



# Mensuration **including** e-Mensuration

**Punjab Revenue  
Academy**

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# PART A

## SURVEYS

Replaces Standing Order 16. Original issue, dated 16th August, 1909 First reprint dated 27th October, 1911; second print dated 3rd November, 1920 and Standing Order 17, dated 15th June 1907]

### SURVEY MARKS

**Note:** - Chapter 12 and Appendix VII of the Settlement Manual should be read in connection with this Chapter

**1. Survey Marks:** - As regards the erection of survey marks, Sections 100-103 of the Land Revenue Act, rules 32 and 33 under that Act, and paragraphs 241, 250 and 251 of the Settlement Manual may be consulted.

The chief survey marks are—

A -Placed by The Survey of India marks are—

- (1) Great Trigonometrical Stations.
- (2) Base line stones placed in the course of riverain surveys.
- (3) Traverse stations supplied in estates not surveyed on the square system.
- (4) Other traverse data (such as corner stone's indicating blocks in the rectangulation carried out by the Survey Department in the Sind Sagar Doab and in the colonies).
- (5) [ International Boundary Pillars]

Note. Traverse data supplied by the Survey Department are not intended to be a guide to Patwaris in execution of their survey except.-

- a. Where the ground is so hilly or broken that accurate squares cannot be laid down;
- b. Where, for special reasons, e.g., in riverain tracts a scientific traverse has been made as the foundation for the Patwari's field survey.

[B-Placed by the Revenue Department]

- a. Tri-junction pillars or platforms or sihaddas, erected at every point where the boundaries of more than two estates meet.
- b. Burjis (mud pillars stone slabs), set up at every angle on the boundary line between two sihaddas.

c. (c) Masonry or stone pillars at the corners of survey squares or rectangles.

**2. Masonry Marks at the Corner of One Square where Estate is Measured in the Square System:** - In estates surveyed on the square system the extremities of a side of one square are marked by survey marks of stones or concrete, each mark being not less than 18 by 6 by 6 inches in size.

**3. Powers of Collector to Dispense with Rules:** - Where boundaries are marked by rivers or hills or where land is exposed to the action of rivers or floods, or in other cases, for sufficient reason the Collector may by order dispense with the construction of the survey marks prescribed in the foregoing rules. An in that case to issue special orders. In such cases the Collector may direct the erection of such other survey marks as are necessary to furnish a base or guide from which the boundary of the estate can from time to time be marked out and its interior survey be accurately renewed. In cases in which the site of tri-junction pillars is immediately exposed to diluvial action, no pakka pillars need be erected. Ordinarily no other exception should be allowed to the rule requiring tri-junction pillars to be made of masonry or stone.

**4. Tri-Junction Pillars:-** The completion and maintenance of tri-junction pillars in every village is a matter of great importance, because, under the existing system of village survey these points form the connecting link between the Patwari survey and the Survey of India, furnishing a basis (1) on which the result of the Patwari maps can be checked against the data of the Survey of India and (2) by the aid of which the topography of the Patwari maps can be incorporated in to the sheets of that survey. Section 103 (1) of the Punjab Land Revenue Act requires the Revenue Officer to give the land owners 30 days within which to erect pillars. As regards tri-junctions he should give the legal notice, at the same time informing the landowners that he is willing to arrange to erect tri-junctions for them at a given cost. Probably all will leave it to him, and after 30 days he can arrange to do the whole work through a contractor.

**5. Preference of Stone to Masonry Pillars:** - where the cost of stone is not prohibitive stone is much better than masonry. Revenue rule 33 leaves it to the Collector to say whether the tri-junction pillar is to be of masonry as there specified or a single block of stone.

**6. Maintenance of Great Trigonometrical Survey Stations:** - Deputy Commissioners with maintain in their officers a list of the Great Trigonometrical Survey Stations and the International Boundary Pillars in their districts and shall see that the instructions given below are carried out.

(2) In his field inspections the Patwari in whose circle and such pillar is situated should not whether the mark is in good repair in the manner prescribed for *pakka* survey marks in the instructions given in Chapter on Harvest Inspections.

(3) On the completion of the Kharif harvest inspection each Patwari shall send a report in the sub-joined form to the tehsildar for submission to the Deputy Commissioner:-

Statement showing the condition of Survey and Boundary marks at the time of kharif harvest inspection year

Tehsil-----District-----

Name of estate in which the pillar is built	No. of pillar (if any)	Survey /khasra No. in which the pillar has been laid down	Condition of pillars	Action needed	Remedy by the Kanungo and other visiting officers
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A- Survey marks.

B- Boundary marks

(4) Should any pillar not be situated within the boundaries of any revenue village the tehsildar shall make special arrangements for the inspection of such pillar and for the preparation of the prescribed report by a Patwari or kanungo as soon as possible after the kharif harvest inspection.

(5) (a) The Deputy Commissioner shall submit an annual return in the above form to the (the Surveyor General of Pakistan, P.O. Box No 1068, Murree Road, Rawalpindi) Deputy Director map Publication, Survey of Pakistan, Murree, on the 1<sup>st</sup> January each year, and shall carry out any repairs to those pillars that the (Surveyor General) may desire him to make and for which he may provide funds.

**7. Maintenance of Base Line Stones Placed in the Course of Riverain Survey: -**  
 Index maps have been supplied by the Survey Department indicating the base line stones fixed by them in the course of riverain surveys. These stones are of essential importance in connection with the maps of riverain tracts with a view more specially to the relaying of fields and village boundaries after emergence from the river. Now that almost all riverain boundaries are fixed (vide paragraph 5.2 infra) the value of base line stones is all the greater. Deputy Commissioner will prepare a list of base line stones from Index maps, which are all kept at district head-quarters and the orders contained in clauses (2),(3) and (4) of paragraph 4.6 of this chapter will apply to them but the report to be submitted by the Patwari should be in the form given below. They will send an annual return in the following form to the Director of Land Records with the annual report on the Land Records of the district: -

1	2	3	4
Name of the village	Number of base line stones as given in the index map supplied by the Survey Department	Field numbers in which the base line stone has been laid down	Remarks on the condition of baseline stone

### **CASE LAWS**

Signatures / thumb-impressions of parties on mutation. Board of Revenue has never prescribed that signatures or thumb-impressions of parties should be obtained on the mutation. Para 4.7 Land Records Manual and Director, Land Record's Circular Letter No. 101, Dated 17.4.1968, strictly prohibit signature thumb impression of parties on mutations.



