Revisions to Highway Design Manual
Chapters 20 & 21

Issued by Engineering Bulletin EB 15-035

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Engineering Bulletin EB 15-035

Effective as of May 5th, 2016 letting

Title: HIGHWAY DESIGN MANUAL REVISION 86 – CHAPTER 2 DESIGN CRITERIA, CHAPTER 20 CADD STANDARDS AND PROCEDURES AND CHAPTER 21 CONTRACT PLANS, SPECIFICATIONS AND ESTIMATE (Limited Revision)

Approved:
Richard W. Lee, P.E.
Deputy Chief Engineer (Design)

Administrative Information:
- This Engineering Bulletin (EB) is effective immediately.
- This EB does not supersede any other issuances.

Purpose: To announce the availability of Highway Design Manual (HDM) Revision No. 86 updating Chapter 2, Chapter 20 and Chapter 21, and the availability of supporting tools and documents.

Technical Information:
Revision 86 includes the limited revisions to HDM Chapters 2, 20 and 21 described below:

Chapter 2:
- Revision of Exhibit 2-15a, Nonstandard Feature Justification for Pedestrian Facilities, to fulfill the decision making and documentation requirement included in ED 15-004.
Revisions to HDM Chapter 2 will be covered in a separate webinar
Revisions to HDM Chapter 20 were done to support:

1. Improvements to the legibility of contract plans
2. Highlighting utility locations to increase awareness & safety
HDM Chapter 21 Revisions:

- **Miscellaneous changes**
- **Quantity workups as required supplemental info**
- **Level of accuracy required for quantity workups**
- **Removing quantity summary tables from plans**
- **Calculators for lump sum WZTC & survey operations**
- **Insurance coverage**
- **Color contract plans**

### TECHNICAL INFORMATION:

**Chapter 21:**
- Incorporated new guidance related to the adoption of the electronic Standard Specifications and Standard Sheets as the Department’s official documents issued by EI 15-001.
- Updated the standard plan sheet border to include the “New York State of Opportunity” logo and revised the guidance for plan sheet preparation to reference the standard notes that are to be included on all contract title sheets issued by EB 15-018.
- Incorporated additional guidance regarding required insurance coverage complementing recent changes to Section 107-06 of the Standard Specifications issued by E1 15-003.
- Updated the Pre-Requisites to Advertisement guidance to highlight the 23 CFR 635.309 requirements that the State provide statement(s) regarding right-of-way clearance, utility, and railroad work.
- Added new section 21.4.2.1H - Review and Approval of Specifications that Transfer Equipment or Materials to DOT, which applies to specifications that transfer equipment or materials from the contractor to DOT for a use that is separate from the original contract. A detailed justification and approval of these specifications will be required by the Office of Legal Services, DQAB and the Main Office Program Area responsible for the specification.
- Require that quantity work-up be provided as supplemental information.
- Require that scaled plans utilize gray scale base mapping and color utility information.
- Require that a black and white PDF of the scaled plans set be provided as supplemental information for printing purposes.
- Revised language on the level of accuracy required for quantity work-ups.
- Revised the list of miscellaneous tables (HDM Section 21.3.9.2K) that are necessary to provide on most projects. Other tables that only summarize information provided elsewhere in the plan set should be provided as supplemental information.
- Updated/added email distribution groups to the PS&E Transmittal Memo.
- Allow unsealed layered and 3D PDF files.
- The availability of a lump sum Basic Work Zone Traffic Control (WZTC) calculator for estimating item 619.01 in place of the labor, equipment and materials estimates.
- The availability of a lump sum Survey Operations calculator for estimating item 623.01 in place of the labor, equipment and materials estimates.
- Announcement of a Design Detail library for use in developing capital projects.
Quantity Work-Up Changes
Quantity Work-Ups as Supplemental Info

- Now required to be provided as supplemental information to bidders

- Advantages
  - Gives the contractors a better understanding of work expected
  - More confidence in their estimates
  - Less perceived risk
  - Should result in lower bids
Quantity Work-Up Method of Development

- Quantity workups should be developed using one of the following methods:
  - Electronically through spread sheets (preferred method)
    - A quantity workup spread sheet shell has been developed and is available on the HDM Chapter 21 Internet Page
    - File name: “Estimate Comp Sheets and Misc Table Shells”
  - Capturing data through CADD or related software
    - Noting that quantities were obtained from CADD is not enough
    - Identify the CADD file in the workup and provide the files to construction
  - Hand written computations
Estimate Comp Sheet Shell

Chapter 21 - Contract Plans, Specifications and Estimates

Purpose:
This chapter provides guidance regarding P&SE preparation and submission within the context of the project development process.

Links:
- Chapter 21 Revised 10/19/15
- Setting Disadvantaged, Minority and Woman Business Enterprise Goals on Construction Projects
- Office of General Services (OGS) Request for Services Form: BOC 153
- ED 15-015 - Rebranded Title Sheets and Border Sheet Cells FAQs

Downloadable Forms:
- P&SE Transmittal Memo Revised 12/31/15
- Status of Special Specifications Table
- DEIT 22
- Request for Change in Goals (Form: HC-256)
- Supplemental Information to Bidder (Form: CORR9)
- Hand-off Memo to the Engineer-in-Charge
- Property Release Form (Form: HC-90) RTF PDF
- Property Release Form (Form: HC-91) RTF PDF
- Construction Pay Item Checklist

References:
- Sample Plan and Proposal Sheets
- NYSDOT Guidelines for Estimating Price Adjustment Items (Metric)
- NYSDOT Guidelines for Estimating Price Adjustment Items (USCG)
- NYSDOT Guidelines for Estimating Training Requirements Item
- Inspection/Quality Control Form Tables with Instructions
- Estimate Comp Sheets and Misc Table Sheets
- Design Guidance Plans with Color Utilities, Graybase Maps & Shading
- Example of Grayscale and Color Utility Plans

New York State Department of Transportation
Estimate Comp Sheet Shell

Designers take note. Red tabs indicate "designer information only" or "jump sum items" and are to be removed prior to providing worksheets to contractor.

PURPOSE:
1. To provide an electronic method of calculating quantities using Excel for comp sheets, with update that can be linked to tabulation files.
2. The need for hand calculations should be reduced, and Estimate books should not be needed. This Excel file will replace it.

