

	PROJECT <i>Pleasant Street S.W. Sidewalk West</i>	SHEET NO. <i>1</i>
--	--	-----------------------

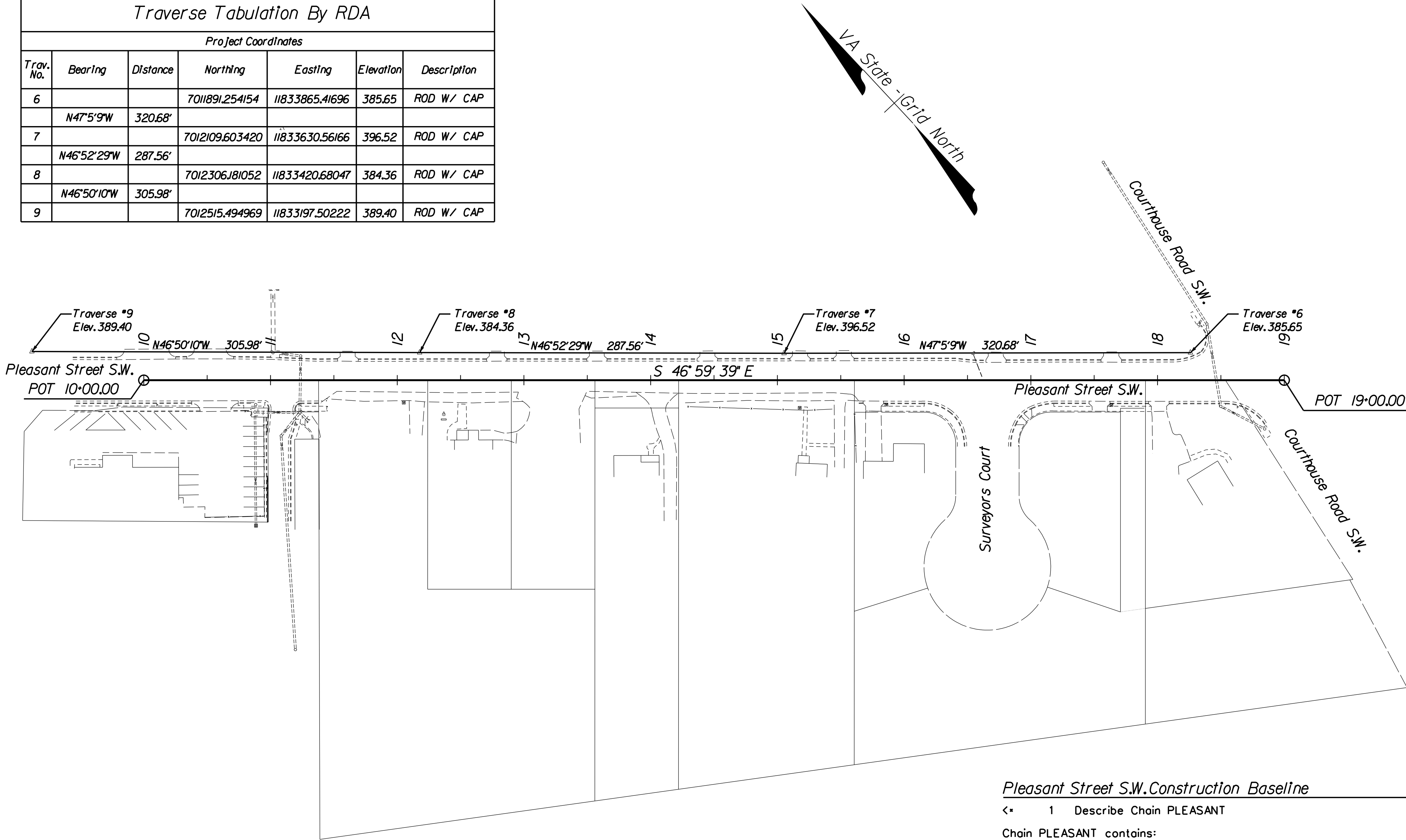
PROJECT MANAGER *Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380*
SURVEYED BY, DATE *Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013*
DESIGN BY *Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373*
SUBSURFACE UTILITY BY, DATE *Mid-Atlantic Utility Location, LLC, June 2013*

Survey Control & Horizontal Alignment Data

REVISED	STATE	TOWN OF VIENNA		SHEET NO.
		ROUTE	PROJECT	
	VA.	N.J.S.	Pleasant Street S.W. Sidewalk West	1G

DESIGN FEATURES RELATING TO CONSTRUCTION
OR TO REGULATION AND CONTROL OF TRAFFIC
MAY BE SUBJECT TO CHANGE AS DEEMED
NECESSARY BY THE DEPARTMENT

Traverse Tabulation By RDA						
Project Coordinates						
Trav. No.	Bearing	Distance	Northing	Easting	Elevation	Description
6			7011891.254154	11833865.41696	385.65	ROD W/ CAP
	N47°5'9"W	320.68'				
7			7012109.603420	11833630.56166	396.52	ROD W/ CAP
	N46°52'29"W	287.56'				
8			7012306.181052	11833420.68047	384.36	ROD W/ CAP
	N46°50'10"W	305.98'				
9			7012515.494969	11833197.50222	389.40	ROD W/ CAP



Pleasant Street S.W. Construction Baseline

<= 1 Describe Chain PLEASANT

Chain PLEASANT contains:
PLEASANT01 PLEASANT02

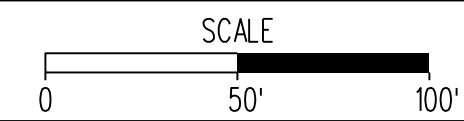
Beginning chain PLEASANT description
Feature: z

Point PLEASANT01 N 7,012,438.78 E 11,833,246.55 Sta 10+00.00

Course from PLEASANT01 to PLEASANT02 S 46° 59' 38.92" E Dist 900.00

Point PLEASANT02 N 7,011,824.91 E 11,833,904.70 Sta 19+00.00

Ending chain PLEASANT description



PROJECT
Pleasant Street S.W.
Sidewalk West

SHEET NO.
1G

Office Locations
Rinker Design Associates, P.C.
10000 Woodloch Forest Drive
Suite 100
Vienna, VA 22182
Phone: (703) 368-7373
Fax: (703) 368-7374

Rinker Design Associates, P.C.
Civil Engineering
Transportation - Environmental
Right of Way Services

TOWN OF VIENNA

6/17/2015

Office Locations
Rinker Design Associates, P.C.
10000 Lee Highway, Suite 100
Manassas, VA 20108
Phone: (703) 368-7373
Fax: (703) 368-7374
www.rinker.com

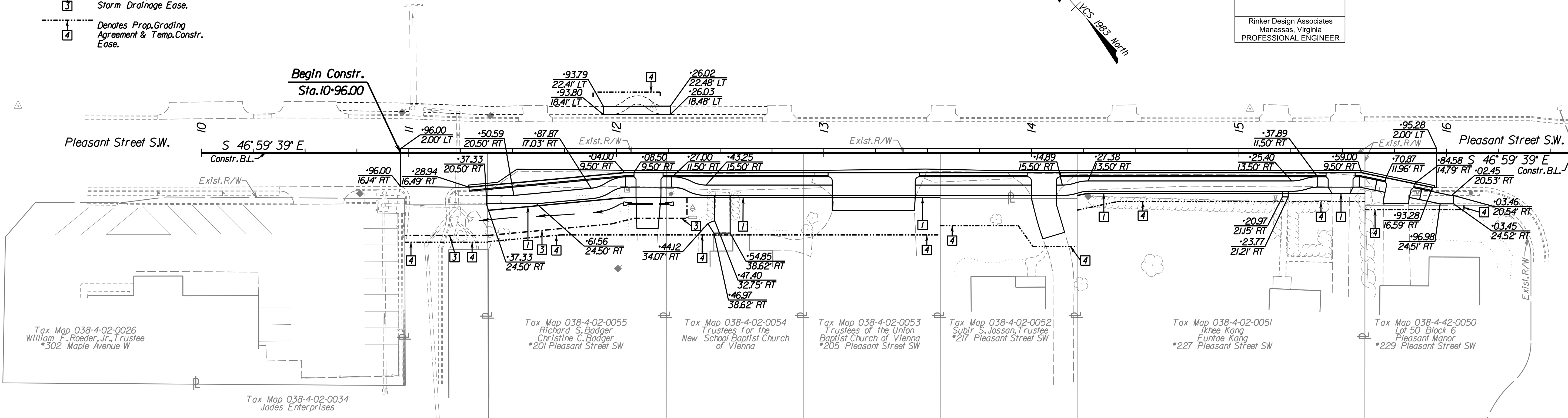
Design Associates, P.C.
Civil Engineering
Transportation
Right of Way Services

TOWN OF VIENNA

6/17/2015

PROJECT MANAGER: Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380
SURVEYED BY, DATE: Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013
DESIGN BY: Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373
SUBSURFACE UTILITY BY, DATE: Mid-Atlantic Utility Locating, LLC, June 2013

- R/W LEGEND**
- 1 Denotes Prop. Right of Way
 - 3 Denotes Prop. Permanent Storm Drainage Easement
 - 4 Denotes Prop. Grading Agreement & Temp. Constr. Easement



COMMONWEALTH OF VIRGINIA
ADAM D. WELSCHENBACH
Lic. No. 044359
PROFESSIONAL ENGINEER

Rinker Design Associates
Manassas, Virginia
PROFESSIONAL ENGINEER

REVISED	STATE	ROUTE	TOWN OF VIENNA PROJECT	SHEET NO.
	VA.	N.A.S.	Pleasant Street S.W. Sidewalk West	1G(1)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

Match Line Sta. 16+75 (C.B.L.) - This Sheet

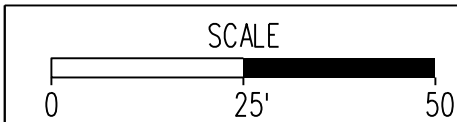
Signage Panel and Post Details

SIGNAGE GENERAL NOTES

- Unless otherwise specified, the Contractor shall have the option of refurbishing framing members on existing sign panels, or furnishing new sign panels with corresponding sign message for mounting on new breakaway post.
- Unless otherwise approved by the Town, existing traffic signs, which are to be removed, shall remain in place until the new sign structure and critical message are in place.
- The Contractor shall notify the Engineer at least five days prior to the proposed delivery date. Salvaged materials shall be delivered to the Departments normal work hours and days and properly stored as directed by the Engineer.
- All sign panels, framing members and miscellaneous hardware shall be salvaged by the Contractor for the Department and delivered intact to: To a location at the discretion of the Town within the Town's limits.
- A majority of the sign structures shall be located within 3' to 5' of the sign's proposed location or proposed relocation as shown on the plans. If installation of a proposed sign or proposed relocation of sign will conflict with a utility service, the Contractor shall notify Town 10 days prior to installation of the sign to coordinate a new location. Utilities shown on the plans are NOT guaranteed. The Contractor shall call "Miss Utility" prior to installation.
- Proposed signs and sign structures shall not impact underground existing utilities. Contractor is responsible for any disruption in utility service due to digging for signage structure. If Proposed signage location will cause impact to existing Utility Service, sign location shall be relocated at the approval of the Town at no additional cost.
- All Signs to be relocated or reset shall be installed with a new STP-I post in accordance with VDOT's ST'd. STP-I. Each post shall be installed with a ST'd. STP-I Conc. Foundation. Existing posts for sign relocated or reset shall be disposed at a location approved by the Town.

TEXT NO.	TEXT	MUTCD ST'D.	SIGN ASSEMBLY COMPONENTS		QTY. (per assem.)	SIGN PANEL AREA (Sq.Ft.)		PROP. SIGN STRUCTURE ST'D.
			PANEL SIZE (Inches)			PER ASSEMBLY	ALL ASSEMBLIES	
			WIDTH	HEIGHT				
A	NO PARKING ANY TIME	R7-1 (Left Arrow)	12	18	1	1.5	1.5	STP-I, 2-1/2" 10 GA. Single Post
B	NO PARKING ANY TIME	R7-1 (Double Arrow)	12	18	1	1.5	1.5	STP-I, 2-1/2" 10 GA. Single Post
C	NO PARKING ANY TIME	R7-1 (Right Arrow)	12	18	1	1.5	1.5	STP-I, 2-1/2" 10 GA. Single Post

Sign Structure Standards shall follow VDOT's ST'd. STP-I unless otherwise directed by the Town.



PROJECT
Pleasant Street S.W.
Sidewalk West

SHEET NO.
1G(1)

PROJECT MANAGER: **Town of Vienna Public Works Dept./ Dennis Johnson, P.E. (703) 255-6380**
SURVEYED BY: **DATE: Rinker Design Associates, P.C./ Sidney Thomas, L.S. (703) 368-7373, July 2013**
DESIGN BY: **Rinker Design Associates, P.C./ Adam Welschenbach, P.E. (703) 368-7373**
SUBSURFACE UTILITY BY: **DATE: Mid-Atlantic Utility Locating, LLC, June 2013**

Erosion & Sediment Control Notes & Details



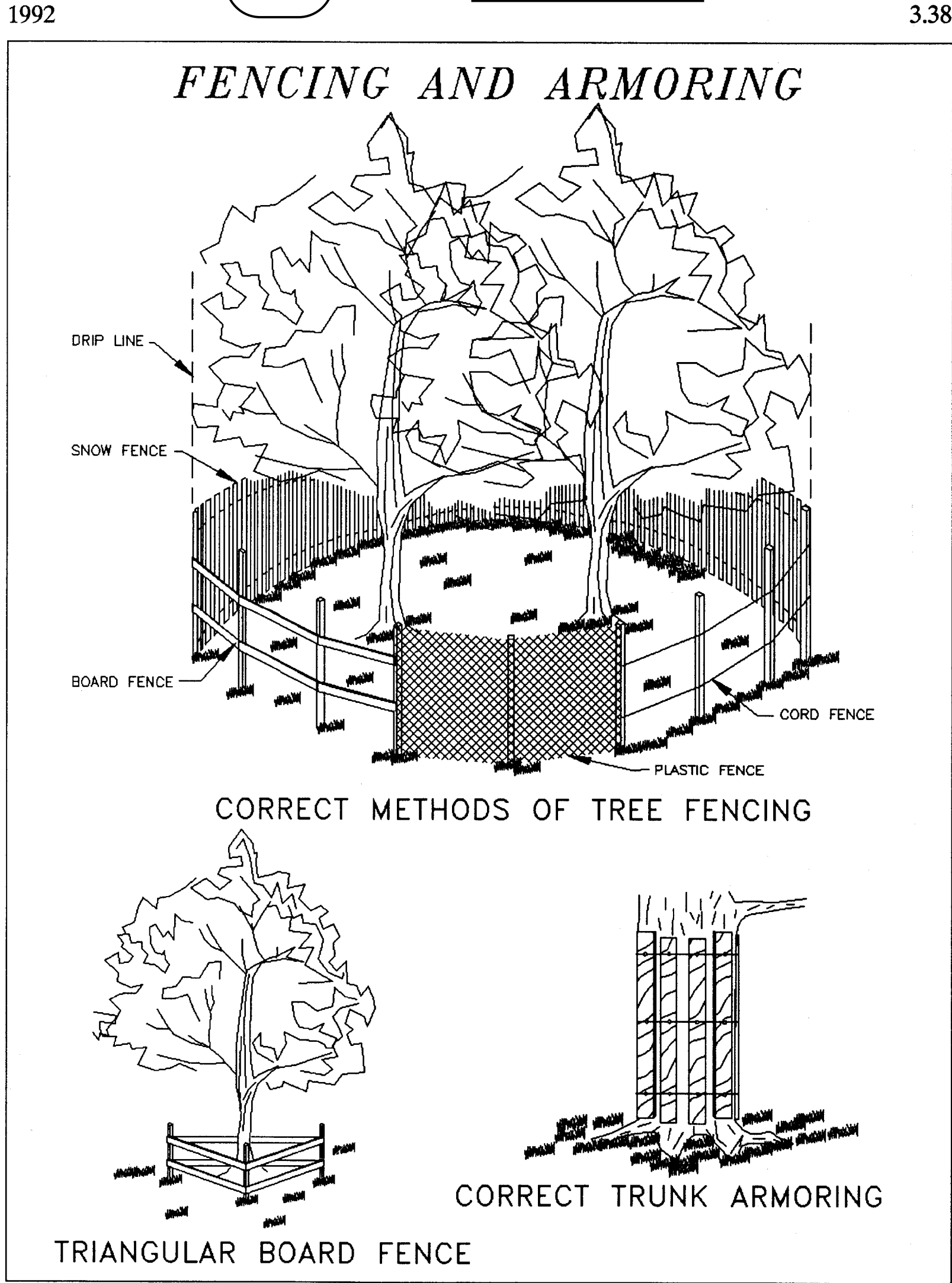
REVISED	STATE	ROUTE	TOWN OF VIENNA PROJECT	SHEET NO.
	VA.	N.A.S.	Pleasant Street S.W. Sidewalk West	1L

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

Rinker Design Associates
Manassas, Virginia
PROFESSIONAL ENGINEER

TP

TREE PROTECTION



Source: Va. DSWC

Plate 3.38-2

Erosion and Sediment Control Narrative

Project Description: The project proposes approximately 550 linear feet of concrete sidewalk along the west side of Pleasant Street SW in the Town of Vienna, Virginia. The project also proposes to add curb and gutter where there is none today. The roadway has existing closed storm sewer systems. The project is located in the Piney Branch watershed management area which is within the greater Difficult Run watershed.

Existing Site Conditions: The project site is along the west side of Pleasant Street SW between Maple Avenue W and Courthouse Road SW. Vegetation within the project site consists of landscaped lawns and some large trees. Storm runoff is collected by drop inlets and conveyed to the northeast via an existing closed storm sewer system.

Adjacent Areas: Areas adjacent to the project are mostly residential in nature though there is a commercial property at the beginning of the project as well as a church.

Off-site Areas: There will be impacts to adjacent parcels associated with the construction of this project. All necessary right-of-way, easements, and provisions will be acquired prior to the start of construction. The Contractor shall be responsible for the locations of acceptable borrow and/or disposal sites, and these shall be in accordance with Town of Vienna or as directed by the Town.

Soils: See soils map located on this sheet.

Critical Areas: There are no critical areas within the project site.

Erosion and Sediment Control Measures: Water quality and sediment/erosion control are of extreme importance. Care must be taken to avoid discharge of sediment into the existing storm water system. In order to best control impacts on this watershed, all vegetative and structural sediment control practices shall be constructed and maintained according to minimum standards and specifications of the Virginia Erosion and Sediment Control Handbook. Strict compliance with this program and standards is required. We are therefore specifying a plan to minimize impacts on the adjacent properties.

At the time of land disturbing activities within the Town right-of-way, the Contractor shall have a representative with Erosion and Sediment Control Contractor Certification (ESCCC) at the project site. The Town and Contractor is responsible for complying with applicable Local, State, and Federal Environmental Laws and Regulations, including acquiring clearances/authorizations from appropriate regulatory agencies.

Land Disturbing/Construction Sequence - Phase 1
1. The Contractor shall install the silt fence, inlet protection, and tree protection as shown on the Phase I Erosion & Sediment Control plan.
2. After the silt fence, inlet protection, and tree protection have been installed, the Contractor shall obtain the site inspector's approval of these controls.
3. After the site inspector's approval of the initial controls, clear and grub the site as necessary.

Land Disturbing/Construction Sequence - Phase 2
1. Fine grade the site and install all proposed storm sewer items.
2. Install curb & gutter, sidewalk, and entrance base course and concrete pavement.
3. Install all permanent seeding and fertilize all grassed areas.
4. Clean site of all trash and debris.
5. Have the inspector inspect all areas to determine if they are adequately stabilized.

