

CEF for Large Projects Instructional Guide V2.1

September 2009



FEMA

Federal Emergency Management Agency
Department of Homeland Security
500 C Street, SW
Washington, DC 20472

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Acronyms and Abbreviations

A&E	Architect and Engineering
ADA	Americans with Disabilities Act
BCI	Building Cost Index
CCI	Construction Cost Index
CEF	Cost Estimating Format
CFR	Code of Federal Regulations
CSI	Construction Specifications Institute
DOT	Department of Transportation
ENR	Engineering News Record
FEMA	Federal Emergency Management Agency
JFO	Joint Field Office
PA	Public Assistance
PAC	Public Assistance Coordination
PW	Project Worksheet

SECTION ONE INTRODUCTION**1.1 FEDERAL ASSISTANCE FOR DISASTER DAMAGE**

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (PL 93-288, as amended) authorizes the Federal government to assist State and local governments with recovery from disasters. In accordance with this legislation, which is referred to as the Stafford Act, State and local governments may receive financial assistance to restore disaster-damaged public facilities and other infrastructure components. The Federal Emergency Management Agency (FEMA), in partnership with State governments, is responsible for managing the provision of this assistance under the Public Assistance (PA) Program.

Through the PA Program, FEMA pays the Federal share of the cost of repair, restoration, or replacement of a facility as it existed prior to the disaster. The estimate of this cost is determined by a team of Federal and State technical specialists working in cooperation with a representative of the State or local government entity applying for the assistance (the applicant).

The applicant and Public Assistance Coordination (PAC) Crew Leader work together to develop a complete scope of work and cost estimate for each project. These projects are documented on a Project Worksheet (PW), which is the basis for PA Program funding

For large projects¹, this estimate is used to determine the initial Federal obligation of funds for the work, but it is not necessarily the final cost that will be approved for the project. Rather, the final cost is based upon the reasonable, actual costs incurred by the applicant in completing the eligible scope of work. Actual costs are determined through a reconciliation process initiated by the State when the work is complete. Discrepancies between the initial estimate and the final cost are addressed through the obligation (or de-obligation) of Federal funds.

The Federal-State team typically prepares the initial construction estimate using the best available unit cost data for the elements of the facility. These unit costs (also referred to as construction costs) represent the itemized breakdown of construction work activities for completing the project. The unit costs usually do not include project design and management costs, contractor overhead and profit, fees, cost escalation due to inflation, and other factors affecting the overall cost of the project. These costs (also referred to as non-construction costs) are addressed through the reconciliation process once the project is complete. While the applicant may eventually receive reimbursement for these costs, the final amount of the grant is unknown at the time of construction. Further, the grant is subject to review during the reconciliation process, and the outcome of this review can affect the amount. To provide the applicant with a better representation of actual costs at the beginning of the assistance process, FEMA developed the Cost Estimating Format (CEF).

This *Instructional Guide* describes the CEF process and how it fits into the PA Program. This guide also describes each of the factors that make up the CEF, how the factors are to be applied to the base construction cost estimate, and how to use the CEF spreadsheet in the estimate

¹The Stafford Act provides for separate grant processes for small and large projects and set the minimum threshold for large projects at \$35,000 when it was passed in 1988. FEMA adjusts this amount at the beginning of each Federal fiscal year to reflect changes in the Consumer Price Index for All Urban Consumers. For Federal Fiscal Year 2009 (ending September 30, 2009), the large project threshold has been set at \$64,200.

calculation. The teams using the CEF will be comprised of engineers, architects, and other construction professionals who have managed key engineering projects or have extensive experience in the construction industry, and who have experience in developing parametric or conceptual estimates without the benefit of complete project documents.

1.2 THE COST ESTIMATING FORMAT

The concept of the CEF was first developed for use at the Northridge Long-Term Recovery Area Office in Pasadena, CA. Repair and replacement costs for facilities damaged during the 1994 Northridge earthquake were estimated using a version of the CEF and final grant offers were made to applicants on the basis of those estimates. A revised version has since been developed for all types of infrastructure damage in all types of disasters. This version has been tested against data from large project closeouts and has undergone a peer review by an independent group of industry experts who evaluated the methodology, substantiated component factors, and recommended improvements necessary to apply the CEF nationally.

The CEF provides a worksheet, called Part A, that allows the user to estimate the base construction costs. The user then applies a series of factors (Parts B through H) that represent potential additional eligible project costs, including general contractor and applicant costs potentially not captured in the base construction costs. These costs can reasonably be expected to be incurred because they are construction-related costs usually encountered during the course of a project. Parts B through H are applied to the Part A base construction costs to estimate the total cost of completing the project. This “forward-pricing” methodology provides an estimate of the total eligible funding at the beginning of the project. This estimate, which is used to obligate the funds for the project, allows the applicant to more accurately manage the budget with a greater degree of confidence.

The CEF provides a more uniform method of estimating costs for large projects. While the CEF accounts for costs incurred across the entire spectrum of eligible work (from design to project completion), it is not a final cost settlement instrument. Eligible costs will be reimbursed on the basis of actual expenses incurred by the applicant; that is, approved grant funds will be reconciled against actual costs after project completion and the grant amount adjusted accordingly. The cost reconciliation process is described in Section 2.6.

The factors of the CEF, which are described in greater detail later in this guide, are listed below.

- **Part A** is the estimated sum of construction costs required to directly complete the eligible scope of work, referred to in this guide as the base cost.
- **Part B** includes construction costs for work that facilitates execution of the eligible work, but are not typically itemized in Part A. Part B includes such costs as the general contractor’s field supervision costs and job site costs, including temporary services and utilities, safety and security measures, and quality control and administrative submittals.
- **Part C** reflects construction estimate uncertainties and is designed to address budgetary risks associated with project unknowns and complexities in determining the scope of work. Part C factors are determined on the basis of the amount of design work completed at the time the estimate is prepared, the complexity of the project, and the degree of difficulty for site access, storage, and staging.

- **Part D** accounts for the contractor's home office overhead, insurance, bonds, and profit. These costs are typically not used for projects completed using the applicant's labor, equipment, and materials (referred to as "force account" work).
- **Part E** accounts for cost escalation over the duration of the project and is based upon an inflation adjustment from the time the estimate is prepared until the mid-point of construction for the eligible scope of work.
- **Part F** includes fees for building permits, plan checks, and special reviews.
- **Part G** is the applicant's reserve for potential change orders related to eligible work and differing site conditions.
- **Part H** accounts for the applicant's cost to manage the design and construction of the project. These costs are not part of the statutory administrative cost allowance provided to the applicant to manage the overall recovery effort. The administrative allowance, which is authorized by the Stafford Act and is intended to defray the cost of requesting, obtaining, and administering Federal assistance, does not account for project management costs.

These factors are described in detail in subsequent sections of this guide and were developed using guidance available from the Construction Specifications Institute (CSI) and the RSMeans Company. The factors were verified using data from closed-out grants for large projects nationwide. The CEF spreadsheet (in Microsoft Excel format) is used to apply the factors in Parts B through H, to the Part A estimate. An electronic copy of the CEF spreadsheet is available from the FEMA Web site (www.FEMA.gov).

Typically, an applicant (the owner or party responsible for repairs) utilizes a general contractor and a number of subcontractors to complete a large construction project in a competitively bid environment. The structure of the CEF mirrors the applicant-general contractor-subcontractor relationship for eligible work in that:

- Part A costs are representative of the construction efforts required to directly and specifically complete the defined eligible work. Typically, Part A represents the trade or subcontractor(s) costs.
- Parts B, C, D, and E represent the general contractor or equivalent costs; they can be considered as components of "as-bid" costs and represent the costs of completing the work.
- Parts F, G, and H represent the applicant's non-construction project costs, including preparation of design or contract documents, plan review and permit fees, cost escalation, and managing project design and construction.

1.3 ELIGIBLE WORK AND COST

Grants administered under the PA Program must comply with the provisions of the Stafford Act. Application of these provisions is described in Title 44 of the Code of Federal Regulations (CFR) Part 206, as amended. These regulations define the types of facilities, work, and costs that are eligible for reimbursement under the PA Program. When a large project estimate is

developed, the base cost (Part A) must include only that work which is eligible under these regulations.

PA grants must also comply with 44 CFR Part 13, which defines procedures for grant administration by the State and provides specific guidance on allowable costs. The factors included in the CEF represent only those non-construction costs that are allowable under Part 13. The factors also represent costs that an applicant can reasonably expect to incur during construction. Excessive mark-ups for possible contingencies are not allowable under the provisions of Part 13.

1.4 APPLICABILITY AND LIMITATIONS

In general, to qualify for CEF consideration, a project must be:

- A large project (according to the FEMA threshold for the applicable fiscal year)
- Permanent restorative work (Categories C – G)
- Less than 90 percent complete (pre-punch list and contractor retaining stage)

Actual eligible costs should be used for large projects that are more than 90 percent complete at the time of facility inspection.

The CEF is intended for use on projects that are eligible under the Stafford Act, Federal regulations, and FEMA policy. It may be used for all types of disasters and all types of facilities, including:

- Transportation facilities, including roadways, bridges, and tunnels
- Water control facilities, such as irrigation and drainage systems
- Buildings and similar structures, including warehouses, garages, offices, schools, libraries, municipal buildings, museums, research facilities, laboratories, and hospitals
- Utilities, such as water treatment, wastewater treatment, and power generation facilities, including the associated transmission, distribution, and collection systems
- Special facilities such as railroads, ports, marinas, and airports

The CEF should not be used for small projects, or for emergency work, such as large-scale debris removal operations (whether a small or a large project).

The results obtained with the CEF are only as accurate as the data that are input into the CEF spreadsheet. The base cost (Part A) is critical to the accuracy of the results. The Federal-State-local team must ensure that Part A is complete, accurate, and based on sound engineering and estimating judgment. This is especially important when considering situations in which damage or necessary repairs may not be immediately evident. The CEF is not designed to account for the failure of the team to develop an adequate base construction cost estimate as outlined in this *Instructional Guide*. The results are also dependent on the appropriate selection of the factors in Parts B through H. These factors must not be applied in an arbitrary manner, and must be correlated specifically with the design and construction activities as they are to be executed.

1.5 CREDENTIALS OF CEF USERS

Given that the success of the CEF system is predicated upon the development of an accurate scope of work in Part A and selection of the appropriate factors in Parts B through H, the professional experience of the user is an important consideration. Members of the CEF team should be engineers, architects, and other construction professionals with experience in design, construction, and parametric and conceptual cost estimating. A complex infrastructure project may require a more experienced engineer or architect with specialized experience in the functional area of the damaged facility. Team members should have:

- Experience as a fully competent engineer/architect in all conventional aspects of the subject matter of the functional area of the assignment
- The ability to plan and conduct work requiring judgment in the independent evaluation, selection and modification of standard techniques, procedures, and criteria
- The ability to devise new approaches to problems encountered
- Successfully completed FEMA PA Project Specialist training

1.6 UPDATES TO THE CEF

The CEF will be periodically reviewed and updated as data on the completion of large projects is gathered. These updates will occur on an as-needed basis. Comments and suggestions should be sent to:

Anthony Ndum, P.E.
Federal Emergency Management Agency
Federal Center Plaza
500 "C" Street, S.W. – Room 414
Washington, D.C. 20472

Additionally, the PA Group Supervisor for each disaster is responsible for reporting on the performance of the CEF. Reporting procedures are described in Section 2.7 of this guide.

SECTION TWO THE COST ESTIMATING FORMAT DEVELOPMENT PROCESS

The CEF is used as part of the large project formulation process. A FEMA representative, the Project Specialist, is responsible for developing large projects in partnership with State and local representatives. The CEF is used to develop the cost estimate for the project and the estimate is then used as the basis for obligating funds.

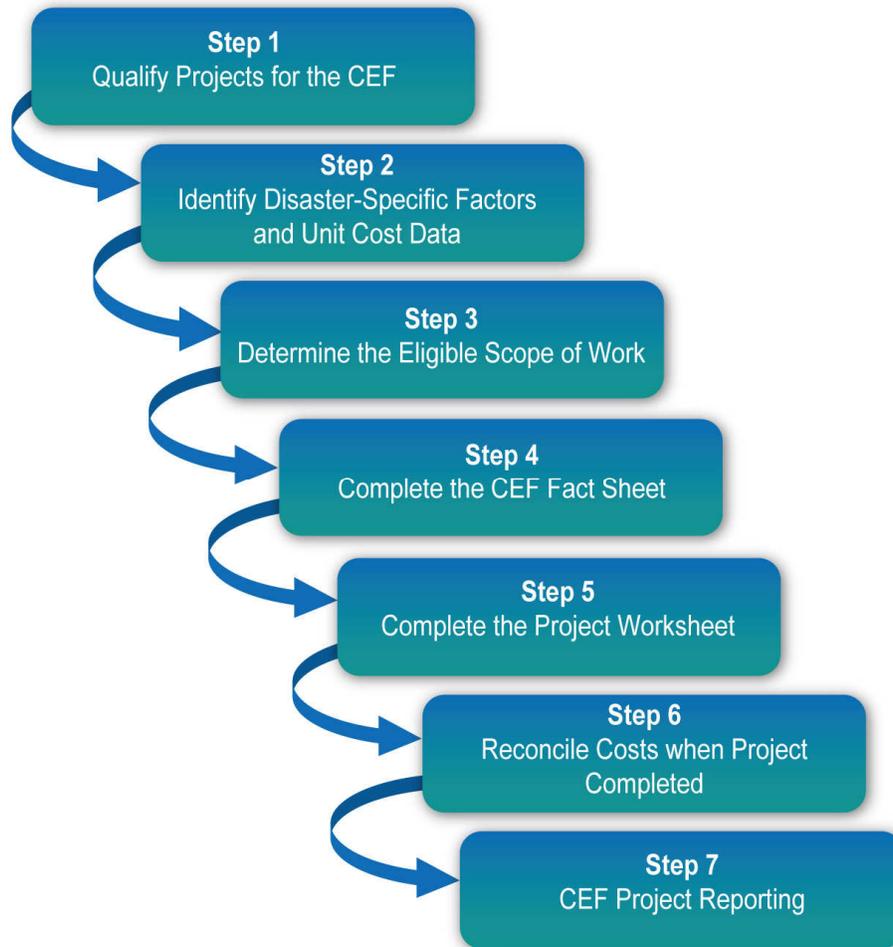


Figure 1: Development and Processing of a CEF Estimate

2.1 STEP 1 – QUALIFY PROJECTS FOR THE CEF

As stated previously, the CEF should only be used on large projects for which the permanent restorative work is less than 90 percent complete. Percent complete for all types of projects (including improved and alternate projects) is calculated by dividing the amount of approved contractor invoices for eligible work by the approved construction contract amount for eligible work and multiplying the resulting decimal by 100.

$$\frac{\text{Approved Contractor Invoices for Eligible Work}}{\text{Approved Amount for Eligible Work}} \times 100 = \text{Percent Complete}$$

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The issues described below may also affect the manner in which the CEF is applied.

Hazard Mitigation Proposals: The Project Specialist may include an appropriate hazard mitigation proposal when developing a large project estimate. To be approved, such a proposal must comply with applicable statutory and regulatory requirements and with all FEMA policies. If FEMA approves the proposal, the base cost (Part A) must include the cost of the hazard mitigation measures. After approved mitigation measures have been included in the base cost, the estimate is completed applying CEF factors as applicable. See Section 4.5 of this *Instructional Guide* for additional information of FEMA's policy on hazard mitigation and how to incorporate hazard mitigation as a type of work into the CEF estimate.

For Improved Projects involving a replacement facility, at the same or new site, Section 406 (Stafford Act) hazard mitigation work items will not be eligible and therefore are excluded from consideration in the CEF, and the PW.

For Alternate Projects, Section 406 hazard mitigation work items will not be eligible and therefore are excluded from consideration in the CEF, and the PW.

Improved Projects: When performing permanent restoration work on a damaged facility, an applicant may decide to use the opportunity to make improvements to the facility while still restoring the facility to its pre-disaster function and capacity. For the most part, these are projects for which the funding for the improvements cannot be separated from the costs for the original repair work.

Improvements beyond restoring a facility to pre-disaster function and capacity are not eligible; therefore, these costs will not be included in the estimated base cost.

The base cost will only reflect the work associated with the eligible disaster-related repair or replacement. The CEF will be used to calculate the final estimate, and the Federal share of this estimate will be forwarded to the State for disbursement through the progress payment system.

The funds are limited to the Federal share of the costs that would be associated with repairing or replacing the damaged facility to its pre-disaster design, or to the actual costs of completing the improved project, whichever is less. Any expenditure in excess of this amount are borne by the applicant, as the work actually accomplished on the project will normally be quite different from the work described on the PW. The State is responsible for ensuring project compliance with Federal regulations.

Alternate Projects: An applicant may determine that the public welfare would not be best served by restoring a damaged facility or its function. In this event, the applicant may use the PA grant for that facility for other eligible purposes. The alternate project may only include eligible work and costs to restore the damaged facility to its pre-disaster design.

The CEF will be used to calculate the final estimate. Ninety percent of the Federal share of the final estimate will be forwarded to the State for disbursement through the progress payment system. As with alternate projects that do not involve the CEF, the funds are capped at 90 percent of the approved Federal share of the estimated eligible costs associated with repairing the damaged facility to its pre-disaster design, or 90 percent of the Federal share of actual costs of completing the alternate project, whichever is less.

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Replacement Projects (50 Percent Rule): A facility is eligible for replacement when the cost of repairing the facility exceeds 50 percent of the replacement cost. This comparison must be based on the following:

- The cost of repair is that which is necessary to repair disaster-damaged components using current methods and materials. The repair costs include non-emergency mold remediation associated with the damaged components and the codes and standards upgrades that apply to the repair of the damaged components. This cost does not include upgrades of other components triggered by codes and standards, design associated with upgrades, demolition of the entire facility, site work, or applicable project management costs, even though such costs may be eligible for PA. The cost of contents and hazard mitigation measures is not included in the repair cost.
- The replacement cost includes the costs for all work necessary to provide a new facility of the same size or design capacity and function as the damaged facility in accordance with all current applicable codes and standards. The cost does not include demolition, site work, applicable project management costs, cost of contents, and hazard mitigation measures.

Both the repair and replacement costs should be calculated for comparison using Part A of the CEF. If the resultant ratio of repair to replacement is greater than 50 percent, the replacement of the facility is eligible. The final estimate is equal to the total cost associated with the eligible work, including items not used in the 50 percent analysis (e.g., eligible codes and standards upgrades, demolition of existing facility for replacements, etc.) using CEF Parts B through H as applicable.

Refer to the *PA Guide*, FEMA 322, and the *PA Policy Digest*, FEMA 321, for additional information regarding the 50 Percent Rule and the eligibility of codes and standards for restoration work.

2.2 STEP 2 – IDENTIFY DISASTER-SPECIFIC FACTORS AND UNIT COST DATA

Local factors affect the development of project cost estimates. Specific items include local unit prices, city cost indices (if applicable), escalation to the mid-point of construction, and local costs for plan checks, building permits, or special reviews. The PA Group Supervisor or designee is responsible for collecting and evaluating this information at the beginning of each disaster and making the information available to the Project and Technical Specialists. The Project and Technical Specialists are responsible for applying the factors in a uniform manner for all CEF analyses.

Unit Cost Data: When evaluating a project, the Project or Technical Specialist should request average weighted unit prices (local costs derived from actual contract history) from the applicant, or from a relevant State or regional agency, for example, the State Department of Transportation (DOT). The average weighted unit price information should be evaluated for consistency with the eligible scope of work.

If the applicant does not have appropriate average weighted unit price data (meaning that the data does not apply to the eligible scope of work), the Project or Technical Specialist should use the most current available cost data in accordance with industry standard construction cost

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estimating resources, (e.g., RSMeans, BNi Costbooks, Marshall & Swift, Sweet's Unit Cost Guide, etc.). Care should be taken in selecting the appropriate cost data reference for the work.

- Major infrastructure repair and construction projects, such as roads, railroads, bridges, and water control facilities, should be estimated using heavy construction cost data guidance.
- Building and structural work expected to exceed \$1,000,000, such as that necessary for schools, hospitals, and municipal buildings, should be estimated using building construction cost data guidance.
- Building and structural work expected to be less than \$1,000,000 should be estimated using facilities construction cost data guidance.

The following cost data references should be available in the Joint Field Office (JFO) for use by the Project or Technical Specialists:

- ADA² Compliance Pricing Guide
- Building Construction
- Concrete & Masonry
- Electrical
- Facilities
- Heavy Construction
- Mechanical
- Plumbing
- Repair and Remodeling
- Site Work and Landscape
- Square Foot Costs

If national cost data is used in Part A, city cost indices for each CSI division of work must be applied to adjust the national unit prices to the nearest city for the declared counties. The PA Group Supervisor or designee is responsible for identifying the zip codes included in the declared area, researching references for the appropriate city cost indices, and tabulating them for use by Project or Technical Specialists.

If the estimate is developed using an electronic estimating tool, the estimate can be developed with the unit costs set for the applicable city. This automatically adjusts the unit cost data to the specified location and the CEF City Adjustment Factor must be entered as 1.0.

Only if the previously mentioned sources are unavailable should FEMA Cost Codes, or other commercial cost-data estimating resources, be used for unit prices in preparing Part A base costs.

Only unit costs from sources outlined in this *Instructional Guide* are acceptable data for developing estimates using the CEF. Use of other unit price data is prohibited without written authorization of the PA Group Supervisor or his/her designee.

Factors: The PA Group Supervisor or designee is responsible for checking the appropriateness of individual factors and ranges (Parts B through H), and for application of these factors. This is especially important with regard to force account efforts, use of contingencies, time frames for escalation, post-disaster inflation adjustments in Part A, and the need for engineering design and construction phase services. Guidance on generally appropriate conditions to use the factors and values of factors to use is provided in Appendix F.

² Americans with Disabilities Act

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The type of damage experienced will dictate the need for, and relative ranges of many of the factors. For example, visual identification of damage may be less difficult after a flood once floodwaters have receded than after a severe earthquake. The PA Group Supervisor may decide that the contingency factors in Part C should therefore be higher than recommended in the CEF for an earthquake. The PA Group Supervisor or his/her designee will be responsible for justifying in writing any changes to the factors, if changes are warranted.

Plan Review and Construction Permit Costs: The PA Group Supervisor or designee is responsible for obtaining documentation related to plan review and construction permit costs and for distributing this documentation to the Project or Technical Specialists. These costs will be determined directly from the controlling jurisdictions in the declared counties. Typical sources include the City Building Department or the Office of the State Architect. Important considerations are listed below.

- How is the plan review or construction permit cost defined?
- What cost item (construction cost or total project cost) serves as the basis for calculation of plan review and construction permit costs?
- What percentage(s) is applied to the base cost?
- Are these percentages on a sliding scale?
- Are these fees ever waived by the State or local jurisdiction in post-disaster situations?

2.3 STEP 3 – DETERMINE THE ELIGIBLE SCOPE OF WORK

The Project or Technical Specialist is responsible for identifying the eligible scope of work in accordance with the requirements of the Stafford Act, Federal regulations, and FEMA policies. All work activities needed to perform the eligible scope of work must be individually listed, as described below in the discussion of preparing the base cost estimate. The scope should also reflect all applicable special considerations, such as historic preservation, environmental and floodplain management issues, insurance considerations, and approved Section 406 hazard mitigation measures. Reference the Project Specialist Checklist for CEF Implementation included in Appendix G.

2.4 STEP 4 – COMPLETE THE CEF SPREADSHEET

The Project or Technical Specialist is responsible for completing and documenting the CEF Spreadsheet. The spreadsheet is described in greater detail in Section 3.

When preparing the CEF estimate, the Project or Technical Specialist must obtain the appropriate supporting documentation. This documentation may include:

- A site map or location plan
- Photographs and sketches
- Measurements and calculations
- Section 406 hazard mitigation proposals
- Force account summary sheets

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- Documentation that applies to applicable codes and standards
- Schematic drawings and, for major construction activities such as water control facilities and large buildings, a set of plans (preferably reduced) containing basic information such as elevations, floor plans, a site plan, structural details, and sections
- Insurance declarations
- Actual/anticipated insurance settlements
- Construction permits/clearances

Source documents such as invoices, vouchers, timesheets, purchase orders, item slips, weight slips, plans, specifications, and insurance policy information reside with the applicant and need not be collected by the Project or Technical Specialist.

2.5 STEP 5 – COMPLETE THE PROJECT WORKSHEET

Once the Project or Technical Specialist has developed an estimate using the CEF Spreadsheet, he or she must complete a PW using that estimate. A printout of the CEF Spreadsheet should be attached to the PW, along with all supporting documentation. The Project or Technical Specialist should work with the PAC Crew Leader to ensure that the case management file is updated to reflect the completion of the estimate and that the PW package is submitted for approval, processing, and storage in accordance with procedures established for that disaster.

Many projects, particularly buildings, to which the CEF is applied, are insurable. The Project Specialist, working with the applicant and the PAC Crew Leader, must identify insurable facilities and ensure that the appropriate actions are taken to account for actual or anticipated proceeds from an insurance settlement. If a facility is insurable, an Insurance Specialist will be responsible for determining the amount for which the grant for that facility should be reduced. The amount of actual or anticipated insurance proceeds should be a line item deduction on the PW. The total cost is given in the “Total Cost” block of the PW. Further instructions on completing the PW can be found in Appendix E. Salvage value or depreciation for equipment should also be deducted from the PW.

2.6 STEP 6 – RECONCILE COSTS WHEN PROJECT IS COMPLETED

The CEF estimate shown on the PW will be used to obligate the Federal share of project costs. This does not mean, however, that these funds are immediately available to the State (the grantee) or to the applicant (the subgrantee). As stated above, the CEF is used to provide an estimate only; it is not used as a final cost settlement instrument. For large projects, funds are made available to the subgrantee on a progress payment basis. The subgrantee may request progress payments for bills already in hand or for funds anticipated to cover project costs in the near future (less than a week). The grantee may draw from the Federal government only the Federal share of the payment in making progress payments. The regulations for grant administration (44 CFR Part 13) provide that payments may be made in advance of actual expenditure if recipients demonstrate the willingness and ability to maintain procedures to minimize the time elapsing between the transfer of funds and their disbursement by the grantee to the subgrantee. Department of Treasury regulations (31 CFR Part 205) govern these

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procedures. The general guidelines are to allow no more than 3 to 4 days between the transfer of funds to the grantee's account and disbursement to the subgrantee.

Upon completion of a large project, the grantee must submit supporting documentation and an accounting of all eligible costs incurred for the project to FEMA for a final determination of eligible project costs. The grantee must certify that the reported costs were incurred in the performance of eligible work and that the project was completed in accordance with FEMA approval. The grantee may perform inspections and audits as it deems necessary to make this certification. FEMA will review the reported costs to determine if the costs are eligible, and may conduct inspections or audits as necessary to verify eligible costs. Upon completing this review, FEMA will reconcile final costs for eligible work against the original estimate and prepare a supplemental PW to adjust the approved amount upward or downward as necessary. If additional funds are approved by FEMA, the grantee may then make an additional drawdown of any funds remaining for that project.

Within 90 days following completion of the last large project, the grantee must submit a final progress report that includes the final amount paid for each large project. If FEMA determines that the grantee has drawn Federal funds for ineligible costs, then the grantee must return those funds to FEMA.

Refer to Appendix E (Standard Operating Procedure – CEF for Large Projects) for additional information relating to the cost reconciliation process.

2.7 STEP 7 – CEF PROJECT REPORTING

The CEF will be revised periodically, as data from actual projects become available. To facilitate revisions, a standard report, called the CEF – Large Project Report, has been developed to collect these data. The report is a Word spreadsheet that is distributed with the electronic CEF template.

