PS&E Preparation Manual

Revised October 2017

Manual Notice 2017-1

From: Camille Thomason, P.E.
Director, Design Division

Manual: *PS&E Preparation Manual*

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Purpose

Chapter 1 and Chapter 3 are being revised:

- To comply with SB 312 and Senate SB 82 regarding roadway closures during Key Dates / Special Events.

Contents

Chapter 1, Section 1:

- Added “Road Closures During Special Events” link under Overview.
- Added “Key Dates / Special Events when roadway closures are prohibited” as a diamond bullet point under Description for Design Concept Conference.
- Added “Road Closures During Special Events” section to include language describing the requirements for SB 312 and 82.

Chapter 3, Section 3:

- Added “Road Closures During Special Events (Special Provision 007-009 and 007-010)” as a diamond bullet point under Special Provisions.
- Added “Road Closures During Special Events (Special Provision 007-009 and 007-010)” as a section to include language of the requirements of special provision 007-009 and 007-010.

Chapter 3, Section 4:

- Added “All construction projects must include either special provision 007-009 or 007-010 to include a procedure for handling road closures before, during and after key dates / special events into the contract.” as a diamond bullet to the Specifications List Checklists.

Chapter 3, Section 6:

- Added “In accordance with special provisions 007-009 and 007-010 all construction projects must include the note “Roadway closures during the following key dates and/or special events are prohibited:” with a list of events and/or dates that road closures are prohibited under Item 7 of the General Notes. If there are no expected road closures involving key dates / special

events, a note indicating “No significant traffic generator events identified” must be included.” as a diamond bullet to the General Notes Checklist.

Contact

Contact the Field Coordination Section staff of the Design Division with any questions or comments.

Archives

Past manual notices are available in a PDF archive link.

Table of Contents

Chapter 1 — Pre-Assembly Activities

Contents:

Section 1 — Environmental, Design, Right-of-Way, and Utility: Requirements and Value Engineering Studies

Non-discrimination

TxDOT policy is to ensure that no person in the United States of America shall on the grounds of race, color, national origin, sex, age or disability be excluded from the participation in, be denied the benefits of or otherwise be subjected to discrimination under any of our programs or activities.

Overview

This section covers the following:

- Environmental Requirements
- Design Conference
- Right-of-Way and Utility Status
- Value Engineering Studies
- Road Closures During Special Events

Environmental Requirements

In the early stages of planning and development of any highway project, consideration should be given to the social, economic, and environmental issues of the project. TxDOT affords the opportunity to identify any social, economic, or environmental consequences on all projects. This is accomplished in cooperation and coordination with local, state and federal agencies. During this process, decisions relative to public hearings and environmental requirements are necessary. The next subsections discuss

- Environmental Clearances
- Design Schematic

Environmental Clearances

The three major categories of environmental study are:

- Categorical Exclusion: Actions that do not individually or cumulatively have a significant effect on the environment
- Environmental Assessment: Actions in which the significance of the impact on the environment is not clearly established

- Environmental Impact Statement: Actions that may significantly affect the environment.

For the purposes of this *PS&E Preparation Manual*, it is assumed that the required environmental and schematic approvals have been obtained (see the *Project Development Process Manual*).

Design Schematic

As part of the environmental approval process and early project development, a preliminary and/or a geometric schematic may be prepared to describe the existing and proposed general geometric features and location requirements for a project. A geometric schematic is required for new location or added capacity projects and for projects requiring control of access or an Environmental Impact Statement. A list of schematic requirements can be found in the TxDOT *Roadway Design Manual*. The schematic should include basic design information, which is necessary for proper review and evaluation of the proposed improvements. For a more complete and detailed discussion of the preliminary schematic or the geometric schematic, refer to the *Project Development Process Manual*.

Design Conference

The next subsections discuss these aspects of a design conference:

- Description
- Attendees.

Description. A design conference is an informal, working meeting to discuss, establish, determine, and finalize the following:

- Programming/funding/federal letter of authority for preliminary engineering
- Agreements
- Status of environmental approvals/public involvement process
- Geometric design elements
- Status of schematic completion
- Surveying elements/photogrammetric elements
- Right-of-way status
- Utility adjustments
- Design criteria
- Bridge data
- Hydraulic elements
- Pavement structures

- Construction phasing/traffic handling
- Key Dates / Special Events when roadway closures are prohibited
- Value engineering study (for more information see the indicated subsection below).

Attendees. The meeting is recommended for all projects and should be scheduled as soon as possible after authorization for PS&E has been secured. Scheduling and moderating should be accomplished by the Project Manager directly responsible for the design and development of the PS&E. Suggested attendees are as follows:.

- Staff from the Area Engineer's office who will have construction responsibilities
- Maintenance Supervisor who will be responsible for maintenance of the roadway
- Staff from offices having primary review responsibilities
- Staff from outside agencies directly involved with the project—i.e. funding responsibilities, review responsibilities, etc.
- Staff who will be directly involved in the development of PS&E for the project

  During the conference it is recommended that all design decisions are documented in a Design Summary Report (DSRform) format for further submittal to Austin.

For a more complete and detailed discussion on how to conduct a design conference and a copy of the suggested DSR form, refer to the *Project Development Process Manual*, Chapter 5, Section 1.

Right-of-Way and Utility Status

During the advance planning and environmental process, a schematic of the project is usually developed for approval and exhibit purposes. As an integral part of the geometrics of the schematic, preliminary proposed right-of-way lines are established. The required right-of-way width should accommodate the design criteria and utilities, both existing and proposed. The locations indicated by the various utility companies are not intended to be exact but rather to advise the designer in advance of those facilities within the corridor. Exact locations of utilities will be determined later in project development. (See the Right of Way Collection).

Once the final right-of-way lines have been established, including temporary construction or permanent drainage easement(s), the designer should coordinate with the district's Right-of-Way Section to verify the proper right-of-way is acquired and that it is free of encroachments. Coordination with the district's Environmental Section should be initiated before the acquisition of the right-of-way.

Value Engineering Studies

Value engineering studies (see Chapter 2, Section 6 of the *Project Development Process Manual*) are required for all transportation corridors or Federal-Aid projects on the NHS with estimated costs (construction plus ROW) of $50 million or more and bridge projects of $40 million or more. These studies typically will be performed near the 30% level of project design completion.

Projects within $10 million of these threshold amounts should be considered for VE studies.

A VE Study is not required on design-build projects. If the Project Manager chooses to conduct a study, this should be performed prior to the release of the Request for Proposal (RFP).

Road Closures During Special Events

Identify events and key dates where the highway mainlanes and ramps must be available during peak traffic periods to the traveling public to minimize safety hazards and economic impacts in accordance with Senate Bill 312, incorporated into Section 224.034 of the Transportation Code.

Additionally, in accordance with Senate Bill 82 incorporated into Section 223.051 of the Transportation Code, in municipalities where the following apply:

- The municipality is included in three counties, two of which have a population of 1.8 million or more;
- The municipality is located primarily in a county with a population of 1.8 million or more;
- The municipality has within its boundaries all or part of an international airport operated jointly by two municipalities.

When notification is provided to the department by the municipality within 180 days of a scheduled event, temporary road closures, including relocations or changes to entrance and exit ramps, are prohibited on the dates specified. Currently this includes the City of Grapevine.

A workflow illustrating the Guidelines for Road Closures During Special Events can be found at: http://crossroads/org/des/fs/index.asp.

Section 2 — Required Legal Documents

Overview

This section covers the following required preparation and paperwork topics:

- Agreements
- Memorandum of Understanding or Memorandum of Agreement
- Permits.

Agreements

The next subsections discuss these aspects of agreements:

- Agreement Description
- Agreement Deadline
- Local Agency Agreements
- Agreement Information References.

Agreement Description

Agreements must be executed between the department and other governmental entities when any of the following are true:

- Funds are provided by another agency.
- Other agencies agree to maintain the facility.
- Other agencies or private companies will construct facilities (e.g. driveways, utilities, etc.) on state right-of-way through their local government.
- The department works on property other than its own right-of-way (e.g. railroad crossings).
- Local entity is to let and/or manage construction or performs construction with its own workers.

Agreements between the department and these agencies are considered an important part of the complete PS&E for a project. Agreements are legally binding documents which must be accurate and in accordance with department policy.

Agreement Deadline

It is essential that all agreements are executed before any work (PS&E and construction) is performed. Negotiating agreements is a time-consuming process and should be initiated as early as possible. Funding agreements should be based on an engineer's sound estimate.

Local Agency Agreements

If a local agency desires to let/manage construction or perform any of the construction with its own workers, it must initiate discussion with the local TxDOT district office to receive a thorough explanation of the department's expectations and submit a written request. The local agency must clearly understand what will be required so the project is not unduly delayed during project development and requirements can be included in the written agreement. For more information, see the Local Government Projects page on the TxDOT website.

Agreement Information References

For more discussion of agreements, refer to the *Project Development Process Manual*. For assistance in the preparation of various types of agreements, contact the Contract Services Office.

Memorandum of Understanding or Memorandum of Agreement

Some projects may be governed by a Memorandum of Understanding (MOU) or a Memorandum of Agreement (MOA). A MOU/MOA is an executed understanding between TxDOT and other state and federal agencies. They are usually used to expedite the review process and minimize the required documentation for such items as:

- Funding
- Design criteria
- Construction
- Maintenance.

Agencies with which the department has a MOU/MOA include:

- Texas Historical Commission
- Texas Parks and Wildlife Department
- Texas Department of Mental Health and Mental Retardation
- Texas Natural Resource Conservation Commission
- U.S. Fish and Wildlife Service
- U.S. Forest Service.

Permits

Regulatory agencies have permitting requirements for proposed construction activities. Some of the conditions which will require these permits appear in Table 1-1.

Table 1-1: Potential Environmental Permits

Condition	Permitting Agency	Responsible Office
Changing 100-year floodplain level Conditional Letter of Map Revision (CLOMR) is needed before construction, and Letter of Map Revision (LOMR) is needed after construction	Federal Emergency Management Agency (FEMA)	District through DES-Hydraulics
Planning a project near an airport, heliport, or seaport Construction or use of an object taller than 200 ft	Federal Aviation Administration (FAA)	District coordination with the FAA
When affecting waters of the U.S. (Section 404 permit)	U.S. Corps of Engineers	District
Bridges over navigable waters of the U.S. (Section 10 permit)	U.S. Corps of Engineers (Environmental Impact on Waterway)	District
Bridges over navigable waters of U.S. (U.S. Coast Guard Permit)	U.S. Coast Guard (Clearance concerns only)	District
When construction will disturb five or more acres of soil area (NPDES General Permit)	Environmental Protection Agency (EPA)	District Design or Construction Office
Building or changing vertical clearance to less than 16 ft. (4.9 m) on interstate highways	Federal Highway Administration (FHWA) or the U.S. Department of Defense (DOD)	District through DES Field Coordination Section
Planning an international bridge (Presidential Permit through TxDOT)	U.S. Department of State	Approval from Transportation Planning and Programming Division prior to submitting application to U.S. Department of State
Changing (water elevation) gauging stations	U.S. Geological Survey (USGS)	District through DES-Hydraulics
Notification of well plugging/capping	Texas Commission on Environmental Quality (TCEQ)	District

Section 3 — PS&E Submissions Schedules

Overview

Prior to beginning detailed design on any project, the designer should determine the funding source (state or federal) for the project and any pertinent time constraints. This section covers the following PS&E submission schedule topics:

- General deadlines and project categories
- Detailed deadlines.

General Deadlines and Project Categories

Approximately six months prior to the beginning of the coming fiscal year, the Finance Division publishes a Fiscal Year Letting Schedule for the approaching fiscal year. This schedule contains projects authorized by the Commission which have been identified as ready for letting or obligation of funds for that fiscal year by each District.

Detailed Deadlines

In addition to the Fiscal Year Letting Schedule, a PS&E Review and Processing Schedule is published that delineates various processing deadlines for meeting a desired letting.

This schedule provides detailed dates from the time a project is identified as a candidate project to the scheduled letting dates for that particular month.

Chapter 2 — Plan Set Development

Contents:

Section 1 — Preliminary Review/Coordination

Overview

This section discusses the following aspects of preliminary review/coordination:

- District Review of Projects
- Federal Review of PoDI/PoCI Projects
- Federal Aviation Administration Coordination
- Bridge Division and Design Division Preliminary Reviews and Approvals
- Traffic Operations Division Preliminary Reviews and Approval

District Review of Projects

The PS&E review for all projects has been delegated to the Districts. The District is responsible for ensuring that projects submitted for letting are complete and in compliance with state law and departmental policies, and that all necessary agreements have been executed. Division personnel are available to provide assistance and expertise to the Districts throughout the project development process. At the request of the District, the Design and Bridge Divisions are available to conduct a review of preliminary PS&E documents at the 30%, 60%, 95% or 100% milestones.

Federal Review of PoDI/PoCI Projects

Under the Stewardship and Oversight Agreement between the FHWA and TxDOT, there are specific projects that have been designated as PoDI (Projects of Division Interest) or PoCI (Projects of Corporate Interest). These projects require Federal coordination and/or approvals of the specific elements of the project designated by the FHWA. If the FHWA has identified that a project requires review of the "Draft Plans, Specification and Estimates (PS&E)", the District should coordinate with the designated FHWA Point of Contact early in the plan development process to arrange for the review.

Federal Aviation Administration (FAA) Coordination

During the early phases of project development, consideration must be given to the effect any proposed highway project might have on vicinity airports. Airway-highway clearances are studied to avoid encroaching upon an airfield or establishing a highway location that would be an obstruction to air navigation. Minimum airway-highway clearance requirements must be considered to avoid the creation of a safety hazard for both highway and air traffic.

Any construction or alteration of more than 200 feet (60 meters) in height above the ground level at its site or any construction or alteration of greater height than an imaginary surface extending outward and upward at one of the FAA's reporting slopes must be reported during the early development of construction plans.

It should be noted that these requirements are not limited to illumination towers or poles. Any element of construction may affect the airway-highway clearance requirements. This includes but is not limited to illumination, signing, bridge superstructures, etc., or any mobile object that would normally traverse a roadway or bridge that could be an obstruction to air navigation.

The District is responsible for preparation and submission of the latest version of Form 7460-1 to the FAA in cases where minimum airway-highway clearance requirements cannot be met. Further guidance on FAA coordination can be found in the Project Development Process Manual and on the FAA website.

Bridge Division and Design Division Preliminary Reviews and Approvals

The District Design Office is responsible for submitting the following preliminary design elements to the appropriate section of the Design Division and Bridge Division for review and approval. These documents should be submitted as early as possible after approval to develop the PS&E. The next subsections cover the following tasks:

- Preliminary Bridge Layouts with Scour and Hydraulic Analysis
- Preliminary Retaining Wall Layouts
- Preliminary Storm Drain Layouts
- Preliminary PS&E Design Reviews

Preliminary Bridge Layouts with Scour and Hydraulic Analysis

All electronic submittals of Bridge Layouts should include the following in the subject of the email: Type of Review, CCSJ, County and Due Date.

The next paragraphs deal with these preliminary bridge layout aspects:

- Submittal to Bridge Division
- Review and approval
- Final bridge layout
- For more information on preliminary bridge layouts, refer to the Bridge Detailing Guide in the Design section of the Bridge Publications page on TxDOT's internet site. Chapter 8 of the guide includes Preliminary Bridge Layout criteria, Completed Bridge Layout criteria and

examples of typical Bridge Layouts. A detailed description of the Preliminary Layout Approval Process can be found in Chapter 5 of the Bridge Project Development Manual.

Submittal to Bridge Division. For each bridge structure (including bridge class culverts), the preliminary layout and plan/profile sheet must be submitted to the Bridge Division, Project Development Section at BRG_PD_PSE@txdot.gov for review, comments, and approval. For stream crossing structures, the layout submission should also include the hydraulic report. For federal oversight projects, the Bridge Division will submit all information to the Federal Highway Administration (FHWA) for review and approval.

Review and Approval. The preliminary layout review and approval process can take a considerable amount of time. The Bridge Division recommends that the preliminary layouts should be sent in for review and approval during the early stages of the design. If the detailed design is to be done by the Bridge Division, approximately nine months lead time before the letting date is required for the complete review, design, and PS&E process. However, if there is a railroad (structure) involved, the review process takes approximately 12 months due to coordination with the railroad company. See the Submission Schedule in the *Bridge Project Development Manual* for recommended lead time for review of preliminary bridge layouts.

Final Bridge Layout. Once approved, and after all comments and suggestions are incorporated into the bridge layout, the revised and/or approved layout becomes the final bridge layout. If any significant subsequent changes are made in the structure layout, the entire review process is repeated. For all projects with bridge structures, including bridge class culverts, submit final bridge layout sheets and estimate of all bridge structures to BRG PS&E Review Section at BRG_PD_PSE@txdot.gov. For projects using Category 6 funding, also include final Plan and Profile sheets.

Preliminary Retaining Wall Layouts

All preliminary retaining wall layouts should be submitted to the Bridge Division, Project Development Section, Project Manager, and when the height of retaining walls exceeds 25 feet (7.6 m), the preliminary retaining wall layouts must be submitted to the Bridge Division. This should be done no later than six months prior to submitting the completed PS&E to the Design Division. A typical section should be included. The use of the WINCORE computer program or the Bentley product Gint with the TxDOT template is encouraged because a uniform representation of core-boring data will be accomplished on a statewide basis. This will result in less confusion during plan review and during construction.

The purpose of the preliminary retaining wall layout is to present the geometric and geotechnical data associated with a proposed retaining wall. This information enables an engineer to design and detail the retaining wall as well as evaluate the wall's stability. Preliminary retaining wall layouts are submitted early to facilitate the review of the design, consideration of alternatives, and obtaining additional geotechnical data should it be needed. Usually, these preliminary layouts are used as the final layouts for design and detailing.

Preliminary Storm Drain Layouts

In cases where the districts need assistance, the hydrologic and hydraulic calculations of the storm drain system may be submitted to the Design Division, Hydraulics Section, for preliminary review and approval.

Preliminary PS&E Design Reviews

At the District's request, the Design Division will review preliminary roadway plan designs, specifications and estimates (PS&E's) at the 30% and 60%. Submission should be early on in the process to not delay delivery of the project.

2R projects - Submit Page 3 of Form 1002, typical sections and a crash analysis.

3R projects not requiring ROW acquisition - Submit Page 3 of Form 1002, typical sections and CURVE data sheet or plan profile sheets. If the geometric information is not required in the PS&E because the scope of work is such that the contractor does not need to reconstruct those areas (scope of work is widening only with no alignment changes) the district may choose to submit the Curve Data Sheets which show the geometric data for the project so that design criteria can be verified instead of recreating the plan and profile sheets. These Curve Data Sheets are not part of the PS&E but are required as supporting documents and they must be signed, sealed and dated by the responsible engineer.

3R projects which require ROW acquisition and all 4R projects - Submit Page 3 of form 1002, DSR, schematics and 60% PS&E throughout the development of the projects as they are developed.

Traffic Operations Division Preliminary Reviews and Approvals

The next subsections cover these aspects of the Traffic Operations Division's preliminary reviews and approvals:

- Signal authorizations
- Agreements

Signal Authorizations

The following paragraphs discuss

- Signal warrant process
- Traffic Signal Authorization Form

Signal Warrant Process. All proposed traffic signal installations must conform to the accepted warrants as listed in the *Texas Manual on Uniform Traffic Control Devices* (TMUTCD). A traffic signal cannot be installed unless at least one of the nine established warrants can be met. The department's policy on highway traffic signals was established with Commission Minute Order No. 85777 (June 29, 1982). Detailed information concerning the required data for traffic studies can be found in the *Traffic Signals Manual*.

Traffic Signal Authorization Form. After determining a signal is warranted and the traffic study is complete, a Traffic Signal Authorization Form must be submitted to the District Engineer for approval. A copy of the approved form should be sent to the Traffic Operations Division.

Agreements

Traffic Operations agreements include:

- Railroad agreements
- Signal/illumination agreements.

Railroad Agreements. When any part of a TxDOT project is within or adjacent to the railroad right-of-way, execution of an agreement with the railroad company will be required. These agreements will usually require an Exhibit A, which is a plan showing the work to be done which affects the railroad, and the responsibilities concerning who (state or railroad) will do this work. Small projects (seal coats, re-planking jobs, etc.) will generally require only a simplified letter-type agreement. Contact the District Railroad Coordinator for assistance.

The review and approval process takes a considerable amount of time (approximately one year). The Traffic Operations Division recommends that agreement negotiations begin during the early stages of the design.

Signal/Illumination Agreements. Refer to the *Traffic Signals Manual* and the *Highway Illumination Manual*, respectively, for detailed explanations and copies of the agreements.

Section 2 — Engineer's Seal and TxDOT Copyright Requirements

Overview

This section deals with the following topics relating to the Engineer's Seal and TxDOT copyright requirements.

The Texas Engineering Practice Act and Rules is the authority for licensed professional engineers employed at TxDOT. Chapter 137, Subchapter B: Sealing Requirements, §137.31 through 137.37 outlines the requirements for signing, sealing, and dating of engineering documents.

Sealing and Dating Construction Documents

Licensed professional engineers shall affix their seal and original signature or electronic seal and signature with the date on the final version of their engineering work before such work is released from their control.

Electronic Seals and Sealing Requirements

Engineering work transmitted in an electronic format that contains a computer generated seal shall be accompanied by the following text or similar wording: "The seal appearing on this document was authorized by (Example: Leslie H. Doe, P.E. 0112) on (date)." unless accompanied by an electronic signature as described in this section. A license holder may use a computer-generated representation of his or her seal on electronically conveyed work, an electronic signature of the license holder and date.

Electronic Signature Requirements

An electronic signature is a digital authentication process attached to or logically associated with an electronic document and shall carry the same weight, authority, and effects as an original signature. The electronic signature, which can be generated by using either public key infrastructure or signature dynamics technology, must be as follows:

- unique to the person using it.
- capable of verification.
- under the sole control of the person using it.
- linked to a document in such a manner that the electronic signature is invalidated if any data in the document are changed.

TxDOT procedures for creating and individualized and secure electronic signature are available at: https://txdot.sharepoint.com/sites/division-DES/EPSE/_layouts/15/start.aspx#/.

Standard Drawing Reliability

Plan sheets of TxDOT standard drawings are considered a product of the company which have evolved and been developed by many people over a considerable number of years and, in the case of existing standards, the details shown on the drawings have proven to be reliable through their years of use. These drawings are not required to be signed and sealed by the responsible professional unless modified during the PS&E preparation for a specific project application.

The responsible engineer will identify, in the Index of Sheets located on the Title Sheet, those standard drawings that he/she issues with the plans and is to add the following note or similar note with signature, seal, and date in the proximity of the Index of Sheets on the Title Sheet:

"The standard sheets specifically identified above, plus sheets ____, ____, ____, ____, ____, have been issued by me and are applicable to this project."

Standard Drawing Modification

When "Standard" drawings are modified, the engineer is to identify the components on the drawing that are modified, sign, seal and date the drawing. The engineer is also responsible for the changes, plus the effect of any design relationship between the revised and the original components on all other plan sheets.

When a standard is modified, MOD should be placed in the title block, as well as a note listing the modified standard should be included in the general notes.

Plan Sheet Revisions

After PS&E submittal to the Design Division, revisions to plan sheets will be coordinated in writing with the responsible engineer or his/her designated representative in the district. It will be the district's responsibility to secure/affirm any approval in writing from the responsible engineer for inclusion of mutually agreeable changes or modifications under the current signature, seal, and date on the plan sheets.

NOTE: Plans with an electronic signature must be returned to the original engineer because changes to the plans by anyone else will render the electronic signature invalid.

Consultant Prepared PS&E. For consultant prepared PS&E, upon receipt of the PS&E from the consultant, the district will send the firm written notification that the department, as the owner, may find it necessary to make modifications to the sealed work. This written notification would only be needed one time and would satisfy the Texas Board of Professional Engineers rules for modifications made prior to letting and during the course of construction. It will be the district's responsibility to secure/affirm any approval in writing from the responsible engineer for inclusion of mutually agreeable changes or modifications under the current signature, seal, and date on the

plan sheets during the District review or the Division final PS&E processing. Any other changes made to the plan sheets by district engineers is signed, sealed, and dated. The district engineer will be responsible for any design relationship between the revised and original components on all other plan sheets. It is considered good engineering practice and a professional courtesy in these cases to notify the original engineer of any proposed changes.

Proposal

The proposal is a bidding document that is composed of Special Provisions, Special Specifications, General Notes, and other miscellaneous forms for bid submission. Each PS&E submission to the Austin divisions are supported with an electronic supplemental proposal sheet with the following statement, signed, sealed, and dated by the responsible engineer:

"The enclosed Special Specifications, Special Provisions, and General Notes in this document have been issued by me or under my responsible supervision."

An example of the Supplemental Proposal Seal and Signature Sheet (sealsig1) shows how this note would appear.

Proposal copies. The Design Division will transmit to the Construction Division the original signed, sealed, and dated supplemental sheet for inclusion in the department's and contractor's copies of the contract. The department's copy of the contract, with the original signed, sealed, and dated sheet, will become the official original repository reflecting Special Specifications, Special Provisions, and General Notes which have been selected by the responsible engineer and applicable to the contract. Security-controlled, computer-generated CADD Seals will be used to generate proposal copies for bidder distribution.

Changes after submittal. Changes to the bid proposal information after submittal to the Design Division will be handled in the same manner as described above for plan sheet changes.

As-built Plans

Construction engineering in accordance with the practices, methods and design requirements, as identified in the plans and contracts, is the responsibility of the registered professional engineer under whose supervision the construction work is performed. For the final as-built plan, the Title Sheet should be signed, sealed, and dated by the responsible engineer to reflect that the construction work was performed in accordance with the plans and contract.

Copyright Requirement Guidelines

Minute Order 107306 adopted administrative rules allowing the department to protect copyrights for intellectual property. Engineering designs contained in construction and routine maintenance plans are included in the definition of intellectual property. The TxDOT's Office of General Coun-

sel has advised that the following notation be placed on the Title Sheet of all plans produced by or for TxDOT:

©XXXX by Texas Department of Transportation; all rights reserved. Where XXXX denotes the current year.

For all other plan sheets, the copyright symbol with current year and TxDOT logo is used. If space does not permit this notation, an abbreviated notation of ©XXXX TxDOT may be used. The year shown in the notation will depend on when the plans are produced.

The copyright notation shown above for Title Sheets must also be placed on schematic layouts. For plans not produced under contract to or by TxDOT, these copyright notations will not be required.

Section 3 — Plan Set Preparation

Overview

The plans are original drawings (or reproductions) approved by the engineer, which are part of the contract and which clearly show the location, character, dimensions, and details of all proposed work. The next paragraphs discuss

- Purposes of plans
- Result of unclear/incorrect plans
- Plan sheet sequence.

Purposes of Plans. The three main purposes of the plans are

- For prospective bidders to prepare a bid as accurately as possible
- For state construction inspector-contractor teams to oversee and perform construction efficiently and accurately
- To provide an accurate record of the construction for future reference.

Result of Unclear/Incorrect Plans. Accurate and clear plans are essential in accomplishing the purpose of accurate bids, efficient construction, and good permanent records. Unclear and/or incorrect plans usually result in increased costs and more work for State personnel for the following reasons:

- Incomplete or inaccurate plans require additional handling and processing and, therefore, cost the state more time and money to get the contract to letting.
- Data that is unclear or interpreted in more than one way could result in higher bid prices by contractors. Unclear data also could result in claims for more compensation and/or more working days by the contractor after award of the contract.
- Incorrect or incomplete plans can precipitate change-orders which require additional processing, usually increase costs, and may cause project delays.

Plan Sheet Sequence. The following plan sheet sequence has been recommended for consistency in plan set development throughout the state.

I. **General**

- Title Sheet
- Project Layout
- Roadway Typical Sections
- General Notes

- Estimate and Quantity Sheets
- Quantity Summary Sheets.

II. **Traffic Control Plan**

- Traffic Control Plan (TCP) Sheets
- Standards.

III. **Roadway Details**

- Survey and Control Index Sheets
- Horizontal and Vertical Control Sheets
- Alignment Data Sheets (Optional)
- Roadway Plan and Profile Sheets
- Intersection Details
- Driveway Details
- Miscellaneous Details
- Standards.

IV. **Retaining Wall Details**

- Wall Layouts
- Standards.

V. **Drainage Details**

- Drainage Area Map Sheets
- Hydraulic Calculation Sheets
- Culvert Layouts
- Drainage Plan and Profile Sheets
- Miscellaneous Details
- Standards.

VI. **Utilities**

- Existing Utilities Plan and Profile Sheets
- Proposed Utilities Plan and Profile Sheets
- Standards (for each utility type).

VII. **Bridges**

- Bridge Hydraulic Data Sheets
- Bridge Layout, Detailed Quantity Summary, and Structural Details grouped together for each bridge
- Bridge Standards.

VIII. **Traffic Items**

- Traffic Signal Layout
- Illumination
- Signing
- Pavement Markings
- Traffic Management System (TMS)
- Standards.