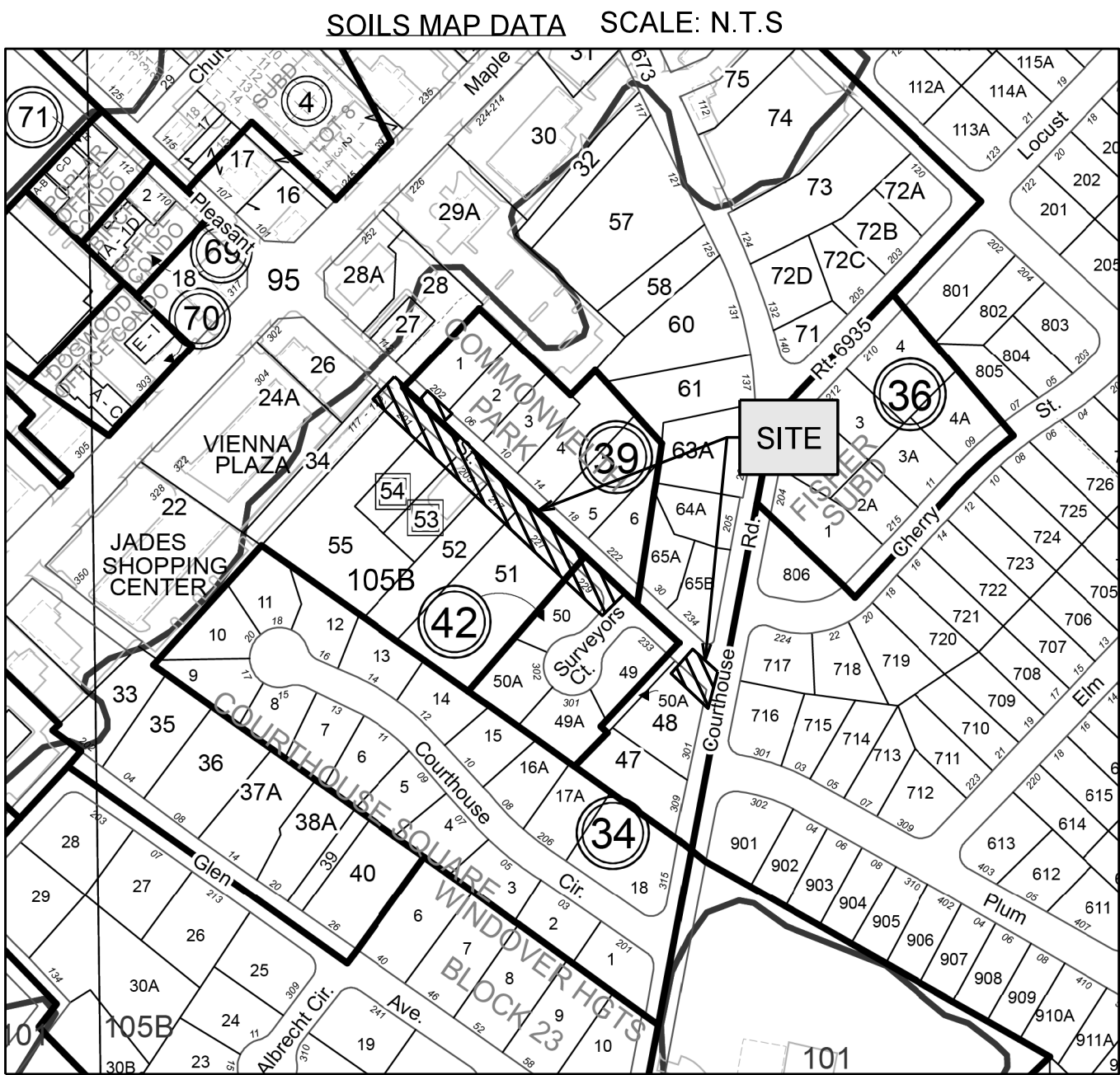
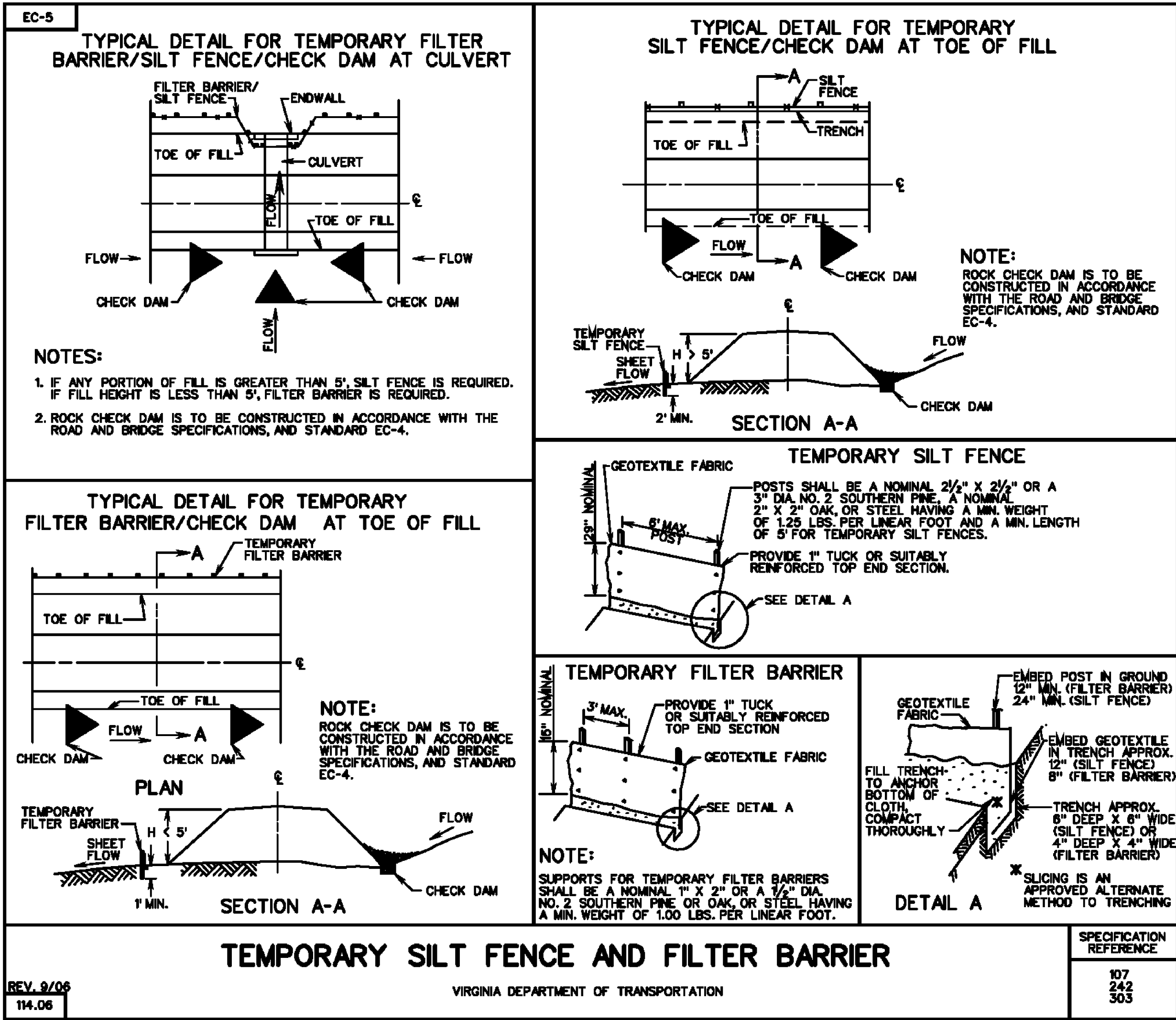
Maintenance Program: The Contractor shall make a visual inspection of all mechanical controls and newly stabilized areas (i.e., seeded, mulched, or sodded areas) on a daily basis and after each rainfall event to insure that all controls are functioning properly. The following items will be checked in particular: Inlet protection will be checked regularly for sediment buildup which will prevent drainage, and if the gravel is clogged by sediment, it shall be removed and cleaned or replaced; the silt fence barrier will be checked regularly for undermining or deterioration of the fabric, and sediment shall be removed when the level of sediment deposition reaches halfway to the top of the barrier; and the seeded areas will be checked regularly to ensure that a good stand is maintained, and areas shall be fertilized and reseeded as needed. Any damaged controls shall be repaired by the end of the work day, including reseeded and mulching if necessary. The Contractor may install additional measures should he or she deem it necessary at the inspector's approval. All erosion & sediment controls shall be removed within seven (7) days after the project is stabilized.

Structural Practices:
1. Silt Fence Barrier (3.05) - Silt fence barriers will be installed downslope of areas with minimal grades to filter sediment-laden runoff from sheet flow as indicated in the Erosion and Sediment control plans.
2. Storm Drain Inlet Protection (3.07) - All storm sewer inlets shall be protected during construction. Sediment-laden water shall be filtered before entering the storm sewer inlets.
3. Temporary Seeding (3.31) - All denuded areas which will be left dormant for extended periods of time shall be seeded with fast germinating temporary vegetation immediately following grading. Selection of the seed mixture will depend on the time of year it is applied.
4. Permanent Seeding (3.32) - Perennial vegetative cover shall be established on disturbed areas by planting seed to reduce erosion and decrease sediment yield and to permanently stabilize disturbed areas. Selection of the seed mixture will depend on the time of year it is applied.
5. Permanent Stabilization - Permanent stabilization shall be done in accordance with the VESCH and all Town of Vienna seeding standards.

Stormwater Runoff Considerations: See sheet 2K16 for Outfall Analysis for this project.

TSF

TEMPORARY SILT FENCE



SOILS MAP SOURCE: <input checked="" type="checkbox"/> COUNTY MAP; <input type="checkbox"/> PRIVATE SOILS SCIENTIST (FOR UNMAPPED SITES)					
SOIL ID NUMBERS	SOIL SERIES NAME	FOUNDATION SUPPORT	SOIL DRAINAGE	EROSION POTENTIAL	PROBLEM CLASS
95	URBAN LAND	N/A	N/A	N/A	IVB
105B	WHEATON GLENELG COMPLEX	GOOD	GOOD	HIGH	IVB
IS THE SITE LOCATED WITHIN NATURALLY OCCURRING ASBESTOS SOILS? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>					
AREAS THAT MAY CONTAIN NATURALLY OCCURRING ASBESTOS SOILS ARE LOCATED ON THE ORANGE SOILS TAX MAP GRIDS ON THE COUNTY WEBSITE. SPECIAL PRECAUTIONS REGARDING THESE SOILS OR FILL ORIGINATING FROM THESE SOILS ARE REQUIRED BY OCCUPATIONAL SAFETY AND HEALTH REGULATIONS ENFORCED BY THE VIRGINIA DEPARTMENT OF LABOR AND INDUSTRY AND SPECIAL GUIDANCE HAS BEEN ISSUED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY.					
SOILS MAPPED OVER NATURALLY OCCURRING BEDROCK. THESE SOILS OCCUR WITHIN A GEOLOGIC FORMATION KNOWN AS THE PINEY BRANCH COMPLEX. LOCALLY KNOWN AS GREENSTONE. NATURALLY-OCCURRING ASBESTOS MINERALS, PREDOMINANTLY ACTINOLITE AND TREMOLITE, ARE KNOWN TO OCCUR IN THIS FORMATION. EXCAVATIONS IN BEDROCK OR EARTH MOVING ACTIVITIES WITHIN THIS FORMATION MAY EXPOSE THESE MINERALS TO THE ATMOSPHERE, ALLOWING THE FIBERS TO BECOME AIRBORNE.					

PROJECT	SHEET NO.
Pleasant Street S.W. Sidewalk West	1L

PROJECT MANAGER *Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380*
SURVEYED BY, DATE *Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013*
DESIGN BY *Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373*
SUBSURFACE UTILITY BY, DATE *Mid-Atlantic Utility Locating, LLC, June 2013*

Erosion & Sediment Control Notes & Details

4.VAC50-30-40. Minimum Standards. (MS-19)

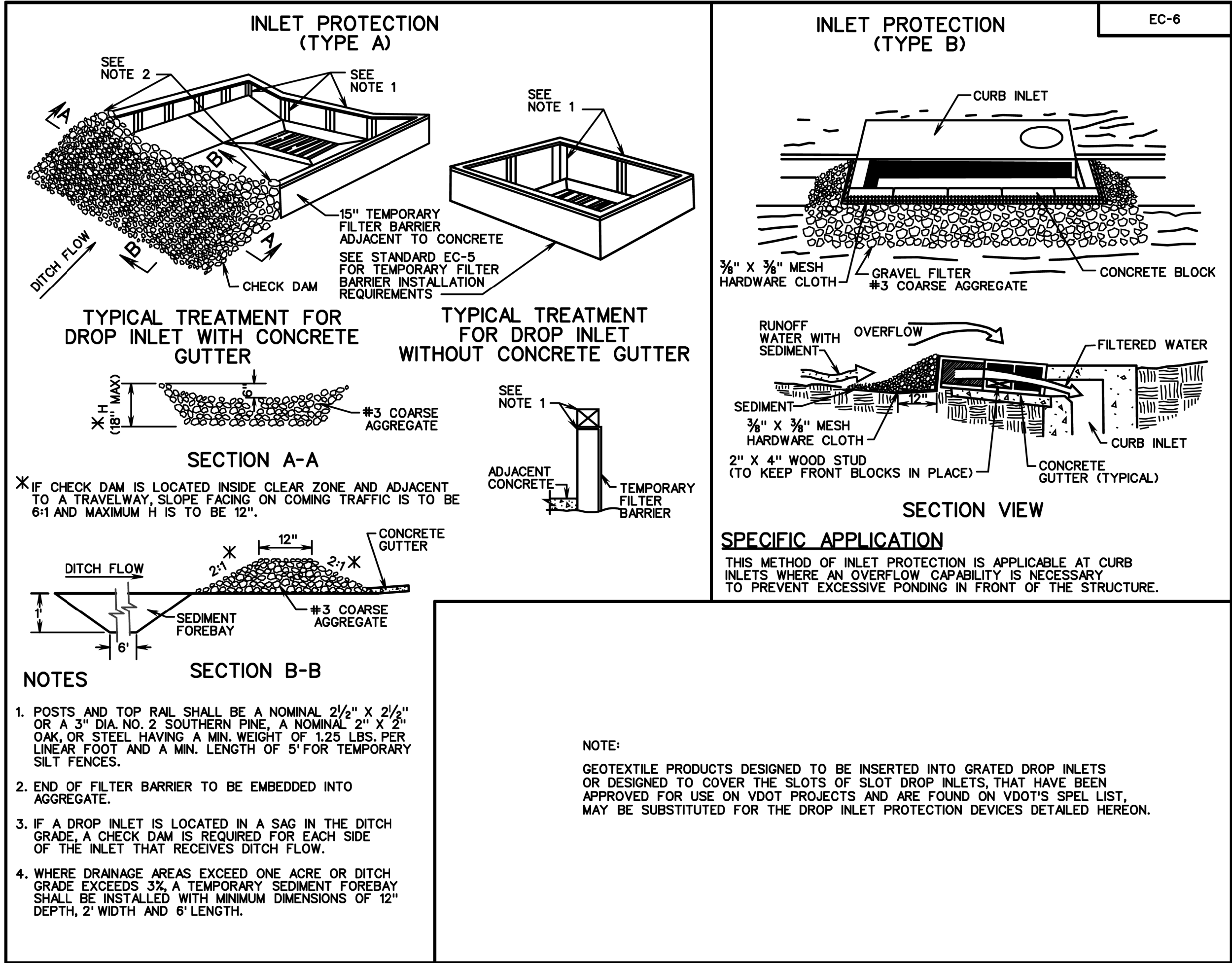
A VESCP must be consistent with the following criteria, techniques and methods:

1. Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within seven days to denuded areas that may not be at final grade but will remain dormant for longer than 14 days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year.
2. During construction of the project, soil stock piles and borrow areas shall be stabilized or protected with sediment trapping measures. The applicant is responsible for the temporary protection and permanent stabilization of all soil stockpiles on site as well as borrow areas and soil intentionally transported from the project site.
3. A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform, mature enough to survive and will inhibit erosion.
4. Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land-disturbing activity and shall be made functional before upslope land disturbance takes place.
5. Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation.
6. Sediment traps and sediment basins shall be designed and constructed based upon the total drainage area to be served by the trap or basin.
 - a. The minimum storage capacity of a sediment trap shall be 134 cubic yards per acre of drainage area and the trap shall only control drainage areas less than three acres.
 - b. Surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to three acres shall be controlled by a sediment basin. The minimum storage capacity of a sediment basin shall be 134 cubic yards per acre of drainage area. The outfall system shall, at a minimum, maintain the structural integrity of the basin during a 25-year storm of 24-hour duration. Runoff coefficients used in runoff calculations shall correspond to a bare earth condition or those conditions expected to exist while the sediment basin is utilized.
7. Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem is corrected.
8. Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume or slope drain structure.
9. Whenever water seeps from a slope face, adequate drainage or other protection shall be provided.
10. All storm sewer inlets that are made operable during construction shall be protected so that sediment-laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.
11. Before newly constructed stormwater conveyance channels or pipes are made operational, adequate outlet protection and any required temporary or permanent channel lining shall be installed in both the conveyance channel and receiving channel.
12. When work in a live watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport and stabilize the work area to the greatest extent possible during construction. Non-erodible material shall be used for the construction of causeways and cofferdams. Earthen fill may be used for these structures if armored by non-erodible cover materials.
13. When a live watercourse must be crossed by construction vehicles more than twice in any six-month period, a temporary vehicular stream crossing constructed of non-erodible material shall be provided.
14. All applicable federal, state and local chapters pertaining to working in or crossing live watercourses shall be met.
15. The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed.
16. Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria:
 - a. No more than 500 linear feet of trench may be opened at one time.
 - b. Excavated material shall be placed on the uphill side of trenches.
 - c. Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or off-site property.
 - d. Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.
 - e. Restabilization shall be accomplished in accordance with this chapter.
 - f. Applicable safety chapters shall be complied with.
17. Where construction vehicle access routes intersect paved or public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto the paved surface. Where sediment is transported onto a paved or public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner. This provision shall apply to individual development lots as well as to larger land-disturbing activities.
18. All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the VESCP authority. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation.
19. Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion and damage due to increases in volume, velocity and peak flow rate of stormwater runoff for the stated frequency storm of 24-hour duration in accordance with the following standards and criteria. Stream restoration and relocation projects that incorporate natural channel design concepts are not man-made channels and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels:
 - a. Concentrated stormwater runoff leaving a development site shall be discharged directly into an adequate natural or man-made receiving channel, pipe or storm sewer system. For those sites where runoff is discharged into a pipe or pipe system, downstream stability analyses at the outfall of the pipe or pipe system shall be performed.
 - b. Adequacy of all channels and pipes shall be verified in the following manner:
 - 1) The applicant shall demonstrate that the total drainage area to the point of analysis within the channel is one hundred times greater than the contributing drainage area of the project in question; or
 - 2)
 - a) Natural channels shall be analyzed by the use of a two-year storm to verify that stormwater will not overtop channel banks nor cause erosion of channel bed or banks.
 - b) All previously constructed man-made channels shall be analyzed by the use of a ten-year storm to verify that stormwater will not overtop its banks and by the use of a two-year storm to demonstrate that stormwater will not cause erosion of channel bed or banks; and
 - c) Pipes and storm sewer systems shall be analyzed by the use of a ten-year storm to verify that stormwater will be contained within the pipe or system.
 - c. If existing natural receiving channels or previously constructed man-made channels or pipes are not adequate, the applicant shall:
 - 1) Improve the channels to a condition where a ten-year storm will not overtop the banks and a two-year storm will not cause erosion to channel the bed or banks; or
 - 2) Improve the pipe or pipe system to a condition where the ten-year storm is contained within the appurtenances;
 - 3) Develop a site design that will not cause the pre-development peak runoff rate from a two-year storm to increase when runoff outfalls into a natural channel or will not cause the pre-development peak runoff rate from a ten-year storm to increase when runoff outfalls into a man-made channel; or
 - 4) Provide a combination of channel improvement, stormwater detention or other measures which is satisfactory to the VESCP authority to prevent downstream erosion.
 - d. The applicant shall provide evidence of permission to make the improvements.
 - e. All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development condition of the subject project.
 - f. If the applicant chooses an option that includes stormwater detention, he shall obtain approval from the VESCP of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance requirements of the facility and the person responsible for performing the maintenance.
 - g. Outfall from a detention facility shall be discharged to a receiving channel, and energy dissipators shall be placed at the outfall of all detention facilities as necessary to provide a stabilized transition from the facility to the receiving channel.
 - h. All on-site channels must be verified to be adequate.
 - i. Increased volumes of sheet flows that may cause erosion or sedimentation on adjacent property shall be diverted to a stable outlet, adequate channel, pipe or pipe system, or to a detention facility.
 - j. In applying these stormwater management criteria, individual lots or parcels in a residential, commercial or industrial development shall not be considered to be separate development projects. Instead, the development, as a whole, shall be considered to be a single development project. Hydrologic parameters that reflect the ultimate development condition shall be used in all engineering calculations.

- k. All measures used to protect properties and waterways shall be employed in a manner which minimizes impacts on the physical, chemical and biological integrity of rivers, streams and other waters of the state.
- l. Any plan approved prior to July 1, 2014, that provides for stormwater management that addresses any flow rate capacity and velocity requirements for natural or man-made channels shall satisfy the flow rate capacity and velocity requirements for natural or man-made channels if the practices are designed to (i) detain the water quality volume and to release it over 48 hours; (ii) detain and release over a 24-hour period the expected rainfall resulting from the one year, 24-hour storm; and (iii) reduce the allowable peak flow rate resulting from the 1.5, 2, and 10-year, 24-hour storms to a level that is less than or equal to the peak flow rate from the site assuming it was in a good forested condition, achieved through multiplication of the forested peak flow rate by a reduction factor that is equal to the runoff volume from the site when it was in a good forested condition divided by the runoff volume from the site in its proposed condition, and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels as defined in any regulations promulgated pursuant to 10J-562 or 10J-570 of the Act.