**8. Maintenance of Traverse Stations Supplied in Estates not Surveyed on the Square System:** - The orders in clauses (2),(3) and (4) of paragraph 4.6 will also apply to traverse stations supplied by the Survey of India in hilly districts.

**9. Maintenance of other Traverse Data Fixed by the Survey of Pakistan:** - The orders in clause (2) of paragraph 4.6 will also apply to other traverse data fixed by the Survey of Pakistan.

**9-A. Care and maintenance of international Boundary Pillars:** – 10[in pursuance to the Indo Pakistan Agreement. The boundary of the Punjab (India)-West Pakistan borders has been clearly demarcated on the spot by means of pillars created by the Survey Department of two countries. Called the West Pakistan-Punjab (India) Border Ground Rules. 1961. With a view to implement these rules the following instruction shall be observed;

- i. Under the Ground Rules. Referred to above the care and maintenance and odd number of pillars has been made the responsibility of the Pakistan authorities and those for the even number of pillars of the Indian authorities.
- ii. All the pillars. Both main and subsidiary. Whether assigned to India or Pakistan. Shall be marked on the shajrakishtwar and entered in the Register girdawari and Diary (Raznamcha) in accordance with the instruction contained in paragraph 4.10.
- iii. Apart from inspection at the time of two harvests the Patwari shall also be responsible to keep a general watch on those pillars and if any time he finds that any pillar has been damaged by any miscreant, he shall immediately report the fact to his Tehsildar. Who, in turn, shall inform the collector of the replacement of the pillar and the punishment of the miscreant?
- iv. As required by the Ground Rules. Referred to above the Collector of the district or his Assistant shall inspect the whole of the boundary line within his district jointly with his counter-part in the border district of India. With whom a contact will be made well in time biannually at the time of kharif, (October-November) and rabi (March-April) harvests, the result of these inspections shall then be

recorded on the statement showing the condition of the boundary pillars, the form of which is given below;-

## **STATEMENT SHOWING THE CONDITION TO THE BOUNDARY PILLARS ON THE PAKSITAN- INDIA BORDER**

Kharif / Rabi 19

Name of the district	Name of the tehsil	Name of village with Hadbast Number	Field number	Pillar no.	Date of inspection	Condition at the time of inspection	Action needed	Remarks by the visiting Officer
1	2	3	4	5	6	7	8	9

This statement will be signed by the revenue officers of the two countries. The Collector or his Assistant shall then take necessary action, as required by the Ground Rules, in connection with the repair and maintenance of these pillars. The District Officers shall then send a copy of the above-said statement to the Commissioner, Board of Revenue, and the Director of Land Records for information.

v. The collector shall get the pillars constructed or repaired through the agency of local of P.W.D (B&R) after observing the procedure laid down in the rule 5 of the Ground Rules referred to above. The expenditure to be incurred on the repair and reconstruction of damaged and missing pillars is debatable to the head "57 – Miscellaneous—I – Miscellaneous and Unforeseen Charges –I-5— Other Chargers—I—5(C) – Demarcation of indo-Pakistan Boundary and will be recovered from the Central Government.

vi. Before an approach is made to these pillars for inspection, the revenue official or officer concerned shall inform the Unit Commander of the Border Security Force at least 24 hours in advance.]

**10. General Orders Relating to Maintenance of all Survey Marks:** - All classes of survey marks set up by the Survey Department and tri-junction pillars and pillars at the corners of survey squares and rectangles will be given a red ink entry without number, after the field number, in which they are situated, and the Patwari will at each harvest inspection, note in his diary if they are in good repair.

**11. Proper Preservation and Inspection of Survey Marks:** - The proper preservation of survey marks of the above kinds is of such importance that the special attention of Deputy Commissioners and Settlement Officers is drawn to the matter. When inspecting girdawari work all Revenue Officers should satisfy themselves that the Patwari has noted whether these survey marks are in good repair. When a Tehsildar or Naib- Tehsildar or Field Kanungo visits a village containing such marks he should invariably inspect them and should, as far as possible, put them in good order if he finds them out of repair. If the repairs require expenditure he should report the matter to the Deputy Commissioner. He should always make an entry in his diary noting the state in which he has found the marks.

**12. Mention about the Condition of Survey Marks in the Annual Report:** - In the annual report on the Department of Land Records, Deputy Commissioners and Settlement Officers should specially note whether the condition of all marks referred to in paragraph 4.10 has been examined during the year and whether they have been put in proper order where necessary.

## **PART B**

### **SURVEY NUMBERS**

**13. Definition of a Survey Number:** - The following definition of a survey number is given for guidance in making new survey or corrections thereof: -

- (i) In all survey work each parcel of land lying in one spot, in the occupation of one person, or of several persons holding jointly, and held under one title, should ordinarily be measured as a separate survey number but large areas may be broken up into convenient fields.
- (ii) A Survey number may have part of its area cultivated and part uncultivated or part of one soil and part of another. Survey numbers should not be multiplied merely on grounds of this kind, unless it is convenient to measure waste separately and not to include irrigated with unirrigated cultivation, as this leads to errors in totaling the village area.
- (iii) Care also should be taken not to multiply survey numbers merely on account of cultivation ridges or other merely temporary divisions. In a simple state of cultivation there is usually no necessity to treat each ridge, made for convenience of cultivation as a separate field boundary.
- (iv) But in the case of valuable lands cultivated by tenants who are frequently changed special care should be taken that the measurements are made so as to show the boundaries of parcels in which the land is usually held for cultivation or irrigation. In such lands the survey numbers will necessarily be smaller than elsewhere.
- (v) In places where land is of little value, if an occupancy tenant has extended his field by Ploughing out, and there is no boundary between the new and old land, nor other plain evidence, such as payment of a different rent by which the new land can be separated from the old land, the Patwari shall survey the whole in one number. In such a case it is not his duty to distinguish between old and new land.

