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| loudoun_county_seal_n12815.png ENGINEERS AND SURVEYORS INSTITUTELOUDOUN COUNTY, VIRGINIAMINIMUM SUBMISSION REQUIREMENTSCONSTRUCTION PLANS AND PROFILES (CPAP) PROJECT NAME & NUMBER:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  SUBMITTING FIRM: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ PHONE #: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  PROJ. COORD: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ E-MAIL ADDRESS: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  DPE NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­­­­­­­ DPE#: \_\_\_\_\_ E-MAIL ADDRESS: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  REVIEW DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ESI REVIEW TEAM: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

Note: (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 8.106.A.1** | **COVER SHEET** |  |  |  |  | 1 |
| FSM 8.106.A | * Seal & signature by Licensed PE or Surveyor |  |  |  |  | 2 |
| FSM 8.106.A | * Sheet size 24” x 36” with match lines as nec. |  |  |  |  | 3 |
| FSM 8.106.A.1.a | * Title “Construction Plans and Profiles” |  |  |  |  | 4 |
| FSM 8.106.A.1.b | * Name and address of the owner of record |  |  |  |  | 5 |
| FSM 8.106.A.1.c | * Name and address of the Applicant |  |  |  |  | 6 |
| FSM 8.106.A.1.d | * Name of the licensed professional engineer (PE) or surveyor (LS) who prepared the plan |  |  |  |  | 7 |
| FSM 8.106.A.1.e | * Sheet Index, including the number of sheets in the plan |  |  |  |  | 8 |
| FSM 8.106.A.1.f | * MCPI (PIN) ref. |  |  |  |  | 9 |
| FSM 8.106.A.1.g | * 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 |  |  |  |  | 10 |
| FSM 8.106.A.1.h | * Approval block |  |  |  |  | 11 |
| FSM 8.106.A.1.i | * Revision block |  |  |  |  | 12 |
| FSM 8.106.A.1.j | * Original Plan Date |  |  |  |  | 13 |
| FSM 8.106.A.1.k | * Source of title |  |  |  |  | 14 |
| FSM 8.106.A.1.l | * Source of Floodplain Note (See 8.101) |  |  |  |  | 15 |
| FSM 8.106.A.1.m | * Archaeology Notes (See 8.101) |  |  |  |  | 16 |
| **FSM 8.106.A.2** | **ALL SHEETS** |  |  |  |  | 17 |
| FSM 8.106.A.2.a | * Scale |  |  |  |  | 18 |
| FSM 8.106.A.2.b | * North arrow, if applic. |  |  |  |  | 19 |
| FSM 8.106.A.2.c | * Proposed name of subdivision or development |  |  |  |  | 20 |
| FSM 8.106.A.2.d | * Revision block |  |  |  |  | 21 |
| FSM 8.106.A.2.e | * Original Plan Date |  |  |  |  | 22 |
| FSM 8.106.A.2.f | * Election District and Loudoun Co., VA, in Title Block |  |  |  |  | 23 |
| FSM 8.106.A.2.g | * Seal & signature (PE or Surveyor) |  |  |  |  | 24 |
| FSM 8.106.A.3 | Zoning district & jurisdictional boundaries |  |  |  |  | 25 |
| FSM 8.106.A.4 | Zoning requirements |  |  |  |  | 26 |
| FSM 8.106.A.5 | Associated land dev. app. info – Nos. & approval dates |  |  |  |  | 27 |
| FSM 8.106.A.6 | No. of floors, floor area, height, exterior dimensions, location & prop. use of each bldg. |  |  |  |  | 28 |
| FSM 8.106.A.7 | Dimensions reqd. to demonstrate compliance w/regs, proffers, & conds. |  |  |  |  | 29 |
| FSM 8.106.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) |  |  |  |  | 30 |
| FSM 8.106.A.9 | Property lines and Adjoining Property Information and use |  |  |  |  | 31 |
| FSM 8.106.A.10 | Approved and/or reserved road names and sign locations |  |  |  |  | 32 |
| FSM 8.106.A.11 | Numbered archaeological sites and structures, cemeteries, and historic landmarks to be preserved. Addressed w/ a note. |  |  |  |  | 33 |
| FSM 8.106.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. |  |  |  |  | 34 |
| FSM 8.106.A.13 | Ex. open space, conservation & any other known esmts. Depicted w/ DB/PG or Instr. No. |  |  |  |  | 35 |
| FSM 8.106.A.14 | Environ. Impact Overlay Districts on grading plan and E&S plans |  |  |  |  | 36 |
| FSM 8.106.A.15 | Scenic Creek Valley Buffer boundaries and other environmental buffer boundaries depicted |  |  |  |  | 37 |
| FSM 8.106.A.16 | 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 |  |  |  |  | 38 |
| FSM 8.106.A.17 | Very Steep Slopes and Moderately Steep Slopes on grading plan and E&S plans |  |  |  |  | 39 |
| FSM 8.106.A.18 | Location, type, and dimensions of vehicular ingress and egress to the site, and clear zones |  |  |  |  | 40 |
| FSM 8.106.A.19 | Design speed for all proposed roadways |  |  |  |  | 41 |
| **FSM 8.106.A.20** | **ROAD DESIGN** |  |  |  |  | 42 |
| FSM 8.106.A.20 | Roadway & utility improvement plans and profile 1”=50’ max H, 1”=5’ max V. Location of roads, lots, storm drainage, sanitary sewer, & water distribution systems in plan view. Rd. profile shows ex. & prop. road, san. sew., water, storm drainage systems, details of standard road sections & curb &gutter type |  |  |  |  | 43 |
| FSM 8.106.A.20.a | * ADT for all existing and proposed roadways |  |  |  |  | 44 |
| FSM 8.106.A.20.b | * 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 |  |  |  |  | 45 |
| FSM 8.106.A.20.c | * 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 |  |  |  |  | 46 |
