



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

**DEPARTMENT OF THE ARMY  
FACILITIES STANDARDIZATION PROGRAM**

**COMPANY OPERATIONS  
FACILITIES  
(COF)  
LEGACY FACILITIES  
RENOVATION STUDY**

February 26, 2013



**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

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# COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY

## SECTION 1 EXECUTIVE SUMMARY

### I. **Statement of Purpose**

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

1. Bring these Legacy Facilities as close as possible to the current standard design;
2. Provide a standardized approach to renovating each type of legacy facility;
3. Achieve a longer useful life for the legacy COF facilities, and;
4. Accomplish this within facilities sustainment, restoration and modernization (SRM) funding limitations.
5. 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.

**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:

1. Determine prototypical types of legacy COFs that are suitable for renovation;
2. Develop a prioritized list of functional/operational requirements predicated on those requirements documented in the COF Standard Design; i.e. a Decision Tier, listing functional spaces a renovated COF is to include. Identify Tier 1 functions as the minimum functional/operational requirements a renovated COF 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 COF Standard Design and indicate their priority/consequence for incorporation via the SRM process;
3. Develop floor plan solutions for each type of legacy COF selected for review.

### II. **How legacy COFs were selected for study:**

The six facility types shown in this study were selected based on site visits at Ft. Hood and Ft. Bragg. After visiting and reviewing eight (8) legacy COF types at Ft. Hood, TX and three (3) legacy COF types at Ft. Bragg, NC, the five (5) COFs chosen for review were based on:

1. Discussions with Master Planners John Burrow (Ft. Hood) and Camille Cole (Ft. Bragg) regarding which legacy COFs they felt were most appropriate for review and evaluation;
2. Study of which legacy COFs 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.
3. Legacy COFs which already meet many basic criteria of the current COF Standard Design were not chosen for further review;

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### III. **Decision Tier:**

The Decision Tier was developed by reviewing the Army mandatory features for COFs as documented in the Army Standard and Standard Design, coordinating those requirements with HQ IMCOM, ARSTAF representatives, FORSCOM, USACE CoS, and military users and DPW staffs at Ft. Hood, TX and Ft. Bragg, NC to determine the following prioritized list of functions for legacy COF renovation:

#### Tier 1 Functions (Mandatory):

1. Open, flexible design, must be reconfigurable without altering the building structure.
2. Accommodation for all Admin Module functions, including the command group offices, platoon offices, training room and conference room.
3. Consolidated showers and latrines. Fixture count and male/female ratio will be in accordance with COF Standard Design.
4. All Readiness Module Supply Bay storage requirements including the arms vault, non-sensitive secure storage, NBC, communications, and unit storage areas, sized and located in accordance with COF Standard Design.
5. Ancillary building support spaces (mechanical, electrical, communications, SIPR and janitor rooms, vending area).

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

1. TA-50 storage area for 100% of Company strength.

#### Tier 3 Functions (Desirable if practicable):

1. TA-50 interior layout space for 50% of Company strength.
2. Covered exterior hardstand.

### IV. **Organization of this Report:**

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

This report is comprised of six sections, each relating to a specific legacy COF, and an Appendix.

Each chapter is organized as follows:

1. Description of physical characteristics of each legacy COF building;
2. Listing of building numbers for each COF type at Ft. Hood, TX and Ft. Bragg, NC;
3. Description of renovation design approach;
4. Tier Matrix, showing which functions each renovated COF can achieve;
5. Space Program, showing specific areas achieved, compared to Standard Design COF;
6. 11 X 17 drawing of legacy COF, existing condition;
7. 11 X 17 drawing of renovation design scheme for legacy COF.

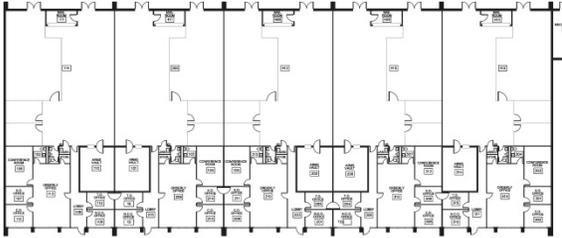
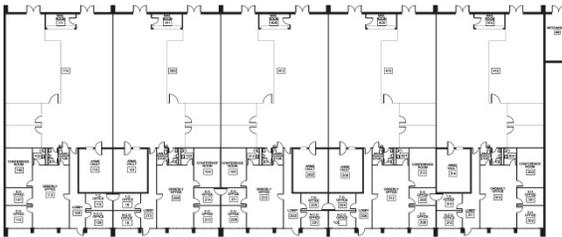
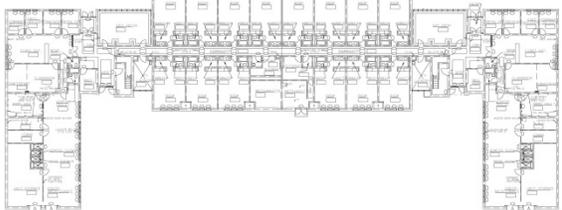
**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

8. Appendices:

- TA-50 Equipment Building Floor Plans
- Site-specific options for each COF, showing exterior covered hardstand area that can be sited for each specific building;
- Meeting and site visit notes.

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

**DESCRIPTION OF COF STUDIES**

	<p>Scheme A1 VOLAR Legacy COF. Renovate to four (4) 100 PN COF's with a central core for shared latrines and ancillary.</p>
	<p>Scheme A2 VOLAR Legacy COF. Renovate to Two (2) 175 PN COF's with a central core for shared latrines and ancillary.</p>
	<p>Scheme B1 Angled Entry Legacy COF. Renovate to three (3) 100 PN COF's with two areas for shared latrines.</p>
	<p>Scheme C1 Split Level Legacy COF. Renovate to two (2) 100 PN COF's with central area for shared latrines.</p>
	<p>Scheme D1 Square Legacy COF. Renovate to two (2) 100 PN COF's with central area for shared latrines.</p>
	<p>Scheme E1 Barracks Legacy COF. Renovate to Renovate to two (2) 125 PN COF's with central area for shared latrines.</p>

# COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY

## COF A1

COF A1 is a notional renovation scheme for the building commonly known as the VOLAR COF. These buildings appear both at Ft. Hood, TX and Ft. Bragg, NC.

The basic building measures 104' in depth (front- to back), with demising walls at 48' OC. The VOLAR COFs are built in configurations with (3), (4) and (5) 48'-wide bays, resulting in buildings from 144' to 240' in width. The image below right shows the typical VOLAR – this one is at Ft. Bragg.

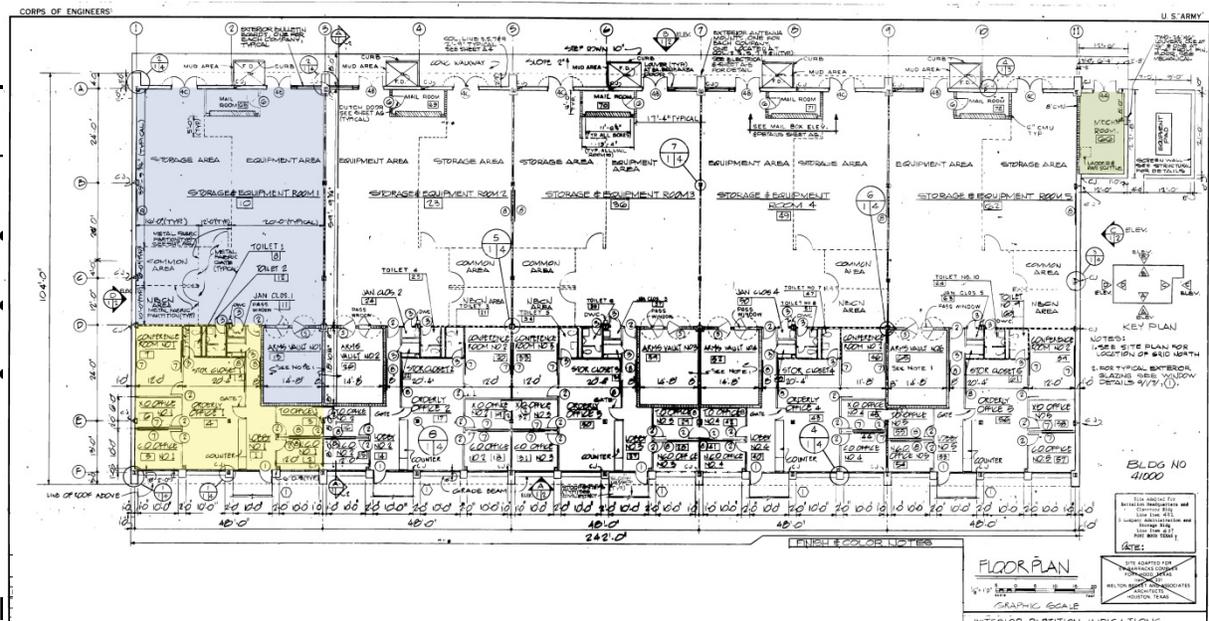
The VOLAR buildings are constructed with steel columns and bar joists; the support beams are at 48'-0" O.C., on the demising walls. Bar joists supporting the roof span the 48'-0" width between demising walls (left-right direction in floor plan below). Each bay accommodates one COF.

A small mechanical room (green area on right side of floor plan image below) is built at one end of the building. The yellow tone shows the current location and extent of the Administration area. The blue tone shows the current Readiness Bay area of the COF.



**Ft. Hood:** 19 VOLAR buildings were identified at Ft. Hood. Of these, 12 have (5) COF units; the other 6 have (4) COF Units and 1 has (3) COFs. Over half have been renovated between 2006 and 2009.

**Ft. Bragg:** 9 VOLAR buildings were identified at Ft. Bragg. Of these, 2 have (5) COF units; 6 have (4) COF Units and 1 has (3) COF Units.



**COMPANY OPERATIONS FACILITIES (COF)  
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The following tables provide information on existing VOLAR COFs at Ft. Hood, TX, and Ft. Bragg, NC:

FT. HOOD, TEXAS VOLAR COFS						
Building No.	Year Built	Area		Major Renovation Performed	Type of COF	Number of COF Units
12020	1-Jul-83	23874	SF	2006	VOLAR	5
31011	1-Jul-83	25480	SF	No Major Renos	VOLAR	5
41000	1-Jul-84	22791	SF	No Major Renos	VOLAR	5
29004	1-Jul-75	20228	SF	No Major Renos	VOLAR	4
29007	1-Jul-75	23787	SF	2010	VOLAR	5
29011	1-Jul-75	18899	SF	No Major Renos	VOLAR	4
29016	1-Jul-75	18899	SF	No Major Renos	VOLAR	4
39020	1-Jul-77	23788	SF	2008	VOLAR	5
39021	1-Jul-77	23788	SF	2007	VOLAR	5
39022	1-Jul-77	23788	SF	2007	VOLAR	5
39042	1-Jul-78	23576	SF	2007	VOLAR	5
39044	1-Jul-78	23520	SF	2007	VOLAR	5
39050	1-Jul-78	24344	SF	2007	VOLAR	5
39054	1-Jul-78	23576	SF	No Major Renos	VOLAR	5
87004	1-Jul-75	19703	SF	2009	VOLAR	4
87011	1-Jul-74	22196	SF	2009	VOLAR	5
87014	1-Jul-74	14436	SF	No Major Renos	VOLAR	3
87016	1-Jul-74	23798	SF	No Major Renos	VOLAR	4
87019	1-Jul-75	19092	SF	No Major Renos	VOLAR	4

FT. BRAGG, NC VOLAR COFS						
Building No.	Year Built	Area (approx.)		Major Renovation Performed	Type of COF	Number of COF Units
H4440	The date on drawings for H5240 is 15 May, 1974	18230	SF	Not known, but H5240 had not had renovations other than self-help, plywood partitions etc.	VOLAR	4
H5057		22800	SF		VOLAR	5
H5240		18230	SF		VOLAR	4
H5757		18230	SF		VOLAR	4
H6262		13675	SF		VOLAR	3
H6308		22800	SF		VOLAR	5
H6418		18230	SF		VOLAR	4
H6612		18230	SF		VOLAR	4
H6715		18230	SF		VOLAR	4

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**Description of Renovation**

In a (5) bay legacy VOLAR, design scheme A1 maintains 4 out of 5 (80%) of the COFs that currently exist within a 5-bay VOLAR legacy COF. The central bay is modified in the A1 renovation design to incorporate all basic ancillary functions as well as the latrines and dedicated conference rooms. The remaining bays are designed to accommodate the Administration functions at the front of the building, with Readiness Bay functions to the rear. A covered entry is added at the front to facilitate circulation from the Admin. areas to the conference rooms and latrines located in the central core.

The (4) bay and (3) bay legacy VOLAR COFs can be renovated per the A1 scheme. One bay will be required for core functions; each remaining bay can each accommodate (1) 100 PN COF.

**Tier Matrix**

The matrix below illustrates the tier criteria achieved for the A1 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.

<b>TIER MATRIX, COF A1</b>			
<b>TIER 1</b>	Open, flexible design, must be reconfigurable without altering the building structure.	<b>X</b>	
	Accommodation for all Admin Module functions, including the Command group offices, platoon offices, training room and conference room.	<b>X</b>	
	Consolidated showers and latrines. Fixture count and male/female ratio will be in accordance with COF Standard Design.	<b>X</b>	
	Accommodation for all Readiness Module supply bay storage requirements including the arms vault, non-sensitive secure storage, NBC, communications, and unit storage areas.	<b>X</b>	
	Ancillary building support spaces (mechanical, electrical, communications, SIPR and janitor rooms, vending area).	<b>X</b>	
<b>TIER 2</b>	TA-50 Locker Area for 100% of Company Strength	<b>X</b>	TA-50 Storage lockers are provided for 100 personnel in each of the (4) COFs
<b>TIER 3</b>	TA-50 interior layout space for 50% of Company strength.		Possibly achievable on a case-by-case basis (depending on site).
	Covered Hardstand		Possibly achievable on a case-by-case basis (depending on site)- See Appendix 2.

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

The following matrix identifies the size of each function in the 100 PN COF Standard Design, and illustrates how the renovation design scheme compares, showing percentage of space provided.

<b>AREA COMPARISON- STANDARD DESIGN 100 PN COF VS A1</b>				
<b>ADMINISTRATION AREA</b>	<b>SPACE DESIGNATION</b>	<b>100 PN COF (SF REQUIRED)</b>	<b>SCHEME A1 (SF PROVIDED)</b>	<b>% of COF Standard NSF Achieved</b>
	STORAGE ROOM	40	40	100%
	XO	150	127 <sup>1</sup>	85%
	1SG	150	127 <sup>1</sup>	85%
	CO	150	127 <sup>1</sup>	85%
	TRAINING ROOM	150	127 <sup>1</sup>	85%
	PLATOON OFFICES (SHARED) 4 EA. @ 150 SF	600	600	100%
	TLT	0	51	N/A
	COPY/RECYCLING	10	10	100%
	CONFERENCE ROOM (1 REQ'D)	310	312	101%
	Subtotal	1,560	1,521	98%
	*Circulation and Internal walls	840	177	
	<b>TOTAL ADMIN AREA</b>	<b>2,400</b>	<b>1,698</b>	<b>71%</b>
<b>READINESS MODULE</b>	<b>SPACE DESIGNATION</b>	<b>100 PN COF (REQUIRED)</b>	<b>SCHEME A1 (PROVIDED)</b>	<b>% of COF Standard NSF Achieved</b>
	SECURE STORAGE NON-SENSITIVE	166	160	96%
	ARMS VAULT	400	334	84%
	NBC STORAGE	94	87	93%
	COMMUNICATIONS STO	94	96	102%
	UNIT STORAGE	367	288	78%
	TA-50 LOCKERS, AISLE SPACE	2,580	1,873	73%
	Subtotal	3,701	2,838	77%
	*Circulation/Internal walls		82	
	<b>TOTAL READINESS MODULE</b>		<b>2,920</b>	<b>79%</b>

<sup>1</sup> The sizes of the XO, 1SG, CO and Training Room equate to or exceed allowances in AR 405-70.

**COMPANY OPERATIONS FACILITIES (COF)  
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LATRINES, ANCILLARIES	SPACE DESIGNATION	400 PN COF <sup>2</sup>	SCHEME A1 (PROVIDED)	% of COF Standard GSF Achieved
	Latrines/Showers	969	968	100%
	Comm., Elec., Mech., SIPR, Jan., Vending, Recycle, Janitor, Int. Walls, Circulation	2,478	2,072	84%
	<b>TOTAL, LATRINES, ANCILLARIES</b>	<b>3,447</b>	<b>3,040</b>	<b>88%</b>
TIER THREE REQUIREMENTS	SPACE DESIGNATION	100 PN COF (REQUIRED)	SCHEME A1 (PROVIDED)	% of COF Standard NSF Achieved
	TA-50 EQUIPMENT LAYOUT AREA (50% OF 100 PN @40 SF)	2,000	0	0%
	EXTERIOR COVERED HARDSTAND- EQUIPMENT MAINTENANCE/LAYOUT SPACE/WEAPONS CLEANING	1,680	Where possible, provide 35' W X 48' <sup>3</sup> L canopy min. 20' clear from rear of COF	

<sup>2</sup> Common Latrine area is calculated as follows (\*per 2012 International Building Code):

Building Occupancy:	Business*
Building population:	400 persons*
Water closets required:	9* (1 per 25 persons for first 50, then 1 per 50 for remaining population). Or, 7 water closets, 2 urinals.
Showers required:	9 (Must serve 25% of building population (100 PN) in a 90 min period. Using 7 ½ min for each shower, each stall accommodates 12 persons. (100 / 12) = 8.33)
Lavatories required:	6* (1 per 40 persons for first 80, then 1 per 80 for remaining population)
Lockers required:	27 (ratio of 3:1 lockers-to-showers per COF Standard Design).

Based on the information above, the Standard Design latrines area is as shown at right. The Utility (Comm., Elec., etc.) area is measured based on measurement of square footage area of standard 2-company COF.

<sup>3</sup> The 48'-width is used because many of the legacy COF buildings use a 48' bay spacing. The 35' dimension is used for efficient 5' X 8' layout spacing- see Appendix 2, page 46.

400 PN COF					
CODE	SPACES		SF	=	TOTAL SF
Showers	9	@	20	SF	180
WC	7	@	20	SF	140
Urinal	2	@	10	SF	20
Lav.	6	@	15	SF	90
Lockers	27	@	4	SF	108
Foyer	2	@	54	SF	108
Subtotal					646
Internal Circulation (50%)					323
<b>Restroom Total:</b>					<b>969</b>

1

2

3

4

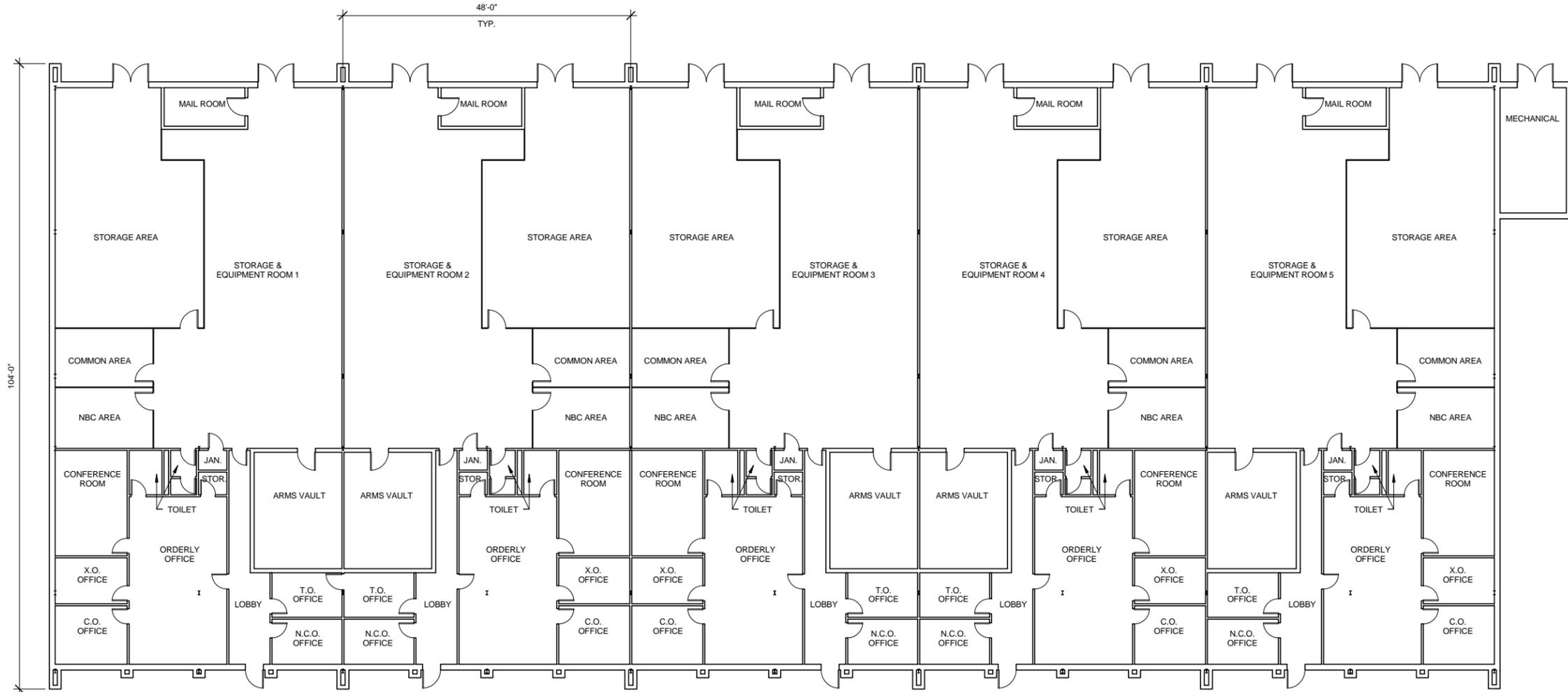
5

D

C

B

A



1  
A1-100

EXISTING FLOOR PLAN - VOLAR COF

3/32" = 1'-0"



SCALE: 3/32"=1'-0" (22X34)  
SCALE: 3/64"=1'-0" (11X17)



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ISSUE BY:	MARK
ISSUE DESCRIPTION:	CORRECTED FINAL SUBMITTAL

DESIGN BY:	LSK
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CHECK BY:	LSK
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ISSUE DATE:	FEB 2013
ISSUE BY:	LSK
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DESIGN BY:	LSK
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ISSUE DATE:	FEB 2013
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SAVANNAH DISTRICT

KNIGHT ARCHITECTS, INC.  
220 ATLANTA, GEORGIA 30341  
TEL: 770-462-0101

COF NOTIONAL STANDARD  
DESIGNS

EXISTING FLOOR PLAN - SCHEME  
A1

SHEET IDENTIFICATION  
A1-100  
SHEET 11 OF 97

DATE	2/26/2013
APPROVED	
DESCRIPTION	
MARKS	
CORRECTED FINAL SUBMITTAL	

ISSUE DATE:	FEB 2013
SOLICITATION NO.:	
CONTRACT NO.:	
FILE NUMBER:	
DESIGN BY:	LSK
CHK BY:	CKK
DATE:	3/22/13
FILE NAME:	file name
SIZE:	27" x 34"

**US ARMY CORPS OF ENGINEERS**  
SAVANNAH DISTRICT

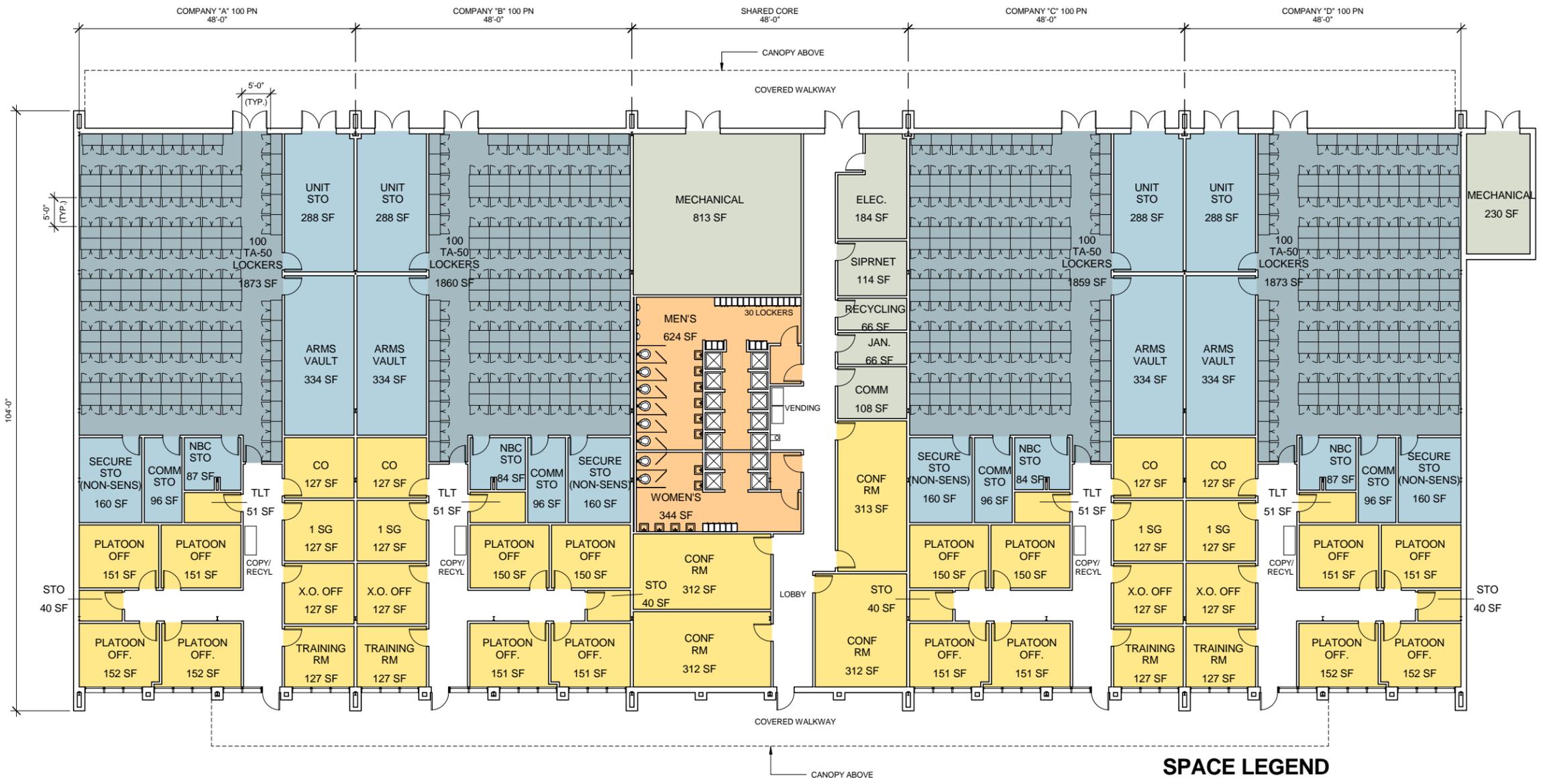
KNIGHT ARCHITECTS, INC.  
2200 ATLANTA ROAD, SUITE 300  
ATLANTA, GEORGIA 30341  
TEL: 770-452-0101

**COF NOTIONAL STANDARD DESIGNS**

**FLOOR PLAN - SCHEME A1**  
**BUILDINGS 4100 (HOOD)**  
**& H-5240 (BRAGG)**

**SHEET IDENTIFICATION**  
**A1-101**

SHEET 12 OF 97



**SPACE LEGEND**

- ADMIN
- LATRINES
- MAINTENANCE/STORAGE
- READINESS
- UTILITY

**1 FLOOR PLAN - RENOVATION DESIGN A1**

A1-101 3/32" = 1'-0"

NOTE: ROOM AREAS SHOWN ON FLOOR PLANS ARE GENERATED BY REVIT AND MAY DIFFER SLIGHTLY FROM AREAS SHOWN ON THE AREA COMPARISON MATRIX.



