

unit. The surveyor must provide proof of photo control points being measured at least twice by RTK methods, spot-checked by conventional survey methods, and that the positional differences are insignificant. The surveyor shall verify that the positional accuracy meets or exceeds the survey specifications. RTK techniques are relatively new and therefore are continually evolving as field practices and experience present improved methods of collection. \*RTK surveying techniques are being improved almost daily and are too numerous to outline in this manual. Therefore it is incumbent on, and the responsibility of, the surveyor with responsible charge providing data to VDOT to secure results that would meet similar accuracy standards as other methods outlined herein. It is also required that documentation demonstrating the method of collection, status of base station control, ties to the CORS or HARN, if used, as well as the accuracy acquired, shall be provided along with the deliverable survey data. Any questions regarding field procedures may be directed to VDOT's Geodetic Surveys Engineer.

#### 5. **Utilizing OPUS on VDOT Projects:**

\*This Online Positioning User Service (OPUS) provides simple access to high-accuracy National Spatial Reference System (NSRS) coordinates. By uploading a data file collected with a survey-grade GPS receiver you can obtain an NSRS position via email.

OPUS requires minimal user input and uses software which computes coordinates for NGS' Continuously Operating Reference Station (CORS) network. The resulting positions are accurate and consistent with other NSRS users.

Your solution is sent privately via email, and, if you choose, can also be shared publicly via the NGS website. To use properly, please familiarize yourself with all the information provided on the National Geodetic Survey website <http://www.ngs.noaa.gov/OPUS/>.

As with RTK GNSS procedures outlined above it is permissible to use OPUS for establishing data for VDOT Projects as long as measures and care are taken to achieve similar accuracy results that meet or exceed the accuracy results that would otherwise be achieved by using Static or Rapid-Static procedures outlined in this manual.

The responsible charge surveyor shall verify that the positional accuracy meets or exceeds the required survey specifications. OPUS techniques are relatively new and therefore are continually evolving as field practices and experience present improved methods of collection. OPUS surveying techniques are being improved almost daily and are too numerous to outline in this manual. Therefore it is incumbent on, and the responsibility of, the surveyor with responsible charge providing data to VDOT to secure results that would meet similar accuracy standards as other methods outlined herein. It is also required that documentation demonstrating the method of collection, status of base station control used, ties to the CORS or HARN, as well as the accuracy acquired, shall be provided along with the deliverable survey data. OPUS provides an

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