

SIGAR

**Special Inspector General for
Afghanistan Reconstruction**

SIGAR 16-16 Inspection Report

Afghan Ministry of Defense Headquarters:
\$154.7 Million Building Appears Well
Built, but Has Several Construction Issues
that Should Be Assessed



FEBRUARY
2016

SIGAR

Special Inspector General for Afghanistan Reconstruction

WHAT SIGAR REVIEWED

On April 21, 2009, the Air Force Civil Engineer Center (AFCEC), previously the Air Force Center for Engineering and the Environment, awarded a \$48.7 million cost-plus-fixed-fee contract to Innovative Technical Solutions, Inc. (ITSI) to construct a Ministry of Defense (MOD) headquarters in Kabul, Afghanistan. ITSI was to complete the building by October 11, 2010. After 14 modifications, the contract cost was raised to \$107.3 million. By November 2013, ITSI had requested an additional \$24.7 million to finish the project. However, due to a lack of available funds, construction work was halted on December 31, 2013.

On July 30, 2014, AFCEC awarded Gilbane Federal—the new corporate name for ITSI—a second \$47.4 million firm-fixed-price contract to complete the MOD headquarters building by July 31, 2015.

The five-story building included, among other things, a national command center, administration space, dining facilities, bathrooms, secure garage, a 1,000-seat auditorium, a waste water treatment plant, and a heating/cooling system.

Since the building is located in an active seismic zone, a key part of its design was the separation into seven sections to avoid the transfer of forces from one section to the other. The separation joints between sections were designed to be complete breaks in the floors, walls, and ceilings that divide the building into discrete sections.

The objectives of this inspection were to assess whether (1) construction was completed in accordance with contract requirements and applicable construction standards, and (2) the building was being used as intended and maintained.

February 2016

Afghan Ministry of Defense Headquarters: \$154.7 Million Building Appears Well Built, but Has Several Construction Issues that Should Be Assessed

SIGAR 16-16 INSPECTION REPORT

WHAT SIGAR FOUND

SIGAR found that the MOD headquarters was constructed as a five-story building in Kabul, which, with some exceptions, generally met contract requirements and appears well built. Originally, the cost of the headquarters building was \$48.7 million, and it was to be completed in about 18 months. However, there were problems with the contract from the outset. Not only did the Afghan National Army refuse the contractor, ITSI, a U.S. company, access to the site for about a year, but other delays, such as weather, security, and funding issues, emerged. As a result, the cost to complete the building rose to \$154.7 million, or more than three times the original estimated cost. Similarly, although the headquarters building is now essentially complete, it took almost 5 years longer to complete than originally anticipated. The Combined Security Transition Command–Afghanistan (CSTC-A) transferred the building to the MOD on December 28, 2015. As of January 7, 2016 the building was not fully occupied.

On April 30, 2015, AFCEC transferred the MOD headquarters building to CSTC-A. The transfer document listed three deficiencies, including the need to install a fire-rated glass entry door. An AFCEC official told us that all three deficiencies have since been corrected.

During our six inspection visits to the MOD headquarters building, we examined the roof drainage system, seismic separation joints, exterior walls and stairwells, plumbing fixtures and mechanical equipment, auditorium seats and platform stage, electrical and water systems, windows, doors, and ceiling panels, as well as fire suppression pumps, fire alarms, and communications lines. We found other deficiencies not identified by AFCEC that could affect the building's structural integrity during an earthquake or prolonged periods of rain. These include issues with building separation joints needed for seismic activity, lateral bracing of equipment needed for seismic activity, inadequate roof drains to remove storm water, and stairway handrails that were installed below the required height.



Afghan Ministry of Defense Headquarters Building in Kabul.

Source: SIGAR, January 7, 2016

Specifically, we found:

- The headquarters building's separation joints, needed to counter seismic activity, were (1) not continuous or aligned vertically from the foundation up to and through the roof; and (2) were spanned with non-structural systems, such as drain pipes, on the inside of the building without the required flexible connections. For example, we found that at least three of the seven separation joints did not provide complete breaks in the floors, walls and ceiling that would divide the building into discrete sections. As a result, it is possible that one of the buildings seven sections will move more during an earthquake than is allowed.
- Building equipment did not have lateral bracing needed for seismic activity. The contracts required that building standards be based on the Department of Defense's Unified Facilities Criteria. Those standards require that lateral bracing be provided for items suspended from the ceiling or floor above. We found items, such as mechanical duct work and a 60-pound ceiling-mounted piece of heating/cooling equipment, with no lateral bracing. In addition, the fire suppression system's fuel supply tank located in the basement was installed without lateral bracing or containment, which could rupture and spill fuel in an earthquake.
- The roof was not constructed in accordance with contract and code requirements for roof drainage. For example, the installed roof drains measured 3 inches and not the required 4 inches in diameter. In addition, no secondary drains were installed. The contract design documents required a secondary emergency overflow system for the headquarters building's roof. Without a secondary system, storm water trapped on the roof could (1) damage the roof mounted heating and cooling equipment, (2) allow water to enter the roof's access doors and damage the building, and (3) freeze in winter and damage the roof.
- The handrails on interior stairways were installed at a height of 31 inches, which does not meet the minimum 34-inch height that the International Building Code requires. A lower height could contribute to falls and injuries. We also found that Gilbane Federal received approval to substitute the originally planned mild steel pipe handrails with stainless steel thin-walled pipe handrails. The walls of the stainless steel pipe are no more than a fourth as thick as the originally required pipe. As a result, the installed handrails have multiple dents, which will increase maintenance costs.

WHAT SIGAR RECOMMENDS

To protect the U.S. government's investment, we recommend that the Commanding General, CSTC-A take action, and report back to SIGAR within 90 days, to:

1. Assess the building's structural integrity where separation joints are not a continuous line from the bottom to the top of the building and the allowable building movement exceeds standards, and if needed, make deficient areas structurally sound.
2. Assess the need for the installation of seismic lateral bracing on non-structural components suspended from the ceiling or floor above, such as heating/cooling equipment, duct work, dropped ceilings, electrical fixtures, and drain pipes.
3. Install flexible connections across all separation joints of non-structural components, such as gypsum wall board, dropped ceilings, and drain pipes.
4. Assess the integrity of lateral bracing, anchorage, isolation, and energy dissipation of all equipment for compliance with the contract's seismic requirements, and make deficient items compliant with the requirements.
5. Assess the installed roof drainage system for compliance with the design documents and the International Building Code, and correct any deficiencies.

In commenting on a draft of this report, CSTC-A stated that its staff evaluated all of the issues we identified by engaging with AFCEC and the contractor, Gilbane Federal, who subsequently conducted assessments and determined that the issues related to the five recommendations in the draft report did not require any additional corrective action. CSTC-A stated that it accepted this determination. However, this statement only addresses four of the five recommendations. Recommendation 3 states that CSTC-A should take specific action as opposed to conducting an assessment. On December 7, 2015, we requested that CSTC-A provide us with a copy of the assessments, but we did not receive the assessments prior to the issuance of this report. We made a sixth recommendation to address the defective handrails. CSTC-A informed us in its comments that the height of the handrails was corrected in November 2015. We confirmed during our follow-up inspection on January 7, 2016, that CSTC-A acted on the recommendation and corrected the handrails. Therefore, we did not repeat recommendation 6 in the final report.

