PROJECT MANAGER Wendy Block Sanford,City of Fairfax,(703) 385-7889
SURVEYED BY Rinker Design Assoc.,P.C.(703) 368-7373
DESIGN SUPERVISED BY Mark Gunn,P.E.,Rinker Design Assoc.,P.C.(703) 368-7373
DESIGNED BY Adam D.Welschenbach,P.E.,Rinker Design Assoc.,P.C.(703) 368-7373

REVISED	STATE	FEDERAL AID PROJECT OWNER	STATE	PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2

PROJECT GENERAL NOTES

GRADING GENERAL NOTES

G-1 The grade line denotes top of finished pavement unless shown otherwise on typical sections or plans.

G-4 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/Signal Pole Foundations,End Walls,Drop inlets,Manholes,Pipes,Concrete Pipes,Concrete Slabs,Curb,Curb and Gutter,Concrete Sidewalk,Asphalt Sidewalk,Brick Items, Foundation Slabs.

G-5 The excavation of unsuitable material as specified on these plans is based on previously conducted subsurface soil investigation.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.

G-6 The borrow material for this project shall be a minimum CBR 10 or as approved by the Materials Engineer.All borrow materials shall have a liquid limit (LL) value of less than 35 and plasticity index (PI) value of less than 6 in their natural state.

DRAINAGE GENERAL NOTES

D-1 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.

D-2 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 City Engineer before installing the culvert or storm sewer outfall pipe.

D-3 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.

D-4 All fill shall be placed and allowed to settle and displace all soft materials.Any necessary temporary drainage shall be installed.When directed by the Engineer,that part of the fill where the permanent drainage structure is to reside shall be removed and the structure placed.The cost of installing and removing the temporary drainage facility,the cost of removing the fill above the original ground for installation of permanent drainage structure and the cost of backfill shall be included in the unit price bid for regular excavation.Excavation below the original ground necessary for the installation of the permanent drainage structure will be measured and paid for in accordance with Section 303 of the applicable VDOT Road and Bridge Specifications.

D-5 At locations where Structural Plate Steel Pipe or Pipe Arch with a concrete invert is required or is allowable as an option to Corrugated Steel Pipe or Pipe Arch,the concrete invert is to be field applied and shall cover,at a minimum,the bottom 25% of the circumference of a circular shape structure or the bottom and corner plates of an arch shape structure.As an option to providing the concrete invert,the plates along the bottom 25% (minimum) of the circumference of the Structural Plate Steel Pipe or the bottom and corner plates (minimum) of the Structural Plate Steel Pipe Arch shall be a minimum of two sheet thickness (gages) heavier than the sheet thickness (gage) indicated in the applicable VDOT Road and Bridge Standard PC-1 for the specified height of cover for the structure.Example: For a pipe with height of cover requiring 0.109" (2.8 mm) sheet thickness (12 gage) plates,the bottom plates shall be 0.168" (3.5 mm) sheet thickness (8 gage).The sheet thickness (gage) of the remainder of the pipe plates shall either conform to those specified in Standard PC-1 for the applicable height of cover or to the heavier plates used in the bottom of the pipe.

D-6 Pipes shall conform to any of the allowable types shown on sheet number XXX within the applicable height of cover limitations.For strength,sheet thickness,or class designation, available sizes,height of cover limitations and other restrictions for a particular pipe type or height of cover,see the VDOT Road and Bridge Standard PC-1.Structural plate pipe may be substituted for corrugated pipe of the same size and a structural plate pipe arch may be substituted for a corrugated pipe arch of the same size,provided the substitution complies with the applicable sections of the VDOT Road and Bridge Standard PC-1.

D-7 All pipe on this project shall be (specify type).For strength,sheet thinkness,or class designation,available sizes,height of cover limitationsand other restrictions for a particular pipe type or height of cover,see the applicablesections of the VDOT Road and Bridge Standards PC-1.

D-10 The proposed riprap may be omitted by the Engineer if the slope designated for placement of riprap is found to be comprised of solid rock or closely consolidated boulders with soundness,size and weight equal to,or exceeding,the specifications for the proposed riprap.

D-12 All existing drainage facilities labeled "To Be Abandoned" shall be left in place,backfilled and plugged in accordance with the VDOT Road and Bridge Standard PP-1.Basis of Payment will be C.Y.of Flowable Backfill.

D-13 Existing drainage facilities being utilized as a part of the drainage system,and designated on the plans "To Be Cleaned Out", shall be cleaned as directed by the Engineer.The cost incidental to this shall be included in the contract price for other items.

D-14 Proposed drop inlets 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.Pipes with less than standard minimum finished height of cover shall be noted as such in the drainage description for the pipe.Specific pipe bedding and cover requirements are provided in the applicable PB-1 and PC-1 standard drawings of the VDOT Road and Bridge Standards.

D-16 When Standard CG-6 or CG-7 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.

D-17 St'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 4 feet,the safety slabs shall not be installed.

PAVEMENT GENERAL NOTES

P-2 The pavement materials on this project will be paid for on a tonnage basis.The weight will vary in accordance with the specific gravity of the aggregates and the asphaltic content of the mix actually used to secure the design depth.The weight of the asphalt concrete is based on 95% of theoretical maximum density.(See IIM-LD-158).

INCIDENTAL GENERAL NOTES

I-3 Service Roads are to be constructed,and private entrances connected thereto prior to the permanent severing of private entrances by other phases of the proposed construction.

I-7 Where Standard slope roundoffs would damage trees,bushes or other desirable vegetation,they shall be omitted when so ordered by the Engineer.

I-8A Clearing and grubbing shall be confined to those areas needed for construction.No trees or shrubs in ungraded areas shall be cut without permission of the City Engineer.

I-9 When no centerline alignment is shown for a proposed entrance,the entrance shall be constructed in the same location as the existing entrance.

I-12 St'd.RM-2 Right of Way Monuments shall be set by the Contractor.

I-16 The "Underground Utilities" survey data on this project has been provided by consultant and copies are available from the City of Fairfax.

I-17 For method of constructing Straight-Line Taper Lanes in Curb and/or Curb and gutter sections, see typical details on Sheet 2A(I).

I-18 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,sequence of construction/traffic control plans,pavement marking plan sheets 8 thru 8B and as directed by the Engineer.

I-19 If questions or problems arise during construction,please contact the City Engineer.DO NOT CONTACT THE OUTSIDE SOURCES.

I-20 The Official Electronic PDF Version of the plans will override the paper copies or prints of specific layers.Portions of this plan assembly have been CADD generated. To assist in the preparation of the bid and construction of the project,Microstation format (.dgn) files will be made available to the prime contractor during bids and after award of the contract.

STORMWATER MANAGEMENT (SWM) GENERAL NOTES

S-1 CLEARING AND GRUBBING OF SWM BASIN SITE- The area where the dam is to be constructed and the area upstream of the dam,to an elevation equal to the crest of the dam (maximum ponded water elevation),shall be cleared and grubbed in accordance with Section 301 of the applicable VDOT Road and Bridge Specifications.

S-2 SWM BASIN DAM CONSTRUCTION- The dam for detention basins (no permanent pool) shall conform to the details contained in the plans and shall be constructed in accordance with Section 303 of the applicable VDOT Road and Bridge Specifications.The native material on which the dam will set shall meet the specifications for AASHTO Type A-4 or finer material.Where the native material does not meet this requirement,the area beneath the dam is to be excavated a minimum of 4' (1.2 m) and backfilled with a material meeting the AASHTO Type A-4 or finer classification,unless otherwise specified in the plans.The material used for the embankment of the dam shall be AASHTO Type A-4 or finer or as otherwise specified in the plans.Dams with foundation and embankment material not meeting the above requirements,dams greater than 15' (4.6m) in height,or dams for retention basins (permanent pool) shall incorporate a membrane-lined trench,a homogenous embankment with seepage controls,a zoned embankment or other such approved designs as specified in the plans.

S-3 SWM BASIN OUTLET PIPE--The pipe culvert under or through the dam for detention basins (no permanent pool) shall be reinforced concrete pipe with rubber gaskets in accordance with Section 232 and 212 of the applicable VDOT Road and Bridge Specifications. A concrete cradle shall extend the full length of the pipe culvert in accordance with the Standard Drawings.The connection between the pipe culvert and the SWM-1 Drainage Structure (or other control structure) shall be made watertight as approved by the Engineer and the cost shall be included in the price bid for the pipe.

S-4 The SWM-1 Drainage Structure (or other control structure) shall have 4" (100 mm) high numbers and 1" (25 mm) wide stripes painted at 1' (300 mm) intervals as shown on the Standard Drawings or detail sheets.The numbers and stripes are to be installed at the time of the initial installation of the SWM-1 Drainage Structure (or other control structure).Paint and application shall be in accordance with Section 231 and 411 of the applicable VDOT Road and Bridge Specifications and the cost is to be included in the price bid for the applicable structure.

S-5 All SWM Basins are designated for use as temporary sediment basins and shall be constructed during the initial phase of earth moving activities or as specified by the plans or directed by the Engineer.During project construction,the SWM-1 Drainage Structure (or other control structure) shall be modified in accordance with the Standard Drawings or plan details in order to provide a temporary sediment basin with both a "wet" storage volume (permanent pool) and a "dry" storage volume.Sediment accumulated in the basin shall be removed when the volume of the "wet" storage (permanent pool) has been reduced by 50%.Sediment shall be disposed of in accordance with Section 106.04 of the applicable VDOT Road and Bridge Specifications.When project construction is complete to a stage where no additional sediment from the project is expected to enter the basin,as determined by the Engineer,the basin shall be cleaned out and restored to the original design elevations,the area stabilized and all temporary modifications to the SWM-1 Drainage Structure (or other control structure) removed.

Orange Soils (Asbestos Soils) Note:

Naturally occurring asbestos soils is known to be encountered within the project area.Please refer to the geotechnical report for a soil map indicating orange soil. The Contractor shall follow all Federal,State,and County guidelines to handle,work around,and/or dispose of soils containing asbestos.

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CITY OF FAIRFAX

8/15/2014

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2

FINAL PLAN

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TYPICAL SECTIONS

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Mark A Gunn
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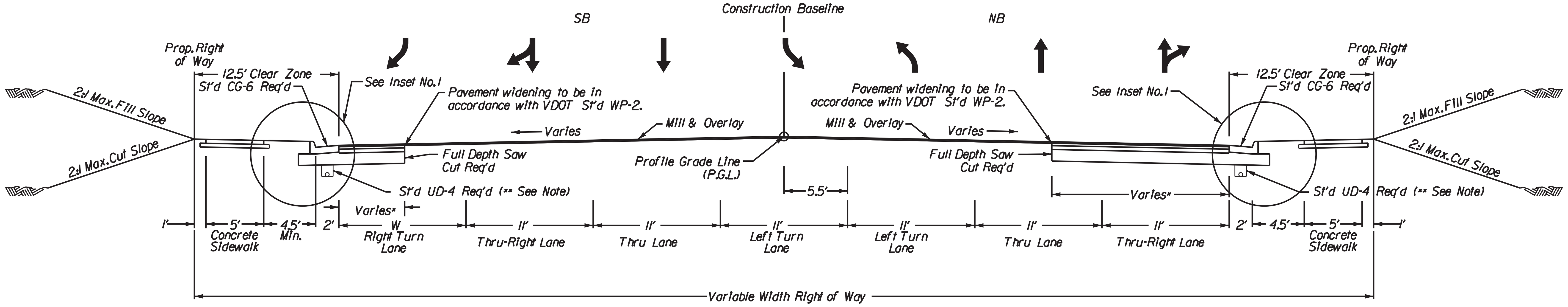
Rinker Design Associates, P.C.
Manassas, Virginia
PROFESSIONAL ENGINEER

REVISED	STATE	FEDERAL AID PROJECT OWNER	STATE	STATE PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2A

Jermantown Road - City Route 6634
(Not to Scale)



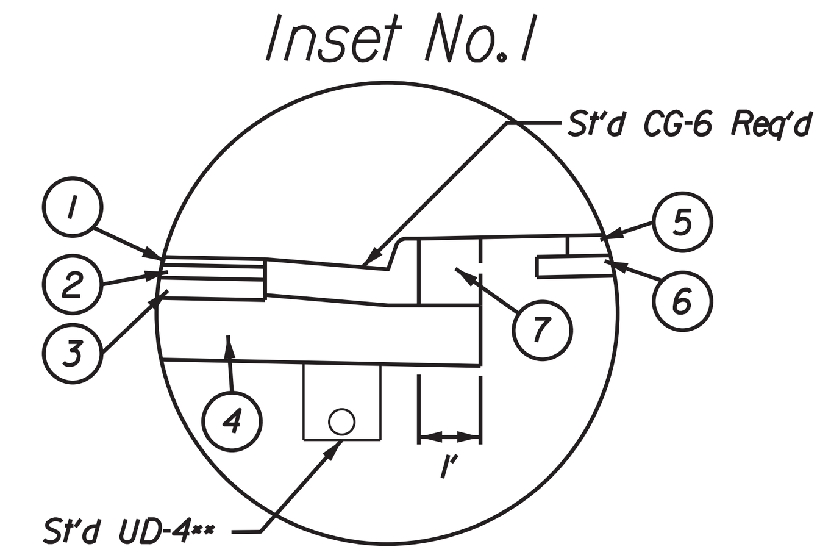
W	STATION	TO	STATION
12'	52+25.12		55+41.82
0'-12'	55+41.82		56+41.82

*See plans and cross sections for widths.

**NOTE: See Underdrain Details on Sheet IP series for locations of standard underdrains

1. Surface Course - (1.5") Asphalt Conc. Type SM-9.5D
2. Intermediate Course - (2.5") Asphalt Conc. IM-19.0A
3. Base Course - (4") Asphalt Conc. BM-25.0A
4. Subbase Course - (12") Aggregate Base Material TY. I, NO. 21B
5. Sidewalk - (4") Class A3 Hydraulic Cement
6. (4") Aggr. Base Material, Type I, Size No. 21A, extended (6") on each side of Sidewalk
7. Regular Fill Material to be Compacted in Accordance with VDOT Road & Bridge Specifications

Inset No. I

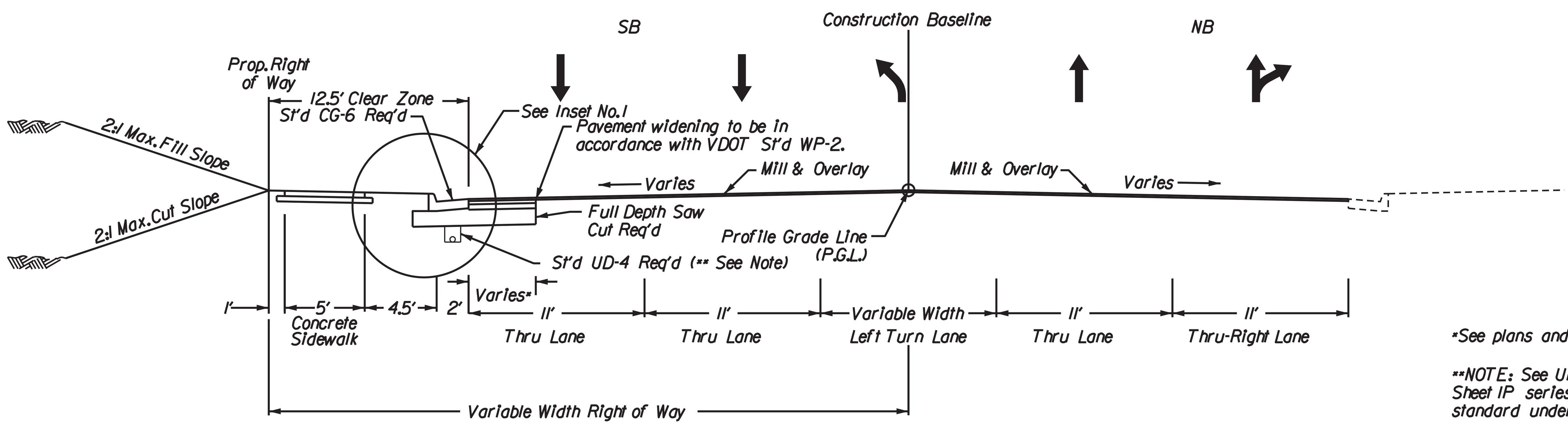


Typical Notes
1. Contractor shall provide positive drainage for subgrade base course No. 21B for outside widening.

2. Contractor shall follow all geotechnical recommendations in Geotechnical Report conducted for the project.

3. Milling of the existing pavement should consist of 1.5" Minimum mill prior to any resurfacing/build-up.

Jermantown Road - City Route 6634
(Not to Scale)

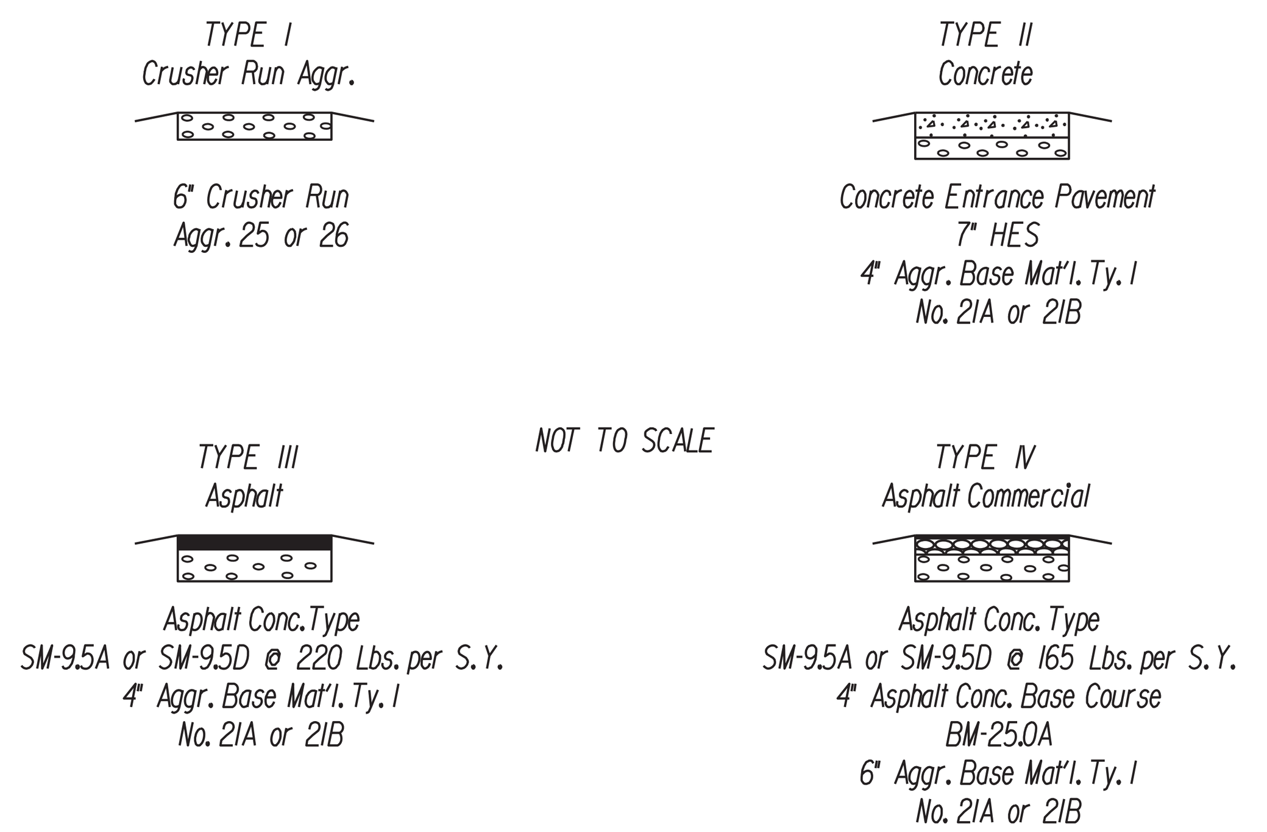


*See plans and cross sections for widths.

**NOTE: See Underdrain Details on Sheet IP series for locations of standard underdrains

STATION	TO	STATION
56+41.82		57+88.06

PRIVATE AND COMMERCIAL ENTRANCES



PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2A

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CITY OF FAIRFAX

8/15/2014

FINAL PLAN

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TYPICAL SECTIONS, RETAINING WALL DETAILS, & GEOMETRIC DETAILS SW CONNECTION AT STA. 23+50

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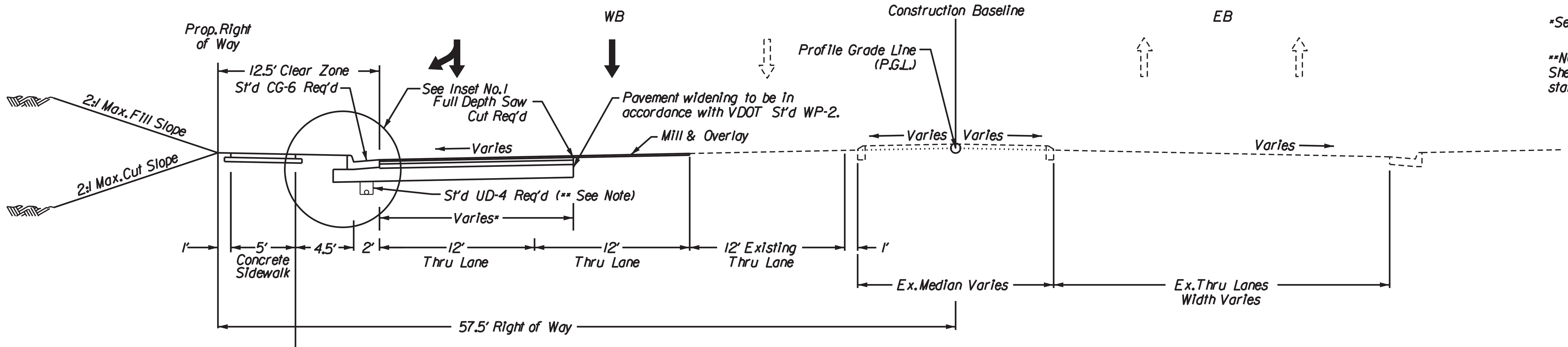
REVISED	STATE	FEDERAL AID PROJECT OWNER		STATE PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2A(1)

Fairfax Boulevard - U.S. Route 50
(Not to Scale)



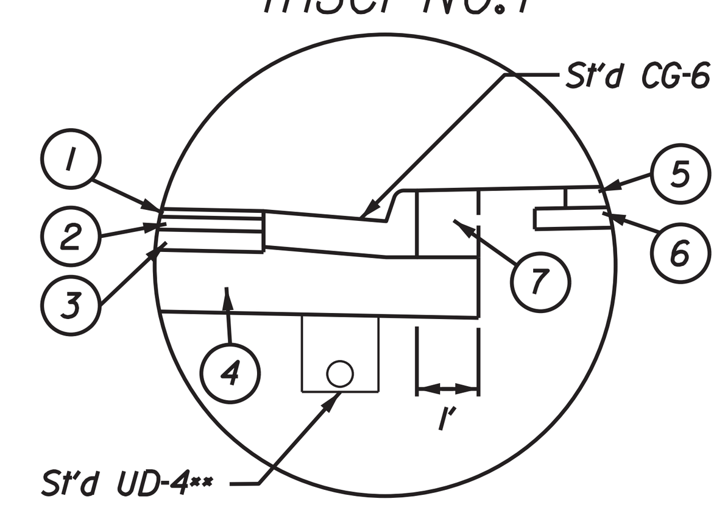
STATION 12+90.40 TO STATION 25+10.71

*See plans and cross sections for widths.

**NOTE: See Underdrain Details on Sheet IP series for locations of standard underdrains

1. Surface Course - (1.5") Asphalt Conc., Type SM-9.5D
2. Intermediate Course - (2.5") Asphalt Conc., IM-19.0A
3. Base Course - (4") Asphalt Conc., BM-25.0A
4. Subbase Course - (12") Aggregate Base Material TY. I, NO. 21B
5. Sidewalk - (4") Class A3 Hydraulic Cement
6. (4") Aggr. Base Material, Type I, Size No. 21A, extended (6") on each side of Sidewalk
7. Regular Fill Material to be Compacted in Accordance with VDOT Road & Bridge Specifications

Inset No. 1

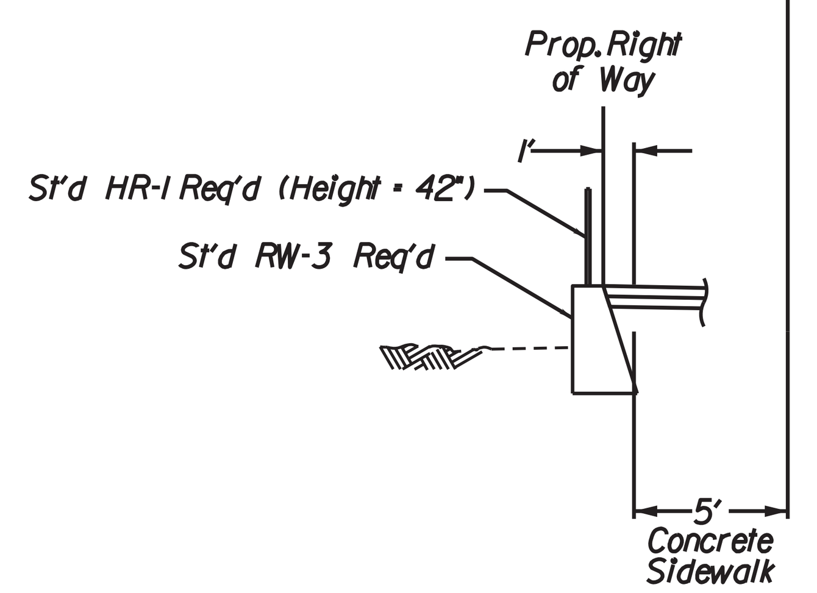


Typical Notes
1. Contractor shall provide positive drainage for subgrade base course No. 21B for outside widening.

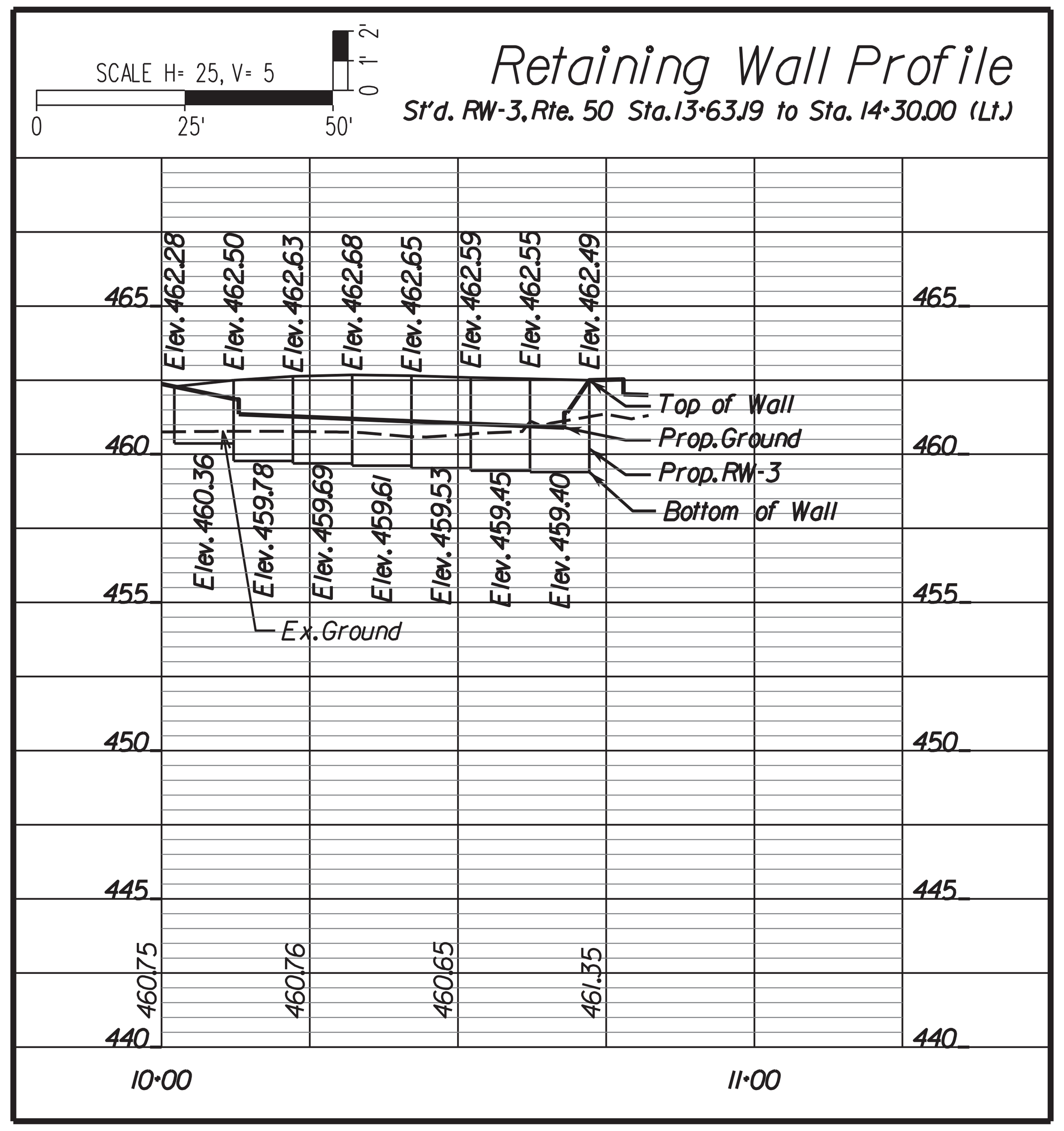
2. Contractor shall follow all geotechnical recommendations in Geotechnical Report conducted for the project.