DIST

INLET PROTECTION



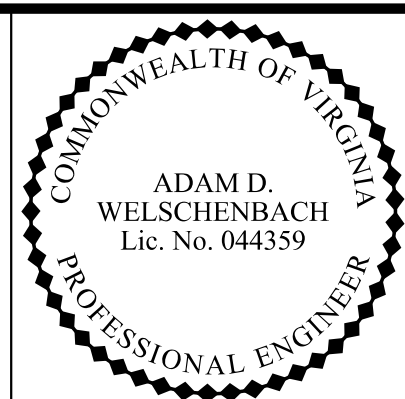
6/17/2015

Design Associates, P.C.



PROJECT MANAGER: *Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380*
SURVEYED BY: *DATE: Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013*
DESIGN BY: *Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373*
SUBSURFACE UTILITY BY: *DATE: Mid-Atlantic Utility Location, LLC, June 2013*

Erosion & Sediment Control Phases 1 & 2



REVISIONS

NO.	DATE	DESCRIPTION
1	6/17/2015	Initial Design

STATE

VA.

ROUTE

N.A.S.

TOWN OF VIENNA

PROJECT

Pleasant Street S.W. Sidewalk West

SHEET NO.

1M

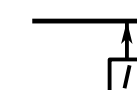
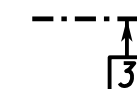

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

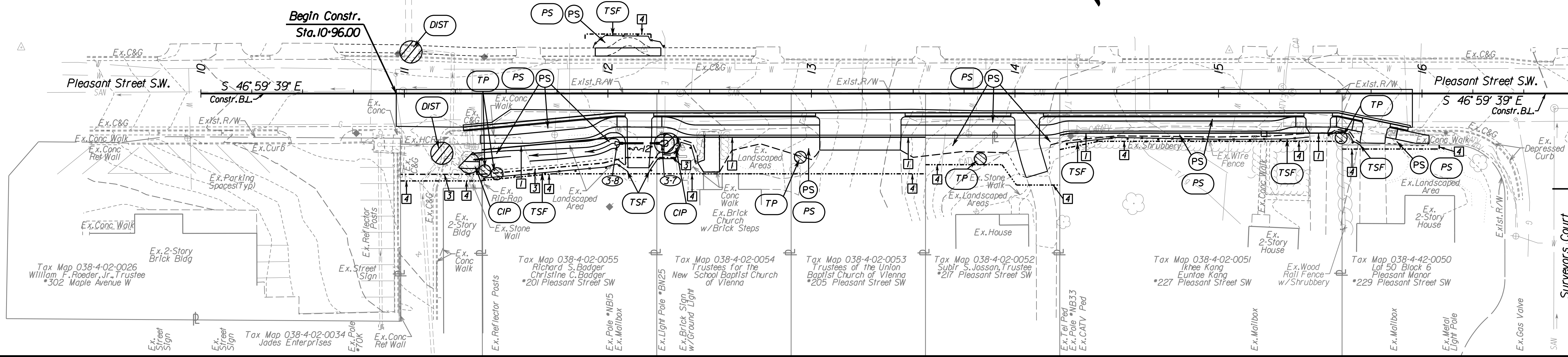
Rinker Design Associates

Manassas, Virginia

PROFESSIONAL ENGINEER

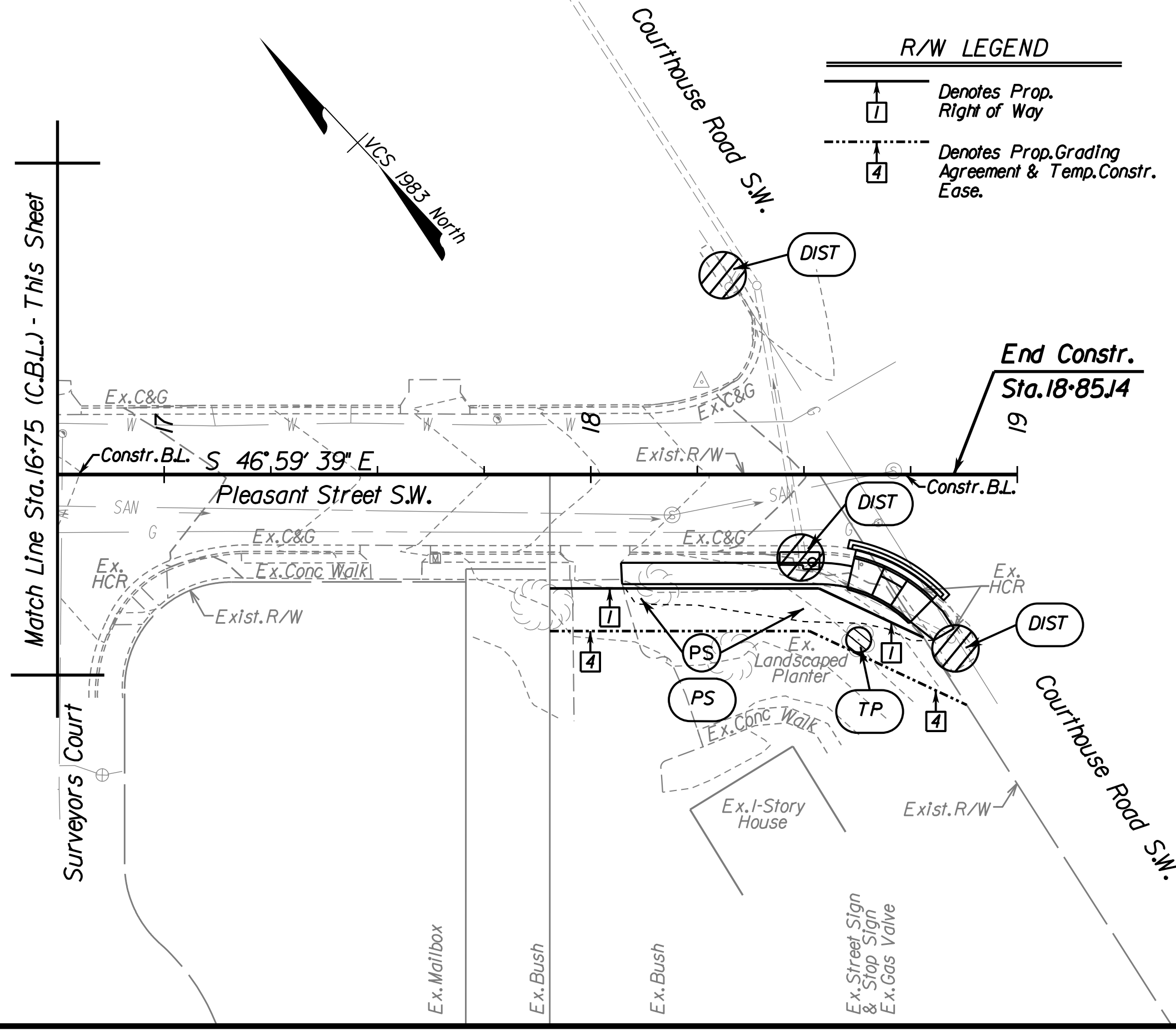
R/W LEGEND

-  Denotes Prop. Right of Way
-  Denotes Prop. Permanent Storm Drainage Easement
-  Denotes Prop. Grading Agreement & Temp. Constr. Easement

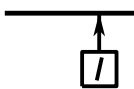
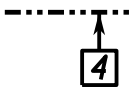


Match Line Sta. 16+75 (C.B.L.) - This Sheet

TOWN OF VIENNA






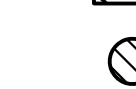
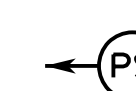
R/W LEGEND

-  Denotes Prop. Right of Way
-  Denotes Prop. Grading Agreement & Temp. Constr. Easement

NOTES:
1) Contractor shall clean cut roots prior to full excavation.
2) Contractor shall ensure all grading activities provide positive drainage and shall not create ponding. The Town of Vienna shall, at its discretion, be permitted to ensure the Contractor provides positive drainage at no additional cost to the project.

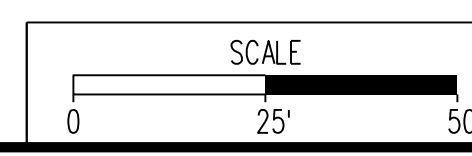
- Denotes Construction Limits in Cuts
- Denotes Construction Limits in Fills

E&S LEGEND

-  Denotes Temporary Silt Fence, S'd EC-5
-  Denotes Drop Inlet Protection, Type A or B (as necessary)
-  Denotes Culvert Inlet Protection
-  Tree Protection
-  Permanent SOD

The Contractor shall follow all Commonwealth of Virginia and Town of Vienna Erosion and Sediment Control requirements for the duration of construction. The Contractor shall submit a formal E&S plan for approval prior to start of construction activities consistent with this plan.

SCALE



PROJECT

Pleasant Street S.W. Sidewalk West

SHEET NO.

1M

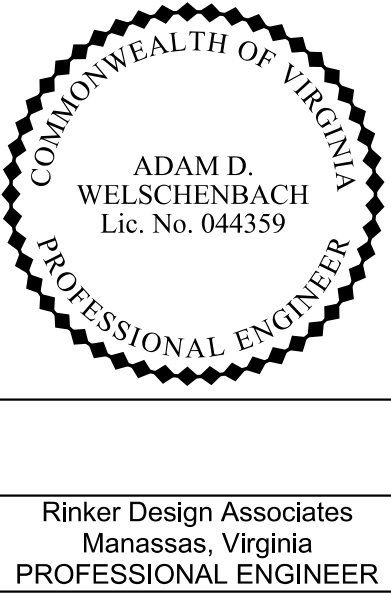
Office Locations
Rinker Design Associates, P.C.
10000
Manassas, VA 20108
703.733.7373
Fax: 703.733.7373
www.rinker.com

Design Associates, P.C.
Civil Engineering
Transportation - Environmental
Right of Way Services
www.rinker.com

TOWN OF VIENNA

6/17/2015

PROJECT MANAGER Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380
SURVEYED BY, DATE Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013
DESIGN BY Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373
SUBSURFACE UTILITY BY, DATE Mid-Atlantic Utility Locating, LLC, June 2013



REVISED	STATE	TOWN OF VIENNA		SHEET NO.
		ROUTE	PROJECT	
	VA.	N.I.S.	Pleasant Street S.W. Sidewalk West	2

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

Rinker Design Associates
Manassas, Virginia
PROFESSIONAL ENGINEER

General Notes & Details

GRADING GENERAL NOTES

- The cost of removal of all existing concrete items located in the area to be graded, including, but not limited to the following, shall be included in the price bid for regular excavation: Small Footings, Light Pole Foundations, End Walls, Drop Inlets, Manholes, Pipes, Concrete Slabs, Curb and Gutter, Concrete or Asphalt Sidewalk, Paved Ditches, Foundation Slabs, and Base or Brick Items.
- If, during construction, it is deemed necessary to change the depth more than 1 foot (0.3 m) or the limits of such excavation, such change shall be made at the direction of the Engineer and measurement and payment shall be made in accordance with Section 303 of the applicable VDOT Road and Bridge Specifications.
- The borrow or embankment material for this project shall be a minimum CBR 6 or as approved by the Town Engineer. Material classified as CH or MH in its natural state according to ASTM D 2487 or ASTM D 2488 shall not be hauled on-site as borrow material.

DRAINAGE GENERAL NOTES

- The horizontal location of all drainage structures shown on these plans is approximate only, with the exception of structures showing specific stations, special design bridges and storm sewer systems.
- The horizontal location and invert elevations shown for proposed culverts and storm sewer outfall pipes are based on existing survey data and required design criteria. If, during construction, it is found that the horizontal location or invert elevations shown on the plans differ significantly from the horizontal location or elevations of the stream or swale in which the culvert or storm sewer outfall pipe is to be placed, the Engineer shall confer with, and get approval from, the applicable Town Engineer before installing the culvert or storm sewer outfall pipe.
- The "H" dimensions shown on the plans for drop inlets and junction boxes and the "L.F." (m) dimensions shown for manholes are for estimating purposes and are based on the proposed invert elevations shown for the structure and the anticipated top (rim) elevation based on existing or proposed finished grade. The actual "H" or "L.F." (m) dimensions are to be determined by the Contractor from field conditions.
- Existing drainage facilities being utilized as a part of the drainage system, including three structures downstream of the project area, shall be cleaned out as directed by the Engineer. The cost to perform this work shall not be covered as a separate pay item, and shall be considered incidental to the project.
- Proposed drop inlet tops with a height (H) less than the standard minimum shown in the VDOT Road and Bridge Standards shall be considered and paid for as Standard Drop Inlets for the type specified.
- When Standard CG-6 or Mod. CG-6 (see this sheet for Town's detail) is specified on a radius (such as at a street intersection), the Engineer may approve a decrease in the cross slope of the gutter to facilitate proper drainage.
- S'd, SL-1 Safety slab locations are based on the assumed use of precast structures. If cast-in-place structures are utilized, and the interior chamber dimensions (length and width, or diameter) are less than four feet, the safety slabs shall not be installed.
- All excavated areas shall be restored and/or patched the same day. Prior to beginning the work, the Contractor shall submit an acceptable contingency plan to the Town outlining temporary protective measures to be utilized should the Contractor be unable to complete the restoration prior to the end of the work day.

PAVEMENT GENERAL NOTES

- For bidding purposes, the Contractor shall utilize the typical section on this sheet. Prior to the start of construction, the Contractor shall obtain pavement cores (as directed by the Town) and submit a pavement design for approval by the Town. Proposed pavement is required in all locations adjacent to proposed curb (1' width) in accordance with VDOT's WP-2 standard.

INCIDENTAL GENERAL NOTES

- Certain trees shall be preserved as noted on plans or as directed by the Engineer.
- When Standard slope roundoffs would damage trees, bushes or other desirable vegetation, they shall be omitted when so ordered by the Town.
- Clearing and grubbing shall be confined to those areas needed for construction. No trees or shrubs in ungraded areas shall be cut without the permission of the Town.
- When no centerline alignment is shown for a proposed entrance, the entrance shall be constructed in the same location as the existing entrance.
- S'd, RM-1 Right of Way Monuments shall be set by the Contractor. Any disturbed by the Contractor shall be restored at the Contractor's cost.
- The "Underground Utilities" survey data on this project has been provided by Mid-Atlantic Utility Locating, LLC.
- All pavement markings and traffic flow arrows shown on the roadway construction plans are schematic only. The actual location and application of pavement markings shall be in accordance with Section 704 of the applicable VDOT Road and Bridge Specifications, MUTCD, and as directed by the Town. All proposed pavement marking work shall be incidental to the project and not paid for as a separate pay item.
- The following outside sources, under contract with VDOT, have provided information on this project:
Hydraulic Design Rinker Design Associates, P.C.
Sidewalk Design Rinker Design Associates, P.C.
Utility Designation Mid-Atlantic Utility Locating, LLC
Utility Location Mid-Atlantic Utility Locating, LLC
Survey Rinker Design Associates, P.C.
If questions or problems arise during construction, please contact the Project Designer. DO NOT CONTACT THE OUTSIDE SOURCES.
- All electronic plan assemblies will include the construction plans in one format: .pdf files. Only the .pdf files will be considered as part of the official plan assembly.

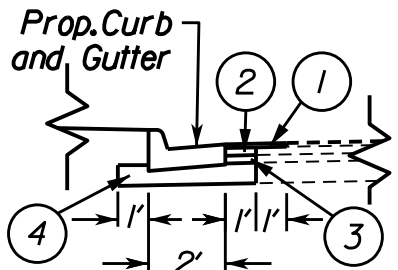
EROSION AND SEDIMENT CONTROL (ESC) GENERAL NOTES

- See Sheets IL and IL(I) for the Erosion & Sediment Control General Notes and Legend.

GENERAL NOTES

- The Contractor shall conduct a post installation visual/video camera inspection of all storm sewer pipes and a selected number of pipe culverts in accordance with the requirements of Section 302.03(d) of the VDOT 2007 Supplemental Road & Bridge Specifications and VTM 123.
- The Contractor shall present a TMP/SOC plan to the Town for approval prior to the start of construction.
-All entrances shall remain open during non-working hours or as directed by the Town.
- All work shall be in accordance with the current edition of the Manual on Uniform Traffic Control Devices (MUTCD), the current edition of the VDOT Road and Bridge Specifications, the current edition of the VDOT Road and Bridge Standards, current VDOT Insertable sheets to the Road and Bridge Standards, and all special provisions in effect at the time the plan is approved. The Contractor is to also perform all work in accordance with all current revisions to the Road and Bridge Standards, as applicable.
- The Contractor shall replace all structure tops within the project limits as noted on the plans. Only structure tops are to be replaced. All related incidental work and adjacent curb/pavement replacement/repair shall be incidental to the cost of structure top replacement.
- The Contractor shall follow all Town of Vienna requirements for planting trees (including installing any tree root barrier when trees are to be installed adjacent to proposed curb) at no additional cost to the project.
- The Town of Vienna shall determine what species of tree(s) to plant. Unless otherwise directed by the Town the following tree types shall be used:
a) Tree Type 1 - Red Maple
b) Tree Type 2 - Willow Oak
c) Tree Type 3 - Northern Red Oak
- a) The Contractor is responsible for locating all utilities. Utilities shown on plans are not guaranteed. Any disruption/impact in utility service is the sole responsibility of the Contractor. The Contractor is responsible for all utility relocation efforts/coordination to ensure utilities are relocated and/or reset (as needed for utility boxes, pole guys, etc.) and/or sidewalk guy wires are installed. The Contractor is responsible for all costs not covered by the Town of Vienna's utility franchise agreement(s). Coordination with Town of Vienna is required.
b) The Town of Vienna's forces will relocate as needed (due to construction conflicts) any other waterline conflicts, fire hydrants, and water meters. The Contractor shall coordinate with the Town of Vienna for construction scheduling to ensure continued service.
- The Contractor shall plant trees in accordance with VDOT's 2007 Road and Bridge Specifications, Section 605.05, (b) of VDOT's 2007 Road and Bridge Specifications is amended to establish the "Establishment Period" for trees planted to be one full year. Additionally, Section 605.05, *1, (b) is amended to add that the Contractor is required to water the trees once a week June 01 through September 31. Lastly, Section 605.05 *4 is amended to replace the last sentence as follows: Any future trees to be replaced shall be at the Contractor's expense, through the end of the "Establishment Period."
- The Contractor shall provide Construction Surveying in accordance with VDOT's 2007 Road and Bridge Specifications under the direction of a Virginia Licensed Land Surveyor. Additionally, the Contractor shall provide Construction Engineering Inspection (CEI) services as directed the Town (if required) at no additional cost to the project.

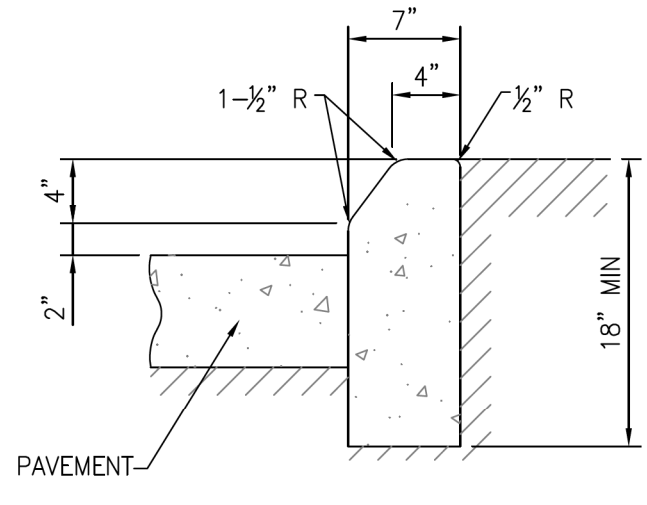
RECOMMENDED PAVEMENT TYPICAL



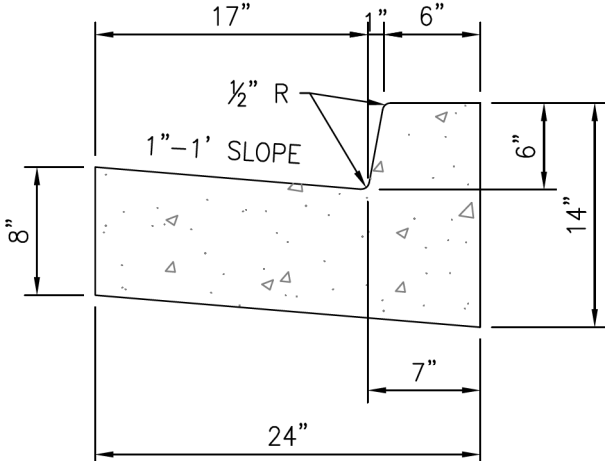
*For all locations with Prop. Curb and Gutter (per WP-2 S'd). For more information, see Pavement General Note 1 on this sheet.

