

CHAPTER 12

SIGNING AND SEALING OF PROFESSIONAL SURVEY DELIVERABLES

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Sec. 12.01 **Introduction**

The purpose of the VDOT Survey Program Area is to provide accurate and complete survey information, which meets legally required minimum standards and can be utilized for design, right-of-way and construction efforts. The creation of survey plan base, the platting of rights-of-way and easements, and the monumentation of right-of-way limits falls under the responsibility and purview of professional land surveyors. This chapter establishes new processes, streamlines existing processes and addresses issues that will bring VDOT into compliance with the Code of Virginia with respect to the professional practice of land surveying. This chapter is a general plan to focus attention on these areas of practice within the Department, to aid management in scheduling and budgeting resources for successful implementation and to assure compliance with both the Code of Virginia and Department policies and procedures.

Sec. 12.02 **Business and Legal Purpose for Signing and Sealing Survey Products**

In accordance with the Chief Engineer’s directives, beginning July 1, 2009, all new VDOT surveys, deliverables and services listed and described in this chapter and the current VDOT L&D IIM-243 “Sealing and Signing of Plans and Documents”, shall be sealed and signed by a surveyor, licensed in the Commonwealth of Virginia. The work shall be performed by, or under the direct supervision of, a land surveyor in good standing, licensed in the Commonwealth of Virginia. The survey products and services shall meet applicable APELSCIDLA minimum standards and regulations and shall follow procedures and practices established in the Department’s Survey Manual.

VDOT requires that all plans and documents are to be signed with ACES (Access Certificates for Electronic Services) Business Representatives Digital Certificates. These certificates are purchased from IdenTrust, LLC, and supplied to VDOT staff. For information regarding the application of these products refer to VDOT’s CADD Manual *Appendix F.

Sec. 12.02.1 **Description of Work and Guidance**

These services consist of performing records research, field work and office computations that ultimately provide certified professionally surveyed information to the Department for its use in evaluating and ascertaining an area for its suitability for transportation purposes, construction or for any other purpose incidental thereto. Safety in the field is paramount therefore; all work zones shall conform to the VDOT Work Zone Safety Protection Manual.

Sec. 12.02.2 **Materials Necessary to Provide Services**

Survey work shall be performed using calibrated, modern surveying equipment, combined with practices and procedures that ensure applicable accuracy requirements are met. All work shall be authorized by the respective District Survey Manager (VDOT employees) or State Survey Program Manager (limited services consultants) with a written notice to proceed and anticipated

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delivery date. The limits of the area and/or identified facilities requiring survey information shall be identified as the result of a scoping meeting or field site review.

Sec. 12.02.3 Application of Survey Seal

These survey products will contain the surveyor's electronic seal, digital signature and certification statement(s) prior to delivery to the requestor. These products may contain notes and statements, by the professional, that define what the product represents and what it does not. The **Survey Cell Library** contains sample notes for modification and insertion into the CADD file product. These survey products are deliverables contained within the MicroStation CADD environment. The surveyor shall affix his seal in the proximity of the Title Block portion of the survey file as depicted [Figure 12-A](#). Additionally, the surveyor shall include general notes pertaining to the representation of the survey in the same proximity of his seal. In the case of specific notes, the surveyor shall place these in proximity to the areas of concern that require attention. Digital signatures are to be placed with ACES (Access Certificates for Electronic Services) Business Representatives Digital Certificates.

Sec. 12.03 Engineering/Topographic Surveys

The majority of this work occurs after project scoping, once funding is authorized, and is delivered at various periods prior to the Plan Coordination Review stage as depicted in the VDOT Project Development Process.

Sec. 12.03.1 Professional Surveying Services & Responsibilities

The application of the professional's seal, electronic signature, and date shall be evidence that the survey meets the minimum requirements of DPOR's APELSCIDLA regulations, is an accurate representation of the existing site and ownership conditions on that date for the area of concern, and correct to the best of the professional's knowledge, information, and belief on that date for:

a. Location Surveys

These types of surveys shall conform to **Chapter 4** of the VDOT Survey Manual, titled, "Location Surveys". These surveys include and encompass ownership of record, compiled title evidence, topography, planimetry, drainage information, subsurface utilities and base survey control. These surveys are requested to obtain information pertaining to wetland identification and mitigation and bridge site surveys. Survey updates will be evaluated during the Detailed Design phase of the VDOT project plan process. Updates are critical to the successful completion of the plan, all survey and sue information will be evaluated to see if it warrants updating the survey or sue information. If consultants or VDOT personnel are being used on the project, the same party should be used to complete the project through setting monumentation at the completion of construction if available by contract. If the original consultant is not available, it is imperative that the Project Manager and District Survey Manager determine who will be responsible for signing and sealing the plans.

