



REC Power Distribution Company Limited

Notice Inviting Limited Tender

(Limited Tender invited through e-Tendering mode only)

(Limited to agencies as per list enclosed in "Annexure C")

For

Survey and Creation of DGPS based Network, Land base and Consumer Indexing for Implementation of Geographical Information System

at

GOA Electricity Department under R-APDRP Part (A)

No. RECPDCL/TECH/DGPS-GED/e-Tender/2015-16/512 Dated: 04.06.2015

REC Power Distribution Company Limited

(A wholly owned subsidiary of REC, a 'Navratna CPSE'

Under the Ministry of Power, Govt of India)

Corporate office

1016-1023, Devika Tower, Nehru Place,

New Delhi-110019

Telefax : 011-44128768

Website : www.recpdcl.in

Description of task, Pre-qualifying criteria, e-tender submission format and procedure is available on RECPDCL website (www.recpdcl.in), REC website (www.recindia.com), Central Publication Portal (www.eprocure.gov.in)

Important Dates for E- Tendering mode	
Date of Release of NIT	04.06.2015
Last date for queries / seeking clarification	08.06.2015 at 1800 Hours
Pre Bid Meeting	09.06.2015 at 1030 Hours
Last date of submission of Tender	15.06.2015 at 1530 Hours
Date of Opening of Technical bid	15.06.2015 at 1600 Hours
Date of Opening of Financial bid	To be intimated later

Note:

Online registration shall be done on e-tendering website i.e. www.tenderwizard.com/REC & in general, activation of registration may takes 24 hours subject to the submission of all requisite documents required in the process.

-Sd-

(S.C. Garg)
Addl. C.E. O.

[This document is meant for the exclusive purpose of Agencies participating against this bid and shall not be transferred, reproduced or otherwise used for purposes other than that for which it is specifically issued]



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SECTION-I

TENDER INFORMATION

Name of the assignment: To carrying out of DGPS Network survey, Land base updates and consumer Indexing work at GOA Electricity Department under R-APDRP Part (A)

Important information

Si. No.	Event	Information to the agencies
1	Date of Release of NIT	04.06.2015
2	Last date for queries / seeking clarification	08.06.2015 at 1800 Hours
3	Pre Bid Meeting	09.06.2015 at 1030 Hours
4	Last date of submission of Tender	15.06.2015 at 1530 Hours
5	Date of Opening of Technical bid	15.06.2015 at 1600 Hours
6	Date of Opening of Financial bid	To be intimated later
7	Pre- Bid Meeting Address	REC Power Distribution Company Limited, 1016-1023, 10 th Floor, Devika Tower, Nehru Place, New Delhi- 110019, India Telefax : 011-4128768,44128760/67
8	Tender Document	The details can be downloaded free of cost from the websites www.recpdcl.in (or) portal.recpdcl.in (or) www.recindia.com (or) www.eprocure.gov.in (or) www.tenderwizard.com/REC
9	EMD #	Rs 2,50,000/-
10	Address for Bid submission	Shri. Subhash Chandra Garg, Addl. Chief Executive Officer, REC Power Distribution Company Limited, 1016-1023, 10 th Floor, Devika Tower, Nehru Place New Delhi- 110019, India. Telefax : 011-4128768,44128760/67 Email- recpdcl@rediffmail.com / recpdcl.goa@gmail.com
11	Contact Person	Shri. Sunil Bisht , Assistant Manager (Technical) REC Power Distribution Company Limited (RECPDCL) Phone:011-44128760; Fax:011-44128768 Email- recpdcl@rediffmail.com / recpdcl.goa@gmail.com

The EMD (Earliest Money Deposit) is to be submitted by all the participating bidders in the form of demand draft/Bank Guarantee of an amount of Rs 2,50,000/- (Two Lakhs and Fifty Thousand Only/-) of any schedule Indian bank in favor of REC Power Distribution Company Limited, Payable at New Delhi .The EMD of unsuccessful bidder will be returned within 90 days from the contract and EMD of successful bidder will also be returned after acceptance

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of work order and submission of PBG (Performance Bank Guarantee) i.e. 10% of the Contract Value.

- The bid shall remain valid for a period of 90 days from the last date of bid opening.



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SECTION-II

PREFACE

Goa Electricity Department (GED) has recently awarded IT Implementation Works under Part-A of R-APDRP Scheme to M/s REC Power Distribution Company Limited (RECPDCL) with Tata Power Delhi Distribution Limited as its Technology Partner.

The Scope of Services includes Preparation of Base-line Data System for the project area covering Consumer Indexing, GIS Mapping, Automatic Metering (AMR) on Distribution Transformers and Feeders, and Automatic Data Logging for all Distribution Transformers & Feeders. It would include Asset Mapping of the entire distribution network at and below the 11kV transformers and include the Distribution Transformers and Feeders, Low Tension lines, poles and other distribution network equipment. It will also include adoption of IT applications for meter reading, billing & collection; energy accounting & auditing; MIS; redressal of consumer grievances and establishment of IT enabled consumer service centers etc.

The Program is proposed to be implemented on all India basis covering Towns and Cities with a population of more than 30,000 (10,000 in case of Special Category States) as per population data of 2001 Census. In addition, in certain high-load density rural areas with significant loads, works of separation of agricultural feeders from domestic and industrial ones, and of High Voltage Distribution System (11kV) will also be taken up and accordingly four towns have been identified to be covered under the scheme as per the details mentioned in Table 1.

Goa, a tiny emerald land on the west coast of India, the 25th State in the Union of States of India, was liberated from Portuguese rule in 1961. It was part of Union territory of Goa, Daman & Diu till 30 May 1987 when it was carved out to form a separate State. Goa is India's smallest state in terms of area and the fourth smallest in terms of population. Located on the west coast of India in the region known as the Konkan, it is bounded by the state of Maharashtra to the north and by Karnataka to the east and south, while the Arabian Sea forms its western coast.

Panaji (also referred to as Panjim) is the state's capital. Vasco da Gama is the largest city. The historic city of Margao still exhibits the influence of Portuguese culture.

Renowned for its beaches, places of worship and world heritage architecture, Goa is visited by hundreds of thousands of international and domestic tourists each year. It also has rich



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flora and fauna, owing to its location on the Western Ghats range, which is classified as a biodiversity hotspot.

Goa covers an area of 3722 square kilometers and comprises two Revenue district viz North Goa and South Goa. Boundaries of Goa State are defined in the North Terekhol River which separates it from Maharashtra, in the East and South by Karnataka State and West by Arabian Sea. Goa lies in Western Coast of India and is 594 Kms (by road) away from Mumbai city.

Goa, for the purpose of revenue administration is divided into district viz. North and South Goa with headquarters at Panaji and Margao respectively. The entire State comprises 11 talukas. For the purpose of implementation of development programmes the State is divided into 12 community development blocks. As per 2001 census, the population of the State is 1342998. A very striking feature of Goa is the harmonious relationship among various religious communities, who have lived together peacefully for generations. Though a late entrant to the planning process, Goa has emerged as one of the most developed States in India and even achieved the ranking of one of the best states in India with regards to investment environment and infrastructure.

This RFP is being floated to appoint Business associate (BA) for Creation and Survey of Land base, DGPS based Network survey and consumer Indexing to meet the requirements as laid down in the SRS and RFP of GED floated under RAPDRP scheme. The activities for BA are described in the detailed scope of work.

The basic statistics are as below:

The Basis Statistics of GED				
Name of Town	Area in Sqkm	Network Length*	No. of Consumers*	No. of Transformers*
Panjim	572	14220	5.16 Lacs	5000
Margao	1638			
Mapusa	1286			
Marmagao	226			

*Above data is only for reference and may vary in actual. Number of consumers shall have growth of 7.5% per annum and shall reach 10Lacs in next 7 years.



Information of Project Areas				
Name of Project Area (town)	Number of Subdivisions Offices	Number of Other Offices	Nearest Railway Station to HQ	Nearest Functional Airport to HQ
Panaji	8	25	Carambolim	Dabolim Airport
Marmagoa	4	19	Vasco Da Gama	Dabolim Airport
Margoa	10	62	Madgao	Dabolim Airport
Mapusa	8	85	Tivim	Dabolim Airport
Total	30	191		

TABLE-1



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SECTION-III

Instructions to Bidders

3.1 Submission of Bid

Agency shall submit their responses online through e-tendering website www.tenderwizard.com/REC

A. The submission and opening of Bids will be through e-tendering process.

Agency can download Bid document from the RECPDCL web site i.e. <http://www.recpdcl.in> or portal.recpdcl.in or www.recindia.com or eprocure.gov.in and e-tendering regd. link is given in RECPDCL website i.e. www.tenderwizard.com/REC

(Note: To participate in the e-Bid submission, it is mandatory for agency to have user ID & Password. For this purpose, the agency has to register them self with REC PDCL through tender Wizard Website given below. Please also note that the agency has to obtain digital signature token for applying in the Bid. In this connection vendor may also obtain the same from tender Wizard.)

Steps for Registration

- (i) Go to website <http://www.tenderwizard.com/REC>
- (ii) Click the link 'Register Me'
- (iii) Enter the details about the E-tendering as per format
- (iv) Click 'Create Profile'
- (v) E-tender will get confirmation with Login ID and Password

Note- Online registration shall be done on e-tendering website i.e. www.tenderwizard.com/REC & in general, activation of registration may takes 24 hours subject to the submission of all requisite documents required in the process. It is sole responsibility of the bidder to register in advance.

B. Steps for application for Digital Signature from Bid Wizard:

Download the Application Form from the website <http://www.tenderwizard.com/REC> free of cost. Follow the instructions as provided therein. In case of any assistance you may contact RECPDCL officers whose address is given at the Bid.

Bid to be submitted through online mode on website www.tenderwizard.com/REC in the prescribed form.

C. The Agency qualifying the criteria mention in section VI should upload Bid document with duly signed scanned soft copy of the documents given below for the prequalifying response:

Pre- Qualifying Criterion Documents/Technical Bid)

- 1 Form-I -----Letter of submission of Tender
- 2 Form-II -----Pre-Qualifying Criteria Details
- 3 Form-IV ----- Format of Curriculum Vitae
- 4 Annexure-A ----- Format for Performance Bank Guarantee
- 5 Annexure-B ----- GIS Data Model
- 6 EMD of Rs. 2,50,000/- in form of DD or Bank Guarantee may be drawn from a scheduled commercial bank in favour of The "REC Power Distribution Company Ltd", New Delhi and scanned copy to be uploaded and original to be submitted before the last date & time of Submission of Tender.
- 7 Documents required in supporting of pre-qualification criteria details.

Financial Bid

1. Form-III-----Financial Proposal (to be submitted through online mode ONLY)



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Financial bid to be submitted in the specific format designed same may be downloaded from website www.tenderwizard.com/REC and after filling the form it is to be uploaded through digital signature.

The all document should be addressed to.

Addl. Chief Executive Officer REC Power Distribution Company Ltd. 1016-1023, 10th Floor, Devika Tower, Nehru Place, New Delhi - 110019

(Note: All papers that comprise the Bid document of the concerned Bid must be numbered. An index of each page should also be provided)



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SECTION-IV

DETAILED SCOPE OF WORK, PERFORMANCE EVALUATION, SLA

1. Scope of Work

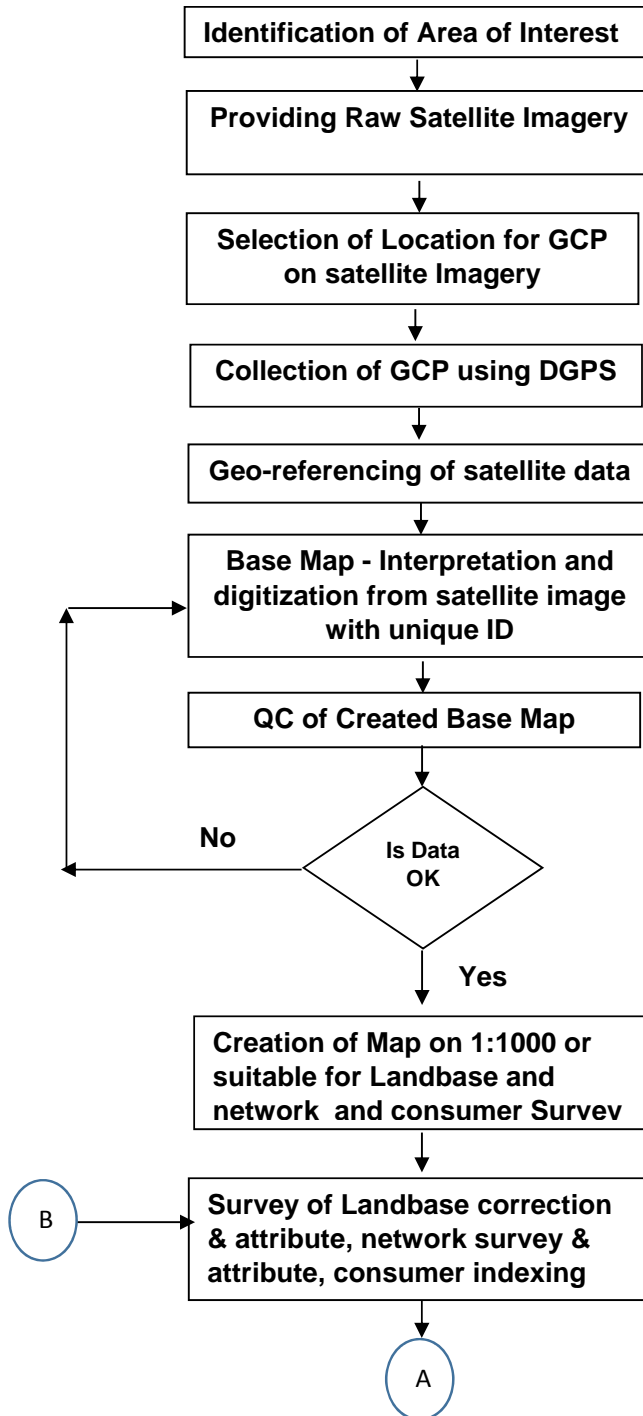
The description given here is broad scope of work to be carried out by the bidder. However, any work even if not specifically mentioned but reasonably implied for the successful implementation and good performance of the system are deemed to be included in the scope of work.