| FSM 8.106.A.20.d | * The centerline profile shall extend 300 feet beyond the property line or boundary on roadways that may provide access to adjoining property |  |  |  |  | 47 |
| FSM 8.106.A.20.e | * A grade line of road construction to include: |  |  |  |  | 48 |
| FSM 8.106.A.20.e.i | * + Percent of grade |  |  |  |  | 49 |
| FSM 8.106.A.20.e.ii | * + Elevations at the beginning and the end of all vertical curves |  |  |  |  | 50 |
| FSM 8.106.A.20.e.iii | * + The length of vertical curves with sight distances and stations of vertical points of intersection |  |  |  |  | 51 |
| FSM 8.106.A.20.e.iv | * + Elevations every 50’ on tangent sections and every 25’ on vertical curves |  |  |  |  | 52 |
| FSM 8.106.A.20.e.v | * + Elevations at: |  |  |  |  | 53 |
| FSM 8.106.A.20.e.v.a) | * + - centerline intersections of roads |  |  |  |  | 54 |
| FSM 8.106.A.20.e.v.b) | * + - road centerline intersections with the boundaries of a subdivision |  |  |  |  | 55 |
| FSM 8.106.A.20.e.v.c) | * + - curb returns |  |  |  |  | 56 |
| FSM 8.106.A.20.e.v.d) | * + - culvert and storm sewer crossings |  |  |  |  | 57 |
| FSM 8.106.A.20.e.v.e | * + - curb inlets |  |  |  |  | 58 |
| FSM 8.106.A.20.e.v.f) | * + - beginning and ending of super-elevation transition sections |  |  |  |  | 59 |
| FSM 8.106.A.20.e.vi | * The point of finished grade on typical section (i.e., centerline, top of curb, etc.) |  |  |  |  | 60 |
| FSM 8.106.A.20.f | Locations of curb-cut ramps for the handicapped |  |  |  |  | 61 |
| FSM 8.106.A.20.g | Proposed location of multiple mailbox groupings |  |  |  |  | 62 |
| FSM 8.106.A.20.h | Proposed roadside ditches indicated in the profile where the ditch varies from running parallel to the road centerline |  |  |  |  | 63 |
| FSM 8.106.A.20.i | Horizontal & vertical locations of prop. & ex. culverts, storm sewer., san. Sew., & utility crossings on road profiles |  |  |  |  | 64 |
| FSM 8.106.A.20.j | Utility easements and proposed relocations |  |  |  |  | 65 |
| FSM 8.106.A.20.k | When a prop. road parallels or is located near an ex. stream or open channel, profiles of top of stream bank, computed water elevations & invert (or flowline) of stream or natural/manmade open channel provided. Road construction shall not encroach on approved FP limit |  |  |  |  | 66 |
| FSM 8.106.A.20.l | Grade profiles of curb & gutter constr. in cul-de-sacs computed along top elevation of face of curb starting at beginning of curb return, following F.C. around cul-de-sac and then to end of return or curve on opposite side of the cul-de-sac: |  |  |  |  | 67 |
| FSM 8.106.A.20.l.i | * Grade ties of road, before entering cul-de-sac grade, shall be shown on each end of cul-de-sac grade profile |  |  |  |  | 68 |
| FSM 8.106.A.20.m | Top of curb right and top of curb left if different |  |  |  |  | 69 |
| FSM 8.106.A.20.n | Landings shown on plans & profiles |  |  |  |  | 70 |
| FSM 8.106.A.20.o | Driveway locations (both individual and common) |  |  |  |  | 71 |
| FSM 8.106.A.20.p | Traffic control signage and structures (e.g., road delineators, barricades, and stop signs), and road signs |  |  |  |  | 72 |
| FSM 8.106.A.20.q | Right-of-way and easements shall be identified |  |  |  |  | 73 |
| FSM 8.106.A.20.r | Typical roadway cross sections |  |  |  |  | 74 |
| FSM 8.106.A.20.s | Sidewalks, trails, and proffered pedestrian improvements shown and maintenance responsibilities indicated (note) |  |  |  |  | 75 |
| FSM 8.106.A.20.t | For informational purposes only, for road sections consisting of more than two lanes, illustrative pavement striping indicating travelways, tapers, turn lanes, directional markings (e.g., turn & thru arrows, solid & dashed line delineators, etc.), & pedestrian crosswalks provided. VDOT may require a separate application |  |  |  |  | 76 |
| FSM 8.106.A.21 | Utility Plan & Profile Standards: Profile of utilities req’d. for storm drain. (storm systems & culverts), san. sew. & water systems. Util. profiles drawn to scale of 1” < 50’ H & 1” < 5’V |  |  |  |  | 77 |
| **FSM 8.106.A.22** | **ALL SITE PLANS - REQUIRED NOTES** |  |  |  |  | 78 |
| FSM 8.106.A.22.a | * Sub-base depth is based on CBR value of 4 (or actual tests) note |  |  |  |  | 79 |
| FSM 8.106.A.22.b | * Smoothing grade note |  |  |  |  | 80 |
| FSM 8.106.A.22.c | * Standard guardrail & handrail note |  |  |  |  | 81 |
| FSM 8.106.A.22.d | * Applicable local, state and federal requirements note |  |  |  |  | 82 |
| **FSM 8.106.A.23** | **GRADING & DRAINAGE PLANS -** Scale 1” < 50’ |  |  |  |  | 83 |
| FSM 8.106.A.23.a | * Proposed contour lines, w/ spot elevations |  |  |  |  | 84 |
| FSM 8.106.A.23.b | * Storm sewers and culverts w/ sizes, top & invert elevs. |  |  |  |  | 85 |
| FSM 8.106.A.23.c | * LOCG, areas of tree canopy & veg. preserved or conserved, or other esmts, if known, that restrict grading |  |  |  |  | 86 |
| FSM 8.106.A.23.d | * Open channels and swales |  |  |  |  | 87 |
| FSM 8.106.A.23.e | * Proposed easements |  |  |  |  | 88 |
| FSM 8.106.A.23.f | Elevations for prop. bsmt. floor, first floor, garage slab for all bldgs. and finished grade at bldg. corners |  |  |  |  | 89 |
