

# COUNTY OF YORK, VIRGINIA

## 1989 HORIZONTAL AND VERTICAL CONTROL MONUMENTATION REFERENCE AND RECOVERY DATA



## FEBRUARY 2005 SUPPLEMENT

1990 Supplement Data begins on page 9.

PREPARED BY:

PRECISION MEASUREMENTS, INC.  
SURVEYORS • GPS • 3-D SCANNING • MAPPERS  
NEWPORT NEWS, VIRGINIA

SUMMARY OF CHANGES INCORPORATED  
INTO THE FEBRUARY 2005 SUPPLEMENT

<u>Station No.</u>	<u>Changes</u>
012 – RESET	Original Main Station destroyed New Main Station set New Main Station elevation established
014 – RESET	Original Main Station destroyed Original RM1, RM2 and RM3 destroyed New Main Station set New Main Station elevation established New RM3R set
027 – RESET	Original Main Station destroyed Original RM1, RM2 and RM3 destroyed New Main Station set New Main Station elevation established New RM3R set
037 – RESET	Original Main Station destroyed Original RM1 and RM2 destroyed New Main Station set New Main Station elevation established

<u>Station No.</u>	<u>Changes</u>
068 – RESET	Original Main Station destroyed Original RM1 and RM2 destroyed New Main Station set New Main Station elevation established
069 – RESET	Original Main Station destroyed Original RM2 and RM3 destroyed New Main Station set New Main Station elevation established New RM3R set
089 – RESET	Original Main Station destroyed Original RM3 destroyed New Main Station set New Main Station elevation established New RM3R set
095 – RESET	Original Main Station destroyed Original RM1 destroyed New Main Station set New Main Station elevation established
102 – RESET	Original Main Station destroyed Original RM1, RM2 and RM3 destroyed New Main Station set New Main Station elevation established New RM3R set

<u>Station No.</u>	<u>Changes</u>
105 – RESET	Original Main Station destroyed New Main Station set New Main Station elevation established
111 – RESET	Original Main Station destroyed Original RM1, RM2 and RM3 destroyed New Main Station set New Main Station elevation established New RM3R set
121 – RESET	Original Main Station destroyed Original RM1, RM2 and RM3 destroyed New Main Station set New Main Station elevation established New RM3R set
125 – RESET A	Original Main Station destroyed Original RM1 destroyed New Main Station set New Main Station elevation established

# NOTICE TO USERS

## Physical Description of Station Marks:

The stations consist of 3-½” diameter domed brass disks set in 6” diameter concrete posts. The disks are stamped with a “STATION” number and a point in the center of a triangle in the center of the disk. The posts are cast in place, 36” in depth, and contain a ¾” diameter reinforcing bar 36” in length for metal detection and stability. Each station is accompanied by one (1) distant reference/azimuth mark. Select stations are also accompanied by one (1) or two (2) nearby reference marks, when said reference marks had not been previously destroyed.

The reference monuments are of the same type of construction as the station monument, but are easily distinguished from the main stations by the size and markings of the disks. The reference mark disks are only 2” in diameter and are stamped “REFERENCE MARK” with a crossed arrow in the center pointing to the main station monument.

The reference and recovery data sheets provide a complete and detailed description of the location of each individual main station and their respective reference marks. To avoid unnecessary excavation, please note the location of the monument with respect to the ties given in the Location Sketch and the descriptions given on the reverse side of the reference and recovery data sheet before digging.

## Units:

The coordinates of each main station refer to the Virginia Coordinate System of 1983 – South Zone and are provided in meters and U.S. Survey Feet; additionally, all bearings are state plane grid bearings. The conversion from meters to U.S. Survey Feet is as follows:

1. To convert from meters to U.S. Survey Feet, multiply meters by (39.37/12) exact, or 3.280833333 approximate

### Scale Factor:

The scale factor is used to convert field measurements to plane distances. Throughout the County of York project area the scale factor is slightly less than one and is a function of latitude (northing). For most small survey projects and average scale factor will produce adequate results. The scale factor at each control station is printed on the reverse side of the reference and recovery data sheet. All published distances are plane distances incorporating the scale factor.

### *Example:*

A survey project is located approximately midway between Stations 002 and 003.

To determine an average scale factor for the survey project, simply average the scale factors of Stations 002 and 003.

Scale factor of Station 002	=	0.99994540
Scale factor of Station 003	=	0.99994543
Project scale factor	=	0.999945415

To determine a reduced horizontal field measurement of 4863.20 feet to a plane distance, multiply the field measurement by the scale factor.

4863.20' (field distance) x 0.999945415 = 4862.93 (plane distance). The scale factor must be applied to all measured distances to compute plane coordinates.

