

STANDARD OPERATING PROCEDURE

1. Purpose and Scope

The SOP provides the technical procedure that will be employed to conduct NC village survey of Assam during the field season 2021-2022. All together 672 NC villages comprising of 1750 Square Kilometer (Appox.) spread across 61 Circles of 22 districts of Assam are to be surveyed. The survey will be conducted for preparation of polygon of NC villages of Assam. The information provided in the SOP is generally applicable for all 22 districts of Assam.

2. Survey Procedure

Survey for preparing the polygon (basic Control framework) of the NC villages will be carried out by using DGPS. In this process surveyor will select the pillar position on the ground for GPS observation. Ideally the reference station will be placed at the Centre of the village for providing other control points along the approximate boundary as identified and erected pillar location. One GPS receiver (Reference) will be placed at the central location and other receiver (Rover) will be placed at the selected control station along the boundary of the village. The processed coordinates from the observed data will be used to prepare polygon of the village and handed over to the district administration for further cadastral survey.

A. Equipment/Materials to be provided at State Level

- a) A pair of DGPS set with all accessories required for observation.
- b) 1 Vehicle for each survey team for smooth conveyance.
- c) 1 laptop for data processing.
- d) COVID protective gear.

3. Capacity Building and Workshop

Training schedule and workshop for capacity building of the surveyors, LR staff and Circle Officers is scheduled from 25/08/21 onwards in view of ensuing proposed field survey operation in NC villages of Assam. The training programme aims to augment the capacity building and to galvanise the members of survey teams

4. Survey Pillar:

Two types of survey pillars will be embedded on the ground as identified by surveyor. Square shape pillar (6"x6"x5") and Tri shape pillar of size (6"x6"x5") with T-base to be used during field survey operation of NC village survey. There will be embossing on each face of the pillars as "Assam Survey/2021-22" at 1.25 ft and 3.75 ft. Pillars will be constructed as per estimate provided by PWD.

5. Responsibility

A. Role of Director of Land Records and Surveys, Assam:

- a) To issue guidelines, directions for implementation and over all supervision of field survey operation.
- b) To plan and provision for logistics, manpower and ICT monitoring platform for effective survey operation.
- c) To arrange necessary resources and issue timely approvals, sanctions of funds and clarifications from time to time.
- d) To provide survey pillars Circle wise preferably in the NC villages, as per the model estimate and specification prepared by PWD.
- e) To provide hired vehicle along with HSD/POL to each of the 25 survey team and other officials for inspection & other work related to Survey.

B. Role of Deputy Commissioner:

- a) To sensitise the community of NC villages before commencement of the survey works.
- b) To activate VLMCC and mobilise LR staff for field survey operation.
- c) To enforce the timeline of survey works and provide logistic support to the survey team as per the provision of this SOP.
- d) To notify a Nodal Officer preferably Additional Deputy Commissioner (Rev) for better coordination and implementation of survey works.
- e) To supply survey pillars on site before start of field survey observation in that particular NC village.
- f) To erect the survey pillars on the selected stations so that the surveyor can start observation as per the timeline provided.
- g) To submit the bills for logistic support and supply, erection of survey pillars during the first week of next month.

C. Role of Nodal Officer:

- a) To co-ordinate with the concerned SDO (Civil), Circle Officer, survey teams and Joint Director of Survey with a view to update DC, DLR&S and JDS on regular basis.
- b) To Monitor and manage the survey activities on daily basis and ensure the survey work is carried out as per time line.
- c) To ensure proper documentation of the survey operation, timely availability of logistic support, accommodation having electricity provision, water supply, drinking water, toilet etc; conveyance and other essential materials to survey parties so that no time is lost in peripheral activities. Documentation of observations and data acquired in the field will provide information on the acquisition of survey and provide a permanent record of field.
- d) To ensure data entry showing progress of the survey work on dashboard.

D. Role of Sub Divisional Officer (Civil) (Within their jurisdiction):

- a) To co-ordinate with the Nodal Officer, concerned Circle Officer and Joint Director of Surveys.
- b) To sensitise the community of NC villages before commencement of the survey works.
- c) To enforce the timeline of survey works and provide logistic support to the survey team as per the provision of this SOP.
- d) To Monitor and manage the survey activities and ensure the survey work is carried out as per time line.
- e) To ensure timely availability of logistic support, accommodation having electricity provision, water supply, drinking water, toilet etc; conveyance and other essential materials to survey parties so that no time is lost in peripheral activities.

E. Role of Circle Officer:

- a) To activate the VLMCC to support survey operation. VLMCC member may also be engaged in sensitization programme before commencement of the survey operation for better coordination and support.
- b) To conduct sensitization programme in the NC Village for smooth conduct of survey operations.
- c) To depute LR staff with each survey team.
- d) To arrange the logistic support, accommodation while shifting to a new place after completion of polygon survey.

F. Role of Lot Mondal

- a) To locate the approximate boundary of NC village on ground.
- b) To locate the existing pillar of the adjacent Revenue village, if available.
- c) To remain present with survey party during field survey operation as and when required.
- d) To organize erection of survey pillar and their embedding in the ground.
- e) To mobilize community support towards survey operation through Gaon Pradhan and VLMCC.

