



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
1616 CAPITOL AVENUE
OMAHA NE 68102-4901

CENWO-ED-DG

4 February 2014

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: End State Technical Review Report, Phase I, construction completed 2013.
Eglin AFB, FL, 7th SFG Liberty Chapel (PN 71492)

PART ONE, ASD FUNCTIONAL BASIS EVALUATION SUMMARY

This portion of the Memorandum will address the specific evaluations made as they relate to the Army Standard Design (ASD) for this facility type, discussed in the order observed. Because any completed facility also includes characteristics and features not part of the ASD requirements, not all of the potential Lesson's Learned have application to the ASD. The primary focus of this investigation is to improve the ASD and to do so in a way that reflects upon the underlying assumptions and theories (design concepts) upon which the ASD was developed. "PART TWO" of the Memorandum will include detail on the actual observations and take up the various issues unique to this facility as well as those applicable to the ASD. To assist perusal of the document the primary functional space type being discussed has been inserted (in parentheses) in between the appropriate groups of comments.

In general, all agreed that the completed facility is performing well in many ways; the building layout allows great flexibility. The users feel generally empowered to accomplish the Chaplaincy mission in ways that were just not possible before. This has been of tremendous value to the congregations being supported and the entire military community and Army mission.

Weaknesses of the facility focus primarily on a few components that are not functioning quite as intended. There were also a (very) small number of weaknesses that were rooted in all of the aspects of what puts a project together (contract, design, construction), as well.

Observations made that relate directly to the ASD requirements and the design concepts selected for use by the Office of the Chief of Chaplains (OCCH) are as follows:

1.1 As intended by the ASD, the building is flexible and allows the User to reconfigure some of the spaces to suit their needs. The User is using some of the classrooms as office space for additional Chaplains and Chaplain Assistants. Permanent arrangements in the Administrative Space are in questions until further notice, due to

CENWO-ED-DG

SUBJECT: End State Technical Review Report, Phase I, construction completed 2013.
Eglin AFB, FL, 7th SFG Liberty Chapel (PN 71492)

reoccurring and frequent deployments for the Ministry Team. **The goal of the ASD is to allow each congregation or user group the optimum usable features for their activities in an environment where all share the benefits of a relatively flexible and extremely functional facility. (This comment is the same as 2.1)**

1.2 The User likes the porcelain tile in the Activity Center; they indicated it is much easier to clean than carpet. **This is gratifying evidence of the forethought put into the 2004 ASD and this specific project. (This comment is the same as 2.4)**

1.3 The User is happy with both the ecclesiastical furniture and office furniture. They indicated that the freestanding ecclesiastical furniture items are lightweight enough to move where needed. Per e-mail from Gene Morisani, the ecclesiastical furniture is from Imperial Woodworks. **This is gratifying evidence of the forethought put into the 2004 ASD and this specific project. (This comment is the same as 2.15)**

1.4 The folding partitions separating the Worship Center and Activity Center are working great and as intended. **This is gratifying evidence of the forethought put into the 2004 ASD and this specific project. (This comment is the same as 2.2)**

1.5 The installation of the baptismal pool did not include handrails. **The ASD text will include additional information regarding handrails at this location. (This comment is the same as 2.6)**

1.6 The Users really enjoy having two separate pantries. **This is gratifying evidence of the forethought put into the 2004 ASD and this specific project. (This comment is the same as 2.10)**

1.7 Door hardware on the cabinets below the stage is missing. **The ASD text will include additional information regarding hardware at this location. (This comment is the same as 2.5)**

1.8 There are no lights in the Choir Robe Closet. As a note, the user changed the function of the room. **The COS will review and consider adding additional language to the ASD to include lights in storage closets. (This comment is the same as 2.12)**

1.9 The warming drawers are a great feature. **This is gratifying evidence of the forethought put into the 2004 ASD and this specific project. (This comment is the same as 2.11)**

CENWO-ED-DG

SUBJECT: End State Technical Review Report, Phase I, construction completed 2013. Eglin AFB, FL, 7th SFG Liberty Chapel (PN 71492)

1.10 The Audio/ Visual (A/V) system is very complex; users did not think they would use all the capabilities of the system even after taking time to study the O&M manuals. **The COS will review and consider adding additional language to the ASD to cover additional training, approximately 6 months after occupancy to address retraining users after they have some experience with the system. (This comment is the same as 2.9)**

