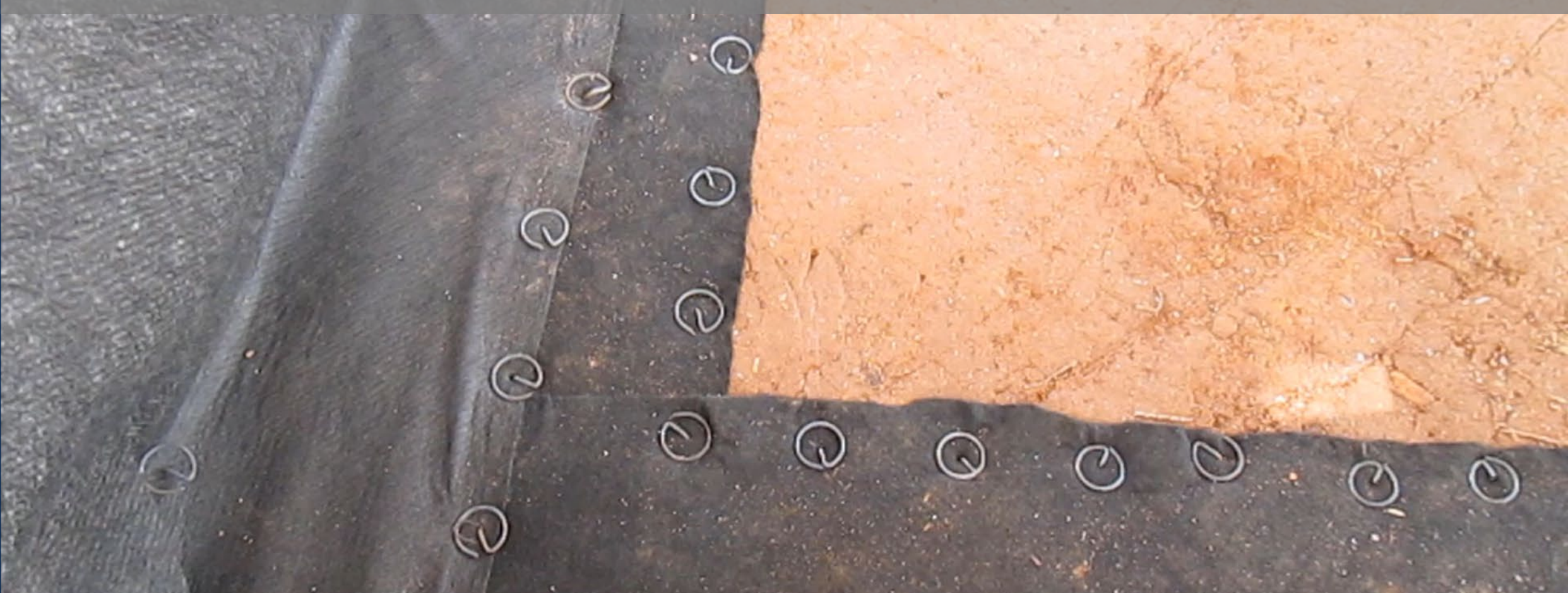


AU - EROSION & SEDIMENT CONTROL TESTING FACILITY



CLEAR WATER ALABAMA – SEPTEMBER 15TH, 2021



AUBURN
UNIVERSITY

Wesley N. Donald, Ph.D., CPESC
Research Fellow
Dept. of Civil & Environmental Engineering

CONSTRUCTION ACTIVITIES ARE THE LARGEST HUMAN INDUCED NON-POINT SOURCE OF SEDIMENT



WATERKEEPER ALLIANCE



NEEDS: IMPROVE PERFORMANCE OF EXISTING PRACTICES, ADVANCE E&SC DESIGN STANDARDS, INSURE PROPER IMPLEMENTATION



2021 REPORT CARD
FOR AMERICA'S INFRASTRUCTURE
ASCE



STORMWATER

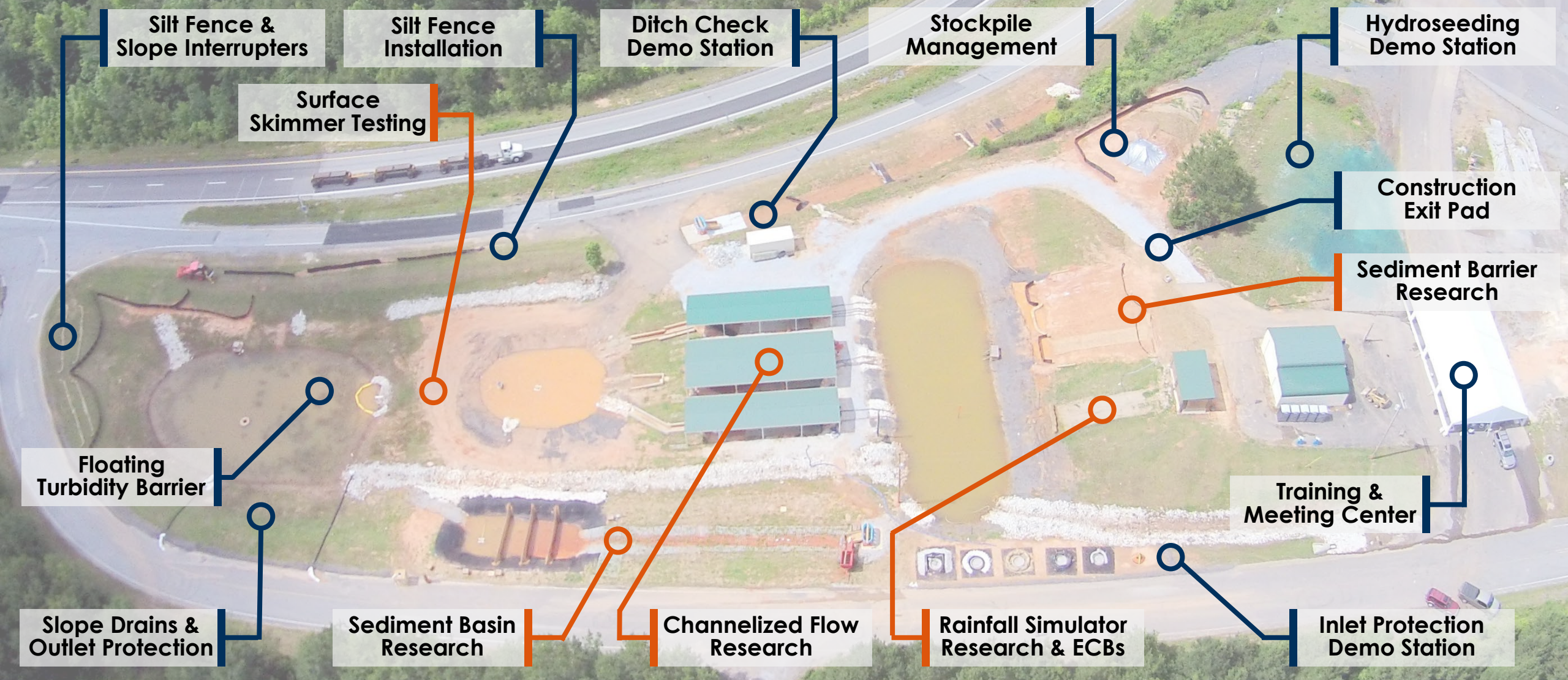
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Craft innovative and practical stormwater management solutions



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Mission

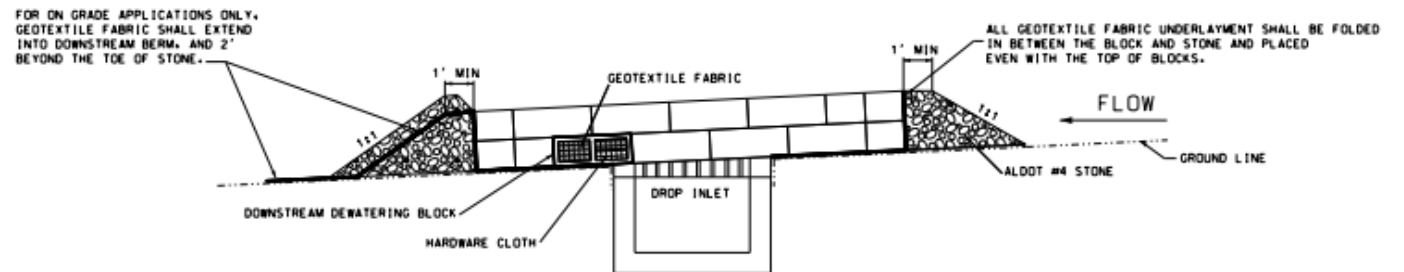
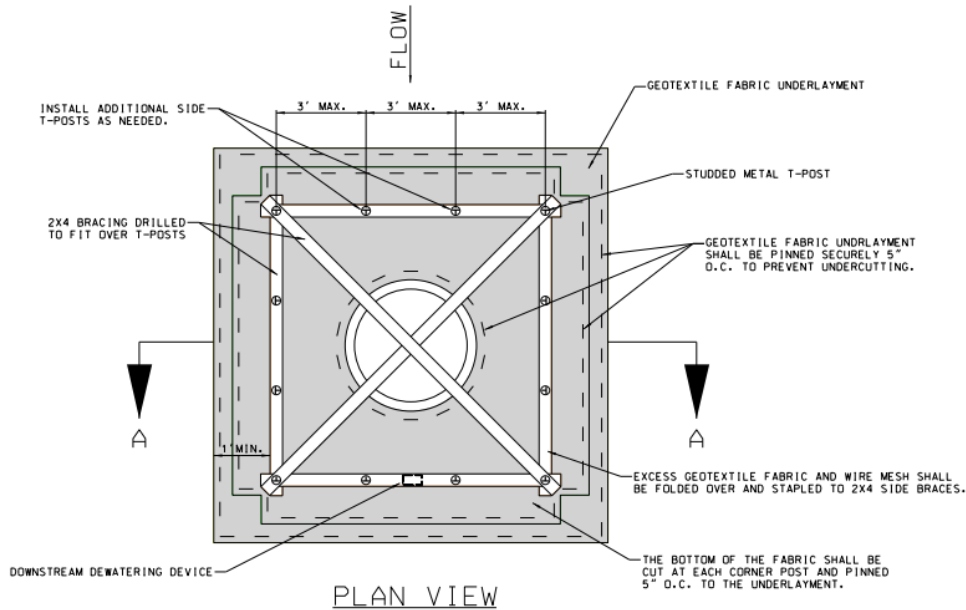
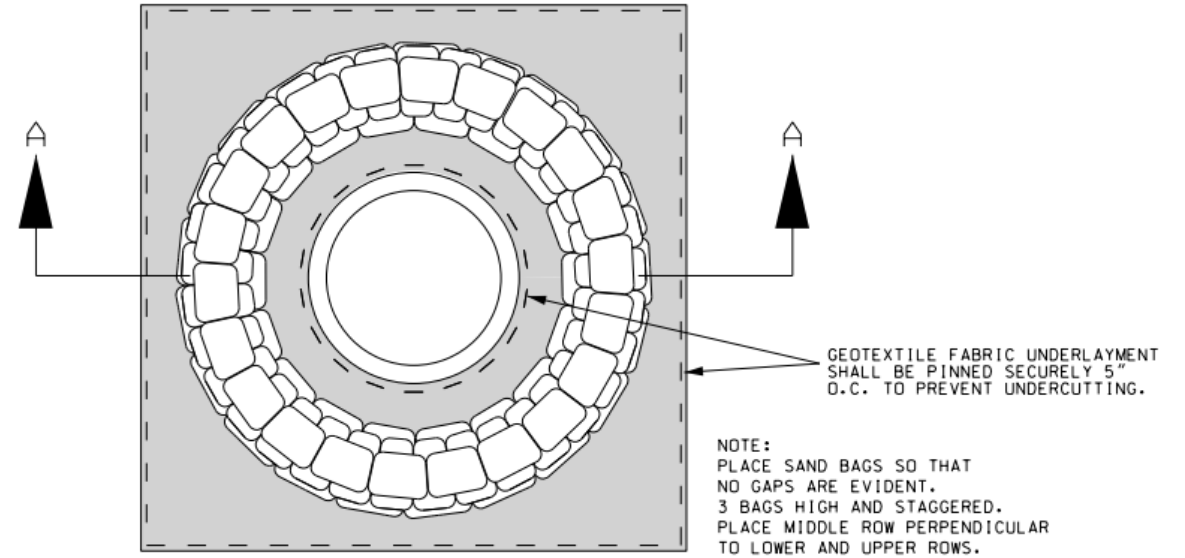
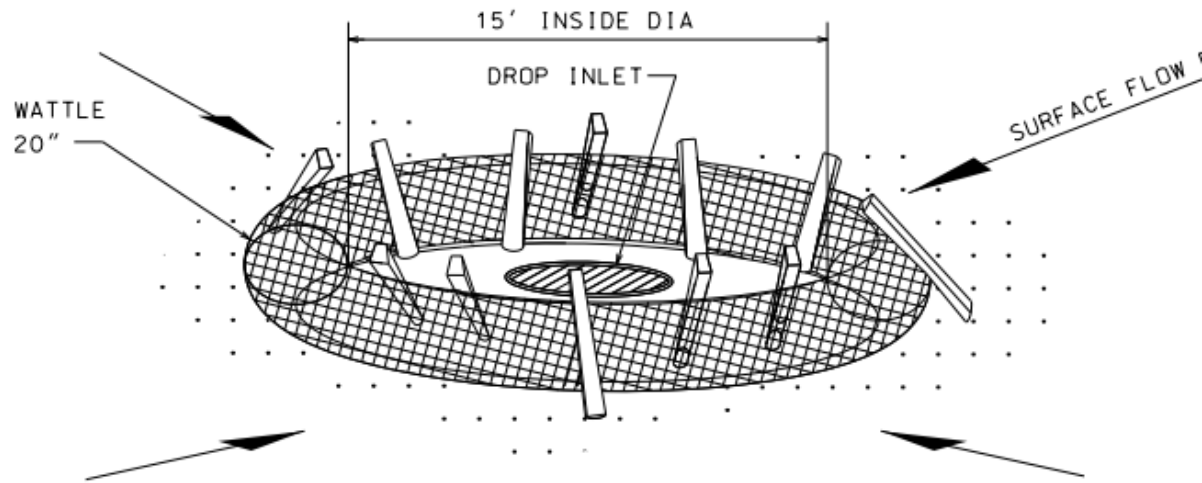
Advance the body of knowledge through Interdisciplinary research, product evaluation, & training



