



ENGINEERS AND SURVEYORS INSTITUTE
 "A public/private partnership"
LOUDOUN COUNTY, VIRGINIA
MINIMUM SUBMISSION REQUIREMENTS



SITE PLANS

PROJECT NAME & NUMBER: _____

SUBMITTING FIRM: _____ PHONE #: _____

PROJ. COORD: _____ E-MAIL ADDRESS: _____

DPE NAME: _____ DPE#: _____ E-MAIL ADDRESS: _____

REVIEW DATE: _____ ESI REVIEW TEAM: _____

Note: The following sheets and information are required for every submission. Additional sheets and information should be provided where necessary to demonstrate compliance with County requirements or conditions of approval. Peer Review dates are determined by Loudoun County Staff once the plan has been submitted following an acceptable MSR review. (Column abbreviations: AD = Addressed; RR = Revisions Required; N/A = Not Applicable)

FSM CHAPTER 8.101 AND 8.106

Code Reference	Description	Sheet	AD	RR	N/A	Line
FSM 8.101.A.1	Scale					1
FSM 8.101.A.2	Proposed name of subdivision or development					2
FSM 8.101.A.3	Revision block					3
FSM 8.101.A.4	Source of title					4
FSM 8.101.A.5	Applicable Zoning ordinance and requirements					5
FSM 8.101.A.6	Associated land dev. app. info – Nos. & appr. date					6
FSM 8.101.A.7	Vicinity map, Scale 1" = 2000' max; Site Location; north arrow, perimeter bound. line, adjoining rds w/ names & nos., Town bound. lines w/in 1 mile of subdivision					7
FSM 8.101.A.8	Coordinate grid ticks (min 3) labeled on plan sheets					8
FSM 8.101.A.9	Adjoining property info: MCPI; zoning; use; departing property lines					9
FSM 8.101.A.10	Zoning district, overlay and jurisdictional boundaries					10
FSM 8.101.A.11	Yard and setback lines shown on plan or in table.					11
FSM 8.101.A.12	Stakeout note; name, address & phone of party to respond					12
FSM 8.101.A.13	Approval block					13
FSM 8.101.A.16	MCPI (PIN) ref.					14
FSM 8.101.A.17	Topo: NAVD 88 (NGVD 29 OK on proj's. started prior to 11/09/09); date taken; by what means; shows entire site area + 50' overlap					15
FSM 8.101.A.18	P.E. or L.S. seal, signature and date on each sheet.					16
FSM 8.101.A.19	Surveyor's Certificate-source of title, place of record and endorsed by PE or LS					17
FSM 8.107.A	Sheet size 24" x 36" with match lines as nec.					18
FSM 8.107.A.1	COVER SHEET					19
FSM 107.A.1.a	• Title "Site Plan"					20
FSM 107.A.1.b	• Name and address of the owner of record					21
FSM 107.A.1.c	• Name and address of the Applicant					22
FSM 107.A.1.d	• Name of the engineer or surveyor who prepared the plan					23

Code Reference	Description	Sheet	AD	RR	N/A	Line
FSM 107.A.1.e	<ul style="list-style-type: none"> Sheet Index, including the number of sheets in the plan 					24
FSM 107.A.1.j	<ul style="list-style-type: none"> Original Plan Date 					25
FSM 107.A.2	ALL SHEETS					26
FSM 107.A.2.b	<ul style="list-style-type: none"> North arrow, if applic. 					27
FSM 107.A.2.c	<ul style="list-style-type: none"> Original Plan Date (date in seal ok) 					28
FSM 107.A.2.f	<ul style="list-style-type: none"> Election District and Loudoun Co., VA, in Title Block 					29
FSM 107.A.4	Zoning Requirements					30
FSM 107.A.5	Associated Land Development Application Information					31
FSM 107.A.6	No. of floors, floor area, height, exterior dimensions, location & prop. use of each bldg.					32
FSM 107.A.7	Dimensions reqd. to demonstrate compliance w/regs, proffers, & conds.					33
FSM 107.A.8	Note(s) on plans where land or facilities are to be dedicated to any type of association (lot-owner's, condo or similar entity)					34
FSM 107.A.9	Property lines and Adjoining Property Information and use					35
FSM 107.A.10	Approved and/or reserved road names and sign locations					36
FSM 107.A.11	Numbered archaeological sites and structures, cemeteries, and historic landmarks to be preserved. Addressed w/ a note.					37
FSM 107.A.12	Pollution sources (dump sites, drainfields, buried fuel tanks, hazardous material storage facilities, solid and liquid disposal sites, etc.), wells, and springs that are known or as identified in LOGIS. Addressed w/ a note.					38
FSM 107.A.12	Existing open space, conservation & other ex. easements with DB/PG or instrument number					39
FSM 107.A.13	Ex. open space, conservation & any other known esmts. Depicted w/ DB/PG or Instr. No.					40
FSM 107.A.14	Environ. Impact Overlay Districts on grading plan and E&S plans					41
FSM 107.A.15	Scenic Creek Valley Buffer boundaries and other environmental buffer boundaries depicted					42
FSM 107.A.17	Very Steep Slopes and Moderately Steep Slopes on grading plan and E&S plans					43
FSM 107.A.18	Location, type, and dimensions of vehicular ingress and egress to the site, and clear zones					44
FSM 107.A.19	Design speed for all proposed roadways					45
FSM 107.A.20	Roadway & utility improvement plans and profile 1"=50' max H, 1"=5' max V. Plan portion of roadway plan shows location of roads, lots, and storm drainage, sanitary sewer, and water distribution systems. Rd. profile shows ex. & prop. road, san. sew., water dist., storm drainage systems, details of standard road sections and curb and gutter type					46
FSM 107.A.20.a	<ul style="list-style-type: none"> ADT for all existing and proposed roadways 					47
FSM 107.A.20.b	<ul style="list-style-type: none"> Stations indicated every 100 feet on centerline; PC, PI, PT at centerline of entrances and intersections, at subdivision or section limits, and at turnaround radius points 					48
FSM 107.A.20.c	<ul style="list-style-type: none"> When a proposed roadway or entrance intersects with an existing roadway, the centerline profile of the existing roadway shall be shown for adequate sight distance 					49
FSM 107.A.20.d	<ul style="list-style-type: none"> The centerline profile shall extend 300 feet beyond the property line or boundary on roadways that may provide access to adjoining property 					50

