

**APPLICANT INSTRUCTIONS:** All applicants must complete this application form. The Commission will notify the applicant of any additional information that may be required and will schedule a Public Hearing if necessary. In addition to the information required, the applicant may submit other supporting facts or documents which may assist the Commission in its evaluation of this proposal. **PLEASE SUBMIT FOURTEEN (14) COPIES OF THE APPLICATION AND FOURTEEN (14) COPIES OF ANY OTHER DOCUMENTS AT LEAST FIVE BUSINESS DAYS PRIOR TO THE MEETING.**

**I. Applicant Information**

Name Lawrence J. Darling Jr.  
Address 61 Mostoway Road; East Lyme, CT 06333  
Tel # 860-304-0556 Cell # 860-304-0556  
Fax # \_\_\_\_\_ Email darlingcarpentry@gmail.com

Interest in Property  Owner  Option Holder  Developer  Harvester  Other  
 **Attach a Written Consent to the proposed activity from the owner if applicant is not the owner**  Required  Not Required

**II. Owner Information**

Name Lynne King Address 20429 Watkins Meadow Drive  
Germantown, MD 20876  
Tel # \_\_\_\_\_ Cell # 240-372-8953  
Fax # \_\_\_\_\_ Email lynneking15@yahoo.com

**III. Engineer Information**

Contact Edward H. Wenke III, PE  
Firm Edward H. Wenke III, PE Address PO Box 544 Mukwonago, WI 53149  
Tel # \_\_\_\_\_ Cell # 860-460-1606  
Fax # \_\_\_\_\_ Email ewenke@comcast.net

**IV. Attorney Information**

Owner's Agent  
Contact Susan Mattern PLS  
Firm DGT Associates Inc. Address 148 Route 2; Preston, CT 06365  
Tel # 860-889-1999 Cell # 860-303-2787  
Fax # \_\_\_\_\_ Email smattern@dgtassociates.com

**V. Property Information**

Address of Proposed Activity 0 Ridge Hill Road; Oakdale/Montville CT; Lat 41.427433 Long -72.1945295  
Assessor's Map and Lot Number M006/B015/L000  
Land Records /Deed Volume: 646 Page: 488-490 Acreage of Property 7.5+/- Acres  
Zoning WRP-160

**Provide a List of the Names and Mailing Addresses of Adjacent Property Owners (Attach Sheet)**

## VI. Wetlands and Watercourse Information

Total Acreage of Wetlands on the site 8313+/- SF; 0.19+/- Ac acres

Wetland Disturbance Area 2,740 sf (0.063 Acres) sq ft

Upland Review Disturbance Area 9,300 sf (0.21 Acres) sq ft

Have the Wetlands Been Flagged  Yes  No Year 2022

Name of Soil Scientist R. Richard Snarski

Linear Feet of Watercourse Disturbance - 0 - ft

Creation of New Wetlands - 0 - sq ft

## VII. Project Description

Subdivision  Review No Regulated Activity  Permit Modification

Regulated Activity  Permitted Use as of Right  Permit Renewal

### Activity will involve (Check all that apply)

Alteration  Construction  Pollution  Stormwater Discharge

Deposition of Material 150 CY Crossing cubic yards 200 CY - U.R.A. Driveway

Removal of Material - 0 - cubic yards

### See attached checklist of items that are to be included on Plan and supplemental data.

A) Attach a Detailed Plan of the Proposal and indicate Plan Title and Date.

"Improvement Location Survey Showing Subsurface Sewage Disposal System & Proposed Wetlands Driveway Crossing"

Date: May 2022; Scale: 1"=30'; Job # C1089; Sheets 1 thru 3 of 3

B) Provide Brief Description of the Proposed Project on separate piece of paper. Instructions attached.

C) List Titles and dates of all documentation which will be included and submitted with this application and attach to application. Documents should include, but are not limited to; Project Proposal, Soil Scientist Reports, and Drainage Calculations. SEE ATTACHED ADDENDUM

## VIII. Other Information

1. Does the application involve an activity in a regulated area that is within 500 ft of another municipality?

Yes  No

- If YES, then a copy of the application and all material is to be submitted to said Town and a copy of the transmittal form is to be provided to the Commission.

2. Is the property located within a Flood Hazard Area?  Yes  No

-If YES, then please provide additional material showing the location of the area.

3. Is the regulated activity within a Public Water Supply Aquifer or Watershed?  Yes  No

- If YES, then a copy of the application and all material is to be submitted to the State Department of Health as well as the appropriate Water Company. See attached instructions for the Notification Process for the State Health Department. A copy of the transmittal forms shall be provided to the Commission.

4. Does the application require approval from Uncas Health District? Yes No  
- If YES, then a copy of the approval is to be provided to the Commission.

5. Does the application require approval from the Public Works Dept? Yes No  
- If YES, then a copy of the approval is to be provided to the Commission.

6. Does the application require approval from the Town of Montville WPCA? Yes No  
- If YES, then a copy of the approval is to be provided to the Commission.

7. Does the application require permits from the following agencies?

			Submission Info
Army Corps of Engineers	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Date _____
Department of Environmental Protection	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Date _____
Department of Transportation	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Date _____

- If YES, then a copy of the application and all material is to be submitted to said Agency and a copy of the transmittal form is to be provided to the Commission.

8. Does this permit require a State Water Diversion Permit? Yes No

9. Does this permit require a State Dam Permit? Yes No

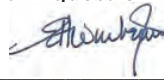
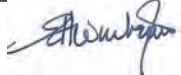
10. Is this property subject to a Conservation Restriction and/or a Preservation Restriction?

-If YES, attach a copy of certified notice. Yes No

11. If the application is a renewal or modification of an existing permit, is a copy of the original approval included in the documentation package? Yes No

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The undersigned applicant hereby consents to necessary and proper inspections of the above mentioned property by agents of the Montville Inland Wetlands Commission at reasonable times, both before and after the permit in question has been granted by the Commission.

Name  Date 05/12/22  
For Lawrence J. Darling Jr.  
Property Owner if other than Applicant  Date 05/12/22  
For Lynne King

# **Edward H. Wenke III, PE**

**CIVIL - STRUCTURAL – ENGINEER**

Licensed in: **CT – RI – MA – ME – NY – PA – MD – WI - CA**

P.O. Box 544 – Mukwonago, WI 53149 Tel. 860.460.1606 Email: [ewenke@comcast.net](mailto:ewenke@comcast.net)

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## **ADDENDUM TO INLAND WETLANDS APPLICATION**

**Applicant: Lawrence J. Darling Jr.**

**Property Address: 0 Ridge Hill Road; Oakdale; Town of Montville, CT**

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### **Existing Site Description:**

This parcel gross area contains approximately 7.5+/- Acres. It is currently an undeveloped vacant wooded lot. The parcel is zoned WRP-160. The proposed use of this parcel will be Single-Family Residential. A new 3-BR house with on-site septic system and private on-site well is proposed. The new house will be located on the east side of the site along the road frontage on Ridge Hill Road.

There is a regulated freshwater wetland area (8,313 sf 0.19 Ac) ~ (2.5% of gross parcel area). This wetland body drains a 3.5 Acres sub-watershed from north to south. It effectively bisects the parcel into an east & west section.

