Sec. 10.04 **General Specifications for *GNSS Surveys**

In general, this section is intended to be a guide for any surveyor who is providing VDOT with GNSS data. These procedures are general minimum requirements that must be met by the surveyor in order for the GNSS survey data to be accepted by VDOT. These procedures are for static and rapid static GNSS observations and techniques. Please refer to "**Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques**" for more specific criteria not covered here. When experience and field conditions allow for alternative procedures, at the discretion of the surveyor in charge, then documentation will be provided demonstrating the accuracy obtained and the procedures followed.

1. **GNSS Survey Project Datum.** Unless otherwise instructed, **ALL VDOT GNSS CONTROL SURVEYS SHALL BE REFERENCED TO THE CURRENT PUBLISHED NATIONAL SPATIAL REFERENCE SYSTEM (NSRS) ADJUSTMENT AND THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) SHALL BE THE ELEVATION DATUM.** Only horizontal NAD 83 coordinates and control data observed by GNSS methods from reference stations included in the NSRS will be accepted by VDOT. The NSRS contains GNSS stations and data published from the following network observations: Continuously Operating Reference Stations (CORS), Federal Base Network (FBN) surveys, Cooperative Base Network (CBN) surveys, Area Navigation Approach (ANA) airport surveys, and "Blue-booked" User Densification Network (UDN) GNSS surveys.

2. **GNSS Network Control Procedures.** All GNSS Network Control and Field Survey procedures will conform to the standards as defined in this section, for routine VDOT surveys, shown hereon as **2a** through **2o**. The intent of these procedures is to produce GNSS surveys and data for the **Project Control Monumentation** that meets a geometric accuracy of 1:100,000 at the 68% confidence interval. A list of specifications is included as **Figure 10-P**, for easy reference.

2a. A minimum of three (3) GNSS receivers shall be used simultaneously during all Static & Rapid Static GNSS sessions.

2b. Existing or known points that will be used to control the survey shall be occupied simultaneously during the initial observation sessions. This is a check to ensure that existing, known or network control has not been disturbed and that the published values are, indeed correct. This is an integral part of the mission plan.

2c. Horizontal networks shall be connected to a minimum of two (2) NGS B-order (or higher) stations (see #1 of this section). At least one benchmark shall be used and held fixed for surveys where horizontal values will be paramount. The use of eccentric horizontal stations is not permitted.

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