

<b>Project Name:</b>	<b>Consultant:</b>
<b>Project Number:</b>	<b>Project Manager:</b>

**ENGINEERING SERVICES GUIDELINES AND PLAN DEVELOPMENT**  
**MILESTONE CHECKLISTS**

The following guidelines have been established to aid the Engineer/Designer/Manager in understanding the design process as it relates to Engineering Services work. These guidelines are meant to be used as the minimum criteria by which design activities occur while realizing that each project is unique and may require special considerations. This checklist is expected to be filled out as design occurs. Notes in each section are encouraged and welcomed to assist with review.

**Design Plan Milestone Checklists**

**Projects are recommended to the following Plan Development Milestones:**

- I. 25% Plans Review (Preliminary Plans – Core Team Review)
- II. 50% Plans Review (Preliminary Plans – Core & Support Team Review)
- III. 75% Plans Review (Preliminary Plans – Core & Support Team Review)
- IV. 90% Plans Review (Preliminary Plans – Core & Support Team Review)
- V. 100% Plans Review/Final Plans (Core & Support Team Review)

Following are Outlines of each Milestone with:

- A. General Overview
- B. Required Submittals
- C. Plan Checklist

**I. 25% Plans Review**

Submittal Date: \_\_\_\_\_ Designer: \_\_\_\_\_

Review Date: \_\_\_\_\_ Reviewer: \_\_\_\_\_

**Note:** Survey should be field verified prior to beginning 25% plans to assure it is correct and no improvements have been installed since survey was received. All review plans submitted must be 24" X 36" Black-Line (Originals or PDFs). Each sheet should have a "Plans Prepared By:" block and have the stamping "Preliminary Plans – Do Not Use for Construction," until the final plan set is issued.

\_\_\_\_\_ Field visit to verify survey \_\_\_\_\_ List date of visit (send photos to PM)

**A. General Overview**

This milestone has been set to ensure the Project Design is proceeding according to IPDS Project Plan, preset design criteria, and sound engineering judgment. At this milestone, conceptual designs should have evaluated multiple alternatives (if applicable) to determine the most cost-effective Preliminary Horizontal and Vertical Alignments based on the client's initial scope of work, design criteria and approved design exceptions. If not, the design should not proceed with plan production with cutting sheets. With the conceptual design approved, proceed with preparing plans. The 25% Plans Review should include the following:

**B. Required Submittals (Place a Check Mark, or N/A)**

\_\_\_\_\_ Design Assumptions or Design Criteria

\_\_\_\_\_ Listing of Required Permits or Special Reviews (Circle below or note)

(Phase I Environmental Site Assessment, Historical Agency Review, NCDOT  
Encroachment Agreement, 401/404 Permit, Erosion Control Permit, PCSO)

\_\_\_\_\_ Verification of Correspondence with Pertinent Utility Companies

\_\_\_\_\_ Vertical Clearance Calculations

\_\_\_\_\_ Preliminary Pavement Design

\_\_\_\_\_ Engineer's Estimate

\_\_\_\_\_ Project Construction Plans (Approx. 25% Completion)

C. 25% Plans Checklist (Place a Check Mark, or N/A)

Note: All plans submitted must be 24" X 36" Black-Line PDFs. Each sheet should have a "Plans Prepared By:" block and have the stamping "Preliminary Plans – Do Not Use for Construction".