3. Milling of the existing pavement should consist of 1.5" Minimum mill prior to any resurfacing/build-up.

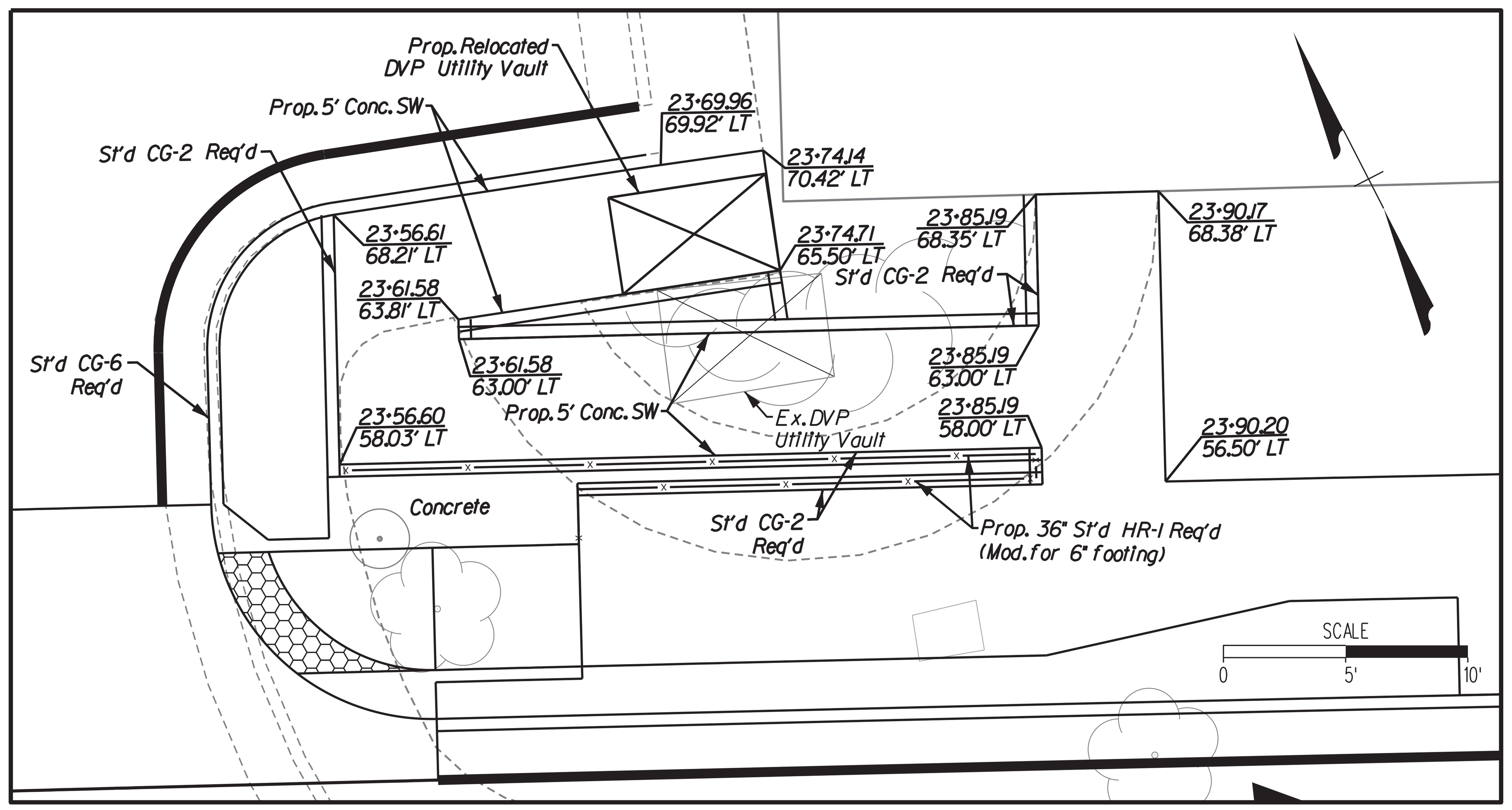
Retaining Wall, Prop. RW-3
(Not to Scale)



STATION 13+63.19 TO STATION 14+30.00

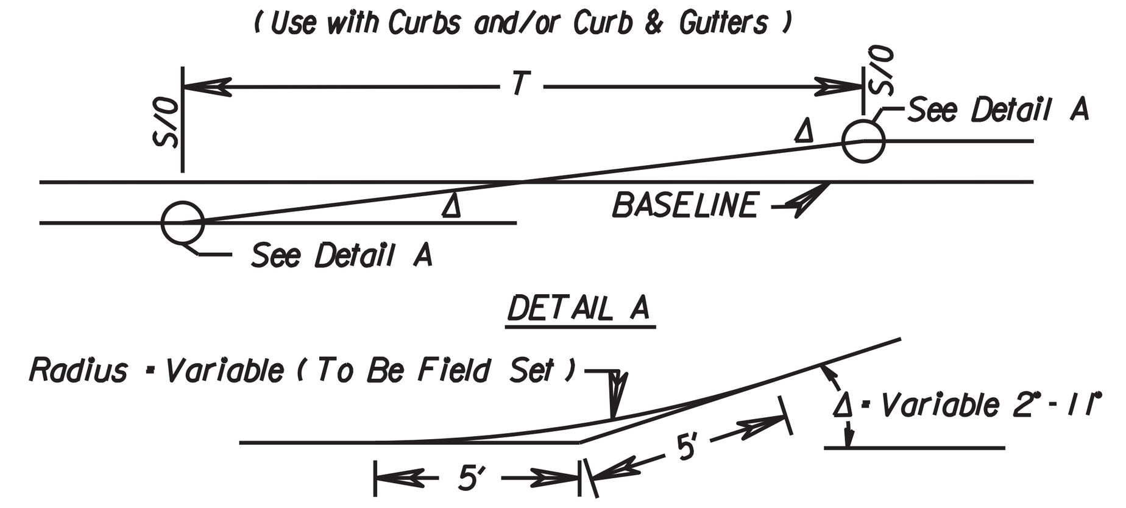


Geometric Details
Sidewalk Connection at Sta. 23+50 (Lt.)



Note: See Sheet 5 for Sidewalk Connection details.

TYPICAL STRAIGHT - LINE TAPER LANE
(Use with Curbs and/or Curb & Gutters)



T - See plans for Length of T.

S/O - See plans for Stations and Offsets.

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8/15/2014

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2A(1)

FINAL PLAN

PROJECT MANAGER Wendy Block Sanford, City of Fairfax, (703) 385-7889
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RADIAL OFFSETS & BULLET NOSE DATA

Office Locations
4501 Daly Drive, Suite 400, Chantilly, VA 20151, Tel: (703) 263-0500, Fax: (703) 263-0520
4501 Daly Drive, Suite 400, Chantilly, VA 20151, Tel: (703) 263-0500, Fax: (703) 263-0520
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Transportation - Environmental
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CITY OF FAIRFAX

8/15/2014

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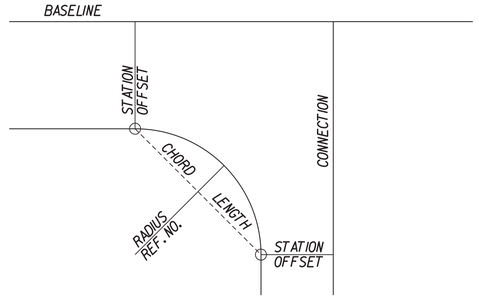
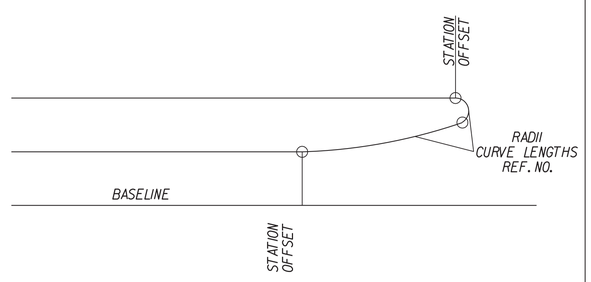
REVISED	STATE	FEDERAL AID PROJECT OWNER	STATE	PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2C

RADIAL OFFSETS / BULLET NOSE DATA





LOCATION (REF. NO.)	BASELINE		CONNECTION		RADIUS LENGTH	CHORD LENGTH	CURVE LENGTH	LOCATION (REF. NO.)	BASELINE		CONNECTION		RADIUS LENGTH	CHORD LENGTH	CURVE LENGTH
SHEET - ITEM	STATION	OFFSET	STATION	OFFSET	FEET	FEET	FEET	SHEET - ITEM	STATION	OFFSET	STATION	OFFSET	FEET	FEET	FEET
3-1	53+17.72	40.50' LT	52+75.33	64.35' LT	50.00	48.83	51.01	3-3	13+61.83	16.04' RT	13+60.09	14.29' RT	1.75	2.47	2.74
3-2	53+30.47	40.50' RT	13+88.39	47.00' LT	45.00	68.12	77.26	3-4	13+60.09	13.96' RT	13+61.84	12.21' RT	1.75	2.48	2.75
3-5**	51+43.88	36.11' RT	13+62.18	43.29' RT	37.00	51.74	57.29								
3-6	13+59.33	93.06' LT	13+69.61	88.30' LT	20.00	11.33	11.49								
3-7	13+77.71	81.19' LT	13+78.76	74.97' LT	5.00	6.31	6.82								
3-8	14+25.77	71.50' LT	14+35.77	71.50' LT	5.00	10	15.71								
3B-1	56+37.09	30.03' LT	56+64.34	59.75' LT	25.00	40.32	46.91								
3B-2	57+36.00	29.20' LT	57+12.28	50.03' LT	25.00	31.56	34.15								
3B-3	57+12.02	51.55' LT	57+31.90	80.31' LT	25.00	34.96	38.71								
4-1	19+19.19	47.00' LT	19+44.06	74.55' LT	25.00	37.11	41.82								
4-2	20+13.81	47.00' LT	19+88.81	72.27' LT	25.00	35.55	39.54								
4-3	16+26.53	85.39' LT	16+30.47	87.79' LT	3.00	4.61	5.26								
4-4	16+34.08	86.56' LT	16+47.55	66.02' LT	20.00	24.56	26.44								
4-5	16+80.56	85.81' LT	16+83.50	85.20' LT	1.50	3.00	4.55								
4-6	19+35.54	86.73' LT	19+43.55	79.55' LT	8.00	10.76	11.80								
4-7	19+88.81	86.34' LT	19+98.78	86.34' LT	10.00	14.12	15.68								
4-8	19+99.79	86.34' LT	20+01.80	84.36' LT	2.00	2.82	3.13								
4-9	21+61.16	81.91' LT	21+70.05	81.67' LT	4.50	8.90	12.77								
5-1	24+66.53	47.00' LT	24+91.38	72.18' LT	25.00	35.46	39.42								
5-2	23+23.55	85.96' LT	23+26.64	86.02' LT	1.55	3.09	4.84								
5-3	23+51.33	62.75' LT	23+56.55	68.71' LT	6.00	7.94	8.67								

** Proposed curb and gutter location and radius are approximate, and should match existing curb and gutter.

9-23-93
SPECIAL DESIGN SECTION
DRAWING NO. A-36

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2C

FINAL PLAN

PROJECT MANAGER Wendy Block Sanford, City of Fairfax, (703) 385-7889
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CURB RETURN ALIGNMENTS

COMMONWEALTH OF VIRGINIA
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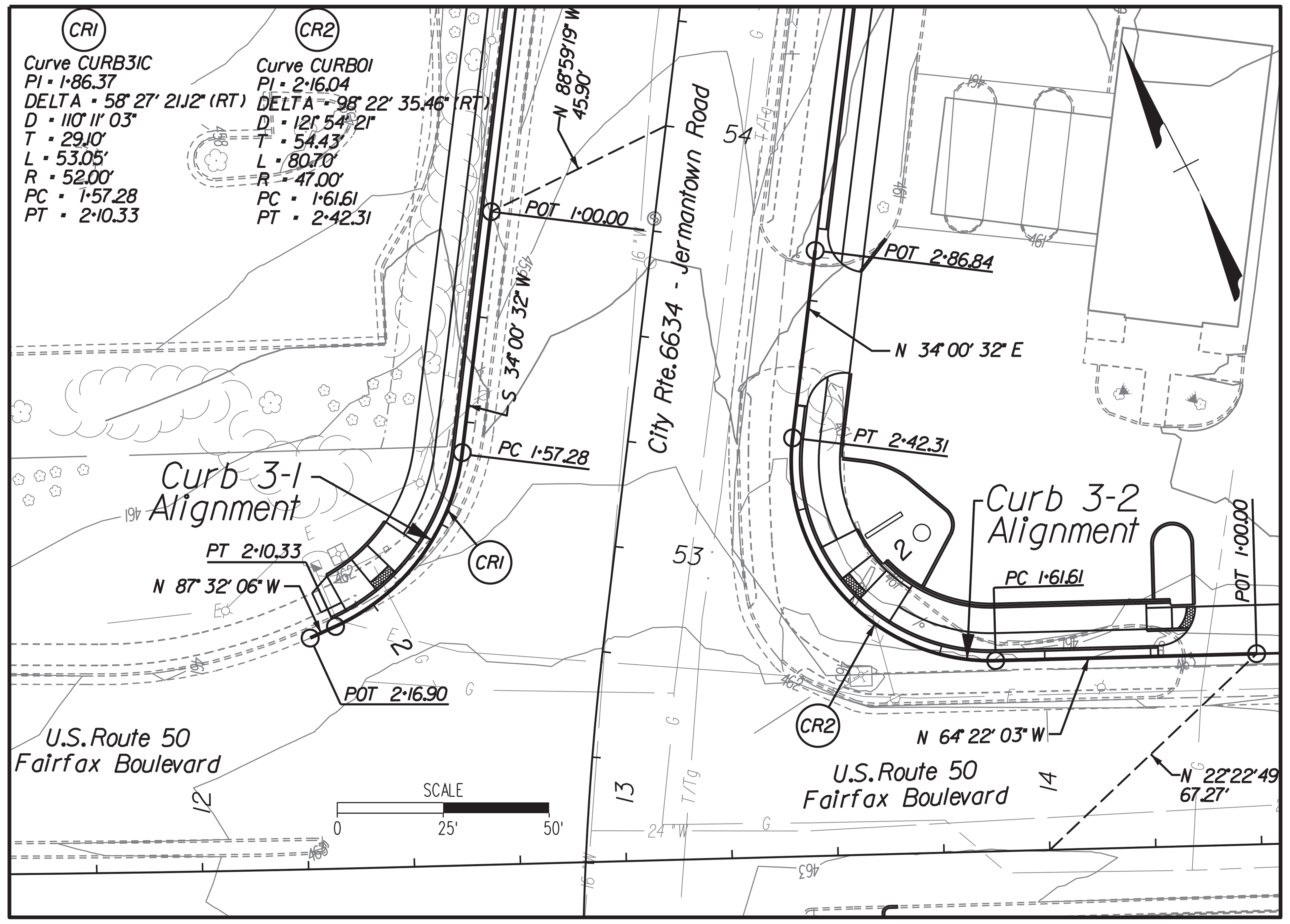
REVISED	STATE	FEDERAL AID PROJECT OWNER	STATE PROJECT	SHEET NO.
	VA.	-	Jermantown Road Phase II Improvements	2C(1)

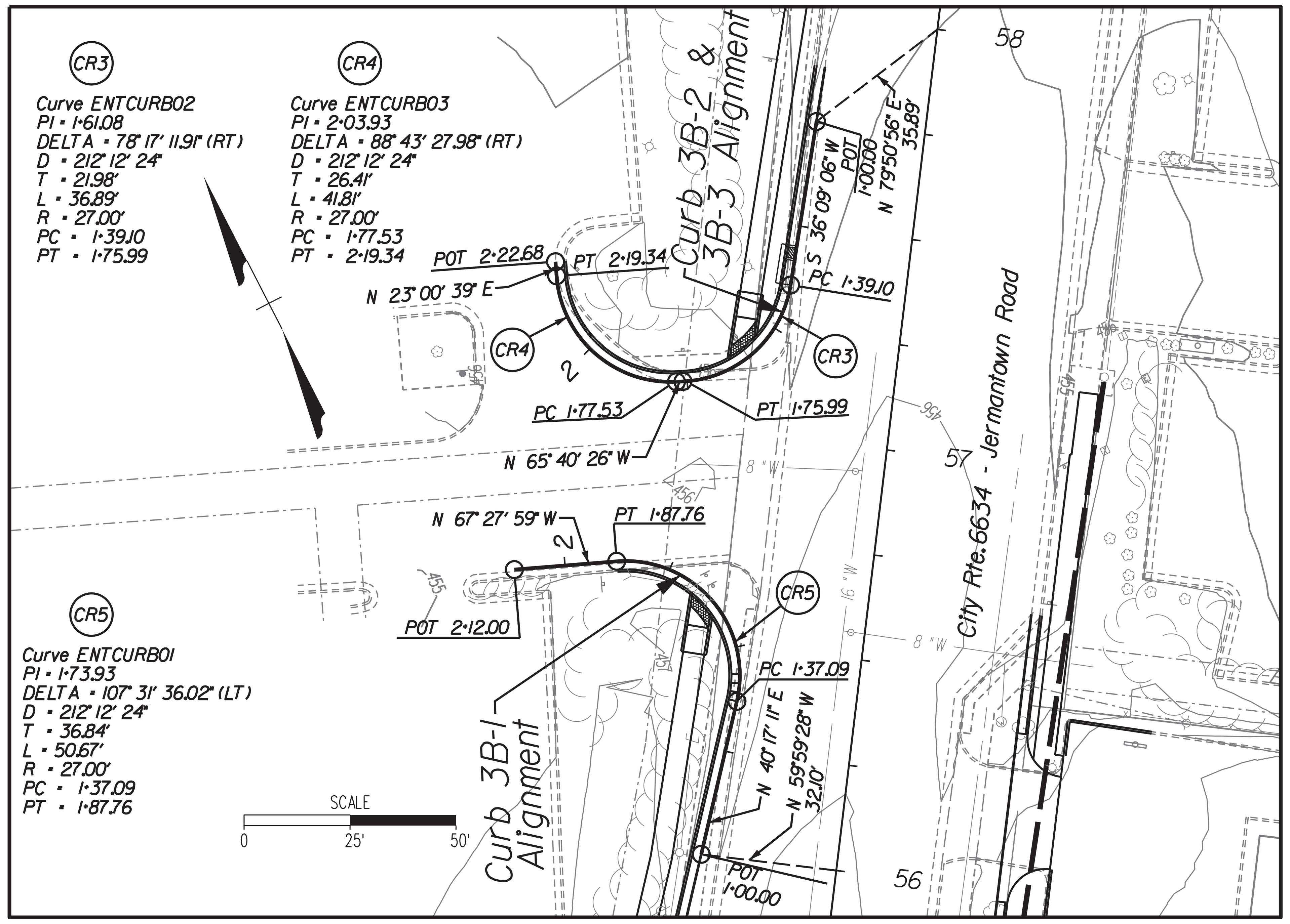
Rinker Design Associates, P.C.
Civil Engineering · Surveying · Land Planning · Transportation · Environmental · Right of Way Services
Office Locations

CITY OF FAIRFAX

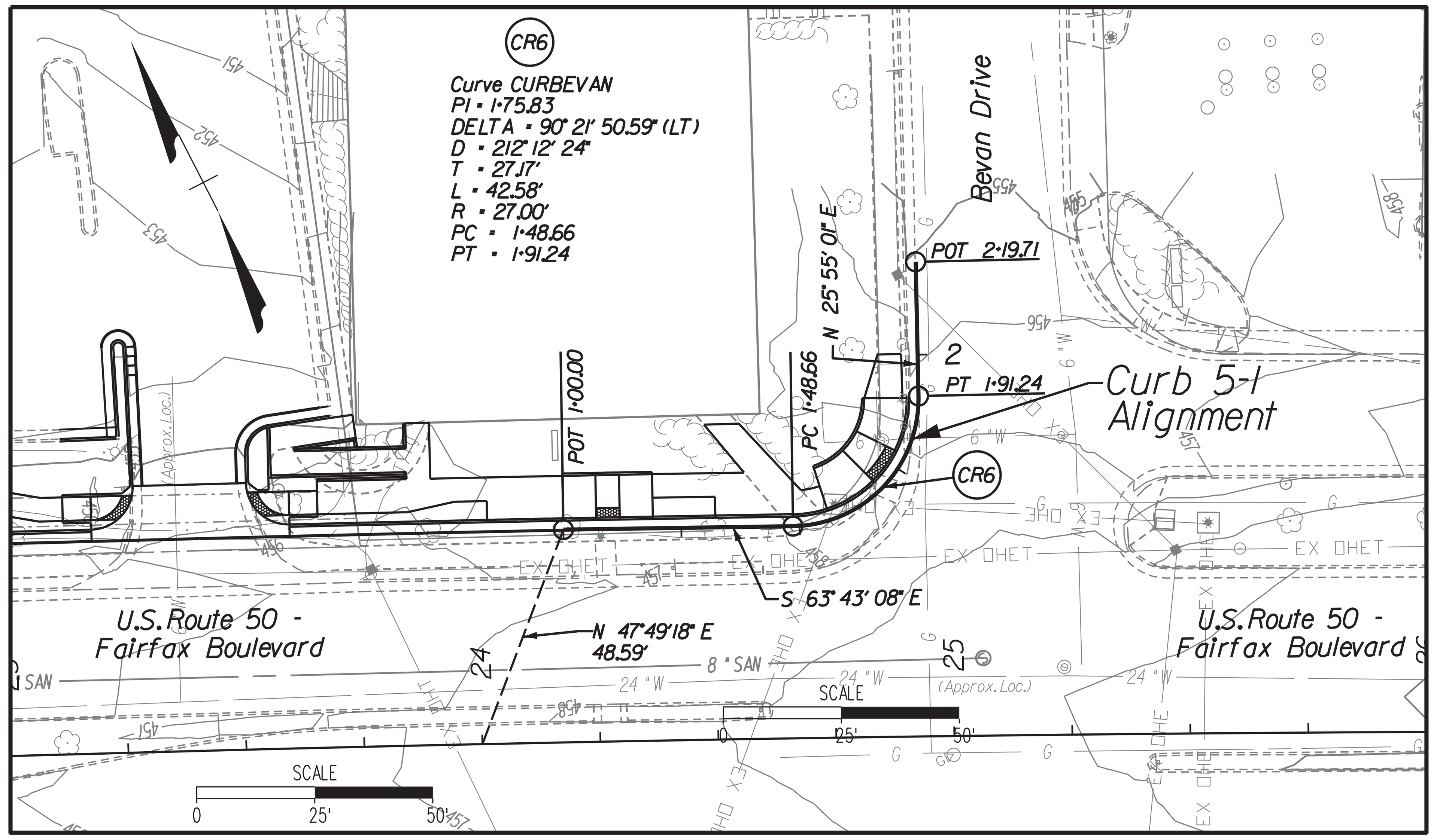
CURB 3-1 AND 3-2 ALIGNMENTS



CURB 3B-1, 3B-2, AND 3B-3 ALIGNMENTS



CURB 5-1 ALIGNMENT



NOTE:
1. This sheet is for curb return alignment information purposes only.

2. All elevations shown for curb return profiles are taken at the edge of pavement.

SEE SHEET 2C(2) FOR CURB RETURN PROFILES

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2C(1)

8/15/2014

FINAL PLAN

35x23 (In)
V:\DesignAid\Plot-Drivers\default_rdа.tbl

default_rdа.tbl
V:\DesignAid\Plot-Drivers\Imperial\025-Plan VDOTLD Local PDF.pltcfg

25.0000 FT / In.

0050002c02.dgn
Plotted By: localuser

PROJECT MANAGER Wendy Block Sanford, City of Fairfax, (703) 385-7889
SURVEYED BY Rinker Design Assoc. P.C. (703) 368-7373
DESIGN SUPERVISED BY Mark Gunn, P.E., Rinker Design Assoc. P.C. (703) 368-7373
DESIGNED BY Adam D. Welschenbach, P.E., Rinker Design Assoc. P.C. (703) 368-7373

SCALE H= 25, V= 5
0 25' 50'

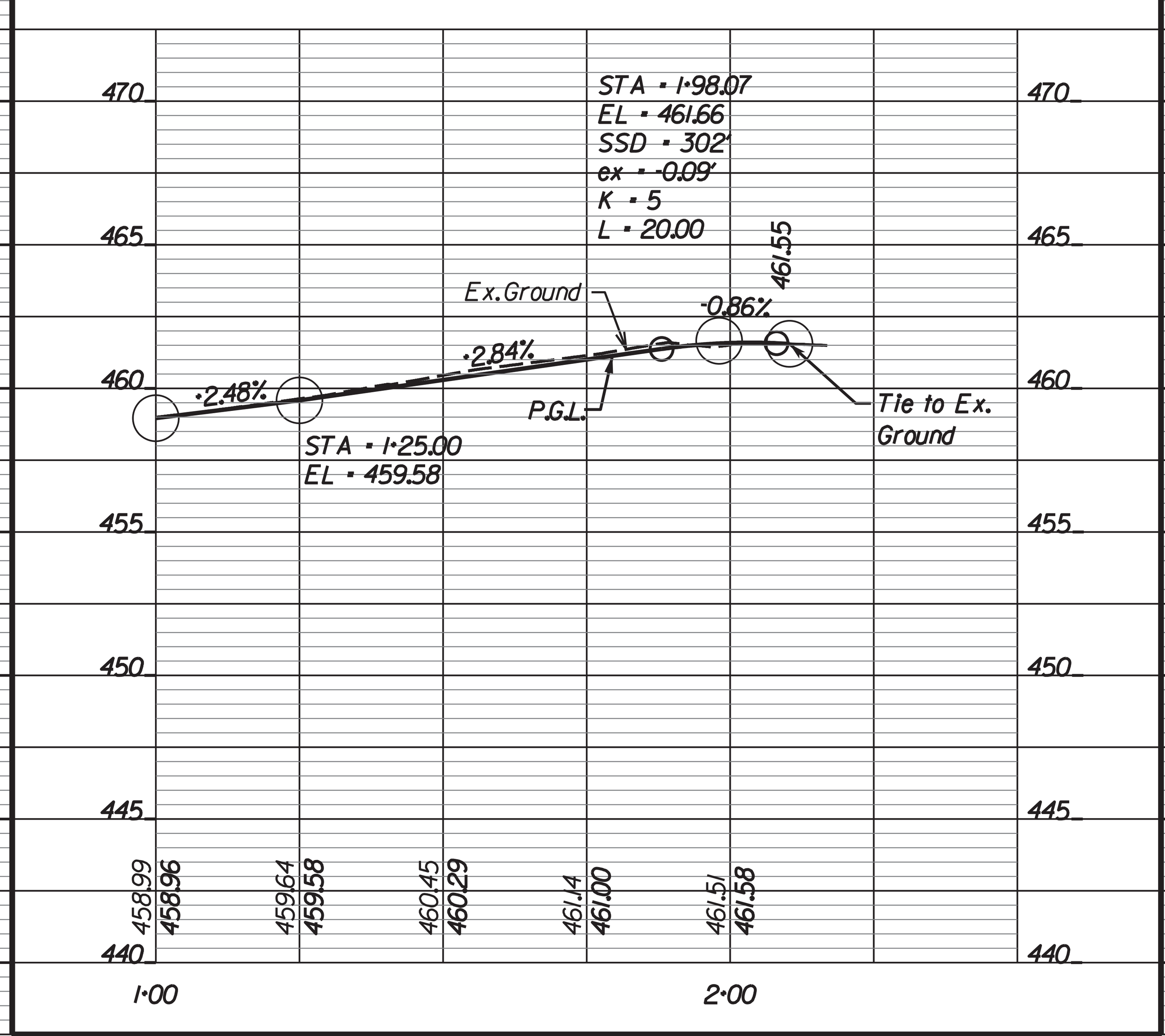
COMMONWEALTH OF VIRGINIA
MARK A. GUNN
Lic. No. 038323
PROFESSIONAL ENGINEER

Mark A Gunn
2014.08.15 13:49:01 -04'00'
Rinker Design Associates, P.C.
Manassas, Virginia
PROFESSIONAL ENGINEER

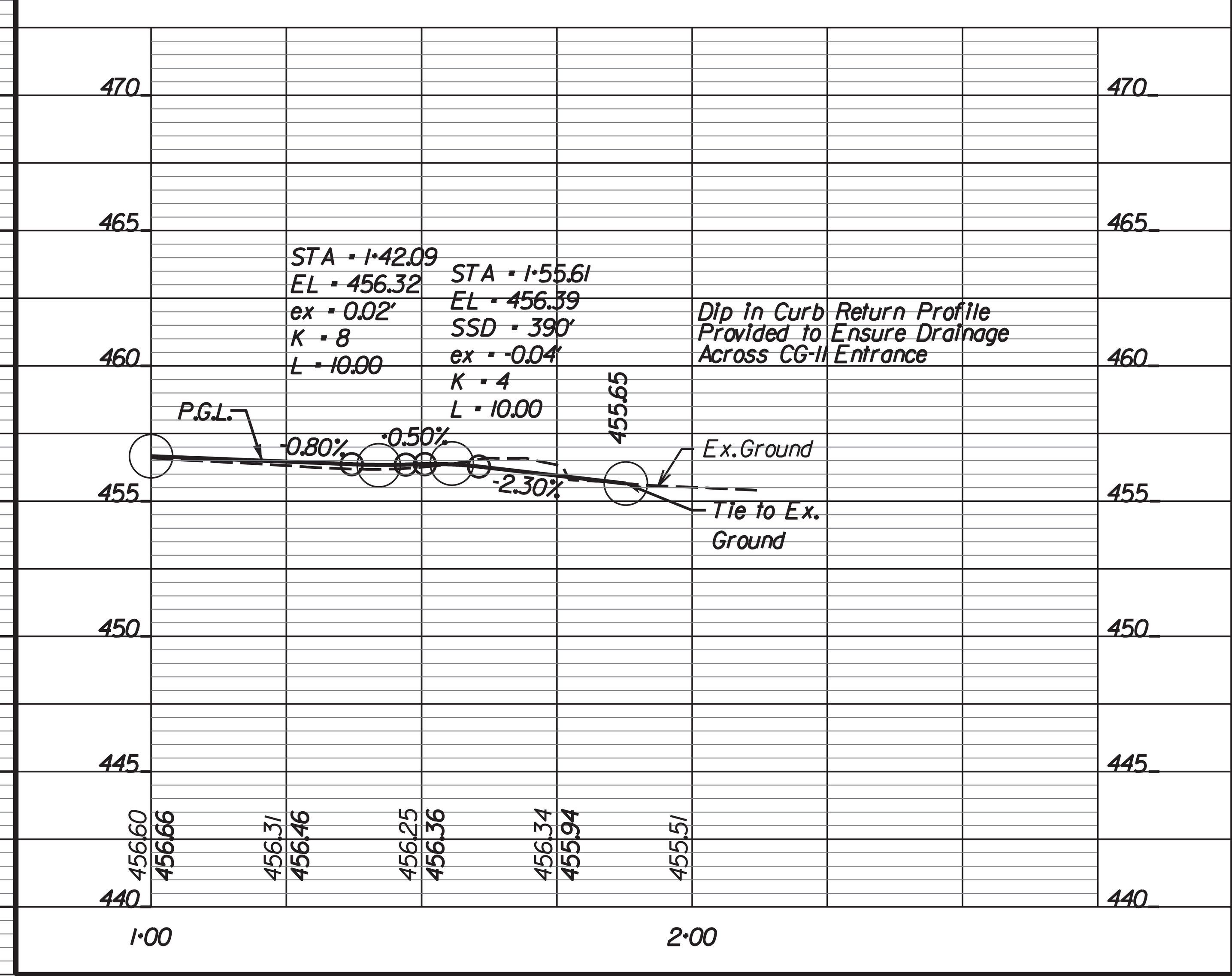
REVISED	STATE	FEDERAL AID PROJECT	ROUTE	STATE PROJECT	SHEET NO.
	VA.	-	-	Jermantown Road Phase II Improvements	2C(2)