- Surface Course - (1.5') Asph. Conc., Type SM-9.5A
- Intermediate Course - (3") Asph. Conc., Type IM-19.0A
- Base Course - (3") Asph. Conc., Type BM-25.0A
- Sub-base Course - (8") Aggregate Base Material, Type I, Size No. 21B

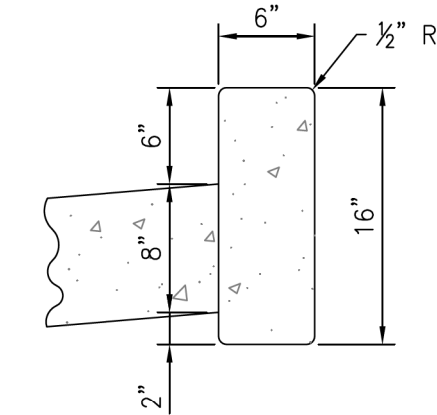
Modified CG-6



STANDARD MEDIAN CURB



STANDARD CURB & GUTTER



STANDARD HEADER CURB

- NOTES:
- CONSTRUCTION JOINTS AT 10' ON CURB.
 - ALL CONCRETE SHALL BE CLASS A-3, AIR-ENTRAINED.
 - EXPANSION JOINTS IN HEADER CURB, CURB AND GUTTER TO BE 40' APART AND AT ALL POINTS AT THE P.C. & P.T. OF CURVES.
 - CONSTRUCTION JOINTS IN SIDEWALK TO BE 5' APART. EXPANSION JOINTS IN SIDEWALK TO BE 40' APART. IF SIDEWALK IS AT THE CURB, EXPANSION JOINTS TO MATCH JOINT IN CURB, ALSO EXPANSION JOINTS BETWEEN CURB AND SIDEWALK. DOWELS AND SLEEVES TO BE INSTALLED IN C&G JOINTS WHERE SUB-GRADE IS UNSTABLE.
 - EXPANSION JOINTS REQUIRED WHERE SIDEWALKS MEET DRIVEWAY APRONS.

STANDARD CURB, GUTTER & SIDEWALK
TOWN OF VIENNA
DEPARTMENT OF PUBLIC WORKS
PREPARED: 11-10-2010
REVISED: 5-18-2011

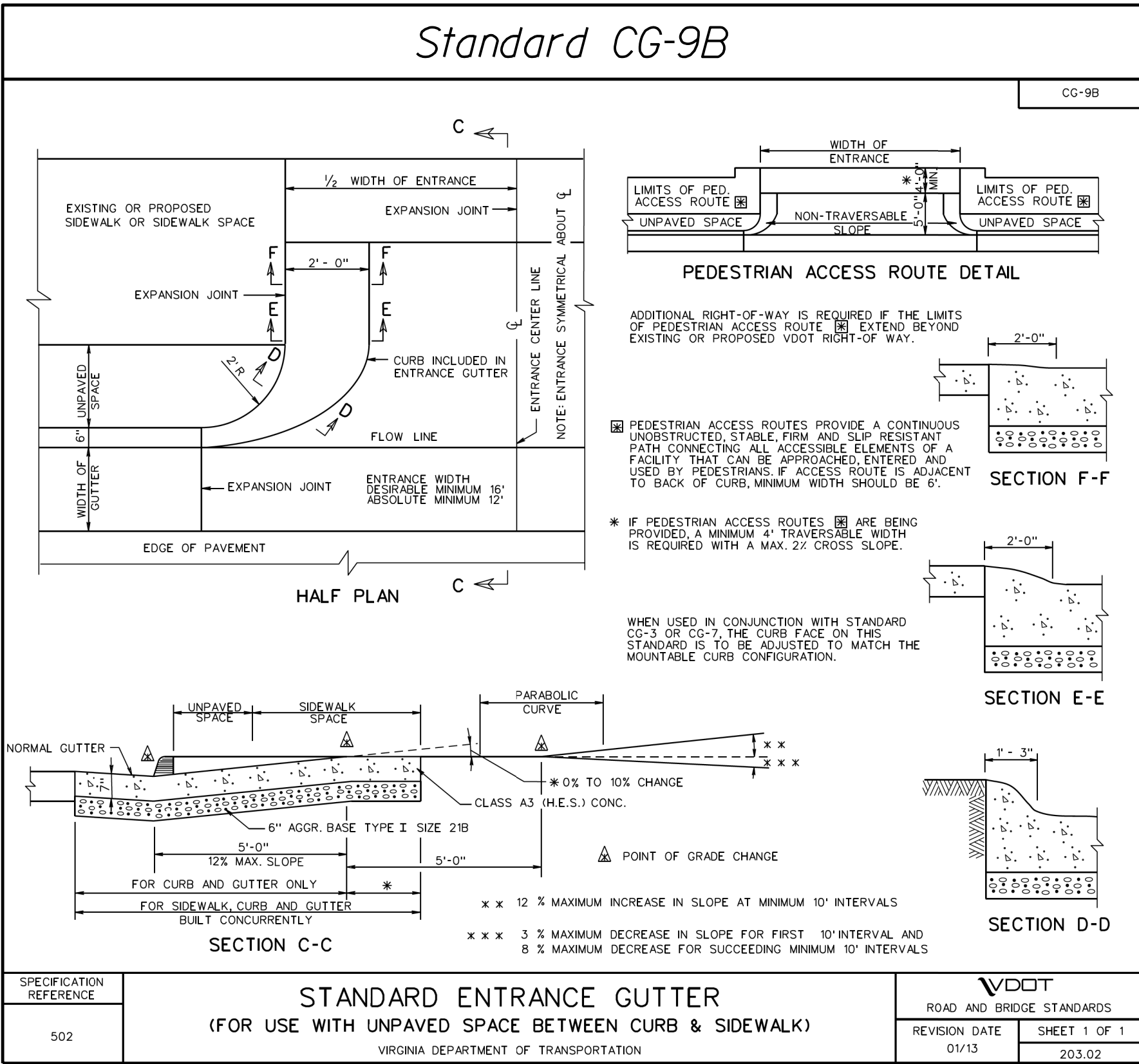
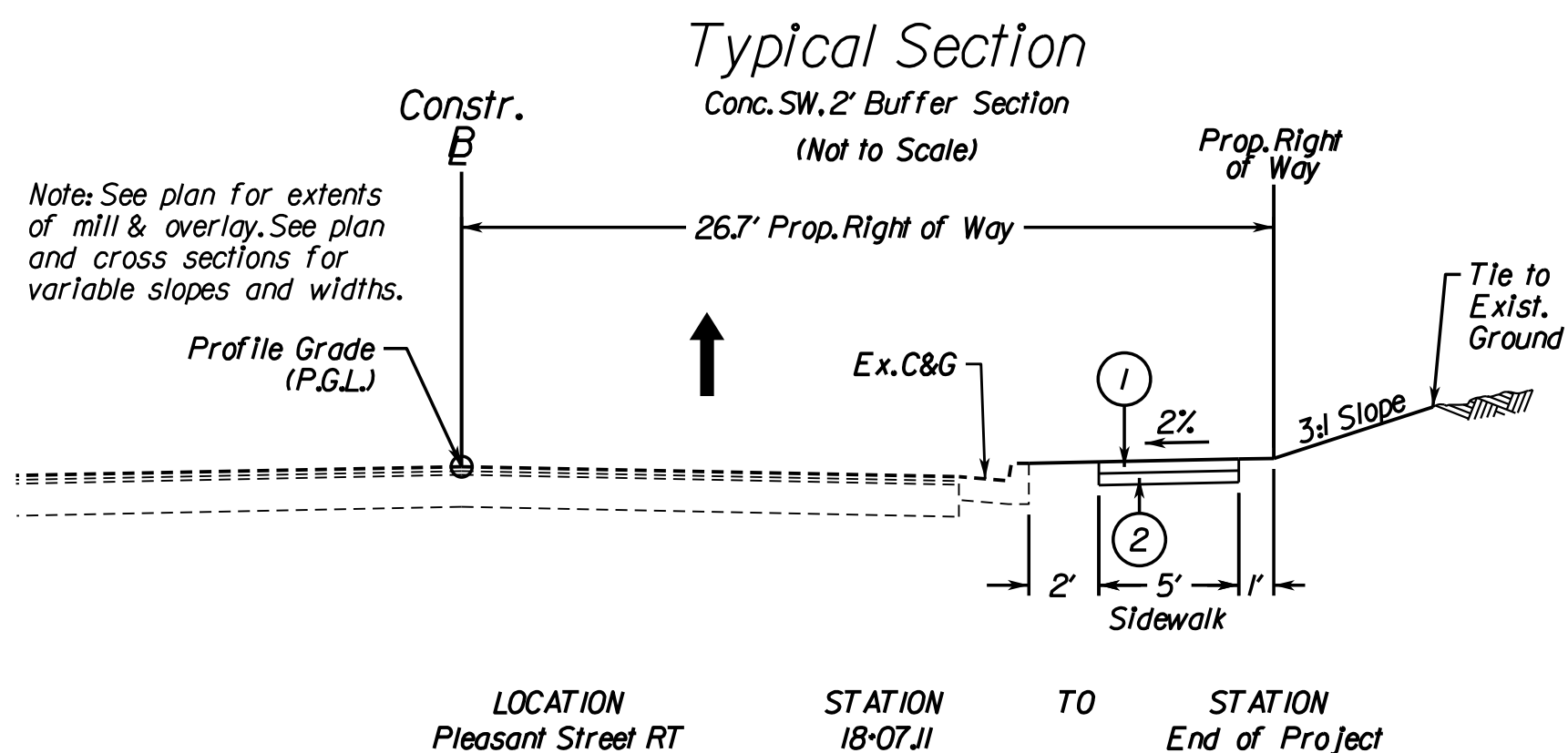
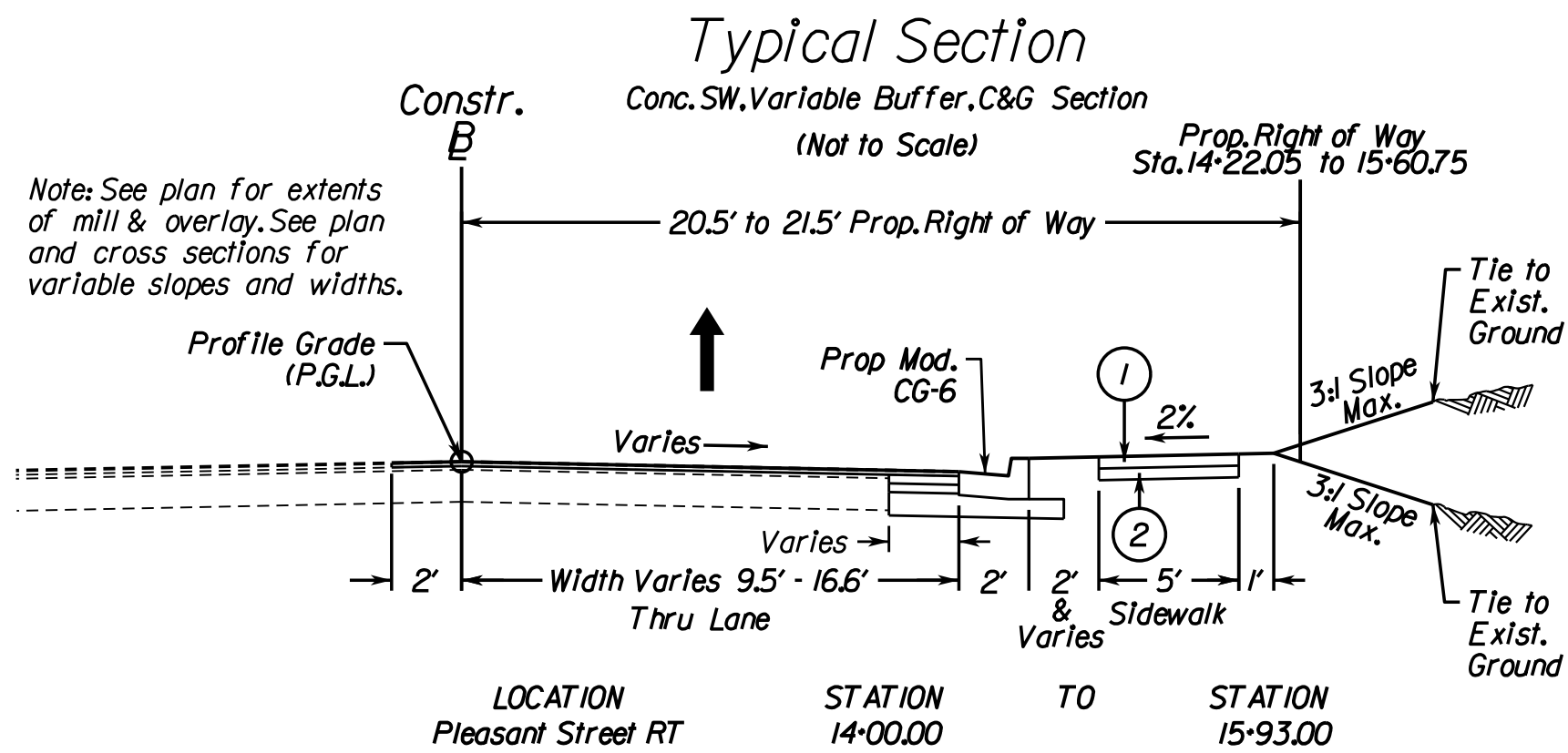
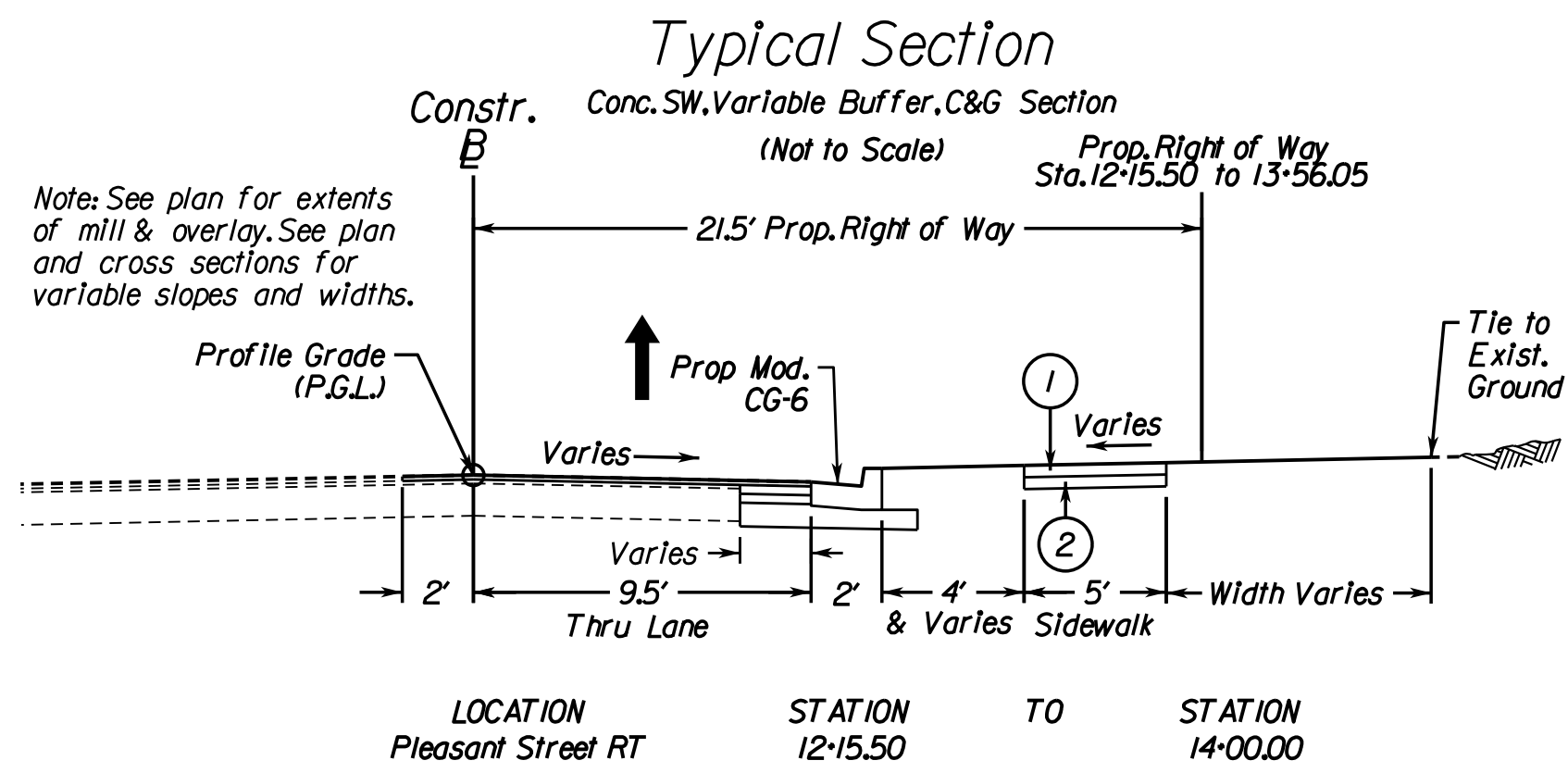
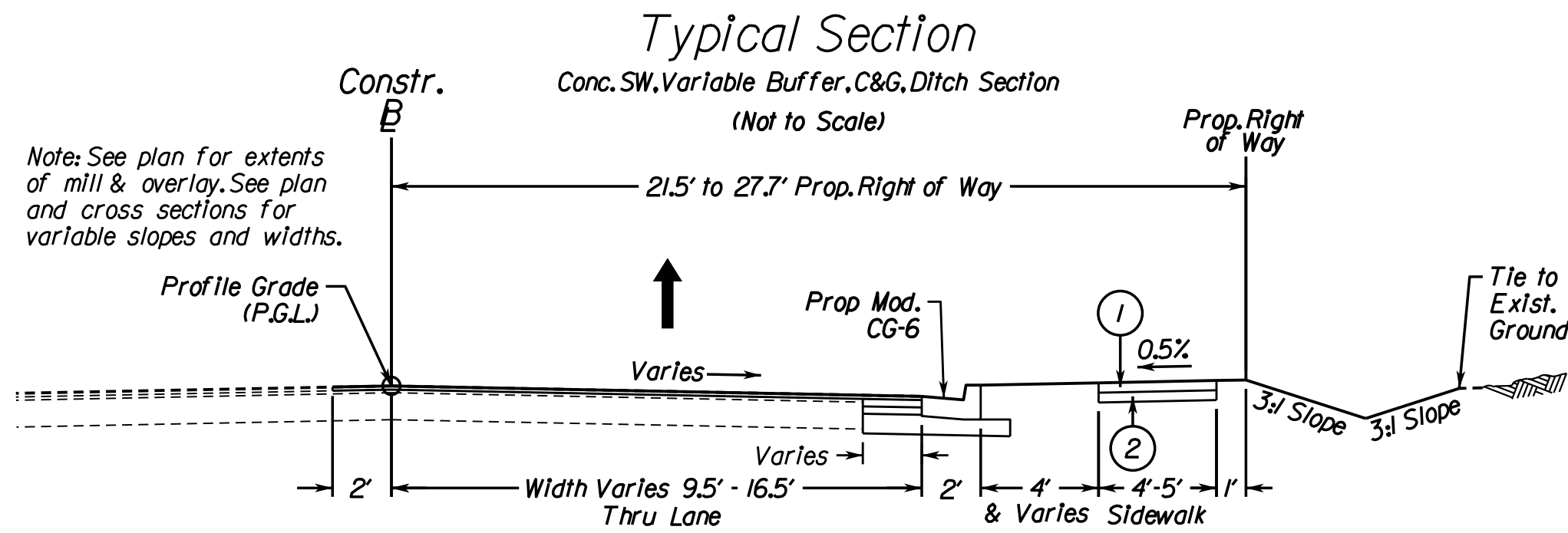
PROJECT MANAGER *Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380*
SURVEYED BY, DATE *Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013*
DESIGN BY *Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373*
SUBSURFACE UTILITY BY, DATE *Mid-Atlantic Utility Locating, LLC, June 2013*

Office Locations
Rinker Design Associates, P.C.
10000 Lee Highway, Suite 100
Manassas, VA 20108
703.368.7373
Fax: 703.368.7374
www.rinkerdesign.com