1. Title Sheet (Use City of Charlotte Standard Cover Sheet)

- \_\_\_\_\_ Vicinity Map is "complete" and "accurate"  
(Includes at least two major streets and an intersection)  
(Show North Arrow inside vicinity map)
- \_\_\_\_\_ Index of Sheets (Varies per Project)  
Suggested Layout:
  - Sheet 1 Title Sheet
  - Sheet 2, 2A, 2B, etc (2 Series) General Notes, Standard Abbreviations & Various Details (including ramp details)
  - Sheet 3, 3A, 3B, etc (3 Series) Typical Sections, Drainage Summary, other summary tables as needed and directed by the City
  - Sheets 4 thru XX Plan & Profile Sheets
  - Sheets TCP1 thru TCPxx Traffic Control Plans
  - Sheets PM1 Thru PMxx Pavement Marking & Signing Plans
  - Sheets EC1 thru ECxx Erosion Control Plans
  - Sheets SP1 thru SPxx Construction Staking Plans
  - Sheets SIG1 thru SIGxx Signal Plans
  - Sheets UC1 thru UCxx Utility Construction Plans
  - Sheets UBO1 thru UBOxx Utilities By Others Plans
  - Sheets X1 thru Xxx Cross-Sections Sheets
- \_\_\_\_\_ Project Name & Project Number (Place in two locations)
  - \_\_\_\_\_ As a heading under the City logo (centered at the top of the sheet)
  - \_\_\_\_\_ Vertically along the Right-Hand Border
- \_\_\_\_\_ Project Features  
(Type of work such as: Grading, Storm Drainage, Concrete Curb & Gutter, Paving, etc. Place under Project Name & Number in heading.)
- \_\_\_\_\_ Standard Specification Date (Most current publication) (NCDOT Standard Specifications for Roads & Structures)
- \_\_\_\_\_ Signature Block entitled "Recommended for Construction" with signature space for project stakeholders (unsigned at this point)
- \_\_\_\_\_ Signature Block containing City Engineer's approval signature & date (unsigned at this point)
- \_\_\_\_\_ Location Map  
Shows Project Layout on numbered superimposed sheets to include the following:
  - \_\_\_\_\_ Project Alignment for all Proposed Construction  
(include Stations for -L- lines, -Y- lines, detours, etc.)
  - \_\_\_\_\_ Existing Roads and Streets affected by construction  
(both those that are part of the project and those not part of project)
  - \_\_\_\_\_ Show Major Proposed Work with Shading

- \_\_\_\_\_ (do not show any associated text or other details)
- \_\_\_\_\_ Street Names, Route Numbers, Survey Line Names & Numbers
- \_\_\_\_\_ Alignment Equality Stations
- \_\_\_\_\_ Streams and Rivers
- \_\_\_\_\_ Railroads
- \_\_\_\_\_ City Limits
- \_\_\_\_\_ Beginning and Ending Stations for the Project
- \_\_\_\_\_ North Arrow – with survey designation (NAD83 with year designation matching survey info)
- \_\_\_\_\_ List of Graphical Scales used for the Project
- \_\_\_\_\_ Label Project Name and Number along right side of sheet
- \_\_\_\_\_ Add 25% Plan label to top right corner of sheet
- \_\_\_\_\_ Survey Description (Complete Information in Survey Prepared By block)

## 2. General Notes

- \_\_\_\_\_ Legend of Conventional Symbols – make sure line types are shown correctly
- \_\_\_\_\_ Start list of standards to be used on project

## 3. Typical Sections (to be shown in the “3 Series” of sheets)

- \_\_\_\_\_ Provide Typical Roadway Section(s). Include road name, construction alignment reference identification and stations. Label pavement types, curb & gutter, sidewalk, etc.... to match items listed in the Preliminary Material Schedule.
- \_\_\_\_\_ Provide Material Schedule

## 4. Plan and Profile Sheets

In general, show Existing Features with dashed and/or “screened” lines and proposed features with heavier solid lines and/or shading. **Use City of Charlotte layering standards.**

- \_\_\_\_\_ Sheets are ½ Plan (at the bottom of sheet) and ½ Profile (at the top of the sheet) unless project lends itself to separate plan and profile sheets. The Horizontal Scale should be 1” = 20’ and the Vertical Scale should be 1” = 4’. Any variance from these scales should be approved by the **Program Manager.**
- \_\_\_\_\_ Existing Plan Survey Features relative to project (field verified by designer)
  - \_\_\_\_\_ Streets, roads, driveways, sidewalks (names, labels, etc.)
  - \_\_\_\_\_ Houses, buildings, garages, sheds (names, labels, etc.)
  - \_\_\_\_\_ Fences, walls (labels)
  - \_\_\_\_\_ Trees, shrubs, woods lines, etc. (type and size if pertinent)
  - \_\_\_\_\_ Utilities (above and below ground) (type, size & mat’l if known)
  - \_\_\_\_\_ Storm Drainage Facilities (size, type, and invert elevations)
  - \_\_\_\_\_ Property Lines, Exist. R/W Lines, Exist. Permanent Easement Lines (Show Monumentation found with label – ex. ½” EIP)
  - \_\_\_\_\_ Property Owner Information (use City of Charlotte standard parcel block info.)
  - \_\_\_\_\_ Railroads (show tracks to scale)(label ownership)
  - \_\_\_\_\_ Bodies of water (rivers, creeks, streams, lakes, ponds, etc.)

