



# Form 2C – Underground Detention Design Form

## City of Prattville Review

Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_

Required Attachments:  Narrative  Design Drawings  H&H Calculations  Drainage Basin Maps  
 Soils Data  Manufacturer Data  Maintenance Plan

Approval Status:  Approved  Approved Contingent  Denied  Incomplete

Comments: \_\_\_\_\_

## Development Information

Date: \_\_\_\_\_

Name: \_\_\_\_\_ BMP ID: \_\_\_\_\_

Address or Location: \_\_\_\_\_

Required Attachments:  Narrative  Design Drawings  H&H Calculations  Drainage Basin Maps  
 Soils Data  Manufacturer Data  Maintenance Plan

Total Development Area: \_\_\_\_\_ acres

Existing Impervious Area (EIA): \_\_\_\_\_ acres

Proposed Impervious Area (PIA):

Water Quality Volume (WQ<sub>v</sub>):

Buildings / Structures: \_\_\_\_\_ acres

WQ<sub>v</sub> = Additional Impervious Area (acres) X 1.14 in X 3,630

Driveways / Side Walks: \_\_\_\_\_ acres

Additional Impervious Area = PIA – EIA

Roads: \_\_\_\_\_ acres

WQ<sub>v</sub> = \_\_\_\_\_ acres X 1.14 in X 3,630

Parking: \_\_\_\_\_ acres

WQ<sub>v</sub> = \_\_\_\_\_ ft<sup>3</sup>

Other: \_\_\_\_\_ acres

Total PIA: \_\_\_\_\_ acres

Comments: \_\_\_\_\_

**Watershed:**  Noland Creek  Autauga Creek  Pine Creek  Fay Branch

## Pre-Development

Pre Development Basin ID:	_____	_____	_____	_____	_____	Pre Total
Drainage Area <input type="checkbox"/> Acres <input type="checkbox"/> ft <sup>2</sup> :	_____	_____	_____	_____	_____	_____
Curve Number:	_____	_____	_____	_____	_____	_____
Time of Concentration (min):	_____	_____	_____	_____	_____	_____
Peak Discharge (ft <sup>3</sup> /s):	_____	_____	_____	_____	_____	Pre Total
1.14" (WQ)	_____	_____	_____	_____	_____	_____
4.21" (2-yr)	_____	_____	_____	_____	_____	_____
5.24" (5-yr)	_____	_____	_____	_____	_____	_____
6.17" (10-yr)	_____	_____	_____	_____	_____	_____
7.55" (25-yr)	_____	_____	_____	_____	_____	_____
9.93" (100-yr)	_____	_____	_____	_____	_____	_____



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Development Name: \_\_\_\_\_

Date: \_\_\_\_\_

BMP ID: \_\_\_\_\_

## Post-Development

Post Development Basin ID:	_____	_____	_____	_____	_____	_____	Post Total
Drainage Area <input type="checkbox"/> Acres <input type="checkbox"/> ft <sup>2</sup> :	_____	_____	_____	_____	_____	_____	_____
Curve Number:	_____	_____	_____	_____	_____	_____	_____
Time of Concentration (min):	_____	_____	_____	_____	_____	_____	_____
Peak Discharge (ft <sup>3</sup> /s):	_____	_____	_____	_____	_____	_____	Post Total
1.14" (WQ)	_____	_____	_____	_____	_____	_____	_____
4.21" (2-yr)	_____	_____	_____	_____	_____	_____	_____
5.24" (5-yr)	_____	_____	_____	_____	_____	_____	_____
6.17" (10-yr)	_____	_____	_____	_____	_____	_____	_____
7.55" (25-yr)	_____	_____	_____	_____	_____	_____	_____
9.93" (100-yr)	_____	_____	_____	_____	_____	_____	_____

## Underground Detention

Detention Type:  Detention  Detention w/ Infiltration

Hydrologic Soil Group:  A  B  C  D      Water Table Depth: \_\_\_\_\_ ft

Saturated Hydraulic Conductivity: \_\_\_\_\_ in/hr      Field Test Performed?  Yes  No

Manufacturer:  ADS  Contech  Other: \_\_\_\_\_

Chamber Specs: Type: \_\_\_\_\_ Height: \_\_\_\_\_ in Width: \_\_\_\_\_ in Length: \_\_\_\_\_ ft

Bare Volume: \_\_\_\_\_ ft<sup>3</sup>      Installed Volume: \_\_\_\_\_ ft<sup>3</sup>

