



**US Army Corps
of Engineers**®
Savannah District

DEPARTMENT OF THE ARMY
FACILITIES STANDARDIZATION PROGRAM

**BRIGADE AND BATTALION
HEADQUARTERS
LEGACY FACILITIES
RENOVATION STUDY**

JULY 16, 2014



**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

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EXECUTIVE SUMMARY

Statement of Purpose

Intent: The intent of this report is to provide information regarding the renovation of Legacy BDE and BN HQ Facilities. The information and notional floor plans included are intended to:

- Bring these Legacy Facilities as close as possible to the current standard design;
- Provide a standardized approach to renovating each type of legacy facility;
- Achieve a longer useful life for the legacy BDE and BN HQ facilities;
- The order of preference for accomplishing necessary adjustments in legacy facilities to satisfy current mission requirements is:
 1. No construction required,
 2. Construction required but within SRM funding limits,
 3. Primarily SRM funded but with a MILCON tail, and,
 4. MILCON funded project.
- In evaluating renovation of any legacy facility, the cost of renovation in comparison to new construction cost must always be considered. If the renovation cost exceeds 75% of new construction cost, new construction should be pursued.
- Several studies within this report show the functions of a BDE or BN HQ divided between 2-3 buildings. It is a goal of this study that these examples be adaptable to similarly sized facilities that are available at other installations.

How this study was conducted: This study was developed under the leadership of the U.S. Army Corps of Engineers, Savannah District Center of Standardization. The following steps were taken in conducting and completing this study:

- Determine prototypical types of legacy BDE and BN HQs that are suitable for renovation;
- Develop a prioritized list of functional/operational requirements predicated on those requirements documented in the BDE and BN HQs Standard Design; i.e. a Decision Tier, listing functional spaces renovated facilities are to include. Identify Tier 1 functions as the minimum functional/operational requirements a renovated facility must satisfy in order for users to be able to meet mission requirements. Then include, in order of preference, all remaining requirements as documented in the Standard Design and indicate their priority/consequence for incorporation via the renovation process;
- Develop floor plan solutions for each type of legacy BDE and BN HQ selected for review.

Selection of Legacy BDE and BN HQs for Study

The facility types shown in this study were selected based on site visits at Ft. Bragg and Ft. Campbell. After visiting and reviewing nine (9) legacy BDE and BN HQ types at Ft. Bragg, NC and twelve (12) legacy BDE and BN HQ types at Ft. Campbell, KY, the BDE and BN HQs chosen for review were based on:

- Discussions with Master Planners and FORSCOM regarding which legacy BDE and BN HQs they felt were most appropriate for review and evaluation;
- Study of which legacy BDE and BN HQs were most prevalent throughout CONUS. While other Installations may not have legacy facilities identical to those shown in this report, it is the goal that the information included herein be adaptable to similar facilities at other Installations.
- Legacy facilities that could not meet the tier 1 requirements were not chosen for this study.

Decision Tiers

The Decision Tier was developed by reviewing the mandatory features for BDE and BN HQs as documented in the Army Standard and Standard Design, and coordinating those requirements with FORSCOM, USACE CoS, HQ USACE Combat Readiness Support Team (CRST) and military users and DPW staffs at Ft. Bragg, NC and Ft. Campbell, KY. This led to the following prioritized list of spaces/functions for legacy BDE HQ and BN HQ renovation:

Brigade Headquarters

Tier 1 Spaces/Functions (Mandatory):

- BOC and NOC
- SCIF (when authorized)
- S1, S2, S3, S4, S6 Staff Sections with associated private offices, open offices, storage and file spaces
- S-3 Conference Room
- Command Section
- Command Conference Room
- Reenlistment Office

Tier 2 Spaces/Functions (Highly Desirable if physical limitations and funding permit):

- Chaplain
- Assistant Chaplain
- FRSA
- All remaining Conference Rooms
- Vending Area
- Showers

Tier 3 Spaces/Functions (Desirable if practicable):

- Team Rooms
- Break Room (to replace Vending Area)
- Recycle Room

Battalion Headquarters

Tier 1 Spaces/Functions (Mandatory):

- S1, S2, S3, S4, S6 Staff Sections with associated private offices, open offices, storage and file spaces
- S-3 Conference Room
- Command Section
- Command Conference Room
- Reenlistment Office

Tier 2 Spaces/Functions (Highly Desirable if physical limitations and funding permit):

- 1 Classroom with storage
- Chaplain
- Assistant Chaplain

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- FRSA
- Vending Area
- Showers

Tier 3 Spaces/Functions (Desirable if practicable):

- 2 additional Classrooms
- Break Room (to replace Vending Area)
- Recycle Room

General Notes

The following are general notes about the content of this report:

- Site design was not a factor included in this study. Adjustments in POV parking should be considered on a case by case basis in adapting this study to individual legacy facilities.
- In Studies 1A, 3B and 4A, the SCIF is shown with shared walls between other functions and security zones. The Special Security Officer (SSO) must have unobstructed physical access and visual/physical control of all SCIF perimeter walls (inside and outside) to prevent any change/damage or manipulation. SCIF walls are built to meet a strict level of accreditation (sound transmission code (STC) and physical security standards) which must be preserved. This should be addressed on a case by case basis for each renovation.
- The process of transforming the Army to a brigade centric force resulted in major changes to Brigade Headquarters requirements. Battalion Headquarters requirements were relatively untouched by the transformation, which means that legacy battalion headquarters are still suited for their needs. For that reason this study places greater emphasis on finding potential solutions for accommodating current Brigade Headquarters operations and functions.
- Brigades with an organic Military Intelligence (MI) data processing mission will be authorized a SCIF by their Army major command (ACOM). All Brigade HQ will be authorized a Brigade Operations Center (BOC) and a Network Operations Center (NOC). For the legacy facilities included in this study with sufficient space to accommodate a SCIF, BOC, and NOC, all three of those elements have been depicted to show their potential accommodation when so authorized. Some legacy facilities have insufficient space to accommodate all three elements. In those cases, only a BOC and NOC have been included. Since the majority of the brigades that require a SCIF are Brigade Combat Teams (BCT) or Battlefield Surveillance Brigades (BfSB), which also require a larger sized facility to accommodate the staff sections, it will be incumbent on the local master planner/real property office to adjust their facility assets accordingly in order to accommodate the mix of legacy and modular brigades present on their installation.

Organization of Report

The information included in this study is listed in the Table of Contents, and is explained as follows:

This report is divided into sections, each relating to specific legacy BDE and BN HQs, and an Appendix. The following information is included within each BDE and BN HQ section:

- Overall facility information including: Installation, building number, characteristics, year built;
- Images and description of the existing buildings;

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- Renovation Description;
- Decision Tier Matrix: This chart shows the criteria within the 3 tiers and identifies which criteria are achieved by the renovation;
- Area Comparison Chart: This chart shows the required area for each function, based on the Standard Design. The space requirements for a Small sized BDE HQ are used as the basis for the space requirement. The chart also shows the space provided for each function in the notional renovation design;
- Existing Floor Plan;
- Renovation Notional Floor Plans: Overall plans color-coded to show the three security zones; enlarged plans with square footage shown for each space;

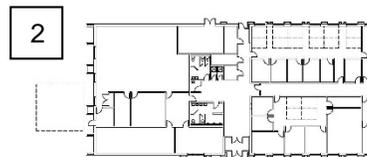
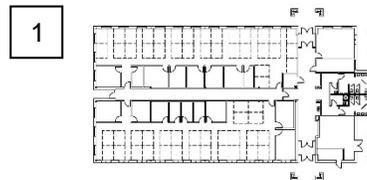
Appendices: Meeting and site visit notes and cost estimate for Ft. Drum addition.

Description of Bde/Bn Studies

The following studies are included within this report:

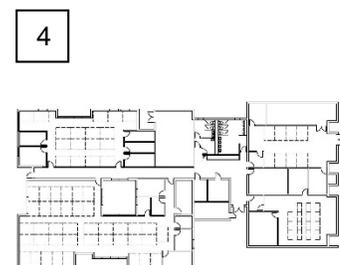
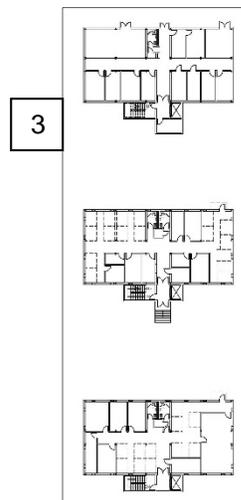
Study 1 includes buildings 24528, 24227 and 24827 at Ft. Bragg, NC. Building 24528 is shown in image 1 at right. Building 24227 is shown in image 2. Building 24827 is identical in footprint to 24227.

- Study 1A uses buildings 24528 and 24227 to provide the functions similar to the Small Bde HQ Standard Design with a BOC, and NOC.
- Study 1B uses buildings 24528, 24227, and 24827 to provide the functions similar to the Small Bde HQ Standard Design with a SCIF, BOC, and NOC.



Study 2 includes buildings H5834 and H5927 at Ft. Bragg, NC. Building H5834 is a 3-story building shown in image 3 at right. Building H5927 is shown in image 4.

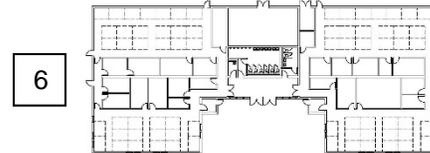
- Study 2 provides the functions similar to the Small Bde HQ Standard Design with a BOC, and NOC.



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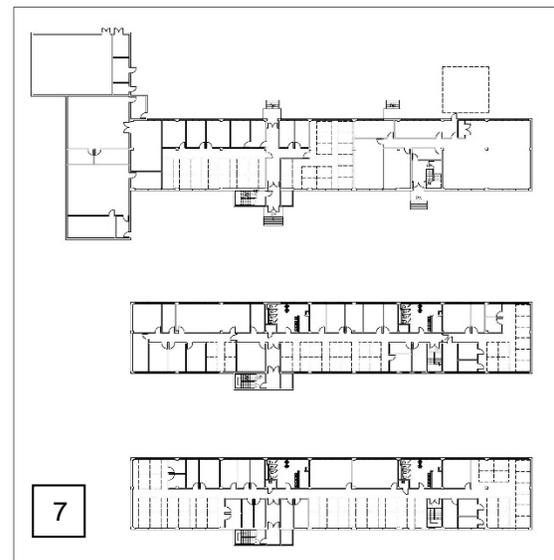
Study 3 includes buildings 3780 and 3763 at Ft. Campbell, KY. Building 3780 is shown in image 5 at right. Building 3763 is shown in image 6.

- Study 3A uses buildings 3780 and 3763 to provide the functions similar to the Small Bde HQ Standard Design with a BOC and NOC.
- Study 3B uses buildings 3780, 3763 and a third building identical to 3763 to provide the functions similar to the Small Bde HQ Standard Design with a SCIF, BOC, and NOC.



Study 4 is based on the hammerhead barracks standard design. The images shown in image 7 are the first, second and third floor plans.

- Study 4A provides one Brigade HQ similar to the Small Brigade HQ Standard Design, including a SCIF, BOC and NOC.
- Study 4B provides two (2) Battalion HQ similar to the Large Battalion Standard Design.
- Study 4C provides one 175 PN COF and one Extra-Large Battalion HQ.



Study 5 is based on a Battalion HQ standard design prevalent at Ft. Drum, NY.



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The following chart illustrates the number of staff accommodated in each design scheme and how those numbers compare to the range allowed for in the corresponding standard design.

STAFF ACCOMMODATED				
	STUDY	DESCRIPTION	STAFF IN STANDARD DESIGN	STAFF IN DESIGN SCHEME
BDE	1A	SMALL BDE HQ WITH BOC AND NOC ¹	57-123	100
	1B	SMALL BDE HQ WITH SCIF, BOC AND NOC ²	107-173	182
	2	SMALL BDE HQ WITH BOC AND NOC ¹	57-123	109
	3A	SMALL BDE HQ WITH BOC AND NOC ¹	57-123	111
	3B	SMALL BDE HQ WITH SCIF, BOC AND NOC ²	107-173	209
	4A	SMALL BDE HQ WITH SCIF, BOC AND NOC ²	107-173	180
BN	4B - ALPHA	LARGE BN HQ	51-70	66
	4B - BRAVO	LARGE BN HQ	51-70	65
	4C	EXTRA LARGE BN HQ	71-85	82

Note 1: The Brigade Operations Center (BOC) and Network Operations Center (NOC) should have no windows. Therefore, every effort should be made to minimize or eliminate windows. If windows cannot be eliminated, see provisions of AR 380-5.

Note 2: SCIF spaces should not have windows and every effort should be made to minimize or eliminate the windows. If windows cannot be eliminated, see provisions of ICD 705 (current version) for window construction security requirements.

References for construction of SCIFs:

- UFC 4-010-05, SCIF Planning, Design, and Construction
- ICD 705 (current version), Technical specifications for Construction and Management of SCIFs

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STUDY 1

Study 1 includes buildings 24528, 24227 and 24827 at Ft. Bragg, NC:

525th MI BDE (Building 24528)



This Brigade HQ facility was built in 1997 by the Savannah District and is approximately 10,000 square feet in size. This facility functions with two additional annexes. The main building contains S1, S3, the Command Suite, conference room and the Chaplain's office. One annex contains the SCIF and S2. The S4 is located above the motor pool, and the S6 is also at the motor pool on the opposite side of the maintenance bays.

525th MI BNs (Buildings 24227 and 24827)



These two buildings, with identical floor plans, are based on a standard design and are located on either side of building 24528. They are each approximately 9,000 square feet in size and were built in the late 1990s.

This configuration of the BDE with two adjacent BNs was thought to be prevalent throughout CONUS, making a study of these buildings used in conjunction to become one Brigade HQ useful.

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Aerial view showing the proximity and layout of buildings 24528, 24227 and 24827. Legacy BDE HQ facilities are indicated by gold text; Legacy BN HQ's with white text.

Description of Renovation

Study 1A uses buildings 24528 and 24227 to provide the functions similar to the Small Brigade HQ Standard Design, including the BOC and NOC.

Study 1B uses buildings 24528, 24227 and 24827 to provide the functions similar to the Small Brigade HQ, including the SCIF, BOC, and NOC.

Tier Matrix

The matrix below illustrates the tier criteria achieved by the renovation design schemes.

- **Tier 1** Criteria represent mandatory requirements that a renovated Legacy Facility must include.
- **Tier 2** Criteria represent highly desirable requirements that should be provided in a renovated Legacy Facility if physical limitations and funding permit.
- **Tier 3** Criteria represent desirable features to be provided if practicable.

Note: If a criteria item includes an 'X' and a yellow tone, this indicates that the item is included in the renovation design.

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TIER MATRIX, BRIGADE HEADQUARTERS - STUDY 1A			
FUNCTIONAL SPACE			NOTES
TIER 1	BOC AND NOC	X	
	SCIF (WHEN AUTHORIZED)		
	S1/S4 STAFF SECTIONS	X	MISSING 3 WORKSTATIONS
	S2/S3/S6 STAFF SECTIONS	X	MISSING 40 WORKSTATIONS
	S-3 CONFERENCE ROOM		
	COMMAND SECTION	X	MISSING DEPUTY OFFICE
	COMMAND CONFERENCE ROOM	X	
	REENLISTMENT OFFICE	X	
TIER 2	CHAPLAIN	X	
	ASSISTANT CHAPLAIN	X	
	FRSA	X	
	ALL REMAINING CONFERENCE ROOMS		
	VENDING AREA	X	EXISTING VENDING AREA
	SHOWERS	X	3 EXISTING SHOWERS
TIER 3	TEAM ROOMS		
	BREAK ROOM (TO REPLACE VENDING AREA)		
	RECYCLE		

TIER MATRIX, BRIGADE HEADQUARTERS - STUDY 1B			
FUNCTIONAL SPACE			NOTES
TIER 1	BOC AND NOC	X	
	SCIF (WHEN AUTHORIZED)	X	
	S1/S4 STAFF SECTIONS	X	
	S2/S3/S6 STAFF SECTIONS	X	MISSING 12 WORKSTATIONS
	S-3 CONFERENCE ROOM	X	
	COMMAND SECTION	X	
	COMMAND CONFERENCE ROOM	X	
	REENLISTMENT OFFICE	X	
TIER 2	CHAPLAIN	X	
	ASSISTANT CHAPLAIN	X	
	FRSA	X	
	ALL REMAINING CONFERENCE ROOMS	X	
	VENDING AREA	X	EXISTING VENDING AREA
	SHOWERS	X	5 EXISTING SHOWERS
TIER 3	TEAM ROOMS	X	2 TEAM ROOMS PROVIDED
	BREAK ROOM (TO REPLACE VENDING AREA)		
	RECYCLE		

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- Restrooms and showers have not been modified from the existing buildings. The restrooms could be redesigned to be more efficient and to include additional showers.

