SECTION 1

SCOPING, BUDGETING AND PROGRAMMING

1.00 Form 1048, Project Scoping/Clearance Record

Form 1048, Project Scoping/Clearance Record comprises a review list that can be used to document the design scoping process, to monitor status toward PS&E approval, and to sign-off on final clearances prior to advertisement of a project. See Section 2.01 for a more detailed discussion of Form 1048.

See previous section labeled “Form 1048” for a recent version of the form. If changes have been made, the current version of Form 1048 is found at:

http://www.coloradodot.info/library/forms/word-forms/cdot1048.doc/view

1.01 STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM

Federal Regulations require that State Transportation Departments develop a Statewide Transportation Improvement Program (STIP). The STIP contains capital and non-capital transportation projects proposed for funding under Title 23 (highways) and Title 49 (transit) of the U.S. Code as well as all regionally significant transportation projects that require an action by the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA).

In July 2012, the President signed Moving Ahead for Progress in the 21st Century (MAP-21). The STIP is developed under current federal regulations (23 USC).. Currently, the development of a new STIP is required at least every four years and must contain a minimum four-year listing of Federal-Aid Projects. The STIP must be approved by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). At the Transportation Commission's direction, Colorado develops a STIP which includes six years of projects. The current STIP covers FY2012–FY2017. However, this current STIP expires June 30, 2015.

Federal regulations require each STIP to be fiscally constrained. All federally funded transportation projects must be included in the STIP. It is Transportation Commission policy to include state funded projects and local projects with CDOT oversight in the STIP.

1.01.01 Project Planning & Budget Process

SAP is an Enterprise Resource Planning (ERP) system that CDOT installed in 2006. A German company, SAP is an acronym for "Systems, Applications and Products in Data Processing." SAP is the financial system of record for CDOT, and provides information through interfaces to other state of Colorado systems including the Colorado Financial Reporting System (COFRS) and the Colorado Personnel and Payroll System (CPPS). Some of the functions the system is used for include:

1. Payroll
2. Human Resources
3. Budget
4. Project Systems
5. Work Orders
6. Project Financials

7. Purchasing
8. Inventory

CDOT also owns an additional SAP system called Public Budget Formulation (PBF) which includes the planning functions (including STIP, Annual Budget, Revenue Forecasting, Resource Allocation, Asset Management and Maintenance Level of Service - MLOS).

The first step in the planning process is inclusion in the long-range Statewide Transportation Plan. This plan covers a minimum of 20 years. Colorado's plan is developed by staff in the Division of Transportation Development (DTD). Instead of a list of projects, the plan looks at long- range visions, strategies and goals for specific transportation corridors throughout the state. This plan is also updated every four years as required by regulations included in 23 USC.

Once a project is consistent with the visions, goals, and strategies of the Statewide Plan, it can be included in the STIP. Projects in the STIP are linked to specific to Plan corridors or pools. Projects are included in the STIP based on priorities determined by the CDOT Regions and Transportation Planning Regions.

Once a project is included in both the Statewide Plan and the STIP, it can be budgeted.

1.01.02 Developing the STIP

Development and ongoing maintenance of the STIP is managed by staff in the Office of Financial Management and Budget at CDOT Headquarters. OFMB works closely with Region Planners, located in each CDOT Region, to ensure that projects are included and updated as necessary. In turn, the Region Planners also work closely with their respective Region Business Offices and Engineering staff, as well as with local officials and representatives from each Transportation Planning Region (TPR).

All STIP projects must be consistent with specific Statewide Plan Corridor Visions before they can be included in the STIP. CDOT budget categories and strategies must also be selected for each STIP project. The connection is made in the projects' master data in SAP and verified by DTD staff for consistency with the Statewide Plan.

At the beginning of any STIP development cycle, Region Planners must follow the process laid out in the Project Priority Programming Process (4P) Guidelines. This process sets forth the parameters for ensuring an open public process for including projects in the STIP. Region Planners work with planning partners in the TPRs to prioritize transportation projects for the next STIP cycle.

The 4P process requires each CDOT Region to hold individual meetings with each TPR, and then hold a joint meeting with all of its TPRs to set project priorities. Region Planners may elect to also meet with individual counties, but this is not required.

Once priorities are selected, projects are entered into SAP and included in the draft STIP document. Fiscal constraint is verified by OFMB prior to requesting the Transportation Commission to release the Draft STIP for public review and comment.

After public review and comment, the Commission holds a public hearing to gather final comments on the draft document. Any necessary changes are made to the draft and submitted to the Commission for adoption. The adopted STIP is then forwarded to FHWA and FTA for final approval.

Below is a summary of the development schedule.

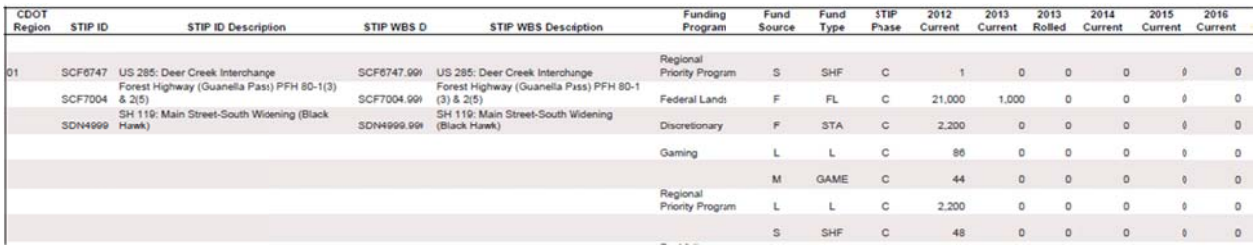
June – September	4P meetings
October – November	Joint TPR meetings
December - February	CDOT Regions submit projects for the draft STIP
March	Draft STIP released by TC for public review and comment Notice of public hearing sent out
April	STAC discussion of draft STIP Public hearing for draft STIP
May	Transportation Commission adopts and FHWA/FTA approves STIP
July 1	New STIP effective

1.01.03 STIP Projects

The STIP contains two types of projects: Regionally Significant and STIP Pool projects. A Regionally Significant project is defined as a discreet STIP number pertaining to one STIP Project. Typically, a regionally significant project is a larger project and is considered significant to the locals, or region, it serves.

STIP Pool projects are location specific projects that are listed under a parent STIP number. Examples would be a Region's Surface Treatment or Bridge On-System pools. STIP pools provide more flexibility for both budgeting and STIP amendments.

Below are samples of both Regionally Significant projects (Figure 1-1) and STIP Pools (Figure 1-2).



CDOT Region	STIP ID	STIP ID Description	STIP WBS D	STIP WBS Description	Funding Program	Fund Source	Fund Type	STIP Phase	2012 Current	2013 Current	2013 Rolled	2014 Current	2015 Current	2016 Current
01	SCF6747	US 285: Deer Creek Interchange	SCF6747.99	US 285: Deer Creek Interchange	Regional Priority Program	S	SHF	C	1	0	0	0	0	0
	SCF7004	Forest Highway (Guanella Pass) PFH 80-1(3) & 2(5)	SCF7004.99	Forest Highway (Guanella Pass) PFH 80-1 (3) & 2(5)	Federal Lands	F	FL	C	21,000	1,000	0	0	0	0
	SDN4999	SH 119: Main Street-South Widening (Black Hawk)	SDN4999.99	SH 119: Main Street-South Widening (Black Hawk)	Discretionary	F	STA	C	2,200	0	0	0	0	0
					Gaming	L	L	C	86	0	0	0	0	0
						M	GAME	C	44	0	0	0	0	0
					Regional Priority Program	L	L	C	2,200	0	0	0	0	0
						S	SHF	C	48	0	0	0	0	0

Figure 1-1
Regionally Significant Project

STIP ID	STIP ID Description	STIP WBS ID	STIP WBS Description	Funding Program	Fund Source	Fund Type	STIP Phase	2012 Current	2013 Current	2013 Rolled	2014 Current	2015 Current	2016 Current
		SR15098.030	US385: Cheyenne Wells Sidewalk & Lardscaping Improvements	Enhancement	F	STE	C	0	0	0	289	0	0
					L	L	C	0	0	0	72	0	0
SR15193	R1 Regionwide TSM-RPP Pool	SR15193.003	Regionwide Safety/TSM HES PE Pool	Regional Priority Program	S	SHF	D	250	250	0	0	0	0
SR15215	R1 Surface Treatment Program Pool	SR15215.000	R1 Surface Treatment Program Pool	Surface Treatment	F	STA	C	2,803	5,037	0	5,248	18,683	28,264
					S	SHF	C	583	1,047	0	1,091	3,884	5,875
		SR15215.001	I-70 West: Eisenhower-Johnson Memorial Tunels Resurfacing	Surface Treatment	F	SHF	C	0	0	0	2,070	0	0
					S	STA	C	0	0	0	430	0	0
		SR15215.019	PE Design Pool (Non-DRCOG Area)	Surface Treatment	F	STA	D	304	510	0	600	0	0
					S	SHF	D	63	106	0	125	0	0
		SR15215.020	PE Design Pool (DRCOG Area)	Surface Treatment	F	SHF	D	607	401	0	331	0	0
					S	SHF	D	126	83	0	69	0	0
		SR15215.022	I-70 East: Tower Road to Colfax Avenue	FASTER - Safety Projects	S	FAS	C	3,900	0	0	0	0	0
				Regional Priority Program	S	SHF	D	0	350	0	0	0	0
				Surface Treatment	F	STA	C	4,967	0	0	0	0	0
					S	SHF	C	1,033	0	0	0	0	0
		SR15215.027	SH71: North of Limon-North	Surface Treatment	F	STA	C	9,138	0	0	0	0	0
					S	SHF	C	1,899	0	0	0	0	0
				Unobligated	F	NHD	C	1,009	0	0	0	0	0
					S	SHF	C	157	0	0	0	0	0
		SR15215.043	I-25 South: El Paso County Line-North PM Treatment	Surface Treatment	F	SHF	C	2,484	0	0	0	0	0
					S	STA	C	516	0	0	0	0	0

Figure 1-2
STIP Pool Project

1.01.04 Fiscal Constraint

The STIP must be fiscally constrained in order to be approved by FHWA and FTA. CDOT looks for constraint by CDOT Region, CDOT program, and fiscal year for federal and state dollars only. Local dollars are not constrained.

Fiscal constraint is determined in SAP. Funding Program amounts are determined through Resource Allocation. These amounts are loaded and stored in Budget Pools in the FM Module after Resource Allocation is adopted. As transactions occur in the FM budget pools, fiscal constraint is based on the adjusted totals using the following formula:

UNBUDGETED = Amount Programmed in STIP minus Budgeted

UNPROGRAMMED = Budget Pool minus Unbudgeted total from above

This remaining unprogrammed amount is what is still available to STIP into other projects. Budget actions must also be constrained to both the STIP and Regional Pool. Within a STIP Pool, a STIP WBS element may be budgeted more than it is programmed, as long as the parent STIP maintains fiscal constraint.

Fiscal constraint may be verified daily by using the STIP Reconciliation Report available in BEx (Business Explorer software). Region Planners and Business Office staff may be able to assist you if you have trouble finding or using this report.

1.01.05 STIP Amendments

Once the STIP is adopted, it can be amended as needed. There are three types of STIP changes – Policy, Administrative, and TIP amendments. Amendments are submitted by the CDOT Region Planners and approved through OFMB.

1.01.05.01 CDOT Policy Amendments

Policy amendments must go through a 30 day public involvement process and then be approved by the Transportation Commission. OFMB oversees the process for public comment as well as submits pending policy amendments to the Commission for approval each month. After the Commission approves these amendments, they are forwarded to FHWA and FTA for concurrence. The following excerpt from the *CDOT Process for Public Involvement and Approval of TIP/STIP Policy Amendments and Administrative Actions* details items which may trigger the need for a policy amendment:

1. Adding projects to, or deleting projects from, the STIP pools for the following Funding Programs:
   a. 7th Pot – all amendments need to be policy (not currently in pools)
   b. Earmarks – all amendments need to be policy
   c. Bridge On System
      i. Any new project totaling $2.5M or more is a policy amendment
      ii. Any funds added to an existing project that makes the total $2.5M or more is a policy amendment
   d. RPP
      i. Any new project totaling $2.5M or more is a policy amendment
      ii. Any funds added to an existing project that makes the total $2.5M or more is a policy amendment
   e. Faster Safety
      i. Any new project totaling $2.5M or more is a policy amendment
      ii. Any funds added to an existing project that makes the total $2.5M or more is a policy amendment

The following details apply to the programs listed above:

The $2.5M threshold would be the total of the project cost in the six STIP years; any amendment that will bring a project's total cost to $2.5M or more will be considered a policy amendment at that time.

1.01.05.02 CDOT Administrative Actions

Administrative Actions are minor changes to STIP projects that do not fall under any of the Policy Amendment requirements. These amendments may be processed without Commission or FHWA and FTA approval. Public review and comment is not required and these changes are effective in one business day.

1.01.05.03 TIP Amendments

Metropolitan Planning Organizations (MPOs) must follow separate federal regulations to develop and amend their TIPs. Once an MPO Board/Council adopts a TIP, it must be approved by the Governor. The Governor also approves any TIP amendments that are made. In Colorado, the Governor has delegated authority to the CDOT Executive Director to approve TIP amendments (the Governor still approves new TIPs). TIP amendments are incorporated into the STIP administratively once approved by the Governor, or his delegate. However, TIP amendments may take up to four months to be completed by the MPO, depending upon each MPO's individual process.

In summary, amendments fall into the following timeline depending on the type of amendment.

1. Administrative Amendments
   a. Overnight process
2. Policy Amendments
   a. Up to 60 day process requiring TC approval
3. TIP Amendments
   a. Up to 4 months depending on MPO processes
   b. Overnight once approved by CDOT Executive Director

1.01.06 STIP Reports

There are several STIP reports available for your use. The most common reports are the Daily STIP Report and the Reconciliation Report.

1.01.06.01 Daily STIP Report

The Daily STIP Report details the funding for all STIP projects in the current STIP. The report itself is a derivative of an Excel spreadsheet providing project basics. It shows the STIP number, the project description, the fund source, and the amount of funding by fiscal year. Since the STIP can be amended on a daily basis, this report reflects the STIP by providing current STIP information on a day-to-day basis. The report is sorted by CDOT Region and then by STIP number. The report allows you to see all the funding programmed to a specific STIP number in one place. Two versions of the Daily STIP report are posted daily on the external CDOT website at http://www.coloradodot.info/business/budget

1.01.06.02 STIP Reconciliation Report

The purpose of the STIP Reconciliation Report is to show that the STIP is fiscally constrained. The report shows funding for STIP projects broken down by CDOT Region, funding program, and fiscal year. This report also shows budget action totals taken against any given STIP number within specific funding programs.

The Reconciliation report provides a very good snapshot of each funding program overall. It provides crucial information concerning how much money has been programmed in the STIP versus how much has been budgeted and what is remaining both to budget or program. However, using the Reconciliation Report to track specific

STIP project information is not recommended because information is sorted by funding program and not by STIP projects.

Also, the STIP Weekly Reconciliation Report provided to FHWA only shows the current and future years of the STIP that require fiscal constraint (the first four years of the STIP), and excludes programs that are not constrained, such as transit. The Reconciliation report is sorted by CDOT Region, Funding Program, Fiscal Year, and STIP number.

1.01.06.03 Access to Reports

The Daily STIP report may be found online at http://www.coloradodot.info/business/budget. The Reconciliation report may be found in CAR via the SAP Portal on the internal website. Region Planners and OFMB STIP Managers can help you if you need assistance in accessing this or other reports.

1.01.07 STIP Resources

OFMB manages the STIP and provides guidance to the Regions regarding STIP development and amendments. If you need assistance with the STIP, please call 303-757-9262.

1.01.08 Additional References:

1. OFMB's "BPS Team Overview Training"
2. OFMB Policy and Procedure Manual - http://intranet.dot.state.co.us/business/ofmb/other/current/ofmb-policy-manual-4-11/view
3. Statewide Long-Range Plan Guidebook
4. On-line Budgeting class through TETP http://intranet.dot.state.co.us/employees/Training/tetp

1.02 ESTIMATED INITIAL PROJECT COST AND SCHEDULE

Estimates need to be made for the total cost of a project for implementation into the Statewide Transportation Improvement Program (STIP), for the Design Scoping Review and later for Field Inspection Review, Final Office Review, and through the engineer's final estimate for bid. This section will address the initial budgeting effort.

1.02.01 Budgeting Basics:

1.02.01.01 Work-Hour Estimate:

This estimate details the personnel work-hours projected to complete the project activities reflected in the project schedule. When labor rates are applied, the Work-Hour Estimate represents a significant portion of the Project Estimate. The Work-Hour estimate is required on all projects prior to the obligation of project funds. On projects with consultant contracts, the Work-Hour Estimate along with the Scope of Work should serve as the basis for the negotiation of final work-hours.

1.02.01.02 Project Estimate:

The Project Estimate is the summary of total costs for a project. This is broken out into Phases identified as ROW, Utilities, Design, Environmental and Miscellaneous (RUDEM) phases (see below). Additionally, the Project Estimate will include projected costs for Construction of the project. At initial budgeting the construction budget may not be relevant. The ROW and utility phases may not be able to be estimated until after the FIR plan level.

1.02.01.03 Indirects:

A brief discussion of how the CE and indirect charges work at CDOT is shown in the text box below.

How Construction Engineering and Indirects are used at CDOT

The current CDOT rate for the CE pool is 10.0%, which on a CDOT CE POOL project covers the Salary and Benefits of CDOT personnel and/or consultant task orders who charge directly to the project. The indirect rate of 90.0% is then added to the costs to cover the costs of CDOT personnel time who do not

charge their time directly to the project.

That indirect rate for federally participating projects is broken out further to **74.51% Participating Indirects** (the FHWA will pay this percentage) and **15.49% non-participating indirects** (FHWA does not pay these costs) which totals to the 90.0%. The indirect rate for non-participating projects is still 90.0%. The logic is the total indirect amount required does not change based on whether the project is participating and non-participating.

The 10.0% for Salary and benefits (or consultant task orders) for construction oversight plus 90.0% indirects is how we get to the typical rate of 19.0% for the total CE charges.

10.0% Construction engineering+(10.0%*90.0%) indirects = 19.0% total CE charges.

Example:

For CE pool project, the CE amount used to cover CDOT's costs for construction engineering is based on how much is paid to the Contractor. If the Contractor gets paid $1,000,000 for his work that month, CDOT would draw from the project the following amount to cover our costs:

1. $100,000.00 for the Direct Personnel charges to the project (10.0% of $1,000,000)
2. $90,000.00 for the Indirect Personnel costs (90.0% of $100,000)

For a Federally participating project the indirects would be broken up as follows:

1. $74,510.00 FHWA pays (74.51% of $100,000)
2. $15,490.00 CDOT pays (15.49% of $100,000)

This same approach needs to be used for CE POOL exempt projects but just on a project by project basis. For projects with all CDOT personnel the rate will probably be less than 23.95%. If it is all consultant, the rate will be higher than 24%.

See Region Business manager for current rates.

1.02.02 Timesheet Reports:

There are time sheet reports now available to see the salary, benefits, and indirects that are charged to the pre-construction phase of projects since June 1, 2008. These will help with future estimating for preconstruction phases and for tracking monthly charges against a project. The time sheet reports are available through the Portal (not SAP) and there are work instructions available for these reports in the portal.

1.02.03 Budgeting Phases

Budgeting is no longer on a project basis but is done by Project Phases. STIPs and budgeting in SAP are done by Phases. Guidance as to what charges should be considered in these phases are as follows. These are identified in SAP by the Work Breakdown Structure (WBS) elements which are designated below as the project 5-digit code shown as XXXXX and then the WBS coding.

ROW (WBS – XXXXX.10.10)

This may not be part of the initial budget until the project is further into the process such as at the Field Inspection Review meeting when the amount of ROW can be determined.

ROW costs include the cost of property acquisition, access control, and easements. Also included is the cost of contingencies (salaries, contracts, potential litigation, and miscellaneous expenses) associated with the acquisitions and relocations.

CDOT staff charges or consultant task order charges are generally not included in this phase but are accounted in the design phase of the project. If the design phase is closed and there is still ROW work being completed, then this phase will need to take into account charges needed to do the work.

Utilities (WBS – XXXXX.10.20)

This may not be part of the initial budget until the project is further into the process such as at the Field Inspection Review meeting when utilities can be identified.

Utility costs include the cost for removals, installations, modifications, and relocation of utilities required to construct a project, including the associated design and agreement processing. The cost may be partially or fully the responsibility of the utility owner,

depending on the type of project funding, utility company, right-of-way occupancy held, and local agency-utility arrangement (See Section 7 Right of Way and Utilities).

Railroad agreements will be funded under the Utility phase of a project.

CDOT staff or consultant task order charges are generally not included in this phase but are accounted in the design phase of the project. If the design phase is closed and there is still ROW work being completed, then this phase will need to take into account charges needed to do the work.

Design (WBS – XXXXX.10.30)

Design costs include survey, design, and other engineering work required to develop a complete set of project plans and specifications. For consultant-designed projects, the cost of these professional services needs to be included.

When estimating this phase the current indirect rate needs to be taken into account and applied to the CDOT staff salary with benefits and Consultant Task orders.

Any design support needed during construction should be charged under the Construction Engineering Cost Center and not the design phase.

For Local Agency projects, this will only include the design work that will be included in the Intergovernmental Agreement (IGA) with the Local. It will exclude any CDOT salary charges.

Environmental (WBS – XXXXX.10.40)

This phase is set up for CDOT staff (Resident Engineer) and consultant charges on major Environmental document charges such as Environmental Assessments (EA) and Environmental Impact Statements (EIS).

The intent is for this phase is to not include any charges required for CDOT projects that are Categorical exclusion and will not include CDOT environmental staff review. In most regions the CDOT environmental staff time is charged to their cost center.

Miscellaneous (WBS – XXXXX.10.50)

This phase is to be used at the discretion of the Region.

Construction (WBS – XXXXX.20.10)

Construction estimate should include the cost of the bid items, force account and the current CE and indirect rates. Check with your business office on the current rates.

CDOT staff or consultant task order charges should not be accounted for here unless it is a CE exempt project such as a FASTER Bridge (Bridge Enterprise) project.

Construction Statistical (WBS – XXXXX.20.20)

There is no funding required for this or budget. This is for tracking charges in the CE cost accumulation center on time sheets only.

1.02.04 Pre-project Budgeting:

Before a project can be budgeted, a good schedule and project estimate (phased, as appropriate) are required. This assures that the Resident Engineer, Specialty Units, Region Business Office and Region Management all have the same understanding of the project scope and the anticipated costs to move the project through the project development process. In order to accomplish this in a proficient and satisfactory manner, the following tasks must be completed:

Preliminary project scoping activities for a given fiscal year if possible should be conducted prior to May 1st of each prior fiscal year. This allows for budgets and ad dates to be entered into the system by May 1st and better estimated ad dates for the Chief Engineer's objectives.

Region scoping pools will be established by each Region. In order to address costs associated with these pre-budget activities, each Region has scoping pools set up. Current scoping pools are cost centers and are R#PSP-010 so for example R1 is R1PSP-010, R2 is R2PSP-010, etc...

The Resident Engineer will create a draft baseline schedule that identifies key project milestones and related activities. Depending on the complexity of the project, the initial schedule may not be able to be accurately forecasted beyond the FIR phase of the project. The purpose of this schedule is to:

1. Identify and specify actual activities in the schedule to ensure adequate planning of the work has been achieved, as well as to permit accurate monitoring and evaluation of the project's progress.
2. Identify the need for CDOT and/or consultant personnel resources.
3. Identify activities that are critical in ensuring the timely achievement of project deadlines.

4. Identify associated dates with respect to the deliverables of other project specialty groups.
5. Identify specific deadlines from CDOT Management or Region work plans.
6. It must consider critical processes such as STIP/TIP/Long Range Plan amendments and project budgeting.
7. Identify specific milestones to allow Region management to easily track project progress.

As a minimum, project milestones will include the following (order may vary):

1. Completed Survey
2. Prelim. Horiz. and Vert. Alignments
3. Prelim. Hydraulic Information
4. Structure Selection Report
5. Field Inspection Review (FIR)
6. Form 128 Signature (Top Portion)
7. Final ROW Plans
8. Final Office Review (FOR)
9. Environmental Clearance
10. Right of Way Clearance
11. Utility Clearance
12. Final PS&E
13. Shelf Date
14. Advertisement Date

Additional milestones may be added, as needed, based on the complexity of individual projects. For projects involving consultants, the project schedule should include milestones and activities related to the contracting/task order process, i.e. SOW, SOI, RFP, Short List, Interviews, Consultant Selection and Notice to Proceed. Where applicable, the project schedule should also include appropriate milestones and activities related to the administration of IGAs.

The Resident Engineer will be responsible for the development of a preliminary work-hour estimate for the project. This work-hour estimate will be required on all projects, regardless of personnel involved (State or consultant) and shall represent reasonable work-hours needed to complete all project activities. On projects which involve consultant contracts, the work-hour estimates shall be done independently of any consultant-provided estimate and shall serve as a resource in work-hour negotiations.