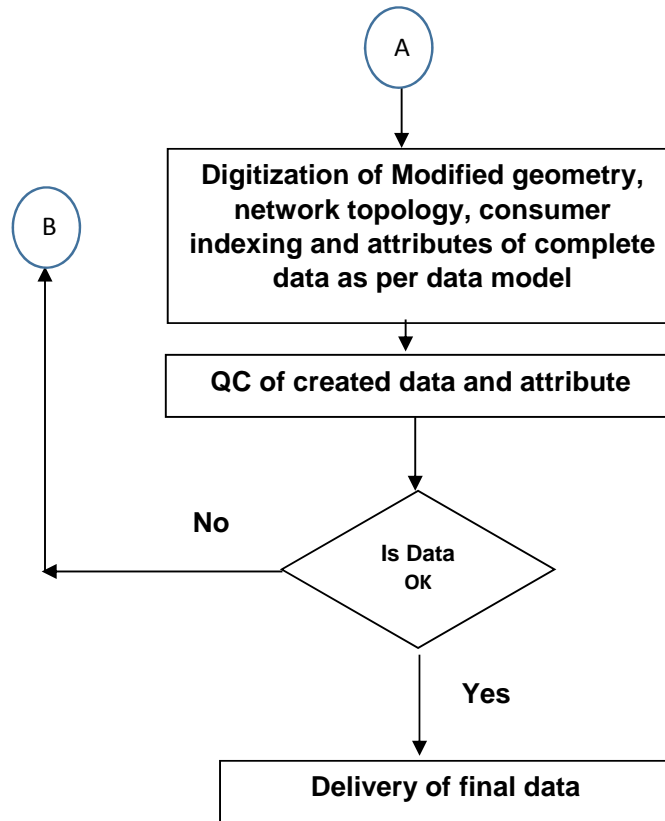
The work shall involve the following:

- a. Collection of Ground Control point (GCP)
- b. Satellite image rectification and geo-referencing
- c. Base map creation through Imagery
- d. DGPS based survey (Sub-meter accuracy) for finding Latitude-Longitude of GED's network, asset and land base features as per data model under Annexure B
- e. Uniquely indexing each Customer based on the electrical system network information as per the provided Data Model under Annexure B.
- f. Numbering allocation and painting of assets.
- g. Updation of above data along with attributes and delivery of complete consolidated data in Shape file.

2. Methodology of Survey:

The preliminary flow chart for data creation is given below.





1.1 Collection of GCP

- a) Bidder shall identify the location on satellite imagery for which GCP is to be collected at field.
- b) Bidder shall arrange the Differential GPS equipment for collection of GCP as per standard guidelines. Two GPS receivers are used to measure a GPS baseline distance. The line between a pair of GPS receivers from which simultaneous GPS data have been collected and processed is a vector referred to as a baseline. The station coordinate differences are calculated in terms of 3D, earth centered coordinate system that utilizes X-, Y-, and Z-values based on the WGS 84 geocentric ellipsoid model. These coordinate differences are then subsequently shifted to fit the local project coordinate system. In this survey base station would be established at a known point and the clearly distinguished points will be identified and they will be captured using the rover. These points would be chosen such that it is spread all over the AOI. These points will be clearly identified points on the ground such as road-rail intersections, water bodies, important landmark etc. The positional accuracy of GCP shall be in range of sub meter.
- c) Bidder shall deploy the team for capturing of GCP of identified location.
- d) It is suggested that one GCP per one sqkm in dense area and one GCP per 5 sqkm in sparse area shall be collected by Bidder.



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- e) It is also considered that 40% of area falls under dense are and 60% falls under sparse area.

1.2 Base map Creation

- a) After collection of GCP, the same would be used for geo-referencing of the satellite imagery.
- b) Satellite imagery shall be provided by RECPDCL/TPDDL.
- c) Bidder shall arrange the ERDAS Imagine using “2nd order polynomial” projection system. The data will be projected to the required projection system.
- d) Bidder shall create the Grid (1km X 1Km) as well sub-grid of (250 m X250m) for carrying out work and monitoring of complete through Unique Grid No.
- e) Bidder shall interpret and digitize from the rectified satellite data as per data model.
- f) The feature shall be created using Auto CAD map software. BA shall arrange all software for creation of desired data.
- g) Bidder shall also carry out the QC of created data before delivery using various QC tools and visual inspection.
- h) Quality checks shall be performed but not limited to for the following
 - 1. Missing features
 - 2. Features shapes
 - 3. Feature classification
 - 4. Matching of vector with raster etc.
- i) The map shall be cleaned for mapping errors such as
 - 1. Dangles
 - 2. Overshoots
 - 3. Snap
 - 4. Pseudo nodes etc.
- j) Topology shall be built as per the feature type. For the tentative layers as mentioned above, it shall be as per the following:

S.No.	Feature Type	Topology Type
1	Transport	Line
2	Hydrology	Polygon / Line / Point
3	Buildings	Polygon
4	Land use	Polygon
5	Administration	Polygon
6	Utility	Points
7	Others	Point / Line / Polygon

- k) The data shall be delivered in .dwg and shp format to RECPDCL/TPDDL to carry out the Quality Assurance of delivered data in Auto CAD and Arc GIS. In case of QC is not up to mark, then same shall be given back to BA.
- l) Bidder shall prepare the map with different scale of the map for further action.



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1.3 Survey for Landbase, Network and Consumer Indexing

- a. After creation of base map as mentioned above, the survey will be required to carry base map marked with available Landmarks and road names through third party information, if required, for facilitation to the surveyor to correlate the exact location in field versus base map.
- b. Surveyor shall carry the Survey forms to capture the attributes for Landbase, network, electrical assets and consumer indexing.
- c. It is also required to mark the feature as per the symbology on maps.
- d. Network and asset survey work shall be carried out Substation wise and feeder wise for every Division of GED. All the features mentioned as per data model shall be surveyed using DGPS Equipments, attributes to be collected and marked on the maps.
- e. It is also required to correct the location of the existing Network if the positions are incorrect on the hardcopy maps.
- f. Once feeder wise network survey is done, Consumer Indexing needs to be started and required attributes as per Data model need to be collected.
- g. All above captured data shall be updated in system using Arc GIS software. Bidder has to ensure that exact location of assets, topology, and accurate consumer indexing.
- h. Bidder shall ensure the complete data management with data backup management.
- i. It is also required to get the approval from Sub division/Division in-charge about correctness of captured data.
- j. All software, hardware infrastructure, office space etc. to carry out work as mentioned shall be arranged by bidder.

1.4 Asset Numbering and Painting:

- a. It is required to number the each assets and same need to be updated in GIS.
- b. The methodology for numbering and painting on the assets is given in Annexure B
- c. Bidder shall deploy the team for allocation of asset numbering followed by painting as described in the Annexure B.

1.5 Resource Deployment:

- a. It is required to deploy the dedicated team for different activities as mentioned below:



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Base map Creation Team

1. Digitisers Team for Base map
2. QC team for Base map

Landbase Team

1. Landbase survey team
2. Land base Survey QC team
3. Landbase data and attribute updation team
4. Land base QC team

Network and Asset Team

1. Network and Asset Survey Team
2. Network and Asset Survey QC team
3. Network and Asset data updation Team
4. Network and Asset QC team

Consumer Indexing Team

1. Consumer Indexing Survey Team
 2. Consumer Indexing QC team
 3. Consumer Indexing Updation Team
 4. Consumer Indexing QC team
- b. Role and responsibilities of each team shall be clearly mentioned by bidder.
- c. It is required to deploy the skilled and experienced resources for each activity to achieve accuracy as mentioned in the document.

1.6 Deliverables

It is required for bidder to deliver the output as given below but not limited to the same. Output shall be delivered as per SRS & RFP of GED.

- a. Complete details of GCP with photograph.
- b. Complete details of base map with unique Grid No. and Sub Grid No.
- c. Complete survey map of landbase duly certified by project manager of bidder.
- d. Complete survey map of each feeder network and asset duly signed by concerned authority of GED.
- e. Shape file of updated data of landbase, network, asset and its attribute updation.
- f. Data for migration to GIS software.



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2. Performance/Progress Evaluation:

- a. The Bidder is required to submit the Time Schedule/Plan of implementation of the assignment as a sample case for one district with details of manpower & equipment's deployment. The Time Schedule/Plan should be prepared in such a way that work may start within 10 days from the date of issue of work order and inspection of all the Feeders in the allotted districts including submission of reports shall be completed within 60 days after mobilization period. Agency may propose their milestone targets to complete the work before schedule.
- b. Bidder shall also provide Name/Contact Nos./Email IDs/Fax No. of all Key management officials.
- c. Completion of assignment in time is most important element of the contract. The progress of work shall be evaluated on daily basis vis-à-vis proposed milestone target for execution of work. Submission of quality inspection reports will be the criteria with which the progress of the work will be measured.
- d. Regular test check of 5% to 10% of data submitted in a lot (or more if necessary) may be done by REC PDCL team in field and if any deviation at site is found unreported or incorrectly reported by the agency concerned, then RECPDCL will ask the agency for re-inspection either of the particular area of the lot/Division/Sub Division as decided by RECPDCL.
- e. In case data is rejected and corrected delivery has to be made. Such correction shall not be considered for delivery output calculation as mentioned above. It is highly important to keep stringent mechanism so that chances of rejection could be eliminated.
- f. Activities shall be performed for 6 days in a week.
- g. Bidder shall perform complete activities from Goa only.

3. Service Level Agreement

The SLA covers the following services:

- a. This Service Level agreement is governed by the scope of work for providing the final delivery of data.
- b. Completion time of deliverables for each town is mentioned below and shall be strictly adhered.

Landbase Creation			
Sr. No	Town Name	Area (in Sq. Km)	Completion Timeline
1	Marmagaon	226	31-Jul-15
2	Margao	1638	31-Aug-15
3	Mapusa	1286	31-Aug-15
Grand Total		3150	
Asset Mapping (33 kV)			
Sr. No	Town Name	Estimated Feeders	Completion Timeline
1	Marmagaon	9	30-Sep-15
2	Margao	27	30-Sep-15
3	Mapusa	28	30-Sep-15
Grand Total		64	
Asset Mapping (11 kV)			
Sr. No	Town Name	Estimated Feeders	Completion Timeline
1	Marmagaon	29	15-Oct-15
2	Margao	82	15-Oct-15
3	Mapusa	85	15-Oct-15
Grand Total		196	
Asset Mapping (LT Network)			
Sr. No	Town Name	Estimated DTs	Completion Timeline
1	Marmagaon	703	30-Oct-15
2	Margao	1724	30-Oct-15
3	Mapusa	2149	30-Oct-15
Grand Total		4576	
Consumer Indexing			
Sr. No	Town Name	Estimated Consumers	Completion Timeline
1	Marmagaon	60901	29-Nov-15
2	Margao	177077	29-Nov-15
3	Mapusa	204400	29-Nov-15
Grand Total		442378	

In addition to the above, Bidder has to carry out the asset numbering allocation and painting in the Panjim Town where landbase, asset survey and GIS data already created. The created



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data shall be provided for numbering allocation and further painting in field for assets as per same methodology as described in this NIT. The estimated numbers of assets in the Panjim town is given below but not limited to this.

Estimated assets details of Panjim Town:

Sr. No	Panjim Town	Estimated Consumers	Completion Timeline
1	Transformers and Substations	2000	30-Aug-2015
2	Poles/FP/Towers	30000	30-Aug-2015

4. Payment Criteria and Penalty

- a. Payment for land base, 33 KV network, 11 KV network, LT network and consumer indexing shall be made separately in line with quoted rate for each item. .
- b. Payment will be released in different phases as hereunder:

Phase-I (Land base creation – Base Map from satellite imagery, and Land base survey activity)*	75% of payment after the fees calculated on the basis of Completion of GIS data creation work and Land base survey activity as per scope of work subject to acceptance by RECPDCL
Phase-II(a) (Asset Mapping of 33 kV, 11kV & LT Network along with asset Numbering and painting)*	75% of payment after the fees calculated on the basis of Completion of Asset Mapping of 33 kV, 11kV & LT Network activity as per scope of work subject to acceptance by RECPDCL
Phase-II(b) (Asset numbering allocation and Painting activity for Panjim Town)*	75% of payment after the fees calculated on the basis of Completion of Asset numbering allocation and Painting activity as per scope of work subject to acceptance by RECPDCL
Phase-III (Consumer Indexing activity)*	75% of payment after the fees calculated on the basis of Completion of Consumer Indexing activity as per scope of work subject to acceptance by RECPDCL
After the Completion of entire scope of work allotted for each activity	Balance 25% of payment of each phase (sr. no. 1 to 4 above) after the Completion of entire scope of work allotted for each activity.

**Note:*

1.) *Payment shall be made based on the actual work done as verified by the RECPDCL Nodal officer.*

2.) *Payment shall be done separately for each phase in line with quoted rate for each item.*

Delivery after completion timeline shall be liable to penalty as mentioned in SLA.

Penalty shall be 10% of the value of respective item per month subject to maximum capping of 30%.



SECTION-V

GENERAL CONDITIONS OF TENDER

Part – 1

1. The bidder must fulfil the above eligibility criteria/pre-qualifying conditions for evaluation of their bids. Bids of bidders fulfilling the above eligibility/pre-qualifying conditions will only be evaluated by the duly constituted evaluation committee. Bids of the bidders not fulfilling the eligibility/pre-qualifying conditions given above may be summarily rejected. Undertaking for subsequent submission of any of the above documents will not be entertained under any circumstances.
2. RECPDCL reserve the right to verify/confirm all original documentary evidence submitted by the bidder in support of above mentioned clauses of eligibility criteria, failure to produce the same within the period as and when required and notified in writing by RECPDCL shall result in summarily rejection of the bid.
3. Engagement with RECPDCL does not confer any right to the agencies to be invited for participating in any bids, tender etc. floated by RECPDCL. RECPDCL reserves the right to call bids/assign work/associate the agency/agencies in any area as may be deemed fit by RECPDCL depending upon the profile provided by the agencies and requirement of assignment.
4. RECPDCL reserves the right to accept or reject any or all requests for engagement without assigning any reason or to accept in parts and engage more than one agencies at its sole discretion.
5. Acceptance of the application(s) constitutes no form of commitment on the part of RECPDCL. Furthermore, this acceptance of the application confers neither the right nor an expectation on any application to participate in the proposed project.
6. RECPDCL reserve the right to waive off any shortfalls; accept the whole, accept part of or reject any or all responses to the Tender.
7. RECPDCL reserve the right to call for fresh tenders at any stage and /or time as per the present and /or envisaged RECPDCL requirements even if the tender is in evaluation stage.
8. RECPDCL reserve the right to modify, expand, restrict, scrap, re-float the tender without assigning any reason for the same.
9. The responder shall bear all costs associated with the preparation and submission of its response, and RECPDCL will in no case be responsible or liable for these costs, regardless of the conduct or the outcome of the tender process.
10. Consortium and joint venture responses are not allowed, in any case. Also, bidders have to note that no sub-contracting / sub-letting is allowed



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11. Rates and Prices

- a Bidders should quote item-wise rates/ prices including all taxes and duties as mentioned in attached Form by explicitly mentioning the breakup of basic prices and applicable taxes.
 - b Price quoted by bidder shall be firm for entire contract period.
 - c Price quoted shall be firm and any variation in rates, prices or terms during validity of the offer shall lead to forfeiture of the EMD of said bidder.
12. In case of default in services or denial of services, RECPDCL, at its sole discretion, will be free to avail services of other service providers at your "Risk & Cost".
13. All other terms and conditions of the GENERAL CONDITIONS OF CONTRACT shall be applicable.
14. Bidders are advised to refrain from taking any deviations on this TENDER. Still in case of any deviations, all such deviations from this tender document shall be set out by the Bidders, Clause by Clause in the format as mentioned in Form and submit the same as a part of the Technical Bid. Please note that in case of deviations to the tender terms, bids may be liable for rejection.
15. **Cost:** The Price Offer shall be for the assignment as per the Scope of work of Bid Document and shall remain FIRM throughout the period of contract. REC PDCL shall not pay and/or reimburse anything over and above the price quoted except Service Tax which shall be payable extra on quoted price, as applicable. The bidder shall have valid service tax registration and ensure deposit of service tax to the tax authorities. The REC PDCL reserves the right to ask the bidder to justify and establish price/rate reasonableness. In the event of an award of contract, income tax will be deducted by the REC PDCL at source as per law.