- The East section contains approximately 47,722 sf (14.6% of gross parcel area) of unregulated area outside of the URA.
  - The West section contains approximately 251,607 sf (77.1% of gross parcel area).
  - The East 50' Upland Review Area (URA) contains approximately 10,330 sf (3.2% of gross parcel area).
  - The West 50' Upland Review Area (URA) contains approximately 8,575 sf (2.6% of gross parcel area).
- 

### **Proposed Project Description:**

The applicant is proposing to construct a 12' wide gravel driveway running from the new house on the east side and extending to the west side of the wetland area. The purpose of this driveway will be to attain reasonable access and use of the western portion of the site, which comprises the majority (77.1%) of the overall parcel area. The applicant proposes to construct an outbuilding/basin/shop on the western portion of this parcel. The outbuilding will not be served by water or septic system services.

The wetland crossing for the proposed gravel driveway requires approval of the following:

- 2,740 SF (0.06 Ac) of tree clearing, permanent fill with 12'W gravel driveway & 18" diameter culvert within the Regulated Wetland Limits.
- Estimated Fill Volume within Regulated Wetland Limits = 150 +/- CY.
- 6,100 SF (0.16 Ac) of tree clearing, permanent fill with 12'W gravel driveway within the Eastern 50' URA Limits.
- Estimated Fill Volume within Eastern 50' URA Limits = 100 +/- CY.

**Edward H. Wenke III, PE – Civil Structural Engineer**

Tel. 860.460.1606 Email: [ewenke@comcast.com](mailto:ewenke@comcast.com)

Licensed in: Connecticut, Rhode Island, Massachusetts, Maine, New York, Pennsylvania, Maryland, Wisconsin & California

- 3,200 sf (0.07 Ac) of tree clearing, permanent fill with 12' W gravel driveway within the Western 50' URA Limits.
- Estimated Fill Volume within Western 50' URA Limits = 100 +/- CY.

**Summary of Regulated Wetland Activities:**

- Gross Fill/Disturbance in Regulated Wetlands = 2,740 SF with 150 +/- CY
- Gross Fill/Disturbance in Regulated 50' URA = 9,300 SF with 200 +/- CY

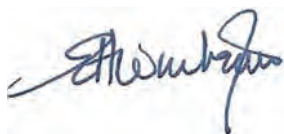
**Alternatives Considered:**

The only way to access the western 5.8 Acre portion of this site for ANY reasonable use will require a crossing of the existing wetland area. There are no other alternatives for reasonable access to the remaining 77% of the overall parcel.

The location of the crossing was selected because it is the narrowest portion, and it allows for a new culvert installation. The culvert will be an 18" dia HDPE pipe culvert with flared inlet & outlet ends. Each end will be lined with 10'x10' modified rip rap stone. Flow velocities have minimum scour effect. The side slopes of the crossing embankment will be graded at 3:1 slopes & stabilized with ryegrass. The culvert size is capable of flowing up to a 100-year storm event (with a headwater build-up at the inlet). However, the hydraulic capacity of the culvert will pass all storms up to and including a 50-year event with excessive headwater build-up. Drainage hydraulic calculations are included with this application.

I trust that this analysis adequately addresses your needs. Please call me at this office if you require any additional information or clarifications. Thank you for your time and consideration.

Respectfully,



Edward H. Wenke III, PE  
Civil Structural Engineer  
CT PE #16771 (exp. 01/31/23)





## Statewide Inland Wetlands & Watercourses Activity Reporting Form

*Please complete this form in accordance with the instructions on pages 2 and 3 and mail to:*

*DEEP Land & Water Resources Division, Inland Wetlands Management Program, 79 Elm Street, 3<sup>rd</sup> Floor, Hartford, CT 06106*

*Incomplete or incomprehensible forms will be mailed back to the inland wetlands agency.*

### PART I: Must Be Completed By The Inland Wetlands Agency

- DATE ACTION WAS TAKEN: year: \_\_\_\_\_ month: \_\_\_\_\_
- ACTION TAKEN (see instructions - one code only): \_\_\_\_\_
- WAS A PUBLIC HEARING HELD (check one)? yes  no
- NAME OF AGENCY OFFICIAL VERIFYING AND COMPLETING THIS FORM:  
(print name) \_\_\_\_\_ (signature) \_\_\_\_\_

### PART II: To Be Completed By The Inland Wetlands Agency Or The Applicant

- TOWN IN WHICH THE ACTIVITY IS OCCURRING (print name): MONTVILLE  
does this project cross municipal boundaries (check one)? yes  no   
if yes, list the other town(s) in which the activity is occurring (print name(s)): \_\_\_\_\_, \_\_\_\_\_
- LOCATION (see instructions for information): USGS quad name: MONTVILLE CONN. or number: \_\_\_\_\_  
subregional drainage basin number: 2203
- NAME OF APPLICANT, VIOLATOR OR PETITIONER (print name): Lawrence J. Darling Jr.
- NAME & ADDRESS OF ACTIVITY / PROJECT SITE (print information): 0 Ridge Hill Road; Oakdale/Montville CT  
briefly describe the action/project/activity (check and print information): temporary  permanent  description: Wetland crossing & U.R.A. disturbance for Driveway
- ACTIVITY PURPOSE CODE (see instructions - one code only): B
- ACTIVITY TYPE CODE(S) (see instructions for codes): 9, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_
- WETLAND / WATERCOURSE AREA ALTERED (see instructions for explanation, must provide acres or linear feet):  
wetlands: 0.06 acres open water body: \_\_\_\_\_ acres stream: \_\_\_\_\_ linear feet
- UPLAND AREA ALTERED (must provide acres): 0.21 acres
- AREA OF WETLANDS / WATERCOURSES RESTORED, ENHANCED OR CREATED (must provide acres): - 0 - acres

DATE RECEIVED:

### PART III: To Be Completed By The DEEP

DATE RETURNED TO DEEP:

FORM COMPLETED: YES NO

FORM CORRECTED / COMPLETED: YES NO

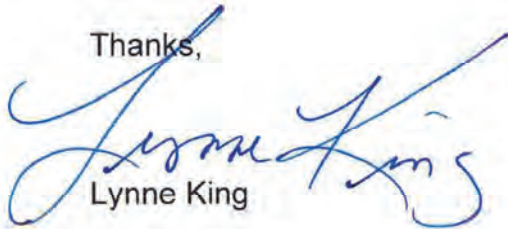
Lynne King  
20429 Watkins Meadow Dr.  
Germantown, MD 20876

May 13, 2022

To Whom it May Concern,

Mr. Edward H. Wenke III PE has my permission to include my name as Owner of Record on the Inland Wetlands Commision Application of the Town of Montville.

Thanks,



Lynne King

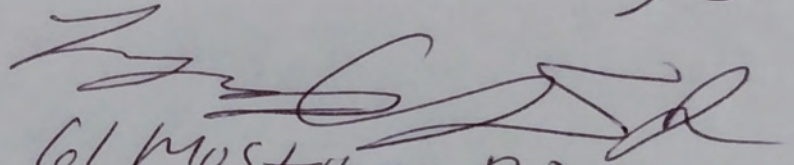
240-372-8953

lynneking15@yahoo.com

5-12-22

I Lawrence J Darling Jr  
G.W. permission to Mr. Edward H. Wenke III PE  
to sign on my behalf for the Inland  
Wetlands Commission Application Town  
of Montville as my agent.