Area Comparison

The following matrix identifies the size of each function in the Small standard design and illustrates how the renovation design scheme compares.

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AREA COMPARISON- SMALL BDE HQ STANDARD DESIGN vs. SCHEME 1A				
	SPACE DESIGNATION	SF STANDARD DESIGN (SF REQUIRED)	SF PROPOSED DESIGN (SF PROVIDED)	% OF STANDARD DESIGN SF ACHIEVED
COMMAND SUITE	CMD CONFERENCE	600	440	73.33%
	CMD TOILET	80	88	110.00%
	COMMANDER	200	201	100.50%
	CSM	150	153	102.00%
	DEPUTY	150	0	0.00%
	DUTY	110	115	104.55%
	EXEC OFCR	150	153	102.00%
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	4 192	4 192	100.00%
	STORAGE	130	101	77.69%
	TOTAL COMMAND SUITE AREA		1762	1443
SUPPORT STAFF	CHAPLAIN	150	150	100.00%
	CHAPLAIN ASST	110	110	100.00%
	FRSA	110	109	99.09%
	REENLIST	110	110	100.00%
	TOTAL PERSONNEL AREA		480	479
	S-1	150	145	96.67%
	S-4	150	151	100.67%
	SR HR SGT	110	110	100.00%
	S-1 CNTRL FILES	135	115	85.19%
	S-1 STOR	60	48	80.00%
	S-4 CNTRL FILES	100	100	100.00%
	S-4 STOR	60	48	80.00%
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	15 720	12 576	80.00%
	TOTAL S-1 / S-4 AREA		1485	1293
S-2 / S-3 / S-6	CMD JUDGE ADV	150	150	100.00%
	OP LAW J.A.	110	110	100.00%
	OPNS OFFICE	110	110	100.00%
	S-2	150	166	110.67%
	S-3	150	150	100.00%
	S-6	150	143	95.33%
	SURGEON	150	150	100.00%
	FSE STOR	100	100	100.00%
	LNO STOR	65	65	100.00%
	OPNS STOR	65	65	100.00%
	OPNS STOR	110	110	100.00%
	S-2 SECURE DOC	100	133	133.00%
	S-2 STOR	65	65	100.00%
	S-2/S-6 STOR	65	65	100.00%
	S-3 CENTRAL FILES	100	100	100.00%
	S-3 STOR	100	100	100.00%
	SURGN STOR	65	65	100.00%
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	100 4800	60 2880	60.00%
TOTAL S-2 / S-3 / S-6 AREA		6605	4727	71.57%
TEAM ROOMS	TEAM ROOM	150	0	0.00%
	TEAM ROOM	150	0	0.00%
	TEAM ROOM	150	0	0.00%
	TEAM ROOM	150	0	0.00%
	TOTAL TEAM ROOM AREA		600	0

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CONF ROOMS	OPNS CONFERENCE	350	0	0.00%
	S-1/S-4 CONFERENCE RM	210	0	0.00%
	S-3 SONFERENCE RM	300	324	108.00%
	TOTAL CONFERENCE ROOM AREA	860	324	37.67%
UTILITY	MECHANICAL - BUILDING 1	830	377	45.42%
	MECHANICAL - BUILDING 2	1138	335	29.44%
	ELECTRICAL - BUILDING 1	131	90	68.70%
	ELECTRICAL - BUILDING 2		79	
	TELECOMM - BUILDING 1	143	88	61.54%
	TELECOMM - BUILDING 2		118	
	SIPRNET - BUILDING 1	47	49	104.26%
	SIPRNET - BUILDING 2		53	
	TOTAL UTILITY AREA	2289	1189	51.94%
MISC	BREAK	335	0	
	RECYCLE	65	0	
	TOTAL MISC AREA	400	0	0.00%
BOC	BOC CONFERENCE	310	320	103.23%
	BRIGADE OPS CENTER (BOC)	930	983	105.70%
	SERVER RM	160	160	100.00%
	VEST	70	72	102.86%
NOC	ISM OFFICE	115	115	100.00%
	NETWORK OPS CENTER (NOC)	990	1140	115.15%
	SERVER RM	455	455	100.00%
	TEAM ROOM	150	150	100.00%
	VEST	70	72	102.86%
	TOTAL BOC AND NOC AREA	3250	3467	106.68%
PERSONNEL ACCOMODATED				
	SMALL BRIGADE STANDARD DESIGN WITHOUT BOC, NOC, & SCIF	48-114	SCHEME 1A	91
	NOC STANDARD DESIGN	9	SCHEME 1A NOC	9
	TOTAL	57-123		100

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AREA COMPARISON- SMALL BDE HQ STANDARD DESIGN vs. SCHEME 1B						
	SPACE DESIGNATION	SF STANDARD DESIGN (SF REQUIRED)	SF PROPOSED DESIGN (SF PROVIDED)	% OF STANDARD DESIGN SF ACHIEVED		
COMMAND SUITE	CMD CONFERENCE	600	532	88.67%		
	CMD TOILET	80	80	100.00%		
	COMMANDER	200	200	100.00%		
	CSM	150	150	100.00%		
	DEPUTY	150	150	100.00%		
	DUTY	110	111	100.91%		
	EXEC OFCR	150	150	100.00%		
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	4	192	4	192	100.00%
	STORAGE	130	80	61.54%		
TOTAL COMMAND SUITE AREA		1762	1645	93.36%		
SUPPORT STAFF	CHAPLAIN	150	150	100.00%		
	CHAPLAIN ASST	110	110	100.00%		
	FRSA	110	110	100.00%		
	REENLIST	110	108	98.18%		
	TOTAL PERSONNEL AREA		480	478	99.58%	
	S-1	150	167	111.33%		
	S-4	150	167	111.33%		
	SR HR SGT	110	110	100.00%		
	S-1 CNTRL FILES	135	135	100.00%		
	S-1 STOR	60	60	100.00%		
	S-4 CNTRL FILES	100	100	100.00%		
	S-4 STOR	60	60	100.00%		
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	15	720	15	720	100.00%
	TOTAL S-1 / S-4 AREA		1485	1519	102.29%	
S-2 / S-3 / S-6	CMD JUDGE ADV	150	150	100.00%		
	OP LAW J.A.	110	110	100.00%		
	OPNS OFFICE	110	110	100.00%		
	S-2	150	166	110.67%		
	S-3	150	150	100.00%		
	S-6	150	150	100.00%		
	SURGEON	150	150	100.00%		
	FSE STOR	100	105	105.00%		
	LNO STOR	65	66	101.54%		
	OPNS STOR	65	65	100.00%		
	OPNS STOR	110	110	100.00%		
	S-2 SECURE DOC	100	133	133.00%		
	S-2 STOR	65	69	106.15%		
	S-2/S-6 STOR	65	69	106.15%		
	S-3 CENTRAL FILES	100	107	107.00%		
	S-3 STOR	100	100	100.00%		
	SURGN STOR	65	88	135.38%		
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	100	4800	88	4224	88.00%
TOTAL S-2 / S-3 / S-6 AREA		6605	6122	92.69%		
TEAM ROOMS	TEAM ROOM	150	108	72.00%		
	TEAM ROOM	150	150	100.00%		
	TEAM ROOM	150	0	0.00%		
	TEAM ROOM	150	0	0.00%		
	TOTAL TEAM ROOM AREA		600	258	43.00%	

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CONF ROOMS	OPNS CONFERENCE	350	350	100.00%
	S-1/S-4 CONFERENCE RM	210	212	100.95%
	S-3 SONFERENCE RM	300	300	100.00%
	TOTAL CONFERENCE ROOM AREA	860	862	100.23%
UTILITY	MECHANICAL - BUILDING 1	830	377	45.42%
	MECHANICAL - BUILDING 2	1138	350	30.76%
	MECHANICAL - BUILDING 3		349	
	ELECTRICAL - BUILDING 1	131	90	68.70%
	ELECTRICAL - BUILDING 2		136	
	ELECTRICAL - BUILDING 3		127	
	TELECOMM - BUILDING 1	143	88	61.54%
	TELECOMM - BUILDING 2	118	135	
	TELECOMM - BUILDING 3		135	
	SIPRNET - BUILDING 1	47	49	104.26%
	SIPRNET - BUILDING 2		67	
	SIPRNET - BUILDING 3		65	
TOTAL UTILITY AREA	2407	1968	81.76%	
MISC	BREAK	335	0	
	RECYCLE	64	0	
	TOTAL MISC AREA	399	0	0.00%
BOC	BOC CONFERENCE	310	310	100.00%
	BRIGADE OPS CENTER (BOC)	930	950	102.15%
	SERVER RM	160	160	100.00%
	VEST	70	70	100.00%
NOC	ISM OFFICE	115	115	100.00%
	NETWORK OPS CENTER (NOC)	990	1151	116.26%
	SERVER RM	455	455	100.00%
	TEAM ROOM	150	150	100.00%
	VEST	70	70	100.00%
SCIF	GEOINT	245	245	100.00%
	SCIF CONFERENCE	355	355	100.00%
	SCIF OPEN OFFICE	1865	1842	98.77%
	SERVER RM	200	200	100.00%
	SIGINT	400	400	100.00%
	STOR	20	20	100.00%
	VEST	65	65	100.00%
	VEST	70	75	107.14%
TOTAL SCIF, BOC, NOC AREA	6470	6633	102.52%	

PERSONNEL ACCOMODATED			
SMALL BRIGADE STANDARD DESIGN WITHOUT BOC, NOC, & SCIF	48-114	SCHEME 1B	123
SCIF STANDARD DESIGN	50	SCHEME 1B SCIF	50
NOC STANDARD DESIGN	9	SCHEME 1B NOC	9
TOTAL	107-173		182

STUDY 2

Study 2 includes buildings H5834 and H5927 at Ft. Bragg, NC:

20th ENG BDE (Building H5834)



H5834 is approximately 9,300 SF, with 3,100 SF on the basement, 1st and 2nd floor levels. This facility was originally built to function as a BDE HQ. Currently only approximately 30% of authorized space for the 20th ENG BDE is provided in this facility. In the legacy configuration, this BDE HQ is split out over 5 different buildings; they use some of their assigned BN HQ and COF space to accommodate BDE HQ functions.

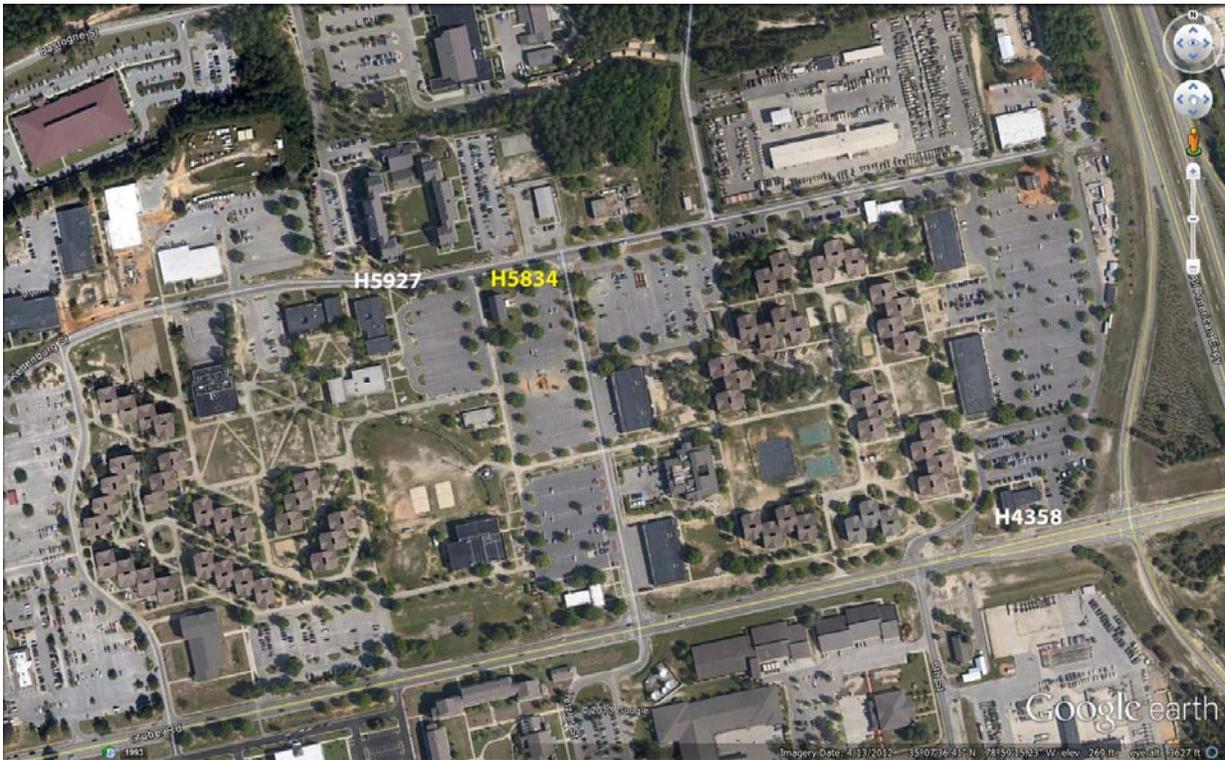
20th ENG BDE Annex (Building H5927)



Building H5927 is a +/- 6,000 SF BN HQ based on a standard developed in the 1980's, and is prevalent throughout CONUS.

This facility contains the overflow functions for the 20th ENG BDE and the 30th BN. One portion of the building has a higher roofline and contains a large room with 14' ceiling height. This room can be used as one large classroom/meeting room or divided by movable partition.

BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY



Aerial view showing proximity of building H5834 and H5927. The two buildings are approximately 320' apart and are separated by a parking lot.



Command Conference room currently in building H5834. This has been reconfigured in the proposed renovations to be more in line with sizing requirements of the standard design and to accommodate additional workspaces on this floor.



The large classroom space in building H5927. In the proposed design, this space is used for the BOC, NOC and S-3 Conference Room.

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

Description of Renovation

Study 2 provides the functions similar to the small Brigade standard design and includes a BOC, and NOC. The design scheme uses H5834 and H5927 to house all functions for a Brigade Headquarters. This would consolidate their current setup, which has the functions spread throughout 5 separate buildings.

Tier Matrix

The matrix below illustrates the tier criteria achieved by the renovation design scheme.

- **Tier 1** Criteria represent mandatory requirements that a renovated Legacy Facility must include.
- **Tier 2** Criteria represent highly desirable requirements that should be provided in a renovated Legacy Facility if physical limitations and funding permit.
- **Tier 3** Criteria represent desirable features to be provided if practicable.

TIER MATRIX, BRIGADE HEADQUARTERS - STUDY 2			
FUNCTIONAL SPACE			NOTES
TIER 1	BOC AND NOC	X	
	SCIF (WHEN AUTHORIZED)		
	S1/S4 STAFF SECTIONS	X	2 ADDITIONAL WORKSTATIONS
	S2/S3/S6 STAFF SECTIONS	X	MISSING 39 WORKSTATIONS
	S-3 CONFERENCE ROOM	X	
	COMMAND SECTION	X	2 ADDITIONAL WORKSTATIONS
	COMMAND CONFERENCE ROOM	X	
	REENLISTMENT OFFICE	X	
TIER 2	CHAPLAIN	X	
	ASSISTANT CHAPLAIN	X	
	FRSA	X	
	ALL REMAINING CONFERENCE ROOMS		
	VENDING AREA		
	SHOWERS		
TIER 3	TEAM ROOMS		
	BREAK ROOM (TO REPLACE VENDING AREA)		
	RECYCLE		

- Restrooms have not been modified from the existing buildings. The restrooms could be redesigned to be more efficient and to include showers.
- A vending area could be designed into the reworked restroom areas.

