

CALIFORNIA DEPARTMENT OF TRANSPORTATION

**PREPARATION GUIDELINES FOR
PROJECT CAPITAL COST ESTIMATES**

Cost Estimating Guidelines

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Preparation Guidelines for Project Capital Cost Estimates

SECTION 1 General Guidelines

ARTICLE 1 Overview

Background

This document was formerly Appendix AA of Project Development Procedure Manual (PDPM). PDPM Chapter 20 – Project Capital Cost Estimates includes the policy and procedures required for developing project capital cost estimates. This document provides minimum guidance to develop reasonably accurate capital cost estimates but does not take place of experience and prudent engineering judgment. This guidance includes discussion of many factors that affect project cost estimates. Estimators should consider all applicable factors in developing a project capital cost estimate.

Importance of Quality Cost Estimates

The reliability of project capital cost estimates at every stage in the project development process is necessary for responsible fiscal management. Unreliable cost estimates cause problems in the Department's programming and budgeting and for local and regional planning, and it results in staffing and budgeting decisions that could impair effective use of resources. This affects the Department's relations with the California Transportation Commission (CTC), the Legislature, local and regional agencies, and the public, and causes loss of credibility.

Goal and Objective

The Department's goal is to avoid project cost overruns and avoid excessive cost underruns. A cost overrun leads to a shortage of funding to deliver the project, while a cost underrun leaves unused funds that could have been used to deliver other important projects. The goal is to produce reliable construction estimates throughout the project planning, development, and delivery process. It is important to identify costly unforeseen items of work before the project has been

programmed to avoid delays and/or cancelation. As the project scope becomes more refined, the estimate must reflect the intent of the final design. The difference between the Engineer's Estimate and the Low Bid must be reduced.

Consistent and Comprehensive Methodology

The Department must strive for reliable project cost estimates so projects can be delivered within budget. Project capital cost estimates must be prepared using a consistent and comprehensive methods. Even with a consistent and comprehensive methods, careful attention is needed to ensure a quality cost estimate. The cost estimator needs to research, compare, and use professional judgment to prepare a quality cost estimate. Consideration of project scope, schedule, and level of design details must develop accurate cost estimates. Cost estimates are never completed. They are not static but must be reviewed continually to keep them current.

Consult Others

Other functional units (Bridge Design, Right of Way, Traffic Operations, Materials, Maintenance, Construction, Environmental, Landscape Architecture, etc.) and local entities should be involved to prepare both project planning cost estimates and project design cost estimates. Project cost estimates should be developed through consultation with the project development team.

ARTICLE 2 Identifying Items of Work and Estimating Quantities - Project Planning Phase

Field Reviews

To estimate a project with confidence, project alternatives must be adequately scoped. This is best done by visiting the project site and performing a field review. Systematic field reviews are an essential part of the project development process. They provide an important perspective that supplements the mapping, photos, survey data and other sources of information about the project. Visiting the proposed project site and seeing it first-hand reduces the possibility of overlooking significant design features.

While in the field, project staff should identify if high-cost items such as utility relocation, noise barriers, retaining walls, major storm drains, hazardous waste mitigation, and environmental impacts would need to be addressed as part of the project. Consult with the local construction and traffic leads to determine the need for a transportation management plan or a traffic handling plan. The local maintenance lead may point out if there are any drainage or accident issues. If high-cost items are present or need to be designed into the project alternatives, they must be quantified. The “worst probable case” scenario should always be assumed, particularly on reconstruction projects. Existing facilities thought to be adequate may have become inadequate because of changes to standards, new data, further deterioration before construction, or other factors. Design feature decisions, project constructability, construction staging, etc. should be evaluated in the field. The estimator should document decisions and identify limits, boundaries, etc. A strip map and proposed typical sections are useful in the field to document proposed project features. Consultation with the Survey Unit and a review of the *Plans Preparation Manual* are advisable.

Additional Information

Additional types of information that must be obtained to prepare a Project Planning Cost Estimate include but are not limited to: existing and forecasted traffic; geotechnical design information (particularly where foundation and slope stability issues can be anticipated); materials and pavement structural section design information; advanced planning cost estimates for new structures and modifying existing structures; hazardous waste assessment; potential environmental issues and mitigation; right of way and utilities data sheets; and use of existing resources (recycling). Research the information available early in the project development process and use it. If this information is not available, ask for it from the proper source unit.