For each disaster, the PA Group Supervisor or designee will prepare the report using, as appropriate, the following information:

- Disaster number and name of the PA Group Supervisor preparing the report
- Declaration date and the date prepared
- Applicant name
- PA ID number
- PW number
- Category of permanent work (C, D, E, F or G)
- CEF estimated cost
- CEF actual post-construction cost
- Dollar amount of obligation or de-obligation
- Reason for cost reconciliation
- Primary function of the facility

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A sample copy of the report has been included in Appendix C, and an electronic copy has been included with this guide. The PA Group Supervisor should submit the report to the address included in Appendix G, PA Group Supervisor Checklist for CEF Implementation.

2.8 SUMMARY OF PA GROUP SUPERVISOR AND PROJECT SPECIALIST RESPONSIBILITIES

The respective responsibilities of the PA Group Supervisor and Project Specialist throughout the CEF process are outlined in Appendix G.

SECTION THREE COMPLETING THE CEF SPREADSHEET

The CEF Spreadsheet has been organized to make it user-friendly and flexible enough to respond to individual project conditions and to promote uniformity in the development of cost estimates. While many projects are simple to analyze, others will need to be analyzed by level of completion and type of work activity being conducted. Therefore, the user can structure the spreadsheet to address specific project characteristics by simply clicking on those parameters that define the project.

The parts of the spreadsheet are separated onto individual tabs at the bottom of the spreadsheet. They are:

- CEF Fact Sheet
- Part A – “Base Costs” for Construction Work In Trades
- Summary for Completed Work
- Summary for Uncompleted Work
- Total Project Summary
- CEF Notes

Each of these parts is described below. A printout of a blank electronic spreadsheet is given in Appendix A for illustration purposes. Please refer to Appendix A.

3.1 CEF FACT SHEET

The CEF Fact Sheet is the first tab in the spreadsheet and should be completed first. Information on the Fact Sheet automatically completes some information in other components of the CEF, including the CEF Notes, Summary of Completed Work, and Summary of Uncompleted Work sheets. It is designed to allow the user to document basic information about the project and the estimate, including the date the CEF was prepared, the declaration number, the FEMA Region, the applicant, the category of work, and the name and location of the facility. The user should also provide a clear and concise description of the eligible scope of work.

The Fact Sheet also allows the user to customize the spreadsheet for the type of work being performed and the level of project completion. This customization occurs automatically when the user specifies the “Type of Work” on the Fact Sheet, and includes changes to the formatting and labeling.

Type of Work: The Fact Sheet asks the user for the type(s) of work that must be performed. Suggested types of work include:

- Repair work: activities that are solely allocated to restore a damaged facility to its pre-disaster condition.
- Retrofit and upgrade: activities undertaken to upgrade a damaged item to current codes and standards.
- New construction: the replacement of part or all of a facility, as opposed to repairing or retrofitting discrete elements.

- **Hazard mitigation:** measures taken to reduce or eliminate future damage from hazards similar to that which caused the damage, or from multiple hazards.
- **Other work:** activities that are typically undertaken outside of the typical applicant-general contractor-subcontractor relationship. Examples include hazardous material abatement, selective demolition, and force account activities.

A project can consist of one type of work, or multiple types, depending upon how the restoration activities match the requirements of the PA Program. Under certain circumstances the estimate may use separate types of work to accurately apply cost factors to reflect the applicant-contractor relationships, e.g., a trade contractor acting as the general contractor thus not requiring general contractor mark-ups on his/her own work.

The user should select the work type(s) to be analyzed and enter it into the Fact Sheet. Once the fact sheet is completed, a CEF Spreadsheet tailored specifically for this analysis is created. Each “Type of Work” entered on the Fact Sheet populates a column title on the Summary of Completed Work and Summary of Uncompleted Work sheets. To change the prepared format, the user must return to the Fact Sheet and redefine the type of work.

Work Completion: Projects being analyzed will likely have completed and uncompleted work elements. Since several of the CEF factors are based upon unknowns that result from the level of completion, the spreadsheet is structured to analyze completed and uncompleted work separately. Therefore, it is recommended that the user separate completed and uncompleted work in Part A.

Mixing completed costs with estimated costs in mid-construction can lead to inaccurate estimates, unless the completed work is a discrete, stand-alone portion of the project without the potential for change orders. For example, cost inaccuracies can result by using unit costs applicable to cast-in-place concrete in bridge abutments for concrete used for deck pavement. Therefore, to be considered completed work, a project work element must be:

- A specific type of work (repair, retrofit, new construction, hazard mitigation, or other) for which actual incurred costs documentation for eligible work can be easily obtained
- A discrete work activity (such as grading or laying foundations) that is complete and has no potential for future change orders

In some cases, an applicant may have solicited bids for the project before the CEF is prepared. The lowest qualified bid amount obtained through a competitive bid process can be accepted for purposes of developing an estimate, as long as the bid conforms substantially to the eligible scope of work, the qualified bidder has been given the notice to proceed, and a cost analysis has been conducted to evaluate the reasonableness of the bid as required in 44 CFR Part 13. The application of the CEF to document the reasonableness of bid costs in such cases is described in Section 4.10 of this *Instructional Guide*.

Preparers’ Notes: The purpose of the Scope/Prepares Notes section is to document the basis of the CEF estimate. The CEF user should use this section to document, as a minimum:

- A clear, concise description of the project, including a summary of the eligible scope of work

- The status of the project at the time of the estimate, i.e., percent of design and/or construction complete
- The anticipated project delivery method, i.e., design-bid-build, force account, etc.
- The source of unit cost data

3.2 CEF NOTES

The CEF Notes sheet provides the user with a place to document the logic, assumptions, and reasoning for the selection of each factor. To ensure proper documentation, the user must enter notes for each work type and must indicate the value chosen for each factor and the rationale for the choice. The sheet also contains an area for miscellaneous comments and notes.

3.3 PART A – BASE COSTS FOR CONSTRUCTION WORK IN TRADES

Part A of the CEF Spreadsheet is designed to capture the detailed construction cost required to directly complete the eligible scope of work. Estimates are defined using the Cost Item Number, Item Description Title or Component Description, and Division or Cost Code columns. The total estimated cost for each work activity is a product of the quantity, unit price, and city adjustment index.

3.4 SUMMARY FOR UNCOMPLETED WORK

Using the Summary for Uncompleted Work, the user selects factors to be applied to the base cost estimate of uncompleted work. Refer to Sections 4 through 11 of the *Instructional Guide* for a description of each factor and guidance on selecting factors. The user employs either check boxes or specific values to apply each factor or sub-factor in the spreadsheet. Check boxes are used when the factor is fixed (such as with B.2, the factor for General Conditions) or is calculated by the spreadsheet automatically (such as with H.1, the factor for Applicant's Project Management – Design Phase). The default value for each factor is 0, i.e., the factors are unselected when opening a new CEF. The user must elect to apply factors appropriate to the eligible work, the conditions under which the work will be performed as documented at the time of the estimate, and the source of unit cost data.

Guidance on selecting factors in Parts B through H is provided below. The components of each factor are described and a recommended range for each factor is provided. All assumptions made by the user and rationale for selecting values, particularly values outside of recommended ranges, should be documented in the CEF Notes section of the spreadsheet. Selection of values outside the recommended ranges will be based on guidance provided by the PA Group Supervisor and shall be included in the supporting documentation for the project.

3.5 SUMMARY FOR COMPLETED WORK

Using the Summary for Completed Work, the user selects factors that are applied to the base cost estimate for completed work. Factors in Parts B through H are applied using check boxes or by selecting specific values in the same manner as described for Summary of Uncompleted Work.

Care must be exercised in determining the applicability of Parts B through H if Part A is based on actual costs for completed work.

3.6 TOTAL PROJECT SUMMARY

The Total Project Summary merges estimated costs for completed and uncompleted work into a single estimate for the entire project. This estimate is used in the preparation of the PW.

SECTION FOUR PART A: “BASE COSTS” FOR CONSTRUCTION WORK IN TRADES

4.1 BACKGROUND

Part A contains the “base costs” for the project. It includes costs for all eligible permanent and non-permanent trade work required to directly complete the eligible scope of work. These costs represent the “complete and in-place” cost components, i.e., the cost of all labor, equipment, materials, small tools, incidentals, and hauling costs necessary to complete an item of work. Each of these components, as they apply to permanent and non-permanent work, is discussed below. As stated above, the preparation of a precise base cost estimate in Part A is critical to the accuracy of the total project estimate developed with the CEF.

4.2 PART A SPREADSHEET

Part A can be formulated to meet the specific requirements of a particular estimate. The user may add rows to the spreadsheet to accommodate additional items of work as necessary.

Rows may be added by left clicking the “Add Row” button on the appropriate Part A subsection:

- Completed Permanent Items
- Completed Non-Permanent Items
- Uncompleted Permanent Items
- Uncompleted Non-Permanent Item

Rows added using the “Add Row” feature are formatted to include the calculation for that rows total cost.

Rows added in any other manner likely will not include the row total cost calculation. The user should check to ensure that formulas have been properly copied after inserting rows in a manner other than the “Add Row” feature.

The CEF is an official document of the Federal Government and may not be changed, altered or amended without review and written concurrence of FEMA Headquarters. Therefore, no changes to the format or functionality of Part A other than the addition of rows as described above are to be made by a CEF User.

4.3 SCOPE OF WORK

Before Part A can be completed, the FEMA eligible scope of work must be clearly defined. This scope is the work required to repair or replace the damaged facility on the basis of the design of the facility as it existed immediately prior to the disaster. Regulations outlining PA eligibility are found in 44 CFR Part 206. As previously described, the scope of work must include eligible upgrades necessary to comply with current codes and standards and it must include any approved hazard mitigation measures. The scope of work must not include ineligible work that would be considered part of an improved or alternate project.

Part A: “Base Costs” for Construction Work In Trades

The Project Specialist, in partnership with State and local representatives, develops the eligible scope of work. The Project Specialist is also responsible for developing the CEF estimate and must ensure that Part A does not contain ineligible work. The application of the CEF is the last step in the large project formulation process; therefore, any eligibility conflicts involving scope of work items must be resolved before the CEF is prepared.

4.4 ORGANIZATION OF “BASE COSTS”

44 CFR Part 206 requires a quantitative estimate for eligible work. To meet the requirements, the user should list work items in Part A with as much detail as possible. The Part A spreadsheet is organized to allow the user to:

- Differentiate between permanent and non-permanent work.
- Differentiate between completed and uncompleted work.
- Sort items by work type (repair, retrofit, new construction, hazard mitigation, and other discrete work elements such as selective demolition and force account). The types of work specified should match those selected when the user completes the CEF Fact Sheet.

Once the user has organized the line items using these categories, the line items within each category should be further organized using standard CSI divisions.

- The 1995 CSI format consists of 16 divisions.
- The 2004 CSI format consists of 50 divisions, including 21 divisions held for future use.
- To avoid the cost of recreating construction documents into the 2004 CSI format, especially for repair projects, applicants and designers frequently use prior model documents written in the 1995 format.
- The 1995 and 2004 formats of the CSI divisions are shown in Table A.1.

Part A may be developed using either CSI MasterFormat 1995 or MasterFormat 2004. However, the estimate must be completed using the same MasterFormat throughout.

Part A: “Base Costs” for Construction Work In Trades

Table A.1: CSI Divisions

1995 Master Format	2004 Master Format	
Division 1: General Requirements	Division 1: General Requirements	Division 24: Open for future use
Division 2: Site Construction	Division 2: Existing Conditions	Division 25: Integrated Automation
Division 3: Concrete	Division 3: Concrete	Division 26: Electrical
Division 4: Masonry	Division 4: Masonry	Division 27: Communications
Division 5: Metals	Division 5: Metals	Division 28: Electronic Safety and Security
Division 6: Woods and Plastics	Division 6: Woods, Plastics, and Composites	Division 29–30: Open for future use
Division 7: Thermal and Moisture Protection	Division 7: Thermal and Moisture Protection	Division 31: Earthwork
Division 8: Doors and Windows	Division 8: Openings	Division 32: Exterior Improvements
Division 9: Finishes	Division 9: Finishes	Division 33: Utilities
Division 10: Specialties	Division 10: Specialties	Division 34: Transportation
Division 11: Equipment	Division 11: Equipment	Division 35: Waterway and Marine Construction
Division 12: Furnishings	Division 12: Furnishings	Divisions 36–40: Open for future use.
Division 13: Special Construction	Division 13: Special Construction	Division 41: Material Processing and Handling
Division 14: Conveying Systems	Division 14: Conveying Systems	Divisions 42–43: Open for future use
Division 15: Mechanical	Division 15–20: Open for future use	Division 44: Pollution Control Equipment
Division 16: Electrical	Division 21: Fire Suppression	Divisions 45–47: Open for future use
	Division 22: Plumbing	Division 48: Electric Power Generation
	Division 23: Heating, Ventilation and Air Conditioning	Divisions 49–50: Open for future use

Part A: “Base Costs” for Construction Work In Trades

All construction work activities must be itemized and quantified. As lump-sum construction cost estimates do not meet the requirement for quantitative estimates, lump sums are not acceptable for preparing the CEF estimate. If eligible unforeseen site conditions are present or eligible hidden damage is discovered and the scope of work must be revised, unit costs lend themselves to this task more readily than lump-sum items.

Using this system, a project may be broken into a series of separate sub-estimates for each major item of work. This facilitates:

- Application of the city cost factors by CSI division
- Checking the estimate
- Analyzing the work to determine if alternative solutions exist
- Use of the estimate for policy determinations
- Future changes in scope without requiring that the estimate be recalculated

Once the user has developed estimates for completed and uncompleted work, the user must enter these estimates in the Summaries of Completed Work and Uncompleted Work, respectively. The estimates are entered in the appropriate fields under Part A on each summary sheet. The distinction between permanent and non-permanent work must be maintained when completing the summary sheets.

Examples of completed Part As can be found in Appendix B. Permanent and non-permanent work is discussed in more detail in Sections 4.8 and 4.9.

4.5 REPAIR VS. REPLACEMENT

The determination of eligibility for a replacement facility shall include only those repairs, including non-emergency mold remediation, associated with the damaged components, and upgrades to meet current codes and standards that apply to the repair of the damaged components. The cost does not include upgrades to other components triggered by codes and standards, project design, demolition of the entire facility, site work, or project management costs (even though these upgrade costs may be eligible for FEMA funding).

The following calculation, known as the “50 Percent Rule,” is used to determine whether replacement is eligible:

$$\text{IF } \frac{\text{Repair Cost}}{\text{Replacement Cost}} < 50\% \text{ THEN only the repair cost is eligible}$$
$$\text{IF } \frac{\text{Repair Cost}}{\text{Replacement Cost}} > 50\% \text{ THEN only the replacement cost is eligible}$$

Refer to the *PA Guide*, FEMA 322, and the *PA Policy Digest*, FEMA 321, for additional information relating to the 50 Percent Rule and the eligibility of codes and standards for restoration work.

In most cases, the criteria outlined in [Table 2: Repair/Replacement](#) in the *PA Guide*, FEMA 322, June 2007, are adequate for repair and replacement projects. However, particular attention should be paid to the repair of damaged historic buildings. Such repair could trigger a

Part A: “Base Costs” for Construction Work In Trades

requirement to upgrade a structure to new construction standards, while at the same time maintaining historic features. The total restoration cost, in this situation, may exceed replacement cost, as in condition 3 found in the referenced Table 2, but the excess over the replacement cost is not eligible.

The regulations [44 CFR 206.226(f)(3)] contain an exception to the funding limitation depicted in the table that applies only when a facility is eligible for listing or is listed in the National Register of Historic Places. If an applicable standard that requires a facility to be restored in a certain manner and disallows other options, such as leaving the facility un-restored, the eligible cost to complete the restoration may exceed the replacement cost.

The repair vs. replacement calculation is begun by completing two separate Part A base cost estimates using the CEF (do not apply parts B through H). The user prepares one estimate for each of the repair and replacement scenarios. The “Total Part A Base Construction Cost” from the estimates is used in calculating the actual repair vs. replacement fraction. The two Part A estimates can be completed using a single CEF to facilitate review of the repair vs. replacement analysis. The resulting percentage determines whether the type of work will be repair or replacement. Once the type of work has been selected for a project (i.e., either repair or replacement), then the project is estimated using CEF in the standard manner (including adding additional eligible costs in Part A and applying the appropriate B through H factors for the project) as illustrated in Appendix B, Example 3.

4.6 HAZARD MITIGATION

Hazard Mitigation is defined as cost-effective action taken to prevent or reduce the threat of future damage to a facility in 44 CFR 206.2. The mitigation measures must be appropriate to the disaster damage and must prevent future damage similar to that caused by the declared event.

For hazard mitigation measures to be approved, the measures must be reviewed by FEMA staff to ensure eligibility, technical feasibility, environmental and historic preservation compliance, and cost effectiveness.

Mitigation measures must be determined to be cost effective. Any one of the following means may be used to determine cost effectiveness:

- Mitigation measures may amount to up to 15 percent of the total eligible cost of the eligible repair work for the damaged facility.
- Certain mitigation measures, see Appendix D, may be determined to be cost effective as long as the mitigation measure does not exceed the cost of the eligible repair work on the project.
- For measures that exceed the costs of eligible repair work, the subgrantee must demonstrate through an acceptable benefit-cost analysis that the measure is cost effective.

Costs of meeting applicable codes and standards in accordance with 44 CFR 206.226 are distinct from mitigation funding.

Section 404 hazard mitigation (statewide mitigation program) does not fall under the purview of the PA Program. Therefore, the grantee and subgrantee must be able to identify specific hazard mitigation work that will be accomplished with funding through Section 406.

Part A: “Base Costs” for Construction Work In Trades

Costs approved for project-specific mitigation measures under Section 406 of the Stafford Act may not be applied to improved projects that will involve the replacement of the disaster-damaged facility, whether on the same site or an alternate site. However, funds recommended for mitigation measures may be approved for an improved project, which will include the work required to repair the disaster-damaged facility and restore its function, as well as improvements.

The cost caps (15 percent or 100 percent) for Section 406 hazard mitigation measures will be based on the total cost of damage to: 1) the damaged element, and 2) the affected building contents.

4.7 FORCE ACCOUNT WORK

As stated previously, the term “force account” refers to the applicant’s own resources, in terms of labor, equipment, or materials. Not all of the CEF factors are applicable to force account work.

- The profit and overhead factors represented by Part D should not be applied to force account work.

In the absence of information regarding the method for completing the project, the Project Specialist should prepare the CEF estimate as if the applicant plans to complete the project using a contractor. The Project Specialist shall make every effort to determine how the applicant intends to complete the work.

- For those instances in which the applicant has begun the work using force account resources or expresses the intent to complete the work with force account resources, the estimate should reflect this intent.
- If the project will be completed by a combination of contractual and force account resources, the Project Specialist should prepare two separate Part A estimates—one for the force account portion of work and one for the contract portion of the work—and should apply the factors separately to each Part A as appropriate.
- Line-items may also be included for an applicant’s fringe benefit costs or productive hourly rate.

4.8 A.1: ESTIMATE FOR PERMANENT WORK

“Permanent work” refers to those work items that are necessary to repair or replace damaged elements of a facility, or that are part of the reconstruction of a facility. Typically, these items relate to a fixed part of the facility and are left in place once the work is complete (for example: installation of an asphalt surface, placement of riprap, patching and painting interior walls, or repairing cracked water distribution lines). If appropriate, permanent work should be separated into structural and non-structural elements to facilitate the application of FEMA policy, particularly with regard to upgrades for codes and standards.

Americans with Disabilities Act (ADA) Compliance: Measures necessary for compliance with applicable codes and standards regarding ADA requirements may be eligible. The increase in design and construction costs associated with ADA compliance will vary considerably according to the category, use, and location of the facility. If possible, ADA costs should be

Part A: “Base Costs” for Construction Work In Trades

developed using a line item estimate in Part A. For example, highway and bridge work undertaken by State DOTs typically include separate work items for ADA compliance, such as wheelchair ramps and utility pole setbacks. Alternatively, set factors for specific cost items may also be used. Reference should be made to nationally accepted or locally set standards for such factors, such as the most recent ADA Compliance Pricing Guide.

For Category E buildings that sustain structural damage, ADA compliance costs are less site-specific but are more easily quantified, and therefore less variable. If the damaged portion of the building does not comply with ADA, and a detailed scope of work for completing ADA upgrades is not available to be included in Part A, an allowance for ADA compliance can be estimated using Table A.2. The ranges provided cover the inherent differences between less complex facilities (warehouses, factories, garages) and facilities where ADA compliance could be more costly (historic and monumental buildings). This allowance should be applied only on the basis of the eligible structural damage to the facility. ADA allowances cannot be applied on the basis of damage to non-structural elements or architectural finishes. The allowances given in Table A.2 should be applied to buildings (Category E) with eligible structural damage only.

When using Table A.2 to select the ADA compliance factor, the user should consider the need for ADA compliance based on local requirements, then the facility’s use and function. The user should also compare the selected factor to other, similar projects undertaken by the applicant, if the information is available.

Table A.2: ADA Compliance Allowance for Category E Facilities

Cost of Structural Repairs (\$)			ADA Compliance Allowance (%)
0	to	82,000	20.00
82,000	to	100,000	12.5–19.8
100,000	to	125,000	8.5–19.5
125,000	to	150,000	5.8–19.00
150,000	to	175,000	5.0–18.5
175,000	to	200,000	5.0–18.0
200,000	to	225,000	4.8–17.5
225,000	to	250,000	4.8–16.5
250,000	to	275,000	4.7–15.0
275,000	to	300,000	4.7–12.5
300,000	to	500,000	4.7–11.5
500,000	to	1,000,000	4.6–10.5
1,000,000	to	2,500,000	4.6–9.8
2,500,000	to	10,000,000	4.6–5.5
Over 10,000,000			4.5–5.5

4.9 A.2: ESTIMATE FOR NON-PERMANENT, JOB-SPECIFIC WORK

“Non-permanent work” includes job-specific work activities or equipment required to complete the permanent work but is not left in-place at the completion of the construction. Examples include:

- Construction aids such as safety nets, scaffolding, construction signs, lighting, and personal safety equipment
- Major equipment such as cranes and other lifting or hoisting equipment
- Activities such as de-watering, temporary relocation of utilities, and the installation of blasting pads, coffer dams, and temporary access roads

Non-permanent work items are included in CSI Division 1 (General Requirements). Unless such work items are specifically required to execute the eligible work and can be quantified based on a schedule analysis, they should not be specified as part of the permanent work (A.1) or duplicate the job site factors covered in Part B.1.

4.10 METHODS FOR PREPARING THE “BASE COST” ESTIMATE

As described above, the Project Specialist should attempt to obtain average weighted unit prices (local costs derived from actual contract history) from the applicant, or from a relevant State or regional agency when preparing Part A. However, if appropriate local data cannot be developed, industry standard construction cost estimating resources (e.g., RSMeans, BNi Costbooks, Marshall & Swift, Sweet’s Unit Cost Guide, etc.) are the recommended source of cost data for the CEF. These publications have been selected based on their wide acceptance in the industry and the availability of data for nationwide use. The Project Specialist must ensure that the current cost data publications are used in these cases.

Some cost estimating resources publish cost data for union and non-union activities. Typically, large, publicly funded projects are completed with union labor. Therefore, union rates should normally be used for estimating purposes, unless the Project Specialist can establish that non-union labor will be used to complete the scope of work. The Project Specialist should document use of non-union rates in the CEF Notes Sheet.

While industry standard construction cost estimating resources are recommended for use with the CEF, these publications may not always provide work items that are appropriate or applicable to the construction activities required to complete the project. There are numerous sources that may be used in the preparation of cost estimates for large projects when it is determined that industry standard cost data are not appropriate. Some additional sources are:

- Historical documentation and average costs for similar work in the area
- Published unit costs from national cost estimating databases
- Low bid or construction contract unit costs from prior projects
- Applicant force account labor, equipment, and material costs
- FEMA Cost Codes

Part A: “Base Costs” for Construction Work In Trades

In all cases, the Project or Technical Specialist should ensure that the components of unit cost data are fully understood. Each unit cost must represent a complete and in-place cost that includes all labor, equipment, materials, small tools, incidentals, and hauling costs necessary to complete the work. Unit costs should not include surveying and construction inspection costs. The Project or Technical Specialist should understand cost elements that could potentially be duplicated in Parts B through H, such as general contractor’s overhead and profit.

The unit costs in Part A should be “base costs,” that is, they should include the subcontractor’s overhead and profit, but should not include general contractor overhead and profit. Factors for general contractor overhead and profit are included in Part D.

- Cost estimating publications provide unit cost data with and without overhead and profit. The overhead and profit included in the total unit price is for the installing trade or subcontractor only and should be used for most projects.
- If a source other than industry standard construction cost estimating resources is used, such as contract or bid unit costs, costs obtained from that source should be analyzed to determine if general contractor overhead and profit are included in the unit cost.
- Overhead and profit are normally part of the unit price for an item of work within a contract (if the contract was let in a bid environment), or as a separate line item in a written quote (if obtained from the contractor in a non-bid environment). As previously indicated, all contractor bid costs must be analyzed for reasonableness as required by 44 CFR Part 13.
- If a prime contractor and subcontractor relationship is anticipated during completion of the work, then the Part A costs should include the subcontractor overhead and profit and the Part D factor should also be included to cover general contractor overhead and profit.
- The prime contractor and subcontractor relationship is generally used for more complex facilities in which prime contractors subcontract specialized work. In all cases, the Federal-State-local team should verify the relationship before the Project Specialist prepares the CEF.

Disaster conditions may cause shortages of skilled labor, building materials, and energy sources, resulting in fluctuations in costs. When these conditions prevail, the available unit cost data may not be accurate. The Project or Technical Specialist should identify and document such conditions during large project formulation and adjust unit cost data before applying the CEF. Any changes in standard cost data must be documented in writing and approved in writing by the PA Group Supervisor or his/her designee.

The following paragraphs describe various scenarios that may be encountered when developing costs in Part A. All assumptions or the basis for development of Part A must be recorded in the CEF Notes Sheet.

a) Development of an estimate when no work has been completed by the applicant:

- i. Define all work activities required to complete the work and determine the quantities and units associated with each work item. As stated above, lump-sum work items should be avoided.
- ii. If the applicant intends to use force account labor, equipment, and materials to complete

Part A: “Base Costs” for Construction Work In Trades

the project, these costs should be treated as contractual work and included in Part A. As stated above, not all CEF factors are applicable to force account work. Home office overhead and profit factors represented in Part D should not be included for force account work.

