**Scope and Technical Specification**

**For**

Empanelment of Survey Agency on Rate Contract Basis for survey work using Modern Survey Techniques for route alignment of transmission line, identification of substation sites and preparation of report for transmission scheme allocated by National Committee on Transmission (NCT) which shall be used in selection of developer as Transmission Service Provider through Tariff Based Competitive Bidding process or any other survey work of transmission lines/ Sub-Stations

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1. **General Information & Scope of Work**
   1. The technical specification covers survey using modern survey techniques for route alignment of transmission line, identification of substation sites and preparation of report for the transmission scheme “[*Name of TBCB Scheme to be inserted*]” comprising the following:

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **Name of Transmission Element** | **Capacity/km** |
|  | *Transmission Lines* |  |
|  | *Sub-stations* |  |
|  | *Switching-stations* |  |
|  | *HVDC links including terminal stations* |  |
|  | *HVDC transmission line* |  |

*[Table to be filled with details as applicable and as per gazette notification.]*

The above scheme, to be implemented through Tariff Based Competitive Bidding (TBCB) route, has been allocated by National Committee on Transmission to CTUIL, henceforth referred to as employer, for carrying out survey works. The employer would get the survey works done through an identified agency, henceforth referred to as ‘Contractor’, selected through bidding process.

The scope of work inter-alia shall include the following: -

1. Route Alignment in KMZ/KML file on Bhuvan (Indian Geo-Platform of ISRO) / Google imagery and Survey of India topographical maps (both in hard & soft copies) to the extent required, inter-alia including:
   * 1. Identification of three alternative route alignments & selection of one optimized route alignment in consultation with the Employer i.e CTUIL. The output (both in hard & soft copies) shall be in the form of final route alignment in KML/KMZ file and pdf / digitized topographical map (i.e digitized topo sheets of Survey of India) with latest details/features including but not limited to forest, revenue area, protected area, wildlife infringement, Animal/Bird sanctuary, infringement of endangered species habitats, Great Indian Bustard (GIB) area, civil and defense Airports, all rivers, sea, coal, mineral areas, mining areas, oil pipe line/underground inflammable pipe lines, railway lines, canals, roads, defense setup etc. upto 8 kms on both sides of selected route alignment.
     2. Walk-over Survey of the route alignment (to be finalized in consultation with the Employer).
     3. Preparation of Survey Report including identification and explanation of route constraints like Forest, revenue area, protected area, wildlife infringement, Animal/Bird sanctuary, infringement of endangered species habitats, GIB area, vicinity to civil and defense Airports, major river/sea crossings & coal, mineral mining areas, oil pipe line/underground inflammable pipe lines, railway lines, canals, roads, defense setup etc., infrastructure details available enroute, various clearances required in the final route alignment, possible RoW constraint areas etc.
2. Preparation of Survey Report incorporating the details as per Annexure-A.
3. Initiation of any forest clearance based on survey of final route alignment with the concerned Authorities.
4. Estimation of the land area required for the substations considering the present & future scope of the substations specified at Clause 1.1 above including provision of staff quarter. Preparation of Single Line Diagram for assessment of land requirement including identification of three alternative of sites alongwith selection of one optimized site for the substation in consultation with Employer as detailed in Clause 4.0 hereinafter.
5. Preparation of alternative site identification Report & selection of one optimized site incorporating the details as per Annexure-A
   1. The quantities indicated in the scope of work are provisional. The final quantities for route alignment & survey (quantities in “kms” unit) shall be the route length along the optimized route alignment. The route alignment shall be carried out by the ‘Contractor’, as per the technical specifications stipulated herein.
   2. The Contractor must note that the Employer shall not be responsible for loss or damage to properties, trees etc. due to contractor’s work during survey. The Contractor shall indemnify the Employer for any loss or damage to properties, trees etc. during the survey work.
   3. The Contractor should note that Employer will not furnish any software or topographical maps prepared by Survey of India, but may assist in obtaining these by providing letters of recommendations, if required, to concerned authorities. Contractor shall have to use original licensed version of the software (not the beta version). Contractor shall give along with their bid, the confirmation/comments/observation in respect of all clauses of technical specification.
   4. The work shall be carried out by the contractor using modern surveying techniques. The contractor shall indicate in his offer, the detailed description of the procedure to be deployed. The details of the equipment & facilities including softwares for image processing, etc. available with the Contractor or his associates shall also be furnished with the bid.
   5. It shall be the responsibility of the Contractor to obtain required permissions from various authorities/agencies (if required) for carrying out survey work. Employer will facilitate by way of issuing authorization letter to the Contractor.
   6. Any other activity not specifically mentioned in this specification but required for successful completion of the scope of work shall be deemed included in the scope of the Contractor, without any cost implication to the Employer.
   7. **Location Details**
   8. The Contractor may visit the site to acquaint with the terrain etc. For this purpose or for any other clarifications, they may contact the Employer at the following address:

*[ Address to be inserted]*

1. **Route Alignment of Transmission Line**
   1. Route Alignment shall be done using Bhuvan/ Google imagery and Survey of India topographical maps (scale 1:50,000). In case the required Survey of India maps are available in digitized form, the same shall be procured and used by the contractor. The contractor shall identify & examine three alternative route alignments and suggest to the Employer the optimal route alignment between the terminal points.
   2. **Requirement of Transmission Line Routing**
      1. The alignment of the transmission line shall be most economical from the point of view of construction (ie: supply, erection and commissioning) and maintenance.
      2. The line routing should avoid large habitations, densely populated areas, scheduled areas, forest/national park/wildlife infringement/GIB/Animal/Bird sanctuary, infringement of endangered species habitat, vicinity to civil and defense Airports, major river/sea crossings & coal/ mineral mining areas, oil pipe line/underground pipe line/land slide prone areas, firing range, coastal regulation zones, inflammable pipe lines etc. to the extent possible. In case it is not possible to avoid the forests or areas having large trees completely, then keeping in view the overall economy, the route should be aligned in such a way that cutting of trees is minimum.
      3. Routing of transmission lines shall be done in accordance with CEA (Technical Standards for Construction of Electrical Plants and Electric lines) Regulations 2010 and subsequent amendments, and relevant IS codes.
      4. The route should have minimum crossings of Major river, Railway lines, National/State highways, overhead EHV power line and communication lines.
      5. The number of angle points shall be kept to a minimum.
      6. The distance between the terminal points specified shall be kept shortest possible, consistent with the terrain that is encountered.
      7. Creeks, Marshy and low lying areas, river beds and earth slip zones shall be avoided to minimize risk to the foundations.
      8. It would be preferable to utilize level ground for the alignment.
      9. Crossing of power lines shall be minimum. Alignment will be kept at a suitable distance from power lines to avoid induction problems on the lower voltage lines.
      10. Crossing of communication line shall be minimized and it shall be preferably at right angle. Proximity and parallel route with telecom lines shall be avoided to eliminate effect of induction in the telecom lines.
      11. Areas subjected to flooding such as Nalah shall be avoided
      12. Restricted areas such as civil and military airfield and shooting ranges shall be avoided. Care shall also be taken to avoid aircraft landing approaches.
      13. All alignment should be easily accessible both in dry and rainy seasons to enable maintenance throughout the year.
      14. Certain areas such as quarry sites, tea, tobacco and saffron fields and rich plantations, gardens & nurseries which would cause problems in acquisition of right of way and construction and maintenance activities, should be avoided.
      15. Angle points should be selected such that shifting of the point within 100 m radius shall be possible at the time of construction of the line.
      16. The areas requiring special foundations and those prone to flooding should be avoided.
      17. For examination of the alternatives & identification of the most appropriate route, besides making use of information/data/details available/extracted through Survey of India Topographical maps, the contractor shall also carryout reconnaissance/ preliminary survey for verification & collection of additional information /data /details.
      18. The contractor shall propose no. of pile/special foundations if required, for crossing of major river spans/large waterbodies/creek area and such crossings should be preferably through the narrowest width of the river/waterbody. The contractor shall propose any type of pile or special foundation required during routing of the line.
      19. The contractor shall submit his preliminary observations & suggestions along with various information/data /details collected and also processed satellite imagery data, scanned topographical map data marked with the alternative routes etc. The final evaluation of the alternative routes shall be conducted by the contractor in consultation with Employer’s representatives and optimal route alignment shall be proposed by the contractor. Site visit and field verification shall be conducted by the contractor for the proposed route alignment.
      20. The route of the transmission line shall be recorded using GPS/DGPS of positional accuracy less than 3m. The co-ordinates of all the angle points as well as other important crossings, landmarks etc. shall be recorded using GPS instrument. The details such as legends, project description, direction marker etc shall be with white background.
      21. Wind Zone map of NBC-2016 and amendment thereof and if data available, from local metrological department is to be referred for identifying wind zone of the terrain through which the line traverses. Wind zone of every section (between consecutive angle points) of the line is to be indicated in the final report. Further, for transmission line sections passing within a distance of 50 km from the boundary of two wind zones (indicated in NBC map), higher of the two wind zones shall be considered for such sections.
2. **Tower Scheduling**

The tower schedule shall include details of all the towers of the transmission line.