16. Financial Bid :

- 1) Bidders has to quote their rates strictly as per the financial bid format enclosed as form-III should be submitted/uploaded through online/e-tendering mode only.
- 2) Price quoted by bidders with any deviation or any conditionality, the offer will be treated as incomplete and will be rejected.
- 3) Any variation in rates, prices or terms during validity of the offer shall lead to forfeiture of the EMD of said bidder.

17. Earnest Money Deposit (EMD)

1. Bidders shall submit, Earnest Money of Rs. 2,50,000/- (Rs. Two Lakhs and Fifty Thousand only/-) in the form of irrevocable Bank Guarantee (BG) from a nationalized/scheduled Bank as per Performa enclosed as "**Annexure-III**" or Bank Draft drawn in favour of REC Power Distribution Company Limited payable at New Delhi and shall be initially be kept valid up to validity of the offer



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i.e 90 days plus 30 days or such extended period. Tenders not accompanied by the requisite amount of Earnest Money shall be rejected.

2. Earnest Money shall be forfeited in case of the following:

a) On revocation of tender or increase in rates after opening of the tender but before the validity of the quotations expires.

b) On refusal to enter into contract agreement after award of contract.

c) Non submission of Contract Performance Guarantee.

3. The EMD shall be returned without interest:

a) To the unsuccessful and successful bidders on acceptance of LOA & submission of Contract Performance Guarantee by successful bidder.

b) In case bidding process is terminated by REC PDCL for any reason.

18. Performance Bank Guarantee (PBG):

1. The bidders has to submit the Performance Bank Guarantee in form of Demand Draft(DD)/ Bank Guarantee on award of any assignment @ 10% PBG of the respective contract value on issuance of work order. The performance bank guarantee shall be returned to the agency without any interest upon completion of all items of work as defined in scope of work, submission of final report and acceptance of the same by RECPDCL and in case of any failures/non-performance of the contract the PBG shall be forfeited/encashed.

19. **Deviation:** The bidder must comply with the Scope of work, all terms and conditions & monthly milestone target for execution of work as per bid document. No deviation on the lower side in this regard shall be accepted. In case of any deviation, Bids shall be summarily rejected.

20. Bidders may be present in person or may send their authorized representative at the time of opening of bid as per schedule. No further intimation shall be given if there is no change in the schedule. It is expected that all bidder shall attend the opening of bids. However, bids shall be opened and decision shall be taken even in absence of representative if the bid opening is not attended.

21. REC PDCL reserves the right to reject any offer in full or in part without assigning any reason thereof and without incurring any liability to the affected bidders for the action of REC PDCL.

22. In case it is decided to split the work to more than one agency at the lowest received rates, preference of work may be given to the agency which quoted the lowest rates in response to tender enquiry.



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23. **Duration/ Period of Contract:** The contract period will be for 120 days from the date of the award of contract including submission of reports. In case duration of the contract is required to be extended for the reason beyond control of agency the same shall be done with mutual consent on same rates, terms & conditions.
24. **Termination of Contract:** The contract shall remain in force as per the award of work or till satisfactory completion of awarded work, whichever is earlier.
25. However, in case, in the opinion of REC PDCL if the agency is not likely to make up for the delay or test checks by REC PDCL are indicating poor quality survey or the agency is acting in anyway prejudicial to the completion of project or on adoption of unethical practices, the contract may be terminated partly or fully by giving 15 days' notice and the balance works shall be got executed at the risk & cost of the agency.
26. In case of default in services or denial of services, RECPDCL, at its sole discretion, will be free to avail services of other service providers at your "Risk & Cost".
27. RECPDCL reserves the right to split the work town wise to separate bidder as per estimated quantities mentioned in SLA.
28. The actual quantity variation in each item is allowed up to 15% of the given. Beyond this, it is responsibility of bidder to intimate and shall not start the work before the approval from RECPDCL.
29. REC PDCL reserves the right to split/combine Town/Divisions/sub-divisions/sub-stations etc & award the work to one or more than one bidders, without assigning any reason thereof.



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SECTION-VI

ELIGIBILITY CRITERIA

S. No.	Qualification Criteria	Documents Required
1	The bidder must have executed at least two projects of Landbase creation which shall include base map from satellite imagery, DGPS survey and final landbase delivery for implementation of GIS system in a utility.	Successful Completion Certificates for all such projects
2	The bidder must have executed at least two projects of DGPS network survey, asset mapping and consumer indexing for implementation of GIS system in electric utility.	Successful Completion Certificates for all such projects
3	The bidder shall have resources of Auto CAD /Arc GIS/ ERDAS for creation of GIS maps to be deployed in this project	List and CVs of the key full time dedicated resources for the said project as per criteria.



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SECTION-VII

TENDER EVALUATION METHODOLOGY

1.0 Preparation of Financial Bids

1.1 The Agency should upload Bid document with duly digitally signed copy of the requisite documents.

1.2 The Bidders are required to submit the complete financial bid documents through e-tendering only after satisfying each and every condition laid down in the tender documents. Other forms the bid shall be summarily rejected.

1.3 Do not upload Financial Bid document with any other bid documents. Financial bid has to be uploaded separately.

1.3 All rates should be in figures and in words. In case of discrepancy between the words and the figures the rate indicated in words shall prevail.

1.4 Rates quoted should be firm and fixed. No price variation and escalation will be allowed.

2.0 Submission of Financial Bid:

2.1 Scan copy of "**Earnest Money Deposit**" along with letter of transmittal should be uploaded in portal.

2.2 Original EMD is to be submitted as on before the last date of the submission.

2.3 Financial Bid should only be submitted through e-tendering mode and duly digitally signed by the authorized person.

2.4 REC PDCL reserves the right to reject any or all tenders or drop part of tender without assigning any reasons whatsoever.

2.5 The quotation shall be valid for entire contract period/completion of the Assignments.

2.6 The bidders should satisfy themselves before submission of the bid to RECPDCL that they understand and satisfy each and every condition laid down in the bid document.

3.0 Opening of Bid:

3.1 Tenders duly submitted/uploaded, will be opened online on the schedule date and time. The tenders will be opened and the bidders or their authorized representative may, if they so desire be present at the time of opening of tenders.

3.2 Bid of only those bidders will be opened who have submitted requisite EMD in original detail as above within the specified time limit.



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3.3 If due date of receipt of tenders and/or that of opening of tender happens to be a closed holiday(s), the tenders would be opened on the next working day but the time of receipt and of opening will remain the same.

3.4 REC PDCL reserves the right to postpone and/or extend the date of submission/opening of tenders or to withdraw the tender notice, without assigning any reason thereof. In such a case the bidders shall not be entitled to any form of compensation from the Company.



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SECTION-VIII

MANDATORY FORMS

FORM-I

Letter for Submission of Tender

To,

Addl. Chief Executive Officer
REC PDCL,
1016-1023, 10th Floor,
Devika Tower,
Nehru Place, New Delhi-110019

Sub.: **Engagement of Agency**

Sir,

1. With reference to your Tender No. ----- dated ----- for **Carrying out of DGPS Network survey, Land base updations and consumer Indexing work**, I wish to apply for engagement with RECPDCL

Further, I hereby certify that

I have read the provisions of the all clauses and confirm that notwithstanding anything stated elsewhere to the contrary, the stipulation of all clauses of Tender are acceptable to me and I have not taken any deviation to any clause.

2. I further confirm that any deviation to any clause of Tender found anywhere in my Bid, shall stand unconditionally withdrawn, without any cost implication whatsoever to the REC PDCL.
3. Our bid shall remain valid for period of 90 days from the last date of bid submission.

Date:
Place:

Signature
Full Name
Designation
Address

Note: In absence of above declaration/certification, the Bid is liable to be rejected and shall not be taken into account for evaluation.



Carrying out of DGPS Network survey, Land base updations and consumer Indexing work

PRE QUALIFICATION CRITERIA DETAILS

1. THE FIRM

2. Name _____

Regd. Address _____

a) Address of Office at Delhi/NCR _____

b) Contact Person's _____

i) Name & Design. _____

ii) Address _____

iii) Tel No. Landline _____ **Mobile** _____

iv) Email ID _____

3. Type of Firm: Private Ltd./ Public Ltd./ Cooperative/
(Please tick) Partnership/ Proprietor

4. PAN _____

5. Service Tax Reg. No.:

6. E.M.D. Details Rs._

DD No._

Name & Address of Bank

Please upload duly signed copies by authorized signatory of documentary evidence e.g. work order, corresponding satisfactory job completion certificates from clients with amount of work order in support of above and any other document indicated in prequalifying criteria)

Signature.....

Full Name.....

Designation.....

Address



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Form-III

Financial Bid (To be submitted through online mode only)
PROFORMA OF SCHEDULE OF RATES

Bidder Name:

S. No.	Item Type	Total Quantity	Unit of Measurement	Unit Rate	App. Taxes	Total all inclusive unit price (Rs.)	Total Amount (Rs.)
				Rs.			
A	B	C	D	E	F	G=E+F	H=CxG
1	Land base Creation: GCP collection, Imagery rectification, base map creation, survey and attribute capturing, updation of surveyed data. Delivery of final land base output in shape file.	3150	Sqkm				
2	Asset Mapping (33 KV): Substation Internal Layout, SLD, DGPS network (OH and UG) and asset survey, attributes capturing, digitization of network and assets with attributes, asset numbering allocation and asset painting. Delivery of complete network and asset with attributes in shape file.	64	Feeder				
3	Asset Mapping (11 KV): Substation Internal Layout, SLD, DGPS network (OH and UG) and asset survey, attributes capturing, digitization of network and assets with attributes, asset numbering allocation and asset painting. Delivery of complete network and asset with attributes in shape file.	196	Feeder				
4	Asset Mapping (LT Network): Substation Internal Layout, DGPS network (OH and UG) and asset survey, attributes capturing, digitization of network and assets with attributes, asset numbering allocation and asset painting. Delivery of complete network and asset with attributes in shape file.	4576	DT				
5	Consumer Indexing: Door to door survey of consumer location using DGPS/GPS, Consumers attribute capturing, consumer connectivity with network and Pole and Pole Number Delivery of complete consumer indexing with attributes in shape file.	442378	Consumer				



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6.	Asset numbering allocation and Painting for Panjim Town: (Landbase, asset, consumer survey completed and data created.)	32000	Assets				
Total							

- The price bid shall be submitted only in the above mentioned price Performa.
- It is mandatory to quote the Unit rate of each item as mentioned above. Any change in quantity shall be adjusted as per the quoted unit rate.
- The quantities mentioned above are for evaluation purposes only. Actual Quantities may vary as per site requirement and shall be paid accordingly.



Format of Curriculum Vitae

1. PROPOSED POSITION:

2. NAME OF FIRM

3. NAME OF STAFF:

4. DATE OF BIRTH:

NATIONALITY:

5. EDUCATION:

YEAR	DEGREE/EXAMINATION	INSTITUTE/BOARD

6. MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

7. OTHER TRAINING:

8. COUNTRIES OF WORK EXPERIENCE:

9. LANGUAGES:

LANGUAGE	SPEAKING	READING	WRITING

10. EMPLOYMENT RECORD:

FROM	TO	EMPLOYER	POSITIONS HELD

11. DETAILED TASKS ASSIGNED:	12. WORK UNDERTAKEN THAT BEST ILLUSTRATES CAPABILITY TO HANDLE THE TASKS ASSIGNED:

13. Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

Signature of authorised representative of the staff

Date:

Full name of authorised representative:



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ANNEXURE-A

PERFORMANCE BANK GUARANTEE

M/s. REC Power Distribution Company Ltd.
1016-23, 10th Floor, Devika Tower,
Nehru Place,
New Delhi
(With due Rs.100/- stamp duty, if applicable)

OUR LETTER OF GUARANTEE No. : **Date:**

Amount: **Valid Date:**

Bank Name & Address:

In consideration of REC Power Distribution Company Ltd. having its office at 1016-1023, 10th floor, Devika Towers, Nehru Place, New Delhi (hereinafter referred to as "RECPDCL" which expression shall unless repugnant to the content or meaning there of include all its successors, administrators and executors) and having entered into an agreement dated _____/issued Work Order No. _____ dated _____ with/on as _____ (hereinafter referred to as "The service" which expression unless repugnant to the content or meaning thereof, shall include all the successors, Administrators and executors).

WHEREAS the Agency having unequivocally accepted to supply the materials as per terms and conditions given in the Agreement accepted to providing service as per terms and conditions given in the Agreement dated _____ /Work Order No. _____ dated _____ and RECPDCL having agreed that the Agency shall furnish to RECPDCL a Performance Guarantee for the faithful performance of the entire contract, to the extent of 10% (ten percent) (or the percentage as per the individual case) of the value of the Work Order i.e. for _____.

We, _____ (The Bank) which shall include OUR successors, administrators and executors herewith establish an irrevocable Letter of Guarantee No. _____ in your favour for account of _____ (The Agency) in cover of performance guarantee in accordance with the terms and conditions of the Agreement/work Order.

Hereby, we undertake to pay upto but not exceeding _____ (say _____ only) upon receipt by us of your first written demand accompanied by your declaration stating that the amount Claimed is due by reason of the Agency having failed to perform the Agreement and despite any contestation on the part of above named Agency.

This Letter of Guarantee will expire on _____ including 30 days of claim period and any claims made hereunder must be received by us on or before expiry date after which date this Letter of Guarantee will become of no effect whatsoever whether returned to us or not.

Authorized Signature
Chief Manager/Manger

Seal of Bank



GIS Data Model

A database is a collection of information that is organized so that it can easily be accessed, managed, and updated. In one view, databases can be classified according to types of content.