| FSM 8.106.A.23.g | Retaining walls with the elevs. prop. for top and bottom of wall |  |  |  |  | 90 |
| FSM 8.106.A.24 | Stormwater management plan provided |  |  |  |  | 91 |
| FSM 8.106.A.25 | Storm drainage calculations and drainage area map showing individual and cumulative drainage area contributing to each point of concentration. Runoff characteristics provided. |  |  |  |  | 92 |
| FSM 8.106.A.26 | Watercourses and names, if any, and floodplain easement(s) |  |  |  |  | 93 |
| FSM 8.106.A.26.a | * Potential jurisdictional waters & wetlands identified by a consultant wetland delineation performed in accordance with Army COE stds. (depicted on plan) |  |  |  |  | 94 |
| FSM 8.106.A.26.b | * Note referencing source of wetland info. depicted on plan (including the Corps JD number & date, if it exists) & indicating that all applic. state & federal permits shall be obtained prior to disturbances w/in jurisdictional waters and wetlands |  |  |  |  | 95 |
| FSM 8.106.A.27 | Soils map and certification (See Ch. 6) |  |  |  |  | 96 |
| FSM 8.106.A.28 | Erosion and sediment control plan (See Ch. 7) |  |  |  |  | 97 |
| FSM 8.106.A.29 | Tree Conservation and Landscape Plan (See Ch. 7) |  |  |  |  | 98 |
| FSM 8.106.A.30 | Lighting plans (See Ch. 7) |  |  |  |  | 99 |
| FSM 8.106.A.31 | Regulatory signage and street name signs |  |  |  |  | 100 |
| FSM 8.106.A.32 | Loc., type, size, & ht. of fencing, screening, & retaining walls |  |  |  |  | 101 |
| FSM 8.106.A.33 | Parking, loading spaces, walkways, and bike paths, indicating type of surfacing, size, angle of stalls, width of aisles, and number of parking and loading spaces provided |  |  |  |  | 102 |
| FSM 8.106.A.34 | Designation of ADU units |  |  |  |  | 103 |
| FSM 8.106.A.35 | Fire apparatus access rds. & signs. (See Ch. 4) |  |  |  |  | 104 |
| **FSM 7.600** | **EROSION AND SEDIMENT CONTROLS** |  |  |  |  | 105 |
| County Policy | Limits of clearing and grading match on all plan sheets – grading plan, E&S and landscape plans |  |  |  |  | 106 |
| VESCH 3.02 | Construction entrance provided |  |  |  |  | 107 |
| VESCH 3.05 | Silt fence used where maximum drainage is < 1 acre or drainage area is < 0.25 acre/100’ of silt fence |  |  |  |  | 108 |
| VESCH 3.07 | Inlet protection provided where the drainage area is < 1 acre |  |  |  |  | 109 |
| VESCH 3.08 | Culvert inlet protection where drainage area is < 3 ac |  |  |  |  | 110 |
| VESCH 3.09 | Maximum drainage area for diversion dike is 5 acres |  |  |  |  | 111 |
| VESCH 3.13 | Silt trap computations provided |  |  |  |  | 112 |
| FSM 7.600.B | Use of diversion dikes to break up drainage divides to support use of sediment traps only allowed when maint. of dike can be accomplished |  |  |  |  | 113 |
| FSM 7.600.C | The E&S plan provides for two phase E&S measures |  |  |  |  | 114 |
| **FSM 7.600.E** | **E&S DETAILED NARRATIVE** |  |  |  |  | 115 |
| FSM 7.600.E.1 | * Project description |  |  |  |  | 116 |
| FSM 7.600.E.2 | * Existing Site Conditions |  |  |  |  | 117 |
| FSM 7.600.E.3 | * Adjacent property info |  |  |  |  | 118 |
| FSM 7.600.E.4 | * Off-site areas (stockpiles, site access, etc.) |  |  |  |  | 119 |
| FSM 7.600.E.5 | * Soil information |  |  |  |  | 120 |
| FSM 7.600.E.6 | * Critical erosion areas |  |  |  |  | 121 |
| FSM 7.600.E.7 | * Explanation of E&S measures (Structural Practices) |  |  |  |  | 122 |
| FSM 7.600.E.8 | * Sequence of construction |  |  |  |  | 123 |
| FSM 7.600.F.1 | SSF placed as close to contour as possible - 5% max for 50’ |  |  |  |  | 124 |
| FSM 7.600.F.2 | SSF not intended to replace primary controls, i.e., ST’s or SB’s |  |  |  |  | 125 |
| FSM 7.600.F.3 | Length of flow contributing to SSF conforms to limits of SSF Table in FSM Ch. 7 |  |  |  |  | 126 |
| FSM 7.600.G | Pipe outlet required on silt traps when drainage area is 1 to 2.99 acres. Pipe outlet detail provided. Storage vol. = 134 CY/AC. |  |  |  |  | 127 |
| County Policy | When curb inlet protection is proposed, FSM detail provided |  |  |  |  | 128 |
| County Policy | When SSF is used, FSM detail provided |  |  |  |  | 129 |
| VESCH 3.14 | Comps. provided for SB |  |  |  |  | 130 |
| VESCH 3.20 | Rock check dams in small open channels which drain < 10 acres |  |  |  |  | 131 |
| VESCH 3.38 | Tree save areas and tree protection limits delineated |  |  |  |  | 132 |
| **FSM CH**. **7.000** | **ENVIRONMENTAL DESIGN STANDARDS** |  |  |  |  | 133 |
| FSM 7.110 | Lighting fixture layout |  |  |  |  | 134 |
| FSM 7.110 | Lighting plan narrative w/ lighting standards and specs, parties responsible for O&M costs and permit requirements, if applicable. |  |  |  |  | 135 |
| FSM 7.110.A | Full cutoff and fully shielded light fixtures note |  |  |  |  | 136 |
| **FSM 7.110.B** | **Residential Subdivisions/Site Plans** |  |  |  |  | 137 |
| 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) |  |  |  |  | 138 |
| FSM 7.110.B.2 | * Street lighting provided along private streets/access ways within TH developments |  |  |  |  | 139 |
| FSM 7.110.B.3 | * Site lighting provided within MF developments |  |  |  |  | 140 |
