



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

**DEPARTMENT OF THE ARMY
FACILITIES STANDARDIZATION PROGRAM**

**TACTICAL EQUIPMENT
MAINTENANCE FACILITIES
(TEMF)
LEGACY FACILITIES
RENOVATION STUDY**

February 26, 2013
Revision 1.0 Dated 6 May 2013



**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

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TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

EXECUTIVE SUMMARY

Statement of Purpose

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

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

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

Selection of Legacy TEMFs 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 five (5) legacy TEMF types at Ft. Hood, TX and three (3) legacy TEMF types at Ft. Bragg, NC, the six (6) TEMFs chosen for review were based on:

- Discussions with Master Planners John Burrow (Ft. Hood) and Camille Cole (Ft. Bragg) regarding which legacy TEMFs they felt were most appropriate for review and evaluation;
- Study of which legacy TEMFs were most prevalent throughout CONUS. While other Installations may not have legacy facilities identical to those shown in this report, it is the goal that the information included herein be adaptable to similar facilities at other Installations.
- Legacy TEMFs which already meet many basic criteria of the current TEMF Standard Design were not chosen for further review;

Decision Tiers

The Decision Tier was developed by reviewing the Army mandatory features for TEMFs 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

TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

staffs at Ft. Hood, TX and Ft. Bragg, NC to determine the following prioritized list of functions for legacy TEMF renovation:

Tier 1 Functions (Mandatory):

1. Accommodation of both Core Area and Repair/Maintenance Area functions in similar proportions to the space distribution for new facilities indicated in the TEMF Standard Design.
 - a) The mandatory Core Area spaces to be accommodated in any renovation scheme include admin & shop control, consolidated bench repair, combat spares, tool storage, accommodation for tool box storage, latrines, and utility space.
 - b) All spaces designated as 'repair/maintenance areas' in the TEMF Standard Design will be accommodated in the existing repair/maintenance bays in the legacy TEMFs, or new high-bay space shall be added as necessary to satisfy this requirement.
2. Open structural bay area for maintenance and repair activities with a minimum column free space of 16' x 32'.
3. Minimum vehicle door size of 14'(h) x 16'(w).
4. Capability to support interior power & data upgrade.
5. Concrete paving for organizational vehicle parking with controlled fenced area.

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

1. Minimum 7-1/2 and preferably a 10 ton bridge crane with multiple bay coverage of the maintenance/repair work areas.
2. Core space that includes break/training room, weapons vault, COMSEC vault, and non-sensitive secure storage.
3. Out-building accommodation for POL, Hazmat, Organization Equipment, UAV Storage, and Distribution Company Storage and fenced Secure Open Storage (when authorized per mission requirement).
4. Open structural bay area for maintenance and repair activities with minimum column free space of 32' x 32'.

Tier 3 Functions (Desirable if practicable):

1. Maintenance pit
2. Open structural bay area for maintenance and repair activities with a minimum column free space of 64' x 32'.

Organization of Report

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

This report is divided into sections, each relating to a specific legacy TEMF, and an Appendix. The following information is included within each TEMF section:

- Overall TEMF information including: installation, building number, characteristics, number of similar facilities, year built;
- Images and description of the existing building;
- Renovation Description;
- Decision Tier Matrix: This chart shows the criteria within the 3 tiers and identifies which criteria are achieved by the renovation;

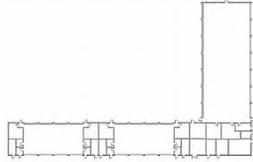
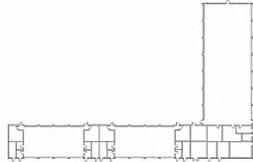
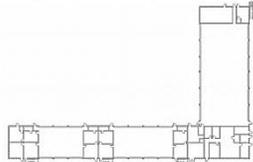
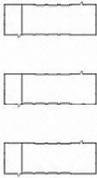
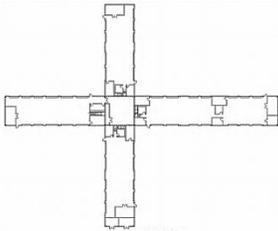
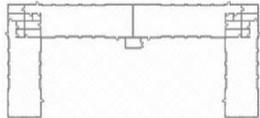
TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

- Area Comparison Chart: This chart show the areas of each function provided in the Small and Medium TEMF standards designs. The areas for these functions in the renovation design are also provided.
- Existing Floor Plan: color-coded to show existing breakdown of core and maintenance/repair areas;
- Renovation Notional Floor Plans: Overall plans color-coded to show the following spaces: core, maintenance/repair, utilities, circulation, and unassigned; enlarged plans to show the new core spaces with square footage shown for each space;

Appendices: Meeting and site visit notes.

Description of TEMF Studies

The following TEMFs are including within this report:

-  TEMF 1A – Fort Hood
L-shape (full double height space)
-  TEMF 1B – Fort Hood
L-shape (partial double height space)
-  TEMF 2 – Fort Hood
L-shape
-  TEMF 3 – Fort Bragg
Group of small rectangular buildings
-  TEMF 4 – Fort Bragg
Cross-shape
-  TEMF 5 – Fort Bragg
U-shape

TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

TEMF 1A

TEMF 1A (Building 38014):

TEMF 1A is characterized as L-shape in plan and was built in the late 1960's. This facility represents one of three types of L-shaped TEMFs seen throughout Ft. Hood. Unlike building 35023 (TEMF 1B), the entire facility consists of double height space. Currently there is no second floor within the facility, but the envelope of the facility will allow for a 2-story renovation.

There are approximately 31 L-shaped TEMFs identified at Ft. Hood. These could be classified as 1A, 1B or 2 within this report. A portion of these L-shaped TEMFs have been recently renovated or are in the process of renovation now. Other installations may have similar L-shaped facilities that this study could be adapted to address.



Building 38014 does not have a bridge crane within the structure. A separate crane structure is located at the rear of the facility. The crane is a 7.5 ton capacity and the structure consists of a 50' span with four 32' bays. Floor plans for buildings 30017 and 32002 which were provided to the design team are similar in plan to 38014.



*Above, left: exterior image of facility;
Above, right: separate crane structure;
Below: exterior view of facility from separate crane structure.*

**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

Description of Renovation

The design scheme consolidates core functions within the building footprint. Where existing core spaces have been removed new high bay spaces will be created providing an opportunity for a bridge crane, wider doors, and maintenance pit. The amount of square footage dedicated to maintenance/repair areas in the existing building will be the same in the renovated design scheme.

A second floor for core areas has been created which requires the addition of two stairwells and an elevator. These have been located outside the existing building footprint.

Tier Matrix

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

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

TIER MATRIX			
TIER 1	Accommodates mandatory Core Areas & Repair/Maintenance Area functions	X	
	Open structural bay w/column free space of 16' x 32'	X	
	Minimum bay door size of 14'(h) x 16'(w)	X	
	Capability to support interior power & data upgrade	X	
	Concrete paving with controlled fenced area	X	
TIER 2	Min. 7-1/2 and preferably a 10 ton bridge crane	X	May require new construction. Feasibility should be reviewed for each project.
	Additional Core spaces including break/ training room, weapons vault, COMSEC vault, non-sensitive secure storage	X	
	Out-building accommodation for POL, Hazmat, Organization Equipment, UAV Storage, and Distribution Company Storage and fenced Secure Open Storage (when authorized)	X	May require new construction. Feasibility should be reviewed for each project.
	Open structural bay w/column free space of 32' x 32'	X	
TIER 3	Maintenance pit	X	Requires new construction. Feasibility should be reviewed for each project.
	Open structural bay w/column free space of 64' x 32'		

**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

- The 10 ton bridge crane and maintenance pit should be evaluated for each Legacy Facility taking into consideration the existing building, possible existing exterior crane structure, users' needs, and overall cost of renovation in comparison to new construction cost.
- The floor plans on the following pages identify areas where a bridge crane could be added but each facility should be evaluated in regard to structural loading. The existing or new framing will need to support new vertical loads along with new lateral and horizontal loads. The crane structure will need to be coordinated with existing building foundations and services.
- The TEMF toured at Fort Hood had various out-building structures surrounding the facility. These could be adapted to accommodate the items listed in the matrix above but would need to be further studied on a case by case basis.