CURB RETURN PROFILES

Curb Return 3-1 Profile

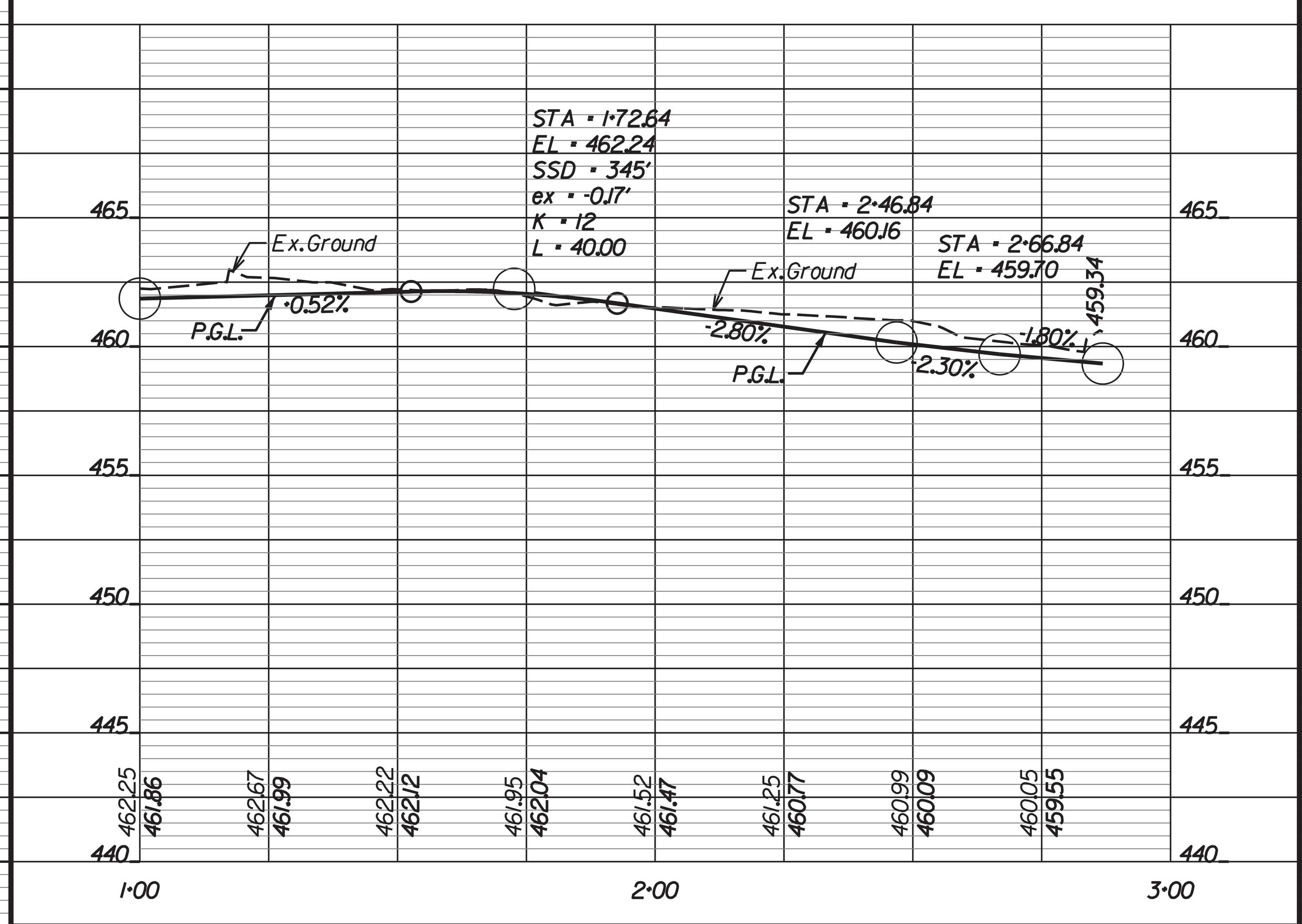


Curb Return 3B-1 Profile

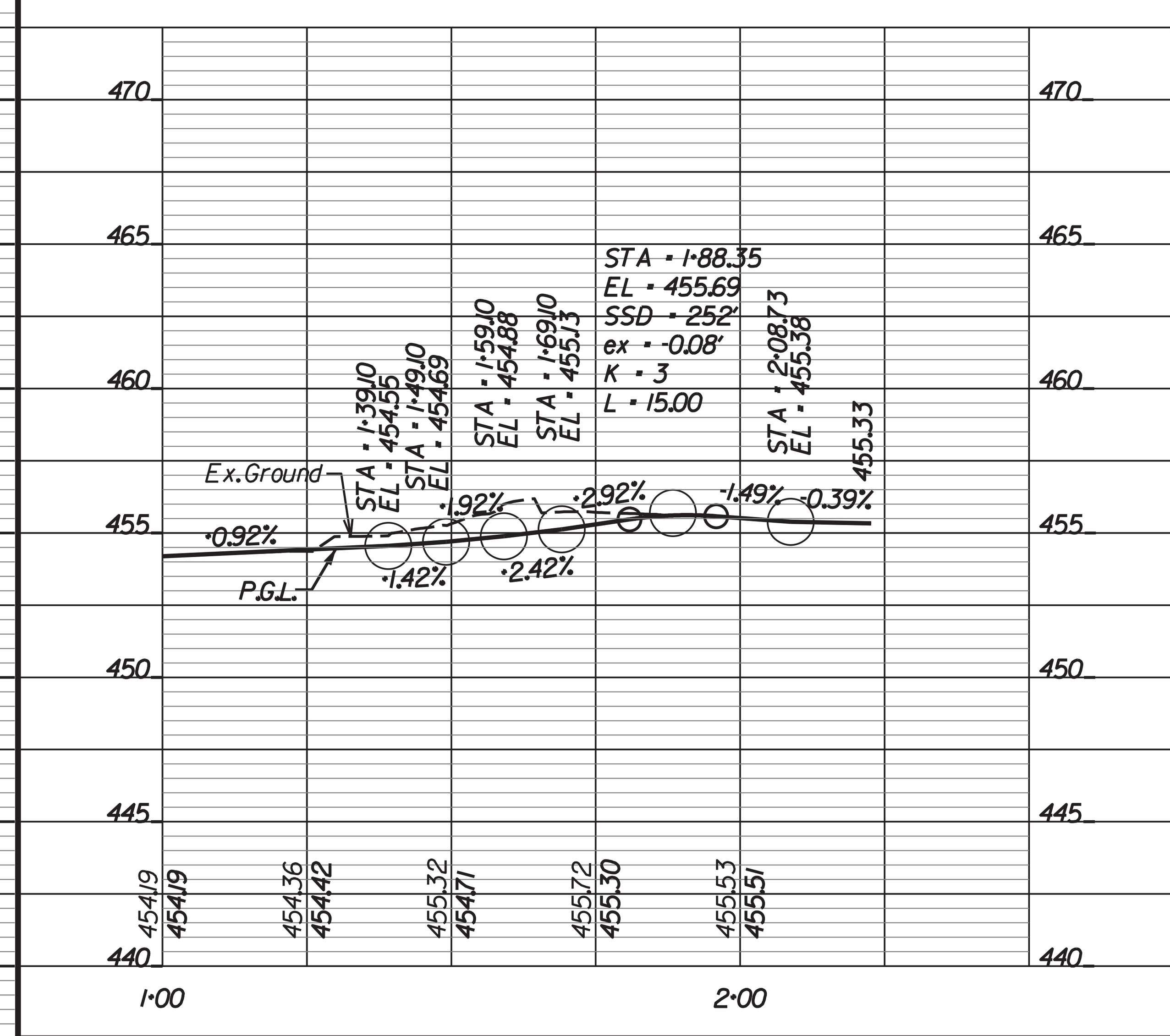


NOTE:
All elevations shown for curb return profiles are taken at the edge of pavement.

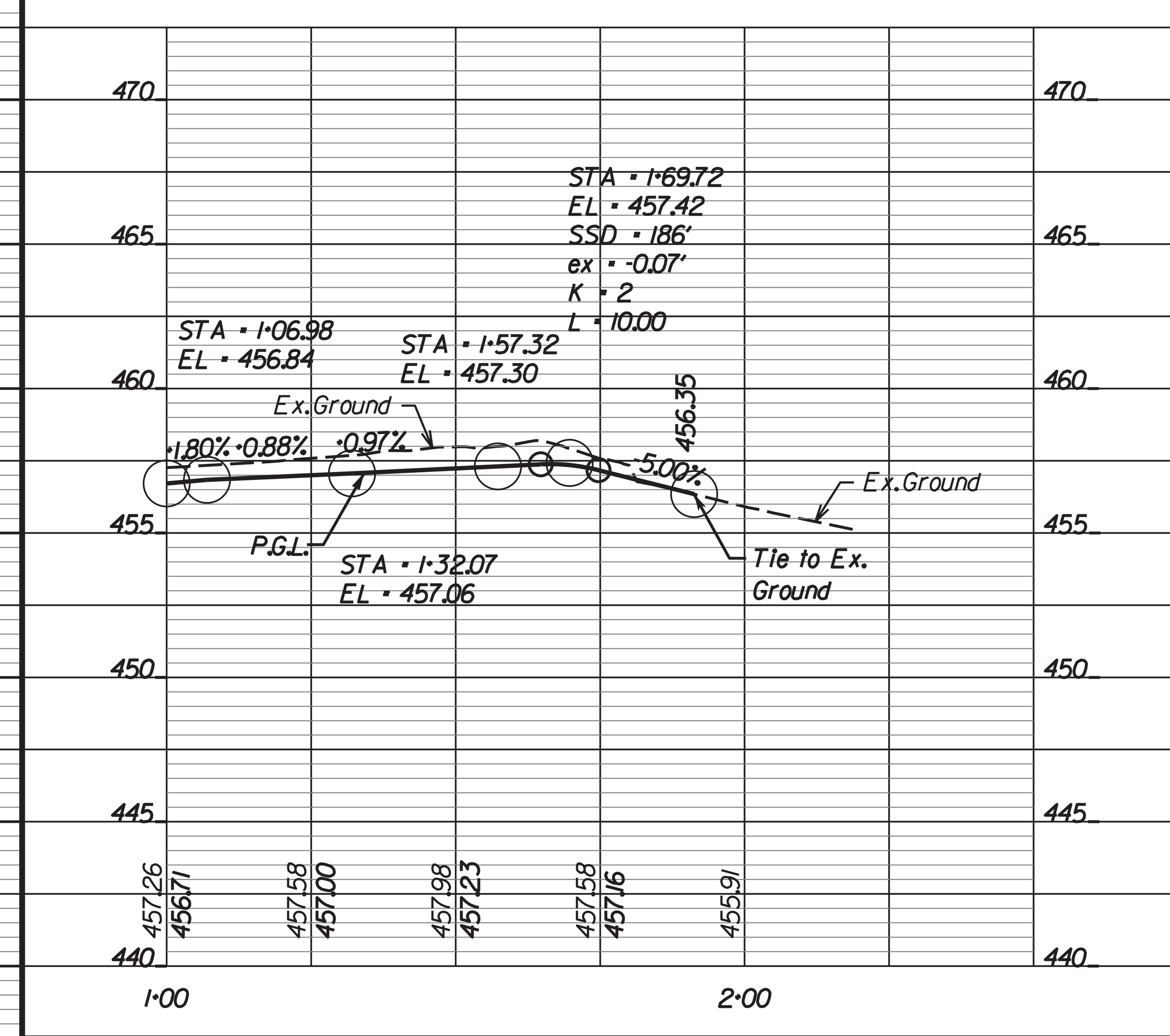
Curb Return 3-2 Profile



Curb Return 3B-2 and 3B-3 Profile



Curb Return 5-1 Profile



Office Locations
Rinker Design Associates, P.C.
Civil Engineering • Surveying • Land Planning • Transportation • Environmental • Right of Way Services

CITY OF FAIRFAX

8/15/2014

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2C(2)

FINAL PLANS

PROJECT MANAGER Wendy Block Sanford, City of Fairfax, (703) 385-7889
SURVEYED BY Rinker Design Assoc., P.C. (703) 368-7373
DESIGN SUPERVISED BY Mark Gunn, P.E., Rinker Design Assoc., P.C. (703) 368-7373
DESIGNED BY Adam D. Welschenbach, P.E., Rinker Design Assoc., P.C. (703) 368-7373

REVISED	STATE	FEDERAL AID PROJECT OWNER		STATE PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2K

EXISTING DRAINAGE & SANITARY DESCRIPTIONS

Existing Drainage Structures

1 Storm MH
Top=446.0
Inv In=438.4
Inv Out=438.1(48")

2 Storm MH
Top=445.7
Inv In=438.5
Inv Out=438.5

3 Storm MH
Top=446.8
Inv In=439.9
Inv Out=439.8

4 Storm MH
Top=453.5
Inv In=446.0(21")
Inv In=442.4(60")
Inv Out=442.0

5 Drop Inlet
Top=453.0
Inv Out=446.2(21")

6 Storm MH
Top=454.6
Inv In=447.1(15" From-8)
Inv In=443.9(48" From-7)
Inv In=443.1(48" From-9)
Inv Out=442.1

7 Drop Inlet
Top=454.5
Inv In=444.7
Inv Out=444.4

8 Drop Inlet
Top=454.9
Inv Out=450.5

9 Storm MH
Top=454.5
Inv In=443.2(48")
Inv Out=443.1(48")

10 Storm MH
Top=454.5
Inv In=443.3(48")
Inv Out=443.2(48")

11 Storm MH
Top=454.5
Inv In=450.2(15" From-13)
Inv In=450.6(24" From-14)
Inv In=445.0(48" From-12)
Inv Out=443.2(48")

12 Drop Inlet
Top=454.0
Inv In=451.1(18" From-42)
Inv In=448.6(24" From-23)
Inv In=446.6(48" From-43)
Inv Out=445.3(48")

13 Drop Inlet
Top=454.6
Inv Out=450.7

14 Storm MH
Top=455.8
Inv In=452.9
Inv Out=452.8

15 Drop Inlet
Top=457.3
Inv In=455.1(15" From-16)
Inv In=454.2(24" From-17)
Inv Out=454.1

16 Drop Inlet
Top=459.4
Inv Out=456.0

17 Storm MH
Top=458.2
Inv In=455.4
Inv Out=455.2

18 Drop Inlet
Top=459.8
Inv In=456.2
Inv Out=455.8

19 Yard Inlet
Top=465.8
Inv Out=457.0

20 Drop Inlet
Top=453.8
Inverts Blocked

21 Drop Inlet
Top=455.5
Inv In=448.3(15" From-20)
Inv In=448.0(48" From-22)
Inv Out=447.2(48")

22 Drop Inlet
Top=455.8
Inv In=449.2
Inv Out=448.9

23 Wing Wall
Top=454.7
Inv In=451.8(18")
Inv In=451.5(24")
Inv Out=449.4

24 Drop Inlet
Top=454.5
Inverts Blocked

25 Drop Inlet
Top=453.8
Inverts Blocked

26 Drop Inlet
Top=460.0
Inv In=453.2(48")
Inv Out=453.1

27 Drop Inlet
Top=458.5
Inv In=452.6
Inv Out=452.5

28 Drop Inlet
Top=457.9
Inv In=452.2
Inv Out=452.1(36" CMP)

29 Storm MH
w/Weir Wall
Top=458.7
Inv In=452.2
Inv Out=452.2(36" CMP)

30 Flared End-Section
Inv=452.2

31 Drop Inlet
Top=453.17
Inv In=449.31
Inv Out=449.15(15")

32 Drop Inlet
Top=458.77
Inv In=455.24
Inv Out=454.55

33 Drop Inlet
Top=460.83
Inv In=456.82(15")
Inv Out=456.01

34 Storm MH
Top=461.93

35 Storm MH
Top=462.74

36 Drop Inlet
Top=462.67
Inv Out=459.07(18")

37 Storm MH
Top=462.65

38 Drop Inlet
Top=463.15
Inv Out=459.88(15")

39 Storm MH
Top=462.97
Inv In=459.77(a)
Inv In=459.58(b)
Inv Out=459.30(18")

40 Storm Grate
Top=463.14
Inv Out=459.74(15")

41 Storm Grate
Top=453.5
Cannot access

42 Yard Inlet
Top=454.6
Inv Out=451.2

43 Drop Inlet
Top=455.7
Inv Out=447.3

44 Drop Inlet
Top=455.35
Inv Out=450.90

45 Drop Inlet
Top=449.16
Inv In=444.95(15")
Inv In=444.48(24"x38")
Inv Out=444.41

46 Yard Inlet
Top=448.64
Throat=444.73
Inv Out=444.59

47 Storm Grate
Top=446.89
Inv In=444.04
Inv Out=438.64

48 Drop Inlet
Top=444.13
Inv In=437.68
Inv Out=437.67

49 Drop Inlet
Top=441.87
Inv In=436.44
Inv Out=436.36

50 Drop Inlet
Top=455.1
Inv Out=450.4

51 Drop Inlet
Top=450.5
Inv In=445.6
Inv Out=444.1

52 Drop Inlet
Top=444.8
Inv In=441.0
Inv Out=440.3

53 Drop Inlet
Top=442.7
Inv In=438.3
Inv Out=438.2

54 Drop Inlet
Top=442.3
Inv In=437.5

55 Drop Inlet
Top=453.5
Inv In=447.8

Existing Sanitary Structures

EX.3 San MH
Top=455.49
(Not accessible)

EX.14 San MH
Top=453.89
Inv Out=447.08

EX.16 San MH
Top=459.24
Inv Out=451.25

EX.17 San MH
Top=461.44
Inv In=450.11
Inv Out=450.06

EX.18 San MH
Top=462.02
(Not Accesible)

Rinker Design Associates, P.C.
Civil Engineering • Surveying • Land Planning • Transportation • Environmental • Right of Way Services
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927 Maple Grove Drive, Suite 105, Fredericksburg, VA 22407, Phone: (540) 548-4470, Fax: (540) 548-4471

CITY OF FAIRFAX

8/15/2014

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2K

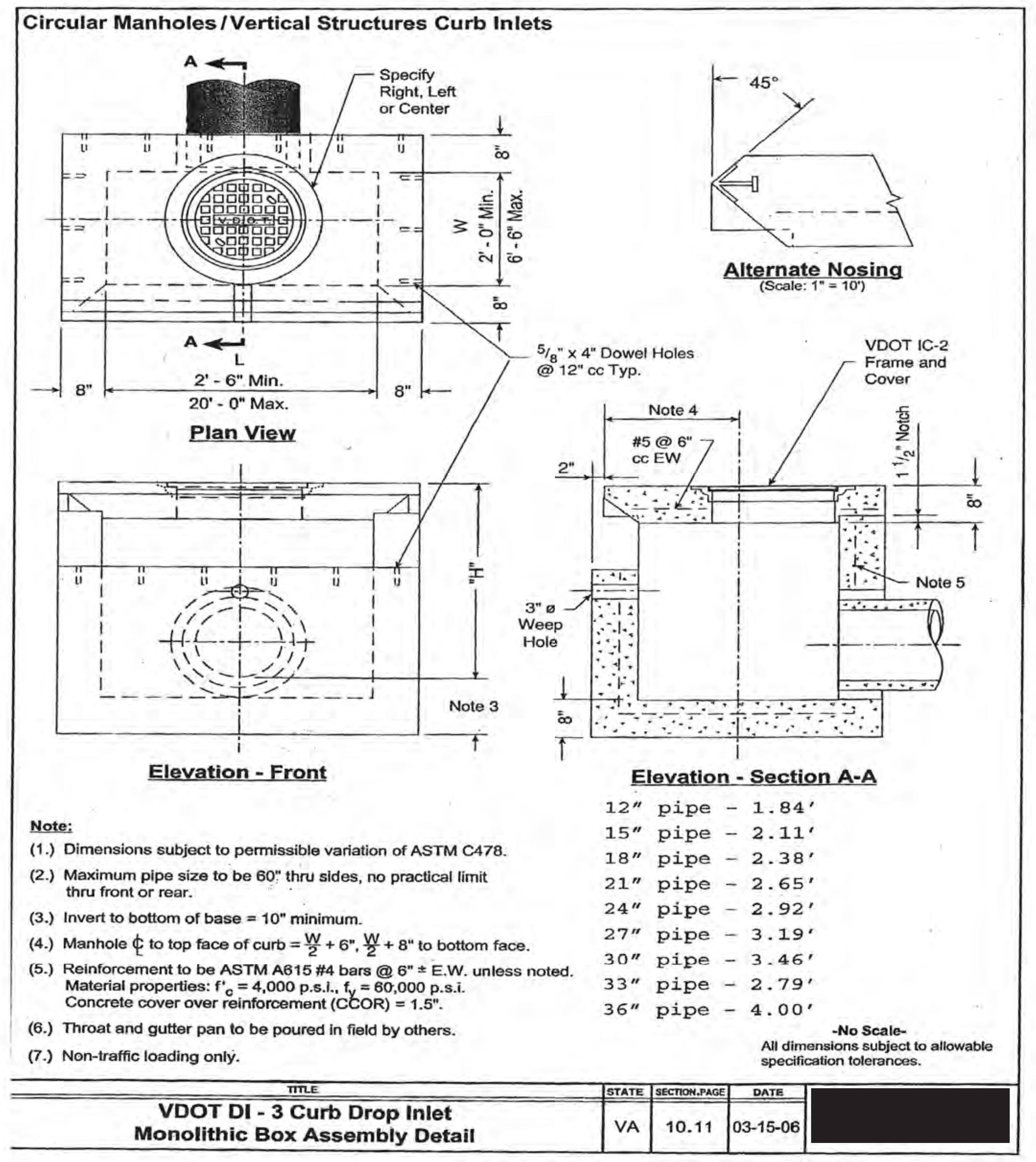
FINAL PLAN

PROJECT MANAGER Wendy Block Sanford, City of Fairfax, (703) 385-7889
SURVEYED BY Rinker Design Assoc. P.C. (703) 368-7373
DESIGN SUPERVISED BY Mark Gunn, P.E., Rinker Design Assoc. P.C. (703) 368-7373
DESIGNED BY Adam D. Weischenbach, P.E., Rinker Design Assoc. P.C. (703) 368-7373

PROPOSED DRAINAGE DESCRIPTIONS

COMMONWEALTH OF VIRGINIA
NIKHIL V. DESHPANDE
Lic. No. 045430
PROFESSIONAL ENGINEER
Nikhil V Deshpande
2014.08.15 15:36:20 -04'00'
Rinker Design Associates, P.C.
Manassas, Virginia
PROFESSIONAL ENGINEER

REVISED	STATE	FEDERAL AID PROJECT OWNER	STATE	PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2K(1)



Note:
1. For non-standard structures, contractor shall provide shop drawings for approval to City of Fairfax prior to ordering materials.

2. All storm sewer pipes, unless otherwise noted, shall be CL-III RCP.

3. 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.

Sheet 3B	
3B-1	1-Mod. DI-3B Req'd. L=6', H=3.7' Inv.=454.35, Top=458.00 Less Than Minimum Height 1 St'd. Monobox Req'd. (See Detail Sht. 2K(1)) St'd. IS-1 Req'd. Connect UD-4 to DI
3B-1 to Ex.44	222' - 15" Storm Sewer Pipe Req'd. (2.5' Cover) Inv.(In)=454.35 Inv.(Out)=452.10
3B-2	1-St'd. DI-2B Req'd. L=8', H=4.8' Inv.=450.21, Top=455.05 St'd. IS-1 Req'd. 9' - 15" Existing Pipe To Be Removed Modify to Accept 15" Pipe Connect UD-4 to DI
3B-2 to Ex.51	243' - 15" Storm Sewer Pipe Req'd. (3.6' Cover) Inv.(In)=450.21 Inv.(Out)=445.60
Sheet 4	
4-1	1-St'd. DI-2B Req'd. L=8', H=7.0' Inv.=453.10, Top=460.08 St'd. IS-1 Req'd. Connect UD-4 to DI
4-1 to 4-10	173' - 15" Storm Sewer Pipe Req'd. (5.8' Cover) Inv.(In)=453.10 Inv.(Out)=451.40
4-2	1-St'd. DI-2B Req'd. L=6', H=5.3' Inv.=450.40, Top=455.72 St'd. IS-1 Req'd. Connect UD-4 to DI
4-2 to 4-14	21' - 15" Storm Sewer Pipe Req'd. (4.1' Cover) Inv.(In)=450.40 Inv.(Out)=450.25
4-3	1-St'd. DI-3C Req'd. L=6', H=4.3' Inv.=449.15, Top=453.47 St'd. IS-1 Req'd.
4-3 to 4-17	36' - 15" Storm Sewer Pipe Req'd. (3.1' Cover) Inv.(In)=449.15 Inv.(Out)=447.50
4-4	1-St'd. DI-1 Req'd. H=5.5' Inv.=448.30, Top=453.81 St'd. IS-1 Req'd.
4-4 to 4-18	67' - 15" Storm Sewer Pipe Req'd. (4.3' Cover) Inv.(In)=448.30 Inv.(Out)=446.95
4-4 to 4-23	3' - 15" Storm Sewer Pipe Req'd. (2.5' Cover) Inv.(In)=450.10 Inv.(Out)=450.00
4-5	1-St'd. DI-1 Req'd. H=5.8' Inv.=447.10, Top=452.90 St'd. IS-1 Req'd.
4-5 to 4-20	15' - 15" Storm Sewer Pipe Req'd. (4.6' Cover) Inv.(In)=447.10 Inv.(Out)=446.95
4-6	1-Mod. JB-1 Req'd. H=11.9', W=12', D=12' Type A Tower Req'd. 1-St'd. T-DI-2BB Top Req'd. L=6' Inv.=442.70 Top=454.56 St'd. IS-1 Req'd. Connect UD-4 to DI
4-7	1-St'd. DI-2C Req'd. L=6', H=4.0' Inv.=450.30, Top=454.30 St'd. IS-1 Req'd. Connect UD-4 to DI
4-7 to 4-15	4' - 15" Storm Sewer Pipe Req'd. (2.8' Cover) Inv.(In)=450.30 Inv.(Out)=450.00
4-8	1-Mod. JB-1 Req'd. H=11', W=6', D=6' Type A Tower Req'd. 1 St'd MH-1 Frame and Cover Req'd. Inv.=442.00 Top=453.00 St'd. IS-1 Req'd.
4-9	1-St'd. DI-3B Req'd. L=4', H=4.0' Inv.=453.45, Top=457.46 St'd. IS-1 Req'd.
4-9 to 4-1	20' - 15" Storm Sewer Pipe Req'd. (2.8' Cover) Inv.(In)=453.45 Inv.(Out)=453.20
4-10	1-St'd. DI-2B Req'd. L=8', H=5.6' Inv.=451.30, Top=456.87 St'd. IS-1 Req'd. Connect UD-4 to DI
4-10 to 4-2	104' - 15" Storm Sewer Pipe Req'd. (4.4' Cover) Inv.(In)=451.30 Inv.(Out)=450.50
4-11	6.3 Lin. Ft St'd. MH-1 or 2 Req'd. 1 St'd MH-1 Frame and Cover Req'd. Inv.=447.25 St'd. IS-1 Req'd.
4-11 to 4-22	2' - 15" Storm Sewer Pipe Req'd. (5.8' Cover) Inv.(In)=447.25 Inv.(Out)=447.20
4-11 to 4-13	56' - 15" Storm Sewer Pipe Req'd. (4.5' Cover) Inv.(In)=448.50 Inv.(Out)=447.90
4-12	48" Dia. Terre Arch System Inv=446.00
4-12 to 4-13	2' - 15" Storm Sewer Pipe Req'd. (5.8' Cover) Inv.(In)=446.00 Inv.(Out)=445.90
4-13	8.3 Lin. Ft St'd. MH-1 or 2 Req'd. 1 St'd MH-1 Frame and Cover Req'd. Inv.=445.00 4" Diameter Orifice Req'd., Inv.=445.00 0.9'x0.15' Orfice Req'd., Inv.=448.60 4' Weir Req'd., Inc.=449.00 St'd. IS-1 Req'd.
4-13 to 4-23	103' - 15" Storm Sewer Pipe Req'd. (7.8' Cover) Inv.(In)=445.00 Inv.(Out)=444.45
4-14	Modify Existing Drop Inlet Adjust to Grade. Lower 0.3' Remove Existing Inlet Top Add St'd MH-1 Frame and Cover Proposed Top Elevation.=455.24 Modify to accept 15" pipe
4-15	Modify Existing Drop Inlet Adjust to Grade. Lower 0.4' Remove Existing Inlet Top Add St'd MH-1 Frame and Cover Proposed Top Elevation.=454.10 Modify to accept 15" pipe
4-16	1-St'd. DI-3C Req'd. L=14', H=5.2' Inv.=449.00, Top=454.17 St'd. IS-1 Req'd.
4-16 to 4-11	50' - 15" Storm Sewer Pipe Req'd. (4.0' Cover) Inv.(In)=449.00 Inv.(Out)=448.50
4-17	48" Dia. Terre Arch System Inv=447.50
4-18	48" Dia. Terre Arch System Inv=446.95
4-19	48" Dia. Terre Arch System Inv=446.00
4-20	48" Dia. Terre Arch System Inv=446.95
4-19 to 4-21	3' - 15" Storm Sewer Pipe Req'd. (5.8' Cover) Inv.(In)=446.00 Inv.(Out)=445.90
4-21	8.7 Lin. Ft St'd. MH-1 or 2 Req'd. 1 St'd MH-1 Frame and Cover Req'd. Inv.=443.60 4" Diameter Orifice Req'd., Inv.=443.60 0.5'x0.25' Orfice Req'd., Inv.=447.00 4' Weir Req'd., Inc.=447.75 St'd. IS-1 Req'd.
4-21 to 4-8	26' - 18" Storm Sewer Pipe Req'd. (7.9' Cover) Inv.(In)=443.60 Inv.(Out)=442.60
4-22	48" Dia. Terre Arch System Inv=447.20
4-23	8.5 Lin. Ft St'd. MH-1 or 2 Req'd. 1 St'd MH-1 Frame and Cover Req'd. Inv.=444.35 St'd. IS-1 Req'd.
4-23 to 4-21	126' - 18" Storm Sewer Pipe Req'd. (7.6' Cover) Inv.(In)=444.35 Inv.(Out)=443.70
4-24	Modify Existing Drop Inlet Adjust to Grade. Lower 0.3' Remove Existing Inlet Top Add St'd MH-1 Frame and Cover Proposed Top Elevation.=454.64 Modify to accept 15" pipe
Sheet 5	
5-1	1-St'd. DI-2B Req'd. L=8', H=4.2' Inv.=451.00, Top=455.22 St'd. IS-1 Req'd. Connect UD-4 to DI
5-1 to 4-24	64' - 15" Storm Sewer Pipe Req'd. (3.0' Cover) Inv.(In)=451.00 Inv.(Out)=450.60

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2K(1)

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Office Locations

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STORM SEWER COMPUTATIONS

COMMONWEALTH OF VIRGINIA
NIKHIL V. DESHPANDE
Lic. No. 045430
PROFESSIONAL ENGINEER

Nikhil V Deshpande
2014.08.15 15:36:47 -04'00'

Rinker Design Associates, P.C.
Manassas, Virginia
PROFESSIONAL ENGINEER

REVISED	STATE	FEDERAL AID PROJECT OWNER		STATE PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2K(2)

ROUTE Jermantown Road **PROJECT** Jermantown Road **DESIGNER:** EB/ND **CHECKED:** SCT **DATE** 5/29/2014 **UNITS** ENGLISH

INLET																														Sag Inlets Only					
NUMBER	TYPE	LENGTH (FT; M)	STATION	DRAINAGE AREA (AC; HA)	C	CA	ΣCA	I (IN/HR; mm/HR)	Q INCR. (CFS; CMS)	Qc CARRYOVER (CFS; CMS)	QT GUTTER FLOW (CFS; CMS)	S GUTTER SLOPE (FT/FT; M/M)	Sx CROSS SLOPE (FT/FT; M/M)	T (SPREAD) (FT; M)	W (GUTTER WIDTH) (FT; M)	W/T	Sw (GUTTER SLOPE) (FT/FT; M/M)	Sw/Sx	Eo (App. 9C-8)	a	S'w	Se	COMPUTED LENGTH L_T (FT; M)	L, SPECIFIED LENGTH (FT; M)	L/LT	E (App. 9C-18)	Q INTERCEPTED (CFS; CMS) or d/h	Qb CARRYOVER (CFS; CMS)	Depth at Curb (IN; MM)	Allowable Ponding Depth d (FT; M)	Height of Curb Opening h (FT; M)	d/h	Depth at Inlet (IN; MM)	T SPREAD @ SAG (FT; M)	REMARKS
3B-1	DI-3B	6	55+00	0.03	0.40	0.01																									0.45				
			41.0'RIGHT	0.25	0.90	0.23																													
							0.24	4	0.95	0.00	0.95	0.01	0.02	4.76	2	0.42	0.08	4.17	0.91	3.52	0.15	0.15	5.97	6	1.01	1.00	0.95	0.00	2.7						
3B-2	DI-2B	8	57+42	0.07	0.40	0.03																									0.45				
			-29.4'LEFT	0.63	0.90	0.57																													
							0.60	4	2.38	0.00	2.38	0.01	0.07	4.33	2	0.46	0.08	1.19	0.82	2.32	0.1	0.15	8.43	2.5	0.95	1.00	2.37	0.01	4.0						
4-1	DI-2B	8	16+25	0.03	0.40	0.01																									0.45				
			-47.0'LEFT	0.37	0.90	0.33																													
							0.35	6.77	2.34	0.00	2.34	0.01	0.03	6.68	2	0.3	0.08	2.78	0.72	3.28	0.14	0.13	9.18	2.5	0.87	0.98	2.28	0.06	3.7						
4-2	DI-2B	6	19+08	0.01	0.40	0.00																									0.45				
			-47.0'LEFT	0.17	0.90	0.15																													
							0.16	6.77	1.06	0.00	1.06	0.01	0.02	6.29	2	0.32	0.08	4.38	0.81	3.54	0.15	0.14	5.66	2.5	1.06	1.00	1.06	0.00	3.0						
4-6	DI-2BB	6	21+50	0.04	0.40	0.02																									0.45				
			-47.0'LEFT	0.16	0.90	0.14																													
							0.16	6.77	1.08	0.00	1.08	0.01	0.02	6.23	2	0.32	0.08	3.58	0.79	3.44	0.14	0.14	5.21	2.5	1.15	1.00	1.08	0.00	3.2						
4-7	DI-2C	6	21+00	0.01	0.40	0.00																									0.45				Back/Lt.
			-47.0'LEFT	0.17	0.90	0.15																													Back/Lt.
							0.16	6.77	1.06	0.00		0.01	0.03	5.37	2	0.37	0.08	2.78		3.28															Back/Lt.
				0.01	0.40	0.00																													Ahead/Rt.
				0.07	0.90	0.06																													Ahead/Rt.
							0.07	6.77	0.45	0.00																									Ahead/Rt.
											1.52	0.01			2									6			1.52		2.0	0.24	0.02	12	4.118	5.59	Weir Flow
4-9	DI-3B	4	16+25	0.06	0.40	0.02																									0.45				Back/Lt.
			-70.0'LEFT	0.06	0.90	0.05																													Back/Lt.
							0.08	5.23	0.41	0.00		0.02	0.01	1.81	2	1.1	0.08	8.33		3.76															Back/Lt.
							0.00	5.23	0.00	0.00																									Ahead/Rt.
											0.41	0.02												4			0.41		1.0	0.16	0.01	12.31	2.979	8.16	Weir Flow
4-10	DI-2B	8	18+00	0.01	0.40	0.00																									0.45				
			-47.0'LEFT	0.18	0.90	0.16																													
							0.17	6.77	1.12	0.06	1.18	0.01	0.03	4.37	2	0.46	0.08	2.78	0.9	3.28	0.14	0.15	6.72	2.5	1.19	1.00	1.18	0.00	2.9						
5-1	DI-2B	8	22+75	0.01	0.40	0.00																									0.45				
			-47.0'LEFT	0.21	0.90	0.19																													
							0.19	6.77	1.31	0.00	1.31	0.01	0.02	7.01	2	0.29	0.08	5.14	0.78	3.61	0.15	0.13	6.99	2.5	1.14	1.00	1.31	0.00	3.0						
EX44	DI-3B	20	57+25	0.07	0.30	0.02																									0.45				
			41.0'RIGHT	0.50	0.90	0.45																													
							0.47	4	1.88	0.00	1.88	0.01	0.07	3.82	2	0.52	0.08	1.16	0.87	2.27	0.09	0.15	7.71	20	2.6	1.00	1.88	0.00	3.6						
EX51	DI-3B	8	59+90	0.12	0.40	0.05																									0.45				
			25.0'RIGHT	0.24	0.90	0.22																													
							0.26	6.77	1.79	0.01	1.80	0.03	0.05	3.73	2	0.54	0.08	1.76	0.91	2.86	0.12	0.16	9.64	8	0.83	0.96	1.73	0.07	3.0						
SWM Inlets																																			