A A1-101-XXX

**COMPANY OPERATIONS FACILITIES (COF)  
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**COF A2**

COF A2 is a notional renovation scheme for the building commonly known as the VOLAR COF. Please see the COF A1 section of this report for background information on the legacy VOLAR buildings at Ft. Hood, TX and Ft. Bragg, NC.

**Description of Renovation**

The A2 renovation design maintains 2 out of 5 (40%) of the COFs that currently exist within a 5-bay VOLAR legacy COF. While this amount of displacement is not preferable, the design scheme is intended to show how to accommodate larger COFs within the legacy VOLAR building shell. The central COF space is modified in the A2 renovation design to incorporate all basic ancillary functions as well as the latrines and dedicated conference rooms. The remaining bays are designed to accommodate the Administration functions at the front of the building, with Readiness Bay functions to the rear. A covered walkway is provided at the front of the building for the two COFs.

**Tier Matrix- A2**

The matrix below illustrates the tier criteria achieved for the A2 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.

<b>TIER MATRIX, COF A2</b>			
<b>TIER 1</b>	Open, flexible design, must be reconfigurable without altering the building structure.	<b>X</b>	
	Accommodation for all Admin Module functions, including the Command group offices, platoon offices, training room and conference room.	<b>X</b>	
	Consolidated showers and latrines. Fixture count and male/female ratio will be in accordance with COF Standard Design.	<b>X</b>	
	Accommodation for all Readiness Module supply bay storage requirements including the arms vault, non-sensitive secure storage, NBC, communications, and unit storage areas.	<b>X</b>	
	Ancillary building support spaces (mechanical, electrical, communications, SIPR and janitor rooms, vending area).	<b>X</b>	
<b>TIER 2</b>	TA-50 Locker Area for 100% of Company strength	<b>X</b>	TA-50 Storage lockers are provided for 175 personnel in each of the (2) COFs
<b>TIER 3</b>	TA-50 interior equipment maintenance & layout space for 50% of Company strength.		Possibly achievable on a case-by-case basis (depending on site).
	Covered exterior hardstand		Possibly achievable on a case-by-case basis (depending on site). See Appendix 2.

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

The following matrix identifies the size of each function in a 175 PN COF Standard Design (see footnote<sup>1</sup> at bottom of table), and illustrates how the renovation design scheme compares, showing percentage of space provided.

<b>AREA COMPARISON- STANDARD DESIGN 175 PN COF<sup>1</sup> VS. A2</b>				
<b>ADMINISTRATION AREA</b>	<b>SPACE DESIGNATION</b>	<b>175 PN COF (SF REQUIRED)</b>	<b>SCHEME A2 (SF PROVIDED)</b>	<b>% of COF Standard NSF Achieved</b>
	STORAGE ROOM	40	55	138%
	XO	150	150	100%
	1SG	150	150	100%
	CO	150	150	100%
	TRAINING ROOM	150	150	100%
	PLATOON OFFICES (SHARED) 4 EA. @ 150 SF	600	600	100%
	TOILET	0	0	N/A
	COPY/RECYCLING	10	15	150%
	CONFERENCE ROOM W/ STORAGE	310	392	126%
	Subtotal	1,560	1,662	107%
	*Circulation and Internal walls	840	793	
	<b>TOTAL ADMIN AREA</b>	<b>2,400</b>	<b>2,455</b>	<b>102%</b>
<b>READINESS MODULE</b>	<b>SPACE DESIGNATION</b>	<b>175 PN COF (REQUIRED)</b>	<b>SCHEME A2 (PROVIDED)</b>	<b>% of COF Standard NSF Achieved</b>
	SECURE STORAGE NON-SENSITIVE	405	436	108%
	ARMS VAULT	550	580	105%
	NBC STORAGE	175	175	100%
	COMMUNICATIONS STORAGE	175	176	101%
	UNIT STORAGE	680	703	103%
	TA-50 LOCKERS, AISLE SPACE	4,187	5,078	121%
	Subtotal	6,172	7,148	116%
	*Circulation/Internal walls		528	N/A
	<b>TOTAL READINESS MODULE</b>		<b>7,676</b>	<b>124%</b>
<sup>1</sup> 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.				

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

	<b>SPACE DESIGNATION</b>	350 PN COF <sup>2</sup>	SCHEME A2 (PROVIDED)	% of COF Standard NSF Achieved
<b>LATRINES, ANCILLARIES</b>	Latrines/Showers	891	967	109%
	Comm., Elec., Mech., SIPR, Jan., Vending, Recycle, Janitor, core circulation and interior walls	2,478	2,135	86%
	<b>TOTAL, LATRINES, ANCILLARIES</b>	<b>3,369</b>	<b>3,102</b>	<b>92%</b>
	<b>SPACE DESIGNATION</b>	175 PN COF (REQUIRED)	SCHEME A2 (PROVIDED)	% of COF Standard NSF Achieved
<b>TIER THREE REQUIREMENTS</b>	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 = 2,330 SF; 200 PN = 2,990 SF). Average = <b>2,660 SF</b> .		Where possible, provide 35' W X 72' L <sup>3</sup> canopy min. 20' clear from rear of COF.	

<sup>2</sup> Common Latrine area is calculated as follows (\*per 2012 International Building Code):

Building Occupancy: Business\*

Building population: 350 persons\*

Water closets required: 8\* (1 per 25 persons for first 50, then 1 per 50 for remaining population). Or, 6 water closets, 2 urinals.

Showers required: 8 (Must serve 25% of building population (88 PN) in a 90 min period. Using 7 ½ min for each shower, each stall accommodates 12 persons. (88 / 12) = 7.33)

Lavatories required: 6\* (1 per 40 persons for first 80, then 1 per 80 for remaining population)

Lockers required: 24 (ratio of 3:1 lockers-to-showers per COF Standard Design).

350 PN COF					
CODE	SPACES		SF	=	TOTAL SF
Showers	8	@	20	SF	160
WC	6	@	20	SF	120
Urinal	2	@	10	SF	20
Lav.	6	@	15	SF	90
Lockers	24	@	4	SF	96
Foyer	2	@	54	SF	108
Subtotal					594
Internal Circulation (50%)					297
Restroom Total:					<b>891</b>

Based on the information above, the Standard Design latrines area is as shown at right: The Utility area (Comm., Elec., etc) is measured based on measurement of square footage area of standard 2-company COF.

<sup>3</sup> See Appendix 2, page 46 for exterior covered hardstand configuration.

1

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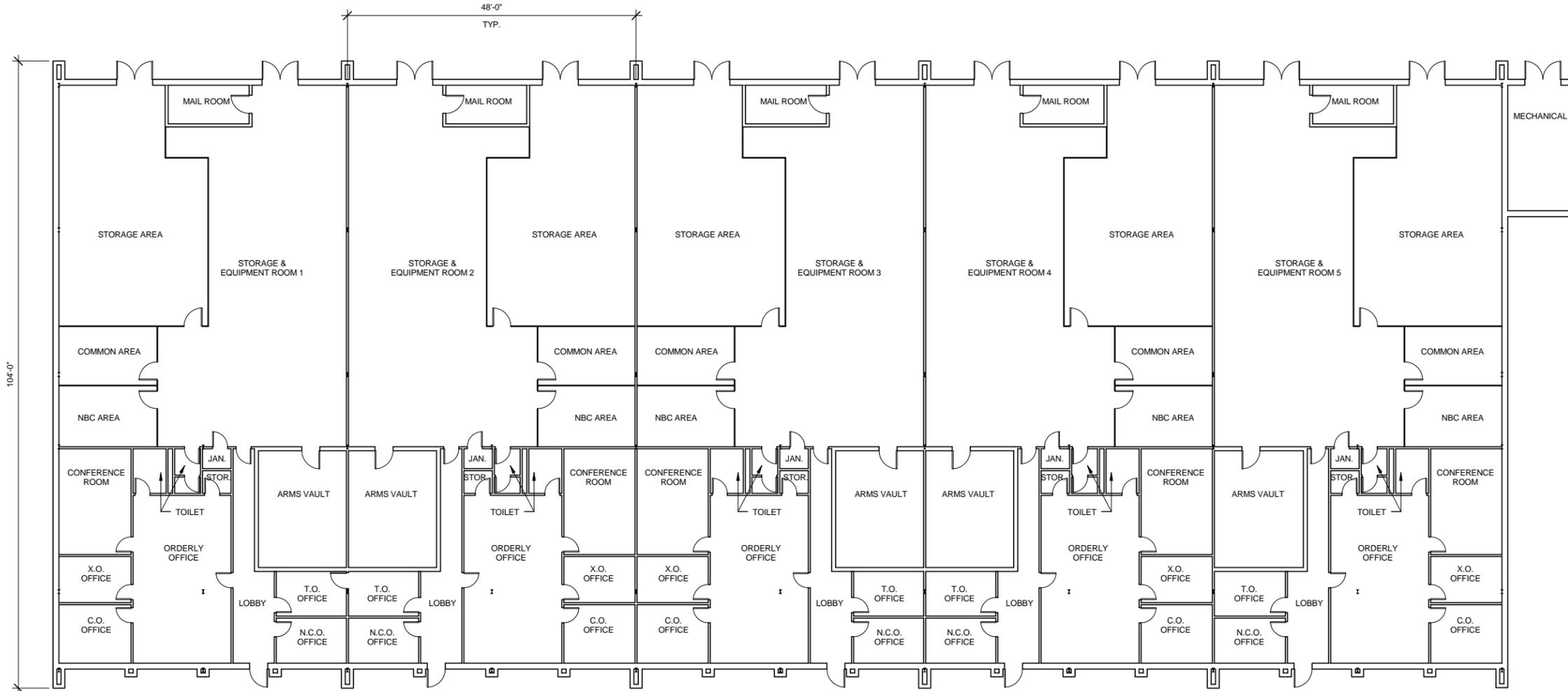
5

D

C

B

A



1  
A2-100

EXISTING FLOOR PLAN - VOLAR COF

3/32" = 1'-0"



SCALE: 3/32"=1'-0" (22X34)  
SCALE: 3/64"=1'-0" (11X17)



ISSUE DATE:	2/26/2013	APPROVED:	
ISSUE BY:		DATE:	
DESIGN BY:		DESCRIPTION:	
DRAWN BY:		MARKS:	
CHECK BY:		CORRECTED FINAL SUBMITTAL:	
DATE:			

DESIGN BY:	LSK	CHECK BY:	CKK
DRAWN BY:	LSK	DATE:	1/30/2013
ISSUE DATE:	FEB 2013	CONTRACT NO.:	
ISSUE BY:		FILE NUMBER:	
FILE NAME:		SIZE:	27' x 34'

US ARMY CORPS OF ENGINEERS  
SAVANNAH DISTRICT  
KNIGHT ARCHITECTS, INC.  
2200 ATLANTA AVENUE  
ATLANTA, GEORGIA 30341  
TEL: 770-462-0101

COF NOTIONAL STANDARD  
DESIGNS  
EXISTING FLOOR PLAN - SCHEME  
A2

SHEET IDENTIFICATION  
A2-100  
SHEET 16 OF 97

A2-100-

1

2

3

4

5

D

C

B

A



**SPACE LEGEND**

- ADMIN
- LATRINES
- MAINTENANCE/STORAGE
- READINESS
- UTILITY

**1 FLOOR PLAN - RENOVATION DESIGN A2**  
A2-101 3/32" = 1'-0"

NOTE: ROOM AREAS SHOWN ON FLOOR PLANS ARE GENERATED BY REVIT AND MAY DIFFER SLIGHTLY FROM AREAS SHOWN ON THE AREA COMPARISON MATRIX.

16 12 8 0 16

SCALE: 3/32"=1'-0" (22X34)  
SCALE: 3/64"=1'-0" (11X17)



ISSUE DATE:	2/26/2013
DESIGN BY:	
DRAWN BY:	
CHECKED BY:	
DATE:	
DESCRIPTION:	

DESIGN BY:	LBK	ISSUE DATE:	FEB 2013
DRAWN BY:	NSP	SOLICITATION NO.:	
CHECKED BY:	CKK	CONTRACT NO.:	
DATE:		FILE NUMBER:	
DESIGNER:	US ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT	FILE NAME:	
ARCHITECT:	KNIGHT ARCHITECTS, INC. 220 N. W. AVENUE ATLANTA, GEORGIA 30301 TEL: 770-462-0101	FILE NUMBER:	

US ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT

COF NOTIONAL STANDARD DESIGNS

FLOOR PLAN - SCHEME A2

'VOLAR' BUILDINGS 4100, 29016 (HOOD) & H-5240 (BRAGG)

SHEET IDENTIFICATION

A2-101

SHEET 17 OF 97

A2-101-

# COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY

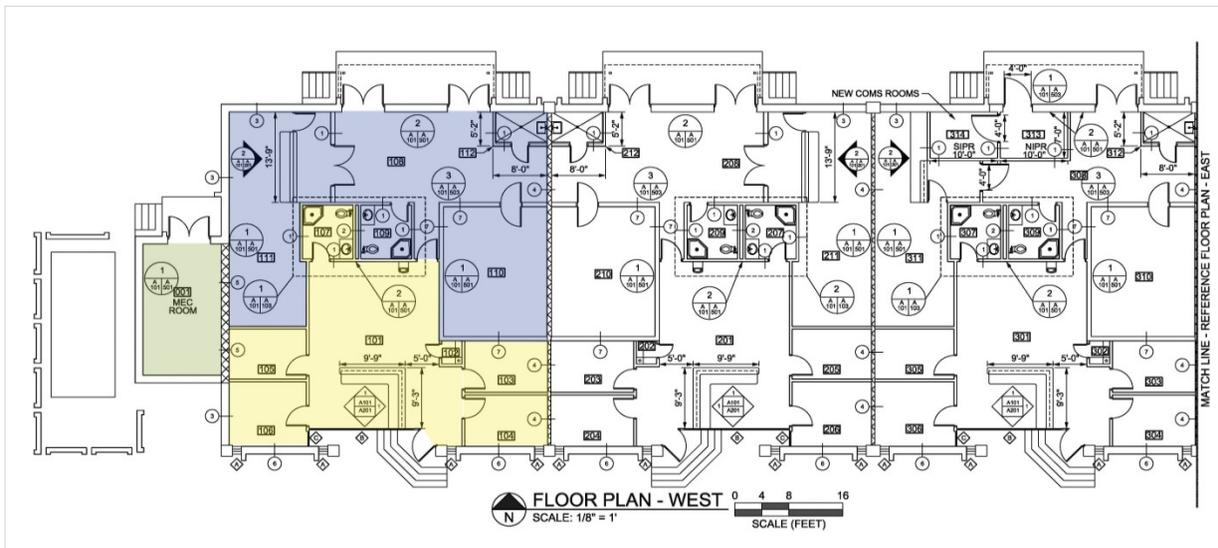
## COF B1

COF B1 is a notional renovation scheme for the building that our team refers to as the 'Angled Entry' COF. Two of these buildings appear at Ft. Hood, TX. This building was chosen for renovation study because it is similar in size to other legacy COFs such as the 'Split Level' (COF C1, pg. 24) and the Square (COF D1, pg. 31) COFs. Similar to the VOLAR COF, the Angled Entry COF has 48'-wide bays. The renovation study conducted on this facility may assist in the renovation design of other non-standard legacy COFs.



The basic building measures 53'-8" in depth (front- to back). Building 34001 includes (6) 48'-0" wide bays, each of which currently accommodate one COF. Building 27008 includes (8) 48' bays and is 302'-0" long, including end walls.

In the current configuration, the buildings accommodate the administration area (yellow in floor plan image below) at the street side (front), with Readiness Bay (blue) opening on to a 4'-0" elevated dock at the rear hardstand area. A small mechanical space (green) is located at one end of each building.



FT. HOOD, TEXAS ANGLED ENTRY COFS						
Building No.	Year Built	Area		Major Renovation Performed	Type of COF	Number of COF Units
27008	1-Jul-75	20887	SF	No Major Renos	Angled Entry	8
34001	1-Jul-75	15810	SF	No Major Renos	Angled Stairs	6

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

**Description of Renovation**

The B1 renovation design accommodates Tier 1 functions for one COF, as indicated in the Tier Matrix below, in the area currently occupied by two COFs, resulting in 50% retention.

**Tier Matrix**

The matrix below illustrates the tier criteria achieved for the B1 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.

<b>TIER MATRIX, COF B1</b>			
<b>TIER 1</b>	Open, flexible design, must be reconfigurable without altering the building structure.	<b>X</b>	Demising walls are load bearing, which limits the flexibility of this building for future reconfiguration.
	Accommodation for all Admin Module functions, including the Command group offices, platoon offices, training room and conference room.	<b>X</b>	
	Consolidated showers and latrines. Fixture count and male/female ratio will be in accordance with COF Standard Design.	<b>X</b>	
	Accommodation for all Readiness Module supply bay storage requirements including the arms vault, non-sensitive secure storage, NBC, communications, and unit storage areas.	<b>X</b>	
	Ancillary building support spaces (mechanical, electrical, communications, SIPR and janitor rooms, vending area).	<b>X</b>	The existing, very small Mechanical area is shown for reuse, with possible expansion. Accommodation of Mechanical requirements is marginal.
<b>TIER 2</b>	TA-50 Storage Lockers for 100% of Company strength		Possibly achievable on a case-by-case basis (depending on site). See Appendix 1.
<b>TIER 3</b>	TA-50 interior equipment maintenance & layout space for 50% of Company strength.		Possibly achievable on a case-by-case basis (depending on site).
	Covered exterior hardstand		Possibly achievable on a case-by-case basis (depending on site). See Appendix 2.

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

The following matrix identifies the size of each function in the 100 PN COF Standard Design, and illustrates how the renovation design scheme compares, showing percentage of space provided.

<b>AREA COMPARISON- 100 PN STANDARD DESIGN COF VS. B1</b>				
<b>ADMINISTRATION AREA</b>	<b>SPACE DESIGNATION</b>	<b>100 PN COF (SF REQUIRED)</b>	<b>SCHEME B1 (SF PROVIDED)</b>	<b>% of COF Standard NSF Achieved</b>
	STORAGE ROOM	40	44	110%
	XO	150	152	101%
	1SG	150	152	101%
	CO	150	152	101%
	TRAINING ROOM	150	152	101%
	PLATOON OFFICES (SHARED) 4 EA. @ 150 SF	600	600	100%
	TOILET	0	50	N/A
	COPY/RECYCLING	10	10	100%
	CONFERENCE ROOM (1 REQ'D)	310	356	115%
	Subtotal	1,560	1,668	107%
	*Circulation and Internal walls	840	629	
	<b>TOTAL ADMIN AREA</b>	<b>2,400</b>	<b>2,297</b>	<b>96%</b>
	<b>READINESS MODULE</b>	<b>SPACE DESIGNATION</b>	<b>100 PN COF (REQUIRED)</b>	<b>SCHEME B1 (PROVIDED)</b>
SECURE STORAGE NON-SENSITIVE		166	284	171%
ARMS VAULT		400	462	116%
NBC STORAGE		94	140	149%
COMMUNICATIONS STORAGE		94	140	149%
UNIT STORAGE		367	458	125%
TA 50 LOCKERS, AISLE SPACE		2,580	0	0%
Subtotal		3,701	1,484	40%
*Circulation/Internal walls			442	
<b>TOTAL READINESS MODULE</b>			<b>1,926</b>	<b>52%</b>

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

<b>LATRINES, ANCILLARIES</b>	<b>SPACE DESIGNATION</b>	300 PN COF <sup>1</sup>	SCHEME B1 (PROVIDED)	% of COF Standard GSF Achieved
	Latrines>Showers	791	1,001	127%
	Comm., Elec., Mech., SIPR, Vending, Recycle, Janitor <sup>2</sup>	2,478	840	34%
	<b>TOTAL, LATRINES, ANCILLARIES</b>	<b>3,269</b>	<b>1,841</b>	<b>56%</b>

<b>TIER THREE REQUIREMENTS</b>	<b>SPACE DESIGNATION</b>	100 PN COF (REQUIRED)	SCHEME B1 (PROVIDED)	% of COF Standard NSF Achieved
	TA-50 EQUIPMENT LAYOUT AREA (50% 100 PN X 40 SF)	2,000	0	0%
	EXTERIOR COVERED HARDSTAND- EQUIPMENT MAINTENANCE/LAYOUT SPACE/WEAPONS CLEANING	1,680	Where possible, provide 35' W X 48' L <sup>3</sup> canopy min. 20' clear from rear of COF	

<sup>1</sup> Common Latrine area is calculated as follows (\*per 2012 International Building Code):

Building Occupancy:	Business*
Building population:	300* persons
Water closets required:	7* (1 per 25 persons for first 50, then 1 per 50 for remaining population). Or, 5 water closets, 2 urinals.
Showers required:	7 (Must serve 25% of building population (75 PN) in a 90 min. period. Using 7½ min. for each shower, each stall accommodates 12 persons. (75/12) = 6.25.)
Lavatories required:	5* (1 per 40 persons for first 80, then 1 per 80 for remaining population)
Lockers required:	21 (ratio of 3:1 lockers-to-showers per COF Standard Design).

Based on the information above, the Standard Design latrines area is as shown at right. The Utility area is measured based on measurement of square footage area of standard 2-company COF.

<sup>2</sup> Square foot area includes Mech./Elec. and Comm. expansion.

<sup>3</sup> The 48' width is used because this and many legacy COF building use a 48' bay spacing. The 35' dimension is used for efficient 5' X 8' layout spacing- see Appendix 2, page 46.

300 PN COF					
CODE	SPACES		SF	=	TOTAL SF
Showers	7	@	20	SF	140
WC	5	@	20	SF	100
Urinal	2	@	10	SF	20
Lav.	5	@	15	SF	75
Lockers	21	@	4	SF	84
Foyer	2	@	54	SF	108
Subtotal					527
Internal Circulation (50%)					263.5
Restroom Total:					<b>790.5</b>





# COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY

## COF C1

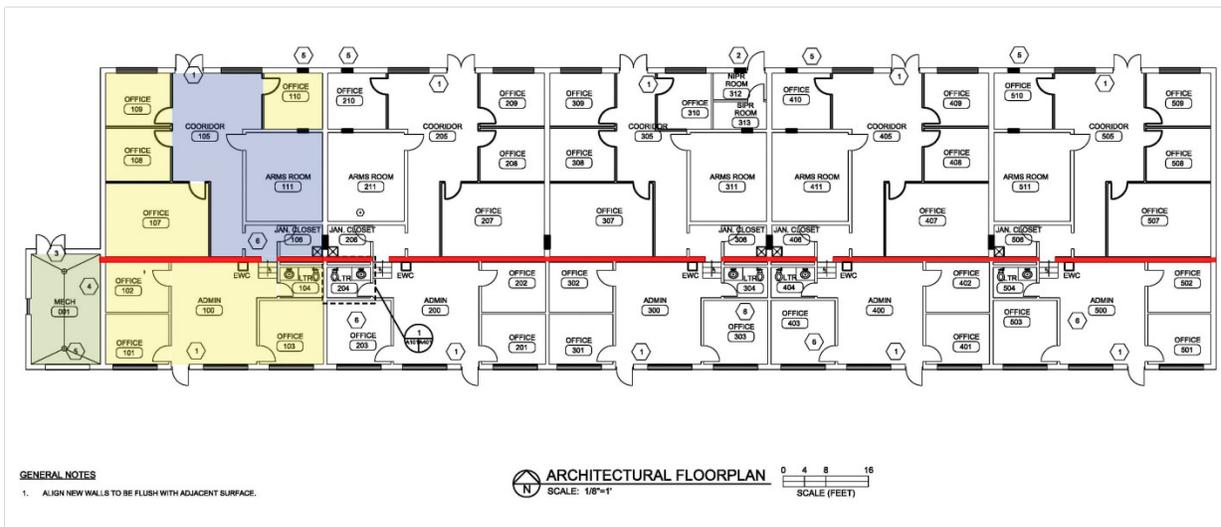
COF C1 is a notional renovation scheme for the building our team refers to as the 'Split Level' COF. Four of these buildings appear at Ft. Hood, TX. This building was chosen for renovation study because it is almost identical to the Square COFs (see COF D1, pg. 31). The renovation study conducted on this facility will assist in the renovation design of other non-standard legacy COFs as well.

The basic building measures 56'-8" in depth (front- to back), with demising walls at 41'-8" on center. These dimensions are identical to the 'Square' legacy COF. The interior wall that runs the length of the building (red in image below), where the interior 'step' occurs, is load-bearing. The roof structure is supported by roof joists in the short direction. The demising walls are not load bearing, but in some cases a step occurs at the demising wall to accommodate a sloping site.



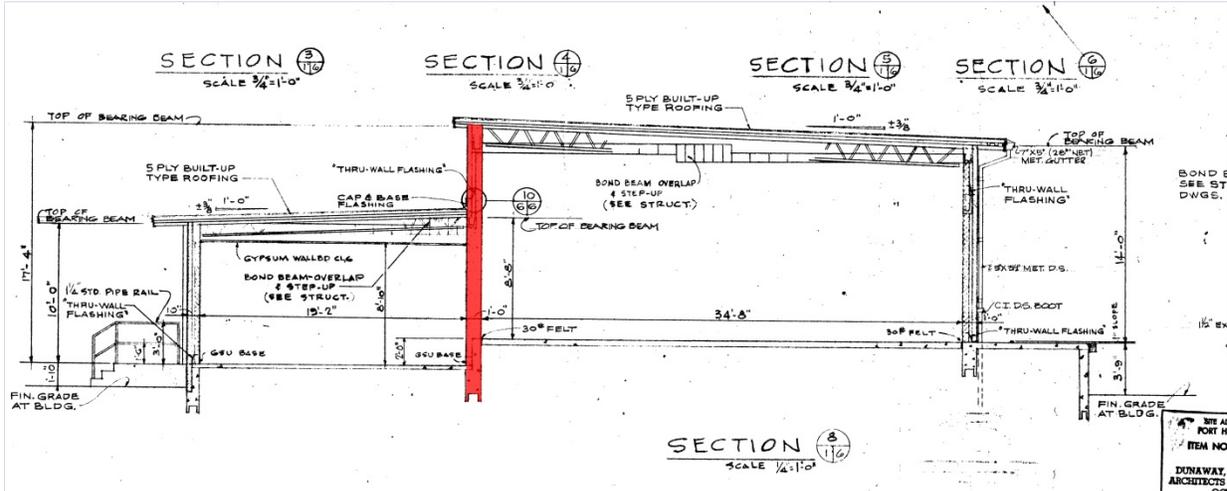
Of the four Split Level legacy COFs at Ft. Hood, three are (5) bays in length, the fourth is only (2) bays in length. The 2-bay Split Level COF cannot be renovated to achieve even Tier 1 functions. The 5-bay Split Level COFs can be renovated to accommodate (2) 100 PN COFs, thus providing 40% retention.

In the current configuration, the buildings accommodate the administration area (yellow in floor plan image below), with Readiness (blue) opening on to a 4'-0" elevated dock at the rear hardstand area. A small mechanical space (green) is located at one end of each building.