b. Photogrammetric Surveys

These types of surveys shall conform to **Chapter 5** of the VDOT Survey Manual, titled, “Photogrammetric Surveys”.

c. Hydraulic Surveys

These types of surveys shall conform to **Chapter 7** of the VDOT Survey Manual, titled, “Hydraulic Surveys”. These surveys are requested for the specific purpose of hydrologic and hydraulic opening evaluation and engineering. The VDOT Survey Manual establishes the methods and criteria to achieve the desired result. This section of the Manual contains guidance for the performance of Bridge Situation surveys and deliverables.

Sec. 12.04 **Right-of-Way, Boundary and Easement Surveys**

The majority of this work occurs after the Design Approval phase as depicted in the VDOT Project Development Process but before the Project Advertisement phase. This work requires good communication and coordination between Survey and Design team members during the project.

Sec. 12.04.1 **Description of Work and Guidance**

On October 28, 2009, the Department presented the DPOR with a letter entitled “Virginia Department of Transportation – Documents Required to be Signed and Sealed” outlining the documents to be signed and sealed.

On July 17, 2012, the Department sent an updated document to clarify the use of the right of way plan sheet, monumentation be set and the timing for setting final monumentation. The LS/PE board met on August 16, 2012 and accepted the clarification. On September 25, 2012, the full APELSCIDLA met and accepted the clarification letter.

L & D Survey and Right of Way have agreed upon the following work products and documentation includes:

- The Right-of-Way Section will record each acquisition recordation instrument with a right of way plan sheet for partial takes and a plat for total take parcels per the Right-of-Way Manual. Additional plats may be necessary and will be provided on an as needed basis.
- The right-of-way plan sheet or plat will be referenced in the conveyance documents.
- The Survey Section will provide acreage for fee take, permanent and temporary easements at the appraisal stage.

- The Right-of-Way Section will pay landowners for the replacement of lot corners. VDOT or a consultant will be responsible for setting the right of way corners once construction is complete.

Sec. 12.04.2 Professional Surveying Services & Responsibilities – January 1, 2013

Right of Way Plan Sheets -

Right-of-Way Division and the Location and Design have agreed to utilize a right of way plan sheet to acquire properties.

This will be a collaborative effort by the design teams and the survey teams. *Communication is the key to the success of this process.*

Design Team responsibilities:

- The design team will create the master right of way design file.
The master Right of Way design file will only have the line work for proposed right of way and easements that is referenced into the master roadway design files.
- After UFI is reached and comments are addressed the Design team will create a RW file for each plan sheet in the R folder. At the discretion of the Project Manager and District Survey Manager, these may be created at FI so Survey can proceed with checking and sheet setup.
Permissions will be restricted to Survey staff only for the R and O folders after UFI. The Design teams will provide the GEOPAK GPK files that have the alignment data so GEOPAK can be used to annotate the stations and offsets.
- The handoff from Design to Survey shall be documented so each team understands their responsibilities.
- The Design team will coordinate any changes to the SPO and Right of way design files through Survey *if they are minor revisions. Major revisions to the Right of way design files will be completed by the design teams and resubmitted to Survey.*

Survey Team responsibilities:

- The Survey team is responsible for master right of way design file, right of way data sheet and SPO file from the handoff until Ad. Any changes to this line work through the checking or annotation process should be communicated back to the PM and the design team so all reference files can be updated. *RW will be provided to Survey by the Design team per Chapter 5 in the CADD manual and should match the plan sheets.* Survey will remove *or turn off* all design information from the RW sheet except for proposed right of way and easements for clarity.