ALDOT INLET PROTECTION RESEARCH



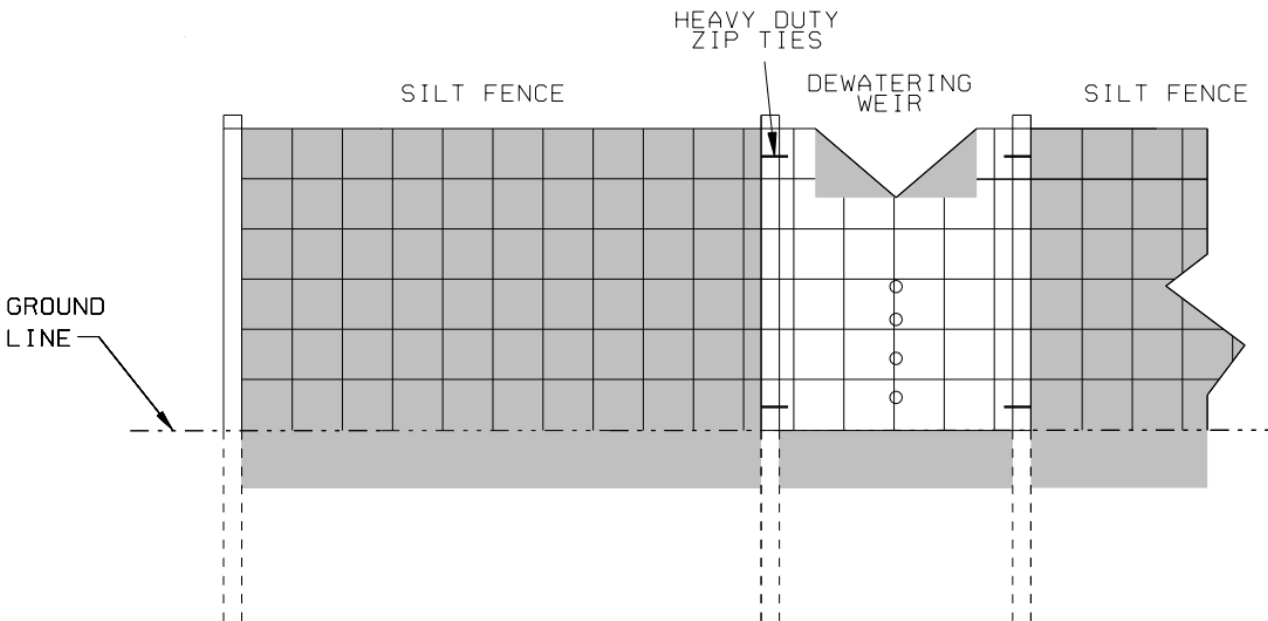
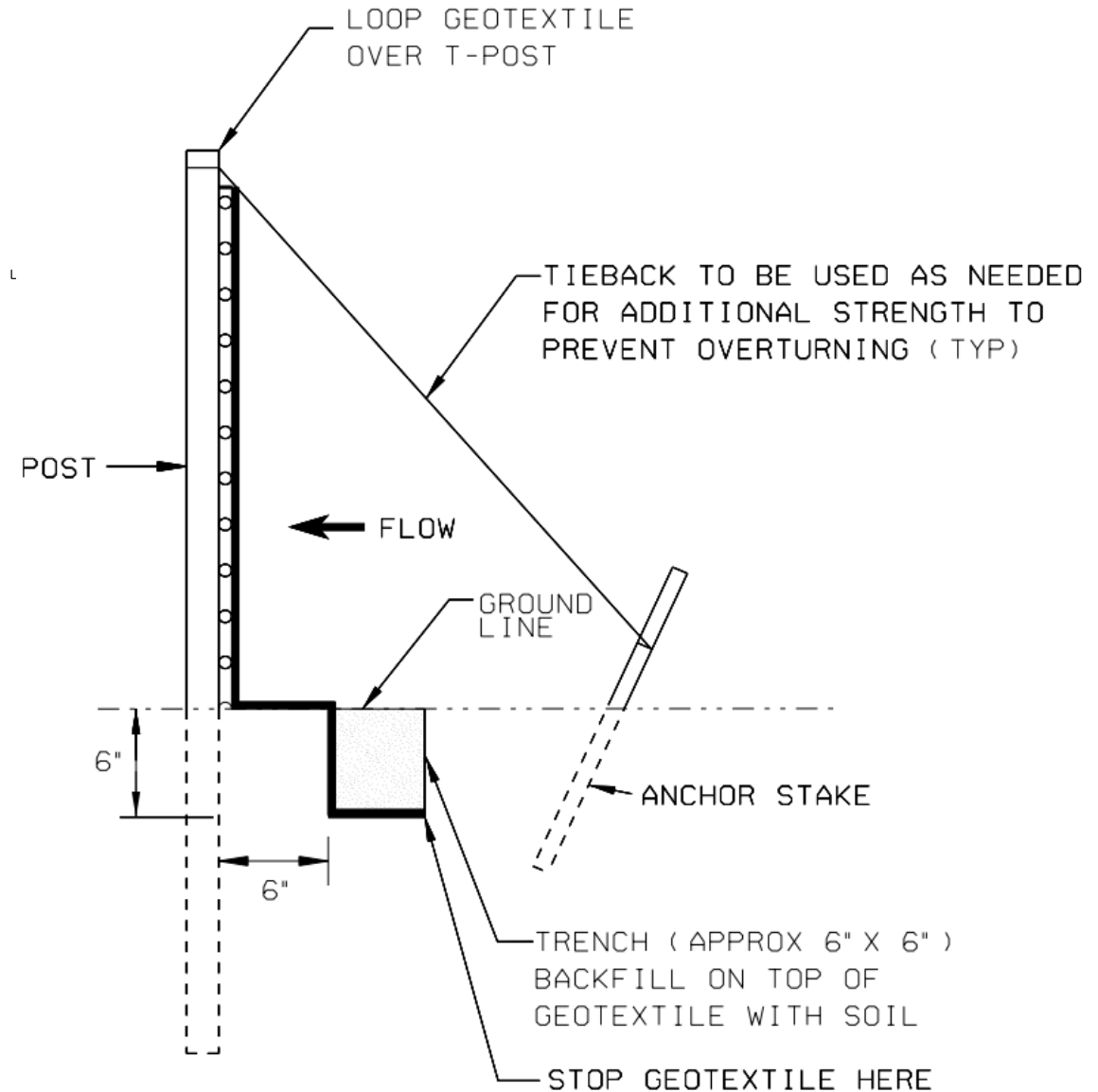
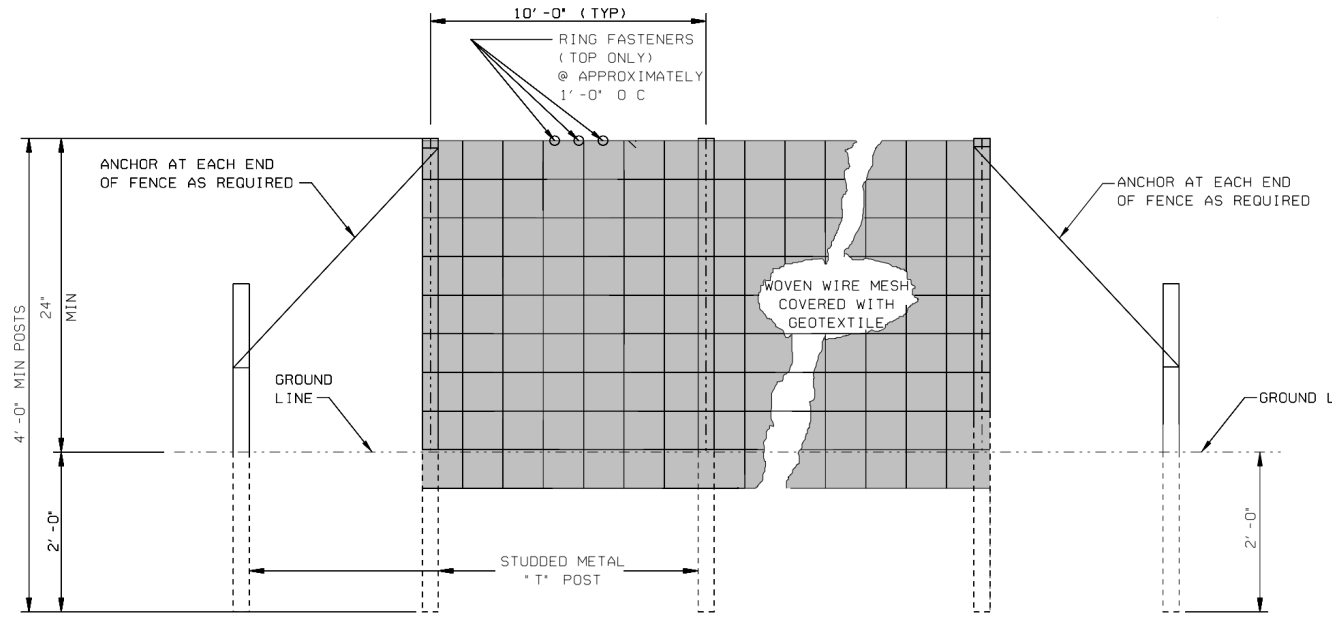
ALDOT INLET PROTECTION DETAILS