Lawrence J Darling Jr



61 Mostony RD

East Lyme CT

06333

860-304-0556

DarlingCarpentry@gmail.com

**ADJOINING PROPERTY OWNERS**

**Project: DARLING RESIDENCE**

**Address: 0 Ridge Hill Road; Montville, CT**

**As Of 05/16/2022**

No.	Owner Name	Parcel Address	Mailing Address
1	Robert A Harris & Nadine D. Harris	124 Ridge Hill Road; Montville, CT	124 Ridge Hill Road; Oakdale, CT 06370
2	Hillary Hollingsworth & Shawn Ginter	136 Ridge Hill Road; Montville, CT	136 Ridge Hill Road; Oakdale, CT 06370
3	Adam McNiece	178 Ridge Hill Road; Montville, CT	5 Palm Drive; Yankeetown, FL 34498
4	City of New London Water Department	Chesterfield Road; Montville, CT	15 Masonic Street; New London, CT 06320
5	The Connecticut Audubon Society Inc	Ridge Hill Road; Oakdale / Montville	2325 Burr Street; Fairfield, CT 06824

**TOWN OF MONTVILLE**  
**INLAND WETLANDS APPLICATION CHECKLIST**

N/A

- Completed application signed by the property owner. If you are acting on behalf of the property owner than a letter must also be submitted by the property owner stating that you are acting as his/her agent.
- Application must have the disturbance area in square feet and acres to include the buffer area, as well as, the wetland area and what type of activity it will be in tabular format.
- A narrative describing the activities to take place on the property. This is to include but not limited to:
  - Alternatives considered.
  - Description of the activity including location and square footage of Disturbance.
  - What type of erosion and sediment control will be used.
  - If machinery will be used or if work will be done by hand.
  - Identify the sub-drainage basin where the proposed activity will occur.
- List of abutting property owners and names indicated on plan.
- Location of all wells and septic systems of abutting property owners, as well as, any located onsite.
- Existing and proposed contours at 5 ft contours.
- Location of all designated wetland and watercourse areas by a Certified Soil Scientist. A soils report from the soil scientist shall also be provided along with a live signature and stamp on the plans.
- Location of all Flood Zones per Federal Flood Insurance Rate Maps.
- Location of all existing and proposed buildings and their uses.
- Location of all crossings and storm water drainage systems and their drainage. calculations based on ten (10) and Twenty-five (25) year storms. In addition all points of ground water discharge will also be shown.
- Location of all Erosion and Sediment control devices and an Erosion and Sediment control plan.
- North arrow and location key at 1"= 1000".
- DEEP Report Form.

Inland Wetlands Checklist  
Page 1 of 2

- The requirements of Section 7.5 shall apply if the proposed activity has been determined **significant**.
- Site plans for the proposed use or operation and the property which will be affected, which show existing and proposed conditions, wetland and watercourse boundaries, land contours, boundaries of land ownership, proposed alterations and use of wetlands and watercourses, and other pertinent features of the development drawn by a licensed surveyor, professional engineer or landscape architect registered in the State of Connecticut or by such other qualified person;
- Engineering reports and analyses and additional drawing to fully describe the proposed project and any filling, excavation, drainage or hydraulic modifications to watercourses and the proposed erosion and sedimentation control plan;
- Mapping of soil types consistent with the categories established by the National Cooperative Soil Survey of the U. S. Soil Conservation Service (the Commission may require the applicant to have the wetlands delineated in the field by a soil scientist and that the field delineation be incorporated onto the site plan);
- Description of how the ecological communities and functions of the wetlands or watercourses involved with the application and the effects of the proposed regulated activities on these communities and wetlands functions;
- Description of how the applicant will change, diminish, or enhance the ecological communities and functions of the wetlands or watercourses involved in the application, and with each alternative, and a description of why each alternative considered was deemed neither feasible nor prudent;
- Analysis of chemical or physical characteristics of any fill material;
- Measures which mitigate the impact of the proposed activity. Such measures include, but are not limited to, plans or actions which avoid destruction or diminution of wetland or watercourse functions, recreational uses and natural habitats, which prevent flooding or degradation of water quality.

**In addition to this checklist, the applicant is also responsible for those items listed in the  
EROSION & SEDIMENT CONTROL CHECKLIST**

**Watershed Conditions & Run-off Analysis**  
**DARLING CULVERT FLOW ANALYSIS**

Rev-A

15-May-22

Darling Residence - 0 Rocky Hill Road - Montville CT

Rational Method

EHW, PE

**HISTORIC CONDITIONS - Design Point #1 - TO CULVERT INLET**

**Watershed Characteristics:**

Surface Description	Area (Acres)	Coeff. "C"	AxC	HSG
Wooded Area - 5%-12% Slope; Forest Litter	3.250	0.40	1.30	B
<b>Totals:</b>	<b>3.250</b>	<b>Total AxC =</b>	<b>1.30</b>	

Gross Watershed Area ( $A_w$ ) - Sq. Miles = 0.0051 < 0.1 Sq. Mile - Therefore Use **NRSC Method\*** for  $T_c$  Analysis

**NRSC Method for Time of Concentration:**

$T_t$  - Overland Sheet Flow (100 LF Max Allowed):  $T_t = (0.007 \times (L \times n_{ol})^{0.80}) / ((P_2)^{0.50} \times (S)^{0.4})$

$T_t$  - Shallow Concentrated Flow:  $T_t = (L) / (3600 \times K \times (S)^{0.5})$

$T_t$  - Defined Open Channel Flow:  $T_t = (L) / ((3600 \times (1.49/n) \times (R)^{0.666} \times (S)^{0.5}))$

2-year / 24 hour Rainfall Depth ( $P_2$ ): **3.43** inches (New London County - CTDOT Manual)

K Factor (Shallow Conc Flow): **16.13** Unpaved Surface **20.32** Paved Surface

Open Channel X-Sectional Area Flow ( $A_c$ ): **71.00** SF

Open Channel Wetted Perimeter (WP): **110.00** LF

Channel Hydraulic Radius =  $R = A_c / WP =$  **0.65**

**Time Of Concentration:**

Reach Description:	Length - "L" (ft)	Mannings "n"	S = % Slope	Velocity (fps)	$T_t^*$ (Minutes)
Overland Flow -Flat Lawn	100	0.400	0.025	0.09	18.97
Shallow Concentrated	550		0.025		3.59
Channelized Flow	100	0.070	0.010	1.59	1.05
<b>Totals:</b>	<b>750</b>	<b>LF</b>		<b><math>T_c</math> (min.) =</b>	<b>22.56</b>

