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***CONNECTICUT DEPARTMENT OF  
TRANSPORTATION***

***DIGITAL PROJECT DEVELOPMENT  
MANUAL***

***Version 2.06***

## **INTRODUCTION**

This document is for Consultant and State Employees responsible for the production or review of digital contract plans, specifications, supplemental contract documents, and contractor submittals. This document covers the development, review and commenting, and submission of digitally signed contract plans in PDF format including revisions, the delivery of specifications in Microsoft Word format, the delivery of supplemental contract documentation in PDF format, and the delivery of contractor submittals in PDF format. This manual also includes sections on the usability of these PDF documents.

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[Version 2.01 Revisions](#) – Issued 4/2012  
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Version 2.04 Revisions – Issued 11/2012 – Clarified Section 1.4 Step 2  
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[Version 2.06 Revisions](#) - Issued 2/2013

# Table of Contents

<b>DEFINITIONS</b>	.....	<b>5</b>
<b>SECTION 1 DIGITAL CONTRACT PLANS, SPECIFICATIONS, AND SUPPLEMENTAL CONTRACT DOCUMENTS</b>	.....	<b>6</b>
<b>1.1 Final Design Document Deliverable</b>	.....	<b>6</b>
<b>1.2 Requesting a Digital Project</b>	.....	<b>6</b>
<b>1.3 Prerequisites and Policies</b>	.....	<b>6</b>
<b>1.4 Format</b>	.....	<b>7</b>
<b>1.5 File Naming</b>	.....	<b>10</b>
1.5.1 Contract Plans (discipline subsets)	.....	10
1.5.2 Specifications	.....	10
<b>1.6 Contract Plan Drawing and Sheet Numbering</b>	.....	<b>10</b>
1.6.1 Drawing Number	.....	10
1.6.2 Final Plan Sheet Numbers	.....	11
1.6.3 Addendum and Design Initiated Change Order Sheet Numbers	.....	19
1.6.4 Adobe – Addendum and Design Initiated Change Order Sheet Numbers	.....	19
1.6.5 Bluebeam – Addendum and Design Initiated Change Order Sheet Numbers	.....	21
<b>1.7 CTDOT For Information Only Sheets</b>	.....	<b>23</b>
<b>1.8 CTDOT Standard Sheets</b>	.....	<b>23</b>
<b>1.9 Contract Plan Sheet Publishing</b>	.....	<b>23</b>
<b>1.10 Example: Typ. Single Volume Digital Contract</b>	.....	<b>24</b>
<b>1.11 Example: Multiple Volume Digital Contract</b>	.....	<b>25</b>
<b>SECTION 2 DIGITAL SIGNATURES FOR CONTRACT PLANS</b>	.....	<b>27</b>
<b>2.1 Graphic Image of Signature</b>	.....	<b>27</b>
<b>2.2 Creating Graphic Image of Signature:</b>	.....	<b>28</b>
2.2.1 CTDOT Staff	.....	28
2.2.2 For Consultant Staff	.....	29
<b>2.3 Setting Digital Signature Appearance Preferences:</b>	.....	<b>30</b>
2.3.1 Adobe Signature Appearance	.....	30
2.3.2 Bluebeam Digital Appearance	.....	34
<b>2.4 Watermarking Plans with Graphic Image of Signature</b>	.....	<b>36</b>
2.4.1 Adobe – Watermarking Plans with Graphic Image of Signature	.....	36
2.4.2 Bluebeam - Watermarking Plans with Graphic Image of Signature (CTDOT and Consultant Designed)	.....	38
<b>2.5 Digital Signature Fields</b>	.....	<b>41</b>
2.5.1 Adobe - Creating Digital Signature Form Fields	.....	42
2.5.2 Bluebeam - Creating Digital Signature Form Fields	.....	44
<b>2.6 Applying Digital Signatures</b>	.....	<b>45</b>
2.6.1 Applying Digital Signatures to 01_General Subset (FDP and Addendum Subsets)	.....	45
2.6.2 Applying a Digital Signatures to 02_Revisions Subset	.....	47
2.6.3 All Other Discipline Subsets - Single Signature	.....	48
2.6.4 Standard Drawing Subsets – Single Signature	.....	48
2.6.5 All Other Discipline Subsets – Multi-Signatures	.....	48
2.6.6 Working Drawings	.....	49
2.6.7 Applying Digital Signature Workflows	.....	49
<b>SECTION 3 SUBMITTING DOCUMENTS TO CTDOT PROJECTWISE</b>	.....	<b>55</b>
<b>3.1 Final Design Plans, Specifications, and Supplemental Document Checklist</b>	.....	<b>56</b>
<b>3.2 Project Data Transmission</b>	.....	<b>56</b>
3.2.1 ProjectWise	.....	56
3.2.2 Projectwise Folders for Contract Documents	.....	57
3.2.3 Uploading Documents - ProjectWise (Thin Client)	.....	58
3.2.4 Uploading Documents – Projectwise (Thick Client)	.....	61
3.2.5 Combining and Uploading Contract Specifications and CSI Special Provisions	.....	64
3.2.6 Uploading Supplemental Contract Documents	.....	65
3.2.7 CTDOT Contracts Finalizing of Contract Specifications	.....	66
3.2.8 Notification of Submittals	.....	66
3.2.9 Contract Plans Workflow (FDP - Advertise)	.....	66
3.2.10 ProjectWise Project folder Security	.....	67
3.2.11 100_Contract_Plans (PDF) Folder (Dynamic Security)	.....	67
3.2.12 Changing the State of a Document	.....	68
<b>SECTION 4 CONTRACT PLAN AND SPECIFICATION REVISIONS (ADDENDA AND DESIGN INITIATED CHANGE ORDER)</b>	.....	<b>70</b>
<b>4.1 Addenda</b>	.....	<b>70</b>
4.1.1 Revised Plans - Addenda	.....	70
4.1.2 New Sheets - Addenda	.....	71
4.1.3 Adding New Subset – Addenda	.....	72
4.1.4 Voiding Sheets	.....	72
4.1.5 Addenda Plans Workflow	.....	73
4.1.6 Addenda Specifications	.....	74
4.1.7 Addenda Report	.....	74
<b>4.2 Design Initiated Change Order (DCO)</b>	.....	<b>74</b>

# Connecticut Department of Transportation Digital Project Development Manual

4.2.1	Revised Sheets – DCO .....	75
4.2.2	New Sheets - DCO .....	76
4.2.3	New Subset – DCO .....	77
4.2.4	Voided Sheets.....	77
4.2.5	DCO Specifications.....	77
<b>4.3</b>	<b>02_Revisions Subset .....</b>	<b>78</b>
4.3.1	02_Revisions Subset Workflow - Addenda.....	80
4.3.2	02_Revisions Subset Workflow - DCO.....	80
4.3.3	Adding a New Revisions Sheet to the 02_Revisions Subset.....	81
4.3.4	Filling Out Revision Index Sheet .....	84
<b>4.4</b>	<b>Placing Stamps on Affected Sheets – Revised, or Deleted Sheets .....</b>	<b>84</b>
<b>SECTION 5</b>	<b>AS-BUILT COMMENTS - FINAL PLANS.....</b>	<b>86</b>
<b>5.1</b>	<b>As-Built Revisions (Digital Comments) Workflow .....</b>	<b>86</b>
5.1.1	Post Construction As-Built.....	87
5.1.2	Active As-Built .....	87
<b>5.2</b>	<b>As-Built Markup of Contract Plans .....</b>	<b>87</b>
<b>5.3</b>	<b>Applying As-Built Comments to Contract Plans .....</b>	<b>88</b>
5.3.1	Before Using Bluebeam for As-Built.....	88
5.3.2	Opening the Contract Plans from Projectwise .....	88
5.3.3	Applying Digital As-Built Stamps.....	90
5.3.4	Applying Digital As-Built Notes.....	94
<b>5.4</b>	<b>Notifications.....</b>	<b>97</b>
5.4.1	Completion of the As-Built.....	97
5.4.2	Notifying Department Personnel .....	97
<b>SECTION 6</b>	<b>CONTRACTOR SUBMITTALS .....</b>	<b>98</b>
<b>6.1</b>	<b>Working Drawings for Permanent Structures .....</b>	<b>98</b>
<b>6.2</b>	<b>Shop Drawings .....</b>	<b>98</b>
<b>SECTION 7</b>	<b>DIGITAL REVIEW AND COMMENTING .....</b>	<b>99</b>
<b>7.1</b>	<b>Digital Review .....</b>	<b>99</b>
<b>7.2</b>	<b>Commenting Tools.....</b>	<b>99</b>
7.2.1	Bluebeam .....	99
7.2.2	Adobe Acrobat .....	103
<b>7.3</b>	<b>Digital Stamps .....</b>	<b>104</b>
7.3.1	Bluebeam Stamps.....	104
7.3.2	Adobe Stamps .....	105
<b>APPENDIX A</b>	<b>107</b>	
	<b>Initial Log into Bluebeam .....</b>	<b>107</b>
	<b>Downloading the CTDOT Bluebeam Profile.....</b>	<b>112</b>
<b>APPENDIX B</b>	<b>114</b>	
	<b>Usability of PDF Documents.....</b>	<b>114</b>
	<b>Structure of Digital Plans.....</b>	<b>114</b>
	<b>Functionality of PDF Digital Plans.....</b>	<b>115</b>
	Digital Plan Levels.....	115
	Searching Digital Plans.....	116
	Measuring on the Digital Plans .....	117
	<b>Digital Specification Package.....</b>	<b>118</b>

## DEFINITIONS

*ACD* – The attribute applied to a revision requested by the Processing unit to an ADP discipline subset.

*ACD2* – The attribute applied to a revision requested by the Processing unit to an ACD discipline subset.

*ADP* – The attribute applied to an Addendum discipline subset.

*DCD* – The attribute applied to a revision requested by the Processing unit to an FDP discipline subset.

*DCD2* – The attribute applied to a revision requested by the Processing unit to a DCD discipline subset.

*Discipline Subset* – A multi-page PDF document that includes all the contract plan sheets for a discipline. Example would be all the structures sheets would be packaged in (1) multi-page PDF document.

*DCO* – The attribute applied to a design initiated change order discipline subset.

*DPD Manual* – Digital Project Development Manual.

*Engineer of Record* – The engineer’s digital signature that is applied to the discipline subsets. For CTDOT staff this would be the Principal Engineer.

*FDP* – The attribute applied to a final design plans discipline subset.

*FIO* – The attribute applied to a “for information only” discipline subset.

*FPL* – The attribute applied to an advertised FDP discipline subset

*Project Manager* – Lead designer on the project. For CTDOT staff this would be the TE 3 or Supervisor of the lead discipline or consultant liaison TE3 or Supervisor.

*Projectwise* - CTDOT is currently using Bentley’s ProjectWise as a data management software for digital projects. Projectwise allows the CTDOT, and authorized business partners to access its data anywhere internet access is available. Projectwise shall be used by all consultant engineers delivering digital contract documents.

*STD* – The attribute applied to the “CTDOT Standard Drawings” discipline subsets.

*WDP* – The attribute applied to working drawing submittals. This includes the plans, calculations, or any supplemental documents in the submittal.

*WDP2* – The attribute applied to a revised WDP submittal.

# Section 1 Digital Contract Plans, Specifications, and Supplemental Contract Documents

## 1.1 Final Design Document Deliverable

The following contract documents shall be submitted into Projectwise when delivering a digital project, see [Section 3](#) of this document for submittal procedures for the above documents: For CTDOT designed projects each discipline is responsible for uploading their documents into Projectwise.

- Contract Plans
- Contract Specifications
- Supplemental Contract Documents - Include but not limited to the following:
  - PW Submittal Checklist
  - Proposal Estimate, with [signed checklist](#)
  - Federal Estimate
  - Calendar Day Estimate
  - Final Design Report
  - Categorical Exclusion
  - Design Approval Letter
  - Environmental Permits
  - DBE/SBE Approval with percentage
  - Commitment list
  - Agreements
  - Proprietary Item Approval
  - Standalone Transportation Management Plan Document, taken from the final design report

## 1.2 Requesting a Digital Project

The following fill able PDF form must be completed and returned to AEC applications by State Design or CTDOT Consultant Liaison personnel to request a digital project: [ProjectWise Project Request Form](#)

## 1.3 Prerequisites and Policies

1. All contract plans prepared by a CT licensed Engineer or CT licensed Architect shall be digitally signed in accordance with this manual. All contract plans, specifications, and supplemental contracts documents will only be accepted by the CTDOT if they meet all the requirements of this manual. Approval for additional development and testing of digital documents and procedures shall come from the CTDOT Office of Quality Assurance.
2. Digital contract plans, in the following stages: Final Design Plans (FDP), Design Completion Data (DCD), Addenda, Addenda Completion Data (ACD), Design Initiated Change Order (DCO), and Working Drawing (WDP) shall be digitally signed in conformance with this manual.
  - a. Digital signatures must meet the requirements of Adobe's Certified Document Services (CDS).
  - b. CDS, and CDS vendor information is provided at the following website: [http://www.adobe.com/security/partners\\_cds.html](http://www.adobe.com/security/partners_cds.html)
  - c. Trial CDS Signatures will not be accepted by the Department, a signature must be purchased from one of the CDS Vendors.

3. After contract plans have been advertised, the digital signature is not allowed to be removed.
4. Standard Computer Aided Design (CAD) Applications shall conform to those listed here <http://www.ct.gov/dot/digitaldesign>.
5. Use of digital signatures not conforming to the requirements of this manual must be approved by both the Office of Quality Assurance, and the Office of Legal Services.
6. This manual is designed to be used with the latest [CTDOT Digital Design Environment](#).
7. Digital Contract Specifications shall be prepared in accordance with the [Departments policies and procedures for Contract Development](#).
8. Supplemental contracts documents shall be submitted digitally in PDF format. See [Section 3.2.8](#) for supplemental contract document list and submission procedures.
9. The Consulting Engineer acknowledges and agrees that Contract Plans submitted using the [Digital Submission Procedure set forth in this Manual] has the same force and effect for the purposes of the Consulting Engineer's agreement with the State as a signature and seal of a Connecticut Licensed Professional Engineer or Architect as set forth in § 20-300-10 of the Regulations of Connecticut State Agencies or § 20-293 of the Connecticut General Statutes, as applicable. Nothing in this DPD Manual serves as an authorization for, or endorsement of, the use of this [Digital Submission Procedure] generally by the Consulting Engineer, its subcontractor(s), or any Connecticut Licensed Professional Engineer or Architect with respect to other work it performs for the State or work it performs for other clients.
10. Version 9.0 of Adobe Acrobat or Version 10.2 of Bluebeam were used in the production of all figures and procedures in this manual.
11. When on call consultants are used for CTDOT projects, the title sheet shall be digitally signed by CTDOT following the procedure in [Section 2.6.1](#) of this manual.

## 1.4 Format

1. Digital contract plans (preliminary, semifinal, FDP, etc.), working drawing plans and shop drawing plans shall be in PDF format; PDF Plans must be sized either 36" x 24" for projects created before 6/2007 and sized 34" x 22" for projects created after 6/ 2007; PDF plans shall be measurable to scale in the PDF; PDF plans shall be able to be printed to paper and scaled appropriately; text must be searchable; and all levels must have the ability to be displayed on or off, unless approved otherwise. All information on the digital contract PDF plans shall have been created from MicroStation or an approved alternate. The only information that shall be added to the plans using a PDF editing software are as follows:
  - a. Sheet numbers (see [Section 1.6.2](#))
  - b. Page labels (see [Section 1.7](#))
  - c. Watermark (see [Section 2.4](#))
  - d. Any digital signature fields (see [Section 2.5](#))
  - e. Digital Signature (see [Section 2.6](#))
2. Contract plans shall be grouped, by discipline into individual multiple page PDF files called discipline subsets. Discipline subsets are not to be combined in a PDF Package/Portfolio. Examples of discipline subsets are: 01\_General, 02\_Revisions, 03\_Highway, 04\_Bridge, etc. [See Section 1.11 & 1.12 for more examples of discipline subsets.](#)
3. Plans *For Information Only* (FIO) shall be submitted digitally, in individual subsets based on the entity providing the information, Amtrak, CL & P, AT&T, Designer etc. These subsets do not require a digital signature, but each sheet in the subset shall be labeled; "For Information Only". The subset numbers shall be selected by the lead designer so that the FIO subsets are last. Each sheet shall be numbered correctly, [see Section 1.6.2](#). Upload and attribute in accordance with [Section 3.2](#).
4. Utility drawings shall be submitted in accordance with the following:
  - a. Utility plans *For Information Only* (FIO) shall be submitted in a utility subset based on the utility company, AT&T subset, CL&P subset, etc. These subsets do

- not require a digital signature, but each sheet shall be labeled; “For Information Only”. FIO utility subsets shall be numbered so that they are the last subsets. Example Labels; 10\_CL&P\_FIO, 11\_AT&T\_FIO
- b. Utility company designed plans that include work being done by the States Contractor shall be submitted in a utility subset based on the utility company, AT&T subset, CL&P subset, etc. These subsets do not require a digital signature. Example Labels; 10\_CL&P, 11\_AT&T
  - c. Utility plans that are designed by Utility or State Consultants firms that include work being done by the States Contractor shall be submitted in a utility subset based on the utility company, AT&T subset, CL&P subset, etc., and shall be digitally signed in accordance with this manual. Example Labels; 10\_CL&P, 11\_AT&T
5. See [Section 3.2](#) for uploading and attributing Utility Plans. [See Section 1.11 & 1.12 for more examples of discipline subsets.](#)
  6. CTDOT Standard sheets shall also be delivered digitally. For each project always download the standards from the CTDOT website to insure the most recent standards are included in the project. The workflow [Assembling CTDOT Standard Sheets.pdf](#) explains how to obtain, create standard sheet subsets, and insert them into a digital project. For submission of CTDOT Standard Sheets, see [Section 3.2](#).
  7. The first and second subsets in the project must always be the 01\_General and 02\_Revisions respectively. The Project Manager is responsible for determining the order of all other discipline subsets, [Sections 1.11 and 1.12](#) show examples.
  8. Discipline subsets shall contain a maximum of 150 sheets.
  9. Discipline subsets shall be published directly from a CAD application. Scanned images or raster image formats will not be accepted.
  10. Footers, displaying the sheet number, shall be placed on each page of each PDF subset. [See Section 1.6.2, “Sheet Numbering”](#)
  11. Each subset shall contain bookmarks; one for each page. [Figure 1](#) displays an example of bookmarks. See [Publishing MicroStation Content to PDF Format.pdf](#) for more instructions.
    - a. [Figure 1](#) also displays examples of subgroup folders. While publishing, subgroups may be created to contain similar sheets. See [Publishing MicroStation Content to PDF Format.pdf](#) for more instructions.
  12. Levels with the appropriate CTDOT names shall have the ability to be displayed on or off within the PDF document.
  13. The first page of the subset 01\_General shall be the CTDOT digital project title sheet which includes an index of the subsets contained within the project, sheet count totals for all subsets, a list of drawings for the 01\_General Subset, and an area(s) reserved for applying the digital signature(s).

Link to digital title sheet:  
[Digital Title Sheet](#)

CTDOT engineers can find the digital title sheet in the seed files on our W: drive.
  14. The 01-General subset shall include all detailed estimate sheets.
  15. The 02\_Revisions subset must be included in each digital project and there shall only be (1) revisions subset.
  16. Subset 02\_Revisions shall contain only revision sheet(s), titled “Index of Revisions”, [See Section 4.3](#). These revision sheets are used for tracking all sheet changes due to addenda and design initiated change order (DCO) with respect to the entire project. These sheets are originally blank and unsigned, and shall be managed and updated as needed by the Project Manager. The CTDOT Revision Contract Sheets can be obtained here:

CTDOT Designed Projects - [02-Revisions Subset](#)  
Consultant Designed Projects - [02-Revisions CE Subset](#)
  17. The first page of each subset shall be a subset cover sheet. This cover sheet shall contain both; an index of drawings contained within the subset that includes both drawing numbers and drawing titles and the form field place holder(s) which receives the digital signatures. The following cell has a table for the index of drawings and the digital

- signature cell place holder [BDR Discipline Cover Sheet cell](#). See [figure 1](#) for an example.
18. Digital Contract Specifications shall be submitted in MS Word format and in accordance with the [Departments policies and procedures for Contract Development](#). CSI special provisions shall be submitted in pdf format.
    - a. For projects where a consultant is the Project Manager on the project, the Specification and CSI special provisions submittals shall be submitted in (1) zipped folder, [see section 3.2.6](#).
    - b. For projects where a CTDOT design unit is the Project Manager on the project, the Specification and CSI special provisions shall be submitted in individual zipped folders per discipline, [see section 3.2.6](#).
    - c. Design Initiated Change Orders shall be place in (1) pdf document, with “C#” and the date in the header. An example would be “Rev. C1 - mm/dd/yy”.
  19. Supplemental documents shall be 8.5” x 11” pdf documents, except the proposal estimate which shall be in “.est” format. Documents that require signatures may be scanned with a minimum resolution of 200 dpi, and size = 8.5”x11”. These documents **do not** need to be digitally signed.
  20. As-built information shall be digitally applied to the contract subsets by District Personnel after the job is complete using Adobe Acrobat Professional or Bluebeam. See [section 4.5](#).
  21. Working Drawing calculations shall be in (1) pdf document with a page size of 8.5” x 11” and be digitally signed in accordance with [Section 2.6](#). Any supplemental documents that are included in the Working Drawing submittal shall be 8.5” x 11” pdf documents. Documents that require signatures may be scanned with a minimum resolution of 200 dpi, and size = 8.5”x11”. These documents need to digitally signed in accordance with [Section 2.6](#).

Using a discipline subset format streamlines both the development of contract plans and the administration of the plans during preliminary design, FDP, DCD, Addenda, DCO and As-Built submissions. Moreover, it also leverages the ability to digitally sign the individual discipline based contract plan subsets per designer.

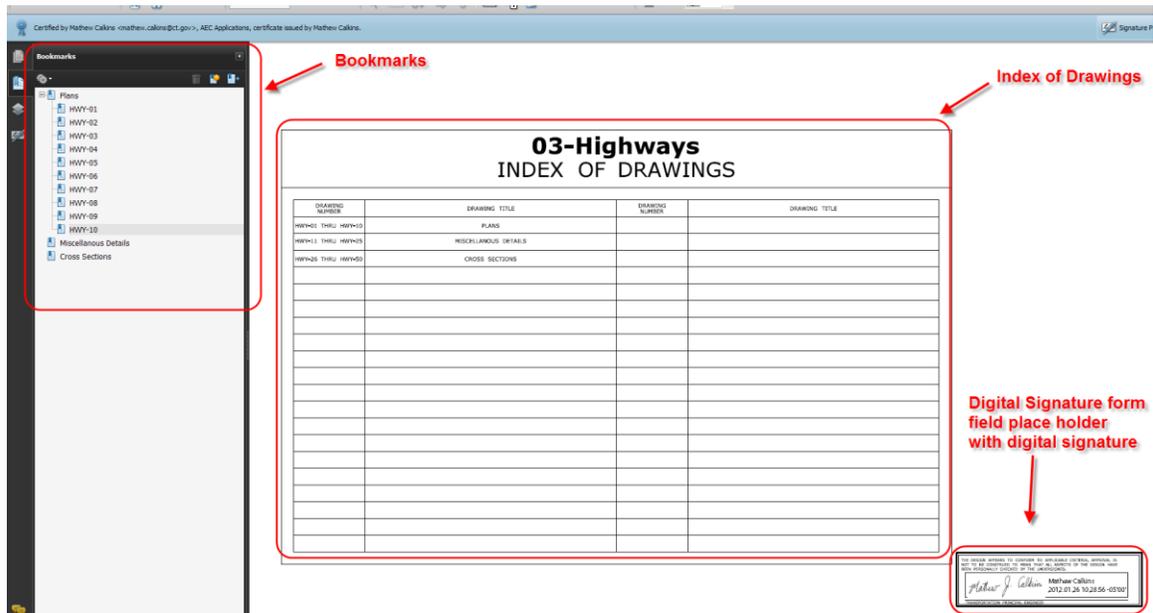


Figure 1 Discipline Subset Bookmarks, Index of Drawings, & Signature fields

See [Section 2.5](#) for digital signature form field place holder cells.

## 1.5 File Naming

### 1.5.1 Contract Plans (discipline subsets)

The file name shall match the discipline subset name. For example, the 02-Revisions subset shall have the file name 02-Revisions.pdf. However, this name will change during the uploading and attributing of the file into Projectwise. See section [3.2 Project Data Transmission](#).

### 1.5.2 Specifications

#### **FDP and Addendum**

These specifications shall be individual word documents placed in a zipped folder. CTDOT processing shall combine all specifications into (1) PDF document and upload this into Projectwise. See [section 3.2.5](#).

#### **Design Initiated Change Orders**

These specification(s) shall be packaged in (1) pdf document and uploaded into projectwise. See [section 3.2.5](#).

## 1.6 Contract Plan Drawing and Sheet Numbering

### 1.6.1 Drawing Number

The drawing number is used primarily for sheet to sheet referencing, typically in, but not limited to; section details, section cuts, and detail callouts. Drawing numbers in digital contracts shall consist of the discipline designator followed by a hyphen and the sheet number. The discipline designator shall remain constant across each discipline subset. For example; a highway subsets discipline designator shall be “HWY”, therefore any sheets in the highway discipline subset would contain the following drawing numbers; HWY-01, HWY-02, etc.

Discipline subsets can be as broad or specific as the Project Manager would like. An example would be the highway sheets can be split out into multiple subsets. They can place all the profiles in one discipline subset where the drawing number would be PRO - ## and they can place all cross sections in another discipline subset, where the drawing numbers would be XSC - ##.

The CTDOT efficiently maintains the drawing numbers in MicroStation using the model properties and project explorer, See the following workflow [Project Explorer to Manage Drawing Numbers](#)

The first sheet in a discipline subset shall have “01” in the drawing number as shown below:

TOWN: <b>STONINGTON/GROTON</b>	PROJECT NO. <b>137-153</b>
DRAWING TITLE: <b>PLAN SHEET</b>	DRAWING NO. <b>HWY-01</b>
	SHEET NO.

Figure 2 Contract Drawing Numbering

## 1.6.2 Final Plan Sheet Numbers

Sheet numbers are applied to the discipline subset after the contract plans are published to PDF.

Sheet numbers shall be managed and placed on the discipline subsets, using the header and footer tool within Adobe Acrobat or Bluebeam. Sheet numbers shall be applied to all submissions of contract plans.

The first sheet in every subset shall start out at 01. For example the first sheet in the 03-Bridge subset shall be 03.01.

TOWN:	<b>STONINGTON/GROTON</b>	PROJECT NO.	<b>137-153</b>
DRAWING TITLE:	<b>PLAN SHEET</b>	DRAWING NO.	<b>HWY-01</b>
		SHEET NO.	<b>03.01</b>

**Figure 3 - Drawing and Sheet Numbering**

The sheet number place holder shall be determined by the total estimated sheet count. For less than 100 sheets two place holders is adequate. For greater than or equal to 100 sheets three place holders are necessary. For subsets less than 10 sheets, two placeholders shall be used i.e. 01.01 thru 01.04 for a four sheet subset.

The sheet number must be placed correctly because it is used to correctly assemble the contract plans into a properly ordered consolidated set.

### **Single Volume Projects:**

The sheet number, for single volume projects shall be a concatenation of the discipline subset number, a decimal point, and the sheet number. For example; the sheet numbers for subset “4” would be as follows; less than 100 sheets 04.01, 04.02, 04.03, etc or Greater than 100 sheets 04.001, 04.002, 04.003 etc.

The Project Manager should determine the total number of subsets and give each discipline their corresponding subset number, [see section 1.11.](#)

### **Multi Volume Projects:**

For a multi volume project the sheet number shall be a concatenation of the volume number, a decimal point, the discipline subset number, a decimal point, and finally the sheet number. Example: Volume 2, Subset 5; 02.05.01, 02.05.02, 02.05.01.

Volume numbers shall be used on large projects. They are effective because the Project Manager only has to deliver to the other engineers their perspective volume numbers, allowing them to manage their subset numbers independently of the other discipline volumes and subset counts, [see section 1.12.](#)

Subset numbers shall start at 01 for all volumes.

### 1.6.2.1 ADOBE - Applying Sheet Numbers

The following workflow gives an example of placing sheet numbers on a single volume project on the '03' subset that contains fewer than 100 sheets. The sheet numbers are added using the Header and Footer tool in Adobe Acrobat.

1. From Adobe Acrobat select "Document/Header & Footer/Add"
2. Place the sheet numbers on all sheets, as shown below.

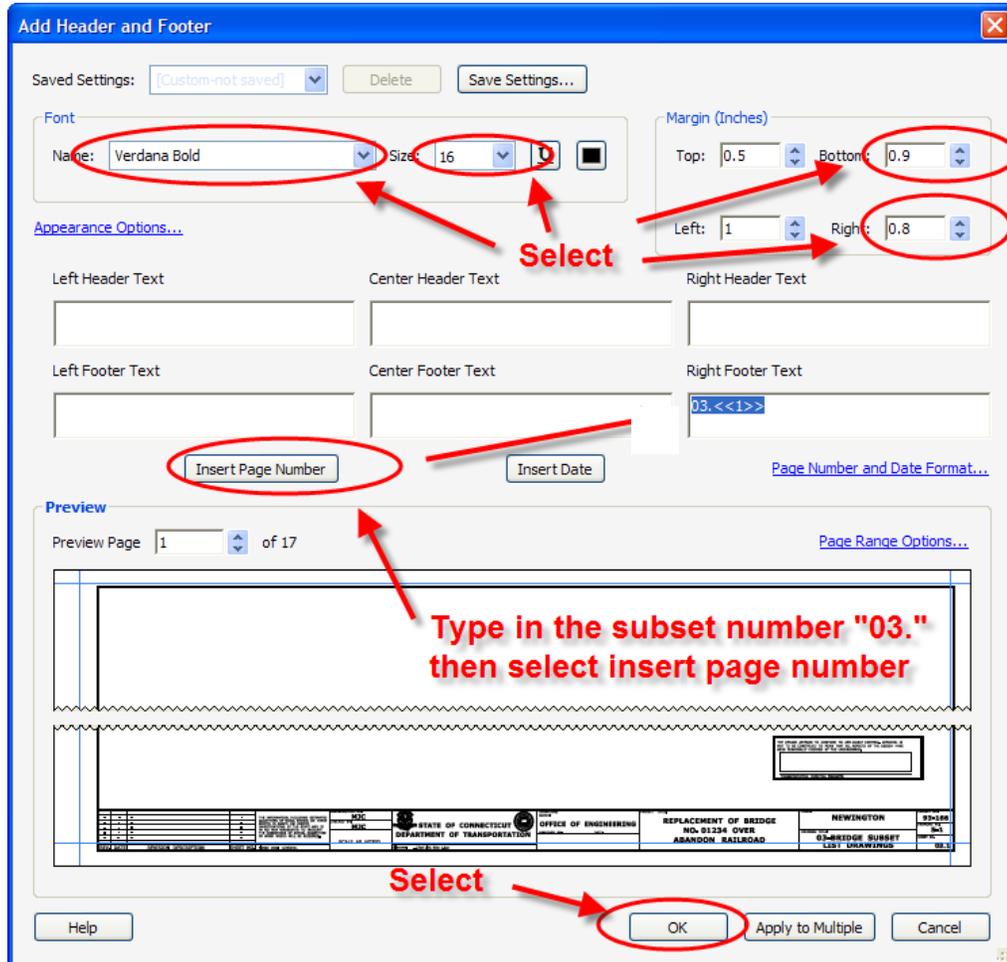


Figure 4 Sheet Numbering

After placing all the sheet numbers, sheets # 1-9 need to be updated to include a zero in front of them, so these sheets have the correct number of place holders.

3. Select Header & Footer>Update. Follow the figure below for inserting the zero on pages 1 thru 9.

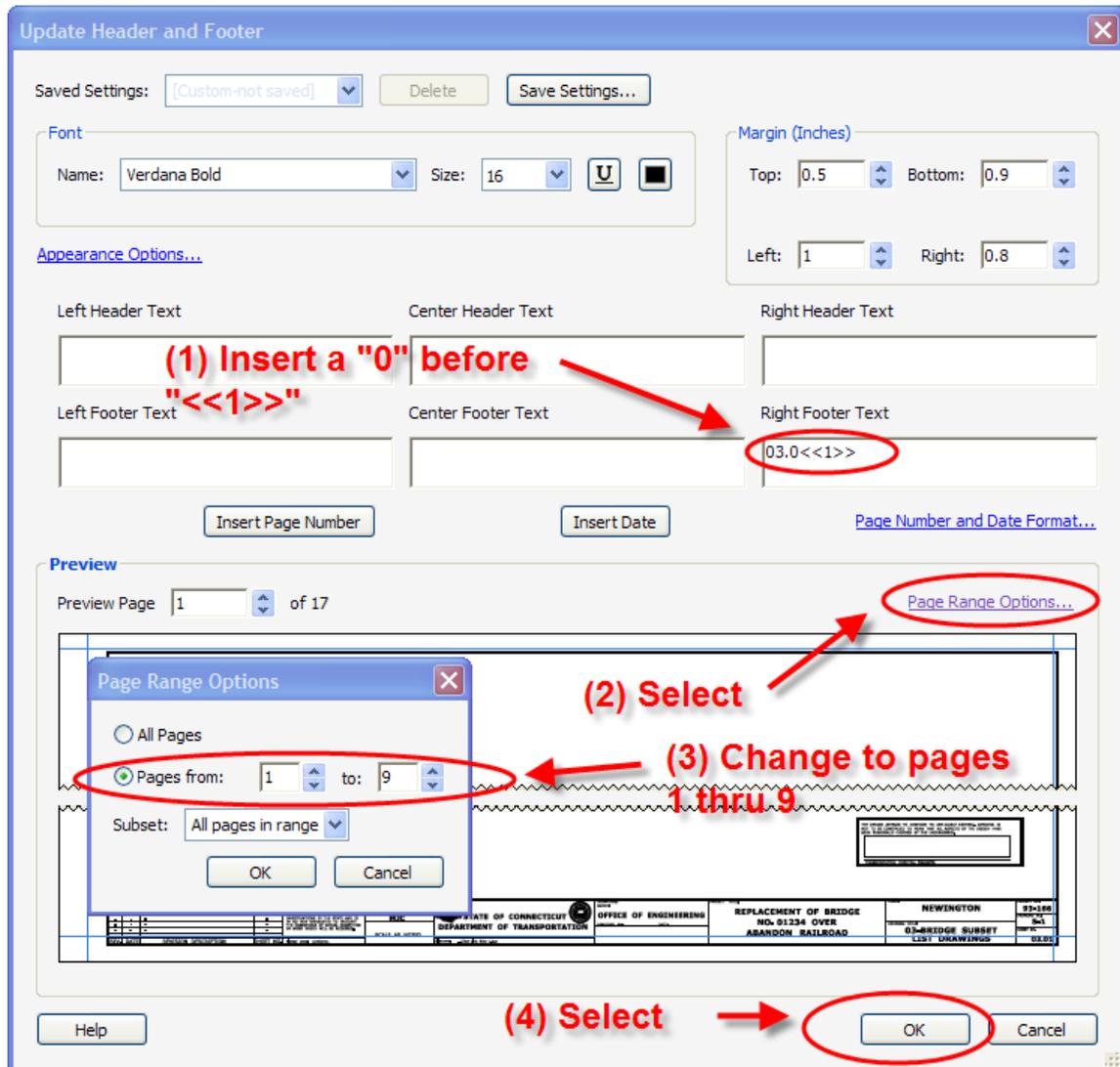


Figure 5 - Inserting Sheet Numbers

For discipline subsets with over 100 contract plan sheets, steps 1-3 will have to be done three times because there is no way to label sheets 1-99 with the correct number of place holder (zeros), consecutively. To label the sheet numbers correctly, the following three steps must be followed:

- All sheets are given sheet numbers.
  - Sheets 1 thru 99 are updated to sheet numbers 01 thru 099.
  - Sheets 1 thru 9 are updated to sheet number 001 thru 009.
4. Next we will page label the sheets. In the Pages (thumbnail) pane, right click and select Number Pages. In this example we are page labeling a subset that contains over 100 sheets.

5. Page label sheets 100-104 using the figure below.

The screenshot shows the 'Page Numbering' dialog box. In the 'Pages' section, the 'From' field is set to 100, the 'To' field is set to 104, and the total is 'of 104'. In the 'Numbering' section, 'Begin new section' is selected, the 'Style' is '1, 2, 3, ...', the 'Prefix' is '03.', and the 'Start' is '100'. A sample of the numbering is shown as '03.100, 03.101, 03.102, ...'. The 'OK' and 'Cancel' buttons are at the bottom right.

**Figure 6 - Page Labeling**

6. Page label sheets 010-099 using the figure below:

The screenshot shows the 'Page Numbering' dialog box. In the 'Pages' section, the 'From' field is set to 10, the 'To' field is set to 99, and the total is 'of 03.104 (104)'. In the 'Numbering' section, 'Begin new section' is selected, the 'Style' is '1, 2, 3, ...', the 'Prefix' is '03.0', and the 'Start' is '10'. A sample of the numbering is shown as '03.010, 03.011, 03.012, ...'. The 'OK' and 'Cancel' buttons are at the bottom right.

**Figure 7 - Page Labeling**

7. Page label sheets 001-009 using the figure below:

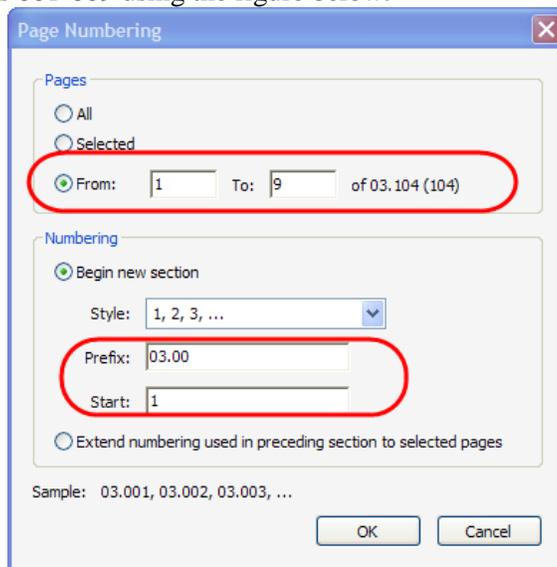


Figure 8 - Page Labeling

### 1.6.2.2 BLUEBEAM - Applying Sheet Numbers

To apply sheet numbers in Bluebeam follow the figures below:

1. First page labels must be applied to the discipline subset. Go to the thumbnail pane as shown below, right click on a thumbnail and select Number Pages:

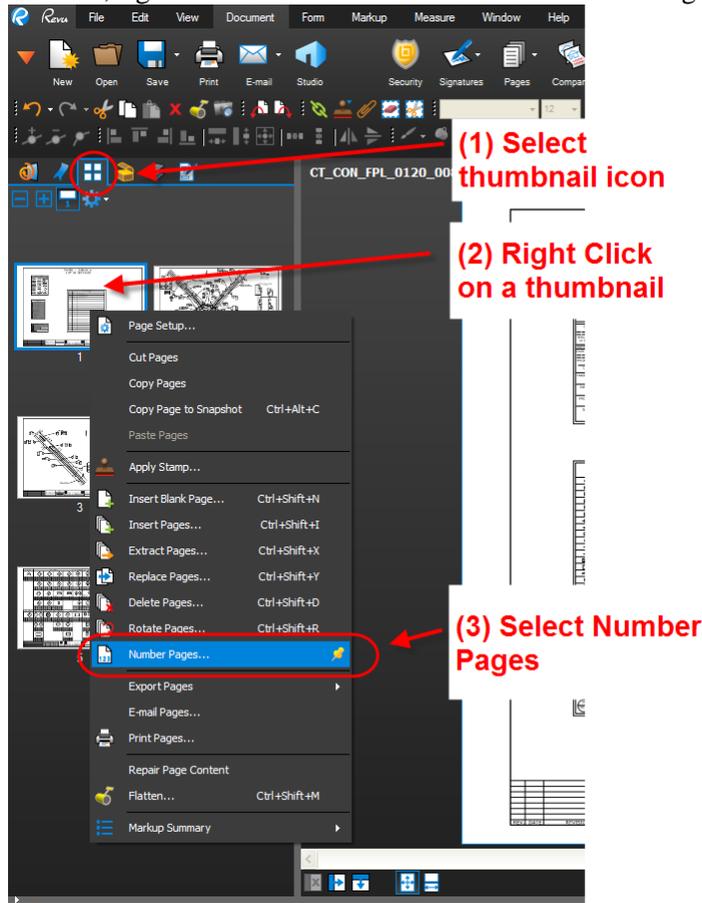


Figure 9 - Adding Page Labels

In this example there are less than 10 sheets in the subset so we can apply the page labels to all the sheets at once. In the case where there are 10 or more sheets in the subset the following will have to be done twice. This is done so the prefix shown below has the correct number of place holders. If the subset has 99 sheets or less an example for the 04 prefix shall be “04.0” for sheets 1-9 and “04.” For sheet 10 through 99.

2. Select the correct style, insert correct prefix for the sheets being numbered, and apply to the correct pages.

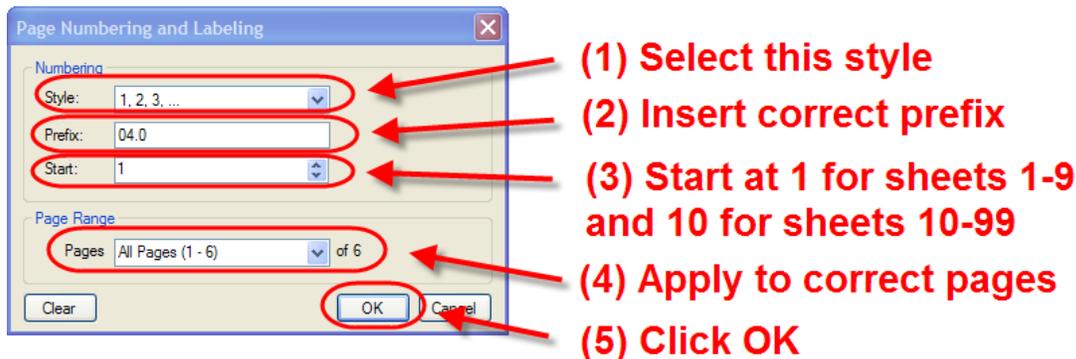


Figure 10- Page Labeling

3. Now the pages will be labeled:

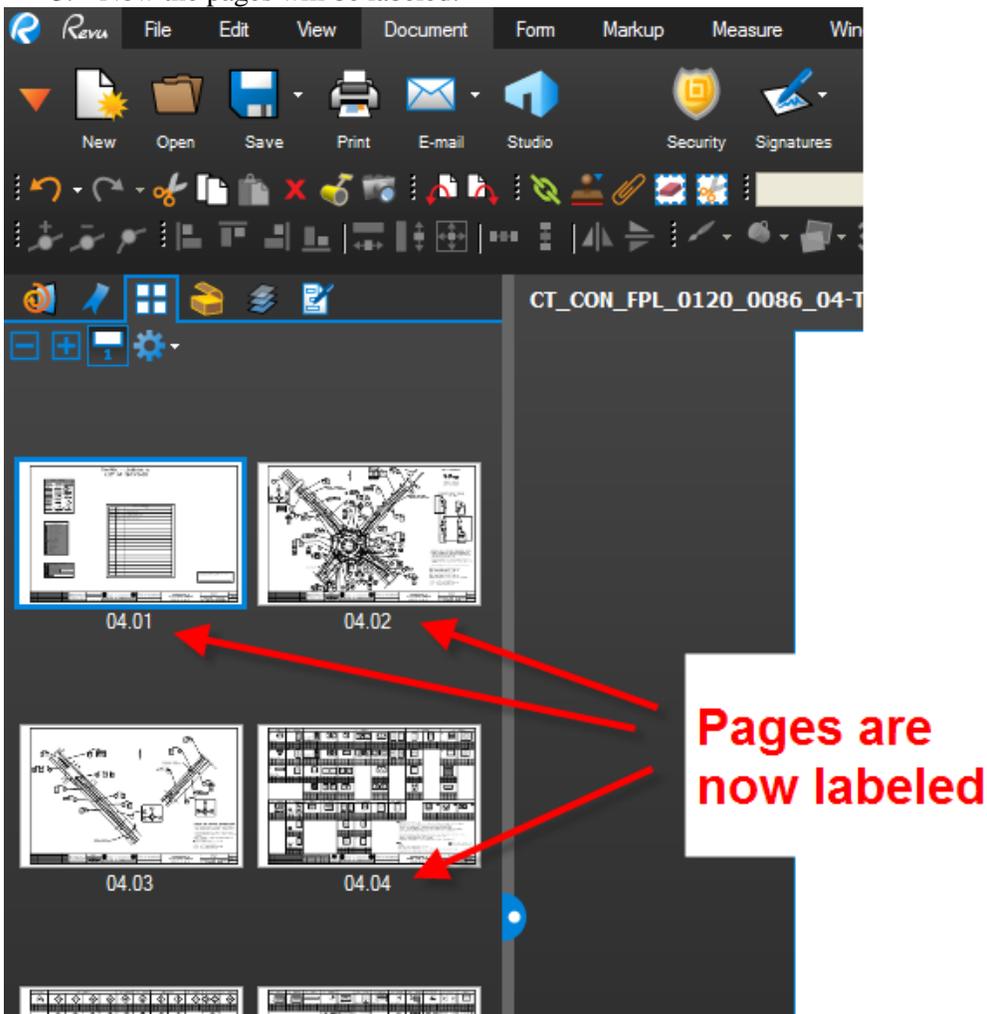


Figure 11 - Labeled Pages

4. Next we will apply the sheet numbers. From Bluebeam select the Document tab and then “Header & Footer”

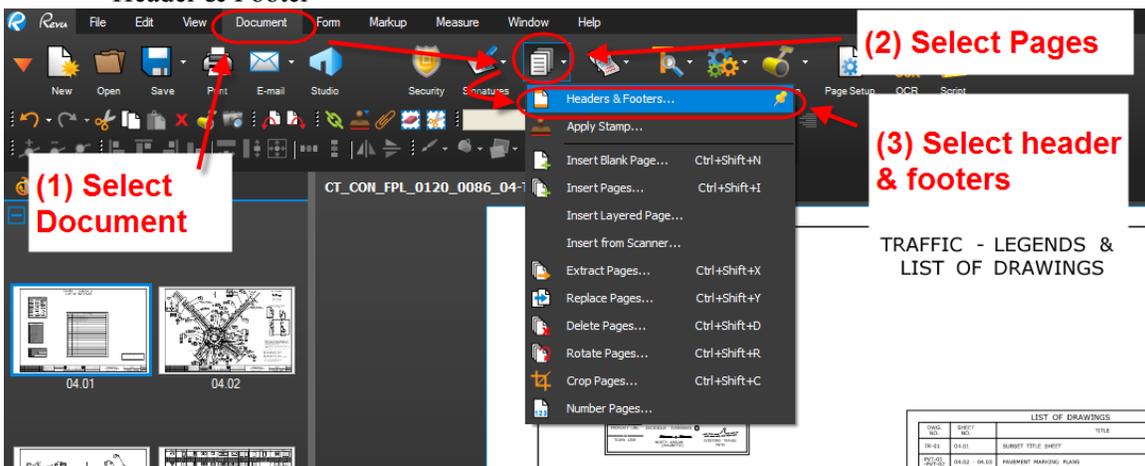


Figure 12 - Header Footer Tool

5. Place the sheet numbers, as shown below:

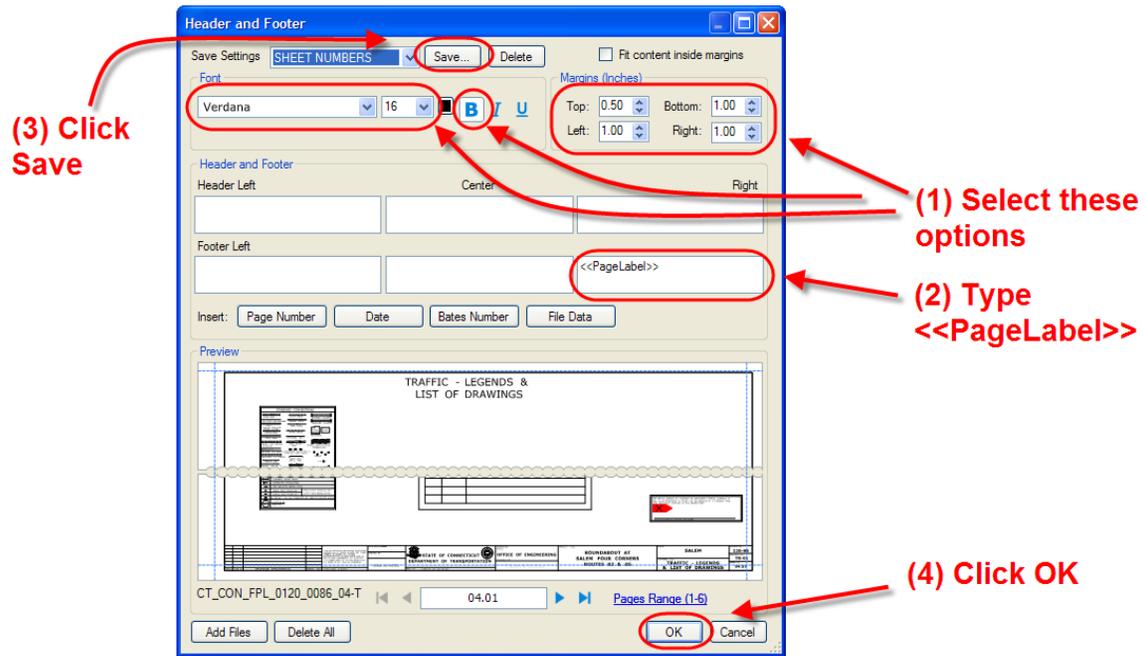


Figure 13 - Insert Sheet Numbers

### 1.6.3 Addendum and Design Initiated Change Order Sheet Numbers

Sheet numbers for an Addendum need to have “.A#” at the end and Change Orders need to have a “.C#” at the end (see [section 4](#)) and Working drawings need to have a “.WD” at the end (see [section 6](#)).

