

Department of Homeland Security **Office of Inspector General**

**FEMA's Incorrect Decisions to Replace Rather than
Repair Facilities in Cedar Rapids, Iowa
Cost Taxpayers Over \$12 Million**



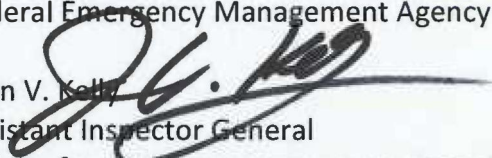


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SEP 17 2014

MEMORANDUM FOR: Beth Freeman
Regional Administrator, Region VII
Federal Emergency Management Agency

FROM: John V. Kelly 
Assistant Inspector General
Office of Emergency Management Oversight

SUBJECT: *FEMA's Incorrect Decisions to Replace Rather than Repair
Facilities in Cedar Rapids, Iowa Cost Taxpayers Over
\$12 Million*
FEMA Disaster Number 1763-DR-IA
Audit Report Number OIG-14-145-D

We audited Public Assistance grant funds awarded to the City of Cedar Rapids, Iowa (City) (Public Assistance Identification Number 113-12000-00). Our overall audit objective was to determine whether the City accounted for and expended Federal Emergency Management Agency (FEMA) grant funds according to Federal regulations and FEMA guidelines. The specific objective of this phase of the audit was to determine whether FEMA (1) correctly applied the "50 Percent Rule" when deciding to replace, rather than repair, City facilities, and (2) properly approved facility relocations.

The Iowa Homeland Security and Emergency Management Division (Iowa), a FEMA grantee, awarded the City \$330 million for damages related to flooding that occurred during the period May 25, to August 13, 2008. The award provided 90 percent funding for 187 large and 138 small projects.¹ This phase of the audit covered the period May 25, 2008, through June 11, 2012, the cutoff date of our audit, and included a review of five projects totaling \$38.6 million for eight building replacements and two building relocations (see Exhibit B, Schedule of Projects Audited and Questioned Costs).

¹ Federal regulations in effect at the time of the disaster set the large project threshold at \$60,900.



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Because of the size of the overall award and number of projects, we divided the audit into phases. We previously reviewed FEMA's second-level appeal ruling on the City's hydroelectric facility under project worksheet 1415 and issued a Management Advisory Report recommending FEMA reconsider its decision to fund the project.² In this phase, we reviewed FEMA's "50 Percent Rule" repair-versus-replacement decisions and building relocation decisions.

We conducted this performance audit between June 2012 and April 2014 pursuant to the *Inspector General Act of 1978*, as amended, and according to generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based upon our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based upon our audit objective. We conducted this audit by applying the statutes, regulations, and FEMA policies and guidelines in effect at the time of the disaster. Exhibit A provides an overview of the criteria applicable to this audit.

We interviewed FEMA and Iowa officials; reviewed judgmentally selected 50 Percent Rule projects (generally based on dollar value); reviewed 100 percent of the relocation projects; and performed other procedures considered necessary to accomplish our objective. We did not assess the adequacy of the City's internal controls applicable to grant activities because it was not necessary to accomplish our audit objective. We did, however, gain an understanding of the City's method of accounting for disaster-related costs.

BACKGROUND

On June 13, 2008, the Cedar River crested at its highest level in Cedar Rapids' history. Floodwaters penetrated 10 square miles or 14 percent of the City. This monumental flood damaged 310 City facilities and 5,390 homes and dislocated more than 18,000 residents. Floodwaters affected 1,126 city blocks, severely damaging 561. The flood interrupted services at six major City buildings including the Veteran's Memorial Building (home to City Hall), the Central Fire Station, the Animal Control Facility, the Public Works Building, the Ground Transportation Center, and the Main Library (figure 1).

² DD-13-09 *FEMA Should Recover \$13.8 Million in FEMA Public Assistance Funds Awarded to Cedar Rapids, Iowa, for Ineligible Hydroelectric Plant*, dated May 01, 2013.



Figure 1: The Cedar River flooded the Main Library, Cedar Rapids, Iowa



Source: City of Cedar Rapids, Iowa.

RESULTS OF AUDIT

FEMA officials did not correctly apply the 50 Percent Rule when deciding to replace, rather than repair, four facilities. Replacing the four facilities cost \$20,674,433, while repairing them would have cost \$8,570,454 (table 1). Normally, we would have questioned the \$12,103,979 difference. However, because FEMA Region VII made the improper decisions related to replacing facilities, and we found no evidence that the City provided false or misleading information to FEMA, we are not questioning these costs. In addition, after our audit of the University of Iowa, FEMA Region VII implemented several corrective actions to prevent future improper replacement decisions.³ We are working with officials in FEMA Headquarters to assist them in improving and clarifying national policies for replacement decisions.⁴

³ *FEMA's Decisions to Replace Rather than Repair Buildings at the University of Iowa* (DD-12-17, June 19, 2012).