Area Comparison

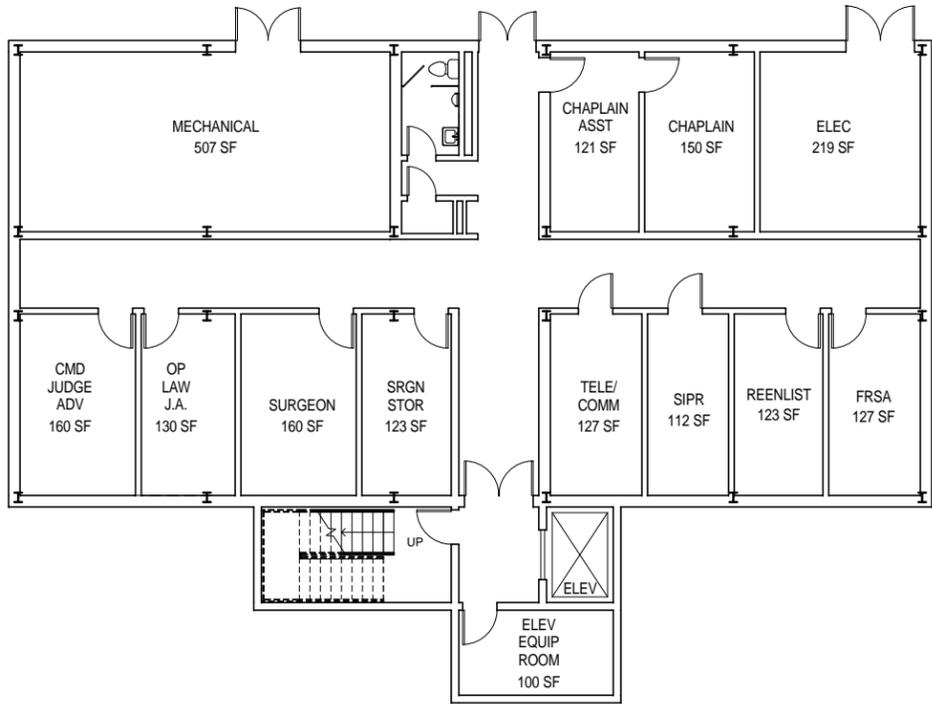
The following matrix identifies the size of each function in the Small Brigade Headquarters Standard Design and illustrates how the renovation design scheme compares.

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

AREA COMPARISON- SMALL BDE HQ STANDARD DESIGN vs. SCHEME 2						
	SPACE DESIGNATION	SF STANDARD DESIGN (SF REQUIRED)	SF PROPOSED DESIGN (SF PROVIDED)	% OF STANDARD DESIGN SF ACHIEVED		
COMMAND SUITE	CMD CONFERENCE	600	527	87.83%		
	CMD TOILET	80	80	100.00%		
	COMMANDER	200	200	100.00%		
	CSM	150	149	99.33%		
	DEPUTY	150	150	100.00%		
	DUTY	110	110	100.00%		
	EXEC OFCR	150	150	100.00%		
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	4	192	6	288	150.00%
	STORAGE	130	135	103.85%		
TOTAL COMMAND SUITE AREA		1762	1789	101.53%		
SUPPORT STAFF	CHAPLAIN	150	150	100.00%		
	CHAPLAIN ASST	110	121	110.00%		
	FRSA	110	127	115.45%		
	REENLIST	110	123	111.82%		
	TOTAL PERSONNEL AREA		480	521	108.54%	
	S-1	150	148	98.67%		
	S-4	150	156	104.00%		
	SR HR SGT	110	103	93.64%		
	S-1 CNTRL FILES	135	135	100.00%		
	S-1 STOR	60	60	100.00%		
	S-4 CNTRL FILES	100	100	100.00%		
	S-4 STOR	60	73	121.67%		
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	15	720	17	816	113.33%
	TOTAL S-1 / S-4 AREA		1485	1591	107.14%	
S-2 / S-3 / S-6	CMD JUDGE ADV	150	160	106.67%		
	OP LAW J.A.	110	130	118.18%		
	OPNS OFFICE	110	119	108.18%		
	S-2	150	140	93.33%		
	S-3	150	154	102.67%		
	S-6	150	141	94.00%		
	SURGEON	150	160	106.67%		
	FSE STOR	100	95	95.00%		
	LNO STOR	65	72	110.77%		
	OPNS STOR	65	72	110.77%		
	OPNS STOR	110	119	108.18%		
	S-2 SECURE DOC	100	100	100.00%		
	S-2 STOR	65	68	104.62%		
	S-2/S-6 STOR	65	72	110.77%		
	S-3 CENTRAL FILES	100	112	112.00%		
	S-3 STOR	100	95	95.00%		
	SURGN STOR	65	123	189.23%		
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	100	4800	61	2928	61.00%
	TOTAL S-2 / S-3 / S-6 AREA		6605	4860	73.58%	
TEAM ROOMS	TEAM ROOM	150	0	0.00%		
	TEAM ROOM	150	0	0.00%		
	TEAM ROOM	150	0	0.00%		
	TEAM ROOM	150	0	0.00%		
	TOTAL TEAM ROOM AREA		600	0	0.00%	

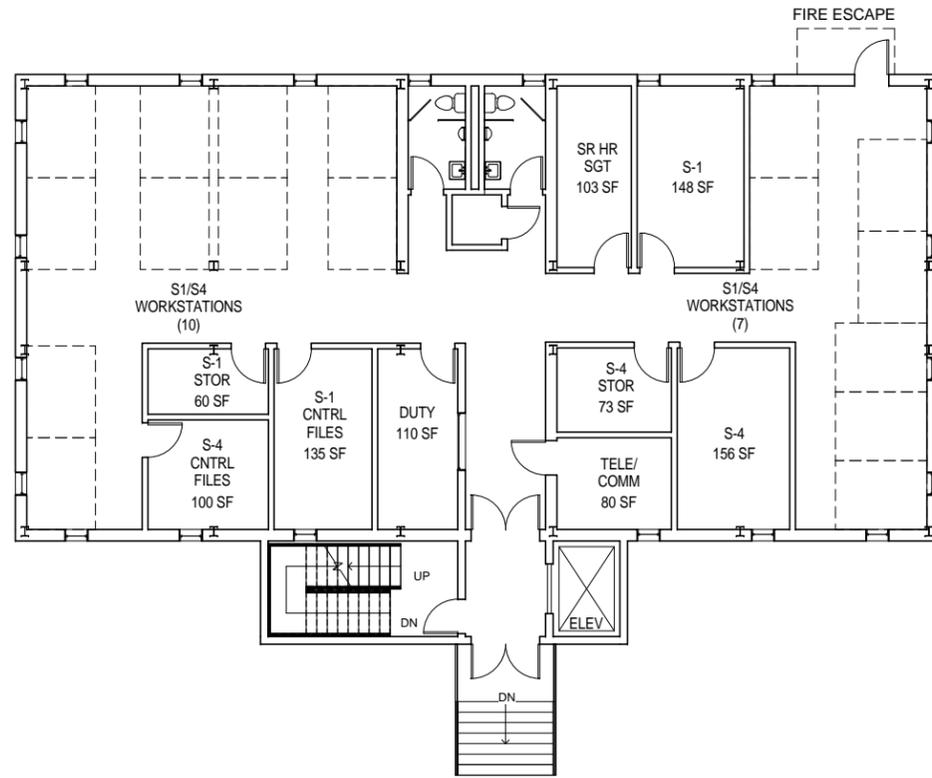
**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

CONF ROOMS	OPNS CONFERENCE	350	0	0.00%
	S-1/S-4 CONFERENCE RM	210	0	0.00%
	S-3 SONFERENCE RM	300	300	100.00%
	TOTAL CONFERENCE ROOM AREA	860	300	34.88%
UTILITY	MECHANICAL - BUILDING 1	830	507	61.08%
	MECHANICAL - BUILDING 2	1138	641	56.33%
	ELECTRICAL - BUILDING 1	131	219	167.18%
	ELECTRICAL - BUILDING 2		166	
	TELECOMM - BUILDING 1 - BASEMENT	143	127	88.81%
	TELECOMM - BUILDING 1 - FIRST FLOOR		80	
	TELECOMM - BUILDING 1 - SECOND FLOOR		126	
	TELECOMM - BUILDING 2	118	140	
	SIPRNET - BUILDING 1	47	112	238.30%
	SIPRNET - BUILDING 2		83	
	TOTAL UTILITY AREA	2407	2201	91.44%
MISC	BREAK	335	0	
	RECYCLE	64	0	
	TOTAL MISC AREA	399	0	0.00%
BOC	BOC CONFERENCE	310	290	93.55%
	BRIGADE OPS CENTER (BOC)	930	920	98.92%
	SERVER RM	160	149	93.13%
	VEST	70	68	97.14%
NOC	ISM OFFICE	115	110	95.65%
	NETWORK OPS CENTER (NOC)	990	980	98.99%
	SERVER RM	455	440	96.70%
	TEAM ROOM	150	139	92.67%
	VEST	70	68	97.14%
	TOTAL EXTRA SMALL SCIF, BOC, NOC AREA	3250	3164	97.35%
PERSONNEL ACCOMODATED				
	SMALL BRIGADE STANDARD DESIGN WITHOUT BOC, NOC, & SCIF	48-114	SCHEME 2	100
	NOC STANDARD DESIGN	9	SCHEME 2 NOC	9
	TOTAL	57-123		109



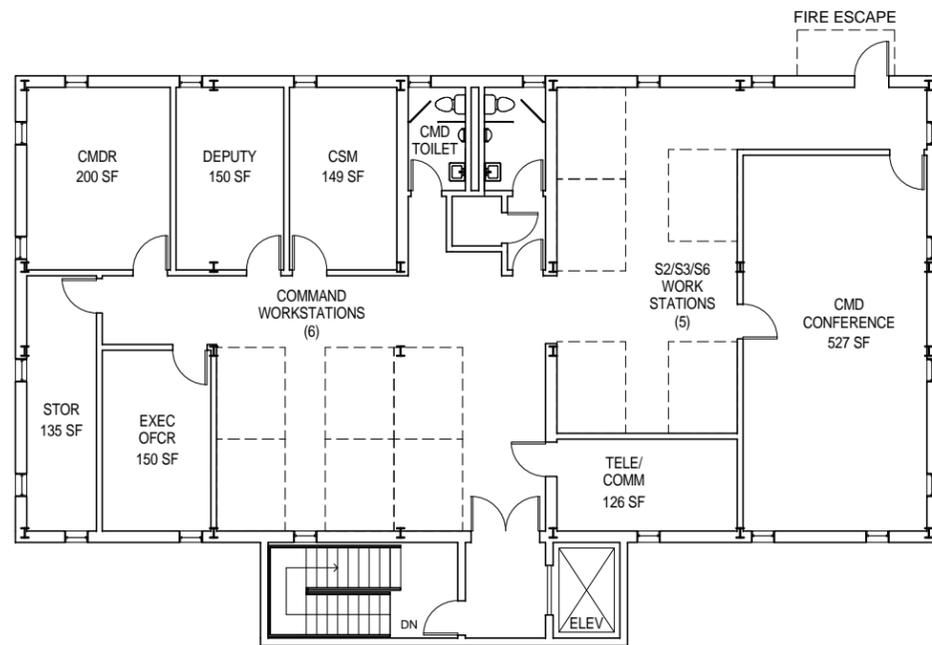
STUDY 2 - BUILDING 1 ENLARGED BASEMENT PLAN

1
2-102
1/8" = 1'-0"



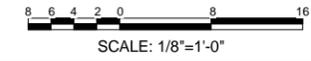
STUDY 2 - BUILDING 1 ENLARGED FIRST FLOOR PLAN

2
2-102
1/8" = 1'-0"



STUDY 2 - BUILDING 1 ENLARGED SECOND FLOOR PLAN

3
2-102
1/8" = 1'-0"



US Army Corps of Engineers® Savannah District	
ISSUE DATE: JULY 2014	SOLICITATION NO.:
DESIGN BY: IND	CONTRACT NO.:
DRAWN BY: IND	FILE NUMBER:
CHK BY: SCA	FILE NAME:
DATE: 7/16/2014	SIZE: 22" x 34"
PLT DATE: 7/16/2014	
PLT SCALE: 1/8" = 1'-0"	
FILE NAME:	
US ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT	KNIGHT ARCHITECTS, INC. 2250 W. BURNING WOOD DRIVE ATLANTA, GEORGIA 30341 TEL: 770.452.0101
BDE / BN NOTIONAL STANDARD DESIGNS	STUDY 2 - ENLARGED BUILDING 1 FLOOR PLANS
SHEET IDENTIFICATION 2-102 SHEET 31 OF 97	

2-102-

STUDY 3

Study 3 includes buildings 3780 and 3763 at Ft. Campbell, KY:

Building 3780



This facility is approximately 9,900 square feet in size and was built in 1979. A portion of the Bastogne Brigade is housed in this building as well as in six other structures. Some of these other structures are across the street but several are much further away, creating issues with coordination. This building represents a reoccurring standard design, although the layout of this facility has been reconfigured multiple times.

Building 3763



This facility was built in 1978 and is approximately 8,300 square feet in size. The building is divided in half, and is used by two battalions. The latrines are located in the center, along with the entry. The floor plan is mirrored on either side of this center core. The building type reoccurs at Ft. Campbell and possibly at other installations.

BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY



Aerial view showing proximity of building 3780 and 3763. The gold text indicates Bde HQs and the white text indicates Bn HQs. Two other small Battalions were visited in this area of Ft. Campbell. Buildings 3780 and 3763 are located approximately 315' apart and are separated by a parking lot.

Description of Renovation

The design scheme uses 3780 and 3763 to house all functions for a Brigade Headquarters. This would consolidate their current setup, which has the functions spread throughout multiple buildings.

Study 3A uses 3780 and 3763 to provide the functions similar to the Small Brigade Headquarters Standard Design, including the BOC and NOC.

Study 3B uses 3780, 3763 and a third building identical to 3763 to provide the functions similar to the Small Brigade, including the SCIF, BOC, and NOC. Because Building 3763 is a reoccurring standard at Ft. Campbell this study illustrates that a SCIF, BOC, and NOC can be achieved with the use of two such buildings.

Tier Matrix

The matrix below illustrates the tier criteria achieved by the renovation design scheme.

- **Tier 1** Criteria represent mandatory requirements that a renovated Legacy Facility must include.
- **Tier 2** Criteria represent highly desirable requirements that should be provided in a renovated Legacy Facility if physical limitations and funding permit.
- **Tier 3** Criteria represent desirable features to be provided if practicable.

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

TIER MATRIX, BRIGADE HEADQUARTERS - STUDY 3A			
FUNCTIONAL SPACE			NOTES
TIER 1	BOC AND NOC	X	
	SCIF (WHEN AUTHORIZED)		
	S1/S4 STAFF SECTIONS	X	MISSING 3 WORKSTATIONS
	S2/S3/S6 STAFF SECTIONS	X	MISSING 30 WORKSTATIONS
	S-3 CONFERENCE ROOM	X	
	COMMAND SECTION	X	
	COMMAND CONFERENCE ROOM	X	
	REENLISTMENT OFFICE	X	
TIER 2	CHAPLAIN	X	
	ASSISTANT CHAPLAIN	X	
	FRSA	X	
	ALL REMAINING CONFERENCE ROOMS	X	S-1/S-4 CONF ROOM PROVIDED
	VENDING AREA		
	SHOWERS		
TIER 3	TEAM ROOMS		
	BREAK ROOM (TO REPLACE VENDING AREA)		
	RECYCLE		

TIER MATRIX, BRIGADE HEADQUARTERS - STUDY 3B			
FUNCTIONAL SPACE			NOTES
TIER 1	BOC AND NOC	X	
	SCIF (WHEN AUTHORIZED)	X	
	S1/S4 STAFF SECTIONS	X	MISSING 3 WORKSTATIONS
	S2/S3/S6 STAFF SECTIONS	X	18 ADDITIONAL WORKSTATIONS
	S-3 CONFERENCE ROOM	X	
	COMMAND SECTION	X	
	COMMAND CONFERENCE ROOM	X	
	REENLISTMENT OFFICE	X	
TIER 2	CHAPLAIN	X	
	ASSISTANT CHAPLAIN	X	
	FRSA	X	
	ALL REMAINING CONFERENCE ROOMS	X	
	VENDING AREA		
	SHOWERS		
TIER 3	TEAM ROOMS	X	1 ADDITIONAL TEAM ROOM
	BREAK ROOM (TO REPLACE VENDING AREA)	X	
	RECYCLE	X	

BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY

- Restrooms have not been modified from the existing buildings. The restrooms could be redesigned to be more efficient and to include showers.
- A vending area could be designed into the reworked restroom areas.