IX. **Railroad**

- Railroad Requirements
- Railroad Scope of Work
- Railroad Plans.

X. **Environmental Issues**

- SW3P
- Wetland Mitigation Plan
- Standards
- EPIC Sheet.

XI. **Miscellaneous Items**

- Removal Sheets
- Landscaping/Irrigation.

This guidance can be applied to both in-house and consultant-produced plans. The rest of this section follows the outline and describes these requirements, which must be addressed during the actual production of the project plan sheets:

- General types of plan sheets
- Traffic control plan
- Roadway details
- Retaining wall details
- Drainage details
- Utilities
- Bridges
- Traffic items
- Railroad
- Environmental issues
- Miscellaneous items

General Types of Plan Sheets

These are the plan sheets discussed below:

- Title Sheet
- Project Layout
- Roadway Typical Sections
- General Notes
- Estimate and Quantity Sheets
- Summary Sheets

Title Sheet

The Title Sheet (for an example of a Title Sheet, see titlesht.) is the first sheet of the plans. It should be neat and contain all of the information as described below. The purpose of the Title Sheet is to:

- Establish the location of the project(s)
- Describe the nature of the work proposed by the plans
- Index the contents of the plans

The following are the contents of the Title Sheet:

- Title Block
- Design Speed and Average Daily Traffic (ADT) Volumes
- Length of Project
- Highway Name And Number, County And Project Number
- Limits
- Project Classification and Type of Work
- Location Map
- Index of Sheets (for an example of an Index of Sheets Sheet, see indexsht.)
- Adoption Date of Governing Specifications
- Exceptions, Equations, and Railroad Crossings
- Signature Block(s)
- RAS Inspection (if needed)
- Legend of Conventional Symbols (if needed).

The next paragraphs discuss these contents.

Title block. This is located in the upper right hand corner and identifies the plans by project number, district designation, county, control-section-job number (CSJ), and highway name and number.

Design speed and average daily traffic (ADT) volumes. Show the design speed of the highway in miles per hour (mph). Design speed and ADT are required to be shown on the Title Sheet of all projects except those where N/A is shown on Form 1002. For detailed explanation of use of design speed and ADT refer to Chapter 5, Section 2: PS&E Submission Data Sheet (Form 1002).

Length of project. For each CSJ, show breakdown of roadway and bridge lengths in feet truncated to two decimal places. The breakdown should also show roadway and bridge lengths in miles truncated to three decimal places. The total length shown should match the DCIS P1 screen.

Highway name and number, county and project number. These are shown in large capital letters to facilitate identification and processing.

Limits. Show limits of proposed construction. This should match the limits shown in the project authorization and on the DCIS Project Identification (P1) Screen.

Project classification and type of work. The project classification text should read, "For the construction of XXXX," where the XXXX corresponds to the project classification shown on the DCIS P1 screen. A listing of the project classification abbreviations shown on the P1 screen is located in *DCIS User Manual*, Appendix B.The type of work text should read, "Consisting of YYYY," where the YYYY corresponds to the type of work field shown on the DCIS P5 screen. As an alternative, the type of work description can be made to match the proposal cover, which is "for work consisting of YYYY," where YYYY corresponds to the type of work field on the DCIS P5 screen.

Location map. Provide a legible map of suitable size showing the location of the project in relation to physical landmarks, other highways, and/or intersections. In addition, the project limits by CSJ(s), county and city boundaries, reference markers, graphic map scale and north arrow should also be shown. The beginning and end of each project should contain the stations, CSJs, and reference markers for each CSJ.

Index of sheets. The Index of Sheets can be shown on the Title Sheet or referenced to another sheet directly following the Title Sheet. The index should show sheet numbers and title or abbreviations as they appear on the sheet. All sheets are to be listed, including OMITTED sheet numbers. All standard sheets listed will bear the asterisk symbol (or other symbol) to identify them as standard sheets. The index of sheets is accompanied by the responsible engineer's approval note for use of standard sheets included in the plans. (See Section 3, Engineer's Seal and TxDOT Copyright Requirements, for more information.)

Adoption date of governing specifications. On state projects, indicate "Special Labor Provisions for State Projects." For Federal-Aid projects, show title and date of appropriate required contract provisions.

Exceptions, equations, and railroad crossings. List by station numbers and lengths. Show as NONE if not applicable.

Exceptions are the station number limits and lengths which are excluded from a project. Equations are used to show the transition of the project from one set of station numbers to a different set.

Signature block(s). Signature blocks are typically required for the Area Engineer in charge of the plans, Director of Transportation, Planning and Development or District Design Engineer, and the District Engineer. Projects that require additional signature blocks are as follows:

- Projects designed by consultants: consultant engineer
- Projects involving cities, counties, irrigation or water districts, corps of engineers, etc.: appropriate official

Registered Accessibility Specialist (RAS) Inspection (if needed). For projects which contain more than $50,000 in pedestrian elements, a review of the construction plans prior to letting and a final inspection by a RAS is required. For these projects, the following note should appear on the Title Sheet:

Registered Accessibility Specialist (RAS) inspection required

TDLR No. EABPRJ _____

The TDLR number will be added to the title sheet once the project is registered and the number assigned. For more information on RAS inspection requirements and coordination, see the Construction Division's Crossroads page.

Legend of conventional symbols (if needed). This legend can be shown on the lower left hand corner. Most Title Sheets already contain these symbols; therefore, verify that the symbols conform to those on the plan sheets and location map.

NOTE: For projects that involve multiple CSJs, individual project lengths, or lengthy indices the above information can be included on supplemental sheets.

For projects which require inspection by the Texas Department of Licensing and Regulation (TDLR) during the construction phase, include this note:

TDLR INSPECTION REQUIRED

This serves as a reminder to construction personnel to inform the TDLR staff and coordinate an appropriate time for them to visit the project site and inspect pedestrian-related elements.

For PS&E submission requirements and policy on TDLR, go to Chapter 5, Section 6.

Project Layout

This sheet(s) (For an example of a Project Layout Sheet, see prolay.) is intended as an overview of the project. Other information that may be included is horizontal alignment data, advance project warning signing, or information not shown elsewhere in the plans.

Roadway Typical Sections

Roadway typical sections (for an example of a Roadway Typical Sections Sheet, see typsect) should be as simple as possible and still provide the necessary construction data. A general representation of the nature of construction in each portion of the project is necessary, but a multitude of details can be confusing. The purpose is to show all the components and dimensions of the roadway within the right-of-way perpendicular to the centerline for each change of existing features or proposed roadway. The following are the contents of the Roadway Typical Section Sheet:

- Existing Typical Section
- Proposed Typical Section
- Profile Grade Line (PGL)
- Station Limits
- Depths
- Roadway Cross Slopes
- Roadway Side Slopes
- Dimensions
- Unique Descriptions
- Utility Location

A discussion of these contents appears below.

Existing typical section. This section shows approximate depths, widths, and station limits of existing roadway materials.

Proposed typical section. This section shows dimensions, depths, and limits for each type of material in the proposed pavement structure. A typical section is also necessary for such features as ramps, detours, crossroads, etc. Barrier and metal beam guard fence should be shown if applicable. In addition, limits of other applicable items of work such as topsoil and seeding, curb and gutter, etc., may also be shown.

Profile grade line (PGL). The PGL shows the location of roadway that represents the grade line shown on the plan and profile sheets. Also, other needed control points such as project baseline or centerline, roadway centerline, and super-elevation pivot points should be shown.

Station limits. This section shows station limits for each section. Each typical section should be checked to ensure that a section has been shown for all of the project roadway and that the roadway widths correspond with those shown on the plan and profile sheets.

Depths. This section shows thickness in inches of each layer in the pavement structure. The approximate quantity per station may be shown for each section. Each type of material should be clearly identified. If stabilization is proposed, indicate the type.

Roadway cross slopes. Show cross slopes for proposed typical sections in percent (%).

Roadway side slopes. Show side slopes as a ratio of horizontal to vertical distances (H:V).

Dimensions. Show dimensions for:

- Subgrade crown width
- Base crown width
- Pavement width
- Stabilized material width
- Lane widths
- Shoulder widths
- Sidewalk widths
- Right-of-way widths
- Side slopes and ditches
- Berm widths
- Curb and gutter/curb offsets
- Prime coat widths.

Unique descriptions. Include any unique descriptions of the pavement structure or explanatory notes such as the following:

- Disposition of old base material and, if salvaged, limits of salvage and limits of replacement
- Indicate contrasting color aggregate for shoulders if applicable
- Dimensions for calculating payment.

Utility location. If a utility line is predominant in a section of roadway, show line identity and approximate depth (if known). A note similar to the following should be used: “Locations of Underground Utilities are Approximate.”

General Notes

These notes (for an example of General Notes, see general), created as described in Chapter 3, Section 5, General Notes of this manual, are placed on plan sheets by the District office prior to final PS&E submission.

Estimate and Quantity Sheets

The next paragraphs discuss these aspects of the Estimate and Quantity (E&Q) Sheets (For an example of an E&Q Sheet, see eq2):

- Purpose
- Use
- References.

Purpose. The purpose of E&Q Sheet is to provide a list of all the pay items and estimated quantities in the contract. This sheet also provides a space for final quantities once a project has been completed. Item numbers, descriptive codes, Special Provision numbers, item descriptions, units of measurement and bid alternates are also shown.

Use. An E&Q sheet summarizes the work to be done, if there is more than one CSJ or project in the plans or if local participation is involved. They also simplify the plans by showing the total quantities of each item of work involved in the construction of the roadway. If the quantities are accurate, the contractor will be encouraged to submit lower bid prices with minimized contingency costs.

References. The final E&Q Sheet is plotted in the District office prior to final PS&E submission. The E&Q Sheet input format and plotting procedures are described in detail in the *DCIS User Manual*, Chapter 4, Instructions for E&Q Sheets. The appropriate IT administrator may also be contacted.

Summary Sheets

The purpose of the Summary Sheet (see tcpsum, roadsum, and drainsum) is to supplement or replace the summary of work totals on individual plan sheets and to bring together the quantities for all the items of work. The contents of the Summary Sheet are discussed in the paragraphs below:

- Work type, quantity, and location
- Separate quantities
- Contractor's information quantities
- Bid items matching estimate.

Work type, quantity, and location. Summary Sheets should indicate type, quantity, and location of work for individual pay items of the proposed project.

Separate quantities. Summary Sheets should show separate quantities for each control or project, city participation, county participation, etc.

"Contractor's information" quantities. Quantities shown on the Summary Sheet(s) "For Contractor's Information Only" should be noted as such.

Bid items matching estimate. Description of bid items should conform with the description shown on the estimate. It is recommended that the individual item headings be kept as simple as possible. As a minimum, the item number with description code, general description, and units of measure should be shown.

Traffic Control Plan

The next subsections discuss

- Traffic Control Plan (TCP) Sheets
- Traffic Standards

Traffic Control Plan (TCP) Sheets

The paragraphs below cover these TCP Sheet (see typseq, tcptypxs, and tcpdrvwy) topics:

- Purpose
- Standard sheets
- Sequence of work
- General notes.

Purpose. Traffic Control Plan (TCP) Sheets, in detail appropriate to the complexity of the project, should provide for moving traffic through or around the construction zone in a safe, expeditious, and clear manner. They are also used to provide for protection of the traveling public, work forces, pedestrians, construction equipment, and the work zone from accidents through the use of traffic control devices.

Standard Sheets. When practical, standard sheets developed by the divisions or districts should be used. Each work zone is different and the standard plan sheets do not cover all situations. In these cases, the standard plan sheets can be used as a starting point from which the traffic control plan can be developed.

Sequence of Work. Sequence of work sheets should be included in the plans if the proposed work causes complicated traffic movements or construction procedures within the project limits. It

should be evident from the traffic control sheets what arrangement of construction signs, pavement markings, construction pavement markings, traffic control devices, etc., are needed to control traffic at all locations in every sequence of work. The layouts should show the projects' construction staging.

The typical cross sections of different construction phases should be included on the sequence of work sheets. These cross sections are very helpful in further clarifying the width of work zones and the method of traffic handling. The more clear and thorough the TCP is, the smoother and safer the construction will be. Explanatory narrative can be included on these sheets, in the General Notes (under Item 502), or in a triple-zero Special Provision.

For an example of a traffic control plan and sequence of work sheet, see typseq and tcptypxs. For an example of a miscellaneous traffic control plan details sheet, see tcpdrvwy.

General notes. On minor projects, the TCP can usually be described by General Notes under Item 502. Most plans should include the Barricade and Construction Standard Sheets.

Traffic Standards

Work zone traffic control standard plan sheets are available on graphics from the Traffic Operations Division's Traffic Engineering Section (TRF-TE). These sheets can be downloaded from TxDOT's Internet site (http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/toc.htm).

Roadway Details

The following roadway detail discussion covers

- Survey Control Index sheets
- Horizontal and Vertical Control Sheets
- Alignment Data Sheets (optional)
- Plan and Profile (P&P Sheets)
- Other sheets.

Survey Control Index Sheets

The next paragraphs cover these Survey Control Index Sheet topics:

- Purpose
- Guidelines
- Contents

Purpose. The purpose of the Survey Control Index Sheet is to show an overall view of the project and the relationship of primary monumentation and survey control used in preparation of the project. This sheet should be used in conjunction with the Horizontal and Vertical Control Sheet.

Guidelines. This sheet should be provided for **all** 4R projects. In addition, this sheet should be provided for 3R projects that involve substantial changes to the vertical grade and/or horizontal alignment of an existing facility and/or right of way acquisition.

The control points shown on the Survey Control Index Sheet should correspond with the information shown on the Horizontal and Vertical Control Sheet. The Survey Control Index Sheet should be signed and sealed by the professional engineer (PE) in direct responsible charge of the surveying. This sheet may also be signed and sealed by the responsible registered professional land surveyor (RPLS) if required by the district.

Contents. The following are the contents of the Survey Control Index Sheet:

- Overall view of the project and primary control monuments set for control of the project
- Identification of the control points
- Baseline and/or centerline
- Graphic (Bar) Scale
- North Arrow
- PE signature, seal and date.

(For an example of a Survey Control Index Sheet, see surveyindex.)

Horizontal and Vertical Control Sheets

The next paragraphs cover these Horizontal and Vertical Control Sheet topics:

- Purpose
- Guidelines
- Content

Purpose. The purpose of the Horizontal and Vertical Control Sheet is to identify the primary survey control and the survey control monumentation used in preparation of the project. This sheet should be used in conjunction with the Survey Control Index Sheet which contains an overall view of the project and the relationship of primary monumentation and survey control used in preparation of the project.

Guidelines. This sheet should be provided for **all** 4R projects. In addition, this sheet should be provided for 3R projects that involve substantial changes to the vertical grade and/or horizontal alignment of an existing facility and/or right of way acquisition.

The Horizontal and Vertical Control Sheet should be signed and sealed by the professional engineer (PE) in direct responsible charge of the surveying. This sheet may also be signed and sealed by the responsible registered professional land surveyor (RPLS) if required by the district. Control point location maps should be drawn to scale and provide sufficient information so that the point can be located.

Contents. The following are the contents of the Horizontal and Vertical Control Sheet:

- Location for each control point, showing baseline and/or centerline alignment and North arrow
- Station and offset (with respect to the baseline or centerline alignment) of each identified control point.
- Basis of Datum for horizontal control (base control monument/benchmark name/number, datum)
- Basis of Datum for vertical control (base control monument/benchmark name/number, datum)
- Date of current adjustment of the datum
- Monumentation set for Control (Description, District name/number and Location ties)
- Surface Adjustment Factor and unit of measurement
- Coordinates (SPC Zone and surface or grid)
- Survey closure information
- Relevant metadata
- Graphic (Bar) scale
- PE signature, seal and date
- TxDOT title block (District name, County, Highway No., and CSJ).

For an example of a Horizontal and Vertical Control Sheet, see h_v-control.

Alignment Data Sheets

Alignment Data Sheets shall be provided for **all** 4R projects. In addition this sheet should be provided for 3R projects that involve substantial changes to the vertical grade and/or horizontal alignment of an existing facility and/or right of way acquisition. The alignment data sheets should (at a minimum) include the following information:

- curve data (if applicable)
  - PC, PI, PT station and coordinates
  - curve radius and degree of curve
  - deflection angle
  - tangent bearings and lengths

- stations and station equations (if applicable)
- station/offset information (in relation to other alignments within the project limits)
- Engineer's seal, signature and date

An imported COGO or GEOPAK similar output file is recommended.

For an example of a horizontal Alignment Data Sheet, see horzalgn.

Plan and Profile Sheets

The next paragraphs cover these Plan and Profile (P&P) Sheet. (For an example of a P&P Sheet, see pavplanp.) topics:

- Purpose
- Guidelines
- Plan view contents
- Profile view contents.

Purpose. The purpose of the P&P Sheets is to show the horizontal and vertical alignments and may describe other work to be done. These sheets will also show existing features which are typically obtained by aerial photography.

Guidelines. Clarity and completeness is the rule to follow in the preparation of P&P Sheets. The plan and profile views are normally shown on the same sheet but may be shown on separate sheets where plan views take up a great deal of space and it would be impractical to show the profile view on the same sheet. Graphic scales vary depending on the type and size of project and the amount of information required. The most common scales used for plan views are 1 inch equals 100 feet and 1 inch equals 50 feet, with respective 1 inch equals 10 feet and 1 inch equals 5 feet vertical scales.

Plan view contents. The following are the contents of the plan view portion of the P&P sheets:

- Beginning and Ending of Project
- Centerline Stationing, Tangent Bearings, and Equations
- Horizontal Curves
- Superelevation
- Intersecting Roads and Driveways
- Existing and Proposed Culverts
- Location Features
- Sheet Totals for Roadway Items

- Miscellaneous.

Beginning and ending of project. Show project number, station number control-section number and reference marker with arrow leader for each control break. Stations should increase from left to right on the plan sheets.

Centerline stationing, tangent bearings and equations. Station numbers should be indicated at 500 feet intervals with tick marks every 100 feet.

Horizontal curves. Show points of curvature, and points of tangency on centerline with small circles/bubbles. Show the points of intersection as a small triangle. List the delta, radius curve, radius, tangent, and length somewhere on the sheet identifying each curve with the point of intersection station.

Superelevation. Show stationing of transitions from normal crown to full superelevation and from full superelevation to normal crown. Indicate emax used.

Intersecting roads and driveways. Show centerline station, name, property line widths, and proposed radii. Show limits of construction (usually to the right-of-way line of the main roadway).

Existing and proposed culverts. For cross drainage structures show stationing, and for parallel drainage structures show the stationing and offset.

Location features. Show north arrow, benchmark data, right-of-way lines, utility and channel easements, right-of-way markers, county lines, city limit lines and stations, section corners, survey lines, and control-of-access lines.

Sheet totals for roadway items (optional). Show item numbers, description, estimated quantities, and units of measurement. Place on right side of sheet.

Miscellaneous

- Show bridges and their beginning and ending stations.
- Show super-elevation direction, rates, and beginning and ending transition stations, and indicate axis of rotation.
- Show right-of-way widths and roadway widths at each break and at the beginning and ending of each sheet.
- Reference roadway layout sheets if applicable for details that cannot be shown on plan sheets.
- Show retaining wall locations.
- Show ditch blocks and alignment of special ditches and channels. In lieu of the plan sheets, this information can be shown on other drainage layout sheets.
- Show railroad crossings, cross fences, and channels with direction of flow arrows.

- Illustration of toes and tops of slopes is sometimes beneficial.

Profile view contents. The following are the contents of the profile view portion of the P&P Sheets:

- Proposed Grade Lines
- Natural Ground Profile
- Elevations
- Utilities
- Stationing And Elevations
- Structures/Culverts.

Proposed grade lines. Use a heavy solid line. Show points of vertical intersection as a small triangle. Show points of vertical curvature and points of vertical tangency with small circles/bubbles and give curve data near point of vertical intersection. Show percent grade on tangents to 3 decimal places. Give description for profile grade line (e.g., Alignment A, Rt. Gutter, Left Frontage Road).

Natural ground profile. Use a light dashed line and give description (e.g., Existing Centerline FM 76).

Elevations. Show proposed and existing elevations at 50 feet intervals.

Utilities. Show opposite plan view and give elevations, if known, or give depth dimensions, if known.

Stationing and elevations. Show station numbers along bottom and datum elevations along sides of sheet.

Structures/culverts. Show below and in line with plan view.

Other Sheets

For larger projects, some of the information which might normally be located on P&P Sheets can be located on other plan sheets such as the roadway and bridge layout sheets in order to improve clarity and completeness. The following are defined below:

- Intersection details
- Driveway details
- Miscellaneous details
- Roadway standards.

Intersection details. Used to show pavement contours, sidewalks, pedestrian ramps, and any details requiring a larger scale (for clarity) than the main P&P Sheets. (For an example of paving details, see intrdtls.)

Driveway details. They are used to provide pertinent construction details such as pavement structure, grades, limits of construction, etc.

Miscellaneous details. For items such as curb types, standard driveways, traffic barrier modifications, sidewalk details, curb ramp details, etc. (For an example of miscellaneous paving details, see miscpav.)

Roadway standards. Such as guardrail, crash attenuators, concrete pavement standards, etc.

Retaining Wall Details

The discussion below covers these retaining wall topics:

- Retaining Wall Layouts
- Retaining Wall Standards

Retaining Wall Layouts

Refer to the Geotechnical *Manual* for more information on retaining wall layouts and foundation design. The next paragraphs deal with

- Guidelines
- Plan view contents
- Profile view contents.

For an example of a retaining wall layout sheet, refer to the *Geotechnical Manual*, Chapter 6.

Guidelines. Horizontal and vertical controls for retaining walls, in plan and elevation views, with typical wall cross section. Show top-of-wall line, and proposed ground line (typically 1-foot minimum above bottom of wall) in profile view.

Plan view contents. The following are the contents of the plan view portion of the retaining wall layout sheets:

- Beginning and Ending Of Wall
- Controlling Roadway Stationing, Tangent Bearings, and Equations
- Horizontal Curves
- Typical Wall Cross Sections

- Intersecting Roads
- Drainage Appurtenances
- Location Features
- Sheet Totals for Retaining Wall Items (optional).

Beginning and ending of wall. Show, begin and end stations, of retaining wall alignment including offsets.

Controlling roadway stationing, tangent bearings and equations. Station numbers should be indicated at 500 feet intervals with tick marks every 100 feet.

Horizontal curves. Show points of curvature, and points of tangency on centerline with small circles/bubbles. Show the points of intersection as a small triangle. List the delta, radius curve, radius, tangent, and length somewhere on the sheet identifying each curve with the point of intersection station.

Typical wall cross sections. Show location of wall in relation to the sidewalk, roadways, rail, coping, and drainage details.

Intersecting roads. Show the location of all roads or driveways within the limits of the wall.

Drainage appurtenances. Show the location of all drainage appurtenances located within the limits of the wall.

Location features. Show north arrow, right-of-way lines, and utility and channel easements.

Sheet totals for retaining wall items (optional). Show item numbers, description, estimated quantities, and units of measurement. Place on right side of sheet.

Profile view contents. The following are the contents of the profile view portion of the retaining wall layout sheets:

- Proposed Grade Lines
- Natural Ground Profile
- Elevations
- Utilities
- Stationing And Elevations
- Drainage Appurtenances.

Proposed grade lines. Use a heavy solid line. Show point of vertical intersection as a small triangle. Show points of vertical curvature and points of vertical tangency with small circles/bubbles

and give curve data near points of vertical intersection. Show percent grade on tangents to 3 decimal places. Show top and bottom of wall grade lines.

Natural ground profile. Use a light dashed line and give description (e.g., Existing Centerline FM 76).

Elevations. Show proposed and existing elevations at 50 feet intervals.

Utilities. Show opposite the plan view and give elevations, if known, or give depth dimensions, if known.

Stationing and elevations. Show station numbers along bottom and datum elevations along sides of sheet.

Drainage appurtenances. Show elevation and align with plan view.

Retaining Wall Standards

These include standards such as cast-in-place wall, mechanically stabilized earth (MSE) wall, special traffic rail, etc. Retaining wall standard sheets can be found on the Bridge Division Standards page.

Drainage Details

Refer to the *Hydraulic Design Manual* for information on drainage design details. The drainage detail discussion below covers:

- Drainage Area Map Sheets
- Hydraulic Calculation Sheets
- Culvert Cross Sections, Layout, and Detail Sheets
- Plan and Profile Sheets
- Miscellaneous details
- Drainage standards.

Drainage Area Map Sheets

Drainage area maps are drawn at a convenient scale to include all of the drainage areas of the project. The purpose of this sheet is to document the size and location of the watersheds used to size each of the drainage structures and/or appurtenances. The following are the contents of Drainage Area Map Sheets (For an example of a Drainage Area Map Sheet, see drainare. For an offsite drainage area map, see offdrain.):

- Major tributaries or streams being crossed
- Major highways and/or streets should be shown for viewer orientation
- Drainage areas are to be numbered for cross-reference in the runoff table
- Location of structure and/or stream crossing.

Hydraulic Calculation Sheets

Each bridge classification stream crossing will have its own hydraulic data sheet. Hydraulic calculations for culverts consist of a runoff computation table and a culvert computation table. Additional tables will be required to show the computations for storm sewer runs and inlets if those appurtenances are included in the plans. The purpose of this sheet is to verify structure design and to document calculations. The following are the contents of the Hydraulic Calculation Sheet:

- Bridge classification structure requirements
- Runoff computations
- Standard calculation tables.

Bridge classification structure requirements. Each stream being crossed by a bridge classification structure will have on its hydraulic calculation sheet: the floodplain cross section, run-off calculations indicating the method used, an elevation vs. discharge curve, and a cumulative conveyance curve if there is a multiple flow divide. (For examples of a Bridge Class Culvert Layout Sheet, see brdgculv and culvlay.)

Runoff computations. Runoff computations for culverts, storm sewers, and inlets need to indicate the method used (i.e. Rational or USGS) and the values used for intensity, coefficient of run-off, etc., used to arrive at the runoff volume for each drainage area.

Standard calculation tables. The Bridge Division's Hydraulics Section has standard calculation tables for the culvert, storm sewer, and inlet computation that may be used in the plans. (For an example of runoff computations, see runcomp; for drainage inlet computations, see inltcomp; for storm sewer computations, see sscomp.)

Culvert Cross Sections, Layout and Detail Sheets

Each culvert involved in the proposed work should have a cross section which shows the work to be done, the description of the culvert, and a summary of estimated quantities. In addition, bridge class culverts should also have layouts that show the same information. The following are the contents of Culvert Cross Section, Layouts and Detail Sheets:

- North Arrow
- Skew Angle

- Centerline of Roadway
- Beginning and End of Structure (show begin and end stations and elevation for bridge class culverts)
- Roadway Width
- Centerline of Structure
- Direction of Flow
- Description of Existing Structure (should be included for documentation purposes)
- Roadway Cross Section
- Earthwork Slope(s)
- Flowline Elevations
- Slope of Culvert
- Wingwall Type
- Overall Length of Culvert
- Description for Proposed Culvert with Appropriate Standards
- Hydraulic Data (Headwater and Tailwater Elevations)
- Estimated Quantities shown in tabulated form
- Scale - (vertical and horizontal scales are relative to sheet size)
- Existing Ground Line
- Special Details (include details such as bill of reinforcing if the proposed work is not shown in a standard or provide location of such details elsewhere in the plans)
- Right-of-Way Lines and/or Easements.

Also, every bridge class structure throughout the nation is assigned a National Bridge Inventory Number. This is a 15-digit number with the last three digits being the permanent structure number. The National Bridge Inventory Number is composed as follows:

- The first two digits are the district number.
- The next three digits are the county number.
- The next digit is always 0.
- The next four digits are the control number.
- The next two digits are the section number.
- The last three digits are the permanent structure number.

The permanent structure number (PSN) is assigned by the Bridge Division. Each bridge classification structure is assigned a separate number. This PSN should be reflected in the heading for the bridge category of work in the estimate. The user should contact the Bridge Inspection Branch of the Bridge Division to obtain a PSN for all existing or proposed structures containing bid items in the plans estimate.

Plan and Profile Sheets

Plan view will show locations of inlets, storm sewers, culverts, ditches, etc., with all roadway detailing not shown. Profile view will show storm sewer runs (type, size, and length) with corresponding profile of details such as

- Existing and proposed ground
- Trench excavation protection
- Existing utilities

For an example of a drainage system plan and profile sheet view, see drainsht.

Miscellaneous Details

For items such as

- Inlet modifications
- Pipe bedding details
- RC pipe connections
- Block sodding
- Flume or channel details.

For an example of miscellaneous drainage details, see miscdrn.

Drainage Standards

Drainage standards include

- Box culverts
- Wingwalls
- Inlets
- Safety end treatments.

Drainage standard sheets can be found on the Bridge Division Standards page.

Utilities

These utility items need to be considered:

- Existing utilities
- Proposed Utility (P&P) Layouts
- Utility Standards.