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- b. All existing monumentation, owners' information, and boundary data should be shown and referenced to the construction centerline. *Prescriptive easements will be shown graphically only. The typical notes should be added to the sheet and all references to sheet numbers should be corrected to RW this includes match line references.
- c. VDOT Monuments should be shown on the applicable RW sheets and labeled.
- d. All angle breaks should be annotated using plus and offsets for the proposed right of way and proposed easements. A plus and offset legend will be shown on the sheet. The perimeter of the new proposed right of way will be shown with metes and bounds sufficient to close the right of way, tie lines may be necessary.
- e. All proposed right of way will be labeled on the sheet. All easements will be labeled for their respective uses.
- f. All Right of way takes, existing prescriptive easement and proposed easement areas shall be shown the RW sheet in table format per parcel. The table will specify the areas for each different easement use. Areas less than 1 acre will be shown in square feet (x,xxx) and areas greater than 1 acre will be shown in acres(X.XXX acres) to three decimal places.
- g. On each sheet, two points on the construction centerline will be labeled with the project coordinate values. The construction centerline will show all tangent and curve data shown on the plan sheet. Roads will be labeled with Route numbers and names.
- h. The Surveyor of Record will be responsible for setting right-of-way break points along the perimeter of the proposed right of way after construction is complete.

Example sheets have been provided. See [Figure 12-C](#) and [Figure 12-D](#).

Please reference Chapter 5 of the CADD manual for more specific details.

Final Right-of-Way Plans shall be submitted with the advertisement plans at plan coordination review stage in accordance with the Advertisement Cut-Off Chart. For In-House Design Only, they shall be electronically sealed and digitally signed by all parties when notified that the status has been set to seal/sign in Falcon by Plan Coordination Section. Once the plans have been electronically sealed and digitally signed, they shall be posted in Falcon. For Consultants, once the Plan Coordination Review has been completed, the plans shall be electronically sealed and digitally signed and files posted to Falcon. This is the same time that the advertisement plans are electronically sealed and digitally signed. The Final Right-of-Way plan sheets will also be included in the project construction contract documents. See Electronic Plan Submission Process Reference Guides link below.

Electronic Plan Flow Chart

http://www.extranet.vdot.state.va.us/locdes/reference-guides/ElectronicPlan_Submission.pdf

Right of Way Submission Tier 1 & Tier 2

http://www.virginiadot.org/business/locdes/Right_of_way_partial_take.asp

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***Metes and Bounds Surveys**

These types of surveys shall conform to **Chapter 6** of the VDOT Survey Manual, titled, “**Metes and Bounds Surveys**” and Section 5.6.6-5.6.9 in the Right of Way Manual of Instructions. These surveys, also referred to as Boundary Surveys or Metes and Bounds Surveys, represent an extensive effort beyond a typical location survey, to identify and delineate record title lines of a parcel of interest to VDOT.

Sec. 12.04.3 Plat Process prior to January 1, 2013.

Right-of-Way Acquisition Plats

***Note: This process is only available for projects prior to January 1, 2013 that have been started using individual plats. All projects after January 1, 2013 will use the RW plan sheet. Plats will be needed for total takes and special properties.**

Right-of-Way Division and Location and Design agreed in 2010 to a pilot program to utilize the Survey Section to develop right-of-way acquisition plats for use in acquiring fee property and/or interest in property for transportation purposes. The plat shall contain a note that it is produced from compiled data, and will contain the fee take, all easements and applicable minimum requirements as required by DPOR’s APELSCIDLA regulations. The plat shall meet the State Library standards for recordation. Preliminary plat preparation shall begin after all Field Inspection comments have been incorporated into the project plans. The naming convention of the plats shall be s(project#)_parcel#. Preliminary Plats shall be submitted to the Central Office Plan Coordination Section prior to the Form LD-368 being completed to notify Right-of-Way Division that plans are available for printing and viewing for Notice to Proceed (NTP) in accordance with the Electronic Plan Submission Process Flow Chart. Preliminary plats shall be provided to right-of-way staff prior to the initial offer being made to a property owner. Upon completion of negotiations with property owners, the plats shall be finalized and electronically sealed and digitally signed and submitted to the Regional Right-of-Way Team Leader for recordation within 45 days. If the courthouse will not accept a digital signature, then a wet signature shall be placed on the seal and provided to the courthouse for recordation. By sealing and signing the product, the land surveyor is testifying that the information shown and depicted in the Right-of-Way Acquisition Plat is a representation of the existing field and ownership conditions on that date for the area of concern, it is produced from compiled sources of data **and** that the survey meets the minimum requirements of DPOR’s APELSCIDLA regulations pertaining to boundary or compilation surveys and plats of record. Please refer to [Figure 12-B](#) for a sample Right-of-Way Acquisition Plat. **Bearings and Distances are the controlling elements for acquisition plats. Stations and offsets are shown on the plat to tie the plat to the project baseline controls (Provide a minimum of 2 points). Plats shall reference the VDOT project number, UPC number parcel number and the corresponding plan**

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sheet associated with these project controls and plusses and offsets. Plats shall clearly show calculated areas of right-of-way and/or easements required to construct the project.