- iii. Using the appropriate cost data source, as recommended above, determine the unit cost for each work item. List the item number, item description, cost code, quantity, and unit price on the Part A worksheet. Care should be taken to avoid combining multiple definable work items in a single loaded unit cost.
 - A critical factor in developing cost estimates is the appropriateness of using assembled (as opposed to non-assembled) costs. Using an assembled cost for work activities that can be represented by a single unit of measurement is acceptable, as long as the source of the assembled costs is valid.
 - For example, some cost estimating publications provide assemblies cost tables for a variety of construction components. These assembled cost tables have unique identification numbers; illustrations, descriptions, and design criteria; listing of system components, their quantities, and units of measure; derived assembly unit costs for materials and installation; and total costs. If the eligible scope of work deviates from the assumed condition upon which the assembly cost is based, the estimate must be based on unit cost data. The assembly description can be used for reference to ensure all components of work are included in the estimate.
 - Assembled costs are most applicable for new or replacement type projects. On the other hand, repair projects are typically characterized by a number of discrete unrelated work activities (represented by different units of measurement); therefore, assembly costs should not be used and a detailed line item cost estimate should be prepared
- iv. After itemizing each work item required to complete the project in Part A, apply the appropriate city adjustment factor from the cost estimating publication to each line in Part A. If local average weighted unit prices (local costs derived from actual contract history) are used, the city cost adjustment must be entered as 1.0. Similarly, if cost estimating is completed with cost data settings to the applicable local area, the city cost adjustment in the CEF is 1.0.
- v. Enter the totals for permanent and non-permanent work in the appropriate fields at the top of the summary for uncompleted work.

b) Estimate based on an Architect and Engineering (A&E) report:

If an A&E report with a construction cost estimate for uncompleted work is available check the reasonableness (44 CFR Part 13) of the estimate as follows:

- i. Verify that all items of work included in the estimate are eligible.
- ii. Check a minimum of six of the ten largest cost items against local average weighted unit prices or industry standard construction cost data, (e.g., RSMeans, BNi Costbooks, Marshall & Swift, Sweet’s Unit Cost Guide, etc.). Note that the largest cost items should consist of systems (e.g., heating, ventilation, and air conditioning systems) or subsystems (e.g., plumbing piping or air distribution duct) and not individual components. The

Part A: “Base Costs” for Construction Work In Trades

selected cost items must represent a minimum of 25 percent of the CSI Divisions included in the eligible scope of work.

- iii. Check a minimum of 25 percent of the remaining cost items against local average weighted unit prices or industry standard construction cost data. The cost items should consist of systems or subsystems representing an additional 25 percent of the CSI Divisions included in the eligible scope of work.
- iv. If the item costs checked in the A&E construction cost estimate are within 10 percent of the local average weighted unit prices or industry standard construction cost data, use the A&E construction cost estimate in Part A.
- v. If the item costs checked in the A&E construction cost estimate are not within 10 percent of the local average weighted unit prices or industry standard construction cost data, assume the entire estimate is not comparable and develop a new Part A. Care should be exercised to ensure that the scope of work used to develop the new Part A contains eligible items only.
 - All work items specified in the report must be listed in Part A and quantified; lump-sum items may not be used. Each work activity should be reviewed to determine if the estimate reflects costs that could be duplicated by factors in Parts B through H. Examples include contingencies, which could be included in the quantities that would be duplicated by Part C; overhead and profit that could be duplicated in Part D; and escalation that could be duplicated in Part E.
- vi. After completing Part A, enter totals in the appropriate fields at the top of the Summary for Uncompleted Work.

c) Estimate based on a bid or construction contract:

If an appropriately procured construction contract or bid for uncompleted work is available, it can be used in the CEF if a cost analysis concludes that the contract cost is reasonable (44 CFR Part 13). The cost analysis must check the contract cost for eligibility, reasonableness, and applicability.

- i. Prepare an objective line item estimate of the work to compare it with the bid. This can be done using the verification process explained in (b) (ii) and (b) (iii) above. If the bid or construction contract is reasonable and the scope of work is eligible, use that value in Part A.
- ii. After completing Part A, enter totals in the appropriate fields at the top of the Summary for Uncompleted Work.
- iii. Identify those factors in Parts B through H that might already be included in the construction contract bid amount. The contractor’s unit costs probably include part or all of the contractor’s overhead and profit reflected in Part D, allowance for contingencies reflected in Part C, and escalation reflected in Part E. These unit costs could even include permit and plan review fees (Part F), and allowances for change orders (Part G). Therefore, the CEF should be adjusted to reflect the inclusion of these factors in the contractor’s unit costs as appropriate.

d) Developing an estimate when the applicant has partially completed the work:

Part A: “Base Costs” for Construction Work In Trades

Mixing actual costs with estimated costs in mid-construction can result in significant inaccuracies, unless the completed work is a discrete, stand-alone portion of the project.

Complete the Part A spreadsheet as follows:

- i. Separate completed and uncompleted work.
- ii. If the applicant had an estimate prepared before the work was completed, compare the actual costs against that estimate and reconcile any differences. Enter the result in Part A, Summary for Completed Work.
- iii. If no estimate exists, prepare a CEF Part A estimate of the eligible completed work activity as outlined in the preceding paragraph c, and compare it against the actual costs and reconcile any differences. Enter the result in Part A, Summary for Completed Work.
- iv. Prepare a Part A estimate for uncompleted work as outlined in the preceding paragraphs a) or b). Enter the result in Part A, Summary for Uncompleted Work.
- v. Using the values that are most applicable to the eligible scope of work will minimize questions on the application of Parts B through H.

Part B: General Requirements and General Conditions

SECTION FIVE PART B: GENERAL REQUIREMENTS AND GENERAL CONDITIONS

Part B accounts for non-permanent job site work that could not be readily itemized in A.2. The Part B factors are applied directly to the work type subtotals from Part A.

- To apply the B.1 factors, enter the percentage factors for each work type.
- To apply the B.2 factors, select each work type to which the factor should be applied.
- If no percentages or check boxes are selected, the B factor will be set to 0.

Parts B.1 and B.2 are described in greater detail below.

5.1 B.1: GENERAL REQUIREMENTS

The General Requirements factor B.1 addresses those costs typically described in the general requirements of construction specifications. B.1 items include safety and security items, temporary services and utilities, submittals, and quality control. Whenever possible, these items should be specified in the non-permanent work section of Part A. If any of these costs have been included in Part A, they should not be duplicated in Part B. All assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet.

Safety and security: This factor includes such items as:

- Guard service
- First aid, barricades, uniformed traffic persons, flagging, railings, toe-boards, and rented fencing
- Harnesses, scaffolding, and other safety equipment
- Fire protection, such as fire extinguishers and temporary hydrants
- Temporary signage that may be required by a regulatory authority (e.g., the Federal Highway Administration) to control pedestrian or vehicle detours within and around the construction zone.

For most construction sites, 4 percent is a reasonable factor for safety and security items. It can be increased to 6 percent as project complexity increases. The higher end of the range would be applicable on projects such as airports, marinas, and ports; large segmented sites with phased construction; projects on sites that require employee tracking during working hours; and projects in areas requiring a 24-hour security staff.

Temporary services and utilities: This factor includes construction trailer or office space, and related office equipment. The space may be for the construction job superintendent or for inspectors. The factor also includes temporary utilities such as construction water, electricity (including temporary power distribution to work areas), telephones, construction craft sanitary facilities, and weather protection that may be necessary for temporary services or utilities. The recommended value for typical projects is 1 percent.

Quality control: This factor reflects completion of quality control by an organization other than the applicant or the contractor. Typically, this organization is an independent testing and

Part B: General Requirements and General Conditions

inspection service with expertise specific to the project scope of work. Examples include concrete strength testing, water quality testing, and non-destructive examination of welds. These costs typically range from 0.5 percent to 1.0 percent of the installation or trade construction cost. The recommend value for typical projects is 0.5 percent, and toward 1.0 percent as the overall project or specific complexities increase (e.g., a broader spread footing required on one side of a building project because of unforeseen, unstable soil conditions at that location).

Submittals: This factor includes the contractor's costs for preparation of shop drawings, materials certifications, and instructions; providing samples and product data; and preparation of construction progress schedules. The recommended value for a typical project is 5 percent.

5.2 B.2: GENERAL CONDITIONS

The B.2 factor represents a prime contractor's on-site project management costs. It covers field supervision. A recommended value of 4.25 percent has been established. Before applying this factor, the Project Specialist should verify that the prime contractor's on-site project management costs have not already been included in any unit costs or bid prices. All assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet.

Part C: Construction Cost Contingencies/Uncertainties (Design and Construction)

SECTION SIX PART C: CONSTRUCTION COST CONTINGENCIES/UNCERTAINTIES (DESIGN AND CONSTRUCTION)

A contingency is a monetary provision for uncertainties about performing the work and unforeseeable costs. It is included in an estimate to create an appropriate level of probability for completing the project within that estimate. The cost allowances added to the estimate in Part C of the CEF represent financial protections for the final delivery of the eligible scope of work (developed in Parts A and B) defined during the engineering and design phase.

Part C includes:

C.1 – Design Phase/Scope Definition Contingencies: This factor represents standard cost estimating contingencies based on the status of the design and engineering process at the time of the estimate. This contingency is based on the concept that there are typically more unknowns and items at the schematic design stage than at the final design stage. As the engineering design becomes more detailed, the scope of work and the means and methods of construction are able to be better determined. Therefore the estimates may include a smaller contingency for uncertainties. A single value representing the status of project design is used for each type of work.

C.2 – Facility or Project Constructability: C.2 allows for premiums due to site conditions or construction process complexities that could increase the cost of a project.

C.3 – Access, Staging, and Storage Contingencies: This factor addresses varying degrees of difficulty in mounting the particular job at a specific site. For example, work in an urban environment may require storage of materials and equipment several miles away from the actual construction site, increasing the project cost.

C.4 – Economies of Scale: This factor offsets the overstatement of costs when CEF factors are applied to large projects with repetitive work elements that allow workers to achieve above average productivity.

To apply the C.1, C.2, and C.3 factors, the user enters the percentage for each work type. To apply the C.4 factor, the user checks the boxes for the work types to which the factor should be applied. If no percentages or check boxes are selected, the C factor will be set to 0. All assumptions for selecting factors must be recorded in the CEF Notes Sheet.

6.1 C.1: STANDARD DESIGN PHASE/SCOPE DEFINITION CONTINGENCIES

The project should be evaluated to determine the accuracy of the scope definition based on the level of design completion at the time the estimate is prepared. The level of completion of A&E work as a function of time can characterize the construction. The unknowns gradually decrease as the scope of work is defined, details for completing the work are developed, and the project advances towards a set of construction drawings and specifications that can be used by a construction contractor. The C.1 factor is designed to account for these unknowns.

Two levels of design development are considered in C.1, as described below.

Preliminary Engineering Analysis Stage: At this stage, concepts have been developed, usually without a significant level of detail. Accurately quantifying work at this stage is difficult, and contractors would assume a relatively high level of risk/uncertainty in bidding a project at this

Part C: Construction Cost Contingencies/Uncertainties (Design and Construction)

time. The recommended values range from 15 to 20 percent to allow some differentiation between simple and more complex projects.

Working Drawing Stage: At this stage of design, the design requirements are better defined, concepts are determined, details are more complete, and work tasks and quantities have been readily defined. Contractors are likely to assume a low to medium level of risk in bidding this type of project. The recommended values range from 2 to 10 percent to allow for differentiation depending on the level of completeness of working drawings. A project in the early stage of working drawing (e.g., less than 60 percent complete), which would have an average level of detail and readily identifiable quantities, should be assigned a factor at the upper end of the range. A project in the final working drawing stage should be assigned a factor at the lower end of the range.

The C.1 contingency is intended to represent the state of the project design development at the time that the CEF is prepared. Only a single C.1 value representing the status of project design is used for each work type. The Project or Technical Specialist should obtain all information necessary to prepare the CEF for the current state of project development. As stated above, all assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet.

6.2 C.2: FACILITY OR PROJECT CONSTRUCTABILITY

The C.2 factor is intended to address project complexity, as it relates to the type of facility and to the type of repair or retrofit being performed.

The complexity of construction activities varies among different types of projects. New construction is comprehensive in scope; that is, something is created where nothing existed before. Conversely, repair and retrofit projects, which must be accomplished within the physical and operational constraints of existing facilities, tend to consist of tasks that are more selectively located, are more intensely detailed and sequenced, and require closer supervision throughout the process. Therefore, the C.2 factor applies to repair and retrofit projects only. No complexity allowance is provided for new construction; the design process is assumed to take the complexity of the project into account.

The constructability factor represents site conditions or construction process complexities such as the following:

- Steep site embankments
- Unstable soil conditions
- Difficult subsurface construction conditions requiring such activities as de-watering and rock excavation
- Extreme weather conditions affecting productivity, such as winter shutdowns
- Urban sites
- Special building code requirements
- Availability of adequate energy, skilled craft labor, and building materials
- The applicant's special requirements and restrictions

Part C: Construction Cost Contingencies/Uncertainties (Design and Construction)

- Environmental considerations

The applicant's requirements and restrictions must be reasonable; that is, they must apply to the specific services related to the eligible scope of construction. For example, specific tolerances related to sports facility floors and seating; end user and/or environmental requirements for hospitals and museums; and special site-specific construction requirements, or restrictions, mandated by State or local regulatory agencies. Such requirements or restrictions could include, for example, access restrictions during normal business hours to portions of the facility being repaired.

If possible, project complexity issues should be addressed in Part A. If all complexity issues are addressed in Part A, the C.2 factor should not be used. However, if certain project conditions cannot be identified or quantified, select a suitable factor from the range of values given in Table C.2.

Table C.2: Constructability Factors

Project Category and Type	Percentage Range
Category C – roads (rural-urban)	1–2
Category C – bridges and culverts (simple-complex)	1–5
Category D – water control facilities	1–5
Category E – simple open buildings	1–2
Category E – schools, libraries, and offices	1–5
Category E – hospitals, museums, and historic buildings	1–7
Category F – public utilities	1–5
Category G – park and recreation facilities	1–5

Simple construction projects should be assigned a C.2 factor of 0 or 1 percent; projects with a combination of features that increase complexity should be assigned factors at the upper end of the appropriate range. For example, two bridges may require the same materials and equipment. However, if unstable soil conditions exist at one of the bridges, the work at this bridge will require more detailed sequencing and greater supervision. As stated above, all assumptions for selecting factors must be recorded in the CEF Notes Sheet.

6.3 C.3: ACCESS, STORAGE, AND STAGING CONTINGENCIES

The C.3 factors address project site conditions that impose additional costs on the work activities listed in Part A. As with C.2, these items should be specifically defined in Part A, if possible. However, if the need for these contingencies is unclear and is not accounted for in Part A, the C.3 factors should be applied. The factors represent the following:

Site Access: This factor addresses access to the project site. Examples include difficult or long access routes for trucks delivering materials; a temporary access roadway or driveway constructed to provide access for equipment; site loading conditions requiring heavy equipment

Part C: Construction Cost Contingencies/Uncertainties (Design and Construction)

such as barges, cranes, or forklifts; off-site parking for workers; restricted material delivery hours at operational facilities; and obstructions created by utilities or exposed systems.

Storage: This factor addresses the storage of construction materials and equipment on site to support proper staging and construction activities. Examples include remote or off-site storage of materials due to space constraints; temporary easements; and lot, sidewalk, or roadway space rental costs.

Staging: This contingency addresses the timing and execution of the work, which could be complicated by occupation of facilities, lack of space, and access to the facility. This factor should be used for sites that have work access limitations because services must continue to run in spite of the construction, such as hospitals and city halls.

The recommended values for C.3 factors range from 1 to 4 percent. The CEF user should assign the appropriate value according to the impact each of these factors has on project cost. All assumptions for selecting factors must be recorded in the CEF Notes Sheet.

6.4 C.4: ECONOMIES OF SCALE

Economies of scale are the increases or decreases in cost, resulting from task or project size. For example, the mobilization cost associated with putting a laborer to work is proportionally higher for 1 day's work than for 30 days' work. Typically, unit costs are applicable for projects of a given size; use of these costs for projects outside of this range can result in distorted estimates. This concept also applies to the factors in the CEF. Therefore, economies of scale must be accounted for when using the CEF. Economy of scale is particularly applicable to new construction projects, but it is also applicable for other types of work for which there is a reduction in cost due to the project size.

Table C.4 lists the construction cost changes (in percentages) that can be anticipated due to economies of scale. The multiplier is set automatically when the user checks the box for the type of work to which the factor should be applied. If the user does not check a box, the factor will be set to 0. If it can be determined that the unit costs in Part A and the factors in Part B reflect economies of scale, the C.4 factor should not be used. All assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet.

Table C.4: Economies of Scale

Project Size	Construction Cost Change (%)
Under \$500,000	0
Under \$2 million	-0.5
Under \$10 million	-1
Over \$10 million	-2

The CEF calculates the value of C.4 based on an interpolation between percentage points. Interpolation is based on a natural logarithmic formula derived from the values shown in Table C.4.

SECTION SEVEN PART D: GENERAL CONTRACTOR'S OVERHEAD AND PROFIT

Part D accounts for the general contractor's construction costs that have not been included in Parts A, B, or C. These factors reflect the general contractor's home office overhead and costs that are related to the construction contract, such as insurance, bonding costs, and profit. Part D factors should not be applied to force account work. Additionally, Part D does not reflect the subcontractors' overhead and profit, which should be included in the line items listed in Part A.

To apply Part D, the user must select the type of work to which the factor applies or enter the percentage, depending on the factor. All assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet.

7.1 D.1: GENERAL CONTRACTOR'S HOME OFFICE OVERHEAD COSTS

The general contractor's main office expenses include labor and salary costs for personnel, including the principals, estimators, project managers, and general office staff, plus all other operational expenses associated with working out of the main office. The value for D.1 is 7.7 percent. All assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet.

7.2 D.2: GENERAL CONTRACTOR'S INSURANCE, PAYMENT, AND PERFORMANCE BONDS

This factor includes an allowance for general contractor's payment and performance bonds (1.5 percent), builder's risk insurance (0.3 percent), and public liability insurance (1.5 percent). The total value of the factor is fixed at 3.3 percent. All assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet.

7.3 D.3: CONTRACTOR'S PROFIT

The general contractor's profit should be taken from Table D.3 below and is applied to the sum of Parts A, B, C, D.1, and D.2. The factor value is set automatically when the user checks the box for the type of work to which the factor should be applied. If the user does not check a box, the factor will be set to 0. All assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet.

Part D: General Contractor's Overhead and Profit

Table D.3: General Contractor's Profit

Project Size (Sum of Parts A, B, C, D.1, and D.2)	General Contractor's Profit (%)		
	Repair	Retrofit	New Construction
Under \$500,000	10	10	10
\$500,000 to \$750,000	9	9	9
\$750,000 to \$1.5 million	8	8	7.5
\$1.5 million to \$3 million	7	7	6.5
\$3 million to \$5 million	5.5	5.5	5
\$5 million to \$10 million	4.5	4.5	4
Over \$10 million	3	3	3

The CEF calculates the value of D.3 based on an interpolation between percentage points. Interpolation is based on a natural logarithmic formula derived from the values shown in Table D.3.

SECTION EIGHT PART E: COST ESCALATION ALLOWANCE

Part E allows the user to adjust the estimated construction costs to account for inflation during the design and construction period. This factor should only be used for escalating the cost of uncompleted work. To apply Part E, which employs a nationally recognized economic inflation factor, the user establishes a design and construction timeline to the mid-point of construction of the eligible portion of the work. This timeline will vary according to whether the eligible work has already started or is delayed. All assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet. The escalated cost of construction is equal to:

$$\text{Escalated Cost} = (\text{Sum of Parts A through D}) \times (\text{Number of Months to the Midpoint of Uncompleted Construction}) \times (\text{Escalation Factor})$$

Before further discussing the cost escalation allowance to the mid-point of uncompleted construction, a design and/or construction timeline needs to be developed and analyzed for eligibility, reasonableness, and applicability to the type of construction activity being contemplated.

The applicant is responsible for submitting their design and/or construction timeline (as appropriate) to the Project Specialist during the project formulation stage. The timeline must include start and finish dates for both the design and/or construction phases. The timeline must be referenced to the eligible scope of work only, and the criterion also applies to improved and alternate projects as well. For further information, reference the *Applicant Handbook*, FEMA 323, Chapter 6, Handling Large Projects. This reference describes subgrantees' large project roles and responsibilities.

The Project Specialist will verify eligibility, reasonableness, and applicability of the design and/or construction timeline submitted by the applicant against the appropriate local data or the industry standard construction time data, (e.g., RSMeans, BNi Costbooks, Marshall & Swift, Sweet's Unit Cost Guide, etc.) prior to application of the CEF, as follows:

- i. Check a minimum of six of the ten largest cost item work activities against the local data or the industry standard construction schedule data.
- ii. Check a minimum of 25 percent of the remaining cost item work activities at random against the local data or the industry standard construction schedule data.
- iii. If the line-item work activities checked within the applicant timeline are within 10 percent of the local data or the industry standard data, use the applicant timeline for determining the mid-point of uncompleted construction.
- iv. If the line-item work activities checked in the applicant timeline are not within 10 percent of the local data or the industry standard cost data, assume the entire timeline is not comparable, and attempt to resolve discrepancies with the applicant. If discrepancies cannot be resolved and the design and/or construction timeline include ineligible items of work (as agreed by the PAC Crew Leader or PA Group Supervisor) use the Project Specialist developed timeline. Care should be exercised to ensure that the work activities used to develop the timeline contain eligible items of work only.

In the absence of an applicant-submitted design and/or construction timeline, the Project Specialist will develop the timeline considering the following elements described in items 1

through 3. The number of months in the escalated cost formula is referenced to the *mid-point of uncompleted construction*, based on the durations necessary to complete the following timelines, as applicable:

1. **Preparation of design and bid documents:** The duration for design can be estimated using data provided by the applicant for completion of similar projects (local data). If this information is not available, the design time will have to be estimated. Use the appropriate industry standard construction cost estimating resources (e.g., RSMeans, BNi Costbooks, Marshall & Swift, Sweet’s Unit Cost Guide, etc.), according to the type of infrastructure being analyzed for estimating design times.
 - For example, RSMeans’ *Facilities Cost Data* recommends estimating the design time for different building types at 25–40 percent of the construction duration (see “Construction Time Requirements,” R01-020). For this example, the lower bound should be used for typical flood and hurricane wind disasters where the damage necessitates less complex design; the upper bound would be applicable to major seismic and hurricane disasters where greater damage necessitates more complex analysis and design.

Repair and replacement activities that are based on a facilities “As-Built” drawing will typically not require a design duration similar to that of a new construction project.

- For this example, the design effort may be limited to updating applicable permits, assembling General Condition’s contract documents, assembling applicable construction standards and specifications, tabulating work activity descriptions and quantities with their itemized unit prices, and deriving an engineer’s estimate for the eligible scope of work prior to bid solicitation.

In all cases, the Project Specialist should ensure that the components of the design effort are fully understood, and are reasonable and applicable to the type of construction activity being contemplated for the eligible scope of work.

2. **Solicitation of bids, review of bids, and award of contract:** The duration for bidding and award can be estimated using data provided by the applicant for completion of similar projects (local data). If this information is not available, the estimated bidding and award time will have to be estimated. A period of 2 to 3 months for bidding and award duration is typical. Extremely large projects (over \$5 million) may need additional time for the bidding and award process.
3. **Construction start and completion dates:** The duration for construction can be estimated by one of two methods.
 - For the first method, the Project Specialist may use information provided by the applicant for completion of similar projects (local data).
 - For the second method, the Project Specialist should prepare an outline of the major construction tasks, and determine the duration and linkages (critical paths and dependencies) associated with each of these tasks to arrive at a total construction time.

The construction start date is determined from the date that the applicant gives notice to proceed to the contractor.

The construction completion date occurs when the owner accepts the project and agrees to

pay any outstanding retainage due the contractor (normally after project punch-list work has been completed and accepted).

Use the appropriate cost data book according to the type of infrastructure being analyzed and reference the “Construction Time Requirements” section to determine the total eligible construction value for eligible work only.

It is important that the construction timeline reflect only eligible items of work. For example, owner activities, such as maintenance, capital improvement planning efforts, ineligible facility improvements, and ineligible code upgrades, are not considered part of the eligible scope of work and should be excluded from the construction timeline.

For improved projects involving a replacement facility, at the same or new site, Section 406 hazard mitigation work items are not eligible and therefore are excluded from the construction timeline. For alternate projects, Section 406 hazard mitigation work items are not eligible and therefore are excluded from the construction timeline. When evaluating improved or alternate projects, the construction duration should reflect the eligible items of work only.

If detailed information is not sufficient to develop a reasonable project schedule, design and construction times may be estimated using the expenditure or “burn” rates in table E.1.

Table E.1: Estimated Design and Construction Times Based on Project Cost

Design and Construction Fees	Monthly Burn Rate Assumption	Ramp-Up and Close-Out Time
Design		
Fee < \$200,000	\$75,000	2 Months
Fee > \$200,000	\$115,000	3 Months
Construction Estimate		
< \$2 million	\$200,000	3 Months
\$2 to \$10 million	\$400,000	4 Months
\$10 to \$20 million	\$750,000	5 Months
> \$20 million	\$1,000,000	6 Months

Time estimate calculations resulting in fractional months should be rounded to the next higher whole month.

Once the eligibility, reasonableness, and applicability of the design and/or construction timeline (whether applicant or Project Specialist developed) to the construction activity being contemplated is confirmed, the *cost escalation allowance to the mid-point of uncompleted construction* can be computed as follows:

The escalation factor is based on a 2-year average of either the Building Cost Index (BCI) or the Construction Cost Index (CCI) according to the *ENR (Engineering News Record)*. Definitions for the BCI and CCI can be found in this publication. The appropriate index should be chosen

according to the nature of the project. The 2-year average of the appropriate index should be used to calculate an average, monthly cost escalation percentage. The PA Group Supervisor or designee is responsible for calculating this percentage at the beginning of a disaster. BCI or CCI information can be obtained from the *ENR* Web site located at <http://www.enr.com/cost/cost2.asp> (access to historical cost indices data may be limited to *ENR* subscribers). The escalation factor should be calculated annually and distributed to the Project Specialists for application within the CEF for disasters of longer duration.

- For example, a disaster is declared in August 2009. For large building projects, the PA Group Supervisor references the BCI for August 2007 (4512) and July 2009 (4762).
- The index has risen 250 points, meaning that the 2-year escalation can be calculated as $(250/4512) \times 100 = 5.54$ percent.
- For CEF purposes, the escalation factor used is a linear interpolation rather than a compound rate.
- The average monthly value can be calculated by dividing the 2-year escalation by 24 (the number of months accounted for in the 2-year average).
- This equates to a rate of 0.231 percent per month.

To apply the Part E factor, the monthly escalation rate and the number of months to the midpoint of uncompleted construction should be entered. Example 1 in Appendix B shows the monthly escalation factor being applied to a project where the work is uncompleted. In the example, the time for completing the outstanding eligible scope of work was calculated. This value, in months, was then multiplied by the monthly escalation rate and divided by two to escalate to the midpoint of construction. The factor was then applied to each work type for the sum of Parts A through D. All assumptions for selecting the escalation factor must be recorded in the CEF Notes Sheet.

If the Part A estimate is based on an A&E report or validated contract price, escalation is typically included. The CEF user should verify that escalation is or is not included in the unit cost data before adding it a second time.

SECTION NINE PART F: PLAN REVIEW AND CONSTRUCTION PERMIT COSTS

Part F reflects fees charged by State and local agencies for plan reviews and construction permits. It should include all fees that are paid to others to obtain approvals required before construction can commence. The actual cost of the fees should be entered into the spreadsheet.

The applicant is generally responsible for obtaining all of the required reviews and producing a bid-ready set of plans and specifications that have been through agency reviews, plan checks, and general building permit processes. Sometimes an applicant may, at his or her option, require the contractor to obtain specific permits necessary for actually performing the eligible scope of work. All assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet.

9.1 F.1: PLAN REVIEW FEES

At the beginning of the disaster, the PA Group Supervisor or designee is responsible for defining the required plan review fee schedules and distributing that information to the Project Specialists. The Project Specialist, working with the applicant, should determine exact figures for plan review fees. Note that State-owned facilities (such as schools, medical facilities, bridges, and treatment plants) may have different approval requirements than other facilities. All assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet.

9.2 F.2: CONSTRUCTION PERMIT FEES

As with plan review fees, the PA Group Supervisor is responsible for defining the required construction permit fee schedules at the beginning of the disaster and distributing that information to the Project Specialists. The Project Specialist, working with the applicant, should determine exact fees for construction permits.