Existing Utilities

Separate sheets would be provided only if the project also includes proposed utilities. Existing utilities are usually included on the roadway P&P Sheets.

Proposed Utility (P&P) Layouts

Consider utility P&P layouts if such work is included in the project.

Utility Standards

Consider utility standards if necessary.

Bridges

For detailed information on structural detailing see the *Bridge Detailing Guide* in the Design Section of the Bridge Publications page on TxDOT's internet site. Bridge Sheets to consider include

- Bridge hydraulic data
- Bridge layout.

Bridge Hydraulic Data

These data can be shown on a separate sheet or may be included in a separate hydraulic report.

Bridge Layout

For an example of a bridge layout, go to the *Bridge Detailing Guide*. Each bridge to be constructed or widened has a layout which clearly illustrates the proposed work drawn at a usual scale of 1 inch equals 50 feet horizontally and 1 inch equals 5 feet vertically. The following paragraphs deal with these aspects of bridge layout:

- National Bridge Inventory Number
- Plan layout

- Profile layout
- Layout review considerations.

National bridge inventory number. Every structure throughout the nation is assigned a National Bridge Inventory Number. This is a 15-digit number with the last three digits being the permanent structure number. The National Bridge Inventory Number is composed as follows:

- The first two digits are the district number.
- The next three digits are the county number.
- The next digit is always 0.
- The next four digits are the control number.
- The next two digits are the section number.
- The last three digits are the Permanent Structure Number (PSN).

The PSN is assigned by the Bridge Division. Each bridge classification structure is assigned a separate number. This PSN should be reflected in the heading for the bridge category of work in the estimate. The user should contact the Bridge Inspection Branch of the Bridge Division to obtain a PSN for all existing or proposed structures containing bid items in the plans estimate.

Plan layout. The following are the contents for the plan layout:

- Reference Line, Centerline, or Profile Grade Line (bearing and location)
- Beginning and Ending Bridge Stations and Elevations
- All Bent Stations and Bearings
- Armor Joint type, Location, and Size of Seal (if used)
- Width (overall, roadway, shoulders, etc.)
- Approach Slab and Curb Returns
- Direction of traffic and/or Stream Flow
- North Arrow
- Correct Plotting of Test Holes, Identification, and Location
- Horizontal Clearances (as required, for structures, utilities, RR tracks, etc.)
- Right-of-Way (if applicable)
- Horizontal Curve Data (if applicable)
- Cross slope and/or Superelevation (if applicable)
- Limits of Riprap, Blockout Around Column
- Skew angle(s) of Structure and/or Bents

- Railing Type (specify rail type and show nominal face of rail)
- Beam Line Numbers (consistent with span details).

Profile layout. The following are the contents for the profile layout:

- Overall Length of Structure
- Lengths and Types of Units/Spans
- Overall length, limits of payment, and Type of Railing (rail post spacing if required to clear slab joints)
- Vertical Curve Data and Grade
- Beginning and Ending Bridge Station and Elevation
- Fixed/Expansion Conditions at All Bents
- Minimum Calculated Vertical Clearances and Other Clearances as Required (structures, utilities, RR tracks, etc.)
- Existing and Proposed Ground Lines Clearly Marked
- High Water Elevation (if applicable)
- Grid Elevations and Stations
- Column Heights
- Number, Size, Length, and Type of Foundations
- Test Holes, Data, and Information
- Bent numbers must be circled
- Show Typical Transverse Section (overall roadway widths, shoulder width, sidewalks, cross slopes and railings)
- Clearance sign(s) and other signs attached to bridge
- Traffic signal detectors in bridge slab
- Permanent Structure Number (PSN)
- Limits and type of riprap
- Design Speed, Average Daily Traffic (ADT), and Functional Classification.

Layout review considerations. The following are important considerations when reviewing a bridge layout:

- Check layout against all structural details for compatibility to be sure that all features correspond.

- Check foundation against structural details and special foundations notes specified by the foundation engineer to be sure spread footings or number and direction of batter of piles are in agreement.
- Checker should initial sheet after checking for the corrected details.

Detailed Summary

This is a detailed summary of the bid items for all bridges, also including PSN identification and bearing seat elevations. For an example of a detailed summary sheet, go to the *Bridge Detailing Guide*.

Structural Details

These are details for abutments, bents, framing plan, slab details, etc.

Bridge Standards

Some of these standards are for beams, deck details, expansion joint, rails, etc. See Bridge Standards for a complete list of standards.

Traffic Items

These traffic items are discussed below:

- Traffic signal layout
- Electrical and illumination
- Signing and delineation
- Pavement markings and markers
- Traffic Management System
- Traffic standards.

Preferably, standard sheets associated with each subsection below should be listed under each traffic item independently.

Traffic Signal Layout

Basic intersection layout showing signal pole/mast arm locations, conduit runs, loop detectors, lanes, and signal head arrangements, etc. Summary tables including all signal bid items should be shown for each signalized intersection. (For examples of Traffic Signal Layout Sheets, see siglay1 and siglay2.)

Electrical and Illumination

These are layouts of lighting pole, mounted luminaire, electrical service, and conduit run locations, etc.

Signing and Delineation

Sheets which could be necessary are Signing and Delineation Layout Sheets (showing locations of all signs and delineators), overhead sign bridge details (elevation view of sign and support), and sign details (showing sign face dimensions and text). Summary of Large Signs Sheets and Summary of Small Signs Sheets would also be included. (For an example of a Summary of Large Signs, see sumlrg; for an example of a Summary of Small Signs, see sumsml.)

Pavement Markings and Markers

These are roadway plan views showing all proposed markings, denoting type, color, width, etc. Include standard pavement markings and raised pavement markers. (For an example of a Permanent Pavement Marking Layout Sheet, see prmpavm.)

Traffic Management System

Such sheets may be needed on large (typically freeway) projects to denote surveillance and control systems items, such as traffic cameras, changeable message signs, vehicle detection, conduit runs, and other details for smart highways type features.

Traffic Standards

Some of these standards are sign standards (TSR, etc.), sign mounting details (SMD), overhead sign bridge/support standards (OSB, etc.), pavement marking (PM, etc.), electrical details (ED), roadway illumination details (RID), signal mast arms (SMA, DMA, MA), etc. See Traffic Standards for a complete list of standards.

Railroad

Railroad Requirements

TxDOT's Traffic Operations, Bridge, and Construction Divisions, along with the Class 1 railroad companies, have developed Railroad Requirements General Note sheets that are now required by the railroad companies to be included as part of the PS&E package.

These sheets assist in ensuring that all bidding contractors will be made aware of UPRR, BNSF, & KCS requirements. Although these sheets were developed with the Class 1 railroads, they are also

required on projects with shortline railroads due to the generic requirements shown when working on railroad rights-of-way.

There are versions of the Railroad Requirements sheets for both Bridge Related Projects and Non-Bridge Related Projects. Both versions contain generic, non-project specific information such as Right of Entry, insurance, safety certification requirements, etc. For Bridge Related Projects, demolition guidelines, construction window constraints, and railroad submittal requirements information are also included.

Sheet 1 of the Bridge Related Projects sheets is to be modified by the designer for project specific details (rail survey and fencing) and signed, sealed, and dated by a P.E. All other sheets (Bridge Related and Non-Bridge Related Projects) do not require a P.E. seal.

Additional information and copies of the Railroad Requirements sheets can be found on the Traffic Operations Division's Plans, Specifications & Estimates Requirements on Projects with Railroads internet page.

Railroad Scope of Work

The Railroad Scope of Work sheet identifies project specific work and requirements. It describes the scope of work at the crossing location(s), other project work in railroad right-of-way, the flagging requirements, any construction work to be performed by the railroad, the railroad insurance requirements, the right of entry agreement, any railroad coordination meeting requirements and the emergency contact information.

Additional information and a copy of the Railroad Scope of Work sheet can be found on the Traffic Operations Division's Plans, Specifications & Estimates Requirements on Projects with Railroads internet page.

Railroad Plans

If railroad work is in the project, necessary plans may include Plan and Profile of new track, grade crossing layouts (planking, signal location, delineation of TxDOT/RR work responsibilities), track typical section, and track details, etc. A Railroad Bridge Layout Sheet would be included with other project bridge layouts, if any. These railroad plan sheets are not labeled as Exhibit A in final plans sets. For an example, refer to the Bridge Detailing Guide in the Design section of the Bridge Publications page on TxDOT's internet site.

Environmental Issues

The next subsections cover these environmental issues:

- Storm Water Pollution Prevention Plans
- Wetland Mitigation Plan

- Environmental Standards
- Environmental Permits, Issues and Commitments (EPIC) Sheet

Storm Water Pollution Prevention Plans

A Storm Water Pollution Prevention Plan (SW3P) consists of plan sheets, which primarily address **temporary** erosion control measures during project construction (For examples of SW3P Sheets, see swppp and swppp3p.). An SW3P is required (by 1990 Clean Water Act) for all projects. The Design Division has directed however that if there is any soil disturbance at all, at predictable locations, a SW3P sheet(s) should be included in the plans. This would as a minimum be the narrative, partially standardized sheet which is always the first sheet of the SW3P portion of the plans; the other sheets will show the locations of the various erosion control features. For jobs which disturb no soil (seal coats, overlays, etc.), a standardized General Note (and selected bid items in the estimate or by force account) will serve as the SW3P. The Temporary Erosion Control Item is required on all projects and makes reference to a SW3P in the project.

Wetland Mitigation Plan

Projects that unavoidably disrupt waters of the United States which have been further determined to be wetlands will require mitigation (replacement) of such wetlands. Approval of mitigation plans must be obtained from the Corps of Engineers such that the project can be authorized under a Section 404 permit. These plans may include layout of replacement wetlands, grading details, possible vegetation replacement, etc., and it is highly desirable to complete these documents (for submittal to the Corps) as early as possible, as these sheets are also used as part of the Section 404 permit application.

Environmental Standards

Erosion control standards (sediment control fence, construction exits, etc.) can be found on the Roadway Standards internet page.

Environmental Permits, Issues and Commitments (EPIC) Sheet

The EPIC sheet must be completed by the district listing all environmental commitments, issues and conditional requirements affecting the contractor and their work on that specific project. The sheet can be supplemented by specific details shown on other plan sheets, but the areas of concern should be shown on the EPIC for the contractor’s information. The sheet should not be used to reiterate what is already shown in environmental permits for all projects. This sheet is specific to the project it is included in, and should address areas the contractor should be aware of. Late changes to commitments that affect contractor work requirements are to be included in the PS&E by an addendum. Include everything from conditional requirements from resource agencies to environmental

commitments made to landowners and other entities (e.g. tree preservation) on the EPIC sheets. EPIC sheets that affect contractor work requirements, further detail contractor obligations in the plans. Changes in commitments after letting will require either a written notice to the contractor (e.g. for identifying a restricted area) or a change order for added or reduced work.

It is not required to have an engineer sign and seal the EPIC sheets. It is a standard sheet which can be found on the Roadway Standards internet page. It can be modified electronically on a project by project basis. Click on EPIC to see a sheet.

Miscellaneous Items

These miscellaneous items appear below:

- Removal Sheets
- Landscaping/irrigation

Removal Sheets

These sheets are usually included on major reconstruction projects when the right-of-way is cluttered with many existing features. The sheets would consist of roadway plan views showing the items for contractor removal, such as structures, pavements, guard rails, and other existing appurtenances. (For an example of Removal Sheets, see remsht.)

Landscaping/Irrigation

These include appropriate layouts and details if such aesthetics treatments are included in the project.

Section 4 — Drafting Guidelines

Overview

Accurate, clear and consistent plans are essential in obtaining accurate bids, efficient construction, and reliable permanent records. The consistent use of uniform drafting guidelines will increase the efficiency in which the plans are reviewed by the contractors prior to bidding and improve their understanding of the contract's intent. It is highly recommended that designers and technicians use uniform drafting styles regardless of whether the plans are prepared by hand or by CADD. The intent is to produce consistent, accurate, and legible sets of plans. Do not clutter the plans with unnecessary information.

This section discusses the following drafting guidelines:

Drafting Conventions

- Show existing topography at a weight of 0 and a line style of dot. (LC=1)
- Show proposed features at a weight of 1–2 and a line style of solid. (LC=0)
- Show centerlines and control lines at a weight of 0–1 and a line style of dash-dot. (LC=4)
- Show R.O.W. lines at a weight of 0–1(existing) or 2–4 (new) and a line style of dash-dot-dot. (LC=6)
- Show hidden lines at a weight of 0–1 and a line style of short dash. (LC=2)
- Show leader, dimension and extension lines at a weight of 0 and a line style of solid. (LC=0)
- Scale of drawing/sheet should be clearly shown, including not-to-scale (NTS) items.

Annotation Conventions

- Show all text with a font of 22 (TXLEROY). Exception: decorative fonts on Title Sheet.
- Show all text with a line style of solid. Exception: screening annotation for existing elements.
- Size all text to plot at standard scales listed below.

- Unusually large text sizes are unnecessary. Exception: decorative fonts on Title Sheet.
- Use minimum or usual size text, font 1, left top justification for blocks of text.
- Avoid clutter. Pull annotation away from the picture.
- Line up annotation.
- Break leader lines at conflicts only where readability would be improved.
- Group leader lines at about the same angle for neatness.
- Use a circular arc for curved leaders.
- Minimize mixing of curved and straight leaders on the same page.
- Include only the annotation required for construction. Exception: hydraulic calculations.
- Additional designer's notes may be placed above the sheet in CADD files. Exception: alignment annotation is placed in the master file.
- Place annotation in the individual sheet files rather than master design or map files.
- Avoid odd abbreviations and squeezing text to fit. Move it or shorten it instead.
- Reference file clip masking to clear annotation can be minimized by better text location.

Design Files

- Complete all design in one or more master design files, not individual sheets. Attach master design file(s) to sheets as a reference file. To avoid problems, do not copy them. This enables drafting modifications and/or updates to be performed in a single file rather than multiple sheet files. Avoid attaching reference file with save full path.
- All master design files should be 2D, unrotated, full scale, real world coordinates. All projects are to be developed using NAD83 English State Plane coordinates.
- Multiple master design files (for TOPO, ROADWAY, DRAINAGE, BRIDGE, etc.) allow several designers to work on different parts of the project at the same time while referencing each other's work.
- Place all features at exact coordinates, not eyeballed - designers will snap to them. Since some features may be used by designers for other calculations or details features should be placed by exact coordinates to avoid errors.
- Avoid working in existing TOPO files due to the hazard of overwriting or corrupting the original file. Always keep good backups.
- Attach master design file(s) to sheets as a reference file. Do not copy them. This avoids version problems.

- Attach PE's seal to sheet file as a reference file (from the shared SITE folder). Do not place a cell. This will save disk space, speed up file retrieval, and provide better control of the PE's seal.
- Working units: Defined by standard unit ratios for Survey Feet within Microstation and are based on 1 Meter (1 meter = 39.37/12 or 1 meter = 3.280833333333. Labeled ft/tn with a resolution of 1000 units of resolution per foot.
- Level names from the TxDOT DGN Library will be used to differentiate features within the overall design.
- The TxDOT DGN library is supplied to establish a standard drafting scheme. This scheme should be used as delivered without modification.
- Be sure all data is being backed up on a daily basis.

File Management

- Keep an information sheet for each project. If too complex, keep a separate sheet for each file. This can be on paper. A readme file in the project folder is even better.
- Keep all files (graphics, notes, PS&E, etc.) for a project in subfolders of a single folder tree. Avoid using long path names as they cause problems.
- Share, do not copy files for more than one person to work on; this prevents duplicate file conflicts.
- Store projects on the shared drive (usually “T”) in a folder with an obvious name.
- Creating an empty subfolder named after the CSJ (e.g., “0253-04-089”) makes the project easier to find in archive listings later.
- When a project is completed, archive all files/data. Presently, CD media is considered the best for long term storage.
- Identify a SITE folder on the “T” drive, or another shared drive. This is the best location for shared files such as cell libraries and mapping files that are used on many different projects.

Standard Sheet Cells

- District and division standard cell libraries are available. Identify and use them whenever possible.

- Create any new standard sheet cells (see Table 2-1 and Table 2-2) at 1" = 100' for consistency.

Table 2-1: Full Size (D) and Half-Size (B) Sheet Text

Text Usage	Leroy Size (D) / (B)	WT	1"=10'(D) 1"=20'(B)	1"=20'(D) 1"=40'(B)	1"=30'(D) 1"=60'(B)	1"=40'(D) 1"=80'(B)	1"=50'(D) 1"=100'(B)	1"=100'(D) 1"=200'(B)
(not used)	< 120 / < 60	-	-	-	-	-	-	-
Minimum	120 / 60	0 – 1	1.2	2.4	3.6	4.8	6	12
Usual	140 / 70	1 – 2	1.4	2.8	4.2	5.6	7	14
Empha-sized	200 / 100	2 – 3	2	4	6	8	10	20
Sheet Title	240 / 120	3 – 4	2.4	4.8	7.2	9.6	12	24
(not used)	> 240 / > 120	-	-	-	-	-	-	-

Table 2-2: Full-Size (D) and Half-Size (B) Sheet Dimensions

Scale	*Heavy border line 21" x 32"	*Outside cut line 22" x 34"	Left margin	Top, Bottom, Right margins
Plotted	16" x 10.5"(B) 10.5" x 16" 15.15" x 10.50"	34" x 22"(D) 17" x 11"(B) 11" x 17"	2" (D) 1"	½ " (D) ¼ " (B)
1" = 10' (D) 1" = 20' (B)	210 x 320	220 x 340	20	5
1" = 20' (D) 1" = 40' (B)	420 x 620	440 x 680	40	10
1" = 30' (D) 1" = 60' (B)	630 x 960	660 x 1020	60	15
1" = 40' (D) 1" = 80' (B)	840 x 1280	880 x 1360	80	20
1" = 50' (D) 1" = 100' (B)	1050 x 1600	1100 x 1700	100	25
1" = 100' (D) 1" = 200' (B)	2100 x 3200	2200 x 3400	200	50
*Cut line only on large format devices				

Plotting Guidelines

Each of the plot drivers set up by engineering support attempts to size and justify the plot on the sheet chosen, then writes the border information (file name, plot date and time, any comments) in the lower left hand corner if room is available. This does not always work perfectly. The next sub-sections provide

- General plotting guidelines
- Local plotting on the current network in use.

General Plotting Guidelines

- Select the correct driver for your plotter.
- Always use preview.
- Snap fence to the outside cut line.
- Verify plot area is set to FENCE in the plot dialog box.
- Use the default “B” (11" x 17") cut page for half-size plots.
- Use the “D” (22" x 34") cut page for full-size plots on applicable plotters.
- Check the scale. If the scale is correct, then the sheet was set up to the dimensions described above.
- If the scale is incorrect, make sure that entity is set to fence, not view.
- If the scale is incorrect and will not reset, the sheet cut line may be nonstandard. Correct the dimensions of the outside cut line and the heavy border line.
- Use the Roll Plot page size for non-standard plot sizes on large format DesignJet plotters.
- Adjust the length (in page size), or Long Axis will run the default length of 25 feet of media on applicable plotters.

Local Plotting on the Current Network in Use

- A port must be captured before plotting in Microstation.
- Printers must be installed on computer by TxDOTNow online IT support.
- Once a printer is installed, the printer can be assigned to a port within MicroStation.
- Open a .DGN file in MicroStation and go to TxDOT/Printer Ports/Map Ports. Under the Map Printers tab, select a LPT#, then select a printer to assign to it, and finally click Map.
- When plotting in Microstation, do not enter a plot name when prompted. Instead, enter the captured port (such as LPT1). An alert message will appear stating that the file (e.g., D:\LPT1) already exists. Disregard this error message and hit OK.

- To avoid typing in the local port every time, Microstation plot driver files can be edited to automatically route a plot to the local printer port. For details, contact your engineering support liaison.
- Use of third party plotting may (Iplot) be supported.

Section 5 — General Plan Set Checklist

Checklist

- ❒ Check the plan set for completeness. Make sure that all sheets (including standards) have been included in the plan set prior to submission.
- ❒ Make sure that the title block (district, county, highway, CSJ, and sheet number) on all plan sheets has been completed correctly.

EXAMPLE: Check the index of sheets. All sheet numbers must be listed, including all supplemental sheets (Example: 13, 13A-F as opposed to 13-13F). Each individual plan sheet must be accounted for in the index of sheets. List all **omitted** sheets in the index of sheets. Titles shown on the index of sheets must match the title exactly on the plan sheet.

- ❒ Check plan set for proper engineer's signature, seal, and date. See Chapter 2, Section 2, Sealing and Dating Construction Documents for additional details.
- ❒ Check design speed and ADT shown on the Title Sheet against that shown on the approved Form 1002, Page 3. (See Page 3 of Form 1002 in Chapter 5, Section 2, for more information.)
- ❒ Check the governing specification note on the Title Sheet to make sure spec book year adoption date and the proper provisions (federal or state) have been referenced.
- ❒ Check the limits, stationing, and equations on the Title Sheet for accuracy. Make sure that the stationing, equations, and exceptions shown equate to the project length shown and match the project length(s) included on DCIS. See the *DCIS User Manual*; Chapter 2, Section1; and Chapter 4, Section 1.
- ❒ Make sure that all necessary signatures (including other entities) have been included on the Title Sheet prior to submission.
- ❒ Make sure that the responsible engineer's statement, seal, and signature have been included next to the index of sheets.
- ❒ Make sure there is an applicable typical section for all stations and roadways.

  The following sheets should be provided for all 4R projects. In addition, these sheets should be provided for 3R projects that involve substantial changes to the vertical grade and/or horizontal alignment of an existing facility and/or right of way acquisition.

- ◆ Survey Control Index Sheet (signed, sealed and dated by a PE)
- ◆ Horizontal and Vertical Control Sheet (signed, sealed and dated by a PE)
- ❒ Check the plans to make sure that the locations of existing utilities are shown. Also make sure that the locations of unacquired ROW parcels (pending acquisition prior to submission) have been shown.

- ❒ Check proposed design features such as horizontal and vertical alignments, superelevation, etc., for compliance with design standards and design speed requirements.
- ❒ Check the bridge layouts, typical sections, and P&P sheets for conformance with any previously approved preliminary design submissions.
- ❒ Confirm that environmental commitments made in the environmental assessment were addressed in the PS&E.
- ❒ Check the proposed roadside design. Make sure all safety enhancements (safety end treatments, metal beam guard fence, single guardrail terminals, etc.) have been addressed. Check layouts, typical sections, etc., for proper clear zone requirements (see *Roadway Design Manual*, Chapter 4, Section 3).
- ❒ Check the TCP for conformance with the TMUTCD.
- ❒ Check the index of sheets to verify all necessary current standards have been listed and that these sheets have been inserted into the plan set. All standards must be inserted into the plan set prior to submission.
- ❒ Check all modified (MOD) standards to verify that they have been properly sealed by the responsible engineer with the modifications noted.
- ❒ Check sidewalks, ramps, and other pedestrian features for compliance with the Americans with Disabilities Act (ADA) and Texas Accessibility Standards (TAS) requirements. (See *Roadway Design Manual*, Chapter 2, Section 6).
- ❒ Check the TCP or other plan sheets to verify that the proper treatment for temporary pavement drop-offs has been provided. (See *Roadway Design Manual*, Appendix B, *Guidelines for Pavement* Drop-offs). Make sure that all ends of temporary or permanent traffic barriers have been properly end treated.
- ❒ Check signing summary and layout sheets to make sure that all signs included on the summary sheets are shown on the layout sheets.
- ❒ Check delineation layouts for proper delineator and object marker usage and spacing.
- ❒ Check pavement marking layouts for conformance with the TMUTCD.
- ❒ Check electrical and illumination sheets for service connections.
- ❒ Check traffic signal layouts for accuracy. Check foundation specifications.
- ❒ If bridges or bridge class culverts are involved, make sure that these lengths have been broken out on the Title Sheet and that the mileages add up to match the total project length shown.
- ❒ Verify permanent structure numbers for bridges and bridge class culverts are shown for TxDOT let projects. The permanent structure number and National Bridge Inventory (NBI) number need to be shown on the bridge/culvert layout sheets and in the estimate with 12 cards completed on P3B screen.
- ❒ Review all plan sheets for legibility and reproducibility (type, size, contrast, clarity, etc.).

- ❒ For final PS&E submissions, the E&Q and General Notes sheets must be plotted and inserted into the plan set. The information on the E&Q sheet must match the data on DCIS.

Chapter 3 — Specifications

Contents:

Section 1 — Types of Specifications and Provisions

Overview

This section discusses:

- Standard Specifications
- Special Specifications
- Special Provisions

Standard Specifications

The Standard Specifications are those specifications listed in the department's specifications book entitled *Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges* adopted November 1, 2014. The General Requirements and Covenants (Items 1–9) are required for all contracts. Specifications for construction bid items or reference items usually address six areas: description, materials, equipment, construction methods, method of measurement, and method of payment. The Standard Specifications must be used unless alternative Special Specifications or Special Provisions have been approved for use through the Roadway Specification Section (CST_RDWY_SPECS). Modifications to Standard Items 1 through 9 require the approval of the administration.

Special Specifications

Special Specifications are methods and/or items of work that are not covered by Standard Specifications. They may introduce a new description, materials, miscellaneous classification, construction methods, equipment, measurement, and/or payment articles. Special Specifications may be completely new specifications or the modification of previously approved specifications. Three types of Special Specifications exist:

- Statewide Special Specifications
- Districtwide Special Specifications
- One-time use Special Specifications

After descriptions of these types, a paragraph appears giving information about a Special Specifications index and references.

Statewide Special Specifications. These Special Specifications have been approved for statewide use by the Specifications Committee.

Districtwide Special Specifications. These Special Specifications have been approved for a specific district(s). If a district desires to use another district's specification, it must be submitted for approval to the Roadway Specification Section (CST_RDWY_SPECS). For detailed information on the submission process, refer to Section 2, New Special Specification and Special Provision Submission Requirements.

One-time use Special Specifications. These Special Specifications are those approved for one-time use on individual projects. These may be used on projects other than the originally approved project, using the submission process described in Section 2, New Special Specification and Special Provision Submission Requirements.

Special Specifications index and references. For an index of these Special Specifications, and the Special Specifications themselves, the designer is directed to the libraries maintained by the Construction Division on the internet at: http://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/specifications.html.

Special Provisions

Special Provisions modify Standard Specifications or Special Specifications. Additionally, there are Special Provisions (Triple Zero Special Provisions) which describe, in narrative form, conditions included in a contract which do not relate directly to a work item specification. For more information regarding Special Provisions refer to Section 3, Specification List.

There are three types of Special Provisions:

- Statewide Special Provisions
- Districtwide Special Provisions
- One-time use Special Provisions

Statewide Special Provisions. These Special Provisions have been approved by the Specifications Committee for statewide use.

Districtwide Special Provisions. These Special Provisions have been approved for a specific district(s). If a district desires to use another district's provision, it must be submitted for approval to the Roadway Specification Section (CST_RDWY_SPECS). For detailed information on the submission process, refer to Section 2, New Special Specification and Special Provision Submission Requirements.

One-time use Special Provisions. These Special Provisions are those approved for one-time use on individual projects. These may be used on projects other than the originally approved project, using the submission process described in Section 2, New Special Specification and Special Provision Submission Requirements.

Section 2 — New Special Specification and Special Provision Submission Requirements

Overview

In the early stages of design, the basic nature and character of work should be established, so that bid items may be selected. Also, this allows the designer to establish if any special circumstances may require Special Specifications or Special Provisions. Special Provisions and Special Specifications should be submitted only when it has been determined that construction under the Standard Specifications will not achieve the desired results or will not prove to be economical. If new Special Provisions or Special Specifications are needed, the early identification will allow time for them to be reviewed and approved by the Roadway Specifications Section (CST_RDWY_SPECS) prior to the submission of the PS&E.

General Guidelines

Special Provisions should modify the Standard Specification only to the extent necessary to accomplish the desired results. When voiding portions of an article, void only the sentences requiring removal/replacement and the remainder of the Article is exactly as it appears in the Standard Specification. While condensation and simplification may result in a more concise Special Provision, this practice has too often resulted in misinterpretation and important Standard Specification requirements being unintentionally omitted.

The same general format and wording used in the Standard Specifications should be followed in preparing Special Specifications. This can most readily be accomplished by using a similar standard item as a guide and substituting the desired wording where appropriate. The measurement and payment paragraphs in particular should be essentially the same as similar standard items. This is necessary since conflicts or vagueness in these paragraphs are often the basis for claims against the department.

During the preparation of both Special Provisions and Special Specifications, considerable thought should be given toward requirements and wording which will permit the use of the Special Provisions or Special Specifications on other projects having slightly different conditions. By relegating certain features such as density and gradation requirements to the plans and exercising foresight in preparing the measurement and payment paragraphs this end can be achieved. The repeated use of desirable Special Provisions and Special Specifications is most beneficial in that it results in progress in construction methods and materials, and uniform interpretation of specification requirements.