⁴ *FEMA's Progress in Clarifying its "50 Percent Rule" for the Public Assistance Grant Program* (OIG-14-123-D, August 7, 2014).



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Table 1: Costs of Replacement vs. Repair

Project Number and Facility	Replacement Cost	Repair Cost	Additional Cost to Replace Facilities
518 – Main Library	\$18,692,296	\$7,863,959	\$10,828,337
522 – Animal Control Facility – West Building*	231,625	41,876	189,749
522 – Animal Control Facility – Cat Building*	223,705	52,477	171,228
10309 – Sokol Park Maintenance / A Street Shop	<u>1,526,807</u>	<u>612,142</u>	<u>914,665</u>
Total	<u>\$20,674,433</u>	<u>\$8,570,454</u>	<u>\$12,103,979</u>

Source: FEMA Project Worksheets, Cost Estimating Format, and OIG Analysis.

* See Footnote 5.

FEMA also included ineligible and excessive elevation costs in one properly approved replacement decision. Therefore, we question \$278,822 for ineligible elevation costs added to the replacement cost of the Main Building at the Animal Control Facility (finding B).

Finding A: FEMA Improperly Applied the 50 Percent Rule

FEMA officials did not correctly apply the 50 Percent Rule when deciding to replace, rather than repair, four City facilities: (1) the Main Library, (2) the Sokol Park Maintenance/A Street Shop, (3) the West Building within the Animal Control Facility, and (4) the Cat Building within the Animal Control Facility.⁵ As a result, FEMA incorrectly approved the replacement of these four facilities, which cost \$12 million more than the estimated cost to repair them. FEMA officials also made errors in applying the 50 Percent Rule to a fifth City facility, the Time Check Recreation Center; however, these errors did not affect the decision to repair or replace the facility.

Main Library

FEMA officials incorrectly applied the 50 Percent Rule to determine whether the City should repair or replace its Main Library (Project 518). FEMA’s 50 Percent Rule calculation included costs not allowed in the repair estimate and did not include costs required to be in the replacement estimate. As table 2 shows, FEMA incorrectly included Category B Emergency Protective Measures “muck out” costs in the repair estimate

⁵ The Animal Control Facility included four structures: the Main Building, the West Building, the Cat Building, and the Kennel. FEMA combined the costs for these four structures into one project (522).



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(numerator) and omitted mandatory National Flood Insurance Program (NFIP) elevation costs in the replacement estimate (denominator).⁶ FEMA’s calculation resulted in a 56.1 percent ratio of repair costs to replacement costs, indicating that FEMA should fund the building’s replacement. However, when calculated correctly, the ratio reaches only 48.4 percent, short of the 50 percent minimum needed to justify replacement.

Table 2. 50 Percent Rule Comparisons – Main Library – Project 518

Type of Cost	FEMA-Included Costs	Incorrect Percent	Correct Percent	Allowable 50 Percent Rule Costs
Cost Summary				
Repair Estimate				
Category B – Muck Out Costs	\$ 589,202			\$ 0
Uncompleted Work - Repairs	<u>4,012,817</u>			<u>4,012,817</u>
Total Estimated Repair	\$4,602,019			\$4,012,817
Replacement Estimate				
RS Means Replacement Estimate	\$8,198,214	56.1%	48.4%	\$8,198,214
Mandatory NFIP Elevation	<u>0</u>			<u>99,235</u>
Total Estimated Replacement	\$8,198,214			\$8,297,449

Source: FEMA Project Worksheets, Cost Estimating Format, and OIG Analysis.

According to *FEMA Disaster Assistance Policy 9524.4*, “disaster damage” for calculating the 50 Percent Rule includes only the costs of repairing the damaged components. The Category B muck out costs added to the Main Library repair estimate included costs not related to repairing the damaged components. FEMA also incorrectly included profit and overhead, airfare, auto rental, lodging, and per diem. In addition, \$50,000 of the \$589,202 was an estimate for future final cleaning costs. These non-repair costs were not eligible for inclusion in the calculation and directly affected the outcome of the replacement decision. Without these Category B costs, the resulting decision would have been to repair the Main Library rather than replace it.

According to *FEMA 322 Public Assistance Guide* (June 2007), p. 36, “Repair cost includes only those repairs, including non-emergency mold remediation, associated with the

⁶ Category B – Emergency Protective Measures are those activities a community performs before, during, and following a disaster that are necessary to eliminate or reduce an immediate threat to life, public health, or safety; or to eliminate or reduce an immediate threat of significant damage to improved public or private property through cost effective measures. Muck out work includes the removal of mud and water and stabilization of a facility following a flood to protect the facility from further damage.



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damaged components and the codes and standards that apply to the repair of the damaged components.” Only direct construction costs should be included in the repair (numerator) cost estimate. Mucking out a building does not repair damaged components, but rather reduces the threat of additional damage.