6. Executive Instructions for Surveyors for polygon survey:

- a) The surveyors will follow the basic procedure while doing survey of NC villages
- b) He will first identify the probable stations for DGPS observation in the village to be surveyed.
- c) Immediately, after identifying the probable stations, the pillars should be embedded on ground in those identified locations.
- d) DGPS observation of those identified stations is to be carried out.
- e) Field book along with sketch of DGPS observation points are to maintained in the prescribed format.
- f) A minimum standard accuracy of 1:100,000 is to be maintained.

- g) Ground control point (GCP) station in the village should be connected with the existing Survey of India GCP if available, in the district so as to maintain uniformity with all stakeholders.
- h) After completion of control provision by DGPS, data shall be processed and polygon will be prepared in UTM co-ordinate system and are to be verified by the Asst. Director of Surveys/Supervisor with certification.
- i) The verified polygon along with co-ordinate will be used for further detail survey in the village. The minimum standard accuracy as scale of map shall be maintain.
- j) Surveyor will upload the post processed data along with scan copy of field book before moving to next village for survey.
- k) Surveyor will upload the daily progress on the dashboard.

7. Executive instructions for Lot Mandal for detailed survey:

Within 15 days of receiving polygon from the Joint Director of Surveys office, detail survey is to be taken up by the District Authority. The lot Mandal, after getting the Polygon will carry out the cadastral survey. The steps are briefed below:

- a) After receiving polygon of N.C village, the Lot Mandal should keep one copy of plot sheet in the office and another copy to be brought to the field along with the Khaka to be prepared by him. Take khaka to the village and start the boundary survey from any one of the station by keeping the village left hand side of the surveyor.
- b) The surveyor will divide the village into some quadrilateral i.e. define some base line which joins the stations breadth wise of the village. The surveyor will mark the points both on the field and khaka where the base line cuts field boundaries, roads, canals etc. These points are katans. The distance of the katans are to be noted on the khaka. Some convenient katans of the baseline should be marked as substation (chanda) so that further quadrilateral and triangles can be formed. If there is no scope of drawing base line, the village is divided by sub-traverse with the help of Plane Table.
- c) All the sub stations are to be plotted on the polygon sheet.
- d) After dividing village into some big division by base line, to make some small division another chain line is drawn from the chanda (sub-station) of the base line to another chanda of another base line or station or boundary katan. These lines are called Murabba lines. Katans are taken on the Murabba lines. After drawing these line some quadrilateral or triangles are formed. These divisions are called Murabba divisions.
All these are recorded in the khaka as a field book. Again these details are in the plot sheets.
- e) After dividing Murabba division, another chain lines drawn either from one Murabba katan to another Murabba katan or from Murabba katan to the base line katan or from Murabba katan to the boundary katan. Offsets are taken on these chain lines with the help of Optical square and the line is called sikimi line.

- f) If there is no chance of moving chain lines then taking a point visible from another two points, survey is done using chain triangulation method.
- g) All the individual land parcel, natural details like roads, rivers, permanent features like kilometer post, telephone post, pillar, bench mark, temple, cremation ground, well, big tree, rail line etc should be surveyed for preparing cadastral map.
- h) On completion of the survey work and plotting on the polygon sheet the recorder should inform the immediate superior to check the survey work. The supervisor Kanungo (SK) will move to the field to check the survey work by using check line in field. He will then note down each and every katan and few offsets on the field book. Drawing the check line on the map (_ . _ . _ .), he will verify the katan and offsets whether these are correct or not.
After verification done by the SK, adopting the same process the concern CO/ASO will also check the map. In case, error is less than 5% of the total number of katans verified, map to be accepted as correct. In case of 5% error, CO will pass an order to correct the map. In case error are more than 5% re-survey may be done as per order of CO.
If it is found correct, the officer will remark as "*checked & found correct*" with signature and date on bottom of the map.
- i) Dag nos. are to be marked, starts from the North- west and end at the South- west of the map.
- j) After checking and correction of the map by the concerned staff and officers the recorder should ink up the map on the boundaries of dag with black ink.
- k) After this, as per rules chitha and Jamabandi are to be prepared. The map is then endorsed by the concerned Deputy Commissioners.
- l) Then the map is sent to the Director of Surveys, Assam for printing. After printing, the maps are to be sent to the D.C.

8. Engagement of Manpower for detail survey of NC village to complete within 1 month

- One Jurisdictional Mandal
- One retired Mandal
- One newly trained Mandal

9. Remuneration of the engaged Mandal (excluding Jurisdictional Mandal)

- Monthly Fixed amount : Rs 1000/-
- Outcome align incentive: Rs 6750/- per square Km

10. Time Line for Field survey (polygon)

- Camp relocation - initial establishment (1 days), shifting to be done if necessary.
- Field reconnaissance = 1 day
- Pillar erection = 2 days

- d) Field Observation= 2 days
- e) Data Downloading and post Processing and uploading =1 day

11. Timeline for preparation of Polygon (to be done at HQ, Guwahati)

- a. Downloading the post processed coordinates and scanned field book = 30 minutes.
- b. Drawing the polygon in CAD software = 3 hours.
- c. Printing (4 copies) of polygon = 1 hour.
- d. Updating Bhunaksha.

Sd/- Gyanendra Dev Tripathi, IAS
Director of Land Records & Surveys etc., Assam
Rupnagar, Guwahati-32