Design Associates, P.C.
Civil Engineering
Transportation
Right of Way Services

TOWN OF VIENNA

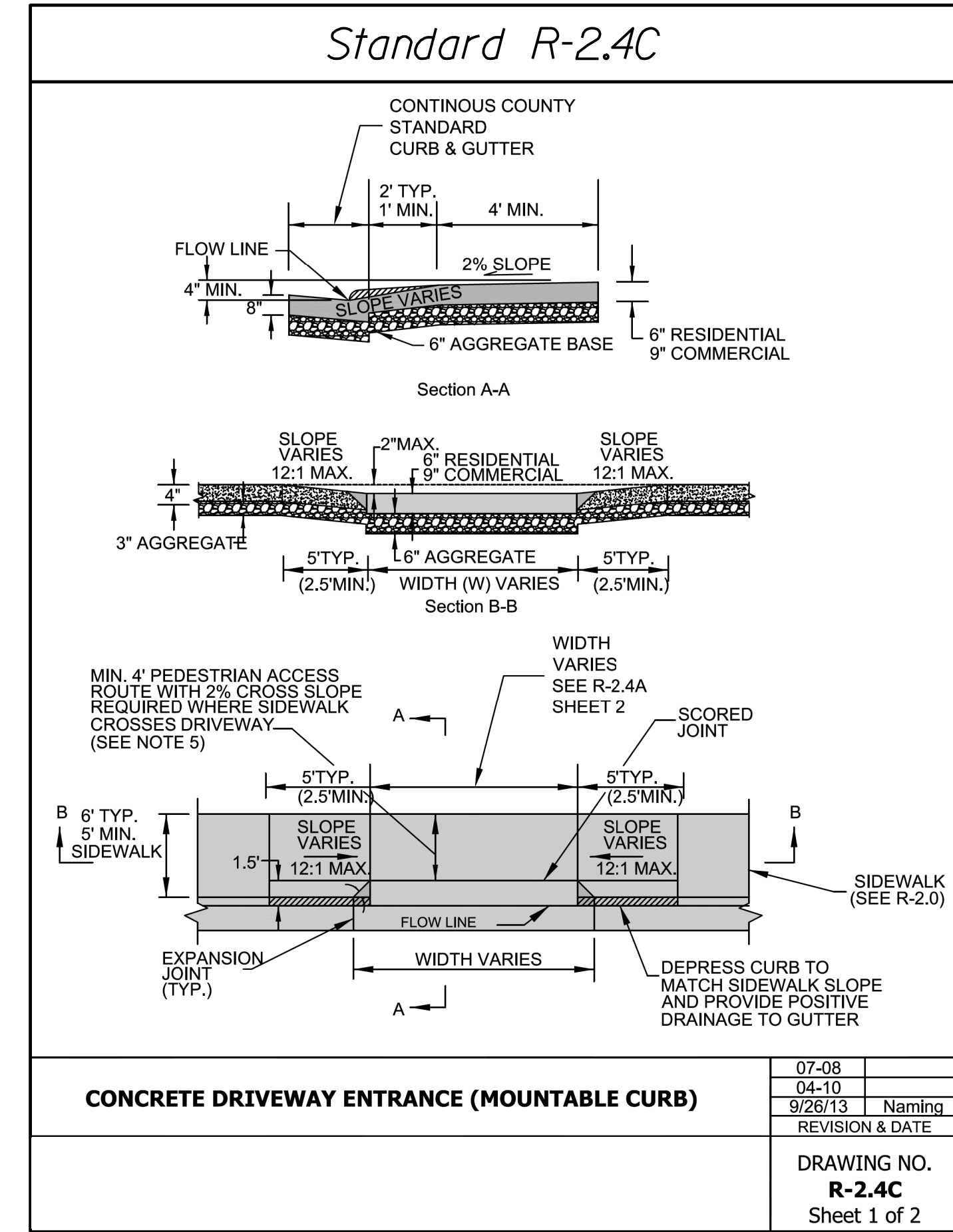
6/17/2015



Contractor shall obtain two pavement cores to determine the existing pavement design to install with curb/gutter installation. All pavement widening shall match existing pavement design and shall be done in accordance with VDOT's WP-2 standard and shall provide positive drainage for all layers applicable. The Town's approval of pavement to be applied is required prior to ordering of materials or pavement application.

- ① Concrete Sidewalk - (4") Class A3 Hydraulic Cement Concrete
- ② Concrete Sidewalk Base - (4") Aggr. Base Material, Type I, Size No. 21A

REVISED	STATE	ROUTE	TOWN OF VIENNA PROJECT	SHEET NO.
	VA.	N.A.S.	Pleasant Street S.W. Sidewalk West	2A
DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT				
Rinker Design Associates Manassas, Virginia PROFESSIONAL ENGINEER				



PROJECT		SHEET NO.
Pleasant Street S.W. Sidewalk West		2A

Office Locations

10000 University Boulevard
Manassas, VA 20108
Phone: (703) 368-7373
Fax: (703) 368-7373

3000 Capital Circle
Gainesville, VA 20626
Phone: (703) 368-7373
Fax: (703) 368-7373

10000 University Boulevard
Manassas, VA 20108
Phone: (703) 368-7373
Fax: (703) 368-7373

Design Associates, P.C.

Civil Engineering
Transportation
Right of Way Services

www.rinker.com

TOWN OF VIENNA

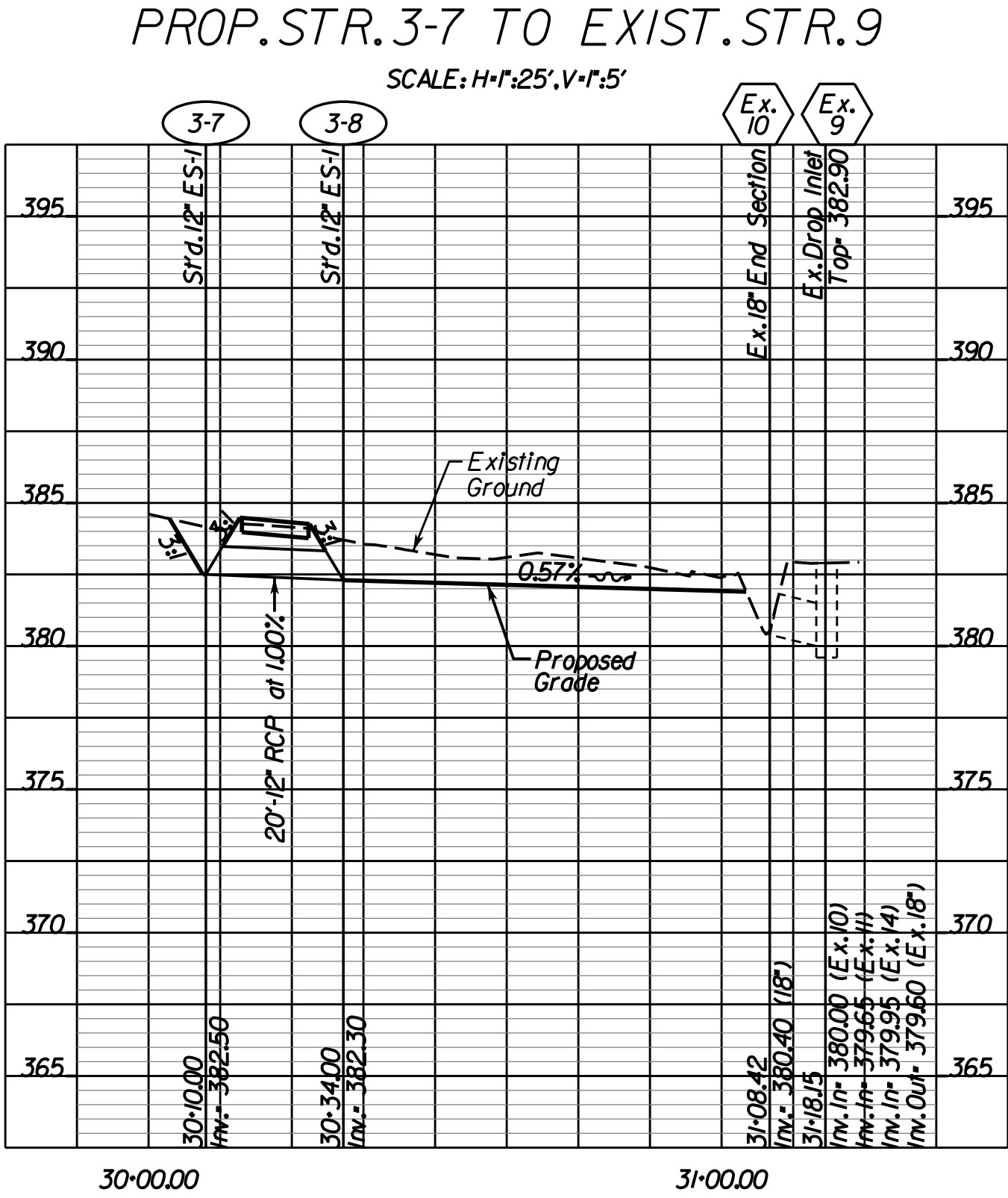
6/17/2015

PROJECT MANAGER *Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380*
SURVEYED BY, DATE *Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013*
DESIGN BY *Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373*
SUBSURFACE UTILITY BY, DATE *Mid-Atlantic Utility Location, LLC, June 2013*

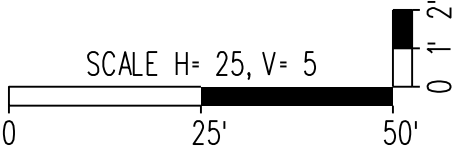
Existing Drainage & Sanitary Descriptions

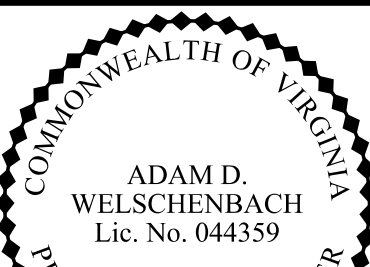
STORM SEWER	SANITARY SEWER
① Ex. Catch Basin Ex. Top=384.40 Ex. Inv. Out=380.70(15" RCP)	Ⓐ Ex. San. MH Ex. Top=384.50 Ex. Inv. In=374.80
② Ex. Catch Basin Ex. Top=384.72 Ex. Inv. In=380.30 Ex. Inv. Out=380.15(18" RCP)	Ⓑ Ex. San. MH Ex. Top=386.17 Ex. Inv. In=376.58 Ex. Inv. Out=376.32(8")
③ Ex. Storm Manhole Ex. Top=383.55 Ex. Inv. In=379.75 Ex. Inv. Out=379.65(18" RCP)	Ⓒ Ex. San. MH Ex. Top=391.42 Ex. Inv. In=383.04 Ex. Inv. Out=383.00(8")
④ Ex. Storm Manhole Ex. Top=382.70 Ex. Inv. In=378.00 Ex. Inv. Out=377.95(18" RCP)	Ⓓ Ex. San. MH Ex. Top=394.05 Ex. Inv. In=383.90(8")
⑤ Ex. Storm Grate Ex. Top=390.85 Ex. Inv. Out=389.45(6" PVC) Direction Unknown	Ⓔ Ex. San. MH Ex. Top=396.20 Ex. Inv. In=390.55(8")
⑥ Ex. Conc. Endwall Ex. Inv.=378.00	Ⓕ Ex. San. MH Ex. Top=384.92 Ex. Inv. In=378.77 Ex. Inv. Out=378.72(8")
⑥A Ex. 32" End-Section Ex. Inv.=374.58	Ⓖ Ex. San. MH Ex. Top=383.28 Approx. Inv.=377.9"
⑦ Ex. Catch Basin Ex. Top=382.93 Ex. Inv. In=378.77 Ex. Inv. Out=378.57(18"x36" RCP)	
⑧ Ex. Storm MH Ex. Top=382.95 Ex. Inv. In=379.10 Ex. Inv. Out=379.05(18" RCP)	
⑨ Ex. Catch Basin Ex. Top=382.90 Ex. Inv. In=380.00(From-10) Ex. Inv. In=379.95(From-14) Ex. Inv. In=379.65(From-11) Ex. Inv. Out=379.60(18" RCP)	
⑩ Ex. End-Section Ex. Inv.=380.40(18" RCP)	
⑪ Ex. Catch Basin Ex. Top=384.68 Ex. Inv. In=381.48(From-12) Ex. Inv. In=381.26(From-13) Ex. Inv. Out=380.93(18" RCP)	
⑫ Ex. Catch Basin Ex. Top=383.25 Ex. Inv. Out=381.70(12"x12" Conc.)	
⑬ Ex. Storm Grate Ex. Top=386.10 Ex. Inv. Out=381.30(15" RCP)	
⑭ Ex. Storm MH Ex. Top=383.75 Ex. Inv. In=380.45 Ex. Inv. Out=380.35(18" RCP)	
⑮ Ex. Storm MH Ex. Top=386.80 Ex. Inv. Out=382.40(18" RCP)	
⑯ Ex. Catch Basin Ex. Top=383.84 Ex. Inv. Out=380.95(12" RCP)	

Storm Sewer Profiles

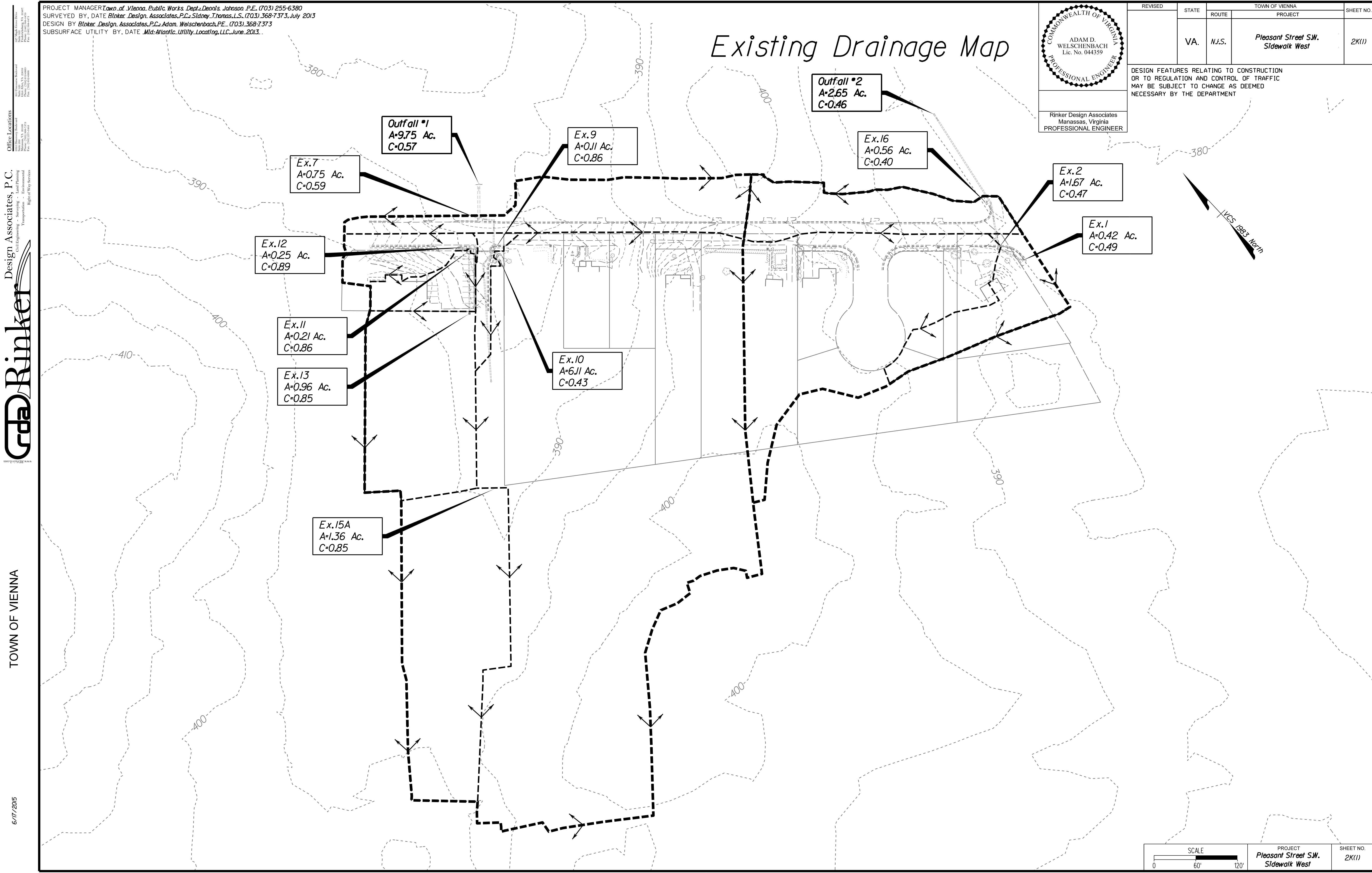


- Storm Sewer Construction Notes**
1. A post installation visual/video camera inspection of storm sewer pipes and pipe culverts shall be conducted by the Contractor in accordance with the requirements of Section 302.03(d) of the VDOT 2007 Supplemental Road & Bridge Specifications. This is to ensure that the pipe joints are properly connected and sealed and that the pipe is undamaged.
 2. Contractor shall flush all proposed storm pipes with clean water before making them operational.

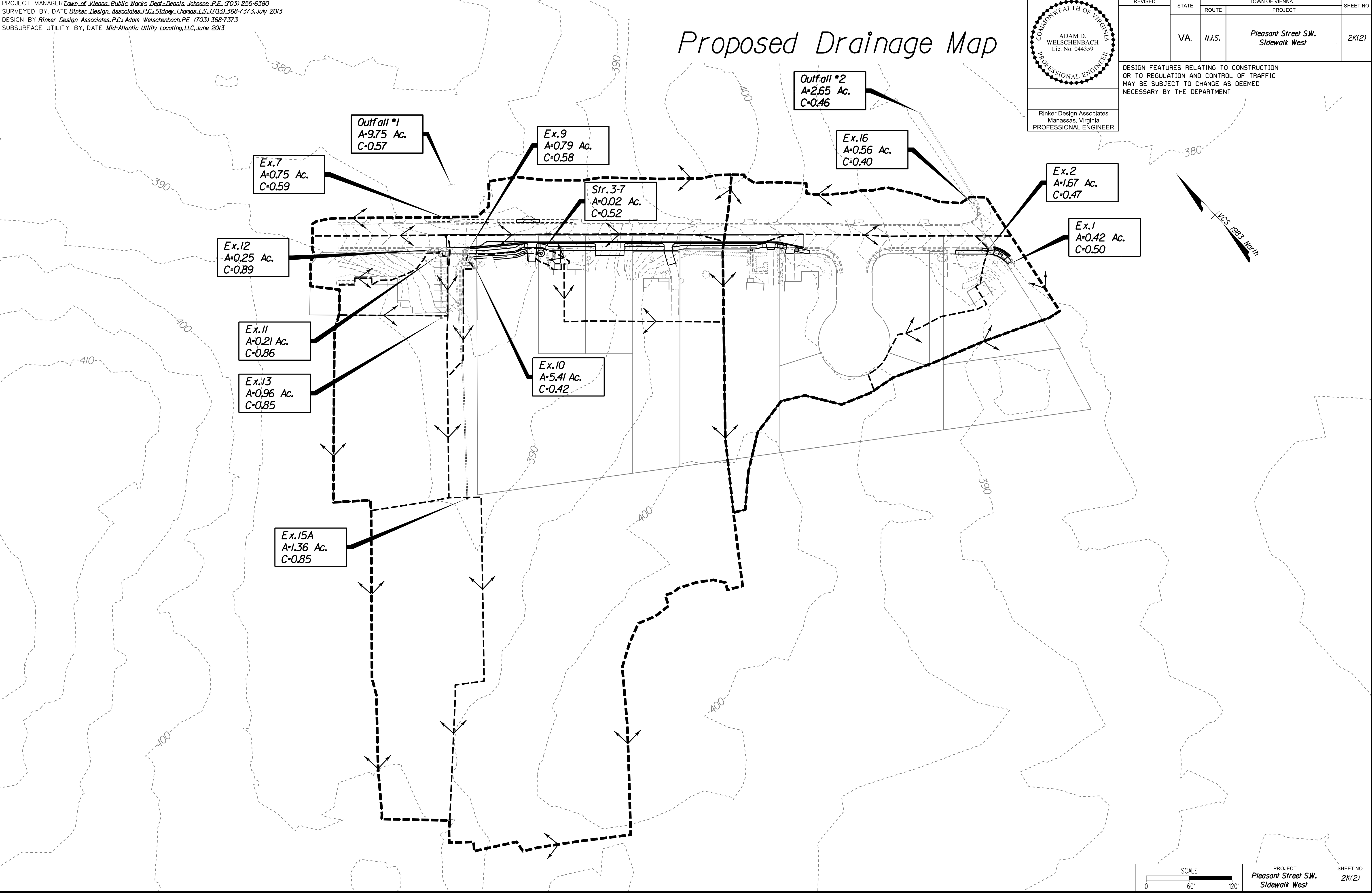


 ADAM D. WELSCHENBACH Lic. No. 044359 PROFESSIONAL ENGINEER	REVISED	STATE	TOWN OF VIENNA		SHEET NO.
			ROUTE	PROJECT	
			VA.	N.A.S.	Pleasant Street S.W. Sidewalk West
	DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT				
Rinker Design Associates Manassas, Virginia PROFESSIONAL ENGINEER					

