CARROLL COUNTY DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING – ENGINEERING REVIEW DIVISION

CONSTRUCTION PLAN CHECKLIST – ROADS AND STORM DRAINS

Project Name: _____ County File No.: _____

Checked by: _____ For: _____ Date: _____
Print name Firm or agency

Items noted in the checklist shall be considered the minimum amount of information necessary for submission of construction plans. The Department of Public Works may require additional information as necessary.

PART I FORMAT

A. GENERAL

[ ] Size of sheets shall be 24"h x 36"w. Allow 2" border on left side, 3/4" border other sides

[ ] Sheets within the set shall be arranged in the following general order:

1. Title sheet
2. Sediment control plan(s)
3. Sediment control detail sheet(s)
4. Grading plan(s)
5. Storm water management plan(s)
6. Storm water management detail sheet(s)
7. Plan/ profile sheet(s) improvements to existing county roads
8. Plan/ profile sheets(s) new roads
9. Temporary traffic control plan(s)
10. Road plan detail sheet(s)
11. Road cross-section sheets
12. Strom drain details
13. Drainage area map, with storm drain tabulations and structure schedule
14. Landscape plan(s)
15. Forest conservation plans and detail sheet(s)

[ ] Check Planning Commission requirements listed in approval letter

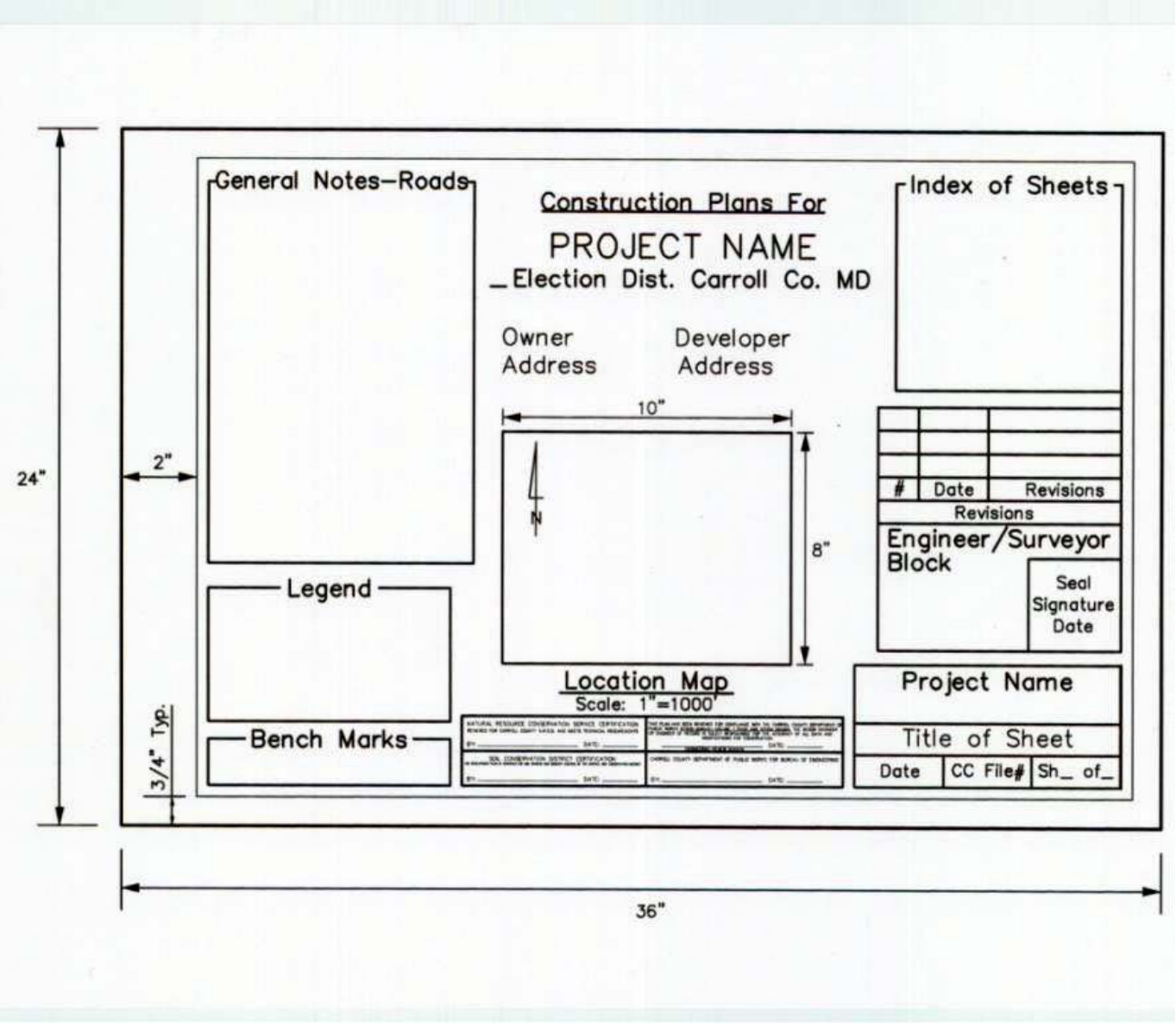
[ ] General format - lower right corner all sheets: standard title block containing project name with section or phase designation, title of sheet, date, county file number, sheet number, and total number of sheets. Engineer/ surveyor block above title block in lower right corner containing company name address, telephone number, fax number, names of persons who designed, drafted, and checked (engineer/ surveyor seal, signature and date required on title sheet only). Revision block above engineer/ surveyor block.