1.11 Mass notification speakers were required to be added outside of all exits before the building could be occupied. The Authority Having Jurisdiction (AHJ) caught this at the final inspection/test. **The ASD requires that the Mass Notification system be designed in accordance with UFC-4-021-01. The COS, Project Delivery Team (PDT), will be more mindful of such requirements in the future. (This comment is the same as 2.16)**

1.12 A Fire alarm speaker/strobe was required to be added to the dressing area behind the baptistry before the building could be occupied. The AHJ caught this at the final inspection/test. **The ASD requires that the Fire Detection and Alarm system be designed in accordance with UFC 3-600-01, UFC-4-021-01, and NFPA 72. The COS PDT will be more mindful of such requirements in the future. (This comment is the same as 2.17)**

IN SUMMARY: In general, the results of this End State Technical Review (ESTR) demonstrate that the underlying concepts behind the 2004 ASD were sound and effective. Each of the principle functional areas and features are supporting an excellent level of successful ministry. The completed facility appears to represent a very-close-to-optimum balance between aesthetics, function, cost, and maintainability. The completed facility also appears to represent a high-value long-term asset for the military community, the Garrison, the OCCH, and the Army.

PART TWO, ALL OBSERVATIONS AND DISCUSSIONS

This portion of the Memorandum will address each observation discussed in the order observed. Because any completed facility also includes characteristics and features not part of the ASD requirements, not all of the potential Lesson's Learned have application to the ASD. Some are project specific and related to project history, unique points-of-view, unique features, or unique functions that needed to be added to the general facility mission. This portion of the report allows all such observations and discussions to be recorded and applied to future projects as appropriate. The following observations and discussions were identified:

CENWO-ED-DG

SUBJECT: End State Technical Review Report, Phase I, construction completed 2013.
Eglin AFB, FL, 7th SFG Liberty Chapel (PN 71492)

(Administrative Spaces)

2.1 As intended by the ASD, the building is flexible and allows the User to reconfigure some of the spaces to suit their needs. The User is using some of the classrooms as office space for additional Chaplains and Chaplain Assistants. Permanent arrangements in the Administrative Space are in questions until further notice, due to reoccurring and frequent deployments for the Ministry Team. **The goal of the ASD is to allow each congregation or user group the optimum usable features for their activities in an environment where all share the benefits of a relatively flexible and extremely functional facility.**

(The Worship Center)

2.2 The folding partitions separating the Worship Center and Activity Center are working great and as intended. **This is gratifying evidence of the forethought put into the 2004 ASD and this specific project.**

2.3 The return grille in this area was making a noticeably loud whistling sound. During the construction phase, this issue was brought to the designer's attention and he discovered the return grille was undersized in the design. The size was increased, but not to the recommended size because the framing that was in place would have caused a costly modification. Even with the increased size, the grille is still creating an unacceptable noise. **The COS recommends that a low cost solution would be to remove the grille and paint the inside of the duct to make it less noticeable. Another solution would be to use a grille with more space between the blades (the resident engineer mentioned this). In any event, this is something we need to look closely at for future projects to ensure that noise is not a problem in this sensitive area.**

(The Activity Center)

2.4 The User likes the porcelain tile in the Activity Center. They indicated it is much easier to clean than carpet. **This is gratifying evidence of the forethought put into the 2004 ASD and this specific project.**

2.5 Door hardware on the cabinets below the stage is missing. **The ASD text will include additional information regarding hardware at this location.**

(The Baptistery Suite)

2.6 The installation of the baptismal pool did not include handrails. **The ASD text will include additional information regarding handrails at this location.**

CENWO-ED-DG

SUBJECT: End State Technical Review Report, Phase I, construction completed 2013.
Eglin AFB, FL, 7th SFG Liberty Chapel (PN 71492)

(Audio/Visual System Issues)

2.7 The User uses the organ approximately once a month. **The intention of this facility is to support a full range of Chaplaincy programs and military community activities and the COS recognizes the needs of the congregation might change overtime; therefore, the ASD is intended to provide a range of furnishings to meet the needs of present and future congregations.**

