

# **Cost Estimating Format for Large Projects Training Module**

## **INSTRUCTOR'S GUIDE**

**Federal Emergency Management Agency**

**Cost Estimating Format for Large Projects  
Training Module  
Instructor's Guide**

**INTRODUCTION**

# **Cost Estimating Format for Large Projects Training Module Instructor's Guide**

## **Objective**

This module is designed to train participants to use the Cost Estimating Format (CEF) for Large Projects. After completing this module, participants will be able to use the CEF to develop estimates for large projects under the Public Assistance Program following Presidentially-declared disasters.

The 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 2000 (ending September 30, 2000), the large project threshold has been set at \$48,900.

## **Target Audience**

This module is designed to train Project Officers and specialists who will work with Applicants to develop large project estimates. The module is focused on the structure of the CEF and the proper application of the CEF to situations commonly encountered during the implementation of the Public Assistance Program. Therefore, the module has been developed assuming that the participants are:

- engineers, cost estimators, or technicians who have been in charge of important engineering work or have extensive experience in the construction industry; and
- experienced in the Public Assistance Program and have an understanding of the laws, regulations, and policies that govern program eligibility.

If the participants do not have Public Assistance Program experience, it is recommended, at a minimum, that they first be exposed to the Eligibility and Special Considerations units of the Public Assistance Operations I course.

Participants should also have basic command of Microsoft Excel software.

## **Instructors**

One instructor can present this module; however, a teaming approach may be more effective, especially during the exercise portion of the course. The instructor(s) should be experienced in:

- the engineering profession;
- Public Assistance Program field operations;
- use of Microsoft Excel; and
- use of the CEF.

## Units

This module consists of the following units, each of which is described in greater detail below:

| <u>Unit</u>                   | <u>Duration</u>    |
|-------------------------------|--------------------|
| Introduction                  | 15 Minutes         |
| Unit 1: The CEF Concept       | 45 Minutes         |
| Unit 2: The CEF Spreadsheet   | 30 Minutes         |
| Unit 3: Developing Part A     | 60 Minutes         |
| Unit 4: Selecting CEF Factors | 60 Minutes         |
| Unit 5: Applying the CEF      | 60 Minutes         |
| Unit 6: Practical Exercise    | <u>150 Minutes</u> |
| <b>Total Time</b>             | <b>7 Hours</b>     |

## References

The following references are required for this module:

- Instructor's Guide;
- Participant's Workbook, which includes the practical exercises and solutions;
- the current version of the Cost Estimating Format for Large Projects Instructional Guide; and
- *Public Assistance Guide*, FEMA 322.

The instructor should also have a copy of a cost data reference guide published by the R.S. Means Company, such as *Building Construction Cost Data*. The instructor should refer to this guide for examples or to respond to questions regarding the use of R.S. Means data.

## Equipment

At minimum, the instructor will need:

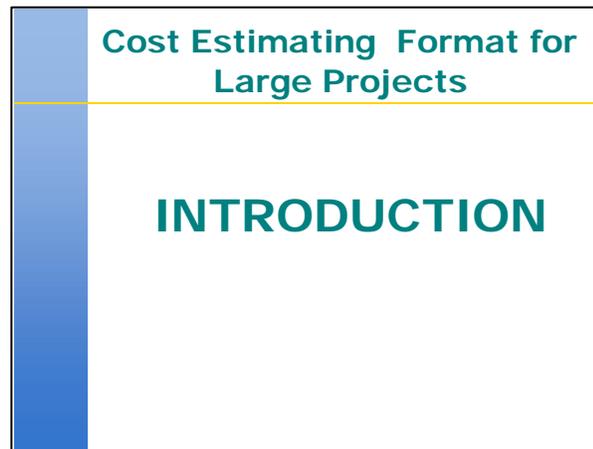
- PowerPoint slides, a computer, and an LCD Projector; or
- transparencies and an overhead projector.

### **If the participants have computers:**

Each participant should have a computer with Microsoft Windows, including Excel. The blank spreadsheet and examples should be loaded on to each hard drive before class.

### **If the participants do not have computers:**

If the space or resources are not available to provide each participant with a computer, participants can work in pairs or small groups on the examples and the practical exercise. If computers are not available, each participant should be provided with printouts of the CEF spreadsheet to be filled out by hand during the class.



## Introduction

🕒 15 minutes

### In this unit:

- Introduce the participants to the course objective.
- Briefly describe the role of CEF users in the PA Program process.
- Give the participants an overview of the course, including descriptions of the units and course materials.

## **Introduction**

Time: 15 Minutes

## **Objective**

In this unit, participants are introduced to the course objective and given an overview of the course.

## **Scope**

The instructor will cover the following:

- Course objective
- Tasks of CEF users
- Description of units and course materials

## **Methodology**

The introduction consists of a lecture in which the instructor provides the framework for the rest of the course. The instructor will describe the course objective and will outline the tasks that the participants will be expected to accomplish as CEF users in the field. Following this presentation, the instructor will briefly describe each of the units in the course and the materials that accompany the course. In describing the materials, the instructor should note the components of the CEF Instructional Guide, including the appendices and the diskette containing the CEF spreadsheet and large project report.

**If computers have been provided for the participants**, the instructor should describe the directories or folders in which the training files are located.

**If computers have not been provided**, the instructor should distribute the printouts of the spreadsheet that the participants will be asked to complete during the practical exercise.

The time frame noted above does not include time for introduction of participants or to make administrative and logistical announcements. If it is necessary to conduct these activities, the instructor should allow additional time.

|  |   |
|--|---|
|  | <b>Course Objective</b>   |
|  | <b>To train participants to use the Cost Estimating Format (CEF) when formulating large projects.</b> |

**Note:** In all cases, be sure to define acronyms before using them. Some participants may be unfamiliar with program terminology.

State the course objective.

Inform the participants that after completing this module, they will be expected to apply the CEF to develop estimates for projects under FEMA’s Public Assistance (PA) Program.

Ask the class if there is anyone who does not know the definition of “large project” under the PA Program. If any participants are not familiar with the concept, state that:

- Large projects are those with an estimated cost greater than \$48,900 for Fiscal Year 2000.
- This threshold changes at the end of each fiscal year (September 30<sup>th</sup>) to reflect changes in the Consumer Price Index.
- FEMA funds large projects on the basis of actual eligible costs; that is, upon project completion, actual costs are reconciled against the estimate.

## Course Outline

- ▶ **Unit 1: The CEF Concept**
- ▶ **Unit 2: The CEF Spreadsheet**
- ▶ **Unit 3: Developing Part A**
- ▶ **Unit 4: Selecting CEF Factors**
- ▶ **Unit 5: Applying the CEF**
- ▶ **Unit 6: Practical Exercise**

Briefly describe each of the units that make up the course.

**Unit 1:** An overview of the CEF concept, its purpose and how the CEF is used during the project formulation process.

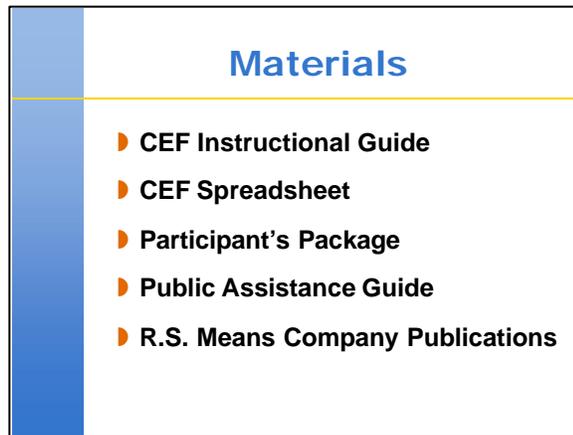
**Unit 2:** A description of the components of the CEF spreadsheet, the capabilities of the spreadsheet, and the transfer of information to the Project Worksheet.

**Unit 3:** Steps to developing Part A in an accurate, organized manner.

**Unit 4:** A description of the selection of CEF factors. This unit includes review of some completed examples.

**Unit 5:** Steps for applying the CEF to various types of projects, such as partially completed projects, force account projects, projects involving hazard mitigation, and improved projects.

**Unit 6:** A practical exercise. Given a project description and relevant data, the participants will complete Part A, develop a CEF estimate, and complete a Project Worksheet (PW).



Briefly describe each of the items used in the training class.

**Instructional Guide:**

Contains guidance on using the CEF.

Appendices include examples, information on hazard mitigation, the CEF Standard Operating Procedure, and the tool used to report CEF results to FEMA Headquarters.

**CEF Spreadsheet:**

**If the participants have computers**, the spreadsheet should be loaded on to the computers before the class starts. Refer the participants to the appropriate directory or folder and instruct them to open the spreadsheet.

**If the participants do not have computers**, refer them to the hard copy of the spreadsheet in the Participant's Workbook.

Note that the Instructional Guide contains a diskette with the spreadsheet and large project report.

**Participant's Workbook:**

Contains materials for the training class such as:

Exercises/Problems by Unit

Exercises and Solutions

Blank CEF and PW

**Public Assistance Guide, FEMA 322:**

Describes PA Program eligibility.

Contains copies of the Stafford Act and regulations governing the PA Program.

**R.S. Means Company publications:**

May be used to develop cost data for Part A.

While each participant may not have a copy of one of these publications, the instructor should have one on hand to answer questions about using Means publications in conjunction with the CEF.



**Transition:** the discussion will now focus on the people who will be using the CEF in the field.

Inform the class that CEF users will be assigned to disaster field office operations as Project Officers depending on the type of infrastructure project. If there are participants who are not familiar with these positions, briefly describe each.

- **Project Officer:** a FEMA representative sent to work with an Applicant on specific projects.
- **Specialist:** a person who provides technical support in specific areas of expertise.

Next, note that the CEF user is generally the Project Officer. However, a complex infrastructure project may require a specialist (i.e. a more experienced engineer or cost estimator) with specialized experience in the functional area of the damaged facility. State that the team:

- Is led by a Project Officer and assigned to an Applicant or a specific project.
- Is responsible for working with the Applicant to develop the eligible scope of work and prepare a cost estimate for that work.
- May or may not include a variety of specialists, depending on the nature and complexity of the project.

CEF users must have certain qualifications. Specifically, the CEF user must have extensive experience:

- as an engineer or cost estimator in the functional area of the project (e.g. a damaged bridge would require experience in transportation structures); and
- in design, construction, and cost estimating.

Emphasize that CEF results are only as accurate as the information used to develop them. Therefore, the qualifications and experience of CEF users are critical to obtaining good results.

| <b>CEF Users<br/>Tasks</b> |   |
|----------------------------|---|
|                            | <ul style="list-style-type: none"><li>▶ <b>Determine if CEF should be used.</b></li><li>▶ <b>Develop the scope of work.</b></li><li>▶ <b>Identify appropriate unit cost data.</b></li><li>▶ <b>Complete the CEF Spreadsheet.</b></li><li>▶ <b>Complete the Project Worksheet.</b></li><li>▶ <b>Keep the PAC informed of problems.</b></li></ul> |

Identify each of the tasks that the CEF user will be expected to complete in the field. Mention that each of these tasks, with the exception of the last one, will be discussed in later units.

Ensure that participants are familiar with:

- **Project Worksheet:** the document used to capture project data so that it can be entered into FEMA's disaster management database, NEMIS.
- **Public Assistance Coordinator (PAC):** the FEMA representative who is responsible for guiding an Applicant through the PA Program process. The PAC ensures that:
  - ◆ all of the Applicant's needs are met;
  - ◆ projects comply with the laws, regulations, and policies that govern the PA Program; and
  - ◆ the Applicant's case management file is up-to-date.



Note each of the CEF user's responsibilities.

Emphasize that it is critical for CEF users to understand PA Program eligibility. Refer participants to the Stafford Act and regulations in the Public Assistance Guide.

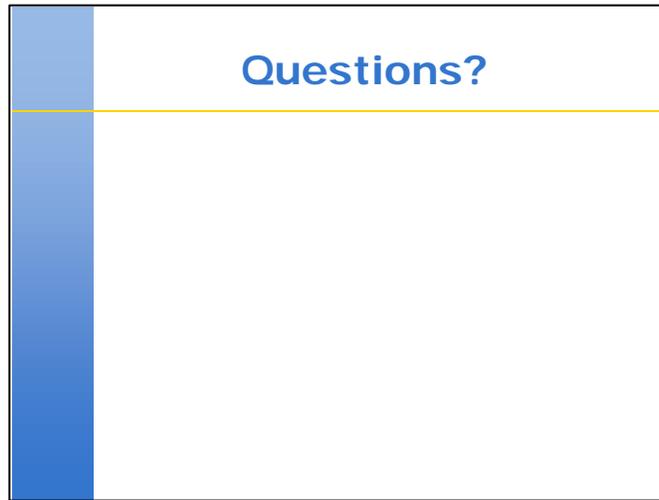
Inform the participants that the term "special considerations" includes:

- **Insurance:** many facilities are insured; PA Program grants must be adjusted to reflect insurance proceeds.
- **406 Hazard Mitigation:** team members should be aware of possible mitigation opportunities.
- **Other laws and regulations:** the PA Program must comply with Federal laws and executive orders, and State or local jurisdictions may have additional requirements that may be included in FEMA's compliance review in these areas.

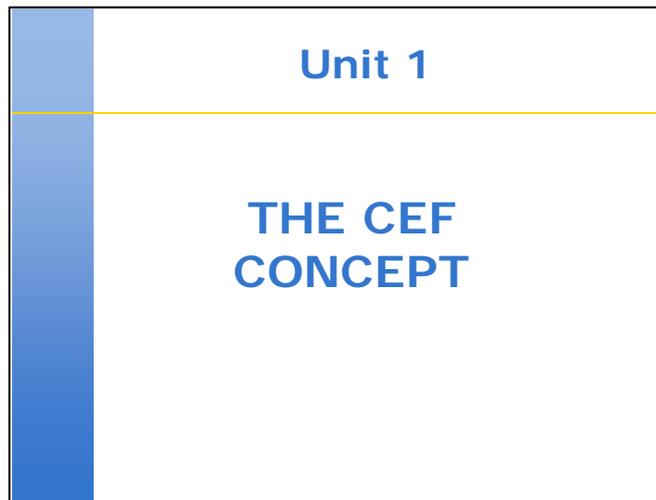
Inform the participants that they need to be aware of disaster-specific policies and procedures. They must also be aware of disaster-specific conditions that could affect cost estimates such as special considerations (e.g. environmental and historic, etc.).

Emphasize the importance of good documentation, particularly in cases involving complex eligibility issues or unusual estimating practices.

Emphasize again that the results obtained with CEF are only as good as the information used to run it. The user is responsible for using CEF carefully.



Ask the class if they have any questions.



## Unit 1 - The CEF Concept

🕒 45 minutes

Inform the class that this unit provides background information and puts the CEF in the context of the project formulation process.

## **Unit 1**

### **The CEF Concept**

Time: 45 minutes

### **Objectives**

At the end of this unit, participants will be able to:

- Describe the purpose of the CEF
- Identify the components of the CEF.
- Describe the application of the CEF during the project formulation process.
- Determine if a project qualifies for CEF.

### **Scope**

The instructor will cover the following:

- Philosophy behind the development of the CEF.
- What the CEF is, and what the CEF is not.
- Components of the CEF.
- The project formulation process.
- Criteria for using the CEF.

### **Methodology**

The instructor will open the unit by giving a description of the background and purpose for developing the CEF. This discussion will include:

- Problems with the development of large projects, both at Northridge and under the Damage Survey Report process.
- Development of the CEF as a uniform means for cost estimating.
- Advantages of using the CEF.

Next, the instructor will describe the CEF in terms of what it is, and what it is not. The instructor will describe the CEF as a “forward-pricing” tool that must be used by experienced personnel, as opposed to an expert system that can be used by anyone. The purpose of this discussion is to emphasize the importance of proper application of the CEF and of realistic expectations for the result.

The instructor will then briefly describe the components of the CEF, including:

- Part A;
- Parts B through H;

- the relationship between these components and Construction Specifications Institute (CSI) divisions; and
- the manner in which the CEF mirrors the owner-general contractor-subcontractor relationship.

The instructor will describe Part A and Parts B through H in more detail in later units.

Referring to the Instructional Guide, the instructor will describe the manner in which the CEF is used during the project formulation process. During this discussion, the instructor will emphasize the responsibilities of the Project Officer.

Finally, the instructor will present a brief description of the criteria for applying the CEF to specific projects. These criteria include:

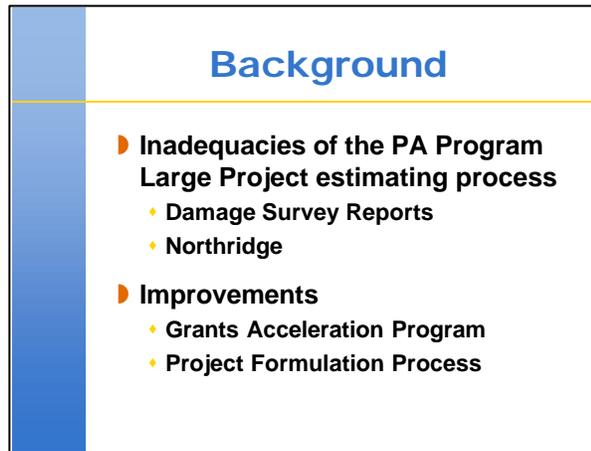
- category of work;
- estimated project cost; and
- stage of completion.

**Exercise:** The participants will be asked to determine if the CEF should be applied to a series of example projects.

## Objectives

- ▶ Describe the purpose of CEF.
- ▶ Identify the components of CEF.
- ▶ Describe CEF application during project formulation.
- ▶ Determine if CEF is appropriate for a project.

State the objectives.



Inform the class that the CEF concept was developed as part of FEMA’s re-design of the PA Program. Use the following points:

**Under the DSR process:**

- Scopes of work and cost estimates could be imprecise
- No standard format for developing large projects existed
- No consistent way to account for non-construction project costs
- Scope of Work and estimates were often changed by review staff in the Disaster Field Office (DFO)
- Applicants could not accurately manage the budget during construction with a degree of confidence

**At Northridge:**

- DSR process was not adequate for large, complex projects
- Applicants were reluctant to accept estimates for fear of changes by FEMA and of the need to gain future approval for costs incurred during construction
- Delays could have occurred, preventing recovery of community and closure of field activities and necessitating years of Federal oversight

**Grants Acceleration Program (GAP):**

- Used at Northridge to speed acceptance of estimates by Applicants
- CEF prototype used to develop estimate
- Final grant offer based on the estimate, rather than actual costs
- Applicants could accept or reject the offer (voluntary in nature)
- Applicants are responsible for overruns but may use excess funds (underruns) for 406 HMP

**The Project Formulation Process:**

- Part of the re-design of the PA Program
- Team works with Applicant to develop scope of work and estimate
- Problems resolved at field level rather than by review staff at DFO
- CEF used by the Project Officer (PO) to provide a uniform means of preparing an estimate for a large project

Non-construction costs directly related to the approved project accounted for in the estimate.

**Advantages**

- ▶ Provides consistent means of estimating
- ▶ Provides applicant with greater degree of confidence
- ▶ Encourages more effective project management
- ▶ Reduces FEMA's administrative costs

State the advantages of using CEF.

Use the following points:

**Uniform and consistent means of estimating:**

- Standard format for developing estimates
- Standard means for addressing non-construction costs
- Consistent guidance for using unit cost data

**Budget:**

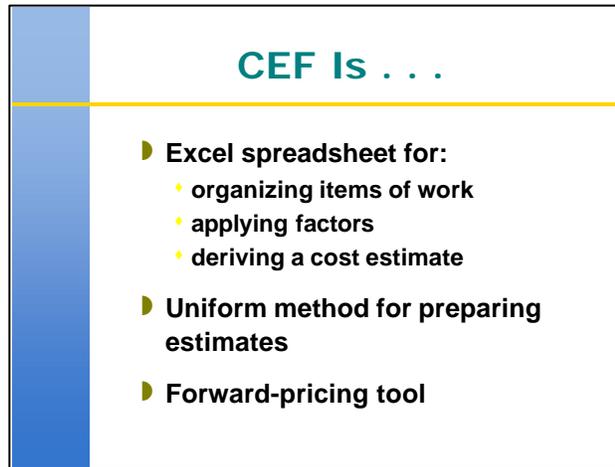
- Applicant has a more accurate picture of overall project costs
- Applicant knows approximate amount of eventual reimbursement

**Project Management:**

- Budgets will be generated using a uniform and consistent estimating tool. This will provide the Applicant with a greater degree of confidence and comfort when accepting funding

**Administrative Costs:**

- Better estimates result in fewer problems during project close-out activities



The next two slides are intended to clearly state the capabilities of CEF; that is, to dispell misconceptions about what can be accomplished with CEF.

Inform the class that the CEF is an Excel spreadsheet. The spreadsheet allows the user to:

- Organize the estimate in a consistent manner.
- Apply factors to the estimate within specific ranges appropriate to the facility and according to industry standards.

By allowing consistent organization of estimates and encouraging the use of standard estimating concepts, the CEF facilitates uniform cost-estimating on a program-wide basis.

The CEF is a “forward-pricing” tool.

- Previously, FEMA based estimates on construction costs; the actual, final cost of a project was not determined until after the project had been completed.
- The CEF allows the user, FEMA, and the Applicant to better estimate the final cost of the project up-front.



It is important for the participants to understand what the CEF is **not** capable of.

The CEF is not an “expert” system; that is, it does not make decisions based on the information the user provides. The CEF only stores information and performs simple mathematical calculations.

The CEF is not intended to make estimating easier. It is intended only to standardize the process and encourage standard estimating techniques.

The CEF is not a replacement for professional expertise; it does not give non-professionals the ability to produce professional estimates. It should be used by experienced engineers and cost estimators.

Emphasize that the results obtained with CEF are only as accurate as the information provided by the user. Accurate results will require:

- Complete development of the scope of work.
- Accurate assembly of construction costs.
- Appropriate application of factors.

Emphasize that CEF will require the preparation of better estimates.



Inform the class that, ultimately, CEF may be used as a final cost settlement instrument, but not at the present time.

- Applicants would receive grants based on the estimate produced using CEF.
- There would be no post construction reconciliation process if the estimate was within a plus or minus percentage range, for example.

Before this can be considered:

- Legislative changes must be made to permit payment on the basis of an estimate.



**Transition:** The discussion will now focus on the components of the CEF.

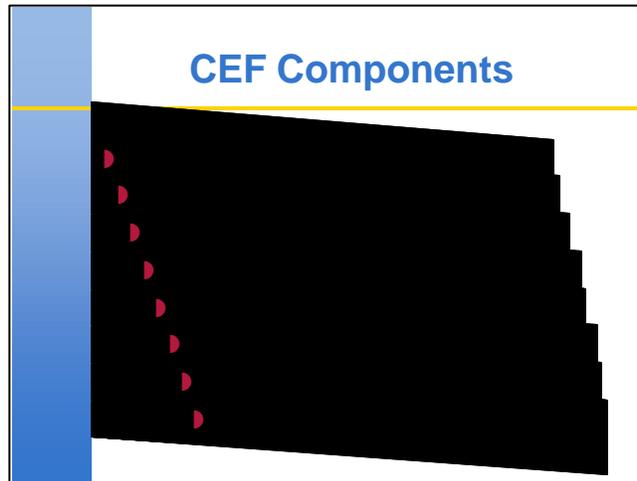
Inform the class that the CEF is organized around construction industry standards; specifically, around guidance published by the Construction Specifications Institute (CSI).

The CSI has defined divisions that are typical components of construction projects.

Briefly review the graphic, which illustrates the manner in which a construction project can be broken down into CSI Divisions.

- Division 1: represents a general contractor's general requirements, maintenance, temporary controls, supervision and miscellaneous responsibilities
- Divisions 2-16: represent the components of a facility; that is, the construction costs
- Other components:
  - ◆ Owner's reserve for construction: that is, to fund changes in the scope of eligible work, or approved change orders to eligible work from items such as hidden damages, differing site conditions, etc. resulting from the disaster.
  - ◆ Owner's costs: design, fees and permits, project management (often referred to as non-construction costs).

State that the CEF is organized around these divisions, as illustrated by the next slide.



Inform the class that the CEF is divided into eight parts, lettered A through H. Describe each of these parts briefly, tying each part back to the discussion of CSI divisions.

**Part A:** Used to break the scope of work into construction elements. Equivalent to CSI Divisions 2 to 16; and parts of CSI Division 1 (temporary controls, maintenance).

**Part B:** Job site factors. Part of CSI Division 1- (temporary services & utilities).

**Part C:** Design contingencies; that is, unknowns based on design phase at the time the estimate is made and project complexity.