[ ] Storm drain design computation booklet – signed sealed and dated by P.E. / L.S.

[ ] Paving design computations

B. Title Sheet

[ ] Standard format as follows



[ ] Title sheet of mylars signed, sealed and dated by Registered Professional Engineer, PE or Land Surveyor, LS (not required on individual sheets, also not required on prints submitted for review)
[ ] Two bench marks with elevations, descriptions, and coordinate values based on NAD 83
[ ] All information shall be contained within the border area

PART II : ROADS

A. General

Font or type size for construction and informational notes on road plans, profiles, cross sections, and traffic control plan shall not be smaller than 12 point, the size used for this note. Engineering or drafting fonts are preferred, cursive or decorative fonts should not be used. Overdrafting of any type is not acceptable. Engineering plans must be presented so that all information is clear, legible, and unobstructed by other information. Each road plan sheet shall include a roadway typical section, plan view, profile, intersection/ cul-de-sac detail, storm drain plan and profile. Unless pre-approved by DPW, construction plan sheets shall contain no more than one road or Use-In-Common driveway.

B. Typical Section

A typical section is required to be shown for each proposed road and for improvements to existing roads. Show at same size as on standard plate. Where roads are continued on other sheets, provide cross-reference to sheet showing typical section.

[ ] Road name
[ ] Right of way width
[ ] Paving width, cross-slope
[ ] Type of curb
[ ] Shoulder width and cross-slope
[ ] Design speed indicated
[ ] Paving joint labeled
[ ] Guard rail shown and labeled, shoulders widened 2 feet
[ ] Profile Grade Line (PGL) labeled
[ ] Subgrade drains (open section roads only)
[ ] Paving thickness/ specifications
[ ] Pedestrian facilities shown and width labeled *
[ ] Show and label existing paving
[ ] Existing ditch lines labeled
[ ] Overlay labeled with thickness given
[ ] Paving removal or wedge and level course labeled

* Pedestrian and recreational facilities are requirements of the Office of Planning or Bureau of Development Review

