

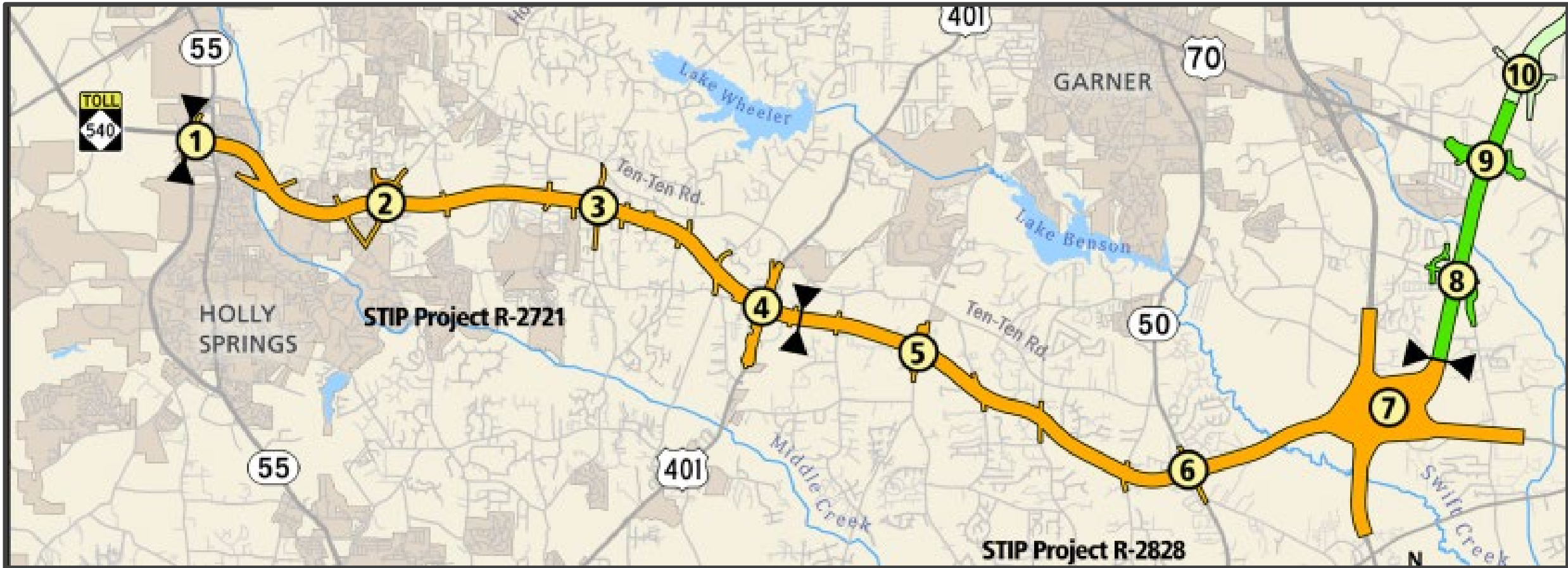
Triangle Expressway Southeast Extension

COMPLETE 540

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Introduction to the Project....



- 1 – NC 55 Bypass in Holly Springs (Interchange)
- 2 – Holly Springs Road in Holly Springs (Interchange)
- 3 – Bells Lake Road in Apex (Interchange)

- 4 – US 401 in Fuquay Varina (Interchange)
- 5 – Old Stage Road in Garner (Interchange)
- 6 – NC 50 in Garner (Interchange)
- 7 – I-40/US 70 in Garner (Interchange)

Estimated Quantities R-2721A

<u>Category</u>	<u>Estimated Qty</u>
Bridge	9 Ea
Culvert	10 Ea
Noise Wall	440,000 Sq Ft
Earth to Move	2,500,000 Cu Yds
Length	4.4 Mi
Silt Fence	71,000 Feet
Permanent Seeding/Mulching	180 Ac
RECP (Coir Fiber Mat, PSRM, Erosion Control Matting)	138,000 Sq Yds
Temporary Slope Drain pipe	10,300 Ft
Skimmer Apparatus (1.5" and 2")	31 Ea
Polyacrylamide	3,500 Lbs
Total Cost	\$187,000,000