The database is arguably the most important part of a GIS because of the costs of collection and maintenance, and because the database forms the basis of all queries, analysis, and decision making.

It is always better to create different database for different type of contents/information such as consumer information, network details etc. for better handling of information.

Three types of database will be created for GIS implementation in GED and these are follows.

Land base Database – All the layers of base map will be stored in this database.

Electrical Database – All the layers of electrical network objects will be stored in this database.

Consumer Database – Details of consumers will be stored in this database.

Data or information, stores in data bases in layers which is a homogeneous collections of features with a common spatial representation and set of attributes. To define the layers and their attributes data model designing is required. Data model is created on the basis of Land base objects, Electrical network and Consumer. Designing of Data model is a pre requisite for any GIS project. Data model should contain all the pre-defined objects including the attribute details and enumerated values which need to be captured.

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i. Land Base Data Model

a. List of Land Base Objects

Total 25 objects will be covered in Land base data model. Land base data model consists a part of Administrative boundaries & Land Base objects. Administrative boundaries consists GOA state boundary and other GED boundaries

Administrative Boundaries of GED are as follows –

Sr. No.	Administrative Boundary
1	State Boundary
2	Circle Boundary
3	Town Boundary
4	Division Boundary
5	Sub division Boundary
6	Locality Boundary

The other land Base objects which will be captured during the survey are as follows

Sr. No.	Land Base Objects
1	Agricultural
2	Audit History
3	Beach
4	Building
5	Built-up
6	Flyover
7	Footpath
8	Forest
9	GED Property
10	Green Area
11	Landmark
12	Map Grid
13	Non Built-Up
14	Rails
15	Road Centerline



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16	Road Edge
17	Satellite Image
18	Transportation Facilities
19	Water Bodies

Land Base Data model is designed on the basis of these above mentioned objects.

Each objects will carry different attributes and values, and they are as follows:-

Attribute comparison between SRS and Proposed

Sr. No.	Layer / Object	No of proposed Attribute
1	Agricultural	8
2	Audit History	6
3	Beach	4
4	Building	14
5	Built-up	12
6	Circle Boundary	5
7	Division Boundary	7
8	Flyover	10
9	Footpath	5
10	Forest	5
11	GED Property	17
12	Green Area	8
13	Landmark	8
14	Locality Boundary	8
15	Map Grid	5
16	Non Built-Up	12
17	Rails	5
18	Road Centerline	9
19	Road Edge	11
20	Satellite Image	1
21	State Boundary	5
22	Sub division Boundary	8
23	Town Boundary	5



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Sr. No.	Layer / Object	No of proposed Attribute
24	Transportation Facilities	8
25	Water Bodies	5
Grand Total		191

b. List of Land Base Objects and its Attributes

Land Base Objects / Layers	Field Name	Enum Value
Agricultural	Gis Id	
Agricultural	Division Name	
Agricultural	Division No	
Agricultural	Sub Division No	
Agricultural	Name	
Agricultural	Khasra No/Address	
Agricultural	Geographic Area	
Agricultural	Annotation	
Building	Gis Id	
Building	Division Name	
Building	Division No	
Building	Sub Division No	
Building	locality Name	
Building	Name of Building / Apartment	
Building	No of Floors	
Building	Tower/Plot/Flat/House/Shop No	
Building	Block/Pocket No	
Building	Sector/Colony Name	
Building	Authority	Government / Private / others / Not Available
Building	Usage	Residential / Commercial / Industrial / Religious /Institutional / Others / Residential cum Commercial



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Land Base Objects / Layers	Field Name	Enum Value
Building	Geographic Area	
Building	Annotation	
Built-up	Gis Id	
Built-up	Division Name	
Built-up	Division No	
Built-up	Sub Division No	
Built-up	locality Name	
Built-up	Name	
Built-up	Block/Pocket No	
Built-up	Sector/Colony Name	
Built-up	Authority	Government / Private / others / Not Available
Built-up	Type	Housing Society / Residential Plot / Defense/ Commercial / Cemetery / Graveyard / Industrial Estates / Institutional Area / Restricted / Slum / Stadium / Others / Religious/ Mining Area / Residential cum Commercial
Built-up	Geographic Area	
Built-up	Annotation	
Green Area	Gis Id	
Green Area	Division Name	
Green Area	Division No	
Green Area	Sub Division No	
Green Area	Name	
Green Area	Type	Park / Garden / Play Ground / Others
Green Area	Geographic Area	
Green Area	Annotation	



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Land Base Objects / Layers	Field Name	Enum Value
Landmark	Gis Id	
Landmark	Division Name	
Landmark	Division No	
Landmark	Sub Division No	
Landmark	Type	Bus Stop / Railway Station / Large Hospitals / Famous Hotel / Xing / Fire Stations / Police Station / Temple / Church / Gurudwara / Mosque / Cinema / Petrol Pump / School / College / University
Landmark	Name	
Landmark	Annotation	
Landmark	Centre Point	
Non Built-Up	Gis Id	
Non Built-Up	Division Name	
Non Built-Up	Division No	
Non Built-Up	Sub Division No	
Non Built-Up	Locality Name	
Non Built-Up	Name	
Non Built-Up	Block/Pocket No	
Non Built-Up	Sector/Colony Name	
Non Built-Up	Authority	Government / Private / others / Not Available
Non Built-Up	Type	Open Space / Hills / Pasture Land / Orchards / others/ Cluster of Trees
Non Built-Up	Non Build Up Area	
Non Built-Up	Annotation	
Rails	Gis Id	
Rails	No of Track	



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Land Base Objects / Layers	Field Name	Enum Value
Rails	Width	
Rails	Rails Line	
Rails	Rail Annotations	
Road Edge	Gis Id	
Road Edge	Division Name	
Road Edge	Division No	
Road Edge	Sub Division No	
Road Edge	Name	
Road Edge	Road Code	
Road Edge	Width	
Road Edge	Surface	Concrete / Tar / Asphalt / Paver Block / unsurfaced / other
Road Edge	Type	National Highway / State Highway / Major Roads / Minor Roads / Lane / Rural Road / Backside Service Lane / Others
Road Edge	Road Line	
Road Edge	Annotation	
Road Centerline	Gis Id	
Road Centerline	Division Name	
Road Centerline	Division No	
Road Centerline	Sub Division No	
Road Centerline	Name	
Road Centerline	Road Code	
Road Centerline	Type	National Highway / State Highway / Major Roads / Minor Roads / Lane / Rural Road / Backside Service Lane / Fly Over / Others
Road Centerline	Centerline	



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Land Base Objects / Layers	Field Name	Enum Value
Road Centerline	Road Annotations	
Flyover	Gis Id	
Flyover	Division Name	
Flyover	Division No	
Flyover	Sub Division No	
Flyover	Name	
Flyover	Width	
Flyover	Surface	Concrete / Tar / Asphalt / Paver Block / unsurfaced / Wood/ Iron / other
Flyover	Type	Bridge / Culvert / others
Flyover	Flyover area	
Flyover	Annotations	
Footpath	Gis Id	
Footpath	Width	
Footpath	Surface	Concrete / Tar / Asphalt / Paver Block / unsurfaced / other
Footpath	Geographic Area	
Footpath	Annotation	
Water Bodies	Gis Id	
Water Bodies	Name	
Water Bodies	Type	River / Canal / Seasonal Water Bodies / Lake / OH Water Tank / Open Drain / Nallah / Dams / Others
Water Bodies	Geographic Area	
Water Bodies	Annotation	
Transportation Facilities	Gis Id	
Transportation Facilities	Division Name	



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Land Base Objects / Layers	Field Name	Enum Value
Transportation Facilities	Division No	
Transportation Facilities	Sub Division No	
Transportation Facilities	Name	
Transportation Facilities	Type	Airport / Railway Station / Bus Depot / Taxi Stand / Bus Terminal / Rickshaw Stand / Jetty / Ferry / Others
Transportation Facilities	Geographic Area	
Transportation Facilities	Annotation	
Forest	Gis Id	
Forest	Name	
Forest	Type	Sanctuary / Reserved Forest / Protected Forest / Zoo / Others
Forest	Geographic Area	
Forest	Annotation	
Beach	Gis Id	
Beach	Name	
Beach	Geographic Area	
Beach	Annotation	
Map Grid	Sub Grid No	
Map Grid	Grid No	
Map Grid	Block No	
Map Grid	Grid Boundary Area	
Map Grid	Annotation	
Satellite Image	Image	
Audit History	Event Type	
Audit History	Event Description	
Audit History	Alternative	



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Land Base Objects / Layers	Field Name	Enum Value
Audit History	User	
Audit History	Changed By	
Audit History	Timestamp	
GED Property	Gis Id	
GED Property	Town	
GED Property	Division Name	
GED Property	Division No	
GED Property	Sub Division No	
GED Property	Locality Name	
GED Property	Name of the Property	
GED Property	Floor	
GED Property	Plot/Flat/House/Shop No	
GED Property	Building/ Apartment Name	
GED Property	Block/Pocket No	
GED Property	Sector / Colony Name	
GED Property	Usages	Station / Distribution transformer Center / Office / Store / others / Collection Center / Call Center
GED Property	Collection Centre	YES / NO
GED Property	Call Centre	YES / NO
GED Property	Building Area	
GED Property	Annotation	
State Boundary	Gis Id	
State Boundary	Name	
State Boundary	No Of Circle	
State Boundary	Geographic Area	



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Land Base Objects / Layers	Field Name	Enum Value
State Boundary	Annotation	
Circle Boundary	Gis Id	
Circle Boundary	Name	
Circle Boundary	No Of Town	
Circle Boundary	Geographic Area	
Circle Boundary	Annotation	
Town Boundary	Gis Id	
Town Boundary	Name	
Town Boundary	No Of Division	
Town Boundary	Geographic Area	
Town Boundary	Annotation	
Division Boundary	Gis Id	
Division Boundary	Division Name	
Division Boundary	Division No	
Division Boundary	No Of Sub Division	
Division Boundary	Circle Name	
Division Boundary	Geographic Area	
Division Boundary	Annotation	
Sub division Boundary	Gis Id	
Sub division Boundary	Name	
Sub division Boundary	Sub Division No	
Sub division Boundary	Division Name	
Sub division Boundary	Division No	
Sub division Boundary	No Of Section	



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Land Base Objects / Layers	Field Name	Enum Value
Sub division Boundary	Geographic Area	
Sub division Boundary	Annotation	
Locality Boundary	Gis Id	
Locality Boundary	Name	
Locality Boundary	Division Name	
Locality Boundary	Division No	
Locality Boundary	Sub Division Name	
Locality Boundary	Sub Division No	
Locality Boundary	Geographic Area	
Locality Boundary	Annotation	

Network Data Model

Total 43 Network objects/layer will be created from while creating the network database through field survey

a. List of Network Objects

The Network objects which will be captured during the survey are as follows:-

Network Data model is designed on the basis of these above mentioned objects. Each objects will carry different attributes and values, and they are as follows:-

Attribute comparison between SRS and Proposed

Sr. No.	Layer / Object	No of proposed Attribute
1	Distribution Board	17
2	11 KV Cable	25
3	11KV Line	22



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Sr. No.	Layer / Object	No of proposed Attribute
4	33 KV Cable	25
5	33/11 KV Station	27
6	33KV Line	22
7	Area Demarcation	11
8	Audit History	6
9	Battery Charger	20
10	Busbar	21
11	Cable Joint	18
12	Capacitor Bank	21
13	Circuit Breaker	28
14	Control and Relay Panel	18
15	Current Transformer	22
16	Distribution Box	21
17	Distribution Transformer	44
18	Distribution Transformer Center	22
19	Earth Switch	17
20	EHV Station	25
21	End Point	11
22	Feeder Pillar	27
23	Fuse	26
24	Hypernode	14
25	Internal Link	7
26	Isolator	27
27	Jumper	13



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Sr. No.	Layer / Object	No of proposed Attribute
28	Lightning Arrester	19
29	LT Cable	27
30	LT Line	24
31	Meter	34
32	Pole	43
33	Potential Transformer	23
34	Power Transformer	39
35	Reactor	22
36	Relay	19
37	RMU	23
38	Sectionalizer	15
39	Service Line	23
40	Shunt Capacitor	30
41	Street Light Pole	23
42	Supply Point	13
43	Tower	22
Grand Total		956

Table 1 Network Attribute Comparison - SRS vs. Proposed

b. List of Network Objects and its Attributes

Network Objects / Layers	Field Name	Enum Value
Pole	Gis Id	
Pole	Town	
Pole	Circle	
Pole	Division Name	



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Network Objects / Layers	Field Name	Enum Value
Pole	Division Number	
Pole	Sub Division Name	
Pole	Sub Division Number	
Pole	Pole No	
Pole	2nd Pole No	
Pole	3rd Pole No	
Pole	4th Pole No	
Pole	IVR No	
Pole	Nearest address to Pole	
Pole	Locality Name	
Pole	Road Name	
Pole	Road Connectivity	
Pole	Pole Assembly	Double Pole / Four Pole / Single Pole / Six Pole / Tri Pole
Pole	Network Type on Pole	HT Pole / HT+LT Pole / HT+LT+SL Pole / LT Pole / LT+SL Pole / Street Light Pole
Pole	Pole Construction	Angle Iron / Steel tubular / Rail / PCC /RCC/RSJOIST
Pole	Network Arrangement	Delta / Vertical / Others / Mixed / Horizontal
Pole	Voltage Level	240V / 440V / 11KV / 33KV
Pole	Rising	YES / NO
Pole	End Point	YES / NO
Pole	LA	YES / NO
Pole	Cross Arm	4pin / 2pin / 11KV V shaped / 33KV V shaped
Pole	Insulator	YES / NO
Pole	Number of Insulator	



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Network Objects / Layers	Field Name	Enum Value
Pole	Type of Insulator	
Pole	Stay	YES / NO
Pole	No of Stay	
Pole	Distribution Box Installed?	YES / NO
Pole	No of Distribution Box	
Pole	Transformers Installed?	YES / NO
Pole	Sectionalizer installed	YES / NO
Pole	Street Light Installed?	YES / NO
Pole	Street Light Switch Installed?	YES / NO
Pole	Number of street Light fittings	
Pole	Streetlight Fitting Wattage	
Pole	Type of Streetlight Fitting	Florescent / Fluorescent + HPSV / HPMV / HPSV / Metal Halide / LED / CFL
Pole	Scheme No	
Pole	Commissioned Date	
Pole	Pole Location	
Pole	Pole Annotation	
Cable Joint	Gis Id	
Cable Joint	Town	
Cable Joint	Circle	
Cable Joint	Division Name	
Cable Joint	Division Number	
Cable Joint	Sub Division Name	
Cable Joint	Sub Division Number	
Cable Joint	Locality Name	