**Part D:** General contractor's overhead, insurance and bonds, and profit. Part of CSI Division 1.

**Part E:** Cost escalation during the period of construction.

**Part F:** Permit and plan review fees.

**Part G:** Owner's reserve for construction.

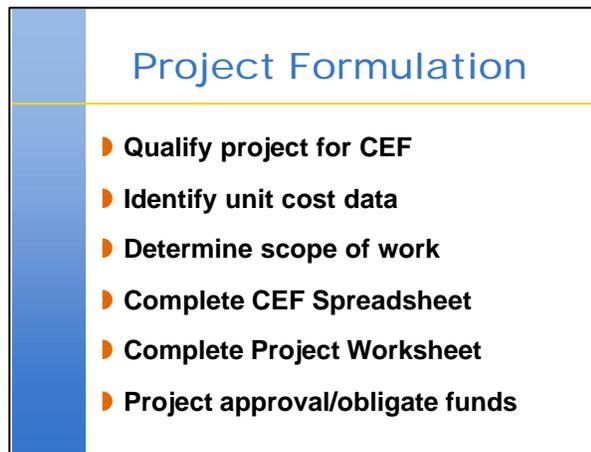
**Part H:** Owner's costs for management and design.

State that the factors represent conditions on a construction project in that;

- Parts B, C, D, E are "as-bid" costs; that is, intended to represent the contractor's bid in a competitive environment.
- Parts F, G, H represent the owner's costs once a contractor has been hired.

Inform the class that the CEF works as follows:

- User develops scope of work and adds items to Part A.
- Factors in Parts B through H are selected and applied and the estimate revised accordingly.
- All factors except F are applied to the preceding total.

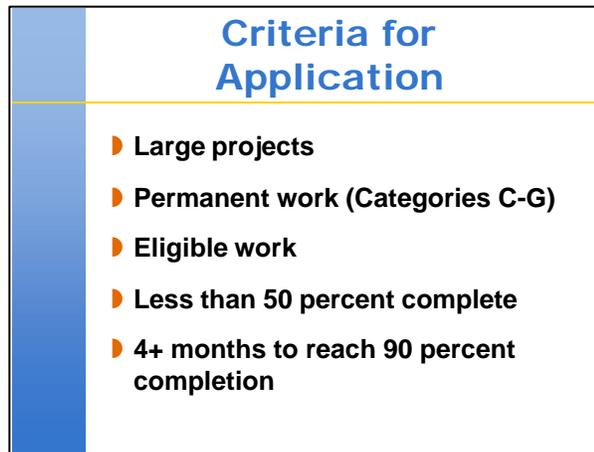


**Transition:** the discussion will now focus on the way the CEF is used as part of the project formulation process.

The slide gives the major steps in the formulation process. Use the PO Checklist for CEF Implementation, which is found on page 15 of the Instructional Guide, to walk the participants through the process. Highlight these steps.

- Obtain disaster specific-information from the PAO before beginning work.
- Meet with the PAC to discuss the Applicant's needs.
- Qualify projects: The CEF may not be appropriate for every project. The project formulation team must determine if the CEF should be used for the project. Criteria for application will be discussed in greater detail with the next slide.
- Identify unit cost data: The user must identify the appropriate cost data for developing Part A. This will be discussed in detail in Unit 3.
- Determine the scope of work: The project formulation team, working with the Applicant, must define the eligible scope of work before developing Part A.
- Complete the CEF spreadsheet to obtain an estimate for the project.
- Complete the Project Worksheet: Refer the class to the example Project Worksheet in the Participant's Workbook. State that this document is used to transfer grant information to FEMA's database for processing. Inform the class that steps for completing the Project Worksheet will be described in Unit 2.
- Attach the appropriate information to the Project Worksheet.
- Assist the PAC with updating the Case Management File.

Inform the class that the project must be recommended and approved by the PAC and then by the PAO and Disaster Recovery Manager before funds can be obligated for it. Once this approval occurs, funds are obligated for use by the State, who then makes the funds available to the Applicant as the work is completed.



Emphasize that the CEF may not be appropriate for every project. The following criteria apply.

**Large Projects:**

- Cannot be used on projects with estimated costs below the large project threshold.
- For Fiscal Year 2000 (ending September 30), the threshold is set at \$48,900.
- Use a preliminary estimate to determine if a project is above the threshold amount.
- CEF can be applied to multiple work activities grouped together as one project, if appropriate.

**Permanent Work:**

- Repairing, restoring, or replacing a facility to its pre-disaster condition.
- Cannot be used for debris removal or emergency work activities.
- Can be used for permanent repair or replacement, for all types of disasters and all types of facilities. Refer the class to the examples that are listed on page 6 of the Instructional Guide.

**Eligible Work:**

- Projects must be eligible under the laws, regulations, executive orders and policies that govern the PA Program.
- Even if the project itself is otherwise eligible, it may include ineligible work activities; however, only the eligible work activities may be included in the CEF.

**Stage of Completion:**

- Less than 50 percent complete, in terms of the design and construction timeline. (Refer to the Instructional Guide: Step 1 - Qualify Projects for the CEF, pg. 8 and Part E, Cost Escalation Allowance, pg. 35).
- More than 4 months to reach 90 percent complete.
- Actual costs should be used for projects that do not meet these criteria.
- An example would be inspecting a damaged facility too soon after a disaster. If the location and level of damage cannot be accurately estimated, the CEF Part A will be inaccurate and it may be inappropriate to estimate using the CEF model.

**EXERCISE**

- ▶ **Qualifying projects for CEF**
  - ◆ five projects

Inform the class that a brief exercise will be conducted to reinforce the discussion of qualifying projects for the CEF.

The exercise consists of five project descriptions. Give the participants 10 minutes to review the scenarios and determine whether the CEF should be used for the projects.

Spend 5 minutes going over the answers with the participants.

## EXERCISE SCENARIO AND SOLUTIONS

### Unit 1

#### Exercise Scenarios

Read the following project descriptions. Determine if the CEF should be used for each project, and give a reason for your decision. Assume that the event that caused the damage has been declared a disaster and that the Applicant is eligible.

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#### Project 1

Three buildings on a high school campus sustained damage during an earthquake. The Applicant has prepared preliminary estimates of the damage as follows:

- Gymnasium: \$500,000
- Multi-Purpose Room: \$30,000
- Classroom Building 1: \$150,000

Due to the nature of the damage, the Applicant intends to hire one contractor to complete all of the work to repair the facilities.

#### Project 2

During a flood, several thousand cubic yards of mud, gravel, and rock are deposited on the roads, parking lots, and open areas of a county park and recreation center. The county has not yet begun work to restore the park to its pre-disaster condition. The preliminary estimate for removing the deposits, which will be done by contractors, is \$100,000.

#### Project 3

A flood has demolished a 400-foot long flood control structure that provides protection to an airport runway. Under FEMA's Flood Control Works policy, permanent restoration of the facility is not eligible. However, FEMA has agreed that proposed construction of an emergency earthen levee to provide protection up to the level of a 5-year flood would be eligible. The Applicant wants to get a grant estimate from FEMA before beginning the work.

#### Project 4

The city hall is damaged during a hurricane. The city has completed emergency repairs (replacing doors, boarding up windows, and repairing mechanical and electrical systems) at a cost of \$75,000 to keep the building functioning. However, the roof must be replaced due to major damage, and permanent repairs to windows, doors, and interiors must be completed. Additionally, the city is interested in installing hurricane shutters for hazard mitigation. Preliminary costs have not been developed for the work that must be completed.

#### Project 5

A school building is severely damaged during a tornado. The Applicant wants to restore the building before the new school year starts and has proceeded with an aggressive reconstruction schedule. Construction, which began 30 days ago, is expected to be complete in 90 days.

## EXERCISE SCENARIO AND SOLUTIONS

### Unit 1

#### Exercise Scenarios

Read the following project descriptions. Determine if the CEF should be used for each project, and give a reason for your decision. Assume that the event that caused the damage has been declared a disaster and that the Applicant is eligible.

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#### Project 1

Three buildings on a high school campus sustained damage during an earthquake. The Applicant has prepared preliminary estimates of the damage as follows:

- Gymnasium: \$500,000
- Multi-Purpose Room: \$30,000
- Classroom Building 1: \$150,000

Due to the nature of the damage, the Applicant intends to hire one contractor to complete all of the work to repair the facilities.

**Solution:** Because the Applicant intends to use one contractor to complete all work, all work to restore the school could be considered one project and the CEF applied to the project as a whole.

#### Project 2

During a flood, several thousand cubic yards of mud, gravel, and rock are deposited on the roads, parking lots, and open areas of a county park and recreation center. The county has not yet begun work to restore the park to its pre-disaster condition. The preliminary estimate for removing the deposits, which will be done by contractors, is \$100,000.

**Solution:** The CEF should not be used for debris removal activities, even though (in this case) the work is necessary to restore the facility to its pre-disaster condition.

#### Project 3

A flood has demolished a 400-foot long flood control structure that provides protection to an airport runway. Under FEMA's Flood Control Works policy, permanent restoration of the facility is not eligible. However, FEMA has agreed that proposed construction of an emergency earthen levee to provide protection up to the level of a 5-year flood would be eligible. The Applicant wants to get a grant estimate from FEMA before beginning the work.

**Solution:** The CEF should not be used for emergency work activities.

**Project 4**

The city hall is damaged during a hurricane. The city has completed emergency repairs (replacing doors, boarding up windows, and repairing mechanical and electrical systems) at a cost of \$75,000 to keep the building functioning. However, the roof must be replaced due to major damage, and permanent repairs to windows, doors, and interiors must be completed. Additionally, the city is interested in installing hurricane shutters for hazard mitigation. Preliminary costs have not been developed for the work that must be completed.

**Solution:** Even though some work on the building has been done, it is likely that the remaining work, regardless of whether the proposed mitigation measures are included, will be far more costly than the work that has been completed. Therefore, the CEF could be used for this facility. Before making the decision to use the CEF, however, the project team should procure or develop the design and construction timeline to ensure that permanent work will take longer than four months to reach a state of being 90% complete (reference pages 36 and 38 of the IG).

**Project 5**

A school building is severely damaged during a tornado. The Applicant wants to restore the building before the new school year starts and has proceeded with an aggressive reconstruction schedule. Construction, which began 30 days ago, is expected to be complete in 90 days.

**Solution:** In terms of time, the project is less than 50 percent complete; however, the project is less than four months from completion. Therefore, the CEF should not be used.

## Review of Objectives

- Describe the purpose of CEF
- Identify the components of CEF
- Describe CEF application during project formulation
- Determine if CEF is appropriate for a project

To reinforce the objectives, ask the class the following questions:

Q. What is the purpose of the CEF?

A. The CEF:

- is a uniform means of preparing and organizing estimates; and
- a forward-pricing tool that allows FEMA to better determine the eventual cost of a project.

Q. What are the components of the CEF?

A. The CEF consists of:

- Part A, which represents the construction costs associated with the scope of work; and
- Parts B-H, which represent the contractor's bid and the owner's costs for management and design.

Q. How is the CEF integrated into the project formulation process?

A. The project formulation team:

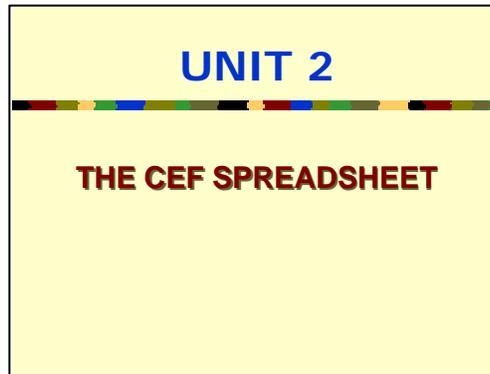
- works with the Applicant to develop the eligible scope of work for the project;
- uses the CEF to develop a cost estimate based on that scope of work;
- prepares a Project Worksheet using the CEF estimate; and
- submits the Project Worksheet, along with the appropriate backup data, to the PAC for approval.

Q. Can the CEF be used for all large projects?

A. No. The CEF cannot be used for:

- debris removal and emergency work; or
- projects that are nearing completion.

Ask if the participants have any questions.



## Unit 2 - The CEF Spreadsheet

🕒 30 minutes

Inform the class that, in this unit, the worksheet components of the CEF spreadsheet will be discussed in detail.

## **Unit 2**

### **The CEF Spreadsheet**

Time: 30 Minutes

#### **Objectives**

At the end of this unit, participants will be able to:

- complete all components of the CEF spreadsheet
- identify the capabilities of the CEF spreadsheet
- transfer essential project information to a Project Worksheet
- identify the information that must be submitted with a Project Worksheet

#### **Scope**

The instructor will cover the following:

- components of the CEF spreadsheet
- capabilities of the spreadsheet
- completion of the Project Worksheet
- examples of a completed spreadsheet and completed Project Worksheet

#### **Methodology**

In this unit, the instructor will guide the participants through the CEF spreadsheet. If the participants have computers, the instructor should walk them through a completed spreadsheet on the computer example 1 of the solutions to Unit 1. If the participants do not have computers, the instructor should refer them to printouts of completed CEF spreadsheet example 1, Appendix B of the Instructional Guide.

The instructor will begin by describing the worksheets within the CEF spreadsheet and the function of each, including:

- the CEF Fact Sheet
- Part A
- Summaries of Completed and Uncompleted Work
- the Total Project Summary, and
- CEF Notes

The instructor will direct the participants to click on the tabs for each worksheet as it is presented, ensuring that the participants are comfortable moving around the spreadsheet. While reviewing each worksheet, the instructor will describe its proper completion.

Next, the instructor will describe the capabilities of the spreadsheet, including:

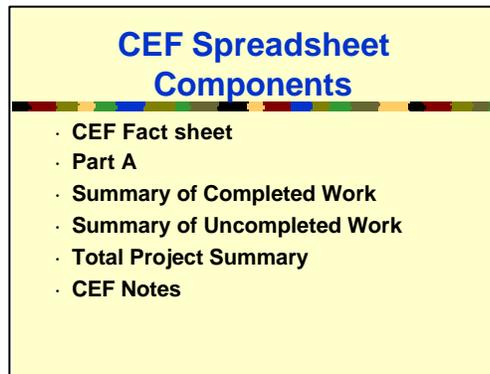
- manipulation of Part A
- use of “check boxes”, and
- links between worksheets

Again, the instructor will direct the participants to manipulate the example spreadsheet on the computer as he or she proceeds with the presentation. Using a Project Worksheet, the instructor will guide the participants through the process for transferring information from the CEF spreadsheet to a Project Worksheet. To complete the unit, the instructor will describe the information that must be submitted with the Project Worksheet as part of the large project package.

## Objectives

- Complete all components of the CEF spreadsheet.
- Describe spreadsheet capabilities.
- Transfer information to a Project Worksheet.
- Identify information submitted with Project Worksheet.

State the objectives.



Describe each of the CEF components in detail, covering the points listed below. Refer the participants to an example of the completed spreadsheet in Appendix B of the Instructional Guide.

**CEF Fact Sheet:**

- Complete this sheet first.
- Enter basic information about the project - date, Applicant, facility, project name, name of preparer, and so on.
- Provide a detailed description of the scope of work.
- Stress that this information is used in preparing the Project Worksheet (PW).

**Part A:**

- Used to break scope of work into a detailed list of itemized work activities.
- Includes description, quantity, unit cost, and adjustment for geographical location.
- Discussed in greater detail in Unit 3.

**Summaries of Completed and Uncompleted Work:**

Inform the participants of the following:

- Summaries are used for application of factors to the estimate developed in Part A.
- Summaries are separated to allow for different application of factors depending on whether work is completed or uncompleted.
- Similarly: columns allow separate application of factors to different types of work (repair, hazard mitigation, and so on).

**Total Project Summary:**

Merges estimated costs for completed and uncompleted work into a single estimate for the entire project.

**CEF Notes:**

- Provides user with a place to capture facts, assumptions, decisions and reasoning for selecting factors.
- Emphasize the importance of completing this sheet:
  - ◆ Facilitates Applicant acceptance and project approval by FEMA.
  - ◆ Reduces the possibility that problems might arise during cost reconciliation and the close-out process.



Describe the spreadsheet's capabilities to the participants.

- **If the participants have computers**, ask them to follow along on their screens. Use the completed, electronic example 1 solution from Unit 1 or the hard copy from Appendix B of the Instructional Guide.
- **If the participants do not have computers**, refer to the completed spreadsheet example 1 solution in Appendix B of the Instructional Guide.

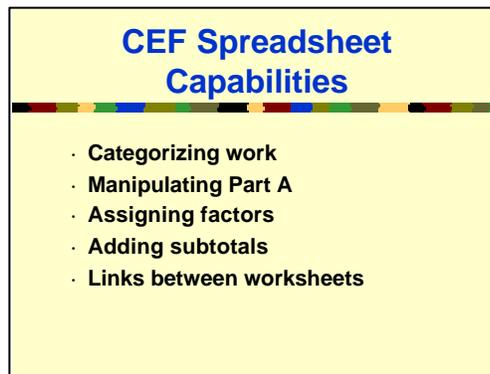
### **Categorizing work:**

- Completed and uncompleted work:
  - ◆ Note separate sections for these types of work. Refer the participants to Part A.
  - ◆ State again that there are separate summary sheets so that factors can be applied differently to completed and uncompleted work.
- Types of work:
  - ◆ Types of work (repair, hazard mitigation, and so on) can be separated so that factors can be applied differently.
  - ◆ Type of work entered on CEF Fact sheet are used as column headers on summaries of completed and uncompleted work sheets. (If the participants have computers, have them enter information in the blanks to demonstrate this feature.)

### **Manipulating Part A:**

- Note that:
  - ◆ Types of work should be listed separately in Part A.
  - ◆ Line items should be organized by CSI Division.
- As a result, it may be necessary to add lines to Part A.
- Refer the participants to page 19 of the Instructional Guide for instructions on adding lines to accommodate additional items of work as necessary to Part A. These instructions must be followed to ensure that formulas in the spreadsheet are copied properly.

**Notes continue on next page.**



**SAME SLIDE -- Notes continued from previous page.**

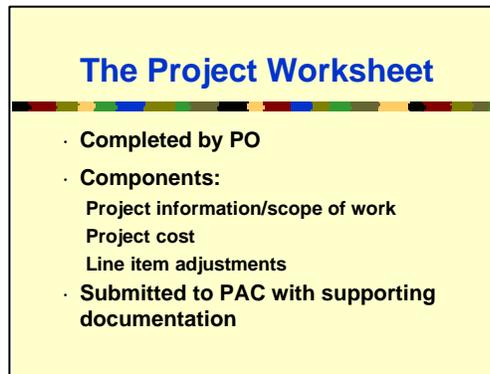
**Assigning factors and adding subtotals:**

- Inform the participants that these operations are accomplished using the Summaries of Completed and Uncompleted Work.
- Demonstrate these operations:
  - ◆ Ask the participants to enter \$100,000 next to Permanent Work (From Part A).
  - ◆ Demonstrate that factors can be applied in two ways:
    - By entering a percentage. Use B.1 as an example.
    - By checking a box to get a fixed percentage. Use B.2 as an example.
  - ◆ Demonstrate that some factors are automatically adjusted depending on the Part A estimate.
    - Use H.2 as an example. These percentages are automatically calculated using the engineering and design services curves found in the Public Assistance Guide.
  - ◆ Note the manner in which the spreadsheet performs calculations and enters new sub-totals in the right-hand column.
  - ◆ Note that the totals for completed and uncompleted work are given at the bottom of the worksheet.

**Links between worksheets:**

Note the following links between worksheets.

- CEF Fact Sheet:
  - ◆ Applicant and facility names used as headers on subsequent worksheets.
  - ◆ Types of work used as column headers on Summaries of Completed and Uncompleted Work.
- Total Project Summary:
  - ◆ Figures from Summaries of Completed and Uncompleted Work are automatically carried forward to this sheet.
  - ◆ Sheet merges these figures into a total project cost.
- Part A:
  - ◆ Note that Part A is not linked to the Summaries of Completed and Uncompleted Work.
  - ◆ Figures entered in Part A must be manually entered into these summaries.



**Transition:** the discussion will now focus on the Project Worksheet and how it is used to process CEF information.

Refer the participants to the example Project Worksheet in the Participant’s Workbook. Note that instructions for completing the Project Worksheet are found in the CEF Standard Operating Procedure located in Appendix E of the Instructional Guide.

Note that the Project Officer is responsible for:

- preparing the Project Worksheet;
- ensuring that all appropriate documentation is attached; and
- submitting the Worksheet and documentation to the PAC.

Using the example Project Worksheet, guide the participants through the process of transferring the appropriate information from the CEF Spreadsheet. Highlight the following:

- Project information, damage description, and scope of work:
  - ◆ This information should be the same as that which was entered on the CEF Fact Sheet.
- Project cost:
  - ◆ One line is used for the CEF estimate.
  - ◆ In the “narrative” column, the user should enter a note referring the reader to the attached CEF spreadsheet for cost details.
  - ◆ The total estimate obtained using the CEF should be entered in the “cost” column.
  - ◆ Any adjustments should be entered on subsequent lines. These include:
    - Actual or anticipated insurance proceeds.
    - Deductions for salvage or other items.
  - ◆ The final cost after adjustments should be entered in the “total cost” section.

## Documentation

- Project Worksheet
- CEF Spreadsheet
- Photographs, maps, plans, specifications
- Permits and clearances
- Cost summary sheets
- Insurance and mitigation information

Briefly describe the items that should be submitted with the Project Worksheet.

Note that, for extremely large and complex projects, it may be prudent to allow plans and specifications to remain with the Applicant except as otherwise noted in Appendix E of the Instructional Guide. A summary or listing can be attached to the Project Worksheet.

Note that some items may not be prepared by the CEF user.

- For example, insurance information may be obtained by an insurance specialist.
- The Project Officer may be responsible for ensuring that this information becomes part of the package.

## Review of Objectives

- Complete all components of the CEF spreadsheet.
- Describe spreadsheet capabilities.
- Transfer information to a Project Worksheet.
- Identify information submitted with Project Worksheet.

To reinforce the objectives, ask the class the following questions.

**Q.** List the six components of the CEF Spreadsheet.

**A.** *The six components are:*

- *CEF Fact Sheet*
- *Part A*
- *Summary of Completed Work*
- *Summary of Uncompleted Work*
- *Total Project Summary*
- *CEF Notes*

**Q.** What is the importance of the CEF Notes Sheet?

**A.** *The user must document all assumptions and reasoning for factor selection here. This facilitates approval of the project and the close-out process.*

**Q.** What component is used to assign factors to the Part A subtotal?

**A.** *The Summaries of Completed and Uncompleted Work are used to assign factors.*

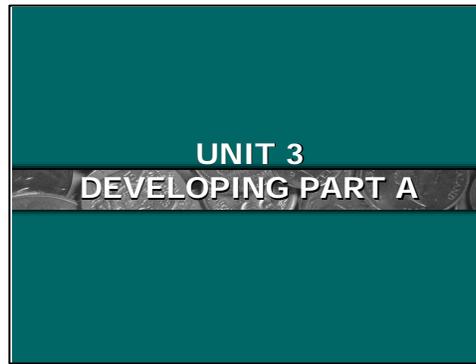
**Q.** What dollar figure is used to complete the CEF line item in the Project Worksheet?

**A.** *The total estimate obtained from the “Total Project Summary” of the CEF Spreadsheet.*

**Q.** Is it necessary to submit specifications and plans with the Project Worksheet?

**A.** *Yes, unless the project is of such size and complexity that it is impractical to collect this information. In such cases, the information should remain with the Applicant, except as otherwise noted in Appendix E of the Instructional Guide.*

Ask the participants if they have any questions.



## Unit 3 - Developing Part A

🕒 60 Minutes

Inform the class that this unit will cover the development of an accurate Part A. State that this is the most important part of using the CEF.

## **Unit 3**

### **Developing Part A**

Time: 60 Minutes

### **Objectives**

At the end of this unit, participants will be able to:

- Prepare an accurate scope of work
- Organize work items in Part A
- Identify unit cost data to use
- Complete Part A
- Evaluate a sample Part A for completeness

### **Scope**

The instructor will cover the following:

- Components of a good scope of work
- Set-up of Part A
- Permanent and non-permanent work
- Completed and uncompleted work
- Types of work
- Items of work
- Choosing unit cost data
- Adjusting unit cost data
- Examples of a completed Part A

### **Methodology**

In this unit, the instructor will emphasize the importance of Part A in the successful development of an estimate with the CEF. During the presentation, the instructor will utilize the multiple examples found in Appendix B of the CEF Instructional Guide, starting with example 1 that was referenced in the previous unit.

The instructor will begin by briefly reviewing the components of an accurate scope of work. Because it is assumed that the participants have experience in the Public Assistance Program, this discussion will be limited to an overview. The instructor will cover:

- sources of eligibility criteria.
- major eligibility issues, and
- necessary information for defining the FEMA-eligible scope of work.

Following this discussion, the instructor will relate the scope of work to Part A. He or she will identify the manner in which construction costs should be organized in Part A. Components include:

- permanent and non-permanent work.
- completed and uncompleted work.
- type of work, and
- organization of line items by CSI Division.