| **FSM 7.110.C** | **Retail, Commercial, Office & Industrial Subdiv./Site Plans** |  |  |  |  | 141 |
| FSM 7.110.C.1 | * Retail, commercial, office and industrial subdivision/site plan street lighting provided at public and Category A subdivision street intx’s |  |  |  |  | 142 |
| FSM 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. |  |  |  |  | 143 |
| FSM 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 |  |  |  |  | 144 |
| FSM 7.120.B.l | Lighting w/in SFA or MF developments in accordance with Table I (5K, 14’ ht., 120’ max; 8K, 14’ ht., 190’ max) |  |  |  |  | 145 |
| FSM 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 ≤ 40 ft-candles at grade level subject to uniformity ratio ≤ 4:1 |  |  |  |  | 146 |
| FSM 7.300.B.1.b | Tree conservation inspection & narrative prep’d. by U.F., C.A. or L.A. |  |  |  |  | 147 |
| FSM 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. |  |  |  |  | 148 |
| FSM 7.300.B.1.b | Description of overall size, species and general conditions w/in TCA’s |  |  |  |  | 149 |
| FSM 7.300.B.1.b | Tree inventory of all 30” (dbh) or greater trees to be preserved w/in 50’ of LOCG – field loc., common name, scientific name & ISA condition rating |  |  |  |  | 150 |
| **FSM 7.302** | **TREE CONSERVATION & LANDSCAPE PLANS** |  |  |  |  | 151 |
| FSM 7.302 | TCLP req’d. when ex. tree canopy/veg. is used to satisfy req. of Z.O., FSM, proffer or cond. of appr. |  |  |  |  | 152 |
| FSM 7.302.A.1 | * Accurate location & species of ea. planting |  |  |  |  | 153 |
| FSM 7.302.A.2 | * No plantings detrimental to sight dist. or other esmts. |  |  |  |  | 154 |
| FSM 7.302.A.3 | * Req’d. landscape buffers |  |  |  |  | 155 |
| FSM 7.302.A.4 | * Areas of ex. tree canopy/veg. to be preserved/conserved |  |  |  |  | 156 |
| FSM 7.302.A.5 | * All tree protection measures req’d. By FSM Sec. 7.303 |  |  |  |  | 157 |
| FSM 7.302.A.6 | * Tree canopy calcs. |  |  |  |  | 158 |
| FSM 7.302.A.7 | * Landscape planting schedule |  |  |  |  | 159 |
| FSM 7.302.A.8 | * Any narrative req’d. By FSM Sec. 7.300 |  |  |  |  | 160 |
| FSM 7.302.A.9 | * Ref. to appropriate guidelines for planting & maint. of new plant mat’l. - Landscape Contractors Association’s: Landscape Specs Guidelines for Balt.-Wash Metro Area |  |  |  |  | 161 |
| FSM 7.302.B | For new plantings used to meet canopy, landscaping and/or buffering & screening reqs., a Landscape Table in accord. w/ the “Sample” Landscape Table in this FSM section |  |  |  |  | 162 |
| FSM 7.302.C | Prop. plantings summarized in a Road Corridor Buffer Table & Buffer Yard Table in accord. w/ this section |  |  |  |  | 163 |
| FSM 7.302.E | Total canopy coverage calcs provided in tabular form (chart) |  |  |  |  | 164 |
| FSM 7.303 | Tree protection provided for ex. trees in accord. w/ VESCH |  |  |  |  | 165 |
| FSM 7.303.B | PRZ (group) & CRZ (indiv.) delineated for ex. trees claimed for canopy |  |  |  |  | 166 |
| ZO 5-1303.C | Tree canopy exclusion in accordance w/ Z.O. category |  |  |  |  | 167 |
| ZO 5-1407 | Interior and peripheral parking lot landscaping calcs, if applic |  |  |  |  | 168 |
| **FSM CH. 5.000** | **WATER RESOURCE MANAGEMENT** |  |  |  |  | 169 |
| FSM 5.100.B | Adequate storm drainage outfall w/ computations and adequate channel narrative and analysis |  |  |  |  | 170 |
| **FSM 5.201** | **Storm Easements** |  |  |  |  | 171 |
| FSM 5.201 | Major & minor floodplains – 100 yr. FP limits shown |  |  |  |  | 172 |
| FSM  5.201 | Overland relief at sumps on rds w/ C&G – 10’ width from public street to rear prop. line of lots abutting street |  |  |  |  | 173 |
| FSM  5.201 | Overland relief on SFD & SFA units— 10’ width extending the length of the O.R. path on the lot |  |  |  |  | 174 |
| FSM 5.201 | Easement required for manmade open channels: |  |  |  |  | 175 |
| FSM 5.201 | * That convey concentrated offsite runoff |  |  |  |  | 176 |
| FSM 5.201 | * > 2 cfs conveyed for 10-yr. storm across resid. lot/parcel |  |  |  |  | 177 |
| FSM 5.201 | * That drains runoff across > 2 full resid. lots, beginning where channel enters third lot |  |  |  |  | 178 |
| FSM 5.201 | Esmts. Required for: |  |  |  |  | 179 |
| FSM  5.201 | * Storm sewer/culverts – ≤ 18”—10’; 21”-33”—15’; 36”-48”—20’; 54”-72”—24’ |  |  |  |  | 180 |
| FSM 5.201 | * Esmt. encompasses 10-yr. WSE at culverts/inlets within or adjacent to a stm. drain esmt. |  |  |  |  | 181 |
| FSM  5.201 | * On-site preserved (natural) open channels w/ > 2 cfs – design flow + 5’ width ea. side (15’ min.) |  |  |  |  | 182 |
| FSM  5.201 | * SWM above-ground fac.(above ground struct., ponds, bioretention areas, etc.) -10’ beyond embank toe & 100-yr. WSE |  |  |  |  | 183 |
| FSM  5.201 | * SWM facilities - Vegetative filter strip used as BMP below a level spreader – width of level spreader rigid lip |  |  |  |  | 184 |
| FSM  5.201 | * SWM underground fac. (storm filter/filterra/oil-water sep.) - 10’ out from structure |  |  |  |  | 185 |
| FSM 5.201 | * SWM access rds. - 1’ on ea. side of roadway |  |  |  |  | 186 |
| FSM 5.201 | * Forest/open space used to meet VRRM requirements to be w/in a VRRM Land Cover Easement |  |  |  |  | 187 |