C. Construction Plans - Improvements to Existing Roads

[ ] Scale of construction plans shall be either 1 inch = 50 feet, or 1 inch = 30 feet
[ ] Existing features: 30' beyond centerline of road on opposite side from development, and either 200' beyond frontage limits, or as necessary to show required sight distance, whichever is greater.
[ ] Pavement type and width, use single lines if road is open section, double lines if curbed
[ ] Elevations at centerline and both edges at 50 foot stations
[ ] Ditches/ streams/ tributaries (with names or numbers if available) shown with flow arrows and labeled

[ ] Storm drain facilities: Location, type, size, top and invert elevations
[ ] Utility poles (with numbers), guy poles (with numbers), guy wires, cabinets, pedestals
[ ] If utility poles or other facilities are being relocated, show and label proposed new location
[ ] Gas mains, electric lines, television, telephone or other underground utilities
[ ] Existing water mains, valve boxes (with top elevation), fire hydrants (with ground elevation)

[ ] Existing sewer mains, manholes (with rim elevation), cleanouts
[ ] Show and label fences, structures, driveways, trees, walks, embankments, guard rails, etc
[ ] Label road name, posted speed and functional classification

[ ] Tract boundary lines
[ ] Existing right of way with recording reference
[ ] Areas of right of way dedication shown and labeled
[ ] Proposed new road right of way with truncations at intersection
[ ] Use previous stationing, if established. Assumed stationing proceeds left to right, no negative stationing

[ ] Proposed roads, lot layout and numbers, parcels identified
[ ] Minimum clear sight distance lines shown and labeled
[ ] Improvements shown and labeled, including work necessary to achieve proper sight distance
[ ] Construction notes shall be boxed in with a leader to the referenced location on the plan, example:

> Sta. 3+50 to sta. 6+70 remove existing paving. Construct new roadway using typical section and full-depth paving

[ ] Lot lines and lot numbers
[ ] Limits of Work noted, stations given
[ ] Traffic control shown or reference to traffic control plan
[ ] Three (3) grid ticks, labeled

Note: Unless specifically requested by DPW, contouring shall not be shown on road construction plans. Contouring is shown on intersection and cul-de-sac details, existing: 2' intervals, proposed: 1' intervals.

D. Construction Plans - New Roads

Road construction plans shall contain standard title block in lower right corner, engineer/ surveyor block in lower left corner, plan and profile views, intersection/ cul-de-sac details, storm drain plan and profile, and construction notes and details.

[ ] Centerline shown, 100' stations indicated by ticks and labeled, 50' stations indicated by ticks
[ ] Road alignment meets current design standards for functional classification
[ ] Control points on road centerline; such as PC, PT, PRC and PCC indicted by flag with name and station. Show using small circle on centerline.
[ ] Centerline bearings and curve data shown (radius, tangent, arc length, chord length/ bearing)
[ ] Centerline intersection labeled with name and station of each road, shown with double circle
[ ] Paving width shown with single line for open section, double line for closed (curbed) section

[ ] Road names shown	[ ] R/W lines shown	[ ] R/W truncated at intersections
[ ] Minimum building lines	[ ] Lots / lot numbers	[ ] Parcels shown and labeled
[ ] Proposed curb and sidewalk	[ ] Grass shoulder width	[ ] Subgrade drains/ outfalls labeled

[ ] Existing features such as ditches, swales, streams, driveways, woods lines, structures, etc
[ ] Method of treatment of existing features

CONSTRUCTION PLAN CHECKLIST – ROADS AND STORM DRAINS

[ ] Areas of non-standard curbs and reversed gutter pan slopes noted
[ ] Curb transitions shown and dimensioned
[ ] Driveway apron stations and details, or note stating individual driveway aprons not in contract
[ ] Storm Water Management "Wide Shoulder Technique" labeled where used
[ ] Storm drains shown and labeled, see storm drain checklist

[ ] Permanent/ temporary cul-de-sacs, centerpoint station and radius given
[ ] Permanent/ temporary turnarounds, limits of work indicated
[ ] Permanent/ temporary easements (bounds only, no shading or cross-hatching)
[ ] Barricades shown and identified
[ ] Sidewalks, ramps, cross-walks and other pedestrian facilities shown and labeled