- \_\_\_\_\_ (give name, width, direction of flow, etc.)
- \_\_\_\_\_ Any other existing features relative to project
- \_\_\_\_\_ Survey Plan Information (shown at the correct location on the plan sheet)
- \_\_\_\_\_ Survey Control Points (symbol, point name, material, N, E, Elev.) (ex. TP-2 (60d Nail) with N, E, and Elev.)
- \_\_\_\_\_ Survey Benchmarks (symbol, name, alignment reference, and Elev.) (ex. BM-2 (-L- Sta 10+53 34' Rt.) (Elev. = 750.56')
- \_\_\_\_\_ North Arrow
- \_\_\_\_\_ Proposed Plan Features
  - \_\_\_\_\_ Horizontal Alignment(s)
    - \_\_\_\_\_ Proposed Design/Construction Alignment(s) to include:
      - \_\_\_\_\_ Heavy solid line(s) showing Proposed Alignment (Designate with -L-, -Y- or multiple with -L1-, -Y1-, etc.)
      - \_\_\_\_\_ Beginning and Ending Stations (with Coordinates) (ex. -L- POT Sta. 10+00.00) (N = , E = )
      - \_\_\_\_\_ Equality Stations (with Coordinates) (ex. -L- POC Sta. 13+26.54 = -Y- POT Sta. 10+85.63) (N = , E = )
      - \_\_\_\_\_ Event Point Stations (i.e. PC, PT, PCC, PRC, PINC, etc.)
      - \_\_\_\_\_ Bearings and Distances on Tangents
- \_\_\_\_\_ Horizontal Curve Data (Show in Curve Info. Box) (Number each curve and provide delta angle, radius, length of curve, and tangent length)(Optional: chord distance, chord bearing)
- \_\_\_\_\_ Proposed Plan Improvements such as curb and gutter, sidewalk, driveways, etc. (show with appropriate line weight and shading). Labeling is not necessary at this milestone. Drainage improvements should not be shown – these are not detailed enough at this milestone)
- \_\_\_\_\_ Proposed pavement markings shown on plan sheets at this phase
- \_\_\_\_\_ Match Lines (reference station number and sheet number)
- \_\_\_\_\_ Existing Profile Features
  - \_\_\_\_\_ Dashed Line(s) labeled Existing Grade along -L-, -Y-, etc. (show existing centerline elevations every 25')
  - \_\_\_\_\_ Existing Drainage or Utility Structures and Pipes (show to scale) (label size, type, material, and top/rim and invert elevations)
- \_\_\_\_\_ Proposed Profile Features
  - \_\_\_\_\_ Vertical Alignment(s) (Show on a project by project basis)
    - \_\_\_\_\_ Proposed Design/Construction Alignments to include:
      - \_\_\_\_\_ Heavy solid line(s) labeled "Proposed Grade" (designate with -L-, -Y- or multiple with -L1-, -Y1-, etc.)
      - \_\_\_\_\_ Label proposed grades along grade line, PVC, PVT, and PVI Stations and Elevations
      - \_\_\_\_\_ Vertical Curves – label PVI station/elevation, K value, algebraic difference in grade, length of curve, low/high point station/elevation
      - \_\_\_\_\_ Proposed Elevations every 25'

5. Cross-Sections Sheets

In general, show Existing Features with dashed and/or “screened” lines and Proposed Features with heavier solid lines and/or shading. **Use City of Charlotte layering standards.**

\_\_\_\_\_ Scale should be 1” = 5’ (Horizontal and Vertical) (Any variance from this scale should be approved by the **PROGRAM MANAGER**)

\_\_\_\_\_ Show Existing Ground Line (give existing elevation at construction alignment location(s))

\_\_\_\_\_ Show critical cross sections as identified by the Project Manager (locations with large obstacles such as trees, signs, retaining walls, culverts, driveways, or locations with high cut/fill lines)

6. General

\_\_\_\_\_ “Preliminary Plans- Do Not Use for Construction” is noted on all sheets.