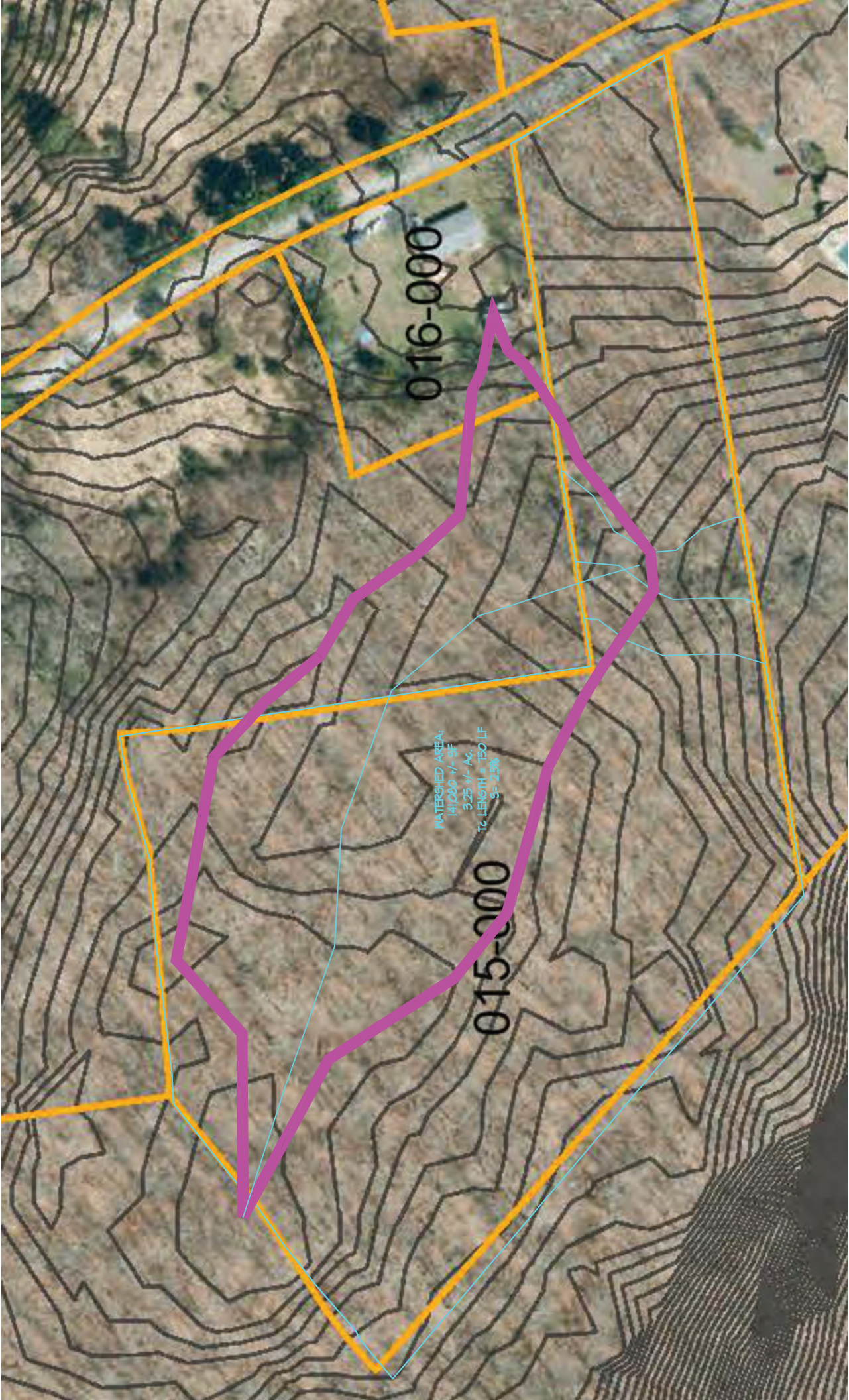
**Rainfall Intensities:**

Storm Event	NOAA Atlas #14 Intensity (In/Hr)	Run-off Rate To Inlet "Q" (CFS)
<b>MINIMUM Historic <math>T_c</math> (Minutes) Used ~</b>	<b>22.6</b>	
2 year	2.30	2.99
10 year	2.91	3.78
25 year	4.12	5.89
50 year	4.65	7.25
100 year	5.21	8.47

**Run-off Coefficient Adjustment Factors:**

< 10 years	1.00
25 Years	1.10
50 Years	1.20
100 Years	1.25





016-000

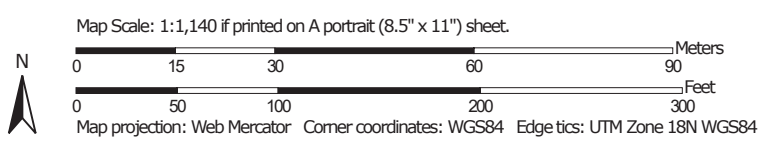
WATERSHED AREA:  
141000 +/- SF  
3.25 +/- Ac.  
TC LENGTH = 750 LF  
S = 2.5%

015-000

Soil Map—State of Connecticut  
(DARLING SITE)



Soil Map may not be valid at this scale.





**NOAA Atlas 14, Volume 10, Version 3**  
**Location name: Oakdale, Connecticut, USA\***  
**Latitude: 41.4261°, Longitude: -72.1936°**  
**Elevation: 389.64 ft\*\***  
 \* source: ESRI Maps  
 \*\* source: USGS



**POINT PRECIPITATION FREQUENCY ESTIMATES**

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aeriels](#)

