

Chapter 5.12 FINAL AS-BUILT PLANS PROCESS

5.12.1 PURPOSE

This procedure defines the process for preparing Final As-Built Plans. The standards provided are applicable to recording final quantities, revisions, and changes during construction in the **Final As-Built Plans**, as well as detailing the process to digitally sign and seal revisions, where applicable.

5.12.2 AUTHORITY

[Section 334.048\(3\), Florida Statutes \(F.S.\)](#)
[Section 20.23 \(3\)\(a\), F.S.](#)

5.12.3 REFERENCES

[Section 337.015\(3\), F.S.](#)
[Section 471, F. S.](#)
[Rule 61G15-23, Florida Administrative Code \(F.A.C.\)](#)

5.12.4 GENERAL

One complete set of the original digitally signed and sealed Plans shall be saved in the project files. A separate complete set of extracted Plans shall be maintained as the **Final As-Built Plans** for each complete construction project.

Contents of the **Final As-Built Plans** will vary, but shall always contain those sheets necessary to completely cover all work performed. The **Final As-Built Plans** shall include all changes, both design and construction, that indicate precisely how the project was constructed. At the conclusion of the project, the **Final As-Built Plans** shall be made available for review to the District Final Estimates Office (DFEO).

The forms referenced in this Section can be found on the Department's website:
<http://www.fdot.gov/procedures/formsandprocedures.shtm>.

5.12.5 DIGITAL SIGNING, SEALING AND CERTIFYING FOR AS-BUILT PLANS

The Department requires the use of digital certificates meeting National Institute of Standards and Technology (NIST) assurance level of three (3) or higher when signing

documents digitally. The digital certificate contains a unique digital ID that can be validated for authenticity. **Section 668.003(3), F.S.** defines using a certificate as a digital signature. For more information on digital signatures:

<http://www.fdot.gov/Construction/eConstruction/DigitalSignatures.shtm>

Rule 61G-15.23, F.A.C. states that affixing a digital signature shall constitute the sealing of engineering work as defined in **Section 471.025, F.S.** The pictorial representation of the seal is not required.

When a document is digitally signed, it is locked to prevent any modifications to the document. The document must be extracted to “break” the certificate and allow editing. Plans and revisions from the Engineer of Record are digitally signed.

When a document is digitally certified, the document is certified for accuracy and locked to prevent changes, but will allow markups and digital signatures to be added. Signatures can be validated after markups are added. The **Final As-Built Plans** shall be digitally certified by the Resident Engineer (RE) prior to submittal to DFEO.

5.12.6 RECEIVING THE SET OF CONTRACT PLANS

(A) District Level Responsibilities

The District Construction Office will be responsible for providing the Plans and Back up Files to the Resident Office (RO) for use during construction.

(B) Resident Level Responsibilities

The original electronic Plans set should be saved in the project files upon receipt. If not provided by component, the plans should be extracted by the RO into the different components and saved to the **Final As-Built Plans** folder of the project files. Any and all changes made to the project will be electronically reflected on the extracted plans. No pages shall be discarded from this set of plans. All revisions will be added to this set of plans. This set of plans will be the **Final As-Built Plans** and made a part of the final estimates package.

5.12.7 UPDATING THE PLANS AFTER CONTRACT AWARD

(A) Changes By Engineer of Record (EOR)

There are situations when it is necessary or desirable to require the modification of the Plans by the EOR after a project is awarded: the Plans may have contained errors or omissions; field conditions may have changed; or the scope of the project may have been

revised. Once the EOR has provided the electronically revised sheet(s) to the District, it is the responsibility of the Resident Engineer (RE) to ensure the sheet(s) are saved in the project file. The revised sheets will be extracted from the signed and sealed file and inserted into the **Final As-Built Plans** file. The original sheet(s) will be voided out.

(B) Revisions for As-Built Conditions

When a Professional Engineer (PE) is making certain changes that reflect the as-built conditions, it has been determined by the statement below, the PE is not considered a “successor engineer”.