Use Groupings from Standard Cost Estimate Format

Individual contract items are difficult to identify at the early project development stages, but it is possible to group basic work functions together to form a systematic approach to project cost estimating. Most projects have grading, pavement structural section materials, drainage, and structures that are relatively easy to recognize and quantify. The standard cost estimating format provides for this approach by using such groupings. Reconciliation of the planning cost estimate with the Standard Specifications is also essential, since the Standard

Specifications define the character, quality, and scope of work to be performed to construct the project.

Contingencies Versus Confidence Factor

Contingency factors for project planning cost estimates vary depending on the cost estimate type. Contingencies are intended to compensate for limited information. The percentage decreases as the project becomes more defined and there are fewer unknowns. Contingencies are not intended to replace incomplete design work. Project alternatives and their associated cost estimates must be compiled by carefully using all available data, modifying that data with good judgment, and using past cost estimating experience so the cost estimates can be used with confidence.

Documentation

Typically, the project development process for a project occurs over a period of years, during which many decisions and agreements are made. All too frequently during this time, project staff changes occur, which can affect the continuity of earlier project decisions. To avoid this situation, all project decisions, and agreements made throughout the project development process should be documented and retained in the project files. This philosophy also applies to notes, decisions, photos, and mapping used during field reviews of the project site. All the assumptions used to develop a cost estimate should be documented along with different versions of cost estimates as they are updated.

ARTICLE 3 Identifying Contract Items and Estimating Quantities -Project Design Phase

Items Entered Into AASHTOWare Project Preconstruction

The items of work identified and estimated during the Project Planning phase can be entered into AASHTOWare Project Preconstruction. As more information and design details become available, the cost estimate should become more accurate. Timely entry of the quantities and corresponding costs in the AASHTOWare Project Preconstruction (AWP-P) helps with estimate updates and eases the preparation of the Engineer's Cost Estimate.

District Cost Estimate

The Engineer's Cost Estimate has two parts: 1) the district capital cost estimate, and 2) the structure capital cost estimate. When these two parts are combined, they equal the total construction cost for the project. The district capital cost estimate consists of:

- **Contract Items** – These are the contract bid items of work used in the Engineer's Cost Estimate in the Proposal as well as the other Contract documents.
- **Supplemental Work** – Supplemental work is work of an uncertain nature or amount, so it is not paid on a contract bid item basis. Work that is known but cannot be predetermined and provided for under contract items of work should be included as supplemental work. Supplemental work is not intended to replace incomplete design work, nor is it to be used for contingencies. Do not add supplemental work items for possible additional work for any major area of work (for example, drainage or traffic items). Additional funds for undeterminable changes, such as increased asphalt content or price fluctuations for paving asphalt, should be included as supplemental work. Extra work identified in the contract special provisions must be itemized as supplemental work.
- **Department-Furnished Materials and Expenses** – Items under this part include work done by Department forces or others, concurrently with contract construction operations, or materials to be purchased and charged against the project, but which will be paid for directly by the Department, not the contractor. Typical items of Department expense are payment to a utility company to provide electrical service, transportation management plan work, or work to be done by a railroad or other agency under a service contract. Certain materials are preapproved by the Federal Highway Administration (FHWA), as being in the public interest, for the Department to furnish to the contractor on federal-aid projects (for example, survey monuments, changeable message signs and assemblies, and traffic management plan). Department-furnished materials and expenses are a part of the total construction costs of the project and are subtotaled and included in the district cost estimate.
- **Contingencies** – Contingencies are a percentage of the subtotal of the cost of contract items, supplemental work, and Department-furnished materials and expenses and are included in the grand total of the district cost estimate to allow for unforeseen increases.

Basing Estimates on Standard Specifications, Contract Plans and Special Provisions

All district cost estimates must be based on the Special Provisions, *Standard Specifications and Contract Plans*. These documents form the basis for determining contract items. The *Standard Specifications*, along with the Contract Plans and Special Provisions for a specific project, prescribe the details for construction and completion of the work which the Contractor undertakes to perform the contract. Coordination between the district cost estimate, the Special Provisions, *Standard Specifications*, and Contract Plans, is required.