The Resident Engineer will provide a copy of the baseline schedule and preliminary work-hour estimate to all internal specialty units at least two weeks prior to the project Scoping Review Meeting. The CDOT specialty unit manager will be notified by the RE of project scoping activities on all projects. For both in-house and consultant design projects, the CDOT specialty unit manager, or designee, will participate in the scoping activities when the project involves their discipline or when requested by the RE. The CDOT specialty unit manager will review the project in advance and prepare any information that may be needed for the scoping meeting, i.e. the structural engineer would review and present existing bridge information on projects involving structures.

The CDOT specialty unit manager will review the baseline schedule on both in-house and consultant design projects and recommend changes as needed to accommodate the project work activities identified for the subject discipline.

1. The specialty unit manager may recommend additions to the minimum milestones as needed for the specific needs of the project. For example, on a retaining wall project that requires extensive geotechnical work that will be in the critical path, additional milestones pertaining to this work may be recommended.
2. The CDOT specialty unit manager will participate in the development of the consultant scope-of-work and write the portions pertaining to their discipline as needed or assigned by the RE/PM.
3. The specialty unit manager will provide review and comments to the RE/PM on the final draft of the consultant scope-of-work.

The CDOT specialty unit manager will provide the RE/PM with an independent work-hour estimate to accomplish the specialty project work. Critical assumptions on which the estimate is based will be included in the submittal. The specialty unit manager will attend work-hour negotiation meetings, or provide consultation, as requested by the RE/PM or Agreements on consultant design projects. Project schedule review comments and work-hour estimates may be prepared the CDOT specialty unit manager's designee, but will be reviewed and submitted to the RE/PM by the specialty unit manager.

The Resident Engineer will be responsible for coordinating the project Scoping Review Meeting. (Refer to Section 2.01 for specific details on the Scoping Review Meeting.) This meeting shall include representatives from all appropriate specialties. The purpose of this meeting will be to discuss the scope of the proposed project and to identify appropriate project Work Breakdown Structure (WBS) elements, work activities, durations and relationships, as well as to thoroughly assess the draft baseline schedule and preliminary work-hour estimate. The Resident Engineer and the other specialties

will consider current work load factors and future projects that may have an impact on their work activities and durations. Feedback obtained from the Scoping Review Meeting will be used by the Resident Engineer and accurately reflected in the draft baseline schedule and preliminary work-hour estimate.

The Resident Engineer will provide the revised draft baseline schedule and work-hour estimate to all key specialties (Bridge, ROW, Environmental, Traffic, Materials, etc.) for final resolution of any potential conflicts of logic or deliverables. Upon this review, any changes will be incorporated by the Resident Engineer.

A Region Management team (as a minimum, the Program Engineer, ROW Manager and Environmental Manager and Resident Engineer) will review and approve the draft baseline schedule and preliminary work-hour estimate, including milestone dates, critical path activities and specific deliverables. The Ad date reflected in the schedule will be addressed at this time and, if agreed to, will be accepted as the project Initial Planned Ad date for use in the project set-up.

Upon review by the Region Management team, the Resident Engineer will make any necessary modifications to the draft baseline schedule and preliminary work-hour estimate. These modifications will be the last changes to either document. The RE/PM will save and refer to these files as the final baseline schedule and final work-hour estimate. These final documents shall not be altered at any time during the remainder of the project.

The Resident Engineer will develop a preliminary cost estimate for the project, including estimates for each phase of the project (Right of Way, Utilities, Design, Environmental, Miscellaneous and Construction). The RE/PM should consider the phase and respective personnel resources (in-house or consultant). The phased estimates will include any respective consultant services for the project.

The CDOT specialty unit manager will participate in the development of the consultant scope of work and write the portions pertaining to their discipline as needed or assigned by the RE/PM. The specialty unit manager will provide review and comments to the RE on the final draft of the consultant scope-of-work. Alternatively, the specialty unit manager may provide the RE with a separate consultant scope of work and preliminary cost estimate for consultant services that the specialty unit manager may choose to directly contract for.

The CDOT Specialty Unit manager will provide the Resident Engineer with a cost estimate for each phase of the project, as appropriate, to accomplish the

specialty project work. Construction, right of way, and utility cost estimates will be rough at this phase of the project. The Specialty Unit managers will be responsible for updating these cost estimates and keeping the RE/PM informed of significant changes throughout the project design.

The Resident Engineer will review the preliminary cost estimate with the Program Engineer and make revisions, where appropriate. Any revisions made to the cost estimate must be reviewed with affected specialty units prior to finalizing.

The Resident Engineer will provide the Initial Planned Ad date and project cost estimate to the RTD and Region Business office. This will be done by July 1 of each year for all planned projects. The Region Business Office will use this project information for entry into CDOT's business management system (SAP). These ad dates will be used for the Chief Engineer's objectives.

The Resident Engineer will develop a closure document that will include the baseline schedule and work-hour estimate, along with documented assumptions and risks associated with the project scope and schedule and any other relevant information used in developing the project schedule. This document will be kept in the project files with copies provided to the RTD, Program Engineer, and appropriate Specialty Unit managers. This may be done after scoping up to the FIR for complex projects.

1.02.05 Additional References:

1. CDOT Procedural Directive 512.1 – Project Scoping and the Design Scoping Review (DSR)
2. Estimate Review by Engineer Estimates and Market Analysis (see Section 2.27 of this manual).
3. OFMB Policy and Procedures Manual - http://intranet.dot.state.co.us/business/ofmb/other/current/ofmb-policy-manual-4-11/view

1.03 FUNDING SOURCES AND RESOURCE ALLOCATION

State, federal, and local funding sources are used to provide for all modes of transportation including aviation, transit, bicycle, pedestrian, rail, bridge replacement, and highways.

Colorado's highway construction program is primarily funded through the Federal Highway Users Trust Fund, the Colorado Highway Users Tax Fund, and special legislation.

Major sources of the Colorado Highway Users Tax Fund are the motor fuel taxes, drivers' license fees, and motor vehicle registration fees. The motor fuel taxes constitute approximately 75 percent of the fund.

CDOT prepares resource allocation projections that reflect revenues for a minimum of a 20-year period to match the timeframe of the Long-Range Transportation Plan.

1.03.01 Revenue Forecasting

Revenue forecasts include all "reasonably anticipated" revenues known to be available to the Colorado Transportation Commission to fund capital improvements, maintenance, and operations for existing and expanded facilities and services of the State of Colorado transportation system.

Every four to six years, Congress passes a new surface transportation act. For resource allocation purposes, it is assumed that the federal program will continue at the same funding level and contain the same program categories.

Financial constraint of the Statewide Transportation Improvement Program (STIP) works through the "highest use" concept. Projects are programmed in the STIP with the highest priority federal funding source that each project qualifies to use. The highest federal funding category is the Interstate, and the next highest federal funding category is the National Highway System. By funding each project with the highest funding source for which it qualifies, the Office of Finance, Management and Budget enables Regions to select projects based on need, not federal funding type.

The transaction in SAP that shows the funding priority for a project is ZF20. The Region business office determines the funding priority.

These ratios are entered in ZF20 in SAP but not everyone has access to this transaction. The Resident Engineer should work with the business office to enter data in Trns*port.

1.03.02 Resource Allocation

For state transportation purposes, the State of Colorado is divided into several different geographic regions. There are 11 Transportation Commission districts.

The Transportation Commission allocates the available revenues to the six CDOT Engineering Regions through the use of Investment Categories. These categories are:

1. Safety
2. Mobility
3. System Quality
4. Program Delivery
5. FASTER

All funds are allocated to the six CDOT Engineering Regions based on results of performance modeling or appropriate formula consistent with Transportation Commission decisions. Metro Planning has been allocated statewide based on the federal funding level. Enhancement funds were allocated to the six CDOT Engineering Regions based on a revenue distribution formula after a statewide allocation was made for program administration.

1.03.03 Special Funding Sources

From time to time the Transportation Commission establishes special funding sources, for example, the 7th Pot or contingency funds.

1.03.04 Program Implementation

Resource Allocation for the Statewide Long-Range Plan is implemented through the Long-Range Plan “control total” planning allocations approved by the Transportation Commission.

1.03.05 Additional References:

1. OFMB Policy and Procedures Manual - http://intranet.dot.state.co.us/business/ofmb/other/current/ofmb-policy-manual-4-11/view

1.04 PROJECT CREATION AND FINANCES

SAP Steps for new projects (click on link to go to work instructions).

ZJ08 – Initiate Project Creation – PM
(ZJ08 Initiate Project Creation)
(http://vupweb.dot.state.co.us/gm/folder-1.11.29385?mode=EU&originalContext=1.11.30034)

SBWP – Complete Project Manager Tab – PM
(SBWP Complete CJ20N) (http://vupweb.dot.state.co.us/gm/folder-1.11.32630?mode=EU&originalContext=1.11.30034)

CJ20N – Enter GIS details in SAP Project Manager – PM
(GIS Project Limits) (http://vupweb.dot.state.co.us/gm/folder-1.11.29337?mode=EU&originalContext=1.11.30034)

CJ20N – Create Project Structure from Standard Template –
(Add Template) (http://vupweb.dot.state.co.us/gm/folder-1.11.29381?mode=EU&originalContext=1.11.30034)

FMMEASURE – Maintain Funded Program for Project
(FMMEASURE) (http://vupweb.dot.state.co.us/gm/folder-1.11.28338?mode=EU&originalContext=1.11.30034)

CJ20N Release Project (CJ20N) -
Release project (http://vupweb.dot.state.co.us/gm/folder-1.11.29333?mode=EU)

Use the link to SAPTraining for SAP checklists for full list of transactions and workflow steps. SAP checklists for project processes (http://vupweb.dot.state.co.us/gm/folder-1.11.33901?mode=EU).

1.04.01 Description

After a project has been scoped and is part of the current STIP, a project is ready to be created in SAP. Although one project usually covers all phases, sometimes it necessary to create multiple projects under one STIP number. For example, the Resident Engineer may create a project for design and a separate project for construction. The Resident Engineer should confer with the Business Office to ascertain if there will be any benefits or deterrents to fragmenting the STIP line item into more than one project.

The Resident Engineer begins the process in SAP with Transaction Code ZJ08. ZJ08 starts a workflow that is routed to OFMB, the person who initiates ZJ08, and the Region Business office. See the online SAP work instructions for more details on project creation steps and information required. SAP Checklists provided in SAP training website show the participants and order for the SAP workflow.

KEY ITEMS TO KNOW FOR PROJECT CREATION - These fields combined, are the project information sent to FHWA via the Financial Management Information System (FMIS) and so it is key to have it as accurate as possible.

PROJECT DESCRIPTION (NAME) – ZJ08

The project name will be based on the information supplied with the request for the project using SAP transaction code – ZJ08. The information should be as descriptive as possible using state roads or federal highways and cities or counties.

PROJECT DESIGNATORS (General Location) – ZJ08

The Project Designators is the general location of the project which is used to generate the project number. If you choose a highway segment, then the system will then generate a number after that highway segment in sequential order. Example project number 0504-055 is on Highway 50 segment 4 (between La Junta and Kansas) and is the 55th project on this segment.

PROJECT PRE-FIX

The business manager will designate the Project Pre-fix to be used on the project during this process. It will depend on the primary scope, location and funding for the project. For example, IM is Interstate Maintenance, FBR is Faster Bridge project, NH is National Highway.

OTHER PROJECT CREATION INFORMATION (fields with a check mark are required)

1. Region Code – Select the Region overseeing the project. For projects not created in the Region, select Statewide (ST). Do not select HQ.
2. Federal System Code:
   - I – Interstate
   - N – NHS Non Interstate
   - O – Other Federal Aid Highway
   - X – For conversion purposes (do not use)
   - Z – Not on any federal aid highway (local agency off system projects for example)
3. Advertised By:

   None – The project is design only or a study and will not go to Ad

State – This is a project advertised by CDOT and will go to ad. If you choose this option, the business manager must enter an ad date into SAP.

Local – This is a project that is advertised by a Local Agency (not CDOT).

If None is chosen above, a reason must be given from the pull down menu.

4. Federal Improvement Code

   Choose an option that best corresponds with the majority of funding or work. For example, if the project is mainly bridge funds then select "bridge replacement (either added capacity or no added capacity)." FHWA will review the code to make sure the work is in line with the funding.

5. State Improvement Code

   The selection here should be similar to the Federal Improvement code based on the funding available.

6. Oversight Designator

   A – CDOT administered – This is the majority of the projects.

   N – Full FHWA (NHS) The Resident Engineer is responsible for determining whether the project is under CDOT or FHWA oversight. The oversight responsibilities are outlined in the Stewardship Agreement between the FHWA Colorado Division and CDOT. Unless the STA/FHWA agreement differs, full FHWA involvement projects will tend to be new construction or reconstruction projects on Interstate routes with an estimated value greater than $1 million. The Resident Engineer can contact the FHWA for further guidance.

   O- Other – This is almost never used. FHWA will indicated if it is needed.

   X- Full FHWA (Non-NHS) – This is rarely used. FHWA will indicate if it is needed.

7. Construction Engineering by:

   C- Cons/Contr – This is a unique situation. Only use if told to do so.

   L- Local – Construction oversight by Local Agency.

   O- Other – Only use if instructed to use for special reasons.

   S- State - This is standard for CDOT projects.

   X- For conversion purposes – Do not select

8. Geographic Location, Terrain Type, Proposal of Work.
   a. For the Geographic Location be as precise as possible (similar to, if not exactly the name of the project) by naming the Federal or State road and the city or county (i.e. – CR 520/CR 616 on SH 69 in Huerfano County).
   b. For terrain type the options are: Level, Mountainous, Plains, Rolling or Urban.
   c. For Proposal of Work list the major activity to be completed (e.g. – Intersection Design, Drainage improvements, Surface Treatment or Safety improvements).
9. % construction complete – this is usually zero
10. Remark or Comments – Add more information here if needed.
11. PROJECT PERSONNEL

a. This information is key if someone needs to contact appropriate party during any of the project development process.
b. The people entered are tied to their organization code and are what is used when SAP sends workflows for key processes in the project development.
c. The organization codes associated with the project personnel need to be correct and if there are more than one organization involved in the project there is an alternate Org code.
d. The business office also enters in Cost Center codes for the project which should correspond to the Residency in-charge of the project.

12. On System or Off System –

    If it is on a state highway then it is ON SYSTEM. If it is on a City or County road or not on a highway, then OFF SYSTEM.

13. CONTRACT DELIVERY METHOD

    a. Design-bid-build is our traditional method for projects.
    b. Other options – Refer to Innovating contracting manual.

14. PLANNED LENGTH AND PLANNED UNIT:

    are not tied to the information given in OTIS at this time. Make sure the Planned Length entered matches the mileposts in OTIS. This information goes into Form 463.

15. INNOVATIVE CONTRACTING METHODS

    Check all that may apply to your project. Update as needed as project develops. Refer to Innovative Contracting manual as needed.

16. LOCATION DETAILS

    a. Exit SAP and go into OTIS to enter this information
    b. Route, beginning and ending reference points, lane quantity, facility type, functional type, and population.DTD has this information for highways on CDOT's Intranet in Data Access – Transportation Data Set and OTIS.
    c. SAP will carry the project location information to other forms such as Form 463, FMIS, ProjectWise project description, and ZJ40 Project Tracker.

17. RAILROAD DESIGNATOR CODE –

    If there are railroads near the project, use the pull-down menus to select which ones may be involved.

18. County Details, Congressional Districts, Structure ID Details, MPO's, TRP;s, and Commission Districts, and TIP information –

    Must press the Calculate County Percentages and Calculate Cong Dist Percentage buttons. This information is calculated automatically based on the project limits entered in OTIS.

19. Other fields such as "Completed construction date" are not required at project creation and can be ignored.

ADVERTISEMENT DATES

The Advertisement Date is the milestone where construction funds are authorized and obligated for the project. This date also serves as the commencement of the period when a project is open for job showings and acceptance of bid proposals. CDOT recognizes three types of Advertisement or "Ad" dates, for use in project schedules. These "Ad" dates are recognized in CDOT's business application system (SAP):

1. Initial Planned Ad date – Ideally this is the Ad date that each region puts forth prior to July 1st of every year for the upcoming fiscal year's projects going to bid or when the project is created. This date is entered into SAP by the Region Business Manager.
2. Current Planned Ad date - This is the Ad date which is current and officially agreed to by the RTD. The Current Planned Ad date will match the Initial Planned Ad date until such time during the course of the fiscal year that the RTD has concurred with the necessity to change. Changes to the Current Planned Ad date are entered into SAP by the Region Business Manager.
3. Scheduled Ad date.

   This is the date that goes into the Go Sheet.

   This is a working Ad date generated by the Resident Engineer based on the most current scheduling information. This Ad date primarily serves as a barometer of progress in the total project. When indicated by a Scheduled Ad date which exceeds the Current Planned Ad date, the Resident Engineer will conduct a further assessment of the project and give consideration to a revision to the Current Planned Ad date (including consulting with the appropriate Region and project personnel).

The Resident Engineer should review CJ20N in SAP after the project is created to be sure all the data is accurate and inform the Business Office of any revisions.

After the project is created in SAP, an email message will be sent to key Region personnel involved indicating the process is complete and show the project information including the 5 digit project code.

The Resident Engineer needs to add a Template to the project before funds can be added to the project in SAP. See the SAP training internal website for work instructions on adding a template to a project. A project cannot be seen in ZJ40 until the template is added.

1.04.02 Budgeting and Obligation

Once a template is added to the project in SAP, the Resident Engineer can notify the business office that the project is ready to be budgeted. See Section 1.02 for estimations for the Preconstruction Phases for a project.

1.04.02.01 Background:

Federal-aid highway funds are authorized by Congress to assist the States provide for the construction, reconstruction, and improvement of highways and bridges on eligible Federal-aid highway routes and for other special purpose programs and projects. Projects utilizing Federal funds must meet specific federal program requirements as outlined below and as a practical matter, at present, CDOT requires all highway projects it constructs to also conform to the federal standards. Doing so ensures consistency and allows for the possibility of adding federal funds to a project that initially, is funded without any federal funds. Federal funds are made available to the department for expenditure on highway related construction projects. Routine highway maintenance activities such as snow removal or filling pot holes do not meet these criteria

1.04.02.02 Definitions:

NCAT: NCAT prevents time/labor charges from hitting the phase, at time sheet entry. The Region Business Office will need to unset NCAT to allow labor charges after Federal authorization is given. The Region Business Office should be notified if the Resident Engineer wants to allow payroll charges. Some projects do not want payroll charges to a particular phase.

NOPT: NOPT (No postings) stops all financial postings to the project. Nothing can be charged to this phase including Purchase Requisitions or direct charges.

ENCUMBRANCE: An encumbrance is a binding obligation to pay.

Pre-Construction Phase encumbrances are generally for ROW acquisition, Utility agreements, and Consultant Task Orders.

Construction phase encumbrances are for the contract with the contractor, Construction Engineering (CE) and Indirects costs calculated for the project.

Intergovernmental agreements (IGA) encumber funds for all phases for the Local Agency on Local Agency projects.

1.04.03 Obligation:

Obligation is the same as authorization. It ensures that FHWA has agreed that CDOT can spend the funds identified for the project. Charges cannot be made against a phase until the funds are obligated. It is further important to note that if federal aid is requested, state authorization is not initiated and not authorized until the federal authorization is received. Work performed on unauthorized projects is not legitimate and could become the personal liability of the individual authorizing such work.

Procedure to Budget Funds: The initiating region must ensure that the project is properly listed in the Statewide Transportation Improvement Plan (STIP) and within the fiscal constraints imposed by the STIP. Each project budget action is individually processed and verified against its approved STIP line item. Each project is budgeted by phase (ROW, Utility, Design, Environmental, Construction, Miscellaneous, etc.) and provider (i.e. Federal, State, or Other (Local).

Identify the sources of funding for the project.

- For Federal Funds there are subcategories that have to match the characteristics of the project such as Interstate Maintenance and Bridge-On System. OFMB reviews the annual federal appropriation bill by category, comparing the appropriations with the authorizations calculating the percentage obligation limits for Colorado by program. Based upon these calculations, CDOT Regions and the Metropolitan Planning Organizations (MPOs) are allotted funds to spend on actual projects by sub-category. It is from these allotted funds or additional funding provided by a local government that a project receives obligated funding.
- The regional business offices must ensure that the project funds from the various federal categories, as well as state and/or local highway funds, are applied in a suitable mix based on estimates from the Resident Engineer.

Funds to be budgeted must be in the current year's STIP. It should be noted that moving funds currently budgeted into a project that are from the same fiscal year is considerably easier than moving funds from a prior fiscal year. For example, if the project needs funds moved from Design to Construction, it will be much easier if the Design funds are in the current fiscal year STIP. If the funds are from a prior fiscal year, they will have to be de-budgeted, rolled forward in the TIP and in the STIP, and re-budgeted into the construction phase.

Determine whether or not the project's budget requires Transportation Commission action. Budget items requiring Commission approval are:

1. Initial Project Budget Actions from certain programs not already approved by Commission as a whole. (i.e., RPP, BRS, FBR)
2. Projects involving Earmarks or Discretionary Funding
3. Local Overmatch not already projected or 100% locally funded projects
4. Strategic Projects (7th Pot)
5. Additional Funding above 15% of prior TC approved Budget

All Budget Actions are processed daily and, if Commission action is required immediately scheduled for the next supplement. The cutoff for Budget Actions inclusion in a Supplement is the 25th of the month preceding the T.C. Scheduled Meeting. These Budget Actions will remain in a "Pre-posted" status until the commission's approval of the Budget Supplement.

After verifying the overall project description, including location and work type with the requested funding and ensures each budget action is linked to a viable STIP number, OFMB applies first and second level approvals to the budget action and determines the Budget Document Type.

OFMB enters the approved budget request into the SAP system which automatically generates the corresponding requests for phase authorization/obligation.

Non-federal-aid phases are authorized and obligated immediately upon Budget Action approval in SAP.

Federal-aid phase authorizations and obligations requests are submitted daily for review and approval by FHWA Colorado Division via the outbound FHWA Fiscal Management Information System (FMIS). The approved federal authorization/obligation is received from FHWA via the inbound FMIS interface.

The process of requesting Federal aid obligation/authorization is differentiated by non-construction and construction phases of work.:

1. Pre-Construction

   For the pre-construction phases of a Federal-aid project OFMB's final approval of a budget action in SAP prompts a request to FHWA for federal authorization/obligation via the outbound FMIS interface. Once authorization is granted by FHWA and recorded in FMIS, the FHWA phase authorization date(s) is auto populated in SAP PS via the inbound FMIS interface.

   The Right of Way phase requires no further budgetary action by the Region. Actual acquisition, however, must be authorized by Staff ROW upon completion and approval of the ROW plans. Staff ROW notifies the Region, via Form 462A, Right of Way Plan Approval, that ROW acquisition may occur.

The Utility phase requires no further budgetary action by the Region, but the region must also submit utility agreements to the utility engineer for processing.

The Design, Environmental and Miscellaneous phase requires no further budgetary action by the Region.

Note: Project Phases are automatically set to NCAT or NOPT (see definitions above) when created. Resident Engineer will notify the business office if they want payroll charges or other charges to be allowed to the Preconstruction phases after budgeting and obligation are complete.

2. For the construction phase Obligation of a Federal-aid construction project (See Section 2.30):
3. Budgeting Timing before obligation:

   Budgeting construction funds is usually in advance of the authorization/obligation process.

   Budgeting construction funds can occur when the current STIP year begins for construction phase designated or when the funds are completed in the STIP process.

   If additional funds for Construction are required, the budgeting request may initiate the change in the STIP process.
4. Obligation – See Section 2.30 Form 1180 section for construction funds obligation process.

1.04.04 After Award of Low Bidder

At the time of award, the construction phase budget will be adjusted so it matches Form 65 exactly. The preconstruction phases have to be closed shortly thereafter (approximately 30 days) or a request with justification has to be made to keep the funds open.

The Approved Commission Budget level is significant in determining the number of authorized actions over the life of a project. Use SAP transaction ZJ20 to access Form 65 which will indicate the Approve Commission Budget. It is from this dollar amount that the 10 percent will be computed for determining if Chief Engineer approval is required for project award during the project bid process. It is also from this amount that the 15 percent will be calculated to establish if Transportation Commission Action is required to increase the project budget or for award of a project at bid.

Any request for additional budget greater than 15 percent of the approved Transportation Commission budget will be processed through a budget supplement action, which occurs on a monthly basis.

If the budget request is less than 15 percent of the Transportation Commission approved budget, OFMB may approve the request as an "allotment advice." Allotment advices include transfers to projects from pools or other projects. Allotment advices are usually processed within a few days.

Any surplus or deficit amounts will be corrected by the Regional Business Managers with a Budget Action submitted to OFMB for approval to de-budget or supplement the amount. If the Regional Business Office wishes to retain this surplus amount, the business office must request an approval to retain the surplus funds from the Chief Engineer. The request must be submitted to the Bids and Awards section by Monday, NOON, following the Letting Day. See Section 2.36 for additional information on retaining surplus bids.

1.04.05 Supplementing the Budget

There are many reasons that project phase budgets need to be supplemented, including additional work or overruns. In those instances, the Resident Engineer will work with the Region Program Engineer and the Business Office to find sources.