Code Reference	Description	Sheet	AD	RR	N/A	Line
FSM 107.A.20.e	<ul style="list-style-type: none"> • A grade line of road construction to include: 					51
FSM 107.A.20.e.i	<ul style="list-style-type: none"> <ul style="list-style-type: none"> ○ Percent of grade 					52
FSM 106.A.20.e.ii	<ul style="list-style-type: none"> <ul style="list-style-type: none"> ○ Elevations at the beginning and the end of all vertical curves 					
FSM 106.A.20.e.iii	<ul style="list-style-type: none"> <ul style="list-style-type: none"> ○ The length of vertical curves with sight distances and stations of vertical points of intersection 					
FSM 106.A.20.e.iv	<ul style="list-style-type: none"> <ul style="list-style-type: none"> ○ Elevations every 50' on tangent sections and every 25' on vertical curves 					
FSM 106.A.20.e.v	<ul style="list-style-type: none"> <ul style="list-style-type: none"> ○ Elevations at: 					
FSM 106.A.20.e.v.a)	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ centerline intersections of roads 					53
FSM 106.A.20.e.v.b)	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ road centerline intersections with the boundaries of a subdivision 					54
FSM 106.A.20.e.v.c)	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ curb returns 					
FSM 106.A.20.e.v.d)	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ culvert and storm sewer crossings 					
FSM 106.A.20.e.v.e)	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ curb inlets 					
FSM 106.A.20.e.v.f)	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ beginning and ending of super-elevation transition sections 					
FSM 106.A.20.e.vi	<ul style="list-style-type: none"> • The point of finished grade on typical section (i.e., centerline, top of curb, etc.) 					55
FSM 106.A.20.f	Locations of curb-cut ramps for the handicapped					56
FSM 106.A.20.g	Proposed location of multiple mailbox groupings					57
FSM 106.A.20.h	Proposed roadside ditches indicated in the profile where the ditch varies from running parallel to the road centerline					58
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FSM 106.A.20.j	Utility easements and proposed relocations					60
FSM 106.A.20.k	When a proposed roadway parallels or is located near an existing stream or open channel, profiles of top of stream bank, computed water elevations and invert (or flowline) of the stream or natural or manmade open channel provided. Road construction shall not encroach on approved floodplain limit					61
FSM 106.A.20.l	Grade profiles of curb and gutter construction in cul-de-sacs computed along the top elevation of the face of the curb starting at the beginning of the curb return, following the face of curb around the cul-de-sac and then to the end of return or curve on the opposite side of the cul-de-sac:					62
FSM 106.A.20.l.i	<ul style="list-style-type: none"> • Grade ties of the road, before entering the cul-de-sac grade, shall be shown on each end of the cul-de-sac grade profile 					63
FSM 106.A.20.m	Top of curb right and top of curb left if different					64
FSM 106.A.20.n	Landings shown on plans & profiles					65
FSM 106.A.20.o	Driveway locations (both individual and common)					66
FSM 106.A.20.p	Traffic control signage and structures (e.g., road delineators, barricades, and stop signs), and road signs					67
FSM 106.A.20.q	Right-of-way and easements shall be identified					68
FSM 106.A.20.r	Typical roadway cross sections					69
FSM 106.A.20.s	Sidewalks, trails, and proffered pedestrian improvements and maintenance responsibilities					70
FSM 106.A.20.t	For informational purposes only, for road sections consisting of					71

Code Reference	Description	Sheet	AD	RR	N/A	Line
	more than two lanes, illustrative pavement striping indicating the travelways, tapers, turn lanes, directional markings (e.g., turn and through arrows, solid and dashed line delineators, etc.), and pedestrian crosswalks shall be provided. VDOT may require a separate application					
FSM 106.A.21	Utility Plan and Profile Standards: The profile of the utilities is required for storm drainage (storm systems & culverts), sanitary sewer, and water distribution systems. Utility profiles are to be drawn to a scale of 1" ≤ 50' H and 1" ≤ 5' V					72
FSM 106.A.22	The following notes shall appear on all construction plans:					73
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FSM 106.A.22.b	<ul style="list-style-type: none"> Smoothing grade note (verbatim from FSM) 					75
FSM 106.A.22.c	<ul style="list-style-type: none"> Standard guardrail note (verbatim from FSM) 					76
FSM 106.A.22.d	<ul style="list-style-type: none"> Applicable local, State and Federal requirements note (verbatim) 					77
FSM 106.A.23	Grading and drainage plans, drawn to a scale of 1" ≤ 50' & include the following:					78
FSM 106.A.23.a	<ul style="list-style-type: none"> Proposed contour lines, with spot elevations 					79
FSM 106.A.23.b	<ul style="list-style-type: none"> Storm sewers and culvert sizes, top and invert elevations 					80
FSM 106.A.23.c	<ul style="list-style-type: none"> Limits of clearing and grading, areas of tree canopy and vegetation preserved or conserved, or other easements, if known, that restrict grading 					81
FSM 106.A.23.d	<ul style="list-style-type: none"> Natural and manmade open channels and swales 					82
FSM 106.A.23.e	<ul style="list-style-type: none"> Proposed easements 					83
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FSM 106.A.26	Watercourses and names, if any, and floodplain easement(s)					88
FSM 106.A.26.a	<ul style="list-style-type: none"> Potential jurisdictional waters and wetlands as identified by a consultant wetland delineation performed in accordance with Army COE stds. 					89
FSM 106.A.26.b	<ul style="list-style-type: none"> Note referencing the source of the wetland information depicted on the plan (including the Corps JD number & date, if it exists) & indicating that all applic. state & federal permits shall be obtained prior to disturbances within jurisdictional waters and wetlands 					90
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FSM 106.A.30	Lighting plans					94
FSM 106.A.31	Regulatory signage and street name signs					95
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FSM 106.A.33	Parking, loading spaces, walkways, and bike paths, indicating type					97

