SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL, MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE, MATTERN & CRAIG

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	U000-118-204, C-501	2E(5)

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

ROADSIDE DEVELOPMENT

CORE MIX

MIX	LBS./ ACRES	DESCRIPTION
1	▲ 100	✱ 100% CERTIFIED FINE FESCUE
2	▲ 100	100% CERTIFIED TALL FESCUE
3	▲ 50 50	50% CERTIFIED TALL FESCUE ✱ 50% CERTIFIED FINE FESCUE
4	▲	50% ORCHARDGRASS 50% CERTIFIED KENTUCKY BLUEGRASS
5	▲	100% BERMUDAGRASS
TEMPORARY		
3/1 - 5/16 and 8/16 - 3/1	50 50	50% CERTIFIED TALL FESCUE 50% BARLEY, WINTER RYE OR WINTER WHEAT
5/16 - 8/16	50 50	50% FOXTAIL MILLET 50% CERTIFIED TALL FESCUE

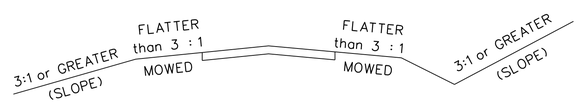
▲ ALL RATES TO BE SPECIFIED BY THE DISTRICT ROADSIDE MANAGER

✱ FINE FESCUES INCLUDE CHEWINGS, CREEPING RED, HARD, SHEEP

ADDITIVES

TYPE	LBS./ ACRES	DESCRIPTION
A	▲ 5	100% LOVEGRASS
B	▲ 22	100% BARLEY, WINTER RYE OR WINTER WHEAT
C	▲ 10	100% FOXTAIL MILLET
D	▲ 10	100% ANNUAL RYEGRASS
E	▲ 20	100% CROWNVETCH (LEGUME)
F	▲ 5	100% SERICEA LESPEDEZA (LEGUME)
G	▲ 8	100% BIRDSFOOT TREFOIL (LEGUME)
H	▲	
I	▲	
J	▲	
K	▲	

SECTION OF SEED LOCATIONS



NOTES:

APPROXIMATELY 2 ACRES WILL BE DISTURBED ON THIS PROJECT AND WILL REQUIRE THE ESTABLISHMENT OF GRASSES AND/OR LEGUMES.

✱ NOTES FOR FIELD USE ONLY

OVERSEEDING RATES SHALL BE 100 PERCENT OF THE SEED MIXTURE SUPPLIED WITHOUT FERTILIZER.

THE ENGINEER WILL REQUIRE THE CONTRACTOR TO PERFORM SUPPLEMENTAL SEEDING WHEN LESS THAN 75 PERCENT UNIFORM STAND OF THE PERMANENT GRASS SPECIFIED IN THE MIXTURES IS OBTAINED. (ANNUAL SPECIES SUCH AS, RYE AND MILLET ARE TEMPORARY VARIETIES AND REQUIRE SUPPLEMENTAL SEEDING.)

NOTES APPLY TO SCHEDULE

LEGUME SEED MIXES (BIRDSFOOT TREFOIL, CROWNVETCH, AND SERICEA LESPEDEZA) AND WEEPING LOVEGRASS SHALL NOT BE USED ON SHOULDERS AND OTHER LOCATIONS FLATTER THAN 3:1 SLOPE.

LEGUME SEED SHALL BE INOCULATED WITH THE APPROPRIATE STRAIN AND RATE OF BACTERIA. FOR HYDROSEEDING, USE FIVE TIMES THE DRY SEEDING RATE OF INOCULATE.

A TEMPORARY MIX OR EROSION CONTROL MULCH, AS DIRECTED BY THE ENGINEER, IS TO BE USED ONLY ON AREAS THAT ARE TO BE REGRADED OR LATER DISTURBED, IF LEFT DORMANT FOR MORE THAN 15 DAYS.

EROSION CONTROL MULCH, AS DIRECTED BY THE ENGINEER, IS TO BE USED ON AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN 15 DAYS BETWEEN DECEMBER 1 AND FEBRUARY 28.

EROSION CONTROL MULCH, AS LISTED ON THE VDOT APPROVED PRODUCTS LIST, SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMENDATIONS.

EROSION CONTROL MULCH SHALL PROVIDE 100 PERCENT COVERAGE OF ALL DENUDED AREAS .

SPRING & SUMMER AND FALL & WINTER DEFINED FOR THE PURPOSE OF DETERMINING WHETHER HULLED OR UNHULLED BERMUDAGRASS AND SERICEA LESPEDEZA SEED IS REQUIRED:

SPRING & SUMMER 4/1 - 9/15 - USE HULLED SEED
FALL & WINTER 9/15 - 4/1 - USE UNHULLED SEED

TYPE I MULCH (STRAW) TO BE USED ON NEWLY SEEDED AREAS ADJACENT TO ALL WATERWAYS, WETLANDS, SWAMPS, OR ANY AREA IN WHICH DRAINAGE FLOWS TOWARD AREAS UNDER THE JURISDICTION OF THE ENVIRONMENTAL REGULATORY AGENCIES.

TYPE I MULCH SHALL BE APPLIED TO PROVIDE A MINIMUM 90 PERCENT COVERAGE.

TYPE I MULCH SHALL BE TACKED WITH FIBER MULCH AT THE RATE OF 750 LBS. PER ACRE AND/OR MULCH TACKIFIER.

TYPE II MULCH (FIBER MULCH) MAY BE SUBSTITUTED FOR TYPE I MULCH AT THE RECOMMENDATION OF THE DISTRICT ROADSIDE MANAGER.

TYPE II MULCH SHALL BE APPLIED AT A RATE OF 1500 LBS. (NET DRY WEIGHT) PER ACRE TO PROVIDE A MINIMUM OF 90 PERCENT COVERAGE, AND SHALL BE APPLIED IN A SEPARATE APPLICATION.

ALL TOPSOIL IS TO BE FREE OF HARD LUMPS, CLODS, ROCKS AND FOREIGN DEBRIS AND IS TO BE HAND RAKED TO TIE INTO EXISTING LAWNS.

ALL SEED MUST BE IN CONFORMANCE WITH VDOT SEED SPECIFICATIONS FOR GRASSES & LEGUMES AND BE PROVIDED AT THE PROJECT SITE IN BAGS NOT OPENED AND LABELED FOR USE ON VDOT PROJECTS WITH A GREEN TAG CERTIFYING INSPECTION BY THE VIRGINIA CROP IMPROVEMENT ASSOCIATION.

MIX REQUIREMENTS THIS PROJECT

RECOMMENDATIONS FOR THE APPLICATION OF SEED MIXTURES (CORE MIX AND ADDITIVES), FERTILIZER, LIME, ETC. ARE TO BE OBTAINED FROM THE DISTRICT ROADSIDE MANAGER.

UNLESS OTHERWISE NOTED ALL DISTURBED AREAS NOT PAVED SHALL BE TOP SOILED, SEEDED AND STD. EC-2 PROTECTIVE COVERING PLACED (JUTE MESH, SOIL RETENTION MATS, BIODEGRADABLE PRODUCTS FROM VDOT'S APPROVED PRODUCTS LIST).

ROADSIDE DEVELOPMENT SUMMARY

PROJECT NUMBERS	⊗ TOPSOIL 2" CLASS A | B	REGULAR SEED	REGULAR OVER SEEDING	LIME	① FERT. 15-30-15	LEGUME SEED	LEGUME OVER SEEDING	TEMPORARY SEEDING	SOD
	ACRES	LBS.	LBS.	TONS	TONS	LBS.	LBS.	LBS.	S.Y.
	2.0	338	211	7.6	0.57	53	33	100	233

⊗ DENOTES ITEM(S) TO BE PAID FOR ON BASIS OF PLAN QUANTITIES IN ACCORDANCE WITH CURRENT ROAD AND BRIDGE SPECIFICATIONS.

① A SOIL TEST IS REQUIRED PRIOR TO FINAL SITE STABILIZATION. THE CONTRACTOR SHALL DETERMINE FERTILIZER APPLICATION RATES FOR THE ESTABLISHMENT OF GRASS ON THE SITE BY CONTACTING THE VIRGINIA COOPERATIVE EXTENSION OR A GEOTECHNICAL FIRM (WITH SOIL TESTING FACILITIES) TO OBTAIN A SOILS REPORT FOR NUTRIENT APPLICATION. COST FOR SOIL TEST SHALL BE INCLUDED IN THE PAY ITEM FOR FERTILIZER

SEEDING SCHEDULE

	SLOPES SEED MIX WITH ADDITIVE	MOWED SEED MIX WITH ADDITIVE	SLOPES SEED MIX WITH ADDITIVE	MOWED SEED MIX WITH ADDITIVE	SLOPES SEED MIX WITH ADDITIVE	MOWED SEED MIX WITH ADDITIVE
	SPRING MONTH & DATE 4/1 - 6/1		SUMMER MONTH & DATE 6/1 - 9/15		FALL & WINTER MONTH & DATE 9/15 - 4/1	
PROJECT NUMBERS	3, D	3, D	3, C	3, C	3, B	3, B
✱ SPECIFY KIND OF FINE FESCUE	HARD OR CHEWING	HARD OR CHEWING	HARD OR CHEWING	HARD OR CHEWING	HARD OR CHEWING	HARD OR CHEWING

	PROJECT	SHEET NO.
	U000-118-204	2E(5)

SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL, MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE, MATTERN & CRAIG

GRADING DIAGRAM AND SUMMARY

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	29	U000-118-204, C-501	2E(6)

COMMONWEALTH OF VIRGINIA
MICHAEL S. AGEE
Lic. No. 015232
PROFESSIONAL ENGINEER

MATTERN & CRAIG, INC
Roanoke, Virginia
(ROADWAY ENGINEER)

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

- ⊢130⊣ Fill — Denotes fill quantity from computer listings and/or manual cross-sections.
- ⊢130⊣ Cut — Denotes cut quantity from computer listings and/or manual cross-sections. Quantity adjusted for demolition of pavement.
- Denotes C.Y. root mat material in cut areas which is included in Regular Excavation quantities.
- Denotes C.Y. root mat material removed from fill sections and backfilled with (specify material) (Backfill with Regular Excavation and/or Borrow Excavation)
- (C) Denotes C.Y. Regular Excavation from private entrances.
- (F) Denotes C.Y. fill for private entrances.
- Denotes C.Y. unsuitable material above subgrade which is included in Regular Excavation.
- Denotes C.Y. of excavation of unsuitable mat'l. below subgrade and backfilled with (specify material)
- Denotes C.Y. Regular Excavation from drainage ditches.
- Denotes C.Y. Minor Structure Excavation.
- Denotes C.Y. existing pavement to be removed as "Demolition of Pavement" from fill sections and backfilled with (specify mat'l.)
- Denotes C.Y. existing pavement to be removed as Demolition of Pavement in cut sections within construction limits and is not included in the Regular Excavation quantities.
- Denotes C.Y. Haul. (Haul Material shown will be C.Y. of mat'l. not compacted.)
- Denotes C.Y. fill for S.W.M. (Stormwater Management Basin)
- Denotes C.Y. cut from S.W.M. (Stormwater Management Basin)
- Denotes Borrow Material (Min. CBR, specify)
- Denotes Surplus Material.
- Denotes C.Y. fill for drainage ditches.

NOTE: FOR ESTIMATING PURPOSED ONLY EARTHWORK TO BE PAID FOR ON A LUMP SUM BASIS.

Location	Roadway Cut (1) (8)	Root Mat in Cut Sections	Root Mat in Fill Sections	Cut - Ditches (9)	Fill - Ditches (9)	Unsuitable Material: Below Subgrade	Unsuitable Material: Above Subgrade	Roadway Fill (10) (8)	Entrances: Cut	Entrances: Fill	Total Regular Excavation	Total Fill	Demolition of Pavement (2)	Minor Structure Excavation (2)	Stormwater Management Basins (5) (2): Cut	Stormwater Management Basins (5) (2): Fill	Surplus ~~Borrow~~ (Embankment)
	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.
Kemper St	286							906			286	906	1647				
Ramp B-1	37							98			37	98	252				
Ramp B-2	99							102			99	102	116				
Ramp C-1	24							67			24	67	65				
Ramp C-2	215							61			215	61	176				
Ramp D-1	125							15			125	15	175				
Ramp D-2	412							402			412	402	286				
Rte. 29	2989							17			2989	17	0				
FORMULAS	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
TOTALS	(3) 4187	(4)	(3) (7)	(3)	(7)	(3) (7)	(4)	(7) 1668	(3)	(7)	4187	1668	2717			(7)	2519

~~The borrow quantity shown was computed on the basis of the average shrinkage or swell factor for the general vicinity of the project. The contractor will be responsible for determining the actual factor for the site(s) from which he proposes to secure borrow material needed to complete this project.~~

~~The embankment quantity shown has not been adjusted for shrinkage or swell factors. The contractor will be responsible for determining the effect of the shrinkage or swell factor of the embankment material, and no adjustment will be made in pay quantities for this factor. The contractor shall determine the actual quantity of embankment material needed to complete this project.~~

(X) Denotes items to be paid for on a basis of plan quantities in accordance with current VDOT Road and Bridge Specifications.

(1) Cut quantity shown does not include the material removed as Demolition of Pavement.

(2) Quantity shown for use in Grading Diagram only. See other Summaries for pay item(s).

(3) Included in Total Regular Excavation.

(4) Included in Roadway Cut quantity.

(5) Quantities for Temporary Sediment Basins and Temporary Sediment Traps are included with the Stormwater Management Basin quantities.

(6) Denotes pay item.

(7) Included in total fill quantity.

(8) This quantity comes from the computer listings and/or manual cross-sections and may be adjusted for other quantities.

(9) Volumes obtained for Cut Ditches and Fill Ditches not included in computer listings.

(10) Includes settlement of in-place soil.

FORMULAS

Roadway Cut (C) = Unadjusted Cut from Computer Listings or Manual Cross-Sections minus (-) Demolition of Pavement.

Roadway Fill (J) = Fill Required plus (+) Material for Backfill of Demolition of Pavement Areas in Fill (for heights of fill < 3 feet below subgrade)

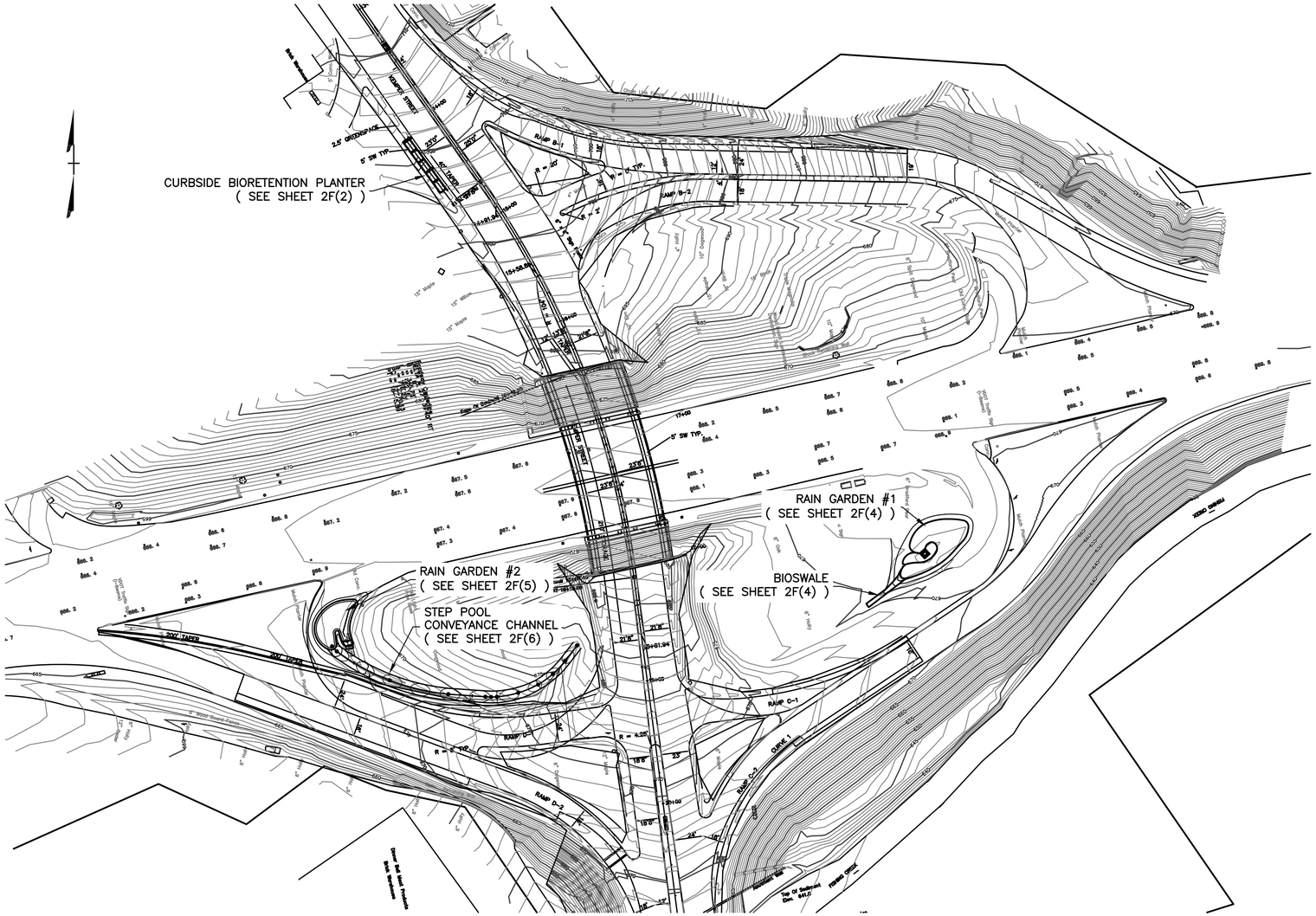
Total Reg. Excav. (M) = C + E + F + H + K

Total Fill (N) = J + E + G + H + L + R

~~Borrow~~ (S) = [N - ([C + F + K + P + Q - D - I] ~~x Compaction Factor)] ÷ Compaction Factor for Borrow Site~~

(Embankment) (S) = N - (C + F + K + P + Q - D - I) (Embankment = Total Fill - Usable Cut) Estimated Material to be obtained off-site.

PROJECT	SHEET NO.
U000-118-204	2E(6)



OVERALL PLAN – LOW–IMPACT STORMWATER FEATURES

SCALE: 1"=50'

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

GENERAL NOTES & SPECIFICATIONS:

1. THIS PROJECT INCLUDES LOW–IMPACT DESIGN (LID) STORMWATER MEASURES (AS SHOWN) THAT RELY UPON INFILTRATION AS A CRITICAL COMPONENT. THESE MEASURES ARE EXTREMELY SENSITIVE TO COMPACTION AND CONTAMINATION FROM SOILS RUNOFF AND TRACKING DURING CONSTRUCTION. CONTRACTOR SHALL TRAIN AND INFORM ALL CONSTRUCTION PERSONNEL TO ENSURE AWARENESS OF THESE CONCERNS, AND TAKE NECESSARY MEASURES TO PROTECT THESE MEASURES. SPECIFIC ACTIONS MAY INCLUDE:
   - SEALING/PROTECTING INLETS FROM ALL RUNOFF
   - CONSTRUCT LID PRACTICES ONLY AFTER ALL UP–GRADIENT CONSTRUCTION AREAS ARE FULLY STABILIZED
   - MINIMIZING DURATION OF OPEN EXCAVATIONS
   - DO NOT STOCKPILE OR HANDLE SOILS UPSTREAM OF PRACTICES
   - WORK FROM UPSTREAM AREAS TOWARD DOWNSTREAM AREAS
   - COVER WORK AREAS WITH PLASTIC, TARPS OR GEOTEXTILES
2. PROTECT ALL TREES TO BE PRESERVED WITHIN CONSTRUCTION ZONES WITH APPROPRIATE MEASURES.
3. ALL EXCAVATED AREAS TO RECEIVE LID MEASURES SHALL BE INSPECTED AND TESTED FOR INFILTRATION (IF REQUIRED) BY OWNER'S REPRESENTATIVE PRIOR TO PLACEMENT OF DRAINAGE STONE.
4. EXCAVATION FOR BIORETENTION PRACTICES SHALL BE PERFORMED IN A MANNER THAT DOES NOT COMPACT, SMEAR, OR SMOOTH THE SUBGRADE SOILS. SURFACE SHOULD BE ROUGH AND LOOSE PRIOR TO PLACEMENT OF STONE OR STRUCTURAL SOIL.
5. UNDERDRAIN CONNECTIONS TO EXISTING STORM SEWER SYSTEM SHALL BE MADE IN ACCORDANCE WITH CITY OF LYNCHBURG UTILITY STANDARDS.
6. MATERIALS AND CONSTRUCTION METHODS RELATED TO THE RAIN GARDENS AND BIORETENTION PLANTER SHOWN HEREIN SHALL COMPLY WITH DESIGN SPECIFICATION #9 – BIORETENTION, VERSION 1.9, BY THE VIRGINIA DEPARTMENT OF CONSERVATION & RECREATION.
7. GENERAL FILTER MEDIA COMPOSITION – THE RECOMMENDED BIORETENTION SOIL MIXTURE IS GENERALLY CLASSIFIED AS A LOAMY SAND ON THE USDA TEXTURE TRIANGLE, WITH THE FOLLOWING COMPOSITION:

   85% to 88% SAND;
   8% to 12% SOIL FINES, AND;
   3% to 5% ORGANIC MATTER.

   ORGANIC MATTER SHALL BE PROVIDED BY COMPOST MEETING THE REQUIREMENTS OF THE U.S. COMPOSTING COUNCIL (USCC).
8. INFILTRATION RATE – THE BIORETENTION SOIL MEDIA SHALL HAVE A MINIMUM INFILTRATION RATE OF 1 TO 2 INCHES PER HOUR, MEASURED AFTER MEDIA HAS SETTLED AND FULLY STABILIZED.
9. MULCH – MULCH LAYER SHALL CONSIST OF 2" TO 3" DEPTH OF SHREDDED, AGED HARDWOOD MULCH. CONTRACTOR SHALL REMOVE AND REPLACE ANY MULCH THAT FLOATS DURING OR AFTER THE FIRST THREE INUNDATIONS OF THE BIORETENTION SYSTEMS.
10. UNDERDRAIN PIPING – UNDERDRAIN PIPING SHALL BE INSTALLED AT THE DEPTHS AND LOCATIONS INDICATED. PIPE AND FITTINGS SHALL CONSIST OF 4–INCH DIAMETER SCHEDULE 40 PVC. PIPING SHALL HAVE ½" DIAMETER PERFORATIONS SPACED EVERY 24" ALONG THE LENGTH OF THE PIPE. PIPE SHALL BE INSTALLED WITH THE PERFORATIONS FACING DOWNWARD. CLEANOUTS SHALL CONSIST OF 4–INCH DIAMETER SCHEDULE 40 PVC THREADED PLUGS, INSTALLED FLUSH WITH THE TOP OF MULCH ELEVATION.
11. STONE LAYER – STONE STORAGE LAYERS SHALL CONSIST OF THE STANDARD VDOT GRADATIONS INDICATED. ALL STONE SHALL BE DOUBLE WASHED AND FIELD VERIFIED TO BE FREE OF DUST AND FINE PARTICLES TO PREVENT CLOGGING OF THE SUBGRADE LAYER.

HDLA
HARVEY DESIGN
LAND ARCHITECTS
901 Jefferson St., Ste 208 Lynchburg, VA 24504
Tel: 434-528-5184 www.HDLA.biz

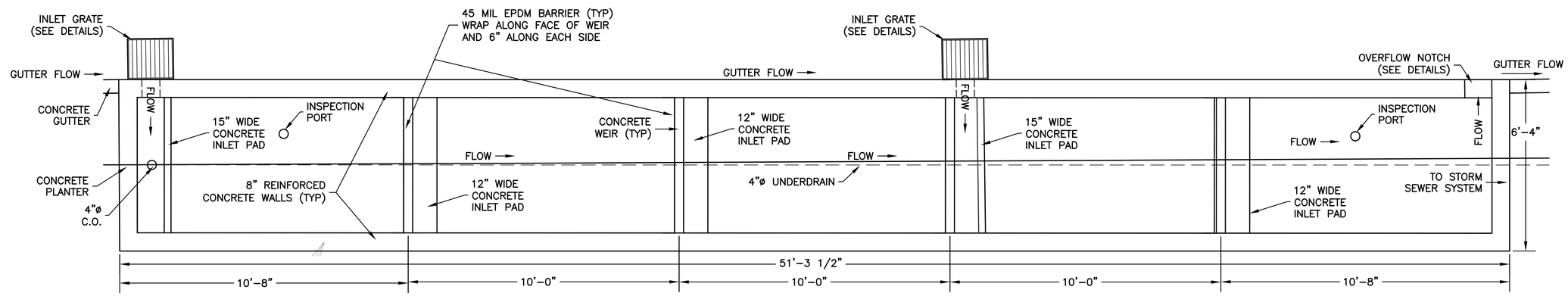
CES
CIVIL & ENVIRONMENTAL SERVICES
Sustainable Site Design
191 Satinwood Lane, Nellysford, VA 22958
Tel: 434-361-1443 www.sustainable-sites.com

COMMONWEALTH OF VIRGINIA
CHRISTOPHER E. SONNE
Lic. No. 020621
9/12/2013
PROFESSIONAL ENGINEER

KEMPER STREET BRIDGE
KEMPER STREET OVER LYNCHBURG EXPRESSWAY (RT.29)
LYNCHBURG, VIRGINIA

MRK	DATE	DESCRIPTION

COMM NO:
DATE: 09–12–2013
DRAWN: CES DESIGN: CES
CHECK: HDLA
CAD FILE:
SHEET SCALE: AS SHOWN
SHEET TITLE
OVERALL SITE PLAN
SHT. NO. 2F(1)

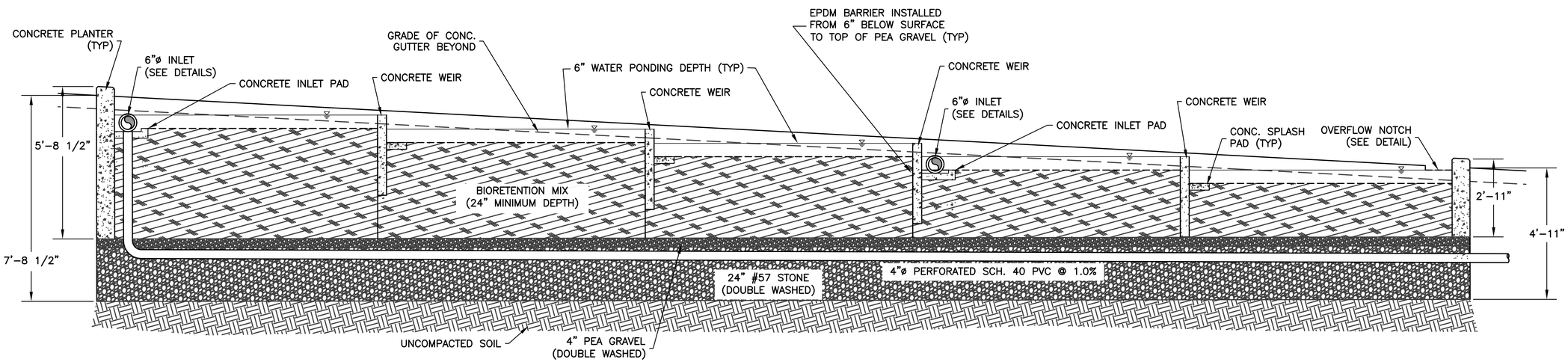


BIORETENTION PLANTER – PLAN VIEW

SCALE: 1/2"=1'

GRAPHIC SCALE

(IN FEET)
1 inch = 2 ft.



BIORETENTION PLANTER – SECTION VIEW

SCALE: 1/2"=1'

BIORETENTION PLANTER NOTES:

1. INLET STRUCTURE SHALL CONSIST OF DUCTILE IRON COMBINATION INLET FRAME, GRATE & CURB BOX, WITH 8"ø REAR OUTLET. DRAINAGE GRATE TYPE SHALL BE TYPE "V" (VANE GRATE). INLET AND GRATE SHALL BE MODEL R-3165, AS MANUFACTURED BY NEENAH FOUNDRY, OR APPROVED EQUAL.
2. UPON INSTALLATION, DRAINAGE INLETS SHALL BE COVERED AND SEALED WITH PLASTIC TO PREVENT CONTAMINATION OF SUBSOILS. REMOVE PLASTIC WHEN PLACING BIORETENTION PLANTER IN SERVICE.
3. PLANTER STRUCTURE SHALL CONSIST OF 5,000 PSI PRECAST CONCRETE OF THE DIMENSIONS SHOWN. UNLESS OTHERWISE INDICATED, ALL PLANTER WALLS SHALL BE 8" THICK. PROVIDE 3/4" CHAMFER ON ALL EXPOSED CORNERS OF PLANTERS. SLOPE TOP OF PLANTER WALLS 1/4" – 1/8" TO PREVENT PONDING. GROUT SMOOTH ALL EXPOSED JOINTS. ALL EXPOSED PORTIONS OF THE CONCRETE PLANTERS SHALL RECEIVE A RUBBED FINISH.
4. PRECAST SUPPLIER SHALL DESIGN PLANTER STRUCTURES IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. MINIMUM DESIGN LOADINGS SHALL INCLUDE A FLOWABLE FILL/BACKFILL DENSITY OF 120 LB/CF; PLANTING MIX DENSITY OF 90 LB/CF; AND H-20 TRAFFIC LOADING SURCHARGE ON THE STREET SIDE OF THE PLANTERS. INTERMEDIATE SUPPORTS, INTEGRAL BEAMS, OR OTHER APPROVED METHODS SHALL BE INCORPORATED INTO THE DESIGN TO MEET THESE REQUIREMENTS. STRUCTURAL DESIGN CALCULATIONS SHALL BE PROVIDED FOR REVIEW AS PART OF THE SHOP DRAWING SUBMITTAL.
5. CLEANOUT PLUGS SHALL BE THREADED BRASS, SET FLUSH WITH SPLASH BLOCK SURFACE.
6. PROVIDE MINIMUM PLANTER SOIL MIX DEPTH OF 24" IN ALL SECTIONS.
7. REFER TO SHEET 2F(3) FOR BIORETENTION PLANTER DETAILS.
8. CONCRETE WEIRS SHALL BE 36" TALL, WITH 6" EXPOSED ON UPPER SIDE (TYP).
9. EPDM BARRIER SHALL CONSIST OF 45 MIL POND LINER.
10. REFER TO SHEET 2F(1) FOR BIORETENTION SPECIFICATIONS.
11. PLANTER SHALL MATCH/MEET EXISTING CG-6 CURBING AT EACH END.