We found CSTC-A's comments to be generally responsive to our recommendations, but documentation substantiating CSTC-A's explanations, such as a copy of the assessments conducted, is necessary to close the recommendations.



SIGAR

Office of the Special Inspector General
for Afghanistan Reconstruction

February 11, 2016

The Honorable Ashton B. Carter
Secretary of Defense

General Lloyd J. Austin III
Commander, U.S. Central Command

General John F. Campbell
Commander, U.S. Forces–Afghanistan and
Commander, Resolute Support

Major General Gordon (Skip) B. Davis, Jr.
Commanding General, Combined Security Transition Command–Afghanistan

Mr. Randy E. Brown
Director, Air Force Civil Engineer Center

This report discusses the results of SIGAR’s inspection of the Afghan Ministry of Defense (MOD) headquarters building in Kabul. The MOD headquarters is a five-story building intended to provide offices for the MOD’s senior leadership and support staff, and serve as the Afghan National Army’s command and control center. During our 2014, 2015, and 2016 site visits, although the building generally met contract requirements and appears well built, we found some construction deficiencies that may have safety implications, such as improperly sized and improperly aligned building separation joints needed in the event of an earthquake.

We recommend that the Commanding General, Combined Security Transition Command–Afghanistan (CSTC-A) take action to: (1) assess the building’s structural integrity where separation joints are not a continuous line from the bottom to the top of the building, and the allowable building movement exceeds standards, and if needed, make deficient areas structurally sound; (2) assess the need for the installation of seismic lateral bracing on non-structural components suspended from the ceiling or floor above, such as heating/cooling equipment, duct work, dropped ceilings, electrical fixtures, and drain pipes; (3) install flexible connections across all separation joints of non-structural components, such as gypsum wall board, dropped ceilings, and drain pipes; (4) assess the integrity of lateral bracing, anchorage, isolation, and energy dissipation of all equipment for compliance with the contract’s seismic requirements, and make deficient items compliant with the requirements; and (5) assess the installed roof drainage system for compliance with the design documents and the International Building Code, and correct any deficiencies. All actions taken in response to these recommendations should be reported to SIGAR within 90 days.

In commenting on a draft of this report, CSTC-A stated that its staff evaluated all of the issues we identified by engaging with the Air Force Civil Engineer Center and the contractor, Gilbane Federal, who subsequently conducted assessments and determined that the issues related to the five recommendations in the draft report require no additional corrective action. CSTC-A stated that it accepted this determination. However, this statement only addresses four of the five recommendations. Our third recommendation states that CSTC-A should take specific action as opposed to conducting an assessment. On December 7, 2015, we requested, through the Office of the Under Secretary of Defense for Policy and U.S. Central Command, that CSTC-A provide us with a copy of the assessments, but we did not receive the assessments prior to the issuance of this report. We had a sixth recommendation to address the defective handrails; however, CSTC-A informed us in its comments that the height of the handrails was corrected in November 2015. We confirmed during our follow-up inspection on January 7,



SIGAR

Office of the Special Inspector General
for Afghanistan Reconstruction

2016, that CSTC-A acted on the recommendation and corrected the handrails. Therefore, we did not repeat recommendation 6 in our final report.

We found CSTC-A's comments to be generally responsive to our recommendations, but documentation substantiating CSTC-A's explanations, such as a copy of the assessments conducted, is necessary to close the recommendations. CSTC-A's comments are reproduced in appendix III.

SIGAR conducted this inspection under the authority of Public Law No. 110-181, as amended, and the Inspector General Act of 1978, as amended; and in accordance with the *Quality Standards for Inspection and Evaluation*, published by the Council of the Inspectors General on Integrity and Efficiency.

John F. Sopko
Special Inspector General
for Afghanistan Reconstruction

TABLE OF CONTENTS

The MOD Headquarters Building Generally Met Contract Requirements, but Some Design and Construction Deficiencies Should Be Addressed.....	2
The MOD Headquarters Building Is Not Fully Occupied, Over 5 Years After Its Original Deadline for Completion	8
Conclusion.....	9
Recommendations	9
Agency Comments	10
Appendix I - Contracts/Task Orders 0030 and TG06	11
Appendix II - Scope and Methodology.....	14
Appendix III - Comments from Combined Security Transition Command –Afghanistan	15
Appendix IV - Acknowledgments	17

TABLES

Table 1 - Task Order 0030 and Modifications	11
Table 2 - Task Order TG06 and Modification	13

FIGURES

Figure 1 - Locations of Earthquakes in Afghanistan (1964–2004)	2
Figure 2 - Headquarters Building Sections Schematic.....	3
Figure 3 - Typical Seismic Restraints for Suspended Equipment	5
Figure 4 - Example of Secondary Drain for a Roof with Parapet Walls.....	6

PHOTOS

Photo 1 - Separation Joint Is Not Continuous: This Joint Ends at Top of the Third Floor, and Resumes at a Different Point on the Fourth Floor	4
Photo 2 - Separation Joint Is Not Continuous at Top.....	4
Photo 3 - Ceiling-Mounted Equipment and Mechanical Duct Work With No Lateral Bracing	6
Photo 4 - Handrail Is 31 Inches in Height and Is Dented	7

ABBREVIATIONS

AFCEC	Air Force Civil Engineer Center
CSTC-A	Combined Security Transition Command–Afghanistan
ITSI	Innovative Technical Solutions, Inc.
MOD	Ministry of Defense
NATO	North Atlantic Treaty Organization

On April 21, 2009, the Air Force Center for Engineering and the Environment awarded a \$48.7 million cost-plus-fixed-fee task order—number 0030 under contract number FA8903-06-D-8513—to Innovative Technical Solutions, Inc. (ITSI), a U.S. company, to construct the new Ministry of Defense (MOD) headquarters building in Kabul, Afghanistan.¹ The contract stated that the headquarters building would provide offices for the MOD's senior leadership and support staff, and serve as the Afghan National Army's command and control center. After 14 modifications, the contract cost increased to \$107.3 million.

The contract originally anticipated that the MOD headquarters building would be fully constructed by October 11, 2010. However, the project's start was delayed for about 1 year when the Afghan National Army refused ITSI access, for unexplained reasons, to clear the building site, which prompted the Air Force's contracting officer to revise the completion schedule. On January 18, 2013, the contracting officer issued a letter of concern to ITSI stating that the project had experienced a steady decline in progress. The letter also noted that the weekly activity report for January 12, 2013, showed that ITSI reported 77.1 percent of the work was completed, at a time when the revised performance schedule required 96.6 percent completion. By November 2013, funds were exhausted, and ITSI requested an additional \$24.7 million to finish the project. However, due to a lack of funding, the contracting officer directed ITSI to cease work on December 31, 2013.²

On July 30, 2014, Gilbane Federal—the new corporate name for ITSI—was awarded a firm-fixed-price task order—number TG06—for \$47.4 million to complete the MOD headquarters building by July 31, 2015.³ Following the award of task order TG06, the total cost of the MOD headquarters building increased to \$154.7 million. Appendix I contains additional details of the modifications under the task orders.