### 1.6.4 Adobe – Addendum and Design Initiated Change Order Sheet Numbers

For addendum and change order subset the sheet numbers need to be applied one at a time.

1. From Adobe Acrobat select “Document/Header & Footer/Add”
2. Place the sheet numbers on all sheets, as shown below.

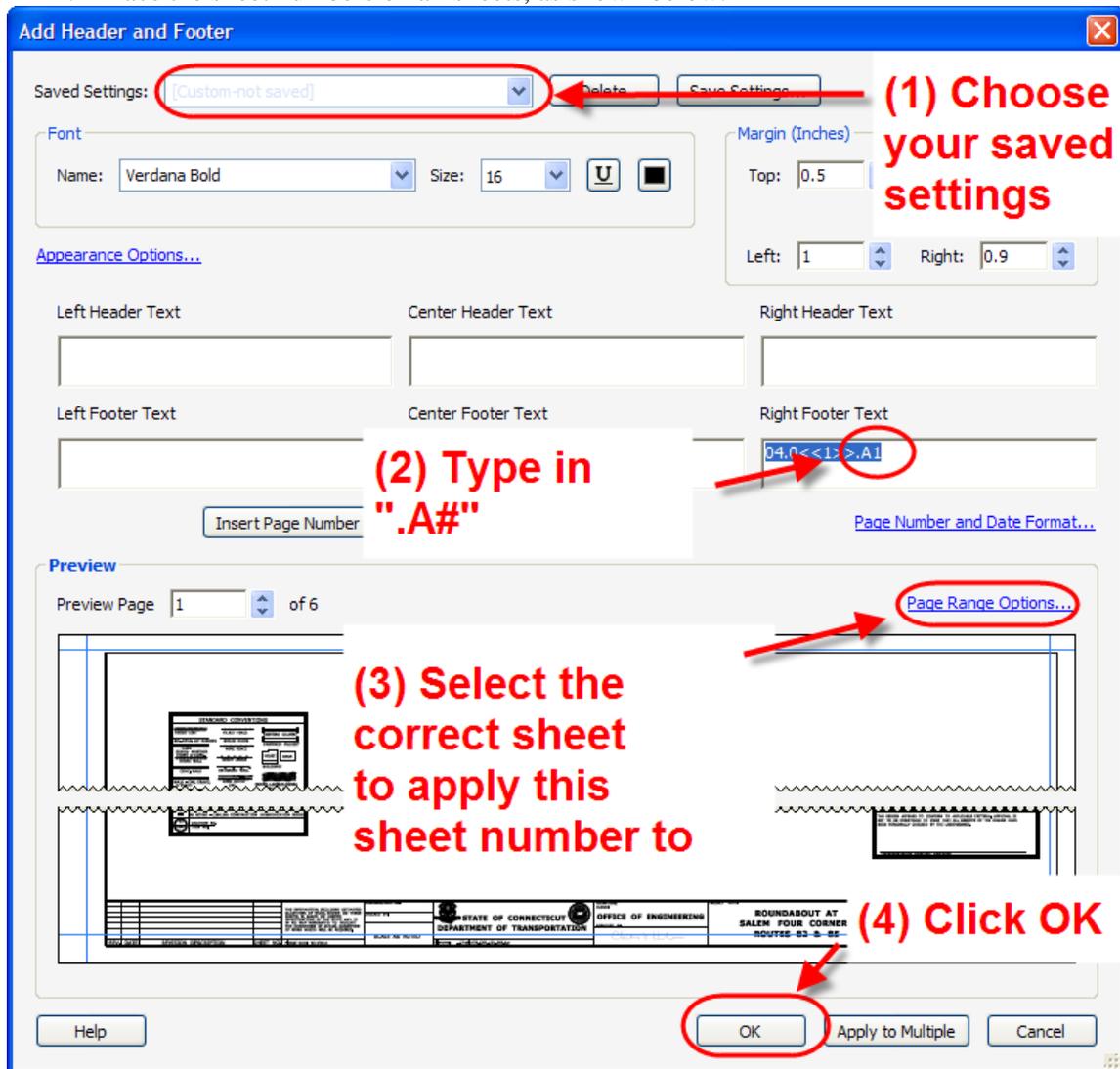
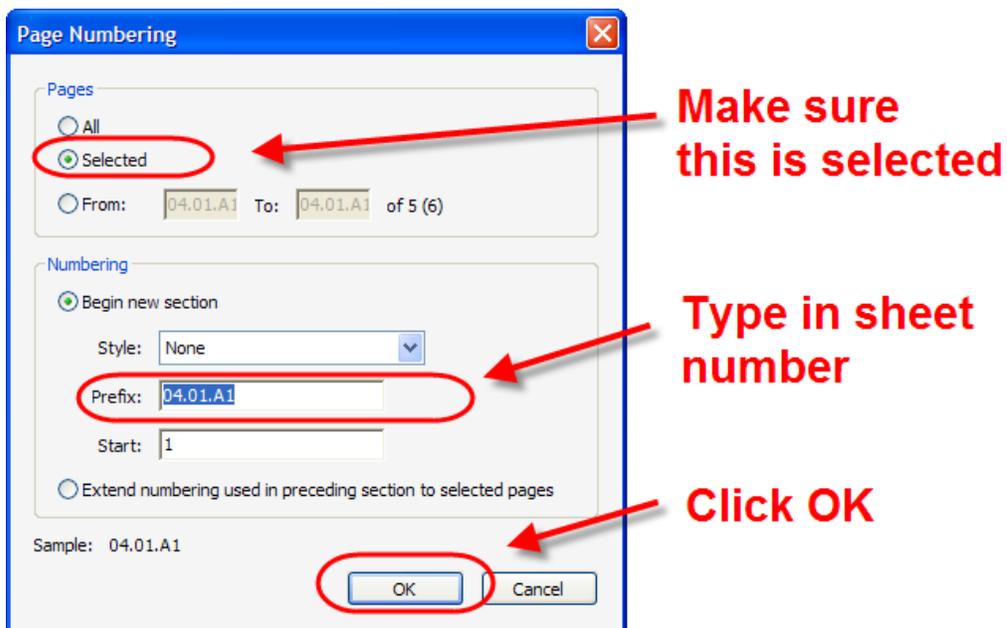


Figure 14 - Applying Sheet Numbers

3. Next apply the page labels one at a time to each Addendum or Change order sheet. First go to the thumbnail pane and select Number Pages.
4. Next type in the correct sheet number in the prefix and click OK as shown below.



**Figure 15 - Applying Page Labels**

## 1.6.5 Bluebeam – Addendum and Design Initiated Change Order Sheet Numbers

1. First page labels must be applied to each sheet in the addendum or change order. This can only be done on sheet at a time.
2. Go to the thumbnail pane as shown below, right click on a thumbnail and select Number Pages:

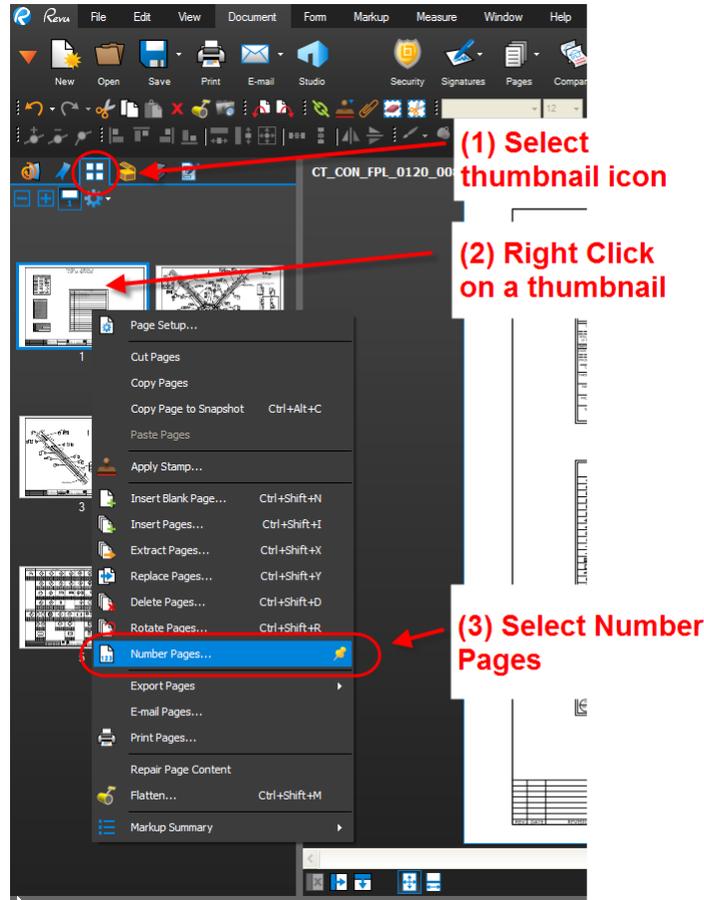


Figure 16 - Adding Page Labels

3. Select None for a style, type in the sheet number of the addendum or change order sheet for a prefix. An example of this would be addendum sheet 04.01.A1 shall be entered as a prefix. Then select which sheet you are labeling. This has to be done for each sheet in the addendum or change order separately. See below:

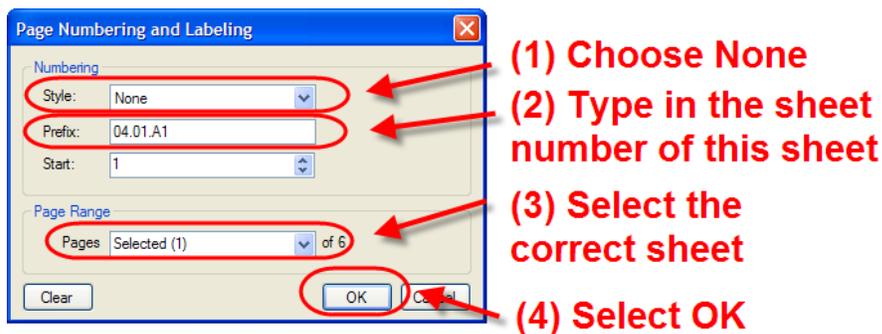


Figure 17 - Applying Addendum Page Labels

- After all page labels have been applied, the sheet numbers can be applied. From Bluebeam select the Document tab and then “Header & Footer”

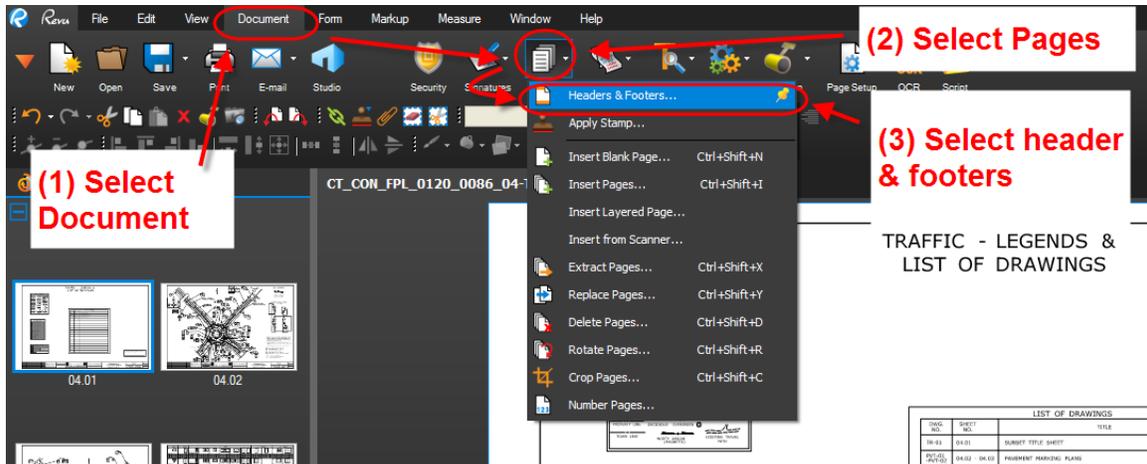


Figure 18 - Header Footer Tool

- Select your sheet numbers saved settings from before and click OK.

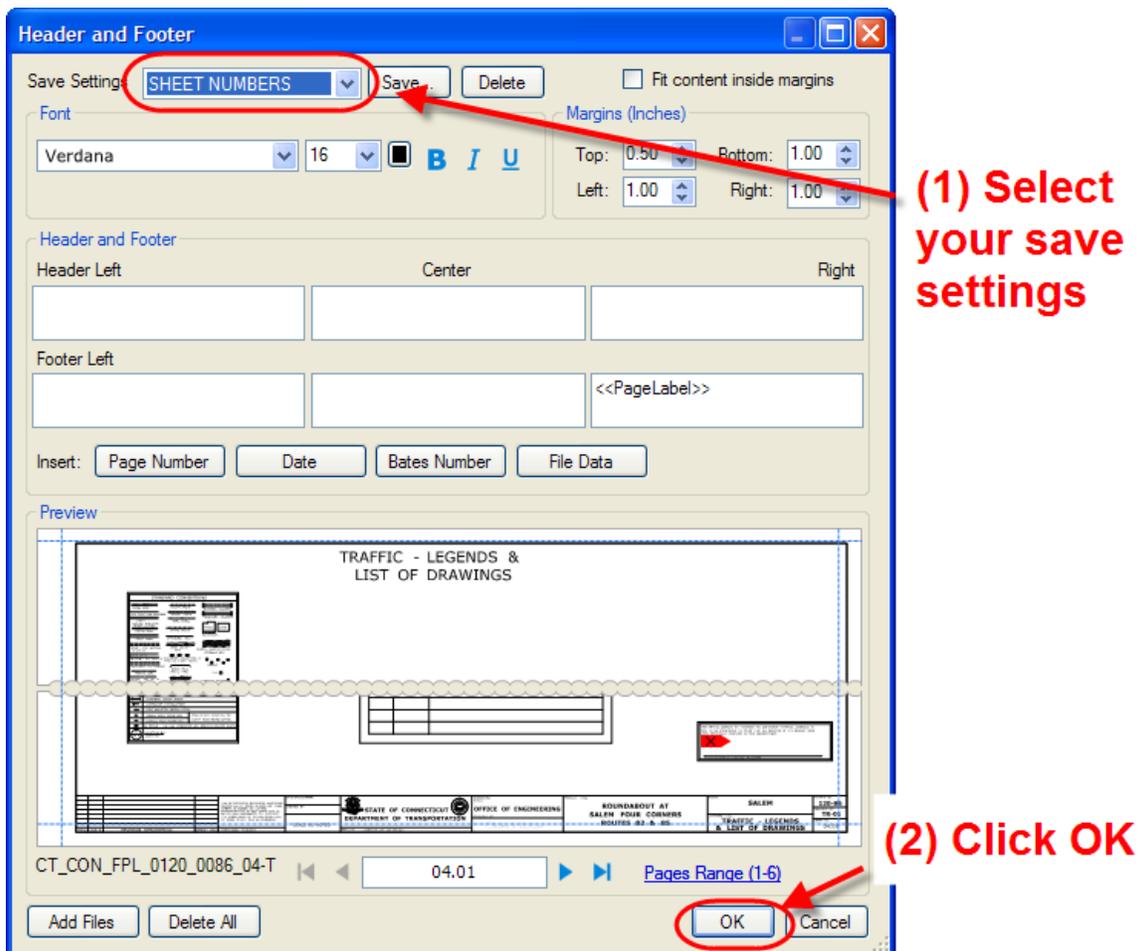


Figure 19 - Applying Addendum or DCO Sheet Numbers

## 1.7 CTDOT For Information Only Sheets

Plans provided *For Information Only* (FIO) shall be submitted digitally, in individual subsets based on the entity providing the information, Amtrak, CL & P, AT&T, Designer etc. These subsets do not require a digital signature, but each sheet in the subset shall be labeled; “For Information Only”. These sheets shall be placed on a border and numbered in accordance with [section 1.6.2](#).

The subset numbers shall be selected by the Project Manager so that the FIO subsets are last. [See Section 3.2](#) for uploading and attributing FIO Plans. [See Section 1.11 & 1.12 for more examples of discipline subsets](#). Information only sheets may be scanned, but must conform to the following specifications; Minimum Size 22”x34”, Minimum dpi = 300.

## 1.8 CTDOT Standard Sheets

Standard sheets shall also be delivered digitally. The workflow [Assembling CTDOT Standard Sheets.pdf](#) explains how to obtain, create standard sheet subsets, and insert them into a digital project. For submission of CTDOT Standard Sheets, see [section 3.2](#).

## 1.9 Contract Plan Sheet Publishing

CTDOT currently uses MicroStation V8i Print Plot and Print Organizer to publish contract plans to a PDF format.

The workflow [Publishing MicroStation Content to PDF Format.pdf](#) shows the fundamentals of publishing contract plans to PDF from MicroStation.

## 1.10 Example: Typ. Single Volume Digital Contract

Single volume digital contracts are used when each discipline or consulting firm designing the project is responsible for 3 subsets or less. The following is an example of a single volume project. Note: The first and second subsets shall always be 01-General and 02-Revisions. The 03 subset does not always need to be 03-Highways, the 04 does not always need to be 04-Structure, etc. The FIO subsets shall be placed at the end of a project right before the STD subsets.

<b>Label (Discipline Subset)</b>	<b>File contents (but not limited to)</b>														
01-General	Title Sheet Detail Estimate Sheet Etc														
02-Revisions	Index of Revisions Sheets														
03-Highways**	<table border="0"> <tr> <td>Index of Plans</td> <td>Boring Logs</td> </tr> <tr> <td>Survey Data</td> <td>Highway Plans</td> </tr> <tr> <td>Alignments</td> <td>Breakout Drainage</td> </tr> <tr> <td>ROW</td> <td>Highway Profile</td> </tr> <tr> <td>Typ Sections</td> <td>Highway X-Sections</td> </tr> <tr> <td>Misc Details</td> <td>Landscape Plan</td> </tr> <tr> <td>Intersect Grading</td> <td>Wetland Mitigation</td> </tr> </table>	Index of Plans	Boring Logs	Survey Data	Highway Plans	Alignments	Breakout Drainage	ROW	Highway Profile	Typ Sections	Highway X-Sections	Misc Details	Landscape Plan	Intersect Grading	Wetland Mitigation
Index of Plans	Boring Logs														
Survey Data	Highway Plans														
Alignments	Breakout Drainage														
ROW	Highway Profile														
Typ Sections	Highway X-Sections														
Misc Details	Landscape Plan														
Intersect Grading	Wetland Mitigation														
04-Structure	Index of Drawings All Structure Sheets Note: Multiple subsets may required for multiple Sites Ex: 04_Structure_Br.No.1266														
05-Traffic	Index of Drawings Signing Pavement Markings MPT Traffic Signal Plans Etc.														
06-Environmental	Index of Drawings All Environmental Compliance Sheets required														
07-"Utility"	Utility Design plans. For example 07_AT & T, 07_CL & P, 07_MDC, etc.														
08-CL&P FIO***	CL & P For Information Only plans														
09-AT&T FIO***	AT & T For Information Only plans														
CTDOT Highway STD	* CTDOT Highway Design Standard Index and Sheets required														
CTDOT Traffic STD	* CTDOT Traffic Engineering Standard Index and Sheets required														

**Figure 20 Typical Highway Project Discipline Subset Contents**

\* For using CTDOT Standard Sheets see 1.5 CTDOT Standard Sheet Assembly

\*\* If a discipline has to be broken up into more than one subset [See Section 1.11](#) for splitting up the discipline subsets.

\*\*\* For Information only discipline subset shall be submitted as individual pdf files based on the entity providing the information only.

## 1.11 Example: Multiple Volume Digital Contract

Multiple volumes are used if the project has 1 or more of the following characteristics:

1. The majority of the discipline/firm designers are responsible for more than 3 subsets each. This allows the individual designers to number their subsets independently of the other disciplines.
2. There are multiple sites on the project. Splitting these sites up into volumes will provide better organization of the project.

The larger the project is, typically the more subsets will be required and their labels will be more specific. The Project Manager will need to organize the discipline volumes. The subsets shall be split up by volume and each volume shall be controlled by its assigned designer. For example, all the subsets designed by the highway designer shall be in the same volume (02) and each subset shall have a unique subset number. For example, see subset 02.02\_Alignments and 02.03\_Plans as shown below.

<b>Label (Discipline Subset)</b>	<b>File contents (but not limited to)</b>	<b>Designer/ Firm</b>
01.01-General	Title Sheet, Detail Estimate Sheet Etc	Lead
01.02-Revisions	Index of Revision Sheets	Lead
01.03-Wtlnd Re-establish	Wetland Reestablishment plans	Designer 1
01.04-Stg Acc.	Staging and Access Plans	Designer 1
02.01-Typ Sections	Typical Sections	Designer 2
02.02-Alignments	Alignment Geometry	Designer 2
02.03-Plan	Plans	Designer 2
02.04-Profiles	Profiles	Designer 2
02.05-ROW Brk	Right of Way Breakout	Designer 2
02.06-Drain	Drainage Plans	Designer 2
03.01-Retaining Wall 1	Retaining wall details	Designer 3
03.02-Retaining Wall 2	Retaining wall details	Designer 3
03.03-Bridge 00456	Bridge_456	Designer 3
03.04-Bridge 01983	Bridge_1983	Designer 3
03.05-Bridge 01984	Bridge_1984	Designer 3
04.01-Stage 1	Stage Construction Details 1	Designer 4
04.02-Stage 2	Stage Construction Details 2	Designer 4
04.03-Stage 3	Stage Construction Details 3	Designer 4
05.01-SPM	Signing and Pavement Marking Site 1	Designer 5
05.02-SPM	Signing and Pavement Marking Site 2	Designer 5
05.03-SPM	Signing and Pavement Marking Site 3	Designer 5
06.01-IMS	IMS Plans and Details Site 1,2,3	Designer 6
07.01-Env 1	Environmental Details Site 1	Designer 7
07.02-Env 2	Environmental Details Site 2	Designer 7
07.03-Env 3	Environmental Details Site 3	Designer 7
08.01-"Utility"	Utility Design plans. For example 07_AT & T, 07_CL & P, 07_MDC, etc.	Designer 8
09.01-CL&P FIO	CL & P For Information Only plans	Designer 8
09.02-AT&T FIO	AT & T For Information Only plans	Designer 8
CTDOT Highway STD	* CTDOT Highway Design Standard Index and Sheets required	Designer 1
CTDOT Traffic STD	* CTDOT Traffic Engineering Standard Index and Sheets required	Designer 5

**Figure 21 – Multiple Design Firms CTDOT Project Subsets**

<b>Label (Discipline Subset)</b>	<b>File contents (but not limited to)</b>	<b>Designer/ Firm</b>
01.01_General	Title Sheet, Detail Estimate Sheet Etc	Lead
01.02_Revisions	Index of Revision Sheets	Lead
01.03_WtInd_Re-establish	Wetland Reestablishment plans	Designer 1
01.04_Stg_Acc.	Staging and Access Plans	Designer 1
02.01_Typ_Sections	Typical Sections	Designer 2
02.02_Alignments	Alignment Geometry	Designer 2
02.03_Plan	Plans	Designer 2
02.04_Profiles	Profiles	Designer 2
02.05_ROW_Brk	Right of Way Breakout	Designer 2
02.06_Drain	Drainage Plans	Designer 2
03.01_Branford_Station	Branford Station	Designer 2
03.02_Retaining_wall_2	Retaining wall details	Designer 2
03.03_Architectural	Architectural Details	Designer 2
03.03_Mechanical	Mechanical Details	Designer 2
03.03_Electrical	Electrical Details	Designer 2
04.01_Guilford Station	Guilford Station	Designer 2
04.02_Architectural	Architectural Details	Designer 2
04.03_Mechanical	Mechanical Details	Designer 2
05.01_"Utility"	Utility Design plans. For example 07_AT & T, 07_CL & P, 07_MDC, etc.	Designer3
06.01_CL&P_FIO	CL & P For Information Only plans	Designer 1
06.02_AT&T_FIO	AT & T For Information Only plans	Designer 1
CTDOT_Highway_STD	* CTDOT Highway Design Standard Index and Sheets required	Designer 1
CTDOT_Traffic_STD	* CTDOT Traffic Engineering Standard Index and Sheets required	Designer 2

**Figure 22 - Multiple Site CTDOT Facilities Project Subsets**

## Section 2 Digital Signatures for Contract Plans

This manual refers to digital signatures in two ways: certifying signatures, and signing signatures. The Engineer of Record will always digitally sign using a visible certifying signature. If multiple signatures are required per document, the sub-engineers shall always digitally sign using a visible signing signature after the primary engineer has applied his certifying signature. Certifying signatures allow controlled changes, to the now certified document. These controlled changes include; allowing PDF digital comments, and the application of additional signatures. Signing signatures should always be accompanied by a note listing the sheets the signer is responsible for within a subset.

In order to digitally secure a PDF document the signer(s) applies a digital signature(s) to only the first sheet of each discipline subset(s), regardless of the number of pages the subset contains. This single digital signature secures the entire document.

A graphic image of the signer's signature must be created, and shall be used for the following two purposes. First, it shall be attached to the digital signature and displayed when the digital signature is applied. Second, it shall be placed as a watermark on all sheets a particular engineer of record is responsible for, and is digitally signing. The watermark shall be placed on all sheets in a working drawing submittal.

A digital ID must be purchased in order to apply a digital signature. Digital ID's must meet the specifications of Adobe's Certified Document Services (CDS). The necessary hardware and software needed to apply the required digital signatures may be purchased from the vendor list provided at the following website: [http://www.adobe.com/security/partners\\_cds.html](http://www.adobe.com/security/partners_cds.html), additional information on Adobe's CDS is also available at this website.

### 2.1 Graphic Image of Signature

The following figure displays an example of both a state designer and a consultant designer's digital signatures, and their accompanying graphic image(s) of their signature(s).

The consultant engineer's graphic image must contain his companies name and address; his signature, his Professional Engineers stamp, or his Professional Architecture Stamp. The state employee's graphic image must contain only his signature. See Below.

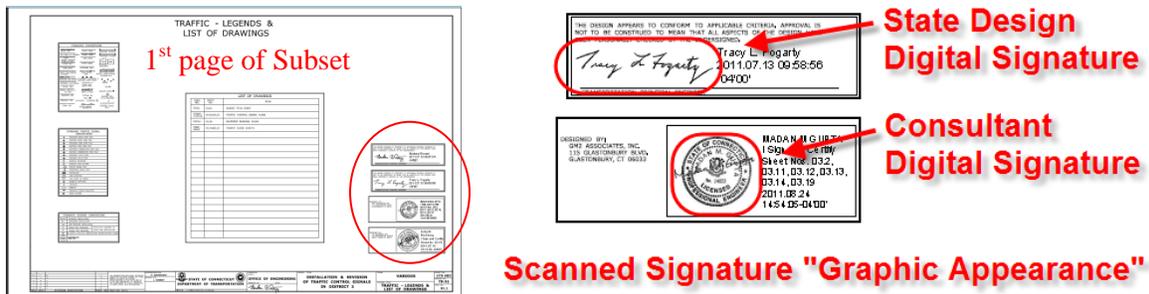
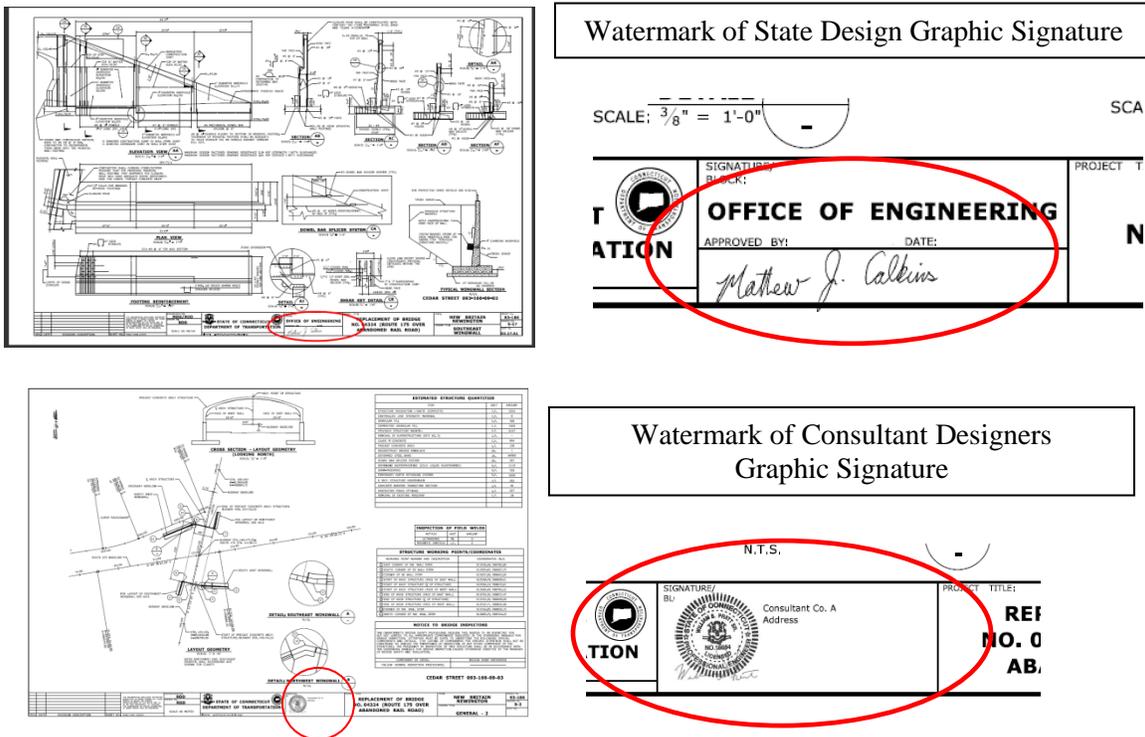


Figure 23 - Graphic Image of Signature

Although discipline subsets requires only one digital signature applied to the first page to complete the certification process and ensure security; the CTDOT also requires that all subsequent pages be watermarked with a copy of the engineer of records graphic signature before

they are digitally signed. Watermarks containing these signatures are applied using Adobe Acrobat or Bluebeam and are always placed in the border as shown. This is to prove validation of a digital document if printed.



**Figure 24 - Watermark**

## 2.2 Creating Graphic Image of Signature:

### 2.2.1 CTDOT Staff:

The graphic signature of CTDOT employees shall consist of only their signature; P.E. stamps are not required.

The following CTDOT employees need to create graphic images of their signatures: Principal Engineer (required to digitally sign plans), Manager of State Design, and the Engineering Administrator. CTDOT graphic signatures shall be created as follows:

1. Signer must sign a blank piece of paper.
2. Scan this signature.
3. Crop the image so that the image is approximately 300 pixels wide by 100 pixels high.
4. Save the images, in PDF if using Adobe or in Tiff if using Bluebeam, to an area on your PC.

**Figure 25 (Example of CTDOT Graphic Image of Signature – Used with Digital Signature and as a Watermark)**

## 2.2.2 For Consultant Staff:

Consultant Engineers shall create two different graphic signature images: one that shall accompany their digital signatures and a different one that shall be placed as a watermark on all the sheets the designer is signing for.

This section shows an example of a Professional Engineer preparing their graphic image of their signature; Architect's shall follow this section when they are preparing their digital signature.

The graphic signature that shall accompany the digital signature needs only to include the designer's signature and P.E. Stamp, and shall be created as follows:

1. Stamp and Sign a blank piece of paper.
2. Scan this signature.
3. Crop the image to approximately 250 pixels wide by 250 pixels high.
4. Save the image, in PDF if using Adobe / in Tiff if using Bluebeam, to an area on your PC or server, where you can easily access it for later use in the signature set-up procedure.



**Figure 26 ((Example of Consultant Engineer Graphic image of Signature – Applied to 1<sup>st</sup> page only with digital signature)**

In addition to the designer's signature and P.E. Stamp, the graphic signature that is placed as a watermark shall also include the designer's company name and address, and shall be created as follows:

1. On blank paper – Print company name and address.
2. Place P.E. stamp next to company name and address.
3. Sign P.E. Stamp.
4. Scan the image created in steps 1 thru 3 above.
5. Crop the image to approximately 500 pixels wide by 250 pixels high.
6. Save the image, in PDF if using Adobe / in Tiff if using Bluebeam, to an area on your PC or server, where you can easily access it for later use in the watermarking procedure.



Consultant Co. A  
Address

**Figure 27 (Example of Consultant Engineer Graphic image of Signature – applied to all pages as a watermark)**

Once the graphic images have been properly created and saved, the digital signature appearance preferences must be set as follows:

## 2.3 Setting Digital Signature Appearance Preferences:

Once the graphic signatures are created the digital signature appearance settings must be defined as follows:

### 2.3.1 Adobe Signature Appearance

1. In Acrobat, go to Edit > Preferences > Security. Check “Verify signatures when the document is opened” and uncheck both “View documents in preview document mode when signing” and “Load security settings from server”.

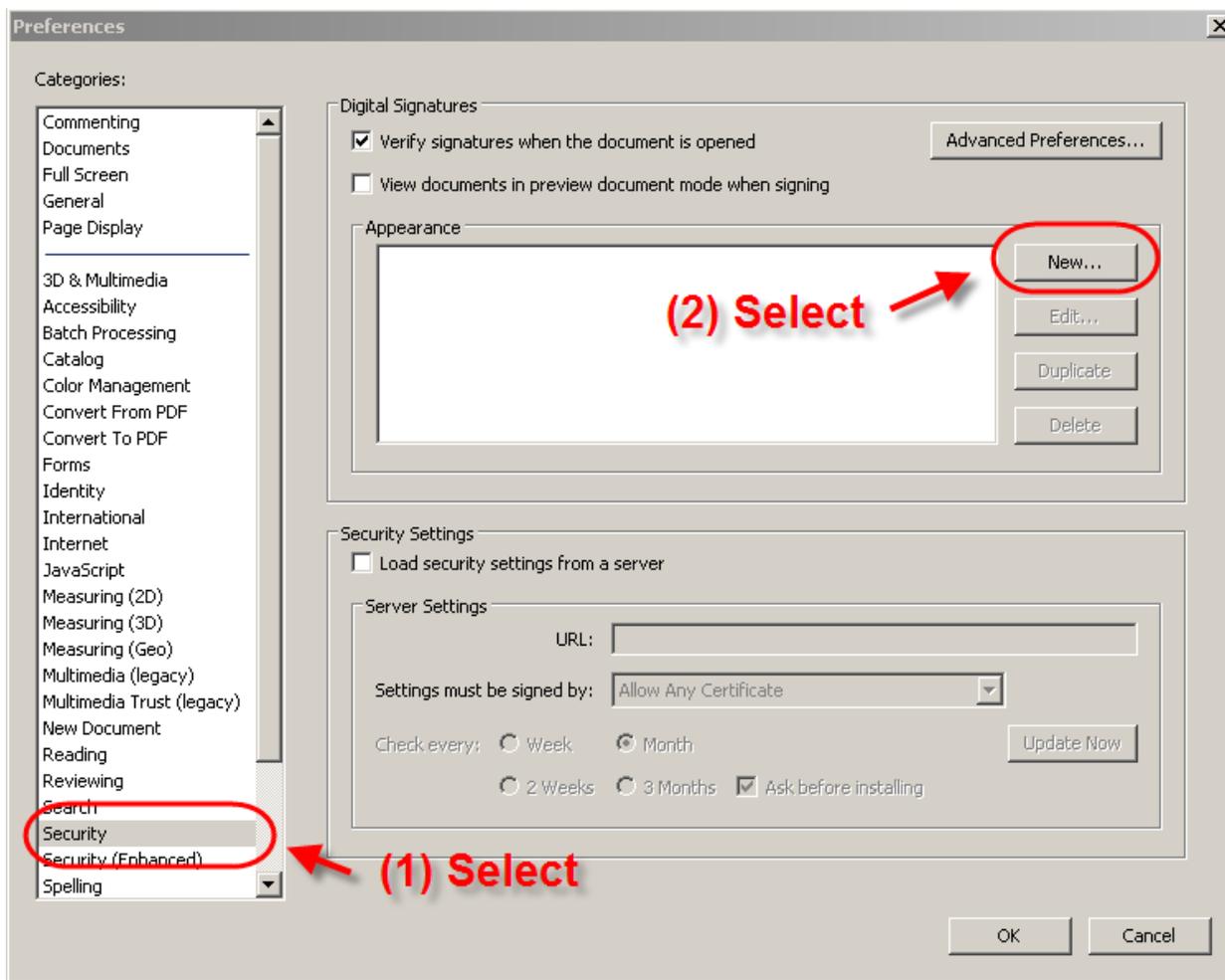


Figure 28 Preferences

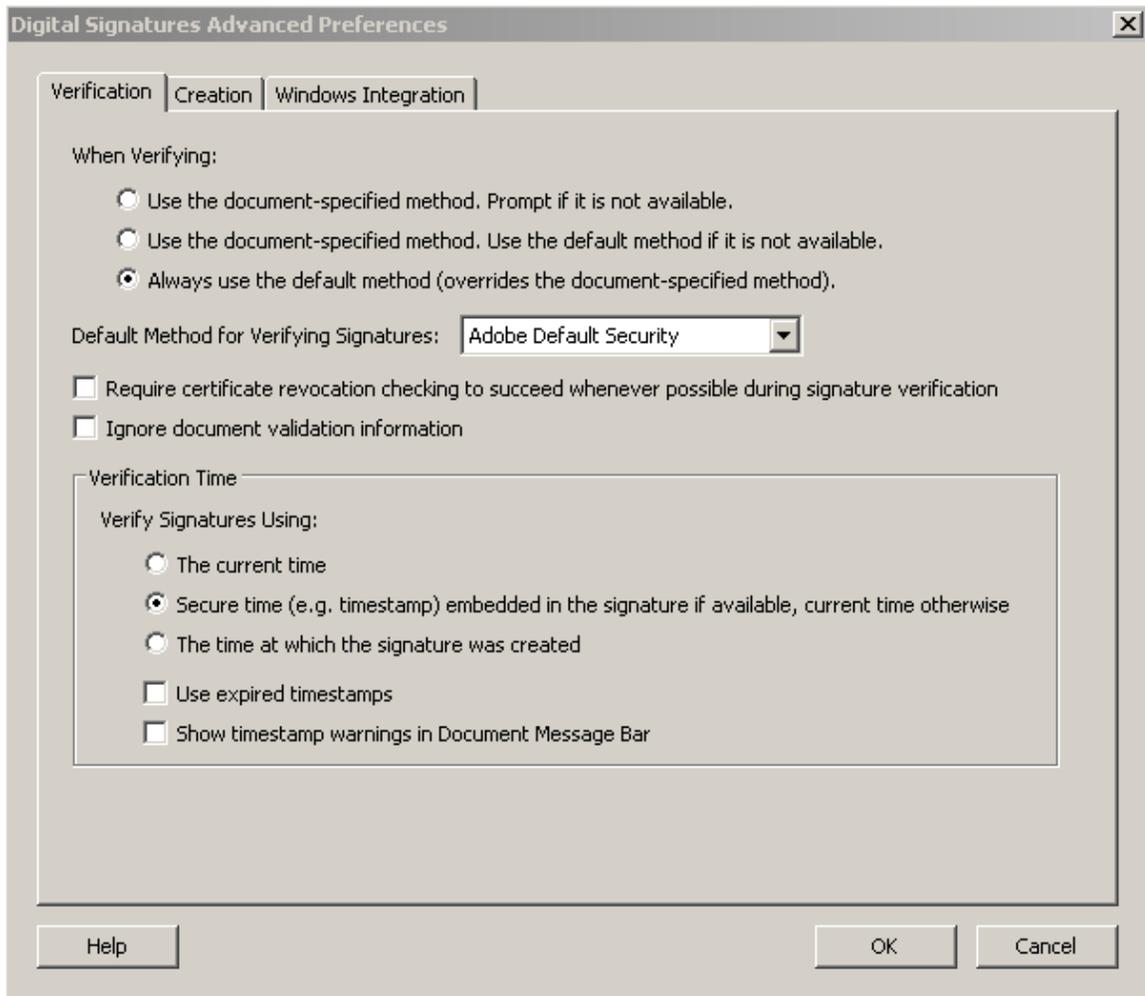
2. Click the “New” button to create your digital signature appearance.

3. On the next screen, name your appearance and import your graphic signature, either, a signature only for state employees, or a P.E. stamp and signature, for consultants. In the configure text selection, make sure Name and Date are checked. Select Ok when complete.



