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21 April 2012

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: End State Technical Review Report, construction completed 2011, Fort Leonard Wood, MO, Chapel Complex (PN 56366 and 72139)

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 was excellent (spectacular, wonderful, beautiful) in many ways. 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. Because it was known ahead that the congregations that would use this facility would include trainees (including IET Trainees), the decision was made to make use of hard-surface flooring in the worship center (and several other spaces where carpeting is the "default" requirement). This has proven to be a wonderful decision. Seven large trainee congregations pass through this space every Sunday. The porcelain tile floor is

easy to clean up when things get messy, it looks beautiful, and the construction team was careful to place the tile with techniques (a high density foam mat underlayment) that diminished the (potentially negative) acoustic impact. A second decision was made to seek out a special fabric finish for the pews to avoid stains from wet and soiled clothing when soldiers must come in through inclement weather. The finish selected has not been as resistant to stains as would be best, and at least one pew has required replacement of the finish and padding behind it. **The floor finish decision (which deviates from the normal or “default” finish requirement of the ASD) has proved to be excellent. The pew protection decision was harder to implement and this may happen in other chapels; the CoS will undertake more study of the options available. (This comment is the same as 2.1)**

1.2. Because seven large trainee congregations pass through this space (one immediately after the other) every Sunday, the congregation members enter from one side of the space and depart from the other side of the space. The ASD concept for entering and leaving the space was that most members would enter and leave from the same portion of the entrances (with experienced members quickly picking other entry choices to favor and so, disperse the flow). The ASD concept for entering and leaving the building was similar. Having high volume flow in at one location and out at the other means that one of the two is always bottle-necked. **While trainee congregations were not the primary focus of this ASD, it was always recognized that such congregations might be included and some accommodations and choice options were included. This facility demonstrates that additional accommodations (a simple change to have maximum doorways/access at both side of the room/building) would allow the ASD to better support trainee congregations while not hindering the accommodation of family congregations at all. (This comment is the same as 2.2)**

1.3. The A/V control desk is located to one side of the Worship Center; the side furthest away from the office suite. As being used at this facility, the controls are operated by the Chaplain staff located most often in the office suite. They would prefer to save a few steps and have it on the opposite side of the space (closer to their offices). **While this might not be the preference in other circumstances, it would still appear to be an easy and sensible change to make in the ASD. (This comment is the same as 2.6)**

1.4. While this facility includes a pre-manufactured baptismal pool, the unit does exhibit some troublesome characteristics. No handrail has been included to assist people in getting in or out. The water level is governed totally by manual “turning-on” and turning-off” switches and the process must be physically monitored by a customer representative for the approximately 2-hour fill time. In addition, the system fills the pool much more rapidly than the over-flow drains can drain it. This is not a sustainable operation and one incident of major spillage has already occurred. Also, when fully loaded, the unit pulls away from the adjacent materials/surfaces, in spite of being heavily reinforced. Some of these weaknesses may be common in the industry or may be unique to this make and model. A contract Modification is under way to change the controlling portion of the system. **Additional research and adding additional appropriate verbiage to the ASD text could improve the problem for most facilities. (This comment is the same as 2.12)**

1.5. At the time this ASD was developed, the expectation was that flat-screen televisions would be purchased (OMA funds) for a few locations in the facility with a portable television or other A/V unit moved around and used in other spaces. The use patterns for technology have changed quickly and recent facilities (such as this one) have gone to the use of televisions in many many spaces. Where coordinated well, this, in and of itself, is not a problem. However, the impact on the energy modeling and heat source aspects of the facility have not been really been “folded into” the appropriate design modeling and this is probably making those studies and the resulting designs of building systems slightly inaccurate which is deleterious to the overall Army goals for energy, etc. **Current ASDs are assuming this (newer) usage of technology, although one imagines that by the time facilities are constructed according to these newer ASDs, some not-yet-imagined use of technology will have a similar effect. (This comment is the same as 2.29)**

IN SUMMARY: In general, the results of this ESTR demonstrate that the underlying concepts behind the 2004 ASD were sound and effective. Each of the principle functional areas and features (keeping in mind that there were deliberate compromises made to target specific facility size and cost) 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:

(Administrative Spaces)

(The Worship Center)

2.1. Because it was known ahead that the congregations that would use this facility would include trainees (including IET Trainees), the decision was made to make use of hard-surface flooring in the worship center (and several other spaces where carpeting is the “default” requirement). This has proven to be a wonderful decision. Seven large trainee congregations pass through this space every Sunday. The porcelain tile floor is easy to clean up when things get messy, it looks beautiful, and the construction team was careful to place the tile with techniques (a high density foam mat underlayment) that diminished the (potentially negative) acoustic impact. A second decision was made to seek out a special fabric finish for the pews to avoid stains from wet and soiled clothing when soldiers must come in through inclement

weather. The finish selected has not been as resistant to stains as would be best, and at least one pew has required replacement of the finish and padding behind it. **The floor finish decision (which deviates from the normal or “default” finish requirement of the ASD) has proved to be excellent. The pew protection decision was harder to implement and this may happen in other chapels; the CoS will undertake more study of the options available.**