Identifying Contract Items of Work

The other functional units (Division of Engineering Services (DES), Traffic Operations, Materials, Maintenance, Construction, Environmental, Landscape Architecture, etc.) and local entities involved to prepare the project design should also identify the contract items of work. If DES Bridge Design is designing structural features for the project, avoid duplicating or overlooking quantities in the cost estimate. Common Bridge Design and district items, like temporary railing, can be easily duplicated and may also have pricing conflicts. Specific contract items should be identified using the coded item list in AWP-P.

ARTICLE 4 Cost Estimate Pricing Methods

Two Common Methods

There are two methods commonly used for estimating prices. One method is to use previous bid prices for establishing prices on the proposed project. The other method is to analyze production rates, labor costs, and material costs. These methods may be used individually or together.

Previous Bid Prices Method

Using previous bid prices for cost estimating is the most often used method and, in most cases, the most practical method. When using this method, it is important to consider these factors:

- Similarly sized projects should be used, and quantities for individual items should be similar.

- Consider using the average of the top three low bidders or average of all bidders after removing the outliers.
- Historic bid prices should be adjusted to the current cost based on the change in the California Historical Highway Construction Price Index between the old bid and the date of the current estimate. (Escalated price column in the Contract Cost Database reflects this change). Also, the current estimate should be escalated forward to the date of anticipated mid-point of construction using available forecasted indices for construction cost escalation and/or inflation. Construction cost data and indices are available at the Headquarters Division of Design, Project Support, Cost Estimating website.
- The reference bid price should be adjusted to reflect different conditions between the reference project and the project for which the cost estimate is being prepared. This would include considerations of differences in type of terrain, geographical location, soil, traffic, and specifications.
- Historic lump sum bid prices or unit prices for items of work (for example, clearing and grubbing, culverts, and trench excavation) that include varying amounts of other related project-specific work should not be used.

In arriving at an estimated price for the individual contract items of work, cost estimators should use recent bid prices from similar projects with competitive bidding. Sources of historic bid prices and other information are:

- [Contract Cost Database](#)
- [Bid Summaries](#) (DES-OE Website)
- [Construction Cost Indices](#)

For further information on cost estimating activities, roles, and responsibilities refer to the [Construction Contract Development Guide](#). For help with AWP-P, contact the district AWP-P Coordinator. Questions on current cost estimating methods and practice should be directed to Headquarters Division of Design, Project Support, Cost Estimating.

Complete Analysis Method

This method is rarely practical for use on every item of work in a project. It may occasionally be necessary to use this method for earthwork items where rock or unusual material hauling is required, or for lump sum items. Under this method, the operation is analyzed, production rates are assumed, and material lists are determined. The cost of materials is determined using available price lists. Labor and equipment hours are determined based on production rates multiplied by the

respective labor rates and equipment rental rates to determine the costs. Overhead costs and profit are then added to obtain the final estimate of cost. Consider possible premium pay for overtime on night work and subsistence. On larger projects with lengthy time limits, it will be necessary to determine whether most work items will be done early or late in the project. To provide for work that cannot be done early in the project, it may be necessary to project wage scales, rental rates, and other such values to account for inflation to estimate the costs more accurately.

ARTICLE 5 Factors that Affect Unit Prices

Prepare Reasonable Cost Estimates

Project cost estimating is not an exact science; however, estimators are expected to prepare reasonable project cost estimates that represent the cost to complete the project. These costs include those required not only for the contractor to construct the project but also include the costs for the purchase of right of way, mitigation of environmental issues, and any other costs that will be incurred to complete the project.

Most project cost overruns are due to conditions that existed when the cost estimate was initially made. There is no single answer to good price estimating for contract items. Rather it is a matter of carefully using all the available data, changing that data with good judgment, and a measure of experience. Experience has shown that project cost estimators should follow factors which can affect bid prices on construction projects.