**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

The building section shows the load-bearing wall in red. The floor is slab on compacted grade, with a foundation wall at the rear to provide the elevated loading dock.



The following table provides information on existing Split Level COFs at Ft. Hood, TX:

FT. HOOD, TEXAS COFS						
Building No.	Year Built	Area		Major Renovation Performed	Type of COF	Number of COF Units
21010	1-Jul-66	12178	SF	No Major Renos	Split Level	5
27007	1-Jul-87	4831	SF	No Major Renos	Split Level	2
37002	1-Jul-69	12995	SF	No Major Renos	Split Level	5
37010	1-Jul-68	12184	SF	No Major Renos	Split Level	5

**Description of Renovation**

The C1 renovation design accommodates Tier 1 and partial Tier 2 functions, as indicated in the Tier Matrix on the following page, for two COFs in the area currently occupied by five COFs, resulting in 40% retention.

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

**Tier Matrix**

The matrix below illustrates the tier criteria achieved for the C1 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.

<b>TIER MATRIX, COF C1</b>			
<b>TIER 1</b>	Open, flexible design, must be reconfigurable without altering the building structure.	<b>X</b>	Interior walls at step in slab are load bearing, which limits the flexibility of this building for future reconfiguration. Also, in some cases, a step occurs at the demising walls between legacy COFs.
	Accommodation for all Admin Module functions, including the Command group offices, platoon offices, training room and conference room.	<b>X</b>	
	Consolidated showers and latrines. Fixture count and male/female ratio will be in accordance with COF Standard Design.	<b>X</b>	
	Accommodation for all Readiness Module supply bay storage requirements including the arms vault, non-sensitive secure storage, NBC, communications, and unit storage areas.	<b>X</b>	
	Ancillary building support spaces (mechanical, electrical, communications, SIPR and janitor rooms, vending area).	<b>X</b>	
<b>TIER 2</b>	TA-50 Locker Area for 100% of Company strength.	<b>X</b>	TA-50 Storage space for 25% of Company strength is achievable. New construction required to achieve the 100% requirement- see Appendix 1.
<b>TIER 3</b>	TA-50 interior equipment maintenance & layout space for 50% of Company strength.		Possibly achievable on a case-by-case basis (depending on site).
	Covered exterior hardstand		Possibly achievable on a case-by-case basis (depending on site). See Appendix 2.

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

The following matrix identifies the size of each function in the 100 PN COF Standard Design, and illustrates how the renovation design scheme compares, showing percentage of space provided.

<b>AREA COMPARISON- 100 PN COF STANDARD DESIGN VS C1</b>				
<b>ADMINISTRATION AREA</b>	<b>SPACE DESIGNATION</b>	<b>100 PN COF (SF REQUIRED)</b>	<b>SCHEME C1 (SF PROVIDED)</b>	<b>% of COF Standard NSF Achieved</b>
	STORAGE ROOM	40	54	135%
	XO	150	137 <sup>1</sup>	91%
	1SG	150	137 <sup>1</sup>	91%
	CO	150	137 <sup>1</sup>	91%
	TRAINING ROOM	150	150	100%
	PLATOON OFFICES (SHARED) 4 EA. @ 150 SF	600	600	100%
	TOILET	0	46	N/A
	COPY/RECYCLING	10	10	100%
	CONFERENCE ROOM (1 REQ'D)	310	317	102%
	Subtotal	1,560	1,588	102%
	*Circulation and Internal walls	840	680	
	<b>TOTAL ADMIN AREA</b>	<b>2,400</b>	<b>2,268</b>	<b>95%</b>
<b>READINESS MODULE</b>	<b>SPACE DESIGNATION</b>	<b>100 PN COF (REQUIRED)</b>	<b>SCHEME C1 (PROVIDED)</b>	<b>% of COF Standard NSF Achieved</b>
	SECURE STORAGE NON-SENSITIVE	166	237	143%
	ARMS VAULT	400	411	103%
	NBC STORAGE	94	119	127%
	COMMUNICATIONS STORAGE	94	119	127%
	UNIT STORAGE	367	429	117%
	TA 50 LOCKERS, AISLE SPACE	2,580	495	19%
	Subtotal	3,701	1,810	49%
	*Circulation/Internal walls		436	
<b>TOTAL READINESS MODULE</b>		<b>2,246</b>	<b>61%</b>	

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

<b>LATRINES, ANCILLARIES</b>	<b>SPACE DESIGNATION</b>	200 PN COF <sup>1</sup>	SCHEME C1 (PROVIDED)	% of COF Standard NSF Achieved
	Latrines/Showers	627	1,072	171%
	Comm., Elec., Mech., SIPR, Vending, Recycle, Janitor, Circulation, interior walls	2,478	1,502	61%
	<b>TOTAL, LATRINES, ANCILLARIES</b>	<b>3,105</b>	<b>2,574</b>	<b>83%</b>
<b>TIER THREE REQUIREMENTS</b>	<b>SPACE DESIGNATION</b>	100 PN COF (REQUIRED)	SCHEME C1 (PROVIDED)	% of COF Standard NSF Achieved
	TA-50 EQUIPMENT LAYOUT AREA	2,000	0	0%
	EXTERIOR COVERED HARDSTAND- EQUIPMENT MAINTENANCE/LAYOUT SPACE/WEAPONS CLEANING	1,680	Where possible, provide 35' W X 48' L <sup>2</sup> canopy min. 20' clear from rear of COF	

<sup>1</sup> The size of the two XO 1SG and CO offices equate to or exceed allowances specified in AR 405-70.

<sup>2</sup> Common Latrine area is calculated as follows (\*per 2012 International Building Code):

Building Occupancy:	Business*
Building population:	200 persons*
Water closets required:	5* (1 per 25 persons for first 50, then 1 per 50 for remaining population). Or, 4 water closets, 1 urinal.
Showers required:	5 (Must serve 25% of building population (50 PN) in 90 min. period. Using 7½ min. for each shower, each stall accommodates 12 persons. (50 / 12) = 4.17.)
Lavatories required:	4* (1 per 40 persons for first 80, then 1 per 80 for remaining population)
Lockers required:	15 (ratio of 3:1 lockers-to-showers per COF Standard Design).

Based on the information above, the Standard Design latrine area is as shown at right. The Utility area (Comm., Elec., etc.) is measured based on measurement of square footage area of standard 2-company COF.

<sup>3</sup> The 48' width is used because many of the legacy COF buildings use a 48' bay spacing. The 35' dimension is used for efficient 5' X 8' layout spacing- see Appendix 2, page 46.

200 PN COF					
CODE	SPACES		SF	=	TOTAL SF
Showers	5	@	20	SF	100
WC	4	@	20	SF	80
Urinal	1	@	10	SF	10
Lav.	4	@	15	SF	60
Lockers	15	@	4	SF	60
Foyer	2	@	54	SF	108
Subtotal					418
Internal Circulation (50%)					209
Restroom Total:					<b>627</b>



DATE	2/26/2013	APPROVED
DESCRIPTION		
CORRECTED FINAL SUBMITTAL		
MARKS		

DESIGN BY:	LSK	ISSUE DATE:	FEB 2013
DRAWN BY:	LSK	SOLICITATION NO.:	
CHECK BY:	CKK	CONTRACT NO.:	
DATE:		FILE NUMBER:	
SCALE:	1/8" = 1'-0"	FILE NAME:	
SIZE:	27" x 34"		

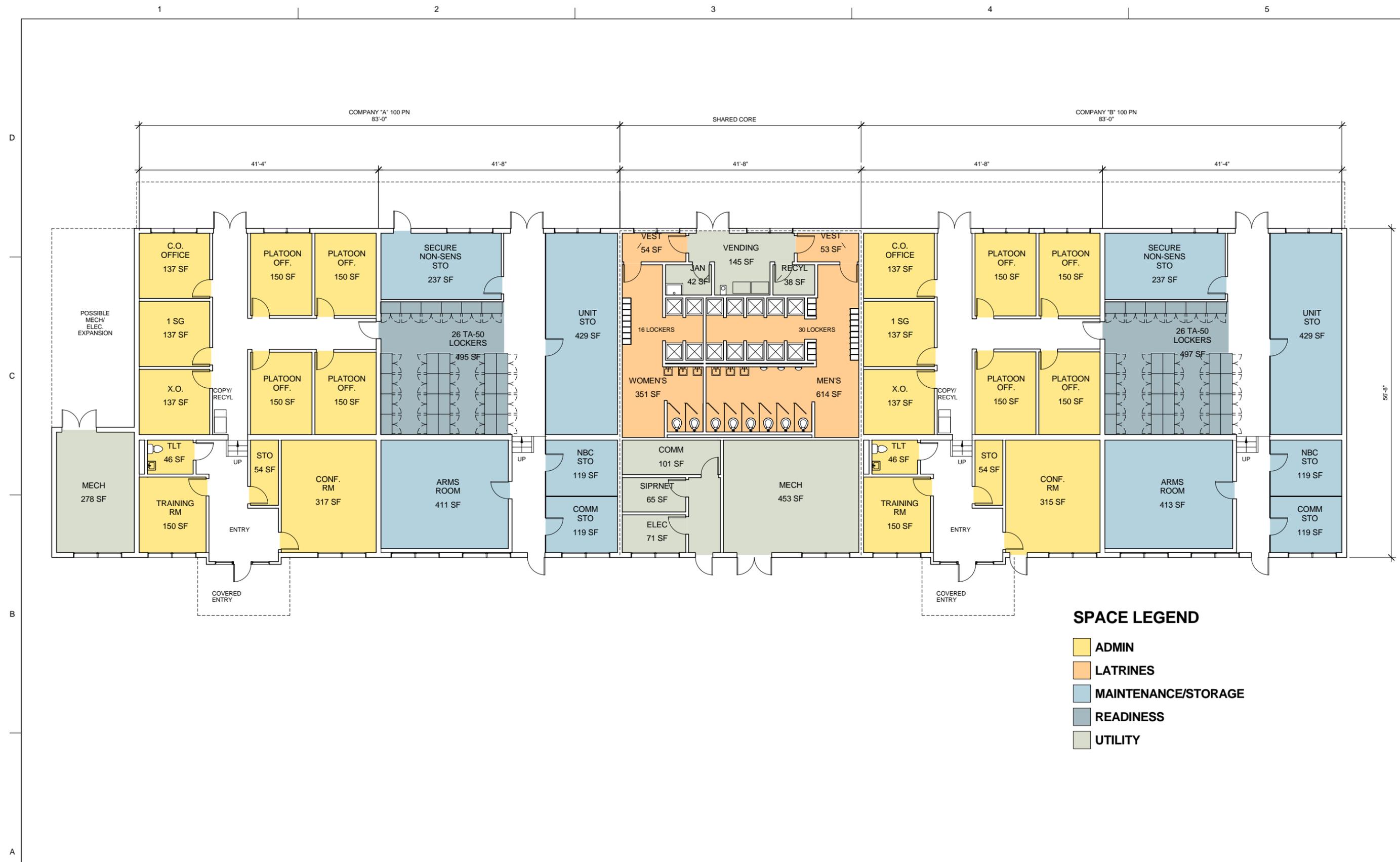
US ARMY CORPS OF ENGINEERS  
SAVANNAH DISTRICT

KNIGHT ARCHITECTS, INC.  
220 W. PEARSON DRIVE  
ATLANTA, GEORGIA 30341  
TEL: 770-462-0101

COF NOTIONAL STANDARD  
DESIGNS

FLOOR PLAN - SCHEME C1  
"SPLIT LEVEL" BUILDINGS 21010,  
27007, 37002, 37010 (HOOD)

SHEET IDENTIFICATION  
**C1-101**  
SHEET 30 OF 97



**1 FLOOR PLAN - RENOVATION DESIGN C1**  
1/8" = 1'-0"

NOTE: ROOM AREAS SHOWN ON FLOOR PLANS ARE GENERATED BY REVIT AND MAY DIFFER SLIGHTLY FROM AREAS SHOWN ON THE AREA COMPARISON MATRIX.

SCALE: 1/8"=1'-0" (22X34)  
SCALE: 1/16"=1'-0" (11X17)

C1-101-

# COF LEGACY FACILITIES RENOVATION STUDIES

## COF D1

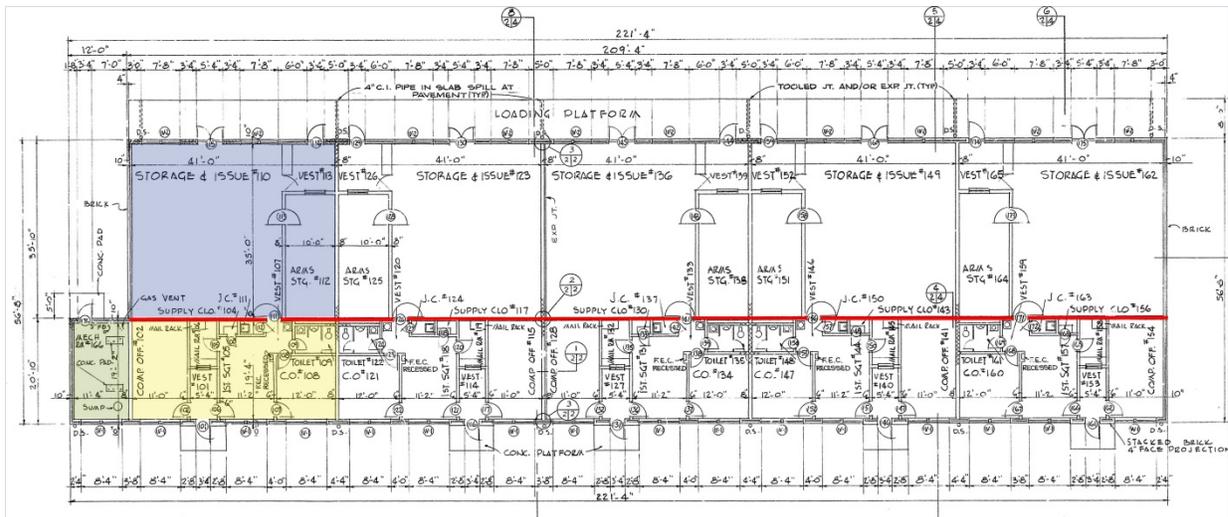
COF D1 is a notional renovation scheme for the building our team refers to as the 'Square' COF. Four of these buildings appear at Ft. Hood, TX; seven are in use at Ft. Bragg, NC. This building was chosen for renovation study because it is almost identical to the 'Split Level' (see C1 COF, pg. 24) COFs. The renovation study conducted on this facility will assist in the renovation design of other non-standard legacy COFs as well.



The basic building measure 56'-8" in depth (front- to back), with demising walls at 41'-8" on center. These dimensions are identical to the 'Split Level' legacy COF. The interior wall that runs the length of the building (red wall in image below) is load-bearing. The roof structure is supported by roof joists in the short direction. The demising walls are not load bearing, but in some cases a step occurs at the demising wall to accommodate a sloping site.

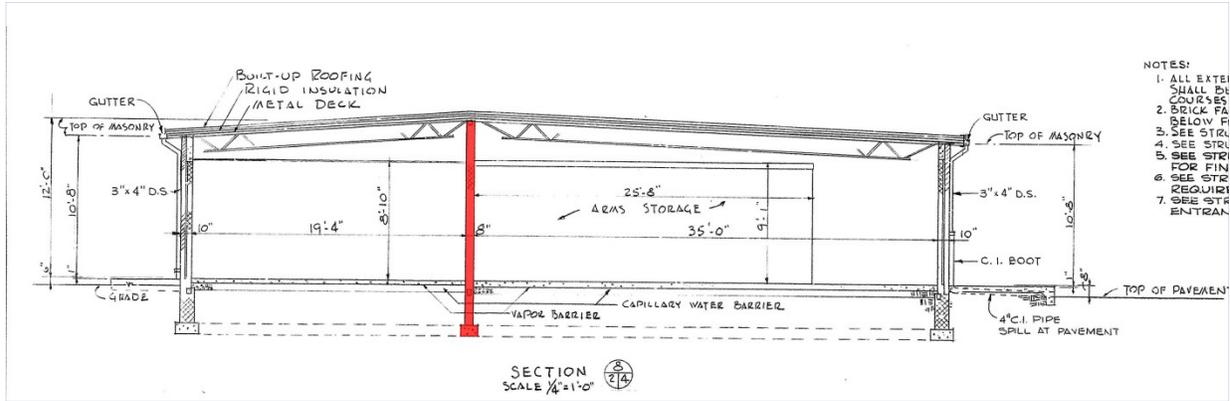
Of the eleven Square legacy COFs at Ft. Hood and Ft. Bragg, all are (5) bays in length except for one, which is (6) bays in length. The 5-bay Square COFs can be renovated to accommodate (2) 100 PN COFs, thus providing 40% retention. The (6) bay Square legacy COF can accommodate (2) 100 PN COFs with an additional 2,360 SF available for TA-50 lockers. Based on our study, a TA-50 locker with adequate aisle space requires min. 20 SF, so this would accommodate +/- 120 TA-50 lockers.

In the current configuration, the buildings accommodate the administration area (yellow in floor plan image below) at the street side (front), with Readiness (blue) opening on to an on-grade loading dock at the rear hardstand area. A small mechanical space (green) is located at one end of each building.



## COF LEGACY FACILITIES RENOVATION STUDIES

The building section shows the load-bearing wall in red, with roof joists bearing at that wall and at exterior load-bearing walls. The floor is a concrete slab-on-grade, with a slightly (8") elevated loading area at the rear, with a concrete turndown slab.



The following table provides information on existing Square COFs at Ft. Hood, TX and Ft. Bragg, NC:

FT. HOOD, TX: SQUARE COFS						
Building No.	Year Built	Area		Major Renovation Performed	Type of COF	Number of COF Units
9413	1-Jul-65	13210	SF	2006	Square	6
12002	1-Jul-64	12114	SF	2006	Square	5
12010	1-Jul-66	11889	SF	2006	Square	5
16010	1-Jul-66	12582	SF	2005	Square	5

FT. BRAGG, NC SQUARE COFS						
Building No.	Year Built	Area (approximate)		Major Renovation Performed	Type of COF	Number of COF Units
D2302	Not known for all, but the drawings for Building D3745 are dated 1 Feb., 1969.	+/- 12,500	SF	Not known for all, but Building D3745 had undergone only cosmetic, self-help renovations.	Square	5
D2307		+/- 12,500	SF		Square	5
D2815		+/- 12,500	SF		Square	5
D3022		+/- 12,500	SF		Square	5
D3255		+/- 12,500	SF		Square	5
D3637		+/- 12,500	SF		Square	5
D3745		+/- 12,500	SF		Square	5

### Description of Renovation

The D1 renovation design accommodates Tier 1 and partial Tier 2 functions, as indicated in the Tier Matrix on the following page, for two COFs in the area currently occupied by five COFs, resulting in 40% retention.

## COF LEGACY FACILITIES RENOVATION STUDIES

### Tier Matrix

The matrix below illustrates the tier criteria achieved for the D1 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, COF D1			
<b>TIER 1</b>	Open, flexible design, must be reconfigurable without altering the building structure.	<b>X</b>	Front, rear and intermediate walls running long direction of building are load bearing, which limits the flexibility of this building for future reconfiguration.
	Accommodation for all Admin Module functions, including the Command group offices, platoon offices, training room and conference room.	<b>X</b>	
	Consolidated showers and latrines. Fixture count and male/female ratio will be in accordance with COF Standard Design.	<b>X</b>	
	Accommodation for all Readiness Module supply bay storage requirements including the arms vault, non-sensitive secure storage, NBC, communications, and unit storage areas.	<b>X</b>	
	Ancillary building support spaces (mechanical, electrical, communications, SIPR and janitor rooms, vending area).	<b>X</b>	
<b>TIER 2</b>	TA-50 Locker Area for 100% of Company strength	<b>X</b>	TA-50 Storage space for 25% of Company strength is achievable. New construction required to achieve the 100% requirement- see Appendix 1.
<b>TIER 3</b>	TA-50 interior equipment maintenance & layout space for 50% of Company strength.		Possibly achievable on a case-by-case basis (depending on site).
	Covered exterior hardstand		Possibly achievable on a case-by-case basis (depending on site). See Appendix 2.

## COF LEGACY FACILITIES RENOVATION STUDIES

The following matrix identifies the size of each function in the 100 PN COF Standard Design, and illustrates how the renovation design scheme compares, showing percentage of space provided.

AREA COMPARISON- 100 PN COF STANDARD DESIGN VS D1				
<b>ADMINISTRATION AREA</b>	<b>SPACE DESIGNATION</b>	100 PN COF (SF REQUIRED)	SCHEME D1 (SF PROVIDED)	% of COF Standard NSF Achieved
	STORAGE ROOM	40	40	100%
	XO	150	137 <sup>1</sup>	91%
	1SG	150	137 <sup>1</sup>	91%
	CO	150	137 <sup>1</sup>	91%
	TRAINING ROOM	150	150	100%
	PLATOON OFFICES (SHARED) 4 EA. @ 150 SF	600	600	100%
	TOILET	0	50	N/A
	COPY/RECYCLING	10	25	250%
	CONFERENCE ROOM (1 REQ'D)	310	317	102%
	Subtotal	1,560	1,593	102%
	*Circulation and Internal walls	840	675	
	<b>TOTAL ADMIN AREA</b>	<b>2,400</b>	<b>2,268</b>	<b>95%</b>
<b>READINESS MODULE</b>	<b>SPACE DESIGNATION</b>	100 PN COF (REQUIRED)	SCHEME D1 (PROVIDED)	% of COF Standard NSF Achieved
	SECURE STORAGE NON-SENSITIVE	166	238	143%
	ARMS VAULT	400	411	103%
	NBC STORAGE	94	117	124%
	COMMUNICATIONS STORAGE	94	117	124%
	UNIT STORAGE	367	420	114%
	TA 50 LOCKERS, AISLE SPACE	2,580	495	19%
	Subtotal	3,701	1,798	49%
	*Circulation/Internal walls		448	
<b>TOTAL READINESS MODULE</b>		<b>2,246</b>	<b>61%</b>	
<b>LATRINES, ANCILLARIES</b>	<b>SPACE DESIGNATION</b>	200 PN COF <sup>2</sup>	SCHEME D1 (PROVIDED)	% of COF Standard GSF Achieved
	Latrines/Showers	627	1,072	171%
	Comm., Elec., Mech., SIPR, Vending, Recycle, Janitor, Circulation, interior walls	2,478	1,451	59%
	<b>TOTAL, LATRINES, ANCILLARIES</b>	<b>3,105</b>	<b>2,523</b>	<b>81%</b>

## COF LEGACY FACILITIES RENOVATION STUDIES

<b>TIER THREE REQUIREMENTS</b>	<b>SPACE DESIGNATION</b>	100 PN COF (REQUIRED)	SCHEME D1 (PROVIDED)	% of COF Standard NSF Achieved
	TA-50 EQUIPMENT LAYOUT AREA	2,000	0	0%
	EXTERIOR COVERED HARDSTAND- EQUIPMENT MAINTENANCE/LAYOUT SPACE/WEAPONS CLEANING	1,680	Where possible, provide 35' W X 48' L <sup>3</sup> canopy min. 20' clear from rear of COF	

<sup>1</sup> The sizes of the XO 1SG and CO Offices equate to or exceed allowances specified in AR 405-70.

<sup>2</sup> Common Latrine area is calculated as follows (\*per 2012 International Building Code):

Building Occupancy:	Business*
Building population:	200* persons
Water closets required:	5* (1 per 25 persons for first 50, then 1 per 50 for remaining population). Or, 4 water closets, 1 urinal.
Showers required:	5 (Must serve 25% of building population (50 PN) in a 90 min. period. Using 7½ min. for each shower, each stall accommodates 12 persons. (50 / 12) = 4.17.)
Lavatories required:	4* (1 per 40 persons for first 80, then 1 per 80 for remaining population)
Lockers required:	15 (ratio of 3:1 lockers-to-showers per COF Standard Design).

Based on the information above, the Standard Design latrines area is as shown at right. The Utility area (Comm., Elec., etc.) is measured based on measurement of square footage area of standard 2-company COF.

<sup>3</sup> The 48' width is used because many of the legacy COF buildings use a 48' bay spacing. The 35' dimension is used for efficient 5' X 8' layout spacing- see Appendix 2, page 46.

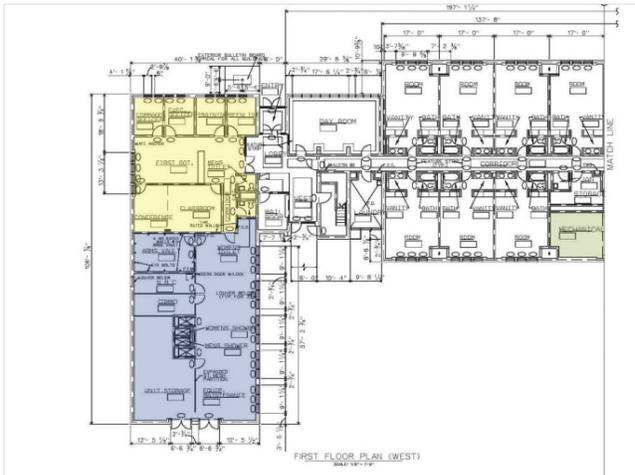
200 PN COF					
CODE	SPACES		SF	=	TOTAL SF
Showers	5	@	20	SF	100
WC	4	@	20	SF	80
Urinal	1	@	10	SF	10
Lav.	4	@	15	SF	60
Lockers	15	@	4	SF	60
Foyer	2	@	54	SF	108
Subtotal					418
Internal Circulation (50%)					209
Restroom Total:					<b>627</b>





**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

**COF E1**



COF E1 is a notional renovation design for the building our team refers to as the ‘Barracks’ COF. Twenty-six COFs similar to these are located in the M area of East Ft. Bragg. This building was chosen for renovation study by Ft. Bragg personnel, and it should be noted that similar COFs appear at installations throughout CONUS.

The Barracks COF is, as the name implies, collocated with a 3-story barracks building. The COF portion is 106’ X 40’. The construction includes load-bearing CMU exterior walls with brick veneer. The interior walls of the COF portion are mostly CMU as well, but are not load-bearing. The roof of the one-story portion is structured with sloping bar joists. The barracks construction uses load-bearing exterior CMU walls, with concrete plank floor construction on the elevated floors. The corridor walls in the barracks are load-bearing; walls perpendicular to corridor walls are not.

The ‘Area’ number on the table below shows the approximate area of the first floor only:

FT. BRAGG, NC BARRACKS COFs						
Building No.	Year Built	Area (approximate)		Major Renovation Performed	Type of COF	Number of COF Units
M3019	Not known for all, but the drawings for Building M4520 are dated 21 Dec., 2001.	+/- 20,775	SF	Not known for all, but Building M4520 had undergone only cosmetic, self-help renovations.	Barracks	2
M3040		+/- 20,775	SF		Barracks	2
M3213		+/- 20,775	SF		Barracks	2
M3226		+/- 20,775	SF		Barracks	2
M3233		+/- 20,775	SF		Barracks	2
M3346		+/- 20,775	SF		Barracks	2
M3519		+/- 20,775	SF		Barracks	2
M3540		+/- 20,775	SF		Barracks	2
M4040		+/- 20,775	SF		Barracks	2
M4313		+/- 20,775	SF		Barracks	2
M4346		+/- 20,775	SF		Barracks	2
M4520		+/- 20,775	SF		Barracks	2
M4540		+/- 20,775	SF		Barracks	2

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

**Description of Renovation**

The E1 renovation design accommodates Tier 1 and Tier 2 functions for one COF in the area currently occupied by one COF, resulting in 100% retention. Renovation scheme E1 proposes also using the first floor of the barracks building to expand the COF.

