practice of PGVCL. Each such HDPE pipe should contain only one cable.

Technical Specification No. 10:

Supply, fixing and testing of Straight Joint Cable Termination kit for 11KV 300sqmm XLPE Cable.
This includes supply of heat shrink straight through Termination kit on HT (11 KV) 3CX300 Sq.mm (E) cable the rate shall be inclusive of all taxes, including transportation loading & unloading at site the jointing lit shall be of fresh batch of 2024-25, making outdoor straight joint Termination kit on HT (11 KV) 3CX300Sq.mm (E) cable, HT Joint shall be carried out precisely with good workmanship work includes all labour and material as directed by Engineer-in-Charge. The Heat Shrinkable Straight Joint Termination offered shall be complete with all parts necessary for their effective and trouble-free operation. The Heat Shrinkable Outdoor Termination offered shall conform to the relevant standards and be of high quality, sturdy, robust and of good design and workmanship complete in all respects and capable to perform continuous and satisfactory operations in the actual service conditions at site and shall have sufficiently long life in service as per statutory requirements.

The Straight joint cable termination is to be mandatorily used for 11kV 300 sqmm XLPE cables termination. The cable termination at pole structures should be done with HDPE pipe of suitable diameter with proper clamping and as per standard practice of PGVCL.

Technical Specification No. 11:

Supply and installation of Earthing coils at each end of the cable individually.

The work includes supply and installation of Earthing coils at each end of the cable individually for each cable. Earthing coils shall be of soft GI Wire Hot Dip Galvanized. The Hot Dip galvanized wire shall have clean surface and shall be free from paint enamel or any other poor conducting material. The coil shall be made

as per REC constructions standard. The Hot Dip galvanizing shall conform to IS: 2629/1966, 2633/1972 and 4826/1969 with latest amendments.

DIMENSIONAL REQUIREMENT: -

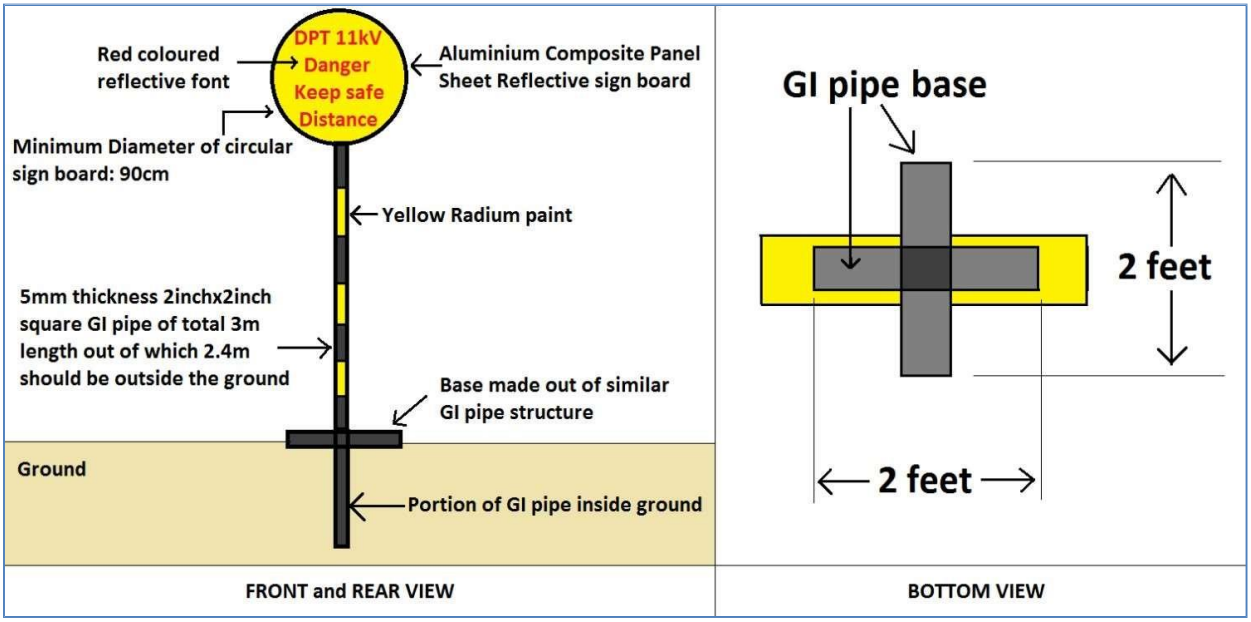
Nominal dia. of GI Wire – 4 mm (Tolerence +/- 2.5%)
Minimum no. of turns – 115 Nos.
External dia of Coil (Min) – 50 mm
Length of Coil (Min) – 460 mm
Free length of GI Wire at one end coil (Min.) – 2500 mm
The turns should be closely bound. Weight of one finished Earthing Coils (min.) – 1.850 Kg.

Technical Specification No.12 :

Supply and Installation of Reflective Signboard as per description:

This includes supply and installation of reflective sign boards at various locations as directed by Engineer-in-charge. The reflective sign boards have to be made out of Aluminium composite panel sheet with at least 3mm thickness and circular shape with minimum 90cm diameter of the circular sign board with reflective yellow coloured background and reflective red coloured bold fonts that are legible at least from a distance of 10meter. The reflective sign boards should be mounted on square GI pipes of minimum thickness 3mm and minimum length 3meter. Out of 3meter length of the GI pipe, 2.4meter should be above the ground level post installation and rest haste be grounded firmly. The base of the GI pipe should also be made with the similar GI pipe and the 'X' base formed should be welded properly with the main pole GI pipe using appropriate welding rods for GI pipe welding. Improper workmanship or fit and finish is liable to be rejected and is at the sole discretion of Engineer-in-charge.

The GI pipe should be painted with double coats of anti-corrosive paint and later with black colour and reflective yellow colour alternatively as referred to in the below figure.