### Convergence:

The convergence angle is used to convert geodetic or astronomic<sup>1</sup> azimuth to state plane azimuth. The convergence angle at each control station is printed on the reverse side of the reference and recovery data sheet

and is subtracted from an astronomic azimuth to determine the state plane azimuth of a line.

*Example:* An astronomic azimuth of a line from Station 001 to a monument is determined to be 176°16'45". The state plane azimuth equals the astronomic azimuth minus the convergence angle.

$$\begin{aligned} \text{State Plane Azimuth} &= 176^{\circ}16'45'' - 01^{\circ}03'44'' = 175^{\circ}13'01'' \\ \text{State Plane Grid Bearing} &= \text{S } 04^{\circ}46'59'' \text{ E} \end{aligned}$$

<sup>1</sup>While the geodetic azimuth and the astronomic azimuth are not exactly equal, the difference is negligible for most survey projects.

Vertical Datum:

Vertical elevations are based on the National Geodetic Vertical Datum of 1929. The station elevations are based on the current County of York published values for the following monuments:

<u>Station No.</u>	<u>Current Published Vertical Value (in Feet)</u>
013	118.53
015	124.74
025	87.77
031	84.57
038	99.99
070	25.13

<u>Station No.</u>	<u>Current Published Vertical Value (in Feet)</u>
090	9.90
094	3.74
104	56.64
116	12.12
117	10.82
128	17.91
130	27.55

These existing County of York monuments are well distributed throughout the County. All new stations were heighted using static GPS methods, with a minimum of two (2) separate occupations for each point and a minimum of thirty minute occupation times.

It appears that the adjustments to the datum by NGS have lowered the vertical plane by approximately 0.38 feet from the values published by A.D.R. Associates in 1974. Extreme caution should be exercised in attempting to integrate any previously published data with data contained herein.

Notification of Disturbed or Destroyed Monuments:

Your assistance is requested in reporting any monument found to have been or subject to being moved, disturbed or destroyed. Please contact the Department of Environmental & Development Services, County of York, at (757) 890-3752.

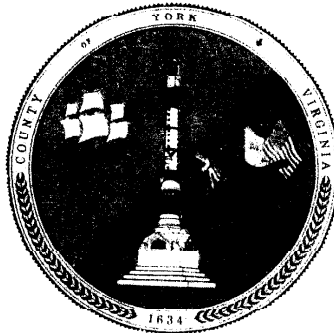
Use of Previously Published Data:

Again, extreme caution should be exercised in attempting to integrate previously published horizontal and vertical data with the data contained herein.



# COUNTY OF YORK, VIRGINIA

## 1989 HORIZONTAL AND VERTICAL CONTROL MONUMENTATION REFERENCE AND RECOVERY DATA



APRIL 1990 SUPPLEMENT

PREPARED BY:

**ROUSE-SIRINE ASSOCIATES, LTD.**

SURVEYORS • PLANNERS  
VIRGINIA BEACH, VIRGINIA

**SUMMARY OF CHANGES INCORPORATED  
INTO THE APRIL 1990 SUPPLEMENT**

<u>Station No.</u>	<u>Changes</u>
019-RESET	Original Main Station destroyed New Main Station set New Main Station elevation established
023-RESET	*New Main Station set New Main Station elevation established New RM4 set
028	Original RM3 destroyed New RM4 set
033-RESET	Original Main Station destroyed New Main Station set New Main Station elevation established New RM4 set
039	New witness post and witness post location at Main Station
057-RESET	Original Main Station destroyed New Main Station set New Main Station elevation established
060	New witness post and witness post location at RM2

\*Existing Main Station and RM1 subject to destruction due to pending roadway construction.

Station No.

Changes

065-RESET

Original Main Station destroyed  
New Main Station set  
New Main Station elevation established

066

New witness post and witness post location at RM3

072

New witness post and witness post location at Main Station

073

New witness post and witness post location at Main Station  
and RM1

075

Original RM3 destroyed  
New RM4 set

083

RM3 description corrected (utility pole number)

084

New witness post and witness post location at Main Station  
and RM2

095

New witness post and witness post location at Main Station

105

New witness post and witness post location at RM2

110

New witness post and witness post location at RM3  
Description corrected (Direction of RM3 from  
utility pole #KB-40)

112

Corrected RM1, RM2 and RM3 bearings

<u>Station No.</u>	<u>Changes</u>
113-RESET	Original Main Station destroyed New Main Station set New Main Station elevation established
116	New witness post and witness post location at RM1
121	New witness post and witness post location at RM1
123-RESET	Original Main Station destroyed New Main Station set New Main Station elevation established
125-RESET	Original Main Station destroyed New Main Station set New Main Station elevation established
126	New witness post and witness post location at Main Station, RM1 & RM2
127	New witness post and witness post location at Main Station
129	New witness post and witness post location at RM2

# NOTICE TO USERS

## Physical Description of Station Marks:

The stations consist of 3/4" diameter domed alloy disks set in 6" diameter concrete posts. The disks are stamped with a "STATION" number and a point in the center of a triangle in the center of the disk. The posts are cast in place, 36" in depth, and contain a 3/4" diameter reinforcing bar 36" in length for metal detection and stability. Each station is accompanied by two (2) nearby reference marks and one (1) distant reference/azimuth mark.