Area Comparison

The following matrix identifies the size of each function in the Small standard design and illustrates how the renovation design scheme compares.

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

AREA COMPARISON- SMALL BDE HQ STANDARD DESIGN vs. SCHEME 3A						
	SPACE DESIGNATION	SF STANDARD DESIGN (SF REQUIRED)	SF PROPOSED DESIGN (SF PROVIDED)	% OF STANDARD DESIGN SF ACHIEVED		
COMMAND SUITE	CMD CONFERENCE	600	555	92.50%		
	CMD TOILET	80	99	123.75%		
	COMMANDER	200	206	103.00%		
	CSM	150	139	92.67%		
	DEPUTY	150	137	91.33%		
	DUTY	110	110	100.00%		
	EXEC OFCR	150	135	90.00%		
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	4	192	4	192	100.00%
	STORAGE	130	130	100.00%		
TOTAL COMMAND SUITE AREA		1762	1703	96.65%		
SUPPORT STAFF	CHAPLAIN	150	150	100.00%		
	CHAPLAIN ASST	110	114	103.64%		
	FRSA	110	110	100.00%		
	REENLIST	110	110	100.00%		
	TOTAL PERSONNEL AREA		480	484	100.83%	
	S-1	150	154	102.67%		
	S-4	150	150	100.00%		
	SR HR SGT	110	110	100.00%		
	S-1 CNTRL FILES	135	135	100.00%		
	S-1 STOR	60	64	106.67%		
	S-4 CNTRL FILES	100	100	100.00%		
	S-4 STOR	60	64	106.67%		
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	15	720	12	576	80.00%
	TOTAL S-1 / S-4 AREA		1485	1353	91.11%	
S-2 / S-3 / S-6	CMD JUDGE ADV	150	150	100.00%		
	OP LAW J.A.	110	111	100.91%		
	OPNS OFFICE	110	110	100.00%		
	S-2	150	135	90.00%		
	S-3	150	150	100.00%		
	S-6	150	135	90.00%		
	SURGEON	150	150	100.00%		
	FSE STOR	100	75	75.00%		
	LNO STOR	65	65	100.00%		
	OPNS STOR	65	65	100.00%		
	OPNS STOR	110	100	90.91%		
	S-2 SECURE DOC	100	100	100.00%		
	S-2 STOR	65	65	100.00%		
	S-2/S-6 STOR	65	64	98.46%		
	S-3 CENTRAL FILES	100	100	100.00%		
	S-3 STOR	100	100	100.00%		
	SURGN STOR	65	60	92.31%		
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	100	4800	70	3360	70.00%
TOTAL S-2 / S-3 / S-6 AREA		6605	5095	77.14%		
TEAM ROOMS	TEAM ROOM	150	120	80.00%		
	TEAM ROOM	150	145	96.67%		
	TEAM ROOM	150	0	0.00%		
	TEAM ROOM	150	0	0.00%		
	TOTAL TEAM ROOM AREA		600	265	44.17%	

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

CONF ROOMS	OPNS CONFERENCE	350	0	0.00%
	S-1/S-4 CONFERENCE RM	210	326	155.24%
	S-3 SONFERENCE RM	300	318	106.00%
	TOTAL CONFERENCE ROOM AREA	860	644	74.88%
UTILITY	MECHANICAL - BUILDING 1	830	319	38.43%
	MECHANICAL - BUILDING 2	1138	721	63.36%
	ELECTRICAL - BUILDING 1	131	108	82.44%
	ELECTRICAL - BUILDING 2		89	
	TELECOMM - BUILDING 1	143	90	62.94%
	TELECOMM - BUILDING 2	118	160	135.59%
	SIPRNET - BUILDING 1	47	65	138.30%
	SIPRNET - BUILDING 2		60	
TOTAL UTILITY AREA	2407	1612	66.97%	
MISC	BREAK	335	0	
	RECYCLE	65	0	
	TOTAL MISC AREA	400	0	0.00%
BOC	BOC CONFERENCE	310	310	100.00%
	BRIGADE OPS CENTER (BOC)	930	930	100.00%
	SERVER RM	160	160	100.00%
	VEST	70	70	100.00%
NOC	ISM OFFICE	115	115	100.00%
	NETWORK OPS CENTER (NOC)	990	990	100.00%
	SERVER RM	455	455	100.00%
	TEAM ROOM	150	150	100.00%
	VEST	70	70	100.00%
	TOTAL EXTRA SMALL SCIF, BOC, NOC AREA	3250	3250	100.00%
PERSONNEL ACCOMODATED				
	SMALL BRIGADE STANDARD DESIGN WITHOUT BOC, NOC, & SCIF	48-114	SCHEME 3A	102
	NOC STANDARD DESIGN	9	SCHEME 3A NOC	9
	TOTAL	57-123		111

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

AREA COMPARISON- SMALL BDE HQ STANDARD DESIGN vs. SCHEME 3B						
	SPACE DESIGNATION	SF STANDARD DESIGN (SF REQUIRED)	SF PROPOSED DESIGN (SF PROVIDED)	% OF STANDARD DESIGN SF ACHIEVED		
COMMAND SUITE	CMD CONFERENCE	600	555	92.50%		
	CMD TOILET	80	99	123.75%		
	COMMANDER	200	206	103.00%		
	CSM	150	139	92.67%		
	DEPUTY	150	137	91.33%		
	DUTY	110	110	100.00%		
	EXEC OFCR	150	135	90.00%		
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	4	192	4	192	100.00%
	STORAGE	130	130	100.00%		
TOTAL COMMAND SUITE AREA		1762	1703	96.65%		
SUPPORT STAFF	CHAPLAIN	150	150	100.00%		
	CHAPLAIN ASST	110	114	103.64%		
	FRSA	110	110	100.00%		
	REENLIST	110	110	100.00%		
	TOTAL PERSONNEL AREA		480	484	100.83%	
	S-1	150	154	102.67%		
	S-4	150	150	100.00%		
	SR HR SGT	110	110	100.00%		
	S-1 CNTRL FILES	135	135	100.00%		
	S-1 STOR	60	64	106.67%		
	S-4 CNTRL FILES	100	100	100.00%		
	S-4 STOR	60	50	83.33%		
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	15	720	12	576	80.00%
	TOTAL S-1 / S-4 AREA		1485	1339	90.17%	
S-2 / S-3 / S-6	CMD JUDGE ADV	150	150	100.00%		
	OP LAW J.A.	110	111	100.91%		
	OPNS OFFICE	110	110	100.00%		
	S-2	150	150	100.00%		
	S-3	150	150	100.00%		
	S-6	150	150	100.00%		
	SURGEON	150	150	100.00%		
	FSE STOR	100	75	75.00%		
	LNO STOR	65	65	100.00%		
	OPNS STOR	65	65	100.00%		
	OPNS STOR	110	100	90.91%		
	S-2 SECURE DOC	100	100	100.00%		
	S-2 STOR	65	65	100.00%		
	S-2/S-6 STOR	65	64	98.46%		
	S-3 CENTRAL FILES	100	100	100.00%		
	S-3 STOR	100	100	100.00%		
	SURGN STOR	65	60	92.31%		
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	100	4800	118	5664	118.00%
TOTAL S-2 / S-3 / S-6 AREA		6605	7429	112.48%		
TEAM ROOMS	TEAM ROOM	150	150	100.00%		
	TEAM ROOM	150	150	100.00%		
	TEAM ROOM	150	150	100.00%		
	TEAM ROOM	150	161	107.33%		
	TOTAL TEAM ROOM AREA		600	731	121.83%	

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

CONF ROOMS	OPNS CONFERENCE	350	354	101.14%
	S-1/S-4 CONFERENCE RM	210	285	135.71%
	S-3 SONFERENCE RM	300	308	102.67%
	TOTAL CONFERENCE ROOM AREA	860	947	110.12%
UTILITY	MECHANICAL - BUILDING 1	830	319	38.43%
	MECHANICAL - BUILDING 2	1138	721	63.36%
	MECHANICAL - BUILDING 3		721	
	ELECTRICAL - BUILDING 1	131	226	172.52%
	ELECTRICAL - BUILDING 2		162	
	ELECTRICAL - BUILDING 3		89	
	TELECOMM - BUILDING 1	143	87	60.84%
	TELECOMM - BUILDING 2	118	113	
	TELECOMM - BUILDING 3		160	
	SIPRNET - BUILDING 1	47	53	112.77%
	SIPRNET - BUILDING 2		87	
	SIPRNET - BUILDING 3		60	
TOTAL UTILITY AREA	2407	2798	116.24%	
MISC	BREAK	335	335	100.00%
	RECYCLE	64	74	115.63%
	TOTAL MISC AREA	399	409	102.51%
BOC	BOC CONFERENCE	310	293	94.52%
	BRIGADE OPS CENTER (BOC)	930	868	93.33%
	SERVER RM	160	200	125.00%
	VEST	70	129	184.29%
NOC	ISM OFFICE	115	115	100.00%
	NETWORK OPS CENTER (NOC)	990	1080	109.09%
	SERVER RM	455	455	100.00%
	TEAM ROOM	150	150	100.00%
	VEST	70	51	72.86%
SCIF	GEOINT	245	245	100.00%
	SCIF CONFERENCE	355	312	87.89%
	SCIF OPEN OFFICE	1865	1870	100.27%
	SERVER RM	200	200	100.00%
	SIGINT	400	397	99.25%
	STOR	20	20	100.00%
	VEST	65	70	107.69%
	VEST	70	137	195.71%
TOTAL SCIF, BOC, NOC AREA	6470	6592	101.89%	

PERSONNEL ACCOMODATED			
SMALL BRIGADE STANDARD DESIGN WITHOUT BOC, NOC, & SCIF	48-114	SCHEME 3B	150
SCIF STANDARD DESIGN	50	SCHEME 3B SCIF	50
NOC STANDARD DESIGN	9	SCHEME 3B NOC	9
TOTAL	107-173		209

STUDY 4

Study 4 is based on the hammerhead barracks standard design.

The design team visited a renovated hammerhead barracks at Fort Campbell, KY (Building 6909). From this example it was decided that this barracks type could be studied as a Brigade Headquarters, as two (2) Battalion Headquarters, and as a combined Battalion Headquarters/COF.



Building 6909

This 1950s hammerhead barracks was renovated to serve as a Battalion HQ. The renovation was completed around 2000 and the budget was approximately \$2M. The renovation solution for this particular battalion did not match the standard design at that time.



Aerial view of building 6909 showing several other nearby hammerhead barracks.

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

Description of Renovation

Some hammerhead barracks were built with full or partial basements. These should be explored on a case by case basis and could potentially be used for additional storage spaces.

Study 4A provides the functions similar to the Small Brigade Headquarters Standard Design, including a SCIF, BOC, and NOC.

Study 4B shows two (2) Large Battalion Headquarters. The hammerhead portion of the first floor is dedicated to shared classroom space to be used by both Battalions. The remainder of the first floor is for Battalion Alpha and includes the Command Suite. The second floor is divided between Battalions Alpha and Bravo. The third floor is dedicated to Battalion Bravo and includes the Command Suite.

Study 4C shows one 175PN COF and one Extra-Large Battalion Headquarters. The COF is located on the first floor and the Battalion is divided between the second and third floors.

Tier Matrix

The matrix below illustrates the tier criteria achieved by the renovation design scheme.

- **Tier 1** Criteria represent mandatory requirements that a renovated Legacy Facility must include.
- **Tier 2** Criteria represent highly desirable requirements that could be provided in a renovated Legacy Facility if physical limitations and funding permit.
- **Tier 3** Criteria represent desirable features to be provided if practicable.

TIER MATRIX, BRIGADE HEADQUARTERS - STUDY 4A			
FUNCTIONAL SPACE			NOTES
TIER 1	BOC AND NOC	X	
	SCIF (WHEN AUTHORIZED)	X	
	S1/S4 STAFF SECTIONS	X	
	S2/S3/S6 STAFF SECTIONS	X	MISSING 14 WORKSTATIONS
	S-3 CONFERENCE ROOM	X	
	COMMAND SECTION	X	
	COMMAND CONFERENCE ROOM	X	
	REENLISTMENT OFFICE	X	
TIER 2	CHAPLAIN	X	
	ASSISTANT CHAPLAIN	X	
	FRSA	X	
	ALL REMAINING CONFERENCE ROOMS	X	
	VENDING AREA		
	SHOWERS	X	EXISTING SHOWERS
TIER 3	TEAM ROOMS	X	3 TEAM ROOMS PROVIDED
	BREAK ROOM (TO REPLACE VENDING AREA)		
	RECYCLE		

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

TIER MATRIX, BATTALION HEADQUARTERS - STUDY 4B			
FUNCTIONAL SPACE			NOTES
TIER 1	S1/S4 STAFF SECTIONS	X	2 ADDITIONAL WORKSTATIONS IN EACH BN
	S2/S3/S6 STAFF SECTIONS	X	BN ALPHA MISSING 6 WORKSTATIONS; BN BRAVO MISSING 7 WORKSTATIONS
	S-3 CONFERENCE ROOM	X	
	COMMAND SECTION	X	
	COMMAND CONFERENCE ROOM	X	
	REENLISTMENT OFFICE	X	
TIER 2	1 CLASSROOM WITH STORAGE	X	
	CHAPLAIN	X	
	ASSISTANT CHAPLAIN	X	
	FRSA	X	
	VENDING AREA	X	PROVIDED ADJACENT TO SHARED CLASSROOMS
	SHOWERS	X	EXISTING SHOWERS
TIER 3	2 CLASSROOMS	X	
	BREAK ROOM (TO REPLACE VENDING AREA)	X	
	RECYCLE	X	

TIER MATRIX, BATTALION HEADQUARTERS - STUDY 4C			
FUNCTIONAL SPACE			NOTES
TIER 1	S1/S4 STAFF SECTIONS	X	
	S2/SS3/S6 STAFF SECTIONS	X	MISSING 2 WORKSTATIONS
	S-3 CONFERENCE ROOM	X	
	COMMAND SECTION	X	
	COMMAND CONFERENCE ROOM	X	
	REENLISTMENT OFFICE	X	
TIER 2	1 CLASSROOM WITH STORAGE	X	
	CHAPLAIN	X	
	ASSISTANT CHAPLAIN	X	
	FRSA	X	
	VENDING AREA		
	SHOWERS	X	EXISTING SHOWERS
TIER 3	2 CLASSROOMS	X	
	BREAK ROOM (TO REPLACE VENDING AREA)	X	
	RECYCLE	X	

- Restrooms and showers have not been modified from the existing buildings with the exception of the first floor of Scheme 4B. The restrooms could be redesigned to be more efficient and to include additional showers.

Area Comparison

The following matrix identifies the area allotted for each function in the standard design and illustrates how the renovation design scheme compares. The matrix for Scheme 4A shows the sizes and functions in comparison to that of the Small Brigade HQ Standard Design. The matrix for Scheme 4B shows the sizes and functions in comparison to the Large Battalion HQ Standard Design. And the matrix for Scheme 4C shows the sizes and functions in comparison to the Extra Large Battalion HQ Standard Design.