Part F is not applicable in those situations for which State and local agencies waive fees during disaster recovery situations. The PA Group Supervisor is responsible for notifying the Project Specialists of these circumstances. All assumptions for selecting factors should be recorded in the CEF Notes Sheet.

SECTION TEN PART G: APPLICANT'S RESERVE FOR CONSTRUCTION

Part G reflects the applicant's reserve for construction. This reserve is intended to be controlled by the applicant; it is to be used to fund approved change orders to eligible work and any other incidental costs that may be incurred after the construction contract is awarded. However, it does not reflect discretionary change orders for upgrades or for any ineligible work. All assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet.

When a work type selection box is highlighted, the applicant's reserve in Part G is applied to the work type subtotal of Parts A through F. The multiplier is set automatically when the user checks the box for the type of work to which the factor should be applied. If the user does not check a box, the factor will be set to 0. The applicant's reserve is based on project size, as shown in Table G.1.

Table G.1: Applicant's Reserve for Construction

Project Size (Sum of Parts A through F)	Percentage
Less Than \$200,000	7
\$200,001 to \$800,000	6
\$800,001 to \$1,400,000	5
\$1,400,000 to \$2,000,000	4
Greater Than \$2,000,000	3

The CEF calculates the value of G.1 based on an interpolation between percentage points. Interpolation is based on a natural logarithmic formula derived from the values shown in Table G.1.

SECTION ELEVEN PART H: APPLICANT'S PROJECT MANAGEMENT AND DESIGN COSTS

Part H represents the applicant's costs for overall project development and management throughout the design and construction phases. The factor includes the applicant's costs for:

- Managing the design process
- Basic design and inspection services normally performed by an A&E firm
- Managing the construction phase (either third party or in-house)

Incidental development costs should be absorbed into these categories.

As stated above, Part H *does not* duplicate the administrative allowance provided to the applicant under the Stafford Act. That allowance is provided to meet the cost of requesting, obtaining, and administering disaster assistance. Part H covers the cost of managing the project, not grant funds. All assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet.

11.1 H.1: APPLICANT'S PROJECT MANAGEMENT – DESIGN PHASE

The applicant's costs to manage the project during the design phase include:

- Managing the A&E contracts for final design
- Managing the permitting and special review process
- Interfacing with other agencies

A value of 1 percent has been established for this factor. To apply the H.1 factor, select the box under each work type to which the factor is to be applied. If the factor box is not highlighted, the factor will be set to 0. The H.1 factor is not applicable in those situations for which design is not required. All assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet.

11.2 H.2: A&E DESIGN CONTRACT COSTS

This factor covers the cost of basic design and inspection services, normally performed by an A&E firm, as well as a number of additional services not necessarily required with every construction project. The basic services consist of:

- Preliminary engineering analysis
- Preliminary design
- Final design
- Construction inspection

The engineering service curves found in the *PA Guide*, FEMA 322, June 2007, are used to estimate the cost of basic engineering services as a percentage of the estimated construction cost. One of two curves, *Curve A* or *Curve B*, may be used to determine the appropriate percentage. These curves have been incorporated into the CEF Spreadsheet.

Part H: Applicant's Project Management and Design Costs

Curve A applies to projects with above-average complexity and non-standard design. Examples include:

- Airports with extensive terminal facilities
- Water, wastewater, and industrial waste treatment plants
- Hospitals, schools, and office buildings
- Power plants
- Large dams and complicated small dams
- Highway and railway tunnels
- Pumping stations
- Incinerators
- Complicated waterfront and marine terminal facilities

Curve B applies to projects of average complexity. Examples include:

- Industrial buildings, warehouses, garages, hangars, and comparable structures
- Bridges and other structures of conventional design
- Simple waterfront facilities
- Roads and streets
- Conventional levees, floodwalls, and retaining walls
- Small dams
- Storm sewers and drains
- Sanitary sewers
- Water distribution lines
- Irrigation works, except pumping plants
- Airports, except as classified for Curve A

The user must select the appropriate project complexity curve and check the box for that curve on the spreadsheet. The spreadsheet automatically calculates the percentage to be applied. If a box is not checked, the factor is set to 0.

In addition to the basic services described above, the following special services may be required and are not usually included in the fee for basic engineering services. These services should be specifically described and justified in Part A, and the cost estimated, before the services are included in the CEF. Examples include:

- Engineering surveys
- Soil investigations
- Resident engineer services

Part H: Applicant's Project Management and Design Costs

- Feasibility studies

When the nature of work requires only basic construction inspection services, a fee that does not exceed 3 percent of construction cost should be used to cover the following items:

- Review of bids
- Work site inspection visits
- Checking and approval of material samples
- Review of shop drawings and change orders
- Review contractors request for payment
- Acting as the applicant's representative

The user must enter the percentage for basic construction services. If the box for this factor is not checked, the factor will be set to 0.

Part H.2 is not applicable in those situations for which design, construction inspection, or other basic services are not required. All assumptions for selecting factors should be recorded in the CEF Notes Sheet.

11.3 H.3: PROJECT MANAGEMENT – CONSTRUCTION PHASE

Project management costs during the construction phase are estimated using Table H.3 and include:

- Quality assurance and management of additional testing during construction
- Advertising and awarding the construction contract
- Decisions on construction problems and requests for information
- Management of change orders for on-site construction conditions and design errors
- Omissions and unforeseen problems, such as differing site conditions and hidden damage

Table H.3: Project Management – Construction Phase

Construction Costs	Project Management - Construction Phase (%)
under \$500,000	6
\$500,000 to \$1,000,000	5
\$1,000,000 to \$5,000,000	4
Greater than \$5,000,000	3

Part H: Applicant's Project Management and Design Costs

To apply the H.3 factor, select the box under each work type to which the factor is to be applied. The values will be automatically calculated. If a box is not checked, the factor will be set to 0. All assumptions or the basis for selecting factors must be recorded in the CEF Notes Sheet.

The CEF calculates the value of H.3 based on an interpolation between percentage points. Interpolation is based on a natural logarithmic formula derived from the values shown in Table H.3.

Appendix A

CEF Spreadsheet

CEF Instructional Guide
(Version 2.1)
September 2009



FEMA

CEF Fact Sheet

9/10/2009

-

Date of Estimate:	
FEMA Region:	
Preparer(s):	
Applicant Name:	
Project Title:	
Damaged Facility:	
Declaration Number:	
Project Number:	
PA ID No.:	
Date of Inspection:	
Event Date(s)	
Work Category:	
Type of Work: <i>(Enter New, Repair, etc.)</i>	
Preparer's Notes:	

CEF Notes

9/10/2009

-

Damaged Facility:	0	
Applicant Name:	0	
Project Number:	0	
Date of Estimate:	January 0, 1900	
Preparer(s):	0	
Part A Notes:	A.1 -	-----
	A.2 -	-----
Part B Notes:	B.1 -	-----
	B.2 -	-----
Part C Notes:	C.1 -	-----
	C.2 -	-----
	C.3 -	-----
	C.4 -	-----
Part D Notes:	D.1 -	-----
	D.2 -	-----
	D.3 -	-----
Part E Notes:	E -	-----
Part F Notes:	F.1 -	-----
	F.2 -	-----
Part G Notes:	G.1 -	-----
Part H Notes:	H.1 -	-----
	H.2 -	-----
	H.3 -	-----
Miscellaneous Notes & Comments:		

CEF Part A

9/10/2009

-

Item No.	Item Description Title / Component Description	Div. # or Cost Code	Qty	Units	Unit Price	City Adj Factor	Total Cost
Completed Work Items							
Add Row	Completed Permanent Items						
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
Completed - Permanent Total							\$ -
Add Row	Completed Non-Permanent Items						
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
Completed - Non-Permanent Total							\$ -

CEF Part A

9/10/2009

-

Item No.	Item Description Title / Component Description	Div. # or Cost Code	Qty	Units	Unit Price	City Adj Factor	Total Cost
Uncompleted Work Items							
Add Row	Uncompleted Permanent Items						
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
Uncompleted - Permanent Total							\$ -
Add Row	Uncompleted Non-Permanent Items						
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
Uncompleted - Non-Permanent Total							\$ -
TOTAL PART A BASE CONSTRUCTION COST							\$ -

CEF Summary of Completed Work

9/10/2009

-																																					
					\$ -	\$ -	\$ -	\$ -	\$ -	Total																											
A "Base Costs" for Construction Work-In Trades																																					
A.1	Permanent Work (CEF Part A)									\$ -																											
A.2	Non-Permanent Job Specific Work (CEF Part A)					\$ -	\$ -	\$ -		\$ -																											
Part A Total					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -																											
B General Requirements and General Conditions																																					
B.1	General Requirements		<table border="1" style="font-size: small; width: 100%;"> <thead> <tr> <th colspan="2" style="text-align: center;">Guide</th> <th colspan="2"></th> </tr> <tr> <th style="text-align: center;">Low</th> <th style="text-align: center;">to</th> <th style="text-align: center;">High</th> <th></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">4.0%</td> <td></td> <td style="text-align: center;">6.0%</td> <td></td> </tr> <tr> <td style="text-align: center;">0%</td> <td></td> <td style="text-align: center;">1.0%</td> <td></td> </tr> <tr> <td style="text-align: center;">0%</td> <td></td> <td style="text-align: center;">1.0%</td> <td></td> </tr> <tr> <td style="text-align: center;">0%</td> <td></td> <td style="text-align: center;">5.0%</td> <td></td> </tr> </tbody> </table>		Guide				Low	to	High		4.0%		6.0%		0%		1.0%		0%		1.0%		0%		5.0%		Enter % in Appropriate Column								
Guide																																					
Low	to	High																																			
4.0%		6.0%																																			
0%		1.0%																																			
0%		1.0%																																			
0%		5.0%																																			
	Safety & Security																																				
	Temporary Services & Utilities																																				
	Quality Control																																				
	Submittals																																				
					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -																											
B.2	General Conditions (4.25%)				<input type="checkbox"/>																																
					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -																											
Part B Total					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -																											
PART A through B SUBTOTAL					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -																											

CEF Summary of Completed Work

9/10/2009

-										
-										
					\$ -	\$ -	\$ -	\$ -	\$ -	Total
D General Contractor's Overhead and Profit										
D.1	GC's Home Office Overhead	7.7%	<input type="checkbox"/>							
			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
D.2	GC's Insurance, Payment & Performance Bonds	3.3%	<input type="checkbox"/>							
			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
D.3	General Contractor's Profit									
	New Construction		<input type="checkbox"/>							
	Repair/Retrofit		<input type="checkbox"/>							
			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Part D Total			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
PART A through D SUBTOTAL			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
E Cost Escalation Factors										
Cost Escalation Factor										
	Months									
	Monthly Factor									
Part E Total			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
PART A through E SUBTOTAL			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

CEF Summary of Completed Work

9/10/2009

-						
						Total
F Plan Review and Permit Construction Cost						
F.1 Plan Review Fees						
	(List Individual Requirements Separately)					
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
F.2 Construction Permit Fees						
	(List Individual Requirements Separately)					
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Part F Total					\$ -	\$ -
PART A through F SUBTOTAL					\$ -	\$ -
G Applicant's Reserve for Change Orders						
Applicant's Reserve for Change Orders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	7.0%	7.0%	7.0%	7.0%	7.0%	
PART G Total					\$ -	\$ -
PART A through G SUBTOTAL					\$ -	\$ -

CEF Summary of Completed Work

9/10/2009

-							
-							
		\$ -	\$ -	\$ -	\$ -	\$ -	Total
H Applicant's Project Management And Design Costs							
H.1	Applicant's Project Management - Design Phase	1.0%	<input type="checkbox"/>				
		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
H.2	A/E Design Contract Applicability						
	Above Average Complexity (Curve A)	<input type="checkbox"/>	5.6%	<input type="checkbox"/>	5.6%	<input type="checkbox"/>	5.6%
	Average Complexity (Curve B)	<input type="checkbox"/>	4.5%	<input type="checkbox"/>	4.5%	<input type="checkbox"/>	4.5%
	Basic Construction Inspection Services	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%
H.3	A/E Design Contract Cost						
	Above Average Complexity (Curve A)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Average Complexity (Curve B)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Basic Construction Inspection Services	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
H.3	Project Management - Construction Phase	<input type="checkbox"/>					
		6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Part H Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PART A through H SUBTOTAL		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL OF COMPLETED WORK							

CEF Summary of Uncompleted Work

9/10/2009

-										
					\$ -	\$ -	\$ -	\$ -	\$ -	Total
A "Base Costs" for Construction Work-In Trades										
A.1	Permanent Work (CEF Part A)									\$ -
A.2	Non-Permanent Job Specific Work (CEF Part A)									\$ -
Part A Total					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
B General Requirements and General Conditions										
B.1	General Requirements		Range Low to High		Enter % in Appropriate Column					
	Safety & Security	4.0%	6.0%							
	Temporary Services & Utilities	0%	1.0%							
	Quality Control	0%	1.0%							
	Submittals	0%	5.0%							
					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
B.2	General Conditions (4.25%)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Part B Total					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PART A through B SUBTOTAL					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

CEF Summary of Uncompleted Work

9/10/2009

-							
						Total	
D General Contractor's Overhead and Profit							
D.1	GC's Home Office Overhead	7.7%	<input type="checkbox"/>				
			\$ -	\$ -	\$ -	\$ -	\$ -
D.2	GC's Insurance, Payment & Performance Bonds	3.3%	<input type="checkbox"/>				
			\$ -	\$ -	\$ -	\$ -	\$ -
D.3	General Contractor's Profit						
New Construction			<input type="checkbox"/>				
Repair/Retrofit			<input type="checkbox"/>				
			\$ -	\$ -	\$ -	\$ -	\$ -
Part D Total			\$ -	\$ -	\$ -	\$ -	\$ -
PART A through D SUBTOTAL			\$ -	\$ -	\$ -	\$ -	\$ -
E Cost Escalation Factors							
E	Cost Escalation Factor						
		Months					
		Monthly Factor					
Part E Total			\$ -	\$ -	\$ -	\$ -	\$ -
PART A through E SUBTOTAL			\$ -	\$ -	\$ -	\$ -	\$ -

CEF Summary of Uncompleted Work

9/10/2009

-						
						Total
F Plan Review and Permit Construction Cost						
F.1	Plan Review Fees					
	(List Individual Requirements Separately)					
		\$ -	\$ -	\$ -	\$ -	\$ -
F.2	Construction Permit Fees					
	(List Individual Requirements Separately)					
		\$ -	\$ -	\$ -	\$ -	\$ -
Part F Total		\$ -	\$ -	\$ -	\$ -	\$ -
PART A through F SUBTOTAL		\$ -	\$ -	\$ -	\$ -	\$ -
G Applicant's Reserve for Change Orders						
G	Applicant's Reserve for Change Orders	<input type="checkbox"/>				
		7.0%	7.0%	7.0%	7.0%	7.0%
PART G Total		\$ -	\$ -	\$ -	\$ -	\$ -
PART A through G SUBTOTAL		\$ -	\$ -	\$ -	\$ -	\$ -

CEF Total Project Summary

9/10/2009

Summary

-

		Completed	Uncompleted	Total
PART A	"Base Costs" for Construction Work In Trades	\$ -	\$ -	\$ -
	A.1 Permanent Work	\$ -	\$ -	\$ -
	A.2 Non-Permanent Job Specific Work (CEF Part A)	\$ -	\$ -	\$ -
PART B	General Requirements and General Conditions	\$ -	\$ -	\$ -
	B.1 General Requirements	\$ -	\$ -	\$ -
	B.2 General Conditions	\$ -	\$ -	\$ -
PART C	Construction Cost Contingencies (Design and Construction)	\$ -	\$ -	\$ -
	C.1 Standard Design-Phase Scope Contingencies	\$ -	\$ -	\$ -
	C.2 Facility or Project Constructability	\$ -	\$ -	\$ -
	C.3 Access, Storage, and Staging Contingencies	\$ -	\$ -	\$ -
	C.4 Economies of Scale in New Construction	\$ -	\$ -	\$ -
PART D	General Contractor's Overhead and Profit	\$ -	\$ -	\$ -
	D.1 General Contractor's Home Office Overhead Costs	\$ -	\$ -	\$ -
	D.2 General Contractor's Insurance, Payment, and Performance Bonds	\$ -	\$ -	\$ -
	D.3 Contractor's Profit	\$ -	\$ -	\$ -
PART E	Cost Escalation Allowance	\$ -	\$ -	\$ -
PART F	Plan Review and Construction Permit Costs	\$ -	\$ -	\$ -
	F.1 Plan Review Fees	\$ -	\$ -	\$ -
	F.2 Construction Permit Fees	\$ -	\$ -	\$ -
PART G	Applicant's Reserve for Construction	\$ -	\$ -	\$ -
PART H	Applicant's Project Management and Design Costs	\$ -	\$ -	\$ -
	H.1 Applicant's Project Management - Design Phase	\$ -	\$ -	\$ -
	H.2 Architecture & Engineering Design Contract Costs	\$ -	\$ -	\$ -
	H.3 Project Management - Construction Phase	\$ -	\$ -	\$ -
	Complete Project Total for Completed and Uncompleted Work	\$ -	\$ -	\$ -

Appendix B

Examples of Completed CEF Spreadsheets

CEF Instructional Guide
(Version 2.1)
September 2009



FEMA

Example 1:
Category C – Roads and Bridges – Simmonds Arch Bridge

This example illustrates the use of unit prices from industry standard construction cost estimating resources for uncompleted work in the preparation of the CEF.

Project Background

The estimate was developed for the replacements of the Simmonds Arch Bridge located near Winchester, VA. The bridge was destroyed by heavy thunderstorms resulting in a declared flood disaster. The applicant is River College, a public university that owns and maintains the bridge. Public universities are eligible applicants and the bridge is an eligible facility. The facility includes the bridge, four wing-walls, and about 25 feet of roadway on each end of the bridge. Observations by the project formulation team at the time of inspection concluded that the bridge was approximately 80 percent destroyed. The guardrails and bridge railing were not salvageable. Because the bridge was more than 50 percent damaged, the bridge is eligible for replacement based on the original function and capacity. The estimate was developed using industry standard building cost data and the associated electronic cost data format.

The Simmonds Arch Bridge is located approximately 150 feet from the Lundberg Dam on Spout Run Creek. The bridge was approximately 15 years old and functional at the time of the declared disaster. The earth-covered reinforced concrete arch was 24 feet long (across the stream) and 26 feet wide (along the stream line). The bridge included two lanes of traffic and a paved walkway. The waterway opening was 24 feet at the base, 3 feet high at the sides, and 5 feet high at the center. Each abutment, including the upstream and downstream wing-walls, was supported on a continuous strip footing 5 feet wide and 2 feet thick. The approach roadway on each side of the bridge consisted of 4 inches of asphalt concrete pavement over a six-inch base course. Bridge postings included a speed limit of 15 miles per hour and a weight limit of 15 tons. Traffic volume on the bridge was 50 vehicles per day.

Removal of debris resulting from the bridge failure was accomplished under a pre-existing facilities maintenance contract with a local contractor. A separate PW was prepared for removing debris from the stream.

Information Relating to Development of the Estimate

Replacement of the Simmonds Arch Bridge was judged to be Category C – Roads and Bridges work.

Quantities for the estimate were calculated based on measurements taken during the site visit conducted by the project formulation team, and cross-checked against the original construction drawings provided by the applicant.

Guidance provided by the PA Group Supervisor included:

- Project unit costs should be adjusted for Winchester, VA.
- The monthly escalation factor is 0.231.

CEF Fact Sheet

9/10/2009

River College - Simmonds Arch Bridge

Date of Estimate:	July 28, 2009
FEMA Region:	III
Preparer(s):	James Allen and John Christopher
Applicant Name:	River College
Project Title:	Simmonds Arch Bridge
Damaged Facility:	Simmonds Arch Bridge
Declaration Number:	FEMA - 1234 - DR - MD
Project Number:	6747
PA ID No.:	955-8888
Date of Inspection:	July 23, 2009
Event Date(s)	July 8 - 9, 2009
Work Category:	C - Roads and Bridges
Type of Work: <small>(Enter New, Repair, etc.)</small>	Replacement
Preparer's Notes:	
<p>Floodwaters during a declared storm event destroyed the Simmonds Arch Bridge across Spout Run Creek. The bridge consisted of a roadway and backfill over a reinforced concrete arch.</p> <p>The eligible scope of work constructing a new bridge having the same function and capacity as the destroyed bridge. Simmonds Arch Bridge was 26 feet wide and 24 feet long with reinforced concrete abutments and wing-walls at each end. The project damage description and scope of work is detailed in the Project Worksheet.</p> <p>The replacement bridge will be completed using a design-bid-build process. Engineering drawings will be based on the original design and are about 50 percent complete.</p> <p>Estimate developed using RSMeans Building Cost Data and CostWorks. Cost data was updated to 2nd quarter 2009.</p>	

CEF Notes

9/10/2009

River College - Simmonds Arch Bridge

Damaged Facility:	Simmonds Arch Bridge
Applicant Name:	River College
Project Number:	6747
Date of Estimate:	July 28, 2009
Preparer(s):	James Allen and John Christopher
Part A Notes:	<p>A.1 - Unit costs for uncompleted permanent work are based on RSMeans Building Cost using CostWorks. Cost data updated to 2nd quarter 2009. Location in CostWorks set as Winchester, VA. City Adjustment Factor is 1.0.</p> <p>A.2 - Unit costs for uncompleted non-permanent work based on RSMeans Building Cost using CostWorks. Cost data updated to 2nd quarter 2009. Winchester, VA. City Adjustment Factor is 1.0.</p>
Part B Notes:	<p>B.1 - Estimate includes a cost of 5%, the average recommended value, for safety and security. Work around water will require special safety and security barriers. Work will also require typical construction safety measures, and security measures to protect equipment and materials during non-working hours. Estimate includes a cost of 1%, the maximum recommended value, for temporary services and utilities. Contractor will be required to provide all site services including temporary power, communications, potable water, and sanitation. Estimate includes a cost of 0.5%, the average recommended value, for quality control. Field testing and inspection is anticipated for concrete, compacted fill and asphalt paving. Estimate includes a cost of 2%, slightly less than the average recommended value, for submittals. Although separate material submittals are expected for guard rails, paint, and miscellaneous items, most materials submittals will be in conjunction with field quality control services.</p> <p>B.2 - General conditions costs have been included for site supervision and coordination.</p>
Part C Notes:	<p>C.1 - Estimate includes a contingency of 5% for design uncertainty, slightly below the average recommended value for the working drawing stage. Although drawings are only 50% complete, design is based on available original design, which reduces uncertainty. However, there are uncertainties in the cost because of a lack of design data for shoring and dewatering requirements during placement of the concrete arch culvert and construction of the abutment and wing-walls.</p> <p>C.2 - No constructability issues are expected for the new construction. Therefore, no costs for constructability are included in the estimate.</p> <p>C.3 - Estimate includes a cost of 1%, the lowest recommended value, for site access. The site is close to Winchester, VA, with good access to labor and materials. Traffic delays and limited access to the project site due to loss of the bridge are expected to have an impact on project cost. Estimate includes a cost of 1% each, the lowest recommended value for storage and staging. The project boundaries are confined to the road right-of-way and one side of Spout Run Creek. Those limitations are expected to have a minor impact on costs as a result of having to handle some materials multiple times from delivery to installation.</p> <p>C.4 - Based on the size of the project, no economies of scale are anticipated.</p>

CEF Notes

9/10/2009

River College - Simmonds Arch Bridge

Part D Notes:	D.1 -	The project is expected to employ a General Contractor. Therefore, GC home office overhead is included in the estimate.
	D.2 -	The project is expected to employ a General Contractor. Therefore, GC costs for project insurance on bonds is included in the estimate.
	D.3 -	The project is expected to employ a General Contractor. Therefore, GC profit is included in the estimate.
Part E Notes:	E -	The anticipated project schedule is 2 months for design, 2 months to bid and award a contract, and 4 months for construction. Time to midpoint of construction = $2+2+(4/2) = 6$ months. Current monthly escalation factor provided by PAO = 0.231%
Part F Notes:	F.1 -	The univeristy is exempt from plan review fees for site work project.
	F.2 -	The univeristy is exempt from building permit fees for site work projects.
Part G Notes:	G.1 -	Estimate includes a cost of 7% for changes in the eligible scope of work that may be encountered during the project.
Part H Notes:	H.1 -	Estimate includes a cost of 1% for the applicant to manage project design.
	H.2 -	Estimate includes a cost of 14% for design services based on a project of average complexity as defined in the PA Guide, June 2007.
	H.3 -	Estimate includes a cost of 6% to manage construction of both completed and uncompleted work.
Miscellaneous Notes & Comments:		Reference to recommended values is to guidance provided in the CEF Instructional Guide, August 2009.

