

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

FEMA's Decisions to Replace
Rather than Repair Buildings
at the University of Iowa



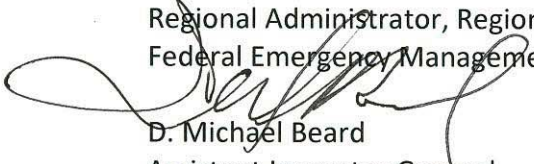


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Department of Homeland Security

Washington, DC 20528 / www.oig.dhs.gov

June 19, 2012

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

FROM: 
D. Michael Beard
Assistant Inspector General
Office of Emergency Management Oversight

SUBJECT: *FEMA's Decisions to Replace Rather than Repair
Buildings at the University of Iowa*
FEMA Disaster Number 1763-DR-IA
Audit Report Number DD-12-17

We audited Federal Emergency Management Administration (FEMA) Region VII's decisions to fund the replacement, rather than the repair, of flood-damaged buildings at the University of Iowa (University) (Public Assistance Identification Number 103-03027-00). We initiated this audit based on an anonymous complaint we received that FEMA Region VII did not correctly decide to replace University buildings. Our audit objective was to determine whether Region VII correctly applied the "50 Percent Rule" when deciding to fund replacement, rather than repair, of two University buildings following the 2008 Iowa River flood. Generally, FEMA can decide to fund the replacement of a damaged facility when repair costs exceed 50 percent of replacement costs or if the facility is destroyed.

The University received an award of \$475 million from the Iowa Homeland Security and Emergency Management Division (IHSEMD), a FEMA grantee, for damages caused by flooding that occurred during the period May 25, to August 13, 2008. The award provided 90 percent FEMA funding. The audit covered the period May 25, 2008, through August 24, 2011, the cutoff date of our audit, and included a review of two building replacement approvals FEMA Region VII made totaling \$296.69 million (see Exhibit A, Schedule of Replacement Projects Reviewed).¹

¹ At the cutoff date of our audit, FEMA had not fully obligated the replacement of these buildings. However, on January 11, 2012, FEMA fully obligated these replacements, and amounts in this report reflect these new obligations.



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We conducted this performance audit between July 2011 and April 2012 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 according to the statutes, regulations, and FEMA policies and guidelines in effect at the time of the disaster.

We interviewed FEMA and IHSEMD officials, reviewed repair and replacement cost estimates, visited the flood-damaged Hancher Voxman-Clapp (HVC) building complex, and performed other procedures considered necessary to accomplish our objective. We did not assess the adequacy of FEMA's internal controls applicable to making the repair or replacement decisions under the 50 Percent Rule because it was not necessary to accomplish our audit objective. We did, however, gain an understanding of FEMA Region VII's method of estimating costs for deciding whether to fund the repair or replacement of damaged facilities.

BACKGROUND

Beginning in late May 2008, catastrophic flooding occurred along the Cedar River and Iowa River, inundating portions of the University along the Iowa River for weeks. As part of the recovery process, FEMA worked with IHSEMD and the University to decide whether FEMA should fund the repair or replacement of damaged structures. Deciding whether to fund repair or replacement of damaged structures can be complicated, and mistakes can result in serious financial consequences.



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The Iowa River (left) flooded the University of Iowa Hancher Voxman-Clapp building complex.

Hancher Voxman-Clapp

The HVC complex consists of the Hancher Auditorium, a multistory auditorium with balconies; the Voxman Music School, a two-story building including classrooms and recital rooms; and the Clapp Recital Hall, a two-story auditorium. The three buildings total approximately 300,000 square feet. The floodwaters reached a depth of approximately 5½ feet above the surrounding exterior of the buildings, inundating the basement level that housed the heating, cooling, ventilation, and electrical systems of the complex and flooding the ground floors to approximately 18 inches. Although site inspections identified no structural damage, the flooding damaged the interior architecture, including floor finishes, acoustical features and equipment, doors and frames, elevators, and shared mechanical and electrical equipment and systems. The flooding also damaged special stage, theater, and musical materials and equipment.

Art Building East

The Art Building East consists of (1) the North Area Buildings, which include the Main Art Building, the Grant Wood Studio, and the North Building Addition; and (2) the South Area Buildings, which include the Ceramics and Metalworking Buildings. Square footage



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for all these buildings totaled approximately 92,000 square feet. Floodwaters inundated the basements; however, the first floor of the Main Art Building did not flood, and only a 300-square-foot area of the first floor of the North Building Addition flooded. The first floor of the South Area Buildings, built at a lower elevation, flooded to 48 inches. Like HVC, these buildings experienced damage to floor finishes, walls, doors and frames, elevator, and the mechanical and electrical equipment and systems.

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.² The application of this tool compares certain repair costs to 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 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 so on.

FEMA bases its exclusion of certain costs on the premise that, when a facility is so severely damaged (not including code-triggered whole-building upgrades) 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 certain code-triggered whole-building upgrade costs with the costs of the repairs to the damaged elements would likely cause erroneous decisions to fund new facilities rather than repair structurally sound and lightly damaged facilities.

² Federal regulation 44 CFR 206.226(f)(1) is clarified under various FEMA policies and publications, including Public Assistance Guide, FEMA 322, p. 36, June 2007; Public Assistance Policy Digest, p. 113, January 2008; and Disaster Assistance Policy, DAP9524.4, September 24, 1998. FEMA updated DAP9524.4 on March 25, 2009.



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Specifically, the numerator of the fraction includes only the direct costs of repairing the disaster damage, referred to as "hard" costs,³ and may include costs associated with the current repair codes and standards that apply to the damaged elements only. The numerator does not include costs associated with the following:

- 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. These codes and standards may relate to structural elements such as mechanical or electrical systems, or the size of a structure. The denominator does not include costs associated with the following:

- 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 Public Assistance program are included. However, FEMA caps the total repair costs at the estimated cost to replace the facility.

RESULTS OF AUDIT

FEMA Region VII officials did not correctly apply the 50 Percent Rule when deciding to replace HVC, and their decision to replace Art Building East was unsupported and likely based on inaccurate cost data. The HVC replacement decision stemmed from flawed calculations and unsupported replacement cost estimates. Rather than developing the

³ Only direct construction costs, 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 fees, cost escalation, and profit. However, for simplicity, dollar amounts in the body of the report refer to both hard and soft costs unless otherwise noted.



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detailed scope of work and itemized costs required by FEMA's Cost Estimating Format (CEF), Region VII Joint Field Office officials estimated replacement costs of the HVC by entering basic square-foot data, along with other general factors, into an off-the-shelf cost-estimating program. However, the use of this cost-estimating program in this circumstance was not only contrary to the FEMA CEF Instructional Guide, it was also inappropriate because this program was not designed to estimate costs for buildings of the size or complexity of HVC.

The problems with the off-the-shelf cost-estimating tool are best illustrated by the fact that, by using that tool, FEMA originally estimated HVC's replacement cost at \$42.56 million; however, today FEMA estimates the HVC replacement cost at \$220.42 million. Similarly, FEMA originally estimated the Art Building East's replacement cost at \$15.697 million; but today, FEMA estimates the cost at \$76.27 million. Additionally, FEMA officials could not provide the documentation supporting their original replacement cost estimates for both buildings. The documents had been stored at the FEMA Iowa Recovery Center rather than the FEMA Regional Office.

This misapplication of the 50 Percent Rule occurred primarily because, in late 2008, IHSEMD, University, and FEMA officials rushed FEMA Region VII cost-estimating staff to develop the cost estimates. The misapplication also occurred, in part, because FEMA Region VII did not have policies, procedures, and review standards to address the special concerns and precautions FEMA should have followed in making repair or replacement decisions on large, complex projects.