| FSM 5.220.A.1 | Storm drainage system designed to convey the runoff from a 10-yr rainfall |  |  |  |  | 188 |
| FSM 5.220.A.3 | Overland relief paths depicted |  |  |  |  | 189 |
| FSM 5.220.A.5  Table 6 | Design criteria for riprap, channel & outlet protection provided |  |  |  |  | 190 |
| FSM 5.220.A  Table 6 | Outlet protection provided at outlets of storm sewers and culverts (2-5 fps-sod; 5-8 fps – CL.I riprap; 8-18 CL.II; >18 fps-special design) |  |  |  |  | 191 |
| FSM 5.220.A.1 | Design computations as req’d by VDOT Drainage Manual, VESCH & VA SWM Handbook |  |  |  |  | 192 |
| FSM 5.220.B.2.a | Storm sewer & culvert designs: All construction info, incl. inverts, pipe size, type, length, gauge/class and slope |  |  |  |  | 193 |
| FSM 5.220.B.2.b | Storm sewer structures: Identified by type & no (e.g MH-1) incl. no. & length of throats & locations |  |  |  |  | 194 |
| FSM.5.220.B.3 | Culvert pipe size shall be determined by hydraulic computations (Hydraulic Design Series No. 5, FHA-DOT or VDOT approved) |  |  |  |  | 195 |
| FSM 5.220.B.4 | 12” min. dia. for conc. stm. pipe outside of R.O.W. where ≤ 50’ between access openings |  |  |  |  | 196 |
| FSM 5.220.B.4 | Minimum pipe size within public right-of-way is 15” |  |  |  |  | 197 |
| FSM 5.220.B.5 | No reduction in pipe size greater than one std. increment |  |  |  |  | 198 |
| FSM 5.220.B.6 | Public or CAT A or B rds – min. cover for drain pipes=2’ or ½ dia. of pipe, whichever is larger |  |  |  |  | 199 |
| FSM 5.220.B.6 | CAT C or outside R.O.W.-2’ min. cover for drain pipes |  |  |  |  | 200 |
| FSM 5.220.B.6 | For LID non-load brg. condition - 1’ min cover for drain pipes |  |  |  |  | 201 |
| FSM 5.220.B.7 | Min. design velocity = 3 fps for design flows of > 1 cfs;  Max. pipe velocities < 18 fps |  |  |  |  | 202 |
| FSM 5.220.B.8 | Maximum length between inlets is 300 ft. for < 36” pipe and 500 ft. for ≥ 36” |  |  |  |  | 203 |
| FSM 5.220.B.9 | The minimum slope for storm sewer is 0.50% |  |  |  |  | 204 |
| FSM 5.220.B.10 | Investigate concrete anchors when pipe slope > 16% |  |  |  |  | 205 |
| FSM 5.220.B.11 | Storm sewer pipes > 15” shall not outfall in front yards of SFD lot ≤ 20,000 SF- extended to rear prop. line |  |  |  |  | 206 |
| FSM 5.220.B.11 | SFA – storm outfalls extend to rear prop. line |  |  |  |  | 207 |
| FSM 5.220.B.12 | Ends of storm sewers provided with appropriate appurtenance |  |  |  |  | 208 |
| **FSM 5.220.B.13** | **Level Spreaders** |  |  |  |  | 209 |
| FSM 5.220.B.13.a | * Detail provided per Fig. 1 or 2 (FSM ch.5) as applicable |  |  |  |  | 210 |
| FSM 5.220.B.13.a | * Level spreader design per VA SW BMP Clearinghouse, max allow. Design flow = 10 cfs (i=1”/hr) |  |  |  |  | 211 |
| FSM 5.220.B.13.b | * If LS loc. w/in 50’ of riparian buffers, wetlands or FP, stilling basin must be added |  |  |  |  | 212 |
| FSM 5.220.B.13.c | * Rigid lip can be timber for Q ≤ 5 cfs; concrete if ≥ 5 cfs |  |  |  |  | 213 |
| FSM 5.220.B.13.f | * 150’ max from level spreader to stable outlet w/ 8% avg. max. slope |  |  |  |  | 214 |
| FSM 5.220.B.13.g | * Not located closer to pipe outlet than req’d length of outlet protection |  |  |  |  | 215 |
| FSM 5.220.B.14 | Storm sewers not located w/in 5’ of bldg. loading plane |  |  |  |  | 216 |
| **FSM 5.220.C** | **Open Channel Flow** |  |  |  |  | 217 |
| FSM 5.220.C.1 | Open channels comply w/ FSM Table 7 - Open Channel Flow |  |  |  |  | 218 |
| FSM 5.220.C.2 | Open Channels w/in R.O.W. designed per VDOT Drain. Manual |  |  |  |  | 219 |
| FSM 5.220.C.2 | Open channel designs include comps. & ditch x-sections |  |  |  |  | 220 |
| FSM 5.220.C.3 | Open channels conveying over 2 cfs designed for stable, subcritical flow. Local depressions or flat slopes permissible if designed to dissipate w/in 48 hrs., unless designed for detention |  |  |  |  | 221 |
| **FSM 5.220.D** | **Grading Criteria - Residential Lots < 1 ac.** |  |  |  |  | 222 |
| FSM 5.220.D.1 | Overall grading illustrates how prop. houses and lot grading will integrate into overall drainage design-honors drain. divides |  |  |  |  | 223 |
| FSM 5.220.D.2 | Bldg. footprints depicted w/ prop. fin. floor (FF) elevs. |  |  |  |  | 224 |
| FSM 5.220.E.1 | All drainage pipes &/or SWM facilities, shall be concrete or High Density Polypropylene (HDPE) or Polypropylene (PE) |  |  |  |  | 225 |
| FSM 5.220.E.1.a | All concrete pipes (RCP) shall be min. Class III. HDPE & PE pipe shall meet VDOT specs. |  |  |  |  | 226 |
| FSM 5.220.E.1.b | Metal & other plastic pipe may be used onsite where outside of esmts. |  |  |  |  | 227 |
| FSM 5.220.E.1.c | CMP - OK for CAT C rds. |  |  |  |  | 228 |
| FSM 5.220.E.1.d | HDPE & PE pipe not permitted in pond embankments |  |  |  |  | 229 |
| **FSM 5.225** | **SWM** |  |  |  |  | 230 |
| FSM 5.225.A.4 | All SWM facilities located within an esmt. |  |  |  |  | 231 |
| FSM 5.225.B.2 | SWM Narrative provided: |  |  |  |  | 232 |
| FSM 225.B.2.a | * Description of pre- & post-development conditions |  |  |  |  | 233 |
