
Appendix A

Right-of-Way Survey “As-Built” Requirements:

1.0 General

The purpose of this section is to set forth procedures for providing right-of-way "As-Built" drawings required by the Henrico County, Department of Public Works. This guidance outlines the minimum required information, the allowable tolerances during survey measurement and the method for providing this information on all drawings submitted as a record of improvements to Henrico County. An “As-Built Drawing” is generally defined as a field run topographic survey.

The following procedures must be followed when submitting “As-Built” drawings for approval by Henrico County:

- a) It will be the responsibility of the project developer or their representative to ensure that the "As-Built" drawings are in compliance with this section before the completion of the project. Right-of-way “As-Built” record drawings are required to be approved before the release of the defect bond.
- b) This section applies to any public or private development project that requires public infrastructure to be installed within Henrico County and/or VDOT right-of-way, whether built by private development or with a County project.

1.1 Procedure

It is the responsibility of the owner/developer to provide right-of-way “As-Built” drawings in an acceptable format to the Henrico County, Department of Public Works. The following process will be followed for the submittal:

- a) All right-of-way "As Built" Plan Sheets are to be sealed and endorsed by a licensed Land Surveyor to the accuracy as defined herein.
- b) Initially, six (6) paper copies of the "As-Built" drawings will be submitted to the Public Works Department - Design Division for review and approval.
- c) The Public Works - Design Division staff will provide copies of the drawings

to the appropriate reviewing agencies. A review comment letter will be provided to the submitter with directions for resubmittal, if required.

- d) Upon approval of the plan drawings, an electronic digital file of the drawings will be provided to the County.
- e) The original "As-Built" project drawings will be filed in the Public Works file system.

1.2 Technical Requirements

This section is not intended to address either construction tolerances or survey practices (e.g., where and how often to take a survey elevation and/or survey horizontal location shot). Usually, the frequency and location of survey shots will match the proposed grade elevations, normally shown on and required by construction plans.

The right-of-way "As-Built" drawings shall include the following minimum information including the specified measurement of survey precision. See the design manual sections 2.06 – 2.08 for County survey standards. A checklist is included with this section to aid in an accurate and complete drawing submittal.

- a) The accuracy of both surface and sub-surface gravity-fed systems will be measured in a survey and recorded to within ± 0.01 foot vertically and \pm one foot horizontally at the structure location.
- b) The accuracy of curb/curb and gutter and pavements measurements will be ± 0.01 foot vertically and \pm one foot horizontally at high points, low points, curb returns, and various other positions following good engineering, construction, and surveying practices.
- c) The accuracy of street sign and light poles will be measured to \pm one foot accuracy, horizontally.
- d) The project title and names must correspond with the approved construction documents, except that the drawing shall be titled "As-Built Survey Drawing of...".
- e) Profiles of improvements shall be a part of the drawing set if a profile was provided in the original project design drawing set.

- f) All public easements provided by the project shall be shown on the drawings along with notation of public record recordation data.
- g) All dimensions and working units will be expressed to the nearest hundredth of a foot. All elevations will be expressed to the nearest hundredth of a foot on solid surfaces and to the nearest tenth of a foot on ground/grass surfaces.
- h) The graphic elements of the As-Built drawing will be registered to the current HORIZONTAL and VERTICAL datums of Henrico County, regardless of the datums of the design plans.
- i) The right-of-way “As-Built” drawings shall show all elements that are shown on the project design plans that lie within right-of-ways and public easements.

1.3 Submittal of Digital “As-Built” Drawing Files

Upon acceptance and approval of a right-of-way “As-Built” drawing a digital copy will be required in a standard AutoCad file. This section provides guidance in order to standardize digital submittals of right-of-way “As-Built” drawings to the Henrico County, Department of Public Works. This section will cover all engineering designs and project plan drawings for public and private project developments. The following information is provided for digital submittals:

- a) **Contract Digital Submittals** - Digital files will be submitted according to the project's contract for all design and project plan record drawing contracts with Henrico County. In addition, Henrico County project right-of-way "As-Built" plans will be submitted in the AutoCad digital design format.
- b) **Development Design Digital Submittals** - Digital files for private development design project drawings will be in AutoCad format.