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Network Objects / Layers	Field Name	Enum Value
Cable Joint	Trunk Feeder	
Cable Joint	Feeder Name	
Cable Joint	Joint Voltage Type	HT/LT
Cable Joint	Joint Type	Cold Shrink / Premoulded / Heat Shrink/ Gas Insulated / Epoxy / Conventional /Other
Cable Joint	Operating Voltage	33KV / 11KV / 440V / 240V
Cable Joint	Date Of Joint	
Cable Joint	Scheme No	
Cable Joint	Sap Id	
Cable Joint	Joint Annotation	
Cable Joint	Joint Point	
RMU	Gis Id	
RMU	Town	
RMU	Circle	
RMU	Division Name	
RMU	Division Number	
RMU	Sub Division Name	
RMU	Sub Division Number	
RMU	Locality Name	
RMU	Nearest Address to RMU	
RMU	RMU Name	
RMU	Station Name	
RMU	RMU Type	4 Way RMU / 3 Way RMU/ 5P Board / 7P Board / HT Panel / LT ACB / LT MAIN / LT Panel / MCCB
RMU	Operating Voltage	33KV / 11KV / 440V / 240V



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
RMU	Status	In Store / In-service / Not In Service / Proposed / Removed
RMU	Normal Connectivity Position	Closed / Open
RMU	Manufacturer Name	
RMU	Manufacturing Date	
RMU	Manufacturer Serial No	
RMU	Commissioned Date	
RMU	Scheme No	
RMU	Sap Id	
RMU	RMU Area	
RMU	RMU Annotation	
Lightning Arrester	Gis Id	
Lightning Arrester	Town	
Lightning Arrester	Circle	
Lightning Arrester	Division Name	
Lightning Arrester	Division Number	
Lightning Arrester	Sub Division Name	
Lightning Arrester	Sub Division Number	
Lightning Arrester	Locality Name	
Lightning Arrester	Status	In Store / In-service / Not In Service
Lightning Arrester	Type of Construction	Metal Oxide / Thyride / Others
Lightning Arrester	Operating Voltage	33KV / 11KV / 440V / 240V
Lightning Arrester	Purpose	Busbar / Capacitor Bank / Tower / Line / Transformer / DTC
Lightning Arrester	Phasing	1/3
Lightning Arrester	Discharge Current Capacity	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Lightning Arrester	Scheme No	
Lightning Arrester	Sap Id	
Lightning Arrester	LA Internal Location	
Lightning Arrester	LA External Location	
Lightning Arrester	Lightning Arrester Annotation	
33 KV Cable	Gis Id	
33 KV Cable	Town	
33 KV Cable	Circle	
33 KV Cable	Division Name	
33 KV Cable	Division Number	
33 KV Cable	Sub Division Name	
33 KV Cable	Sub Division Number	
33 KV Cable	Locality Name	
33 KV Cable	Trunk Feeder Name	
33 KV Cable	Feeder Name	
33 KV Cable	Station Name	
33 KV Cable	IVR No	
33 KV Cable	Type Of Installation	Overhead / Underground
33 KV Cable	Connectivity Position	HT Consumer / HT Panel to HT Panel / Mains
33 KV Cable	Total Length	
33 KV Cable	Status	In Store / In-service / Not In Service / Proposed / Removed
33 KV Cable	Cross Sectional Area	1000 Sq mm / 150 Sq mm / 185 Sq mm / 240 Sq mm / 300 Sq mm / 35 Sq mm / 400 Sq mm / 630 Sq mm / 70 Sq mm / 95 Sq mm
33 KV Cable	No Of Cores	1/3



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
33 KV Cable	Cable Material	Aluminum / Copper
33 KV Cable	Type	PILCA / PVC / XLPE / ABC
33 KV Cable	Commissioned Date	
33 KV Cable	Scheme No	
33 KV Cable	Sap Id	
33 KV Cable	Cable Route	
33 KV Cable	Cable Annotation	
11 KV Cable	Gis Id	
11 KV Cable	Town	
11 KV Cable	Circle	
11 KV Cable	Division Name	
11 KV Cable	Division Number	
11 KV Cable	Sub Division Name	
11 KV Cable	Sub Division Number	
11 KV Cable	Locality Name	
11 KV Cable	Trunk Feeder Name	
11 KV Cable	Feeder Name	
11 KV Cable	Station Name	
11 KV Cable	IVR No	
11 KV Cable	Type Of Installation	Overhead / Underground
11 KV Cable	Connectivity Position	HT Consumer / HT Panel to HT Panel / HT Panel to Transformer / Mains
11 KV Cable	Total Length	
11 KV Cable	Status	Existing / In Store / In-service / Not In Service / Proposed / Removed



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
11 KV Cable	Cross Sectional Area	1000 Sq mm / 150 Sq mm / 185 Sq mm / 240 Sq mm / 300 Sq mm / 35 Sq mm / 400 Sq mm / 630 Sq mm / 70 Sq mm / 95 Sq mm
11 KV Cable	No Of Cores	1 / 3
11 KV Cable	Cable Material	Aluminium / Copper
11 KV Cable	Type	PILCA / PVC / XLPE / ABC
11 KV Cable	Commissioned Date	
11 KV Cable	Scheme No	
11 KV Cable	Sap Id	
11 KV Cable	Cable Route	
11 KV Cable	Cable Annotation	
LT Cable	Gis Id	
LT Cable	Town	
LT Cable	Circle	
LT Cable	Division Name	
LT Cable	Division Number	
LT Cable	Sub Division Name	
LT Cable	Sub Division Number	
LT Cable	Locality Name	
LT Cable	Feeder Name	
LT Cable	Station Name	
LT Cable	IVR No	
LT Cable	Operating Voltage	440V / 240V
LT Cable	Phase	1 / 3
LT Cable	Type Of Installation	Overhead / Underground



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
LT Cable	Connectivity Position	ACB - Air Circuit Breaker / LT Main /RMU - Ring Main Unit/FP - Feeder Pillar/SP - service Pillar/MN - Meter Niche
LT Cable	Total Length	
LT Cable	Status	Existing / In Store / In-service / Not In Service / Proposed / Removed
LT Cable	Cross Sectional Area	10 Sq mm / 16 Sq mm / 25 Sq mm / 35 Sq mm / 50 Sq mm/ 120 Sq mm / 150 Sq mm / 185 Sq mm / 240 Sq mm / 300 Sq mm / 400 Sq mm / 630 Sq mm / 70 Sq mm / 95 Sq mm
LT Cable	No Of Cores	1 / 2 / 3.5 / 4 / 6
LT Cable	Operating Voltage	440V / 240V
LT Cable	Conductor Material	Aluminium / Copper
LT Cable	Cable Type	PILCA / PVC / XLPE / ABC
LT Cable	Commissioned Date	
LT Cable	Scheme No	
LT Cable	Sap Id	
LT Cable	Cable Route	
LT Cable	Cable Annotation	
Battery Charger	Gis Id	
Battery Charger	Town	
Battery Charger	Circle	
Battery Charger	Division Name	
Battery Charger	Division Number	
Battery Charger	Sub Division Name	
Battery Charger	Sub Division Number	
Battery Charger	Locality Name	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Battery Charger	Station Name	
Battery Charger	Status	Not in-Service / Inservice
Battery Charger	Operating Voltage	
Battery Charger	Rated Current	
Battery Charger	Manufacturer Name	
Battery Charger	Manufacturer Serial No	
Battery Charger	Manufacturing Date	
Battery Charger	Commissioned Date	
Battery Charger	Scheme No	
Battery Charger	Sap Id	
Battery Charger	Point	
Battery Charger	Annotation	
Power Transformer	Gis Id	
Power Transformer	Town	
Power Transformer	Circle	
Power Transformer	Division Name	
Power Transformer	Division Number	
Power Transformer	Sub Division Name	
Power Transformer	Sub Division Number	
Power Transformer	Locality Name	
Power Transformer	Station Name	
Power Transformer	Power Transformer Name	
Power Transformer	Status	In Store / In-service / Not In Service / Proposed / Removed
Power Transformer	Type	Indoor / Outdoor



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Power Transformer	Capacity	3.15 MVA / 5 MVA / 6.30 MVA / 10 MVA / 8 MVA
Power Transformer	Primary Voltage	33KV/66 KV
Power Transformer	Output Voltage	
Power Transformer	Type of Core	
Power Transformer	Iron Loss	
Power Transformer	Copper Loss	
Power Transformer	Vector Group	Delta - Delta / Delta - Star / Star - Delta / Star - Star / Others
Power Transformer	% Impedance	
Power Transformer	PTR Manufacturer Name	
Power Transformer	PTR Manufacturer Serial No	
Power Transformer	PTR Manufacturing Date	
Power Transformer	Commissioned Date	
Power Transformer	Presence of Tap	YES / NO
Power Transformer	Current Tap Position	
Power Transformer	Tap Changing Type	
Power Transformer	Minimum Tap	
Power Transformer	Maximum Tap	
Power Transformer	Phase	1/3
Power Transformer	Scheme No	
Power Transformer	Sap Id	
Power Transformer	Power Txr Route	
Power Transformer	TAP Changer Manufacturer Name	
Power Transformer	Tap Changer Serial No	
Power Transformer	Tap Changer Manufacturing Date	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Power Transformer	Power Transformer Catalogue	
Power Transformer	Power Transformer History	
Power Transformer	Power Txr Annotation	
Distribution Transformer Center	Gis Id	
Distribution Transformer Center	Town	
Distribution Transformer Center	Circle	
Distribution Transformer Center	Division Name	
Distribution Transformer Center	Division Number	
Distribution Transformer Center	Sub Division Name	
Distribution Transformer Center	Sub Division Number	
Distribution Transformer Center	Locality Name	
Distribution Transformer Center	DTC Name	
Distribution Transformer Center	Location/Pole No.	
Distribution Transformer Center	Status	In-service / Not In Service / Proposed / Removed / Work In Progress
Distribution Transformer Center	Type of DT Center	Indoor / Kiosk / Outdoor / Package
Distribution Transformer Center	Sub Type of DT Center	HVDS / Plinth Mounted / Pole Mounted / Other
Distribution Transformer Center	Fencing	YES / NO
Distribution Transformer Center	Number of Distribution Transformer	
Distribution Transformer Center	Total Capacity Distribution Transformer	
Distribution Transformer Center	Total no. of Earth Pit	
Distribution Transformer Center	Commissioned Date	
Distribution Transformer Center	Scheme No	
Distribution Transformer Center	Sap Id	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Distribution Transformer Center	DT Center Boundary	
Distribution Transformer Center	DT Ceneter Annotation	
Distribution Transformer	Gis Id	
Distribution Transformer	Town	
Distribution Transformer	Circle	
Distribution Transformer	Division Name	
Distribution Transformer	Division Number	
Distribution Transformer	Sub Division Name	
Distribution Transformer	Sub Division Number	
Distribution Transformer	Locality Name	
Distribution Transformer	Station Name	
Distribution Transformer	DT Name	
Distribution Transformer	Status	In Store / In-service / Not In Service / Proposed
Distribution Transformer	DT No	
Distribution Transformer	Type	Indoor / Outdoor
Distribution Transformer	Sub Type	Pole mounted / Plinth Mounted
Distribution Transformer	Usage	Auxillary / Distribution / HTC / HVDS / Package Transformer / Street Light
Distribution Transformer	Capacity	630 KVA / 500 KVA / 400 KVA / 315 KVA / 250 KVA / 200 KVA / 160 KVA / 150 KVA / 100 KVA / 75 KVA / 63 KVA / 50 KVA / 25 KVA / 16 KVA / 15 KVA
Distribution Transformer	High voltage side volt	
Distribution Transformer	Low voltage side volt	
Distribution Transformer	Core Type	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Distribution Transformer	Vector Group	Delta - Delta / Delta - Star / Star - Delta / Star - Star
Distribution Transformer	Phase	
Distribution Transformer	% Impedance	
Distribution Transformer	LV feeder protection	
Distribution Transformer	HV protection	
Distribution Transformer	LV protection	
Distribution Transformer	Owned By	GED / Customer
Distribution Transformer	Manufacturer Name	
Distribution Transformer	Manufacturer Serial No	
Distribution Transformer	Manufacturing Date	
Distribution Transformer	No of LT Panel/ACB	
Distribution Transformer	No of LT Feeder	
Distribution Transformer	Meter No	
Distribution Transformer	Presence of Tap	
Distribution Transformer	Current Tap Position	
Distribution Transformer	Tap Changing Type	
Distribution Transformer	Minimum Tap	
Distribution Transformer	Maximum Tap	
Distribution Transformer	TAP Changer Manufacturer Name	
Distribution Transformer	Tap Changer Serial No	
Distribution Transformer	Scheme No	
Distribution Transformer	Sap Id	
Distribution Transformer	DT Location	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Distribution Transformer	Distribution Txr Route	
Distribution Transformer	Distribution Txr Annotation	
Distribution Box	Gis Id	
Distribution Box	Town	
Distribution Box	Circle	
Distribution Box	Division Name	
Distribution Box	Division Number	
Distribution Box	Sub Division Name	
Distribution Box	Sub Division Number	
Distribution Box	Locality Name	
Distribution Box	Station Name	
Distribution Box	DT No	
Distribution Box	No Of LV Feeders	
Distribution Box	Type	MCCB / LV Panel
Distribution Box	scheme no	
Distribution Box	SAP Id	
Distribution Box	Current Capacity	400/800/1200/1000 A
Distribution Box	Manufacturer Serial No	
Distribution Box	Manufacturer Name	
Distribution Box	Manufacturing Date	
Distribution Box	Commissioned Date	
Distribution Box	Location	
Distribution Box	Annotation	
Distribution Board	Gis Id	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Distribution Board	Town	
Distribution Board	Circle	
Distribution Board	Division Name	
Distribution Board	Division Number	
Distribution Board	Sub Division Name	
Distribution Board	Sub Division Number	
Distribution Board	Locality Name	
Distribution Board	33/11 KV Station Name	
Distribution Board	Type	AC Dist. Board / DC Dist. Board
Distribution Board	Manufacturer Make	
Distribution Board	Manufacturer Serial No	
Distribution Board	Manufacturing Date	
Distribution Board	Commissioned Date	
Distribution Board	Annotation	
Distribution Board	scheme no	
Distribution Board	SAP Id	
33KV Line	Gis Id	
33KV Line	Town	
33KV Line	Circle	
33KV Line	Division Name	
33KV Line	Division Number	
33KV Line	Sub Division Name	
33KV Line	Sub Division Number	
33KV Line	Locality Name	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
33KV Line	Trunk Feeder Name	
33KV Line	Feeder Name	
33KV Line	Station Name	
33KV Line	IVR No	Feeder Code
33KV Line	Connectivity Position	HT Consumer / HT Panel to Transformer / Mains
33KV Line	Total Length	
33KV Line	Status	Existing / In Store / In-service / Not In Service / Proposed / Removed
33KV Line	Commissioned Date	
33KV Line	Conductor Type	Tiger / Raccoon / Wolf / Panther / others
33KV Line	Configuration	Horizontal / Vertical / Delta / Mixed
33KV Line	Line Route	
33KV Line	Line Annotation	
33KV Line	Scheme No	
33KV Line	SAP Id	
11KV Line	Gis Id	
11KV Line	Town	
11KV Line	Circle	
11KV Line	Division Name	
11KV Line	Division Number	
11KV Line	Sub Division Name	
11KV Line	Sub Division Number	
11KV Line	Locality Name	
11KV Line	Trunk Feeder Name	
11KV Line	Feeder Name	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
11KV Line	Station Name	
11KV Line	IVR No	Feeder Code
11KV Line	Connectivity Position	HT Consumer / HT Panel to Transformer / Mains
11KV Line	Total Length	
11KV Line	Status	Existing / In Store / In-service / Not In Service / Proposed / Removed
11KV Line	Commissioned Date	
11KV Line	Conductor Type	Weasel / Raccoon / AAAC / Others
11KV Line	Configuration	Horizontal / Vertical / Delta / Mixed
11KV Line	Line Route	
11KV Line	Line Annotation	
11KV Line	Scheme No	
11KV Line	SAP Id	
LT Line	Gis Id	
LT Line	Town	
LT Line	Circle	
LT Line	Division Name	
LT Line	Division Number	
LT Line	Sub Division Name	
LT Line	Sub Division Number	
LT Line	Locality Name	
LT Line	Feeder Name	
LT Line	IVR No	
LT Line	DT No	
LT Line	Station Name	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
LT Line	Operating Voltage	440V / 240V
LT Line	Connectivity Position	ACB - Air Circuit Breaker / LT Main /RMU - Ring Main Unit/FP - Feeder Pillar/SP - service Pillar/MN - Meter Niche
LT Line	Total Length	
LT Line	Status	Existing / In Store / In-service / Not In Service / Proposed / Removed
LT Line	Commissioned Date	
LT Line	Conductor Type	Wasp / ANT / GNAT / Rose / Irish / Others
LT Line	Phase	Single Phase 4 W/ Single Phase 3 W / Two Phase 5 W/ Three Phase 6 W / Three Phase 7 W
LT Line	Configuration	Horizontal / Vertical / Delta / Mixed
LT Line	Line Route	
LT Line	Line Annotation	
LT Line	Scheme No	
LT Line	SAP Id	
Service Line	Gis Id	
Service Line	Town	
Service Line	Circle	
Service Line	Division Name	
Service Line	Division Number	
Service Line	Sub Division Name	
Service Line	Sub Division Number	
Service Line	Locality Name	
Service Line	IVR No	
Service Line	DT No	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Service Line	Status	In-service / Not In Service
Service Line	Type Of Installation	Overhead / Underground
Service Line	Line Length	
Service Line	No Of Cores	
Service Line	Phase	
Service Line	Service Line Route	
Service Line	Ed Demand Point	
Service Line	Operating Voltage	
Service Line	Connectivity Position	Pole to Meter, Feeder Pillar to Meter, Distribution Box to Meter, Service Pillar to Meter
Service Line	Pole/FP/SP No	
Service Line	Connected Consumers	
Service Line	scheme no	
Service Line	SAP Id	
Busbar	Gis Id	
Busbar	Town	
Busbar	Circle	
Busbar	Division Name	
Busbar	Division Number	
Busbar	Sub Division Name	
Busbar	Sub Division Number	
Busbar	Locality Name	
Busbar	Station Name	
Busbar	Status	In Store / In-service / Not In Service
Busbar	Voltage	400KV / 220KV / 110KV / 33KV / 11KV / 440V / 240V