Task orders 0030 and TG06 required construction of a five-story MOD headquarters building with a national command center, administration space, dining facilities, bathrooms, library, secure garage, media center, conference room, computer lab, storage room, and a 1,000-seat auditorium, as well as an outside garden and parking area. In addition, the task orders required electrical and lighting systems, water supply and distribution systems, a waste water treatment plant, a fire suppression system, and a heating/cooling system.

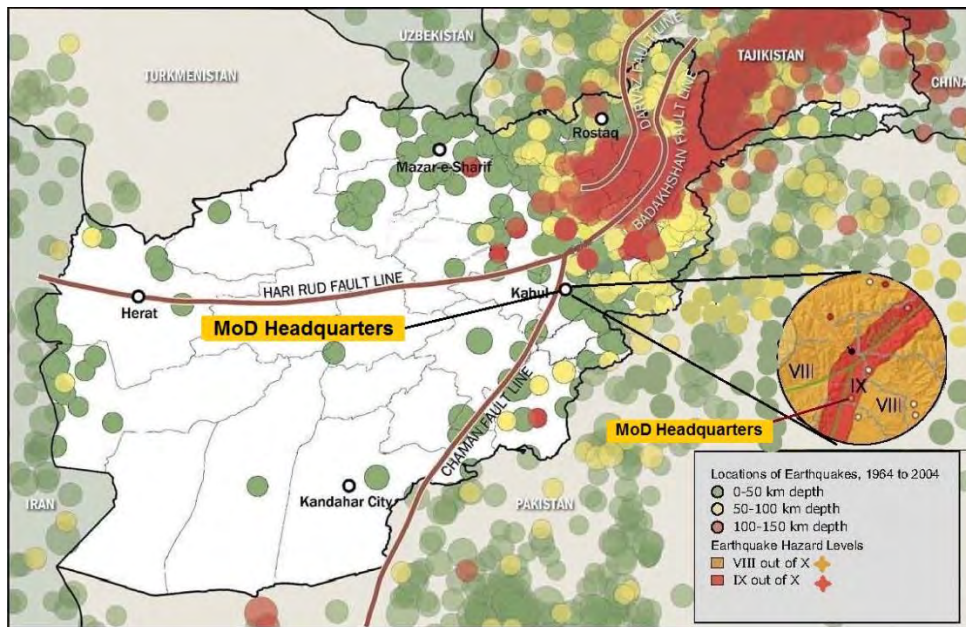
The MOD headquarters building has design features to counter seismic activity due to its location in an active seismic zone. For example, Kabul experienced a 7.4 magnitude earthquake in 2002 that killed 150 people. Similarly, the mountains north of Kabul experienced a 5.9 magnitude earthquake in 1998 that destroyed 8,000 homes and killed 2,300 people. Figure 1 shows the locations of earthquakes that have occurred in Afghanistan from 1964 through 2004, according to the most currently available data aggregated by the U.S. Geological Survey.

¹ The Air Force Center for Engineering and the Environment, the Air Force Civil Engineer Support Agency, and the Air Force Real Property Agency merged to become the Air Force Civil Engineer Center on October 1, 2012.

² The contract was modified multiple times, which increased the cost until the funding available at the time was exhausted.

³ Gilbane Federal is a wholly owned subsidiary of Gilbane Building Company, one of two operating companies of Gilbane Company, Inc. Gilbane Building Company acquired ITSI on August 3, 2010. The company name changed to Gilbane Federal on January 1, 2012.

Figure 1 - Locations of Earthquakes in Afghanistan (1964-2004)



Source: U.S. Geological Survey, modified by SIGAR

Notes:

Hazard Level VIII: Very strong shaking and difficult to stand, objects fall from shelves, and an unreinforced masonry building will suffer slight to moderate structural damage and a few will experience moderate to heavy structural damage.

Hazard Level IX: Violent shaking with people forcibly thrown to the ground, monuments and columns fall, and most unreinforced buildings will suffer heavy to very heavy structural damage.

Hazard Level X: Extreme shaking and most unreinforced masonry buildings will suffer very heavy structural damage.

The objectives for this inspection were to determine whether (1) construction was completed in accordance with contract requirements and applicable construction standards, and (2) the building was being used as intended and maintained. We made six inspection visits to the MOD headquarters construction site on March 7, 2014; March 14, 2014; September 5, 2014; January 16, 2015; May 27, 2015; and January 7, 2016.

We conducted our work in Kabul, Afghanistan, from February 2014 through February 2016, in accordance with the *Quality Standards for Inspection and Evaluation*, published by the Council of the Inspectors General on Integrity and Efficiency. The engineering assessment was conducted by our professional engineer in accordance with the National Society of Professional Engineers' *Code of Ethics for Engineers*. Appendix II contains additional details on our scope and methodology.

THE MOD HEADQUARTERS BUILDING GENERALLY MET CONTRACT REQUIREMENTS, BUT SOME DESIGN AND CONSTRUCTION DEFICIENCIES SHOULD BE ADDRESSED

During our six site inspections between March 2014 and January 2016, we examined the roof drainage system, seismic separation joints, exterior walls and stairwells, plumbing fixtures and mechanical equipment, auditorium seats and platform stage, electrical and water systems, windows, doors, and ceiling panels, as well as fire suppression pumps, fire alarms, and communications lines. We found that the MOD headquarters was constructed as a five-story building, which, with some exceptions, generally met contract requirements. We

found that the plumbing fixtures and mechanical equipment were installed and working. The auditorium's seats were installed, and the platform stage was completed. The electrical and water systems were installed and connected. The windows, doors, and ceiling panels were installed throughout the building. The fire suppression pumps and fire alarm systems were installed in the basement. During our site inspection on May 27, 2015, work on the communications system and landscaping was still ongoing.

On April 30, 2015, the Air Force Civil Engineering Center (AFCEC) transferred the MOD headquarters building to the Combined Security Transition Command–Afghanistan (CSTC-A). The DD Form 1354, Transfer and Acceptance of Department of Defense Real Property, approved by the CSTC-A program manager, listed three deficiencies, including the need to: (1) install a fire-rated glass entry door, (2) install missing transformer louvers (vents) in the basement, and (3) replace broken glass in one of the doors. The AFCEC contracting officer's representative told us on June 3, 2015, that the three deficiencies were corrected.

During our site inspections, we found several other deficiencies with the MOD headquarters building that AFCEC had not identified that could impact the building's structural integrity during a seismic event or during heavy or prolonged periods of rain. These include issues with building separation joints needed for seismic activity, lateral bracing of equipment needed for seismic activity, and inadequate roof drains to remove storm water. We also found stairway handrails that were installed below the required height.

