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Government Notice

MINISTRY OF LANDS, RESETTLEMENT AND REHABILITATION

No. 58 2002

REGULATIONS RELATING TO THE MANNER IN WHICH LAND SURVEYS SHALL BE CONDUCTED: LAND SURVEY ACT, 1993

With the approval of the Minister, the board has, under section 5 of the Land Survey Act, 1993 (Act No. 33 of 1993), made the regulations which are set out in the Schedule.

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**PART I
PRELIMINARY**

Definitions

1. In these regulations a word or expression to which a meaning has been given in the Act bears that meaning and, unless the context otherwise indicates -

“accurately determined” means determined with a standard of accuracy conforming with that specified in regulation 9;

“arc” means the mean of two rounds of observations to surrounding stations and beacons, one being taken in a clockwise direction and the other with the telescope transitted, taken in an anti-clockwise direction;

“approved” and its derivatives, means approved by the Surveyor-General;

“metre” means the unit of length as defined in table 1 of the first schedule to Government Notice R.1146 published under the Measuring Units and National Measuring Standards Act, 1973 (Act No. 73 of 1973);

“original diagram” means the diagram of the property being surveyed, re-surveyed or subdivided;

“registration division” means a registration division referred to in regulation 3 of the Deeds Registries Regulations, promulgated in Government Notice No. 180 of 1996;

“rural land” means land which is not situated in a township or settlement;

“side” when used in relation to a figure on a diagram or general plan, means a straight boundary represented thereon, or the imaginary line joining any two beacons between which the boundary is curvilinear, and includes the line joining an unbeaconed corner point with the indicatory beacon defining such point;

“SBP” means Satellite Based Position;

“the Act” means the Land Survey Act, 1993 (Act No. 33 of 1993);

Operation of regulations

2. These regulations shall not apply to a survey, the field work of which commenced before the coming into force of these regulations or to a diagram which was framed in accordance with the regulations in force at the date of that survey.

PART II TESTING OF SURVEYS BY SURVEYOR-GENERAL

Surveyor-General may test surveys

3. (1) The Surveyor-General may, at any time in the field, check the accuracy of any survey conducted by a land surveyor under the Act.

(2) If, after having carried out a check as provided for in subregulation (1), the Surveyor-General has reason to doubt the accuracy, correctness or authenticity of a survey or any information supplied in connection with that survey, he or she may, after having given notice of his or her intention to the land surveyor concerned, appoint a land surveyor who may be a staff member in the employ of the State, to test the accuracy, correctness or authenticity of the survey and thereafter the Surveyor-General may take any action which he or she reasonably considers necessary in the circumstances.

PART II FIELD WORK

Survey information

4. (1) Before carrying out a survey, a land surveyor shall obtain all available information in respect of any previous surveys of the piece of land to be surveyed and of the adjoining pieces of land, and the Surveyor-General shall, if he or she is in a position to do so, supply that information to land surveyors.

(2) A land surveyor who wishes to prepare a diagram under section 36 or 38 of the Act shall obtain all the available information in respect of that diagram.

(3) When applying for the information referred to in subregulation (1) or (2), a land surveyor shall furnish a sketch plan or verbal description of the land indicating the approximate location of the portion to be surveyed, or the diagrams required in relation to surrounding pieces of land.

Survey instruments

5. (1) Every land surveyor shall ensure that instruments and equipment which he or she uses for any survey or which are used in a survey for which he or she is responsible are in proper working order.

(2) The Surveyor-General may, at any time request a land surveyor to make available for testing by the Surveyor-General, the instruments or equipment which the land surveyor uses for surveying.

(3) A land surveyor who receives a request made under subregulation (2) shall comply with that request and he or she shall furnish the Surveyor-General with any calibration certificate and any other documentary evidence which proves that subregulation (1) has been complied with.

(4) After making a request under subregulation (2) and receiving the documents referred to in subregulation (3), the Surveyor-General may test the instruments or equipment and if he or she is satisfied that -

- (a) the instruments are or the equipment is suitable for survey work, he or she may assign an official number to each instrument or to the equipment;
- (b) the instruments are or the equipment is unsuitable for survey work he or she may, in writing, declare that they are or it is so unsuitable and advise the land surveyor concerned.

(5) No land surveyor shall use instruments which have or equipment which has been declared unsuitable under subregulation (4)(b) unless the instruments comply or equipment complies with the requirements of subregulation (1) and the Surveyor-General has confirmed that fact in writing.