\_\_\_\_\_ Same project number is shown on all sheets.

\_\_\_\_\_ Date plans printed shown in the title block.

\_\_\_\_\_ Verify latest CAD standards and sheet templates are used

Notes (explanation of any variance from standard, why N/A used, conversations had that complete checklist):

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## II. 50% Plans Review

Submittal Date: \_\_\_\_\_ Designer: \_\_\_\_\_

Review Date: \_\_\_\_\_ Reviewer: \_\_\_\_\_

### A. General Overview

Note: A cursory review of previous milestone reviews should be completed prior to proceeding with the next milestone review to ensure changes and additions have been updated or corrected.

At this point, the design should be checked for constructability, utility conflicts and compliance with Storm Water Services design requirements. To meet this milestone requirement, initial storm drainage design should be completed with preliminary spread calculations and inlet locations with pipe layout and slopes. In addition, a written phasing for traffic control should be reviewed by CDOT to ensure the project can be constructed without temporary widening or overnight lane closures. Utility conflicts, above ground and underground, should be highlighted and discussed with the Utility Coordinator. Throughout the project limits, cut and fill lines should be imported to identify tree and environmental impacts as well as potential retaining wall or guardrail locations.

### B. Required Submittals (Place a Check Mark, or N/A)

- \_\_\_\_\_ Geotechnical Report (if applicable)
- \_\_\_\_\_ Summary of concerns noted in the Phase I ESA document (if applicable)
- \_\_\_\_\_ Storm Drainage Calculations to include topo map with drainage areas
- \_\_\_\_\_ 50% Engineer's estimate
- \_\_\_\_\_ Project Construction Plans (approximately 50% complete)
- \_\_\_\_\_ Update on list of required Permits or Special Reviews
- \_\_\_\_\_ Verification of Correspondence with Pertinent Utility Companies

### C. 50% Plans Checklist (Place a Check Mark, or N/A)

- \_\_\_\_\_ Verify latest CAD standards and sheet templates are used
- \_\_\_\_\_ Update all items from previous checklist that have changed
- 1. Title Sheet (Use City of Charlotte Standard Cover Sheet) (complete per 25% Plans)
  - \_\_\_\_\_ Update label to 50% Plans on top right corner.
- 2. Details and Typical Sections (to be shown in the "2 & 3 Series" of sheets)
  - \_\_\_\_\_ Provide Details for retaining walls, non-standard catch basins and culvert improvements.
  - \_\_\_\_\_ Provide Details for other non-standard items not covered under NCDOT Specs.
  - \_\_\_\_\_ Label Detail sheets with description of details included on sheet within title block.
  - \_\_\_\_\_ Update List of standards used on project.
  - \_\_\_\_\_ Update typical sections and material schedule

### 3. Plan and Profile Sheets

- \_\_\_\_\_ Label proposed Improvements such as curb and gutter, sidewalk, driveways, etc. (show with appropriate line weight and shading).
- \_\_\_\_\_ Label center of proposed driveways at EOP with width, material, station, and standard (i.e. Prop. 15' Conc. Dwy, Sta. 11+45.80, CLDSM 10.25A)
- \_\_\_\_\_ Label tie-in material of driveway if material other than concrete
- \_\_\_\_\_ Label pavement widths and tapers/transitions.
- \_\_\_\_\_ Label utility poles to be relocated "by others."
- \_\_\_\_\_ Highlight above ground and underground utilities that are in conflict with the proposed improvements.
- \_\_\_\_\_ Show and label proposed drainage system with structure numbers, pipe material, length, slope and class.
- \_\_\_\_\_ Import cut/fill lines and show retaining wall limits if determined necessary.
- \_\_\_\_\_ Add required tree protection.
- \_\_\_\_\_ Show pavement removal with appropriate hatching
- \_\_\_\_\_ Show accessible ramp locations
- \_\_\_\_\_ Show super elevation at correct plan location(s) (if applicable)
- \_\_\_\_\_ Show guard rail and retaining wall location(s) (if applicable)
- \_\_\_\_\_ Show proposed drainage system in profile view

### 4. Traffic Control (Written Phasing Scheme only)

- \_\_\_\_\_ List by phase the proposed approach to accommodating the traffic control during the life of the project. Phases should be consistent with general construction guidelines and practices.
- \_\_\_\_\_ Show proposed detours if required.