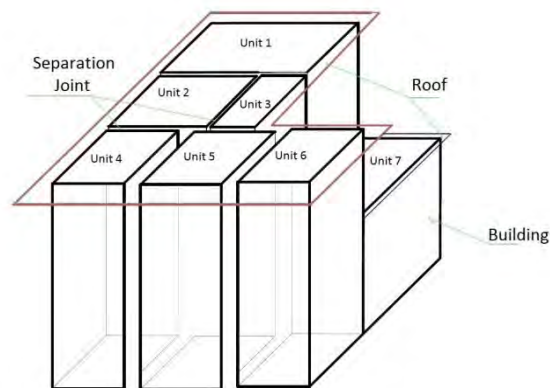
Building Separation Joint Deficiencies

We found that the MOD headquarters building's separation joints, which are needed to counter seismic activity, were not constructed according to contract requirements and building codes. We found separation joints that were (1) not continuous or aligned vertically; and (2) were spanned with non-structural systems, such as drain pipes, on the inside of the building without flexible connections. These deficiencies could compromise the building's ability to withstand ground motion caused by seismic activity.

Since the MOD headquarters building is located in an active seismic zone, a key part of the building's design was its separation into seven sections to avoid the transfer of forces from one section to another. Building Unit 2 potential movement during a seismic event otherwise known as allowable drift exceeded the American Society of Civil Engineers standard 7 allowable movements, which meant that it failed to meet the standard required in the contract.

The separation joints between the building sections—designated as expansion joints in the design documents—are complete breaks or separation in the floors, walls, and ceilings that divide the overall building into smaller discrete sections. Those individual sections are designed to handle larger vertical displacement, building settlement, materials shrinkage, and seismic activity. When properly constructed, separation joints create a continuous break line from the foundation up to and through the roof. Each building section needs a distinct structural system on each side of the continuous break line. For example, two walls or columns and beams may be required, whereas only one would be provided in a building that did not require separation joints. No structural system can span across the separation joint or the purpose of the joint is lost. Lastly, non-structural systems must be installed with flexible connections across the separation joints. Figure 2

Figure 2 - Headquarters Building Sections Schematic



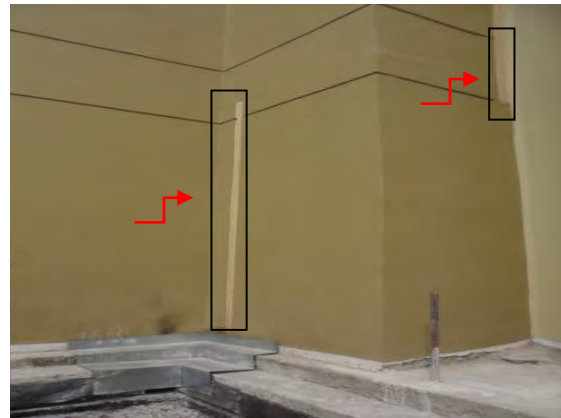
Source: SIGAR, based on design documents

presents a schematic of the seven sections of the headquarters building and the separation joints that run from the foundation up to and through the roof. In addition to including separation joints to reduce damage to a structure during an earthquake, the building can include stronger walls, columns, and beams. Stronger walls called shear walls were included in this building. However, Building Unit 2 shear walls will not be strong enough to prevent the movement from exceeding the maximum allowable by the American Society of Civil Engineers standard 7.

During our inspections of the MOD headquarters building, we found:

- The separation joints were not constructed according to the structural design drawings. The structural design drawings were deficient because they identified 200 millimeters as the maximum width but did not provide more specific widths based on the seismic design calculations for each of the separation joints. However, the separations joints were constructed in compliance with the seismic design calculations and will handle movement caused by seismic activity. Building Unit 2 seismic design calculations of the building movement exceeds the maximum allowable movement according to American Society of Civil Engineers standard 7 Table 12.12.1, occupancy category IV, for a 5-story building.
- Not all of the separation joints were aligned vertically from the foundation up to and through the roof of the building, as the contract design documents required (see photos 1 and 2 showing that the separation joints are not continuous.) As a result, the seismic calculations used are not valid. Most significantly, a structural failure of the concrete frame could result in occupants being harmed and the affected areas being rendered unusable until repairs are made. We requested Quality Assurance/Quality Control reports and photographs from AFCEC for the period of the concrete pour and form removal of specific areas. However, we did not receive the reports or photographs for the separation joints that concerned us.
- Some separation joints that we were able to observe without destructive testing, which would require us to damage finishes on the inside of the building, were spanned with non-structural systems, such as drain pipes, dropped ceiling framing, and inflexible gypsum wall board (sheet rock), without flexible

Photo 1 - Separation Joint Is Not Continuous: This Joint Ends at Top of the Third Floor, and Resumes at a Different Point on the Fourth Floor



Source: AFCEC, February 12, 2015

Note: The boxes denote the location of the separation joint.

Photo 2 - Separation Joint Is Not Continuous at Top



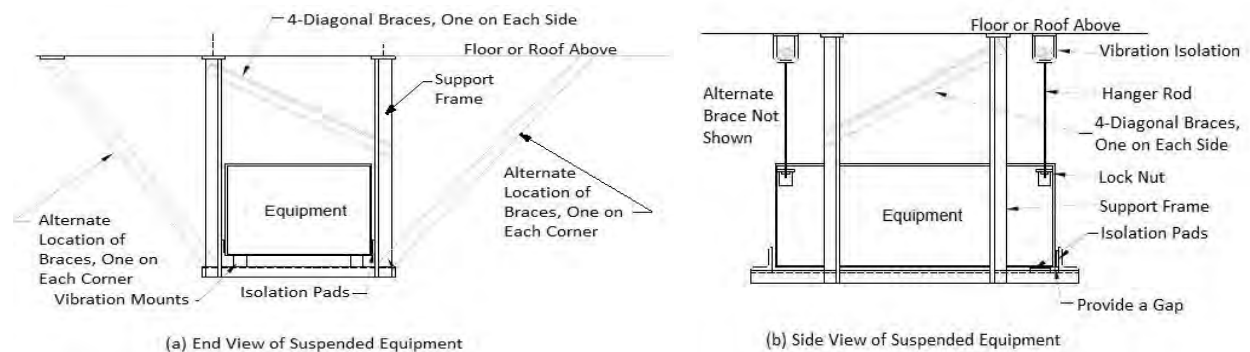
Source: SIGAR, May 27, 2015

connections between the separation joints.⁴ As a result of improper installation, these non-structural systems are not in compliance with minimum building standards and will increase the risk of property damage and other safety concerns during a seismic event. For example, the dropped ceiling support grid is made of light-gauge aluminum frames that will bend when they are forced into each other during an earthquake. Bent frames and broken ceiling tiles will increase the cost of repairs following an earthquake. This repair cost would be reduced, if not eliminated, by installing the dropped ceiling according to the approved design. In addition, the rigid sheet rock finish will crack and buckle, resulting in significant repair costs that could have been prevented if flexible material as specified in the design drawings, such as continuous aluminum plates over a flexible gasket, had been installed.

Lateral Bracing of Equipment is Deficient

During our May 27, 2015, inspection, we found building equipment that did not have lateral bracing. Task orders 0030 and TG06 required that electrical and structural building standards, as defined in the Department of Defense's Unified Facilities Criteria, be followed in constructing the headquarters building.⁵ Based on the Unified Facilities Criteria, lateral bracing must be provided for items supported from the ceiling or floor above. Figure 3 shows typical seismic bracing, based on the Unified Facilities Criteria, used for equipment suspended from the ceiling or floor above.