Code Reference	Description	Sheet	AD	RR	N/A	Line
	of surfacing, size, angle of stalls, width of aisles, and number of parking and loading spaces provided					
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	EROSION AND SEDIMENT CONTROLS					99
County Policy	Limits of clearing and grading match on all plan sheets – grading plan, E&S and landscape plans					100
VESCH Chap. 3	E&S controls complete on phases 1&2					101
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FSM 7.600.F.3	Length of flow contributing to SSF conforms to limits of SSF Table in FSM Ch. 7					121
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County Policy	When curb inlet protection is proposed, FSM detail provided					123
County Policy	When SSF is used, provide FSM detail					124
VESCH 3.14	Computations provided for sediment basin					125
VESCH 3.20	Rock check dams in small open channels which drain ≤ 10 acres					126
VESCH 3.38	Tree save areas and tree protection limits delineated					127
FSM CH. 7.000	ENVIRONMENTAL DESIGN STANDARDS					128
FSM 7.11	Lighting fixture layout					129
FSM 7.11	Lighting plan narrative w/ lighting standards and specs, parties responsible for O&M costs and permit requirements, if applicable.					130
FSM 7.110.A	Full cutoff and fully shielded light fixtures note					131
FSM 7.110.B.1	Street lighting provided at public and Category A subdivision street intx's w/in SFD subdivisions in Urban & Planned districts (except PD-RV & PD-CV)					132
FSM 7.110.B.2	Street lighting provided along private streets/access ways within TH developments					133
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Code Reference	Description	Sheet	AD	RR	N/A	Line
	street lighting provided at public and Category A subdivision street intx's					
7.110.C.2	Site lighting provided within developments which provide customer service to general public after 5:00 PM. Provide a note whether or not cust. service will be provided after 5:00 PM.					136
7.120.A.1	Subdivision street intersections lighting is a min. of 5000 lumen colonial fixtures w/ type III reflectors or approved equal mounted at 14' ht. Four-way intxs. req. 2 lights on opp. corners. Four lane div. rd intxs. req. lights at all corners					137
7.120.B.1	Lighting w/in SFA or MF developments in accordance with Table I (5K, 14' ht., 120' max; 8K, 14' ht., 190' max)					138
7.120.B.2	Lighting w/in developments providing customer service to public after 5:00 PM has min. 0.6 ft-candle at grade and avg. horiz. illumination \leq 40 ft-candles at grade level subject to uniformity ratio \leq 4:1					139
7.300.B.1.b	Tree conservation inspection & narrative prep'd. by U.F., C.A. or L.A.					140
7.300.B.1.b	Date of inspection & name of individual identified in T.C. narr. for ex. tree save credit to meet canopy and/or buffering and screening reqs.					141
7.300.B.1.b	Description of overall size, species and general conditions w/in TCA's					142
7.300.B.1.b	Tree inventory of all 30" or greater trees to be preserved w/in 50' of LOCG – field loc., common name, scientific name & ISA condition rating					143
7.304	The plan delineates the riparian stream buffer (RSB)					144
7.303.A	Tree protection provided for ex. trees					145
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ZO 5-1413	Interior and peripheral parking lot landscaping					149
FSM CH. 5.000	WATER RESOURCE MANAGEMENT					150
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FSM 5.201	Storm sewer/culverts – \leq 18"-10'; 21"-33"-15'; 36"-48"-20'; 54"-72"-24'					155
FSM 5.201	Easement encompasses 10 yr. WSE at culverts/inlets within or adjacent to storm drain easement					156
FSM 5.201	On-site (preserved) open channels w/ > 2 cfs – design flow + 5' width ea. side (15' min.)					157
FSM 5.201	SWM above ground fac.–10' beyond embank toe & 100-yr. WSE					158
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FSM 5.201	SWM underground (storm filter/filtrerra/oil-water sep.) - 10' out					160
FSM 5.201	SWM access rds. - 1' on ea. side of roadway					161
FSM 5.201	Easement encompasses 10-yr. WSE at culverts/inlets within or					162