2.8 According to the Resident Engineer at Eglin, there were many items called out to be installed in the A/V drawings that are not in production anymore. He thinks we should take the time to define the salient features and remove the MFR specific makes/models. The media console cabinet built to house the main mixing board is also not large enough to accommodate the equipment specified - the lid would not close and had to be modified. **The ASD does describe the salient features for the A/V system that are required to enhance the functional ministry and communication capabilities. During the design for the Eglin Chapel, the COS was continuing to define the scope and criteria for the A/V system. The intent of the ASD was always to require the Contractor to submit an A/V design proposal of sufficient detail to evaluate the general quality, media, and recording/broadcasting supporting features.**

2.9 The A/V system is very complex; users did not think they would use all the capabilities of the system even after taking time to study the O&M manuals. **The COS will review and consider adding additional language to the ASD to cover additional training, approximately 6 months after occupancy to address retraining users after they have some experience with the system.**

(The Kitchen Suite)

2.10 Users really enjoy having two separate pantries. **This is gratifying evidence of the forethought put into the 2004 ASD and this specific project.**

2.11 The warming drawers are a great feature. **This is gratifying evidence of the forethought put into the 2004 ASD and this specific project.**

CENWO-ED-DG

SUBJECT: End State Technical Review Report, Phase I, construction completed 2013.
Eglin AFB, FL, 7th SFG Liberty Chapel (PN 71492)

(The Blessed Sacrament Space)

(Multi-purpose/Classroom Spaces)

2.12 There are no lights in the Choir Robe Closet. As a note, the user changed the function of the room. **The COS will review and consider adding additional language to the ASD to include lights in storage closets.**

(The Toddler Nursery Accommodations)

(Vestibules/Lobbies/Corridors/Stairways)

(Storage Spaces)

2.13 Several large closets did not have overhead lights. **Although the ASD does not specifically address light fixtures in Storage Closets, the ASD does require lighting in Storage Rooms. The COS will amend the ASD, adding lighting in Storage Closets that are greater than 15 square feet.**

(Toilet Rooms and Janitor's Closets)

(Building Features and Finishes)

2.14 More downspouts were required for the high bay roof area than are indicated in the building elevations. The Government did not pay for a mod on this, but it was a contentious issue that could have been solved quickly with a revision to the building elevations. **This is gratifying evidence of the PDT's ability to manage problems that arise during construction projects.**

(Furniture, Appliances, and Equipment Items)

2.15 The User is happy with both the ecclesiastical furniture and office furniture. They indicated that the freestanding ecclesiastical furniture items are lightweight enough to move where needed. Per e-mail from Gene Morisani, the ecclesiastical furniture is from Imperial Woodworks. **This is gratifying evidence of the forethought put into the 2004 ASD and this specific project.**

CENWO-ED-DG

SUBJECT: End State Technical Review Report, Phase I, construction completed 2013. Eglin AFB, FL, 7th SFG Liberty Chapel (PN 71492)

(Equipment Rooms and Systems)

2.16 Mass notification speakers were required to be added outside of all exits before the building could be occupied. The AHJ caught these at the final inspection/test.

The ASD requires that the Mass Notification system be designed in accordance with UFC-4-021-01. The COS PDT will be more mindful of such requirements in the future.

2.17 A Fire alarm speaker/strobe was required to be added to the dressing area behind the baptistery before the building could be occupied. The AHJ caught these at the final inspection/test.

The ASD requires that the Fire Detection and Alarm system be designed in accordance with UFC 3-600-01, UFC-4-021-01, and NFPA 72. The COS PDT will be more mindful of such requirements in the future.

2.18 According to the Resident Engineer at Eglin, the Heating, Ventilation, and Air Conditioning (HVAC) drawings show "relief" versus "return" terminology, for the Air Handling Units (AHU's). The terms were inconsistently used and created confusion based on typical conventions in the trade. On sheet M-501 the AHU has a relief fan, but on sheet M701, diagram it is the return fan. The "return" fan is not really a return air fan based on the convention that return air goes back into the building. The "return" fan in our controls design is really the fan that pushes air out of the building - typically, one would call this relief or exhaust. Additionally, in the Direct Digital Control (DDC) drawings on sheet M701-702, the sequence of operations terminology is inconsistent and ambiguous on the relationship between OA and return/relief/exhaust. We have to scrub the mechanical design and coordinate terminology and intent. **Although the schematic and AHU details confirm that this is a relief fan, this error caused confusion on the operation of the AHU. A minor mistake that can be easily corrected in future designs. Additionally, it is unclear what the contractor assumed for the relief rates, but the building was in a negative pressure condition during operation and this caused the problem. The resident engineer feels that they have corrected the problem. Although the problem may not have been caused by the control sequence, this is something that needs to be explicit in the design documents and must be corrected for future designs.**