**Tier Matrix**

The matrix below illustrates the tier criteria achieved for the E1 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.

<b>TIER MATRIX, COF E1</b>			
<b>TIER 1</b>	Open, flexible design, must be reconfigurable without altering the building structure.	<b>X</b>	Note that interior load-bearing CMU walls at the barracks portion require that these walls remain in place.
	Accommodation for all Admin Module functions, including the Command group offices, platoon offices, training room and conference room.	<b>X</b>	
	Consolidated showers and latrines. Fixture count and male/female ratio will be in accordance with COF Standard Design.	<b>X</b>	
	Accommodation for all Readiness Module supply bay storage requirements including the arms vault, non-sensitive secure storage, NBC, communications, and unit storage areas.	<b>X</b>	
	Ancillary building support spaces (mechanical, electrical, communications, SIPR and janitor rooms, vending area).	<b>X</b>	
<b>TIER 2</b>	TA-50 Locker Area for 100% of Company strength.	<b>X</b>	TA-50 Storage lockers are provided for 127 personnel in each of the (2) COFs.
<b>TIER 3</b>	TA-50 interior equipment maintenance & layout space for 50% of Company strength.		Possibly achievable on a case-by-case basis (depending on site).
	Covered exterior hardstand		Possibly achievable on a case-by-case basis (depending on site). See Appendix 2.

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

The following matrix identifies the size of each function in the 125 PN COF Standard Design, and illustrates how the renovation design scheme compares, showing percentage of space provided.

<b>AREA COMPARISON- STANDARD DESIGN 125 PN COF<sup>1</sup> VS. E1</b>				
<b>ADMINISTRATION AREA</b>	<b>SPACE DESIGNATION</b>	<b>125 PN COF (SF REQUIRED)</b>	<b>SCHEME E1 (SF PROVIDED)</b>	<b>% of COF Standard NSF Achieved</b>
	STORAGE ROOM	40	89	223%
	XO	150	139 <sup>2</sup>	93%
	1SG	150	151	101%
	CO	150	151	101%
	TRAINING ROOM	150	139 <sup>2</sup>	93%
	PLATOON OFFICES (SHARED) 4 EA. @ 150 SF	600	580	97%
	TOILET	0	110	N/A
	COPY/RECYCLING	10	15	150%
	CONFERENCE ROOM/STORAGE	310	496	160%
	Subtotal	1,560	1,870	120%
	*Circulation and Internal walls	840	998	
	<b>TOTAL ADMIN AREA</b>	<b>2,400</b>	<b>2,868</b>	<b>120%</b>
<b>READINESS MODULE</b>	<b>SPACE DESIGNATION</b>	<b>125 PN COF (REQUIRED)</b>	<b>SCHEME E1 (PROVIDED)</b>	<b>% of COF Standard NSF Achieved</b>
	SECURE STORAGE NON-SENSITIVE	236	225	95%
	ARMS VAULT	450	442	98%
	NBC STORAGE	123	131	107%
	COMMUNICATIONS STORAGE	123	131	107%
	UNIT STORAGE	481	471	98%
	TA-50 LOCKERS, AISLE SPACE	2,250	2,715	121%
	Subtotal	3,663	4,115	112%
	*Circulation/Internal walls		888	
	<b>TOTAL READINESS MODULE</b>		<b>5,003</b>	<b>137%</b>
<b>LATRINES, ANCILLARIES</b>	<b>SPACE DESIGNATION</b>	<b>250 PN COF<sup>3</sup></b>	<b>SCHEME E1 (PROVIDED)</b>	<b>% of COF Standard GSF Achieved</b>
	Latrines/Showers	713	1,132	159%
	Comm., Elec., Mech., SIPR, Vending, Recycle, Janitor	2,478	1,417	57%
	<b>TOTAL, LATRINES, ANCILLARIES</b>	<b>3,191</b>	<b>2,645</b>	<b>83%</b>

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

<b>TIER THREE REQUIREMENTS</b>	<b>SPACE DESIGNATION</b>	125 PN COF (REQUIRED)	SCHEME E1 (PROVIDED)	% of COF Standard NSF Achieved
	TA-50 EQUIPMENT LAYOUT AREA (50% OF 125PN x 40 SF)	2,520	0	0%
	EXTERIOR COVERED HARDSTAND- EQUIPMENT MAINTENANCE/LAYOUT SPACE/WEAPONS CLEANING	2,000	Where possible, provide 35' W X 64' L <sup>4</sup> canopy min. 20' clear from rear of COF.	

<sup>1</sup> Because this scheme is able to accommodate 127 TA-50 lockers, the area requirements for a 125-PN COF are calculated by interpolating between Standard Design requirements for a 100 PN and a 150 PN COF.

<sup>2</sup> The sizes of the XO Office and Training room equate to or exceed allowances specified in AR 405-70.

<sup>3</sup> Latrine area is calculated as follows (\*per 2012 International Building Code):

Building Occupancy:	Business*
Building population:	250* persons
Water closets required:	6* (1 per 25 persons for first 50, then 1 per 50 for remaining population). Or, 4 water closets, 2 urinals.
Showers required:	6 (Must serve 25% of building population (63 PN) in a 90 min. period. Using 7½ min. for each shower, each stall accommodates 12 persons. (63 / 12) = 5.25.)
Lavatories required:	5* (1 per 40 persons for first 80, then 1 per 80 for remaining population)
Lockers required:	18 (ratio of 3:1 lockers-to-showers per COF Standard Design).

Based on the information above, the Standard Design latrines area is as shown at right:  
The Utility area (Comm., Elec., etc.) is measured based on measurement of square footage area of a standard 2-company COF.

<sup>4</sup> The 35' X 64' is an efficient size for 5' X 8' layout spacing. See Appendix 2, page 46.

250 PN COF					
CODE	SPACES		SF	=	TOTAL SF
Showers	6	@	20	SF	120
WC	4	@	20	SF	80
Urinal	2	@	10	SF	20
Lav.	5	@	15	SF	75
Lockers	18	@	4	SF	72
Foyer	2	@	54	SF	108
Subtotal					475
Internal Circulation (50%)					238
Restroom Total:					<b>713</b>

1

2

3

4

5

D

C

B

A



1  
E1-100

**EXISTING FLOOR PLAN - BARRACKS COF**

3/32" = 1'-0"



SCALE: 3/32"=1'-0" (22X34)  
SCALE: 3/64"=1'-0" (11X17)



DATE	2/26/2013
APPROVED	

DESCRIPTION	
CORRECTED FINAL SUBMITTAL	
MARKS	

DESIGN BY:	LSK	CHK BY:	GJK
DRAWN BY:	LSK	ISSUED BY:	LSK
DATE:	3/22/11	DATE:	1/31/11
SCALE:	3/32" = 1'-0"	SCALE:	3/32" = 1'-0"
SIZE:	27" x 34"	FILE NAME:	

ISSUE DATE:	FEB 2013	SOLICITATION NO.:	
CONTRACT NO.:		FILE NUMBER:	

US ARMY CORPS OF ENGINEERS  
SAVANNAH DISTRICT

KNIGHT ARCHITECTS, INC.  
2000 W. BROAD ST.  
ATLANTA, GEORGIA 30331  
TEL: 770-452-0101

COF NOTIONAL STANDARD  
DESIGNS

EXISTING FLOOR PLAN - SCHEME  
E1

SHEET IDENTIFICATION  
**E1-100**  
SHEET 42 OF 97

E1-100-

DATE	2/26/2013
APPROVED	
DESCRIPTION	
CORRECTED FINAL SUBMITTAL	
MARKS	

ISSUE DATE:	FEB 2013
SOLICITATION NO.:	
CONTRACT NO.:	
FILE NUMBER:	
DESIGN BY:	LBK
DRAWN BY:	NSP
CHECK BY:	GJK
DATE:	1/31/13
FILE NAME:	27 x 34

US ARMY CORPS OF ENGINEERS  
SAVANNAH DISTRICT

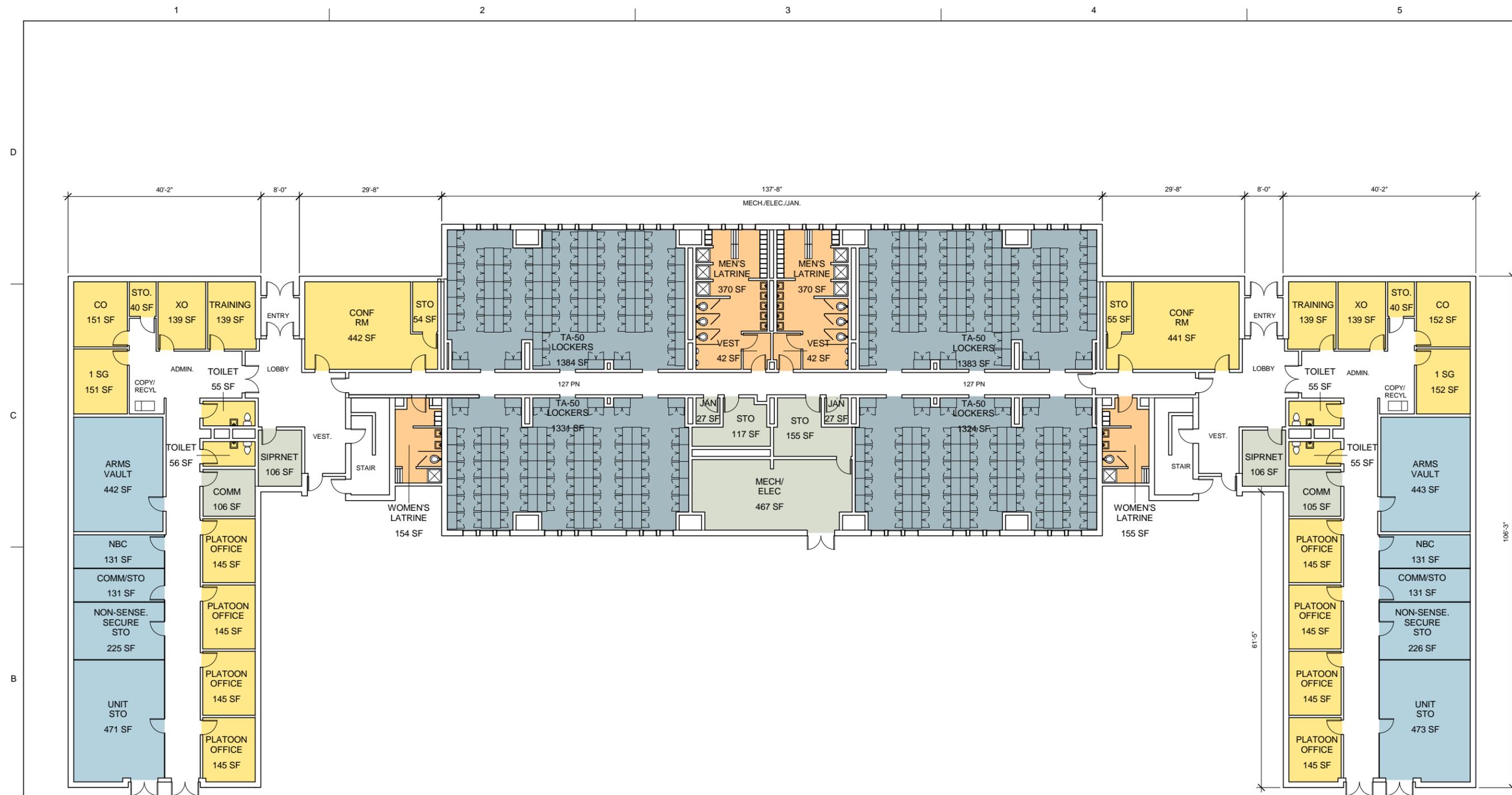
KNIGHT ARCHITECTS, INC.  
2200 ATLANTA ROAD, SUITE 300  
ATLANTA, GEORGIA 30341  
TEL: 770-452-0101

COF NOTIONAL STANDARD  
DESIGNS

FLOOR PLAN - SCHEME E1  
"COMBINED BARRACKS/COF"  
BUILDING M4520 (BRAGG)

SHEET IDENTIFICATION  
E1-101

SHEET 43 OF 97



**SPACE LEGEND**

- ADMIN
- LATRINES
- MAINTENANCE/STORAGE
- READINESS
- UTILITY

**1 FLOOR PLAN - RENOVATION DESIGN E1**  
E1-101 3/32" = 1'-0"

NOTE: ROOM AREAS SHOWN ON FLOOR PLANS ARE GENERATED BY REVIT AND MAY DIFFER SLIGHTLY FROM AREAS SHOWN ON THE AREA COMPARISON MATRIX.

16 12 8 0 16

SCALE: 3/32"=1'-0" (22X34)  
SCALE: 3/64"=1'-0" (11X17)

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

**APPENDICES**

Appendix 1: TA-50 Equipment Storage Building Floor Plans	Pg. 45
Appendix 2: Site Specific Options for Renovations	Pg. 46
Appendix 3: Meeting Minutes, IMCOM 9/5/2012	Pg. 70
Appendix 4: Meeting Minutes and tour of Legacy COFs, Ft. Hood, TX 9/6/2012	Pg. 73
Appendix 5: Meeting Minutes Ft. Bragg, NC, 9/26/2012	Pg. 84
Appendix 6: Tour of Legacy COFs, Ft. Bragg, NC, 9/27/2012	Pg. 86
Appendix 7: Meeting Minutes, Preliminary Review Conference IMCOM 12/10/2012	Pg. 94
Appendix 8: Meeting Minutes, Final Review Conference IMCOM 2/12/2012	Pg. 97

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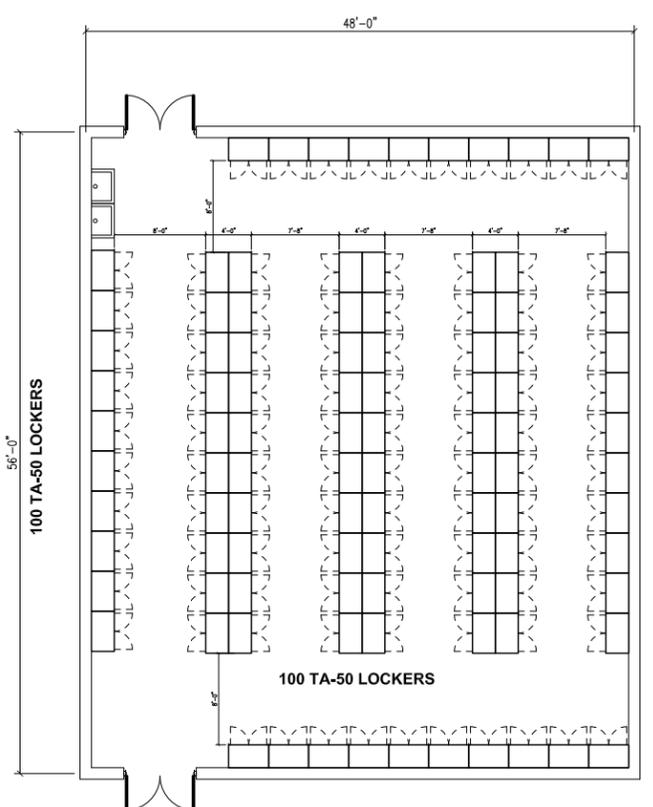
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D

C

B

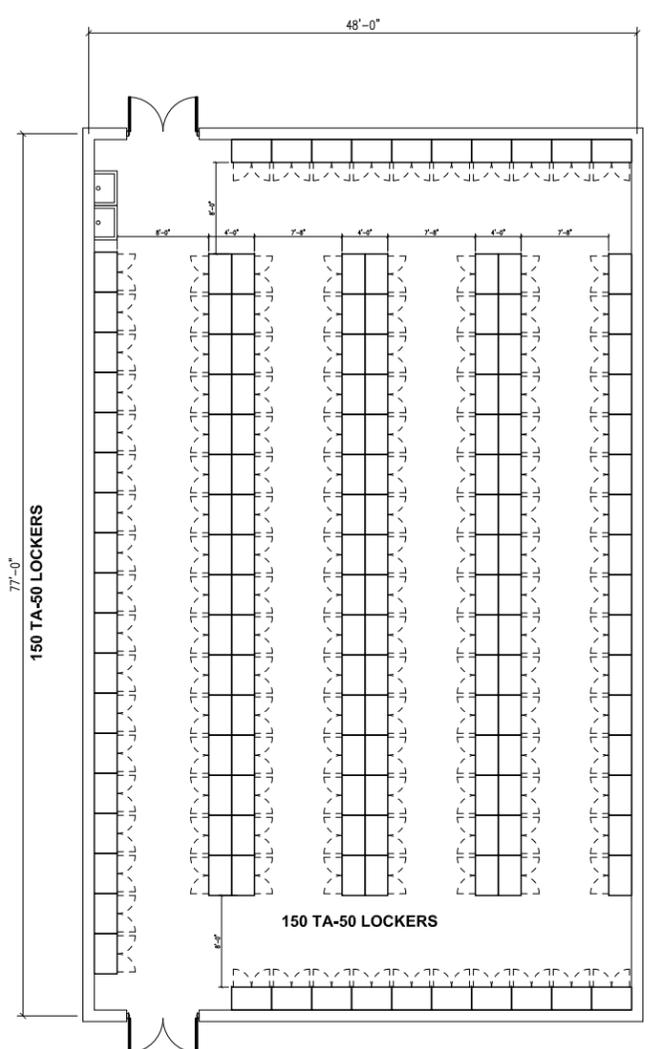
A



**TYPICAL TA-50 LOCKER BUILDING FOR ONE 100 PN COMPANY (56'x48"=2,688 NSF)**

0 8' 16' 32'

SCALE: 1/16" = 1'-0"



**TYPICAL TA-50 LOCKER BUILDING FOR ONE 150 PN COMPANY (77'x48'=3,696 NSF)**

0 8' 16' 32'

SCALE: 1/16" = 1'-0"



MARK	DESCRIPTION	DATE	APPR.

DESIGN BY: LBN	ISSUE DATE: 02/19/2013
DRAWN BY: LBN	CONTRACT NO.:
SRMT BY:	CONTRACT NO.:
PLOT DATE: 02/19/2013	FILE NO.:
PLOT SCALE: 1/16" = 1'-0"	FILE NAME:
SIZE: 11" x 17"	FILENAME

US ARMY CORPS OF ENGINEERS  
SAVANNAH DISTRICT  
SINGH, SCHWITZER, INC.  
2359 PERIMETER PARK DRIVE  
ATLANTA, GEORGIA 30341  
TEL: 770.452.0101

COF NOTIONAL  
STANDARD DESIGNS  
TYPICAL TA-50 EQUIPMENT BLDG  
FOR A 100 AND 150 PN COMPANY

SHEET  
IDENTIFICATION  
**F1-101**  
SHEET 45 OF 97

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

**APPENDIX 2: SITE SPECIFIC OPTIONS FOR RENOVATIONS**

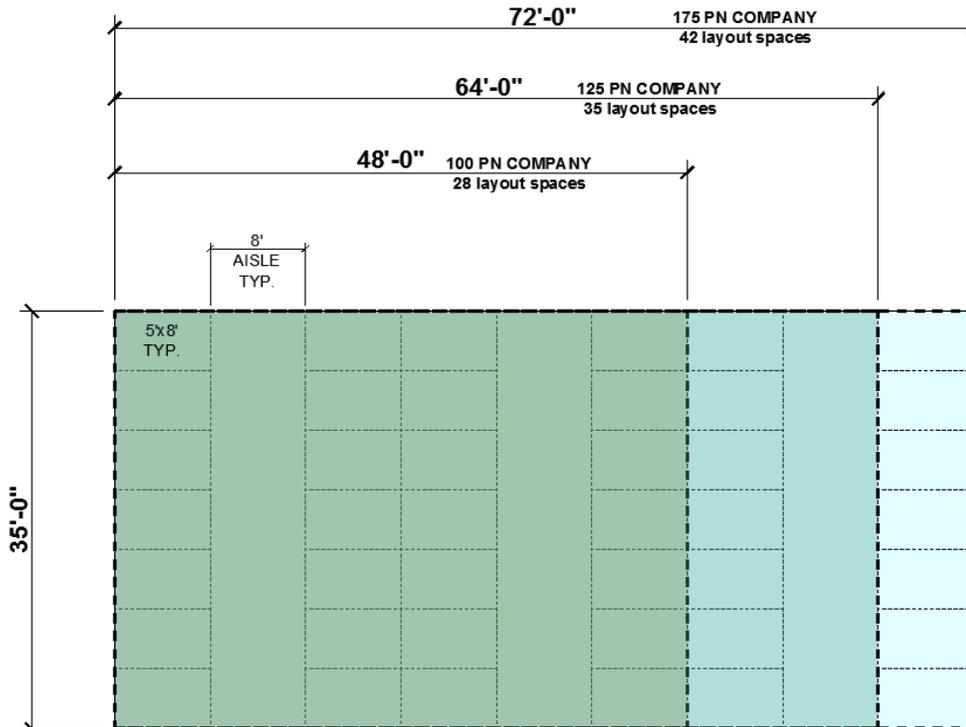
General note about exterior covered hardstand structures:

As is stated in the Area Comparison tables for each type of COF, the sizes for each COF covered hardstand (CHS) are as shown in the following table. The required SF shown in the 4<sup>th</sup> column comes from the Standard Design.

Building Type	Renovation Design Scheme	Population (PN) per COF	Exterior CHS area required (SF)	Exterior CHS dimensions shown						Exterior CHS Area shown (SF)	Delta
				DEPTH		WIDTH					
VOLAR	A1	100	1,680	35	FT	X	48	FT	=	1,680	0
VOLAR	A2	175	2,660	35	FT	X	72	FT	=	2,520	(140)
Angled Entry	B1	100	1,680	35	FT	X	48	FT	=	1,680	0
Split- Level	C1	100	1,680	35	FT	X	48	FT	=	1,680	0
Square	D1	100	1,680	35	FT	X	48	FT	=	1,680	0
Barracks	E1	125	2,000	35	FT	X	64	FT	=	2,240	240

The following notes are stated in the footnotes to the Area Comparison Tables:

- The 48' width dimension comes from the standard bay width (48') for the VOLAR and Angled Entry type Legacy COFs. It is also used in the other 100 PN COF designs.
- A 35' X 48' CHS can accommodate (28) 5' X 8' layout spaces, as shown below.
- The 72' width and 64' width for the A2 and E1 renovation designs, respectively, comes from using a multiple of 8' in order to closely approximate the required area for CHS. Based on the image below, extending the CHS to these lengths can accommodate (42) 5' X 8' layout spaces for the 72' length, and (35) layout spaces for the 64' length.



(Left)  
Notional  
design for  
exterior  
covered  
hardstand  
structure(s)  
for 100,  
125 and  
175 PN  
Company  
strength.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY

### Site-Specific options for VOLAR renovation:

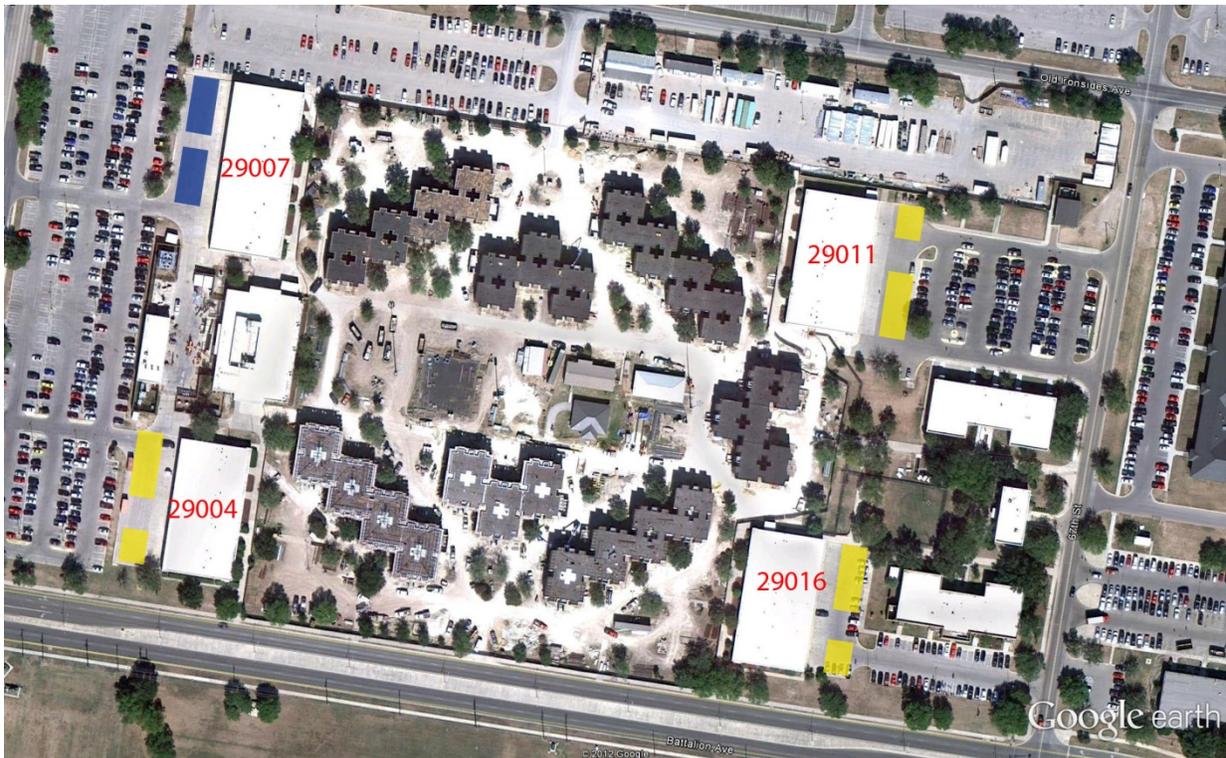
In the following aerial images taken from Google Earth, the yellow shapes are scaled elements that represent 35' X 48' covered hardstand areas, if the building is renovated per the A1 VOLAR renovation design. The blue shapes relate to the A2 VOLAR renovation design, and show how a 35' X 72' covered hardstand can be accommodated. Note that in order to construct the suggested exterior covered hardstand structures, the Installation Master Planner will need to verify that this approach is workable.



#### Ft. Hood:

- Building 12020 is a (5) bay VOLAR. This image shows (2) 35' X 96' covered hardstand structures, to provide covered exterior equipment maintenance space for (4) 100 PN COFs, if 12020 is renovated per the A1 scheme. This building can also be renovated per the A2 scheme, and would then have (2) 35' X 72' exterior covered hardstand structures.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### Ft. Hood:

- Buildings 29004, 29011 and 29016 are each (4) bay VOLAR COFs. These can each be renovated to accommodate (3) 100 PN COFs. This image shows, at the appropriate scale, (1) 35' X 96' and (1) 35' X 48' covered hardstand at each of these buildings.
- Building 29007 is a (5) bay VOLAR COF, and shows (2) 35' X 72' exterior covered hardstand structures to accommodate (2) 175 PN COFs.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### **Ft. Hood:**

- Building 31011 is a (5) bay VOLAR. This image shows (2) 35' X 96' covered hardstand structures, to provide covered exterior equipment maintenance space for (4) 100 PN COFs.