Figure 29 Configure Signature Appearance

4. In the Preferences Dialog, see figure 17, go to Advanced Preferences. Select options in each tab in the following figures:



**Figure 30 Advanced Preferences**

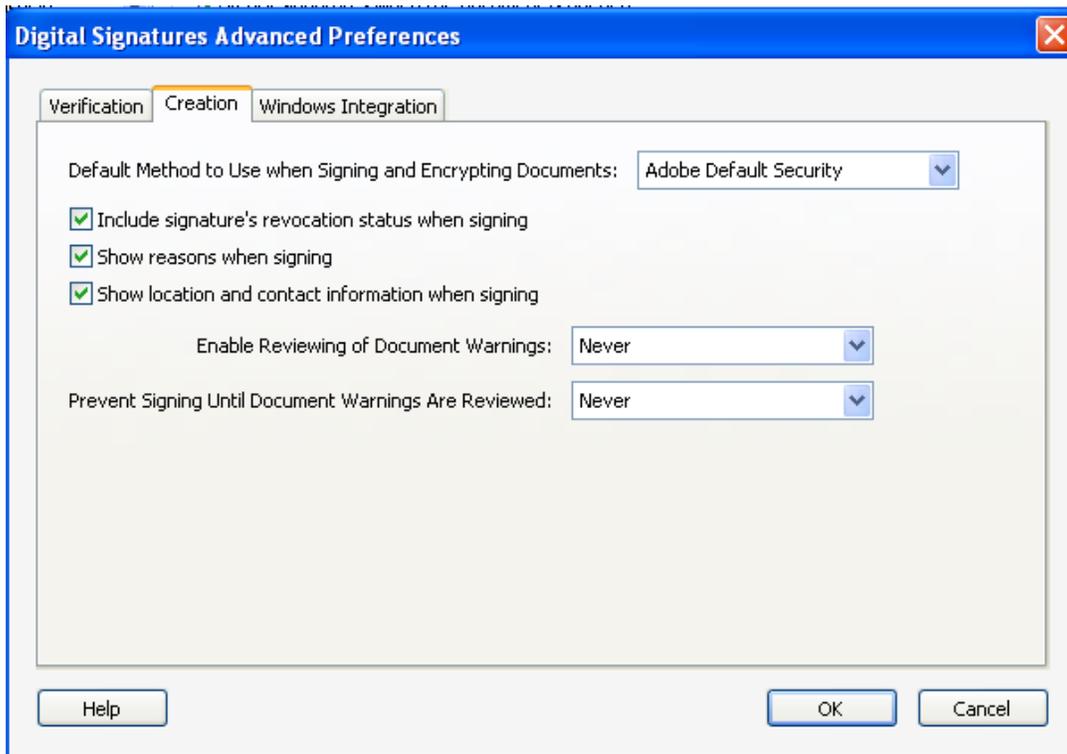


Figure 31 Advanced Preferences

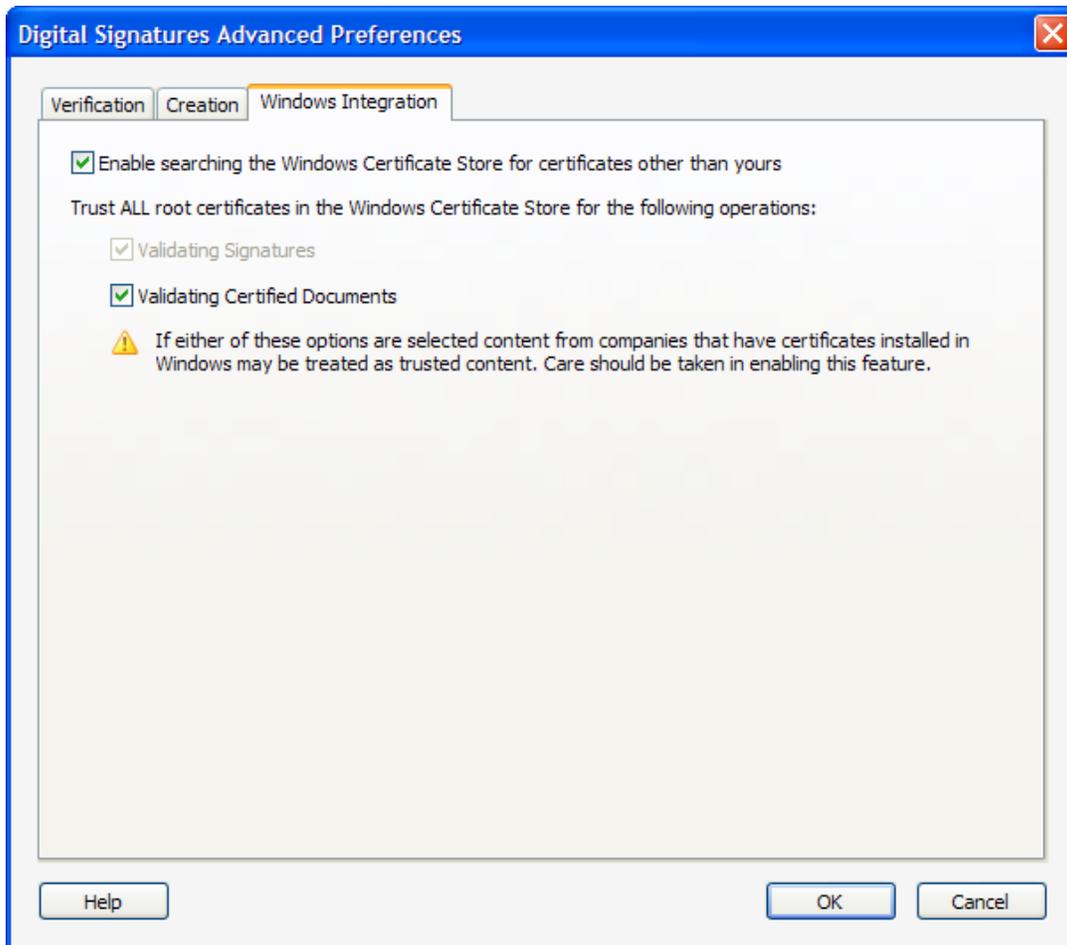


Figure 32 - Windows Integration

### 2.3.2 Bluebeam Digital Appearance

1. Make sure your CDS USB token is inserted into the computer then in Bluebeam go to the Document tab and select Signatures>Digital ID's:

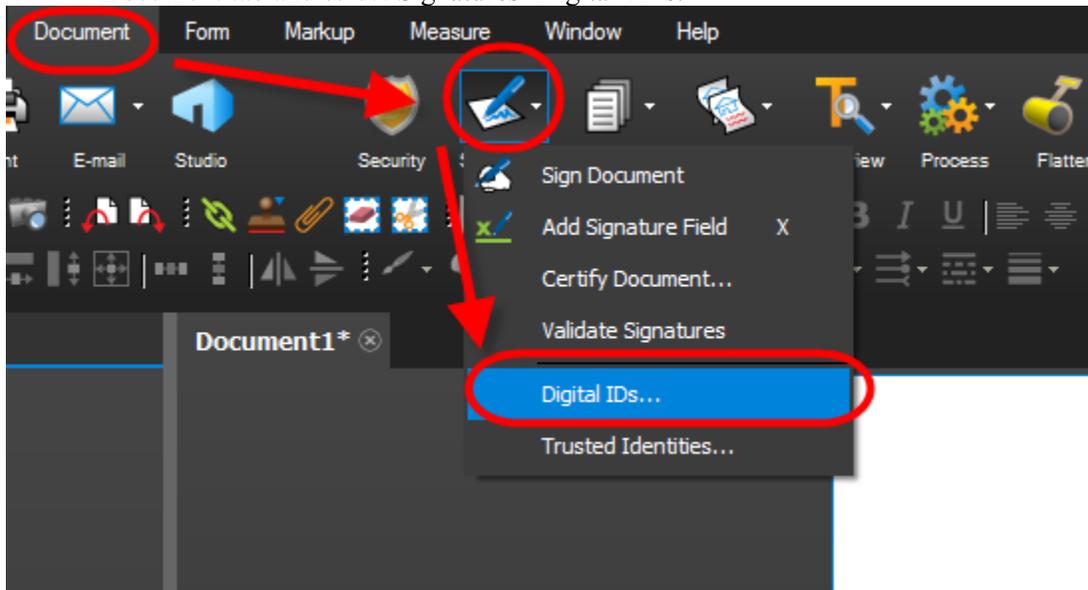


Figure 33 - Digital Appearance

2. Next click on your ID and click Manage Appearances:  
is form it signifies complete and has had As-Built information applied to th

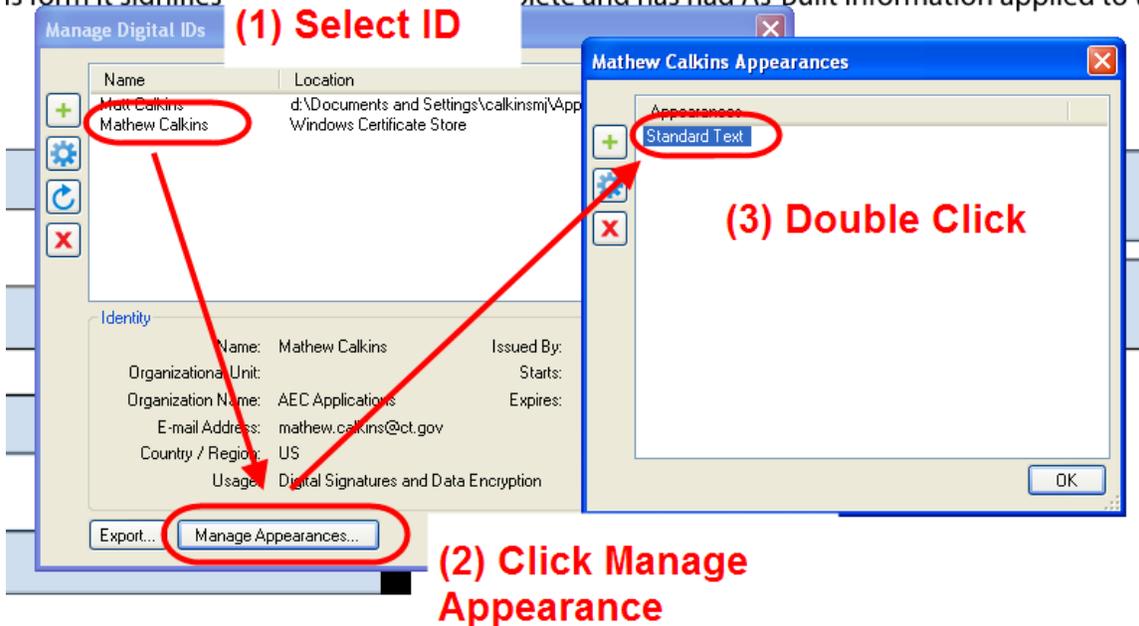


Figure 34 - Manage Appearances

3. Next follow the figure below:

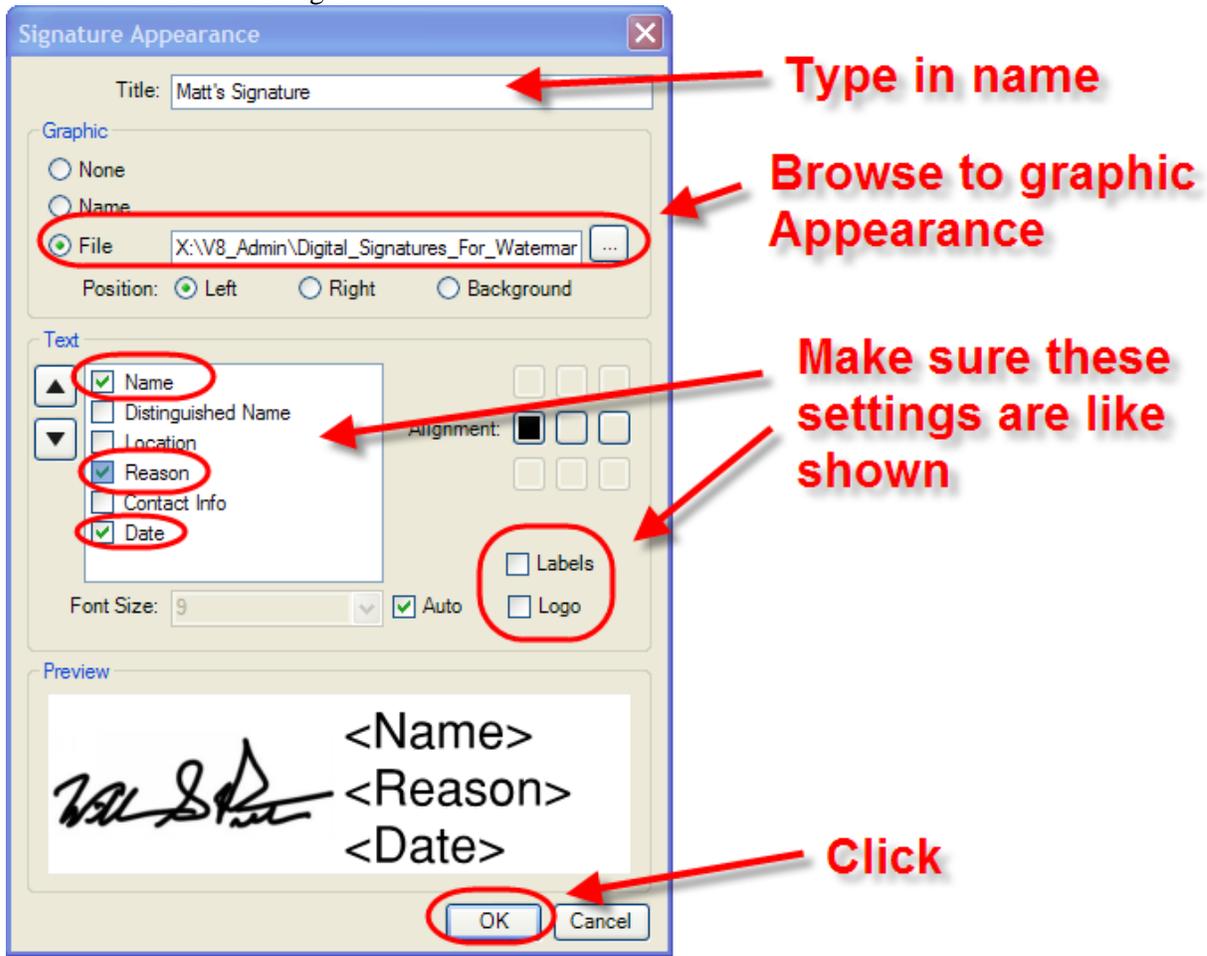


Figure 35 - Setting the Digital Appearance

4. Now the digital appearance will be saved and can be used to digitally sign.

## 2.4 Watermarking Plans with Graphic Image of Signature

The Engineer of Record (Principal Engineers for State Design), for each discipline, shall place a copy of their graphic signature as a watermark on each page of each discipline subset, or working drawing submittal that they are responsible for.

### 2.4.1 Adobe – Watermarking Plans with Graphic Image of Signature

1. From Adobe Acrobat select Document> Watermark>Add.
2. In the Add Watermark dialog box browse to your graphic signature (X:\V8\_Admin\Digital\_Signatures\_For\_Watermarks)
3. Adjust Scale Relative to page as shown below.
4. Adjust position as shown below.
5. Shall be placed on all sheets, except on the title sheet in the 01-General subset. This sheet does not need a watermark. See figure below (#5) for selecting page range options.
6. Save settings when complete for future use.

#### 2.4.1.1 CTDOT Designed Plans

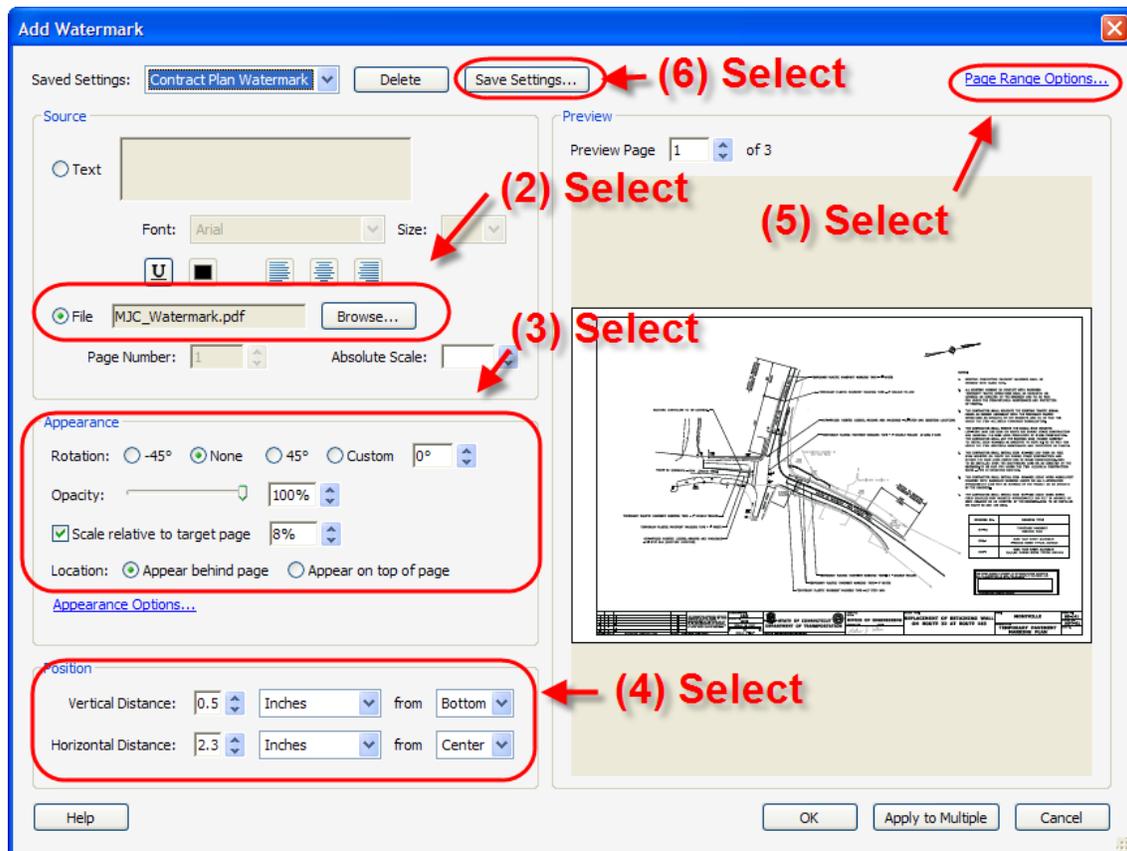


Figure 36 Add CTDOT Watermark Dialog

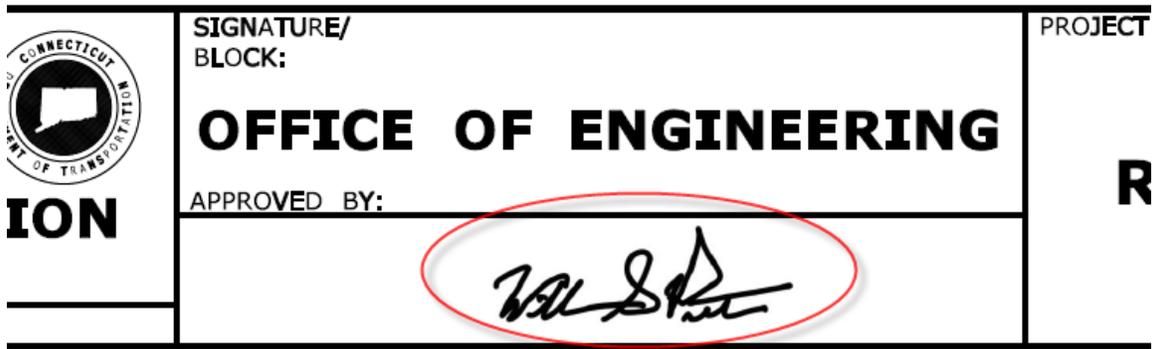


Figure 37 CTDOT Signature Watermark

### 2.4.1.2 Consultant Designed Contract Plans

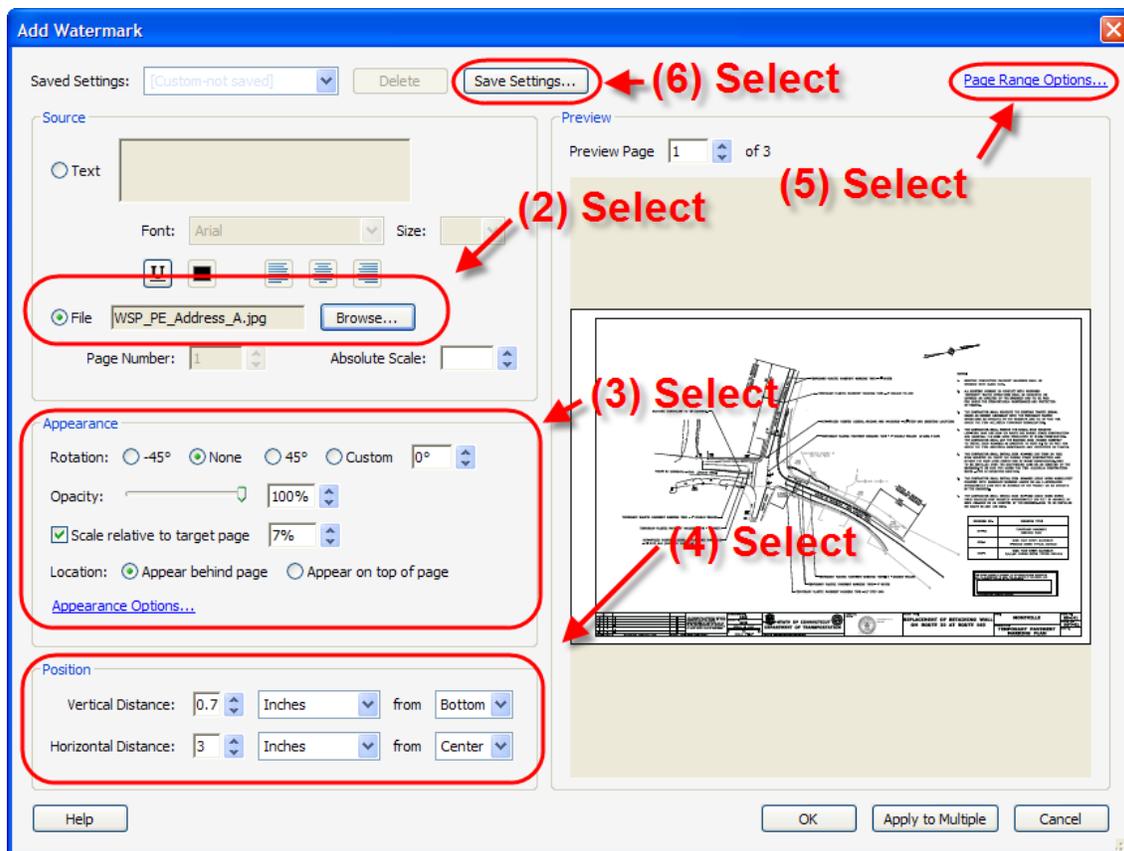


Figure 38 Consultant PE Stamp, Company and Address - Watermark Dialog

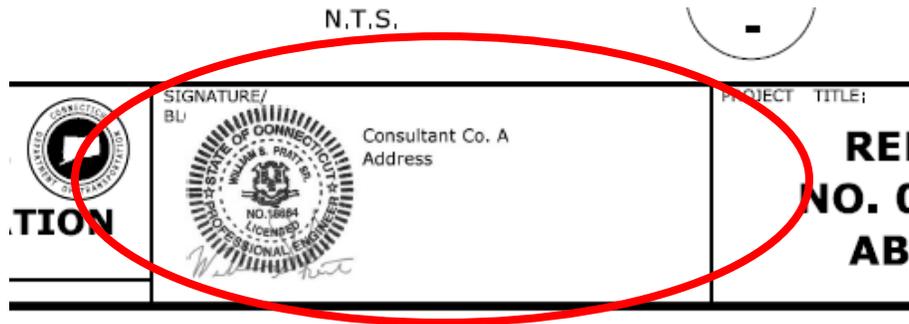


Figure 39 Consultant Completed Watermark

### 2.4.2 Bluebeam - Watermarking Plans with Graphic Image of Signature (CTDOT and Consultant Designed)

The engineer of record (Principal Engineers for State Design), for each discipline, shall place a copy of their graphic signature as a watermark on each page of each discipline subset, or working drawing submittal that they are responsible for. There are two ways to apply watermarks using Bluebeam, see below for options 1 and 2.

Watermarking Workflow:

Option 1

1. The watermark in Bluebeam is placed using the stamp function. First go to the Markup tab and select Stamp and then choose your stamp. If your stamp is not in the list follow section [Section 7.3](#). If your stamp is in the list go to step 2.
2. Next Place the stamp in the border on the first sheet

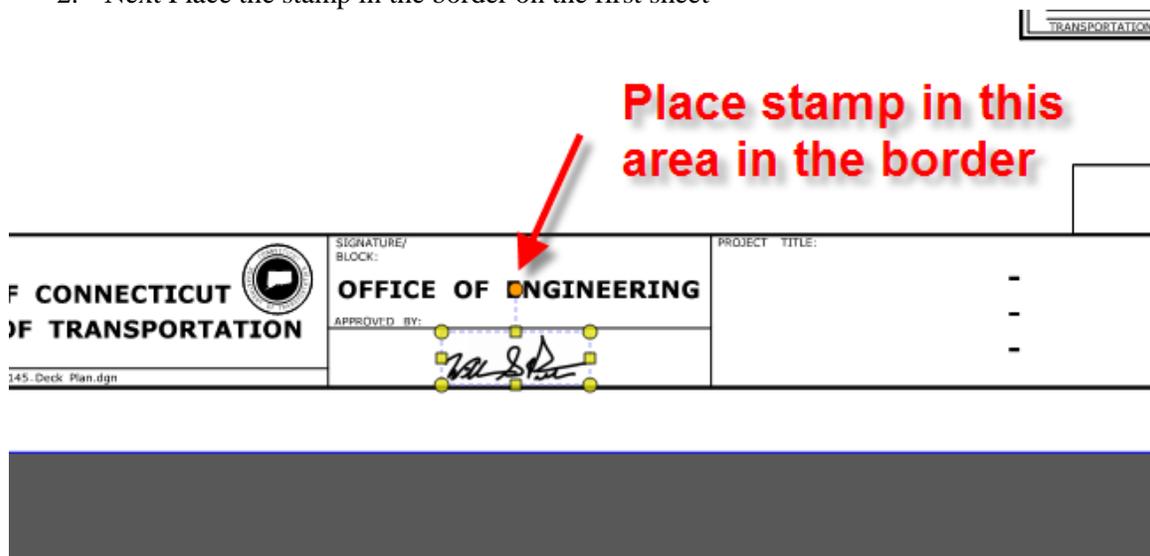
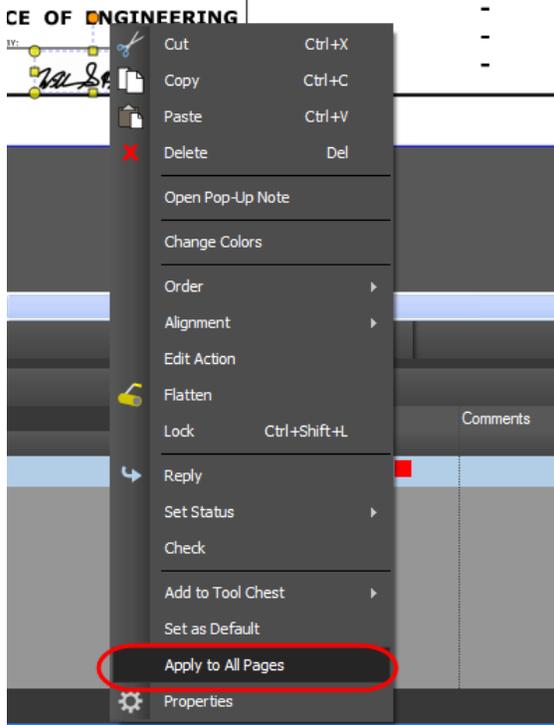


Figure 40 - Placing Watermark

3. Next right click on the stamp and select “Apply to all pages”



**Figure 41 - Placing Watermark on All Pages**

If more than one group has to watermark this subset, browse to the pages the other group is responsible for and delete the watermark. Then they can come in a place their watermark on these sheets.

4. In Bluebeam a stamp is considered a comment so after all the watermarks have been placed on the subset, we are going to “flatten” the comments onto the pdf so no one can delete the watermarks. To do this go to Document>Flatten Markups. Use the default settings and click OK.

Option 2

1. Go to the Document tab and Pages>Apply Stamp.

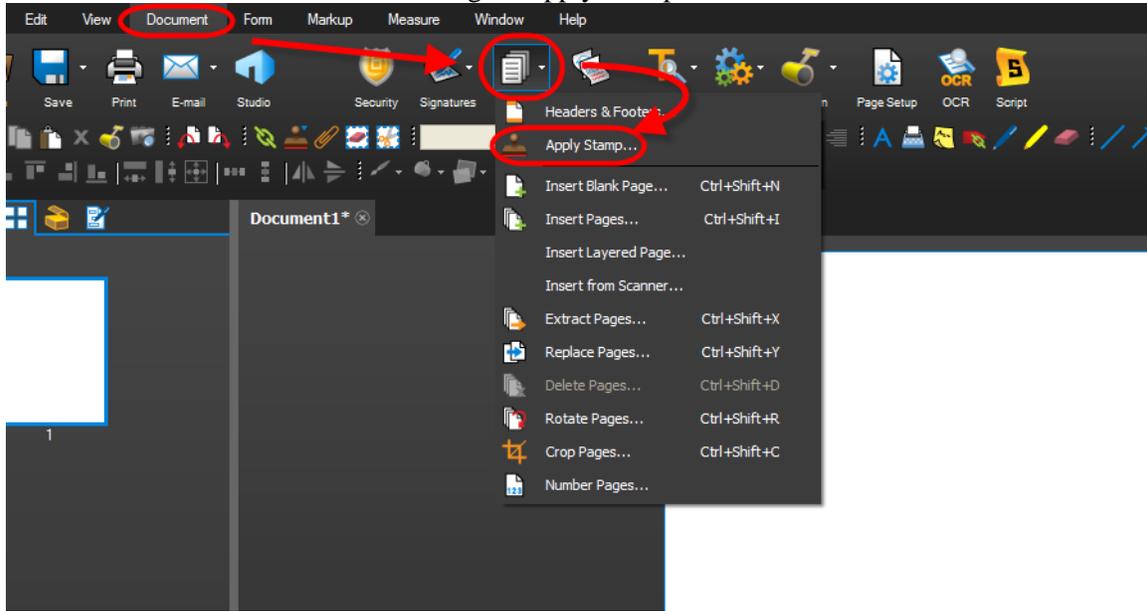


Figure 42 - Applying Stamps

2. Select stamp, input scale and coordinates, and page range as shown below.

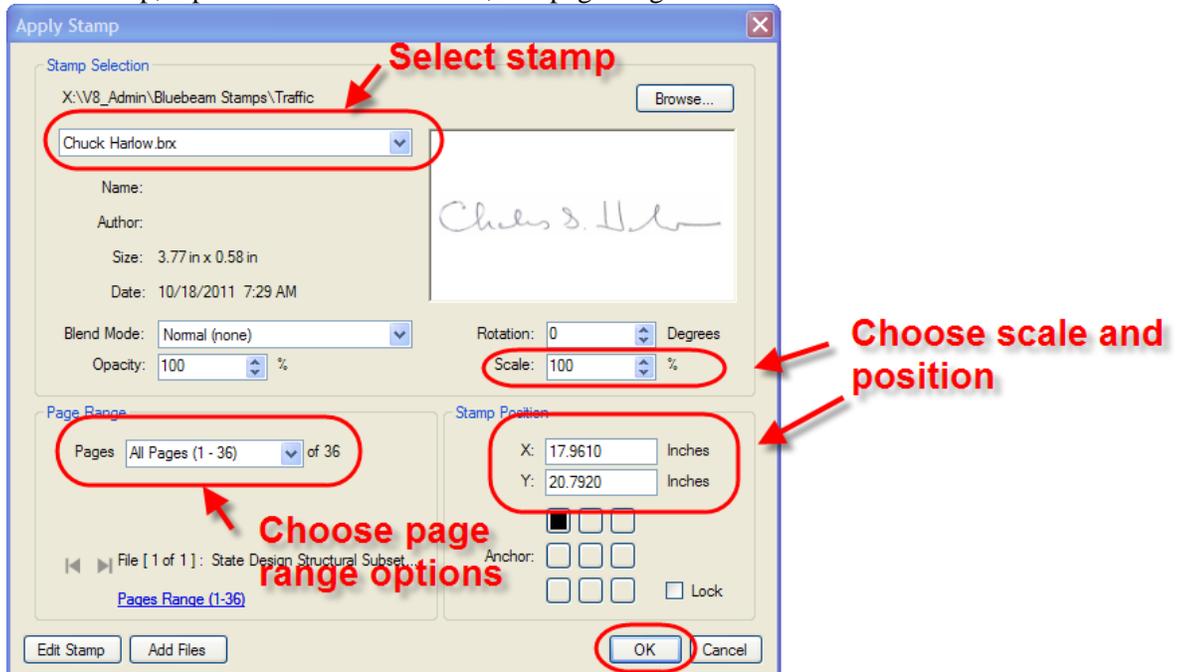
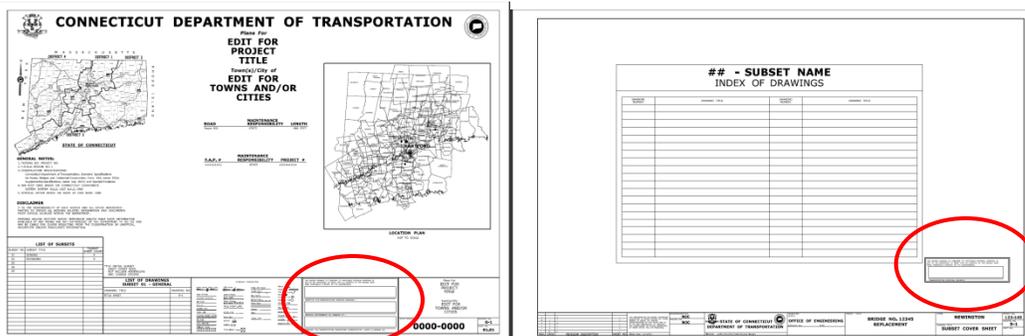


Figure 43 - Applying Stamps

3. In Bluebeam a stamp is considered a comment so after all the watermarks have been placed on the subset, we are going to “flatten” the comments onto the pdf so no one can delete the watermarks. To do this go to the Document tab and select Flatten Markups. Use the default settings and click OK.

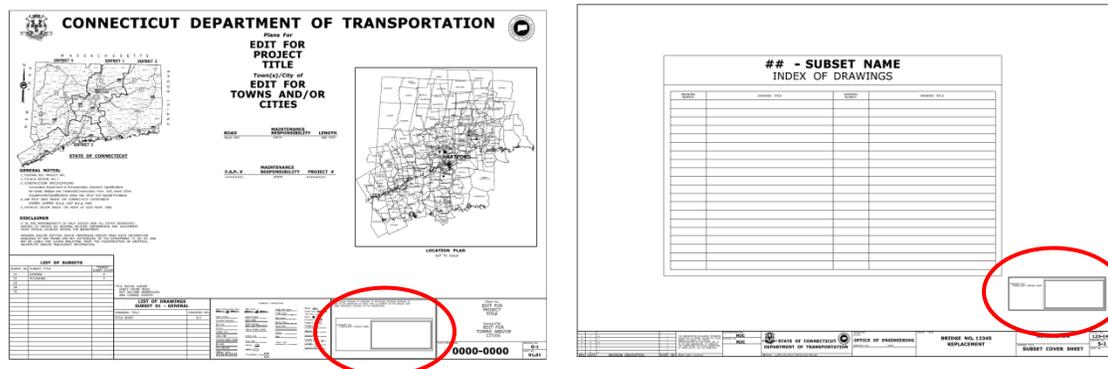
## 2.5 Digital Signature Fields

Digital signature fields are form fields created using Adobe Acrobat or Bluebeam, and are used to house the digital signatures. Digital Signature form fields shall be superimposed onto form field place holders. The form field place holders are cells that are placed in the MicroStation file on the title sheet and the subset cover sheets and on any Addendum or Change Order Subset. The figure below shows a CTDOT designed project with the form field place holders (circled) on the title sheet and the discipline subset cover sheet.



**Figure 44 - Digital Signature Fields**

The figure below shows a consultant designed project's title sheet and discipline subset cover sheet with their form field place holders.



Place holders determine the location and size of the digital signature form field.

Form field place holding cell library: [CT\\_Digital\\_Sigs.zip](#)

The digital signature place holder and form fields shall be created on the first page of each discipline subset for each required digital signature.

All signature form fields need to be created for both certifying and signing signatures before any digital signatures is applied to the document.

## 2.5.1 Adobe - Creating Digital Signature Form Fields

The following work flow explains how to add signature form fields to a PDF document.

1. In Acrobat select forms>Add or Edit Fields

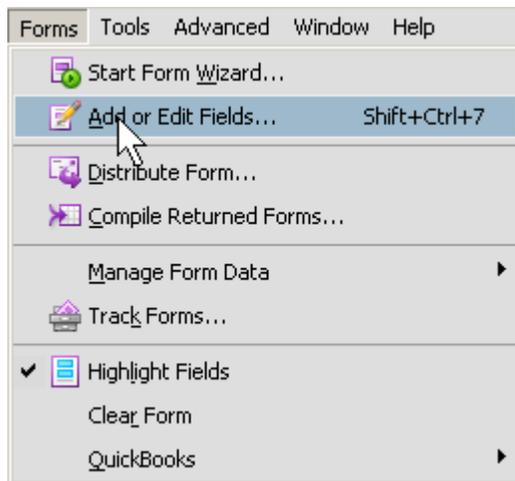


Figure 45 Manually Placed Digital Signature Field

2. When this dialog box appears - Select No.



Figure 46 - Auto Detect Fields

3. Select Add New Field>Digital Signature.



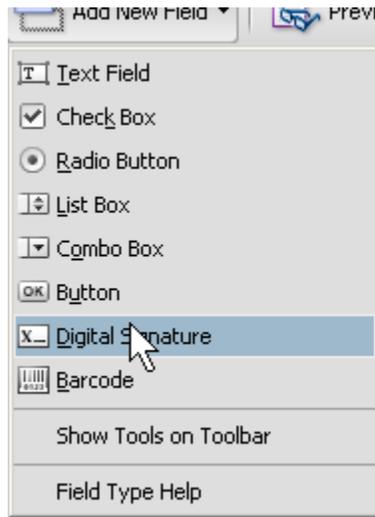


Figure 47 - Placing Digital Signature Field

Place the digital signature form field in top left corner of place holder and adjust bottom right corner using handles.

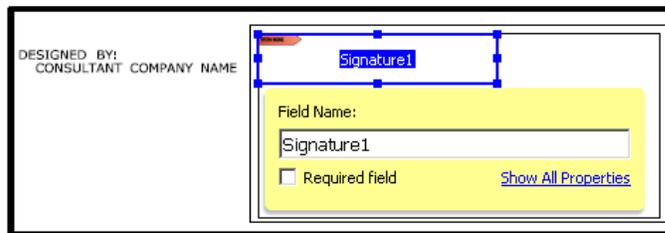


Figure 48 - Placing Digital Signature Field

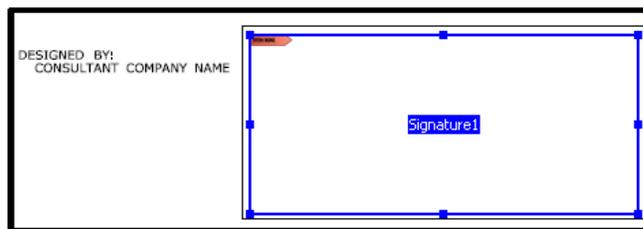


Figure 49 Signature Field placed on Inside Box – Consultant Signature field

Next, click the Close Form Editing button located in the upper right hand corner of view.

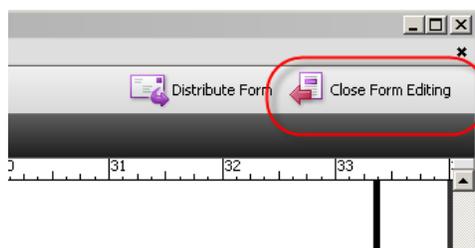


Figure 50 - Close For Editing

## 2.5.2 Bluebeam - Creating Digital Signature Form Fields

The following example shows how to place the (3) digital signature form fields on the 01-General title sheet of a CTDOT designed project. For a discipline subset or a consultant designed 01-General title sheet, only one digital signature form field needs to be placed.

1. Go to the Document tab and select Signatures>Add Signature Field.

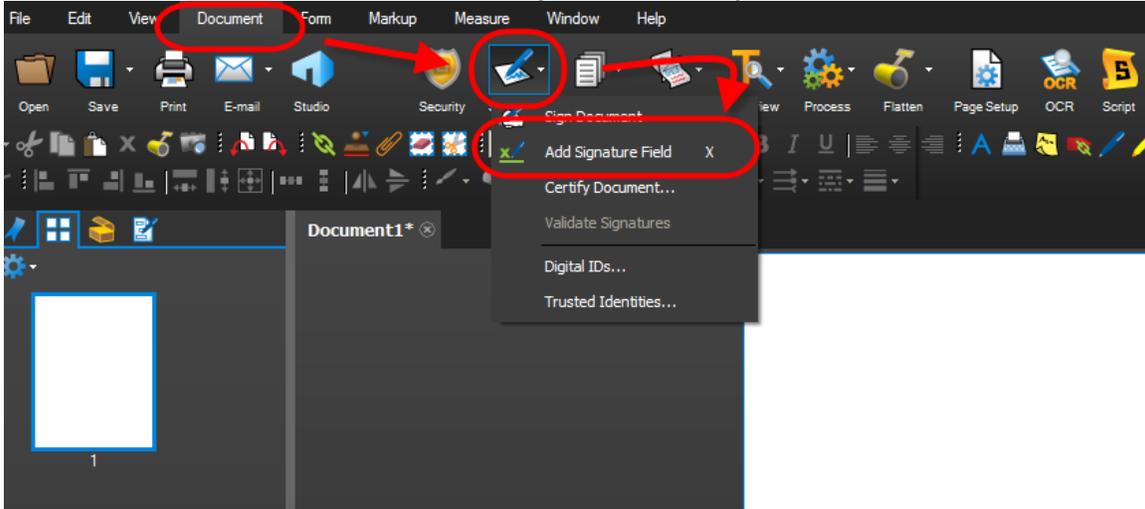


Figure 51 - Adding Signature Fields

2. Next place three signature fields in the appropriate location and hit save as shown below:

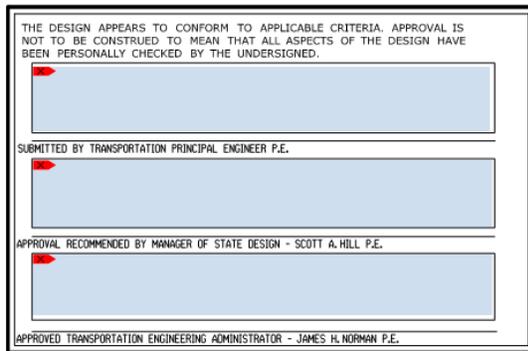


Figure 52 - Placing Signature Fields

## 2.6 Applying Digital Signatures

This section describes how to apply digital signatures. Subsets 01-General and 02-Revisions and the Highway and Traffic Standard drawing subsets have unique requirements as described in the following sections.

CTDOT projects shall have their subsets digitally signed after they have been uploaded into projectwise because the Principal Engineer will be looking in projectwise to digitally sign documents.

Discipline subsets designed by a single engineer shall be digitally signed, by the engineer of record, using a single visible certifying signature, applied to the signature form field located on the first page of each subset.

Discipline subsets designed by multiple engineers shall first be digitally signed by the Engineer of Record who is responsible for the most sheets in the subsets. This engineer will apply a visible certifying signature in the top most form field. The next Engineer of Record shall apply their signing signatures in the subsequent form fields. This Engineer shall also include a reason, when applying their digital signatures, listing the pages they are responsible for.

Digital signatures must be applied to digital form fields, previously created. [See Section 2.5](#)

### 2.6.1 Applying Digital Signatures to 01\_General Subset (FDP and Addendum Subsets)

CTDOT DESIGNED PROJECTS:

The following procedure applies to both the 01\_General subset at FDP and any 01\_General\_A# subset.

The project title sheet of the 01\_General subset shall first be digitally signed by the lead discipline's Principal Engineer, using a **certifying signature**. The Principal Engineer should make sure that all three digital signature form fields (blue boxes in the signature block) are placed before signing, as these forms cannot be added after the document is digitally certified. After processing has approved the 01\_general subset for Advertising, the Manager, and the Transportation Engineering Administrator shall digitally sign the same sheet directly below the principal's signature, using a **signing signature** while the plans are in the **Manager and Engineer Admin. Sign** state.

Processing shall notify the lead designer when the 01-General subset is placed in the **Manager and Engineer Admin. Sign** state. The lead designer shall then coordinate the digital signing by the Manager and Engineering Administrator of the 01\_General subset. When both signatures are applied to the plans, the lead designer shall then notify processing that the 01-General subset has been signed.

[See Section 2.6.7 Applying Digital Signature Workflows](#)

Note: When digitally signing the 01\_General subset all signers shall leave the reason code blank.

The following image shows a typical project title sheet from the 01\_General subset that is digitally signed:



## 2.6.2 Applying a Digital Signatures to 02\_Revisions Subset

This section applies to both CTDOT designed projects and Consultant designed projects. The figures contained in this section show a consultant signature, but the workflows are the same.

This subset does not need to be signed at FDP. This subset must be signed when the sheet is filled out for an Addendum or design initiated change order, whichever comes first.

The first index of revision sheet(s) located in the 02\_Revisions subset shall be digitally signed by the lead designer, using a certifying signature.