In early 2012, FEMA officials provided detailed cost estimates for HVC and Art Building East that continued to include unallowable code-triggered upgrades. However, FEMA officials continued to assert that they properly decided to replace, rather than repair, the buildings. In written comments to a draft of this report, FEMA officials also presented new criteria—the facilities were destroyed—to support their replacement decisions.⁴ For the reasons discussed in this report, we disagree with FEMA's assertion that it properly applied the 50 Percent Rule. Therefore, this report recommends that FEMA Region VII officials take the following actions:

1. Suspend the replacement decisions for the Hancher Voxman-Clapp building and the Art Building East.

⁴ In FEMA's written comments, it stated that the Regional Administrator required the relocation of the HVC and the Art Building East facilities to new site(s) outside the floodplain, pursuant to 44 CFR 206.226(g). 44 CFR 206.226(g) states that the Regional Director may approve funding for and require restoration of a destroyed facility at a new location when (i) the facility is and will be subject to repetitive heavy damage; (ii) the approval is not barred by other provisions of title 44 CFR; and (iii) the overall project, including all costs, is cost effective.



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2. Develop cost-estimating policies and procedures and review standards to address cost estimating for large and technically complex projects under the 50 Percent Rule.
3. Deobligate \$61,684,880 (\$55,516,392 Federal share) from the Hancher Voxman-Clapp building (Project 10367) and put those Federal funds to better use.
4. Deobligate \$22,060,714 (\$19,854,643 Federal share) from Art Building East (Project 1587) and put those Federal funds to better use.

November 2008 HVC and Art Building East Repair and Replacement Estimates

FEMA significantly underestimated the cost to replace the HVC, which ultimately led to FEMA's improper decision to replace the building under the 50 Percent Rule. On Friday, November 14, 2008, Region VII's Joint Field Office cost-estimating team received the direction that they had to finalize preliminary repair or replacement estimates on six large University facilities for presentation to the University the following Monday, November 17. Because of those time constraints, the team developed its estimates without the benefit of site visits or a detailed scope of work and relied on gross square footage estimates and aerial photos, rather than descriptions of damage based on the detailed construction documents. They calculated the HVC replacement cost estimate using the gross square footage of the buildings with an off-the-shelf cost-estimating program.⁵ Additionally, the replacement estimate did not consider the many special architectural, acoustical, and mechanical characteristics of the HVC building.

As shown in figure 1, this initial November 2008 50 Percent Rule calculation resulted in an HVC 50.1 percent ratio based on a \$21.34 million repair estimate and a \$42.56 million replacement estimate. This repair vs. replacement cost ratio barely exceeded the 50 percent minimum requirement threshold for replacement. Similarly, as shown in figure 2, the Art Building East calculation resulted in a 50.9 percent ratio based on a \$7.984 million repair estimate and a \$15.697 million replacement estimate. Again, this ratio barely exceeded the 50 percent minimum replacement requirement. The HVC calculation not only used general and incomplete cost data, but also included hard and soft costs, whereas only hard costs should be considered in these calculations. Because FEMA Region VII officials considered these calculations preliminary, they did not make their replacement decisions based on these estimates.

⁵ The cost estimating team used the RSMeans CostWorks Square Foot Calculator model for facilities of like kind, size, and capacity. However, the Square Foot Calculator is a user-friendly tool designed for quick "conceptual estimates," and is not a substitute for detailed cost estimating.



December 2008 HVC Repair and Replacement Estimates

Several weeks later, a Region VII Building Assessment Team visited the damaged buildings to develop information for re-estimating repair costs and, as a result, increased the HVC estimated repair costs from \$21.34 million to \$26.3 million. Then, Region VII officials reduced the updated repair estimate of \$26.3 million and the original replacement estimate of \$42.56 million by 32 percent because they believed the 32 percent represented the soft costs that are not supposed to be included in the repair or replacement decision. Thus, as shown in figure 1, Region VII officials arrived at a 61.8 percent ratio of repair costs to replacement costs by comparing the adjusted repair cost estimate of \$17.87 million to the adjusted replacement cost estimate of \$28.94 million to support its December 21, 2008, decision to approve funding replacement of HVC.

Based on interviews and reviews of FEMA and IHSEMD files, the December 2008 HVC replacement cost estimate that Region VII staff relied upon to approve the replacement of HVC had many deficiencies:

1. Contrary to FEMA policy, FEMA did not use the CEF to develop its cost estimate,⁶ but rather used gross square footage data and did not use estimates of detailed line-item costs based on available original construction drawings. FEMA uses the CEF tool to estimate the cost of constructing large projects across the entire range of eligible permanent work. FEMA should have calculated both the repair and replacement cost estimates using a clear, concise, and complete scope of work along with a description of all individual activities needed to perform the work. The FEMA CEF Instructional Guide provides specific direction for using the CEF in the 50 Percent Rule calculations.
2. The RSMeans Square Foot Calculator program was not appropriate to estimate the replacement cost of large buildings like HVC. The RSMeans Square Foot Calculator clearly warns users not to use the software when “parameters are not within the ranges recommended by RSMeans.”
3. The RSMeans Square Foot Calculator did not address the unique qualities and complexities of the HVC building, but rather considered only broad construction parameters.
4. The RSMeans Square Foot Calculator estimated replacement costs that were so unreasonably low (\$142 per square foot for hard and soft costs) that Region VII

⁶ “Implementation of Cost Estimating Format (CEF) in the Public Assistance Program Module of NEMIS,” March 1, 2007, David Garratt memorandum to Regional Directors/Acting Regional Director Regions I–X.



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cost estimators should have realized that it understated the true HVC replacement cost.

5. Region VII staff did not compare the RSMeans-generated replacement cost with the estimate that the University provided to FEMA before the December 2008 decision, indicating an estimated replacement cost of \$350 per square foot (hard and soft costs). FEMA received these University estimates before it finalized the cost estimates.
6. Region VII staff did not compare the RSMeans-generated replacement cost with available comparable construction costs for similar buildings, which ranged from \$373 to \$577 per square foot (for hard and soft costs).
7. The assumption made by Region VII staff that they could remove the soft costs from the total repair and replacement costs by reducing them both by 32 percent was not appropriate because soft costs for replacement estimates are generally higher than those for repair estimates.
8. The Region VII Technical Assistance Contractor who prepared the replacement estimate did not visit the flood-damaged HVC building before preparing his estimates.

Post-2008 HVC Repair and Replacement Estimates

As shown in figure 1, on November 6, 2009, Region VII adjusted the repair vs. replacement ratio to 54.2 percent. Region VII arrived at this ratio by applying the CEF, which used detailed line-item cost estimates that almost doubled its HVC replacement cost estimate from \$42.56 million to \$84.5 million. At the same time, Region VII also increased its repair estimate by adding \$27.1 million in triggered hazard mitigation costs. Region VII asserted that the upgrades were necessary to comply with current codes and standards and, thus, were allowed on the repair side of the 50 percent calculation. However, Region VII was incorrect because these upgrades were hazard mitigation upgrades that were triggered by the floodplain manager's determination that the buildings were "substantially damaged."

According to both FEMA senior management and some staff at the Iowa Closeout Center, Region VII's decision to include the hazard mitigation upgrade costs in the repair vs. replacement ratio was improper because the 50 Percent Rule specifically precludes triggered upgrades in its calculation. Specifically, in April 2007, FEMA's Acting Assistant Administrator, Disaster Assistance Directorate, said in a memorandum to the Associate Deputy Administrator for Gulf Coast Recovery that triggered provisions are "not



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considered when determining if the damaged structure is eligible for replacement pursuant to . . . the 50 percent rule.” Consequently, on April 13, 2011, cost estimation staff at FEMA’s Iowa Closeout Center removed the code-triggered upgrades from the repair side of the fraction, resulting in 50 Percent Rule ratios of 21.1 percent and 19.4 percent.