This presentation will be used as the framework for the remainder of this unit. Throughout, the instructor will use the other examples of completed Part A, examples 2 and 3 in Appendix B of the Instructional Guide to reinforce the discussion.

First, the instructor will describe permanent and non-permanent work, and completed and uncompleted work, providing criteria and examples for each. Then the instructor will describe the different types of work, including:

- repair.
- retrofit.
- new construction.
- hazard mitigation, and
- other types of work.

As part of the discussion, the instructor will provide examples and emphasize the importance of categorizing the work appropriately.

The discussion will then focus on the appropriate assembly of line items. The instructor will describe:

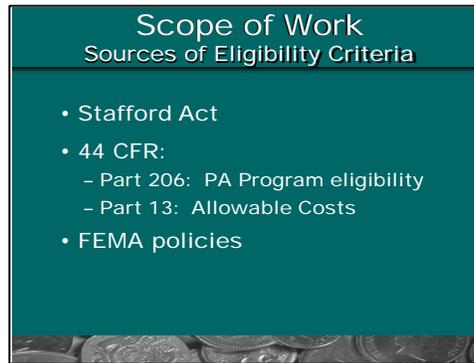
- The breakdown of work elements into line items.
- Sources of unit cost data. The instructor will describe the preferred sources for unit costs (local cost data, R.S. Means publications, FEMA cost codes), and the analysis of unit costs (overhead and profit, union and non-union rates, the effects of disasters on unit costs).
- Organization of line items by CSI Division.
- The adjustment of line items based upon using the city adjustment factor.

**Exercise:** As a summary, the participants will be given a simple example of a completed Part A and will be asked to review it for completeness.

## Objectives

- Prepare an accurate scope of work.
- Organize work items appropriately.
- Identify appropriate unit cost data.
- Complete Part A.
- Evaluate Part A for completeness.

State the objectives.



Inform the class that development of Part A begins with defining the eligible scope of work. Emphasize that knowledge of PA Program eligibility is crucial to defining an eligible scope of work.

By way of review, briefly describe the components of PA Program eligibility. State that the PA Program is grounded in statute (law), executive orders, regulations, and policies.

**Note:** If there are participants who do not have PA Program experience, let them know that this presentation is just a brief overview and is not designed to train them in program eligibility. Encourage them to:

- read through available documents;
- FEMA website ([www.fema.gov/r-n-r](http://www.fema.gov/r-n-r))
- attend a training session such as PA Operations I and PA Operations II; and
- work closely with an experienced person on the job such as the PAC or PO to better understand the rules of program eligibility.

### **Statute: the Stafford Act**

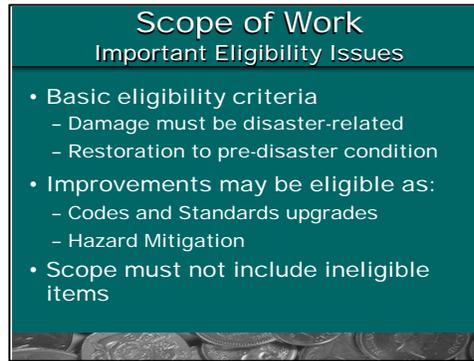
- Refer the participants to Appendix B of the Public Assistance Guide.
- Highlight the following points:
  - ◆ The Stafford Act authorizes the PA Program.
  - ◆ Permanent work is authorized under Section 406 of the Stafford Act (page B-20).
  - ◆ PA Program grants must comply with the Stafford Act.

### **Regulations: Title 44 of the Code of Federal Regulations (44CFR)**

- Regulations are designed to implement a statute in accordance with an agency's interpretation.
- Two parts of 44 CFR are important when preparing scopes of work:
  - ◆ Part 206: these regulations implement the PA Program.
    - Refer the class to Appendix C of the Public Assistance Guide.
    - Subpart H covers program eligibility.
  - ◆ Part 13: this part establishes uniform administrative rules for Federal grants and cooperative agreements and sub-awards to State, local and Indian tribal governments.
    - Provides specific guidance on allowable costs.

### **FEMA Policies**

- Policies are issued by FEMA Headquarters.
- Used to apply the law and regulations to specific situations.
- Sources for policies:
  - ◆ Public Assistance Officer
  - ◆ Publications: Public Assistance Guide and Public Assistance Policy Digest
  - ◆ FEMA website ([www.fema.gov/r-n-r](http://www.fema.gov/r-n-r))



Inform the class that they will now review a few of the most important eligibility issues.

**Disaster-related damage:**

- Only work that is necessary to restore as a result of the disaster is eligible.
- The scope of work must not include damage or items of work that are the result of:
  - ◆ Damage that existed before the disaster.
    - Example: water damage in a building that was damaged by an earthquake.
  - ◆ Maintenance (non-disaster related).
    - Example: “alligator” cracking in a road that was briefly inundated by flood waters.

**Pre-disaster design:**

- Work to restore a facility on the basis of its pre-disaster design, capacity and function as they existed immediately prior to the disaster and in conformity with applicable standards is eligible.
- Includes:
  - ◆ repair; or
  - ◆ replacement, if the facility is too badly damaged to repair (over 50% damaged).
- Replacement facilities must have the same function and capacity.
- Use of current materials and construction methods is eligible.

**Improvements:**

Improvements are eligible if they are:

- Upgrades necessary to meet current codes and standards.
  - ◆ See 206.226(b) for criteria.
  - ◆ Examples:
    - Changes to lane widths on a damaged bridge to comply with current State DOT standards for bridge construction.
    - Installation of hurricane bracing in damaged roofs to comply with county building codes.
- Eligible 406 hazard mitigation measures.
  - ◆ Actions taken to prevent or reduce the threat of future damage to a facility.
  - ◆ See the hazard mitigation policy on page 20 of the Instructional Guide.
  - ◆ Examples:
    - Enlargement of a culvert to prevent overtopping during the next flood.
    - Installation of bracing to prevent damage to equipment during the next earthquake.

**Ineligible work:**

Emphasize that the scope of work—and therefore Part A—must not include ineligible items.

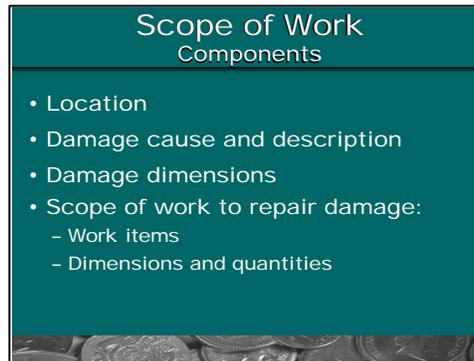
**Notes continue on next page.**

## Scope of Work (cont'd) Important Eligibility Issues

- An eligible facility must:
  - be the responsibility of an eligible applicant
  - be located in a designated disaster area
  - not be under the specific authority of another Federal agency
  - be in active use at the time of the disaster

Explain the requirements for a facility to be eligible.

Ask the class if they have any questions about eligibility.



**Transition:** inform the class that the discussion will now focus on the elements of a complete scope of work.

State that an accurate and complete scope of work contain essential elements of information critical to efficient grant processing, approval, and close-out.

Emphasize that the scope of work must include all four elements shown on the slide.

**Location:**

- The location of the facility, in terms of its address or physical location, must be noted.
- Some projects may include facilities at several locations; these should be differentiated and itemized.

**Damage cause and description:**

- What caused the damage?
  - ◆ Examples:
    - Floodwaters
    - Wind-driven rain
    - High winds
  - ◆ Damage must be related to the cause.
- What was damaged?
  - ◆ Only disaster-related damage is eligible.
  - ◆ Need to specifically identify what was damaged so that repairs can be related to damage.

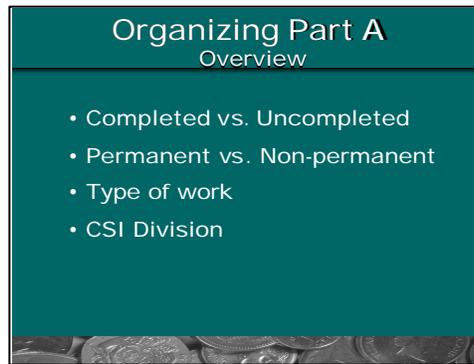
**Damage dimensions:**

- Define damaged elements in quantitative terms.
- Need to know the extent of the damage to evaluate the scope of repair.

**Scope of work to repair damage:**

- Repair must:
  - ◆ be completely described; and
  - ◆ correspond to the cause and extent of the damage.
- Scope description should include:
  - ◆ Items of work.
  - ◆ Dimensions and quantities.
- The Part A worksheet can be used to list specific items of work.

Ask the participants if they have any questions about writing a complete scope of work.



**Transition:** inform the class that the discussion will now focus on the proper organization of Part A around the scope of work.

The visual gives the basic system for organizing work in Part A.

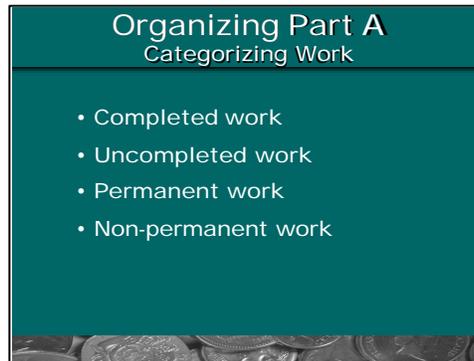
Work elements should be classified as follows:

- Completed vs. uncompleted work.
- Permanent vs. non-permanent work.
- Type of work (repair, retrofit, new construction, and so on).
- CSI Division.

Inform the class that this classification system allows the project to be broken down into a series of sub-estimates for major items of work. This facilitates:

- Applying factors separately to different types of work.
  - ◆ Example: Part C (Contingencies) is not applicable to completed work.
  - ◆ Example: C.3 (Access, Staging, and Storage) may be higher for repair and retrofit work than for new construction.
- Application of city cost adjustment factors by CSI Division.
- Review by specialists.
  - ◆ For example: hazard mitigation items may be reviewed by a separate specialist in the DFO for cost effectiveness, technical feasibility, eligibility and environmental review, if applicable.
- Changes in scope without redoing the entire estimate (the estimate will be recalculated).
- Processing, approval, close-out, and audits.

Inform the class that each of the items on the visual will now be covered in some detail.



State that the first step to organizing Part A is to categorize the work appropriately.

Refer the class to the example of Part A in Appendix A.

- Note that:
  - ◆ Part A is divided into completed and uncompleted work; and
  - ◆ Each of these sections is divided into permanent and non-permanent work.

Briefly review each of these categories of work.

### **Completed vs. Uncompleted:**

- Note that, in some situations, the Applicant may have already initiated repair or reconstruction work.
- Mixing completed and uncompleted work may lead to an inaccurate estimate.
- Define completed work as:
  - ◆ A discrete work activity that is complete and has no potential for eligible change orders.
  - ◆ Work for which documentation of incurred costs can be obtained.
- Define uncompleted work as: work activities that remain to be completed and have potential for eligible change orders.
- Give the class an example of a project where some work has been completed and the costs can be isolated.
  - ◆ See page 3 of Example 1 in Appendix A. Completed work has been isolated at the top of Part A.
- Note that completed work should be documented in the scope of work on the CEF Fact Sheet.

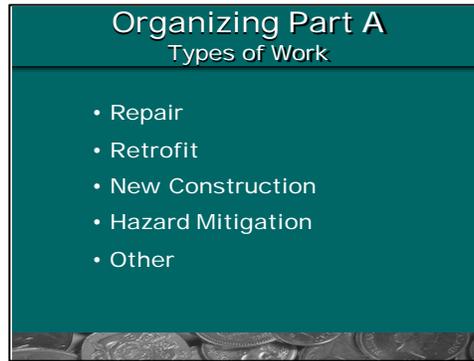
### **Permanent vs. Non-Permanent:**

Give the class the following definitions.

- Permanent work:
  - ◆ Eligible damaged items repaired or replaced to restore facility.
  - ◆ Remains in place once work is complete.
  - ◆ Ask the class for examples. Refer the class to the list of examples on page 22, part A.1 of the Instructional Guide.
- Non-permanent work:
  - ◆ Job specific work activities required to complete permanent work but not left in-place after construction.
  - ◆ Ask the class for examples. After discussing suggested examples, refer the class to the list of examples on page 23 of the Instructional Guide.
  - ◆ Note that the cost of these items is eligible, because they are required to complete the permanent work but are not left in-place at the completion of construction.

Refer the class to Example 3 in Appendix B of the Instructional Guide.

Briefly review the example with the class, noting the categorization of work items.



Inform the class that work items should be further defined as one of these five types of work.

Briefly describe each type of work. Give examples of each.

**Repair:**

- Activities necessary to restore a facility to pre-disaster condition.
  - ◆ Replacing flood-damaged flooring, drywall, insulation, and wiring.
  - ◆ Epoxy injection of earthquake cracks in columns.

**Retrofit and upgrade:**

- Upgrading damaged items to meet current codes and standards.
  - ◆ Replacing damaged pipes using pipe material and/or current construction methods specified under current code.

**New construction:**

- Replacement of part or all of a facility (as opposed to repair or retrofit of discrete elements).
  - ◆ Replacement of a bridge washed out during a flood.
  - ◆ Replacement of a wing of a school building, even though the remainder of the building requires repair only.

**Hazard mitigation:**

- As described earlier in this unit: actions taken to prevent or reduce the threat of future damage to a facility.
  - ◆ Refer the class to Appendix D of the Instructional Guide for examples.

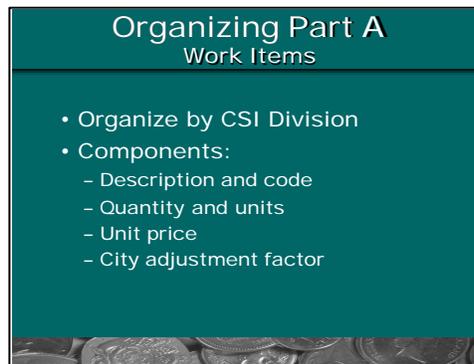
**Other work:**

- Activities that are typically undertaken outside of the owner-general contractor-subcontractor relationship. These types of work are often completed under another contract or by Force Account personnel. This work is separated from other work types for greater estimating flexibility.
  - ◆ Asbestos abatement during restoration of a building.
  - ◆ Force account work to remove flood deposits from the interior of a school building before repair work begins.
  - ◆ Large equipment purchases

Note that a project may consist of one type of work only, or may include several types.

Refer the class to Example 3 in Appendix B of the Instructional Guide. Note that hazard mitigation is broken out in Part A and on the Summary of Uncompleted Work.

Briefly review the example with the class, noting the categorization of work items.



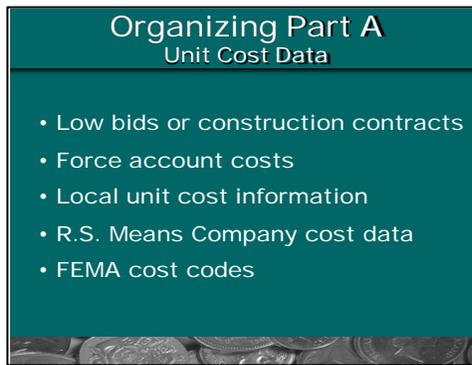
**Transition:** inform the class that the discussion will now focus on the specific work elements used to define the scope of work.

Emphasize that the work elements must:

- Be necessary to restore the facility to its pre-disaster condition, with eligible improvements.
- Correspond to the eligible scope of work.
- Be fully itemized and quantified.
- Not be expressed in terms of lump sum cost estimates--use discrete work items, quantities and units of measurement.

Note that CSI Divisions are listed on page 21 of the Instructional Guide.

Using the example, briefly note each of the items shown on the visual.



Inform the class that the Project Officer must select the appropriate unit cost data for the project before developing the estimate. The visual shows possible sources of unit cost data, in the preferred order that they should be used. Emphasize, however, that:

- The data used must be appropriate for the eligible scope of work.
- Therefore, the Project Officer’s decision should be based on the specific circumstances of the project.

Briefly describe each of the five types of cost data in order of preference.

**Low bids or partially/fully completed construction contracts:**

- May be used with careful review to determine how CEF factors should be applied and if the contract substantially conforms to the eligible scope of work approved by FEMA.

**Force account costs:**

- Use only for eligible work activities that have been completed using force account labor, equipment, materials.

**Local unit cost information:**

- Average weighted unit costs derived from contract history.
- May be available from the Applicant or from a relevant state agency (such as the State DOT).

**R.S. Means Company cost data:**

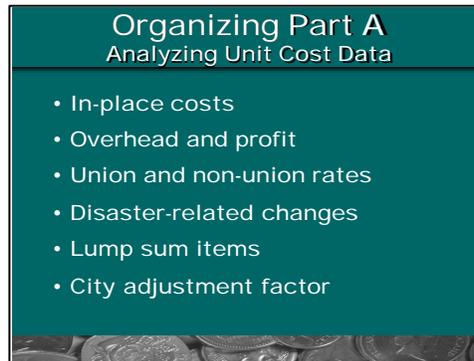
- Use current year editions.
- Use publication that is most appropriate for the type of work.
  - ◆ Example: for bridges and roads, use *Heavy Construction Cost Data*.
  - ◆ Example: for schools, use *Building Construction Cost Data*.
- City adjustment factors must be applied to line items taken from Means.

**FEMA Cost Codes:**

- Note that the cost codes are:
  - ◆ Issued by the FEMA Regional office at the beginning of DFO operations.
  - ◆ Represent “in-place” costs (that is, labor, equipment, and material necessary to complete installation).
  - ◆ Include overhead and profit.
- Emphasize that use of FEMA cost codes is not required; they are a tool to be used only if the cost data described above are unavailable.

**Other considerations:**

- It will be up to the CEF preparer to use engineering judgment when considering the overall appropriateness of the project components. For example, large discrete components of work that would usually be completed under a contract between the owner and installer or supplier should be put in separate columns for estimating purposes, e.g., large equipment purchase, demolition, etc.



Emphasize that, when the Project Officer is selecting unit cost data, the data must be analyzed to ensure that:

- they are used properly; and
- the CEF factors are properly applied, given the source and components of the data.

The visual gives specific items for consideration.

**In-place costs:**

- Does the unit cost include all labor, equipment, materials, and activities necessary to install the item?

**Overhead and profit:**

- Does the unit cost include the subcontractor's overhead and profit?
  - ◆ Example: Means gives costs with and without overhead and profit.
- Unit costs should include subcontractor's overhead and profit.
- If the unit cost includes general contractor's overhead and profit, Part D should not be used.

**Union and non-union rates:**

- Typically, large, publicly-funded projects are completed using union labor. Union rates should normally be used for estimating purposes, unless the PO can establish that non-union labor rates will be used to complete the scope of work. The PO should document the use of non-union rates on the CEF Notes Sheet.
- Consideration of union and non-union rates is not applicable to force account labor projects where force account rates will be used for estimating purposes.

**Disaster-related changes:**

- Unit costs may be affected by the disaster.
  - ◆ For example, shortages of materials may cause prices to rise.
- The Project Officer should evaluate the impact of the disaster on unit costs, the timing of construction and adjust unit costs accordingly.

**Lump sum items:**

- Lump sum items should not be used.
  - ◆ Example: 10,000 square-foot building with a unit cost of \$x per square-foot.

**Notes continue on next page.**

**Organizing Part A**  
Analyzing Unit Cost Data

- In-place costs
- Overhead and profit
- Union and non-union rates
- Disaster-related changes
- Lump sum items
- City adjustment factor

**SAME SLIDE -- Notes continued from previous page.**

- Lump sum items should be broken down into discrete elements of work.

**City adjustment factor:**

- R.S. Means data must be adjusted for geographical location.
- Factors can be found in the Cost Indexes section of Means publications.
- Factors are published by CSI Division.
- Organizing work by CSI Division allows the appropriate application of these factors.

Ask the class if there are any questions regarding unit costs.

## Organizing Part A

Review

- Completed vs. Uncompleted
- Permanent vs. Non-permanent
- Type of work
- CSI Division

Briefly review the organization of Part A.

# EXERCISE

Inform the class that a brief exercise will be conducted to reinforce the discussion regarding the organization of Part A.

The exercise consists of a CEF Fact Sheet and Part A for the project in question. Give the class 10 minutes to review the project and determine what problems, if any, exist with the documentation. Inform the class that they should concentrate on the items included in the scope of work and the organization of Part A, not on possible differences of opinion with regard to various engineering approaches.

Spend 5 minutes going over the answers with the participants.

## Unit 3 Exercise

### Johnstown School:

Inform the class that a brief exercise will be conducted to reinforce the discussion regarding the organization of Part A. The exercise consists of a CEF Fact Sheet and Part A for the project in question.

- Read the description below.
  - The class should individually determine what problems, if any, exist with the CEF Part A Estimate.
  - Participants should review only 2 pages - the CEF Fact Sheet and the CEF Part A Estimate.
  - Inform the class that they should concentrate on the items included in the scope of work and the organization of Part A, not on possible differences of opinion regarding engineering or eligibility.
  - Give the class 10 minutes to review the project.
  - Spend 5 minutes going over the answers with the participants.
- 

### Description:

*Johnstown School on Learning Curve in Johnstown, CA was damaged by an earthquake on April 4, 1999. The disaster was declared and both the Applicant and facility are eligible. Most of the damage on the campus was to the main classroom building and was a direct result of the disaster. The project has been determined to be a large project and suitable for estimating using the CEF.*

*The main classroom building contains four large classrooms (A, B, C & D) divided by a central corridor. Each classroom has four large windows which were smashed by the earthquake. The exterior concrete walls and slab suffered extensive cracking and the concrete around and between the windows has spalled. The interior plaster wall finishes were also cracked.*

*The scope of repair work includes: epoxy injection of concrete walls & slab; patching concrete spalls; repair/replacement windows; paint walls; patch and paint cracks in interior plaster walls and ceilings. The epoxy injection work has already been completed. The rest of the work is outstanding.*

*A Hazard Mitigation Proposal (HMP) was submitted to in fill the broken window in each classroom. The bays would be filled in with concrete and tied into the existing walls using dowels to increase the strength of the building. The HMP has already been reviewed and approved.*

## CEF Fact Sheet

Johnstown School District - Earthquake Damage Repair and Hazard Mitigation

|                                  |  |
|----------------------------------|--|
| <b>Date of Estimate:</b>         | September 10, 1999   |
| <b>FEMA Region:</b>              | IX   |
| <b>Preparer (s):</b>             | FEMA   |
| <b>Applicant Name:</b>           | Johnstown School District  |
| <b>Project Title:</b>            | Earthquake Damage Repair and Hazard Mitigation   |
| <b>Damaged Facility:</b>         | Johnstown School Main Classroom Bldg. (Classrooms A, B, C & D)   |
| <b>Facility Location:</b>        | 4220 Learning Curve, Johnstown, California   |
| <b>Declaration Number:</b>       | FEMA-1482-CA   |
| <b>Project Number:</b>           | 3720   |
| <b>PA ID No.:</b>                | 037-12345  |
| <b>Date of Inspection:</b>       | August 21, 1999  |
| <b>Event Date(s):</b>            | April 4, 1999  |
| <b>Work Category:</b>            | E  |
| <b>Type of Work:</b>             | REPAIR   |
| <i>(Enter New, Repair, etc.)</i> | HMP  |
|                                  |  |
|                                  |  |
|                                  |  |
| <b>Scope:</b>                    | <p>The scope of repair work includes: epoxy injection of concrete walls &amp; slab; patching concrete spalls; repair/replacement windows; paint walls; patch and paint cracks in interior plaster walls and ceilings. The epoxy injection work has already been completed. The rest of the work is outstanding.</p> <p>A Hazard Mitigation Proposal (HMP) was submitted to in fill the broken windows in each classroom. The bays would be filled in with concrete and tied into the existing walls using dowels to increase the strength of the building. The HMP has already been reviewed and approved.</p> |