Field measurements and observations

6. (1) A land surveyor shall determine the positions of all stations, beacons, landmarks and boundaries within the limits of accuracy specified in regulation 9 and he or she shall check the accuracy of every part of each survey carried out by him or her or under his or her control.

(2) In the case where topographical or other features have a bearing on the determination of the position of a beacon or boundary, those features shall be fixed with a degree of accuracy commensurate with the purpose for which they are required.

(3) Unless a point is otherwise adequately checked -

- (a) when its position is determined by intersection or trilateration, the angle at the vertex of any triangle used in such determination shall not be less than 30 degrees nor greater than 150 degrees;
- (b) its position shall not be determined by resection from less than four points favourably situated, and the observations used in such determination shall consist of not less than two arcs, unless three of the points are within 3 000 metres of the point being determined, in which case only one arc need be observed;
- (c) its position shall not be determined by a single triangle only, unless observations are made at all three points and on at least two different parts of the circle;
- (d) its position shall, in a SBP survey, be determined from at least two known points.

(4) Angular observations at any station or beacon shall consist of at least one arc when observed over distances exceeding 1 000 metres, or over any distance of more than 100 metres when the slope exceeds 10 degrees.

(5) When witness marks are placed as stipulated in regulation 15 the measured distance from the beacon to such witness marks shall be recorded in the field book.

- (6) (a) Points which are co-ordinated by photogrammetric methods shall -
 - (i) fall wholly within the perimeter of the ground control points;
 - (ii) be measured in at least two stereoscopic models where the base over height ratio shall not be greater than 0.80, or be measured in at least four photographs for bundle intersections, where the intersection for any pair of rays shall not be less than 30 degrees and not greater than 150 degrees;

- (iii) be positively identified on the photographs by the land surveyor.
- (b) Every beacon, the co-ordinates of which have been determined photogrammetrically, shall be adequately checked by the land surveyor, but however, all block corners shall, unless otherwise checked, be checked by the measurement in the field of at least two distances terminating at that block corner, where the difference in the directions of the two check distances shall not be less than 30 degrees and not greater than 150 degrees.

(7) Unless otherwise adequately checked by the land surveyor, in a township, the relative positions of adjacent beacons in close proximity to one another which have been determined independently of one another or from distances greater than 300 metres shall be verified by the measurement of at least two distances terminating at such beacons, as long as the difference in the directions of the two check distances is not less than 30 degrees and not more than 150 degrees.

(8) When traversing between two fixed points, observations must be taken at both fixed points in order that the traverse may be properly adjusted, unless the orientation is otherwise adequately checked.

Measurement of distances

7. (1) The unit of measurements for all distances shall be the metre.

(2) Measured distances shall be corrected for slope and for all factors to enable the correct plane distance to be obtained and measurements made in the course of a survey based on trigonometrical stations shall, in addition, be reduced to sea level and corrected for scale enlargement factor.

Connection to the National Control Survey System

8. (1) Any survey of land shall be based on the national control survey system but, the Surveyor-General may, in exceptional circumstances and subject to necessary conditions which he or she may impose, exempt any survey from the operation of this subregulation.

(2) When beacons are co-ordinated by means of SBP techniques, sufficient SBP vectors shall be measured to determine the local relationship between the SBP reference datum and the national control survey reference datum by connection to at least three trigonometrical stations or reference marks which are nearest to the land under survey and to any trigonometrical station or reference mark within the boundaries of the land under survey and the survey shall fall wholly within the perimeter of these trigonometrical stations or reference marks.

(3) A land surveyor may use the co-ordinate value of any survey station or beacon whose position on the trigonometrical survey system has been determined in the manner and with a degree of accuracy acceptable to the Surveyor-General and whose physical position has been verified by the land surveyor concerned.

(4) When a visible feature of a permanent nature which is not situated on ground level is surveyed for the purpose of registering a servitude or lease, the difference in height between the feature and two permanent survey stations in the vicinity of the land being surveyed, shall be determined.

Limits of allowable error in field work

9. (1) For the purpose of this regulation -
- (a) class A refers to:
- (i) the determination of reference marks established under section 20 of the Act;
 - (ii) the fixing of reference marks in previously surveyed townships; and
 - (iii) any other determination which the Surveyor-General may make,
- (b) class B refers to:
- (i) the survey of new townships;
 - (ii) the survey or subdivision of an erf in an existing township;
 - (iii) the survey for the replacement of a beacon in a township; and
 - (iv) the survey for the preparation of a diagram required under the law relating to the registration of mining titles in respect of precious stones and metals,
- (c) class C refers to all surveys not included in class A or B, and includes surveys for mining titles in respect of base materials.