In a 2008, 50 Percent Rule calculation, second appeal decision, FEMA’s Assistant Administrator, Disaster Assistance Directorate, ruled on whether the 50 Percent Rule calculation should include Category B work. The ruling concluded that:

Emergency work is not considered in The 50% Rule analysis. In accordance with 44 CFR 206.226(d)(1), “A facility is considered repairable when disaster damages do not exceed 50 percent of the cost of replacing a facility.” The 50% Rule policy states that the numerator in this calculation is “the cost of repair of the disaster damage” only. Repair of disaster damage is work necessary to restore a facility on the basis of its predisaster design. This work is, by definition, permanent work. Emergency work eliminates or reduces threats to a facility, but does not encompass permanent repair of disaster damage to the facility, and is not considered in The 50% Rule analysis.

FEMA Region VII officials countered that they believed the classification of the work (emergency protective measures) is not as important as what the work accomplishes, and that some work under emergency conditions is appropriate to include in the repair costs of the 50 Percent Rule calculation. In Region VII’s view, items of work necessary to effect repairs and/or stabilize the facility from further damages are eligible to be in the repair estimate (numerator) of the 50 Percent Rule calculation.

Region VII agreed that the calculation should not include soft costs, but added that, from a practical standpoint, the inappropriate inclusion of soft costs in both repair and replacement causes minimal harm. However, this is not always true. In close calculations, this type of error could easily result in an incorrect decision. Region VII added that it has no formal regional written policy/procedure regarding the inclusion of Category B costs in the numerator of the calculation.

Region VII agreed that portions of the \$589,202 of muck out costs were not eligible for the 50 Percent Rule calculation. However, Region VII contends that some of the costs, such as first floor demolition, debris removal of carpeting, sheetrock, and other damaged elements, should be included in the repair estimate. Region VII’s basis for including the costs is *Disaster Assistance Policy 9524.4*, which states, “demolition essential to the repair of the damaged elements may be included in the numerator.” Region VII reviewed the muck out costs and estimated that approximately \$132,000 of



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the costs were associated with demolition essential to the repair of damaged elements. FEMA Region VII recalculated the 50 Percent Rule including the \$132,000 in the repair estimate. This calculation resulted in a 49.95 percent ratio of repair costs to replacement costs, which is short of the 50 percent threshold necessary to authorize the building replacement.

We disagree with Region VII's assessment that these costs were demolition costs essential to the repair of damaged elements. The catalyst for these costs was not to prepare the building for ultimate permanent repair of the damages, but to eliminate and reduce an immediate threat to life, public health, or safety and to eliminate or reduce an immediate threat of significant damage to public property—the very definition of emergency protective measures. The disaster was a flood. Water stood for days in the building. The carpet and walls were wet. There was an immediate need to remove all wet items, such as carpeting, books, and portions of the walls (sheetrock). This was not unique to this flooding event; this is standard emergency protective measures following any significant flooding event. Therefore, the initial muck out work was in response to an immediate need to stabilize the building and reduce a health threat, not to prepare for permanent repairs.

Further, emergency protective measures, like mucking out a building, are not relevant to the repair/replacement decision because the applicant incurs these costs regardless of the outcome of the decision. These are unavoidable "sunk costs" FEMA reimburses regardless of FEMA's eventual decision to either repair or replace the facility. Consequently, FEMA should not consider any of the costs when applying the 50 Percent Rule. Therefore, we agree with FEMA's Assistant Administrator, Disaster Assistance Directorate that Category B emergency work should not be included in the 50 Percent Rule calculation.

Although FEMA incorrectly included Category B muck out costs in other 50 Percent Rule decisions we reviewed, the additional non-repair costs did not affect the outcome of those replacement decisions. The calculation would have met the 50 Percent Rule threshold even without the Category B costs in the repair estimate.⁷ However, just as with the Main Library, the numerator of the 50 Percent Rule calculation in one decision included costs such as profit and overhead, airfare, lodging, and per diem.

Additionally, FEMA did not include \$99,235 of elevation cost in the replacement (denominator) estimate in the 50 Percent Rule calculation of the Main Library, as required. *FEMA Disaster Assistance Policy 9524.4* states that the denominator of the fraction is the cost of replacing the facility based on its predisaster design and according

⁷ We reviewed eight building replacements and determined that FEMA had incorrectly approved four of the replacements based on its misapplication of the 50 Percent Rule.



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to applicable codes and standards currently in effect. Further, according to FEMA 322 *Public Assistance Guide* (June 2007), p. 36, "Replacement cost includes the costs for all work necessary to provide a new facility of the same size or design capacity and function as the damaged facility in accordance with current codes and standards."

The Main Library was in a Special Flood Hazard Area (SFHA) flood zone at the time of the disaster. The City's local floodplain ordinance requires elevation of structures constructed or rebuilt in a SFHA to at least 1 foot above the base flood elevation. The floodplain requirement would have mandated the additional elevation cost in the total construction cost to rebuild the facility in its current location. Not including the elevation cost in the replacement cost (denominator) and other errors in the repair cost (numerator) previously discussed resulted in the incorrect replacement decision. FEMA Region VII agreed that the 50 Percent Rule calculation should have included the \$99,235 of elevation cost.