This section covers

- Form 1814 and Accessing Specification Templates.

Form 1814 and Specification Templates

The next subsections discuss these Form 1814 and Specification topics:

- When to Submit Completed Form
- How to Complete Form
- Accessing Specification Templates

When to Submit Completed Form

To submit a new Special Provision or Special Specification, the Form 1814 must be filled out completely by the district. The form may be downloaded from 1814.pdf. The District Engineer must submit the completed Form 1814 directly to the Roadway Specifications Section (CST_RDWY_SPECS) to receive a new Special Provision or Special Specification number.

For all projects, districtwide use status of a Special Provision or Special Specification is encouraged when the item has been used three (3) or more times. When the district determines they want a proposed Special Provision or Special Specification for districtwide use, the district must submit Form 1814. These districtwide use Special Provisions or Special Specifications are submitted to the Specifications Committee for review and approval in their monthly meeting. Statewide use status for an item is usually submitted by a division.

How to Complete Form

The Form 1814 *Proposed Special Provision or Special Specification, Departmental Material Specification, or Bid Codes* needs to be filled out completely (see Table 3-1, below). Use the latest version of Form 1814. The Form is located at eForms, and may be accessed via the following link: http://www.txdot.gov/txdoteforms/GetForm?formName=/1814.pdf&appID=/CST&status=/reportError.jsp&configFile=WFServletConfig.xml. This form must accompany the Proposed Special Provision or Special Specification.

Table 3-1: Instructions for Completing Form 1814

Step	Action
1	Indicate whether the submittal is for Statewide Use, Districtwide Use, One-Time Use, Bid Codes (only) or Departmental Material Specifications (DMS) by clicking the appropriate box at the top of the form.
2	Select the Division, District, or Office from which the request is coming.
3	Select the specification book year.
4	For Statewide Use, Districtwide Use or DMS, indicate whether the submittal is for construction and/or maintenance use and if its use is to be required or optional.

Table 3-1: Instructions for Completing Form 1814

Step	Action
5	For One-Time Use and Bid Codes (only), list the letting month and year, project number, highway, CSJ and county.
6	Indicate if the proposed specification or provision is for an addendum. If it is, provide the absolute deadline date.
7	For One-Time Use, indicate whether this has been submitted previously and, if so, how many times.
8	Provide the proposed item/DMS number, funding type, and the proposed SP/SS/DMS Title. For Bid Codes (only), proceed to Step 13.
9	Indicate if the submittal is new, identical or similar to a previously approved specification or provision. If similar or identical, list the most recent specification or provision.
10	Provide a clear and concise summary of the proposed change requested. For DMS, proceed to Step 13.
11	Indicate whether the proposed SP/SS will require new bid codes. If yes, list them under Special Instructions for Review.
12	List any reference items.
13	Indicate who created the submittal, contact phone number and the date the submittal was created. List any special instructions for review.

When received at the Roadway Specification Section (CST_RDWY_SPECS), the Form 1814 is logged in. Processing time varies depending on the content of the Special Provision or Special Specification and the information given on Form 1814. Preference is given to Special Provisions or Special Specifications that let first. Many one-time use proposed Special Provisions or Special Specifications are forwarded to other divisions for review and comments. Click here for an example of a completed Form 1814.

Accessing Specification Templates

In order to post Specifications and Provisions to the updated website, templates have been developed and must be used. The templates are found at the Specifications web page at http://www.txdot.gov/business/resources/txdot-specifications.html. The templates open with a .docx extension and must be saved with an .rtf extension prior to emailing the file to CST_RDWY_SPECS. Once the document is opened, the information has been typed in and it's ready to be saved, click on File/Save As, then click on Save As Type, select Rich Text Format (*.rtf). No formatting is lost.

Special Specifications and Special Provisions cannot be accepted for submittal and review unless they are in the correct format.

Click here for an example of a Special Specification.

Centralized Libraries

The approved Special Provision or Special Specification is stored on the appropriate centralized library. The centralized libraries are used to build bid proposals. Contact the Roadway Specification Section (CST_RDWY_SPECS) for questions about these libraries.

(Refer to the Construction Division's Internet site at http://www.txdot.gov/business/resources/txdot-specifications.html for the proper formatting of triple zero Special Provisions.)

Approval Procedure

Any Special Provision to Items 1 through 9 must receive approval from the Administration. All other proposed Special Provisions and Special Specifications (statewide and districtwide) must be submitted to the Specifications Committee composed of Division Heads from the Design Division, Bridge Division, Maintenance Division, Traffic Operations Division, and Construction Division; the section head of Materials and Pavements of the Construction Division; and three District Engineers. One-time-use Special Provisions or Special Specifications are approved through the Roadway Specifications Section (CST_RDWY_SPECS).

One purpose of the Specifications Committee is to carefully screen all Special Provisions and Special Specifications for conformance with departmental policies and construction practices and to approve only those deemed essential. The Specifications Committee also approves Special Provisions or Special Specifications affecting Departmental policy. The Committee also has liaison with legitimate highway industry associations and representatives for the purpose of discussing and/or clarifying specifications affecting those institutions.

Section 3 — Specification List

Overview

Each Standard Specification item, Special Provision, and Special Specification proposed for a project must be listed using a standard format. This listing is called the List of Governing Specifications and Special Provisions, more commonly referred to as the "Specification List" or "spec list." This Specification List is used to assemble the bidding proposal through automated computer programs. Special Provisions and Special Specifications contained in the Specification List are assembled in the bidding proposal. The bidding proposal is a legal document on which the contractor bases bids for a project. Hence, the completeness and accuracy of the Specification List is important.

This section covers:

- Specification list components
- Specification list creation
- Specification list review
- Specification list checklist

Specification List Components

Components of the Specification List are:

- Standard Specifications
- Special Provisions
- Special Specifications
- Reference items

Standard Specifications

This portion of the Specification List always contains Items 1 through 9, which are "General Requirements and Covenants." (See Specification List (speclist) example.) It also always contains the items "Mobilization," "Barricades, Signs, and Traffic Handling" and "Temporary Erosion, Sedimentation, and Environmental Controls." The Specification List provides a listing of the items shown in the estimate. See Chapter 4, Section 2, Determination of Bid Items. Reference items are shown adjacent to their respective Standard and Special Specifications, as applicable.

Special Provisions

This section of the Specification List will contain all the required and optional provisions. Different contract Special Provisions are used on federally funded and state-funded contracts. Under the present system only one Special Provision to any bid item can be used, with the following exception: An alternate bid item description may have different Special Provisions from its base bid item. To use more than one Special Provision on a bid item, a new one-time use Special Provision that incorporates all project specific and required specification revisions must be requested as previously described. Care must be taken to ensure that the new Special Provision is not contradictory to other articles in the specification and combined Special Provision and specification revisions on the project.

Required Triple Zero Provisions also vary between state and federally funded contracts. Other Triple Zero Provisions are project specific irrespective of the funding. Examples of these would be "Detours, Barricades, Warning Signs, Sequence of Work, etc.," or an "Important Notice to Contractors" which may list unclear utilities and/or right-of-way parcels. The following subsections discuss:

- Important Notice to Contractors
- Road User Cost Provisions and accelerated contruction strategies through Special Provision 008---006 which consolidate accelerated construction strategy provisions to the contract.
- `Road Closures During Special Events (Special Provision 007-009 and 007-010)`

Important Notice to Contractors

This provision is a Triple Zero Special Provision and directs the attention of the contractor to any of the following as may be necessary:

- Outstanding utilities
- Outstanding right-of-way
- Outstanding right-of-way encroachments
- Relocation assistance
- Other (contamination information, local materials sources, etc.)

These Special Provisions need to be included with the PS&E when sent to Austin. A template for these Special Provisions may be found at http://www.txdot.gov/business/resources/txdot-specifications/local-government.html.

Outstanding utilities. A notice will be included when utility adjustments required for the construction of the project are still remaining at the time of letting. The contractor is invited to review the list of outstanding utility adjustments with the Area Engineer. The list includes the owner of the

utility, a description of the utility, the location of the utility and an estimated completion date of the outstanding adjustment.

Outstanding right-of-way. A notice will be included when right-of-way acquisition required for the construction of the project has not been completed at the time of letting. The contractor is invited to review the list of outstanding right-of-way with the Area Engineer. The list includes the parcel number, the owner, the location and an estimated acquisition date of the outstanding parcel.

Outstanding right-of-way encroachments. A notice will be included when existing improvements within the project right-of-way remain which would conflict with the contractor's operations. Estimated date of removal would be included for the contractor's information.

Relocation assistance. A notice will be included when former property owners or tenants have not vacated the property. Estimated dates of relocation will be supplied in this Special Provision.

Railroad Requirements for Construction Projects Impacting Railroad Right-of-Way

The following paragraph deals with:

- Contractor requirements, and

  Contractor requirements. TxDOT frequently prepares Plans, Specifications and Estimates (PS&E) for construction and maintenance projects impacting railroads. On each project, include a section titled "Railroad" in the Index of Sheets which includes (1) the appropriate Railroad Requirements Sheet (for Bridge or Non-Bridge Projects) and (2) the Railroad Scope of Work Sheet. These sheets are meant for the contractor and are not part of the Construction and Maintenance Agreement between TxDOT and the railroad company. For further information, please visit the following link for contractor Requirements for Construction projects Impacting Railroad Right-of-Way:

  http://www.txdot.gov/inside-txdot/division/traffic/requirements.html

Road User Cost Provisions

In the past, on most TxDOT projects, the contractor's progress towards project completion was controlled by specifying the number of working days and then assessing contract administration liquidated damages when construction went beyond the contract time allowed. Contract administration liquidation damages were based on the daily cost incurred by the state to continue administering the contract beyond the time established in the contract.

Section 223.012(a)(1) of the Transportation Code requires TxDOT to "develop a schedule of liquidated damages that accurately reflects the costs associated with project completion delays, including administrative and travel delays." Travel delay costs are commonly referred to as road user costs.

The next paragraphs cover these topics relating to road user cost provisions:

- Incentives
- Road user cost application
- A+B bidding description
- Function of part “B”
- A+B bidding use

008---006 allows for the use of use of road user cost for incentives/disincentives. The guidelines outlined herein are to be used as an aid when making decisions on whether to require road user cost on projects. Road user cost, in addition to contract administration costs, should be considered for the following types of projects:

- Projects that add capacity (may include grade separations)
- Projects where construction activities are expected to have an economic impact to local communities and businesses
- Rehabilitation projects in very high traffic volume areas

In addition to meeting at least one of the above, a secondary evaluation should be made considering the following:

- Conflicting utilities will be relocated prior to construction and the right-of-way is clear.
- There is an adequate inspection force available.

If any of the secondary criteria is not met, the district should re-evaluate the proposed use of road user cost liquidated damages before making the decision.

Other considerations when increasing liquidated damages over the standard amounts are as follows:

- If liquidated damages exceed $10,000/day, a daily bonus incentive equal to the daily liquidated damages (with a cap on the number of days) should be offered.
- It is important to have a good estimate of the contract time.
- Calendar day/working day definition should be used.
- The working day definition needs to clearly specify the allowable work hours.
- The beginning and ending of each phase must be clearly defined.
- The maximum bonus amount must be specified.

Table 3-2: Table of Road User Cost Guidelines

Suggested Road User Requirements	Type of Projects
A+B Bidding Strategy	May be used on projects with high volumes that have a significant impact on the local business or create road user cost in excess of $10,000.00. A+B bidding should be used on a very limited basis (CPM required). The maximum number of days that may be bid must be specified.
Road User Cost with Incentive	There are new requirements for use of CPM scheduling. Please see Amadeo Saenz' Accelerated Construction Memo 7-12-04. Special Provision 008---006 consolidates accelerated construction strategies.
Road User Cost without Incentive	May want to use road user cost without incentives on projects where the risk of having utility conflicts is high, such as projects in older urban areas.
Contract Administration Liquidated Damages (CALD) Only	Majority of TxDOT projects.

Incentives Using CALD

Incentives. When the decision has been made to use road user cost, districts should include incentives with the disincentive. There may be occasions when the potentials of discovery of unknown utilities during construction make it prudent to include road user cost as disincentives only. When including incentives, a maximum bonus (number of days) is included in the project proposal. Calendar day definitions should also be used for all incentive projects and may be used on road user cost projects without incentives.

Road user cost application. The daily rate for road user cost may only be applied to the point of completed (end phase) stated in the plans for each phase or substantial completion for the total project. Substantial completion is defined as occurring when all project work requiring lane or shoulder closures or obstructions is completed, and traffic is following the lane arrangement as shown on the plans for the finished roadway or phase. The deadline, locations, and completeness of the work should be clearly stated in the general notes.

A+B bidding

A+B bidding provisions should be considered for large and highly critical projects where early completion should be considered in award of the contract. Care should be taken to ensure that delays in construction time, such as Utility or ROW delays, are eliminated to the greatest extent possible before project letting. This will reduce the chance of contractor claims brought against the department.

Specifications

Article 2.11.5.1 of the general requirements and covenants allows the use of A+B bidding provisions. Article 2.11.5.1 indicates that the bids will be tabulated by the total amount bid for the total construction cost or the "A" part of the bid. The "B" part of the bid is the total number of days bid per project phase/milestone or substantial completion multiplied by the Road User Cost liquidated damages per day calculated for the project.

The **Road User Cost** is calculated by determining the delay caused by the project and multiplying it by the value of time. The value of time used is updated yearly by the Construction Division, and can be found on their crossroads website, http://www.txdot.gov/inside-txdot/division/construction/road-user-costs.html.

Special provision **008---006** allows for the introduction of incentives and disincentives using a combination of Contract Administrative Liquidated Damages and Road User Costs as Accelerated Construction Strategies. This special provision also allows the number of working days bid as the "B" part of the bid to become the working days allowed at the rate (5, 6, 7 day work weeks) specified in the plans.

008---006 should be used where time adjustments can be made by the engineer where:

- work, under the control of the Department, such as extension of limits or changes in scope, change the actual duration of completion,
- delays occur due to unadjusted utilities or unclear right-of-way when clearance is not the responsibility of the Contractor, or
- catastrophic events occur, such as a declared state of emergency or natural disaster, if the event directly affects the Contractor's prosecution.

General Notes

The following information needs to be included in the general notes:

- road user cost per day calculated for the contract,
- the maximum number of working days that will be accepted as a responsive bid for substantial completion of phases/milestones (it is important because the maximum working days do not show up in the bid tabs on the proposal),
- the total number of days allowed for final acceptance of the project after substantial completion (usually 20 days),
- the total sum of incentives available to the contractor for substantial completion of the project or phases/milestones,
- working day determination other than stand workweek must be used,
- CPM scheduling is required on the project.

DCIS/Estimate

- On the P5 screen, the RUC/day needs to be included in the "USER COST AMT" field.
- On the P5 screen, include an asterisk (*) in the "NUMBER WORK DAYS" field in place of the "W".
- The estimate should include item 800-6001 with the RUC/day in the quantity field and the maximum working days in the unit price field. The maximum working days does not show up in the proposal.
- An "N" needs to be included in the unit field of the estimate indicating a non-bid item.
- After the apparent low bidder is determined the working days bid will be included in the "NUMBER WORK DAYS" field and the asterisk (*) is replaced with a "W".
- Include special provision 008---006.

Road Closures During Special Events (Special Provision 007-009 and 007-010)

In accordance with Senate Bill 312, incorporated into Section 224.034 of the Transportation Code, special provision 007-010 is required on all construction projects. The intent of this special provision is to minimize the adverse impacts of road closures to public safety and the economy. This special provision requires that key dates/special events be listed in the plans where the contractor will coordinate with the engineer to ensure that all lanes and ramps possible are available before, during, and after the event.

In accordance with Senate Bill 82 incorporated into Section 223.051 of the Transportation Code, special provision 007-009 is required on all construction projects that include the City of Grapevine and all other affected municipalities. Temporary road closures, including temporary relocations or changes to entrance and exit ramps will be prohibited for all events that are coordinated between the municipality and the department 180 days preceding the scheduled event or key date. This special provision requires that these key dates/special events be listed in the plans where temporary road closures are prohibited.

Special Specifications

All Special Specifications under which payment is to be made or which are used as reference items must be listed by number and title. Particular attention should be given to insure that any standard

items or other Special Specifications referred to in the Special Specifications are indicated as reference items.

Reference Items

Reference items are Standard or Special Specifications used to supplement other specifications. They are noted, mentioned, or referenced in the specification itself or in a plan or general note or by plan note/reference Special Provision. Reference items must be referred to in the Specification List to verify that subsidiary work is performed in accordance with them. **Special Specification**s used as reference items will be listed under the Special Specifications so a copy of the Special Specification will be included in the proposal. In order for a non-pay item to be included in the executed contract, it must be shown as a reference to one of the plans quantity items.

Specification List Creation

The DCIS Specification List cannot be prepared until the Engineer's Estimate has been input into the DCIS P4 screen (see Chapter 4, Section 2). Accordingly, the Specification List should be the last part of the PS&E to be prepared, to allow the designer the opportunity to incorporate all changes to the estimate into the Specification List. Each district is responsible for the creation of the Specification List on DCIS.

The "C3" screen in DCIS is used to create the Specification List. To prepare the Specification List on DCIS, the project identification screen (P1) and the project estimate screen (P4) must be complete. To reach the (C3) screen, sign on to DCIS and on the menu screen, enter the tag of C3, enter the contract CSJ, and then press the ENTER key. For more information on the C3 screen see *DCIS User Manual* Chapter 4, Section 3. The next subsections give procedure and guidelines for:

- Specification list editing
- Specification list printing

Specification list preparation. The Specification List should be the last part of the PS&E to be prepared to verify that any last minute changes to the DCIS estimate were incorporated into the Specification List. The items contained in the plans, estimate, and General Notes must be shown on the Specification List.

To prepare the Specification List, the project identification (P1) screen and the project estimate (P4) screen on DCIS must be complete. Refer to Chapter 4, Section 3 in the *DCIS User Manual*. The SPEC BOOK YEAR field on the P1 screen must have "14" keyed in to create a Specification List using the 2014 specifications. Each district is responsible for the creation of the Specification List records in DCIS. The Specification List becomes part of the bidding proposal so that each Standard

Specification Item, Special Provision, and/or Special Specification proposed for the project(s) is listed and identified in the contract. Table 3-3 details steps to create a Specification List on DCIS.

Table 3-3: Specification List Creation Procedure

Step	Action
1	Sign on to DCIS. The screen shown in Figure 3-1 will appear.
2	Key in “C3” for the BUILD SPECIFICATIONS LIST and enter the contract or controlling CSJ. Press ENTER. The screen shown in Figure 3-2 will appear.
3	On the SPECIFICATION LIST BUILD MENU screen, enter “A” in the PROGRAM OPTION field and press ENTER.
4	Press the F10 key to build and save the Standard Specifications.
5	Press the F2 key to return to the SPECIFICATION LIST BUILD MENU screen.
6	On the SPECIFICATION LIST BUILD MENU screen, enter “B” in the PROGRAM OPTION field and press ENTER.
7	Press the F10 key to build and save the Special Specifications.
8	Press the F2 key to return to the SPECIFICATION LIST BUILD MENU screen.
9	On the SPECIFICATION LIST BUILD MENU screen, enter “C” in the PROGRAM OPTION field and press ENTER.
10	Press the F10 key to build and save the Special Provisions.
11	Press the F2 key to return to the SPECIFICATION LIST BUILD MENU screen.
12	On the SPECIFICATION LIST BUILD MENU screen, enter “D” in the PROGRAM OPTION field and press ENTER.
13	Press the F10 key to build and save the 000’s provisions.
14	Press the F2 key to return to the SPECIFICATION LIST BUILD MENU screen.
15	On the SPECIFICATION LIST BUILD MENU screen, enter “E” in the PROGRAM OPTION field and press ENTER. Figure 3-3 shows the system response.
16	Make the necessary changes and press the F3 key then the F10 key to update the information.
17	Press the F12 key to exit the program and return to the DCIS menu screen.

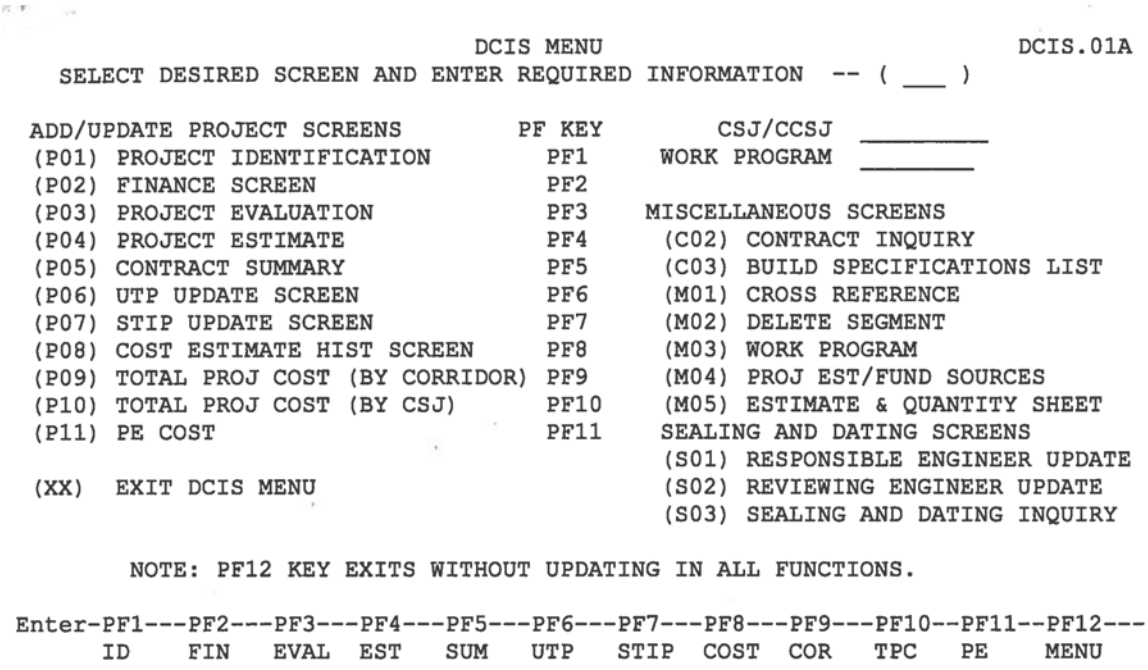

Figure 3-1. DCIS Menu Screen

Specification list editing. To edit an existing Specification List, sign on to DCIS and enter “C3” for the BUILD SPECIFICATIONS LIST and enter the contract or controlling CSJ. The steps shown in Table 3-4 explain how to edit the Specification List at the SPECIFICATION LIST BUILD MENU screen.

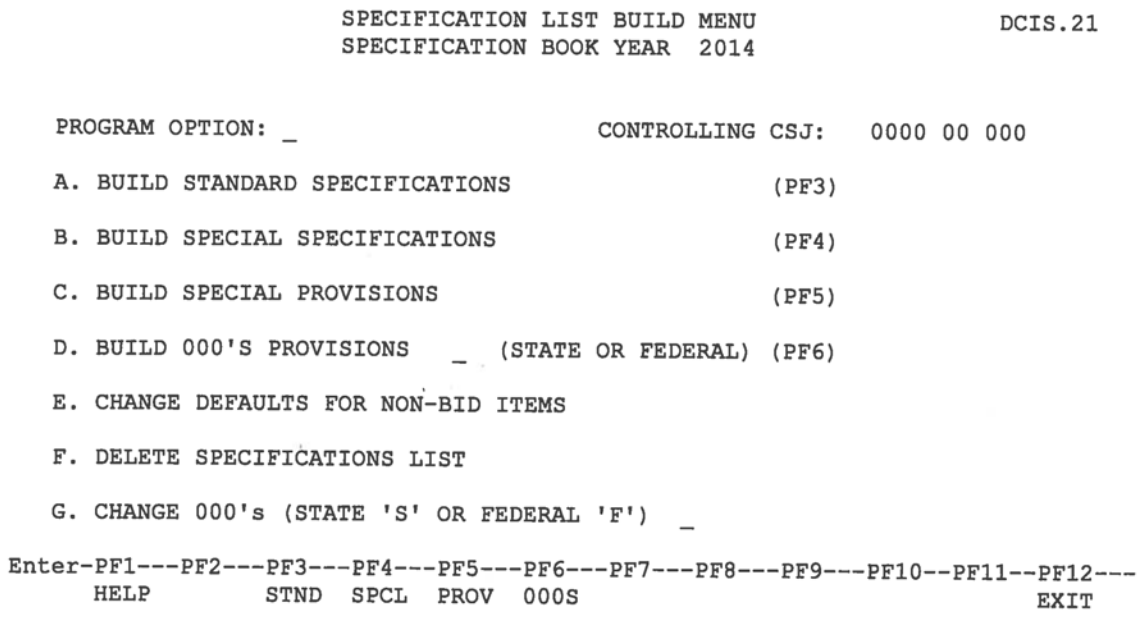

Figure 3-2. DCIS Specification List Build Menu Screen

Table 3-4: Specification List Editing Procedure

Step	Process
1	On the SPECIFICATION LIST BUILD MENU screen, enter "A" in the PROGRAM OPTION field and press ENTER to edit Standard Specifications. NOTE: (**NOTE: Only reference items can be changed on this screen. To add or delete a bid item, edit the estimate on the project estimate (P4) screen.**)
2	Enter a "C" in the CHG IND field, then tab to the reference item to be deleted or to a blank field to enter a new reference number. Press the ENTER key after all changes are made. Press the F10 key to update the Standard Specifications.
3	Press the F2 key to return to the SPECIFICATION LIST BUILD MENU screen.
4	On the SPECIFICATION LIST BUILD MENU screen, enter "B" in the PROGRAM OPTION field and press ENTER to edit Special Specifications. The highlighted items in the bid item column are Special Specifications that were listed under the standard or Standard Specification items as reference items, or as bid items on the estimate, so that they can be included in the proposal. To edit these highlighted items, change the standard or Standard Specification items to which they are referenced, or the item on the estimate. NOTE: (**Only reference items can be changed on this screen. To add or delete a bid item, edit the estimate on the project estimate (P4) screen**.)
5	Enter a "C" in the CHG IND field, then tab to the reference item to be deleted or to a blank field to enter a new reference number. Press ENTER after all changes are made. Press the F10 key to update the Special Specifications.

Table 3-4: Specification List Editing Procedure

Step	Process
6	Press the F2 key to return to the SPECIFICATION LIST BUILD MENU screen.
7	On the SPECIFICATION LIST BUILD MENU screen, enter “C” in the PROGRAM OPTION field and press ENTER to edit Special Provisions. The highlighted items can be changed or deleted.
8	To change the Special Provision number, enter a “C” in the CHG IND field, then tab to the Special Provision number to be changed or deleted, or tab to a blank field to enter a new number. Press ENTER after all changes are made. Special Provisions that affect bid items need to be updated through the engineer’s estimate. NOTE: (**Entering “C” in the CHG IND field, allows changing only one line at a time.**)
9	To delete all optional Special Provisions to an item, enter a “D” in CHG IND field. Press ENTER.
10	To add a Special Provision, enter an “A” in the CHG IND field and press ENTER. Then enter the item number and Special Provision number to be added, and press ENTER.
11	After all changes have been made to the Special Provisions, press the F10 key to update and save the Special Provisions.
12	Press the F2 key to return to the SPECIFICATION LIST BUILD MENU screen.
13	On the SPECIFICATION LIST BUILD MENU screen, enter “D” in the PROGRAM OPTION field and press ENTER to edit 000’s provisions.
14	To change the 000’s provisions, enter a “C” in the CHG IND field and make the necessary changes. Press ENTER.
15	To delete 000’s provisions, enter a “D” in the CHG IND field. Then press ENTER.
16	To add a 000’s provisions, enter an “A” in the CHG IND field and press ENTER. Then enter the 000’s provisions title and number to be added, and press ENTER.
17	After all changes have been made to the 000’s provisions, press the F10 key to update the changes.
18	Press the F12 key to exit the program and return to the DCIS menu.