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COMMONWEALTH OF VIRGINIA
CHRISTOPHER E. SONNE
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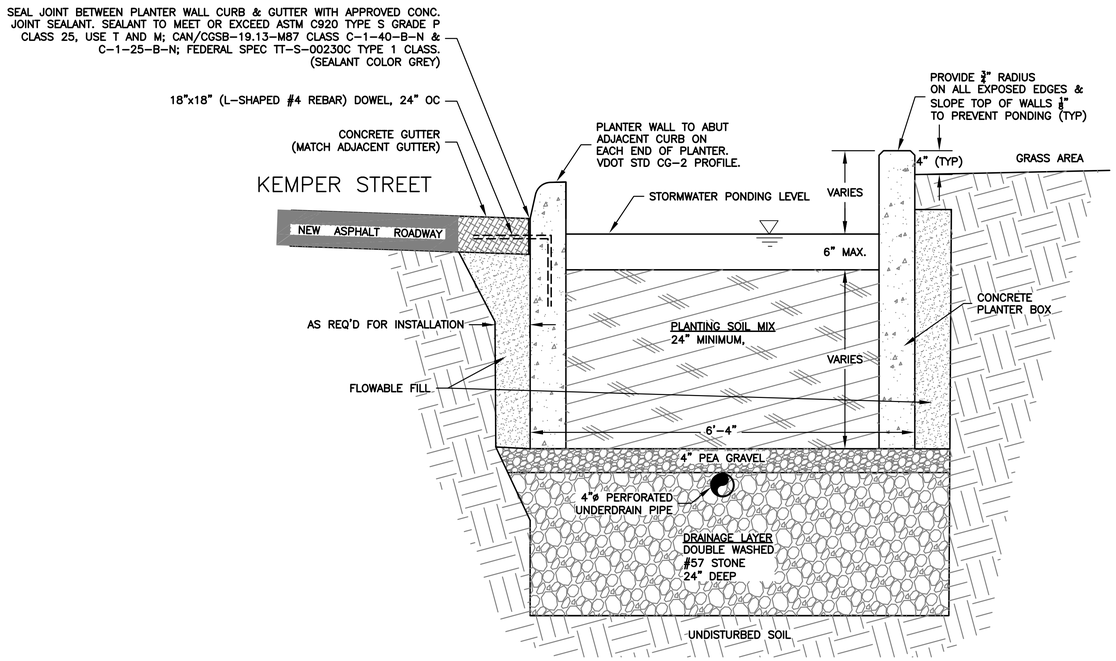
9/12/2013
PROFESSIONAL ENGINEER

KEMPER STREET BRIDGE
KEMPER STREET OVER
LYNCHBURG EXPRESSWAY (RT.29)
LYNCHBURG, VIRGINIA

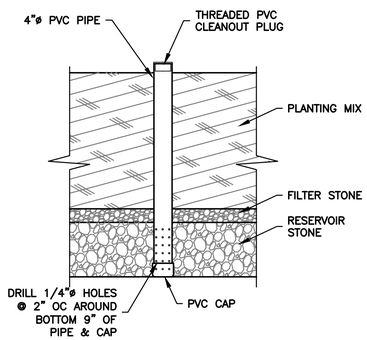
MRK	DATE	DESCRIPTION

COMM NO:
DATE: 09-12-2013
DRAWN: CES DESIGN: CES
CHECK: HDLA
CAD FILE:
SHEET SCALE: AS SHOWN
SHEET TITLE
BIORETENTION PLANTER
SHT. NO. 2F(2)



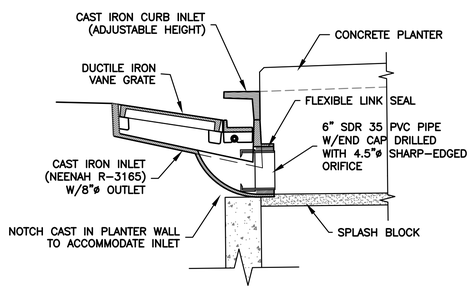
CROSS SECTION KEMPER ST. PLANTER

SCALE: 1"=1'



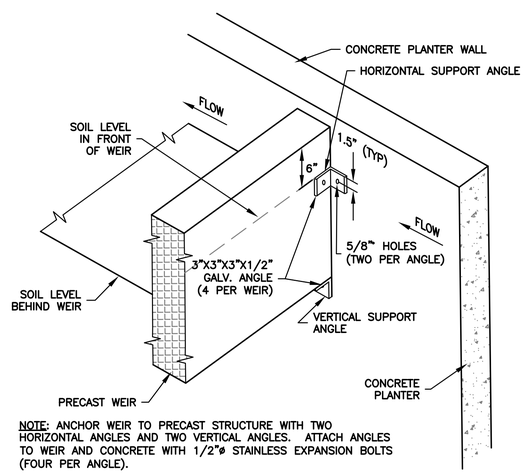
INSPECTION PORT DETAIL

SCALE: NONE



GRATE INLET DETAIL – KEMPER ST. PLANTER

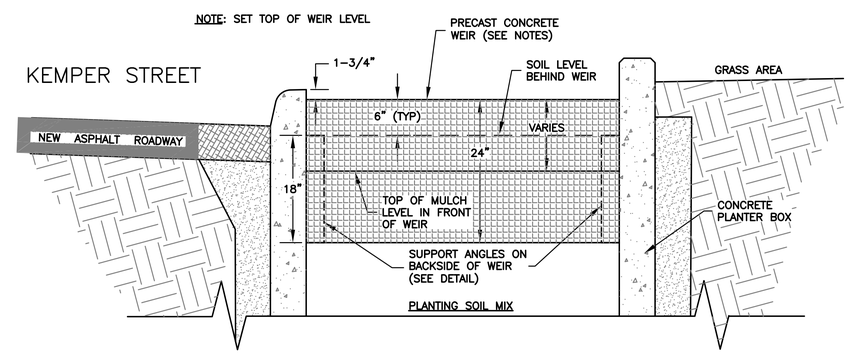
SCALE: 1"=1'



NOTE: ANCHOR WEIR TO PRECAST STRUCTURE WITH TWO HORIZONTAL ANGLES AND TWO VERTICAL ANGLES. ATTACH ANGLES TO WEIR AND CONCRETE WITH 1/2"ø STAINLESS EXPANSION BOLTS (FOUR PER ANGLE).

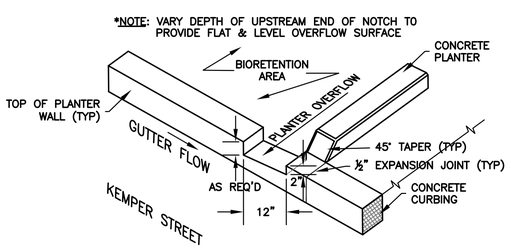
WEIR MOUNTING DETAIL – KEMPER ST. PLANTER

SCALE: NONE



CROSS SECTION AT WEIR – KEMPER ST. PLANTER

SCALE: 1"=1'



OVERFLOW NOTCH DETAIL – KEMPER ST. PLANTER

SCALE: NONE

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Tel: 434-361-1443 www.sustainable-sites.com

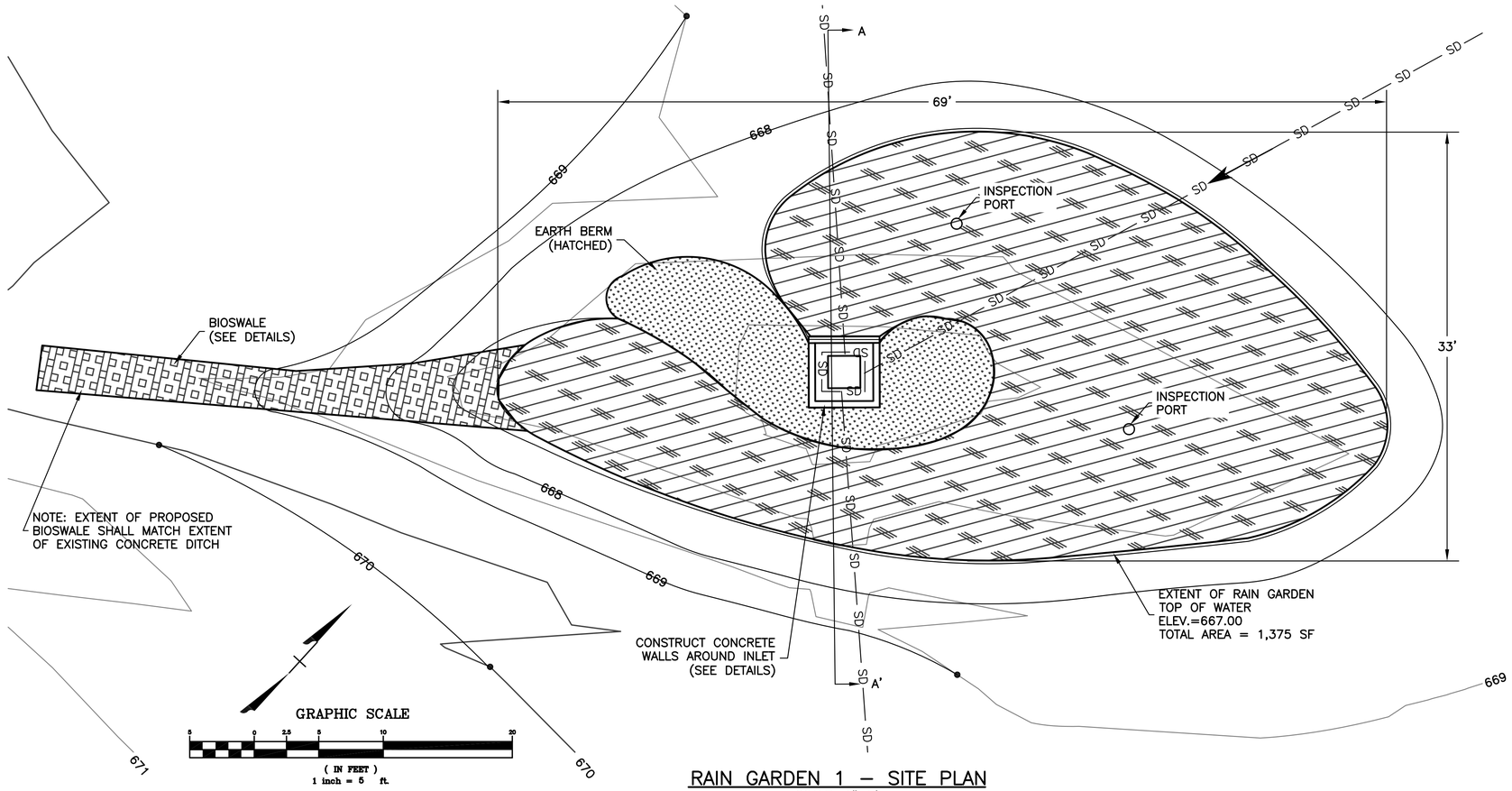
COMMONWEALTH OF VIRGINIA
CHRISTOPHER E. SONNE
Lic. No. 020621
9/12/2013
PROFESSIONAL ENGINEER

KEMPER STREET BRIDGE
KEMPER STREET OVER LYNCHBURG EXPRESSWAY (RT.29)

LYNCHBURG, VIRGINIA

MRK	DATE	DESCRIPTION

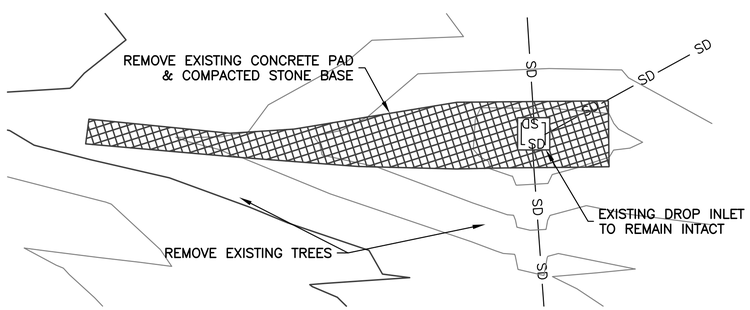
COMM NO:
DATE: 09-12-2013
DRAWN: CES DESIGN: CES
CHECK: HDLA
CAD FILE:
SHEET SCALE: AS SHOWN
SHEET TITLE
PLANTER DETAILS
SHT. NO. 2F(3)



REFER TO SHEET 2F(1) FOR BIORETENTION SPECIFICATIONS.

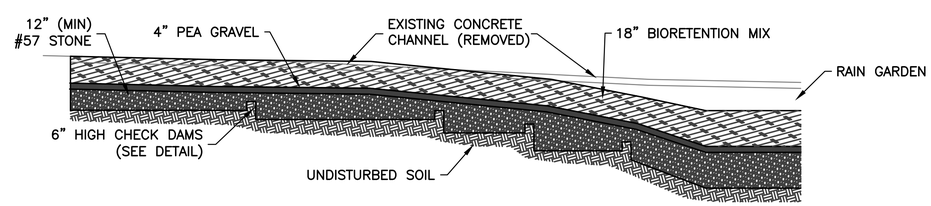
RAIN GARDEN 1 – SITE PLAN

SCALE: 1"=5'



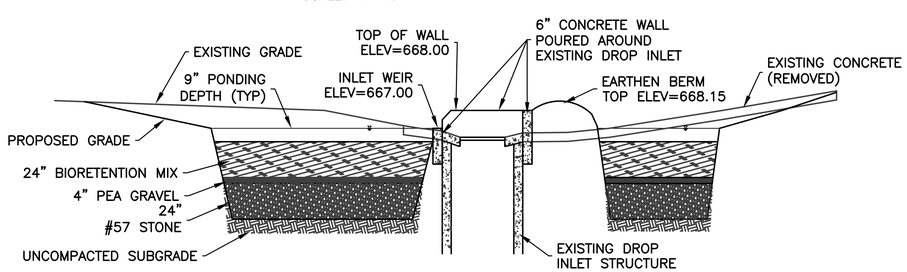
RAIN GARDEN 1 – DEMOLITION PLAN

SCALE: 1"=10'



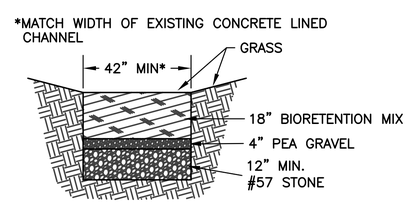
BIOSWALE CENTERLINE SECTION

SCALE: 1"=4'



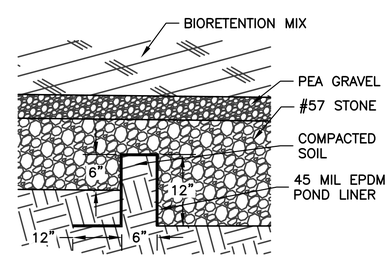
RAIN GARDEN 1 – SECTION A–A'

SCALE: 1"=4'



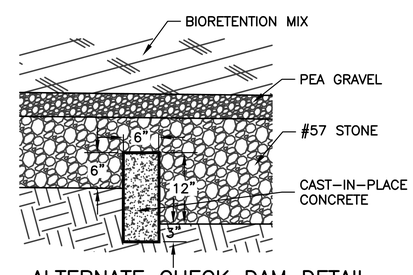
BIOSWALE CROSS–SECTION

SCALE: NONE



CHECK DAM DETAIL

SCALE: NONE



ALTERNATE CHECK DAM DETAIL

SCALE: NONE

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COMMONWEALTH OF VIRGINIA
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9/12/2013
PROFESSIONAL ENGINEER

KEMPER STREET BRIDGE
KEMPER STREET OVER LYNCHBURG EXPRESSWAY (RT.29)

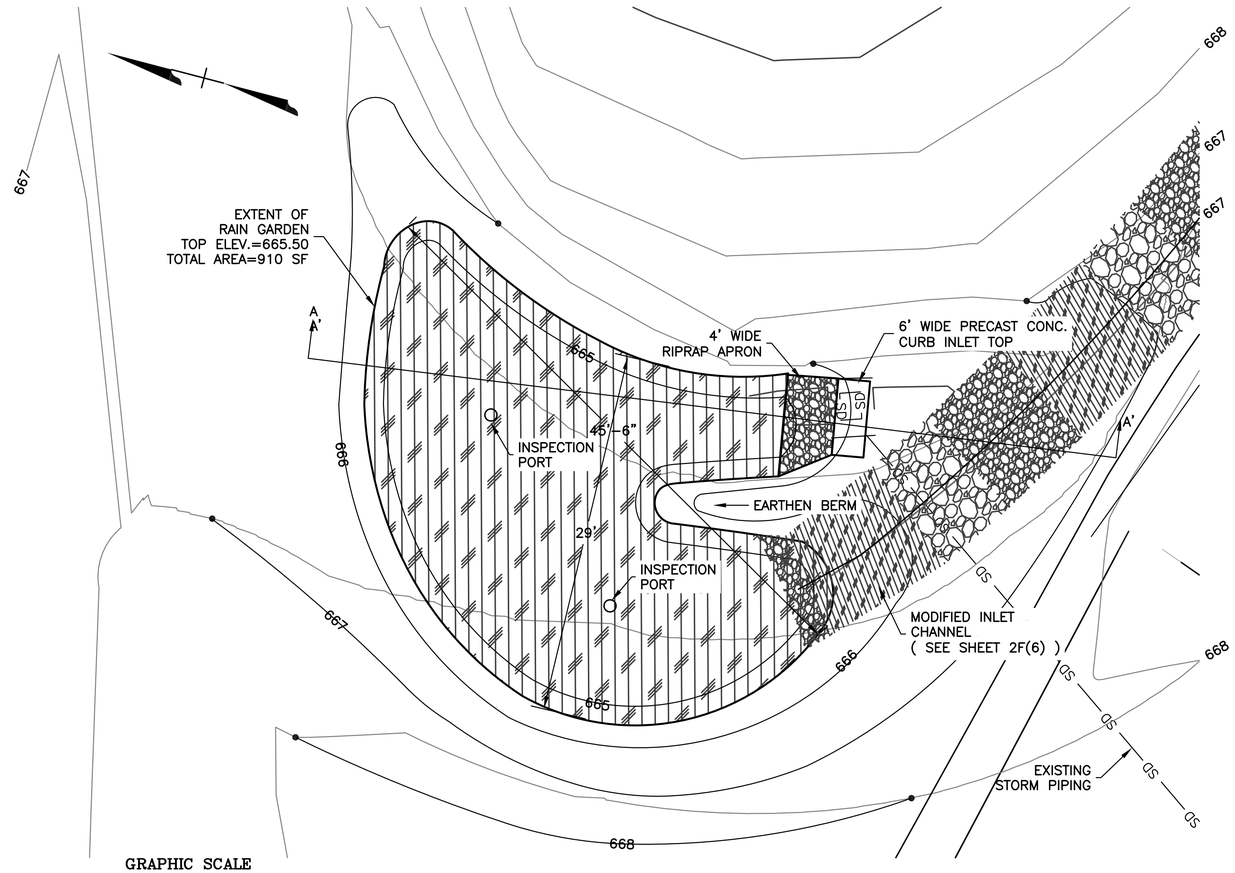
LYNCHBURG, VIRGINIA

MRK	DATE	DESCRIPTION

COMM NO:
DATE: 09–12–2013
DRAWN: CES DESIGN: CES
CHECK: HDLA
CAD FILE:
SHEET SCALE: AS SHOWN
SHEET TITLE

RAIN GARDEN NO. 1

SHT. NO. 2F(4)



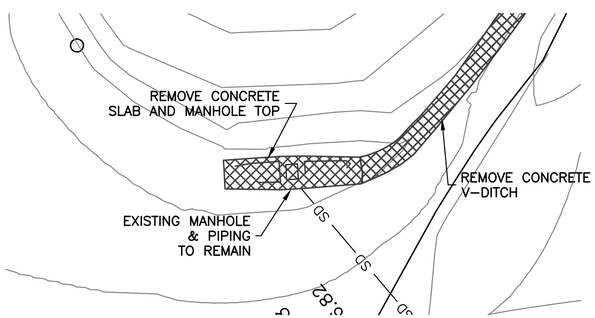
GRAPHIC SCALE

(IN FEET)
1 inch = 5 ft.

RAIN GARDEN 2 – SITE PLAN

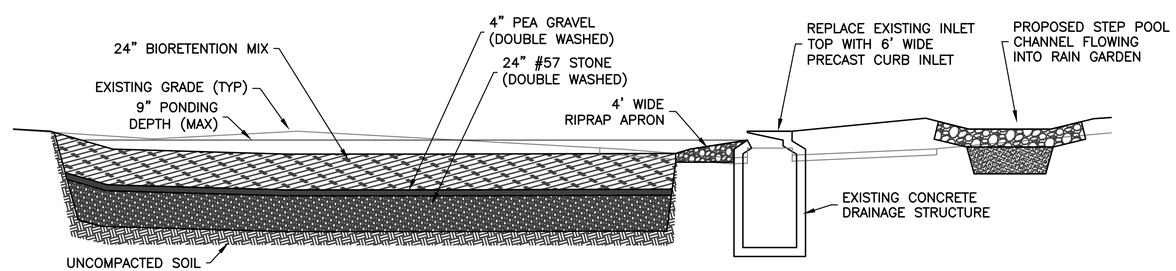
SCALE: 1"=5'

REFER TO SHEET 2F(1) FOR BIORETENTION SPECIFICATIONS.



RAIN GARDEN 2 – DEMOLITION PLAN

SCALE: 1"=10'



RAIN GARDEN 2 – SECTION A–A'

SCALE: 1"=4'

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KEMPER STREET OVER
LYNCHBURG EXPRESSWAY (RT.29)

LYNCHBURG, VIRGINIA

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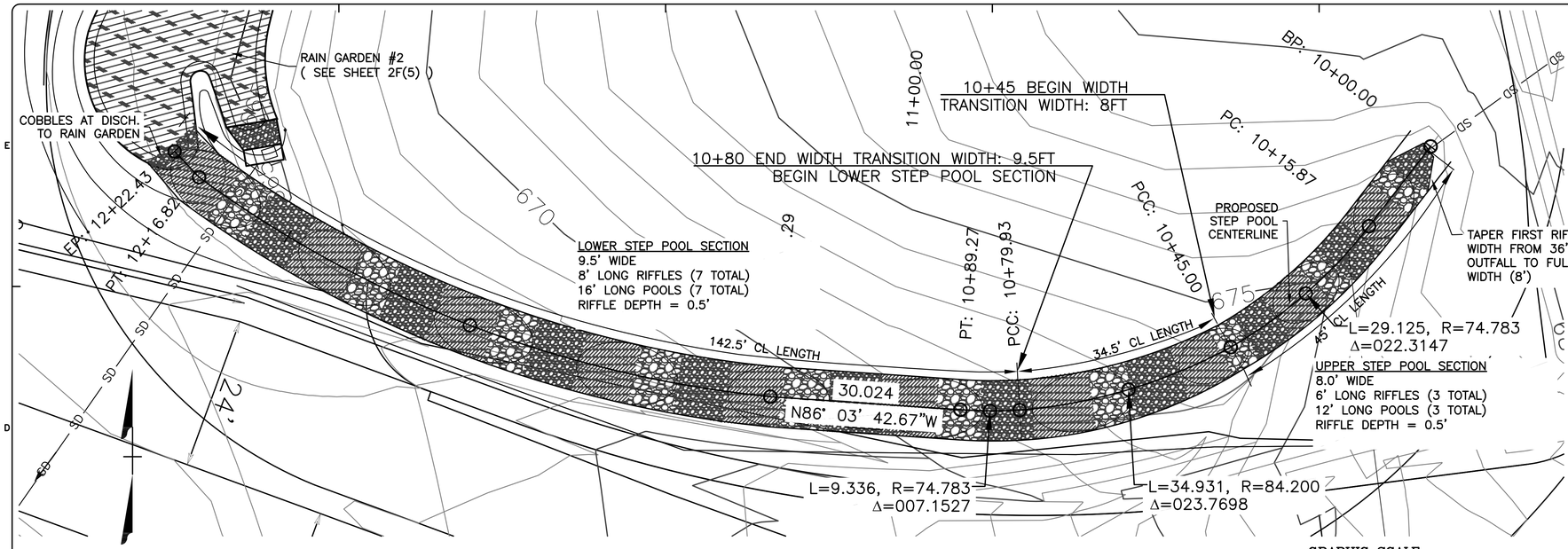
CHECK: HDLA
CAD FILE:
SHEET SCALE: AS SHOWN
SHEET TITLE

RAIN GARDEN
NO. 2

SHT. NO.
2F(5)

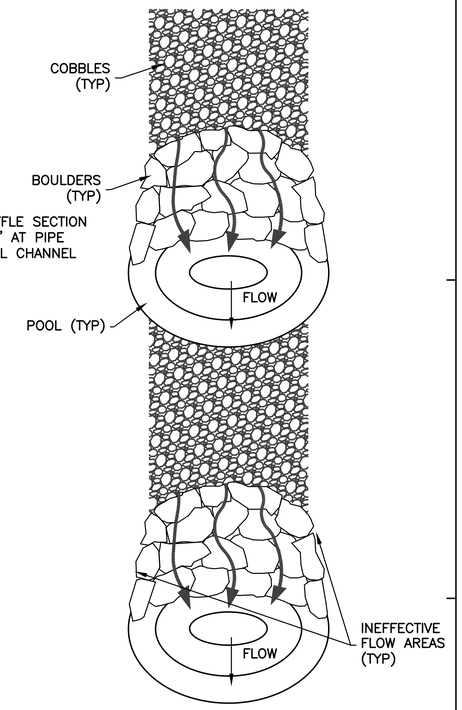


STEP POOL CONVEYANCE – PLAN VIEW

SCALE: 1"=10'

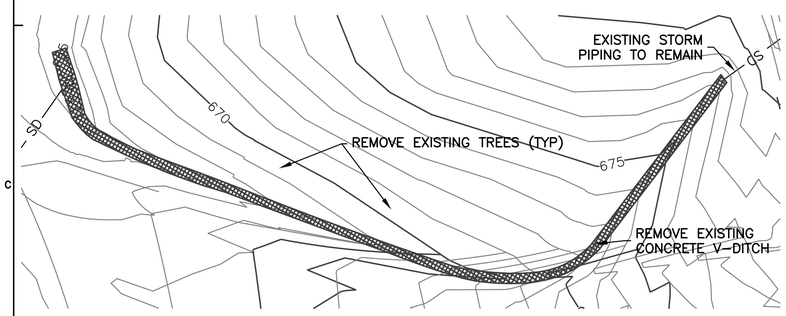
GRAPHIC SCALE

(IN FEET)
1 inch = 10 ft.



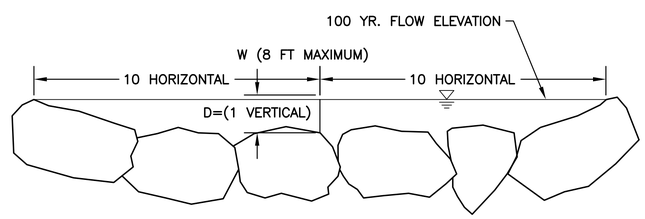
RIFFLE POOL SEQUENCE (TYPICAL)

SCALE: NONE



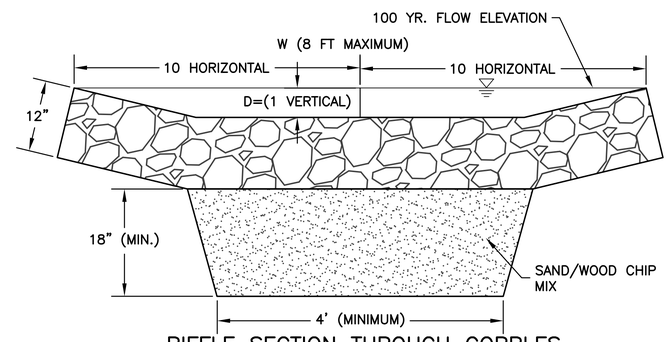
STEP POOL CONVEYANCE – DEMOLITION PLAN

SCALE: 1"=20'



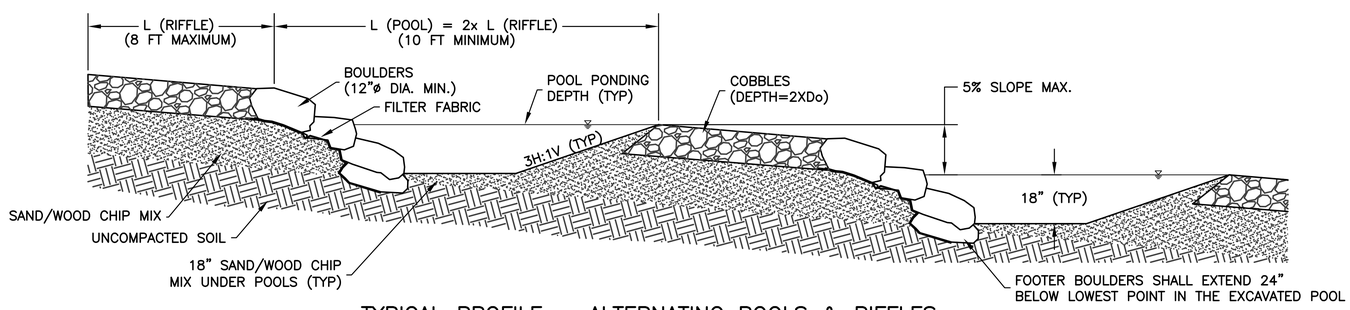
RIFFLE SECTION THROUGH BOULDERS

SCALE: NONE



RIFFLE SECTION THROUGH COBBLES

SCALE: NONE



TYPICAL PROFILE – ALTERNATING POOLS & RIFFLES

SCALE: NONE

STEP POOL CONVEYANCE CHANNEL NOTES:

1. POOLS SHALL BE CONSTRUCTED WITH MINIMUM SIDE SLOPE OF 3H:1V. MINIMUM DEPTH RATIO FOR RIFFLES IS 10H:1V.
2. SAND/WOOD CHIP FILTER MEDIUM SHALL MEET THE AASHTO–M–6 OR ASTM–C–33, 0.02 INCHES TO 0.04 INCHES IN SIZE. SAND SUBSTITUTIONS SUCH AS DIABASE AND GRAYSTONE (AASHTO #10) ARE NOT ACCEPTABLE. NO CALCIUM CARBONATE OR DOLOMTIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND. WOOD CHIPS ARE TO BE ADDED TO THE SAND MIX AT 20% BY VOLUME TO INCREASE ORGANIC CONTENT AND PROMOTE PLANT GROWTH AND SUSTAINABILITY.
3. MINIMUM DEPTH OF SAND/WOOD CHIP FILTER MEDIUM BELOW BOTTOM OF POOLS SHALL BE 18".
4. FILTER FABRIC SHALL BE PLACED UNDER ALL BOULDERS, AS INDICATED. TO PREVENT UNDERCUTTING, A CONTINUOUS SHEET OF FILTER FABRIC SHALL BE USED ALONG THE CROSS–SECTION. FILTER FABRIC SHALL NOT BE PLACED UNDER RIFFLES OR POOLS.
5. BOULDERS SERVE AS THE WEIR COMPONENT OF THE RIFFLE GRADE CONTROL STRUCTURES. BOULDERS SHOULD BE ARRANGED IN A CURVED MANNER AS SHOWN. THIS ARRANGEMENT IS INTENDED TO ENCOURAGE FLOW DEFLECTION TO THE CENTER OF THE POOLS AND THE CREATION OF INEFFECTIVE FLOW AREAS NEAR THE CHANNEL BANKS. TO ACHIEVE THIS, THE BOULDERS SHALL BE ARRANGED HORIZONTALLY IN THE CENTER OF THE CHANNEL AND THE ARMS ON EITHER SIDE OF THE CHANNEL SHALL BE EXTENDED PARABOLICALLY (APPROXIMATELY 20° ANGLE LONGITUDINALLY TO THE CENTER OF THE POOLS). THE BOULDERS SHOULD BE TABULAR IN SHAPE TO ENCOURAGE INTERLOCKING.
6. FOOTER BOULDERS SHALL BE ANCHORED AT LEAST 24 INCHES BELOW THE LOWEST EXCAVATED ELEVATION IN THE POOLS.
7. BOULDERS SHALL BE EITHER SANDSTONE OR GRANITE. COBBLES SHALL BE QUARTZ OR GRANITE. LIMESTONE SHALL NOT BE USED.