Because FEMA did not correctly apply the 50 Percent Rule, we normally would have questioned \$10,828,337 as ineligible. We would have calculated the \$10,828,337 in questioned costs as the difference between the total project cost (\$18,692,296), which includes the replacement and relocation of the facility, and the estimated repair costs (\$7,863,959). FEMA approved the Main Library project as an improved project.⁸ The City used additional funding from multiple sources to rebuild the Library. The City held the grand opening for the Library in August 2013 (figure 2). Because the Main Library is an improved project, we would have recommended that FEMA cap funding of the project at the amount of eligible repairs, or \$7,863,959. However, because FEMA Region VII has implemented corrective actions to prevent future improper replacement decisions, and we found no evidence that the City provided false or misleading information to FEMA, we are not questioning the \$10,828,337. Although we are not questioning the costs, we recommend that FEMA Region VII review and revise its 50 Percent Rule policies and procedures regarding the inclusion of Category B (Emergency Protective Measures) costs in the repair cost estimate.

⁸ An Improved Project is any project (large or small) where the applicant chooses to make additional improvements to the facility while making disaster repairs. Federal funding for improved projects is limited to the Federal share of the estimated costs and to the time limits that would be associated with repairing the damaged facility to its pre-disaster design.



Figure 2: Architectural Drawing of Main Library, Cedar Rapids, Iowa



Source: City of Cedar Rapids.

Sokol Park Maintenance/A Street Shop

FEMA officials incorrectly applied the 50 Percent Rule to determine whether Cedar Rapids should repair or replace the Sokol Park Maintenance/A Street Shop (Sokol Park) (Project 10309). The calculation included several cost elements not allowed in the 50 Percent Rule and omitted mandatory costs that should have been included in the calculation. As table 3 shows, FEMA incorrectly included costs for code upgrades and site work in the repair estimate (numerator), and did not include mandatory elevation costs in the replacement estimate (denominator). FEMA's calculation resulted in a 57.3 percent ratio of repair costs to replacement costs, indicating that FEMA should fund the building's replacement. However, when calculated correctly, the ratio reaches only 26.7 percent, far short of the 50 percent minimum needed to justify replacement.



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Table 3. 50 Percent Rule Comparisons – Sokol Park – Project 10309

Type of Cost	FEMA- Included Costs	Incorrect Percent	Correct Percent	Allowable 50 Percent Rule Costs
Cost Summary				
Repair Estimate				
Code Upgrade-Fire Suppression	\$ 64,880			\$ 0
Site Work	30,355			0
Uncompleted Work - Repairs	<u>300,413</u>			<u>300,413</u>
Total Estimated Repair	\$395,648			\$ 300,413
Replacement Estimate				
RS Means Replacement Estimate		57.3%	26.7%	
Mandatory NFIP Elevation	\$ 0			\$ 435,540
Estimated Replacement	<u>690,139</u>			<u>690,139</u>
Total Estimated Replacement	\$690,139			\$1,125,679

Source: FEMA Project Worksheets, Cost Estimating Format, and OIG Analysis.

This dramatic decrease from FEMA’s calculation of a 57.3 percent ratio to our calculation of a 26.7 percent ratio resulted from FEMA’s errors in both the denominator (\$435,540) and the numerator (\$95,235). However, in this instance, correcting the errors on either side alone would have pushed the ratio well below the 50 percent level. Only correcting the denominator would have resulted in a 35.1 percent ratio (\$395,648 divided by \$1,125,679); and only correcting the numerator would have resulted in a 43.5 percent ratio (\$300,413 divided by \$690,139).

Most notably, FEMA did not include the \$435,540 of elevation cost in the replacement (denominator) estimate in the 50 Percent Rule calculation, as required.⁹ The Sokol Park facility was in a SFHA flood zone at the time of the disaster. Cedar Rapids’ local floodplain ordinance requires elevation of structures constructed or rebuilt in a SFHA to at least 1 foot above the base flood elevation. The floodplain requirement would have mandated the additional elevation cost in the total construction cost to rebuild the facility in its current location. Although omitted from the 50 Percent Rule calculation, FEMA included the \$435,540 of mandatory elevation cost in the final total replacement

⁹ FEMA Disaster Assistance Policy 9524.4 states that the denominator of the fraction is the cost of replacing the facility based on its predisaster design and according to applicable codes and standards currently in effect. Further, according to FEMA 322 *Public Assistance Guide* (June 2007), p. 36, “Replacement cost includes the costs for all work necessary to provide a new facility of the same size or design capacity and function as the damaged facility in accordance with current codes and standards.”



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project cost estimate. Not including the elevation cost in the replacement (denominator) cost and other errors in the repair cost (numerator) discussed below resulted in the incorrect replacement decision. FEMA Region VII agreed that the 50 Percent Rule calculation should include the \$435,540 of elevation cost.