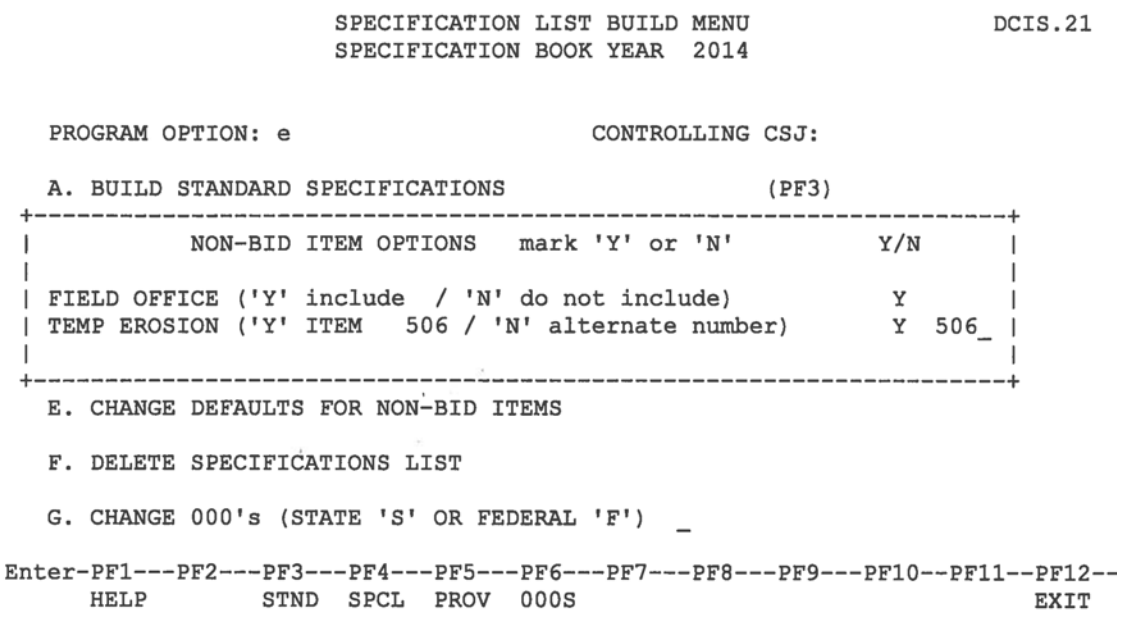

Figure 3-3. DCIS Specification List Build Menu - Program Option E Screen

Specification list printing. Once all the information for the Specification List on DCIS is entered, print a copy of the Specification List. Table 3-5 provides useful information for printing the Specification List.

Table 3-5: Specification List Printing Procedure

Step	Action
1	Sign on to your ROSCOE account.
2	Type “RJEJCL 10 2” and press ENTER (see Figure 3-4 for system response).
3	Key in necessary JOB CARD INFORMATION. (Your IT Helpdesk should be able to answer any questions about this screen.) Press ENTER (see Figure 3-5 for system response).
4	Key in “19” for Automatic Specifications List and press ENTER (see Figure 3-6 for system response).
5	Key in the contract or controlling CSJ and press ENTER (see Figure 3-7 for system response).
6	Key in “X” by Submit the job using JSUB. Press ENTER twice.

```
                      JOB CARD INFORMATION                          RJEJCL2
-------------------------------------------------------------------------------
 Service Request Number :  00220823
        Name - Location :  YOUR NAME_
               MSGCLASS :  A         R - For REVIEW,  A - For PRINT
               CPU Time :  1         Minutes
          ROSCOE Notify :  _         X - To use ROSCOE Notify
       Number of Copies :  1

      Computer Location :  CENTRAL
      Print Destination :  DES46___   _______   _______
                                      NYRXX for RJE Printer or
                                      NY.UXXX for VPS Printer where
                                      Y = Node and XXX = Printer Location
         Plot Indicator :  _          X - for NO PLOT Jobs, I for InkJet Plot,
                                      or BLANK for Drum Plot
 Plot/Punch Destination :  DES46      NYRXX for Drum Plot where Y= NODE and
                                      XX= Plotter Number; DDDNN for InkJet Plot
                                      where DDD = Location, NN = Plotter Number
             Forms Code :  ____  FCB :  ____    For Special Forms

-------------------------------------------------------------------------------
      PF1             PF3                 PF5                 PF9
      Help            Exit          Print Destinations   Save these settings
MB                  :00.3                                              04/38
```

Figure 3-4. ROSCOE Job Card Information Screen

```
P1002                D C I S  Reports                  DCIS.REPORTS
    Select the RPT desired   _

     1  - 414426  Work Program Submission Report    **
     2  - 414496  Estimate Reports (Eng, Plans, Low Bid, Combined)
     3  - 414424  Work Program Status Report
     4  - 420672  General Notes and Spec Data Report
     5  - 414475  Project List Reports
     6  - 411507  USF Report
     7  - 414433A Proposal Insert Report (Via DOTS)
     8  - 414433  Proposal Insert Report
     9  - 414469  Preletting Report
    10  - GO THROUGH CMCS TO OBTAIN NOTICE TO CONTRACTORS REPORT.
    11  - 414473  Monthly Letting List Report
    13  - 414410  DCIS Work Sheet
    14  - 414403  District Estimate Report
    15  - 414425  Recommend Award Report
    16  - N/A
    17  - 414407  Engineer Sign, Seal and Date Report
    18  - N/A
    19  - 414448  Automatic Specifications List
    20  - 414478  Legislative Districts Report
      **  Contact D-8 for information on these RPF's
      Depress the ENTER key to continue     ANY PF key to abort
MB                  :00.3                                              02/31
```

Figure 3-5. ROSCOE DCIS Reports Menu Screen

```
P100219              SPECIFICATION LIST REPORT                    DCIS.48

    ENTER DESIRED CCSJ        _________




      Depress the ENTER key to continue     ANY PF key to abort
```

```
IB                          :00.2                                    03/33
```

Figure 3-6. ROSCOE Specification List Report Screen

```
PA1 or PF3              RJEJCL SUBMISSION                            RJEJCL3
 to ABORT       _ Submit the job using JSUB
                _ Submit the job using JSUB keep using _
                _ Attach the AWS and exit RJEJCL

<...+....1....+....2....+....3....+....4....+....5....+....6....+....7.
//R414448  JOB (00220823,D480306),'YOUR NAME',
//  CLASS=I,REGION=4096K,TIME=1,MSGLEVEL=(0,0),MSGCLASS=A
/*JOBPARM COPIES=1
/*ROUTE PRINT DES46
/*ROUTE PUNCH DES46
/*ROUTE XEQ CENTRAL
//USER  OUTPUT PRMODE=PAGE,PAGEDEF=USER,FORMS=DCIS,
//         NAME='YOUR NAME',DEST=DES46
//PORT  OUTPUT PRMODE=PAGE,PAGEDEF=PORT,FORMS=PORT,
//         NAME='YOUR NAME',DEST=DES46
//LAND  OUTPUT PRMODE=PAGE,PAGEDEF=LAND,FORMS=LAND,
//         NAME='YOUR NAME',DEST=DES46
//JES   OUTPUT JESDS=ALL,NAME='YOUR NAME',
//         DEST=DES46
//*--------------------------------------------------------------------*
```

```
IB                          :00.2                                    02/17
```

Figure 3-7. ROSCOE RJEJCL Submission Screen

Detailed instructions on building the Specification List may be found in the *DCIS User Manual*, Chapter 4. Detailed instructions on printing the Specification List may be found in Chapter 5, under Report Program Selections in the *DCIS User Manual*.

Specification List Review

After completing the Specification List, a detailed examination should be performed to verify that all necessary items have been included.

- In addition to the items listed in the estimate, Items 1 through 9, Mobilization, Barricades, Signs, and Traffic Handling, and Temporary Erosion, Sedimentation, and Environmental Controls, must always be included.
- If a field laboratory or field office is desired, Item 504 Facilities for Field Office and Laboratory, must be included on the Specification List along with a note in the General Notes specifying the type of structure required.
- A check of reference items should be made.

  Reference items are included in the Specification List to inform the contractor that other subsidiary items of work are performed in compliance to the referenced item. For all projects, go to the Construction Division's ftp site at ftp://ftp.dot.state.tx.us/pub/txdot-info/des/reference-items-checklist.pdf for a checklist of 2014 specs. If these reference items are the result of a reference in the Standard Specifications, no additional note needs to be added to the PS&E. If however, the reference item is specified by the designer and not specified in the appropriate specification, it should be the result of a note in the General Notes or the plans.
- The appropriate Special Provisions should be included.

  A list of required and special case Special Provisions exists in the Construction Division's Internet site at http://www.dot.state.tx.us/apps-cg/specs/chklst_toc.asp?year=4&type=sp for 2014 specifications. With an updated list of Special Provisions at hand, simply check to see if all required and needed special case Special Provisions are included. Those which are not on the Specification List must be added manually. Required Special Provisions must also be included for reference items.
- The automatic Specification List system will take care of the majority of your required Specification List items.

  Your primary task will be to add new specifications and Special Provisions, and to remove items that may not apply to your particular project. Refer to the *DCIS User Manual*, Chapter 4, Section 3, for details on the creation and modification of Specification Lists. The Roadway Specification Section (CST_RDWY_SPECS) issues updated checklists which should be used **immediately** before submission of PS&E to Austin.

Section 4 — Specification List Checklist

The following checklist provides some additional information:

- ❒ Make sure that all pay items in the estimate are included on the Specification List. If not, update the Specification List.
- ❒ Check listed reference items. All reference items must either be mentioned within the specification or Special Provision or in the plans or General Notes.
- ❒ Check required Special Provisions. Make sure all Special Provisions and Special Specifications are current. Use the current listing issued by the Roadway Specification Section (CST_RDWY_SPECS). A list of required and special case Special Provisions exists in the Construction Division's Internet site at http://www.dot.state.tx.us/apps-cg/specs/chklst_toc.asp?year=4&type=sp for 2014 specifications.
- ❒ If any new Special Provisions or Special Specifications are required, make sure the Specification has been created in Microsoft Word using the correct template. (See the Construction Division's Internet site at http://www.txdot.gov/business/resources/txdot-specifications.html). For all projects, obtain Special Provision numbers from the Roadway Specification Section (CST_RDWY_SPECS) prior to submission and add to the Specification List.
- ❒ Check Special Provision titles (as listed on the spec list) closely to verify they match the titles (as shown on the current listing) exactly. Also be sure to check quotation marks and the number of dashes. The format must be either (XXX---XXX), (XXX--XXXX), or (XXXX-XXXX). These errors can cause the automated proposal assembly system to create an incomplete proposal.
- ❒ Make sure that the first provision listed is either FHWA Form 1273 for Federal-Aid projects, or State Labor Provisions for state projects. Wage Rates is the second provision listed.
- ❒ Make sure the Item 506 "Temporary Erosion, Sedimentation, and Environmental Controls" is on all Specification Lists.
- ❒ Make sure all referenced Special Specifications are listed under the Special Specification section of the Specification List.
- ❒ For signing, illumination, and signal projects, make sure that the proper Special Provision has been included to allow the contractor lead time to accumulate materials.
- ❒ Make sure the dates and other information included on all 000 Special Provisions regarding right-of-way acquisition, utility adjustments, relocation assistance, and/or right-of-way encroachments match the information included on the corresponding certifications and are current.
- ❒ For projects that require accelerated construction strategies, ensure that the appropriate Special Provision to Item 8 is included in the Specification List.

- ❒ All construction projects must include either special provision 007-009 or 007-010 to include a procedure for handling road closures before, during and after key dates / special events into the contract.

Section 5 — General Notes

Overview

The purpose of the General Notes is to provide, in one section of the plans, the various supplemental data required by the specifications. This can consist of information such as base material requirements, gradation requirements, density requirements, and surface treatment data. The General Notes sometimes includes the Basis of Estimate. The Basis of Estimate is necessary for plans preparation and review, for basis of bid preparation, and for control of construction. It should show the basis for estimating each of the pay quantities of the contract, which cannot be directly measured from the plans. These include such items as sprinkling, rolling, blading, lime, fertilizer, asphalt, aggregate, etc., and should include compaction factors and unit weight for flexible base and embankment items when this information is needed for estimating purposes. Sometimes these items are subsidiary and should be indicated as such.

The sheets are also intended for general design notes such as variations in slopes, superelevation of curves, concrete surface finish, paint price list, protection system for structures, and type of bedding for concrete pipe. (The type of bedding for concrete pipe should be shown in the Culvert Summary where different structures require different bedding). This use of General Notes has successfully provided for the recording of such data as closed season dates for the application of asphaltic materials and minor modification of gradation requirements which are available in acceptable usage. General Notes are included in bidding proposals for ready reference by contractors, materials suppliers, etc.

The rest of this section discusses:

- Key points regarding General Notes
- Specification modifications
- Creating General Notes.

Key Points Regarding General Notes

- General Notes must be set up in the Microsoft Word "General Notes" template and converted to .pdf for use in building the proposal prior to submission to DES.
- The use of notes furnishing quantities that are subject to change because of sequence of construction operations, such as designating portions of unclassified road excavation as rock excavation or foundation course, has resulted in confusion in interpretation and in some cases litigation in which the department has been successfully contested.

  Where quantities for subsidiary items are available and are accurate, they should be shown but should be labeled “FOR CONTRACTOR’S INFORMATION ONLY”.

- All proposed plans notes should be worded so that they are clear, concise and can have only one meaning.

Specification Modifications

Modification of Specifications by General Note is **not** allowed. General Notes are to be used to give information when allowed by the specification by the use of terms such as "as shown on the plans," "as directed by the engineer," or others. Or, they may be used to supplement information by the specification such as the closed season for asphaltic materials and curing required for base materials. In no case are General Notes to be used to change, revise or modify the requirements of a Standard Specification, Special Specification, or Special Provision. Special Provisions are necessary for revisions to Standard Specifications or Special Specifications. All notes should be referred to the specification to which they apply.

Special Provisions take precedence over the General Notes, in case of a conflict, in accordance with Article 5.4 of the Standard Specifications, which is available at this address: ftp://ftp.dot.state.tx.us/pub/txdot-info/des/spec-book-1114.pdf.

The General Notes should not be used to reiterate that which is already covered in the Standard Specifications, Special Provisions and/or Special Specifications. The use of these sheets should be minimized.

Each of the Standard Specifications, Special Provisions and Special Specifications used in a project as a direct pay item or reference item must be examined carefully. Those specifications that require "as shown on the plans" information **must** be completed by plan notes in the General Notes sheets. There are some instances where such terms are in the specifications to allow flexibility. But, there are also those that must be shown in the General Notes in order to have the complete information. This may consist of material specifications, design criteria, gradation requirements, density requirements and surface treatment data.

Numerical dimensions govern over scaled dimensions. Special provisions govern over plans (including general notes), which govern over standard specifications and special specifications. Job-specific plan sheets govern over standard plan sheets.

However, in the case of conflict between plans (including general notes) and specifications regarding responsibilities for hazardous materials and traffic control in Items 1 through 9, "General Requirements and Conditions" and Item 502, "Barricades, signs, and Traffic Handling," special provisions govern over standard specifications and special specifications, which govern over the plans.

Processing General Notes

For instructions go to: http://crossroads/org/des/tools/props/index.asp, and select "Proposal Creation and Printing."

Section 6 — General Notes Checklist

- ❒ Make sure that all notes required to supplement the specifications, Special Provisions, and standards have been included. Notes should not conflict with the plans or specifications.
- ❒ General Notes should only be used to supplement the Standard Specifications, Special Provisions, Special Specifications, and standards and are usually mentioned in the specifications and/or standards. General Notes cannot be used to modify measurement and payment articles. Changes to specifications must be done by submittal of Special Provisions or Special Specifications to CST_RDWY_SPECS.
- ❒ Check the notes for clarity, grammatical errors, and/or misspellings.
- ❒ Make sure all items appearing in the General Notes are included on the Specification List.
- ❒ Make sure that any material or construction methods notes specified are provided for by the specifications and do not require Special Provisions.
- ❒ Make sure the descriptions of items in the Basis of Estimate agree with the specification.
- ❒ Make sure all modified standards are listed in the notes and index of sheets.
- ❒ If Item 504 has been included on the Specification List, make sure that the type of facility required has been specified by note.
- ❒ Check notes specifying minimum aggregate class for surface aggregate.
- ❒ When manufacturer's names are listed as examples, always list at least two names plus the words "Or Equivalent," to be in compliance with FHWA directives regarding proprietary items.
- ❒ Any proprietary or sole source items included in the notes or in the specifications must be justified. Prepare and send a letter of public interest to the responsible Austin division.
- ❒ Make sure that all computer hardware and software referenced in the notes or specifications are in compliance with state law and TxDOT/FHWA policies.
- ❒ If state-furnished equipment or materials are specified by note, a Public Interest Statement must be prepared and submitted to the responsible Austin division.
- ❒ Check to make sure that there are no General Notes included which establish contractor qualifications.
- ❒ Check to make sure that there are no General Notes which imply legal responsibilities of the contractor regarding traffic safety beyond the requirements of the Standard Specifications.
- ❒ Check to make sure that the "safety contingency" note is included with Item 502.
- ❒ Standard workweek charges as defined by Article 8.3.1.4 are assumed if there is not a note included to define another working day schedule.

- ❒ In accordance with special provisions 007-009 and 007-010 all construction projects must include the note "Roadway closures during the following key dates and/or special events are prohibited:" with a list of events and/or dates that road closures are prohibited under Item 7 of the General Notes.

  If there are no expected road closures involving key dates / special events, a note indicating "No significant traffic generator events identified" must be included.

NOTE: "The Contractor Force Account 'Safety Contingency' that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of the enhancement."

Chapter 4 — Plans Estimate

Contents:

Section 1 — Overview

Plans Estimate Description

The plans estimate is a tabulated listing of construction bid items that documents the project's total estimated construction cost. The listing includes the description, unit bid price and quantity of each bid item for the major categories of work. The major categories of work for a project are separated into roadway items, bridge items or items for other categories as defined by the district. Bridges and bridge classified culverts along with all pertaining items, should be separated from roadway items in the estimate.

NOTE: For each bridge and bridge classified culvert breakout, a Bridge Cost Information (BCI, also know as mainframe's 12 card) should be entered on the Design and Construction Information System (DCIS) estimate to include name of structure, existing and proposed structure identification numbers (NBI), clear roadway and overall deck widths, bridge type, bridge work, deck area, cost %, an indication whether the bridge is on or off system, length of structure, and beginning and ending station numbers. For further information reference *DCIS User Manual* Chapter 4 Section 1. Also you may reference http://crossroads/org/brg/PD/index.htm.

A properly prepared construction estimate will also identify all different types of work that are to be included in the contract. This includes work to be performed by state or other forces, work eligible or ineligible for federal participation, and local government work such as utility work, storm sewer, sidewalk, landscaping, etc., that may be desired to be let in the project. The designer needs to carefully consider all aspects of design requirements, project agreement obligations, and federal requirements in identifying and composing the item of work in a construction contract. It is better to do the job correctly before the letting than to negotiate a dispute or item of work with a contractor unprepared to do the work after signing the contract.

Section 2 — Preparation of Project Estimate

Overview

The preparation of a project estimate is a constantly evolving process that begins when the plan preparation begins and continues throughout the course of the project. The following are procedures for the preparation of a project estimate.

Determine the correct items of work necessary to perform the proposed construction. The units of measurement and method of payment must be established so that the quantities can be calculated in the correct units.

- Unit bid prices must be estimated using all of the current trends and pricing information so that an accurate estimate can be made.
- Alternates to bid items must be studied and used if they are appropriate.
- Special accounts should be established to pay for work done with state maintenance forces or other agencies.

  All of the above information must be entered into the DCIS in order to be submitted with the PS&E for further processing by the Austin divisions. The next subsections discuss these aspects of project estimate preparation:

- P1 Screen (DCIS)
- P5 Screen (DCIS)
- Determination of Bid Items
- Computer File Format (P4 Screen/ROSCOE/Estimator® Software)

P1 Screen (DCIS)

The project identification screen (P1) is the first screen required to set up a control-section-job (CSJ) in DCIS. This screen is established by the district's TP&D section in the early stages of the project. Prior to beginning the plans estimate input process in DCIS, the designer should verify the following items are correctly shown on the P1 Screen:

- Description of location
- Classification of work
- Length of project
- Specification Book Year.

Once the information has been verified, the user should input a contract CSJ in the CONTRACT CSJ field of the P1 screen. For projects containing more than one CSJ, the designer should obtain the proper CONTRACT CSJ from the district's TP&D section. Refer to *DCIS User Manual* for details regarding the P1 screen information (see *DCIS User Manual*, Chapter 2, Section 1).

P5 Screen (DCIS)

The contract summary screen (P5) is created when the nine digit CONTRACT CSJ field is entered on the P1 screen. When the contract summary screen is created by the district, the 'EST CODE' field shows a default of P indicating that only the district can update the estimate screen and the contract summary screen. Once the estimate is complete and the district is ready to submit final PS&E, the district must change this field 'EST CODE' to 8. An 8 allows only the Austin division office to update the estimate screen and the contract summary screen. When the 'EST CODE' is an 8, the district cannot change the estimate screen or the contract summary screen. This code can be changed to 8 status when the proposal is created for final PS&E submission. See the Design Division web site for proposal instructions.

Prior to releasing the estimate to the division, the responsible engineer must seal the project using the DCIS (S1) screen (see *DCIS User Manual* Chapter 4, Section 4). The information to be input on the contract summary screen (P5) at the district level for release of control to the Design Division office includes:

- Estimate code for release of estimate,
- Responsible Area Engineer information,
- Number of working days in contract,
- Division responsibility for PS&E review,
- Use of combined flag for multiple CSJs,
- Include 9 cards for all CSJs in DCIS estimate for generation of the proposal guarantee.

The use of combined flags attached to CSJs in the lower portion of the P5 screen will allow those CSJs to be included in combined estimates for construction and accounting purposes. Refer to *DCIS User Manual* Chapter 4, Section 2, for more information regarding the P5 screen.

Determination of Bid Items

The work to be performed by the contractor and to be paid for directly is described by what are known as construction bid items. The bid items used must be either standard specifications or Special Specifications. It is important to choose the correct bid item so the work performed by the contractor will achieve the results intended by the designer. The selection of the bid item and the method of measurement and payment is not based only on the actual work called for in the specification, but the process should also take into account the nature of the project and its location, the

experience and resources of the local contractors likely to bid on the project, and area engineer's preferences. These are the different aspects of a project estimate:

- Standard Bid Items
- Alternate Bid Items
- Descriptive Code Numbers
- Requesting New Descriptive Codes

Standard Bid Items

Each bid item is assigned a number that represents a certain category of work to be performed by the contractor. A description of the work to be accomplished under a bid item is available in the Texas Department of Transportation's (TxDOT) *Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges* (otherwise known as the Spec Book) for standard specification items. In order to achieve the results intended, the specification for each bid item should be read carefully before selecting the appropriate bid item. Minor changes and clarifications to the specifications should be noted and placed in the General Notes. Major changes to a specification requires a Special Provision be submitted to the department's Specification Committee for review and approval.

Alternate Bid Items

An alternate is a bid item that may be substituted for the primary base bid item of work. For example, in some instances the bid item Limestone Rock Asphalt Pavement may be used as an alternate to the bid item Hot Mix Asphaltic Concrete Pavement. Having more than one choice gives the prospective bidders more opportunities to streamline their bids and affords the state with a more competitive bid. It is the designer's discretion to consider alternate work items and to include such items in the plans estimate when practical.

The designer must make sure that the primary bid item and the alternate are equivalent in quality and performance and that one does not have an inherent advantage over the other. Alternates are shown in the project estimate, and the total estimated construction cost must be the same for the primary bid item and its alternate. Furthermore, if accompanying items (such as structural excavation) are affected, they must also appear in the alternate with the adjusted quantity. For further information on alternate bid item inclusion in the DCIS estimate reference the *DCIS User Manual* Chapter 4 Section 1.

Descriptive Code Numbers

The next paragraphs cover these descriptive code topics:

- Descriptive code use

- Descriptive code example
- Bid item and descriptive code listings

Descriptive code use. Each bid item number is accompanied by a descriptive code which is a four-digit number representing different ways to bid an item whether it be different units of measurement, different sizes of the item, different types of the item, etc. It is important that the correct descriptive code be selected because it becomes a part of the Estimate and Quantity (E&Q) sheet in the project plans and bid inserts in the proposal. Contractors use the bid inserts to prepare their bids, thus an erroneously selected descriptive code can result in costly change orders and negotiations with the contractor.

Descriptive code example. Consider the following example using the 2014 Specification Items 247-6001 and 247-6450. Item 247 designates Flexible Base. The descriptive codes are 6001 and 6450. Both descriptive codes call for identical material to be delivered to the project site; however, the methods of measurement and payment are different for each item. Item 247-6001, Flexible Base (Complete in Place) (Type A Grade 2 Class 1), requires payment for the base by the loose cubic yards in vehicles delivered to the job site as specified by Class 1 Measurement. Item 247-6450, Flexible Base (Complete in Place) (Type A Gr1-2)(In Veh), requires payment by the cubic yard of dry mass and requires that the contractor determine the weight of each load by the use of truck scales. It further implies the need for ticket writers and/or certified public weighers to verify that the state is receiving the appropriate quantity of the material. Thus, it is important that the designer evaluate each situation before selecting a certain descriptive code, because one item may require more personnel and paperwork or place unnecessary restrictions on the contractor that will result in higher bid prices.

Bid item and descriptive code listings. A listing of current bid items and descriptive codes can be obtained through an automated mainframe procedure or the internet. The instructions for both methods are shown Table 4-1 and Table 4-2.

Table 4-1: Mainframe Procedure to Obtain Listings

Step	Action
1	Sign onto a regional ROSCOE account.
2	Type RJEJCL 10 2 then <enter>.
3	Hit <enter> again at the Job Card Information screen.
4	Select option 6 from the menu then <enter>.
5	Follow the instructions shown on the screen then <enter>.
6	Place an X next to Submit the job using JSUB then <enter>.
7	Retrieve and print the output through the normal JOUT process.

The user is cautioned that descriptive code listings are very lengthy.

Table 4-2: Internet Procedure to Obtain Listings

Step	Action
1	Log onto the TxDOT Homepage. (http://www.txdot.gov/)
2	Click on Business.
3	Under the resources heading click Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges which links to http://www.txdot.gov/business/resources/txdot-specifications.html
4	Under the resources heading click on the "Bid Codes: (View)(Text)" link to view bid codes which links to http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/usfe/2014/usfe0101.htm

Requesting New Descriptive Codes

If there are no suitable descriptive codes for existing bid items, the designer can submit a code request to the CST - Specifications Section at CST_RDWY_SPECS. If a new Special Specification is needed, the designer should send the Form 1814 along with the supporting documentation to the CST - Specification Section. Refer to Chapter 3, Section 2, of this manual for more information regarding the specification/provision approval process.

In either case, the designer should submit documentation for new codes to the CST - Specification Section as early as possible in the PS&E development. This will allow the designer to create a complete estimate in DCIS with minimal delay.

Computer File Format (P4 Screen/ROSCOE/Estimator® Software)

The development of a project estimate is a constantly evolving process that begins when the plan preparation begins and continues throughout the course of the project. When the district user has enough information, the district should create the CSJ estimate in DCIS. Some important items need to be determined in order for a project estimate to be prepared in DCIS. The items include the following:

- Bid items and descriptive codes
- Quantities
- Unit bid prices
- Alternates and/or options to base bid items
- Special accounts
- In addition to the above items the designer also needs to determine the appropriate categories of work and/or any permanent structure numbers.

Plans estimates are divided into separate sections. Normally these sections are roadway, bridge, or other categories of work as defined by the district. Items of work that are to be paid for by other entities may be placed in a separate category. Each estimate must contain at least one category of work. The next subsections discuss:

- Permanent structure number
- P4 screen (DCIS)
- ROSCOE batch program
- Estimator® Software.

Permanent Structure Number

Every structure throughout the nation is assigned a National Bridge Inventory Number. This is a 15-digit number with the last three digits being the Permanent Structure Number (PSN). The National Bridge Inventory Number is composed as follows for on-system bridges:

- The first two digits are the district number.
- The next three digits are the county number.
- The next digit is always 0.
- The next four digits are the control number.
- The next two digits are the section number.
- The last three digits are the PSN.
- For off-system bridges the control number and section number is replaced by a six-digit alpha-numeric route number.

The PSN is assigned by the Bridge Division. Each bridge classification structure is assigned a separate number. This PSN should be reflected in the heading for the bridge category of work in the estimate. The user should contact the Bridge Division Inspection Section to obtain a PSN for all existing or proposed structures containing bid items in the plans estimate.

P4 Screen (DCIS)

In order to create an estimate in DCIS on the project estimate screen (P4), the project must be in DCIS as a CSJ with information on the screens for project identification (P1), project finance (P2), project finance - percent, and project evaluation (P3).

On the project identification screen, enter the field Contract CSJ. The project estimate screen (P4) can then be obtained, and the project estimate created in DCIS by entering the estimate information online. An alternate way of creating an estimate in DCIS is to copy from a similar estimate by using the DCIS copy function.

The next subsections cover these aspects of the P4 Screen:

- Data card types
- Creating estimate on DCIS
- Helpful hints
- Online updating of DCIS estimates
- Project estimate printing procedure
- General P4 Screen guidelines

Data card types. In all of the above methods, five card types must be used. These five types of data cards are used for adding information to the estimate. Table 4-3 lists the five types and a description of each.

Table 4-3: Card Types

Card	Description
Card Type 2	Work Category
Card Type 3	Description (Comments)
Card Type 4	Item-Price-Quantity
Card Type 5	Description for Special Accounts or Unique Items
Card Type 9	End of Money (Item-Price-Quantity)

Card type 2. The card type 2 is used for entering the different categories of work to be done. One card type 2 must be provided for each different work categories in the estimate. Any number of work category cards can be used within a CSJ. Category of work cards must be used to separate roadway and bridge items of work. At least one card type 2 must be included in each project estimate. Additional definitions of work categories can be defined by the district. A subtotal will automatically be tabulated and listed for each category of work. This tabulation will be printed after the items of work under that category of work.