- (vi) Field names, if locally used, should be written under the survey numbers. (vii) In short, every care should be taken to make the survey simple, but not to omit details convenient for the annual girdawari and jamabandi. It should be borne in mind that every unnecessary entry increases unnecessarily the Patwari's annual work.
- (vii) Where the boundaries of a survey number is known, but is not marked on the ground owing to rich cultivation or sandy soil, the boundary should be delineated on the map by broken lines.
- (viii) Where there is a large area of undivided waste it may be cut up into survey numbers corresponding with the limits of the survey squares.
- (ix) In all cases in which a new map of any estate is prepared the provisions of this paragraph and especially of sub-section (ii) must be applied with due regard to canal requirements, and so far as may be possible the limits of canal irrigation, as ordinarily practised, must be shown in separate numbers.

## **PART C**

### **SURVEYS DURING SETTLEMENT**

**14. Instructions Regarding Re-Measurement and Map Correction:-** The instructions as regards re-measurement and map correction during a general re-assessment of a district will be found in Chapter XII and Appendices VII and XXI of the Settlement Manual.

**15. Survey Implements and Mapping Paper:-** Instructions as to survey implements and mapping paper will be found in Chapter No.3 (Patwaris). In hilly and broken land where squares cannot be used, application for plotted traverse sheets should be made to the Director of Land Records, and that officer, in communication with the Survey Department, will supply suitable sheets for the Patwari's use.

**16. Patwaris not to be Excused Measurements:-** The main portion of the measurement and record work should be done by the circle Patwaris, the settlement Patwaris being looked on primarily as an aid to them in their work. A Patwari must in no case be excused from doing both measurement and record work. If he is unable at first to do the work required of him he should be taught, and if he fails to learn his services should be terminated.

**17. Riverine Measurement Rules Hitherto Observed by the Survey Department:-** The following are the rules under which riverine measurements have been carried out through-out the Punjab in conjunction with the Survey Department:-

(1) It is the duty of the Settlement Officer to supply the Riverine Survey Officer, by the first of May each year, with a statement showing the villages to be traversed in the ensuing season, distinguishing those which are to be wholly and those which are to be partially re-measured, and affording information as to the scale to be used and the distance desired between traverse points. With this statement should be sent a small-scale map of the district showing the names of the different villages as well as their boundaries. The Riverine Officer will then prepare a program for the ensuing season and submit it by the 1st of June, to the Director, North Western Circle, Chandigarh who will forward it to the Financial Commissioner for approval. Before actually commencing the work of the season the Riverine Survey Officer should consult the Settlement Officer as to the order in which villages should be traversed. The Settlement Officer must be careful to

arrange in ample time (at present the Press requires about two months' notice) with the Director of Land Records for the supply of ruled and backed musavisi to the Riverine Drawing Officer. There will be two kinds of musavisi, namely, 16 square and 8 square ones. The latter will be used for such outer portions of villages as can be included with them.

(2) It is the duty of the Settlement Officer to see that all existing boundary pillars are put in a proper state of repair.

(3) It is the duty of the Settlement Officer to make arrangements with a contractor for the supply of stones to mark the corners of base lines according to the list supplied by the Officer-in-charge of Riverine Survey.

(4) Early in the cold weather it will be the duty of the Officer in-charge of Riverine Survey to arrange that traversers begin work in the riverine track. At the commencement of work, each party should be accompanied by the village Patwari and the lambardar to point out boundaries and to show where points should be thrown as well as to arrange for the supply of information, etc., and to act generally between villagers and the traversers.

(5) Such points as the Settlement Officer may require should be traversed and where necessary marked on the ground by the Officer in-charge of Riverine Survey. These should include-

- a. all existing tri-junction pillars;
- b. recognizable physical features of a permanent nature;
- c. the survey part's traverse points. These should not be more than 340 meters apart and should invariably be close to the district or tehsil boundary;
- d. A number of points in the kacha area to facilitate internal measurements by the Patwaris. These points will usually be in cultivation.

(6) The [Surveyor General of Pakistan, P.O. Box No. 1068, Murress Road, Rawalpindi] should also obtain the last settlement maps of all coter-minus villages on either side of the boundary and combine them into a single four-inch map in order to see how far they agree with each other.

(7) Inside each village a suitable square should be selected by the Officer-in-charge of Riverain Survey to form the special base line of that village. This should be on ground not exposed to river action. Stone pillars should be erected at three corners of this square. A corresponding square on pakka ground should in each case be selected and similarly marked on the opposite side of the river. This will

materially facilitate the relaying of boundaries on future occasions when such may be necessary.

(8) As a result of the traverser's work the Riverine Drawing Office will supply the Settlement Officer with-

- a. *musavis* showing paper boundaries in those cases where it is discovered in the course of the examination prescribed in rule 6 that the boundaries of the settlement maps do not coincide;
- b. Separate *musavis* for each village showing the points traversed under rule 5.

This (b) series will be complete and continuous for the whole tract and will be numbered serially. Where it is found necessary because of discrepancies to prepare an (a) *musavi*, the (a) *musavi* will correspond exactly to a (b) *musavi* and bear the number not of a separate (a) series what of the (b) series. It will be easy to transfer the points shown in (b) to (a) with the help the squares shown in both. The Patwari will work on (b) and (a) will remain in the Revenue Record Room until they are required for reference under Rule 11. It is advisable to have paper boundaries marked only on (a). If they are worked on (b) the Patwaris are apt to show dissension even when there is no actual dispute on the spot. It is for this reason that the traverser should show "*Chandas*" only along the boundary and not to attempt to mark out the actual boundary itself.