1. The lead designer shall apply a **certifying signature** as described in [section 2.6.7 Applying Digital Signature Workflows](#) with the following **EXCEPTION**; the option “No Changes Allowed” must be selected to eliminate unauthorized changes after certifying the document. See the figure below:

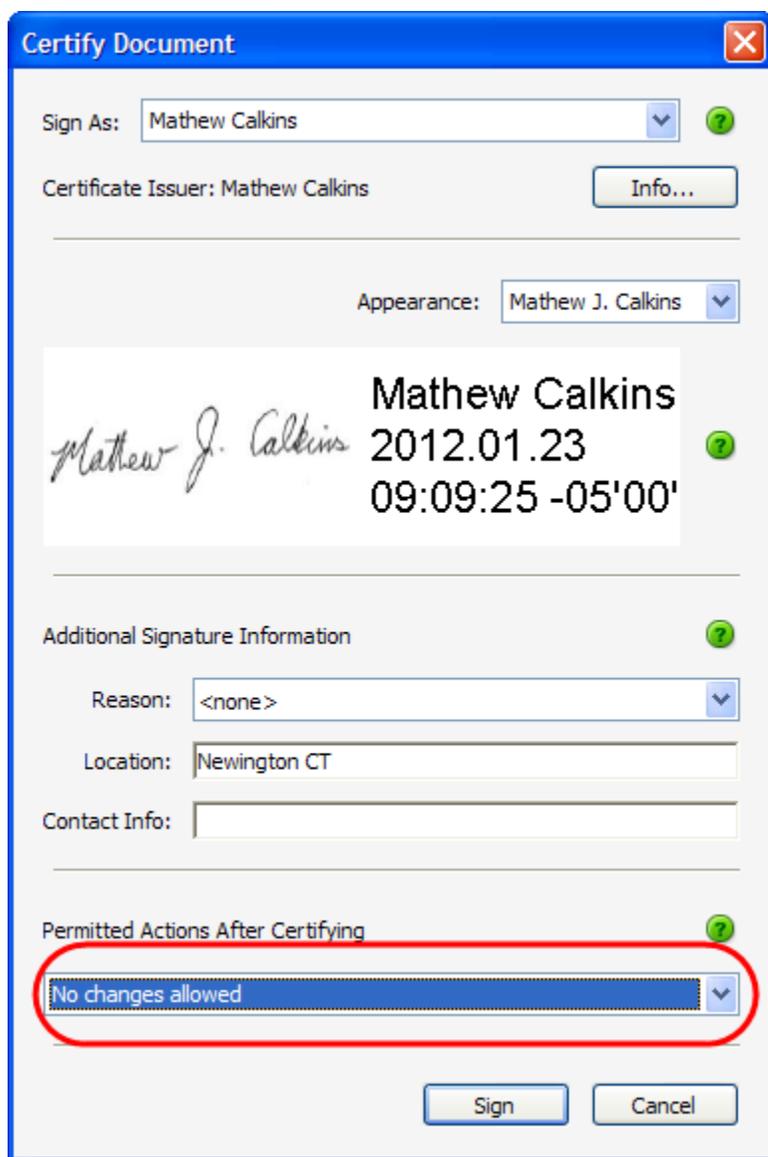


Figure 55 Certifying Dialog Box for 02\_Revisions.pdf

## 2.6.3 All Other Discipline Subsets - Single Signature

This section applies to both CTDOT designed projects and Consultant designed projects. The figures contained in this section show a consultant signature, but the workflow is the same.

Each discipline subset shall be digitally signed with a visible certifying signature, by ONLY the responsible design engineer. As shown below.

[See section 2.6.7 Applying Digital Signature Workflows](#)

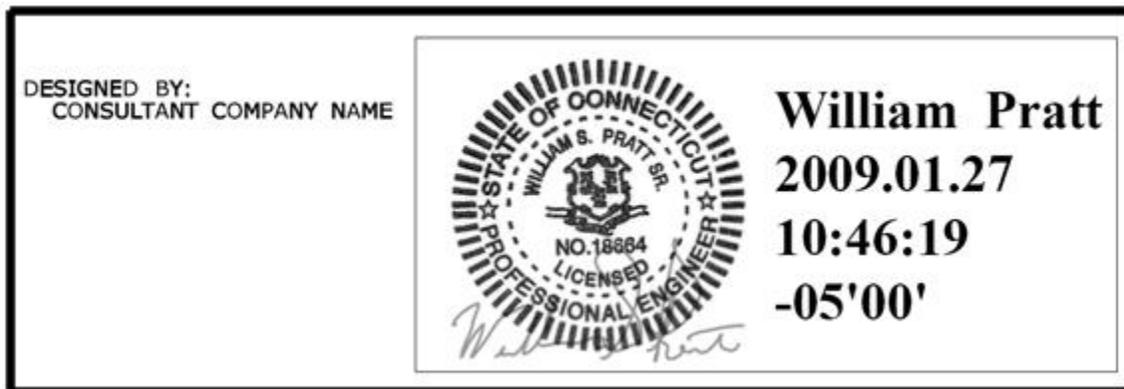


Figure 56 CTDOT Certified Plan Subset

## 2.6.4 Standard Drawing Subsets – Single Signature

This section applies to both CTDOT designed projects and Consultant designed projects. The figures contained in this section show a consultant signature, but the workflow is the same.

Only the standard drawing subset index sheets, Highways and Traffic Standard Drawings, need to be digitally signed with a visible signing signature, by ONLY the responsible design engineer.

[See section 2.6.7 Applying Digital Signature Workflows](#)

## 2.6.5 All Other Discipline Subsets – Multi-Signatures

This section applies to both CTDOT designed projects and Consultant designed projects. The figures contained in this section show a consultant signature, but the workflow is the same for CTDOT designed projects.

Multiple signatures per a single subset are required where two or more disciplines/firms are responsible for one subset.

The lead designer that is responsible for most of the pages within a discipline subset shall digitally sign the subset using a certifying signature, and leave the reason code blank. [See Section 2.6.7 Applying Digital Signature Workflows](#)

Once certified by the subset lead, the remaining designers(s) shall digitally sign the same subset using a signing signature, and complete the reason code with a note stating which pages, contained in this subset, that they are responsible for. See table 2-1 below:

[See Section 2.6.7 Applying Digital Signature Workflows](#)

**Table 2-1 Reason Codes for Prime and Sub Consultants**

<b>Designer</b>	<b>Certify or Sign</b>	<b>Responsible Sheet Numbers</b>	<b>Reason Code</b>
Lead Designer	Certify		
Sub-Designer 1	Sign	03.78 Thru 03.88	I am Signing for Sheet Nos. 03.78 thru 03.88
Sub-Designer 2 – etc.	Sign	03.88 Thru 03.98	I am Signing for Sheet Nos. 03.88 thru 03.98

## 2.6.6 Working Drawings

Working drawing submittals, plans, calcs, and supplemental documents shall be digitally signed in accordance with [section 2.6.7](#) of this manual.

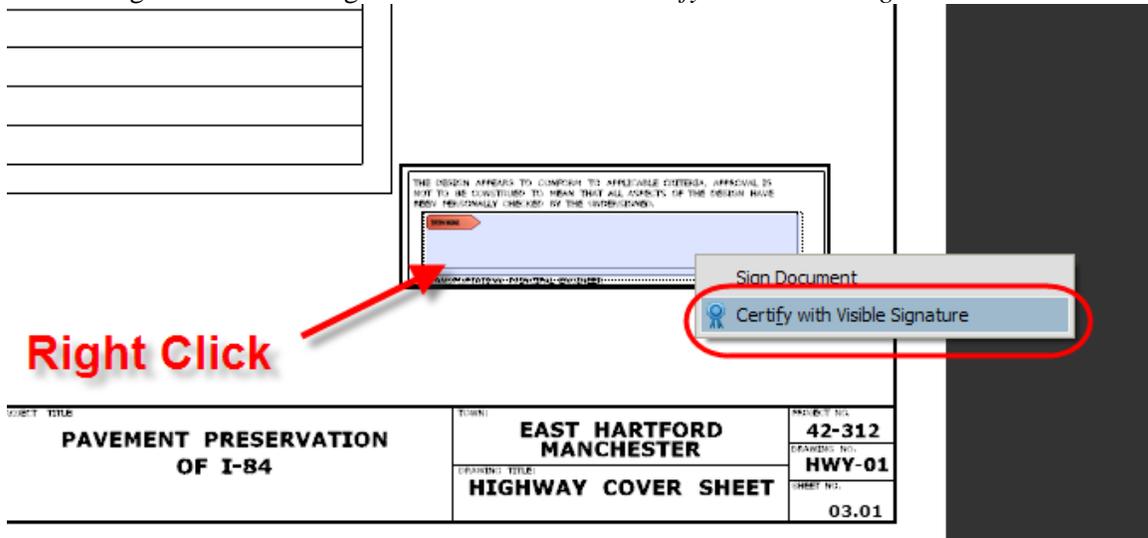
## 2.6.7 Applying Digital Signature Workflows

### 2.6.7.1 Adobe

This section applies to both CTDOT designed projects and Consultant designed projects. The figures contained in this section show a consultant signature, but the workflows are the same.

### Visible Digital Signature using a Certifying Signature Workflow:

1. Right Click on the signature field and select *Certify with Visible Signature*.



**Figure 57 Certify with visible Signature**

2. Select appearance and permitted actions as shown below:

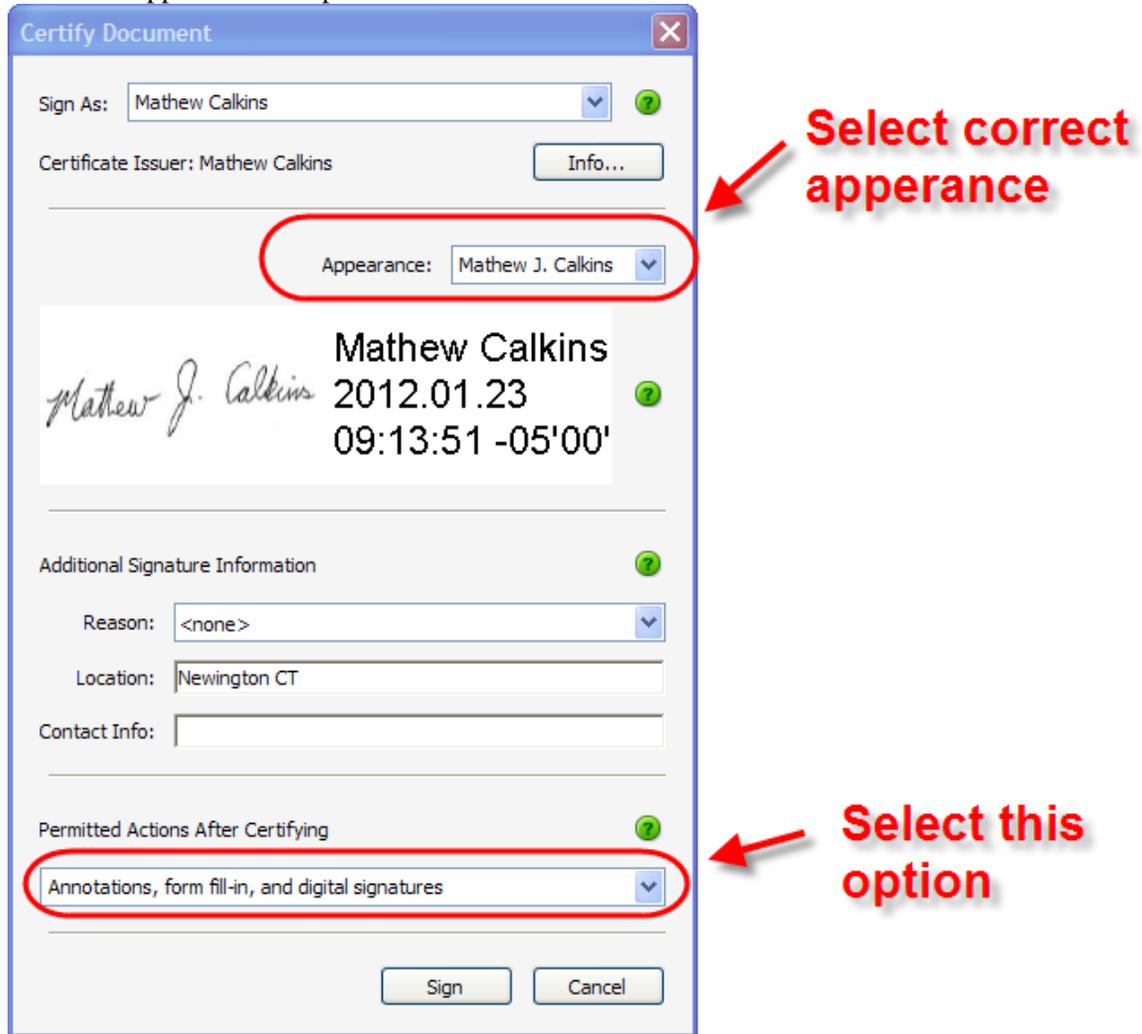


Figure 58 Consultant Designed Certify with Visible Signature

3. Next it will ask you to save the document. Make sure to overwrite the existing document.
4. Enter password and click OK. The document will now be digitally signed.

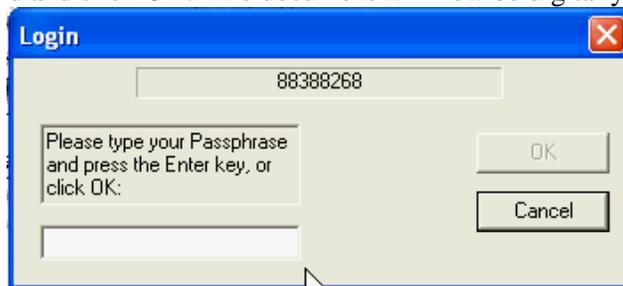


Figure 59 Digital Signature Pass-phrase

5. The document is certified correctly when there is a blue banner displayed on the top of the sheet and in the signature properties it must say, "Only commenting, form fill-ins, and signing and page adding actions are allowed."

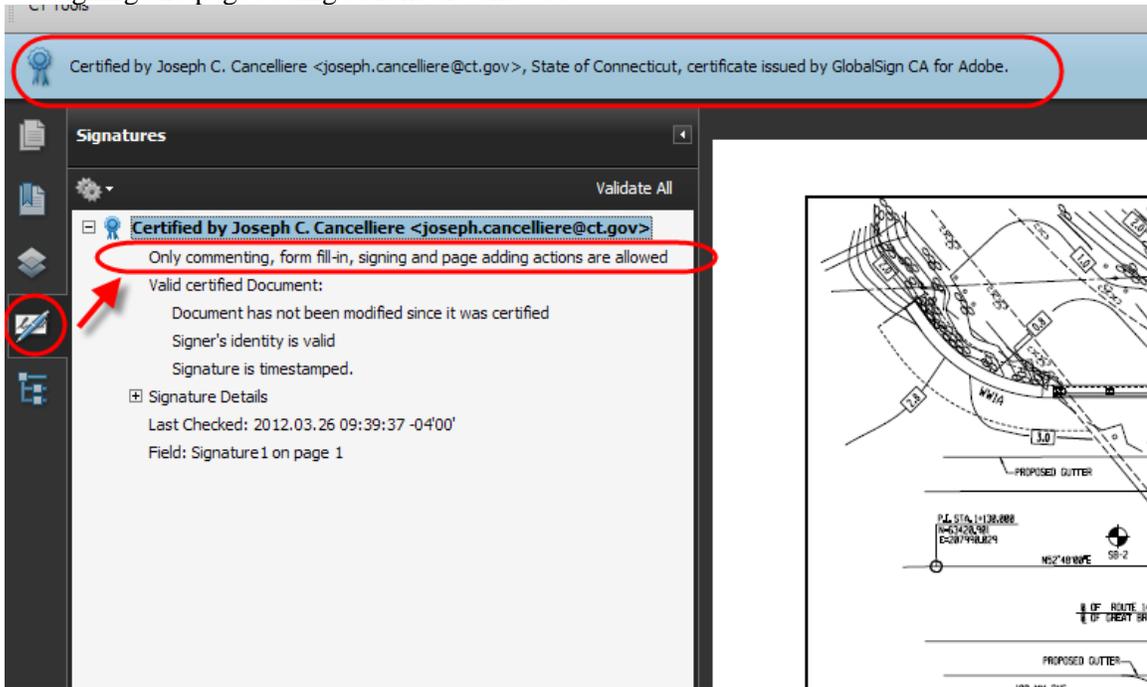


Figure 60 - Certified Correctly

## Visible Digital Signature using a Signing Signature Workflow:

1. Right Click on the signature field and select *Sign Document*.

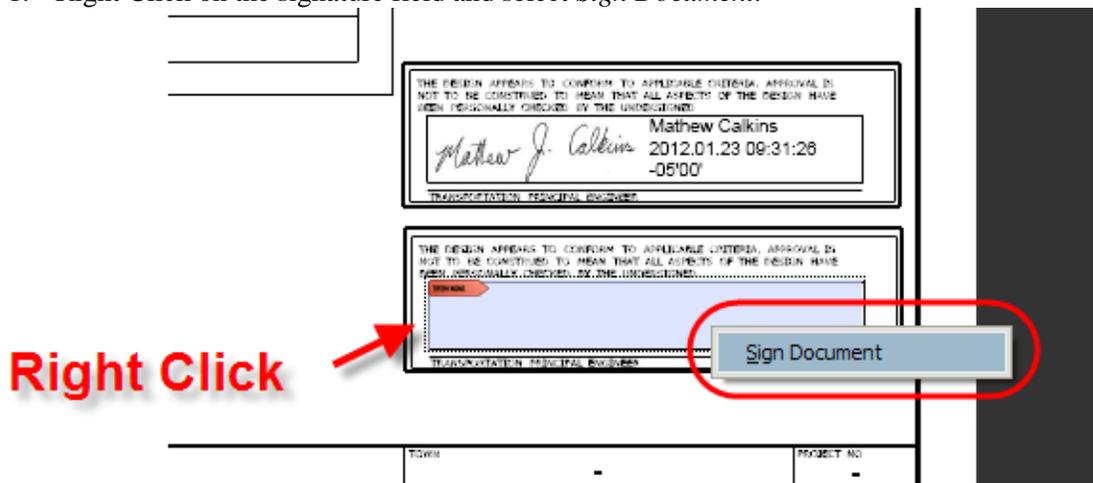


Figure 61 Signing a Document

2. Select appearance and type in a reason following [section 2.6.5](#).



Figure 62 Signing with Reason Code

3. Next it will ask you to save the document. Make sure to overwrite the existing document.
4. Enter password and click OK. The document will now be digitally signed.

## 2.6.7.2 Bluebeam

This section applies to both CTDOT designed projects and Consultant designed projects. The figures contained in this section show a CTDOT signature, but the workflows are the same. The Consultant designer will only have (1) signature.

### Visible Digital Signature using a Certifying Signature Workflow:

1. Left click on the signature field and then update the settings as shown below:

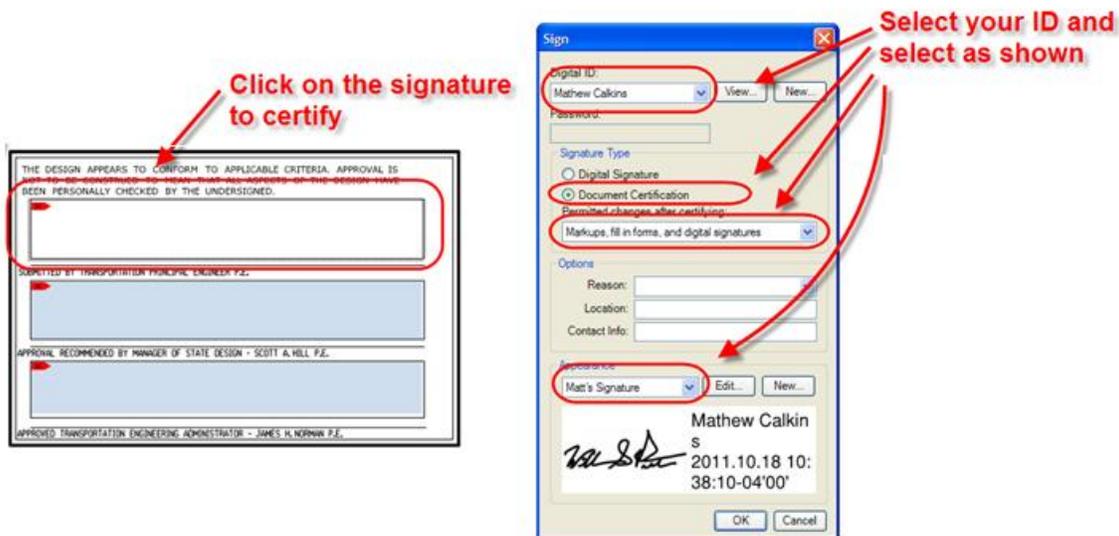
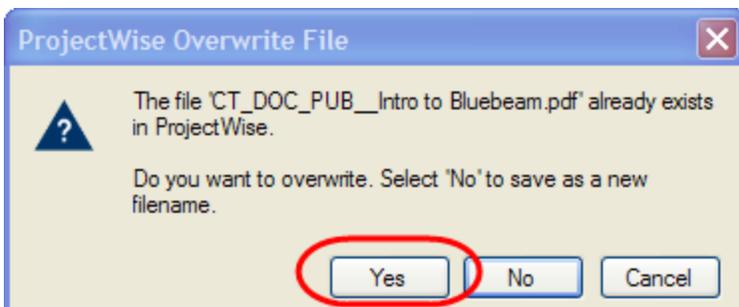
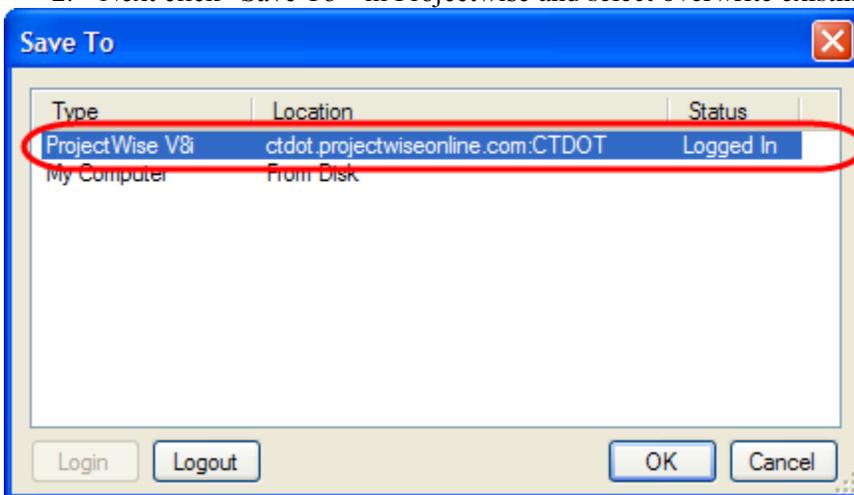


Figure 63 - Certifying Signature Bluebeam

2. Next click “Save To” in Projectwise and select overwrite existing file:



3. Then check the document back into Projectwise.

### Visible Digital Signature using a Signing Signature Workflow:

Once the prime engineer applies his certifying signature the additional signing signatures can be applied by the sub-consultants as follows:

1. Left click on the signature field and then update the settings as shown below:

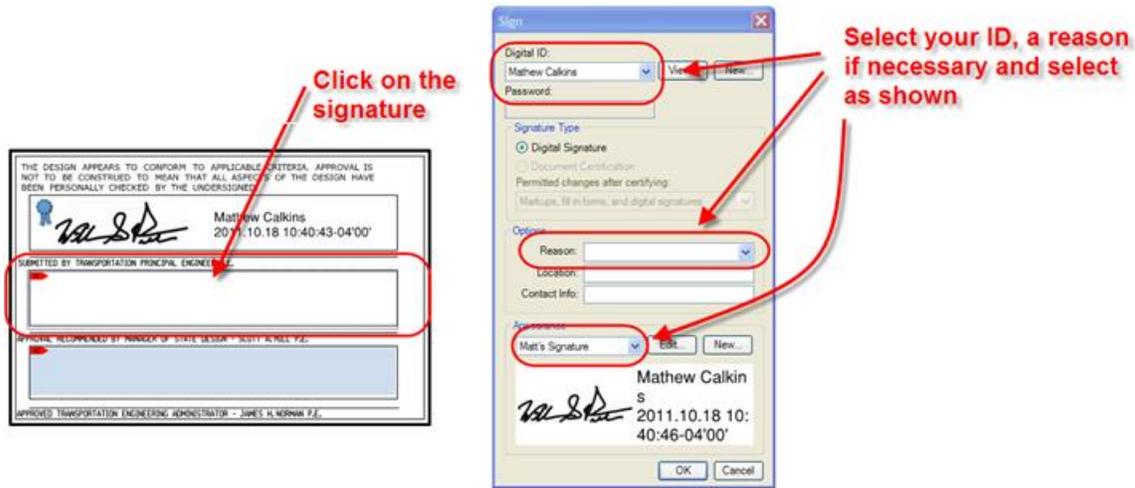
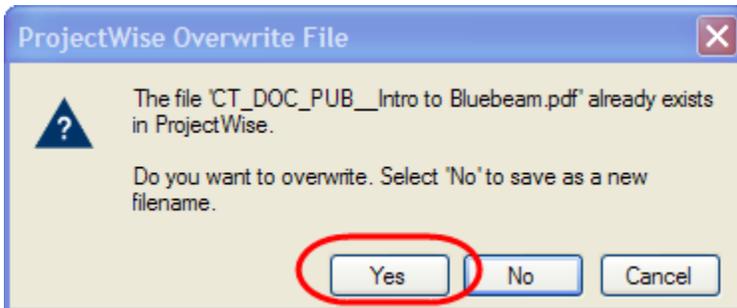
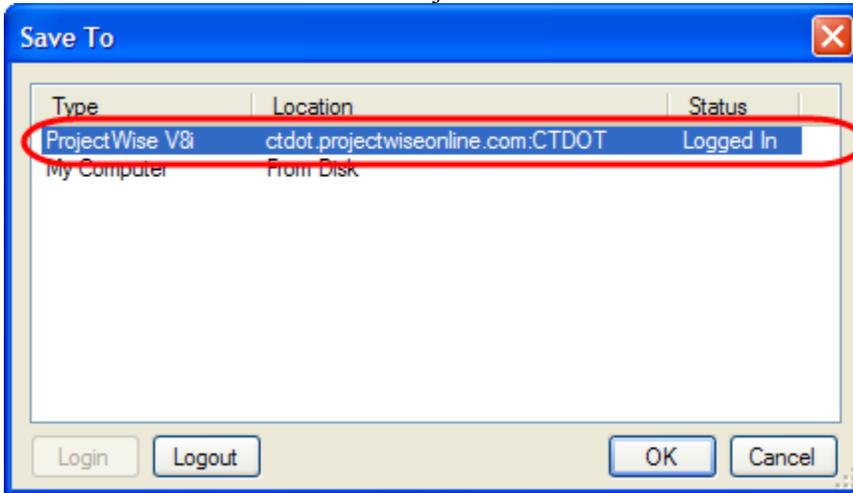


Figure 64 - Signing Signaure Bluebeam

2. Next click "Save To" in Projectwise and select overwrite existing file:



3. Then check the document back into projectwise.

## **Section 3 Submitting Documents to CTDOT Projectwise**

### **DIGITAL CONTRACT PLANS:**

The CTDOT will consider all digital contract plans submitted for its use “official” contract documents; the engineer of record shall not alter these documents unless explicitly asked to by the CTDOT, and shall only alter what was requested. Consultant engineers submitting changes that were not requested or submitting requested changes outside the processes in this manual may be held liable for damages.

Check the following for completeness prior to submitting digital contract plans to the CTDOT. When submitting preliminary plans only step 1 needs to be performed. All steps shall be completed in accordance with this manual.

1. Project Manager should obtain the number of discipline subsets and notify each discipline of their subset number for sheet numbering. FIO subsets shall be last.
2. All pages of the discipline subsets contain a footer displaying the sheet number.
3. All pages of the discipline subsets display a graphic signature of the engineer of record (watermark).
4. The first sheet of each discipline subset shall be digitally signed by the engineer(s) of record, and shall contain a list of drawings contained in that subset. In addition, the first page of the 01\_General subset must contain a list of subsets contained in the project.
5. All sheets contained in any FIO subsets must be labeled, “For Information Only”

### **DIGITAL CONTRACT SPECIFICATIONS:**

The Designer shall submit individual word documents for each specification into Projectwise, [see section 3.2.7](#). Specifications shall be prepared in accordance with the [Departments policies and procedures for Contract Development](#). CTDOT Processing shall combine all specifications into (1) PDF document for the contract.

### **DIGITAL SUPPLEMENTAL CONTRACT DOCUMENTS:**

Supplemental contract documents shall include but not limited to the list below:

- Proposal Estimate, with signed checklist.
- Federal Estimate
- Calendar Day Estimate
- Final Design Report
- Categorical Exclusion
- Design Approval Letter
- Environmental Permits
- DBE/SBE Approval with percentage
- Commitment list
- Agreements
- Proprietary Item Approval
- Stand alone Transportation Management Plan Document, taken from the final design report

These documents shall be submitted to CTDOT in PDF format, except the proposal estimate, this shall be in an “.est” format. If these documents do not need to be digitally signed, they may be signed and scanned into PDF, however the minimum page size shall be 8.5” x 11” and the minimum resolution shall be 200 dpi.

## 3.1 Final Design Plans, Specifications, and Supplemental Document Checklist

The following checklist is made up of two sections. The first section lists the final steps required prior to delivering digital contract plans, specifications, and supplemental documents. The second section lists the project manager responsibilities, after files have been submitted into Projectwise:

### Designer Checklist

Check	Task	Section in Manual for Instructions
	1. Complete CAD files for final PDF Publishing	NA
	2. Publish Discipline Subsets to PDF	<a href="#">Section 1.4 step 11</a>
	3. Post Process Discipline Subsets in PDF Software	
	a. Apply Sheet Numbers	<a href="#">Section 1.6.2</a>
	b. Apply Page Labels	<a href="#">Section 1.7</a>
	c. Apply Watermark	<a href="#">Section 2.4</a>
	d. Apply Digital Signatures	<a href="#">Section 2.6</a>
	4. Prepare Standard Subsets	<a href="#">Section 1.4 step 6</a>
	a. Download latest from Web	
	b. Updated index sheets accordingly	
	c. Delete sheets that are not required	
	d. Digitally sign the index sheets	
	5. Upload Discipline Subsets into Projectwise	<a href="#">Section 3.2.3</a> or <a href="#">3.2.4</a>
	6. Prepare specifications in word format	<a href="#">Section 1.4 step 18</a>
	7. Combine and Upload specifications in a zip folder into Projectwise	<a href="#">Section 3.2.5</a>
	8. Upload supplemental documents into Projectwise	<a href="#">Section 3.2.6</a>
	9. Notify Liaison Engineer, if a consultant designed project, when documents have been uploaded into Projectwise	
	10. Notify Processing when documents have been uploaded into projectwise after the project manager has completed their check list below	

### Project Manager Checklist

Check	Task
	1. Check tasks 1 thru 8 in the designers checklist have been completed correctly

## 3.2 Project Data Transmission

CTDOT is currently using Bentley's ProjectWise as a data management software for digital projects. Projectwise allows the CTDOT, and authorized business partners to access its data anywhere internet access is available. Projectwise shall be used by all consultant engineers delivering digital contract documents.

### 3.2.1 ProjectWise

Consultant engineers may use either Projectwise thin client or Projectwise thick client. Thin client is a web based version of Projectwise, which does not require any software installations. All that is required to login to the appropriate webpage is a user name and password supplied by CTDOT. Thin client allows access to the CTDOT dataset anywhere internet access is available. The thick client conversely requires the installation of the Projectwise client software.

In addition to performing all the functions of thin client; thick client has the addition functionality:

- Delta file transfer – Improves speed of downloads
- Managed workspaces – Eliminates the need to install the CTDOT DDE
- Attributing multiple documents at once

Users can get Projectwise Thick Client for free if they have an active license of Microstation. Download Projectwise Client from [Bentley](#) using your select ID. Once Projectwise is installed on your computer use this document to connect to the datasource:

### [Connecting to Datasource Using Thick Client](#)

The following workflow shows how to log in and change your password: [Projectwise Log in](#)

Consultant firms are usually given (2) user names that can be used by the whole firm. More than one person can use the user name at a time. It is the firm's responsibility to manage the user name and password in cases where employees leave and work at another firm. This way the employee that leaves cannot use their old company's user name and password.

## 3.2.2 Projectwise Folders for Contract Documents

This section gives directions on which folder contract documents will be submitted in Projectwise.

**100\_Contract Plans (PDF)** – This folder contains all Contract Plan Discipline Subsets. This includes all Final plans, Addendum plans, Design Initiated Change Order, As built, and FIO Plans.

**110\_Contract Specifications (PDF)** – This folder contains the Final, Addendum, and Construction Order Requests Contract Specifications packages. The designer will **NOT** submit Final or Addendum specifications into this folder; they shall submit Final Specifications and Addendum contract specifications in word format, into the 240\_Contract Development folder. The designer can only submit change order specifications into this folder.

CTDOT finalizes the FDP and Addendum Specification Packages into one PDF file and places the final package into this folder.

**120\_Contractor Submittals (PDF)** – This folder contains all working and shop drawings submittals.

**210\_Construction** – This folder is used by CTDOT construction.

**240\_Contract Development** – Designer shall submit the following supplemental contract documents into this folder:

- All contract specifications and Notice to Contractors (NTC), in word format, both final and addendum specifications
- Proposal Estimate
- Federal Estimate
- Calendar Day Estimate
- Final Design Report
- Categorical Exclusion
- Design Approval Letter
- Environmental Permits
- DBE/SBE Approval with percentage
- Commitment list

- Agreements
- Proprietary Item Approval
- Standalone Transportation Management Plan Document, taken from the final design report

**310\_Preliminary\_Design\_Documents** – The designer shall submit all preliminary design documents into this folder. This includes plans, specifications, reports, estimates, etc.

Contract documents shall be uploaded into the appropriate folder as described above and attributed in accordance with the following sections.

### 3.2.3 Uploading Documents - ProjectWise (Thin Client)

The following shows how to upload Contract plans into the 100 Contract Plan folder in Projectwise, but this procedure can be followed for uploading documents into any folder in Projectwise.

1. Once logged into Projectwise browse out to project and folder you need to upload into. Then select the **Interface** “CTDOT\_Attributes” and the make sure the **View** “Documents”.

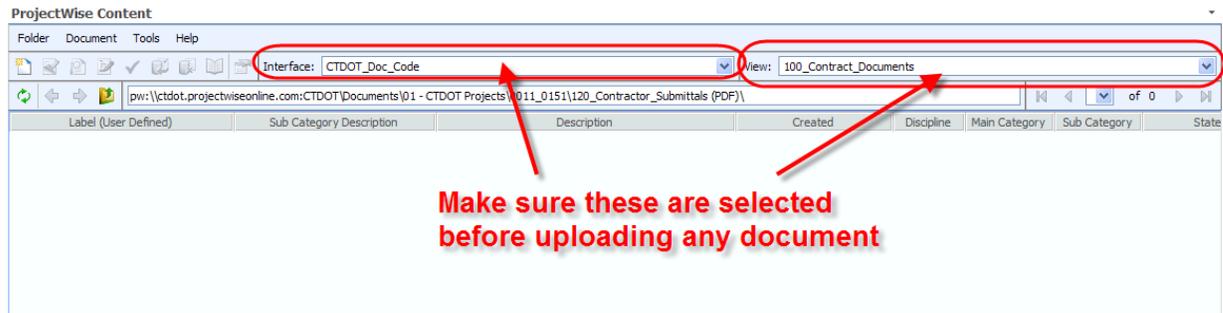


Figure 65 - Selecting the Appropriate Interface and View

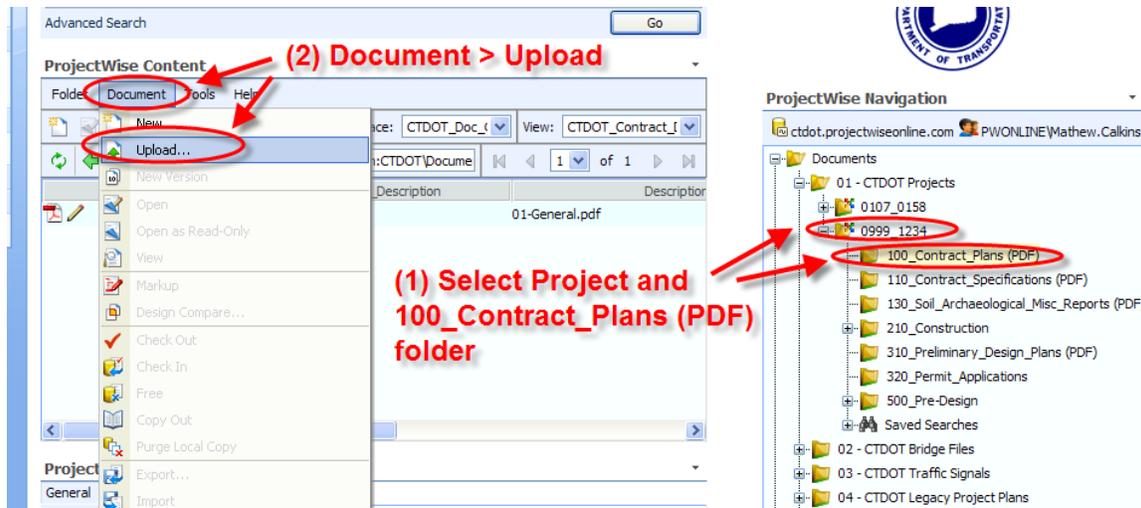


Figure 66 - Uploading Document into Projectwise (Thin Client)

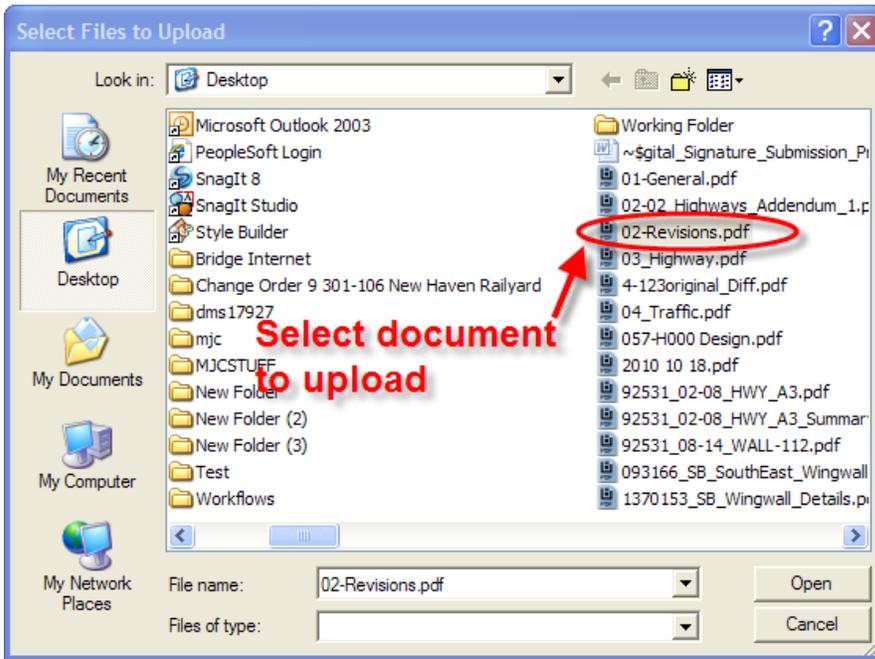


Figure 67 - Selecting File to Upload

Once the document has been uploaded it needs to be attributed and the document and file names need to be changed. Also the document description must be entered explaining what the subset contains. Attributing the documents is important and required because (1) these attributes replace sub-folders and allow for easy searching, and (2) the document and file names become a concatenation of all the attributes, so when the document is exported the file name makes sense.

Follow the figures below for attributing a document within projectwise:

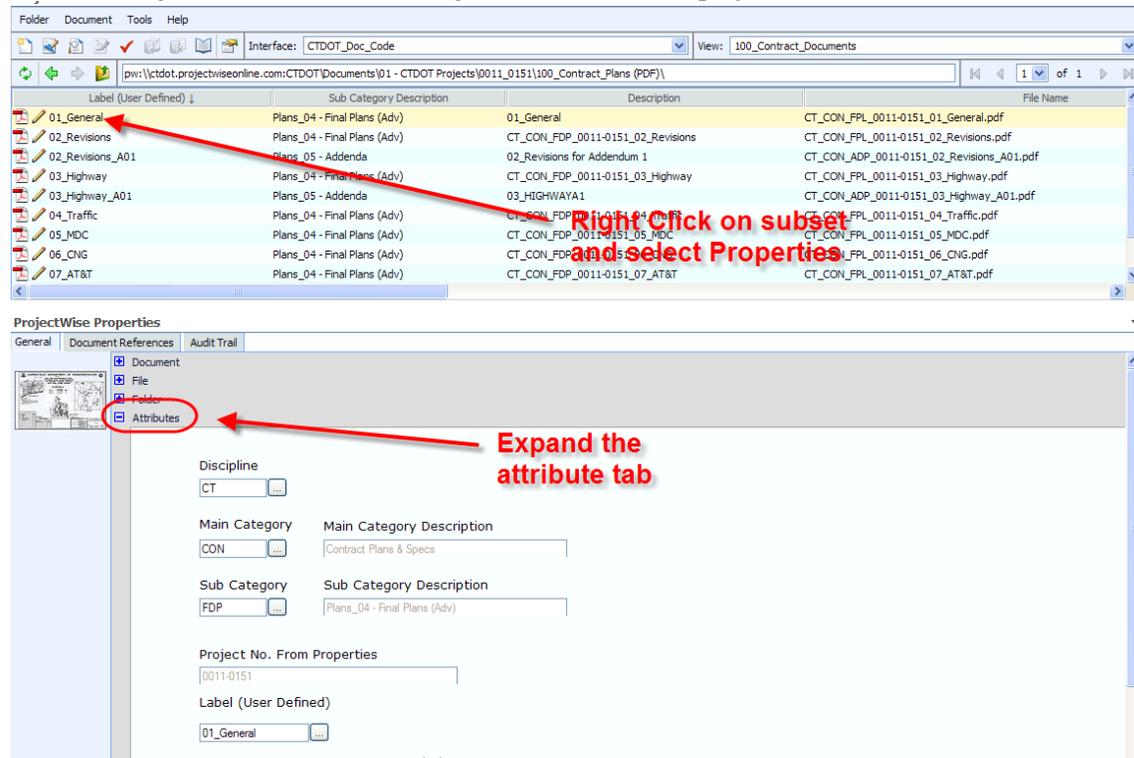


Figure 68 - Assigning Attributes to Documents

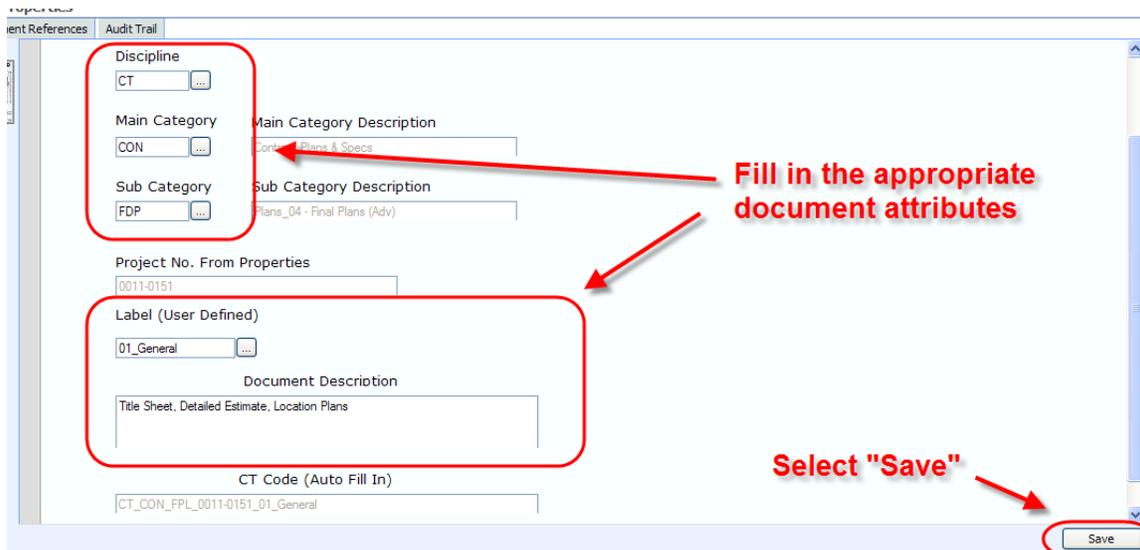


Figure 69 - Selecting Attributes

**Attributes:**

Discipline: CT

Main Category: CON = Contract Plans & Specs (PDF)  
 CNS = Contractor Submittal (Working Drawings, Shop Drawings, RFI's)

Sub Category:

If CON is selected:

FDP = Final Design Plans, DCD = Design Completion Data, DCD2= Design Completion Data 2, FPL = Final Plans, ADP = Addendum Plans, ACD = Addendum Completion Data, DCO = Design Initiated Change Order

If CNS is selected:

WDP = Working Drawing for Permanent Structures, WDT = Working Drawings for Temporary Structures, SHD = Shop Drawing

Label:

Contract Plans

- Name of the subset, 01-General for the General subset.
- FDP and DCD submittals shall always have the same label.
- ADP and ACD submittals shall always have the same label (01-General\_A##)
- DCO Submittals shall have the label 01-General\_C##.
- CTDOT standard drawing shall be “CTDOT\_HIGHWAY\_STD” and “CTDOT\_TRAFFIC\_STD”.
- For Information Only subsets, FIO must be included in the Label, 11\_AT&T\_FIO.

Contractor Submittals

- Item Number

Description:

Contract Plans

The document description must be entered explaining what the subset contains.

Contractor Submittals

Describe the submittal.

After save is selected notice the document and file names match the CTCode and the document description updates to what was typed in above. You may have to hit refresh to see this change.

