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GUIDELINES ON THE USE OF REAL TIME KINEMATIC (RTK) GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) IN THE CONDUCT OF ALL KINDS OF LOT SURVEYS WITH TERTIARY ACCURACY

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Pursuant to DAO No. 2007-29, "The Revised Regulations on Land Surveys," and in order to keep abreast with the advancement in the modern procedures and technology in surveying and mapping and to improve the delivery of public service, following guidelines for the use of RTK-GNSS is hereby prescribed for the guidance of all concerned:

Section 1. Registration of Receivers. Before Geodetic Engineers can use RTK-GNSS in the conduct of land surveys, the RTK-GNSS Receivers shall first be registered pursuant to Section 22, DAO 2007-29.

Section 2. Procedures and Conditions for the Use of RTK-GNSS

2.1 The RTK-GNSS may also be used in the conduct of all kinds of lot surveys with tertiary accuracy. The survey instrument to be used shall be Dual Frequency Receivers with pertinent specifications as stated in Section 202(g) of the DMC 2010-13, "The Manual on Land Survey Procedures".

2.2 A Real-Time Kinematic survey requires one GNSS receiver as a base station and at least one other GNSS receiver as a rover.

2.3 The GNSS Receiver (base) shall be located on a point which has unobstructed view of the sky, with horizon clearance of at least 15 o in all directions and with known WGS-84 coordinates.

2.4 The RTK Receiver (rover) shall be mounted on a range pole and supported by a bipod during the observation in order to avoid unnecessary movement of the instrument as in the case when it is hand held.

2.5 In the conduct of land survey, the procedures as stated in Sections 20-27 of DMC 2010-13 shall be followed.

2.6 In addition, the following conditions should be present:

a. The lot be subjected to survey shall be located in an open field or

areas wherein all corners shall have a horizon clearance of at least 15 o in all directions.

b. The Electronic Total Station (ETS) shall be used in the following ground situations to augment the RTK:

   1) Lot corners that are surrounded by buildings and other structures where in the 15 o horizon clearance requirement is not met.
   2) Lot corners that are surrounded by deciduous trees with thick canopy because of marginal sky visibility.
   3) Lot corners that coincide with the corner of an existing concrete fence.
   4) Lot corners that coincide with the building wall.
   5) Lot corners located beneath a 20 meter radius high voltage power transmission line and other communication facilities.

c. In cases where lot corners coincide with an existing concrete fence, the RTK may also be used by placing the receiver directly on top of the corner.

d. Monitor the Root Mean Square (RMS) value of the station/location. If the RMS value exceeds 70, transfer to another station/location. For more precise RTK survey, the RMS value should be 35 or below.

e. The RTK observation time or session length to be allotted for each lot corner shall not be less than two (2) minutes. It shall be able to track at least five (5) satellites at each station/location with good geometry.

f. The RTK shall always be initialized prior to start of data collection, maintain lock to satellites and to base station radio signal while transferring from one station/location to another.

g. A baseline with intervisible ends and a length of at least 200 meters but not more than one (1) kilometer shall be established using the RTK instrument within the vicinity preferably not more than one (1) kilometer from the lot. The distance from the RTK observation shall be compared with the distance using the ETS of which the difference shall not be more than one (1) centimeter for every fifty (50) meters or twenty (20) centimeter for every one (1) kilometer. This is equivalent to a Tertiary Accuracy of 1:5,000, required for Lot Survey Accuracy pursuant to Section 29, DAO 2007-29.

Section 3. Contents of Observation Field Notes. The content of GNSS- RTK Observation Field Notes shall be as follows:

3.1 Instrument
   1) Antenna
      a) Type
      b) Serial Number
      c) Set-up (Tripod, Plumbing Pole, etc.)
   2) Receiver
      a) Type