“Where changes arise relating to the fact that an engineering engagement to provide as-built design documents may not be the same professional service as performing engineering design services. Many PE’s design and provide as-built services for the same project, there is no requirement that the same PE who designs the project must perform the as-built services. Therefore, since the services being provided are different in each case, a PE who only prepares, and digitally signs and seals the as-built drawings is not a “successor engineer” as discussed in [Rule 61G15-27.001, F.A.C.](#) and need not follow the provisions of that Rule.”

For revisions not made by the EOR, the proper language of qualification is required on the **Final As-Built Plans**. The statement will be added to the **Final As-Built Signature Sheet(s)**. This language should note that, by signing and sealing the disclaimer, the responsible PE is only taking responsibility: (1) for the changes in the plans and not the entire set of plans; (2) and for the specific change(s) only shown in redline, not for the entire page.

Disclaimer to use when changes have been made:

“The above named professional engineer shall be responsible for the following changes, indicated in redline revision, in accordance with Rule 61G15-23.004, F.A.C. This project was constructed in substantial compliance with these plans as provided by the Engineer of Record.”

If **Final As-Built Plan** sets have no changes, the RE shall digitally sign and seal the **Final As-Built Signature Sheet(s)** with a disclaimer that states:

"This project was constructed in substantial compliance with these plans as provided by the Engineer of Record. These plans reflect "as-built" conditions and no changes were made to the plan sheets."

(C) Revisions by Others

Changes made by the Contractor's EOR or Specialty Engineer shall follow the criteria in the **Specifications** and **Plans Preparation Manual (PPM)** for revisions.

(D) Revisions using CADD

If CADD is utilized to make changes, the requirements in this chapter, and the [CADD Manual, Topic No. 625-050-001](#) must be met.

Resident Level Responsibilities

If a Resident's Office chooses to make changes electronically using the native CADD files to show as-built conditions (i.e., field changes, such as extended sidewalk, or curb and gutter), they may use the cloud revision utility from the Bar Menu in MicroStation or other mark-up tools in other software. The **CADD Manual, Section 5.14** describes the process of generating the proper naming convention and standards for updating the CADD files electronically. If revisions are performed other than by cloud revision, such as completely manipulating the native CADD file, all changes will conform to the same procedures and requirements outlined in the **CADD Manual, Chapters 2, 4 & 5** and the **PPM, Volume 1, Chapters 19 & 20** and **Volume 2, Chapter 30**. After the native CADD file has been revised to reflect as-built conditions, a PDF version shall be created for the **Final As-Built Plans** folder.

(E) Revision Process

Resident Level Responsibilities

The **Final As-Built Plans** shall be updated as the project progresses. All additions, deletions, and revisions shall be clearly delineated to reflect the actual conditions of the completed project. If an entire plan sheet is revised, the original plan sheet shall have **VOID** imprinted using red text on it and the new plan sheet shall be inserted after the original (old) sheet in the set of **Final As-Built Plans**, with the exception of the **Key Sheet**. The voided **Key Sheet(s)** should follow the revised **Key Sheet(s)**. All revised sheets will be defined on the **Key Sheet(s)** of the appropriate component.

Each plan component will have its own **Final As-Built Signature Sheet(s)** inserted behind the **Key Sheet(s)**. All changes made in the field not requiring an engineering analysis will be indexed on the **Final As-Built Signature Sheet(s)** and digitally certified and signed and sealed by the PE in charge of the project. The **Final As-Built Plans** will be digitally certified, per **CPAM, Section 5.12.5**, to allow the DFEO personnel to make comments where appropriate. No pages shall be discarded from this set.

(1) Marking Conventions

The following procedure shall be performed when making changes to the ***Final As-Built Plan*** set(s):

a. Resident Level Responsibilities

All changes shall be made electronically on the ***Final As-Built Plan*** Set(s) with redline revision.

b. District Level Responsibilities

All markups by the Initial Reviewer shall be made with blue line revision.

All markups by the Overviewer shall be made with green line revision.

If a consultant is hired, on behalf of the District Final Estimates Office, they shall follow the appropriate marking conventions for the role they are supplementing. The function of the DFEO Initial Reviewer and Overviewer are detailed in the ***Review and Administration Manual, Section 4.2.1.***

5.12.8 FINAL AS-BUILT PLANS REVISIONS

The following information shall be the minimum standard for preparing ***Final As-Built Plans*** on a typical project.

