WASHINGTON COUNTY, LAND DEVELOPMENT ENGINEERING CHECKLIST
PRELIMINARY SUBDIVISION PLAT

DATE: _____

PROJECT: _____

COUNTY PLAN FILE NUMBERS: _____

DESIGN FIRM: _____

INSTRUCTIONS: To be completed by the applicant. It is to be signed by the appropriate design professional with the initial document submittal. Indicate "N/A" for not applicable and "✓" for included. Subsequent checklist submittals will be at the discretion of the Deputy Director, Land Development Engineering.

I. SUBMISSION DOCUMENTS

A. Road Adequacy and Site Distance Worksheets/Accident Analysis and Mitigation Plan included _____
B. Stormwater Management/Storm Drain Computations _____
C. Geotechnical Report for Stormwater Management _____

II. ROAD CONSTRUCTION PLANS – GENERAL INFORMATION

A. STANDARD TITLE AND SIGNATURE BLOCKS (ALL SHEETS)

1. Owner/Developer name, address and phone number _____
2. Design Professional name, address, phone number, seal, signature, date _____
3. Project name, zoning, tax map, election district, street address, parcel no. _____
4. Planning file reference numbers, water & sewer contract numbers, etc. _____
5. Washington County Land Development Engineering approval block _____

B. VICINITY MAP REQUIREMENTS (COVER SHEET)

1. Scale 1" = 2000', north arrow shown _____
2. ADC Map Coordinates _____
3. Two (2) Washington County Geodetic Coordinates shown and labeled _____
4. Site delineated _____
5. Major roads identified _____
6. Washington County Survey Control Shown on vicinity map _____

NOTES AND INFORMATION (COVER SHEET)

1. Washington County Standard General Notes for Preliminary Subdivision Plats _____
2. Site Analysis Data Sheet _____

3. Legend
4. Sheet Index

C. **GENERAL SHEET INFORMATION (ALL SHEETS)**

1. Plan scale 1" = 10' to 1" = 50'
2. Profile scale 1" – 5' vertical, 1" = 50' horizontal
3. Maximum drawing size = 24" x 36"
4. Minimum three (3) grid ticks with MD Grid Coordinates on plan sheets
5. North arrow
6. Match lines labeled and referenced
7. Profiles, details and cross-sections drawn to scale
8. Design Professionals seal, signature and date
9. Sheets numbered, consecutively; revisions noted with date

D. **BASE INFORMATION - PLAN VIEW**

1. Existing Conditions
   a. Streets – existing rights of way, property lines, property owners labeled, all easements, pavement width, and street names shown and dimensioned.
   b. Existing Utilities – water and sewer, contract numbers, invert of existing storm drains at point of connection
   c. Storm drains, size, material
   d. Telephone, gas and electric lines and street lights (if available)
2. Proposed Conditions
   a. Lots shown in solid line with lots numbered
   b. Separate plan sheets for work within SHA right-of-way
   c. Floodplain limits shown
   d. Wetland limits shown with buffers
   e. Sensitive areas shown
   f. Utility locations.

III. PRELIMINARY PLAT PLANS – (DESIGN INFORMATION)

A. **ROADS**

1. Show proposed street alignments, right of way widths, pavement widths, intersection taper dimensions, speed control devices, cul-de-sacs with radius.
2. Provide horizontal curve data Delta, R, T, L and chord length and bearing, speed control device dimensions, deflection angles and radius for speed control devices
3. Show plus stations of centerline at 50-ft. intervals and all P.C., P.R.C., P.C.C. and P.T., centerline equalities at all street intersections, transitions for speed control devices and pavement transitions
4. Show beginning and end of road construction by stations
5. Show all curb fillet radii, as well as fillet PC and PT elevations and stationing
6. Show tee or y-turnaround at terminus of the street.

