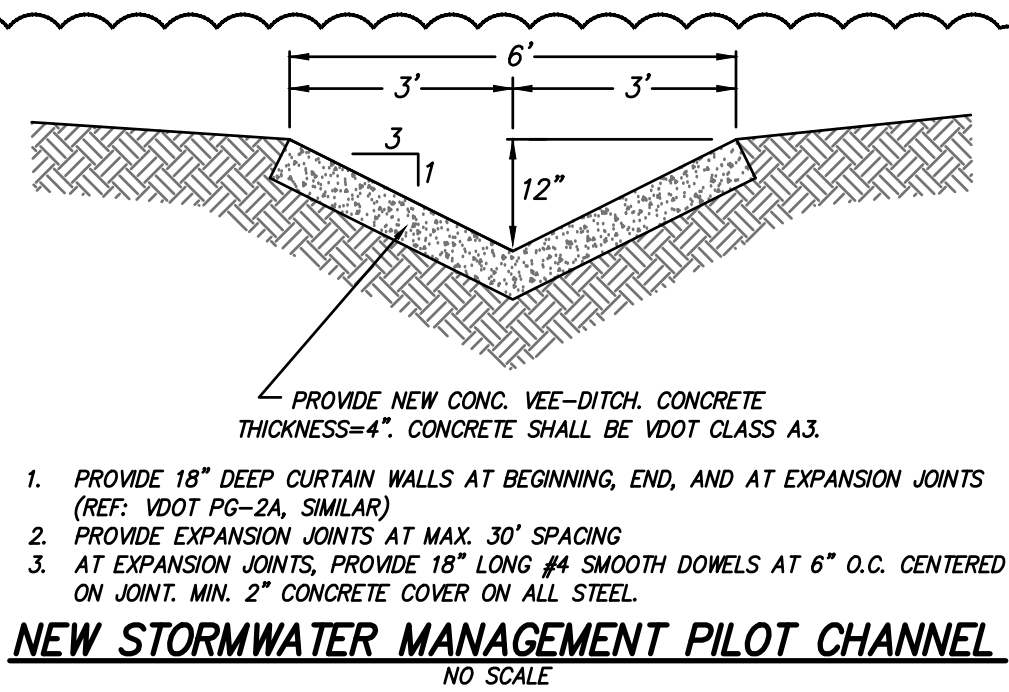




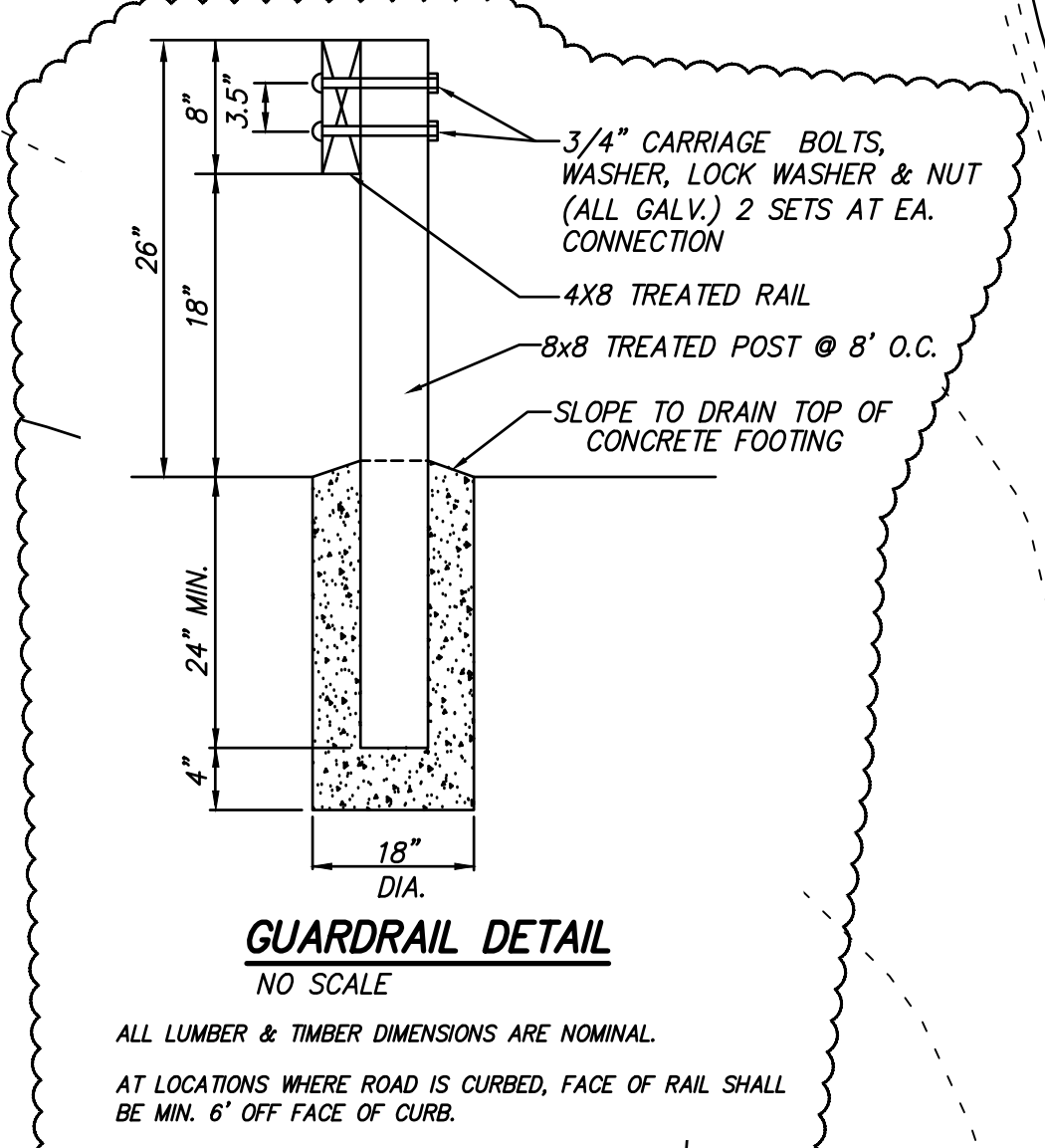
SUMP DISCHARGE NOTES

A NEW 10' SQUARE CONCRETE SUMP IS ADDED TO THE EASTERN CORNER OF THE BUILDING, TO SERVE AS A COLLECTION POINT FOR THE LOWER LEVEL FOUNDATION DRAINS. A SWITCH-FLOATED PUMP WILL BE INSTALLED IN THE SUMP. SEE BUILDING PLANS FOR DETAILS.

THE EFFLUENT FROM THE SUMP PUMP WILL BE CONVEYED TO THE PREVIOUSLY SHOWN ROOF COLLECTOR SYSTEM AS SHOWN HEREON, VIA A NEW 2 INCH FORCE MAIN (FM) PIPE. SEE PLUMBING SHEETS FOR PIPE TYPE.

THE NEW 2 INCH LINE SHALL CONNECT TO THE 6 INCH ROOF COLLECTOR WITH A REDUCING WYE, AND TRANSITION COUPLINGS AS MAY BE REQUIRED TO TRANSITION FROM THE FORCE MAIN PIPE TYPE TO THE SDR-35 PVC ROOF COLLECTOR.

AS THIS WILL ADD FLOW TO THE ROOF COLLECTOR PIPING, IT IS REQUIRED THAT THE 6 INCH ROOF COLLECTOR BE INSTALLED AT A MINIMUM 1.25% FROM THE INTERCONNECTION WITH STORM DRAIN 106A TO AT LEAST THE NEW CLEANOUT LOCATED IMMEDIATELY UPSTREAM OF THE POINT OF CONNECTION OF THE NEW 2 INCH FORCE MAIN.



LIMITS OF ON-SITE DISTURBANCE
244,629 SQ. FT. = 5.62 ACRES

NEW STORM DRAIN SCHEDULE

UNLESS OTHERWISE NOTED, ALL NEW STORM DRAIN STRUCTURES SHALL BE PRECAST CONCRETE. MATERIALS, FABRICATION AND INSTALLATION SHALL BE IN ACCORDANCE WITH VDOT STANDARDS AND SPECIFICATIONS. ALL NEW STORM DRAIN STRUCTURES SHALL RECEIVE VDOT STD IS-1 INLET SHAPING.