CEF Part A

9/10/2009

River College - Simmonds Arch Bridge

Item No.	Item Description Title / Component Description	Div. # or Cost Code	Qty	Units	Unit Price	City Adj Factor	Total Cost
Completed Work Items							
Add Row	Completed Permanent Items						
							\$ -
							\$ -
							\$ -
					\$ -		\$ -
Completed - Permanent Total							\$ -
Add Row	Completed Non-Permanent Items						
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
Completed - Non-Permanent Total							\$ -

CEF Part A

9/10/2009

River College - Simmonds Arch Bridge

Item No.	Item Description Title / Component Description	Div. # or Cost Code	Qty	Units	Unit Price	City Adj Factor	Total Cost
Uncompleted Work Items							
Add Row	Uncompleted Permanent Items						
	Public Storm Utility Drainage Piping, concrete reinforced culvert reinforced elliptical, 8' lengths, 38" x 60" inside, round equivalent 48" diameter, C507 class 3, excludes excavation or backfill	334113603550	26.00	L.F.	\$ 320.01	1.0000	\$ 8,320.14
	Borrow, select granular fill, 3/4 C.Y. bucket, loading and/or spreading, front end loader, wheel mounted	312323155050	200.00	B.C.Y	\$ 18.40	1.0000	\$ 3,680.01
	Compaction, structural, select fill, 8" lifts, sheepsfoot or wobbly wheel roller	312323240400	200.00	E.C.Y	\$ 1.17	1.0000	\$ 234.00
	Structural concrete, in place, continuous strip footing, 36" wide x 12" deep, includes forms (4 uses), reinforcing steel, and finishing	033053403950	80.00	C.Y.	\$ 233.99	1.0000	\$ 18,719.08
	Structural concrete, in place, retaining wall, level backfill, 8' high, includes forms (4 uses), reinforcing steel, and finishing	033053406300	36.00	C.Y.	\$ 324.98	1.0000	\$ 11,699.42
	Compaction, 2 passes, 6" lifts, towed vibrating roller	312323236200	75.00	E.C.Y	\$ 0.82	1.0000	\$ 61.50
	Fine grading, finish grading, small area, to be paved with grader	312216100012	220.00	S.Y.	\$ 3.24	1.0000	\$ 712.86
	Base course drainage layers, aggregate base course for roadways and large paved areas, crushed stone base, compacted, crushed 1-1/2" stone base, to 6" deep	321123230302	220.00	S.Y.	\$ 11.05	1.0000	\$ 2,430.97
	Plant-mix asphalt paving, for highways and large paved areas, wearing course, 4" thick	321216130480	220.00	S.Y.	\$ 17.05	1.0000	\$ 3,750.96
	Sidewalks, driveways, and patios, side walks, asphaltic concrete, 2-1/2" thick, excludes base	320610100100	15.00	S.Y.	\$ 13.70	1.0000	\$ 205.50
	Painted pavement markings, acrylic waterborne, white or yellow, 6" wide	321723130200	225.00	L.F.	\$ 0.43	1.0000	\$ 96.74
	Vehicle guide rails, corrugated steel, galvanized steel posts, steel posts 6'-3" O.C., 6" x 8" posts	347113260012	80.00	L.F.	\$ 33.00	1.0000	\$ 2,639.98
	Vehicle guide rails, corrugated steel, galvanized steel posts, install wrap around end section	347113260300	4.00	Ea.	\$ 231.00	1.0000	\$ 924.01
	Rip-rap and rock lining, random, broken stone, 50 lb. average, dumped	313713100300	10.00	Ton	\$ 41.00	1.0000	\$ 410.00

CEF Part A

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River College - Simmonds Arch Bridge

Item No.	Item Description Title / Component Description	Div. # or Cost Code	Qty	Units	Unit Price	City Adj Factor	Total Cost
	Railing, ornamental, steel, 3'-6" high, posts @ 5' O.C., shop fabricated, maximum	05 73 2350 0560	80.00	LF	\$ 160.00	1.0000	\$ 12,800.00
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
Uncompleted - Permanent Total							\$ 66,685.18
Add Row	Uncompleted Non-Permanent Items						
	Dewatering, pumping, 8 hours, attended 2 hours per day, 4" discharge pump used for 8 hours, includes 20 L.F. of suction hose and 100 L.F. of discharge hose	312319200650	40.00	Day	\$ 166.03	1.0000	\$ 6,641.00
	Sheet piling, steel, 22 psf, 15' excavation, drive, extract and salvage, excludes wales	314116101300	540.00	S.F.	\$ 20.00	1.0000	\$ 10,800.99
	Synthetic erosion control, silt fence, polypropylene, ideal conditions, 3' high	312513101000	200.00	L.F.	\$ 0.94	1.0000	\$ 187.98
					\$ -		\$ -
Uncompleted - Non-Permanent Total							\$ 17,629.97
TOTAL PART A BASE CONSTRUCTION COST							\$ 84,315.15

CEF Summary of Completed Work

9/10/2009

River College - Simmonds Arch Bridge								
		Replacement	\$ -	\$ -	\$ -	\$ -	Total	
A "Base Costs" for Construction Work-In Trades								
A.1	Permanent Work (CEF Part A)						\$ -	
A.2	Non-Permanent Job Specific Work (CEF Part A)		\$ -	\$ -	\$ -		\$ -	
Part A Total			\$ -	\$ -	\$ -	\$ -	\$ -	
B General Requirements and General Conditions								
B.1	General Requirements		Enter % in Appropriate Column					
		Guide Low to High						
	Safety & Security	4.0% 6.0%						
	Temporary Services & Utilities	0% 1.0%						
	Quality Control	0% 1.0%						
	Submittals	0% 5.0%						
			\$ -	\$ -	\$ -	\$ -	\$ -	
B.2	General Conditions (4.25%)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
			\$ -	\$ -	\$ -	\$ -	\$ -	
Part B Total			\$ -	\$ -	\$ -	\$ -	\$ -	
PART A through B SUBTOTAL			\$ -	\$ -	\$ -	\$ -	\$ -	

CEF Summary of Completed Work

9/10/2009

River College - Simmonds Arch Bridge

River College - Simmonds Arch Bridge								
		Replacement	\$ -	\$ -	\$ -	\$ -	Total	
C Construction Cost Contingencies								
C.1 Design-Phase Scope Contingencies	Guide		Enter % in Appropriate Column					
	Low to High							
	Preliminary Engineering Analysis	7.0%	20.0%					
	Working Drawings	2.0%	10.0%					
			\$ -	\$ -	\$ -	\$ -	\$ -	
C.2 Facility or Project Constructability	See IG for Values		Enter % in Appropriate Column					
	Facility or Project Type and Complexity							
				\$ -	\$ -	\$ -	\$ -	\$ -
C.3 Access, Storage & Staging	Guide		Enter % in Appropriate Column					
	Low to High							
	Access Contingencies	0%	4.0%					
	Storage Contingencies	0%	4.0%					
	Staging Contingencies	0%	4.0%					
			\$ -	\$ -	\$ -	\$ -	\$ -	
C.4 Economies of Scale			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				\$ -	\$ -	\$ -	\$ -	\$ -
				\$ -	\$ -	\$ -	\$ -	\$ -
Part C Total			\$ -	\$ -	\$ -	\$ -	\$ -	
PART A through C SUBTOTAL			\$ -	\$ -	\$ -	\$ -	\$ -	

CEF Summary of Completed Work

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River College - Simmonds Arch Bridge

							Total	
		Replacement	\$ -	\$ -	\$ -	\$ -		
D		General Contractor's Overhead and Profit						
D.1	GC's Home Office Overhead	7.7%	<input type="checkbox"/>					
			\$ -	\$ -	\$ -	\$ -	\$ -	
D.2	GC's Insurance, Payment & Performance Bonds	3.3%	<input type="checkbox"/>					
			\$ -	\$ -	\$ -	\$ -	\$ -	
D.3	General Contractor's Profit							
	New Construction		<input type="checkbox"/>					
	Repair/Retrofit		<input type="checkbox"/>					
			\$ -	\$ -	\$ -	\$ -	\$ -	
Part D Total			\$ -	\$ -	\$ -	\$ -	\$ -	
PART A through D SUBTOTAL			\$ -	\$ -	\$ -	\$ -	\$ -	
E		Cost Escalation Factors						
Cost Escalation Factor								
	Months							
	Monthly Factor							
Part E Total			\$ -	\$ -	\$ -	\$ -	\$ -	
PART A through E SUBTOTAL			\$ -	\$ -	\$ -	\$ -	\$ -	

CEF Summary of Completed Work

9/10/2009

River College - Simmonds Arch Bridge

River College - Simmonds Arch Bridge						
	Replacement	\$ -	\$ -	\$ -	\$ -	Total
F Plan Review and Permit Construction Cost						
F.1 Plan Review Fees (List Individual Requirements Separately)						
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
F.2 Construction Permit Fees (List Individual Requirements Separately)						
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Part F Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PART A through F SUBTOTAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
G Applicant's Reserve for Change Orders						
Applicant's Reserve for Change Orders	<input type="checkbox"/>					
	7.0%	7.0%	7.0%	7.0%	7.0%	
PART G Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PART A through G SUBTOTAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

CEF Summary of Completed Work

9/10/2009

River College - Simmonds Arch Bridge							
	Replacement	\$ -	\$ -	\$ -	\$ -		Total
H Applicant's Project Management And Design Costs							
H.1 Applicant's Project Management - Design Phase	1.0%	<input type="checkbox"/>					
		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
H.2 A/E Design Contract Applicability	Above Average Complexity (Curve A)	<input type="checkbox"/>	5.6%	<input type="checkbox"/>	5.6%	<input type="checkbox"/>	5.6%
	Average Complexity (Curve B)	<input type="checkbox"/>	4.5%	<input type="checkbox"/>	4.5%	<input type="checkbox"/>	4.5%
	Basic Construction Inspection Services	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%
A/E Design Contract Cost	Above Average Complexity (Curve A)	\$ -	\$ -	\$ -	\$ -	\$ -	
	Average Complexity (Curve B)	\$ -	\$ -	\$ -	\$ -	\$ -	
	Basic Construction Inspection Services	\$ -	\$ -	\$ -	\$ -	\$ -	
		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
H.3 Project Management - Construction Phase	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	6.0%	6.0%	6.0%	6.0%	6.0%		
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Part H Total		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PART A through H SUBTOTAL		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL OF COMPLETED WORK							

CEF Summary of Uncompleted Work

9/10/2009

River College - Simmonds Arch Bridge								
		Replacement	\$ -	\$ -	\$ -	\$ -	Total	
A "Base Costs" for Construction Work-In Trades								
A.1	Permanent Work (CEF Part A)	\$ 66,685					\$ 66,685	
A.2	Non-Permanent Job Specific Work (CEF Part A)	\$ 17,630					\$ 17,630	
Part A Total		\$ 84,315	\$ -	\$ -	\$ -	\$ -	\$ 84,315	
B General Requirements and General Conditions								
B.1	General Requirements	Range Low to High		Enter % in Appropriate Column				
	Safety & Security	4.0%	6.0%	5.0%				
	Temporary Services & Utilities	0%	1.0%	1.0%				
	Quality Control	0%	1.0%	0.5%				
	Submittals	0%	5.0%	2.0%				
		\$ 7,167	\$ -	\$ -	\$ -	\$ -	\$ 7,167	
B.2	General Conditions (4.25%)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		\$ 3,583	\$ -	\$ -	\$ -	\$ -	\$ 3,583	
Part B Total		\$ 10,750	\$ -	\$ -	\$ -	\$ -	\$ 10,750	
PART A through B SUBTOTAL		\$ 95,065	\$ -	\$ -	\$ -	\$ -	\$ 95,065	

CEF Summary of Uncompleted Work

9/10/2009

River College - Simmonds Arch Bridge

Replacement								\$ -	\$ -	\$ -	\$ -	\$ -	Total		
C Construction Cost Contingencies															
C.1 Design-Phase Scope Contingencies	Range		Enter % in Appropriate Column												
	Low	to High													
	7.0%	20.0%													
Preliminary Engineering Analysis															
Working Drawings			5.0%												
			\$ 4,753	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,753	
C.2 Facility or Project Constructability	Enter % in Appropriate Column														
	Facility or Project Type and Complexity		See IG for Values												
			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
C.3 Access, Storage & Staging	Range		Enter % in Appropriate Column												
	Low	to High													
	0%	4.0%													
	Access Contingencies			1.0%											
	Storage Contingencies			1.0%											
Staging Contingencies			1.0%												
			\$ 2,852	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,852	
C.4 Economies of Scale	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>														
				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Part C Total			\$ 7,605	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7,605	
PART A through C SUBTOTAL			\$ 102,671	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 102,671	

CEF Summary of Uncompleted Work

9/10/2009

River College - Simmonds Arch Bridge

River College - Simmonds Arch Bridge							
		Replacement	\$ -	\$ -	\$ -	\$ -	Total
D General Contractor's Overhead and Profit							
D.1	GC's Home Office Overhead	7.7%	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
			\$ 7,906	\$ -	\$ -	\$ -	\$ 7,906
D.2	GC's Insurance, Payment & Performance Bonds	3.3%	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
			\$ 3,388	\$ -	\$ -	\$ -	\$ 3,388
D.3	General Contractor's Profit						
		10.0%					
	New Construction		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Repair/Retrofit		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
			\$ 11,396	\$ -	\$ -	\$ -	\$ 11,396
	Part D Total		\$ 22,690	\$ -	\$ -	\$ -	\$ 22,690
	PART A through D SUBTOTAL		\$ 125,361	\$ -	\$ -	\$ -	\$ 125,361
E Cost Escalation Factors							
E	Cost Escalation Factor						
		Months	6				
		Monthly Factor	0.231%				
	Part E Total		\$ 1,738	\$ -	\$ -	\$ -	\$ 1,738
	PART A through E SUBTOTAL		\$ 127,098	\$ -	\$ -	\$ -	\$ 127,098

CEF Summary of Uncompleted Work

9/10/2009

River College - Simmonds Arch Bridge

River College - Simmonds Arch Bridge							
	Replacement	\$	-	\$	-	\$	-
Total							
F	Plan Review and Permit Construction Cost						
F.1	Plan Review Fees						
	(List Individual Requirements Separately)	\$	-				
		\$	-	\$	-	\$	-
F.2	Construction Permit Fees						
	(List Individual Requirements Separately)						
		\$	-	\$	-	\$	-
	Part F Total	\$	-	\$	-	\$	-
	PART A through F SUBTOTAL	\$	127,098	\$	-	\$	-
G	Applicant's Reserve for Change Orders						
G	Applicant's Reserve for Change Orders	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		7.0%	7.0%	7.0%	7.0%	7.0%	
	PART G Total	\$	8,897	\$	-	\$	-
	PART A through G SUBTOTAL	\$	135,995	\$	-	\$	-

CEF Summary of Uncompleted Work

9/10/2009

River College - Simmonds Arch Bridge

Replacement								\$ -	\$ -	\$ -	\$ -	\$ -	Total	
H Applicant's Project Management And Design Costs														
H.1	Applicant's Project Management - Design Phase	1.0%	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
			\$ 1,360	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,360
H.2	A/E Design Contract Applicability													
	Above Average Complexity (Curve A)	<input type="checkbox"/>	24.8%	<input type="checkbox"/>	5.6%									
	Average Complexity (Curve B)	<input checked="" type="checkbox"/>	13.9%	<input type="checkbox"/>	4.5%	<input type="checkbox"/>	5.6%							
	Basic Construction Inspection Services	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%	
	A/E Design Contract Cost													
	Above Average Complexity (Curve A)		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	Average Complexity (Curve B)		\$ 18,906	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	Basic Construction Inspection Services		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
			\$ 18,906	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 18,906
H.3	Project Management - Construction Phase													
		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	
			\$ 8,160	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 8,160
	Part H Total		\$ 28,426	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 28,426
	PART A through H SUBTOTAL		\$ 164,421	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 164,421
TOTAL OF UNCOMPLETED WORK													\$164,421	

CEF Total Project Summary

9/10/2009

Summary

River College - Simmonds Arch Bridge

		Completed	Uncompleted	Total
PART A	"Base Costs" for Construction Work In Trades	\$ -	\$ 84,315	\$ 84,315
	A.1 Permanent Work	\$ -	\$ 66,685	\$ 66,685
	A.2 Non-Permanent Job Specific Work (CEF Part A)	\$ -	\$ 17,630	\$ 17,630
PART B	General Requirements and General Conditions	\$ -	\$ 10,750	\$ 10,750
	B.1 General Requirements	\$ -	\$ 7,167	\$ 7,167
	B.2 General Conditions	\$ -	\$ 3,583	\$ 3,583
PART C	Construction Cost Contingencies (Design and Construction)	\$ -	\$ 7,605	\$ 7,605
	C.1 Standard Design-Phase Scope Contingencies	\$ -	\$ 4,753	\$ 4,753
	C.2 Facility or Project Constructability	\$ -	\$ -	\$ -
	C.3 Access, Storage, and Staging Contingencies	\$ -	\$ 2,852	\$ 2,852
	C.4 Economies of Scale in New Construction	\$ -	\$ -	\$ -
PART D	General Contractor's Overhead and Profit	\$ -	\$ 22,690	\$ 22,690
	D.1 General Contractor's Home Office Overhead Costs	\$ -	\$ 7,906	\$ 7,906
	D.2 General Contractor's Insurance, Payment, and Performance Bonds	\$ -	\$ 3,388	\$ 3,388
	D.3 Contractor's Profit	\$ -	\$ 11,396	\$ 11,396
PART E	Cost Escalation Allowance	\$ -	\$ 1,738	\$ 1,738
PART F	Plan Review and Construction Permit Costs	\$ -	\$ -	\$ -
	F.1 Plan Review Fees	\$ -	\$ -	\$ -
	F.2 Construction Permit Fees	\$ -	\$ -	\$ -
PART G	Applicant's Reserve for Construction	\$ -	\$ 8,897	\$ 8,897
PART H	Applicant's Project Management and Design Costs	\$ -	\$ 28,426	\$ 28,426
	H.1 Applicant's Project Management - Design Phase	\$ -	\$ 1,360	\$ 1,360
	H.2 Architecture & Engineering Design Contract Costs	\$ -	\$ 18,906	\$ 18,906
	H.3 Project Management - Construction Phase	\$ -	\$ 8,160	\$ 8,160
	Complete Project Total for Completed and Uncompleted Work	\$ -	\$ 164,421	\$ 164,421

**Example 2:
Category F – Utilities – River Park Elevated Water Tank**

This example illustrates the use of unit prices from industry standard construction cost estimating resources for uncompleted work in the preparation of the CEF.

Project Background

The estimate was developed for the replacement of a 100,000-gallon water storage tank located near Mobile, AL. The water tank collapsed as a result of a tornado that caused area-wide damage resulting in a disaster declaration. The elevated water tank was owned by the Lower Alabama Water Authority. The public authority is an eligible applicant and the water tank is an eligible facility. The tank shell was severely damaged by the collapse, and falling debris damaged pumps, the emergency generator, and foundations, requiring that they be replaced.

Removal of debris is being accomplished by Authority employees as Category A – Debris Removal. That work is included on a separate PW.

Information Relating to Development of the Estimate

Replacement of the River Park elevated water tank was judged to be Category F – Utilities work.

Quantities for the estimate were calculated based on measurements taken during the site visit conducted by the project formulation team.

The estimate was developed using industry standard building cost data and the associated electronic cost data format.

Guidance provided by the PA Group Supervisor included:

- Project unit costs should be adjusted for Mobile, AL.
- The monthly escalation factor is 0.231.

CEF Fact Sheet

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank

Date of Estimate:	May 19, 2009
FEMA Region:	IV
Preparer(s):	Frank Beason and Joseph Peters
Applicant Name:	Lower Alabama Water Authority
Project Title:	River Park Elevated Water Tank
Damaged Facility:	River Park Elevated Water Tank
Declaration Number:	FEMA 1256 DR - AL
Project Number:	41373
PA ID No.:	567-9832
Date of Inspection:	May 15, 2009
Event Date(s)	May 10, 2009
Work Category:	F - Utilities
Type of Work: <i>(Enter New, Repair, etc.)</i>	New
Preparer's Notes:	
<p>A tornado during a declared event destroyed the River Park elevated water tank.</p> <p>The eligible scope of work includes replacement of a 100,000-gallon elevated water tank, an emergency generator, supply pump, and associated piping. Piping consists of a network of short sections located above grade. The falling tank pulled anchor bolts from the foundations. The new tank manufacturer requires new foundations as a condition of validating the warranty. Facility damage description and scope of work is detailed in the PW.</p> <p>Rubble is being removed by Lower Alabama Water Authority staff. Costs associated with that work are being included in a separate Category B PW.</p> <p>The replacement water tank will be completed using a design-bid-build process. Engineering drawings will be based on the original design and are about 25 percent complete.</p> <p>Estimate developed using RSMeans Building Cost Data and CostWorks. Cost data updated to 1st quarter 2009.</p>	

CEF Notes

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank

Damaged Facility:	River Park Elevated Water Tank	
Applicant Name:	Lower Alabama Water Authority	
Project Number:	41373	
Date of Estimate:	May 19, 2009	
Preparer(s):	Frank Beason and Joseph Peters	
Part A Notes:	A.1 -	Unit costs for uncompleted work based on RSMeans Building Cost and CostWorks. Cost data updated to 1st quarter 2009. Location in CostWorks set as Mobile, AL. City Adjustment Factor is 1.0.
	A.2 -	
Part B Notes:	B.1 -	<p>Estimate includes a cost of 4%, the minimum recommended value, for safety and security. Work installing elevated tank will require safety measures related to fall hazards for a small work crew. Other project work will required typical construction safety measures, and security measures to protect equipment and materials during non-working hours.</p> <p>Estimate includes a cost of 0.5%, the average recommended value, for temporary services and utilities. Contractor will be required to provide all site services including temporary power, communications, potable water, and sanitation.</p> <p>Estimate includes a cost of 0.5%, the average recommended value, for quality control. Field testing and inspection is anticipated for concrete, and structural steel erection.</p> <p>Estimate includes a cost of 5%, the recommended value, for submittals. Submittals from the tank supplier are expected to include structural design calculations, foundation design loads, and erection details.</p>
	B.2 -	General conditions costs have been included for site supervision and coordination.
Part C Notes:	C.1 -	Estimate includes a contingency of 10% for design uncertainty, the low range of recommended values during the preliminary design phase. Drawings are only 25% complete resulting in uncertainties about foundation details and water tank erection requirements.
	C.2 -	No constructability issues are expected for the new construction. Therefore no costs for constructability are included in the estimate.
	C.3 -	<p>Estimate includes a cost of 2%, the average recommended value, for site access. The site is close to Mobile, AL, with good access to labor and materials. Traffic delays and rough access into the project site, particularly relative to delivery of the elevated tank and supporting structure, is expected to have an impact on project cost.</p> <p>Estimate includes a cost of 2% each, the average recommended value, for storage and staging. The project site is expected to be too congested to store all materials until after the elevated tank is erected, requiring some materials to be stored off site and only be staged as needed. Those limitations are expected to have an impact on costs as a result of having to handle some materials multiple times from delivery to installation.</p>
	C.4 -	Based on the size of the project, no economies of scale are anticipated.
Part D Notes:	D.1 -	The project is expected to employ a General Contractor. Therefore, GC home office overhead is included in the estimate.
	D.2 -	The project is expected to employ a General Contractor. Therefore, GC costs for project insurance on bonds is included in the estimate.

CEF Notes

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank

	D.3 -	The project is expected to employ a General Contractor. Therefore, GC profit is included in the estimate.
Part E Notes:	E -	The anticipated project schedule is 1 month for design, 2 months to bid and award a contract, and 10 months for construction. Time to midpoint of construction = $1+2+(10/2) = 8$ months. Current monthly escalation factor provided by PAO = 0.231%
Part F Notes:	F.1 - F.2 -	LAWA is exempt from plan review fees. LAWA is exempt from building permit fees .
Part G Notes:	G.1 -	Estimate includes a cost of 7% for changes in the eligible scope of work that may be encountered during the project.
Part H Notes:	H.1 - H.2 - H.3 -	Estimate includes a cost of 1% for the applicant to manage project design. Estimate includes a cost of 11.3% for design services based on a project of average complexity as defined in the PA Guide, June 2007. Estimate includes a cost of 4.3% to manage construction of uncompleted work.
Miscellaneous Notes & Comments:		Reference to recommended values is to guidance provided in the CEF Instructional Guide, August 2009.

CEF Part A

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank

Item No.	Item Description Title / Component Description	Div. # or Cost Code	Qty	Units	Unit Price	City Adj Factor	Total Cost
Completed Work Items							
Add Row	Completed Permanent Items						
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
Completed - Permanent Total							\$ -
Add Row	Completed Non-Permanent Items						
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
Completed - Non-Permanent Total							\$ -

CEF Part A

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank

Item No.	Item Description Title / Component Description	Div. # or Cost Code	Qty	Units	Unit Price	City Adj Factor	Total Cost
Uncompleted Work Items							
Add Row	Uncompleted Permanent Items						
	Aboveground Water Utility Storage Tanks, elevated Steel Storage Tanks for water, 100' to bottom capacity line, 100,000 gallons, incl. painting, excl. pipes or pumps	331619503300	1	Ea.	\$ 308,500.00	1.0000	\$ 308,500.00
	Structural excavation for minor structures, bank measure, for spread and mat footings, elevator pits, and small building foundations, common earth, 1/2 C.Y. bucket, machine excavation, hydraulic backhoe	312316166030	100	B.C.Y.	\$ 21.50	1.0000	\$ 2,150.19
	Structural concrete, in place, spread footing, over 5 C.Y., includes forms (4 uses), reinforcing steel, and finishing	033053403850	300	C.Y.	\$ 266.99	1.0000	\$ 80,097.60
	Anchor bolts, J-type, 1-1/2" diameter x 36" long, galvanized, includes nut and washer	031505023600	32	Ea.	\$ 74.49	1.0000	\$ 2,383.84
	Fence, chain link industrial, galvanized steel, 6 ga. wire, 2-1/2" posts @ 10' OC, 8' high, includes excavation, in concrete, excludes barbed wire	323113200920	300	L.F.	\$ 42.50	1.0000	\$ 12,749.51
	Fence, chain link industrial, double swing gates, 8' high, 20' opening, includes excavation, posts & hardware in concrete	323113205090	1	Opng.	\$ 3,049.87	1.0000	\$ 3,049.87
	Utility Piping, cast iron, B & S, 12" diameter, excludes excavation or backfill	333113132032	200	L.F.	\$ 101.99	1.0000	\$ 20,398.48
	Water Utility distribution valves, butterfly valves with boxes, cast iron, mechanical joint, 12" diameter, includes valve box and mechanical joints, excludes excavation and backfill	331216103340	3	Ea.	\$ 3,149.96	1.0000	\$ 9,449.88
	Water Utility distribution valves, gate valves, cast iron, mechanical joint, with boxes, 250 PSI, 12" diameter, includes valve box and mechanical joint, excludes excavation and backfill	331216103820	3	Ea.	\$ 2,425.02	1.0000	\$ 7,275.06
	Fire Pumps, electric, 1500 GPM, 100 psi, 139 HP, 1770 RPM, 6" pump, incl. controller, fittings & relief valve	213113503750	1	Ea.	\$ 41,899.25	1.0000	\$ 41,899.25
	Generator set, gas/gasoline, 3 phase 4 wire, 277/480 V, 100 kW, incl battery, charger, muffler & automatic transfer switch	263213160700	1	Ea.	\$ 30,899.75	1.0000	\$ 30,899.75
	Shelters, aluminum frame, acrylic glazing, 3' x 9' x 8' h	133423700020	2	Ea.	\$ 4,375.07	1.0000	\$ 8,750.14

CEF Part A

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank

Item No.	Item Description Title / Component Description	Div. # or Cost Code	Qty	Units	Unit Price	City Adj Factor	Total Cost
	Grounding rod, copper clad, 10' long, 1/2" diameter	260526800080	2	Ea.	\$ 86.01	1.0000	\$ 172.01
	Rigid galvanized steel conduit, 4" diameter, to 15' high, incl couplings only	260533100680	400	L.F.	\$ 36.00	1.0000	\$ 14,399.20
	Wire, copper, stranded, 600 volt, 3/0, type XHHW, in raceway	260519903200	12	C.L.F.	\$ 815.02	1.0000	\$ 9,780.28
					\$ -		\$ -
Uncompleted - Permanent Total							\$ 551,955.05
Add Row	Uncompleted Non-Permanent Items						
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
Uncompleted - Non-Permanent Total							\$ -
TOTAL PART A BASE CONSTRUCTION COST							\$ 551,955.05

CEF Summary of Completed Work

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank								
	New	\$ -	\$ -	\$ -	\$ -		Total	
A "Base Costs" for Construction Work-In Trades								
A.1 Permanent Work (CEF Part A)							\$ -	
A.2 Non-Permanent Job Specific Work (CEF Part A)		\$ -	\$ -	\$ -			\$ -	
Part A Total	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	
B General Requirements and General Conditions								
B.1 General Requirements	Guide		Enter % in Appropriate Column					
	Low to High							
	Safety & Security	4.0%	6.0%					
	Temporary Services & Utilities	0%	1.0%					
	Quality Control	0%	1.0%					
Submittals	0%	5.0%						
		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
B.2 General Conditions (4.25%)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Part B Total	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	
PART A through B SUBTOTAL		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

CEF Summary of Completed Work

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank							
		New	\$ -	\$ -	\$ -	\$ -	Total
C Construction Cost Contingencies							
C.1 Design-Phase Scope Contingencies	Guide		Enter % in Appropriate Column				
	Low	to High					
	7.0%	20.0%					
	Preliminary Engineering Analysis						
	Working Drawings						
			\$ -	\$ -	\$ -	\$ -	\$ -
C.2 Facility or Project Constructability	Guide		Enter % in Appropriate Column				
	Low	to High					
	See IG for Values						
	Facility or Project Type and Complexity						
			\$ -	\$ -	\$ -	\$ -	\$ -
C.3 Access, Storage & Staging	Guide		Enter % in Appropriate Column				
	Low	to High					
	0%	4.0%					
		Access Contingencies					
		Storage Contingencies					
	Staging Contingencies						
			\$ -	\$ -	\$ -	\$ -	\$ -
C.4 Economies of Scale			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			\$ -	\$ -	\$ -	\$ -	\$ -
Part C Total			\$ -	\$ -	\$ -	\$ -	\$ -
PART A through C SUBTOTAL			\$ -	\$ -	\$ -	\$ -	\$ -