Figure 3 - Typical Seismic Restraints for Suspended Equipment



Source: Unified Facilities Criteria 3-310-04, *Seismic Design of Buildings*, June 1, 2013

As shown in figure 3, diagram (a) presents an end view of suspended equipment and shows lateral bracing both inside and outside of the support frame holding the equipment. Diagram (b) presents a side view of suspended equipment and shows the lateral bracing inside of the support frame, as well as the hanger rods tied into the ceiling or floor above and the suspended equipment.

⁴ A drop ceiling is a secondary ceiling, hung below the main structural ceiling. Failure of these components in an earthquake has the potential to cause harm, block egress, and impede rescue efforts, and can disrupt the building's function.

⁵ The Department of Defense's Unified Facilities Criteria unifies all technical criteria and standards used by the Armed Services (Army, Navy, and Air Force) by streamlining the military criteria system and eliminating duplication. The U.S. Army Corps of Engineers, Naval Facilities Engineering Command, and AFCEC administer the Unified Facilities Criteria program.

According to the Unified Facilities Criteria and the American Society of Civil Engineers standard 7, all architectural, mechanical, and electrical components should be designed to include bracing, anchorage, isolation, and energy dissipation, as appropriate. This is because ceiling-mounted equipment, which includes heating/cooling equipment, mechanical duct work, and light fixtures, could swing freely during a seismic event and separate from their hangers and fall, damaging the equipment and possibly leading to injury.

Photo 3 shows a ceiling-mounted piece of heating/cooling equipment and mechanical duct work with no lateral bracing. In addition, the fuel supply for the fire suppression pump in the basement was installed without lateral bracing, isolation joints, or containment.⁶ In a seismic event, the elevated 238-gallon diesel fuel tank could spill fuel across the pump room floor. The fuel would then leak into the rain water collection system, be directed to the wastewater treatment plant, and ultimately discharged into the Kabul River.

Photo 3 - Ceiling-Mounted Equipment and Mechanical Duct Work With No Lateral Bracing

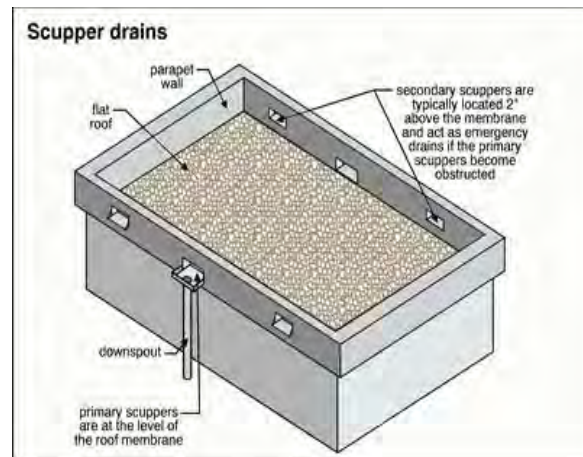


Source: SIGAR, March 7, 2014

Roof Design and Construction Deficiencies

During our 2015 inspections, we found that the roof was not designed or constructed in accordance with the contract and code requirements for roof drainage.⁷ For example, we found that the installed roof drains measured 3 inches, not the 4 inches in diameter required by the ITSI engineers' revised calculations. In addition, secondary drains, known as scuppers, were not installed. The contract design documents required—as does the building code—a secondary emergency overflow for roofs with a parapet wall (see figure 4 showing examples of secondary emergency roof drains).⁸ Otherwise, if storm water is trapped on the roof behind the parapet walls, it could (1) damage the ventilation and heating/cooling equipment that is roof mounted on 4-inch high platforms, and (2) allow water to enter the roof access doors and flood the building causing damage to equipment and interior finishes.

Figure 4 - Example of Secondary Drain for a Roof with Parapet Walls



Source: Encyclopedia of Building & Environmental Inspection, Testing, Diagnosis, Repair

⁶ Isolation joints involve a flexible coupling on the fuel line that absorbs movement of the tank during an earthquake and prevents the fuel line from breaking. According to CSTC-A officials, isolation joints were installed on the fire suppression pumps.

⁷ International Building Code 1503.4, Roof Drainage.

⁸ A parapet is a barrier that is an extension of the wall at the edge of a roof, terrace, balcony, walkway, or other structure.

Our inspections also revealed that water from one of the building's seven sections drains to and is collected in a pit in the basement floor that contains two pumps. These pumps require electricity, and if the power is interrupted or the system is not well maintained, the basement could flood, potentially damaging the fire suppression system and water supply pumps for the building, as well as servers and the switch control panel for the back-up power generators. The other six sections of the building's roof drain directly to sewage collection manholes around the building and then to the wastewater treatment plant.

We also found that the rain water from the roof drains could overload the wastewater treatment plant. The roof drains have the capacity to collect approximately 93,000 gallons of storm water and direct it to the wastewater treatment plant.⁹ The treatment plant drains into the Kabul River, as would any untreated overflow from an overwhelmed treatment plant. Best management practices discourage the mixing of storm water with sewage water. The wastewater treatment plant, which is capable of treating 203,000 gallons per day, is designed to receive 190,584 gallons of wastewater from the MOD headquarters building.¹⁰ As a result, adding an additional 93,000 gallons of rain water would exceed the wastewater treatment plant's capacity.

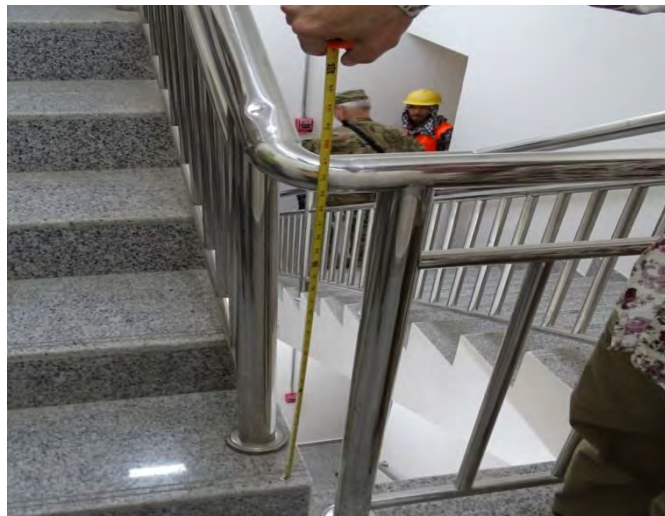
Lastly, if the roof does not drain within 48 hours as required by minimum standards referenced in the design documents, the standing water could increase maintenance and repair costs, and decrease the useful life of the roof. Further, standing water in the winter could freeze and cause damage to the roof's membrane and roof equipment supports.¹¹

Handrail Height and Quality Deficiencies

We found that the handrails on interior stairways were not installed at the proper height. During our May 27, 2015, site inspection, we measured the handrail height at 31 inches, which does not meet the minimum 34-inch height required by the International Building Code (see photo 4 showing the lower than required handrail height).¹² The 34-inch handrail height is standardized to allow the average person to reach for the handrail at an average height, so a lower height could contribute to falls on the stairways and injuries.