| FSM 225.B.2.c | * SWM Facility Table provided |  |  |  |  | 234 |
| FSM 5.225.B.3 | Computations submitted w/ detail design for prop. SWM fac. |  |  |  |  | 235 |
| FSM 5.225.B.4 | Min. low flow orifice for extended det. fac.= 2.5” w/ open grill trash protection. May be reduced to 1.75” w/ stack filtering system |  |  |  |  | 236 |
| FSM 5.225.B.5 | All dry SWM facilities incorporate provisions for low flow conveyance without concrete trickle ditches |  |  |  |  | 237 |
| FSM 5.225.B.6.a | For structures relying on soil suitability, underground SWM fac. requires Geotech Report – to ESI 1st |  |  |  |  | 238 |
| FSM 5.225.B.6.c | Underground SWM facility –Description, specs., and mfgr. maint. & maint. schedule provided |  |  |  |  | 239 |
| FSM 5.225.B.7 | SWM facilities w/ infiltration must verify Seasonal High Water Table (SHWT), incl. perched cond. is at least 2’ below bottom of fac. – verified by 1 of 3 methods in FSM |  |  |  |  | 240 |
| FSM 5.225.B.7.a.iv | If 2’ separation bet. facility bottom and SHWT is not achieved, underdrains and clay or geotextile liner is acceptable |  |  |  |  | 241 |
| FSM 5.225.B.7.b | Geotech Report required to demonstrate depth from facility bottom to bedrock > 2’ - to ESI 1st |  |  |  |  | 242 |
| **FSM 5.225.B.8** | **Dam Embankments** |  |  |  |  | 243 |
| FSM 5.225.B.8.a | For dam embankments, a Geotech Report is required addressing soil seepage, embankment design, & soil & water pH & erosiveness on principal spillway pipe mat’ls. |  |  |  |  | 244 |
| FSM 5.225.B.8.b | No landscape plantings proposed on dam embankments |  |  |  |  | 245 |
| FSM 5.225.B.8.c | Pond outfalls are far enough from property line to achieve adequate transition per VSMH & VESCH |  |  |  |  | 246 |
| FSM 5.225.B.8.d | Low-level drains provided in wet ponds where gravity outfall is available |  |  |  |  | 247 |
| **FSM 230.A.2.C.a** | **For manmade open channels:** |  |  |  |  | 248 |
| FSM 230.A.2.d.ii.a)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 |  |  |  |  | 249 |
| FSM 230.A.2.d.ii.a)2) | After first 150’, to downstream limit of analysis, provide narrative based on visual inspection |  |  |  |  | 250 |
| FSM 230.A.2.d.ii.b) | Pipe systems 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 |  |  |  |  | 251 |
| FSM 230.A.2.d.ii.b) | For individual pipes (e.g., culverts), a controlling headwater determined from energy grade line (per VDOT LD-269) or through a stormwater routing calculation such as HY-8 |  |  |  |  | 252 |
| FSM 230.B.2 | Provide all VRRM spreadsheets found at VA SW BMP Clearinghouse |  |  |  |  | 253 |
| FSM 230.C.1 | Identify whether the site is a stormwater hotspot; if so, identify measures that reduce pollutants |  |  |  |  | 254 |
| FSM 230.C.4.a | Oil/water separation required for 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 |  |  |  |  | 255 |
| 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 |  |  |  |  | 256 |
| 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 algaecides shall be removed or neutralized and solids shall be removed and stabilized. Note provided. |  |  |  |  | 257 |
| **FSM CH. 4.00** | **TRANSPORTATION** |  |  |  |  | 258 |
| FSM 4.200.A.l | Private roadway classification provided |  |  |  |  | 259 |
| FSM 4.200.A.2.b | Dedicate one-half total right-of-way adjacent to public road |  |  |  |  | 260 |
| 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. |  |  |  |  | 261 |
| FSM 4.200.A.2.e | Shared use trails provided w/ ditch rd. sections. S/W’s permitted in lieu of trails where lot size ≤ 1.0 acre. |  |  |  |  | 262 |
| FSM 4.200.A.2.f | Reserve strips (spite strips) controlling access to public rds. are prohibited. |  |  |  |  | 263 |
| FSM 4.200.A.2.g | In PDH districts, 80 or more DU require more than 1 point of access directly to publicly maintained rds. or indirectly to publicly maintained roadways via an access easement. |  |  |  |  | 264 |
| FSM 4.310.A | Roads configured to avoid floodplain and to limit stream crossings |  |  |  |  | 265 |
| FSM 4.310.B | No roadway shall intersect a public rdwy. or CAT A rd. at < 80° |  |  |  |  | 266 |
| FSM 4.310.C | Road jogs w/ centerline offsets < 225 feet prohibited |  |  |  |  | 267 |
| FSM 4.310.D | Public roads and category A road intersections align with existing or planned roadway intersections |  |  |  |  | 268 |
| FSM 3.310.E | Maximum cul-de-sac lengths conform to cul-de-sac table, Ch. 4 |  |  |  |  | 269 |
| FSM 4.310.E.1 | Cul-de-sac turnaround grades 6% along the FC or EP |  |  |  |  | 270 |
| FSM 4.310.E.2 | Cul-de-sac: 40’R min. at prop. line; 30’R min. at FC or EP. Fire Apparatus Acc. Rd. cul-de-sacs require min. 45’R at FC or EP |  |  |  |  | 271 |
| 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 |  |  |  |  | 272 |
| FSM 4.310.E.5 | Landscaped islands w/in cul-de-sacs must accommodate turning radius of an SU-40 design vehicle. |  |  |  |  | 273 |
| 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’ |  |  |  |  | 274 |
| FSM 4.310.G | Private roads shall have = 50’ min. between curb return and/or curb cuts except single residential driveways |  |  |  |  | 275 |