The installation of GI pipe should be perfectly vertical so as to make the sign board perfectly erect without any tilt and all the sign boards should be meticulously installed at almost the same height. The GI pipe base should be affirmed by muffling the base with 2.5feetx2.5feetx2feet concreting of the ratio 1:2:4 of Cement : sand : metal. The concreted structure has to be painted with waterproofing coating twice and later with two layers of yellow coloured radium paint and black paint in form of strips. Please note that the concrete structure is not shown in the above figure but has to be compulsorily installed for all the sign board GI pipes without fail. The above figure is indicative and can be used for reference for better understanding of the requirements. The land is soft, muddy type marshy land hence a PCC carpet of 50mm thick shall be provided at the bottom and cured before erection of GI pipes of sign boards wherever necessary as directed by Engineer-in-charge.

Technical Specification No.13:

Guarding assembly for 1km under 11kV Overhead line with approximate pole span 30m or as per site requirement in piecemeal. This work includes the supply, installation, testing and commissioning of Guarding Assembly especially at road crossing etc, as per site requirement at various locations under 11kV Overhead line using as per the standards adopted practice by PGVCL complete with labour & materials and as per the directions of Engineer-in-Charge.

Technical Specification No.14:

Reclamation of land and approach are for erection of Tension pole, guys and concreting etc. at Various Tension Pole as directed & certified by the Civil Engineering Department, DPA.

Reclamation of land in which construction of granular sub-base by providing, laying, spreading and compacting CLOSE/COARSE GRADED MATERIAL spreading in uniform layers with motor grader on prepared surface and compacting with power vibratory roller of require type and capacity to achieve the desired density including all labour, watering, material, machinery, lighting, guarding, barricading

complete as directed. (Mix in place method) With material conforming to Grade-1 (size range 75mm to 0.075mm) having CBR Value-30 complete with labour & materials and to entire satisfaction of Engineer in charge.

Technical Specification No.15:

Energizing of 11KV new HT line complete with TESTING and Commissioning with existing LINE including Electrical Inspectors approval after completion of 11KV Line Erection, for energizing of 11KV new HT line complete with TESTING and Commissioning with existing LINE which include Electrical Inspectors approval, which is require to obtain from District Electrical Inspector/CEA. Contractor has to complete the complete formalities for inspection of newly erected installation, inspection and commissioning activity includes permission to energize the line its liasoning work is to be paid by contractor, while DPA will pay its statutory fees. Complete work is in the scope of contractor.

Technical Specification No.16:

The work includes numbering to New erected 11KV New line and Existing 11KV Line Pole Numbering with epoxy paint, sequence for 11KV Feeder, New Pole Numbering in 11KV DC1 and DC 2 Feeder, is to be done by contractor in proper way of minimum 100 mm dia, with complete labour & materials and old number is to be erased properly.

Technical Specification No.17:

Supply, Installation, Testing and Commissioning of 500kVA 11/0.43kV as per latest IS, Outdoor Type Compact Substation(Pre-Fabricated) with HT Panel, Transformer, LT Panel, Protection and Metering Device, etc. and other relevant accessories in a suitable enclosure with IP54 Supply, Installation, Testing and Commissioning of Outdoor Type Foundation Mounted Compact Substation of 11kV/415 Volts, equipped with 500kVA Oil immersed Transformer, 630A at 11KV with one SF6 Circuit Breaker for the primary side controls & with 800A Air Circuit Breaker as secondary side control., This also include 2nos of neutral earthing of copper & 2nos of body earthing of GI. The components shall be enclosed, by either common enclosure or by an assembly of enclosure. All the components shall comply with their relevant IS/IEC standards Protection with Metering Device. This includes all labour and material as directed by Engineer-in- Charge.

The Outdoor Package:

- Single integrated metal housing, comprising three compartments accommodating:
- HV switchgear (Protection degree of this compartment: IP65)
- Transformer (Protection degree of this compartment: IP65)
- LV switchgear (Protection degree of this compartment: IP65)

Enclosure of Compact Substation:

- The Outdoor enclosure of compact Substation shall be fabricated from Hot Dip Galvanized sheet steel 2mm thick build on heavy channel skid frame tropicalized to local weather conditions & saline atmosphere.

- Four nos. of Lifting lugs to be provided on top to enable lifting total package unit without any problem for site handling / lifting by crane. The metal base shall ensure rigidly for easy transport and installation to withstand the weight of the Transformer, MV & LV component.
- Ventilation openings shall be so arranged or shielded that same degree of specified for enclosure is obtained to reduce the equipment ambient temperature and prevent heating through the roof due to sun radiation the roof is to be made of double layer with foam insulation in between.
- The roof of the CSS should be Removable canopy type made from 2 mm thick Galvanized sheet metal with 10-degree Slope.
- Separation between RMU & transformer compartment and Separation between Transformer compartment & L.V compartment should be made from 2mm thick G.I sheet steel.
- The covers and door are the part of the enclosures when they are closed they shall provide the degree of the protection specified for the enclosure. All cover, doors or roof shall be provided with locking facility. The doors shall open outward at an angle of at least 90 degree and to be equipped with advisable to maintain them in an open position.
- Gland plate for RMU compartment should be made from 3mm thick S.S plate suitable for 3C x 300 Sq.mm XLPE cable 2 no's. The gland pate should be Split type.
- Gland Plate for LV Compartment should be made from 3mm thick S.S plate suitable for 4 nos. outgoing cable. The gland pate should be Split type
- The space between Transformer, MV component and LT component shall be provided in accordance with latest IEC recommendations standard.
- The enclosure shall be made in such a way that the above components shall be accommodated and the accommodation of components shall be maintained as per IEC recommendation. The enclosure shall be tested by OEM as per Type Test and the relevant documents be submitted. This includes all labour and material as directed by Engineer-in-Charge.