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KEMPER STREET BRIDGE

KEMPER STREET OVER
LYNCHBURG EXPRESSWAY (RT.29)

LYNCHBURG, VIRGINIA

MRK	DATE	DESCRIPTION

COMM NO:
DATE: 09–12–2013
DRAWN: CES DESIGN: CES
CHECK: HDLA
CAD FILE:
SHEET SCALE: AS SHOWN
SHEET TITLE
STEP POOL CONVEYANCE

SHT. NO. 2F(6)

EXISTING TREE DESIGNATION KEY

	EXISTING TREE TO REMAIN.
	EXISTING TREE TO BE REMOVED. INCLUDING ROOT REMOVAL.
	EXISTING TREE TO BE REMOVED. REMOVE TREE DOWN TO GRADE ONLY.

REVISE TO INCLUDE ROOT REMOVAL

1

EXISTING TREE TO BE REMOVED. GRIND TREE TO GRADE. (TYP)

SAFETY NETTING FOR PROTECTING EXISTING TREES DURING CONSTRUCTION.

EXISTING TREES TO REMAIN TO BE PROTECTED AT DRIPLINE. (TYP)

QUADRANT 'A'

QUADRANT 'B'

QUADRANT 'C'

QUADRANT 'D'

EXISTING TREE TO BE REMOVED, INCLUDING ROOT BALL REMOVAL. (TYP)

SAFETY NETTING FOR PROTECTING EXISTING TREES DURING CONSTRUCTION.

KEMPER STREET

17TH STREET

BUCHANAN ST.

BLAKE

LYNCHBURG EXPRESSWAY (RT. 29)

RAMP B-1

RAMP B-2

RAMP C-1

RAMP C-2

RAMP D-1

RAMP D-2

ARTURO FERNANDEZ LOPEZ
INST. No. 080002700
PARCEL ID. 02640009

CITY OF LYNCHBURG
INST. No. 090005291
PARCEL ID. 02702005

LELIA H. PROCTOR
D.B. 625, PG. 269
PARCEL ID. 02639001

SIMON J. REPPERT
D.B. 1069, PG. 1
PARCEL ID. 02640002

EVA B. MASON
D.B. 437, PG. 078
PARCEL ID. 02640006

GREGORY P. SCHULER
INST. No. 040000587
PARCEL ID. 02640007

DINNER BELL MEAT PRODUCTS, INC.
INST. No. 090000721
PARCEL ID. 05001002

NORTH

0 20' 40'
SCALE:1:20

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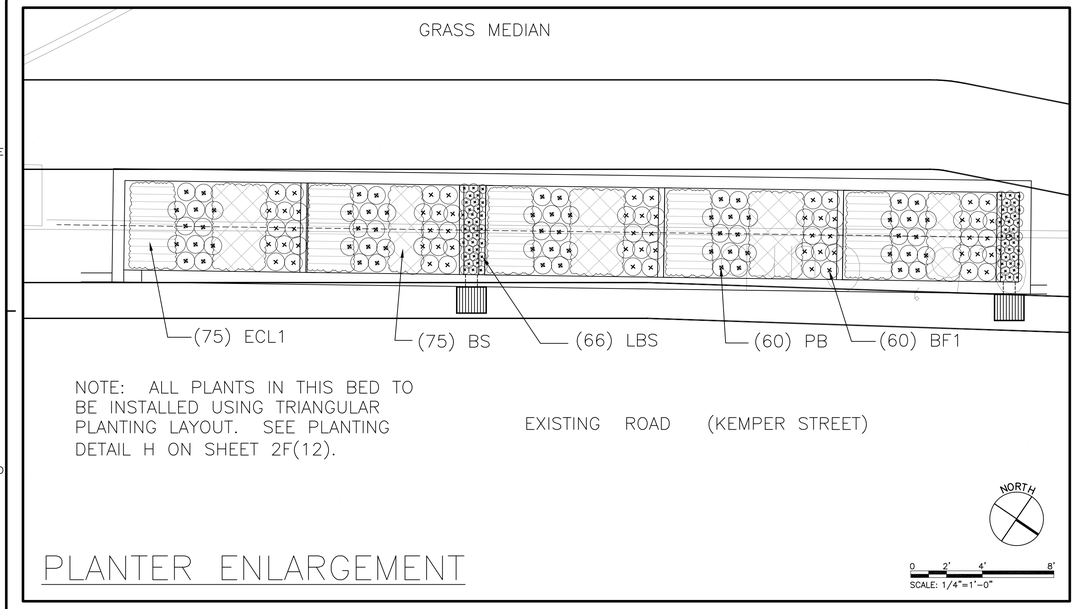
COMMONWEALTH OF VIRGINIA
PROCTOR S. HARVEY
Cert. No. 080
09-12-13
LANDSCAPE ARCHITECT

KEMPER STREET BRIDGE
KEMPER STREET OVER LYNCHBURG EXPRESSWAY (RT.29)
LYNCHBURG, VIRGINIA

MRK	DATE	DESCRIPTION
1	7/22/2014	Revised to include root removal by Mattern & Craig Inc.

COMM NO:
DATE: 09-12-2013
DRAWN: NH/CA DESIGN: PH/CA
CHECK: PH
CAD FILE:
SHEET SCALE: AS SHOWN
SHEET TITLE
TREE DEMO AND PROTECTION
SHT. NO. 2F(7)



PLANTER ENLARGEMENT

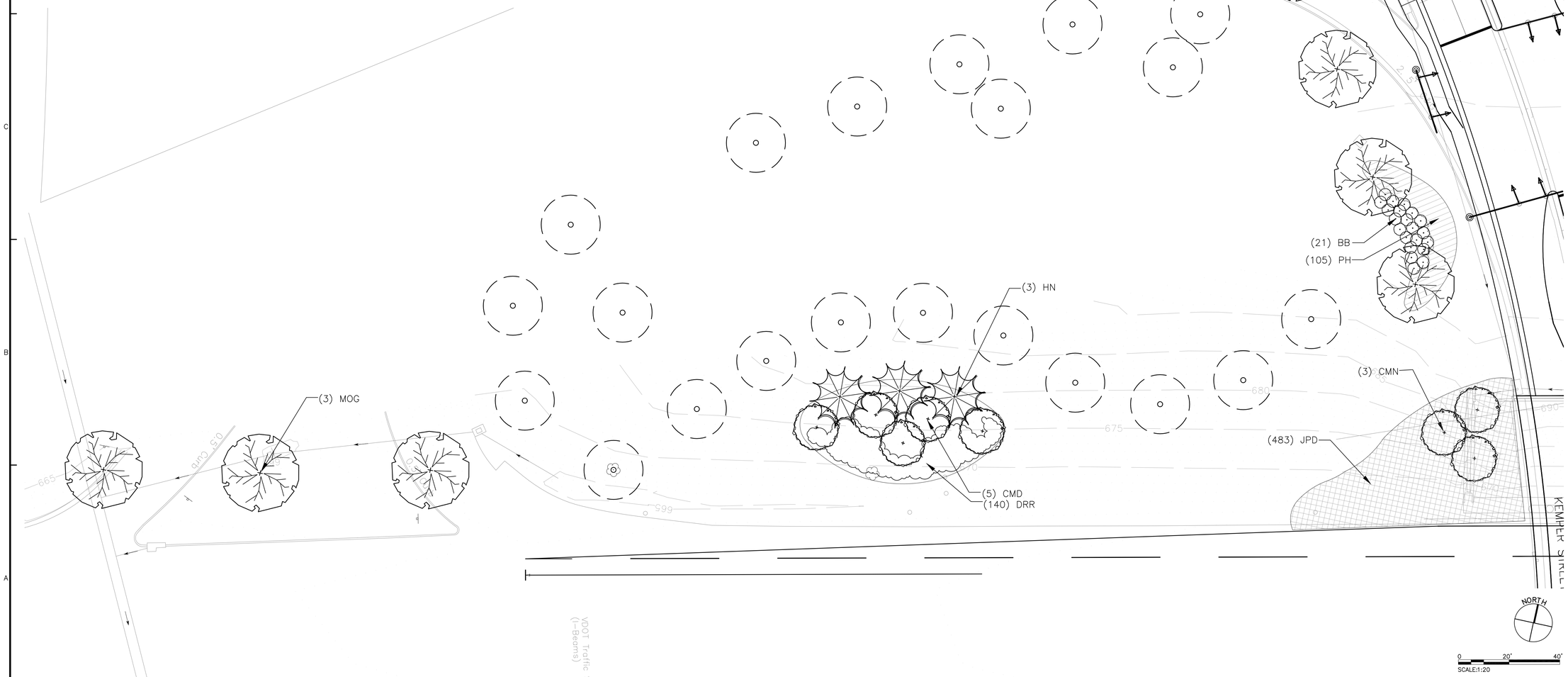
NOTE: SEE MASTER PLANT SCHEDULE SHEET 2F(9)

NOTE: CONTRACTOR TO SCARIFY TO A DEPTH OF 12" BELOW GRADE.

NOTE: CONTRACTOR TO SEED ALL DISTURBED AREAS, SEE SHEET 2E(5).

NOTE: ANY PLANTS/TREES NOT IDENTIFIED ON PLAN TO BE REVIEWED WITH LANDSCAPE ARCHITECT ON SITE FOR DETERMINATION.

NOTE: USE ONLY EC-2 STAPLED IN PLACE FOR SEED MULCH IN TRAFFIC ISLANDS.



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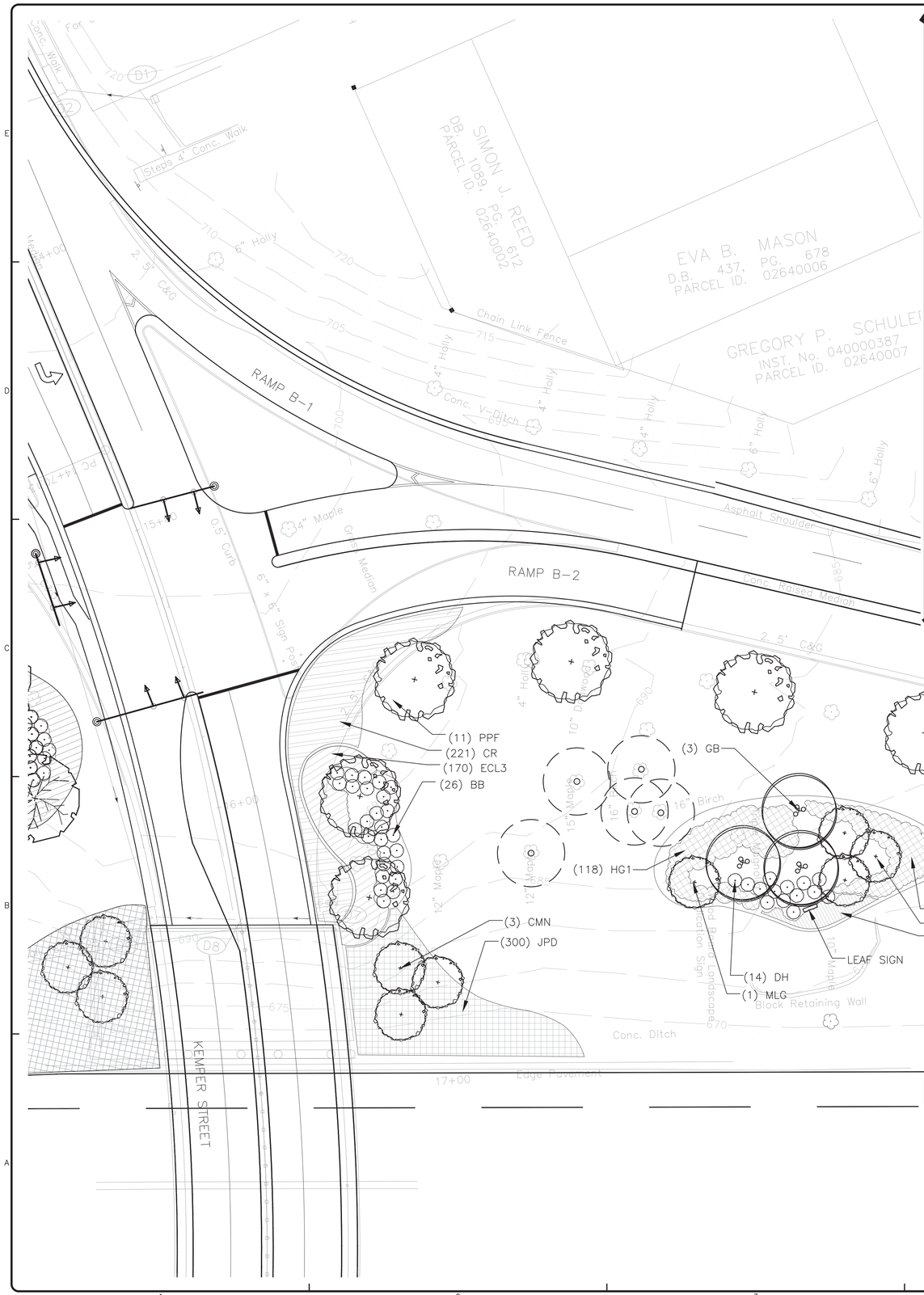
KEMPER STREET BRIDGE
KEMPER STREET OVER LYNCHBURG EXPRESSWAY (RT.29)

LYNCHBURG, VIRGINIA

MRK	DATE	DESCRIPTION

COMM NO:
DATE: 09-12-2013
DRAWN: NH/CA DESIGN: PH/CA
CHECK: PH
CAD FILE:
SHEET SCALE: AS SHOWN
SHEET TITLE
'A' QUADRANT LANDSCAPE PLAN
SHT. NO. 2F(8)



KEMPER STREET BRIDGE MASTER PLANT SCHEDULE

PLANT INFORMATION				PLANT SIZE					MARK	NOTES
				INSTALLATION			MATURITY			
MARK	QTY	COMMON TRADE	BOTANICAL OR LATIN	CAL(IN.)	HEIGHT	CONT	HEIGHT	CANOPY		
TREES										
CMA	6	CRAPE MYRTLE 'ACOMA'	LAGERSTROEMIA INDICA'ACOMA'		8'	B&B				3-5 TRUNKS
CMD	5	CRAPE MYRTLE 'DYNAMITE'	LAGERSTROEMIA INDICA 'DYNAMITE'		7'-8'	B&B				3-5 TRUNKS
CMN	12	CRAPE MYRTLE 'NANCHEZ'	LAGERSTROEMIA INDICA 'NANCHEZ'		8'	B&B				3-5 TRUNKS
CMS	3	CRAPE MYRTLE 'SOUIX'	LAGERSTROEMIA INDICA 'SOUIX'		8'	B&B				3-5 TRUNKS
CVS	7	STELLAR PINK DOGWOOD	CORNUS x 'RUTGAN' STELLAR PINK	2.0	7'-8'	B&B				
GB	3	MALE GINKGO	GINKGO BILOBA	2.5	10'	B&B				MALE ONLY
HN	11	NELLIE STEVENS' HOLLY	ILEX x 'NELLIE R. STEVENS'		5'-6'	B&B				
MLG	1	MAGNOLIA LITTLE GEM	MAGNOLIA GRANDIFLORA 'LITTLE GEM'	2	7'-8'	B&B				SINGLE LEADER ONLY
MOG	11	OCTOBER GLORY' MAPLE	ACER RUBRUM 'OCTOBER GLORY'	2.5	10'	B&B				
PPF	20	PINK FLAIR CHERRY	PRUNUS SERRULATA 'JFS-KW58'	2.0	9'-10'	B&B				
SHRUBS										
BB	137	BURNING BUSH	EUONYMUS ALATUS		24"-30"	3 GAL				5' OC
CH	223	CHINESE HOLLY 'CARISSA'	ILEX CORNUTA 'CARISSA'		15"-18"	3 GAL				3' OC
CMP	306	POCOMOKE CRAPE MYRTLE	LAGERSTROEMIA INDICA 'POCOMOKE'		15"-18"	3 GAL				3' OC
DH	52	DWARF BURFORD HOLLY	ILEX CORNUTA 'DWARF BURFORD'		24"-30"	5 GAL				4' OC
DRA	32	APRICOT DRIFT ROSE	ROSA 'MEIMIRROTE'		12"-15"	3 GAL				3' OC
DRR	250	RED DRIFT ROSE	ROSA 'MEIGALPIO'		12"-15"	2 GAL				3' OC
HG1	95	LITTLE HENRY VIRGINIA SWEETSPIRE	ITEA VIRGINICA 'SPRICH'		15"-18"	3 GAL				3' OC
JPD	1675	DWARF JAPANESE GARDEN JUNIPER	JUNIPERUS PROCUMBENS 'NANA'		15"-18"	1 GAL				2' OC
GROUND COVER										
CR	221	CORAL CARPET ROSE	ROSA x 'NOALA'		12"-15"	2 GAL				18" OC
ECL3	170	COCONUT LIME CONEFLOWER	ECHINACEA PURPUREA 'COCONUT LIME'		15"-18"	1 GAL				2' OC
LV2	1034	VARIEGATED LIRIOPE	LIRIOPE MUSCARI 'VARIEGATA'		6"	4" POT				18" OC
PH	226	DWARF FOUNTAIN GRASS	PENNISETUM ALOPECUROIDES 'HAMELN'		12"-15"	1 GAL				3' OC
VBR	330	BLUE RUG JUNIPER	JUNIPERUS HORIZONTALIS 'WILTONII'		12"-15"	1 GAL				30" OC
RAIN GARDEN PLANTS										
BF1	50	BLUEFLAG IRIS	IRIS VERSICOLOR		10"-12"	1 GAL				1' OC
BF2	46	BLUEFLAG IRIS	IRIS VERSICOLOR		10"-12"	1 GAL				2' OC
BS	75	BLACKEYED SUSAN	RUDBECKIA HIRTA		10"-12"	1 GAL				1' OC
ECL1	75	COCONUT LIME CONEFLOWER	ECHINACEA PURPUREA 'COCONUT LIME'		10"-12"	1 GAL				1' OC
ECL2	64	COCONUT LIME CONEFLOWER	ECHINACEA PURPUREA 'COCONUT LIME'		10"-12"	1 GAL				2' OC
HG2	49	LITTLE HENRY VIRGINIA SWEETSPIRE	ITEA VIRGINICA 'SPRICH'		15"-18"	3 GAL				3' OC
LBS	66	LITTLE BLUESTEM	SCHIZACHYRIUM SCOPARIUM		10"-12"	1 GAL				6" OC IN STAGGERED
LV1	[illegible]	VARIEGATED LIRIOPE	LIRIOPE MUSCARI 'VARIEGATA'		6"	1 GAL				18"
PB	50	PRAIRIE BLAZING STAR	LIATRIS PYCNOSTACHYA		10"-12"	1 GAL				1' OC
[illegible]	41	VARIEGATED RED TWIG DOGWOOD	CORNUS ALBA 'ELEGANTISSIMA'		18"-24"	3 GAL				4' OC

REFER TO KEMPER STREET BRIDGE MASTER PLANT SCHEDULE REVISED 1-9-2014 IN PROJECT SPECIFICATIONS FOR PLANT INFORMATION.

NOTE: USE ONLY EC-2 STAPLED IN PLACE FOR SEED MULCH IN TRAFFIC ISLANDS.

NOTE: CONTRACTOR TO SCARIFY TO A DEPTH OF 12" BELOW GRADE.

NOTE: CONTRACTOR TO SEED ALL DISTURBED AREAS, SEE SHEET 2E(5).

NOTE: ANY PLANTS/TREES NOT IDENTIFIED ON PLAN TO BE REVIEWED WITH LANDSCAPE ARCHITECT ON SITE FOR DETERMINATION.

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Cert. No. 080
09-12-13
LANDSCAPE ARCHITECT

KEMPER STREET BRIDGE
KEMPER STREET OVER LYNCHBURG EXPRESSWAY (RT.29)
LYNCHBURG, VIRGINIA

MRK	DATE	DESCRIPTION

COMM NO:
DATE: 09-12-2013
DRAWN: NH/CA DESIGN: PH/CA
CHECK: PH
CAD FILE:
SHEET SCALE: AS SHOWN
SHEET TITLE
'B' QUADRANT LANDSCAPE PLAN
SHT. NO. 2F(9)

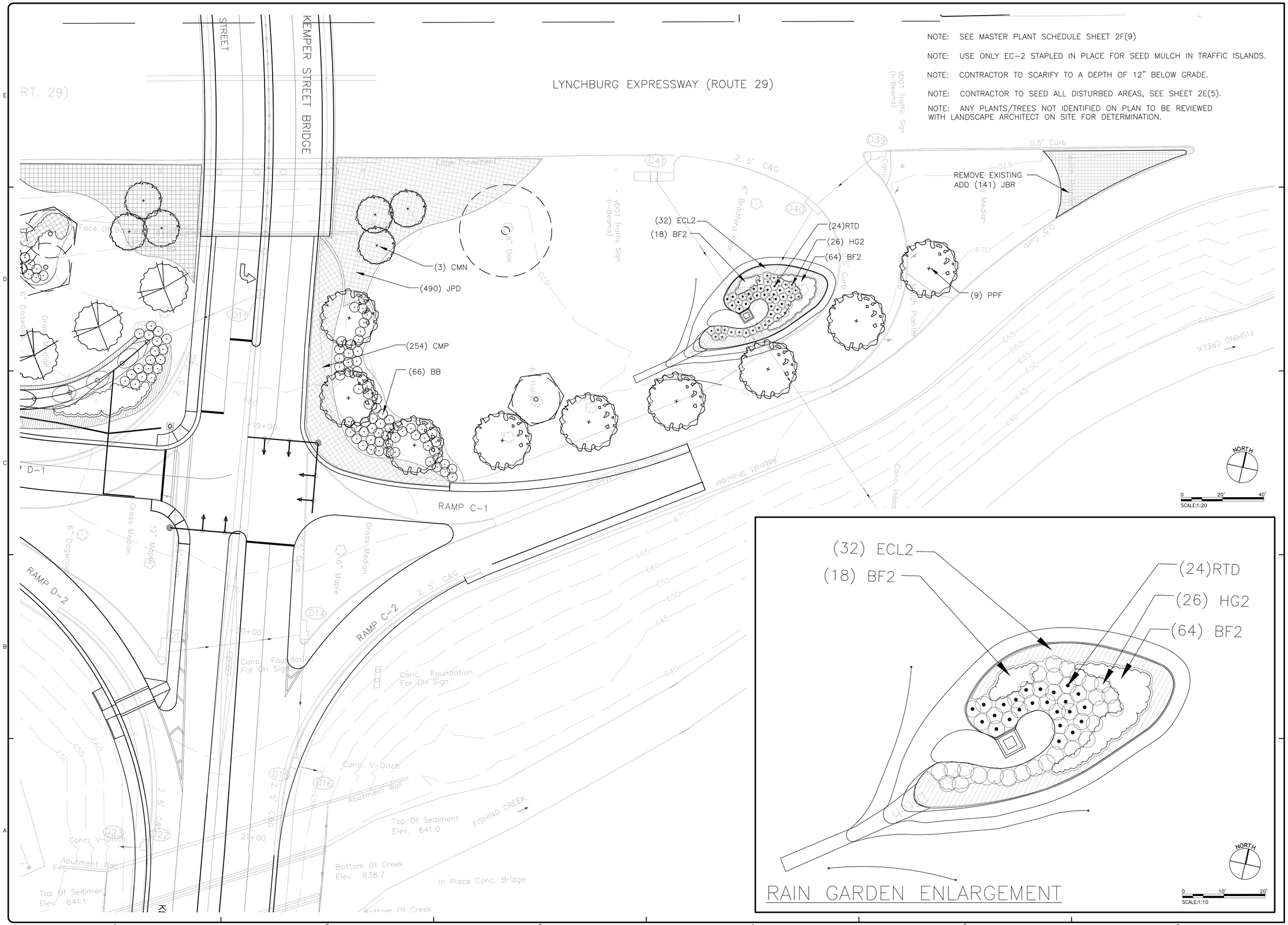
NOTE: SEE MASTER PLANT SCHEDULE SHEET 2F(9)

NOTE: USE ONLY EC-2 STAPLED IN PLACE FOR SEED MULCH IN TRAFFIC ISLANDS.

NOTE: CONTRACTOR TO SCARIFY TO A DEPTH OF 12" BELOW GRADE.

NOTE: CONTRACTOR TO SEED ALL DISTURBED AREAS, SEE SHEET 2E(5).

NOTE: ANY PLANTS/TREES NOT IDENTIFIED ON PLAN TO BE REVIEWED WITH LANDSCAPE ARCHITECT ON SITE FOR DETERMINATION.



RAIN GARDEN ENLARGEMENT

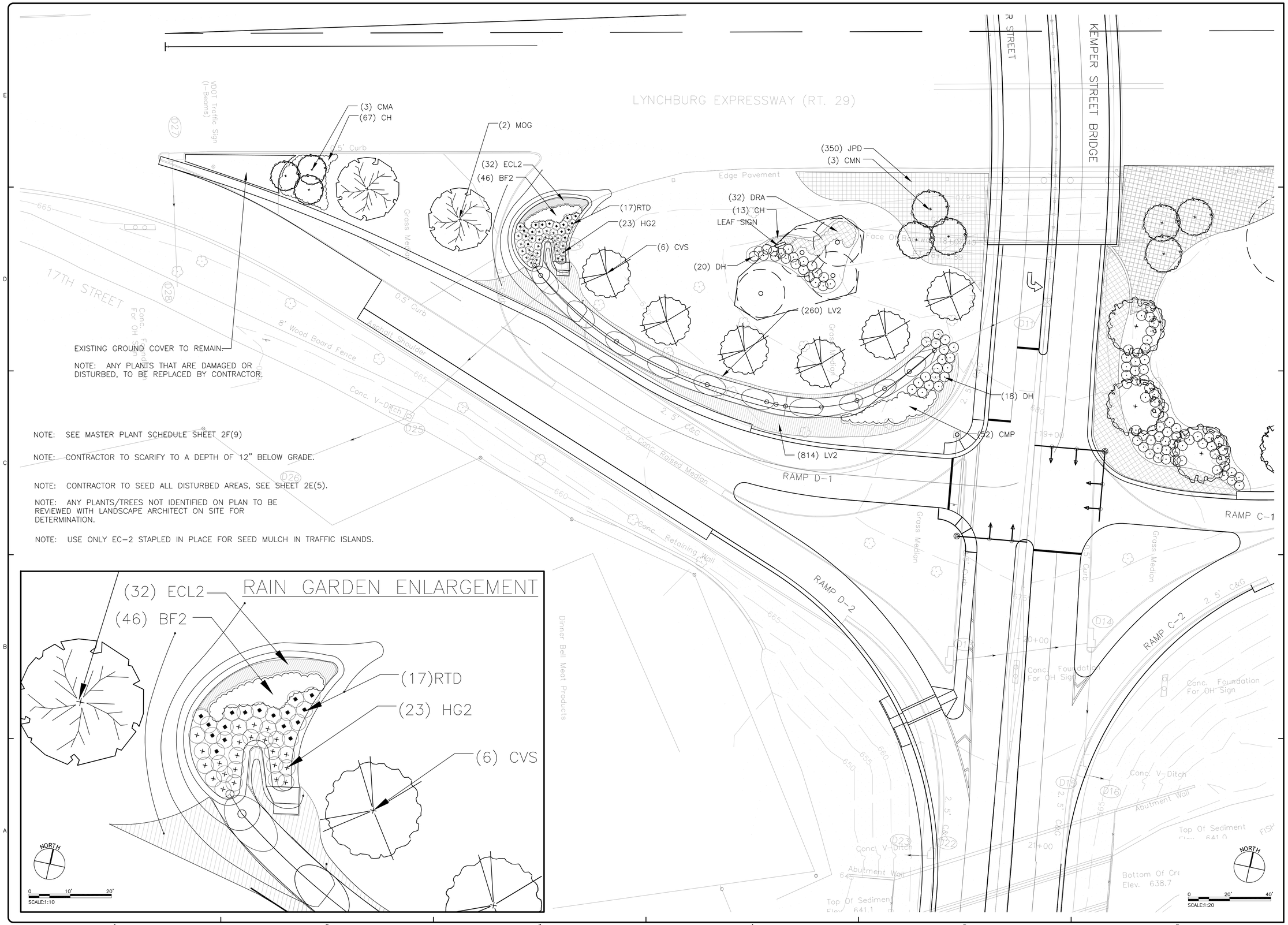
HDLA
HARVEY DESIGN
LAND ARCHITECTS
901 Jefferson St., Ste 206 Lynchburg, VA 24504
Tel: 434-528-5184
www.HDLA.biz

COMMONWEALTH OF VIRGINIA
PROCTOR S. HARVEY
Cert. No. 080
09-12-13
LANDSCAPE ARCHITECT

KEMPER STREET BRIDGE
KEMPER STREET OVER LYNCHBURG EXPRESSWAY (RT.29)
LYNCHBURG, VIRGINIA

MRK	DATE	DESCRIPTION

COMM NO:
DATE: 09-12-2013
DRAWN: NH/CA DESIGN: PH/CA
CHECK: PH
CAD FILE:
SHEET SCALE: AS SHOWN
SHEET TITLE
'C' QUADRANT LANDSCAPE PLAN
SHT. NO. 2F(10)



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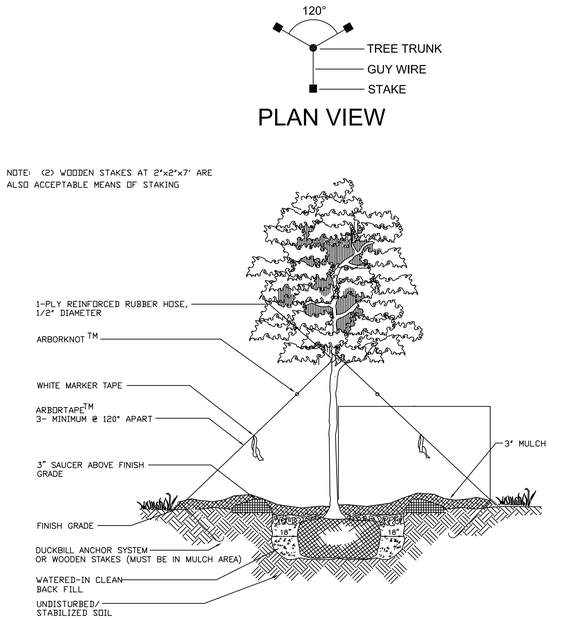
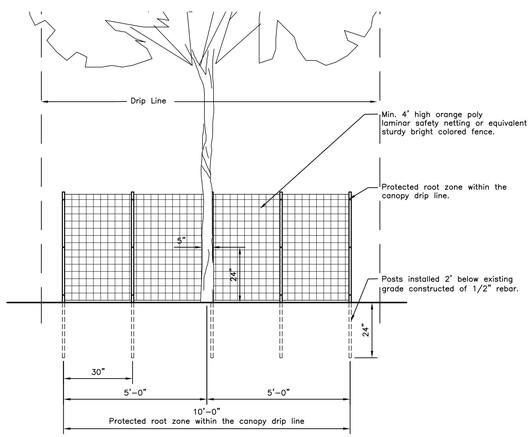
LYNCHBURG, VIRGINIA