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

AREA COMPARISON- SMALL BDE HQ STANDARD DESIGN vs. SCHEME 4A						
	SPACE DESIGNATION	SF STANDARD DESIGN (SF REQUIRED)		SF PROPOSED DESIGN (SF PROVIDED)		% OF STANDARD DESIGN SF ACHIEVED
COMMAND SUITE	CMD CONFERENCE	600		503		83.83%
	CMD TOILET	80		108		135.00%
	COMMANDER	200		238		119.00%
	CSM	150		158		105.33%
	DEPUTY	150		141		94.00%
	DUTY	110		118		107.27%
	EXEC OFCR	150		158		105.33%
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	4	192	4	192	100.00%
	STORAGE	130		174		133.85%
TOTAL COMMAND SUITE AREA		1762		1790		101.59%
SUPPORT STAFF	CHAPLAIN	150		130		86.67%
	CHAPLAIN ASST	110		109		99.09%
	FRSA	110		103		93.64%
	REENLIST	110		118		107.27%
	TOTAL PERSONNEL AREA		480		460	
	S-1	150		120		80.00%
	S-4	150		176		117.33%
	SR HR SGT	110		103		93.64%
	S-1 CNTRL FILES	135		122		90.37%
	S-1 STOR	60		63		105.00%
	S-4 CNTRL FILES	100		103		103.00%
	S-4 STOR	60		66		110.00%
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	15	720	15	720	100.00%
	TOTAL S-1 / S-4 AREA		1485		1473	
S-2 / S-3 / S-6	CMD JUDGE ADV	150		140		93.33%
	OP LAW J.A.	110		123		111.82%
	OPNS OFFICE	110		101		91.82%
	S-2	150		141		94.00%
	S-3	150		136		90.67%
	S-6	150		119		79.33%
	SURGEON	150		158		105.33%
	FSE STOR	100		108		108.00%
	LNO STOR	65		62		95.38%
	OPNS STOR	65		0		0.00%
	OPNS STOR	110		133		120.91%
	S-2 SECURE DOC	100		103		103.00%
	S-2 STOR	65		63		96.92%
	S-2/S-6 STOR	65		66		101.54%
	S-3 CENTRAL FILES	100		105		105.00%
	S-3 STOR	100		103		103.00%
	SURGN STOR	65		62		95.38%
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	100	4800	86	4128	86.00%
	TOTAL S-2 / S-3 / S-6 AREA		6605		5851	
TEAM ROOMS	TEAM ROOM	150		158		105.33%
	TEAM ROOM	150		140		93.33%
	TEAM ROOM	150		131		87.33%
	TEAM ROOM	150				0.00%
	TOTAL TEAM ROOM AREA		600		429	

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

CONF ROOMS	OPNS CONFERENCE	350	360	102.86%
	S-1/S-4 CONFERENCE RM	210	234	111.43%
	S-3 SONFERENCE RM	300	289	96.33%
	TOTAL CONFERENCE ROOM AREA	860	883	102.67%
UTILITY	MECHANICAL - 1ST FLOOR	830	762	91.81%
	MECHANICAL - 1ST FLOOR		232	
	MECHANICAL - 2ND FLOOR	1138	232	20.39%
	MECHANICAL - 3RD FLOOR		232	
	ELECTRICAL - 1ST FLOOR	131	108	82.44%
	ELECTRICAL - 1ST FLOOR		112	
	ELECTRICAL - 2ND FLOOR		125	
	ELECTRICAL - 3RD FLOOR		125	
	TELECOMM - 1ST FLOOR	143	115	
	TELECOMM - 1ST FLOOR		92	
	TELECOMM - 2ND FLOOR	118	89	75.42%
	TELECOMM - 3RD FLOOR		89	
	SIPRNET - 1ST FLOOR	47	53	
	SIPRNET - 1ST FLOOR		58	
	SIPRNET - 2ND FLOOR		64	
	SIPRNET - 3RD FLOOR		64	
TOTAL UTILITY AREA	2407	2552	106.02%	
MISC	BREAK	390	0	0.00%
	RECYCLE	1730	0	0.00%
	TOTAL MISC AREA	2120	0	0.00%
BOC	BOC CONFERENCE	310	310	100.00%
	BRIGADE OPS CENTER (BOC)	930	914	98.28%
	SERVER RM	160	150	93.75%
	VEST	70	70	100.00%
NOC	ISM OFFICE	115	115	100.00%
	NETWORK OPS CENTER (NOC)	990	955	96.46%
	SERVER RM	455	455	100.00%
	TEAM ROOM	150	150	100.00%
	VEST	70	99	141.43%
SCIF	GEOINT	245	236	96.33%
	SCIF CONFERENCE	355	320	90.14%
	SCIF OPEN OFFICE	1865	1794	96.19%
	SERVER RM	200	194	97.00%
	SIGINT	400	409	102.25%
	STOR	20	31	155.00%
	VEST	65	70	107.69%
	VEST	70	92	131.43%
TOTAL SCIF, BOC, NOC AREA	6470	6364	98.36%	

PERSONNEL ACCOMODATED			
SMALL BRIGADE STANDARD DESIGN WITHOUT BOC, NOC, & SCIF	48-114	SCHEME 4A	121
SCIF STANDARD DESIGN	50	SCHEME 4A SCIF	50
NOC STANDARD DESIGN	9	SCHEME 4A NOC	9
TOTAL	107-173		180

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

AREA COMPARISON- LARGE BN HQ STANDARD DESIGN vs. SCHEME 4B							
SPACE DESIGNATION	SF LARGE BN STANDARD DESIGN (SF REQUIRED)		BATTALION ALPHA		BATTALION BRAVO		
			SF PROPOSED DESIGN (SF PROVIDED)	% OF STANDARD DESIGN SF ACHIEVED	SF PROPOSED DESIGN (SF PROVIDED)	% OF STANDARD DESIGN SF ACHIEVED	
COMMAND SUITE	CMD CONFERENCE	500	508	101.60%	496	99.20%	
	CMD RR	80	48	60.00%	46	57.50%	
	BN CMDR	200	191	95.50%	174	87.00%	
	CMD SGT MAJ	150	158	105.33%	158	105.33%	
	BN EXEC OFCR	150	158	105.33%	158	105.33%	
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	2	96	2	96	100.00%	100.00%
	CMD SUPPLY	100	88	88.00%	90	90.00%	
	TOTAL COMMAND SUITE AREA	1276	1247	97.73%	1218	95.45%	
SUPPORT STAFF	CHAPLAIN	150	135	90.00%	136	90.67%	
	CHAPLAIN ASST	110	118	107.27%	106	96.36%	
	FRSA	110	110	100.00%	125	113.64%	
	REENLIST	110	110	100.00%	106	96.36%	
	DUTY	110	123	111.82%	125	113.64%	
	TOTAL PERSONNEL AREA	590	596	101.02%	598	101.36%	
S-1 / S-4	S-1	110	122	110.91%	116	105.45%	
	S-4	110	115	104.55%	116	105.45%	
	SR HR SGT	110	115	104.55%	116	105.45%	
	CENTRAL FILES	120	128	106.67%	118	98.33%	
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	12	576	14	672	116.67%	116.67%
	TOTAL S-1 / S-4 AREA	1026	1152	112.28%	1138	110.92%	
S-2 / S-3 / S-6	S-2	110	125	113.64%	140	127.27%	
	S-3	150	140	93.33%	131	87.33%	
	S-3 OPS SGT	110	103	93.64%	120	109.09%	
	S-6	110	103	93.64%	103	93.64%	
	S-3 STOR	100	103	103.00%	103	103.00%	
	S-3 CONFERENCE	255	250	98.04%	222	87.06%	
	SEC DOC	200	173	86.50%	176	88.00%	
	STORAGE	110		0.00%			
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	44	2112	38	1824	86.36%	84.09%
TOTAL S-2 / S-3 / S-6 AREA	3257	2821	86.61%	2771	85.08%		
CLASS-ROOMS	CLASSROOM 1 (SHARED)	1000	1287	128.70%	1287	128.70%	
	CLASSROOM 2	1000	543	54.30%	520	52.00%	
	CLASSROOM 3	1000		0.00%		0.00%	
	STORAGE	150		0.00%		0.00%	
	TOTAL CONF / TEAM ROOM AREA	3150	1830	58.10%	1807	57.37%	
MISC	BREAK	120	151	125.83%	151	125.83%	
	RECYCLE	60	38	63.33%	38	63.33%	
	STORAGE	115	306	266.09%	306	266.09%	
	STORAGE	75					
	TOTAL MISC AREA	370	495	133.78%	495	133.78%	

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

UTILITY (SHARED BY BOTH BATTALIONS)	MECHANICAL - 1ST FLOOR	520	754	145.00%
	MECHANICAL - 1ST FLOOR	800	178	22.25%
	MECHANICAL - 2ND FLOOR	250	178	
	MECHANICAL - 3RD FLOOR		178	
	ELECTRICAL - 1ST FLOOR	150	423	282.00%
	ELECTRICAL - 1ST FLOOR	130	103	79.23%
	ELECTRICAL - 2ND FLOOR		103	
	ELECTRICAL - 3RD FLOOR		103	
	TELECOMM - 1ST FLOOR	110	99	90.00%
	TELECOMM - 1ST FLOOR		73	
	TELECOMM - 2ND FLOOR	110	71	64.55%
	TELECOMM - 3RD FLOOR	110	71	64.55%
	SIPRNET - 1ST FLOOR	65	49	75.38%
	SIPRNET - 2ND FLOOR		48	
	SIPRNET - 3RD FLOOR	65	48	73.85%
	TOTAL UTILITY AREA	2310	2479	107.32%

PERSONNEL ACCOMODATED	
LARGE BATTALION HQ W/CLASSROOMS	51-70
BATTALION ALPHA	66
BATTALION BRAVO	65

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

AREA COMPARISON- EXTRA LARGE BN HQ STANDARD DESIGN vs. SCHEME 4C						
		SF EXTRA LARGE BN STANDARD DESIGN (SF REQUIRED)	SF PROPOSED DESIGN (SF PROVIDED)	% OF STANDARD DESIGN SF ACHIEVED		
COMMAND SUITE	CMD CONFERENCE	440	441	100.23%		
	CMD RR	60	92	153.33%		
	BN CMDR	200	174	87.00%		
	CMD SGT MAJ	150	158	105.33%		
	BN EXEC OFCR	150	158	105.33%		
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	6	288	6	288	100.00%
	CMD SUPPLY	145	132	91.03%		
	TOTAL COMMAND SUITE AREA	1433	1443	100.70%		
SUPPORT STAFF	CHAPLAIN	150	150	100.00%		
	CHAPLAIN ASST	110	122	110.91%		
	FRSA	110	118	107.27%		
	REENLIST	110	112	101.82%		
	DUTY	110	113	102.73%		
		TOTAL PERSONNEL AREA	590	615	104.24%	
	S-1	110	110	100.00%		
	S-4	110	103	93.64%		
	SR HR SGT	110	140	127.27%		
	CENTRAL FILES	170	159	93.53%		
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	14	672	14	672	100.00%
		TOTAL S-1 / S-4 AREA	1172	1184	101.02%	
S-2 / S-3 / S-6	S-2	110	121	110.00%		
	S-3	150	157	104.67%		
	S-3 OPS SGT	110	118	107.27%		
	S-6	110	121	110.00%		
	S-3 CONFERENCE	230	245	106.52%		
	SEC DOC	250	249	99.60%		
	STORAGE	85				
	OPEN OFFICE WORKSTATION TYPICAL (@ 48 SF EACH)	52	2496	50	2400	96.15%
		TOTAL S-2 / S-3 / S-6 AREA	3541	3411	96.33%	
CLASS-ROOMS	CLASSROOM 1	1000	730	73.00%		
	CLASSROOM 2	1000	607	60.70%		
	CLASSROOM 3	1000	597	59.70%		
	STORAGE	120				
		TOTAL CONF / TEAM ROOM AREA	3120	1934	61.99%	
MISC	BREAK	140	135	96.43%		
	RECYCLE	60	35	58.33%		
	STORAGE	175	132	75.43%		
	SUPPLY	95	103			
		TOTAL MISC AREA	470	405	86.17%	

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

		SF EXTRA LARGE BN STANDARD DESIGN (SF REQUIRED)	SF PROPOSED DESIGN (SF PROVIDED)	% OF STANDARD DESIGN SF ACHIEVED
UTILITY (SHARED BY BOTH BATTALIONS)	MECHANICAL - 1ST FLOOR	520	374	71.92%
	MECHANICAL - 1ST FLOOR	875	178	20.34%
	MECHANICAL - 2ND FLOOR	500	178	
	MECHANICAL - 3RD FLOOR		178	
	ELECTRICAL - 1ST FLOOR	128	207	161.72%
	ELECTRICAL - 1ST FLOOR	116	103	88.79%
	ELECTRICAL - 2ND FLOOR		103	
	ELECTRICAL - 3RD FLOOR		102	
	TELECOMM - 1ST FLOOR	125	71	56.80%
	TELECOMM - 2ND FLOOR	76	71	93.42%
	TELECOMM - 3RD FLOOR		72	
	SIPRNET - 1ST FLOOR	89	48	53.93%
	SIPRNET - 2ND FLOOR	84	48	57.14%
	SIPRNET - 3RD FLOOR		48	
TOTAL UTILITY AREA		2513	1781	70.87%

PERSONNEL ACCOMODATED	
X-LARGE BATTALION HQ W/ CLASSROOMS	71-85
SCHEME 4C	82

AREA COMPARISON - STANDARD DESIGN 175 PN COF*				
ADMINISTRATION AREA	SPACE DESIGNATION	175 PN COF (SF REQUIRED)	SCHEME 4C (SF PROVIDED)	% of COF Standard NSF Achieved
	STORAGE ROOM	40	76	190%
	XO	150	176	117%
	1SG	150	167	111%
	CO	150	176	117%
	TRAINING OFFICE	150	177	118%
	PLATOON OFFICES (SHARED) 4 EA. @ 150 SF	600	724	121%
	TLT	0	0	N/A
	COPY/RECYCLING	10	122	1220%
	COPY/RECYCLING		177	
	CONFERENCE ROOM W/ STORAGE	310	476	154%
	UNASSIGNED		531	
	VENDING		104	
	TOTAL ADMIN AREA	1,560	2,906	186%

READINESS MODULE	SPACE DESIGNATION	175 PN COF (REQUIRED)	SCHEME 4C (PROVIDED)	% of COF Standard NSF Achieved
	SECURE STORAGE NON-SENSITIVE	405	430	106%
	ARMS VAULT	550	580	105%
	NBC STORAGE	175	176	101%
	COMMUNICATIONS STO	175	176	101%
	UNIT STORAGE	680	700	103%
	TA-50 LOCKERS, AISLE SPACE	4,187	3,935	94%
	TOTAL READINESS MODULE	6,172	5,997	97%