ALDOT SILT FENCE RESEARCH



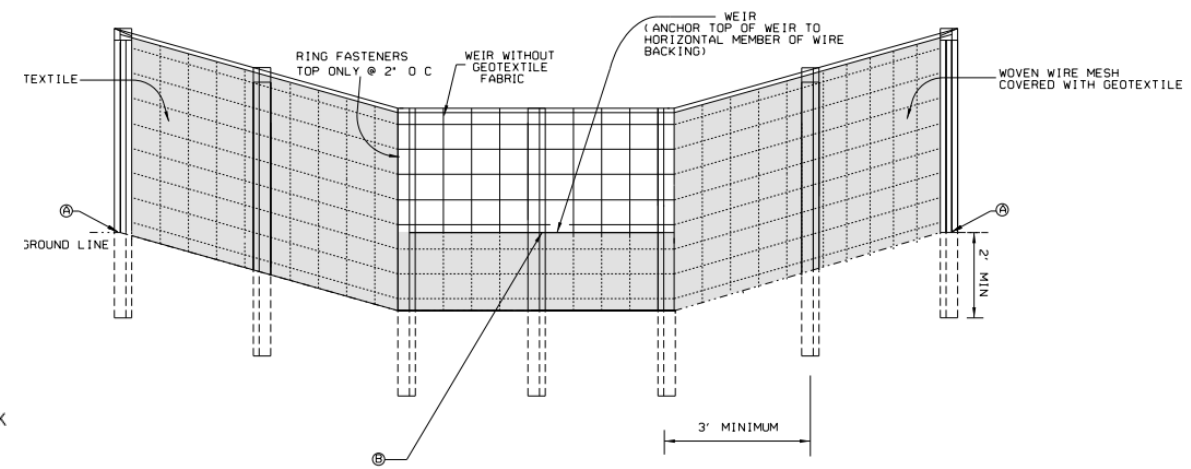
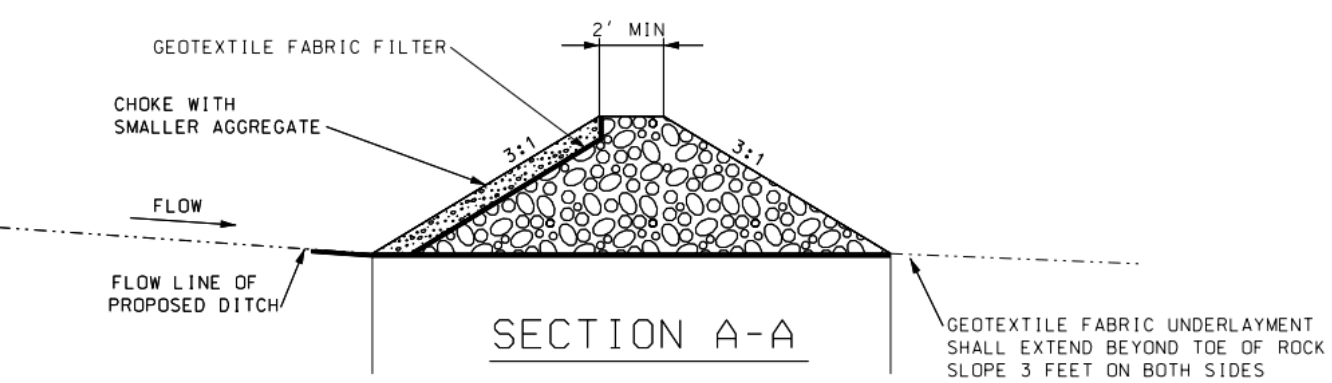
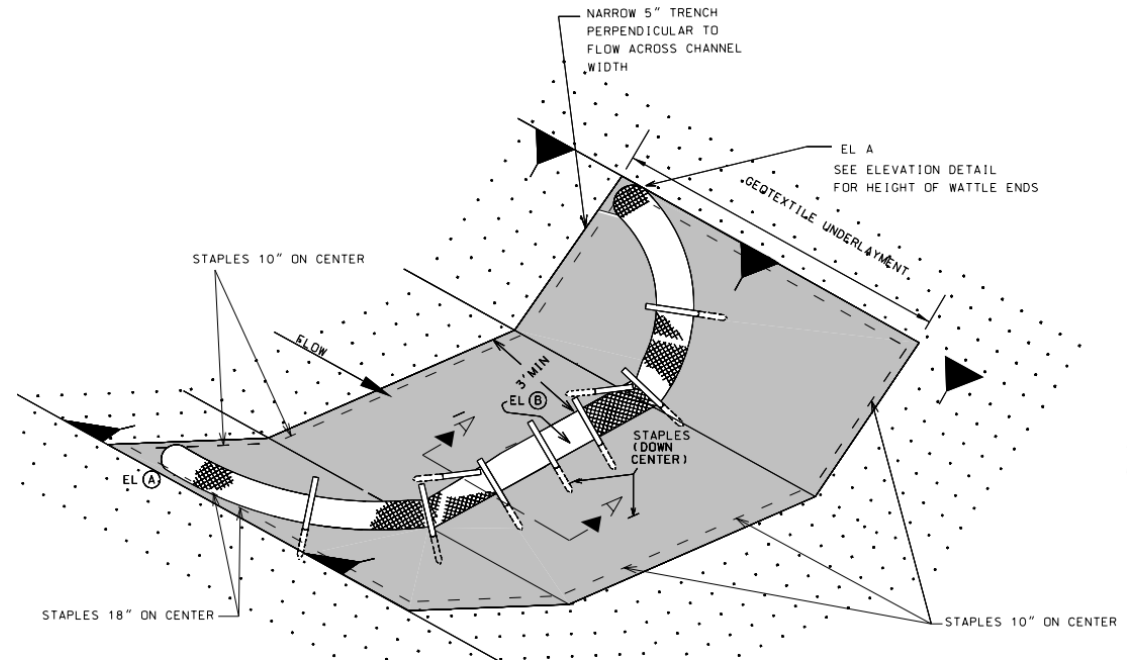
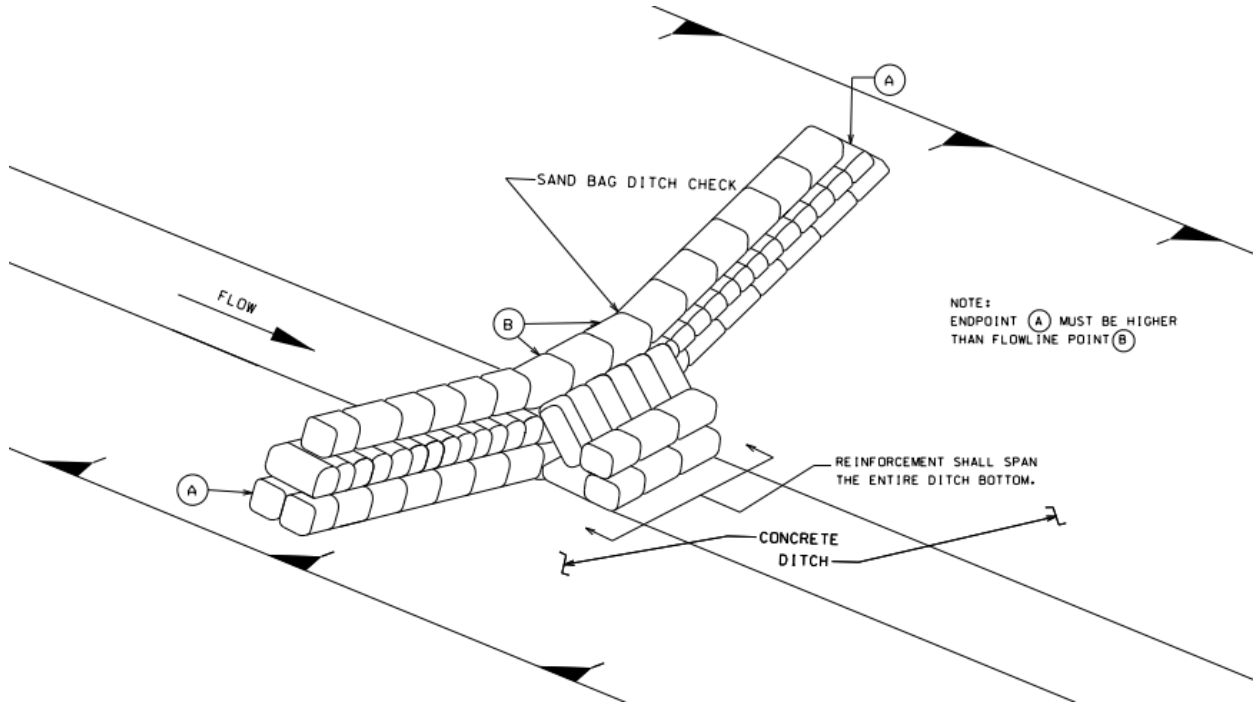
ALDOT SILT FENCE DETAILS