- **HV Switchgear/TRANSFORMER CIRCUIT BREAKER:**

a)	Type	Three pole operated simultaneously by a common shaft.
b)	No of phase	3
c)	Arc interruption in dielectric medium	SF-6
d)	Type of Charging, Mechanism:	Manual (spring assisted) as well as motorized with 230 VAC operated motor
e)	Continuous Rating	630Amp at ambient design 40 deg C
f)	Short Ckt Withstand	21 KA for 3Sec
g)	Fault making Capacity	52.5 KA
h)	Fault Breaking Capacity	21 KA minimum
i)	Current transformer	3 nos. epoxy cast Current Transformers with 15 VA burden STR of 21 KA for 3 second metering accuracy Class 0.2s and protection accuracy 10P10 and having of CTR 150/75/5A.

j)	Potential Transformer	3-phase draw out type PT of Ratio 11000/110 Volts of 50 VA burden to meet with auxiliary requirement with Class 0.5 accuracy including HT fuses on both incomer end.
k)	Protection Relay	Numeric type or updated version (Make: SCHNEIDER/ALSTOM/SIEMENS/ABB) with RS 485 connectivity with the protection of inverse, definite time, short circuit, over current, instantaneous and earth fault, master trip and trip supervision.
l)	Metering Compartment	Multi-Function meter having digital type (single) with voltage, current, PF, frequency, KW and KWH (Make – ENERCON/L&T /Secure)
m)	Accessories	2 sets of operating handle, spring charging handle, spanner set and other required accessories.
n)	Optional	One no. shunt trip and tripping coil operating on 12V DC. 2 nos. of space heater with ON/OFF switch and thermostat in each side of panel & Cable chamber, Power pack unit shall also be provided with 2hrs backup period.

The SF-6 breaker shall be completed with necessary interconnection with fine wiring, ferruled properly including foundation bolts, earthling etc. The layout drawing, dimensional drawings and electrical wiring diagram and operation &maintenance manuals shall be supplied with SF-6 Breaker. The SF-6 breaker shall be supplied in conformity with relevant ISS i.e. with up to date amendments along with manufacturers test certificate. This includes all labour and material as directed by Engineer-in-Charge.

TRANSFORMER 500 KVA:

The transformer shall be fully tested for routine tests, as per BIS-1985. The tenderer shall furnish date regarding adequacy DIN of Transformer capacity.

a)	Transformer capacity	500 KVA (Oil immersed)
b)	Primary voltage	11 KV +/- 10%
c)	Frequency	50 HZ
d)	No. of Phases	3
e)	Insulation Class	'F'
f)	Cooling	Oil Immersed
g)	Temperature	As per standard IS
h)	Percentage Rise	As per IS
i)	In winding	As per standard IS
j)	Winding connection	Secondary Star/Primary Delta

k)	Impedance	As per IS/BIS/DIN
l)	Vector Group	Dyn 11
m)	Neutral Grounding	HV ungrounded LV Solidly Grounded
n)	Winding material	Copper
o)	Noise Level	As per IEEE 141
p)	Vibration Level	As per standard IS
q)	Painting	632 Shed of IS:5 or BIS/DIN Standard
r)	Tapping Range	+/- 5%, Off-load tap changer
s)	Losses	Maintain as per IS/BIS/DIN
t)	Star Rating	It should be complied with Level II
u)	Make	Siemens/Crompton/BHEL/Schneider.

LV SWITCHGEAR:

The L.V side should be designed to equipment the following**: -**
Low voltage Bus bar system the equipment shall have all the following features

a)	LV bus bar	From transformer LV bushing to ACB and from ACB to MCCBs
b)	Bus bar size for phase & neutral	Tinned copper busbar, size shall be as per manufacturer design. All the phases and neutral busbar shall be same rating / size. Bus bar size for phase & neutral Suitable spreader to be provided at outgoing side of MCCB to connect suitable size of cable with aluminum lug.
c)	Bus bar support	insulators 1 kV voltage class, SMC epoxy
d)	Bus bar sleeve	insulation Color coded, for 1kv
e)	Bus bar rated current	Suitable for 800A continuous current rating within the 10K class enclosure @ 400 C ambient temp
		ambient temp
f)	Bus bar short circuit	withstand 50 kA for 1 sec

- **<u>Low voltage switchgear, ACB</u>**

The equipment shall have all the following features -

a)	Rated operational voltage (V) at 50 Hz	440V
b)	Rated frequency (Hz)	50Hz
c)	Current rating Amps (rms)	800Amps
d)	Rated insulation voltage (V) at 50 Hz	1000

e)	Number of poles	4
f)	Rated impulse withstand voltage(kV)	8
g)	Rated Ultimate Short circuit breaking capacity at 415 V, 50 Hz (kA rms) Icu	50
h)	Rated Service Short circuit breaking capacity at 415 V,50 Hz (kA rms), Ics	50
i)	Rated short circuit making capacity at 50Hz (kA peak), expressed as multiples of Icu	105
j)	Rated short time withstand current for 1 sec at 50 Hz (kA rms), Icw, expressed as percentage of Icu	50
k)	Category of utilization	As per standard
l)	Shutters on 'Trip' & 'Close' push button with sealing facility	Yes
m)	Accessories mounting	Accessories shall be front accessible plug in type. Accessories namely motor shunt trip & closing coil, UVT etc. should be common for the entire range & shall be suitable for both AC & DC voltages. Power pack unit is also be supplied for 2 hour backup
n)	Operating mechanism	Spring charging stored energy type , manual & Automatic
o)	Mechanical life (Operating cycles)	20000
p)	Indications	Breaker shall have following mechanical indications: 1. ON, 2. OFF, 3. TRIP 4. SPRING CHARGE STATUS
q)	Sensing	True RMS based
r)	Type	Microprocessor based
s)	Control Terminal	Should be front accessible and minimum NO/NC contacts shall be provided for electrical interlocking.
t)	Protection	As per latest standrad

u)	Metering required	Multi-Function meter for measuring 3 Ph current,3 Ph Voltage, KWH, KVAH, Power Factor, Max Demand (KVA), Fault History of Minimum Events,
v)	Indication	Release shall give individual indication for each type of fault

