Chapter 14

Final Engineering Design Process

14.1 General 14-1

14.2 Final Engineering Design 14-1

14.3 Contract Plans Preparation 14-3

14.4 Specifications and Special Provisions 14-3

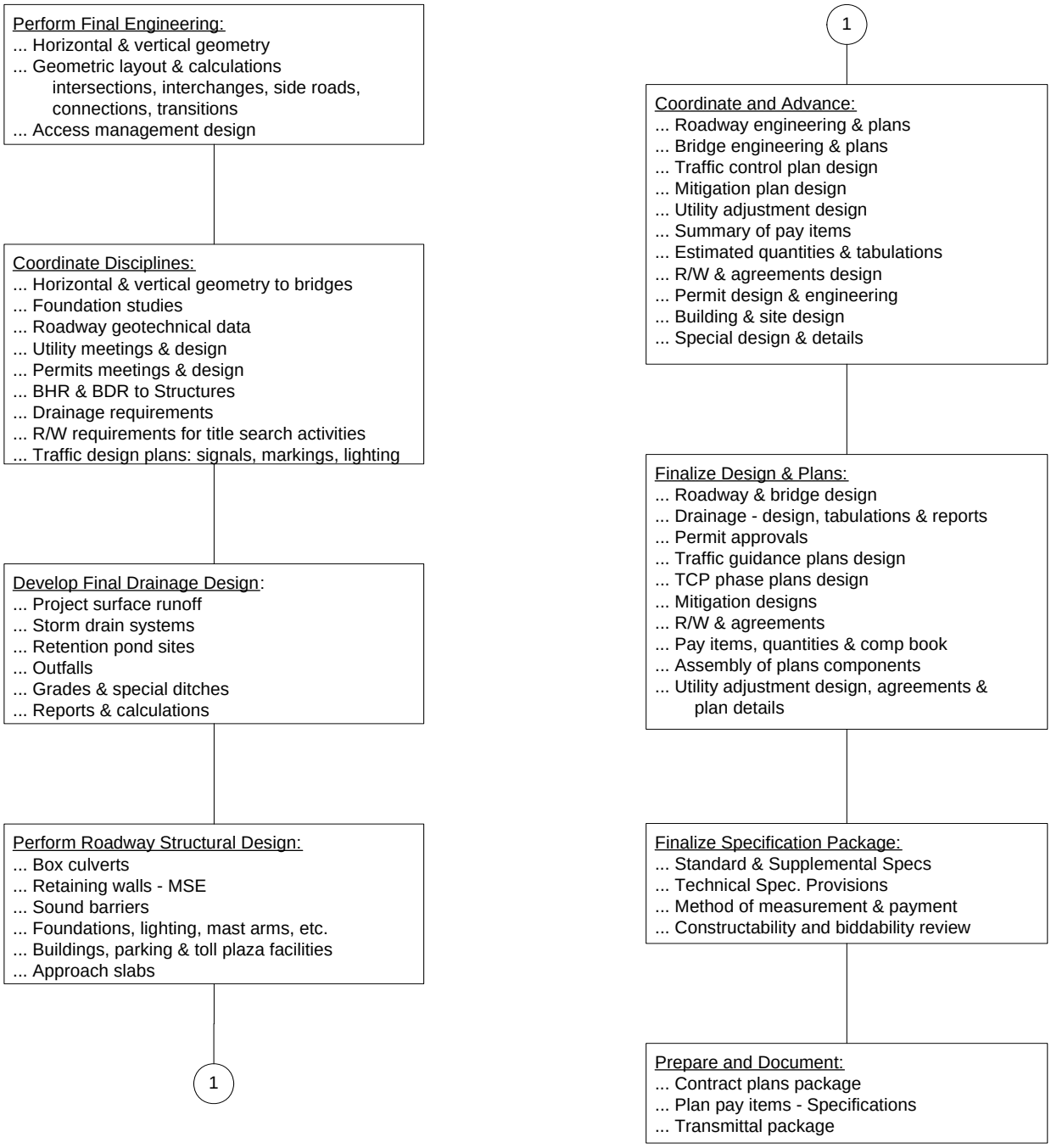
14.5 Pay Items and Summaries of Quantities 14-4