PROJECT Pleasant Street S.W. Sidewalk West	SHEET NO. 2K
--	-----------------



PROJECT MANAGER *Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380*
SURVEYED BY, DATE *Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013*
DESIGN BY *Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373*
SUBSURFACE UTILITY BY, DATE *Mid-Atlantic Utility Locating, LLC, June 2013*



COMMONWEALTH OF VIRGINIA
ADAM D. WELSCHENBACH
Lic. No. 044359
PROFESSIONAL ENGINEER

Rinker Design Associates
Manassas, Virginia
PROFESSIONAL ENGINEER

REVISED	STATE	ROUTE	TOWN OF VIENNA PROJECT	SHEET NO.
	VA.	N.A.S.	Pleasant Street S.W. Sidewalk West	2K(2)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

Office Locations
Rinker Design Associates, P.C.
10000 University Blvd.
Suite 200
Manassas, VA 20108
Phone: (703) 368-7373
Fax: (703) 368-7373
www.rinker.com

Design Associates, P.C.
Civil Engineers
Transportation - Environmental
Right of Way Services
www.rinker.com

PROJECT MANAGER *Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380*
SURVEYED BY, DATE *Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013*
DESIGN BY *Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373*
SUBSURFACE UTILITY BY, DATE *Mid-Atlantic Utility Locating, LLC, June 2013*

Storm Drainage Computations

COMMONWEALTH OF VIRGINIA
ADAM D. WELSCHENBACH
Lic. No. 044359
PROFESSIONAL ENGINEER

Rinker Design Associates
Manassas, Virginia
PROFESSIONAL ENGINEER

REVISED	STATE	ROUTE	TOWN OF VIENNA PROJECT	SHEET NO.
	VA.	N.A.S.	<i>Pleasant Street S.W. Sidewalk West</i>	2K(3)

DESIGN FEATURES RELATING TO CONSTRUCTION
OR TO REGULATION AND CONTROL OF TRAFFIC
MAY BE SUBJECT TO CHANGE AS DEEMED
NECESSARY BY THE DEPARTMENT

PRE-DEVELOPMENT INLET COMPUTATIONS

FORM LD-204

INLET COMPUTATIONS

ROUTE: *Pleasant Avenue*

DESIGNED BY: CW
CHECKED BY: AW
DATE: 6/16/2015
UNITS: ENGLISH

Inlet			Station	Drainage Area (Ac)	C	CA	Sum CA	I (in/Hr)	Q Incr. (CFS)	Qc Carryover (CFS)	QT Gutter Flow (CFS)	S Gutter Slope (Ft/Ft)	Sx Cross Slope (Ft/Ft)	T (Spread) (Ft)	W (Gutter Width) (Ft)	W/T	Sw (Gutter Slope) (Ft/Ft)	Sw/Sx	Eo (App.9C-8)	a	S'w	Se	Computed Length (Ft)	L Specified Length (Ft)	L/LT	E (App.9C-18)	Q Intercepted (CFS)	Qb Carryover (CFS)	Depth at Curb (in)	Sag Inlets Only					Remarks
Number	Type	Length (Ft)																												Allowable Ponding Depth (Ft)	Height of Curb Opening h (Ft)	d/h	Depth at Inlet (in)	T Spread @ SAG (Ft)	
Ex01	DI-3C	8	18+88	0.36	0.49	0.176																												Back/Lt.	
				0.06	0.49	0.029	0.176	4	0.70	0.00																								Back/Lt.	
							0.029	4	0.12	1.86		0.0100	0.0500	4.89	1.5	0.306	0.0833	1.6660		2.10														Ahead/Rt.	
											2.68	0.0100												8		2.68		2.7	0.40	0.03	12.00	4.2	4.56		Weir Flow
Ex02	DI-3B	4	18+51	1.67	0.47	0.785																													
							0.785	4	3.14	0.00	3.14	0.0410	0.0420	4.87	1.5	0.308	0.0833	1.9833	0.690	2.24	0.1246	0.1280	15.9	4	0.252	0.407	1.28	1.86	3.2						
Ex07	DI-3C	6	11+04	0.11	0.59	0.065																												Back/Lt.	
				0.64	0.59	0.378	0.065	4	0.26	0.00																								Back/Lt.	
							0.378	4	1.51	0.00		0.0150	0.0510	3.98	1.5	0.377	0.0833	1.6333		2.08														Ahead/Rt.	
											1.77	0.0150																						Ahead/Rt.	
Ex09	DI-3C	6	11+20	0.03	0.86	0.026																													
							0.026	4	0.10	0.00																								Back/Lt.	
				0.08	0.86	0.069																												Back/Lt.	
							0.069	4	0.28	0.00		0.0300	0.0500	1.45	1.5	1.033	0.0833	1.6660		2.10														Ahead/Rt.	
											0.38	0.0300																						Weir Flow	

POST-DEVELOPMENT INLET COMPUTATIONS

FORM LD-204

INLET COMPUTATIONS

ROUTE: *Pleasant Street*

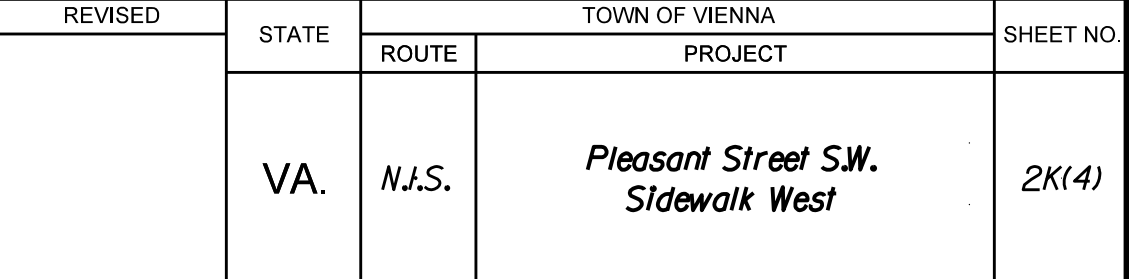
DESIGNED BY: CW
CHECKED BY: AW
DATE: 6/16/2015
UNITS: ENGLISH

Inlet			Station	Drainage Area (Ac)	C	CA	Sum CA	I (in/Hr)	Q Incr. (CFS)	Qc Carryover (CFS)	QT Gutter Flow (CFS)	S Gutter Slope (Ft/Ft)	Sx Cross Slope (Ft/Ft)	T (Spread) (Ft)	W (Gutter Width) (Ft)	W/T	Sw (Gutter Slope) (Ft/Ft)	Sw/Sx	Eo (App.9C-8)	a	S'w	Se	Computed Length (Ft)	L Specified Length (Ft)	L/LT	E (App.9C-18)	Q Intercepted (CFS)	Qb Carryover (CFS)	Depth at Curb (in)	Sag Inlets Only					Remarks
Number	Type	Length (Ft)																												Allowable Ponding Depth (Ft)	Height of Curb Opening h (Ft)	d/h	Depth at Inlet (in)	T Spread @ SAG (Ft)	
Ex01	DI-3C	8	18+88	0.36	0.50	0.18																												Back/Lt.	
				0.06	0.50	0.03	0.18	4	0.72	0.00																								Back/Lt.	
							0.03	4	0.12	0.89		0.0100	0.0500	3.68	1.5	0.41	0.0833	1.6660		2.10														Ahead/Rt.	
											1.73	0.0100												8			1.73		2.0	0.40	0.03	12.00	3.5	3.40	Weir Flow
Ex02	DI-3B	8	18+51	1.67	0.47	0.78																													
							0.79	4	3.14	0.00	3.14	0.0410	0.0420	4.87	1.5	0.31	0.0833	1.9833	0.690	2.24	0.1246	0.1280	15.9	8	0.50	0.72	2.25	0.89	3.2						
Ex07	DI-3C	6	11+04	0.11	0.59	0.06																												Back/Lt.	
				0.64	0.59	0.38	0.07	4	0.26	0.00																								Back/Lt.	
							0.38	4	1.51	0.00		0.0150	0.0510	3.98	1.5	0.38	0.0833	1.6333		2.08														Ahead/Rt.	
											1.77	0.0150												6			1.77		2.4	0.41	0.03	12.00	3.9	3.89	Ahead/Rt.
Ex09	DI-3C	6	11+20	0.39	0.58	0.23																												Back/Lt.	
				0.40	0.58	0.23	0.23	4	0.90	0.00																								Back/Lt.	
							0.23	4	0.93	0.00		0.0300	0.0500	2.76	1.5	0.54	0.0833	1.6660		2.10														Ahead/Rt.	
											1.83	0.0300												6			1.83		2.4	0.40	0.03	12.00	3.9	4.06	Weir Flow

PROJECT
*Pleasant Street S.W.
Sidewalk West*

SHEET NO.
2K(3)

Storm Drainage Computations



PRE-DEVELOPMENT STORM COMPUTATIONS, 10-YEAR STORM

CHECKED BY: *AW* UNITS: *ENGLISH*

Pipe No.	From Point		To Point		Drain Area "A" (Acres)	Runoff Coeff. "C"	CA		Total Inlet Time (Minutes)	Rain Fall (In/Hr)	Runoff		Invert Elevations		Length of Pipe (Ft)	Slope (Ft/Ft)	Pipe Dia. or Sp. Rise (In)	Shape	Number of Pipes	Capacity (CFS)	Friction Slope (Ft/Ft)	Normal Flow					Flow Time (Sec)	Remarks
	Reference	Sta.	Reference	Sta.			Increment	Accumulated			Lateral (CFS)	Total Q (CFS)	Upper End	Lower End								Hm (Ft)	Vn (Ft/Sec)	En (Ft)				
Ex11toEx09	Ex11	10+88	Ex09	11+20	0.21	0.86	0.18	1.22	5.33	6.66	0.00	812	380.93	379.65	33	0.0388	18	Circular	1	20.69	0.0062	0.65	0.74	0.34	11.0	2.53	3	
Ex10toEx09	Ex10	11+30	Ex09	11+20	6.11	0.43	2.63	2.63	15.00	4.62	0.00	1213	380.40	380.00	9	0.0444	18	Circular	1	22.14	0.0139	0.79	0.95	0.39	12.8	3.34	1	
Ex09toEx08	Ex09	11+20	Ex08	11+24	0.11	0.86	0.09	5.10	15.01	4.62	0.00	28.08	379.60	379.10	44	0.0114	18	Circular	1	11.20	0.0745	1.50	1.77	0.38	15.9	5.42	3	Pressure Flow
Ex08toEx07	Ex08	11+24	Ex07	11+04	0.00		0.00	5.10	15.06	4.61	0.00	28.08	379.05	378.77	18	0.0156	18	Circular	1	13.10	0.0745	1.50	1.77	0.38	15.9	5.42	1	Pressure Flow
Ex07toEx06	Ex07	11+04	Ex06	11+02	0.75	0.59	0.44	5.54	15.08	4.61	0.00	28.08	378.57	378.00	49	0.0116	36 x 18	Elliptical	1	27.45	0.0122	1.50	3.53	0.50	7.9	2.48	6	Pressure Flow
Ex01toEx02	Ex01	18+88	Ex02	18+51	0.42	0.49	0.21	0.21	5.00	6.77	0.00	1.39	380.70	380.30	38	0.0105	15	Circular	1	6.63	0.0005	0.39	0.33	0.22	4.3	0.67	9	
Ex02toEx03	Ex02	18+51	Ex03	18+39	1.67	0.47	0.78	0.99	5.15	6.72	0.00	6.66	380.15	379.75	65	0.0062	18	Circular	1	8.24	0.0042	1.02	1.28	0.44	5.2	1.44	13	
Ex03toExT	Ex03	18+39	ExT		0.00		0.00	0.99	5.36	6.65	0.00	6.66	379.65	379.60	5	0.0110	18	Circular	1	11.02	0.0042	0.84	1.02	0.40	6.5	1.50	1	
Ex16toExT	Ex16	18+32	ExT		0.56	0.40	0.22	0.22	5.00	6.77	0.00	1.52	380.95	379.60	6	0.2258	12	Circular	1	16.93	0.0019	0.20	0.11	0.12	13.3	2.97	0	
ExT1toEx04	ExT		Ex04		0.00		0.00	1.21	5.37	6.65	0.00	8.18	379.60	378.00	145	0.0110	18	Circular	1	11.02	0.0063	0.96	1.20	0.43	6.8	1.69	21	

POST-DEVELOPMENT STORM COMPUTATIONS, 10-YEAR STORM

CHECKED BY: *AW* UNITS: *ENGLISH*

Pipe No.	From Point		To Point		Drain Area "A" (Acres)	Runoff Coeff. "C"	CA		Total Inlet Time (Minutes)	Rain Fall (In./Hr.)	Runoff		Invert Elevations		Length of Pipe (Ft)	Slope (Ft./Ft.)	Size Dia. of Spill Rise (In.)	Shape	Number of Pipes	Capacity (CFS)	Friction Slope (Ft./Ft)	Normal Flow					Flow Time (Sec)	Remarks
	Reference	Sta.	Reference	Sta.			Increment	Accumulated			Lateral (CFS)	Total Q (CFS)	Upper End	Lower End								Hm (Ft)	Vn (Ft./Sec)	En (Ft)				
																									Depth of Flow, dn (ft)	Area of Flow, An (SqFt)		
E x I1toE x09	E x I1	10+88	E x09	11+20	0.21	0.86	0.18	1.22	5.33	6.66	0.00	8.12	380.93	379.65	33	0.0388	18	Circular	1	20.69	0.0062	0.65	0.74	0.34	11.0	2.53	3	
E x I0toE x09	E x I0	11+30	E x09	11+20	5.43	0.42	2.28	2.28	15.00	4.62	0.00	10.54	380.40	380.00	9	0.0444	18	Circular	1	22.14	0.0105	0.73	0.85	0.37	12.4	3.11	1	
E x09toE x08	E x09	11+20	E x08	11+24	0.79	0.58	0.46	5.12	15.01	4.62	0.00	26.49	379.60	379.10	44	0.0114	18	Circular	1	11.20	0.0663	1.50	1.77	0.38	15.0	4.99	3	Pressure Flow
E x08toE x07	E x08	11+24	E x07	11+04	0.00		0.00	5.12	15.06	4.61	0.00	26.49	379.05	378.77	18	0.0156	18	Circular	1	13.10	0.0663	1.50	1.77	0.38	15.0	4.99	1	Pressure Flow
E x07toE x06	E x07	11+04	E x06	11+02	0.75	0.59	0.44	5.56	15.08	4.61	0.00	26.49	378.57	378.00	49	0.0116	36 x 18	Elliptical	1	27.45	0.0109	1.19	3.01	0.61	8.9	2.41	6	
E x01toE x02	E x01	18+88	E x02	18+51	0.42	0.50	0.21	0.21	5.00	6.77	0.00	1.42	380.70	380.30	38	0.0105	15	Circular	1	6.63	0.0005	0.39	0.33	0.22	4.3	0.68	9	
E x02toE x03	E x02	18+51	E x03	18+39	1.67	0.47	0.78	0.99	5.15	6.72	0.00	6.69	380.15	379.75	65	0.0062	18	Circular	1	8.24	0.0042	1.03	1.29	0.44	5.2	1.45	13	
E x03toE xT	E x03	18+39	E xT		0.00		0.00	0.99	5.36	6.65	0.00	6.69	379.65	379.60	5	0.0110	18	Circular	1	11.02	0.0042	0.84	1.02	0.40	6.5	1.51	1	
E x16toE xT	E x16	18+32	E xT		0.56	0.40	0.22	0.22	5.00	6.77	0.00	1.52	380.95	379.60	6	0.2258	12	Circular	1	16.93	0.0019	0.20	0.11	0.12	13.3	2.97	0	
E xT1toE x04	E xT		E x04		0.00		0.00	1.22	5.37	6.65	0.00	8.21	379.60	378.00	145	0.0110	18	Circular	1	11.02	0.0064	0.96	1.20	0.43	6.8	1.69	21	

* Existing condition.
* Existing condition.

PROJECT MANAGER: *Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380*
SURVEYED BY, DATE: *Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013*
DESIGN BY: *Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373*
SUBSURFACE UTILITY BY, DATE: *Mid-Atlantic Utility Location, LLC, June 2013*

Storm Drainage Computations

COMMONWEALTH OF VIRGINIA

ADAM D. WELSCHENBACH
Lic. No. 044359

PROFESSIONAL ENGINEER

Rinker Design Associates
Manassas, Virginia
PROFESSIONAL ENGINEER

REVISED	STATE	ROUTE	TOWN OF VIENNA PROJECT	SHEET NO.
	VA.	N.A.S.	Pleasant Street S.W. Sidewalk West	2K(15)

DESIGN FEATURES RELATING TO CONSTRUCTION
OR TO REGULATION AND CONTROL OF TRAFFIC
MAY BE SUBJECT TO CHANGE AS DEEMED
NECESSARY BY THE DEPARTMENT

PRE-DEVELOPMENT HGL COMPUTATIONS

FORM LD-347

HYDRAULIC GRADE LINE ANALYSIS

INCIDENCE PROBABILITY 10-Year

DESIGNED BY: CW
CHECKED BY: AW
DATE: 6/16/2015
UNITS: ENGLISH

INLET OR JUNCTION	STA.	INVERT	DEPTH	OUTLET	DIA.	DESIGN	LENGTH	FRICTION	FRICTION	JUNCTION LOSS									SURFACE FLOW	Adj.Ht	Inlet	0.5	FINAL	Inlet	Top of MH	Ad Justment?
		EL.	OF FLOW	WATER	PIPE	DISCH.	PIPE	SLOPE, S _{f0}	LOSS	H _I (Expn) 0.35*MAX. H _I (2/2g)	SKEW Angle	K	Bend H	Sum HL	I.3 H _I	Shapng?	H _I	H		Water Surface Elevation	Top of Inlet Elev.					
		OUTFLOW	OUTFLOW	SURFACE	Do	Qo	Lo	(FT/FT)	Hf																	
		PIPE	PIPE	ELEV.	(In/mm)	(CFS/CMS)	(F1/M)	(M/M)	(F1/M)																	
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)	Y/N	(F1/M)	(F1/M)	(18)	(19)	
Ex06																								379.20		
Ex07	11+04	378.00	1.50	379.50	36 X 18	28.08	49	0.0122	0.597	7.9	0.245	15.9	3.922	1.373	83.0	0.65	2.543	4.161	2.039	4.161	YES	2.081	2.677	382.18	382.43	O.K.
Ex08	11+24	378.77	1.50	382.18	18	28.08	18	0.0747	1.345	15.9	0.980	15.9	3.922	1.373	84.0	0.65	2.554	4.907	0.000	4.907	YES	2.453	3.798	385.98	382.95	ADJUST
Ex09	11+20	379.10	1.50	385.98	18	28.08	44	0.0747	3.288	15.9	0.980	12.8	2.550	0.893	90.0	0.70	1.316	3.189	0.437	3.189	YES	1.594	4.882	390.86	382.40	ADJUST
Ex11	10+88	379.65	1.50	390.86	18	8.12	33	0.0063	0.206	11.0	0.470	4.5	0.315	0.110	95.0	0.67	0.836	1.416	1.203	1.416	YES	0.708	0.914	391.77	384.18	ADJUST
Ex13	10+89	381.26	1.25	391.77	15	5.53	88	0.0076	0.673	4.5	0.079	0.0	0.000	0.000	0.0	0.00	0.000	0.079	5.526	0.102	NO	0.102	0.776	392.55	386.10	ADJUST
Ex10	11+30	380.00	1.50	390.86	18	12.13	9	0.0139	0.126	12.8	0.638	0.0	0.000	0.000	0.0	0.00	0.000	0.638	0.000	0.638	NO	0.638	0.763	391.62	382.50	ADJUST
Ex12	10+88	381.48	1.00	391.77	12	1.51	3	0.0019	0.006	8.9	0.310	0.0	0.000	0.000	0.0	0.00	0.000	0.310	1.507	0.404	NO	0.404	0.409	392.18	382.75	ADJUST
Ex04																								379.20		
ExT		378.00	1.50	379.20	18	8.18	145	0.0063	0.918	6.8	0.181	6.5	0.662	0.232	63.0	0.57	1.576	1.988	0.000	1.988	YES	0.994	1.912	381.11	383.50	O.K.
Ex03	18+39	379.60	1.50	381.11	18	6.66	5	0.0042	0.021	6.5	0.165	5.2	0.418	0.146	23.0	0.27	0.112	0.424	0.000	0.424	YES	0.212	0.233	381.35	383.55	O.K.
Ex02	18+51	379.75	1.50	381.35	18	6.66	65	0.0042	0.273	5.2	0.105	4.3	0.284	0.100	53.0	0.51	0.146	0.350	5.276	0.455	YES	0.227	0.500	381.85	384.22	O.K.
Ex01	18+88	380.30	1.25	381.85	15	1.39	38	0.0005	0.018	4.3	0.071	0.0	0.000	0.000	0.0	0.00	0.000	0.071	1.394	0.092	NO	0.092	0.111	381.96	383.90	O.K.
Ex16	18+32	379.60	1.00	381.11	12	1.52	6	0.0019	0.011	13.3	0.691	0.0	0.000	0.000	0.0	0.00	0.000	0.691	1.517	0.899	NO	0.899	0.910	382.02	383.34	O.K.