* 1. The following shall be borne in mind:

1. **Span**

The maximum length of a section shall not exceed 15 spans or 5 Km in plain terrain and 10 spans or 3 km in hilly terrain. Further, in case of line traversing through cyclone prone area i.e areas upto 60 km from coast, the maximum length of a section shall not exceed 10 spans or 3 km, in order to reduce the failure of such towers in coastal areas due to cascading effect. A section point shall comprise of tension point with DB/B type or DC/C type or DD/D type towers as applicable. The normal span shall be considered as 350 m for 220 kV, 400 m for 400 kV lines and 400m for 765 kV lines. Right of Way shall be as per statutory guidelines.

1. **Railway Crossings**

All the railway crossings enroute the transmission line shall be identified by the Contractor. The crossings shall be supported on DD/D type towers on either side. The crossing span will be limited to 300 meters. The crossing shall normally be at right angle to the railway track. No crossing shall be located over a booster transformer, traction switching station, traction sub-station, Overlap Section or a track cabin location in an electrified area. Clearance between the overhead line and railway track shall be in accordance with the Regulations for Power Line Crossings of Railway Tracks laid down by the Railway Authorities.

1. **Sea/River/canal/lake/Crossings**

Suitable type of suspension/tension tower shall be used for crossings. Navigable or non-navigable river is to be identified. For non-navigable river, clearance shall be reckoned with respect to highest flood level (HFL). HFL and distance of the nearest recorded HFL point from the river crossing to be provided. Span and name of the river to be provided. For lake, reservoir, canal, & large water body crossing, crossing span to be provided alongwith Full Reservoir Level (FRL) wherever applicable. For line passing/crossing through sea, High tide level (HTL) to be provided.

1. **Power line Crossings**

For power line crossing following points shall also be applicable: -

1. For power line crossing of 400kV or above voltage level, large angle & dead end towers (i.e. D/DD/QD) shall be used on either side of power line crossing.
2. For power line crossing of 132kV and 220kV (or 230kV) voltage level, angle towers (B/C/D/DB/DC/DD/QB/QC/QD) shall be used on either side of power line crossing depending upon the merit of the prevailing site condition and line deviation requirement.
3. For power line crossing of 66kV and below voltage level, suspension/tension towers shall be provided on either side of power line crossing depending upon the merit of the prevailing site condition and line deviation requirement.
4. **Telecommunication Line Crossings**

The angle of crossing shall be as near to 90 degree as possible. However, deviation to the extent of 30 degree may be permitted under exceptionally difficult situations.

1. **Crossing of wildlife/ eco sensitive zones**
2. During the survey work of transmission lines (upto 400 kV level) which are passing through wildlife/ eco sensitive zones, the possibility of stringing the transmission line on available transmission corridor (i.e. vacant circuits) of existing multi circuit transmission lines, if any, traversing through the same wildlife/eco sensitive zone shall be explored by the surveyor and the coordinates of these existing transmission line towers shall be provided in the report. The details of route considering these multi circuit transmission towers for the wildlife/eco sensitive area shall be included as an alternative in the survey report.
3. For the transmission lines upto 400 kV level which are passing through wildlife/ eco sensitive zones, the survey work for towers located in such sections shall be done considering Multicircuit (4 circuits) configuration of same voltage level. The top cross arms of these multi-circuit towers shall be used for stringing initially & the balance cross arms shall be made available for stringing of any future transmission line (inter-state or intra-state) passing through the same wildlife/ eco sensitive zone.
4. **Crossing of Petroleum/Gas lines**
5. No tower footing/structure of an overhead line of voltage 33 kV or above/HVDC shall be closer than 25 meters from the edge of the Right of Way (ROW) of a Petroleum/National Gas Pipeline.
6. Wherever overhead line of voltage 33 kV or above/HVDC shall intend to cross the Right of Way (RoW) of Petroleum/natural Gas Pipeline, the angle of crossing of overhead line with respect to the pipelines shall preferably be right angles, but the crossing angle shall not be less than 75 degrees in any case.
   1. **Clearance from Ground, Building, Trees etc.**

Clearance from ground, buildings, trees and telephone lines shall be provided in conformity with the CEA (Measures relating to Safety and Electric Supply) Regulations, 2010, as amended.