2.2. Because seven large trainee congregations pass through this space (one immediately after the other) every Sunday, the congregation members enter from one side of the space and depart from the other side of the space. The ASD concept for entering and leaving the space was that most members would enter and leave from the same portion of the entrances (with experienced members quickly picking other entry choices to favor and so, disperse the flow). The ASD concept for entering and leaving the building was similar. Having high volume flow in at one location and out at the other means that one of the two is always bottle-necked. **While trainee congregations were not the primary focus of this ASD, it was always recognized that such congregations might be included and some accommodations and choice options were included. This facility demonstrates that additional accommodations (a simple change to have maximum doorways/access at both side of the room/building) would allow the ASD to better support trainee congregations while not hindering the accommodation of family congregations at all.**

2.3. Integrating all electrical outlet, stage-lighting, communication outlet, and features connected to non-MCA provided equipment is a major challenge in the chapel facilities; especially as regards the Worship Center. This facility did have some close-calls and failures to fully accomplishing the optimum integration. One recessed outlet box is insufficiently recessed into the floor and several of the outlets cannot be used without creating a tripping hazard (the flush-with-the-floor-covers will not fully close). **This was an early facility in the most recent RFP process and the CoS team definitely learned lessons later that could have made coordination for this facility smoother. Even then, experience tells us that the Army Regulation required separations between chapel features will always make this coordination inherently difficult to simplify.**

2.4. The specific recessed light fixture and installation used in the Worship Center is not sufficiently secure and the fixture will fall out of the trim ring opening and hang by the wiring. Chapel staff representatives have had to regularly arrange for repairs as the incidents occur. **This is a specific fixture and installation problem not normally run in to on projects.**

2.5. The wood trim in the Worship Center (and other spaces) was installed relatively early in the room finish process. Its moisture content at the time of installation was different than the later moisture vapor levels in the completed-and-being-used building and significant shrinkage occurred which has caused awkward gaps at joints and twisting of the trim. This detracts from the appearance.. **This is a specific problem for this facility that does not reflect on the ASD or standard construction procedures.**

2.6. The A/V control desk is located to one side of the Worship Center; the side furthest away from the office suite. As being used at this facility, the controls are operated by the Chaplain staff located most often in the office suite. They would prefer to save a few steps and have it on

the opposite side of the space (closer to their offices). **While this might not be the preference in other circumstances, it would still appear to be an easy and sensible change to make in the ASD.**

2.7. The ecclesiastical lectern in this facility has already been slightly damaged in lifting and relocating activities (not from falls or bumps, but from the lifting process over-taxing the fasteners between components). While it is hard to be certain, the unit appears to be of excellent quality. **It appears that the ASD would do well to require large casters with movement lock devices on all of the heavier ecclesiastical furniture pieces.**

2.8. A long standing issue with all of the Chapels (and a problem for this facility) is how to best accommodate the changing of lighting lamps in the high-ceilinged areas, i.e. the Worship Center. **Private Sector religious facilities sometimes include relatively expensive catwalk systems that allow for lamp changes to be easily accomplished. Some do not feel that the expense for the catwalk system is appropriate and have to contract out for this task. Since appropriate use of Army resources is also important for such decisions, OCCH has also not directed that a full catwalk system be used. The CoS team has experimented with a multitude of techniques for a “good” (if not perfect) solution and will continue to do so in hopes of finding an appropriate middle ground between the ideal catwalk feature and standard lighting solutions.**

(The Activity Center)

2.9. The standard design does not fully detail the arrangement of or the components of the Activity Center raised platform and under-platform storage (it is not intended to be a fully detailed and specified working drawing). At this facility drapery has been used to “skirt” the raised platform and form a closure for the under-platform storage. While the closed appearance is excellent, the drapery hardware selected is not holding up and the drapery system has some practical drawbacks to how it functions (as do solid door closures, etc., etc.). **The under-platform storage has not succeeded perfectly at any of the completed facilities, in spite of a very wide variety of closure and construction choices. The newest ASDs have abandoned both the (permanent) raised platform and the under-platform storage (for numerous additional reasons) for ASDs currently being developed.**

2.10. The selection process for the OMA provided folding chairs was very careful to procure a sturdy and well made unit, and the customer representatives are very pleased with those aspects of their performance. However, the manufacturer has selected an end-cap type (six to a chair) that split under normal load stresses. The customer representative’s collection of ruined end-caps is already huge. When an end-cap is missing, using the chair damages the floor. The manufacturer has supplied a huge number of replacement end-caps, but this is not a sustainable solution. A structurally sound/resilient end cap must be found for this chair to continue to perform as it should. **While this is a project specific incident, steps are being taken to resolve the problem for this project and future procurer’s of this product.**