(9) *Musavis* are supplied gradually by the Survey Department from the 15th December to 15th March. As the latest *musavis* are not issued till 15th March it is necessary for the Patwaris to whom these *musavis* are issued to have everything in readiness to start work immediately. If the work is not completed in April the traverse marks will be washed away by the rivers rising when the snows in the hills begin to melt. The Settlement Officer should give separate *musavis* alluded to in rule 8 to Patwaris upon which it is easy for them to carry out a rapid and accurate survey. In the kacha area of course re-measurement is required, but where the system of measurement in use is that of tarmim, the Patwari need not re-measure the whole of the pakka area of each village. The pakka area may be tarmimed separately, and the work so done can for the sake of completion be transferred to the Survey *musavis* in continuation of the re-measurement of the kacha, either by scale or by pantograph. The scale is the best instrument for this work, since any slight discrepancy can then be distributed, with the pantograph this is not feasible.

(10) The kanungos who were employed with the traversers may now be appointed by the Settlement Officer to supervise the detailed measurements. It is



advisable to have a special naib-tehsildar in charge of the whole cadastral survey of riverine areas.

(11) It is in connection with re-measurement of the kacha area that boundary disputes arise and discrepancies have to be reconciled, and this requires careful treatment. The naib-tehsildar will first of all mark the external boundaries of the village as shown in the settlement Shajra. The Patwari will then easily be able to fix the field boundaries which he should show to the owner concerned. In case the settlement shajras are in such a dilapidated state that they do not clearly show the village boundaries or in case the boundaries of two villages overlap or an area has been omitted from measurement in both maps, the naib tehsildar should prepare a statement of the cases illustrated by tracing from the musavis, and submit it to the Settlement Officer for his decision which will be marked on both sets of musavis. His report should include the statements of lambardars and owners interested in the matter. To enable him to deal properly with disputes, the naib tehsildar will require-

- a. the settlement shajras of village on both sides of the river;
- b. all record of previous disputes and decisions. If any of the villages involved are situated in another district, it is necessary to obtain the cooperation of those authorities. The most convenient course is to obtain jurisdiction for the Settlement Officer over the whole of the riverine area of the adjoining district.

(12) It may happen that the scales employed on each side of a river differ. It is of course essential that the whole area be plotted on one scale and the more convenient one may be selected and the internal measurements conducted accordingly, if considered necessary, reduction or enlargement of the completed map can be carried out subsequently for villages using a different scale from that adopted.

(13) An important part of the traverser's duties is the embedding of base line stones, this work must be carried out by the Survey Department who will supply the Settlement Officer with an index map showing the corners of squares so demarcated.

(14) It is the duty of the Director of Land Records to maintain a list of selected kanungos so that one may be deputed without delay as soon as the traversers arrive in the district.

(15) A supply of wooden pegs, 2 feet long and 6 Inches in circumference should be provided by the zamindars under orders of the Settlement Officer for marking points.

(16) Lambardars should be made responsible that the pegs and survey marks are not removed or destroyed. A list should be maintained by the village patwari in the following form:-

1. No. of chanda
2. Field No. in which the chanda is situate.
3. Owner's name
4. Name of the tenant.
5. Signature or thumb mark of the owner of the field.
6. Seal of lambardar concerned.

The position of the pegs and chandas should be marked by the kanungo on one of the Patwari's maps, it will then be easy to fix responsibility.

(17) The naib-tehsildar on special duty should be provided with a Miniature Swiss cottage tent and a shouldari. One or two Muharrirs should also be given him and a small contingent advance. He will need a good deal of tracing cloth for his reports on disputed boundaries.

## **PART D**

### **PROCEDURE FOR CORRECTION OF FIELD MAPS IN THE INTERVAL BETWEEN TWO SETTLEMENTS**

**18. Responsibility of Revenue Officer for Correctness of Patwari's Survey:** - All Revenue Officers are reminded of their responsibility for the correctness of field surveys executed by the Patwaris whom they control-a responsibility which is much increased by the circumstance that the Patwari's maps are occasionally used for the correction of the topographical sheets of the Survey of India.

**19. Instructions Regarding Incorporation of Field Maps Changes:** - The following instructions are issued for the purpose of collecting material from year to year for incorporating in the field map changes, which occur in fields in the interval between two settlements.

**20. Changes of a Permanent Nature:** - The Changes in fields, which ought to lead to the correction of a field map in the interval between two settlements, and the methods by which the map should be corrected, are stated in the following instructions: - Firstly, changes which are due to transactions on account of which a mutations order has been, or should be, passed. The chief examples are-

- a. Partitions.
- b. Sales.
- c. Mortgage with possession.
- d. Redemption when part of an old field has been mortgaged and in consequence a new number has been made, the result of redemption being the restoration of the original number.
- e. Exchange.
- f. Gifts.

**21. Changes Due to Nautor and Hissadari Kasht. Secondly, Other Changes of a Sufficiently Permanent Character, Examples Are:-**

- a. Nautor.
- b. Conversion of part of a barani field into irrigated land when the change is of a permanent nature. Such changes will especially occur

when a new well has been sunk or some other new means of irrigation has been provided.

- c. Separate cultivation of share-holders in fields jointly owned (hissadari kasht) when arrangements for separate possession has lasted for not less than four years. Such arrangements when once made usually continue until a partition is carried out under the orders of a Revenue Officer.

**22. New Field Numbers not to be Created Needlessly:** - (a) Care should be taken not to increase the number of field needlessly. New fields should not be made on account of changes of cultivating occupancy by tenants-at-will. Such changes will, as at present, be recognised by min numbers in the khasra girdawari and jamabandi. Similarly new numbers are not required when part of a field is cultivated by the owner and part by a tenant-at-will or when part is cultivated and part uncultivated. In the former case the entry can be shown in the column headed "changes of rights, possession, and rent of the khasra girdawari" thus:-

A. Owner .....2 bighas/kanals/Acre  
B tenant-at-will .....1 bighas/kanal/Acre

(b) Petty cases of nautor, due to ploughing out, are not a cause for making new fields or changing the boundaries of old ones.

(c) Field numbers should not be combined into a single field unless the clubbing is clearly desirable for the purposes of girdawari.