- **Low voltage switchgear, MCCB.**

a)	a) For 400 Amps b) For 200 Amps c) For 200 Amps. d) For 100 Amps	Outgoing feeders – 1 nos Outgoing feeders – 2nos . Outgoing feeders – 2 nos. Outgoing feeders – 4 nos
b)	MCCB rated voltage & Rated frequency (Hz)	415v +/- 10% at 50Hz
c)	Number of poles	4
d)	Current rating Amps (rms)	325Amps
e)	MCCB rated 3 phase short circuit breaking capacity Ics = Icu Rated impulse withstand voltage(kV)	50 KV minimum at 415v and 50Hz
f)	MCCB rated 3 phase short circuit withstand capacity, Icw	8kA for 1sec
g)	Rated insulation voltage (V) at 50 Hz MCCB mechanical & electrical Endurance	1000 As per IS 13947 / IEC
h)	MCCB category of duty	C as per IS / IEC 947
i)	MCCB indications	ON, OFF & TRIP
j)	MCCB protection	Adjustable / front accessible thermal and magnetic setting. (Thermal setting for overload adjustable from 70% - 100% of the rated current & magnetic setting for short circuit adjustable 4-10 times / 5-10 times).

Safety Devices:

Rubber Mats, Fire Extinguisher & First Aid Box should include along with the Compact Substation. The rate should be inclusive of all taxes, levies, service tax, VAT loading at manufacturer's depot, transportation and unloading at the site of work etc. This includes all labour and material as directed by Engineer-in-Charge.

Technical Specification No.18:

This includes supply at site LT XLPE 1.1KV grade, 4 core x 70 sqmm & 16sqmm Aluminium conductor, XLPE insulated armoured cable confirming to IS: 7098 (Part-I) 1985 with up to date amendments and of approved make with ISI mark. The manufacturer shall produce TYPE TEST certificate with similar size of cable, which shall not be more than 3 years old. The cable shall have marking/embossing at the interval of every meter showing its progressive length. During the cable inspection, the manufacturer shall show the relevant ROUTINE TESTS to inspecting authority or otherwise the manufacturer shall produce the routine test certificate during supply of cable at site. The rate shall inclusive of all taxes, excise duty, packing, forwarding, insurance, transportation and unloading at site of work etc.

Technical Specification No.19:

This includes laying of single length 4 core x 70 or 4 core x 16sqmm Sq.mm LT armoured alluminum Conductor XLPE Cable of 1.1KV Grade (excluding supply of cable) through excavation in soft/hard soil. The trench to be excavated 0.3 mtr. wide 1.0 mtr. deep. The bed of 50mm of river sand shall be provided in the bottom of the excavated trench. The cable shall be laid over the bed of river sand. This includes providing & laying of bricks on both sides and top side of cable lengthwise i.e. parallel to the cable and the gaps shall be filled by fresh river sand. The cable shall be covered properly. The filling of the trench shall be done with the excavated stuff & should be watered and rammed properly to its original position. The excess excavated stuff shall be disposed off from the Site of work and spreaded in low laying area as directed.

Technical Specification No.20:

This includes laying of single length cable up to 4 core x 50 or 4 X 16 Sq.mm LT armoured aluminum Conductor XLPE Cable of 1.1KV Grade (excluding supply of cable) through road crossing in the trench to be excavated 0.3 mtr wide 1.0 mtr deep. by providing of 2 lengths of RCC NP2 Class pipe of 150mm diameter, in which cable shall be passed through and second shall be kept as spare. The excavated stuff shall be disposed off from the Site of work and spreaded in low laying area as directed. The filling of the trench shall be done with material in layers of 20 cm thickness and each layer should be watered and rammed properly and road position shall be properly re-done to its original position with all material and labour as directed by Engineer- in-charge.

Technical Specification No.21:

This includes supply at site, laying, fixing and connecting of G.I strip of size 50x6 mm from earth station/existing earthing system to H.T/L.T. panel, H.T/LT switchgears, Power, panel, transformer etc. as directed.

The G.I strip also shall be laid from earth station to HT/LT switch gears & transformers etc. directly connected to two separate and distinct main earth as directed and shall be clamped

suitably on wall/floor or buried in the ground / pucca trench as directed. The work includes all material & labour required shall done as directed by Engineer-in-charge.

Technical Specification No.22:

This includes preparation of earth station with G.I. Earth plate 600mm x 600mm. x 10mm. thickness and shall be buried in such a way that its top edge is at a depth of not less than 1.5 Meter from the surface of ground. It shall have a G.I pipe (Class-B) for watering of size 20mm dia. buried vertically and adjacent to plate electrode and other end shall be provided with funnel. The two runs of G.I. flat of size 50mm x 6mm thick shall be clamped near funnel and to be taken from main earth plate. The value of earth pit shall be less than 5Ω.

A cement concrete (ratio 1:4:8) chamber of at least 30 cm x 30 cm shall be provided just below the surface of ground over the funnel for watering and having RCC/CI cover of suitable size as directed. The pit shall be filled with alternative layer of 15cm each of charcoal and salt. This also includes removal of extra-excavated earth from the site. The work shall be carried out to entire satisfaction of Engineer-in-charge. This work includes all labour and material as directed by Engineer-in-charge.

Technical Specification No-23:

HIGH MAST SPECIFICATION

The work include design, supply and erection testing & commissioning of 20M high mast flood lighting towers, including the installation, testing and commissioning of asymmetrical & symmetrical LED cool white flood light and other electrical accessories, arrangement for raising and lowering the lights during maintenance. This also include FRP feeder pillar with locking arrangement and same is to be installed on S.S angle 316 grade of 50x50 two-meter length. The feeder pillar will be mounted on same with PCC 300mm deep. The accessories are 100Amp MCCB four pole C Curve 415v 50Hz AC, three phase contactor 100amps,415V,50Hz AC rating,1No, Astronomical timer 24hrs 1No and Hylem connector strip of suitable size for termination of cables. The work includes complete labour & material and to entire satisfaction of Engineer In Charge.