Many requests to add funds to a project do not require Transportation Commission approval. However, in those cases that do require Transportation Commission approval, the Resident Engineer needs to be aware that supplementing a project can take months. See Section 1.01 requirements on STIP/TIP, and Transportation Commission Action (PD 707.1).

The Region should make as few presentations to the Transportation Commission as possible on any given project If there is any likelihood that several phases such as utilities and right of way are going to run over budget, both requests should be calculated and communicated to the Region Program Engineer as soon as the Resident Engineer has solid figures.

1.04.06 Day-to-Day Financial Management

The Resident Engineer should check their projects in either ZJ40 or ZF70 in SAP to determine the current status of the project funding, expenditures, and encumbrances. It is recommended to use the timesheet report available through the Portal and run the report as needed to see which CDOT employee charges to their project(s) and the indirects that hit the project(s) budget.

If any phase of a project goes into deficit, payment for any phase of the project to a third party will not be processed. For example, if the design phase goes into deficit after the project is awarded in construction, the contractor cannot be paid. The Resident Engineer needs to be aware of CDOT purchasing requirements, rules, and directives. State Procurement, CDOT Procurement, and the Center for Accounting offer training applicable to the financial aspects of running a project. There is an On-line budgeting class available through the Transportation Engineering Training Program (TETP).

1.04.07 Additional References:

1. OFMB Policy and Procedures Manual - http://intranet.dot.state.co.us/business/ofmb/other/current/ofmb-policy-manual-4-11/view
2. PD 707.1 – Annual Budget Process
3. FHWA A Guide to Federal-Aid Programs and Projects http://www.fhwa.dot.gov/federalaid/projects.pdf
4. Title 23, United States Code (23 U.S.C.) Title 23, Highways, of the Code of Federal Regulations (23 CFR) – 630.106 (Project Authorizations (FMIS) Preconstruction)
5. The FHWA/CDOT Stewardship Agreement) http://www.coloradodot.info/business/permits/accesspermits/references/stewardship-agreement.pdf
6. TETP On-line budget training
7. SAP Training website

1.05 CONSULTANT SELECTION AND CONTRACTING PROCESS

When the State does not have adequate resources (such as qualified personnel, adequate staff, specialized expertise, or ample time) to perform a task, consultant services are contracted. A professional consultant is a licensed professional engineer, licensed professional architect, licensed landscape architect, licensed industrial hygienist, or licensed surveyor. A qualified and experienced consultant in relation to the expected scope of work is obtained according to an approved selection process through the Engineering Contracts Unit Program in the Contracts & Market Analysis Branch.

This process is also followed when Construction Manager/General Contractor or CMGC services contractor is required for CMGC delivery. If CMGC services that require a Contractor produce any stamped design plans or lead a formal Value Engineering Study, Brooks Act compliance per the Consultant Selection process will be required. If no Brooks Act compliance is required for the CMGC process, please follow the alternate process for CMGC projects.

The method for obtaining a professional consultant to do a specific scope of work or non-project-specific consultant services shall comply with applicable federal and state laws governing the services of consultants, as outlined in CDOT Procedural Directive 400.1, Obtaining Professional Consultant Services, and 23 CFR Section 172, Administration of Engineering and Design Related Services.

The Agreements Program Manager in the Contracts & Market Analysis Branch is responsible for the prequalification and coordination in the selection of a consultant, and developing a contract between the state and the selected consultant. The Agreements Program facilitates the selection process. The Resident Engineer shall evaluate the consultant's performance on projects.

1.05.01 Obtaining a Consultant Contract

The following steps are necessary to obtain an executed consultant contract. The Agreements Program shall perform the steps unless otherwise noted [responsible persons are identified in parentheses after each step]:

1. Ensure that the proposed consultant service is consistent with CDOT's Long-Range Plan, Statewide Transportation Improvement Program, the CDOT budget, and the Obligation Plan (Program Engineer, Resident Engineer and Business Office).

2. Develop scope of work (Resident Engineer).
3. Prepare a contract cost estimate (Resident Engineer).
4. Prepare consultant selection request, including the Underutilized Disadvantaged Business Enterprise (UDBE) goals, for the Chief Engineer's approval for advertisement (Resident Engineer and Region EEO/Civil Rights Specialist).
5. Establish a selection panel (Resident Engineer).
6. Create selection schedule (Resident Engineer and the Engineering Contracts Program Staff).
7. Advertise Invitation for Consultant Services on the Internet and, as needed, in special journals (contract writer).
8. Create and distribute the selection information and instruction package to the consultant community (contract writer).
9. Coordinate and facilitate selection panels to achieve consensus and make a recommendation to the Chief Engineer (contract writer).
10. Obtain RTD's approval of the selection results. (Resident Engineer)
11. Obtain the Chief Engineer's approval of the selection results (contract writer).
12. Notify consultants of selection results (contract writer).
13. Finalize scope of work, and for project-specific funds-encumbered contracts, negotiate work-hours and the cost proposal (Resident Engineer and the consultant representative), and submit those to the Agreements Program. **Note:** For task order contracts, this step is done for each task order request.
14. Obtain and review the consultant's financial information, insurance information, and initial cost proposal (Consultant Audit).
15. Initiate audit evaluation (Consultant Audit Program).
16. Analyze audit evaluation report and negotiate consultant fee and final contract cost exhibit (contract writer).
17. Prepare final contract and route the contract for approval and signatures. Distribute executed contract (Procurement and Business Offices).
18. Issue the Notice-to-Proceed to the consultant (Agreements Program Staff).
19. Debrief consultants, as requested, on selection results (contract writer).
20. Compile selection documentation and transmit the selection file to the CDOT Records Center (contract writer).

The Resident Engineer is responsible for the submittal of the Contract Certification and Contractor Evaluation forms that are part of the Colorado State Controllers Contract Management System (CMS). See Section 1.06 Contract Certification and Evaluation Requirements for Colorado Contract Management System (CMS).

1.05.02 Obtaining a CMGC Contract (Alternate Process)

The following steps are necessary to obtain an executed CMGC contract. The Agreements Program shall perform the steps unless otherwise noted [responsible persons are identified in parentheses after each step]:

1. Ensure that the proposed CMGC service is consistent with CDOT's Long-Range Plan, Statewide Transportation Improvement Program, the CDOT budget, and the Obligation Plan (Program Engineer, Resident Engineer and Business Office).
2. Develop scope of work (Resident Engineer).
3. Prepare a contract cost estimate (Resident Engineer).
4. Prepare CMGC selection request, including the Underutilized Disadvantaged Business Enterprise (UDBE) goals, for the Chief Engineer's approval for advertisement (Resident Engineer and Region EEO/Civil Rights Specialist).
5. Establish a CMGC selection panel per CMGC guidance from the Innovative Contracting Advisory Committee (Resident Engineer).
6. Create selection schedule (Resident Engineer and the Engineering Contracts Program Staff).
7. Advertise Invitation for CMGC Services on the Internet and, as needed, in special journals (contract writer).
8. Create and distribute the selection information and instruction package to the CMGC and CCA community (contract writer).
9. Coordinate and facilitate selection panels to achieve consensus and make a recommendation to the Chief Engineer (contract writer).
10. Obtain RTD's approval of the selection results. (Resident Engineer)
11. Obtain the Chief Engineer's approval of the selection results (contract writer).
12. Notify contractors of selection results (contract writer).
13. Finalize scope of work, and for project-specific funds-encumbered contracts, negotiate work-hours and the cost proposal (Resident Engineer and the contractor representative), and submit those to the Agreements Program. **Note:** For task order contracts, this step is done for each task order request.
14. Obtain and review the contractor's financial information, insurance information, and initial cost proposal (contract writer). (Only for Brooks Act CMGC Contracts.)
15. Initiate audit evaluation (contract writer). (Only for Brooks Act CMGC Contracts.)
16. Analyze audit evaluation report and negotiate contractor fee and final contract cost exhibit (contract writer). (Only for Brooks Act CMGC Contracts.)
17. Prepare final contract and route the contract for approval and signatures. Distribute executed contract (Procurement and Business Offices).
18. Issue the Notice-to-Proceed to the contractor (Agreements Program Staff).
19. Debrief contractors with CMGC Debrief Template on selection results. In-person debriefs are optional and up to the Resident Engineer. (contract writer)

20. Compile selection documentation and transmit the selection file to the CDOT Records Center (contract writer).

The Resident Engineer is responsible for the submittal of the Contract Certification and Contractor Evaluation forms that are part of the Colorado State Controllers Contract Management System (CMS). See Section 1.06 Contract Certification and Evaluation Requirements for Colorado Contract Management System (CMS).

1.06 CONTRACT CERTIFICATION AND EVALUATION REQUIREMENTS FOR COLORADO CONTRACT MANAGEMENT SYSTEM (CMS)

As stated in Section 1.05, the Project Manager is responsible for the submittal of the Contract Certification and Contractor Evaluation forms that are part of the Colorado State Controller's Contract Management System (CMS). (See Section 1.05 Consultation Selection and Contracting Process).

1.06.01 Contract Management System

Colorado's Contract Management System was created under direction of Senate Bill 07-228. The law was enacted to facilitate tracking, evaluation and reporting of vendor performance. The requirements are now codified as Colorado Revised Statutes, see C.R.S. §§ 24-102-205, 24-102-206, 24-103.5-101, and 24-105-102.

1.06.02 Form Use Required

The Project Manager is required to complete forms associated with the Contract Management System when a contract meets all of the following criteria:

1. Personal services contract
2. Value greater than $100,000
3. Entered into after July 1, 2009

State Controller Fiscal Rule 3-1, Section 2.27 defines "personal services contract" as follows:

> "A contract between an Agency or Institution of Higher Education [IHE] and another party, where the other party provides personal services for the benefit of the Agency or Institution of Higher Education or a third party. An individual or entity performing services under a personal services contract is an independent contractor and not an employee of the State."

Personal services contracts include the following categories:

1. Construction contracts (including those entered into using forms provided by the Office of the State Architect)
2. Grants contracts
3. Individual task orders when evaluated separately by the Agency or IHE

4. Master task orders when evaluated by the Agency or IHE
5. Information technology contracts
6. Interagency contracts (no evaluation required)
7. Intergovernmental contracts, including grants
8. Mixed procurements where the service component is greater than $100,000
9. Multi-party contracts
10. Outsource agreements
11. Price agreements for services
12. Professional services as defined in CRS §24-30-1402(6)
13. Purchase orders for services greater than $100,000
14. Purchased services as defined in CRS §24-50-502(3)

For contracts that meet the above criteria, eight separate forms are available. Five of these forms are mandatory and three are optional depending on additional requirements. The forms and requirements are listed in Table 1-1.


Table 1-1 Forms Summary

Project Engineers may use the Contract Management System to track other types of contracts, which do not fall within the definition of “personal services contract,” but are not required to complete the forms for these other types of contracts. A complete list of all contract types is included in Table 1-2 Forms Use and Certification Applicability per Contract Type.


Table 1-2 Form Use and Certification Appl

1.06.03 Contract Completion

By statute, the Project Engineer is required to finalize the evaluation of the contractor and enter the evaluation in the Contract Management System within 30 days after contract completion.

For construction contracts, “contract completion” means the later of the following two occurrences:

1. The end of the contractor warranty period, occurring one year following the date of the Notice of Substantial Completion, or as otherwise provided in the construction contract.
2. The completion of the public notification requirements under CRS §38-26-107.

For all other contracts, "contract completion" means the date upon which the contractor has finished all of his performance obligations, including submission of the final invoice, AND the earlier of the following two occurrences:

1. The Project Engineer has accepted the contractor's performance and agreed upon the final payment to the contractor.
2. Six months have elapsed after the contractor submitted his final invoice.

1.06.04 Use of Forms in a "Typical" Personal Service Contract

The following hypothetical scenarios illustrate how the Contract Management System forms would be used during these contract stages:

1. Solicitation Stage
2. Pre-contract Execution
3. Executed Contracts
4. Multi-year contracts
5. End of the Full Contract Period
6. Construction Contracts Equal to or Greater than $500,000

1.06.04.01 Solicitation Stage

1. Responding vendors are requested to provide vendor disclosure information as part of their bid/proposal.
2. The Vendor Disclosure Statement form may be attached to the solicitation with appropriate instruction for completion of fields.
3. The Sole Source Justification and Certification form, if applicable, may be scanned and attached to the CMS record when the record is created.
4. If applicable, the Personal Services Certification form prepared by the Division of Human Resources may be scanned and attached to the CMS record when the record is created.

1.06.04.02 Pre-contract Execution

1. Ensure that the Statement of Work includes:
   a. Performance measures and standards tied to the work to be performed.

b. Accountability language tied to the performance measures and standards.
c. Monitoring requirements tied to the performance measures and standards.
d. Resolution methods specific to the work to be performed.

2. If using the Performance Measures and Standards Certification for Original Contract form, maintain the form as part of the official contract file or scan the form and attach it to the CMS record when the record is created.
3. Complete the field in CMS asking if the contract has been certified.

1.06.04.03 Executed Contracts

1. Create a contract record in CMS.
2. Include vendor disclosure information in appropriate record fields.
3. Attach scanned Vendor Disclosure Statement form, if applicable (optional but recommended).
4. Begin monitoring of contractor's performance obligations in the contract Statement of Work

1.06.04.04 Multi-year Contracts

Annually On or Before Each 12-month Anniversary of Contract Effective Date:

1. Annual Certification. If using this form, maintain it as part of the official contract file. The form may be scanned and attached to the CMS record when the record is created.
2. Complete recertification fields in CMS.
3. Use of the INTERIM Contractor Performance Evaluation Worksheet is optional. The form is provided as an aid in gathering information in support of contract completion, recertification and vendor evaluation. Project Engineers should incorporate the use of this form (or a similar form) as part of their own contracting process.
4. Assignment of an interim rating at the end of each contract term is recommended. If such rating is assigned, record the interim rating and date the rating was assigned in a CMS Notes field.

1.06.04.05 End of the Full Contract Period

1. Complete the FINAL Contractor Performance Evaluation form.
2. Attach the scanned FINAL Contractor Performance Evaluation form to the CMS record.
3. Send the FINAL Contractor Performance Evaluation form to the contractor for review.

4. Update the CMS record with the contractor's response to its evaluation and rating, if any.
5. Enter the final rating into the appropriate CMS record field.
6. The FINAL Contractor Performance Evaluation form and contractor's response, if any, shall be posted on the public website.

1.06.05 Construction Contracts Equal to or Greater than $500,000**

(**Note that Project Engineers entering into construction contracts with a dollar value over $100,000.00 also must comply with the requirements of the preceding stages.)

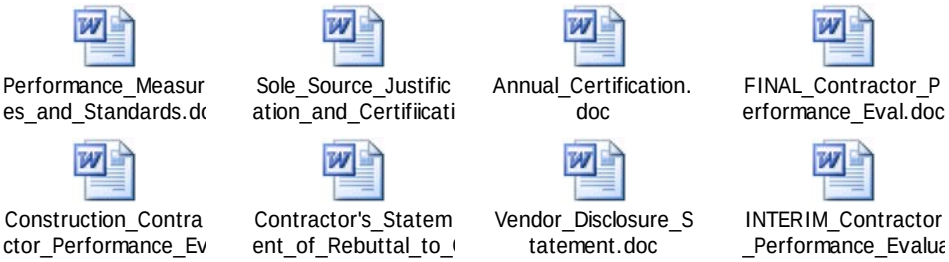
Prior to completion of the construction contract:

1. Complete and sign the Construction Contractor Performance Evaluation Report form.
2. Attach the scanned Construction Contractor Performance Evaluation Report form to the CMS record.
3. Send form to the contractor for review.
4. Update CMS record with the contractor's response to its evaluation and rating, if any.
5. Enter final rating into appropriate CMS record field.

1.06.06 Forms

The eight forms are embedded here for convenience. More recent copies, if any, may be found at:

http://www.colorado.gov/dpa/dfp/sco/contracts/Contract_Administration/WebPages/Current_Processes_&_Forms.htm



1.06.07 Additional References:

1. Colorado's Contract Management System and Vendor Performance Statutes Form Completion - Technical Assistance Guide – May 2010 http://www.colorado.gov/dpa/dfp/sco/contracts/Contract_Administration/Current_Processes_Forms/Technical_Assitance_Guide.pdf

1.07 PRE-CONSTRUCTION PROJECT (OR DESIGN) SCHEDULE

1.07.01 PROJECT MANAGEMENT

Project Management is the discipline of organizing and managing resources in a way that facilitates the successful project delivery within defined scope, quality, time and cost constraints. At CDOT, Project Management responsibilities will be applied in three phases:

1. Phase I: Pre-Project Budget – see Section 1.02
2. Phase II: Design
3. Phase III: Construction (not included in this manual)

A project which is effectively managed has a clearly defined scope and strategy which is well executed, monitored and controlled. In the end, the results meet the anticipations and expectations of the stakeholders.

1.07.02 PROJECT SCHEDULING

Project Scheduling is the task of defining relationships between work activities having duration, events without duration that indicate a significant completion, and milestones that represent major achievements or decision points in a project. Scheduling is an inexact process in that it tries to predict the future. While it may not be possible to predict with certainty the duration of a project, there are techniques that can increase the accuracy of a reasonable timeline estimate. Project schedules are most effective when the project activities are well-defined and appropriately linked.

1.07.03 WORK BREAKDOWN STRUCTURE (WBS)

Within the Project Schedule, the WBS defines and organizes the scope of a project in a hierarchical structure. The hierarchical structure of a WBS includes a list of project activities which are critical to the scheduling, estimating and budgeting processes of Project Management. In order to be included in the WBS, project activities must meet the following criteria:

1. Must have a definable beginning and end,
2. Must have a finite duration, with at least one start and one end date,
3. Must have an associated level of effort,

4. Must have a state of completion that can be estimated and
5. Must have a reviewable deliverable at completion of the task/subtask

1.07.04 PROJECT ACTIVITIES AND RELATIONSHIPS

Project activities are the most detailed element of a project schedule and address the following:

1. Who is going to do the work?
2. When is the work going to be done and how much time will the work require?
3. How much is the work going to cost?
4. How is the work going to be accomplished?

Relationships of project activities must be established within the project schedule so that an order of completion and dependencies on one another are clearly represented.

1.07.05 PROJECT MANAGER

The Project Manager for any given project is responsible for the following:

1. Ensuring that all of the work is being completed on time, within budget and scope, and at the correct performance level.
2. Coordinating staff assignments to ensure work is done in a manner which meets the objectives of the project.

It is recommended that the Project Manager not be assigned to perform the engineering or technical work of a project. Technical work should be the assignment of a project's technical staff. This differentiation is pointed out because when conflicts arise, the technical work typically takes priority and management of the work becomes secondary.

For the purpose of this resource document, a project's technical staff shall refer to those assigned the oversight and/or direct application of engineering principles to a project. Where applicable, a licensed engineer in this capacity shall assume all appropriate professional liability associated with the exercising of engineering decisions. For further information on Professional Engineering responsibilities and/or liability, please refer to CDOT Procedural Directive 508.1 – Professional Engineer's Stamp.

1.07.06 RESIDENT ENGINEER

For the purpose of this resource, the Resident Engineer refers to the supervisor of an engineering staff assigned the task of applying technical expertise to a project from scoping through construction. It is recommended that the Resident Engineer serve as the Project Manager for projects under their direct supervision and be responsible for the successful coordination, oversight and completion of all Project Management-related activities detailed within these guidelines. The Resident Engineer may delegate Project Management activities and tasks, as deemed appropriate, but should retain the appointment as Project Manager and responsibility for their successful completion. The appointment of Project Management responsibilities to any particular person does not transfer license liability which otherwise resides with licensed Professional Engineers involved on a project, i.e. lead designer, construction project engineer, etc. For further information on Professional Engineering responsibilities and/or liability, please refer to CDOT Procedural Directive 508.1 – Professional Engineer's Stamp.

1.07.07 STEPS OF GOOD PROJECT MANAGEMENT

Successful project management relies on the following work processes:

1. INITIATE – Define what is to be done to meet the requirements of the project; Authorize the work on the project; Establish the project team; Define the authority, responsibility, and accountability of the project team; Establish the scope of the project; Communicate with all project team members and Region management personnel, as appropriate; Consider a Team Charter for complicated projects.
2. PLAN – Define what must be done and by whom, how will it be done, when must it be done, how much will it cost and what will be done with it; Establish contingency plans.
3. EXECUTE – Commence performance of the technical work and implementation of the project plan.
4. MONITOR AND CONTROL – Assess the quantity and quality of the work; Comparing where the project is to where it is supposed to be; Taking action to correct for any deviations in the project plan; Perform iterations of Steps 1, 2 and 3, as needed.
5. CLOSE – Identifying lessons learned; Identify pitfalls for future projects; Celebrate your accomplishments.

1.07.08 PITFALLS

By acknowledging lessons learned from others, our transition to a more Project Management-oriented organization can occur more smoothly. Examples of Pitfalls include the following:

1. You cannot control your project if you do not have a plan.
2. Involve the people who must do the work in the development of the plan.
3. Be prepared to revise the plan – the plan WILL change!
4. Do not attempt to serve as a single point of knowledge for the project.
5. Disseminate information…nobody ever complains that they are being told too much, but they usually resent being told too little.
6. Identifying and documenting risks is like putting up lighthouses…fewer shipwrecks.

1.07.09 BASELINE SCHEDULE – (See Section 1.02)

This schedule details anticipated project activities, durations and resource allocations and is developed prior to the commencement of any project activities. At the point of acceptance by all project participants, a finalized version of the baseline schedule is saved by the Resident Engineer and remains unchanged throughout the duration of the project.

1.07.10 WORKING SCHEDULE

This schedule details actual project activities, durations and resource allocations. This schedule is updated regularly by the Resident Engineer and reflects actual progress of work activities throughout the duration of the project. At any time, a comparison may be made between the working and baseline schedules to assess the progress of a project. The Resident Engineer should perform a comparison, at least monthly, to assist with the identification and management of unanticipated obstacles.

1.07.11 WORK-HOUR ESTIMATE – (See Section 1.02)

This estimate details the personnel work-hours projected to complete the project activities reflected in the project schedule. When labor rates are applied, the Work-Hour Estimate represents a significant portion of the Project Estimate. The Work-Hour estimate is required on all projects prior to the obligation of project funds. On projects with consultant contracts, the Work-Hour Estimate along with the Scope of Work should serve as the basis for the negotiation of final work-hours.

1.07.12 PROJECT ESTIMATE – (See Section 1.02)

The Project Estimate is the summary of total costs for a project. This estimate is often broken out into ROW, Utilities, Design, Environmental and Miscellaneous (RUDEM) phases. Additionally, the Project Estimate will include projected costs for Construction of the project. Reasonably accurate Project Estimates are important, as budgets and project limits are often established from them.

A project schedule is prepared to monitor the progress of preconstruction activities and to determine a reasonable date for the advertisement of the project.

The project schedule is developed by the Resident Engineer to monitor important events and activities required to complete the design, right-of-way acquisition, environmental clearances, utility work, and other associated tasks required to finalize design of a project. The Resident Engineer will monitor the schedule to ensure important dates are met to successfully advertise the project.

The Resident Engineer should give priority attention to critical path tasks that often require considerable time such as right-of-way acquisition, complex bridge design, consultant selection, environmental investigations, local agency agreements, utility and railroad agreements, and hazardous materials mitigation.

Microsoft Project is used to establish the project schedule, critical path and milestones. Using Microsoft Project, the Resident Engineer and the Specialty Units can coordinate production milestones for completion of assigned tasks.

The Resident Engineer needs to consider the availability of funds when determining schedules. For example, preliminary engineering should not be started until funds have been budgeted and obligated for the design phase, and a project may not be advertised until funds are available for construction, particularly if federal aid is involved. In addition, local agencies may provide funds and their processes and time constraints for providing these funds have to be considered.

The Resident Engineer will develop the project schedule and coordinate project progress with the project design team and all affected parties. The project team will be informed of activity schedule changes and accomplishments in order to coordinate plan development. Strategies should be developed for resolving critical path activity delays. The Resident Engineer will inform affected parties of any changes to the schedule and adjustment to the advertisement date.

Developing and managing a project schedule includes the following activities:

1. Conduct the project design scoping prior to preliminary design by initiating a Design Scoping Review – See Sections 1.02 and 2.01.
2. Develop a proposed project schedule, preferably within 30 days after the Design Scoping Review.
3. Coordinate, monitor and update the project schedule with other appropriate milestones such as request and receipt of the survey, Field Inspection Review, Final Office Review, and advertisement date.
4. Update any changes to these dates in Microsoft Project.

The project schedule should be saved on a server within the Region or as a shared file on a personal computer so that specialty units and other members of the design project team may review the schedule. Any changes to the schedule or notes to be added should be coordinated through the Resident Engineer.

For Programming and Budgeting of funds refer to Sections 1.02, 1.03 and 1.04:

1.07.13 Additional References:

1. CDOT Procedural Directive 512.1, Project Scoping and the Design Scoping Review (DSR) at the following link: http://intranet/resources/policy-procedure/documents/0512-1/view
2. SAP Workflows at the following site: http://vupweb.dot.state.co.us/gm/folder-1.11.33901?mode=EU
3. OFMB Policy and Procedures Manual - http://intranet.dot.state.co.us/business/ofmb/other/current/ofmb-policy-manual-4-11/view
4. Controlling our Critical Path guide found at the following link: http://www.coloradodot.info/business/designsupport/design-docs/Controlling_Our_Critical_Path.pdf/view

1.08 INNOVATIVE CONTRACTING

Innovative contracting differs from conventional contracting by using alternative techniques to provide CDOT with quality transportation facilities. It is a process of systematic decision-making, risk management, strategy development, and goal identification that creates a competitive procurement environment, which promotes innovation and partnership between CDOT and all others involved.