Code Reference	Description	Sheet	AD	RR	N/A	Line
	adjacent to storm drain easement					
FSM 5.201	Easement required for manmade open channels:					163
FSM 5.201	<ul style="list-style-type: none"> That convey concentrated offsite runoff 					
FSM 5.201	<ul style="list-style-type: none"> > 2 cfs conveyed for 10-yr. storm across resid. lot/parcel 					
FSM 5.201	<ul style="list-style-type: none"> That drains runoff across > 2 full resid. lots, beginning where channel enters third lot 					
FSM 5.100.B	Adequate storm drainage outfall w/ computations and adequate channel narrative and analysis					164
FSM 5.220.A.1	Storm drainage system designed to convey the runoff from a 10-yr rainfall (for $T_c=5\text{min}$, $i_{10}=6.75''/\text{hr}$)					165
FSM 5.201	Forest/open space used to meet VRRM requirements is required to be w/in a VRRM Land Cover Easement					166
FSM 5.220.A	Design criteria for riprap, channel & outlets provided in accordance with Table 3					167
FSM 5.220.A.2	Drainage systems not terminated at the project boundary unless an adequate channel exists at that point					168
FSM 5.220.A.3	All storm drainage systems must be designed to provide overland relief for 100-yr. rainfall (1' min between relief pt. & lowest entry pt. of bldg.)					169
FSM 5.220.B.1	Design computations as req'd by VDOT Drainage Manual					170
FSM 5.220.B.2.a	Storm sewer & culvert designs-All construction information inverts, pipe size, type, length, class and slope					171
FSM 5.220.B.2.b	Storm sewer structures: identified by type & no (e.g MH-1) incl. no. & length of threats & locations					172
FSM.5.220.B.3	Culvert pipe size shall be determined by hydraulic computations on the plans					173
FSM 5.220.B.4	12" min. dia. for conc. stm. pipe outside of R.O.W. where $\leq 50'$ between access openings					174
FSM 5.220.B.4	Minimum pipe size within public right-of-way is 15"					175
FSM 5.220.B.5	No reduction in pipe size greater than one std. increment					176
FSM 5.220.B.6	Public or CAT A or B rds – min. cover for drain pipes=2' or $\frac{1}{2}$ dia. of pipe, whichever is larger					177
FSM 5.220.B.6	CAT C or outside R.O.W.-2' min. cover for drain pipes					178
FSM 5.220.B.6	For LID non-load brg. condition - 1' min cover for drain pipes					179
FSM 5.220.B.7	Velocity range in pipes between 3 and 18 fps					180
FSM 5.220.B.8	Maximum length between inlets is 300 ft. for < 36" pipe and 500 ft. for $\geq 36''$					181
FSM 5.220.B.9	The minimum slope for storm sewer is 0.50%					182
FSM 5.220.B.10	Provide concrete anchors when pipe slope exceeds 16%					183
FSM 5.220.B.11	Storm sewer pipes > 15" shall not outfall in front yards of SFD lot $\leq 20,000$ sf- extended to rear prop. line					184
FSM 5.220.B.11	SFA – storm outfalls extend to rear prop. line					185
FSM 5.220.B.12	Ends of storm sewers provided with appropriate appurtenance					186
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FSM 5.220.A	Dimensions of culvert outlet protection determined according to VESCH					188
FSM 5.220.B.13	Level Spreaders					189
FSM 5.220.B.15.a	<ul style="list-style-type: none"> Detail provided per fig. 1 or 2 (FSM ch.5) as applicable 					190