Area Comparison

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

AREA COMPARISON				
		SMALL TEMF	MEDIUM TEMF	TEMF 1A
CORE AREA	Admin & Shop Control	800	2,150	2,252
	Training Room	1,080	1,080	1,076
	Consolidated Bench	580	1,380	915
	Combat Spares	500	970	663
	Tool Room	400	840	414
	Tool Box Storage / Secure Tool Storage	192	384	139
	Latrine	480	1,340	800
	Break, Training & Conference	250	600	549
	Weapons Vault	300	300	258
	COMSEC Vault	300	300	260
	Secure Storage	150	300	222
	Telecomm (NIPRNet)	150	150	106
	Telecomm (SIPRNet)	150	150	135
	Core Total		5,332	9,944
REPAIR/ MAINT AREA	Fluid Distribution Room	260	320	295
	Maintenance/Repair Area	8,192	17,536	13,861
	Maintenance/Repair Area Total	8,452	17,856	14,156
UTILITY	Mechanical	460	1,460	1,067
	Electrical	240	250	115
	Elevator Machine Room		160	131
	Unassigned		770	212
NET TOTAL:		14,484	30,440	23,470

1

2

3

4

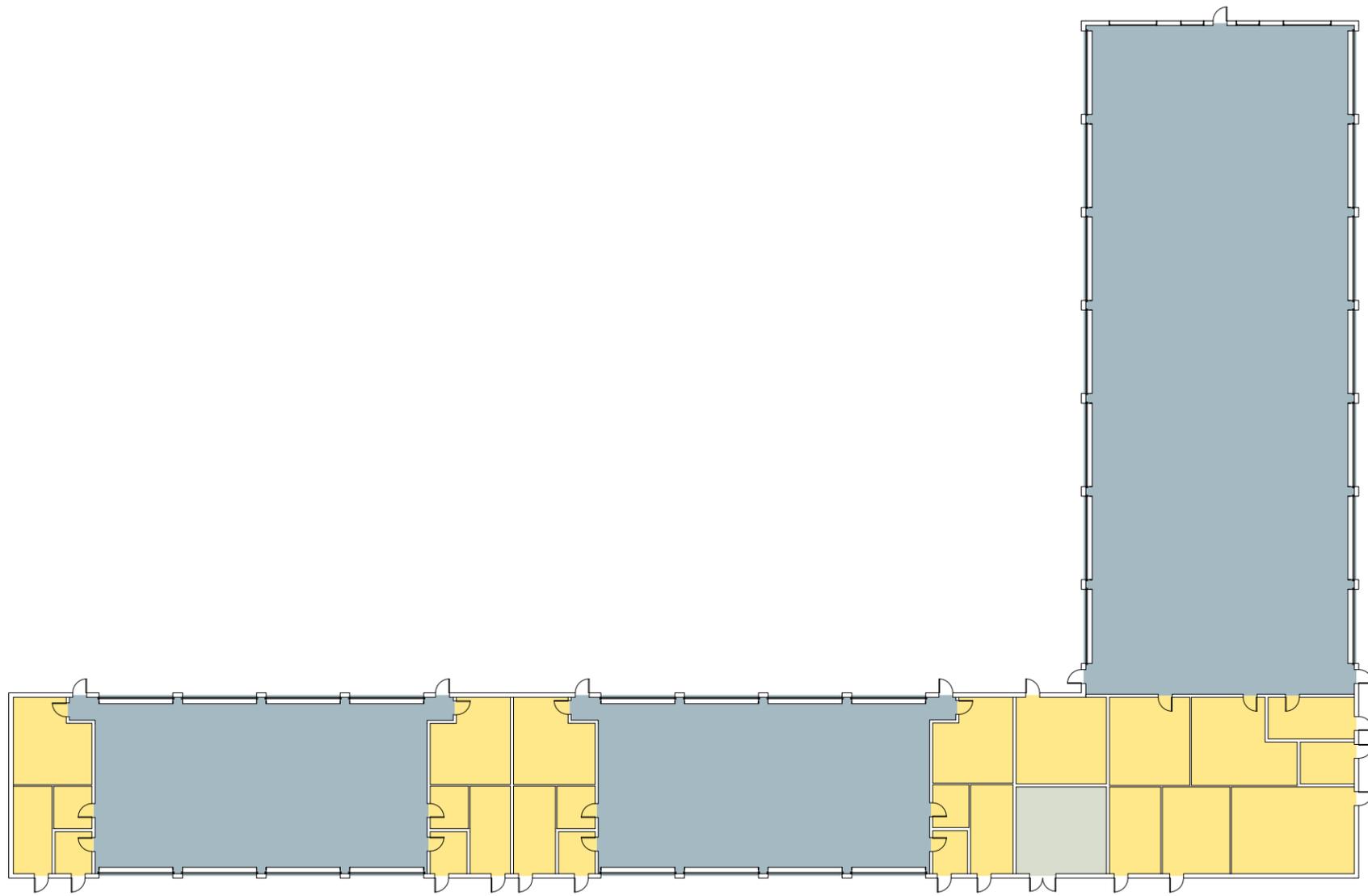
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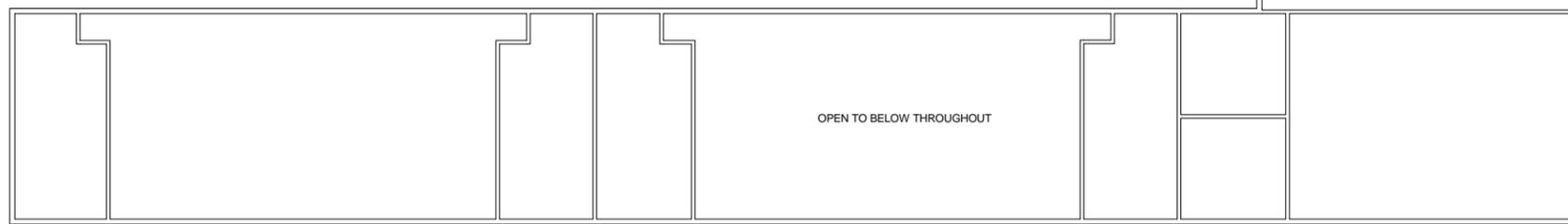
C

B

A



1
1A-100 1/16" = 1'-0"
EXISTING FIRST FLOOR PLAN



2
1A-100 1/16" = 1'-0"
EXISTING SECOND FLOOR PLAN

SPACE LEGEND

- CIRCULATION
- CORE
- MAINTENANCE / REPAIR
- UNASSIGNED
- UTILITY

OPEN TO BELOW THROUGHOUT

OPEN TO BELOW THROUGHOUT



SCALE: 1/16"=1'-0" (22x34)
SCALE: 1/32"=1'-0" (11x17)



MARKS	DESCRIPTION	DATE	APPRO
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BY: NPD	FILE NUMBER:	FILE NUMBER:	
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SIZE: 27" x 34"			

