

TECHNICAL SPECIFICATION

Item No.1

Carrying out ROW Validation with respect to Village Map or JM Sheet & Also Collection of All Map and Existing Field DGPS UTM Co-ordinate Superimpose. Preparation of Final DGPS UTM Co-ordinate.

1.1 The Contractor shall be responsible for Collection of Village Map& JM Sheet from concerned DILR office.

Tracing and scanning:

The village maps procured from Land Records Department (LRD) for each tahsil are traced wherever required before scanning in case it is torn, mutilated or not legible.

The maps are then scanned with the following specifications:

- Maps are scanned at 200 dpi Black/White mode.
- The image are stored in Tiff format *.TIF
- The image orientation is upright.
- The image file is cleaned and de-speckled to remove noise.
- Feature legibility at 1X (Zoom factor) is good.
- Measured length and width within the bounding box is $\pm 0.1\%$ of the map manuscript measurements.

1.2 The Contractor shall be responsible for Digitization of Village Map& JM Sheet. Digitization of land parcels & map features should be carried out from the ortho-image on 'Mirror Principle'.

Vectorisation / Digitisation:

The village maps scanned in image format are digitized using heads-up digitisation in CAD environment using Auto CAD. A standard template is used to have uniformity in layers, line type, colors etc., for digitisation of the village maps.

The default setting in Auto CAD for all the layers is done. The default settings assume that scanning/paper coordinates are in centimeters. If the scanning / paper coordinates are in some other units then the symbols, fonts, etc., are proportionately scaled. The symbols, standard legend and logo block for use in the digitisation process are created as symbol libraries and are available both as insert able blocks within the template drawing and also as separate drawings in the "blocks" directory created for the purpose. All digitisation has been done using standard template designed at MRSAC. All the features have been captured on the respective layers as per the template. After completion of digitisation, symbols have been inserted as per their location on village maps. Text is then inserted for Parcel / Khasara nos. using 'English font'.

1.3 The Contractor shall be responsible for Collection of DGPS Co-ordinate of Village Survey Number (Land Parcel) and Geo Reference on Village Map& JM Sheet After Finalized Right of way Co-ordinate with **Minimum accuracy (± 0.150)** of the All alignment Right of way Co-ordinate at 50 Mt.

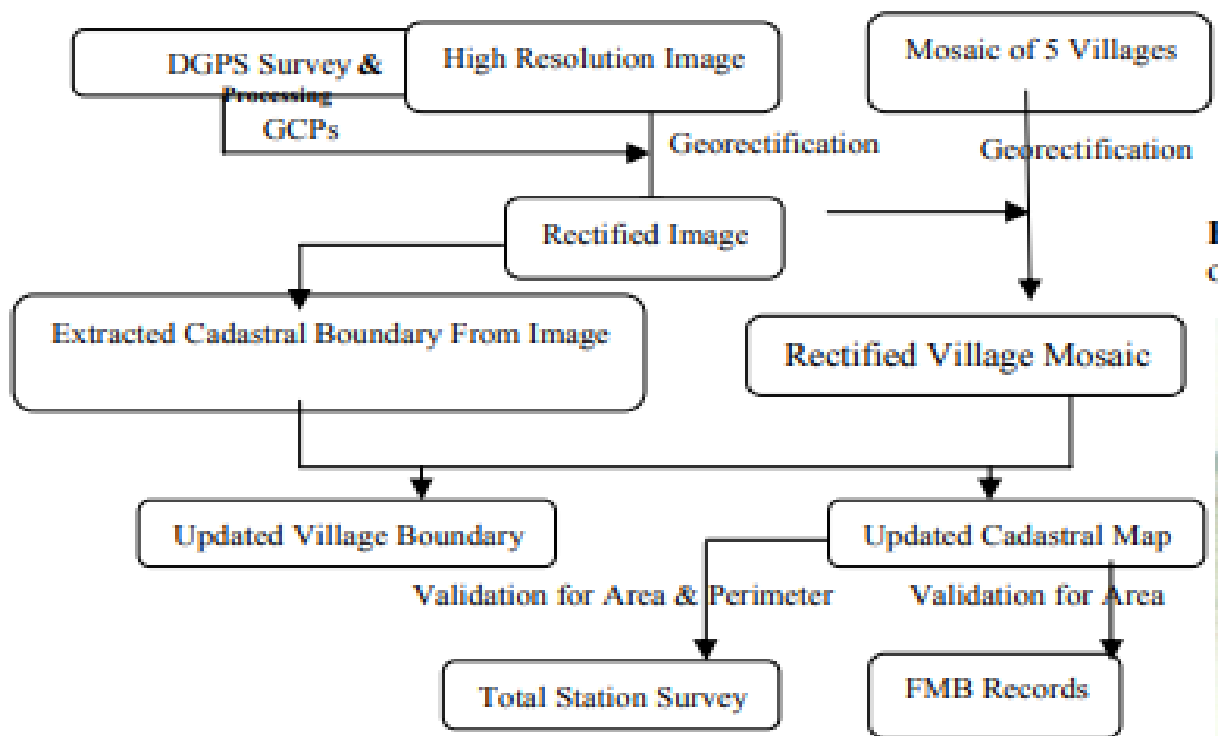
Geo-referencing:

Common points are identified on the Village Map and scanned map where the TICs/GCPs are to be located. The village map is geo-referenced to the image using sufficient number of GCPs. The coverage is transformed into the new co-ordinate system, and the projection parameters added to the transformed coverage so as to make it compatible with other spatial database.