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Busbar	Current Rating	
Busbar	Busbar Internal Route	
Busbar	Busbar External Route	
Busbar	Busbar Annotation	
Busbar	Bus bar Type	
Busbar	Manufacturer Name	
Busbar	Manufacturer Serial No	
Busbar	Manufacturing Date	
Busbar	Scheme No	
Busbar	Sap Id	
Jumper	Gis Id	
Jumper	Town	
Jumper	Circle	
Jumper	Division Name	
Jumper	Division Number	
Jumper	Sub Division Name	
Jumper	Sub Division Number	
Jumper	Locality Name	
Jumper	IVR No	
Jumper	Type Of Conductor/Cable	
Jumper	Jumper HT Route	
Jumper	Jumper Lt Route	
Jumper	Station Name	
33/11 KV Station	Gis Id	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
33/11 KV Station	Town	
33/11 KV Station	Circle	
33/11 KV Station	Division Name	
33/11 KV Station	Division Number	
33/11 KV Station	Sub Division Name	
33/11 KV Station	Sub Division Number	
33/11 KV Station	Locality Name	
33/11 KV Station	Name of Station	
33/11 KV Station	Station Code	
33/11 KV Station	Status	Existing / In-service / Not In Service / Proposed / Removed / Work In Progress
33/11 KV Station	Station Voltage	33/11KV
33/11 KV Station	Station Owner	GED/ Customer
33/11 KV Station	Type of Construction	Indoor / Outdoor
33/11 KV Station	Total No of Power Transformer	
33/11 KV Station	Total Capacity Power Transformer	
33/11 KV Station	No. of Incoming Feeders	
33/11 KV Station	No. of Outgoing Feeders	Manned / Unmanned
33/11 KV Station	Total Capacity Capacitor Bank	
33/11 KV Station	Substation Operation	Manned / Unmanned
33/11 KV Station	Commissioned Date	
33/11 KV Station	Scada Id	
33/11 KV Station	Scheme No	
33/11 KV Station	SAP ID	
33/11 KV Station	Station Boundary	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
33/11 KV Station	Station Internal Boundary	
33/11 KV Station	Station Annotation	
Shunt Capacitor	Gis Id	
Shunt Capacitor	Town	
Shunt Capacitor	Circle	
Shunt Capacitor	Division Name	
Shunt Capacitor	Division Number	
Shunt Capacitor	Sub Division Name	
Shunt Capacitor	Sub Division Number	
Shunt Capacitor	Locality Name	
Shunt Capacitor	Station Name	
Shunt Capacitor	Status	Not in-Service / Inservice
Shunt Capacitor	Type	
Shunt Capacitor	Switching	
Shunt Capacitor	Operating Voltage	33KV / 11KV
Shunt Capacitor	Total Capacity	
Shunt Capacitor	Shunt Reactance multiplication factor	
Shunt Capacitor	Phae	
Shunt Capacitor	On Setting	
Shunt Capacitor	On Setting	
Shunt Capacitor	Off setting	
Shunt Capacitor	Reactor	
Shunt Capacitor	Nominal Voltage	
Shunt Capacitor	Manufacturer Name	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Shunt Capacitor	Manufacturing Date	
Shunt Capacitor	Manufacturer Serial No	
Shunt Capacitor	Commissioned Date	
Shunt Capacitor	Internal Location	
Shunt Capacitor	External Location	
Shunt Capacitor	Shunt Capacitor Annotation	
Shunt Capacitor	Scheme No	
Shunt Capacitor	Sap Id	
End Point	Gis Id	
End Point	Town	
End Point	Circle	
End Point	Division Name	
End Point	Division Number	
End Point	Sub Division Name	
End Point	Sub Division Number	
End Point	Locality Name	
End Point	IVR No	
End Point	End Point LT Location	
End Point	End Point Ht Location	
Relay	GIS ID	
Relay	Town	
Relay	Circle	
Relay	Division Name	
Relay	Division Number	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Relay	Sub Division Name	
Relay	Sub Division Number	
Relay	Locality Name	
Relay	Station Name	
Relay	Status	Not in-Service / Inservice
Relay	Type Of Relay	Feeder Protection Relay / Transformer Protection / Back Up Protection / Auxiliary Protection
Relay	Manufacturer Name	
Relay	Manufacturer Serial No	
Relay	Manufacturing Date	
Relay	Commissioned Date	
Relay	Sap Id	
Relay	Scheme No	
Relay	Location	
Relay	Annotation	
Isolator	Gis Id	
Isolator	Town	
Isolator	Circle	
Isolator	Division Name	
Isolator	Division Number	
Isolator	Sub Division Name	
Isolator	Sub Division Number	
Isolator	Locality Name	
Isolator	Isolator External Line	
Isolator	Station Name	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Isolator	Control	Bus / Capacitor / Cable / Line / Spare / Tie / Transformer /Incomer/Feeder
Isolator	Status	In Store / In-service / Not In Service
Isolator	Normal Connectivity Position	Closed / Open
Isolator	Physical Location	Indoor / Outdoor
Isolator	Operation Type	Off Load / On Load
Isolator	Construction Type	Central Break / Double Break / Single Break / GO Switch
Isolator	Medium Type	Air Break / Oil Immersed / SF6 / Others
Isolator	Type Of Mounting	Horizontal / Vertical
Isolator	Control Type	Automated / Manual / Motorised
Isolator	Operating Voltage	33 kV/ 11 kV/ 440V
Isolator	Manufacturer Name	
Isolator	Manufacturer Serial No	
Isolator	Manufacturing Date	
Isolator	Commissioned Date	
Isolator	Isolator Internal Line	
Isolator	Scheme No	
Isolator	Sap Id	
Meter	Gis Id	
Meter	Town	
Meter	Circle	
Meter	Division Name	
Meter	Division Number	
Meter	Sub Division Name	
Meter	Sub Division Number	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Meter	Locality Name	
Meter	CA No	
Meter	Status	In-service / Not In Service
Meter	Feeder Name	
Meter	Station Name	
Meter	Rated Current	
Meter	Phase	
Meter	Multiplying Factor	
Meter	Type	Electromechanical / Electronic / Static
Meter	Connection Type	CT Operated 3 Phase 4 Wire / CT PT Operated 3 Phase 3 Wire / Whole Current / Others
Meter	Meter No	
Meter	Operating Voltage	33KV / 11KV
Meter	CT Ratio	
Meter	PT Ratio	
Meter	Purpose	11kV Feeder Meter / 11kV In Meter / 33kV In Meter / 33kV Out Meter / DT Meter / Feeder Meter / Station Meter / HVDS Meter / HVDS T-Off Meter / Power Transformer Meter / T-Off Meter/Meter / Town Boundary Meter / Sub Division Boundary Meter
Meter	MDI (kVA)	
Meter	Power Factor	
Meter	DT No	
Meter	Commissioned Date	
Meter	Manufacturer Name	
Meter	Manufacturer Serial No	



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Meter	Manufacturing Date	
Meter	External Location	
Meter	Internal Location	
Meter	Meter Annotation	
Meter	Scheme No	
Meter	Sap Id	
Circuit Breaker	Gis Id	
Circuit Breaker	Town	
Circuit Breaker	Circle	
Circuit Breaker	Division Name	
Circuit Breaker	Division Number	
Circuit Breaker	Sub Division Name	
Circuit Breaker	Sub Division Number	
Circuit Breaker	Locality Name	
Circuit Breaker	Station Name	
Circuit Breaker	Control	11kV Incomer / Bus Coupler / Bus Section / Capacitor Bank / Cable / Line / Power Transformer / Spare / Station Transformer / Tie / Transformer / 33KV Incomer / Feeder
Circuit Breaker	Status	In Store / In-service / Not In Service
Circuit Breaker	Control Type	Auto Reclosure / Automated / Sectionalizer / Manual / Others
Circuit Breaker	Panel Position	1/2/3
Circuit Breaker	Normal Connectivity Position	Closed / Open
Circuit Breaker	Physical Location	Indoor / Outdoor
Circuit Breaker	Medium Type	ACB / BOCB / MCCB / MOCB / SF6 / VCB



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Circuit Breaker	Operating Voltage	33KV / 11KV / 0.433 KV
Circuit Breaker	Breaker Type	Distribution Circuit Breaker / Station Breaker / RMU Breaker / Transmission Breaker / Others
Circuit Breaker	Current Rating	
Circuit Breaker	Phase	
Circuit Breaker	Manufacturer Name	
Circuit Breaker	Manufacturer Serial No	
Circuit Breaker	Manufacturing Date	
Circuit Breaker	Commissioned Date	
Circuit Breaker	Circuit Breaker Internal Line	
Circuit Breaker	Circuit Breaker External Line	
Circuit Breaker	Scheme No	
Circuit Breaker	Sap Id	
Fuse	Gis Id	
Fuse	Town	
Fuse	Circle	
Fuse	Division Name	
Fuse	Division Number	
Fuse	Sub Division Name	
Fuse	Sub Division Number	
Fuse	Locality Name	
Fuse	Station Name	
Fuse	Type	Horn Gap / Kitkat / HRC / Drop Out
Fuse	Current Rating	
Fuse	Status	In Store / In-service / Not In Service



REC Power Distribution Company Limited

Network Objects / Layers	Field Name	Enum Value
Fuse	Feeder Name	
Fuse	Feeder Number	
Fuse	DT Name	
Fuse	Operating Voltage	11KV / 440V / 240V
Fuse	Phasing	1/3
Fuse	Fuse Annotation	
Fuse	Fuse LT Route	
Fuse	Fuse HT Route	
Fuse	Manufacturer Name	
Fuse	Manufacturer Serial No	
Fuse	Manufacturing Date	
Fuse	Commissioned Date	
Fuse	Scheme No	
Fuse	Sap Id	
Capacitor Bank	Gis Id	
Capacitor Bank	Town	
Capacitor Bank	Circle	
Capacitor Bank	Division Name	
Capacitor Bank	Division Number	
Capacitor Bank	Sub Division Name	
Capacitor Bank	Sub Division Number	
Capacitor Bank	Locality Name	
Capacitor Bank	Station name	
Capacitor Bank	Status	In Store / In-service / Not In Service



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Network Objects / Layers	Field Name	Enum Value
Capacitor Bank	Voltage Level (DC)	
Capacitor Bank	No Of Cells	
Capacitor Bank	Scheme No	
Capacitor Bank	Sap Id	
Capacitor Bank	Rated Current	
Capacitor Bank	Manufacturer Name	
Capacitor Bank	Manufacturer Serial No	
Capacitor Bank	Manufacturing Date	
Capacitor Bank	Commissioned Date	
Capacitor Bank	Point	
Capacitor Bank	Annotation	
Tower	Gis Id	
Tower	Town	
Tower	Circle	
Tower	Division Name	
Tower	Division Number	
Tower	Sub Division Name	
Tower	Sub Division Number	
Tower	Locality Name	
Tower	Status	In-service / Not In Service / Proposed / Removed / Work In Progress
Tower	Tower Type	A / A+12 / A+3 / A+6 / A+9 / B / B+12 / B+3 / B+6 / B+9 / C / C+12 / C+3 / C+6 / C+9 / D / D+12 / D+3 / D+6 / D+9
Tower	Construction Date	
Tower	Tower No	