Code Reference	Description	Sheet	AD	RR	N/A	Line
FSM 5.220.B.13.a	<ul style="list-style-type: none"> Level spreader design per VA SW BMP Clearinghouse, max allow. Design flow = 10 cfs ($i=1''/hr$) 					191
FSM 5.220.B.13.b	<ul style="list-style-type: none"> If LS loc. w/in 50' of riparian buffers, wetlands or FP, stilling basin must be added 					192
FSM 5.220.B.13.f	<ul style="list-style-type: none"> 150' max from level spreader to stable outlet w/ 8% max slope 					193
FSM 5.220.B.13.g	<ul style="list-style-type: none"> Not located closer to pipe outlet than req'd length of outlet protection 					194
FSM 5.220.B.13.h	<ul style="list-style-type: none"> Level spreader receiving flow from storm sewer within VDOT R.O.W are subject to following: 					195
FSM 5.220.B.13.c	<ul style="list-style-type: none"> Rigid lip can be timber for $Q \leq 5$ cfs; concrete if ≥ 5 cfs 					196
FSM 5.220.B.13.h.i	<ul style="list-style-type: none"> If possible, 1' min. vert. clearance provided between storm sewer inv. out and level spreader top 					197
FSM 5.220.B.13.h.ii	<ul style="list-style-type: none"> If 1' vert. clearance not possible, evidence of positive relief for 10-yr. storm w/o restriction to hydraulic function of storm sewer provided 					198
FSM 5.220.B.14	Storm sewers not w/in 5' of bldg. loading plane					199
FSM 5.220.C	Open Channel Flow					200
FSM 5.220.C.1	Open channels comply w/ FSM Table - Open Channel Flow					201
FSM 5.220.C.2	Open Channels w/in R.O.W. designed per VDOT Drainage Manual					202
FSM 5.220.C.2	All open channel designs shall contain computations and ditch cross-sections					203
FSM 5.220.C.3	Open channels conveying over 2cfs should be designed for stable, subcritical flow. Local depressions & flat slopes permissible if designed to dissipate w/in 48 hrs.					204
FSM 5.220.G.1	All storm sewer easements sized according to pipe size					205
FSM 5.220.G.1	$\leq 18''$ pipe-10' esmt. Width; 21-33'' pipe-15'; 36-48'' pipe-20'; 54-72'' pipe-24'					206
FSM 5.220.G.1	With multiple pipes or $>72''$, esmt = 5' min. from outer pipe edges (w/ 1:1 trench width:depth) or per above minimums-greatest applies					207
FSM 5.220.G.2	Esmts. extended to property line and to an adequate channel					208
FSM 5.220.G.2	Esmts. Extended beyond prop. Line if off site drain. improvements					209
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FSM 5.220.G.3	All open channels require min. esmt. Width = design flow width + 5' ea. Side (15' min.)					211
FSM 5.220.G.4	Easements provided for open channels draining runoff across more than two full residential lots. (esmt. Provided where channels enters 3 rd lot)					212
FSM 5.220.G.5	Easements required to completely encompass 10-yr ponding area at all culverts and inlets					213
FSM 5.220.E.1	All drainage pipes, incl. SWM facilities, shall be concrete or HDPE					214
FSM 5.220.E.1.a	All concrete pipes shall be cl.III num. HDPE pipe meets VDOT specs.					215
FSM 5.220.E.1.b	Metal & other plastic pipe may be used onsite & outside of esmts.					216
FSM 5.220.E.1.c	CMP - OK for CAT C rds.					217
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Code Reference	Description	Sheet	AD	RR	N/A	Line
FSM 5.225.A.8	Energy dissipaters provided at SWM channel outfalls					219
FSM 5.230.A.1	Stormwater management facility provided where adequate receiving channel doesn't exist or can't be provided					220
FSM 5.230.A.1	SWM design attenuates post-development peak runoff rate from 1-yr, 2-yr, and 10-yr storms to not exceed respective pre-dev. rate					221
FSM 5.230.A.7	SWM faculty not req'd. where adeq. channel provided through on-site or off-site improvements extended to annex. adeq. channel					222
FSM 5.230.A.1.a	Concentrated runoff running leaving dev. is discharged directly into well defined nat. or constructed receiving channel, pipe or pipestem. Receiving channel cross sections provided					223
FSM 5.230.b	Conveyance system protection and flood protection analyses provided at every discharge point of concentrated flow originating from site improvements					224
FSM 5.230.c	Increased volumes of sheet flow originating from site improvements that may cause erosion of flooding on down-gradient property shall be identified and diverted to a stable outlet or stormwater management facility that provides the required conveyance system protection and flood protection					225
FSM 230.A.2.C.a	For manmade open channels:					226
FSM 230.A.2.C.1	Provide at a minimum, for first 150', field surveyed corss-sections every 50' and wherever there is a reasonably substantial change in stream geometry, roughness coefficient, or slope					227
FSM 230.A.2.C.2	After first 150', to downstream limit of analysis, provide narrative based on visual inspection					228
FSM 230.A.2.C.b	Pipe stems and pipes: for pipe systems (i.e., storm sewer), segments shall be analyzed and if potential exists for surcharge of system, a hydraulic grade line (HGL) shall be provided					229
FSM 230.A.2.C.b	For individual pipes (e.g., culverts), a controlling headwater must be determined from energy grade line (per VDOT LD-269) or through a stormwater routing calculation					230
FSM 230.B.2	Provide all VRRM spreadsheets					231
FSM 230.B.4.b.v.a	Super silt fence will be substituted for silt fence in all perimeter locations					232
FSM 230.B.4.b.v.b	Sediment traps and basins will provide double the minimum required volume (286 CY/acre), except volume may be reduced to avoid impacts to sensitive environmental features (e.g., streams, wetlands, forest cover, steep slopes)					233
FSM 230.C.1	Identify whether the site is a hotspot; if so, identify measures that reduce pollutants					234
FSM 230.C.4.a	Oil/water separation required facilities that engage in activities (other than agricultural) that potentially generate oily runoff, including, but not limited to, vehicle maintenance/washing/detailing, fuel storage/dispensing, and machine and paint shops					235
FSM 230.C.4.b	Secondary containment required for activities that propose storing, handling, and/or dispensing of petroleum products (except for liquefied petroleum gas) and hazardous substances					236
FSM 230.C.5.a	Discharge from chemically treated pools, fountains and similar water features – prior to discharge to storm sewer or other manmade or natural stormwater conveyance systems, chemically treated water from pool draining and filtering operations shall be de-chlorinated and metallic-based algaeades shall be removed or neutralized and solids shall be removed and stabilized					237