(2) The accuracy with which a survey, other than the survey referred to in subregulation (3), shall be done, shall be in accordance with Item 7 of the Annexure and is expressed by the following formulae -

- (a) when the position of a point is determined by polars, traverse, triangulation, trilateration, SBP or a combination of these methods, the displacement between any observed ray, measured distance or SBP vector and the equivalent quantity derived from the final co-ordinates of the point fixed shall not exceed -
- (i) for class A-A metres;
 - (ii) for class B-1.5A metres; and
 - (iii) for class C-3A metres,

where A is equal to -

$$0.012 + \frac{0.082S}{3S + 1000} + \frac{0.15S}{100\,000}$$

and S is the distance in metres between the known and the unknown point but, in the case of a SBP vector, the comparison is made between the vector derived from the final co-ordinates and the measured vector after the datum transformation has been applied and in the case of a traverse, the comparison is made to the misclosures of the traverse, where S is the total length of the traverse in metres; and

- (b) when the position of a beacon in a township is checked by the measurement of distances from adjacent beacons, the difference between a single measured distance and the adopted final distance shall not exceed 0.06 metres.

(3) The error in a survey made for the purposes of determining the position of a curvilinear boundary shall not exceed the limits set for class C.

(4) The position of a curvilinear boundary shall be determined with an accuracy commensurate with tacheometric measurement.

(5) The Surveyor-General may determine a standard of accuracy for any survey operation not specified in this regulation.

Limit of allowable difference from original survey

10. (1) For the purpose of section 14 of the Act, the limit of disagreement from the existing diagram is -

$0.2d$

where d represents the distance in metres derived from data on the existing diagram between any two beacons affected by the subdivision and any portion of a boundary line shall be deemed to be within the limit when the whole of such boundary line is within such limit.

(2) The limits of allowable difference referred to in sub-regulation (1) shall not exceed the limits set out in Item 6 of the Annexure.

Adoption of data for alignment purposes

11. (1) When the position of a terminal beacon has previously been properly identified and determined on the trigonometrical system, the co-ordinates of that beacon may be adopted for the purpose of alignment, as long as any beacon is not placed so close to that terminal beacon that its alignment could be appreciably affected by such survey errors as could normally be expected in the determination of the position of the terminal beacon.

(2) The data defining an unbeaconed point in relation to an indicatory beacon and obtained in the process of correcting the alignment of a beacon as specified in regulation 15, may be adopted without verification for the purpose of any new diagram.

Curvilinear boundaries

12. (1) When the centre line of a railway forms or defines an existing boundary, the intersections of that centre line with the rectilinear boundaries, and when necessary, the ends of the straights, shall be accurately determined.

(2) The position of a railway curve defining an existing boundary may be determined by any survey method as long as -

(a) that determination conforms with the standard of accuracy specified in regulation 9; and

(b) points surveyed on that railway curve shall not be more than 30 metres apart, unless the elements of the curve are accurately determined, or the curve is determined by photogrammetric methods.

(3) Notwithstanding subregulation (2), it shall not be necessary to re-determine the radius and the centre of a circular railway curve which forms or defines an existing boundary, when that curve has previously been accurately determined.

(4) Wire fences, railway fences, roads (except those roads which are proclaimed roads as defined in section 1 of the Roads Ordinance, 1972 (Ordinance No. 17 of 1972) and have been surveyed), streams which are liable to change course or any regular curves or natural or artificial features which are not permanently or clearly defined, shall not be adopted as new boundaries.

(5) When a land surveyor is prevented from obtaining access to the middle of a river forming a boundary, he or she may determine its position by surveying the position of one of the banks and the widths at critical points.

(6) When a river boundary is described on an original diagram in ambiguous terms, but the land is depicted as extending to a bank, and when the ambiguity is not removed under section 28 of the Act, the position of that bank shall be determined for the purpose of representing it on a new subdivision diagram.

(7) The Surveyor-General shall not permit a curvilinear boundary to be substituted by a boundary of another character, unless he or she is satisfied that the two boundaries are so nearly coincident that no material alteration in area of land has taken place by reason of the substitution.