Innovative contracting, applied successfully, can result in an effective and efficient delivery of programs and projects in less time, with less disruption, at less cost, but without compromising safety and the environment. The needs of CDOT, funding providers, designers, constructors, stakeholders, and end users are all blended into cooperative partnerships focused on meeting or exceeding customer expectations. These aligned efforts are the foundation of Innovative Contracting.

The choices of Program and Project Delivery are varied. To assist in making these choices, consideration should be given to: identifying and defining the complexity of the program or project; the program or project goals; the allocation of risk; the availability of funding; the capability and experience of contractors, and CDOT's ability to develop, implement and manage the contract.

The assignment of risk between CDOT and the Contractor will assist in determining which option or provision is best suited for use with a program or project. Low risk allocation to CDOT may equate to a high risk allocation to the contractor, and vice versa. Understanding which risks can and must be controlled by CDOT, and which risks can and should be shared with the contractor, will result in an efficient and effective bid package, a competitive bidding environment, and overall lower costs. The CDOT Innovative Contracting Staff is available to assist with determining the best Project Delivery method for your project and should be contacted anytime innovative contracting is considered.

The four major categories of Innovative Contracting include:

1. Project Delivery Methods (Design-Build, Modified Design-Build, CMGC, etc…),
2. Procurement Methods (A+B, Multiple Bid Schedule, Alternate Bid Schedule, etc…),
3. Contracting Methods (Phase Funding, Lump Sum Contracts, Value Engineering), and
4. Contract Management Techniques (Lane Rentals, Incentives/Disincentives, Liquidated Savings).

All CDOT Projects using any Innovative Contracting technique are currently tracked in SAP. When the project is created or under design, the innovated contracting methods are to be populated in CJ20N under the PM tab. During the 1180 workflow, there is another screen that asks for this information again. In addition, all Resident Engineers should report any innovative contracting technique to the appropriate entity, as described in the "Reporting" Section in the CDOT Innovative Contracting Manual and to the Engineering Estimates and Market Analysis Unit early in design development.

For further information regarding CDOT Innovative Contracting techniques, please refer to the CDOT Innovative Contracting Guidelines, and the CDOT Design-Build Manual.

Additional References:

1. CDOT Design-Build Manual
2. CDOT Innovative Contracting Guidelines
3. CDOT Innovative Contracting Website http://www.coloradodot.info/business/designsupport/innovative-contracting-and-design-build
4. Policy Memo 21 Guidelines for Ensuring Bidding Competition, March 11, 2010

1.09 ENTITY AGREEMENT (LOCAL AGENCY, INTER-GOVERNMENTAL, INTER-AGENCY, PUBLIC/PRIVATE)

An entity agreement is required when CDOT and an entity have a shared interest in a transportation project. The entity agreement identifies the responsibilities of every party and their respective financial contributions. The agreement enables the transferring of funds between CDOT and the entity. The term "entity," as used here, refers to a public agency, local public agency, established publicly owned organization or private interest that can legally enter into an agreement with CDOT for a transportation project.

The following definitions apply:

Local Public Agency

Local Public Agency is any city, county, township, municipality, or other political subdivision that is empowered to cooperate with CDOT in transportation matters. This is usually referred to as a local agency. An agreement between CDOT and a city or county is entered into when a project is within a local public agencies jurisdiction and CDOT administers the federal-state funding. When the entity is a local public agency, the CDOT Colorado Local Agency program guidelines apply. (See the CDOT Local Agency Manual: http://www.coloradodot.info/business/designsupport/bulletins_manuals/2006-local-agency-manual .)

Public Agency

Public Agency is any organization with administrative or functional responsibilities directly or indirectly affiliated with a national, state or local jurisdiction. CDOT may enter into an agreement with another state agency, a federal agency such as the National Forest Service, or a regional agency such as the Denver Regional Council of Governments.

Public Owned Organization

Public Owned Organization is a company, corporation, or enterprise that has publicly traded stock; this could include utilities, railroads, or any other public company. CDOT may enter into these agreements to relocate utilities and railroads, and for projects such as a bicycle path in railroad right of way. A public company may contribute funds to transportation projects.

Private Interest

Private Interest is a privately held company, landowner, or developer. CDOT

may enter into an agreement with a private interest to provide improved access to a state highway and as part of local development plans.

The Resident Engineer should work with the entity to determine the parameters of an appropriate agreement whenever an entity or public agency needs to:

1. Maintain or construct a project affecting the State Highway System;
2. Provide funds for such a project; or
3. Address other interests that require the entity to coordinate with CDOT on such a project.

The Agreements Program in the Contracts and Market Analysis Branch is responsible for the execution of an agreement between CDOT and an entity or public agency except for the following types of agreements:

1. Railroad and utility agreements (which are done by the Utilities and Railroad Programs in the Safety and Traffic Engineering Branch)
2. Safety grant contracts (which are done by the Safety, Planning and Grants unit, also in the Safety and Traffic Engineering Branch)
3. Right of Way agreements (which are done by the Regional Right of Way Unit, often as part of a larger document such as an Inter-Governmental Agreement (IGA).

If there will be utility involvement (i.e., the relocation of existing facilities or the installation of new services) the Resident Engineer must coordinate with the Region Utilities Engineer to determine if any contracts may be required, and to initiate contract development.

In general, a separate contract with each involved utility will be required for any work by the utility for which CDOT repays the utility, or for utility work incorporated into the project for which the utility repays the project. The Region Utilities Engineer, in consultation with the Resident Engineer, negotiates an appropriate agreement with the utility and processes that agreement for approval via Agreements Program personnel. All required utility agreements should be in place prior to the project being advertised for construction. Copies of utility agreements are on file with the Resident Engineer, Region Utilities Engineer, Region Business Office, and Records Management in the Administrative Service Center.

The following steps for implementing an original entity agreement or an amendment to an entity agreement for a transportation project are performed by the Agreements Program personnel unless otherwise noted:

1. Ensure that the proposed entity agreement is consistent with CDOT's Long-Range Plan, State-wide Transportation Improvement Program (STIP), the CDOT budget, and the Obligation Plan. (Program Engineer, Resident Engineer and Business Office).
2. Determine division of work responsibilities for the project (Resident Engineer and entity representative)
3. Prepare and transmit to the Agreements Program a contract request, including budget, encumbrance, scope of work (e.g., Form 463), preconstruction checklist, and construction list (Resident Engineer in coordination with Region Business Office).
4. Review and analyze contract request, prepare draft contract, and forward draft to Region
5. Review and comment on contract draft (Resident Engineer in coordination with Region Business Office)
6. Send final draft copies to the entity (in coordination with the Region Business Office)
7. Revise final draft, if requested and, as appropriate, to address entity concerns (in coordination with the Resident Engineer, Region Business Office, and the Attorney General, as needed)
8. Check local agency resolution or other authorization document to ensure funding commitment and signature authority
9. Route the entity-signed contract copies for execution.
10. Distribute executed contract (Procurement and Region Business Office)
11. Issue Notice to Proceed to entity (Agreements Program personnel).

The Agreements Program is also responsible to review entity-consultant selection processes and contracts and entity-contractor bids for compliance with federal aid funding requirements. The review process must occur before any of the following take place: (1) an entity-consultant selection is advertised; (2) an entity-consultant agreement is executed; and (3) an entity-contractor bid is awarded. The steps in this review process are:

1. For consultant selections: Prior to the selection, the entity shall submit its consultant-selection procedures and the proposed consultant contract to the Agreements Program (entity in coordination with the Resident Engineer). (Currently Jefferson County and Denver consultant procurement procedures have been approved by CDOT under the Local Agency Certification Acceptance process and do not need review).
2. For contractor selections: Prior to the advertisement, the entity shall submit its bid procedures to the Region, which may at its discretion, forward it to the Agreements Program for review. Prior to the award, the bid results, a financial

statement, and all required bid forms from the low bidder must be sent to the Agreements Program with a request for concurrence in award (entity in coordination with the Resident Engineer)

3. Review and analyze the entity's submissions.
4. Send the entity either notice of approval of the entity's submissions or send the entity advice on the required revisions to bring the submissions into compliance with the federal aid funding guidelines.

1.10 PROJECT DELIVERY METHODS

CDOT projects are typically delivered using a Design-Bid-Build approach, where CDOT defines the scope and requirements of a construction project by fully completing design documents, either in-house, or with the assistance of design consultants. A construction contractor is then selected to build the project using a low-bid process. In Design-Bid-Build, CDOT retains most of the risks, and very few risks are transferred to the contractor.

CDOT projects can also be delivered using innovative project delivery methods such as Design-Build, Modified Design-Build, Construction Manager/General Contractor (CMGC), or Public Private Partnerships (PPPs). All these methods are approved for use by Federal Regulations, State Statutes, and CDOT policies and procedures (See CDOT Innovative Contracting Guidelines and CDOT Design-Build Manual).

In Design-Build, CDOT defines clear project scope and requirements through initial design documentation, and then procures both the final design and the construction through the evaluation of technical proposals, price, or both. The project is typically procured using a two phase process by producing Request for Qualifications (RFQ), and Request for Proposal (RFP) documents. The project is awarded using a Best Value process, where price and other factors are considered. Some of these other factors may include schedule, past performance, qualifications, project scope, project approach, design alternatives, innovations, aesthetics, and quality management plan.

Design-Build projects can significantly vary in the amount of design included in the RFP and risks allocated to the design-build team, but the key element in each project is a single source of responsibility for CDOT through one contract for both the design and the construction. The major advantages for using Design-Build are better risk mitigation, and shortening the project delivery schedule by overlapping the project design phase with the project construction phase.

In Construction Manager/General Contractor (CMGC), CDOT executes two separate contracts: one with a design consultant and one with a Construction Manager who also takes the role of a General Contractor. The design consultant is selected using normal CDOT consultant selection procedures. CDOT awards the CMGC contract to the CM firm based on Best Value. The responsibility of reviewing the design for constructability, administering the construction contract, and executing the work is transferred to the CM firm for a guaranteed maximum price. The CM firm works with the design consultant to ensure innovation, cost savings, and a reduced delivery schedule. CDOT does have flexibility with design staffing when using the CMGC delivery method. CDOT can use in-

house staff for the design, a hybrid of consultant and in-house staff, or utilize a consultant for the entire design. It is recommended that the overall project manager not be the designer to ensure an objective role in the decisions that are made and the direction of the project.

The use of CMGC requires SEP-14 approval from FHWA headquarters. CDOT currently has a programmatic SEP-14 agreement with FHWA for eight projects that could be expanded through the Project Development Branch.

In Public Private Partnerships (PPPs), CDOT executes contracts with private entities or developers to design, construct, operate, maintain, and finance large-scale transportation projects in return for monetary compensation derived from the transportation improvement(s). CDOT typically utilizes a two phase Design-Build process to award PPPs. Solicited PPPs are preferred by CDOT, as opposed to un-solicited PPPs because they provide CDOT with improved levels of risk management, contract negotiation, and Best Value determination.

Additional References:

1. CDOT Design-Build Manual (2006)
2. CDOT Innovative Contracting Guidelines (2006)
3. CDOT Innovative Contracting website: http://www.coloradodot.info/business/designsupport/innovative-contracting-and-design-build
4. CDOT Policy Directive 504.0
5. 2 CCR 601-15 Rules to Establish Requirements for Procurement by CDOT of Design-Build Contracts for Transportation Projects
6. 23 CFR Part 636

1.11 FORCE ACCOUNT CONSTRUCTION METHOD (FORM 895)

The term “Force Account Construction Method” refers to construction work a public agency performs on federal or state funded projects using its own forces. Specifically, it means the direct performance of highway construction work by the Department, local entity, county, railroad, public utility company, or other agency by use of labor, equipment, materials, and supplies furnished by the agency and used under its contract terms (23 CFR part 635.203(c)). This Section does not apply to Planned Force Account items of work as defined in CDOT’s Standard Specifications.

Competitive bidding is specifically required by title 23 USC 112. Waiving the requirements should be done only after careful consideration of the effect or precedent that will be set. Projects may be entirely or partially constructed by the force account method only when it is determined that the needs of the public will be better met by not following the general rules.

If circumstances justify a negotiated contract or another unusual method of construction, the policies and procedures prescribed herein for the force account construction method apply.

A Finding in the Public Interest (FIPI) fully justifying the use of the force account construction method must be prepared and documented on Form 895, Force Account Construction Method - Finding in the Public Interest. All supporting documentation must be attached.

The force account construction method may be justified on a federal or state funded project under any one of the following conditions:

1. Emergency work, as defined in Section 120.8 of CDOT's Construction Manual, is necessary to protect public health and safety, or a major element or segment of a highway or roadway has failed, and competitive bidding is impossible or impractical. Competitive bidding may be precluded because immediate action is necessary to minimize the extent of the damage, to protect remaining facilities, or to restore essential travel as provided in 23CFR 635.204(b).
2. The inherent nature of the operation makes it cost effective to perform minor adjustments (as determined by the railroad or utility) of railroad and utility facilities by the force account construction method, while the majority of work is performed by competitive bid. See 23CFR 635.205(b).

3. It is cost effective to perform work that is incidental to the main purpose of the project by the force account construction method. The majority of work is still accomplished by competitive bidding.
4. It is cost effective to perform the work by the force account construction method and the agency demonstrates that the circumstances are unusual and unlikely to recur.
5. The construction contract value is under $50,000, and does not justify the costs associated with the competitive bidding process; or there is a lack of bids, or the bids received are unreasonable.

When the force account construction method is considered it must be justified by a cost effectiveness determination that shows a substantial savings over estimated contract prices.

1. The cost effectiveness determination should compare the detailed cost estimate for work by the force account construction method with the detailed cost estimate of work by the competitive bid method of construction. The estimates for both shall be all inclusive so a fair and equal comparison can be made.
2. The public agency estimate for the force account construction method must include all costs associated with the work and not just the work that will be billed to the project. These costs include non-reimbursable costs that are inherent to the work including labor, overhead, equipment, materials, and supplies.
3. The cost effectiveness determination may be based on unit prices, including all engineering and administrative costs. Unit prices must be based on the cost of performing the work. If the public agency has no set rates for its equipment, it may use the current rental rates specified in subsection 109.04(c) of CDOT's Standard Specifications.
4. The cost effectiveness determination must include the overhead costs incurred by the public agency (employee wages, benefits, and equipment costs) and other items subsidized by the taxpayer.
5. To perform work by the force account construction method, the public agency must be adequately staffed and suitably equipped to perform the work cost effectively in the prescribed time.

The following items of documentation, when used to justify the use of force account construction methods by a public agency, must be retained in the project files:

1. Form 895.
2. Cost effectiveness determination.
3. Evaluation that demonstrates the circumstances are unusual and unlikely to recur.
4. Documentation of the emergency.
5. Documentation demonstrating a lack of bids or bids received were unreasonable.

The Region administration process for the force account construction method includes the following procedures.

1. The Region investigates the public agency's request to use the force account construction method.
2. The public agency Project Manager completes a Form 463 that clearly indicates the method used.
3. The Region Program Engineer certifies that the public agency is capable of administering and performing the specified work and assembles the supporting documentation listed on Form 895.
4. The public agency prepares a set of plans. The minimum plans consist of:
   a. General plan sheets (typical sections, plan and profile) as applicable.
   b. Estimate of quantities (summary of quantities).
   c. Tabulation of bid items, general notes, description of project work type, and location (map).
   d. Special details, as required.
   e. Special Provisions, as required.
5. The public agency obtains all required clearances and permits as applicable on Form 1048, Project Scoping/Clearance record.
6. SAP shall show that the project will be constructed by the force account construction method, whether state forces or a local agency does the work.
7. CDOT's Office of Financial Management and Budget (OFMB) completes Form 418 after receipt of the signed Form 1180. Obligation must be requested and approved through SAP. For federal aid projects, Form 418 is used to obtain obligation/authorization approval for the construction phase from FHWA.
8. For projects that do not go through the CDOT bid process, the Region issues a Notice to Proceed only when all of the following are complete:
   a. All documentation justifying the force account construction method is complete.
   b. Plans are complete and approved by the Resident Engineer.
   c. Obligation authority and funding are cleared by the Resident Engineer.

   A copy of the Notice to Proceed must be sent to OFMB and Projects and Grants for CDOT to authorize expenditures for the construction phase.

Blanket approval under force account is given to state forces (with a current limit of $5,000) for certain advance construction signing, temporary construction striping, permanent signing, and permanent striping, all of which have an existing blanket FHWA approval.

Additional References:

1. 23 CFR Part 635B, Force Account Construction
2. CDOT Policy Directive 387.0, Construction by Public Agencies
3. For forms, see CDOT on-line forms library
   http://www.coloradodot.info/library/forms

1.12 CONSOLIDATED PROJECTS

Construction projects conceived independently of one another and having different types of work or funding may be consolidated into a single project for the purpose of bid and award of the construction work and to allow for more efficient construction management. In 1990, the Federal Highway Administration (FHWA) and CDOT agreed to eliminate the combination process (i.e., two separate project numbers advertised together). Trns*port allows for consolidation of projects, which was found to be a more efficient way of managing the project. It should also be noted that SiteManager® does not handle combination projects. (SiteManager is a registered trademark of the American Association of State Highway and Transportation Officials.)

Consolidated projects are used to:

1. Increase the total construction bid amount of small projects (less than $100,000) to allow more interest for contractor bids.
2. Place multiple or sequenced projects under the control of a single general contractor for considerations such as traffic control, scheduling, decreased mobilization costs, and remote locations.

Consolidation allows for construction of a project that is beneficial to several entities with multiple, varied funding sources. Projects are best consolidated early in the design phase. In some cases, it may be appropriate to consolidate construction projects later in the development process; however, this involves additional steps and approvals and may delay the project. The consolidation must be completed prior to the project being advertised for bids.

Plans, specifications and estimates shall be prepared under a single project number. When federal funds contribute to a consolidated project or design is done with federal funds, federal rules and regulations apply to the entire project.

All proposals submitted must be prepared under a single project number, including single bid quantities and single pay estimate of quantities. All funding sources are commingled and each funding source participates at the authorized prorata. Consolidation of construction projects may be more efficient due to lower engineering and administration costs as a percentage of total project costs.

Pay quantities and tabulations can be accumulated and reported at the project level rather than at the component project level. Trns*port allows for the items to be identified in multiple ways:

1. Pay items can be billed and paid using a common proportion of federal, state, and local funds regardless of location within the project, using an agreed upon percentage split.
2. The pay items can also be isolated by category, each category is then capable of unique funding.
3. Individual items can be isolated and funded uniquely.

The Resident Engineer will initiate the appropriate budget requests for funding distribution in SAP to consolidate funds. A Form 950, Project Closure, should be prepared in SAP for closing a project being absorbed in consolidation. Closure should be coordinated with the Business Office.

Additional References:

1. 23 CFR Part 635.111, Tied Bids
2. CDOT Trns*Port Client-server
3. CDOT Trns*Port PES/LAS manual
4. Pay Estimates: http://www.coloradodot.info/business/payestimates
5. For forms, see CDOT on-line forms library
   http://www.coloradodot.info/library/forms

1.13 SIGNATURE PROJECTS

A Signature Project is one that has a complex feature that is unique or different from most CDOT projects. The complex feature requires extra consideration by CDOT when estimating the project and by bidders when bidding the project. The size of a project should not be a factor in its designation as a signature project, only its complexity. Aspects to consider in determining this designation include, design features, constructability, and innovative delivery methods. Few CDOT projects require this designation.

The Region Program and Resident Engineers are responsible for designating Signature Projects. The following criteria should be considered in their determination:

1. Will there be less than 8 hours of productive work time each day?
2. Will there be significant work outside normal work hours?
3. Will the use of state of the art technology be required?
4. Is current cost comparison data unavailable?
5. Will an alternative bid method be used? Examples are:
    a. Cost + Time
    b. Modified Design Build
    c. Alternate Bridge Design
    d. Multiple Bid Schedules
6. Will there be unusual or limited access to the work site (e.g. tunnel, mountain pass)?
7. Will Escrow of Proposal Documents be required?

The Region Program and Resident Engineers should use engineering judgment in designating Signature Projects. The existence of one or two of the triggers identified above does not automatically require the project to be designated as a Signature Project. It is the region's responsibility to make an informed determination when considering this classification.

Signature Projects shall be so designated by the Resident Engineer in a memo to the project file. A copy of the memo shall be e-mailed to the Program Engineer and the Engineering Estimates Program Manager.

A constructability review should be conducted by the region to define risks and potential costs associated with the project. The constructability review should include members of the contracting community and occur shortly after the Field Inspection Review stage of design (See Section 2.18).

A Value Engineering (VE) analysis is required for federally funded projects over $40 million. A VE analysis often leads to money and time savings, a more constructible project, and lower impacts to the traveling public. Although not required for projects under $40 million, it is a good practice to perform a VE on projects that have complexities, or elements that may benefit from a VE analysis. Examples are projects that have major structures, complex design or construction, challenging constraints, difficult technical issues, external influences and unique or complicated functional requirements, competing community and stakeholder objectives, etc. (See Section 2.15.)

A minimum advertisement period of five weeks should be used. During the minimum 5 week ad, bidders shall be required to have a project showing within the first 3 weeks after advertisement. During the showing the bidder may ask questions with regard to the plans and the project. Those questions should be handled according to section 102.5.2 of the Construction Manual. The longer advertisement time should allow CDOT enough time to summarize the questions from the showings, identify any areas of concern, and prepare answers to the questions. If possible, the summary should include questions asked subsequent to the showings. The Engineering Estimates Program Manager should be invited to the project showings.

Additional References:

1. CDOT Construction Manual

1.14 *FASTER* BRIDGE ENTERPRISE PROJECTS

1.14.01 Background

Legislation titled “Funding Advancements for Surface Transportation and Economic Recovery” (FASTER) was enacted in 2009 to increase the state’s ability to improve structures and roadway safety in Colorado.

A major component of the bill was the creation of the Bridge Enterprise (BE). The term Enterprise means “a nonprofit entity that dedicates derived funding specifically to the functions of the enterprise.” A key point: these Bridge Enterprise funds are not directed to CDOT, but to the Bridge Enterprise. This funding goes specifically to the replacement, rehabilitation, repair, and maintenance of eligible structures in the State of Colorado.

According to the legislation, structures that are structurally deficient or functionally obsolete and have been designated as poor by the Department are eligible for transfer to the BE. Every year the list of bridges meeting this eligibility requirement will change.

To prevent these funds from being included in the calculation of the State’s funding limits established by the TABOR legislation, structures must be transferred as assets from CDOT to the BE, and the funds used for these bridges must be tracked separately. Generally State funds are not to be used for these bridges in order to protect the enterprise status of the BE. The statutes allow federal funds and a small amount of state funds to be used for the BE, and occasionally OFMB may elect to use this small allowance of State funds. For project planning purposes it should be assumed that CDOT or Local Agency funds cannot be used for bridges transferred to the BE without an additional project set up in combination with the BE project.

1.14.02 Bridge Enterprise Projects

A Bridge Enterprise project must meet specific criteria and any increase to the cost of the project or additional type of funding must be approved by the Bridge Enterprise Board before moving forward. Funding for a Bridge Enterprise project can be either FASTER Bridge funds only, or may have a combination of Federal Bridge and FASTER bridge funds included. The Bridge Enterprise Board will indicate what type and the amount of funding is approved for the project.

1.14.03 Scope for a Bridge Enterprise Funded Project

Projects that will use the FASTER bridge funds need to have the scope of the project for any non-bridge work limited to work that is necessary to replace or rehabilitate the bridge and bring the bridge up to current roadway and structural standards. This may include portions of roadway approaches that require work to facilitate the bridge rehabilitation or replacement.

Restrict the scope of the Bridge Enterprise Project to that of replacing the bridge and the approaches as needed to replace or rehabilitate the bridge. Avoid increasing the project scope during the project development process. Such a change in scope may cause the need for additional funds, a different type of funding, or both for the project.

1.14.04 Adding a Non Bridge Enterprise Related Type of Funding

The method to develop, advertise and construct a project with a combination of BE and CDOT roadway funds is laid out in Design Bulletin 2010-8, Combined BE and CDOT funded projects.

When considering the scope and requirements of a Bridge Enterprise Project, keep in mind that adding another type of funding from either a Local Agency or CDOT roadway funds, will increase the complexity and difficulty of the project dramatically.

1.14.05 Federal Participation on the Bonding Process (Fund 542)

A quick discussion on the Federal participation for the BE Binding is as follows. The FHWA chose to participate in the Bridge Enterprise Bonding process with a $20 million dollar annual contribution with the intent to cover a portion of the annual debt services to bond the money. That $20 million dollar contribution allowed the BE bonds to get a better interest rate since on the Bond market due to the FHWA involvement in the funding process.