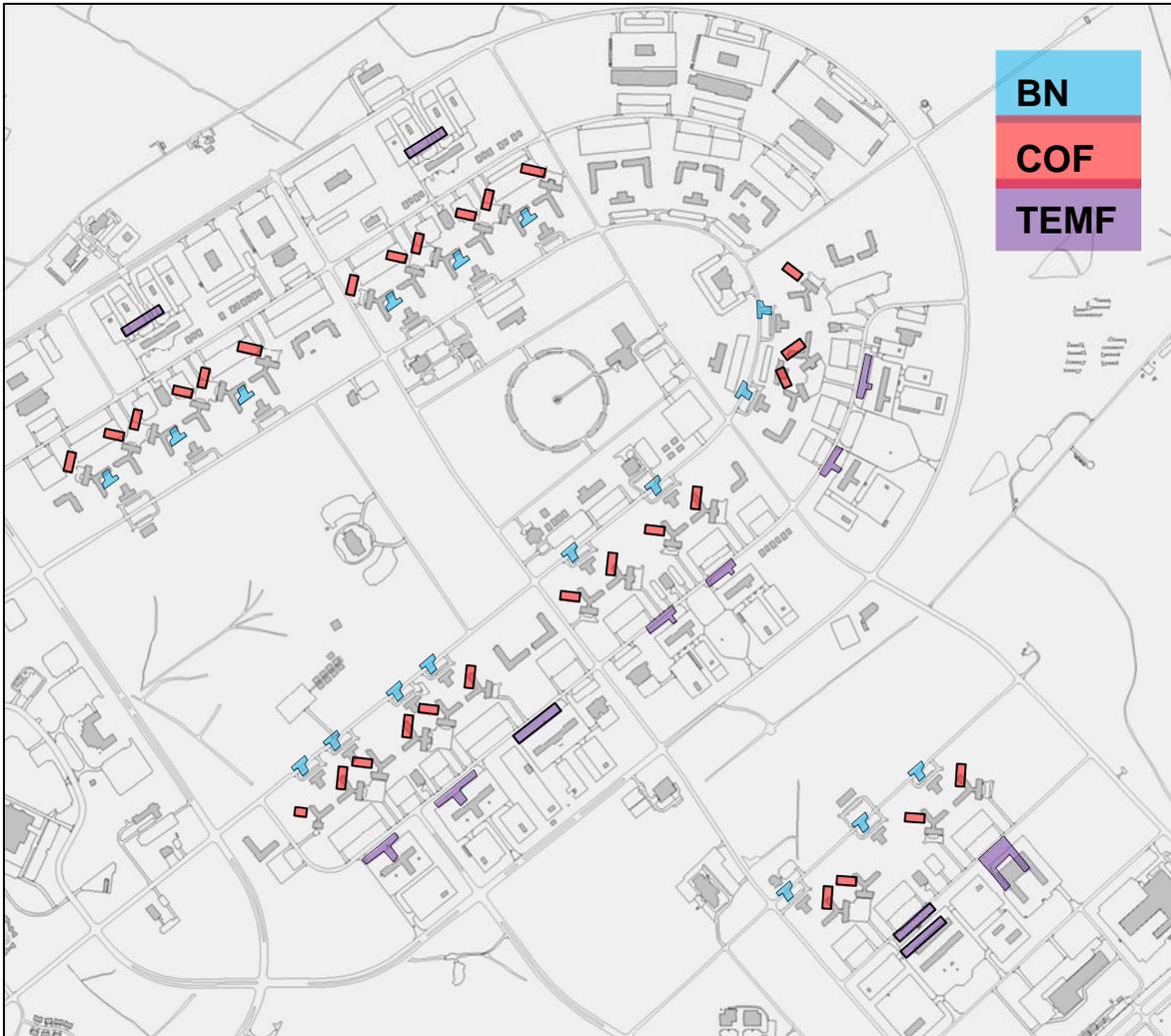
* Because this scheme is able to accommodate 175 TA-50 lockers, the area requirements for a 175-PN COF are calculated by interpolating between Standard Design requirements for a 150 PN and a 200 PN COF.

TIER THREE REQUIREMENTS	SPACE DESIGNATION	175 PN COF (REQUIRED)	SCHEME 4C (PROVIDED)	% of COF Standard NSF Achieved
	INTERIOR TA-50 EQUIP LAYOUT AREA (50% OF 175 PN @ 40 SF)	3,520	0	0%
	EXTERIOR COVERED HARDSTAND-EQUIPMENT MAINTENANCE/LAYOUT SPACE/WEAPONS CLEANING (Note: Per Standard Design, 150 PN = 2,328 SF; 200 PN = 2,985 SF). Average = 2,657 SF.		Where possible, provide 34' W X 78' L canopy min. 20' clear from rear of COF.	

STUDY 5

Ft. Drum Legacy BN HQ

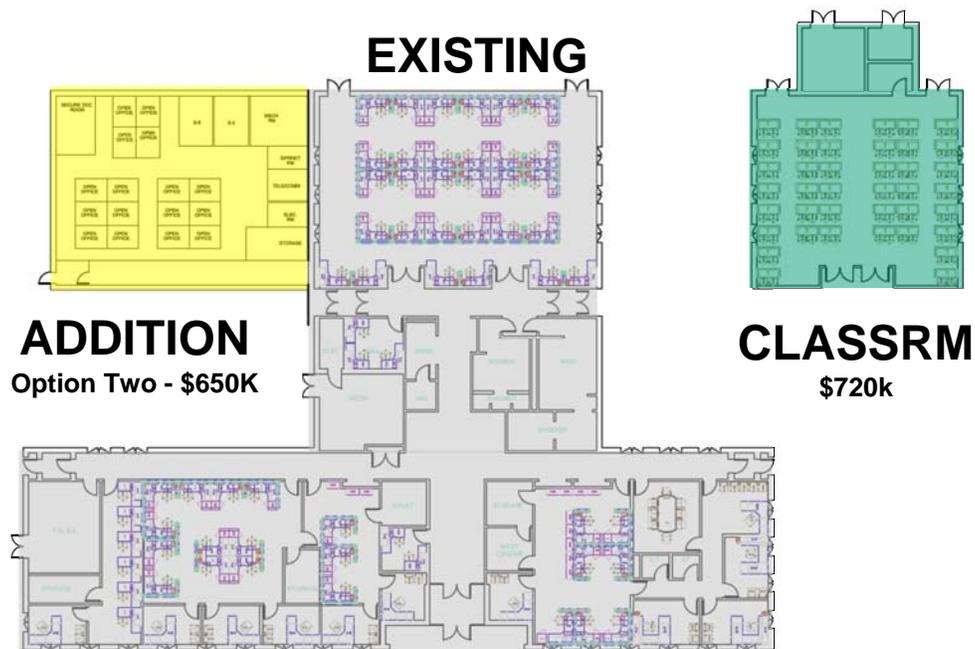
Study 5 includes review of a BN HQ expansion design developed by others for facilities at Fort Drum, NY. Our design team developed an alternative design to address Ft. Drum's need for additional office space in the BN HQs.



The image above shows the layout of BNs, COFs and TEMFs at Ft. Drum. The Installation's Battalion HQs are in need of additional administration space. After surveying their needs and the capabilities of their existing facilities, the expansion concept on the following page was developed by others.

The design would convert the existing classroom space in each BN HQ to admin space. This conversion, along with an addition (shown in yellow), would provide additional admin space for each Battalion. This would eliminate their classrooms, requiring the construction of standalone classroom buildings to be shared by multiple BNs.

BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY



Below are Ft. Drum's overall notes on this concept.

Pro's

- Adds additional personnel work spaces by converting existing classroom into admin space
- Keeps existing floor plan
- BN's can share a classroom until additional classrooms are built

Con's

- Requires separate classroom building
- Larger footprint
- Reduction in classroom size

Ft. Drum's initial analysis estimated that the addition would cost \$650K and the classroom building would cost \$720K.

Description of Renovation

For this study, the design team examined this issue with the goal of eliminating the need for construction of a new separate building. The following design scheme shows an option that would retain the existing classrooms and consolidate the additional admin spaces into one addition.

The cost estimate for this scheme is approximately \$740K (see appendices).

APPENDICES

MEETING MINUTES & SITE VISIT NOTES:

- Ft. Bragg
- Ft. Campbell
- Preliminary Review Conference Meeting Minutes
- Final Review Conference Meeting Minutes

NOTIONAL RENOVATION COST ESTIMATE FOR FT. DRUM ADDITION

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

FT. BRAGG SITE VISIT

DATE: 11/12/13 – 11/14/13

LOCATION: FT. BRAGG DPW

MEETING ATTENDEE	ORGANIZATION	CONTACT INFO (PHONE / EMAIL)
Tom Brockbank, PE	USACE, Savannah District	Thomas.r.brockbank@usace.army.mil 912-652-5212
Steve Toney, RA	USACE, Savannah District	Steven.v.toney@usace.army.mil 912-652-5212
Jerry Harbison	FORSCOM G-3/5/7 Engineers	Jerry.a.harbison2.civ@mail.mil 910-570-7112
Mark G. Byrd	FORSCOM G-3/5/7 Engineers	Mark.g.byrd.civ@mail.mil 910-570-7115
Jim Healy	CRST HQ, USACE	James.f.healy@usace.army.mil 202-761-7490
Tim Fussell	HQ FORSCOM	Timothy.j.fussell.civ@mail.mil 910-570-5229
Joe Knight, AIA	Knight Architects, Inc.	jknight@knightarchs.com 770-452-0101
Narra DeMichina, AIA, LEED AP	Knight Architects, Inc.	ndemichina@knightarchs.com 770-452-0101
Matt Steinberg, AIA	Knight Architects, Inc.	msteinberg@knightarchs.com 770-452-0101
Dwight Luedtke	Sigma Planning Group, Inc.	dwightl@sigmaep.com 540-992-4440

The meeting began with Tom Brockbank’s presentation of the project and the previous COF and TEMF studies.

The approach to funding was discussed:

1. No construction
2. Construction, but within SRM limits
3. SRM construction but with MILCON tail
4. Fully funded MILCON project

Joe Knight stated that \$750K equals approximately 3,000 SF of new construction.

For the last legacy standard designs IMCOM provided the guidance that renovation cannot cost more than 75% of new construction. This percentage has no correlation to law but only as a rule of thumb for assessing facilities.

The emphasis on bringing facilities “closer” to the standard design was discussed. Tom stated that the goal is to achieve 75% of the standard design.

The process for the COF and TEMF legacy standard designs was explained.

It was stated that LEED and AFTP concerns are not a consideration for this effort.

Prior to, and after the site visits to various buildings on Ft. Bragg, we had meetings on Tuesday, 11/12/13 and Thursday, 11/14/13 in which the following issues were discussed:

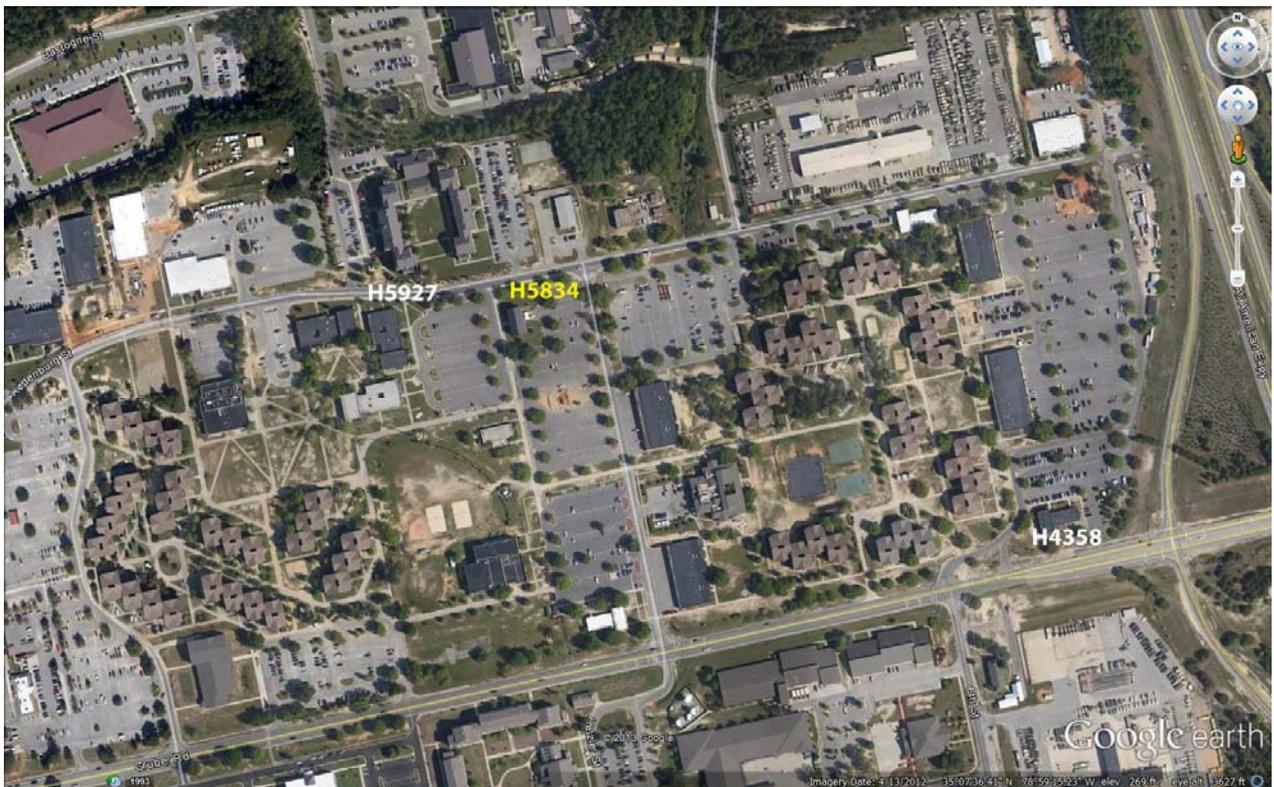
BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY

- The Brigades in the Army include functional Brigades (such as DISCOM, 525th MI, 20th EN and 16th MP, which we visited at Bragg) and Brigade Combat Teams (BCTs). The BCTs are the warfighting Brigades.
- Currently there are 45 BCTs in the US Army and approximately 570,000 troops. Over time, this will draw down to 33 BCTs, with a total Army of ~490,000 troops.
- After Ft. Bragg, the Facility Design Team (FDT) agreed that Ft. Campbell has the best mix of BDE and BN HQs.

Preliminary tiers for Battalion and Brigade renovations were discussed. These were revised following the site visits

Wednesday, November 13, Legacy Facility Site Visits – 0800

The first area visited was the H Area in the southeast corner of the main cantonment; including the BDE HQ for the 20th Engineer Brigade (Bldg. H5834), as well as one of their 7 Battalion Headquarters (Bldg. H5927).



BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY

20th ENG BDE (Building H5834)

H5834 is approximately 9,300 SF, with 3,100 SF on the basement, 1st and 2nd floor levels. This BDE HQ is split out over 5 different buildings; they use some of their assigned BN HQ and COF space to accommodate BDE HQ functions. This BDE would need a Brigade Operations Center (BOC) and a Network Operations Center (NOC), but not a Sensitive Compartmented Information Facility (SCIF). There was general agreement among the Facility Design Team (FDT) that building H5927 is prevalent at installations throughout the Continental US (CONUS). One of the significant problems with this design is the placement of the Duty station- there is no clear sightline from that position to the entry, so the Duty personnel cannot provide one of their basic functions, to visually control entry to the building.



(Above, left) Front exterior view of the building; (Above, right) Back exterior view of the building showing break and vending area.



(Above, left) Command Conference room; (Above, right) Upstairs corridor outside of the Conference room. Both images show the detail of improvements the 20th ENG BDE has made to the building.

Currently only approximately 30% of authorized space is provided in this facility. Functions are split between this building and four other facilities.

The separation between buildings means that it is hard to communicate except in meetings with all groups which can create unnecessary meetings and wasted time.

The pitched roof was added approximately 4 years ago. The building does not have an elevator.

The basement level contains the S-1 shop, mechanical room, staff duty, showers, server room, card section, and mail room. The office areas on this floor are cramped. The mail room is

BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY

unnecessary and could function from the annex. An exterior break area with vending machines is located outside the main entrance to this level.

The second floor contains the S-3 shop and conference room.

The third floor contains a large conference room, XO, Commander, Executive Offices and a unisex restroom. The conference room is designed to function around existing columns. The wood wainscot paneling and columns in this room have been stained to match furniture.

20th ENG BDE Annex (Building H5927)

Building H5927 is a +/- 6,000 SF BN HQ based on a standard developed in the 1980's, and is prevalent throughout CONUS.



This facility contains overflow functions for the 20th ENG BDE and the 30th BN. One portion of the building has a higher roofline and contains a large room with 14' high ceiling. This room can be used as one large classroom/meeting room or divided by movable partition.

The building is designed with an open courtyard at the center to allow for more windows.

The S-6 for the BDE has one large room which could be made more efficient with systems furniture. Windows from the S-6 to the corridor allow for a help desk.

The S-4 shop is in a large space with case good furniture. More desk space could be created with smaller systems furniture. A help desk window to assist with customer service would allow the space to function better while not interfering with the administration functions.

More localized copy and print machines would help the different offices function more efficiently. Currently the entire building uses one copy machine.