Resident Level Responsibilities

(1) The Key Sheet

The ***Key Sheet*** of the set of ***Final As-Built Plans*** shall show the following data ([see Figure No. 5.12-1](#)):

- a. ***Final As-Built Plans*** shall be prominently redlined across the top of the sheet in place of or above the “Contract Plans” preprinted line and those words shall be lined through or completely deleted.
- b. On the right side and near the lower corner, the following information shall be displayed in red ink on the ***Key Sheet***:
 1. Name of Prime Contractor

2. Name of Prime Consultant Construction Engineering Inspection (CCEI) (If In-House Project, so state)
 3. Name of District Secretary, RE, and Project Manager
 4. Project Administrator
 5. Date Work Started
 6. Date of Final Acceptance
- c. A complete Index of the related documents shall be shown on the left side of the **Key Sheet, not to exclude the following:**
1. A complete list of permanent field books and a general description of their contents shall be shown.

Note: It is recommended to use Form No. 700-050-61 - Final Measurement "Miscellaneous" instead of field books as a cost savings to the Department.
 2. Additional plans such as shop drawings, working drawings, etc.
 3. Other As-Built Plans or Drawings, such as Jack & Bore, Boring Path Reports, Bore Logs, Plowing, or Signalization shall be listed as well.

(2) The Design and Final As-Built Signature Sheet

- a. Design changes made by the professional's area of responsibility shall follow the guidelines set forth in the **PPM, Volume 1, Chapter 20**. This chapter defines how changes or revisions should be indexed on the **Final As-Built Signature Sheet(s)** along with the digital signature.
- b. All major revisions to the **Final As-Built Plans** during construction shall be shown on the **Final As-Built Signature Sheet(s)** for each component. The information shall include:
 1. Sheet number on which the change is shown in the plans
 2. A brief description of the revision

- c. All project descriptions, Financial Project ID Numbers, length, etc., shown on the **Key Sheet** shall be corrected to agree with the actual construction.

(3) Typical Section Sheets

Authorized revisions to the typical section shall be marked appropriately. Documentation for such revisions shall be included as a part of the final estimates package. Some typical examples include:

- a. Increase or decrease in thickness
- b. Change in type of material
- c. Substitution of pay items
- d. Change in limits of work
- e. Addition/Deletion of items of work
- f. Other Geometric designs (such as varied cross slope)

(4) Asphalt Roadway - As-Built Pavement Data Form

The purpose of the **Roadway-As-Built Pavement Data, Form No. 700-050-12** is to record main line pavement data as the pavement operation progresses. This form is to be completed after paving operations and will provide a complete record of the composite make-up of the pavement applied to each project. The objective is to provide a Pavement Design Engineer with sufficient information and necessary data that can be used to develop and apply proper engineering practices for future roadway development, design, maintenance, etc. The RE will be responsible for ensuring that this data is available.

NOTE: Only reflect pavement data for the mainline (through lane). Data for ramps, shoulders, side roads, auxiliary lanes, or non-state road facilities are not needed. The Roadway Verification Technician should perform this operation and complete the form to reflect the actual pavement composition. Once the form(s) have been generated, upload into Electronic Document Management System (EDMS), under the Final Estimates folder, and record the EDMS number on the **Final Plans and Estimates Transmittal Form No. 700-050-20**.

(5) Summary of Pay Items

The **Plan Summary Sheets** for each of the major groups of pay items are to be included in the **Final As-Built Plans**. Pay item quantities shall be updated on the Summary of Pay Items in the appropriate **Pay Item Summary Box** as detailed in [CPAM, Section 5.13](#).

(6) Plan Sheets

The **Plan Sheet** details for all the major groups of plans become the permanent historical record of the construction project. All changes in construction that would constitute a conflict in this record shall be clearly delineated on the **Final Plan Sheets**. Insert revisions and cross out all incorrect data. The following revisions must be noted:

- a. Revisions to the horizontal and vertical alignments as shown on the original plans
- b. Stations or equations that have been introduced or revised during construction
- c. Intersection and crossover details that have been modified or relocated
- d. Inlets, manholes, box culverts, and end walls that were added, relocated, revised, or deleted
- e. All sidewalk that was modified in thickness or otherwise, and all curb and gutter, and shoulder gutter that was added, revised, or deleted
- f. All driveways that were not shown on the original plans, or were shown but are no longer in existence, or were modified in thickness or otherwise
- g. All ditch locations and grades that were adjusted during construction
- h. Changes in fencing items, including gate location
- i. Sign locations changed and pavement markings that were modified
- j. All signal details that changed during construction
- k. All Bridge, Approach Slab, and Lighting details that are different from the actual construction

- I. Bench Marks (BM) and their descriptions that were set during construction shall be added to the profile portion of the **Plan Sheets**
- m. All Utility relocates and/or conflicts shall be reflected on the **Utility Adjustment Sheets**

(7) Summary of Drainage Structures, Optional Materials Tabulation and Drainage Structure Sheets

Revisions shall be made on the **Final As-Built Plans** set, to reflect:

- a. Plan lengths changed to reflect the actual construction length when an authorized field change is made or a plan error is noted
- b. Changes in flow line elevations shall be shown on the **Plan Profile Sheets**
- c. Changes in stations or offset dimensions
- d. Changes in size of structures
- e. Added/Deleted structures
- f. Type of pipe material and thickness used at each structure shall be shown on the **Drainage Structures Sheets** and the **Optional Materials Tabulation Sheets**. The as-built column will be checked to indicate what type of pipe material and thickness was used at each structure.
- g. Types of inlets and manholes constructed shall be indicated
- h. When the method of measurement is plan quantity for cross drain and storm sewer pipes, plan errors shall be distinguished from field revisions due to different tolerances being applicable.
- i. **Lateral Ditch Sheets:** All adjustments in horizontal alignment of flow line grade shall be delineated on the **Plan and Profile Sheets**. The cross section shall be adjusted to reflect the revision if a pay quantity adjustment is required.

(8) Cross Section Sheets

The disposition of the **Cross Section Sheets** with regard to a set of **Final As-Built Plans** depends on the method of payment set up for the earthwork items (refer to the **Special Provisions** of each Contract).

- a. **Excavation Borrow Pits, Excavation Subsoil, and Excavation Channel on Cubic Yard Basis:** Final **Cross Section Sheets** and volumetric computations are to be prepared and included in the **Final As-Built Plans**. They are required to reflect the actual work accomplished and are the basis of final pay quantities. The original plan cross sections shall remain a part of the **Final As-Built Plans**.
- b. **Embankment, Regular Excavation, and Lateral Ditch Excavation on Cubic Yard Plan Quantity Basis:** The original design cross sections are used as the basis for both plan and final pay quantities and to control grading operations. They are to be retained as part of the **Final As-Built Plans**. Additional cross sections to correct plan errors and/or to reflect field revisions are prepared and added to the **Final As-Built Plans**. Detailed instructions pertaining to earthwork are included in **Section 5.16**.

(9) Final As-Built Bridge Plans

The Structures Designer and Facilities Engineers need to have accurate bridge records available for inspection, maintenance, rehabilitation, and emergency repair operations, and any future widening operations. The following information shall be recorded on the proper matrices, plans sheets, log books, and forms for bridge projects:

- a. As-Built load rating calculations, input files, output files and load rating summary sheets or letter from EOR stating that the as-bid load ratings represent the as-built condition. Clearly list casting dates and stressing dates for all post-tensioned concrete components in the as-built load rating calculations. Load Ratings, based on as-built condition shall be recorded on the appropriate forms and scanned into EDMS in the appropriate group and document type with structure number identified.
- b. Drill Shaft Inspection Records shall be kept with the **Final As-Built Plans**.
- c. Pile Driving Log Books/Pile Driving records shall be recorded and appropriately marked as permanent record and scanned into EDMS.

- d. All crack observations on the structures shall be documented either through detailed sketches or "Crack Maps", it is the responsibility of the CCEI Inspector to perform this inspection (as outlined in the **CPAM, Section 10.3.5**).
- e. Shop Drawings
- f. Engineer approved repairs due to Request for Corrections (RFC) not included in the **Final As-Built Plans**. For further explanation see **CPAM, Section 8.11**.

