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# WALKER SURVEYING COMPANY

January 17, 2020

Town Hall  
Town of White Lake, N.C. 28337

## RE: ELEVATION GAUGE


Ladies and Gentlemen;

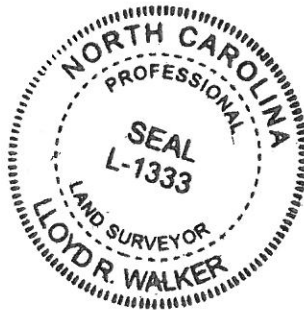
Please consider this a MEMORANDUM of Survey Work performed in conjunction with herewith submitted Drawing entitled Spot Elevations For TOWN OF WHITE LAKE "SPILLWAY" dated December 18, 2017, and Revised January 16, 2020, to provide additional Elevations and Gauge Installation Information. Field Survey Data for both the Original and Revised Survey Dates, and subsequent Data Reduction, and Field Staking for Setting the Furnished Water Elevation Gauge, were all performed by Jason S. Walker, NC PLS No. L-5147. Referenced Vertical Datum used on both Survey Dates was NAVD 88. A comparison of this Datum with the Older Datum NGVD 29, which has been used for many Utility Projects at White Lake over the years, is that the Elevation Number for the Newer Datum (NAVD 88) is Approximately 1.0 Foot LOWER than the Elevations Number for the Older (NGVD 29) Datum. The observed Top of Lake Water Elevations on Both Survey Dates were both the same (64.50 Feet – NAVD 88).

The Survey Work for setting the referenced Water Elevation Gauge was performed in accordance with the Standards of Practice for Land Surveying in the State of North Carolina.

Thank you for the opportunity to provide this service; and we will be glad to address any questions or comments.

Sincerely,

  
Lloyd R. Walker, P.L.S.  
Walker Surveying Company



# VERTCON - North American Vertical Datum Conversion

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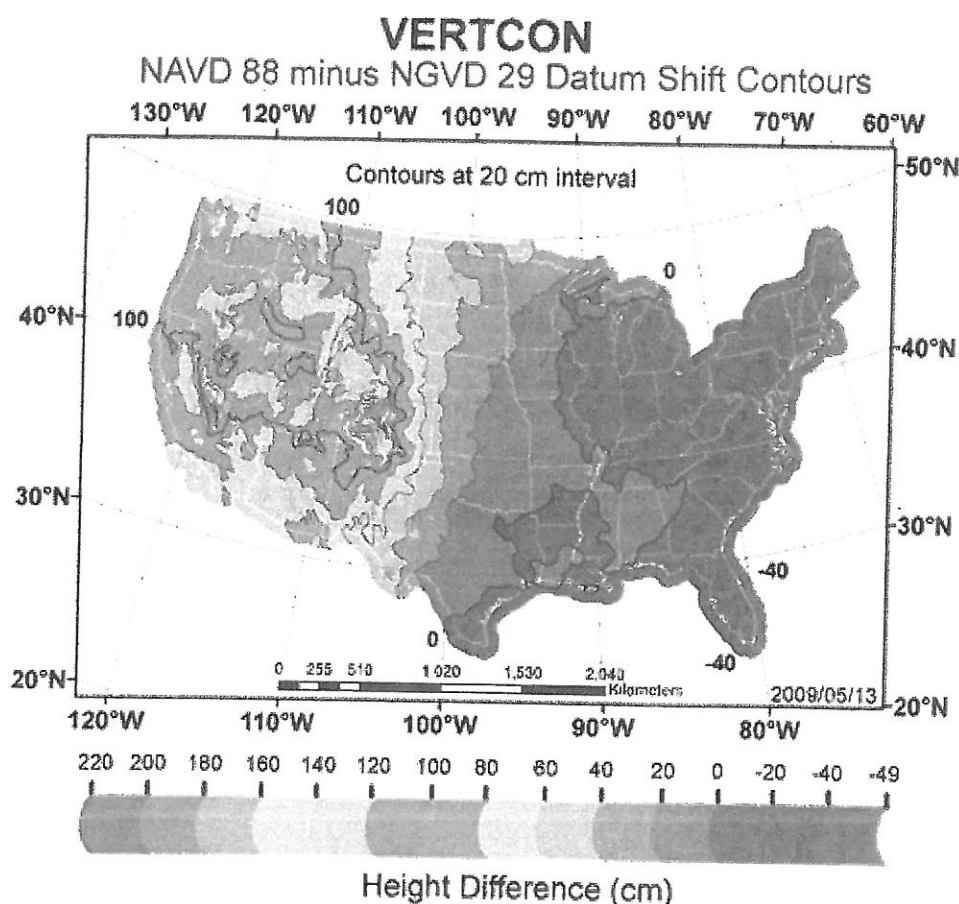