ALL NEW HOPE PIPE SHALL BE ADS TYPE "N-12" OR ENGINEER APPROVED EQUIVALENT. BEDDING AND INSTALLATION SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.

ALL NEW CONCRETE PIPE SHALL BE MINIMUM VDOT CLASS III REINFORCED CONCRETE. INSTALLATION AND BEDDING SHALL BE PER VDOT STANDARDS AND SPECIFICATIONS.

100 PROVIDE VDOT STD. DI-1 INV. IN = 1014.80 INV. OUT = 1013.40	110A PROVIDE 112'-15" HOPE PIPE AT 2.59% INV. IN = 1016.30 INV. OUT = 1013.40
100A PROVIDE 27'-15" HOPE PIPE AT 1.0% INV. IN = 1014.80 INV. OUT = 1014.53	111 PROVIDE VDOT STD. DI-1 TOP = 1016.50 INV. IN = 1013.30 INV. OUT = 1013.30
101 PROVIDE VDOT STD. DI-1 TOP = 1018.0 INV. IN = 1014.53 INV. OUT = 1013.40	111A PROVIDE 177'-15" HOPE PIPE AT 1.0% INV. IN = 1013.30 INV. IN = 1011.53 INV. IN = 1010.53
101A PROVIDE 92'-15" HOPE PIPE AT 1.0% INV. IN = 1014.43 INV. OUT = 1013.51	112 PROVIDE VDOT STD. DI-38, L=6' TOP = 1016.50 INV. IN = 1011.53 INV. IN = 1008.75
102 PROVIDE NEW VDOT STD STORM MANHOLE RM = 1020.00 INV. IN = 1013.51 INV. OUT = 1013.41	112A PROVIDE 84'-24" CONC. PIPE AT 8.50% INV. IN = 1004.97 INV. IN = 997.83 RM=1105.00
102A PROVIDE 105'-15" HOPE PIPE AT 1.0% INV. IN = 1013.41 INV. OUT = 1012.36 TOP = 1018.0	113 PROVIDE VDOT STD. DI-38, L=12' INV. IN = 997.83 INV. OUT = 997.10
103 PROVIDE VDOT STD. DI-1 TOP = 1018.0 INV. IN = 1014.80	113A PROVIDE 32'-24" CONC. PIPE AT 1.50% INV. IN = 997.10 INV. OUT = 996.62
103A PROVIDE 28'-15" HOPE PIPE AT 1.0% INV. IN = 1014.80 INV. OUT = 1014.52	114 PROVIDE VDOT STD. DI-38, L=12' RM=1103.00 INV. IN = 996.62 INV. IN = 989.75
104 PROVIDE VDOT STD. DI-1 TOP = 1018.0 INV. IN = 1014.52 INV. IN = 1012.36 INV. OUT = 1012.26	114A PROVIDE 54'-24" CONC. PIPE AT 7.90% INV. IN = 989.75 INV. OUT = 985.80
104A PROVIDE 138'-15" HOPE PIPE AT 1.0% INV. IN = 1012.26 INV. OUT = 1010.88	115 PROVIDE NEW VDOT STD STORM MANHOLE RM=993.3 INV. IN = 985.80 INV. OUT = 982.70