Code Reference	Description	Sheet	AD	RR	N/A	Line
FSM 5.230.A.1.d	Offsite SWM facilities OK if designed to accommodate site w/ approved maint. agreement					238
FSM 5.230.A.4	SWM is located w/in an easements & esmt. Is 10' from toe of slope and/or periphery					239
FSM 5.225.B.2	SWM design narrative provided					240
FSM 5.225.B.3	Computations submitted with detail design for proposed SWM facility					241
FSM 5.225.B.3.a	Stage – storage relationship provided					242
FSM 5.225.B.3.b	Stage – discharge relationship provided					243
FSM 5.225.B.3.c	Routing data provided					244
FSM 5.225.B.3.d	Hydrologic computations provided					245
FSM 5.225.B.4	Min. low flow orifice = 2.5" w/ open grill trash protection. May be reduced to 1.75" w/ stack filtering system					246
FSM 5.225.B.5	All dry SWM facilities incorporate provisions for low flow conveyance without concrete trickle ditches					247
FSM 5.225.B.6.a	Underground SWM facility requires Geotech Report – to ESI 1st					248
FSM 5.225.B.6.c	Underground SWM facility –Description, specs., and maint. schedule provided					249
FSM 5.225.B.7	SWM facilities w/ Infiltration – verify SHWT, incl. perched cond. Is at least 2' below bottom of fac. – verified by 1 of 3 methods in FSM					250
FSM 5.225.B.7.iv	If 2' separation bet. facility bottom and SHWT is not achieved, underdrains and clay or geotextile liner is acceptable					251
FSM 5.225.B.4.c	Geotech Report required for SWM embankments- to ESI 1st					252
FSM 5.225.B.5.b	No landscape plantings proposed on dam embankments					253
FSM 5.225.B.5.c	Pond outfalls are far enough from property line to achieve adequate transition per VSMH & VESCH					254
FSM 5.225.B.5.d	Low-level drains provided in wet ponds where gravity outfall is available					255
FSM CH. 4.00	TRANSPORTATION					256
FSM 4.200.A.1	Private roadway classification provided					257
FSM 4.200.A.2.b	Dedicate one-half total right of way adjacent to public road					258
FSM 4.200.A.2.e	Curb and gutter req'd. in developments w/in Rte. 28 tax district & PD (excl. PD-RV & PD-CV), & R & CLI.					259
FSM 4.200.A.2.e	Shared use trails provided w/ ditch rd. sections. S/W's permitted 110 trails where lot size ≤ 1.0 acre.					260
FSM 4.200.A.2.f	Reserve (spite) strips controlling access to public roads is prohibited					261
FSM 4.200.A.2.g	In PDH districts, no more than 80 d.u. permitted to be served by a single point of access directly to publicly maintained roadways or indirectly to publicly maintained roadways via access easements.					262
FSM 4.200.A.2.h	Where req'd. by 2.0 interparcel conn. req'd. for vehicular & non-motorized users					263
FSM 4.310.A	Roads configured to avoid floodplain and to limit stream crossings					264
FSM 4.310.B	No roadway shall intersect a public rdwy. Or CAT A rd. at < 80°					265
FSM 4.310.C	Road jogs w/ centerline offsets < 225 feet prohibited					266
FSM 4.310.D	Public roads and category A road intersections align with existing or planned roadway intersections					267
FSM 3.310.E	Maximum cul-de-sac lengths conform to table, Ch. 4					268
FSM 4.310.E.1	Cul-de-sac turnaround grades 6% along the FC or EP					269

Code Reference	Description	Sheet	AD	RR	N/A	Line
FSM 4.310.E.2	Cul-de-sac: 40' min. radius at property line; 30' min. radius at face of curb or edge of pavement					270
FSM 4.310.E.3	Developments with a single point of access shall provide a secondary point of access for emergency vehicle use if the length of road exceeds the maximum allowed					271
FSM 4.310.F	Max. landing grade = shall be 3%. Min. length = 50', Breakovers = 6% max. Landings for category B roadways, 6% max. for 25'					272
FSM 4.310.G	Private roads shall have = 50' min. between curb return and/or curb cuts except residential driveways					273
FSM 4.310.H	Curb and gutter sections 6' min. (except Cat. B & C roads) between face of curb and right of way line (or esmt.)					274
FSM 4.310.K	Residential driveway entrances in C&G sections shown in accordance w/ Figures 6 & 7 of Chapter 4					275
FSM 4.310.L	On roads > 2000 VPD, no direct access from D/W or pipestem serving ≤ 3 D.U. w/o traffic calming measures					276
FSM 4.310.L	On roads > 4000 VPD, no direct access from D/W or pipestem serving ≤ 3 D.U.					277
FSM 4.320.A	PUBLIC ROADWAY STANDARDS: All construction shall conform to VDOT standards. Provide note.					278
FSM 4.330.A.3	PRIVATE ROADWAY STANDARDS: Private roadways designed for SU-30 and emergency vehicles. (travelway inside radius $\geq 25''$, except for alleys)					279
FSM 4.330.A.6	Sidewalks placed within public access easements					280
FSM 4.330.A.6	HC ramps provided at C&G intersections					281
FSM 4.330.B	CATEGORY A ROADWAYS					282
FSM 4.330.B.2	Width of access easement for private roads shall extend to property line along frontage of individual lots to which it provides access					283
FSM 4.330.B.3	Category A roads shall have a paved surface. See Table 1 for minimum pavement sections and design criteria					284
FSM 4.330.B.4	Utility easements shall be provided, as necessary					285
FSM 4.330.B.5	Category A roadway requires construction plans & profiles					286
5.1	CAT A rds have a min. 20' travelway width FC to FC					287
FSM 4.330.B.5.2	Turn lanes req'd. at entrances with ADT > 5500 VPD					288
FSM 4.330.B.5.3	Roadways > 3000 VPD shall be super-elevated					289
FSM 4.330.5.4	If ADT > 250 VPD, required pavement thickness shall be based on ADT volumes					290
FSM 4.330.5.5	If ADT ≤ 250 VPD, minimum pavement section: 2" bit. surface course and 6" aggregate base course					291
FSM 4.330.C	CATEGORY B ROADWAYS					292
FSM 4.330.C	Category B roads: townhouse and multi-family uses					293
FSM 4.330.C	Design of category B roadways meets minimum standards shown in Table II. Category B: < 1000 VPD					294
FSM 4.330.C	Angle parking is not allowed on type B3 roadways. Parallel parking allowed on Cat. B with additional pavement					295
FSM 4.330.C.1	Roadways and parking areas have a curb section and are contained within an access easement					296
FSM 4.330.C.2	For Type B2 and B3 roads, intersections spaced ≥ 50 feet apart					297
FSM 4.330.C.4	Category B road intersections onto a public or Category A road not spaced < 100 feet at centerline					298
FSM 4.330.C.5	No parking for minimum distance of 30' from intersections					299