As part of plat development, recordation and prior to the commencement of construction, **The Surveyor of Record will be responsible for setting right-of-way break points and points of intersection between the new right-of-way and existing property lines.** Such break points will be shown on the acquisition plats. VDOT will no longer pay the affected property owners for the placement of these points.

Final Right-of-Way Acquisition Plats shall be submitted with the advertisement plans at plan coordination review stage in accordance with the Advertisement Cut-Off Chart. For In-House Design Only, they shall be electronically sealed and digitally signed by all parties when notified that the status has been set to seal/sign in Falcon by Plan Coordination Section. Once the plats have been electronically sealed and digitally signed, they shall be posted in Falcon. For Consultants, once the Plan Coordination Review has been completed, the plats shall be electronically sealed and digitally signed and files posted to Falcon. This is the same time that the advertisement plans are electronically sealed and digitally signed. The Final Right-of-Way Acquisition Plats put to record will also be included in the project construction contract documents.

Sec. 12.05 **Construction Surveys**

The majority of this work occurs after the Project Advertisement phase as depicted in the VDOT Project Development.

Sec. 12.05.1 **Professional Surveying Services & Responsibilities**

All survey work shall adhere to the minimum specifications and guidance as referenced in **Chapters 8 and 9** of the VDOT Survey Manual and Sec. 12.02

a. Levels, Benchmarks and Project Elevations

These types of surveys shall conform to **Chapter 8, Sec. 8.03** of the VDOT Survey Manual, titled, “Levels, Benchmarks and Project Elevations”. Project benchmarks are shown on the survey alignment data sheet in the plan set. Benchmarks should be checked prior to their use in stakeout. Differential leveling should be run between benchmarks and recorded in field notes. Any appreciable differences in benchmark elevation should be recorded in field notes and check levels should be run to verify the difference. If additional benchmarks are set on the project, a list of the benchmarks with a description and elevation should be given to the project inspector and contractor. For examples of level notes see **Figures 8F, 8G, and 8H** of the VDOT Survey Manual.

b. Borrow Pits

These types of surveys shall conform to **Chapter 8, Sec. 8.05** of the VDOT Survey Manual, titled, “Borrow Pits”. Borrow Pits will be surveyed by creating a digital DTM surface. DTM’s are used to secure elevations, then an appropriate number of control stations should be used to insure integrity of the pit and readings should be secured at appropriate intervals to insure accurate coverage for computations of volume.

c. Culvert Stakeout

These types of surveys shall conform to **Chapter 8, Sec. 8.06** of the VDOT Survey Manual, titled, “Culvert Stakeout”. All box culverts are to be staked, according to furnished alignment and grades. **Figure 8-L** illustrates a procedure for checking the stake out of a box culvert. All culverts will be staked in accordance with **Section 105.13 and 517** of VDOT’s Road and Bridge Standards and **Figure 1** as shown at the beginning of **Figure 8-L** of the VDOT Survey Manual.

All pipe culverts, with an equivalent hydraulic opening of 12.6 square feet and larger, and all culverts with design grades, are to be staked in accordance with section **105.13 and 517** of the Road and Bridge Specifications. All pipe culverts with equivalent hydraulic openings less than 12.6 square feet may be staked by contract personnel.