[ ] Guard rail: provided where warranted, refer to Guard Rail Requirement Chart
[ ] Guard rail: shown on road plan view, typical section, and cross sections
[ ] Guard rail: limits noted by station, location noted by dimension from Profile Grade Line
[ ] Guard rail: end treatment specified
[ ] Guard rail: shoulders widened by 2 feet

[ ] Show roads which will be extended into adjacent property, and label "Future Extension By Others"
[ ] Adjacent property owners labeled with subdivision plat book and folio numbers
[ ] Scales - Shown in proper location
[ ] Three (3) grid ticks, labeled
[ ] Match lines properly shown with sheet cross reference

[ ] Limits Of Work (LOW) clearly shown and stationed
[ ] Soil test locations shown and identified
[ ] Intersection, cul-de-sac, turnaround details. Shown on same plan sheet as the facility
    [ ] Size: 100' minimum from centerpoint of facility
    [ ] Scale: 1"= 30'
    [ ] Edges of paving
    [ ] Storm drains shown and labeled
    [ ] Flow arrows in ditch and curb lines
    [ ] Centerlines shown with stations
    [ ] R/W lines
    [ ] Road names
    [ ] Subgrade drains / outfall shown

    [ ] 3 (min.) spot elevations/ each fillet – intersections
    [ ] Spot elevations at radius point and quarter points – cul-de-sacs
    [ ] Spot elevations at corners of paving – turnarounds
    [ ] Existing contours 2' intervals – dashed lines/ labeled

    [ ] Proposed contours I' intervals – solid lines/ labeled
    [ ] Proposed water and sewer facilities shown and labeled
    [ ] Limits of work
    [ ] Temporary barricades
    [ ] Storm drainage shown (see Storm Drain checklist below)

[ ] Roadside ditches: shown by + with offset and elevation at 50 foot intervals
[ ] Roadside ditches: shown with flow arrows → → → →
[ ] Plan, profile, cross section, type of stabilization and construction limits – all ditches

E. Profiles

Profiles are required for all new roads, extensions of existing roads, and for existing roads which are being improved in conjunction with proposed development. Profiles shall be shown on same sheet with road plan, below the plan view.

[ ] Profiles shall be at scale 1"=50' horizontal and 1"= 5' vertical
[ ] Show 1" background grid
[ ] Show Road name, design speed, and scale of profile
[ ] Label 100' and 50' stations along bottom, elevations at 5' intervals, both sides
[ ] Profile of existing road shall throughout frontage of site to 200' (min.) beyond site boundaries, OR as necessary to include entire required sight distance, whichever is greater

[ ] Profiles shall show entire width of intersecting roadway with stationing beginning at centerline
[ ] Show centerline station and elevation of starting point at intersecting road
[ ] Show and label existing grade line, dashed lines with date of survey noted
[ ] Profile Grade Line (PGL) with solid line elevations
[ ] Show existing elevations left side of station line, 50 foot intervals

[ ] PGL elevations on right side of station line, 50' intervals on tangent, 25' intervals in vertical curves
[ ] Landing grades, vertical curves, and slope checked for conformance to design criteria
[ ] Possible future extensions shown 400' minimum beyond tract boundary
[ ] Slope of PGL indicated in percent, to 2 decimal places (hundredths), upgrades (+), downgrades (-)
[ ] PVI shown with triangle, grades indicated

[ ] Crest / sump station and elevation shown
[ ] Control points such as PVC, PVT, PVCC, PVRC, BLP, ELP, CP cul-de-sac noted
[ ] Intersecting roads, Use-In-Common Driveways and tract boundary shown with circle on PGL, station and elevation noted
[ ] Limit of paving and limit of work indicated with station
[ ] Data Block shown: VC Length, PVI station, PVI elevation, k values (design & min.)