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Network Objects / Layers	Field Name	Enum Value
Tower	Voltage	400KV / 220KV / 110KV / 33KV
Tower	No Of Circuits	
Tower	Height Of Tower	
Tower	Type of Construction	GI / MS Painted
Tower	Phase To Phase Distance	
Tower	Line To Line Separation	
Tower	Tower Point	
Tower	Tower Annotation	
Tower	Scheme no	
Tower	SAP Id	
Feeder Pillar	Gis Id	
Feeder Pillar	Town	
Feeder Pillar	Circle	
Feeder Pillar	Division Name	
Feeder Pillar	Division Number	
Feeder Pillar	Sub Division Name	
Feeder Pillar	Sub Division Number	
Feeder Pillar	Locality Name	
Feeder Pillar	IVR No	
Feeder Pillar	FP/SP No.	
Feeder Pillar	Status	In Store / In-service / Not In Service
Feeder Pillar	Operating Voltage	33KV / 11KV / 440V / 240V
Feeder Pillar	Type	Feeder Pillar / Meter Niche / Service Pillar / Street light pillar / CT-PT Unit
Feeder Pillar	No Of Ways	



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Network Objects / Layers	Field Name	Enum Value
Feeder Pillar	Nearest Plot/Flat/House/Shop No	
Feeder Pillar	Landmark	
Feeder Pillar	Road Name	System Generated
Feeder Pillar	Road Connectivity	System Generated
Feeder Pillar	Manufacturer Name	
Feeder Pillar	Manufacturer Serial No	
Feeder Pillar	Manufacturing Date	
Feeder Pillar	Date Installed	
Feeder Pillar	Feeder Pillar Location	
Feeder Pillar	Feeder Pillar Annotation	
Feeder Pillar	Connected Consumers	
Feeder Pillar	Scheme No	
Feeder Pillar	Sap Id	
Control and Relay Panel	Gis Id	
Control and Relay Panel	Town	
Control and Relay Panel	Circle	
Control and Relay Panel	Division Name	
Control and Relay Panel	Division Number	
Control and Relay Panel	Sub Division Name	
Control and Relay Panel	Sub Division Number	
Control and Relay Panel	Locality Name	
Control and Relay Panel	Status	In Store / In-service / Not In Service
Control and Relay Panel	Purpose	Bus Coupler Control / Transformer Control / Capacitor Bank Control / Feeder Control / Line Control / Others



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Network Objects / Layers	Field Name	Enum Value
Control and Relay Panel	Operating Voltage	33KV / 11KV / 440V / 240V
Control and Relay Panel	Control and Relay Panel Area	
Control and Relay Panel	Manufacturer Name	
Control and Relay Panel	Manufacturer Serial No	
Control and Relay Panel	Manufacturing Date	
Control and Relay Panel	Commissioned Date	
Control and Relay Panel	Scheme No	
Control and Relay Panel	Sap Id	
Current Transformer	Gis Id	
Current Transformer	Town	
Current Transformer	Circle	
Current Transformer	Division Name	
Current Transformer	Division Number	
Current Transformer	Sub Division Name	
Current Transformer	Sub Division Number	
Current Transformer	Locality Name	
Current Transformer	CT Location	
Current Transformer	Ratio	
Current Transformer	Type	Indoor / Outdoor
Current Transformer	Status	In Store / In-service / Not In Service / Proposed / Removed
Current Transformer	Operating Voltage	33kV / 11KV / 440V
Current Transformer	Construction Type	Cast Resin/ Ring / Poly Cret / Oil
Current Transformer	Manufacturer Name	



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Network Objects / Layers	Field Name	Enum Value
Current Transformer	Manufacturer Serial No	
Current Transformer	Manufacturing Date	
Current Transformer	Commissioned Date	
Current Transformer	No Of Cores	
Current Transformer	CT Annotation	
Current Transformer	Scheme No	
Current Transformer	Sap Id	
Hypernode	Gis Id	
Hypernode	Town	
Hypernode	Circle	
Hypernode	Division Name	
Hypernode	Division Number	
Hypernode	Sub Division Name	
Hypernode	Sub Division Number	
Hypernode	Locality Name	
Hypernode	Circuit Id	
Hypernode	Hypernode External Location	
Hypernode	Hypernode Internal Location	
Hypernode	Hypernode Annotation	
Hypernode	Sub Feeder	
Hypernode	Trunk Feeder	
Potential Transformer	Gis Id	
Potential Transformer	Town	
Potential Transformer	Circle	



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Network Objects / Layers	Field Name	Enum Value
Potential Transformer	Division Name	
Potential Transformer	Division Number	
Potential Transformer	Sub Division Name	
Potential Transformer	Sub Division Number	
Potential Transformer	Locality Name	
Potential Transformer	PT Location	
Potential Transformer	Ratio	
Potential Transformer	PT Type	Indoor / Outdoor
Potential Transformer	Status	In Store / In-service / Not In Service / Proposed / Removed
Potential Transformer	Operating Voltage	33kV / 11kv / 440 V
Potential Transformer	No Of Cores	
Potential Transformer	Manufacturer Name	
Potential Transformer	Manufacturer Serial No	
Potential Transformer	Manufacturing Date	
Potential Transformer	Commissioned Date	
Potential Transformer	Construction Type	Glass Fiber / Resin Cast / Oil Cooled / Oil Filled / Porcelain / Poly Cret
Potential Transformer	Potential Txr Annotation	
Potential Transformer	Purpose	Bus PT / line PT
Potential Transformer	Scheme No	
Potential Transformer	Sap Id	
Supply Point	Gis Id	
Supply Point	Town	
Supply Point	Circle	
Supply Point	Division Name	



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Network Objects / Layers	Field Name	Enum Value
Supply Point	Division Number	
Supply Point	Sub Division Name	
Supply Point	Sub Division Number	
Supply Point	Locality Name	
Supply Point	IVR No	
Supply Point	Distribution Transformer	
Supply Point	Connected Consumers	
Supply Point	Supply Point Location	
Supply Point	Ed Service Line	
Reactor	Gis Id	
Reactor	Town	
Reactor	Circle	
Reactor	Division Name	
Reactor	Division Number	
Reactor	Sub Division Name	
Reactor	Sub Division Number	
Reactor	Locality Name	
Reactor	Station Name	
Reactor	Status	In Store / In-service / Not In Service
Reactor	operating Voltage	33KV / 11KV / 440V / 240V
Reactor	Inductance	
Reactor	Reactor Capacitance	
Reactor	Normal Condition	Open / Close
Reactor	Reactor Location	



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Network Objects / Layers	Field Name	Enum Value
Reactor	reactor Annotation	
Reactor	Manufacturer Name	
Reactor	Manufacturer Serial No	
Reactor	Manufacturing Date	
Reactor	Commissioned Date	
Reactor	scheme no	
Reactor	SAP Id	
Earth Switch	Gis Id	
Earth Switch	Town	
Earth Switch	Circle	
Earth Switch	Division Name	
Earth Switch	Division Number	
Earth Switch	Sub Division Name	
Earth Switch	Sub Division Number	
Earth Switch	Locality Name	
Earth Switch	Operating Voltage	33KV / 11KV / 440V / 240V
Earth Switch	Phase	
Earth Switch	Rated Current	
Earth Switch	Normal Rated Current	
Earth Switch	Type	
Earth Switch	Location	
Earth Switch	Earth Switch Annotation	
Earth Switch	scheme no	
Earth Switch	SAP Id	



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Network Objects / Layers	Field Name	Enum Value
Sectionalizer	Gis Id	
Sectionalizer	Town	
Sectionalizer	Circle	
Sectionalizer	Division Name	
Sectionalizer	Division Number	
Sectionalizer	Sub Division Name	
Sectionalizer	Sub Division Number	
Sectionalizer	Locality Name	
Sectionalizer	Operating Voltage	33KV / 11KV / 440V
Sectionalizer	Usage	
Sectionalizer	Type	
Sectionalizer	Location	
Sectionalizer	Sectionalizer Annotation	
Sectionalizer	scheme no	
Sectionalizer	SAP Id	
Street Light Pole	Gis Id	
Street Light Pole	Town	
Street Light Pole	Circle	
Street Light Pole	Division Name	
Street Light Pole	Division Number	
Street Light Pole	Sub Division Name	
Street Light Pole	Sub Division Number	
Street Light Pole	Locality Name	
Street Light Pole	Nearest Plot/Flat/House/Shop No	Field survey



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Network Objects / Layers	Field Name	Enum Value
Street Light Pole	Landmark	Field survey
Street Light Pole	Road Name	System Generated
Street Light Pole	Road Connectivity	System Generated
Street Light Pole	Status	In-service / Not In-Service
Street Light Pole	Pole No	
Street Light Pole	Wattage	
Street Light Pole	Type	1 Arm / 2 Arm / 2 Arm / 4 Arm / High Mast
Street Light Pole	Type of Streetlight Fitting	Fluorescent / Fluorescent + HPSV / HPMV / HPSV / Metal Halide / LED / CFL
Street Light Pole	Number of street Light installed	
Street Light Pole	Street Light Switches	YES/NO
Street Light Pole	Location	
Street Light Pole	Street Light Annotation	
Street Light Pole	scheme no	
Street Light Pole	SAP Id	
Area Demarcation	Gis Id	
Area Demarcation	Town	
Area Demarcation	Circle	
Area Demarcation	Division Name	
Area Demarcation	Division Number	
Area Demarcation	Sub Division Name	
Area Demarcation	Sub Division Number	
Area Demarcation	Locality Name	
Area Demarcation	Type	Electrified / Unelectrified
Area Demarcation	Comments	



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Network Objects / Layers	Field Name	Enum Value
Area Demarcation	Area Demarcation Boundary	
Audit History	Event Type	
Audit History	Event Description	
Audit History	Alternative	
Audit History	User	
Audit History	Changed By	
Audit History	Timestamp	
Internal Link	Gis Id	
Internal Link	Town	
Internal Link	Circle	
Internal Link	Locality Name	
Internal Link	Internal Link	
Internal Link	External Link	
Internal Link	Operating Voltage	33KV / 11KV / 440V / 240V
EHV Station	Gis Id	
EHV Station	Town	
EHV Station	Circle	
EHV Station	Division Name	
EHV Station	Division Number	
EHV Station	Sub Division Name	
EHV Station	Sub Division Number	
EHV Station	Locality Name	
EHV Station	Name of Station	
EHV Station	Station Code	



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Network Objects / Layers	Field Name	Enum Value
EHV Station	Status	Existing / In-service / Not In Service / Proposed / Removed / Work In Progress
EHV Station	Station Voltage	220/110/33 KV OR 110/33KV OR 220/33 KV
EHV Station	Station Owner	GED/ Customer
EHV Station	Type of Construction	Indoor / Outdoor
EHV Station	Substation Operation	Manned / Unmanned
EHV Station	Total no. of Earth Pit	
EHV Station	Total No of Power Transformer	
EHV Station	Total Capacity Power Transformer	
EHV Station	Commissioned Date	
EHV Station	SCADA Id	
EHV Station	Scheme No	
EHV Station	SAP ID	
EHV Station	Station Boundary	
EHV Station	Station Internal Boundary	
EHV Station	Station Annotation	

ii. Consumer Data Model

Details of Consumer will be captured from site and other GED sources as per the consumer data model.

a. Consumer and its Attributes

Object	Field Name	Enum Value
Consumer	Gis Id	
Consumer	Town	
Consumer	Division	



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Object	Field Name	Enum Value
Consumer	Sub Division	
Consumer	Old Consumer No	
Consumer	New Consumer No	
Consumer	Consumer Name	
Consumer	Father/ Husband Name	
Consumer	Occupant Name	
Consumer	Tower/Plot/Flat/House/Shop No	
Consumer	Building/ Apartment Name	
Consumer	Block/Pocket No	
Consumer	Sector/Colony Name	
Consumer	Locality Name	
Consumer	Pin code	
Consumer	Sanctioned Load	
Consumer	Category	LTD/Domestic and Non-Commercial / Tariff LTD/ Low Income Group / Tariff LTD/ Domestic Mixed / Tariff LTC/Commercial / Tariff LTP/Motive Power / Ind. Up to 20 HP / Ind. 21 to 50 HP / Ind. above 50 HP / LTP/Ice manufacturing / LTP/Mixed (Hotel Industries) / LTAG-Agriculture / LTPL-Public lighting / LTPWW-Public water works / LT Temporary / Tariff HT-Mixed / Tariff HTI-Industrial / HT-Hotel Ind / HTAG / HTPWW / Defense / EHTI/Industrial / HT-Public water supply and sewage / LTD Govt. / LTC Govt./ Public Lighting by PWD & Tourism
Consumer	Captive Power Plant	YES / NO
Consumer	Metering	Net Metering / Pre Paid Meter / Post Paid Meter
Consumer	Supply Voltage	110KV (6 Consumer) / 33KV / 11kV / 240V / 440V
Consumer	No Of Phases	Single Phase /Three Phase
Consumer	Connection Status	PD / Live / Temporary Disconnected



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Object	Field Name	Enum Value
Consumer	Meter No	
Consumer	DT No	
Consumer	IVR No	
Consumer	CT PT No	
Consumer	Customer Location	
Consumer	Customer Annotation	
Consumer	Pole/FP/SP No	
Consumer	Feeder Name	
Consumer	Installation No	
Consumer	MRU	
Consumer	Distribution Transformer	
Consumer	Left/Right side House Customer Index No.	
Consumer	Whether Under BPL	NO / YES
Consumer	BPL Number	
Consumer	Landline no	
Consumer	Mobile No	
Consumer	Physical location of meter	INSIDE / OUTSIDE
Consumer	Height of Mounting	
Consumer	Viewing Glass	OK / BROKEN / FOGGED
Consumer	Type of Meter	ELECTRO MECHANICAL / HYBRID / STATIC / ELECTRONIC
Consumer	Make and Class	
Consumer	Seal No.	
Consumer	Seal	OK / BROKEN
Consumer	Date of Meter Installation	



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Object	Field Name	Enum Value
Consumer	Pole having multiple feeder	YES / NO
Consumer	Conductor co-relation at Nearest LT Pole (for 1 Phase Customer)	TOP / MIDDLE / BOTTOM



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Asset Numbering Methodology and Painting

For network assets (33 KV to Pole/Feeder pillar) such as pole, feeder pillar, tower, distribution transformer, ACB and Stations unique number will be given.

Those unique numbers will be maintained in system against the pre-defined assets and the same number will be painted at site on each assets.