Pretreatment:  Yes  No  Type: \_\_\_\_\_

Inlet Filters:  Yes  No  Type: \_\_\_\_\_

System Cross Section:	Depth	Bottom EL	Top EL
Stone Base:	_____ in	_____ ft	_____ ft
Chamber Height:	_____ in	_____ ft	_____ ft
Stone Above Chamber:	_____ in	_____ ft	_____ ft
Compacted Backfill:	_____ in	_____ ft	_____ ft
Finished Grade:	_____ in	_____ ft	_____ ft

Chamber Row Separation: \_\_\_\_\_ in      Meets Manufacturer Requirements?  Yes  No

Separation Geotextile Used?  Yes  No      Type: \_\_\_\_\_

System Layout:	No. Rows	Row Length	Row Volume	Inv EL
Manifold Row(s):	_____ ea	_____ ft	_____ ft <sup>3</sup>	_____ ft
Isolator Row(s):	_____ ea	_____ ft	_____ ft <sup>3</sup>	_____ ft
Chamber Row(s):	_____ ea	_____ ft	_____ ft <sup>3</sup>	_____ ft

Isolator Row Manhole:	Sump Depth	Diameter	Bottom EL	Top EL
_____ in	_____ in	_____ ft	_____ ft	_____ ft

Underdrain Pipe(s): Material: \_\_\_\_\_  No underdrain system

Perforated Pipe Invert EL: \_\_\_\_\_ ft      Diameter: \_\_\_\_\_ in

Outlet Pipe Invert EL: \_\_\_\_\_ ft      Diameter: \_\_\_\_\_ in

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Development Name: \_\_\_\_\_

Date: \_\_\_\_\_

BMP ID: \_\_\_\_\_

## Underground Detention (cont.)

Inspection Port(s) Material: \_\_\_\_\_  
 Number of Ports: \_\_\_\_\_ ea Diameter: \_\_\_\_\_ in

No inspection port

### Outlet Control Manhole:

Material: \_\_\_\_\_ Shape: \_\_\_\_\_

Diameter: \_\_\_\_\_ ft

Width: \_\_\_\_\_ ft Length: \_\_\_\_\_ ft

Bottom EL: \_\_\_\_\_ ft Top EL: \_\_\_\_\_ ft

	Shape	Size	Inv. EL
Outlet Pipe:	_____	_____ in	_____ ft
WQ <sub>v</sub> Orifice:	_____	_____ in	_____ ft

Filter:  Yes  No

Orifice 2: \_\_\_\_\_ in \_\_\_\_\_ ft

Orifice 3: \_\_\_\_\_ in \_\_\_\_\_ ft

Orifice 4: \_\_\_\_\_ in \_\_\_\_\_ ft

	Shape	Length	Inv. EL
Weir 1:	_____	_____ ft	_____ ft
Weir 2:	_____	_____ ft	_____ ft

Drawing / Sketch Attached

Emergency Spillway:  Yes  No Type: \_\_\_\_\_

Drawing / Sketch Attached:  Yes  No

## Outfall Location

Latitude: \_\_\_\_\_° \_\_\_\_\_' \_\_\_\_\_"

Longitude: \_\_\_\_\_° \_\_\_\_\_' \_\_\_\_\_"

## Discharge Summary:

Rainfall	Pre Q	Pond In Q	Pond Out Q	Max. Stage	Outlet Velocity	Total Post Q
1.14" (WQ)	_____ ft <sup>3</sup> /s	_____ ft <sup>3</sup> /s	_____ ft <sup>3</sup> /s	_____ ft	_____ ft/s	_____ ft <sup>3</sup> /s
4.21" (2-yr)	_____ ft <sup>3</sup> /s	_____ ft <sup>3</sup> /s	_____ ft <sup>3</sup> /s	_____ ft	_____ ft/s	_____ ft <sup>3</sup> /s
5.24" (5-yr)	_____ ft <sup>3</sup> /s	_____ ft <sup>3</sup> /s	_____ ft <sup>3</sup> /s	_____ ft	_____ ft/s	_____ ft <sup>3</sup> /s
6.17" (10-yr)	_____ ft <sup>3</sup> /s	_____ ft <sup>3</sup> /s	_____ ft <sup>3</sup> /s	_____ ft	_____ ft/s	_____ ft <sup>3</sup> /s
7.55" (25-yr)	_____ ft <sup>3</sup> /s	_____ ft <sup>3</sup> /s	_____ ft <sup>3</sup> /s	_____ ft	_____ ft/s	_____ ft <sup>3</sup> /s
9.93" (100-yr)	_____ ft <sup>3</sup> /s	_____ ft <sup>3</sup> /s	_____ ft <sup>3</sup> /s	_____ ft	_____ ft/s	_____ ft <sup>3</sup> /s