(8) The survey records relating to a survey conducted under subregulation (7) shall include a plan showing complete details of the new boundary together with the relevant numerical data for inclusion in a new diagram that may be required to be framed on any property so affected.

(9) Photogrammetric methods that have been accepted by the Surveyor-General may be used for determining the position of any curvilinear boundary as long as the annotation of that boundary on an aerial photograph is done in the field and is the personal responsibility of the land surveyor concerned.

Physical features affecting rights of ownership

13. During the survey of any land, sufficient observations, measurements and sketches shall be made to enable physical features affecting rights of ownership such as roads and railway lines to be determined but, the positions of those physical features may be obtained from large scale modern maps or from aerial photographs as long as the positions of those physical features which are liable to change are verified.

Alignment of existing boundaries

14. (1) When surveying a piece of land, any existing beacon which is supposed to be on a straight line boundary common to that piece of land and other land, a surveyor shall, subject to subregulation (6), proceed as follows -

- (a) when the terminals of the common boundary line are lawfully established beacons or are well ascertained beacons recognised by all parties, the beacon if not on a straight line joining the terminals shall, subject to subregulation (5), be replaced on line unless it is a lawfully established beacon of the land under survey;
- (b) when the terminals of the common boundary line are not lawfully established beacons, and the positions of one or both is doubtful, the beacon, if not on line, may be adopted as long as it is a well ascertained beacon recognised by all parties and in respect of which an agreement similar to the one contained in the First Schedule to the Act has been signed by all parties and lodged with the Surveyor-General.

(2) Where a beacon which is supposed to be on the common boundary referred to in subregulation (1), of a piece of land adjoining that under survey is found not to be on line, it need not be dealt with as long as -

- (a) if it is a lawfully established beacon, it shall be adopted as a beacon of the land under survey; and
- (b) if it is a well ascertained beacon recognised by all parties and in respect of which an agreement similar to the one contained in the First Schedule to the Act has been signed by all parties concerned and lodged with the Surveyor-General, may be adopted as a beacon of the land under survey.

- (3) In cases not provided for in this regulation, a land surveyor shall -
- (a) investigate the matter thoroughly and collect all available information and evidence to enable him or her to place beacons in the most likely positions;
 - (b) submit to the Surveyor-General, any agreement referred to in this regulation;
 - (c) take cognisance of beacons and boundaries of a township along the straight line boundary; and
 - (d) submit to the Surveyor-General, a full report detailing all the evidence on which the land surveyor based his or her action as well as the relevant survey records.
- (4) When correcting the alignment of a beacon as provided for in this regulation, a land surveyor shall, as a rule, place the relevant beacon at the intersection of the boundary line of which it forms a terminal, with the straight line on which it is supposed to be.
- (5) For the purpose of this regulation, a beacon shall be deemed not to be on the true and correct boundary when its displacement exceeds $0.06 + d/4000$ metres with a maximum of 900 millimetres but a beacon need not be moved in order to correct its alignment when its displacement falls within the limits of $0.06 + d/2000$ metres with a maximum of 900 millimetres, where in both cases, "d" is the distance in metres from that beacon to the nearest terminal, or point justifiably adopted as the terminal under this regulation, and in cases where it is necessary to correct alignment, if the relevant beacon is not placed on line -
- (a) it shall be used as an indicatory beacon for the unbeaconed point as a corner of the land under survey; and
 - (b) any data which may be necessary to define the position of that unbeaconed point in relation to that indicatory beacon shall be recorded on any new diagram affected by the alignment.
- (6) Where a land surveyor is able to identify a beacon previously placed on line and in respect to which survey records have been approved, and the Surveyor-General is satisfied that the alignment was correctly done, that beacon need not be re-tested for alignment.

PART IV
BEACONS, TRIGONOMETRICAL STATIONS
AND REFERENCE MARKS

Specifications for beacons and witness marks

15. (1) Unless as otherwise provided for in regulation 17, the corner points of every surveyed piece of land shall be marked by beacons which shall comply with the following minimum requirements -
- (a) for land situate in a township the beacon shall be an iron peg 12 millimetres in diameter or a galvanised iron pipe 15 millimetres in diameter, either of which must be at least 400 millimetres in length and driven vertically and flush with the surface of the ground;
 - (b) for rural land and land situate in a settlement -
 - (i) the beacon shall be an iron standard weighing approximately three kilograms per metre and one metre long or an iron peg or a galvanised iron pipe 20 millimetres in diameter and at least 600 millimetres in length;