**CEF Part A Estimate**

Johnstown School District - Earthquake Damage Repair and Hazard Mitigation

| Item No.                                   | Item Description Title / Component Description             | Div. # or Cost Code | Qty.     | Units | Unit Price  | City Adj. Factor | Total Cost      |
|--|--|---------------------|----------|-------|-------------|------------------|-----------------|
| <b>Completed</b>                           |  |                     |          |       |             |                  |                 |
| <b>Permanent</b>                           |  |                     |          |       |             |                  |                 |
|  |  |                     |          |       |             |                  | \$0             |
| <b>Completed - Permanent Total</b>         |  |                     |          |       |             |                  | <b>\$0</b>      |
| <b>Non-Permanent</b>                       |  |                     |          |       |             |                  |                 |
|  |  |                     |          |       |             |                  |                 |
| <b>Completed - Non-Permanent Total</b>     |  |                     |          |       |             |                  | <b>\$0</b>      |
| <b>Uncompleted</b>                         |  |                     |          |       |             |                  |                 |
| <b>Permanent</b>                           |  |                     |          |       |             |                  |                 |
|  | <b>STRUCTURAL REPAIRS</b>                                  |                     |          |       |             |                  |                 |
|  | Conc. Patch walls, incl. Chipping, cleaning, & grout       |                     | 400.00   | SF    | \$6.70      | 1.112            | \$2,980         |
|  | <b>2.0 Site Work - Demolition</b>                          |                     |          |       |             |                  |                 |
|  | Interior painting, walls, 2 coats, sand finish, spray      | 099-224-0980        | 4,000.00 | SF    | \$0.26      | 1.180            | \$1,227         |
|  | Selective demolition                                       |                     | 1.00     | LS    | \$10,000.00 | 1.056            | \$10,560        |
|  | Remove and reset windows                                   | 020-754-5080        | 12.00    | EA    | \$117.00    | 1.056            | \$1,483         |
|  | Epoxy inject up to 0.25" wide                              | 037-330-0100        | 750.00   | LF    | \$33.50     | 1.155            | \$29,019        |
|  | Concrete (in-place, incl. forms, rebar, finish walls)      | 033-130-4250        | 16.00    | CY    | \$500.00    | 1.155            | \$9,240         |
|  | Casement windows, incl. Frame, screen, trim                | 086-120-0840        | 16.00    | EA    | \$285.00    | 1.044            | \$4,761         |
|  | Paint exterior perimeter walls (2 CT)                      | 099-124-0410        | 4,000.00 | SF    | \$0.26      |                  | \$0             |
|  | Interior painting, walls, 2 coats, sand finish, spray      | 099-224-0980        | 4,000.00 |       | \$0.26      | 1.180            | \$1,227         |
|  | Drywall, nailed or screwed to studs 5/8", taped & finished | 092-608-0250        | 4,000.00 | SF    | \$1.24      | 1.180            | \$5,853         |
|  | <b>TOTAL STRUCTURAL WORK</b>                               |                     |          |       |             |                  | <b>\$66,350</b> |
|  |  |                     |          |       |             |                  |                 |
|  | <b>UPGRADES</b>  |                     |          |       |             |                  |                 |
|  |  |                     |          |       |             |                  | \$0             |
|  | <b>TOTAL UPGRADES</b>                                      |                     |          |       |             |                  | <b>\$0</b>      |
|  |  |                     |          |       |             |                  |                 |
|  | <b>STRUCTURAL HAZARD MITIGATION (HMP)</b>                  |                     |          |       |             |                  |                 |
|  | Install tension ties                                       | 060-512-7038        | 320.00   | EA    | \$18.25     | 1.091            | \$6,371         |
|  | Drilling concrete (4" deep)                                | 050-515-0700        | 320.00   |       | \$9.35      | 1.041            | \$3,115         |
|  | Drilling (each additional Inch)                            | 050-515-0750        | 320.00   | EA    | \$7.92      | 1.041            | \$2,638         |
|  | Install bolts 15" long, 3/4" dia.                          | 060-512-0600        | 320.00   | EA    | \$6.20      | 1.091            | \$2,165         |
|  |  |                     |          |       |             |                  | \$0             |
|  | <b>TOTAL HMP</b>   |                     |          |       |             |                  | <b>\$14,289</b> |
|  |  |                     |          |       |             |                  |                 |
|  | <b>NON-STRUCTURAL WORK</b>                                 |                     |          |       |             |                  |                 |
|  |  |                     |          |       |             |                  | \$0             |
|  | <b>TOTAL NON-STRUCTURAL WORK</b>                           |                     |          |       |             |                  | <b>\$0</b>      |
|  |  |                     |          |       |             |                  |                 |
| <b>Uncompleted - Permanent Total</b>       |  |                     |          |       |             |                  | <b>\$80,639</b> |
| <b>Non-Permanent</b>                       |  |                     |          |       |             |                  |                 |
|  | Scaffolding rental   | 015-255-4100        | 4.00     | EA    | \$1,250.00  | 1.00             | \$5,000         |
| <b>Uncompleted - Non-Permanent Total</b>   |  |                     |          |       |             |                  | <b>\$5,000</b>  |
| <b>TOTAL PART A BASE CONSTRUCTION COST</b> |  |                     |          |       |             |                  | <b>\$85,639</b> |

## Unit 3

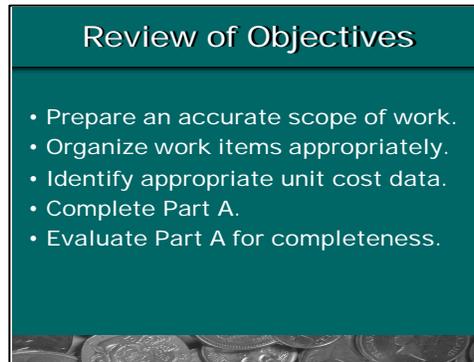
### Exercise Solutions

#### Johnstown School:

The following is a list of text book solutions for the exercise. The Trainer should get participants to volunteer solutions and show where the corrections should be made to the CEF Part A Estimate. The purpose of this exercise is to illustrate how to and how not to use the standard CEF format.

---

- *Epoxy injection work is listed as uncompleted instead of completed (as stated in the description and CEF Fact Sheet).*
- *Missing Item Numbers for all components.*
- *Missing Units for interior painting and drilling concrete.*
- *Inconsistent line items, e.g. drywall and window replacement items are included but not discussed in the scope.*
- *Duplicated line items for interior painting.*
- *The line items are not itemized by division (harder to check City Adj. Factor and for duplication).*
- *Missing Division Numbers for the selective demolition.*
- *Poor description of selective demolition – no details or quantities.*
- *A Lump Sum item for selective demolition has been included.*
- *The concrete for the window in-fill is in repair not HMP.*
- *The City Adjustment Factor for exterior painting is missing and therefore the calculation is wrong.*



To reinforce the objectives, ask the class the following questions.

**Q.** What are the four elements of a complete scope of work?

**A.** *A complete scope of work must include:*

- *Project location.*
- *Cause and description of damage.*
- *Dimensions of damage.*
- *Scope of eligible work to repair the damage.*

**Q.** What are the five types of work into which a project can be divided?

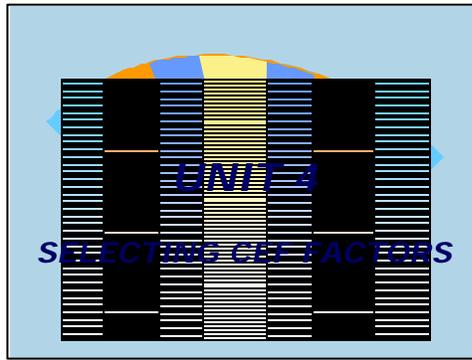
**A.** *The five types of work are:*

- *Repair.*
- *Retrofit.*
- *New construction.*
- *Hazard mitigation.*
- *Other.*

**Q.** When should FEMA cost codes be used for an estimate?

**A.** *When better information, such as local average weighted unit costs, is not applicable or available (use FEMA cost codes as a last resort only).*

Ask the participants if they have any questions.



## Unit 4 - Selecting CEF Factors

🕒 60 Minutes

Inform the class that this unit will focus on the accurate selection of CEF factors.

## **Unit 4**

### **Selecting CEF Factors**

Time: 60 Minutes

### **Objectives**

At the end of this unit, participants will be able to:

- Describe the factors in Parts B through H.
- Select factors, given the scope of work and project conditions.

### **Scope**

The instructor will cover the following:

- Parts B through H of the CEF Spreadsheet
- Examples of completed CEF Spreadsheets, using example 1-3, Appendix B of the Instructional Guide.

### **Methodology**

The instructor will open the unit with a brief recap of Parts B through H. Following this description, the instructor will emphasize the importance of addressing as many items as possible in Part A and **using Parts B through H only for those items that cannot be adequately addressed in Part A.**

The instructor will then describe the factors in each of the Parts. The instructor will use example 3 from Appendix B of the Instructional Guide to illustrate the selection of each factor, given specific project conditions. Participants will follow along on their computers or handouts.

The instructor should emphasize that the rules for applying CEF factors are covered in Unit 5.



## Objectives

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- ▲ Describe the factors in Parts B-H.
- ▲ Apply factors appropriately.

State the objectives.

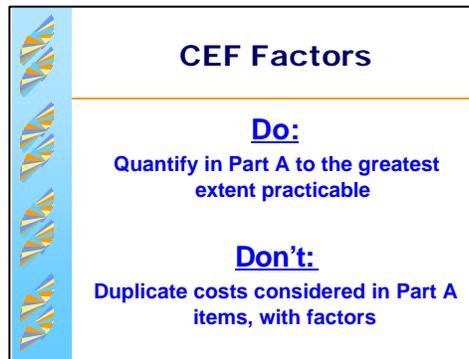
| <b>CEF Factors</b>  |   |
|---|---|
|  | <b>B: General requirements</b>          |
|   | <b>C: Cost contingencies</b>            |
|   | <b>D: Overhead and profit</b>           |
|   | <b>E: Inflation</b>                     |
|   | <b>F: Permits and fees</b>              |
|   | <b>G: Reserve for change orders</b>     |
|   | <b>H: Project management and design</b> |

Briefly re-cap the factors that make up the CEF.

Recalling the discussion of eligibility, note that the costs represented by these factors are allowable under Part 13 of 44 CFR (refer to page 5 of the Instructional Guide - Eligible Work and Cost).

Inform the class that each factor will be described in detail.

Instruct the class to open the Instructional Guide to the Summary of Uncompleted Work in Appendix A. As each factor is described, refer the class to the relevant lines on this worksheet.



Inform the class that the factors are available to estimate construction related costs normally encountered during the course of construction at the time the estimate is prepared.

Emphasize that the items represented by the factors should be quantified in Part A if possible.

- For example : if costs for access to a site are known and can be quantified, include those items in Part A instead of using the C.3 factor; also general conditions/temporary controls in B factor.

Also caution the class that they must not use a factor if the cost represented by that factor has been quantified in Part A.

- For example : if unit costs obtained from a bid package include the general contractor's overhead, insurance and bonds, and profit, Part D must not be used.

Referring to the Summaries of Completed and Uncompleted Work, remind the class that:

- the factors can be applied separately to the two categories of work (permanent and non-permanent); and
- using the columns across the worksheet, the factors can be applied separately to different types of work.

Emphasize that any assumptions made when selecting factors must be recorded on the CEF Notes Sheet.



Inform the class that Part B represents the general contractor's non-permanent, job-site costs. Briefly describe each of the items here, providing examples and giving recommended factors.

**Safety and security measures:**

- Refer the class to the examples on page 29 of the Instructional Guide.
- Recommended value - 4 to 6 percent.
- Use higher end for:
  - ◆ Large projects, such as airports.
  - ◆ Segmented sites with phased construction.
  - ◆ Projects in urban areas.
  - ◆ An example of special cases where this has been included in Part A could be the Div.1 mark-up for prisons.

**Temporary services and utilities:**

- Includes:
  - ◆ Construction trailer, temporary site office space, and related site office equipment.
  - ◆ Temporary utilities.
  - ◆ Weather protection, temporary services or utilities.
- Recommended value - 1 percent.

**Quality control:**

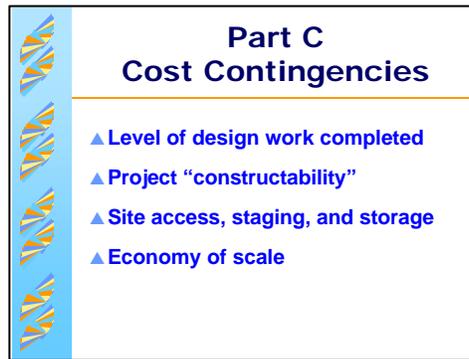
- Completion of quality control by an organization other than the Applicant or the contractor.
  - ◆ Example: independent testing and inspection service to ensure quality of construction.
- Examples of quality control activities:
  - ◆ Non-destructive examination of welds.
  - ◆ Water-quality testing.
- Recommended value - 0.5 percent for most projects; up to 1.0 percent.
  - ◆ Use higher incremental values as specific complexities increase.

**Submittals:**

- Contractor's costs for preparing shop drawings, certifications, samples, progress schedules.
- Recommended value - up to 5 percent.

**General conditions:**

- Represents contractor's on-site project management costs.
  - ◆ Field supervision.
  - ◆ Quality control.
- Before applying this factor, verify that these costs are not included in unit costs or bid prices.
- Factor is fixed at 4.25 percent.



Inform the class that Part C accounts for factors that are unknown at the time the estimate is prepared. It is included to create an appropriate level of probability for completing the project within that estimate. Briefly describe each of the items here, providing examples and giving recommended factors.

### **Design phase scope contingencies:**

- Based on the concept that there are more unknowns early in the design process (the schematic stage) than at the final design stage.
  - ◆ Example: quantity take-offs will be less accurate at the *schematic stage* (or the preliminary engineering analysis stage) than at the *working drawing stage*.
- Factor should be applied based on progress of design at the time the estimate is prepared.
- Refer to page 31 of the Instructional Guide for the range of recommended values as applied to the two levels of design development.

### **Constructability:**

- Accounts for complexity of construction, given the type of facility and site conditions.
- Applies to repair and retrofit projects only; does not apply to new construction.
- Refer the participants to:
  - ◆ The list of site conditions and construction process complexities on page 32 of the Instructional Guide.
  - ◆ Table C.2 on page 32, which gives a range of factors. The factor may be directly entered into the Summary of Uncompleted Work.
- Use an example:
  - ◆ Unstable soil conditions at a bridge require more detailed sequencing and greater supervision. Using Table C.2, a factor of 5 percent could be applied; if the anticipated increase in the construction cost had not already been included in the Part A estimate.

### **Access, staging, and storage:**

- Accounts for site conditions that could impose additional unaccounted for costs on the work activities listed in Part A.
- Ask the class for examples. Use the following after class offers examples:
  - ◆ Site access obstructions created by utilities.
  - ◆ Off-site storage of materials due to space constraints at site of construction.
  - ◆ Staging complications brought about by the need to keep a facility open while it is being repaired. For example, hospitals, prisons and city halls.
- Recommended value - 1 to 4 percent for each item.
- Each item should be assessed separately by the Project Officer. Reference page 33 of the Instructional Guide.

### **Economies of scale:**

- Accounts for the reduction in cost that may be associated with an unusually large project.
- Refer the class to Table C.4 on page 34 of the Instructional Guide for values.

Note that the worksheet automatically sets the factor, depending on the cost of the project.



Inform the class that Part D accounts for the general contractor's costs that have not been included in Parts A, B, and C.

Briefly describe each of the items here, providing examples and giving recommended factors.

Note that the Part D factor should not be used:

- If unit costs in Part A include the general contractor's costs, e.g. using general contractors bid costs.
- For force account work.

**Home office overhead (Factor D.1):**

- Accounts for the general contractor's main home office expenses, such as labor and operating costs.
- Factor is fixed at 7.7 percent.

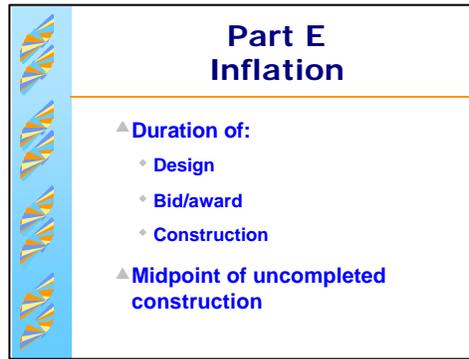
**Insurance and bonds (Factor D.2):**

- Accounts for the general contractor's costs for:
  - ◆ Payment and performance bonds.
  - ◆ Builder's risk insurance.
  - ◆ Public liability insurance.
- Factor is fixed at 3.3 percent.

**Profit:**

- Accounts for the general contractor's profit.
- Factor is based on:
  - ◆ Project size - the sum of Parts A, B, C, D.1, and D.2.
  - ◆ Type of work being performed (repair, retrofit or new construction).

Refer the participants to Table D.3 on page 35 of the Instructional Guide for values.



Inform the class that Part E allows the user to adjust the estimate for inflation during the design and construction period.

Refer the participants to page 35 of the Instructional Guide and describe the equation used to calculate cost escalation allowance.

Note that the user will have to determine:

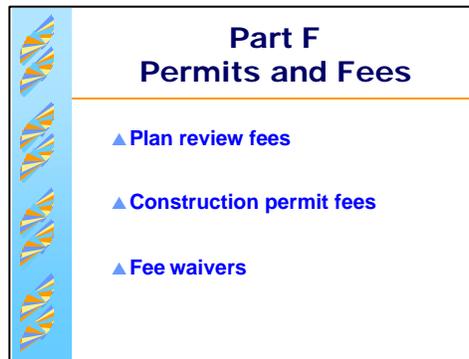
- The number of months to the midpoint of uncompleted construction from a design/construction timeline analyzed for eligibility, reasonableness and applicability to the type of construction activity to be undertaken.
- The escalation factor.

#### **Determining the midpoint of uncompleted construction:**

- Need to establish project timeline that includes:
  - ◆ Preparation of design and bid documents.
  - ◆ Solicitation of bids, review of bids, and awards.
  - ◆ Construction start and completion dates.
- Emphasize that the timeline must be based only on:
  - ◆ Uncompleted work.
  - ◆ Eligible work.
- Timeline may be developed:
  - ◆ By the Applicant.
  - ◆ By the Project Officer only in the absence of an Applicant developed timeline, who may:
    - use information for similar projects; or
    - If above is unavailable, use estimates.
- Estimated durations:
  - ◆ Design/bid: for buildings 25 to 40 percent of construction time (reference the appropriate R.S. Means Cost Data book for the type of infrastructure).
  - ◆ Bid process: typically 2 to 3 months (may be shorter or longer).
  - ◆ Construction: outline major construction tasks/critical path items.
- Emphasize: looking for the months to the midpoint of *construction*, not to the midpoint of design and construction (the whole process).

#### **Determining the escalation factor:**

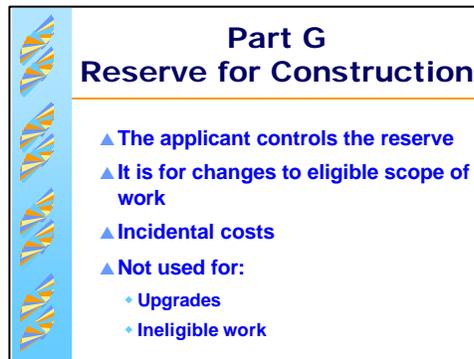
- Based on a 2-year average of cost indexes found in the *Engineering News Record* (the internet address is [www.enr.com/cost/cost2.asp](http://www.enr.com/cost/cost2.asp)).
- The information should be obtained at the beginning of the disaster from the PAO or from the ENR internet site.
- Refer the class to the example at the bottom of page 37 of the Instructional Guide. Emphasize that information regarding the escalation factor should be included on the CEF Notes Sheet.



Inform the class that Part F allows for fees charged by State and local agencies for plan reviews and construction permits.

Highlight the following points:

- The user must enter the actual cost of fees into the spreadsheet.
  - ◆ The PAO may obtain this information at the beginning of the disaster and distribute it to the Project Officers (generally a flat fee or % of the engineers estimate); or
  - ◆ the Project Officer may work with the Applicant to determine actual costs.
- Some facilities, such as hospitals, may require special additional reviews by State regulatory agencies.
- State and local agencies may waive fees during disaster recovery situations.
  - ◆ Where fees are waived Part F is not applicable.



Inform the class that Part G reflects the Applicant’s reserve for construction.

These funds are:

- Approved by FEMA for changes in the eligible scope of work.
- Incidental costs that could be incurred after the construction contract is awarded.
- Instructor should provide specific examples as appropriate for:
  - ◆ errors and omissions
    - changes in the work between the time of the CEF estimate and the time of construction
    - minor changes orders associated with the eligible scope after the start of construction
  - ◆ schedule improvements
    - changes in scheduling of the work between the time of the CEF estimate and the time of construction
  - ◆ unforeseen construction problems
    - for example, changes to the method of work, etc. after the design is complete
  - ◆ estimating inaccuracies
    - minor quantity changes due to estimating inaccuracies after design was completed (pre-design stage is accounted for on the design stage contingency, Part C)

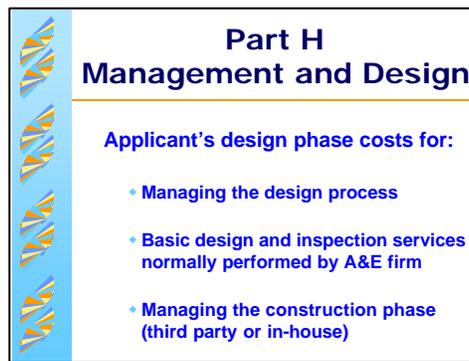
These funds are not intended for:

- Upgrades that are not part of the eligible scope of work.
- Ineligible items.

If the additional work is:

- **eligible** - FEMA will approve funds and prepare a supplemental Project Worksheet obligating additional funds as necessary.
- **ineligible** - FEMA will prepare a supplemental Project Worksheet deobligating funds as necessary.

Note that the factor is based on project size, and refer the class to Table G.1 at page 39 for the range of factors.



Inform the class that Part H represents the Applicant's costs for project management. Emphasize that these costs are:

- Eligible costs associated with completing the work.
- Not to cover initial damage identification.
- Not covered by the statutory administrative allowance that the Applicant receives as a percentage of the grant. The statutory administrative allowance is provided to cover the Applicant's costs for requesting, obtaining, and administering Federal assistance, not costs for managing projects.

**Managing the design phase (if applicable):**

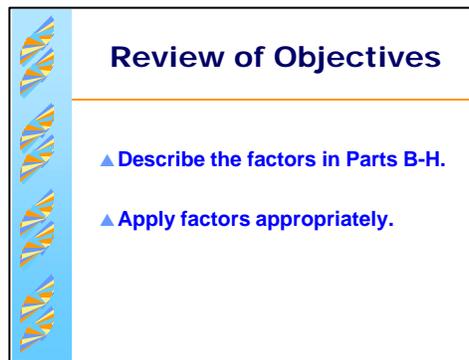
- The factor is fixed at 1 percent. Allows for the cost of:
  - ◆ Procuring and managing A&E contracts.
  - ◆ Managing permitting and special review processes.
  - ◆ Interfacing with other agencies.

**A&E contract costs (if applicable):**

- Allows for the cost of basic services, including:
  - ◆ Preliminary engineering analysis.
  - ◆ Preliminary design.
  - ◆ Final design.
  - ◆ Construction inspection.
- Factor based on FEMA's engineering services curves.
  - ◆ Refer the class to the Summary of Uncompleted Work. Note that user must select Curve A (complex projects) or Curve B (projects of average complexity). Spreadsheet automatically calculates.
  - ◆ Curve A & B definitions are found on pages 40 and 41 of the Instructional Guide.
  - ◆ Worksheet calculates percentage based on project size.
- Special services: if required are not considered in curves A or B. These services include:
  - ◆ Emphasize, the costs of these services should be itemized in Part A.
    - engineering surveys
    - soil investigations
    - resident engineer services
    - feasibility studies
- Construction inspection factor:
  - ◆ Use when the nature of the work requires only basic construction inspection services.
  - ◆ Refer the class to page 41 of the Instructional Guide for a list of these services.
  - ◆ May not be used in combination with Curve A or B.
  - ◆ Factor is fixed at 3 percent.

**Project management (construction phase):**

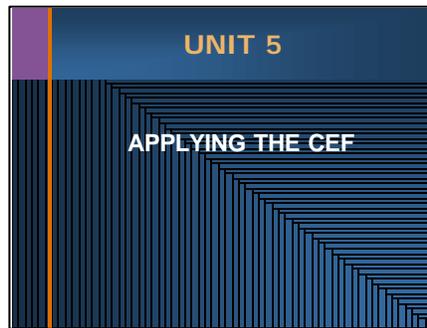
- Factor is based on project size. Allows for project management costs during construction. Refer class to Table H.3 on page 42 of the Instructional Guide for examples and the range of factors



To reinforce the objectives, ask the class the following questions.

- Q.** Based on past experience with the contractor and the nature of the project, the Applicant is able to provide an estimated cost for concrete testing or is able to conduct the testing in-house during construction. How should this cost be handled?
- A.** *Rather than using the B.1 factor (turn this factor off), this cost should be included in Part A.*
- Q.** The project involves replacement of the damaged wing of a school building. Should the C.2 factor (Constructability) be used?
- A.** *No. This factor should not be applied to replacement projects.*
- Q.** Unit costs in Part A are taken from R.S. Means and include overhead and profit. Should Part D (General Contractor's Overhead and Profit) be used?
- A.** *Yes, if the project will have the typical general contractor-subcontractor relationship. If the project will not have this relationship, e.g., an extremely simple piece of work that would not be divided or subcontracted (painting). In this example the unit costs for painting from Means should be sufficient to represent the contractor's overhead and profit and additional general contractor overhead and profit (Part D), should not be used.*
- Q.** Where can the escalation factor be obtained?
- A.** *From the Engineering News Record or from the Public Assistance Officer.*
- Q.** If the Applicant requires construction inspection services only, should A&E contract costs be included?
- A.** *No. Only the construction inspection services factor should be included.*

Ask the participants if they have any questions.