CITY OF FAIRFAX

8/15/2014

PROJECT MANAGER Wendy Block Sanford, City of Fairfax, (703) 385-7889
SURVEYED BY Rinker Design Assoc., P.C. (703) 368-7373
DESIGN SUPERVISED BY Mark Gunn, P.E., Rinker Design Assoc., P.C. (703) 368-7373
DESIGNED BY Adam D. Welschenbach, P.E., Rinker Design Assoc., P.C. (703) 368-7373

STORM SEWER COMPUTATIONS

COMMONWEALTH OF VIRGINIA
NIKHIL V. DESHPANDE
Lic. No. 045430
PROFESSIONAL ENGINEER

Nikhil V Deshpande
2014.08.15 15:38:13 -04'00'

Rinker Design Associates, P.C.
Manassas, Virginia
PROFESSIONAL ENGINEER

REVISED	STATE	FEDERAL AID PROJECT OWNER	STATE	PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2K(2A)

Rinker Design Associates, P.C.
Civil Engineering • Surveying • Land Planning
Transportation • Environmental
Right of Way Services
Office Locations

CITY OF FAIRFAX

INLET																														Sag Inlets Only					
NUMBER	TYPE	LENGTH (FT; M)	STATION	DRAINAGE AREA (AC; HA)	C	CA	ΣCA	I (IN/HR; mm/HR)	Q INCR. (CFS; CMS)	Qc CARRYOVER (CFS; CMS)	QT GUTTER FLOW (CFS; CMS)	S GUTTER SLOPE (FT/FT; M/M)	Sx CROSS SLOPE (FT/FT; M/M)	T (SPREAD) (FT; M)	W (GUTTER WIDTH) (FT; M)	W/T	Sw (GUTTER SLOPE) (FT/FT; M/M)	Sw/Sx	Eo (App. 9C-8)	a	S'w	Se	COMPUTED LENGTH L_T (FT; M)	L, SPECIFIED LENGTH (FT; M)	L/LT	E (App. 9C-18)	Q INTERCEPTED (CFS; CMS) or d/h	Qb CARRYOVER (CFS; CMS)	Depth at Curb (IN; MM)	Allowable Ponding Depth d (FT; M)	Height of Curb Opening h (FT; M)	d/h	Depth at Inlet (IN; MM)	T SPREAD @ SAG (FT; M)	REMARKS
SWM Inlets																																			
4-3	DI-3C	6	19+50	0.05	0.40	0.02																									0.45				Back/Lt.
			-71.0'LEFT	0.12	0.90	0.11																													Back/Lt.
							0.13	6.77	0.87	0.00																									Back/Lt.
				0.05	0.40	0.02																													Ahead/Rt.
				0.18	0.90	0.16																													Ahead/Rt.
							0.18	6.77	1.23	0.00		0.04	0.04	2.84	2	0.7	0.08	2.08		3.04															Ahead/Rt.
											2.10	0.04												6			2.10		2.5	0.32	0.03	11.85	4.498	5.2	Weir Flow
4-4	DI-1	4	20+00	0.02	0.40	0.01																													Back/Lt.
			-73.0'LEFT	0.06	0.90	0.05																													Back/Lt.
							0.06	6.77	0.42	0.00		0.07	0.04	1.45	2	1.38	0.08	2.08		3.04															Back/Lt.
							0.00	6.77	0.00	0.00																									Ahead/Rt.
											0.42	0.07			2									4			0.42		0.7	0.32			4.696	1.45	Weir Flow
4-5	DI-1	4	21+50	0.11	0.40	0.04																													Back/Lt.
			-73.0'LEFT	0.23	0.90	0.21																													Back/Lt.
							0.25	6.77	1.70	0.00		0	0.02	12.1	2	0.17	0.08	4		3.5															Back/Lt.
							0.00	6.77	0.00	0.00																									Ahead/Rt.
											1.70	0			2									4			1.70		1.8	0.17			5.769	7.09	
4-16	DI-3C	14	18+00	0.04	0.40	0.02																									0.45				Back/Lt.
			-65.0'LEFT	0.25	0.90	0.23																													Back/Lt.
							0.24	6.77	1.63	0.00		0.03	0.05	3.34	2	0.6	0.08	1.67		2.8															Back/Lt.
				0.01	0.40	0.00																													Ahead/Rt.
				0.02	0.90	0.02																													Ahead/Rt.
							0.02	6.77	0.15	0.00																									Ahead/Rt.
											1.78	0.03												14			1.78		1.5	0.4	0.03	12.12	3.494	2.49	Weir Flow

EXISTING STORM SEWER COMPUTATION – 10 YEAR STORM EVENT

PIPE NO.	FROM POINT REFERENCE (1)	FROM POINT STA.	TO POINT REFERENCE (2)	TO POINT STA.	DRAIN. AREA "A" Acre (3)	RUNOFF COEFF. "C" (4)	CA INCRE-MENT (5)	CA ACCUM-ULATED (6)	TOTAL INLET TIME Minutes (7)	RAIN FALL In/Hr (8)	RUNOFF Lateral CFS	Total Q CFS (9)	INVERT ELEVATIONS UPPER END (10)	INVERT ELEVATIONS LOWER END (11)	LENGTH of Pipe Ft. (12)	SLOPE Ft./Ft. (13)	SIZE (Dia. Or Span/Rise) In. (14)	SHAPE	Number of Pipes	Capacity CFS (15)	Friction Slope Ft./Ft.	NORMAL FLOW Depth of Flow, dn Ft.	Area of Flow, An SqFt	Hrn Ft.	Vn Ft/Sec (16)	En Ft.	FLOW TIME Sec. (17)	REMARKS (18)
EX7toEX6	Ex7		Ex6		16.54	0.81	13.39	13.39	15.00	4.62	0.00	61.84	444.40	443.90	47	0.01064	48	Circular	1	148.17	0.00190	1.80	5.49	0.93	11.3	3.77	4	
EX6toEX4	Ex6		4-8		0.00		0.00	30.05	15.22	4.59	0.00	139.21	442.70	442.40	26	0.01154	60	Circular	1	279.78	0.00300	2.49	9.78	1.25	14.2	5.64	2	
EX4toEX3	Ex4		EX3		0.00		0.00	30.30	15.25	4.58	0.00	140.87	442.00	439.90	318	0.00660	60	Circular	1	211.59	0.00300	2.98	12.21	1.38	11.5	5.05	28	
EX3toEX2	EX3		EX2		0.00		0.00	30.30	15.71	4.52	0.00	140.87	439.80	438.50	189	0.00688	48	Circular	1	119.15	0.01000	4.00	12.57	1.00	11.2	5.95	17	Pressure Flow
EX2toEX1	EX2		EX1		0.00		0.00	30.30	15.99	4.49	0.00	140.87	438.50	438.40	4	0.02500	48	Circular	1	227.12	0.01000	2.28	7.40	1.08	19.0	7.91	0	
EX5toEX4	Ex5		Ex4		0.35	0.70	0.25	0.25	5.00	6.77	0.00	1.66	446.20	446.00	5	0.04000	21	Circular	1	31.69	0.00010	0.27	0.24	0.17	7.0	1.03	1	
EX8toEX6	Ex8		Ex6		0.23	0.86	0.20	0.20	5.00	6.77	0.00	1.33	450.50	447.10	51	0.06667	15	Circular	1	16.68	0.00040	0.24	0.16	0.15	8.1	1.27	6	
EX11toEX6	EX11		Ex6		21.75	0.76	16.47	16.47	15.00	4.62	0.00	76.04	443.20	443.10	80	0.00125	48	Circular	1	50.79	0.00290	4.00	12.57	1.00	6.1	4.57	13	Pressure Flow

8/15/2014

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2K(2A)

FINAL PLAN

PROJECT MANAGER Wendy Block Sanford, City of Fairfax, (703) 385-7889
SURVEYED BY Rinker Design Assoc. P.C. (703) 368-7373
DESIGN SUPERVISED BY Mark Gunn, P.E., Rinker Design Assoc. P.C. (703) 368-7373
DESIGNED BY Adam D. Welschenbach, P.E., Rinker Design Assoc. P.C. (703) 368-7373

STORM SEWER COMPUTATIONS

LD-229
STORM SEWER DESIGN COMPUTATIONS

STORM FREQUENCY: 10

PROJECT: Jermantown Road
LOCATION: Route 50 and Jermantown Road
COUNTY: Fairfax

Designed by: EB/ND
Checked by: SCT

UNITS: ENGLISH

PIPE NO.	FROM POINT REFERENCE (1)	FROM POINT STA.	TO POINT REFERENCE (2)	TO POINT STA.	DRAIN. AREA "A" Acre (3)	RUNOFF COEFF. "C" (4)	CA INCREMENT (5)	CA ACCUMULATED (6)	TOTAL INLET TIME Minutes (7)	RAIN FALL In/Hr (8)	RUNOFF Lateral CFS	RUNOFF Total Q CFS (9)	INVERT ELEVATIONS UPPER END (10)	INVERT ELEVATIONS LOWER END (11)	LENGTH of Pipe Ft. (12)	SLOPE Ft./Ft. (13)	SIZE (Dia. Or Span/Rise) In. (14)	SHAPE	Number of Pipes	Capacity CFS (15)	Friction Slope Ft./Ft.	NORMAL FLOW Depth of Flow, dn Ft.	NORMAL FLOW Area of Flow, An SqFt	NORMAL FLOW Hm Ft.	NORMAL FLOW Vn Ft/Sec (16)	NORMAL FLOW En Ft.	FLOW TIME Sec. (17)	REMARKS (18)
3B-1toEX44	3B-1	55+00	EX44	57+25	0.28	0.85	0.24	0.24	5.00	6.77	0.00	1.61	454.35	452.10	222	0.01014	15	Circular	1	6.51	0.00060	0.42	0.37	0.24	4.4	0.72	51	
EX44toEX45	EX44	57+25	EX45		0.57	0.83	0.47	0.71	5.84	6.50	0.00	4.60	450.90	444.95	297	0.02003	15	Circular	1	9.14	0.00530	0.63	0.62	0.31	7.5	1.49	40	
EX45toEX47	EX45		EX47		0.34	0.81	0.28	4.93	11.15	5.23	0.00	25.77	444.41	444.04	63	0.00587	38 X 24	Elliptical	1	31.43	0.00400	1.38	3.67	0.73	7.1	2.16	9	
EX47toEX48	EX47		EX48		2.55	0.37	0.95	5.88	11.30	5.20	0.00	30.58	438.64	437.68	148	0.00649	36	Circular	1	53.73	0.00220	1.62	3.90	0.79	7.8	2.58	19	
EX46toEX45	EX46		EX45		6.48	0.61	3.94	3.94	11.00	5.26	0.00	20.73	444.59	444.48	43	0.00256	38 X 24	Elliptical	1	20.76	0.00260	1.64	4.36	0.75	4.8	1.99	9	
3B-2toEX51	3B-2	57+42	EX51	59+90	0.70	0.85	0.60	0.60	5.00	6.77	0.00	4.03	450.21	445.60	243	0.01897	15	Circular	1	8.90	0.00410	0.59	0.57	0.30	7.1	1.37	34	
EX51toEX52	EX51	59+90	EX52		0.36	0.73	0.26	0.86	5.57	6.58	0.00	5.66	444.10	441.00	180	0.01722	18	Circular	1	13.78	0.00300	0.67	0.76	0.35	7.4	1.52	24	
EX52toEX53	EX52		EX53		0.26	0.77	0.20	1.06	5.98	6.46	0.00	6.83	440.30	438.30	124	0.01613	24	Circular	1	28.73	0.00090	0.66	0.91	0.37	7.5	1.54	17	
EX53toEX54	EX53		EX54		0.32	0.70	0.22	1.28	6.25	6.37	0.00	8.17	438.20	437.50	49	0.01429	24	Circular	1	27.04	0.00140	0.75	1.08	0.41	7.5	1.64	7	
4-9to4-1	4-9	16+25	4-1	16+25	0.12	0.65	0.08	0.08	5.00	6.77	0.00	0.53	453.45	453.20	20	0.01250	15	Circular	1	7.22	0.00010	0.23	0.15	0.14	3.4	0.41	6	
4-1to4-10	4-1	16+25	4-10	18+00	0.40	0.86	0.35	0.42	5.10	6.74	0.00	2.85	453.10	451.40	173	0.00983	15	Circular	1	6.41	0.00200	0.58	0.56	0.30	5.1	0.98	34	
4-10to4-2	4-10	18+00	4-2	19+08	0.19	0.87	0.17	0.59	5.67	6.55	0.00	3.86	451.30	450.50	104	0.00769	15	Circular	1	5.67	0.00370	0.76	0.78	0.35	5.0	1.14	21	
4-2to4-14	4-2	19+08	4-14	19+25	0.18	0.87	0.16	0.75	6.02	6.45	0.00	4.81	450.40	450.25	21	0.00714	15	Circular	1	5.46	0.00580	0.91	0.96	0.38	5.0	1.30	4	
4-14to4-15	4-14	19+25	4-15	20+11	0.00		0.00	13.01	15.11	4.60	1.16	62.59	447.20	444.70	173	0.01445	48	Circular	1	172.67	0.00200	1.67	4.95	0.88	12.6	4.15	14	
4-15to4-6	4-15	20+11	4-6	21+50	0.00		0.00	13.23	15.34	4.57	0.00	64.10	444.40	443.90	47	0.01064	48	Circular	1	148.17	0.00210	1.84	5.64	0.95	11.4	3.85	4	
4-6to4-8	4-6	21+50	4-8	21+75	0.20	0.80	0.16	30.05	15.41	4.56	0.00	141.45	442.70	442.40	26	0.01154	60	Circular	1	279.78	0.00310	2.52	9.90	1.26	14.3	5.69	2	
4-8toEX3	4-8	21+75	EX3		0.00		0.00	30.05	15.44	4.56	0.00	147.19	442.00	439.90	318	0.00660	60	Circular	1	211.59	0.00330	3.07	12.64	1.40	11.6	5.18	27	
EX3toEX2	EX3		EX2		0.00		0.00	30.05	15.90	4.50	0.00	147.19	439.80	438.50	189	0.00688	48	Circular	1	119.15	0.01090	4.00	12.57	1.00	11.7	6.13	16	Pressure Flow
EX2toEX1	EX2		EX1		0.00		0.00	30.05	16.16	4.46	0.00	147.19	438.50	438.40	4	0.02500	48	Circular	1	227.12	0.01090	2.35	7.66	1.10	19.2	8.09	0	
EX22TO4-14	EX22	19+25	4-14	19+25	15.15	0.81	12.26	12.26	15.00	4.62	0.00	56.62	448.90	448.00	77	0.01169	48	Circular	1	155.31	0.00160	1.67	4.97	0.88	11.4	3.68	7	
4-7to4-15	4-7	21+00	4-15	20+11	0.26	0.86	0.22	0.22	5.00	6.77	0.00	1.52	450.30	450.00	4	0.07500	15	Circular	1	17.69	0.00060	0.25	0.17	0.15	8.8	1.45	0	
EX11to4-6	EX11		4-6	21+50	21.75	0.76	16.47	16.47	15.00	4.62	0.00	76.04	443.20	443.10	80	0.00125	48	Circular	1	50.79	0.00290	4.00	12.57	1.00	6.1	4.57	13	Pressure Flow
5-1to4-24	5-1	22+75	4-24	22+08	0.22	0.88	0.19	0.19	5.00	6.77	0.00	1.31	451.00	450.60	64	0.00625	15	Circular	1	5.11	0.00040	0.43	0.38	0.24	3.5	0.62	18	
4-24to4-6	4-24	22+08	4-6	21+50	0.00		0.00	0.19	5.31	6.67	0.00	1.31	450.50	447.10	51	0.06667	15	Circular	1	16.68	0.00040	0.24	0.16	0.14	8.1	1.25	6	
EX25TO4-16	EX25	18+00	4-16	18+00	0.24	0.78	0.19	0.19	5.00	6.77	0.00	1.26	449.75	449.44	62	0.00500	15	Circular	1	4.57	0.00040	0.45	0.40	0.25	3.2	0.61	19	
4-16TO4-11	4-16	18+00	4-11	18+50	0.32	0.82	0.26	0.45	5.33	6.66	0.00	2.99	449.00	448.50	50	0.01000	15	Circular	1	6.46	0.00220	0.60	0.58	0.30	5.2	1.01	10	
4-11TO4-13	4-11		4-13		0.00		0.00	0.00	5.00	0.00	0.00	2.99	448.50	447.90	56	0.01071	15	Circular	1	6.69	0.00220	0.59	0.57	0.30	5.3	1.02	11	
4-13TO4-23	4-13		4-23		0.00		0.00	0.00	5.18	6.71	0.00	4.62	445.00	444.45	103	0.00534	15	Circular	1	4.72	0.00530	1.00	1.05	0.38	4.4	1.30	23	
4-23TO4-21	4-23		4-21		0.00		0.00	0.00	5.57	6.59	0.00	5.04	444.35	443.70	126	0.00516	18	Circular	1	7.55	0.00240	0.90	1.10	0.42	4.6	1.22	28	
4-21TO4-8	4-21		4-8		0.00		0.00	0.00	6.03	6.44	0.00	5.74	443.60	442.60	26	0.03846	18	Circular	1	20.60	0.00310	0.54	0.58	0.30	10.0	2.09	3	
4-12TO4-13	4-12		4-13		0.00		0.00	0.00	5.00	0.00	0.00	1.63	446.00	445.90	2	0.05000	15	Circular	1	14.45	0.00070	0.28	0.21	0.17	7.8	1.23	0	
4-4TO4-23	4-4		4-23		0.00		0.00	0.00	5.00	0.00	0.00	0.42	450.10	450.00	3	0.03333	15	Circular	1	11.79	0.00000	0.16	0.09	0.10	4.5	0.48	1	
4-19TO4-21	4-19		4-21		0.00		0.00	0.00	5.00	0.00	0.00	0.70	446.00	445.90	3	0.03333	15	Circular	1	11.79	0.00010	0.21	0.13	0.13	5.3	0.64	1	
4-11to4-22	4-11	18+50	4-22		0.00		0.00	0.45	5.49	6.61	0.00	2.99	447.25	447.20	2	0.02500	15	Circular	1	10.21	0.00220	0.46	0.41	0.25	7.2	1.28	0	
4-3TO4-17	4-3	19+50	4-17	19+00	0.40	0.78	0.31	0.31	5.00	6.77	0.00	2.10	449.15	447.50	36	0.04583	15	Circular	1	13.83	0.00110	0.33	0.26	0.19	8.1	1.36	4	
4-4TO4-18	4-4	20+00	4-18	21+00	0.08	0.78	0.06	0.06	5.00	6.77	0.00	0.42	448.30	446.95	67	0.02015	15	Circular	1	9.17	0.00000	0.18	0.11	0.11	3.8	0.41	18	
4-5TO4-20	4-5	21+50	4-20	21+40	0.34	0.74	0.25	0.25	5.00	6.77	0.00	1.70	447.10	446.95	15	0.01000	15	Circular	1	6.46	0.00070	0.44	0.38	0.24	4.4	0.74	3	

COMMONWEALTH OF VIRGINIA
NIKHIL V. DESHPANDE
Lic. No. 045430
PROFESSIONAL ENGINEER

Nikhil V Deshpande
2014.08.15 15:38:41 -04'00'

Rinker Design Associates, P.C.
Manassas, Virginia
PROFESSIONAL ENGINEER

REVISED	STATE	FEDERAL AID PROJECT OWNER	STATE	STATE PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2K(2B)

Rinker Design Associates, P.C.
Civil Engineering · Surveying · Land Planning · Transportation · Environmental · Right of Way Services

CITY OF FAIRFAX

8/15/2014

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2K(2B)

FINAL PLAN

PROJECT MANAGER Wendy Block Sanford, City of Fairfax, (703) 385-7889
SURVEYED BY Rinker Design Assoc., P.C. (703) 368-7373
DESIGN SUPERVISED BY Mark Gunn, P.E., Rinker Design Assoc., P.C. (703) 368-7373
DESIGNED BY Adam D. Weischenbach, P.E., Rinker Design Assoc., P.C. (703) 368-7373

HYDRAULIC GRADE LINE COMPUTATIONS

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 (Ft/M)	FRICTION SLOPE, Sfo (FT/FT) (M/M)	FRICTION LOSS Hf (Ft/M)	JUNCTION LOSS Vo	Contr. Ho (Ft/M)	Vi	Vi*2/2g	Hi (Expn) 0.35*MAX. (Vi2/2g)	SKEW Angle	K	Bend H (Ft/M)	Sum HL (Ft/M)	SURFACE FLOW	Adj. Ht 1.3 Ht (Ft/M)	Inlet Shaping? Y/N	0.5 Ht (Ft/M)	FINAL H (Ft/M)	Inlet Water Surface Elevation	Top of MH Top of Inlet Elev. APPROX.	Adjustment?
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)		(14)	(15)		(16)		(16)	(17)	(18)	(19)	
EX48																								440.08		
EX47		437.68	3.00	440.08	36	30.58	148	0.00220	0.325	7.8	0.239	7.1	0.8	0.272	5.0	0.07	0.054	0.566	4.949	0.566	YES	0.28	0.61	440.69	446.89	O.K.
EX45		444.04	2.00	445.64	38 X 24	25.77	63	0.00395	0.249	7.1	0.195	4.8	0.4	0.123	65.0	0.58	0.204	0.522	1.444	0.522	YES	0.26	0.51	446.15	449.16	O.K.
EX44	57+25	444.95	1.25	446.15	15	4.60	297	0.00530	1.575	7.5	0.216	4.4	0.3	0.105	0.0	0.00	0.000	0.321	3.061	0.417	NO	0.42	1.99	451.53	455.35	O.K.
3B-1	55+00	452.10	1.25	453.10	15	1.61	222	0.00065	0.143	4.4	0.075	0.0	0.0	0.000	0.0	0.00	0.000	0.075	1.605	0.097	YES	0.05	0.19	454.77	458.00	O.K.
EX46		444.48	2.00	446.15	38 X 24	20.73	43	0.00255	0.110	4.8	0.088	0.0	0.0	0.000	0.0	0.00	0.000	0.088	20.731	0.114	NO	0.11	0.22	446.37	448.64	O.K.
EX54																								439.10		
EX53		437.50	2.00	439.10	24	8.17	49	0.00136	0.067	7.5	0.221	7.5	0.9	0.305	25.0	0.29	0.251	0.777	1.421	0.777	YES	0.39	0.46	439.56	442.70	O.K.
EX52		438.30	2.00	439.90	24	6.83	124	0.00095	0.118	7.5	0.218	7.4	0.9	0.299	0.0	0.00	0.000	0.517	1.285	0.517	YES	0.26	0.38	440.96	444.80	O.K.
EX51	59+90	441.00	1.50	442.20	18	5.66	180	0.00303	0.545	7.4	0.213	7.1	0.8	0.272	0.0	0.00	0.000	0.485	1.738	0.631	YES	0.32	0.86	444.77	450.50	O.K.
3B-2	57+42	445.60	1.25	446.60	15	4.03	243	0.00407	0.988	7.1	0.194	0.0	0.0	0.000	0.0	0.00	0.000	0.194	4.029	0.252	YES	0.13	1.11	450.80	455.05	O.K.
EX1																								441.60		
EX2		438.40	4.00	441.60	48	147.19	4	0.01097	0.044	19.2	1.435	11.7	2.1	0.746	10.0	0.13	0.274	2.455	0.000	2.455	YES	1.23	1.27	442.87	445.70	O.K.
EX3		438.50	4.00	442.87	48	147.19	189	0.01097	2.074	11.7	0.533	11.6	2.1	0.737	25.0	0.29	0.606	1.875	0.000	1.875	YES	0.94	3.01	445.88	446.80	O.K.
4-8	21+75	439.90	5.00	445.88	60	147.19	318	0.00334	1.062	11.6	0.526	14.3	3.2	1.109	10.0	0.13	0.408	2.044	0.000	2.044	YES	1.02	2.08	447.97	453.00	O.K.
4-6	21+50	442.40	5.00	447.97	60	141.45	26	0.00308	0.080	14.3	0.792	11.4	2.0	0.702	65.0	0.58	1.163	2.657	0.730	2.657	YES	1.33	1.41	449.38	454.56	O.K.
4-15	20+11	443.90	4.00	449.38	48	64.10	47	0.00208	0.098	11.4	0.501	12.6	2.5	0.868	0.0	0.00	0.000	1.370	0.000	1.370	YES	0.68	0.78	450.16	454.10	O.K.
4-14	19+25	444.70	4.00	450.16	48	62.59	173	0.00198	0.343	12.6	0.620	11.4	2.0	0.705	80.0	0.64	1.288	2.613	0.000	2.613	YES	1.31	1.65	451.81	455.24	O.K.
4-2	19+08	450.25	1.25	451.81	15	4.81	21	0.00579	0.122	5.0	0.098	5.0	0.4	0.134	15.0	0.18	0.071	0.303	1.012	0.393	YES	0.20	0.32	452.13	455.72	O.K.
4-10	18+00	450.50	1.25	452.13	15	3.86	104	0.00373	0.388	5.0	0.096	5.1	0.4	0.140	0.0	0.00	0.000	0.235	1.088	0.306	YES	0.15	0.54	452.67	456.87	O.K.
4-1	16+25	451.40	1.25	452.67	15	2.85	173	0.00204	0.352	5.1	0.100	3.4	0.2	0.064	75.0	0.62	0.114	0.278	2.325	0.361	YES	0.18	0.53	453.68	460.08	O.K.
4-9	16+25	453.20	1.25	454.20	15	0.53	20	0.00007	0.001	3.4	0.046	0.0	0.0	0.000	0.0	0.00	0.000	0.046	0.528	0.060	YES	0.03	0.03	454.23	457.46	O.K.
EX11		443.10	4.00	449.38	48	76.04	80	0.00293	0.234	6.1	0.142	0.0	0.0	0.000	0.0	0.00	0.000	0.142	76.035	0.185	YES	0.09	0.33	449.70	454.50	O.K.
4-24	22+08	447.10	1.25	449.38	15	1.31	51	0.00043	0.022	8.1	0.254	3.5	0.2	0.066	5.0	0.07	0.013	0.333	0.000	0.333	YES	0.17	0.19	450.74	454.64	O.K.
5-1	22+75	450.60	1.25	451.60	15	1.31	64	0.00043	0.027	3.5	0.047	0.0	0.0	0.000	0.0	0.00	0.000	0.047	1.307	0.061	YES	0.03	0.06	451.66	455.22	O.K.
4-7	21+00	450.00	1.25	451.00	15	1.52	4	0.00058	0.002	8.8	0.302	0.0	0.0	0.000	0.0	0.00	0.000	0.302	1.517	0.392	YES	0.20	0.20	451.20	454.30	O.K.
EX22	19+25	448.00	4.00	451.81	48	56.62	77	0.00162	0.125	11.4	0.503	0.0	0.0	0.000	0.0	0.00	0.000	0.503	56.617	0.654	YES	0.33	0.45	452.26	455.80	O.K.
4-8																								447.97		
4-21		442.60	1.50	447.97	18	5.74	26	0.00312	0.081	10.0	0.387	4.6	0.3	0.114	90.0	0.70	0.302	0.803	0.000	0.803	YES	0.40	0.48	448.45	453.00	O.K.
4-23		443.70	1.50	448.45	18	5.04	126	0.00241	0.303	4.6	0.081	4.4	0.3	0.105	0.0	0.00	0.000	0.186	0.000	0.186	YES	0.09	0.40	448.85	453.48	O.K.
4-13		444.45	1.25	448.85	15	4.62	103	0.00535	0.551	4.4	0.075	5.3	0.4	0.153	90.0	0.70	0.661	0.888	0.000	0.888	YES	0.44	1.00	449.84	454.00	O.K.
4-11		447.90	1.25	449.84	15	2.99	56	0.00224	0.126	5.3	0.109	0.0	0.0	0.000	0.0	0.00	0.000	0.109	0.000	0.109	YES	0.05	0.18	450.02	454.26	O.K.
4-19		445.90	1.25	448.45	15	0.70	3	0.00012	0.000	5.3	0.108	0.0	0.0	0.000	0.0	0.00	0.000	0.108	0.000	0.108	YES	0.05	0.05	448.51	453.00	O.K.
4-4		450.00	1.25	451.00	15	0.42	3	0.00004	0.000	4.5	0.080	0.0	0.0	0.000	0.0	0.00	0.000	0.080	0.000	0.080	YES	0.04	0.04	451.04	453.81	O.K.
4-12		445.90	1.25	449.84	15	1.63	2	0.00067	0.001	7.8	0.236	0.0	0.0	0.000	0.0	0.00	0.000	0.236	0.000	0.236	YES	0.12	0.12	449.96	453.00	O.K.
4-11																								450.02		
4-16	18+00	448.50	1.25	450.02	15	2.99	50	0.00224	0.112	5.2	0.104	3.2	0.2	0.055	85.0	0.65	0.103	0.261	1.752	0.339	YES	0.17	0.28	450.30	454.17	O.K.
EX25	18+00	449.44	1.25	450.44	15	1.26	62	0.00040	0.025	3.2	0.039	0.0	0.0	0.000	0.0	0.00	0.000	0.039	1.260	0.051	NO	0.05	0.08	450.52	454.17	O.K.
4-22																								449.11		
4-3	19+50	447.50	1.25	449.11	15	2.10	36	0.00110	0.040	8.1	0.257	0.0	0.0	0.000	0.0	0.00	0.000	0.257	2.099	0.334	YES	0.17	0.21	449.48	453.47	O.K.
4-18																								446.90		
4-4	20+00	446.95	1.25	447.95	15	0.42	67	0.00004	0.003	3.8	0.056	0.0	0.0	0.000	0.0	0.00	0.000	0.056	0.420	0.073	YES	0.04	0.04	448.48	453.81	O.K.
4-20																								446.90		
4-5	21+50	446.95	1.25	447.95	15	1.70	15	0.00072	0.011	4.4	0.077	0.0	0.0	0.000	0.0	0.00	0.000	0.077	1.700	0.099	YES	0.05	0.06	448.01	452.90	O.K.