5. Cross-Sections Sheets

- \_\_\_\_\_ Show Proposed Ground Line (templates with no labeling at this point).
- \_\_\_\_\_ Add daylight lines for Cut/Fill slopes.
- \_\_\_\_\_ Provide proposed elevation at construction alignment location(s).
- \_\_\_\_\_ Show proposed retaining wall or guardrail locations.
- \_\_\_\_\_ Sections should be shown at min. 50' increments (25' increment are required for projects < 1 mile and all sidewalk projects along the construction alignment(s) (i.e. 10+00, 10+50, 11+00, etc.).
- \_\_\_\_\_ Label alignment designation and station on each cross section. (i.e. 10+50 -L-)
- \_\_\_\_\_ Check to ensure sight distance requirements have been met per the design criteria at intersections and major entrances with large traffic volumes.

Notes (explanation of any variance from standard, why N/A used, conversations had that complete checklist):

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**75% Plans Review**

Submittal Date: \_\_\_\_\_ Designer: \_\_\_\_\_

Review Date: \_\_\_\_\_ Reviewer: \_\_\_\_\_

A. General Overview

Note: Survey should be field verified again prior to beginning 75% plans to assure no improvements have been installed since survey was received and last field visit occurred. A cursory review of previous milestone reviews should be completed prior to proceeding with the next milestone review to ensure changes and additions have been updated or corrected.

For this review, mark-ups/comments from utility companies as well as Storm Water Services should be incorporated into the project design. A traffic control plan (both written phasing and associated diagrams), erosion control plan, and a pavement marking plan should be prepared for this submittal in addition to the detailed plans, an updated engineer’s estimate should be prepared. Any required permits should be reviewed at this milestone and plans should be prepared for appropriate submittals as needed such as 401/404 permitting. Project grading limits should be checked for area disturbed. If the area exceeds one acre, an erosion control permit is required.

\_\_\_\_\_ Field visit to verify survey and design \_\_\_\_\_ Date of visit

B. Required Submittals (Place a Check Mark, or N/A)

\_\_\_\_\_ Updated 75% engineer’s estimate

\_\_\_\_\_ Storm Drainage Calculation Revisions

\_\_\_\_\_ ROW/easement quantities (spreadsheet)

\_\_\_\_\_ Project Construction Plans (approximately 75% complete)

\_\_\_\_\_ Update on list of required Permits or Special Reviews

\_\_\_\_\_ Verification of Correspondence with Pertinent Utility Companies

C. 75% Plans Checklist (Place a Check Mark, or N/A)

\_\_\_\_\_ Verify latest CAD standards and sheet templates are used

\_\_\_\_\_ Update all items from previous checklist that have changed

1. Title Sheet

\_\_\_\_\_ Update label to 75% Plans on top right corner.

2. Typical Sections & Details (to be shown in the “2 and 3 Series” of sheets)

- \_\_\_\_\_ All necessary dimensions shown on pavement, subgrade, shoulders, slopes, centerline, medians, sidewalks, utility strips, curb & gutter, etc.
- \_\_\_\_\_ Milling limits shown
- \_\_\_\_\_ All slopes shown on pavement, sidewalk, shoulders, subgrade, hinge point grading, ditches, cut & fills.
- \_\_\_\_\_ All grade points shown.
- \_\_\_\_\_ All variable limits shown.
- \_\_\_\_\_ Provide Details for retaining walls, non-standard catch basins, and culvert improvements. (update from previous milestone reviews).
- \_\_\_\_\_ Provide Details for special ditches (lateral and berm ditches). Provide alignment, station, offset, and quantities such as drainage ditch excavation, rip rap, and filter fabric. (Note: Project Manager may choose to show this information on the plan sheets.)
- \_\_\_\_\_ Provide Details for other non-standard items not covered under NCDOT Specifications. Some that may be considered are sidewalk taper, pipe trench detail for storm drainage pipe, and pavement overlay or wedging.
- \_\_\_\_\_ Update List of standards used on project.
- \_\_\_\_\_ Update typical sections and material schedule