7. Show existing features including structures, floodplain, wetland, etc. within construction limits to be removed or retained. _____
8. Show auxiliary lanes and improvements to existing roadways dimensioned and stationed. _____
9. Show sidewalks. _____

B. **STORM DRAINAGE (PROVIDE THE FOLLOWING)** _____

1. Drains - size, type, length and flow direction shown. _____
2. Drains - structure numbered beginning at downstream end of system as per drainage area map. _____
3. Drainage easements for surface flow greater than 5 cfs. _____
4. Easements or fee simple transfers for storm drains, stormwater management, utilities and 100-year floodplain (check against record plat). Show off site easements. _____
5. Road drainage at tee or y-turnarounds with provisions for erosion control and outlet protection. _____
6. Label and dimension outlet protection, denote material type and size. _____
7. Swales labeled, proposed grading shown, lining denoted. Max.side slope to be 3:1 within public right-of-way. _____

C. **ROAD PROFILES (1"-5' VERTICAL; 1" = 50' HORIZONTAL)**

1. Show existing ground profile on centerline. Check driveway grades and check for requirement of guardrails. _____
2. Profile grade line shown and location labeled. _____
3. Show all plus stations, intersections, etc., and give P.G.L. elevations and existing ground elevations every 50 feet (25 feet in vertical curve). _____
4. Label proposed slope and check against minimum and maximum slope _____
5. Provide vertical curve data (min. V.C. length = 100 feet):
   a. P.V.I. Station and Elevation. _____
   b. Length of vertical curve, PVC and PVT stations and elevations. _____
   c. Correction. _____
   d. H.S.D. for sags and S.S.D. for crests. _____
   e. Stationing and elevations for sump locations or crest locations. _____
6. When proposed paving is to be extended in the future, the profile grade line must be projected for a minimum of 400-ft off PL or beyond proposed pavement limits. _____
7. Provide all intersection approaches. _____
8. Show critical utility crossing(s). Insure adequate cover _____
9. Show design speed and road classification; label road name _____

IV. SUPPLEMENT DRAWINGS, INFORMATION

A. **GRADING PLAN /SEDIMENT & EROSION CONTROL PLAN**

1. Limit of disturbance shown. _____
2. Existing and proposed contours labeled. _____

3. Proposed drainage breaks labeled. _____
4. Proposed SWM and SD system shown. _____
5. Proposed Sediment and Erosion Control shown. _____

B. **STORM DRAIN DRAINAGE AREA MAP (MAXIMUM SCALE 1" = 200')**

1. Show and label proposed drainage system, pipe size and structure numbers include swales, road pavement, curb and gutter, proposed lot lines, proposed right-of-way lines, proposed easements, proposed building locations, existing building locations, existing topography to 200 feet from property line, existing water and sewer, existing down stream storm drain conveyance system, existing or proposed on site and offsite easements. _____
2. Label sub drainage areas to inlet structures and culverts; reference to design computations. _____
3. Provide runoff data. Show Tc flow path. Label sub area, "C" factor and percent of impervious area, (summary table may be used). _____
4. Label proposed contours, (consistent with grading plan). _____
5. Show 100-year floodplain WSEL _____
6. Swale/channel capacity computations. _____
7. HEC RAS modeling (if required). _____
8. FEMA Map Revision (Granted, Required, Applied for) _____

C. **STORM DRAIN COMPUTATIONS (INCLUDE IN SUPPLEMENTAL COMPUTATIONS)**

1. Impervious area computations _____
2. Swale/Channel capacity _____
3. HECRAS or HEC-2 model runs _____

V. RETAINING WALLS IN SWM FACILITIES (privately owned & maintained, outside of right-of-ways)

A. **GENERAL ITEMS TO INCLUDE:**

1. Retaining walls greater than 3' in height measured from finished grade at the front to the top of the wall shall require structural design _____
2. Grades shall not exceed 2:1 above the wall or 4:1 below the wall within the maintenance easement _____
3. Horizontal dimensions measured from bottom face of the wall at the proposed grade _____
4. Retaining walls shall not be constructed on fill materials _____
5. Retaining walls & supports shall not be within a Washington County right-of-way or easement _____
6. Toe of retaining wall, tie backs, geogrid outside the 100' WSEL. _____
7. Maximum height of 3' in publicly maintained facilities. _____
8. Maximum height of 10' in privately maintained facilities. _____
9. Upper walls of tiered walls do not influence lower walls. _____
10. Retaining walls above upper maintenance bench less than 3' and in cut. _____

11. Retaining walls designed to withstand hydrostatic pressure and saturated ground conditions. _____
12. Retaining walls shall not be used as a pond embankment. _____
13. Retaining walls in excess of 30" in height shall have appropriate safety railing or fence. _____