The contractor shall also intimate the Employer, his assessment about the likely no. of trees required to be cut during execution stage. This assessment shall be done considering prevailing practices/ guidelines, local regulation and other enquiries from local authorities.

* 1. **Survey Report**
     1. Each angle point location with angle of deviation, elevation above MSL shall be shown with detailed sketches showing existing close-by permanent land marks such as specific tree(s), cattle shed, homes, tube wells, temples, electric pole/tower, telephone pole, canal, roads, railway lines etc. The relative distance of land marks from the angle points and their bearings shall be indicated in the sketch. These details shall be included in the survey report in tabular format alongwith sketches.
     2. Information w.r.t. infrastructure details available enroute, identification and explanation of route constraints, etc shall also be furnished in the Survey report.
     3. All observations which the Contractor thinks would be useful to the construction of the transmission lines mentioned under scope of work are to be reported.
     4. Some portions of the line may require clearance from various authorities. The Contractor shall indicate the portion of the line that requires clearance and the name of concerned organizations such as local bodies, municipalities, P&T (name of circle), Inland navigation, Irrigation Department, Electricity Boards and Zonal railways, Divisional Forest Authorities, Civil & defense airports, sea ports, defense areas etc. from whom the clearance is required.
     5. The Transmission Line may encounter snowbound areas and may also pass through elevations of above 1000 m above mean sea level (MSL). Contractor shall provide details of minimum & maximum elevations above mean sea level of the route alignment. The line sections which may be affected in snowbound areas to be indicated in the report.

1. **Sub Stations**
   1. The contractor shall estimate and verify the requirement of land for the present & future scope of the substations mentioned at clause 1.1, including provision of staff quarters and for this purpose. The contractor shall prepare a Single Line Diagram for the Sub-station in order to assess the requirement of land in consultation with the Employer. The contractor shall identify a minimum of three sites of adequate size for sub-station. The optimum location of sub-station shall be finalized in consultation with the Employer. The Contractor shall estimate the cost of the proposed site keeping in view the area required (including provision of staff quarters) and the prevalent rate/acre for various types of land, which shall also be separately indicated. The details as per Annexure-A shall be furnished for each of the proposed alternative sites of the sub-station. Contractor shall provide details of elevations above mean sea level of the all three alternative sites of the Substation. GPS co-ordinates of the corners of the substation sites shall also be included in the report.
   2. **Selection of Substation site criteria:**
      1. Preferably fairly levelled land and nearness to motorable road.
      2. Away from vicinity of rivers, sea coast, creeks, marshy lands and area of subsidence.
      3. HFL of the nearest river or FRL of the nearest dam/reservoir to be provided and distance from such water body to be indicated.
      4. Avoiding forest land, scheduled areas, vicinity to airports, any land belonging to authorities like railways, highways, mining, oil, defense, educational institutions, religious institutions, hospital , etc.
      5. Area subjected to flooding and higher water accumulation should be avoided.
      6. Indicative level (Altitude above MSL) of the site and nearest motorable road to be indicated.
      7. Size of the land for the proposed site shall preferably be rectangular and shall preferably have at least three side open for line corridors.
      8. Area with religious structures such as graveyard, temple, mosque etc. should be avoided
      9. Approach road to the site shall be suitable for transportation of the heaviest equipment of the sub-station i.e. Transformer, Reactor etc. Requirement of strengthening of bridges/culverts, if required, needs to be indicated in the Report.
2. **Statutory Regulations and Standards**
   1. **Statutory Regulations**

The Contractor is required to follow local statutory regulations stipulated in Electricity Act 2003, CEA (Measures relating to Safety and Electricity Supply) Regulations 2010, CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2010, Railway Regulations, Defence /Civil aviation guidelines, MoEF guidelines, Inland Water Authority of India/CWC Regulations etc. as amended from time to time and other applicable local rules and regulations.