That $20 million dollar annual contribution requires the BE bonded projects to be treated as federal participation. Generally that means these BE projects are required to follow the 1180 process and the stewardship agreement for the administration of the project. Generally for the advertisement process, it means the FHWA obligation to participate on the projects must be completed and the purchase requisition for the project needs to be created as federally participating. Examples will follow:

1.14.06 Critical Differences between CDOT Projects and BE Projects

Funds used for the Bridge Enterprise are not the same as CDOT projects and have unique conditions and categories. Here are some of the main differences that need to be kept in mind.

1.14.06.01 Significant Differences in SAP

1. Fund Numbers 538, 540 or 542 are the fund types for Bridge Enterprise. The typical value for the fund center is 400 for CDOT projects
2. Project Prefix: FBR is correct for Bridge Enterprise projects
3. Org Group: B8800-538 is the Responsible Cost Center for BE projects
4. Profit Center 5000-538 instead of the normal CDOT value 5000-010
5. Investment Profile is Z00992 instead of the normal CDOT value of Z00990
6. Unlike typical CDOT projects, budget actions for funding BE projects will completed by OFMB at Headquarters rather than at the regional level.

1.14.06.02 Purchase Requisitions

1. Release Strategy: Bridge Enterprise PR releases are available for all Program Engineers statewide to complete. They are also available for all Business Office managers to complete for the second required release. The intent is still for the responsible region to approve their own regional Purchase Requisitions.
2. Plant: 7001 is always used for Bridge Enterprise projects rather than your regional plant designation.

1.14.06.03 Assets for Bridge Enterprise Projects:

A difference with the Bridge Enterprise is that once the existing bridge is transferred to the Bridge Enterprise, the existing bridge and any new bridge resulting from replacement, become assets of the Bridge Enterprise not CDOT. Existing bridges must be transferred to the Bridge Enterprise before any Bridge Enterprise funds are used for design or construction.

1.14.06.04 CE Pool Exempt:

Because the construction cost for these projects must be kept separate from normal CDOT funds, the CDOT CE Pools cannot be used to fund the Construction engineering costs of the BE projects.

1.14.06.05 CDOT Indirects

CDOT Indirects charges will still be collected at the current rate for CDOT staff working on BE projects. Those indirects will be applied for any payroll charges or consultant task orders used.

1.14.06.06 PES TRNS•PORT categories differences:

Different standard categories will be used in TRNS•PORT to identify and separate BE items from typical CDOT funded sources. Category examples are shown below:

	Bridge Enterprise Items	**All Other**
Roadway	0250, 0251	0200
Single Bridge	0350	0300
Multiple Bridges	0351, 0352, etc.	0301, 0302, etc.
Construction Engineering Bid Items	0450	0400
Indirects	1125	1100

1.14.07 Technical Bridge Enterprise Requirements

1.14.07.01 Creation in SAP

There are significant differences in the process of adding the WBS structure for a BE project. Please use the following link to SAP Work Instructions to add the standard template for a BE project.

BE%20Template%20WI.pdf

1. The first key step is Step 5 in the work instructions which requires the Profit Center Field at the project definition level to be changed from the normal value of 5000-010 to the BE value of 5000-538 (See Figure 1-3). That change will propagate the correct profit center throughout the template after the new template is added.

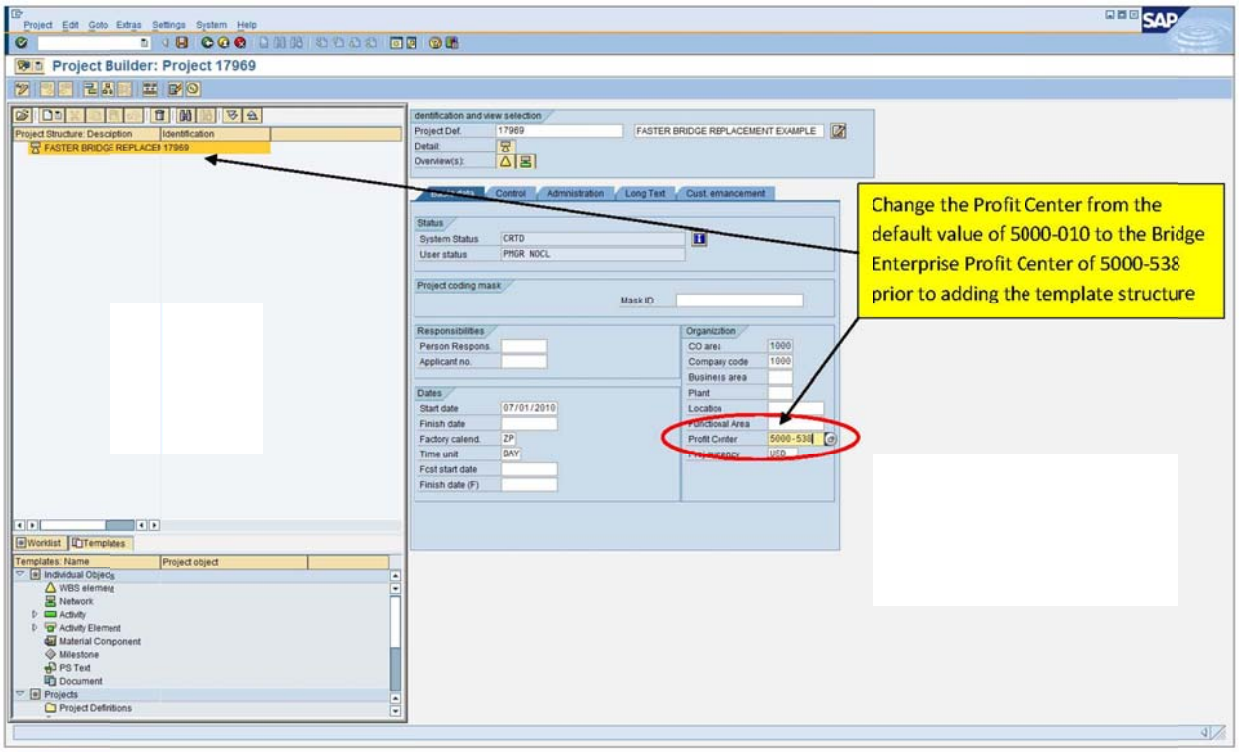


Figure 1-3
Profit Center Value

2. The second key step is Step 17 in the work instructions which requires the Responsible Cost Center to be entered as B8800-538 instead of the typical RE Org code (R5112-010 for example). (See Figure 1-4.) This will ensure billings against the project are billed against the BE group and not CDOT cost centers.

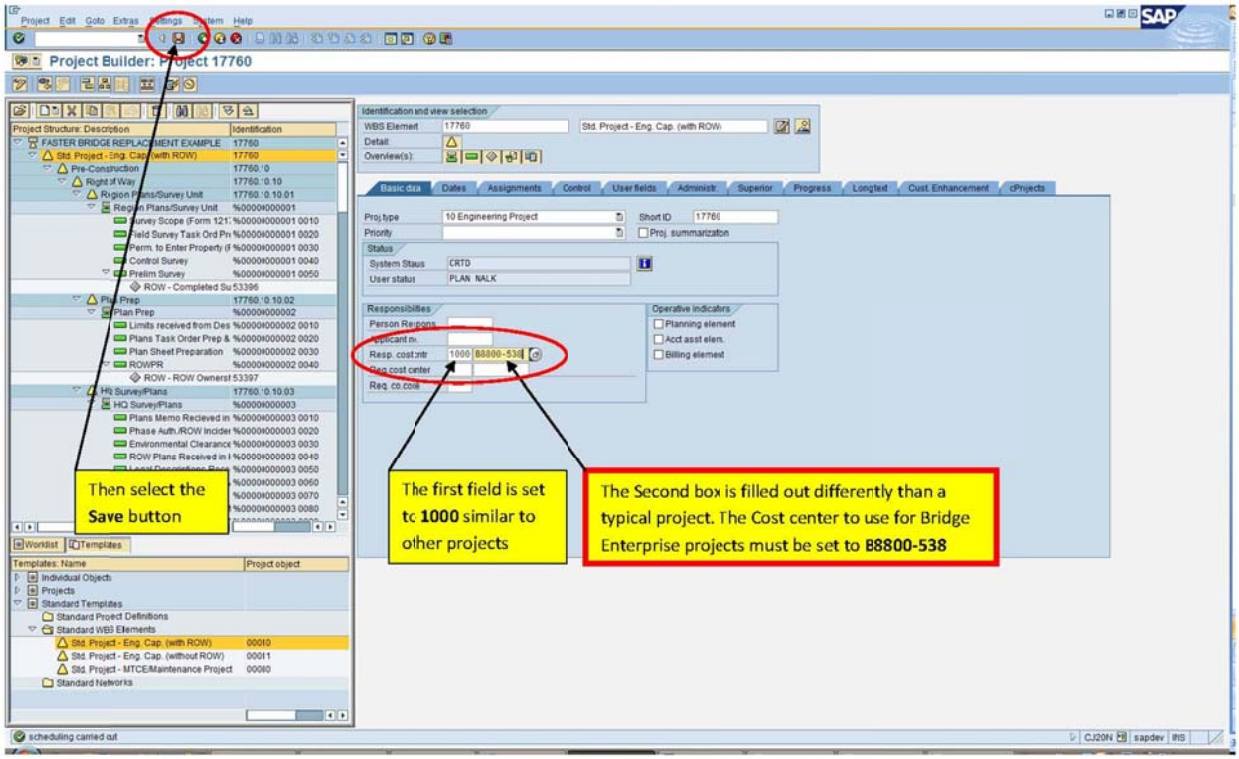


Figure 1-4
Responsible Cost Center

3. It is highly recommended that the Resident Engineers have the business office review the project template before “releasing” the template structure in CJ20N. If it is released and it is not correct, a new project would need to be created with the correct template set up structure for a BE project for the project to get processed correctly as a BE project. Review the following Resource Guide (See Figure 1-5, pages 1 through 6) on what to check for prior to releasing the BE template structure in CJ20N.