The above items should be documented in the appropriate manner and should be stored in EDMS in the appropriate directory. Original documents may be turned over to the District Structures and Maintenance Engineers for their use. Ensure all documents have been Quality Control reviewed to ensure correctness and legibility.

The electronic design files for the Category II (see **PPM Volume 1, Chapter 26** for category definitions) bridge plans will be updated to reflect as-built conditions in the native CADD format. The Districts will have the option to have the appropriate EOR or the CCEI consultant perform this CADD service. The plans shall be submitted with the final estimate. The EOR shall update the bridge load ratings based on the as-built bridge plans or review load ratings submitted by the Contractor's EOR for contractor initiated revisions per **CPAM, Section 10.11**.

The RE will markup sheets requiring minor (non-engineering analysis) as-built changes and show those changes on the **Final As-Built Signature Sheet(s)**. For major changes, the RE will send these changes back to the appropriate EOR as outlined in **PPM Volume 1, Chapter 20**. Any changes made by value engineering decisions will be digitally signed and sealed by the Contractor's EOR. This may be a Cost Savings Initiative Proposal (CSIP) redesign or an original design of certain components including Shop Drawings. The Contractor's EOR will send the signed and sealed plan changes back to the RE for inclusion into the **Final As-Built Plan** set.

Prior to submittal of the final estimate package, the electronic as-built bridge plans will be secured with a digital certification.

5.12.9 CHANGES AFTER SUBMITTAL OF FINAL ESTIMATES PACKAGE

Resident Level Responsibilities

It will be the ROs responsibility to make any changes, required due to findings by the DFEO during the PAR, that modify the final plans. All changes will be made in accordance with this Manual.

Exception to the above: Updates to an item's quantity by the DFEO after submittal of the final estimates package with no corresponding modifications to the plans will not require changes or new digital signature by the RO.

5.12.10 FINAL AS-BUILT PLANS HANDLING PROCESS

District Level Responsibilities

After the final close-out/Post Audit Reviews (PARs), the DFEO will ensure all required documents are included in the electronic files in EDMS.

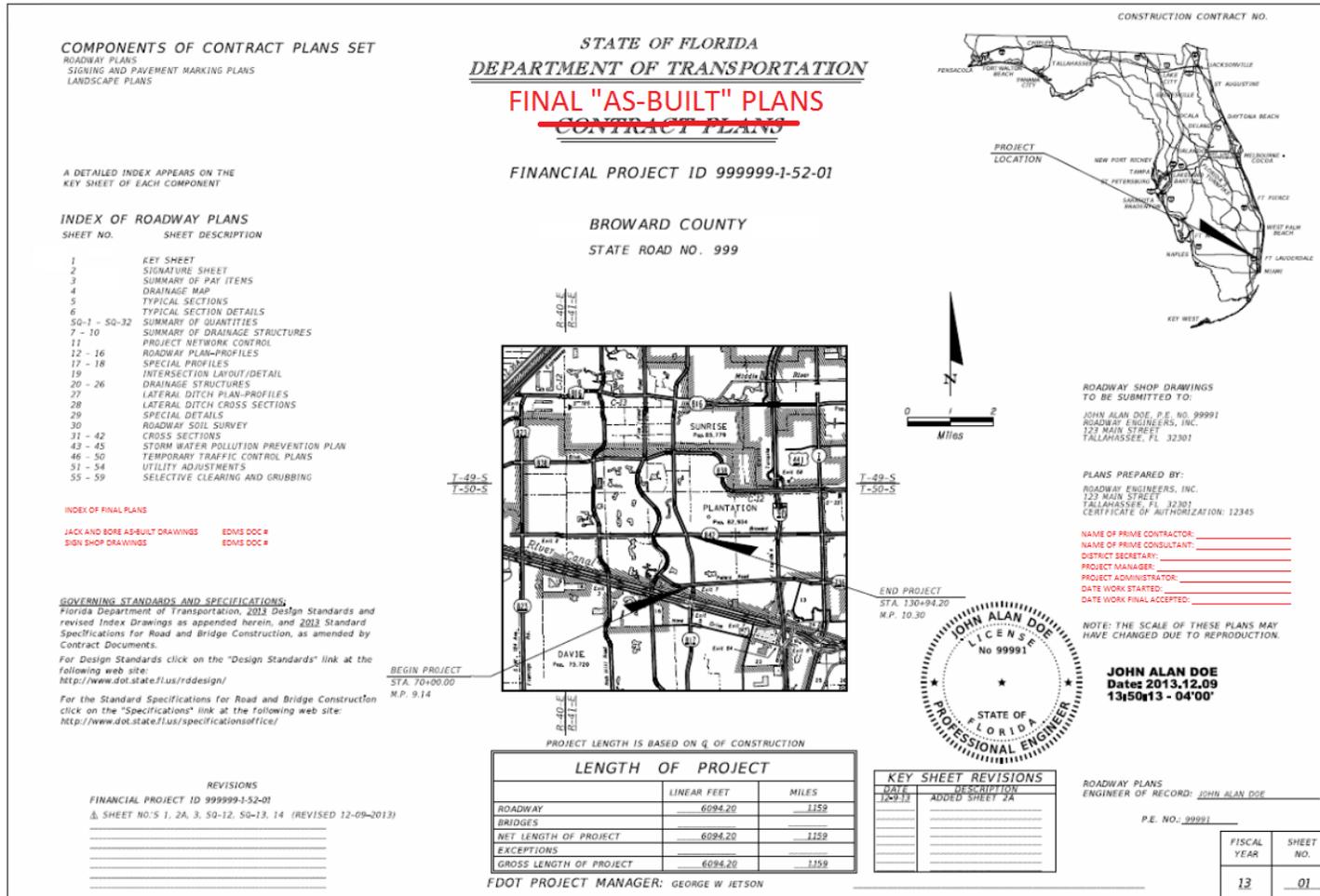
Projects pending litigation will be kept available until they are finalized.