MRK	DATE	DESCRIPTION

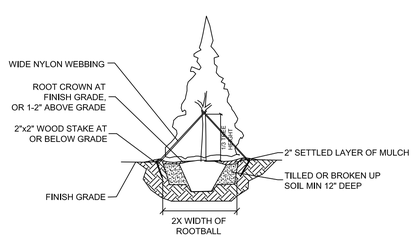
COMM NO:
DATE: 09-12-2013
DRAWN: NH/CA DESIGN: PH/CA
CHECK: PH
CAD FILE:
SHEET SCALE: AS SHOWN
SHEET TITLE
'D' QUADRANT LANDSCAPE PLAN
SHT. NO. 2F(11)



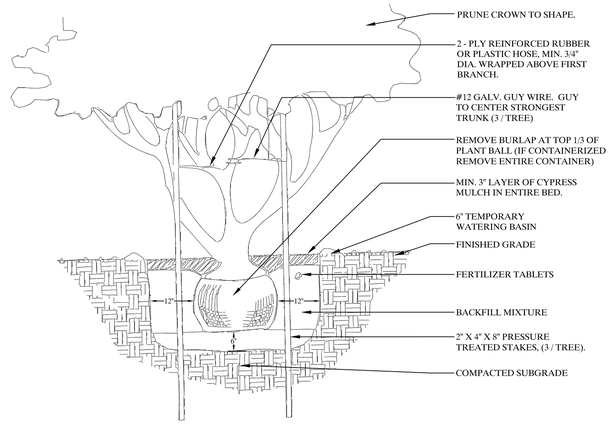
A TREE PLANTING SINGLE LEADER
NOT TO SCALE



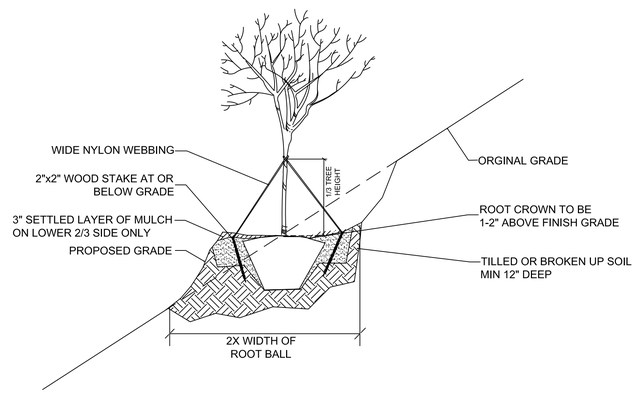
B EXISTING TREE PROTECTION
NOT TO SCALE



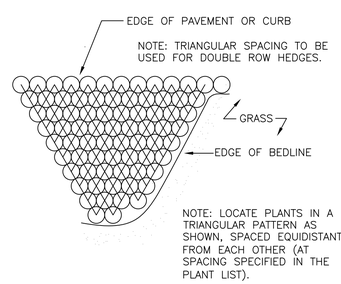
C EVERGREEN TREE PLANTING
NOT TO SCALE



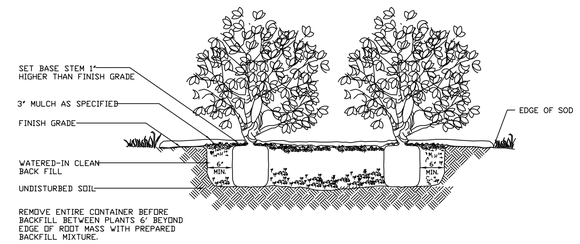
D TREE PLANTING MULTI-TRUNK
NOT TO SCALE



E TREE PLANTING ON SLOPE
NOT TO SCALE



F SHRUB SPACING
NOT TO SCALE



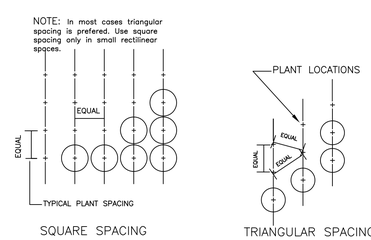
G SHRUB & GROUNDCOVER PLANTING
NOT TO SCALE

PLANTING NOTES TO SUPPLEMENT SPECIFICATIONS:

1. REMOVE PINNING NAILS OR ROPE LACING FROM EARTH BALL TOPS AFTER PLANTING.
2. CUT AWAY THE WRAPPING MATERIALS AROUND NECK/TRUNK OF PLANT.
3. REMOVE ALL NON-DEGRADABLE WRAPPING.
4. FOLD BACK THE TOP OF WIRE FROM WIRE BASKETS.
5. REMOVE ALL ROPE FROM TRUNKS OF TREES.
6. CUT THROUGH ROOTS CIRCLING THE ROOT BALL EXTERIOR IN CONTAINER GROWN TREES AND SHRUBS TO PREVENT THE ROOTS FROM GIRDLING THE PLANT.
7. WATER THOROUGHLY TO SETTLE AIR POCKETS WHEN HOLE IS HALF FILLED.
8. WATER ALL PLANTS IMMEDIATELY AFTER PLANTING.
9. REMOVE TAGS AND LABELS FROM TREES AND SHRUBS TO PREVENT GIRDLING BRANCHES AND TRUNKS.
10. MULCH PITS, TRENCHES AND PLANTED AREAS. PROVIDE 3-INCH THICKNESS OF HARDWOOD MULCH.
11. FORM SAUCER WITH MINIMUM 4" HIGH BERM (OR 1 1/2" HEIGHT FOR EACH CALIPER OF TREE) AROUND TREE AND SHRUB PITS 12" WIDER THAN BALL DIAMETER.
    ON SLOPES FORM SAUCER ONLY ON LOWER 2/3 OF PLANT.
12. KEEP MULCH FROM TOUCHING THE TREE TRUNK OR SHRUB STEMS.
13. PROVIDE TREE SPECIES WITH A SINGLE MAIN TRUNK. TREES THAT HAVE THE MAIN TRUNK FORMING A "Y" SHAPE ARE NOT ACCEPTABLE, UNLESS NOTED.
14. LIFT AND SET THE TREE BY ROOT BALL ONLY. DO NOT LIFT USING THE TREE TRUNK AND DO NOT USE TREE TRUNK AS A LEVER.
15. SET THE TOP OF THE ROOT BALL 1" ABOVE SOIL SURFACE OR SLIGHTLY HIGHER IF THE SOIL IS PRONE TO SETTLING.
16. REMOVE ANY TRUNK WRAP REMAINING AT TIME OF PLANTING. NO WRAPS SHALL BE PLACED ON TRUNK.

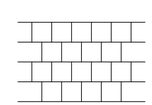
THE CONTRACTOR IS ENCOURAGED TO VISIT THE SITE MONTHLY TO REVIEW PLANT GROWTH AND MAINTENANCE, AND TO NOTIFY LANDSCAPE ARCHITECT AND OWNER IN WRITING OF ANY PROBLEMS HE NOTICES.

ALL SHRUB BEDS TO BE STRIPPED OF ALL GRASS, WEEDS AND OTHER GROWTH. ROTO-TILL ALL BEDS MINIMUM 6" DEEP, INCORPORATING [THREE (3) PARTS EXISTING SOIL TO ONE (1) PART PEAT MOSS AND 1-LB. PLANT FERTILIZER PER CUBIC YARD] PRIOR TO PLANTING.



H GROUNDCOVER SPACING
NOT TO SCALE

SOD SHALL BE LAID IN A STAGGERED MANNER. SOD STRIPS SHALL BE JOINED TIGHTLY AGAINST ONE ANOTHER SPACES MEASURING GREATER THAN 1/2" SHALL BE REJECTED.



I SOD PLANTING
NOT TO SCALE

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LAND ARCHITECTS
901 Jefferson St., Ste 208 Lynchburg, VA 24504
Tel: 434-528-5184 www.HDLA.biz

COMMONWEALTH OF VIRGINIA
PROCTOR S. HARVEY
Cert. No. 080
09-05-13
LANDSCAPE ARCHITECT

KEMPER STREET BRIDGE
KEMPER STREET OVER
LYNCHBURG EXPRESSWAY (RT.29)
LYNCHBURG, VIRGINIA

MRK	DATE	DESCRIPTION

COMM NO:
DATE: 09-05-2013
DRAWN: NH/CA DESIGN: PH/CA
CHECK: PH
CAD FILE:
SHEET SCALE: AS SHOWN
SHEET TITLE
LANDSCAPE DETAILS & SPECS
SHT. NO. 2F(12)

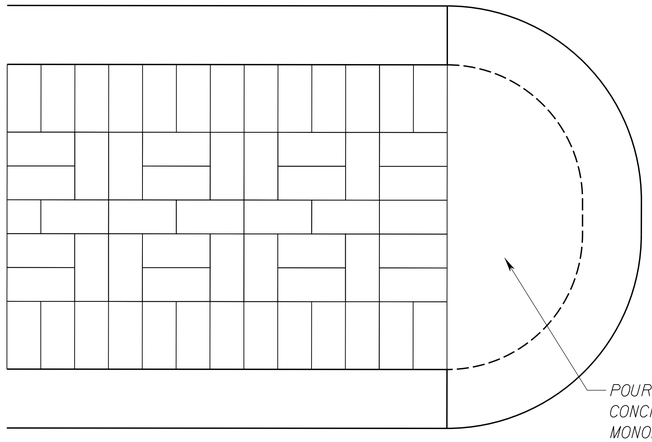
SUPERVISED BY CITY OF LYCHBURG
PROJECT MANAGER STEVE CAMPBELL, MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE, MATTERN & CRAIG

TYPICAL DITCH SECTIONS

NO SCALE

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC

REVISED	STATE	FEDERAL AID PROJECT	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.		29	U000-118-204, C-501	2F(13)



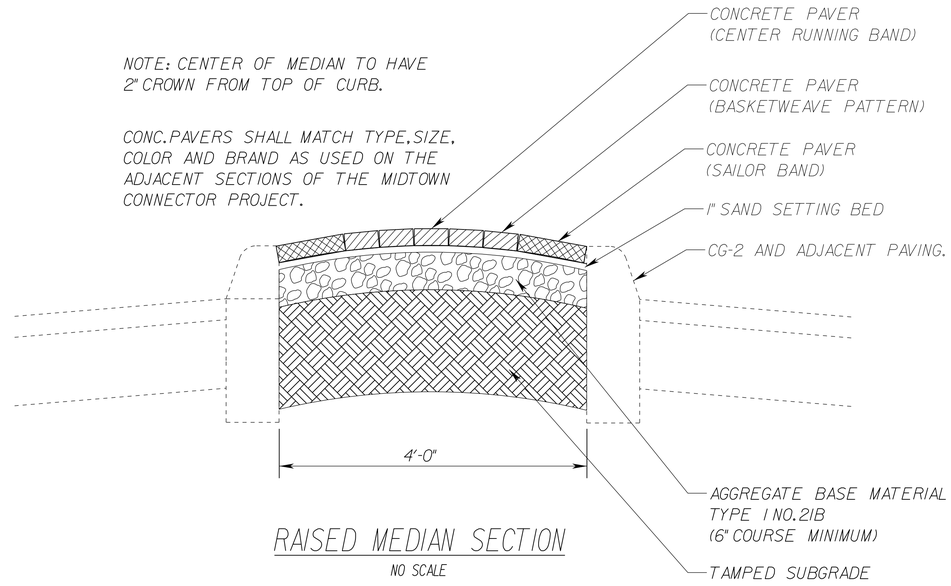
PATTERN TERMINATION PLAN

NO SCALE

(SEE RAISED MEDIAN SECTION)

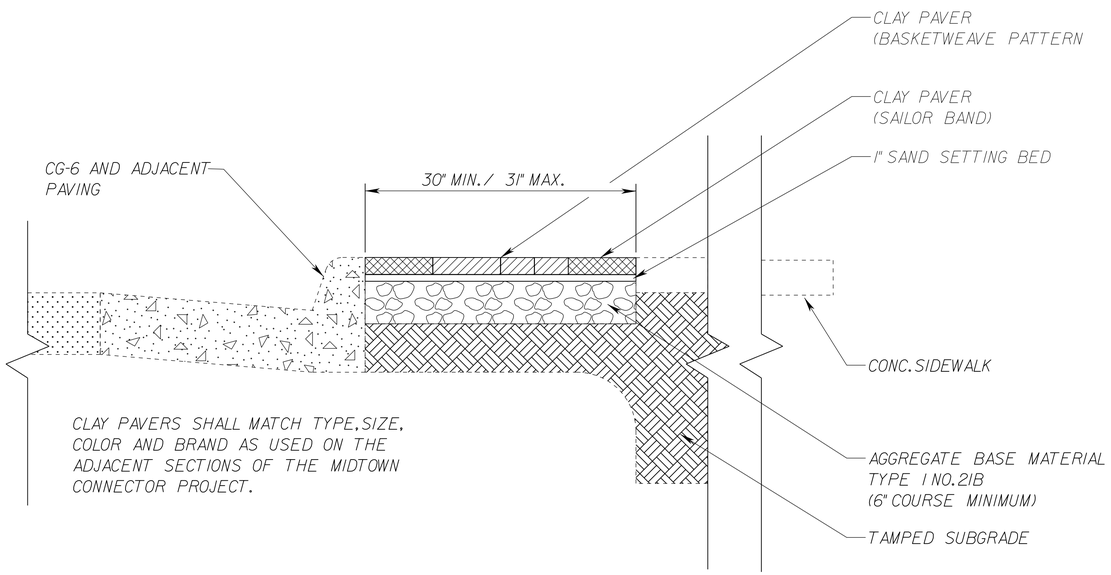
NOTE: CENTER OF MEDIAN TO HAVE 2" CROWN FROM TOP OF CURB.

CONC. PAVERS SHALL MATCH TYPE, SIZE, COLOR AND BRAND AS USED ON THE ADJACENT SECTIONS OF THE MIDTOWN CONNECTOR PROJECT.



RAISED MEDIAN SECTION

NO SCALE



SIDE WALK TO CURB - 30" BRICK BANDING SECTION

NO SCALE

GENERAL SHEET NOTES:

1. ALL REFERENCES TO CLAY PAVERS REFER TO THE SPECIAL PROVISIONS IN THE PROJECT MANUAL SPECIFICATIONS.
2. ALL REFERENCES TO CONCRETE PAVERS REFER TO THE SPECIAL PROVISIONS IN THE PROJECT MANUAL SPECIFICATIONS.
3. ALL CONCRETE AND CLAY PAVERS SHALL MATCH TYPE, SIZE, COLOR AND BRAND AS USED ON THE ADJACENT SECTIONS OF THE MIDTOWN CONNECTOR PROJECT. COODINATE WITH THE CITY OF LYNCHBURG.

DETAILS ON THIS SHEET ARE FROM THE "MIDTOWN CONNECTOR PROJECT", PROJ. NO. U000-118-V09, C-501, R201, R202

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
	U000-118-204		2F(13)

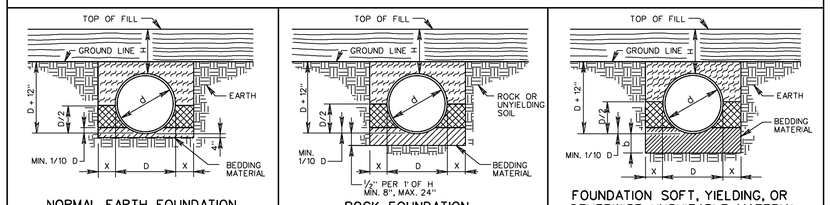
SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL, MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGN BY MIKE AGEE, MATTERN & CRAIG

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	29	U000-118-204, C-501	2G(1)

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

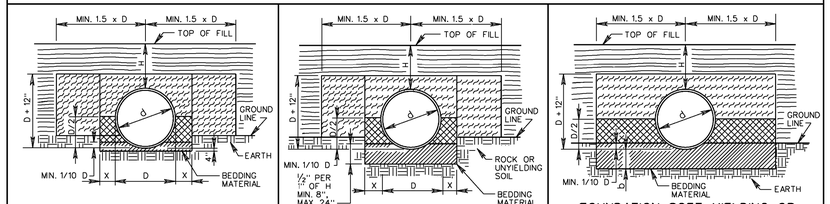
PB-1

NO PROJECTION OF PIPE ABOVE GROUND LINE



NORMAL EARTH FOUNDATION — ROCK FOUNDATION — FOUNDATION SOFT, YIELDING, OR OTHERWISE UNSUITABLE MATERIAL

PIPE PROJECTION ABOVE GROUND LINE



NORMAL EARTH FOUNDATION — ROCK FOUNDATION — FOUNDATION SOFT, YIELDING, OR OTHERWISE UNSUITABLE MATERIAL

- BEDDING MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.
- CLASS I BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.
- FOR PLASTIC PIPE CLASS I BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.
- FOR ALL OTHER PIPE REGULAR BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.
- EMBANKMENT

NOTES:

FOR GENERAL NOTES ON PIPE BEDDING, SEE INSTALLATION OF PIPE CULVERTS AND STORM SEWERS GENERAL NOTES ON SHEET 107.00.

CRUSHED GLASS CONFORMING TO THE SIZE REQUIREMENTS FOR CRUSHER RUN AGGREGATE SIZE 25 AND 26 MAY BE USED IN PLACE OF CLASS I BACKFILL.

VDOT ROAD AND BRIDGE STANDARDS

INSTALL. OF PIPE CULVERTS AND STORM SEWERS CIRC. PIPE BEDDING AND BACKFILL - METHOD "A"

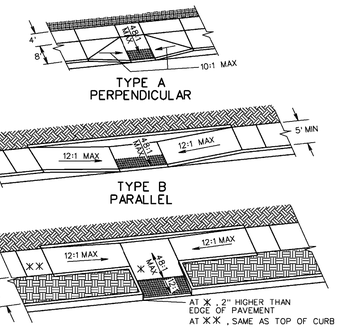
VIRGINIA DEPARTMENT OF TRANSPORTATION

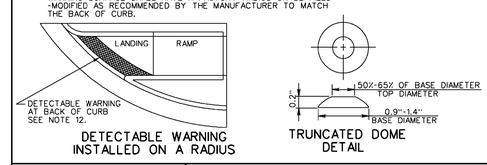
SHEET 1 OF 4	REVISION DATE	SPECIFICATION REFERENCE
107.01	7/11	302 303

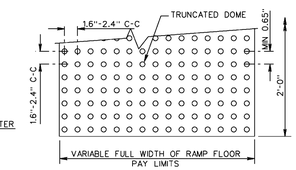
CG-12

GENERAL NOTES:

1. THE DETECTABLE WARNING SHALL BE PROVIDED BY TRUNCATED DOMES.
2. DETECTABLE WARNING TO BE CLASS A-3 CONCRETE (CLASS A-4 IF PRECAST) WITH SLIP RESISTANT INTEGRAL SURFACE COVERING THE FULL WIDTH OF THE RAMP FLOOR BY 2 FOOT IN LENGTH IN THE DIRECTION OF PEDESTRIAN TRAVEL. OTHER TYPES OF MATERIAL WITH THE TRUNCATED DOMES DETECTABLE WARNING MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
3. SLOPING SIDES OF CURB RAMP MAY BE POURED MONOLITHICALLY WITH RAMP FLOOR OR BY USING PERMISSIBLE CONSTRUCTION JOINT WITH REQUIRED BARS.
4. IF RAMP FLOOR IS PRECAST, HOLES MUST BE PROVIDED FOR DOWEL BARS SO THAT ADJOINING FLARED SIDES CAN BE CAST IN PLACE AFTER PLACEMENT OF PRECAST RAMP FLOOR. PRECAST CONCRETE SHALL BE CLASS A-4.
5. REQUIRED BARS ARE TO BE NO. 5 X 8" PLACED 1' CENTER TO CENTER ALONG BOTH SIDES OF THE RAMP FLOOR, MID-DEPTH OF RAMP FLOOR. MINIMUM CONCRETE COVER 1½".
6. CURB / CURB AND GUTTER SLOPE TRANSITIONS ADJACENT TO CURB RAMPS ARE INCLUDED IN PAYMENT FOR CURB / CURB AND GUTTER.
7. CURB RAMPS ARE TO BE LOCATED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THEY ARE TO BE PROVIDED AT INTERSECTIONS WHEREVER AN ACCESSIBLE ROUTE WITHIN THE RIGHT OF WAY OF A HIGHWAY FACILITY CROSSES A CURB REGARDLESS OF WHETHER SIDEWALK IS EXISTING, PROPOSED, OR NONEXISTENT. THEY MUST BE LOCATED WITHIN PEDESTRIAN CROSSWALKS AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER, AND SHOULD NOT BE LOCATED BEHIND VEHICLE STOP LINES, EXISTING LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC. ACCESSIBLE ROUTES PROVIDE A CONTINUOUS UNOBSTRUCTED, STABLE, FIRM AND SLIP RESISTANT PATH CONNECTING ALL ACCESSIBLE ELEMENTS OF A FACILITY THAT CAN BE APPROACHED, ENTERED AND USED BY PEDESTRIANS.
8. RAMPS MAY BE PLACED ON RADIAL OR TANGENTIAL SECTIONS PROVIDED THAT THE CURB OPENING IS PLACED WITHIN THE LIMITS OF THE CROSSWALK AND THAT THE SLOPE AT THE CONNECTION OF THE CURB OPENING IS PERPENDICULAR TO THE CURB.
9. TYPICAL CONCRETE SIDEWALK IS 4" THICK. WHEN THE ENTRANCE RADII CANNOT ACCOMMODATE THE TURNING REQUIREMENTS OF ANTICIPATED HEAVY TRUCK TRAFFIC, REFER TO STANDARD CG-13, COMMERCIAL ENTRANCE (HEAVY TRUCK TRAFFIC) FOR CONCRETE DEPTH.
10. WHEN CURB RAMPS ARE USED IN CONJUNCTION WITH A SHARED USE PATH, THE MINIMUM WIDTH SHALL BE THE WIDTH OF THE SHARED USE PATH
11. WHEN ONLY ONE CURB RAMP IS PROVIDED FOR TWO CROSSINGS (DIAGONAL), A 4' x 4' LANDING AREA SHALL BE PROVIDED TO MANEUVER A WHEELCHAIR INTO THE CROSSWALK WITHOUT GOING INTO THE TRAVELWAY. THIS 4' x 4' LANDING AREA MAY INCLUDE THE GUTTER PAN.
12. ALL CASES WHERE CURB RAMPS INTERSECT A RADIAL SECTION OF CURB AT ENTRANCES OR STREET CONNECTIONS THE DETECTABLE WARNING SURFACE SHALL HAVE A FACTORY RADIUS OR BE FIELD -MODIFIED AS RECOMMENDED BY THE MANUFACTURER TO MATCH THE BACK OF CURB.







VDOT ROAD AND BRIDGE STANDARDS

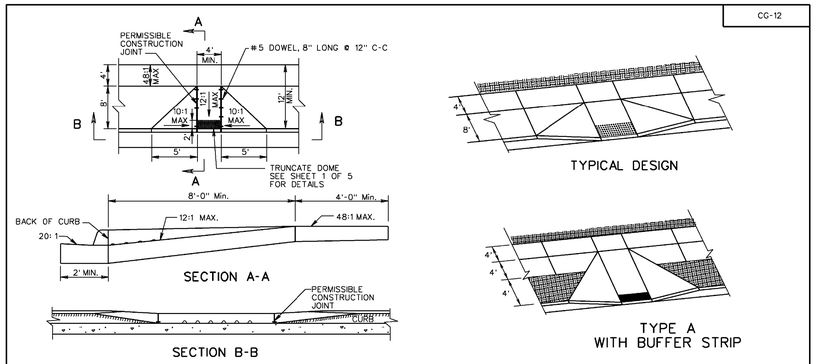
CG-12 DETECTABLE WARNING SURFACE

(GENERAL NOTES)

VIRGINIA DEPARTMENT OF TRANSPORTATION

SHEET 1 OF 5	REVISION DATE	SPECIFICATION REFERENCE
203.05	7/11	105 502

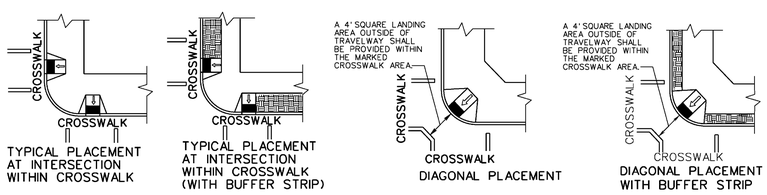
CG-12



NOTES:

FOR GENERAL NOTES ON THE DETECTABLE WARNING SURFACE, SEE SHEET 1 OF 5.

THIS DESIGN TO BE USED FOR CONSTRUCTION THAT INCORPORATES WIDER SIDEWALK. LANDING (4' WIDE) REQUIRED AT TOP OF CURB RAMP. MINIMUM CURB RAMP LENGTH 8 FEET FOR NEW CONSTRUCTION, 6 FEET FOR ALTERATIONS.



SPECIFICATION REFERENCE: 105, 502

CG-12 DETECTABLE WARNING SURFACE

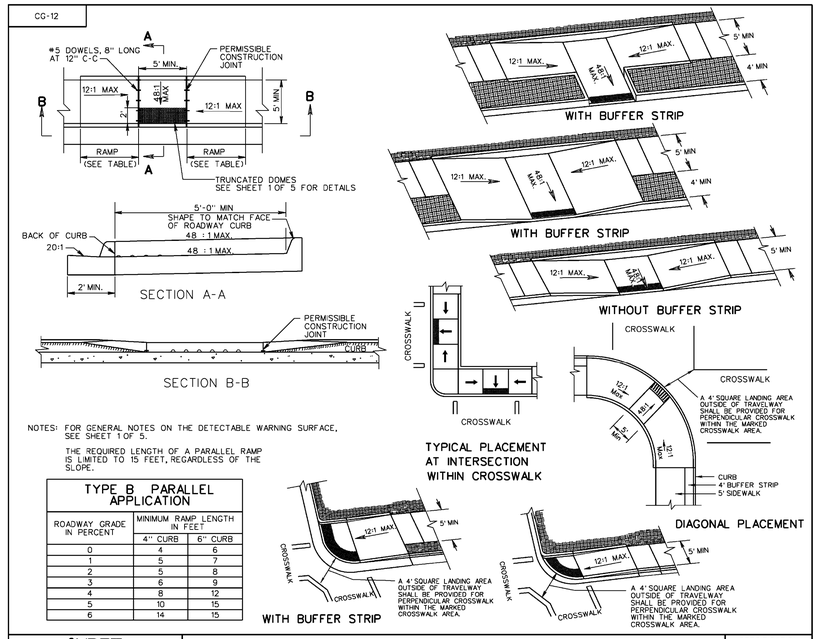
TYPE A (PERPENDICULAR) APPLICATION

VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT ROAD AND BRIDGE STANDARDS

REVISION DATE	SHEET 2 OF 5
7/11	203.06

CG-12



NOTES: FOR GENERAL NOTES ON THE DETECTABLE WARNING SURFACE, SEE SHEET 1 OF 5.

THE REQUIRED LENGTH OF A PARALLEL RAMP IS LIMITED TO 15 FEET, REGARDLESS OF THE SLOPE.

TYPE B PARALLEL APPLICATION		
ROADWAY GRADE IN PERCENT	MINIMUM RAMP LENGTH IN FEET	
	4" CURB	6" CURB
0	4	6
1	5	7
2	5	8
3	6	9
4	8	12
5	10	15
6	14	15

VDOT ROAD AND BRIDGE STANDARDS

CG-12 DETECTABLE WARNING SURFACE

TYPE B (PARALLEL) APPLICATION

VIRGINIA DEPARTMENT OF TRANSPORTATION

SHEET 3 OF 5	REVISION DATE	SPECIFICATION REFERENCE
203.07	7/11	105 502

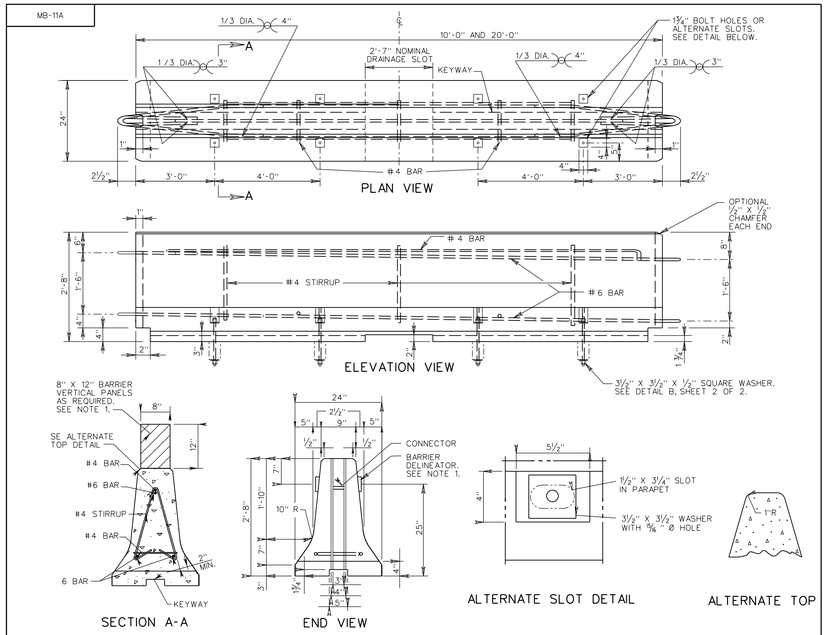
PROJECT	SHEET NO.
U000-118-204	2G(1)

SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL, MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE, MATTERN & CRAIG

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	29	U000-118-204, C-501	2G(2)

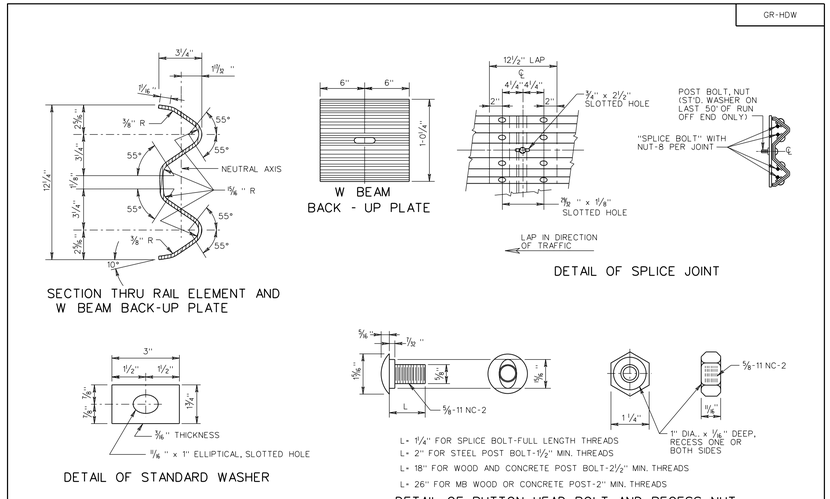
DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

MB-11A



VDOT ROAD AND BRIDGE STANDARDS		TRAFFIC BARRIER SERVICE CONCRETE PARAPET (DOUBLE FACE) (FOR TEMPORARY INSTALLATION ON BRIDGE DECK EXTERIOR) VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 3	REVISION DATE 01/09		105 512
502.13			

GR-HDW



NOTES:

ALL HARDWARE IS TO BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS.