| FSM 4.310.H | Curb and gutter sections 6’ min. (except Cat. B & C roads) between face of curb and R.O.W. line or esmt. |  |  |  |  | 276 |
| FSM 4.310.K | Residential driveway entrances in C&G sections shown in accordance w/ Figures 6 & 7 of Chapter 4 |  |  |  |  | 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 > 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 |
| FSM 4.330.B.5.1 | CAT A rds shall 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.B.5.4 | If ADT > 250 VPD, required pavement thickness shall be based on ADT volumes using VDOT Road Design Manual |  |  |  |  | 290 |
| FSM 4.330.B.5.5 | If ADT < 250 VPD, minimum pavement section: 2” bit. surface course & 6” aggr. base course on compacted subgrade |  |  |  |  | 291 |
| FSM 4.330.C | **CATEGORY B ROADWAYS** |  |  |  |  | 292 |
| FSM 4.330.C | Category B roads: TH & MF (incl. condo) 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 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 curb sections and are contained within an access easement extending along entire frontage of lots to which it provides legal access |  |  |  |  | 296 |
| FSM 4.330.C.2 | For Type B2 and B3 roads, intersections spaced > 50 feet apart (See Fig. 3) |  |  |  |  | 297 |
| FSM 4.330.C.4 | Category B road intersections onto a public or Category A road not spaced < 100 feet at centerline (See Fig. 4) |  |  |  |  | 298 |
| FSM 4.330.C.5 | No parking for minimum distance of 30’ from intersections measured from the flow line of the gutter pan (See Fig. 5) |  |  |  |  | 299 |
| FSM 4.330.C.6 | Category B roads: Max posted speed = 15 mph. Provide note |  |  |  |  | 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-around 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 > 400 feet shall include vehicular turn-arounds |  |  |  |  | 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. Provide note |  |  |  |  | 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 |
|  | * Lots sharing a pipestem driveway provide > 3 parking spaces per dwelling outside of the travelway. Driveways are clearly labeled, noted “no parking along driveway” |  |  |  |  | 311 |
|  | * 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 |
|  | * Each pipestem clearly identified as a private drive (sign at entry w/ words “Private Drive” & addresses) |  |  |  |  | 313 |
|  | * 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 (if soil tests have not been performed). Provide note. |  |  |  |  | 317 |
| FSM 4.340.F | The minimum pavement section for privately owned and maintained parking areas with a projected ADT of less than 400 VPD shall consist of 1.5” bit. surf. course, 3” bit. base course and 6” aggr. 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 > 4 parking spaces and all parking spaces shall be delineated and striped |  |  |  |  | 321 |
| FSM 4.400.B.1 | Minimum parking space sizes: |  |  |  |  | 322 |
|  | * Standard head-in 9’x 18’ |  |  |  |  | 323 |
|  | * Parallel parking 8’ x 22’ |  |  |  |  | 324 |
| FSM 4.400.B.2 | Aisle widths for standard car parking lots: |  |  |  |  | 325 |
|  | * 90    - 22’ |  |  |  |  | 326 |
|  | * 60    - 20’ |  |  |  |  | 327 |
|  | * 45    - 18’ |  |  |  |  | 328 |
|  | * Min. travel aisle width = 18’ |  |  |  |  | 329 |
| FSM 4.400.B.3 | Stall width can be reduced to 8’ when spaces separated by dbl. lines set 1’ apart |  |  |  |  | 330 |
| FSM 4.400.B.4 | Where wheel stops or curbing are provided for parking spaces, a 1 foot reduction in the stall length allowed but cannot encroach on req’d. open space or pedestrian access system |  |  |  |  | 331 |
| FSM 4.400.B.5 | Parking spaces for handicapped persons and related access aisles, accessibility routes and signage for physically handicapped persons provided in accord. w/ State & Fed reqs. |  |  |  |  | 332 |
| FSM 4.400.B.6.a | Entrances to parking bays located along the site accessway to avoid blockage of the public right-of-way. No parking allowed w/in 30’ of the entrance (See Fig. 5) |  |  |  |  | 333 |
| FSM 4.400.B.6.b | Major site accessways are clearly defined, w/ no direct angle parking allowed where ADT’s > 1500 VPD & accommodate SU-30 & SU-40 design vehicle movements w/o requiring a change in direction |  |  |  |  | 334 |
| FSM 4.400.B.6.c | Retaining walls, screens, landscaping & building walls protected from vehicle contact |  |  |  |  | 335 |
| FSM 4.400.B.6.d | Overhang areas which are a part of the required parking space are graded ≤ 2” above top of curb not encroached by landscape plantings, signs, or obstructions. |  |  |  |  | 336 |
| FSM 4.400.B.6.e | Loading spaces and dumpster pads are accessible by the design vehicle with all parking spaces occupied |  |  |  |  | 337 |
| FSM 4.400.B.6.f | Where drive-through facilities proposed, travelway width is a min. of 10’ and provides safe vehicle stacking |  |  |  |  | 338 |
| FSM 4.400.B.8 | A Permanent turn-a-round is required when a dead-end aisle exceeds 500 feet |  |  |  |  | 339 |
| FSM 4.400.C | **LOADING SPACES** |  |  |  |  | 340 |
| FSM 4.400.C.1.a | Single unit loading space: 15’W x 30’L min. W/ 15’ min. horiz. clearance. When more than one space is provided adjacent to each other, additional spaces can be 12’ wide. |  |  |  |  | 341 |