All pipe culverts with design grades, such as storm sewers, regardless of size may be staked by the contract surveyor when specifically requested by the project engineer.

d. Bridge Stakeout

These types of surveys shall conform to **Chapter 8, Sec, 8.07** of the VDOT Survey Manual, titled, “Bridge Stakeout”. Stakes should be set at the intersection of the baseline of the bridge and the centerline of each pier. Also, stakes shall be set on the baseline of the bridge at the intersection of the lines shown on the plans on the abutments from which the dimensions were referenced. These intersection points will be shown on the sub-structure layout sheet of the bridge plans. All bridge staking shall be in accordance with **Section 105.13 and 517** of VDOT’s Road and Bridge Standards and **Figures 2 and 3** in Chapter 8 of the VDOT Survey Manual.

e. As-built or Final Surveys

These types of surveys shall conform to **Chapter 4** of the VDOT Survey Manual, titled, “Location Surveys” and **Chapter 9** of the Survey Manual titled, “Final Surveys”. As-built Surveys represent the existing condition post-construction. These surveys are invoked by special request and can include and encompass location and volumetric information for the entire project or just items selected specifically for review and investigation. By sealing and signing the product, the land surveyor is testifying that the information shown and depicted in the survey file product is an accurate representation of the existing site, feature or facility post-construction on that date for the area(s) of concern. Currently, these products may be delivered as a PDF or MicroStation CAD file(s).

Sec. 12.06 **Survey Information Not Requiring a Seal or Signature**

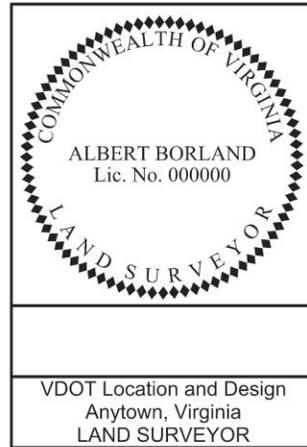
Asset management surveys, or those surveys that are for purely quantitative purposes (i.e. measuring linear feet of guardrail, number of signs, etc.) will not require a seal or signature unless deemed necessary by the requestor. Information secured by surveyors that does not depict critical elevations or planimetric locations, modeled existing conditions or boundary evidence are not required to be sealed and signed.

Information not listed above that is contained within the **Chapter Contents** section of Chapter 8 of the VDOT Survey Manual will not require sealing and signing unless specifically requested.

IIM-LD-243 Signing and Sealing

<http://www.virginiadot.org/business/locdes/rd-ii-memoranda-index.asp>

Figure 12-A



Route : 1
Project : 0001-026-107-PI01.C501
District : Richmond
County : Dinwiddie
From : 0J6 MI.N.Of Int.Rte.1 & Rte.226
To : 0J5 MI.S.Of Int.Rte.1 & Rte.226
Horizontal Datum Based On NAD 83 (93)
Vertical Datum Based On NAVD 88
Survey By : Albert Borland L.S.
Operator : P.W. Herman
Date : 7 - 13 - 09
Scale : 1" = 25'
UPC* : 73268

NOTES:

I HEREBY CERTIFY THAT THIS ROUTE SURVEY TO THE BEST OF MY KNOWLEDGE AND BELIEF IS CORRECT AND COMPLIES WITH THE STANDARDS AND PROCEDURES AS ESTABLISHED BY THE VIRGINIA DEPARTMENT OF TRANSPORTATION LOCATION AND DESIGN DIVISION, SURVEY MANUAL 2009.

PROPERTY INFORMATION IS BASED ON DEEDS AND PLATS OF RECORD. PHYSICAL EVIDENCE FOUND WAS PLACED ON DRAWING.

THE INFORMATION SHOWN ON THIS DRAWING WAS COMPILED FROM EXISTING LAND RECORDS AND DOES NOT REPRESENT A BOUNDARY SURVEY.