Document	
Document Name	CT_CON_FDP_0011-0151_01_General.pdf
Document Description	Title Sheet, Detailed Estimate, Location Plans
Version	
Sequence	0
Workflow	Contract Plans Processing
State	ADVERTISE
Application	Acrobat PDF
Department	<none>
Status	Checked In
Node	
Out To	
On	1/17/2012 4:42 PM
Created By	Ahsan.Saghir
On	8/5/2011 5:51 PM
Updated By	CTCodeChangeMonitor
On	1/19/2012 12:56 PM
File	
File Name	CT_CON_FDP_0011-0151_01_General.pdf
File Size	1.61 MB (1,683,824 bytes)

**Figure 70 - Document Name, Document Description, and File Name**

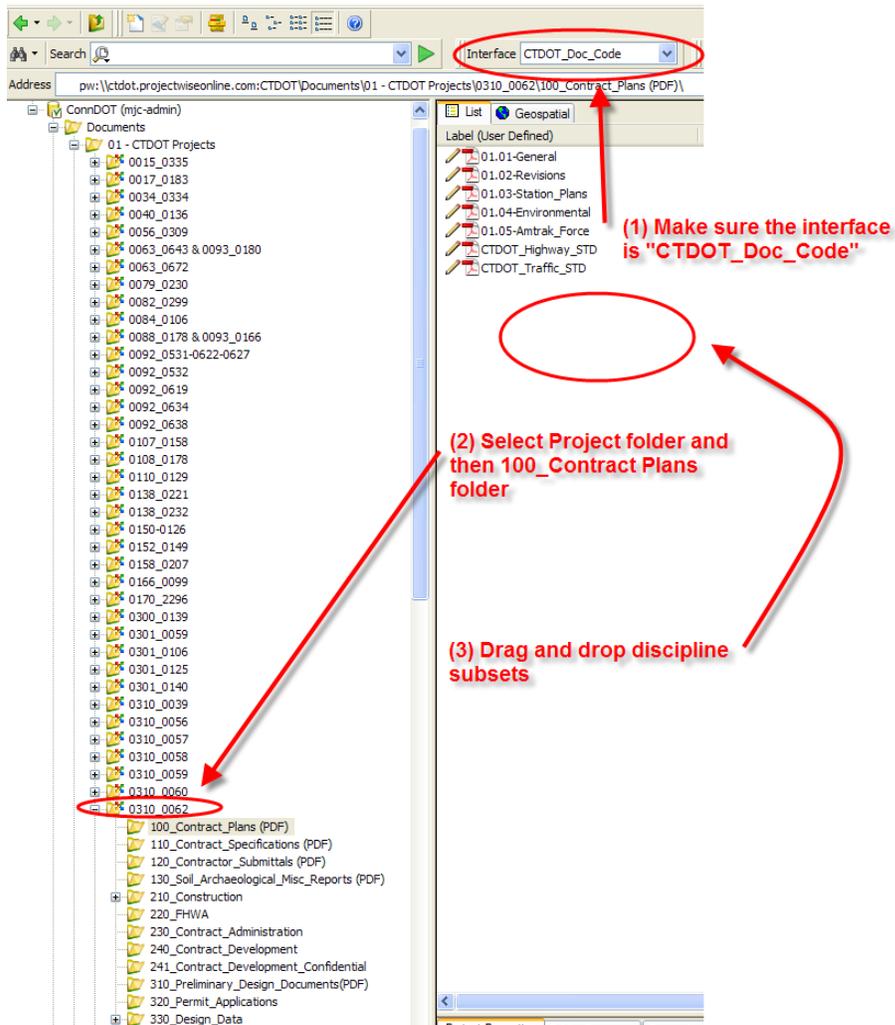
### 3.2.4 Uploading Documents – Projectwise (Thick Client)

This section gives direction on how to upload and attribute contract documents, for both one document and multiple documents. All files must be named according to the, naming conventions in this manual.

#### 3.2.4.1 Uploading and Attributing a **Single Document**

The following figures give direction on how to upload and attribute files one at a time into Projectwise:

1. Select the **Interface** “CTDOT\_Attributes” as shown below, if the interface box is not shown go to *View>Toolbars* and select interface.
2. Drag and Drop files into the correct folder in the Project.



**Figure 71 - Uploading Into Projectwise (Thick Client)**

3. Select the “Advanced Wizard”
4. Click “Next” until you reach the figure below:
5. Fill in the appropriate attributes as shown below:

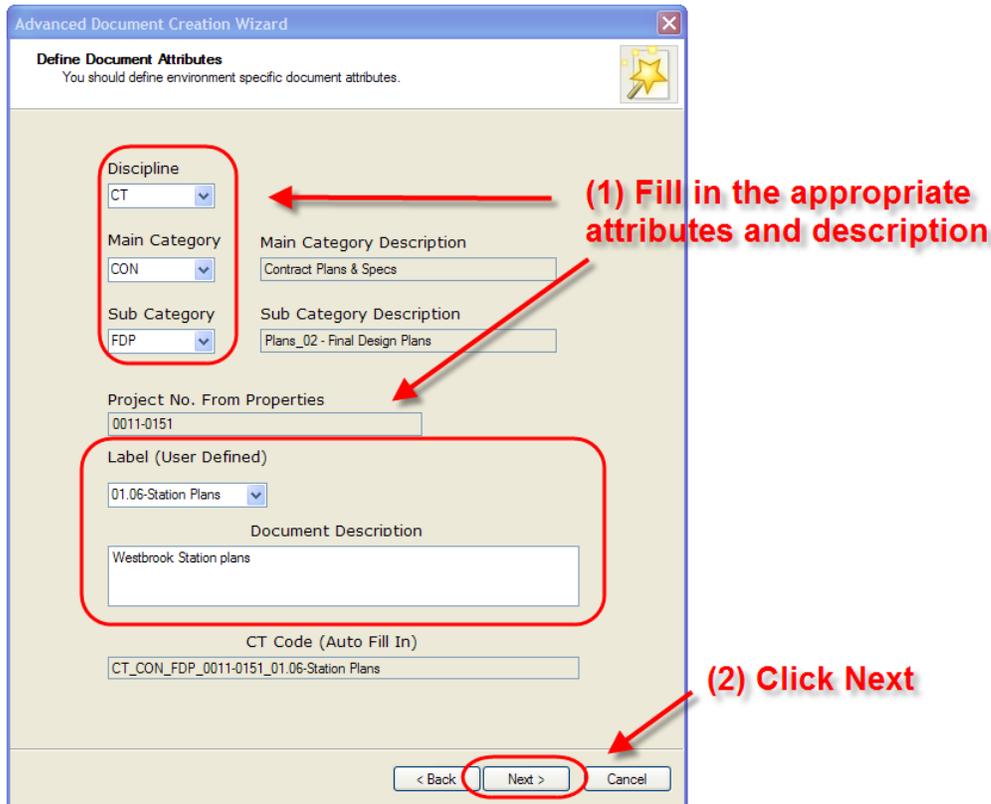


Figure 72 - Attributing (Thick Client)

**Attributes:**

Discipline: CT

Main Category: CON = Contract Plans & Specs (PDF)

CNS = Contractor Submittal (Working Drawings, Shop Drawings, RFI's)

Sub Category:

If CON is selected:

FDP = Final Design Plans, DCD = Design Completion Data, DCD2= Design Completion Data 2, FPL = Final Plans, ADP = Addendum Plans, ACD = Addendum Completion Data, DCO = Design Initiated Change Order

If CNS is selected:

WDP = Working Drawing for Permanent Structures, WDT = Working Drawings for Temporary Structures, SHD = Shop Drawing

Label:

**Contract Plans**

- Name of the subset, 01-General for the General subset.
- FDP and DCD submittals shall always have the same label.
- ADP and ACD submittals shall always have the same label (01-General\_A##)
- DCO Submittals shall have the label 01-General\_C##.
- CTDOT standard drawing shall be “CTDOT\_HIGHWAY\_STD” and “CTDOT\_TRAFFIC\_STD”.
- For Information Only subsets, FIO must be included in the Label, 11\_AT&T\_FIO.

**Contractor Submittals**

- Item Number

Description:

**Contract Plans**

The document description must be entered explaining what the subset contains.

**Contractor Submittals**

Describe the submittal.

6. On the Document Properties page nothing needs to be edited. There is a tool that will copy the CTCCode into the New document name and New document file name fields.
7. On the create document page click next and the document will be uploaded into Projectwise.
8. Once the document is uploaded the user may need to click F5 (refresh) to see the file name update.

### 3.2.5 Combining and Uploading Contract Specifications and CSI Special Provisions

For projects that are led by a consultant designer, FDP and Addendum Contract specifications and CSI Special Provisions shall be placed in (1) zipped folder. For projects that are led by a CTDOT design unit, FDP and Addendum Contract specifications and CSI Special Provisions shall be placed in individual zipped folders per discipline.

Addendum specifications shall be placed in (1) zipped folder. Each page of the specification section shall be marked in the bottom right corner with “Addendum No. Y”, where “Y” equals the addendum number.

Design Initiated Change Orders specifications shall be placed in (1) PDF document with a “C#” and the date in the right side of the header. An example would be, “Rev. C1 - 01/01/10”.

The following shows an example of a consultant designed project, but the process shall also be followed for a CTDOT designed project.

See the figures below for how to zip a folder:

1. Place all specifications (word documents) in one folder.
2. Right click on the folder and select “Compress to” option shown below:



Figure 73 - Compress Spec. Folder

Specifications shall be submitted in a zipped folder for every submittal into Projectwise. Submittals include FDP, revised FDP specifications, Addendum specifications, and revised addendum specifications. Revised FDP and addendum submissions shall only include the revised specifications.

**Submitting Contract Specifications**

Once logged into Projectwise the final contract specifications shall be submitted as follows:

1. Drag and Drop the zipped specifications folder into the 240\_Contract Development Folder or the pdf of the change order specs into the 110\_Contract Specifications folder.
2. Use the advanced wizard and select the attributes as follows:  
 Discipline = CT  
 Main Category= CON

Sub-Category =	FSP	FDP Specs.
	FSR	Revised FDP Specs. or Additional FDP Specs
	ASP	Addendum Specs.
	ASR	Revised Addendum Specs.
	CSP	Design Initiated Change Orders

Label:

**Consultant projects**

- FDP Specs – Should be “FDP Specs” or “Revised FDP Specs”
- Addendum Specs – Should be “ASP# Specs” or “Revised ASP# Specs”
- Construction Orders – Should be “C# Specs”

**CTDOT Designed Projects**

- FDP Specs – Should be “Discipline\_FDP\_Specs” (Discipline = HWY, SB, TR, etc.) Example = “HWY\_FDP\_Specs.” or for a revised spec package “Revised\_HWY\_FDP\_Specs.
- Addendum Specs – Should be same as FDP specs but change to ASP or ASR. Example = “HWY\_ASP#\_Specs” or “Revised\_HWY\_ASP#\_Specs.”
- Construction Orders – Should be “C# Specs”

3. Click next until the document is uploaded. The document name and file name will be automatically updated to match the CTCCode when Projectwise is refreshed.

### 3.2.6 Uploading Supplemental Contract Documents

Supplemental Contract Documents shall be submitted into the 240\_Contract Development folder in Projectwise. These documents shall be attributed in accordance with the table below:

Document	Discipline	Main Category	Sub-Category	Label
Proposal Estimate	CT	DAT	EST	Proposal
<a href="#">Proposal Esitmate Checklist</a>	CT	DOC	MDO	Proposal Estimate Checklist
Federal Estimate	CT	DAT	EST	Federal
Calendar Day Estimate	CT	DAT	EST	Calendar Day
Final Design Report	CT	DOC	RPT	Final Design
Categorical Exclusion	CT	DOC	AVL	CAT EX
Design Approval Letter	CT	DOC	AVL	Design AVL Letter
Environmental Permits	CT	DOC	AVL	ENV Permits Name
DBE/SBE Approval with percentage	CT	DOC	AVL	DBE_SBE
Commitment list	CT	DOC	AVL	Commitment List
Agreements	CT	DOC	AGR	Make specific to what type of agreement
Proprietary Item Approval	CT	DOC	AVL	Proprietary Item
Standalone Transportation Management Plan Document, taken from the final design report	CT	DOC	MDO	Trans. Man. Plan

**Table 2 - Supplemental Contract Documents**

If a supplemental document is revised, a new revised document shall be uploaded into projectwise following the above attribution with the addition of “Revised” being included in the Label. The only exception shall be the “PW Submittal Checklist” do not include “Revised” in that submittal.

The document name and file name will automatically update to match the CTCCode when Projectwise is refreshed.

### 3.2.7 CTDOT Contracts Finalizing of Contract Specifications

CTDOT Contracts shall finalize the specifications working in the 110\_Contracts\_Specifications Folder following this workflow [CTDOT Contracts Workflow](#).

### 3.2.8 Notification of Submittals

When Contract Plans, Specifications, and supplemental contract documents are submitted into Projectwise the applicable personnel must be notified as follows as applicable:

1. For consultant designed projects, the consultant will notify their Liaison Engineer, who will then notify, by memorandum, processing that contract plans or specifications have been submitted for review.
2. For state design projects, the project manager will notify, by memorandum, processing that contract plans and specifications have been submitted.

### 3.2.9 Contract Plans Workflow (FDP - Advertise)

Table 3-3 below shows how final digital design plans (FDP) flow from delivery through processing to their final state in advertising.

Processing personnel shall use the following workflow: [Projectwise for Processing](#)

<b>Final Design Submission (Subsets)</b>		
<b>Step</b>	<b>Group</b>	<b>Responsibilities of Group</b>
1	Designer	-Submits FDP subsets into the 100_Contract Plans folder.
2	Processing (CTDOT)	- Change FDP subsets to the Processing State and digitally mark up with comments and save FDP plans. Keep FDP Plans in the Processing State. If there are no comments proceed to step 7.  - Create a comment report of these comments and save on your computers desktop. Then upload and attribute this report correctly into the 240_Contract_Development folder.
3	Designer	- Change subsets to reflect comments made by Processing  - Submits DCD subsets
4	Processing (CTDOT)	- Change DCD subsets to Processing state  - Perform a document compare on the FDP and DCD plans using Bluebeam.  - Digitally markup DCD subsets with comments and save. If there are no comments proceed to step 7.  - Create a comment report of these comments and save on your computers desktop. Then upload and attribute this report correctly into the 240_Contract_Development folder.
5	Designer	- Change subsets to reflect comments made by Processing on DCD Plans  - Submits DCD2 subsets

6	Processing (CTDOT)	<ul style="list-style-type: none"> <li>- Changes DCD2 subsets to Processing state</li> <li>- Perform a document compare on the DCD and DCD2 plans using Bluebeam.</li> <li>- Digitally markup DCD2 subsets with comments. If there are no comments proceed to step 7.</li> <li>- Create a comment report of these comments and save on your computers desktop. Then upload and attribute this report correctly into the 240_Contract_Development folder.</li> </ul>
7	Processing (CTDOT)	<ul style="list-style-type: none"> <li>- Change the Sub Category Attribute of the approved subset from FDP or DCD(1,2..etc.) plans to FPL plans. STD and FIO plans shall not be change to FPL.</li> <li>- Copy the CTCODE and make the document and file name the CTCODE. Make sure the file name has a “.pdf” on the end.</li> <li>-If is a CTDOT Design project, change all discipline subsets to the Manager and Engineering Admin. Sign State. Notify Designer they have to have Manager and Engineering Admin sign the title sheet. When the Designer notifies processing these signatures have been applied to the title sheet, change all discipline subsets to the Advertise state.</li> <li>-If is a Consultant Designed Project, change discipline subsets to Advertise State.</li> <li>-Delete all previous versions of plans, FDP, DCD, DCD2, etc.</li> <li>-Keep Comment reports in the 240_Contract_Development folder for records if necessary</li> <li>-Formally notify Contracts when all subset have been approved for Advertising</li> </ul>

**Table 3-3 Workflow for CTDOT Processing Unit (Contract Drawings)**

### 3.2.10 ProjectWise Project folder Security

Through the use of Workflows and States, Projectwise can provide dynamic securities to a folder or document. Dynamic security allows a different level of security to each document at various phases of its life cycle. This allows a document to reside in one location, in Projectwise, throughout the project life cycle.

### 3.2.11 100\_Contract\_Plans (PDF) Folder (Dynamic Security)

During the design submittal process the Projectwise workflow, “Contract Plans Processing”, shall be applied to this folder. This workflow allows three different states (securities settings) to be applied to documents within this folder. Each state provides a unique security. The CTDOT Contracts Processing Unit shall determine which state a document in this folder shall be in.

The “Contract Plans Processing” workflow contains the following security states:

**Document Transfer State** – allows either the Consultant or State Designer to upload, read and alter a document.

**Processing State** – Allows only the processing unit read, write access, allowing them to review the documents in a secluded area. All other users shall have read access.

**Manager and Engineering Admin. Sign** – Allows the Manager and Engineering Administrator to sign the project Title sheet.

**Advertise State** - Allows all users file read access, allowing any user to open and read the document.

Once the contract is awarded to the low bidder (Contractor), the Contract Processing Unit shall move all the documents into the a new workflow called “Contract Plans Construction Workflow” which hands control of the documents states to the CTDOT Office of Construction (all offices).

The “Contract Plans Construction” workflow contains the following security states:

**Construction State** – allows construction to upload, read and alter a document. All other users shall only have file read.

**Contractor State** – documents in this state allow access to the contractor.

**Perform As-Built** – allows construction to place as-built information on the plans. All other users shall only have file read.

**As-Built Complete** – All users will have read only when the documents are put in this state.

### 3.2.12 Changing the State of a Document

The designer and district construction will be required to change the state of documents for contractor submittals during the review process. To change the state of a document, follow the figure below:

1. Right click on the document that you want to change the state of, then select change state>change, as shown below:

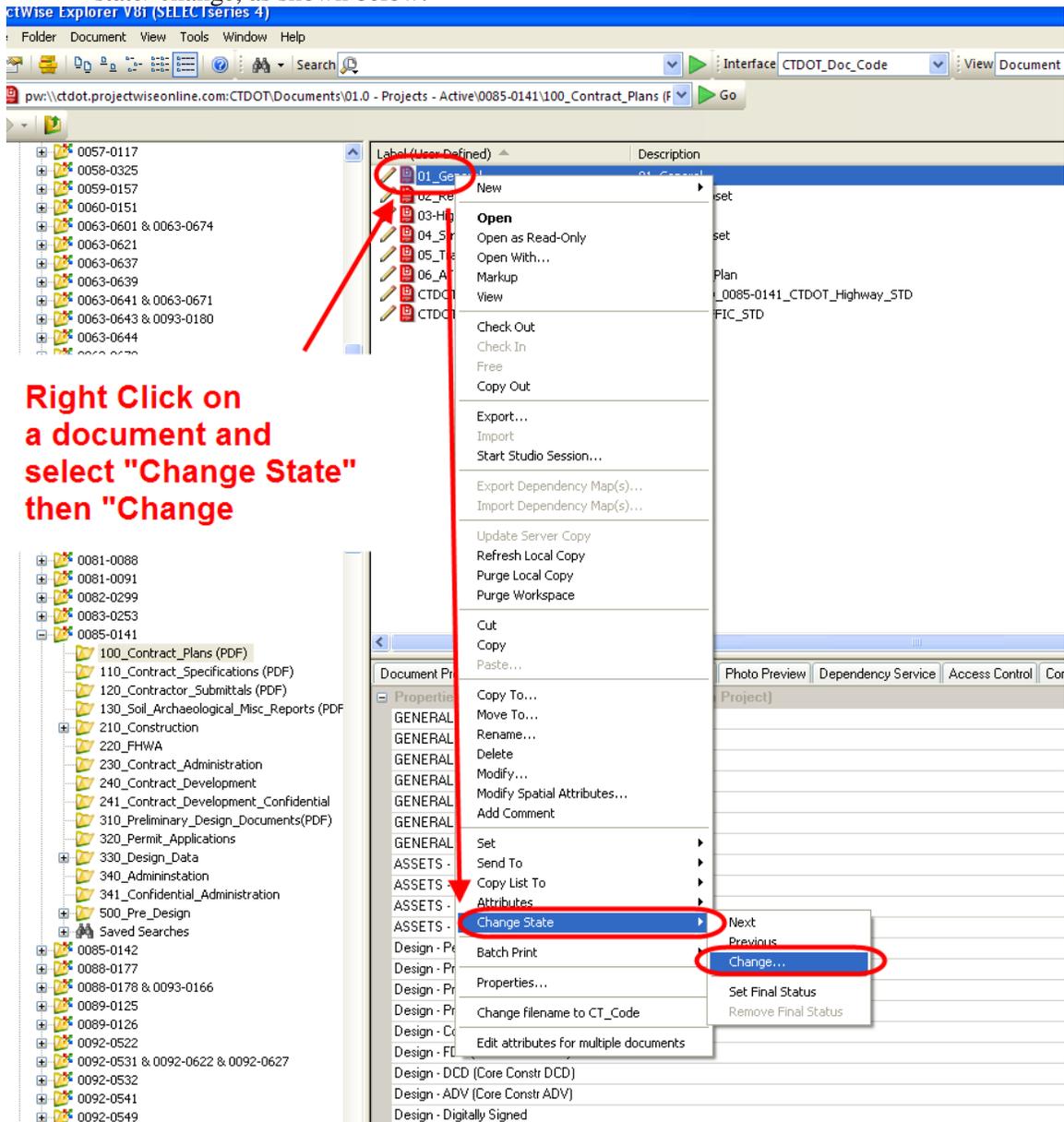


Figure 74 - Changing the State

- Next drag the file(s) from one state to another as shown below:

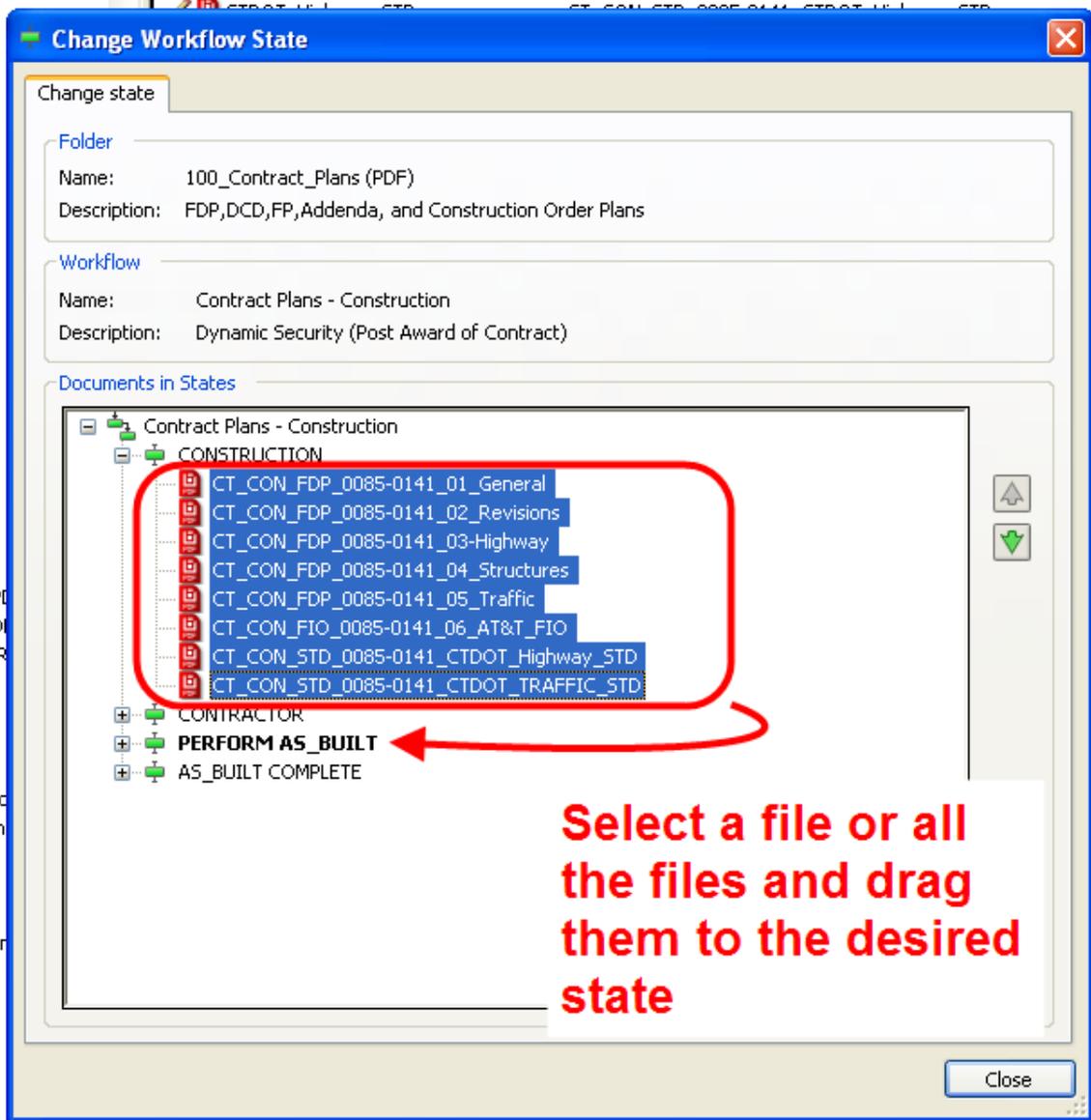


Figure 75 - Changing the State

- Click OK when the comment window opens up and the documents state will change. Next close the change workflow state window.
- Notice the “State” column, the state of the documents has been changed.

Label (User Defined)	Description	Main Category	Sub Category	Sub Category Description	Application	State	File Size	Out to
01_General	01_General	CON	FDP	Plans_02 - Final Design Plans	Acrobat PDF	PERFORM AS_BUILT	925 KB	
02_Revisions	Revisions Subset	CON	FDP	Plans_02 - Final Design Plans	Acrobat PDF	PERFORM AS_BUILT	339 KB	
03-Highway	03-Highway	CON	FDP	Plans_02 - Final Design Plans	Acrobat PDF	PERFORM AS_BUILT	1,448 KB	
04_Structures	Structural Subset	CON	FDP	Plans_02 - Final Design Plans	Acrobat PDF	PERFORM AS_BUILT	1,559 KB	
05_Traffic	05-TRAFFIC	CON	FDP	Plans_02 - Final Design Plans	Acrobat PDF	PERFORM AS_BUILT	1,620 KB	
06_AT&T_FIO	AT&T_Utility_Plan	CON	FIO	Plans_11 - For Info. Only Dwg.	Acrobat PDF	PERFORM AS_BUILT	218 KB	
CTDOT_Highway_STD	CT_CON_STD_0085-0141_CTDOT_Highway_STD	CON	STD	Plans_10 - Standard Drawings	Acrobat PDF	PERFORM AS_BUILT	2,012 KB	
CTDOT_TRAFFIC_STD	CTDOT_TRAFFIC_STD	CON	STD	Plans_10 - Standard Drawings	Acrobat PDF	PERFORM AS_BUILT	3,344 KB	

Figure 76 - State has been Changed

## **Section 4 Contract Plan and Specification Revisions (Addenda and Design Initiated Change Order)**

### **4.1 Addenda**

Contract plans that are revised or added due to addenda shall be submitted in digitally signed PDF discipline subsets containing only the changed sheets. The first sheet of each addendum subsets shall be digitally signed in a digital signature place holder, that is placed in Microstation as described in [Section 2.0](#) of this manual, DO NOT ADD an index of drawings sheet. Once digitally signed the addendum subsets shall be submitted, to the CTDOT, using Projectwise as described in [Section 3.0](#) of this manual.

Addenda sheets from different subsets cannot be combined and submitted as one subset, they must be submitted per their respected subsets.

The discipline Addenda subsets shall be attributed as follows, when uploaded into Projectwise ([See Section 3.0](#)): The addenda subset shall have the same label as the original final plan subset with the addition of (\_A##) added to the end, where the ## equals the addenda number. The sub-category attribute shall be ADP and ACD if the ADP plans are revised. See example below:

**PROJECTWISE LABEL**

Original Discipline Subset:	<b>04_Traffic</b>
Addenda Discipline Subset:	<b>04_Traffic_A01</b>
2nd Addenda	<b>04_Traffic_A02</b>
6th Addenda	<b>04_Traffic_A06</b>

The contract sheets (previously submitted final plans or earlier addenda plans), being revised by addenda shall NOT be modified except; the Engineer of Record shall place an addenda stamp on the affected sheets. This addenda stamp crosses out the entire sheet with a red X and adds the following note; "THIS SHEET REPLACED BY ADDENDUM NO."Y"; where "Y" equals the addendum number. This stamp is placed over digital signatures therefore; removal of the signatures is not required prior to placing the addenda stamp. [For this process see Section 4.4.](#)

WARNING – When placing the stamps, removing the digital signature is not allowed.

The Index of Revisions Sheet(s) located in the 02\_Revisions subset(s) shall be managed by the project manager for all addenda, and submitted as described in [Section 4.3.1](#). A new subset must be updated for each addendum. For addendums that only affect specifications

A watermark of the signer’s signature; signature only for (CTDOT), or PE Stamp for (Consultants) shall be placed on all added or revised sheets. [See Section 2.2](#)

#### **4.1.1 Revised Plans - Addenda**

A note shall be placed, directly above the bottom right hand corner of the title block, on the replacement sheets stating “ADDENDUM NO. “Y”, where “Y” equals the addenda number. This note is a level in Microstation that needs to be turned on and edited.

Sheet numbers for revised plans shall be as follows:

Original Final Plan Sheet;

Original:	02.25
Addenda 1:	02.25.A1

Previous Addenda Sheet;

Original: 02.25.A2  
Addenda 4: 02.25.A4

For revised sheets the drawing numbers shall not be modified.

The revision block, located on the revised sheets, shall be completed as follows: A numbered triangle (revision number) will be placed within the clouded (changed) area and a like numbered triangle will be placed in the revision block, accompanied by a description of the revision itself. The revision number is specific to a particular sheet, and increases in consecutive order per revision and per addenda. If a sheet is changed for the first time under addenda five the revision number is 1 NOT 5. If it is changed again under addenda 7 the revision number becomes 2.

If a sheet requires further revisions by a subsequent addendum, the addendum shall be prepared, as detailed above. The previously revised sheet shall now be stamped using Adobe Acrobat after addendum approval, see [Section 4.4](#).

**Note: When preparing an Addendum that will change quantities on a project that includes a "Detailed Estimate Sheet", never revise the "Detailed Estimate Sheet." A "Detailed Estimate Sheet" is never included in an addendum. Also, the "Quantities" box shown on the General Plan sheet for any structure is never to be revised.**

## 4.1.2 New Sheets - Addenda

Changes that require a new sheet(s) to be added to a discipline subset shall be formatted in one of two ways, as follows:

1. If the new sheet does not have to be placed in a specific location within the discipline subset, the new sheet shall be placed last, and numbered sequentially from the last sheet of the discipline subset. The total number of sheets noted on the project plans and discipline subsets stays the same. A note shall be placed on the new sheet stating, "NEW SHEET ADDED BY ADDENDUM NO."Y", where "Y" equals the addendum number. This note shall be located directly above the right hand corner of the title block. This note is a level in Microstation that needs to be turned on and edited. The revision block on the added sheet, shall not be filled out.
2. If the designer determines that the new sheet must go in a specific location within the discipline subset, the new sheet number shall be the number of the previous sheet followed by (-1.A#), where # is the Addendum Number. For example, if the new sheet must be placed in a discipline subset right after sheet 02.57, the new sheet shall be numbered 02.57-1.A1, if an additional sheet needs to be added, in this case it would be 02.57-2.A1. The total number of sheets noted on the project plans stays the same. A note shall be placed on the new sheet stating, "NEW SHEET ADDED BY ADDENDUM NO."Y", where "Y" equals the addendum number. This note shall be located directly above the right hand corner of the title block. This note is a level in Microstation that needs to be turned on and edited.

When adding a new sheet a new drawing number is also required. As with the sheet number the drawing number of the new sheet shall be the drawing number of the previous sheet plus a decimal and the sheet count. For example, if the new drawing must be placed in the project plans right after drawing number S-5, the drawing number shall be S-5-1.

Added sheet numbers, inserted NOT added to the end of Subset, shall be as follows:

Original Final Plan Sheet;

Original: 04.31  
Addenda 3: 04.31-1.A3

Previous Addenda - Added Sheet;

Original: 03.24.A1  
Addenda 4: 03.24-1.A4

Previous Addenda - Revised Sheet;

Original: 05.14-1.A1  
Addenda 2: 05.14-1.A2

Previous Addenda - Added Sheet;

Original: 05.14-1.A1  
Addenda 2: 05.14-2.A2

If adding sheets to the end of a subset, the new sheet number shall be a continuation of the previous sheet number plus .A#, where # equals the addenda number.

Original Final Plan Sheet;

Original Last Sheet: 04.31  
Addenda 3: 04.32.A3

### 4.1.3 Adding New Subset – Addenda

The new subset shall be submitted by an Addendum and be prepared the same way as an FDP discipline subset, with the addition of an A# in the sheet numbers and a note shall be placed, directly above the right hand corner of the title block, on the sheets stating “ NEW SHEET ADDED BY ADDENDUM NO. “Y”, where “Y” equals the addenda number. This note is a level in Microstation that needs to be turned on and edited. The label attribute on the new subset shall contain an “\_A##”. The first sheet of a new subset to the contract will be a subset cover sheet and contain an index of drawings.

### 4.1.4 Voiding Sheets

Sheets submitted within final design plan subsets and addenda subsets shall NOT be deleted; but shall voided by the engineer of record with an addenda stamp, using Adobe Acrobat or Bluebeam. This addenda stamp crosses out the entire sheet with a red X and adds the following note; "VOIDED BY ADDENDUM NO."Y"; where "Y" equals the addendum number. [See Section 4.4](#)

## 4.1.5 Addenda Plans Workflow

Table 4-1 Contract Processing Addenda File Workflow for Contract Drawings below shows how addenda subsets are delivered and processed for advertisement.

**Table 4-1 Contract Processing Addenda File Workflow for Contract Drawings**

<b>Addendum Plans</b>		
<b>Step</b>	<b>Group</b>	<b>Responsibilities of Group</b>
1	Designer	-Submits ADP subsets into the 100_Contract Plans folder.
2	Processing (CTDOT)	<ul style="list-style-type: none"> <li>- Changes document to the Processing State and digitally mark up with comments and save. Keep ADP Plans in the Processing State. If there are no comments proceed to step 7.</li> <li>- Create a comment report of these comments and save on your computers desktop. Then upload and attribute this report correctly into the 240_Contract_Development folder. Notify the designer when this is finished.</li> </ul>
3	Designer	<ul style="list-style-type: none"> <li>- Change subsets to reflect comments made by Processing</li> <li>- Submits ACD Subsets</li> </ul>
4	Processing (CTDOT)	<ul style="list-style-type: none"> <li>- Changes ACD subsets to Processing state</li> <li>- Perform a document compare on the ADP and ACD plans using Bluebeam.</li> <li>- Digitally markup ACD subsets with comments. If there are no comments proceed to step 7.</li> <li>- Create a comment report of these comments and save on your computers desktop. Then upload and attribute this report correctly into the 240_Contract_Development folder. Notify the designer when this is finished.</li> </ul>
5	Designer	<ul style="list-style-type: none"> <li>- Change subsets to reflect comments made by Processing on ACD Plans</li> <li>- Submits ACD2 Subsets.</li> </ul>
6	Processing (CTDOT)	<ul style="list-style-type: none"> <li>- Change ACD2 Subsets to Processing state</li> <li>- Perform a document compare on the ACD and ACD2 plans using Bluebeam.</li> <li>- Digitally markup ACD2 subsets with comments. If there are no comments proceed to step 7.</li> <li>- Create a comment report of these comments and save on your computers desktop. Then upload and attribute this report correctly into the 240_Contract_Development folder. Notify the designer when this is finished.</li> </ul>
7	Processing (CTDOT)	<ul style="list-style-type: none"> <li>- Change the Sub Category Attribute of the approved subset from ACD(1,2..etc.) plans to ADP plans</li> <li>- Copy the CTCCode and make the document and file name the CTCCode. Make sure the file name has a ".pdf" on the end.</li> <li>- Change discipline subsets to the Advertise State.</li> <li>-Delete all previous versions of plans, ADP, ACD, ACD2, etc.</li> <li>-Keep Comment reports in 240_Contract_Development folder for records if necessary</li> <li>- Formally notify Contracts when all subset have been approved for Advertising</li> <li>- Notify the designer that the plans are going to be advertised and they can put the addenda stamps on the affected sheets.</li> </ul>

## 4.1.6 Addenda Specifications

Contract Specifications that are revised or added due to addenda shall be submitted digitally in accordance with [section 3.2.5](#).

Addendums that only affect specifications shall be recorded on the 02-Revisions plan subset with the following options selected:

- Rev No. = Addendum number
- Sheet No. = NA
- Date = Date of Addendum
- Check “Rev” for all these cases
- Description = “No Change to Plans”

See [section 4.3.1](#) for updating the 02-Revisions set.

## 4.1.7 Addenda Report

Addenda report shall contain all the changes to the plans and specifications and any contractor questions and answers. This report shall be submitted in Word format into the 240\_Contract\_Development in Projectwise with the following attributes:

Discipline = CT

Main Category = DOC

Sub Category = RPT

Label = “Addn. No. # Report”, where # is the addendum number. If a report is revised the label shall include “Rev.” at the end. If the report is revised a second time the label shall include “Rev. 2” at the end, etc.

Description = Give a brief description of the submission.

## 4.2 Design Initiated Change Order (DCO)

Design Initiated Change Orders (DCO) are change order requests in which the designer alters the original contract by:

- A revision to an existing plan sheet(s) or specification(s)
- The addition of a new plan sheet(s) or specification(s)
- The deletion of an existing plan sheet(s) or specification(s)

The creation and management of DCO’s shall be as specified in this section.

Contract plans changed or added due to DCO’s shall be submitted in a digitally signed PDF discipline subsets containing only the added or changed sheets. The first sheet of each DCO subset shall be digitally signed in a digital signature place holder, that is placed in Microstation as described in [Section 2.0](#) of this manual, DO NOT ADD a cover sheet. Once digitally signed the DCO subsets shall be submitted, to the CTDOT, using Projectwise as described in Section 3.0 of this manual.

DCO sheets from different subsets cannot be combined and submitted as one subset.

The discipline DCO subsets shall be coded as follows, when uploaded into Projectwise ([See Section 3.0](#)): The DCO subset shall have the same name as the original final plan subset with the addition of (\_C###) added to the end, where the ### equals the DCO number. The sub-category attribute shall be DCO (Design Initiated Change Order) See Examples below:

**PROJECTWISE LABEL**

Original Discipline Subset:	<b>04_Traffic</b>
DCO Discipline Subset:	<b>04_Traffic_C001</b>
6th DCO	<b>04_Traffic_C006</b>
Original Addenda Subset:	<b>04_Traffic_A03</b>
DCO Discipline Subset:	<b>04_Traffic_C001</b>
3 <sup>rd</sup> DCO	<b>04_Traffic_C003</b>

The contract sheets (previously submitted final plans, addenda plans, or DCO plans), being revised by DCO shall NOT be modified except; the Engineer of record shall place a DCO stamp on the revised sheets using Adobe Acrobat. This digital DCO stamp crosses out the entire sheet with a red X and adds the following note; "THIS SHEET REPLACED BY DESIGN INITATED CHANGE ORDER NO."Y" –mm/dd/yy; where "Y" equals the Design Initiated Change Order number. This stamp is placed over digital signatures therefore; removal of the signatures is not required prior to placing stamp. [For this process see Section 4.4](#)

WARNING – When placing the stamps, removing the digital signature is not allowed.

The Index of Revisions Sheet(s) located in the 02\_Revisions subset shall be updated by the project manager for all DCO, and submitted as described in [Section 4.3.2](#). This includes DCO’s that affect plan sheets as well as any DCO’s that do not affect the plan sheets. Any DCO that does not affect a plan sheet shall be recorded on the 02-Revisions set stating, “No Change to Plans”.

A watermark of the signer’s signature, signature only for (CTDOT), or PE Stamp for (Consultants) shall be placed on all DCO sheets. [See Section 2.2](#)

### 4.2.1 Revised Sheets – DCO

A note shall be placed, directly above the right hand corner of the title block, on the replacement sheets stating “DESIGN INITIATED CHANGE ORDER NO. “Y” – mm/dd/yy, where “Y” equals the Design Initiated Change Order number. This note is a level in Microstation that needs to be turned on and edited.

Sheet numbers for revised plans shall be as follows:

Original Final Plan Sheet;

Original:	02.25
DCO 1:	02.25.C1

Previous Addenda Sheet;

Original:	02.25.A2
DCO 4:	02.25.C4

Previous DCO Sheet;

Original:	02.25.C2
DCO 4:	02.25.C4

Previous DCO Sheet;

Original:	02.25.C2
DCO 4:	02.25.C10

Drawing numbers shall not be modified on revised sheets.

Approval blocks on all new sheets shall be watermarked with a signature (CTDOT) or PE Stamp (Consultant) and the first sheet of the subset shall be digitally signed in accordance with [Section 2](#) of this document.

#### 4.2.2 New Sheets - DCO

Changes that require new sheet(s) to be added to a discipline subset shall be formatted in one of two ways, as follows:

1. If the new sheet does not have to be placed in a specific location within a discipline subset, the new sheet shall be numbered sequentially from the last sheet of the discipline subset. The total number of sheets noted on the project plans and discipline subsets stays the same. A note shall be placed on the new sheet stating, “NEW SHEET ADDED BY DESIGN INITIATED CHANGE ORDER NO. Y – mm/dd/yy” where “mm/dd/yy” equals the month, day and year the change order request was submitted. This note shall be located directly above the title block. This note is a level in Microstation that needs to be turned on and edited.
2. If the designer determines that the new sheet belongs in a specific location within a discipline subset, the new sheet number shall be the number of the sheet it most closely relates to followed by (-1.C#). For example, if the new drawing should reside in the 03\_Highway discipline subset right after sheet 03.57, the new sheet shall be numbered 03.57-1.C#.
3. The total number of sheets noted on the project plans stays the same. A note shall be placed on the new sheet stating, “NEW SHEET ADDED BY DESIGN INITIATED CHANGE ORDER NO. Y – mm/dd/yy” where “mm/dd/yy” equals the month, day and year the change order request was submitted. This note shall be located directly above the bottom right hand corner of the title block. This note is a level in Microstation that needs to be turned on and edited.

When adding a new sheet a new drawing number is also required. The drawing number of the new sheet shall be the drawing number of the sheet it most closely relates to followed by (-#). For example, if the new drawing must be placed in the project plans right after drawing number HWY-10, the drawing number shall be HWY-10-1.

Added sheet numbers, to a specific location, shall be as follows:

Original Final Plan Sheet;

Original: 04.31  
DCO 3: 04.31-1.C3

Previous Addenda – Added Sheet;

Original: 03.24.A1  
DCO 4: 03.24-1.C4

Previous DCO – Revised Sheet;

Original: 02.45.C1  
DCO 2: 02.45.C2

Previous Addenda - Added Sheet;

Original: 05.14-1A1  
DCO 2: 05.14-2.C2

Previous DCO – Added Sheet;

Original: 02.45-1.C1  
DCO 2: 02.45-2.C2

If adding sheets to the end of a subset, the new sheet number shall be a continuation of the previous sheet number plus C#, where # equals the Design Initiated Change Order Request number.

Original Final Sheet

Original Last Sheet: 04.35  
DCO 4: 04.36.C4

### 4.2.3 New Subset – DCO

The new subset shall be submitted by DCO and be prepared the same way as an FDP discipline subset, with the addition of an C# in the sheet numbers and a note shall be placed, directly above the right hand corner of the title block, on the replacement sheets stating “NEW SHEET ADDED BY DESIGN INITIATED CHANGE ORDER NO. “Y” – mm/dd/yy, where “Y” equals the Design Initiated Change Order number. This note is a level in Microstation that needs to be turned on and edited. The label attribute shall contain “\_C##”. The first sheet of a new subset to the contract will be a subset cover sheet and contain an index of drawings.

### 4.2.4 Voided Sheets

Sheets submitted within final design plan subsets, addenda subsets, or design initiated change order subsets shall NOT be deleted; but shall be voided by the engineer of record, with a DCO stamp using Adobe Acrobat or Bluebeam. This DCO stamp crosses out the entire sheet with a red X and adds the following note; "VOIDED BY DESIGN INTIATED CHANGE ORDER NO. Y – mm/dd/yy; where "Y" equals the Design Initiated Change Order number. [See Section 4.4](#)

### 4.2.5 DCO Specifications

Design Initiated Change Orders specifications shall be placed in (1) PDF document with a “C#” and the date in the right side of the header. An example would be, “Rev. C1 - 01/01/10”.

DCOs that only affect specifications shall be recorded on the 02-Revisions plan subset with the following options selected:

- Rev No. = DCO number
- Sheet No. = NA
- Date = Date of DCO
- Check Rev for all these cases
- Description = “No Change to Plans”

See [section 4.3.2](#) for updating the 02-Revisions set.

Specifications shall be created in accordance with the [Departments policies and procedures for Contract Development](#). The Engineer shall also combine all specifications into (1) PDF document and upload that into the 110\_Contract Specifications (PDF) folder in Projectwise following [section 3.2.5](#).