APPLICABLE STANDARDS

The following shall be the Reference Standards for the loading of the high mast: BS
Code of Practice, CP-3, Gradient of wind related to height Chapter-V,
BS 4360 Grades of MS Plates BS
5135 Welding
BD 729 Galvanising
Technical Report (TR) No.7 – 1996 Specification for Mast and Foundation. IS 875
(Pt-III) 1987 Code of Practice for Design Loads for structure

TECHNICAL SPECIFICATIONS HIGH MAST

Structure

The High mast shall be of continuously tapered, polygonal cross section, 20 sided or as per proven design, presenting a pleasing appearance and shall be based on proven In- Tension

design conforming to standards, to give an assured performance and reliable service.
The mast height shall be 20 meters, with minimum diameters as per proven design. Minimum plate thickness of bottom section shall be 6mm and other sections 5mm. The PCD of the mast flange shall be minimum 740 mm or as per proved design. The structure shall be suitable for wind loading as per IS-875, part-3, 1987 or relevant to site condition.
Construction
The mast shall be capable of safely withstanding the strong winds prevailing at site. The deflection at the top during heavy storm periods shall therefore be considered in the design and the mast designed in such way that the above deflection during worst periods is kept to a minimum value. The mast shall be fabricated from special steel plates, conforming to BS-EN10- 025, cut and folded to form a polygonal section as stated above and shall be telescopically jointed and fillets welded. The welding shall be in accordance with BS:5135. The procedural weld geometry and the workmanship shall be exhaustively tested on the completed welds. The 20-meter size mast shall be delivered in sections, and shall be jointed of the entire section. The base flange shall be provided with supplementary gussets between the bolt holes to ensure elimination of helical stress concentration. For the environmental protection of the mast, the entire fabricated mast shall be hot dip galvanized, internally and externally, having a uniform thickness of 65 microns.

Door Opening
An adequate door opening shall be provided at the base of the mast and the opening shall be such that it permits clear access to equipment like winches, cables, plug and socket, etc. and also facilitate easy removal of the winch. The door opening shall be complete with a close fitting, vandal resistant, weather proof door, provided with a heavy duty double internal lock with special paddle key. The door opening shall be carefully designed and reinforced with welded steel section, so that the mast section at the base shall be unaffected and undue buckling of the cut portion is prevented.

Dynamic Loading for the Mast
The mast structure shall be suitable to sustain an assumed maximum reaction arising from a wind speed as per IS 875, and shall be measured at a height of 10 meters above ground level.

LANTERN CARRIAGE FABRICATION
A fabricated Lantern Carriage shall be provided for fixing and holding the flood light LED fitting. The Lantern Carriage shall be of special design and shall be of steel tube construction, the tubes acting as conduits for wires, with holes fully protected by grommets. The Lantern Carriage shall be so designed and fabricated to hold the required number of LED floodlight fittings and junction boxes, and also to have a perfect self-balance. The Lantern Carriage shall be fabricated in two halves and joined by bolted flanges with stainless steel bolts and plastic lock type stainless steel nuts to enable easy installation or removal from the erected mast. The inner lining of the carriage shall be provided with protective PVC arrangement, so that no damage is caused to the surface of the mast during the raising and lowering operation of the carriage. The entire Lantern Carriage shall be hot dip galvanized after fabrication. and raise the Lantern Carriage Assembly. To enable this, a suitable Winch Arrangement shall be provided, with winch fixed at the base of the mast and the specially designed head frame assembly the top.

Winch

The winch shall be of of double drum type as per IS 807, suitable to lift optimum mechanical load,shall be operated manually & electrically ,Permanent oil bath of SAE 90 or equicalent of proven design. The gear ratio may be according to manufacturer's standard. However, the minimum working load shall be not less than 400Kg. The winch drums shall be grooved to ensure perfect seat for stable and tidy rope lay, with no chances of rope slippage. The rope termination in the winch shall be such that distortion or twisting is eliminated and at least 5 to 6 runs of rope remains on the drum even when lantern carriage is fully lowered and rested on the rest pads.

It shall be possible to remove the double drum after dismantling, through the door opening provided at the base of mast. Also a winch gear box for simultaneous and reversible operation of the double drum winch shall be provided as part of the contract.

Head Frame

The head frame which is to be designed as a capping unit of the mast, shall be of welded steel construction, galvanized both internally and externally after assembly. The top pulley shall be appropriate diameter, large enough to accommodate the stainless steel wire ropes and the multi-core electric cable. The pulley block shall be made of non-corrosive material, and shall be of die caste aluminium alloy (LM-6). Pulley made of synthetic material such as plastic or PVC are not acceptable. Self- lubricating bearings and stainless steel shaft shall be provided to facilitate smooth and maintenance free operation for a long period. The pulley assembly shall be fully protected by a canopy galvanized externally and internally, Close fittings guides and sleeves shall be provided to ensure that the ropes and cables do not dislodged from their respective positions in the grooves. The head frame shall be provided with guides and stops with PVC buffer for docking the lantern carriage.

Stainless Steel Wire Ropes

The suspension system shall be essentially be without intermediate joint and shall consist of any non-corrosive stainless steel of AISI 316 or better grade. The stainless steel wire ropes shall be of 7/19 construction, the central core being of the same material. The overall diameter of the rope shall not be less than 6 mm. The breaking load of each rope shall not be less than 2350kg individually, giving factor of safety or over 5 for system at full load, the minimum recommended value as per the TR-7 referred to in the beginning of the specification. The end construction of rope to winch drum shall be fitted with talurit. The thimbles shall be secured on ropes by compression splices. Two continuous lengths of stainless steel wire ropes shall be used in the system and no intermediate joints are acceptable in view of the required safety. No intermediate joints, either bolted or else is provided on the wire ropes between winch and lantern carriage.

CABLE:

Trailing cable EPR Insulated and PCP sheathed 2.5sqmm 5core annealed copper cable.

LED SPECIFICATION:

Cool white LED, 2 year Warranty mandatory, Power 300W, Lighting effect grade 100LM/W, Input Voltage AC85V～265V, Frequency Range 50Hz～60Hz, Power Factor ＞0.95, Power Efficiency ＞92 %

Lifetime >50000 Hrs, die cast metal body. IP 65. Qty 100Nos (for 5 nos. high mast)

Power TOOL (Integral to system)

3Phase, 415v ,50 HZ,AC +/- 5% Rating of the motor shall be suitable to the design with control & torque limiting protection single speed.