Code Reference	Description	Sheet	AD	RR	N/A	Line
	measured from the flow line of the gutter pan.					
FSM 4.330.C.6	Category B roads: Max posted speed = 15 mph					300
FSM 4.330.C.9	Minimum pavement section for Category B roads and parking areas with projected ADT < 250 VPD: 2" bit. surf. & 6" aggr. base					301
FSM 4.330.C.10	Permanent turn-a-round required when dead-end road > 500'					302
FSM 4.330.D	CATEGORY C ROADWAYS					303
FSM 4.330.D.1	Category C rds: priv. access rds., cl. III rds. serving ≤ 25 lots, pipestem drives & alleys					304
FSM 4.330.D.2	Category C roads designed to meet Table III min. standards					305
FSM 4.330.D.3.a	Permanent dead-end C3 and C4 roads which exceed 400 feet shall include vehicular turn-a-rounds					306
FSM 4.330.D.3.b	C3 and C4 roads located within class III and IV soils shall provide a field determination of CBR values					307
FSM 4.330.D.3.c	C3 roads constructed of gravel include a 50 foot paved apron when accessing an existing paved road					308
FSM 4.330.D.3.d	C3 and C4 roads include signage for road names, private road identification, and traffic control as appropriate					309
FSM 4.330.D.3.e	The following criteria applies to the design of C1 and C2 roads constructed as pipestem drives:					310
	<ul style="list-style-type: none"> Lots sharing a pipestem driveway provide ≥ 3 parking spaces per dwelling outside of the travelway. Driveways clearly labeled or noted "no parking along driveway." 					311
	<ul style="list-style-type: none"> The design of the pipestems serving more than one lot shown in typical section and on grading plan together with turnaround and required utilities 					312
	<ul style="list-style-type: none"> Each pipestem clearly identified as a private drive (sign at entry w/ words "Private Drive" & addresses) 					313
	<ul style="list-style-type: none"> No pipestem extends a distance of > 400 feet from public road to property which it serves or > 800' total if a loop 					314
FSM 4.340	PAVEMENT THICKNESS DESIGN STANDARDS					315
FSM 4.340.A	Methods and materials shall conform to VDOT standards. Provide note.					316
FSM 4.340.C	Preliminary subbase and pavement design shall be based on an assumed design CBR value of 4. Provide note.					317
FSM 4.340.F	The minimum pavement section for privately owned and maintained parking lots with a projected ADT of less than 400 VPD shall consist of 1.5" bituminous surface course, 3" bit. base course and 6" aggregate subbase course					318
FSM 4.340.G	Pavements in commercial areas shall be of a heavy-duty design in major cartways and loading areas and at dumpster pads. A minimum 6" depth 3000 psi concrete section with steel reinforcement over 4" of aggregate shall be used for loading areas and dumpster pad areas.					319
FSM 4.400	PARKING GEOMETRIC STANDARDS					320
FSM 4.400.A.2	Paved parking areas are required for four or more parking spaces and all parking spaces shall be delineated and striped					321
FSM 4.400.B.1	Minimum parking space sizes:					322
	<ul style="list-style-type: none"> Standard head-in 9' x 18' 					323
	<ul style="list-style-type: none"> Parallel parking 8' x 22' 					324
FSM 4.400.B.2	Aisle widths for standard car parking lots:					325

Code Reference	Description	Sheet	AD	RR	N/A	Line
	<ul style="list-style-type: none"> • 90 - 22' 					326
	<ul style="list-style-type: none"> • 60 - 20' 					327
	<ul style="list-style-type: none"> • 45 - 18' 					328
	<ul style="list-style-type: none"> • A minimum aisle width of 25' shall be maintained adjacent to buildings. Min. travel aisle width = 18' 					329
FSM 4.400.B.4	Where wheel stops or curbing are provided for parking spaces, a 1 foot reduction in the stall length will be allowed					330
FSM 4.400.B.5	Parking spaces for handicapped persons and related access aisles, accessibility routes and signage for physically handicapped persons shall be provided					331
FSM 4.400.B.6.a	Entrances to parking bays shall be located along the site access way to avoid blockage of the public right-of-way. No parking shall be allowed within 30 feet of the entrance					332
FSM 4.400.B.6.b	Major site accessways shall be clearly defined, with a minimum aisle width of 25 feet. No direct angle parking shall be allowed where ADT's exceed 1500 VFD					333
FSM 4.400.B.6.c	Retaining walls, screens, landscaping and building walls shall be protected from vehicle contact					334
FSM 4.400.B.6.d	Overhang areas which are a part of the required parking space graded $\leq 2''$ above top of curb not encroached by landscape plantings, signs, or obstructions.					335
FSM 4.400.B.6.e	Loading spaces and dumpster pads shall be accessible by the design vehicle with all parking spaces occupied					336
FSM 4.400.B.6.f	For drive-through facilities are proposed, the travelway width shall be a minimum of 10 feet and shall provide safe vehicle stacking					337
FSM 4.400.B.8	A Permanent turn-a-round shall be required when the dead-end aisle exceeds 500 feet					338
FSM 4.400.C	LOADING SPACES					339
FSM 4.400.C.1.a	Single unit loading space: 15' x 30'; 15' minimum horizon. clearance. When more than one space is provided adjacent to each other, additional spaces: 12 feet wide.					340
C.1.b	Uses which are req'd. to provide a single unit ldg. sp. shall provide an entr. & circulation system which can accom. a SU-30 des. veh.					341
FSM 4.400.C.2.a	Semi-trailer loading sp: 15' x 55'; 15' min. horiz. clearance					342
FSM 4.400.C.2.b	Uses which are req'd. to provide a single unit ldg. sp. shall provide an entr. & on-site circulation system which can accom. a WB-50 des. veh.					343
FSM 4.400.C.4	No off-roadway loading area shall be located within any front yard. Loading areas shall be designed and located such that they do not interfere with the free circulation of vehicles within parking and stacking areas					344
FSM 4.500	DRIVEWAYS					345
FSM 4.500.B.1	Driveway slopes shall be 12% or less					346
FSM 4.500.B.2	Driveways in Mtnside Dev. Overlay district or in steep slope areas – 16% max.					347
FSM 4.500.B.3	Driveways maintain full width of garage doors to property line or a distance of 18 feet outside of garage, whichever is less.					348
FSM 4.500.B.4	Skewed driveways cannot exceed a 10:1 angle with the driveway apron or garage – provide Fig. 8 or 9					349
FSM 4.500.B.5	Curved driveways must be designed with a 10 foot minimum inside radius and a 24 foot outside radius – provide Fig. 10 or 11					350