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SAVANNAH DISTRICT

KNIGHT ARCHITECTS, INC.
220 W. PINE STREET
ATLANTA, GEORGIA 30341
TEL: 770-452-0101

TEMP NOTIONAL STANDARD
DESIGNS

EXISTING OVERALL FLOOR PLANS
TEMP-1A
FORT HOOD

SHEET IDENTIFICATION
1A-100
SHEET 8 OF 60

1A-100-

1

2

3

4

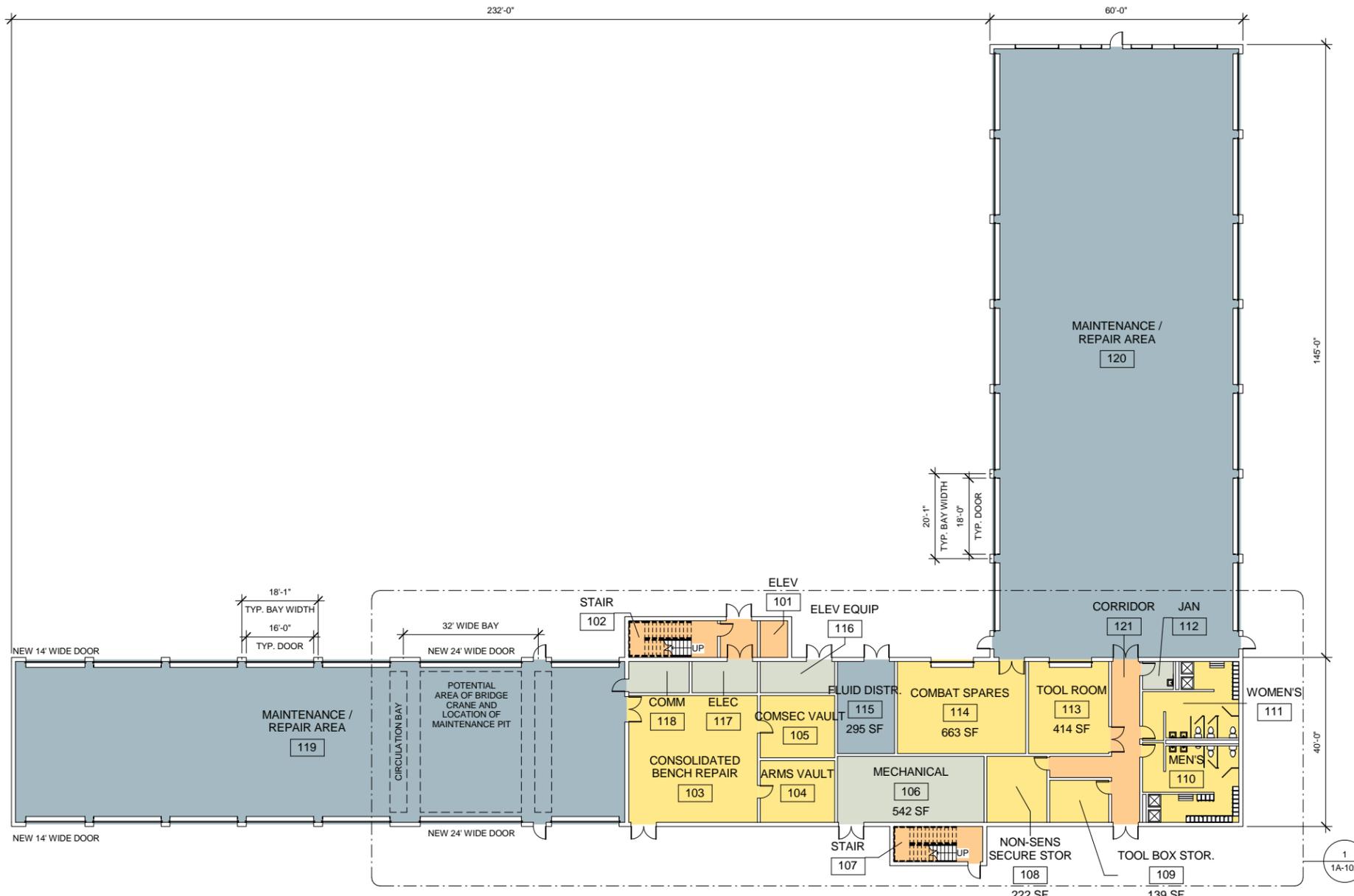
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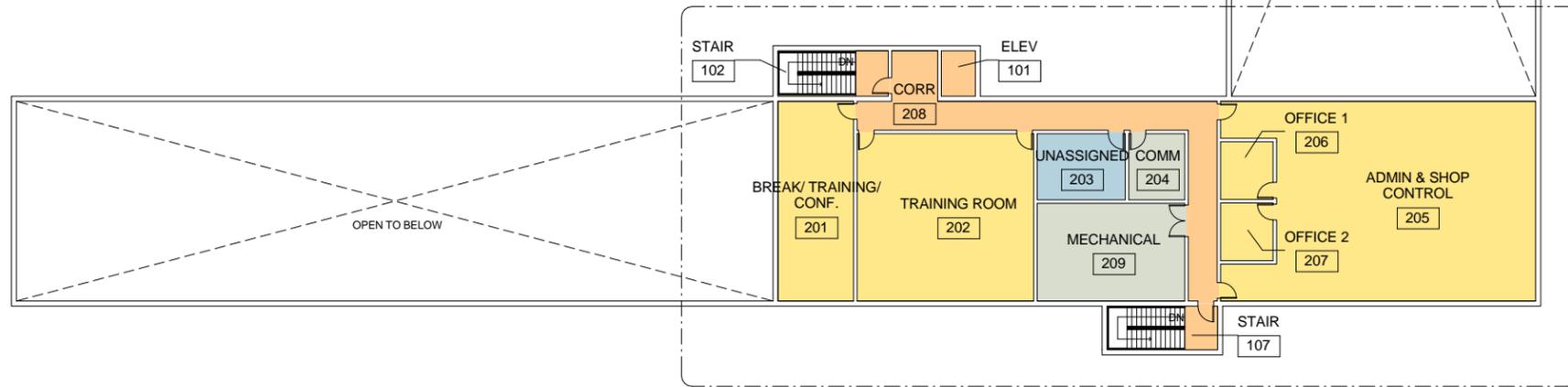
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B

A



1
1A-101
1/16" = 1'-0"



3
1A-101
1/16" = 1'-0"

SPACE LEGEND

- CIRCULATION
- CORE
- MAINTENANCE / REPAIR
- UNASSIGNED
- UTILITY



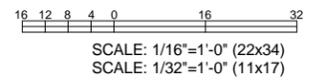
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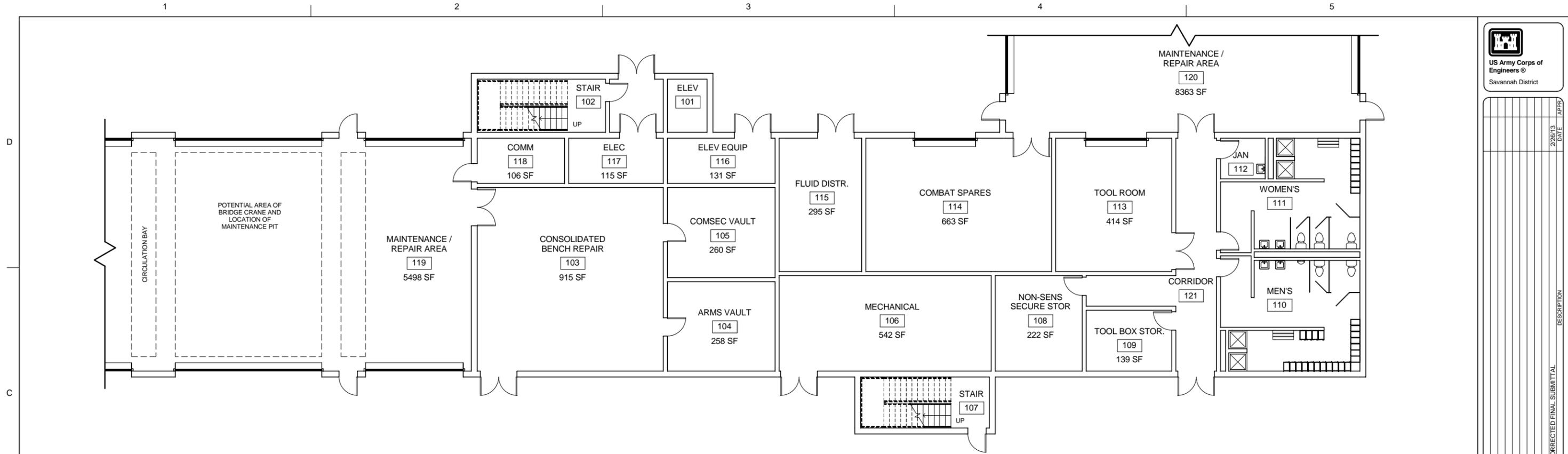
KNIGHT ARCHITECTS, INC.
220 JEFFERSON AVENUE
ATLANTA, GEORGIA 30304
TEL: 770-452-0101