SILT FENCE DITCH CHECK INSTALLATION



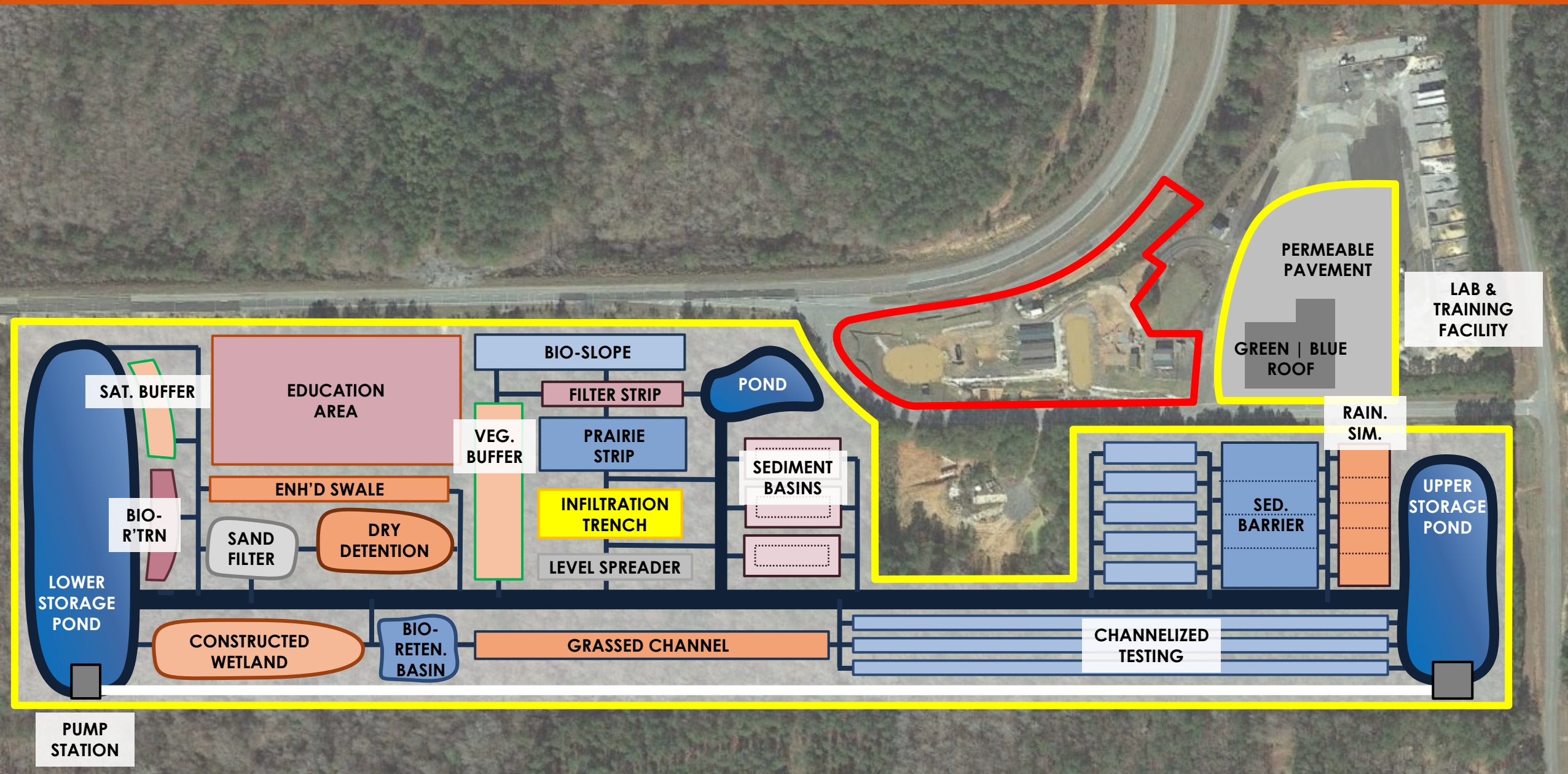
ALDOT DITCH CHECK DETAILS



SILT FENCE DITCH CHECK INSTALLATION – MOBILE, AL



NATIONAL STORMWATER RESEARCH LAB



AUBURN UNIVERSITY
EROSION & SEDIMENT CONTROL
TESTING FACILITY
- PROPOSED EXPANSION -

9/17/2019

LEGEND

- PROP. POND
- 5 FT CONTOURS
- 1 FT CONTOURS
- PARCEL
- EPHEMERAL
- INTERMITTENT
- WETLAND
- BUFFER



Lower
Storage Pond

Iowa DOT Channel

Upper
Storage Pond

ALDOT Rainfall
Simulators



CURRENT RESEARCH: RAINFALL SIMULATION

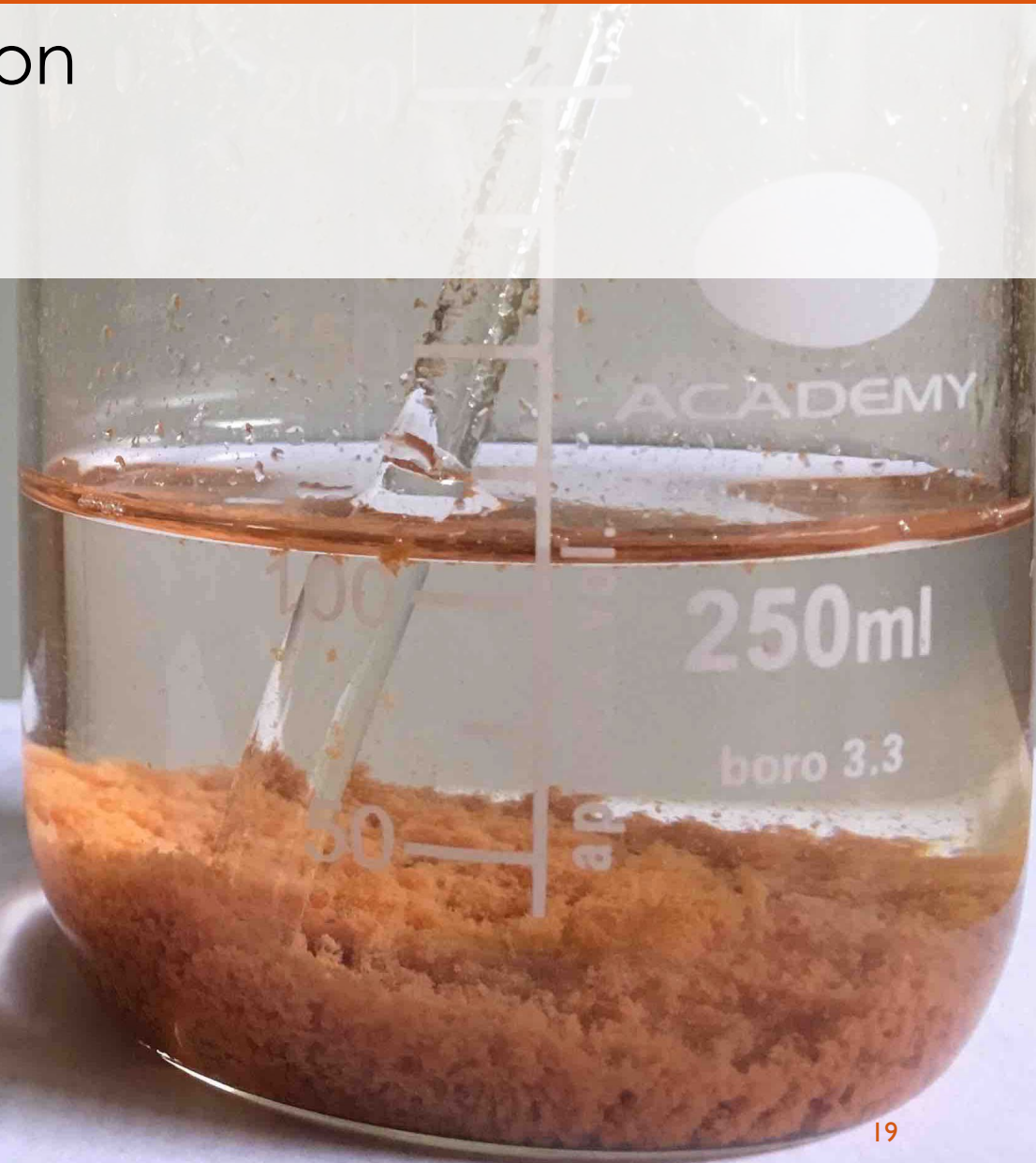
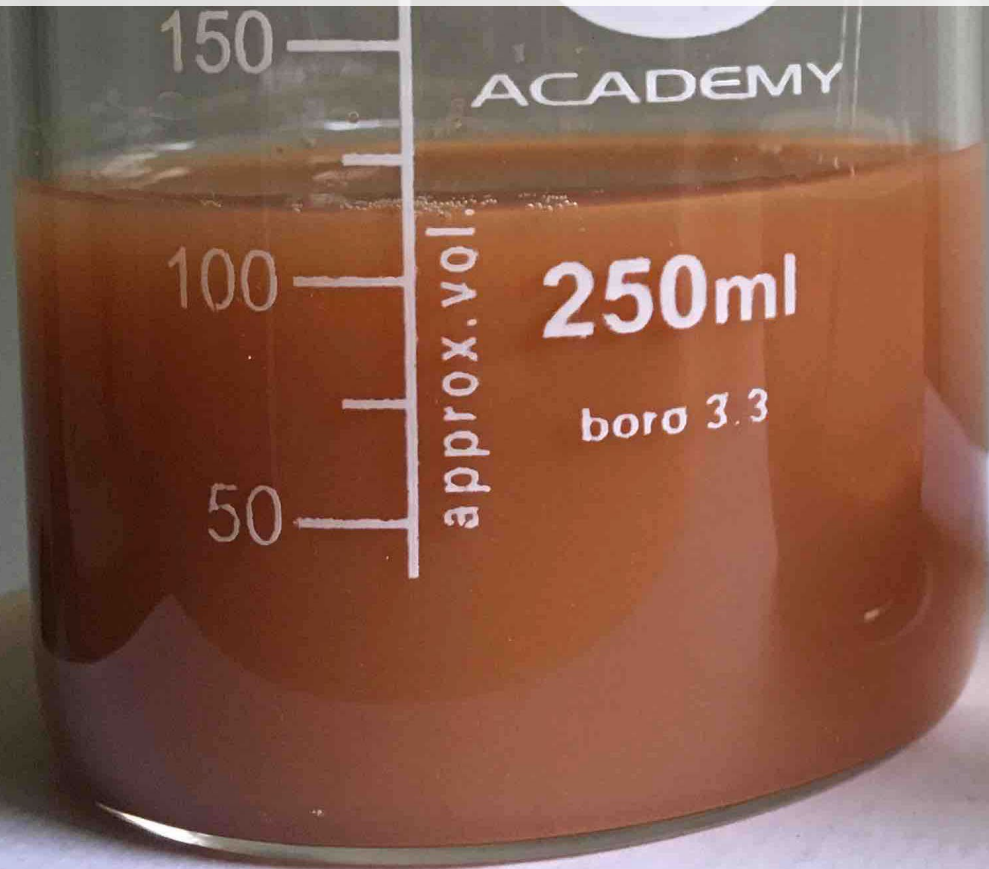


CURRENT RESEARCH: FLOCCULANT GUIDANCE

- **Develop best practices for use**
 - **design-based guidance**
 - **provide more effective and responsible use on job sites**
- **Performance of market-available products and practices**
- **Determine optimum dosage requirements and delivery mechanisms**

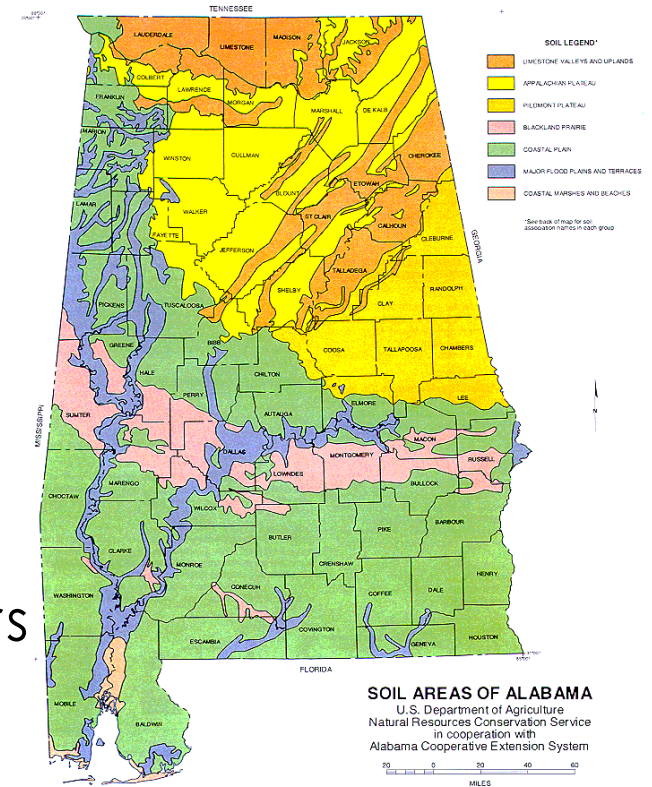
FLOCCULANTS

- Facilitate coagulation and flocculation
- Increases sedimentation rate
- Decreases detention time



BACKGROUND SUMMARY

- ALDOT relies on passive dosing of flocculants
- Requires regular maintenance and reapplication
- Some flocculants are soil specific and require soil testing
 - 460 named soil series in Alabama within 7 primary areas
 - High variability in soils across a construction site
- ALDOT currently recognizes 5 approved manufacturers
 - Manufacturers provide dosage guidance



This project aims to develop guidance for the use of flocculants on Alabama roadway construction sites