In April 2011, struggling over the 50 Percent Rule calculation, Region VII’s Public Assistance Branch Chief asked the FEMA Acting Director, Public Assistance Division, Recovery Directorate, whether FEMA Region VII could take another approach when calculating the 50 Percent Rule and consider provisions of 44 CFR Part 9, *Floodplain Management and Protection of Wetlands*, in deciding whether these costs were allowable.⁷ The Acting Director agreed with the Branch Chief, and responded that “the measures triggered under 9.11(d)(3) due to the determination of substantial damage by the floodplain manager are considered codes and standards compliance requirements” and are “appropriately considered part of the repair costs for the purposes of determining eligibility for replacement assistance under the 50% rule.” Although this is a novel approach to an attempt to justify the replacement of the HVC, that determination contradicts FEMA policy that specifically excludes triggered upgrades in the calculation.

As an additional complication, in 2009, when the Iowa Department of Natural Resources, as floodplain manager, determined that the HVC building was “substantially damaged” and therefore required hazard mitigation upgrades to perform the repairs, the floodplain manager made the determination incorrectly by using FEMA’s \$42.56 million replacement cost instead of predisaster fair market value, as required.⁸

Incorrect as it was, the floodplain manager’s decision was irrelevant anyway because the triggered hazard mitigation, even if required, is not allowed in the repair calculations under the 50 Percent Rule.

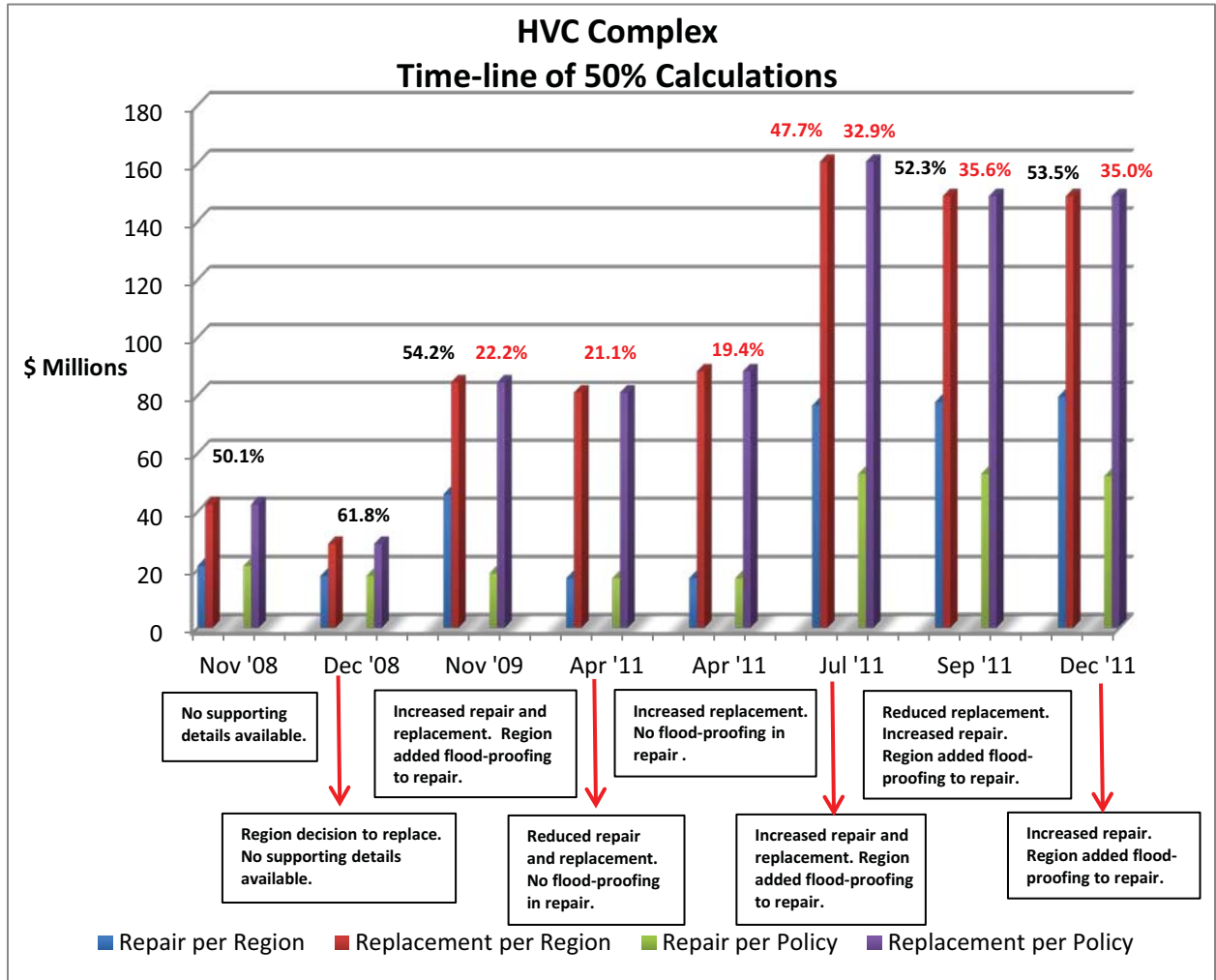
⁷ 44 CFR Part 9.11(d)(3).

⁸ 44 CFR 59.1 – Definitions. “Substantial damage means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the *market value of the structure before the damage occurred.*” [emphasis added]



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Figure 1: Comparison of Region VII's Calculations for HVC to Calculations Per the 50 Percent Rule





Recent HVC Repair and Replacement Estimates

As the HVC replacement estimate increased, Region VII staff recognized that the earlier repair estimate should be updated. Therefore, Region VII prepared an unofficial “gut check” repair vs. replacement calculation based on a July 2011 walk-through that resulted in a \$76.56 million estimate to repair the HVC and a \$160.6 million estimate to replace it. These new estimates produced a 47.7 percent repair vs. replacement ratio that was short of the required 50 percent.⁹ However, these estimates continued to include \$23.7 million in unallowable code-triggered hazard mitigation costs (unallowable in the 50 Percent Rule calculation, but allowable for reimbursement under the Public Assistance program). Removing the \$23.7 million in hazard mitigation drops the estimated repair costs to \$52.86 million, or 32.9 percent of the replacement costs, well short of the required 50 percent. However, Region VII ignored this estimate because of the limited nature of the July 2011 walk-through and the expectation that repair costs would increase after an exhaustive examination.

In September 2011, Region VII performed a further refinement of the calculation based on the July 2011 walk-through. This calculation resulted in a \$77.75 million estimate for HVC repair costs and a reduced \$148.66 million estimate for replacement. This calculation produced a 52.3 percent repair vs. replacement ratio. However, the repair costs continued to include \$24.88 million in hazard mitigation costs (unallowable in the 50 Percent Rule calculation, but allowed for reimbursement under the Public Assistance program). Removing the \$24.88 million in hazard mitigation costs drops the estimated repair costs to \$52.87 million, or 35.56 percent of the replacement costs, again well short of the required 50 percent.

On January 6, 2012, FEMA Region VII officials provided updated and detailed repair and replacement costs and revised 50 Percent Rule calculations for HVC based on the University architects’ November 21, 2011, “HVC Repair and Protection Estimate.” This new information reflected HVC estimated repair costs of \$52.09 million and estimated replacement costs of \$148.66 million (both hard costs only). These estimates produced a 50 Percent Rule calculation of 35.04 percent. However, when the code-triggered mitigation of elevating the whole-building was included, the estimated costs to repair the building increased to \$79.52 million. Adding the unallowable whole-building elevation costs to the repair costs resulted in a 50 Percent Rule calculation of 53.49 percent (\$79.52 million divided by \$148.66 million).