BEARINGS AND DISTANCES IN PARENTHESES ARE FROM RECORDED PLATS OR DEED DATA

Sample Location of Seal and Signature in MicroStation File

(Note: Digital Signature is embedded in the MicroStation Cell

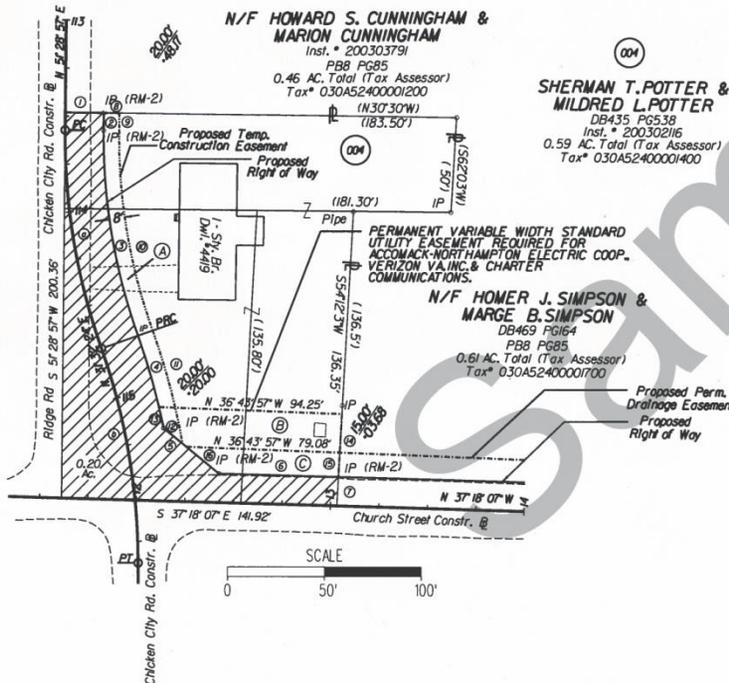
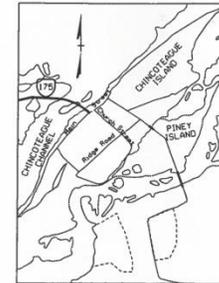
Figure 12-B

NOTES:

1. Albert Borland, Certify That This Plat Meets The Minimum Plat Standards Of The VA DPOR APELSCIDLA Regulations.
2. This Compiled Plat Was Prepared To Show The 0.20 Acres Fee Take (Hatch Area) And Does Not Constitute A Boundary Survey Of The Property Hereon.
3. All Of The Properties Physical Improvements Are Not Shown Hereon.
4. This Compiled Plat Was Performed Without The Benefit Of A Title Report And May Not Show All Easements Which May Affect The Property Shown Hereon.
5. No Designation Or Location Of Subsurface Utilities Was Performed During Preparation Of This Plat.
6. The Datum On This Compiled Plat Is Based On VDOT Project * U000-190-109, R-201, UPC * 71587, Plan Sheet * 3, Parcel * 004.

COMPILED PLAT SHOWING
0.20 ACRE FEE TAKE AREA
BEING GRANTED TO
COMMONWEALTH OF VIRGINIA

PROPERTY OF SHERMAN T.
& MILDRED L. POTTER
FANTASY LAND
MAGISTERIAL DISTRICT
TV LAND, VIRGINIA
SCALE: 1" = 50'



CURVE DATA CHICKEN CITY RD

① PI • 114-15.75 Δ • 19° 56' 33" L. D • 17' 12" 2" T • 53.54' L • 115.50' R • 333.00' PC • 113-57.20 PT • 114-73.11	② PI • 115-30.19 Δ • 19° 27' 10" R. D • 17' 12" 2" T • 51.08' L • 113.06' R • 333.00' PC • 114-73.11 PT • 115-86.17
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LINE DATA TABLE

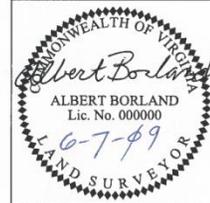
LINE	BEARING	DISTANCE
1	N 38° 09' 47" W	20.00'
2	N 51° 28' 57" E	9.03'
5	N 00° 49' 07" E	36.84'
6	N 37° 18' 07" W	61.73'
7	N 54° 12' 03" E	15.00'
8	N 38° 09' 47" W	8.00'
9	N 51° 28' 57" E	8.98'
12	S 00° 49' 07" W	12.56'
14	N 54° 12' 03" E	32.61'
15	N 54° 12' 03" E	12.61'
16	S 00° 49' 07" W	21.69'

AREAS OF EASEMENT TABLE

AREA	Description	Distance
A	0.03 Ac For Proposed Temporary Construction Easement	12.56'
B	0.06 Ac For Utilities Easement	32.61'
C	0.02 Ac For Proposed Permanent Drainage Easement	21.69'

CURVE DATA TABLE

CURVE	DELTA	RADIUS	ARC	TANGENT	CH. BEARING	CHORD
3	19° 56' 33"	313.00'	108.94'	55.03'	N 41° 30' 41" E	108.39'
4	08° 04' 08"	353.00'	49.71'	24.90'	N 35° 34' 28" E	49.67'
10	19° 56' 33"	305.00'	106.16'	53.62'	N 41° 30' 41" E	105.62'
11	09° 37' 22"	361.00'	60.63'	30.39'	N 36° 21' 05" E	60.56'
13	01° 47' 54"	353.00'	11.08'	5.54'	S 38° 42' 35" W	11.08'