105 PROVIDE VDOT STD. DI-1 TOP = 1019.0 INV. IN = 1015.43 INV. OUT = 1015.00	115A PROVIDE 148'-24" CONC. PIPE AT 2.00% INV. IN = 982.70 INV. OUT = 979.43
106 PROVIDE NEW VDOT STD STORM MANHOLE RM = 1021.20 INV. IN = 1015.00 INV. IN = 1010.88 INV. IN = 1010.78	116 PROVIDE NEW VDOT STD. STORM MANHOLE RM=988.1 INV. IN = 979.43 INV. IN = 967.72
106A PROVIDE 142'-15" HOPE PIPE AT 1.0% INV. IN = 1010.78 INV. OUT = 1009.36	117 PROVIDE NEW VDOT STD. STORM MANHOLE RM=973.9 INV. IN = 967.72 INV. OUT = 967.62
107 PROVIDE VDOT STD. DI-38, L=8' RM = 1018.30 INV. IN = 1011.04 INV. IN = 1009.36 INV. OUT = 1009.26	117A PROVIDE 22'-24" CONC. PIPE AT 1.00% RM=973.3 INV. IN = 967.62 INV. IN = 966.65 (EXIST. 42" RCP-VERIFY)
107A PROVIDE 85'-24" HOPE PIPE AT 1.0% INV. IN = 1009.26 INV. OUT = 1008.41 INV. OUT = 1007.30	118 PROVIDE VDOT STD. STORM MANHOLE RM=973.3 INV. IN = 966.65 (EXIST. 42" RCP-VERIFY) INV. OUT = 966.65 (EXIST. 42" RCP-VERIFY)
108 PROVIDE VDOT STD. DI-38, L=8' TOP = 1017.30 INV. IN = 1008.41 INV. OUT = 1008.31	119 PROVIDE 12" NEW 12" C.M. PIPE AT 2.00% W/ VDOT ES-2 FLARED END SECTIONS INV. IN=1019.30 INV. OUT=1015.06
108A PROVIDE 204'-24" HOPE PIPE AT 1.0% INV. IN = 1008.31 INV. OUT = 1006.27	209A PROVIDE 50'-18" HOPE PIPE AT 1.00% INV. IN=1011.54 INV. OUT=1011.04 PLUG & CAP FOR FUTURE EXTENSION.
109 PROVIDE VDOT STD. DI-38, L=8' TOP = 1018.00 INV. IN = 1006.27 INV. OUT = 1006.17	SWM PROVIDE 60'-24" CONC. PIPE AT 2.00% INV. IN=984.00 INV. OUT=982.80
109A PROVIDE 110'-24" HOPE PIPE AT 1.0% INV. IN = 1006.17 INV. OUT = 1005.07	SEE STORMWATER MANAGEMENT DETAILS FOR OUTLET STRUCTURE AT UPPER END OF PIPE SWM.
110 PROVIDE VDOT STD. DI-1 TOP = 1020.50 INV. IN = 1016.30	SEE C7.1 FOR GASKET AND CONCRETE CRADLE REQUIREMENTS.