The Department's procedure for Record Retention shall be adhered to as outlined in the *Records Management Procedure, Topic No. 050-020-025*.

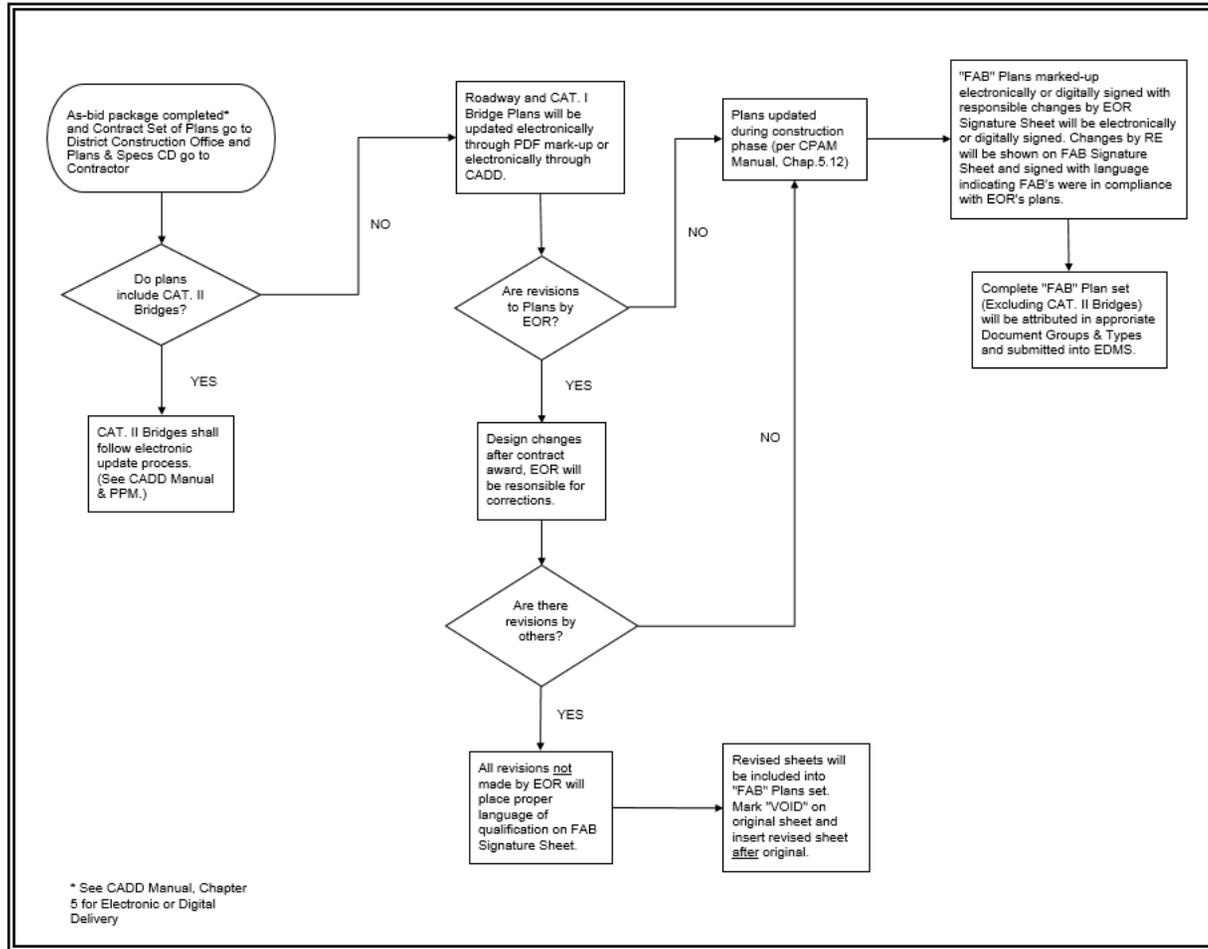
5.12.11 LIST OF FIGURES FOLLOWING THIS CHAPTER