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REVISED	STATE	FEDERAL AID PROJECT OWNER		STATE PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2K(2C)

Rinker Design Associates, P.C.
Civil Engineering • Surveying • Land Planning
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Right of Way Services
Office Locations

CITY OF FAIRFAX

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2K(2C)

FINAL PLAN

PROJECT MANAGER Wendy Block Sanford, City of Fairfax, (703) 385-7889
SURVEYED BY Rinker Design Assoc. P.C. (703) 368-7373
DESIGN SUPERVISED BY Mark Gunn, P.E., Rinker Design Assoc. P.C. (703) 368-7373
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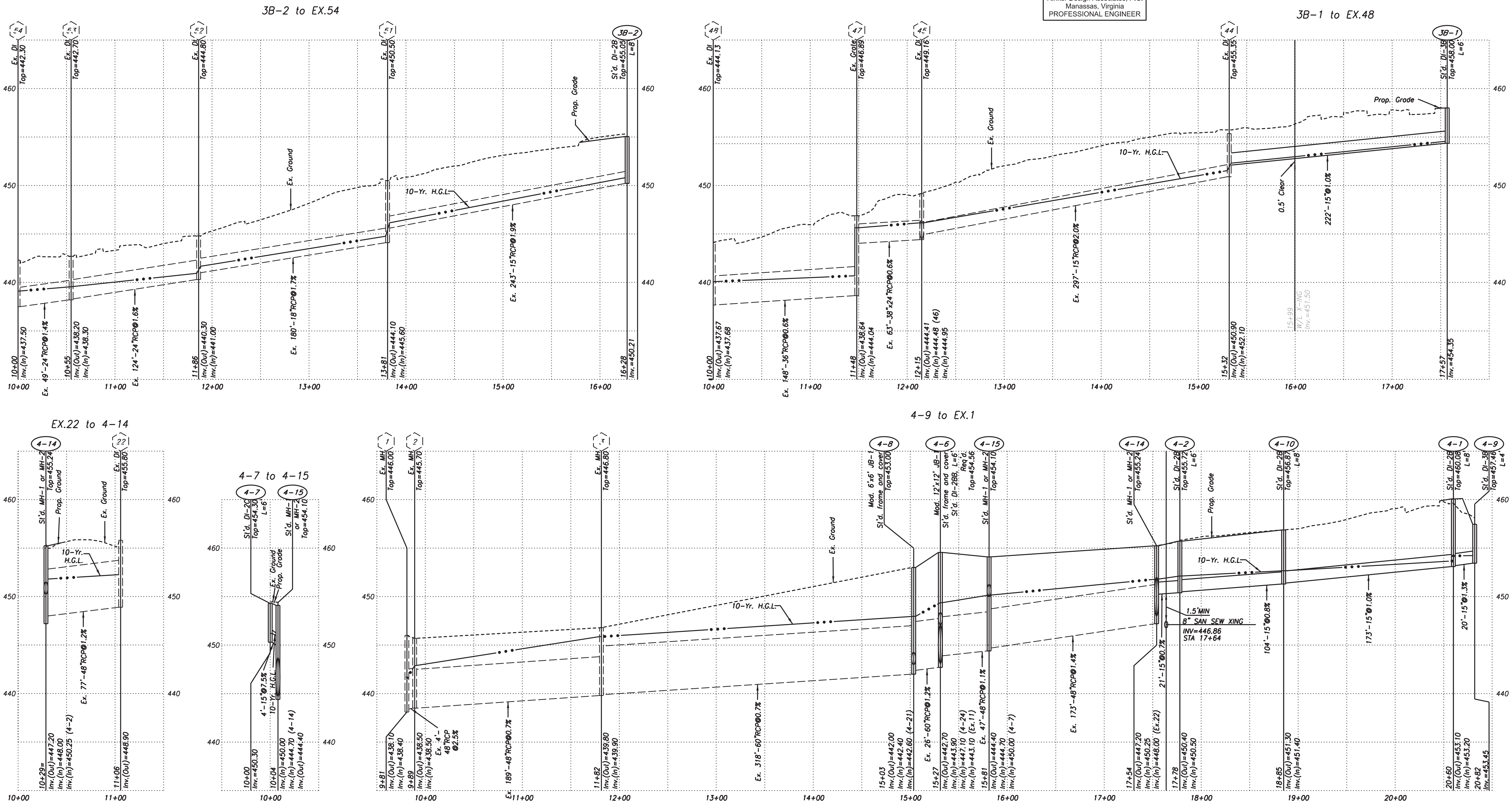
STORM SEWER PROFILES

COMMONWEALTH OF VIRGINIA — NIKHIL V. DESHPANDE — Lic. No. 045430 — PROFESSIONAL ENGINEER
Nikhil V Deshpande
2014.08.15 15:39:35 -04'00'
Rinker Design Associates, P.C.
Manassas, Virginia
PROFESSIONAL ENGINEER

REVISED	STATE	FEDERAL AID PROJECT OWNER	STATE	PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2K(3)



Notes: All Storm Sewer Pipes, unless otherwise noted, shall be CL-III RCP

SCALE H= 50, V= 5

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2K(3)

FINAL PLAN

Rinker Design Associates, P.C.

CITY OF FAIRFAX

8/15/2014

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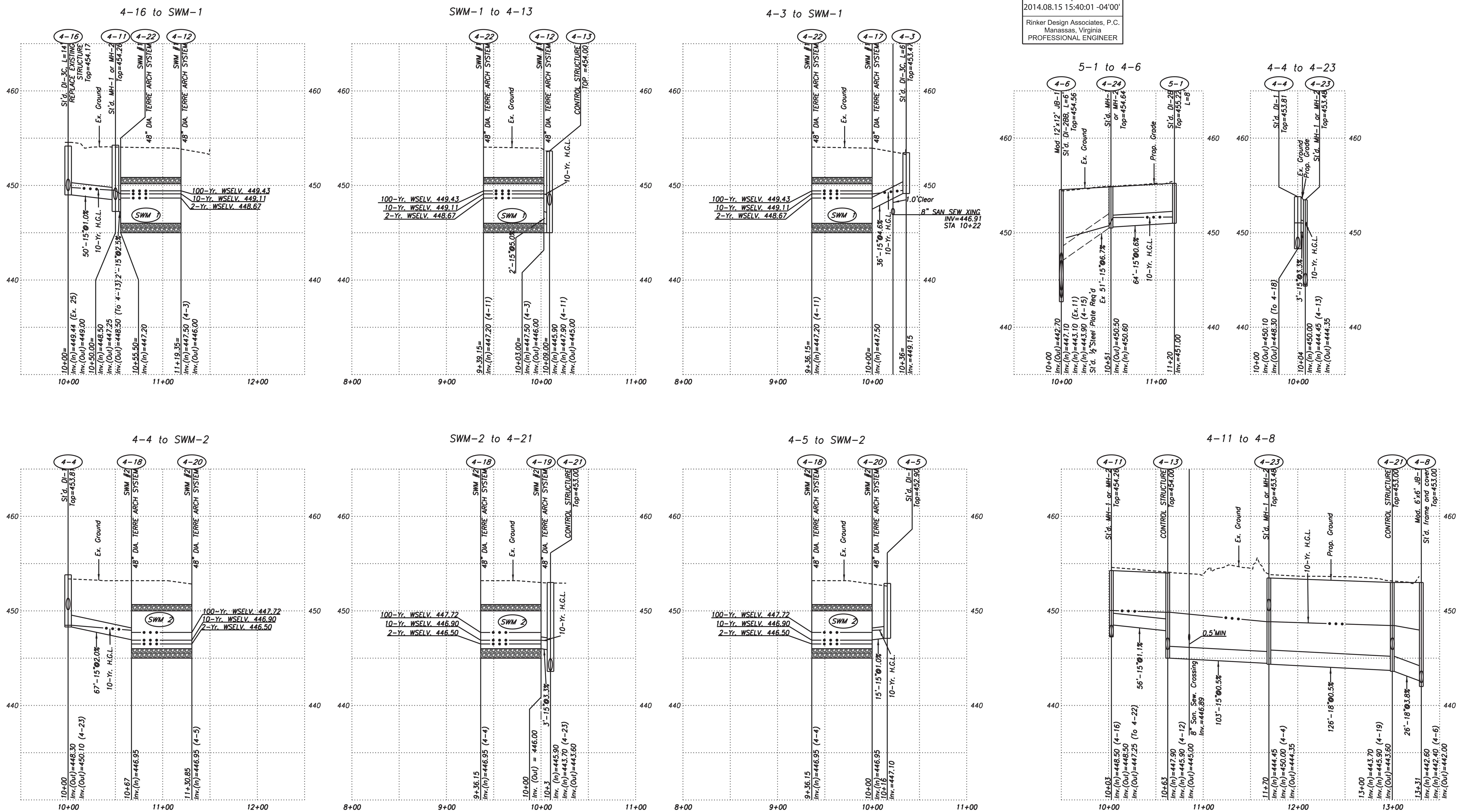
REVISED	STATE	FEDERAL AID PROJECT OWNER		STATE PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2K(3A)

COMMONWEALTH OF VIRGINIA
NIKHIL V. DESHPANDE
Lic. No. 045430
PROFESSIONAL ENGINEER

Nikhil V Deshpande
2014.08.15 15:40:01 -04'00'

Rinker Design Associates, P.C.
Manassas, Virginia
PROFESSIONAL ENGINEER

STORM SEWER PROFILES



Notes: All Storm Sewer Pipes, unless otherwise noted, shall be CL-III RCP

SCALE H= 50, V= 5

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2K(3A)

FINAL PLAN

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Office Locations

CITY OF FAIRFAX

8/15/2014

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Right-of-Way Services
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4501 Daly Drive, Suite 101, Chantilly, VA 20151, Tel: (703) 263-0500, Fax: (703) 263-0520
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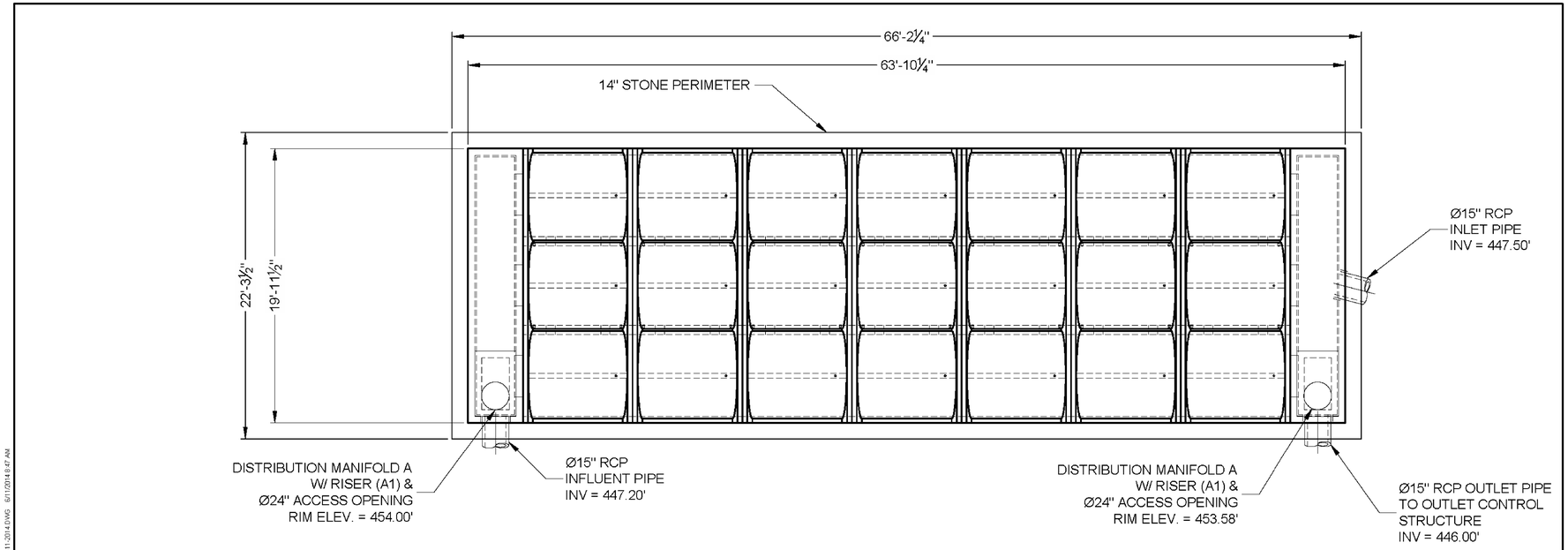
CITY OF FAIRFAX

REVISED	STATE	FEDERAL AID PROJECT OWNER	STATE	PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2K(4)

STORMWATER MANAGEMENT DETAILS AND NOTES (SWM-1)



BILL OF MATERIALS

PIECE	QTY	DESCRIPTION	SIZE	HEIGHT
	7	TERRE ARCH 48	7'-11 ½" x 19'-11 ½"	4'-8"
	0	CAPPING SLAB	0'-4" x 10'-0"	4'-8"
	2	EJIW #41600389, OR EQ., CASTING	Ø24"	4"
	2	ANTI-SCOUR MAT	6'-6" x 15'	N/A
	2	EROSION MAT	15' x 22'	N/A
A & B	2	DISTRIBUTION MANIFOLD	4'-0" x 19'-11 ½"	4'-8"
	2	RISER	**Ø24" / 3'-0" x 4'-9 1/4"**	TBD
	0	END CAP STRAP	10" x 3"	9 ¼"
	0	HEX HEAD BOLT AND WASHER	Ø1/2" x 2"	N/A
	TBD	CONSEAL CS102-B	N/A	N/A

HEAVIEST PICK WEIGHT = 22,500 LBS

* ALL MATERIALS PROVIDED BY CONTECH, INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE

ASSEMBLY

SCALE: 0.141967
LOADING: H20/H25
BOTTOM OF ARCH = 446.00'
BOTTOM OF STONE = 445.00'

STORAGE VOLUME

DISTRIBUTION BOX STORAGE (STONE AND BOX) = 480 CF
CONCRETE ARCH STORAGE (STONE AND ARCH) = 4,129 CF
TOTAL STORAGE = 4,609 CF
NOTE: 12" STONE BASE IS REQUIRED FOR THE ARCHES BUT HAS BEEN IGNORED IN THE VOLUME CALCULATION. THIS WATER WILL BE PERMANENT (WILL INFILTRATE)

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
605 Global Way, Suite 113, Linthicum, MD 21090
866-740-3318 410-740-8490 866-376-8511 FAX

TERRE ARCH™ PATENT PENDING
CONTECH PROPOSAL DRAWING

TERRE ARCH 48 - 481241-010
JERMANTOWN
FAIRFAX, VA
SITE DESIGNATION: SWM1

PROJECT No.	SEQ. No.	DATE
481241	010	6/11/2014
DESIGNED: AML	DRAWN: AML	
CHECKED:	APPROVED:	
SHEET NO.: 1 OF 4		

Maintenance

Underground stormwater retention/detention systems should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities rather than the size or configuration of the system. If accumulated silt is interfering with the operation of the detention system it should be removed.

It is easiest to maintain a system when there is no flow entering. For this reason, cleanout should be scheduled during dry weather. It is important to block the outlet pipe from the system prior to maintenance to limit the potential for pollutants to be flushed downstream. A vacuum truck or other similar devices can be used to remove sediment from the treatment train and distribution manifold. Starting upstream, maintain manholes with sumps and any pre-treatment devices (following manufacturer recommended procedures). Once maintenance is complete, replace all caps, lids and covers. It is important to document maintenance events on the inspection and maintenance log.

Terre Arch Row Maintenance

If maintenance to the arch rows is required, a JetVac truck utilizing a high pressure nozzle (sledge dredging tool) with rear facing jets will be required. Insert the nozzle from the distribution manifold into the arch row through the opening. Turn the water feed hose on and feed the supply hose until the nozzle has reached the end of the arch row. Withdraw the nozzle slowly. The tool will backflush the arch row forcing debris into the distribution manifold. Use the stringer vacuum hose to remove the sediments and debris from the distribution manifold. Multiple passes may be required to fully cleanout the arch row. Use caution to minimize movement of stone bedding at the arch invert while performing this task; relevel stone as needed. Vacuum out the distribution manifold and remove all debris that may be clogging the outlet pipe.

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2K(4)

FINAL PLAN

8/15/2014

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STORMWATER MANAGEMENT DETAILS AND NOTES (SWM-1)

REVISED	STATE	FEDERAL AID PROJECT OWNER		STATE PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2K(5)

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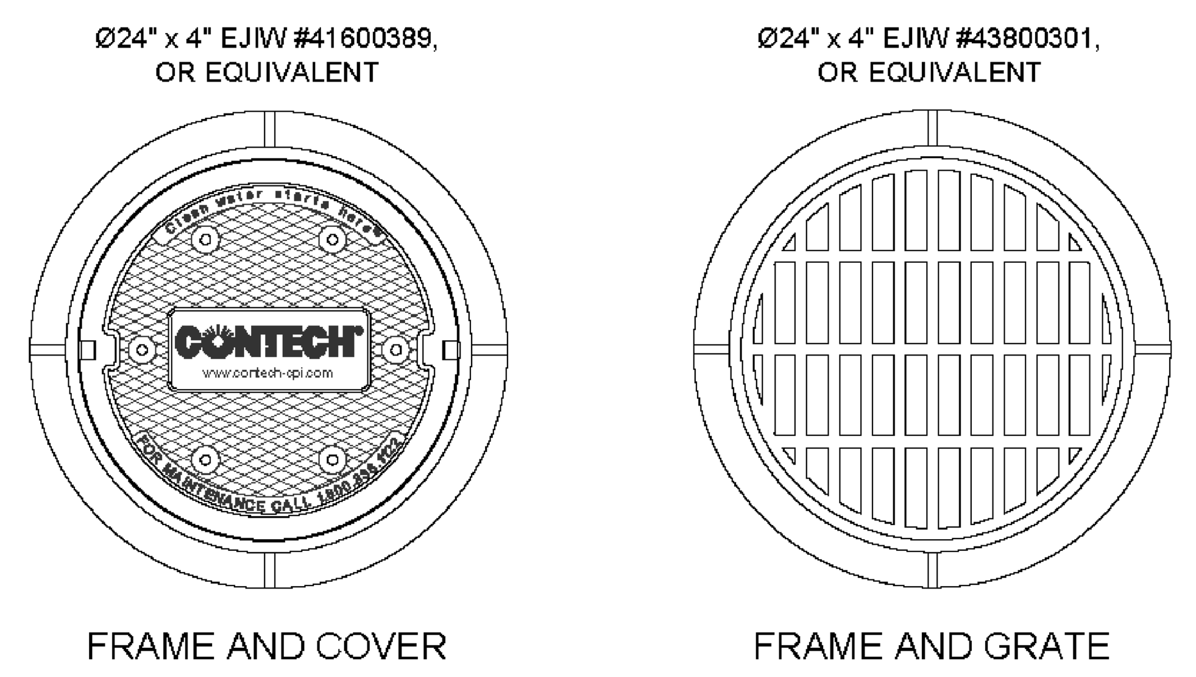
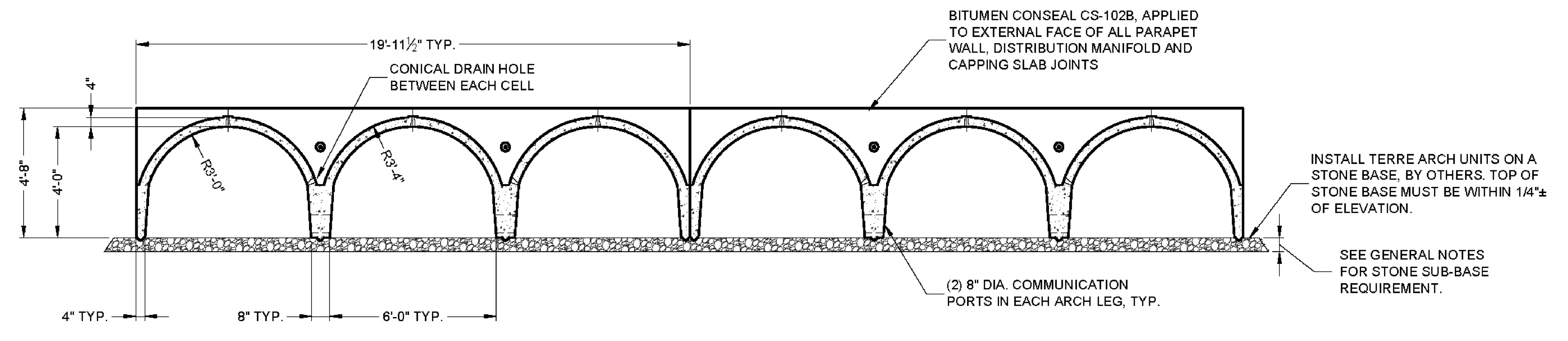
Office Locations

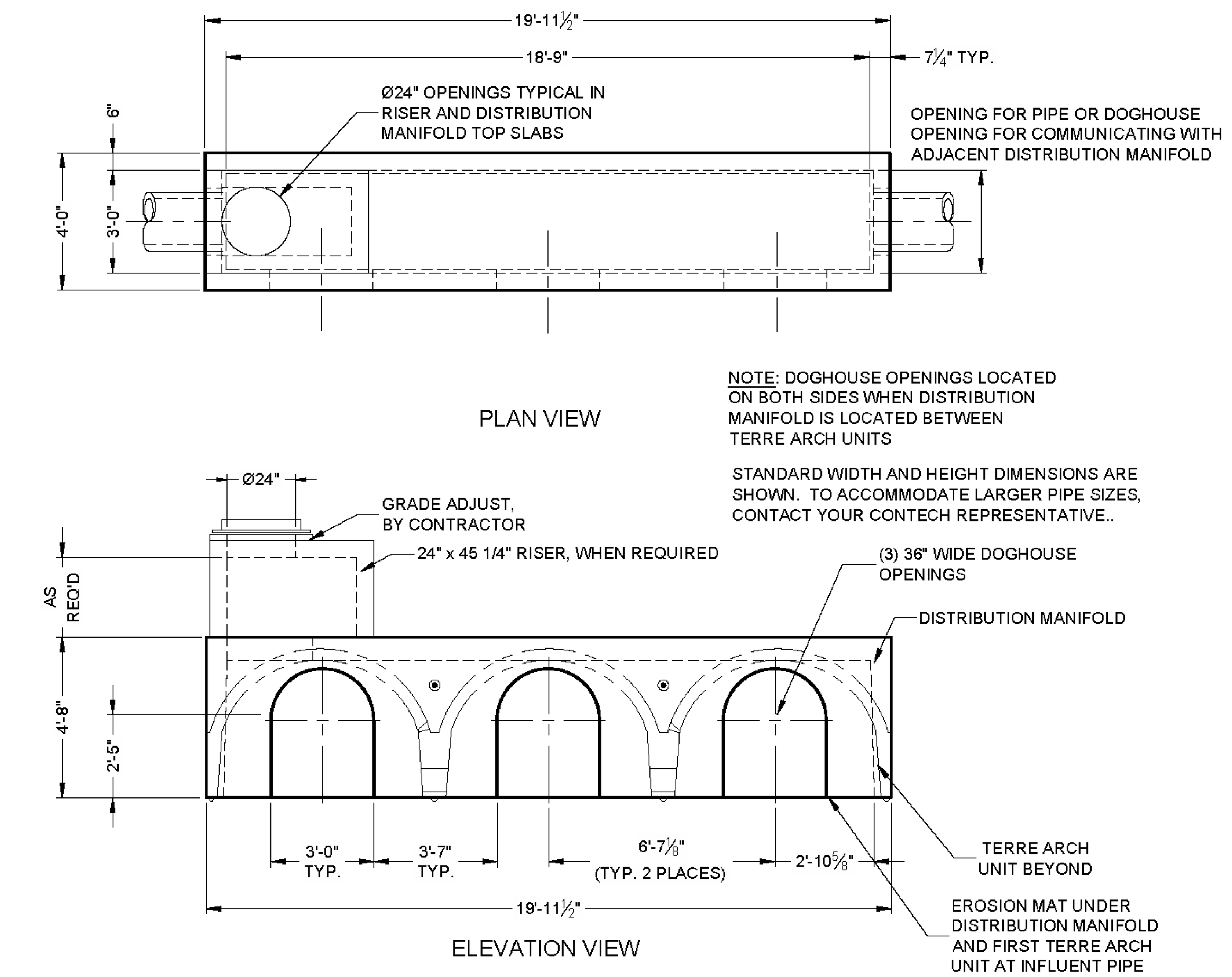
CITY OF FAIRFAX



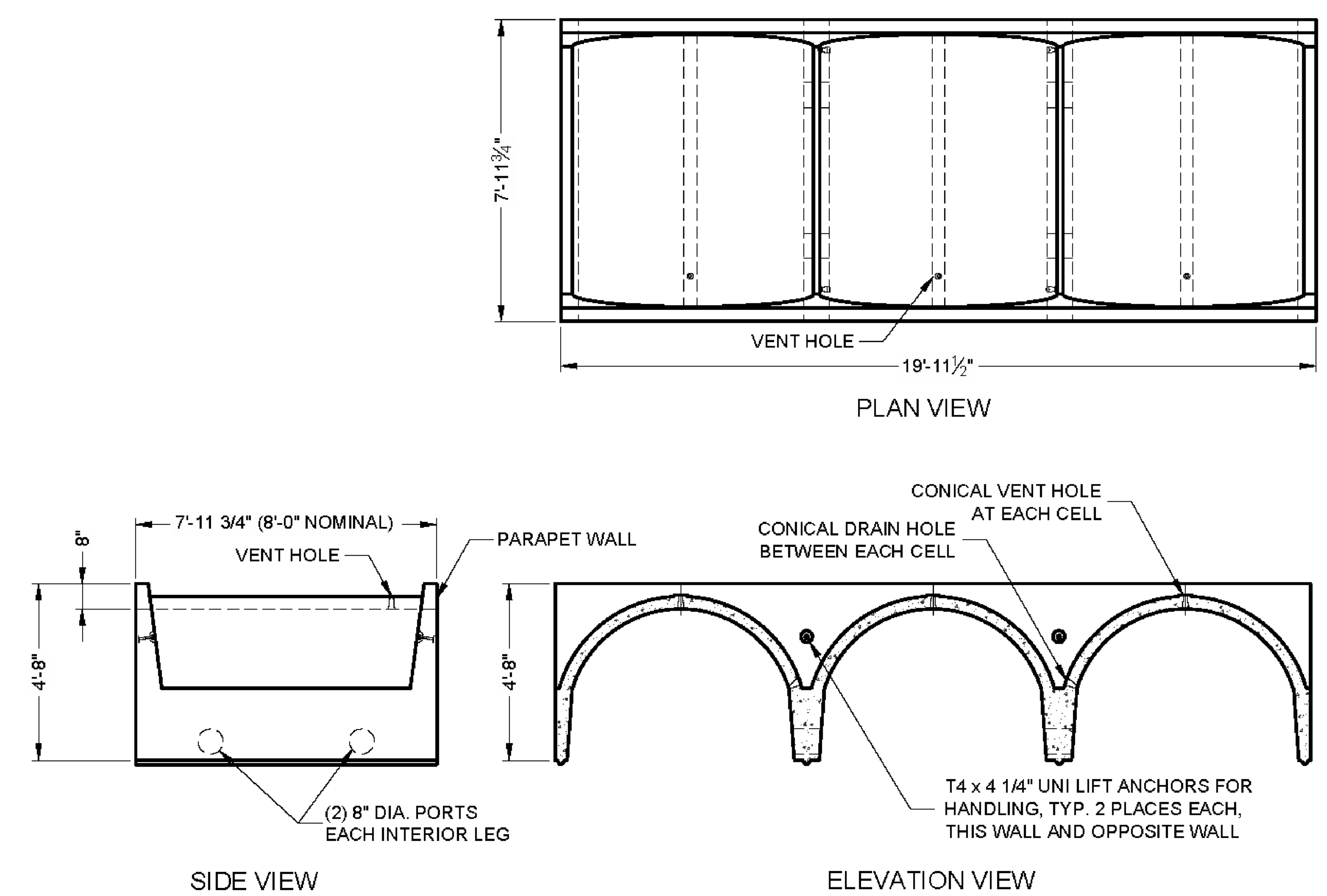
TYPICAL CASTINGS



TYPICAL ASSEMBLY SECTION
(STONE BASE)



TYPICAL DISTRIBUTION MANIFOLD



TYPICAL TERRE ARCH 48 DETAIL
(STONE BASE)

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
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866-740-3318 410-740-8490 866-376-8511 FAX

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PATENT PENDING
CONTECH PROPOSAL DRAWING

TERRE ARCH 48 - 481241-010
JERMANTOWN
FAIRFAX, VA
SITE DESIGNATION: SWM1

PROJECT No.: 481241	SEQ. No.: 010	DATE: 6/11/2014
DESIGNED: AML		DRAWN: AML
CHECKED:		APPROVED:
SHEET NO.: 2 OF 4		

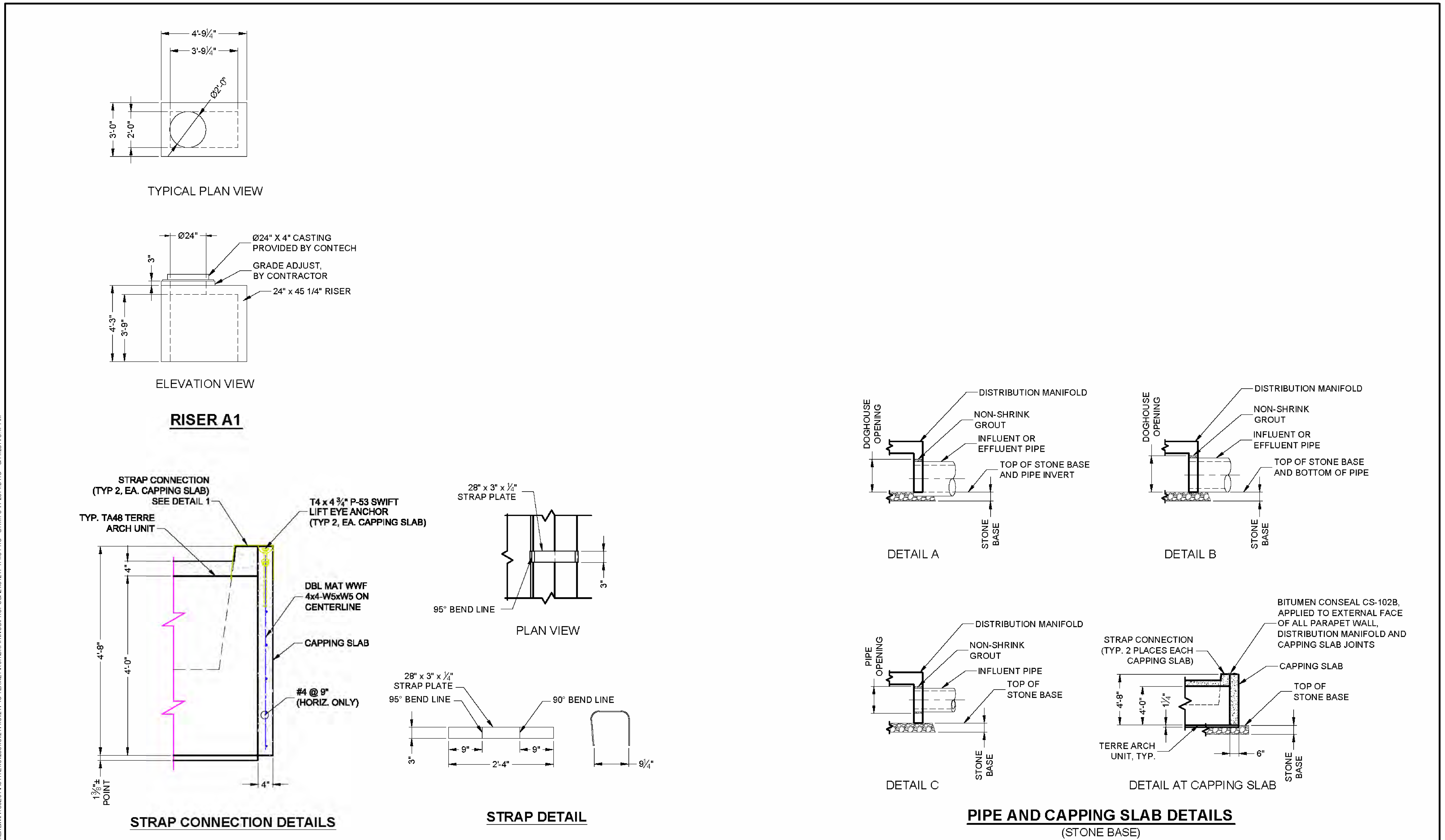
PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2K(5)

FINAL PLAN

PROJECT MANAGER Wendy Block Sanford, City of Fairfax, (703) 385-7889
SURVEYED BY Rinker Design Assoc., P.C. (703) 368-7373
DESIGN SUPERVISED BY Mark Gunn, P.E., Rinker Design Assoc., P.C. (703) 368-7373
DESIGNED BY Adam D. Welschenbach, P.E., Rinker Design Assoc., P.C. (703) 368-7373

STORMWATER MANAGEMENT DETAILS AND NOTES (SWM-1)

REVISED	STATE	FEDERAL AID PROJECT OWNER		STATE PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2K(6)



MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
605 Global Way, Suite 113, Linthicum, MD 21090
866-740-3318 410-740-8490 866-376-8511 FAX

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Rinker Design Associates, P.C.
Civil Engineering • Surveying • Land Planning • Transportation • Environmental • Right of Way Services
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CITY OF FAIRFAX

8/15/2014

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THE TERRE ARCH TM [PATENT PENDING 11/569,437 (10-30-2007)] UNDERGROUND DETENTION SYSTEM AS DESIGNED AND MANUFACTURED BY TERRE HILL STORMWATER SYSTEMS. CONTACT YOUR CONTECH REPRESENTATIVE FOR MORE INFORMATION. www.ContechES.com

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EROSION & ANTI-SCOUR MATS SHALL BE INSTALLED UNDER DISTRIBUTION MANIFOLDS AT EACH INFLUENT PIPE LOCATION. EROSION MAT TO BE TENSAR BX-1200 BIAXIAL GEOGRID AS MANUFACTURED BY TENSAR EARTH TECHNOLOGIES, INC. OR EQUIVALENT. ANTI-SCOUR MAT TO BE WOVEN FILTRATION MEDIA, 58500 WHITE-CC-HONEYCOMB FILTER AS MANUFACTURED BY TENCATE NICOLON, OR EQUIVALENT.

