

FIRM NAME _____

FPID #: _____

DESCRIPTION: _____

COUNTY: _____

DESIGNER: _____

CHECKER: _____

DATE: _____

DRAINAGE DESIGN CHECKLIST	Provided		Designers Initials	Checkers Initials
	YES	NO		
I. Drainage Report				
A. Executive Summary - Brief Overview of Project Drainage Design				
B. Project Description				
1. Existing Conditions				
2. Proposed Project Conditions				
3. Project Justification Narrative - Basin Schematic and Description				
4. Location Maps, Floodplain Maps, USGS Maps, SCS Maps, Drainage Map, etc.				
5. Text on Maintenance of Traffic Drainage Design				
6. Assessment of permanent and temporary environmental impacts				
7. Assessment of inclusion of Bold Landscaping into the Drainage Design				
C. Design Criteria and permits required				
1. List minimum criteria and determine which is controlling the drainage design				
2. List all permits required and determine which is controlling				
3. Document all contacts with agencies				
D. Drainage Map (See FDM Chapter 305 for additional criteria)				
1. All offsite areas shown and labeled				
2. Required Information on Existing Structures included and Field Verified				
3. City Lines, WMD and local WMD's boundaries where applicable				
4. Onsite and offsite topography/contours				
5. Design High Water Information				
6. Flood Summary Data Table for all cross drains with notes				
E. Drainage Calculations				
1. Open Channel Flow				
a. Supporting Documentation - Tc, CN or C calculations				
b. Hydrologic Analysis - Storm frequencies and duration				
c. Hydraulic Analysis - Hydraulic Worksheet for Roadside Ditches - Include channel lining requirements				
d. Outfall ditches sized for 25YR storm				
2. Stormdrain Systems				
a. FDOT Stormdrain Tabulations				
1. Correct zone and frequency used? Please see Drainage Manual Ch 3.3 for frequency criteria.				
b. Supporting Documentation - Tc, CN or C calculations, drainage map with flow paths				
1. Starting tailwater documented?				
c. Areas of special inlet placement, SE transitions, intersections, side streets, lane tapers against grade, sags				
d. Inlet Spacing/Spread Calculations/Bypass Flow/Debris Tolerance				
e. Check 50 year storm event for sag inlets with no other outlet				
f. Stormdrains which act as crossdrains should be checked using crossdrain criteria				
g. Minimum pipe slopes are sufficient to provide self-cleansing velocities (2.5 fps)				
h. Minimum required HGL clearance provided?				

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3. Optional Pipe Analysis				
a. Include geotechnical results of soil chemistry				
b. Latest version of culvert service life estimator run				
c. CSLE results checked for structural evaluation and cover requirements against Appendix E (Drainage Manual)				
4. Cross Drains				
a. Description of Drainage Area				
1. Natural Features				
2. Existing Facilities				
3. Existing Flooding/Drainage Problems				
4. Bridge/Bridge Culvert category				
b. Previous Studies				
1. Drainage Studies				
2. Water Management Permits/DERM				
3. FEMA - Define floodplain/floodway impacts				
c. Peak Design Flows				
1. All Design Storm Peaks				
2. FDOT Methodology				
d. Existing Conditions				
1. Flood Stages - Source				
2. Tailwater Elevation - Source				
3. Headwater Elevation - Source				
4. Scour - Source				
e. Culvert Design (Pre/Post)				
1. Supporting Documentation - Tc, CN or C calculations				
Tailwater Methodology and calculations				
2. FDOT Culvert Design Methodology				
3. Headwater/Tailwater Comparison to Existing Conditions for Design Storms				
4. Design HW does not exceed Allowable HW				
5. 100 year HW not increased (if increased, provide evidence of no adverse impact to offsite)				
6. Erosion/Scour calculations and protection requirements met?				
7. Clear Zone standards met?				
8. Flood Data Box Information				
f. Box Culvert Design (Pre/Post)				
1. Supporting Documentation - Tc, CN or C calculations				
Tailwater Methodology and calculations				
2. FDOT Culvert Design Methodology				
3. Headwater/Tailwater Comparison to Existing Conditions for Design Storms				
4. Design HW does not exceed Allowable HW				
5. 100 year HW not increased (if increased, provide evidence of no adverse impact to offsite)				
6. Include low flows evaluations or backwater curves for design flows				

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5. Underdrain, Vertical Column Recovery Structures or other drawdown systems				
a. Pollution abatement volume				
b. Design method				
c. Estimated length of underdrain for filtering pollution abatement volume				
d. Typical section with elevations				
e. Gravity flow in underdrain pipe(s)				
f. Estimated drawdown time to evacuate the pollution abatement volume				
g. Design addresses the drawdown of seasonal highwater table as applicable				
h. Design certified by geotechnical engineer				
i. Does system affect base clearance?				
6. Stormwater Management				
a. Pond description - Wet, Dry, Detention, Retention, On-line, Off-line				
b. Stage storage calculations for proposed pond excluding compensation storage				
c. Supporting Documentation - Areas, Tc, CN or C calculations				
d. Computed tailwater elevation of receiving facility for appropriate design frequency event				
e. Hydrologic Analysis				
1. Pre and Post Development Hydrographs				
f. Hydraulic Analysis				
1. Pond Routing Calculations				
2. Pond Volume Calculations				
3. Water Quality Volume Calculations Included. Correct criteria used				
4. Water Quality and Water Quantity Drawdown Times				
5. Littoral Area Calculations (wet pond), if applicable				
6. Permanent Pool Volume (wet pond).				
g. Computer Modeling Information				
1. Model Input Data				
2. Model Output Data				
7. Summary of Results in Table Form				
1. Pre vs. Post peak flows to receiving water				
2. Design high water in pond(s). Compare to min. req'd distance below roadway base				
3. 1 foot of freeboard above peak stage in pond(s)				
4. Flood plain compensation addresses				
5. NWL in ponds				
6. Control elevation, size, and provided recovery time versus required, including recovery pond models				
7. Required versus Provided water quality volumes				
8. Pre versus Post stages any where offsite HGL affected by project				