⁹ We emailed a memorandum to FEMA Region VII officials on June 30, 2011, announcing that we would begin this audit in July 2011.



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Because Region VII's HVC replacement decision was initially unsupported and later based on estimates that included unallowable costs for code-triggered whole-building upgrades, the decision to replace the HVC is not supported by FEMA's 50 Percent Rule. Therefore, we question \$61,684,880, and recommend that those Federal funds be put to better use. The amount questioned is the difference between the current project replacement amount of \$220,417,038 (obligated) and the most recent repair estimate of \$158,732,158, which includes the code-triggered mitigation costs that are eligible for FEMA reimbursement, but are not allowed to be used in the repair or replacement decision.¹⁰

Art Building East Repair and Replacement Estimates

In December 2008, Region VII officials prepared additional cost estimates for making their decision to repair or replace Art Building East. They made their decision to replace it in the same manner as their decision to replace HVC, using incomplete data collected under similar rushed conditions. Therefore, the estimates used to support replacing Art Building East suffered from estimating problems similar to HVC's. As shown in figure 2, Region VII's December 2008 decision used a 50 Percent Rule calculation of 56.7 percent to support the replacement of Art Building East. That ratio was based on an \$8.9 million estimate to repair the Art Building and a \$15.697 million estimate to replace it. However, Region VII staff said they could not find the detailed supporting cost data for the Art Building East replacement estimate. In October 2009, FEMA performed new repair and replacement estimates for another 50 Percent Rule calculation for Art Building East. Those estimates yielded a 54.2 percent ratio that would have authorized the replacement of the buildings. As with HVC, the replacement costs escalated from \$15.697 million in 2008 to \$76.27 million, a fivefold increase (hard and soft costs).

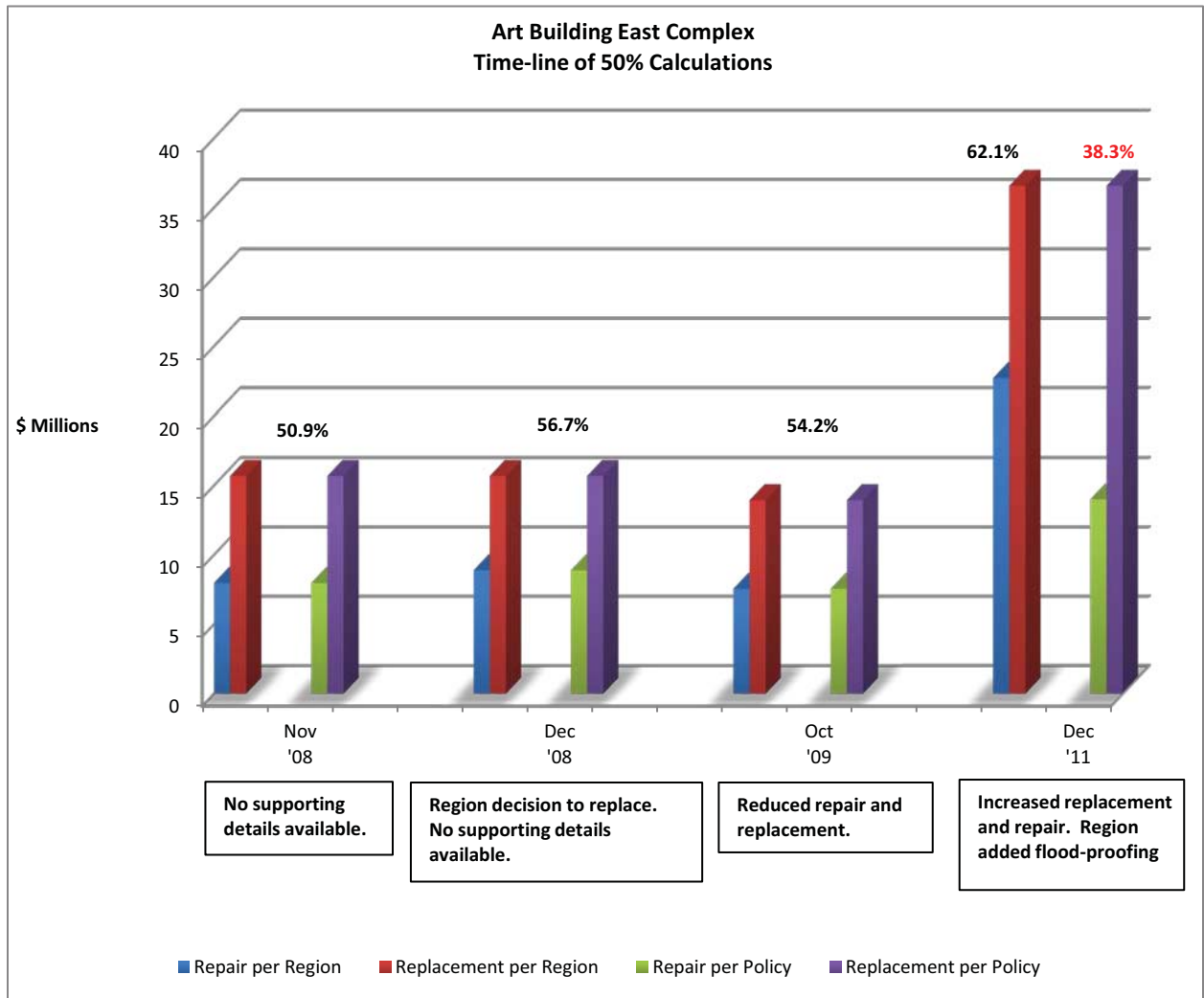
¹⁰ We calculated funds put to better use using the December 8, 2011, \$158,732,158 repair cost estimate that includes the code-triggered, whole-building elevation costs. The \$158,732,158 in repair costs (hard and soft costs) is allowable under FEMA's Public Assistance program. However, FEMA's 50 Percent Rule only allows \$52.09 million (hard costs only) in the numerator.



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Figure2: Comparison of Region VII's Calculations for Art Building East to Calculations Per the 50 Percent Rule





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On January 6, 2012, FEMA Region VII officials also provided updated repair and replacement costs and revised 50 Percent Rule calculations for Art Building East based on the University architect's November 21, 2011, "Art Building Complex Flood Repair & Flood Protection Study & Estimate." This new information reflected estimated costs of \$14.02 million for building repairs and \$36.58 million for replacement, resulting in a 50 Percent Rule calculation of 38.32 percent. However, when the unallowable code-triggered mitigation cost to flood-proof the buildings were included, the estimated repair costs increased to \$22.707 million. Adding the whole-building flood-proofing costs to the repair costs resulted in a 50 Percent Rule calculation of 62.07 percent (\$22.707 million divided by \$36.584 million).

Because Region VII's Art Building East replacement costs were initially unsupported, and later based on estimates that included unallowable costs for code-triggered whole-building upgrades, the decision to replace the Art Building East is not supported by the 50 Percent Rule. Therefore, we question \$22.06 million and recommend that those funds to be put to better use. The amount questioned is the difference between the current project amount of \$76.27 million (obligated) and the most recent repair estimate of \$54.21 million, which includes the code-triggered mitigation costs that are eligible for FEMA reimbursement but are not allowed to be used in the repair or replacement decision.