We also found that the handrail material was insufficient in quality. Our review of construction documents showed that the originally specified handrail material was mild steel pipe, but that AFCEC approved ITSI's request to substitute stainless steel thin-

Photo 4 - Handrail Is 31 Inches in Height and Is Dented



Source: SIGAR, May 27, 2015

⁹ Rainfall intensity = 1.37 inches per hour, based on the 100-year, 1-hour storm event based on ITSI's submittal of the 95 percent plumbing calculation, dated December 19, 2010.

¹⁰ This is the design peak daily flow based on ITSI's submittal of the 95 percent plumbing calculation, dated December 19, 2010.

¹¹ A roof membrane is a layered roofing system used on flat roofs consisting of membrane layers of synthetic rubber, thermoplastic, or bitumen. The MOD headquarters building's membrane is bitumen.

¹² International Building Code 2009, Section 1012, Handrails.

walled pipe.¹³ The walls of the stainless steel pipe are no more than a fourth as thick as the originally required pipe. As a result, we found that the installed handrail has multiple dents, which is common for stainless steel thin-walled pipe. The substitution to the thin-walled stainless steel pipe will result in increased maintenance costs for the handrails, which run the risk of being dented further when furniture is moved into the building.

Our draft report, sent to Office of the Under Secretary of Defense for Policy, U.S. Central Command, U.S. Forces-Afghanistan, and CSTC-A for review on August 12, 2015, included a recommendation to make the necessary adjustments to the stairway handrails so they meet the International Building Code's height requirements. In commenting on our draft report, CSTC-A stated that Gilbane Federal initiated action to correct those handrails by November 2015. On January 7, 2016, during our follow-up inspection, we confirmed that CSTC-A acted on the recommendation and corrected the handrails. Therefore, we did not repeat the recommendation in our final report.

Post-earthquake Inspection Conducted on January 7, 2016

Between October and December 2015, Kabul, where the MOD headquarters building is located, experienced two earthquakes. On October 26, 2015, a 7.5 magnitude earthquake occurred 153 miles north-north east of Kabul. On December 25, 2015, a 6.3 magnitude earthquake struck an area 174 miles northeast of Kabul. The distance of the epicenters of those earthquakes from Kabul reduced the intensity of the shaking the MOD headquarters building experienced to "moderate" or "light."¹⁴ On January 7, 2016, we conducted a limited site inspection of the MOD headquarters building to assess how the separation joints held up under the movement of the building following the two earthquakes. We found some repairs had been made, including gypsum wall board patches, caulking, painting, and floor skirt repairs. The separation joints we observed on the fifth floor showed some signs of damage from building movement that was not present during our previous inspection, which occurred on May 27, 2015. Overall, we did not identify any major damage, defects or areas of concern regarding the MOD headquarters building, and do not have any additional recommendations. However, given Kabul's location in an active seismic zone, we remain concerned about the extent to which the MOD headquarters building would withstand an earthquake with an epicenter closer to Kabul or of greater magnitude.

THE MOD HEADQUARTERS BUILDING IS NOT FULLY OCCUPIED, OVER 5 YEARS AFTER ITS ORIGINAL DEADLINE FOR COMPLETION

During our site inspection on May 27, 2015, we found that the MOD headquarters building was largely complete, with the exception of installation signs, communications lines, and some landscaping. MOD officials were assigning office space, but they were still not using the headquarters building. According to the AFCEC contracting officer's representative, construction on the building was completed on April 3, 2015, within the timeframe required by the second contract. However, as of the time we drafted this report, the MOD had not yet occupied the building, nearly 5 years after the project was originally scheduled to be complete. The contracting officer's representative told us that the MOD was expected to occupy the headquarters upon the completion of a North Atlantic Treaty Organization (NATO)-funded contract to provide furniture, fixtures, and equipment for the building. AFCEC officials were unable to tell us when the NATO contract would be completed because CSTC-A was still negotiating the contract. On December 28, 2015, CSTC-A reported that it transferred the MOD headquarters building to the MOD, and the MOD had started to occupy the building. During our follow-up site inspection on January 7, 2016, we noted that the building was not fully occupied by MOD personnel.

¹³ The contract originally required schedule 40 mild steel (M.S.) pipe.

¹⁴ "U.S. Geological Survey Earthquake Hazards Program," accessed February 7, 2016, http://earthquake.usgs.gov/earthquakes/eventpage/us10003re5#impact_dyfi and http://earthquake.usgs.gov/earthquakes/eventpage/us100049i1#impact_dyfi.

According to an AFCEC official, the CSTC-A Combined Joint-Engineering Directorate plans to add the MOD headquarters building to the U.S. Army Corps of Engineers' National Operations and Maintenance contract.¹⁵ CSTC-A is working with the MOD Construction Property and Maintenance Department to get trained operation and maintenance personnel to operate and maintain the building's critical systems so that they do not fall into disrepair.

CONCLUSION

The MOD headquarters building appears well built and is nearly ready to be occupied by the Ministry's senior leadership and support staff, and serve as the Afghan National Army's command and control center. However, original plans for the headquarters building to cost \$48.7 million and to be completed by October 11, 2010, were derailed early on due to delays and other problems. As a result of those problems, the cost to complete the building continued to increase, rising to \$154.7 million, or more than three times the original estimate. Similarly, it took the contractor 5 years longer to complete the building than initially anticipated. According to AFCEC, the building was completed on April 3, 2015, and would be transferred to the MOD pending the completion of a NATO-funded contract to provide furniture, fixtures, and equipment for the building. CSTC-A transferred the building to the MOD, and MOD personnel began to occupy it in late December 2015. As of January 7, 2016, the building was not fully occupied.

Despite the increased costs and delays, the MOD headquarters building contains some construction deficiencies, which potentially impact the building's structural integrity during a seismic event or during prolonged periods of rain. We identified deficiencies with some of the separation joints designed to help stabilize the building during seismic activity. Three of the seven separation joints are not continuous from the bottom to the top of the building; and joints inside the building are spanned with non-structural systems, such as drain pipes, that do not have the required flexible connections. As a result, it is possible that one of the building's seven sections will move more during an earthquake than is allowed. Further, lateral bracing that would help stabilize overhead equipment and other items during a seismic event were absent. In addition, the roof lacked adequately sized drains to remove storm water and an adequate secondary emergency drainage system in the event of a significant rainstorm. Lastly, we observed that the building's handrails on interior stairways were set below the standard height, and CSTC-A has begun to replace these handrails. These deficiencies have potential safety implications, and should be addressed as soon as possible. While CSTC-A was reviewing a draft of this report, Gilbane Federal initiated action to correct the handrails deficiency. On January 7, 2016, we confirmed that the handrails were corrected to meet the International Building Code's minimum height requirements.