The 30th Battalion has the S-1, S-2, S-3, S-4, and S-6 grouped together in an open office. The Command Suite functions well with a waiting area and controlled access. The suite also contains a conference with VTC.

The facility contains latrines with male and female showers.

The facility is based on a standard design from the 1980's.

Building H4358

This facility was visited briefly on Thursday following the out-brief discussion. It is an approximately 6,000 square foot Battalion Headquarters based on a standard design used in the 1970's. This building represents one of three of these standard designs at Fort Bragg.

BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY

The facility originally had three classrooms, one of which has now been converted to administration space.

Many of the interior partitions, including both sides of the 4' central corridor are constructed of CMU.

Despite the small size this facility is adequate for its current use. All personnel are housed in this building with no overflow into additional annex spaces.

Next, the FDT visited BDE HQ for the 3rd ID- Building A2356. After lunch, the team visited the Division Support Command (DISCOM) BDE HQ, Building C1140, in the Faith Barracks complex. The image below notes the location of one of the four BN HQs in the Faith Barracks complex.



3rd BDE 82nd (Building A2356)

This is a renovation of an older standard design. The existing building was a one story facility and the renovation consisted of a two story addition. The first floor addition contains the SCIF, BOC, NOC, and S-4. The existing building houses the S-1 and Command Suite. The second floor of the addition contains the S-2, S-3, and S-6. With the addition, the facility can be compared to the Large Standard Design.

The existing facility was 10,000 square feet.

One criticism of the completed building is the lack of private areas for discreet counseling. This is currently an issue throughout the Army.

The second floor is designed with multiple solar tubes in the open office space to bring further light into the spaces.

BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY

2nd BN 505th (Building A2469)

This facility is based on a standard design that was used from approximately the early 1990's to 2006.

The facility has a central corridor with a staff duty desk which has a view of both entrances. The main complaint of this standard design was the dual entrances. Later the standards were revised to have one central entrance with the staff duty desk located adjacent.

Classrooms are located on one wing of the first floor.

The facility functions adequately as a Battalion Headquarters and is not a candidate for renovation.

DISCOM BDE (C1140)



This BDE HQ is based on a standard developed in the 1980's (the same BDE/BN Standard used to develop H5927), and has since had a SCIF and S-2 offices addition added to the south. To accommodate the required BDE HQ functions, the DISCOM BDE HQ also uses space in one of its subordinate BN HQs.

The final two complexes the team visited are in the northeast area of the Ft. Bragg cantonment. These were the 525 Military Intelligence Brigade, the Leland J. Holland Barracks Complex (Building 24528, 24827 and 24227), and the 16th Military Police Brigade (Buildings 25426 and 25112).

BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY



525th MI BDE (Building 24528)



This facility was built in 1997 by the Savannah District.

This facility functions with two additional annexes. The main building contains S1, S3, the Command Suite, conference room and the Chaplain's office. One annex contains the SCIF and S2. The S4 is located above the motor pool and the S6 is also at the motor pool on the opposite side of the maintenance bays.

Two adjacent Battalion Headquarters are based on the same standard design. One of these facilities has 3 classrooms which are shared by both Battalions and the Brigade. The other BN HQ has converted the classrooms into additional office space.

16th MP BDE (Building 25426)



The facility also functions with spaces in an additional annex.

The facility is the same 10,000 square foot standard design as the 525th MI. Located in this building are the S1, S2, S3, S6, Command and Chaplain. Located in the first annex are the S4, a portion of the S1 and storage. A second annex contains the SARC, SHARP, Surgeon, and FRSA.

This Brigade does not have a need for a SCIF.

The S1 has 5 staff in this facility with a further 3 staff in the annex. The S1 space in the main building is in need of a waiting area.

The XO makes the overall decisions about which functions are located in which buildings.

503rd MP BN (Building 25112)

This Headquarters is based on the same standard design as the 2nd BN 505th visited earlier in the day. This facility also functions adequately as a Battalion and would not be a candidate for renovation. This type of standard design could be considered as overflow or supplemental space for and Brigade Headquarters.

This facility has 3 classrooms which are used at least three times a week. It was stated that a fourth classroom would even be useful. The classrooms are configured as one large space with two movable partitions. The space is used predominately as three separate spaces, but the flexibility is useful. The Battalion Commander uses the classrooms frequently because the Command Conference Room is not large enough for all necessary meetings.

Thursday, November 14, Debrief – 0800

Jerry stated that this study and a description of the previous day's site visits will be in the weekly FORSCOM Executive Summary.

Glen presented the master planning overview for Ft. Bragg.

Jerry summarized the site visits from the previous day. Overall the Brigades visited are all short on space and have moved into additional annex space and the Battalions are in better condition with more adequate sizes and are repurposing the classrooms for various uses depending on individual needs.

Tom stated that facilities built fifty or more years ago should not be considered for renovation. The fact that some facilities of this age are still required to be used was discussed. It was decided that even if older facilities must be utilized the army should not invest further money into them at this time.

Glen mentioned that an early Battalion Headquarters standard design used in the 1970's has three examples at Ft. Bragg. This standard was possibly used at other installations during that time period. It was decided that the team would visit one of these examples following the out-brief, building H4358.

It was decided that based on the site visits the following facilities or building types should be studied for renovation:

- 10,000 SF BDE HQ standard design – to be studied with a new construction addition or to be used in conjunction with an existing BN HQ.
- 20th ENG Annex – this standard design should be examined to see if a standalone BDE HQ can be accommodated.
- 20th ENG three story facility – to be studied in conjunction with a BN annex.

The preliminary tiers discussed on 11/12/2013 were reviewed and further revised.

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

FT. CAMPBELL SITE VISIT

DATE: 12/3/13 – 12/4/13

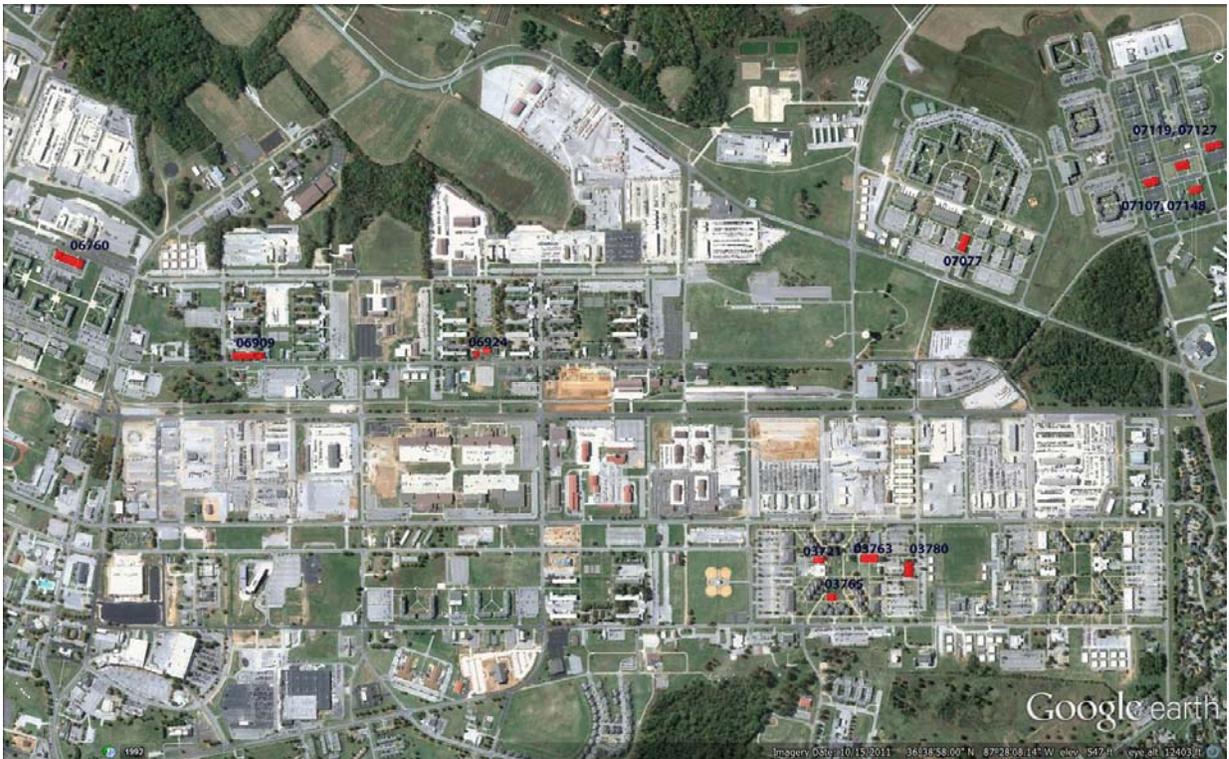
LOCATION: FT. CAMPBELL DPW

MEETING ATTENDEE	POSITION / ORGANIZATION	CONTACT INFO (PHONE / EMAIL)
Tom Brockbank, PE	USACE, Savannah District	Thomas.r.brockbank@usace.army.mil 912-652-5212
Steve Toney, RA	USACE, Savannah District	Steven.v.toney@usace.army.mil 912-652-5212
Laura Yates	DPW, Master Planning Division	Laura.e.yates4.civ@mail.mil 270-798-7427
Travis Steele	DPW, Master Planning Division	Travis.e.steele.civ@mail.mil 270-798-9730
Michael Malham	DPW, Master Planning Division	Michael.j.malham.civ@mail.mil 270-461-4850
Len May	DPW, Master Planning Division	270-798-9720
Sally Castleman	DPW, Master Planning Division	Sally.p.castleman.civ@mail.mil 270-798-7311
Jim Duttweiler	DPW	James.f.duttweiler.civ@mail.mil 270-798-9700
Bob Hilgartner	DPW Master Planning Division	Robert.m.hilgartner.civ@mail.mil 270-798-5242
Brad Goodman	IBCT BDE Engineer	Brad.m.goodman.mil@mail.mil 270-956-3853
Donald Heckathorn	IBCT BDE Engineer NCO	Donald.g.heckathorn.mil@mail.mil 270-956-3353
Fred Williams	DPW	Frederick.l.williams26.civ@mail.mil 270-798-9731
Joe Knight, AIA	Knight Architects, Inc.	jknight@knightarchs.com 770-452-0101
Narra DeMichina, AIA, LEED AP	Knight Architects, Inc.	ndemichina@knightarchs.com 770-452-0101
Matt Steinberg, AIA	Knight Architects, Inc.	msteinberg@knightarchs.com 770-452-0101

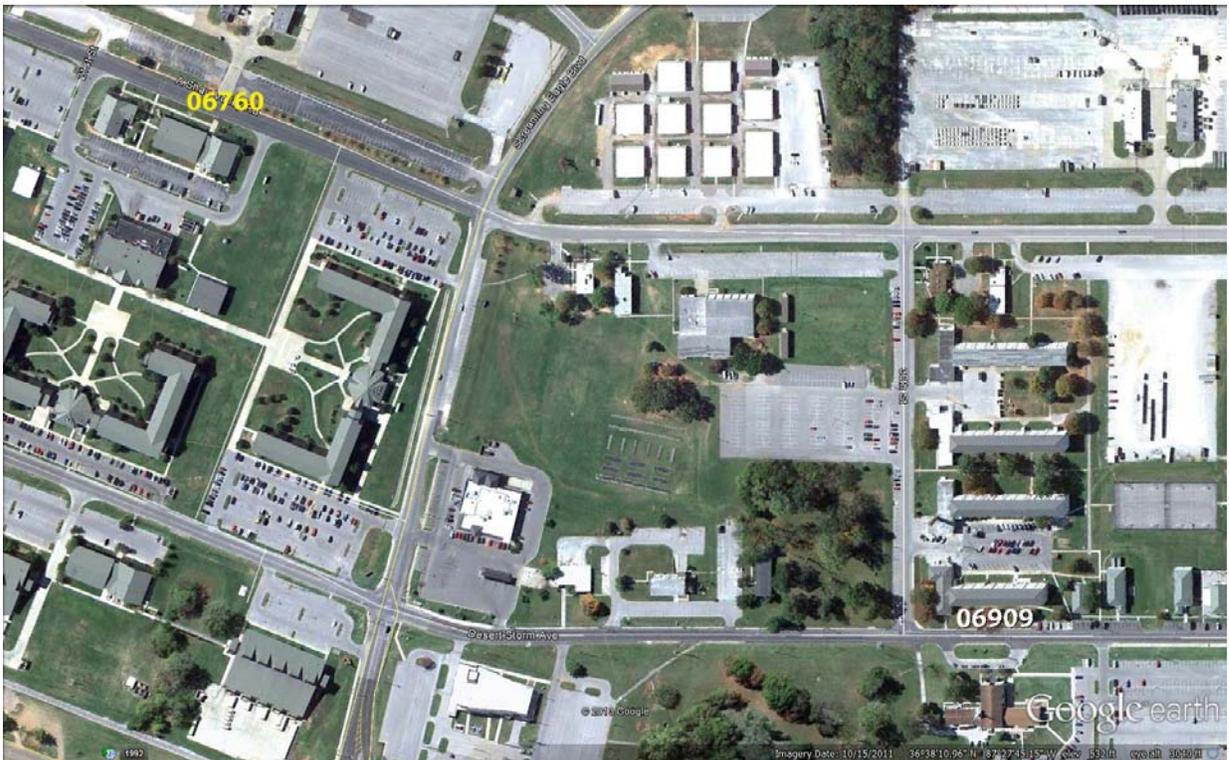
Tom Brockbank summarized the previous COF and TEMF studies and reviewed the results of the kick-off meeting at Fort Bragg for this project. The tier 1, 2 and 3 criteria discussed with FORSCOM were presented and discussed.

BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY

Following this discussion, the team began site visits of BDE and BNs selected by DPW. The following image shows the areas visited throughout Ft. Campbell.



BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY



The above aerial image shows the location of building 6760. This was the first BDE HQ visited by the design team.

Building 6760

This facility serves as the 3rd Brigade Headquarters. The facility was built in 1997 and is approximately 15,000 square feet. The building was originally designed to be a Battalion HQ. Two classrooms serve as one large conference room. The third classroom has been converted to an office suite for FRSA, Chaplain, and Chaplain Assistant. The suite has an exterior entrance which provides privacy for those visiting the Chaplain.

There is not an onsite SCIF or space for classified storage. The Division SCIF is used instead.

The Brigade is split up between six separate buildings. In this facility are the S3 and S2 offices, other functions are in nearby trailers and relocatables.

BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY



Building A6924



The 3rd Battalion, 320th Field Artillery is housed in this facility as well as in three additional buildings. The S2 and S3 offices are in this building. The facility was built in 1962 and is approximately 4,500 square feet. This design represents a recurring building type.

Building 6924



This 2,000 square foot facility is also used by the 3rd Battalion 320th Field Artillery. The S1, XO, Commander and Command Sergeant Major offices are in this building.

BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY

Building 6909



This 1950s hammerhead barracks was renovated to serve as a Battalion HQ. The renovation was completed in 2000 and the budget was approximately \$2M. The renovation was done specifically for this battalion and did not match the BN HQ Standard Design at that time.

The design team noted several empty spaces in touring the facility. It appears that the facility is large for a single Battalion. Based on this observation the design team discussed other options for renovating existing hammerhead facilities. These include 2 BN HQs and 1 BDE HQ.



Building 3780



This facility is approximately 9,900 square feet in size and was built in 1979. A portion of the Bastogne Brigade is housed in this building as well as in six other structures. Some of these other structures are across the street but several are much further away, creating issues with coordination. This building represents a reoccurring standard design, although the layout of this facility has been reconfigured multiple times.

Building 3763



This facility was built in 1978 and is approximately 8,300 square feet in size. The building is divided in half and used by two battalions. The latrines are located in the center, as is the entry. The floor plan is mirrored on either side of this center core. The building type is reoccurring at Ft. Campbell and possibly at other installations.

The facility has a 10' wide center corridor, which creates unnecessary circulation space.

BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY

Building 3721



This facility was originally built as a Dining Facility and has been renovated to be a Battalion HQ. The facility is approximately 6,600 SF and was built in 1983.