TEMP NOTIONAL STANDARD
DESIGNS
OVERALL FLOOR PLANS
TEMF-1A
FORT HOOD

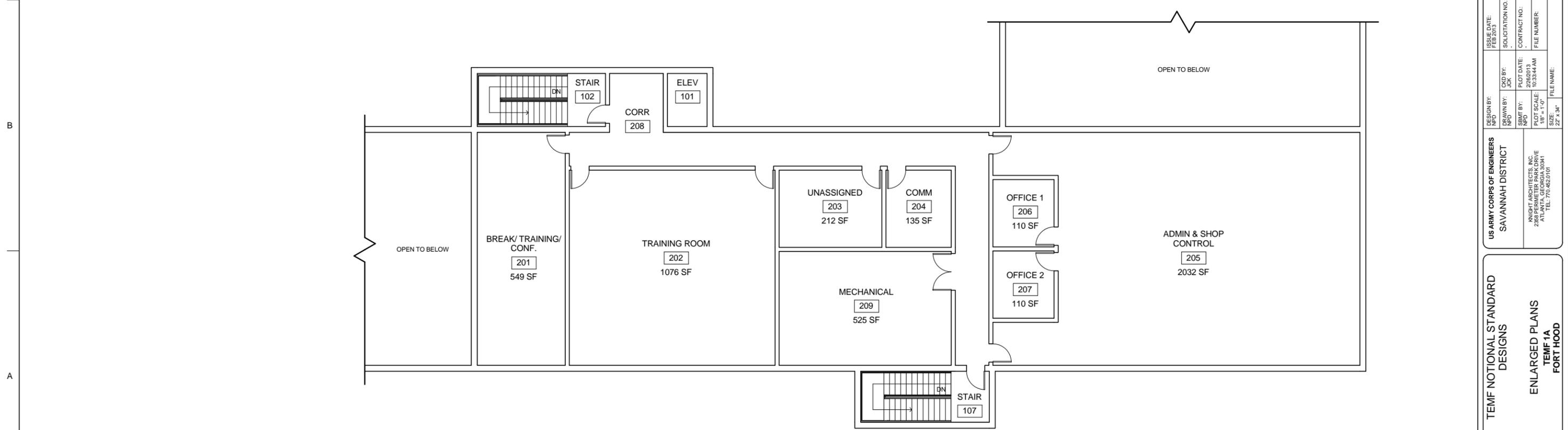
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SHEET 9 OF 60



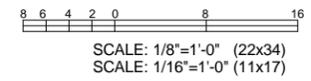
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1 FIRST FLOOR ENLARGED PLAN
 1A-102 1/8" = 1'-0"



2 SECOND FLOOR ENLARGED PLAN
 1A-102 1/8" = 1'-0"



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TEMP NOTIONAL STANDARD
 DESIGNS

ENLARGED PLANS
 TEMF-1A
 FORT HOOD

SHEET IDENTIFICATION
1A-102
 SHEET 10 OF 60

1A-102

**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

TEMF 1B

TEMF 1B (Building 35023)

TEMF 1B is characterized as L-shape in plan and was built in the 1970's. This facility represents one of three types of L-shaped TEMFs seen throughout Ft. Hood. Unlike building 38014 (TEMF 1A), this facility has double height space within the 2 wings while the admin area at the corner is only 1-story in height. The facility has newly renovated space created by adding second-floor space above first floor admin spaces.

There are approximately 31 L-shaped TEMFs identified at Ft. Hood. These could be classified as 1A, 1B or 2 within this report. A portion of these L-shaped TEMFs have been recently renovated or are in the process of renovation now. Other installations may have similar L-shaped facilities that this study could be adapted to address.



Top, left & right: exterior views of facility showing areas with double height and single story;

Below: interior view of maintenance bays and bridge crane added during renovation.



TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

Description of Renovation

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A second floor for core areas requires the addition of two stairwells and an elevator. These have been located outside the existing building footprint.

Tier Matrix

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- **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			
TIER 1	Accommodates mandatory Core Areas & Repair/Maintenance Area functions	X	
	Open structural bay w/column free space of 16' x 32'	X	
	Minimum bay door size of 14'(h) x 16'(w)	X	
	Capability to support interior power & data upgrade	X	
	Concrete paving with controlled fenced area	X	
TIER 2	Min. 7-1/2 and preferably a 10 ton bridge crane	X	May require new construction. Feasibility should be reviewed for each project.
	Additional Core spaces including break/ training room, weapons vault, COMSEC vault, non-sensitive secure storage	X	
	Out-building accommodation for POL, Hazmat, Organization Equipment, UAV Storage, and Distribution Company Storage and fenced Secure Open Storage (when authorized)	X	May require new construction. Feasibility should be reviewed for each project.
	Open structural bay w/column free space of 32' x 32'	X	
TIER 3	Maintenance pit	X	Requires new construction. Feasibility should be reviewed for each project.
	Open structural bay w/column free space of 64' x 32'		

**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

- The 10 ton bridge crane and maintenance pit should be evaluated for each Legacy Facility taking into consideration the existing building, possible existing exterior crane structure, users' needs, and overall cost of renovation in comparison to new construction cost.
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The following matrix identifies the size of each function in the Small and Medium TEMF standard designs and illustrates how the renovation design scheme compares.

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	Weapons Vault	300	300	258
	COMSEC Vault	300	300	260
	Secure Storage	150	300	202
	Telecomm (NIPRNet)	150	150	115
	Telecomm (SIPRNet)	150	150	86
	Core Total		5,332	9,944
REPAIR/ MAINT AREA	Fluid Distribution Room	260	320	280
	Maintenance/Repair Area	8,192	17,536	13,861
	Maintenance/Repair Area Total	8,452	17,856	14,141
UTILITY	Mechanical	460	1,460	695
	Electrical	240	250	114
	Elevator Machine Room		160	131
	Unassigned		770	
NET TOTAL:		14,484	30,440	21,446

1

2

3

4

5

232'-0"

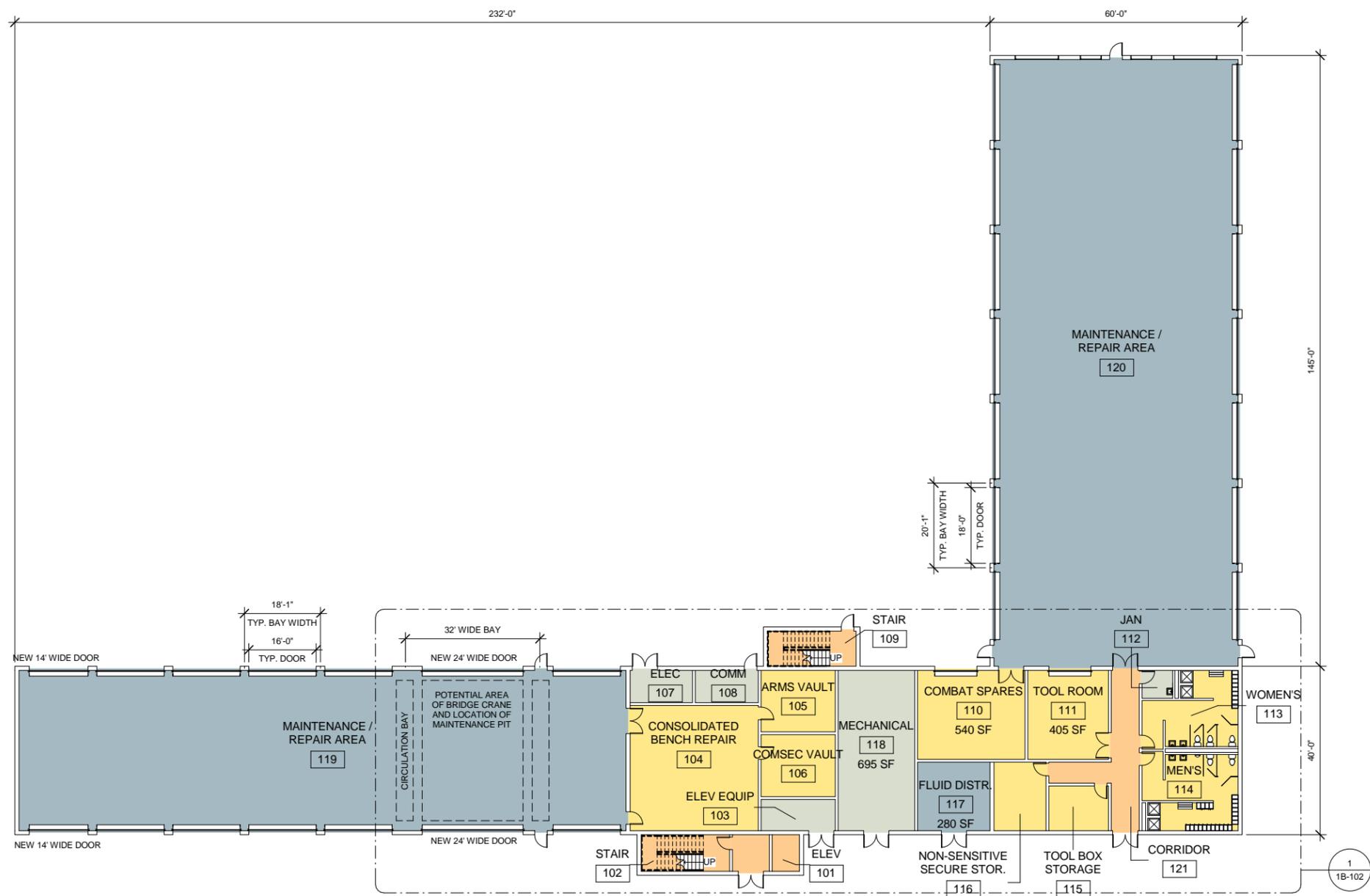
60'-0"