**RAINFALL INTENSITIES**

<b>PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)<sup>1</sup></b>										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.06 (3.16-5.06)	4.86 (3.78-6.06)	6.17 (4.79-7.72)	7.24 (5.58-9.11)	8.72 (6.52-11.4)	9.84 (7.21-13.1)	11.0 (7.84-15.1)	12.4 (8.32-17.2)	14.3 (9.25-20.6)	15.9 (10.1-23.3)
10-min	2.87 (2.24-3.58)	3.44 (2.68-4.29)	4.36 (3.38-5.46)	5.12 (3.95-6.45)	6.18 (4.61-8.07)	6.97 (5.10-9.27)	7.80 (5.56-10.7)	8.75 (5.89-12.2)	10.1 (6.56-14.6)	11.3 (7.13-16.5)
15-min	2.26 (1.76-2.81)	2.70 (2.10-3.36)	3.42 (2.65-4.28)	4.02 (3.10-5.05)	4.84 (3.62-6.33)	5.46 (4.00-7.27)	6.12 (4.36-8.42)	6.86 (4.62-9.58)	7.94 (5.15-11.4)	8.84 (5.59-12.9)
30-min	1.59 (1.24-1.98)	1.90 (1.48-2.37)	2.41 (1.87-3.01)	2.83 (2.18-3.56)	3.41 (2.55-4.45)	3.84 (2.81-5.11)	4.30 (3.06-5.91)	4.83 (3.25-6.74)	5.58 (3.61-8.02)	6.20 (3.92-9.07)
60-min	1.02 (0.797-1.27)	1.22 (0.952-1.53)	1.55 (1.20-1.94)	1.82 (1.41-2.29)	2.20 (1.64-2.87)	2.48 (1.81-3.30)	2.77 (1.97-3.81)	3.11 (2.09-4.34)	3.59 (2.33-5.17)	3.99 (2.52-5.84)
2-hr	0.673 (0.528-0.834)	0.803 (0.630-0.996)	1.02 (0.794-1.26)	1.19 (0.926-1.49)	1.44 (1.08-1.86)	1.62 (1.19-2.14)	1.81 (1.30-2.48)	2.04 (1.38-2.82)	2.37 (1.54-3.37)	2.64 (1.68-3.83)
3-hr	0.521 (0.411-0.643)	0.621 (0.489-0.767)	0.785 (0.616-0.971)	0.920 (0.718-1.15)	1.11 (0.837-1.43)	1.25 (0.923-1.64)	1.40 (1.01-1.90)	1.57 (1.07-2.16)	1.83 (1.19-2.59)	2.05 (1.30-2.94)
6-hr	0.332 (0.264-0.407)	0.395 (0.314-0.485)	0.498 (0.394-0.612)	0.583 (0.458-0.720)	0.700 (0.533-0.898)	0.788 (0.588-1.03)	0.881 (0.639-1.19)	0.990 (0.675-1.35)	1.15 (0.755-1.62)	1.29 (0.824-1.84)
12-hr	0.205 (0.164-0.249)	0.243 (0.194-0.296)	0.306 (0.244-0.373)	0.358 (0.283-0.439)	0.429 (0.329-0.546)	0.483 (0.362-0.625)	0.539 (0.393-0.721)	0.605 (0.415-0.818)	0.702 (0.462-0.975)	0.783 (0.503-1.11)
24-hr	0.120 (0.097-0.146)	0.144 (0.116-0.174)	0.182 (0.146-0.221)	0.214 (0.171-0.260)	0.258 (0.199-0.325)	0.290 (0.219-0.373)	0.325 (0.238-0.431)	0.365 (0.252-0.489)	0.426 (0.281-0.585)	0.476 (0.307-0.664)
2-day	0.067 (0.055-0.081)	0.081 (0.066-0.098)	0.104 (0.084-0.126)	0.123 (0.099-0.149)	0.149 (0.116-0.187)	0.169 (0.129-0.216)	0.189 (0.140-0.250)	0.215 (0.148-0.284)	0.252 (0.167-0.343)	0.285 (0.184-0.393)
3-day	0.049 (0.040-0.058)	0.059 (0.048-0.070)	0.075 (0.061-0.090)	0.089 (0.072-0.107)	0.108 (0.084-0.135)	0.122 (0.093-0.155)	0.137 (0.102-0.180)	0.155 (0.108-0.205)	0.183 (0.122-0.247)	0.206 (0.134-0.283)
4-day	0.039 (0.032-0.047)	0.047 (0.039-0.056)	0.060 (0.049-0.072)	0.071 (0.058-0.085)	0.086 (0.067-0.107)	0.097 (0.074-0.123)	0.109 (0.081-0.142)	0.123 (0.086-0.162)	0.145 (0.096-0.195)	0.163 (0.106-0.223)
7-day	0.027 (0.022-0.032)	0.032 (0.026-0.038)	0.040 (0.033-0.047)	0.047 (0.038-0.056)	0.056 (0.044-0.069)	0.063 (0.048-0.079)	0.070 (0.052-0.091)	0.079 (0.055-0.103)	0.092 (0.062-0.123)	0.103 (0.067-0.140)
10-day	0.022 (0.018-0.026)	0.025 (0.021-0.030)	0.031 (0.026-0.037)	0.036 (0.030-0.043)	0.043 (0.034-0.053)	0.048 (0.037-0.060)	0.054 (0.040-0.069)	0.060 (0.042-0.077)	0.069 (0.046-0.092)	0.077 (0.050-0.103)
20-day	0.015 (0.013-0.018)	0.017 (0.015-0.020)	0.021 (0.017-0.024)	0.023 (0.019-0.027)	0.027 (0.021-0.033)	0.030 (0.023-0.036)	0.032 (0.024-0.041)	0.035 (0.025-0.045)	0.040 (0.027-0.052)	0.043 (0.028-0.057)
30-day	0.013 (0.011-0.015)	0.014 (0.012-0.017)	0.016 (0.014-0.019)	0.018 (0.015-0.021)	0.021 (0.017-0.025)	0.023 (0.018-0.028)	0.025 (0.018-0.031)	0.026 (0.019-0.034)	0.029 (0.020-0.038)	0.031 (0.020-0.041)
45-day	0.011 (0.009-0.012)	0.012 (0.010-0.014)	0.013 (0.011-0.015)	0.014 (0.012-0.017)	0.016 (0.013-0.019)	0.018 (0.014-0.021)	0.019 (0.014-0.023)	0.020 (0.014-0.025)	0.022 (0.015-0.028)	0.023 (0.015-0.030)
60-day	0.009 (0.008-0.011)	0.010 (0.009-0.012)	0.011 (0.010-0.013)	0.012 (0.010-0.014)	0.014 (0.011-0.016)	0.015 (0.012-0.018)	0.016 (0.012-0.019)	0.017 (0.012-0.021)	0.018 (0.012-0.023)	0.018 (0.012-0.024)

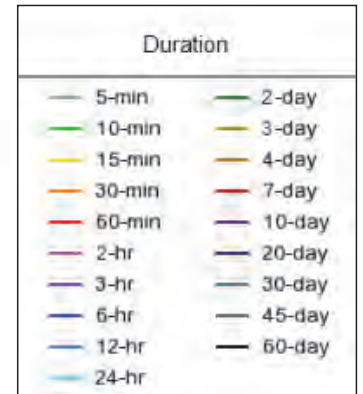
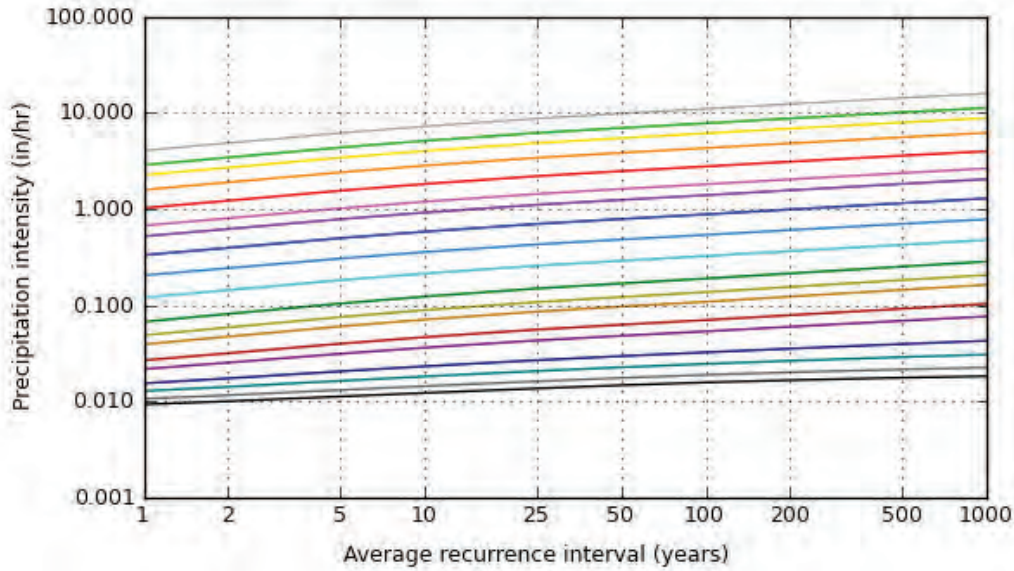
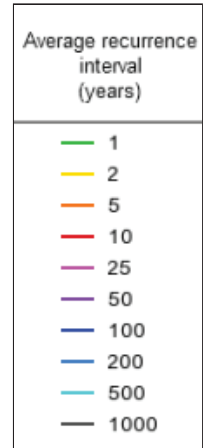
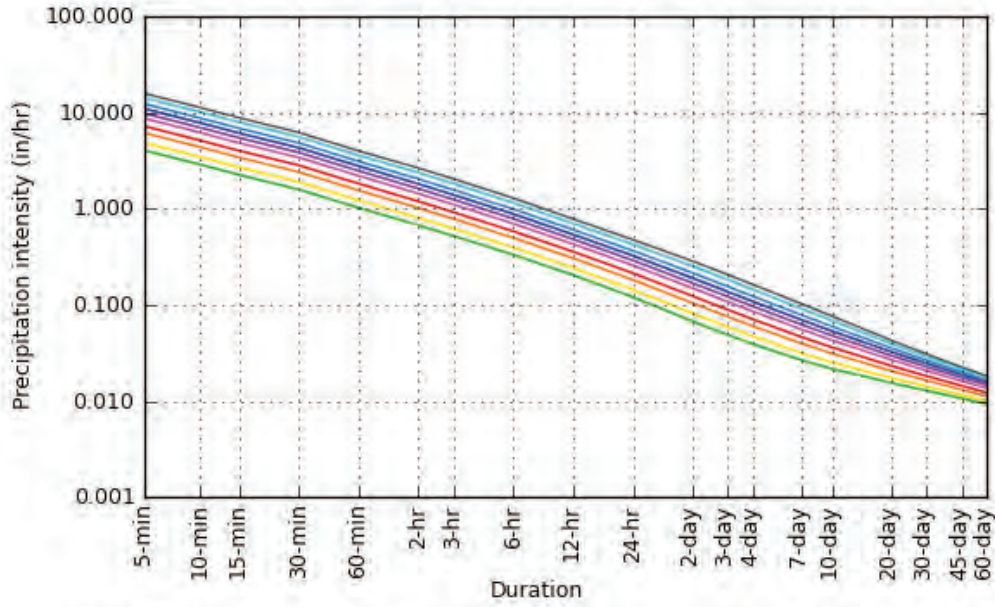
<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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**PF graphical**