Card type 3. The card type 3 is used for entering a comment or descriptive information card. It is the primary device for supplying descriptive information and for tailoring the style of the estimate listing to suite the individual user. Use of the card type 3 is optional but often desirable. They can be used anywhere in the estimate, except between a card type 4 that is a special account or unique item and its accompanying card type 5. There are 50 spaces set aside for comments. These spaces may be blank, or they may contain alphanumeric characters. Generally, when the program encounters a type 3 card, the comments are printed on the estimate in the same order as shown in the file.

Card type 4. The card type 4 is used to enter regular bid items, alternate bid items (if any exist), unique items in each category of work, and special account items. This card constitutes the bulk of

entries for an estimate. There must be one type 4 card for each item in each work category. These items can be either regular bid items, special account items, or unique items.

Card type 5. The card type 5 is used to describe a special account item or unique item. For both unique and special account items, the card type 5 must be preceded by a card type 4. Each card type 5 is equivalent to one printed line when used with a special account item. These cards are required for all special account items. When using more than one card type 5 consecutively, only the last card type 5 should contain the unit of measurement.

Card type 9. The card type 9 is used to indicate that the estimate is complete. It will automatically update the latest estimated cost and proposal guarantee fields on Contract Summary Screen (P5); therefore, the type 9 card should only be input when the estimate is essentially complete.

For any further explanation or examples of uses for these card types, refer to the *DCIS User Manual* Chapter 4.

Creating estimate on DCIS. Now we are ready to create an estimate on DCIS. We will use the DCIS copy function to create an estimate. This procedure assumes that the project identification (P1) screen, the project finance (P2) screen, and the project evaluation (P3) screen have already been filled out correctly. Refer to the DCIS *User Manual* for this procedure if the screens have not been created.

1. Sign onto DCIS (see Figure 3-1).
2. Select a CSJ in DCIS that has a project estimate similar to the one to be prepared.
3. Retrieve the project estimate (P4) screen for the selected CSJ to be copied. Press ENTER.
4. Key in the CSJ of the estimate to be prepared over the CSJ field selected on the project estimate (P4) screen. Press ENTER.
5. The user is prompted to press the PF7 key to continue.
6. DCIS will copy the original estimate selected to the CSJ of the new estimate keyed in. All bid items will be copied, except that the quantity fields will contain zero. Retrieve the new estimate, add in the new quantities and, if necessary, change the unit bid prices. Also, new items can be added and other items can be deleted using an add screen by pressing the PF8 key (see Figure 4-1).

Figure 4-1. DCIS blank project estimate (P4) screen

Helpful hints.

- Use the tab key to move from column to column, left to right.
- For a card type 2, use the bottom line of the line pair only. This card type, as previously stated, is to group and subtotal the bid items in the estimate, such as Roadway and Bridge items.
- For card type 3, use only the bottom line of the line pair.
- The card type 4 can be used for regular bid items, alternate bid items, special account numbers, or unique items.
- For card type 4, use only the top line of the line pair. For unique items and special account items, the card type 5 uses the bottom line of the line pair and must be preceded by a card type 4. These cards are required for all special account items.

- If a regular bid item descriptive code is used elsewhere in the contract or on another CSJ of a combined estimate, the same price must be entered or an error will be shown on the combined estimate report.
- For a project that has a regular bid item with an alternate bid item, the alternate field should consist of a number and an alphabetic character (i.e.-1A, 1B, 2A, etc.) on the same line as the regular bid item.
- For a project that has a special account number, the special account number field, quantity field, and unit price field must be filled in.
- For unique items, the user needs to enter an item that does not have an item number or descriptive code, a unique item can be created by typing “000” in the bid item number field and “0000” in the descriptive code field and a card type 5 must be added. Then, enter the quantity and unit price in their respective fields for the card type 4.
- When using more than one card type 5 consecutive, only the last card type 5 should contain the unit of measurement in the unit of measurement field. Only ten (10) type 5 cards can be used with a card type 4 for a special account number, and only one (1) card type 5 can be used with a card type 4 for a unique item. The information typed in on the card type 5 should be placed on the bottom line of the line pair.
- Mobilization is a lump sum bid item that must be included in all estimates. For contracts that include one project, handle the mobilization bid item like any other bid item. For contracts that combine two or more Federal-Aid projects, prorate this item, rounding to the nearest hundredth of a unit, to each project. For contracts that combine one or more Federal-Aid projects with one or more state projects, prorate this item, rounding to the nearest hundredth of a unit, to each project. For contracts that combine two or more state projects, this item may be prorated to each project or included in the controlling CSJ only (especially if the projects are combined on the C1 screen). In all cases, as with any lump sum bid item, the combined contract total must be exactly 1.
- Engineering and contingencies (E&C) is a percentage that is input at the top of the DCIS P4 screen to account for and estimate the cost of construction engineering and unknown contingencies.

  This information is updated yearly and is populated automatically in DCIS. Districts can override E&C percentages on the P4 screen. This will allow the obligation of federal funds for these costs. These district administrative indirect cost rate percentages are distributed each year by memorandum to all district engineers.
- For a card type 9, use the bottom line of the line pair only. This card should be placed at the end of the project estimate. This card is not added until the estimate is complete in DCIS.

  Online updating of DCIS estimates. There are three (3) ways of updating data online in DCIS project estimates.

- Changing data through the online DCIS project estimate screen. Key in “C” in the CHG IND (Change Indicator) field and tab to the field that needs to be changed, (i.e. - the line number field, the item number field, the unique description field, etc.). Press ENTER to update the estimate.
- Adding or copying data to the online DCIS project estimate screen. To add one line of data, key in an “A” in the CHG IND field and add any information that is needed in their respective fields. Press ENTER to update the estimate.

  To copy one line of data, key in an “A” and the LINE NUMBER and press ENTER to update. Now, all the card data will be added to the new line without deleting the old line. To add more than one line of data, press the PF10 key to get a blank screen. Once the data is entered, press ENTER to update the estimate.
- Deleting data from the online DCIS project estimate screen. Key in a “D” on the CHG IND field. Press ENTER to update the estimate.

NOTE: Make sure to delete all associated card type 5’s when deleting card type 4’s.

Project estimate printing procedure. Once all the information is entered on the online DCIS project estimate screen, print a copy of the project estimate. Table 4-4 provides useful information for printing the estimate.

Table 4-4: Project Estimate Printing Procedure

Step	Action
1	Sign on to your ROSCOE account.
2	Type “RJEJCL 10 2” and press ENTER (see Figure 3-4)
3	Key in necessary JOB CARD INFORMATION. (Your IT Administrator should be able to answer any questions about this screen.) Press ENTER (see Figure 3-5).
4	Key in “2” for Estimate Reports (Eng, Plans, Low Bid, Combined) and press ENTER (see Figure 4-2).
5	Review the REPORT TYPES key in either “1, 2, 3, etc.” for the DESIRED REPORT TYPE and key in the DESIRED CONTRACT CSJ. If this contract is a combined estimate, key in the controlling CSJ or CCSJ (see Figure 3-7).
6	Key in “X” by Submit the job using JSUB and your DCIS password. Press ENTER twice.

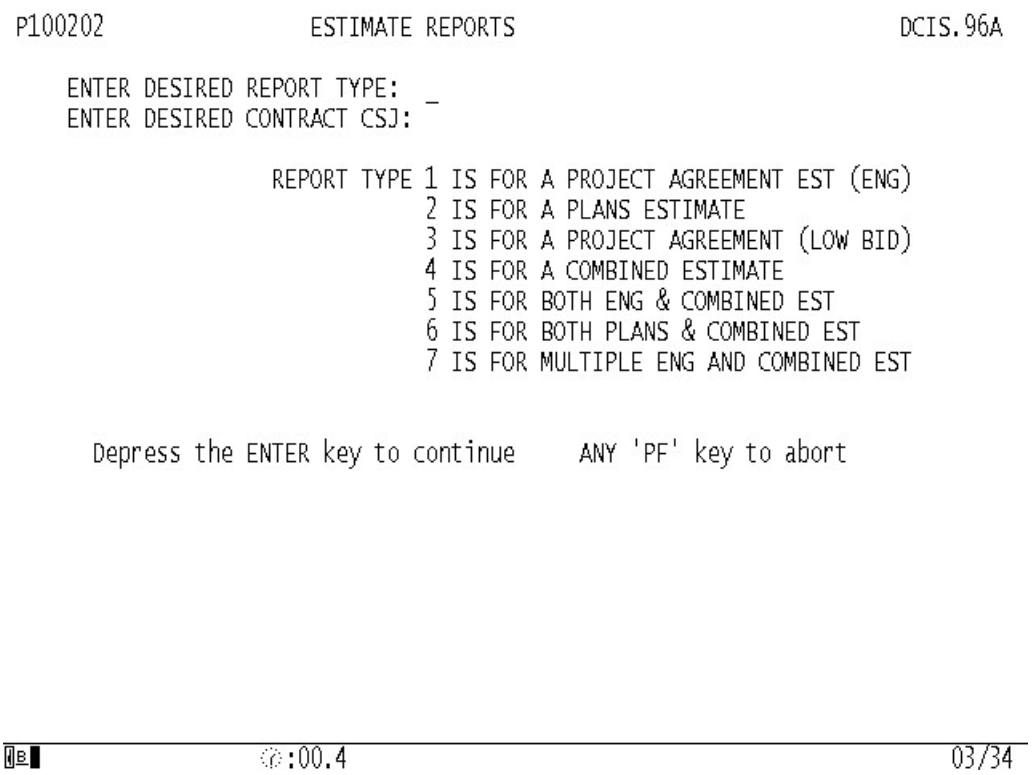

Figure 4-2. ROSCOE Estimate Reports Screen

General P4 Screen Guidelines.

- The project estimate screen can be obtained from the DCIS menu screen by inputting P4 and the CSJ. Alternately, the PF4 key can be used to reach the project estimate screen (P4) from the P1 screen for the input CSJ.
- On the first line of the estimate screen, the estimate code field is displayed. The code of P indicates that the estimate is controlled by the district. A code of 8 indicates that the estimate is controlled by the responsible Austin division office.
- Use the tab key to move from left to right along the line pairs on the estimate screen.
- Line numbers must be entered on the estimate screen for every card type used. Number the lines with ample number spacing, so additional lines can be inserted later if necessary. (Suggestion: 10, 20, 30, 40, 50, 60, etc. or 25, 50, 75, 100, 125, 150, etc.)
- A card type 2 is used for entering the different categories of work. A card type 3 is optional and may be used for entering a comment or descriptive information.
- A card type 4 is used for entering the bid item number, quantity, and price. A card type 5 is used for a special account item or a unique item that does not have a bid item number or descriptive code. An item number including the descriptive code must be obtained for all construction bid items.
- A card type 9 is used to indicate the estimate is complete and is entered at the end of the plans estimate. This card causes the estimated cost on the P1 screen to be automatically updated.

- Once an estimate is in DCIS, an authorized user can change, add, or delete items. Any user can view an estimate after it is in DCIS. Press the ENTER key to page through an estimate, or use the line number field at the top of the estimate screen.
- A printed copy of the estimate can be obtained by using the RJEJCL procedures on ROSCOE. Refer to Chapter 5 of the *DCIS User Manual* for more information.

  For additional information and a more detailed discussion, see the *DCIS User Manual*.

ROSCOE Batch Program

Some districts use a ROSCOE batch program to create a plans estimate. In this method, the estimate data is input into a specific ROSCOE file format and is then batched over to DCIS. The ROSCOE batch is also used to convert output from the Estimator® software. Users should contact their district staff for more information regarding the batch program method.

Estimator® Software

Estimator® is an AASHTO cost estimating program. It is available for preparing estimates on a personal computer. Check with your automation administrator for access to this program, which requires a catalog of bid items and bid prices to do the price calculations. The latest catalogs are posted on the TxDOT Internet Website under “Business: Construction and Maintenance Letting Information: Supplemental Information: Estimator Converter and Catalog” and are named MMYYMET for Metric items and MMYYENG for English items, where MMYY indicates the month and year it was created.

To prepare a construction estimate using Estimator®, follow the procedure outlined in Table 4-5.

Table 4-5: Construction Estimate Procedure Using Estimator®

Step	Action
1	Open the latest catalog.
2	Pick a bid item from the lookup list.
3	Enter the quantity, and the program’s suggested price will appear.
4	The program’s prices can be changed using alternate sources, such as bid tabulations (bid tabs) or bid averages.
5	Next, translate the program’s output for uploading to DCIS.

1. Open the latest catalog.
2. Pick a bid item from the lookup list.
3. Enter the quantity, and the program’s suggested price will appear.

4. The program's prices can be changed using alternate sources, such as bid tabulations (bid tabs) or bid averages.

Translate Program's Output for Uploading to DCIS

- After exporting the estimate to a CSV file, use a utility program called Converter; Converter lays out the estimate in the ROSCOE card format and saves it in a TXT file editable in any word process. Check the TxDOT website where the Estimator® catalogs are located for the latest version of Converter.
- After converting the estimate layout, use FTP to transfer it to D59.XFER.SHR.your ACID.
- Login to ROSCOE and enter XO.XFER.
- Upload the estimate file to your directory.
- Fetch/attach it to view and edit as needed.
- Run RJEJCL to transfer the estimate to DCIS.

The output from the software is arranged in the required ROSCOE file format. The district is responsible for batching the file to DCIS. Users should contact their district staff for more information regarding the batch program method. For more information about the Estimator® and assistance in using this program, please contact the DES, Roadway Design Section.

Section 3 — Quantities

Overview

The Quantities for each item of work are provided for in the DCIS estimate, the Quantity Summary Sheets, and the Estimate and Quantity Sheets in the plans. All bid items are included in the E&Q sheets.

Occasionally, it may be desirable to specify work that is not to be paid for directly. Work handled in this manner should be insignificant in the scope of the overall project. These are items which are referred to as subsidiary or incidental. Their use should be minimal. When subsidiary or incidental items of work are specified, it is necessary that the work be explained in sufficient detail, possibly even including referencing specifications, and a quantity should be shown in the plans but marked with the following statement:

"This item will not be paid for directly but shall be considered subsidiary to Item ____. The quantity is shown here for contractors' information only."

This is necessary in order for contractors to be able to accurately account for this work in their bids. The next subsections discuss these Quantities topics:

- Bid Quantity Tolerances (Degree of Accuracy)
- Participating/Non-participating Items and Accounts
- Special Accounts

Bid Quantity Tolerances (Degree of Accuracy)

Table 4-6 shows the greatest degree of accuracy that should be shown in the estimate for the various items. Quantities should be shown on the ENGINEER'S ESTIMATE to no greater accuracy than is given below.

Table 4-6: Bid Quantity Tolerances

ITEM	SHOW TO NEAREST			
	ENGLISH		METRIC	
Earthwork Items (including Structural Excavation & Backfill)	0.01 0.01 1 1 1	STA AC CY SY YH	0.001 0.01 1 1 1	KM HA M^3 M^2 M^3H
Watering and Sprinkling	0.1	MG	0.01	KL

Table 4-6: Bid Quantity Tolerances

ITEM	SHOW TO NEAREST			
Blading, Rolling & Traffic Control	1	HR	1	HR
Base and Base Treatment Items	0.01 1 1 1	STA CY SY TON	0.001 1 1 1	KM M^3 M^2 MGR
Asphalts, Oils and Emulsions	1 0.01	GAL TON	1 0.01	L MGR
Asphaltic Pavements & Surface Treatment Aggregates/Materials	1 1 1	TON CY SY	1 1 1	MGR M^3 M^2
Concrete Pavement Items (also to include Riprap & Structure Approach Slabs)	1 1	CY SY	1 1	M^3 M^2
Cleaning, Sealing Joints, Sealed Expansion Joints Preformed Joint Sealers	1 0.01 1 1	LF LM LB GAL	0.1 0.01 1 1	M LKM KG L
Planning, Texturing, Fabric Underseal & Surface Rehab	1	SY	1	M^2
Trench Excavation	1	LF	0.1	M
Pilings & Drilled Shafts	1	LF	0.1	M
Structural Concrete (including Structural Repairs, Concrete Overlay of Structure Decks, Pre-cast Concrete Pipe, Pipe, Culverts & Drains)	0.1 0.1 1 1	CY SY SF LF	0.1 0.1 --- 0.1	M^3 M^2 --- M
Retaining Wall	1	SF	0.1	M^2
Reinforced Concrete Slabs & Traffic Signs	1	SF	0.1	M^2
Pre-stressed Concrete Beams	0.01	LF	0.001	M
Structural Steel (including Armor Joint & Sign Support) (nearest 10 lb or 100 lb if 1% accuracy is maintained)	1	LB	1	KG
Bridge Railing (including Removal)	0.1	LF	0.01	M
Jacking, Boring or Tunneling	1	LF	0.1	M
Timber Structures	1	MFB	0.01	M^3
Detours	0.1 1	STA SY	0.01 1	KM M^2
Traffic Barrier & Pavement Markings	1	LF	0.1	M

Table 4-6: Bid Quantity Tolerances

ITEM	SHOW TO NEAREST			
Curb, Gutter, C&G, Sidewalks, Walkways, Driveways, Medians & Islands	1 1	LF SY	1 1	M M^2
Fencing, MBGF, Underdrains, Conduit, Conductors, Cable & Detectors	1	LF	1	M
Mobilization*	1.00 LS			
* All Items measured by the Month, Each or Lump Sum should be in whole units. If mobilization is broken out into several CSJs for any one contract, the resulting quantities should be carried to the hundredth place.				

Participating/Non-participating Items and Accounts

The next subsections cover:

- Participating/Non-participating Bid Items
- Participating/Non-participating Special Accounts

Participating/Non-participating Bid Items

On Federal-Aid projects, it is often necessary to distinguish the items that are not eligible for federal funds. Historically, examples of items for which the FHWA will not provide reimbursement are replacement concrete, traffic barrier hardware, and maintenance activities such as cleaning of culverts, and mowing ROW. Click here to see memo with more information.

Bid items that are non-participatory in federal funds must be grouped together in their own category of work and indicated as such in the category of work heading, e.g., CTB Hardware (Non-Part).

Participating/Non-participating Special Accounts

Similarly, special accounts (see the subsection below) which are not direct bid items but which are used to account for certain project costs (such as railroad flagging, state-furnished traffic signal controllers, off duty patrolman, etc.) may or may not be federally participating.

Those special accounts that are not federally participating must be distinguished from those that are by including (Non-Part) or (Part) as part of heading.

Special Accounts

The next subsections deal with these aspects of special accounts:

- Description of special accounts
- Special account classification
- Force account work
- State-furnished material
- Special account codes
- Special account customizing

Description of Special Accounts

Special accounts are accounts that are set up to cover costs of various items of work or the supply of materials that are not provided for in the estimate as ordinary bid items. Other special accounts may cover the participation in the contract by other entities for work not funded by TxDOT. Some examples of special accounts are State Force Account Work, Material Furnished by the State, Railroad Force Account, and Contractor Force Account. The project estimate must include the special account number, a brief description of the item of work, and an estimated cost. The unit of a special account is usually lump sum, and the price should be determined by consulting with maintenance personnel, from past experience, or the best available information and method depending on the item of the account.

Special Account Classification

Special accounts are classified as either Participating or Non-participating on federally funded projects. Participating (Part) refers to special accounts that the FHWA will participate in the cost of the work and Non-Participating (Non-Part) refers to accounts for which the FHWA will not participate in the cost of the work.

Force Account Work

Force account work in general is either additional work over and above the work described by the standard bid items or work that will be done by work forces other than the contractor. This work may be ordered, performed, and accepted on a Force Account basis. Force Accounts are a type of special account. The next three paragraphs discuss:

- State Force Account Work
- Railroad Force Account Work
- Contractor Force Account Work.

State force account work. State Force Account Work is work that is to be done by state maintenance forces on the project, such as striping and the removal of temporary sediment control fence.

The inclusion of these types of accounts allows the district to charge the costs of the work items to the project and not to their maintenance budget.

Railroad force account work. Railroad Force Account Work is work that will be done by a railroad company during the construction of a project. This includes items such as signal relocation, planking work, and flagging at railroad crossings that will be done by railroad personnel.

Contractor force account work. Contractor Force Account Work is potential work that might be done by the contractor and which has not been estimated and included as a bid item but might be required on the project. An example is temporary erosion, sediment and water pollution control on a project such as an asphaltic concrete pavement overlay.

State-Furnished Material

Material furnished by the state is another type of special account that covers materials used on the project but furnished by the state. An example of materials furnished by the state are traffic signal controllers and traffic paint. Materials furnished by the state usually include those materials that are difficult to obtain on the open market, small quantities and expensive, or what the state prefers to use and have in stock.

Special Account Codes

Most projects will require some work to be done by state maintenance forces or other agencies. Therefore, special accounts should be established so the state maintenance forces or other agencies can properly account for their work and charge to the project. Special accounts are identified in the project estimate by special account code numbers, and Table 4-7 is a list of some special accounts and their item number.

Table 4-7: Special Accounts

Code Number	Special Accounts
01	State Force Account Work (Non-part)
02	Railroad Force Account Work
06	Material Furnished By State
08	Contractor Force Account Work
11	State Force Account Work (Part)
12	Railroad Force Account Work (Part)
16	Material Furnished By State (Part)
18	Contractor Force Account Work (Part)
22	Contractor Force Account Or Agreed Unit Price

Table 4-7: Special Accounts

Code Number	Special Accounts
26	Contractor Force Account Or Agreed Unit Price (Part)
27	State Force Account Work
28	Stockpile Account Number
29	Participation by City of
30	Participation by County of

Special Account Customizing

All of these special accounts can be customized for descriptions which vary slightly. In order to customize any of the special account code numbers, first identify which special account most closely fits the need. Then add 50 to the code number.

EXAMPLE: For participation by the city, the code number is 29. Add 50 to this number: 29 + 50 = 79. So the code number to enter on the DCIS estimate (P4 screen) is 79. Then use a card type 3 on the estimate to describe the city (or insert any description needed). For additional information refer to the *DCIS User Manual*.

Section 4 — Prices

Overview

This section gives guidelines on the following aspects of prices:

- Average bid price access
- Project specific adjustments
- Factors affecting unit bid prices.

Average Bid Price Access

Unit prices are usually determined by locating previously submitted low bid prices or average low bid prices and adjusting them to fit the project being estimated. All projects are different, and the prices bid for one project can vary substantially from prices bid on others. Previously submitted bid prices or average low bid prices should only be used as a starting point from which a more accurate unit bid price can be derived with good engineering judgment.

The next subsections cover these areas when accessing average bid prices:

- Bid tabs
- Average low bid unit prices.

Bid Tabs

Each month during and after letting, the Construction Division inputs all of the bids received for every item on every project into the DCIS database. A tabulation of bids, or bid tabs, is generated and verified for each bidder on every project. This information is made available to the various divisions and districts on a Data on Terminal (DOTS) File once the bids have been verified by the Construction Division. An estimator could use a tabulation of bids report for a recent contract similar in scope and location to the project being estimated in conjunction with the average low bid unit price reports to derive unit prices.

Average Low Bid Unit Prices

After the Commission awards the low bids, the Construction Division accumulates the letting's low bids and the previous 12 months' low bids for each district and inputs this information on the database. This information is available on TxDOT's Internet site at http://www.dot.state.tx.us/business/prepostletting.htm. Statewide averages and averages by TxDOT district can be found under the Business section of the TxDOT Internet at http://www.txdot.gov/business/letting-bids/average-low-bid-unit-prices.html.

Project Specific Adjustments

When making project specific adjustments, consider the following factors:

- Unit bid determination
- Unbalanced bidding
- Project variations
- Importance of good estimating
- Factors affecting unit bid prices.

Unit Bid Determination

The determination of unit bid prices is based on experience and past trends. The designers should gather all the statistical data and information available and then study it with their knowledge and experience to establish the most accurate estimated unit bid price.

Unbalanced Bidding

Since the TxDOT low bid prices are actual contract bid prices, the estimator must realize that if a contractor has unbalanced a bid, only the estimator's experience and judgment can identify if the prices truly reflect the conventional bid prices for the items. Unbalanced bidding is the somewhat common practice of a contractor setting higher-than-conventional bid prices on items which will yield large payouts early in the construction process. The front-end loading represented by the higher bid prices are then compensated for by the contractor with lower-than-conventional bid prices for items to be accomplished later in the project. It will be to the estimator's advantage to keep a running record of the unit bid prices received on projects by area office.

Project Variations

The estimator can use the average low bid unit prices in arriving at a base price, but should keep in mind that every project will differ from all other projects in some way. These variations must be identified by the estimator and considered during the price selection process.

Importance of Good Estimating

As will be noted later, the consequences of poor estimating can be substantial. No one can predict exactly how the low bidder will bid, but by using effective estimating aids and good judgment, reasonably accurate unit prices can be determined. Each project requires individual consideration, and the estimating aids provide a starting point from which unit prices suitable for a project can be derived.

Factors Affecting Unit Bid Prices

Consider the following rules of thumb when making adjustments to unit bid prices:

Project size. Projects with large quantities will tend to have lower unit bid prices than a project with small quantities.

Project location. The location of a project, such as a rural project with long material hauls and no commercial asphaltic concrete hot-mix plants or ready-mix concrete plants available, most likely will have higher unit bid prices than an urban project where these facilities are readily available.

Traffic conditions. Traffic conditions quite frequently have a significant effect on bid prices. Due to difficulties, dangers and expenses caused by traffic, contractors will typically raise prices to reflect these conditions. Projects with complex sequences of work and high traffic volumes will command higher prices than uncomplicated projects with low traffic volumes.

Construction season. The time of year that a project is to be let for contract and the estimated time required for completion may be significant in price selection. Factors, such as if the project will have to be suspended or delayed by inclement weather, will have an effect on bid prices.

Accessibility. Accessibility to the work area and the existing terrain are important factors. For example, construction on an existing interchange may require long out of direction movements by men and equipment. If material hauling must be accomplished under these conditions, it can be unusually expensive.

The type of terrain where the project is located may have a bearing on bid prices. Work that is normally easy to accomplish on level terrain or gentle slopes may be almost impossible on steep slopes.

Restrictive conditions. Restricting the working hours or method of work on a project can have a great effect on prices. If the specifications limit work to nighttime or short shifts, unit prices may need to be increased to reflect the higher costs involved.

Availability of materials. The availability of materials also influences bid prices. An example is the fluctuation of bid prices received for asphalt over the years which is directly related to the availability or use of crude oil.

Experimental or research items. Projects which include experimental or research items usually receive higher bids. Since the bidders cannot foresee all the difficulties associated with these items, they usually pad their bids to allow for contingencies, thus resulting in higher bids.

Specifications. The estimator must also be aware of Special Specifications and Special Provisions which may dictate materials or procedures more costly to the contractor than the conventional items.

Construction time. Projects requiring long periods of construction, a year or longer, will quite likely reflect higher bid prices for items which must be purchased from suppliers. Especially noteworthy are large quantity items or expensive items which will be constructed during the later stages of the project, since suppliers are usually unwilling to guarantee prices for extended periods of time. The Contractor(s), for protection against any increase in prices, will usually hedge their bid on this type of item, resulting in higher prices than in projects with shorter completion times.

Plan clarity. Plans which are neat, clear, and accurate will usually contribute to lower overall unit bid prices.

Bidder competition. The number of bidders bidding on a project has been shown to be directly related to the unit bid prices received. The general rule is the greater the number of bidders to bid on a project, the lower the bids received. This is due to the increased competition necessary among bidders in order to be awarded the low bid. In determining the unit bid prices, the designer should account for the anticipated amount of bidding competition.

Section 5 — Funding Program Overruns

Overview

This section discusses

- Project selection process description
- Implications of erroneous estimates
- Pre-letting overrun approval.

Project Selection Process Description

The Commission authorizes projects in the Unified Transportation Program (UTP) in several different ways. One way is to authorize program amounts (usually once a year) for activities which reflect the Commission's intentions to address a specific activity such as rehabilitation or preventative maintenance. The program amounts for a particular program may be allocated to the districts by a formula (with the formula also approved by the Commission), with eligible projects selected by the districts or by the MPO on an as-needed basis within their allocation. For other programs, such as safety or railroad signals, the program amounts are distributed on a statewide basis by the TxDOT division office responsible for the administration of that program after the division office has evaluated, ranked, prioritized, and selected projects for the program. For more information on the funding process, see the *Transportation Programming and Scheduling Manual* in the Transportation Planning and Programming Collection.

Specific projects listed in the UTP are ranked by indices such as cost per vehicle mile, congestion relief index, bridge condition, or fatalities/injuries. Generally, the lower the ranking index calculated for the project the higher the priority or rank that project will receive in its program since it will be considered more cost effective. Most of these indices require the estimated cost as part of their calculation.