POST-DEVELOPMENT HGL COMPUTATIONS

FORM LD-347

HYDRAULIC GRADE LINE ANALYSIS

INCIDENCE PROBABILITY 10-Year

DESIGNED BY: CW
CHECKED BY: AW
DATE: 6/16/2015
UNITS: ENGLISH

INLET OR JUNCTION	STA.	INVERT EL. OUTFLOW PIPE	DEPTH OF FLOW OUTFLOW PIPE	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In/mm)	DESIGN DISCH. Qo (CFS/CMS)	LENGTH PIPE Lo (F1/M)	FRICTION SLOPE, Sfo (FT/FT)	FRICTION LOSS Hf (F1/M)	JUNCTION LOSS								SURFACE FLOW	Adj.Ht I.3 Ht (F1/M)	Inlet Shapng? Y/N	0.5 Ht (F1/M)	FINAL H (F1/M)	Inlet Water Surface Elevation (18)	Top of MH Top of Inlet Elev. APPROX. (19)	Ad Justment?				
										Vo	Contr. Ho (F1/M)	VI	VI+2/2g	HI (Expn) 0.35*MAX. (V12/2g)	SKEW Angle	K	Bend H (F1/M)									Sum HL (F1/M)			
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)			(16)	(17)		(18)	(19)		
Ex06																											379.20		
Ex07	11+04	378.00	1.50	379.20	36 X 18	26.49	49	0.0108	0.531	8.9	0.305	15.0	3.490	1.221	83.0	0.65	2.263	3.790	2.039	3.790	YES	1.895	2.426	381.63	382.43	O.K.			
Ex08	11+24	378.77	1.50	381.63	18	26.49	18	0.0665	1.197	15.0	0.872	15.0	3.490	1.221	84.0	0.65	2.273	4.366	0.000	4.366	YES	2.183	3.380	385.01	382.95	ADJUST			
Ex09	11+20	379.10	1.50	385.01	18	26.49	44	0.0665	2.926	15.0	0.872	12.4	2.379	0.833	90.0	0.70	1.316	3.021	2.115	3.021	YES	1.510	4.436	389.44	382.40	ADJUST			
Ex11	10+88	379.65	1.50	389.44	18	8.12	33	0.0063	0.206	11.0	0.470	4.5	0.315	0.110	95.0	0.67	0.836	1.416	1.203	1.416	YES	0.708	0.914	390.36	384.18	ADJUST			
Ex13	10+89	381.26	1.25	390.36	15	5.53	88	0.0076	0.673	4.5	0.079	0.0	0.000	0.000	0.0	0.00	0.000	0.079	5.526	0.102	NO	0.102	0.776	391.13	386.10	ADJUST			
Ex10	11+30	380.00	1.50	389.44	18	10.54	9	0.0105	0.095	12.4	0.595	0.0	0.000	0.000	0.0	0.00	0.000	0.595	0.000	0.595	NO	0.595	0.689	390.13	382.50	ADJUST			
Ex12	10+88	381.48	1.00	390.36	12	1.51	3	0.0019	0.006	8.9	0.310	0.0	0.000	0.000	0.0	0.00	0.000	0.310	1.507	0.404	NO	0.404	0.409	390.77	382.75	ADJUST			
Ex04																										379.20			
ExT		378.00	1.50	379.20	18	8.21	145	0.0064	0.925	6.8	0.181	6.5	0.663	0.232	63.0	0.57	1.576	1.989	0.000	1.989	YES	0.995	1.919	381.12	383.50	O.K.			
Ex03	18+39	379.60	1.50	381.12	18	6.69	5	0.0042	0.021	6.5	0.166	5.2	0.419	0.147	23.0	0.27	0.112	0.425	0.000	0.425	YES	0.212	0.234	381.35	383.55	O.K.			
Ex02	18+51	379.75	1.50	381.35	18	6.69	65	0.0042	0.275	5.2	0.105	4.3	0.287	0.101	53.0	0.51	0.147	0.353	5.276	0.458	YES	0.229	0.505	381.86	384.22	O.K.			
Ex01	18+88	380.30	1.25	381.86	15	1.42	38	0.0005	0.019	4.3	0.072	0.0	0.000	0.000	0.0	0.00	0.000	0.072	1.422	0.093	NO	0.093	0.113	381.97	383.90	O.K.			
Ex16	18+32	379.60	1.00	381.12	12	1.52	6	0.0019	0.011	13.3	0.691	0.0	0.000	0.000	0.0	0.00	0.000	0.691	1.517	0.899	NO	0.899	0.910	382.03	383.34	O.K.			

* Existing condition.
* Existing condition.

* Existing condition.
* Existing condition.

* Existing condition.
* Existing condition.

* Existing condition.

Office Locations
Rinker Design Associates, P.C.
10000 University Blvd., Suite 200
Manassas, VA 20108
703.761.1100
Fax: 703.761.1101
www.rinker.com

Design Associates, P.C.
Civil Engineering
Transportation - Environmental
Right of Way Services
www.rinker.com

TOWN OF VIENNA

6/17/2015

PROJECT MANAGER *Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380*
SURVEYED BY, DATE *Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013*
DESIGN BY *Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373*
SUBSURFACE UTILITY BY, DATE *Mid-Atlantic Utility Locating, LLC, June 2013*

Outfall Analysis

COMMONWEALTH OF VIRGINIA
ADAM D. WELSCHENBACH
Lic. No. 044359
PROFESSIONAL ENGINEER

Rinker Design Associates
Manassas, Virginia
PROFESSIONAL ENGINEER

REVISED	STATE	ROUTE	TOWN OF VIENNA PROJECT	SHEET NO.
	VA.	N.A.S.	Pleasant Street S.W. Sidewalk West	2K(16)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

OUTFALL ANALYSIS SUMMARY TABLE

DESIGNED BY: CW DATE: 6/16/2015
CHECKED BY: AW UNITS: ENGLISH

Outfall	Outfall Location (Station)	Outfall Structure (If any)	Drainage Area (ac)					Cw	Tc (min)	I-Value (in/hr)		Peak Flow,Q (cfs)		Relative Increase in Peak Flow (cfs)		% Increase In Peak Flow		Outfall Receiving Channel					Outfall Adequacy Yes/No	Remarks
			Total Area	Impervious (C=0.90)	Grass (C=0.35)	Commercial (C=0.85)	Residential (C=0.40)			2-yr	10-yr	2-yr	10-yr	2-yr	10-yr	2-yr	10-yr	Channel Velocity	Natural Channel	Manmade Channel	Stormdrain System			
																		2-yr Check (ft/s)	2-yr Avail. Depth (in)	10-yr Avail. Depth (in)	Size (in)	10-yr Pipe Capacity (cfs)		
Outfall #1	Pleasant Street																							
Pre-Developed	11+02 LT	Ex.6	9.75	0.82	0.29	2.79	5.84	0.570	15J	3.50	4.61	19.45	25.58					**	N/A	**	36x18	27.45	Yes	Ex.Storm System to Ex.Ditch
Post-Developed	11+02 LT	Ex.6	9.75	0.83	0.29	2.79	5.84	0.570	15J	3.50	4.61	19.46	25.59	0.01	0.01	0.0%	0.0%	**	N/A	**	36x18	27.45	Yes	Ex.Storm System to Ex.Ditch
											Change +	0.01	0.01											
Outfall #2	Courthouse Road																							
Pre-Developed	200' North	Ex.4	2.65	0.330	0.23	0.00	2.09	0.458	5.4	5J3	6.65	6.22	8.06					N/A	N/A	N/A	18	11.02	Yes	Existing Storm System
Post-Developed	200' North	Ex.4	2.65	0.339	0.22	0.00	2.09	0.460	5.4	5J3	6.65	6.25	8.10	0.03	0.04	0.4%	0.4%	N/A	N/A	N/A	18	11.02	Yes	Existing Storm System
											Change +	0.03	0.04											

** Additional survey required to analyze existing ditch downstream of outfall.

WATER QUALITY CALCULATIONS

Watershed: Difficult Run
BEST MANAGEMENT PRACTICES (BMP) NARRATIVE AND CALCULATIONS

Best Management Practices (BMP) for the site are being provided by:

Structural Measures
Non-Structural Measures

Runoff from the developed site's impervious area is controlled by:

Retention Basins
Extended Detention Basins
Constructed Wetlands
Infiltration Trenches
Bioretention Basins ("Rain Gardens")

Sand Filters
Grassed Swales
Vegetated Filter Strips
Filterria Bioretention Structures
Storm Filter

PERFORMANCE-BASED WATER QUALITY CALCULATIONS

STEP 1 - Determine the Applicable Area, (A) and the Post-Developed Impervious Cover, (Ipost).

APPLICABLE AREA, (A):

Total Site Area = 0.24 AC
Planning Area = AC
A = 0.24 AC
Off-Site R/W = AC

POST-DEVELOPED IMPERVIOUS COVER, (Ipost):

Tabulation of Impervious Areas
On-Site 0.13 AC
Pavement AC
Ipost = Total Impervious Area / A
Ipost = 0.13 AC
Ipost = 0.24 AC
Ipost = 56.9 %
Total - 0.13 AC

STEP 2 - Determine the Existing Impervious Cover, (Iexisting) OR Use the Average Land Cover Condition, (Iwatershed)

EXISTING IMPERVIOUS COVER, (Iexisting):

Tabulation of Impervious Areas
On-Site 0.12 AC
Pavement AC
Iexisting = Total Impervious Area / A
Iexisting = 0.12 AC
Iexisting = 0.24 AC
Iexisting = 50.8 %
Total - 0.12 AC

AVERAGE LAND CONDITION, (Iwatershed):

Iwatershed = 16 %

Is the Existing Impervious Cover (Iexisting) served by an existing stormwater management BMP that addresses water quality?

STEP 3 - Determine the Appropriate Development Situation

DEVELOPMENT SITUATION

SITUATION 3

Land development where the Existing Impervious Cover (Iexisting) is greater than the Average Land Cover (Iwatershed).

REQUIREMENT

The Post-Development Pollutant Discharge (Lpost) shall not exceed 1) the Existing Pollutant Discharge based on the Existing Conditions (Lpre-existing) less 10%; or 2) the Existing Pollutant Discharge based on the Average Land Cover Condition (Lpre-watershed), whichever is greater.

STEP 4 - Determine the Relative Pre-Development Pollutant Load, (Lpre)

Lpre-existing = [0.05 + (0.009 x Iexisting)] x A x 2.28
Lpre-existing = [0.05 + (0.009 x 50.8)] x 0.24 x 2.28
Lpre-existing = 0.27 LB/YR

Lpre-watershed = [0.05 + (0.009 x Iexisting)] x A x 2.28
Lpre-watershed = [0.05 + (0.009 x 16.0)] x 0.24 x 2.28
Lpre-watershed = 0.10 LB/YR

STEP 5 - Determine the Relative Post-Development Pollutant Load, (Lpost)

Lpost = [0.05 + (0.009 x Ipost)] x A x 2.28
Lpost = [0.05 + (0.009 x 56.9)] x 0.24 x 2.28
Lpost = 0.30 LB/YR

STEP 6 - Determine the Relative Pollutant Removal Requirement, (RR)

RRexisting = Lpost - (0.9 x Lpre-existing)
RRexisting = 0.30 - (0.9 x 0.27)
RRexisting = 0.06 LB/YR

RRwatershed = Lpost - Lpre-watershed
RRwatershed = 0.30 - 0.10)
RRwatershed = 0.20 LB/YR

RR = LESSER OF RRexisting OR RRwatershed
RR = 0.06 LB/YR

STEP 7 - Identify the Best Management Practice (BMP) Options for the Site

REQUIRED REMOVAL EFFICIENCY:

EFF = (RR / Lpost) x 100
EFF = $\frac{0.06}{0.30}$ x 100
EFF = 19 %

Outfall Narrative

Project Overview: This outfall analysis is for a linear pedestrian access improvement project along the west side of Pleasant Street SW in the Town of Vienna, Virginia. The project proposes to add curb and gutter and a 5' concrete sidewalk for a total of 550 feet. The sidewalks will be installed along the west side of Pleasant Street SW. In the existing condition, this roadway has some sections of curb and gutter and some shoulder sections. The existing pedestrian facilities have gaps between segments, and this project will fill in those gaps. The roadway has existing closed storm sewer systems. The project is located in the Plney Branch watershed management area which is within the greater Difficult Run watershed.

Outfall Descriptions: Drainage for this project impacts two outfalls as described below.

Outfall #1 - This outfall is an existing storm sewer system into an existing ditch. The drainage consists of 9.75 acres of sheet flow from the roadway and surrounding commercial and residential areas. This project increases the amount of impervious area going to this outfall by 0.005 acre, and the C-value remains the same at 0.57. The peak flows for the 2- and 10-year storm events increase a negligible amount by 0.01 cfs each as shown in the Outfall Analysis Summary Table on this sheet. Storm Computations on Sheets 2K(3) through 2K(5) show that the existing storm sewer system is not adequate to convey the flows in the existing condition. Since the existing storm sewer system is not being replaced with this project, the existing pressure flow and HGL issues remain in the proposed condition. However, the existing and proposed topography provide overland relief from the project area to the outfall channel.

Outfall #2 - This outfall is an existing storm sewer system. The drainage consists of 2.65 acres of sheet flow from the roadway and surrounding residential areas. This project increases the amount of impervious area going to this outfall by 0.009 acre, and the C-value remains the same at 0.46. The peak flows for the 2- and 10-year storm events increase a relatively negligible amount by 0.03 cfs and 0.04 cfs respectively as shown in the Outfall Analysis Summary Table on this sheet. Storm Computations on Sheets 2K(3) through 2K(5) for the pipes downstream of the project show that the existing system is adequate to convey the flows for the 10-year storm in both the existing and proposed conditions.

Drainage Area: The total project area for this project is 0.84 acre. The project proposes the addition of 0.014 acre of impervious area within 0.24 acre of disturbed area.

Final Opinion: The existing storm sewer has adequate capacity to convey the proposed flow for Outfall #2. It is our opinion that Outfall #2 will not be adversely impacted by the proposed walkway addition. Outfall #1 at its point of analysis is inadequate in the existing condition. However, the increases in peak runoff to the outfall due to the proposed project are negligible, and existing and proposed topography provide overland relief from the project area to the outfall channel. The increases in peak runoff to Outfall #1 and Outfall #2 due to the proposed project are 0.0% and 0.4% respectively. There are no known flooding problems at the points of analysis for Outfall #1 and Outfall #2.

WQN/WQL Narrative

This project proposes to add curb and gutter and a 5' concrete sidewalk for a total of 550 feet. The sidewalk will be installed along the west side of Pleasant Street SW. The project is located in the Plney Branch watershed management area which is within the greater Difficult Run (PL22) watershed. This project has two outfalls as described in the Outfall Narrative. The Drainage Maps can be found on sheets 2K(1) and 2K(2) and Storm Computations can be found on sheets 2K(3), 2K(4), and 2K(5). From the computations, it can be seen that:

- There will be negligible increases in peak flow rates for all outfalls.
- The existing storm sewer system is adequate to convey the flows for Outfall #2, and the existing and proposed topography provide overland relief for Outfall #1.
- There are no additional anticipated flooding or erosion problems downstream.

Further, at the points of analysis, it can be seen that:

- The increases in peak flow rates downstream of the discharge points are negligible.
- There are no additional anticipated flooding or erosion problems downstream of the discharge points.

The Erosion and Sediment Controls for this project can be found on the IL and IM sheet series.

Quantity Control: Based on the negligible impact to peak flow rates at project outfalls resulting from this linear project, water quantity controls should be waived because of SWM facilities managed and maintained by the Town of Vienna and in compliance with the Town Code, Chapter 23, Article 3.

Quality Control: Per the BMP Calculations on this sheet and in compliance with VSMP water quality control requirements, a nutrient credit purchase per Town Code Section 23-17.C of the equivalent loading of 0.06 pound/year is proposed.

Note: The Contractor, after receiving notice to proceed AND prior to obtaining a VSMP permit, shall obtain certified nutrient credits for the equivalent loading amount of 0.06 pound/year on behalf of the Town of Vienna. This nutrient credit purchase shall be coordinated with the Town, and the proper documentation/materials shall be provided to the Town. The Contractor is responsible for all costs associated with this purchase and shall provide documentation of what is being purchased to the Engineer for approval prior to final purchase. The nutrient credits shall be from a nutrient credit bank that serves the Difficult Run watershed.

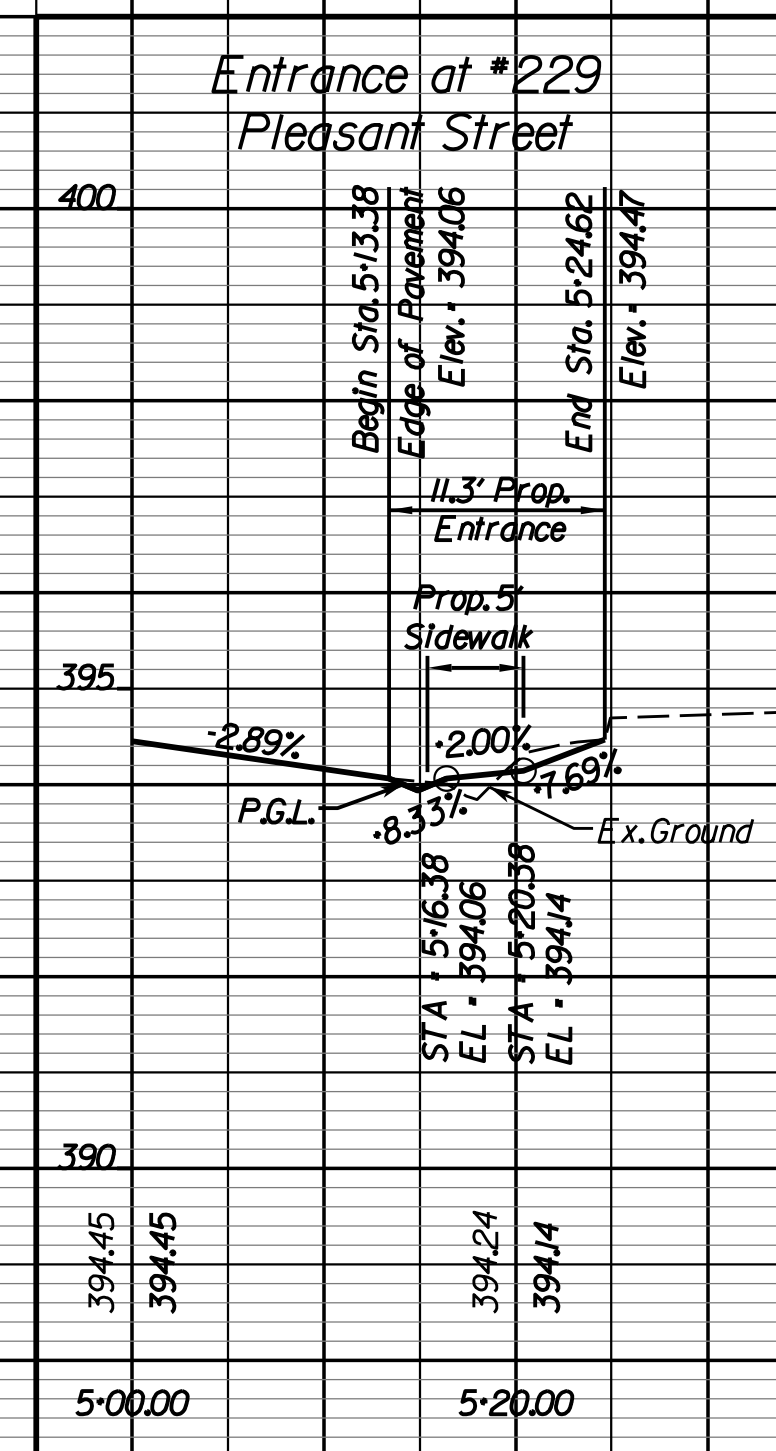
PROJECT
Pleasant Street S.W.
Sidewalk West

SHEET NO.
2K(16)