FEMA also included \$95,235 for a fire suppression system code upgrade and for site work costs on the repair side of the equation that are unallowable in the 50 Percent Rule calculation. FEMA included the cost for a fire suppression system in the repair estimate, although the facility did not originally have a system. *FEMA Disaster Assistance Policy 9524.4* states that “disaster damage” for calculating the 50 Percent Rule includes only the costs of repairing the damaged components. It further states that the numerator does not include costs associated with upgrades and other elements triggered by codes and standards or site work. These costs are allowable repair costs that FEMA will ultimately pay under the Public Assistance program; however, FEMA policy specifically excludes them in the 50 Percent Rule calculation. FEMA Region VII agreed that the 50 Percent Rule calculation should not include the fire suppression system and the site work costs.

Because FEMA did not correctly apply the 50 Percent Rule, we normally would have questioned \$914,665 as ineligible. We calculated the \$914,665 in questioned costs as the difference between the total replacement project cost (\$1,526,807) and the estimated repair costs (\$612,142). FEMA approved Sokol Park as an improved project, deobligated funding for the project from project worksheet 10309, and transferred it to another improved project—the Public Works building (Project 10311). Because of the transfer of funding to Project 10311, we would have recommended that FEMA deobligate the \$914,665 of ineligible costs for Sokol Park from the total amount obligated on Project 10311. However, because FEMA Region VII has implemented corrective actions to prevent future improper replacement decisions, and we found no evidence that the City provided false or misleading information to FEMA, we are not questioning the \$914,665.

Animal Control Facility – West Building

FEMA officials incorrectly applied the 50 Percent Rule to determine whether Cedar Rapids should repair or replace the West Building at the Animal Control Facility (Project 522). As table 4 shows, FEMA did not include the mandatory elevation cost in the replacement estimate (denominator). FEMA’s calculation resulted in a 57.3 percent ratio of repair costs to replacement costs, indicating that FEMA should fund the building’s replacement. However, when calculated correctly, the ratio reaches only 41.6 percent, short of the 50 percent minimum needed to justify replacement.



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Table 4. 50 Percent Rule Comparisons – West Building – Project 522

Type of Cost	FEMA- Included Costs	Incorrect Percent	Percent With Elevated Slab (OIG's Initial Calculation)	50 Percent Rule Costs with Elevated Slab	Percent with Dirt Fill Elevation (OIG's Re- calculation)	50 Percent Rule Costs with Dirt Fill Elevation
Cost Summary						
Repair Estimate						
Uncompleted Work - Repairs	<u>\$21,421</u>			<u>\$21,421</u>		<u>\$21,421</u>
Total Estimated Repair	\$21,421			\$21,421		\$21,421
Replacement Estimate						
Mandatory Elevation	\$ 0	57.3%	21.4%		41.6%	
Mandatory Elevation – Elevated Slab				\$ 62,850		\$ 0
Mandatory Elevation – Dirt Fill				0		14,066
Estimated Replacement	<u>\$37,416</u>			<u>\$37,416</u>		<u>\$37,416</u>
Total Estimated Replacement	\$37,416			\$100,266		\$51,482

Source: FEMA Project Worksheets, Cost Estimating Format, and OIG Analysis.

FEMA did not include the \$14,066 of elevation cost in the replacement (denominator) estimate in the 50 Percent Rule calculation, as required (see footnote 9). The West Building was in an SFHA flood zone at the time of the disaster. The City's local floodplain ordinance requires elevation of structures constructed or rebuilt in a SFHA to at least 1 foot above the base flood elevation. The floodplain requirement would have mandated the additional elevation cost in the total construction cost to rebuild the facility in its current location. Although FEMA omitted the \$14,066 in elevation costs from the 50 Percent Rule calculation, FEMA included mandatory elevation costs in the final total



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replacement project cost estimate. Not including the elevation cost in the replacement cost estimate (denominator) resulted in the incorrect replacement decision.

Although FEMA omitted mandatory elevation costs in the calculation, in 2011 FEMA added elevation costs for the West Building to the final combined project estimate. FEMA based the elevation estimate on elevating the structure with an elevated slab. Therefore, we initially included FEMA's \$62,850 estimate for an elevated slab in calculating replacement costs for the 50 percent decision, which resulted in a 21.4 percent ratio. Because of this audit, FEMA Region VII staff reviewed the elevation costs and disagreed with the methodology that the original estimator used when creating the 2011 estimate. Region VII said the most cost effective elevation method would be using hauled-in dirt fill, rather than elevating with an elevated slab.

We agree that FEMA should use the most cost effective method when calculating project costs; therefore, we re-calculated replacement costs using FEMA's \$14,066 estimate for dirt-fill elevation. As table 4 shows, including the less costly dirt fill costs results in a 41.6 percent ratio of repair costs to replacement costs, which is still well below the 50 percent threshold.