**23. Method of Preparation of Tatimma Shajras Based on Permanent Changes:** -

In the case of new numbers due to transactions on account of mutation order (paragraph 4.20) the Revenue Officer must not sanction the mutation in the absence of a proper map of the new field numbers attested by the kanungo and checked by himself. When the Patwari enters up the mutation he will draw to scale on the back of the mutation sheet and its counterfoil the numbers effected and will enter under them the details prescribed for the field book referred to in paragraph 4.26. The new field will be temporarily numbered, e.g. 155/1 155/2 etc., permanent numbers not being adopted lest the mutation be rejected or the new fields be affected by subsequent mutation. The kanungo will check on the spot the dimensions and areas of the new numbers and will sign his name at the foot of the map with a note "attested on the spot". In the case of mutations due to sales, etc., the kanungo is responsible for seeing that the measurements

correspond with the area actually transferred. In the case of partitions it will not always be possible to show the new numbers and field book details on the back of the mutation order. If so, they will be shown on separate mapping sheets. The tatimma shajra in the case of a partition will be a copy of that prepared as soon as the partition is completed (paragraph 18.12 (a) and 18.14). The kanungo who attests the tatimma shajra in the case of a partition will be held strictly responsible that the map really shows the land allotted to each share-holder and pointed out to him (paragraph 18.14).

In case of a transaction based on a registered deed the revenue officer should immediately on receipt of the registration memorandum from the Registration Officer (paragraph 7.23), direct the kanungo and the Patwari to proceed to the spot and prepare a tatimma shajra, if one is necessary, on the basis of the material given in the registration memorandum and that alone. On the completion of the tatimma shajra it shall be submitted by the kanungo to the revenue officer.

**24. Preparation of Tatimma Shajras Necessitated by Hissadari Kasht Etc:** - The changes referred to in paragraphs 4.21 are already recorded by the Patwari by putting a red cross in columns 10,15,20,25 or 30 of the khasra girdawari (vide note to column 10 of the form of shajra girdawari in paragraph 9.3). All such entries must be carefully checked by the field kanungo harvest by harvest. In the year in which the quinquennial jamabandi of an estate is to be prepared the kharif girdawari must be made with great care, and the field kanungo is responsible that no number which has changed permanently escapes detection. After the girdawari is finished he will at once draw up a list of the cross marked numbers and give it to the Patwari who will make the necessary measurements without delay and prepare the tatimma shajras on mapping sheets of the same size as the sheets used for jamabandis. Field book details will be entered on the back of these maps as prescribed in paragraph 4.23. In the case of villages measured on the square system these mapping sheets will have two squares marked on them. The field kanungo will check the tatimma shajras on the spot during the cold weather before the end of January. The new fields will at this stage be temporarily numbered as laid down in the preceding paragraph.

**25. Boundaries and Dimension of New Field Numbers to be Shown in Red Ink:** - In the maps prescribed by the two last paragraphs all new boundaries and other amendments will be shown in red ink. It is unnecessary to re-chain such of the

boundaries as have undergone no alteration, and if a side of a new field includes the whole of a side of an adjoining field which is not being amended only the remaining part of the side of the new field need be re-measured. When an old field number is divided into two or more new numbers the patwari will recalculate the areas of each of the new numbers. To facilitate identification one adjoining number which has not altered will be shown in the tatimma shajra.

**26. Preparation of Field Book of New Field Numbers:** - In the case of any further changes brought to light at the rabi girdawri the procedure prescribed by paragraph 4.23 and 4.24 must be gone through as soon as possible and when it is completed the patwari will enter all the new field for which tatimma shajras have been prepared under the above mentioned paragraphs in a field book in the form below:-

**SUPPLEMENTARY MAP (TATIMA SHAJRA)  
PART A**

**SUPPLEMENTARY FIELD BOOK**

Estate \_\_\_\_\_ Tehsil \_\_\_\_\_ District \_\_\_\_\_ for the year Book No. / Leaf No.

Survey / Khasra No.		No. Khata	Length and breadth of survey / khasra no.				Calculation of area	Area and soil classification	Re-marks
Former	Present		East	West	South	North			

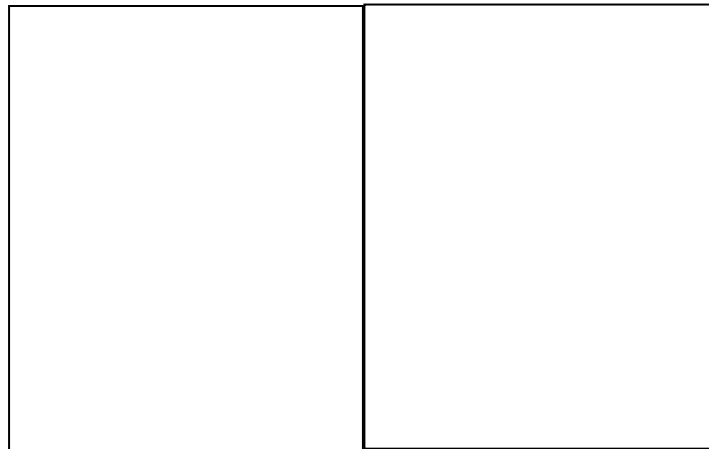
Signature of Patwari

Signature of Kanungo

Signature of Revenue Officer

**PART B**

**2 SQUARES – 2 RECTANGLES**



Signature of Patwari

Signature of Kanungo

Signature of Revenue Officer

**In the Field Book the Fields will be Finally Renumbered as Follows:-** If a field number, say 24, has been subdivided into two, and the last number in the field register of the village is 150, entry No.24 should be scored through and the new field entered as 151/24 152/24.

Where a second sub-division takes place the denominator number should simply be the numerator of the field, which is again sub-divided. Thus in the example, we should have first 151/24, then 185/151 and lastly 202/185, from each of which, if necessary it would be very easy to trace back to the old number. If field nos. 31 and 32 have been joined into one field the new entry may be 153/31 and 32, 152 being the last number in the field register. The new numbers given in the field book will be entered in red ink in the tatimma shajras prepared under paragraphs 4.23 and 4.24 above, and each entry in the field book will be initialed by the field kanungo in token of its correctness. A slip containing a copy of the entries in the field book will be given to the owner or mortgagee or in the case of land held in joint ownership to the share-holder in occupation of the new field.