## Unit 5 - Applying the CEF

🕒 60 minutes

Inform the class that this unit will cover the application of the CEF to different project situations.

## **Unit 5**

### **Applying the CEF**

Time: 60 minutes

#### **Objectives**

At the end of this unit, participants will be able to apply the CEF and understand how the CEF handles a broad range of project conditions, including:

- Stage of completion
- Force account work
- PA Program funding options

#### **Scope**

The instructor will cover the following:

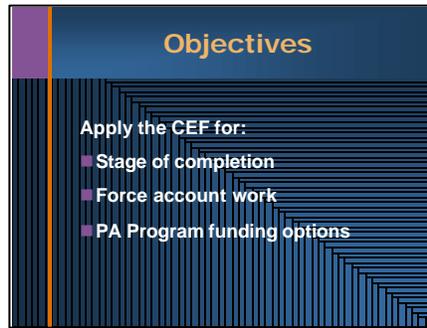
- Various stages of completion of the work
- Combinations of force account and contract work
- Funding options such as: hazard mitigation, approved projects, alternate projects, and repair vs replacement

#### **Methodology**

In this unit, the instructor will use examples of various projects at different stages of completion to illustrate how the CEF is applied. The instructor will also discuss the impact of projects that will utilize all force account, a combination of force account and contract, and projects where there is a lack of information on how the work will be executed. The instructor will then discuss the PA Program funding options and how the CEF is applied to those options.

#### **Exercise:**

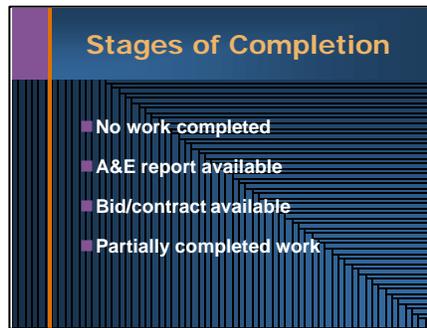
There are four examples of various stages of completion of projects. Four scenarios are presented for the same project, and the exercise is designed to illustrate to participants how the stage of completion affects the application of the CEF.



State the objectives.

Note that “PA Program funding options” include:

- Hazard mitigation
- Improved projects
- Alternate projects
- Repair vs. replacement projects (using the 50-percent rule)



Begin by noting the stages of completion shown on the visual. State that the CEF may be applied differently to each situation.



## EXERCISE

Inform the class that an exercise will be conducted to illustrate how the CEF is applied in these circumstances.

In this exercise, the participants will be asked to apply the CEF concept to each of these situations.

Give the participants 15 minutes to review the exercise and provide their results. Take 15 minutes to review the results and provide solutions.

During the review of the exercise, emphasize that unit costs must be reviewed to ensure that factors are appropriately applied.

## EXERCISE SCENERIO AND SOLUTIONS

### Unit 5

#### Exercise

The facility, a one-story elementary school building with an attached gymnasium/multipurpose room, was damaged during a tornado. The gymnasium must be replaced. The school building sustained major damage to doors, windows, roof, and interior components.

---

For each of the following exercise scenarios, perform the following tasks.

1. Describe the source of line items to be used in Part A.
2. Indicate whether the line items in Part A should be adjusted for:
  - overhead and profit; and
  - geographic location.
3. Assess the general applicability of Factors B through H and determine which factors should be applied. It is not necessary to analyze the specific subfactors of Parts B and C.

Note any differences that would occur due to the type of work (repair, retrofit, and so on) being completed.

## EXERCISE SCENERIO AND SOLUTIONS Continued...

### Scenario 1: No Work Completed

In Scenario 1, the Applicant has not started work to restore the facility, other than installation of security fencing and removal of scattered debris. The Applicant has retained an A&E firm to begin design work, and intends to contract the restoration work out. The Applicant does not have recent cost data that could be used to estimate the cost of the work.

---

#### Source of data for Part A:

- *Because the Applicant does not have recent cost data, the team should use R.S. Means cost data to develop the estimate.*
- *Work should be separated into repair (school building) and replacement (gymnasium).*

#### Adjustments to Part A:

- *Overhead and profit? Subcontractor overhead and profit should be included in Part A.*
- *Geographic location? Line items should be adjusted using the cost indexes from R.S. Means.*

#### Application of factors:

Part B: General Requirements: *Check unit costs first to review if safety and security, temporary services, quality control, submittals and general contractor's on-site project management are included in the Part A costs, then apply Part B factor if not already included.*

Part C: Contingencies: *Yes. Each part C factor should be reviewed for inclusion. The constructability factor, C.2, would not be applied to the non-complex gymnasium construction.*

Part D: Overhead and Profit: *Check unit costs first, then apply if appropriate and not already included. Overhead and Profit should already be included in "as-bid" costs, therefore the Part D factor should not be added. A&E cost estimates should be carefully reviewed to see if Overhead and Profit for the general contractor has been included.*

Part E: Escalation: *Yes, after a review of the design and construction timeline has been completed and the months to the mid-point of uncompleted construction determined.*

Part F: Fees: *Yes, assuming they have not been waived.*

Part G: Applicant's Reserve: *Yes, construction has not commenced, and approved change orders would be eligible.*

Part H: Project Management: *Yes, project management costs are eligible. If actual completed A&E costs are known, they can be included in Part A and the H.2 factor would not be used.*

## EXERCISE SCENERIO AND SOLUTIONS Continued...

### Scenario 2: A&E Report Available

In Scenario 2, the Applicant has not started work to restore the facility, other than installation of security fencing and removal of scattered debris. The Applicant has retained an A&E firm to handle the design work and provide engineering services during the bid process and construction. The firm has produced an A&E report with a construction cost estimate, and this report is available to the project formulation team.

The Applicant intends to contract the restoration work out but has not yet begun the process of soliciting bids.

---

#### Source of data for Part A:

*The team should review the A&E cost estimate to ensure that all costs are necessary, reasonable, and tied to the eligible scope of work. If the estimate meets these criteria, line items from the estimate may be used. Otherwise, the team should use an appropriate source (such as Means).*

*The A&E costs should be evaluated for the inclusion of factors B-H. If the estimate is based on “as-bid” costs, the Part A, unfactored costs should be extracted. The unfactored or “stripped” costs should then be factored using the CEF as appropriate. Work should be separated into repair (school building) and replacement (gymnasium).*

#### Adjustments to Part A:

- Overhead and profit?  
*The team should ensure that the A&E line items include subcontractor overhead and profit.*
- Geographic location?  
*If the A&E firm based its estimate on local costs, an adjustment is not appropriate.*

#### Application of factors:

*The line items should be reviewed to see if any of the factors are accounted for in unit costs.*

Part B: General Requirements: *Check unit costs first to review if safety and security, temporary services, quality control, submittals and general contractor’s on-site project management are included in the Part A costs, then apply Part B factor if not already included.*

Part C: Contingencies: *Yes. Each part C factor should be reviewed for inclusion. The constructability factor, C.2, would not be applied to the non-complex gymnasium construction.*

Part D: Overhead and Profit: *Check unit costs first, then apply if appropriate and not already included. Overhead and Profit should already be included in “as-bid” costs, therefore the Part D factor should not be added. A&E cost estimates should be carefully reviewed to see if Overhead and Profit for the general contractor has been included.*

Part E: Escalation: *Check unit costs first, then apply if appropriate and not already included.*

Part F: Fees: *Yes, assuming they have not been waived.*

Part G: Applicant’s Reserve: *Yes, construction has not commenced, and approved change orders would be eligible.*

Part H: Project Management: *Yes, H1 and H3 only. The cost of the A&E work should be known and can be included in Part A.*

## EXERCISE SCENERIO AND SOLUTIONS Continued...

### Scenario 3: Bid/Construction Contract Available

In Scenario 3, the Applicant has not started work to restore the facility; however, using appropriate procurement procedures, the Applicant has retained a contractor who will soon begin work. The bid documents, with the contractor's unit costs, are available to the project formulation team.

The Applicant had previously retained an A&E firm to handle the design work and provide engineering services during the bid process and construction.

---

#### Source of data for Part A:

*The team should review the bid to ensure that all costs are necessary, reasonable, and tied to the eligible scope of work. If the estimate meets these criteria, unit costs from the bid may be used. Otherwise, the team should use an appropriate source (such as Means).*

*Work should be separated into repair (school building) and replacement (gymnasium).*

#### Adjustments to Part A:

- Overhead and profit?  
*No; the bid should include subcontractor overhead and profit.*
- Geographic location?  
*No; the bid should reflect the cost of completing work in this location.*

#### Application of factors:

- *The line items should be reviewed to see if any of the factors are accounted for in unit costs.*

Part B: General Requirements: *No, the bid should already include the contractor's General Requirements.*

Part C: Contingencies : *No, the bid should already include the contractor's Contingencies.*

Part D: Overhead and Profit: *No, the bid should already include the contractor's Overhead and Profit.*

Part E: Escalation : *No, the bid should already include the contractors Escalation.*

Part F: Fees: *Yes, assuming they have not been waived.*

Part G: Applicant's Reserve: *Yes, construction has not commenced, and approved change orders would be eligible.*

Part H: Project Management *Yes, H1 and H3 only. The cost of the A&E work should be known and can be included in Part A.*

## EXERCISE SCENERIO AND SOLUTIONS Continued...

### Scenario 4: Work Partially Completed

In Scenario 4, the Applicant has completed demolition of the damaged gymnasium building and has cleared the site. The Applicant was required to retain an environmental engineering firm to test for asbestos and to monitor air quality during demolition. The contractor who performed the demolition work is not the same contractor who has won the contract to restore the facility.

Assume that Scenario 4 is otherwise the same as Scenario 3. Describe how the CEF would be applied differently.

---

### Source of data for Part A:

*Work should be separated into completed and uncompleted work. The actual cost of demolition should be included in Part A for completed work.*

### Adjustments to Part A:

- Overhead and profit? *For completed work, these costs should already be included;*
- Geographic location? *For completed work, these costs should already be included.*

### Application of factors:

Part B: General Requirements *No, actual costs are available.*

Part C: Contingencies *No. There are no contingencies for actual costs.*

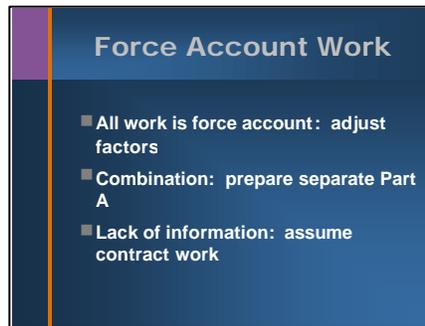
Part D: Overhead and Profit *No, actual costs are available.*

Part E: Escalation *No, actual costs are available.*

Part F: Fees *Yes, assuming they have not been waived and have not been included in Part A.*

Part G: Applicant's Reserve *No, actual costs are available.*

Part H: Project Management *H.1 and H.3 only. The cost of the environmental firm should be known and should be included in Part A.*



Inform the class that there is an additional situation--force account work--that affects the manner in which the CEF is applied.

- **Note:** ensure that all participants understand the meaning of the term “force account.” If there are participants who are unfamiliar with this term, state that it refers to the use of the Applicant’s own labor, equipment, and material to complete a project.

**For work already completed using force account resources:**

- Use actual costs based on force account rates for labor, equipment, and material.
- Do not apply factors.

**For work to be completed using force account resources:**

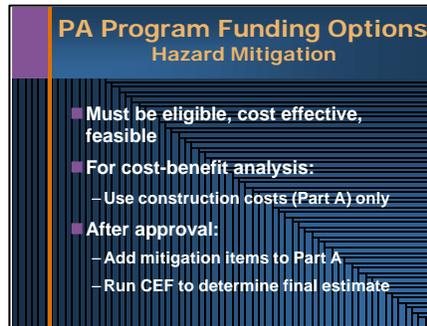
- Ask the class to state the source of costs in Part A and which of the factors B-H that could be applied.
  - ◆ Use unit costs from an appropriate source (such as R.S. Means production rates, historical records) for the Part A estimate, not expected labor and equipment hours.
  - ◆ Unit costs may include subcontractor overhead and profit.
  - ◆ Do not use Part D.

**For combinations of force account and contract work:**

Prepare separate Part A and apply factors separately.

**Will work be completed using force account?**

- The Project Officer should attempt to determine if force account resources will be used.
- If better information is not available, assume work will be completed by a general contractor and subcontractors, not by force account.



**Transition:** The discussion will now focus on the application of the CEF to various PA Program funding options.

The first of these options is hazard mitigation.

Inform the class that, under FEMA policy, mitigation measures must be:

- Eligible.
- Cost effective.
- Feasible.
- Directly related to eligible disaster related damages.
- Reduce potential of future, similar damages.

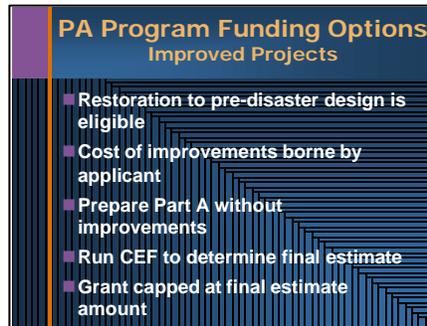
Refer the class to page 20 of the Instructional Guide for FEMA policy regarding criteria for cost-effectiveness.

- Note that cost-effectiveness is tied to the cost of eligible work.
- Emphasize that, when making the cost-effectiveness determination, only the Part A cost should be used.
- Use these examples to illustrate this concept.
  - ◆ A bridge is destroyed during a flood. As part of the replacement, the Applicant proposes that riprap be installed along both banks of the stream as a mitigation measure. The construction cost (Part A) of the riprap is less than 15 percent of the construction cost (Part A) of the new bridge. Under FEMA policy, the riprap installation is cost-effective.
  - ◆ Floodwaters inundate a county office building, damaging equipment in the basement, and flooring, doors, walls, and furnishings on the first floor. As part of the repair, the project formulation team proposes the installation of floodproofing measures to prevent inundation during the next flood. A cost-benefit analysis must be conducted by the Grantee or Subgrantee for measures that exceed:
    1. 15% of the total eligible cost of the eligible repair work for a particular project, and
    2. the pre-approved mitigation measures listed in the Appendix (4/29/98) of FEMA Policy 9526.1.

Only the Part A cost of the repair items and the Part A cost of the floodproofing measures may be used when the cost-benefit analysis is performed.

Once a mitigation proposal has been approved:

- Work elements for mitigation should be included in Part A.
- CEF factors should be applied to the Part A total (including mitigation) to develop the final estimate.

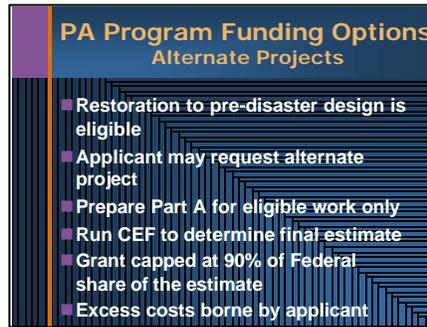


Briefly outline the improved project concept.

- Restoration of a facility to its pre-disaster design, function, and capacity is eligible.
- An Applicant may request that, as part of the restoration, improvements be included.
- Examples:
  - ◆ A fire station with two bays is destroyed in a tornado. The Applicant decides to rebuild the station with four bays.
  - ◆ A 48-inch corrugated metal pipe conveys a stream beneath town streets. The pipe, which is destroyed during the flood, is subject to frequent corrosion and is undersized. The Applicant would like to replace the pipe with a 60-inch reinforced concrete pipe.
- In such cases, PA Program funds are capped at the eligible cost of the restoration; the Applicant must cover the additional cost of the improvements.

Describe the steps to applying the CEF to improved projects:

- Prepare the Part A estimate for restoration of the pre-disaster design of the facility; that is, without improvements.
  - ◆ Using the pipe example cited above: prepare Part A for restoration of the 48-inch corrugated metal pipe.
- Apply factors to Part A to get the final estimate.
- Grant funds are capped at this estimate.



Briefly outline the alternate project concept.

- Restoration of a facility to its pre-disaster design, function, and capacity is eligible.
- An Applicant may request that the facility be abandoned and the funds used for an alternate project.
- Example:
  - ◆ A bridge crosses a river that changes course frequently. The latest flood has washed out the abutments and convinced the Applicant that they cannot rebuild the bridge at this location. They request that PA Program funds for the bridge be used to improve roads on the far side of the river so that the bridge is no longer necessary.
- In such cases, PA Program funds are capped at 90% of the Federal share for the estimated cost of the eligible work.

Note that the steps to applying the CEF to alternate projects are similar to those for improved projects.

- Prepare the Part A estimate for restoration of the pre-disaster design of the facility.
  - ◆ Using the bridge example cited above: prepare Part A for restoration of the bridge, not for the improvements to the road.
- Apply factors to Part A to get the final estimate.
- Grant funds are capped at 90% of the Federal share of this estimate.

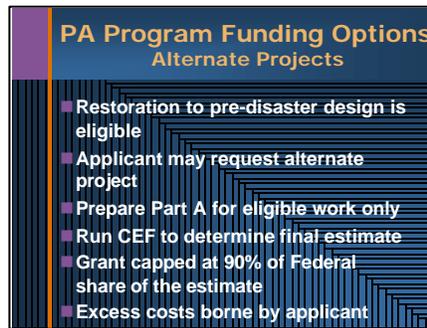
An example of an alternate project cap calculation performed in the normal fashion is:

- Disaster is 75% Federal share and 25% State share (cost sharing amounts between the Federal government and the non-Federal interests is established in the FEMA-State Agreement for each disaster).
- The eligible project cost estimate obtained from the CEF Total Project Summary sheet is \$100,000.
  - ◆ Federal share = \$75,000
  - ◆ State share = \$25,000
- Cap funds at 90% of the cost estimate.
  - ◆ Alternate project cap = \$67,500 Federal share

The first step is to complete the Project Worksheet for an alternate project as follows:

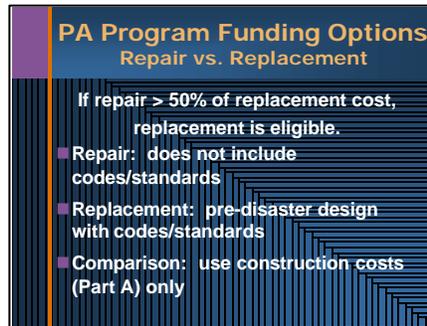
1. Under the **Project Cost** section of the Project Worksheet (FEMA Form 90-91) the Project Officer will print the following information:

**Notes continue on next page.**



**SAME SLIDE -- Notes continued from previous page.**

- Start with Item #1; use Code #9999; add in the *Narrative* block this statement “See attached CEF spreadsheet for itemized unit-price estimate particulars”; add 1/LS (lump sum) for the *Quantity/Unit*; and use the Complete Project Total for Completed and Uncompleted Work value that is obtained from the CEF Total Project Summary sheet to fill-in the *Unit Price* and *Cost* blocks.
2. Use additional line items as necessary for cost adjustments to line item #1 above. Examples of cost adjustments are a deduction for anticipated or actual insurance proceeds, or salvage value/depreciation, etc.
  3. The next step is to make the alternate project adjustment. Start with the appropriate *Item* number; use Code #9999; add the title “Alternate Project Cap” in the *Narrative* block; add 1/LS (lump sum) for the *Quantity/Unit*; and enter 10% of the remaining project cost after adjustments into the *Unit Price* and *Cost* blocks. Use a negative sign (-) in front of the value. This action will reduce the final project cost estimate by 10% (after appropriate cost adjustments are made – see item #2 above).
  4. The *Total Cost* block of the PW will now reflect the final eligible 100% project cost estimate (after any cost adjustments previously noted). Subsequent processing of the PW will proportion the cost into its Federal/State/local share components.



Inform the class that the PA Program regulations provide for replacement of facilities when they are too badly damaged to be repaired.

Review the equation given on the visual. Note that this equation is often referred to as the “50 percent rule.”

Define the costs that are included when comparing repair and replacement.

**Repair:**

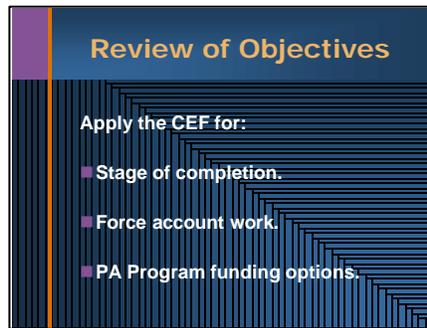
- Work necessary to restore the facility to pre-disaster condition.
- *Does not include* the cost of upgrades necessary to meet current codes and standards, even though these costs may be eligible.

**Replacement:**

- The cost of replacing the facility to its pre-disaster design, function, and capacity.
- *Includes* the cost of upgrades necessary to meet current codes and standards.

Using the CEF with the 50-percent rule:

- Prepare separate Part A’s for repair and replacement.
- Compare these estimates to determine if the facility should be repaired or replaced.
- If repair is selected, add any eligible upgrades for codes and standards and apply CEF factors to get final estimate.
- If replacement is selected, apply CEF factors to get final estimate.



To reinforce the objectives, ask the following questions:

**Q.** If a bid is being used to develop an estimate, what factors should be carefully reviewed?

**A.** *Parts B, C, D, and E should be checked to ensure that they do not duplicate costs that may be present in the contractor's unit costs.*

**Q.** If the Project Officer is not sure whether work will be completed using force account resources, how should he or she proceed?

**A.** *The Project Officer should prepare the estimate as though the work will be completed under contract.*

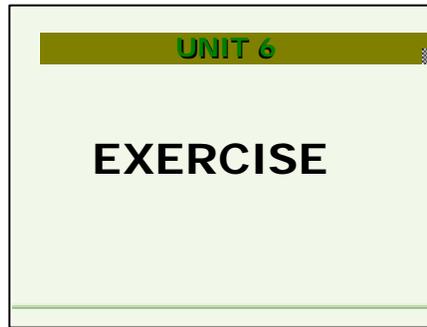
**Q.** What costs should be used when determining the cost-effectiveness of a hazard mitigation proposal?

**A.** *Only the Part A cost should be used.*

**Q.** For an improved project, should the cost of improvements be included in Part A?

**A.** *No. Only the eligible cost of restoring the facility to its pre-disaster condition should be used in Part A.*

Ask the class if there are any questions.



## Unit 6 - Exercise

🕒 150 minutes

Inform the participants that they will now participate in an exercise in which they can apply what they have learned.

## **Unit 6**

### **Practical Exercise**

Time: 150 Minutes

### **Objective**

At the end of this unit, participants will be able to develop an estimate using the CEF.

### **Methodology**

In this unit, the participants will apply what they have learned to a practical problem. The instructor will allow the participants to work for 90 minutes, then spend 60 minutes reviewing the results and taking questions.

The participants will be given an exercise that includes:

- a description of a damaged facility;
- a list of proposed work items;
- unit cost data; and
- information regarding the adjustment of unit costs and CEF factors.

To ensure that the participants focus on the objectives of the course, the participants will be directed to assume that all of the proposed work items are eligible. Also, the project in the exercise will meet all of the qualifications for using the CEF. Using this information, the participants will develop Part A, complete the CEF Spreadsheet, and complete a Project Worksheet.

Once the participants have completed their work, the instructor will lead a discussion of the results. The instructor will focus on the participants' completion of critical tasks, including:

- Categorizing the type of work (that is, as repair, retrofit, and so on).
- Organizing Part A and adjusting unit cost data to account for project conditions.
- Completing Part A.
- Selecting factors.
- Applying the CEF, given the stage of project design or completion and possible Public Assistance Program options (that is, hazard mitigation, improved project, and so on).
- Completing all components of the CEF Spreadsheet.
- Completing the Project Worksheet.

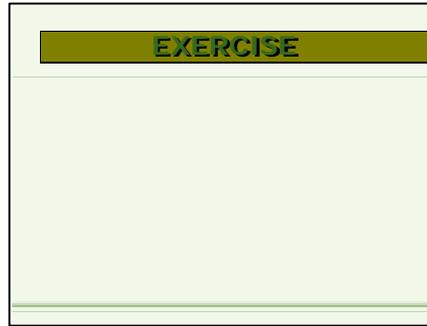
At the conclusion of the discussion, the instructor will hand out a solution to the problem, emphasizing that more than one result is possible.

The instructor will conclude the course by taking any questions.

| Objective                                 |
|---|
| <b>Develop an estimate using the CEF.</b> |

State the objective.

Inform the participants that, at the end of this unit, they will be able to develop an estimate using the CEF.



Refer the class to the Unit 6 exercise in the Participant's Workbook.

Briefly review the scenario with them.

Inform the participants that need to perform the following tasks:

- Complete Part A, using the information provided.
- Apply the factors, noting the justification for applying each factor.
- Complete the components of the CEF spreadsheet.
- Complete the Project Worksheet.

Give the participants 90 minutes to complete work.