Estimated Quantities R-2721B

<u>Category</u>	<u>Estimated Qty</u>
Bridge	12 Ea
Culvert	10 Ea
Noise Wall	300,000 Sq Ft
Earth to Move	2,000,000 Cu Yds
Length	4.9 Mi
Silt Fence	110,000 Feet
Permanent Seeding/Mulching	160 Ac
RECP (Coir Fiber Mat, PSRM, Erosion Control Matting)	238,000 Sq Yds
Temporary Slope Drain pipe	4,600 Ft
Skimmer Apparatus (1.5" and 2")	104 Ea
Polyacrylamide	2,100 Lbs
Total Cost	\$169,000,000

Estimated Quantities R-2828

<u>Category</u>	<u>Estimated Qty</u>
Bridge	27 Ea
Culvert	9 Ea
Noise Wall	200,000 Sq Ft
Earth to Move	6,500,000 Cu Yds
Length	8.6 Mi
Silt Fence	65,000 Feet
Permanent Seeding/Mulching	405 Ac
RECP (Coir Fiber Mat, PSRM, Erosion Control Matting)	605,000 Sq Yds
Temporary Slope Drain pipe	26,000 Ft
Skimmer Apparatus (1.5" and 2")	103 Ea
Polyacrylamide	1,500 Lbs
Total Cost	\$400,000,000

Estimated Total Quantities Complete 540

<u>Category</u>	<u>Estimated Qty</u>
Bridge	48 Ea
Culvert	29 Ea
Noise Wall	940,000 Sq Ft
Earth to Move	11,000,000 Cu Yds
Length	17.9 Mi
Silt Fence	246,000 Feet
Permanent Seeding/Mulching	705 Ac
RECP (Coir Fiber Mat, PSRM, Erosion Control Matting)	981,000 Sq Yds
Temporary Slope Drain pipe	40,900 Ft
Skimmer Apparatus (1.5" and 2")	238 Ea
Polyacrylamide	7,100 Lbs
Total Cost	\$756,000,000