CIVIL FOUNDATION:

High mast civil foundation is also in the scope of contractor, the design of foundation shall be approved from our Design section civil department, similarly its execution will also be under civil department. The soil bearing capacity is 5T/Mtsquare; however, during start of work contractor has to obtain complete detail of soil and based on same design is to be done. Work include complete materials & labour, and to entire satisfaction of Engineer In charge.

Technical Specification No.24:

This includes supply & Laying at site LT XLPE 1.1KV grade, 4 core x 35 sqmm Aluminium conductor, XLPE insulated armoured cable confirming to IS: 7098 (Part-I) 1985 with up to date amendments and of approved make with ISI mark. The manufacturer shall produce TYPE TEST certificate with similar size of cable, which shall not be more than 3 years old. The cable shall have marking/embossing at the interval of every meter showing its progressive length. During the cable inspection, the manufacturer shall show the relevant ROUTINE TESTS to inspecting authority or otherwise the manufacturer shall produce the routine test certificate during supply of cable at site. The rate shall inclusive of all taxes, excise duty, packing, forwarding, insurance, transportation and unloading at site of work etc. This also includes laying of single length 4 core x 35Sq.mm LT armoured alluminum Conductor XLPE Cable of 1.1KV Grade (excluding supply of cable) through excavation in soft/hard soil. The trench to be excavated 0.3 mtr. wide 1.0 mtr. deep. The bed of 50mm of river sand shall be provided in the bottom of the excavated trench. The cable shall be laid over the bed of river sand. This includes providing & laying of bricks on both sides & top sides of cable lengthwise i.e. parallel to the cable and the gaps shall be filled by fresh river sand. The cable shall be covered properly. The filling of the trench shall be done with the excavated stuff & should be watered and rammed properly to its original position. The excess excavated stuff shall be disposed off from the Site of work and spreaded in low laying area as directed.

TECHNICAL SPECIFICATION FOR PART B

Technical Specification No.1:

The work includes dismantling of existing 9 Meter Octagonal Streetlight Pole from existing Location and same is to be re-installed at New Location as per the direction of Engineer-in-charge. Dismantling of existing 9 Mt. Octagonal Streetlight Pole from existing Location along with its arms and streetlight fixtures thereof removal of pole from its Original foundation bolt safely along with its LT Cable etc. removal of all street light pole obstructing proposed six-Lane road pole with its foundation is to be fixed within six-Lane road area with its existing Foundation & same is to be re-fixed at an interval of 30meter length including work of pole earthing, fixing of Fixtures of 90-120 w, providing power supply from its distribution power cable through mains of LT Panel complete with lugs and all necessary tightness at both end along with contactor of

100 amp, timer, 4 pole MCCB of 100 ampere along with connectors etc. to entire satisfaction of Engineer In Charge this also includes numbering to streetlight pole complete with labour and materials.

Technical Specification No.2:

Dismantling of existing Double circuit DC 1 and DC 2 Over head Line removal of existing double circuit 11KV DC 1 and DC 2 Over head line, removal of jumpers, old conductors, pin/disc insulators, hardware removing and stacking of fabrication items, also existing poles are to be cut from ground level and same is to be shifted & stacked as directed by Engineer in charge.

Sd/-

Signature of Contractor

Executive Engineer (Electrical)
Deendayal Port Authority

Approved Make List for Electrical Items		
Sr. No.	Description	Recommended Makes
1	HV VCB	SIEMENS / CROMPTON GREAVES/ABB/Schneider
1(a)	HV Gas Insulated Breakers	SIEMENS /Schneider/ABB
2	POWER TRANSFORMERS	VOLTAMP/CROMPTON GREAVES /BHARAT BIJLEE/ BHEL/ SIEMENS/ABB/ Schneider/T&R
3	DISTRIBUTION TRANSFORMERS	EMCO/KIRLOSKAR/PATSON/VOLTAMP/ABB/Schneider/T&R
4	RESIN CAST TRANSFORMERS	
	A) RESIN CAST IMPREGNATED	VOLTAMP / KIRLOSKAR / EMCO
	B) DRY CAST	VOLTAMP/KIRLOSKAR/EMCO
5	HT XLPE CABLES	POLYCAB/TORRENT/RPG ASIAN/ NICCO/GLOSTER/ UNISTAR/ UNIVERSAL
6	LT XLPE CABLES	POLYCAB/TORRENT/RPG ASIAN/ NICCO/ RALLISON/PRIMECAB/ HAVELLS/ UNIVERSAL/ UNISTAR/AVOCAB
7	LT ACB	SIEMENS/L&T/SCHNEIDER/C&S
8	PROTECTION RELAYS	AREVA/L&T/SIEMENS/ABB/C&S
9	LT PANEL	CPRI APPROVED
10	CHANGE OVER SWITCH	SIEMENS/L&T/ABB/C&S/SCHNIDER/ LEGRAND / INDOASIAN
11	SFU FOR MAIN LT DISTRIBUTION PANELS	SIEMENS/L&T/ABB/C&S
12	SFU FOR DISTRIBUTION PANELS & FEEDER PILLERS	SIEMENS/L&T/ABB/C&S/ SCHNEIDER/ LEGRAND/ INDOASIAN/HAVELLS
13	MCCB FOR MAIN LT DISTRIBUTION PANELS	SIEMENS/L&T/ABB
14	MCCB FOR DISTRIBUTION PANELS AND FEEDER PILLERS	SIEMENS/L&T/ABB/C&S/ SCHNIDER/ LEGRAND/ INDOASIAN/HAVELLS
15	MCB/ELCB/RCCB/ RCCBO FOR MAIN LT DISTRIBUTION PANELS	SIEMENS/HAGER L&T/ABB
16	MCB FOR DISTRIBUTION PANELS AND FEEDER PILLERS	SIEMENS/L&T/ABB/C&S/ SCHNEIDER/ LEGRAND/ INDOASIAN/ HAVELLS/ STANDARD
17	MCB DISTRIBUTION BOARD	STANDARD / HENSEL/LEGRAND / INDOASIAN / HAVELLS