DESIGNER INSTRUCTIONS:
3. There are approximately 300 of the most commonly used NYSDOT item numbers contained in this file.
4. Identify items used on the project.
5. Fields qualify worksheets on the individual tab. Quantity workups should provide enough detail to convey designer intent and the scope of work. Designer areas provide references in order to ensure consistency of all components of the project.
6. The total quantity will automatically calculate at the bottom of the tab and it will be referenced on the corresponding row on the ESTIMATE SUMMARY Tab.
7. Determine the use price from the Pay Item Catalog or Transport Estimator.
8. On the ESTIMATE SUMMARY Tab, the "Formular" column will automatically calculate.
9. The user should expect to need additional blank tabs, since the thousands of item numbers were reduced to just over 300.
10. Tabs may be copied to create additional item numbers not contained in the shell.

When a tab is added, the following must be done:
11. Active tab must be added in the INDEX and ESTIMATE SUMMARY tabs.
12. The item or item added must be hyperlinked to bring the user to the appropriate shell tab.
13. The SKY quantity must be linked to the appropriate cell for the shell to be ESTIMATE SUMMARY tab.
14. When the designer adds tabulars that an item (or group of items) will not be used on the project, the individual item tab and the corresponding record on the INDEX and ESTIMATE SUMMARY tab, may be deleted.
15. When workups on all other tabs have been completed, calculate items 609.31, 625.01, 627.03, and 995.610081. These items all use a project value in the calculation, and cannot be calculated until all other items are complete.

TABLES:
16. INSTRUCTIONS:
17. INDEX:
18. Formulas at item numbers contained in this file without pricing information. This tab can be provided to the contractor.
19. Each item number is hyperlinked to a worksheet containing appropriate data.
20. ESTIMATE SUMMARY:
21. Contains all item numbers contained in this file.
22. E to E tab for information on calculating the Engineer's Estimate.
23. When items with variables are changed to a specific item, change the item number in the appropriate part.
24. On the ESTIMATE SUMMARY Tab:
25. On the E to E Tab.
### Estimate Comp Sheet Shell

**Item 606.01 (LF)**

<table>
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<tr>
<th>STATION</th>
<th>STATION</th>
<th>SIDE</th>
<th>COMMENTS</th>
<th>LENGTH</th>
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<td>0.00</td>
</tr>
</tbody>
</table>

**Total:** 0.00

Added for unanticipated field conditions:

**CAB:** 0
# Estimate Comp Sheet Shell

## Engineer's Estimate

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<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QUAN</th>
<th>UNIT PRICE</th>
<th>AMOUNT</th>
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<td>CLEARING AND GRUBBING (LARGE AREA)</td>
<td>LS</td>
<td>$</td>
<td>$</td>
<td>$</td>
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<tr>
<td>281.07</td>
<td>CLEARING AND GRUBBING (SPECIFIC LOCATION(S))</td>
<td>ACRE</td>
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<td>$</td>
<td>$</td>
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<tr>
<td>282.00</td>
<td>DRAINAGE SYSTEMS (USE THIS SHEET TO POPULATE ITEMS 282.52 AND 282.57)</td>
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<td>-----</td>
<td>$</td>
<td>$</td>
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<tr>
<td>283.02</td>
<td>UNLOADING AND DISPOSAL</td>
<td>CY</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>283.03</td>
<td>EMBANKMENT IN PLACE</td>
<td>CY</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>289.07</td>
<td>SELECT SIAMARI FILL</td>
<td>CY</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>293.05</td>
<td>CONTROLLED HORIZONTAL Erosion</td>
<td>CY</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>296.10</td>
<td>EXCAVATION AND BACKFILL INCLUDING SURFACE RESTORATION</td>
<td>LF</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>296.20</td>
<td>CONCRETE EXCAVATION AND BACKFILL (REMOVING TOP SURFACES)</td>
<td>LF</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>296.30</td>
<td>TEST HOLES</td>
<td>CY</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>296.40</td>
<td>TEST PIT EXCAVATION</td>
<td>EA</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
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<td>CHECK DRAIN PATTERN</td>
<td>CY</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
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<td>CHECK DRAIN PATTERN</td>
<td>CY</td>
<td>$</td>
<td>$</td>
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<td>296.70</td>
<td>CHECK DRAIN PATTERN</td>
<td>CY</td>
<td>$</td>
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## Other Items

- 291.00: Silt Fence, Temporary
- 292.00: Seed Mixtures, Temporary
- 293.00: Bi-Ontone Mixture, Class II, Permanent
- 294.00: Bi-Ontone Mixture, Class II, Intermediate
- 295.00: Bi-Ontone Mixture, Class II, Permanent
- 296.00: Bi-Ontone Mixture, Class II, Temporary
- 297.00: Soil Stabilizers, Class IV, Type X
- 298.00: Construction Entrance
- 299.00: Subaqueous Course, Type 1
- 300.00: Pavement Ride Quality Adjustment Level 1, Mainline
- 301.00: Pavement Ride Quality Adjustment Level 2, Ramps

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**Department of Transportation**

2/4/2016
Quantity Work-Up Level of Accuracy

- **Quantity workups should be developed to an accuracy that allows:**
  - *The contractor to properly bid the item*
  - *The department to estimate the funds needed for construction*
  - *For survey tolerances*
  - *Inspectors to verify contractors request for payment*
List of Miscellaneous Tables
Revised List of Miscellaneous Tables

- Revised list of Misc. Tables that are to be included in the plan set to remove summary only tables and provide them as supplemental information.