ROOF DRAIN COLLECTORS

IT IS NOTED THAT THE EXACT LOCATIONS OF THE ROOF COLLECTORS REQUIRES FURTHER COORDINATION WITH BUILDING PLANS PRIOR TO FINAL DESIGN. THE LOCATIONS OF DOWNSPOUTS SHOWN IS APPROXIMATE AND IS PROVIDED SOLELY TO GUIDE THE CONTRACTOR AS TO THE LIKELY AMOUNT THAT CAN DISCHARGE AT-GRADE VERSUS THOSE THAT WILL BE REQUIRED TO BE PIPED INTO THE STORM DRAIN SYSTEM.

ALL NEW ROOF COLLECTOR PIPING, BENDS, WYES, CLEANOUTS, ETC. SHALL BE SDR-35 PVC

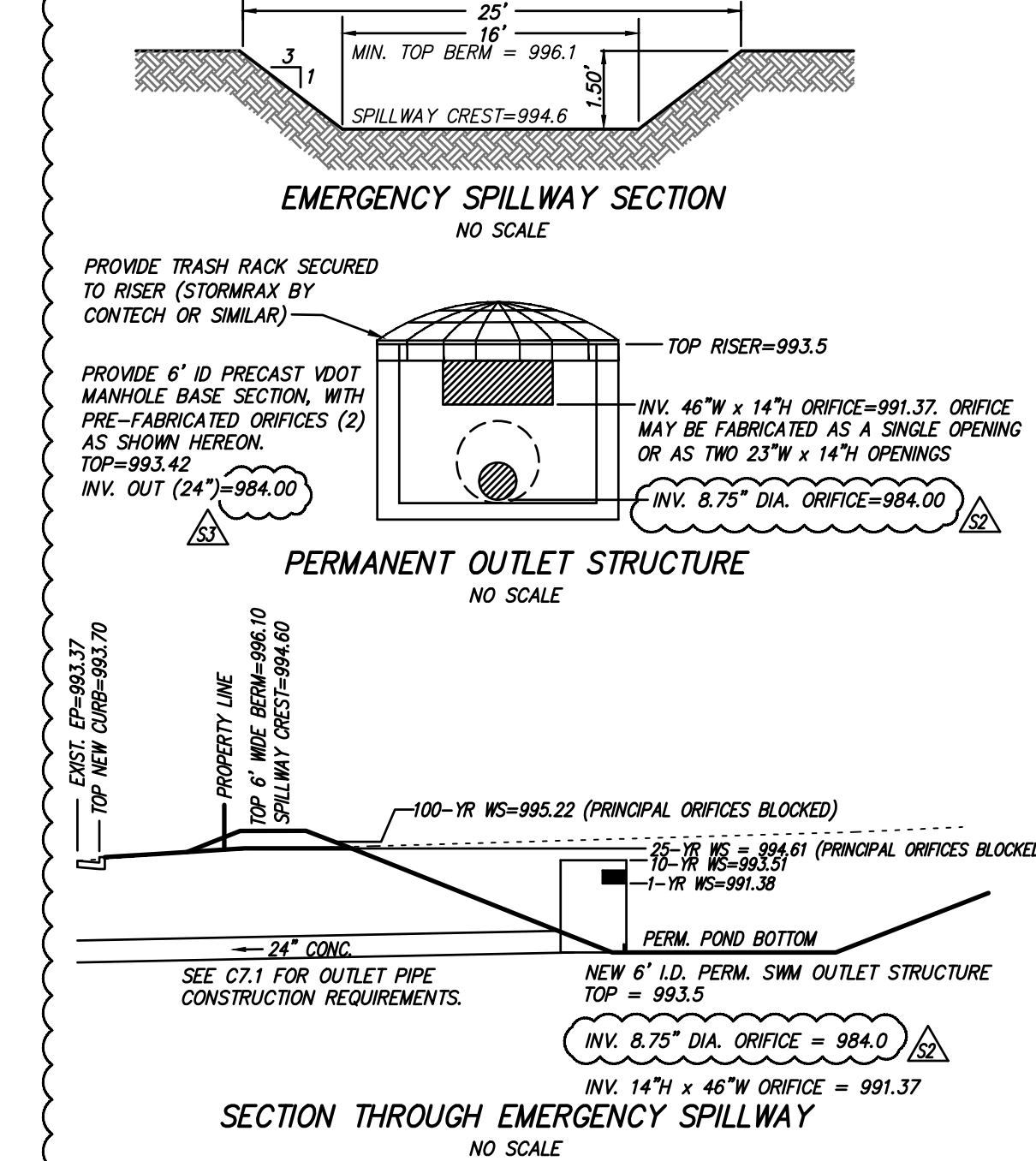
○ = NEW DOWNSPOUT, PROVIDE PVC TRANSITION BOOT AND ADAPTOR (AS REQUIRED) TO TRANSITION TO 6" SDR-35 PVC PIPE.

● = NEW CLEANOUT ASSEMBLY. CLEANOUTS SHALL BE PLUMBED IDENTICAL TO NEW SANITARY SWENT CLEANOUTS. CLEANOUT CAP SHALL HAVE RECESSED SQUARE, BE SET FLUSH WITH FINISH GRADE, AND SHALL BE PROVIDED WITH 18" SQUARE CONCRETE PAD, 4" THICK.

WHERE NEW ROOF LEADERS INTERCONNECT DIRECTLY TO NEW HOPE PIPE, THE CONTRACTOR SHALL INSTALL APPROPRIATELY SIZED "INSERTA TEE". MATERIALS & INSTALLATION SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.

ALL NEW COLLECTOR PIPING WILL BE 6" DIAMETER SDR-35 PVC AT 1.04% MIN. SLOPE, EXCEPT AS OTHERWISE NOTED IN THE "SUMP DISCHARGE NOTES" SHOWN HEREON.