Because FEMA did not correctly apply the 50 Percent Rule, we normally would have questioned \$189,749 as ineligible. We calculated the \$189,749 in questioned costs as the difference between the total project cost (\$231,625) and the estimated repair costs (\$41,876). The total project cost of \$231,625 includes \$63,966 of elevated slab elevation costs and \$7,086 of demolition costs. Because the project did not meet the 50 percent threshold, and only repair is eligible, these additional replacement costs are not eligible. The Animal Control Facility is an improved project; therefore, we would have recommended that FEMA cap funding for the West Building at the eligible repair amount of \$41,876. However, because FEMA Region VII has implemented corrective actions to prevent future improper replacement decisions, and we found no evidence that the City provided false or misleading information to FEMA, we will not be questioning the \$189,749.

Animal Control Facility – Cat Building

FEMA officials incorrectly applied the 50 Percent Rule to determine whether Cedar Rapids should repair or replace the Cat Building (Project 522). The calculation did not include a mandatory cost that should have been included in the calculation. As table 5 shows, FEMA did not include the mandatory elevation cost in the replacement estimate (denominator). FEMA's calculation resulted in a 52.9 percent ratio of repair costs to replacement costs, indicating that FEMA should fund the building's replacement. However, when calculated correctly, the ratio reaches only 42.0 percent, short of the 50 percent minimum needed to justify replacement.



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Table 5. 50 Percent Rule Comparisons – Cat Building – Project 522

Type of Cost	FEMA- Included Costs	Incorrect Percent	Percent With Elevated Slab (OIG's Initial Calculation)	50 Percent Rule Costs with Elevated Slab	Percent with Dirt Fill (OIG's Re- Calculation)	50 Percent Rule Costs with Dirt Fill Elevation
Cost Summary						
Repair Estimate						
Uncompleted Work - Repairs	\$26,940			\$26,940		\$26,940
Total Estimated Repair	\$26,940			\$26,940		\$26,940
Replacement Estimate						
Mandatory Elevation	\$ 0	52.9%	25.4%		42.0%	
Mandatory Elevation – Elevated Slab				\$ 55,023		\$ 0
Mandatory Elevation – Dirt Fill				0		13,221
Estimated Replacement	\$50,894			\$50,894		\$50,894
Total Estimated Replacement	\$50,894			\$105,917		\$64,115

Source: FEMA Project Worksheets, Cost Estimating Format, and OIG Analysis.

FEMA did not include the \$13,221 of elevation cost in the replacement (denominator) estimate in the 50 Percent Rule calculation, as required (see footnote 9). The Cat Building was in an SFHA flood zone at the time of the disaster. The City's local floodplain ordinance requires elevation of structures constructed or rebuilt in a SFHA to at least 1 foot above the base flood elevation. The floodplain requirement would have mandated the additional elevation cost in the total construction cost to rebuild the facility in its current location. Although FEMA omitted the \$13,221 from the 50 Percent Rule calculation, FEMA included mandatory elevation costs in the final total replacement



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project cost estimate. Not including the elevation cost in the replacement cost estimate (denominator) resulted in the incorrect replacement decision.

Although FEMA omitted mandatory elevation costs in the calculation, in 2011 FEMA added elevation costs for the Cat Building to the final combined project estimate. FEMA based the elevation estimate on elevating the structure with an elevated slab. Therefore, we initially included FEMA's \$55,023 estimate for an elevated slab in calculating replacement costs for the 50 percent decision, which resulted in a 25.4 percent ratio. Just as with the West Building, FEMA Region VII staff reviewed the elevation costs and disagreed with the methodology that the original estimator used when creating the 2011 estimate. Region VII said the most cost effective elevation method would be using hauled-in dirt fill, rather than elevating with an elevated slab.

Again, we agree that FEMA should use the most cost effective method when calculating project costs; therefore, we re-calculated replacement costs using FEMA's \$13,221 estimate for dirt-fill elevation. As table 5 shows, including the less costly dirt fill costs results in a 42.0 percent ratio of repair costs to replacement costs, which is still well below the 50 percent threshold.

Because FEMA did not correctly apply the 50 Percent Rule, we normally would have questioned \$171,228 as ineligible. We calculated the \$171,228 in questioned costs as the difference between the total project cost (\$223,705), and the estimated repair costs (\$52,477). Total project cost of \$223,705 includes \$56,046 of elevated slab elevation costs and \$7,086 of demolition costs. Because the project did not meet the 50 percent threshold, and only repair is eligible, these additional replacement costs are not eligible. The Animal Control Facility is an improved project; therefore, we would have recommended that FEMA cap funding for the Cat Building at the eligible repair amount of \$52,477. However, because FEMA Region VII has implemented corrective actions to prevent future improper replacement decisions, and we found no evidence that the City provided false or misleading information to FEMA, we are not questioning the \$171,228.