### 4.3.1 02\_Revisions Subset Workflow - Addenda

Each time an addendum is issued, the “Index of Revisions sheet” must be updated by the Project Manager as follows:

1. The user will export/download the latest 02\_Revisions subset out of Projectwise to their local computer.
2. With your digital signature USB key inserted within the USB, right click on the Signature Box and select Clear Signature as shown below, this is the first Addendum this step can be skipped since the subset will not have a signature on it:

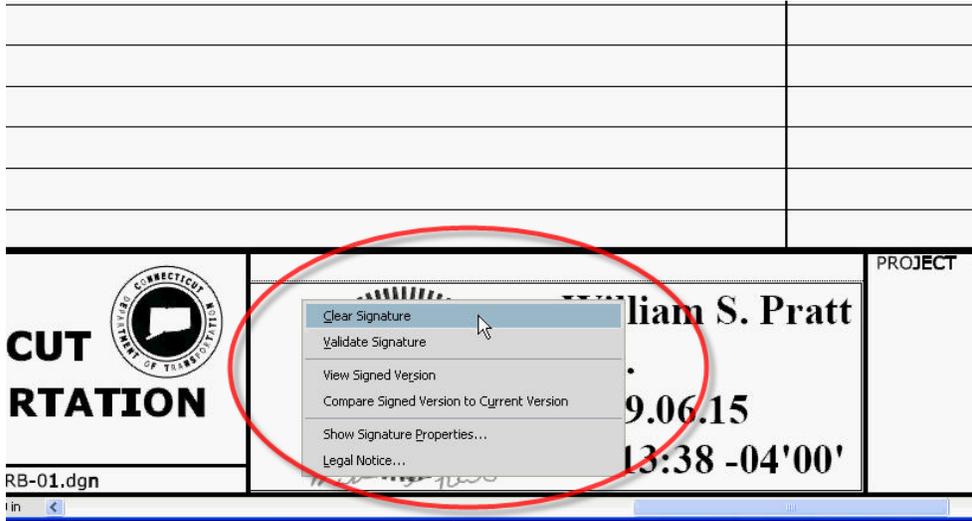


Figure 81 Clearing the Digital Signature

3. Enter the information into form fields as described in [section 4.3.4](#).
4. Add note “ADDENDUM NO. Y” in the bottom right hand corner of the sheet above the title block, where Y = the Addendum number.
5. Add new revision sheet each time previous sheet becomes full. Add note “NEW SHEET ADDED BY ADDENDUM NO. “Y”, where “Y” equals the addenda number. Follow [section 4.3.3](#) of this document.
6. When finished sign using a certifying signature as shown in [Section 2.6.2](#)
7. Upload the document into Projectwise.
8. Attribute the subset: Main Category = CON, Sub-Category = ADP, Label = 02\_Revisions\_A##
9. Make the document description 02\_Revisions\_A#.

### 4.3.2 02\_Revisions Subset Workflow - DCO

Preparing the 02\_Revision subset for the first DCO the Project Manager shall follow the workflow for preparing the addendum 02\_Revision subset, see [section 4.3.1](#) amended as follows:

Step 4 becomes: Add note “DESIGN INITIATED CHANGE ORDER NO. Y – mm/dd/yy” in the bottom right hand corner.

Step 8 becomes: attribute the subset: Main Category = CON, Sub-Category = DCO, Label = 02\_Revisions\_DCO.

Step 10 becomes: Make the document description 02\_Revisions\_DCO.

The following workflow shall be used by the Project Manager for recording subsequent change DCOs to the 02\_Revisions\_DCO subset. In this workflow the user edits the subset in Projectwise, they do not have to export the document out and submit a new subset:

1. Check out the 02\_Revisions\_DCO subset from Projectwise.
2. Follow steps 2 through 7 from [section 4.3.1](#) amended as follows:
  - a. In step 4 edit note “DESIGN INITIATED CHANGE ORDER NO. Y - mm/dd/yy”
  - b. In step 5 add note “NEW SHEET ADDED BY DESIGN INITIATED CHANGE ORDER NO. Y – mm/dd/yy”
  - c. In step 7 “Check In” the document into Projectwise

### 4.3.3 Adding a New Revisions Sheet to the 02\_Revisions Subset

#### 4.3.3.1 Adobe Adding New Revisions Sheet

This section shall be used when a new sheet is to be added to the 02\_Revisions Subset (Addendum and DCO)

See [Section 1.4](#) step 16 for link to “Index of Revisions Sheet”

1. In the open Index of Revisions sheet select, File>Print.
2. Choose the Adobe PDF printer and select OK as shown below:

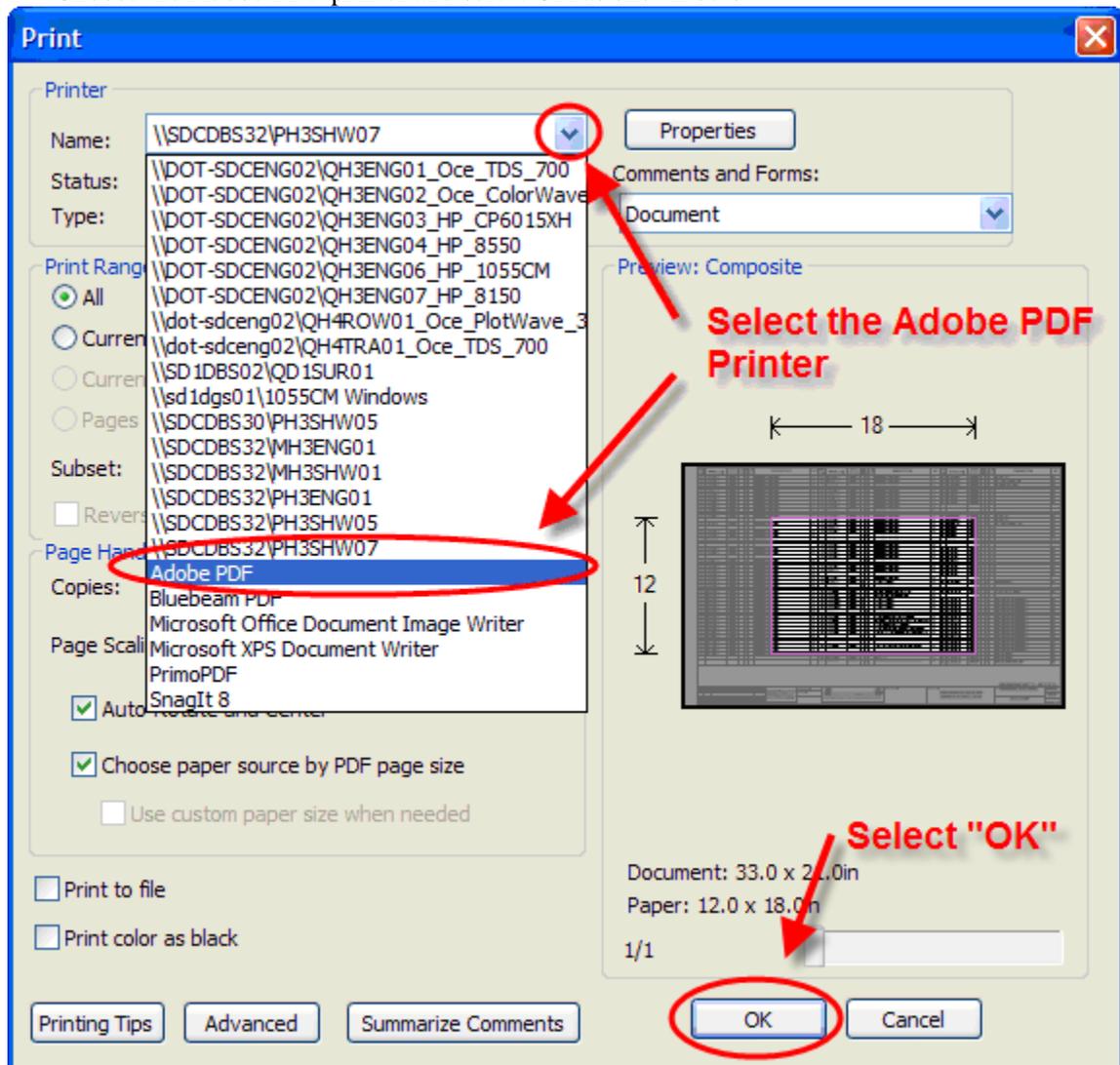


Figure 82 - Selecting the PDF Printer

3. Select OK and save this new document on your computer. Include “(Cleared Forms)” in the file name as shown below.

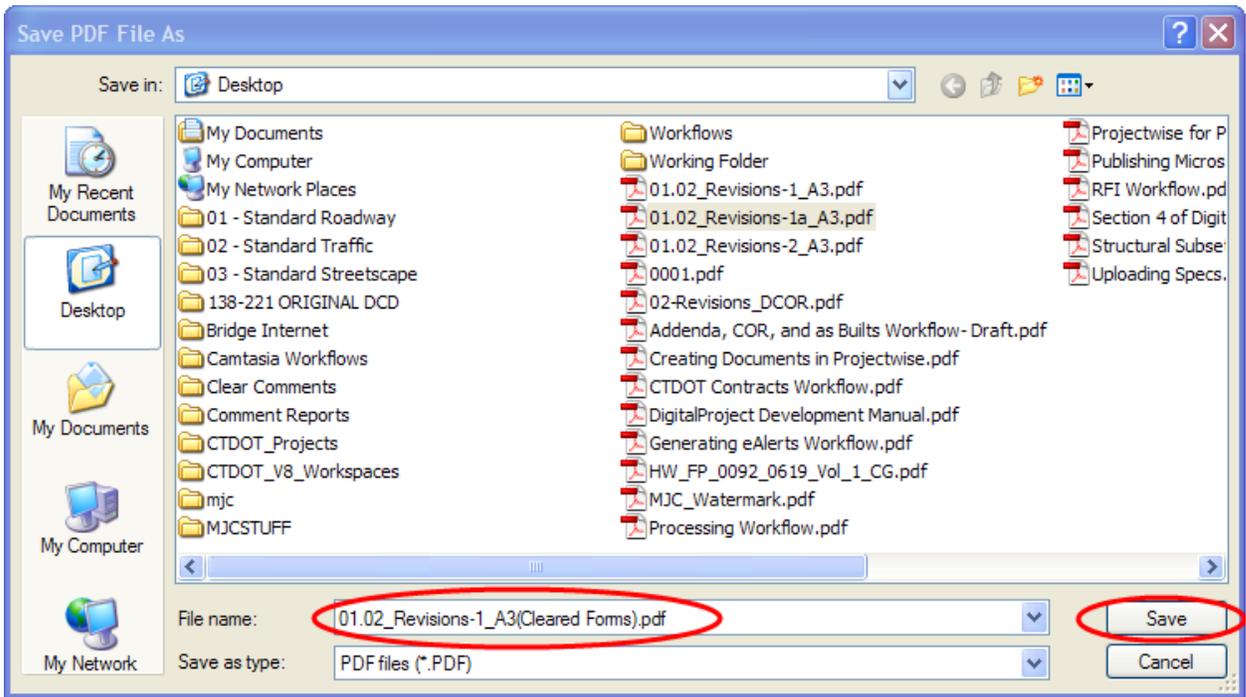


Figure 83 - Saving Cleared Form Fields Document

Document will open automatically and will no longer have active form fields.

4. Close the cleared form document once inspected for lack of form fields.

The cleared form document must now be inserted into the original document that contains the active form fields. See step 5.

5. Go to Document > Insert Pages>From File. Browse to file, select correct file and click select. Follow the figure below:

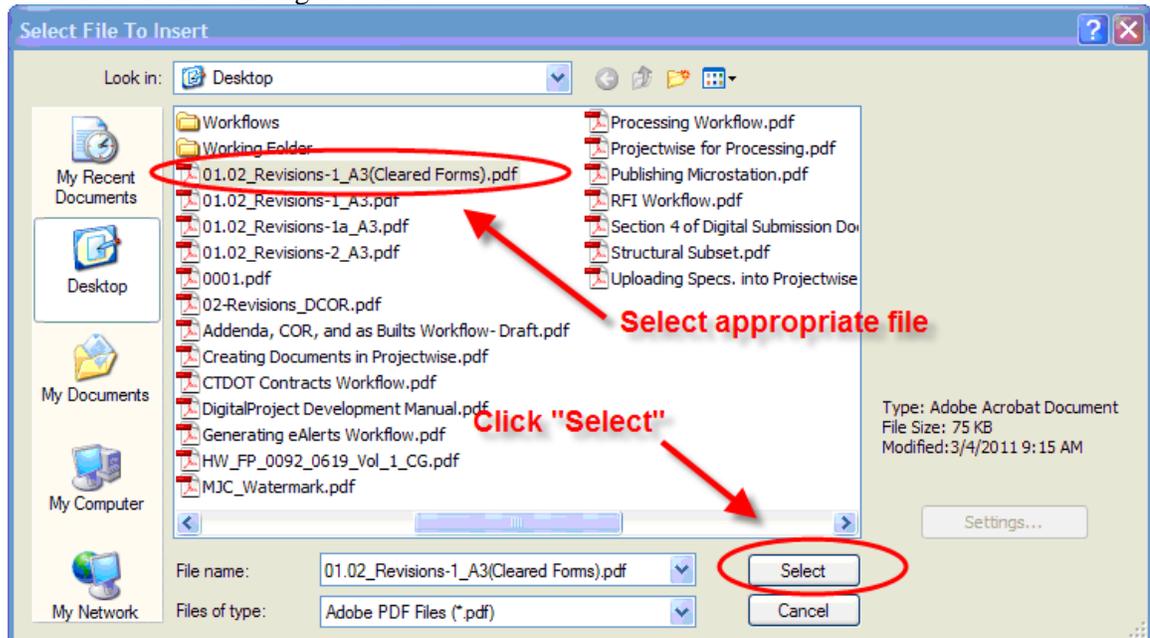


Figure 84 - Inserting a Page

The following dialog opens up.

- Ensure location is set to “before” and click OK as shown below

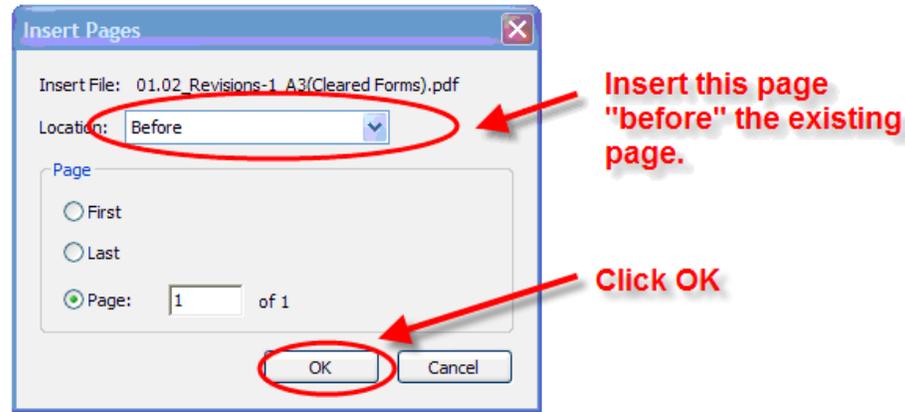


Figure 85 - Inserting a Page Before

- Next clear the information in the form fields located on the now second sheet. See figure below:

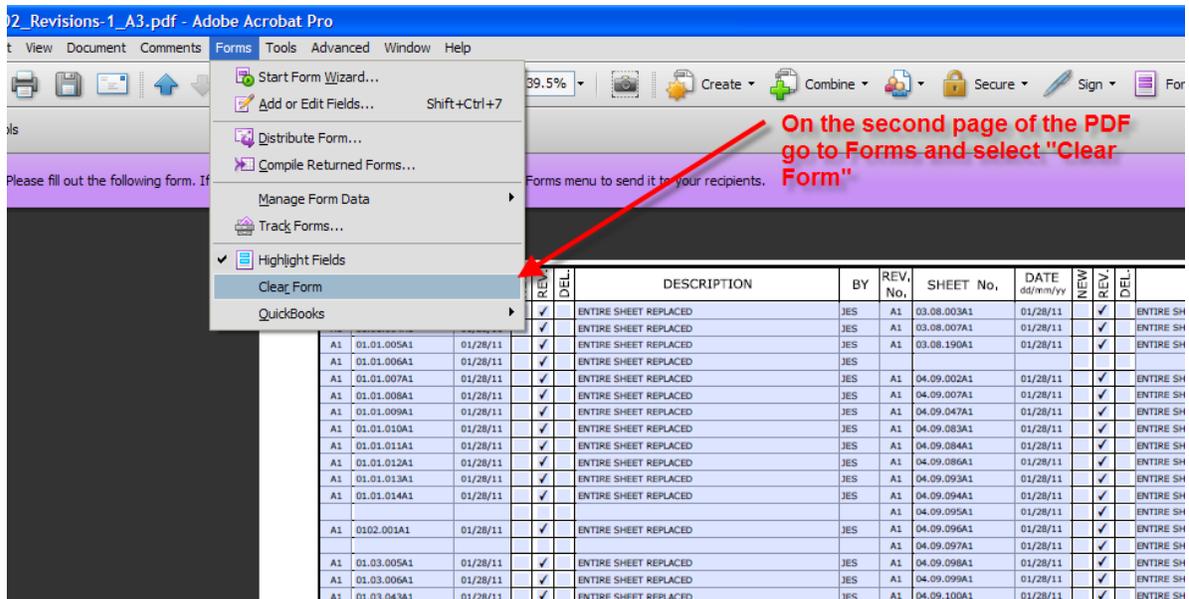


Figure 86 - Clearing Forms

- After forms are cleared. Record the new addendum/DCO information.
- Fill in title block information by copying the information on page 1 of this pdf document and paste it in the forms on page two.
- Clear the signature field on the second sheet of this document and create a signature field on the first sheet of this document.
- After all the Addendum/DCO information is inserted, place the water mark on page two of the document and update the page number.
- Follow [section 4.3.1](#) or [section 4.3.2](#) where applicable to complete the 02\_Revisions Subset.

### 4.3.3.2 Bluebeam – Adding New Revisions Sheet

- Download a new “Index of Revisions sheet” from [Section 1.4](#) step 16.
- Insert the new sheet into the existing 02-Revisions subset. Update the title block information and update the sheet accordingly.

### 4.3.4 Filling Out Revision Index Sheet

To fill out a form field simply click on the box and begin typing. The first column is the Addendum or Design Initiated Change Order. The second column is the revised or new sheet number. The third column is the date, followed by a brief description that is similar to the description on the actual sheet being revised. Finally click in the appropriate check box per row to describe the action taken, new sheet, revised sheet, or sheet deleted. Note: The Engineer is not required to input changes numerically by Sheet No. If another changed sheet is added to an Addendum in the eleventh hour, it can be placed at the bottom of the list on the “Index of Revisions Subset”.

REV. No.	SHEET No.	DATE dd/mm/yy	NEW	REV.	DEL.	DESCRIPTION	BY
A1	02.06.003A1	01/01/11		<input checked="" type="checkbox"/>		REMOVED DETAIL	MJC
A1	03.05.001A1	01/01/11			<input checked="" type="checkbox"/>	DELETED SHEET	MJC
A2	04.05.003A2	01/20/11		<input checked="" type="checkbox"/>		BEARING DETAILS	MJC
A2	02.06.003-1A2	01/20/11	<input checked="" type="checkbox"/>			ABUTMENT DETAILS	MJC
C1	04.01.026C1	02/15/11		<input checked="" type="checkbox"/>		WINGWALL DETAILS	MJC
C2	03.04.055-1C2	03/02/11	<input checked="" type="checkbox"/>			WALL 101 DETAILS	MJC

Figure 87 Modifying the “Index of Revisions Subset”

### 4.4 Placing Stamps on Affected Sheets – Revised, or Deleted Sheets

A digital stamp that crosses out the entire sheet shall be placed on digital contract sheets that are affected by Addenda or Design Initiated Change Order. The stamp shall be placed using Adobe Acrobat Custom Stamps tools or Bluebeam Stamp tools. In addition to crossing out the sheet this stamp includes an area for the note. The note shall describe the action responsible for the revision. See [section 7.3](#) for PDF stamps.

WARNING – When placing the stamps, removing the digital signature is not allowed.

Table 4-1 below lists the notes that shall be used for addenda, construction order requests, and as built notes. These notes should be used in conjunction with the cross-out stamp.

Table 4-1 Modifications to Existing Sheets by Addendum, Construction Orders and As-Builts

Addendum Notes	Description of Use
THIS SHEET REPLACED BY ADDENDUM NO. Y	The revised sheet is considered to replace, in total, the original sheet.
VOIDED BY ADDENDUM NO. Y	Sheet is voided by Addendum.
Design Initiated Change Order Notes	Description of Use
THIS SHEET REPLACED BY DESIGN INITIATED CHANGE ORDER NO. Y – mm/dd/yy	Used for revisions to existing sheets. Changes must be noted only on the revised sheet.
VOIDED BY DESIGN INITIATED CHANGE ORDER NO. Y – mm/dd/yy	Use this for voiding of existing sheets.

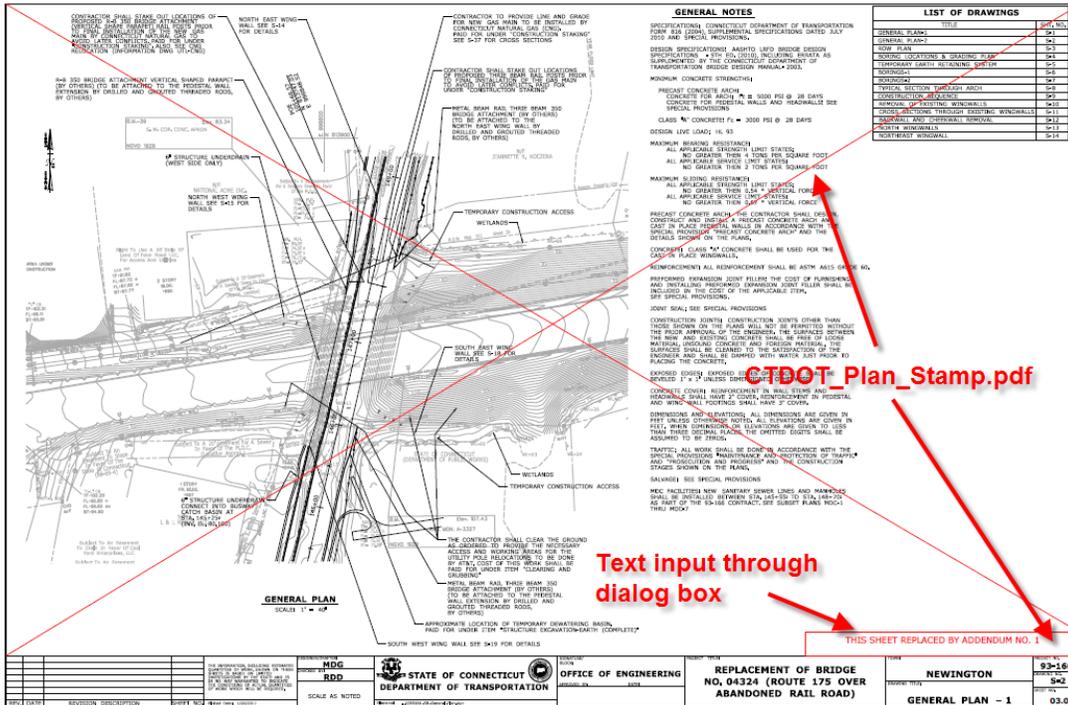


Figure 88 Typical Sheet Replaced by Addendum 1

AND DISPOSE EXISTING CONCRETE BARRIER AND SIDEWALK IN SPANS 10 & 11.

AND DISPOSE EXISTING BITUMINOUS WEARING SURFACE, CONCRETE FILLED CURB, DECK JOINTS AND STEEL ROADWAY STRINGERS IN ARCH SPANS 10 & 11.

REMOVE AND ERECT NEW STEEL ROADWAY STRINGERS, CONCRETE FILLED GRID DECK, CURBS, CONCRETE SIDEWALK, BARRIER CURB AND INCIDENTALS IN SPANS 10 & 11.

REMOVE AND DISPOSE EXISTING ELASTOMERIC BEARINGS AT 10 LOCATIONS PORTLAND VIADUCT.

REMOVE AND INSTALL ELASTOMERIC BEARINGS AT 10 LOCATIONS PORTLAND VIADUCT.

INSTALL CONCRETE BASE PEDESTALS AT 4 LOCATIONS IN THE PORTLAND VIADUCT.

REMOVE THE EXISTING BRIDGE DRAINAGE SYSTEM (SCUPPERS AND DOWNSPOUTS) IN ARCH SPANS INCLUDING CLEANING OF DRAINAGE TROUGHS AT SPANS 10 AND 11.

ESTIMATED QUANTITIES OF MATERIAL REQUIRED FOR THIS PROJECT. QUANTITIES SHOWN ARE FOR INFORMATION ONLY AND ARE NOT TO BE USED FOR BIDDING OR CONTRACTING PURPOSES. ACTUAL QUANTITIES WILL BE DETERMINED BY THE CONTRACTOR.

THIS SHEET REPLACED BY DESIGN INITIATED CHANGE ORDER NO. Y - mm/dd/yy

<p><b>PROJECT TITLE:</b> REPAIRS TO THE BRIGONI BRIDGE</p>	<p><b>TOWN:</b> MIDDLETOWN PORTLAND</p>	<p><b>PROJECT NO.:</b> 82-299</p>
	<p><b>DRAWING TITLE:</b> NOTES AND TABLE OF QUANTITIES</p>	<p><b>DRAWING NO.:</b> STR-2</p>
		<p><b>SHEET NO.:</b> 03.02</p>

Figure 89 Typical Sheet Replaced by DCO

## Section 5 As-Built Comments - Final Plans

As stated in the [CTDOT's Construction Manual chapter 1-313 "Final Revisions of Plans and Cross Sections"](#), it is the responsibility of either the Contracting Engineers (Consultant Inspectors) or State Forces (Office of Construction) to perform final as-built revisions of Contract Plans. As-Built revisions shall be recorded in accordance with Chapter 1-313 of the Construction Manual, amended as follows:

Final as-built revisions will be applied to the digitally signed PDF plans as a digital comment, using Adobe or Bluebeam's commenting tools. Digital comments are placed over the top of the digital signature and its security, therefore, the original content of the PDF plans can never be altered. Because as-built comments are digital and placed over the top of the plans they are easily recognizable, searchable, and may be turned off if necessary.

As-built comments shall be applied to the original, addenda, or construction order plans, whichever sheet is the latest. The original, addenda and construction orders PDF plans are located in ProjectWise within the active project's 100\_Contract Plans folder.

CAD drawings may be updated, at the discretion of each design office, to reflect any addenda, change orders, and as-built revisions for use in the future; however the original digitally signed as-built PDF plans shall not be replaced and shall be the PDF set for permanent records.

### 5.1 As-Built Revisions (Digital Comments) Workflow

Two methods for applying as-built revisions to the digital PDF plans are provided in the following sections; [5.1.1](#) and [5.1.2](#).

The first method is [Section 5.1.1](#) Post Construction. District staff shall record as-built revisions on their record set (paper copies) during construction. Once construction is completed these revisions shall then be applied as comments to the digital PDF per the following workflow.

The second method, using [Section 5.1.2](#) Active As-Built, district staff shall record as-built revisions on their record set (paper copies), and shall apply them as comments to the final set of digital PDF plans on an intermittent bases during construction. By using this method as-built information becomes available to all parties that have access to ProjectWise during the construction process, improving communication and transparency.

### 5.1.1 Post Construction As-Built

As-Built Workflow		
Step	Personnel	Task
1	Chief Inspector	Notify the Contracting Engineer or Designated District Staff that As-Built can be applied to the Contract Plans.
2	Contracting Engineer or District Staff	Change the state of the Contract Plans to “Perform As Built”, see <a href="#">Section 3.2.12</a>
3	Contracting Engineer or District Staff	Apply As-Built revisions to the Contract Plans in accordance with <a href="#">Section 5.3</a>
4	Contracting Engineer or District Staff	Change the state of the Contract Plans to “As Built Complete”, see <a href="#">Section 3.2.12</a>
5	Contracting Engineer or District Staff	Fill out the “As-Built Completion” Form <a href="#">As-Built Completion Form</a> and submit to AEC Applications
6	Contracting Engineer or District Staff	Notify all applicable personnel list in the <a href="#">Section 5.4.2</a> that the As-Built have been completed for this project.
7	AEC Applications Staff	After the “As-Built Completion” form is received, proceed to Section X.X (Process for Archiving a Project)

### 5.1.2 Active As-Built

Under Development:

## 5.2 As-Built Markup of Contract Plans

All as-built information will be placed using a few basic Bluebeam commenting tools. These tools include text tools, line and arrow tools, and stamp tools (all other tools will still be available under the main toolbar). These tools will be in the left-hand panel under “CTDOT As Built Tools” tool box when the CTDOT As-Built Profile is selected (see [CTDOT Bluebeam Profile](#)):

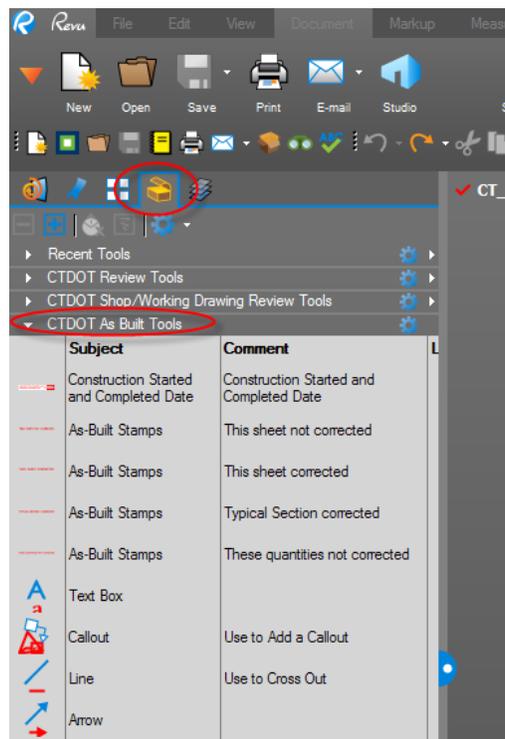


Figure 90 - As-Built Commenting Tools

## 5.3 Applying As-Built Comments to Contract Plans

### 5.3.1 Before Using Bluebeam for As-Built

All CTDOT users are required to complete the steps in [Appendix A](#) prior to applying as-built revisions. By completing these steps as-built revisions will be standardized across the all CTDOT users. These steps only need to be completed the first time using Bluebeam or when the user logs into a new computer.

- Perform the initial login steps for Bluebeam. [Initial Log Into Bluebeam](#)
- Download the CTDOT Bluebeam profile. [Download CTDOT Bluebeam Profile](#)
- The user must have a ProjectWise login/password. Contact Julie Annino if you do not have a Projectwise Username and Password.

### 5.3.2 Opening the Contract Plans from Projectwise

The contract plans are located in the 100\_Contract\_Plans folder of the project in Projectwise, as shown below:

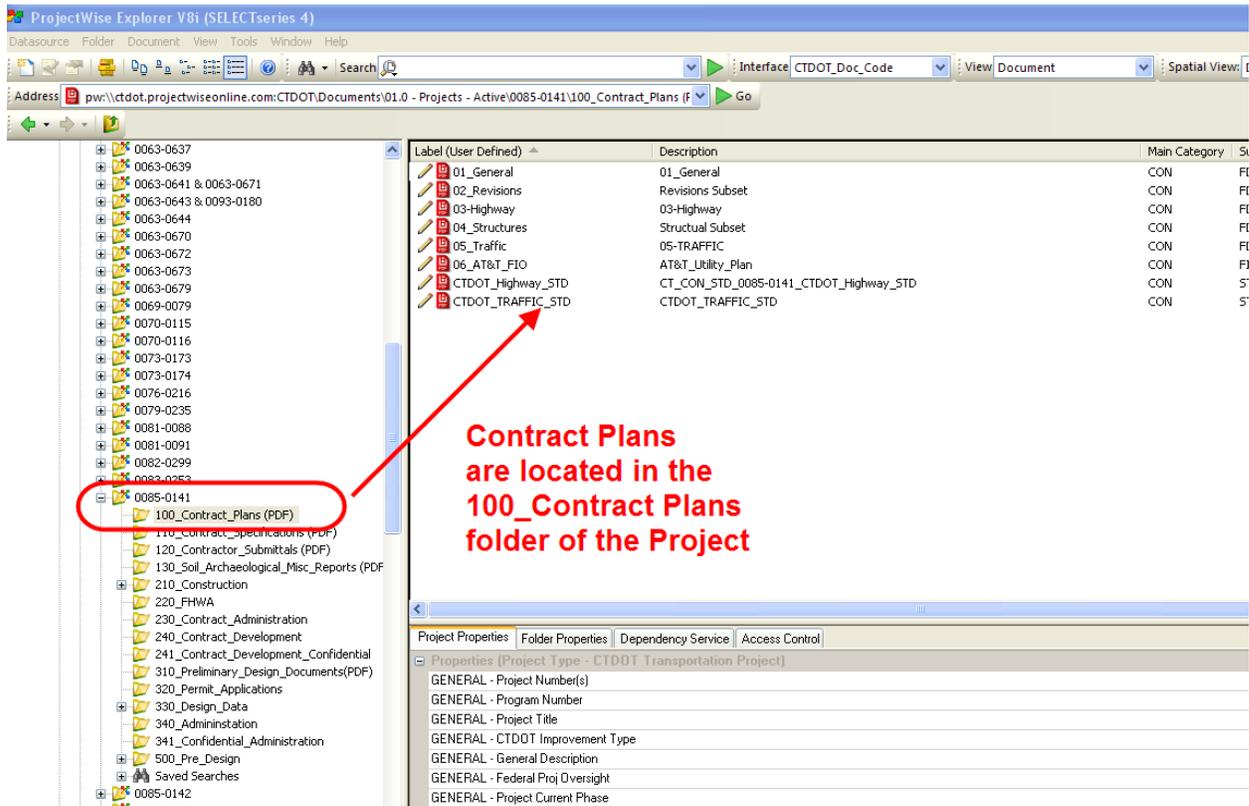


Figure 91 - Location of the Contract Plans in Projectwise

1. Login into Projectwise, then browse to the 100\_Contract\_Plans folder of the project you are working on.
2. To open a document with Bluebeam right click on the document, and select “Open With” as shown below:

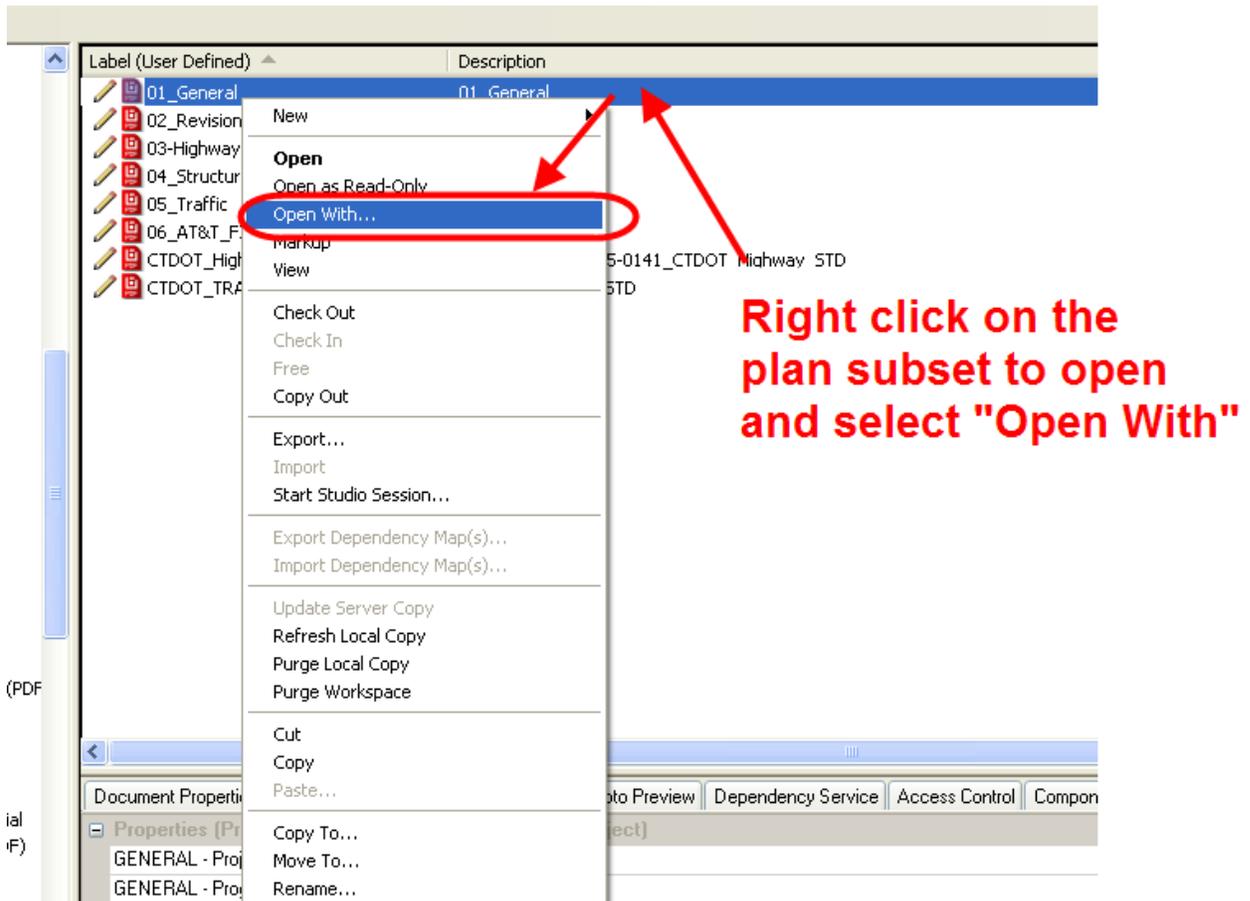


Figure 92 - Open With Bluebeam

3. Select the Bluebeam icon and check “Always use this program” and select OK. The document will now be checked out of Projectwise and open with Bluebeam:

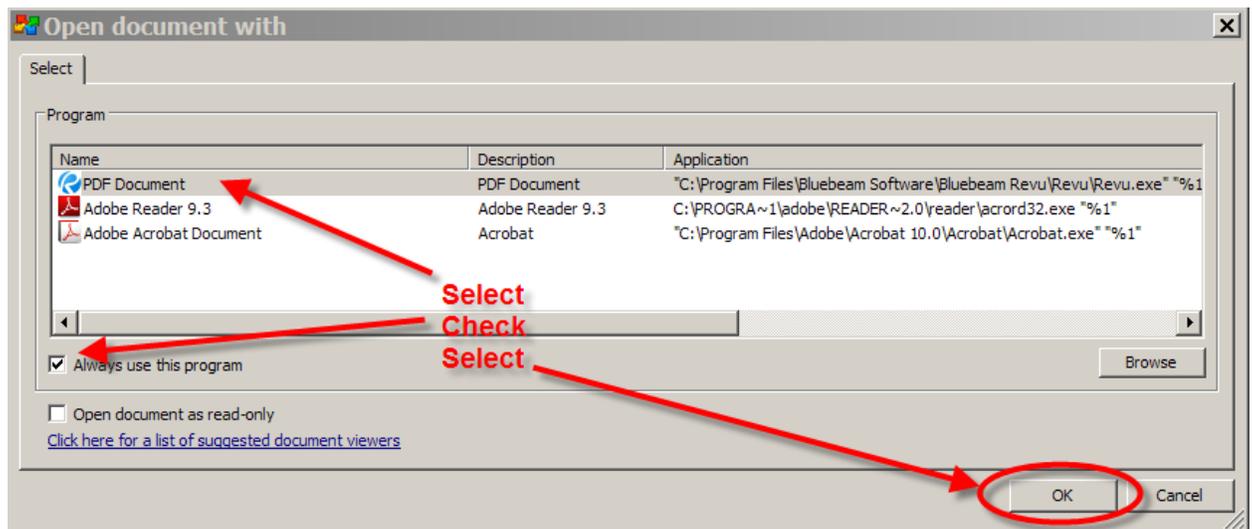


Figure 93 - Open with Bluebeam

Note: Since we checked “Always use this program”, the next time you open a pdf in ProjectWise with Bluebeam all you need to do is double click on the file.

- After the As-BUILTs are applied to the contract plans click save in Bluebeam and then select “Check In” when a projectwise dialog box pops up. If the document is not checked back into Projectwise the As-BUILTs will not be uploaded to Projectwise.

### 5.3.3 Applying Digital As-Built Stamps

#### 5.3.3.1 Construction Started & Completed Dates

The construction started and complete date stamps must be applied to the PDF title sheet, located in the 01\_General subset, as stated below:

- Select the ”ConstructionStartedandCompletedDates”: stamp from the “CTDOT As Built Tools” tool box and place it at a conspicuous location on the title sheet:

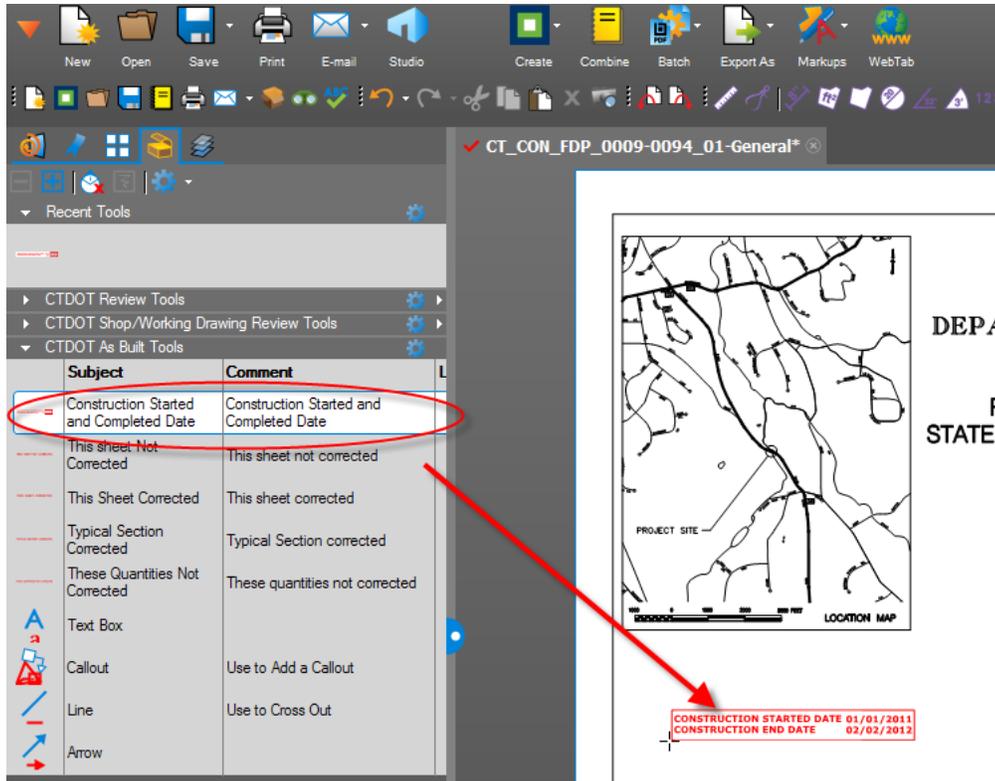
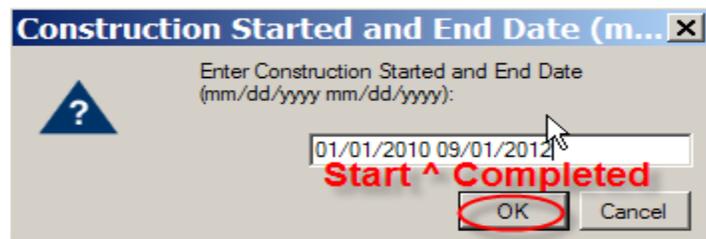


Figure 94 - Construction Started and Completed Date Stamp

- Enter Start and Completed dates in a mm/dd/yyyy format with a space between them and select OK:



**Enter start Date, space, Enter Completed Date (mm/dd/yyyy Format) Select OK**

Figure 95 - Entering the Dates for the Stamp

Below is an example of the placed stamp.

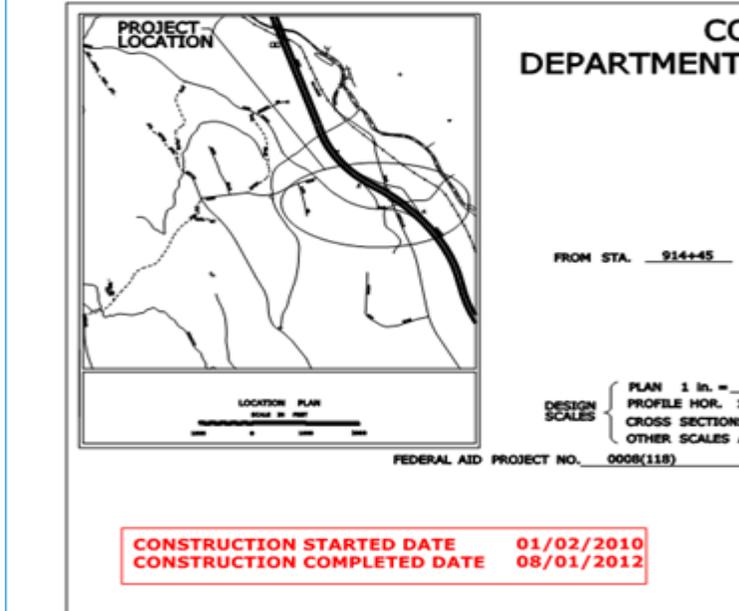


Figure 96 - Placed Stamp

### 5.3.3.2 This Sheet Not Corrected Stamp

This stamp must be placed on all PDF sheets that do not contain as-built revisions. Detail Estimate Sheets must never be revised; therefore, they always receive this stamp.

1. To place the “THIS SHEET NOT CORRECTED” stamp on an individual PDF sheet, select that stamp from the CTDOT As Built Tools tool box and place it in the lower right-hand corner of the sheet, by clicking once.