CEF Summary of Completed Work

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank						
	New	\$ -	\$ -	\$ -	\$ -	Total
D General Contractor's Overhead and Profit						
D.1 GC's Home Office Overhead	7.7%	<input type="checkbox"/>				
		\$ -	\$ -	\$ -	\$ -	\$ -
D.2 GC's Insurance, Payment & Performance Bonds	3.3%	<input type="checkbox"/>				
		\$ -	\$ -	\$ -	\$ -	\$ -
D.3 General Contractor's Profit						
New Construction		<input type="checkbox"/>				
Repair/Retrofit		<input type="checkbox"/>				
		\$ -	\$ -	\$ -	\$ -	\$ -
Part D Total		\$ -	\$ -	\$ -	\$ -	\$ -
PART A through D SUBTOTAL		\$ -	\$ -	\$ -	\$ -	\$ -
E Cost Escalation Factors						
Cost Escalation Factor	Months					
	Monthly Factor					
	Part E Total	\$ -	\$ -	\$ -	\$ -	\$ -
PART A through E SUBTOTAL		\$ -	\$ -	\$ -	\$ -	\$ -

CEF Summary of Completed Work

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank						
	New	\$	-	\$	-	\$
Total						
F	Plan Review and Permit Construction Cost					
F.1	Plan Review Fees					
	(List Individual Requirements Separately)					
	\$	-	\$	-	\$	-
F.2	Construction Permit Fees					
	(List Individual Requirements Separately)					
	\$	-	\$	-	\$	-
	\$	-	\$	-	\$	-
Part F Total	\$	-	\$	-	\$	-
PART A through F SUBTOTAL	\$	-	\$	-	\$	-
G	Applicant's Reserve for Change Orders					
	Applicant's Reserve for Change Orders					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	7.0%	7.0%	7.0%	7.0%	7.0%	
Part G Total	\$	-	\$	-	\$	-
PART A through G SUBTOTAL	\$	-	\$	-	\$	-

CEF Summary of Completed Work

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank							
	New	\$ -	\$ -	\$ -	\$ -	\$ -	Total
H Applicant's Project Management And Design Costs							
H.1 Applicant's Project Management - Design Phase	1.0%	<input type="checkbox"/>					
		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
H.2 A/E Design Contract Applicability							
Above Average Complexity (Curve A)		<input type="checkbox"/>	5.6%	<input type="checkbox"/>	5.6%	<input type="checkbox"/>	5.6%
Average Complexity (Curve B)		<input type="checkbox"/>	4.5%	<input type="checkbox"/>	4.5%	<input type="checkbox"/>	5.6%
Basic Construction Inspection Services		<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%
A/E Design Contract Cost							
Above Average Complexity (Curve A)		\$ -	\$ -	\$ -	\$ -	\$ -	
Average Complexity (Curve B)		\$ -	\$ -	\$ -	\$ -	\$ -	
Basic Construction Inspection Services		\$ -	\$ -	\$ -	\$ -	\$ -	
		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
H.3 Project Management - Construction Phase		<input type="checkbox"/>					
		6.0%	6.0%	6.0%	6.0%	6.0%	
		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Part H Total		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PART A through H SUBTOTAL		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL OF COMPLETED WORK							

CEF Summary of Uncompleted Work

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank							
	New	\$ -	\$ -	\$ -	\$ -		Total
A "Base Costs" for Construction Work-In Trades							
A.1 Permanent Work (CEF Part A)	\$ 511,955						\$ 511,955
A.2 Non-Permanent Job Specific Work (CEF Part A)	.						\$ -
Part A Total	\$ 511,955	\$ -	\$ -	\$ -	\$ -		\$ 511,955
B General Requirements and General Conditions							
B.1 General Requirements	Range Low to High		Enter % in Appropriate Column				
Safety & Security	4.0%	6.0%	4.0%				
Temporary Services & Utilities	0%	1.0%	0.5%				
Quality Control	0%	1.0%	0.5%				
Submittals	0%	5.0%	5.0%				
	\$ 51,196	\$ -	\$ -	\$ -	\$ -		\$ 51,196
B.2 General Conditions (4.25%)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	\$ 21,758	\$ -	\$ -	\$ -	\$ -		\$ 21,758
Part B Total	\$ 72,954	\$ -	\$ -	\$ -	\$ -		\$ 72,954
PART A through B SUBTOTAL	\$ 584,909	\$ -	\$ -	\$ -	\$ -		\$ 584,909

CEF Summary of Uncompleted Work

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank								
	New	\$	-	\$	-	\$	-	
Total								
C Construction Cost Contingencies								
C.1 Design-Phase Scope Contingencies	Range Low to High		Enter % in Appropriate Column					
	Preliminary Engineering Analysis	7.0% 20.0%	10.0%					
	Working Drawings	2.0% 10.0%						
		\$ 58,491	\$ -	\$ -	\$ -	\$ -	\$ 58,491	
C.2 Facility or Project Constructability	See IG for Values		Enter % in Appropriate Column					
	Facility or Project Type and Complexity							
			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
C.3 Access, Storage & Staging	Range Low to High		Enter % in Appropriate Column					
	Access Contingencies	0% 4.0%	2.0%					
	Storage Contingencies	0% 4.0%	2.0%					
	Staging Contingencies	0% 4.0%	2.0%					
			\$ 35,095	\$ -	\$ -	\$ -	\$ -	\$ 35,095
C.4 Economies of Scale			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
			-0.6%					
			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Part C Total		\$ 93,585	\$ -	\$ -	\$ -	\$ -	\$ 93,585	
PART A through C SUBTOTAL		\$ 678,494	\$ -	\$ -	\$ -	\$ -	\$ 678,494	

CEF Summary of Uncompleted Work

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank							
	New	\$	-	\$	-	\$	-
Total							
D General Contractor's Overhead and Profit							
D.1 GC's Home Office Overhead	7.7%	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	\$ 52,244	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 52,244
D.2 GC's Insurance, Payment & Performance Bonds	3.3%	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	\$ 22,390	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 22,390
D.3 General Contractor's Profit							
	8.7%						
New Construction		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Repair/Retrofit		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	\$ 65,448	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 65,448
Part D Total	\$ 140,083	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 140,083
PART A through D SUBTOTAL	\$ 818,577	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 818,577
E Cost Escalation Factors							
E Cost Escalation Factor							
	Months	8					
	Monthly Factor	0.231%					
Part E Total	\$ 15,127	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 15,127
PART A through E SUBTOTAL	\$ 833,704	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 833,704

CEF Summary of Uncompleted Work

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank								
	New	\$	-	\$	-	\$	-	
							Total	
F Plan Review and Permit Construction Cost								
F.1 Plan Review Fees (List Individual Requirements Separately)								
	\$	-	\$	-	\$	-	\$	-
F.2 Construction Permit Fees (List Individual Requirements Separately)								
	\$	-	\$	-	\$	-	\$	-
Part F Total	\$	-	\$	-	\$	-	\$	-
PART A through F SUBTOTAL	\$	833,704	\$	-	\$	-	\$	833,704
G Applicant's Reserve for Change Orders								
G Applicant's Reserve for Change Orders	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	4.9%	7.0%	7.0%	7.0%	7.0%			
Part G Total	\$	41,212	\$	-	\$	-	\$	41,212
PART A through G SUBTOTAL	\$	874,916	\$	-	\$	-	\$	874,916

CEF Summary of Uncompleted Work

9/10/2009

Lower Alabama Water Authority - River Park Elevated Water Tank							
		New	\$ -	\$ -	\$ -	\$ -	Total
H Applicant's Project Management And Design Costs							
H.1	Applicant's Project Management - Design Phase	1.0%	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		\$ 8,749	\$ -	\$ -	\$ -	\$ -	\$ 8,749
H.2	A/E Design Contract Applicability						
	Above Average Complexity (Curve A)		<input type="checkbox"/> 16.7%	<input type="checkbox"/> 5.6%	<input type="checkbox"/> 5.6%	<input type="checkbox"/> 5.6%	<input type="checkbox"/> 5.6%
	Average Complexity (Curve B)		<input checked="" type="checkbox"/> 11.3%	<input type="checkbox"/> 4.5%	<input type="checkbox"/> 4.5%	<input type="checkbox"/> 4.5%	<input type="checkbox"/> 5.6%
	Basic Construction Inspection Services		<input type="checkbox"/> 3.0%	<input type="checkbox"/> 3.0%	<input type="checkbox"/> 3.0%	<input type="checkbox"/> 3.0%	<input type="checkbox"/> 3.0%
H.3	A/E Design Contract Cost						
	Above Average Complexity (Curve A)		\$ -	\$ -	\$ -	\$ -	\$ -
	Average Complexity (Curve B)		\$ 98,867	\$ -	\$ -	\$ -	\$ -
	Basic Construction Inspection Services		\$ -	\$ -	\$ -	\$ -	\$ -
		\$ 98,867	\$ -	\$ -	\$ -	\$ -	\$ 98,867
H.3	Project Management - Construction Phase		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		4.3%	6.0%	6.0%	6.0%	6.0%	
		\$ 37,516	\$ -	\$ -	\$ -	\$ -	\$ 37,516
Part H Total		\$ 145,132	\$ -	\$ -	\$ -	\$ -	\$ 145,132
PART A through H SUBTOTAL		\$ 1,020,047	\$ -	\$ -	\$ -	\$ -	\$ 1,020,047
TOTAL OF UNCOMPLETED WORK							\$1,020,047

CEF Total Project Summary

9/10/2009

Summary

Lower Alabama Water Authority - River Park Elevated Water Tank

		Completed	Uncompleted	Total
PART A	"Base Costs" for Construction Work In Trades	\$ -	\$ 511,955	\$ 511,955
	A.1 Permanent Work	\$ -	\$ 511,955	\$ 511,955
	A.2 Non-Permanent Job Specific Work (CEF Part A)	\$ -	\$ -	\$ -
PART B	General Requirements and General Conditions	\$ -	\$ 72,954	\$ 72,954
	B.1 General Requirements	\$ -	\$ 51,196	\$ 51,196
	B.2 General Conditions	\$ -	\$ 21,758	\$ 21,758
PART C	Construction Cost Contingencies (Design and Construction)	\$ -	\$ 93,585	\$ 93,585
	C.1 Standard Design-Phase Scope Contingencies	\$ -	\$ 58,491	\$ 58,491
	C.2 Facility or Project Constructability	\$ -	\$ -	\$ -
	C.3 Access, Storage, and Staging Contingencies	\$ -	\$ 35,095	\$ 35,095
	C.4 Economies of Scale in New Construction	\$ -	\$ -	\$ -
PART D	General Contractor's Overhead and Profit	\$ -	\$ 140,083	\$ 140,083
	D.1 General Contractor's Home Office Overhead Costs	\$ -	\$ 52,244	\$ 52,244
	D.2 General Contractor's Insurance, Payment, and Performance Bonds	\$ -	\$ 22,390	\$ 22,390
	D.3 Contractor's Profit	\$ -	\$ 65,448	\$ 65,448
PART E	Cost Escalation Allowance	\$ -	\$ 15,127	\$ 15,127
PART F	Plan Review and Construction Permit Costs	\$ -	\$ -	\$ -
	F.1 Plan Review Fees	\$ -	\$ -	\$ -
	F.2 Construction Permit Fees	\$ -	\$ -	\$ -
PART G	Applicant's Reserve for Construction	\$ -	\$ 41,212	\$ 41,212
PART H	Applicant's Project Management and Design Costs	\$ -	\$ 145,132	\$ 145,132
	H.1 Applicant's Project Management - Design Phase	\$ -	\$ 8,749	\$ 8,749
	H.2 Architecture & Engineering Design Contract Costs	\$ -	\$ 98,867	\$ 98,867
	H.3 Project Management - Construction Phase	\$ -	\$ 37,516	\$ 37,516
	Complete Project Total for Completed and Uncompleted Work	\$ -	\$ 1,020,047	\$ 1,020,047

Example 3: Category E – Buildings

This example illustrates the use of unit prices from industry standard construction cost estimating resources for conducting a repair vs. replacement analysis and completing the eligible work estimate.

Project Background

Severe flooding in Galveston, TX, caused by a subtropical storm resulted in a Presidential disaster declaration. The flooding heavily damaged the offices of the Coastal Texas Planning Commission. The Coastal Texas Planning Commission is an eligible applicant, and the Commission-owned office building is an eligible facility.

The facility consists of a 4,100-square-foot, one-story, pile-supported office building.

Information Relating to Development of the Estimate

Based on the extent of damages observed during a site inspection, the project formulation team judged that the eligible scope of work might be a replacement building designed for the pre-disaster function and capacity. Determination of the eligibility for a replacement facility requires a comparison of the repair and replacement costs. Facility replacement is eligible if the repair cost is greater than 50 percent of the replacement costs. The repair scope of work is based on damages identified and measurements taken during the site inspection conducted by the project formulation team. The replacement scope of work is also based on building function and design identified by the project formulation team during the site inspection.

The repair estimate was prepared using industry standard building cost and assembly cost data for uncompleted work. The replacement estimate was prepared using Square Foot and Assembly Cost Data. Assembly Cost data was used to tailor the square-foot cost building model to account for site-specific conditions, i.e., pile foundations in lieu of shallow spread footings. Estimates were prepared using an industry standard electronic cost data format.

The building was constructed in the mid-1970s and has no historic issues. No environmental assessment has been conducted to evaluate the presence hazardous materials, such as asbestos containing materials or lead-based paint.

The applicant has retained an A&E design firm, but design has not begun. The applicant intends to manage the project using a design-bid-build approach and a single contract to demolish and replace existing building, or remove, replace, and repair damages to existing building based on eligibility.

Guidance provided by the PA Group Supervisor included:

- Project unit costs should be adjusted for Galveston, TX.
- The monthly escalation factor is 0.231.

CEF Fact Sheet

9/10/2009

Coastal Texas Planning Commission - Planning Commission Office Building

Date of Estimate:	August 5, 2009
FEMA Region:	VI
Preparer(s):	Nathan Charles and Ave Grace
Applicant Name:	Coastal Texas Planning Commission
Project Title:	Planning Commission Office Restoration
Damaged Facility:	Planning Commission Office Building
Declaration Number:	FEMA 9876 DR - TX
Project Number:	
PA ID No.:	
Date of Inspection:	August 3, 2009
Event Date(s)	July 23 - 25, 2009
Work Category:	E - Buildings
Type of Work: <small>(Enter New, Repair, etc.)</small>	Repair
	Replacement
	Other Eligible Work
Preparer's Notes:	
<p>Heavy rain from a subtropical storm caused extensive flooding in the Galveston, Texas area. The storm caused flooding received a disaster declaration.</p> <p>The main office building of the Coastal Texas Planning Commission received extensive exterior and interior damage as a result of the flooding. The main office building is a one-story, timber pile supported, wood frame structure encompassing approximately 4,100 SF.</p> <p>Based on the extent of the building damage, a repair vs. replacement analysis was performed. As shown in this CEF, the estimated Part A repair cost is \$306,743, and the estimated Part A replacement cost is \$491,268. The repair/replacement ratio is 62.4% which is greater than 50% making replacement the eligible scope of work.</p> <p>The repair estimate is based on RSMeans Building Construction and Assembly unit cost data, and the replacement estimate is based on RSMeans Square Foot and Assembly unit cost data. Both estimates are based on 2nd quarter 2009 data adjusted to Galveston Texas.</p> <p>An architect has been retained but design work is just beginning. The project is expected to use the design-bid-build delivery method.</p> <p>Applicant intends to award a single contract for demolition of the damaged building and construction of new building.</p> <p>Damage description and eligible work for the replacement building is detailed on the Project Worksheet.</p>	

CEF Notes

9/10/2009

Coastal Texas Planning Commission - Planning Commission Office Building

Damaged Facility:	Planning Commission Office Building	
Applicant Name:	Coastal Texas Planning Commission	
Project Number:	0	
Date of Estimate:	August 5, 2009	
Preparer(s):	Nathan Charles and Ave Grace	
Part A Notes:	A.1 -	Unit costs for based on RSMeans Building Cost, Square Foot Cost, and Assembly Cost data using CostWorks. Cost data updated to 2nd quarter 2009. Location in CostWorks set as Galveston, TX. City Adjustment Factor is 1.0.
	A.2 -	-----
Part B Notes:	B.1 -	Estimate includes a cost of 5%, the average recommended value, for safety and security. Demoliton work will require special safety and security barriers. Other work will require typcial construction safety measures, and measures to secure equipment and materials during non-working hours. Estimate includes a cost of 0.5%, the average recommended value, for temporary services and utilities. Contractor will be required to provide all site services including temproyary power, communications, potable water, and sanitation. Estimate includes a cost of 0.5%, the average recommended value, for qualtiy control. Field testing and inspection is anticipated for pile installation, concrete, and compacted fill. Estimate includes a cost of 5%, the recommended value, for submittals. Project spefications are expected to require submittals of shop drawings, samples of maerials, and manufacturer certifications that materials meet specification requirements.
	B.2 -	General conditions costs have been included for site supervision and coordination.
Part C Notes:	C.1 -	Estimate includes a contingency of 12% for design uncertainty, slightly below the average recommended value during the preliminary design stage. An A&E has been selected but design has not started. Uncertainties include potential presence of hazardous materials, such as asbestos in the existing buiding being demolished, and type and capacity of piles for the foundations.
	C.2 -	No constructability issues are expected for the new construction. Therefore no costs for constructability are included in the estimate.
	C.3 -	Estimate includes a cost of 2%, the average recommended value, for site access. The site is close to Galveston, TX, with good access to labor and materials. Site access for new construction will be impacted by demolition work during the initial stages of construction. Estimate includes a cost of 2% each, the average recommended value for storage and staging. The site is relatively small requiring off-site storage of most construction materials. Those limitations are expected to have an impact on costs as a result of having to handle some materials multiple times from delivery to installation.
	C.4 -	Based on the size of the project, no economies of scale are anticipated.
Part D Notes:	D.1 -	The project is expected to employ a General Contractor. Therefore, GC home office overhead is included in the estimate.
	D.2 -	The project is expected to employ a General Contractor. Therefore, GC costs for project insurance on bonds is included in the estimate.

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	D.3 -	The project is expected to employ a General Contractor. Therefore, GC profit is included in the estimate.
Part E Notes:	E -	The anticipated project schedule is 4 months for design, 2 months to bid and award a contract, and 12 months for construction. Time to midpoint of construction = $4+2+(12/2) = 12$ months. Current monthly escalation factor provided by PAO = 0.231%
Part F Notes:	F.1 -	The Planning Commission is exempt from plan review fees.
	F.2 -	The Planning Commission is exempt from building permit fee.
Part G Notes:	G.1 -	Estimate includes a cost of 4.15% for changes in the eligible scope of work that may be encountered during the project.
Part H Notes:	H.1 -	Estimate includes a cost of 1% for the applicant to manage project design.
	H.2 -	Estimate includes a cost of 15.4% for design services based on a project of average complexity as defined in the PA Guide, June 2007.
	H.3 -	Estimate includes a cost of 3.6% to manage construction of both completed and uncompleted work.
Miscellaneous Notes & Comments:		Reference to recommended values is to guidance provided in the CEF Instructional Guide, August 2009.

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Item No.	Item Description Title / Component Description	Div. # or Cost Code	Qty	Units	Unit Price	City Adj Factor	Total Cost
Completed Work Items							
Add Row	Completed Permanent Items						
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
Completed - Permanent Total							\$ -
Add Row	Completed Non-Permanent Items						
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
Completed - Non-Permanent Total							\$ -

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Item No.	Item Description Title / Component Description	Div. # or Cost Code	Qty	Units	Unit Price	City Adj Factor	Total Cost
Uncompleted Work Items							
Add Row	Uncompleted Permanent Items						
	REPAIR ESTIMATE						\$ -
	Partition, galv LB studs, 18 ga x 6" W studs 16" O.C. x 12' H, incl galv top & bottom track, excl openings, headers, beams, bracing & bridging	054104006200	150.00	L.F.	\$35.00	1.0000	\$ 5,250.01
	Wood framing, miscellaneous, nailers, treated, steel construction, 2" x 4"	061105458660	0.64	M.B.F.	\$1,924.72	1.0000	\$ 1,227.97
	Custom Cabinets, kitchen base cabinets, hardwood, prefinished, 1 top drawer, 1 door below, 24" deep, 35" high, 24" wide, excl. countertops	064101000880	7.00	Ea.	\$414.99	1.0000	\$ 2,904.96
	Custom Cabinets, kitchen wall cabinets, hardwood, prefinished, 2 doors, 12" deep, 15" high, 30" wide	064101004400	6.00	Ea.	\$239.00	1.0000	\$ 1,434.01
	Counter Tops, stock, plastic laminate, 24" wide, includes backsplash, minimum	064151000020	15.00	L.F.	\$20.00	1.0000	\$ 300.00
	Blanket insulation, for walls or ceilings, kraft faced fiberglass, 3-1/2" thick, R13, 11" wide	072109500060	2,157.00	S.F.	\$0.66	1.0000	\$ 1,423.66
	Roof Deck Insulation, expanded polystyrene, 3" thick, R11.49, 1#/CF density	072207002110	4,096.00	S.F.	\$1.25	1.0000	\$ 5,120.00
	Polymer-based exterior insulation and finish system, field applied, 4" EPS insulation, with 1/2" cement board sheathing	072401000130	875.00	S.F.	\$11.80	1.0000	\$ 10,325.18
	Polymer-based exterior insulation and finish system, v-groove shape in panel face	072401000370	200.00	L.F.	\$0.67	1.0000	\$ 134.20
	Vapor Retarders, building paper, aluminum and kraft laminated, foil 1 side	072601000020	22.00	Sq.	\$14.45	1.0000	\$ 317.89
	APP modified bituminous membrane, base sheet, #15 glass fiber felt, fully mopped to deck	075505000040	41.00	Sq.	\$30.00	1.0000	\$ 1,229.98
	SBS modified bituminous membrane, granule surface cap sheet, polyester reinforced, 160 mils, mopped	075505001100	4,096.00	S.F.	\$2.16	1.0000	\$ 8,848.59
	Sheet metal flashing, aluminum, flexible, mill finish, .050" thick, including up to 4 bends	076506000300	496.00	S.F.	\$4.96	1.0000	\$ 2,460.36
	Doors, commercial, steel, flush, full panel, hollow core, hollow metal, 20 ga., 3'-0" x 7'-0" x 1-3/4" thick	081102000640	2.00	Ea.	\$410.00	1.0000	\$ 820.00

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Item No.	Item Description Title / Component Description	Div. # or Cost Code	Qty	Units	Unit Price	City Adj Factor	Total Cost
	Frames, steel, knock down, hollow metal, single, 16 ga., up to 5-3/4" deep, 7'-0" h x 3'-0" w	081108200100	20.00	Ea.	\$164.00	1.0000	\$ 3,280.00
	Doors, wood, architectural, flush, interior, hollow core, 7 ply, birch face, 3'-0" x 6'-8" x 1-3/8" thick	082109000180	18.00	Ea.	\$139.01	1.0000	\$ 2,502.13
	Storefront Systems, aluminum frame, monumental grade, clear 3/8" plate glass, 3' x 7' door with hardware, 400 SF max wall, wall height to 12' high	084101400700	189.00	S.F.	\$45.50	1.0000	\$ 8,599.29
	Door hardware, school, single, interior, regular use, excl. lever	087101502500	20.00	Door	\$357.50	1.0000	\$ 7,150.00
	Stucco, 3 coats, float finish, with mesh, on wood frame, 1" thick	092202000015	240.00	S.Y.	\$34.50	1.0000	\$ 8,278.99
	Expansion joint, 3/4" grounds, limited expansion, 1 piece, galv.	092057001800	8.00	C.L.F.	\$210.00	1.0000	\$ 1,680.00
	Partition wall, interior, standard, taped both sides, installed on & incl. 25 ga. NLB metal studs, 3 5/8" wide, 16" O.C., 8' to 12' high, 5/8" gypsum drywall	092601003800	4,330.00	S.F.	\$3.11	1.0000	\$ 13,468.12
	Ceramic tile, sanitary cove base, mud set, 6" x 4-1/4" h	093101001200	108.00	L.F.	\$8.90	1.0000	\$ 961.22
	Paints & Coatings, walls & ceilings, interior, concrete, drywall or plaster, oil base, 3 coats, smooth finish, brushwork	099109201200	6,507.00	S.F.	\$0.67	1.0000	\$ 4,359.69
	Paints & Coatings, int. latex, doors, flush, both sides, roll & brush, primer, incl. frame & trim	099103100110	20.00	Ea.	\$28.00	1.0000	\$ 559.92
	Ceramic tile, walls, interior, thin set, 4-1/4" x 4-1/4"	093101005400	1,467.00	S.F.	\$4.81	1.0000	\$ 7,055.24
	Ceramic tile, exterior walls, frostproof, crystalline glazed, mud set, scored, 4-1/4" x 4-1/4"	093101006700	14.00	S.F.	\$9.60	1.0000	\$ 134.41
	Suspended Acoustic Ceiling Tiles, fiberglass boards, film faced, 2' x 2' or 2' x 4' x 3/4" thick	095107000400	843.00	S.F.	\$2.47	1.0000	\$ 2,082.17
	Cove base, rubber or vinyl, standard colors, 4" h, .080" thick	096512001150	745.00	L.F.	\$1.82	1.0000	\$ 1,355.97
	Resilient Flooring, vinyl composition tile, solid, 12" x 12" x 3/32"	096581007300	1,472.00	S.F.	\$2.88	1.0000	\$ 4,239.30
	Carpet, commercial grades, direct cement, nylon, plush, 60 oz., heavy traffic	096808003340	34.00	S.Y.	\$72.50	1.0000	\$ 2,465.04
	Paints & Coatings, int. latex, doors, flush, both sides, roll & brush, finish coat, incl. frame & trim	099103100120	20.00	Ea.	\$29.00	1.0000	\$ 579.91
	Entrance screens, toilet, floor mounted, plastic laminate on particle board, 58" h x 48" w	101651004300	2.00	Ea.	\$579.99	1.0000	\$ 1,159.98