Time Check Recreation Center

FEMA made similar calculation errors when calculating the 50 Percent Rule for the Time Check Recreation Center. However, these mistakes did not change the outcome. FEMA included unallowable costs in the repair estimate and omitted required costs from the replacement estimate of the calculation. Similar to the Main Library calculation, FEMA incorrectly included Category B Emergency Protective Measures costs in the repair (numerator) estimate. In addition, FEMA incorrectly included the cost of a fire suppression system in the repair calculation when the facility did not originally have one.



FEMA also made errors in estimating the replacement (denominator) cost. Similar to the Sokol Park and Animal Control Facility calculations FEMA incorrectly omitted the additional costs to elevate the facility to meet floodplain elevation requirements. Although these errors were not significant enough to affect the 50 Percent Rule calculation, mistakes like these are serious because in different circumstances the errors could have resulted in an erroneous decision costing millions of dollars.

Finding B: Correct Replacement Decision Included Ineligible Costs

Animal Control Facility – Main Building

FEMA included \$278,822 of excessive and ineligible elevation costs in the final project cost of the eligible replacement of the Animal Control Facility - Main Building. Although FEMA correctly included elevation in the replacement cost estimate, FEMA based the costs (as with the West and Cat Buildings) on a more costly elevated slab methodology.

FEMA included elevation costs in a revised total replacement estimate for the individual structure and additional elevation costs in the final combined project estimate.¹⁰ FEMA added additional eligible square footage to the Main Building. As a result, in August 2011, FEMA re-estimated the Main Building's total replacement cost using RS Means 2011 cost data to account for the additional square footage and to estimate the project using current cost data. The revised replacement estimate included elevation costs, based on elevating the structure with an elevated slab. Again, because of our audit, FEMA Region VII staff reviewed the elevation costs and disagreed with the methodology that the original estimator used when creating the 2011 estimate. Region VII said the most cost effective elevation method would be using hauled-in dirt fill, rather than with the more costly method of an elevated slab.¹¹ We agree that FEMA should use the most cost effective method when calculating project costs.

Although FEMA properly approved the replacement of the Main Building, FEMA included \$198,736 of ineligible elevation costs in the final replacement funding. As explained above, the 2011 revised replacement estimate for the Main Building included elevated slab elevation costs. The 2011 replacement estimate for the Main Building

¹⁰ FEMA added elevation costs for the Animal Control Facility - Main Building twice to the final combined project (Project 522). Initially in the replacement cost estimate for the individual Main Building structure and again in a separate elevation estimate that estimated additional elevation for each of the 3 buildings (Main, West, and Cat) on the combined project worksheet (Project 522). FEMA combined the replacement/repair costs for the four individual structures at the Animal Control Facility (Main, West, Cat and Kennel) into one project (Project 522).

¹¹ With the dirt-fill method, elevation is achieved with hauled in dirt and less solid concrete, whereas, the elevated slab method requires more solid concrete, which is more expensive. Region VII said that elevating with dirt-fill would have sufficiently elevated the structure at less cost.



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totaled \$958,630. FEMA recalculated the required elevation using the dirt fill method in 2011 costs, which totaled \$759,894. The difference between the two estimates, or \$198,736 (\$958,630 minus \$759,894), is the amount of excess elevation costs FEMA awarded to the City. In addition to these elevation costs, FEMA included an additional \$80,086 for elevating the structure to the final combined project (Project 522). Because the replacement estimate for the Main Building included excessive elevation in the replacement estimate and additional or duplicate elevation in the final combined project (Project 522) cost, we question \$278,822 (\$198,736 plus \$80,086) as ineligible costs. The Animal Control Facility is an improved project (see footnote 8); therefore, FEMA should cap funding at the eligible replacement amount of \$759,894. Region VII agreed with our finding that it should cap funding at \$759,894.

City/Iowa Response. City and Iowa officials disagreed with our finding. They contend that our report does not provide the rationale for disagreement with the methodology FEMA used in the original estimate for elevation. Therefore, it is difficult for them to comment on the cost effectiveness of the elevated slab versus the hauled-in dirt fill for elevation, and we should not question the costs.

Office of Inspector General (OIG) Response. We disagree. As a result of our audit, FEMA Region VII staff reviewed the elevation costs and disagreed with the original estimators' elevation methodology used in the 2011 cost estimate. Our report clearly states that, because the "hauled-in dirt" method was more cost effective, FEMA deemed it preferable to the more costly elevated slab method.



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RECOMMENDATIONS

We recommend that the Regional Administrator, FEMA Region VII:

Recommendation #1: Review and revise 50 Percent Rule policies and procedures regarding the inclusion of Category B (Emergency Protective Measures) costs in the repair cost estimate (finding A) and provide guidance, when appropriate, on identifying and using the most cost effective elevation methodology in the 50 Percent Rule calculation and final replacement cost (findings A and B).

Recommendation #2: Disallow \$278,822 (\$250,940 Federal share) of ineligible facility elevation costs from the Animal Control Facility – Main Building (Project 522) (finding B).