1. **Completion Period for Survey using Modern Survey Techniques and preparation of report**
   1. Submission of alternate route alignments for transmission line, finalization of optimized route alignments of Transmission Line in consultation with the Employer, walk over survey of optimized route, identification of three alternatives for sub-station land and selection of one optimized site, submission of draft report, Final report (duly incorporating comments/suggestions of Employer within 7 days, after receiving comments, suggestions) etc. shall be completed within 2 months from the date of LOA.The major milestone activities for the packages shall be as under:

|  |  |
| --- | --- |
| Submission of draft Report to CTUIL | Within 45 Days from date of LOA. |
| Comments/suggestions by CTUILon draft report | Within 8 days of submission of draft Report |
| Submission of Final Report along with all deliverables | Within 7 days  (Total completion period of 2 months). |

* 1. The Contractor’s scope of work shall also include assisting Employer in initiating the process of acquisition of Land (if applicable) and forest clearance (if optimized route is passing through forest land) with concerned authorities.

All the above activities shall be carried out by the contractor till issuance of LoI and signing of all agreements with the Transmission Service Provider (TSP). The report along with all the relevant documents associated with the project shall be handed over to the TSP on as-is-where-is basis, so that TSP may take further action to obtain consents, clearances and permits.

* 1. The Contractor shall be required to attend the meetings/conference with the prospective TSPs or any other agency as intimated by Employer to clarify the issues relating to Survey during the Bidding Process of the transmission scheme.

1. **Deliverables:**

**All the deliverables, as mentioned in this clause and Technical Specifications shall be submitted.**

* 1. The Contractor will submit progress report for all the works/ studies/ survey, every fortnight as per the format mutually agreed upon.
  2. The Contractor will submit three (3) copies of the draft report with requisite plans & drawings in English language. The Contractor is also required to submit geotagged detailing of photographs of each Angle point (AP). The tower schedule shall include details of all the towers alongwith the transmission route.
  3. The Contractor will submit five (05) copies of Final Report (high quality printout) with requisite plans & drawings in English language. The Final Report should be submitted within 7 days after comments of Employer on draft Report. The final report and drawings (both hard copy as well as soft copy) shall also include the GPS coordinates of selected points of the final route as per specifications.
  4. Soft copy shall also be submitted for the Report along with drawings.
  5. All raw data for all the studies/ reports/ surveys shall also be submitted.
  6. All reports shall be submitted in A4 size sheets with font size 12, properly bound and printed using good quality paper & material. Map/sketch shall be provided in appropriate size sheets.
  7. Any other deliverable as per scope of work defined in Technical specifications.

Annexure - A

Content of Work for Report

| **Description** |
| --- |
| 1. Project Highlight 2. Brief Background 3. Scope of Work 4. Complete project profile of the project giving technical parameters of the Transmission System & equipment. 5. Metrological data like temperature, humidity, rainfall, type of terrain, max. altitude, snow zone, wind zone, &pressure. 6. **DETAILS RELATED TO TRANSMISSION LINE**   Survey Report covering the scope of work detailed in the specification with all maps & other enclosures including details of the following enroute the transmission line   * 1. Places of Archaeological importance, river (navigable or non-navigable), lakes, reservoir, canal, large waterbody, streams, Estuary, sea, hills/ mountains, coal, mineral mining areas, shooting ranges/firing range, coastal regulation zones, oil pipe line/underground inflammable pipe lines etc.   2. Places of Historical, Cultural, Religious or Tourist importance   3. Defense installation/ vicinity to civil and Airports/Seaports/ shooting ranges/firing ranges   4. Railway /Highway Crossings   5. Power Line / Telecom Line Crossings   6. Land Availability (if required for acquisition)      1. Extent of land available      2. Land use pattern (agricultural, barren, forest etc.)      3. Land ownership (Govt. Pvt., tribal, non-tribal etc.)   7. Environmental and social aspect  1. Forest Involvement (revenue, protected etc.) / Clearance 2. Social Issue / R&R Measure 3. wildlife infringement 4. Animal/Bird sanctuary 5. infringement of endangered species habitat 6. national park 7. GIB area (Priority/Potential area)    1. Creeks, Marshy and low-lying areas    2. No. of pile/special foundations    3. Angle point location with angle of deviation, GPS coordinates, section length, cumulative length, crossing details, elevation above MSL, wind zone, snow zone    4. Circle rate of land, cost of Crop & Tree compensation    5. Pollution level, section wise as per available pollution map    6. Any other details relevant to the route. |