3. Plan Sheets

- \_\_\_\_\_ Turn off pavement markings on plan sheets since PM plans are created.
- \_\_\_\_\_ Show the limits of construction by placing slope-stake lines on the plans. (lines should be designated as cut or fill by linetype)
- \_\_\_\_\_ Show berm and lateral ditches if required. Insert corresponding ditch details.
- \_\_\_\_\_ Show and label pipe inlet and outlet devices such as headwalls, endwalls, flared-end sections, false sumps, rip rap and filter fabric requirements and quantities.
- \_\_\_\_\_ Label radii measured to face of curb.
- \_\_\_\_\_ Label proposed utility poles to be relocated “by others” at the specified locations indicated by utility companies.
- \_\_\_\_\_ Guardrail shown & labeled
- \_\_\_\_\_ Show and label signal items to be installed by roadway contractor (ped bases, pull boxes, conduit, etc.) Note, if signal is to be included in construction contract, separate signal plan to be provided by CDOT. These items shall be shown, but labels are not required as plan should reference SIG sheets for signal items.

- \_\_\_\_\_ Retaining walls shown & labeled
- \_\_\_\_\_ Ramps shown accurately on plan sheet with station labels (details not yet created)
- \_\_\_\_\_ Easements shown accurately (permanent and temporary). Temporary easements should include all needs for removal of trees for utility relocation. Temporary Easements needed for only a specific duration (i.e. tree removal) shall be labeled as such.
- \_\_\_\_\_ Check to ensure no property has been landlocked with proposed improvements

#### 4. Profile Sheets

- \_\_\_\_\_ Show curb line grades if different from proposed design-line grade line.
- \_\_\_\_\_ Label proposed edge of pavement elevations for left and right lip lines.
- \_\_\_\_\_ Show proposed lateral ditches with beginning, ending, and PVI stations and elevations. Label proposed lateral ditch grades.
- \_\_\_\_\_ Update proposed drainage. Make sure drainage structure number corresponds with that shown in plan view.
- \_\_\_\_\_ If a retaining wall is needed show the wall envelope. Ensure that the top, bottom and steps in the wall are accurately shown with station and elevations. Wall profile may be shown on separate sheets.

#### 5. Erosion Control Plans

- \_\_\_\_\_ Preferred scale 1"=40'.
- \_\_\_\_\_ Erosion Control Notes & Legend Key.  
(Use symbology consistent with the Erosion & Sediment Control Planning & Design Manual: <https://deq.nc.gov/about/divisions/energy-mineral-land-resources/energy-mineral-land-permit-guidance/erosion-sediment-control-planning-design-manual>)
- \_\_\_\_\_ Erosion Control measures shown on plan view. Erosion control plan must be sufficient to obtain plan approval and required erosion permits from NCDEQ.
- \_\_\_\_\_ Erosion Control Details - if standard, refer to standard number.
  - \_\_\_\_\_ Temporary Wattle Check Dam/Inlet Protection
  - \_\_\_\_\_ Temporary Silt Fence
  - \_\_\_\_\_ Temporary and Permanent Seeding Specifications
  - \_\_\_\_\_ Other

6. Traffic Control/ Pavement Marking Plan

- \_\_\_\_\_ Standard Traffic Control General Notes & Project Notes modified per project.
- \_\_\_\_\_ Traffic control phasing is consistent with general construction practices.
- \_\_\_\_\_ Traffic control custom phase drawings and/or CDOT WATCH diagrams correctly referenced per written phasing.
- \_\_\_\_\_ If on an NCDOT street, be sure notes and work hours are updated for NCDOT requirements. (Note S: add NCDOT Engineer, Note T: change 2' to 5', Revise works hours restricted 6:00 am - 9:00 am and 4:00 pm – 8:00 pm or as directed by NCDOT.)
- \_\_\_\_\_ Pavement Marking Plan preferred scale 1"=40'.
- \_\_\_\_\_ Legend matches NCDOT pavement marking schedule.
- \_\_\_\_\_ Legend matches plan view symbology.