- Advantages of removing summary tables from the plan set:
  - Will decrease the potential of having conflicting information within the plan set.
  - Since summary tables are typically produced in the quantity workups, it will be less time consuming for designers if they don’t have to recreate these same tables in the plan set.
Earth Work
Summary
Sheets
Earth Work Summary Sheets

Available on the HDM Chapter 21 Internet Page

File name: “Estimate Comp Sheets and Misc Table Shells”

<table>
<thead>
<tr>
<th>OUT SECTION</th>
<th>QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB</td>
<td>EXCAVATION OF BENCHES (top, bottom and flat surface)</td>
</tr>
<tr>
<td>CR</td>
<td>EXCAVATION OF BENCHES (top, bottom, and flat surface)</td>
</tr>
<tr>
<td>CP</td>
<td>EXCAVATION OF BENCHES (top, bottom, and flat surface)</td>
</tr>
<tr>
<td>CE</td>
<td>EXCAVATION OF BENCHES (top, bottom, and flat surface)</td>
</tr>
<tr>
<td>TE</td>
<td>EXCAVATION OF BENCHES (top, bottom, and flat surface)</td>
</tr>
<tr>
<td>CA</td>
<td>EXCAVATION OF BENCHES (top, bottom, and flat surface)</td>
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<tr>
<td>C1</td>
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<tr>
<td>CO</td>
<td>EXCAVATION OF BENCHES (top, bottom, and flat surface)</td>
</tr>
<tr>
<td>CN</td>
<td>EXCAVATION OF BENCHES (top, bottom, and flat surface)</td>
</tr>
<tr>
<td>CT</td>
<td>EXCAVATION OF BENCHES (top, bottom, and flat surface)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The contractor attention is directed to the fact that these tables are estimates, and are provided for the purpose of preliminary estimate. They are not to be construed as being fixed or final. They are intended to supplement and not to replace the specifications or designations of the work to be performed. Any significant difference from this representation, whether or not stated herein, during the actual work, shall be handled according to the specifications for the particular project.</td>
</tr>
</tbody>
</table>
**Excel Spreadsheet**

**203.02 & 203.03 (Sheet ES-2)**
The designer will fill in the table below. Highlighted cells will fill in automatically.

**203.02 & 203.03 (Sheet ES-1)**
This table will autofill with numbers from the table to the left. The Total Excavation and Total Fill will autofill into the appropriate cells of the 203.02 and 203.03 quantity work up tabs.

**206.0201 (Sheet ES-1)**
The highlighted portions of this table will autofill using data from the 206.0201 quantity work up tab.
Data Entry

Fill in the subdivision number and the source locations

Fill in the suitable excavation quantities

Fill in the unsuitable excavation quantities

Fill in the embankment quantities

<table>
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<tr>
<th>SUBDIVISION NO.</th>
<th>SOURCE STATION TO STATION</th>
<th>SUITABLE EXCAVATION</th>
<th>ROCK</th>
<th>UNSUITABLE EXCAVATION</th>
<th>TOTAL EXCAVATION</th>
<th>EMBANKMENT</th>
</tr>
</thead>
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<td>CG</td>
<td>CP</td>
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</tr>
</tbody>
</table>

These columns will calculate the designers input and autofill the totals.
### Trench & Culvert Summary

**SUMMARY OF TRENCH AND CULVERT EXCAVATION**  
*(ITEMS 206.0201 ONLY)*

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>ROCK</th>
<th>NON-ROCK</th>
<th>ITEM 206.0201</th>
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</thead>
<tbody>
<tr>
<td>PIPE SUBTOTAL:</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>STRUCTURES SUBTOTAL:</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>UNDERDRAIN SUBTOTAL:</td>
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<tr>
<td>GAS LINE BEDDING:</td>
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</tr>
<tr>
<td>CULVERT:</td>
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<tr>
<td>MISC:</td>
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<tr>
<td><strong>TOTALS</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The source column autofills from the 206.0201 quantity work up tab - except for the Misc. row.

The rock and non-rock columns must be filled in by hand.

The highlighted cells will calculate and display automatically.
Exporting to MicroStation

Once tables have been filled out they can be brought into MicroStation using the instructions posted on the HDM Chapter 21 internet page.
WZTC & Survey Operations Calculators
Spreadsheet for WZTC Calculator

- Available on the HDM Chapter 21 Internet Page
- File name: “Estimate Comp Sheets and Misc Table Shells”

**ITEM 619.01 (LS)**
**BASIC WORK ZONE TRAFFIC CONTROL**

**PROJECT TYPE:** 3R

<table>
<thead>
<tr>
<th>Designer Instructions</th>
<th>Item 619.01 Lump Sum Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineer's Estimate Subtotal (without 619.01 or 625.01)</td>
<td>$</td>
</tr>
</tbody>
</table>

- **Drainage:** None-0.00, Minor-0.30, Major-0.60  Drop Down
- **Complexity (Project):** Simple-0.00, Moderate-0.30, Complex-0.60  Drop Down
- **Intersection:** None-0.00, Minor-0.30, Major-0.60  Drop Down
- **Detour:** None-0.00, Minor-0.30, Major-0.60  Drop Down
- **Temporary Signal:** None-0.00, Simple-0.30, Complex-0.60  Drop Down
- **Crossover:** None-0.00, One-0.30, Two-0.60  Drop Down
- **Multilane Construction:** One-Lane, Two-Lane, Three-Lane  None-Pass

**Chart of Recent Bid Results**
WZTC Calculator

**Chose a project type:**
- 1R/2R
- 3R
- New & Reconstruction/Intersect.
- Bridge Replacement/Rehab
- Large Culvert

**Enter the EES (in the blue cell)**

**Select the appropriate value from the drop down menu**

**Look at each modifier and its description**

**The lump sum cost (green cell) is linked to & automatically entered into the Engineer’s Estimate**

### Item 619.01 (LS)

**Basic Work Zone Traffic Control**

<table>
<thead>
<tr>
<th>Modifier</th>
<th>Description</th>
<th>Value</th>
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</thead>
<tbody>
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<td>Drainage</td>
<td>None-0.00, Minor-0.30, Major-0.60</td>
<td></td>
</tr>
<tr>
<td>Complexity (Project)</td>
<td>Simple-0.00, Moderate-0.30, Complex-0.60</td>
<td></td>
</tr>
<tr>
<td>Intersection</td>
<td>None-0.00, Minor-0.30, Major-0.60</td>
<td></td>
</tr>
<tr>
<td>Detour</td>
<td>None-0.00, Minor-0.30, Major-0.60</td>
<td></td>
</tr>
<tr>
<td>Temporary Signal</td>
<td>None-0.00, Simple-0.30, Complex-0.60</td>
<td></td>
</tr>
<tr>
<td>Cross-over</td>
<td>None-0.00, One-0.30, Two-0.60</td>
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<tr>
<td>Multi-year construction</td>
<td>One-0.00, Two-0.30, Three-0.60</td>
<td></td>
</tr>
<tr>
<td>Population: Upstate / Downstate (I-84 is cutoff)</td>
<td>Sparse-0.00, Upstate-0.30, Downstate-0.60</td>
<td></td>
</tr>
<tr>
<td>Total Adjustments</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td>Base Percentage</td>
<td>4.40%</td>
<td></td>
</tr>
<tr>
<td>Adjusted Percentage (Compare to chart on right)</td>
<td>4.40%</td>
<td></td>
</tr>
</tbody>
</table>

**Item 619.01 Lump Sum Cost**

$
Chart of Recent Average WZTC Bids

- Charts to the right of each project type give the average bid results of recent projects based on project type and cost.