1.4 General Requirements:

- The (X, Y) co-ordinates shall be recorded both in Lat-Long and UTM with reference to WGS 84 datum. Pure Ground Survey Method using ETS and DGPS
- Specifications of the instruments used for GCP surveys shall be recorded.
- DGPS/ ETS equipment shall be calibrated prior to survey with respect to established base lines.
- A sketch for each category of the Control Points shall be prepared, showing the location of the Control Points along with their description for easy identification.
- A Village Map or JM Sheet showing all the Control Points along with their Co-ordinates shall be maintained by State Land Records and Survey authorities.
- Survey Method using High accuracy with Differential GPS and/or ETS survey.
- Identification of Parcels at Village Boundary : The Revenue Field Officer(s) concerned shall identify the plots occurring at the village boundary. In case of ambiguity, boundary confirmation shall be made by Revenue Field Officer(s) with the help of village elders and concerned land owners.

The major steps involved in the present study are shown in the **Figure 1.**



Mode of Measurement: -

Payment shall be made on basis of Per Km. of Work done only (Including Co-Ordinate) The Payment of work done per one Km. must be paid and adjusted plus(+) or Minus(-) according to final measurement of Approval, award, land to be transferred and payments of compensation.

The payment shall be made at the rate of 75% for the completed Item, remaining 25% payment will be released after final submission of JM Sheet & Co-ordinate (As per Engineer-in-charge), and Plans (As Engineer-in-charge)

Item No.2:-

Staking out ROW with respect to JM Sheet, Finalization of DGPS UTM Co-ordinate for using DGPS Instruments. Providing and Fixing TBM Stone (Size 230 mm x 230 mm x 1000mm) of ROW at Every 1 Km and Indicator Stone (Size 150 mm x150 mm x450 mm) of ROW at Every 50 Mt Both Stone Painted red on top as per Point Marking and Final DGPS UTM Co-ordinate.

The Contractor shall be responsible for Finalized Row Co-ordinate and Staking out With Respect to DGPS Instrument of Demarcation.

- 1.1 The Contractor shall be responsible for maintaining the accuracy (± 0.040) of the alignment, positions, levels and dimensions of the work in accordance with the drawings, directions or instructions given to him from time to time and every facility shall be given to the Engineer/Irrigation and or his Representative for checking of the same. The Contractor at his own cost shall rectify any error in the dimensions, alignment positions or levels of work set out or constructed by him, to the satisfaction of the Engineer/Irrigation or his Representative, whenever it come to notice before or during the execution.
- 1.2 The work shall be set out by the contractor to the satisfaction of the Engineer/ Irrigation or his representative but his approval thereto shall not, nor shall his joining with the Contractor in setting out the work, relieve the Contractor from his entire and sole responsibility thereof.
- 1.3 The Contractor shall also provide, fix and be responsible for the maintenance of all stakes, templates, profiles, levels, marks, points etc. and must take all necessary precaution to prevent these being removed, altered or disturbed and will be held responsible for the consequence of such removal, alterations or disturbances should the same take place and for their efficient reinstatement.

The Reference points like DGPS, TBM and Travers points should be so located that these will be on ground and location by coordinates of the reference points supplied by Consultants. If Travers points are not available on ground should be reproduction on the ground (Re Traversing).

A closed traversing in loop has to be completed prior to ROW marking. A closed loop traverse will be run from point to point. Maximum length of each loop shall not be more than 5km. While traversing, stations will be established 200 to 250m apart. These points would be further used for Centerline marking. The traversing survey measurement shall be two rounds of angle measurements to be taken on both left and right face in both clockwise and anticlockwise directions. The angle spread between observed round shall not be more than 5 seconds. The minimum accuracy of this survey will be 1:10000. as per Scope of Services mentioned in Terms of

Reference(including bypass and Realignment locations)

Staking out survey shall be done with a total station. Staking out survey for Row will be marked on the ground at every-50 m intervals in straight portion and 20 m interval in curve portion. In bypass location Pegs to be installed as per Scope of Services mentioned in Terms of Reference (including bypass and Realignment locations) also Coordination with Revenue Surveyor during LA Site Verification. The ROW of the road, as determined in the design office, is translated on the ground by means of continuous transit survey and staking of the center line as the survey proceeds. Double reversal method should be adopted at all horizontal intersection points (HIP) and intermediate points of transit (POT) on long tangents. The HIPs should be fixed on hubs driven flush with the ground and suitably referenced so that they may be readily located. Usually, these should be serially numbered for easy identification and will be defined by coordinates. On long tangents, the intermediate transit points (POTs) should also be fixed on hubs in the case of new roads, and by means of spikes or nails driven into the pavement in the case of existing road with proper referencing. The reference points should be so located that these will not be disturbed during construction. Description and location by coordinate of the reference points should be noted for reproduction on the final drawings. All the curve points, namely the beginning of spiral transition curve (BS), beginning of circular curve (BC), end of circular curve (EC) and the end of spiral transition (ES) should be fixed and referenced in the same manner as for POTs described earlier. (For the procedure of setting curves, reference may be made to IRC:38"Design Tables of Horizontal Curves for Highways)". The final centerline of the road should be suitably staked. Stakes should be fixed at 50 meter intervals in plain and rolling terrain, and 20 meter intervals in hilly terrain. The stakes are intended only for short period for taking levels of the ground along the Row with reference thereto. In the case of existing roads, paint marks with button headed steer nails may be used instead of stakes. Distance measurement along the final Row should be continuous following the horizontal curves where these occur. The traverse in case of road alignment would be open and should be controlled by establishing control points to be established by sophisticated GPS or by astronomical observations or by running cut-off liens between intermediate stations.

- 1.4 Providing and Fixing Indicator Stone of ROW at Every 50 mt. (Size 150 mm x150 mm x450 mm) and TBM Stone (Size 230 mm x 230 mm x 1000mm) of ROW at Every 50 Mt Both Stone Painted red on top as per Point Marking and Final DGPS UTM Co-ordinate.

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