

# Constructability Guidelines

The Constructability Guidelines offer a list of items that should be considered by the Project Manager and/or Designer during the Concept Development Phase through the Final Design Phase.

The Guidelines consist of several categories:

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Few projects will use every Guideline list. The Project Manager and/or Designer should be aware of all of the category lists and the content of each category and select the appropriate lists for any project.

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## **Project Type**

Identify Type of Project (use for selecting appropriate Guideline lists)

- Safety – Safety Improvements/Signals/Geometric/ Guide Rail
- Removal / Demolition Building or Structure
- Electrical – Highway Lighting
- Drainage – Pipe/Culverts/Basins/etc
- Structure – Bridge (over Water; Railroad; Roadway/Highway)
- Pavement Management – resurfacing/reconstruct
- Utility – Overhead or Underground
- Environmental Mediation
- Combination of Above

## **Site Visits**

Items needed for all Site Visits include:

- Maps
- Field Book
- Reflective vest and hard hat
- Paper and pencil
- Digital camera –with extra batteries
- Tape measure / measuring wheel
- Introduction letter from Department to eliminate potential conflicts with Homeland Security
- Sturdy shoes or boots

## **Initial Site Visit Guidelines**

Use appropriate list(s) and reference materials. The following is a list of constructability issues and questions to consider while preparing for and conducting the site visit:

- Earthwork and Grading
- Signalization - Conflicts with Utilities / Staging, including temporary signals
- Possible Staging and Traffic Control - Maintenance of Traffic
- Utility issues – construction coordination / overhead & underground issues
- Are there possible work areas for Contractor staging?
- Is the project in a remote area?
- Can access be constructed to remote locations? (Review – Construction Procedures Manual – Section 2 Subsection A)
- Are there Unusual Site Conditions? – Identify and explain.
- Should the project be closed to traffic?
- Should detours be used
- Could there be impacts to school bus routes or emergency vehicles?
- Sanitary Sewer / Force Mains – any possible conflicts?
- Drainage – Existing Pipe Lines and Drainage Conflicts – underground utilities?
- Existing slope conditions - Soil Erosion/Sediment Control – Drainage runoff

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- Environmental Issues – wetlands, 4(f) properties
- Structures – Existing condition: Detour or open to traffic during construction?
- Residential & Commercial properties–Any possible access problems to driveways?
- How could possible staging affect access?
- Could timing of project affect local/seasonal events, such as shore traffic, fairs, etc.?
- Any Historic considerations within proposed project limits?
- Research and note any other NJDOT Projects proposed in vicinity of project

### **Ongoing Site Visits**

Use appropriate list(s) and reference materials. The following is a list of constructability issues and questions to consider while preparing for and conducting the site visit.

- Construction Concepts - good engineering judgment
- Earthwork and Grading
- Signalization - Conflicts with Utilities / Staging
- Staging and Traffic Control Plans - Maintenance of Traffic
- Is access provided to work areas?
- Can access be constructed to remote locations?

### **Right of Way**

- Has ROW been acquired?

### **Earthwork and Grading**

- Any available stockpiling sites?
- Can available construction equipment meet project requirements? (e.g., Crane limits, height limits, etc. Minimize restricted areas that eliminate normal equipment use
- Is earthwork phasing compatible with construction requirements?
- Are cuts in rock wide enough to accommodate equipment?
- Are roadway grading/ fill widths compatible with equipment size?
- Can contractor access remote locations on project?
- Is there presence of ground water or active streams within project limits?
- Water table vs. excavation depth
- Does the Earthwork Summary need to be presented by stage?

### **Pavements and Base Courses**

- Minimize low production or hand work areas
- Can overloads / widths be hauled through job?
- Design roadway widening that will accommodate standard equipment
- Is there enough room to allow for concrete/bituminous concrete paving equipment?
- Are special material sources available and within reasonable haul distance?

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## ***Pipelines and Drainage***

- Identify possible underground utility conflicts
- Is underground work sequenced with roadway operation?
- Any potential drainage or flooding problems through temporary construction?
- Through the stages, is the outfall portion of the drainage system constructed before the up-gradient portion
- Could sidewalk pond water at transition to bridge deck?

## ***Drainage-Water Runoff/Soil Erosion/Sediment Control***

- Are there areas of soil erosion – wash-outs?
- Check drainage staging to ensure functional during all stages
- Does staging trap water or push water down side streets or driveways?
- Will site work cause flooding or ponding on private property?
- Are silt fence and or floating turbidity barriers required?

## ***Structures***

- Will caisson drilling require special measures?
- Is dewatering required?
- Consider working areas needs around structures
- Check for overhead utility conflicts
- Consider access to structure site
- Consider requirements for temporary utility ductwork support
- Are there aerial utilities that will limit crane usage?
- Are there drainage conflicts that may affect bridge?
- Pedestrian usage of structure during construction
- Limits on other local structures that hinder truck delivery of contract items
- Will vibrational effect of work, such as pile driving, affect local structures?

## ***Staging Plans and Traffic Control Plans***

- Ensure that detour design fits field / traffic needs
- Does detour allow enough area for planned work?
- Consider staged construction - vertical elevation differences for traffic lanes
- Check access for local business/ residents
- Is traffic control plan coordinated with job phasing/staging?
- Can traffic conflicts be reduced by innovative haul roads?
- Are work zones large enough for equipment access?
- Can emergency vehicles travel through work zones without delays?
- Positive road closure when existing structure is being demolished
- Provide emergency pull-offs when shoulders are eliminated during construction staging
- Is there a need for a separate truck detour? Has detour route been analyzed for truck traffic?

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## ***Electrical***

- Will temporary signals or highway lighting be required for staging?
- Are there any existing loop detectors?
- Does required conduit installation fit construction staging?

## ***Utility Issues***

- Do power lines or other utilities conflict – including above or below ground?
- Do services need to be relocated as a result of project construction?
- Is there a conflict with utilities for contractor equipment – pile driving, bridge erection, sheeting, noise walls, retaining walls, overhead signs, culverts, etc?
- Does area require pre-design underground utility locations verified – test pits?
- Is there a need to relocate underground utilities?
- Is existing lighting impacted by construction? – Are street lights impacted?
- Is there evidence of buried underground fiber optic lines or ITS facilities?
- Can utility relocations start prior to construction by Contractor?
- Can utility relocations be performed by the State’s Contractor?
- Is project in proximity to railroad property? – active or exempt
- Are there conflicts with railroads and do they have limitations on work hours?
- Check driveways/ sidewalks for conflicts with utilities

## ***Incidentals***

- Is temporary fencing needed to protect work sites
- Has pedestrian access been provided during construction staging
- Are there constructability items, issues, or concerns related to Materials and Specialty Items, Maintenance of Right of Way, Demolition, or Environmental categories?

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