Building 3765

This is a 4,000 SF facility built in 1996 (not pictured). The building functions as a portion of a Battalion HQ. The building type appears to be a standalone at Ft. Campbell.



Building 7077

This building is one of five in this area of the installation. This 10,000 SF facility is based on the same standard design as several visited at Ft. Bragg. This group of facilities functions well at Ft. Campbell and it is not necessary to redesign the functional layouts. Each building houses a complete Battalion.

BRIGADE AND BATTALION HQ LEGACY FACILITIES RENOVATION STUDY



(Above, left) Building 7119; (Above, right) Building 7107

Building 7119

This is the first of several buildings visited in this area of the installation. All buildings were built in about 1997. This 9,500 square foot facility was built as a Battalion HQ but currently serves as a portion of a Brigade HQ. The layout has no classrooms. Several spaces have vaulted ceilings, with clerestory windows.

The adjacent building 7148 was not visited by the design team but also houses a part of the Brigade HQ. It has an identical floor plan to 7119.

Building 7127

This 12,000 square foot facility houses the remaining functions of the Brigade HQ. The floor plan is similar to that of 7119 and 7148 but has the addition of classrooms.

The combination of these three facilities provides adequate space for a Brigade Headquarters. There are some issues with lack of adjacency between certain functions but the close proximity of the three buildings makes this feasible.

Building 7107

This facility is similar to 7127 in plan with a slightly shorter main wing. It is used as a Battalion Headquarters. All staff sections are accommodated in this building and the classrooms are used as classroom or meeting room space.

Wednesday, December 4, Debrief – 1500

Fred Williams gave an overview of the Fort Campbell master plan and how these studies will be utilized by the installation.

The buildings toured during the site visits were reviewed. Most buildings were too small to be made more efficient. These small facilities have been customized to the individual users and would not benefit further from being adapted to the standard.

Buildings 3780 and 3763 are reoccurring types at Fort Campbell. These two facilities were selected for study. It was decided that 3780 should be studied as a Brigade HQ with 3763 as an annex. An additional study was recommended with 3780 as a BDE HQ with a new construction annex or addition. These studies were selected for their adaptability to other building types of similar sizes.

The design possibilities for renovation of existing hammerhead barracks were discussed. It was decided that the hammerhead would be studied as a single BDE HQ, 1 BN HQ and 1 COF, and 2 BN HQs.

The building criteria tiers were discussed again. The possibility of changing the SCIF, BOC, and NOC criteria for BDE HQs was discussed as shown below:

Battalion Headquarters

- Tier 1
S1, S2, S3, S4, S6, Reenlist, Command Section, and Command Conference Room
- Tier 2
Showers, 1 Classroom with storage, Chaplain, Assistant Chaplain, FRSA, and Vending area
- Tier 3
2 Classrooms, Break Room (to replace Vending area), and Recycle

Brigade Headquarters

- Tier 1
SCIF based on extra small standard design; S1, S2, S3, S4, S6, Reenlist, Command Section, and Command Conference Room
- Tier 2
SCIF, BOC, and NOC based on small – extra-large standard design; Showers, Chaplain, Assistant Chaplain, FRSA, all remaining Conference Rooms, and Vending area
- Tier 3
Team Rooms, Break Room (to replace Vending area), Recycle

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

PRELIMINARY REVIEW CONFERENCE

DATE: 3/4/14

LOCATION: FT. BRAGG FORSCOM

MEETING ATTENDEE	ORGANIZATION	CONTACT INFO (PHONE / EMAIL)
Tom Brockbank, PE	USACE, Savannah District	Thomas.r.brockbank@usace.army.mil 912-652-5212
Steve Toney, RA	USACE, Savannah District	Steven.v.toney@usace.army.mil 912-652-5212
Jerry Harbison	FORSCOM G-3/5/7 Engineers	Jerry.a.harbison2.civ@mail.mil 910-570-7112
Ruben E. Vasquez	M52, G2	Ruben.e.vasquez.civ@mail.mil 910-394-7883
Scott Boulton	DPW, BOID Ft. Bragg	R.a.boulton.civ@mail.mil 910-396-7736
Sey Nam	DPW, Ft. Bragg	Sey.s.nam.civ@mail.mil 910-907-1760
Larry Poole	ISEC	
Joe Knight, AIA	Knight Architects, Inc.	jknight@knightarchs.com 770-452-0101
Narra DeMichina, AIA, LEED AP	Knight Architects, Inc.	ndemichina@knightarchs.com 770-452-0101
Dwight Luedtke	Sigma Planning Group, Inc.	dwightl@sigmaep.com 540-992-4440

The meeting opened with introductions of attendees.

Tom Brockbank and Narra DeMichina presented a summary of the report and described the individual design schemes. The comments throughout this discussion are detailed below.

Scheme 1

- 1A – Utility spaces such as telecomm, electrical and SIPR in Building 2 need to be located within the design.
- 1B – Move FRSA, Asst. Chaplain, and Chaplain to building 1. Reenlist can possibly stay in building 2. Switch these spaces with Surgeon, Surgeon Storage, Command Judge Advocate, and Op Law J.A.

Scheme 2

- Building 1 was originally a Brigade HQ not a Battalion HQ.
- Add elevator tower with stair to building 1.
- The fact that the 20th ENG Bde does not have a need for a SCIF was discussed.
- Modify Command Suite so that open office area is adjacent to stairs.

Scheme 3

- Shift SZ1 functions within Building 1 to have a private entrance and to not be located within SZ2 open office area.
- Relocate Duty office in Building 2 to be closer to entry.

Scheme 4

- Add note to renovation description that some hammerheads may have full or partial basements to be used for storage.
- Add elevator and stair tower.
- 4A – Change overflow workstations in hammerhead portion of first floor to the BOC or NOC if possible.
- 4B – Limit the amount of classroom spaces and switch scheme to show two Large Battalion HQs.
- 4B – Add restrooms adjacent to shared classroom area on first floor.
- 4C – New study to be included showing a Large Battalion and COF within the barracks.

Overall comments:

- Add additional scheme to document the three (3) building BDE visited at Fort Campbell.
- In many schemes a deficiency of workstations is shown in the Tier Matrix for S6. This deficit should be divided between S2, S3 and S6. It was pointed out that there is a range for personnel in a Small Brigade HQ so some deficiency may not preclude the feasibility of the renovation. It was decided that the Tier Matrix items should be modified so that S2, S3 and S6 are one item and that S1 and S4 should also be grouped together as one item.
- Access and control of the exterior perimeter wall space between SCIF and other functions poses a security concern. It was decided that this should be pointed out within the report and that this can be addressed on a case by case basis for each renovation.
- Expand TSVA note on floor plans to include reference to the standard design.
- An overall note should be added stating that parking capacity should be studied and adapted on a site specific basis.

**BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY**

FINAL REVIEW CONFERENCE

DATE: 5/29/14

LOCATION: FT. BRAGG DPW

MEETING ATTENDEE	ORGANIZATION	CONTACT INFO (PHONE / EMAIL)
Tom Brockbank, PE	USACE, Savannah District	Thomas.r.brockbank@usace.army.mil 912-652-5212
Steve Toney, RA	USACE, Savannah District	Steven.v.toney@usace.army.mil 912-652-5212
Jerry Harbison	FORSCOM G-3/5/7 Engineers	Jerry.a.harbison2.civ@mail.mil 910-570-7112
Ravin L. Howell	HQ USACE / CRST	Ravin.l.howell@usace.army.mil 202-261-7580
Scott Boulton	DPW, BOID Ft. Bragg	R.a.boulton.civ@mail.mil 910-396-7736
Tim Fussell	HQ FORSCOM	Timothy.j.fussell.civ@mail.mil 910-570-5229
Susan Nachtigall	USACE Combat Readiness Support Team (CRST)	Susan.D.Nachtigall@usace.army.mil 217-373-4579
Pat Caraway	HQ IMCOM Public Works, Master Planning Branch	Patrick.H.Caraway.civ@mail.mil 210-466-0526
Duncan Vaughn	USACE, Savannah District	Duncan.g.vaughn@usace.army.mil 912-652-5614
Joe Knight, AIA	Knight Architects, Inc.	jknight@knightarchs.com 770-452-0101
Narra DeMichina, AIA, LEED AP	Knight Architects, Inc.	ndemichina@knightarchs.com 770-452-0101
Dwight Luedtke	Sigma Planning Group, Inc.	dwightl@sigmaep.com 540-992-4440

The meeting opened with introductions of attendees.

Tom Brockbank and Narra DeMichina presented a summary of the report and described the individual design schemes. The comments throughout this discussion are detailed below.

Discussion of SCIF:

- The adequacy of the extra small SCIF, BOC and NOC design schemes was discussed.
- Access and control of the exterior perimeter wall space between SCIF and other functions poses a security concern. It was decided that further clarification about this be added to the General Notes in the Executive Summary.

Telecommunications concerns:

- The general telecommunication requirements were discussed. The minimum dimension for any room is 8' and a telecomm room is required on each floor of all design schemes

Scheme 1

- 1A and 1B – revise S1/S4 area to have only one door. Entry to the suite should require visitors to pass by the Duty office.
- 1B – Switch conference rooms in Building 3 with Support Staff (Assistant Chaplain, Chaplain, FRSA and Reenlist) in Building 1.

Scheme 2

- Fire escape required to provide second exit on first and second floors of Building 1.
- Telecomm room required on all floors of Building 1.
- Relocate door to electrical room in Building 2 so that it is not facing entry.

Scheme 3

- Relocate door to electrical room in Building 1 so that it is not facing entry.
- Reconfigure Support Staff spaces (in Building 2 in Study 3A and Building 3 in Study 3B) to be closer to the main entry of the building.

Scheme 4A

- Add restrooms to first floor.
- Change current Reenlistment office to Duty.
- Move the BOC and NOC server rooms into the large mechanical space. Use the space where the server rooms were located for S2/S3/S6 workstations.
- Stacking mechanical, telecomm, electrical and SIPR required on all floors.

Scheme 4B

- Relocate the restrooms adjacent to the shared classrooms to be within the large mechanical space. Use the space vacated by the restrooms to enlarge the classrooms.
- Reconfigure first floor restroom to show separate male and female restrooms.
- On first and third floors, relocate the Chaplain, Assistant Chaplain, Reenlist and FRSA to be adjacent to the Duty office.
- Add note to explain that the restrooms on the second floor could be reconfigured to allow for a male and female restrooms for each Battalion or that the two Battalions will share restrooms.

Scheme 4C

- Flip admin areas on first floor so that Platoon Offices are adjacent to the TA-50.
- Relocate the Chaplain, Assistant Chaplain, Reenlist and FRSA to be adjacent to the Duty office.
- Change the break room and classroom spaces to be Security Zone 1.

Overall comments:

- Add information about staff accommodated in each design versus the staff range for the comparable standard design.

Fort Drum Addition					
Assembly Cost Estimate					
Watertown NY, 13602					
Description	Unit	Quantity	Cost Per Unit		Total Cost
Continuous footings, 3' - 0" wide x 12" deep, 3 KSF soil bearing capacity, 25 K load	LF	252	\$18.85	/LF	\$4,750.20
Slab on grade, 5" thick, non industrial, reinforced	S.F.	3600	\$8.01	/SF	\$28,828.80
Roof, steel joists, 1.5" 22 ga metal deck, on bearing walls, 25' bay, 17.5" deep, 20 PSF superimposed load, 40 PSF total load	SF Flr.	3600	\$5.68	/SF	\$20,462.40
Concrete block (CMU) wall, regular weight, hollow, 8 x 8 x 16, 2000 PSI, perlite core fill	S.F.	300	\$16.63	/SF	\$4,989.60
Brick veneer wall, standard face, 16 ga x 3-5/8" LB @ 16" metal stud back-up, 1 1/2" rigid insulation, sheathing, batt insulation, air barrier.	S.F.	1900	\$35.63	/SF	\$67,697.00
Windows, aluminum, casements, insulated glass, 4'-5" x 5'-3"	Ea.	6	\$1,596.00	/EA	\$9,576.00
Door, aluminum & glass, without transom, wide stile, double door, hardware, 6'-0" x 7'-0" opening	Opng.	1	\$8,435.00	/EA	\$8,435.00
Door, steel 18 gauge, hollow metal, 1 door with frame, no label, 3'-0" x 7'-0" opening	Opng.	4	\$2,618.00	/EA	\$10,472.00
Formed roofing, zinc-copper alloy, standing seam, 2-1/2" min slope, .032" thick, 1.39 PSF	S.F.	3600	\$36.12	/SF	\$130,032.00
Metal partition, 5/8" fire rated gypsum board face, no base layer, 1-5/8" @ 16", 5/8" regular gypsum board opposite face, no insulation	S.F.	3000	\$6.33	/SF	\$18,984.00
Wood door/metal frame, solid core/flush, oak face, 2'-8" x 6'-8", butt welded frame, 8-3/4"	Ea.	6	\$1,071.00	/EA	\$6,426.00
Hinges, full mortise, low frequency, steel base, 6" x 6" USP	Ea.	30	\$68.60	/EA	\$2,058.00
Locksets, heavy duty cylindrical, keyed, single cylinder function	Ea.	10	\$244.30	/EA	\$2,443.00
Closers, rack & pinion, adjustable backcheck, 3 way mount, hold open arm	Ea.	10	\$422.10	/EA	\$4,221.00
Panic devices, narrow stile, rim mounted, bar, exit only	Ea.	2	\$1,077.30	/EA	\$2,154.60

BRIGADE AND BATTALION HQ
LEGACY FACILITIES RENOVATION STUDY

Description	Unit	Quantity	Cost Per Unit	Total Cost
Painting, interior on plaster and drywall, brushwork, primer & 2 coats	S.F.	6000	\$1.65 /SF	\$9,912.00
Composition flooring, acrylic, 3/8" thick, vinyl base.	S.F.	400	\$12.15 /SF	\$4,860.80
Carpet tile, nylon, fusion bonded, 18" x 18" or 24" x 24", 42 oz, vinyl base.	S.F.	3200	\$8.88 /SY	\$28,403.20
Gypsum board ceilings, 5/8" fire rated gypsum board, painted and textured finish, 1-5/8" metal stud furring, 24" OC support	S.F.	600	\$5.36 /SF	\$3,217.20
Acoustic ceilings, 5/8" fiberglass board, 24" x 24" tile, tee grid, suspended support	S.F.	3000	\$5.89 /SF	\$17,682.00
A/C Package, Air Cooled, Electric Heat, VAV, 10 ton	S.F.	3600	\$13.19 /SF	\$47,476.80
Dry pipe sprinkler systems, steel, ordinary hazard, each additional floor, 5000 SF	S.F.	3600	\$5.71 /SF	\$20,563.20
Overhead service installation, includes breakers, metering, 20' conduit & wire, 3 phase, 4 wire, 120/208 V, 200 A w/circuit breaker	Ea.	1	\$7,385.00 /EA	\$7,385.00
Wall switches, 5.0 per 1000 SF	S.F.	3600	\$1.75 /SF	\$6,300.00
Receptacles and wall switches, 3600 SF, 28 receptacles	S.F.	3600	\$3.65 /SF	\$13,154.40
Fluorescent fixtures, type D, 48 fixtures per 3000 SF	S.F.	3600	\$13.69 /SF	\$49,291.20
Lawn, flat area, sod, bluegrass, small commercial	M.S.F.	10	\$2,097.20 /MSF	\$20,972.00
Strip topsoil and stockpile 6 inch deep, 200' haul, 1101-4000 S.Y., by dozer	S.Y.	2000	\$0.78 /SY	\$1,568.00
Electric power feed 600 Amp, 4' deep, 100', including excavation, backfill, concrete & compaction	Ea.	1	\$20,785.80 /EA	\$20,785.80
SubTotal before markup				\$573,101.20
Subtotal Markup for AT/FP	5.0%	\$	28,655.06	
Subtotal Markup for GC Military Installation access	15.0%	\$	85,965.18	
Subtotal Markup for LEED requirements	10.0%	\$	57,310.12	
Total cost				\$745,031.56
Cost per SF (3600 SF)				\$206.95