- **If the participants have computers**, have them complete their work on-screen. If they are sharing computers, allow them to work as small groups.
- **If the participants do not have computers**, have them use the blank copy of the spreadsheet found in the Participant's Workbook. Instruct them to use the engineering curves on pages 77-78 of the Public Assistance Guide to establish the H.2 factor, if necessary.

After the participants have completed their work, take 60 minutes reviewing the results and taking questions.

Following the review, hand out the solution to the problem, emphasizing that more than one result is possible.

## **Los Angeles County Medical Center, Administration Building (Category E)**

### **Project Description**

The Los Angeles County Medical Center, Administration Building at 999 First Street, Los Angeles, California (Region IX) was damaged as a result of an earthquake on April 1, 1999. The earthquake was declared as FEMA disaster FEMA-0000-DR-CA. The facility is owned and operated by Los Angeles County, an eligible Applicant, PA-ID Number 999-99999. The Medical Center functions as an intermediate care facility and the work is under project number 9999.

Constructed in 1928, the Administration Building is a 31,100 square foot one-story structure with a partial basement. The building sits on a hillside covered by wild grasses and shrubs and is removed from the rest of the buildings comprising the medical campus. The building had an occupancy permit at the time of the disaster. No significant pre-existing conditions were identified. The existing plans indicate that the building has not been significantly modified since its construction.

The building consists of reinforced concrete foundations, floors, perimeter walls, and cross walls with wood frame interior partitions and roof. Interior and exterior walls and ceilings include painted plaster or stucco finish. The roof consists of clay tile over 1' x 6' sheathing.

The Applicant has submitted an A&E report which includes a preliminary estimate of \$400,000 to restore the building to pre-disaster condition and function. The building replacement cost has been estimated at \$90 per square foot or approximately \$2.8 million. All functions have been relocated to adjacent buildings until building repairs are complete.

### **Damage Description**

The damage was verified by FEMA based on a field inspection conducted on May 1, 1999. The major items of repair include:

- Cracking and spalling of basement walls and columns,
- Horizontal and diagonal cracks in reinforced concrete exterior walls,
- Cracks in the concrete walls and floor slab,
- Plaster cracking or spalling of approximately 25% of the wood framed walls and ceilings,
- Exterior stucco cracking or spalling,
- Split or splintered framing members in walls, floor framing, and ceiling panel system,
- Splitting and/or warping of wood framed roof and walls, and
- Displacement or damage of clay tile roofing.

### **Scope of Work**

Detailed information of crack widths and lengths were reviewed in accordance with FEMA publications 306, 307 and 308. As a result of this review the eligible scope of work and repair methods include the following:

- Epoxy inject cracks in concrete columns (19 LF),
- Patching concrete spalls (4 SF),
- Epoxy inject cracks in concrete basement walls and floor slab (817 LF),
- Epoxy inject cracks in concrete exterior walls (257 LF),
- Demolish and replace 8" concrete wall (6.5 CY),
- Remove and replace floor beams (54 BF),

- Remove and replace 6” slab-on-grade (3 CY),
- Remove and replace 1’ x 3’ reinforced strip footing (13 CY),
- Remove and replace wood framed porch roof (14,700 CF),
- Remove and replace wood framed roof (2,455 SF),
- Remove and replace wood framed walls (1,225 SF),
- Patch and paint cracks in interior plaster walls (13,610 SF),
- Patch and paint cracks in interior plaster ceilings (7,775 SF),
- Remove and replace stucco over wood (200 SF),
- Reset/replace displaced or damaged clay roof tiles (3,110 SF),
- Replace casement windows (25 EA),
- Paint exterior (11,603 SF), and
- Paint interior walls (613 SF).

In addition to the repair scope of work, the following ADA upgrades in compliance with FEMA Policy (see page 23 of the IG) have been recommended based on:

- Construct new sidewalks and ramps (1,300 SF), and
- Modify existing ramps to code (1,300 SF).

The Applicant has requested a Hazard Mitigation Proposal (HMP) to tie the roof diaphragm to the perimeter walls. The Subgrantee has performed a cost-benefit analysis that complies with FEMA Policy Number 9526.1 regarding cost effectiveness. The hazard mitigation scope of work that passed the cost-benefit analysis includes:

- Drilling of 1” diameter holes through concrete perimeter walls (215 EA),
- Installation of tension ties (215 EA), and
- Installation of ¾” diameter machine bolts and washers (215 EA).

The Applicant has completed minor repairs using force account labor in order. It has been determined by FEMA that the force account work was part of the permanent repair of the building. Documentation of the following costs has been submitted and reviewed by FEMA:

- Labor (20 hrs @ \$67.82/hr),
- Benefits (20 hrs @ \$37.46/hr),
- Materials (\$1,200), and
- Equipment (\$750).

### **Information relating to the calculation of the CEF factors**

- The project is in the preliminary stages of the design phase. Quantities were estimated based on record drawings provided by the Applicant and verified during the site inspection.
- Based on the Applicant’s design and construction timelines for eligible work, that were reviewed and concurred with by FEMA, it is estimated that there are 7 months of eligible work until the completion date. This timeframe includes design (1.5 months), bid/award (1.5 months), and construction (4 months).
- Building complexity, interior work congestion, and the degree of difficulty of the repair work is considered moderate. Traffic and storage limitations at the site are minimal.

- The Applicant has provided local costs for plan check fees and building permits based on the approved scope of work. Construction permit fees are estimated at \$1,675 and plan review fees are estimated at \$1,325.
- The Applicant, state, or regional agency does not maintain average weighted unit price data (derived from contract history); therefore, the most current R. S. Means cost data publications are the recommended source of cost data to develop the CEF.
- The following City Cost Indices for Los Angeles County has been established by the PAO from 1999 R. S. Means data.

| <b>Division</b> | <b>Category</b>      | <b>Index</b> |
|-----------------|----------------------|--------------|
| 2.0             | Sitework             | 105.1        |
| 3.0             | Concrete             | 115.2        |
| 4.0             | Masonry              | 114.4        |
| 5.0             | Metals               | 105.8        |
| 6.0             | Wood & Plastics      | 108.5        |
| 7.0             | Thermal & Moisture   | 116.3        |
| 8.0             | Doors & Windows      | 103.7        |
| 9.0             | Finishes             | 115.9        |
| 10.0 – 14.0     | Total Division 10–14 | 103.4        |
| 15.0            | Mechanical           | 108.3        |
| 16.0            | Electrical           | 116.6        |
| 1.0 - 16.0      | Weighted Average     | 110.6        |

- The Applicant does not plan to solicit bids for the project before the CEF will be prepared. However, the Applicant plans to complete repairs using a general contractor.

**CEF Fact Sheet**

-

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

**CEF Notes**

-

|   |                                  |
|---|----------------------------------|
| <b>Damaged Facility:</b>                        |                                  |
| <b>Applicant Name:</b>                          |                                  |
| <b>Project Number:</b>                          |                                  |
| <b>Date of Estimate:</b>                        |                                  |
| <b>Preparer(s):</b>                             |                                  |
| <b>Part A Notes:</b>                            | A.1 -<br>A.2 -                   |
| <b>Part B Notes:</b>                            | B.1 -<br>B.2 -                   |
| <b>Part C Notes:</b>                            | C.1 -<br>C.2 -<br>C.3 -<br>C.4 - |
| <b>Part D Notes:</b>                            | D.1 -<br>D.2 -<br>D.3 -          |
| <b>Part E Notes:</b>                            | E.1 -                            |
| <b>Part F Notes:</b>                            | F.1 -<br>F.2 -                   |
| <b>Part G Notes:</b>                            | G.1 -                            |
| <b>Part H Notes:</b>                            | H.1 -<br>H.2 -<br>H.3 -          |
| <b>Miscellaneous Notes &amp; Comments:</b>      |                                  |
| <p><i>Use mouse to<br/>Activate Cursor:</i></p> |                                  |





|                                  |   |  |                      |       |  |                          | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | Total |      |
|----------------------------------|---|--|----------------------|-------|--|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|-------|------|
| <b>PART A</b>                    |   |  |                      |       |  |                          | <b>"Base Costs" for Construction Work-In Trades</b> |                          |                          |                          |                          |       |      |
| <b>A.1</b>                       | <b>Permanent Work (From Part A Estimate)</b>                  |  |                      |       |  |                          |   |                          |                          |                          |                          |       | \$ - |
| <b>A.2</b>                       | <b>Non-Permanent Job Specific Work (From Part A Estimate)</b> |  |                      |       |  |                          |   |                          |                          |                          |                          |       | \$ - |
| <b>Part A Total</b>              |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>PART B</b>                    |   |  |                      |       |  |                          | <b>General Requirements and General Conditions</b>  |                          |                          |                          |                          |       |      |
| <b>B.1</b>                       | <b>General Requirements</b>                                   |  | Range<br>Low to High |       | Enter % in Appropriate Column  |                          |   |                          |                          |                          |                          |       |      |
|                                  | Safety & Security - Airports, Ports & Govt. Owned Marina      |  | 4.0%                 | 6.0%  |  |                          |   |                          |                          |                          |                          |       |      |
|                                  | Temporary Services & Utilities                                |  | 0.0%                 | 1.0%  |  |                          |   |                          |                          |                          |                          |       |      |
|                                  | Quality Control   |  | 0.0%                 | 1.0%  |  |                          |   |                          |                          |                          |                          |       |      |
|                                  | Submittals  |  | 0.0%                 | 5.0%  |  |                          |   |                          |                          |                          |                          |       |      |
|                                  |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>B.2</b>                       | <b>General Conditions (4.25%)</b>                             |  |                      |       |  |                          | <input type="checkbox"/>                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |       |      |
| <b>Part B Total</b>              |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>PART A through B SUBTOTAL</b> |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>PART C</b>                    |   |  |                      |       |  |                          | <b>Construction Cost Contingencies</b>              |                          |                          |                          |                          |       |      |
| <b>C.1</b>                       | <b>Design-Phase Scope Contingencies</b>                       |  | Range<br>Low to High |       | Enter % in Appropriate Column  |                          |   |                          |                          |                          |                          |       |      |
|                                  | Preliminary Engineering Analysis                              |  | 15.0%                | 20.0% |  |                          |   |                          |                          |                          |                          |       |      |
|                                  | Working Drawings  |  | 2.0%                 | 10.0% |  |                          |   |                          |                          |                          |                          |       |      |
|                                  |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>C.2</b>                       | <b>Facility or Project Constructability</b>                   |  |                      |       |  |                          | Enter % in Appropriate Column                       |                          |                          |                          |                          |       |      |
|                                  | Facility or Project Type and Complexity                       |  | (See IG for Values)  |       |  |                          |   |                          |                          |                          |                          |       |      |
|                                  |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>C.3</b>                       | <b>Access, Storage &amp; Staging Contingencies</b>            |  | Range<br>Low to High |       | Enter % in Appropriate Column  |                          |   |                          |                          |                          |                          |       |      |
|                                  | Access Contingencies  |  | 1.0%                 | 4.0%  |  |                          |   |                          |                          |                          |                          |       |      |
|                                  | Storage Contingencies   |  | 1.0%                 | 4.0%  |  |                          |   |                          |                          |                          |                          |       |      |
|                                  | Staging Contingencies   |  | 1.0%                 | 4.0%  |  |                          |   |                          |                          |                          |                          |       |      |
|                                  |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>C.4</b>                       | <b>Economies of Scale</b>                                     |  | 0.0%                 |       | Enter % in Appropriate Column  |                          |   |                          |                          |                          |                          |       |      |
|                                  |   |  | 0.0%                 |       | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>                            | <input type="checkbox"/> | <input type="checkbox"/> |                          |                          |       |      |
|                                  |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>Part C Total</b>              |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>PART A through C SUBTOTAL</b> |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>PART D</b>                    |   |  |                      |       |  |                          | <b>General Contractor's Overhead and Profit</b>     |                          |                          |                          |                          |       |      |
| <b>D.1</b>                       | <b>GC's Home Office Overhead</b>                              |  | 7.7%                 |       | Enter % in Appropriate Column  |                          |   |                          |                          |                          |                          |       |      |
|                                  |   |  |                      |       |  | <input type="checkbox"/> | <input type="checkbox"/>                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |       |      |
|                                  |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>D.2</b>                       | <b>GC's Insurance, Payment &amp; Performance Bonds</b>        |  | 3.3%                 |       | Enter % in Appropriate Column  |                          |   |                          |                          |                          |                          |       |      |
|                                  |   |  |                      |       |  | <input type="checkbox"/> | <input type="checkbox"/>                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |       |      |
|                                  |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>D.3</b>                       | <b>General Contractor's Profit</b>                            |  | 10.0%                |       | Enter % in Appropriate Column  |                          |   |                          |                          |                          |                          |       |      |
|                                  | New Construction  |  | 10.0%                |       | Select a top box for the type of project, and applicable bottom boxes to apply the factor. |                          |   |                          |                          |                          |                          |       |      |
|                                  | Repair/Retrofit   |  | 10.0%                |       | New Construction <input type="checkbox"/>  |                          | Repair/Retrofit <input type="checkbox"/>            |                          |                          |                          |                          |       |      |
|                                  |   |  |                      |       |  | <input type="checkbox"/> | <input type="checkbox"/>                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |       |      |
|                                  |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>Part D Total</b>              |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>PART A through D SUBTOTAL</b> |   |  |                      |       |  | \$ -                     | \$ -  | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |

|   |  |   |                          |                          |                          |                          | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | Total      |
|---|--|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|------------|
| <b>PART E</b> Cost Escalation Factors                         |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          |            |
| <b>E</b>  | <b>Cost Escalation Factor</b>                        | Months                                    | Monthly Factor           |                          |                          |                          |                          |                          |                          |                          |                          |            |
|   |  |   |                          | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -       |
| <b>PART A through E SUBTOTAL</b>                              |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          | \$ -       |
| <b>PART F</b> Plan Review and Construction Permit Cost        |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          |            |
| <b>F.1</b>  | <b>Plan Review Fees</b>                              | (List Individual Requirements Separately) |                          |                          |                          |                          |                          |                          |                          |                          |                          |            |
|   |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          |            |
|   |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          | \$ -       |
| <b>F.2</b>  | <b>Construction Permit Fees</b>                      | (List Individual Requirements Separately) |                          |                          |                          |                          |                          |                          |                          |                          |                          |            |
|   |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          |            |
|   |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          | \$ -       |
| <b>Part F Total</b>   |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          | \$ -       |
| <b>PART A through F SUBTOTAL</b>                              |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          | \$ -       |
| <b>PART G</b> Applicant's Reserve for Change Orders           |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          |            |
| <b>G</b>  | <b>Applicant's Reserve for Change Orders</b>         | 7.0%                                      | <input type="checkbox"/> |            |
|   |  |   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -       |
| <b>PART A through G SUBTOTAL</b>                              |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          | \$ -       |
| <b>PART H</b> Applicant's Project Management and Design Costs |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          |            |
| <b>H.1</b>  | <b>Applicant's Project Management - Design Phase</b> | 1.0%                                      | <input type="checkbox"/> |            |
|   |  |   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -       |
| <b>H.2</b>  | <b>A/E Design Contract Cost</b>                      | Above Average Complexity (Curve A)        | <input type="checkbox"/> | 0.0%                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     |            |
|   |  | Average Complexity (Curve B)              | <input type="checkbox"/> | 0.0%                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     |            |
|   |  | Basic Construction Inspection Services    | <input type="checkbox"/> | 3.0%                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     |            |
|   |  |   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -       |
| <b>H.3</b>  | <b>Project Management - Construction Phase</b>       | 6.0%                                      | <input type="checkbox"/> |            |
|   |  |   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -       |
| <b>Part H Total</b>   |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          | \$ -       |
| <b>PART A through H SUBTOTAL</b>                              |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          | \$ -       |
| <b>TOTAL OF COMPLETED WORK</b>                                |  |   |                          |                          |                          |                          |                          |                          |                          |                          |                          | <b>\$0</b> |

|                                  |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | Total |      |
|----------------------------------|---|--|--|---|-------|--|--|--------------------------|--------------------------|--------------------------|--------------------------|-------|------|
| <b>PART A</b>                    |   |  |  |   |       |  | "Base Costs" for Construction Work-In Trades |                          |                          |                          |                          |       |      |
| <b>A.1</b>                       | <b>Permanent Work (From Part A Estimate)</b>                  |  |  |   |       |  |  |                          |                          |                          |                          |       | \$ - |
| <b>A.2</b>                       | <b>Non-Permanent Job Specific Work (From Part A Estimate)</b> |  |  |   |       |  |  |                          |                          |                          |                          |       | \$ - |
| <b>Part A Total</b>              |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>PART B</b>                    |   |  |  |   |       |  | General Requirements and General Conditions  |                          |                          |                          |                          |       |      |
| <b>B.1</b>                       | <b>General Requirements</b>                                   |  |  | Range<br>Low to High                            |       | Enter % in Appropriate Column  |  |                          |                          |                          |                          |       |      |
|                                  | Safety & Security - Airports, Ports & Govt. Owned Marinas     |  |  | 4.0%  | 6.0%  |  |  |                          |                          |                          |                          |       |      |
|                                  | Temporary Services & Utilities                                |  |  | 0.0%  | 1.0%  |  |  |                          |                          |                          |                          |       |      |
|                                  | Quality Control   |  |  | 0.0%  | 1.0%  |  |  |                          |                          |                          |                          |       |      |
|                                  | Submittals  |  |  | 0.0%  | 5.0%  |  |  |                          |                          |                          |                          |       |      |
|                                  |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>B.2</b>                       | <b>General Conditions (4.25%)</b>                             |  |  |   |       |  | <input type="checkbox"/>                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |       |      |
| <b>Part B Total</b>              |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>PART A through B SUBTOTAL</b> |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>PART C</b>                    |   |  |  |   |       |  | Construction Cost Contingencies              |                          |                          |                          |                          |       |      |
| <b>C.1</b>                       | <b>Design-Phase Scope Contingencies</b>                       |  |  | Range<br>Low to High                            |       | Enter % in Appropriate Column  |  |                          |                          |                          |                          |       |      |
|                                  | Preliminary Engineering Analysis                              |  |  | 15.0%   | 20.0% |  |  |                          |                          |                          |                          |       |      |
|                                  | Working Drawings  |  |  | 2.0%  | 10.0% |  |  |                          |                          |                          |                          |       |      |
|                                  |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>C.2</b>                       | <b>Facility or Project Constructability</b>                   |  |  |   |       | Enter % in Appropriate Column  |  |                          |                          |                          |                          |       |      |
|                                  | Facility or Project Type and Complexity                       |  |  | (See IG for Values)                             |       |  |  |                          |                          |                          |                          |       |      |
|                                  |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>C.3</b>                       | <b>Access, Storage &amp; Staging Contingencies</b>            |  |  | Range<br>Low to High                            |       | Enter % in Appropriate Column  |  |                          |                          |                          |                          |       |      |
|                                  | Access Contingencies  |  |  | 1.0%  | 4.0%  |  |  |                          |                          |                          |                          |       |      |
|                                  | Storage Contingencies   |  |  | 1.0%  | 4.0%  |  |  |                          |                          |                          |                          |       |      |
|                                  | Staging Contingencies   |  |  | 1.0%  | 4.0%  |  |  |                          |                          |                          |                          |       |      |
|                                  |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>C.4</b>                       | <b>Economies of Scale</b>                                     |  |  | 0.0%  |       | <input type="checkbox"/>   |  |                          |                          |                          |                          |       |      |
|                                  |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>Part C Total</b>              |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>PART A through C SUBTOTAL</b> |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>PART D</b>                    |   |  |  |   |       |  | General Contractor's Overhead and Profit     |                          |                          |                          |                          |       |      |
| <b>D.1</b>                       | <b>GC's Home Office Overhead</b>                              |  |  | 7.7%  |       | <input type="checkbox"/>   |  |                          |                          |                          |                          |       |      |
|                                  |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>D.2</b>                       | <b>GC's Insurance, Payment &amp; Performance Bonds</b>        |  |  | 3.3%  |       | <input type="checkbox"/>   |  |                          |                          |                          |                          |       |      |
|                                  |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>D.3</b>                       | <b>General Contractor's Profit</b>                            |  |  | New Construction 10.0%<br>Repair/Retrofit 10.0% |       | Select a top box for the type of project, and applicable bottom boxes to apply the factor.<br>New Construction <input type="checkbox"/> Repair/Retrofit <input type="checkbox"/> |  |                          |                          |                          |                          |       |      |
|                                  |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>Part D Total</b>              |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |
| <b>PART A through D SUBTOTAL</b> |   |  |  |   |       |  | \$ -   | \$ -                     | \$ -                     | \$ -                     | \$ -                     | \$ -  |      |

| -                                      |  |   |                          |                          |                          |                          |  |             |      |      |            |       |
|--|--|---|--------------------------|--------------------------|--------------------------|--------------------------|--|-------------|------|------|------------|-------|
|  |  |   |                          |                          |                          |                          | \$ -   | \$ -        | \$ - | \$ - | \$ -       | Total |
| <b>PART E</b>                          |  |   |                          |                          |                          |                          | <b>Cost Escalation Factors</b>                         |             |      |      |            |       |
| <b>E</b>                               | <b>Cost Escalation Factor</b>                        | <b>Months</b>                             | <b>Monthly Factor</b>    |                          |                          |                          | \$ -   | \$ -        | \$ - | \$ - | \$ -       |       |
| <b>PART A through E SUBTOTAL</b>       |  |   |                          |                          |                          |                          | \$ -   | \$ -        | \$ - | \$ - | \$ -       | \$ -  |
| <b>PART F</b>                          |  |   |                          |                          |                          |                          | <b>Plan Review and Construction Permit Cost</b>        |             |      |      |            |       |
| <b>F.1</b>                             | <b>Plan Review Fees</b>                              | (List Individual Requirements Separately) |                          |                          |                          |                          |  |             |      |      |            |       |
|  |  |   |                          |                          |                          |                          | \$ -   | \$ -        | \$ - | \$ - | \$ -       | \$ -  |
| <b>F.2</b>                             | <b>Construction Permit Fees</b>                      | (List Individual Requirements Separately) |                          |                          |                          |                          |  |             |      |      |            |       |
|  |  |   |                          |                          |                          |                          | \$ -   | \$ -        | \$ - | \$ - | \$ -       | \$ -  |
| <b>Part F Total</b>                    |  |   |                          |                          |                          |                          | \$ -   | \$ -        | \$ - | \$ - | \$ -       | \$ -  |
| <b>PART A through F SUBTOTAL</b>       |  |   |                          |                          |                          |                          | \$ -   | \$ -        | \$ - | \$ - | \$ -       | \$ -  |
| <b>PART G</b>                          |  |   |                          |                          |                          |                          | <b>Applicant's Reserve for Change Orders</b>           |             |      |      |            |       |
| <b>G</b>                               | <b>Applicant's Reserve for Change Orders</b>         | <b>7.0%</b>                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | \$ -   | \$ -        | \$ - | \$ - | \$ -       |       |
| <b>PART A through G SUBTOTAL</b>       |  |   |                          |                          |                          |                          | \$ -   | \$ -        | \$ - | \$ - | \$ -       | \$ -  |
| <b>PART H</b>                          |  |   |                          |                          |                          |                          | <b>Applicant's Project Management and Design Costs</b> |             |      |      |            |       |
| <b>H.1</b>                             | <b>Applicant's Project Management - Design Phase</b> | <b>1.0%</b>                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | \$ -   | \$ -        | \$ - | \$ - | \$ -       |       |
| <b>H.2</b>                             | <b>A/E Design Contract Cost</b>                      |   |                          |                          |                          |                          |  |             |      |      |            |       |
| Above Average Complexity (Curve A)     |  |   |                          |                          |                          |                          | <input type="checkbox"/>                               | <b>0.0%</b> | \$ - | \$ - | \$ -       | \$ -  |
| Average Complexity (Curve B)           |  |   |                          |                          |                          |                          | <input type="checkbox"/>                               | <b>0.0%</b> | \$ - | \$ - | \$ -       | \$ -  |
| Basic Construction Inspection Services |  |   |                          |                          |                          |                          | <input type="checkbox"/>                               | <b>3.0%</b> | \$ - | \$ - | \$ -       | \$ -  |
|  |  |   |                          |                          |                          |                          | \$ -   | \$ -        | \$ - | \$ - | \$ -       | \$ -  |
| <b>H.3</b>                             | <b>Project Management - Construction Phase</b>       | <b>6.0%</b>                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | \$ -   | \$ -        | \$ - | \$ - | \$ -       |       |
| <b>Part H Total</b>                    |  |   |                          |                          |                          |                          | \$ -   | \$ -        | \$ - | \$ - | \$ -       | \$ -  |
| <b>PART A through H SUBTOTAL</b>       |  |   |                          |                          |                          |                          | \$ -   | \$ -        | \$ - | \$ - | \$ -       | \$ -  |
| <b>TOTAL OF UNCOMPLETED WORK</b>       |  |   |                          |                          |                          |                          |  |             |      |      | <b>\$0</b> |       |