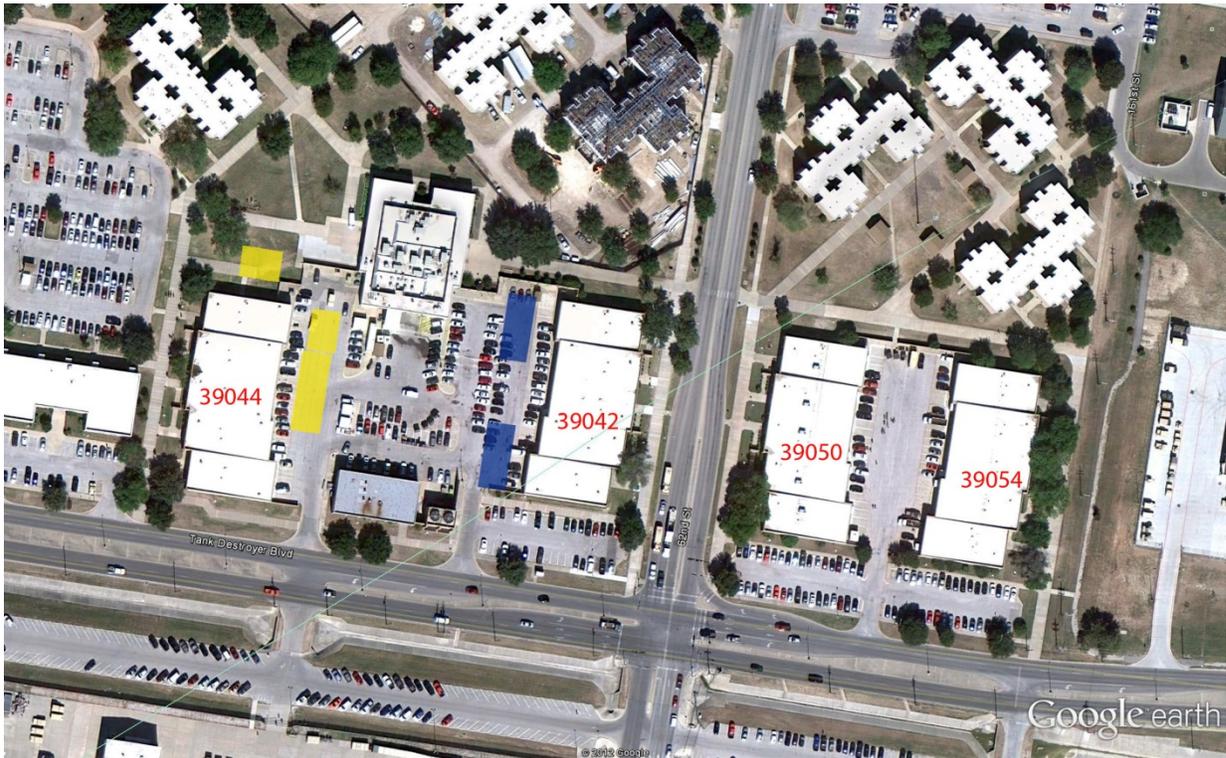
## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### **Ft. Hood:**

- Buildings 39020, 39021 and 39022 are each (5) bay VOLAR COFs. These can be renovated to each accommodate (4) 100 PN COFs, or (2) 175 PN COFs, or a mixture of these two options. This image shows, at the appropriate scale:
- Building 39020 with (2) 35' X 96' covered hardstand structures to accommodate (4) 100 PN COFs.
- Building 39021 with (2) 35' X 96' covered hardstand structures to accommodate (4) 100 PN COFs.
- Building 39022 shows the option for a 35' X 72' and a 35' X 96' covered hardstand to accommodate respectively, (1) 175 PN and (2) 100 PN COFs. Note that as this is a (5) bay VOLAR, it can accommodate either of the options stated here, or (2) 175 PN COFs. In the latter case, (2) 35' X 72' exterior covered hardstand structures would be required.

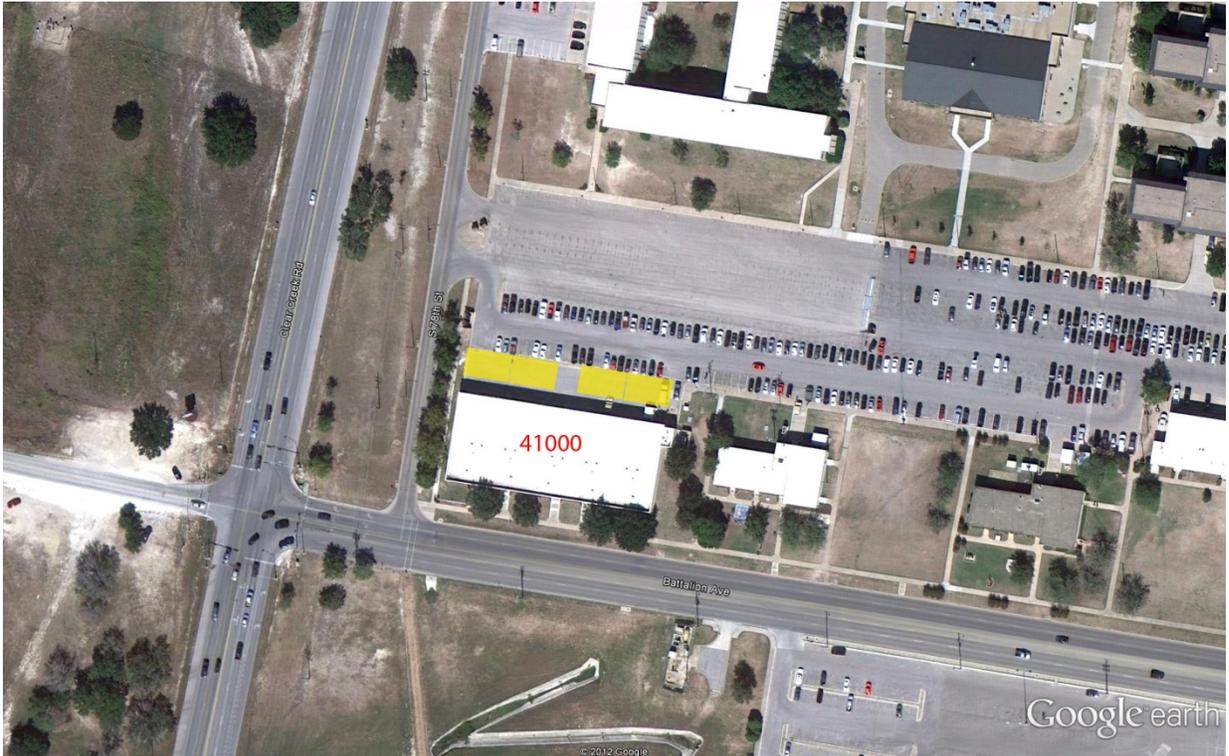
## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### Ft. Hood:

- Building 39042 is a (5) bay VOLAR; this image shows (2) 35' X 72' exterior covered hardstand structures to accommodate (2) 175 PN COFs.
- Building 39044 is a (5) bay VOLAR. The yellow shapes represent (4) 35' X 48' covered hardstands to accommodate (4) 100 PN Companies.
- Buildings 39050 and 39054 do not appear to have adequate space between or around their locations to accommodate exterior covered hardstand structures, unless all parking areas between the two buildings are eliminated.

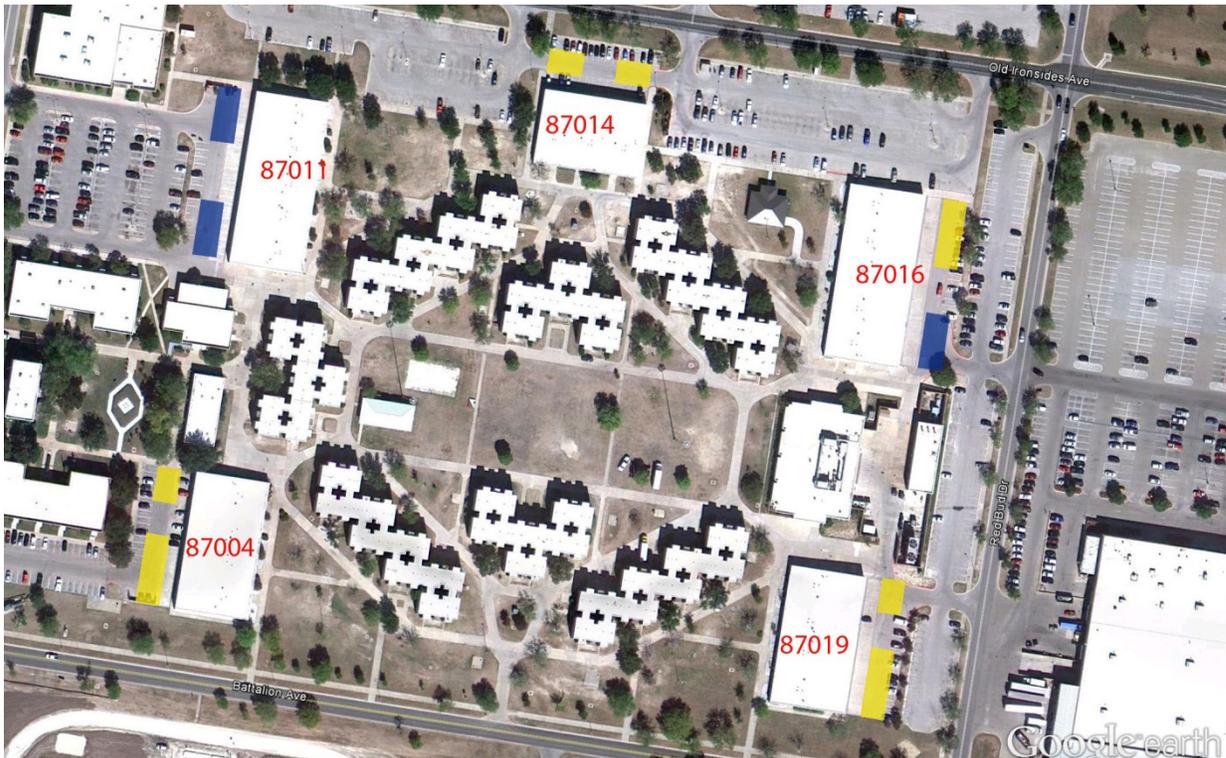
## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### **Ft. Hood:**

- Building 41000 is a (5) bay VOLAR COF. This building can be renovated to accommodate (4) 100 PN COFs, with (4) 35' X 48' covered hardstand areas as indicated. This building can also be designed per the A2 design scheme to accommodate (2) 175 PN COFs. In this case, (2) 35' X 72' exterior covered hardstand structures would be required.

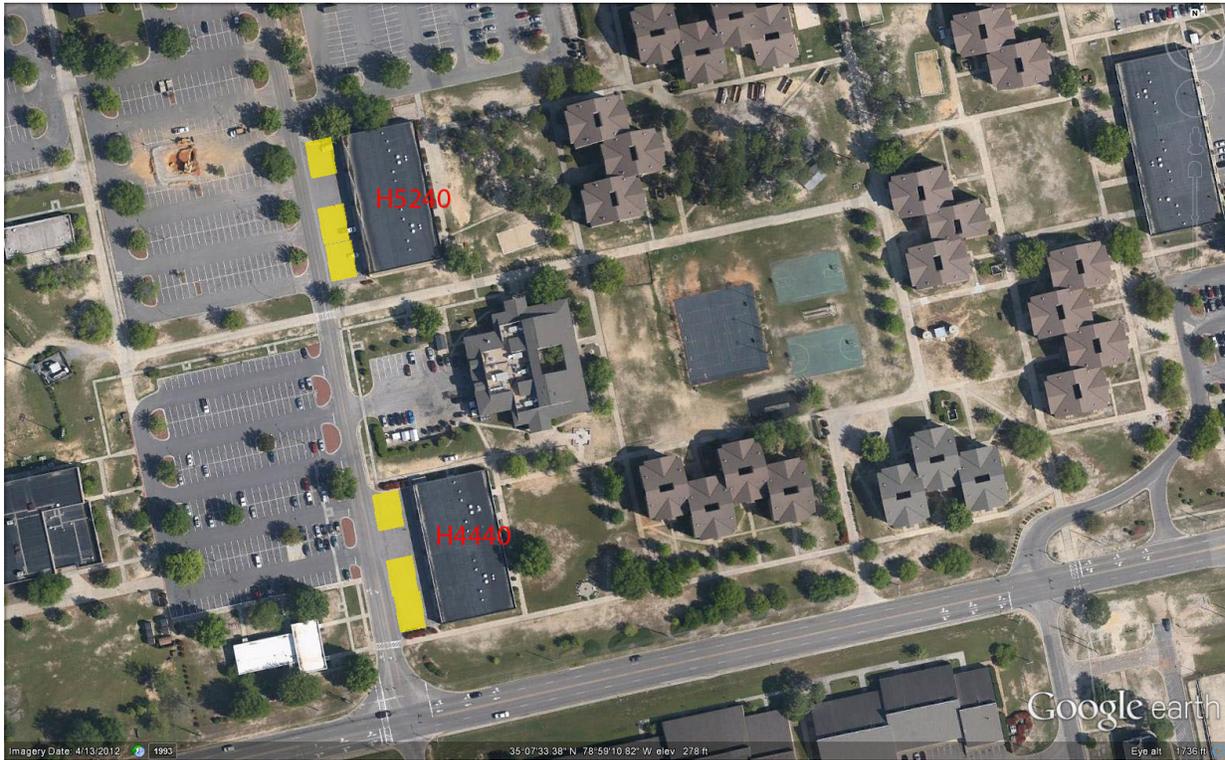
## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### Ft. Hood:

- Building 87004 is a (4) bay VOLAR, and as such it can accommodate (3) 100 PN COFs using the A1 renovation approach. Building 87004 is shown with (1) 35' X 48' and (1) 35' X 96' exterior covered hardstand area to accommodate a total of (3) 100 PN COFs.
- Building 87011 is a (5) bay VOLAR, shown with (2) 35' X 72' exterior covered hardstand structures to accommodate (2) 175 PN COFs per the A2 renovation design.
- Building 87014 is a (3) bay VOLAR; it can accommodate (2) 100 PN COFs using the A1 renovation design. Building 87014 is shown with (2) 35' X 48' exterior covered hardstand areas, to accommodate the two 100 PN COFs.
- Building 87016 is a (5) bay VOLAR. This image shows (1) 35' X 96' and (1) 35' X 72' covered hardstand structure to provide covered exterior equipment maintenance space for, respectively, (2) 100 PN COFs and (1) 175 PN COF.
- Building 87019 is a (4) bay VOLAR, and as such it can accommodate (3) 100 PN COFs using the A1 renovation approach. Building 87019 is shown with (1) 35' X 48' and (1) 35' X 96' exterior covered hardstand areas to accommodate a total of (3) 100 PN COFs.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### **Ft. Bragg:**

- Building H4440 and H5240 are each (4) bay VOLAR COFs. Each can accommodate (3) 100 PN COFs using the A1 renovation approach. Both buildings are shown with (1) 35' X 48' and (1) 35' X 96' exterior covered hardstand areas to accommodate a total of (3) 100 PN COFs per building.

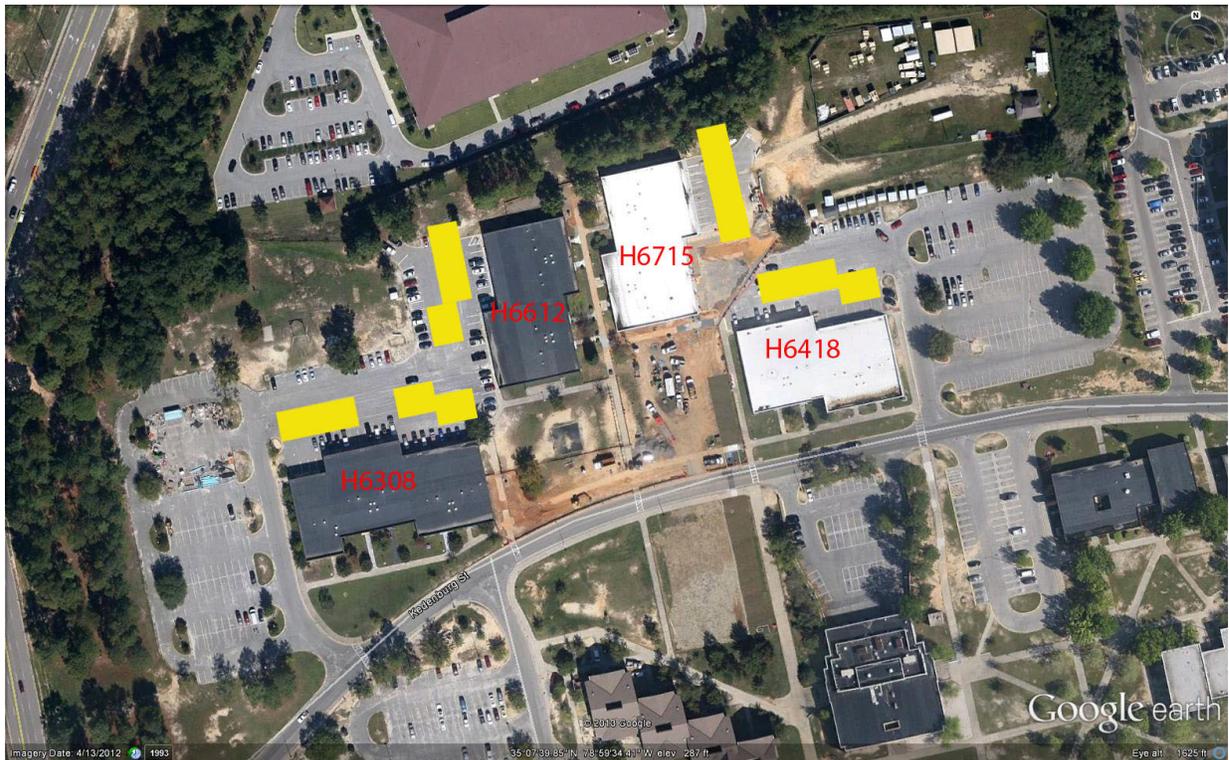
## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### Ft. Bragg:

- Building H5057 is a (5) bay VOLAR and can be renovated per the A2 renovation design, to accommodate (2) 175 PN COFs. (2) 35' X 72' exterior covered hardstand structures are shown to serve the (2) 175 PN Companies.
- Building H5757 is a (4) bay VOLAR, and as such it can accommodate (3) 100 PN COFs using the A1 renovation approach. Building H5757 is shown with (1) 35' X 48' and (1) 35' X 96' exterior covered hardstand area, to accommodate a total of (3) 100 PN COFs.
- Building H6262 is a (3) bay VOLAR; it can accommodate (2) 100 PN COFs using the A1 renovation approach. This image shows (2) 35' X 48' covered hardstand structures to provide covered exterior equipment maintenance space for (2) 100 PN COFs.

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**



**Ft. Bragg:**

- Four VOLAR buildings in the 6000 block can accommodate exterior covered hardstand structures if the parking areas can be modified to allow this space to be taken over for this new purpose. Building H6308 is a (5) bay VOLAR, the other three buildings are each (4) bay legacy VOLARs. H6308 can accommodate (4) 100 PN COFs. It is shown above with (1) 35' X 96' and (2) 35' X 48' exterior covered hardstand areas. The other three buildings are each shown with the equivalent of (3) 35' X 48' exterior covered hardstand areas, to accommodate a total of (3) 100 PN COFs per building.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY

### Site-Specific options for B1 renovation:

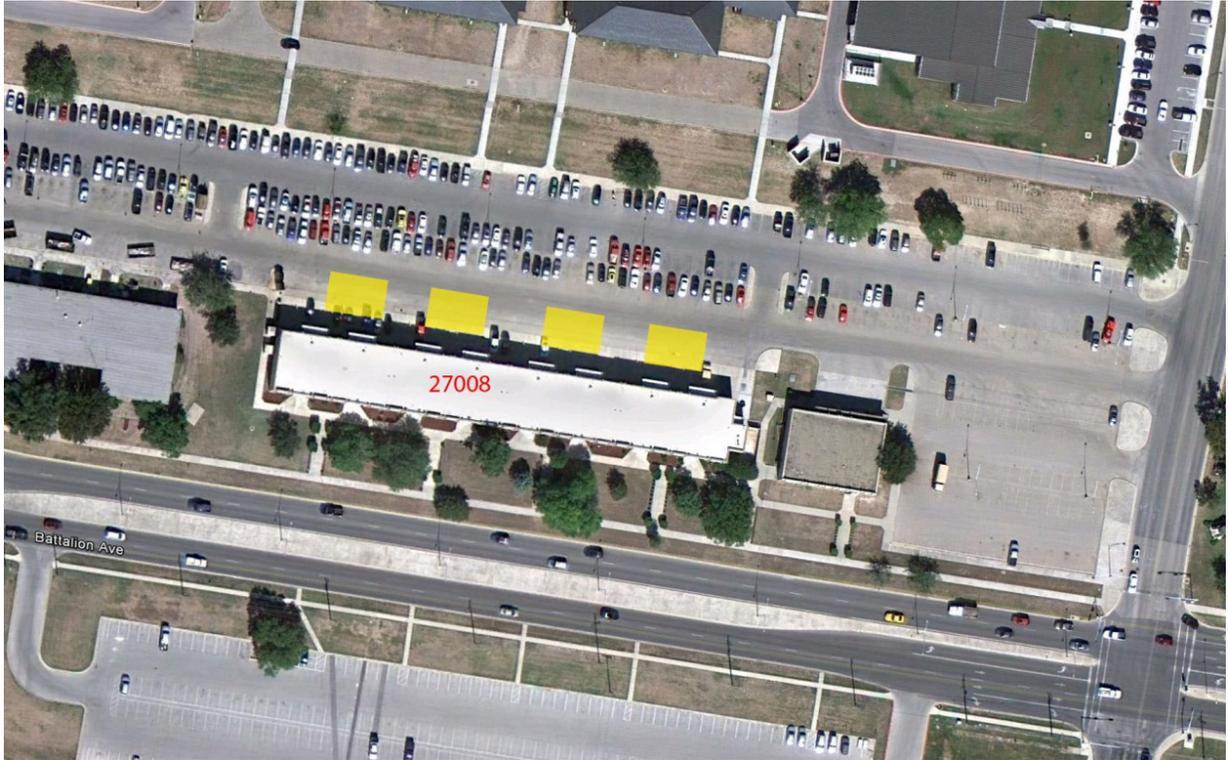
In the following aerial images taken from Google Earth, the yellow shapes are scaled elements that represent (1) 35' X 48' covered hardstand area. Note that in order to construct the suggested exterior covered hardstand structures, the Installation Master Planner will need to verify that this approach is workable.



### Ft. Hood:

- Building 34001 (above) is a (6) bay Angled Entry COF and can thus be converted to accommodate (3) 100 PN COFs using the B1 renovation design. The image above shows (3) 35' X 48' covered hardstand structures, to provide covered exterior equipment maintenance space for the (3) 100 PN COFs.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### **Ft. Hood:**

- Building 27008 (above) is an (8) bay Angled Entry COF and can thus be converted to accommodate (4) 100 PN COFs using the B1 renovation design. The image above shows (4) 35' X 48' covered hardstand structures, to provide covered exterior equipment maintenance space for the (4) 100 PN COFs.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY

### Site-Specific options for C1 renovation:

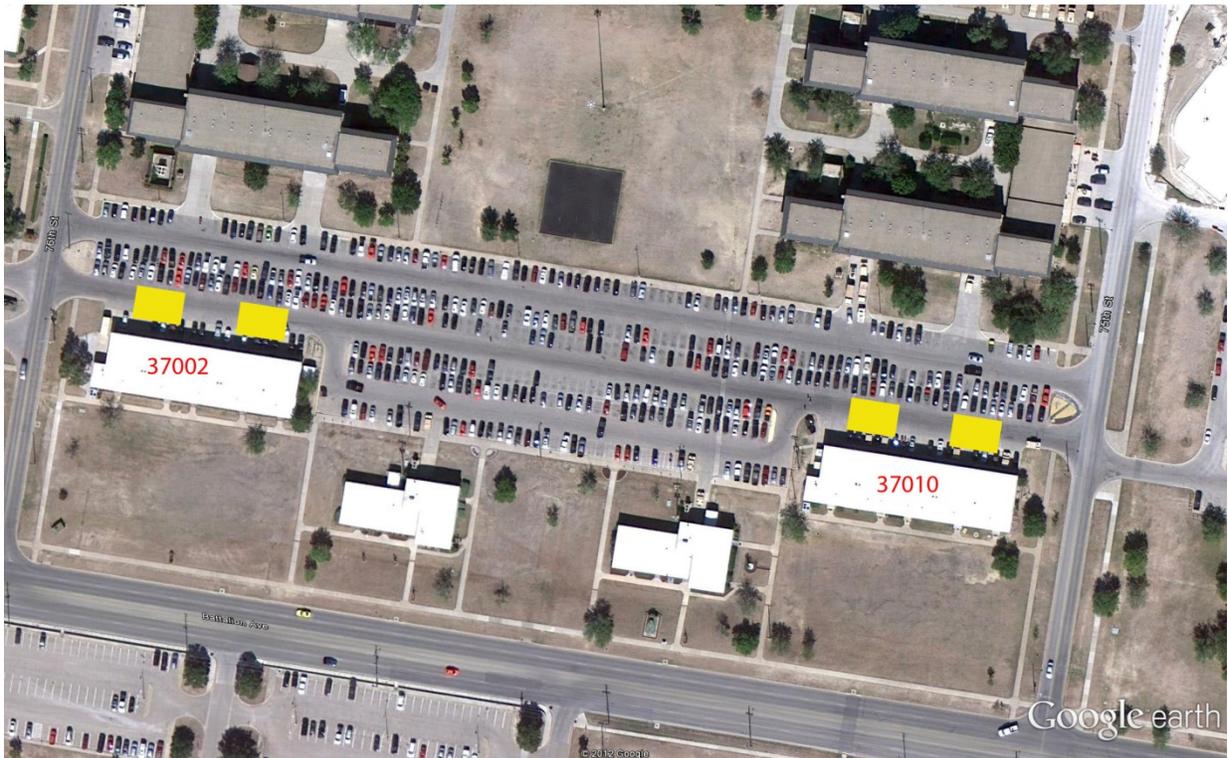
In the following aerial images taken from Google Earth, the yellow shapes are scaled elements that represent (1) 35' X 48' covered hardstand areas. Note that in order to construct the suggested exterior covered hardstand structures, the Installation Master Planner will need to verify that this approach is workable.