1. **Information Required for Substation Sites**

| **Sl.**  **No.** | **Criterion** | **Site-I** | **Site-II** | **Site-III** | **Remarks** |
| --- | --- | --- | --- | --- | --- |
| 1.0 | Land Co-ordinates |  |  |  |  |
| a) | Corner 1 |  |  |  |  |
| b) | Corner 2 |  |  |  |  |
| c) | Corner 3 |  |  |  |  |
| d) | Corner 4 |  |  |  |  |
| e) | ------------ |  |  |  |  |
| 1.1 | Size (Acre) (Mtr x Mtr) |  |  |  |  |
| 1.2 | Govt. /Private/Forest land |  |  |  |  |
| 1.3 | Agriculture/Waste land |  |  |  |  |
| 1.4 | Development |  |  |  |  |
| 1.5 | Approximate cost |  |  |  |  |
| a. Circle rate per acre |  |  |  |  |
| b. Market rate per acre |  |  |  |  |
| c. Approx. cost of the land |  |  |  |  |
| 1.6 | Type of soil |  |  |  |  |
| 1.7 | No. of Owners |  |  |  |  |
| 1.8 | Environment/Pollution in the vicinity |  |  |  |  |
| 1.9 | Location with reference to nearest town |  |  |  |  |
| 1.10 | H.F.L. Data |  |  |  |  |
| 1.11 | Diversion of Nallah/Canal required |  |  |  |  |
| 1.12 | Slope |  |  |  |  |
| 1.13 | Approximate Extent of leveling required (in meter) |  |  |  |  |
| 1.14 | Land acquisition feasibility |  |  |  |  |
| 1.15 | Rate of Govt. Land |  |  |  |  |
| 1.16 | No. of Owners |  |  |  |  |
| 1.17 | Extent of approach |  |  |  |  |
| 1.18 | Planned/unplanned development |  |  |  |  |
| 1.19 | Size of sites (m x m) |  |  |  |  |
| 1.20 | No. of families to be displaced |  |  |  |  |
| 1.21 | Level of site with reference to road level |  |  |  |  |
| a. Level of road |  |  |  |  |
| b. Level of site |  |  |  |  |
| 1.22 | Distance from sea shore |  |  |  |  |
| 1.23 | Approach |  |  |  |  |
| 2.0 | Obstacles in reaching site |  |  |  |  |
| 2.1 | Nearby main road |  |  |  |  |
| 2.2 | Length of approach road to be constructed |  |  |  |  |
| 2.3 | Name of nearest airport |  |  |  |  |
| 2.4 | Name of nearest Rail head |  |  |  |  |
| 2.5 | Availability of ground water |  |  |  |  |
| 2.6 | Availability of transmission corridor (Three /four sides) |  |  |  |  |
| 2.7 | Existence of structures/dwelling units in the land of the proposed site |  |  |  |  |
| 2.8 | Availability of disposal of rain/storm water |  |  |  |  |
| 2.9 | Crops grown and types (Multi-crop/single crop) |  |  |  |  |
| 2.10 | Distance from main road |  |  |  |  |
| 2.11 | Nearest railway station (BG/MG) |  |  |  |  |
| 2.12 | Unloading facility at railway station |  |  |  |  |
| 2.13 | No. of Culverts required for approach |  |  |  |  |
| 2.14 | Nearest EHV line |  |  |  |  |
| 2.15 | Length of line between this site & nearest substation for construction power at 33/11kV |  |  |  |  |
| 2.16 | Frontage for line take off |  |  |  |  |
| 2.17 | Telephone/Telegraph line |  |  |  |  |
| 3.0 | Community Facilities |  |  |  |  |
| 3.1 | Drinking Water |  |  |  |  |
| 3.2 | Drainage |  |  |  |  |
| 3.3 | Distance from   1. Post Office 2. Telephone 3. School 4. Market |  |  |  |  |
| 3.4 | Security |  |  |  |  |
| 3.5 | Availability of construction water |  |  |  |  |
| 3.6 | Availability of drinking water |  |  |  |  |
| 4.0 | Seismic zones |  |  |  |  |
| 5.0 | Others |  |  |  |  |
| 6.0 | Recommended Site |  | | | | |