2.11. Multi-purpose tables are best if light in weight and sturdy. The industry does manufacture sturdy tables that are still light in weight. The industry also provides sturdy tables that are rather

heavy and, unfortunately, the table provided for this facility is of that type. This means that many of the facility users need help setting up and taking down their meeting arrangements and that everyone involved is at some extra risk for injury. **The CoS intends to check with Huntsville about table suppliers being used and adding additional appropriate verbiage to the ASD text to require (current verbiage says “consider”) the light weight tables.**

(The Baptistery Suite)

2.12. While this facility includes a pre-manufactured baptismal pool, the unit does exhibit some troublesome characteristics. No handrail has been included to assist people in getting in or out. The water level is governed totally by manual “turning-on” and turning-off” switches and the process must be physically monitored by a customer representative for the approximately 2-hour fill time. In addition, the system fills the pool much more rapidly than the over-flow drains can drain it. This is not a sustainable operation and one incident of major spillage has already occurred. Also, when fully loaded, the unit pulls away from the adjacent materials/surfaces, in spite of being heavily reinforced. Some of these weaknesses may be common in the industry or may be unique to this make and model. A contract Modification is under way to change the controlling portion of the system. **Additional research and adding additional appropriate verbiage to the ASD text could improve the problem for most facilities.**

2.13. The same privacy drapery was selected for use in the changing stalls in the Baptistery Suite as was selected to separate the baptismal pool from the Worship Center when not in use. While it is perfectly appropriate for the latter use, it is not as appropriate for the former and this was aggravated by using too lightweight a drapery hardware. Ideally, the changing stalls drapery needs to be light and water resistant. The drapery selected for this facility is neither and has already overwhelmed the supporting hardware. While new enough that repeated wettings have not caused noticeable damage (and many full-immersion baptisms are taking place), it is certain to occur in the future. **While additional directive language will be considered for the ASDs, this was a common sense error and should not have occurred or ever be expected to occur.**

2.14. The drapery used to separate the baptismal pool from the Worship Center and the Activity Center from the Activity Center raised platform is perfectly appropriate and works well from the Worship Center/Activity Center side. The CoS team noted that requiring a lined drapery would have made the appearance better from the opposite side. **Additional directive language will be added to the ASD/s .**

2.15. No permanent (or even portable) changing room seating (the ASD requires a fixed bench) was supplied for this facility. **It is assumed that this was inadvertently overlooked and would not be expected to occur on other facilities.**

(Audio/Visual System Issues)

2.16. The performance of the completed A/V system has been excellent and the customer representatives are very happy with it. **This is encouraging, the process of procuring and coordinating these systems is very difficult, but a successful system supports successful ministry in countless ways.**

(The Kitchen Suite)

2.17. This project kitchen exactly matched the ASD defined kitchen (both the MCA and OMA portions). The appearance and the performance of the completed kitchen is and has been excellent and the customer representatives are very happy with it. **This is encouraging, the process of procuring and coordinating the MCA and OMA portions is very difficult, but a successful system supports successful ministry in countless ways.**

2.18. The pass-through counter between the Kitchen and the Activity Center has been detailed just as intended, so that the surface is continuous from one side to the other; this has not occurred in all of the recent facilities. **This was encouraging to see and will also support successful ministry in countless ways.**

(The Blessed Sacrament Space)

(The Sacristy and Robing Suite)

(Multi-purpose/Classroom Spaces)

2.19. The automatic light operation provided by DoD requirements has been cited by a Jewish congregation considering relocating into this facility as a conflict to their religious requirements. Since we know that a Jewish congregation is meeting happily in the Fort Hood Chapel Complex, this may be a finer point of doctrine not common to all Jewish faith branches. **None of the criteria cited has been provided to the CoS previous to this. The CoS will consult again with OCCB and modify (or retain) the ASD requirements at their direction.**

2.20. The operating period has demonstrated (just like past projects) that this facility type needs more and larger classrooms. **This was understood by all parties developing the ASD. However, the need to target a size and cost of facility that would compete better in the regular military appropriation for Army resources, led to the eyes-wide-open (deliberate) compromise to include fewer and smaller classrooms than the known need. Older ASDs tried to hope for a separate project for classrooms; as these almost never materialized, the 2004 ASD was deliberately supplied with some classrooms to try to keep from falling further behind Army-wide. The classrooms in the 2004 ASD are getting intense use.**