Fluctuation of Costs

Project cost estimates should be reviewed and updated periodically. This practice should continue close to the project "Listing" for advertisement. Material shortages may develop at unexpected intervals, which can result in an increase in material prices. Wages continually increase, although usually at a somewhat predictable rate. The time of the year that the project is advertised or constructed often affects prices and, if this has changed for the project, the unit prices for the contract items may need revision. Project cost estimates must be current when the final contract documents are prepared. The AWP-P Item Price and Quantity Reports contain dates when item prices and quantities were last updated. Update the estimates

during volatile market conditions. Construction cost indices and forecasts are good indicators of construction market volatility and fluctuations.

Traffic Conditions

Traffic conditions significantly affect prices. Prices should be adjusted to reflect access limitations, exposure, and delay caused by traffic conditions. Contractors are inclined to raise their prices on projects to be constructed with work sites and haul routes exposed to considerable traffic.

Restrictive Work Hours or Method of Work

Restrictions on contractors' working hours and the method of work on a project may significantly affect prices. The prices for work limited to short shifts, required to be completed in long shifts, or limited to nighttime operations should be increased to reflect the cost of premium wages required for this work and for the general inefficiencies and decreased productivity that may result. Night work for plant operations (for example, asphalt concrete production) can especially be expensive when small quantities are involved. Plants rarely operate at night and may require special production runs at much higher-than-normal operating costs.

Quantities of Work

Small quantities of work usually have higher unit cost than identical work in larger quantities because move-in, overhead, and other such costs must be distributed over a smaller base. Production rates are also less efficient and are usually slower for small quantities, which also usually increase unit prices.

Separate Operations

Separate operations will usually increase item costs, especially if the order of work or the work unit is to be constructed at scattered locations throughout the project (each requiring move-in and move-out costs). If so, unit prices should be based on the smaller unit sizes and should not be based on the entire quantity for the total project.

Handwork and Inefficient Operations

Handwork and small or inefficient operations (even though equipment may be used) will have higher unit costs than work able to be mass produced or constructed by using techniques that result in higher production rates.

Accessibility

Work requiring long out-of-direction movements by construction staff and equipment can be especially expensive. Material hauling that must be done by entering and exiting only on interchange ramps, material hauling uphill rather than downhill, and work on the top of slopes or retaining walls are always more expensive to construct than work easy to accomplish on level or gentle slopes. The ease of accessibility to the work will affect the cost to do the work.

Geographic Location

Geographically remote locations usually result in higher bid prices. If subsistence payment will be required for the workers, it will affect the bid prices. Consider where the sources of supply are and the distance to the project from which materials and equipment must be delivered.

Construction Season

The time of the year that the project is advertised and constructed affects the unit cost for items of work. Contractors are usually more readily available for work early in the spring and will therefore bid conservatively. Later in the spring and during the summer, many contractors have ongoing projects that keep them busy, so they usually bid higher or not at all. Consideration should also be given when a project is to be awarded near the end of summer or the end of the construction season. It is important to know whether the work can be done before winter weather causes the project to be shut down. If the job cannot be finished before the end of the construction season and the project needs to be suspended, contractors will increase their bid prices to cover their overhead during the winter and repairs for any damage that may occur. Even if contractors reasonably expect to finish before the winter, they may protect themselves to allow for an early winter. This can especially be true if construction involves work on items that may be affected by winter weather (for example, drainage channels or earthwork, hot-mix asphalt, and striping).

Material Shortages

Material shortages will have a major effect on prices since prices are directly affected by supply and demand. In a location where a shortage of an item is severe, a change in design should be considered if appropriate rather than increased bid prices.

SECTION 2 Project Planning Capital Cost Estimates

ARTICLE 1 General

Estimate Each Alternative

The project development process includes engineering and environmental studies to determine alternatives to make sure all social, economic, and environmental issues have been considered. Each possible alternative must have an estimate. The highest realistic cost alternative should be used for programming the project.