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Item No.	Item Description Title / Component Description	Div. # or Cost Code	Qty	Units	Unit Price	City Adj Factor	Total Cost
	Shower doors, tempered glass door, economy, 24" w, excludes plumbing	101851004200	1.00	Ea.	\$245.98	1.0000	\$ 245.98
	Lockers, steel, baked enamel, single tier box, 12" x 15" x 72"	1050555000110	3.00	Ea.	\$260.98	1.0000	\$ 782.94
	Lavatory, wall hung, porcelain enamel on cast iron, white, single bowl, 16" x 14", includes trim	154184504040	6.00	Ea.	\$510.02	1.0000	\$ 3,060.13
	Carriers/supports, urinal, wall-mounted, plate type system	154102006300	10.00	Ea.	\$300.01	1.0000	\$ 3,000.10
	Faucets/fittings, lavatory faucet, center set with porcelain cross handles, polished chrome, with pop-up drain	154103002220	3.00	Ea.	\$189.00	1.0000	\$ 567.01
	Faucets/fittings, flush valves, with vacuum breaker, water closet, exposed rear spud	154103000860	3.00	Ea.	\$182.01	1.0000	\$ 546.04
	Faucets/fittings, flush valve, urinal, concealed stall	154103000960	1.00	Ea.	\$190.00	1.0000	\$ 190.00
	Faucets/fittings, flush valve, automatic flush sensor and operator for urinals or waterclosets	154103000972	1.00	Ea.	\$465.00	1.0000	\$ 465.00
	Faucets/fittings, shower thermostatic mixing valve, concealed	154103004200	1.00	Ea.	\$374.99	1.0000	\$ 374.99
	Shower, head, water economizer	154185005500	1.00	Ea.	\$67.50	1.0000	\$ 67.50
	Drain, floor, medium duty, cast iron, deep flange, 7" diameter top, 2" and 3" pipe size	151503002040	1	Ea.	\$204.99	1.0000	\$ 204.99
	Water heater, residential, electric, glass lined tank, double element, 5 year, 120 gallon	154802001180	1	Ea.	\$1,499.97	1.0000	\$ 1,499.97
	Pipe, copper, tubing, solder, 1/2" diameter, type L, includes coupling & clevis hanger assembly 10' O.C.	151074202140	50	L.F.	\$8.75	1.0000	\$ 437.42
	Sink, kitchen, counter top style, porcelain enamel on cast iron, single bowl, 24" x 21", includes faucet and drain	154186002000	1	Ea.	\$404.98	1.0000	\$ 404.98
	Faucets/fittings, kitchen sink faucets, top mount, cast spout	154103001000	1	Ea.	\$95.49	1.0000	\$ 95.49
	A/C packaged, DX, air cooled, electric heat, VAV, 60 ton	D30502021060	1	Ea.	\$87,323.54	1.0000	\$ 87,323.54
	Service installation, includes breakers, metering, 20' conduit & wire, 3 phase, 4 wire, 120/208 V, 1600 A	D50101200520	1	Ea.	\$32,218.90	1.0000	\$ 32,218.90
	Feeder installation 600 V, including RGS conduit and XHHW wire, 1600 A	D50102300520	50	L.F.	\$421.91	1.0000	\$ 21,095.58
	Receptacles and wall switches, 400 SF, 6 receptacles	D50201200560	4,100	S.F.	\$2.14	1.0000	\$ 8,759.81
	Fluorescent fixtures, type D, 12 fixtures per 600 SF	D50202081640	4,100	S.F.	\$7.13	1.0000	\$ 29,219.80
	Central air conditioning power, 8 watts	D50201400360	4,100	S.F.	\$0.75	1.0000	\$ 3,059.01
	Miscellaneous power, 2 watts	D50201350440	4,100	S.F.	\$0.35	1.0000	\$ 1,415.48
	REPAIR SUBTOTAL						\$ 306,742.83

CEF Part A

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Coastal Texas Planning Commission - Planning Commission Office Building

Item No.	Item Description Title / Component Description	Div. # or Cost Code	Qty	Units	Unit Price	City Adj Factor	Total Cost	
							\$ -	
	REPLACEMENT ESTIMATE						\$ -	
	Wood piles, 25' long, 50K load, friction type, 3 pile cluster	A10201602240	25	Ea.	\$1,549.79	1.0000	\$ 38,744.75	
	Grade beam, 15' span, 28" deep, 12" wide, 8 KLF load	A10202102220	640	L.F.	\$81.00	1.0000	\$ 51,841.34	
	Slab on grade, 5" thick, light industrial, reinforced	A10301203400	4,100	S.F.	\$5.40	1.0000	\$ 22,128.93	
	Roof Construction	B1020	4,100	S.F	\$7.12	1.0000	\$ 29,192.00	
	Exterior Walls	B2010	4,100	S.F	\$6.88	1.0000	\$ 28,208.00	
	Exterior Windows	B2020	4,100	S.F	\$5.02	1.0000	\$ 20,582.00	
	Exterior Doors	B2030	4,100	S.F	\$2.22	1.0000	\$ 9,102.00	
	Roof Coverings	B3010	4,100	S.F	\$1.70	1.0000	\$ 6,970.00	
	Partitions	C1010	4,100	S.F	\$3.88	1.0000	\$ 15,908.00	
	Interior Doors	C1020	4,100	S.F	\$3.95	1.0000	\$ 16,195.00	
	Fittings	C1030	4,100	S.F	\$0.46	1.0000	\$ 1,886.00	
	Wall Finishes	C3010	4,100	S.F	\$1.07	1.0000	\$ 4,387.00	
	Floor Finishes	C3020	4,100	S.F	\$6.95	1.0000	\$ 28,495.00	
	Ceiling Finishes	C3030	4,100	S.F	\$5.10	1.0000	\$ 20,910.00	
	Plumbing Fixtures	D2010	4,100	S.F	\$4.07	1.0000	\$ 16,687.00	
	Domestic Water Distribution	D2020	4,100	S.F	\$1.48	1.0000	\$ 6,068.00	
	Terminal & Package Units	D3050	4,100	S.F	\$16.34	1.0000	\$ 66,994.00	
	Sprinklers	D4010	4,100	S.F	\$2.20	1.0000	\$ 9,020.00	
	Standpipes	D4020	4,100	S.F	\$0.95	1.0000	\$ 3,895.00	
	Electrical Service/Distribution	D5010	4,100	S.F	\$8.71	1.0000	\$ 35,711.00	
	Lighting and Branch Wiring	D5020	4,100	S.F	\$8.46	1.0000	\$ 34,686.00	
	Communications and Security	D5030	4,100	S.F	\$5.59	1.0000	\$ 22,919.00	
	Other Electrical Systems	D5090	4,100	S.F	\$0.18	1.0000	\$ 738.00	
	REPLACEMENT SUBTOTAL						\$ 491,268.01	
							\$ -	
	Repair/Replacement Analysis: Repair Cost (\$306,743)/Replacement Cost (\$491,268) = 0.6244 = 62.4%. Exceeds 50%, replacement is eligible.							\$ -
	Additional Eligible Work for Replacment						\$ -	
	Building demolition, small buildings or single buildings, concrete, includes 20-mile haul, excludes salvage, foundation demolition or dump fees	022201100600	5,750	C.F.	\$0.37	1.0000	\$ 2,127.73	
	Bldg. footings and foundations demolition, floors, concrete slab on grade, concrete, wire mesh reinforced, 4" thick, excludes disposal costs and dump fees	022201300280	4,096	S.F.	\$3.86	1.0000	\$ 15,806.46	

CEF Part A

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Item No.	Item Description Title / Component Description	Div. # or Cost Code	Qty	Units	Unit Price	City Adj Factor	Total Cost
	Bldg. footings and foundations demolition, add for disposal, up to 5 miles, excludes disposal costs and dump fees	022201304250	2,200	C.Y.	\$13.80	1.0000	\$ 30,362.86
	Selective demolition, dump charges, typical urban city, building construction materials, includes tipping fees only	022203300100	2,000	Ton	\$137.50	1.0000	\$ 275,000.00
Additional Work Subtotal							\$ 323,297.05
Uncompleted - Permanent Total							\$ 814,565.07
Add Row	Uncompleted Non-Permanent Items						
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
					\$ -		\$ -
Uncompleted - Non-Permanent Total							\$ -
TOTAL PART A BASE CONSTRUCTION COST							\$ 814,565.07

CEF Summary of Completed Work

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Coastal Texas Planning Commission - Planning Commission Office Building											
		Repair	Replacement	Other Eligible Work	\$	-	\$	-	Total		
A "Base Costs" for Construction Work-In Trades											
A.1	Permanent Work (CEF Part A)			\$	-				\$	-	
A.2	Non-Permanent Job Specific Work (CEF Part A)		\$	-	\$	-	\$	-	\$	-	
Part A Total		\$	-	\$	-	\$	-	\$	-	\$	-
B General Requirements and General Conditions											
B.1	General Requirements	Guide Low to High		Enter % in Appropriate Column							
	Safety & Security	4.0%	6.0%								
	Temporary Services & Utilities	0%	1.0%								
	Quality Control	0%	1.0%								
	Submittals	0%	5.0%								
		\$	-	\$	-	\$	-	\$	-	\$	-
B.2	General Conditions (4.25%)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		\$	-	\$	-	\$	-	\$	-	\$	-
Part B Total		\$	-	\$	-	\$	-	\$	-	\$	-
PART A through B SUBTOTAL		\$	-	\$	-	\$	-	\$	-	\$	-

CEF Summary of Completed Work

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Coastal Texas Planning Commission - Planning Commission Office Building							
	Repair	Replacement	Other Eligible Work	\$	-	\$	Total
C Construction Cost Contingencies							
C.1 Design-Phase Scope Contingencies	Guide		Enter % in Appropriate Column				
	Low	to High					
	7.0%	20.0%					
	2.0%	10.0%					
	\$	-	\$	-	\$	-	\$ -
C.2 Facility or Project Constructability	See IG for Values		Enter % in Appropriate Column				
	\$	-	\$	-	\$	-	\$ -
C.3 Access, Storage & Staging	Guide		Enter % in Appropriate Column				
	Low	to High					
	0%	4.0%					
	0%	4.0%					
	0%	4.0%					
	\$	-	\$	-	\$	-	\$ -
C.4 Economies of Scale	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	\$	-	\$	-	\$	-	\$ -
Part C Total		\$	-	\$	-	\$	\$ -
PART A through C SUBTOTAL		\$	-	\$	-	\$	\$ -

CEF Summary of Completed Work

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Coastal Texas Planning Commission - Planning Commission Office Building						
	Repair	Replacement	Other Eligible Work	\$	-	\$
Total						
D General Contractor's Overhead and Profit						
D.1 GC's Home Office Overhead	7.7%	<input type="checkbox"/>				
	\$	-	\$	-	\$	-
D.2 GC's Insurance, Payment & Performance Bonds	3.3%	<input type="checkbox"/>				
	\$	-	\$	-	\$	-
D.3 General Contractor's Profit						
New Construction		<input type="checkbox"/>				
Repair/Retrofit		<input type="checkbox"/>				
	\$	-	\$	-	\$	-
Part D Total	\$	-	\$	-	\$	-
PART A through D SUBTOTAL	\$	-	\$	-	\$	-
E Cost Escalation Factors						
Cost Escalation Factor						
	Months					
	Monthly Factor					
	Part E Total	\$	-	\$	-	\$
	PART A through E SUBTOTAL	\$	-	\$	-	\$

CEF Summary of Completed Work

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Coastal Texas Planning Commission - Planning Commission Office Building						
	Repair	Replacement	Other Eligible Work	\$	-	\$
Total						
F	Plan Review and Permit Construction Cost					
F.1	Plan Review Fees					
	(List Individual Requirements Separately)					
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
F.2	Construction Permit Fees					
	(List Individual Requirements Separately)					
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Part F Total					
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	PART A through F SUBTOTAL					
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
G	Applicant's Reserve for Change Orders					
	Applicant's Reserve for Change Orders					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	7.0%	7.0%	7.0%	7.0%	7.0%	
	PART G Total					
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	PART A through G SUBTOTAL					
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

CEF Summary of Completed Work

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Coastal Texas Planning Commission - Planning Commission Office Building							
	Repair	Replacement	Other Eligible Work	\$	-	\$	Total
H Applicant's Project Management And Design Costs							
H.1 Applicant's Project Management - Design Phase 1.0%	<input type="checkbox"/>						
	\$	-	\$	-	\$	-	\$
H.2 A/E Design Contract Applicability							
Above Average Complexity (Curve A)	<input type="checkbox"/>	5.6%	<input type="checkbox"/>	5.6%	<input type="checkbox"/>	5.6%	<input type="checkbox"/>
Average Complexity (Curve B)	<input type="checkbox"/>	4.5%	<input type="checkbox"/>	4.5%	<input type="checkbox"/>	4.5%	<input type="checkbox"/>
Basic Construction Inspection Services	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%	<input type="checkbox"/>
A/E Design Contract Cost							
Above Average Complexity (Curve A)	\$	-	\$	-	\$	-	\$
Average Complexity (Curve B)	\$	-	\$	-	\$	-	\$
Basic Construction Inspection Services	\$	-	\$	-	\$	-	\$
\$	-	\$	-	\$	-	\$	-
H.3 Project Management - Construction Phase	<input type="checkbox"/>						
	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	
\$	-	\$	-	\$	-	\$	-
\$	-	\$	-	\$	-	\$	-
\$	-	\$	-	\$	-	\$	-
\$	-	\$	-	\$	-	\$	-
\$	-	\$	-	\$	-	\$	-
\$	-	\$	-	\$	-	\$	-
\$	-	\$	-	\$	-	\$	-
PART A through H SUBTOTAL							
TOTAL OF COMPLETED WORK							

CEF Summary of Uncompleted Work

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Coastal Texas Planning Commission - Planning Commission Office Building									
		Repair	Replacement	Other Eligible Work	\$	-	\$	-	Total
A "Base Costs" for Construction Work-In Trades									
A.1	Permanent Work (CEF Part A)		\$ 491,268	\$ 323,297					\$ 814,565
A.2	Non-Permanent Job Specific Work (CEF Part A)								\$ -
Part A Total		\$ -	\$ 491,268	\$ 323,297	\$ -	\$ -			\$ 814,565
B General Requirements and General Conditions									
B.1	General Requirements	Range Low to High		Enter % in Appropriate Column					
	Safety & Security	4.0%	6.0%	5.0%	5.0%				
	Temporary Services & Utilities	0%	1.0%	0.5%	0.5%				
	Quality Control	0%	1.0%	0.5%	0.5%				
	Submittals	0%	5.0%	0.5%	0.5%				
		\$ -	\$ 31,932	\$ 21,014	\$ -	\$ -			\$ 52,947
B.2	General Conditions (4.25%)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
		\$ -	\$ 20,879	\$ 13,740	\$ -	\$ -			\$ 34,619
Part B Total		\$ -	\$ 52,811	\$ 34,754	\$ -	\$ -			\$ 87,566
PART A through B SUBTOTAL		\$ -	\$ 544,079	\$ 358,051	\$ -	\$ -			\$ 902,131

CEF Summary of Uncompleted Work

9/10/2009

Coastal Texas Planning Commission - Planning Commission Office Building								
			Repair	Replacement	Other Eligible Work	\$ -	\$ -	Total
C Construction Cost Contingencies								
C.1 Design-Phase Scope Contingencies	Range		Enter % in Appropriate Column					
	Low	to High						
	7.0%	20.0%		12.0%	12.0%			
	Preliminary Engineering Analysis							
	Working Drawings	2.0%	10.0%					
			\$ -	\$ 65,290	\$ 42,966	\$ -	\$ -	\$ 108,256
C.2 Facility or Project Constructability	Range		Enter % in Appropriate Column					
	Low	to High						
	See IG for Values							
			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
C.3 Access, Storage & Staging	Range		Enter % in Appropriate Column					
	Low	to High						
	0%	4.0%		2.0%	2.0%			
		Access Contingencies						
		Storage Contingencies	0%	4.0%		2.0%	2.0%	
	Staging Contingencies	0%	4.0%		2.0%	2.0%		
			\$ -	\$ 32,645	\$ 21,483	\$ -	\$ -	\$ 54,128
C.4 Economies of Scale			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				-0.5%				
				\$ -	\$ -	\$ -	\$ -	\$ -
Part C Total			\$ -	\$ 97,934	\$ 64,449	\$ -	\$ -	\$ 162,384
PART A through C SUBTOTAL			\$ -	\$ 642,014	\$ 422,501	\$ -	\$ -	\$ 1,064,514

CEF Summary of Uncompleted Work

9/10/2009

Coastal Texas Planning Commission - Planning Commission Office Building						
	Repair	Replacement	Other Eligible Work	\$	-	\$
D General Contractor's Overhead and Profit						
D.1 GC's Home Office Overhead	7.7%	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	\$	-	\$ 49,435	\$ 32,533	\$ -	\$ -
D.2 GC's Insurance, Payment & Performance Bonds	3.3%	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	\$	-	\$ 21,186	\$ 13,943	\$ -	\$ -
D.3 General Contractor's Profit						
		8.9%	10.0%			
New Construction	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Repair/Retrofit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	\$	-	\$ 63,345	\$ 46,898	\$ -	\$ -
Part D Total	\$	-	\$ 133,966	\$ 93,373	\$ -	\$ -
PART A through D SUBTOTAL	\$	-	\$ 775,980	\$ 515,873	\$ -	\$ -
E Cost Escalation Factors						
E Cost Escalation Factor						
	Months	12	12			
	Monthly Factor	0.231%	0.231%			
Part E Total	\$	-	\$ 21,510	\$ 14,300	\$ -	\$ -
PART A through E SUBTOTAL	\$	-	\$ 797,490	\$ 530,173	\$ -	\$ -

CEF Summary of Uncompleted Work

9/10/2009

Coastal Texas Planning Commission - Planning Commission Office Building						
	Repair	Replacement	Other Eligible Work	\$	-	\$
Plan Review and Permit Construction Cost						
F.1	Plan Review Fees					
	(List Individual Requirements Separately)					
	\$	-	\$	-	\$	-
F.2	Construction Permit Fees					
	(List Individual Requirements Separately)					
	\$	-	\$	-	\$	-
	Part F Total					
	\$	-	\$	-	\$	-
	PART A through F SUBTOTAL					
	\$	-	\$	797,490	\$	530,173
	\$	-	\$	-	\$	-
Applicant's Reserve for Change Orders						
G	Applicant's Reserve for Change Orders					
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	7.0%	5.0%	5.4%	7.0%	7.0%	
	PART G Total					
	\$	-	\$	39,903	\$	28,890
	\$	-	\$	-	\$	-
	PART A through G SUBTOTAL					
	\$	-	\$	837,393	\$	559,064
	\$	-	\$	-	\$	-
	\$	-	\$	-	\$	68,793
	\$	-	\$	-	\$	1,327,663
	\$	-	\$	-	\$	1,396,456

CEF Summary of Uncompleted Work

9/10/2009

Coastal Texas Planning Commission - Planning Commission Office Building								
	Repair	Replacement	Other Eligible Work	\$	-	\$	Total	
H Applicant's Project Management And Design Costs								
H.1 Applicant's Project Management - Design Phase	1.0%	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	\$	-	\$ 8,374	\$ 5,591	\$ -	\$ -	\$ 13,965	
H.2 A/E Design Contract Applicability								
Above Average Complexity (Curve A)	<input type="checkbox"/>	5.6%	<input checked="" type="checkbox"/>	16.9%	<input checked="" type="checkbox"/>	18.4%	<input type="checkbox"/>	5.6%
Average Complexity (Curve B)	<input type="checkbox"/>	4.5%	<input type="checkbox"/>	11.4%	<input type="checkbox"/>	11.8%	<input type="checkbox"/>	4.5%
Basic Construction Inspection Services	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%	<input type="checkbox"/>	3.0%
A/E Design Contract Cost								
Above Average Complexity (Curve A)	\$	-	\$ 141,336	\$ 102,762	\$ -	\$ -		
Average Complexity (Curve B)	\$	-	\$ -	\$ -	\$ -	\$ -		
Basic Construction Inspection Services	\$	-	\$ -	\$ -	\$ -	\$ -		
	\$	-	\$ 141,336	\$ 102,762	\$ -	\$ -	\$ 244,098	
H.3 Project Management - Construction Phase								
	6.0%	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	\$	-	\$ 36,621	\$ 30,729	\$ -	\$ -	\$ 67,350	
Part H Total	\$	-	\$ 186,331	\$ 139,082	\$ -	\$ -	\$ 325,413	
PART A through H SUBTOTAL	\$	-	\$ 1,023,724	\$ 698,145	\$ -	\$ -	\$ 1,721,869	
TOTAL OF UNCOMPLETED WORK							\$1,721,869	

CEF Total Project Summary

9/10/2009

Summary

Coastal Texas Planning Commission - Planning Commission Office Building

		Completed	Uncompleted	Total
PART A	"Base Costs" for Construction Work In Trades	\$ -	\$ 814,565	\$ 814,565
	A.1 Permanent Work	\$ -	\$ 814,565	\$ 814,565
	A.2 Non-Permanent Job Specific Work (CEF Part A)	\$ -	\$ -	\$ -
PART B	General Requirements and General Conditions	\$ -	\$ 87,566	\$ 87,566
	B.1 General Requirements	\$ -	\$ 52,947	\$ 52,947
	B.2 General Conditions	\$ -	\$ 34,619	\$ 34,619
PART C	Construction Cost Contingencies (Design and Construction)	\$ -	\$ 162,384	\$ 162,384
	C.1 Standard Design-Phase Scope Contingencies	\$ -	\$ 108,256	\$ 108,256
	C.2 Facility or Project Constructability	\$ -	\$ -	\$ -
	C.3 Access, Storage, and Staging Contingencies	\$ -	\$ 54,128	\$ 54,128
	C.4 Economies of Scale in New Construction	\$ -	\$ -	\$ -
PART D	General Contractor's Overhead and Profit	\$ -	\$ 227,339	\$ 227,339
	D.1 General Contractor's Home Office Overhead Costs	\$ -	\$ 81,968	\$ 81,968
	D.2 General Contractor's Insurance, Payment, and Performance Bonds	\$ -	\$ 35,129	\$ 35,129
	D.3 Contractor's Profit	\$ -	\$ 110,242	\$ 110,242
PART E	Cost Escalation Allowance	\$ -	\$ 35,810	\$ 35,810
PART F	Plan Review and Construction Permit Costs	\$ -	\$ -	\$ -
	F.1 Plan Review Fees	\$ -	\$ -	\$ -
	F.2 Construction Permit Fees	\$ -	\$ -	\$ -
PART G	Applicant's Reserve for Construction	\$ -	\$ 68,793	\$ 68,793
PART H	Applicant's Project Management and Design Costs	\$ -	\$ 325,413	\$ 325,413
	H.1 Applicant's Project Management - Design Phase	\$ -	\$ 13,965	\$ 13,965
	H.2 Architecture & Engineering Design Contract Costs	\$ -	\$ 244,098	\$ 244,098
	H.3 Project Management - Construction Phase	\$ -	\$ 67,350	\$ 67,350
	Complete Project Total for Completed and Uncompleted Work	\$ -	\$ 1,721,869	\$ 1,721,869

Appendix C

CEF - Large Project

Report

CEF Instructional Guide
(Version 2.1)
September 2009



FEMA

Appendix D

Hazard Mitigation Measures for

Large Projects

CEF Instructional Guide
(Version 2.1)
September 2009



FEMA

Appendix D

Hazard Mitigation Funding Under Section 406 (Stafford Act)

POTENTIAL MITIGATION MEASURES THAT ARE PRE-DETERMINED TO BE COST EFFECTIVE

The following potential mitigation measures (reference: paragraph VII.B.2) are determined to be cost-effective if they:

- do not exceed 100% of project cost,
- are appropriate to the disaster damage,
- will prevent future similar damage,
- are directly related to the eligible damaged elements,
- do not increase risks or cause adverse effects to the property or elsewhere,
- are technically feasible for the hazard and location, and
- otherwise meet requirements stipulated in this policy, including environmental, historic, and mitigation planning considerations.

This list will continue to be evaluated and will evolve over time as new information becomes available.

General

I. Drainage/crossings and bridges

- A. Drainage structures - When drainage structures are destroyed, replacing the structure with multiple structures or a larger structure. Sizing of replacement culverts can be made using in-place state/local drainage criteria (nomographs). However, structures need to be considered with regard to a total drainage system and should not be upgraded without a watershed hydrology study with an emphasis on downstream effects and NFIP regulations.
- B. Culverts – Where the alignment of culverts is inconsistent with streams flowing through them (because it has been blown-out), realign or relocate the culverts to improve hydraulics and minimize erosion. However, realignment of structures must be considered in regard to a total drainage system and shall not be replaced without a hydrology study with an emphasis on downstream erosion effects.
- C. Headwalls and wing walls - Installation to control erosion.
- D. Low-water crossings – When bridges are destroyed and where traffic counts are low, replacing bridges with carefully placed low-water crossings.
- E. Gabion baskets, riprap, sheet-piling, and geotextile fabric installation - Installation to control erosion.
- F. Roadways – Where roadways shoulders are damaged by overflow from adjacent water courses, stabilize shoulders and embankments with geotextile fabric.

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Hazard Mitigation Funding Under Section 406 (Stafford Act)

- G. Restraining cables on bridges - Installation of cables to restrain a bridge from being knocked off piers or abutments during floods or earthquakes. Also, where bridges have been damaged or destroyed when girders, beams and decking system are displaced by storm surges or earthquakes, install girder and deck uplift tie-downs to prevent their displacement from the substructure.

II. Sanitary and storm sewer systems

- A. Access covers - When feasible, access covers can be elevated to the hydraulic grade line. There are a number of devices that prevent infiltration into access holes.
- B. Sewer lines – Repair, lining or encasement of damaged sections to prevent infiltration or structural collapse.
- C. Pump stations –
 - 1. Equipment or controls in a pump station that are subject to damage from the 100- year flood can be elevated. Pump station buildings can be dry flood-proofed.
 - 2. Installation of camlocks, transfer switches, and electrical panels to facilitate the connection of portable emergency generators.
 - 3. Pump stations – If pumps and their attached motors are damaged by storm water inundation, replace them with submersible or inline pumps as appropriate.
 - 4. Pump stations – If pump station equipment is damaged as a result of inundation resulting from power failure, install switches, circuit isolation and/quick connect capability to facilitate rapid connection of backup power.

III. Wastewater treatment plants

- A. Elevation of equipment and controls that can be elevated easily.
- B. Dry or wet flood-proofing of buildings.

IV. Potable water

- A. Well systems –
 - 1. Reduction of infiltration and subsequent contamination of the aquifer. Methods include casing the well or raising the elevation of the well head.
 - 2. Elevation of controls, mechanical equipment, or electrical service associated with use of the well to protect them from flood damage.
- B. Raw water intakes - Buttressing to prevent damage from erosion, scour and flood debris.
- C. Water treatment plants –
 - 1. Elevation of equipment and controls that can be elevated easily.

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Hazard Mitigation Funding Under Section 406 (Stafford Act)

2. Dry flood-proofing.

V. Electric power distribution

- A. Pad-mounted transformers - elevating above the base flood elevation.
- B. Using multiple poles to support transformers.
- C. Anchoring or otherwise protecting fuel tanks from movement in a disaster.
- D. Replacing damaged poles with higher-rated poles, of the same or different material such as replacing wood poles with precast concrete or steel.
- E. Adding guy wire or additional support to power lines.
- F. Removing large diameter lines from poles.
- G. Providing looped distribution service or other redundancies in the electrical service to critical facilities.

VI. Above ground storage tanks

- A. Strengthening or stiffening base connections.
- B. Installation of self-initiating disconnects and shut-off valves between tanks and distribution lines to minimize damage and leaks.

VII. Underground pipelines - Installation of shut-off valves so that damaged sections of pipeline can be isolated.

Buildings:

I. General effects of flood damage –

- A. Buildings substantially damaged under NFIP regulations - Repair, dry flood-proofing, or elevation so they are protected to meet minimum NFIP regulations. If the building is replaced, rather than repaired, minimum NFIP requirements are generally in place as codes and standards in participating communities and are applicable in both repair and replacement situation. Section 406 mitigation should be considered in those cases where these standards either fall short or provide no protection against other hazards.
- B. Buildings not substantially damaged under NFIP regulations - If technically feasible, dry flood-proofing. Electrical panels, machinery rooms, emergency generators can be elevated above the BFE or dry flood-proofed. If dry flood-proofing is not feasible, these buildings should be wet flood-proofed.

II. Roofs - Because the failure of a roof covering can lead to extensive damage to contents and operation, damaged roofing should be evaluated to determine cause of failure.

- A. Low slope roofs - Replacement of the entire roof with a roof covering with a secondary membrane and a fully adhered roof covering, such as modified bitumen. Mechanically fastened insulation or membranes are not acceptable.