DISCUSSION WITH MANAGEMENT AND AUDIT FOLLOWUP

We discussed the results of our audit with FEMA, Iowa, and City officials during our audit and included their comments in this report, as appropriate. We also provided a draft report in advance to FEMA, Iowa, and City officials and discussed it at exit conferences held with FEMA officials on October 24, 2013, and with State and City officials on November 19, 2013. We also provided a final draft report to these officials on July 21, 2014. FEMA officials did not agree with our Main Library (PW 518) replacement finding, but generally agreed with all other findings and with all our recommendations.

Within 90 days of the date of this memorandum, please provide our office with a written response that includes your (1) agreement or disagreement, (2) corrective action plan, and (3) target completion date for each recommendation. Also, please include the contact information of responsible parties and any other supporting documentation necessary to inform us about the current status of the recommendation. Until we receive your response, we will consider the recommendations open and unresolved.

Consistent with our responsibility under the *Inspector General Act*, we will provide copies of our report to appropriate congressional committees with oversight and appropriation responsibility over the Department of Homeland Security. We will post the report on our website for public dissemination.

Major contributors to this report are Christopher Dodd, Acting Director; Patti Smith, Auditor-in-Charge; and Sharon Snedeker, Senior Auditor.



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Please call me with any questions at (202) 254-4100, or your staff may call Christopher Dodd, Acting Director, Central Regional Office, at (214) 436-5200.



**Federal Regulations and FEMA Guidelines for
Repair vs. Replace Decisions and Relocating Facilities**

The “50 Percent Rule”

According to Federal regulation 44 CFR 206.226(f)(1), “A facility is considered repairable when disaster damages do not exceed 50 percent of the cost of replacing a facility....” FEMA refers to this regulation as the 50 Percent Rule and implements it according to its *Disaster Assistance Policy 9524.4*. This policy provides the decision making tool to determine whether FEMA should fund the repair or replacement of a disaster-damaged facility.¹² The tool compares certain repair costs with certain replacement costs and results in a fraction that expresses repair costs as a percentage of replacement costs. The calculation specifically excludes many otherwise allowable repair and replacement costs that FEMA will ultimately pay under the Public Assistance (PA) program.

FEMA policy excludes these costs because including them in the repair or replacement decision calculation could distort the results. For example, according to FEMA, if the repair side of the calculation included seismic upgrade costs to undamaged elements of the building, then the repair costs of older buildings with even minor damage could exceed the 50 percent cost threshold because of the comparatively high cost of code-triggered whole-building upgrades, seismic upgrading, and related repairs.

FEMA bases its exclusion of certain costs on the premise that, when a facility is so severely damaged that the cost to repair the damage exceeds 50 percent of the cost of a new building, it is often justifiable and reasonable to replace the building. However, including costs not eligible for inclusion in the calculation with the costs of the repairs to the damaged elements could cause erroneous decisions to fund new facilities rather than repair lightly damaged facilities.

Specifically, the numerator of the fraction includes only the direct cost of repairing the disaster damage, often referred to as “hard” costs, and may include costs associated with the current repair codes and standards that apply to the damaged elements only.¹³ The numerator does not include costs associated with—

¹² Various Federal policies and publications clarify 44 CFR 206.226(f)(1). These include *FEMA 322 Public Assistance Guide* (June 2007), p. 36; *Public Assistance Policy Digest* (January 2008), p. 113; and *Disaster Assistance Policy DAP9524.4* (September 24, 1998). FEMA updated DAP9524.4 on March 25, 2009.

¹³ Only direct construction costs, known as base or “hard” costs, can be included in the numerator or denominator of either the repair or the replacement costs. “Soft” costs include the costs for project management, architectural and design fees, and insurance.



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- a. upgrades and other elements triggered by codes and standards,
- b. design associated with upgrades,
- c. demolition of entire facility,
- d. site work,
- e. applicable project management costs,
- f. contents, and
- g. hazard mitigation measures.

The denominator of the fraction is the cost of replacing the facility based on its predisaster design and according to applicable codes and standards currently in effect. The denominator does not include costs associated with—

- a. demolition,
- b. site work,
- c. applicable project management costs,
- d. contents, and
- e. hazard mitigation measures.

Deciding to repair a facility may not necessarily result in cost savings to taxpayers after all allowable costs under the PA program are included. However, FEMA caps the total repair costs at the estimated cost to replace the facility.



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Exhibit B

Schedule of Projects Audited and Questioned Costs

Project Number	Net Award Amount	Finding A	Finding B	Total Costs Questioned
518	\$18,692,296	\$0	\$0	\$0
10308	14,825,531	0	0	0
9882	1,820,173	0	0	0
522	1,705,406	0	278,822	278,822
10309	<u>1,526,807</u>	<u>0</u>	<u>0</u>	<u>0</u>
Totals	<u>\$38,570,213</u>	<u>\$0</u>	<u>\$278,822</u>	<u>\$278,822</u>

Source: FEMA Project Worksheets and OIG Analysis.



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