Exception Approval Required

Project Planning Cost Estimates should be prepared based on designing to all applicable standards. (See PDPM [Chapter 20](#) – Project Capital Cost Estimates for procedural information.) Cost estimates for alternatives, that do not meet boldfaced or underlined design standards are only valid when there is an approved design standard decision document. Proposed exceptions to boldfaced and underlined design standards must be approved following the procedures in [Chapter 21](#) – Design Standard Decisions

Format

All project planning cost estimates, except those specialized formats developed for certain project types (see Article 3 in this section), are to be prepared and submitted using the standard format discussed in this guidance.

Keep the Cost Estimate Current

As studies progress in the Project Planning phase, more information such as final contour mapping, materials and drainage information, and structure studies become available. Each piece of new information will increase the accuracy of the cost estimate and provides the opportunity to update the project cost. Project cost estimates should be reviewed periodically and updated. (See policy for updating cost estimates in PDPM Chapter 20.)

ARTICLE 2 Preparing the Standard Format for Project Planning Cost Estimates

General

A standard cost estimate template is available in Excel spreadsheet format on Headquarters Division of Design, Project Support, Cost Estimating, Useful Spreadsheets link. It is intended to be a standard format for all project planning cost estimates. For many projects, the template can be used as-is by completing the project information on the cover sheet and filling in the unit costs and quantities for items or subtotals for the subsections in rest of the sheets. If needed, lines can be deleted, replaced, or added for items not listed. Additional lines for subsections or subtotals may be added as necessary. The estimator is responsible to make sure the Excel formulas work well, and the total calculated costs are correct in the completed spreadsheets.

The standard format is segregated into four main components Roadway, Structures, Right of Way, and Support Costs. They are organized over 11 spreadsheets in an Excel workbook:

- Cover Sheet - sheet 1 of 11
- Roadway Items Summary - sheet 2 of 11
- Roadway Item Sections - sheets 3 through 8 of 11
- Structure Items - sheet 9 of 11
- Right of Way Data Sheet - sheet 10 of 11
- Support Cost Summary and Escalated Cost - sheet 11 of 11

Note: When attaching the cost estimate to a Project Initiation Document (PID), only the first 10 sheets should be printed. The support costs on sheet 11 are attached separately under Support Cost Tables in the PID.

The idea behind the standard format requires that the cost estimator determine quantities and costs for groups of related work. Identification of contract items is unnecessary but would be beneficial to obtain a realistic cost estimate for each viable project alternative. Calculation sheets, maps, and sketches used to determine costs and quantities for the cost estimate should be retained in the project files until the project has been completed and finalized. Each spreadsheet of the standard format is described below.

Cover Sheet

All project planning cost estimates should have a standard cover sheet to provide a project description, a summary of the project (or alternate) cost estimate, and approval signatures. Totals from the other sheets automatically transfer to this main summary sheet in the Excel template but the estimator should verify them.

I. Roadway Items Summary

All the roadway items subsections are summarized here. Subtotals from roadway subsections automatically transfer to this sheet but the estimator should verify them.

Section 1: Earthwork

Roadway excavation and the possible need for imported borrow is ideally estimated by developing typical cross sections, profiles, contour maps, and then using electronic calculations. Without this luxury, it is necessary to walk the project with a map and a typical cross section and profile (for a new facility). Quantities can be calculated using slope distance, width, and length of widening. With careful judgment used in averaging the end areas, a realistic cost estimate can be obtained. For projects with a new profile, it is possible to calculate earthwork by plotting the profile and existing ground line and then plotting a few critical cross sections. Additional cross sections may need to be plotted at interchanges.

Clearing and grubbing is an important item in all cost estimates, particularly in areas with significant vegetation. Calculations by the acre are desirable but payment is usually made by lump sum.

Develop water supply can be included in other items of work, but it is prudent to include a lump sum amount where the availability of water is in doubt (for example, in desert areas). A good method would be to use a realistic percentage figure based on the quantity of roadway excavation (5 to 10 percent, for example). Special studies on the availability of water and the economics of supplying water may be required. If water is not supplied, compaction methods may need to be altered and reflected in the estimate.

Section 2: Pavement Structural Section

Preliminary materials information is necessary to adequately estimate pavement structural section items. If not available, the pavement structural section of a similar adjacent project could be used. Most of these items are calculated by determining width, depth, and length. Items with side slope material such as aggregate base should be calculated using average widths and depths times length for the portions outside the hinge point.