Code Reference	Description	Sheet	AD	RR	N/A	Line
FSM 4.500.B.6	Tapered driveways cannot exceed 10:1 taper - prov. Fig. 8, 9 or 10					351
FSM 4.500.B.8	Roll top curbs not allowed as D/W entrances					352
FSM 4.600	PEDESTRIAN AND BICYCLE ACCOMMODATIONS					353
FSM 4.600.A.3.a	NCUS provides access to destinations such as recreation, school, retail & commercial locations within subdivision					354
FSM 4.600.A.3.b	NUCS req'd. to extend to property boundaries of project, tie into ex. systems & previously approved planned systems and provide for future additions. When a sidewalk or trail is located outside of VDOT right-of-way, rt. shall be contained within a public access easement 1' beyond outside both sides of s/w or trail.					355
FSM 4.600.A.3.c	Sidewalks shall be provided on both sides of curb and gutter roadways for single family detached lots					356
FSM 4.600.A.3.d	Sidewalks shall be provided in front of all units and to the parking areas for townhouses and multi-family units					357
FSM 4.600.A.3.e	Sidewalks or trails shall be provided leading to activity centers and/or crosswalks such as play grounds, pools, tot lots and rec. centers					358
FSM 4.600.A.3.f	Office and commercial areas: Sidewalks leading to facility and/or crosswalks					359
FSM 4.600.A.3.g	NUCS provided along road frontages to provide pedestrian interparcel access where such access is set forth in the Zoning Ordinance as a performance standard					360
FSM 4.600.A.3.h	Sidewalks provided on both sides of roadway where they conform to VDOT standards and allowances					361
FSM 4.600.A.3.i	Shared-use trails provided w/ shoulder and ditch rds. in Suburban Policy Areas, transition Policy Areas, Joint Land Mgmt. Areas & Rural Villages. S/Ws may be provided in lieu of shared-use trails in devs. of lots of 1 acre or less.					362
FSM 4.600.B	SIDEWALKS					363
FSM 4.600.B.1.a	Sidewalk and trails shall be constructed on a subgrade compacted to 95% density at opt. moist. content					364
FSM 4.600.B.1.b	Sidewalk and trails shall be constructed to one of the following cross-sections:					365
	• VDOT Type A-3 concrete, 4" thick					366
	• 4" thick crushed stone (21-A) topped with 1.5" asphalt					367
	• On well-drained soil, 4" of asphalt					368
	• Alternative sections may be approved by the Director and VDOT					369
FSM 4.600.B.1.c	The maximum cross-slope allowed shall be 1/4" per foot					370
FSM 4.600.B.1.d	Sidewalks shall be constructed to VDOT standards-note					371
FSM 4.600.B.1.e	Sidewalk longitudinal slope shall be consistent with the adj. rdwy.					372
FSM 4.600.B.1.f	VDOT standards for CG-12 shall be provided at pedestrian roadway crossings on curb and gutter roadway sections (includes trails)					373
FSM 4.600.B.1.g	Sidewalks shall have a minimum unobstructive width of 5 feet for residential developments where the average density exceeds 10 units per acre, for non-resid. dev. & for dev. adj. to rds in CTP. For all other applications a min. width of 4'					374
FSM 4.600.B.2	SHARED-USE TRAILS					375
FSM 4.600.B.2.d	Shared-use trails outside of VDOT R.O.W.: Min. width 6'					376
FSM 4.800	SIGNS					377

Code Reference	Description	Sheet	AD	RR	N/A	Line
FSM 4.800.1	Where Fire Lane identification is required:					378
	<ul style="list-style-type: none"> Travelways w/ total width < 26' shall be identified as Fire Lane on both sides of travelway 					379
	<ul style="list-style-type: none"> Travelways w/ total width \geq 26', and \leq 32' shall be identified as Fire Lane on one side of travelway 					380
	<ul style="list-style-type: none"> Commercial/non-residential bldgs. shall require Fire Lane identification along frontage of bldg. and at other bldg. access points 					381
	<ul style="list-style-type: none"> Public pools shall provide Fire Lane identification at any entrance for emergency vehicles 					382
FSM 4.800.2	Fire Lane identification specifications for Residential Developments:					383
	a) Fire Lane signs shall be installed at beginning and end of designated Fire Lane w/ directional arrows pointing in. Curbing shall be painted yellow w/ "Fire Lane" stenciled in black on curbing every 50' of Fire Lane in 4" letters					384
	b) In lieu of curb markings, Fire Lanes \geq 75' in length may have intermediate "Fire Lane" signs installed w/ double directional arrows pointing away from center of sign towards opposing ends of fire lane; spacing of signs is \leq 80' in residential areas					385
FSM 4.821	Sign installed indicating possible extension of street where a future street extension is anticipated to provide access to adjacent property					386
FSM 4.830	Handicap signs provided in accordance with ADA reqs.					387