Implications of Erroneous Estimates

During the programming stage, funds are earmarked for specific projects. An inaccurate estimate significantly exceeding what will actually be bid (underrun) will appear less cost effective in the program. The projects which appear to be more cost effective will be scheduled and let, whereas the project which is actually more cost effective may be delayed.

An inaccurate estimate less than what will actually be bid (overrun) will appear more cost effective than it actually is by causing the ranking index to be lower than it actually should be. This project will be ranked higher than it should be and, as a consequence, could jeopardize the letting of more cost-effective projects. An inaccurate preliminary estimate may also cause the designer to under-

design or over-design a project in order to arrive at approximately the same overall cost as the preliminary estimate.

Pre-Letting Overrun Approval

The current governing procedures for approving construction estimate increases as approved by the Texas Transportation Commission (Commission) on June 29, 2000, by Minute Order 108241, needs to be revised to address new categories established in the 2004 Unified Transportation Program (UTP).

The following outlines the specific categories and the appropriate level of approval for the amount of construction cost estimate increase as compared to total programmed amount prior to letting:

Category I - Preventive Maintenance and Rehabilitation and Category II - District Discretionary are categories whose projects are selected by the districts and limited by the allocation of funs for specific programs. All programmed project estimate increases/ decreases are credited debited to the district programs. These categories will have the following approval criteria:

- The District Engineer may approve all increases that do not exceed the district's authorized funding in these categories.

Category 2 - Metropolitan Area (TMA) Corridor Projects, Category 3 - Urban Area (Non-TMA) Corridor Projects, Category 4 - Statewide Connectivity Corridor Projects and Category 6 - Structures Replacement and Rehabilitation are categories whose projects are approved by the Commission as part of the UTP. These categories will have the following approval criteria:

- The appropriate division director may approve all increases not to exceed $2.5 million. The Executive Director may approve all increases up to an amount not to exceed $25 million. The Commission will consider all increases in excess of $25 million.

Category 5 - Congestion Mitigation and Air Quality Improvement and Category 7 - Surface Transportation Program, Metropolitan Mobility Rehabilitation are projects selected by specific Metropolitan Planning Organizations (MPO). All programmed project estimate increases/decreases are credited/debited to the program's allocation. These categories will have the following approval criteria:

- The District Engineer may approve all increases within the limits outlined in the MPO's Transportation Improvement Program, otherwise only with MPO approval not to exceed the MPO's allocation for these categories.

Category 8 - Safety, Category 9 - Transportation Enhancements (Safety Rest Areas) and Category 10 - Supplemental Transportation Projects are categories whose projects are selected by the responsible district engineer, division director or agency director based on applicable program criteria approved by the Commission for that Program. All pro-

grammed project estimate increases/decreases are credited/debited to the program's allocation. These categories will have the following approval criteria:

- The appropriate district engineer, division director or agency director may approve all increases that do not exceed the program's allocation.

Category 9 - Transportation Enhancements and Category 12 - Strategic Priority are categories whose projects are selected by the Commission based on specific program criteria. These categories will have the following approval critera:

- All increases require Commission approval.

Section 6 — Estimate Checklist

The project estimate should be created in DCIS prior to the spec list. The automated spec list program pulls most of its information from the estimate. Refer to the DCIS *User Manual* for further details on the creation and modification of the estimate and associated information that needs to be input at the same time.

- ❒ Check quantities, descriptions, and units of measurement in the estimate against those shown in the plans.
- ❒ Verify that all descriptive codes used are valid and can still be used. (See memorandum to all DE's from DES dated August 19, 1996, and refer to the payment articles in the specifications or Special Provision) Valid codes can be found at http://ftp.dot.state.tx.us/pub/txdot-info/des/specs/usfcod14.txt.
- ❒ Make sure Special Provision numbers are listed with all applicable bid items.
- ❒ For all projects, make sure that all new descriptive codes have been obtained through the CST_RDWY_SPECS prior to final PS&E submission.
- ❒ Check estimated unit prices.
- ❒ Make sure that all items measured by lump sum have a quantity of 1.0. On projects with multiple CSJs, the combined lump sum quantity must total 1.0. No quantities should be 0.0.
- ❒ Make sure that the same Item/Descriptive Codes have the same unit price throughout the estimate (all CSJs, categories of work, etc.). Discrepancies can be quickly determined by printing a combined estimate. The combined estimate will print an error message for different bid prices.
- ❒ Check the mileage on the DCIS P1 screen(s), category of work cards (P4 screen) and Title Sheet to make sure they all match.
- ❒ The type of work on the DCIS C1 screen (CCSJ) should match the type of work description on the Title Sheet.
- ❒ Make sure the limits on DCIS P1 screen(s) and on the Title Sheet match.
- ❒ Make sure the proper force account codes are used. If eligible for Federal-Aid, make sure that PART is used.
- ❒ Make sure all items of work not eligible for Federal-Aid are broken out into a separate NON-PARTICIPATING category of work.
- ❒ Include all required comment cards.
- ❒ Make sure all items of work to be paid for by other entities are broken out into a separate category of work.

- ❒ For projects that include lump sum contributions from other entities, add comment card(s) (Type 3), after the Type 9 card at the end of the estimate, that explain in detail the funding amount contributed and the contributor. This information will be used by the Finance Division to properly set up the funding for the contract. This notation is not necessary for participation in specific bid items (which should be broken out in the estimate) or for **projects with local matching funds**.
- ❒ Check base bid and alternate items. Make sure that they are properly entered. Check to verify that the total dollar amounts of the base bid items and the corresponding alternate bid items are the same for the entire contract.
- ❒ Make sure all Type 9 cards have been included at end of all CSJs.
- ❒ Check measurement and payment articles of specifications and provisions to verify that all necessary bid items have been included in the estimate.
- ❒ If State force account work is proposed on Federal-Aid project, the district prepares a Public Interest Justification and will forward to the responsible Austin division. The responsible Austin division will approve on Federal-Aid State oversight projects. The FHWA will approve on Federal-Aid Federal oversight projects.
- ❒ For projects involving structural steel, prestressed products and/or epoxy-coated reinforcing steel, the Bridge Division Planning/Programming Section will prepare and submit material bills to fabricators.
- ❒ If bridges or bridge class culverts are involved, make sure that all bridge-related items have been broken out into separate categories of work. National Bridge Inventory and Permanent Structure Numbers must be listed on the bridge cost information card (12 card).
- ❒ After the estimate(s) is finalized, place the 9 card and the correct proposal guaranty amount will be automatically calculated and placed on the DCIS P5 screen based on Minute Order No. 108851 (March 28, 2002). If the estimate has been updated then remove and replace the 9 card. The guaranty amount will be recalculated. Highway improvement contracts estimated at $25,000 or less will not require a proposal guaranty. The amount of the proposal guaranty for those contracts estimated to involve more than $25,000 will be 2 percent of the department's engineer's estimate as of the proposal release date, rounded to the nearest $1,000 and not to exceed $100,000. The proposal guaranty should be verified on the p5 screen and a proposal generated prior to final PS&E submission.

Table 4-8: Proposal Guaranty

Total Estimate (-E&C Force Accounts)	$
$25,000 or less	$0
$25,001 up to $4,999,000	2% rounded up or down to the nearest $1,000*
$5,000,000 or above	$100,000

Table 4-8: Proposal Guaranty

Total Estimate (-E&C Force Accounts)	**$**
*If 2% of your “Total Bid Items” is $3,503.00, then your proposal guaranty will be $4,000.00 *If 2% of your “Total Bid Items” is $3,493.00, then your proposal guaranty will be $3,000.00	

Chapter 5 — PS&E Submissions and Processing

Contents:

Section 1 — Overview

Introduction

This chapter covers some of the activities required to prepare a PS&E package for submission to Austin and the processing that occurs prior to letting. The components of the PS&E Transmittal Data Form 1002 and the information that is placed on these forms are covered in detail. PS&E checklists outline what documents must be sent to Austin for processing for letting. The review processes necessary at the district and division levels are described. The final section outlines the process used to prepare and process addenda to prospective bidders.

All PS&E packages and also supporting documents are electronically submitted to DES. For instructions on how to electronically submit the documents please go to http://crossroads/org/des/fs/docs/e_PSE.pdf.

Section 2 — PS&E Transmittal Data (Form 1002)

Overview

When PS&E is submitted to the Austin Office for review, it is necessary for the PS&E Transmittal Data Form 1002 to be sent in with the submission. Form 1002 serves several purposes:

- It is a supporting documents checklist to be used by the designer in preparing the PS&E.
- It is to provide the Austin divisions with a record of all supporting papers contained in the submission.
- Page 3 of Form 1002 is the department's official location where basic design criteria of each project are documented.
- Page 3 of Form 1002 provides a request/approval document for design exceptions/design waivers approved at the District level.

This form should be completed and carefully checked when preparing the submission to avoid overlooking any of the supporting papers. There are 13 sections on the form which must be completed:

1. Project Identification
2. Supporting Documents Checklist
3. State Transportation Improvement Program Status
4. Environmental Status
5. Financing
6. Other Participation
7. Agreements
8. Airway-Highway Clearance
9. Contract Time
10. District Contact Person(s)
11. Estimated Cost of Pedestrian Elements
12. Proposed Basic Design Data Information

Subsections covering each of these items, with step-by-step instructions to complete the form, follow.

Project Identification

Information on the first four lines of the form relate to identifying important data relative to the project location, the controlling CSJ, the project number, length of project, limits of work and the proposed letting date. This information should be retrieved from the Project Identification Screen (P1) in the Design and Construction Information System (DCIS) (the project length would also match that shown on the plans Title Sheet).

Supporting Documents Checklist

The checklist portion of the form assists and guides the designer in providing the necessary supporting documents to the Austin divisions. See Section 3 for more information regarding the Supporting Documents Checklist.

State Transportation Improvement Program Information

The appropriate State Transportation Improvement Program (STIP) year and STIP page number should be shown. This information will be used to verify if the project has been properly included in the STIP, thereby showing that funding has been set aside for the project.

Environmental Status

The status of the project's environmental clearance should be entered here.

Financing

A detailed accounting of authorized funding should be shown under this section. Projects from the same program should be listed under the controlling CSJ. The work program number should also be shown along with the authorized amount and the estimated cost. The estimated cost should reflect only the regular bid items, materials supplied by the state, state force account work, and the like. It should not include engineering and contingencies or portions of work financed by other governmental bodies. Estimated costs should then be subtracted from authorized funds to obtain an underrun or overrun. When overruns are encountered, reasons should be stated. This is necessary if additional funds are to be requested. Reasons stated should be significant enough to completely explain the overrun. Reasons such as "an underestimation of work" should be expanded to explain specific quantities and items.

Other Participation

Other participation, such as that supplied by a local government, should be noted here. If other participation has been included, specify what county, city, or other entity the agreement should be with, the amount of their participation (including preliminary engineering charges), and indicate if

it is fixed sum or actual cost amount and minute order number if applicable. As noted, a copy of the executed agreement should be attached.

Agreements

If a railroad agreement is required, place a check by the "yes" space and fill in the name of the railroad. **The agreement should be executed prior to PS&E submission**. If, however, the agreement has not yet been executed, the date the request was made to the Railroad Division should be listed.

If a Section 404 Permit, Nationwide Permit, United States Coast Guard Permit, or other agreements are required, the appropriate "Yes/No" spaces should be selected along with other requested data.

Airway-Highway Clearance

If airway-highway clearance is required, place a check by the "yes" space and indicate the date it is approved. For more information, see "Airway-Highway Clearances" in Chapter 2, Section 1 of this manual.

Contract Time

Careful consideration should be given to the number of working or calendar days set up for the contractor's working time. The number of working days should be the same number of working days shown on the contract time determination summary. The number of working days set up in the contract will be the number that is input on the Contract Summary (P5) Screen on DCIS.

District Contact Person(s)

Specify the name(s) of the responsible district reviewer(s) and list the person's telephone and fax number(s).

Estimated Cost of Pedestrian Elements

The cost of any pedestrian elements (such as sidewalks, extra bridge width or curb ramps, pedestrian signals, crosswalks, entire cost of hike and bike trail projects, and building and enhancement projects) should be noted here. If the estimated cost of pedestrian elements exceeds $50,000 the project must be instected by a Registered Accessibility Specialist (RAS). Please see http://cross-roads/org/cst/docs/RAS_Web_Page_20160128.docx for information on submitting a project for RAS inspection.

Documentation of TDLR registration, or review performed by the RAS should be submitted to DES as supporting documentation for final PS&E submission.

Proposed Basic Design Data Information

Though it may appear to be another form, this is the third page of Form 1002. Its primary purpose is to document the basic design criteria established on the project. This page must be completed for all contracts. Some of the information in this page/form are:

- Proposed Standards (Structures, Roadway, and Traffic)
- Design Speed (Applicable)
- Terrain
- Traffic
- Highway Functional Class
- Design Exceptions
- Design Waivers

A brief discussion of each appears in the subsections below.

Proposed Standards (Structures, Roadway, and Traffic)

Proposed Design Standards refers to the basic criteria for structures, roadways, and traffic which form the basis of the project design. The designer will list the standards chosen in the spaces provided. For example, the proposed Traffic standard may be the *Texas Manual on Uniform Traffic Control Devices*, the roadway standard may be that for "Standards of Design for Multilane Rural Highways" (see *Roadway Design Manual*, Chapter 3, Multi-Lane Rural Highways) and the structures standard may be "HS 20" loading or a hydraulic design frequency.

The roadway design criteria shown will generally be stated as "2R", "3R" (see Chapter 4 of the *Roadway Design Manual*), or "4R" (see Chapter 3 of the *Roadway Design Manual*) with additional specificity listed whenever possible. 2R design guidelines (standards) are only used on non-freeway related projects (see the *Roadway Design Manual*, Chapter 5). Notations that certain standards are not applicable to the project should be entered on the form as necessary. For example, a 2R project may only use the TMUTCD and "BC" standard sheets as a design standard (in addition to "2R" as the roadway standard) and a "Transportation Enhancement" project (architectural work) may only reference the Americans with Disabilities Act (ADA) and Texas Accessibility Standards (TAS) requirements as a structures standard. Such notation of non-applicability may also apply to the other Form 1002, Page 3 entries, discussed below.

Design Speed (Applicable)

The applicable design speed is the speed chosen to design the highway facility. The design speed criteria is outlined in the *Roadway Design Manual*, Chapter 2, and is a result of highway functional classification, terrain, and traffic. Variation from these criteria requires a design exception. The

speed selected should be entered in this space. There may be more than one value entered, depending on the different types of highway facilities involved in the project.

Terrain

Terrain refers to the general vertical lay of the land on which the highway facility was/is designed. The type of terrain was determined prior to the preparation of the PS&E and was used in selecting other design criteria, such as design speed and level of service. Terrain classifications are flat or rolling. The selected terrain should be entered in this space.

Traffic

Traffic refers to the average daily traffic on an existing or proposed facility. Existing traffic is that traffic which presently exists on a facility. Twenty-year projected traffic is the average daily traffic estimated for a facility twenty years from current year. Traffic volumes can be obtained from county traffic maps or from the Transportation Planning and Programming (TPP) Division. The traffic must be entered in the spaces provided for each project. If multiple highways or projects are encountered in a contract, data should be given for each highway in the contract. This data is used for several purposes, which include the selection of pavement, cost overrun justification, congestion relief indices, etc.

Highway Functional Class

Functional classification is a description of a roadway system's usage. These classifications are selected prior to PS&E preparation and are used in the selection of design criteria. Functional classifications may be found on functional classification maps, which are obtained from the TPP Division. The proper classification should be entered in the appropriate space (urban or rural). For functional class maps see: http://www.dot.state.tx.us/apps/statewide_mapping/statewideplanningmap.html.

Due to the ever changing nature of land use on the fringes of urban areas, we often encounter locations that are functionally classified as rural but have either begun to take on urban characteristics due to new development or are expected to do so in the near future. In these cases, districts will typically use urban design standards in lieu of rural design standards. We recommend that districts use an asterisk on the classification with a corresponding note similar to the following: "Urban street guidelines were used for this area because of existing and anticipated development."

Design Exceptions

The next paragraphs discuss these design exception topics:

- Requirements for design exceptions

- Controlling criteria

  Requirements for design exceptions. A design exception is required whenever the guidelines for certain controlling criteria specified in the department design manuals are not met. Although design and construction of projects that do not meet the recommended guidelines are sometimes justifiable, districts are responsible for approving and documenting the exceptions on Form 1002. A copy of the approved design exception package should be sent to the Design Division. An example of a Form 1002, Page 3 and Request for Design Exception can be found at: Form 1002 and Design Exception. A design exception is not required when values meet or exceed the guidelines for controlling design criteria. See *Roadway Design Manual*, Chapter 1, Section 2, for details on design exception approval.

  Controlling criteria. For new construction and reconstruction projects, the Federal Highway Administration (FHWA) has designated 13 controlling categories of roadway design criteria which will require design exceptions. When the minimum standard for any of these controlling criteria cannot be met, a design exception request must be made. The 13 controlling categories are detailed in the *Roadway Design Manual*.

Design Waivers

When criteria in the *Roadway Design Manual*, Chapter 1 are not met in a non-controlling category, a design exception is not required. However, variations from the guidelines in these cases are handled by design waivers prepared and approved at the district level. Design waivers will be granted as the district authorizes in accordance with sound engineering judgment. The complete documentation should be retained in the district project file but documented on this form with the original signature. They should also be sent to DES for permanent filing.

For a complete list of non-controlling criteria for each project category, see Design Waivers section of the *Roadway Design Manual*, Chapter 1, Section 2.

TAS Design Variances

A request for a design variance for any deviation from the Texas Accessibility Standards (TAS) are to be submitted to the Texas Department of Licensing and Regulation (TDLR) through the Construction Division (CST). Specific design requirements to accommodate the needs of persons with disabilities are established by the ADA Public Accessibility Guidelines for pedestrians in the Public ROW (PROWAG) and the Texas Accessibility Standards.

Districts are to complete page 2, section I, and page 3 of Form 1002, and include all information detailed in the Request for TAS Design Variance sheet (see http://crossroads/org/des/ada/docs/ADA.doc). Requests for design variances should be submitted to the Construction Division (CST), as soon in the design process as it's determined that a standard design value can not be met. This holds for any minimum design standard, ADA/TAS related or not.

Section 3 — Supporting Documents Checklist

Overview

The checklist portion of Form 1002 assists and guides the designer in providing the necessary supporting documents for final PS&E submission to the Austin divisions. The number of copies of the supporting papers and plans prints are outlined on the form by project type and are important to the smooth processing of the PS&E prior to letting. This section discusses the following checklist items:

- Plan Set (electronic PS&E)
- Project Proposal
- List of Governing Specifications and Special Provisions
- General Notes and Specification Data
- Plans Estimate
- Engineer's Sign, Seal, Date supplemental sheet
- Contract Time Determination Summary
- Significant Project Procedures Form
- Right-of-Way/Utility/Relocation/ Encroachments/Railroad Certifications

Plan Set

Verify that the electronic PS&E Portfolio is prepared in accordance with the e PS&E Submittal Instructions available at the intranet site http://crossroads/org/des/fs/index.asp.

Project Proposal

Verify the the Project proposal has been built using the Construction and Maintenance Contract System, and is available on your district's Miramo drive folder. Instructions for building proposals can be found at the intranet site http://crossroads/org/des/fs/index.asp.

List of Governing Specifications and Special Provisions

Verify that the correct Governing Specifications and Special Provisions have been included in the electronic transmittal package, or is available for printing through the ROSCOE program.

General Notes and Specification Data

Verify that the correct General Notes file has been included in the electronic transmittal package, or it is available in the District's Miramo folder.

Plans Estimate

Verify the correct plans estimate has been included in the electronic transmittal package, or is available for printing through the ROSCOE program.

Engineer's Sign, Seal, and Date Supplemental Sheets

One electronic supplemental sheet with the responsible engineer's signature, seal, and date must be included with the PS&E package. This is eventually used in the respective final construction contract proposals (i.e., the state's and the contractor's).

Contract Time Determination Summary

The required Contract Time Determination Summary is also included as a "supporting paper." It consists of a brief summary of the projected production rates used for major work items, to arrive at the final estimate of construction time (measured in either work days or calendar days) It is required to be signed and dated by the responsible engineer.

Significant Project Procedures

Verify that the correct Significant Project Procedures is included with the electronic transmittal package. The Significant Project Procedures Form 2229 is available at http://txeform/eFormsWorkspace/.

If construction speed zoning is desired for projects or portions of a project outside the limits of incorporated cities, the Request for Regulatory Construction Speed Zone Form 1204 should be prepared and submitted to TRF division to coordinate for commission action. The form is self-explanatory with instructions contained on the reverse side. Cities have the authority to establish construction speed zones within their corporate limits, and this should be encouraged since the city will likely be responsible for enforcement. If, however, a city desires the commission to establish the zones, then a written statement from the city is required.

Right-of-Way/Utility/Relocation/ Encroachments/Railroad Certifications

The status of these items is shown on the Form 1002. The designer should check the appropriate status as either "Clear" or "To Be Clear" at the time of the submission of the 100% PS&E package.

One original signed copy of the certifications must be submitted with the 100% PS&E package as supporting documents. These certifications are:

- Right-of-Way Certification
- Relocation Advisory Assistance Certification
- Right-of-Way Encroachment Certification
- Utility Clearance Certification.
- Railroad Certification

A discussion of each follows.

Right-of-Way Certification

A right-of-way certification is submitted for every project. The certification will be signed by the district engineer and submitted with the 100% PS&E package. The certification describes the status of the right-of-way acquisition process. Examples of the required certifications for the various conditions are shown below.

- **Right-of-Way Not Required** – use clrrow1 to certify that the project will be developed without the acquisition of additional right-of-way.
- **Right-of-Way Acquisition Complete (State Project)** – use clrrow2 to certify all the project right-of-way has been acquired in accordance with current State requirements.
- **Right-of-Way Acquisition Complete (Federal Project)** – use clrrow3 to certify all the project right-of-way has been acquired in accordance with current Federal directives.
- **Right-of-Way Acquisition Not Complete (State Project)** – use unclr1 to certify the project right-of-way has been acquired in accordance with current State requirements except the parcel(s) listed on the certification, which will be acquired in accordance with current State requirements.
- **Right-of-Way Acquisition Not Complete (Federal Project)** – use unclr2 to certify the project right-of-way has been acquired in accordance with current Federal directives except the parcel(s) listed on the certification, which will be acquired in accordance with current Federal directives. In addition, for incomplete right-of-way on Federal projects, the rowstat form should be included with the certification to list the outstanding parcels and their possible effect on delays to construction.

If the status of right of way acquisition has been updated since the submission of the 100% PS&E, a new certification letter is required.

Relocation Advisory Assistance Certification

A Relocation Advisory Assistance Certification is required for every project. The certification will be signed by the district engineer and submitted with the 100% PS&E package. If any right-of-way was acquired, certification of proper relocation assistance is necessary. Examples of the required certifications for the various conditions are shown below.

- **Right-of-Way Acquisition Not Required or Right-of-Way Acquisition does not Include Displacements (State Project)** – use reloc1 to certify that the State funded project will be developed without the need for relocation assistance.
- **Right-of-Way Acquisition Not Required or Right-of-Way Acquisition does not Include Displacements (Federal Project)** – use reloc2 to certify that the Federal funded project will be developed without the need for relocation assistance.
- **Relocation Process Complete (State Project)** – use reloc3 to certify that the relocation process has been completed for all displacements in accordance with State requirements.
- **Relocation Process Complete (Federal Project)** – use reloc4 to certify that the relocation process has been completed for all displacements in accordance with Federal directives
- **Relocation Process Incomplete (State Project)** – use reloc5 to certify that the relocation process has been completed for all displacements, with the exception of those displacees listed on the certification who will be relocated in accordance with State requirements.
- **Relocation Process Incomplete (Federal Project)** – use reloc6 to certify that the relocation process has been completed for all displacements, with the exception of those displacees listed on the certification who will be relocated in accordance with Federal directives.

If the status of relocation assistance process has been updated since the submission of the 100% PS&E, a new certification letter is required.

Right-of-Way Encroachment Certification

The right-of-way encroachment certification is required for each project. The certification will be signed by the district engineer and submitted with the 100% PS&E package. An encroachment is typically an instance of privately-owned improvements existing on the State's project right-of-way. There are two requirements that must be met to properly address right-of-way encroachments. The next paragraphs cover the requirements.

- Requirements for Federally Funded Projects
- Requirements Under State Law
- Certification

Requirements for Federally Funded Projects – In order to advance a federally funded project, we must deal with encroachments as outlined in the *Federal-Aid Policy Guide, Section 1.23 (23*

CFR 1.23). To meet these guidelines, the district can provide support documentation that leaving the encroachment in place will not impair the highway or interfere with the free and safe flow of traffic. When an encroachment is discovered on a project, this support documentation should be sent to the Design Division with copies to the Construction Division and the Right-of-Way Division. If this cannot be certified, then the encroachment must be addressed otherwise, which may involve removal or safety treatment, in order for the federal project to proceed and utilize federal funding.

Requirements Under State Law – The state requirements are derived from broad state laws involving the use of public property for private use. The current TxDOT interpretation applies this to highway ROW. The interpretation is that TxDOT must have a formal agreement with the owner of the encroachment to allow the encroachment to exist in the right of way. The options to comply with the state law have been determined to be: (1) remove the encroachment; (2) sell the area of the ROW to the owner of the encroachment; or (3) lease the area of the ROW to the owner of the encroachment. To address these requirements, the district should work with the Right-of-Way Division with copies of this information sent to the Design Division and the Construction Division. These options must be pursued even if approval has been obtained in compliance with the Federal-Aid Policy Guide as discussed above.

Examples of the required certifications for the various conditions are shown below.

- **Right-of-Way Encroachments Do Not Exist or Right-of-Way Encroachment Removals Have Been Completed** – use rowencr1 to certify that there are no right-of-way encroachments within the limits of the project.
- **Right-of-Way Encroachments Need to be Removed or Will Remain In Place** – use cert3a to describe existing encroachments and to certify they will either be removed or they will remain in place. The “status” column should specify that the encroachment will either be removed and by whom or that it will remain in place.

If the status of right-of-way encroachment has been updated since the submission of the 100% PS&E, a new certification letter is required.

Utility Clearance Certification

A utility clearance certification is submitted for all projects. The certification will be signed by the district engineer and submitted with the 100% PS&E package. The certification describes the status of the utility adjustment process. Examples of the required certifications for the various conditions are shown below.

- **Utility Adjustments are Not Required or Utility Adjustments Have Been Completed** – use utiladj1 to certify that there are utility adjustments required or they have been completed prior to PS&E submission.

- **Utility Adjustments are Incomplete** – use utiladj2 to certify that incomplete utility adjustments are present at the time of the PS&E submission. The certification lists the utility owner, the location of the utility to be adjusted and the expected completion date for the adjustment. For Federal-aid projects, the certification is supplemented by Utility Status (utilstat) data sheet(s) listing the unclear utilities and their possible effects on delays to construction.

If the status of utility adjustment has been updated since the submission of the 100% PS&E, a new certification letter is required.

Railroad Certification

A railroad certification is submitted for all projects. The certification will be signed by the district engineer and submitted with the 100% PS&E package. The certification describes the status of the coordination with railroad companies when railroad ROW is within the project limits, A railroad crossing (advance warning signs within the project limits) is near the project limits or parallels the project, a traffic signal is or will be linked to railroad signal devices, and the traffic control plan will influence a railroad crossing. Examples of the required certifications for the various conditions are shown below:

- **No Railroad Work** – This certification applies when no work within or near the limits of railroad ROW is included in the project. Use (rrc-no_rrwrk) to certify work is not being done on or near the railroad ROW and that a railroad right of entry agreement is not required.
- **Agreement Executed – work prior to construction** – this certification applies to projects where the coordination and agreement are executed; railroad work is completed before letting; and only flagging is to be done during construction. Use (rrc-ae-wrkpriorcst) to certify that railroad work will be completed before construction operations begins and the agreement with the railroad is executed.
- **Agreement Executed – work during construction** – this certification applies to projects where the coordination and agreement are executed, and railroad work will be completed during construction. Use (rrc-ae-wrkdurcst) to certify that railroad work will be completed during construction operations and the agreement with the railroad is executed.
- **Agreement not executed – work during construction** – this certification applies to projects where the coordination is complete and the railroad agreement will be executed without causing a construction delay for the contractor. Use (rrc-ane-wrkdurcst) to certify that railroad work will be completed during construction operations begins and the agreement with the railroad not executed.

If the status of the railroad work has been updated since the submission of the 100% PS&E, a new certification letter is required.

Important Notice to Contractors Special Provision for Unclear Certifications

Contractors must be notified about unclear certifications in the project contract proposal. This is done through an Important Notice to Contractors Special Provision. A Triple Zero Special Provision needs to be prepared using the "Special Provision to Item 000" template provided on the Specifications page on the TxDOT web site.