18	MULTI FUNCTION DIGITAL METER FOR MAIN LT DISTRIBUTION PANELS/DIGITAL KWH METERS	L&T/ENERCON/SECURE/L&G/ RISHABH
19	ANALOG VOLT/AMPARE METER FOR DISTRIBUTION PANELS AND FEEDER PILLERS	RISHABH/AE/ENERCON/L&T
20	SLECTOR SWITCH FOR VOLTMETER/AMPARE METER	L&T/SIEMENS/C&S
21	POWER CONTACTOR & OVER LOAD RELAYS	L&T/SIEMENS/ABB
22	QUARTZ TIME CLOCK SWITCH	L&T/INDOASIAN/SIEMENS
23	PVC WIRE WITH COPPER CONDUCTOR	RR KABEL/KEI/POLYCAB/MILEX/GUJCAB/ STANDARD/ FINOLEX/ANCHOR
24	FLUSH TYPE SWITCHES, SOCKETS, HOLDERS AND CEILING ROSES & ELECTRONIC REGULATORS	ANCHOR/MK/NORTHWEST/VINAY/PANAMA/HAVELLS
25	DOOR BELLS/CALL BELLS	ANCHOR/LEGEND/MK/NORTHWEST
26	MODULAR SWITCHES, SOCKETS, PLATES & BOXES	ANCHOR / MK / NORTHWEST / LEGRAND /HAVELLS/INDOASIANSIEMENS
27	PVC CONDUIT/OVAL CONDUIT & CASSING CAPPING AND ACCESSORIES	PRECISION/VULCAN/FINOLEX/ GARWARE/RESTOPLAST/SWASTIK/BPI
28	GLS LAMPS & FLUORESCENT LAMPS	PHILIPS / BAJAJ / WIPRO / CROMPTON GREAVES / OSRAM / SURYA ROSHNI /GE
29	HPSV, HPMV & METAL HELIDE LAMPS	PHILIPS / BAJAJ / WIPRO / CROMPTON GREAVES / OSRAM / SURYA ROSHNI /GE
30	IGNITORS FOR HPSV, METAL HELIDE LAMPS	PHILIPS / BAJAJ / WIPRO / CROMPTON GREAVES / OSRAM / SURYA ROSHNI /GE
31	LUMINARIES	PHILIPS/BAJAJ/WIPRO/CROMPTON GREAVES / OSRAM / SURYA ROSHNI /GE
31a	LED Luminaries	Philips /Bajaj/Wipro/CG/Surya/Pyrotech/Syska/Nessa having surge Protection ≥10KV for fittings & internal Surge rotection for Driver of≥4KV, LED Chip only OSRAM/CREE/Philips Lumileds/Citizen/Nicia with LM-79,80 CERTIFICATION
32	CEILING FANS	BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC
33	WALL MOUNTING FANS	BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC

34	EXHUAST FANS	BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC
35	HEAVY DUTY INDUSTRIAL WALL MOUNTING FANS	BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC
36	WATER COOLER	VOLTAS/SHRIRAM USHA/BLUE STAR
37	AIR CONDITIONERS	VOLTAS/CARRIER/BLUESTAR/USHA/ HITACHI/LG/ SAMSUNG/ONIDA
38	REFRIGERATORS	VOLTAS/CARRIER/BLUESTAR/USHA/ HITACHI/LG/ SAMSUNG/WHIRLPOOL
39	VOLTAGE STABILIZER	VEELINE / CAPRI
40	INVERTERS	SUKAM / MICROTEK
41	D.G. SETS A) ENGINE B) ALTERNATOR	 CUMMINS/GREAVES/KIRLOSKAR/ CATERPILLAR/ ASHOK LEYLAND/VOLVO STAMFORD/CROMPTON GREAVES /JYOTI/ KIRLOSKAR ELECTRIC
42	ELECTRIC MOTOR	ALSTOM/CROMPTON GREAVES /SIEMENS/ KIRLOSKAR/ABB
43	WATER PUMPS	SWASTIK / KSB
44	WATER GEYSER	BAJAJ/USHA / CROMPTON GREAVES / SPHEREHOT / RACOLD
45	LUGS & CABLE GLANDS	DOWELLS / JAINSON / BRACO
46	Heat shrink Joint for HT/LT cables	Raychem/YamunaDenson/3M/Mseal/ or as per approved list of GETCO/PGVCL.

Note:

In case of supply of Make of material which is not in the DPA approved Make list, the said material should be supplied as per the latest GETCO approved Make list.

In case of supply of Make of material which is neither available in the DPA approved Make list not in the latest GETCO approved Make list, the said material should be supplied as per the Make decided by EIC for which written intimation will be given to the contractor.

Before procurement of material, the Make of the material should be approved by EIC in writing.

-sd/

Signature & Seal of Contractor **Executive Engineer (E)**

Deendayal Port Authority

Annexure I

Bill of Quantities

Name of Work – "Shifting of 11KV Double Circuit SIPC feeder, due to widening of the Road to 6 Lanes at DPA Kandla."