SHEET NO.
3

SHEET NO.	3A
-----------	----

Entrance at #229
Pleasant Street



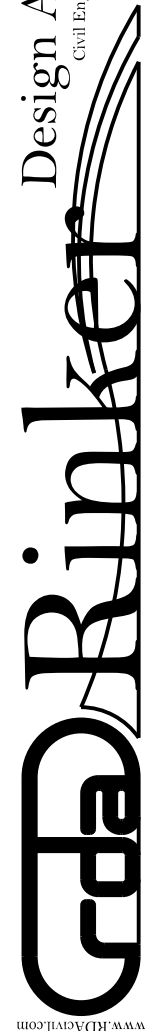
\$DGN\$
\$DGNLEV

Design Associates, P.C.
Civil Engineering Transportation - Environmental
Right of Way Services

TOWN OF VIENNA

\$TIME\$ \$STAMP\$

Office Locations
1000 University Boulevard
Suite 200
Arlington, VA 22204
Phone: (703) 261-1100
Fax: (703) 261-1101
www.Rinker.com



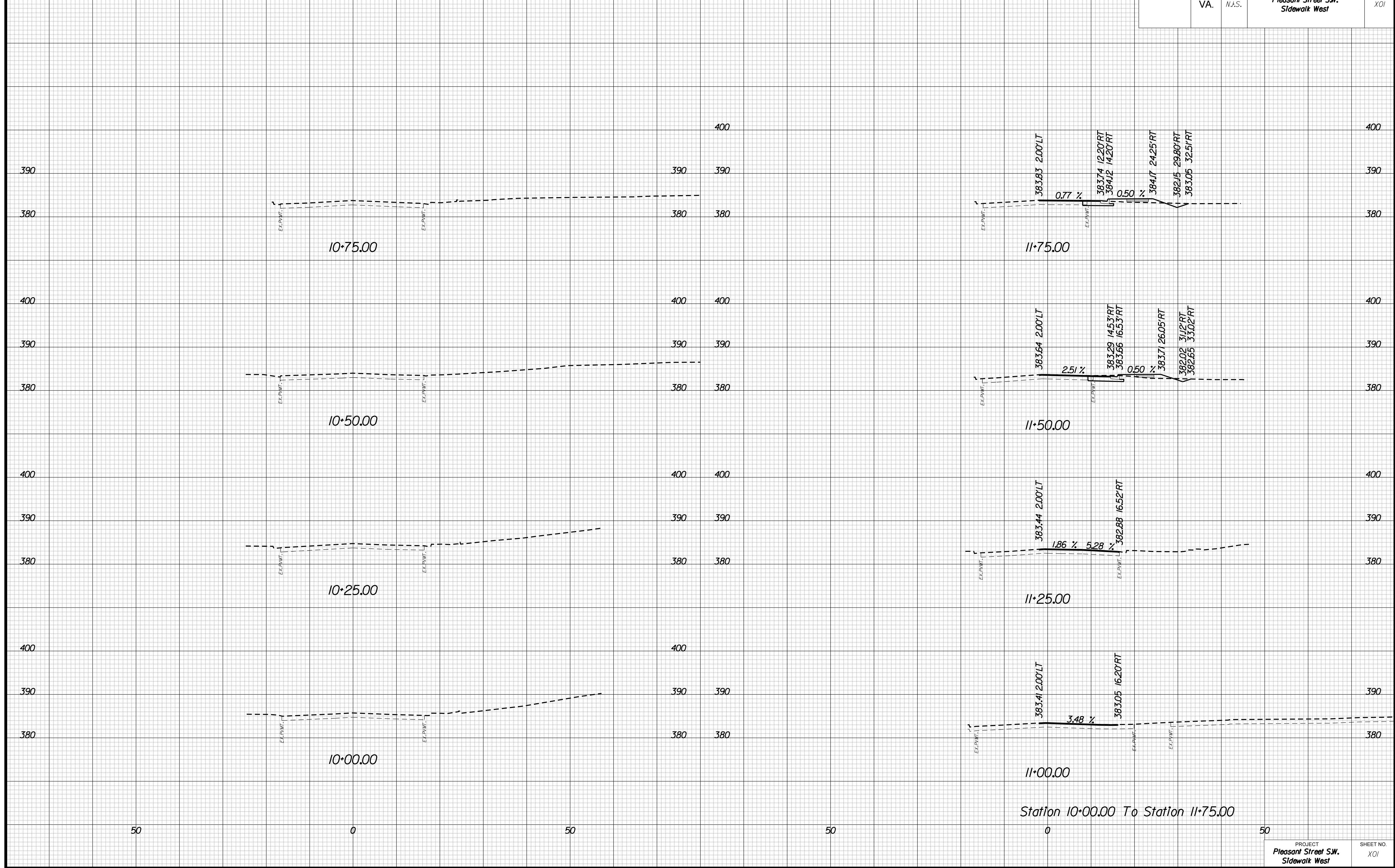
PROJECT MANAGER *Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380*
SURVEYED BY, DATE *Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013*
DESIGN BY *Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373*
SUBSURFACE UTILITY BY, DATE *Mid-Atlantic Utility Locating, LLC, June 2013*

CROSS SECTIONS

SCALE 1 IN. = 10 FT

DESIGN FEATURES RELATING TO CONSTRUCTION
OR TO REGULATION AND CONTROL OF TRAFFIC
MAY BE SUBJECT TO CHANGE AS DEEMED
NECESSARY BY THE DEPARTMENT

REVISED	STATE	ROUTE	TOWN OF VIENNA PROJECT	SHEET NO.
	VA.	N.A.S.	Pleasant Street S.W. Sidewalk West	



PROJECT	SHEET NO.
Pleasant Street S.W. Sidewalk West	XOI

\$DGN\$
\$DGNLEV

Grda Rinke
Design Associates, P.C.
Civil Engineering • Surveying • Land Planning
Transportation • Environmental
Flight & WMA Services

TOWN OF VIENNA

\$TIME\$STAMP\$

Office Locations
2485 Discovery Boulevard
Suite 200
Manassas, VA 20108
Phone: (703) 208-7325
Fax: (703) 457-5443

527 Maple Grove Drive
Suite 105
Fredericksburg, VA 22407
Phone: (540) 546-4470
Fax: (540) 546-4971

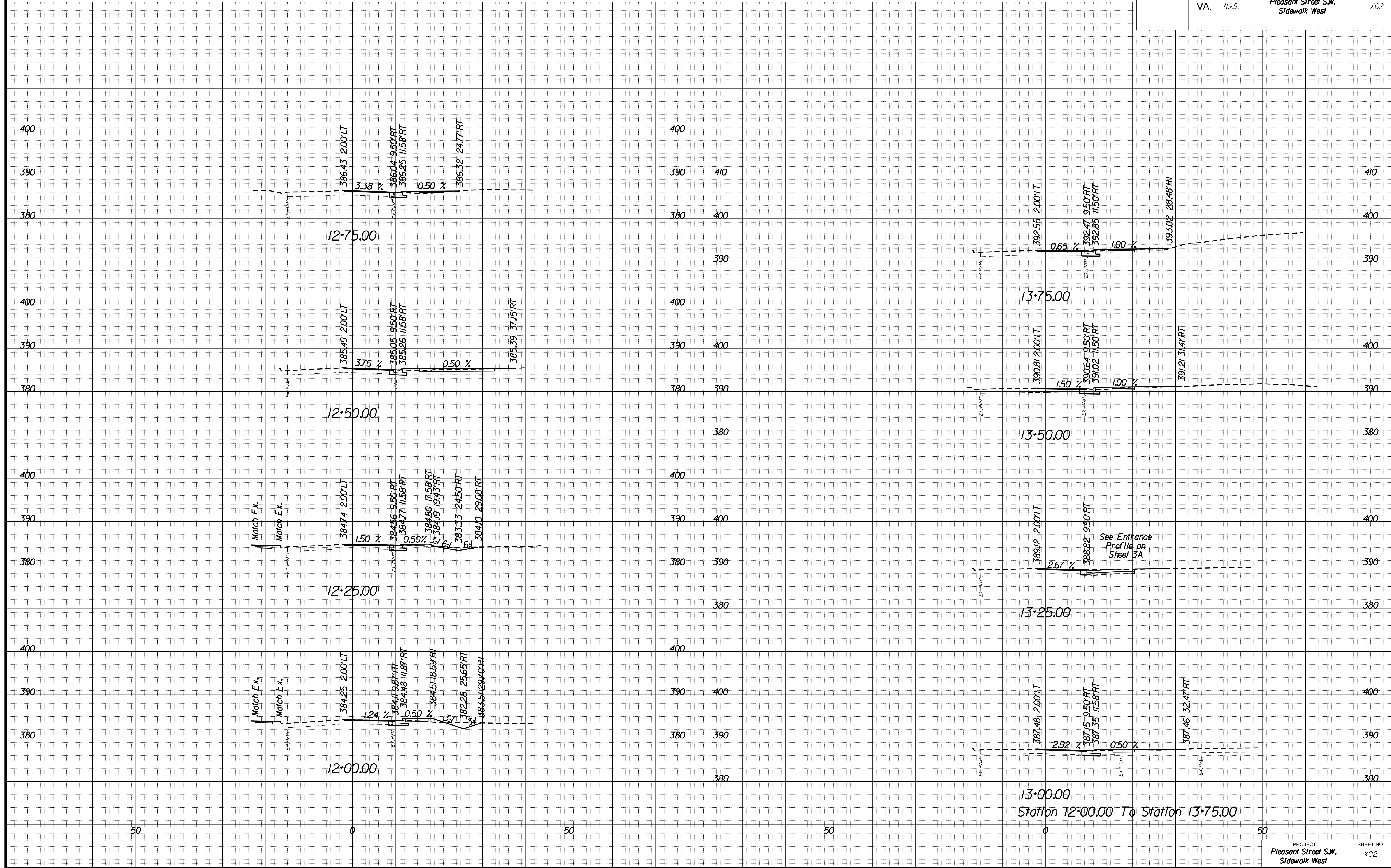
PROJECT MANAGER *Town of Vienna Public Works Dept., Dennis Johnson, P.E. (703) 255-6380*
SURVEYED BY, DATE *Rinker Design Associates, P.C., Sidney Thomas, L.S. (703) 368-7373, July 2013*
DESIGN BY *Rinker Design Associates, P.C., Adam Welschenbach, PE (703) 368-7373*
SUBSURFACE UTILITY BY, DATE *Mid-Atlantic Utility Locating, LLC, June 2013*

CROSS SECTIONS

SCALE 1 IN. = 10 FT

DESIGN FEATURES RELATING TO CONSTRUCTION
OR TO REGULATION AND CONTROL OF TRAFFIC
MAY BE SUBJECT TO CHANGE AS DEEMED
NECESSARY BY THE DEPARTMENT

	REVISED	TOWN OF VIENNA		SHEET NO.
	STATE	ROUTE	PROJECT	
	VA.	N.A.S.	Pleasant Street S.W. Sidewalk West	X02



\$DGN\$
\$DGNLEV

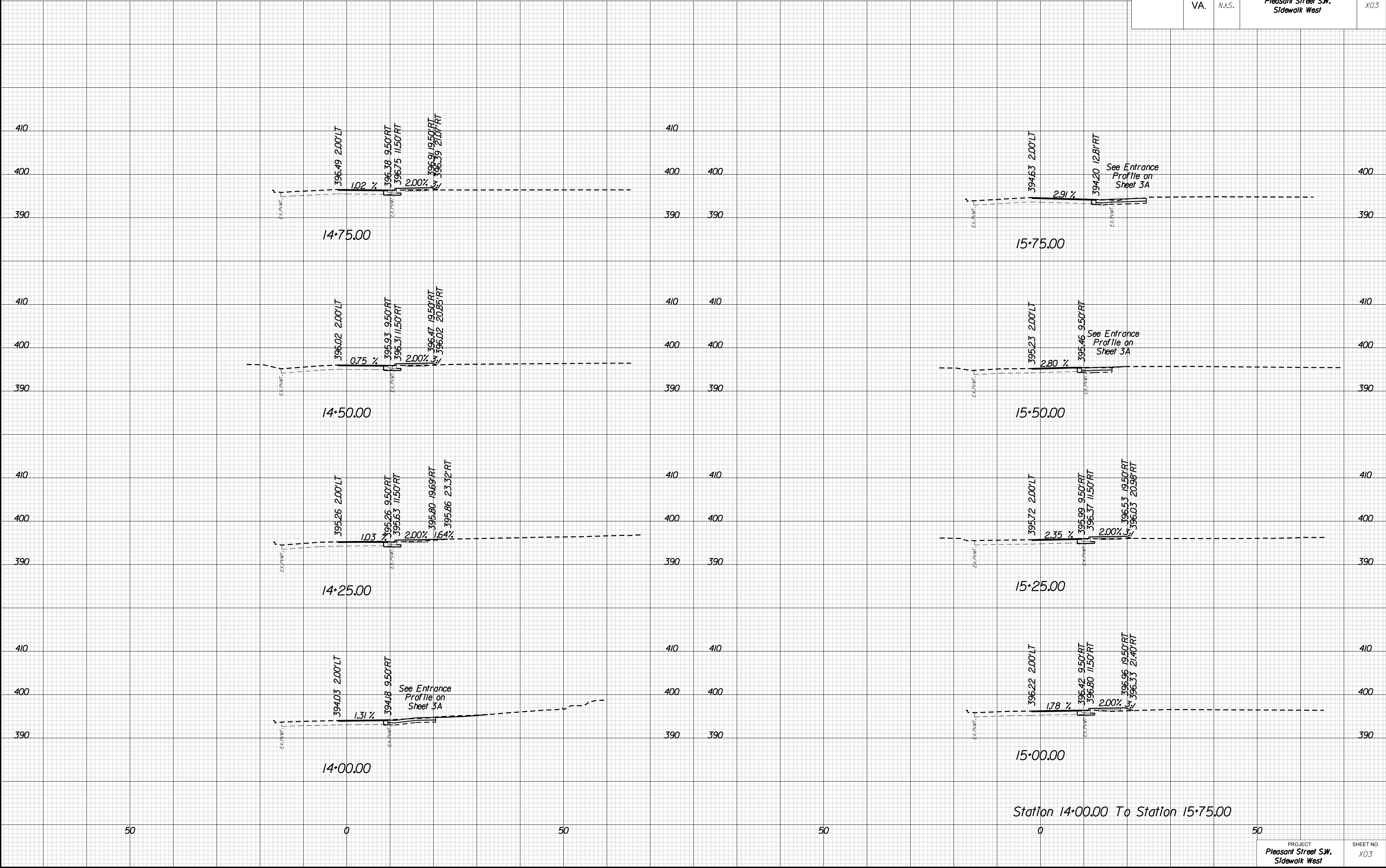
PROJECT MANAGER *Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380*
SURVEYED BY, DATE *Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013*
DESIGN BY *Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373*
SUBSURFACE UTILITY BY, DATE *Mid-Atlantic Utility Locating, LLC, June 2013*

CROSS SECTIONS

SCALE 1 IN. = 10 FT

DESIGN FEATURES RELATING TO CONSTRUCTION
OR TO REGULATION AND CONTROL OF TRAFFIC
MAY BE SUBJECT TO CHANGE AS DEEMED
NECESSARY BY THE DEPARTMENT

REVISED	STATE	ROUTE	TOWN OF VIENNA PROJECT	SHEET NO.
	VA.	N.A.S.	Pleasant Street S.W. Sidewalk West	



\$DGN\$
\$DGNLEV

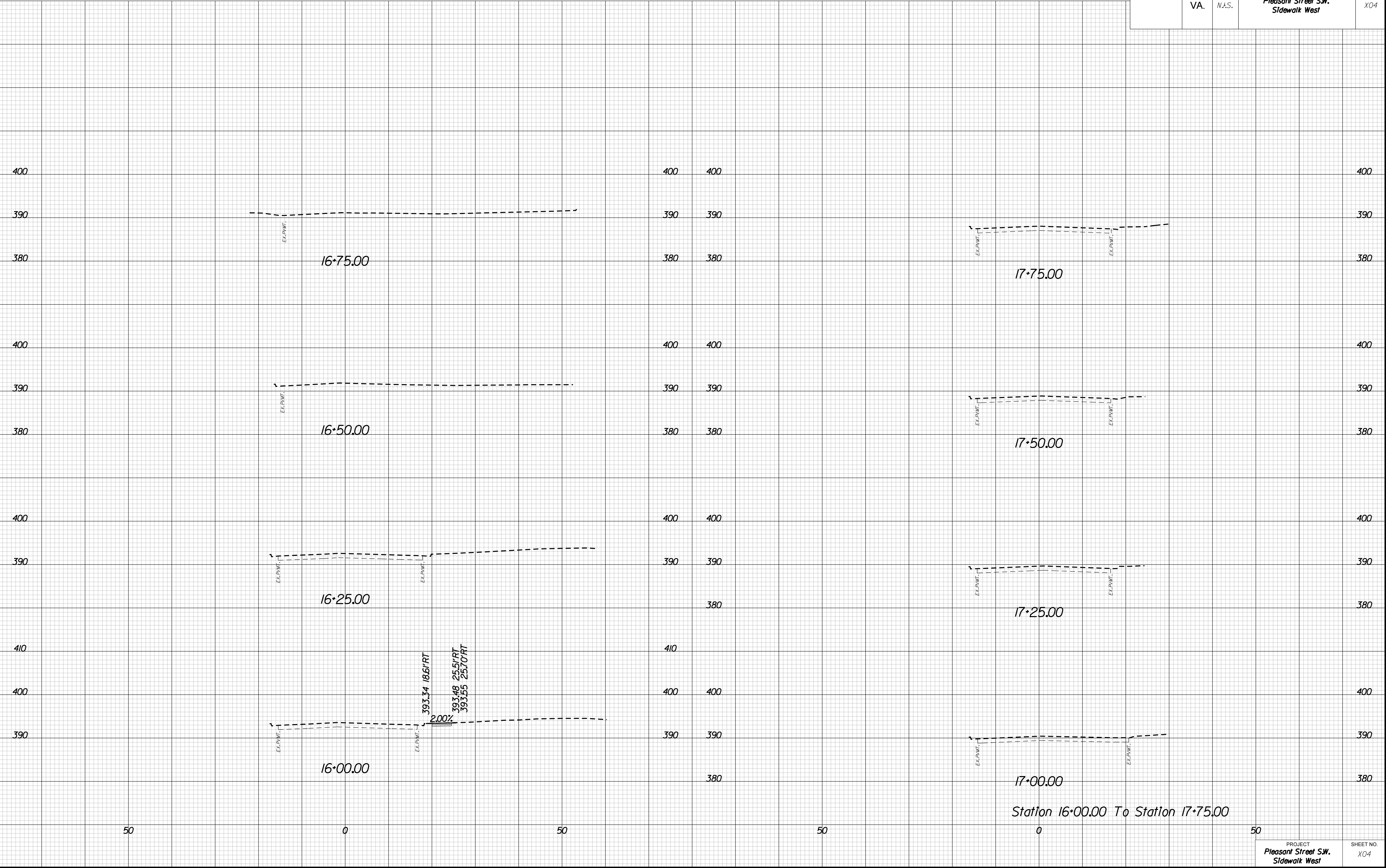
PROJECT MANAGER *Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380*
SURVEYED BY, DATE *Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013*
DESIGN BY *Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373*
SUBSURFACE UTILITY BY, DATE *Mid-Atlantic Utility Locating, LLC, June 2013*

CROSS SECTIONS

SCALE 1 IN. = 10 FT

DESIGN FEATURES RELATING TO CONSTRUCTION
OR TO REGULATION AND CONTROL OF TRAFFIC
MAY BE SUBJECT TO CHANGE AS DEEMED
NECESSARY BY THE DEPARTMENT

REVISED	STATE	ROUTE	TOWN OF VIENNA PROJECT	SHEET NO.
	VA.	N.A.S.	<i>Pleasant Street S.W. Sidewalk West</i>	



\$DGN\$
\$DGNLEV

PROJECT MANAGER *Town of Vienna Public Works Dept. Dennis Johnson, P.E. (703) 255-6380*
SURVEYED BY, DATE *Rinker Design Associates, P.C. Sidney Thomas, L.S. (703) 368-7373, July 2013*
DESIGN BY *Rinker Design Associates, P.C. Adam Welschenbach, P.E. (703) 368-7373*
SUBSURFACE UTILITY BY, DATE *Mid-Atlantic Utility Locating, LLC, June 2013*

CROSS SECTIONS

SCALE 1 IN. = 10 FT

DESIGN FEATURES RELATING TO CONSTRUCTION
OR TO REGULATION AND CONTROL OF TRAFFIC
MAY BE SUBJECT TO CHANGE AS DEEMED
NECESSARY BY THE DEPARTMENT

REVISED	STATE	ROUTE	TOWN OF VIENNA PROJECT	SHEET NO.
	VA.	N.A.S.	<i>Pleasant Street S.W. Sidewalk West</i>	