14.6 Assemble Contract Plans Package 14-4

Exhibits

Exhibit 14-A Major Activities – Final Engineering Design Process 14-ii

Exhibit 14-A Major Activities – Final Engineering Design Process



Chapter 14

Final Engineering Design Process

14.1 General

The final engineering design process follows the initial engineering design process and review (see ***Chapters 13*** and ***16*** of this volume). The final engineering design phase should be roughly 50% of the total effort. The primary objective of the final engineering design phase is to prepare contract plans and specifications that can be used to bid and construct the project with a minimum of field changes, delays, and cost overruns.

14.2 Final Engineering Design

The Engineer and Project Manager must coordinate all activities to ensure that the quality, accuracy, and appropriate decisions go into the performance of each step. The project quality control should include a plan-do-check routine for each set of activities or operations.

The major design activities include, but are not limited to, the following:

1. Pavement design
2. Drainage design
3. Structural (bridge) design
4. Structural (roadway) design
5. Roadway design including access management, earthwork, geometrics, ADA, etc.
6. Traffic plans design including signing, marking, signals, lighting, etc.
7. Utility adjustment design
8. Permit preparation design including ponds, mitigation, etc.
9. Traffic control plans (work zone) design
10. R/W requirements design
11. Building and site design including landscaping, ADA, transit, etc.
12. Estimates and computation book preparation
13. Specifications and special provisions
14. Landscaping design
15. Sound barrier design

Project stationing information is to be checked and entered into the Work Program Administration (WPA) system during final engineering design. This information is important for tying construction records, such as material coring, sampling and testing to other databases. The information is entered by stations, which are related to roadway mile post for later information retrieval.

The project designer is responsible for finalizing the project stationing. The District Design Engineer should designate an individual to be responsible for coordinating the input of stationing information into the WPA system.

The station equations and begin/end stations are entered into the WPATS27A computer screen under IMS on DOTNET. Update access to this screen is granted through the Work Program Development Office in Tallahassee. While entering the station information, it is important to check to see if the milepost limits in WPA are still accurate. This can be accomplished by reviewing the WPATS27A computer screen. If the project length has changed, the District Work Program Office should be advised to correct the mileposts.

This information will become increasingly important as Geographic Information Systems increase in use and project locations are automatically mapped based on milepost limits.

14.3 Contract Plans Preparation

The outcomes of the engineering design activities are component sets of contract plans developed using CADD. The major component sets may include:

1. Roadway
2. Signing and Pavement Marking
3. Signalization
4. Intelligent Transportation Systems (ITS)
5. Lighting
6. Landscape
7. Architectural Plans
8. Structures Plans

Utility Joint Participation Agreement Plans have a separate Financial Project ID and are placed in the back of the contract plans set.

These component sets, the specifications package, and the TRNS*PORT pay item listing and quantities are assembled and packaged as the construction contract letting documents.

14.4 Specifications and Special Provisions

The Engineer of Record must develop engineering designs that can be constructed, controlled, measured and paid for under the current edition of the FDOT ***Standard Specifications for Road and Bridge Construction***. In the event the work required is not covered by the standard specifications or the supplements and special provisions thereto, the Engineer must develop Technical Special Provisions to be made part of the contract for this project. The Engineer can obtain Department procedural guidance to assist with the preparation.

14.5 Pay Items and Summaries of Quantities

As the engineering plans and specifications are prepared, the quantities are calculated, tabulated, and summarized by Pay Item (of work) as stipulated by specifications and the ***Basis of Estimates Handbook***. The summary of pay items is updated as quantities are determined and summarized.

14.6 Assemble Contract Plans Package

The completed plans, specifications, and District estimate are transmitted to the central office for letting or they are assembled and held in the district for district advertisement and letting. ***Chapter 20*** of this volume provides further guidance on the contents of the transmittal.