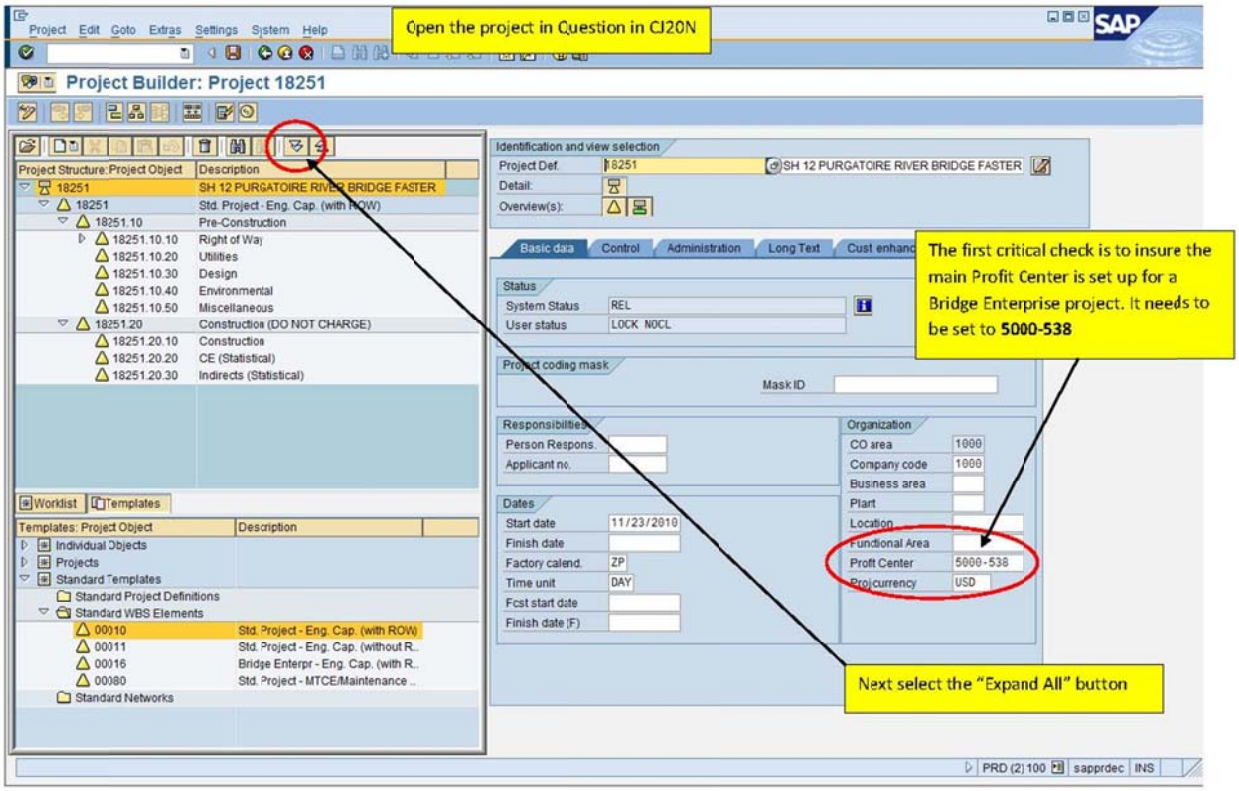


Figure 1-5, Page 1 of 6
BE Project Resource Guide

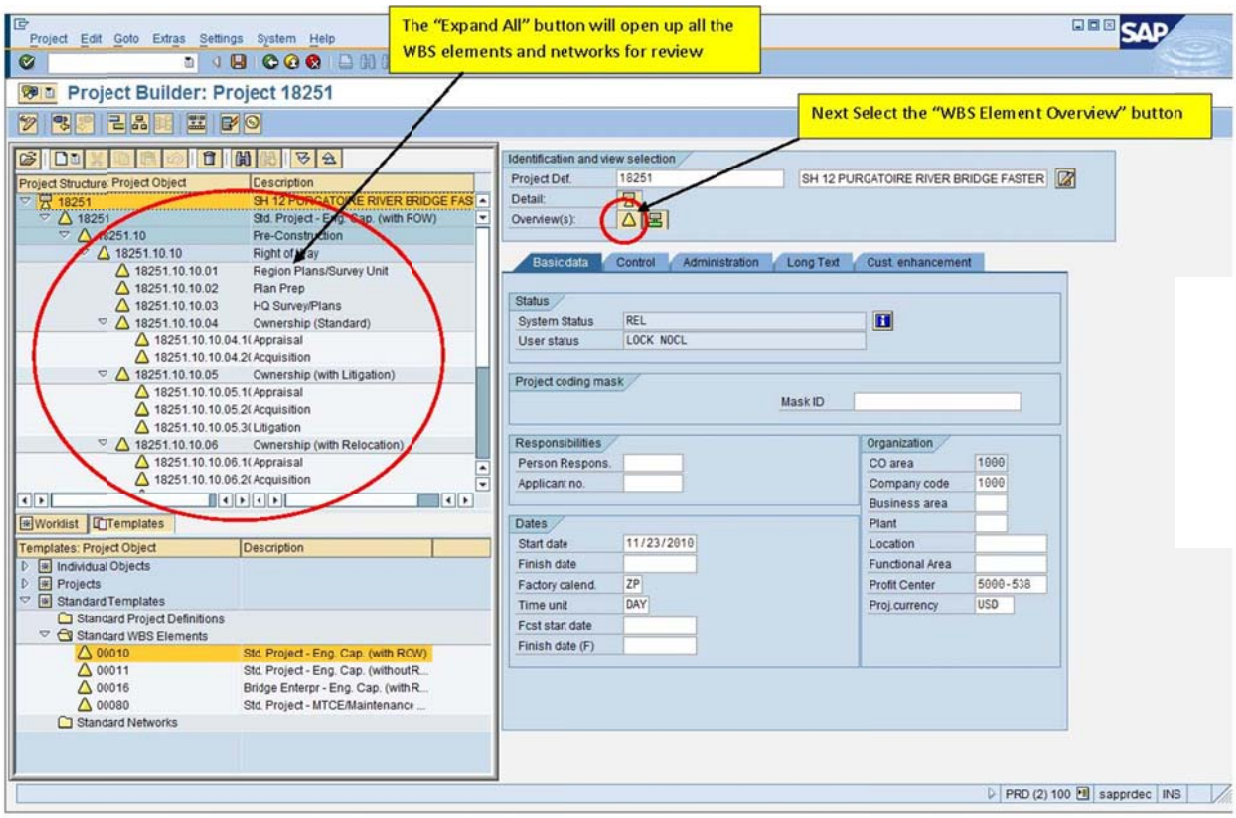


Figure 1-5, Page 2 of 6
BE Project Resource Guide

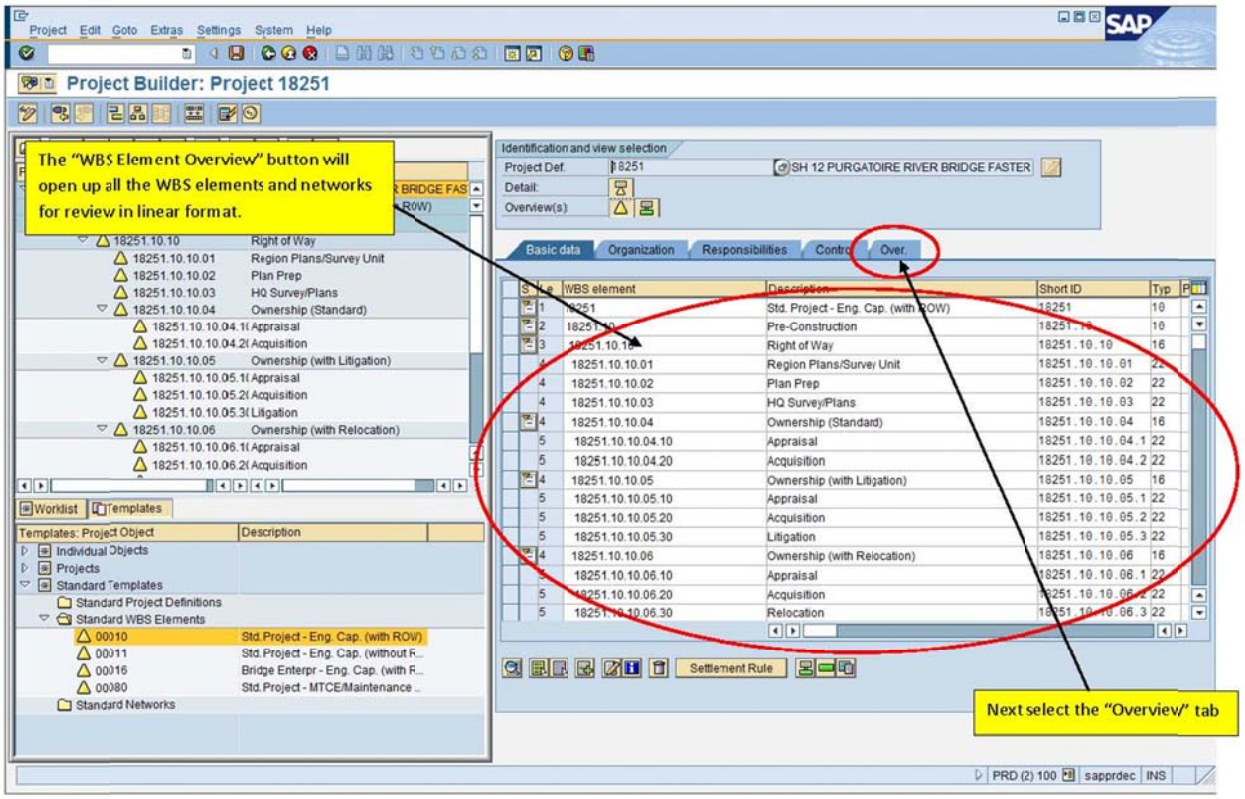


Figure 1-5, Page 3 of 6
BE Project Resource Guide

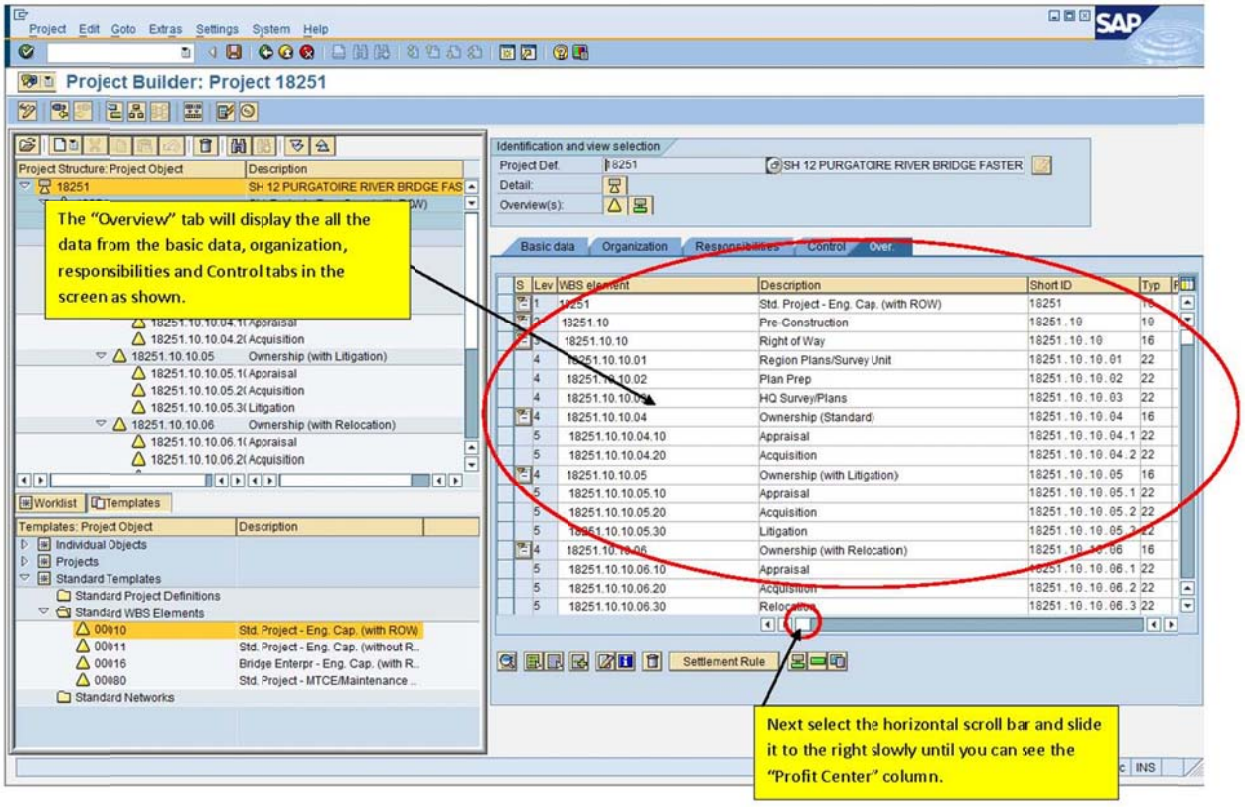


Figure 1-5, Page 4 of 6
BE Project Resource Guide

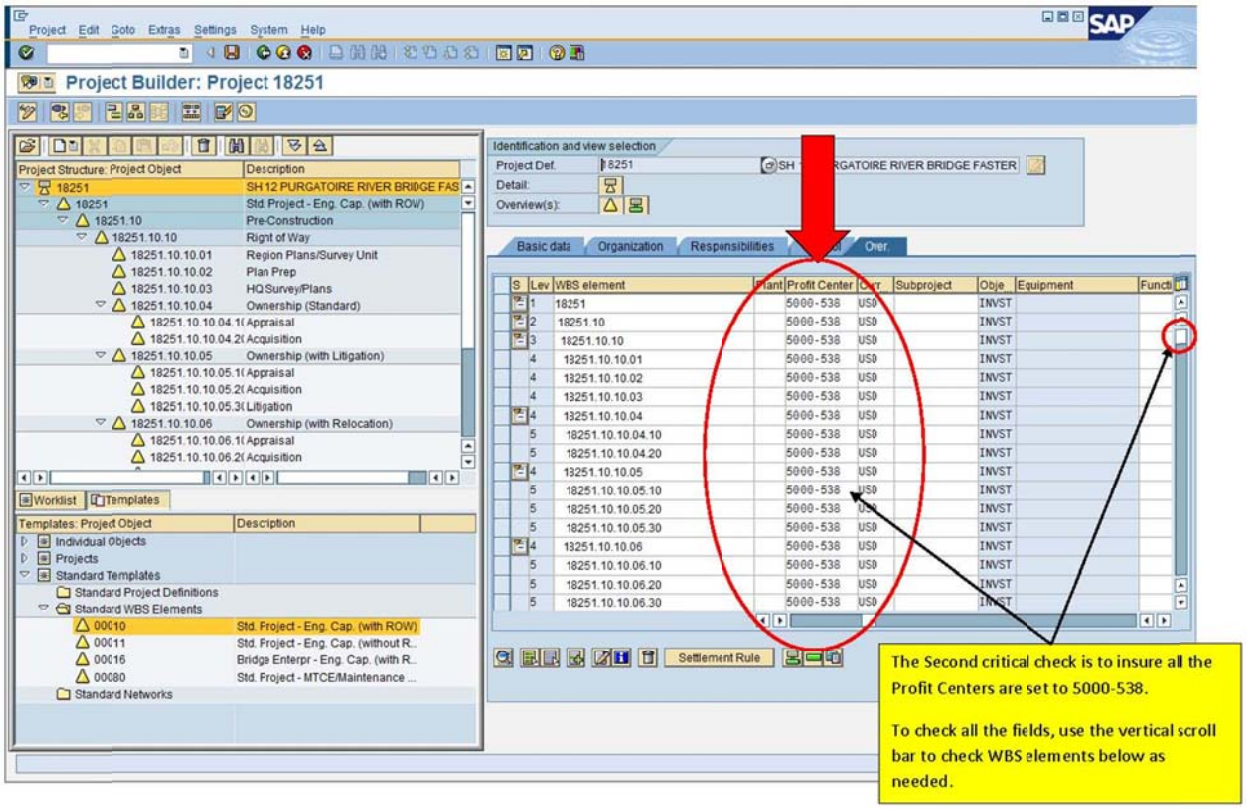


Figure 1-5, Page 5 of 6
BE Project Resource Guide

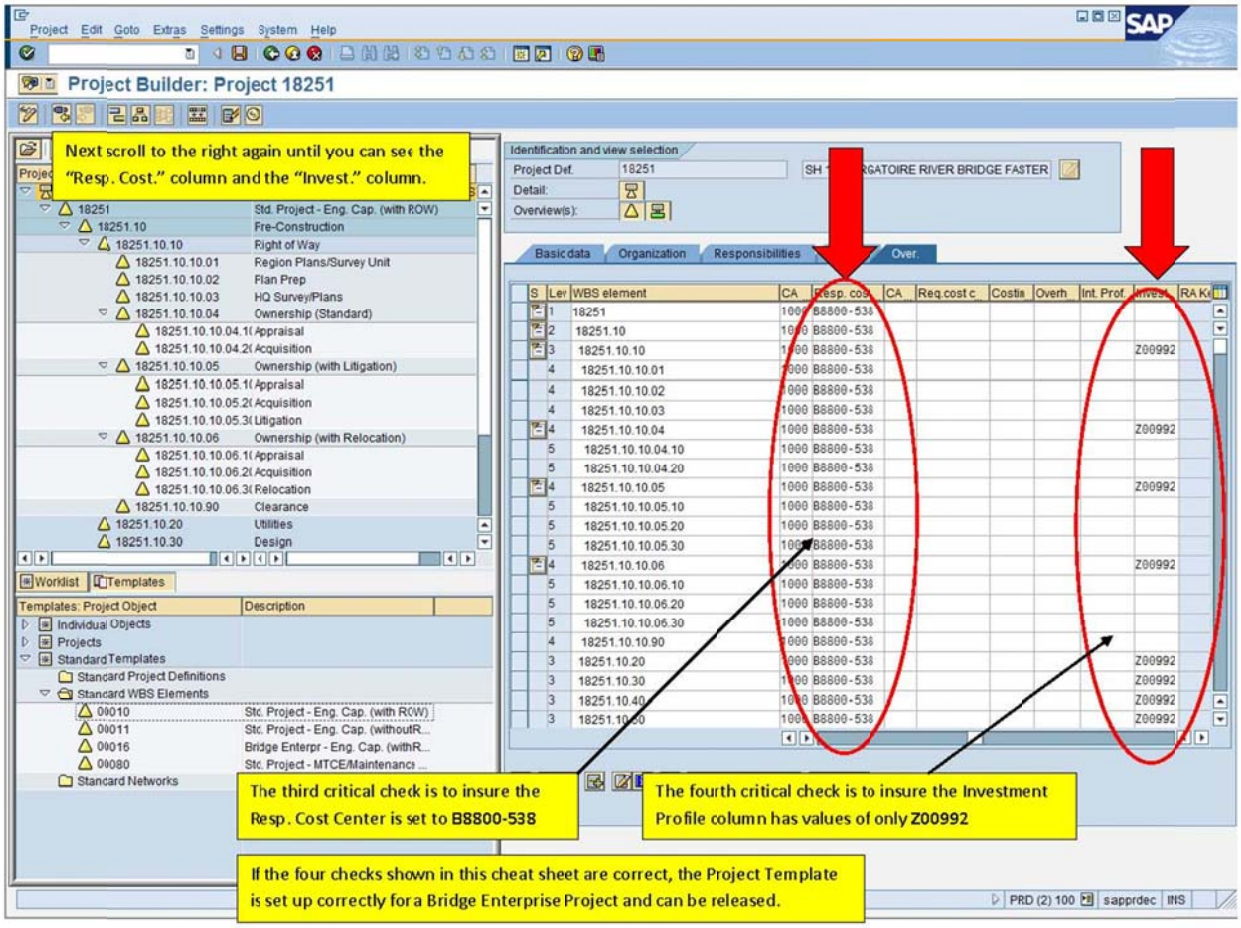


Figure 1-5, Page 6 of 6
BE Project Resource Guide

1.14.07.02 Construction Engineering is (CE) Pool Exempt

Bridge Enterprise projects are required to be CE Pool Exempt. The project personnel will need to charge their time directly to the construction phase of the specific project rather than to the Region Construction Engineering Pool.

Typically on CDOT projects, the construction budget is reduced to cover only the Prime Contractor commitment amount. Since the CDOT employees will be charging directly against the construction budget, the Resident Engineer will need to estimate and set aside sufficient construction budget to cover all the costs associated with the Construction Engineering (CE) on the project. The charges that need to be accounted for in the estimate include the following:

1. CDOT personnel charging to the project including benefits.
2. Construction Engineering task orders for Consultant Services.
3. Indirect charges at the current rate agreed to with the FHWA (applied to both internal charges and consultant charges).
4. Materials test costs from central lab.

A brief discussion of how the CE and indirect charges work at CDOT is shown in the text box below.

How Construction Engineering and Indirects are used at CDOT

The current CDOT rate for the CE pool is 10.0%, which on a CDOT CE POOL project covers the Salary and Benefits of CDOT personnel and/or consultant task orders who charge directly to the project. The indirect rate of 90.0% is then added to the costs to cover the costs of CDOT personnel time who do not charge their time directly to the project.

That indirect rate for federally participating projects is broken out further to **74.51% Participating Indirects** (the FHWA will pay this percentage) and **15.49% non-participating indirects** (FHWA does not pay these costs) which totals to the 90.0%. The indirect rate for non-participating projects is still 90.0%. The logic is the total indirect amount required does not change based on whether the project is participating and non-participating.

The 10.0% for Salary and benefits (or consultant task orders) for construction oversight plus 90.0% indirects is how we get to the typical rate of 19.0% for the total CE charges.

10.0% Construction engineering+(10.0%*90.0%) indirects = 19.0% total CE charges.

Example:

For CE pool project, the CE amount used to cover CDOT's costs for construction engineering is based on how much is paid to the Contractor. If the Contractor gets paid $1,000,000 for his work that month, CDOT would draw from the project the following amount to cover our costs:

1. $100,000.00 for the Direct Personnel charges to the project (10.0% of $1,000,000)
2. $90,000.00 for the Indirect Personnel costs (90.0% of $100,000)

For a Federally participating project the indirects would be broken up as follows:

1. $74,510.00 FHWA pays (74.51% of $100,000)
2. $15,490.00 CDOT pays (15.49% of $100,000)

This same approach needs to be used for CE POOL exempt projects but just on a project by project basis. For projects with all CDOT personnel the rate will probably be less than 23.95%. If it is all consultant, the rate will be higher than 24%. See the Excel worksheets referenced below for more information on how to calculate on a project by project basis.

All these Construction Engineering costs for the project need to be estimated accurately so sufficient budget is set aside to cover the anticipated costs. The indirect rate will be applied to both the Employee payments including benefits as well as any Consultant Construction Engineering Task orders.

When developing the construction engineering estimate, meetings to be included in the construction engineering charges are: partnering, preconstruction, pre-paving, pre-pour, pre-survey**,** bridge demolition, pre-erection, dispute resolution meetings, weekly scheduling meetings, and any other meetings the project is expected to require. When estimating the actual hours required for the CE estimate, the following personnel and support units should be considered to ensure all potential charges are estimated:

1. Resident Engineer (site visits and meetings)
2. Project Engineer
3. Inspectors (overtime for non-exempt employees should be considered)

4. Testers (overtime for non-exempt employees should be considered)
5. Region Materials lab (site visits, IATs, deck pour assistance, submittals, etc.)
6. Region Utilities unit
7. Central Lab (HQ) test costs for samples submitted to Headquarters for testing
8. Staff Bridge
    a. fabrication inspections
    b. construction assistance
    c. required Project Acceptance final Bridge review
9. Bridge Designer – Staff Bridge or consultant as applicable
    a. Review of shop drawings
    b. Construction assistance
10. Staff Geotechnical Personnel
11. Environmental Group Support (NPDES, T & E inspections)
12. Public Relations Support
13. Finals Engineers
    a. Processing CMOs in Site Manager
    b. Finals package review and check
14. Staff Branches (Area Engineers and Asst. Area Engineers)
    a. CMO review/assistance
    b. Dispute resolution assistance
15. Consultant Construction Staff.

    Based on whether the construction phase of the project is state funded or has federal participation, choose the correct Excel worksheet below to develop the estimated Construction Engineering costs of the project.

For the purposes of choosing which excel form to use, the key difference is whether there is a federal funding source to cover the Indirects.

If the construction phase is funded solely with any combination of the following, use the ‘all state BE funded’ spread sheet:

1. FAB538
2. FAB540
3. FAB542

If there are FHWA funds in addition to the BE funds listed above, you need to use the “BE_Federal Participating’ worksheet for your estimate. For example, a fund type that would require the participating worksheet is FABL1CE in SAP or FL1CE in Trns•port PES.

State Funded:

CE est wksht - all state BE Funded.xls

Federal Participation:

CE est wksht - BE_Federal Partcip.xl

A key point to note on the CE services Task order portion of this estimate sheet is you will not be able to process the Task Order for CE services until after the 1180 process is completed on the PS and E package. Once you have obtained the Federal obligation of participation, you can also submit the TO for processional services to hopefully get that in place prior to the project getting awarded and the notice to proceed given to the contractor. Use the estimated value in the above spread sheet, but keep in mind any amount you short yourself there, will be taken from the available budget for your internal charges.

1.14.08 Purchase Requisitions (PR) For Construction and Construction Consultant Task Order

The purchase requisition required for Bridge Enterprise projects will need to be created differently from a typical CDOT capital engineering project.

1.14.08.01 PR for BE Project

For any Purchase Requisition (PR) created for a BE project, a key difference is the “Plant 7001” needs to be used rather than the plant of your region. Unfortunately, the plant field in SAP for PRs is not an editable field. So if a Plant other than 7001 is

entered and saved incorrectly, the PR will need to get closed and a new PR created with the correct plant.

If you ever have PR for a BE project that does not have a “Release Strategy” tab, the error is likely an incorrect plant was used.

1.14.08.02 PR for CE Services

For Purchase Requisitions (PR) for Construction engineering services, there will now be a pre-requisite step prior to starting the PR in SAP. An email will need to be sent to the Outlook distribution group “*HQ-OFMB-Project Accounting Bid and Award Unit” to have them set up the G/L number on the SAP Project validation table. Once that step has been completed, the PR for CE services can be created correctly so that the billings operate as required. The G/L Account number for the Bridge Enterprise projects will be based on whether there are Federal funds on the project or if it is bridge enterprise state funded only.

1. G/L number for Bridge Enterprise funded projects is 4192000010
2. G/L number for Bridge Enterprise projects with Federal participation is 4192000011

See the attached screen shot for an example of both a state funded PR (Figure 1-6, Page 1 of 2) and Federal participating PR (Figure 1-6, Page 2 of 2). A quick caveat is even though your project may not have a separate Federal funding source such as FABL1CE or FL1CE, it likely still has federal money involved with the ‘debt services’ which would require the PR to get set up as federal participation. The only instance of a BE project not being federally participating would be if the fund was fund 538 or 540.

"State Funded" Bridge Enterprise Purchase Requisition for CE services

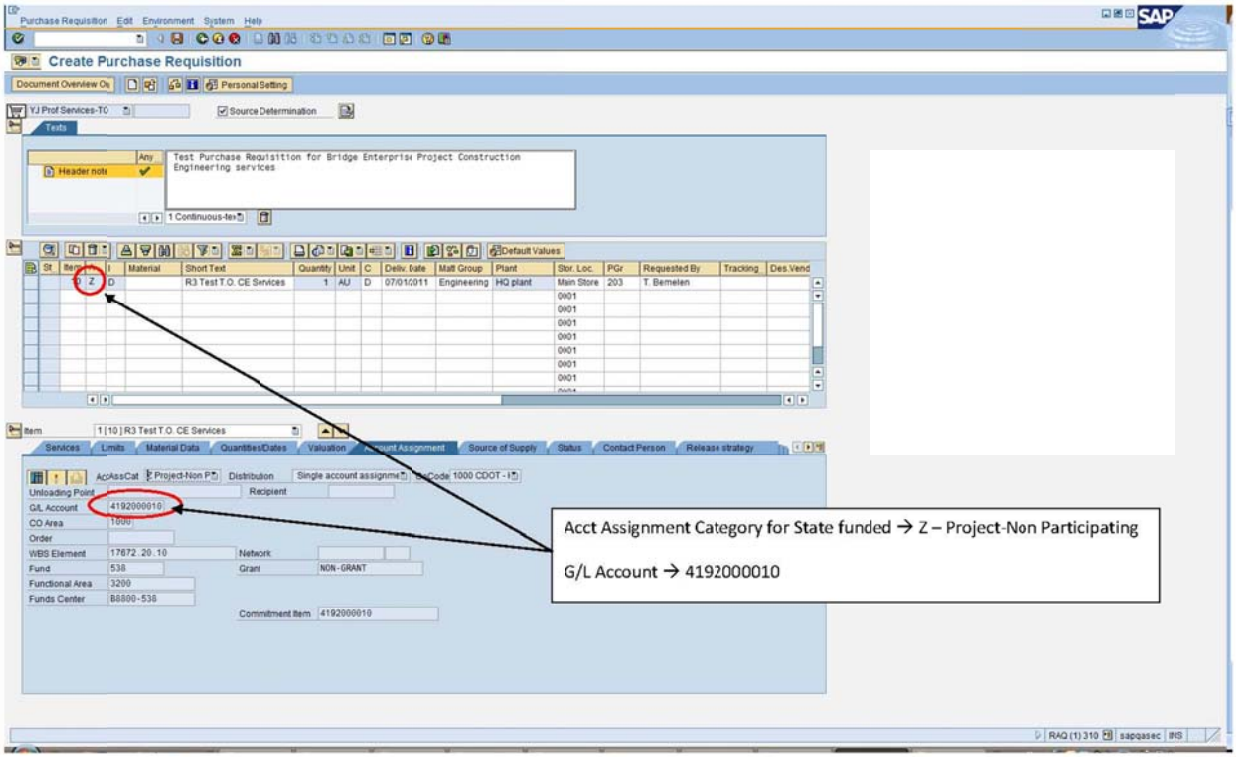


Figure 1-6, Page 1 of 2
PR Creation

Federally Participating Bridge Enterprise Purchase Requisition for CE Services

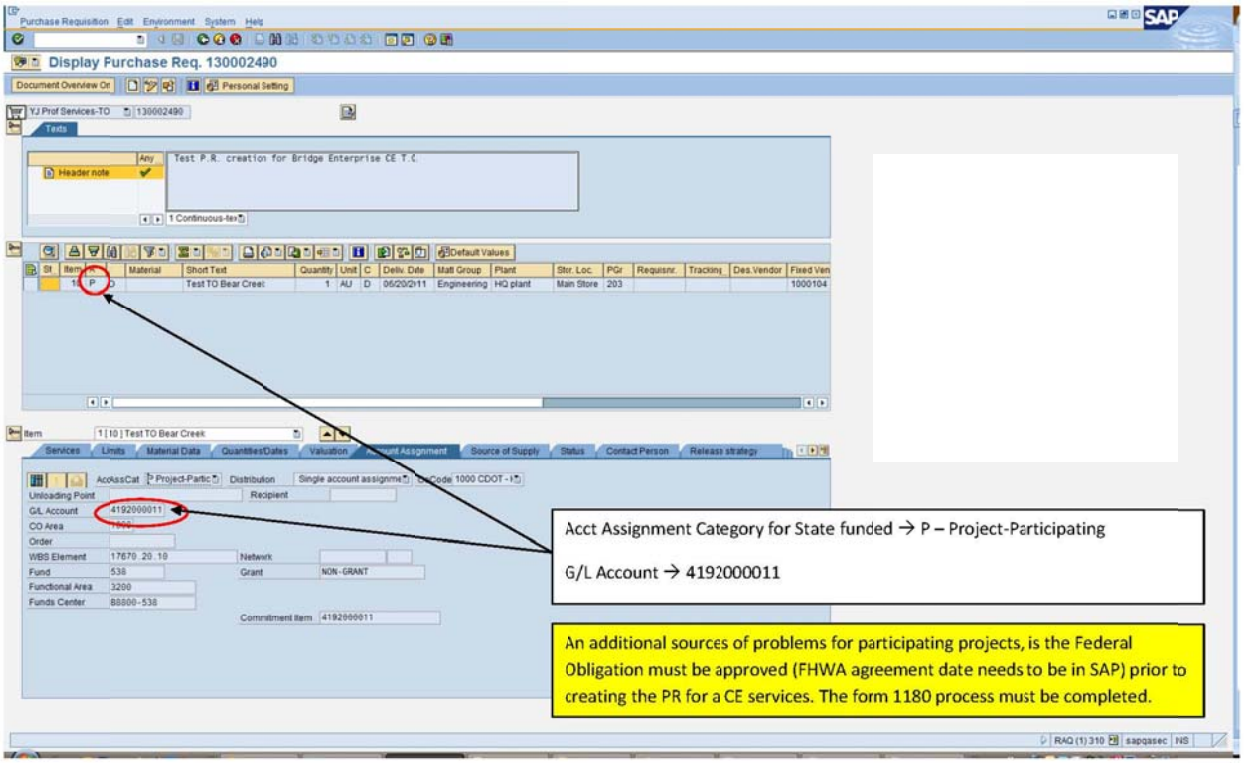


Figure 1-6, Page 2 of 2
PR Creation

1.14.08.03 SAP Release Strategy

The SAP release strategy for a Bridge Enterprise PR is slightly different. The PRs are available to be approved and released by any Program Engineer statewide for the first release and any Business Manager statewide for the second release. The responsible regions should normally release their own PRs. See the example of the release window for a Bridge Enterprise project (See Figure 1-7).

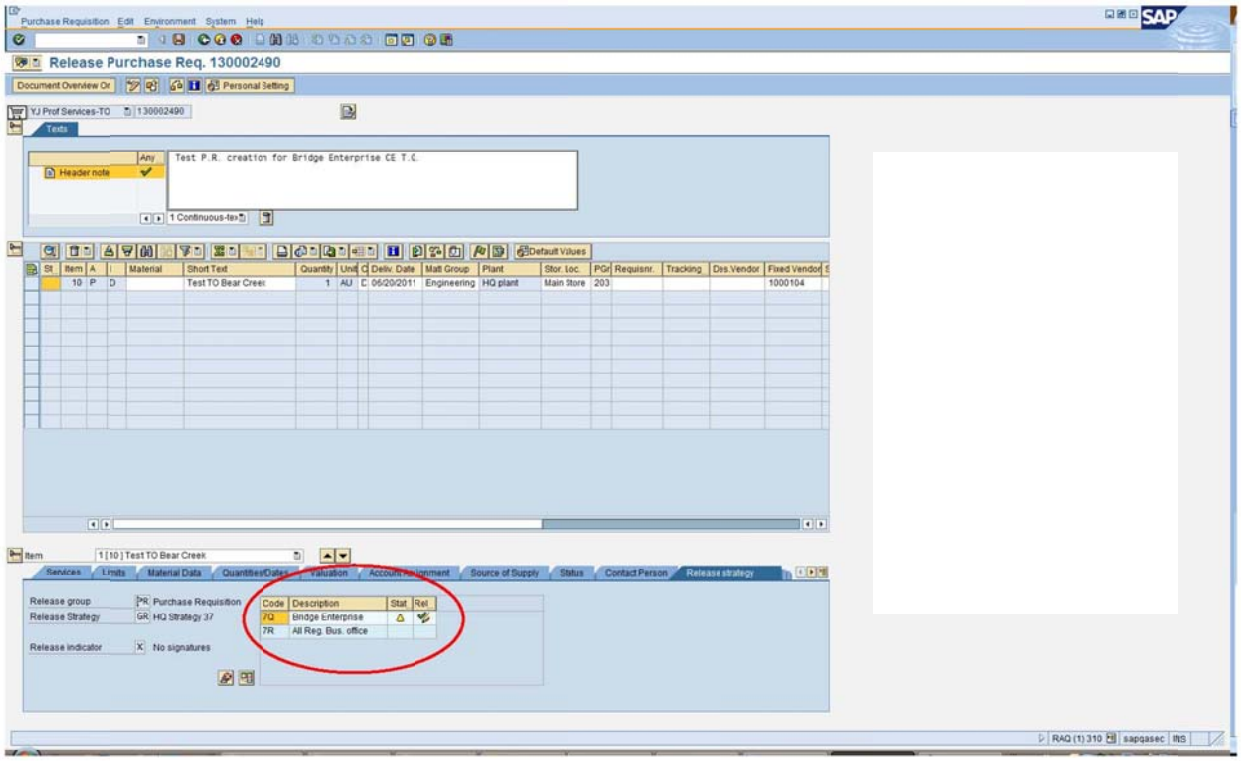


Figure 1-7
Release Strategy

1.14.09 Check of TRNS*PORT PES, Form 65 and SAP

The anticipated costs of the CE and indirects, which were calculated previously, must be incorporated into the overall cost estimate in PES (trns*port) and on Form 65 Project Financial Statement. The value is not entered directly, but as a percentage. The estimated value of CE costs is added into the PES (trns*port) estimate and Form 65 via a percentage calculation, similar to how CE costs for the CE pool are included in the cost of the estimate, basically as a percentage of the estimated cost of the project.

Once the Engineer's Estimate has been reviewed by the Cost Estimates Unit and the estimated costs are firm for the CE and indirects, a correct version of Form 65 may be generated that matches up with the PES (trns*port) Estimate for the total construction estimate. This will be required prior to submitting the project's 1180 to the FHWA. Use the amounts shown in the Excel estimating spreadsheet to enter in the CE Pool percentage in PES (Trns*port) and calculate the Indirects in the 1100 category above.

1.14.10 Immediately Before Requesting 1180:

There are two places where the CE Pool Percentage is needed to calculate the estimate amount correctly on the 1180. The first location is the in Trns•port PES at the category levels. The Resident Engineer is responsible for entering this value. The second location is in SAP via CJ20N on the custom fields "Accounting" tab. The only group authorized and expected to enter this value is OFMB or the SAP Project Systems BPX. The percentage for the CE Pool calculation in SAP will reset every night to the current CE Pool rate. This field is important to get corrected the same day that you start the form 1180. The exact amount of CE Pool and indirects calculated from the percentage entered into SAP and Trns•port may have a small rounding difference. Let your business manager know that they may not match exactly.

1.14.11 After Project Is Awarded:

Once the project is awarded to the low bidder, the percentage for CE used to set aside the construction budget required for the Personal charging to the project directly will need to change in SAP based upon the percentage in conjunction with the Contractor's commitment amount instead of the engineer's estimate. The percentage for CE Pool will now need to be recalculated again and the new percentage based will need to be entered in SAP accounting tab (the percentage does not need to be changed in Trns•port after award). The indirects will be automatically calculated in the system (currently set at 90.0).

The following screensshots show how to check that the project is set up correctly in Trns•port, PES, and SAP so that the CE costs will calculate correctly. Based upon your project having Federal Bridge funds along with the BE funds or if your project is BE funded only, choose one of the following documents to check your PES set up in conjunction with the SAP form 65.

The following screenshots show how to check that the project is set up correctly in TRNS*port, PES, and SAP so that the CE costs will calculate correctly. Choose one of the following documents depending on whether the project is totally state-funded

through Bridge Enterprise (Figure 1-8) or there are federal funds in the project (Figure 1-9).

For help with this complicated process, contact Tony Bemelen, Project Systems Support in the Contracts and Market Analysis Branch, or train a person in the region to become the expert in this process to help others in the region.

SAP check – CJ20N accounting tab – The screenshot below is an example of the accounting tab in CJ20N prior to the project getting awarded.