### Ft. Hood:

- Building 21010 (above) is a (5) bay Split Level COF and can thus be converted to accommodate (2) 100 PN COFs using the C1 renovation design. The image above shows (2) 35' X 48' covered hardstand structures, to provide covered exterior equipment maintenance space for the (2) 100 PN COFs.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



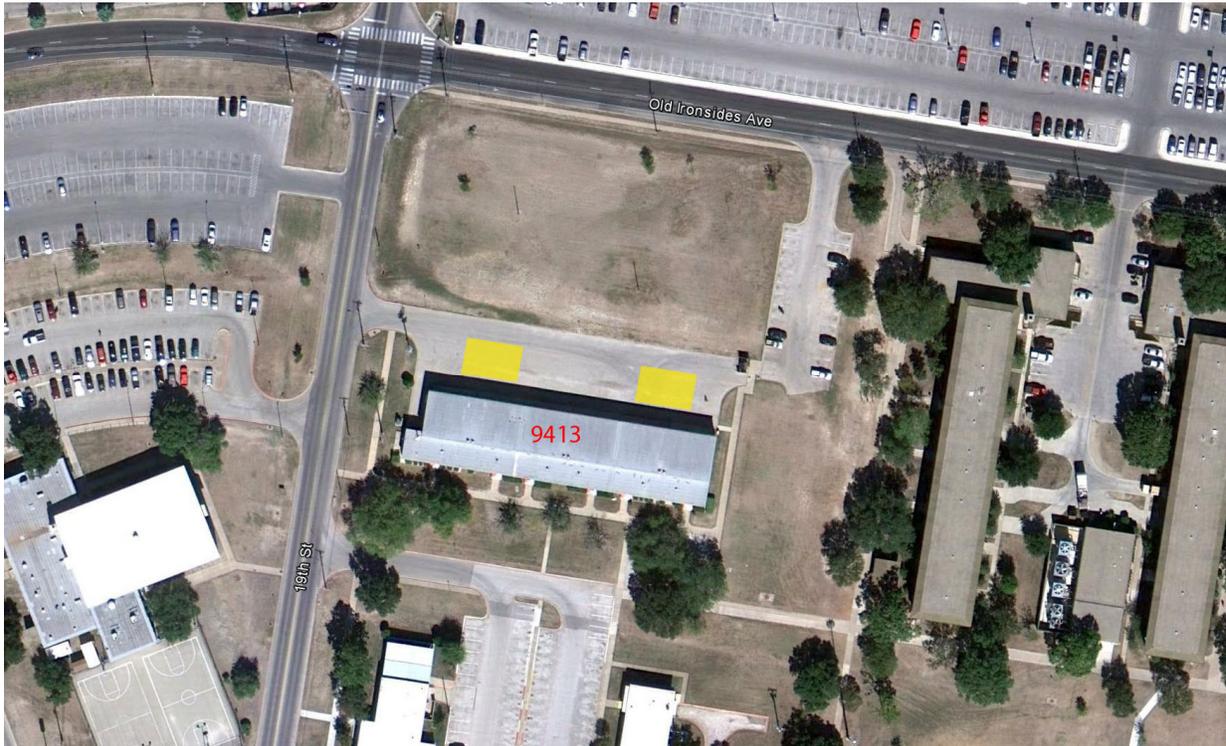
### **Ft. Hood:**

- Buildings 37002 and 37010 (above) are both (5) bay Split Level COFs. Each building can be converted to accommodate (2) 100PN COFs using the C1 renovation design. The image above shows each of these two buildings with (2) 35' X 48' covered hardstand structures, to provide covered exterior equipment maintenance space for the (2) 100 PN COFs in each building.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY

### Site-Specific options for D1 renovation:

In the following aerial images taken from Google Earth, the yellow shapes are scaled elements that represent (1) 35' X 48' covered hardstand areas. Note that in order to construct the suggested exterior covered hardstand structures, the Installation Master Planner will need to verify that this approach is workable.



### Ft. Hood:

- Building 9413 (above) is a (6) bay Square COF. The D1 renovation design is typically used with a (5) bay Square COF; with this (6) bay condition, the additional bay could be used to accommodate approximately 120 TA-50 storage lockers (without layout space). The image above shows (2) 35' X 48' covered hardstand structures, to provide covered exterior equipment maintenance space for the (2) 100 PN COFs.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### **Ft. Hood:**

- Buildings 12002 and 12010 (above) are both (5) bay Square COFs. Each building can be converted to accommodate (2) 100PN COFs using the D1 renovation design. The image above shows each of these two buildings with (2) 35' X 48' covered hardstand structures, to provide covered exterior equipment maintenance space for the (2) 100 PN COFs in each building.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### **Ft. Hood:**

- Building 16010 (above) is a (5) bay Square COF. This building can be converted to accommodate (2) 100PN COFs using the D1 renovation design. The image above shows (2) 35' X 48' covered hardstand structures, to provide covered exterior equipment maintenance space for the (2) 100 PN COFs.

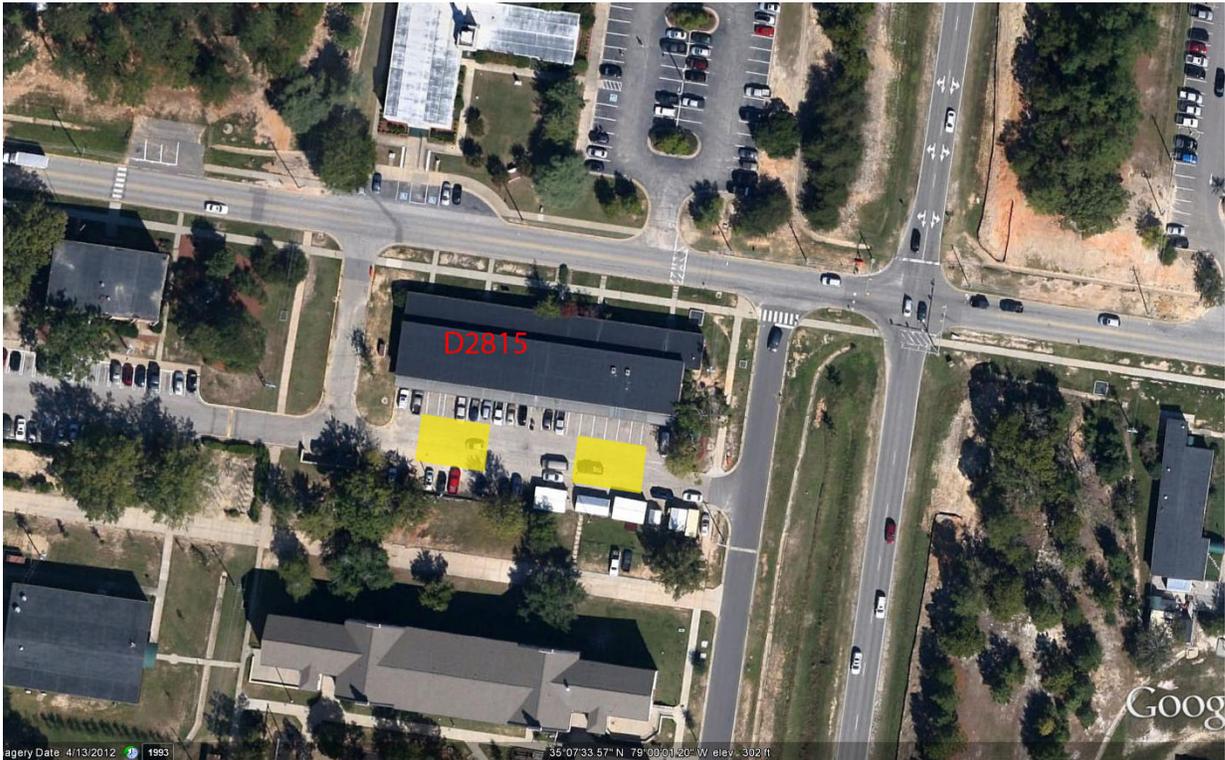
## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### Ft. Bragg:

- Buildings D2302 and D2307 (above) are both (5) bay Square COFs. Each building can be converted to accommodate (2) 100PN COFs using the D1 renovation design. The image above shows each of these two buildings with (2) 35' X 48' covered hardstand structures, to provide covered exterior equipment maintenance space for the (2) 100 PN COFs in each building.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### **Ft. Bragg:**

- Building D2815 (above) is a (5) bay Square COF. This building can be converted to accommodate (2) 100PN COFs using the D1 renovation design. The image above shows (2) 35' X 48' covered hardstand structures, to provide covered exterior equipment maintenance space for the (2) 100 PN COFs.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### Ft. Bragg:

- Buildings D3022 and D3255 (above) are both (5) bay Square COFs. Each building can be converted to accommodate (2) 100PN COFs using the D1 renovation design. The image above shows each of these two buildings with (2) 35' X 48' covered hardstand structures, to provide covered exterior equipment maintenance space for the (2) 100 PN COFs in each building.

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**



**Ft. Bragg:**

- Building D3637 (above) is a (5) bay Square COF. This building can be converted to accommodate (2) 100PN COFs using the D1 renovation design. The image above shows (2) 35' X 48' covered hardstand structures, to provide covered exterior equipment maintenance space for the (2) 100 PN COFs.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY



### **Ft. Bragg:**

- Building D3745 (above) is a (5) bay Square COF. This building can be converted to accommodate (2) 100PN COFs using the D1 renovation design. The image above shows (2) 35' X 48' covered hardstand structures, to provide covered exterior equipment maintenance space for the (2) 100 PN COFs.

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY

### Site-Specific options for E1 renovation:

In the following aerial images taken from Google Earth, the blue shapes are each scaled elements that represent (1) 35' X 64' covered hardstand area. Note that in order to construct the suggested exterior covered hardstand structures, the Installation Master Planner will need to verify that this approach is workable.



### Ft. Bragg:

- The overall image of the M-Area in East Ft. Bragg (above), and the enlarged sector below show how 35' X 64' covered hardstand structures might be sited to provide covered exterior equipment maintenance space for the 125 PN COFs.



**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

**DATE:** September 5, 2012  
**TIME:** 0900  
**LOCATION:** IMCOM HQ, Ft. Sam Houston, TX  
**RE:** Kickoff Meeting

**PARTICIPANTS:**

Frank King	COE, Savannah	<a href="mailto:frank.e.king@usace.army.mil">frank.e.king@usace.army.mil</a>
Tom Brockbank	COE, Savannah	<a href="mailto:thomas.r.brockbank@usace.army.mil">thomas.r.brockbank@usace.army.mil</a>
Dan Seastrum	HQ IMCOM G4 PW	<a href="mailto:daniel.j.seastrum.civ@mail.mil">daniel.j.seastrum.civ@mail.mil</a>
Anne de la Sierra	HQ IMCOM G4 PW	<a href="mailto:anne.b.delasierra.civ@mail.mil">anne.b.delasierra.civ@mail.mil</a>
Ramon Sison	HQ IMCOM G4 PW	<a href="mailto:ramon.sison@us.army.mil">ramon.sison@us.army.mil</a>
Susan Nachtigall	HQ USACE/CRST	<a href="mailto:susan.d.nachtigall@usace.army.mil">susan.d.nachtigall@usace.army.mil</a>
Ravin Howell	HQ USACE/CRST	<a href="mailto:ravin.l.howell@usace.army.mil">ravin.l.howell@usace.army.mil</a>
Joe Knight	Knight Architects, Inc.	<a href="mailto:jknight@knightarchs.com">jknight@knightarchs.com</a>
Lourdes Knight	Knight Architects, Inc.	<a href="mailto:lknight@knightarchs.com">lknight@knightarchs.com</a>
Narra DeMichina	Knight Architects, Inc.	<a href="mailto:ndemichina@knightarchs.com">ndemichina@knightarchs.com</a>
Mike Biscotte	Knight Architects, Inc.	<a href="mailto:mike.biscotte@gmail.com">mike.biscotte@gmail.com</a>

Following an introduction of the team players, some of the IMCOM staff roles were identified:

Dan is the lead for Master Planning within IMCOM. He is working with Baker and AECOM on a Master Planning IDIQ for IMCOM installations.

AI is developing an inventory of COFs and TEMFs from different eras. AI opened with a discussion about the variety in design and age of COFs in existence. Process to get each 'vintage' some percentage of that particular size standard. Focus on density of type of COF, "get most bang for buck" and affect the most installations out there. Want a product that is more valuable than what they have today.

Currently, each garrison is working independently to renovate their facilities. The purpose of this study is to determine the best overall arrangement for different types of legacy facilities in common use, to achieve the best approximation of the current Standard requirements. Following our visits to Ft. Hood and Ft. Bragg, we will recommend which legacy facilities appear most prevalent and are thus candidates for design studies.

Ft. Hood has done a good job of documenting their existing COF and TEMF Facilities. We will not review any that are WWII Wood, or ones where the COF is part of a barracks building, such as the attached COFs in Hammerhead and Rolling Pin type barracks buildings.

Some discussion ensued as to what percentage of the Standard Design square footage allocations we need to be met. In the Readiness Module, the Arms Vault is the most important space (and the spaces have been prioritized in the Scope of Work provided by Savannah

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY

District). Tom Brockbank stated that in the Readiness Module, we must include all storage space; the TA-50 layout space has a lower priority, as is the Covered Hardstand. A consensus developed that we should target a minimum of 75% of required square footage for the entire COF.

IMCOM has no desire for us to suggest battalion-centric solutions. This will be up to the Master Planner at each installation. Tom Brockbank stated that we should consolidate amenities so plumbing, showers and conference rooms can be shared.

Frank discussed the \$750K cost limitation; this is the maximum amount of 'new work' that can be designed in to a renovated building. All other work must qualify as 'Renovation'. Dan Seastrum has access to a DA Pamphlet that gives a (possibly confusing) description of the difference between the two- he will forward this document to Knight Architects. Because of the components (admin module, readiness module and covered hardstand), renovation and new construction to complete all three may not be possible given this cost limitation.

Anne pointed out that covered hardstand has a different category code from the Readiness or Administration Module and thus could be a separate project. Frank stated that the covered hardstand is still part of the requirements. Tom suggested it is worthwhile to develop 2 schemes - one to fit \$750K, one to give all requirements. We also need to note that AT/FP standoff requirements will be hard to meet, and probably can only be met by hardening the buildings (which is sufficient if 10M standoff is provided).

Frank - Technical requirements. Will provide representative floor plans.

3 most common types of legacy COFs.

Survey - visual inspection of number and type of existing buildings.

Discussion of the exclusion of hammerheads. Ann thinks that is most prevalent and should definitely be included. Tom states that that line can be ignored in the statement of work.

Conversion/new work - would that be MILCON?

Mandatory features from Army Standard (not listed by priority):

- Battalion Centric Design - will be difficult because of the way the building has grown. Anne does not think this should be priority.
- Open, flexible design for admin and readiness modules.
- Consolidated showers and latrines
- Readiness module storage areas. Spaces listed in order of priority:
  - Arms vaults (should already have)
  - Unit supply (should already have)
  - TA-50 Lockers (at least lockers should be accommodated)
  - Non-sensitive secure storage
  - Interior operations and maintenance area (layout space does not have to be indoors - would be easier to be exterior)
- Exterior Covered Hardstand - separate cat code. Probably separated from readiness
- Economy of Construction to Suit Function

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

-Operation Site Orientation

**Submittals and Deliverables**

Anne - eliminate an official first submittal, have it be more of a presentation with discussion about process, intent and approach.

COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY

**DATE:** September 6, 2012  
**TIME:** 0900-1400  
**LOCATION:** Ft. Hood, TX  
**RE:** Tour of Legacy COFs

**PARTICIPANTS:**

Frank King	COE, Savannah	<a href="mailto:frank.e.king@usace.army.mil">frank.e.king@usace.army.mil</a>
Anne de la Sierra	HQ IMCOM G4 PW	<a href="mailto:anne.b.delasierra.civ@mail.mil">anne.b.delasierra.civ@mail.mil</a>
Joe Knight	Knight Architects, Inc.	<a href="mailto:jknight@knightarchs.com">jknight@knightarchs.com</a>
Lourdes Knight	Knight Architects, Inc.	<a href="mailto:lknight@knightarchs.com">lknight@knightarchs.com</a>
Alan Erwin	IMWE-HOD-PWM, Ft. Hood	<a href="mailto:robert.a.erwin18.civ@mail.mil">robert.a.erwin18.civ@mail.mil</a>

Following our meeting at DPW Ft. Hood, Alan Erwin escorted the COF team on a visit to eight (8) separate legacy COF building types. The map on the following two pages shows the buildings visited on Main Post, followed by an aerial image showing the buildings visited on West. Ft. Hood.



*Fort Hood, Main Cantonment area- showing COFs visited 9/6/2012.*



West Fort Hood, showing location of Building 91230 relative to Main Cantonment.

- Building 41000, VOLAR (also, 29016, Similar):** Building 4100 includes five (5) equal-sized 'Volar'-type COF facilities; each is approximately 4,630 SF. The plan at right is oriented with north at the top of the page. We visited the westernmost COF facility in the building. The drawings we received on the building indicate that it was designed in 1982. The roof is membrane on structure that slopes down from north to south at approximately 1/4" per foot. The following information applies to the notes on the plan image:

Note 1: Finished floor to underside of roof deck above at this point measures 14'-9";

Note 2: The inside clear width dimension here is 47'-10". This is consistent with the dimensions on the floor plan pdf we were provided. The roof structure consists of 24" deep bar joists at 5'-0" O.C, running east-west. The demising wall on column line 3 does not appear to be a load-bearing wall. This is based on our observation that there are steel columns and a steel roof support beam at this location.

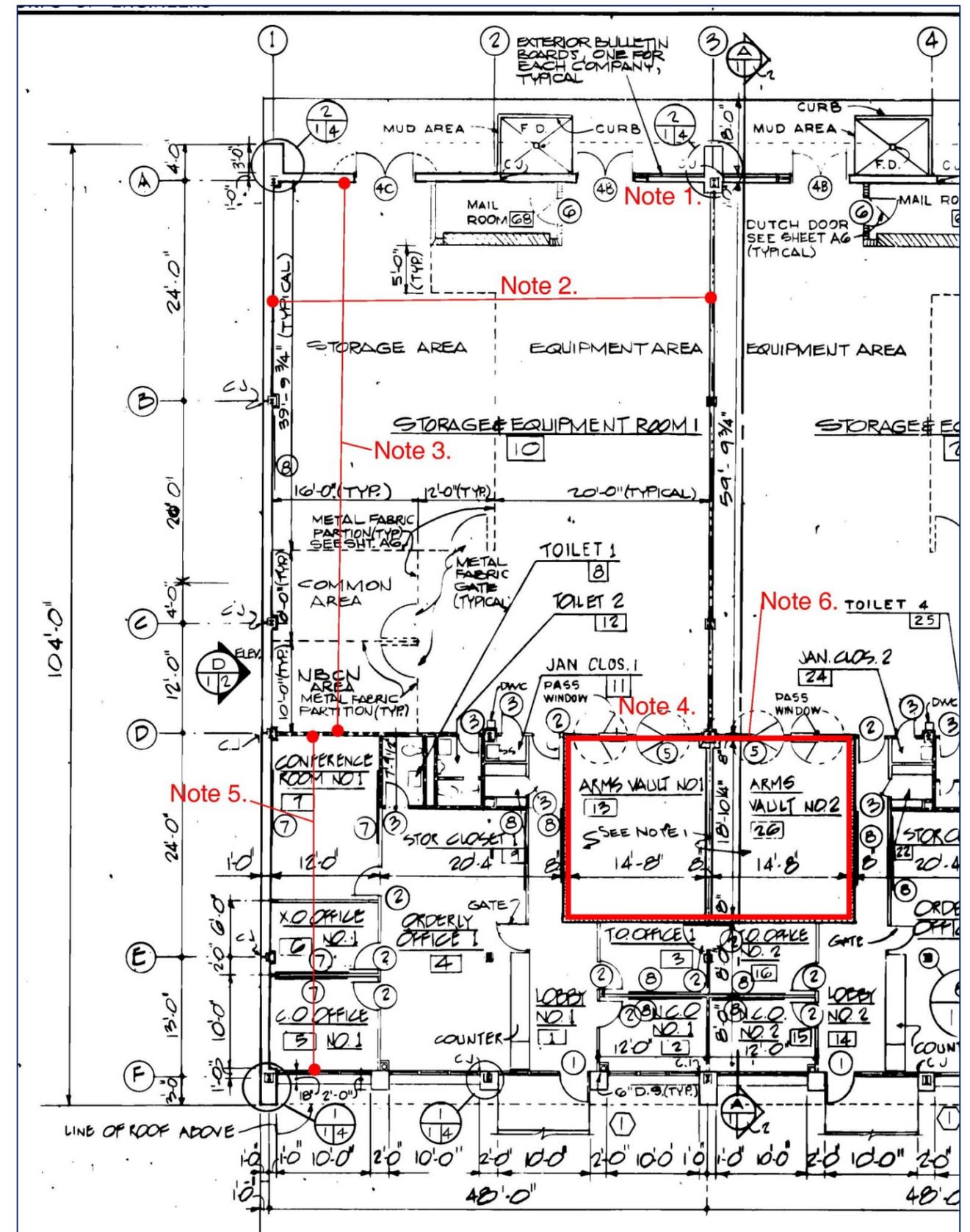
Note 3: The inside clear north-south dimension here is 59'-10". This is consistent with the dimensions on the floor plan pdf we were provided.

Note 4: Finished floor to underside of roof deck above at this point measures 13'-8";

Note 5: The inside clear north-south dimension here is 36'-4". This is consistent with the dimensions on the floor plan pdf we were provided.

Note 6: The walls around the Arms Vault are 8" CMU. All other interior walls appear to be gypsum board on metal or wood studs.

(Below, left)- Maintenance Bay area at Building 41000; (Below, Right) - the loading area at the rear of the VOLAR buildings we visited was on grade (no elevated loading dock).



2. **Building 34001, 'ANGLED ENTRY' (and 27008, Similar):** This building includes six (6) equal-sized COF facilities; each COF is approximately 2,330. The drawings we received on the building indicate that it was designed in 1973. The following information applies to the notes on the plan image:

Note 1: Long-span roof joists; see Building Section 'C' on following page.

Note 2: 8" cast-in-place concrete structure at Arms Vault.

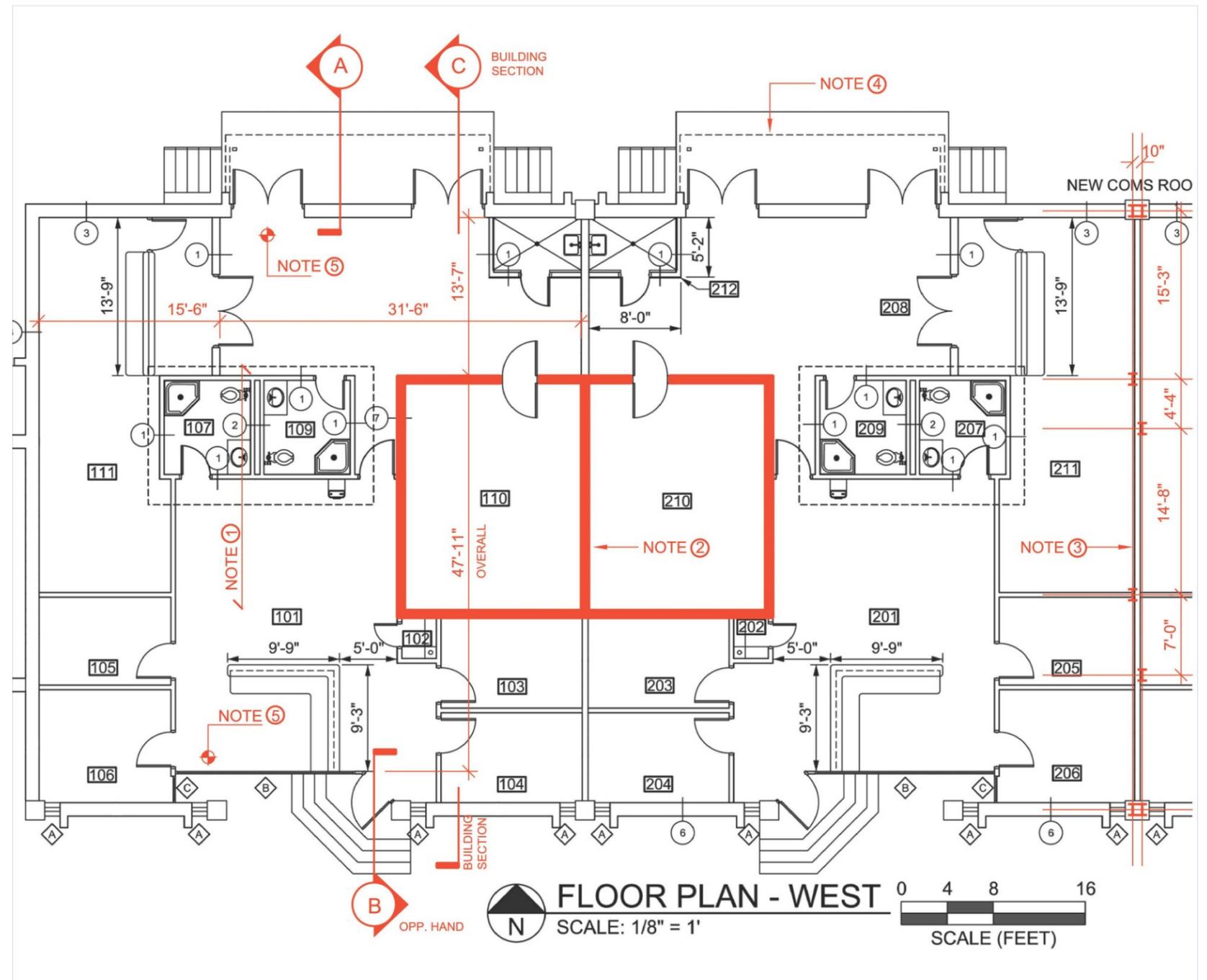
Note 3: The demising walls are not load-bearing, but at some places a step (elevation change) occurs at these walls.

Note 4: Elevated loading dock- see Wall Section 'A' on following page.

Note 5: The inside clear height from finished floor to underside of roof deck is 16'-0" at this point.