VI. SUPPORTING INFORMATION – SWM (one copy required)

1. SWM Design Plan Information form (Form WCSWM-1). _____
2. Pond Summary Sheet (SCS MD-Eng14). _____
3. SWM Drainage area maps, pre & post development drainage areas; including drainage divides, area in acres, time of concentration flow paths and land uses with corresponding acreage, proposed SWM facility, proposed and existing storm drain conveyance system. _____
4. USDA Soils map with site and drainage area delineated. _____
5. Storm drain plans including any site areas not draining directly into pond (must show safe conveyance). _____
6. Sensitive areas map showing floodplains, wetlands, forested areas, steep slopes greater than 25%, and rock outcrops. _____
7. Pond structure hazard classification (per SCS378). _____
8. Erosion & sediment control plan. _____
9. Existing / proposed down stream drainage easement, statement regarding investigation of downstream effects (ability of downstream system to carry 10/25 year storm normal pond outflow). _____
10. Justify use of detention. _____
11. Bench mark shown on plans (datum per NAVD88 is preferable). _____
12. Coordinates shown on at least three monuments within the project area. Must be per NAD83 datum. _____

A. HYDROLOGY

1. Detailed narrative describing how stormwater management is addressed. _____
2. Pre-development RCN (TR-55 Worksheet #2). _____
3. Post-development RCN (TR-55 Worksheet #2). _____
4. Ultimate development RCN for off-site drainage area. _____
5. $WQ_{v,}$ Re_v, Cp_v, Q_p & Q_f. _____
6. Pre-development TC (TR-55 Worksheet #3). _____
7. Post-development TC (TR-55 Worksheet #3). _____
8. Runoff hydrographs for 1,10, 25 & 100-year storms (acceptable methods: TR-20, TR-55, PSUHM). _____
9. Basin Routing: using storage indication, TR-20 PSUHM; for post & ultimate development conditions. _____
10. For drainage areas greater than 30 acres, provide HEC RAS model for proposed conditions. Identify cross section locations every 100 feet and show 100 WSEL for each cross section. _____
11. Other SWM Computations. _____

12. BMP Stage / Storage relationship. _____
13. BMP Stage / Discharge relationship (provide equations and cite references, include a graph plot for 10 yr conveyance; 100 yr where required). _____
14. Supply and channels sized using manning equation, limiting velocities checked for lining of ditches. _____
15. Dam breach analysis (using SCS 378 method). _____
16. Downstream analysis of conveyance systems and hazards, include photos. _____
17. Routing storm through downstream development (if deemed necessary by Deputy Director). _____
18. Identify where SWM credits used (credit areas to be shown on plans). _____

VII. GEOTECHNICAL ANALYSIS:

1. Geotechnical report (required for all sites / facility geotechnical report). Report shall include registration number, date and seal and signature of responsible design professional. _____
2. Geotechnical report recommends proposed SWM structure location is acceptable for proposed use. _____
3. Min. SWM Pond boring locations: borrow area, pond pool area, principle spillway, top of dam near abutment. _____
4. Boring logs with unified soil classification; blow counts, surface elevation of boring, depth gw encountered, fill areas identified, surface elevation. . _____
5. Infiltration rate/in situ permeability test as per MDE 2000 Stormwater Design Manual for infiltration, bioretention, sand filters for soils below proposed facility. _____
6. Discussion of karst geology present. _____
7. Presence and location of existing sink holes. _____

VIII. SITE ENVIRONMENTAL INVESTIGATION:

1. 100 year floodplain delineated on the plan (include FEMA Panel Number). _____
2. Non-tidal wetlands delineated. _____

IX. STORMWATER MANAGEMENT PLANS:

A. **PLAN VIEW OF FACILITY (SCALE < 1" = 50'; I.E., 40', 30', ETC.)**

1. Existing and final contours (1' or 2' intervals).. _____
2. Existing and proposed improvements. _____
3. Ex. topography, contour labels, & site feature information extends a min. of 200' offsite. _____
4. Existing and proposed property lines and rights-of-way, all adjacent property owners labeled. _____
5. Locations of geotechnical borings. _____
6. Outflow pipe, outlet protection outfall channel to stable outfall. _____
7. Emergency spillway outlet channel. _____
8. Proposed easements for ponding and/or pond slopes on private property. _____