- Charts are to be used to check the calculator results to ensure valid costs.
Example

**STEPS:**
1. Select Project Type [Bridge Replacement]
2. Enter EES (blue cell) [$10M]
3. Select the appropriate value from the drop down menus on the right (yellow cells) based on descriptions given for each category on the left
4. The spreadsheet calculates and displays the 619.01 Lump Sum Cost (green cell)
5. That number will automatically be entered into the Engineers Estimate
**Example (continued)**

**STEPS:**

7. The chart shows an AVG. cost of 4.0% for projects with an EES of $10,000,000.

8. Since this job is of moderate complexity and does not have staged construction or off site detours, it's likely the lump sum would come in a little lower than the chart.
Identifying Insurance Coverage Requirements
All Possible vs. Contract Specific

- **Insurance Related Changes (§21.5.2)**
  - EI 15-003 (effective 5/7/2015) - Revised/Updated §107-06 to include all types of insurance that might be required.
  - EB 15-035 – Revised HDM Chapter 21 to require a project specific note identifying types of insurance not required.

- **The Standard Specifications** identify all possible insurances required on any contract

- **The Special Note** clarifies which are not applicable to the specific contract

  - Helps convey and confirm the Department’s expectations to Bidders
### Special Note

**INSURANCE COVERAGE**

By virtue of the scope, location, type, and/or estimated value, the following types of insurance, listed in the Standard Specifications §107-06B, do not apply to this project and the Contractor is under no obligation to furnish proof of such insurance.

- **Professional Liability/ Errors and Omissions is not required unless the Contractor intends to include** professional services requiring the signature, stamp or certification of a licensed professional, including, without limitation, erection plans, demolition plans, containment plans, coffer dams, and temporary sheeting.

- **Railroad Protective Liability Insurance is not required because the project scope does not require work affecting any Railroads as described in §105-09.**

- **Marine Protection & Indemnity Insurance is not required because the project scope does not require** any Work performed on a navigable waterway using barges or other watercraft.

- **Pollution Liability Insurance is not required because** the Contractor will not employ mobile equipment or tanks or facilities for fueling vehicles or equipment on-site. The Contractor will only use licensed and registered vehicles that are covered by a Commercial Automobile Policy, or provide the Pollution Liability Insurance.

---

**ADJUSTMENTS TO RAILROAD PROTECTIVE LIABILITY INSURANCE COVERAGE.**

By virtue of the railroad requirements specific to the location of this project, the limits of liability applicable to this project, required by the Standard Specifications §107-06B, are adjusted to: $_______ combined Bodily Injury Liability and/or Property Damage for each occurrence with a $_______ aggregate.

---

The shell MS Word document for the Special Note is available on the HDM Chapter 21 internet webpage. File is ‘Special Note-Insurance Coverage’ listed under ‘References’ then ‘Sample Plans and Proposal Sheets’.

Select which notes apply, and remove the others.

Fill in information as necessary.
As-Applicable Insurance Requirements

- The following types of insurance may be eliminated, if not required:
  - Professional Liability / Errors and Omissions
  - Railroad Protective Liability Insurance
  - Marine Protection & Indemnity
  - Pollution Liability Insurance
  - Builders’ Risks Policy
Insurance Coverage Limits

- The following types of insurance may require insurance coverage limits to be specified in the contract proposal:
  - Railroad Protective Liability Insurance
    - Applicable to any work affecting railroads (§105-09).
  - Builders' Risks Policy
    - Applicable to projects valued at $25M or more that call for the construction of any “Structure” or building.
Railroad Liability Limits

- Railroad Protective Liability Insurance Limits determined as follows:
  - §107-06 limits are $5M per occurrence with a $10M aggregate.
  - Limits may be reduced to $2M per occurrence with a $6M aggregate where railroad is not used for intra- or inter-city passenger service nor major freight traffic.
  - Limits may be increased on advice of counsel.
  - Confirm that the dollar amounts stated in the special note match the dollar amounts stated in the railroad force account agreement.
Builder’s Risk Limits

SPECIAL NOTE
INSURANCE COVERAGE

By virtue of the scope, location, type, and/or estimated value, the following types of insurance, listed in the Standard Specifications §107-06B, do not apply to this project and the Contractor is under no obligation to furnish proof of such insurance.

Professional Liability/Errors and Omissions is not required unless the Contractor intends to include professional services.

BUILDERS’ RISKS INSURANCE

Builders’ Risks Insurance is not required for this contract.

OR

The required policy limit of Builders’ Risks insurance required for this contract is $__ Million.