Numbering format or logic will be generated for respective assets.

i. Pole/Feeder Pillar/Service Pillar/Meter Box Numbering Methodology

The unique asset numbering of the utility points i.e. Poles, Feeder Pillars, Service Pillars and Meter rooms is vital for consumer and network connectivity reference in field as well as in GIS system also. The numbering of these assets helps in locating all connected objects to these assets, in field.

To track the no. of poles/feeder pillars/ service pillars from where the electricity is distributed to the consumers will be uniquely numbered and same number will be painted on poles. The same will be mapped in GIS to monitor the geographical location of poles and direct the crew members for resolving the service related complaints as well as asset management.

In existing system there is no numbering concept for pole, feeder pillar, and meter rooms but as per SRS pole number to be assigned based on current electric connectivity, which is prone to change very often. So each time when network connectivity will change, the pole no of that feeder will change and repainting of pole no is required at field, which is very tedious and expensive task. So to avoid these circumstances each pole will be assigned a unique number based on their geographical location while considering Division, Sub division boundary, Voltage level and main roads.

The methodology for numbering is given below:

Pole numbering Rules

a. Pole numbering and road coding rules

Considering the thickness of the Poles used in GED, numbers will be written in three lines on pole and it will be divided by two horizontal lines.

Frist line will provide the information of voltage level as per below-



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For LT/FP/SP poles – “LT” will be written

For HT pole – “HT” will be written

For Tower – “EHT” will be written

Second line will provide the information of Division no, Sub division No and Road code as per below-

Frist two digits – Division No

Third digit – Sub Division No

Below mentioned are proposed division & sub division no for pole no assigning.

District	Town	Division		Sub Division	Proposed no. for Division and Sub-Division
		Name	Number	Number	(Frist two Digit- Division and last digit -Sub division)
North Goa	Panjim Town	Panjim	I	I	011
			I	II	012
			I	III	013
			I	IV	014
		Ponda	X	I	101
			X	II	102
	X		III	103	
	Mapusa Town	Mapusa	VI	I	061
			VI	II	062
			VI	III	063
			VI	IV	064
		Mapusa	XVII	I	171
			XVII	II	172
			XVII	III	173
		Bicholim	V	I	051
			V	II	052
V			III	053	
South Goa	Marmagao Town	Vasco	XI	I	111
			XI	II	112
			XI	III	113
		Verna	XIV	I	141
			XIV	III	143
	Margao Town	Margao	IV	I	041
			IV	II	042



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			IV	IV	044
			IV	V	045
		Curchorem	VII	I	071
			VII	II	072
			VII	III	073
			VII	IV	074
		Margao	XVI	I	161
			XVI	III	163
			XVI	IV	164

After division and Sub Division number there will be Hyphen " – " (this will work as a separator between division sub-division number and road code) and after that one/two or three digit will be the **Road Code**.

While painting and entering in system there will be no space between Division no & Sub division no.

Roads will be coded on the basis of road width 15 ft. or above and any prominent/known road. Road width with 15ft. and above or any prominent road will come under major Road and the road with width less than 15ft. will come under Minor Road. e.g., on each pole in second line, it shall be numbered as

LT011-1.... LT011-2.....LT011-**100** onwards.

Third Line will provide the information of pole no.

Wherever LT Poles/FP /SP and HVDS/HT Poles are going parallel then road code for LT Poles/FP /SP and HVDS/HT Poles remain same but numbering is done separately.

b. Numbering New Poles

Poles of the all coded road will be numbered from 1 onwards in last line e.g.

For LT Pole /FP/SP will be numbered as (mentioned in bold)

LT 011-1	,	LT 011-1	,	LT 011-1	onwards
1		2		3	

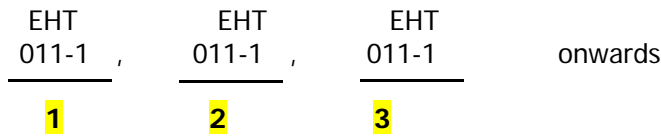
Similarly, For HVDS/HT Pole

HT 011-1	,	HT 011-1	,	HT 011-1	onwards
1		2		3	



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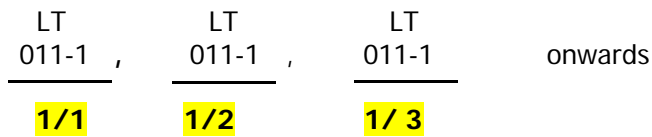
Similarly, For Towers



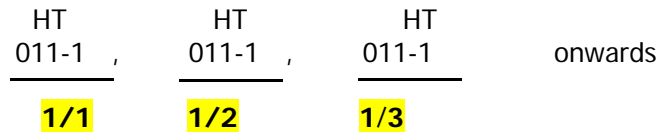
c. Coding for T-offs

Case 1: Any T-off from any pole is depicted as " / ". In electrical distribution network, T-off is a point from where another branch is taken to cater different areas. e.g.

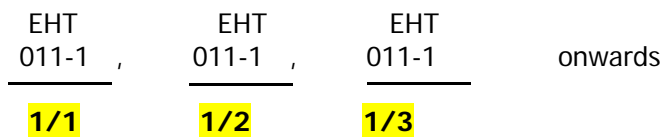
For LT Pole/FP/SP, Ist pole onwards from T-off shall be numbered as (mentioned in bold)



Similarly, For HVDS/HT Pole

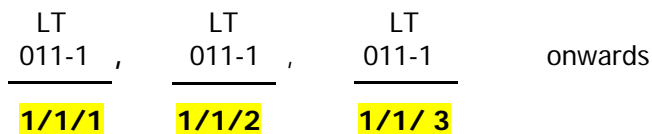


Similarly, For Towers

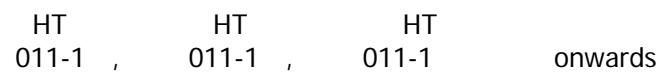


Case 2: In case two T-off from one pole are there then two different T-off will be numbered separately. e.g.

For LT Pole/FP/SP, Ist pole onwards from **1st T-off** shall be numbered as (mentioned in bold)



Similarly, For HVDS/HT Pole





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1/1/1 **1/1/2** **1/1/3**

Similarly, For Towers

<u>EHT</u> 011-1	,	<u>EHT</u> 011-1	,	<u>EHT</u> 011-1	onwards
1/1/1		1/1/2		1/1/3	

Ist Pole onwards from **2nd T-off** shall be numbered as (mentioned in bold)

<u>LT</u> 011-1	,	<u>LT</u> 011-1	,	<u>LT</u> 011-1	onwards
1/2/1		1/2/2		1/2/3	

Similarly, For HVDS/HT Pole

<u>HT</u> 011-1	,	<u>HT</u> 011-1	,	<u>HT</u> 011-1	onwards
1/2/1		1/2/2		1/2/3	

Similarly, For Towers

<u>EHT</u> 011-1	,	<u>EHT</u> 011-1	,	<u>EHT</u> 011-1	onwards
1/2/1		1/2/2		1/2/3	

d. Numbering New poles between existing Poles

In case of installation of new pole(s) between 2 existing poles then new pole shall be suffixed with Alphabet starting with "A" onwards. e.g.

For LT Pole/FP/SP, new pole is installed between pole no. 1 & 2 then new pole is numbered as (mentioned in bold)

<u>LT</u> 011-1	,	<u>LT</u> 011-1	,	<u>LT</u> 011-1	onwards
1/1		1/1A		1/2	

Similarly, For HVDS/HT Pole

<u>HT</u> 011-1	,	<u>HT</u> 011-1	,	<u>HT</u> 011-1	onwards
1/1		1/1A		1/2	



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e. Numbering extension of poles for feeding new areas

In case of extension of poles for feeding new areas, continuous numbering can be given if possible, and in case it is not possible then same is suffixed with A, B, C as per Rule no 4 or till new road code is generated as per Rule no 1.

E.g. for LT Pole/FP/SP, continuous numbering shall be (mentioned in bold)

LT 011-1	,	LT 011-1	,	LT 011-1	,	LT 011-1	,	LT 011-1
1/1		1/2		1/ 3		1/ 4		1/ 5

Similarly, For HVDS/HT Pole

HT 011-1	,	HT 011-1	,	HT 011-1	,	HT 011-1	,	HT 011-1
1/1		1/2		1/ 3		1/ 4		1/ 5

OR new road code is generated (mentioned in bold)

LT 011- 2	,	LT 011- 2	,	LT 011- 2	,	LT 011- 2	,	LT 011- 2
1/1		1/2		1/ 3		1/ 4		1/ 5

Similarly, For HVDS/HT Pole

HT 011- 2	,	HT 011- 2	,	HT 011- 2	,	HT 011- 2	,	HT 011- 2
1/1		1/2		1/ 3		1/ 4		1/ 5

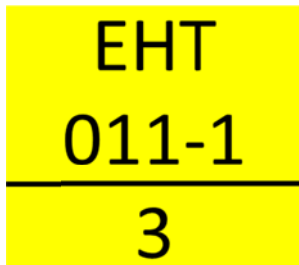
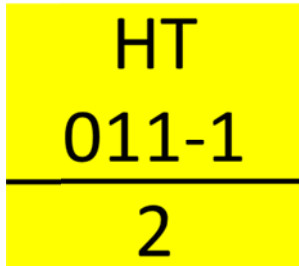
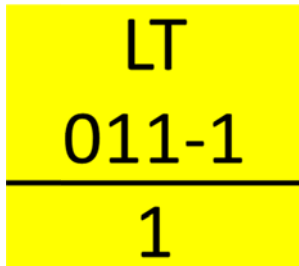
f. Pole Painting Specifications

- i. Painting shall be carried out at 5.5 ft height of poles from ground level and maintain consistency for all poles.
- ii. Pole numbers are written in two lines in terms of numerator and denominator on PCC poles or where pole width is sufficient, while on rail pole pole no shall be painted in three line.
- iii. Paint the number with Yellow background with black color number.
- iv. Number painted on poles should not be tilted, distorted and spread over etc.
- v. Number should be easily readable from minimum 20 ft. distance.



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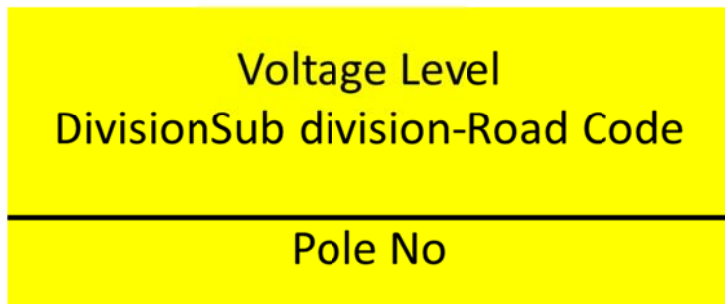
vi. Base Box shall be straight and Number shall be written with stencils with dimensions as mentioned below:



Pole Numbering Proposal

LT011-1/1
HT011-1/2
EHT011-1/3

Pole no updation in system



011 (Frist Two digit of Division no & last is subdivision no)

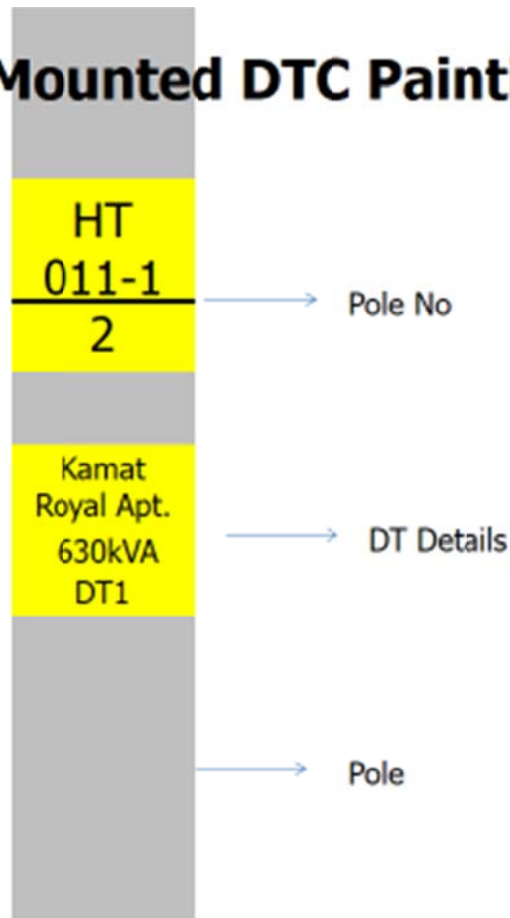
ii. Sub Station Numbering Methodology

For 33 kV & 11 kV Station

Painting on the main gate/Wall/Pole/Fencing for Plinth Mounted and Pole Mounted Stations

- Name of the substation
- Capacity of DTs OR PTs
- DT1 & DT2 OR PT1 & PT2

Pole Mounted DTC Painting Pattern



Plinth Mounted DTC Painting Pattern



33/11KV Station Painting Pattern

Kadamba Plateau 10MVA PTR 1

Painting on equipment (Transformer and Breaker)

- Manufacturer Serial No
- Manufacturer Name
- Capacity

Transformer Painting Pattern

SR45789 L&T 630KVA

Circuit Breaker Painting Pattern



SR9832 ABB 400KVA

iii. Asset Numbering Checks and validation

The primary objectives of involving Checks and Validations for Asset numbering are to ensure that all predefined assets for numbering are numbered properly with proper logic so that it meets most of the project specifications and acceptance criteria envisaged for the project. It provides the project team with a standard set of criteria to follow during the pilot and full-scale project, and ensures a minimum amount of data rework is necessary as the project evolves.

At each specific stage Checks are required, starting from number allocation to the assets till punching of attributes in system.

There are chances of mistakes during the activity. Therefore checks will be performed on the following:

- No duplicate number for any specific individual assets.
- Proper logic to be followed while assigning the numbering of assets.
- While painting the asset numbers at site proper color coding will be followed.
- While painting the asset numbers at site proper font and size will be followed.
- During entering the data in system precautions will be taken.

System generated checks will be there to find out the duplicate numbers if any.



REC Power Distribution Company Limited

ANNEXURE-C

S.No.	Name of Agencies
1.	M/s. Xplorer Consultancy Service Private Ltd
2.	M/s. Trident Techlabs Private Ltd.
3.	M/s. Riding Consulting Engineers India Private Ltd.
4.	M/s. Power Research and development consultants Pvt. ltd
5.	M/s. Last Peak Data Private Limited
6.	M/s Stesalit Limited
7.	M/s. N-Arc Consulting
8.	M/s. COORD Technologies
9.	M/s. ADCC infocad Ltd
10.	M/s. Ramtech Software Solutions Pvt. Ltd
11.	M/s. Geinfosys Technologies
12.	M/s. AKS Construction Pvt. Ltd
13.	M/s. North South GIS INDIA Private Limited
14.	M/s. NK Enterprises