| FSM 4.400.C.1.b | Uses which are req’d. to provide a single unit ldg. sp. provide an entr. & circulation system which accom. an SU-30 des. veh. |  |  |  |  | 342 |
| FSM 4.400.C.2.a | Semi-trailer loading sp: 15’W x 55’L min.w/ 15’ min. horiz. clr. |  |  |  |  | 343 |
| FSM 4.400.C.2.b | Uses req’d. to provide a std. or semi-loading space provide an entr. & on-site circulation system accomm. a WB-50 des. veh. |  |  |  |  | 344 |
| FSM 4.400.C.4 | No off-roadway loading area located w/in front yards. Loading areas designed and located such that they do not interfere w/ free circulation of vehicles w/in prkg. & stacking areas |  |  |  |  | 345 |
| FSM 4.500 | **DRIVEWAYS** |  |  |  |  | 346 |
| FSM 4.500.B.1 | Driveway slopes - 12% or less |  |  |  |  | 347 |
| FSM 4.500.B.2 | Driveways in Mtnside Dev. Overlay district or in steep slope areas – 16% max. |  |  |  |  | 348 |
| FSM 4.500.B.3 | Driveways maintain full width of garage doors to property line or a distance of 18’ outside of garage, whichever is less. |  |  |  |  | 349 |
| FSM 4.500.B.4 | Skewed driveways cannot exceed a 10:1 angle with the driveway apron or garage – provide Fig. 8 or 9 |  |  |  |  | 350 |
| FSM 4.500.B.5 | Curved driveways have a 10’ min. inside radius and a 24’ outside radius – provide Fig. 10 or 11 |  |  |  |  | 351 |
| FSM 4.500.B.6 | Tapered driveways not exceeding 10:1 taper - prov. Fig. 8, 9 or 10 |  |  |  |  | 352 |
| FSM 4.500.B.8 | Roll top curbs not allowed as D/W entrances |  |  |  |  | 353 |
| FSM 4.600 | **PEDESTRIAN AND BICYCLEACCOMMODATIONS** |  |  |  |  | 354 |
| FSM 4.600.A.3.a | NUCS provides access to destinations such as recreation, school, retail & commercial locations within subdivision |  |  |  |  | 355 |
| 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 VDOT right-of-way, it is contained w/in a public access esmt. 1’ min. beyond outside both sides of s/w or trail |  |  |  |  | 356 |
| FSM 4.600.A.3.c | SFD: Sidewalks provided on both sides of curb & gutter rdwys |  |  |  |  | 357 |
| FSM 4.600.A.3.d | TH & MF: Sidewalks in front of all units and to parking areas |  |  |  |  | 358 |
| FSM 4.600.A.3.e | Activity Centers (playgrounds, pools, tot lots, rec ctrs: Sidewalks or trails leading to the facility and/or crosswalks |  |  |  |  | 359 |
| FSM 4.600.A.3.f | Office & commercial areas: Sidewalks leading to facility and/or crosswalks |  |  |  |  | 360 |
| 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 |  |  |  |  | 361 |
| FSM 4.600.A.3.h | Sidewalks provided on both sides of roadway where they conform to VDOT standards and allowances |  |  |  |  | 362 |
| FSM 4.600.A.3.i | Shared-use trails provided w/ shoulder and ditch rds. in Suburban Policy Areas, Transition Policy Areas, JLMA & Rural Villages. S/Ws may be provided in lieu of shared-use trails in devs. of lots < 1acre. |  |  |  |  | 363 |
| FSM 4.600.B | **SIDEWALKS** |  |  |  |  | 364 |
| FSM 4.600.B.1.a | Sidewalk and trails constructed on subgrade compacted to 95% density at opt. moist. content. Provide note. |  |  |  |  | 365 |
| FSM 4.600.B.1.b | Sidewalk & trails constructed to one of following x-sections: |  |  |  |  | 366 |
|  | * + VDOT Type A-3 concrete, 4” min. depth |  |  |  |  | 367 |
|  | * + Crushed stone (21-A), 4” thick, 1.5” asphalt surface |  |  |  |  | 368 |
|  | * + On well-drained soil, 4” of asphalt |  |  |  |  | 369 |
| FSM 4.600.B.1.c | Max. cross-slope allowed: 1/4” per foot (2.08%) |  |  |  |  | 370 |
| FSM 4.600.B.1.d | Sidewalks constructed to VDOT standards-note |  |  |  |  | 371 |
| FSM 4.600.B.1.e | Sidewalk longitudinal slope consistent with the adj. rdwy. |  |  |  |  | 372 |
| FSM 4.600.B.1.f | VDOT standards for CG-12 HC ramps provided at pedestrian roadway crossings on curb and gutter roadway sections |  |  |  |  | 373 |
| FSM 4.600.B.1.g | Sidewalks have a min. unobstructive width of 5’ for residential developments where the avg. density > 10 units per acre, for non-resid. dev. & for dev. adj. to rds. in CTP. For 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 | **FIRE APPARATUS ACCESS ROADS (FAAR) & SIGNS** |  |  |  |  | 377 |
| FSM 4.810.B.1.a | FAAR have a min. width of 20’, incl. compacted/treated shoulders to support emergency vehicles (Exception: FM may reduce width to 18’ for SFD & SFA) |  |  |  |  | 378 |
| FSM 4.810.B.1.b | FAAR have min. vertical clearance = 13.5’ |  |  |  |  | 379 |
| FSM 4.810.B.2 | FAAR fire lane parking identification provided in accord. w/ Table IV |  |  |  |  | 380 |
| FSM 4.810.B.5 | Dead end FAAR > 150’ requires turnaround |  |  |  |  | 381 |
| FSM 4.810.C.2.a | Fire lane sign & painting identification provided in accord. W/ Table V |  |  |  |  | 382 |
| FSM 4.820 | Permanent street name signs provided |  |  |  |  | 383 |
| FSM 4.821 | Sign installed indicating possible extension of street where a future street extension is anticipated to provide access to adjacent property |  |  |  |  | 384 |
| FSM 4.830 | Handicap signs provided in accordance with ADA reqs. |  |  |  |  | 385 |