

NORTH CAROLINA Department of Transportation



Pre-Construction Workshop R/W Plans Complete May 8, 2018

R/W Plans Complete

- Roadway/U-3315 Overview
- Locations and Surveys
- Hydraulics
- Utilities
- Geotechnical/Geo-Environmental
- Division/Construction
- Questions and Answers

Roadway

- 25% Preliminary Plans
- FDFI/CFI Plans
- Right-of-way Plans





- Tenth Street Connector
- Purpose & Need



U-3315 Purpose & Need



- Tenth Street Connector
- Purpose & Need
- Local Funding
- Turnkey Municipal Project
- Ownership Transfer

U-3315 Timeline

- 2010 Public Hearing
- 2012 Right-of-Way
- 2015 Letting
- 2019 Construction Completion



NORTH CAROLINA Department of Transportation



Final Surveys for R/W Plan Sheet Development

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NCDOT Pre-Construction Workshop May 8-9, 2018

Project Design Types

Functional Design

 General design that includes horizontal and vertical alignments, EP's, slope stakes and preliminary R/W limits for all study alternatives done on Orthophotography.

Preliminary Design

 Specific design that includes horizontal and vertical alignments, EP's, slope stakes, turn lanes, superelevation and preliminary R/W limits done on preliminary mapping (topographic mapping, shell plan sheet mapping, or preliminary plan sheet mapping).

Final Design

- Very detailed design done on the most accurate form of mapping, final surveys.

Products / Timeframe

• Digital Mosaic (M)

- Primary use for Functional Design and / or display purposes
- Timeframe: 1-3 months after receipt of request

Orthophotography (OP)

- Primary use for Functional and Preliminary Design work
- Imagery from this product can be supplemented and transformed into Topographic Mapping
- Timeframe: 2-4 months after aerial photography completed and receipt of photo control

Topographic Mapping (T)

- Primary use for Preliminary Design work on new location and large scale widening projects with multiple alternatives
- Timeframe: 2-4 months after aerial photography completed and receipt of photo control

Products / Timeframe

Shell Plan Sheet Mapping (SPS)

- Primary use for preliminary design work on widening projects and bridge replacement projects
- This mapping is frequently converted into Final Surveys for Final Design
- Timeframe: 2-4 months after aerial photography completed and receipt of photo control

• Preliminary Plan Sheet Mapping (PPS)

- Primary use for preliminary design work on widening projects and small new location projects
- This mapping is frequently converted into Final Surveys for Final Design
- Timeframe: 2-4 months after aerial photography completed and receipt of photo control

Products / Timeframe

Final Surveys (FS)

- Used for Final Design to produce Right of Way Plans
- Usually produced jointly by Photogrammetry and Location & Surveys for larger projects where Shell or Preliminary Plan Sheet Mapping is converted to Final Surveys.
- Can be completed solely by Location & Surveys for smaller projects (e.g. intersection improvement projects or bridge replacement projects).
- Timeframe: Photogrammetry needs 2-4 months after aerial photography completed and receipt of photo control. Depending on project complexity and length, L & S needs an additional 1-5 months after receipt of SPS or PPS data from Photogrammetry to complete Final Surveys.
- If numerous smaller projects are identified during the annual cycle prior to leaf-off flight season, it is usually most efficient to involve Photogrammetry and treat them as part of a statewide program,

Mapping Scale

• 1" = 400', 200'

ncdot.gov

- Generally used for display purposes or **Functional Design** work for large study areas

 Available from existing statewide geospatial data or can also be flown at high altitude for more current image (0.5 foot pixel mosaic)

• 1" = 200', 100'

- Generally used for Preliminary Design work for large projects
- Topographic mapping or 0.5 foot pixel orthophoto

• 1" = 50', 30', 20'

- Generally used for **Final Design** work or preliminary design for small projects
- 1" = 50' is considered "NCDOT standard"
- 1" = 30', 20' useful for densely developed urban settings

Components Included in Final Surveys

Photogrammetric data

– SPS and / or PPS

Location & Surveys data

- Establish Project Control (GPS, Baseline, Vertical Control)
- Contact Property Owners
- Property Owner Research / Compilation of Property Data (CADD, Deeds, Plats, Database, etc.)
- Drainage Features (Natural and Man-made)
- Utility Data (SUE, Gravity, Above Ground)
- Pavement DTMs (Mobile LiDAR)
- Additional Topographic Features & Obscured Areas
- Merging of All Data Sources / Quality Control

