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Effective Ditch Check Designs

- Protecting from erosion at the ditch check and channel interface is key.
- Wattles using nondestructive staking and sod staples are best.
- Plan for flow rates:
  - Wattles only up to 1.0 to 1.25 cfs in steep channels.
  - Riprap and silt fence w/ weir for greater than 1.25 cfs.
- Use a choker with riprap to increase low flow treatment performance.
- Sandbags require middle row to be turn parallel to flow w/ additional support bags in the middle.
Effective IPP Designs

- Structural reinforcement
  - Adequate Staking, Bracing
- Provide for overtopping
  - Dedicated Spillways, Weirs
- Prevent undercutting
  - Stapling, underlay, material pinning
- Efficient dewatering mechanism
  - Minimize flood hazard

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**M8 TRENCH OFFSET**

**DEWATERING WEIR**

**SEDIMENT BARRIER RESEARCH**

1. **DEVELOP A METHODOLOGY AND CONSTRUCT AN APPARATUS FOR EVALUATING SEDIMENT BARRIER PRACTICES**
   - Based on ASTM D7311
   - Incorporates regional hydraulic and sediment loading

2. **EVALUATE ALDOT STANDARD NONWOVEN, WIRE-BACK SILT FENCE AND DEVELOP IMPROVED INSTALLATION METHODS**
   - Identify common failures
   - Develop and evaluate alternative installation strategies
   - Provide installation enhancement recommendations

3. **EVALUATE INNOVATIVE AND MANUFACTURED SEDIMENT BARRIER PRACTICES**
   - Identify and analyze unique perimeter control practices
   - Provide performance based comparisons

4. **EVALUATE COMMON GEOFABRIC USED IN SILT FENCE APPLICATION**
   - Identify hydraulic and sediment retention capabilities
   - Quantify water quality improvements

**SEDIMENT BASINS**

**SEDIMENT BASIN TESTING**
SEDIMENT BASIN TESTING

CATCH BASIN INSERT TESTING

TESTING FLOW RATES

<table>
<thead>
<tr>
<th>Flow Rate (ft³/s)</th>
<th>Weight of Sediment Introduced (lb.)</th>
<th>Weight of Sediment Retained (lb.)</th>
<th>Percent Retained (%)</th>
<th>Average Upstream TSS (lb./ft³)</th>
<th>Average Downstream TSS (lb./ft³)</th>
<th>Average TSS Removal (%)</th>
<th>Start of Overflow (min.)</th>
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</tbody>
</table>

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**CONTROL TEST RAINFALL INTENSITIES – SANDY LOAM**

- 2 in/hr
- 4 in/hr
- 6 in/hr

Total sediment loss = 688 lb

**PHASE I INITIAL RESULTS**

- Calibration and validation of existing simulator is complete
- Temporary erosion control practices evaluated
  - Blown straw
  - Crimped straw – performed poorly initially compared to blown straw
  - Tacked straw – performed well initially compared to blown straw
- Hydraulic mulch testing underway – likely not meeting ALDOT product performance requirements
- Rolled erosion control products testing pending
- NTPEP certification pending

**AU - EROSION & SEDIMENT CONTROL TESTING FACILITY**

- Surface Erosion Testing
- Sediment Basin Research
- Controlled Flow Research
- Sediment Simulator Research & ECUs

**RESEARCH**

- 13 Research Projects
- $2.5 Million in Grants
- 28 Journal Articles
- 37 Conference Proceedings
- 102 Presentations
- 17 Graduate Students
Ten Years of Research at AU - Erosion and Sediment Control Testing Facility

**MAJOR RESEARCH INFRASTRUCTURE**

- Ditch Check Channels
- Inlet Protection Channel
- Sediment Basin
- Inlet Catch Basin
- Sediment Barrier Slope
- Rainfall Simulator Slope
- Surface Skimmer Tank

**AU - EROSION & SEDIMENT CONTROL TESTING FACILITY**

**TRAINING & OUTREACH**

- 11 Training Events
- 7.8 CEU’s
- 915 Total Participants
- 293 ALDOT Participants

**2019 Environmental Excellence Award**

IECA’s premier award, recognizing an outstanding stormwater project, program or operation that demonstrates excellence in natural resource conservation and environmental protection.

**FUTURE RESEARCH: EROSION CONTROL PRACTICES**

- Varying configurations
- Slope, soil type, topsoil
- Develop design-based guidance on practice/product selection

**FUTURE RESEARCH: FLOCCULANTS**

- 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
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