RECOMMENDATIONS

To protect the U.S. government's investment, we recommend that the Commanding General, CSTC-A, take action to:

- 1. Assess the building's structural integrity where separation joints are not a continuous line from the bottom to the top of the building and the allowable building movement exceeds standards, and if needed, make deficient areas structurally sound.**
- 2. Assess the need for the installation of seismic lateral bracing on non-structural components suspended from the ceiling or floor above, such as heating/cooling equipment, duct work, dropped ceilings, electrical fixtures, and drain pipes.**

¹⁵ The National Operations and Maintenance contract is an on-budget contract that is expected to provide operation and maintenance for power generation, clean water treatment, wastewater treatment and facility maintenance for selected Afghan National Defense and Security Forces facilities.

3. **Install flexible connections across all separation joints of non-structural components, such as gypsum wall board, dropped ceilings, and drain pipes.**
4. **Assess the integrity of lateral bracing, anchorage, isolation, and energy dissipation of all equipment for compliance with the contract's seismic requirements, and make deficient items compliant with the requirements.**
5. **Assess the installed roof drainage system for compliance with the design documents and the International Building Code, and correct any deficiencies.**

All actions taken in response to these recommendations should be reported to SIGAR within 90 days.

AGENCY COMMENTS

We provided a draft of this report to the Office of the Secretary of Defense for Policy, U.S. Central Command, U.S. Forces–Afghanistan, and CSTC-A for review and comment. CSTC-A provided written comments through U.S. Central Command and U.S. Forces–Afghanistan, which are reproduced in appendix III. The Office of the Secretary of Defense for Policy provided technical comments, which we incorporated into this report, as appropriate.

In its comments, CSTC-A stated that its staff evaluated all of the issues we identified by engaging with AFCEC and the contractor, Gilbane Federal, who subsequently conducted assessments and determined that the issues related to the five recommendations in the draft report did not require any additional corrective action. CSTC-A stated that it accepted this determination. However, the assessments conducted by the contractor would have only addressed four of the five recommendations. Our third recommendation did not call for an assessment; instead, it states that CSTC-A should “Install flexible connections across all separation joints of non-structural components” On December 7, 2015, we requested, through the Office of the Under Secretary of Defense for Policy and U.S. Central Command, that CSTC-A provide us with a copy of Gilbane Federal assessments that determined whether seismic lateral bracing was needed for non-structural components, but we did not receive the assessments prior to the issuance of this report.

Our draft report included a sixth recommendation for CSTC-A to address the defective handrails. In its comments, CSTC-A informed us that Gilbane Federal corrected the height of the handrails in November 2015. We confirmed during our post-earthquake inspection on January 7, 2016, that CSTC-A acted on the recommendation and corrected the handrails. Therefore, we did not repeat the sixth recommendation in our final report.

We found CSTC-A's comments to be generally responsive to our recommendations, but documentation substantiating CSTC-A's explanations is necessary to close the recommendations. With respect to the five recommendations, this documentation should demonstrate that an assessment was completed or, as in the case of our third recommendation, that corrective action was taken. Since CSTC-A did not provide us with a copy of the assessments prior to the issuance of this report, the recommendations will remain open until we obtain and review the documentation. In accordance with our normal procedures, we will monitor implementation of actions taken as part of our regular recommendation follow-up activities.

APPENDIX I - CONTRACTS/TASK ORDERS 0030 AND TG06

Task order 0030, awarded under contract number FA8903-06-D-8513, was a cost-plus-fixed-fee award to build the Ministry of Defense (MOD) headquarters building, which would provide offices for the MOD's senior leadership and support, and serve as the Afghan National Army's command and control center.

Table 1 - Task Order 0030 and Modifications

Task Order and Modifications	Date Awarded	Contractor	Period of Performance Expiration	Construction Requirement and Modifications	Contract and Modification Amount
Task Order 0030	April 21, 2009	Innovative Technical Solutions, Inc. (ITSI)	October 11, 2010	Construct the MOD five-story building	\$48,739,238
Modification 01	June 1, 2009	ITSI	N/A	Incorporate Revised Statement of Work and Contract Data Requirements List A, B, and C	No Cost
Modification 02	September 4, 2009	ITSI	N/A	Increase Contract Ceiling Amount, Incorporate Revised Statement of Work, and Revised Appendix A1	\$128,635
Modification 03	September 14, 2009	ITSI	N/A	Increase Contract Ceiling Amount, Incorporate Revised Statement of Work, Incorporate Revised Appendix A1	\$139,804
Modification 04	October 5, 2010	ITSI	Field Performance (January 21, 2012) Task Order Completion (March 21, 2012) Warranty Oversight (January 20, 2013)	Extend Period of Performance	No Cost
Modification 05	August 2, 2011	ITSI	N/A	Increase Contract Ceiling Amount	\$15,563,897
Modification 06	September 15, 2011	ITSI	N/A	Increase Contract Ceiling Amount, Incorporate Revised Statement of Work, Incorporate Revised Appendix A1	\$925,560
Modification 07	October 31, 2011	ITSI	N/A	Transfer of Government Property	No Cost
Modification 08	January 22, 2012	ITSI	Field Performance (February 15, 2012) Task Order Completion (April 21, 2012) Warranty Oversight (February 15, 2013)	Extend Period of Performance	No Cost

Modification 09	February 15, 2012	ITSI	Field Performance (February 29, 2012) Task Order Completion (April 29, 2012) Warranty Oversight (February 28, 2013)	Extend Period of Performance	No Cost
Modification 10	March 9, 2012	ITSI	Field Performance (December 25, 2012) Task Order Completion (February 25, 2013) Warranty Oversight (December 24, 2013)	Increase Contract Ceiling Amount and Change Periods of Performance	\$20,932,554
Modification 11	April 30, 2012	ITSI	N/A	Add Clause 952.225-0022, Inbound and Outbound Cargo and Contractor Equipment Census (April 2012)	No Cost
Modification 12	November 2, 2012	ITSI	N/A	Supplemental Modification to Correct Section J by Adding Attachment 05, U.S. Central Command, Joint Theater Support Contracting Command	No Cost
Modification 13	March 1, 2013	ITSI	Field Performance (April 1, 2013) Task Order Completion (June 1, 2013) Warranty Oversight (March 31, 2014)	Extend Period of Performance	No Cost
Modification 14	April 1, 2013	ITSI	Field Performance (December 31, 2013) Task Order Completion (March 1, 2014) Warranty Oversight (December 30, 2014)	Increase Contract Ceiling Amount and Change Periods of Performance	\$20,913,854
Total					\$107,343,542

Source: Air Force Civil Engineer Center contract documents

Task order TG06, awarded under contract number FA3002-08-D-0008, was a firm-fixed-price award for \$47.4 million to complete the MOD headquarters building by July 31, 2015.