PDS-based intensity-duration-frequency (IDF) curves

Latitude: 41.4261°, Longitude: -72.1936°



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**Maps & aerials**

Small scale terrain

# Culvert Report

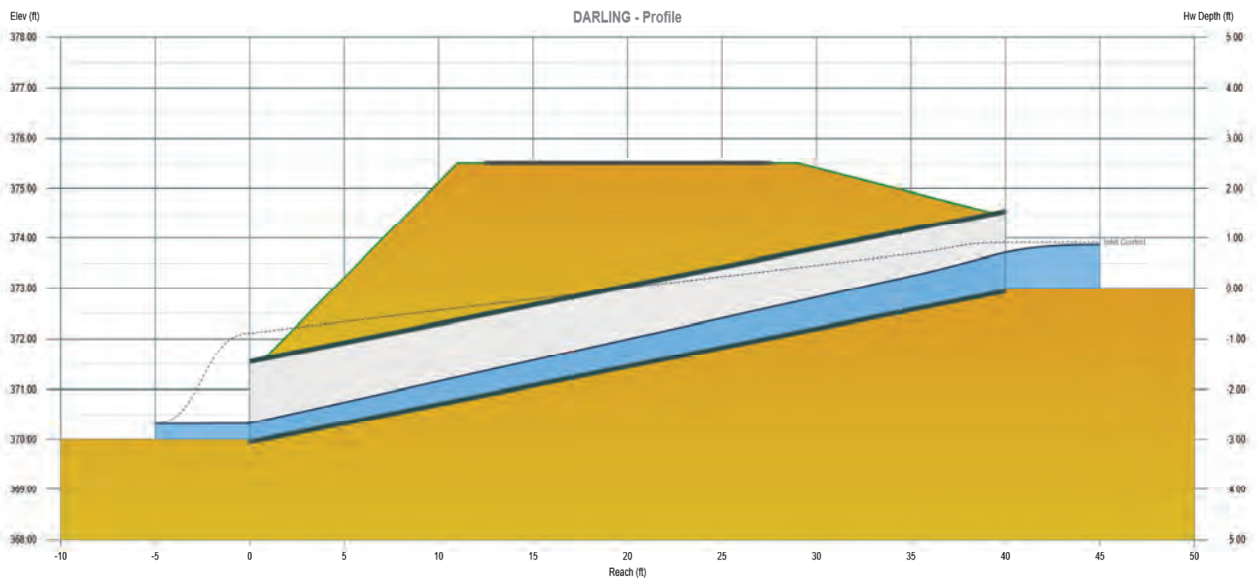
## DARLING

## Culvert 1

<b>CULVERT</b>		<b>EMBANKMENT</b>	
Shape	= Circular	Top Width	= 18.00 ft
Inlet Edge	= Projecting	Top Elevation	= 375.50 ft
Material	= HDPE	Crest Length	= 60.00 ft
Manning's n	= 0.012	<b>DISCHARGE</b>	
Rise	= 18 in	Method	= Qmin to Qmax
Span	= 18 in	Q Min	= 3.00 cfs
Invert Elev. Down	= 370.00 ft	Q Max	= 8.50 cfs
Length	= 40.0 ft	Q Increment	= 1.00 cfs
Slope	= 0.075 ft/ft	<b>TAILWATER</b>	
Invert Elev. Up	= 373.00 ft	Tailwater Elevation	= Normal Depth
No. Barrels	= 1		
Plan Skew Angle	= 0 degrees		

### CALCULATION SAMPLE

Discharge			Velocity		Depth		HGL @ Hw/D = 0.58		
Total	Culvert	Over Top	Down	Up	Down	Up	Down	Up	Hw
(cfs)	(cfs)	(cfs)	(ft/s)	(ft/s)	(in)	(in)	(ft)	(ft)	(ft)
3.00	3.00	0.00	10.73	3.98	3.9	8.0	370.32	373.66	373.87