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See the text version of an [article](#) about VERTCON that appeared in the *Professional Surveyor* magazine, March 2004 Volume 24, Number 3

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# National Geodetic Survey (NGS) Height Conversion Methodology

**This process is designed to provide datum shift between the NAVD 88 and NGVD 29 vertical datums at specified geographic position.**

Dennis G. Milbert, Ph.D.

05/12/1999

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## METHOD

Program VERTCON computes the modeled difference in orthometric height between the North American Vertical Datum of 1988 (NAVD 88) and the National Geodetic Vertical Datum of 1929 (NGVD 29) for a given location specified by latitude and longitude.

The VERTCON 2.0 model was computed on May 5, 1994 using 381,833 datum difference values. A key part of the computation procedure was the development of the predictable, physical components of the differences between the NAVD 88 and NGVD 29 datums. This included models of refraction effects on geodetic leveling, and gravity and elevation influences on the new NAVD 88 datum. Tests of the predictive capability of the physical model show a 2.0 cm RMS agreement at our 381,833 data points. For this reason, the VERTCON 2.0 model can be considered accurate at the 2 cm (one sigma) level. Since 381,833 data values were used to develop the corrections to the physical model, VERTCON 2.0 will display even better overall accuracy than that displayed by the uncorrected physical model. This higher accuracy will be particularly noticable in the eastern United States.

It should be emphasized that VERTCON 2.0 is a datum transformation model, and can not maintain the full vertical control accuracy of geodetic leveling. Ideally, one should process level data using the latest reduction software and adjust it to established NAVD 88 control. However, VERTCON 2.0 accuracy is suitable for a variety of mapping and charting purposes.

Most horizontal positions of the bench marks used to generate VERTCON were scaled from USGS topographic maps. The estimated uncertainty of the scaled positions, 6", is greater than the differences between NAD 27 and NAD 83. Therefore, the latitude and longitude provided to VERTCON can be on either the NAD 27 or NAD 83 datum.

The VERTCON 2.0 model expresses datum differences between NAVD 88 and NGVD 29 due to removal of distortions in the level data, as well as due to the physical differences in the height systems. In some rare cases, these local NGVD 29 distortions could be 20 cm or more. If both ends of your old vertical survey were tied to one of these "problem" lines, then the datum difference of the problem line is appropriate to use to transform the survey data. If both ends of a vertical survey are tied to "undistorted lines", then it is appropriate to use a slightly distant point to compute the transformation, no matter how close your survey data may approach a given problem line. The possible presence of a problem NGVD 29 line in the vicinity of your survey will become evident if dramatically different datum transformation values are computed

within a small area.

It must also be emphasized that VERTCON 2.0 is not to be considered reliable beyond the boundaries of the lower 48 United States. Future versions of VERTCON may be extended into neighboring countries. The National Imagery and Mapping Agency (NIMA - previously the Defense Mapping Agency) has been of immense help in this endeavor. NIMA has provided a major portion of the NGS land gravity data set. NIMA has also been instrumental in the creation of the various 30" elevation grids in existence. Although the work of the NIMA generally precludes public recognition, their cooperation in this work is gratefully acknowledged.

Questions concerning the VERTCON process may be mailed to NGS

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Latitude: 34.3848

Longitude: 078.3034

NGVD 29 height:

Datum shift (NAVD 88 minus NGVD 29): -0.307 meter

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NAVD 88 is lower than NGVD 29 in the east, so the conversion factor will be a negative number. The elevation converted to NAVD 88 will be a lower number than the elevation in NGVD 29.