Clearing Phase

~ 930 Acres

~ 350 Ft width

~ 20 Mi length



Typical BMPs

- Perimeter Silt Fence
- Clean Water Diversion
- Temp Stream Crossing



Culvert/Bridge Phase

Typical BMPs

Diversion Channels

Work Trestles

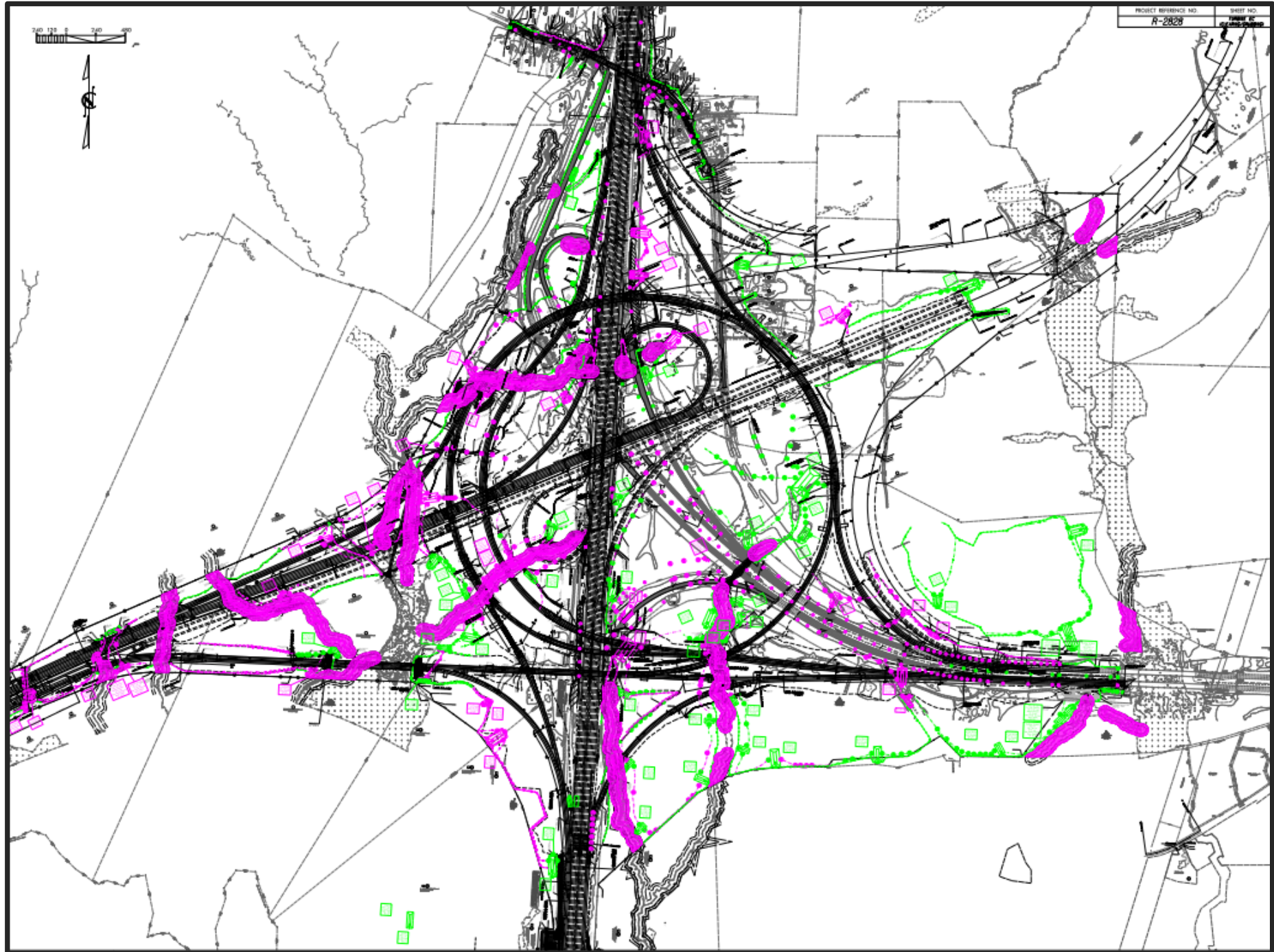
Dewatering



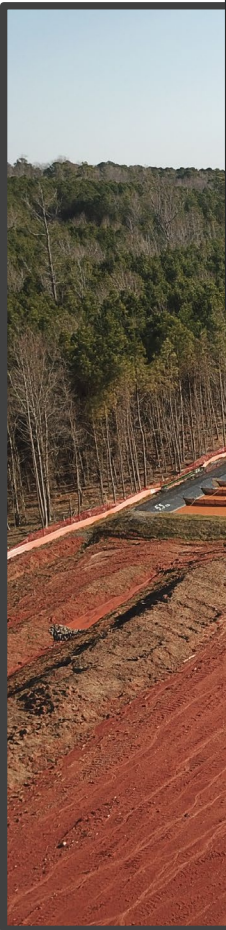
Earthwork phase

Typical BMPs

- Rock Checks
- Silt Fence
- Diversion Ditches
- Slope Drains
- Skimmer Basins
- Groundcover
- Polyacrylamide







Physical Challenges of the project...

Inspection/Administration Staff ~ 60 Consultant Inspection (~ 10 companies)

- Roadway, Structures, ITS

Providing oversight of Jurisdictional impacts

- R-2721A&B: **51** Permitted Areas
- R-2828: **54** Permitted Areas
- R-2828: **1** Archeological Site
- R-2828: **1** Endangered Species relocation (Dwarf Wedge Mussel)

Providing oversight of Clearing and Grubbing operations

Providing oversight of Erosion Control Installation/Maintenance

Providing oversight of Seeding and Mulching Sub Contractor

Provide competent oversight of NPDES/NCGo1 record keeping

- R-2721 A&B: **~200** Stormwater Discharge Outfalls(SDO)
- R-2828: **~300** Stormwater Discharge Outfalls (SDO)

Anticipated Challenges on Projects of this Size

- Design Build
- Tolerances within specifications
- Inability to pay for "extra work"
- Contractor/inspector relationship
- Dance between directing and guiding work



Management Challenges

Coordination meetings *prior* to permit site impacts

- Pre-clearing meetings are held on site
- Additional pre-construction meetings held prior to next phase of construction

Coordinate Erosion Control Designer reviews

- Intermediate EC Plan Design coordinated between the Contractor and Design Partner

Provide review of Vegetation Management Plan submittals

Coordinate weekly NPDES inspection meetings with contractor



Management Challenges

Provide *constant* reminders to management about Environmental Compliance

Provide proper monitoring of Erosion Control Subs

- Primary Responsibility falls on the Contractor Level II Site Supervisor
- Inspection Staff provides secondary oversight

Ensure Contract Specifications/Commitments are being met

- Joint Efforts between the Resident Engineers Office, Division Office, Roadside Environmental, NCTA

Maintain management with Environmental Regulatory Agencies

- Division Coordinates with DWR and ACOE
- Roadside Environmental Coordinates with DEMLR



Unanticipated challenges....