Identify which scenario applies to the contract (& remove the other)

Fill in any necessary information (Refer to HDM 21.5.2 for guidance on determining this value)
Color
Contract Plans
New Look & New Standards

- **Color Electronic Plans (.pdf)**
  - New required format for plans
  - Gray base mapping
  - Black proposed features
  - Color utilities (existing & proposed)
  - Gray area shading (optional)

- **New Supplemental Data Requirement – Grayscale Plans (.pdf)**
  - Required as supplemental info to bidders
  - Must keep updated with the color plan set through contract award
CONR 9 Supplemental Information Available to Bidders

- New CONR 9 form
- Added two required deliverables
  - Grayscale plans
  - Quantity Work Ups
- Available online
  - IntraDOT
  - www.dot.ny.gov

SUPPLEMENTAL INFORMATION AVAILABLE TO BIDDERS
The information checked in the “Digital” column on this form is available at the Contract Documents tab within the Construction Contracting section of the Business Center on the Department’s web site. The information checked in the “Inspection Only” column on this form is available at the Regional Office having jurisdiction for this project, as identified in the advertisement for bids, for inspection and review prior to the letting date. The bidder’s signature on this proposal certifies that they have made themselves aware of the availability of the information indicated below:

THERE IS NO SUPPLEMENTAL INFORMATION AVAILABLE FOR THIS CONTRACT: ☐

<table>
<thead>
<tr>
<th>INFORMATION</th>
<th>Digital</th>
<th>Inspection Only</th>
</tr>
</thead>
</table>
| 1. Grayscale PDF of Sealed Plan Set (for printing)
| 2. Unsealed Layered or 3D PDF Files
| 3. CADD Information
| a. MicroStation DGN
| b. InRoads DTM and XML format
| c. InRoads ALG and XML format
| 4. Cross Sections in ADOBE PDF format
| 5. Quantity Work-ups

1. All digital material is provided in ADOBE (PDF) format, unless noted above.
2. Required for all projects that have plan sets. See HDM Section 21.3.9.2
3. Required for all projects.
Why Add Color to Plans

- **Existing Features / Base Mapping** - Now displayed as gray
  - Helps distinguish existing info (gray) from proposed info (black).
  - Better highlights proposed info.

- **Utilities** (most) - Now displayed as 1 of 7 assigned colors
  - Colors - pink, red, purple, orange, blue, cyan, green.
  - Draws attention to location of utilities.
  - Improve safety. Reduce cost/delays due to utility conflicts & hits.
  - Helps differentiate info on plans, especially in ‘busy’ areas (e.g., sidewalk).
## Utility Colors

<table>
<thead>
<tr>
<th>NYSDOT Color</th>
<th>Utility</th>
<th>APWA Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pink</td>
<td>Unknown</td>
<td>Pink</td>
</tr>
<tr>
<td>Red</td>
<td>Electric</td>
<td>Red</td>
</tr>
<tr>
<td>Purple</td>
<td>Gas / Oil</td>
<td>Yellow</td>
</tr>
<tr>
<td>Orange</td>
<td>Communications</td>
<td>Orange</td>
</tr>
<tr>
<td>Blue</td>
<td>Potable Water</td>
<td>Blue</td>
</tr>
<tr>
<td>Cyan</td>
<td>Storm Sewer / Drain Line</td>
<td>Blue</td>
</tr>
<tr>
<td>Green</td>
<td>Sanitary Sewer</td>
<td>Green</td>
</tr>
<tr>
<td>N/A</td>
<td>Irrigation / Reclaimed Water</td>
<td>Purple</td>
</tr>
</tbody>
</table>
Color Terminology

- **Black & White / B&W / Monochrome** (‘Plans_Black_All.set’)
  - Everything displayed as black only

- **Grayscale / Grayscale Only** (‘Plans_Gray_NoColorUtilities.set’)
  - Everything displayed in black or 1 of 3 shades of gray

- **Grayscale with Color Utilities / Color** (‘Plans_Gray_ColorUtilities.set’)
  - Everything displayed in black or gray, except…
  - Utility features (existing & proposed) displayed in 1 of 7 assigned colors

- **Full Color** (‘Plans_Color_All.set or Plans_Color_WithColorUtilStdsOn.set’)
  - Everything displayed in any color
Black & White Plans

- Previous standard for contract plans (both paper & .pdf)

Notice that area shading plots as an opaque shape.

Therefore:
Don’t use area shading if plotting in black & white.
Black & White Plans

All Features (black)
Grayscale Plans
Grayscale Plans

- Sheet Info (black)
- Existing Features (dark gray)
- Existing Utilities (dark gray)
- Proposed Features (black)
- Proposed Utilities (black)
Grayscale with Color Utilities Plans
Grayscale with Color Utilities Plans

Sheets Info (black)

Existing Features (dark gray)

Existing Utilities (1 of 7 colors)

Proposed Features (black)

Proposed Utilities (1 of 7 colors)
Full Color Plans

- Not a common format for contract deliverables
Full Color Plans

All Features (any color)
Plotting Terminology

- **Color Tables** (*ctb files*)
  - Associates specific RGB values to the 256 MicroStation colors

- **Pen Tables** (*pen files*)
  - Assigns specific line thicknesses (mm) to the various MicroStation line weights
  - Can assign & override many other settings (color, line style, etc.)
  - Can assign different settings to different levels & element types (line or text)
  - Can set priorities as to what levels to display in the background or on top
  - Can override the MicroStation settings and the color table settings

- **.SET Files**
  - With 1 file a user can set up the color table, pen table, and paper size

- **Printer Queue Default Setting** (Uses a .set file)
  - Printer specific default settings (color table, pen table & paper size)
Basic Methodology

- No manual changes to the elements in a design file are required.
- All necessary design file changes are addressed through a simple update to the CADD levels for each file.
- The addition of color is done through the plotting/printing process.
- The pen table overrides and controls what gets displayed in color.
- Use .SET files to simplify loading the correct combination of color and pen tables.
- Continue to use basic color assignments in CADD (colors 0 -15, the top row in the palette), and use the pen table to adjust the printed/plotted colors slightly so they display & photocopy clearly.
- Can be applied at any time in the design process.
What’s New

- Replaced all the pen tables & color tables with new ones
  - Name of all new files start with “ny_”
  - No change to the color tables, they were just renamed
  - Should stop using the old pen & color tables

- ‘One Size Fits All’ – Same pen table used for Size A, B, or D plans

- Two new groups of .SET files for easy setup of settings
  - The name of all files for producing plan sheets start with “Plans_”
  - The name of all files for producing large displays start with “LargeDisplay_”

- Two new levels for area shading (‘O_Area_Shading 1’ & ‘O_Area_Shading 2’)  

- Reassignment of colors for a few utility features

- Proposed sidewalk line style is solid (no longer a dashed line)