# Culvert Report

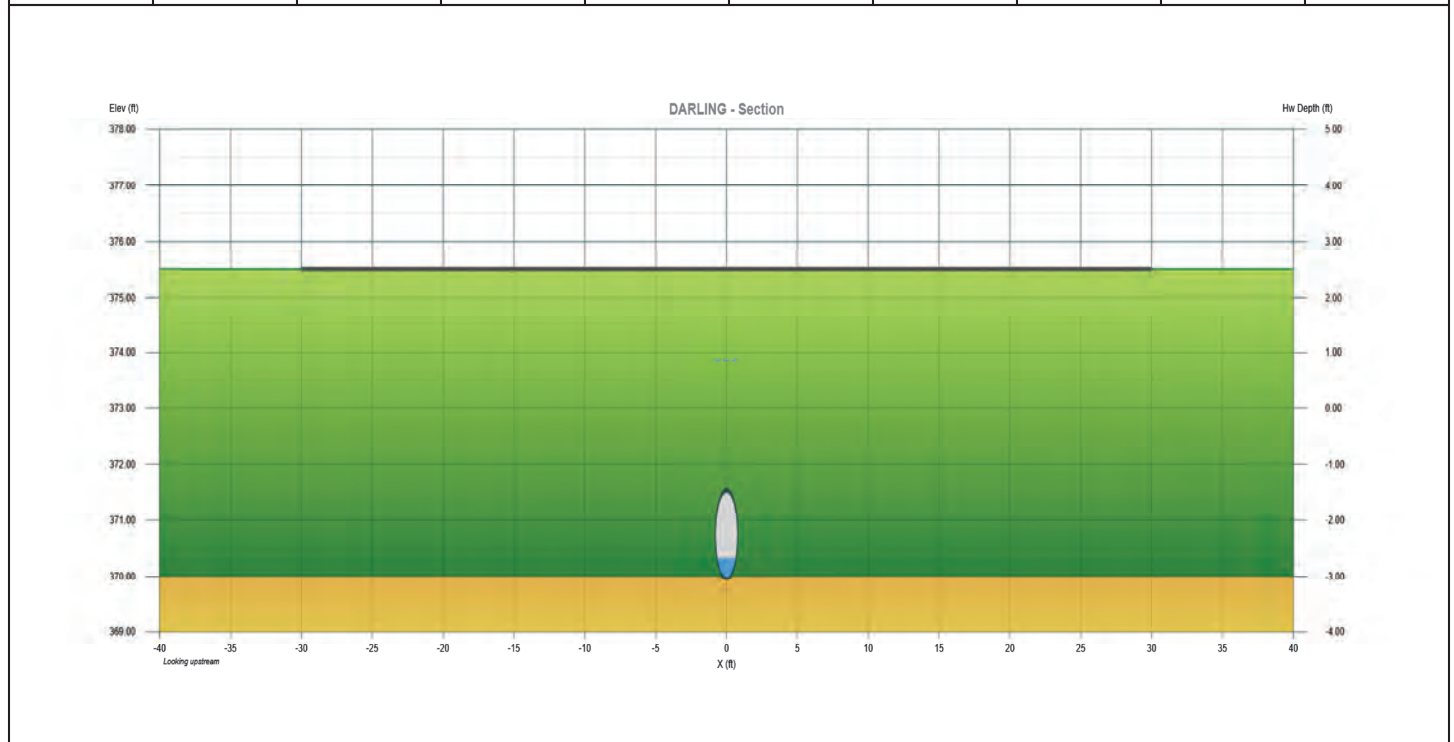
## DARLING

## Culvert 1

<b>CULVERT</b>		<b>EMBANKMENT</b>	
Shape	= Circular	Top Width	= 18.00 ft
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### CALCULATION SAMPLE

Discharge			Velocity		Depth		HGL @ Hw/D = 0.58		
Total	Culvert	Over Top	Down	Up	Down	Up	Down	Up	Hw
(cfs)	(cfs)	(cfs)	(ft/s)	(ft/s)	(in)	(in)	(ft)	(ft)	(ft)
3.00	3.00	0.00	10.73	3.98	3.9	8.0	370.32	373.66	373.87



# Culvert Report

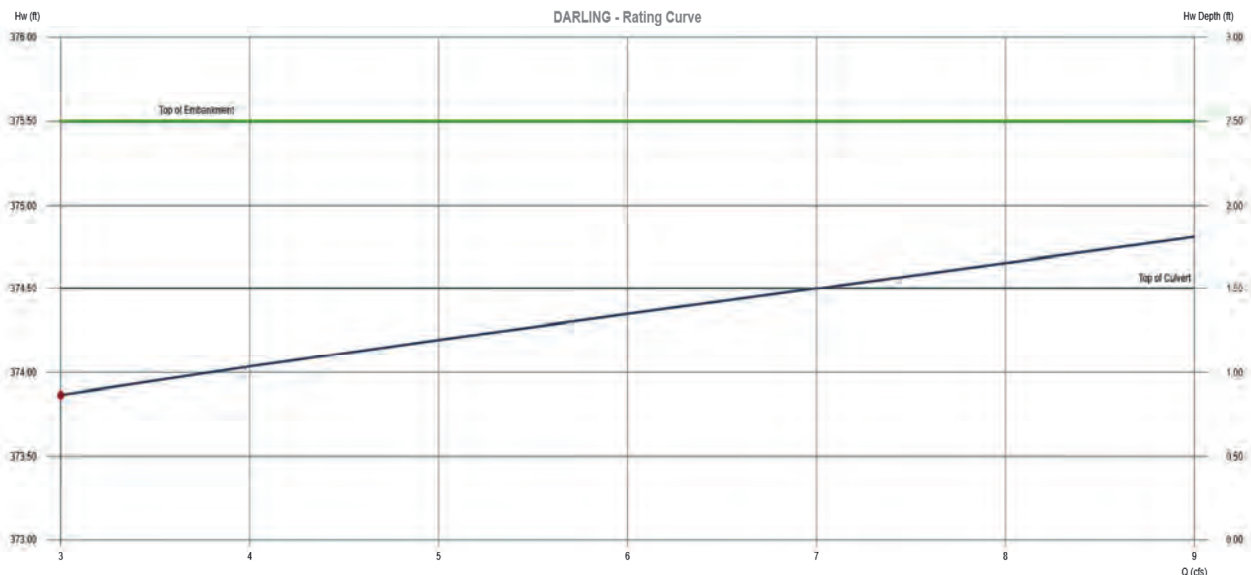
## DARLING

## Culvert 1

<b>CULVERT</b>		<b>EMBANKMENT</b>	
Shape	= Circular	Top Width	= 18.00 ft
Inlet Edge	= Projecting	Top Elevation	= 375.50 ft
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Plan Skew Angle	= 0 degrees		

### CALCULATION SAMPLE

Discharge			Velocity		Depth		HGL @ Hw/D = 0.58		
Total	Culvert	Over Top	Down	Up	Down	Up	Down	Up	Hw
(cfs)	(cfs)	(cfs)	(ft/s)	(ft/s)	(in)	(in)	(ft)	(ft)	(ft)
3.00	3.00	0.00	10.73	3.98	3.9	8.0	370.32	373.66	373.87