Figure No. 5.12-1Key Sheet
Figure No. 5.12-2 Final As-Built Plans Process
Figure No. 5.12-3Final As-Built Signature Sheet

Figure 5.12-1 KEY SHEET



**Figure 5.12-2
 FINAL PLANS PROCESS**



**Figure 5.12-3
 FINAL AS-BUILT SIGNATURE SHEET**

THIS DOCUMENT HAS BEEN DIGITALLY SIGNED AND SEALED BY:
JOHN ALAN DOE
Date: 2013.10.09
16:52:48 - 4'00'
PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED. THE SIGNATURE MUST BE VERIFIED ON THE ELECTRONIC DOCUMENTS.

ROADWAY ENGINEERS, INC.
 123 MAIN STREET
 TALLAHASSEE, FL 32301
 CERTIFICATE OF AUTHORIZATION: 12345
 JOHN ALAN DOE, P.E. NO. 99991

THIS DOCUMENT HAS BEEN DIGITALLY SIGNED AND SEALED BY:
JOHN ALAN DOE
Date: 2013.10.09
16:52:48 - 4'00'
PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED. THE SIGNATURE MUST BE VERIFIED ON THE ELECTRONIC DOCUMENTS.

ROADWAY ENGINEERS, INC.
 123 MAIN STREET
 TALLAHASSEE, FL 32301
 CERTIFICATE OF AUTHORIZATION: 12345
 JOHN ALAN DOE, P.E. NO. 99991

Digital Signature

Signature Appearance

Statement of Qualification

List of Responsible Sheets

"THIS PROJECT WAS CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THESE PLANS AS PROVIDED BY THE ENGINEER OF RECORD. THESE PLANS REFLECT "AS-BUILT" CONDITIONS AND NO CHANGES WERE MADE TO THE PLAN SHEETS."

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING CHANGES, INDICATED IN REDLINE REVISION, IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C. THIS PROJECT WAS CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THESE PLANS AS PROVIDED BY THE ENGINEER OF RECORD.

ROADWAY PLANS

SHEET NO	SHEET DESCRIPTION
1	KEY SHEET
2A	SIGNATURE SHEET
SQ1-SQ12	SUMMARY OF QUANTITIES
4	TYPICAL SECTION
14	PLAN SHEET

SIGNING & PAVEMENT MARKING PLANS

SHEET NO	SHEET DESCRIPTION
S-2	TABULATION OF QUANTITIES
S-5	PLAN SHEET

NO CHANGES

WITH CHANGES

REVISIONS				ROADWAY ENGINEERS, INC. 123 MAIN STREET TALLAHASSEE, FL 32301			STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. 2A
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	FINAL "AS-BUILT" SIGNATURE SHEET			
				999	BROWARD	999999-1-52-01				