- Color and line thicknesses when plotting/printing
## New Files

<table>
<thead>
<tr>
<th>Color Tables</th>
<th>Pen Tables</th>
<th>.SET files</th>
</tr>
</thead>
<tbody>
<tr>
<td>ny_color.ctb</td>
<td>ny_b_basic.pen</td>
<td>Plans_Black_All.set</td>
</tr>
<tr>
<td>ny_bw.ctb</td>
<td>ny_b_gray.pen</td>
<td>Plans_Gray_NoColorUtilities.set</td>
</tr>
<tr>
<td>ny_b_gray_colorutil.pen</td>
<td>Plans_Gray_ColorUtilities.set</td>
<td></td>
</tr>
<tr>
<td>ny_b_fullcolor.pen</td>
<td>Plans_Color_All.set</td>
<td></td>
</tr>
<tr>
<td>ny_b_fullcolor_colorutil.pen</td>
<td>Plans_Color_WithColorUtilStdsOn.set</td>
<td></td>
</tr>
<tr>
<td>ny_e_basic.pen</td>
<td>LargeDisplay_Black_All.set</td>
<td></td>
</tr>
<tr>
<td>ny_e_gray.pen</td>
<td>LargeDisplay_Gray_NoColorUtilities.set</td>
<td></td>
</tr>
<tr>
<td>ny_e_gray_colorutil.pen</td>
<td>LargeDisplay_Gray_ColorUtilities.set</td>
<td></td>
</tr>
<tr>
<td>ny_e_fullcolor.pen</td>
<td>LargeDisplay_Color_All.set</td>
<td></td>
</tr>
<tr>
<td>ny_e_fullcolor_colorutil.pen</td>
<td>LargeDisplay_Color_WithColorUtilStdsOn.set</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** There are new design library files, but they are named the same as the old files.
Implementation Steps Overview

1. **Download the latest ‘CADD V8i Resources and Settings’**
   (Same download for InRoads SS2 and InRoads SS4 users)

2. **Within each design file manually update the level assignments**
   (In the key-in browser type: “dgnlib update all” to sync with the new design library file)

3. **Verify data is on the proper levels**

4. **Use ‘Plans_Gray_NoColorUtilities.set’ to generate a complete supplemental grayscale contract plan set**

5. **Use ‘Plans_Gray_ColorUtilities.set’ to generate the appropriate sections of the plans in color. Make a file copy of the grayscale plan set and then replace the appropriate sections with the color plan sheets.**

6. **Keep any amendments in sync between both plan sets through contract award**

7. **Make any field changes or as-built plan revisions to the color plan set**
Step 1

From LANDesk download the latest ‘CADD V8i Resources and Settings’

- Loads the new .set, .dgnlib, color tables, and pen tables
- Both InRoads SS2 and InRoads SS4 users download the same file
- Note: Make sure there are no open Bentley products (MicroStation, ProjectWise, etc.) when downloading and installing the resources & settings

![Computer Desktop Icon]

![LANDesk Management Suite Policy Management]

![NYSDOT Software Installs]
Step 2

**Within each design file manually update the level assignments** (from the new design library file which was automatically installed in the correct folder by the ‘Resource & Settings’ update)

- Still necessary even though the .dgnlib file name didn’t change

- In MicroStation, open ‘Utilities’ (or ‘Help’) from the top toolbar, & then ‘Key-in’ browser
- Type in “dgnlib update all” (or select from menu options) and hit ‘Enter’
- To verify: In Level Manager check to see if ‘O_Area_Shading 1’ is now listed

  Place a proposed sidewalk feature and it should display as a solid line

  (Note: ‘O_Area_Shading 1’ will be listed in Level Manager after the setting update, even if the ‘dgnlib update all’ function was not run, so it is not a valid test for verifying the level assignments were updated)

- Repeat for all design files (e.g., plot file, main design file, any referenced file, etc.)

**Note:** Users may need to request that the Photogrammetry Unit update the referenced base map files for their project
Step 3  Verify data is on the proper levels

- The pen table assigns several attributes and overrides based on level name.
  - If data is on the incorrect level it may display improperly (color, etc.)
  - It is most critical that utility related data be verified to be on the correct level and that non-utility data is not on the utility levels.
  - Be aware that the color assignments for a few utility levels will have been changed by the design library update.
# Color Assignments by Level

<table>
<thead>
<tr>
<th>Color</th>
<th>If Level Name Starts With (ABC*) or Includes (<em>ABC</em>)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pink</td>
<td>U_A_CAL*, UC*, UM*, UP, UP_<em>, UPB</em>, UPD*, UPG*, UU*</td>
</tr>
<tr>
<td>Red</td>
<td>UE*, UL*, UPL*</td>
</tr>
<tr>
<td>Purple</td>
<td>UG*, UO*</td>
</tr>
<tr>
<td>Orange</td>
<td>I_A_CAL*, IA*, IC*, IDET*, IH*, IL*, IM*, IP*, IR*, IS*, IT*, IVID*, IVMS, IVMS_<em>, IW</em>, UI*, UT*, UF*</td>
</tr>
<tr>
<td>Blue</td>
<td>UW*</td>
</tr>
<tr>
<td>Cyan</td>
<td>D_A_CAL*, DC*, DES*, DH*, DI*, DS*, DU*, DW*</td>
</tr>
<tr>
<td>Green</td>
<td>US*</td>
</tr>
<tr>
<td>Black</td>
<td><em>_P</em> (proposed), <em>_Z</em> (as-built)</td>
</tr>
<tr>
<td>Gray (light)</td>
<td>O_Area_Shading 1</td>
</tr>
<tr>
<td>Gray (medium)</td>
<td>O_Area_Shading 2</td>
</tr>
<tr>
<td>Gray (dark)</td>
<td>All remaining levels</td>
</tr>
</tbody>
</table>
Step 4  

Use Plans_Gray_NoColorUtilities.set to generate a complete supplemental grayscale plan set

- Complete plan sets are typically the product of combining several sections and subparts each of which are generated from separate InterPlot Organizer .ips files (Example: May have separate .ips files for general plans, typical sections, profiles, misc. tables, structures plans, etc.)

- Use the ‘Plans_Gray_NoColorUtilities.set’ settings file (Loads ‘ny_b_gray.pen’ & ‘ny_color.ctb’) to plot all plan sheets.

- Combine all the sections & subparts into a collective electronic plan set. Note: This may require multiple files/volumes due to file size limitations (75Mb max.).