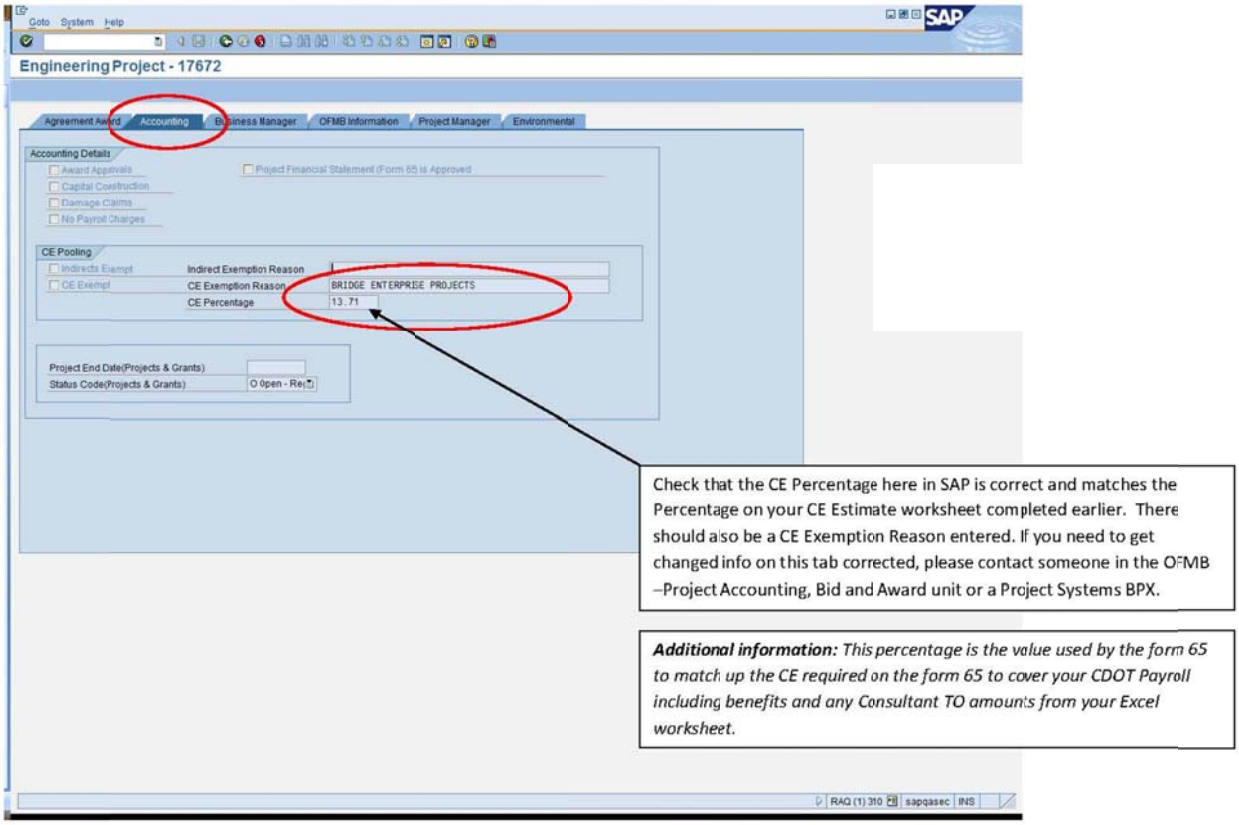


Figure 1-8, Page 1 of 7

TRNS*PORT PES review - The screenshot below is an example of PES project 17672-bid. This is the Categories Tab.

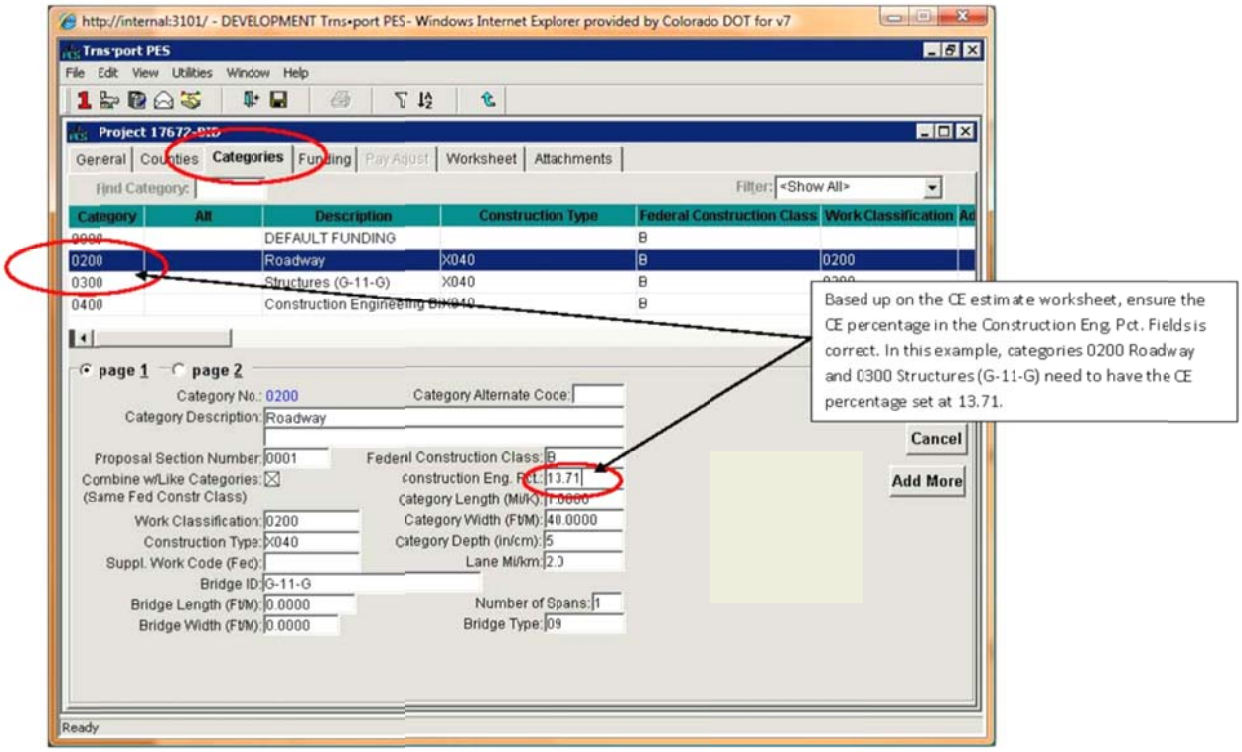


Figure 1-8, Page 2 of 7

TRNS*PORT PES review - The screenshot below is an example of PES project 17672-bid. This is the Categories Tab.

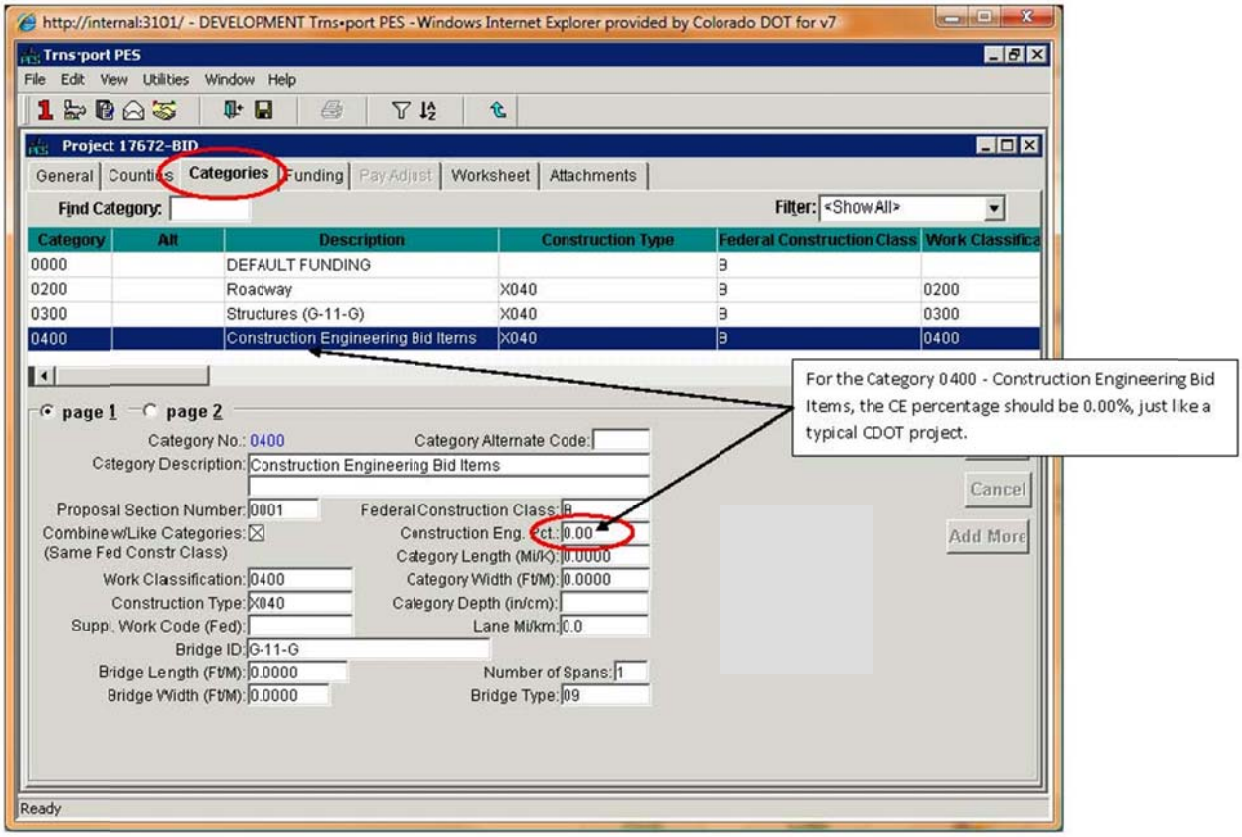


Figure 1-8, Page 3 of 7

TRNS*PORT PES review - The screenshot below is an incorrect example of PES project 17672-bid. This is the Funding Tab.

Fund source for CE Bid Items - Another item that should be checked in regards to the Category 0400 Construction Engineering Bid items is on the Funding tab. Ensure the Fund Code for the 0400 category is set up the same as the other bid categories. It should not be CEPOOL.

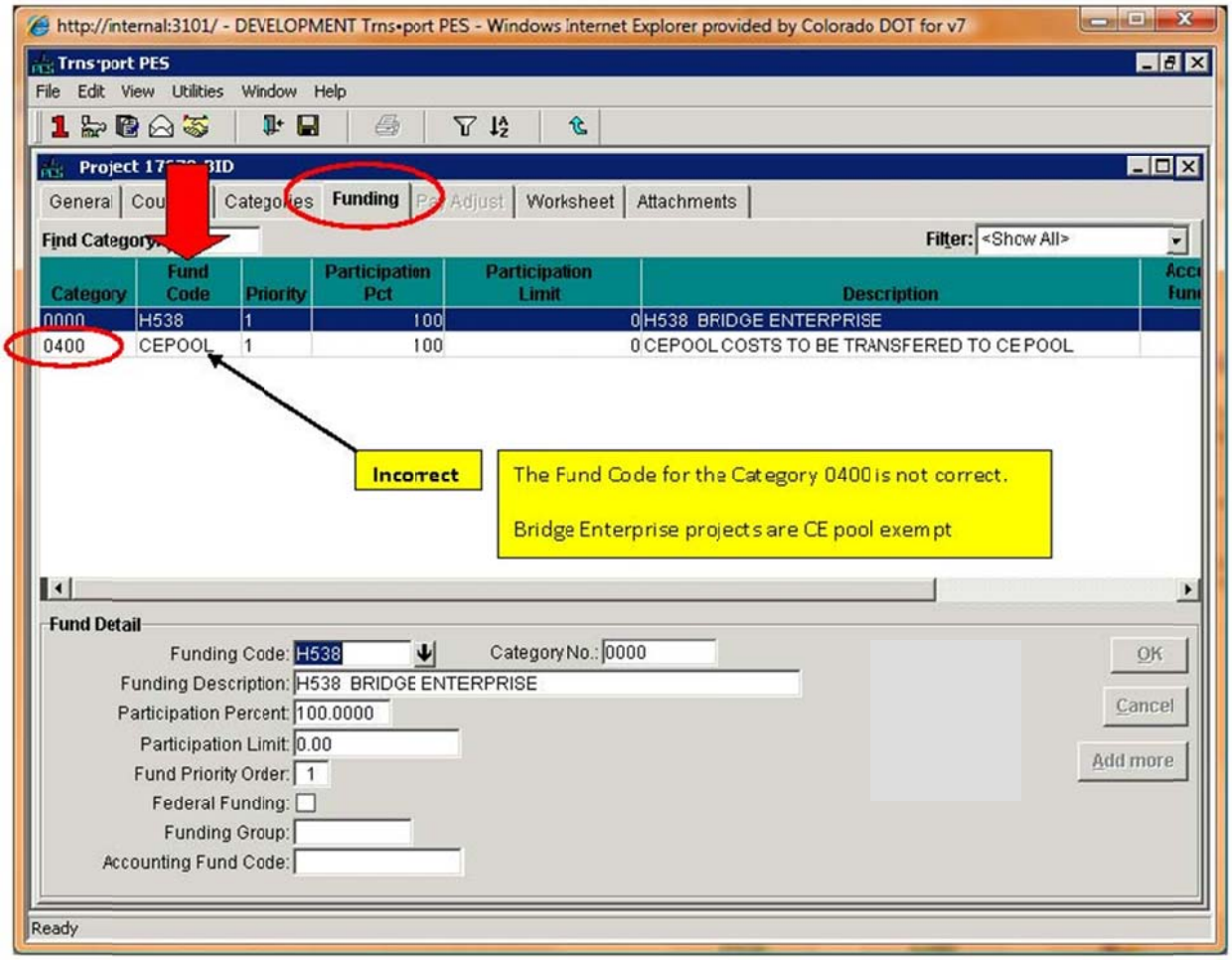


Figure 1-8, Page 4 of 7

TRNS*PORT PES review - The screenshot below is a corrected example of PES project 17672-bid. This is the Funding Tab.

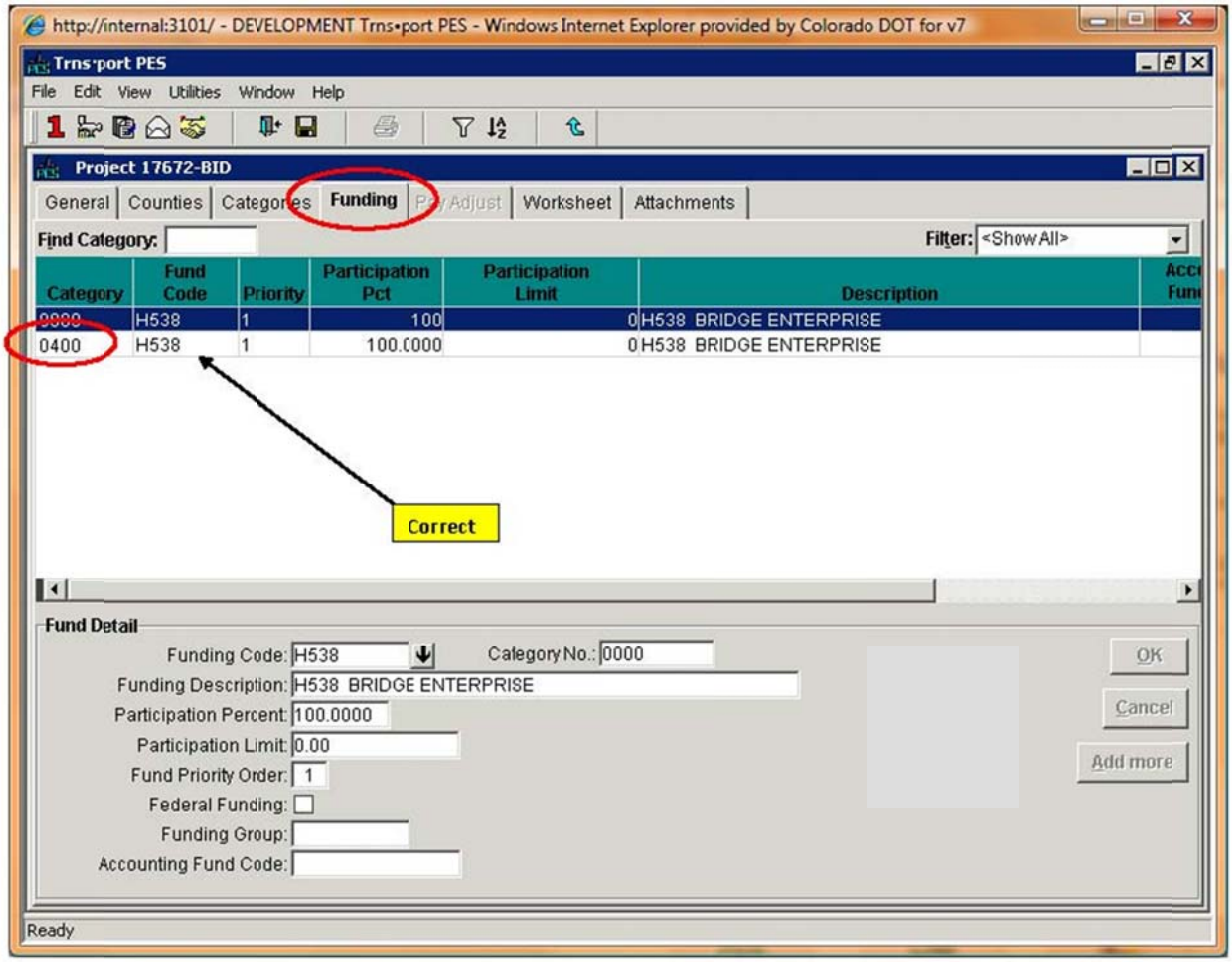


Figure 1-8, Page 5 of 7

TRNS*PORT PES review - The screenshot below is an example of PES project 17672-NONBID. This is the Worksheet Tab.

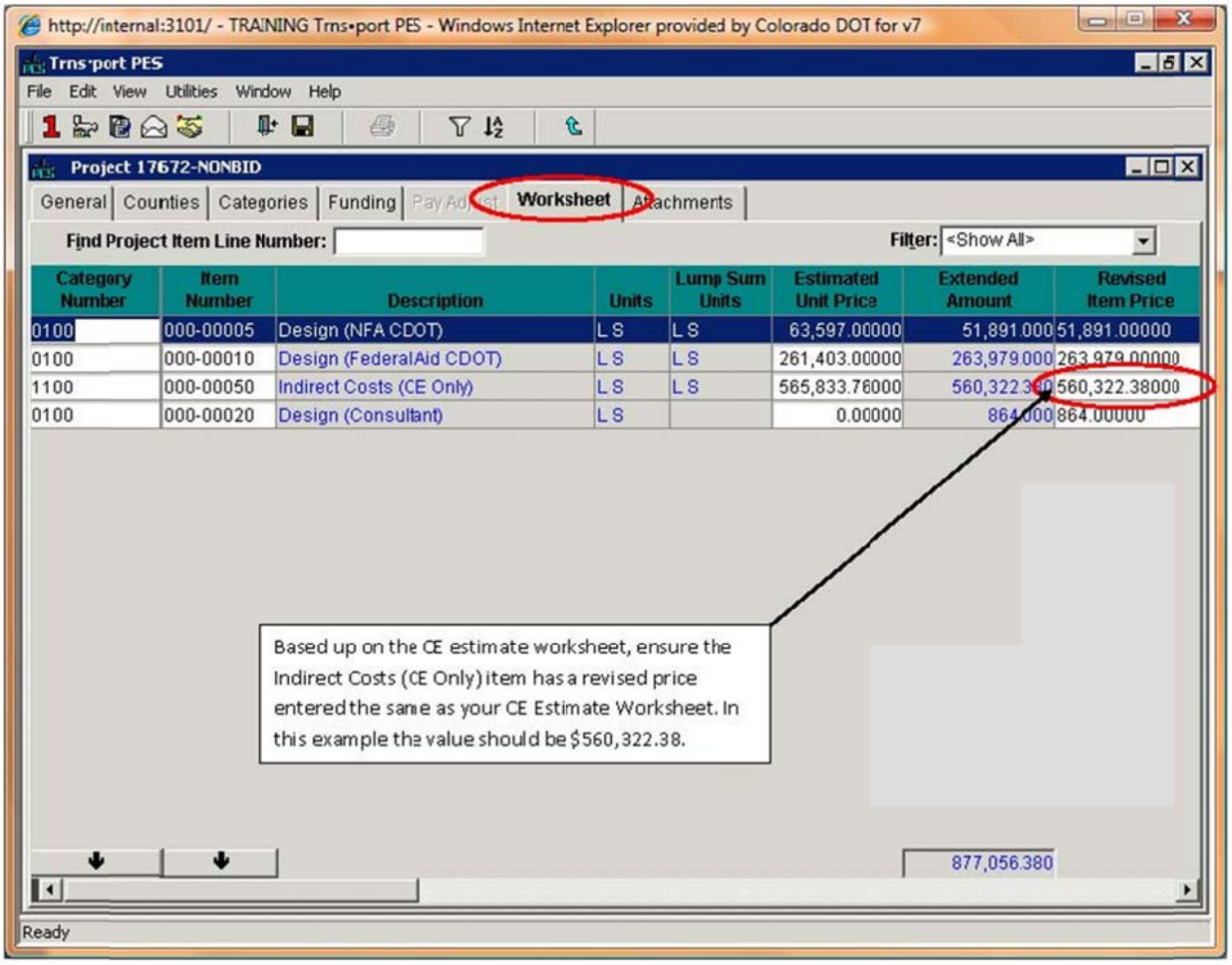


Figure 1-8, Page 6 of 7

Form 65 Check

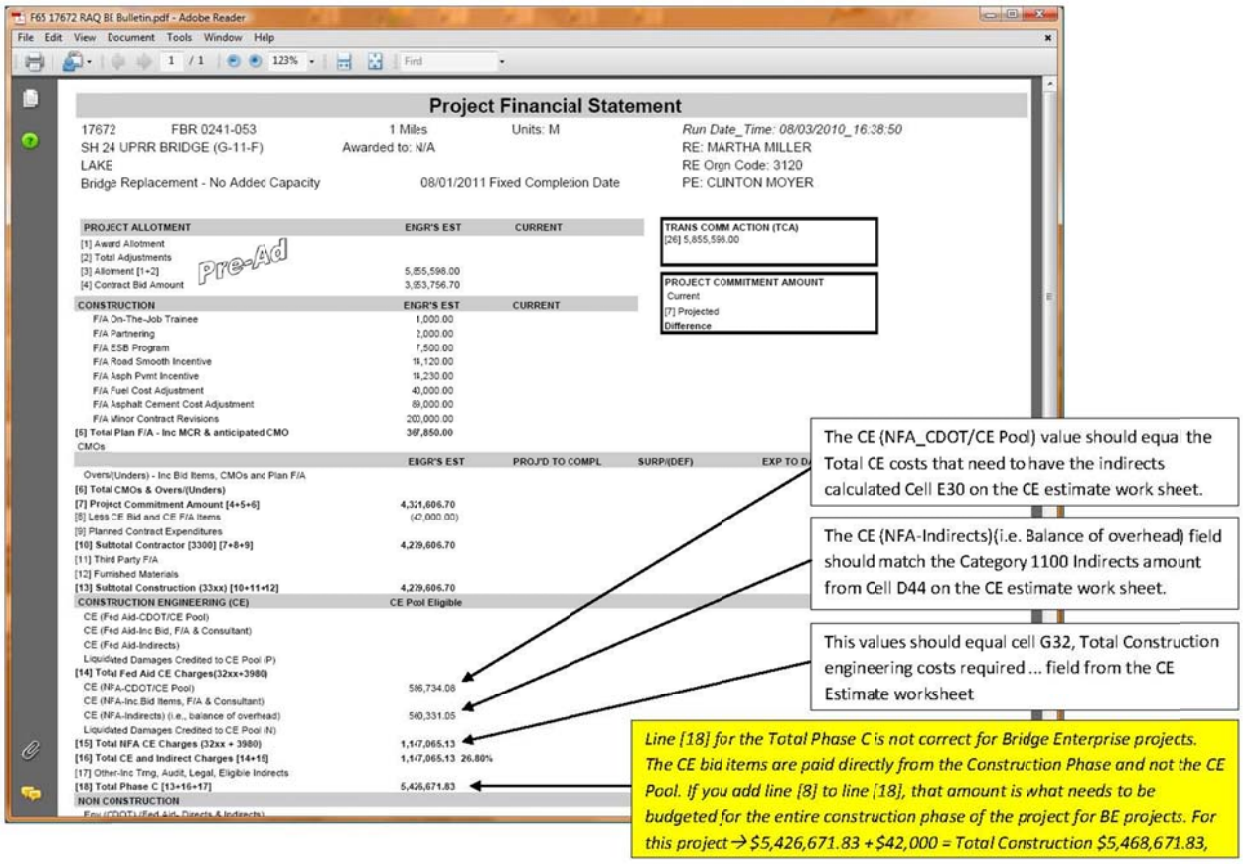


Figure 1-8, Page 7 of 7

Accounting tab CJ20N Custom tab - The screenshot below is an example of CJ20N on the Accounting custom tab.