7. Cross-Sections Sheets

- \_\_\_\_\_ Label cut & fill slopes and varying pavement cross slopes.
- \_\_\_\_\_ Label pertinent proposed elevations such as lip elevations and grade break point elevations.
- \_\_\_\_\_ Show berm and lateral ditches.
- \_\_\_\_\_ Show additional critical cross-sections at driveways and other critical areas such as drainage inlets.
- \_\_\_\_\_ Label any non-typical existing or proposed features such as retaining walls, buildings, headwalls, channel changes, etc.
- \_\_\_\_\_ If NCDOT street, follow NCDOT Cross Section Guidelines.

8. Utility By Others (UBO) Plans

- \_\_\_\_\_ Label all utility conflicts with UBO boxes.
- \_\_\_\_\_ Include in the construction set as separate plans if needed due to plan sheet clutter

Notes (explanation of any variance from standard, why N/A used, conversations had that complete checklist):

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**90% Plans Review**

Submittal Date: \_\_\_\_\_ Designer: \_\_\_\_\_

Review Date: \_\_\_\_\_ Reviewer: \_\_\_\_\_

A. General Overview

Note: A cursory review of previous milestone reviews should be completed prior to proceeding with the next milestone review to ensure changes and additions have been updated or corrected.

This review milestone precedes preparing plats and easement exhibits for real estate acquisition. For this review, final mark-ups/comments from utility companies as well as Storm Water Services should be incorporated into the project design. The project design at this milestone should include updated drainage (horizontal and vertical), traffic control, and pavement marking plans. In addition to the detailed plans, an updated engineer’s estimate should be prepared with an updated real estate cost. All required permit applications should be prepared at this point along with any required fees with check requests submitted.

B. Required Submittals (Place a Check Mark, or N/A)

\_\_\_\_\_ Final Pavement Design Calculation

\_\_\_\_\_ Final storm drainage calculations

\_\_\_\_\_ Updated 90% engineer’s estimate

\_\_\_\_\_ Permit Applications that do not require final signed plans such as 401/404 permit. Other permits typically wait until final plans are completed. Verity with Project Manager which permit submittals are needed.

\_\_\_\_\_ Ramp Calculations

\_\_\_\_\_ Project Construction Plans (approximately 90% complete).

\_\_\_\_\_ Update on list of required Permits or Special Reviews

\_\_\_\_\_ Verification of Correspondence with Pertinent Utility Companies

C. 90% Plans Checklist (Place a Check Mark, or N/A)

\_\_\_\_\_ Verify latest CAD standards and sheet templates are used

\_\_\_\_\_ Update all items from previous checklist that have changed

1. Title Sheet

\_\_\_\_\_ Update label to 90% Plans on top right corner.

2. Typical Sections& Details (to be shown in the “2 and 3 Series” of sheets)

\_\_\_\_\_ Ramp details

\_\_\_\_\_ Curb return details and profiles (ensure no low points without appropriate drainage)

\_\_\_\_\_ Update List of standards used on project.

\_\_\_\_\_ Update typical sections and material schedule

\_\_\_\_\_ Drainage Summary (Pipes and Structures) (Standard NCDOT or City formats)

3. Plan and Profile Sheets

\_\_\_\_\_ Show curb return elevations (if necessary). Label elevation on plan at 10’ increments along lip of curb or shown on a curb return profile on a separate sheet

\_\_\_\_\_ Check to ensure all proposed work is clearly indicated. Such items overlooked to this point might include: fence relocations/additions, tree removal/protection & trimming needs, sign relocations/removal/additions, pipes to be removed/plugged/extended/, sealing abandoned wells, driveway reconnections, driveway pipes, etc.

\_\_\_\_\_ Right-of-way & Easement lines, and Parcel numbers shown with standard parcel block information (check to make sure this matches plats/exhibits)

\_\_\_\_\_ Check to ensure no property has been landlocked with proposed improvements

\_\_\_\_\_ Areas to remain undisturbed with the right-of-way clearly marked

\_\_\_\_\_ Finalize proposed drainage. Label all pipes (parallel and cross-pipes) with size, material, length, slope, and class of pipe in plan view.

\_\_\_\_\_ Provide top/rim and invert elevations for all drainage structures in profile view. Label NCDOT or CLDSM standards required (i.e. NCDOT Std. 840.01).

