

**Year 2009**

1. (575) panel points along I-26 & I-126 for **1"=50' aerial mapping**.

- a. "Fifty readings were collected at each point to determine the SC State Plane Coordinates of the target. If the PDOP's for any given solution were greater than four or if the GPS elevation had more than a 0.3' differential compared with the digital level elevation, the target was re-occupied until the results were acceptable. Most morning and afternoon GPS sessions began with the occupation of either a Geodetic Monument or a corridor mapping control point established by others." (December 2, 2009, Aerial Survey Report).
- b. "Elevations for the targets were established by Digital Level runs through each target generally looping from interchange to interchange with each mainline loop tying back to the starting point. We also checked into three First Order Class II geodetic monuments along the way. The Level Runs were held to a minimum third order closure [0.05'xVmi] with turns of approximately 150 feet but no more than 200 feet. Interchange levels were run from mainline targets usually from different loops and provided another check between mainline loops." (December 2, 2009, Aerial Survey Report).

c. **Horizontal  $\pm 0.07'$**  (Leica System 1200 GPS: RTK: SC VRN)

- i. NGS Monument Ties:
  - INT A 1 ( $\Delta 0.06'$ )
  - INT A 2
  - INT A 3 ( $\Delta 0.05'$ )
  - CINDY ( $\Delta 0.09'$ )
  - HOSPITAL AZ MK ( $\Delta 0.07'$ )
  - FRONT AZ MK



d. **Vertical  $\pm 0.025'$**  (Leica DNA 03 Digital Level)

- i. NGS Monuments:
  - 40002
  - CINDY
  - RICLEX 21 or RICLEX 5
  - FRONT
  - HOSPITAL



e. Points:

- i. See (2009) Helicopter Aerial Targets report for complete list.
- ii. Typical number scheme: 26W71, 7758A, 671A.

2. (106) panel points along I-26, I-126 & I-20 for **1"=300' aerial mapping**.

- a. **Horizontal  $\pm 0.1'$**  (RTK GPS SC VRN).
- b. **Vertical  $\pm 0.1'$**  (RTK GPS SC VRN).
- c. Numbered 1 thru 105.



**SCDOT Carolina Crossroads**  
Project Survey Control Summary  
February 13, 2020

**Year 2018**

1. (32) Primary Survey Control (PSC) and (62) Main Survey Control (MSC) points.
2. South Carolina State Plane Grid NAD83(2011)
3. GPS RTK base and rover network established from NGS monuments:  
  
Wiggly (PID AH4505)  
Zoo (PID EC2949)  
Lex 113 (PID F3830)  
Holt (PID EC2906)
4. Each PSC, MSC and checks were observed for a minimum of (3) minutes.
5. Vertical elevations established using differential leveling methods holding NGS monument:  
  
Zoo (PID EC2949)

**Year 2019**

1. (16) Project Localization Monuments, (224) panel points and (219) validation points.
2. **Project Localization Monuments (PLM)**
  - a. **Horizontal  $\pm 0.07'$  (GNSS Static)**

Static GNSS network adjustment including:

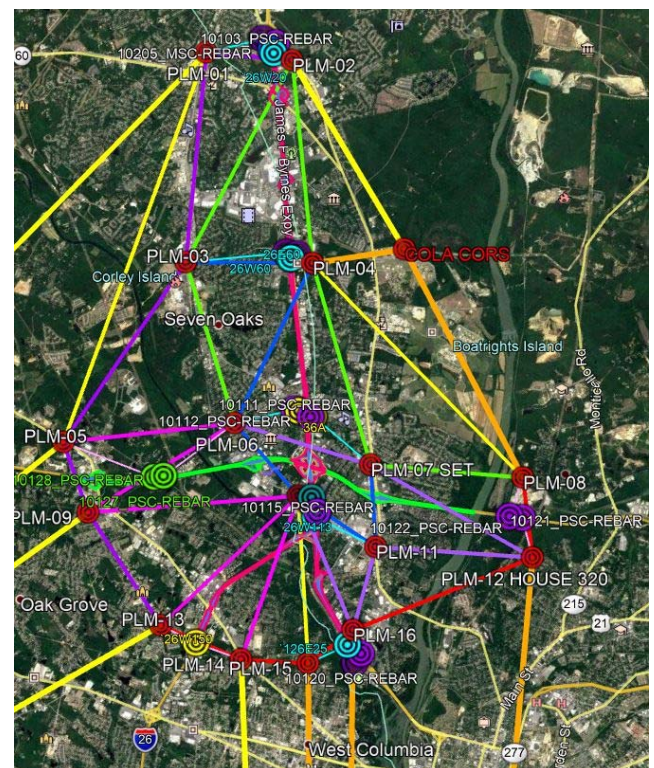
- (16) PLM
- (3) CORS
- (9) year2009 control points
- (15) year2018 control points

Minimal constraint network holding:

- (1) year2009 control point "126E25".

Full constraint network holding:

- (9) year2009 control points
- (7) year2018 control points
- (1) CORS



**3. Panel points (GCP) and Validation points (VP)**

- a. **Horizontal  $\pm 0.07'$**  (GNSS RTK SC VRN)
- b. Site Calibration using:

- (16) Project Localization Monuments (PLM)
  - (6) year2009 control points

**4. Project Localization Monuments (PLM), Panel points (GCP) and Validation points (VP)**

- a. **Vertical: (PLM) $\pm 0.07'$  \_ (GCP) & (VP)  $\pm 0.025'$**  (Trimble DiNi Series 0.3mm per KM)

- i. Double-Run closed digital level loops including:

- (61) year2009 control points
    - (24) year2018 control points
    - (3) NGS monuments
      - Wiggly ( $\Delta 0.05'$ )
      - Zoo ( $\Delta -0.06'$ )
      - Holt ( $\Delta 0.11'$ )
      - Cindy ( $\Delta 0.05'$ )
      - Front AZ MK ( $\Delta 0.13'$ )
      - Hospital AZ MK ( $\Delta 0.04'$ )

- ii. Balanced level runs were used to establish a best-fit scenario for all control points holding:

- (24) year2009 control points
    - (5) year2018 control points

Adjusted elevations resulted in deviations on remaining control points

of: 0.01' to 0.13'  
(majority within 0.07') with few outliers.