2.21. Providing operable partitions between classrooms provides extra flexibility that, in the case of this facility, allowed the facility to overcome an unexpected and crippling decision by the local authority having jurisdiction. Having enclosures for the partitions protects them best, and provides a neater appearance. Unfortunately it also functions as an obstruction in the rooms. **The CoS team has experimented with a multitude of techniques for a “good” (if not perfect) solution and will continue to do so in hopes of finding an appropriate middle ground between the ideal exterior-of-the-building-wall enclosure “fin” and no enclosure or an obstructing enclosure.**

(The Toddler Nursery Accommodations)

2.22. The local Life Safety authority has insisted that special CDC criteria (two separate exits from any single space) be applied to such spaces. That requires the congregations to use two spaces that could be made in to one only when beneficial, as a single space only. This has not proven to be a major hurdle to ministry but is a restriction that occasionally makes things difficult. **These differences of opinion come up from time to time and it is not always possible to foresee them. The CoS will consult with the OCCH for direction.**

2.23. Table T-2 (children's sized table) was shown on the Designer provided furniture plans, but an actual order form was not included in the Designer provided FF&E package and no T-2 tables ended up being provided. **It is assumed that this was inadvertently overlooked and would not be expected to occur on other facilities.**

(Vestibules/Lobbies/Corridors/Stairways)

(Storage Spaces)

2.24. The Fort Leonard Wood staff felt that their climate doesn't require a coat storage room very often. **Any Army Standard Design needs to meet the needs across many environments. Too much information gets lost when facilities are "tailored" to local conditions. In consequence, the coatrooms are provided in all facilities and all end up being used well, even if not for coats.**

(Toilet Rooms and Janitor's Closets)

(Building Features and Finishes)

2.25. While ASDs normally try to avoid hardware details, this facility would have benefited by an automatic opening feature at the primary doors such as is usually provided on other Garrison facilities. **While the Garrison provided requirements for RFP's may have been or get changed too, it would also be an easy change to include in the ASD and will be incorporated.**

2.26. The steeple for this facility is a standard pre-manufactured product for this purpose. The particular make and model provided includes some integral louvers that have not proved to be sufficiently resistant to wind-driven moisture and this has led to some problems and extra maintenance. **The CoS is going to experiment with additional text requirements to see if this problem can be eliminated on future projects, since there is no legal way to limit the sources of this product beyond a certain degree.**

2.27. Some of the light fixtures in the facility make use of a lamp that needs to be "broken in" in a particular way to gain optimum lamp life. This was overlooked during construction and lamps were failing almost before the facility was occupied. Those original lamps continue to fail. **The procedure is not so rare that being overlooked should be a recurring problem.**

(Furniture, Appliances, and Equipment Items)

2.28. See items 2.7., 2.10., 2.11., and 2.20.

2.29. At the time this ASD was developed, the expectation was that flat-screen televisions would be purchased (OMA funds) for a few locations in the facility with a portable television or other A/V unit moved around and used in other spaces. The use patterns for technology have changed quickly and recent facilities (such as this one) have gone to the use of televisions in many many spaces. Where coordinated well, this, in and of itself, is not a problem. However, the impact on the energy modeling and heat source aspects of the facility have not been really been “folded into” the appropriate design modeling and this is probably making those studies and the resulting designs of building systems slightly inaccurate which is deleterious to the overall Army goals for energy, etc. **Current ASDs are assuming this (newer) usage of technology, although one imagines that by the time facilities are constructed according to these newer ASDs, some not-yet-imagined use of technology will have a similar effect.**

(Equipment Rooms and Systems)

2.30. The building equipment spaces for this facility appear to be excellent for size and arrangement. General project history demonstrates that this is very difficult to accomplish with all of the mutually exclusive variables forced onto ASDs. **The history of Equipment spaces and this ASD is too complex to repeat here, but the CoS was encouraged by the results of many difficult decisions that led to this good result.**

2.31. The work space for the baptismal pool is not lighted and this makes maintenance difficult. **The space should have been lighted, but this was overlooked during design.**

(Site Issues)

PART THREE, UNIQUE ISSUES

No issues surfaced that are not already recorded elsewhere in this report.

Not Used.

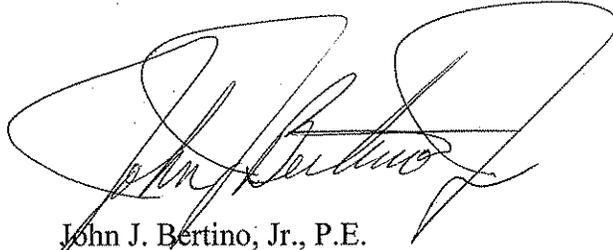
PART FOUR, THE REVIEW PROCESS AND PARTICIPANTS

The following team of participants gathered at the Chapel Complex on March 21, 2012. The review process began with a meeting and discussions of lessons learned related issues, 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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Any questions or concerns the aforementioned items may be directed to Mr. Askelon Parker, (402) 995-2173.

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