Submittals shall be provided on DVD in the .dwg format of the version currently used by Henrico County. Submit all information required to reproduce a hard copy of the submitted right-of-way “As-Built” drawing set. All externally referenced drawings and images must be bound to the drawing or provided with the file.

Also include any non-standard or custom settings (e.g. plot styles, fonts, or linetypes) that will be needed to reproduce a hard copy of the plans.

1.4 Right-of-Way Survey “As-Built” Drawing Checklist

A checklist is attached for use in preparation of any right-of-way survey “As-Built” drawings for County approval. This check list is not to be considered a complete specification, but rather as a guideline. This checklist cannot reflect all conditions for all types of “As-Built” drawings, but shall provide guidance in their preparation.

Right-of-way survey “As-Built” drawings shall not be submitted for County review until all construction items are in place and complete. Bonding of any construction item that is required to be on the “As-Built” drawings will delay the approval of the drawings.

Basically, an “As-Built” drawing is a product of an in-field run topographic survey. The survey must be performed by a Land Surveyor that is licensed in the Commonwealth of Virginia. Since the surveyor cannot see the location or depth of newly constructed underground pressure pipes, the information for same must be obtained from the Contractor’s marked up record drawings. These must be furnished to the Surveyor prior to the survey. Many times, changes have been made on the location or depth of these items due to found existing conditions and the surveyor has no information on such changes.

The “As-Built” drawings are to be a true representation of elements that exist as a result of a completed construction project. Therefore, all references to PROPOSED or CONTRACTOR SHALL or any other that refers to a construction process must not be on the survey drawing.

All questions on the right-of-way survey “As-Built” drawings, reviews, comments, etc should be directed to Rob Setzer, County Surveyor within the Public Works Department. The County surveyor can be reached at 804-727-8288.

RIGHT-OF-WAY SURVEY “AS-BUILT” DRAWING CHECKLIST

ROADWAYS

PAVEMENT:

- Centerline of roadway control line with stations
- Entrances, Curbs or Curb and Gutters with top of curb elevations
- Finish pavement elevations along edge of pavement
- Finish pavement elevations along centerline of roadway pavement
- Finish ground elevations along the centerline of grass medians
- Crosswalks, type and detail

TRAFFIC CONTROL:

- Lane paint lines and centerline paint lines
- Painted Turn lane arrows and messages
- Traffic control signage (Stop, Yield, Street Name, Speed, ETC.)
- Traffic Signal Poles, control boxes, etc.

MISCELLANEOUS:

- Right-of-Way monumentation
- Street Light Poles with Pole Numbers
- Sidewalk and multi-use paths with elevations
- Handicap ramps

STORM DRAINAGE SYSTEM

STRUCTURES:

- Type of structure is clearly defined in LEGEND and in PLAN view
- Rim and invert of structure
- Inlet shaping noted if in place
- Invert elevation of each pipe in structure
- End wall or flared end sections clearly noted and shown
- Riprap limits outlined
- Roadside swale elevations
- Monitoring well location, material, size, type, rim and invert elevation



PIPES:

- Size and type of pipe
- Invert of both ends of each pipe
- Slope of pipe based on actual invert elevations

DRAWINGS

GENERAL:

- Survey and Drawing prepared by licensed Land Surveyor
- Surveyor's Seal on all sheets, signed and dated
- Name and address of Surveyor
- Certification Note giving date(s) of survey
- Horizontal Control Datum Note
- Vertical Control Datum Note with Bench Mark reference
- Geodetic Control Network (minimum of 4 coordinates as per Section 2.09 of the DPW Design Manual)
- Site / Project Bench Mark
- Legend depicting all items on survey drawing
- Graphic Scales
- Vicinity Map
- Cover Sheet with Sheet Index if more than two drawing sheets
- Drawing sheets numbered in sequence
- All easements shown and labeled

PLAN SHEETS:

- 24" X 36" Sheets
- Title states **“AS-BUILT” DRAWING**
- Match Lines with sheet match data
- Profile sheets showing grades and utility data
- Note on Profile Sheets depicting source of pressure pipe data