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Hazard Mitigation Funding Under Section 406 (Stafford Act)

- B. Roof-mounted equipment should be attached to a foundation that will resist expected wind forces.
 - C. Hurricane clips - Hurricane clips for use in high-wind areas.
 - D. Roofs – When roof damages are due to wind pressure beneath soffits and overhangs, strengthen the soffit and overhang material and means of attachment to prevent wind pressure adversely affecting the roofing system.
 - E. Roofs – When there is roof system damage or water intrusion due to damage to roof opening such as hatches and skylights strengthen the openings or the windows to avoid future damage.
 - F. Roofs – For gable roofs damaged by wind, replace the gable end-framing with hipped roof framing to reduce wind forces (lower edge pressure; reduced projected wind area) and strengthen the roof framing.
- III. **Shutters** - In areas subject to hurricane winds, shutters are appropriate in the following areas:
- A. All damaged windows on critical facilities such as hospitals.
 - B. The lower floors of buildings with damaged windows most likely to be struck by debris.
 - C. Damaged windows of buildings with very high value contents that can be damaged by water (such as libraries and document centers).
 - D. Damaged windows of buildings subject to debris from nearby ballasted roofs, metal buildings, manufactured homes or other structures likely to fail and result in debris.
- IV. **Anchoring** –
- A. Anchoring of mechanical and electrical equipment in critical facilities.
 - B. For small ancillary buildings that have sustained damage and/or have caused damage to other facilities, anchor the buildings to foundations to prevent toppling or becoming missile hazards.
- V. **Flexible piping** - Installation of flexible piping at pipe/conduit connections to equipment to accommodate expected movement in an earthquake.
- VI. **Bracing** –
- A. Bracing of and large diameter pipes and electrical lines to meet seismic loads.
 - B. Bracing non structural interior walls and partitions.
 - C. Bracing parapets, anchoring veneer or cladding, and bracing other non-structural elements that could collapse and cause injury or block safe exit of a building during an earthquake.
- VII. **Replacement of glass** - Replacement of glass with impact-resistant material.

Appendix D

Hazard Mitigation Funding Under Section 406 (Stafford Act)

VIII. General Buildings –

- A. Buildings – Where spread footings have been undercut by scour, underpin footings.
- B. Siding – if siding has been damaged by wind, replace with a stronger siding with stronger attachments to the wall sheathing and structure.
- C. Venting – Where there has been water damage caused by water intrusion through venting systems, replace the vents with rain and water resistant vents.

IX. Doors and Windows –

- A. Where damage has resulted from wind and water intrusion around weather stripping on doors and/or windows, upgrade the weather stripping to prevent water infiltration.
- B. Where damage has been caused by wind-induced failure of doors, replace the doors with stronger units. This applies to the door frame, door, hinges and lock hardware. Both entry and garage doors should be considered.

X. Miscellaneous Structures –

- A. Marine Piers – If marine piers ramps that attach to decking have been damaged by storm-surge uplift and buoyancy, install open decking or floating decking with uplift-resistant tie-downs and fasteners.
- B. Signage – If sign panels and their supports have failed, replace with a stronger type of system of supports and panels. Consider using multiple support posts and stronger panels and fasteners.
- C. Gutters and Downspouts – If damaged by either wind and/or water, upgrade the gutter and downspout system to directing water away from the structure and preventing interior or basement water damage.

Appendix E

Standard Operating

Procedure – CEF for

Large Projects

CEF Instructional Guide
(Version 2.1)
September 2009



FEMA



COST ESTIMATING FORMAT STANDARD OPERATING PROCEDURE

This Standard Operating Procedure (SOP) provides an overview of the Cost Estimating Format (CEF) for Large Projects and guidance on how to use the CEF tool. The SOP also discusses FEMA Headquarters large project reporting requirements.

What reference information is available on the CEF for Large Projects?

- The [CEF Information Update \(January 1999\)](#) provides an overview of FEMA's cost estimating methodology for large projects.
- The [Cost Estimating Format for Large Projects Instructional Guide, Version 2.1 \(September 2009\)](#) provides application guidance to users responsible for developing large project cost estimates.
- A Microsoft Excel-based template, referred to as the [CEF for Large Projects Spreadsheet](#), provides more uniformity in estimating costs for large projects, and is user friendly and flexible enough to respond to individual project conditions for all types of permanent restorative work.
- The [Applicant Handbook \(FEMA Publication 323, October 2009\) – Chapter 6, Handling Large Projects](#) describes an applicant roles and responsibilities in formulating and documenting large projects.

(All documents referenced above can be located on the FEMA Web site at <http://www.fema.gov/government/grant/pa/resources.shtm>).

For which Large Projects can the CEF be used to estimate costs?

The CEF should only be used on large projects for which the permanent restorative work (categories C, D, E, F, and G) is less than 90 percent complete. Percent complete for all types of projects (including improved and alternate projects) is calculated by dividing the amount of approved contractor invoices for eligible work by the approved construction contract amount for eligible work and multiplying the resulting decimal by 100.



What is the process for preparing an estimate for a Large Project using the CEF?

- The CEF tool is to be used for developing estimates of eligible costs for certain permanent work large projects as described below. The primary objective is ensure FEMA develops sound and reasonable estimates of eligible costs based on the numerous factors, complexities, and local considerations related to the geographic area and circumstances arising from the declared event. In order to develop the most accurate and sound estimates, FEMA depends on a strong partnership with grantees and subgrantees. The local officials and local technical professionals (i.e. engineers and architects) commonly are in the best position to develop the estimates of eligible costs once FEMA, the State, and local officials have agreed upon eligible scopes of work. The role of FEMA is often to validate the estimates of eligible costs developed by the locals, ensure the costs address only eligible disaster-related work, and that appropriate CEF factors are applied to the base costs.
- The Public Assistance (PA) Group Supervisor or designee will determine which local factors to use to develop the project cost estimate. Specific factors include unit price sources, city cost indices (if applicable), and local costs for plan checks, building permits, or special reviews. The PA Group Supervisor will collect and evaluate this information for use in all CEF analyses at the beginning of each disaster.
- Project Specialists will determine the eligible scope of work and base costs (Part A of the CEF); including Special Considerations and appropriate Section 406 hazard mitigation for large projects that meet the CEF criteria. Projects Specialists will complete Part A of the CEF in accordance with the guidance provided in the *Cost Estimating Format for Large Projects Instructional Guide*. All work activities needed to perform the eligible scope of work must include a written description of the scope of work, the cost item reference [Construction Specifications Institute (CSI) based], cost code reference (if FEMA cost codes are used), the unit [linear foot (LF), square foot (SF), each (EA), cubic yard (CY), etc. - do not use lump sum (LS)], the quantity or measurement, the unit cost, and the quantity cost. Project Specialists will adjust each line item's unit price and subtotal cost to reflect the city cost index where the work will take place.
- Project Specialists will document the eligible scope of work on the CEF Fact Sheet. Documentation must include detailed supporting backup information such as site maps (or location plan), photographs, sketches, calculations, measurements, insurance declarations, anticipated or actual insurance settlement, Section 406 Hazard Mitigation Proposal(s) (HMP), construction permits and clearances, force account summary sheets, and codes and standards described in the CEF Notes Sheet. For major construction activities (e.g. water control facilities and large buildings), the applicant should submit to the Project Specialist schematic drawings, a set of plans



(preferably reduced to 11" x 17") containing basic information such as elevations, floor plans, site plan, structural plans and sections, etc., as applicable. The applicant should keep copies of source documents such as invoices, vouchers, timesheets, purchase orders, item slips, weight slips, plans and specifications, and insurance policies.

- After the eligible scope of work and its base costs are completed in Part A, the Project Specialist will complete Parts B through H (the factors applied to the base cost) of the CEF. The Project Specialist will develop separate summaries for completed and uncompleted work. The Project Specialist will document assumptions used in selecting factors B through H on the CEF Notes sheet.
- The Project Specialist will complete the Project Cost section of the PW as follows:
 - *Item* – Enter sequential item number
 - *Code* – #9000
 - *Narrative* – add statement "*See attached CEF spreadsheet for itemized unit-price estimate particulars*"
 - *Quantity/Unit* – 1 LS (lump sum)
 - *Unit Price* – use the total estimate value from the CEF spreadsheet
 - Apply appropriate cost adjustments to the CEF line-item #1 (e.g., a deduction for anticipated or actual insurance proceeds, salvage value/depreciation, etc.)
 - The *Total Project Cost* will reflect the final eligible cost after any cost adjustments
- The following steps will then be performed:
 1. The Project Specialist will print the Excel file containing the CEF estimate and attach it to the PW. All applicable supporting back-up documentation noted above must be attached to the CEF spreadsheet. The Project Specialist will submit the completed PW and the CD ROM containing the electronic CEF spreadsheet to the Public Assistance Coordination (PAC) Crew Leader for review.
 2. The PAC Crew Leader will review, approve, and submit a paper and electronic copy of the PW and CEF documentation to the Data Coordinator for entry into EMMIE.
 3. The *Total Cost* block of the PW will be used as the basis for obligating the Federal share of the large project cost.
- When applicants complete large projects and submit project documentation to the State and FEMA, FEMA will reconcile actual eligible costs against estimated costs, except for alternate and improved projects.



- If the Project Specialist requires assistance with any part of the CEF, the PAC Crew Leader will request a Technical Specialist (a cost estimator, engineer, environmental specialist, historic preservation specialist, insurance specialist, etc.) from the Ordering Specialist. Refer to the *CEF for Large Projects Instructional Guide* for more detail.

What is the process for preparing an estimate for a Large Project if CEF is not used?

- The Project Specialist will prepare the eligible scope of work and cost estimate using the standard damage assessment cost estimating procedures (see the *Public Assistance Guide FEMA 322*).
- The applicant should submit the same back-up and source documentation for all large projects formulated with or without CEF.
- The Data coordinator will scan all applicable supporting back-up documentation and attach to the PW.
- If the Project Specialist requires assistance with any part of the CEF, the PAC Crew Leader will request a Technical Specialist (a cost estimator, engineer, environmental specialist, historic preservation specialist, insurance specialist, etc.) from the Ordering Specialist.

What are the appropriate references for unit prices in preparing Part A base costs?

- Project Specialists will request average weighted unit prices (local costs derived from actual contract history) from the applicant or relevant State/regional agency (e.g., Department of Transportation) in order to develop Part A of the CEF. The Project Specialist should evaluate the average weighted unit price information for applicability to the eligible scope of work and consistency over a reasonable time period.
- The Project Specialist may use the FEMA Cost Codes, but is not required to do so. The FEMA Regional offices issue cost codes at the beginning of a Joint Field Office (JFO) operation. The cost codes represent “complete and in-place” costs (i.e., labor, equipment, and material costs necessary to complete installation) at the general contractor level (different from various industry standard cost estimating resources) and include overhead and profit.
- The Project Specialist may use the current edition of industry standard construction cost estimating resources (e.g., RSMeans, BNi Costbooks, Marshall & Swift, Sweet’s Unit Cost Guide, etc.) if the applicant does not have appropriate average weighted unit price data for unit prices in preparing Part A base costs.



The PA Group Supervisor should order (at a minimum) one copy of each of the following cost data books for use by PA staff at the JFO:

- ADA Compliance Pricing Guide
- Building Construction
- Concrete and Masonry
- Electrical
- Repair and Remodeling
- Site Work and Landscape
- Facilities
- Heavy Construction
- Mechanical
- Plumbing
- Square Foot Costs

- If the Project Specialist uses national industry standard cost data in Part A, he should apply city cost indices to adjust the national unit prices to the nearest city for the declared counties. The PA Group Supervisor or designee will identify the zip codes included in the declared area, research industry standard cost estimating resources for the appropriate city cost factors and tabulate them for use by the Project Specialists.
- If cost estimating data is provided in an electronic format, only the appropriate city and/or zip codes may need to be provided. Various industry standard electronic cost estimating resources can be used to adjust the unit cost data to the required location automatically.

How are local costs for Plan Review and Construction Permits (Part F) determined?

- The PA Group Supervisor or designee should request documentation related to plan review and construction permit costs from the grantee and distribute the costs in tabular form to the Project Specialists for their use.
- Alternatively, the Project Specialist may request this documentation from the applicant and provide the documentation to the PAC Crew Leader and the PA Group Supervisor for review and approval.
- The controlling jurisdiction (e.g., City Building Department or Office of State Architect) will determine costs applicable to its areas of responsibility. Key items of information include:
 - A description of how the plan review or construction permitting cost is defined.
 - Identification of the cost item that (construction cost, total project cost, etc.) serves as the basis for calculation of plan review/construction permit costs.
 - The percentage applied to the base cost and these percentages may be on a sliding scale.
 - If the fees are waived in post-disaster situations.



What are the responsibilities of the PA Group Supervisor?

The PA Group Supervisor or designee is responsible for checking the appropriateness of individual factors and ranges (Parts B through H) and for uniform application of these factors during large project formulation. This is especially important with regard to force account efforts, use of contingencies, time frames for escalation, post-disaster inflation adjustments (e.g., when local costs are used in Part A, etc.), and the need for engineering design and construction phase services.

The type of damage sustained will dictate how the values are selected for many of the factors. For example, visual identification of damage may be less difficult after a flood (once floodwaters have receded) than after an earthquake. The PA Group Supervisor may decide that the contingency factors in Part C should therefore be at the higher end of the range for an earthquake than for flooding.

The PA Group Supervisor will be responsible for justifying range selections in writing.

How is completed work costs included when the CEF is used for estimating the total cost of a Large Project that is less than 90 percent complete?

The Project Specialist will prepare a Part A estimate using the CEF for Large Projects spreadsheet for the entire project. The Project Specialist is responsible for separating eligible work from ineligible work. If the applicant had an estimate prepared before the work was completed, the Project Specialist should compare the actual costs against that estimate, and if reasonable, reconcile the cost differences. The result should be entered in Part A "Summary for Completed Work." If no applicant estimate exists, the Project Specialist will prepare a CEF Part A estimate of the eligible completed work activities and compare the actual costs against it, and if reasonable, reconcile the cost differences. The result should be entered in Part A "Summary for Completed Work." In both instances, the Project Specialist will also prepare a Part A CEF estimate for the uncompleted work portion using either average weighted unit prices or industry standard construction cost estimating resources (e.g. RSMeans, BNi Costbooks, Marshall & Swift, Sweet's Unit Cost Guide, etc.). The Project Specialist is also responsible for completing Parts B through H, as appropriate, for both the completed and uncompleted work.



FEMA

Cost Estimating Format (CEF) For Large Projects Standard Operating Procedure (SOP) SOP9570.8

What are the CEF large project reporting requirements?

- The CEF Large Project Report is a Microsoft Word-based form that is distributed with the CEF Excel-based spreadsheet. Both tools are located on a CD ROM attached to the inside-back cover of the *Cost Estimating Format for Large Projects Instructional Guide*, Version 2.1, September 2009.
- For every large project FEMA estimated using CEF, the PA Group Supervisor or designee will prepare a CEF Large Project Report consisting of:
 - Disaster Number (and preparer's name)
 - Declaration Date (and date prepared)
 - Applicant Name
 - PA ID Number
 - PW Number
 - Category of Work
 - Type and function of the Facility
 - CEF Estimated Project Cost
 - Actual Project Cost
 - Dollar Amount of Obligation or Deobligation
 - Reason for Cost Reconciliation
- After applicants complete all large projects for which FEMA used CEF to estimate the costs, and FEMA reconciles the actual project costs with estimates, the PA Group Supervisor will forward the CEF Large Project Report to:

Anthony Ndum, P.E.
Federal Emergency Management Agency
500 "C" Street, S.W., Room 414
Washington, D.C. 20472

Appendix F

Guidelines for Selecting Values

CEF Parts B through H

**CEF Instructional
Guide
(Version 2.1)
September 2009**



FEMA

CEF V2.1
Guidelines for Application of Parts B through H

PART	TITLE	CEF RANGE	RECOMMENDED APPLICATIONS	
			VALUE	APPLICATION
B	General Requirements & Conditions			
B.1	Safety & Security	4% to 6%	4%	Most projects requiring routine site security, including temporary fences, barricades, etc., and general worker safety provisions.
			5%	Projects with unusual safety and security concerns such as requirements to maintain public access during construction, special needs to protect construction material and equipment during non-working hours, or special worker safety issues such as work requiring a confined space entry program
			6%	Projects with extraordinary safety or security issues such as airports, ports, correctional facilities, etc. that require full-time worker identification and interaction with facility users.
	Temporary Facilities & Services	0 to 1%	0%	All temporary services, including power, water, sanitation, communications, etc. are fully itemized in Part A as non-permanent work
			0.50%	Some, but not all, temporary services are included in Part A, e.g. sanitation facilities.
			1%	Temporary services are not itemized as non-permanent work in Part A.
	Quality Control	0 to 1%	0%	Only appropriate for projects limited to non-structural repairs conducted using contract package without technical specifications.
			0.50%	Applicable to most routine projects involving A&E contract documents.
			1%	Applicable to projects with A&E specifications requiring special testing, such as pile load tests or full-scale load tests of structural elements, or projects requiring special full-time engineering inspection and reports.
	Submittals	0 to 5%	0%	Only appropriate for projects limited to non-structural repairs conducted using pre-existing services contracts.
			2.50%	Only appropriate for projects limited to non-structural repairs conducted using contract package without technical specifications.
			5%	Applicable to most routine projects involving A&E contract documents.
B.2	General Conditions	On or Off	Off	Off if project is performed without the involvement of a General Contractor, or if all General Contractor project costs, including supervision, trade coordination, etc. are detailed in Part A.
			On	Any project not included in the "Off" description.
C	Construction Cost Contingencies			
C.1	Preliminary Engineering Analysis – Design Phase Scope Contingencies	15% to 20%	15%	Estimates developed without engineering drawings and having a scope of work consisting primarily of work from three or less CSI Divisions (based on 16 Division Format).
			17.50%	Estimates developed without engineering drawings and having a scope of work consisting primarily of work from more than three and less than eight CSI Divisions (based on 16 Division Format)
			20%	Estimates developed without engineering drawings and having a scope of work consisting primarily of work from more than eight CSI Divisions (based on 16 Division Format)
	Working Drawings – Design Phase Scope Contingencies	2% to 10%	7% to 10%	Estimates developed from a scope of eligible work based on preliminary engineering drawings equal to or less than 50% complete.
			4% to 6%	Estimates developed from a scope of eligible work based on preliminary engineering drawings more than 50% and less than 80% complete.
			2% to 5%	Estimates developed from a scope of eligible work based on preliminary engineering drawings equal to or more than 80% complete.

CEF V2.1
Guidelines for Application of Parts B through H

PART	TITLE	CEF RANGE	RECOMMENDED APPLICATIONS	
			VALUE	APPLICATION
C.2	Facility of Project Constructability	0 to 5%	Refer to CEF IG	Applies to repair or retrofit only. Does not apply to new construction. Represents cost for site conditions or applicant or facility operations conditions not readily captured in Part A costs. Refer to <i>CEF Instructional Guide</i> for detailed guidance.
C.3	Access Contingency	1% to 4%	1%	Project is located in a metropolitan area with ready access to construction labor, materials, and equipment without long trip times.
			2.50%	Project is located in a suburban to ex-urban area with access to construction labor, materials, and equipment with trip distances of 25 to 70 miles.
			4%	Project is located in a rural or other remote area with limited access to construction labor, materials, and equipment with trip distances exceeding 70 miles.
	Storage Contingency	1% to 4%	1%	Project site has ample interior and exterior storage areas easily accessible to delivery vehicles.
			2.50%	Project site has limited interior storage areas and/or exterior storage areas are not easily accessible to delivery vehicles.
			4%	Project site has interior and exterior storage space resulting in frequent deliveries of material and equipment.
	Staging Contingency	1% to 4%	1%	Facility is unoccupied during construction, there is ample space to assemble elements of work prior to final installation, and there is easy access to all work areas.
			2.50%	Facility is occupied by Applicant's staff, there are some limitations on space for pre-assembly of components, and/or access is restricted to some work areas.
			4%	Facility is open to the public during construction, no space for pre-assembly of components, and access to all work spaces is limited by facility operations.
C.4	Economies of Scale	On or Off	Off	If scope of work lacks sufficient repetitive, continuous work elements to achieve large scale efficiency in production that would lower unit costs.
			On	If scope of work contains sufficient repetitive, continuous work elements to achieve large scale efficiency in production that would lower unit costs.
D	General Contractor's Overhead and Profit			
D.1	General Contractor's Home Office Overhead	On or Off	Off	If no General Contractor involved on the project.
			On	For all projects involving a General Contractor.
D.2	General Contractor's Insurance, Payment, & Performance Bonds	On or Off	Off	If no General Contractor involved on the project.
			On	For all projects involving a General Contractor.
D.3	General Contractor's Profit	On or Off	Off	If no General Contractor involved on the project.
			On	For all projects involving a General Contractor.
E	Cost Escalation Factor	Time to mid-point of construction = design time + ½ (construction time)		
E	Months	Any Number	Months	Number of months to the mid-point of uncompleted construction
E	Escalation Factor	<1	Refer to CEF IG	Based on a 2-year average of either the Building Cost Index or the Construction Cost Index according to the <i>Engineering News Record</i> .

CEF V2.1
Guidelines for Application of Parts B through H

PART	TITLE	CEF RANGE	RECOMMENDED APPLICATIONS	
			VALUE	APPLICATION
F	Plan Review and Construction Permit Costs			
F.1	Plan Review Fees			Established by local Building Official
F.2	Construction Permit Fees			Established by local Building Official
G	Applicant's Reserve for Change Orders			
G	Applicant's Reserve for Change Orders	On or Off	Off	Recommend Off for completed projects, or work elements with evidence that all claims for additional payment beyond the bid price are resolved.
			On	Recommend using for all cases not meeting the "Off" conditions above.
H	Applicant's Project Management and Design Cost			
H.1	Applicant's Project Management - Design Phase	On or Off	Off	Off for projects limited to less than four trades and work procured through pre-existing service contract.
			On	On for projects involving competitive procurement to cover costs of developing construction bid documents.
H.2	A/E Design Contract Cost	Curve A		Refer to <i>Public Assistance Guide</i> , FEMA 322/June 2007 for guidance on determining above-average complexity projects.
		Curve B		Refer to <i>Public Assistance Guide</i> , FEMA 322/June 2007 for guidance on determining average complexity projects.
		Construction Inspection Services		Use for projects that do not require development of construction bid documents; i.e., plans, specifications and General Contract Conditions.
H.3	Project Management – Construction Phase	On or Off	Off	Off for projects in which Applicant's direct costs associated with the construction phase, including approval of submittals, attending progress meetings, processing progress payment, etc. are included and documented elsewhere.
			On	For all cases apply factor not meeting the "Off" conditions above.

NOTE: Interpolation between values is acceptable. Interpolations should limit significant figures to a tenth of a percent.

Appendix G

Checklists – PA Group

Supervisor, Project Specialist, and Part A

CEF Instructional Guide
(Version 2.1)
September 2009



FEMA

PA Group Supervisor Checklist for CEF Implementation

To implement the CEF during the large project formulation process, the PA Group Supervisor or designee is responsible for the actions listed below.

Obtain the following:

- Disaster-specific Public Assistance Program policies
- List of approved, cost-effective hazard mitigation measures
- Current versions of industry standard construction cost estimating resources, (e.g., RSMeans, BNi Costbooks, Marshall & Swift, Sweet's Unit Cost Guide, etc.)
- Current FEMA cost codes
- City cost adjustment factors appropriate for the disaster area.
- CEF factors appropriate for the disaster (*such as the escalation factor*)
- Plan review and construction permits fee information for the controlling jurisdictions in the declared counties

Set policies regarding the application of CEF, particularly with regard to:

- Force account efforts
- Use of contingencies
- Adjustments for post-disaster inflation
- The need for engineering, design, and construction phase services
- Location of disaster-specific information for CEF users

Complete the CEF Large Project Report, as described above, and submit the report to FEMA Headquarters:

Anthony Ndum, P.E.
Federal Emergency Management Agency
Federal Center Plaza
500 "C" Street, S.W. - Room 414
Washington, D.C. 20472

Project Specialist Checklist for CEF Implementation

During the formulation and processing of large projects, the Project Specialist is responsible for the actions listed below.

- Obtain the following from the PA Group Supervisor or designee:
 - Disaster-specific Public Assistance Program policies
 - List of approved, cost-effective hazard mitigation measures
 - Current versions of industry standard construction cost estimating resources (e.g., RSMeans, BNi Costbooks, Marshall & Swift, Sweet’s Unit Cost Guide, etc.)
 - Current FEMA cost codes
 - City cost adjustment factors appropriate for the disaster area
 - CEF factors appropriate for the disaster (*such as the escalation factor*)
 - Plan review and construction permits fee information for the controlling jurisdictions in the declared counties

 - Meet with the PAC Crew Leader to discuss the applicant’s needs.
 - Meet with the applicant and the State to assess the applicant’s large projects.
 - Obtain average weighted unit cost data from the applicant or relevant State or regional agency.
 - Determine if the large project qualifies for CEF use.
 - Conduct a site visit and determine the eligible scope of work.
 - Identify any special considerations issues, including insurance, potential hazard mitigation measures, floodplain management, and compliance with environmental and historic preservation legislation, and executive orders. Notify the PAC Crew Leader of potential issues and revise the scope of work as appropriate.
 - Assemble all appropriate back-up documentation, and a design/construction timeline.
 - Prepare the CEF Spreadsheet. Document all assumptions on the CEF Notes Sheet.
 - Review the estimate with the PAC Crew Leader.
 - Complete the PW.
 - Attach the CEF Spreadsheet to the PW. Submit the PW and appropriate back-up data to the PAC Crew Leader for processing and filing. See Appendix E – page 3.
 - Assist the PAC Crew Leader in updating the Case Management File.
- Assist the PA Group Supervisor in preparing the CEF Large Project Report as necessary.

**Part A Checklist for CEF Implementation
Eligible Scope of Work**

- Does the scope of work address the damage caused by the disaster?
- Has a site visit by the project formulation team (Federal, State, and local members) been conducted?
- Is the scope of work eligible?
- Has the most effective method for accomplishing the work been selected?
- Does the scope of work include required code upgrades?
- Are upgrades for compliance with ADA eligible (for structural damage only)? If so, does the scope of work include ADA upgrades?
- Does the scope of work include approved hazard mitigation proposals?
- Has the applicant requested an improved or alternate project?
- Does the scope of work address special considerations such as insurance, floodplain management, compliance with the National Environmental Policy Act and other environmental laws, and compliance with the National Historic Preservation Act?
- Has special considerations clearance been obtained?
- Is the scope clearly defined in terms of repair, retrofit, new construction, hazard mitigation and other activities that might be contracted separately?
- Are completed work items separated from uncompleted work items?
- Are permanent and non-permanent work items clearly separated?
- Have all eligibility decisions been made and agreed upon with the applicant?

Itemized Cost Estimate

- Has each itemized work activity been identified, described, quantified, and assigned the appropriate cost item number or cost code?
- Can the eligible scope of work be clearly related to the itemized cost estimate?
- Have the quantities and units been established and spot-checked?
- Is the source of the unit prices appropriate?
- Do the unit prices include the installing contractor's overhead and profit?
- Have the current year values been used?
- Have the values been adjusted for regional differences using city cost adjustment factors?
- Have lump-sum items been used? If so, eliminate them and provide itemized units of measurement.

Part A Totals

- Are there separate totals for completed work and are they separated by work type (repair, retrofit, new construction, hazard mitigation, and other)?
- Are there separate totals for uncompleted work and are they separated by work type (repair, retrofit, new construction, hazard mitigation, and other)?
- Are all situations where Part A includes factors that could be duplicated in Parts B through H noted?
- Have all assumptions or clarifying notes been included in the CEF Notes Sheet?