Process for Completing Final Surveys for Right of Way Plans

- Specific project funding needs to be in place and released
- Once a request is made for mapping, L & S and Photogrammetry coordinate a project delivery schedule.
- A project delivery memo is sent to requesting customer.
- L & S and Photo work concurrently to deliver project mapping to customer by scheduled delivery date.
- Photogrammetry often compiles "Shell Plan Sheet mapping (SPS)" or "Preliminary" Plan Sheet mapping (PPS)" concurrently while L&S conducts field surveys.
- SPS & PPS are typically completed by Photo 2-4 months after aerial photography acquisition & receipt of photo control which is delivered to Location & Surveys to complete Final Surveys.

Collaborative Effort

 The majority of mapping and surveys products used for planning and design are produced with work performed concurrently by Photogrammetry and Location & Surveys





Photogrammetric DTM Data



Photogrammetric DTM Data + Pavement Data



Photogrammetric PPS (Includes Field Classification Data)



Merged Photo and L & S Data (Final Surveys)







Regional Team Lead

Regional Engineer - Derek Bradner, PE, PLS, CPM

Division Group Leads

- Division 4 Vacant
- · Division 5 Jason Hedley, PLS
- Division 7 David Langston, PE
- Division 8 Greg Myrick, PE
- Division 10 Mojdelh Masihpour

Regional Team Lead

Regional Engineer - Pat Tuttle, PE, PLS, CPM

Division Group Leads

- Division 9 Mike Motsinger, PLS
- Division 11 Larry Absher
- Division 12 James Jeffreys, PE, PLS
- Division 13 Richard Hensley, PE
- Division 14 Barry Hamrick

Regional Team Lead

Regional Engineer - Keith Honeycutt, PE, PLS, CPM

Division Group Leads

- Division 1 Vacant
- Division 2 Robert Reigner, PLS
- Division 3 Rick Neal
- Division 6 John Kaukola, PLS
- Sonar Surveys Group Mark Ward, PLS

More details are available at the Photogrammetry Unit and Location & Surveys Unit Booths

Sealed Drainage Evaluation

















Hydraulics -Right of Way Plans Complete Design

- Project Scoping Meeting: Attendance by Design Engineer, GEC, and NCDOT Staff to appropriately identify all potential risks and lock down project scope is key to a successful project.
- Line and Grade 15% Roadway Plans: Design Engineer identifies hydraulic design constraints including but not limited to: evaluating grade control at major drainage structures for desired level of service, avoiding lateral encroachments into FEMA regulated floodplains, eliminating sags in cuts, ensuring minimum cover, etc.
- Preliminary 25% Roadway Plans: Design Engineer reviews plan set with additional roadway design detail reflected as well as contours to ensure that the design can be adequately drained. Official design of drainage begins once 25% plans are approved.

Hydraulics - Right of Way Plans Complete Design

- Hydraulics Pre-Design Review Meeting: Design Engineer and GEC (if applicable) meet with Hydraulics Unit Staff to discuss all specific hydraulic design criteria, methods, procedures, and all potential risks including how they will be addressed including but not limited to: anticipated environmental permits, FEMA involvement/compliance, NPDES compliance, GeoEnvironmental, and potential drainage impacts.
- Field Reconnaissance: Design Engineer conducts field review to gather required information with all previously identified potential risks in mind.
- Development, Review, and Approval of Bridge/Culvert Survey Reports: Hydraulics Unit or GEC will be responsible for the review/approval (acceptance) of these reports (major structures). Hydraulics Unit will provide a high level review of the GEC approved reports (major structures).