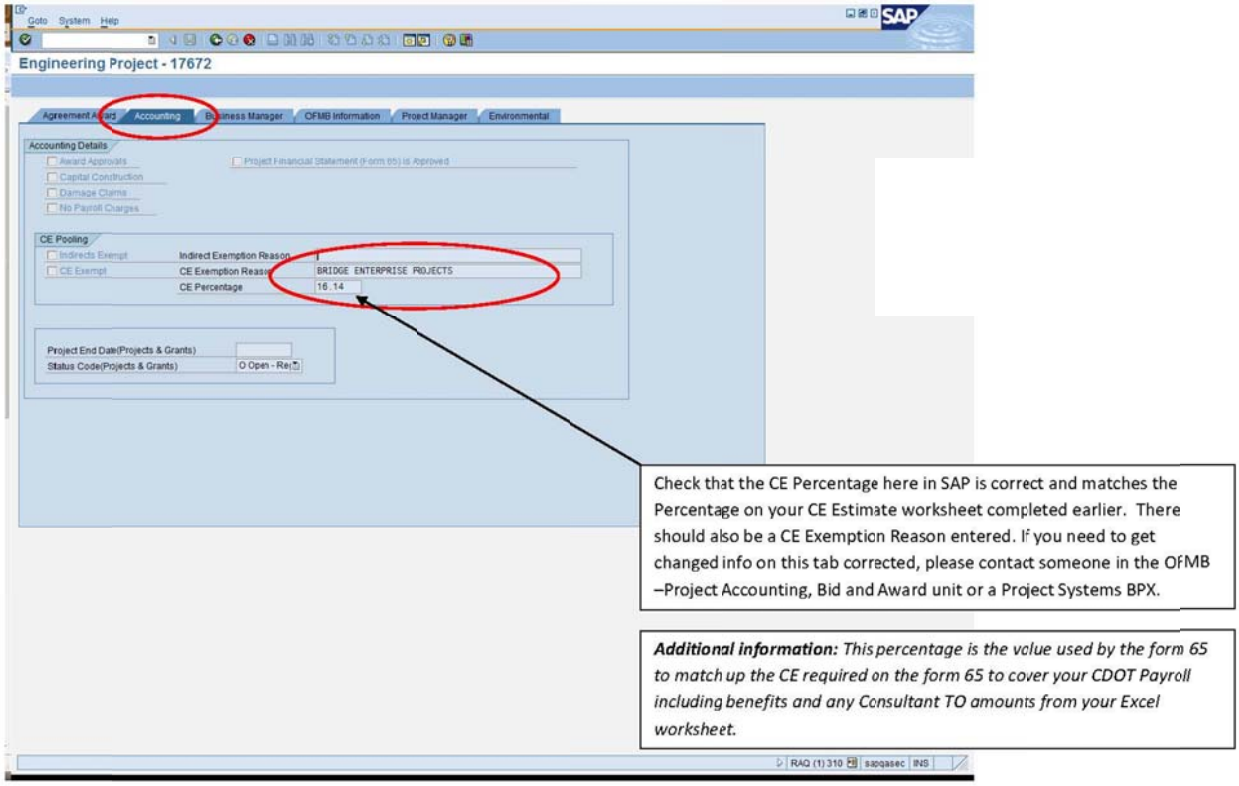


Figure 1-9, Page 1 of 7

TRNS*PORT PES review - The screenshot below is an example of PES project 17672-bid. This is the Categories Tab.

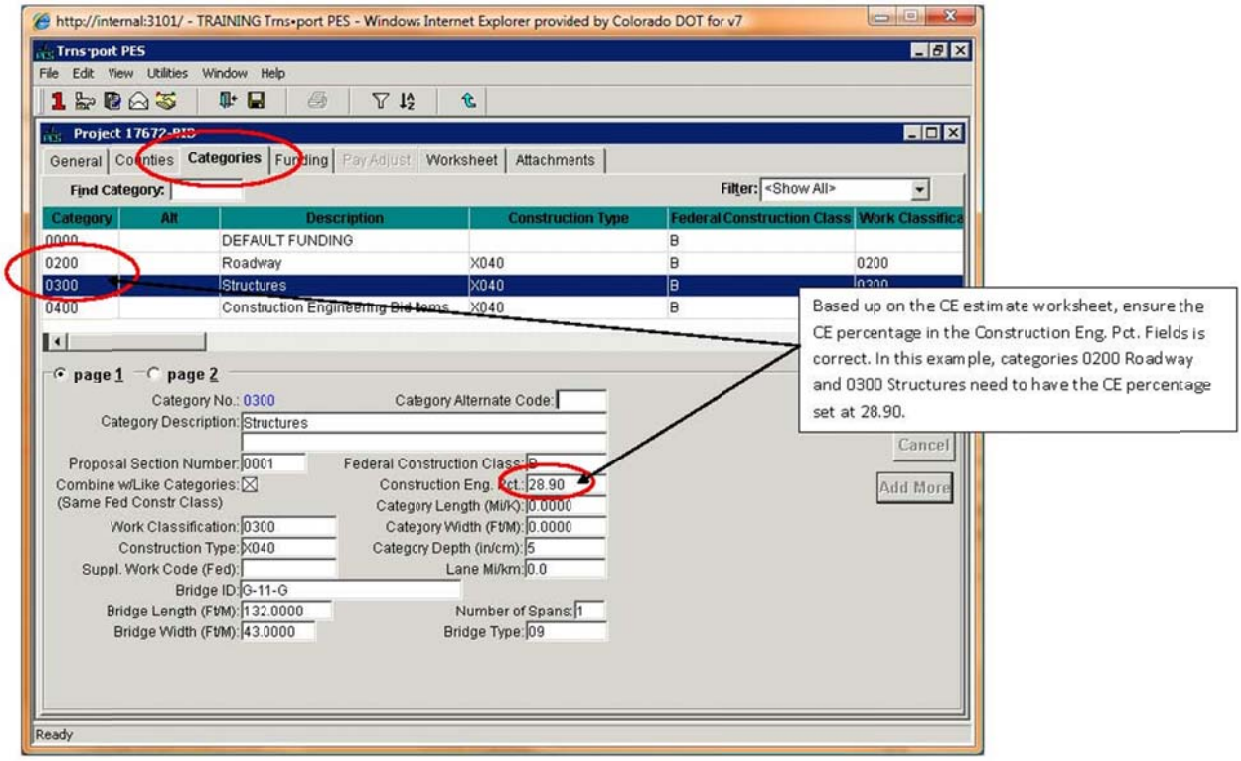


Figure 1-9, Page 2 of 7

TRNS*PORT PES review - The screenshot below is an example of PES project 17672-bid. This is the Categories Tab.

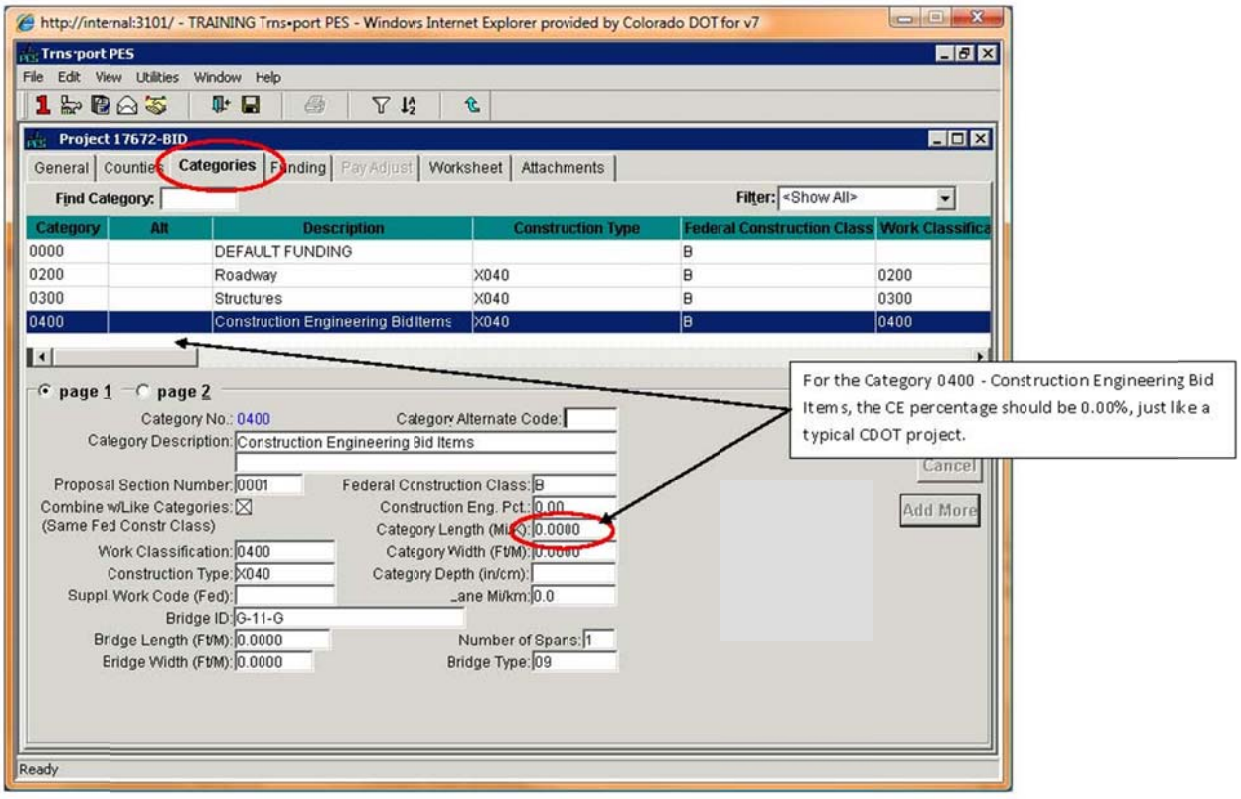


Figure 1-9, Page 3 of 7

TRNS*PORT PES review - The screenshot below is an incorrect example of PES project 17672-bid. This is the Funding Tab.

Fund source for CE Bid Items - Another item that should be checked in regards to the Category 0400 Construction Engineering Bid items is on the Funding tab. Ensure the Fund Code for the 0400 category is set up the same as the other bid categories. It should not be CEPOOL.

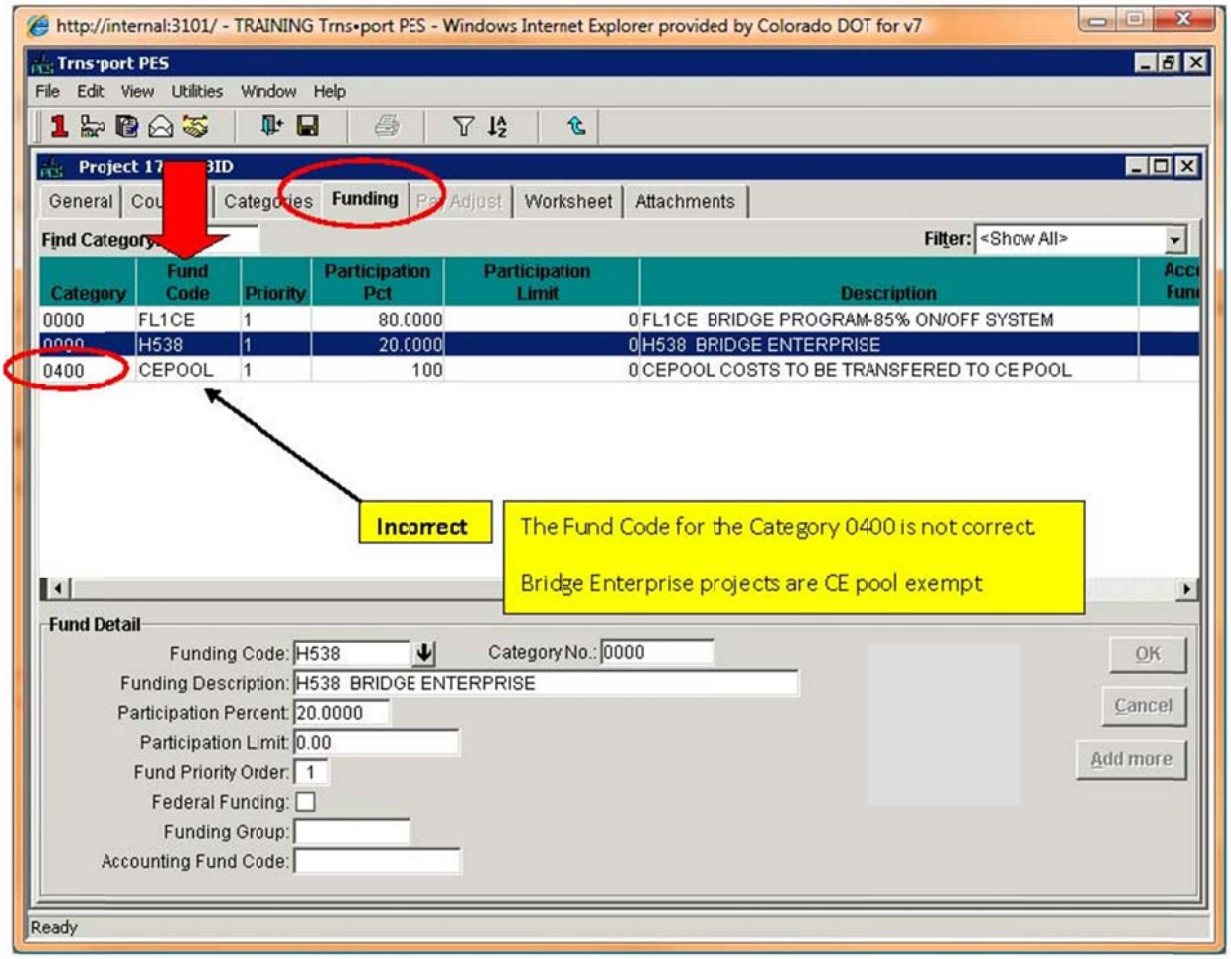


Figure 1-9, Page 4 of 7

TRNS*PORT PES review - The screenshot below is a corrected example of PES project 17672-bid. This is the Funding Tab.

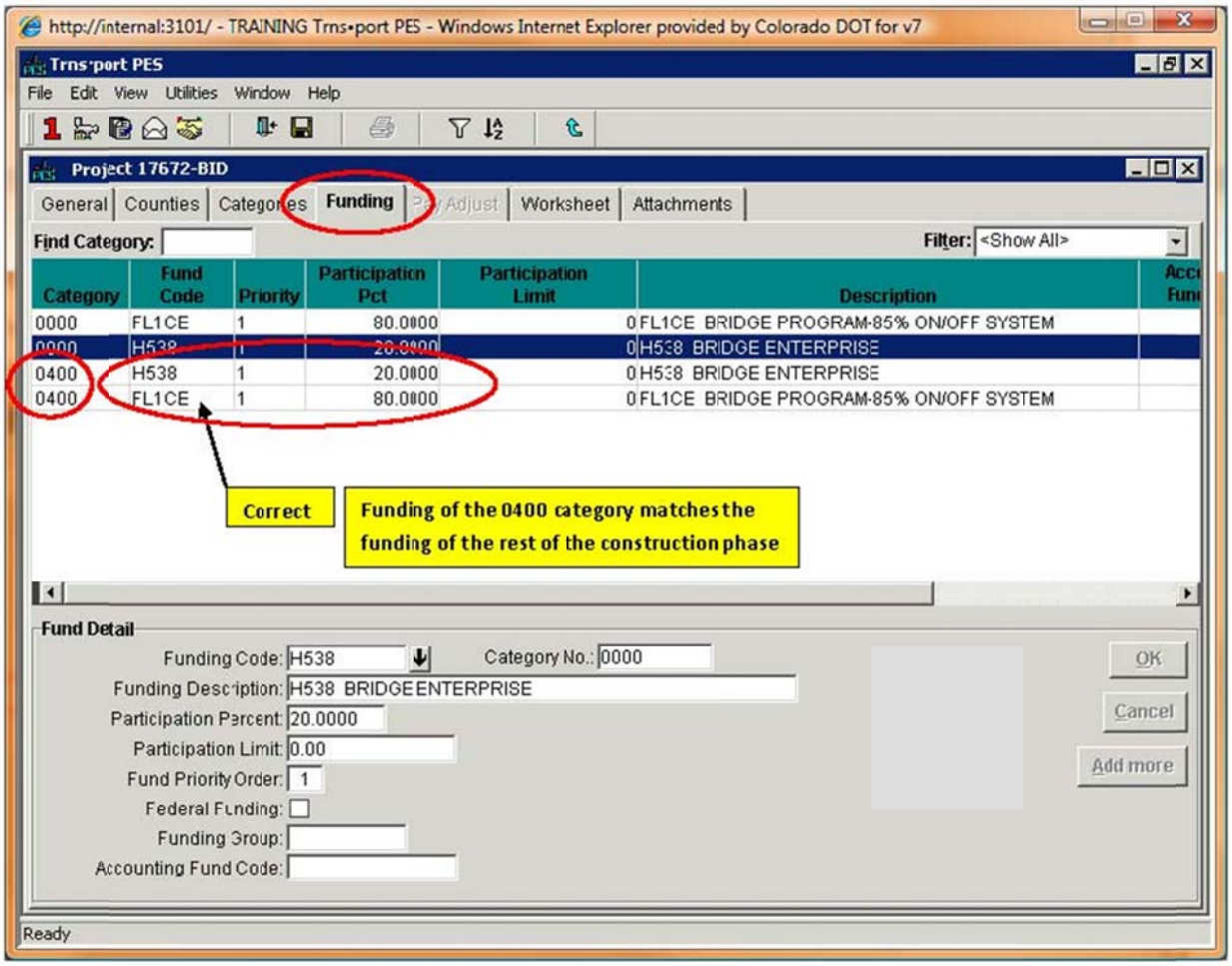


Figure 1-9, Page 5 of 7

TRNS*PORT PES review - The screenshot below is an example of PES project 17672-NONBID. This is the Worksheet Tab.

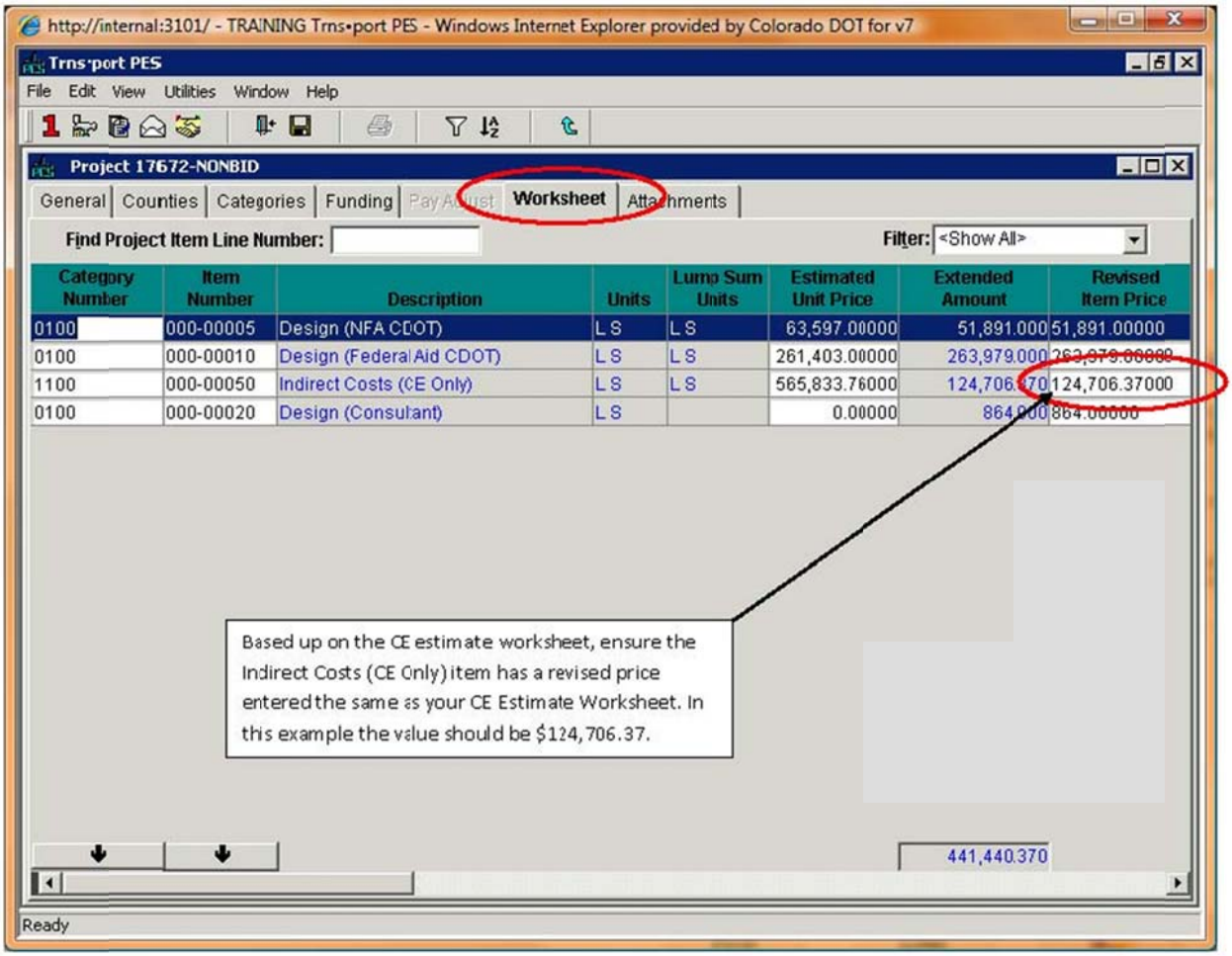


Figure 1-9, Page 6 of 7

Form 65 Check

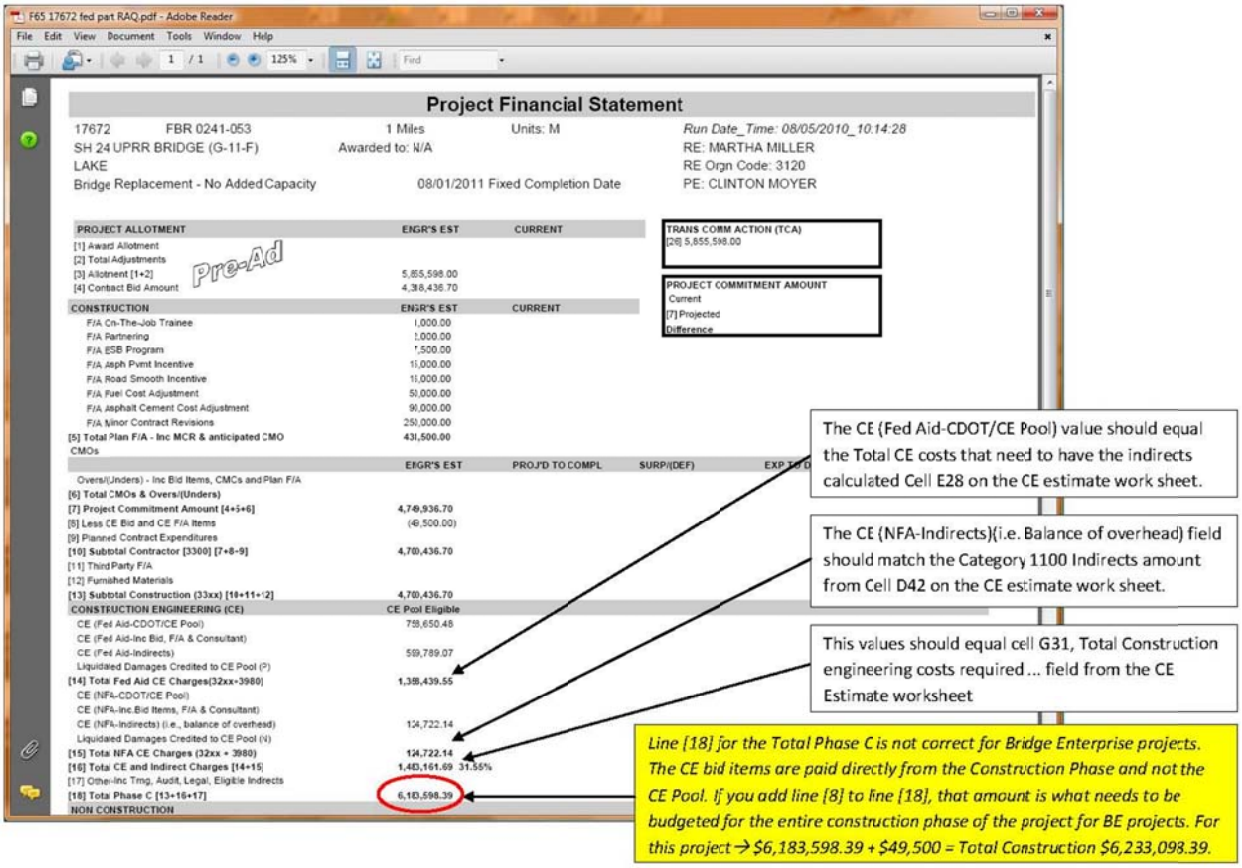


Figure 1-9, Page 7 of 7

1.14.12 Project Signs for *FASTER* Projects

All projects funded with FASTER money shall have special signs identifying them as FASTER projects. The signs are to be erected at each major approach to the project. There will normally be a minimum of two of these signs on the project. Since there may be special circumstances, the Resident Engineer should consult the Region Traffic

Engineer on the number and locations of signs. The sign layout consists of two panels, a W21-1a “Workers Sign” sign mounted on a special FASTER sign.

Signs shall be mounted on 6 X 6 timber posts for a temporary installation in accordance with the applicable S-Standards. These signs will be paid for using bid item 630-80344, Construction Traffic Sign (Special).

The sign layout can be accessed via the HQ Safety and Traffic Engineering Branch website under the link to the CDOT Sign Library webpage at: http://www.coloradodot.info/library/traffic/traffic-manuals-guidelines/fed-state-co-traffic-manuals/cdot-sign-library.html.