The reference monuments are of same type of construction as the station monument, but are easily distinguished from the main stations by the size and markings of the disks. The reference mark disks are only 2" in diameter and are stamped REFERENCE MARK with a crossed arrow in the center pointing to the main station monument.

The reference and recovery data sheets provide a complete and detailed description of the location of each individual main station and their respective reference marks and witness posts. To avoid unnecessary excavation, please note the location of the monument with respect to the witness post and pinpoint the location with the ties given on the reverse side of the reference and recovery data sheet before digging. **NOTE:** All distance ties stated in the Station Description (reverse side) are rounded to the nearest one-half (0.5) foot.

## Units:

The coordinates of each main station refer to the Virginia Coordinate System of 1983-South Zone and are provided in meters, US survey feet and international feet; additionally, all bearings are state plane grid bearings. The conversions from meters to the respective feet values are as follows:

1. To convert from meters to international feet multiply meters by  $(100/2.54 \times 12)$  exact, or 3.280839895 approximate.
2. To convert from meters to US survey feet multiply meters by  $(39.37/12)$  exact, or 3.280833333 approximate.

As you will note, the difference between the two conversions is very small, less than 1 part in 150,000, and can be ignored for conversions of most field measurements. The difference does become significant when converting numbers larger than 1,500 feet, i.e., meter coordinates.

### Scale Factor:

The scale factor is used to convert field measurements to plane distances. Throughout the York County project area the scale factor is slightly less than one and is a function of latitude (northing). For most small survey projects an average scale factor will produce adequate results. The scale factor at each control station is printed on the reverse side of the reference and recovery data sheet. All published distances are plane distances incorporating the scale factor.

### Example:

A survey project is located approximately midway between Stations 2 and 3.

To determine an average scale factor for the survey project simply average the scale factors of Stations 1 and 2.

Scale factor of Sta. 2 = 0.99994540  
Scale factor of Sta. 3 = 0.99994543  
Project scale factor = 0.999945415

To determine a reduced horizontal field measurement of 4863.20 feet to a plane distance, multiply the field measurement by the scale factor.

4863.20 field distance x 0.999945415 = 4862.93 plane distance. The scale factor must be applied to all measured distances to compute plane coordinates.

### Convergence:

The convergence angle is used to convert geodetic or astronomic<sup>1</sup> azimuth to state plane azimuth. The convergence angle at each control station is printed on the reverse side of the reference-recovery sheet and is subtracted from an astronomic azimuth to determine the state plane azimuth of a line.

Example: An astronomic azimuth of a line from Station 1 to a monument is determined to be 176°16'45". The state plane azimuth equals the astronomic azimuth minus the convergence angle.

State Plane Azimuth = 176°16'45" - 01°03'44" = 175°13'01"  
State Plane Grid Bearing = S04°46'59"E

<sup>1</sup>While the geodetic azimuth and the astronomic azimuth are not exactly equal, the difference is negligible for most survey projects.

Vertical Datum:

The station elevations are based on the current NGS published values for the following Federal Government vertical monuments which have been incorporated into the vertical network:

<u>Monument Name</u>	<u>Current Published Vertical Value (in Feet)</u>	<u>Date of Last NGS Adjustment</u>
Halstead	86.378	1972
S313 (VADH Reset 1975)	69.104	1975
N455	47.684	1972
R377	23.14	1983
R266 (VADH Reset 1956)	11.027	1956
L266	17.431	1953
D262	117.542	1972
K00L2	114.773	1977
G345	99.780	1959
A262	96.109	1972
K377	92.388	1972

These existing Federal Government vertical monuments are well distributed throughout the County. The published NGS values for these monuments were confirmed by conventional, accurate differential leveling methods. Additionally, all stations were heighted by the same differential leveling methods and tied to these Federal Government vertical monuments.

It appears that the adjustments to the datum by NGS have lowered the vertical plane by approximately 0.38' from the previous values published by A.D.R. Associates in 1974. Extreme caution should be exercised in attempting to integrate any previously published data with data contained herein.

Notification of disturbed or destroyed monuments:

Your assistance is requested in reporting any monument found to have been or subject to being moved, disturbed or destroyed. Please contact The Department of Planning and Community Development, County of York, at (804) 898-0080.

Use of Previously Published Data:

Again, extreme caution should be exercised in attempting to integrate previously published horizontal and vertical data with the data contained herein.