## Total Project Summary

|  |  | Completed   | Uncompleted | Total       |
|--|--|-------------|-------------|-------------|
| <b>PART A</b>  | <b>"Base Costs" for Construction Work In Trades</b>                | \$ -        | \$ -        | \$ -        |
|  | A.1 Permanent Work   | \$ -        | \$ -        | \$ -        |
|  | A.2 Non-Permanent Job Specific Work (From Part A Estimate)         | \$ -        | \$ -        | \$ -        |
| <b>PART B</b>  | <b>General Requirements and General Conditions</b>                 | \$ -        | \$ -        | \$ -        |
|  | B.1 General Requirements   | \$ -        | \$ -        | \$ -        |
|  | B.2 General Conditions   | \$ -        | \$ -        | \$ -        |
| <b>PART C</b>  | <b>Construction Cost Contingencies (Design and Construction)</b>   | \$ -        | \$ -        | \$ -        |
|  | 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                         | \$ -        | \$ -        | \$ -        |
| <b>PART D</b>  | <b>General Contractor's Overhead and Profit</b>                    | \$ -        | \$ -        | \$ -        |
|  | D.1 General Contractor's Home Office Overhead Costs                | \$ -        | \$ -        | \$ -        |
|  | D.2 General Contractor's Insurance, Payment, and Performance Bonds | \$ -        | \$ -        | \$ -        |
|  | D.3 Contractor's Profit  | \$ -        | \$ -        | \$ -        |
| <b>PART E</b>  | <b>Cost Escalation Allowance</b>                                   | \$ -        | \$ -        | \$ -        |
| <b>PART F</b>  | <b>Plan Review and Construction Permit Costs</b>                   | \$ -        | \$ -        | \$ -        |
|  | F.1 Plan Review Fees   | \$ -        | \$ -        | \$ -        |
|  | F.2 Construction Permit Fees                                       | \$ -        | \$ -        | \$ -        |
| <b>PART G</b>  | <b>Applicant's Reserve for Construction</b>                        | \$ -        | \$ -        | \$ -        |
| <b>PART H</b>  | <b>Applicant's Project Management and Design Costs</b>             | \$ -        | \$ -        | \$ -        |
|  | H.1 Applicant's Project Management - Design Phase                  | \$ -        | \$ -        | \$ -        |
|  | H.2 Architecture & Engineering Design Contract Costs               | \$ -        | \$ -        | \$ -        |
|  | H.3 Project Management - Construction Phase                        | \$ -        | \$ -        | \$ -        |
| <b>Complete Project Total for Completed and Uncompleted Work</b> |  | <b>\$ -</b> | <b>\$ -</b> | <b>\$ -</b> |

**PROJECT WORKSHEET**

**PAPERWORK BURDEN DISCLOSURE NOTICE**

Public reporting burden for this form is estimated to average 30 minutes. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the forms. You are not required to respond to this collection of information unless a valid OMB control number is displayed in the upper right corner of the forms. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington, DC 20472, Paperwork Reduction Project (3067-0151). **NOTE:** Do not send your completed form to this address.

|  |             |          |      |          |
|--|-------------|----------|------|----------|
| DECLARATION NO.<br>FEMA- ____-DR- ____ | PROJECT NO. | FIPS NO. | DATE | CATEGORY |
|--|-------------|----------|------|----------|

|                  |   |
|------------------|---|
| DAMAGED FACILITY | WORK COMPLETE AS OF:<br>_____ : _____ % |
|------------------|---|

|           |        |
|-----------|--------|
| APPLICANT | COUNTY |
|-----------|--------|

|          |                   |                    |
|----------|-------------------|--------------------|
| LOCATION | LATITUDE<br>--/-- | LONGITUDE<br>--/-- |
|----------|-------------------|--------------------|

DAMAGE DESCRIPTION AND DIMENSIONS

SCOPE OF WORK

Does the Scope of Work change the pre-disaster conditions at the site?  Yes  No  
 Special Considerations issues included?  Yes  No Hazard Mitigation proposal included?  Yes  No  
 Is there insurance coverage on this facility?  Yes  No

| PROJECT COST |      |           |               |                   |      |
|--------------|------|-----------|---------------|-------------------|------|
| ITEM         | CODE | NARRATIVE | QUANTITY/UNIT | UNIT PRICE        | COST |
|              |      |           | /             |                   |      |
|              |      |           | /             |                   |      |
|              |      |           | /             |                   |      |
|              |      |           | /             |                   |      |
|              |      |           | /             |                   |      |
|              |      |           | /             |                   |      |
|              |      |           | /             |                   |      |
|              |      |           | /             |                   |      |
|              |      |           | /             |                   |      |
|              |      |           | /             |                   |      |
|              |      |           |               | <b>TOTAL COST</b> |      |

PREPARED BY:

**CEF Fact Sheet**

Los Angeles County - Earthquake Damage Repair and Hazard Mitigation

|                                  |  |
|----------------------------------|--|
| <b>Date of Estimate:</b>         | August 1, 1999   |
| <b>FEMA Region:</b>              | IX   |
| <b>Preparer (s):</b>             | FEMA   |
| <b>Applicant Name:</b>           | Los Angeles County   |
| <b>Project Title:</b>            | Earthquake Damage Repair and Hazard Mitigation   |
| <b>Damaged Facility:</b>         | LA Medical Center - Administration Building  |
| <b>Facility Location:</b>        | 999 First Street, Los Angeles, California  |
| <b>Declaration Number:</b>       | FEMA-0000-DR-CA  |
| <b>Project Number:</b>           | 9999   |
| <b>PA ID No.:</b>                | 999-99999  |
| <b>Date of Inspection:</b>       | May 1, 1999  |
| <b>Event Date(s):</b>            | April 1, 1999  |
| <b>Work Category:</b>            | E  |
| <b>Type of Work:</b>             | REPAIR   |
| <i>(Enter New, Repair, etc.)</i> | HMP  |
|                                  | UPGRADES   |
|                                  |  |
|                                  |  |
| <b>Scope:</b>                    | <p>The scope of repair work includes: epoxy injection of concrete columns, walls and floor slab; patching concrete spalls; partial demolition and replacement of concrete wall; repair/replacement of interior partition walls and floor beams; remove and replace 6" slab-on-grade; remove &amp; replace 1' x 3' reinforced strip footing; repair of damage to wood frame walls and roof; patch and paint cracks in interior plaster walls and ceilings; patch and paint cracks and spalls in stucco; reset dispalced clay roof tiles and remove /replace damaged tiles; replace casement windows; and painting of the interior and exterior walls.</p> <p>A Hazard Mitigation Proposal (HMP) was submitted to tie the roof diaphragm to the peremeter walls. The scope of work includes installation of tension ties to the roof system. In addition to the HMP scope of work, upgrades to the existing exterior ramps and sidewalks and the construction of new ramps and sidewalks has been recomended for ADA compliance.</p> |

**CEF Notes**

## Los Angeles County - Earthquake Damage Repair and Hazard Mitigation

|  |  |
|--|--|
| <b>Damaged Facility:</b>   | LA Medical Center - Administration Building  |
| <b>Applicant Name:</b>   | Los Angeles County   |
| <b>Project Number:</b>   | 9999   |
| <b>Date of Estimate:</b>   | August 1, 1999   |
| <b>Preparer (s):</b>   | FEMA   |
| <b>Part A Notes:</b>   | <p>A.1 - Construction costs based on 1999 R.S. Means unit costs with appropriate city index for CSI division of work and force account records submitted by the applicant.</p> <p>A.2 - Construction costs based on 1999 R.S. Means unit costs with appropriate city index for CSI division of work.</p>                             |
| <b>Part B Notes:</b>   | <p>B.1 - General Requirement costs added for Safety &amp; Security (4%), Temporary Utilities and Services (1%), Quality Control (0.5%), and Submittals (2%)</p> <p>B.2 - 4.25% - Standard CEF factor used for General Conditions</p>   |
| <b>Part C Notes:</b>   | <p>C.1 - 2% - Repair, Haz. Mit. - Scope of work is well defined, equivalent to working drawings stage</p> <p>C.2 - 2% - Project complexity is minimal to moderate</p> <p>C.3 - 0% - Access, storage, and staging are adequate for repair, upgrade, and HMP.</p> <p>C.4 - 0% - Project is too small for economies of scale factor</p> |
| <b>Part D Notes:</b>   | <p>D.1 - 7.7% - Standard CEF factor used for GC's Home Office Overhead</p> <p>D.2 - 3.3% - Standard CEF factor used for GC's Insurance, Payment &amp; Performance Bonds</p> <p>D.3 - 10% - Standard CEF factor used for GC's Profit</p>  |
| <b>Part E Notes:</b>   | <p>E.1 - Cost Escalation Factor: Total duration = 7 months; Monthly factor 0.188%<br/>Design = 1.5 months; Bid/Award = 1.5 months<br/>1/2 of Construction = 2 months</p>   |
| <b>Part F Notes:</b>   | <p>F.1 - Plan Review Fees are based on Los Angeles County requirements</p> <p>F.2 - Construction Permit Fees are based on Los Angeles County requirements</p>  |
| <b>Part G Notes:</b>   | <p>G.1 - 6.9% - Standard CEF factor used for Applicant's Reserve for Change Orders</p>   |
| <b>Part H Notes:</b>   | <p>H.1 - 1% - Standard CEF factor used for Project Management - Design Phase</p> <p>H.2 - 10.4% - Standard CEF factor used for A/E Design Contract Costs</p> <p>H.3 - 6% - Standard CEF factor used for Project Management - Construction Phase</p>  |
| <b>Miscellaneous Notes &amp; Comments:</b><br><i>Use mouse to Activate Cursor:</i> | <p>(1) Upgrades (ADA Compliance) are required due to local building requirements. A detailed scope of work for completing ADA upgrades is included in Part A.</p> <p>(2) A general contractor/subcontractor will be retained in order to complete repairs.</p> <p>(3) Completed Force Account received factors H.1, H.2 and H.3</p>  |

**CEF Part A Estimate**

## Los Angeles County - Earthquake Damage Repair and Hazard Mitigation

| Item No.                               | Item Description Title / Component Description                   | Div. # or Cost Code | Qty.      | Units | Unit Price | City Adj. Factor | Total Cost     |
|--|--|---------------------|-----------|-------|------------|------------------|----------------|
| <b>Completed</b>                       |  |                     |           |       |            |                  |                |
| <b>Permanent</b>                       |  |                     |           |       |            |                  |                |
| 1                                      | Labor without benefits   | Force Account       | 20.00     | HRS   | \$67.82    | 1.000            | \$1,356        |
| 2                                      | Benefits   | Force Account       | 20.00     | HRS   | \$37.46    | 1.000            | \$749          |
| 3                                      | Materials  | Force Account       | 1.00      | LS    | \$1,200.00 | 1.000            | \$1,200        |
| 4                                      | Equipment  | Force Account       | 1.00      | LS    | \$750.00   | 1.000            | \$750          |
| <b>Completed - Permanent Total</b>     |  |                     |           |       |            |                  | <b>\$4,056</b> |
| <b>Non-Permanent</b>                   |  |                     |           |       |            |                  |                |
|  |  |                     |           |       |            |                  |                |
| <b>Completed - Non-Permanent Total</b> |  |                     |           |       |            |                  | <b>\$0</b>     |
| <b>Uncompleted</b>                     |  |                     |           |       |            |                  |                |
| <b>Permanent</b>                       |  |                     |           |       |            |                  |                |
|  | <b>STRUCTURAL REPAIRS</b>  |                     |           |       |            |                  |                |
|  | <b>1.0 General Requirements</b>                                  |                     |           |       |            |                  |                |
| 5                                      | Conc. Patch walls, incl. Chipping, cleaning, & grout             | 018-030-1030        | 4.00      | SF    | \$14.50    | 1.106            | \$64           |
|  | <b>2.0 Site Work - Demolition</b>                                |                     |           |       |            |                  |                |
| 6                                      | Selective demolition, wood frame, joists 2x8                     | 020-714-4240        | 300.00    | LF    | \$0.61     | 1.051            | \$192          |
| 7                                      | Selective demolition, floor sheathing & flooring                 | 020-704-7200        | 3.00      | EA    | \$72.50    | 1.051            | \$229          |
| 8                                      | Demo, conc., 8" walls, bar reinforced, over 6 CF                 | 020-704-1450        | 175.50    | CF    | \$30.00    | 1.051            | \$5,534        |
| 9                                      | Conc. Removal, footings 1' x 2'                                  | 020-754-1000        | 15.00     | LF    | \$11.15    | 1.051            | \$176          |
| 10                                     | Demo, slab on grade, 6", bar rein., over 8 SF                    | 020-704-1250        | 162.00    | SF    | \$15.85    | 1.051            | \$2,699        |
| 11                                     | Building Demo, incl. 20 mi haul, exclu. Dump fees, CF            | 020-604-0700        | 14,700.00 | CF    | \$0.25     | 1.051            | \$3,862        |
| 12                                     | Dump charges, typical urban city, fees only                      | 020-612-0100        | 59.00     | T     | \$55.00    | 1.051            | \$3,410        |
| 13                                     | Remove and reset windows   | 020-734-5020        | 25.00     | EA    | \$61.00    | 1.051            | \$1,603        |
|  | <b>3.0 Concrete</b>  |                     |           |       |            |                  |                |
| 14                                     | Epoxy inject up to 0.25" wide                                    | 037-330-0100        | 1,093.00  | LF    | \$22.00    | 1.152            | \$27,701       |
| 15                                     | Conc. In-place, incl. Forms, rebar, finish walls, 8", to 8' high | 033-172-4950        | 6.50      | CY    | \$32.50    | 1.152            | \$243          |
| 16                                     | Conc. In-place, footings, strip, 1' x 3', reinforced             | 033-130-3950        | 13.00     | CY    | \$172.00   | 1.152            | \$2,576        |
| 17                                     | Conc., in place, slab on grade, 6 " thick                        | 033-130-4700        | 3.00      | CY    | \$122.00   | 1.152            | \$422          |
|  | <b>6.0 Woods and Plastics</b>                                    |                     |           |       |            |                  |                |
| 18                                     | Framing Joists, 2' x 8'  | 061-114-2613        | 400.00    | LF    | \$1.75     | 1.085            | \$760          |
| 19                                     | Framing, heavy mill timber beams, 4' x 8'                        | 061-304-0262        | 54.00     | BF    | \$2.08     | 1.085            | \$122          |
| 20                                     | Framing, rafters to 4 12 pitch, 2' x 6'                          | 061-120-5000        | 1,090.00  | LF    | \$1.32     | 1.085            | \$1,561        |
| 21                                     | Framing, roofs, fascia boards 2' x 8'                            | 061-120-5880        | 195.00    | LF    | \$2.42     | 1.085            | \$512          |
| 22                                     | Sheating, plywood on roof 1/2" pneumatic nailed                  | 061-154-0103        | 2,455.00  | SF    | \$0.88     | 1.085            | \$2,344        |
| 23                                     | Framing walls, studs, 8' high, 2' x 4', pneumatic nailed         | 061-128-5147        | 615.00    | LF    | \$0.95     | 1.085            | \$634          |
| 24                                     | Sheating, plywood on walls, ext. CDX 1/2" pneumatic nailed       | 061-154-0607        | 1,225.00  | SF    | \$0.98     | 1.085            | \$1,303        |
|  | <b>7.0 Thermal and Moisture Protection</b>                       |                     |           |       |            |                  |                |
| 25                                     | Roof deck insulation, extruded polystyrene, 25 PSI, 4", R-20     | 072-203-1946        | 2,455.00  | SF    | \$1.56     | 1.163            | \$4,454        |
| 26                                     | Prepared roll roofing, 3-ply glass fiber felt, lapped 19" mopped | 075-204-0400        | 25.00     | SQ    | \$170.00   | 1.163            | \$4,943        |

**CEF Part A Estimate**

## Los Angeles County - Earthquake Damage Repair and Hazard Mitigation

| Item No.                                   | Item Description Title / Component Description                   | Div. # or Cost Code                          | Qty.      | Units | Unit Price | City Adj. Factor | Total Cost       |
|--|--|--|-----------|-------|------------|------------------|------------------|
|  | <b>8.0 Doors and Windows</b>                                     |  |           |       |            |                  |                  |
| 27   | Casement windows, incl. Frame, screen, trim                      | 086-120-8040                                 | 25.00     | EA    | \$296.00   | 1.037            | \$7,674          |
|  | <b>9.0 Finishes</b>  |  |           |       |            |                  |                  |
| 28   | Paint exterior perimeter walls (2 CT)                            | 099-124-0410                                 | 10,990.00 | SF    | \$0.26     | 1.159            | \$3,312          |
| 29   | Stucco, 3 coats, 1" thick, float finish on wood frame            | 092-304-0010                                 | 5.00      | SY    | \$20.50    | 1.159            | \$119            |
| 30   | Ceilings, gypsum drywall, finished, screwed to joists, 1/2"      | 092-604-0100                                 | 2,455.00  | SF    | \$1.22     | 1.159            | \$3,471          |
| 31   | Drywall, nailed or screwed to studs 5/8", taped & finished       | 092-608-0250                                 | 613.00    | SF    | \$1.29     | 1.159            | \$917            |
| 32   | Exterior painting, stucco, rough, oil base, paint 2 coats, spray | 099-106-1600                                 | 613.00    | SF    | \$0.34     | 1.159            | \$242            |
| 33   | Interior painting, walls, 2 coats, sand finish, spray            | 099-224-0980                                 | 613.00    | SF    | \$0.26     | 1.159            | \$185            |
| 34   | Interior painting, ceilings, 2 coats, sand finish, spray         | 099-224-0980<br>099-224-1800                 | 2,455.00  | SF    | \$0.33     | 1.159            | \$939            |
|  | <b>TOTAL STRUCTURAL WORK</b>                                     |  |           |       |            |                  | <b>\$82,200</b>  |
|  | <b>UPGRADES</b>  |  |           |       |            |                  |                  |
| 35   | Construct new sidewalks and ramps                                | 025-128-0350                                 | 1,300.00  | SF    | \$3.30     | 1.051            | \$4,509          |
| 36   | Adjust exterior ramps to code (50 %)                             | 025-128-0350                                 | 1,300.00  | SF    | \$1.65     | 1.051            | \$2,254          |
|  | <b>TOTAL UPGRADES</b>  |  |           |       |            |                  | <b>\$6,763</b>   |
|  | <b>STRUCTURAL HAZARD MITIGATION (HMP)</b>                        |  |           |       |            |                  |                  |
| 37   | Install tension ties   | 060-512-7038                                 | 215.00    | EA    | \$18.25    | 1.083            | \$4,249          |
| 38   | Drilling concrete (4" deep)                                      | 050-515-0700                                 | 215.00    | EA    | \$9.35     | 1.058            | \$2,127          |
| 39   | Drilling (each additional Inch)                                  | 050-515-0750                                 | 215.00    | EA    | \$7.92     | 1.058            | \$1,802          |
| 40   | Install bolts 15" long, 3/4" dia.                                | 060-512-0600                                 | 215.00    | EA    | \$6.20     | 1.083            | \$1,444          |
| 41   | Install washers 3" x 3" x 3/16"                                  | 060-512-5500                                 | 215.00    | EA    | \$0.63     | 1.083            | \$147            |
|  | <b>TOTAL HMP</b>   |  |           |       |            |                  | <b>\$9,768</b>   |
|  | <b>NON-STRUCTURAL WORK</b>                                       |  |           |       |            |                  |                  |
| 42   | Backfill by hand, compaction in 6" layers, hand tamp             | 022-204-0300<br>022-204-0010                 | 32.00     | CY    | \$34.45    | 1.051            | \$1,159          |
| 43   | Conc., in place, grade walls, 8 " thick, 8' high                 | 033-130-4200                                 | 21.00     | CY    | \$320.00   | 1.152            | \$7,741          |
| 44   | Conc., in place, slab on grade, 6 " thick                        | 033-130-4700                                 | 11.00     | CY    | \$122.00   | 1.152            | \$1,546          |
| 45   | Clay tile, spanish, 171 pcs per SQ, red                          | 073-202-0600                                 | 32.00     | SQ    | \$535.00   | 1.163            | \$19,911         |
| 46   | Plaster, repair cracking and paint                               | 092-154-0010<br>099-224-0840                 | 21,385.00 | SF    | \$1.05     | 1.159            | \$26,024         |
| 47   | Stucco over wood, remove, replace, and paint                     | 020-732-0300<br>092-304-0010<br>099-106-1400 | 200.00    | SF    | \$1.79     | 1.159            | \$415            |
|  | <b>TOTAL NON-STRUCTURAL WORK</b>                                 |  |           |       |            |                  | <b>\$56,796</b>  |
| <b>Uncompleted - Permanent Total</b>       |  |  |           |       |            |                  | <b>\$155,527</b> |
| <b>Non-Permanent</b>                       |  |  |           |       |            |                  |                  |
| 49   | Scaffolding rental   | 015-255-4100                                 | 12.00     | EA    | \$1,250.00 | 1.11             | \$16,590         |
| 49   | Temporary fencing  | 015-304-0200                                 | 200.00    | LF    | \$8.15     | 1.11             | \$1,803          |
| <b>Uncompleted - Non-Permanent Total</b>   |  |  |           |       |            |                  | <b>\$18,393</b>  |
| <b>TOTAL PART A BASE CONSTRUCTION COST</b> |  |  |           |       |            |                  | <b>\$177,975</b> |

| Los Angeles County - Earthquake Damage Repair and Hazard Mitigation |   |                               |                          |                               |                          |                          |                          |
|---|---|-------------------------------|--------------------------|-------------------------------|--------------------------|--------------------------|--------------------------|
|   |   | REPAIR                        | HMP                      | UPGRADES                      |                          |                          | Total                    |
| <b>PART A</b> "Base Costs" for Construction Work-In Trades          |   |                               |                          |                               |                          |                          |                          |
| <b>A.1</b>  | <b>Permanent Work (From Part A Estimate)</b>                  | \$ 4,056                      |                          |                               |                          |                          | \$ 4,056                 |
| <b>A.2</b>  | <b>Non-Permanent Job Specific Work (From Part A Estimate)</b> |                               |                          |                               |                          |                          | \$ -                     |
| Part A Total  |   | \$ 4,056                      | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ 4,056                 |
| <b>PART B</b> General Requirements and General Conditions           |   |                               |                          |                               |                          |                          |                          |
| <b>B.1</b>  | <b>General Requirements</b>                                   | Range<br>Low to High          |                          | Enter % in Appropriate Column |                          |                          |                          |
|   | Safety & Security - Airports, Ports & Govt. Owned M           | 4.0%                          | 6.0%                     |                               |                          |                          |                          |
|   | Temporary Services & Utilities                                | 0.0%                          | 1.0%                     |                               |                          |                          |                          |
|   | Quality Control   | 0.0%                          | 5.0%                     |                               |                          |                          |                          |
|   | Submittals  | 0.0%                          | 5.0%                     |                               |                          |                          |                          |
|   |   | \$ -                          | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ -                     |
| <b>B.2</b>  | <b>General Conditions (4.25%)</b>                             | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/> | \$ -                     |
| Part B Total  |   | \$ -                          | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ -                     |
| <b>PART A through B SUBTOTAL</b>                                    |   | \$ 4,056                      | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ 4,056                 |
| <b>PART C</b> Construction Cost Contingencies                       |   |                               |                          |                               |                          |                          |                          |
| <b>C.1</b>  | <b>Design-Phase Scope Contingencies</b>                       | Range<br>Low to High          |                          | Enter % in Appropriate Column |                          |                          |                          |
|   | Preliminary Engineering Analysis                              | 15.0%                         | 20.0%                    |                               |                          |                          |                          |
|   | Working Drawings  | 2.0%                          | 10.0%                    |                               |                          |                          |                          |
|   |   | \$ -                          | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ -                     |
| <b>C.2</b>  | <b>Facility or Project Constructability</b>                   | Enter % in Appropriate Column |                          |                               |                          |                          |                          |
|   | E (See IG for Values)   |                               |                          |                               |                          |                          | \$ -                     |
|   |   | \$ -                          | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ -                     |
| <b>C.3</b>  | <b>Access, Storage &amp; Staging Contingen</b>                | Range<br>Low to High          |                          | Enter % in Appropriate Column |                          |                          |                          |
|   | Access Contingencies  | 1.0%                          | 4.0%                     |                               |                          |                          |                          |
|   | Storage Contingencies   | 1.0%                          | 4.0%                     |                               |                          |                          |                          |
|   | Staging Contingencies   | 1.0%                          | 4.0%                     |                               |                          |                          |                          |
|   |   | \$ -                          | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ -                     |
| <b>C.4</b>  | <b>Economies of Scale</b>                                     | 0.0%                          |                          | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |   | 0%                            | 0%                       | 0%                            | 0%                       | 0%                       | \$ -                     |
|   |   | \$ -                          | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ -                     |
| Part C Total  |   | \$ -                          | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ -                     |
| <b>PART A through C SUBTOTAL</b>                                    |   | \$ 4,056                      | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ 4,056                 |
| <b>PART D</b> General Contractor's Overhead and Profit              |   |                               |                          |                               |                          |                          |                          |
| <b>D.1</b>  | <b>GC's Home Office Overhead</b>                              | 7.7%                          |                          | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |   | \$ -                          | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ -                     |
| <b>D.2</b>  | <b>GC's Insurance, Payment &amp; Performance Bo</b>           | 3.3%                          |                          | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |   | \$ -                          | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ -                     |
| <b>D.3</b>  | <b>General Contractor's Profit</b>                            | 10.0%                         |                          | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |   | \$ -                          | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ -                     |
| Part D Total  |   | \$ -                          | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ -                     |
| <b>PART A through D SUBTOTAL</b>                                    |   | \$ 4,056                      | \$ -                     | \$ -                          | \$ -                     | \$ -                     | \$ 4,056                 |