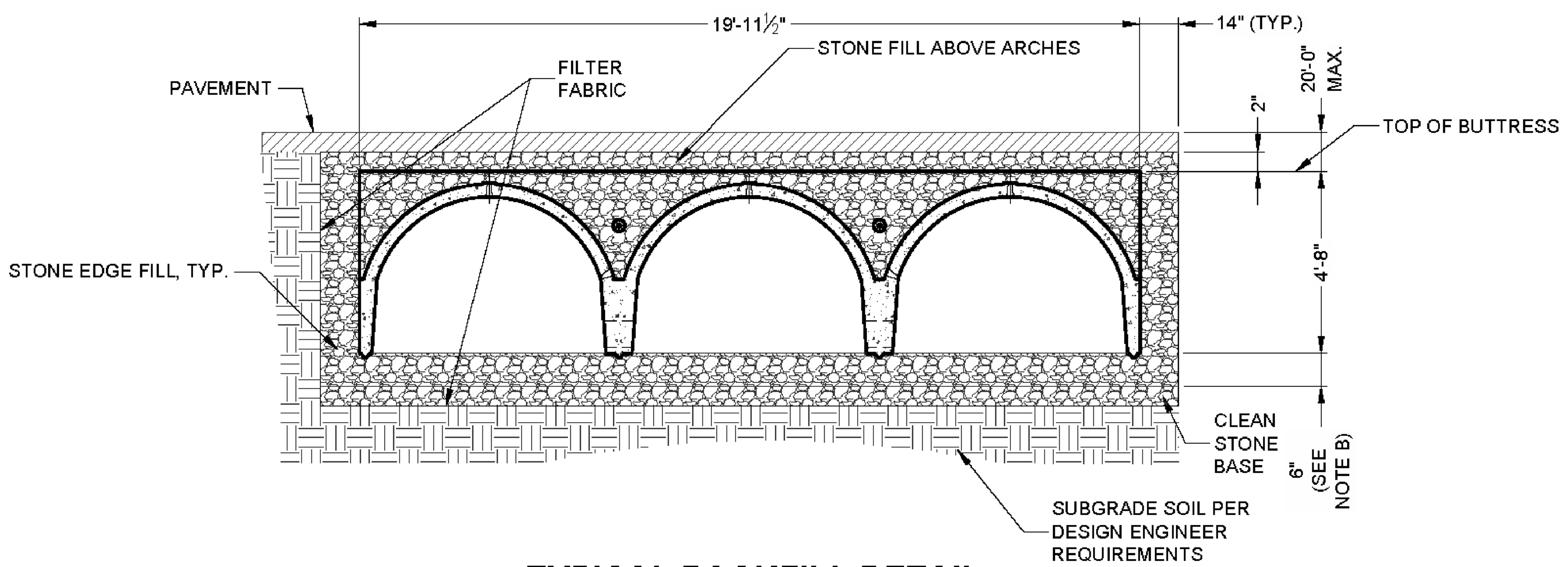
MANHOLE FRAMES AND COVERS ARE SUPPLIED BY CONTECH. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO. CONTRACTOR SHALL SUPPLY AND INSTALL ANY GRADE RINGS OR RISERS REQUIRED TO BRING THE CASTINGS FLUSH WITH FINISHED GRADE.

EXCAVATION, COMPACTED STONE BASE, BACKFILL AND GRADING BY CONTRACTOR.

IT IS RECOMMENDED THAT AN INSPECTION BE MADE ON A QUARTERLY BASIS AND AFTER EACH SIGNIFICANT RAINFALL EVENT. ANY ACCUMULATED DEBRIS/SEDIMENTATION THAT IMPAIRS THE PERFORMANCE OF THE SYSTEM IS TO BE REMOVED THROUGH THE PROVISION OF FULL ACCESS INTO ALL AREAS OF THE UNDERGROUND STORAGE SYSTEM.

EXCAVATION, DEWATERING AND SHORING OF EXCAVATION WILL BE BY CONTRACTOR. THIS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH PROJECT SPECIFICATIONS AS PROVIDED BY ENGINEER OF RECORD AND OSHA REQUIREMENTS.

THE TERRE ARCH PRECAST CONCRETE UNDERGROUND STORAGE SYSTEMS ARE DESIGNED TO MEET STORAGE CAPACITY REQUIREMENTS, AND HS-25 LOADING REQUIREMENTS.



TYPICAL BACKFILL DETAIL
(STONE BASE)

TERRE ARCH PERFORMANCE, DESIGN AND INSTALLATION SPECIFICATIONS

THE TERRE ARCH IS A PRECAST CONCRETE MODULAR ROMAN ARCH STRUCTURE CONSISTING OF FOUR CONNECTED PARALLEL VAULTS FOR SUBSURFACE STORAGE OF STORMWATER. ACCESSORY COMPONENTS SUCH AS INFLOW AND OUTFLOW STRUCTURES, E.G. MANIFOLDS ARE DESIGNED, ENGINEERED, AND MANUFACTURED TO MATCH SPECIFIC NEEDS:

1. DETENTION FOR CONTROLLED DISCHARGE THROUGH AN OUTLET CONTROL STRUCTURE
2. INFILTRATION TO RECHARGE THE GROUND WATER
3. HS-25 LOAD RATING ON THE CROWN OF THE ARCH. NO MINIMUM COVER OR FILL REQUIREMENTS. NO REQUIREMENT FOR LOAD BEARING STONE BETWEEN OR ABOVE STRUCTURE. DIRECT ACCESS FOR HEAVY INSTALLATION EQUIPMENT, INCLUDING STONE FILLED DUMP TRUCK (PERIMETER STONE FILL IS REQUIRED PRIOR TO IMPOSING HS-25 LOADING ON THE SYSTEM)
4. MAXIMUM COVER UP TO 20 FT. (VERIFY SUB-BASE DEPTH AND SOIL BEARING)
5. A STORMWATER TREATMENT SYSTEM SHOULD BE PLACED IN FRONT OF THE TERRE ARCH TO PREVENT ENTRY OF SEDIMENT, OIL, GREASE, LITTER, AND DEBRIS TO THE MAXIMUM EXTENT PRACTICABLE
6. STRUCTURE HAS 5,000 PSI COMPRESSIVE STRENGTH AND 100 YEAR DESIGN LIFE
7. 160 SQ.FT. (8 FEET BY 20 FEET) INFILTRATION SURFACE PER STRUCTURE
8. 541 CU.FT. OF STORAGE IN CUSTOMARY INSTALLATION, I.E. VALLEYS BETWEEN ARCHES FILLED WITH STONE TO THE TOP OF THE BUTTRESSES (40% VOID SPACE TYPICAL WITH STONE)
9. EACH STRUCTURE IS LESS THAN 22,500 LBS. ALLOWING SHIPMENT OF 2 STRUCTURES PER TRUCK. PLACEMENT FROM TRUCK INTO THE PREPARED EXCAVATION BY LIGHT CRANE OR LOADER
10. NO MINIMUM COVER OR FILL REQUIREMENTS ALLOW FOR SHALLOW INSTALLATION CONDITIONS
11. VENTILATION AND DRAINING ORIFICES IN TOP AND VALLEY AREAS OF STRUCTURE
12. COMMUNICATION HOLES IN THE INTERIOR LEGS OF THE ARCH CELLS TO ALLOW FLOW BETWEEN ALL SECTIONS. MATING LEG WITH STONE PERIMETER WILL HAVE NO CROSS FLOW HOLE
13. EROSION MATTING IS REQUIRED AT ALL INFLUENT PIPES
14. NO REQUIREMENT FOR GEOTEXTILE SEPARATION LAYER BELOW. USE FILTERFABRIC OR GEOTEXTILE WHERE SILT MIGRATION FROM THE SIDES OR TOP INTO THE VOID SPACE OF THE STONE IS POSSIBLE
15. CONTECH SHALL SUBMIT DOCUMENTATION AS REQUESTED BY ENGINEER OF RECORD TO VERIFY PERFORMANCE AND DESIGN SPECIFICATIONS
16. EACH TERRE ARCH SHALL CONTAIN LIFTING POINTS WITH UNI-LIFT PINS. MANUFACTURER SHALL LOAN THE LIFTING HARDWARE TO THE CONTRACTOR, WHICH SHALL BE THE PROPERTY OF MANUFACTURER. CONTRACTOR SHALL PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING CAPACITY TO UNLOAD AND SET THE TERRE ARCH

PRODUCT INSTALLATION PROCEDURES

A. CONTRACTOR SHALL EXCAVATE ACCORDING TO THE LATEST DATED APPROVED DRAWING SET. DEWATER AND SHORE IN ACCORDANCE WITH PROJECT SPECIFICATIONS, AS PROVIDED BY ENGINEER OF RECORD
B. UNLESS OTHERWISE SPECIFIED, SUB-GRADE SHALL BE ESTABLISHED AS SHOWN ON THE DRAWINGS. UNDERLYING SOIL AND SUB-GRADE MATERIAL SHALL HAVE DESIGN LOADING OF NOT LESS THAN 3000 POUNDS PER SQUARE FOOT (PSF), AS ESTABLISHED BY ENGINEER (TYPICAL STONE BED SHALL BE 12 INCHES OF #8 AASHTO (1/2-INCH STONE) LEVEL TO PLUS OR MINUS 3/8-INCH)
C. ARCHES SHALL BE PLACED WITHIN A NOMINAL 8'-0" BY 20'-0" MATRIX
D. ANCHORING OF THE ARCHED SYSTEM RELATIVE THE INFLUENT MANIFOLDS OR DISTRIBUTION MANIFOLDS IS RECOMMENDED. PLACE RISER SECTIONS ON MANIFOLDS
E. PLACE CONSEAL ON THE JOINTS BETWEEN THE ARCHES TO PREVENT MIGRATION OF FINES INTO THE JOINT GAP
F. PRIOR TO ALLOWING ANY TOP LOADING, ALL PERIMETER SPACE BETWEEN THE EDGE OF THE ARCH SYSTEM AND THE SOIL SHALL BE FILLED WITH AT LEAST 12 INCHES OF STONE
G. BULLDOZE STONE ONTO THE ARCHES WITH 2 INCHES OF STONE ABOVE THE BUTTRESS ELEVATIONS
H. USE VIBRATING/ROLLING EQUIPMENT TO STABILIZE THE TOP STONE AND SETTLE THE ARCHES INTO THE SUB-BASE
I. FINALIZE COVERING THE SYSTEM WITH THE SPECIFIED STONE TOP LOADING AND COVER WITH FILTER FABRIC TO PREVENT MIGRATION OF FINES INTO THE STONE VOIDS
J. PLACE ADDITIONAL SOIL AMENDMENTS AND GRADING REQUIREMENTS
K. CONTRACTOR SHALL REMOVE ALL MATERIAL AND DEBRIS FROM THE TERRE ARCH
L. WARRANTY: 4 YEARS FROM DATE OF SUBSTANTIAL COMPLETION FOR LABOR AND MATERIAL IN THE EVENT THAT THE MATERIAL SUPPLIED IS NOT FREE FROM DEFECTS. EQUIPMENT SHALL BE INSTALLED AND USED ONLY IN THE PARTICULAR APPLICATION FOR WHICH IT WAS SPECIFICALLY MANUFACTURED
M. TERRE ARCH INSTALLATION MAY REQUIRE DISTRIBUTION BOX(ES) AND END CAP PLATES AS SHOWN ON THE DRAWINGS
N. CONTRACTOR SHALL PROVIDE, INSTALL AND GROUT PIPES USING NON-SHRINK GROUT. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN

PRODUCT SUBSTITUTION PROCEDURES

NO UNDERGROUND STORMWATER STORAGE SYSTEM SHALL BE APPROVED AS AN EQUIVALENT SUBSTITUTION FOR A TERRE ARCH SYSTEM UNLESS THE ENGINEER OF RECORD SHALL RECEIVE AND APPROVE DRAWINGS AND SPECIFICATIONS STAMPED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE WHEREIN THE PROJECT IS LOCATED SHOWING THE FOLLOWING:

- PROJECT SPECIFIC SIZING CALCULATIONS CLEARLY SHOWING THAT THE UNIT MEETS OR EXCEEDS THE PERFORMANCE AND DESIGN SPECIFICATIONS OF THE TERRE ARCH

MAINTENANCE PROCEDURES

- WHEN A STORMWATER TREATMENT SYSTEM IS PLACED IN FRONT OF THE TERRE ARCH SYSTEM NO CLEAN OUT OR MAINTENANCE IS ANTICIPATED, AS LONG AS THE STORMWATER TREATMENT SYSTEM IS PROPERLY MAINTAINED
- INSPECTION CAN BE ACCOMPLISHED FROM GRADE WITH PROPER EQUIPMENT BY ENTRY THROUGH THE ACCESS OPENING(S)
- SYSTEM SHALL CONTAIN SUFFICIENT DISTRIBUTION MANIFOLDS TO ALLOW ENTRY FOR INSPECTION AND MAINTENANCE INTO EACH TERRE ARCH

SUBJECT TO CHANGE WITHOUT NOTICE.
VERIFY LATEST INFORMATION WITH CONTECH ENGINEERED SOLUTIONS, LLC www.ContechES.com

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TERRE ARCH™ PATENT PENDING
CONTECH PROPOSAL DRAWING

TERRE ARCH 48 - 481241-010
JERMANTOWN
FAIRFAX, VA
SITE DESIGNATION: SWM1

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Rinker Design Associates, P.C.
CITY OF FAIRFAX

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-	Jermantown Road Phase II Improvements	-	2K(7)

8/15/2014

FINAL PLAN

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STORMWATER MANAGEMENT DETAILS AND NOTES (SWM-2)

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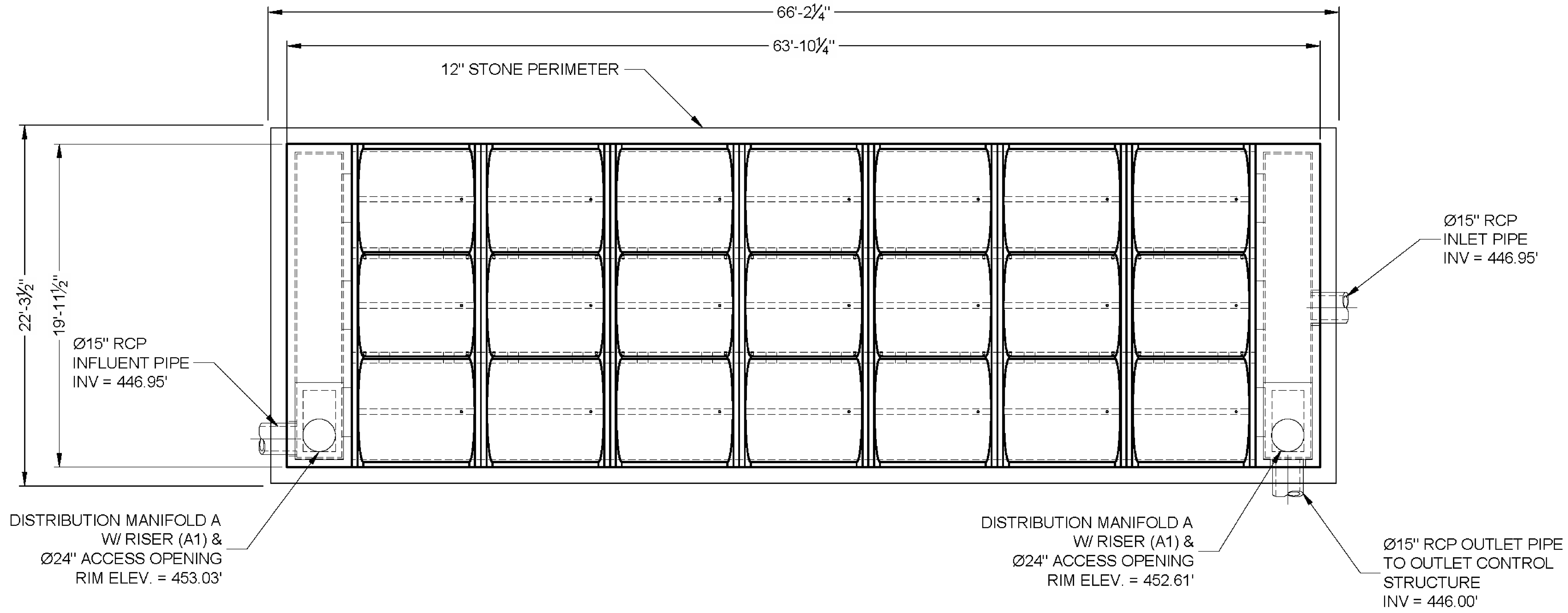
	VA.		-	Jermantown Road Phase II Improvements	2K(8)



BILL OF MATERIALS

PIECE	QTY	DESCRIPTION	SIZE	HEIGHT
	7	TERRE ARCH 48	7'-11 ½" x 19'-11 ½"	4'-8"
	0	CAPPING SLAB	0'-4" x 10'-0"	4'-8"
	2	EJIW #41600389, OR EQ., CASTING	Ø24"	4"
	2	ANTI-SCOUR MAT	6'-6" x 15'	N/A
	2	EROSION MAT	15' x 22'	N/A
A & B	2	DISTRIBUTION MANIFOLD	4'-0" x 19'-11 ½"	4'-8"
	2	RISER	Ø24" / 3'-0" x 4'-9 1/4"	TBD
	0	END CAP STRAP	10" x 3"	9 ¼"
	0	HEX HEAD BOLT AND WASHER	Ø1/2" x 2"	N/A
	TBD	CONSEAL CS102-B	N/A	N/A

HEAVIEST PICK WEIGHT = 22,500 LBS

* ALL MATERIALS PROVIDED BY CONTECH, INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE

ASSEMBLY

LOADING: H20/H25
BOTTOM OF ARCH = 446.00'
BOTTOM OF STONE = 445.00'

STORAGE VOLUME

DISTRIBUTION BOX STORAGE (STONE AND BOX) = 475 CF
CONCRETE ARCH STORAGE (STONE AND ARCH) = 4,080 CF
TOTAL STORAGE = 4,555 CF
NOTE: 12" STONE BASE IS REQUIRED FOR THE ARCHES BUT HAS BEEN IGNORED IN THE VOLUME CALCULATION. THIS WATER WILL BE PERMANENT (WILL INFILTRATE)

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TERRE ARCH™ PATENT PENDING
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TERRE ARCH 48 - 481241-020
JERMANTOWN
FAIRFAX, VA
SITE DESIGNATION: SWM2

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Maintenance

Underground stormwater retention/detention systems should be inspected at regular intervals and maintained when necessary to ensure optimum performance.The rate at which the system collects pollutants will depend more heavily on site activities rather than the size or configuration of the system.If accumulated silt is interfering with the operation of the detention system it should be removed.

It is easiest to maintain a system when there is no flow entering.For this reason,cleanout should be scheduled during dry weather.It is important to block the outlet pipe from the system prior to maintenance to limit the potential for pollutants to be flushed downstream.A vacuum truck or other similar devices can be used to remove sediment from the treatment train and distribution manifold.Starting upstream,maintain manholes with sumps and any pre-treatment devices (following manufacturer recommended procedures).Once maintenance is complete,replace all caps,lids and covers. It is important to document maintenance events on the inspection and maintenance log.

Terre Arch Row Maintenance

If maintenance to the arch rows is required,a JetVac truck utilizing a high pressure nozzle (sledge dredging tool) with rear facing jets will be required.Insert the nozzle from the distribution manifold into the arch row through the opening.Turn the water feed hose on and feed the supply hose until the nozzle has reached the end of the arch row.Withdraw the nozzle slowly.The tool will backflush the arch row forcing debris into the distribution manifold.Use the stringer vacuum hose to remove the sediments and debris from the distribution manifold.Multiple passes may be required to fully cleanout the arch row.Use caution to minimize movement of stone bedding at the arch invert while performing this task;relevel stone as needed. Vacuum out the distribution manifold and remove all debris that may be clogging the outlet pipe.

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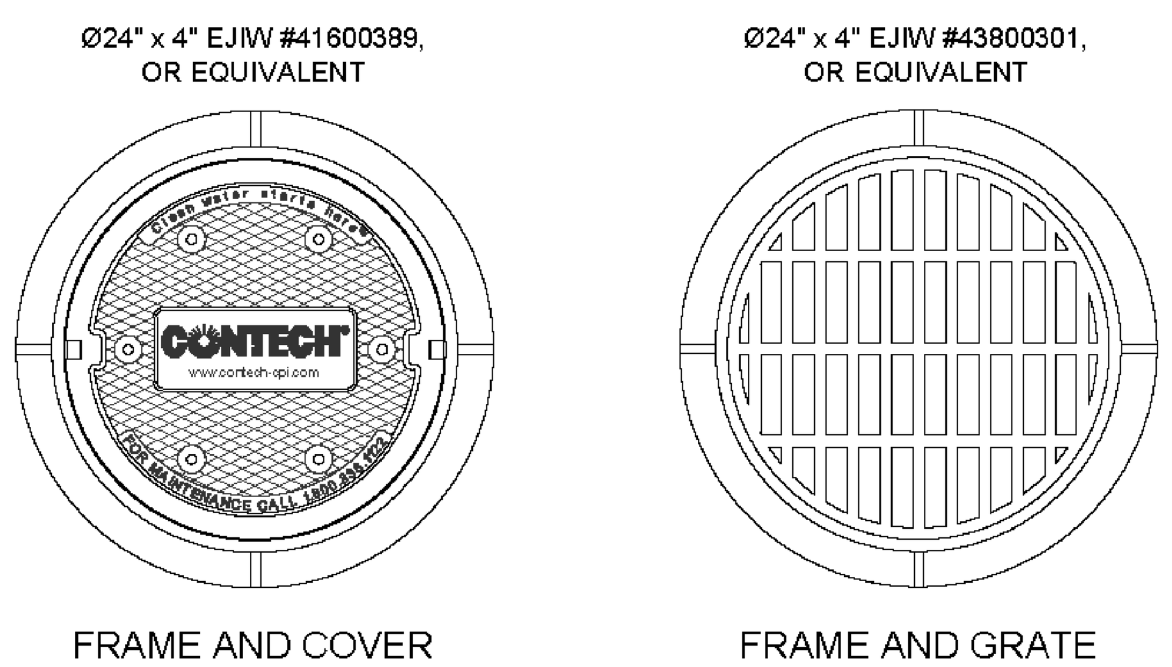
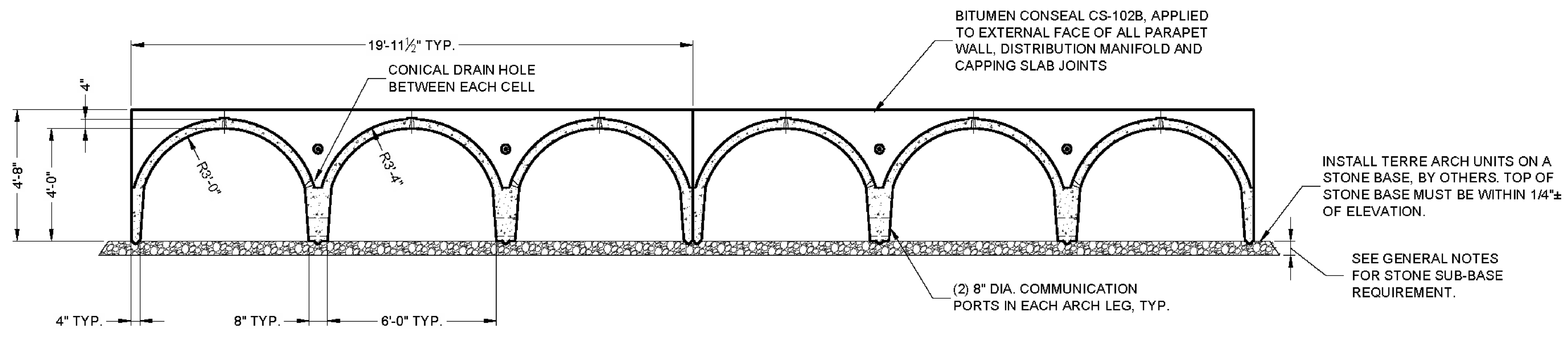
STORMWATER MANAGEMENT DETAILS AND NOTES (SWM-2)

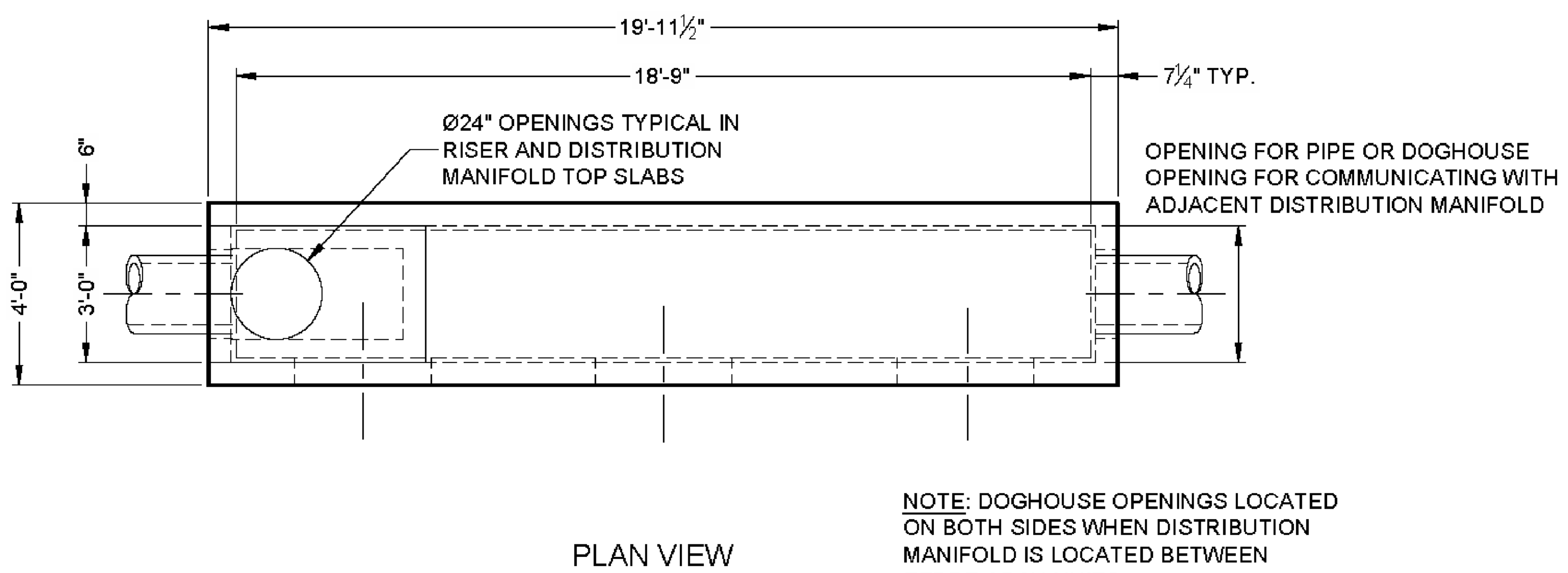


TYPICAL CASTINGS



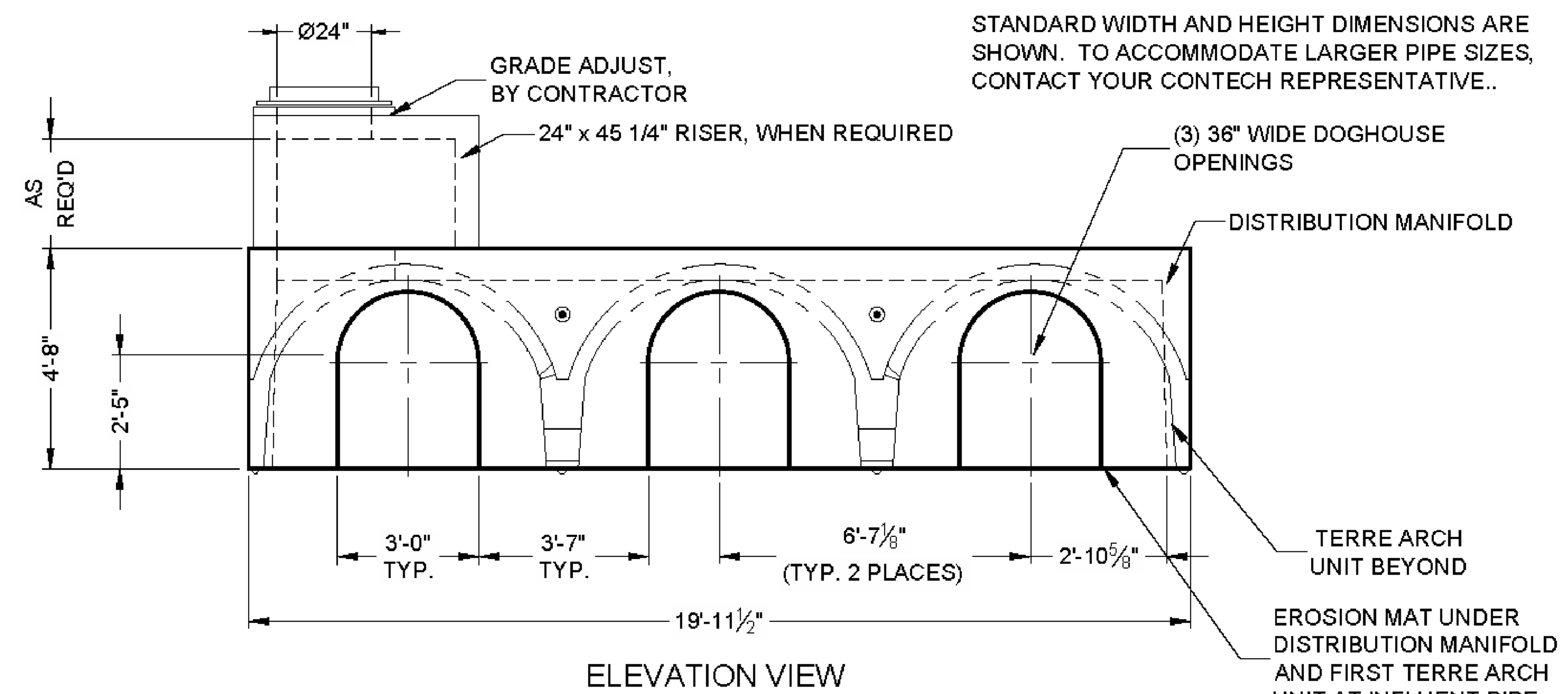
TYPICAL ASSEMBLY SECTION

(STONE BASE)