**27. Tatimma Shajras to be Bound with the Jamabandis (Now Periodical Records):-** The original tatimma shajras prepared on the spot under paragraph 4.24 will be bound up with the Government copy of the jamabandi, and copies checked and signed by the field kanungo will be bound with the Patwari's copy of the jamabandi. No copy of the tatimma shajras prepared on the back of mutation sheets is required for the Government copy of the jamabandi, in which the original mutation sheets are incorporated, but copies of them must be made on mapping sheets for the Patwari's copy of the jamabandi. The field book details need not be copied on the copies of the tatimma shajras field with the Patwari's copies of jamabandis as the details are already given in the field book kept by him.

**28. Check of Tatimma Shajras by Tehsildars and Naib-Tehsildars:** - The tehsildar and naib-tehsildar shall when on tour, check on the spot at least 25 percent of the tatimma shajras prepared in each village in the period intervening between two jamabandis. They are not expected to do much in the way of chaining, but they must remember that they are responsible for the general accuracy of the measurement. They should be able to recognise by eye whether there is any palpable mistake in the karukan or in the area, and if there is any reason to believe that a mistake exists they must have the field re-chained and the area re-



calculated in their presence. They must also check the entries in the field book referred to in paragraph 4.26. All tatimma shajras so checked must be endorsed "Certified that this has been verified on the spot" and signed and dated.

**29. Keeping up-to-Date of Maps.** The above instructions apply to all districts. The intention is that the Patwari's copy of the settlement map and the fair copy kept in the tehsil should include all changes from time to time brought to light, but it is recognized that when the last settlement of a district is not very recent it would be difficult to keep the maps completely up to date at present. But it is a matter of great importance that the maps of all recently settled districts should be kept completely up-to-date, and Deputy Commissioners are responsible that this is carried out. To secure this end the following additional instructions are issued.

**30. Renewal of Patwaris Copies of Shajra Kishtwar:** - The patwari shall in future have in his custody only one copy of the settlement map for use at girdawari and for all other purposes. The karukan will be shown in the copy. The patwaris copy will be on latha cloth. The fair copy of the settlement map formerly in the custody of the Patwari will hereafter be permanently kept in the tehsil. The Patwaris copy of the map of every village must be renewed at the time of filing of every other jamabandi of that village. For special reasons, however, a fresh copy may be prepared after the lapse of a shorter period under the orders of the collector; in which case the map will be again renewed at the second jamabandi from the date of this special renewed, e.g. If a map was prepared at the jamabandi of 1970 it would be renewed in 1980 and then again in 1990; but if the Collector orders its renewal in 1978, it will be again renewed not in 1990 but in 1988. The date of renewal should always be noted on the map.

**31. Incorporation of Amendments in the Parat Tehsil Maps and in the Shajras Kishtwar Kept by Patwaris:** - When the Patwari brings the jamabandi to the tehsil at the beginning of September he will at the same time bring his copy of the settlement map, the tatimma shajras prepared under paragraph 4.24 the field book, the work book and the mutation register. He wills, under the field kanungo's supervision, transfer to his own copy of the settlement map and to the fair copy kept in the tehsil all the new field shown in the tatimma shajras prepared under paragraph 4.23 and 4.24. The new lines of amended fields should in the first instance be shown in pencil by the Patwari and then inked by the kanungo in shingraf after comparison with the tatimmas concerned. The tatimma

shajras relating to mortgages of all kinds, redemptions, lessees and hissedari-kasht need not be incorporated in the fair copy of the field map kept in the tehsil. If the new fields are so small that the corrections are difficult to read they should be drawn on a larger scale in the margin of the map. If under the above instructions it becomes necessary to make any further alterations in any portion of the tehsil copy of the settlement map which portion has been already so much altered that further alterations cannot be made therein without giving rise to confusion then a tracing of the portion in which further alterations have to be made should be prepared on the margin of the map, or, if sufficient space be not available on the margin, on a separate sheet, and the alterations necessary as well as any alterations that may have to be subsequently made in this portion should be made in the tracing thereof prepared on the margin or on the separate sheet as the case may be. The kanungo must carefully compare the changes made in the maps with those shown in the tatimma shajras, and must state in his note of the result of checking the jamabandi that he has done so. The tehsildar and naib-tehsildar shall also examine the incorporation of 25 percent, of the tatimma shajras in the parat tehsil musavi.

**32. Preparations of Tatimma Shajras of Alluvion and Diluvion Tract:** - The above instructions do not apply in their entirety to estates subject to alluvion and diluvion. In such estates no tatimma shajras should be prepared for changes due to alluvion or diluvion even if such changes necessitate the passing of mutation order, as in the case of estates where the submergence of proprietary land involves its conversion into shamilat. For changes due to other cause, however, tatimma shajras will be prepared in accordance with the above instructions. The instructions contained in paragraph 4.31 regarding the correction of maps will apply only to the portions of the estate not subject to alluvion or diluvion. As regards the remaining portion the changes due to alluvion or diluvion as well as those for which tatimma shajras have been prepared will be incorporated in the tracing to be filed with the detailed jamabandi according to local alluvion and diluvion rules or orders as sanctioned at settlement. But the fields which actually touch the fields affected by river action should always be shown in this map or tracing.

**33. Co-Ordination of Departmental Land Plans with Corresponding Revenue Papers:-** In order to obviate the difficulties that have occurred in the past the Punjab Government consider it essential that all departmental land plans of Government property should, in future, be coordinated with the corresponding revenue papers.

A sufficient number of fixed and easily identifiable points, such as tri-junction pillars, base line marks, milestones or in default of these other permanent topographical details, which may be found on the corresponding revenue map then in existence, should be plotted on the departmental plan and the Government property should then be plotted on it with reference to such fixed points. The following procedure will be observed:-

(1) The Public Works Department have agreed to provide a technical surveyor to carry out the surveying on a large scale metric units of any areas of Government property required to be surveyed under the instructions issued in Punjab Government circular No.2240 (Rev. and Agri.- Genl.), dated 21st January, 1921.