- Apply professional seals (PE stamp) and sheet numbering

- Label the grayscale plan set with the suffix “_NoColor”  
  Example: “D263456_R04_Plans_Vol1of5_NoColor.pdf”
Step 4 (continued)

**IPLOT Example**

- Open ‘File’, and then ‘Select Settings...’ which opens the ‘ipset’ folder with .set files
- Select the ‘Plans_Gray_NoColorUtilities’ .set file (and click ‘Open’)
- Open ‘File’, and then ‘Export PDF...’, then continue to create a .pdf file
Step 4 (continued)

InterPlot Organizer (existing .ips file) Example

• Within InterPlot Organizer select the files which you want to change their settings.

• Open ‘Edit’, then ‘Settings File’, then click ‘Apply…’ which opens the ‘ipset’ folder with the .set files. Select the ‘Plans_Gray_NoColorUtilities’.set file (and click ‘Open’)

• Then continue to use Interplot Organizer as usual to create a .pdf plan set
Step 4 (continued)

**InterPlot Organizer (new .ips file) Example**

- Open InterPlot Organizer & select the option to create a new plot set, then click ‘OK’, which opens the ‘Create Plots’ dialog box.

- Click ‘Browse...’ for the ‘Settings file name’, which opens the ‘ipset’ dialog box.

- As in the previous example, proceed by selecting from the list of .set files, the ‘Plans_Gray_NoColorUtilities’ .set file (and click ‘Open’)

- Then continue to use Interplot Organizer as usual to create a .pdf plan set
Step 5

Use ‘Plans.Gray.ColorUtilities.set’ to generate the appropriate sections of the plans in color. Make a file copy of the grayscale plan set and then replace the appropriate sections with the color plan sheets.

- **Determine which sections of the plan set are to be plotted in color.**
  - This will be the legend sheet and then any plan view plan sheets on which utility information may be displayed (e.g., general plans, WZTC plans, sign location plans, utility & drainage plans, etc.).
  - Conversely, other types of plan sheets (e.g., tables, details, typical sections, profiles, etc.) would not be required to be plotted in color.

- **Identify the .ips files used to generate the corresponding grayscale version of these plan sheets to be plotted in color, and then for all appropriate plan sheets apply the ‘Plans.Gray.ColorUtilities.set’ settings [see next slide] (Loads ‘ny_b_gray_colorutil.pen’ & ‘ny_color.ctb’).**
  - To ensure consistency between plans sets, it is recommended that the same .ips file that was used to generate the grayscale plans be used (except apply the ‘Plans.Gray.ColorUtilities’.set file changes).
Step 5 (continued)

Same process as in Step 4, except select and use the ‘Plans_Gray_ColorUtilities’ .set file to produce individual plans sheets or groups of plan sheets
Step 5 (continued)

- Make a file copy of the grayscale plans (.pdf) and remove the "_NoColor" suffix from the file name.  
  (Example: “D263456_R04_Plans_Vol1of5_NoColor.pdf” copied & renamed “D263456_R04_Plans_Vol1of5.pdf”)

- Using Adobe, replace the appropriate plan sheets in the .pdf file with the color versions.

- Apply professional seals (PE stamp) and sheet numbering to the replacement plan sheets.
Professional Seal & Sheet Number

- Discourage physical stamping (‘wet stamping’)
  - Requires sheets to be scanned which immediately introduces a reduction in legibility and some degradation (wash out) of the colors and shaded areas
  - EI 11-014 states electronic sealing of documents is the preferred method

- Recommend using Adobe software to place PE Seals and sheet numbering on plan sheets (Adobe Standard or better version required)
  - Do as last step before PS&E submittal
  - Ensure placement is exactly the same on both the color & grayscale plan sets
  - Perform quality assurance checks between the two plan sets to verify they match exactly (except for utility colors).
  - Can use ScanSoft, but stamping is easier in Adobe
Why a Supplemental Grayscale Plan Set?

- Quality source document for printing to paper
  - Some colors do not translate well when printers convert them to grayscale

- Cost less to print to paper
  - There are various users (NYSDOT, contractors, fabricators, etc.)
  - Only a fraction of the total plan set will involve color sheets
  - Printing the entire plan set in color may not be cost effective
  - Printing some sheets in color and some in grayscale could introduce opportunities for errors (plan assembly, identifying every sheet with color, etc.)

- Not everyone / every location has a color printer

- Option for persons with difficulty viewing certain colors

- Reminder: Contractors and field staff can always print color paper plan sheets from the electronic contract plans (.pdf)
Color to Grayscale Wash Out

Created as Grayscale

Grayscale from Color .pdf

Proposed utilities display in gray
(gray represents existing features)
Step 6  
Keep amendments/updates to both plans sets in sync through contract award

- The .pdf plan set with the color sheets is the official contract plans
- The supplemental grayscale plan set (.pdf) will be used for printing the paper plan sets for NYSDOT use
- The PS&E submission shall include both the color contract plans and the supplemental grayscale plans (as noted in the PS&E transmittal memo shell)
- Any plan sheet revisions require two versions to be submitted to DQAB - One for the color set & one for the grayscale set (even if the revised plan sheet has no color utility information on it)
  - Coordinate with DQAB as to whether .pdf files for the whole plan set or just for individual sheets should be provided if making numerous revisions
Step 6 (continued)

- The suffix “_NoColor” differentiates between the files
  - Sample file name for a revision to the color contract plan set: ‘D123456_R09_Plans_Vol1of6_Rev1.pdf’
  - The corresponding revision to the supplemental grayscale plan set would be: ‘D123456_R09_Plans_Vol1of6_NoColor_Rev1.pdf’

- Amendments will identify the change to the color contract plan set along with mention of a revision to the supplemental information to bidders (i.e., the corresponding update to the supplemental grayscale plan set)
  - The color contract plan sheet revisions will be in the amendment document, while the revision to the supplemental information will be a separate file (same process as how supplemental info revisions are currently handled)
Step 7  Make any field changes or as-built plans revisions to the color plans

- Refer to the MURK 1A (CAM) for guidance and procedures regarding field change sheets and as-built plans.

- The contract plans are grayscale with color utilities. Therefore, any revisions to a plan sheet should be done to the color version of the plan sheet (i.e., don’t use grayscale only or B&W plan sheets as the base document for the revisions).