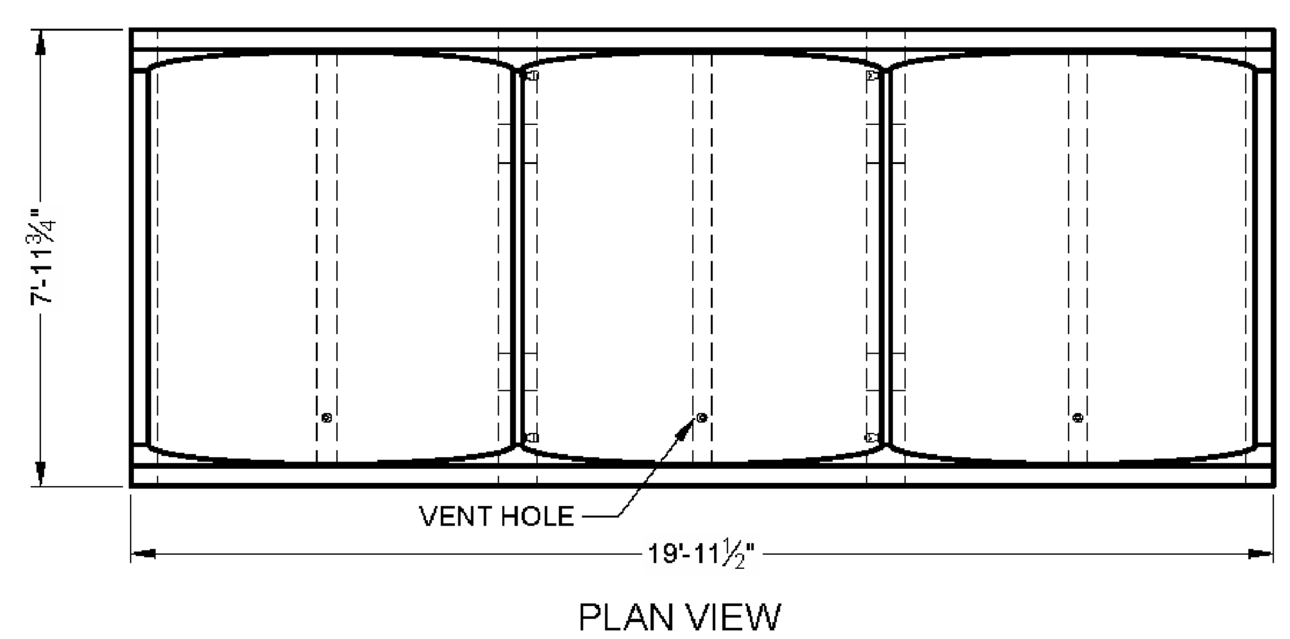


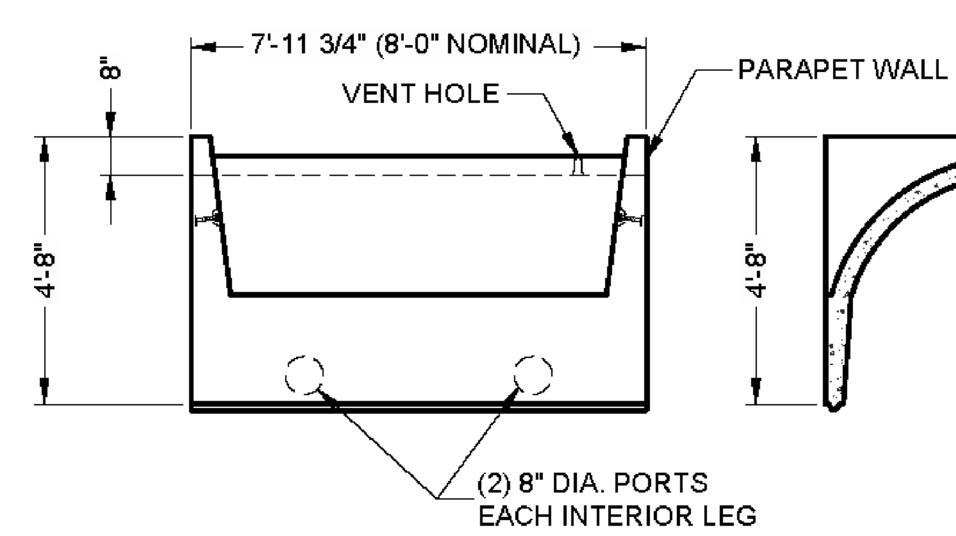
NOTE: DOGHOUSE OPENINGS LOCATED ON BOTH SIDES WHEN DISTRIBUTION MANIFOLD IS LOCATED BETWEEN TERRE ARCH UNITS

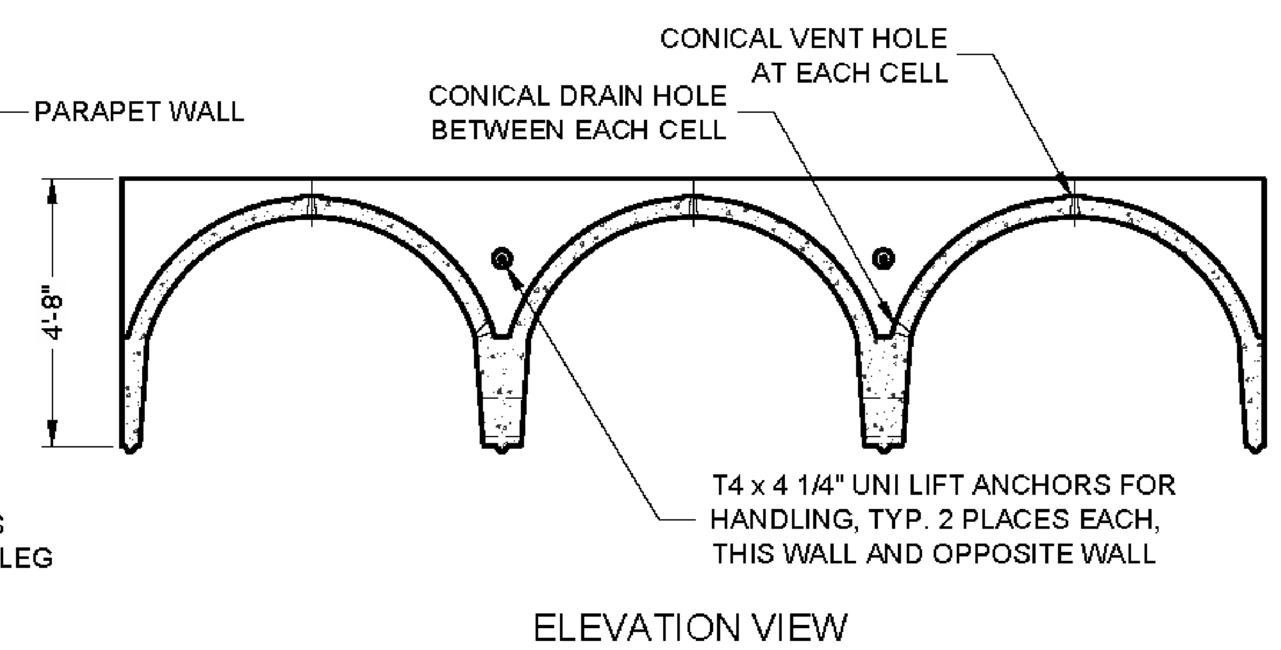
STANDARD WIDTH AND HEIGHT DIMENSIONS ARE SHOWN. TO ACCOMMODATE LARGER PIPE SIZES, CONTACT YOUR CONTECH REPRESENTATIVE..



TYPICAL DISTRIBUTION MANIFOLD







TYPICAL TERRE ARCH 48 DETAIL

(STONE BASE)

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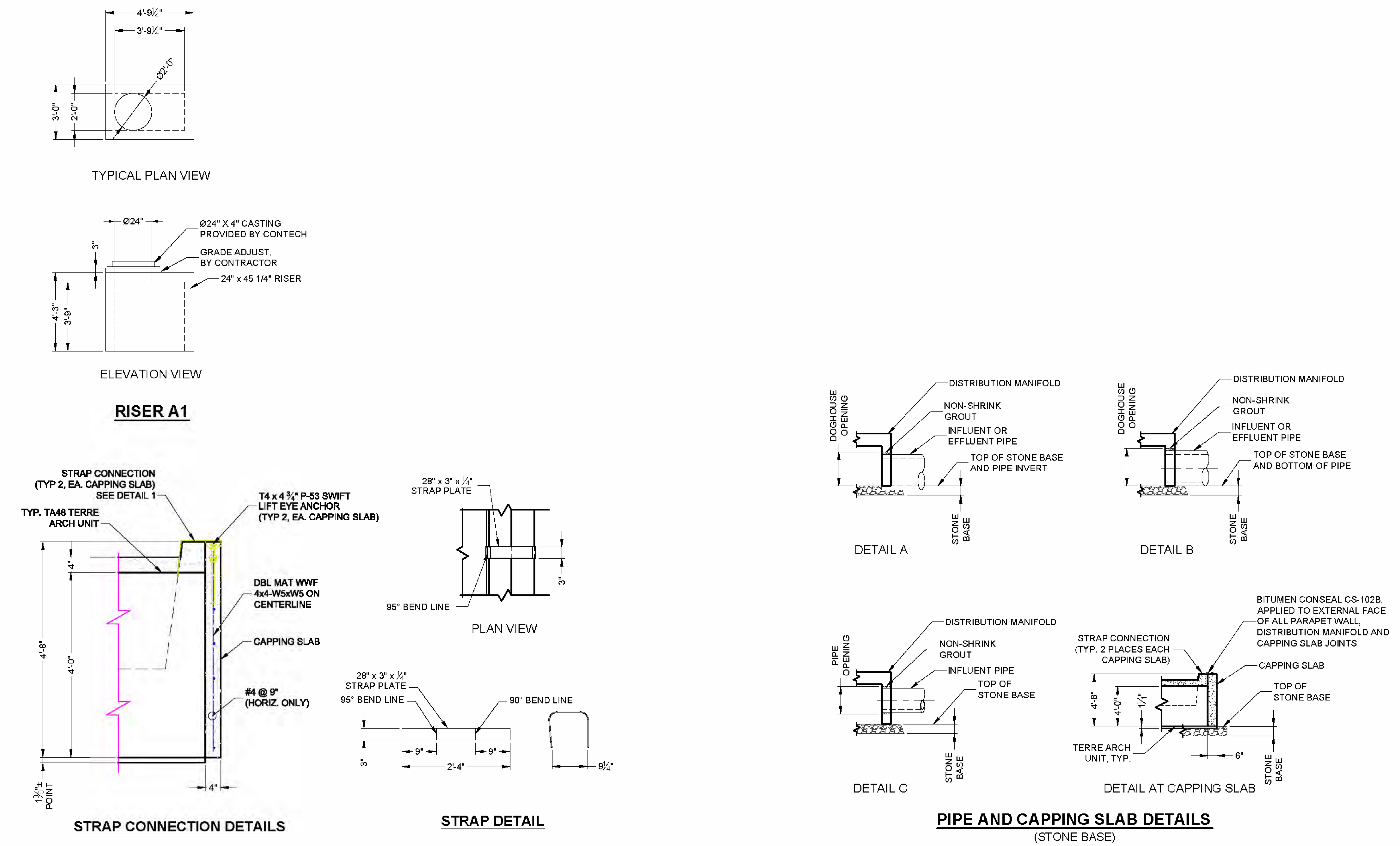

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PA THREADED INSERTS MANUFACTURED BY PENNSYLVANIA INSERT CORPORATION.

JOINT SEALING MATERIAL SHALL BE BITUMEN CONSEAL CS-102B JOINT MATERIAL MANUFACTURED BY CONCRETE SEALANTS, INC. AND CONFORMING TO FEDERAL SPECIFICATION SS-S-210A. JOINT SEALANT MUST BE INSTALLED IN ACCORDANCE WITH CONCRETE SEALANTS, INC. RECOMMENDATIONS.

EROSION & ANTI-SCOUR MATS SHALL BE INSTALLED UNDER DISTRIBUTION MANIFOLDS AT EACH INFLUENT PIPE LOCATION. EROSION MAT TO BE TENSAR BX-1200 BIAXIAL GEOGRID AS MANUFACTURED BY TENSAR EARTH TECHNOLOGIES, INC. OR EQUIVALENT. ANTI-SCOUR MAT TO BE WOVEN FILTRATION MEDIA, 58500 WHITE-CC-HONEYCOMB FILTER AS MANUFACTURED BY TENCATE NICOLON, OR EQUIVALENT.

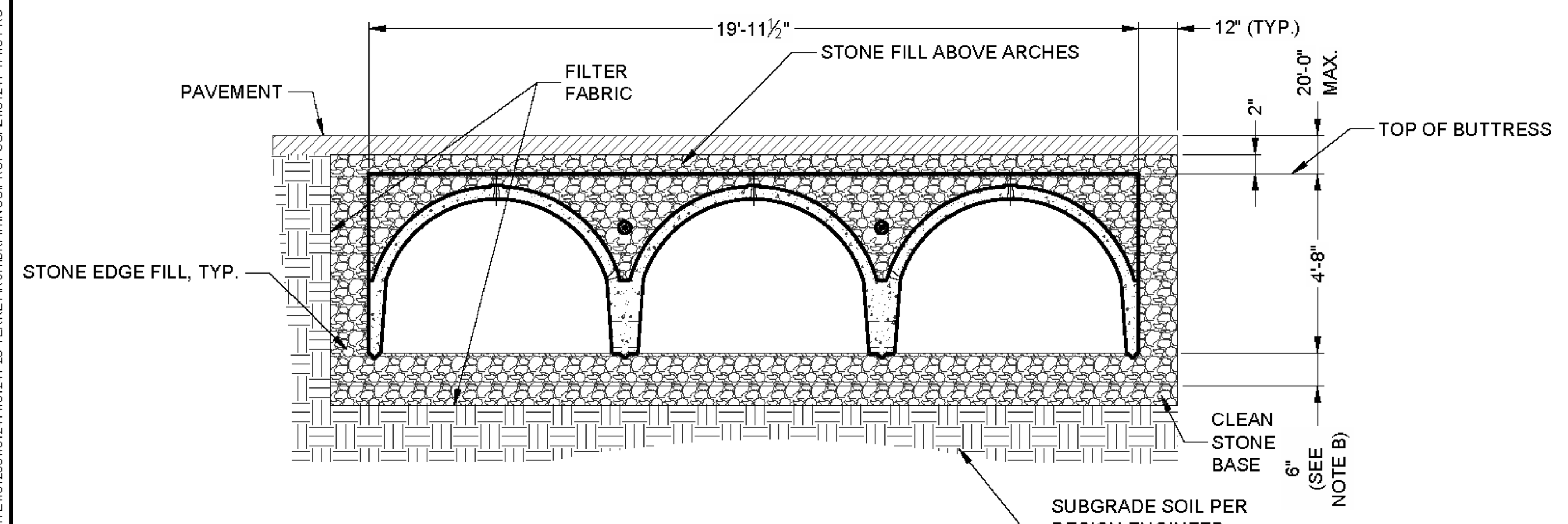
MANHOLE FRAMES AND COVERS ARE SUPPLIED BY CONTECH. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO. CONTRACTOR SHALL SUPPLY AND INSTALL ANY GRADE RINGS OR RISERS REQUIRED TO BRING THE CASTINGS FLUSH WITH FINISHED GRADE.

EXCAVATION, COMPACTED STONE BASE, BACKFILL AND GRADING BY CONTRACTOR.

IT IS RECOMMENDED THAT AN INSPECTION BE MADE ON A QUARTERLY BASIS AND AFTER EACH SIGNIFICANT RAINFALL EVENT. ANY ACCUMULATED DEBRIS/SEDIMENTATION THAT IMPAIRS THE PERFORMANCE OF THE SYSTEM IS TO BE REMOVED THROUGH THE PROVISION OF FULL ACCESS INTO ALL AREAS OF THE UNDERGROUND STORAGE SYSTEM.

EXCAVATION, DEWATERING AND SHORING OF EXCAVATION WILL BE BY CONTRACTOR. THIS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH PROJECT SPECIFICATIONS AS PROVIDED BY ENGINEER OF RECORD AND OSHA REQUIREMENTS.

THE TERRE ARCH PRECAST CONCRETE UNDERGROUND STORAGE SYSTEMS ARE DESIGNED TO MEET STORAGE CAPACITY REQUIREMENTS, AND HS-25 LOADING REQUIREMENTS.



TYPICAL BACKFILL DETAIL
(STONE BASE)

TERRE ARCH PERFORMANCE, DESIGN AND INSTALLATION SPECIFICATIONS

THE TERRE ARCH IS A PRECAST CONCRETE MODULAR ROMAN ARCH STRUCTURE CONSISTING OF FOUR CONNECTED PARALLEL VAULTS FOR SUBSURFACE STORAGE OF STORMWATER. ACCESSORY COMPONENTS SUCH AS INFLOW AND OUTFLOW STRUCTURES, E.G. MANIFOLDS ARE DESIGNED, ENGINEERED, AND MANUFACTURED TO MATCH SPECIFIC NEEDS:

1. DETENTION FOR CONTROLLED DISCHARGE THROUGH AN OUTLET CONTROL STRUCTURE
2. INFILTRATION TO RECHARGE THE GROUND WATER
3. HS-25 LOAD RATING ON THE CROWN OF THE ARCH. NO MINIMUM COVER OR FILL REQUIREMENTS. NO REQUIREMENT FOR LOAD BEARING STONE BETWEEN OR ABOVE STRUCTURE. DIRECT ACCESS FOR HEAVY INSTALLATION EQUIPMENT, INCLUDING STONE FILLED DUMP TRUCK (PERIMETER STONE FILL IS REQUIRED PRIOR TO IMPOSING HS-25 LOADING ON THE SYSTEM)
4. MAXIMUM COVER UP TO 20 FT. (VERIFY SUB-BASE DEPTH AND SOIL BEARING)
5. A STORMWATER TREATMENT SYSTEM SHOULD BE PLACED IN FRONT OF THE TERRE ARCH TO PREVENT ENTRY OF SEDIMENT, OIL, GREASE, LITTER, AND DEBRIS TO THE MAXIMUM EXTENT PRACTICABLE
6. STRUCTURE HAS 5,000 PSI COMPRESSIVE STRENGTH AND 100 YEAR DESIGN LIFE
7. 160 SQ.FT. (8 FEET BY 20 FEET) INFILTRATION SURFACE PER STRUCTURE
8. 541 CU.FT. OF STORAGE IN CUSTOMARY INSTALLATION, I.E. VALLEYS BETWEEN ARCHES FILLED WITH STONE TO THE TOP OF THE BUTTRESSES (40% VOID SPACE TYPICAL WITH STONE)
9. EACH STRUCTURE IS LESS THAN 22,500 LBS. ALLOWING SHIPMENT OF 2 STRUCTURES PER TRUCK. PLACEMENT FROM TRUCK INTO THE PREPARED EXCAVATION BY LIGHT CRANE OR LOADER
10. NO MINIMUM COVER OR FILL REQUIREMENTS ALLOW FOR SHALLOW INSTALLATION CONDITIONS
11. VENTILATION AND DRAINING ORIFICES IN TOP AND VALLEY AREAS OF STRUCTURE
12. COMMUNICATION HOLES IN THE INTERIOR LEGS OF THE ARCH CELLS TO ALLOW FLOW BETWEEN ALL SECTIONS. MATING LEG WITH STONE PERIMETER WILL HAVE NO CROSS FLOW HOLE
13. EROSION MATTING IS REQUIRED AT ALL INFLUENT PIPES
14. NO REQUIREMENT FOR GEOTEXTILE SEPARATION LAYER BELOW. USE FILTERFABRIC OR GEOTEXTILE WHERE SILT MIGRATION FROM THE SIDES OR TOP INTO THE VOID SPACE OF THE STONE IS POSSIBLE
15. CONTECH SHALL SUBMIT DOCUMENTATION AS REQUESTED BY ENGINEER OF RECORD TO VERIFY PERFORMANCE AND DESIGN SPECIFICATIONS
16. EACH TERRE ARCH SHALL CONTAIN LIFTING POINTS WITH UNI-LIFT PINS. MANUFACTURER SHALL LOAN THE LIFTING HARDWARE TO THE CONTRACTOR, WHICH SHALL BE THE PROPERTY OF MANUFACTURER. CONTRACTOR SHALL PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING CAPACITY TO UNLOAD AND SET THE TERRE ARCH

PRODUCT INSTALLATION PROCEDURES

A. CONTRACTOR SHALL EXCAVATE ACCORDING TO THE LATEST DATED APPROVED DRAWING SET. DEWATER AND SHORE IN ACCORDANCE WITH PROJECT SPECIFICATIONS, AS PROVIDED BY ENGINEER OF RECORD
B. UNLESS OTHERWISE SPECIFIED, SUB-GRADE SHALL BE ESTABLISHED AS SHOWN ON THE DRAWINGS. UNDERLYING SOIL AND SUB-GRADE MATERIAL SHALL HAVE DESIGN LOADING OF NOT LESS THAN 3000 POUNDS PER SQUARE FOOT (PSF), AS ESTABLISHED BY ENGINEER (TYPICAL STONE BED SHALL BE 12 INCHES OF #8 AASHTO (1/2-INCH STONE) LEVEL TO PLUS OR MINUS 3/8-INCH)
C. ARCHES SHALL BE PLACED WITHIN A NOMINAL 8'-0" BY 20'-0" MATRIX
D. ANCHORING OF THE ARCHED SYSTEM RELATIVE THE INFLUENT MANIFOLDS OR DISTRIBUTION MANIFOLDS IS RECOMMENDED. PLACE RISER SECTIONS ON MANIFOLDS
E. PLACE CONSEAL ON THE JOINTS BETWEEN THE ARCHES TO PREVENT MIGRATION OF FINES INTO THE JOINT GAP
F. PRIOR TO ALLOWING ANY TOP LOADING, ALL PERIMETER SPACE BETWEEN THE EDGE OF THE ARCH SYSTEM AND THE SOIL SHALL BE FILLED WITH AT LEAST 12 INCHES OF STONE
G. BULLDOZE STONE ONTO THE ARCHES WITH 2 INCHES OF STONE ABOVE THE BUTTRESS ELEVATIONS
H. USE VIBRATING/ROLLING EQUIPMENT TO STABILIZE THE TOP STONE AND SETTLE THE ARCHES INTO THE SUB-BASE
I. FINALIZE COVERING THE SYSTEM WITH THE SPECIFIED STONE TOP LOADING AND COVER WITH FILTER FABRIC TO PREVENT MIGRATION OF FINES INTO THE STONE VOIDS
J. PLACE ADDITIONAL SOIL AMENDMENTS AND GRADING REQUIREMENTS
K. CONTRACTOR SHALL REMOVE ALL MATERIAL AND DEBRIS FROM THE TERRE ARCH
L. WARRANTY: 4 YEARS FROM DATE OF SUBSTANTIAL COMPLETION FOR LABOR AND MATERIAL IN THE EVENT THAT THE MATERIAL SUPPLIED IS NOT FREE FROM DEFECTS. EQUIPMENT SHALL BE INSTALLED AND USED ONLY IN THE PARTICULAR APPLICATION FOR WHICH IT WAS SPECIFICALLY MANUFACTURED
M. TERRE ARCH INSTALLATION MAY REQUIRE DISTRIBUTION BOX(ES) AND END CAP PLATES AS SHOWN ON THE DRAWINGS
N. CONTRACTOR SHALL PROVIDE, INSTALL AND GROUT PIPES USING NON-SHRINK GROUT. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN

PRODUCT SUBSTITUTION PROCEDURES

NO UNDERGROUND STORMWATER STORAGE SYSTEM SHALL BE APPROVED AS AN EQUIVALENT SUBSTITUTION FOR A TERRE ARCH SYSTEM UNLESS THE ENGINEER OF RECORD SHALL RECEIVE AND APPROVE DRAWINGS AND SPECIFICATIONS STAMPED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE WHEREIN THE PROJECT IS LOCATED SHOWING THE FOLLOWING:

- PROJECT SPECIFIC SIZING CALCULATIONS CLEARLY SHOWING THAT THE UNIT MEETS OR EXCEEDS THE PERFORMANCE AND DESIGN SPECIFICATIONS OF THE TERRE ARCH

MAINTENANCE PROCEDURES

- WHEN A STORMWATER TREATMENT SYSTEM IS PLACED IN FRONT OF THE TERRE ARCH SYSTEM NO CLEAN OUT OR MAINTENANCE IS ANTICIPATED, AS LONG AS THE STORMWATER TREATMENT SYSTEM IS PROPERLY MAINTAINED
- INSPECTION CAN BE ACCOMPLISHED FROM GRADE WITH PROPER EQUIPMENT BY ENTRY THROUGH THE ACCESS OPENING(S)
- SYSTEM SHALL CONTAIN SUFFICIENT DISTRIBUTION MANIFOLDS TO ALLOW ENTRY FOR INSPECTION AND MAINTENANCE INTO EACH TERRE ARCH

SUBJECT TO CHANGE WITHOUT NOTICE.
VERIFY LATEST INFORMATION WITH CONTECH ENGINEERED SOLUTIONS, LLC www.ContechES.com

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
605 Global Way, Suite 113, Linthicum, MD 21090
866-740-3318 410-740-8490 866-376-8511 FAX

TERRE ARCH™ PATENT PENDING
CONTECH PROPOSAL DRAWING

TERRE ARCH 48 - 481241-020
JERMANTOWN
FAIRFAX, VA
SITE DESIGNATION: SWM2

PROJECT No.: 481241	SEQ. No.: 020	DATE: 6/11/2014
DESIGNED: AML		DRAWN: AML
CHECKED:		APPROVED:
SHEET NO.: 4 OF 4		

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2K(II)

FINAL PLAN

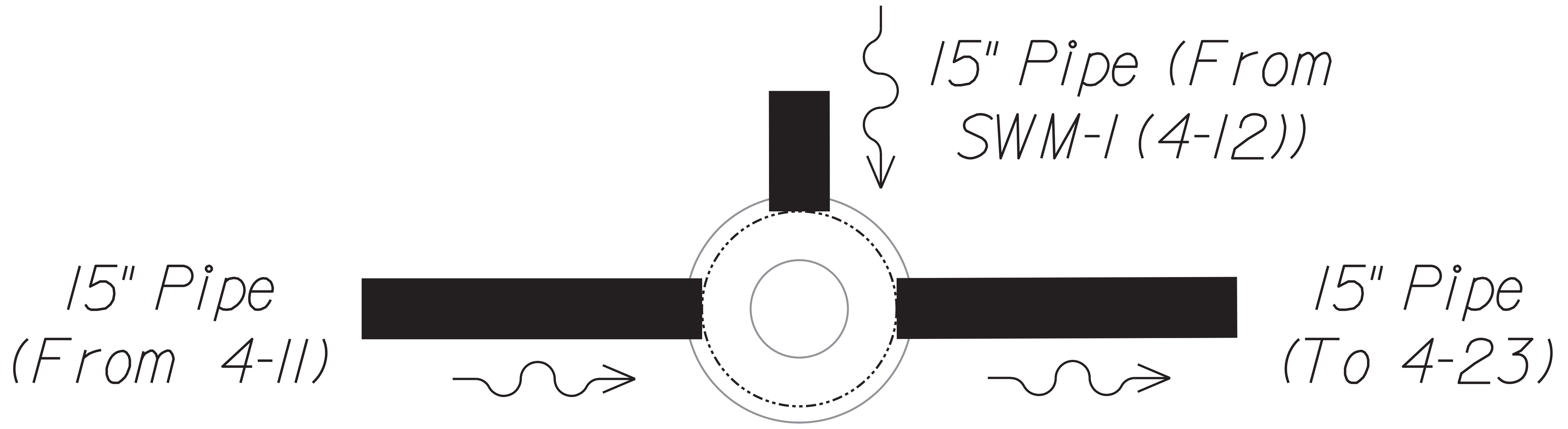
Rinker Design Associates, P.C.
CITY OF FAIRFAX
8/15/2014

PROJECT MANAGER Wendy Block Sanford, City of Fairfax, (703) 385-7889
SURVEYED BY Rinker Design Assoc. P.C. (703) 368-7373
DESIGN SUPERVISED BY Mark Gunn, P.E., Rinker Design Assoc. P.C. (703) 368-7373
DESIGNED BY Adam D. Welschenbach, P.E., Rinker Design Assoc. P.C. (703) 368-7373

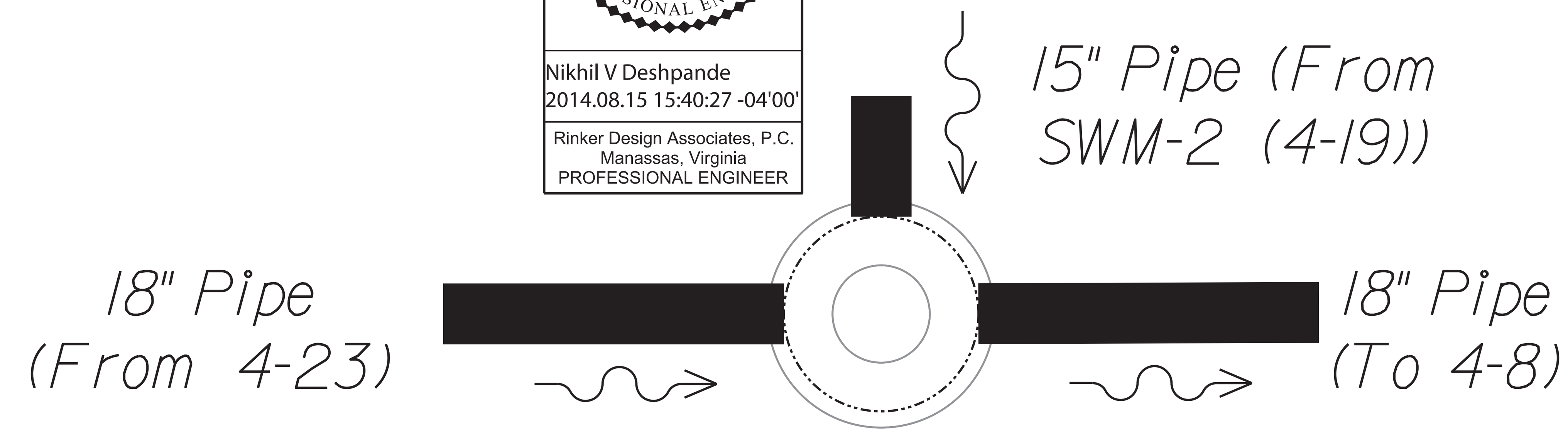
CONTROL STRUCTURE DETAIL
STR 4-13 & 4-21

COMMONWEALTH OF VIRGINIA
NIKHIL V. DESHPANDE
Lic. No. 045430
PROFESSIONAL ENGINEER
Nikhil V Deshpande
2014.08.15 15:40:27 -04'00'
Rinker Design Associates, P.C.
Manassas, Virginia
PROFESSIONAL ENGINEER