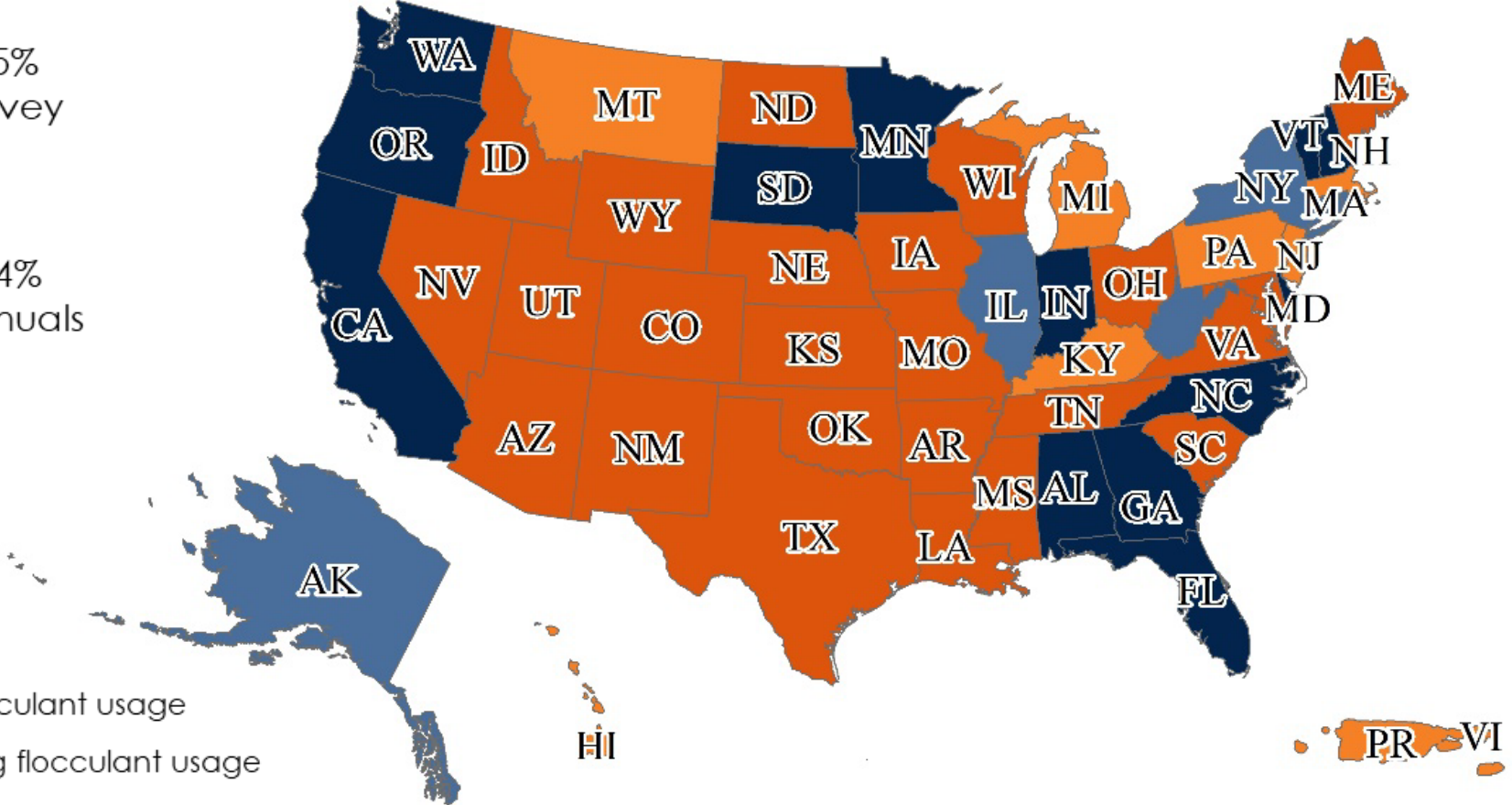
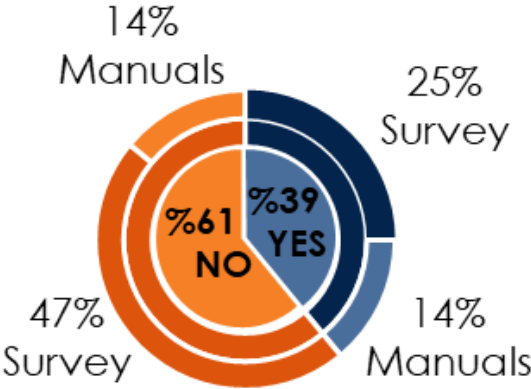
STATE OF THE PRACTICE SURVEY

- Qualtrics XM Online Survey
- June - July 2020
- 51 SHAs
- 3 distribution cycles
- 13 multiple choice questions:
 - 3 for SHAs that do NOT use flocculants
 - 10 for SHAs that use flocculants
- Participant number: 37



PRELIMINARY RESULTS- STATE OF THE PRACTICE SURVEY

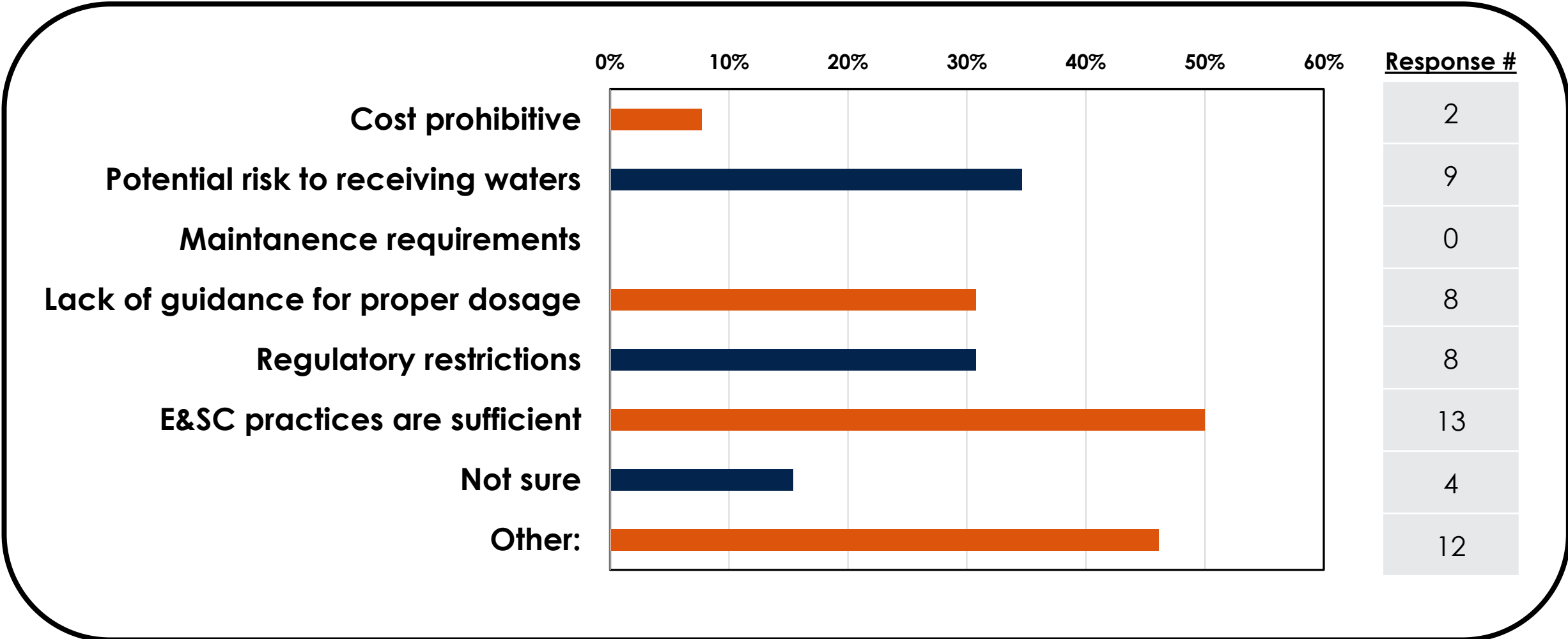
Does your agency use chemical flocculants on active construction sites for treating stormwater runoff?



- Participating SHAs allowing flocculant usage
- Non-participating SHAs allowing flocculant usage
- Participating SHAs not allowing flocculant usage
- Non-participating SHAs not allowing flocculant usage

PRELIMINARY RESULTS- STATE OF THE PRACTICE SURVEY

Why are flocculants not used by your DOT?

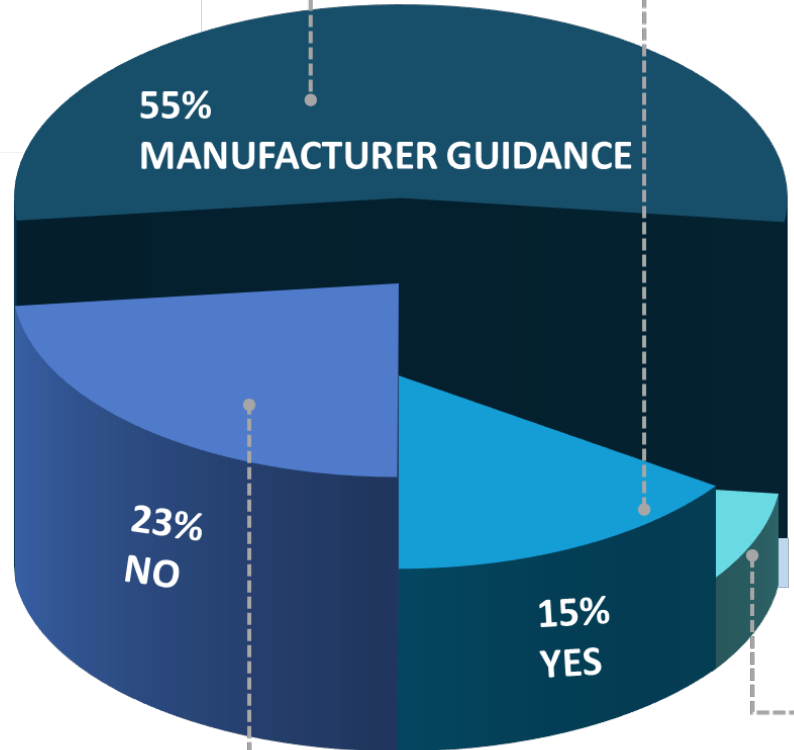


PRELIMINARY RESULTS- STATE OF THE PRACTICE SURVEY

Has your agency developed standard guidance on dosage or application rates?