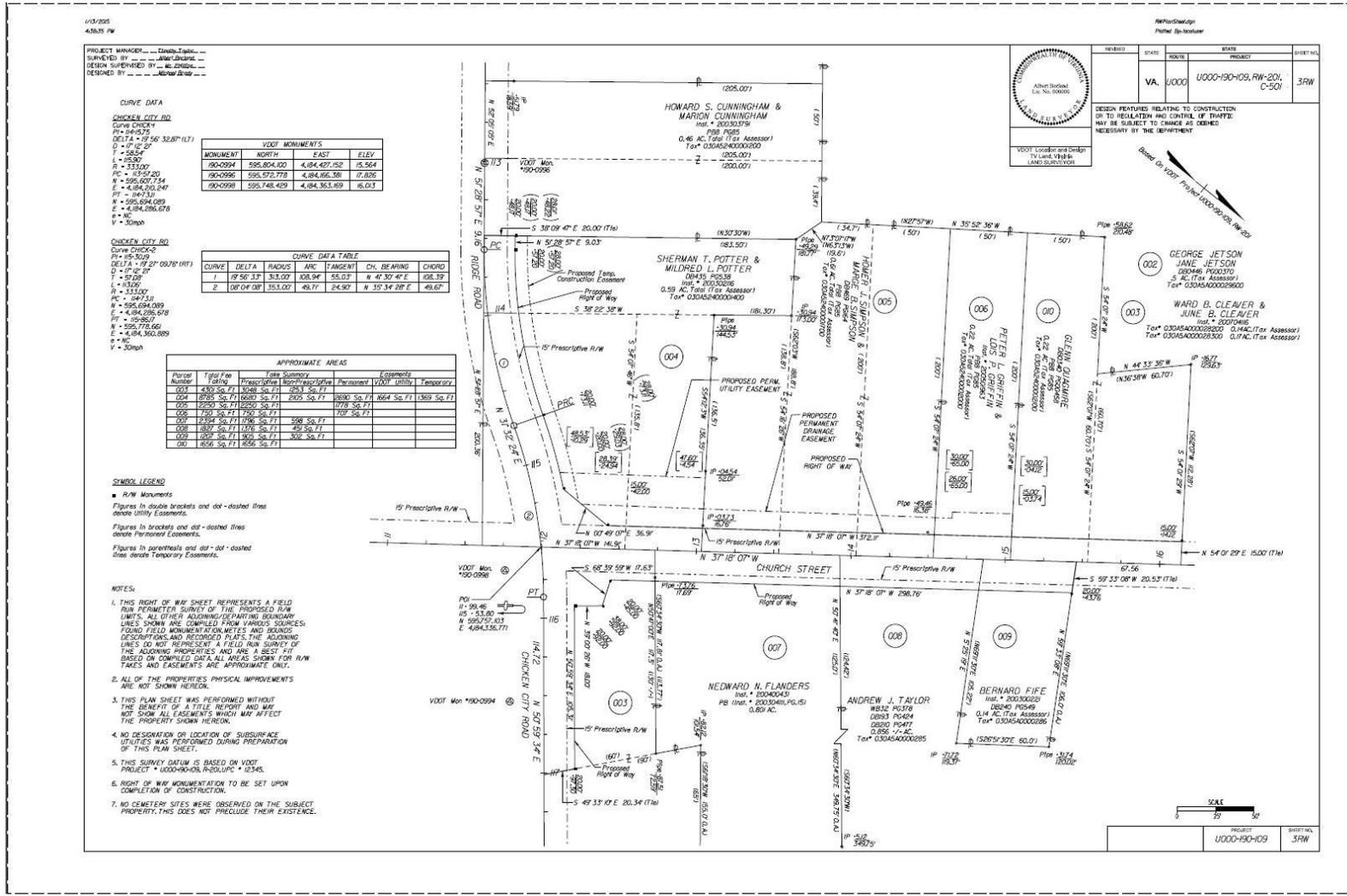


Albert Borland
2009.06.07 16:30:00-04'00'
VDOT Location and Design
Anytown, Virginia
LAND SURVEYOR