145'-0"

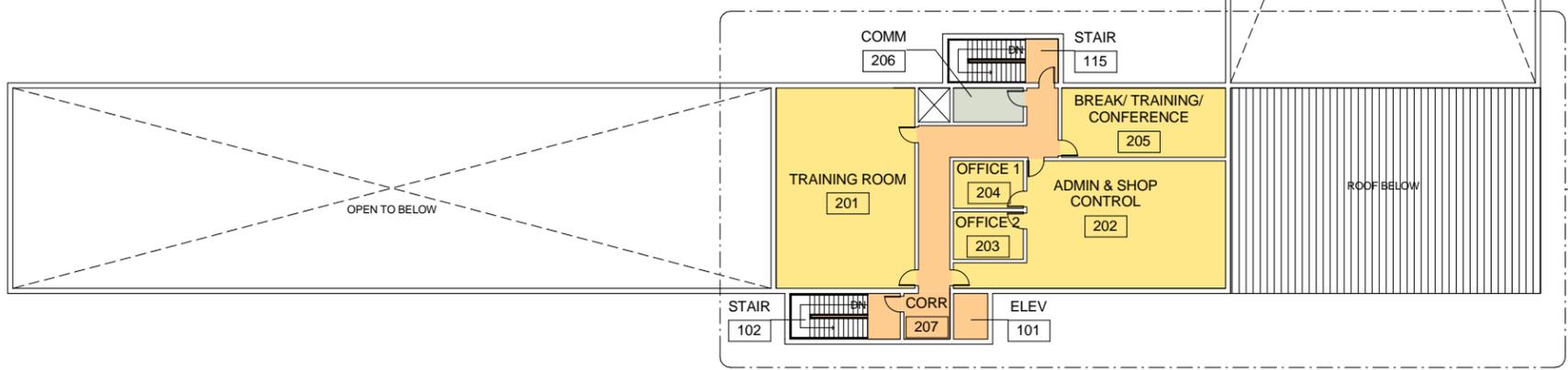
40'-0"

SPACE LEGEND

- CIRCULATION
- CORE
- MAINTENANCE / REPAIR
- UNASSIGNED
- UTILITY



1 FIRST FLOOR PLAN
1B-101 1/16" = 1'-0"



2 SECOND FLOOR PLAN
1B-101 1/16" = 1'-0"

SCALE: 1/16"=1'-0" (22x34)
SCALE: 1/32"=1'-0" (11x17)



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SIZE:	22" x 34"

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TEMP NOTIONAL STANDARD
DESIGNS

OVERALL PLANS
TEMP 1B
FORT HOOD

SHEET IDENTIFICATION
1B-101
SHEET 15 OF 60

1B-101-

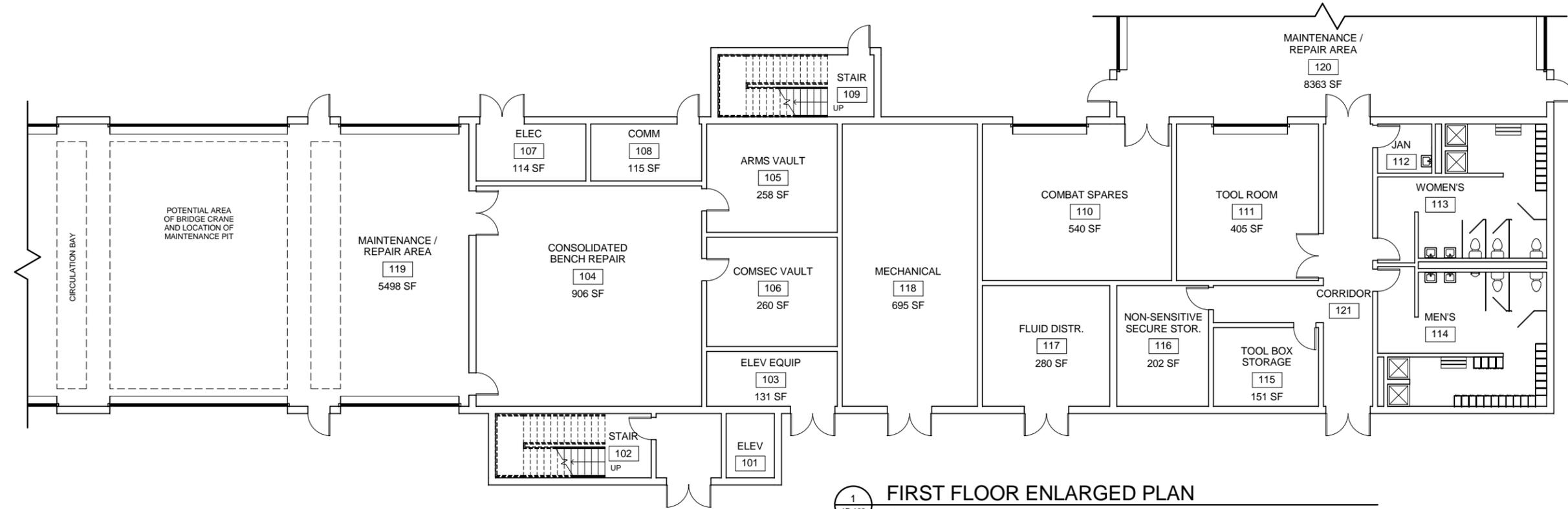
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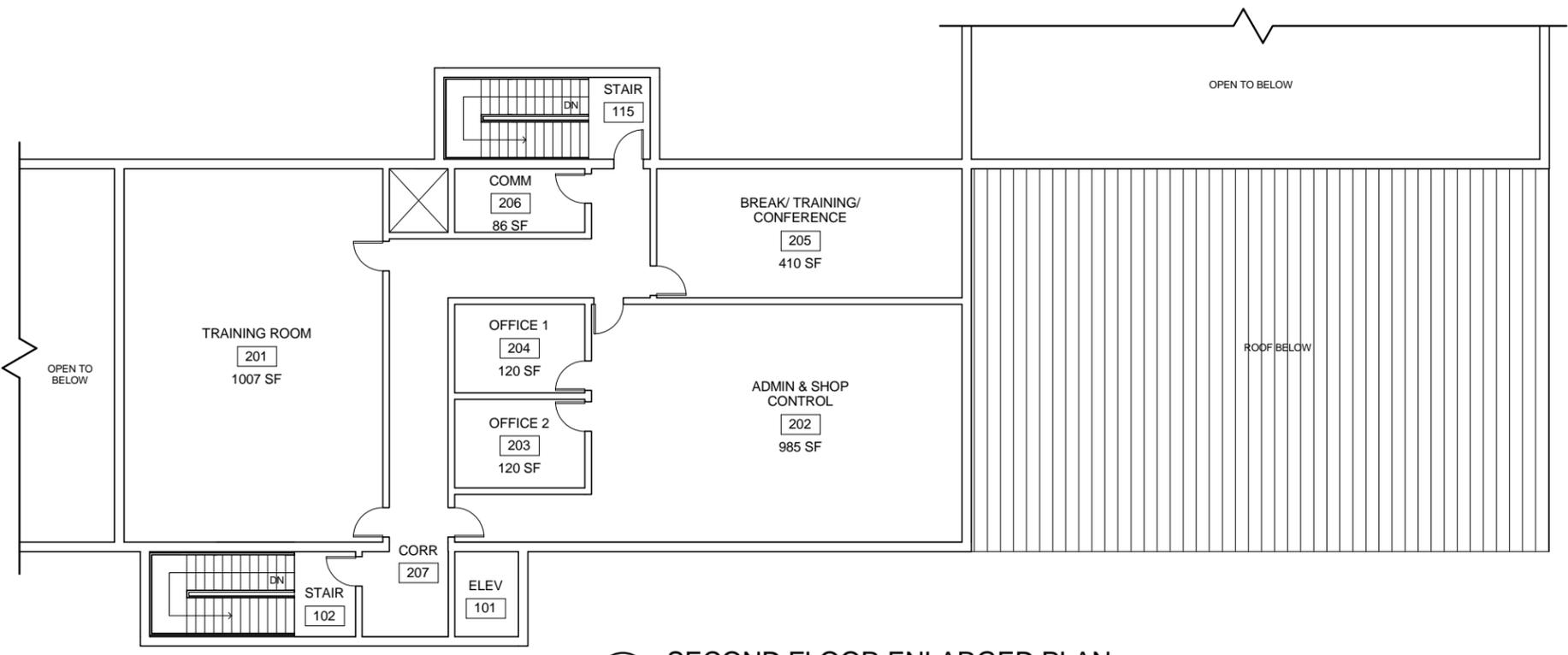
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B