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8. General				
1. Description of offsite easements and/or flood rights, if required				
2. Check that existing drainage system will function under proposed conditions				
3. Verify that improvements do not result in adverse affects on adjacent property				
4. Temporary drainage addressed				
F. Correspondence and Supporting Documentation				
II. Engineering Plans (Please see FDM Part 3 and TDH for additional requirements)				
A. Drainage Maps (See Item D under 1.0 Drainage Report)				
B. Summary of Pay Items includes all drainage items				
C. Summary of Drainage Structures				
1. Check sizes, lengths, inlet types, stations, sides, etc.				
2. Check for consistent structure labeling format				
3. Confirm that cross drains, side drains, ditch pavement riprap, bridge drainage, etc. are quantified in plans.				
D. Optional Materials Sheet				
1. Check Drainage Manual Appendix E for availability, suitability, and fill height prior to inclusion				
2. Are you using materials that require a design review or approval by the State Engineer?				
3. Gage for metal pipe noted				
4. RCP Class noted				
E. Quantity Sheets				
1. Erosion control items, side drains, and ditch pavement summarized				
F. Typical Sections				
1. Ditch Sections shown, where typical				
2. Minimum depth of ditch shown				
3. Check number of lanes sloped in one direction vs. FDM Fig. 211.2.1 & TDH 211.2.3 to determine need for hydroplaning calculations.				
G. Plans				
1. Check Drainage and Outfall Structures, Underdrain and Cleanout Locations				
2. Check Lengths of pipes and flow line information				
3. Check underground utility locations and Soil Boring locations				
4. Ponds labeled				
5. Check consistency of stationing with all sheets				
6. Check structure numbers for consistency				
7. Stations for locations of pond access are included				
8. Check to confirm no construction outside Right of Way				
9. Jurisdictional lines shown				
10. Are inlets required at super elevation transition, median lanes, sags, tapers, or intersections?				
11. Are pipes to remain/be removed properly labeled?				
H. Profiles				
1. Check Existing Ground Elevations (Beginning and End of Sheet)				
2. Special Ditches plotted (including median)				
3. Are special gutter grades shown and labeled where proposed grades are less than 0.3%?				

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I. Drainage Structures Sheets				
1. Check plotting of drainage structures/pipes, any border clips need adjustments, offsets as indicated in Standards.				
2. Existing structures requiring work are noted				
3. Drainage structure notes include structure number, pipe sizes, flow lines, flow arrows, Standard Plan No.				
4. Structure Number and station shown along right border of sheet				
5. Underground utilities are shown. Gas mains running through conflict boxes not allowed				
6. Existing Ground Line and Proposed Grade Plotted				
7. All utility conflicts have been identified				
8. Design fill heights for box culverts are shown (includes top slab thickness)				
9. Check structural capacity of pipe using Appendix E of the Drainage Manual to ensure adequate cover on pipe				
10. Check for adequate cover between ground elevation and pipes				
11. Riprap/energy dissipators shown, quantified and labeled if required				
12. Minimum depth of pipe flowlines adhere to FDOT Drainage Design Guide Chapter 6				
13. Check if any structures are located within the clear zone. If so, can they be relocated or do they require protection?				
J. Drainage Details (Control Structures and Pond Details)				
1. Check that Pond radii points and access driveway have a station offset				
2. Minimum maintenance berm and littoral shelf provided				
3. Pond parameters given and verified (I.e. control, SHW, Weir elevation, pond bottom, berm, slopes)				
4. Check to see if a fence, gate, or sediment sump is required				
5. Show existing contours/tie down slopes, sod limits				
6. If relying on infiltration through the bottom of ponds/treatment swales, are sufficient notes provided in the plans to accommodate this design?				
7. Geotech borings for pond shown on plans				
8. Actual Pond cross sections provided with soil borings shown				
9. Skimmer details required if not using Standard Plan 425-070				
10. Drainage easement or floodrights required?				
11. Check ponds that are "bermed up" to evaluate water level and potential for failure.				
K. Cross Sections				
1. Check for roadway and lateral ditch intersection				
2. Special ditch grade elevations shown				
3. Soil borings shown w/ SHWT				
4. Underground utilities (4 inch or greater) shown				
5. Check low points in ditches with locations of DBI's				
6. Check that toe of slope stays within Right of Way				
7. Check for off-site ponding caused by project				
8. Does project eliminate any existing conveyance ditches?				
9. Shoulder gutter requirements met				
10. Are there any v-ditches shown within the cross sections that can be avoided?				
11. Check cross sections to verify that there are no locations where water will be trapped.				

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III. Geotechnical Report				
A. Boring Location and Logs				
B. Estimated Seasonal High Groundwater Elevations for Ponds and Roadway				
C. Certification of Underdrain Designs				
D. Geotech certification for embankment stability				
E. Recovery parameters provided				
F. Check for soil and water corrosion indicators for optional materials.				
IV. Drainage Issues				
A. Status of Design Variances or Exceptions				
B. Liability Concerns				
1. Documentation that proposed drainage design meets clear zone requirements				
2. Documentation that proposed drainage design will not affect historic stormwater discharge location, rate and quantity (as applicable), and stages				
C. Right of Way				
1. Are easement or Right-of-Way acquisitions required for any construction activity proposed beyond the right of way lines shown on the plans?				
2. Are flood rights required?				

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