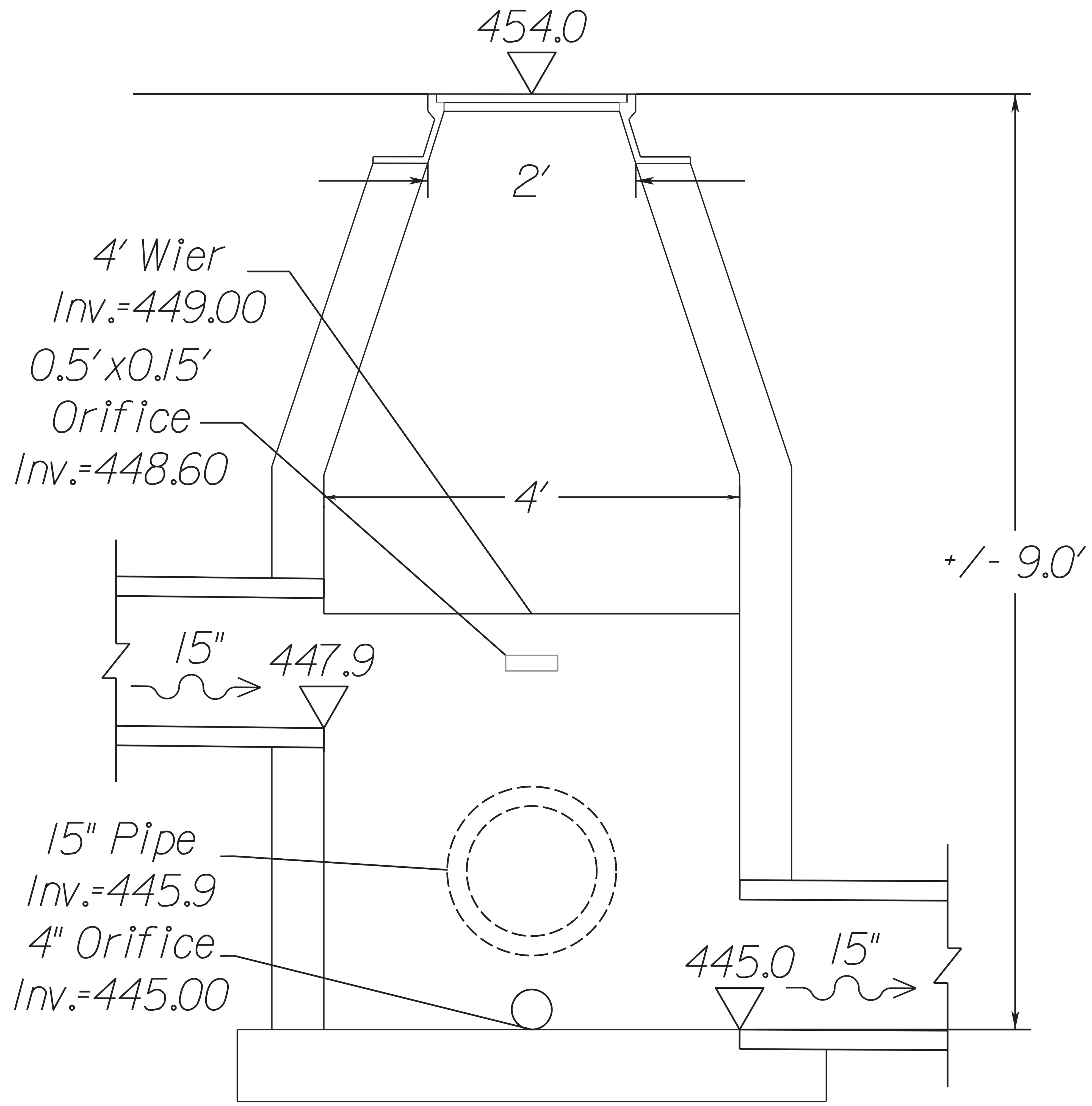
REVISED	STATE	FEDERAL AID PROJECT OWNER		STATE PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2K(12)



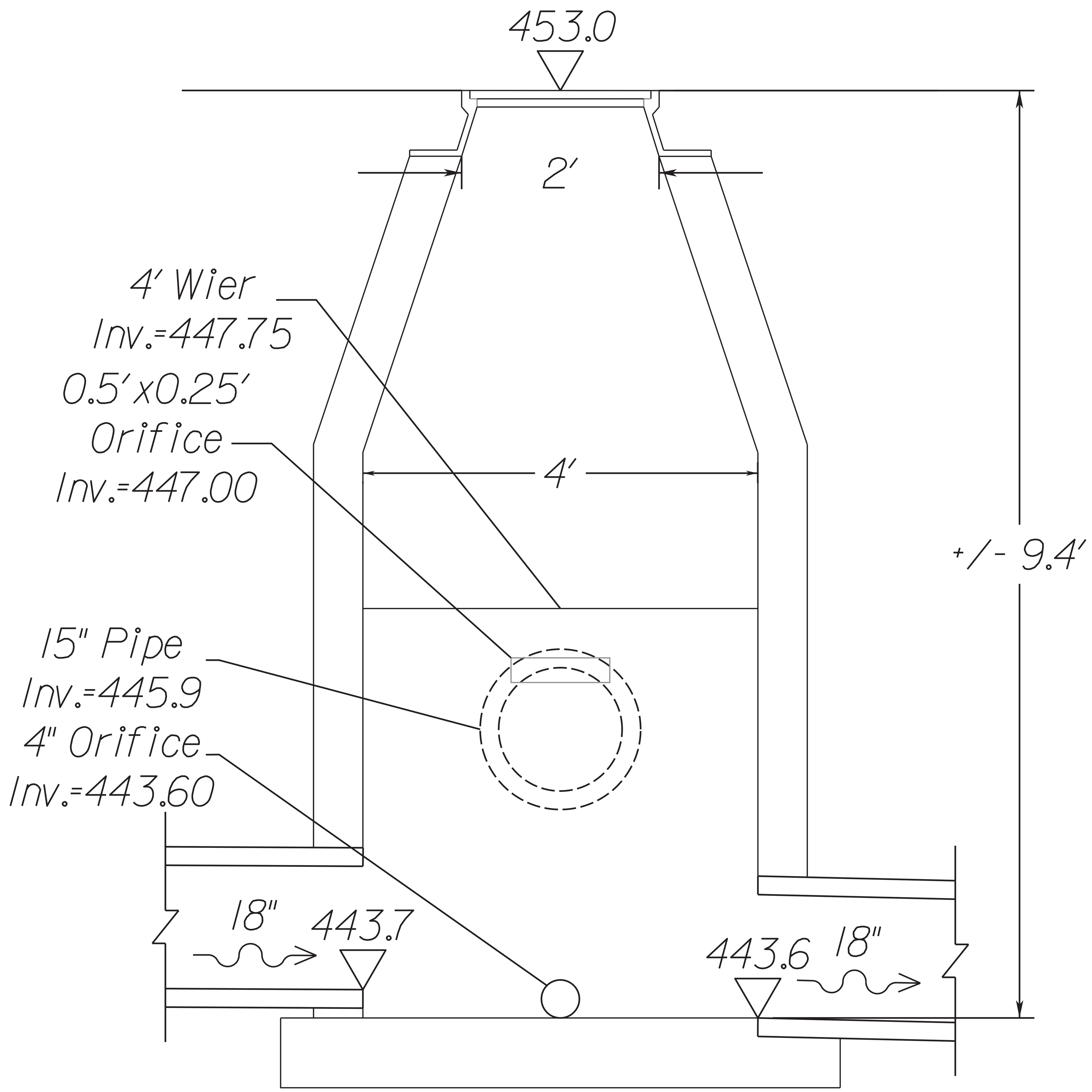
PLANVIEW (4-13)



PLANVIEW (4-21)



CROSS SECTION (4-13)



CROSS SECTION (4-21)

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2K(12)

CITY OF FAIRFAX

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

8/15/2014

FINAL PLAN

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OUTFALL COMPUTATIONS & NARRATIVE

REVISED	STATE	FEDERAL AID PROJECT OWNER		STATE PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2K(13)

COMMONWEALTH OF VIRGINIA
NIKHIL V. DESHPANDE
Lic. No. 045430
PROFESSIONAL ENGINEER

Nikhil V Deshpande
2014.08.15 15:40:52 -04'00'

Rinker Design Associates, P.C.
Manassas, Virginia
PROFESSIONAL ENGINEER

Outfall Tabulation:

Watershed: Difficult Run

			Existing Condition					Proposed Condition										Remark
Outfall	Station	Project R/W	Drainage Area	Cw	Tc (min.)	Q_2 (cfs)	Q_{10} (cfs)	Drainage Area	New Impervious Area	Cw	Tc (min.)	Q_2 (cfs)	Q_{10} (cfs)	Natural Channel	Manmade Channel	Pipe	Pond	
1A	60+89 Rt	0.50	10.31	0.63	5	34.0	44.0	10.22	0.10	0.64	5	34.2	44.3			X		Existing Storm Sewer System Surface flow where proposed curb ties to existing
1B	660+89 Lt	0.76	1.66	0.81	5	7.0	9.1	1.64	0.06	0.82	5	7.0	9.1			X		Existing Storm Sewer System
	Sheet Flow	0.16																
Total		1.42							0.16									

Watershed: Accotink Creek

			Existing Condition					Proposed Condition										Remark
Outfall	Station	Project R/W	Drainage Area	Cw	Tc (min.)	Q_2 (cfs)	Q_{10} (cfs)	Drainage Area	New Impervious Area	Cw	Tc (min.)	Q_2 (cfs)	Q_{10} (cfs)	Natural Channel	Manmade Channel	Pipe	Pond	
2A	21+75 Lt	1.62	41.06	0.80	15	115.4	151.7	41.26	0.22	0.81	15	116.6	153.4			X		Existing Storm Sewer System
	Sheet Flow	0.05							0.01									
Total		1.67							0.23									

Note: Overall Drainage Map, See Sheet 1N(2)

Drainage Tabulation:

Watershed: Difficult Run

Drainage Tabulation										
							Required SWM			
Outfalls	Station	Project R/W Area (ac.)	Existing Impervious (ac.)	New Impervious (ac.)	Total Impervious (ac.)	Outfall Drainage (ac.)	WQN	WQL	Regulated Disturbed Area (ac.)	Remarks
1A	52+25 to 55+00 Rt' (Rt.655)	0.50	0.37	0.10	0.47	0.50			0.27	Outfall to existing drainage system.
	Offsite Downstream Rt'					9.72				
	Total	**0.50**	**0.37**	**0.10**	**0.47**	**10.22**	No	No		
1B	52+25 to 58+00 Lt' (Rt.655)	0.76	0.64	0.06	0.70	0.76			0.23	Outfall to existing drainage system.
	Offsite Downstream Lt'					0.88				
	Total	**0.76**	**0.64**	**0.06**	**0.70**	**1.64**	No	No		
SF#1	Sheet flow (12+50 Lt)	0.16	0.14	0.00	0.14	0.16				
	Watershed Totals:	**1.42**	**1.15**	**0.16**	**1.31**	**12.02**				

Watershed: Accotink Creek

Drainage Tabulation										
							Required SWM			
Outfalls	Station	Project R/W Area (ac.)	Existing Impervious (ac.)	New Impervious (ac.)	Total Impervious (ac.)	Outfall Drainage (ac.)	WQN	WQL	Regulated Disturbed Area (ac.)	Remarks
2A	14+00 to 25+00 Lt' (Rt.50)	1.62	1.25	0.22	1.47	1.62			0.68	Outfall to existing drainage system.
	Offsite Up/Downstream					39.6				
	Total	**1.62**	**1.25**	**0.22**	**1.47**	**41.26**	No	No		
SF#2	Sheet flow 2 (24+75 Lt)	0.05	0.04	0.01	0.05	0.05				
	Watershed Totals:	**1.67**	**1.29**	**0.23**	**1.52**	**41.31**				

Project totals:	**3.09**	**2.44**	**0.39**	**2.83**

Stormwater and Best Management Practices Narrative:

Overview
This project proposes road widening at the intersection of Jermantown and Route 50 (Fairfax Boulevard).This project outfalls to two watersheds.The Western portion of the Jermantown Road is within the Difficult Run watershed.The Eastern portion on Route 50 is within the Accotink Creek Watershed.The sites adjacent to the project and developed commercial sites.

STORMWATER MANAGEMENT
Due to widening along Fairfax Boulevard,three existing stormwater detention pits located along the road frontage will be replaced with underground detention facilities providing storage volume equivalent to the existing systems.The underground facilities will consist of 2 48" Terre Arch facilities called out as SWM-1 and SWM-2 are located below the parking areas.Routing computations for the Terre Arch facilities are provided under a seperate cover.Please refer to Sheet 2K(4) through 2K(11) for Terre Arch details.These facilities provide water quantity control only and no water quality control.The water quantity control is provided only for the adjacent site and does not provide any quantity control for roadway runoff.

Existing and proposed drainage divides can be seen on Sheet 2K and Sheet 2K(1) respectively.The inlet and storm computations can be seen on Sheet 2K(2) through Sheet 2K(2B).
This project adds 0.16 acre of new impervious area within the Difficult Run watershed and 0.23 acre of new impervious area within the Accotink Creek watershed.From the pipe computations it can be seen that the downstream system is adequate to handle the flows.Therefore no quantity controls are required.

BEST MANAGEMENT PRACTICES
This is a linear development project.
The total regulated land disturbance area within Difficult Run is 0.50 acre with a new impervious area of 0.16 acre added.The total regulated land disturbed area to the Accotink Creek is 0.68 acre with a new impervious area of 0.23 acre added.Therefore it can be seen that:

1.Less than one acre will be disturbed per outfall or watershed.
2.There will be insignificant increase in peak flow rates downstream of the discharge point.
3.There is no existing or anticipated flooding or erosion problems downstream of the discharge point.

Therefore the project qualifies for an exemption from the water quality requirements in accordance with the VDOT Drainage Manual.

Outfall Narrative:

OUTFALL DESCRIPTIONS:
This project has 2 primary outfalls and 3 secondary outfalls. Primary Outfall #1 is the Difficult Run Watershed.The total project area withing the watershed is 1.42 acre and there is 0.16 acre of new impervious area added to this watershed.This watershed has two secondary outfalls.Primary Outfall #2 is the Accotink Creek Watershed.The total project area within the watershed is 1.67 acre and 0.23 acre of new impervious area is added to this watershed. This watershed has one secondary outfall.

DIFFICULT RUN WATERSHED
Secondary Outfall #1A is located to the right along Jermantown Road. The project area is 0.50 acre and 0.10 acre of new impervious area is added to this outfall.There is a negligible increase in peak flow rate as a result of this increase in impervious area.The runoff is captured by the proposed and existing stormsewer inlets and flows into the existing system.The capacity of the existing system was analyzed and determined to be adequate to handle the negligible increase in peak flows.Therefore it is our opinion that this constitutes an adequate outfall and no adverse impact downstream is anticipated.

Secondary Outfall #1B is located to the left along Jermantown Road. The project area is 0.76 acre and 0.06 acre of new impervious area is added to this outfall.There is a negligible increase in peak flow rate as a result of this increase in impervious area.The runoff is captured by the proposed and existing stormsewer inlets and flows into the existing system.The capacity of the existing system was analyzed and determined to be adequate to handle the negligible increase in peak flows.Therefore it is our opinion that this constitutes an adequate outfall and no adverse impact downstream is anticipated.

Approximately 0.16 acre of project area flows via sheet flow and is captured by the existing gutter.There is no increase in impervious area and the existing gutter is adequate to handle the flow.

ACCOTINK CREEK WATERSHED
Secondary Outfall #2A is located to the left along Fairfax Boulevard (Route 50).The project area is 1.62 acre and 0.22 acre of new impervious area is added to this outfall.There is a negligible increase in peak flow rate as a result of this increase in impervious area.The runoff is captured by the proposed and existing stormsewer inlets and flows into the existing system.The existing system at this location is under pressure flow.A comparison between existing and proposed project conditions has been provided to demonstarte that this is an existing condition and not caused due to the widening project.A hydraulic grade line analysis has been performed and the HGL is below the structure tops.Therefore it is our opinion that this constitutes an adequate outfall and no adverse impact downstream is anticipated.

Approximately 0.05 acre of project area flows via sheet flow and is captured by the existing gutter.There is an increase of approximately 0.01 ac of impervious area and the existing gutter is adequate to handle the flow.

FINAL OPINION
This project is subject to a negligible increase in peak runoff as a result of the increase in impervious area.The outfalls are adequate to convey project runoff for the 10-year event.It is our opinion that the requirements of MS-19 are satisfied and no adverse impacts are anticipated as a result of this project.

Rinker Design Associates, P.C.
CITY OF FAIRFAX
8/15/2014

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2K(13)

FINAL PLAN

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

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9385 Discovery Boulevard, Suite 200, Manassas, VA 20109, Phone: (703) 368-7373, Fax: (703) 257-5443
4301 Dominion Boulevard, Suite 100, Glen Allen, VA 23059, Phone: (804) 612-0665, Fax: (804) 612-0668
927 Maple Grove Drive, Suite 105, Fredericksburg, VA 22407, Phone: (540) 548-4470, Fax: (540) 548-4471

CITY OF FAIRFAX

8/15/2014

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REVISED	STATE	FEDERAL AID PROJECT OWNER	STATE	PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2L

UNDERGROUND UTILITY TEST HOLE INFORMATION

PLAN SHEET	TEST HOLE	DISTANCE (FEET)	(1) STATION & ROADWAY	OWNER	TYPE OF FACILITY	(2) ELEV. (FEET)	(3) CONFLICT YES/NO	(4) REMARKS	UTILITY (5) ADJUSTMENT REQUIRED
3B	TH-1	39.18 (LT)	Sta.56+91.68 - Jermantown Road (City Route 6634)	City of Fairfax	Waterline ($8\frac{3}{4}$" Ductile Iron)	452.17	No	3.3' cover from top of utility to finished grade	No
3B	TH-2	30.14 (RT)	Sta.55+93.87 - Jermantown Road (City Route 6634)	Washington Gas	Gas Line ($8\frac{1}{2}$" Epoxy Coated Steel)	452.35	No	4.1' cover from top of utility to finished grade	No
3	TH-3	48.96 (LT)	Sta.14+38.86 - Fairfax Boulevard (U.S.Route 50)	Washington Gas	Gas Line ($1\frac{1}{4}$" Paper Wrapped Steel)	456.34	No	5.4' cover from top of utility to finished grade	No
3	none	57.01 (LT)	Sta.14+83.93 - Fairfax Boulevard (U.S.Route 50)	City of Fairfax	Sanitary Manhole	461.44	Yes	Relocate manhole (Ex.17) in conflict with proposed sidewalk	Yes
3	none	47.00 (LT)	Sta.14+82.30 - Fairfax Boulevard (U.S.Route 50)	City of Fairfax	Sanitary Line (8")	~450.73	No	Approx.10' from top of utility to finished grade	No
4	TH-4	50.18 (LT)	Sta.16+02.62 - Fairfax Boulevard (U.S.Route 50)	Washington Gas	Gas Line ($2\frac{1}{2}$" P.E.)	457.66	No	4.0' cover from top of utility to finished grade	No

SUBSURFACE UTILITY OWNERS
MISS UTILITY 1-800-257-7777

(1) ATT/TCG
7777 LEESBURG PIKE, SUITE 100N
FALLS CHURCH, VA 22043
MS. DEBORAH TULIPANO

(2) COX COMMUNICATIONS
3080 CENTREVILLE ROAD
HERNDON, VA 20171
MR. FRANK STIDMAN

(3) DOMINION VIRGINIA POWER
171 ELDEN STREET
HERNDON, VA 20170
MS. VERNA LOVE

(4) FAIRFAX CITY DEPARTMENT OF UTILITIES
CITY HALL ANNEX ROOM 300
10455 ARMSTRONG STREET
FAIRFAX, VA 22030
MR. RICK THOESEN, DIRECTOR

(5) VERIZON VIRGINIA INC.
22001 LOUDOUN COUTY PARKWAY
BUILDING C1-2, 552
ASHBURN, VA 20147
MR. BILL SUTER

(6) WASHINGTON GAS
6801 INDUSTRIAL ROAD
SPRINGFIELD, VA 22151
MR. ALLAN MELIZA

LEGEND

W
T/Tg Duct
SFM
G
E
FO
CAFO
FO Duct

NOTES:

(1) ALL TEST HOLES ARE REFERENCED FROM THE SURVEY BASELINE UNLESS OTHERWISE NOTED.

(2) ELEVATIONS SHOWN HEREON ARE TO THE TOP OF THE FACILITY UNLESS OTHERWISE NOTED.

(3) YES OR NO; NO INDICATES NO DIRECT CONFLICT, HOWEVER, CLEARANCE MAY BE LESS THAN ACCEPTABLE TO UTILITY OWNER.

(4) REMARKS TO INCLUDE CLEARANCE DIMENSION (REGARDLESS OF DISTANCE).

(5) YES OR NO; INFORMATION TO BE PROVIDED BY THE VDOT DISTRICT UTILITY ENGINEER.

Revised 1-95

SPECIAL DESIGN SECTION
DRAWING NO. A-41

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2L

FINAL PLAN

PROJECT MANAGER Wendy Block Sanford, City of Fairfax, (703) 385-7889
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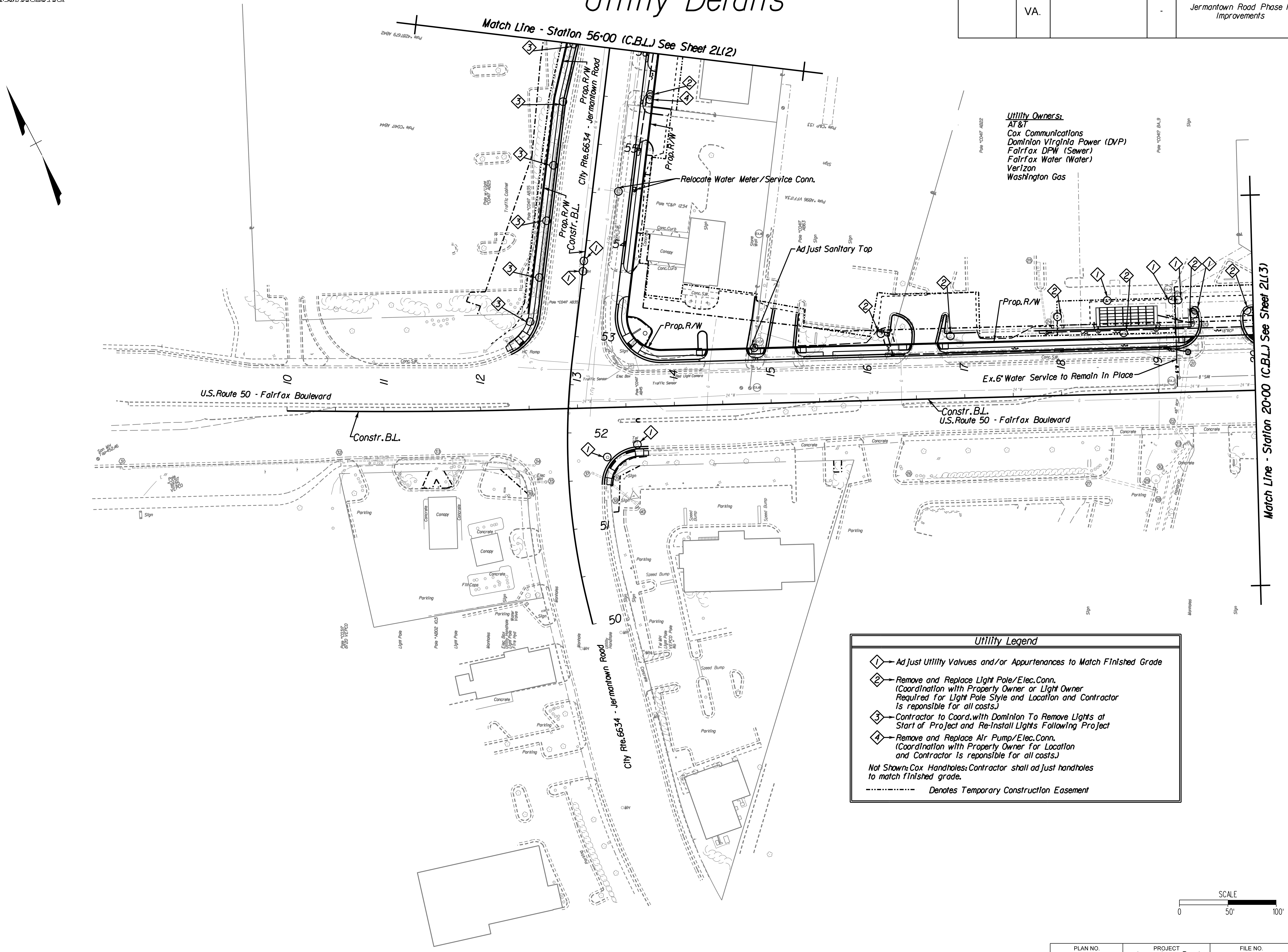
DESIGNED BY Adam D. Welschenbach, P.E., Rinker Design Assoc. P.C. (703) 368-7373

REVISED	STATE	FEDERAL AID PROJECT OWNER		STATE PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2L(1)

Utility Details



Utility Owners:
AT&T
Cox Communications
Dominion Virginia Power (DVP)
Fairfax DPW (Sewer)
Fairfax Water (Water)
Verizon
Washington Gas

Utility Legend

1 - Adjust Utility Valvues and/or Appurtenances to Match Finished Grade

2 - Remove and Replace Light Pole/Elec. Conn. (Coordination with Property Owner or Light Owner Required for Light Pole Style and Location and Contractor is reponsible for all costs.)

3 - Contractor to Coord. with Dominion To Remove Lights at Start of Project and Re-Install Lights Following Project

4 - Remove and Replace Air Pump/Elec. Conn. (Coordination with Property Owner for Location and Contractor is reponsible for all costs.)

Not Shown: Cox Handholes: Contractor shall adjust handholes to match finished grade.

-·-·-·- Denotes Temporary Construction Easement

SCALE 0 50' 100'

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2L(1)

Rinker Design Associates, P.C.
Civil Engineering · Surveying · Land Planning · Transportation · Environmental · Right of Way Services
Office Locations

CITY OF FAIRFAX

8/15/2014

FINAL PLAN

PROJECT MANAGER Wendy Block Sanford,City of Fairfax,(703) 385-7889
SURVEYED BY Rinker Design Assoc.,P.C.(703) 368-7373
DESIGN SUPERVISED BY Mark Gunn,P.E.,Rinker Design Assoc.,P.C.(703) 368-7373
DESIGNED BY Adam D.Welschenbach,P.E.,Rinker Design Assoc.,P.C.(703) 368-7373

REVISED	STATE	FEDERAL AID PROJECT OWNER		STATE PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2L(2)

Utility Details

Utility Owners:
AT&T
Cox Communications
Dominion Virginia Power (DVP)
Fairfax DPW (Sewer)
Fairfax Water (Water)
Verizon
Washington Gas

Utility Legend

1 → Adjust Utility Valvues and/or Appurtenances to Match Finished Grade

2 → Remove and Replace Light Pole/Elec.Conn. (Coordination with Property Owner or Light Owner Required for Light Pole Style and Location and Contractor is reponsible for all costs.)

3 → Contractor to Coord.with Dominion To Remove Lights at Start of Project and Re-install Lights Following Project

4 → Remove and Replace Air Pump/Elec.Conn. (Coordination with Property Owner for Location and Contractor is reponsible for all costs.)

-·-·-·-·- Denotes Temporary Construction Easement

SCALE
0 50' 100'

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2L(2)

FINAL PLAN

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CITY OF FAIRFAX

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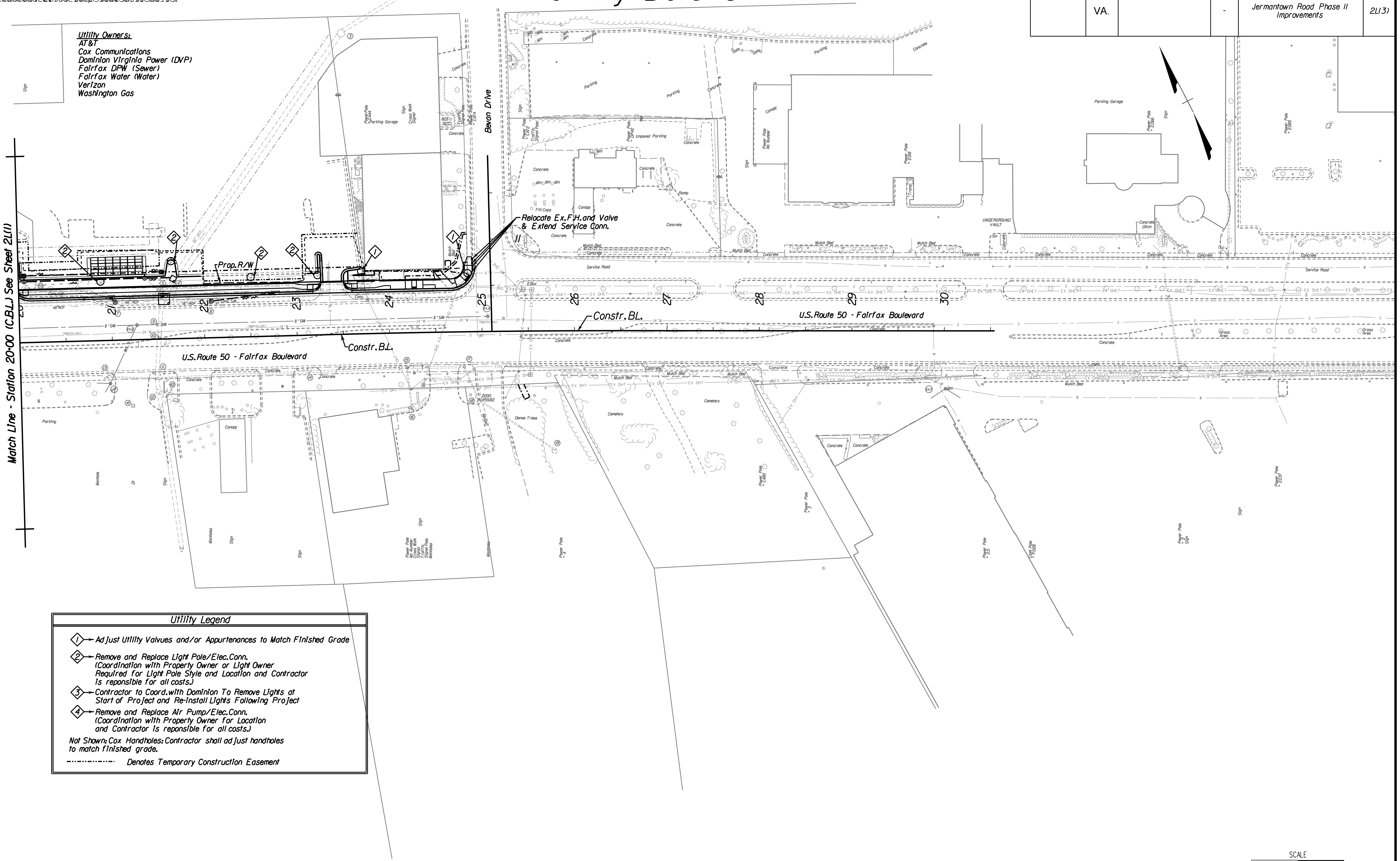
Utility Details

REVISED	STATE	FEDERAL AID PROJECT OWNER		STATE PROJECT	SHEET NO.
	VA.		-	Jermantown Road Phase II Improvements	2L(3)

Utility Owners:
- AT&T
- Cox Communications
- Dominion Virginia Power (DVP)
- Fairfax DPW (Sewer)
- Fairfax Water (Water)
- Verizon
- Washington Gas



Utility Legend

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SCALE 0 50' 100'

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
-	Jermantown Road Phase II Improvements	-	2L(3)

FINAL PLAN

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