4. Erosion Control Plans

\_\_\_\_\_ Narrative (if necessary)

\_\_\_\_\_ Construction Sequence (if necessary)

\_\_\_\_\_ Check to ensure all erosion control measures are contained within existing or proposed right-of-way and easements

5. Traffic Control/ Pavement Marking Plan

\_\_\_\_\_ Update sheets per comments from 75% review

6. Cross-Sections Sheets

- Show volumes for embankments, unclassified excavation, and known undercut excavation on each cross-section.
- Provide dimensions as needed (required on NCDOT streets).

7. Utility Construction Plans (Water and Sewer Plans)

- Check to ensure only work to be performed by the contractor is indicated with heavy lines and text
- Show other pertinent plan information with background or gray-scale symbology

8. Utilities By Others Plans

- Include in the construction set as separate plans if needed due to plan sheet clutter
- Check to ensure only work to be performed by others (not the contractor) is indicated with heavy lines and text
- Show other pertinent plan information with background or gray-scale symbology

Notes (explanation of any variance from standard, why N/A used, conversations had that complete checklist):

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**Final (100%) Plan Review**

Submittal Date: \_\_\_\_\_ Designer: \_\_\_\_\_

Review Date: \_\_\_\_\_ Reviewer: \_\_\_\_\_

A. General Overview

This milestone review has as its purpose to finalize construction plans, engineer’s estimate, project special provisions, and any other items necessary to submit to Bid Phase. It incorporates review comments from the 90% plans review and external reviews such as NCDOT Encroachment Agreement. Prior to this review, right-of-way and easement needs have been determined and incorporated into the plans, plats and exhibits have been prepared, and Real Estate Phase is well underway. Coordination has occurred for landscaping needs, traffic signal work, and utility relocations.. This review should present a clear picture of the project design with all necessary details for successful construction.

B. Required Submittals (Place a Check Mark, or N/A)

- \_\_\_\_\_ Submit Permit Applications (May include Erosion Control, NCDOT encroachment, Municipal Agreement, PCSO).
- \_\_\_\_\_ Final Engineer’s Estimate (all computations included)
- \_\_\_\_\_ Written Project Special Provisions
- \_\_\_\_\_ Final Project Construction Plans with signed/sealed mylar cover sheet and final review stamp on remaining sheets

C. Final Plans Checklist (Place a Check Mark, or N/A)

1. Title Sheet

- \_\_\_\_\_ Updated Index of Sheets
- \_\_\_\_\_ Project Stakeholder signatures under the “Recommended for Construction” block
- \_\_\_\_\_ City Engineer’s approval signature
- \_\_\_\_\_ When submitting mylar cover sheet, update label to Final Plans on top right corner. Otherwise may note as 100% Plans if part of review set.

2. Details (to be shown in the “2 Series” of sheets)

- \_\_\_\_\_ List of Standard Drawings pertinent to project (NCDOT or CMLDS)
- \_\_\_\_\_ Revise details as needed to match plans.

3. Plan Sheets

- All cross-reference notes are correct
- All utility relocations/adjustments labeled and clearly identified as work the contractor is to perform or as work to be done by others
- Make any changes from RE agreements

4. Profile Sheets

- All cross-reference notes are correct if separate plan & profile sheets

5. Traffic Control Plans

- Update to reflect any changes from 90% review or to address any access issues

6. Pavement Marking Plans

- Clearly denote markings to be removed (include line item(s) & quantities in engineer's estimate)
- Check for any temporary markings needed (include line item(s) & quantities in engineer's estimate)
- Check for the need of permanent pavement markers (raised or snow plowable)
- Reference Standard Drawings (if applicable)
- Clearly identify signs to be installed by the contractor & signs to be installed by others

7. Signal Plans

- Include in the construction plans if the contractor is to perform this work (this should be signed/sealed and provided by CDOT)

8. Permits

- Submit final plans and application to NCDEQ for EC permit when disturbance is greater than 1 acre.
- Prepare NCDOT encroachment forms (EA161B, VCER, NPDES) if any part of project is on an NCDOT maintained street.
- Prepare/submit for any other necessary permits. List here: \_\_\_\_\_

9. All other sheets

- Update/review for accuracy