9. Show minimum 15 foot setback from SWM facility toe of fill or top of cut to nearest property lines. Show minimum 25 foot setback from SWM facility outfall channel protection to nearest property lines.
10. Appropriate signature block for Land Development Engineering approval.
11. Rev, WQ_v, CP_v, 10-yr, 100-yr WSEL, permanent pool WSEL
12. Graphically identify all proposed non-structural credit areas.
13. Provide summary table identifying the are in acres, the required and provided Rev, WQv, Cpv, Qp10 and Qp100 for each drainage area. In a narrative below the table summarize the type of facility used to achieve each of the above requirements.
14. For all public facilities show fee simple swm parcel, lot with a minimum 25-foot wide fee simple access from public right-of-way.
15. Maintenance access road a minimum of 10' wide with maximum cross slope of 4:1, maximum longitude slope of 15% no ditches may occupy the access easement area. Maintenance access must reach control structure and pond bottom. Maintenance access must reach forebay areas.
16. Maintenance easement area for private facilities delineated on the plan.
17. Access entrance apron to be paved.
18. Existing and proposed utilities and utility easements
19. Show and label limits of pond forebay, forebay weir, forebay weir protection and reference detail.
20. Show and label principal spillway, control structure, limits of embankment fill stationed.
21. Limits of pond liner labeled (if applicable).

B. **PUBLIC SAFETY CONSIDERATIONS:**

1. Slopes – no steeper than 3:1 anywhere around pond.
2. For ponds with permanent pool, show and label under water safety bench.
3. Show & label 4' chain link fence required when pool depth is 4.0' or greater for the 100-yr storm.
4. Fence located 5' from SWM boundary the top or toe of slope, fence not permitted on berm.
5. Flared end sections (or headwall) on all pipes.
6. No trees or shrubs permitted on the embankment
7. Ponds > 8' deep (measured to 100-year W.S.E.) shall be benched within the ponding area 4' horizontally at 4' elevation intervals.
8. Ponds which pass the 100-year storm through the principal spillway shall include a token spillway 1' below top of dam, min. 8' width, located entirely within cut soils.

1. Miscellaneous Items:
   a. Title Block.
   b. Property line outline and owner information.
   c. Vicinity map.
   d. North arrow.
   e. Certifications: Owner / Developer; Designer; etc.
   f. Miss Utility note.

g. Sealed by P.E. or Professional L.S. _____
h. **NOTE**: All grading on lot, either before or after the construction of a dwelling or appurtenances, shall be the full responsibility of the lot owner. _____
i. **NOTE**: No permanent structures (fences, sheds, play equipment, retaining walls) shall be permitted within any storm drainage easement either shown or described on the final plat of subdivision. _____

X. STORMWATER MANAGEMENT PLANS – UNDERGROUND DETENTION – ADDITIONAL INFORMATION REQUIRED:

A. **PLAN VIEW OF STRUCTURE (scale <1"=50'; i.e. 40', 30', etc.)**
1. Grit Chamber _____
2. Minimum of one (1) access ports per storage pipe / chamber _____

XI. STORMWATER MANAGEMENT PLANS – INFILTRATION – ADDITIONAL INFORMATION REQUIRED:

A. **PLAN VIEW OF STRUCTURE (scale <1"=50'; i.e. 40', 30', etc.)**
1. Observation well location shown. _____
2. Stone diaphragm or stone trench or other pretreatment. _____

XII. STORMWATER MANAGEMENT PLANS – FILTRATION- ADDITIONAL INFORMATION REQUIRED:

A. **PLAN VIEW OF STRUCTURE (scale <1"=50'; i.e. 40', 30', etc.)**
1. Geotechnical boring locations shown in plan view. _____
2. Landscaping plan required for bioretention facilities. _____
3. Show and label pretreatment. _____
4. Minimum top width of berm 3 feet. _____
5. Bioretention facility to be off line. Show flow splitter device. _____

XIII. STORMWATER MANAGEMENT PLANS – OPEN CHANNEL SYSTEMS – ADDITIONAL INFORMATION REQUIRED: _____

A. **PLAN VIEW OF STRUCTURE (scale <1"=50'; i.e. 40', 30', etc.)**
1. Pretreatment shown and labeled _____
2. Under drain location (if applicable).. _____

XIV. ADDITIONAL COMMENTS: _____

1. Check if additional comments have been attached. _____

Prepared by: _____

Name (signed)	Company	Date
Name (printed)	Registration Number	Telephone

Developer: _____

Telephone