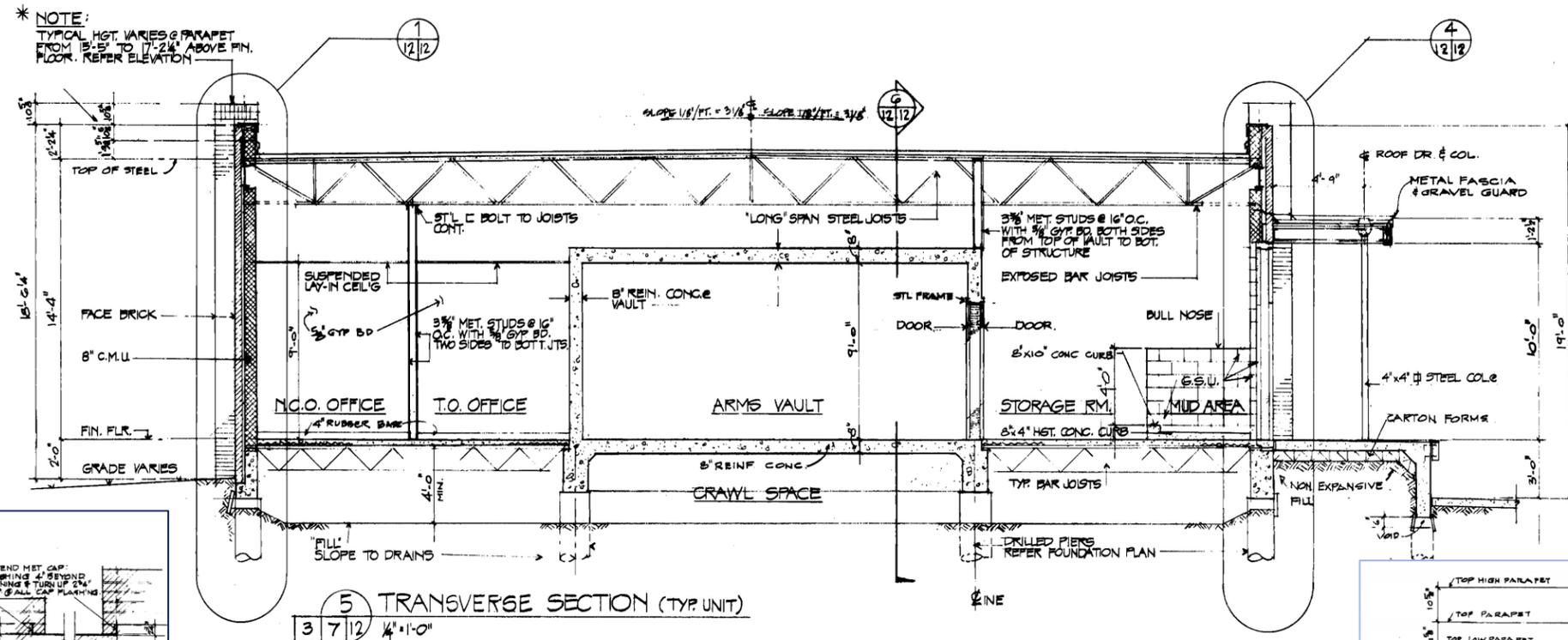


(Above, left)- Entry to Building 34001

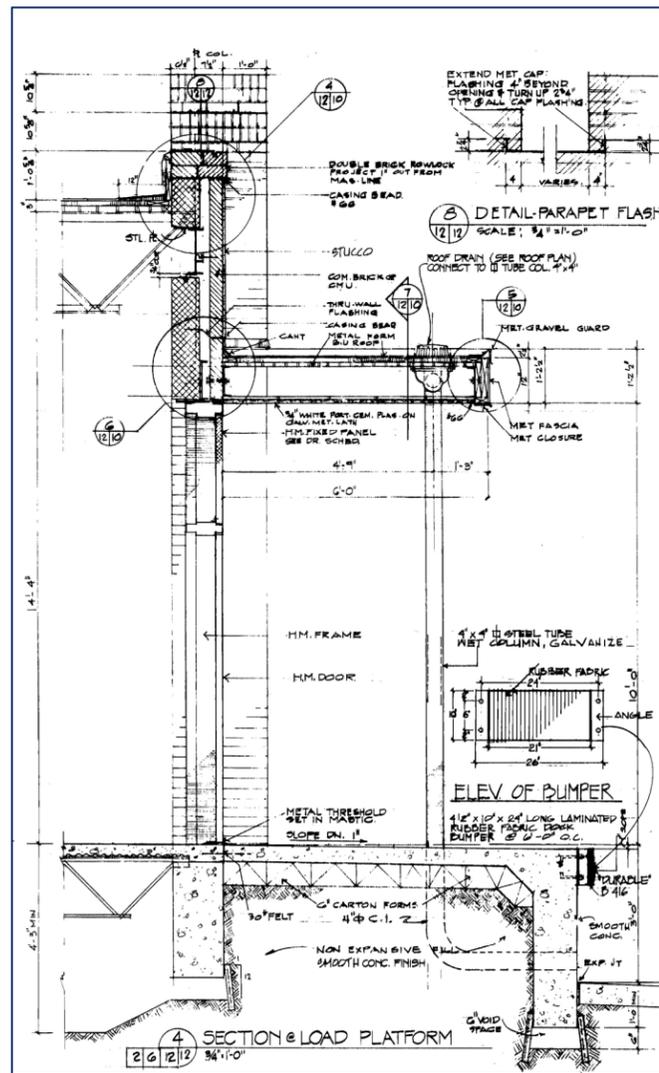


'C' (Right)

'A' (Below)

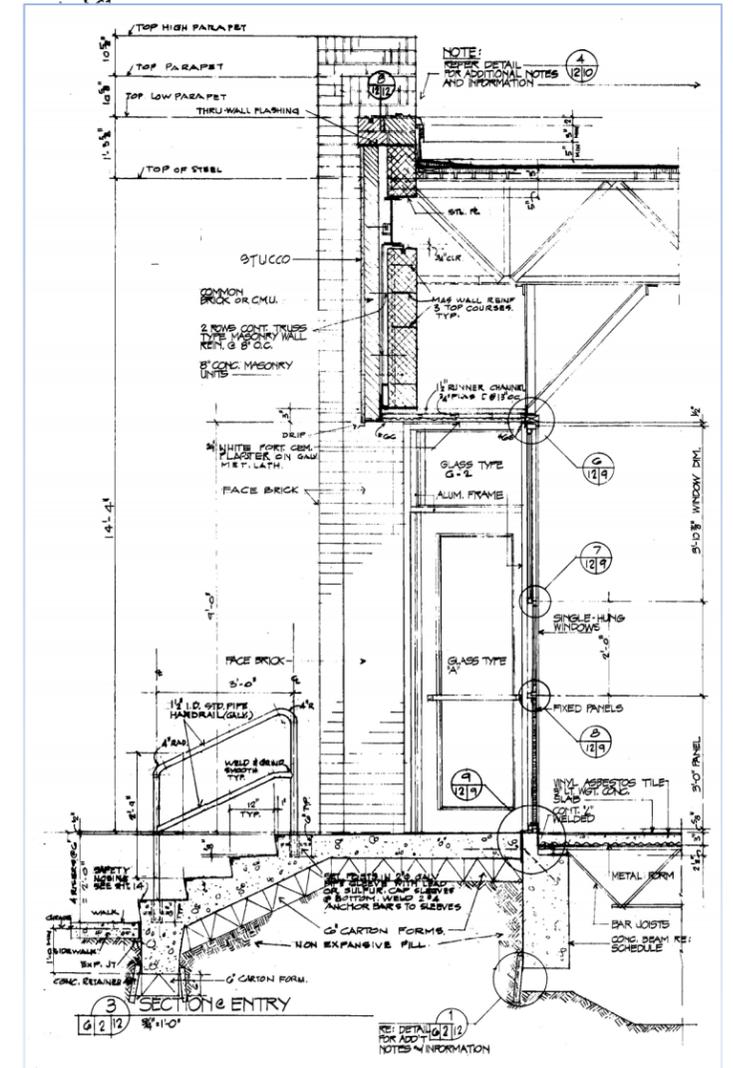


'B' (Below)



Building Section 'C', (Above) - the structure is built with a crawl space and an elevated rear loading dock (see Wall Section 'A' at left for rear loading dock condition. 'A' is shown opposite hand relative to Building Section above). The overall building roof structure consists of long span joists. It appeared during our field investigations that the demising walls between COF spaces (approximately 48'-0" O.C.) are load-bearing. This may be incorrect as the roof joists span from front-to-back.

Wall Section 'B' (right) is also shown opposite hand relative to Building Section 'C' above. 'B' indicates the entry area.

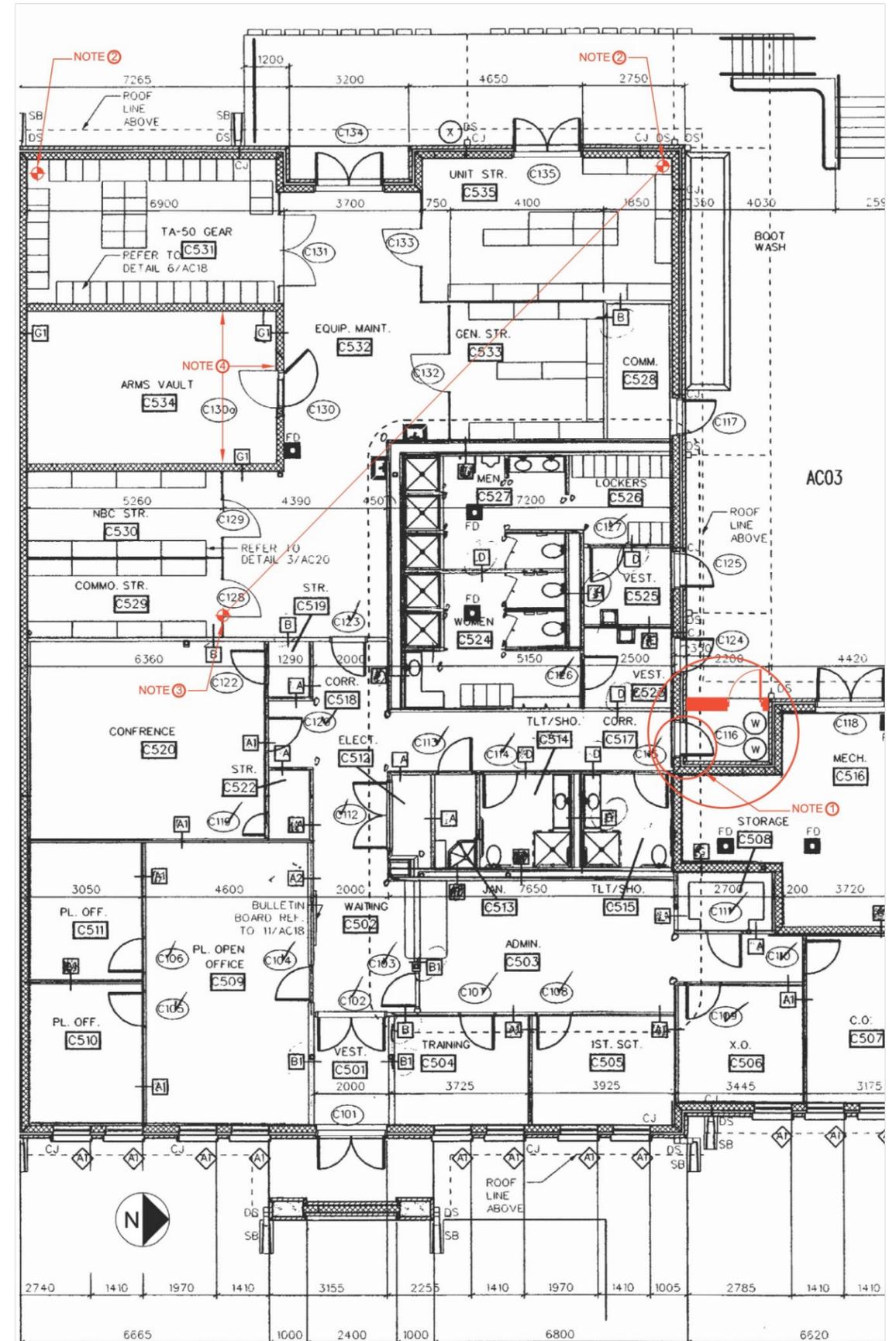


3. **Building 33034 (and 18021, Similar):** This COF is built in a building with five (5) equal-sized COF facilities; each is approximately 5,850 SF. The drawings we received on the building indicate that it was designed in 2001. The roof is standing seam metal on sloping bar joist structure. The following information applies to the notes on the plan image:

Note 1: In this area, the door to the exterior actually occurs on the outside wall as shown in red- not in the corridor as shown in the drawings. See photograph below left.

Note 2: Finished floor to underside of roof deck above at this point measures 11'-10"

Note 3: Finished floor to underside of roof deck above at this point measures 26'-0". See photograph below right.



(Top, left above)-Aerial view of COF complex which includes building 33034. (Above, left)- Exterior door from Admin area occurs in the wall perpendicular to wall with latrine entry doors. (Above, right)-The Readiness Module area has a high sloping roof with 26'-0" clear at highest point. If a 2-level scheme to accommodate TA-50 storage were viable, this volume could provide additional storage space.

4. **Building 91230:** This building includes eight (8) equal-sized COF facilities; each is approximately 5,855 SF. The drawings we received on the building indicate that it was designed in 1995. The roof appears to be built-up, on metal roof deck over bar joist structure. The following information applies to the notes on the plan image:

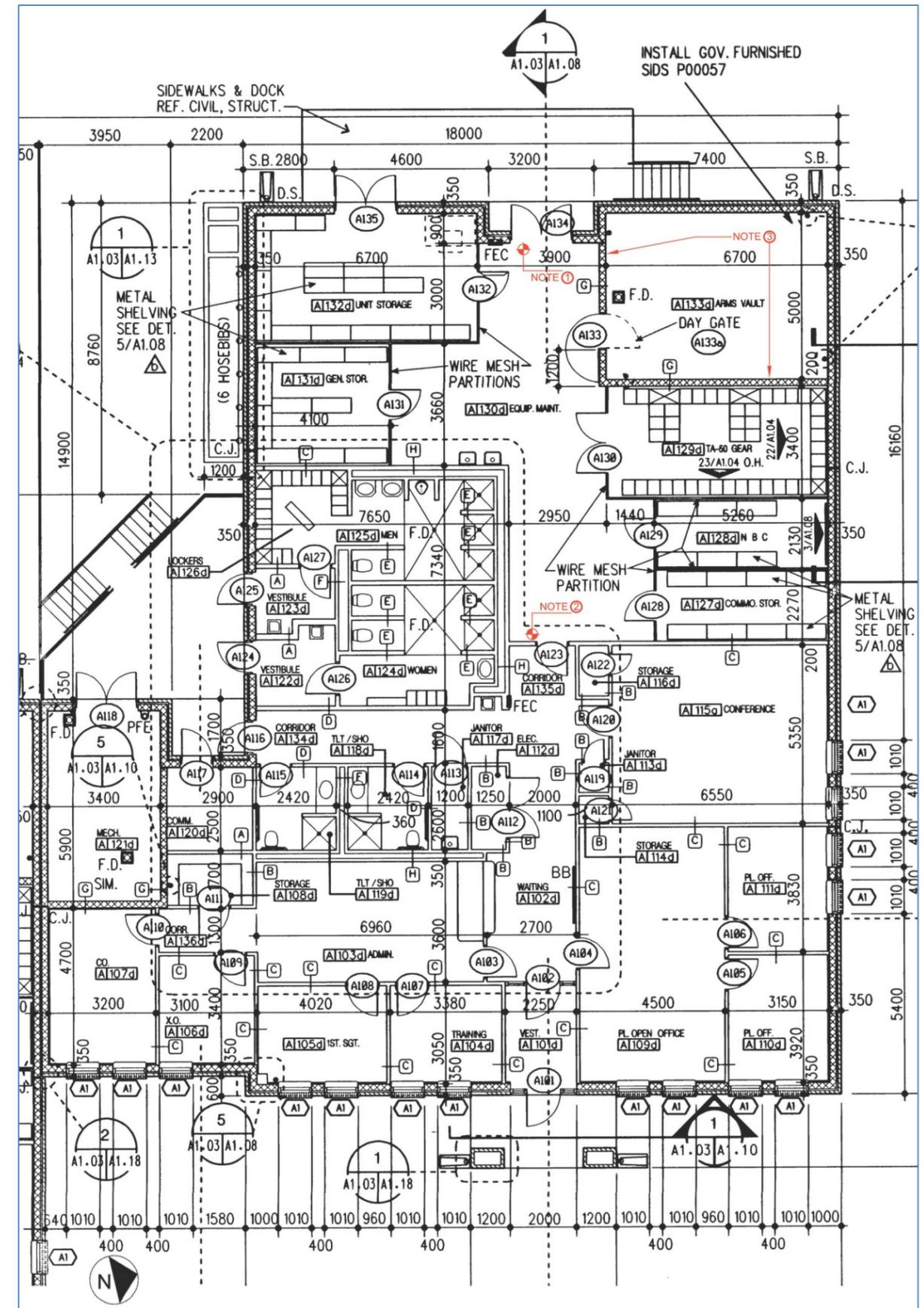
Note 1: Finished floor to underside of roof deck above at this point measures 13'-4";

Note 2: Finished floor to underside of roof deck above at this point measures 14'-0";

Note 3: 8" CMU at Arms Vault.

(Right)- Interior view at TA-50 Gear storage area, with Arms Vault beyond.

(Below)- Aerial view of 8-building COF complex.



5. **Building 21010, 'SPLIT LEVEL' (NOTE, 'SQUARE', SIM.):** This building included six (6) equal-sized COF facilities. Each COF, between load-bearing demising walls, is approximately 2,230 SF. The drawings we received on the building indicate that it was designed in 1964. The roof is membrane on sloping bar joist structure. The following information applies to the notes on the plan image:

Note 1: Loading dock at approximately 3'-10" above adjacent grade.

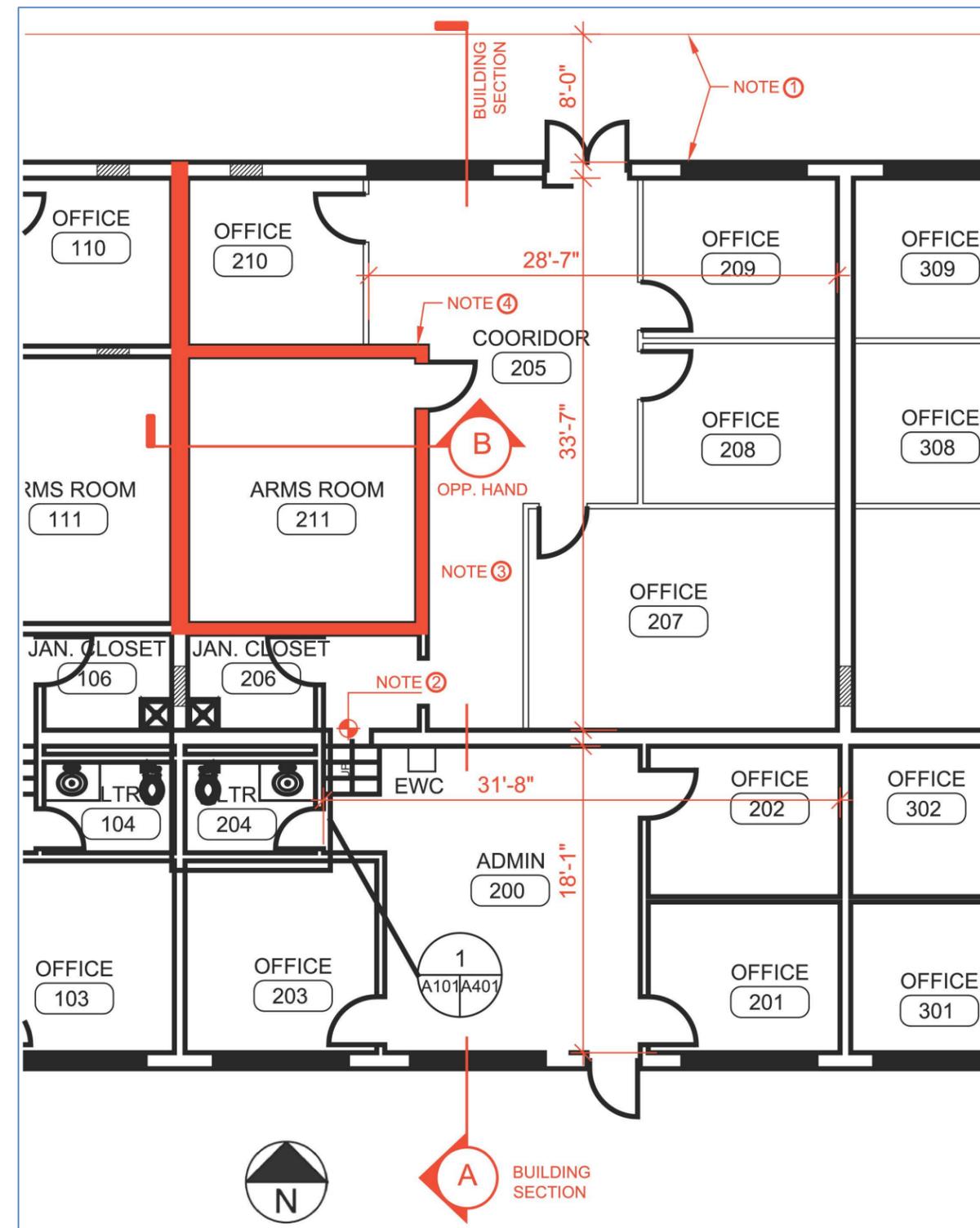
Note 2: 2'-0" elevation change (down to Room 200, Admin.)

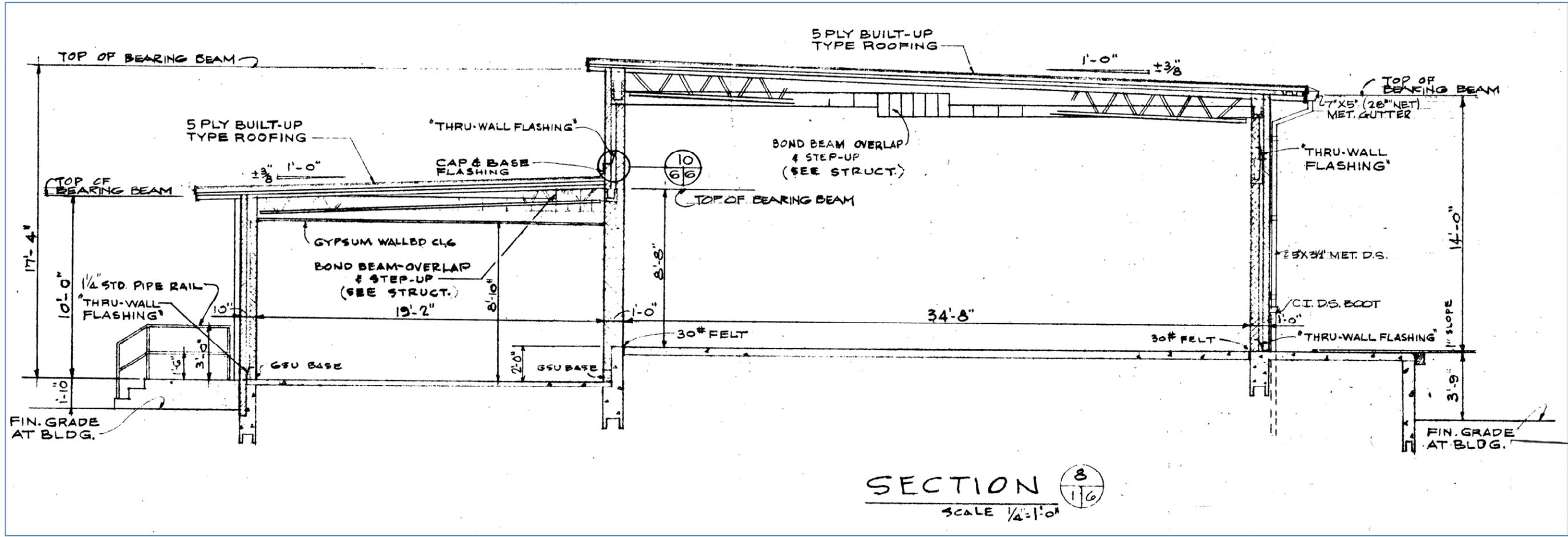
Note 3: Finished floor to underside of roof deck above at this point measures 13'-9".

Note 4: Cast-in-place concrete walls and cap at Arms Vault- see Section 'B' on following page.



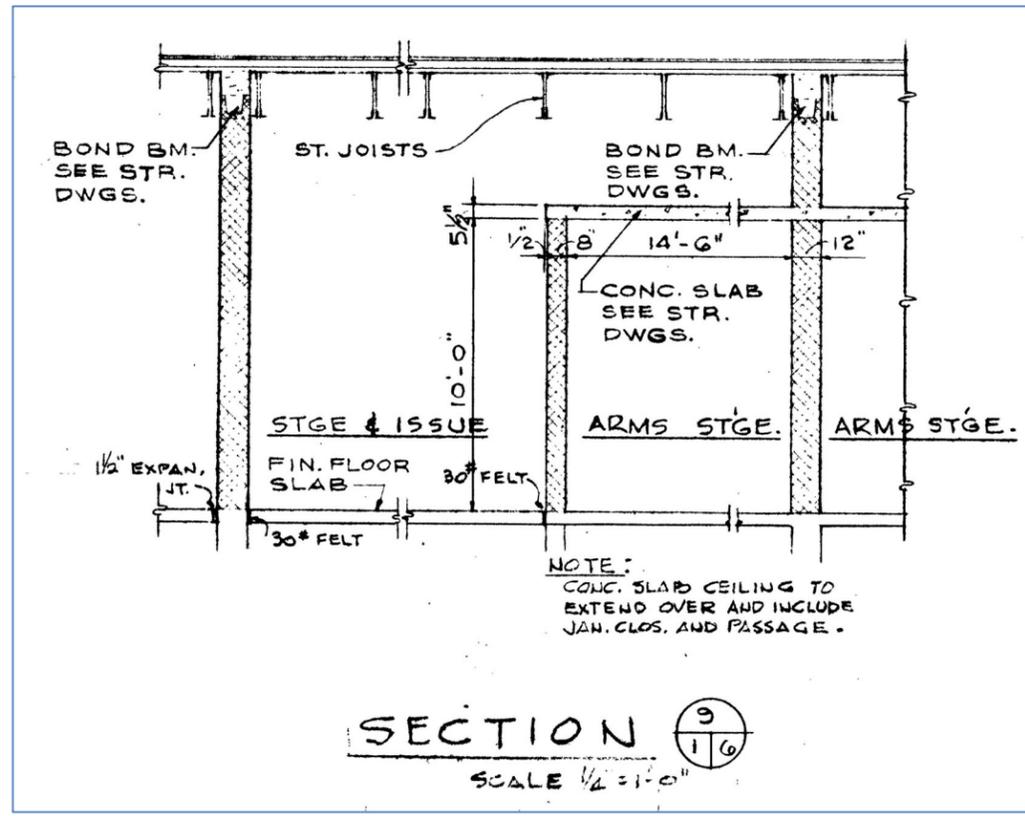
(Above) Images at exterior and interior of Building 21010. The interior view shows the Arms Room to the right, with clerestory beyond. The clerestory occurs in the wall where the grade change occurs (see Building Section 'A' on following page).





Building 21010 Section 'A' (Above) shows the clerestory at the wall where the 2'-0" step transition occurs.

Partial building section 'B' (Right) indicates the type of construction at the Arms Vault.



**Conclusion:**

The decision was made, based on the number of buildings of similar type that appear both at Ft. Hood and Ft. Bragg, to investigate notional renovation schemes for the following COF types that appear at Ft. Hood:

- VOLAR (Buildings 41000, 29016, Item 1, page 4);
- ANGLED ENTRY (Buildings 34001, 27008, Item 2, page 5);
- SPLIT LEVEL (Building 21010, Item 5, Page 9).

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

**DATE:** September 26, 2012  
**TIME:** 0830  
**LOCATION:** DPW Conference Room, Ft. Bragg, NC  
**RE:** Meeting prior to TEMF, COF tour(s)

**PARTICIPANTS:**

Greg Bean	DPW, Ft. Bragg	
Camille M. Cole	DPW, Master Planning	910-396-5300. <a href="mailto:Camille.m.cole.civ@mail.mil">Camille.m.cole.civ@mail.mil</a>
Glen Prillaman	DPW, Master Planning & Real Property	910-396-6761. <a href="mailto:glen.w.prillaman.civ@mail.mil">glen.w.prillaman.civ@mail.mil</a>
John Rose	DPW, Ft. Bragg	910-396-7905. <a href="mailto:john.j.rose@us.army.mil">john.j.rose@us.army.mil</a>
Scott Boulton	DPW, Ft. Bragg	<a href="mailto:r.s.boulton.civ@mail.mil">r.s.boulton.civ@mail.mil</a>
Tom Brockbank	COE, Savannah	<a href="mailto:thomas.r.brockbank@usace.army.mil">thomas.r.brockbank@usace.army.mil</a>
Frank King	COE, Savannah	<a href="mailto:frank.e.king@usace.army.mil">frank.e.king@usace.army.mil</a>
Jeff Stein	COE, Savannah	<a href="mailto:jeffrey.stein@us.army.mil">jeffrey.stein@us.army.mil</a>
Todd O'Dell	COE, Savannah	<a href="mailto:todd.odell@usace.army.mil">todd.odell@usace.army.mil</a>
Frank King	COE, Savannah	<a href="mailto:frank.e.king@usace.army.mil">frank.e.king@usace.army.mil</a>
Dan Seastrum	HQIMCOM G4 PW	<a href="mailto:Daniel.j.seastrum.civ@mail.mil">Daniel.j.seastrum.civ@mail.mil</a>
Lourdes Knight	Knight Architects, Inc.	<a href="mailto:lknight@knightarch.com">lknight@knightarch.com</a>
Narra DeMichina	Knight Architects, Inc.	<a href="mailto:ndemichina@knightarch.com">ndemichina@knightarch.com</a>
Mike Biscotte	Knight Architects, Inc.	<a href="mailto:mike.biscotte@gmail.com">mike.biscotte@gmail.com</a>
Joe Knight	Knight Architects, Inc.	<a href="mailto:jknight@knightarch.com">jknight@knightarch.com</a>

Following an introduction of the team players, the following points were discussed;

We should consider two approaches:

- First, an approach which incorporates maximum \$750K of new work into the solution;
- Since some MILCON funding will be available, we should look at an approach that incorporates new work, most especially on the TEMF.