A



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



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

8 6 4 2 0 8 16
SCALE: 1/8"=1'-0" (22x34)
SCALE: 1/16"=1'-0" (11x17)



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Savannah District

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	MARKS

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	MARKS

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TEL: 770-452-0101

TEMP NOTIONAL STANDARD
DESIGNS
ENLARGED PLANS
TEMP-1B
FORT HOOD

SHEET IDENTIFICATION
1B-102
SHEET 16 OF 60

1B-102-

TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

TEMF 2

TEMF 2 (Building 38023)

TEMF 2 is characterized as L-shape in plan and was built in the 1970's. This facility represents one of three types of L-shaped TEMFs seen throughout Ft. Hood. This facility has double height space within the 2 wings while the admin area at the corner is only 1-story in height. The facility has renovated space created by adding second-floor space above first floor admin spaces. These new second floor spaces each have separate exterior stairs. While this allows for more admin and storage space, the layout is choppy and does not fit the users' needs.

There are approximately 31 L-shaped TEMFs identified at Ft. Hood. These could be classified as 1A, 1B or 2 within this report. A portion of these L-shaped TEMFs have been recently renovated or are in the process of renovation now. Other installations may have similar L-shaped facilities that this study could be adapted to address.



Above: exterior images showing existing exterior stairs.

**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

Description of Renovation

The design scheme consolidates core functions within the building footprint. Where existing core spaces have been removed new high bay spaces will be created providing an opportunity for a bridge crane, wider doors, and maintenance pit. The amount of square footage dedicated to maintenance/repair areas in the existing building will be the same in the renovated design scheme.

A second floor for core areas requires the addition of two stairwells and an elevator. These have been located outside the existing building footprint.

Tier Matrix

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

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

TIER MATRIX			
TIER 1	Accommodates mandatory Core Areas & Repair/Maintenance Area functions	X	
	Open structural bay w/column free space of 16' x 32'	X	
	Minimum bay door size of 14'(h) x 16'(w)	X	
	Capability to support interior power & data upgrade	X	
	Concrete paving with controlled fenced area	X	
TIER 2	Min. 7-1/2 and preferably a 10 ton bridge crane	X	May require new construction. Feasibility should be reviewed for each project.
	Additional Core spaces including break/ training room, weapons vault, COMSEC vault, non-sensitive secure storage	X	
	Out-building accommodation for POL, Hazmat, Organization Equipment, UAV Storage, and Distribution Company Storage and fenced Secure Open Storage (when authorized)	X	May require new construction. Feasibility should be reviewed for each project.
	Open structural bay w/column free space of 32' x 32'	X	
TIER 3	Maintenance pit	X	Requires new construction. Feasibility should be reviewed for each project.
	Open structural bay w/column free space of 64' x 32'		

**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

- The 10 ton bridge crane and maintenance pit should be evaluated for each Legacy Facility taking into consideration the existing building, possible existing exterior crane structure, users' needs, and overall cost of renovation in comparison to new construction cost.
- The floor plans on the following pages identify areas where a bridge crane could be added but each facility should be evaluated in regard to structural loading. The existing or new framing will need to support new vertical loads along with new lateral and horizontal loads. The crane structure will need to be coordinated with existing building foundations and services.
- The TEMF toured at Fort Hood had various out-building structures surrounding the facility. These could be adapted to accommodate the items listed in the matrix above but would need to be further studied on a case by case basis.

Area Comparison

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

AREA COMPARISON				
		SMALL TEMF	MEDIUM TEMF	TEMF 2
CORE AREA	Admin & Shop Control	800	2,150	1,226
	Training Room	1,080	1,080	1,065
	Consolidated Bench	580	1,380	1,271
	Combat Spares	500	970	743
	Tool Room	400	840	652
	Tool Box Storage / Secure Tool Storage	192	384	342
	Latrine	480	1,340	800
	Break, Training & Conference	250	600	364
	Weapons Vault	300	300	346
	COMSEC Vault	300	300	348
	Secure Storage	150	300	261
	Telecomm (NIPRNet)	150	150	125
	Telecomm (SIPRNet)	150	150	130
	Core Total		5,332	9,944
REPAIR/ MAINT AREA	Fluid Distribution Room	260	320	338
	Maintenance/Repair Area	8,192	17,536	11,732
	Maintenance/Repair Area Total	8,452	17,856	12,070
UTILITY	Mechanical	460	1,460	1,083
	Electrical	240	250	125
	Elevator Machine Room		160	190
	Unassigned		770	
NET TOTAL:		14,484	30,440	21,141