- Revisions preferably should be done electronically. If not, only revise a ‘first generation’ printed paper plan sheet (i.e., Don’t mark up photocopied plan sheets; colors degrade each time the sheets are photocopied).

- Scan revisions to color .pdf files (or grayscale if no color utilities).
  - A minimum resolution of 300 dpi is recommended. Balance file size with resolution. (Note: Original plan sets are printed at 600 dpi.)
  - Be aware that file size can be substantially larger (10x) for grayscale and color .pdf files than for B&W versions.
New Setting Files & Printing

- **For Current Design Files**
  - Manually *update* the level assignments for each design file *(key-in: “dgnlib update all”)*
  - *Stop* using old .set files, color tables, and pen tables
  - *Start* using new setting files and tables

- **For New Design Files – No action required**
  (just load the new resources & settings, no change to seed files)

- **Printer Queue Default Settings**
  - Printer defaults settings remain the ‘same’ *(default remains black & white for most printers and color for plotters)*
    - Old Default: ‘B_size.pen’ & ‘bw.ctb’ *(most common default setting for NYSDOT printers)*
    - New Default: ‘ny_b_basic.pen’ & ‘ny_bw.ctb’
    - Remember area shading displays solid when plotting in B&W
    - *If desire color prints:* Generate a color .pdf file, then use it as the source document to produce a color print.
# Which .SET File to Use

## Common Uses

<table>
<thead>
<tr>
<th>Settings File</th>
<th>Use to Produce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plans_Gray_ColorUtilities.set</td>
<td>Contract plans</td>
</tr>
<tr>
<td>Plans_Gray_NoColorUtilities.set</td>
<td>Supplemental grayscale plans</td>
</tr>
</tbody>
</table>

*Note: For every day printing/test plots, can use the printer defaults (most set to B&W printing)*

## Other Uses

<table>
<thead>
<tr>
<th>Settings File</th>
<th>Use to Produce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plans_Black_All.set</td>
<td>Black &amp; white documents</td>
</tr>
<tr>
<td>Plans_Color_All.set</td>
<td>Full color (256 colors) documents WYSIWYG, except yellow &amp; white</td>
</tr>
<tr>
<td>Plans_Color_ColorUtilStdsOn.set</td>
<td>Full color documents but applies the desired display colors and line thicknesses for utilities</td>
</tr>
</tbody>
</table>

*Same .set file is used for all contract plan sizes (ANSI size A, B, or D plans)*
Large Displays

- For large presentation materials, et al.
- Use .SET files with the prefix of “LargeDisplay_” (instead of “Plan_”)
  - ‘LargeDisplay_Gray_NoColorUtilities.set’
  - ‘LargeDisplay_Gray_ColorUtilities.set’
  - ‘LargeDisplay_Black_All.set’
  - ‘LargeDisplay_Color_All.set’
  - ‘LargeDisplay_Color_ColorUtilStdsOn.set’
- Good for any large size display (even though pen table indicates size E).
  - Size D (22”x34”)
  - Size E (34”x44”)
- Similar to corresponding “Plan_”.set file settings, except some assigned line thicknesses are heavier. Based on old ‘D_size.pen’ pen table line thickness settings.
Hatching vs. Area Shading

Hatching
(can block other data & reduce legibility)

Area Shading
(minor contrast issue with cyan)
Area Shading

- Alternative to using hatching to identify an area on the plan sheets
- Two pre-set levels designated for area shading
  - 'O_Area_Shading 1' – Light gray. Use this level if only one area is being shaded.
  - 'O_Area_Shading 2' – Medium gray.
- Only using gray for area shading at this time
- On a designated level, draw a shape (circle, block, etc.) and ensure the Area is set to ‘Solid’ and Fill Type is set to ‘Opaque’
Area Shading (continued)

- **Recommend that each group of shapes are kept in separate files**
  (i.e., shapes for general plans in one file, shapes for WZTC plans in another file)

- **Most of the new pen tables will print the shading behind the other data**
  (may not display properly with the ‘ny_b_basic’ or ‘ny_b_bw’ pen table)

  - Be aware that shading may not look correct when printing in black & white
    and/or may display as a dark opaque area

  - **If shapes for area shading are kept in separate reference files, users may need to set the ‘update sequence’** (a.k.a, display order, priorities, etc.) for the reference files so when viewing in CADD that the shading areas display in the background (otherwise they may mask/cover other data).

  Note: Regardless of whether any reference file update is established, information on levels ‘O_Area_Shading 1’ & ‘O_Area_Shading 2’ will plot/print properly in the background (this is controlled by the pen table).
Line Thickness

- **Minor adjustments made to some line thicknesses**
  - Example 1 – Line Weight 0 changed from 0.08mm to 0.15mm for existing features (gray) and to 0.10mm for proposed features (black)
  - Example 2 – Line Weight 1 changed from 0.24mm to 0.25mm
  - No change to thickness for text (except for utilities)

- **Color Utilities – Line & text thicknesses adjusted for each color**
  - Lines of same thickness but different colors tend to visually appear to be of different thicknesses.
  - Assigned thicknesses were adjusted so each color element visually appears to be of similar thickness as other elements of similar weight.
  - Some colors required slightly heavier thickness assignments to ensure line integrity when the plan sheet is photocopied.
Additional Color Plans Guidance

- **IntraDOT** *(Highway Design Manual > Chapter 21 > References)*
  - Copy of this presentation (to be posted)
    - Good for overview & basic design library updating information
  - ‘Design Guidance: Plans with Color Utilities, Gray Base Maps & Shading’
    - Provides more in-depth details & background information (except .dgnlib updating)

- **NYSDOT’s external website**

- **Submit technical issues/problems through the Help Desk**

- **Submit suggestions through your CADD Coordinator / EAMT Representative** *(Coordinators/Reps to then compile & submit to Rob Howland)*
Questions?

- Type in questions.
- Please only ask general questions of statewide significance.
- Direct specific questions to the appropriate contact person after the webinar.

Contact Persons

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- List of Misc. Tables
- Earthwork Summary Sheets
- WZTC Lump Sum Calculator
- Survey Operations Calculator

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