FEMA Cost-Estimating Policies and Procedures

FEMA policies and procedures do not specifically address how FEMA staff should perform and review cost estimates under the 50 Percent Rule for large and complex facilities other than to state that a "complex infrastructure project may require a more experienced engineer or cost estimator with specialized experience in the functional area of the damaged facility."¹¹ Although FEMA's CEF cost-estimating guidance explains the estimating process, the guidance does not require an independent review of the results. However, we believe that multimillion-dollar decisions based on estimates warrant a systematic and independent review by highly qualified professionals. Had Region VII officials conducted an independent review of their cost estimates, they could have corrected many of the deficiencies identified in this report. Therefore, Region VII should develop cost-estimating procedures and review standards for large and complex cost estimates to prevent serious errors on future projects.

¹¹ CEF for Large Project Instructional Guide, Version 2, November 1998.



Region VII Comments During the Audit

During our fieldwork, we discussed our findings with FEMA Region VII officials, who acknowledged that Region VII could improve its cost-estimating procedures under the 50 Percent Rule. Although Region VII officials suspended their decision, developed revised detailed cost estimates, and generally agreed to further develop and refine their policies and procedures to address large and complex cost-estimating projects, they disagreed with our other findings and recommendations, stating that—

1. The methodology used by FEMA’s cost estimators is meant to establish a ratio of repair to replacement using a consistent estimating methodology, not to estimate the actual repair and replacement costs.
2. The CEF is as much art as science and estimates will always change over time, resulting in equally valid estimates.
3. FEMA policy is silent regarding how much information is required to make the 50 Percent Rule determination; Region VII staff used the best information they perceived available at the time.
4. FEMA’s senior management believes it is contrary to good disaster recovery management to overturn a FEMA repair or replace decision once it has been made, because applicants rely on FEMA’s decision to move forward on recovery activities.
5. Federal regulations require applicants to complete permanent projects in 18 months, which makes timely decisions essential.
6. The April 13, 2007, memorandum from the FEMA Acting Assistant Administrator, Disaster Assistance Division, to the Associate Deputy Administrator for Gulf Coast Recovery was not issued FEMA-wide and is therefore not binding on Region VII.
7. May 24, 2011, the then-Acting FEMA Public Assistance Division Director approved Region VII’s use of the hazard mitigation upgrade (dry flood-proofing) as a code and standard to be included on the repair side of the 50 percent calculation based upon the floodplain manager’s determination of substantial damage.



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8. The Iowa floodplain manager fulfilled his responsibility to determine whether the facility was substantially damaged; the methodology he used to make this determination is beyond FEMA's control.
9. Further delays in replacing the HVC building will adversely affect the University and increase costs to the taxpayer as costs escalate, including the ongoing costs of temporary classrooms.
10. The University has incurred more than \$16 million planning to replace HVC as well as \$6.5 million in new land acquisitions, costs that FEMA may have to pay.
11. Unforeseen repair costs may further increase overall cost to taxpayers.
12. The University could move ahead with its replacement and relocation plans, claim actual costs, and appeal any attempt by FEMA to place a cap on expenditures.

Although we generally disagree with Region VII's comments, we recognize that FEMA's repair costs may escalate if Region VII reverses its replacement decisions. However, the repair vs. replace ratio should be based on carefully developed cost estimates using the best data available, not on rushed estimates using general and incomplete data. Finally, although we acknowledge FEMA's concern that Federal regulation requires applicants to complete permanent projects in 18 months, FEMA routinely extends this deadline, sometimes for many years. Without accurate cost estimates, FEMA Region VII cannot know whether replacing the buildings is the right decision under the 50 Percent Rule.

Recent Information Provided

On January 6, 2012, FEMA Region VII officials provided us with new documentation for both HVC and Art Building East:

1. Predisaster fair market value appraisals;
2. A new Iowa Department of Natural Resources determination letter requiring upgrades to HVC and Art Building East to protect the buildings from future floods;
3. Repair and flood protection engineering reports, including cost estimates; and
4. Revised repair vs. replacement calculations.

On January 17, 2012, FEMA Region VII officials also provided us with independent reviews of the University's repair cost estimates for HVC and Art Building East. These



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reviews examined the cost assumptions used by the University's architects to estimate costs for repairing the buildings and protecting them from future flooding. On April 20, 2012, Region VII officials provided a written response to our draft report that included a new legal justification not brought up during our audit (exhibit B). In their response, FEMA officials asserted that the Regional Administrator has the authority to relocate (and by logical extension replace) a destroyed facility.¹² This justification, coming long after the decision-making process, is flawed. Clearly, FEMA recognized that the proper approach was to apply the 50 Percent Rule and did so though, as we demonstrate in this report, the analysis was seriously flawed. If relocation were permissible from the outset, FEMA would have had no reason to expend efforts to determine whether repair or replacement was authorized. Relocation is only authorized if a building is destroyed, and the University's buildings were not. Further, to countenance a relocation decision under § 206.226(g) based on purportedly destroyed facilities, without first determining whether the facility was even eligible for replacement under § 206.226(f), would permit vitiation of the 50 Percent Rule.

Regarding FEMA policy, code-triggered upgrades like those required by the Iowa Department of Natural Resources to protect the building from future flooding, although reimbursable under the Public Assistance program, are not included in the 50 Percent Rule calculation used to determine whether FEMA should fund the repair or replacement of damaged buildings.

CONCLUSION

FEMA Region VII officials did not properly estimate replacement costs under the 50 Percent Rule for HVC. Rather than relying on lump-sum square footage data, Region VII cost estimators should have prepared detailed replacement cost estimates based on clear, concise, and complete scopes of work using available detailed construction drawings. Region VII also should have recognized that the size and unique qualities of the HVC building complex required greater care in preparing and reviewing cost estimates. FEMA has since provided detailed cost estimates. However, in the most recent estimates, Region VII officials were only able to surpass the 50 percent thresholds by adding unallowable code-triggered upgrades to their repair estimates.

Region VII officials have recently asserted a FEMA authority to relocate "destroyed" buildings. However, the criteria for replacement under the 50 Percent Rule were not met, and the University's buildings were not eligible for relocation because they were not destroyed. Therefore, Region VII officials should suspend their decisions to replace

¹² 44 CFR 206.226(g)(1).



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these buildings, develop cost-estimating policies and procedures and review standards to address the challenges presented by large and complex estimating projects, and deobligate \$83.7 million, which represents the difference between the current project amounts and the most recent repair estimates that include the code-triggered mitigation costs that are eligible for FEMA reimbursement but are not allowed to be used in the repair or replacement decision. In future disasters, Region VII should also resist pressure to make rushed repair or replacement funding decisions.

RECOMMENDATIONS

We recommend that the Regional Administrator, FEMA Region VII:

Recommendation #1: Suspend the replacement decisions for the Hancher Voxman-Clapp building and the Art Building East.

Recommendation #2: Develop cost-estimating policies and procedures and review standards to address cost estimating for large and technically complex projects under the 50 Percent Rule.

Recommendation #3: Deobligate \$61,684,880 (\$55,516,392 Federal share) from Hancher Voxman-Clapp building (Project 10367) and put those Federal funds to better use.

Recommendation #4: Deobligate \$22,060,714 (\$19,854,643 Federal share) from Art Building East (Project 1587) and put those Federal funds to better use.

MANAGEMENT COMMENTS AND OIG ANALYSIS

We discussed the results of our audit with FEMA and IHSEMD officials during our audit and included their comments in this report, as appropriate. We also provided a draft report in advance to FEMA officials and discussed it at an exit conference held with them on January 30, 2012. At the exit conference, FEMA officials requested the opportunity to respond in writing before we issued our final report. We have included a copy of the April 20, 2012, management comments to the draft report except for its attachments, which are too voluminous to include in this report (exhibit B).