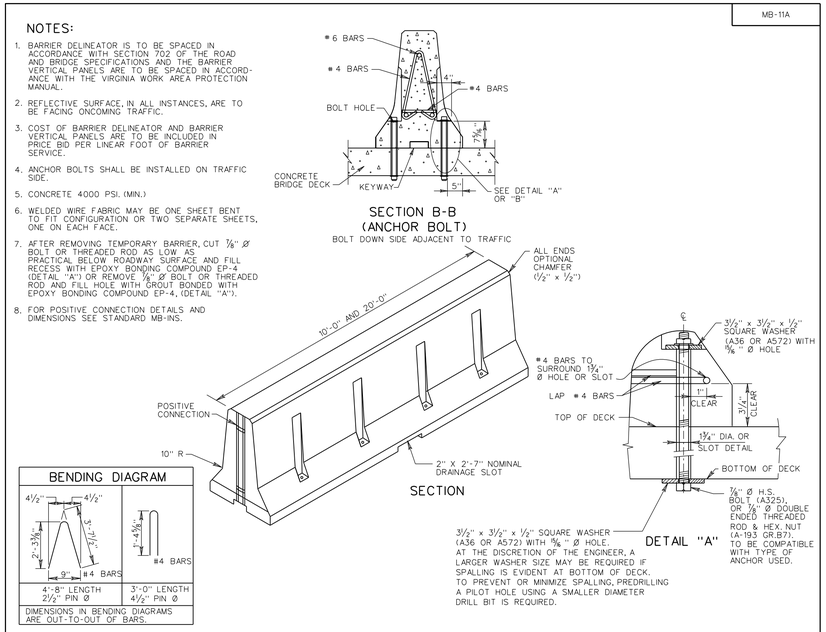
THE GUARDRAIL AND MEDIAN BARRIER COMPONENTS DEPICTED IN ARTBA TECHNICAL BULLETIN NUMBER 268B MAY BE SUBSTITUTED IF INTERCHANGEABLE WITH THE STANDARDS FOR GUARDRAIL (GR) OR MEDIAN BARRIER (MB) AND APPROVED BY THE ENGINEER.

SPECIFICATION REFERENCE	STANDARD GUARDRAIL HARDWARE VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS
221 505		REVISION DATE 4/09 — SHEET 1 OF 3 — 501.01

MB-11A

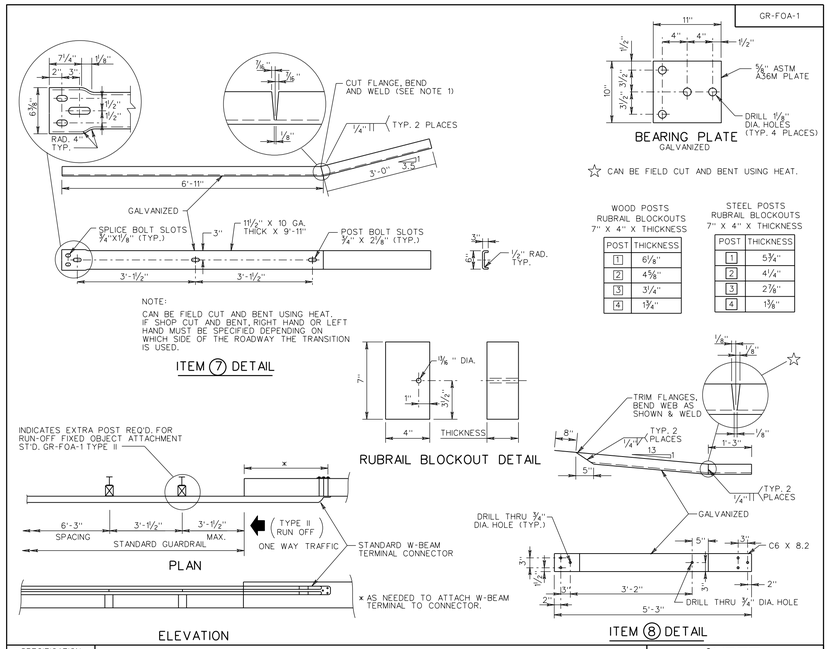
NOTES:

1. BARRIER DELINEATOR IS TO BE SPACED IN ACCORDANCE WITH SECTION 702 OF THE ROAD AND BRIDGE SPECIFICATIONS AND THE BARRIER VERTICAL PANELS ARE TO BE SPACED IN ACCORDANCE WITH THE VIRGINIA WORK AREA PROTECTION MANUAL.
2. REFLECTIVE SURFACE, IN ALL INSTANCES, ARE TO BE FACING ONCOMING TRAFFIC.
3. COST OF BARRIER DELINEATOR AND BARRIER VERTICAL PANELS ARE TO BE INCLUDED IN PRICE BID PER LINEAR FOOT OF BARRIER SERVICE.
4. ANCHOR BOLTS SHALL BE INSTALLED ON TRAFFIC SIDE.
5. CONCRETE 4000 PSI. (MIN.)
6. WELDED WIRE FABRIC MAY BE ONE SHEET BENT TO FIT CONFIGURATION OR TWO SEPARATE SHEETS, ONE ON EACH FACE.
7. AFTER REMOVING TEMPORARY BARRIER, CUT 7/8" Ø BOLT OR THREADED ROD AS LOW AS PRACTICAL BELOW ROADWAY SURFACE AND FILL RECESS WITH EPOXY BONDING COMPOUND EP-4 (DETAIL "A") OR REMOVE 7/8" Ø BOLT OR THREADED ROD AND FILL HOLE WITH GROUT BONDED WITH EPOXY BONDING COMPOUND EP-4, (DETAIL "A").
8. FOR POSITIVE CONNECTION DETAILS AND DIMENSIONS SEE STANDARD MB-INS.



SPECIFICATION REFERENCE	TRAFFIC BARRIER SERVICE CONCRETE PARAPET (DOUBLE FACE) (FOR TEMPORARY INSTALLATION ON BRIDGE DECK EXTERIOR) VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS
105 512		REVISION DATE 01/09 — SHEET 2 OF 3 — 502.14

GR-FOA-1



SPECIFICATION REFERENCE	W-BEAM GUARDRAIL - FIXED OBJECT ATTACHMENT (RUBRAIL AND HARDWARE DETAILS) VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS
505		REVISION DATE 4/09 — SHEET 3 OF 3 — 501.27

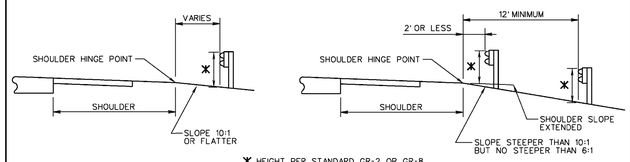
PROJECT	SHEET NO.
U000-118-204	2G(2)

SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL, MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE, MATTERN & CRAIG

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	29	U000-118-204, C-501	2G(3)

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

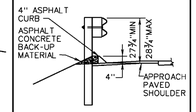
GR-INS



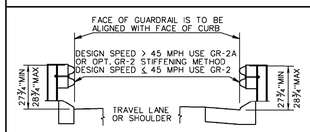
MEASURING GUARDRAIL HEIGHT ON FRONT SLOPE RELATIVE TO SHOULDER HINGE POINT

FACE OF GUARDRAIL IS TO BE ALIGNED WITH FACE OF CURB.

DESIGN SPEED > 45 MPH USE GR-2A OR OPTIONAL GR-2 STIFFENING METHOD. DESIGN SPEED ≤ 45 MPH USE GR-2.



ASPHALT CURB SECTION

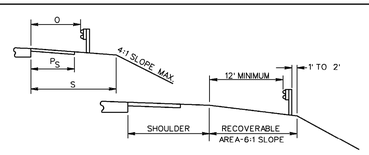


GR-2 INSTALLATION WITH CG-3 OR CG-7 CURB

FOR GUARDRAIL DESIGN POLICIES USING CG-2 AND CG-6 OR URBAN DESIGNS WITH SIDEWALK OR SIDEWALK SPACE SEE APPENDIX A OF THE ROAD DESIGN MANUAL

TABLE I
NORMAL GUARDRAIL LOCATION-THROUGH TRAFFIC LANES LEFT OF TRAFFIC

TOTAL SHOULDER WIDTH (S) (PAVED & GRADING)	PAVED SHOULDER WIDTH (P_S)	OFFSET FROM EDGE OF PAVEMENT TO FACE OF GUARDRAIL (O)
17'	12'	14'
15'	3', 4', OR 10'	12'
13'	3'	10'
11'	3'	8'
8' (MED.)	3' or 4'	5'



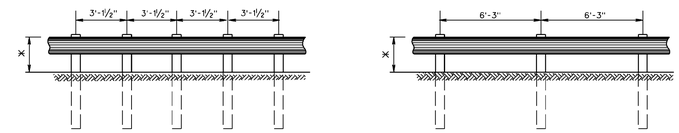
GUARDRAIL LOCATION ON RECOVERABLE SLOPE

TABLE II
NORMAL GUARDRAIL LOCATION-THROUGH TRAFFIC LANES RIGHT OF TRAFFIC

TOTAL SHOULDER WIDTH (S) (PAVED & GRADING)	PAVED SHOULDER WIDTH (P_S)	OFFSET FROM EDGE OF PAVEMENT TO FACE OF GUARDRAIL (O)
17'	12'	14'
15'	6' or 10'	12'
13'	8'	10'
11'	0, 3', 4' or 6'	8'
9'	0, 3' or 4'	6'
8'	3'	5'
7'	2'	4'
5'	0	2'

SPECIFICATION REFERENCE		VDOT ROAD AND BRIDGE STANDARDS	
221 505	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. **W-BEAM GUARDRAIL INSTALLATION CRITERIA** VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE 7/11	SHEET 6 OF 9 501.39

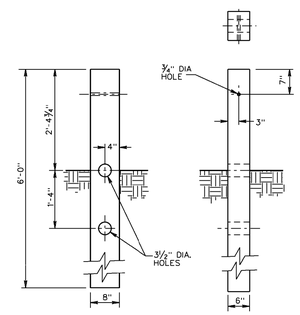
GR-2, 2A



✱ 27¾" MIN - 28¾" MAX RAIL HEIGHT

GR-2A
(3'-1½" POST SPACING)
MAX DYNAMIC DEFLECTION = 2'

GR-2
(6'-3" POST SPACING)
MAX DYNAMIC DEFLECTION = 3'



CRT POST

NOTES:

GUARDRAIL LOCATIONS SHOWN ON PLANS ARE APPROXIMATE ONLY AND CAN BE ADJUSTED DURING CONSTRUCTION IF AND AS DIRECTED BY THE ENGINEER.

FOR DETAILS OF POST AND BLOCKOUTS SEE SHEET NO. 501.05.

FOR DETAILS OF RAIL ELEMENT, RAIL SPLICE JOINT, AND ASSOCIATED HARDWARE SEE SHEET NOS. 501.01 AND 501.02.

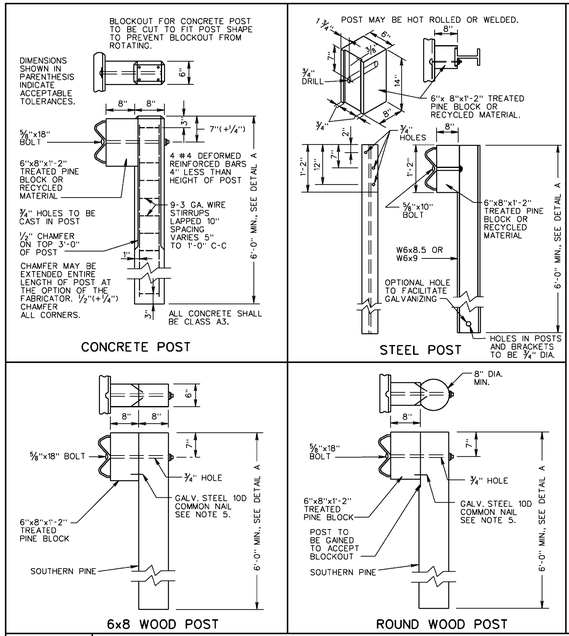
RAIL ELEMENTS ARE FURNISHED SHOP CURVED FOR RADII BETWEEN 5 FEET AND 150 FEET.

ALL GUARDRAIL POSTS SHALL BE SET PLUMB. POST SHALL NOT BE SET WITH A VARIATION OF MORE THAN ⅛" PER FOOT FROM VERTICAL. W-BEAM, BLOCKOUTS, AND POSTS SHALL BE SET AND ALIGNED WITHOUT ALTERATION OR FORCE, AS PER SECTION 505 OF THE SPECIFICATIONS.

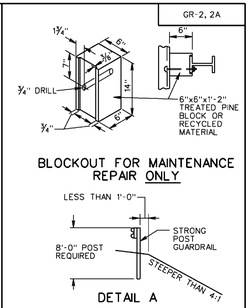
ALL GR-2 AND GR-2A RAIL SHALL BE MAINTAINED AT A HEIGHT OF 27¾" MIN - 28¾" MAX AS MEASURED PER STANDARD GR-INS.

ALL W-BEAM RAILS SHALL BE LAPPED IN THE DIRECTION OF VEHICULAR TRAVEL FOR THE FINISHED ROADWAY.

VDOT ROAD AND BRIDGE STANDARDS			SPECIFICATION REFERENCE
SHEET 1 OF 2 501.04	REVISION DATE 7/11	**STANDARD BLOCKED-OUT W-BEAM GUARDRAIL (STRONG POST SYSTEM)** VIRGINIA DEPARTMENT OF TRANSPORTATION	221 505



GR-2, 2A



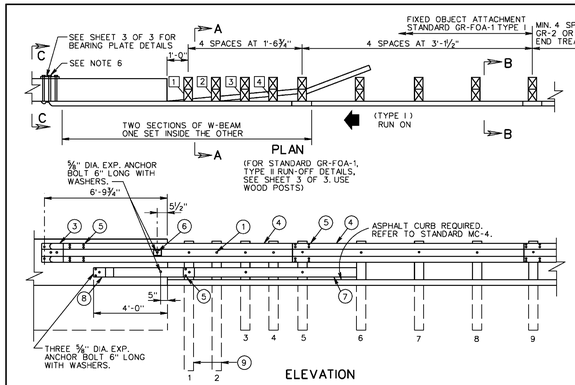
GUARDRAIL INSTALLATION SITES REQUIRING LONGER GUARDRAIL POSTS

NOTES:

1. ALL BOLTS, NUTS, WASHERS, AND OTHER STEEL ITEMS ARE TO BE GALVANIZED.
2. ALTERNATE TYPE POSTS AND BLOCKOUT MAY BE INTERCHANGED ON ANY ONE PROJECT WITH THE RESTRICTION THAT THE SAME TYPE OF POST AND BLOCKOUT MUST BE USED IN ANY SINGLE RUN OF GUARDRAIL.
3. FOR DETAILS OF GUARDRAIL ELEMENT SPLICE JOINT, HARDWARE, ETC. SEE SHEET NOS. 501.01 AND 501.02.
4. THE GUARDRAIL AND MEDIAN BARRIER COMPONENTS DEPICTED IN A.R.T.B.A. TECHNICAL BULLETIN NUMBER 268B MAY BE SUBSTITUTED IF INTERCHANGEABLE WITH THE STANDARDS FOR GUARDRAIL (GR) OR MEDIAN BARRIER (MB) AND APPROVED BY THE ENGINEER.
5. DRIVE NAIL ON BOTH SIDES WITHIN 2" OF THE TOP OR BOTTOM OF BLOCKOUT AFTER ⅝" x 18 BOLT IS INSTALLED.

SPECIFICATION REFERENCE		VDOT ROAD AND BRIDGE STANDARDS	
221 236 505	**STANDARD BLOCKED-OUT W-BEAM GUARDRAIL (STRONG POST SYSTEM, POST AND BLOCKOUT DETAILS)** VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE 7/11	SHEET 2 OF 2 501.05

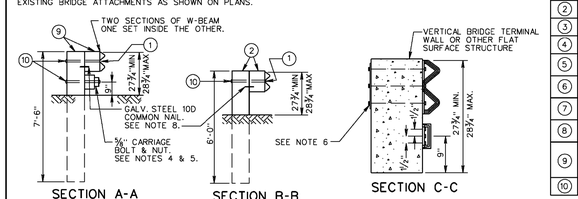
GR-FOA-1



NOTES:

1. FIXED OBJECTS MAY CONSIST OF BRIDGE RAILS, ABUTMENTS, PIERS, RETAINING WALLS, OR OTHER FLAT SURFACED STRUCTURES WITH VERTICAL FACE.
2. BRIDGE RAIL ENDS AND BRIDGE PARAPETS MUST BE OF ADEQUATE STRENGTH TO ACCEPT FULL IMPACT LOADING.
3. GUARDRAIL COMPONENTS SHALL BE IN ACCORDANCE WITH VDOT ROAD AND BRIDGE STANDARDS.
4. POSTS 1, 2, 3, 4, AND 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH BLOCKS AND/OR RUBRAIL. RUBRAIL IS NOT BOLTED TO POSTS 2 AND 4.
5. BOTTOM WOOD BLOCKS LOCATED ON POSTS 1 THROUGH 4 ARE CENTER DRILLED AND SECURED WITH ⅝" CARRIAGE BOLTS (LENGTH AS REQUIRED).
6. APPROPRIATE LENGTH ⅞" DIAMETER ASTM A325 HEX BOLTS WITH WASHERS MUST BE USED WITH THRU DRILLED HOLES WITH A ⅝" BEARING PLATE ON THE BACK SIDE OF THE BRIDGE PARAPET OR TERMINAL WALL.
7. DRIVE NAIL WITHIN 2" OF THE TOP OR BOTTOM OF THE BLOCKOUT AFTER ⅝" X 18 BOLT IS INSTALLED.
8. SEE SHEET 3 OF 3 FOR RUBRAIL BLOCKOUT DETAILS.

NEW BRIDGES - ATTACHMENTS
ONE WAY TRAFFIC - RUN-ON, 2-GR-FOA-1, TYPE I
- RUN-OFF, 2-GR-FOA-1, TYPE II
TWO WAY TRAFFIC - RUN-ON, 4-GR-FOA-1, TYPE I
EXISTING BRIDGE ATTACHMENTS AS SHOWN ON PLANS.



ITEM	MATERIAL/SPECIFICATIONS/NOTES
1	⅝" X 18" LONG. GUARDRAIL BOLT AND RECESSED NUT.
2	STANDARD 6" x 8" WOOD POST AND BLOCK
3	STANDARD W-BEAM TERMINAL CONNECTOR
4	STANDARD W-BEAM RAIL
5	⅝" X 2" LONG GUARDRAIL BOLT & RECESSED NUT (SEE ST'D. GR-HDW)
6	RECTANGULAR PLATE WASHER (SEE STD. GR-HDW)
7	BENT PLATE RUBRAIL (SEE SHEET 3 OF 3)
8	C6 X 8.2 RUBRAIL (SEE SHEET 3 OF 3)
9	8" X 8" X 7'-6" LONG WOOD POST & 8" X 8" X 14" LONG TREATED PINE BLOCK OR RECYCLED MATERIAL
10	WASHER FOR ⅝" BOLT

SPECIFICATION REFERENCE		VDOT ROAD AND BRIDGE STANDARDS	
505	**W-BEAM GUARDRAIL - FIXED OBJECT ATTACHMENT FOR USE BETWEEN VERTICAL FIXED OBJECTS AND GUARDRAIL (WOOD POSTS)** VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE 7/11	SHEET 1 OF 3 501.25

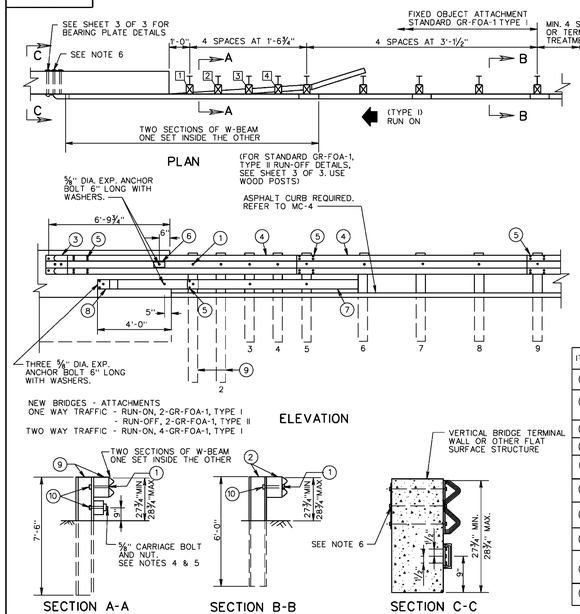
PROJECT	SHEET NO.
U000-118-204	2G(3)

SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL, MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE, MATTERN & CRAIG

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	29	U000-118-204, C-501	2G(4)

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

GR-FOA-1



NOTES:

1. FIXED OBJECTS MAY CONSIST OF BRIDGE RAILS, ABUTMENTS, PIERS, RETAINING WALLS, OR OTHER FLAT SURFACED STRUCTURES WITH VERTICAL FACE.
2. BRIDGE RAIL ENDS AND BRIDGE PARAPETS MUST BE OF ADEQUATE STRENGTH TO ACCEPT FULL IMPACT LOADING.
3. GUARDRAIL COMPONENTS SHALL BE IN ACCORDANCE WITH VDOT ROAD AND BRIDGE STANDARDS.
4. POSTS 1, 2, 3, 4, AND 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH BLOCKS AND/OR RUBRAIL. RUBRAIL IS NOT BOLTED TO POSTS 2 AND 4.
5. BOTTOM WOOD BLOCKS LOCATED ON POSTS 1 THROUGH 4 ARE CENTER DRILLED AND SECURED WITH ⅝" CARRIAGE BOLTS (LENGTH AS REQUIRED).
6. APROPRIATE LENGTH ⅞" DIAMETER ASTM A325 HEX BOLTS WITH WASHERS MUST BE USED WITH THRU DRILLED HOLES WITH A ⅝" BEARING PLATE ON THE BACK SIDE OF THE BRIDGE PARAPET OR TERMINAL WALL.
7. SEE SHEET 3 OF 3 FOR RUBRAIL BLOCKOUT DETAILS.

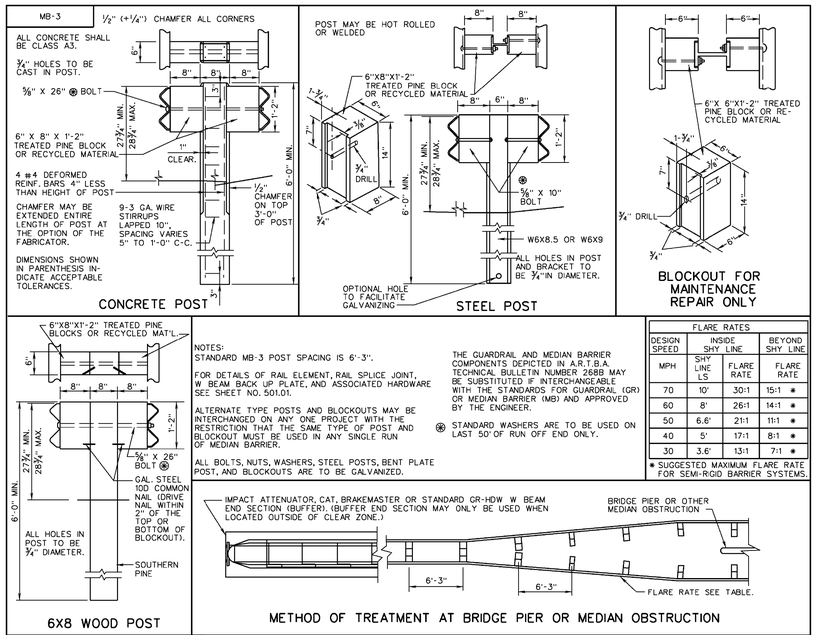
ITEM	MATERIAL/SPECIFICATIONS/NOTES
1	⅝" X 10" LONG HEX BOLT WITH NUT
2	ST'D. W6X8.5 OR W6X9 STEEL POST ST'D. 6X8X14" LG. TREATED PINE BLOCK OR RECYCLED MATERIAL
3	STANDARD W-BEAM TERMINAL CONNECTOR
4	STANDARD W-BEAM RAIL
5	⅝" X 2" LONG GUARDRAIL BOLT & RECESSED NUT (SEE STANDARD GR-HDW)
6	RECTANGULAR PLATE WASHER (SEE ST'D. GR-HDW)
7	BENT PLATE RUBRAIL (SEE SHEET 3 OF 3)
8	C6 X 8.2 RUBRAIL (SEE SHEET 3 OF 3)
9	W8 X 13 X 7'-6" LONG STEEL POST WITH STANDARD 6" X 8" X 14" LONG TREATED PINE BLOCK OR RECYCLED MATERIAL
10	WASHER FOR ⅝" BOLT

VDOT ROAD AND BRIDGE STANDARDS

W-BEAM GUARDRAIL-FIXED OBJECT ATTACHMENT
FOR USE BETWEEN VERTICAL FIXED OBJECTS AND GUARDRAIL (STEEL POSTS)
VIRGINIA DEPARTMENT OF TRANSPORTATION

SHEET	REVISION DATE	SPECIFICATION REFERENCE
2 OF 3	7/11	505
501.26		

MB-3



NOTES:
STANDARD MB-3 POST SPACING IS 6'-3".

FOR DETAILS OF RAIL ELEMENT, RAIL SPLICE JOINT, W BEAM BACK UP PLATE, AND ASSOCIATED HARDWARE SEE SHEET NO. 501.01.

ALTERNATE TYPE POSTS AND BLOCKOUTS MAY BE INTERCHANGED ON ANY ONE PROJECT WITH THE RESTRICTION THAT THE SAME TYPE OF POST AND BLOCKOUT MUST BE USED IN ANY SINGLE RUN OF MEDIAN BARRIER.

ALL BOLTS, NUTS, WASHERS, STEEL POSTS, BENT PLATE POST, AND BLOCKOUTS ARE TO BE GALVANIZED.

THE GUARDRAIL AND MEDIAN BARRIER COMPONENTS DEPICTED IN A.R.T.B.A. TECHNICAL BULLETIN NUMBER 2688 MAY BE SUBSTITUTED IF INTERCHANGEABLE WITH THE STANDARDS FOR GUARDRAIL (GR) OR MEDIAN BARRIER (MB) AND APPROVED BY THE ENGINEER.

⊛ STANDARD WASHERS ARE TO BE USED ON LAST 50'OF RUN OFF END ONLY.

FLARE RATES

DESIGN SPEED	INSIDE SHY LINE		BEYOND SHY LINE
MPH	SHY LINE LS	FLARE RATE	FLARE RATE
70	10'	30:1	15:1 *
60	8'	26:1	14:1 *
50	6.6'	21:1	11:1 *
40	5'	17:1	8:1 *
30	3.6'	13:1	7:1 *

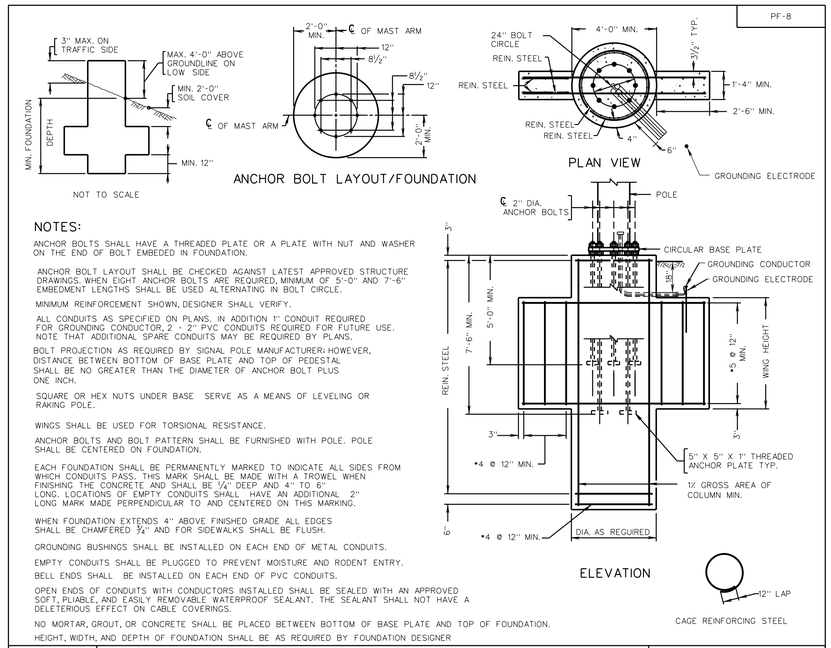
* SUGGESTED MAXIMUM FLARE RATE FOR SEMI-RIGID BARRIER SYSTEMS.

VDOT ROAD AND BRIDGE STANDARDS

BLOCKED-OUT W-BEAM MEDIAN BARRIER
VIRGINIA DEPARTMENT OF TRANSPORTATION

SHEET	REVISION DATE	SPECIFICATION REFERENCE
1 OF 1	7/11	221 505
502.01		

PF-8



NOTES:

ANCHOR BOLTS SHALL HAVE A THREADED PLATE OR A PLATE WITH NUT AND WASHER ON THE END OF BOLT EMBEDED IN FOUNDATION.

ANCHOR BOLT LAYOUT SHALL BE CHECKED AGAINST LATEST APPROVED STRUCTURE DRAWINGS. WHEN EIGHT ANCHOR BOLTS ARE REQUIRED, MINIMUM OF 5'-0" AND 7'-6" EMBEDMENT LENGTHS SHALL BE USED ALTERNATING IN BOLT CIRCLE.

MINIMUM REINFORCEMENT SHOWN, DESIGNER SHALL VERIFY.

ALL CONDUITS AS SPECIFIED ON PLANS. IN ADDITION 1" CONDUIT REQUIRED FOR GROUNDING CONDUCTOR, 2 - 2" PVC CONDUITS REQUIRED FOR FUTURE USE. NOTE THAT ADDITIONAL SPARE CONDUITS MAY BE REQUIRED BY PLANS.

BOLT PROJECTION AS REQUIRED BY SIGNAL POLE MANUFACTURER; HOWEVER, DISTANCE BETWEEN BOTTOM OF BASE PLATE AND TOP OF PEDESTAL SHALL BE NO GREATER THAN THE DIAMETER OF ANCHOR BOLT PLUS ONE INCH.

SQUARE OR HEX NUTS UNDER BASE SERVE AS A MEANS OF LEVELING OR RAKING POLE.

WINGS SHALL BE USED FOR TORSIONAL RESISTANCE.

ANCHOR BOLTS AND BOLT PATTERN SHALL BE FURNISHED WITH POLE. POLE SHALL BE CENTERED ON FOUNDATION.

EACH FOUNDATION SHALL BE PERMANENTLY MARKED TO INDICATE ALL SIDES FROM WHICH CONDUITS PASS. THIS MARK SHALL BE MADE WITH A TROWEL WHEN FINISHING THE CONCRETE AND SHALL BE ¼" DEEP AND 4" TO 6" LONG. LOCATIONS OF EMPTY CONDUITS SHALL HAVE AN ADDITIONAL 2" LONG MARK MADE PERPENDICULAR TO AND CENTERED ON THIS MARKING.

WHEN FOUNDATION EXTENDS 4" ABOVE FINISHED GRADE ALL EDGES SHALL BE CHAMFERED ¾" AND FOR SIDEWALKS SHALL BE FLUSH.

GROUNDING BUSHINGS SHALL BE INSTALLED ON EACH END OF METAL CONDUITS.

EMPTY CONDUITS SHALL BE PLUGGED TO PREVENT MOISTURE AND RODENT ENTRY.

BELL ENDS SHALL BE INSTALLED ON EACH END OF PVC CONDUITS.

OPEN ENDS OF CONDUITS WITH CONDUCTORS INSTALLED SHALL BE SEALED WITH AN APPROVED SOFT, PLIABLE, AND EASILY REMOVABLE WATERPROOF SEALANT. THE SEALANT SHALL NOT HAVE A DELETERIOUS EFFECT ON CABLE COVERINGS.