2.19 Ventilate mechanical room; the summertime conditions frequently result in condensation in mechanical rooms that are open to the outside. For this area of the country, we would not recommend natural ventilating. **Ventilation of the mechanical room is common practice in many areas, and we have used this method on other projects in the South. The lesson learned is that we need to consider mechanically cooling these spaces in high humidity areas of the country and verify whether the installation commonly uses mechanical cooling. In this case,**

CENWO-ED-DG

SUBJECT: End State Technical Review Report, Phase I, construction completed 2013.
Eglin AFB, FL, 7th SFG Liberty Chapel (PN 71492)

an opening was introduced in the AHU supply duct to bleed conditioned air into the space. Although I advised against this approach, it was a low (or zero) cost solution and does not seem to have affected the system performance.

2.20 There are issues arising from the DDC/lighting Occupancy sensors. The occupancy sensors in the electrical drawings are intended to control the DDC system as well as the lights. This is not clearly noted in the plans/specs for each of these disciplines. The two subcontractors expected each other to provide the sensors for the DDC. In our case, the sensors installed were not capable of controlling more than the lights so we had to go back and direct the mechanical sub to provide sensors based on the notes in the controls drawings. This could be solved with a note in the electrical drawings and mechanical drawings that clarifies the intent. **The mechanical controls call for occupancy sensors to the Variable Air Volume (VAV) controllers. However, they also reference the (HVAC) sheets for occupancy sensor location. In future designs, we must reference the Electrical sheets and ensure that the sensors specified include the capabilities required by the control sequence.**

(Site Issues)

PART THREE, UNIQUE ISSUES

3.1 The Chapel currently has approximately 20 - 65 people attend services. They feel they are in a start up period and the numbers will increase. The facility is frequently in use by other organizations such as the Family Readiness Group (FRG) and Protestant Women of the Church (PWOC), that are keeping the Ministry Team busy scheduling these activities. **The Eglin Liberty Chapel is in a remote location, between two towns. Currently, potential congregants choose to attend services closer to where they live.**

3.2 The installation has a contract for weekly bathroom cleaning.

3.3 Eglin Picks-up recycling.

3.4 The Facility experienced problems with the footing design prior to the start of construction. According to the Resident Engineer at Eglin, we lost a claim on this one. While he understood the rationale from the engineers on why they sized the foundation, we cannot put a design in the contract and then make the statement that if it is not adequate to support the Pre-Engineered Metal Building (PEMB) the contractor is responsible for redesigning it. This violates the Spearin Doctrine that states we have to warrant that our design will work. Other ways to word the contract might be that the

CENWO-ED-DG

SUBJECT: End State Technical Review Report, Phase I, construction completed 2013.
Eglin AFB, FL, 7th SFG Liberty Chapel (PN 71492)

building design SHALL NOT exceed the allowable footing loads in the table.
Alternatively, we may as well just complete the structural design and not ask for a hybrid design. As prescriptive as it is we are, we are not really giving the contractors much of an opportunity to come up with significant cost saving innovations in the structure. **The COS has guidance in place for future in-house designs that will require the PEMB Contractor to provide the footing design as part of the contract.**

PART FOUR, THE REVIEW PROCESS AND PARTICIPANTS

The following team of participants gathered at the Eglin AFB 7th SFG Liberty Chapel on February 4, 2014. The review process began with a meeting and continuation of previous discussions of lessons learned related issues, building operations, descriptions of what congregations are being served and their usage patterns, etc. Once general discussion reached an appropriate point, the team shifted to a tour of the facility with further items brought up as we went.

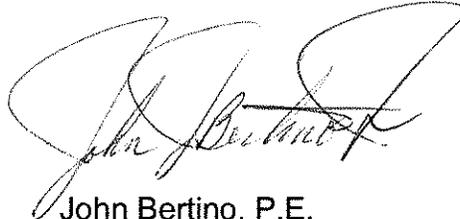
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CENWO-ED-DG

SUBJECT: End State Technical Review Report, Phase I, construction completed 2013.
Eglin AFB, FL, 7th SFG Liberty Chapel (PN 71492)

Any other questions, comments, or concerns on the aforementioned items may be directed to Mr. Askelon Parker, (402) 995-2173 or email address at Askelon.M.Parker@usace.army.mil.

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