7 of the DOTs relies on manufacturer guidance for dosage and application rates

2 of the DOTs have their own standard guidance for dosage and application rates



3 of the DOTs do not have a standard guidance for dosage and application rates

1 of the DOTs follows toxicology limits

PRELIMINARY RESULTS- SOIL ASSESSMENT

SOIL SAMPLING LOCATIONS

- **NORTH** – SR-25 Roadway Relocation Etowah Cty. (RAEDAA-0025(556))
- **WEST CENTRAL**- Bridge Replacement on SR-6 Bibb County (BR-0006(573))
- **EAST CENTRAL**- Roadway Improvement and Bridge Widening on I-65 Shelby County(NHF-IMF-I065 (354))
- **SOUTHWEST**- U.S. 98/ SR-158 Extension Mobile Cty. (NHF 0158 (502)&(508))
- **SOUTHEAST**- Bridge Replacement on SR-6 at Jenkins Creek Montgomery Cty. (BR-0006(563))

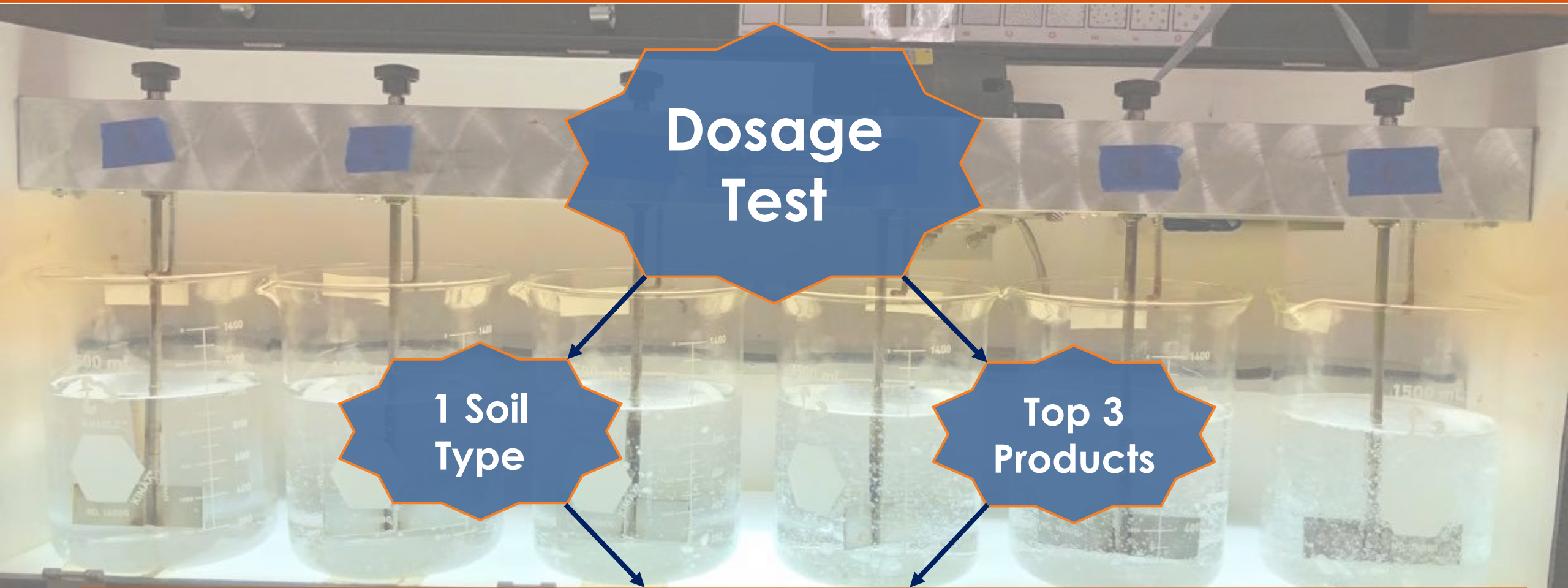


PRELIMINARY RESULTS-MATCH TEST

SOIL TYPE	PRODUCT	SOIL TYPE	PRODUCT
ETOWAH-9	D	Mont_Loc1	F
	E		K
	K		A
ETOWAH-18	E	Mont_Loc2	E
	F		F
	A		A
ETOWAH-43	F	SHELBY TsE	E
	K		F
	A		A
MOBILE_WaB	F	SHELBY TtE	F
	K		J
	J		A
MOBILE_BeB	E	BiBB_MIA	N
	F		G
	A		H
MOBILE_MaD	B	BiBB_CmA	A
	F		D
	A		A

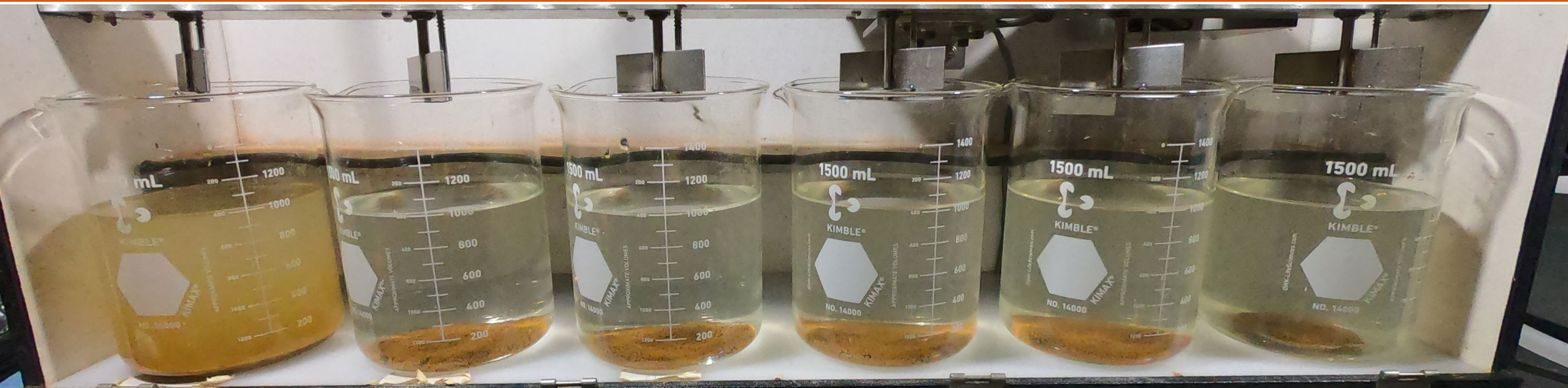
Match Test Results

DOSAGE TEST



Dosage ranges between 0% to 200% of the manufacturer recommendation.

PRELIMINARY RESULTS- DOSAGE TEST



0%

20%

40%

80%

100%

200%

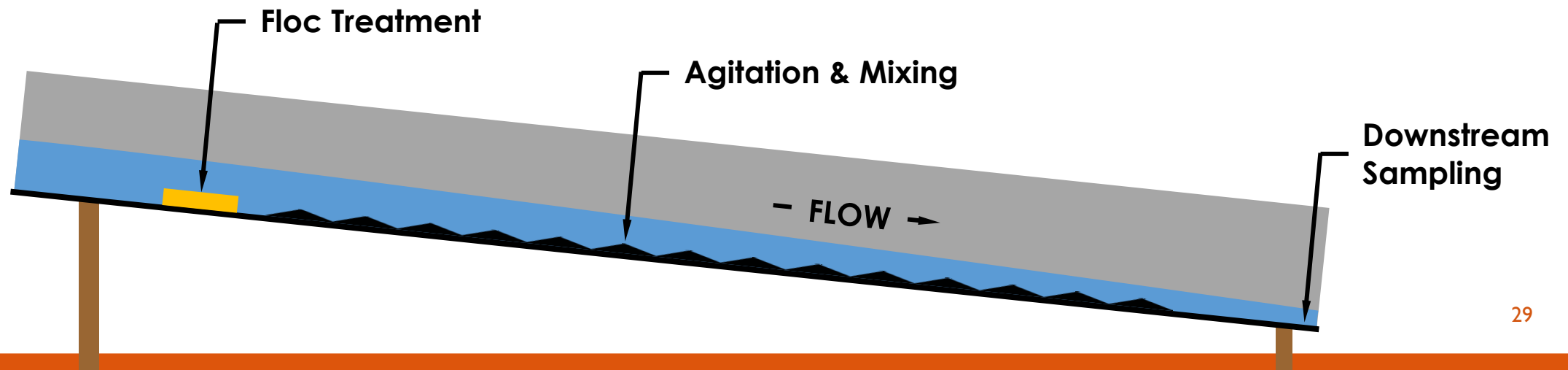


Dosage Test

Manufacturer dosage recommendation

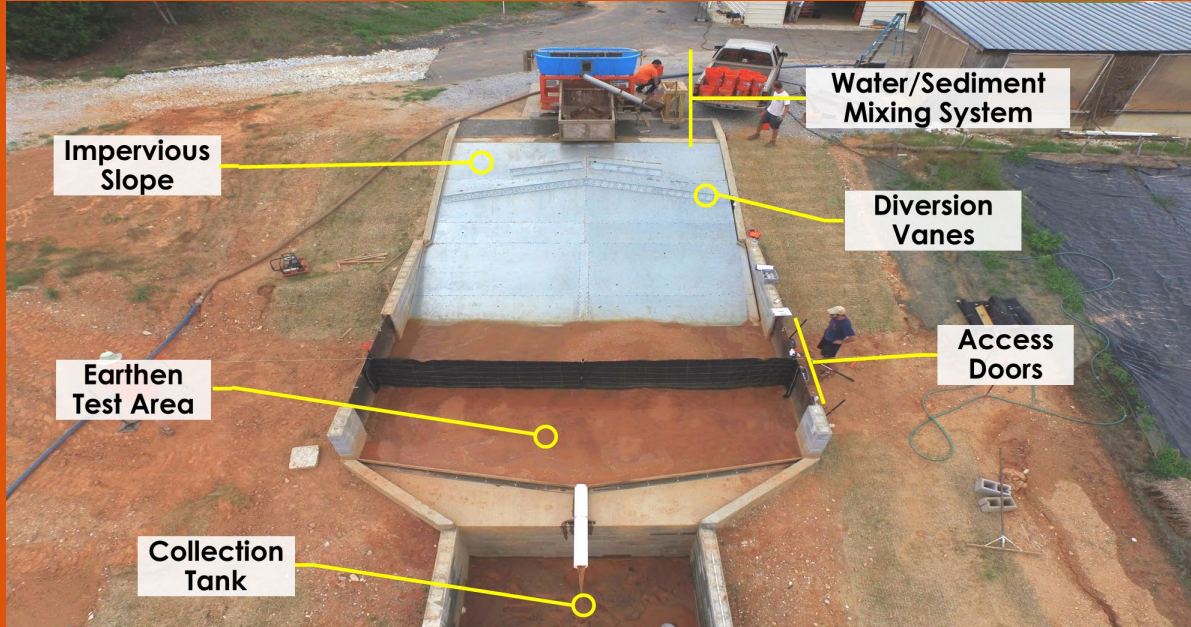
FUTURE TASKS- FLUME TESTING AT THE AU-ESCTF

- Construct 40 ft long flume (1ft x 1ft)
- Delivery of optimum dosage
- Floc delivery method
- Agitation and mixing requirements
- Longevity of treatment method
- Total tests: 72