| Los Angeles County - Earthquake Damage Repair and Hazard Mitigation |   |   |                                     |          |      |          |      |                   |
|---|---|---|-------------------------------------|----------|------|----------|------|-------------------|
|   |   |   |                                     | REPAIR   | HMP  | UPGRADES |      | Total             |
| <b>PART E</b> Cost Escalation Factors                               |   |   |                                     |          |      |          |      |                   |
| <b>E</b>  | <b>Cost Escalation Factor</b>                     | Months                                    | Monthly Factor                      |          |      |          |      |                   |
|   |   |   |                                     | \$ -     | \$ - | \$ -     | \$ - | \$ -              |
| <b>PART A through E SUBTOTAL</b>                                    |   |   |                                     | \$ 4,056 | \$ - | \$ -     | \$ - | \$ 4,056          |
| <b>PART F</b> Plan Review and Construction Permit Cost              |   |   |                                     |          |      |          |      |                   |
| <b>F.1</b>  | <b>Plan Review Fees</b>                           | (List Individual Requirements Separately) |                                     |          |      |          |      |                   |
|   |   |   |                                     |          |      |          |      |                   |
|   |   |   |                                     | \$ -     | \$ - | \$ -     | \$ - | \$ -              |
| <b>F.2</b>  | <b>Construction Permit Fees</b>                   | (List Individual Requirements Separately) |                                     |          |      |          |      |                   |
|   |   |   |                                     |          |      |          |      |                   |
|   |   |   |                                     | \$ -     | \$ - | \$ -     | \$ - | \$ -              |
| <b>Part F Total</b>   |   |   |                                     | \$ -     | \$ - | \$ -     | \$ - | \$ -              |
| <b>PART A through F SUBTOTAL</b>                                    |   |   |                                     | \$ 4,056 | \$ - | \$ -     | \$ - | \$ 4,056          |
| <b>PART G</b> Applicant's Reserve for Change Orders                 |   |   |                                     |          |      |          |      |                   |
| <b>G</b>  | <b>Applicant's Reserve for Change Orders</b>      | 7.0%                                      | <input type="checkbox"/>            | \$ -     | \$ - | \$ -     | \$ - | \$ -              |
| <b>PART A through G SUBTOTAL</b>                                    |   |   |                                     | \$ 4,056 | \$ - | \$ -     | \$ - | \$ 4,056          |
| <b>PART H</b> Applicant's Project Management and Design Costs       |   |   |                                     |          |      |          |      |                   |
| <b>H.1</b>  | <b>Applicant's Project Management - Design Ph</b> | 1.0%                                      | <input checked="" type="checkbox"/> | \$ 41    | \$ - | \$ -     | \$ - | \$ 41             |
| <b>H.2</b>  | <b>A/E Design Contract Cost</b>                   |   |                                     |          |      |          |      |                   |
|   | Above Average Complexity (Curve A)                | 0.0%                                      | <input type="checkbox"/>            | \$ -     | \$ - | \$ -     | \$ - | \$ -              |
|   | Average Complexity (Curve B)                      | 0.0%                                      | <input type="checkbox"/>            | \$ -     | \$ - | \$ -     | \$ - | \$ -              |
|   | Basic Construction Inspection Services            | 5.0%                                      | <input checked="" type="checkbox"/> | \$ 203   | \$ - | \$ -     | \$ - | \$ 203            |
|   |   |   |                                     | \$ 203   | \$ - | \$ -     | \$ - | \$ 203            |
| <b>H.3</b>  | <b>Project Management - Construction Phase</b>    | 6.0%                                      | <input checked="" type="checkbox"/> | \$ 243   | \$ - | \$ -     | \$ - | \$ 243            |
| <b>Part H Total</b>   |   |   |                                     | \$ 487   | \$ - | \$ -     | \$ - | \$ 487            |
| <b>PART A through H SUBTOTAL</b>                                    |   |   |                                     | \$ 4,542 | \$ - | \$ -     | \$ - | \$ 4,542          |
| <b>TOTAL OF COMPLETED WORK</b>                                      |   |   |                                     |          |      |          |      | <b>\$4,542.27</b> |

| Los Angeles County - Earthquake Damage Repair and Hazard Mitigation |   |                      |                                     |                                     |                                     |                                     |                                     |  |
|---|---|----------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--|
|   |   |                      | REPAIR                              | HMP                                 | UPGRADES                            |                                     | Total                               |  |
| <b>PART A</b> "Base Costs" for Construction Work-In Trades          |   |                      |                                     |                                     |                                     |                                     |                                     |  |
| <b>A.1</b>  | <b>Permanent Work (From Part A Estimate)</b>                  |                      | \$ 138,996                          | \$ 9,768                            | \$ 6,763                            |                                     | \$ 155,527                          |  |
| <b>A.2</b>  | <b>Non-Permanent Job Specific Work (From Part A Estimate)</b> |                      | \$ 18,393                           |                                     |                                     |                                     | \$ 18,393                           |  |
| <b>Part A Total</b>   |   |                      | \$ 157,389                          | \$ 9,768                            | \$ 6,763                            | \$ -                                | \$ 173,920                          |  |
| <b>PART B</b> General Requirements and General Conditions           |   |                      |                                     |                                     |                                     |                                     |                                     |  |
| <b>B.1</b>  | <b>General Requirements</b>                                   | Range<br>Low to High | Enter % in Appropriate Column       |                                     |                                     |                                     |                                     |  |
|   | Safety & Security - Airports, Ports & Govt. Owned M           | 4.0% 6.0%            | 4.00%                               | 4.00%                               | 4.00%                               |                                     |                                     |  |
|   | Temporary Services & Utilities                                | 0.0% 1.0%            | 1.00%                               | 1.00%                               | 1.00%                               |                                     |                                     |  |
|   | Quality Control   | 0.0% 1.0%            | 0.50%                               | 0.50%                               | 0.50%                               |                                     |                                     |  |
|   | Submittals  | 0.0% 5.0%            | 2.00%                               | 2.00%                               | 2.00%                               |                                     |                                     |  |
|   |   |                      | \$ 11,804                           | \$ 733                              | \$ 507                              | \$ -                                | \$ 13,044                           |  |
| <b>B.2</b>  | <b>General Conditions (4.25%)</b>                             |                      | <input checked="" type="checkbox"/> |  |
|   |   |                      | \$ 6,689                            | \$ 415                              | \$ 287                              | \$ -                                | \$ 7,392                            |  |
| <b>Part B Total</b>   |   |                      | \$ 18,493                           | \$ 1,148                            | \$ 795                              | \$ -                                | \$ 20,436                           |  |
| <b>PART A through B SUBTOTAL</b>                                    |   |                      | \$ 175,882                          | \$ 10,916                           | \$ 7,558                            | \$ -                                | \$ 194,355                          |  |
| <b>PART C</b> Construction Cost Contingencies                       |   |                      |                                     |                                     |                                     |                                     |                                     |  |
| <b>C.1</b>  | <b>Design-Phase Scope Contingencies</b>                       | Range<br>Low to High | Enter % in Appropriate Column       |                                     |                                     |                                     |                                     |  |
|   | Preliminary Engineering Analysis                              | 15.0% 20.0%          |                                     |                                     |                                     |                                     |                                     |  |
|   | Working Drawings  | 2.0% 10.0%           | 2.00%                               | 2.00%                               | 2.00%                               |                                     |                                     |  |
|   |   |                      | \$ 3,518                            | \$ 218                              | \$ 151                              | \$ -                                | \$ 3,887                            |  |
| <b>C.2</b>  | <b>Facility or Project Constructability</b>                   |                      | Enter % in Appropriate Column       |                                     |                                     |                                     |                                     |  |
|   | E (See IG for Values)   |                      | 2.00%                               | 2.00%                               | 2.00%                               |                                     |                                     |  |
|   |   |                      | \$ 3,518                            | \$ 218                              | \$ 151                              | \$ -                                | \$ 3,887                            |  |
| <b>C.3</b>  | <b>Access, Storage &amp; Staging Contingen</b>                | Range<br>Low to High | Enter % in Appropriate Column       |                                     |                                     |                                     |                                     |  |
|   | Access Contingencies  | 1.0% 4.0%            |                                     |                                     |                                     |                                     |                                     |  |
|   | Storage Contingencies   | 1.0% 4.0%            |                                     |                                     |                                     |                                     |                                     |  |
|   | Staging Contingencies   | 1.0% 4.0%            |                                     |                                     |                                     |                                     |                                     |  |
|   |   |                      | \$ -                                | \$ -                                | \$ -                                | \$ -                                | \$ -                                |  |
| <b>C.4</b>  | <b>Economies of Scale</b>                                     | 0.0%                 | <input checked="" type="checkbox"/> |  |
|   |   |                      | \$ -                                | \$ -                                | \$ -                                | \$ -                                | \$ -                                |  |
| <b>Part C Total</b>   |   |                      | \$ 7,035                            | \$ 437                              | \$ 302                              | \$ -                                | \$ 7,774                            |  |
| <b>PART A through C SUBTOTAL</b>                                    |   |                      | \$ 182,917                          | \$ 11,353                           | \$ 7,860                            | \$ -                                | \$ 202,130                          |  |
| <b>PART D</b> General Contractor's Overhead and Profit              |   |                      |                                     |                                     |                                     |                                     |                                     |  |
| <b>D.1</b>  | <b>GC's Home Office Overhead</b>                              | 7.7%                 | <input checked="" type="checkbox"/> |  |
|   |   |                      | \$ 14,085                           | \$ 874                              | \$ 605                              | \$ -                                | \$ 15,564                           |  |
| <b>D.2</b>  | <b>GC's Insurance, Payment &amp; Performance Bo</b>           | 3.3%                 | <input checked="" type="checkbox"/> |  |
|   |   |                      | \$ 6,036                            | \$ 375                              | \$ 259                              | \$ -                                | \$ 6,670                            |  |
| <b>D.3</b>  | <b>General Contractor's Profit</b>                            | 10.0%                | <input checked="" type="checkbox"/> |  |
|   |   |                      | \$ 18,292                           | \$ 1,135                            | \$ 786                              | \$ -                                | \$ 20,213                           |  |
| <b>Part D Total</b>   |   |                      | \$ 38,413                           | \$ 2,384                            | \$ 1,651                            | \$ -                                | \$ 42,447                           |  |
| <b>PART A through D SUBTOTAL</b>                                    |   |                      | \$ 221,329                          | \$ 13,737                           | \$ 9,511                            | \$ -                                | \$ 244,577                          |  |

| Los Angeles County - Earthquake Damage Repair and Hazard Mitigation |  |  |                                     |                                     |                                     |                          |                          |           |                  |  |
|---|--|--|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-----------|------------------|--|
|   |  | REPAIR                                 | HMP                                 | UPGRADES                            |                                     |                          |                          |           | Total            |  |
| <b>PART E Cost Escalation Factors</b>                               |  |  |                                     |                                     |                                     |                          |                          |           |                  |  |
| <b>E</b>  | <b>Cost Escalation Factor</b>                        | Months                                 | Monthly Escalation                  |                                     |                                     |                          |                          |           |                  |  |
|   |  | 5                                      | 0.188%                              | \$ 2,080                            | \$ 129                              | \$ 89                    | \$ -                     | \$ -      | \$ 2,299         |  |
| <b>PART A through E SUBTOTAL</b>                                    |  |  |                                     | \$ 223,410                          | \$ 13,866                           | \$ 9,600                 | \$ -                     | \$ -      | \$ 246,876       |  |
| <b>PART F Plan Review and Construction Permit Cost</b>              |  |  |                                     |                                     |                                     |                          |                          |           |                  |  |
| <b>F.1</b>  | <b>Plan Review Fees</b>                              |  |                                     |                                     |                                     |                          |                          |           |                  |  |
|   |  | Los Angeles County requirements        | \$ 1,200                            | \$ 75                               | \$ 50                               |                          |                          |           |                  |  |
|   |  |  |                                     | \$ 1,200                            | \$ 75                               | \$ 50                    | \$ -                     | \$ -      | \$ 1,325         |  |
| <b>F.2</b>  | <b>Construction Permit Fees</b>                      |  |                                     |                                     |                                     |                          |                          |           |                  |  |
|   |  | Los Angeles County requirements        | \$ 1,500                            | \$ 100                              | \$ 75                               |                          |                          |           |                  |  |
|   |  |  |                                     | \$ 1,500                            | \$ 100                              | \$ 75                    | \$ -                     | \$ -      | \$ 1,675         |  |
| <b>Part F Total</b>   |  |  |                                     | \$ 2,700                            | \$ 175                              | \$ 125                   | \$ -                     | \$ -      | \$ 3,000         |  |
| <b>PART A through F SUBTOTAL</b>                                    |  |  |                                     | \$ 226,110                          | \$ 14,041                           | \$ 9,725                 | \$ -                     | \$ -      | \$ 249,876       |  |
| <b>PART G Applicant's Reserve for Change Orders</b>                 |  |  |                                     |                                     |                                     |                          |                          |           |                  |  |
| <b>G</b>  | <b>Applicant's Reserve for Change Orders</b>         | 6.9%                                   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |           |                  |  |
|   |  |  | \$ 15,577                           | \$ 967                              | \$ 670                              | \$ -                     | \$ -                     | \$ 17,214 |                  |  |
| <b>PART A through G SUBTOTAL</b>                                    |  |  |                                     | \$ 241,687                          | \$ 15,008                           | \$ 10,395                | \$ -                     | \$ -      | \$ 267,090       |  |
| <b>PART H Applicant's Project Management and Design Costs</b>       |  |  |                                     |                                     |                                     |                          |                          |           |                  |  |
| <b>H.1</b>  | <b>Applicant's Project Management - Design Phase</b> | 1.0%                                   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |           |                  |  |
|   |  |  | \$ 2,417                            | \$ 150                              | \$ 104                              | \$ -                     | \$ -                     | \$ 2,671  |                  |  |
| <b>H.2</b>  | <b>A/E Design Contract Cost</b>                      |  |                                     |                                     |                                     |                          |                          |           |                  |  |
|   |  | Above Average Complexity (Curve A)     | <input type="checkbox"/>            | 9.5%                                | \$ -                                | \$ -                     | \$ -                     | \$ -      | \$ -             |  |
|   |  | Average Complexity (Curve B)           | <input checked="" type="checkbox"/> | 7.4%                                | \$ 18,000                           | \$ 1,118                 | \$ 774                   | \$ -      | \$ -             |  |
|   |  | Basic Construction Inspection Services | <input checked="" type="checkbox"/> | 3.0%                                | \$ 7,251                            | \$ 450                   | \$ 312                   | \$ -      | \$ -             |  |
|   |  |  |                                     | \$ 25,250                           | \$ 1,568                            | \$ 1,086                 | \$ -                     | \$ -      | \$ 27,904        |  |
| <b>H.3</b>  | <b>Project Management - Construction Phase</b>       | 6.0%                                   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |           |                  |  |
|   |  |  | \$ 14,501                           | \$ 900                              | \$ 624                              | \$ -                     | \$ -                     | \$ 16,025 |                  |  |
| <b>Part H Total</b>   |  |  |                                     | \$ 42,168                           | \$ 2,619                            | \$ 1,814                 | \$ -                     | \$ -      | \$ 46,600        |  |
| <b>PART A through H SUBTOTAL</b>                                    |  |  |                                     | \$ 283,855                          | \$ 17,627                           | \$ 12,209                | \$ -                     | \$ -      | \$ 313,691       |  |
| <b>TOTAL OF UNCOMPLETED WORK</b>                                    |  |  |                                     |                                     |                                     |                          |                          |           | <b>\$313,691</b> |  |

## Total Project Summary

Los Angeles County - Earthquake Damage Repair and Hazard Mitigation

|  |  | Completed       | Uncompleted       | Total             |
|--|--|-----------------|-------------------|-------------------|
| <b>PART A</b>  | <b>"Base Costs" for Construction Work In Trades</b>                | \$ 4,056        | \$ 173,920        | \$ 177,975        |
|  | A.1 Permanent Work   | \$ 4,056        | \$ 155,527        | \$ 159,583        |
|  | A.2 Non-Permanent Job Specific Work (From Part A Estimate)         | \$ -            | \$ 18,393         | \$ 18,393         |
| <b>PART B</b>  | <b>General Requirements and General Conditions</b>                 | \$ -            | \$ 20,436         | \$ 20,436         |
|  | B.1 General Requirements   | \$ -            | \$ 13,044         | \$ 13,044         |
|  | B.2 General Conditions   | \$ -            | \$ 7,392          | \$ 7,392          |
| <b>PART C</b>  | <b>Construction Cost Contingencies (Design and Construction)</b>   | \$ -            | \$ 7,774          | \$ 7,774          |
|  | C.1 Standard Design-Phase Scope Contingencies                      | \$ -            | \$ 3,887          | \$ 3,887          |
|  | C.2 Facility or Project Constructability                           | \$ -            | \$ 3,887          | \$ 3,887          |
|  | C.3 Access, Storage, and Staging Contingencies                     | \$ -            | \$ -              | \$ -              |
|  | C.4 Economies of Scale in New Construction                         | \$ -            | \$ -              | \$ -              |
| <b>PART D</b>  | <b>General Contractor's Overhead and Profit</b>                    | \$ -            | \$ 42,447         | \$ 42,447         |
|  | D.1 General Contractor's Home Office Overhead Costs                | \$ -            | \$ 15,564         | \$ 15,564         |
|  | D.2 General Contractor's Insurance, Payment, and Performance Bonds | \$ -            | \$ 6,670          | \$ 6,670          |
|  | D.3 Contractor's Profit  | \$ -            | \$ 20,213         | \$ 20,213         |
| <b>PART E</b>  | <b>Cost Escalation Allowance</b>                                   | \$ -            | \$ 2,299          | \$ 2,299          |
| <b>PART F</b>  | <b>Plan Review and Construction Permit Costs</b>                   | \$ -            | \$ 3,000          | \$ 3,000          |
|  | F.1 Plan Review Fees   | \$ -            | \$ 1,325          | \$ 1,325          |
|  | F.2 Construction Permit Fees                                       | \$ -            | \$ 1,675          | \$ 1,675          |
| <b>PART G</b>  | <b>Applicant's Reserve for Construction</b>                        | \$ -            | \$ 17,214         | \$ 17,214         |
| <b>PART H</b>  | <b>Applicant's Project Management and Design Costs</b>             | \$ 487          | \$ 46,600         | \$ 47,087         |
|  | H.1 Applicant's Project Management - Design Phase                  | \$ 41           | \$ 2,671          | \$ 2,711          |
|  | H.2 Architecture & Engineering Design Contract Costs               | \$ 203          | \$ 27,904         | \$ 28,107         |
|  | H.3 Project Management - Construction Phase                        | \$ 243          | \$ 16,025         | \$ 16,269         |
| <b>Complete Project Total for Completed and Uncompleted Work</b> |  | <b>\$ 4,542</b> | <b>\$ 313,691</b> | <b>\$ 318,233</b> |

**PROJECT WORKSHEET**

**PAPERWORK BURDEN DISCLOSURE NOTICE**

Public reporting burden for this form is estimated to average 30 minutes. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the forms. You are not required to respond to this collection of information unless a valid OMB control number is displayed in the upper right corner of the forms. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington, DC 20472, Paperwork Reduction Project (3067-0151). **NOTE:** Do not send your completed form to this address.

|   |                     |                       |                        |               |
|---|---------------------|-----------------------|------------------------|---------------|
| DECLARATION NO.<br>FEMA- <u>0000</u> -DR- <u>CA</u> | PROJECT NO.<br>9999 | FIPS NO.<br>999-99999 | DATE<br>August 1, 1999 | CATEGORY<br>E |
|---|---------------------|-----------------------|------------------------|---------------|

|  |   |
|--|---|
| DAMAGED FACILITY<br>Los Angeles Medical Center | WORK COMPLETE AS OF:<br><u>5/1/99</u> : <u>10</u> % |
|--|---|

|                                 |                              |
|---------------------------------|------------------------------|
| APPLICANT<br>Los Angeles County | COUNTY<br>Los Angeles County |
|---------------------------------|------------------------------|

|   |                   |                    |
|---|-------------------|--------------------|
| LOCATION<br>999 First Street, Los Angeles, California | LATITUDE<br>--/-- | LONGITUDE<br>--/-- |
|---|-------------------|--------------------|

**DAMAGE DESCRIPTION AND DIMENSIONS**  
Constructed in 1928, 31,100 SF one-story structure. Earthquake damage includes: c racking and spalling of basement walls and columns; horizontal and diagonal cracks in reinforced concrete exterior walls; cracks in the concrete walls and floor slab; plaster cracking or spalling of approximately 25% of the wood framed walls and ceilings; exterior stucco cracking or spalling; split or splintered framing members in walls, floor framing, and ceiling panel system; splitting and/or warping of wood framed roof and walls; displacement or damage of clay tile roofing.

**SCOPE OF WORK**  
Epoxy inject cracks in concrete columns (19 LF); patching concrete spalls (4 SF); epoxy inject cracks in concrete basement walls (817 LF); epoxy inject cracks in concrete exterior walls (257 LF); demolish and replace 8" concrete wall (6.5 CY); remove and replace floor beams (54 BF); remove and replace 6" slab-on-grade (3 CY); remove and replace 1' x 3' reinforced strip footing (13 CY); remove and replace wood framed porch roof (14,700 SF) remove and replace wood framed roof (2,455 SF); remove and replace wood framed walls (1,225 SF); patch and paint cracks in interior plaster walls (13,610 SF); patch and paint cracks in interior plaster ceilings (7,775 SF); remove and replace stucco over wood (200 SF); reset/replace displaced or damaged clay roof tiles (3,110 SF); replace casement windows (25 EA); paint exterior (11,603 SF); paint interior (613 SF); construct new sidewalks and ramps (1,300 SF); modify existing ramps to code (1,300 SF); drilling of 1" diameter holes through concrete perimeter walls (215 EA); installation of tension ties (215 EA); installation of 3/4" diameter machine bolts and washers (215 EA); and restore electrical and plumbing service to the building.

Does the Scope of Work change the pre-disaster conditions at the site?  Yes  No  
 Special Considerations issues included?  Yes  No Hazard Mitigation proposal included?  Yes  No  
 Is there insurance coverage on this facility?  Yes  No

| PROJECT COST |      |   |               |                   |              |
|--------------|------|---|---------------|-------------------|--------------|
| ITEM         | CODE | NARRATIVE   | QUANTITY/UNIT | UNIT PRICE        | COST         |
| 1            | 9999 | See attached CEF spreadsheet for itemized unit price estimate | 1 / LS        | \$318,233         | \$318,233.00 |
|              |      |   | /             |                   |              |
|              |      |   | /             |                   |              |
|              |      |   | /             |                   |              |
|              |      |   | /             |                   |              |
|              |      |   | /             |                   |              |
|              |      |   | /             |                   |              |
|              |      |   | /             |                   |              |
|              |      |   | /             |                   |              |
|              |      |   | /             |                   |              |
|              |      |   |               | <b>TOTAL COST</b> | \$318,233.00 |

PREPARED BY: John Smith

### **The CEF Large Project Report**

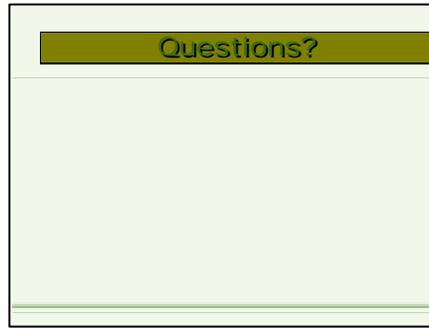
- **Refer to Appendix C of IG**
- **PAO prepares report for FEMA Headquarters**
- **POs may assist PAO in preparation**

Refer the participants to Appendix C of the Instructional Guide.

Inform them that the PAO prepares this report to submit CEF data to FEMA Headquarters for analysis.

Briefly review the information that is included in the report.

Note that Project Officers may be asked to assist the PAO in collecting this information.



Ask the class if there are any questions about the material covered in the training class.