Pandemic

- Personnel Competency and Availability
- Material unavailability (slope drains, seed, etc...)
- Lack of personal relationship development
- Training restrictions

Increased Reliance on Sub Contractors

Communication – “Trickle Down”

Wet soil conditions (ground water and weather related)

Soil pH and fertility challenges

Lack of experience

Right of Way acquisition delays



Possible paths to meeting those challenges

Increased Use of New Technology

Improved communication

- Weekly Oversight Meetings initiated by the Resident Engineers Office and the Contractor

Additional training of inspectors and contractor employees (from outside and support of their internal training)

Vegetation establishment alternatives.... Compost seeding, limestone, Soil Modifiers, etc....

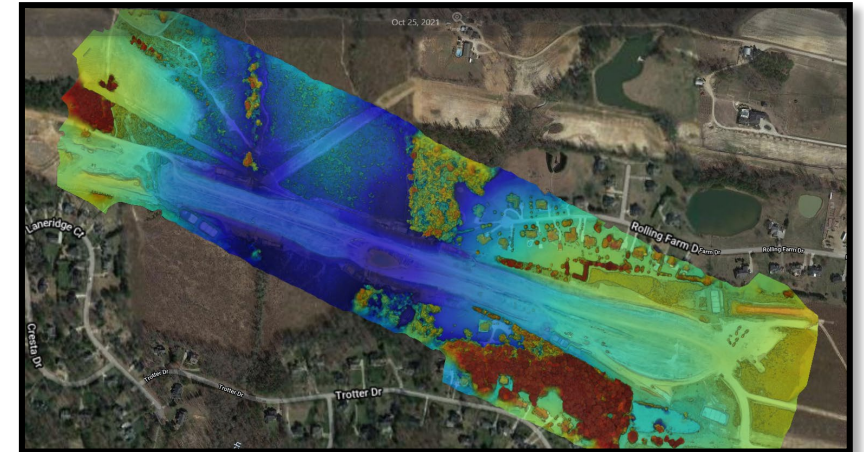
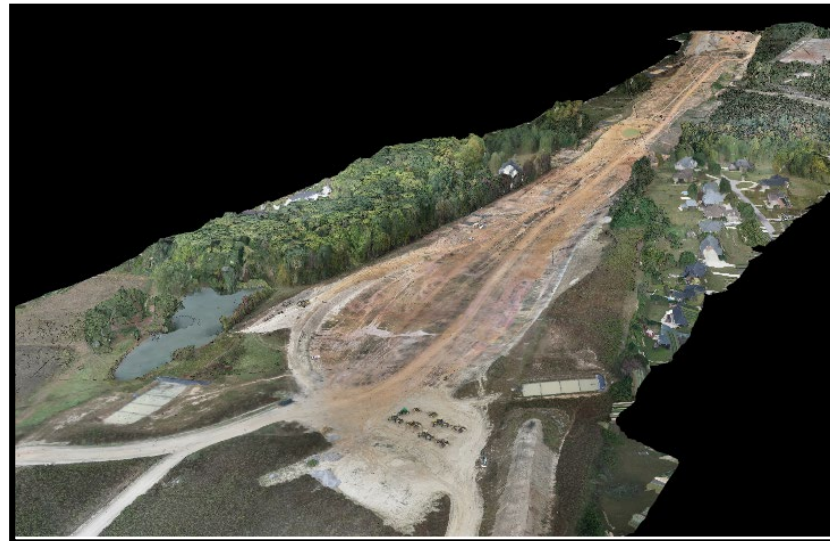
Continuing to Encourage containment and management of construction stormwater holistically

- Erosion & Sediment Control along with Stabilization are Components of Construction, not Impediments

Guiding contractor toward mindset of completing work areas and stabilizing

- Consider the End Goal during planning/mobilization

Promote Partnership



Questions?

Please Remember to Complete the End of Workshop Evaluation



<https://bit.ly/2021EscEval>