- (ii) the beacon referred to in subparagraph (i) shall be driven vertically into the ground and shall not project more than 150 millimetres above the surface of the ground;
 - (iii) the beacon referred to in subparagraph (i) shall be marked by a cairn of stones 600 millimetres high with a base of 600 millimetres in diameter or a solid stone or concrete block 900 millimetres in length and 225 square centimetres in cross-section and firmly planted into the ground to a depth of at least 600 millimetres, or marked in some other identifiable manner.
- (2) Notwithstanding subregulation (1) -
- (a) if the corner point falls in soft or sandy ground, the length of the standard, peg or pipe shall be increased sufficiently to ensure the stability and permanence of the beacon;
 - (b) if it is not possible to drive the standard, iron peg or pipe into the ground, the corner point shall be defined by a hole of sufficient depth drilled into the obstructing rock, pavement or structure;
 - (c) if the corner point falls on hard or rocky ground and the standard, peg or pipe cannot be driven in to the depth specified in subregulation (1), the standard, peg or pipe's length may be reduced, if the stability and permanence of the beacon will not be impaired, otherwise the corner point shall be defined by a standard, peg or pipe which is at least 300 millimetres in length and embedded in a symmetrical block of concrete 15 000 cubic centimetres in volume,
 - (d) when necessary, any standard, peg or pipe may be embedded in a symmetrical block of concrete; and
 - (e) where the piece of land constituting the perimeter of a proposed township is surveyed or re-surveyed at the same time as the township, the requirements of subregulation (1)(a) shall, subject to necessary changes, apply to that survey or re-survey.
- (3) In the case of a post the following conditions apply -
- (a) when the post forms part of a properly erected fence and occupies a corner point of land being surveyed, it may be adopted as a beacon;
 - (b) in the case of rural land being surveyed, the corner post shall be distinguished from other fence posts in the vicinity in some physical manner; and
 - (c) a peg shall not be placed at the foot of the corner post for the purposes of identification.
- (4) In surveying rural land, a land surveyor may place two or more witness marks in respect of each beacon which he or she determines during the course of the survey, and the witness marks should consist of iron pegs which -
- (a) are not less than ten millimetres in diameter and at least 450 millimetres long; and
 - (b) shall be driven in below the surface of the ground at a distance of approximately five metres from the beacon and along the boundaries meeting at that beacon,

but where necessary, witness marks may be placed at any distance other than the distance referred to in this regulation.

(5) Any person who wishes to depart from the requirements for beacons specified in this regulation may only do so with the approval of the Surveyor-General.

(6) Where during the survey of a piece of land, a beacon which should define one of its corner points is missing, is in a dilapidated condition or is composed of inferior type of material, it shall be replaced or repaired so that it complies with the requirements of this regulation.

(7) No person shall use a trigonometrical station erected by the Surveyor-General as a new beacon.

(8) This regulation shall not apply to the survey of a mining right.

When beacons are not required

16. (1) It shall not be necessary to define any corner point by a beacon -

- (a) where the corner point coincides with the corner of a permanent building, which shall, in that case be adopted as a beacon;
- (b) where the corner point is in such close proximity to the corner of a building that a beacon cannot be conveniently placed in position, in which case the position of the corner of the building shall be accurately determined for use as an indicatory beacon;
- (c) where the area affected by a servitude is of defined width and in that case it shall be necessary to place beacons along one side of the area or on a convenient line indicatory to that side;
- (d) at the ends of the straight of a railway line forming a boundary;
- (e) when the purpose of the beacon will fall away by consolidation of title; or
- (f) in the case of a servitude based on visible physical features of a permanent nature.

(2) The Surveyor-General may waive the requirement to erect or restore a beacon when he or she considers that the erection or restoration of the beacon will serve no useful purpose.

Indicatory beacons

17. (1) Where a corner point of a piece of land or the beacon of a real right falls in an inaccessible or insecure position or in a position where it is unsuitable to place a beacon, that position shall be preserved by means of indicatory beacons.

(2) Except as otherwise provided in regulation 15(6), an indicatory beacon shall be placed on each of two of the rectilinear boundaries meeting at such corner point and as close thereto as will be consistent with its safety, but, it shall not be placed in a position where it could be mistaken for the corner beacon and it shall not be necessary to place an indicatory beacon when -

- (a) permission not to do so has been obtained from the Surveyor-General; or
- (b) it cannot be placed on line due to the existence of an obstructing building or other permanent structure.