In its April 20, 2012, response, FEMA provided written comments on a draft of this report. In those comments, FEMA concurred with our recommendation to “Develop cost estimating policies and procedures and review standards to address cost estimating



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for large and technically complex projects under the 50 Percent Rule.” FEMA, however, did not concur with our recommendations to:

- Reverse the decisions to fund the replacement of the Hancher Voxman-Clapp building and the Art Building East, or suspend the replacement decisions until detailed and comprehensive cost estimates can be developed;
- Deobligate \$61,684,880 (\$55,516,392 Federal share) from Hancher Voxman-Clapp complex based on unsupported and inaccurate replacement estimates under the 50 Percent Rule and put those Federal funds to better use; and
- Deobligate \$22,060,714 (\$19,854,643 Federal share) from Art Building East based on unsupported and inaccurate replacement estimates under the 50 Percent Rule and put those Federal funds to better use.

In its response to the report, FEMA stated that it performed adequate and detailed cost estimates to determine that the facilities were eligible for replacement. In justifying its decision, FEMA asserted that the RSMeans software that it used to arrive at its cost estimate “is a nationally recognized software used by contractors, architects and engineers for the purpose of developing construction estimates and is one of the most used, quoted and reliable cost data guides available to the construction industry.” However, arguments raised in FEMA’s written response are irrelevant to the propriety of the repair/replacement decision because the costs of either the elevation or flood proofing upgrades required by the flood-plain manager are unallowable in the numerator of the 50 Percent Rule calculation. FEMA could not reach the minimum 50 percent thresholds without including these upgrades.

Further, while we do not intend to impugn the quality and usefulness of the RSMeans software in general, our report points out the limitations of the Square Foot Estimator feature of RSMeans when used to estimate the cost of replacing buildings as large and complex as the HVC and Art Building East. Further, as discussed below, the software feature specifically warns users that the software should not be used when the area of the building is outside the range recommended by RSMeans.

The Square Foot Estimator is not designed to consider the costs of the unique qualities and complexities of an iconic structure like the HVC performance hall-classroom complex and Art Building East. The Square Foot Estimator is a conceptual tool designed to use a limited number of typical building styles and cost variables. The user need only enter a limited amount of information (i.e. type of building, area, perimeter, number of stories, story height, framing, and exterior walls) for a “conceptual level” cost estimate. For example, the Square Foot Estimator cannot differentiate between the cost to build a



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high school auditorium and a world-class performance hall. Finally, if the user enters building parameters that are not within the recommended range, as in this case, RSMeans literature warns the user that the cost per square foot and total building cost may not be accurate.

Our decision to question the propriety of the RSMeans Square Foot Estimator software to estimate the replacement cost of the two facilities is supported by the nearly six-fold increase in the estimated cost to replace the two facilities. Specifically, the cost to replace the facilities has grown from an estimate of less than \$50 million to a current estimate of nearly \$300 million. Thus, given the RSMeans Square Foot Estimator warning, and the magnitude of Federal expenditures proposed for the two complexes, FEMA should not have relied on the Square Foot Estimator to justify its replacement decisions.

As noted above, in addition to questions concerning the appropriateness of the software used to arrive at estimated replacement costs, FEMA's decision to include code-triggered upgrades in its replacement decision calculation is contrary to FEMA's policies in effect at the time of the disaster. Specifically, the Acting Assistant Administrator, Disaster Assistance Division, issued a memorandum in April 2007 to provide guidance on eligibility of costs Public Assistance applicants incur to comply with locally adopted flood plain management ordinances. These ordinances require substantially damaged structures in an identified 100-year flood plain to be flood proofed or elevated. However, while the memorandum points out that the cost to flood proof or elevate the facility is an allowable repair expense that FEMA will pay, it emphasizes that those costs are not an allowable expense to be included in the Eligibility of Facilities for Replacement calculation, commonly referred to as the 50 Percent Rule.

FEMA's decision to fund the replacement of the facilities, rather than provide the funds necessary to repair the facilities, means that FEMA would improperly pay about \$75 million. In other words, based on the policies in effect at the time, FEMA should be providing the University about \$192 million (Federal share) to repair the two facilities, rather than its current proposal to provide the University about \$267 million (Federal share) to replace the two facilities.

Finally, FEMA also asserted that it justified its decision to replace the buildings based on flood plain management requirements. FEMA asserted that, under National Flood Insurance Program requirements and the Federal floodplain management regulations, when a building is either "substantially damaged" or "substantially improved," the community must either elevate the structure so the lowest floor (including basement) is at or about the base flood level, or ensure the portion of the facility and its attendant



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utilities below the base flood level are watertight. FEMA continued by stating that the definition of substantial improvement requires flood plain management measures whenever the cost to repair a facility in a special flood hazard area to its pre-damaged condition equals or exceeds 50 percent of the market value of the structure.

To support that these facilities meet these definitions, FEMA provided a January 2012 letter from the Iowa Department of Natural Resources that referred to an independent appraisal company valuation and replacement cost of both HVC and Art Building East. That letter stated that pre-damage market values of the HVC complex and Art Building East were \$5.8 million and \$870,000, respectively, while the cost to reconstruct the two facilities would be \$45 million and \$14 million, respectively. Given the extremely low fair market value of the two buildings, the extremely high December 2011 \$297 million total estimated replacement cost of the two facilities, and our concerns regarding FEMA's incorrect calculations in applying the 50 Percent Rule, we have serious doubts concerning the validity of the process FEMA used to arrive at its decisions to replace these facilities.

We recognize that the application of the correct criteria will have a significant financial impact. However, given the record annual Federal budget deficits, the unprecedented Federal debt, and the precedent that this decision could have on other Public Assistance grant decisions, we maintain that FEMA should comply with the criteria set forth in its policy for applying the 50 Percent Rule and implement all of the recommendations in this report.

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 responsible parties and any other supporting documentation necessary to inform us about the current status of the recommendations. Until your response is received and evaluated, Recommendations #1, #3, #4, and #5 will be considered open and unresolved. Recommendation #2 will be considered resolved and open.

Consistent with our responsibility under the *Inspector General Act*, we are providing 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. Significant contributors to this report were Tonda Hadley, Christopher Dodd, John Polledo, and Patti Smith.

Should you have questions, please call me at (202) 254-4100, or your staff may contact Tonda Hadley, Director, Central Regional Office, at (214) 436-5200.



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EXHIBIT A

**Schedule of Replacement Projects Reviewed
May 25, 2008, through August 24, 2011
University of Iowa, Iowa City, Iowa
FEMA Disaster Number 1763-DR-IA**

A	B	C	D
Project Number	Award Amount	Repair Estimate¹³	Amount Questioned (B-C)
10367	\$ 220,417,038	\$ 158,732,158	\$ 61,684,880
1587	<u>\$ 76,271,623</u>	<u>\$ 54,210,909</u>	<u>\$ 22,060,714</u>
Totals	<u>\$ 296,688,661</u>	<u>\$ 212,943,067</u>	<u>\$ 83,745,594</u>

¹³ The HVC repair estimate is based on Neumann Monson Architects' November 21, 2011, "HVC Repair and Protection Estimate." The Art Building East repair estimate is based on Invision Planning Architecture Interiors' November 21, 2011, "Art Building Complex Flood Repair & Flood Protection Study & Estimate." The repair estimates include all hard and soft costs.