[ ] Tie-in to existing grade shown to scale, slopes labeled
[ ] Linear profiles shown for permanent cul-de-sacs.
[ ] Plan / profile shown by match lines, proper cross-references noted
[ ] Linear Profile Grade (LPG) at edge of paving or flow line of curb
[ ] LPG: shown separate from, not attached to, PGL road profile

[ ] LPG: show 100' of entry grade at Beginning of Linear Profile (BLP)
[ ] LPG: show 100' of exit grade at End of Linear Profile (ELP)
[ ] Existing grade and LPG elevations at 25 foot intervals and at crest and sump points
[ ] Side ditches shown and labeled

F. Traffic Control Plan

A Traffic Control Plan is required for all projects and must part of final plan package at initial submission. Traffic control plans shall be used only for the purpose of providing plan and details for temporary traffic control in and around work zones.

[ ] Scale of plan 1"= 500' unless otherwise required by DPW
[ ] North arrow
[ ] Traffic control general notes
[ ] Entire area of placement of facilities shown to scale
[ ] Existing physical features shown and labeled
  [ ] Roadway edge lines
  [ ] Trees, fences, shrubs, walls and other visual obstructions
  [ ] Existing driveways
  [ ] Existing bridges
  [ ] Utility Poles

[ ] Road names
[ ] Intersecting roads shown with traffic control facilities indicated
[ ] Placement of facilities checked for unobstructed view
[ ] Placement of facilities – do not obstruct view of existing signs or facilities

[ ] Type and placement of signs checked to avoid conflicting messages with other signs
[ ] Proposed construction shown schematically and labeled
[ ] Traffic control facilities; signs, flaggers, barrels, cones shown with proper symbol and labeled with MUTCD designations

G. Cross sections

Cross sections shall be provided for all new roads and for improvements to existing roads. Cross section sheets shall follow road detail sheets and shall be arranged in same general order as road plan sheets. Cross sections shall read up the sheet (lowest station at bottom). Two columns of sections may be placed on the same sheet provided sections do not overlap. Where two columns are used, lowest station at bottom of left column, highest station at top of right column.

[ ] Scale: 1" = 10' Horizontal and Vertical, 1" background grid shown
[ ] Sections shown at 50' stations, cross culverts, centers of cul-de-sacs and others as required by DPW
[ ] Station and datum indicated below section on centerline
[ ] Offset distances, left and right, noted at 10 foot intervals. Left offsets with minus (-) *
[ ] Right of way lines shown and labeled
[ ] Existing ground line shown in dashed line
[ ] Existing paving shown and labeled, elevations given at centerline and both edges
[ ] Existing paving to be removed shown with cross hatching and labeled
[ ] Finished road template shown and P.G.L. elevation given

* At bottom of each column only. Offsets shall extend 10 feet beyond right of way or 10 beyond limit of construction whichever is greater

[ ] New side ditches shown, offset and elevation noted
[ ] Subgrade drains shown (open section roads only)
[ ] Cross-section through center of cul-de-sac or temporary turnaround
[ ] Typical section information such as right of way width and paving and shoulder width indicated once on each sheet, lower left cross section

[ ] Easements beyond right of way shown, labeled and dimensioned
[ ] Shoulders widened 2' at guard rails
[ ] Guard rail shown and labeled
[ ] Sidewalk shown
[ ] Label wide shoulders when used for storm water management

PART III STORM DRAINS

A. Plan View

The plan view for storm drain construction shall be shown on road construction plans as part of road work. When a Grading Plan is provided as part of construction plans, drainage facilities shall also be shown for reference on the Grading Plan

[ ] Existing watercourses such as swales, ditches, creeks, and streams with flow arrows (→ → →)
[ ] Type, size, and invert elevations of existing pipes, with flow arrow (→)
[ ] Existing drainage structures; inlets, manholes, endwalls, etc. labeled, top elevation noted
[ ] Show and label proposed inlets, manholes, connecting pipes, cross-culverts, end sections, end walls, swales, and ditches. Show flow arrows, all drainage facilities
[ ] Storm drain pipe specification note upper left corner, each plan sheet. Note shall read as follows:
Unless otherwise specified, storm drain pipe for this project shall be (gauge/ thickness, type, common abbreviation), noted (dia.)" D.