Hydraulics - Right of Way Plans Complete Design

- Development, Review, and Approval of Roadway Drainage Recommendations: The Hydraulics Unit or respective GEC will be responsible for the overall review/approval (acceptance) of these designs.
- Merger Projects: Design Engineer will conduct 4B Meeting (30% Hydraulic Design) with Resource Agencies and respective Hydraulics Unit representative (or GEC reviewer) in attendance.
- Final Design Field Inspection (FDFI): Design Engineer and Hydraulics Unit representative (or GEC reviewer) should attend this meeting.
- Recommendations from the FDFI: Design Engineer to incorporate any drainage design recommendations with the goal of finalizing the R/W plans in mind.
- Preconstruction Site: All associated drainage design deliverables should be placed on the respective project specific site in accordance with the December 8, 2017 memo, Use of the Preconstruction SharePoint Application, from the Chief Engineer.

Hydraulics - Right of Way Plans Complete Coordination and Support

Support - Initiatives

Initiative	Description
Hydraulics Support Inside Page	Hydraulic resources for Divisions for both design and operations
Hydraulics Procedures Documentation for Connect Preconstruction Page	Description of workflow for project deliverables and documentation protocol.
Hydraulics ATLAS TOOL Development	GIS and database tools for collecting and reporting of hydraulics project information.
Open Roads Designer (ORD) Hydraulics Workspace and SUDA Development	Working with Bentley, Roadway and CADD Support Services to develop next generation of design.
Stormwater and Floodplain Program Support and Special Provisions Development	Post-Construction guidance, MOA enhancements, and new special provisions.

Hydraulics - Right of Way Plans Complete Support and Coordination

Coordination - Staffing:

Design and Operations:

Divisions 1-6 and 8: Jay Twisdale

Design/ Review: Paul Atkinson Operations: Galen Cail (7&9)

Divisions 7, 9-14: Matt Lauffer

Design/ Review: Bill Elam Operations: Mark Shown (Acting)

Highway Floodplain Program: Jerry Snead Highway Stormwater Program: Andy McDaniel

Utilities- Records

- Unknown/Inaccurate Utilities
- Frequent Issue During Construction
- Follow Up on any Hints of Inaccuracy
- Use Owners as a Resource

Utilities- PUE

- Permanent Utility Easements
- For Utilities with Compensable Interest
- Others can Share
- Aerial- Poles AND Guywires

Utilities- Agreements

- Which Agreement? Depends...
 "Who Pays?" and "Who Constructs?"
- See Chart on Utilities Connect Site
- Cost Responsibility- Article on Connect

Utilities- Permitting

- Dept. Permits for ALL Enviro. Impacts
- Advanced Partial Permit for UbOs
- Utilities Permit Individually for RR Permit

Utilities- Engineering

- Benefits of Design Team
- Utilities Unit's 12 Limited Services Firms
- Potential Issues with Owner's Firm or Inhouse
- Owner's Buy In

Utilities- Coordination

- Scoping UbO Inspection
- Coordinator in the Highway Contract
- Communication- Design Team & Utilities
- Minimize Conflicts- Drainage, Walls, Guardrail, etc.

Utilities- New Initiative

- Early Coordination Between Design Team and Utilities
- Minimize Conflict (Drainage, Guardrail, Walls, etc.) to Reduce Relocations
- Reduce Chance of Project Delays
- More Info at the Utilities Unit's Table

Geotechnical



GeoEnvironmental Involvement

Trigger: Start of Study Letter

Planning

Scoping Comments

PreScoping Survey



GeoEnvironmental Involvement

Trigger: Preferred Alternative



GeoEnvironmental Phase I



Sanborn

Historical Aerials

GIS Data Layers

Phase I Results



Sites of Concern



Design Reference File



GeoEnvironmental Involvement

Trigger: Final Design Field Inspection



Phase II

Site Assessments

Right of Way Recommendations

Potential Contamination



Known Contamination



U-3315 Plan with Known Contamination Symbology



Drainage Recommendations



GeoEnvironmental Involvement

Trigger: Right of Way Acquired



Underground Tank Removal

Contaminated Soil Removal

CEPI

UST

Key Points

Investigate All

Ground Disturbing

Projects

Avoid or Minimize

Impacts to Sites

Involve

GeoEnvironmental

Early in the Project

Cure Sites Before

Let to the Extent

Practicable

Communicate

Findings to

Stakeholders



SOIL CONTAMINATION

GROUND WATER CONTAMINATION UNDERGROUND STORAGE TANK

Pre-Construction Workshop



R/W Plans Complete

Questions?