(3) An indicatory beacon for defining the intersection of a rectilinear boundary with a curvilinear boundary shall be placed -

- (a) on the rectilinear boundary as near to the intersection as circumstances permit without endangering the permanency of the beacon; and

- (b) where it is practicable, on the same side of the curvilinear boundary as the land under survey.

(4) Where the removal of a beacon has been authorised under section 33 of the Act and it is not possible to replace the beacon in its original position the land surveyor conducting the survey shall -

- (a) place indicatory beacons where possible one on each of the straight boundary lines meeting there or in such other positions which have been authorised by the Surveyor-General; and
- (b) without delay, furnish the Surveyor-General with all information which would enable the Surveyor-General to record the positions of the indicatory beacons on the relevant diagrams.

Marking of survey stations

18. Favourably situated main survey stations which are not likely to be disturbed, shall be marked in a permanent manner, preferably by iron pipes or wire nails which are not less than 150 millimetres long.

Damage to and removal of trigonometrical stations, reference marks and bench marks

19. (1) No person shall remove or demolish a reference mark erected under section 20 of the Act, a trigonometrical station or a benchmark unless he or she has, in writing, been authorised to do so by the Surveyor-General.

(2) When a land surveyor has knowledge that a reference mark, trigonometrical station or benchmark has been or is likely to be damaged or destroyed, he or she shall immediately supply that information to the Surveyor-General.

Reference marks

20. (1) In the survey of new townships, extensions to existing townships or the subdivision of an erf, reference marks shall be placed at convenient intervals and in suitable positions, but -

- (a) not less than two reference marks shall be placed;
- (b) in general the reference marks shall be placed in the order of 300 metres from each other; and
- (c) in the case of the subdivision of an erf, the reference marks may only be placed if a general plan is required under regulation 50.

(2) Notwithstanding subregulation (1), the Surveyor-General may, after an application has been made to him or her, relax the requirements of subregulation (1).

(3) A person who is carrying out a survey pursuant to subregulation (1) shall, for the purpose of determining the most suitable position of the reference marks so as to obviate the possibility of destruction of those reference marks by the subsequent installation of service facilities, consult with the local authority of the area where the survey is being carried out.

(4) A reference mark erected under section 20 of the Act shall comply with the specifications indicated in Item 11 of the Annexure.

(5) A reference mark referred to in subregulation (4) shall consist of an iron peg or iron pipe -

- (a) which is at least 12 millimetres in diameter and at least 700 metres long; and
- (b) which is set in concrete at least 200 millimetres below the surface of the ground,

but the Surveyor-General may, subject to conditions which he or she may impose, sanction a departure from this subregulation.

PART V DIAGRAMS

Nature, form and size

21. (1) Except as provided in subregulation (4), a diagram shall be framed on one or more rectangular sheets of good durable paper of a quality approved by the Surveyor-General and in accordance with the lay-out, style, specifications and symbols indicated in Item 9 of the Annexure, but -

- (a) where the diagram comprises more than one sheet of paper, a note to that effect and the relevant sheet number shall be placed in a prominent position on each sheet of the diagram; and
- (b) only one side of each sheet of paper shall be used.

(2) A departure from the requirements of subregulation (1) shall be made with the prior approval of the Surveyor-General.

(3) A diagram shall be prepared in good quality black ink or black print which is acceptable to the Surveyor-General and the signature of the land surveyor shall be in black or blue-black ink of good quality.

(4) Unless otherwise authorised by the Surveyor-General, at least one copy of each diagram shall be framed on paper referred to in subregulation (1) and the remaining copies may be prepared on any other material or prepared by a process approved by the Surveyor-General.

(5) The dimensions of a diagram form shall be 297 by 210 millimetres (size A4) but, in exceptional circumstances, the Surveyor-General may permit the use of forms of different dimensions.

(6) The margins of a diagram shall -

- (a) in the case of size A4 forms, be 40 millimetres wide along the left-hand edge of the longer side and ten millimetres along the other sides; or
- (b) in the case of other forms approved by the Surveyor-General, be those permitted by the Surveyor-General.

(7) No writing or drawing shall encroach onto the margins of a diagram but the right-hand margin may be used for initiating alterations.

(8) The Surveyor-General may refuse to approve a diagram which he or she considers to be dilapidated, framed in a careless manner or spoilt in appearance by amendments or additions.