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Development Name: \_\_\_\_\_

Date: \_\_\_\_\_

BMP ID: \_\_\_\_\_

**Stage-Area-Storage Summary:** (Notes: Maximum elevation increment of 1 foot.)

Elevation	Area	Cumulative Volume		Elevation	Area	Cumulative Volume
_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>		_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>
_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>		_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>
_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>		_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>
_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>		_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>
_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>		_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>
_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>		_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>
_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>		_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>
_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>		_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>
_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>		_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>
_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>		_____ ft	_____ ft <sup>2</sup>	_____ ft <sup>3</sup>

WQ<sub>v</sub> Required: \_\_\_\_\_ ft<sup>3</sup>    WQ<sub>v</sub> Provided: \_\_\_\_\_ ft<sup>3</sup>    Stage: \_\_\_\_\_ ft

**Professional Engineer Certification:**

By affixing my professional seal and signature on this form, I hereby certify that this stormwater management facility provides the required water quality volume (WQ<sub>v</sub>) and is designed in accordance with the City of Prattville Technical Memorandum dated 21 March 2020. I further certify that the drainage areas shown in the hydrology and hydraulic (H&H) calculations do in fact drain into this facility and that the post-development runoff mimics pre-development hydrology to the maximum extent practicable (MEP).

Company: \_\_\_\_\_

Seal:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

E-mail: \_\_\_\_\_

Phone: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



# Form 2C – Underground Detention Design Form

## Supplemental Instructions

1. The developer/owner shall retain the services of a professional engineer to:
  - a. Complete Form 2C – Underground Detention Design Form; and,
  - b. Provide ALL required attachments:
    - Narrative
    - Design Drawings
    - H&H Calculations
    - Drainage Basin Maps
    - Soils Data
    - Manufacturer Data
    - Maintenance Plan
2. General design standards and requirements shall be as follows:
  - a. Stormwater management facilities cannot be constructed within the floodway;
  - b. Installation of stormwater management facilities shall not adversely impact and/or cause flooding of properties located upstream and/or downstream of the development;
  - c. The calculation methodology shall utilize the National Resource Conservation Resources (NRCS) Urban Hydrology for Small Watersheds Technical Release 55 (TR-55) or equivalent as approved by the City Engineer;
  - d. All applicable developments shall be responsible for ensuring that post-development hydrology mimics pre-development hydrology for the WQ, 2-year, 5-year, 10-year, and 25-year, 24-hour rainfall depths;
  - e. The storm drainage system (i.e. piped storm sewer, overland flow, etc.) within the development shall be designed to convey the discharge resulting from a 100-year, 24-hour storm event in a manner that will not adversely impact and/or cause flooding of structures within the development;
  - f. The principal spillway for a stormwater management facility shall be sized to convey the 25-year, 24-hour storm event without allowing any discharge from the emergency spillway;
  - g. Design plans for stormwater management facilities shall have a maximum scale of 1 inch = 100 feet and show existing contours, proposed contours, floodplain, floodway, details of outlet structure, details of emergency spillway, layout of storm sewer system, details of storm sewer system outlet protection, property lines, roads, rights-of-way, streets, easements, etc.; and,
  - h. H&H studies for stormwater management facilities shall include model network, drainage basin map(s), existing drainage areas, proposed drainage areas, time of concentration, curve number, pre-development peak discharges, post-development peak discharges, outlet structure geometry, emergency spillway geometry, pond stage-area-storage summary, pond discharge summary, inflow and outflow hydrographs, and outlet pipe velocities.



## Form 2C – Underground Detention Design Form

### 3. BMP Information:

- a. For the form to be considered complete, all required attachments shall be provided with a completed form;
- b. Narrative: Shall describe the stormwater management strategy and associated assumptions;
- c. H&H Calculations: Shall include all supporting information and data required to complete this form; and,
- d. Soils Data: Shall include published data and supporting documentation of all field tests performed to determine the saturated hydraulic conductivity.

### 4. Pre-Development Conditions:

- a. Provide a unique basin identification number for each basin that drains to the proposed location of the underground detention system; and,
- b. If multiple basins drain to the underground detention system, the combined peak discharges shall be completed in the last column of this section.

### 5. Post-Development Conditions:

- a. Provide a unique basin identification number for each basin that drains to the proposed location of the underground detention system; and,
- b. If multiple basins drain to the underground detention system, the combined peak discharges shall be completed in the last column of this section.