Typical cross sections need to be developed at the earliest stage to help with cost estimating, and a sketch should be provided with the cost estimate to indicate the basis for the calculations. The Traffic Index (T.I.) and “R” Values used should be on the referenced typical cross section sketch. These values should be obtained as early as possible. (They can be assumed from adjacent projects or with consultation with the District Materials Unit.) If ordering “R” Value tests, make sure enough tests are performed. The estimate should be updated if this information changes.

Section 3: Drainage

Large drainage facilities (for example, reinforced concrete boxes or animal crossings) should be estimated separately and the *Standard Plans* should be consulted for quantities. Drainage items for widening and rehabilitation projects can be estimated by determining extensions to existing culverts and the number of other features, such as inlets, and overside drains, that will be affected. Be aware of any additional right of way that may be needed for drainage easements. Unit costs from previously awarded projects in the same geographical location or similar in scope can be evaluated for unit costs. Cost estimates for drainage on new alignment projects can be quantified by comparisons with similar types of projects.

Section 4: Specialty Items

Features such as retaining walls and noise barriers can usually be identified during field reviews. Locations can be shown on the field map and reasonable calculations can be made using *Standard Plans*. Some specialty items such as retaining walls and sound walls require consultation with other functional units in the District, Division of Engineering Services, and Headquarters.

Section 5: Environmental Items

District Environmental should be consulted to develop reasonable cost estimates for environmental items such as [handling and disposal of hazardous wastes](#) and environmental mitigation. Deal with hazardous waste and environmental issues immediately and avoid them since they often cause large cost increases that impact project cost estimates. Landscape, irrigation and NPDES (National Pollutant Discharge Elimination System) items should be included in the estimate after consultation with respective functional units. Reference the most current specifications for these items.

Reconstruction of irrigation facilities (for example, pumps, sumps, and return lines) that are to be handled as a part of the construction contract can also be identified from the field review. Locations should be shown on the field map, and reasonable calculations can be made using Standard Plans.

Items such as erosion control or slope protection (both during construction and permanent) can be estimated by using slope information obtained from the field review.

Section 6: Traffic Items

The district Traffic Unit can provide realistic cost estimates for signing, stripping, and traffic electrical items when given project specific data. Traffic handling is almost always a major consideration for cost estimates, especially for staged construction. A Transportation Management Plan must be developed early in the process with consultation from other functional units within the district (for example, Traffic, Construction, Maintenance, and Surveys).

Section 7: Detours

A local road or street is often used as a detour during the project construction. The Department is responsible for restoration of the local road or street to its former condition at the end of its use as a detour. The Department is responsible for all reasonable additional maintenance costs incurred by local agencies attributable to the detour. Consult with the project development team so the necessary items of work are included in the estimate.

Section 8: Minor Items

Minor items (for example, fencing, curbs, sidewalks, and access ramps) can be estimated by using a percentage (5% to 10% depending on level of design) of total cost of the “main” construction items (Sections 1-5). Ideally, these items should be identified in the field and placed on the strip map to be calculated and totaled in the office later. Remember to consider work on local streets, such as work that may eventually be on a freeway agreement, and other requirements such as access features needed to comply with the Americans with Disabilities Act (ADA) and bike path requirements.

Section 9: Mobilization

Depending on the project need, mobilization may be from 0 to 10 percent of the sum of all contract item costs, including the mobilization item. The mobilization percentage should be determined using recent contract item cost data for similar projects with mobilization and by considering project conditions such as project size, duration, location, and other conditions that could influence mobilization. Mobilization for structures should not be included in this total as it is part of the cost estimates from the DES. Occasionally, it may be justified to increase the mobilization percentage above 10 percent for a project due to stage construction with multiple move-ins and move-outs, or if the project is in a remote location. If so, discuss with the DES, Program Project Management and Office Engineer before increasing the mobilization percentage.

Section 10: Supplemental Work

Supplemental Work (SW) provides funds for construction work that cannot be predicted or calculated beforehand because of an uncertain nature or amount, so it is paid on a contract item basis. Typical examples are removal of slide material, removal of unsuitable material, or increases in the asphalt content. Supplemental work does not replace incomplete design work and is not used for contingencies. Smaller projects could require 10 percent of the total of the main construction items plus minor items while large projects could require only 2 to 3 percent for supplemental work.