Number of copies required

22. Unless the land being surveyed is to be registered by reference to a general plan, a diagram shall be submitted to the Surveyor-General in single and the Surveyor-General shall prepare and supply the additional copies required for registration but, where a diagram of a size larger than size specified in regulation 21(5) is submitted, the Surveyor-General may call for additional copies required for registration.

Figure

23. (1) Land shall be represented on a diagram by a single figure but two or more parts of a piece of land may be represented on more than one figure, where -

- (a) the diagram is framed for the purpose of amendment or rectification of title as contemplated in section 44 of the Deeds Registries Act, 1937 (Act No. 47 of 1937);
- (b) the diagram is framed for the purpose of consolidation of title and a component portion has been split into parts by the deduction of one or more intervening portions or comprises existing detached portions represented on a single property;
- (c) those parts meet at one or more common points;
- (d) those parts are disconnected by the prior deduction of a strip of road or a railway reserve; or
- (e) a diagram of rural land is framed for the purpose of a single lease in respect of those parts of one parent property.

(2) Where a diagram is framed on any size other than the size specified in regulation 21(5), the figure shall be drawn wholly to the left or right of the central margin.

Scale and plot

24. (1) The figure of a diagram shall be accurately plotted to one of the following scales, 1/1000, 1/1250, 1/1500, 1/2000, 1/2500, 1/3000, 1/4000, 1/5000, 1/6000, 1/7000 or to any of these scales in which the denominator is multiplied or divided by ten to any integral power but, the size of the figure shall not be less than six square centimetres except in the case of a servitude diagram or in circumstances permitted by the Surveyor-General.

(2) Where beacons are in such close proximity to each other that their respective positions cannot be clearly shown without unduly increasing the size of the diagram form, they may be represented in an inset at a larger scale oriented to the main figure.

(3) The scale to which the figure is plotted shall be recorded on the diagram below the figure and the scale of an inset shall be given in the inset.

(4) The plot of the figure shall agree with the data on the diagram within a limit of one millimetre.

Physical features

25. The physical features referred to in regulation 13 shall be depicted on the diagram in the conventional manner indicated in Item 8 of the Annexure.

Land held under different tenures or conditions of title

26. Where, for the purpose of registration, it is necessary to present on a diagram the boundaries of areas held under different tenures or conditions of title, those boundaries shall be represented by black broken lines which shall be lettered and those lines shall be repeated in a similar manner on all subsequent diagrams unless they are no longer required for registration purposes.

How to indicate contiguous properties

27. The directions of the boundary lines of contiguous properties shall be indicated by broken lines drawn from the points representing common beacons, and the names and other designations of such contiguous properties shall be written in their respective positions.

Connecting figure

28. Where it is necessary to depict the connecting figure referred to in regulation 33(1), it shall be indicated on a diagram by broken lines or by means of an inset, and it shall not be necessary to plot such figure to scale if this is found to be inconvenient.

Description and official designation of beacons

29. (1) A diagram shall contain a clear and concise description of each beacon, and of the location of each beacon in relation to any permanent feature in its vicinity and if any beacon is a fence post, this must be stated as a description of that beacon.

(2) A reference to witness marks placed in respect of a beacon and the distance at which those witness marks are placed from the beacon, shall be recorded on a diagram.

Unit of measure

30. On any diagram the sides, and when required the co-ordinates, shall be expressed in metres.

Numerical data

31. (1) Subject to regulation 46(2), a diagram shall contain the following numerical data:-

- (a) subject to regulation 32, the co-ordinates in metres, to two decimal places, of -
 - (i) every corner point defining the rectilinear figure and of every indicatory beacon defining that corner point;
 - (ii) all other corner points in respect of which connecting data is furnished under regulation 33;
 - (iii) all trigonometrical stations within the figure or within 30 metres of any corner point referred to subparagraphs (i) and (ii);
 - (iv) at least two favourably situated trigonometrical stations or two reference marks erected under section 20 of the Act, to which the survey has been connected but the Surveyor-General may waive this requirement;
 - (v) the centre and tangent points of every circular curve forming a boundary, if determined during the course of the survey;
 - (vi) the ends of the straights when the elements of the curve have not been accurately determined and where these straights form part of the boundary of the land being surveyed,
- (b) the length, in metres to two decimal places, of -
 - (i) the sides of the rectilinear figure;
 - (ii) the radius of every circular curve forming a boundary, if determined or adopted during the course of the survey,

but it shall not be necessary to record the distance from an indicatory beacon to an irregular curvilinear boundary,