NO MORTAR, GROUT, OR CONCRETE SHALL BE PLACED BETWEEN BOTTOM OF BASE PLATE AND TOP OF FOUNDATION.

HEIGHT, WIDTH, AND DEPTH OF FOUNDATION SHALL BE AS REQUIRED BY FOUNDATION DESIGNER

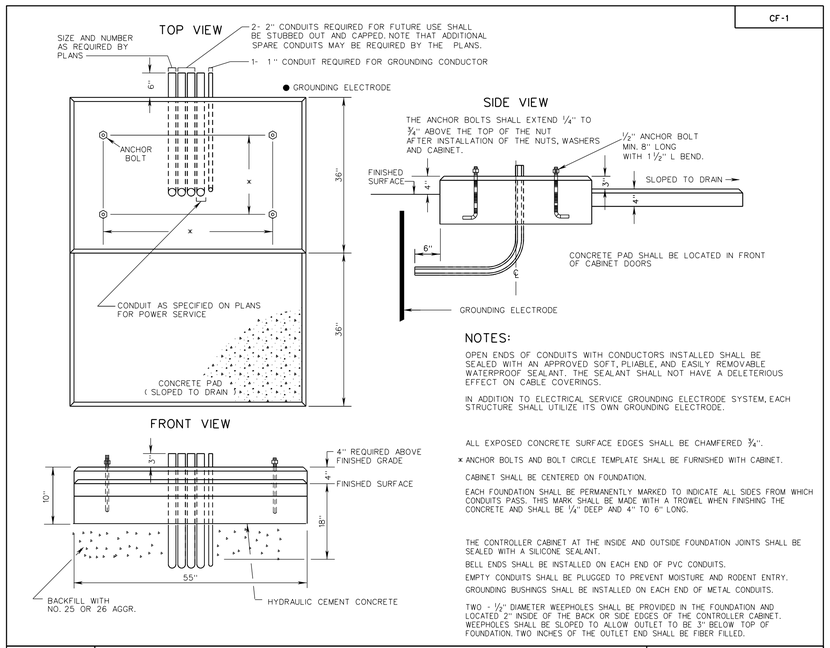
SPECIFICATION REFERENCE
700

SIGNAL POLE FOUNDATION
INSTALLATION DETAILS
VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT ROAD AND BRIDGE STANDARDS

REVISION DATE	SHEET _1_ OF _1_
NEW 04/09 06/15/2009	_1310.11_

CF-1



NOTES:

OPEN ENDS OF CONDUITS WITH CONDUCTORS INSTALLED SHALL BE SEALED WITH AN APPROVED SOFT, PLIABLE, AND EASILY REMOVABLE WATERPROOF SEALANT. THE SEALANT SHALL NOT HAVE A DELETERIOUS EFFECT ON CABLE COVERINGS.

IN ADDITION TO ELECTRICAL SERVICE GROUNDING ELECTRODE SYSTEM, EACH STRUCTURE SHALL UTILIZE ITS OWN GROUNDING ELECTRODE.

ALL EXPOSED CONCRETE SURFACE EDGES SHALL BE CHAMFERED ¾".

× ANCHOR BOLTS AND BOLT CIRCLE TEMPLATE SHALL BE FURNISHED WITH CABINET.

CABINET SHALL BE CENTERED ON FOUNDATION.

EACH FOUNDATION SHALL BE PERMANENTLY MARKED TO INDICATE ALL SIDES FROM WHICH CONDUITS PASS. THIS MARK SHALL BE MADE WITH A TROWEL WHEN FINISHING THE CONCRETE AND SHALL BE ¼" DEEP AND 4" TO 6" LONG.

THE CONTROLLER CABINET AT THE INSIDE AND OUTSIDE FOUNDATION JOINTS SHALL BE SEALED WITH A SILICONE SEALANT.

BELL ENDS SHALL BE INSTALLED ON EACH END OF PVC CONDUITS.

EMPTY CONDUITS SHALL BE PLUGGED TO PREVENT MOISTURE AND RODENT ENTRY.

GROUNDING BUSHINGS SHALL BE INSTALLED ON EACH END OF METAL CONDUITS.

TWO - ½" DIAMETER WEEPHOLES SHALL BE PROVIDED IN THE FOUNDATION AND LOCATED 2" INSIDE OF THE BACK OR SIDE EDGES OF THE CONTROLLER CABINET. WEEPHOLES SHALL BE SLOPED TO ALLOW OUTLET TO BE 3" BELOW TOP OF FOUNDATION. TWO INCHES OF THE OUTLET END SHALL BE FIBER FILLED.

SPECIFICATION REFERENCE
700

CONTROLLER CABINET FOUNDATION
CABINET PLACEMENT DETAILS
VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT ROAD AND BRIDGE STANDARDS

REVISION DATE	SHEET 1 OF 1
06-15-2009	1301.10

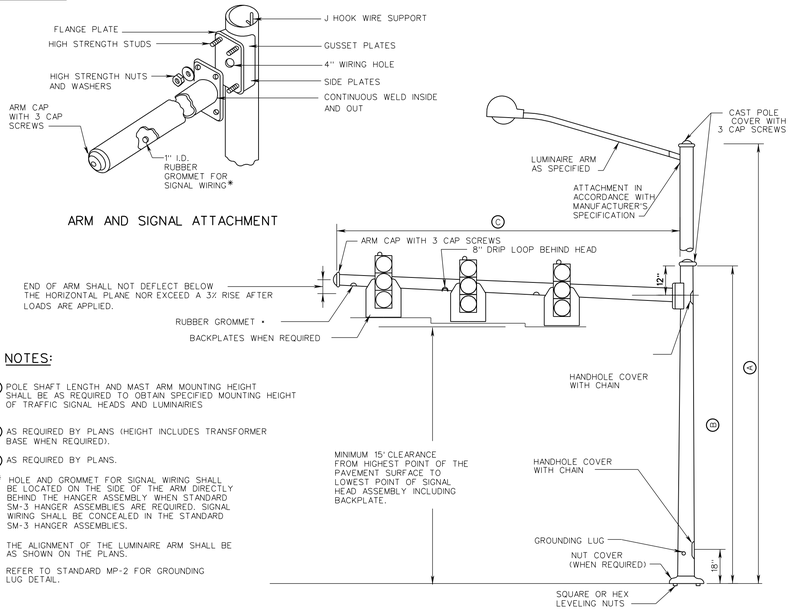
PROJECT	SHEET NO.
U000-118-204	2G(4)

SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL, MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE, MATTERN & CRAIG

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

REVISED	STATE	FEDERAL AID PROJECT	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.		29	U000-118-204, C-501	2G(5)

MP-1



NOTES:

(A) POLE SHAFT LENGTH AND MAST ARM MOUNTING HEIGHT SHALL BE AS REQUIRED TO OBTAIN SPECIFIED MOUNTING HEIGHT OF TRAFFIC SIGNAL HEADS AND LUMINAIRIES

(B) AS REQUIRED BY PLANS (HEIGHT INCLUDES TRANSFORMER BASE WHEN REQUIRED).

(C) AS REQUIRED BY PLANS.

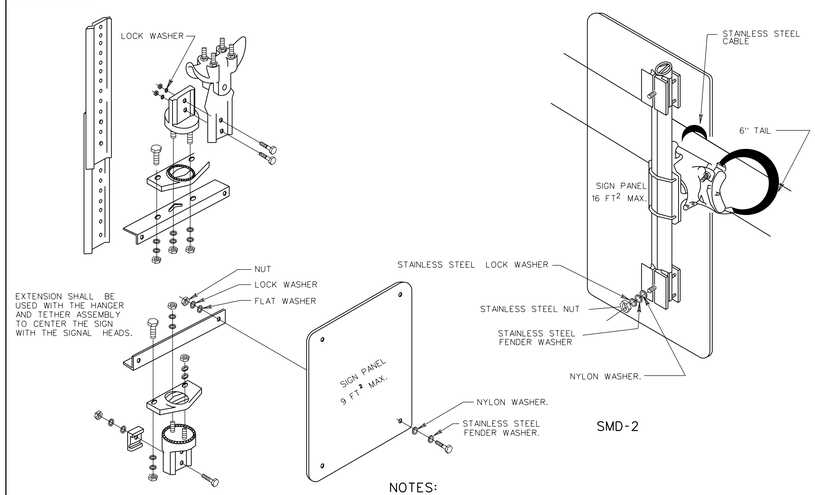
* HOLE AND GROMMET FOR SIGNAL WIRING SHALL BE LOCATED ON THE SIDE OF THE ARM DIRECTLY BEHIND THE HANGER ASSEMBLY WHEN STANDARD SM-3 HANGER ASSEMBLIES ARE REQUIRED. SIGNAL WIRING SHALL BE CONCEALED IN THE STANDARD SM-3 HANGER ASSEMBLIES.

THE ALIGNMENT OF THE LUMINAIRE ARM SHALL BE AS SHOWN ON THE PLANS.

REFER TO STANDARD MP-2 FOR GROUNDING LUG DETAIL.

VDOT ROAD AND BRIDGE STANDARDS	SIGNAL POLE DETAILS	SPECIFICATION REFERENCE
SHEET 1 OF 1 / REVISION DATE 06-15-2009 / 1302.10	MAST ARM AND COMBINATION LUMINAIRE MAST ARM POLE VIRGINIA DEPARTMENT OF TRANSPORTATION	700

SMD-1,2



NOTES:

NUTS AND BOLTS USED FOR ATTACHMENT OF SIGN PANEL SHALL BE STAINLESS STEEL AND ¾" IN DIAMETER.

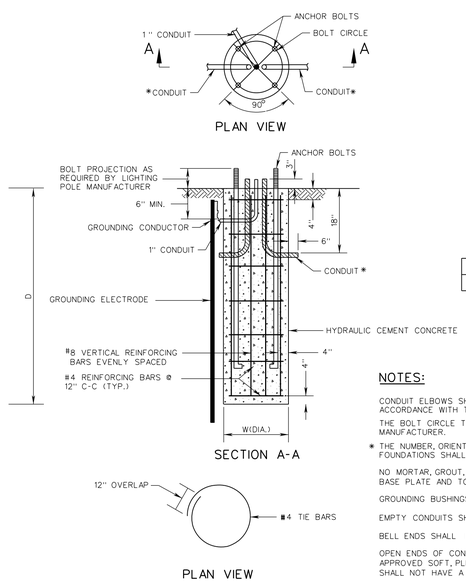
A 1¼" NYLON AND STAINLESS STEEL FENDER WASHER SHALL BE USED ON THE FRONT OF SIGN PANEL WHERE BOLT PASSES THROUGH SIGN PANEL.

ALL NUTS, BOLTS AND WASHERS SHALL BE STAINLESS STEEL OR GALVANIZED STEEL UNLESS OTHERWISE INDICATED

SPACERS SHALL BE INSTALLED BETWEEN THE EYELET OF THE SIGN HANGAR AND THE SPAN WIRE CLAMP TO ELIMINATE ANY GAP.

VDOT ROAD AND BRIDGE STANDARDS	SIGN MOUNTING DETAILS	SPECIFICATION REFERENCE
SHEET 1 OF 1 / REVISION DATE 06-15-2009 / 1305.10	VIRGINIA DEPARTMENT OF TRANSPORTATION	703

LF-1



TYPE	W	D	VERTICAL BARS
A	2'-6"	8'	8 - #8

NOTES:

CONDUIT ELBOWS SHALL HAVE A 90° BEND. THE BEND RADIUS SHALL BE IN ACCORDANCE WITH THE N.E.C.

THE BOLT CIRCLE TEMPLATE SHALL BE FURNISHED BY THE LIGHTING POLE MANUFACTURER.

* THE NUMBER, ORIENTATION AND SIZE OF CONDUITS ENTERING AND EXITING FOUNDATIONS SHALL BE AS SHOWN ON THE PLANS.

NO MORTAR, GROUT, OR CONCRETE SHALL BE PLACED BETWEEN BOTTOM OF BASE PLATE AND TOP OF FOUNDATION.

GROUNDING BUSHINGS SHALL BE INSTALLED ON EACH END OF METAL CONDUITS.

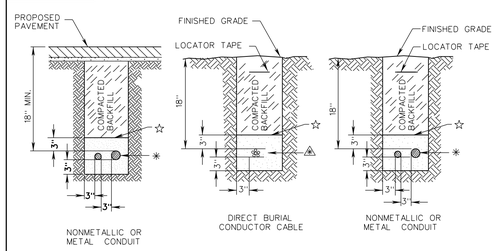
EMPTY CONDUITS SHALL BE PLUGGED TO PREVENT MOISTURE AND RODENT ENTRY.

BELL ENDS SHALL BE INSTALLED ON EACH END OF PVC CONDUITS.

OPEN ENDS OF CONDUITS WITH CONDUCTORS INSTALLED SHALL BE SEALED WITH AN APPROVED SOFT, PLIABLE, AND EASILY REMOVABLE WATERPROOF SEALANT. THE SEALANT SHALL NOT HAVE A DELETERIOUS EFFECT ON CABLE COVERINGS.

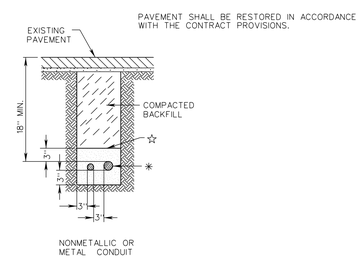
SPECIFICATION REFERENCE	LIGHTING POLE FOUNDATION	VDOT ROAD AND BRIDGE STANDARDS
700	INSTALLATION DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE 06-15-2009 / SHEET 1 OF 1 / 1310.20

ECI-1



NON - PAVEMENT AND PROPOSED PAVEMENT AREA INSTALLATION

ECI-2



EXISTING PAVEMENT AREA INSTALLATION

NOTES:

CONTRACTOR SHALL INSTALL A 4" MINIMUM TO 6" MAXIMUM WIDE RED PLASTIC LOCATOR TAPE 6" TO 8" BELOW FINISHED GRADE AND DIRECTLY ABOVE BURIED CONDUIT OR CONDUCTOR CABLES, EXCEPT UNDER PAVEMENT.

CONDUIT INSTALLED UNDER EXISTING OR PROPOSED ROADWAYS FOR DIRECT BURIED CABLES SHALL EXTEND 24" BEYONDTHE PAVED SURFACE AND/OR SIDEWALK.

WHERE CONDUIT FOR POWER AND CONDUIT FOR COMMUNICATION ARE TO BE INSTALLED IN CLOSE PROXIMITY TO EACH OTHER, CONDUITS SHALL BE PLACED PARALLEL IN A COMMON TRENCH WITH NO LESS THAN 6" OF SEPARATION SEPARATION BETWEEN CONDUIT SYSTEMS.

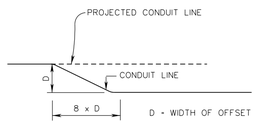
☆ BACKFILL MATERIAL BELOW THIS LEVEL SHALL BE SANDY FILL (FREE OF ANY STONES, CINDERS, WOOD, ROOTS, DEBRIS, ETC.)

✳ ONE OR MORE CONDUITS AS REQUIRED.

△ ONE OR MORE CONDUCTOR CABLES AS REQUIRED.

OFFSETTING OF CONDUIT MAY BE USED FOR TIEING INTO EXISTING CONDUIT SYSTEMS OR BYPASSING OBSTRUCTIONS AS DIRECTED BY THE ENGINEER.

WHEN OFFSETTING CONDUIT TO BYPASS AN OBSTRUCTION, THE CONDUIT SHALL MAINTAIN A MINIMUM CLEARANCE OF 12" FROM THE CLOSEST POINT OF THE OBSTRUCTION.



METHOD OF OFFSETTING CONDUIT

VDOT ROAD AND BRIDGE STANDARDS	ELECTRICAL CONDUIT AND CONDUCTOR CABLE	SPECIFICATION REFERENCE
SHEET 1 OF 1 / REVISION DATE 06-15-2009 / 1318.10	UNDERGROUND INSTALLATION VIRGINIA DEPARTMENT OF TRANSPORTATION	700

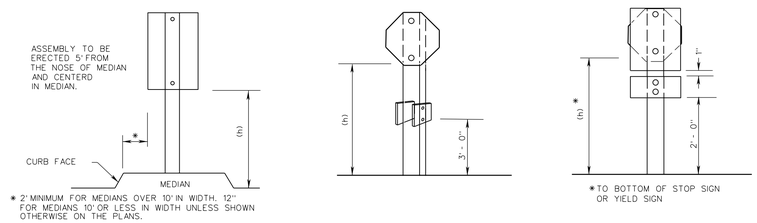
PLAN NO.	PROJECT	FILE NO.	SHEET NO.
	U000-118-204		2G(5)

SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL, MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE, MATTERN & CRAIG

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

REVISED	STATE	FEDERAL AID PROJECT	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.		29	U000-118-204, C-501	2G(6)

STP-1

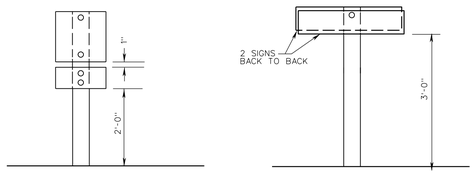


* 2' MINIMUM FOR MEDIANS OVER 10' IN WIDTH. 12" FOR MEDIANS 10' OR LESS IN WIDTH UNLESS SHOWN OTHERWISE ON THE PLANS.

SINGLE POST MEDIAN INSTALLATIONS

ONE WAY SIGNS ON EXIT RAMPS WITH STOP SIGN

STOP OR YIELD SIGNS AND DO NOT ENTER SIGN AT EXIT RAMPS

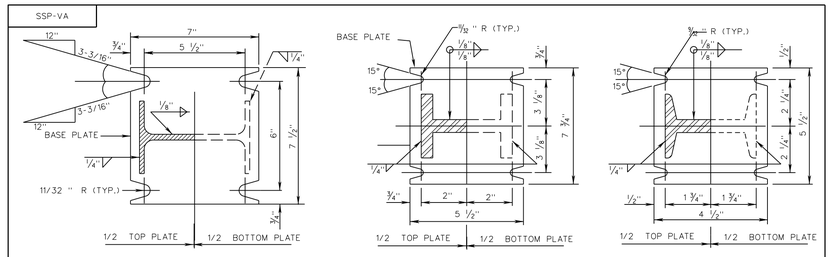


WRONG WAY SIGN AND DO NOT ENTER SIGN ON EXIT RAMPS

ONE WAY SIGNS ON EXIT RAMPS

SPECIFICATION REFERENCE	SQUARE TUBE SIGN POST	VDOT ROAD AND BRIDGE STANDARDS
700	VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE 6-15-09 / SHEET 3 OF 3 / 1321.12

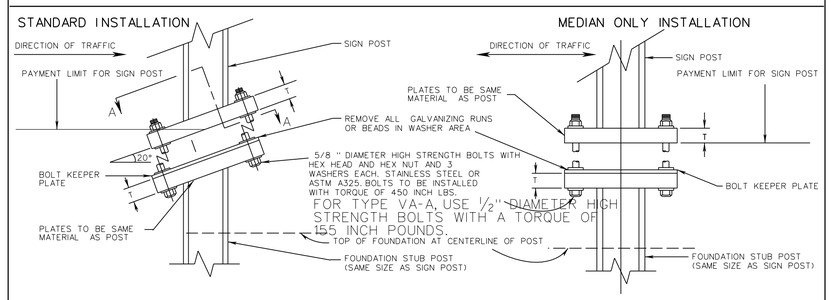
SSP-VA



SECTION A-A FOR W6 x 12 POST

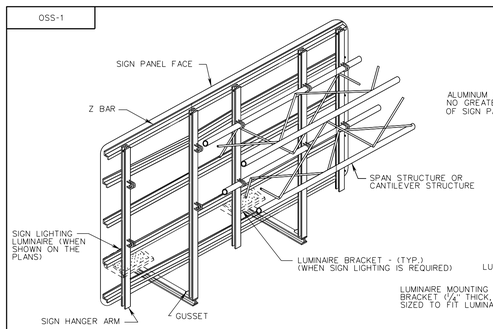
SECTION A-A FOR W4 x 13 POST

SECTION A-A FOR S3 x 5.7 POST



VDOT ROAD AND BRIDGE STANDARDS	VA SIGN STRUCTURE INSTALLATION DETAILS	SPECIFICATION REFERENCE
SHEET 3 OF 4 / 1322.12 / REVISION DATE 6-15-09	VIRGINIA DEPARTMENT OF TRANSPORTATION	700

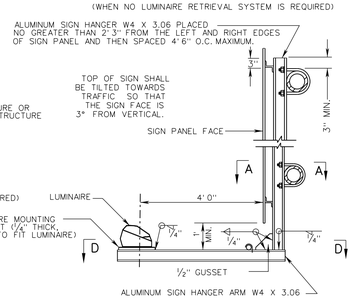
OSS-1



SIGN ATTACHMENT TO TRUSS-TYPE STRUCTURES

SIGN HANGER ERECTION DETAIL WITH LUMINAIRE

(WHEN NO LUMINAIRE RETRIEVAL SYSTEM IS REQUIRED)

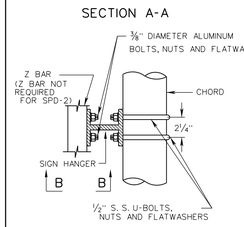


NOTE

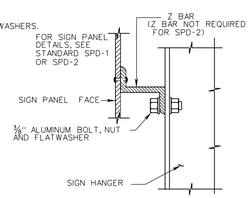
LUMINAIRES REQUIRED WHERE INDICATED ON THE PLANS.

LUMINAIRE TO BE ATTACHED TO MOUNTING BRACKET WITH FOUR, 3/8" DIA. GALVANIZED CAP SCREWS, LOCKWASHERS AND NUTS.

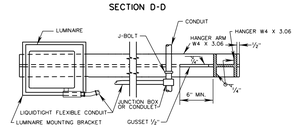
SECTION A-A



SECTION B-B

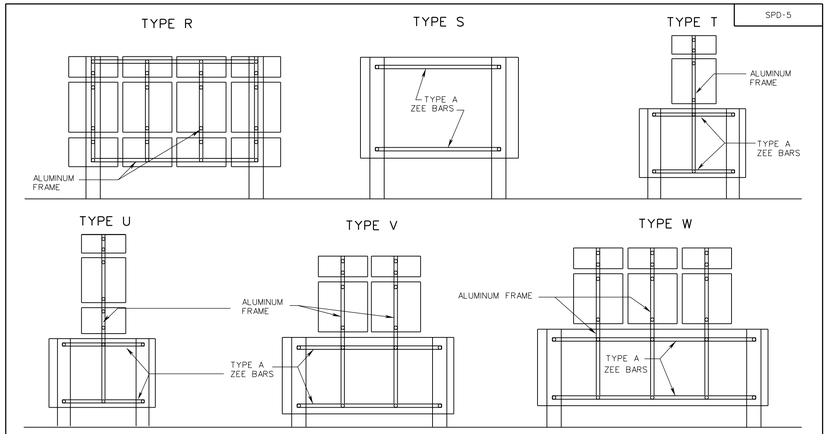


SECTION D-D



VDOT ROAD AND BRIDGE STANDARDS	OVERHEAD SIGN STRUCTURE HANGER AND LUMINAIRE DETAIL	SPECIFICATION REFERENCE
SHEET 2 OF 2 / 1324.16 / REVISION DATE 6-15-09	VIRGINIA DEPARTMENT OF TRANSPORTATION	700

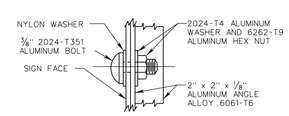
SPD-5



ALUMINUM FRAMING

SIGN PANEL ATTACHMENT DETAILS

(FOR SIGN PANEL ATTACHMENT TO Z BARS, SEE STANDARD SPD-1)



NOTES

NYLON WASHER SHALL BE 1/4" THICK MINIMUM WITH AN OUTSIDE DIAMETER OF 1" AND AN INSIDE DIAMETER OF 7/16".

TO OBTAIN A FLUSH MOUNTING SURFACE FOR SIGNS, ALL WOOD POST SHALL BE MORTISED WHERE NECESSARY TO RECESS THE FLANGE OF ALUMINUM ANGLE.

THE TYPE A ZEE BARS SHALL BE 2 7/8" X 1 1/4" X 3/16".

ALL VERTICAL AND HORIZONTAL SPACING BETWEEN SIGNS IN AN ASSEMBLY SHALL BE ONE INCH UNLESS SPECIFIED.

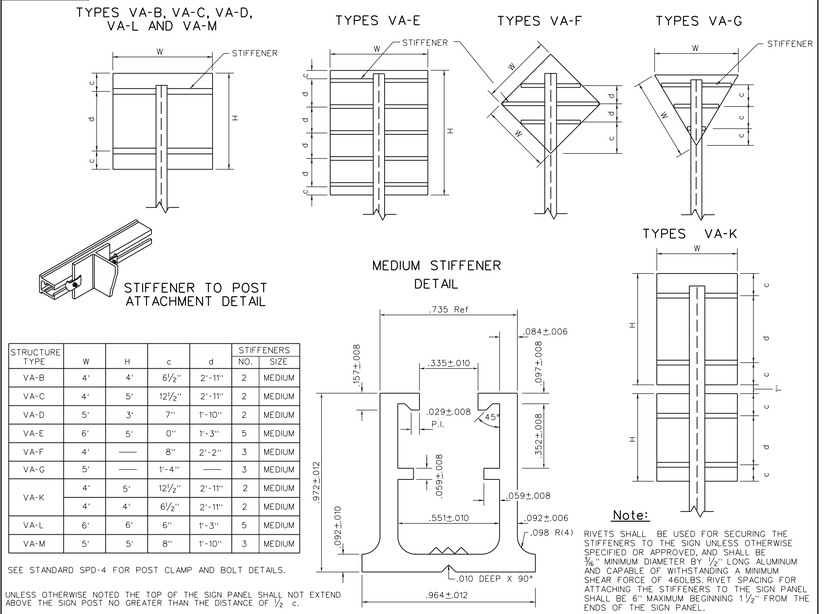
THESE ARE TYPICAL SIGN PANEL ASSEMBLIES: ALL ASSEMBLIES SHALL BE IN ACCORDANCE WITH PLAN DETAILS.

SPECIFICATION REFERENCE	SIGN PANEL DESIGN	VDOT ROAD AND BRIDGE STANDARDS
701	VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE 6-15-09 / SHEET 2 OF 2 / 1325.51

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
	U000-118-204		2G(6)

SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL, MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE, MATTERN & CRAIG

SPD-6



STRUCTURE TYPE	W	H	c	d	STIFFENERS NO.	STIFFENERS SIZE
VA-B	4'	4'	6½"	2'-11"	2	MEDIUM
VA-C	4'	5'	12½"	2'-11"	2	MEDIUM
VA-D	5'	3'	7"	1'-10"	2	MEDIUM
VA-E	6'	5'	0"	1'-3"	5	MEDIUM
VA-F	4'	——	8"	2'-2"	3	MEDIUM
VA-G	5'	——	1'-4"	——	3	MEDIUM
VA-K	4'	5'	12½"	2'-11"	2	MEDIUM
	4'	4'	6½"	2'-11"	2	MEDIUM
VA-L	6'	6'	6"	1'-3"	5	MEDIUM
VA-M	5'	5'	8"	1'-10"	3	MEDIUM

SEE STANDARD SPD-4 FOR POST CLAMP AND BOLT DETAILS.

UNLESS OTHERWISE NOTED THE TOP OF THE SIGN PANEL SHALL NOT EXTEND ABOVE THE SIGN POST NO GREATER THAN THE DISTANCE OF ½ c.

Note:

RIVETS SHALL BE USED FOR SECURING THE STIFFENERS TO THE SIGN UNLESS OTHERWISE SPECIFIED OR APPROVED, AND SHALL BE ⅜" MINIMUM DIAMETER BY ½" LONG ALUMINUM AND CAPABLE OF WITHSTANDING A MINIMUM SHEAR FORCE OF 460LBS. RIVET SPACING FOR ATTACHING THE STIFFENERS TO THE SIGN PANEL SHALL BE 6" MAXIMUM BEGINNING 1½" FROM THE ENDS OF THE SIGN PANEL.

VDOT ROAD AND BRIDGE STANDARDS		SIGN PANEL DESIGN	SPECIFICATION REFERENCE
SHEET 1 OF 1	REVISION DATE 6-15-09	VIRGINIA DEPARTMENT OF TRANSPORTATION	701
1325.60			

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

REVISED	STATE	FEDERAL AID PROJECT	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.		29	U000-118-204, C-501	2G(7)

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
	U000-118-204		2G(7)

SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE MATTERN & CRAIG

STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
VA.	29	U000-118-204, C-501	3

REVISED

COMMONWEALTH OF VIRGINIA
MICHAEL S. AGEE
Lic. No. 015232
PROFESSIONAL ENGINEER

MATTERN & CRAIG, INC
Roanoke, Virginia
(ROADWAY ENGINEER)

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

LEGEND

- C _ _ _ DENOTES CONSTRUCTION LIMITS IN CUTS
- F _ _ DENOTES CONSTRUCTION LIMITS IN FILLS
- (1) STD. CG-6 CURB AND GUTTER
- (2) STD.MS-1A CONC.RAISED MEDIAN STRIP
- (3) 4" HYDRAULIC CEMENT CONCRETE SIDEWALK
- (4) STD. CG-2 CURB
- (5) STD. GR-2 GUARDRAIL
- DENOTES DEMOLITION OF PAVEMENT
- DENOTES PROPOSED PAVEMENT
- SIGNAL HEAD
- SIGNAL POLE

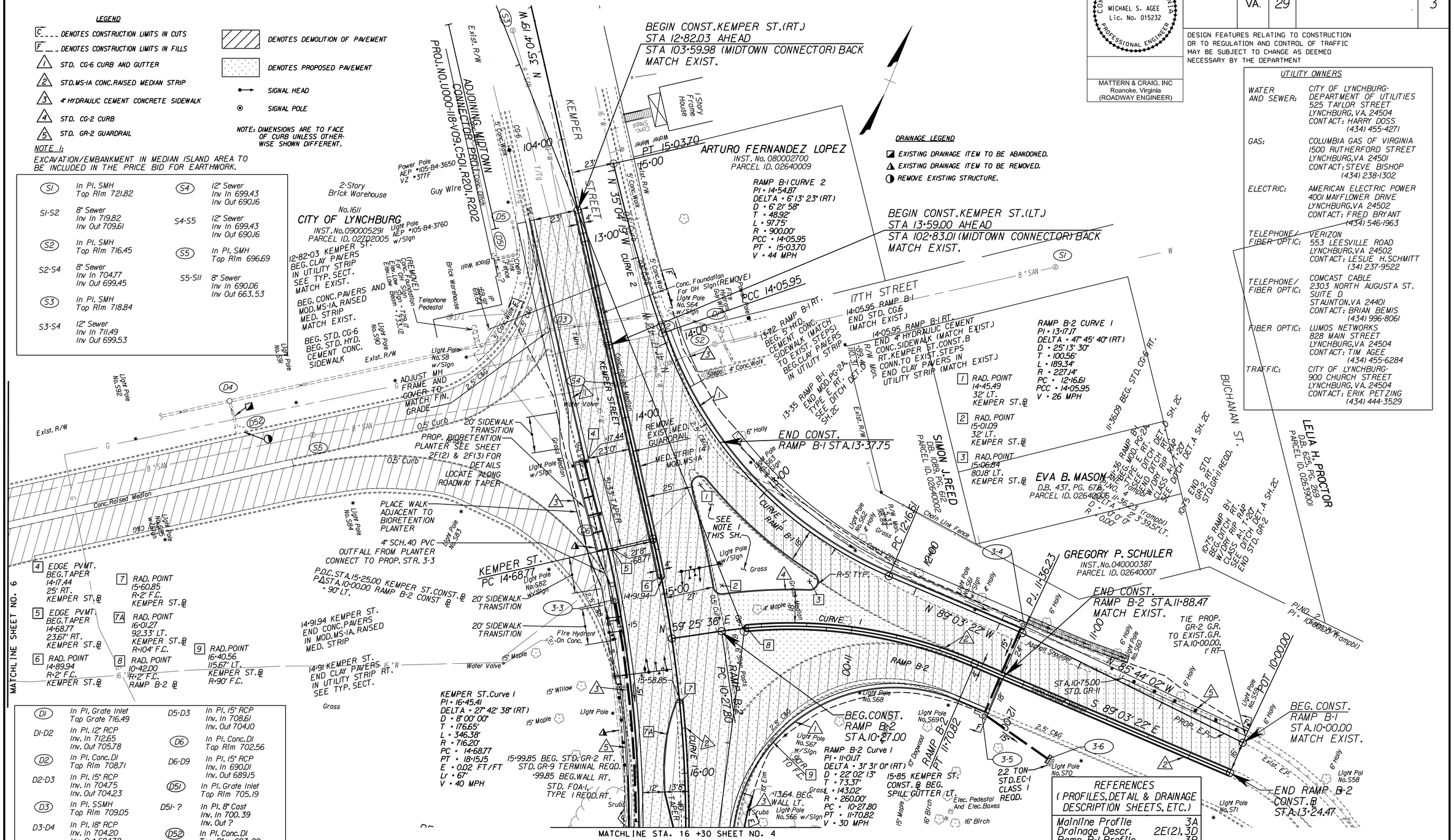
NOTE: DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE SHOWN DIFFERENT.