Table 2 - Task Order TG06 and Modification

Task Order and Modification	Date Awarded	Contractor	Period of Performance Expiration	Construction Requirement and Modifications	Contract and Modification Amount
Task Order TG06	July 30, 2014	Gilbane Federal	July 31, 2015	Resume construction activities on the partially completed headquarters building	\$47,402,646
Modification 01	September 18, 2014	Gilbane Federal	N/A	Change the pay station	No Cost
Total					\$47,402,646

Source: Air Force Civil Engineer Center contract documents

APPENDIX II - SCOPE AND METHODOLOGY

This report provides the results of our inspection of the new Ministry of Defense headquarters building in Kabul, Afghanistan. For this inspection, we assessed whether (1) construction was completed in accordance with contract requirements and applicable construction standards, and (2) the building was being used as intended and maintained. Specifically, we:

- reviewed contract documents, design submittals, site visit reports, building codes, and other relevant project documentation;
- conducted engineering assessments of the project drawings and construction methods used;
- interviewed U.S. and Afghan government officials concerning the project's construction; and
- conducted site inspections on March 7, 2014; March 14, 2014; September 5, 2014; January 16, 2015; May 27, 2015; and January 7, 2016.

We did not rely on computer-processed data in conducting this inspection. However, we considered the impact of compliance with laws and fraud risk, as well as data reliability and internal controls, as applicable.

We conducted our work in Kabul, Afghanistan, from February 2014 through February 2016. This work was conducted in accordance with the *Quality Standards for Inspection and Evaluation*, published by the Council of the Inspectors General on Integrity and Efficiency. The engineering assessment was conducted by our professional engineer in accordance with the National Society of Professional Engineers' *Code of Ethics for Engineers*. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our inspection objectives. We conducted this inspection under the authority of Public Law No. 110-181, as amended; and the Inspector General Act of 1978, as amended.

APPENDIX III - COMMENTS FROM COMBINED SECURITY TRANSITION COMMAND-AFGHANISTAN



NON SENSITIVE INFORMATION RELEASABLE TO THE PUBLIC
DEPUTY CHIEF OF STAFF SECURITY ASSISTANCE
COMBINED SECURITY TRANSITION COMMAND-AFGHANISTAN
KABUL, AFGHANISTAN
APO AE 09356

DCOS SA/CSTC-A

14 October, 2015

MEMORANDUM THRU

United States Forces-Afghanistan Audit Cell, APO AE 09356
United States Central Command (CCIG), MacDill AFB, FL 33621

FOR: Special Inspector General for Afghanistan Reconstruction, 2530 Crystal Drive, Arlington,
VA 22202-3940

SUBJECT: CSTC-A Response to Draft Recommendations on SIGAR I-015 "Ministry of
Defense Headquarters Building"

1. Reference: SIGAR I-015 Draft Report; Special Inspector General for Afghanistan Reconstruction (SIGAR).
2. Thank you for providing Combined Security Transition Command-Afghanistan (CSTC-A) the opportunity to review the SIGAR draft report titled, SIGAR I-015 "Ministry of Defense Headquarters Building." CSTC-A concurs with SIGAR's assessment that the MoD Headquarters Building is well built.
3. By working closely with SIGAR inspectors over the past six months, CSTC-A staff has carefully evaluated all of the issues SIGAR presented in this report by engaging the designer of record who subsequently conducted thorough assessments. The designer of record determined that the issues related to the first five findings and recommendations in the draft report require no additional corrective action. CSTC-A accepts this assessment. With respect to the finding and recommendation concerning the height of some of the handrails, Gilbane Federal has initiated action to correct those that are too low by November 2015 at no additional cost to the U.S. Government.
4. Our determination to complete this iconic project was driven by its significant potential to improve the effectiveness of the Ministry of Defense and Afghan National Army General Staff in their direction and oversight of their defense and security of Afghanistan and the Afghan people. While we struggled with a cost-plus delivery strategy in its early stages, running up two thirds of the final cost, we took SIGAR recommendations on the disadvantages of cost-plus contracting as an important lesson, re-awarded this project as a firm-fixed price contract, and limited it to the \$60M approved by our Congress. The re-awarded project was delivered three months ahead of schedule and under budget.
5. CSTC-A is committed to protecting the American taxpayers' investment in the Afghan Security Institutions by ensuring construction of Afghan facilities that are safe for occupancy,

NON SENSITIVE INFORMATION RELEASABLE TO THE PUBLIC

NON SENSITIVE INFORMATION RELEASABLE TO THE PUBLIC

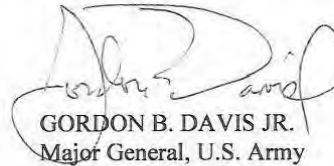
DCOS SA/CSTC-A

SUBJECT: CSTC-A Response to Draft Recommendations on SIGAR I-015 "Ministry of Defense Headquarters Building"

and designed and used as intended. We appreciate SIGAR's recognition of the inherent safety and structural soundness of this critical construction project.

6. We also appreciate SIGAR's continuing mission and significant contributions to ensuring good stewardship and effective use of American government funds. CSTC-A remains committed to close collaboration with and responsiveness to SIGAR efforts.

7. The point of contact for this action is Rhonda C. Dinkins, at DSN [REDACTED] or via e-mail at [REDACTED].



GORDON B. DAVIS JR.
Major General, U.S. Army
Commanding General

NON SENSITIVE INFORMATION RELEASABLE TO THE PUBLIC

APPENDIX IV - ACKNOWLEDGMENTS

Daniel Domke, Senior Inspection Manager

Arthur Granger, Senior Inspector-in-Charge

Melissa McAllister, P.E. Engineer

Jennifer Hoegen, Program Analyst

Ahmad Javed Khairandish, Engineer

Hasibullah Zeer, Program Analyst

This inspection was conducted
under project code SIGAR-I-015.

SIGAR's Mission

The mission of the Special Inspector General for Afghanistan Reconstruction (SIGAR) is to enhance oversight of programs for the reconstruction of Afghanistan by conducting independent and objective audits, inspections, and investigations on the use of taxpayer dollars and related funds. SIGAR works to provide accurate and balanced information, evaluations, analysis, and recommendations to help the U.S. Congress, U.S. agencies, and other decision-makers to make informed oversight, policy, and funding decisions to:

- improve effectiveness of the overall reconstruction strategy and its component programs;
- improve management and accountability over funds administered by U.S. and Afghan agencies and their contractors;
- improve contracting and contract management processes;
- prevent fraud, waste, and abuse; and
- advance U.S. interests in reconstructing Afghanistan.

Obtaining Copies of SIGAR Reports and Testimonies

To obtain copies of SIGAR documents at no cost, go to SIGAR's Web site (www.sigar.mil). SIGAR posts all publicly released reports, testimonies, and correspondence on its Web site.

To Report Fraud, Waste, and Abuse in Afghanistan Reconstruction Programs

To help prevent fraud, waste, and abuse by reporting allegations of fraud, waste, abuse, mismanagement, and reprisal, contact SIGAR's hotline:

- Web: www.sigar.mil/fraud
- Email: sigar.pentagon.inv.mbx.hotline@mail.mil
- Phone Afghanistan: +93 (0) 700-10-7300
- Phone DSN Afghanistan: 318-237-3912 ext. 7303
- Phone International: +1-866-329-8893
- Phone DSN International: 312-664-0378
- U.S. fax: +1-703-601-4065

Public Affairs

Public Affairs Officer

- Phone: 703-545-5974
- Email: sigar.pentagon.ccr.mbx.public-affairs@mail.mil
- Mail: SIGAR Public Affairs
2530 Crystal Drive
Arlington, VA 22202