(2) In districts or portions of districts not under settlement the Deputy Commissioner will communicate to the Executive Engineer, Public Works Department, by April 1st of each year, the exact area in which Quinquennial revision of revenue records is to take place in the year commencing October 1st following, and state the parcels of Government property in that area. In tracts under settlement, the Settlement Officer will, as his work progresses, give the Executive Engineer information as long ahead as possible of the date on which re-measurement or revision of the maps of estates in which Government property is situated, will be commenced.

(3) The Executive Engineer will then cause to be prepared plans showing the extent and position of each parcel according to the Public Works Department's records. These plans will also show both all topographical features adjoining the Government land which are likely to assist the Revenue Officials in checking its boundaries and area and also any Revenue "fixed" points in the neighborhood.

All distances will be shown in metric units. The plans should reach the Collector concerned by a date to be agreed on between him and the Executive Engineer.

When land plans of any area have once been prepared and discrepancies, if any, have been settled, it will not be necessary to prepare them again at a future quinquennial revision unless in the meantime some change has occurred which

necessitates an alteration in the plans. If there has been no such change the Executive Engineer should merely supply a certificate to the effect that the land plans are as they were at the last quinquennial revision.

(4) The collector will then arrange for the plans to be checked by the tehsildar. If no discrepancies are found then the tehsildar will note in red ink on the shajra kishtwar (parat tehsil as well as on the Patwaris copy) the distances given in metric units on the Public Works Department plan. "The revenue record will thus read" ..... karams .....gathas the equivalent of .....metre.

(5) The tehsildar will then return the plan for signature by the Collector and the Executive Engineer, and for the preparation of duplicate to form an inset to the shajra kishtwar (parat sarkar) and to be similarly signed.

Note: - If relevant in a suit brought by Government the "inset" will be produced before the court by the Sadar kanungo, or his assistant.

If any discrepancy is observed, then the tehsildar will note it in pencil on the plan and return the plan to the Collector concerned for transmission to the Executive Engineer, sider these discrepancies in consultation with the Patwari. If the two are satisfied that the revenue record is correct, and the Public Works Department plan incorrect, then that plan will be corrected accordingly and the papers returned to the tehsildar who will enter distances as required above in the revenue record and forwarded the plan for signature to the Collector.

If the revenue map appears to be incorrect the case will be submitted to the collector, who will, if he concurs, direct that mutation proceedings be entered up for the correction of the map.

When mutation proceedings have been completed, a tatimma shajra will be prepared for the revenue records. Distances will be marked on it metric units according to the Public Works Department plan, and the inset signed and recorded as above.

(6) The procedure prescribed in the preceding subparagraphs for checking departmental land plans of the Public Works Department will mutatis mutandis be carefully observed in the case of Forest, Zila Parishads and Railway Department maps also.

(7) The detailed plan of any property belonging to the Government in the estate shall form part of the record of rights, -vide Financial Commissioner's notification No.1953-R, dated the 21st September, 1937.

(8) It shall be the duty of the revenue staff to afford every assistance to the officials or other departments in matters connected with the co-ordination of departmental land plans.

**34. Cantonment Boundaries:-** Under instructions from the Government of India it is necessary that in any survey which may in future be made by the Revenue Establishment so as to include any portion of the boundary of a cantonment that boundary should invariably be defined by a series of straight lines drawn from each of the cantonment boundary pillar to the next, except where it is distinctly stated to the contrary in the description of the boundary published by notification in the local gazette. Before any such survey is finally accepted it should be communicated to the military authorities for information and scrutiny. The attention of Settlement Officer is particularly directed to these instructions.

## **PART E**

### **Tehsil and District Maps based on Patwaris Surveys**

**35. Preparation of the Grouped (*Mujmili*) Map:** - Where fairly recent survey or other maps on a sufficiently large scale showing village boundaries do not exist the Settlement Officer should prepare for each tehsil a grouped (*mujmili*) map on a scale of one inch to a mile. The grouped map is made on tracing cloth and is an exact reproduction of the index maps, prescribed in paragraph 19 of appendix VII of the Settlement Manual. In the case of large tehsils with big estates and much waste it may be convenient to reduce the index maps to the scale of  $\frac{1}{2}$  inch to the mile. It should for two reasons be started as soon as the index maps are available, and should not be deferred to the very end of the settlement, for (i) in piecing together the index maps errors in the boundaries are often brought to light, which are real errors of measurements which require light to be rectified by a further inspection of the ground, and (ii) there are differences in practice as regards the showing of roads, canal cuts, etc. indifferent Patwaris or kanungos circles, and uniformity can only be secured by consulting the men who have actually made or supervised the measurement and who know the country intimately.

**36. Size and Translation:** - The map can most conveniently be prepared in separate sheets, each of the size of an ordinary village mapping sheet, but Settlement Officers can consult their own convenience in this respect. It will be best to make two copies of the group map. One of these (the original) would be in vernacular and exact copy of the index maps. The other would be a copy in English. By having a list of the vernacular entries prepared with all the vowel points marked the settlement officer can insure a uniform transliteration into English which will represent the actual pronunciation of the names, and, by the help of the accumulated local knowledge of his staff, he will be able to avoid some of the mistakes which often disfigures our topographical maps.

**37. Copy to be Sent to Survey Office:** - A copy of the *mujmili* map, when ready should be sent to the Director, North Western Circle, Survey of India, Chandigarh. From this the Survey Department will obtain materials for showing new roads, canals, dak bungalows, etc., in revised editions of their maps. The number of the standard sheet, in which the village will be found, should be clearly marked on each map sent to the Director.

**38. Reduced Grouped Maps:** - If no convenient survey maps of the district exist the Settlement Officer should reduce the grouped tehsil map by pantograph to a smaller scale (such as 1 inch or ½ an inch to the mile) and prepare a district map, Preparation of maps.

**39. Preparation of Maps:** - Such copies of these maps as are required should be prepared (by the Surveyor General of Pakistan, P.O. Box No. 1068 Murree Road, Rawalpindi) if the office is in a position to meet the requirements of the Settlement Officer. Three copies of each such map should be forwarded to the Financial Commissioner's office for record.