- (c) directions to the nearest one second of all sides but -
 - (i) when the length of side is less than 1 000 metres, the direction may be expressed to the nearest ten seconds;
 - (ii) when the side is part of a boundary determined during the course of the survey, and whose length exceeds 1 000 metres, the direction of such sides shall be expressed to single seconds;
 - (iii) on a diagram of land in a township, the directions of all lines less than 1 000 metres in length shall be expressed to the nearest ten seconds; and
 - (iv) angles may be recorded on the diagram of an erf, if the erf is represented on an approved general plan on which angles are recorded,
- (d) the area shall be expressed in square metres to the nearest square metre when the area is less than one hectare, otherwise it shall be expressed in hectares to four decimal places, but -
 - (i) when disconnected parts of land are represented on the diagram, only the combined area of those parts shall be recorded;
 - (ii) as a general rule, the area of a servitude need not be recorded,
- (e) subject to regulation 43(2), any data which may be necessary to determine the limits of the figure representing a servitude; and
- (f) any data which is specified in regulation 33.

(2) All data shall be tabulated, but any indicative data may be shown in an insert drawn to an enlarged scale.

(3) When tabulating the data on a diagram, the corner points of the figure shall be referred to consecutively in clockwise order by letters placed outside the figure.

Co-ordinates system: When not required

32. (1) When a survey has been based on trigonometrical stations or reference marks, a reference to the co-ordinate system shall be recorded on the diagram.

- (2) Co-ordinates need not be stated on a diagram -
 - (a) framed from an approved general plan, unless the co-ordinates of each corner point of the land concerned are stated on that general plan;
 - (b) of land situate in a township or settlement, unless the survey or re-survey of that land is based on or connected to trigonometrical stations or to reference marks in the manner specified in regulation 8;
 - (c) compiled for consolidated title in the special circumstances referred to in regulation 46(1)(b) and (c).

Connecting data

33. (1) Where the rectilinear boundary of a subdivision does not coincide, in whole or in part, with a boundary of the land being subdivided, the position of two suitably situated beacons of that land, of a former subdivision of that land, shall be accurately determined and, connecting data, comprising the sides, directions and co-ordinates of the quadrilateral figure connecting those beacons to two beacons of the subdivision shall be furnished on the subdivision diagram, but -

- (a) the co-ordinates shall be omitted when no other co-ordinates are furnished;
- (b) if a diagram of a road or railway traversing the land or of a servitude area within the land is filed in the office of the Surveyor-General, the subdivision may be connected to two suitable beacons represented on that diagram;
- (c) connecting data shall not be furnished on a subdivision diagram when the subdivision survey is based on trigonometrical stations or on reference marks, and any approved survey which included at least two beacons not less than 150 metres apart of the land being subdivided has been similarly based.

(2) Where a rectilinear boundary of a subdivision coincides in whole or in part with a boundary of the land being subdivided, the following data shall be recorded on the diagram:-

- (a) the sides of the remaining extent along the boundary on either sides of the subdivision as well as the co-ordinates of the corresponding terminals, adjusted, if necessary, to coincide with the true and correct boundary determined under regulation 14; and
- (b) the distances from -
 - (i) the terminals referred to in paragraph (a);
 - (ii) the beacons of the subdivision on that rectilinear boundary,to the beacons referred to in regulation 14(1) and (2), if the positions of those beacons have been accurately determined for the purpose of effecting the correct alignment;

(c) the co-ordinates of the terminals referred to in regulation 14(1) and (2).

(3) In spite of subregulation (2)(b) and (c) -

- (a) the co-ordinates of the terminals shall be omitted when no other co-ordinates are furnished;
- (b) if a land surveyor is in a position to effect the correct alignment of the subdivisional beacons without determining the positions of both terminals referred to in subregulation (2)(a), data in respect of only one of those terminals need to be recorded, but if section 8 of the Act applies to the boundary, the position of both terminals shall be accurately determined and the data recorded accordingly;
- (c) the connecting data shall not be recorded if the subdivisional survey is based on trigonometrical stations or reference marks and the co-ordinates of the terminals are similarly based and recorded on an approved diagram, unless it is necessary to redetermine the position of the terminals.

(4) Connecting data shall not be furnished on a subdivisional diagram if that data can be deduced from diagrams of adjoining subdivisions submitted for examination at the same time.

(5) For the purposes of this regulation "terminal" means a beacon which terminates the boundary of the land being subdivided.