**If the majority of the sheets do not contain as-built revisions it is easier to apply this note to every sheet included in plan set, including the as-built revised sheets, and then go back and remove it from the sheets that were corrected.**

1. To place the “THIS SHEET NOT CORRECTED” stamp on the entire plan set, select that stamp from the CTDOT As Built Tools tool box and place it in the lower right-hand corner of the first sheet in the plan set:

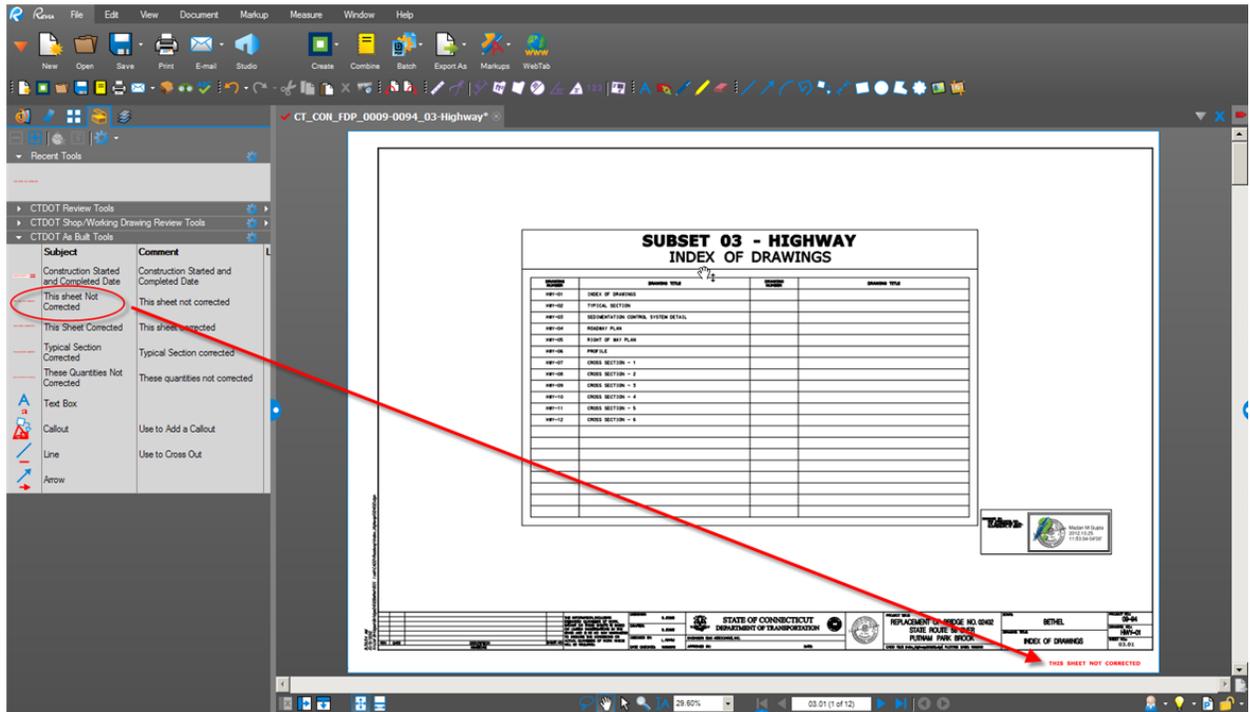


Figure 97 - Placing the "This Sheet Not Corrected Stamp"

2. Right click on the stamp that was placed and select “Apply to All Pages”:

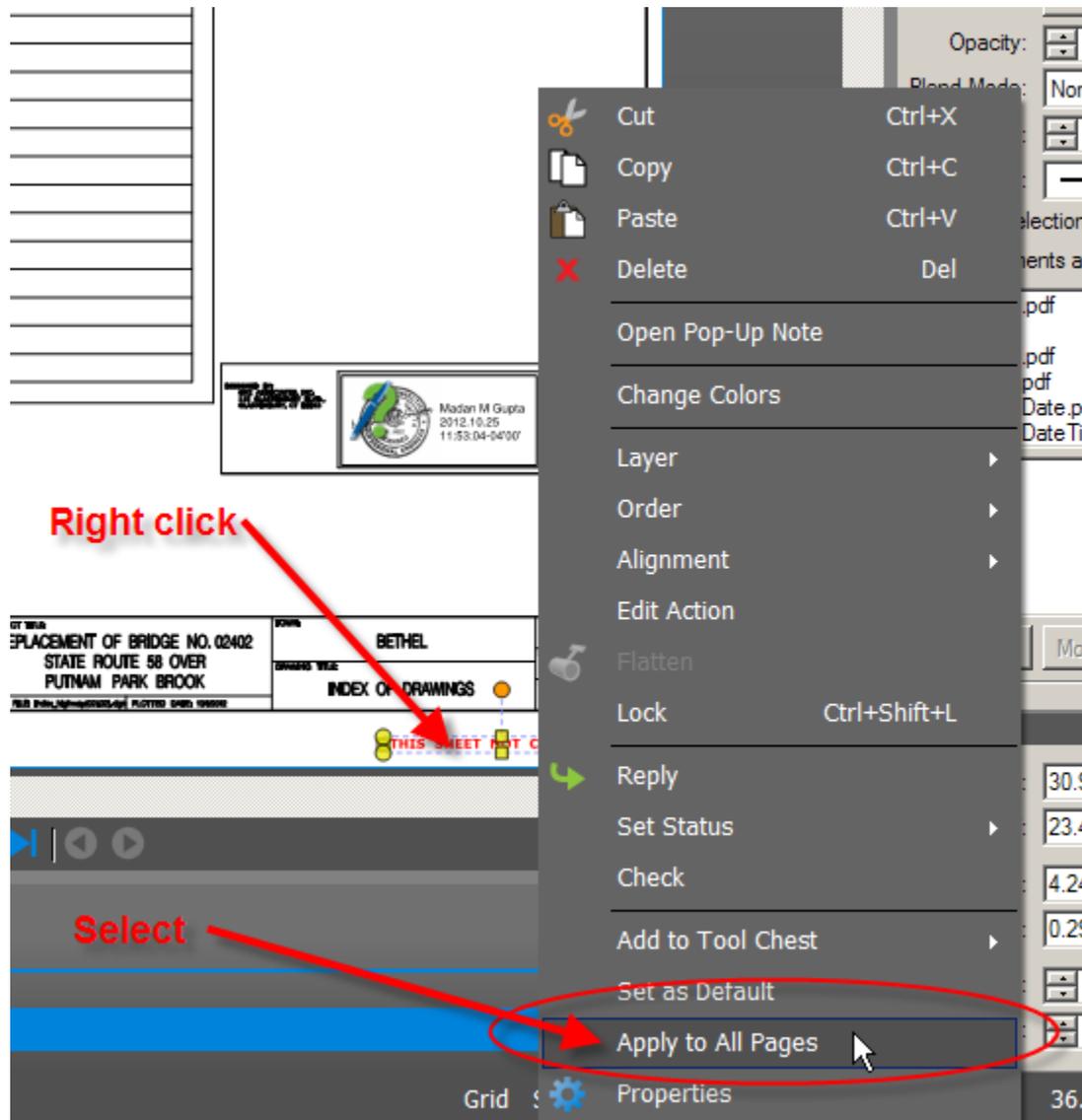


Figure 98 - Placing the Stamp on All Pages

This will place the “THIS SHEET NOT CORRECTED” stamp on every plan sheet within the pdf set.

**NOTE: You must go back and replace this note on the sheets that contain as-built revisions with the appropriate stamp.**

### 5.3.3.3 This Sheet Corrected

This stamp must be applied to all PDF sheets that contain as-built revisions.

1. To place the “THIS SHEET CORRECTED” stamp on an individual PDF sheet, select that stamp from the CTDOT As-Built Tools tool box and place it in the lower right-hand corner of the sheet, by clicking once.

**If the majority of the sheets contain as-built revisions it is easier to apply this note to every sheet included in plan set, including sheets that do not contain as-built revisions, and then go back and replace it, with the appropriate stamp, on the sheets that were not corrected.**

1. To place the “THIS SHEET CORRECTED” stamp on the entire plan set, select that stamp from the CTDOT As Built Tools tool box and place it in the lower right-hand corner of the first sheet in the plan set:
2. **NOTE: You must go back and replace this note on the sheets that do not contain as-built revisions with the “THIS SHEET NOT CORRECTED” stamp.**

### 5.3.4 Applying Digital As-Built Notes

To place an as-built revision, simply select any of the provided tools located within the as-built tool box shown below and apply it to the document that is being as-built.

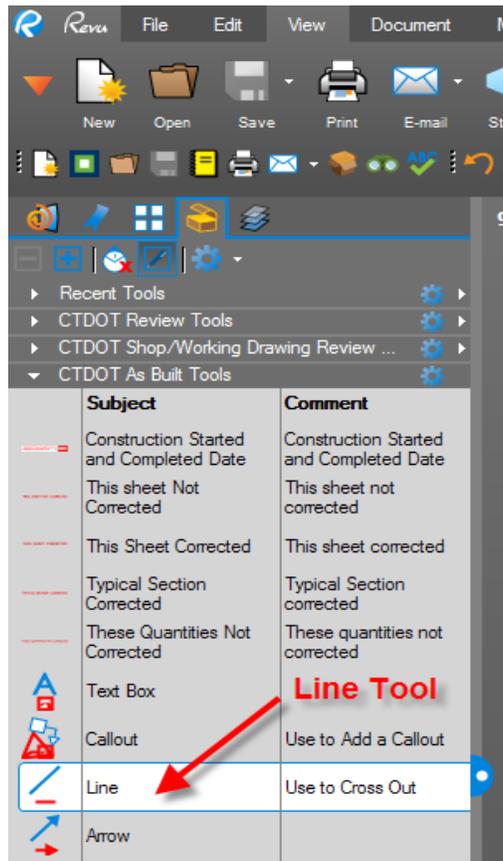


Figure 99 - As-Built Tools

In the following example, the Line tool was used to cross out the existing text and the Text Box tool was used to add text:

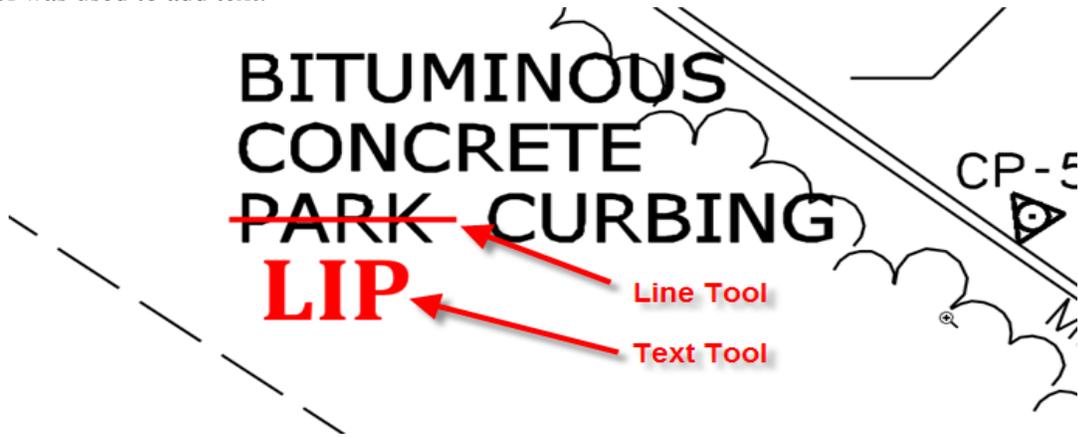


Figure 100 - As-Built Note Example

Additional tools are available by selecting Markup:

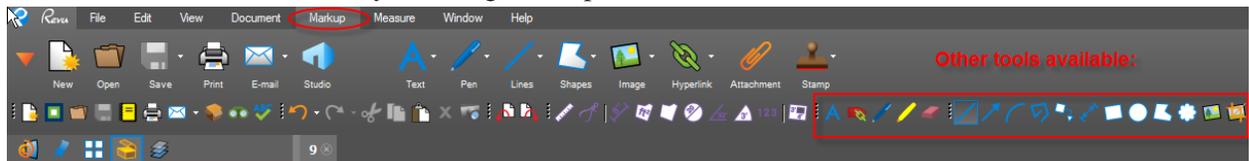


Figure 101 - Other Markup Tools

These tools include:



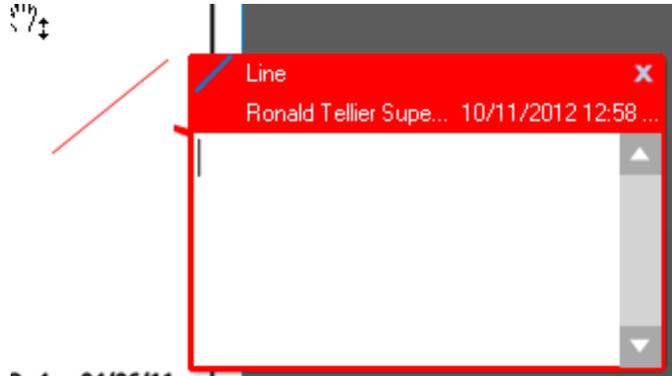
A B C D E F G H I J K L M N O P Q R

List of Commenting Tools:

- A. Text – commonly used tool for as-builts
- B. **Typewriter – Do Not Use for As-Builts – cannot edit text**
- C. **Note - Do Not Use for As-Builts – will not print**
- D. Flag
- E. Pen
- F. Highlight
- G. **Eraser - Do Not Use for As-Builts – cannot edit graphics**
- H. Line– commonly used tool for as-builts
- I. Arrow– commonly used tool for as-builts
- J. Arc
- K. Polyline
- L. Callout– commonly used tool for as-builts
- M. Dimension
- N. Box
- O. Circle

- P. Polygon
- Q. **Cloud – Do Not Use for As-Built - this may be confused with change orders or addendums**
- R. Picture – Pictures can be inserted into a document or attached. It is recommended that pictures be attached as not to obstruct any part of the pdf.

**Do not add a note to a comment by double clicking on the comment. For example, if a line was placed the user could double click on the line and add notes to it:**



**Figure 102 - Incorect Way to Add Text**

**If notes are added this way they do not print.**

#### 5.3.4.1 Digital As-Built Stamps and Notes Using ADOBE

The following stamp files need to be downloaded to the user's computer and placed in this folder: C:\Documents and Settings\User\Application Data\Adobe\Acrobat\8.0\Stamps\. This could be either C:\ or D:\ Drive depending on your computer. With the "User" folder being the current user's login Username. If Acrobat version 9 is being used, replace 8.0 with 9.0 in the previous sentence, if version 10 is used replace with 10.

##### **Stamp Files**

[As-Built stamps.pdf](#)

[Construction started and completed dates.pdf](#)

These stamps are to be placed following [Section 5.3](#) above.

As-Built notes shall be placed on the plans in accordance with [Section 5.3](#) using the Adobe commenting tools in the following format:

1. Text Font shall be Cambria 16, and the color Red.
2. All line work shall be line width 2 and the color Red.

## 5.4 Notifications

### 5.4.1 Completion of the As-Builts

After the as-built information has been completed, the person responsible for the as-builts revisions must notify AEC Applications by filling out the following form:

[As-Built Completion Form](#)

### 5.4.2 Notifying Department Personnel

After the as-built information has been completed and the above form has been sent to AEC Applications, the person responsible for the as-built revisions shall notify the appropriate Department personnel (via e-mail):

- Lead Designer
- Chief Inspector
- Central Surveys
- ROW
- Central Construction
- Bridge Maintenance (if a structure is on the project)

## **Section 6 Contractor Submittals**

### **6.1 Working Drawings for Permanent Structures**

This section is in development.

### **6.2 Shop Drawings**

This section is in development:

The following link is the Contractor Submittal workflow:

## Section 7 Digital Review and Commenting

This section is in development.

This section details the procedure for digital review and commenting on pdf documents, this includes preliminary design, working drawing, shop drawing reviews, and other contractor submittals. Also included in this section are the stamps that are applied to working drawing and shop drawing.

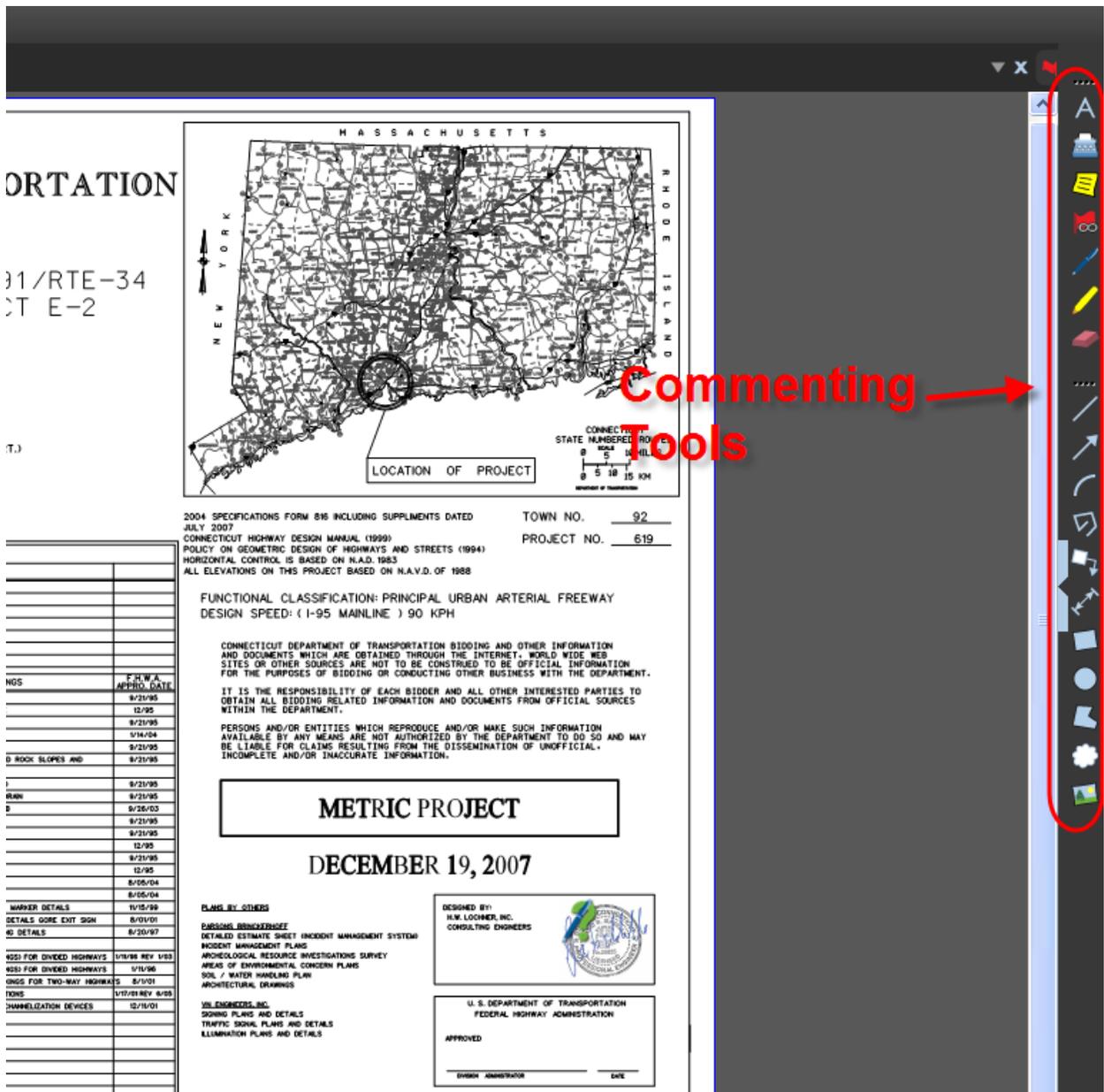
### 7.1 Digital Review

This section is in development.

### 7.2 Commenting Tools

#### 7.2.1 Bluebeam

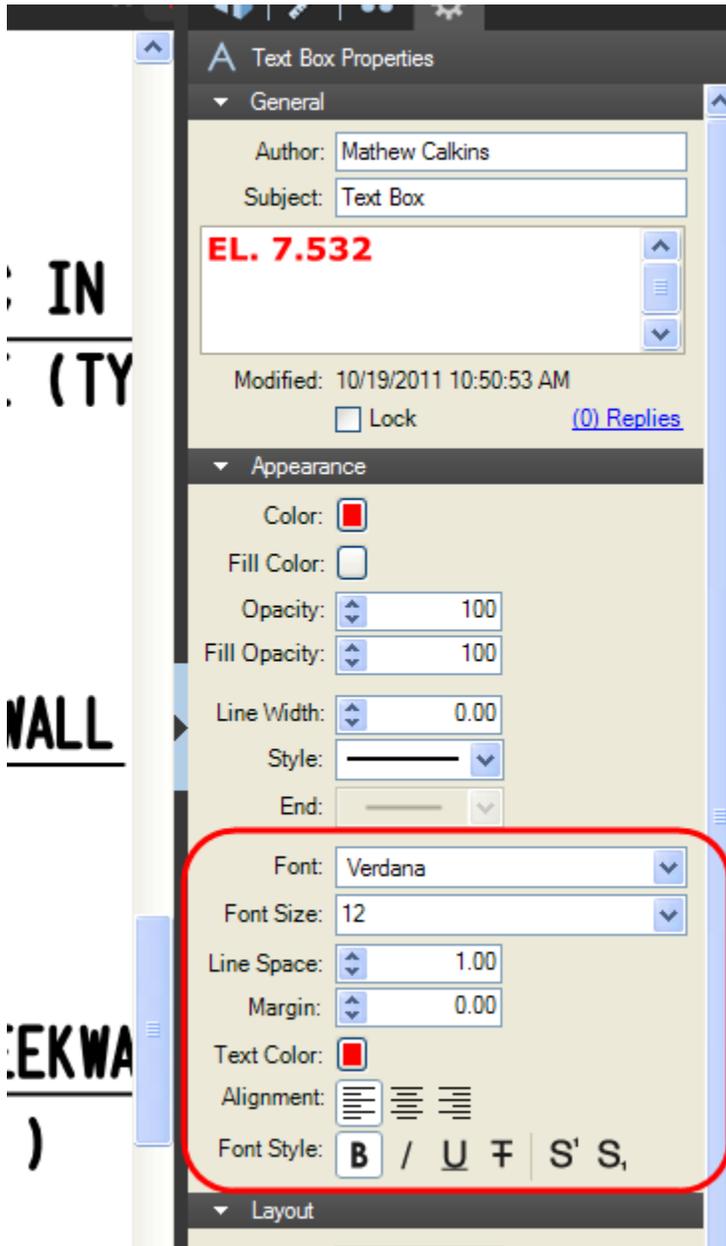
The following figures show the commenting tools in Bluebeam.





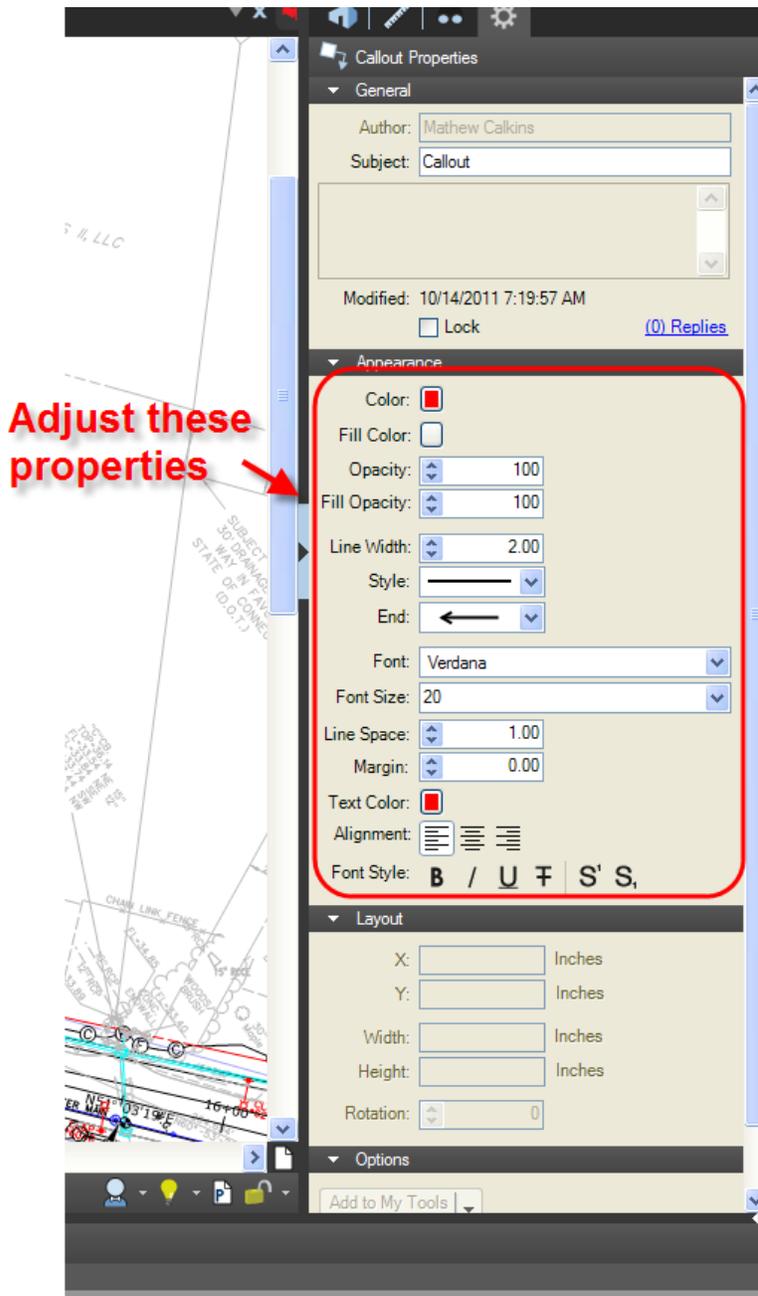
**List and Settings for Commenting Tools**

- A. Text - All text shall be the color “Red” and the text for a general note shall be verdana size 12. The text for the X’d out Addendum and Change Order sheets, shall be **verdana bold** size 20.

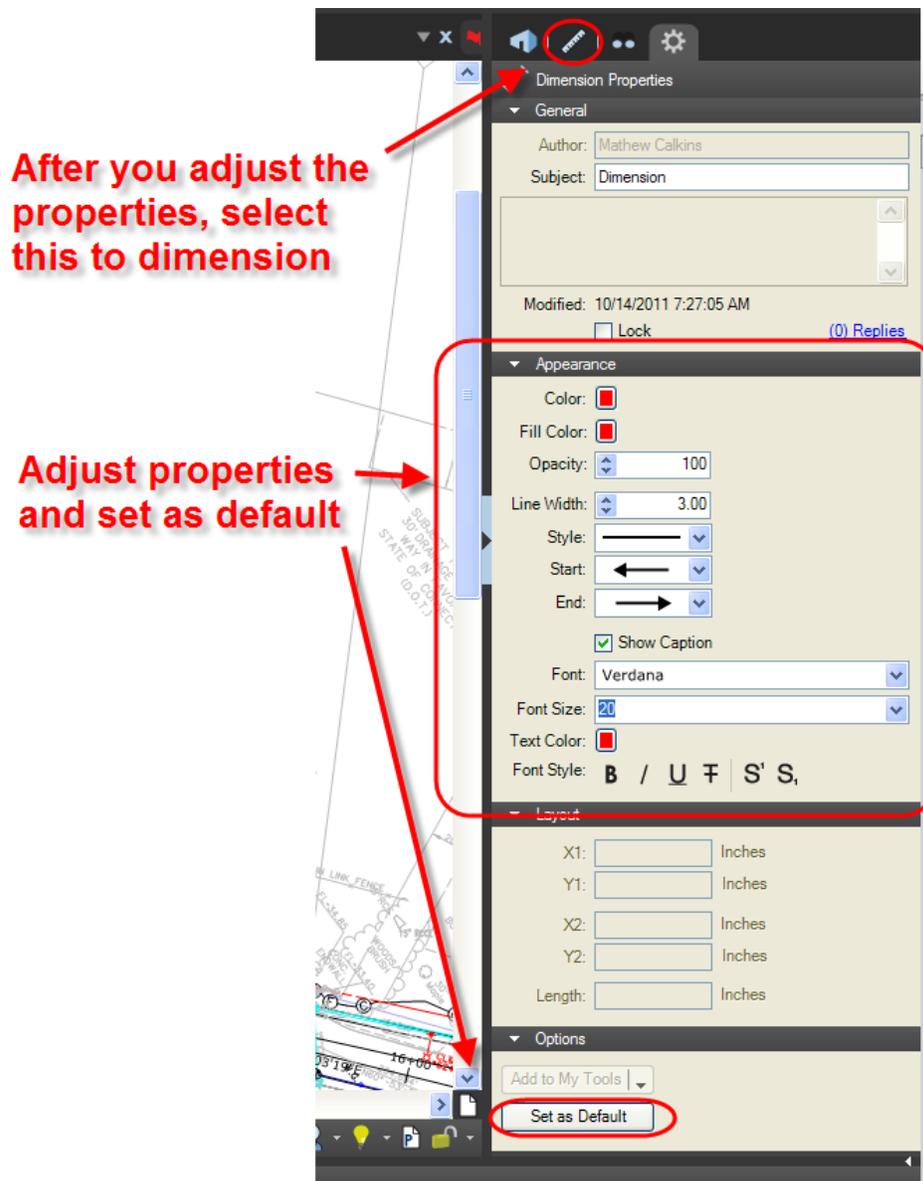


- B. Typewriter – The text color shall be “Red” and Verdana size 12
- C. Note – Use Default Settings
- D. Flag – Use Default Settings
- E. Pen – Use Default Settings
- F. Highlight – Use Default Settings
- G. Eraser – Use Default Settings

- H. Line – Color = Red and line width = 3.00
- I. Arrow – Color = Red and line width = 3.00
- J. Arc – Color = Red and line width = 3.00
- K. Polyline – Color = Red and line width = 3.00
- L. Callout – Adjust the properties as shown below:



M. Dimension – Adjust as shown below and click “Set as Default”



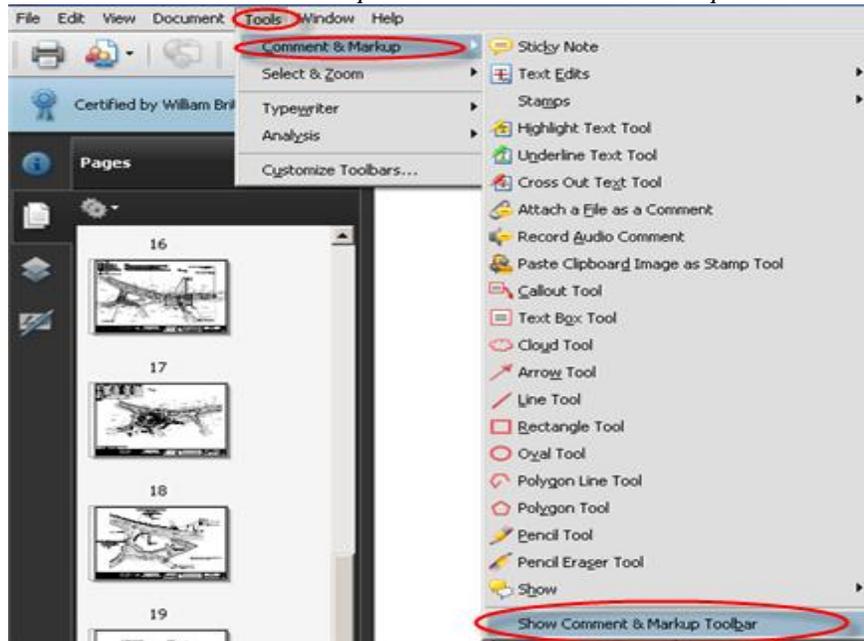
- N. Box - Color = Red and line width = 3.00
- O. Circle - Color = Red and line width = 3.00
- P. Polygon - Color = Red and line width = 3.00
- Q. Cloud - Color = Red and line width = 3.00
- R. Picture – Use default settings.

## 7.2.2 Adobe Acrobat

The following figures show the commenting tools in Adobe.

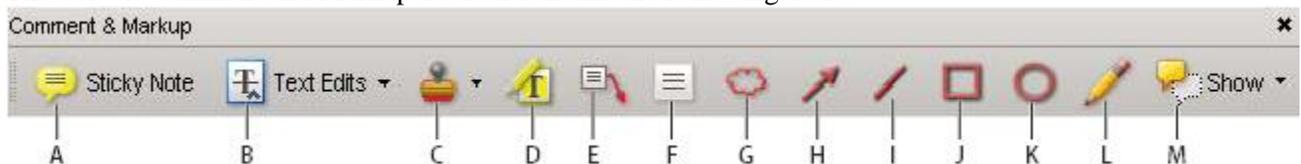
Open the pdf you wish to markup. If the Comment & Markup tools are not available in your menu bar go to:

*Tools>Comment & Markup>Show Comment and Markup Toolbar:*



Note: In order for the Commenting tools to be available, the *Extend Features in Adobe Reader* must have been enabled in the original pdf using Adobe Pro. If the commenting tools are not available, please contact the owner of the document.

The default Comment and Markup Toolbar contains the following tools:



### **Comment & Markup toolbar and settings:**

- A. Sticky Note tool – use default settings
- B. Text Edits tool – use default settings
- C. Stamp tool and menu – use default settings
- D. Highlight Text tool – use default settings
- E. Callout tool – Verdana 12pt
- F. Text Box tool– Verdana 12pt
- G. Cloud tool – Weight = 2pt
- H. Arrow tool– Weight = 2pt
- I. Line tool– Weight = 2pt
- J. Rectangle tool– Weight = 2pt
- K. Oval tool – Weight = 2pt
- L. Pencil tool– Weight = 2pt
- M. Show menu

## 7.3 Digital Stamps

### 7.3.1 Bluebeam Stamps

To be able to select your stamps follow the figure below:

1. Select the Markup tab and select Stamps>Change Stamp Folder.

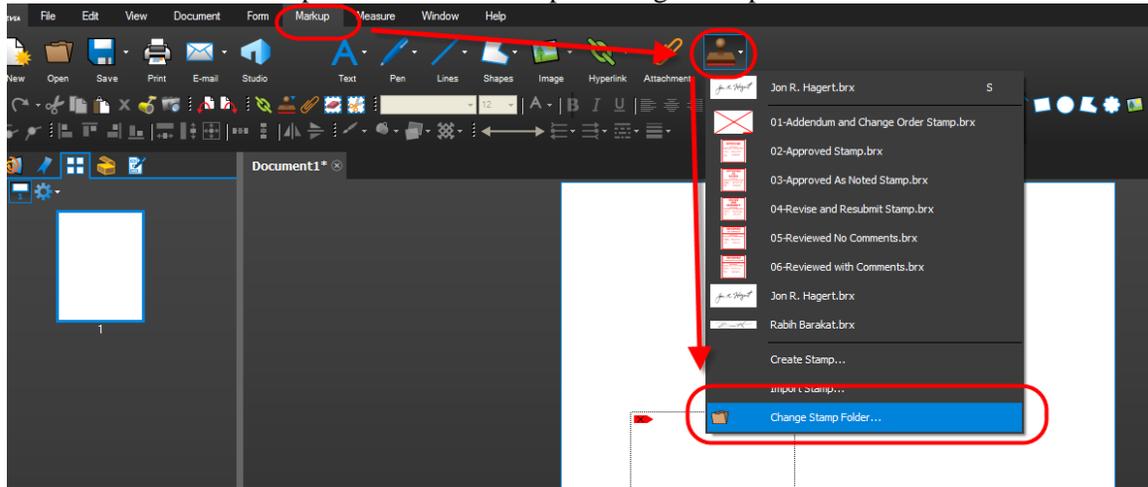


Figure 103 - Selecting a Stamp Folder

2. Browse to [\\SH3DGS18\CTDOT\\_Projects\V8\\_Admin\Bluebeam Resources](#) and select correct discipline.

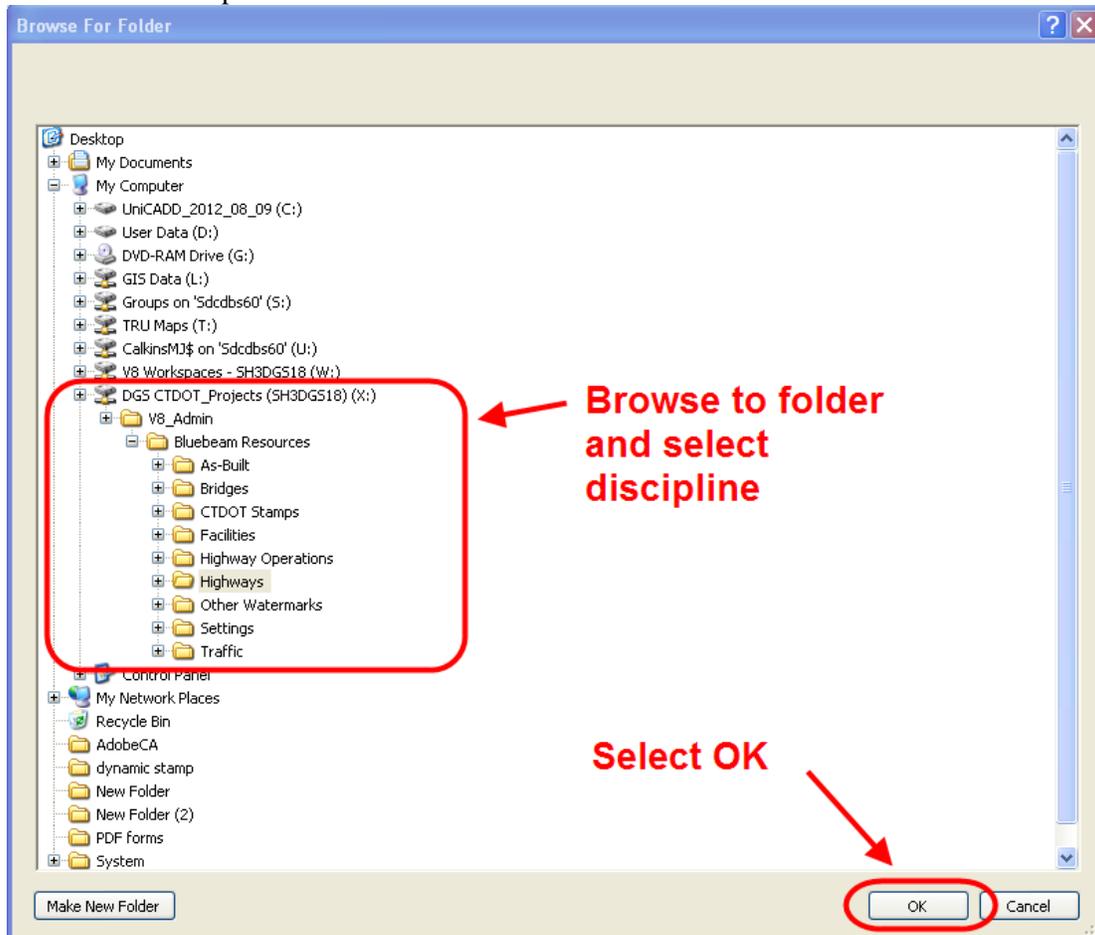


Figure 104 - Selecting Stamp Folder

### 7.3.1.1 Placing Addendum and Change Order Stamps

When an addendum or design initiated change order are submitted, the sheets affected must get crossed out with the appropriate note placed on them. Follow this workflow:

1. Place the Addendum and Change Order Stamp.
2. Then using the “Text” comment tool shown in [section 7.2.1](#) to place the notes required in [section 4.4](#).
3. Then select flatten markups by selecting *Document>Flatten Markups*. Keep the default settings and select flatten.

### 7.3.2 Adobe Stamps

The following stamp files need to be downloaded to the user’s computer and placed in this folder:

C:\Documents and Settings\User\Application Data\Adobe\Acrobat\8.0\Stamps\. CTDOT users shall download this file to the same location as above but instead of the C:\ it will be in D:\. With the “User” folder being the current user’s login Username. If Acrobat version 9 is being used, replace 8.0 with 9.0 in the previous sentence.

#### **Stamp Files**

[CTDOT Plan Stamp.pdf](#) this is for the crossing out sheets due to Addendum and Change Orders.

*Contractor Submittal Stamps*

[Shop Drawing Stamps](#)

[Working Drawing Stamps](#)

[Facilities Stamps](#)

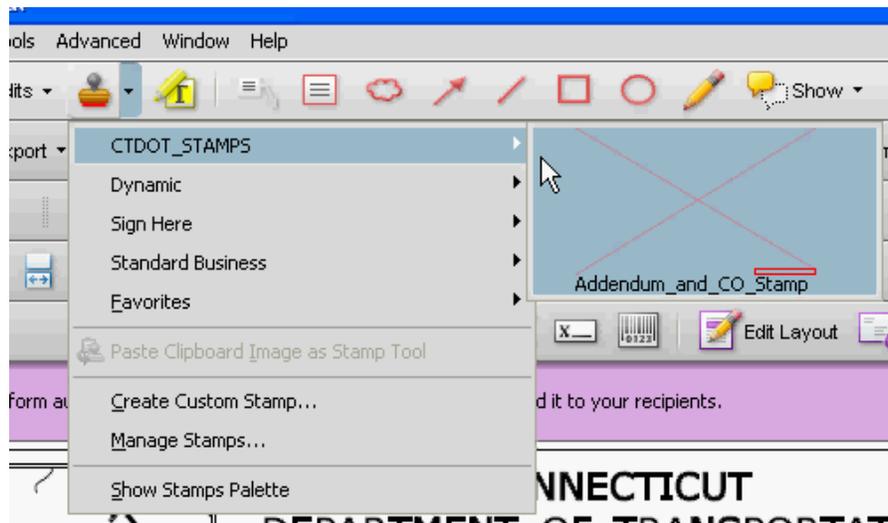
These stamps will need to be updated with the consultant’s information.

*As-Built Stamps*

[As-Built stamps.pdf](#)

[Construction started and completed dates.pdf](#)

The figure below is an example of placing the crossed out sheet stamp:



Place stamp in correct location, then fill in the dialog box with the correct text as required. If a mistake has been made, right click, delete and place again. After stamp is located correctly, right-click stamp, and select properties. From Stamp Properties dialog, select “Locked”.

## Appendix A

### Initial Log into Bluebeam

These steps only need to be completed the first time using Bluebeam or when the user logs into a new computer.