FUTURE TASKS- LARGE SCALE TESTING

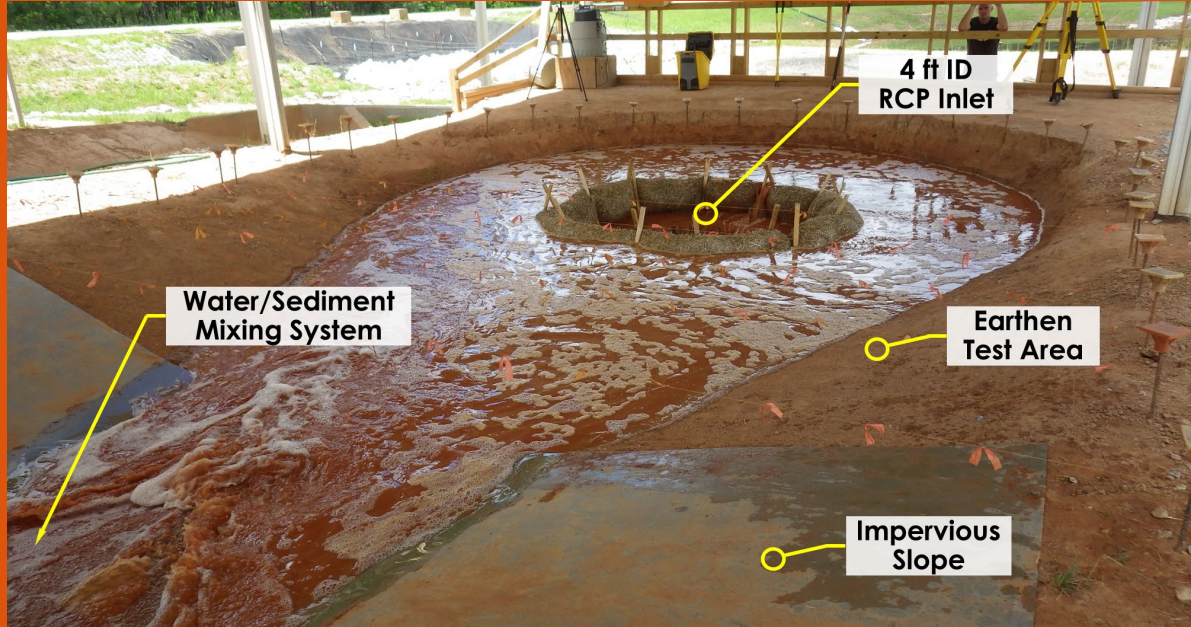
SEDIMENT BARRIER



DITCH CHECK



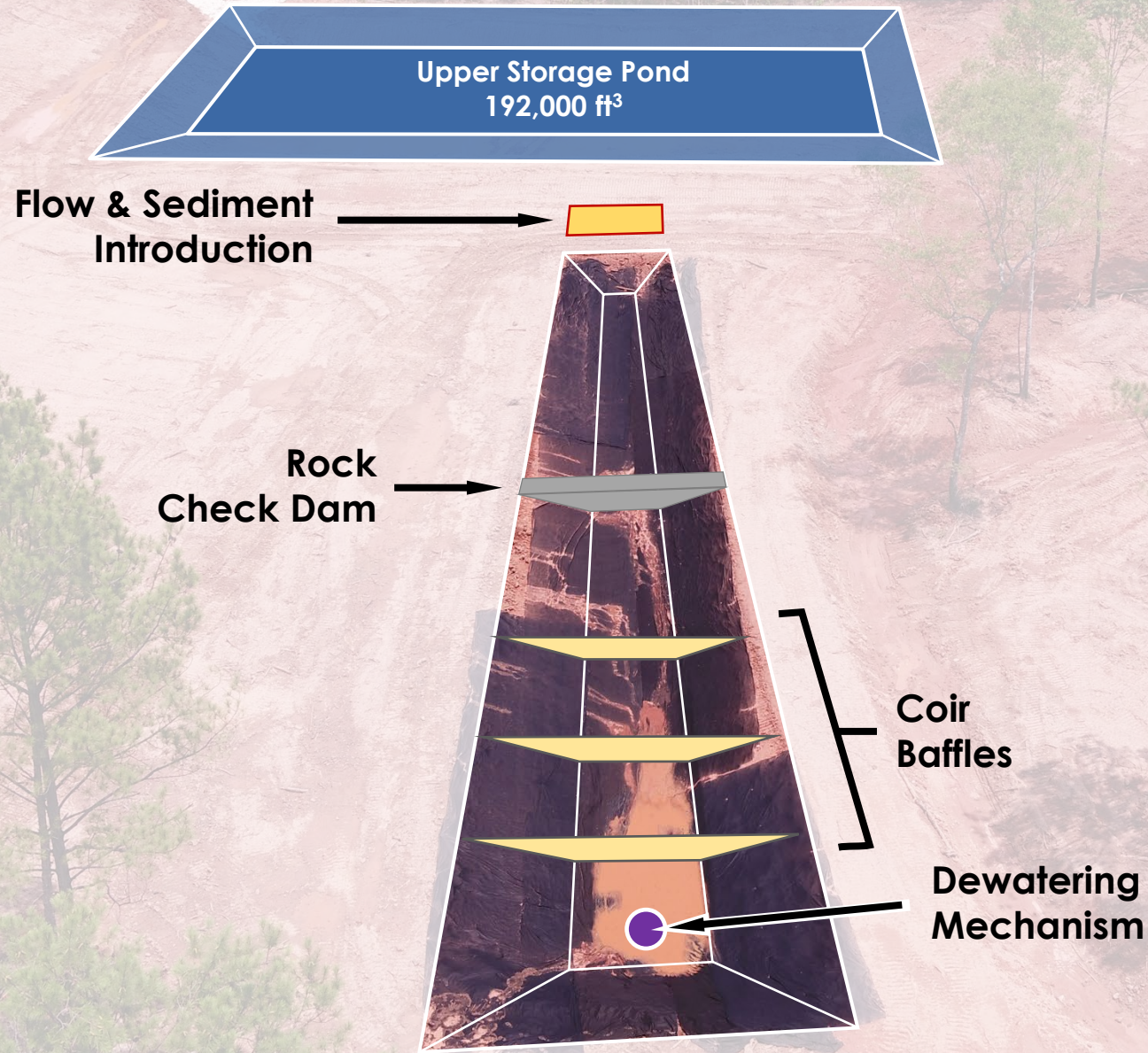
INLET PROTECTION



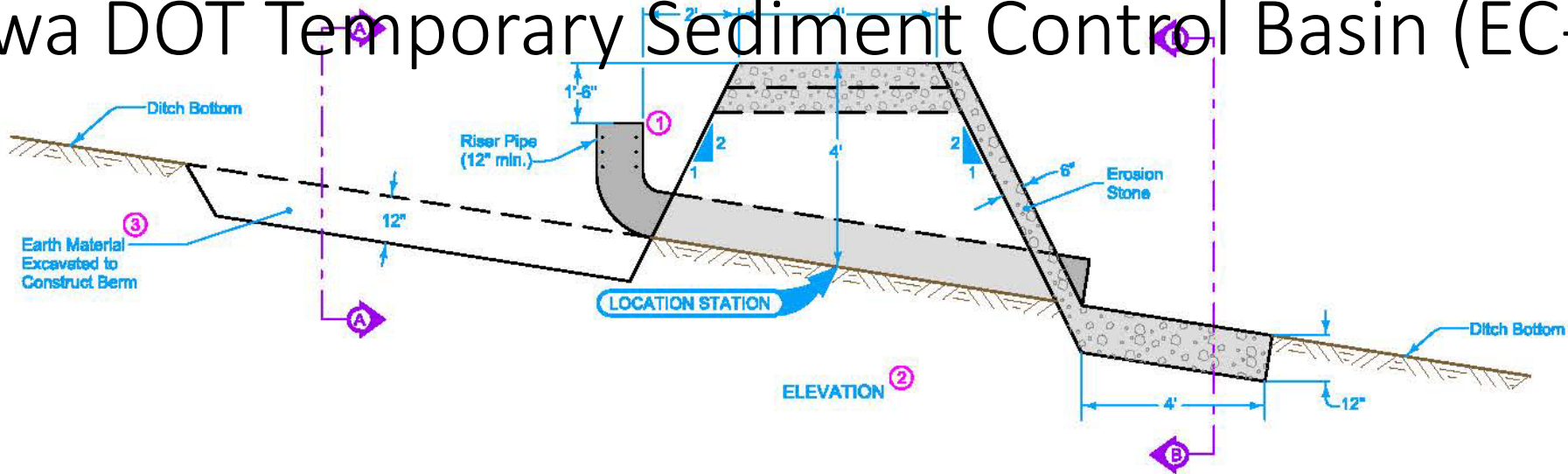
SEDIMENT BASIN



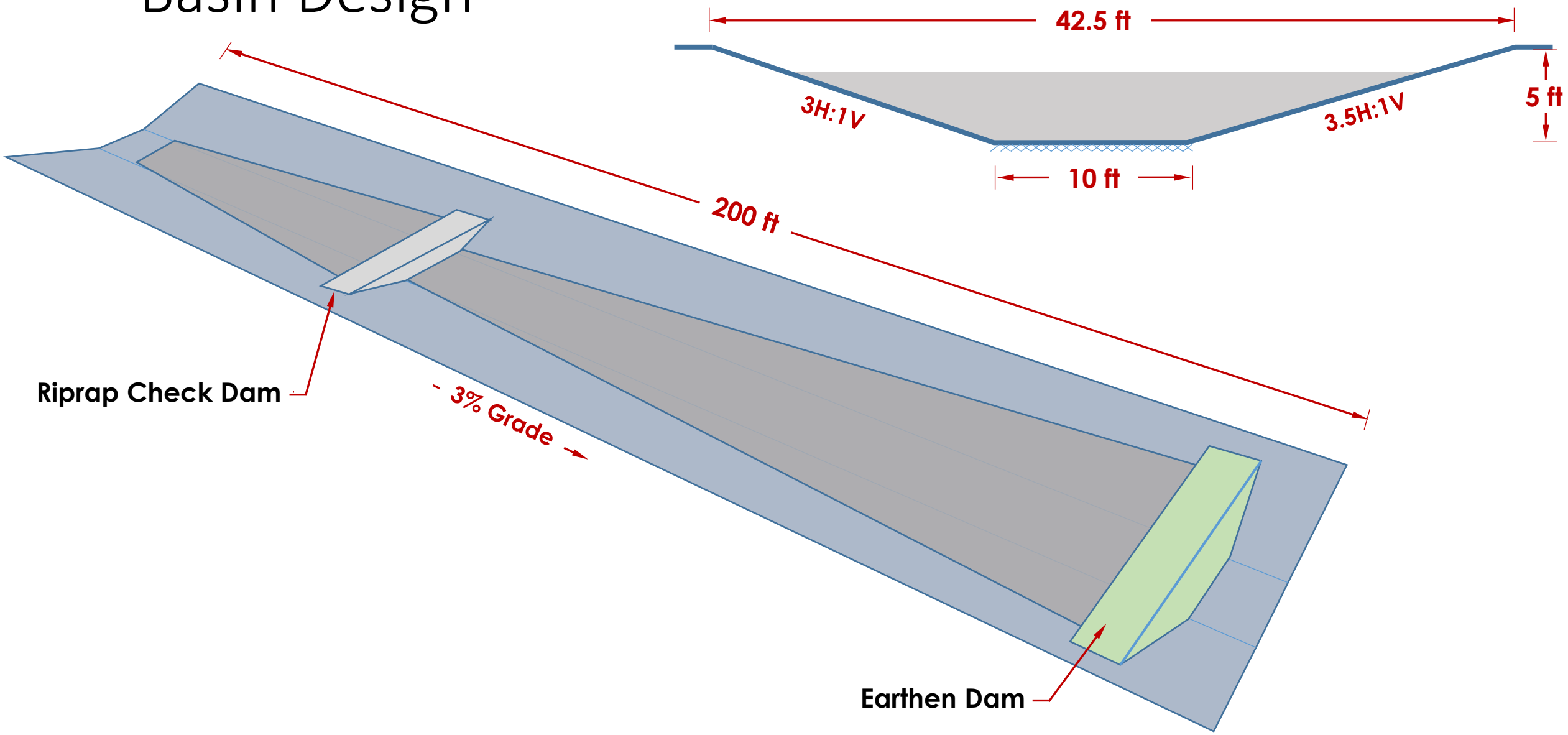
CURRENT RESEARCH: SEDIMENT BASINS



Iowa DOT Temporary Sediment Control Basin (EC-601)