Section 11: Department-Furnished Materials and Expenses

Department-Furnished Materials and Expenses (DFME) include items paid for by Department or another agency. These items are not part of the contract items but

must be included in the project estimate. It includes items such as COZEEP, RE Office, Public Information, etc.

Section 12: Time-Related Overhead

The bid item for Time-Related Overhead (TRO) compensates the Contractor for overhead expenses such as those for a field and home office. Include this bid item on all projects over the Minor B cost threshold. TRO is calculated based on percentage of contract items only, excluding mobilization, SW, DFME and contingency. TRO percentage may be from 0 to 10 percent. Select the TRO depending on project specific circumstances. Consider TRO on bid history of recent similar type of projects near the project location. See the [Construction Contract Development Guide \(CCDG\)](#) for more information on TRO.

Section 13: Contingency

The contingency amount varies from 50 percent to 5 percent depending on the phase of the project. The contingency is calculated as the percentage of the total of the estimates for the main construction items plus minor items, SW, DFME, and TRO. The percentage contingency should decrease as the project becomes more defined as it progresses through the project development process. The final project contingency is the amount in the engineer's estimate to cover the cost of unforeseen factors related to construction within the defined project scope.

II. Structure Items

Estimates of structure costs should be obtained from the DES, Structure Office Engineer (SOE). Contact the SOE to discuss the cost estimate requirements for projects with structure items. Besides the bridge work, other structure work may be required on a project. For example, non-standard noise barriers and non-standard retaining walls will require special designs and need cost estimates prepared by the SOE. (See the *Standard Plans* for details.) When cost estimates are requested from the SOE, provide enough information in the request to adequately define the proposed structure work. Use the Advanced Planning structure cost estimates and other back-up calculations from the SOE as part of the project cost estimate.

The cost estimates for up to six structures may be entered into the structure cost estimate worksheet (sheet 9 of 11). If over six spaces are required, insert more spaces or sheets (e.g., sheets 9A, 9B ...).

Railroad related items of work such as shooflys or track reallocations must be on the project cost estimating workbook. This work may be identified through the right of way process, but it should be in the cost estimate at this location.

The cost estimates for structure items usually include separate contingencies, TRO, and mobilization. Check for duplication on these items when compiling the project cost estimate.

III. Right of Way Items

District Right of Way prepares its cost estimate based on current procedures and guidelines in the *Right of Way Manual*. Costs for the listed right of way items are to be obtained from the Right of Way Data Sheet (see [Appendix JJ](#) – Preparation Guidelines for Resolutions of Necessity). The Right of Way Data Sheet should be referenced in the project cost estimate as backup information.

“Construction Contract Work,” contractual obligations developed by Right of Way with the property owner, such as the costs to relocate fencing, reconstruct gates, or reconstruct road approaches, should be described briefly and include the estimated cost to perform the work. The estimated cost should only be in this part of the project planning cost estimate workbook. Construction contractual obligations are to be included in the project cost estimate as construction items of work.

ARTICLE 3 Specialized Project Planning and Other Cost Estimates

Specialized Project Types

Some units in the Department have developed specialized project development reports to aid the project approval process for certain specialized project types. Many of these specialized project development reports also include their own specialized cost estimate formats. Usually, these specialized formats were created from the standard format but have been simplified to focus on the typical items of work associated with these specialized project types.

Some of the specialized formats have a “fill in the blanks” structure and include preparation guidelines to help with completion of the cost estimate formats. The standard format templates can be modified to serve the same purpose.

The concepts in this guidance relating to field reviews, identifying items of work, determining prices, and other factors still apply to the specialized forms and should be followed while completing them.

Other Cost Estimates

Various programs (Transportation System Management, Facilities, etc.) and processes during project development (for example, Design Standard Decision Documents for boldfaced and underlined design exceptions and determination of cooperative features) require cost estimating. For guidance on preparing these specialized cost estimates, see the appropriate appendices in the PDPM or instructions in other manuals or documents, as appropriate.