## PART F LAND MEASURES

**40. Instructions for Converting Local Measure into Hectares:** - The land measure used in all revenue work is the local measure and not the English acre. These local measures are of two kinds. The bigha measure and the kanal or ghumao measure.

Prior to British rule, and indeed up to recent years, the size of the local measure varied from village to village. The adoption of the local measure for use by all revenue officials has given to it an exactness which it did not before possess. But both the bigha and ghumao still vary in size in different districts.

**41. Units of Length:** - The unit of length is the karam or gatha which varies in length in different districts. The units at present adopted for revenue work are as follows:-

District	Length of karam	Length of gatha.	Remarks
Bigha Measure.			
1. 56, Delhi, Gurgaon, Rohtak, Ludhiana, Panipat (Karnal)	Inches. .....	Inches. 99	*The exact length is 57.157
2. 57 (a) Ambala, Karnal (except Panipat)	*57 .....	.....	
(b) Fazilka (Ferozepore, Hissar) Except Sirsa	.....	57	
3. 58 (Sirsa Hissar)	66	.....	
4. 59 (Simla)	54	.....	
5. 60 (Kulu and Plach Kangra)	56	.....	
Ghumao Measure.			
6. 61 ( Jullundur, Hoshiarpur and kangra except Kulu and Plach and the shahpr Hill Circle in Gurdaspur)	57.5	.....	
7. (a) 62 ( Amritsar, Gurdaspur except Shakargarh Tehsil and shah pur Hill Circle and chak andar, Pathankot Tehsil, Lahore except the part of the district north of the Ravi)	60	.....	
63 (b) Ferozepore except fazilka)			



8. All Districts not named above except Lahore	..... 66	60 .....	The Ghumao in this instance is equal to the English acre, and twelve karams are equal to a gunter's chain.
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## CASE LAW

Term “Qabiz” denoting assertion of adverse possession, in terms of para 7.41 (4), Land Records manual, could not be entered into record-of-rights, without a mutation attested for such purpose by the Revenue Officer. No such mutation being on record, entry of Qabiz into the record-of-rights was unauthorized and carried little evidentiary value.

**42. Units of Area:** - The unit of area is a square *karam* or *gatha*. In the case of the local bigha measure the unit is called a *biswansi*, and in the case of the ghumao measure as *sarshai*.

The following is the table of area measure

PBigha Measure				
66(20 Biswansis)	.....	.....	.....	1 Biswa
20 Biswas	.....	.....	.....	1 Bigha
Ghumao Measure				
67(9 Sarsahis)	.....	.....	.....	1Marla
20 Marlas	.....	.....	.....	1 Kanal
8 Kanals	.....	.....	.....	1 Ghumao.

If follows that, in the several districts of the Punjab, the bighas and ghumaos used in the revenue records represent the areas of English measure shown in the following table:-

Unit of length	English equivalent of local measure expressed in
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					Square yards	Decimals of an acre (4,840 square yards)
Bigha measure						
1)	99 inch gatha	.....	.....	.....	3,025	.625
2)	57 " " or karam		.....	.....		
3)	66 " "	.....	.....	.....	1,008.33	.208
4)	54 " "	.....	.....	.....	900	.186
5)	56 " "	.....	.....	.....	968	.2
Ghumao Measure						
6)	57.5 inch karam				3,674	.759
7)	60 " "	.....	.....	.....	4,000	.826
8)	66 " "	.....	.....	.....	4,480	One acre

**43. Further Variation:** - The bigha derived from the 99 inch gatha is known the pakka (or Shahjahani) bigha. It is exactly three time the size of the Zamindars' or kacha bigha, for which the linear unit of 57.125 inch karam was devised. The pakka bigha is 5/8ths and the ordinary kacha bigha 5/24ths of an acre. For the revenue records kacha bighas are shown. In the district in which the ghumao measure is used bigha often means half a ghumao.

**44. Local Measurers to be Used in Village Records:** - in all village records, whether prepared by the land revenue agency or by the irrigation Forest or other Department s areas are to be stated in the local measure, and all rates are to be expressed in village records with reference to that measure, and to with reference to the English acre. If rates have been sanctioned in the local measure before being carried into village or other vernacular proceedings. The area in village note-book, however, will be entered in acres by the Patwari.

In revenue suits and proceeding it is unnecessary to convert the local measure into English measure. Areas should be stated in the local measure used in the village records.

**45. Comparison of Measures:** - Tables showing the equivalent of local measures in English measure, with rules for converting either measure to the other, are appended.

- (a) Gunter's chain is equivalent to the following gatha or karams.

Length of gatha or karam				Equivalent of chain
99 inch gatha	.....	.....	.....	8 gathas
57 " "	.....	.....	.....	13.8 " or karams
66 " karam	.....	.....	.....	12 karams
54 " "	.....	.....	.....	14.3 "
56 " "	.....	.....	.....	14.14 "
57.5 " "	.....	.....	.....	13.95 "
60 " "	.....	.....	.....	13.2 gathas or karams

(b) Equivalent of square measures

(i) to (v) Deleted)

(vi) Lahore district (except the part of the district north of the Ravi)

1 Ghumao .... = 4,000 square yards = .826 acre.

1 kanal .... = 500 square yards = .103 acre.

1 marla .... = 25 square yards = .005 acre.

1.21 ghumao .... = 1 acre.

774.4 ghumaos .... = 640 acres.

To convert ghumaos into acres. – Add two ciphers and divide twice by eleven Reckon each odd kanal as 0.1 acre and 2 marlas as 0.01 acre.

To convert acres into ghumas.—multiply twice by eleven and reject the two last figures. Reckon each 0.1 acre as a kanaland each .01 as 2 marlas.

(vii) Ghumaon of Tehsil Shakargarh, the part of the Lahore district north of the Ravi, and all the districts not named in the foregoing statements.—

1 ghumao .. = 4,480 square yards = 1 acre.

1 kanal .. = 605 square yards = .125 acre.

1 marla .. = 30.25 square yards = .006 acre.

1 ghumao .. = 1 acre.

640 ghumaos .. = 640 acres.