Basin Design





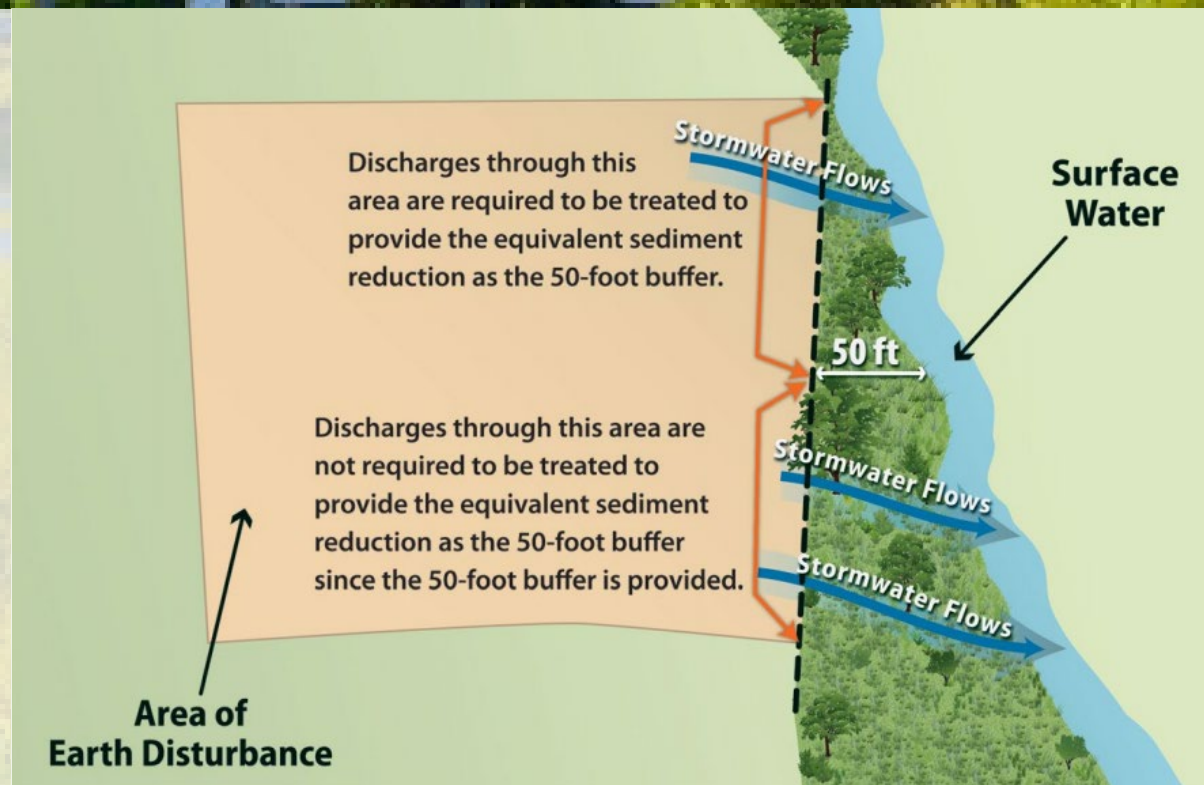
Pre-test soil classification



50 FT BUFFER REQUIREMENT – NDEE & U.S. EPA

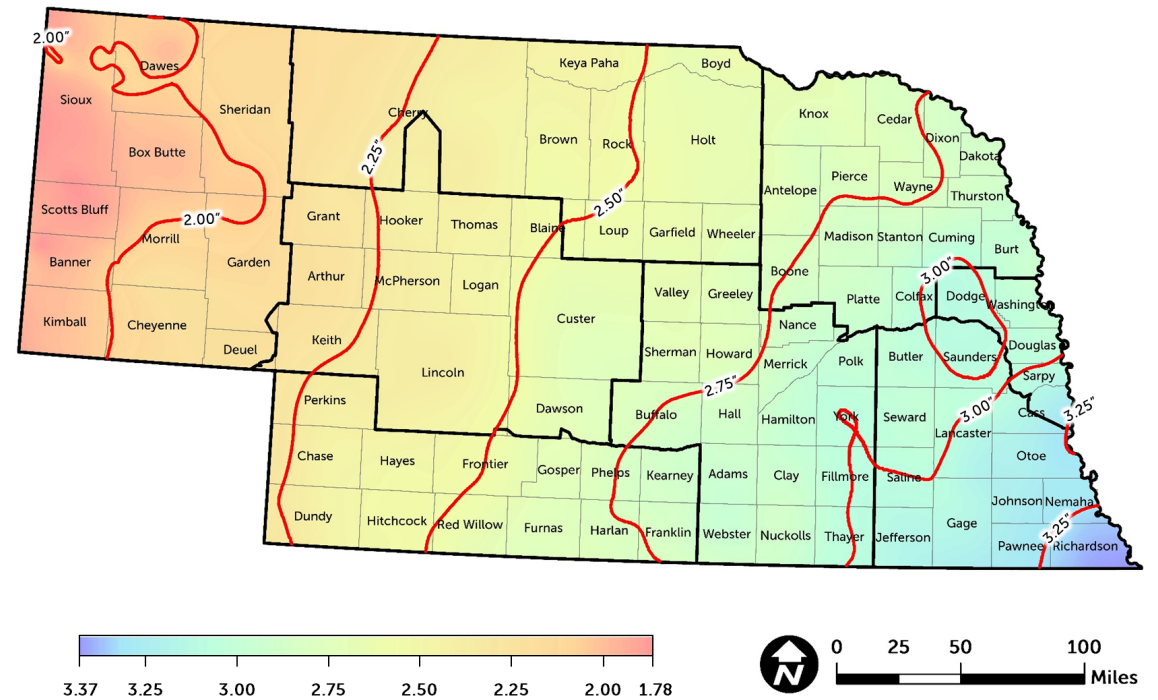
A 50 ft buffer is required between construction activity and WOTUS. If infeasible, then BMPs must achieve equivalent stormwater treatment to a 50 ft buffer.

- **Option 1:** 50 ft buffer
- **Option 2:** >50 ft buffer + additional E&SCs
 - Together achieves sediment load reduction of a 50 ft buffer
- **Option 3:** E&SCs that achieve sediment load reduction equivalent of a 50 ft buffer



LARGE-SCALE TESTING METHODOLOGY

- Flow and sediment introduction rate calculated based on common conditions observed on NDOT construction sites
- Modified ASTM D7351-13 Testing Apparatus



PRODUCT EVALUATION



Conduct third-party, independent, performance-based testing to evaluate manufactured devices/practices

PRODUCT EVALUATION PARTNERS



FLOOD-CON

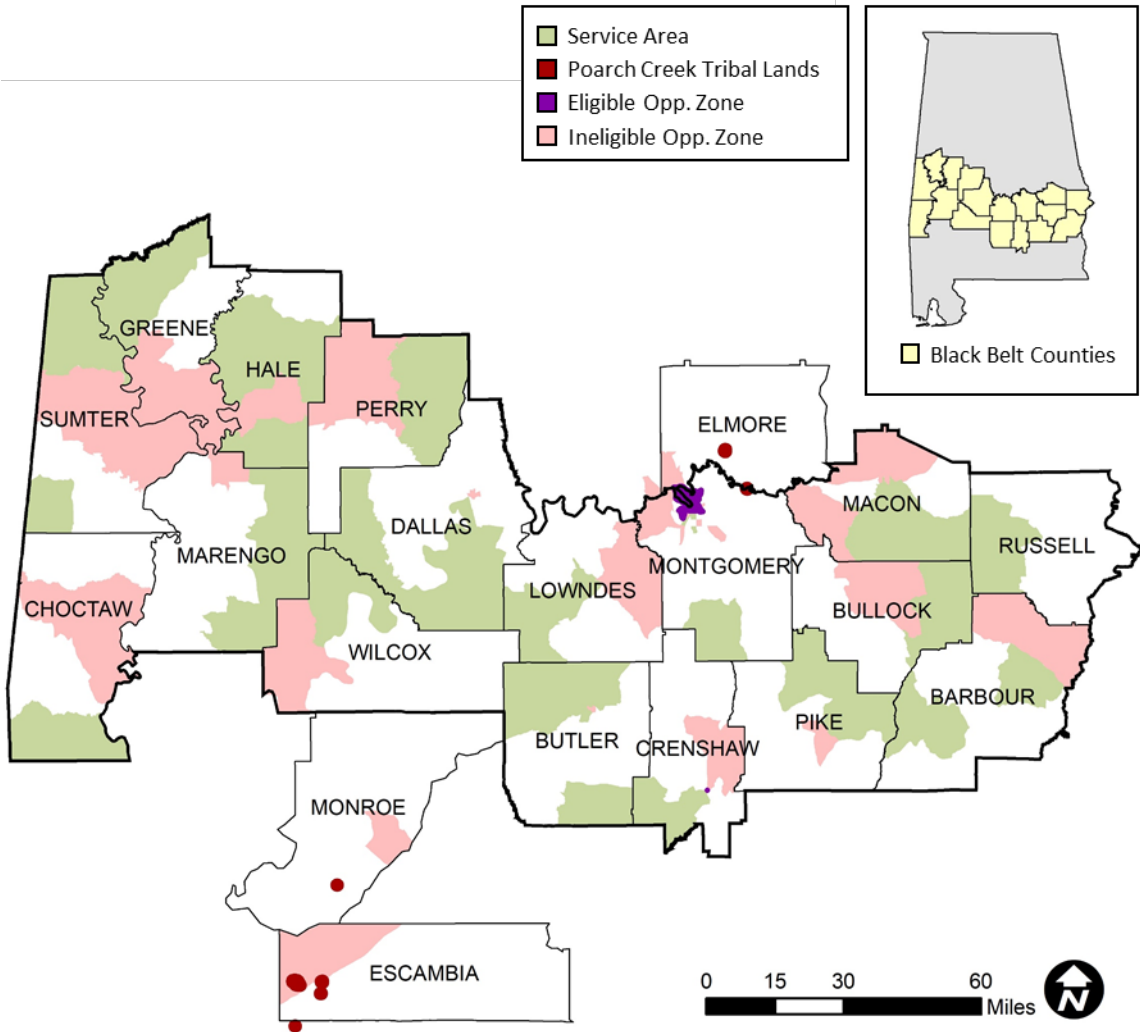
Faircloth
Skimmer.



TRAINING & OUTREACH



RESEARCH: IMPLEMENTATION & OUTREACH





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IECA 
International Erosion Control Association
Protecting Soil and Water Resources

2021 Auburn University E&SC Installer Training | Nov 17 - 18



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International Erosion Control Association
Protecting Soil and Water Resources

2021 Auburn University Erosion & Sediment Control Field Day | Nov 19

BRANDING & MARKETING

Stormwater Testing Facility

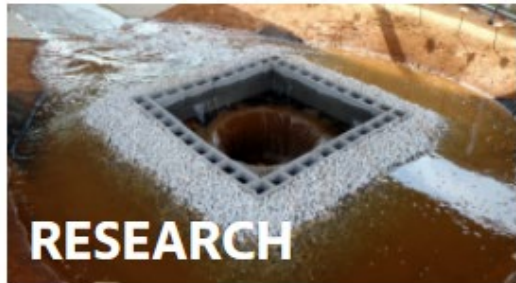
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Upcoming Events

- **Date** - Event name
- **Date** - Event name
- **Date** - Event name

No upcoming events.]



News and Updates

- New Publication Alert: Hydraulic Performance Evaluation of

Contact Us

stormwater@auburn.edu

Stormwater Testing Facility:
1600 Lee Rd. 151
Opelika, AL 36840

Dr. Mike Perez
mike_perez@auburn.edu
(334) 844-6267

Dr. Wesley Donald
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- 0:22
- 0:26
- 1:20
- 0:34
- 0:50

AU - Erosion & Sediment Control Testing Facility

23 Tweets



AU - Erosion & Sediment Control Testing Facility
@StormwaterAU

The AU-ESCTF is an Auburn University research center focused on providing research, testing, and training for the erosion and sediment control industry.

📍 Auburn, AL 🌐 eng.auburn.edu/research/cente... 📅 Joined April 2021

Tweets by @StormwaterAU



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Jacob & 3 other connections work here • 6 employees

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See all details

Upcoming events

Erosion & Sediment Control Installer Training
Wed, Nov 17 - Thu, Nov 18
Veronica Ramirez, PE, Madison Moreman and 3 other attendees

Erosion & Sediment Control Field Day
Fri, Nov 19, 8:00 AM
Madison Moreman and 1 other attendee

Page posts

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Perry's Erosion and Sediment Control Tip of the Day: ...see more



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