PERMANENT STORMWATER MANAGEMENT POND OUTLET CONTROL DETAILS



STORMWATER MANAGEMENT - WATER QUALITY

AS THE FUTURE PHASE 2 DEVELOPMENT MAY VARY SLIGHTLY IN THE AMOUNT OF HARD SURFACES PROPOSED FROM THAT DEVELOPED TO DATE, IT IS THE INTENT TO PROVIDE STORMWATER QUALITY MEASURES ONLY FOR THE CURRENTLY PROPOSED PHASE ONE CONSTRUCTION. BASED ON IMPROVEMENTS SHOWN HEREON, IT IS REQUIRED TO PROVIDE A TOTAL PHOSPHOROUS REDUCTION OF 4.46 LBS/YR FOR PHASE ONE CONSTRUCTION UPON CITY APPROVAL OF THE ENGINEERING COMPUTATIONS FOR THE SITE. IT IS THE OWNER'S INTENT TO PURCHASE NUTRIENT CREDITS SUFFICIENT TO MEET THE 4.46 LBS/YR REDUCTION REQUIREMENT. THIS WILL HAVE NO EFFECT ON THE WORK TO BE PERFORMED BY THE CONTRACTOR.

SEE SHEET C7.1 FOR NEW STORM DRAIN PROFILES

SITE REVISION "S1" IS SOLELY TO REVISE AN INVERT ELEVATION ON THE PERMANENT OUTLET STRUCTURE DETAIL AND INVERT ELEVATIONS ON THE STORM DRAIN SCHEDULE, TO MATCH PROFILE REVISIONS THAT WERE REQUIRED UNDER "S2" TO ACCOUNT FOR THE ADDITION OF THE SWM PILOT CHANNEL.

POPE ARCHITECTS

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RICHFIELD LIVING AT THE ROANOKE CAMPUS
Roanoke, Virginia

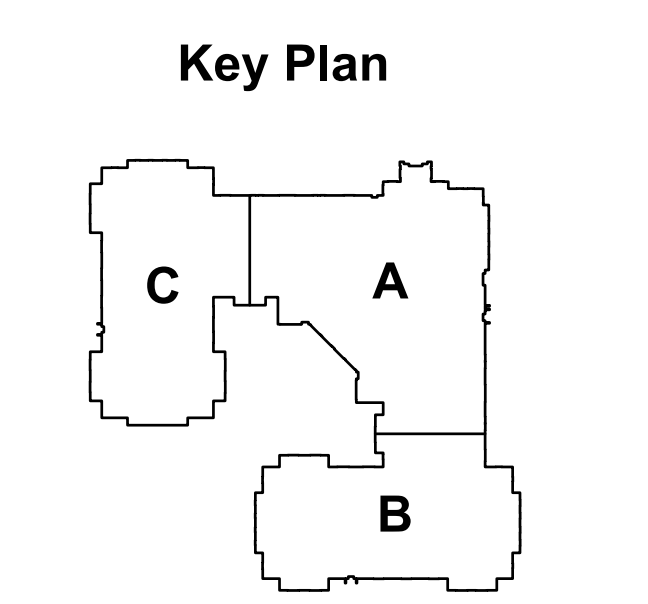
RICHFIELD

CWA CALDWELL WHITE ASSOCIATES
ENGINEERS / SURVEYORS / PLANNERS

1000 W. MAIN STREET
SUITE 200
ROANOKE, VA 24060
PHONE: (540) 984-1010
FAX: (540) 984-1070

Scale: As Shown
W.D. 19-0034

Designed: C.L. White
Drawn: C.L. White



GRADING AND STORM DRAINAGE PLAN

Issues and Revisions:

04/19/2019	DESIGN DEVELOPMENT ISSUE
06/06/2019	PERMIT SET
07/17/2019	PER 1ST CITY SITE REVIEW
07/31/2019	ADDENDUM 4 / 100% CD SET (date revisions same as Delta S1 dated 07/17/2019)
08/13/2019	PER 2ND CITY SITE REVIEW
08/23/2019	PER 3RD CITY SITE REVIEW
03/31/2020	PR #2
07/07/2020	PR #4
12/18/2020	ADD MEDGAS & GUARDRAIL

COMMITMENT OF VIRGINIA

CORBIN L. WHITE
PROFESSIONAL ENGINEER
EXPIRATION DATE: 12-18-20

Commission No: 63132-18180

Drawn by: _____

Checked by: _____

SHEET

C4.1

30' 0' 30' 60'

1" = 30' GRAPHIC SCALE