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EXHIBIT B

Management Comments to the Draft Report


U.S. Department of Homeland Security
Region VII
9221 Ward Parkway, Suite 300
Kansas City, MO 64114-3372



FEMA

APR 20 2012

MEMORANDUM TO: D. Michael Beard
Acting Assistant Inspector General
Office of Emergency Management Oversight

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

SUBJECT: *FEMA's Decisions to Replace Rather Than Repair Buildings at the University of Iowa*
FEMA Disaster Number 1763-DR-IA
Audit Report Number DD-12-##

The Federal Emergency Management Agency (FEMA) has reviewed the Office of Inspector General's (OIG) draft report of March 19, 2012 entitled *FEMA's Decisions to Replace Rather Than Repair Buildings at the University of Iowa*. Thank you for the opportunity to respond to the findings and recommendations presented in the report.

Recommendation #1: Reverse the decisions to fund the replacement of the Hancher Voxman-Clapp Building and the Art Building East, or suspend the replacement decisions until detailed and comprehensive cost estimates can be developed.

FEMA Response: FEMA disagrees with this recommendation. FEMA performed adequate and detailed cost estimates for the University's Hancher Voxman-Clapp Building (HVC) and Art Building East (ABE) facilities to determine whether they are eligible for replacement. These projects are written as improved projects because the University desired an enhanced facility beyond pre-disaster design. Therefore, the eligible costs for the improved projects have been capped as required under 44 CFR 206.203(d)(1). Furthermore, in 2010, the Regional Administrator required relocation of the HVC and ABE facilities to a new site(s) outside the floodplain, pursuant to 44 CFR 206.226(g).

FEMA has provided below a summary of its approach to HVC and ABE.

Project Formulation and Cost Estimating – Generally

To generate the cost estimates, FEMA used the Cost Estimating Format (CEF)¹ to compile the relevant data and information (e.g., building specifications, materials, itemized units of damage, etc.). The CEF should only be used on large projects, like HVC and ABE, for which the permanent restorative work is less than 90 percent complete.² The CEF is a worksheet that allows the user to

¹ For more information on the CEF, visit: <http://www.fema.gov/government/grant/pa/cefsop.shtm>

² See CEF for Large Projects Instructional Guide, page 2-1.

www.fema.gov



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estimate the base construction costs and then apply a series of factors that represent potential additional eligible project costs not captured in the base construction costs. Those base costs, referred to as “Part A”, are representative of the construction efforts required to directly and specifically complete the defined eligible work – typically, the trade or subcontractor(s) costs that are eligible under the Public Assistance program.

When evaluating a project using a CEF, FEMA requests averaged weighted unit prices from the applicant, or from a relevant State or regional agency. If the applicant does not have appropriate average weighted unit price data, FEMA uses the most current available cost data in accordance with industry standard construction cost estimating resources, such as RSMeans, BNi Costbooks, Sweet’s Unit Cost guide, the ADA Compliance Pricing Guide, and square foot costs.³

RSMeans is nationally-recognized software used by contractors, architects and engineers for the purpose of developing construction estimates, and is one of the most used, quoted and reliable cost data guides available to the construction industry.⁴ RSMeans allows for use of a square foot area method to develop construction estimates, which is one of five methods recognized by the American Institute for Architects for estimating construction costs for projects.

Initial Project Formulation and Cost Estimating for HVC and ABE

To determine whether the facilities were eligible for repair or replacement, FEMA generated estimates of the damage to the HVC and ABE facilities. FEMA conducted initial assessments of both facilities in November 2008, but because FEMA had limited access to the facilities, the Agency performed more detailed assessments in December 2008.

For the December 2008 assessments, FEMA assembled a Building Assessment Team (BAT) to conduct thorough site inspections of the facilities, generate architectural take-offs, and develop accurate cost estimates using FEMA-approved tools. This team was comprised of highly qualified and experienced professional engineers, construction managers, insurance adjusters and cost estimators.

Because the as-built drawings and Project Specification Manual were not available to FEMA when conducting the initial assessments of HVC and ABE, FEMA was not able to create an itemized unit cost repair or replacement estimate. Consequently, FEMA used the square foot area method and RS Means cost data to develop its estimates, which were then entered into Part A of the CEF and used to generate the repair and replacement estimates for HVC and ABE.

The December 2008 calculations⁵ completed by the FEMA BAT team yielded the following repair and replacement estimates:⁶

Hancher Voxman-Clapp

Repair Estimate: \$26,279,328.30
Replacement Estimate: \$42,557,400.00
Damage Percentage: 61.8%

Art Building East

Repair Estimate: \$8,901,724.59
Replacement Estimate: \$15,696,700.00
Damage Percentage: 56.7%

³ See CEF for Large Projects Instructional Guide, page 2-3.

⁴ For more information on RSMeans, see website at <http://www.meanscostworks.com/>.

⁵ See Attachment A. These calculations did not include costs to elevate the facilities.

⁶ **The dollar amounts reflected are estimates, and do not (nor are they intended to) reflect actual dollar amounts to repair or replace the facility.**



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“The 50% Rule” - Generally

FEMA may provide assistance to repair, restore, and replace damaged facilities. Eligible costs are based on “the design of such facility as it existed immediately prior to the major disaster and in conformity with current applicable codes, specifications, and standards (including floodplain management and hazard mitigation criteria). . . .”⁷ When determining whether a facility should be repaired or replaced, FEMA must determine whether the cost to repair a facility is greater than 50 percent of the cost to replace it.⁸ The dollar amounts reflected are estimates, and do not (nor are they intended to) reflect actual dollar amounts to repair or replace the facility.

FEMA Policy 9524.4⁹ provides that “the determination of eligibility for a replacement facility shall include only costs for the repair of damage, and not the costs of any triggered or mandatory upgrading of the facility beyond the repair of the damaged elements.” To determine the percentage of repair costs to replacement costs, the repair cost (numerator) is divided by the replacement cost (denominator). The FEMA Public Assistance Policy Digest¹⁰ states the “repair cost includes only those repairs, including non-emergency mold remediation, associated with the damaged components and the codes and standards that apply to the repair of the damaged components.” In addition, “the cost does not include upgrades of other components triggered by codes and standards, design associated with upgrades, demolition of the entire facility, site work, or applicable project management costs.”¹¹ This means the cost to upgrade damaged elements required as part of the repairs to the damaged elements of the facility are appropriately factored into the estimated repair cost of the facility.¹²

On January 21, 2009, based on the above 50% Rule calculations, FEMA informed the State that both HVC and ABE were eligible for replacement.¹³

Applicability of Floodplain Management Requirements

Both HVC and ABE are located in flood zone AE, which is a Special Flood Hazard Area.¹⁴ Under National Flood Insurance Program requirements, as well as Federal floodplain management regulations applicable to all FEMA assistance, when a building in the AE Zone is either “substantially damaged” or “substantially improved,” the community must either elevate the structure so the lowest floor (including basement) is at or above the base flood level, or ensure the portion of the facility and its attendant utilities below the base flood level are watertight, with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy, e.g., dry floodproof.¹⁵

⁷ Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. §5172 (the “Stafford Act”).

⁸ 44 CFR 206.226(f).

⁹ FEMA Policy 9524.4, Eligibility of Facilities for Replacement under 44 CFR 206.226(d)(1), September 24, 1998. This rule further interprets the “50 percent” requirement established in 44 CFR 206.226(f).

¹⁰ FEMA 321 / January 2008, p. 113.

¹¹ *Id.* at 113.

¹² Under the 50% Rule, the calculation is based on a fraction (or ratio) with the numerator representing the estimated repair cost and the denominator representing the estimated replacement cost.

¹³ See Attachment B.

¹⁴ See Attachment C.

¹⁵ See 44 CFR 60.3(c)(3) and 44 CFR 9.11(d)(3).