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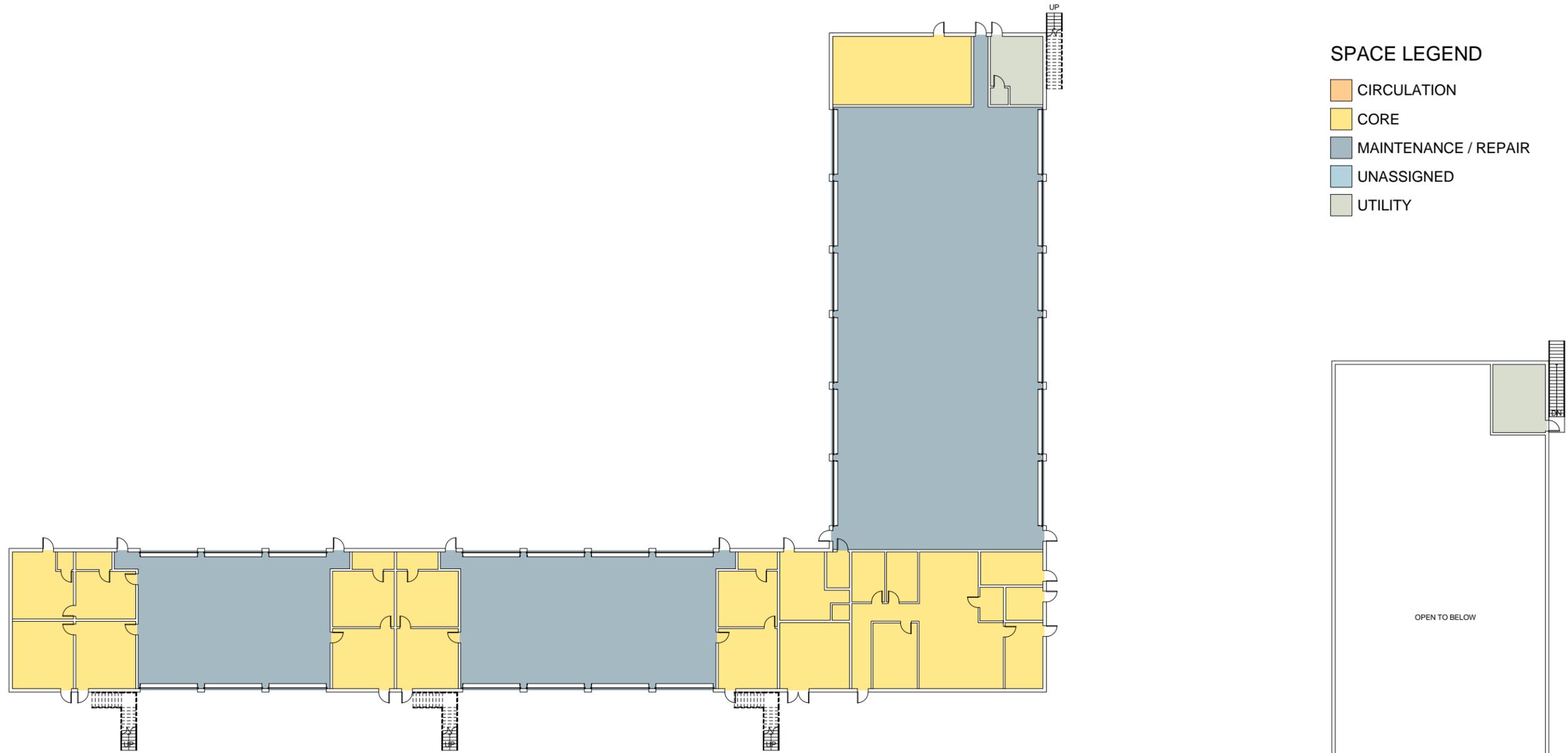
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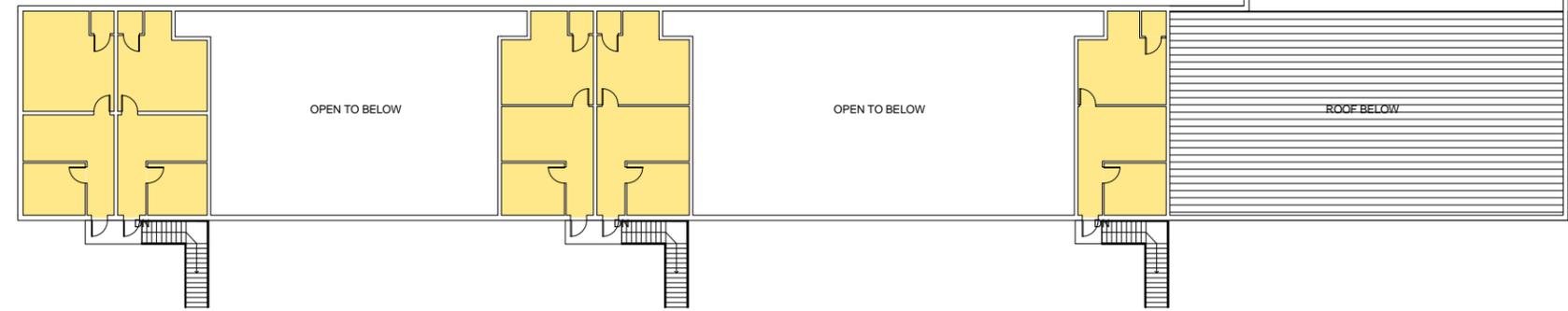
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2-100

EXISTING FIRST FLOOR PLAN

1/16" = 1'-0"



2
2-100

EXISTING SECOND FLOOR PLAN

1/16" = 1'-0"

SPACE LEGEND

- CIRCULATION
- CORE
- MAINTENANCE / REPAIR
- UNASSIGNED
- UTILITY



ISSUE DATE:	FEB 2013
DESIGN BY:	NPD
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DATE:	2/26/13
APPROVED:	
DESCRIPTION:	CORRECTED FINAL SUBMITTAL

DESIGN BY:	NPD	ISSUE DATE:	FEB 2013
DRAWN BY:	NPD	SOLICITATION NO.:	
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DATE:	2/26/13	FILE NUMBER:	
APPROVED:		FILE NAME:	27 x 34

US ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT

KNIGHT ARCHITECTS, INC.
220 W. BROAD ST.
ATLANTA, GEORGIA 30334
TEL: 770-452-0101

TEMP NOTIONAL STANDARD
DESIGNS

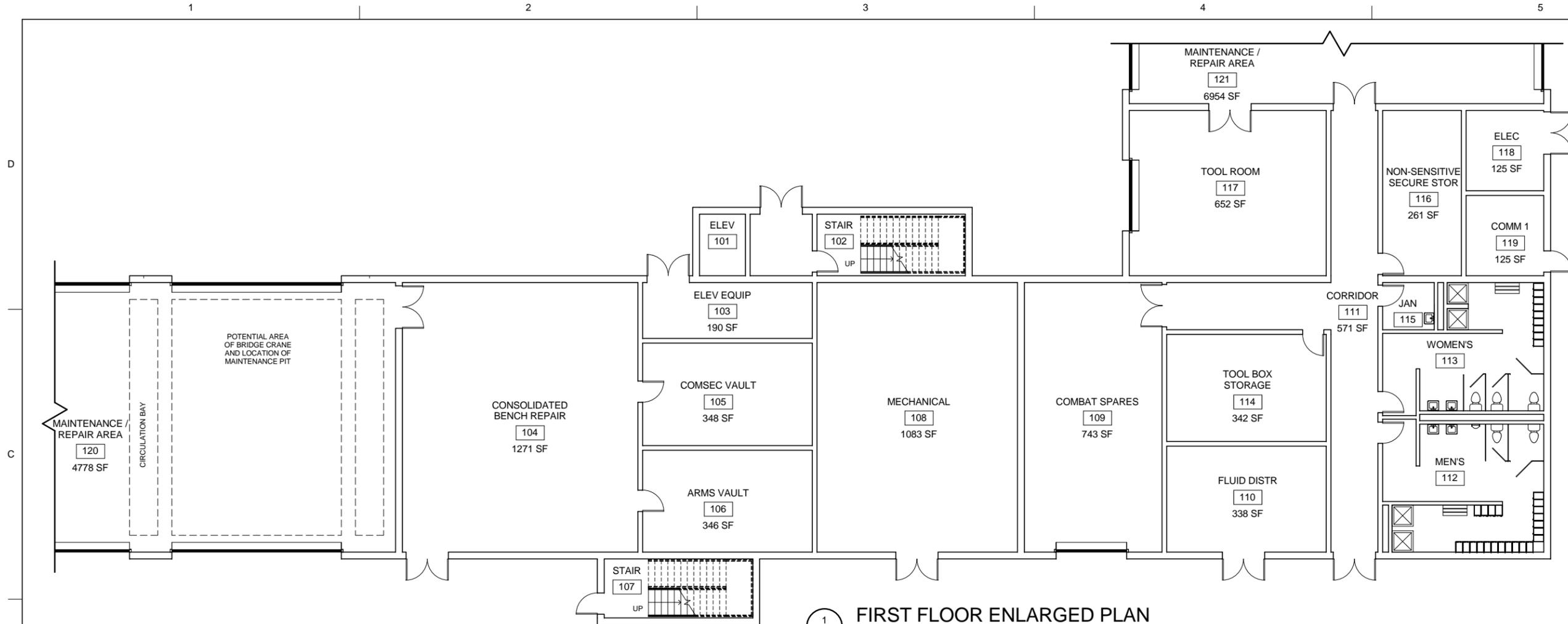
EXISTING OVERALL FLOOR PLANS
TEMP 2
FORT HOOD