NOTE 1:
EXCAVATION/EMBANKMENT IN MEDIAN ISLAND AREA TO BE INCLUDED IN THE PRICE BID FOR EARTHWORK.

(S1)	In Pl. SMH Top Rim 721.82	(S4)	12" Sewer Inv In 699.43 Inv Out 690.16
S1-S2	8" Sewer Inv In 719.82 Inv Out 709.61	S4-S5	12" Sewer Inv In 699.43 Inv Out 690.16
(S2)	In Pl. SMH Top Rim 716.45	(S5)	In Pl. SMH Top Rim 696.69
S2-S4	8" Sewer Inv In 704.77 Inv Out 699.45	S5-S11	8" Sewer Inv In 690.06 Inv Out 663.53
(S3)	In Pl. SMH Top Rim 718.84		
S3-S4	12" Sewer Inv In 711.49 Inv Out 699.53		

DRAINAGE LEGEND

- EXISTING DRAINAGE ITEM TO BE ABANDONED.
- EXISTING DRAINAGE ITEM TO BE REMOVED.
- REMOVE EXISTING STRUCTURE.



UTILITY OWNERS

WATER AND SEWER:	CITY OF LYNCHBURG-DEPARTMENT OF UTILITIES 525 TAYLOR STREET LYNCHBURG, VA. 24504 CONTACT: HARRY DOSS (434) 455-4271
GAS:	COLUMBIA GAS OF VIRGINIA 1500 RUTHERFORD STREET LYNCHBURG, VA 24501 CONTACT: STEVE BISHOP (434) 238-1302
ELECTRIC:	AMERICAN ELECTRIC POWER 4001 MAYFLOWER DRIVE LYNCHBURG, VA 24502 CONTACT: FRED BRYANT (434) 546-1963
TELEPHONE/ FIBER OPTIC:	VERIZON 553 LEESVILLE ROAD LYNCHBURG, VA 24502 CONTACT: LESLIE H. SCHMITT (34) 237-9522
TELEPHONE/ FIBER OPTIC:	COMCAST CABLE 2303 NORTH AUGUSTA ST. SUITE D STAUNTON, VA 24401 CONTACT: BRIAN BEMIS (434) 996-8061
FIBER OPTIC:	LUMOS NETWORKS 828 MAIN STREET LYNCHBURG, VA 24504 CONTACT: TIM AGEE (434) 455-6284
TRAFFIC:	CITY OF LYNCHBURG-900 CHURCH STREET LYNCHBURG, VA. 24504 CONTACT: ERIK PETZING (434) 444-3529

(D1)	In Pl. Grate Inlet Top Grate 716.49
D1-D2	In Pl. 12" RCP Inv. In 712.65 Inv. Out 705.78
(D2)	In Pl. Conc. DI Top Rim 708.71
D2-D3	In Pl. 15" RCP Inv. In 704.75 Inv. Out 704.23
(D3)	In Pl. SSMH Top Rim 709.05
D3-D4	In Pl. 18" RCP Inv. In 704.20 Inv. Out 684.78
(D4)	In Pl. SSMH Top Rim 696.28
(D5)	In Pl. Conc. DI Top Rim 712.91
D5-D3	In Pl. 15" RCP Inv. In 708.61 Inv. Out 704.10
(D6)	In Pl. Conc. DI Top Rim 702.56
D6-D9	In Pl. 15" RCP Inv. In 690.01 Inv. Out 689.15
(D51)	In Pl. Grate Inlet Top Rim 705.19
D51- ?	In Pl. 8" Cast Inv. In 700.39 Inv. Out ?
(D52)	In Pl. Conc. DI Top Rim 693.20
D52-D4	In Pl. 12" RCP Inv. In 685.90 Inv. Out 684.90

REFERENCES (PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

Mainline Profile	3A
Drainage Descr.	2E(2), 3D
Ramp B-1 Profile	3B
Ramp B-2 Profile	3B
ESC Plan	13(3)
Ditch Details	2C
Ditch Profiles	6A
Pavement Markings	8(1)
Signal Plan	9(1)

PROJECT	SHEET NO.
U000-118-204	3

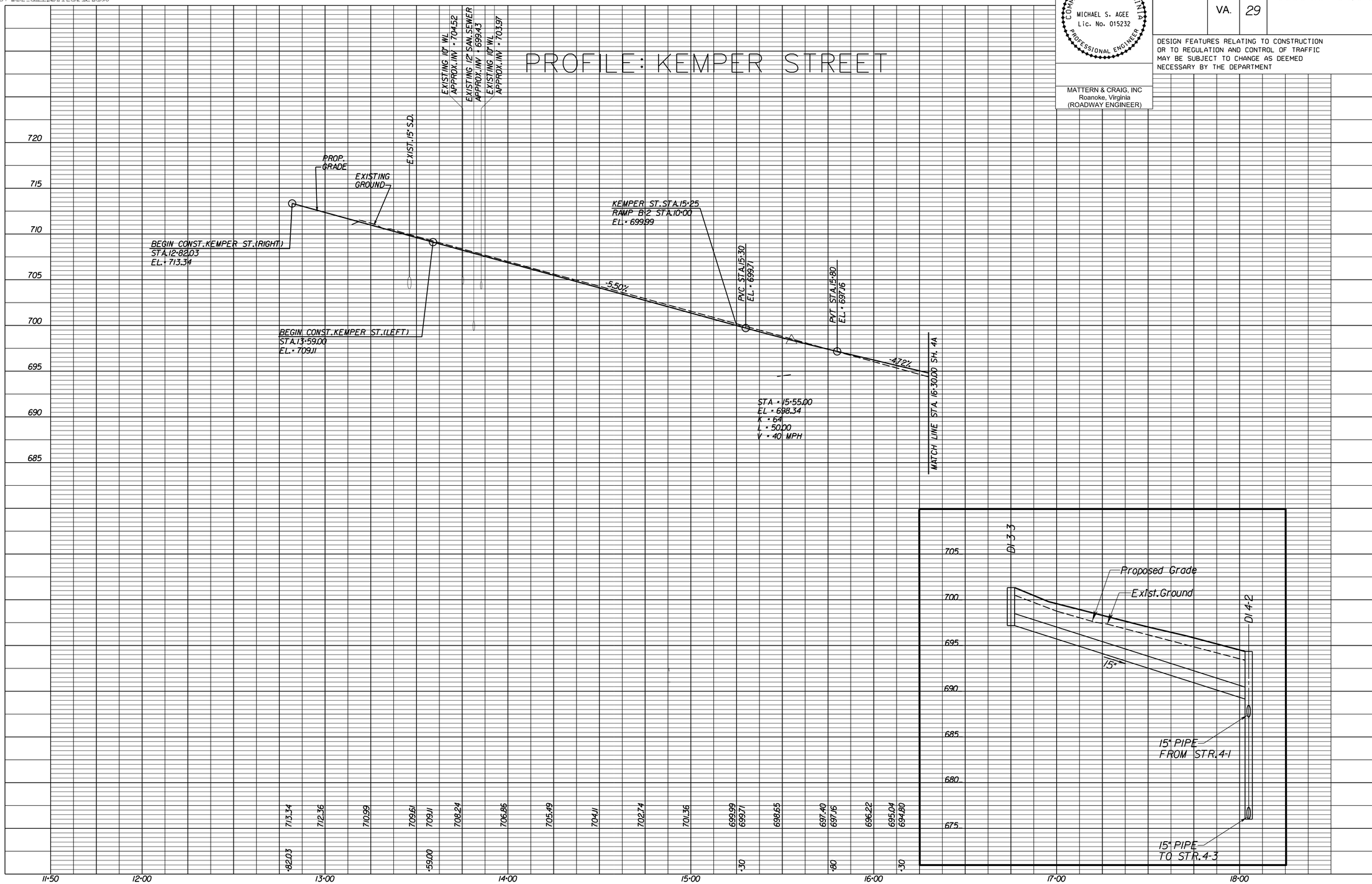
SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE MATTERN & CRAIG

COMMONWEALTH OF VIRGINIA
MICHAEL S. AGEE
Lic. No. 015232
PROFESSIONAL ENGINEER

MATTERN & CRAIG, INC
Roanoke, Virginia
(ROADWAY ENGINEER)

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	U000-118-204, C-501	3A

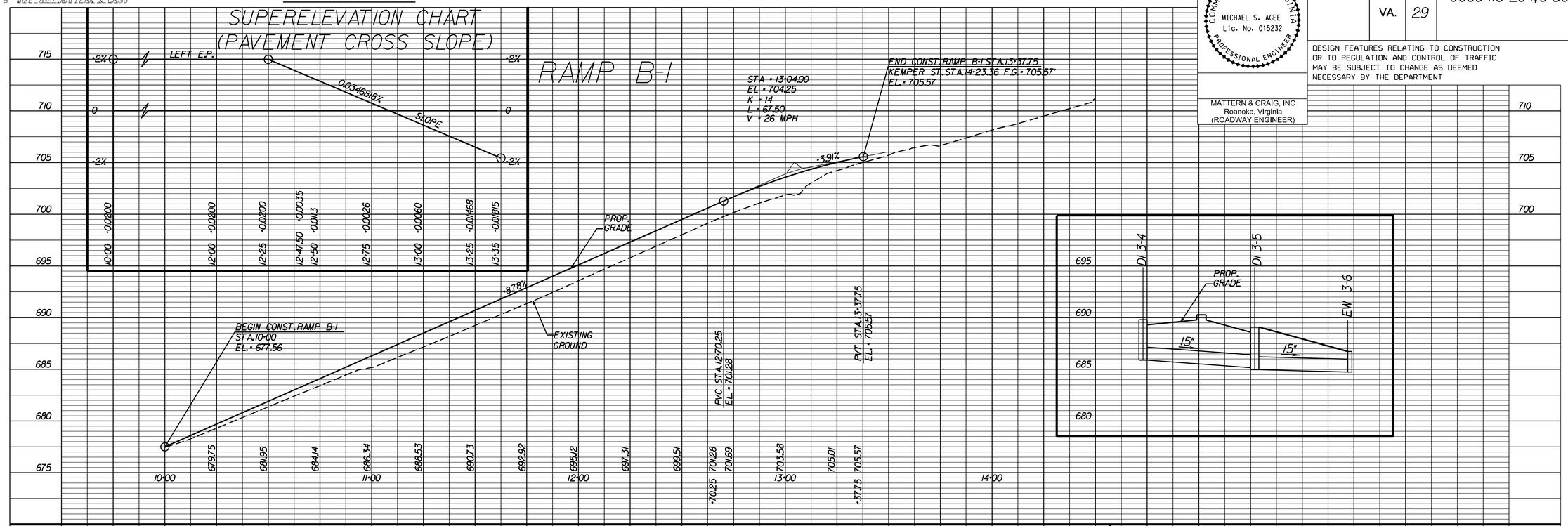
DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

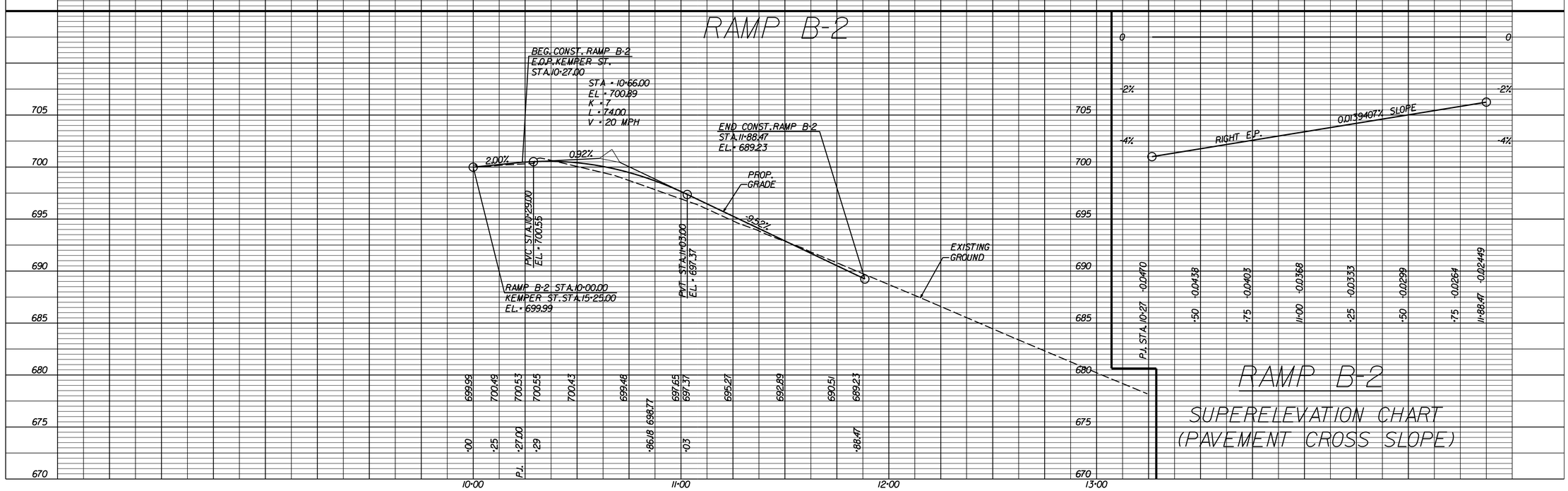


PROJECT	SHEET NO.
U000-118-204	3A

SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE MATTERN & CRAIG

RAMP B-1





COMMONWEALTH OF VIRGINIA
MICHAEL S. AGEE
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PROFESSIONAL ENGINEER

MATTERN & CRAIG, INC
Roanoke, Virginia
(ROADWAY ENGINEER)

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	U000-118-204, C-501	3B

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

PROJECT	SHEET NO.
U000-118-204	3B

SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL, MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE, MATTERN & CRAIG

COMMONWEALTH OF VIRGINIA
MICHAEL S. AGEE
Lic. No. 015232
PROFESSIONAL ENGINEER

MATTERN & CRAIG, INC
Roanoke, Virginia
(HYDRAULIC ENGINEER)

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	U000-118-204, C-501	3D

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

PROPOSED DRAINAGE

3-3
1 STD. DI-2B REQ'D
L = 8' H = 4.6', INV. 697.30

3-4
1 STD. DI-2B REQ'D
L = 12' H = 3.9', INV. 685.89

3-5
1 STD. DI-2B REQ'D
L = 6' H = 4.1', INV. 684.96

3-4 - 3-5
50' - 15" CONC. PIPE REQ'D (COVER = 2.00')
INV. EL. 685.89 (IN), 685.16 (OUT)

3-6
1 STD. EW-1 REQ'D
INV. 684.74

3-5 - 3-6
43' - 15" CONC. PIPE REQ'D (COVER = 2.2')
INV. EL. 684.96 (IN), 684.74 (OUT)

4-1
1 STD. DI-3B REQ'D
L = 6' H = 7.2', INV. 687.46

4-2
1 STD. DI-2BB REQ'D
L = 8' H = 18.34', INV. 676.00
STD. SL-1 REQD.

3-3 - 4-2
132' - 15" CONC. PIPE REQ'D (COVER = 2')
INV. EL. 697.30 (IN), 689.14 (OUT)

4-1 - 4-2
28' - 15" CONC. PIPE REQ'D (COVER = 3.46')
INV. EL. 687.46 (IN), 687.15 (OUT)

4-3
6.5 L.F. INV. STD. MH-1 OR MH2 REQD
1-STD. MH-1 FRAME AND COVER REQD
INV. 675.00

4-2 - 4-3
16' - 15" CONC. PIPE REQ'D (COVER = 2')
INV. EL. 676.00 (IN), 675.92 (OUT)

4-4
1 STD. DI-3B REQ'D
L = 14' H = 6.1', INV. 680.03

4-5
7.2 LF STD. MH-1 OR MH-2 REQ'D
1 STD. MH-1 FRAME AND COVER REQ'D
INV. 678.37

4-4 - 4-5
10' - 15" CONC. PIPE REQ'D (COVER = 4.42')
INV. EL. 680.03 (IN), 678.50 (OUT)

4-6
1 STD. DI-2B REQ'D
L = 10' H = 3.9', INV. 677.38

4-7
1 STD. EW-1 REQ'D
INV. 674.90

4-6 - 4-7
51' - 15" CONC. PIPE REQ'D (COVER = 2.0')
INV. EL. 677.38 (IN), 674.90 (OUT)

4-8
1 STD. DI-2B REQ'D
L = 8' H = 3.9', INV. 670.57

4-9
1 STD. DI-2B REQ'D
L = 8' H = 3.9', INV. 668.90

4-3A
1 STD. PS-2 PIPE SPILLOUT REQ'D, 2:1 SLOPE

4-3 - 4-3A
2' - 15" CONC. PIPE REQ'D (COVER = 2.0')
INV. EL. 675.00 (IN), 674.99 (OUT)

4-10
1 STD. DI-2BB REQ'D
L = 6', H = 10.1', INV. 657.15
CONN. TO EXIST. 18" PIPE

4-9 - 4-11A
38' - 15" CONC. PIPE REQ'D (COVER = 6.08')
INV. EL. 668.90 (IN), 668.32 (OUT)

4-11A
1 STD. EW-1 REQ'D
INV. 668.32

4-12
1 STD. DI-2B REQ'D
L = 12' H = 5.9', INV. 667.47

4-8 - 4-12
85' - 15" CONC. PIPE REQ'D (COVER = 2.0')
INV. EL. 670.57 (IN), 667.67 (OUT)

4-13
1 STD. DI-2B REQ'D
L = 12' H = 6.7', INV. 665.01

5-1
1 STD. DI-2B REQ'D
L = 6' H = 4.3', INV. 665.39

4-12 - 5-1
58' - 15" CONC. PIPE REQ'D (COVER = 2.39')
INV. EL. 667.47 (IN), 665.77 (OUT)

5-2
1 STD. EW-1 REQ'D
INV. 664.33

5-1 - 5-2
10' - 15" CONC. PIPE REQ'D (COVER = 2.39')
INV. EL. 665.39 (IN), 664.33 (OUT)

5-3
1 STD. DI-2B REQ'D
L = 8' H = 4.1', INV. 663.34

4-13 - 5-3
73' - 15" CONC. PIPE REQ'D (COVER = 2.20')
INV. EL. 665.01 (IN), 663.54 (OUT)

5-4
1 STD. EW-1 REQ'D
INV. 662.58

5-3 - 5-4
12' - 15" CONC. PIPE REQ'D (COVER = 2.20')
INV. EL. 663.34 (IN), 662.58 (OUT)

6-1
1 STD. DI-7A REQ'D
H = 3.08', INV. 659.23

EXIST. BOX - 6-1
24' - 24" CONC. PIPE REQ'D (COVER = 2')
INV. EL. 659.23 (IN), 658.75 (OUT)
CONN. TO EXIST. BOX CULVERT

4-15 - 5-14
64' - 36" SMOOTH STEEL PIPE REQ'D
INV. EL. 665.35 (IN), 665.00 (OUT)

4-17 - 4-16
64' - 36" SMOOTH STEEL PIPE REQ'D
INV. EL. 666.60 (IN), 665.77 (OUT)

EXISTING DRAINAGE

D-6 - D-9
150' OF EXIST. 15" PIPE TO BE REMOVED.

D-7 - D-8
27' OF EXIST. 15" PIPE
TO BE ABANDONED.

D-8 - D-9
26' OF EXIST. 15" PIPE
TO BE REMOVED.

D-9 - D-10
17' OF EXIST. 15" PIPE
TO BE REMOVED.

D-13 - D-14
65' OF EXIST. 15" PIPE
TO BE ABANDONED.

D-14 - D-15
58' OF EXIST. 15" PIPE
TO BE REMOVED.

D-29 - D-30
35' OF EXIST. 18" PIPE
TO BE ABANDONED.

D-30 - D-31
80' OF EXIST. 24" PIPE
TO BE ABANDONED.

D-31 - D-32
68' OF EXIST. 24" PIPE
TO BE ABANDONED.

D-33 - D-34
13' OF EXIST. 12" PIPE
TO BE ABANDONED.

D-39 - D-40
35' OF EXIST. 18" PIPE
TO BE ABANDONED.

D-40 - D-42
59' OF EXIST. 18" PIPE
TO BE ABANDONED.

D-52 - D-4
14' OF EXIST. 12" PIPE
TO BE ABANDONED.

SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE MATTERN & CRAIG

GRADING SHEET

COMMONWEALTH OF VIRGINIA
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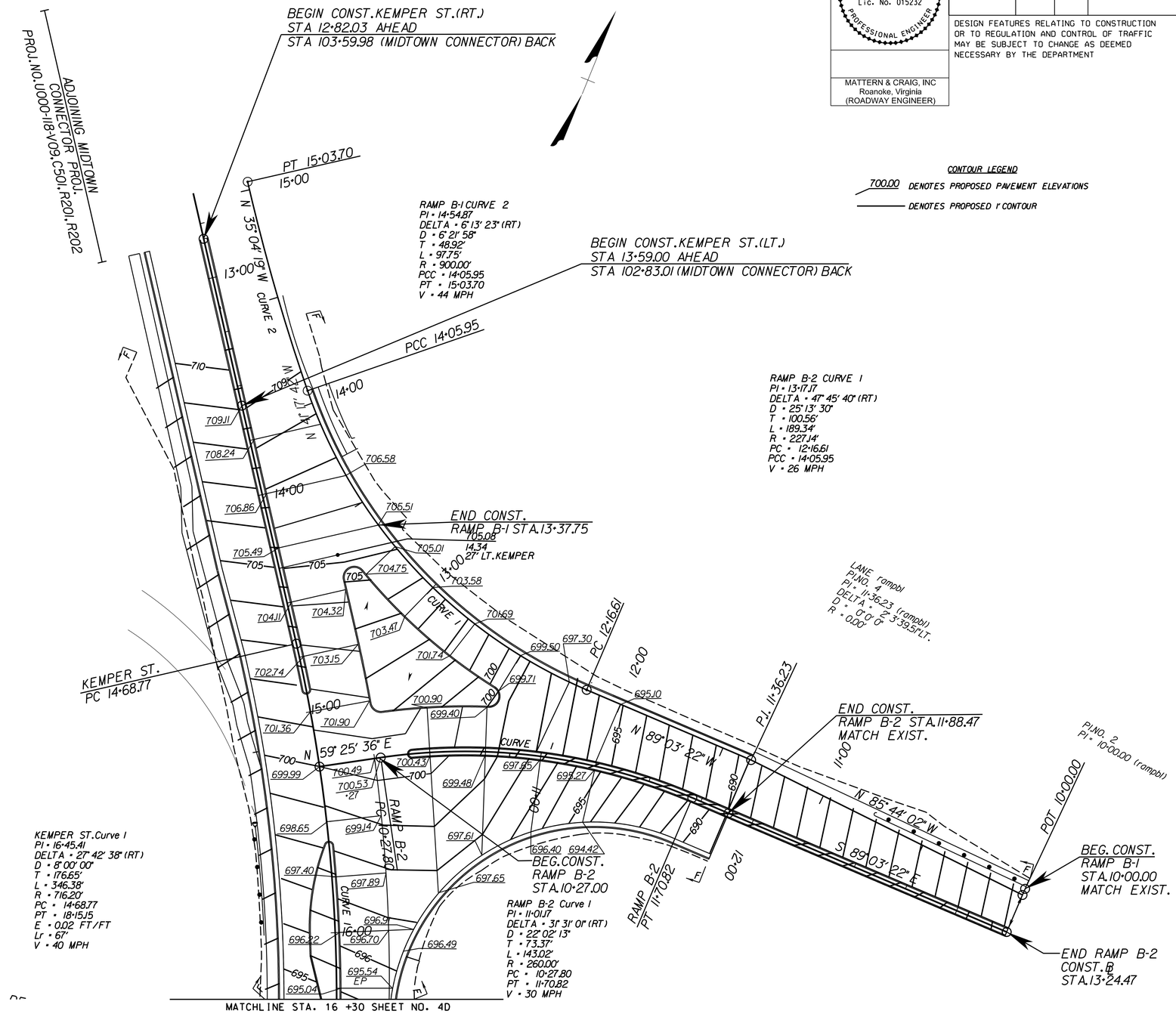
Roanoke, Virginia
(ROADWAY ENGINEER)

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	U000-118-204, C-501	3E

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



SCALE
0 25' 50'

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U000-118-204	3E

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REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	U000-118-204,C-501	3F

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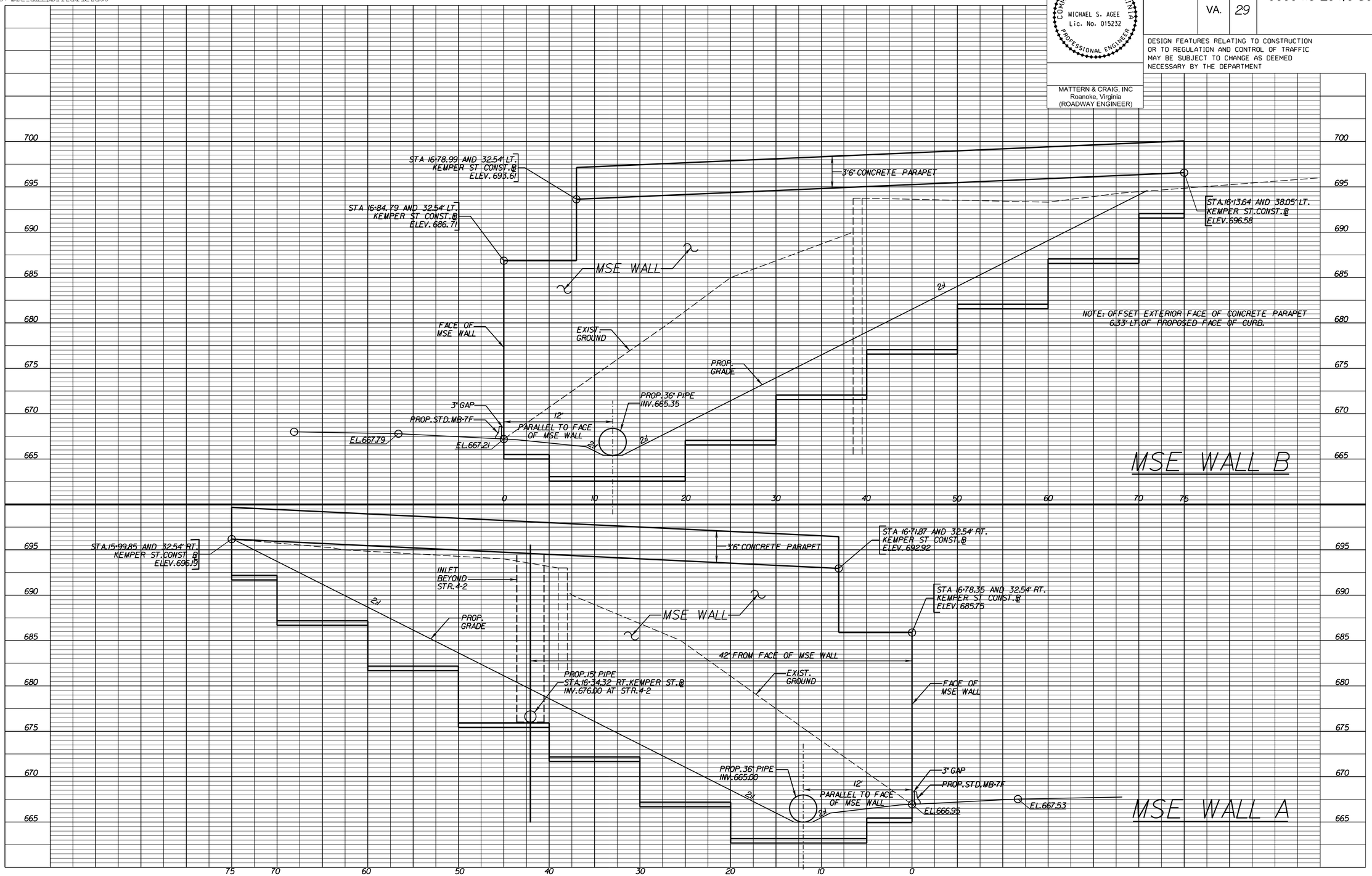

PROJECT	SHEET NO.
U000-118-204	3F

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	VA.	29	U000-118-204,C-501	3G