PREPARED BY Albert Borland DATE June 7, 2009
1313 Mockingbird Lane
(804) 867-5309

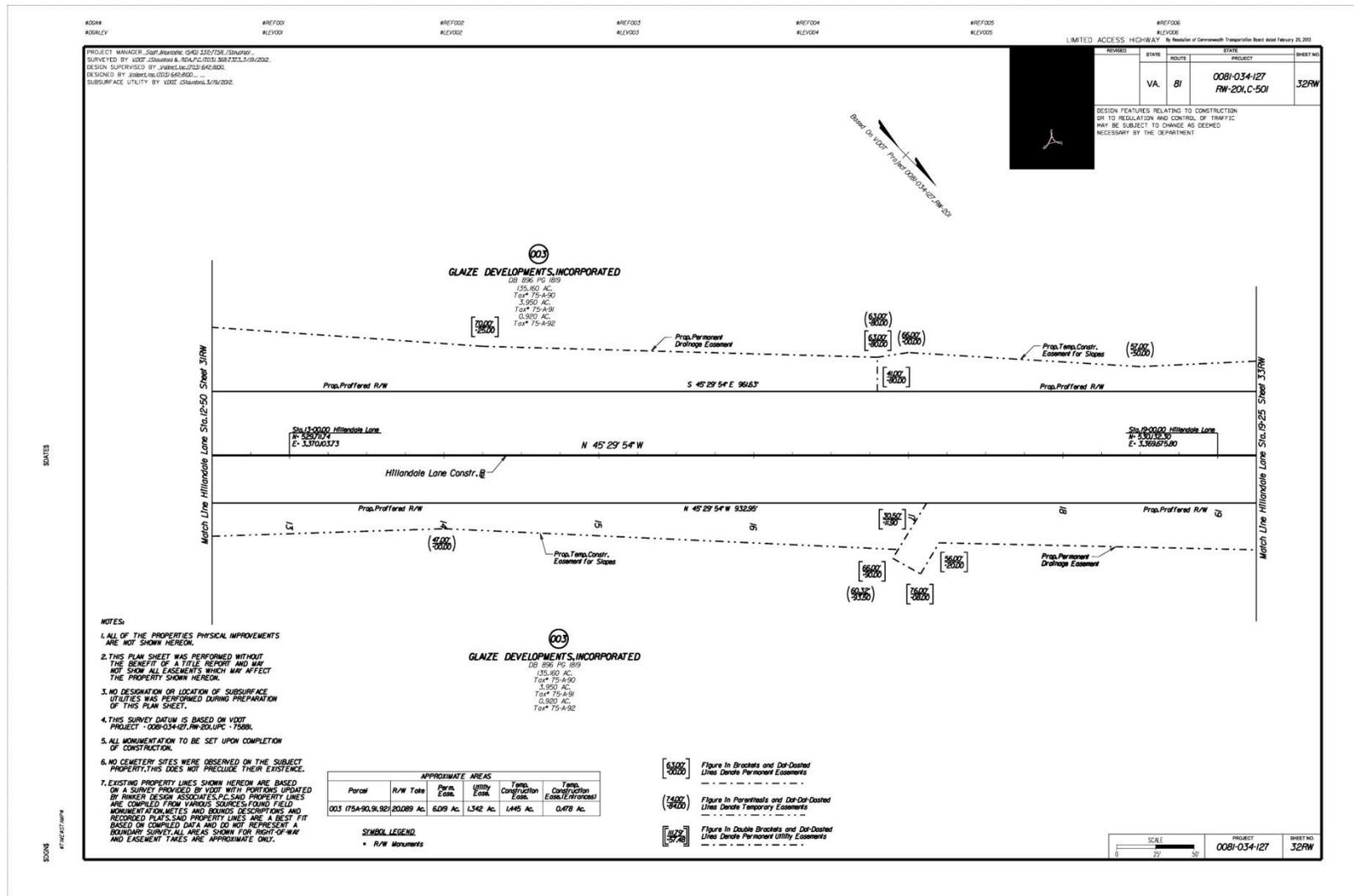
Sample Right-of-Way Acquisition Plat

Figure 12-C Sample Right-of-Way Plan



Line Weights have been turned off for clarity.

Figure 12-D



Sample Right-of-Way Plan