# Culvert Report

## DARLING

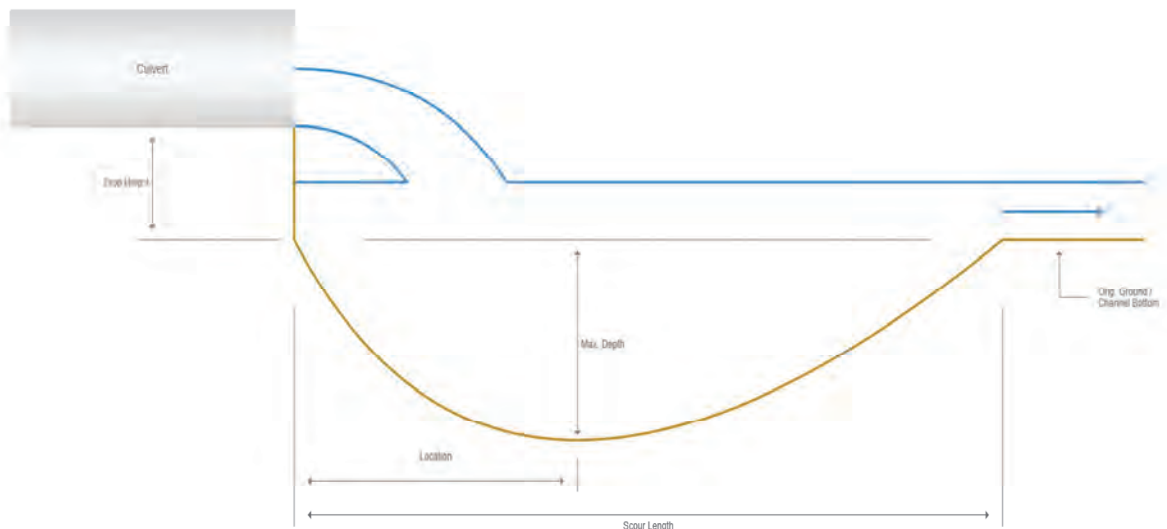
## Culvert 1

<b>CULVERT</b>		<b>EMBANKMENT</b>	
Shape	= Circular	Top Width	= 18.00 ft
Inlet Edge	= Projecting	Top Elevation	= 375.50 ft
Material	= HDPE	Crest Length	= 60.00 ft
Manning's n	= 0.012	<b>DISCHARGE</b>	
Rise	= 18 in	Method	= Qmin to Qmax
Span	= 18 in	Q Min	= 3.00 cfs
Invert Elev. Down	= 370.00 ft	Q Max	= 8.50 cfs
Length	= 40.0 ft	Q Increment	= 1.00 cfs
Slope	= 0.075 ft/ft	<b>TAILWATER</b>	
Invert Elev. Up	= 373.00 ft	Tailwater Elevation	= Normal Depth
No. Barrels	= 1		
Plan Skew Angle	= 0 degrees		

### CALCULATION SAMPLE

Discharge			Velocity		Scour Geometry				
Total	Culvert	Over Top	Down	Up	Depth	Width	Length	Volume	Location
(cfs)	(cfs)	(cfs)	(ft/s)	(ft/s)	(ft)	(ft)	(ft)	(cft)	(ft)
3.00	3.00	0.00	10.73	3.98	0.00	0.00	0.00	0.00	0.00

Scour Geometry Profile



# Culvert Report

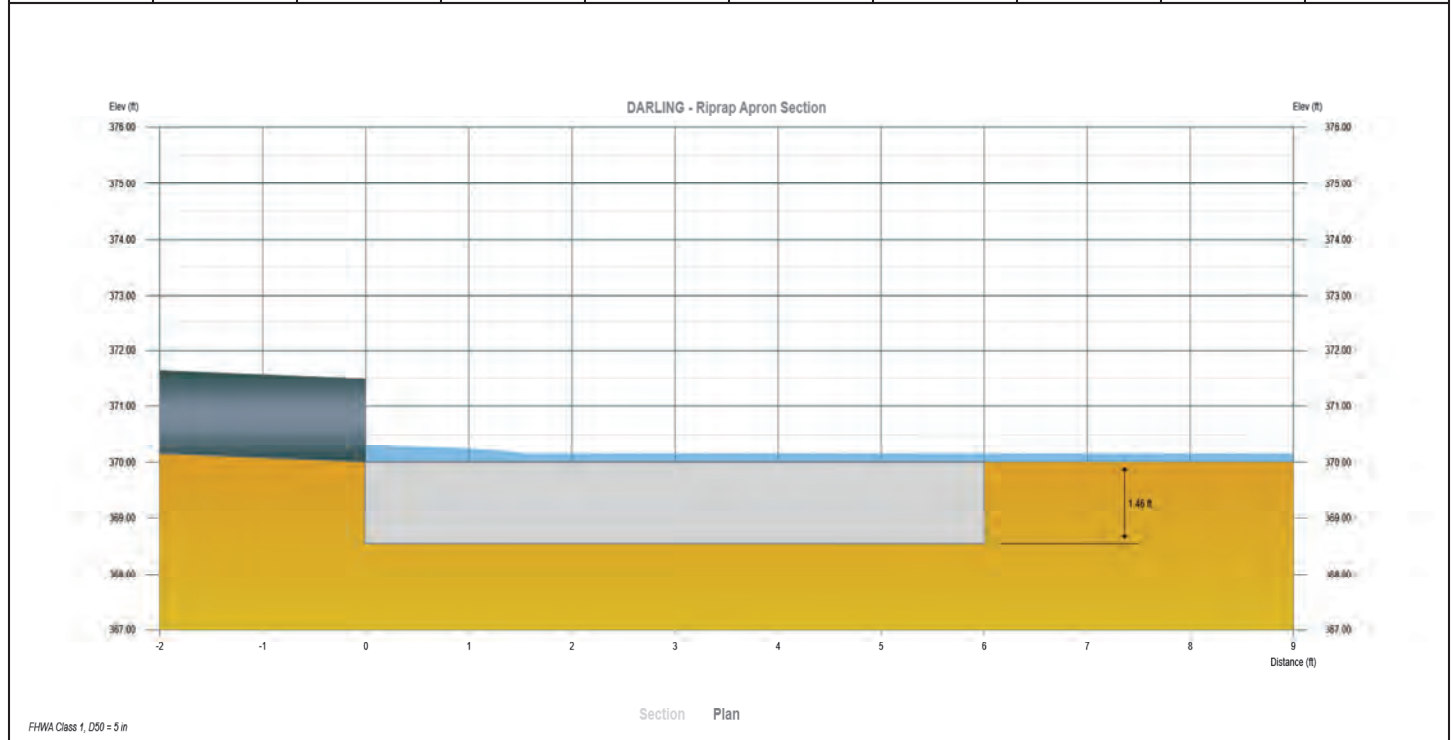
## DARLING

## Culvert 1

<b>CULVERT</b>		<b>EMBANKMENT</b>	
Shape	= Circular	Top Width	= 18.00 ft
Inlet Edge	= Projecting	Top Elevation	= 375.50 ft
Material	= HDPE	Crest Length	= 60.00 ft
Manning's n	= 0.012	<b>DISCHARGE</b>	
Rise	= 18 in	Method	= Qmin to Qmax
Span	= 18 in	Q Min	= 3.00 cfs
Invert Elev. Down	= 370.00 ft	Q Max	= 8.50 cfs
Length	= 40.0 ft	Q Increment	= 1.00 cfs
Slope	= 0.075 ft/ft	<b>TAILWATER</b>	
Invert Elev. Up	= 373.00 ft	Tailwater Elevation	= Normal Depth
No. Barrels	= 1		
Plan Skew Angle	= 0 degrees		

### CALCULATION SAMPLE

Discharge			Velocity		Riprap Apron Design				
Total	Culvert	Over Top	Down	Up	Length	Width	Depth	D50	Velocity
(cfs)	(cfs)	(cfs)	(ft/s)	(ft/s)	(ft)	(ft)	(ft)	(in)	(ft/s)
3.00	3.00	0.00	10.73	3.98	6.00	8.52	1.46	5	2.26





WETLAND