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The regulations in 44 CFR Part 9 use the term “substantial improvement” to trigger the elevation or waterproofing requirement, while 44 CFR Part 60 uses the term “substantial damage.” The definition of substantial improvement requires floodplain management measures whenever the cost to repair a facility in a Special Flood Hazard Area to its pre-damage condition equals or exceeds 50% of the market value of the structure or replacement cost of the facility.¹⁶ The definition of substantial damage requires floodplain management measures whenever the cost to restore the structure would equal or exceed 50 percent of the market value of the structure before the damage occurred.¹⁷

In 2009, the Iowa Department of Natural Resources (DNR) determined the HVC and ABE facilities were “substantially damaged.”¹⁸ DNR reaffirmed these substantial damage determinations via subsequent assessments conducted by an independent appraisal company on HVC and ABE in 2011, which was based on a ratio of repair costs to fair market value of the facility, not on FEMA’s replacement costs.¹⁹ Also, as previously explained, FEMA’s December 2008 cost estimate concluded the HVC facility had a repair to replacement ratio of 61.8% and the ABE facility had a repair to replacement ratio of 56.7%.²⁰ The cost of repair for each facility exceeded 50% of the replacement cost; therefore, had FEMA applied the Part 9 definition of substantial improvement, it would have triggered the floodplain management measures discussed above. Thus, the scope of work for the projects was required, pursuant to both Part 9 and Part 60, to include repair with elevation, or repair with floodproofing.

Refining the Estimates

With the Agency’s determination on the 50% Rule made and the requirement to include floodplain management measures in accordance with regulations, FEMA continued to refine its estimates as additional information became available regarding specific building elements, e.g., required elevation of the structures.

The requirement to elevate structures above the 100-year floodplain²¹ impacts the basement and part of the first floor of the HVC. Portions of the first floor above the 100-year floodplain are not subject to the elevation requirement. However, engineers and architects hired by the Applicant advised that elevating only portions of the building subject to the compliance requirements would result in differing elevations and would create unacceptable compatibility issues with the functional areas of the building. As noted in the project worksheets, FEMA determined elevation of only the affected portions of the structure was not technically feasible.²² This determination was substantiated in 2011 by the University’s consulting architects and engineers.²³ Thus, in order to comply with floodplain management requirements, the entire building must be elevated when repaired. In addition, in order to comply with applicable elevation or floodproofing requirements for the damaged elements of both facilities, it is not feasible to elevate the HVC, nor is it cost-effective to floodproof just the damaged

¹⁶ 44 CFR 9.4.

¹⁷ 44 CFR 59.1.

¹⁸ See Attachment D. Further, FEMA Publication 213, dated May 1991, states that FEMA may accept a local government official’s determination of substantial damage.

¹⁹ See Attachment E.

²⁰ See Attachments A and B.

²¹ See 44 CFR 9.11(d)(3) and 60.3(c)(3).

²² See Attachment C.

²³ See Attachments F and G.



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elements; for the ABE, it is not cost-effective to elevate or to floodproof the facility.²⁴ From a public policy perspective, it is important to note that compliance with floodplain management requirements would improve and extend the useful life of the buildings and bring the safety of the buildings up to current standards.²⁵

In late 2009, FEMA revised its cost estimates for the HVC complex, increased the repair costs by \$27.1 million to reflect the cost of floodplain management compliance measures i.e., elevation of the structures, and increased the replacement costs from \$42.56 million to \$84.5 million. For the ABE, FEMA decreased the repair costs by \$1.3 million and the replacement costs by \$1.75 million. These changes were based on line-item cost estimates developed using FEMA's CEF. While FEMA had already determined both facilities were eligible for replacement based on its previous 50% Rule calculation in December 2008,²⁶ application of these refined 2009 estimates served as the basis for eligible costs in the PWs for the HVC and ABE facilities.²⁷ These 2009 estimates are shown below:

Hancher Voxman-Clapp

Repair Estimate: \$45,857,554
Replacement Estimate: \$84,536,389
Damage Percentage: 54.2%

Art Building East

Repair Estimate: \$7,558,763
Replacement Estimate: \$13,946,284
Damage Percentage: 54.2%

Recommendation #2: Develop cost estimating policies and procedures and review standards to address cost estimating for large and technically complex projects under the 50 Percent Rule.

FEMA Response: FEMA agrees and understands the importance of consistently reviewing the adequacy of reviews and other internal controls. In response to lessons learned from the 2008 Iowa Floods and later disaster operations such as DR-1980 (Joplin), FEMA has developed field guidance for applying the 50% Rule in unusual circumstances, a copy of which is included as Attachment L to this response. Accordingly, FEMA believes this recommendation should be considered resolved and closed.

Recommendation #3: Deobligate \$61,684,880 (\$55,516,392 federal share) from Hancher Voxman-Clapp complex (Project 10367) based on unsupported and inaccurate replacement estimates under the 50 Percent Rule and put those federal funds to better use.

FEMA Response: FEMA disagrees with this recommendation. Please see our response to Recommendation #1. FEMA maintains its determination regarding the facility's eligibility for replacement is accurate and consistent with applicable regulations and policies. FEMA's cost estimates are fully supported by technical expertise, and third party verification that the HVC building satisfies the 50% Rule, consistent with FEMA regulations and policy.

Recommendation #4: Deobligate \$22,060,714 (\$19,854,643 federal share) from Art Building East (Project 1587) based on unsupported and inaccurate replacement estimates under the 50 Percent Rule and put those federal funds to better use.

²⁴ See Attachments F, G, H and J.

²⁵ See FEMA Policy 9524.4.

²⁶ See Attachment A.

²⁷ Based on FEMA's procedures and guidance for project formulation, FEMA formulated large project worksheets (PWs) for HVC (PW #10367) and ABE (PW #1587) using estimated costs. See also FEMA 9570.5 SOP – Public Assistance, Standard Operating Procedure, *Project Formulations*, September 1999.



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FEMA Response: FEMA disagrees with this recommendation. Please see our response to Recommendation #1. FEMA maintains its determination regarding the facility's eligibility for replacement is accurate and consistent with applicable regulations and policies. FEMA's cost estimates are fully supported by technical expertise, and third party verification that the ABE building satisfies the 50% Rule, consistent with FEMA regulations and policy.

FEMA considers all findings resolved and closed and corrective actions completed. Again, we thank you for the opportunity to provide comments concerning this report. Please contact Brad Shefka, FEMA's Chief Audit Liaison at 202-646-1308, regarding further questions or concerns.

Enclosures

Cc: Brad Shefka, FEMA HQ Audit Liaison



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EXHIBIT B

Management Comments to the Draft Report

Table of Attachments

- A. December 2008 50% Rule calculation documentation.
- B. January 2009 Memo from FEMA to University, notifying University of FEMA's "50% Rule" determinations for each building.
- C. June 2011 PWs for ABE (#1587) and HVC (#10367).
- D. July 31, 2009 Iowa Department of Natural Resources determination of "substantial damage" letter.
- E. January 4, 2012 Iowa Department of Natural Resources market value appraisal letter.
- F. Hancher Voxman-Clapp Repair and Protection Estimate, Neumann Monson (November 2011).
- G. University of Iowa Art Building Complex Flood Repair & Flood Protection Study & Estimate, INVISION Architects (November 2011).
- H. FEMA Region VII's cost effective analysis pertaining to the relocation of HVC, completed July 29, 2010.
- I. FEMA Region VII's permanent relocation approval letter for HVC, signed August 5, 2010.
- J. FEMA Region VII's cost effective analysis pertaining to the relocation of ABE, completed September 2, 2010.
- K. FEMA Region VII's permanent relocation approval letter for ABE, signed September 30, 2010.
- L. FEMA Region VII's Draft Guidance for Applying the 50% Rule.



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EXHIBIT C

Report Distribution List
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