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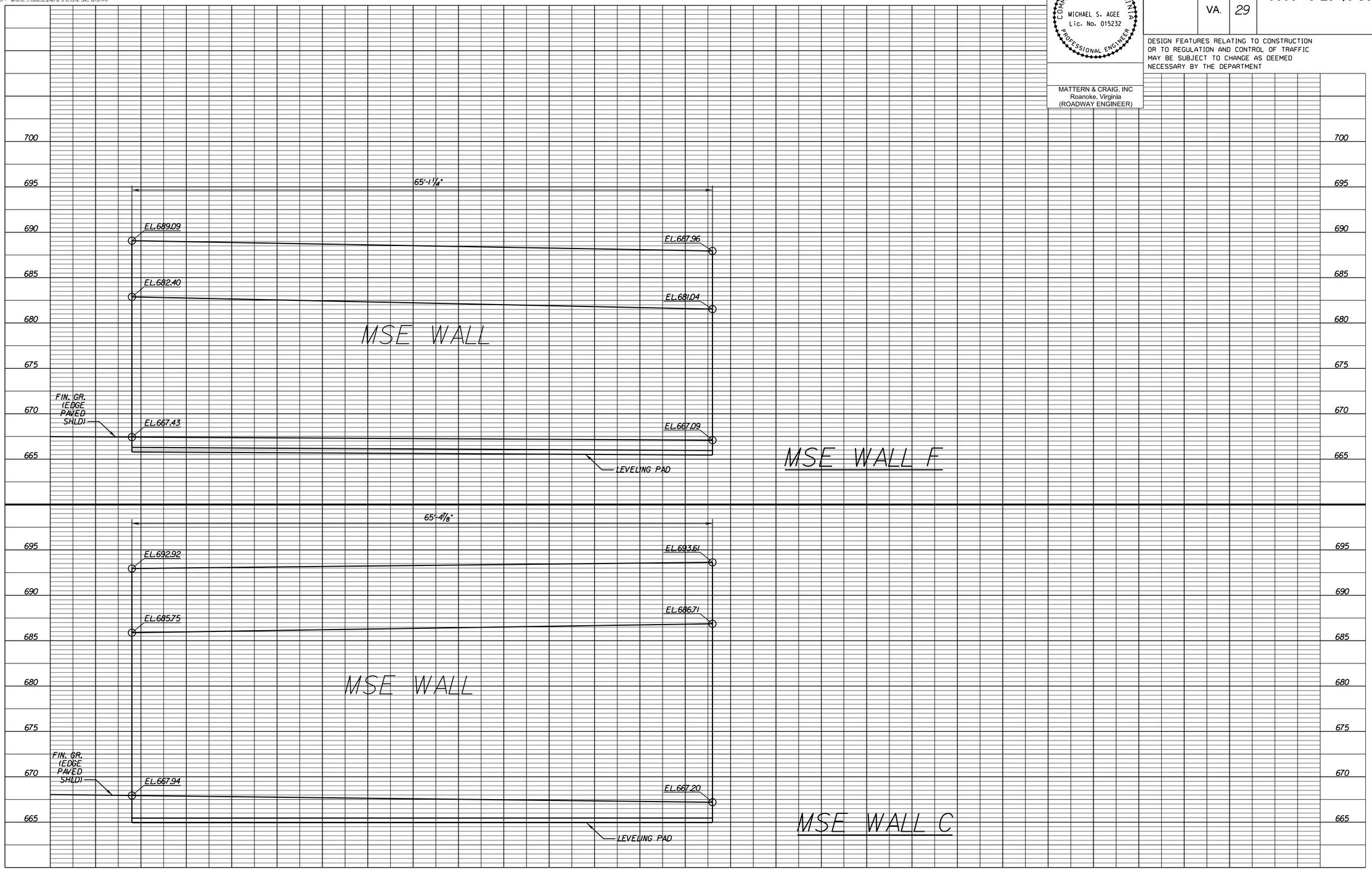

PROJECT	SHEET NO.
U000-118-204	3G

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	VA.	29	U000-118-204, C-501	3H

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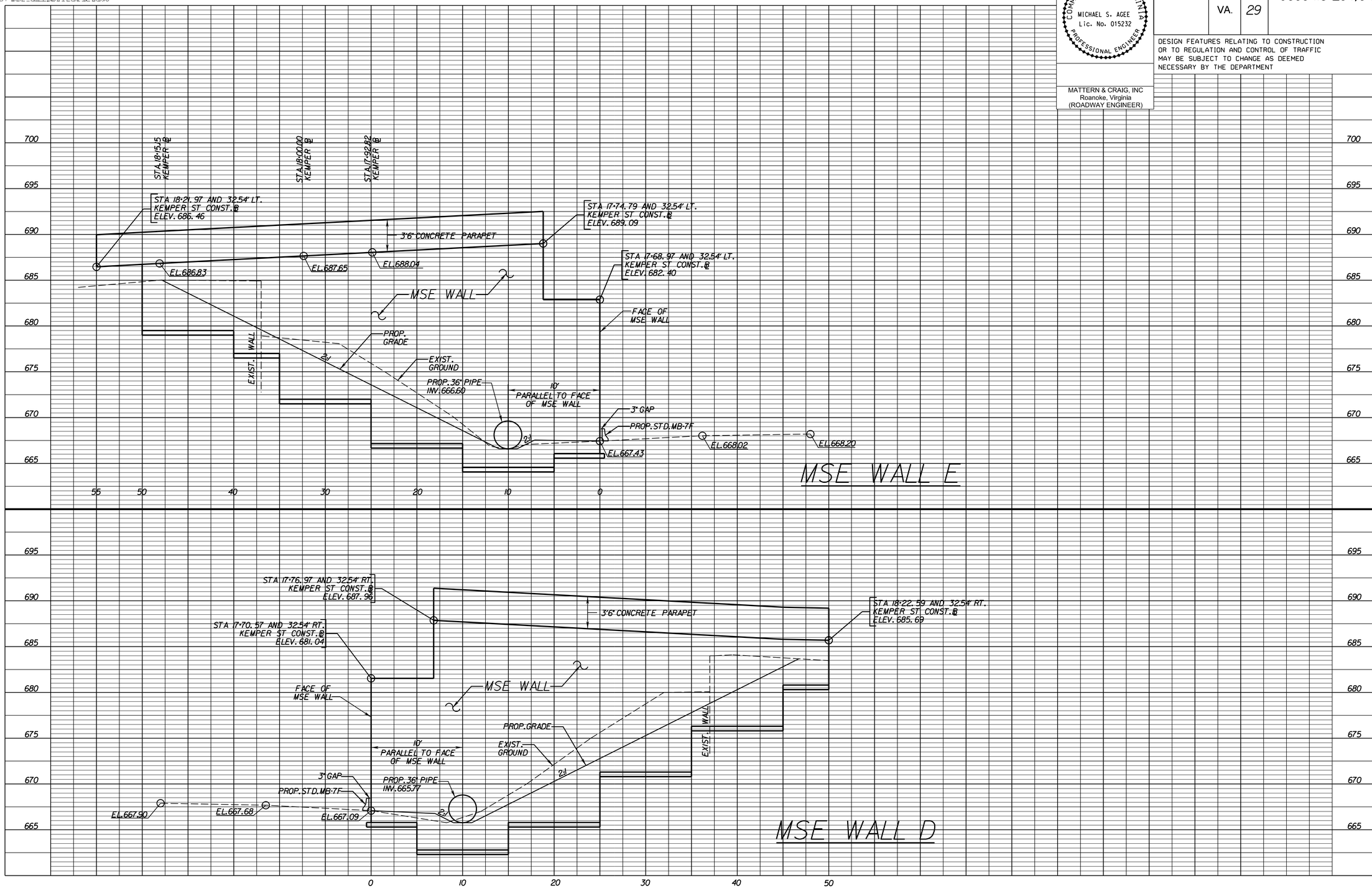

PROJECT	SHEET NO.
U000-118-204	3H

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NOTE 1:
EXCAVATION/EMBANKMENT IN MEDIAN ISLAND AREA TO BE INCLUDED IN THE PRICE BID FOR EARTHWORK.

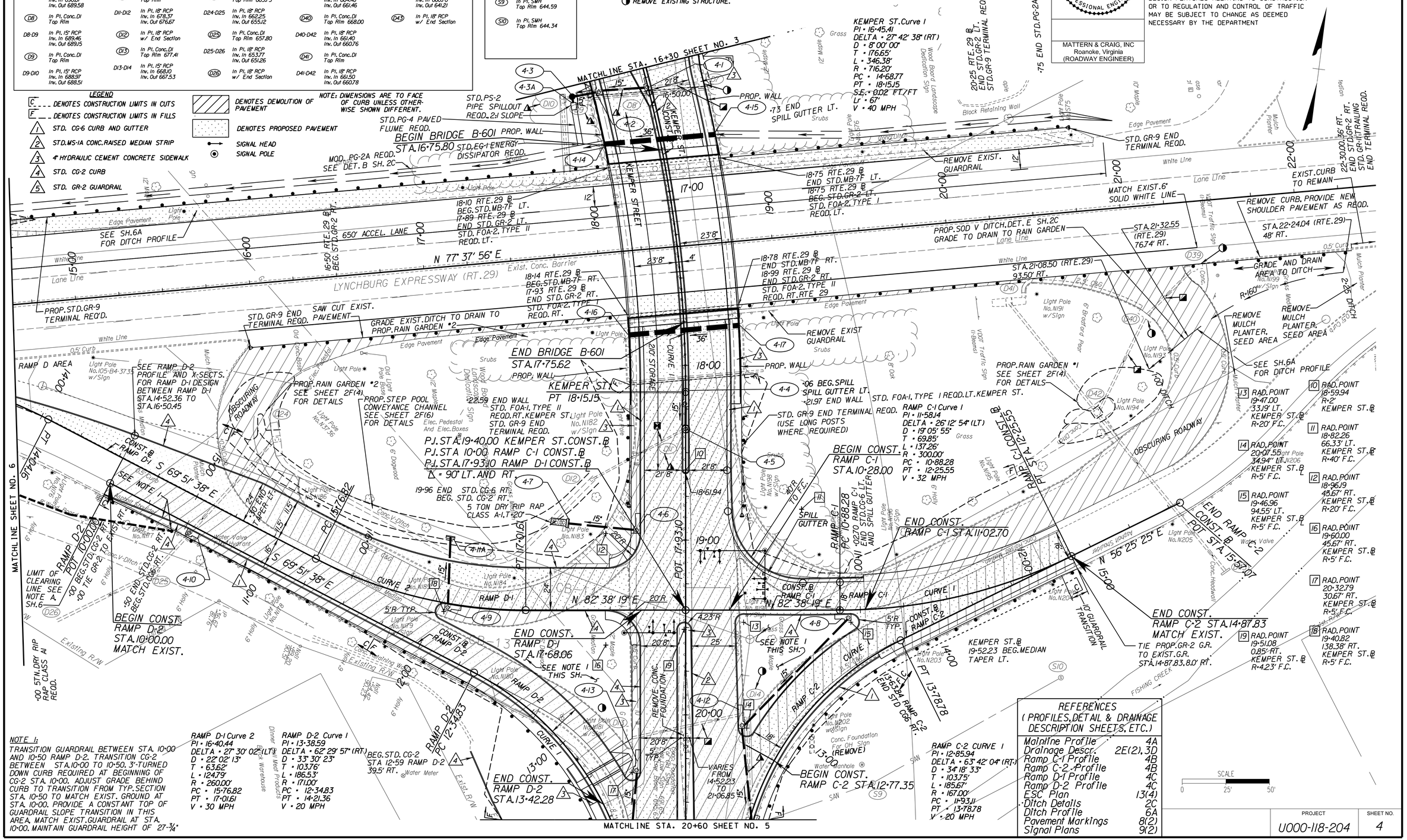
D7	In Pl. Conc.DI Top Rim	D10	In Pl. 15" RCP w/ End Section	D14	In Pl. Conc.DI Top Rim 673.09	D39	In Pl. Conc.DI Top Grate 669.35	D42	In Pl. Grate Inlet Top Grate 666.60
D7-D8	In Pl. 15" RCP Inv. In 690.01 Inv. Out 689.58	D11	In Pl. Conc.DI Top Rim	D24	In Pl. Conc.DI Top Rim 665.75	D39-D40	In Pl. 18" RCP Inv. In 664.48 Inv. Out 661.46	D42-D43	In Pl. 18" RCP Inv. In 660.70 Inv. Out 641.21
D8	In Pl. Conc.DI Top Rim	D11-D12	In Pl. 18" RCP Inv. In 678.37 Inv. Out 676.67	D24-D25	In Pl. 18" RCP Inv. In 662.25 Inv. Out 655.12	D40	In Pl. Conc.DI Top Rim 668.00	D43	In Pl. 18" RCP w/ End Section
D8-D9	In Pl. 15" RCP Inv. In 689.46 Inv. Out 689.15	D12	In Pl. 18" RCP w/ End Section	D25	In Pl. Conc.DI Top Rim 657.80	D40-D42	In Pl. 18" RCP Inv. In 661.40 Inv. Out 660.76		
D9	In Pl. Conc.DI Top Rim	D13	In Pl. Conc.DI Top Rim 677.41	D25-D26	In Pl. 18" RCP Inv. In 653.77 Inv. Out 651.26	D41	In Pl. Conc.DI Top Rim		
D9-D10	In Pl. 15" RCP Inv. In 688.97 Inv. Out 688.51	D13-D14	In Pl. 15" RCP Inv. In 668.10 Inv. Out 667.53	D26	In Pl. 18" RCP w/ End Section	D41-D42	In Pl. 18" RCP Inv. In 661.50 Inv. Out 660.78		

S8	In Pl. SMH Top Rim 647.45	S9	In Pl. SMH Top Rim 644.59
S10	In Pl. SMH Top Rim 644.34		

DRAINAGE LEGEND
- EXISTING DRAINAGE ITEM TO BE ABANDONED.
- EXISTING DRAINAGE ITEM TO REMAIN.
- EXISTING DRAINAGE ITEM TO BE REMOVED.
- REMOVE EXISTING STRUCTURE.

LEGEND
- C - - - - DENOTES CONSTRUCTION LIMITS IN CUTS
- F - - - - DENOTES CONSTRUCTION LIMITS IN FILLS
- 1 STD. CG-6 CURB AND GUTTER
- 2 STD.MS-1A CONC.RAISED MEDIAN STRIP
- 3 4" HYDRAULIC CEMENT CONCRETE SIDEWALK
- 4 STD. CG-2 CURB
- 5 STD. GR-2 GUARDRAIL
- DENOTES DEMOLITION OF PAVEMENT
- DENOTES PROPOSED PAVEMENT
- SIGNAL HEAD
- SIGNAL POLE

NOTE: DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE SHOWN DIFFERENT.



NOTE 1:
TRANSITION GUARDRAIL BETWEEN STA. 10+00 AND 10+50 RAMP D-2. TRANSITION CG-2 BETWEEN STA.10+00 TO 10+50. 3'-TURNED DOWN CURB REQUIRED AT BEGINNING OF CG-2 STA. 10+00. ADJUST GRADE BEHIND CURB TO TRANSITION FROM TYP.SECTION STA. 10+50 TO MATCH EXIST. GROUND AT STA. 10+00. PROVIDE A CONSTANT TOP OF GUARDRAIL SLOPE TRANSITION IN THIS AREA. MATCH EXIST.GUARDRAIL AT STA. 10+00. MAINTAIN GUARDRAIL HEIGHT OF 27-3/4".

REFERENCES (PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)	
Mainline Profile	4A
Drainage Descr.	2E(2), 3D
Ramp C-1 Profile	4B
Ramp C-2 Profile	4B
Ramp D-1 Profile	4C
Ramp D-2 Profile	4C
ESC Plan	13(4)
Ditch Details	2C
Ditch Profile	6A
Pavement Markings	8(2)
Signal Plans	9(2)

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	VA.	29	U000-118-204, C-501	4

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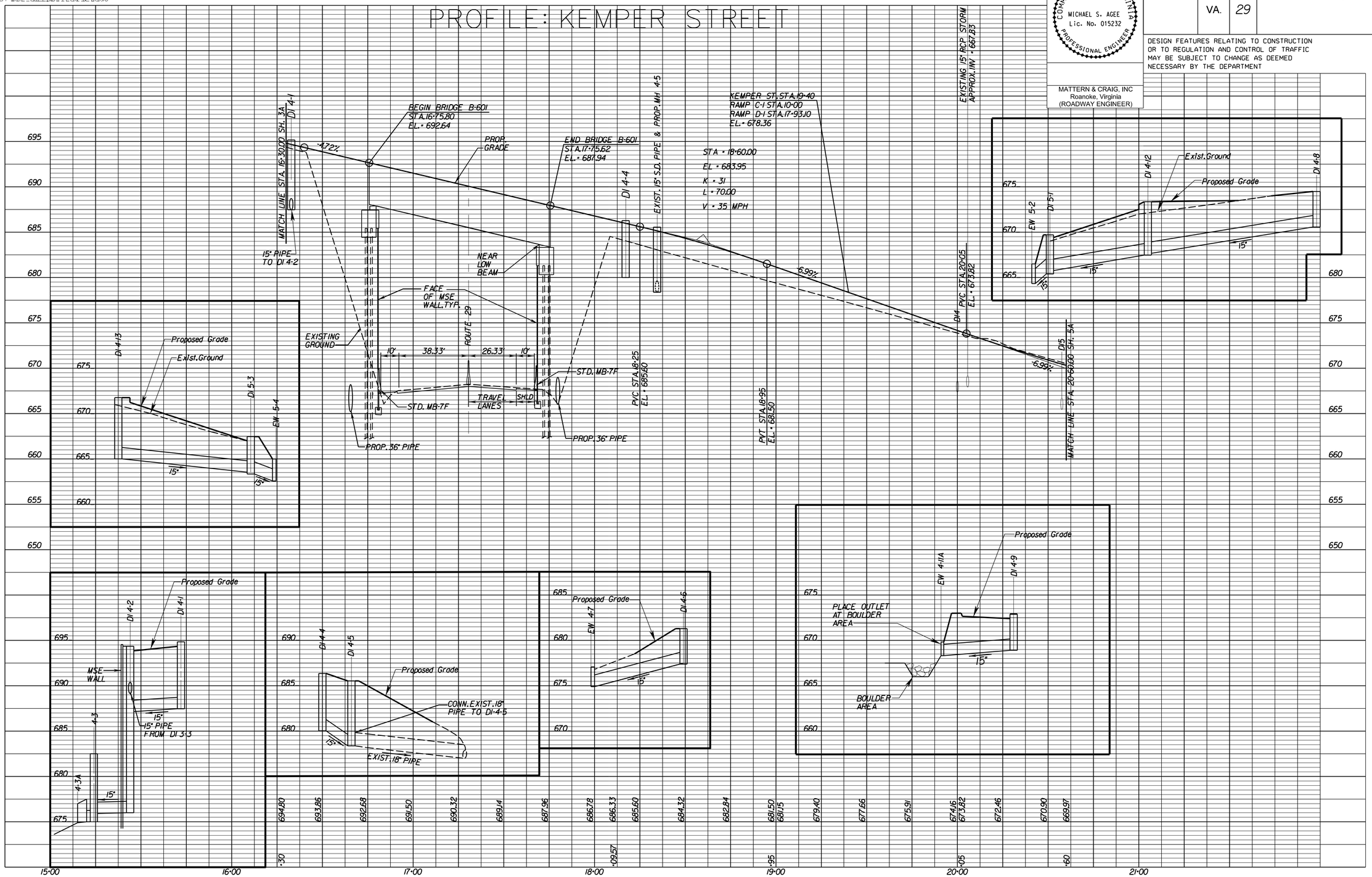
PROJECT	SHEET NO.
U000-118-204	4

SUPERVISED BY CITY OF LYNCHBURG
PROJECT MANAGER STEVE CAMPBELL MATTERN & CRAIG (540)-345-9342
SURVEYED BY MATTERN & CRAIG (540)-345-9342
DESIGNED BY MIKE AGEE MATTERN & CRAIG

PROFILE: KEMPER STREET



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	VA.	29	U000-118-204, C-501	4A

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PROJECT	SHEET NO.
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	VA.	29	U000-118-204, C-501	4B

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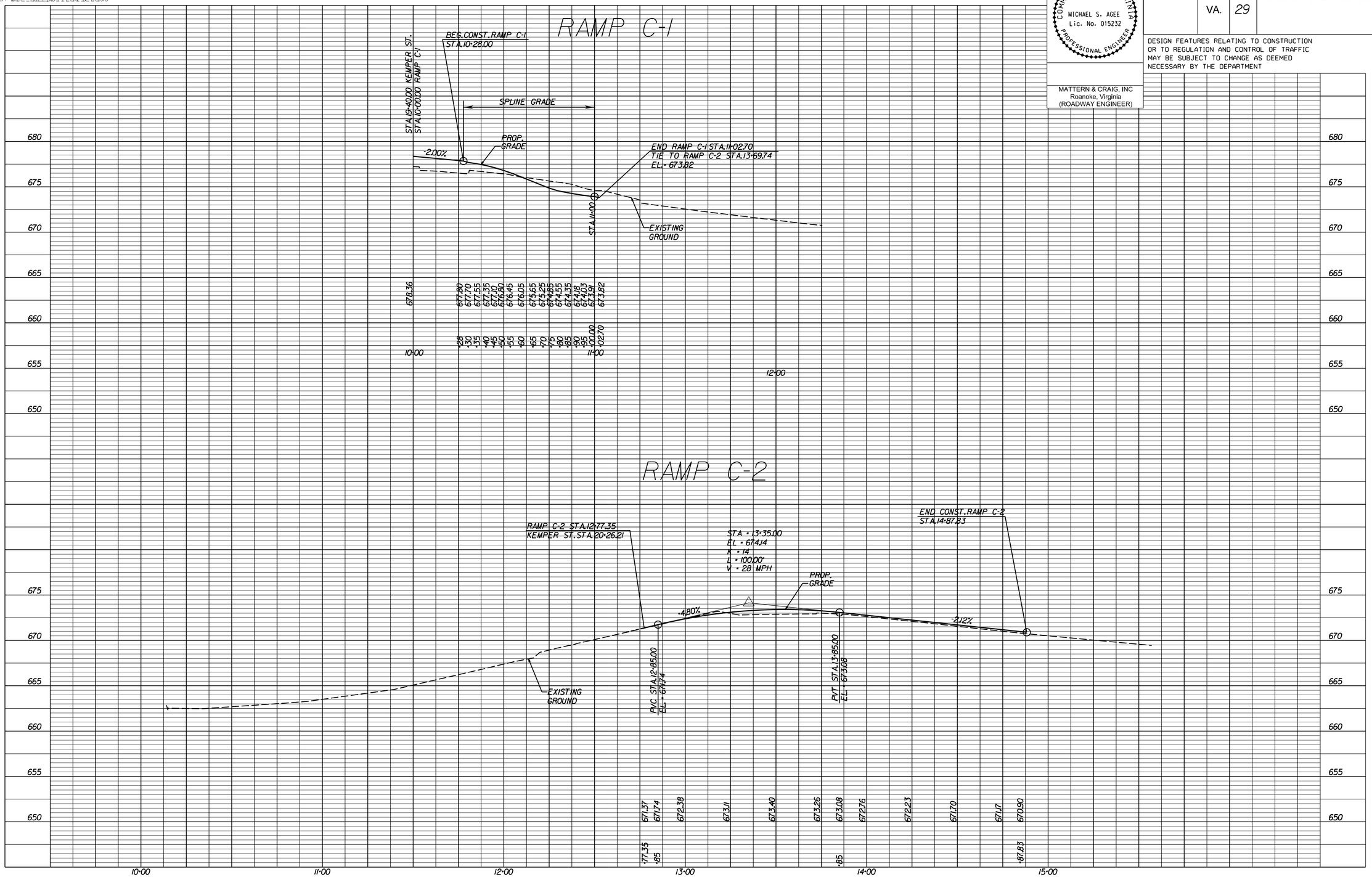

PROJECT	SHEET NO.
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	VA.	29	U000-118-204, C-501	4C

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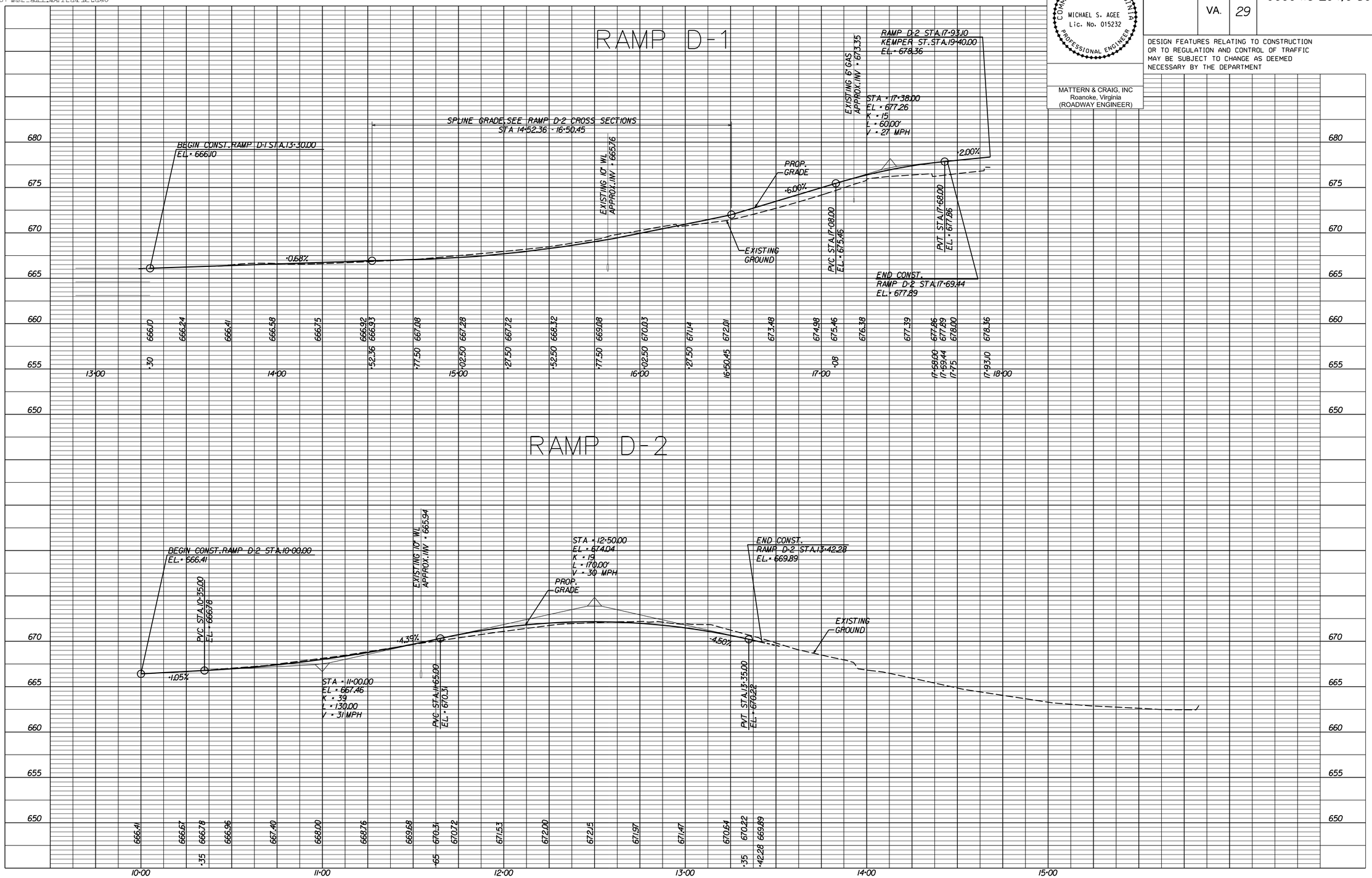

PROJECT	SHEET NO.
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GRADING SHEET

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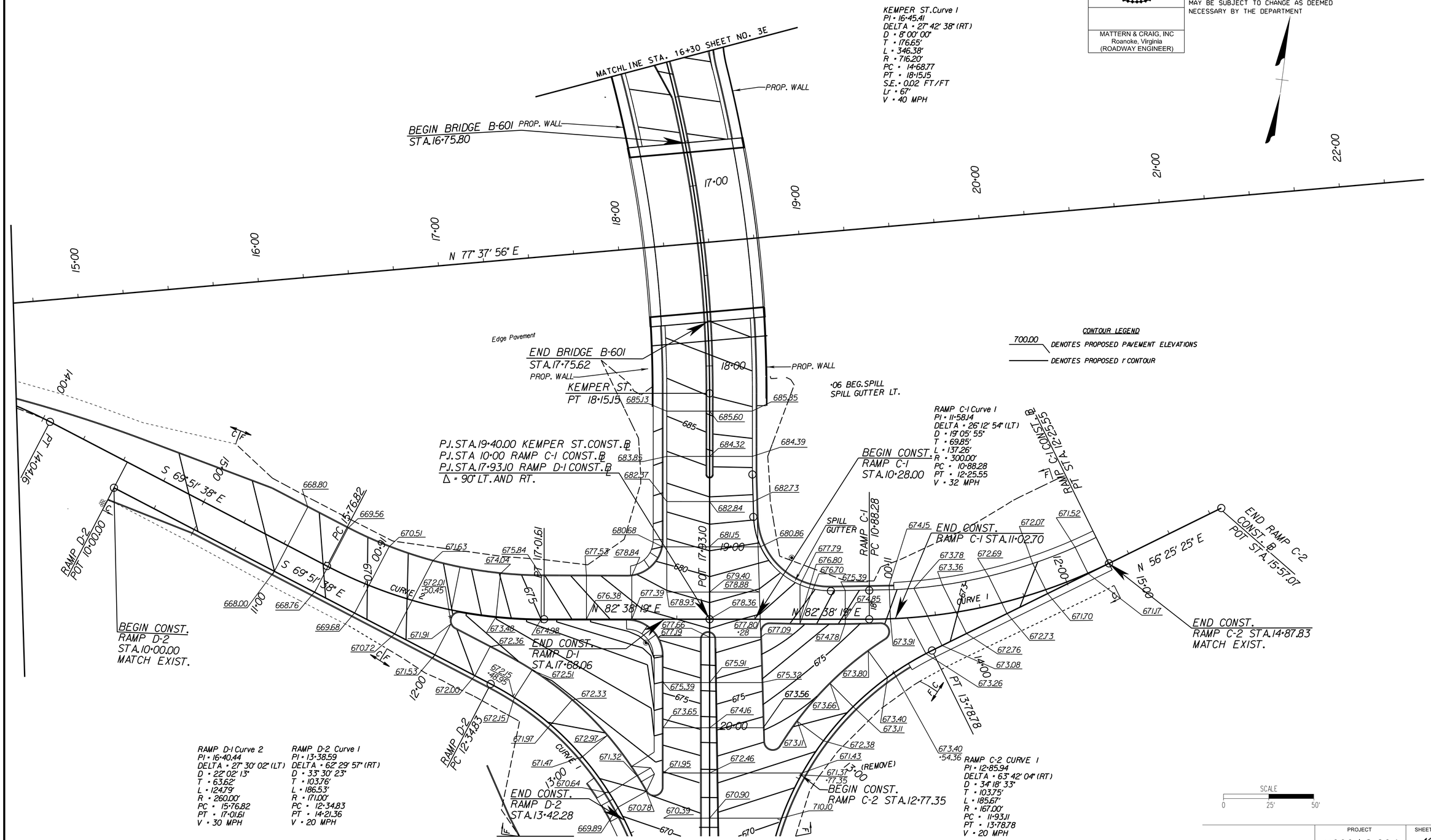
KEMPER ST. Curve 1
PI = 16+45.41
DELTA = 27° 42' 38" (RT)
D = 8° 00' 00"
T = 176.65'
L = 346.38'
R = 716.20'
PC = 14+68.77
PT = 18+15.15
S.E. = 0.02 FT/FT
Lr = 67'
V = 40 MPH



RAMP D-1 Curve 2
PI = 16+40.44
DELTA = 27° 30' 02" (LT)
D = 22° 02' 13"
T = 63.62'
L = 124.79'
R = 260.00'
PC = 15+76.82
PT = 17+01.61
V = 30 MPH

RAMP D-2 Curve 1
PI = 13+38.59
DELTA = 62° 29' 57" (RT)
D = 33° 30' 23"
T = 103.76'
L = 186.53'
R = 171.00'
PC = 12+34.83
PT = 14+21.36
V = 20 MPH

RAMP C-2 CURVE 1
PI = 12+85.94
DELTA = 63° 42' 04" (RT)
D = 34° 18' 33"
T = 103.75'
L = 185.67'
R = 167.00'
PC = 11+93.11
PT = 13+78.78
V = 20 MPH

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