The owner and location information, estimated clearance dates, and effect on construction should be included as shown on the certification letters. The prepared special provision and 1814 form need to be sent to CST_RDWY_SPECS through Outlook for their approval. If the information on the Important Notice to Contractors Special Provision is updated before proposals are released to contractors, and updated special provision should be forwarded to CST_RDWY_SPECS. Design Division should also be contacted to rebuild the proposal with the revised Important Notice to Contractors. When proposals have been released to contractors 21 days prior to letting, a new special provision needs to be requested form the Construction Division Roadway Specification Section. This revised Important Notice to contractors Special Provision needs to replace the outdated Special Provision by and addendum.

When a railroad agreement is not executed at the time of letting an "Important Notice to Contractor's" special provision is required. The special provision is meant to inform the contractor of the location of work done in railroad ROW, estimated clearance of right of entry for construction operations, and anticipated effect on the construction. This special provision should reference and agree with the railroad scope of work PS&E plan sheets.

Standard Operating Procedure for Item 8 Delayed Start Special Provisions

To ensure that the contractor can pursue construction activities without delays due to outstanding ROW, utility, and unexecuted agreement issues, the department has implemented a Standard Operating Procedure (SOP) for including a construction delay. For a project to include a delayed construction start date, a request to include delayed start provisions in the contract needs to be prepared with a management plan and submitted to DES for review and forwarding for Administration approval. This request for inclusion of delayed start should be sent to DES- Field Coordination Engineer for routing and approval by Administration one week prior to FIN posting of the candidate list of projects for letting according to the PS&E processing schedule on Letting Management's web page. The link to this web site is below:
http://crossroads/org/fin/Guidance/LettingManagement.htm.

The management plan is a written, logical construction activity description with a schedule, right of way/relocation/encroachment/utility/railroad certifications and a selected item 8 delayed start provision template which clearly demonstrates reasonable construction progression of the project.

The following situations are exempted from this SOP:

- Construction delays for material processing or mobilization cost saving initiatives that do not exceed 90 days
- Delayed start work provisions for manufactured items including signal poles, mast arms, luminaries, high mast lighting assemblies, bridge beams, etc.
- Seal Coat, ACP overlays, and microsurfacing only projects.

Section 4 — PS&E Checklists

Overview

This section presents the following checklists:

- Pre-submission checklist
- PS&E checklist for letting

Pre-Submission Checklist

- ❒ Make sure all approved preliminary submissions agree with the design proposed in the plans.
- ❒ Check the proposed design to see if any design exceptions and/or design waivers are necessary. If so, check to see if all necessary design exception request(s) have been approved.
- ❒ Check to see if any new specifications, provisions or descriptive codes are needed. If so, make sure that all applicable Form 1814's have been sent to the CST for processing at least two months prior to submission.
- ❒ Check the Form 1002, Page 3, to see if it has been properly filled out. Ensure that it has been forwarded, signed and approved by the appropriate district staff. Make sure that the proposed design standards are suitable for the type of work and funding category proposed. For the most current guide to design criteria, go to http://crossroads/org/des/fs/docs/utprestructure.pdf.
- ❒ Check to see if any road closures are proposed. If so, check to see if letters of concurrence from the affected local entities have been obtained and that documentation indicating district engineer's approval is prepared.
- ❒ Check to see if a railroad agreement is necessary. A railroad agreement is necessary if any work is proposed within railroad right-of-way. If so, check to see if a request has been sent to the Railroad Division (desirably one year prior to letting). Check to see if an agreement has been executed prior to submission. For all projects, railroad agreements must be executed (and approved by the FHWA for federal oversight projects) prior to receipt of bids. Certain projects are authorized to proceed to Letting and be conditionally awarded if the Traffic Operations Division (Railroad Section) determines that an executed agreement will be received in a timely manner for construction to proceed.
- ❒ Check to see if airway-highway clearance is involved. If so, make sure that the proper documentation has been completed and coordinated with the Federal Aviation Administration (FAA) and/or FHWA.
- ❒ If a construction speed zone is required, make sure that Form 1204 has been properly filled out and forwarded to TRF for processing. The district needs to notify TRF and submit the form to that division.

- ❒ For all traffic signals involved, prepare and submit one copy of each executed authorization form to the Traffic Operations Division. Temporary traffic signals used during construction also require an executed authorization form even though warrants are not required to be met.
- ❒ If guarantees and/or warranties are required in the specifications or plans, check for compliance with *23 CFR 635.413*. If necessary, prepare and submit to the responsible Austin division a memorandum requesting approval. The responsible Austin division reviews and approves the Federal-Aid State oversight projects or coordinates with the FHWA to obtain approval for Federal-Aid Federal oversight projects.
- ❒ If experimental features or items of work are proposed, prepare and submit to the responsible Austin division a proposed work plan for approval. Work plans are reviewed by the responsible Austin division for Federal-Aid State oversight projects or submitted to the FHWA for approval on Federal-Aid Federal oversight projects.
- ❒ Execute all necessary traffic signal or illumination agreements.
- ❒ If escrow agreements are involved, check to make sure that the agreements have been executed and the proper advance funds are in hand 45 days prior to letting. Districts are required to certify receipt of funds (financial clearance) prior to letting and prior to award.

PS&E Checklist for Letting

The submittal (to Austin) date of the final PS&E will be as noted on the Finance Division's "PS&E Review and Processing Schedule," which can be accessed at http://crossroads/org/fin/Guidance/LettingManagement.htm (see Chapter 1, Section 3, PS&E Submissions Schedules, of this manual) by picking the schedule for the applicable fiscal year.

The following documentation should be submitted to the Design Division:

- ❒ Pre-approved Special Provisions and/or Special Specifications (Form 1814)
- ❒ General Notes
- ❒ Letter of Transmittal to be used when issues to be discussed other than on Form 1002 are in the job
- ❒ Form 1002 (all pages - preferably with Page 3 previously approved)
- ❒ Plans Estimate
- ❒ Specifications List
- ❒ Sealed engineer's certification
- ❒ Sealed copy of hydraulic report cover page
- ❒ Construction speed zone requests

- ❒ The Form 1814, for approval of new Special Provisions or Special Specifications, must also have been submitted at least two months prior to the PS&E submittal, such that the project estimate and Specification List must be completed in order to build a proposal by the District
- ❒ Letters from cities regarding construction speed zone request if within incorporated city limits, and city desires for TxDOT to pass a commission minute order
- ❒ ROW parcel, utility adjustment, encroachment, relocation certifications, and railroad certifications.
- ❒ Any new Triple Zero Special Provision (for unclear ROW, Utilities, unexecuted Railroad Agreement, or Sequence of Work)
- ❒ Supplementary data sheets for both unclear ROW parcels and unclear utilities (i.e. unclear past letting date), which describe the effects on construction (required for Federal-Aid projects only)
- ❒ Highway traffic signal recommendation(s)
- ❒ State Transportation Improvement Program (STIP) page (required on Federal projects)
- ❒ Time worksheet
- ❒ Public interest justification for proprietary Items
- ❒ It is also the responsibility of the district to include a plot of the General Notes sheets in the final plans (see Chapter 3, Section 5, General Notes and 6, General Notes Checklist for more information).
- ❒ Copies of applicable executed agreements
- ❒ The submittal of project documents to Registered Accessibility Specialist if estimated cost of pedestrian elements exceeds $50,000.
- ❒ The Title Sheet of the plans must show “Approved For Letting” at the district engineer’s signature location. The standard Austin approval signature blocks may be deleted or left blank if included
- ❒ It is the responsibility of the district staff to include a plot of the E&Q sheet in the final plans. Once the estimate has been entered onto the DCIS P4 screen, this E&Q plot can be obtained by creation of a ROSCOE input file (see *DCIS User Manual*, Chapter 4, Instructions for E &Q Sheets, for detailed instructions) which is then used within the RJEJCL process (RJEJCL 10 1, program option #8, or new DCIS option M5).
- ❒ A “Check” copy of the bid proposal must be built by the district. This is to verify the accuracy and completion of the Spec List and to verify readiness for final handling by the Field Coordination Sections. Once the General Notes, Spec List, and project estimate (on DCIS P4) have been completed, the check proposal is obtained by performing the following:
  - Logging onto CICS

- Selecting the CMCS application (must have this automation access capability), inputting of “B13” at “select option”
- Following the screen-by-screen instructions.

❒ One Proposal Submittal Sheet and one Pre-letting Checklist.

The Proposal Submittal Sheet can be obtained on the Design Division’s Intranet site at http://crossroads/org/des/tools/props/docs/PrjsubmTemplate2.pdf. The data on this form is for the most part self-explanatory. However, “Waived” refers to the waiver of pre-qualification of bidders for projects under $300,000, and “attachments” (usually “no”) refers to the presence of supplementary data attached to a project Special Specification, such as outside entity requirements for work contained in the project.

The pre-letting checklist can also be obtained on the Intranet Crossroads site at http://crossroads/org/des/tools/props/docs/cklist.doc. Instructions to assist in filling out this form can be found at http://crossroads/org/des/tools/props/index.asp.

Two required inputs in this process are:

◆ The “Bids Received Until” date on the DCIS P5 screen (if blank, contact Letting Management, for a “Bid Received Until” date)

◆ The Proposal Guaranty amount on the P5 screen (amount set by project cost according to Minute Order # 108851 [Chapter 4, Section 6]). Guaranty will be generated by DCIS once 9 cards are added.

For the final PS&E package, only the Proposal Submittal Sheet and the printed proposal cover page are transmitted to Austin, rather than the entire printout of the check proposal itself. Upon completion of an accurate check bid proposal, the DCIS estimate code will be changed from “P” to “8”, after the proposal is built and released to the Design Division by entering "Y."

Section 5 — District Level PS&E Review Process

Overview

The process by which plans and specifications are developed and reviewed varies from district to district. Whether the PS&E is prepared in an area office, by a consultant, or in the District Design Office, it should be thorough, accurate, and clearly understandable.

Clarity and accuracy in the plans will help to achieve timely completion of construction with a reduced probability of having change orders or claims for additional compensation by the contractor. In order to prepare accurate and legible PS&E, it is strongly recommended that each district establish a section dedicated to the independent review and processing of PS&E packages. This section should be staffed with personnel who are current with the latest design guidelines, policies, and procedures and knowledgeable in PS&E preparation, as the review is typically more efficient when performed by individuals not involved in the development of the project.

A thorough review of plans and specifications must take place before PS&E packages are forwarded to the Design Division for further review and processing prior to letting. The next subsections discuss these aspects of district-level review:

- Process for Final PS&E Submission
- Checklist of Required Items
- Submission Dates

Process for Final PS&E Submission

The review process at the district level is of the utmost importance for final PS&E (see Chapter 2, Section 1, Preliminary Review/Coordination). All projects, regardless of the review type, must be complete prior to being submitted to Design Division. This facilitates the review process and prevents projects from being delayed to a later letting date.

Checklist of Required Items

In the course of the review process for all projects, these items should be checked and/or verified:

- Previous approval of
  - Typical sections
  - Geometrics
  - Pavement design
  - Design exceptions

- Bridge layouts
- Hydraulic calculations.

The reviewer should check for previous approval of these items. Checks should be made to see if all required agreements have been executed.

- **Clarity of information on plan sheets**

  Plan Sheets should be checked for clarity of information. All quantities should be checked item by item. Refer to the General Plan Set Checklist in Chapter 2.

- **Use of correct bid codes and method of measurements**

  Estimate should be checked to make sure the correct bid codes and method of measurements are used. All quantities from the plan sheets should be reflected on the estimate. Estimated unit bid prices should reflect the recent prices. Refer to the Estimate Checklist in Chapter 4.

- **Specification List**

  Specification List should reflect the latest applicable Special Provisions, specifications and reference items. Refer to the Specification List Checklist in Chapter 3.

- **General Notes for clarity, redundancy, and conflicts**

  General Notes should be reviewed for clarity, redundancy, and conflicts. Refer to the General Notes Checklist in Chapter 3.

Submission Dates

The completed PS&E package should be submitted to the Design Division by the due dates noted in the published "PS&E Review and Processing Schedule." Refer to Form 1002 - PS&E Transmittal Data, Pre-Submission Checklist in Chapter 5, and PS&E Checklist for Letting Chapter 5 for submission process and required documentation for district and division review projects.

All federal oversight projects should be sent to the FHWA as per latest PODI List, when they are due to Austin. Further information is available on Form 1002, page 1.

Section 6 — Addendum Process

Overview

This section covers the following aspects of the addendum process:

- Need for addendum
- Addendum notice
- Federal oversight project addendum
- Final PS&E project addendum
- Last revision date
- Addendum notice procedure
- Addendum information sheet.

Need for Addendum

After the PS&E package has been submitted and processed through the Design Division – Field Coordination Section (see the PS&E Processing Schedule for more information), copies of the assembled contract proposal and half-scale copies of the plans are forwarded to the responsible district and division offices. Personnel in these offices should recheck these documents to make sure that all necessary changes or corrections have been made. For various reasons, it is sometimes necessary to make changes to the plans or proposal. Any changes to these documents that must be made at this stage must be documented by the responsible office in the form of an addendum notice.

Addenda to be processed for a particular project are performed after the proposal release date as shown on the PS&E Processing Schedule.

An addendum should be submitted for processing only when:

- The competitiveness of the bid would be in jeopardy if the changes were not made
- The quantities are in error to a degree that could place the department at a disadvantage in negotiating significant corrections after contract award
- The bid documents would not be substantially representative of the project unless the change is made. This could include special design standard sheets, Special Specification, etc.; however, if a regularly used statewide standard sheet was omitted, it would not be considered significant and an addendum would not be released. A change order should be used to add the missing statewide standard sheet.

To help identify changes to PS&E that should and should not be addenda, following are a few examples of addenda that should not be pursued:

- To renumber sheets on the title sheet or to add sheet numbers that were omitted. This is not critical to bidders.
- To change the title sheet to include one now signed by local officials in all released copies (having the original is adequate). It is not critical to the bidders to have that signature.
- If a sheet or so in the PS&E that was released was not signed and sealed, it is necessary to get the original corrected, but it is not critical to the bidders to release an addendum.
- To change the quantity of riprap or add a few feet of curb and gutter is generally not critical so as to risk the project by issuing an addendum.

These are only a few examples, but keep in mind that to risk a project by issuing an addendum, it must be critical to the bidders that they have this information. Otherwise, those changes should be handled after the project is awarded.

There are also concerns when a potential error in the plans is brought to the attention of TxDOT by a potential bidder/contractor/supplier. When this occurs, there shouldn't be any indication that **this will be changed prior to letting or by a change order.** If this is stated to anyone and not to all, then the potential exists that all bids may be thrown out. TxDOT should issue a thank you to the potential bidder/contractor/supplier for notification of the error and state that it **will be looked into and if a change is required, an addendum will be issued.** Otherwise, they are to bid the project just as they see it presented in the PS&E bid package.

Please note, no addenda will be processed prior to the proposal release date. In accordance with the PS&E Review and Processing Schedule, addenda are due in Austin approximately ten working days prior to letting. This addendum will be marked as Addendum #1. Any subsequent modifications to the bidding package should be a rarity; however, when this situation occurs, the second and/or any subsequent addenda will be numbered appropriately. An addendum at this late date will also require contacting each contractor by the divisions to notify them, but may easily mean pulling the job from the letting. Addenda will require authorization, by the CST division director, requested by district engineer.

Addendum Notice

This addendum notice provides a written summary of all changes that are made to the plans and proposal after the PS&E package has been processed and submitted to the Design Division – Field Coordination Section. For exact dates, please see Monthly Processing Schedule. The preparation of the addendum notice is described later in this section. In order to process an addendum, the district needs to provide a written summary of all changes to be made to the plans. The district should either provide replacement sheets that incorporate all of the necessary changes or should arrange with the responsible division to obtain the plans and make the changes in Austin. If the plan

changes can be quickly made and if the workload permits, some minor plan changes can be made by division personnel. Any changes to the estimate, General Notes, and Specification List must also be documented. The district should coordinate with DES Field Section for DCIS changes to the estimate and specifications list, and the final copy of the general notes are placed in the appropriate Miramo folder for preparation of the addendum notification.

Federal Oversight Project Addendum

On federal oversight projects, any changes which must be made during the advertising period after issuance of the federal letter of authority must be forwarded to the FHWA for approval. Once FHWA approves the changes, and CST approves the addendum to be released to contractors, the proposal addendum and plan sheet changes are posted to Plans Online.

Addendum Process

The addendum process should begin with coordination with DES for preparation of the addendum notification. The district is responsible for preparing the addendum notice and the addendum information sheet. The preparation of these documents is described later in this section. In order to make the DCIS and ROSCOE changes, the district needs to contact the Design Division – Field Coordination Section to have the estimate released back to the district's control on the DCIS P5 screen. After all changes have been made and the district has prepared the addendum notice, the estimate must be released back to division control by changing the P to an 8 by contacting Finance Division Letting Management Section, on the DCIS P5 screen. The addendum package must then be forwarded to the Design Division – Field Coordination Section for further handling. The paperwork for the addendum package consists of:

- Addendum notice
- Addendum information sheet
- Copy of the estimate
- One copy of the Specification List
- Revised Plan Sheets.

District should send in a complete copy of addenda for Design Division's file copy.

Once the Design Division – Field Coordination Section receives the addendum package, the revised plan sheets are sent out for reproduction. The addendum notice file is accessed and transferred to the proper location. Once processing is complete, the addendum notice is released to the Construction Division for distribution to prospective bidders. All prospective bidders must acknowledge receipt of addenda on the acknowledgment sheet of their bidding proposal. Failure to do so will cause their bid to be considered non-responsive.

Last Revision Date

Due to the number and size of changes received for processing, there is the possibility that changes provided on this date might not be able to be processed in time to be delivered to all parties involved.

This results in the removal of the project from the letting. For this reason, it is recommended that only necessary changes be requested and that they be requested as early as possible. Processing numerous addenda, particularly at the last minute, requires extensive manpower which, in turn, delays the processing of future projects.

Addendum Notice Procedure

The procedure for completing the addendum notice is shown in Table 5-1.

Table 5-1: Addendum Notice Procedure

Step	Action
1	Sign onto your regional ROSCOE. (ROSCP for divisions.)
2	Type PC.NOTICE and enter.
3	On the main menu screen, input a filename for your library where the addendum data should be stored (such as A1023001).
4	On the addendum notification screen, input all the necessary data as follows:
5	For TO: input the district that the project is in, CST and DES.
6	For FROM: input the name of the district or division preparing the notice and the section and initials.
7	For CONTROL: input all nine digits of the controlling CSJ.
8	Input an addendum date MM/DD/YY.
9	Put an X under proposal if the addendum changes the proposal cover, such as the contract time or proposal guaranty amount.
10	Input the page number of all BID INSERT sheets that will change due to the addendum, such as due to quantity changes, item or descriptive code changes, provision number changes, etc.
11	Input the sheet number of any General Note and sheets that change due to the addendum. Users with access rights will place a revised General Notes PDF file in Miramo set up in a TxDOT directory. Notes must be submitted for update prior to completion of addenda for printing revisions.
12	Input the page number of any Specification List pages that change due to the addendum.
13	Input the numbers of any Special Provisions or Special Specifications that are added or deleted.
14	Under OTHER: list the plan sheet numbers of all sheets that change due to the addendum or use the description of changes screen to summarize all changes.
15	Once all of the above fields have been input, hit ENTER.

Table 5-1: Addendum Notice Procedure

Step	Action
16	A Description of Above Changes screen will appear. Describe changes. All changes must be summarized in sufficient detail so that prospective bidders can see what has changed. Proposal cover changes should be described in narrative form, if applicable. Bid Insert changes must be described. General Note changes are described next. The changes to the Specification List must be summarized. Changes to all plan sheets must be described in narrative form. Estimate changes should also be summarized except for unit price changes. Click here for more information.
17	Once all data has been input, the main menu can be accessed by hitting PF1.
18	A check copy of the addendum notice can be printed by hitting PF11 from the main menu.
19	Submit Addendum by hitting PF12 from the main menu

Addendum Information Sheet

In addition to the addendum notice, an addendum information sheet must be filled out before the package can be turned in to the Design Division – Field Coordination Section. For all review projects, the following information must be provided for further addendum processing and posting to Plans Online.

- County name
- Letting date
- CCSJ
- Sequence Number (Refer to DCIS P5 Screen (P5))
- ROSCOE key number and filename for the addendum notice
- Forward updated General Notes file

Click here for more information.

Chapter 6 — Pre-Letting and Post-Letting

Contents:

Section 1 — Overview

Pre-Letting Information

- Preparation and submission of the Federal Project Authorization and Agreement (FPAA) form (for all projects with federal project numbers),
- Preparation of the state letter of authority (LOA) (only for locally let projects),
- Publishing of advertisements and release of proposals to prospective bidders,

In addition, the project financial clearance process for projects involving participation by other entities is described.

Post-Letting Information

Post-letting issues include

- Letting overrun justification memorandum criteria
- Bid validity determination.

Section 2 — Federal Project Authorization and Agreement

Overview

This section covers the following Federal Project Authorization and Agreement (FPAA) and state LOA topics:

- Function of FPAA
- Respective FPAA Duties
- FPAA Detailed Reporting Instructions

More information on the FPAA can be found in Task 6030: Obtain Funding and Approval of PS&E in the Project Development Process Manual.

Function of FPAA

The FPAA form is required for each federally funded project. The primary function of this form is to obligate federal funds for the project by phases. By completion of the FPAA form, federal funds are obligated and an agreement is entered into with the Federal Highway Administration (FHWA).

FIN/Letting Management Office FPAA Duties

Letting Management Section of the Finance Division is responsible for completing and submitting the FPAA to the FHWA. The forms are submitted no later than the date established on the PS&E Review and Processing Schedule for the applicable letting.

FPAA Detailed Reporting Instructions

The Detailed Reporting Instructions packet for inputting data into a FPAA form can be obtained from the Letting Management Section of the Finance Division. The packet includes

- Step-by-step instructions
- Copy of the FPAA form
- Federal apportionment code listings which are not currently published in manual format.

Section 3 — State Letter of Authority

Overview

This section discusses

- Function of LOA
- Letting Management Office LOA Duties
- LOA Form Field Completion Procedure

Function of LOA

The state LOA is a form that is issued on all projects let by local public agencies (LPA). Letting Management Section of the Finance Division provides an LOA and signed FPAA to the District on all federally funded projects let by a LPA. The LPA must have an LOA with the approved environmental clearance and a FPAA signed by FHWA prior to advertising projects with federal funding.

Letting Management Office LOA Duties

Approximately one week after the letting schedule has been approved for any given letting, the Finance Division – Letting Management Section prints all necessary state letters of authority. The forms include all identifying information such as district, county, highway, CSJ, project number, functional classification, work program, limits, and type of work from the corresponding information from the various DCIS screens. The Letting Management section prints out a form for all CSJs that are to be locally let by an LPA or for projects to be constructed by LPAs. Letting Management will indicated on the form if a FPAA is required and the responsible section. The forms are then sent to the Environmental Affairs Division.

LOA Form Field Completion Procedure

The form is then sent to the District for further handling.

Section 4 — Project Financial Clearance

Overview

This section contains the following pre-letting information:

- Other Participation Field
- Additional Payments
- Financial Clearance Reference.

Other Participation Field

The funding for any project involving participation by another agency, county, city, etc., must be checked prior to and after letting. For more information on inputting this information, see the *DCIS User Manual*, Chapter 1, Section 2, Fields and Chapter 2, Section 1 of this manual. Most funding agreements require the entity to pay their share of the costs 45 days prior to the proposed letting date. The district personnel who coordinated the agreement with the entity normally receive these payments. Once the total estimated payments are received, the district must prepare and submit a Notice of Financial Clearance For Bid Opening and Award form. This form certifies that all of the necessary estimated payments from the entity have been received.

Additional Payments

After letting, the entity's participation needs to be recalculated based on the apparent low bidder's unit prices. If the entity's participation increases based on the apparent low bid, the district must contact the entity to request payment of the additional costs. The project is conditionally awarded, pending receipt of any additional funds from the participating entities. Once the district has received the additional payments, the district should prepare and submit the financial clearance form to the Contract Services Office. This office verifies that the necessary funds have been received and has the Construction Division issue a letter of award of contracts to the contractor. Once the contract is executed the work order by which construction can commence is issued. This entire process should be initiated and completed as soon as possible so that construction is not delayed. Long delays have resulted in the apparent low bidder electing to withdraw from the contract, and in some instances, filing claims against the department to recover financial losses resulting from the delay.

Financial Clearance Reference

For more information about the financial clearance process, see the *Negotiated Contracts Procedures Manual*, Chapter 9, Advanced Funding Agreements. Contact the Contract Services Office for additional information.

Section 5 — Pre-letting Checklist

Checklist

The following checklist contains activities completed by the responsible district personnel prior to submission of the PS&E to DES in Austin.

- ❒ Check to see if pre-bid conferences are shown. DES Director approval is required for mandatory pre-bid conferences. If so, make sure the DCIS P05 screen (PF 11 Pre-Bid screen) with pre-bid meeting information has been completely and accurately filled out. Also, pre-bid dates should be checked to allow sufficient advertising prior to meeting date.
- ❒ If the project is less than $300,000 (total bid items excluding E&C and force accounts), check to make sure WAIVER FLAG on the DCIS P05 screen is Y.
- ❒ Once the estimate is complete and all corrections have been made (including revisions), run the pre-letting update and report. Send a copy of pre-letting report to FIN-Letting Management Section at least one week prior to letting.
- ❒ Check the DCIS P05 screen for accuracy. Make sure the number of working days is accurate and in agreement with the contract time estimate worksheet. Always show the contract time on the DCIS P05 screen as W (C for calendar days is no longer used.) Check the area engineer's name (last name, first name), address, and phone number for accuracy.
- ❒ Check the amount of authorized funds (DCIS P2 screen[s] and UTP). Compare the current total engineer's estimate to the amount authorized. If insufficient funds, check Minute Order No. 106788 to identify who is authorized to approve the necessary additional funds. Prepare and send the necessary memorandums/justification.
- ❒ If participation by others is involved, check to see if the appropriate agreements have been prepared. Check to make sure the total participation by other entities has been input on the other participation field on the DCIS P1 screen. See the *DCIS User Manual*, Chapter 2, Section 1 Fields for more information.
- ❒ For Federal-Aid projects, the FIN Division - Letting Management Section prepares an FPAA form, coordinates with FHWA. The project must be environmentally clear (by the FHWA) and in an approved STIP before this form can be submitted to the FHWA.
- ❒ District prepares draft of proposal for review by district and DES.
- ❒ Design Division Field Section develops final proposal, and CST issues proposals to interested bidders.

Section 6 — Post-letting Guidelines

Overview

This section includes the following post-letting guidelines:

- Letting overrun/underrun justification,
- Local participation.

Letting Overrun/Underrun Justification

The next subsections discuss:

- Overrun/underrun justification memorandum guidelines,
- Construction Division determination of bid validity,
- District review responsibilities.

Overrun Justification Memorandum Guidelines

Accurate estimating is essential in determining the validity of bids. The following are the latest guidelines for overrun/underrun justification memorandums for federal aid and state-funded construction projects.

Letting overrun/underrun justification memorandums are required for all types of projects where the apparent low bid is 20% or more over or under the engineer's estimate and there are two or more bidders, regardless of project cost. Projects with only one bidder require justification when the apparent low bid varies from the engineer's estimate by more than +/-10%. These memorandums are prepared by the district and submitted to CST/Letting for further handling and coordination with the letting management office of the Finance Division. This office submits all memorandums to the Construction Division director for ultimate approval of the recommended bid award or rejection by the Texas Transportation Commission.

For more information, refer to the *Project Development Process Manual*, Task 6210.

Construction Division's Determination of Bid Validity

The aforementioned letting overrun/underrun justification memorandums are used by the Construction Division to determine the validity of the bids. The following items are checked:

- Errors in plans or engineering estimate
- Adequate competition

- Indications of collusion among bidders
- Unbalanced bidding.

  Once these points have been considered, the Construction Division recommends award or rejection of the bid overruns/underruns to be acted on by the Texas Transportation Commission during the same month's scheduled Commission meeting.

  For more information, refer to the *Project Development Process Manual*, Task 6200.

Local Participation

- Update other participation Field on P2C Screen.

  As noted in the Additional Payments subsection in Section 4, the district personnel that coordinated the funding agreements with the local entity should update this information. The Contract Services Office (CSO) and the Construction Division uses this information when issuing the construction work order.

- Prepare a Financial Clearance Analysis

  Projects with outside funds are conditionally awarded, and contracts are released only after all terms as outlined in the project's Advance Funding Agreement (AFA) have been met. The responsibility for the financial clearance function has been delegated to the District Engineer (DE). The Notice of Financial Clearance for Bid Opening and Award form signed by the DE needs to be sent to CSO once 30 days prior to bid opening and once prior to award. If a project overruns after letting, the district needs to discuss the bid prices with the local entity or Metropolitan Planning Organization (MPO) participating in the funding of the project and insure that the outside entity concurs with the acceptance of the higher costs. If they do not concur, the contract is not to be recommended to the Commission for award.