Sr. No.	Description	Qty	Unit	Rate	Amount
Part A: Electrical Item					
1	Supply, Installation, Testing and commissioning of 11KV overhead line with 100mm2 AAAC DOG Conductor with wind pressure 100kg/m2 on RSJ 9mtr pole (Approximate span of 30m) as per technical specification no.1				
(a)	Supply	8.5	KM		
(b)	Erection testing & Commissioning	8.5	KM		
2	Supply, Installation, Testing and commissioning of 11KV overhead line with 100mm2 AAAC DOG Conductor with wind pressure 100kg/m2 on RSJ 11mtr pole (Double pole structure) as per technical specification no.2				
(a)	Supply	12	Set		
(b)	Erection testing & Commissioning	12	Set		
3	Providing and fixing of Cement Concreting of 1:2:4 ratio mixtures for Poles / Guys including C.C for Poles and Guys as per site requirement as per technical specification no.3	300	M^3		
4	Supply, Installation, testing and commissioning of Stay Set (Extra) with Erection as per technical specification no.4				
(a)	Supply	40	Set		
(b)	Erection testing & Commissioning	40	Set		
5	Supply, Installation, Testing and commissioning of DP structure with 11KV A.B. Switch & D.O. Fuse on 9MTR RSJ POLE as per technical specification no.5				
(a)	Supply	4	No		
(b)	Erection testing & Commissioning	4	No.		
6	Supply at site HT XLPE(E) 3C x 300 sqmm insulated armoured aluminium conductor cable	5500	mtr		

	as per Technical Specification No.6				
7	Laying of Double circuit (three parallel cables) 3CX300 Sq.mm (E) XLPE Cable through Hard/Soft Soil Excavation and laying through Half Round Pipe (2 Nos.) 6" inner Diameter and 1 Meter length as per technical specification no. 7	4000	mtr		
8	Laying of Double circuit (three parallel cables) 3CX300 Sq.mm (E) XLPE Cable through RCC/Road/Rail Crossing by Putting Suitable HDPE pipe in between Crossing as per technical specification no.8 (AUGAR ITEM)	1500	mtr		
9	Supply, fixing and testing of Outdoor Cable Termination kit for 11kV 300sqmm XLPE Cable as per technical specification no.9				
(a)	Supply	15	No		
(b)	Erection testing & Commissioning	15	No.		
10	Supply, fixing and testing of Straight through Joint Cable Termination kit for 11kV 300sqmm XLPE Cable as per technical specification no.10				
(a)	Supply	6	No		
(b)	Erection testing & Commissioning	6	No.		
11	Supply and installation of Earthing coils at each end of the cable individually for each cable as per technical specification no.11				
(a)	Supply	15	No		
(b)	Erection testing & Commissioning	15	No.		
12	Supply and installation of reflective sign boards as per technical specification no.12				
(a)	Supply	50	No		
(b)	Erection testing & Commissioning	50	No.		
13	Guarding assembly for 1km under 11kV Overhead line as per site requirement approximate pole span 30m as per technical specification no. 13	100	mtr		
14	Reclamation of land and approch area for erecting of Double Tension pole including all fittings like gay sets and concreting etc. at Various Tension Poles as per specification 14	31000	M^3		
15	Energizing of 11KV new HT line complete with TESTING and Commissioning with existing LINE including Electrical Inspectors visit/approval as per specification No 15	1	Com-plete Job		

16	New erected 11KV New line and Existing 11KV Line Pole Numbering correction and Providing New Pole Numbering on 11KV DC1 and DC 2 Feeder as per specification no 16	300	No.		
17	Supply, Installation, Testing and Commissioning of 500kVA 11/0.43kV Outdoor Type Compact Substation with HT Panel, Transformer, LT Panel, Protection and Metering Device, etc. and other relevant accessories in a suitable enclosure with IP54 as per technical specification no 17	3	No.		
18	Supply at site LT XLPE insulated armoured aluminium conductor cable as per mentioned below as Technical Specification No. 18				
(i)	4C X 70 Sqmm	4	KM		
(ii)	4C X 16 sqmm	3	KM		
19	Laying of LT XLPE cable through excavation in hard & soft soil as per site requirement between pole to pole and as per technical specification no 19				
(i)	4C X 70Sqmm	1.5	KM		
(ii)	4C X 16sqmm	2	KM		
20	Laying of LT XLPE cable through excavation at road crossing through NP2 class pipe as per site requirement as per technical specification no. 20				
(i)	4C X 70Sqmm	0.5	KM		
(ii)	4C X 16sqmm	1	KM		
21	Supply & fixing of 50x6mm GI Flat with Earth Pit termination at site complete with labour & Materials.	200	Mtr.		
22	Supply & fixing of GI plate earthing of size 600 x600x 10mm GI plate with charcoal & salt and as directed by Engineer In Charge.	19	No.		
23	Supply Installation testing & commissioning of 20Mtr High mast GI tower along with its civil foundation as per Soil Bearing Capacity of approx. 1.5T/Mtr square, This also includes supply & fixing of 300W LED cool white flood light fitting, complete as per technical specification no 23	5	Nos.		
24	Supply & Laying at site LT XLPE insulated armoured aluminium conductor cable as per mentioned below as Technical Specification No. 24. (i)4c x 35sqmm	2	KM		

Total:	

(In words Rupees _____ only)

(NOTE: The rates should be inclusive of all taxes, duties, fees, cess etc and all incidental charges; but exclusive of GST).

-sd/-

Signature & Seal of Contractor

Executive Engineer (E)
Deendayal Port Authority

Name of Subject : "Shifting of 11KV Double Circuit SIPC feeder, due to widening of the Road to 6 Lanes at DPA Kandla."

Sr. No	Description	Qty	Unit	Rate	Amount
PART-B 11KV DC 1 and 11KV DC 2 Feeder					
1	Dismentalling of streetlight fixtures with arm and other assesories from the existing octogonal street light pole and there after removal of 9 meter octagonal pole along with its civil foundation and shifting, re-errection, testing and commissioning with all street fixture accessories like arm, fixture, MCB and other accessories at the location as directed by Engineer-in-charge also include new pole numbering complete with labour & materials. as per specification Part B No 1	200	Nos		
2	Removal of conductor with all hardware guys, guy wire insulators from existing PSC Poles and there after cutting from the base and removal of PSC Poles and shifting & storing at suitable locations as directed by Engineer in charge.	250	Nos		
				TOTAL	

(In words Rupees _____ only)

(NOTE: The rates should be inclusive of all taxes, duties, fees, cess etc and all incidental charges; but exclusive of GST).

Sd/-

Signature & Seal of Contractor

Executive Engineer (E)
Deendayal Port Authority