1. Open Bluebeam by selecting the desktop icon:

If you do not have a desktop icon, select **Start>Bluebeam Software**. Right click on **Bluebeam Revu**, select **Send To>Desktop (create shortcut)**. This will place the Bluebeam icon on your desktop:

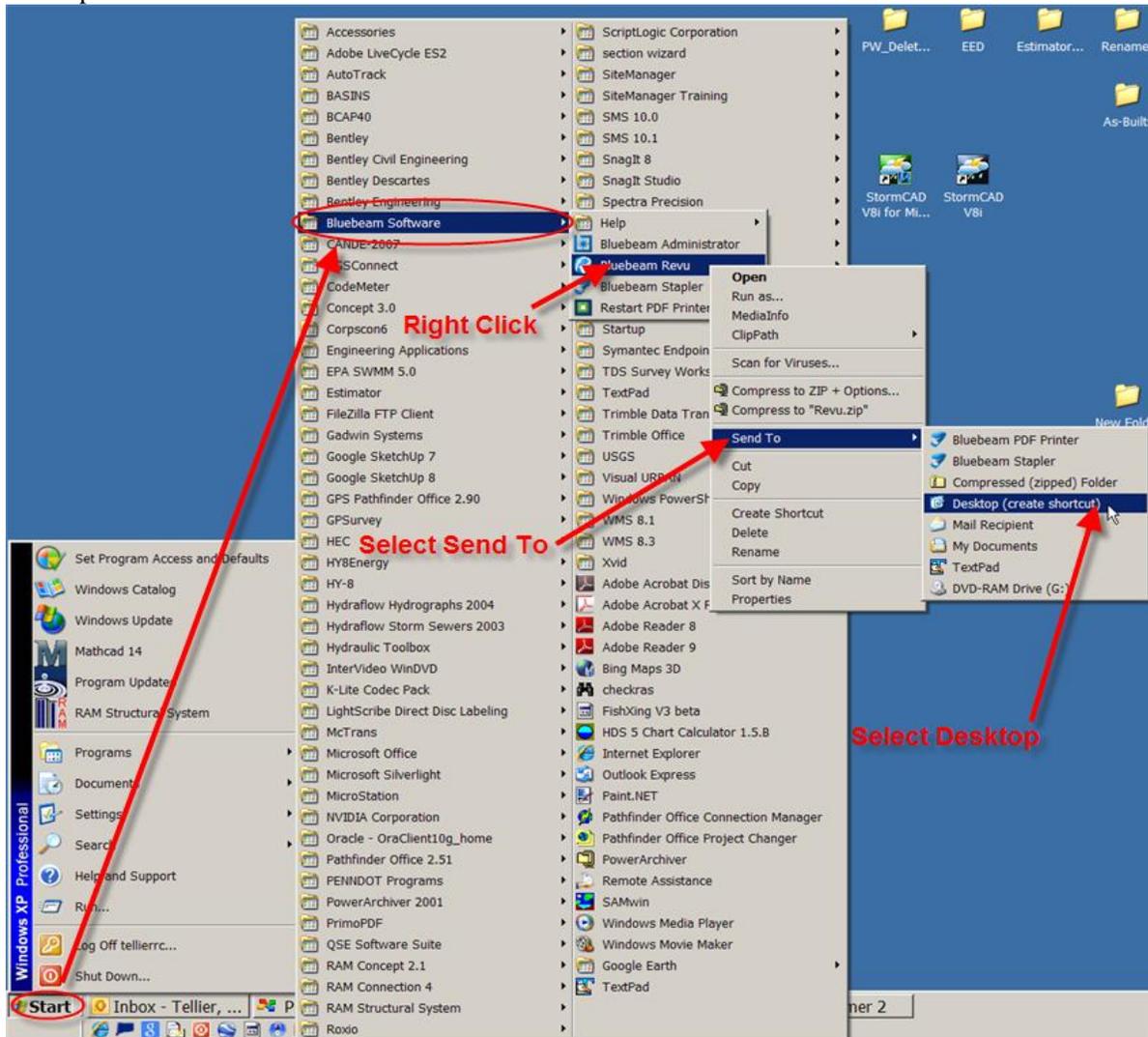


Figure 105 - Creating Desktop Shortcut

2. When the “Welcome to Revu” dialog box opens, select **Design** profile and **Dark** look:

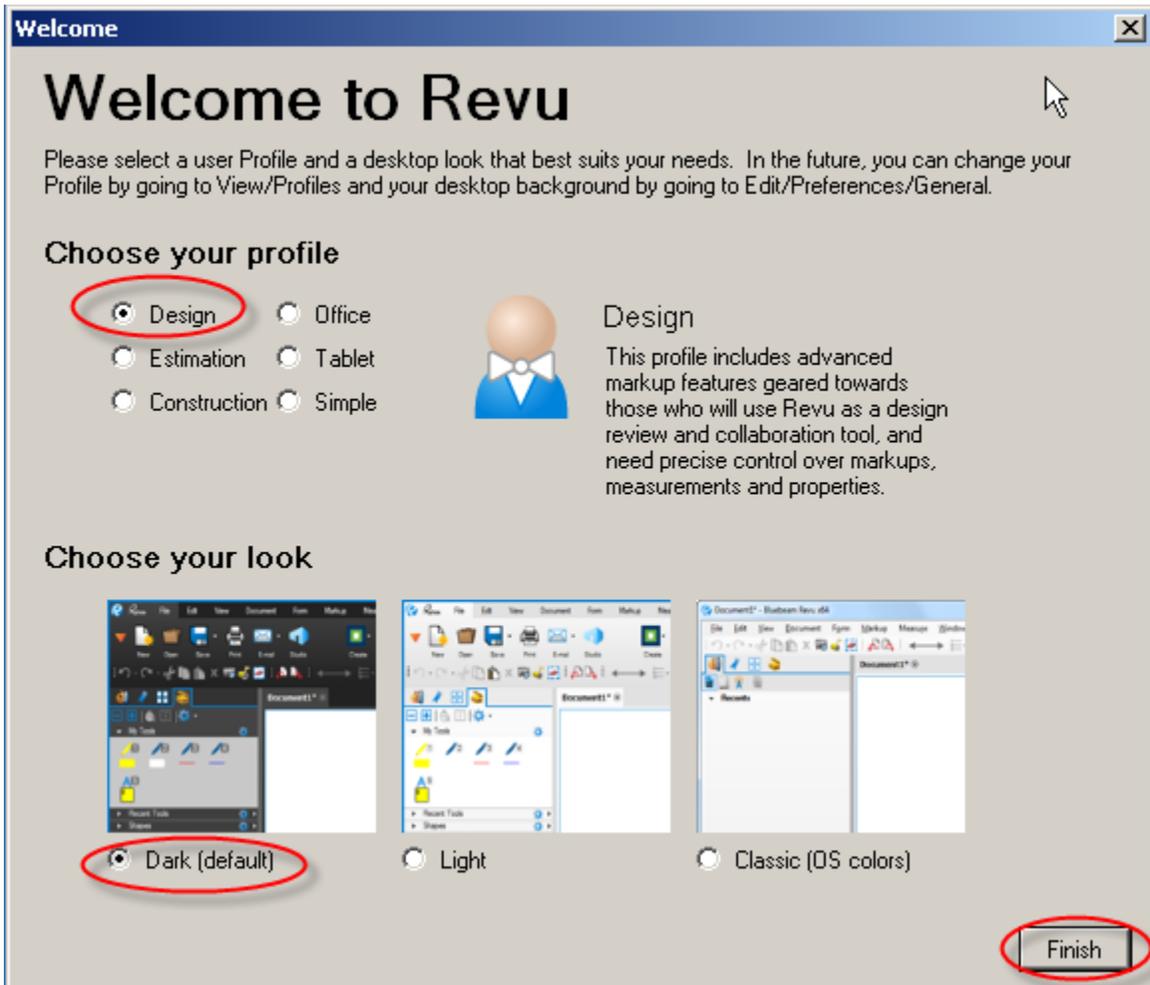


Figure 106 - Welcome to Revu

3. A dialog box may appear asking if you would like to add a ProjectWise Client Interface. Select **Yes**:

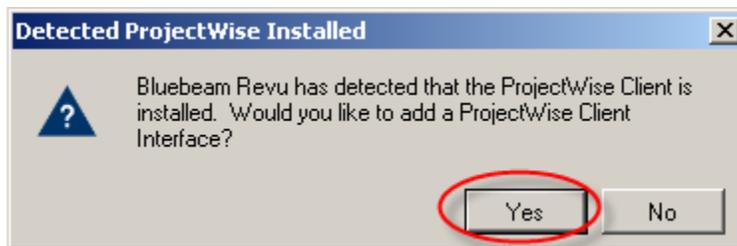


Figure 107 - Bluebeam/Projectwise Link

4. Enter ProjectWise **Login Name** and **Password**. Check **“Checkout on Open”** and **“Checkout on Open from Hyperlinks”**. Select **OK**:

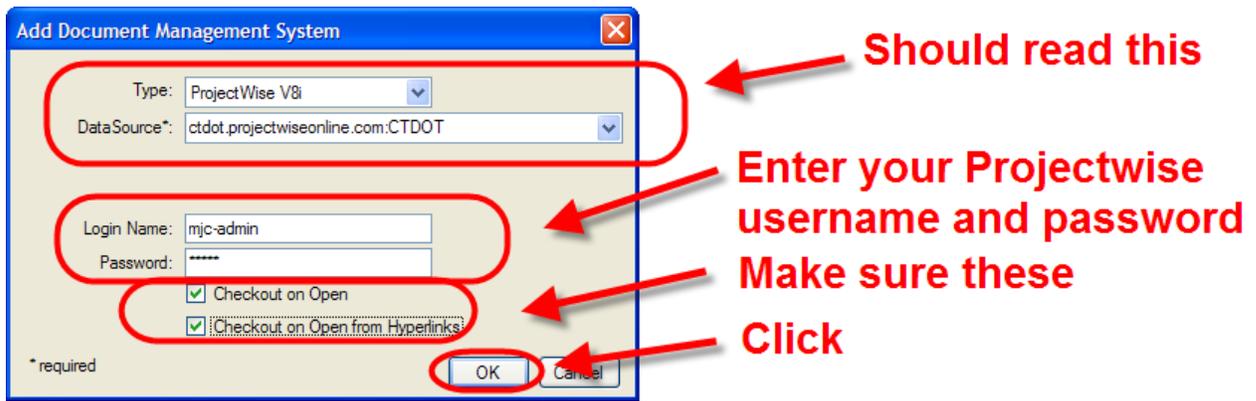


Figure 108 - Projectwise Login

- Click on the settings icon in the top right hand corner and click *Preferences* as shown below. If you cannot find the settings icon in the top right, go to the Edit menu and select Preferences.

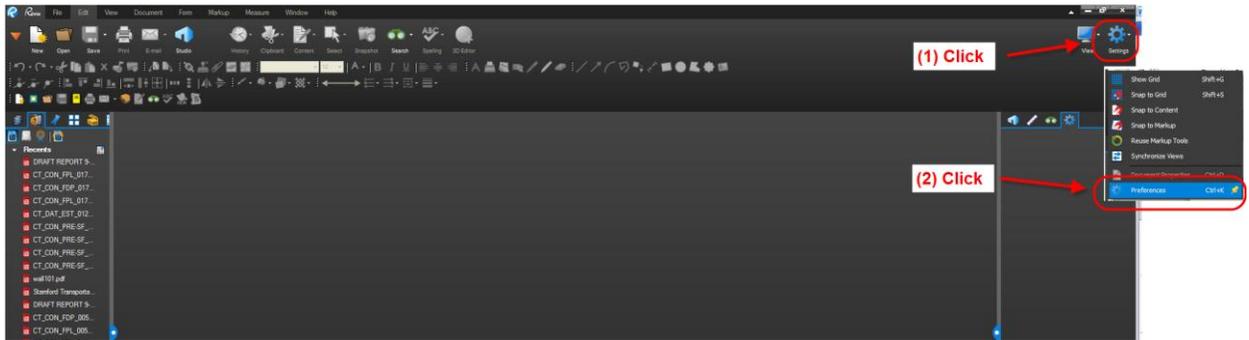


Figure 109 - Bluebeam Preferences

- Click on File Access and make sure the box is checked as shown below: If ProjectWise is not listed click on Add

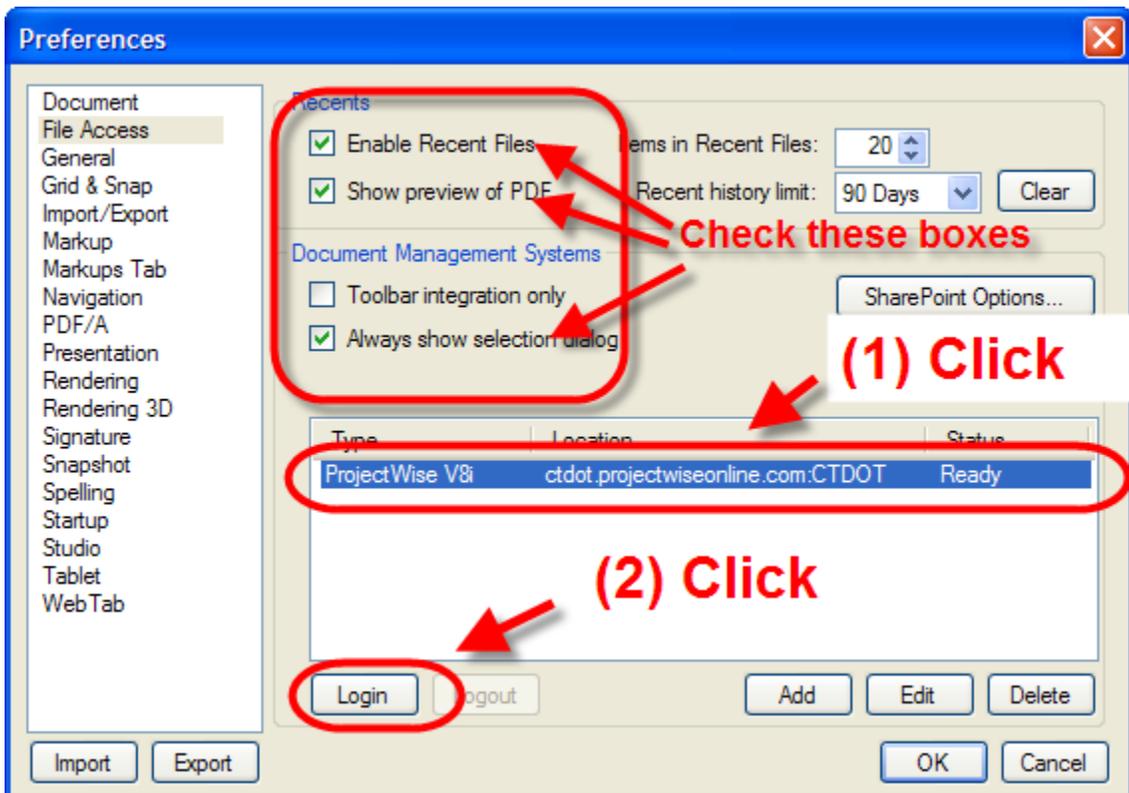
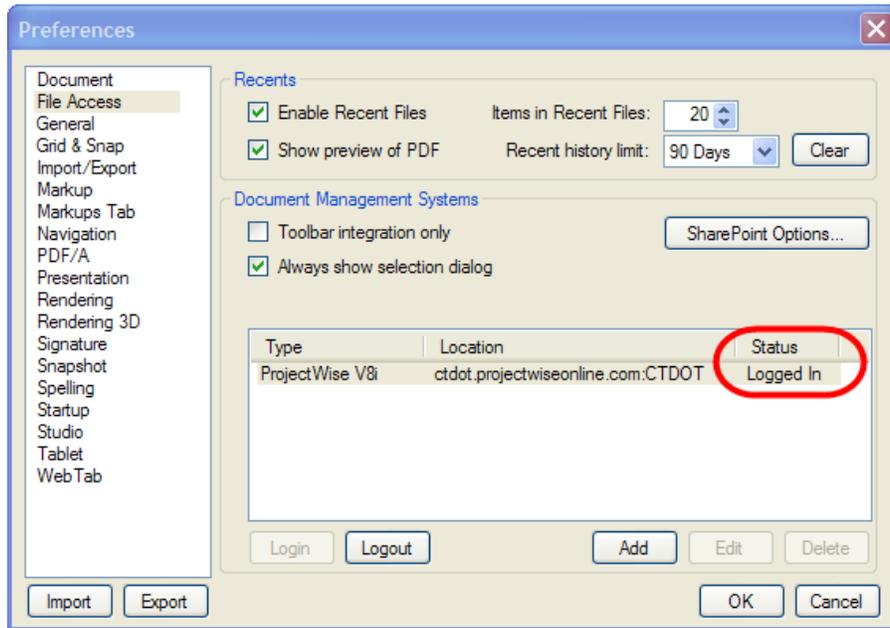


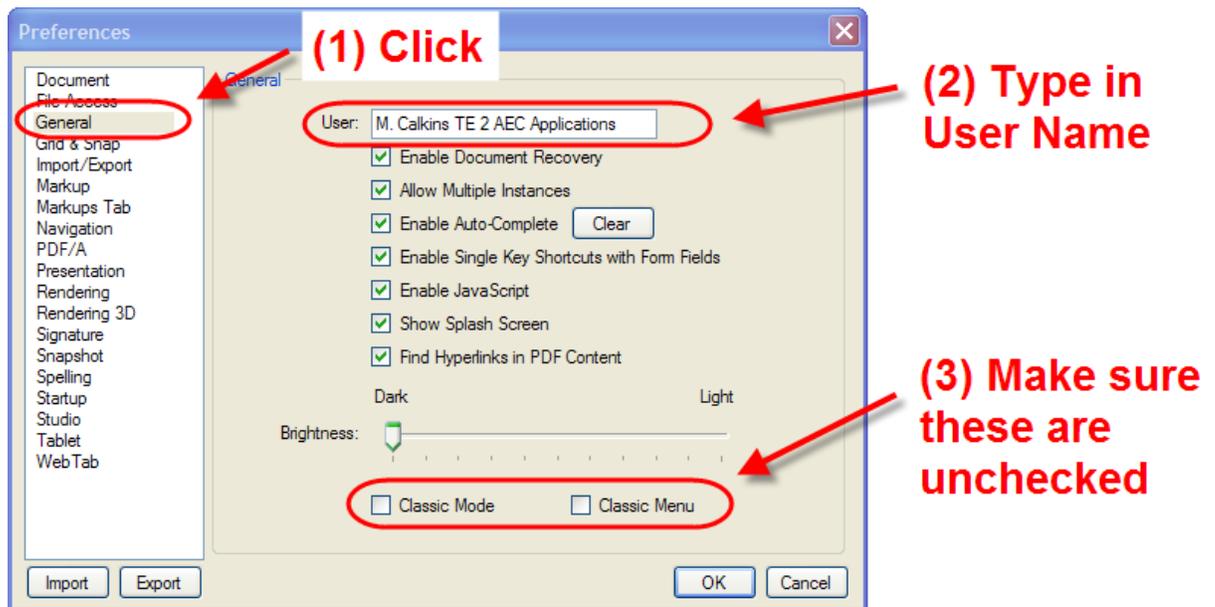
Figure 110 - Projectwise Integration

After you click *Log in* the status should read *Logged In* as shown below:



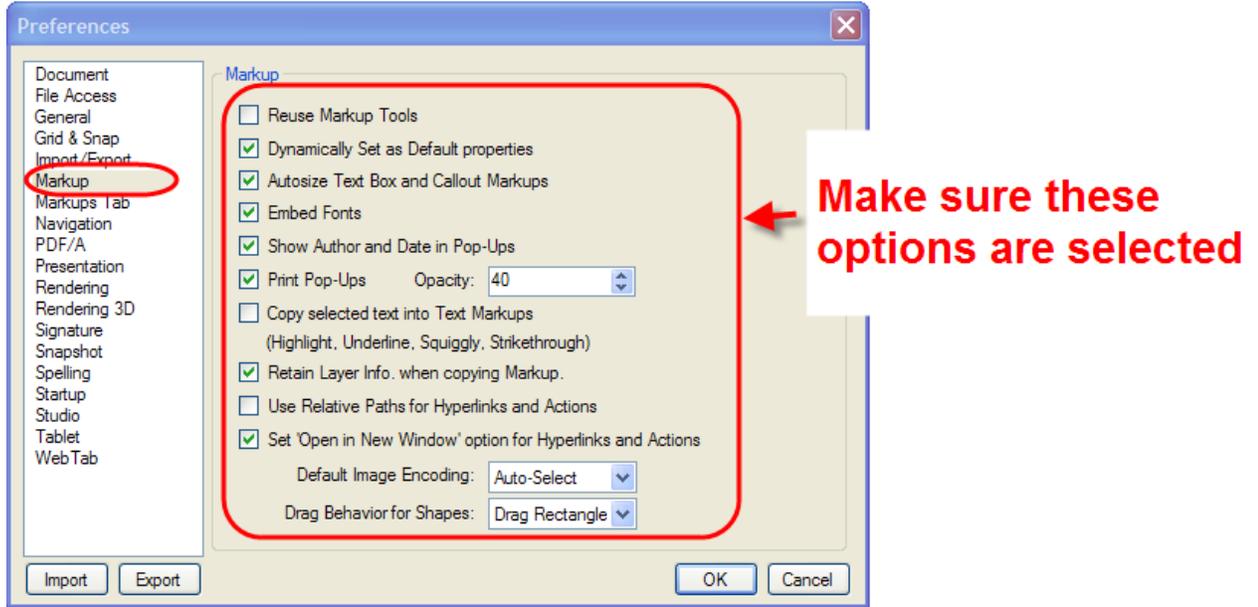
**Figure 111 - Projectwise Integration**

7. In the General section in the User area type in your name (First Initial and Last Name), title, and your office name. An example for me would be M. Calkins TE 2 AEC Applications. An example for a district construction user would be J. Smith TE 3 D2 Construction.



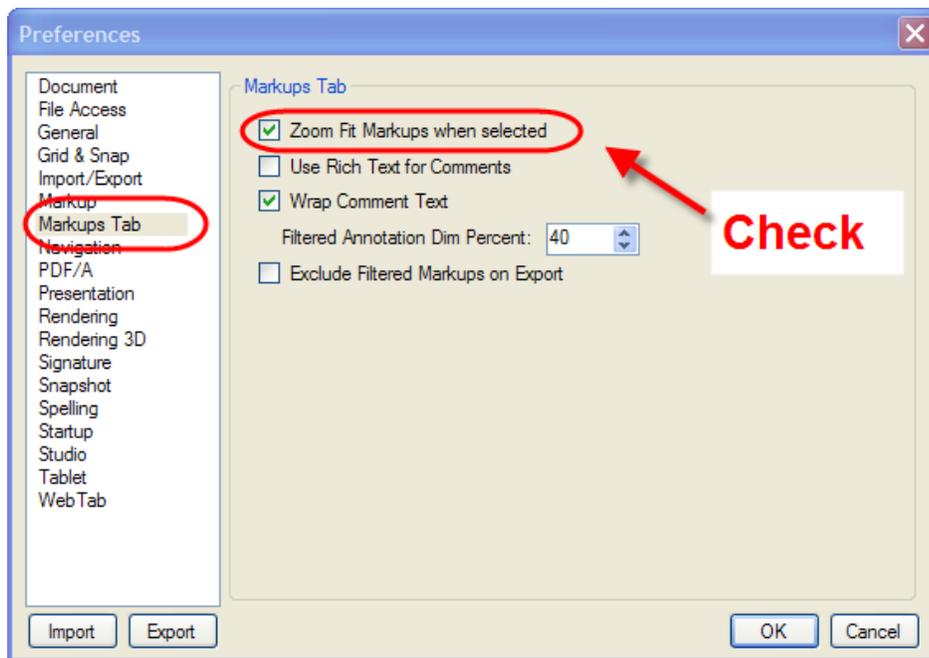
**Figure 112 - General Preferences**

- Update the markups options to match the following:



**Figure 113 - Markup Preferences**

- Update the markups tab options to match the following:



**Figure 114 - Markup Preferences**

- Click on the Web Tab section and make sure the box for Open PDF hyperlinks in Web Tabs is unchecked. This will open any hyperlink that is in a PDF document using Internet Explorer instead of Bluebeam. This is the last preference you will need to update so you can click Ok at the bottom right now.

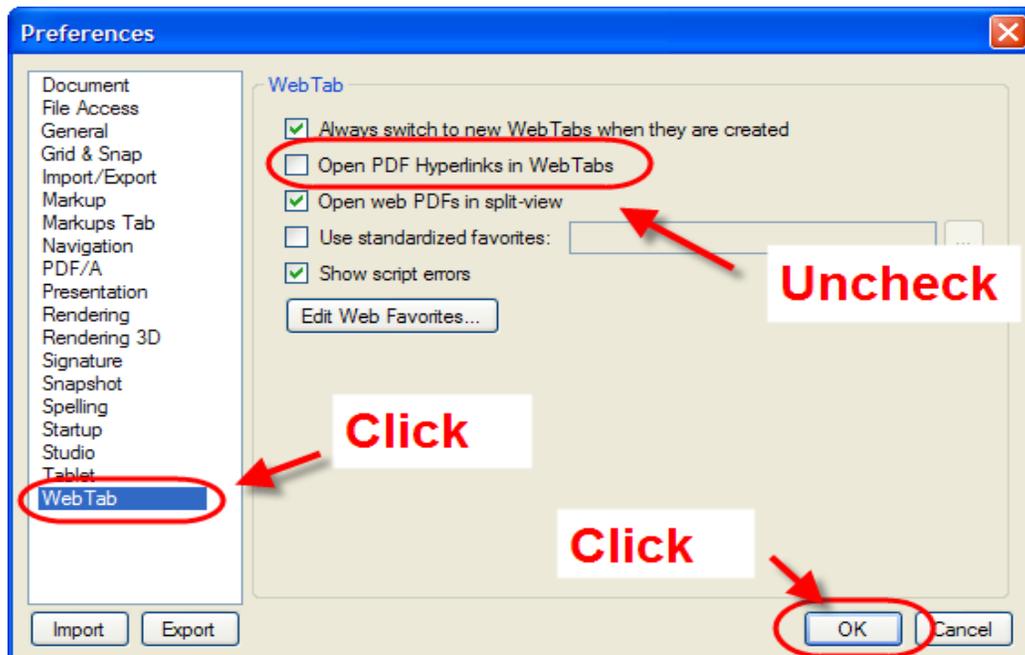


Figure 115 - Webtab Preferences

## Downloading the CTDOT Bluebeam Profile

1. Download this file and save it to your desktop: [CTDOT Bluebeam Profile](#)
2. Double click on the profile in the zipped folder on your desktop.

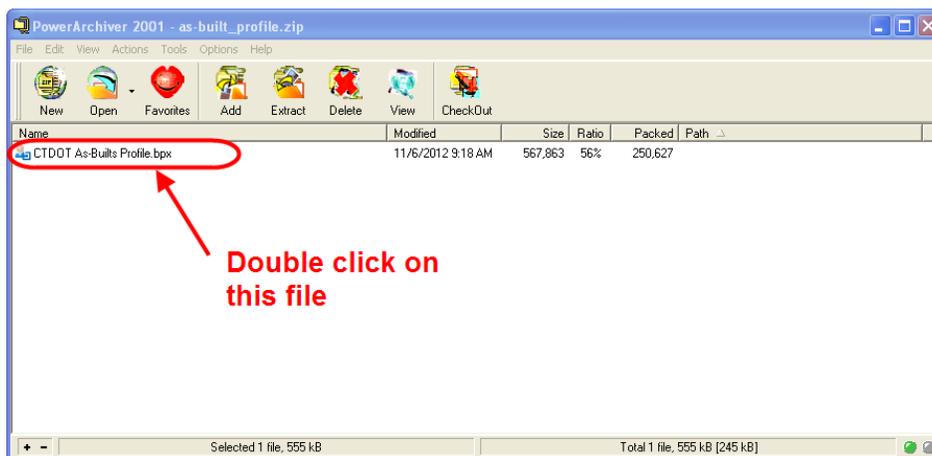
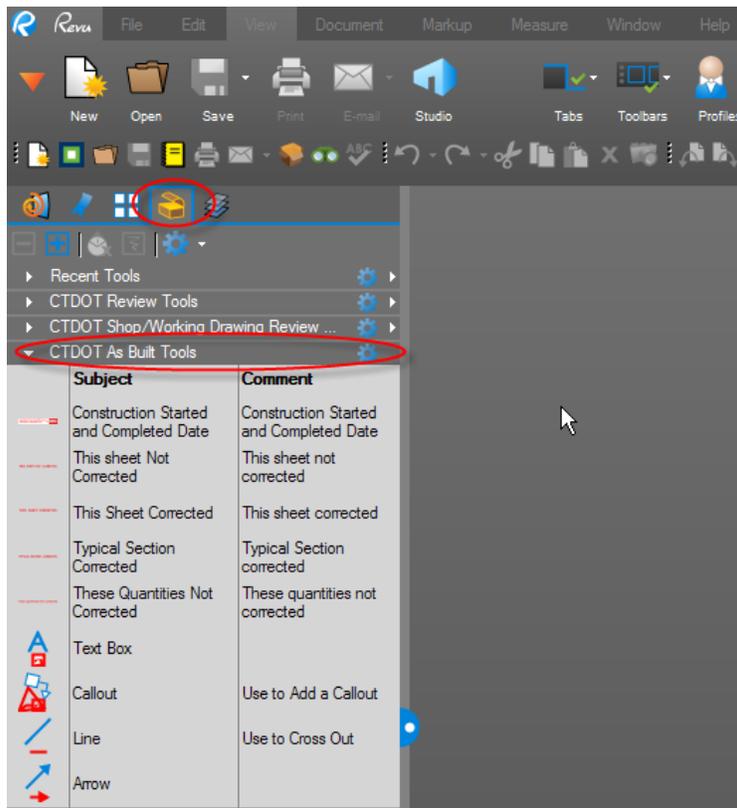


Figure 116 - Importing the Bluebeam Tools

3. In Bluebeam, on the left-hand panel, select the tool box icon and expand the CTDOT As Built Tools:



**Figure 117 - As-Built Tools**

All of the stamps and tools required for completing as-builts are now ready for use.

## Appendix B

### Usability of PDF Documents

This section contains information about viewing digital contract documents.

### Structure of Digital Plans

#### **Final Design Plans, Addendums, and Design Initiated Change Orders**

The contract plans are split up into discipline subsets, which are multiple sheet PDF documents digitally signed by the Designer. Addendums and Change Orders are also submitted as discipline subset, with only the changed sheets. For example, an Addendum that affects the 03-Bridge Subset will require the submission of a 03-Bridge\_A1 subset.

Digital Plans are located in the 100\_Contract\_Plans folder in Projectwise. Below is an example of a project's discipline subsets in Projectwise:

ProjectWise\_Admin\User Admin Areas\Calkins\0123-0145\100\_Contract\_Plans (PDF)\

Label (User Defined)	Sub Category Description	Description
01-General	Plans_04 - Final Plans (Adv)	01_General
02-Revisions	Plans_04 - Final Plans (Adv)	02_Revisions
02-Revisions_A1	Plans_05 - Addenda	02-Revisions_A1
02-Revisions_A2	Plans_05 - Addenda	02-Revisions_A2
02-Revisions_DIC	Plans_07 - Design Initiated CO	02-Revisions_Design Initiated Change Orders
03-Bridge	Plans_04 - Final Plans (Adv)	03_Bridge
03-Bridge_A1	Plans_05 - Addenda	03.Structures_A1
03-Bridge_C1	Plans_07 - Design Initiated CO	03-Bridge_C1
04-IMS	Plans_04 - Final Plans (Adv)	04_IMS
04-IMS_A2	Plans_05 - Addenda	04-IMS_A2
05-Traffic	Plans_02 - Final Design Plans	05-Traffic
05-Traffic_C2	Plans_07 - Design Initiated CO	05-Traffic_C2
06-Utility plans	Plans_02 - Final Design Plans	06-Utility plans
CTDOT_Highway_STD	Plans_10 - Standard Drawings	CTDOT_Highway_STD
CTDOT_Traffic_STD	Plans_10 - Standard Drawings	CTDOT_Traffic_STD

**Figure 118 - Discipline Subsets in Projectwise**

The figure above shows a project that includes multiple Addendums and Change Orders.

#### **As-Built's**

As-built's will be placed directly on the PDF Subsets using Adobe. This will be done by the inspector after the project has been completed.

## Functionality of PDF Digital Plans

The PDF digital plans have the following functions when the digital contract plans are created in accordance with this manual:

- Turn levels on and off
- Search for all text on the documents.
- PDF plans are measurable

## Digital Plan Levels

The plans have the ability to have their levels turned off and on. This can allow for easier viewing of the contract sheets. See below for turning levels on and off:

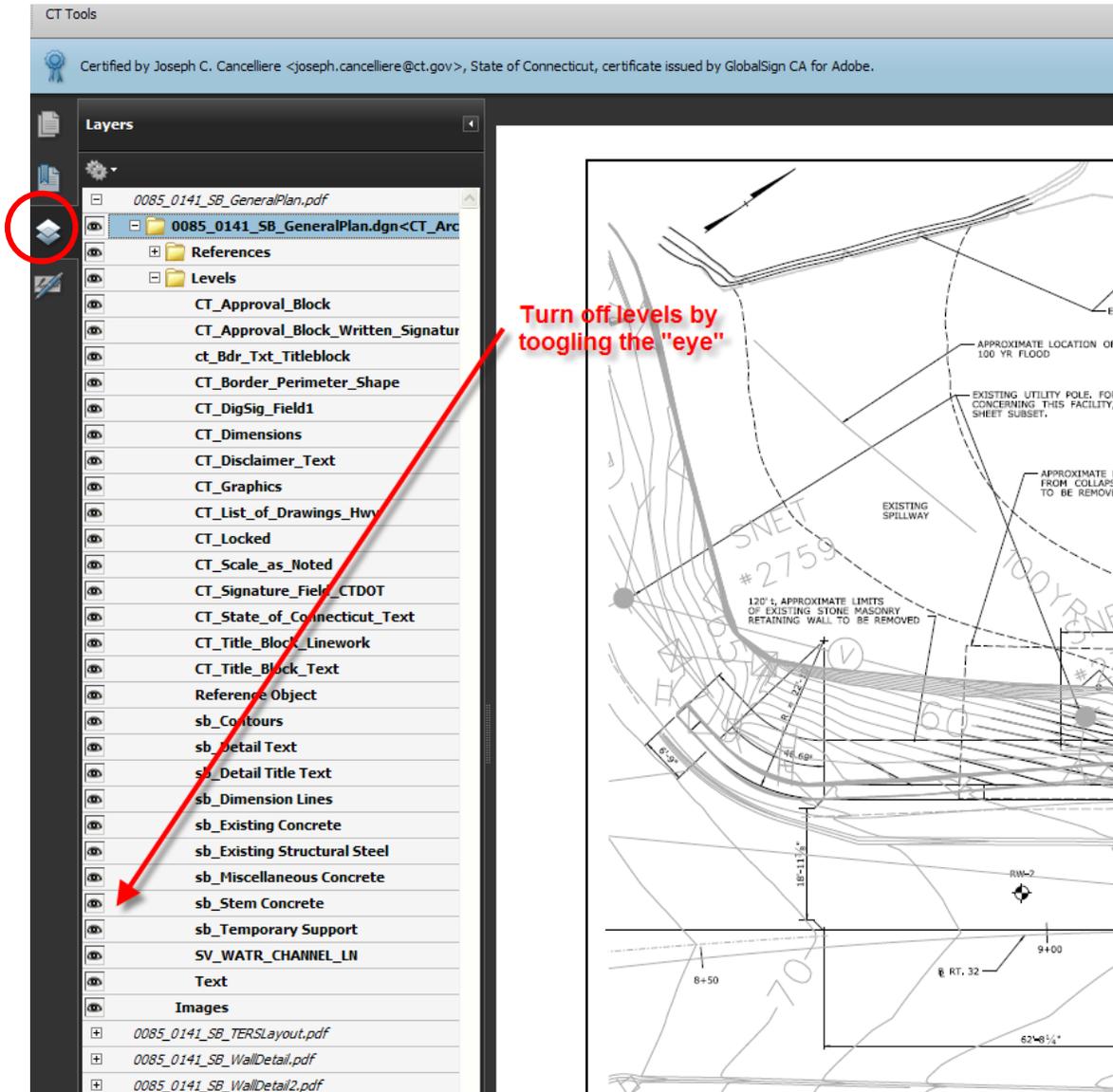


Figure 119 - Turning Levels On and Off

## Searching Digital Plans

The plans can be searched for any text located on them. This can be useful if searching for a certain pay item.

See below for searching the PDF Plans for text.

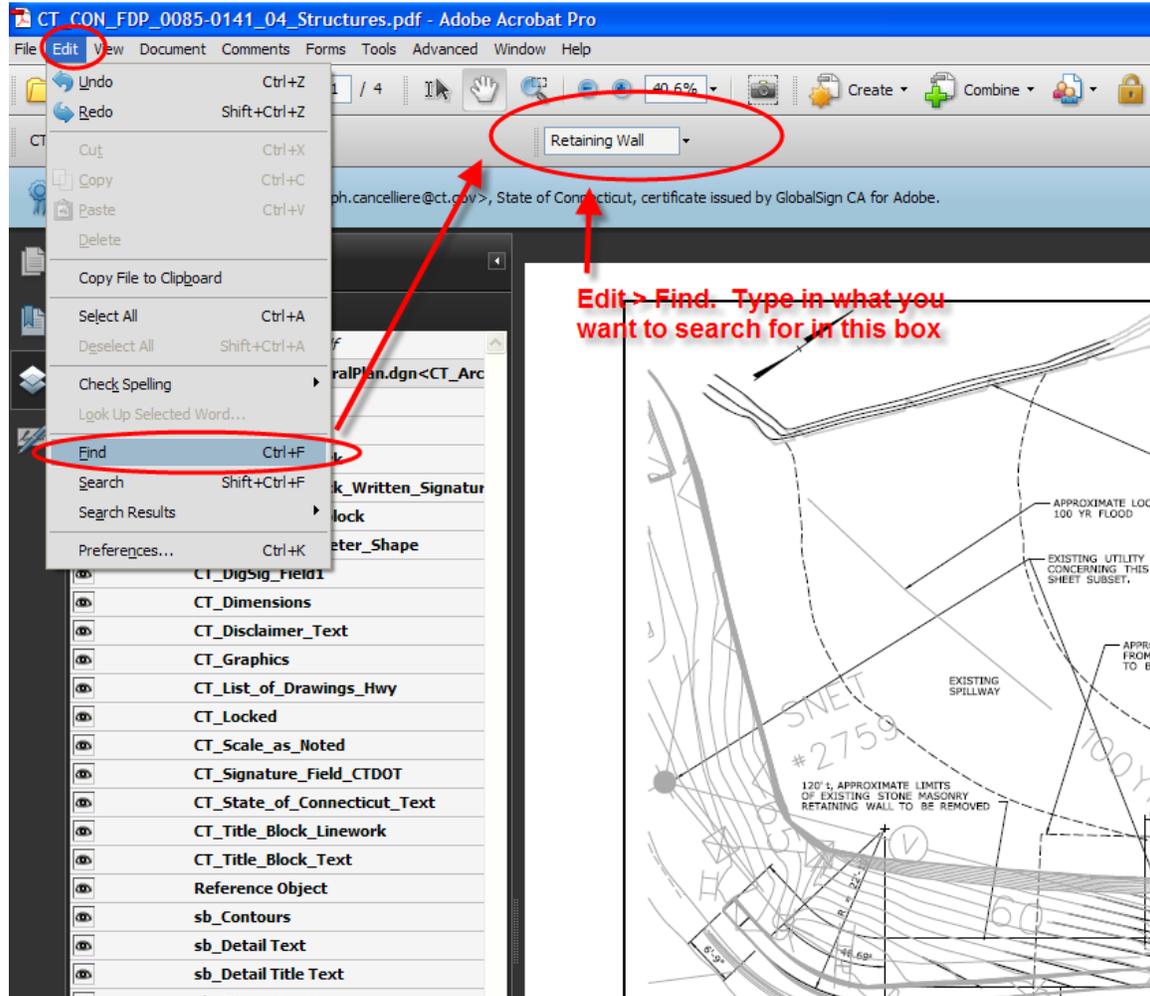


Figure 120 - Searching for Text in PDF Plans

## Measuring on the Digital Plans

The plans have the ability to be measured in PDF. This is helpful because a paper set does not need to be created for on desk measuring.

See below for measuring in PDF.

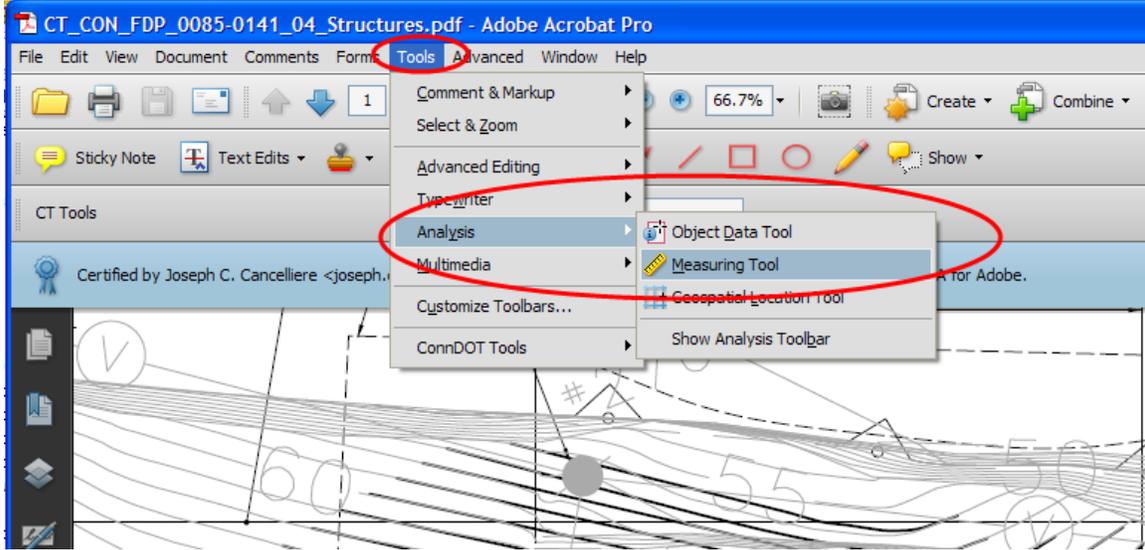


Figure 121 - Measuring Tool in Adobe

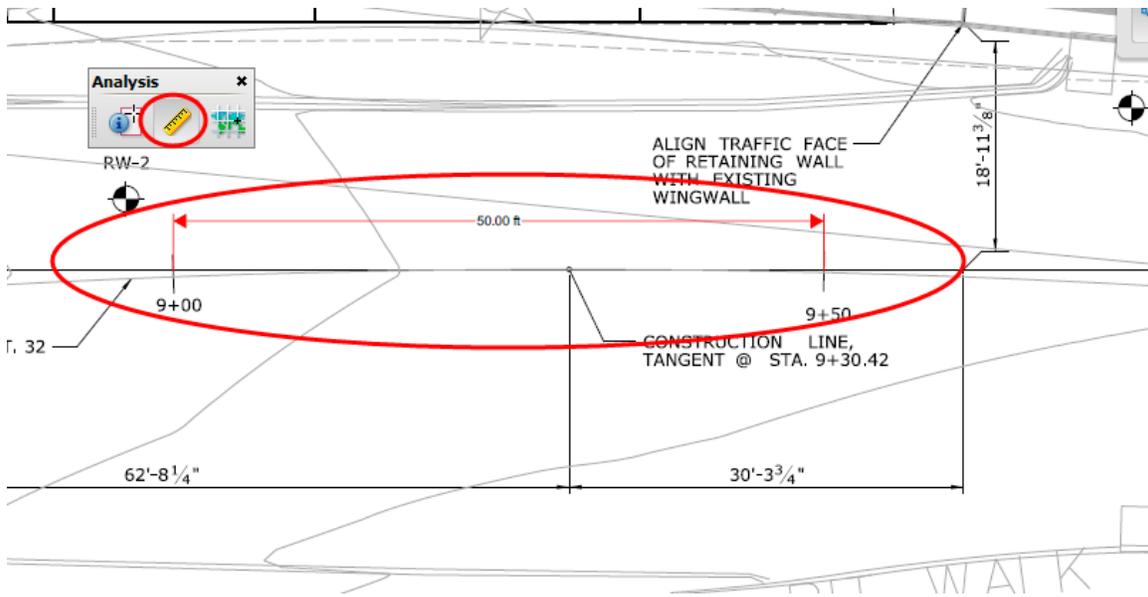


Figure 122 - Measuring Tool in Adobe

## Digital Specification Package

The FDP specification package will be one PDF document and located in the 110\_Contract\_Specifications folder. This package includes all specifications, Notice to Contractors, Wage information, etc.

The Addendum specifications prepared in the same way as the FDP specification package and will also be located in the 110\_Contract Specifications folder.

The Design Initiated Change Order specifications will be contained in one PDF document located in the 110\_Contract Specifications folder when they are released to the Contractor.

Some useful features on the digital specification package are:

- Search for any text in the document, [see section 5.2.2.](#)
- Bookmarks for each section in the specification package

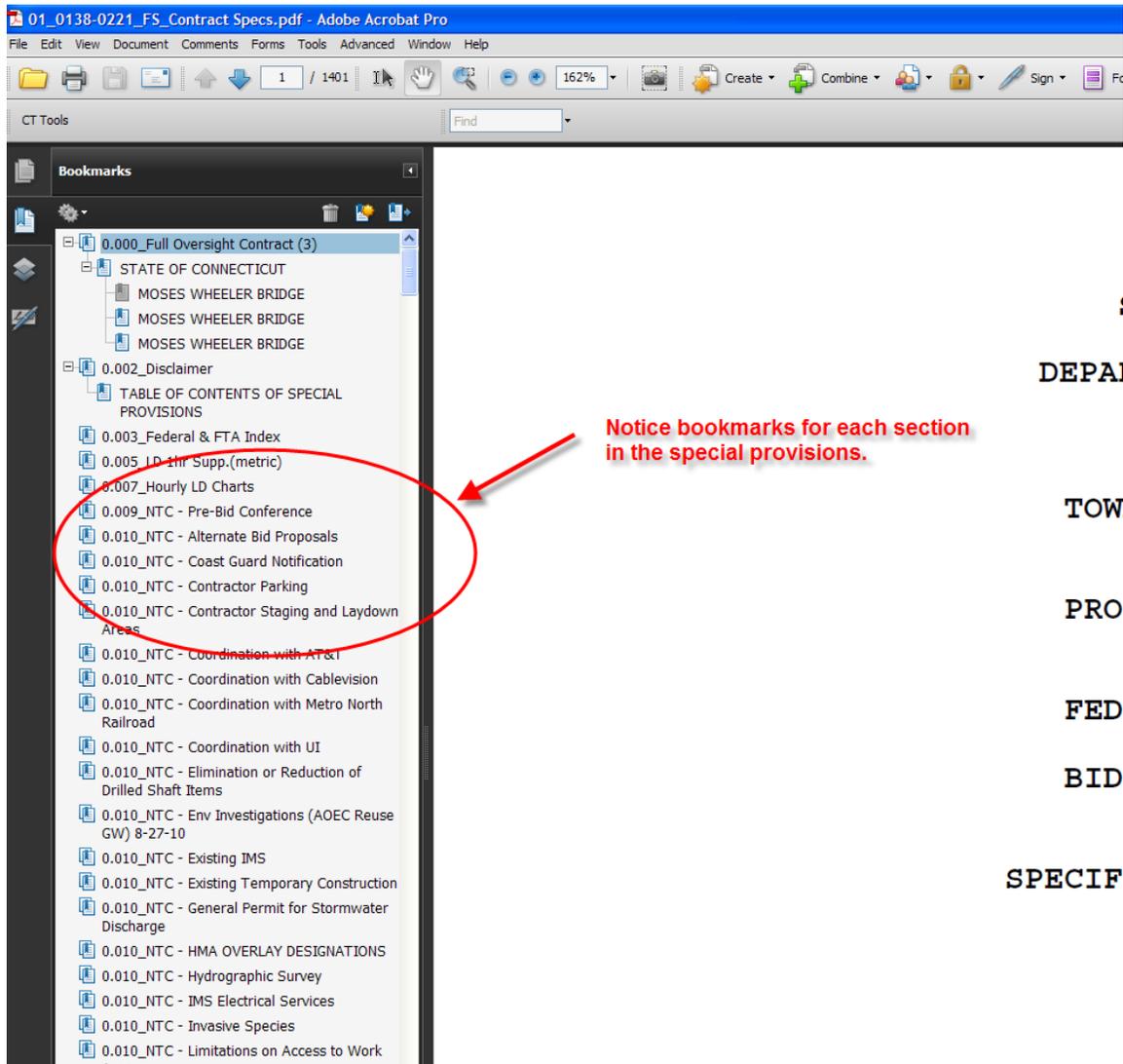


Figure 123 - Bookmarks in the Spec. Package