[ ] Drains shown with double lines and intermittent shading
[ ] Label each run of proposed storm drain pipe, also show flow arrow (→)
[ ] Permanent diversions shown with proper symbol and labeled
[ ] Proposed drainage facilities numbered, beginning at downstream end and labeled as follows: Inlets: I-1, I-2 etc, manholes: M-1, M-2 etc, structural end walls: EW-1, EW-2 etc, prefabricated end sections: ES-1, ES-2 etc, use ½" diameter circle for labeling

[ ] Inlets placed on upgrade side of all intersections (closed section roads only)
[ ] Outfall protection at all storm drain discharge points, shown to scale
[ ] Plan, profile and cross section of outfall protection; scale 1" = 10'. Outfall details may be shown on storm drain detail sheet, provide sheet cross reference

[ ] Post development 25 year headwater elevation and configuration
[ ] Permanent drainage easement for post development 25 year headwater elevation
[ ] Proper horizontal and vertical clearance from other utilities, existing and proposed
[ ] Provision for drainage at limits of construction

B. Profiles

Profiles shall be provided for all storm water conveyance facilities and shall be shown on same sheet as road plan. Except for road side ditch profiles which are shown along with the road PGL, storm drain profiles shall be presented separately, but on the same sheet. If necessary, profiles may be continued on the following sheet with proper cross references.

[ ] Scale: 1"=50' H, 1"= 5' V. Use standard profile bracket, label elevations 5' intervals
[ ] Finished grade in accordance with proposed typical section
[ ] Existing grade line shown from 25 year water elevation (high side) to natural swale or ditch (low side) but not less than 100' in each direction from intake/ discharge points
[ ] Existing grade properly labeled : Existing grade (if no natural swale), Existing indicating existing swale, ditch, stream

[ ] Label road name and centerline station
[ ] Show and label proposed culvert(s). Show size, type, invert elevations, slope, Q 25 (in cfs), actual velocity (in fps), outfall stabilization
[ ] Show and label post development 25 year water elevation
[ ] Show and label proposed outfall channel if not discharging directly into an existing ditch

C. Drainage Area Map

Drainage area map shall not be used for purposes other than depicting areas draining to permanent storm drainage facilities.

[ ] Minimum scale 1" = 100'
[ ] Existing topography with contours, 2' intervals
[ ] Soil groups (A, B, C and D designations), based on SCS Soil Survey maps
[ ] Existing physical features such as woods, fields, meadows, paving, etc shown and identified

[ ] Existing drainage facilities shown and labeled
[ ] Hundred (100) year flood plain, stream buffers, wetlands and buffers
[ ] Lot arrangement with numbers, parcels labeled
[ ] New roads: Names, right of way lines, paving edge or curb lines and centerline stationing

[ ] New drainage facilities shown and labeled identified
[ ] Entire drainage area to each facility shown to scale, and identified by letter in ½" hexagon
[ ] Time of concentration flowpath shown

[ ] Storm drain tabulation chart containing the following columns;
Structure number: From – To
Drainage Area: Area Designation – Area (acres) – "C" – CA
Runoff: Σ A – Σ CA – Time of Concentration (tc) – Frequency (yr) - Intensity (i) – Quantity (Qcfs) -
Pipe Data: Diameter (in) – Type - "n" – actual slope (%) – actual velocity (fps) – Length (ft) – time in pipe (minutes) – Full flow capacity (cfs)
Remarks: any information needed to clarify intent of design/ construction

[ ] Storm drain structure schedule, as follows;

STORM DRAIN STRUCTURE SCHEDULE						
No.	Type	Plate	Top Elev.	Invert In/ Out	Coordinates	
					North	East