*After reviewing these two comments after the meeting, our team chose to stick with the approach we currently have, which will maximize what can be done with existing building space, with the understanding that miscellaneous functional areas such as Mech. And Comm. Can be built as 'add-ons' within the \$750K limit for new construction.*

## COMPANY OPERATIONS FACILITIES (COF) LEGACY FACILITIES RENOVATION STUDY

The COFs at Ft. Bragg are a mix of renovation and new construction projects. We were told that East Bragg includes a good example of a detached COF Readiness but could be a bit better looking.

Because of Force Protection requirements, Design-Build route may be cheaper than to renovate. This puts the onus of figuring out blast protection requirements on the D/B Contractor. Probably all of the COFs we will see are going to be less than 82' from adjacent roads.

### **Discussion of 'Tiers' (decision-making process):**

We must minimize displacement in existing legacy space, i.e., if a building currently has (6) COFs, try to get at least a 66% yield (4 larger, more functional COFs that incorporate as much as possible of 'tiers' we are developing). As an example, Company displacement cannot reduce from 4 to 2 but can go from 4 to 3 Companies. The Tier 1 should include Showers and Toilets; we may have to displace 1 or 2 units per building to force "them" to add new space for the displaced company.

We currently are thinking of TA-50 locker space as being in the Tier 1 ('Must Have') tier-but discussions at Ft. Bragg suggested that this space may move from "Must have Tier" to the "Middle, Nice-to-have Tier

Arms Vault goes with Admin. space as a Tier 1 'must have' item. Need Handicap Access to ADMIN. Need all the Admin Storage

Volar – look at turning the D-Building first floor into a full-blown COF  
Repurposing use of dorms to COF

Tom Brockbank stated that COF Standard Design is going to be reduced by 2,000 SF.

Add a disclaimer that states that Asbestos abatement IS "NOT INCLUDED IN COST"

**COMPANY OPERATIONS FACILITIES (COF)  
LEGACY FACILITIES RENOVATION STUDY**

**DATE:** September 27, 2012  
**TIME:** 0900-1400  
**LOCATION:** Ft. Bragg, NC  
**RE:** Tour of Legacy COFs

**PARTICIPANTS:**

Frank King	COE, Savannah	<a href="mailto:frank.e.king@usace.army.mil">frank.e.king@usace.army.mil</a>
Todd O'Dell	COE, Savannah	<a href="mailto:todd.odell@usace.army.mil">todd.odell@usace.army.mil</a>
Joe Knight	Knight Architects, Inc.	<a href="mailto:jknight@knightarch.com">jknight@knightarch.com</a>
Lourdes Knight	Knight Architects, Inc.	<a href="mailto:lknight@knightarch.com">lknight@knightarch.com</a>
Camille Cole	Chief, Master Planning Branch, DPW	<a href="mailto:Camille.m.cole.civ@mail.mil">Camille.m.cole.civ@mail.mil</a>

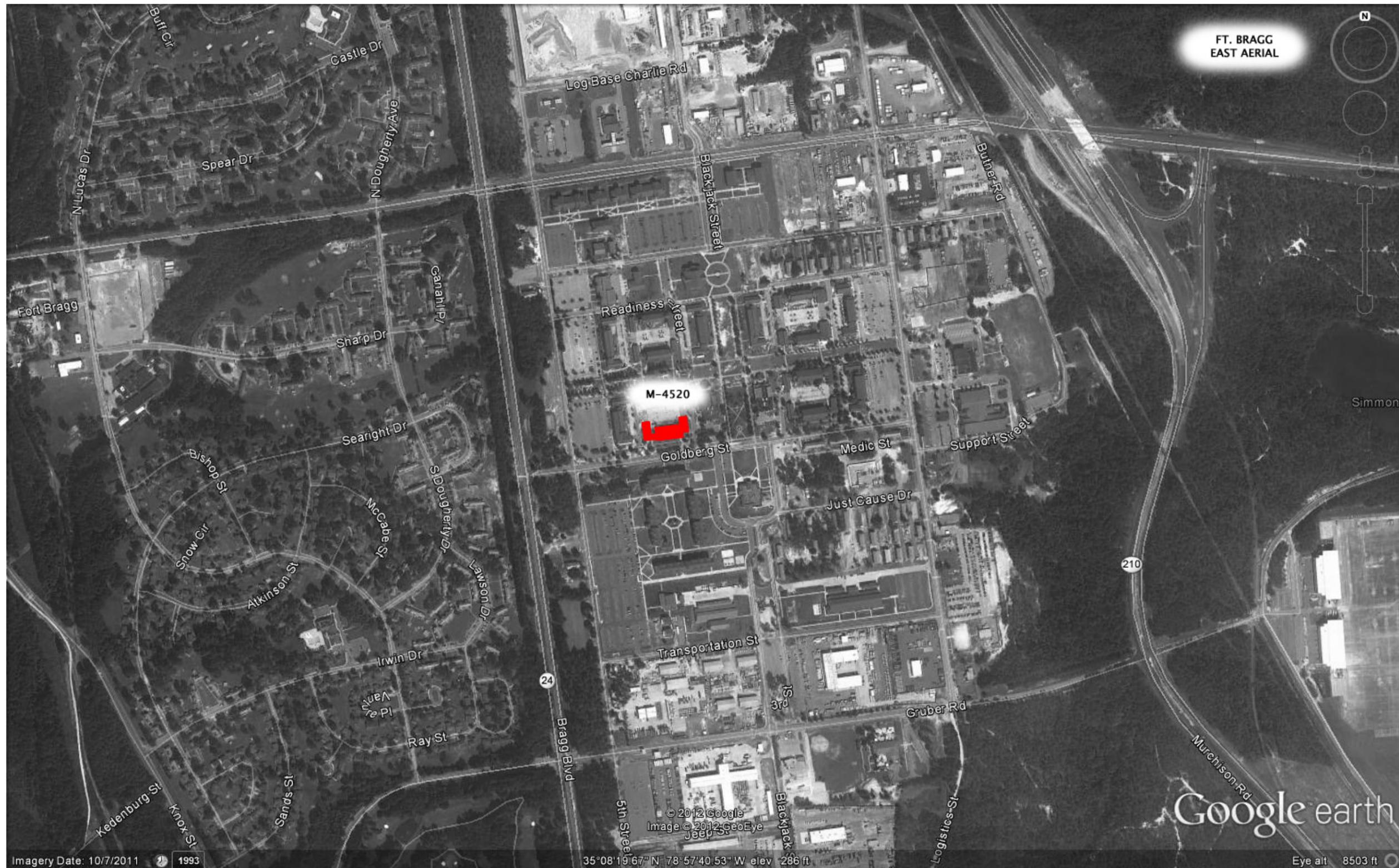
Following our meeting at DPW Ft. Bragg, Camille Cole escorted the COF team on a visit to legacy COF building types. The map on the following two pages shows the buildings visited on Main Post, followed by an aerial image showing the buildings visited in the D and H Areas, as well as the M Area in East Ft. Bragg.



Fort Bragg, showing (3) Legacy COFs visited 9/27/2012.



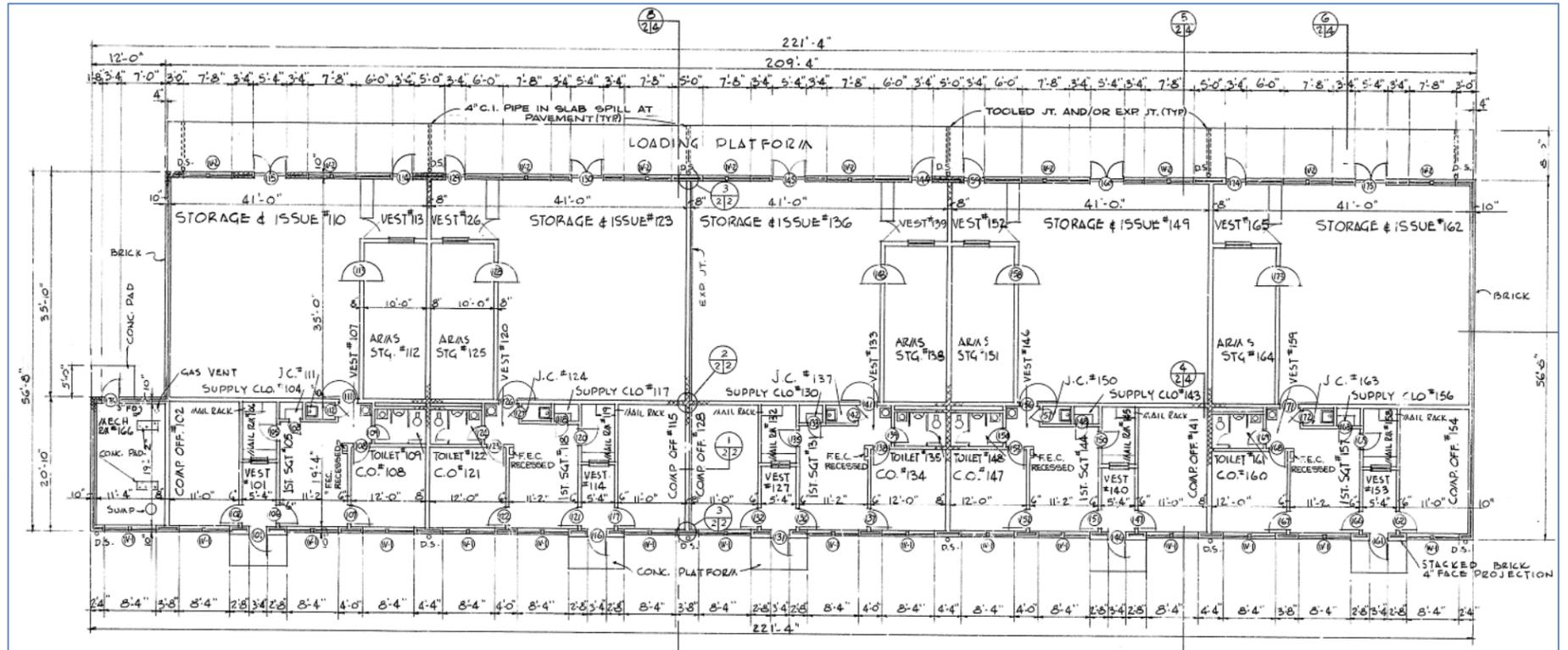
Enlarged aerial image of D- and H-Area COFs visited 9/27/12.



Enlarged aerial image of East Ft. Bragg showing M-Area COF visited 9/27/12.

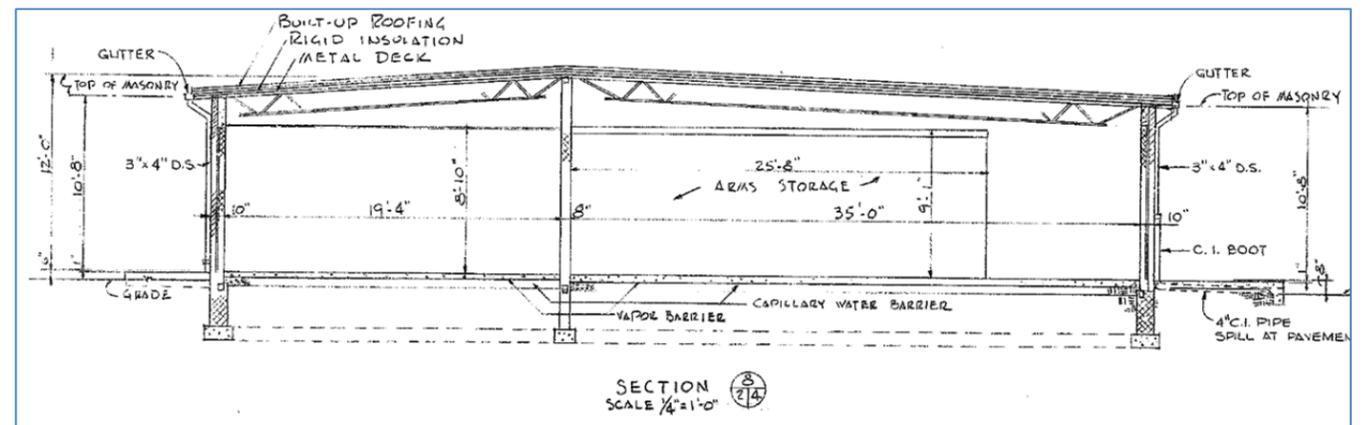
1. **Building D-3745, 'SQUARE':** This COF is built in a building with five (5) equal-sized COF facilities; each is approximately 2,320 SF. The drawings we received on the building indicate that it was designed in 1969. The roof is membrane, on sloping bar joist structure as indicated in the building section below right. This building is pretty much identical to the 'Split Level' COF we visited at Ft. Hood, with the exception being that the 'Square' COF is all on one level. Incidentally, there are (5) more buildings like this at Ft. Bragg and (5) buildings similar to this at Ft. Hood.

One concern on this building, as on almost every legacy COF we saw, is the lack of AT/FP setback. At the northeast corner, Building D-3745 sits less than 43' off of Ardennes Road. However, on the rear side of the building, there is a clear dimension of 170' to the nearest adjacent building to the south. The existing hardstand on the rear of the building is 85' deep. We discussed the possibility of creating an overhead shelter at this rear hardstand for Exterior Equipment Maintenance. A 20' deep (front to back) shelter could be accommodated at all the 'D-area 'Square' COFs.

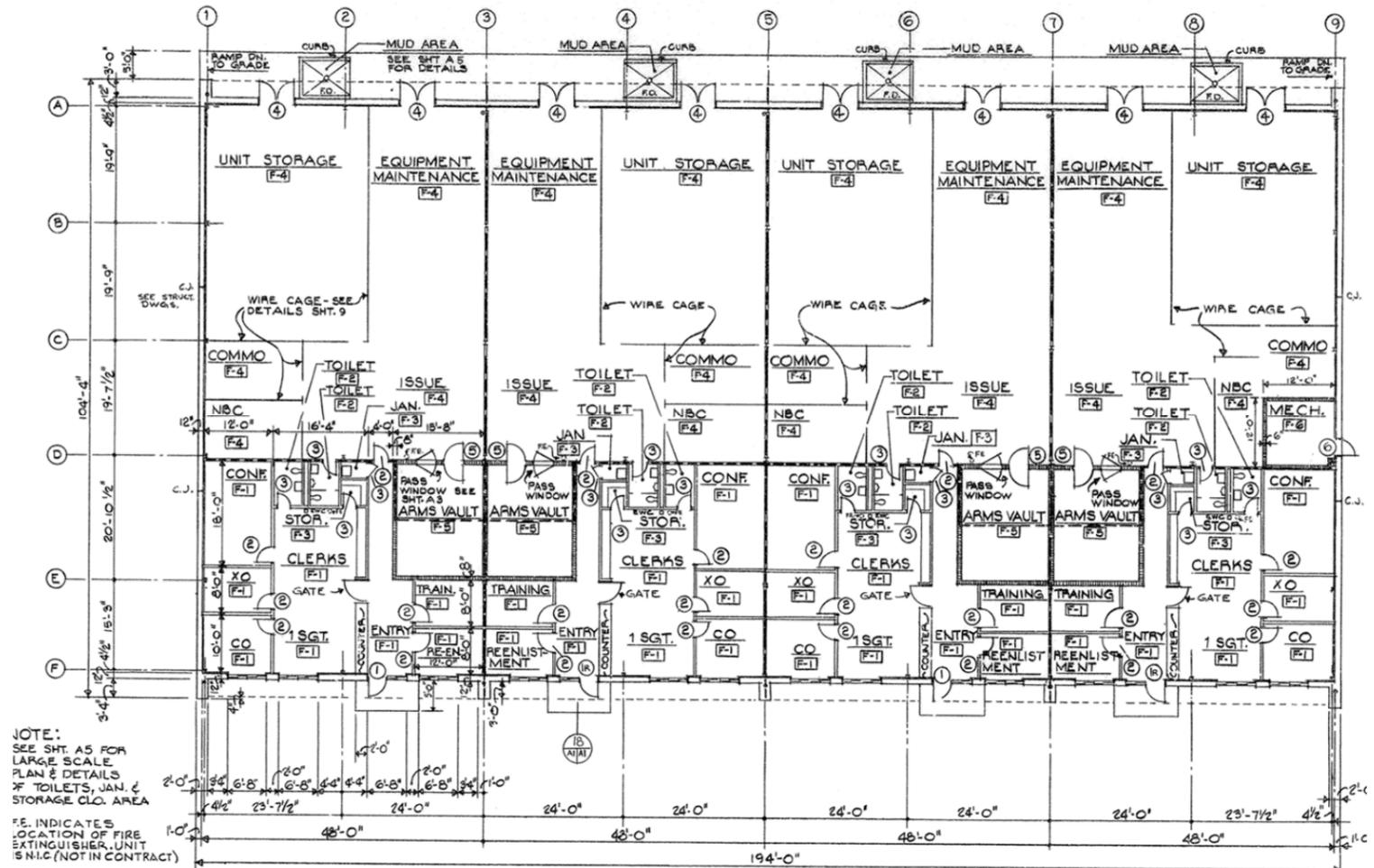


(Left) Images at exterior of Building D-3745 showing the rear hardstand and the proximity to Ardennes Road in the image at left.

As is indicated in the building section at right, there is a load-bearing wall that runs the length of the building. This will need to be incorporated into any notional floor plan.

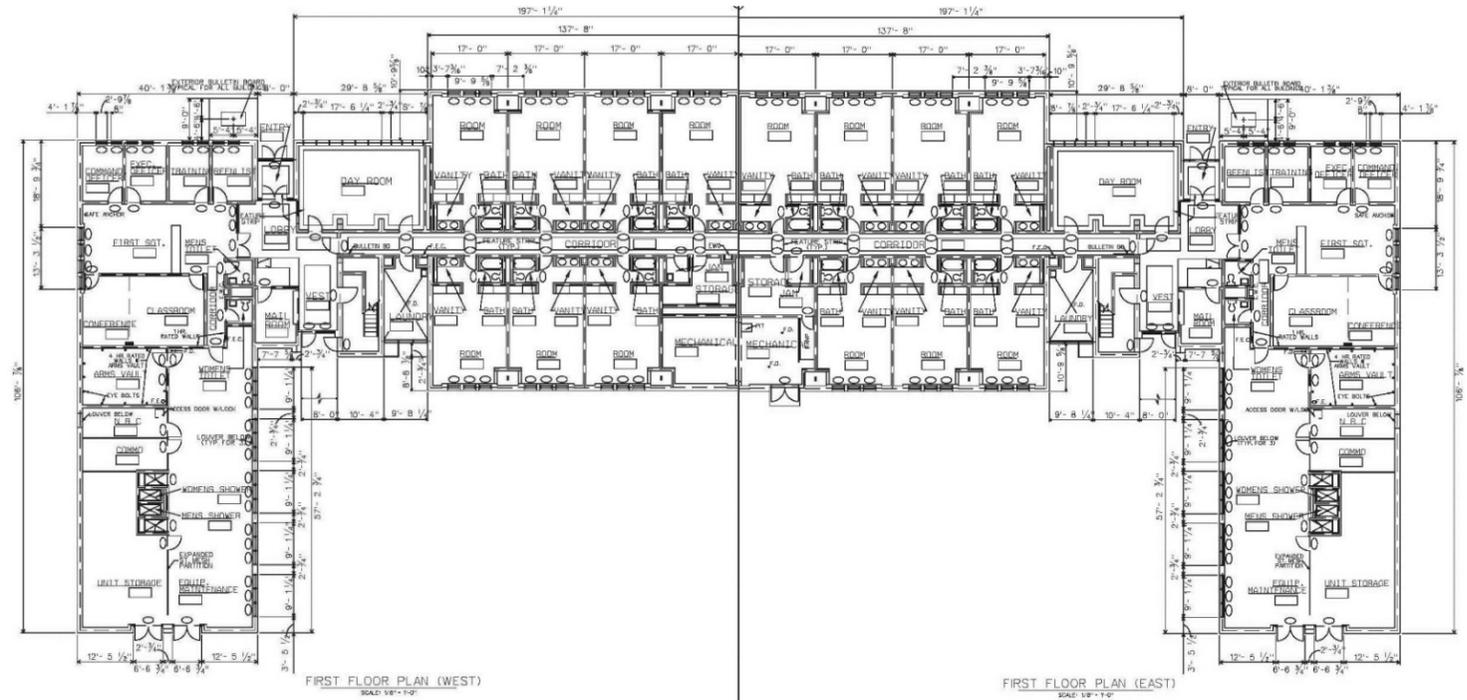


2. **Building H-5240, 'SQUARE'**: This COF is built in a building with five (4) equal-sized COF facilities; each is approximately 4,800 SF. The drawings we received on the building indicate that it was designed in 1974. The roof is membrane, on sloping bar joist structure. This building is pretty much identical to the VOLAR COFs we visited at Ft. Hood.



3. **Building M-4520, 'BARRACKS COF'**: This COF, along with another mirror-image COF is built in the first floor of a Barracks building. The photograph below left shows the end of the Maintenance Bay area of the COF, facing to a central paved area.

The wall construction consists of brick over CMU; there is a shingle roof on bar joist roof structure at the one-story portion of the COF. The interior construction at the barracks area appears to be CMU walls supporting concrete plank floor structure.



Conclusion:

The decision was made, based on the number of buildings of similar type that appear both at Ft. Bragg and Ft. Hood, to investigate notional renovation schemes for all three of the COF types that we visited at Ft. Bragg.

**DATE:** December 10, 2012  
**TIME:** 1300 - 1700  
**LOCATION:** IMCOM, Fort Sam Houston, TX  
**RE:** Preliminary Submittal Review Meeting, COF Notional Designs

Attendees:

Tom Brockbank, Jeff Stein and Frank King from SAS  
Anne de la Sierra, Dan Seastrum and Al Carroll from IMCOM  
Susan Nachtigall and Ravin Howell from HQ USACE  
John Burrow and Kris Manning from Ft Hood  
Jim Kennedy from FORSCOM (on the phone)  
Joe Knight, Lourdes Knight and Narra DeMichina from Knight Architects

**General Notes/Comments:**

- Restructure report to group all info for each facility together;
- Describe 'intent' at beginning of report (Statement of Purpose);
  - Here are important things to explain in intro;
    - Why we did this study- to take legacy buildings and renovate to Army Standard and Standard Design requirements as much as possible, within SRM limits. This is the Statement of purpose.
    - Because not all things were possible, we made a decision tier, prioritizing the criteria based on our SOW, meetings with IMCOM, Fort Hood and Bragg reps, as well as from what we learned from Company Commanders we interviewed.
    - Explain that we tried to retain as many COFs as possible but that a certain amount of displacement occurs.
    - Explain that each renovation scheme goes as deep down the tier list as possible. Also, that where building envelope only accommodates tier 1 we also provide a notional solution for tier 2 if site allows (sketch in TA-50 storage space required, if site allows it to go there).
  - Note that schemes are predicated on surveys of typical facilities at Hood and Bragg, but are meant to be applicable for similar facilities worldwide.
  - Explain how we arrived at the buildings we chose to renovate:
    - Installations chose COFs to show us;
    - Of those, which ones currently meet the least of current COF standard requirements;
    - Which types of COFs tend to be prevalent at multiple installations.
- Following the Intro- include a 'How to Use This Document' page. This will show Installation Master Planners how to accomplish the renovations.

- FORSCOM stated that in their view, the decision tiers are the most important part of this study. Need to explain this in intro. Then, when Tiers are covered, need a clear listing of the Tiers (don't just bury that in a matrix).
- Overall, we need to figure out what to do with all these matrices- how to present them (if at all). Maybe in appendix, for anyone who is interested in viewing several different facilities- i.e., not something a Master Planner will necessarily be interested in.
- Include page numbers throughout the report;
- Final document should be PDF with bookmarks for each section.
- Drawings should be 11 X 17. We might include a note stating that when they print from the pdf, pick 'choose paper based on source paper size' so that they will get 11 X 17 prints.
- Show existing or as-built floor plans for each facility.
- SAS will note reference to legacy studies in applicable standard designs online and provide a link.
- For schemes that reduce overall quantity of user facilities, note potential solutions for accommodating the deficit.
- IMCOM will provide guidance on O&M vs. new construction funding classification for SRM work.
- Consider template or an example 1391 for SRM work.
- Need to add caveat that if renovation cost exceeds 50% of new construction cost, the new construction needs to be pursued.
- IMCOM will provide guidance on O&M vs. new construction funding classification for SRM work.

**Final Report Organization:**

Table of contents

- Executive summary
  - Intent
  - Describe decision tiers; overall tier matrix
  - General information about facility type (organized to reference page numbers where each building is described)
- How to Use this Report;
- Table of Contents;
- COF 1
  - Photographs and description of existing building
  - Map with locations at each Installation;
  - Number of applications
  - Existing floor plan
  - Tier matrix (with further description about why specific tiers may or may not be feasible)
  - Description of thought process behind renovation
  - Chart showing square footage provided for individual functions

- Renovation notional floor plans- overall, and then an enlarged plan to show one Company area.
- Close with explanation of what tier items we met. In case of smaller ones, show site-specific solutions for achieving TA-50 if that is possible (on each specific site).
- COF 2
- COF 3...
- Meeting minutes/Trip report

**Intent/How to use**

The intent of this report is to provide information regarding the renovation of Legacy Facilities. The information and notional floor plans included are intended to bring these Legacy Facilities as close as possible to the current standard design and to achieve a longer useful life. The notional floor plans are not intended to be prescriptive, but to suggest a solution that can be adapted to particular building circumstances. The six facility types shown in this study were selected based on site visits at Ft. Hood and Ft. Bragg. While other installations may not have legacy facilities identical to those shown in this report it is the goal that the information included be adaptable to individual installations' specific needs.

**Review of specific COF building types:**

- VOLAR: Show a covered walkway on the front for Admin areas to access central core.
- In some cases, could we add a MILCON-funded addition on the end to keep 100% of COFs. Maybe add on the Core building.
- Look at AR 405-70 for minimum space sizes.
- B1- need to show dashed line for TA-50 out the back where specific sites allow. Same for C-1 and D-1.
- E- Take out some TA-50 in center portion of TA-50 area to provide latrines- or maybe this is male latrine and Females use the ones we already show.

**DATE:** February 12, 2013  
**TIME:** 1300 - 1700  
**LOCATION:** IMCOM, Fort Sam Houston, TX  
**RE:** Final Submittal Review Meeting, COF Notional Designs

Attendees:

Tom Brockbank, Jeff Stein and Frank King from SAS  
Anne de la Sierra, Dan Seastrum and Al Carroll from IMCOM  
Susan Nachtigall and Ravin Howell from HQ USACE  
John Burrow and Kris Manning from Ft Hood  
Joe Knight and Narra DeMichina from Knight Architects

General Notes/Comments:

The Final Review conference consisted of review of the Final Design comments and the team's approach to correcting and completing the report. There were minor revisions and additions, including the TA-50 Building design that appears in Appendix 1, and the notional design for the exterior covered hardstand structures shown at the beginning of Appendix 2.