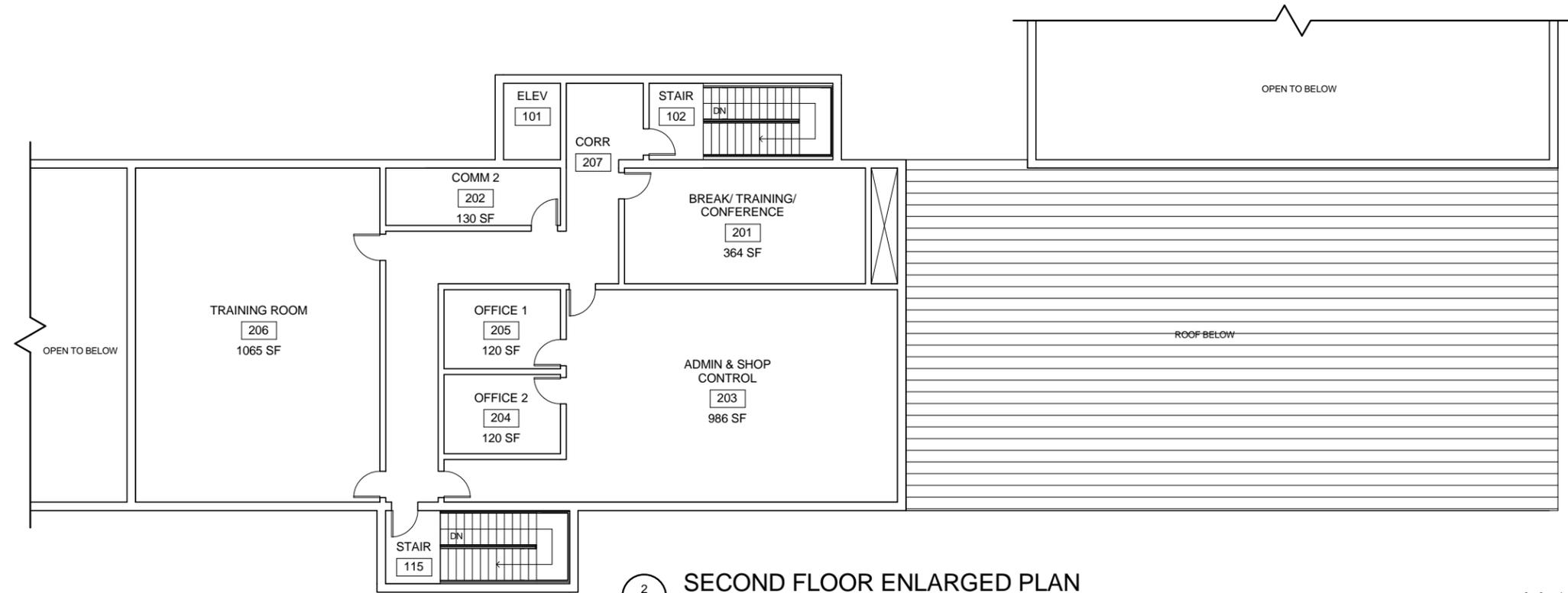
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SCALE: 1/32"=1'-0" (11x17)

SHEET IDENTIFICATION
2-100
SHEET 20 OF 60

2-100-



1
2-102 1/8" = 1'-0"
FIRST FLOOR ENLARGED PLAN



2
2-102 1/8" = 1'-0"
SECOND FLOOR ENLARGED PLAN

8 6 4 2 0 8 16
SCALE: 1/8"=1'-0" (22x34)
SCALE: 1/16"=1'-0" (11x17)



NO.	DATE	DESCRIPTION
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DATE: 10/30/13	FILE NAME:	
SIZE: 27" x 34"		

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TEMP NOTIONAL STANDARD
DESIGNS

ENLARGED PLANS
TEMP 2
FORT HOOD

SHEET IDENTIFICATION
2-102
SHEET 22 OF 60

2-102-

TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

TEMF 3

TEMF 3 is characterized as a group of small buildings (3-6) that together combine to provide the functions of 1 TEMF. Two of these were visited at Fort Bragg as well as a third TEMF (D2564) that has been renovated to add high-bay space between two buildings. There are a total of 6 TEMFs at Fort Bragg similar to the ones shown below. All were built in the 1950s and 1960's.

Buildings C3515, C3514, C3513, C3512, C3511, C3510, C3509:

The buildings are all in relatively poor condition and have interior columns at approximately 20-foot center with overhead doors typically 12-feet wide by 14-feet tall. There is no overhead materials handling equipment and existing lifts have been abandoned. External tool and vault containers are being used adjacent to the buildings.

Buildings D2026, D1926, D1826, D1727:

This is a nearly identical group of buildings to the ones previously seen. The buildings are all in relatively poor condition and have interior columns at approximately 20-foot centers with overhead doors typically 12-feet wide by 14-feet tall. There is no overhead materials handling equipment and existing lifts have been abandoned. External tool and vault containers are being used adjacent to the buildings.

Building D2564:

This TEMF facility was constructed by in-filling a new high-bay area between two existing 1950's rectangular buildings similar to those seen at the first two TEMFs visited. The infill area is 50'-0" wide. This spacing seems typical of the rectangular buildings visited. The overall combined building works well to provide maintenance and storage functions.



*Above & below, right: exterior images of buildings;
Below, left: view of D2564 showing new high-bay space added between existing buildings.*

**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

Description of Renovation

3 buildings within each group will be renovated to provide the core areas of a TEMF. Between the buildings two high-bay areas will be constructed to provide the maintenance and repair areas.

Tier Matrix

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

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

TIER MATRIX			
TIER 1	Accommodates mandatory Core Areas & Repair/Maintenance Area functions	X	Requires new construction for inclusion of Repair/Maintenance Area. Feasibility should be reviewed for each project.
	Open structural bay w/column free space of 16' x 32'	X	See first item above.
	Minimum bay door size of 14'(h) x 16'(w)	X	See first item above.
	Capability to support interior power & data upgrade	X	
	Concrete paving with controlled fenced area	X	Existing facilities visited did not meet this requirement. The need for new concrete paving should be evaluated for each project.
TIER 2	Min. 7-1/2 and preferably a 10 ton bridge crane	X	See first item above.
	Additional Core spaces including break/ training room, weapons vault, COMSEC vault, non-sensitive secure storage	X	
	Out-building accommodation for POL, Hazmat, Organization Equipment, UAV Storage, and Distribution Company Storage and fenced Secure Open Storage (when authorized)	X	May require new construction. Feasibility should be reviewed for each project.
	Open structural bay w/column free space of 32' x 32'	X	See first item above.
TIER 3	Maintenance pit	X	Requires new construction. Feasibility should be reviewed for each project.
	Open structural bay w/column free space of 64' x 32'	X	See first item above.

TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

- The cost of renovation in comparison to new construction may be a factor for TEMF Scheme 3. If the renovation cost exceeds 75% of new construction cost, new construction should be explored.
- The 10 ton bridge crane and maintenance pit should be evaluated for each Legacy Facility taking into consideration the existing building, users' needs, and overall cost of renovation in comparison to new construction cost.
- The TEMFs toured at Fort Bragg had various out-building structures surrounding the facilities. These could be adapted to accommodate the items listed in the matrix above but would need to be further studied on a case by case basis.

Area Comparison

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

AREA COMPARISON				
		SMALL TEMF	MEDIUM TEMF	TEMF 3
CORE AREA	Admin & Shop Control	800	2,150	2,096
	Training Room	1,080	1,080	1,220
	Consolidated Bench	580	1,380	2,063
	Combat Spares	500	970	807
	Tool Room	400	840	600
	Tool Box Storage / Secure Tool Storage	192	384	603
	Latrine	480	1,340	800
	Break, Training & Conference	250	600	814
	Weapons Vault	300	300	313
	COMSEC Vault	300	300	313
	Secure Storage	150	300	448
	Telecomm (NIPRNet)	150	150	193
	Telecomm (SIPRNet)	150	150	193
	Core Total		5,332	9,944
REPAIR/ MAINT AREA	Fluid Distribution Room	260	320	397
	Maintenance/Repair Area	8,192	17,536	11,840
	Maintenance/Repair Area Total	8,452	17,856	12,237
UTILITY	Mechanical	460	1,460	802
	Electrical	240	250	388
	Elevator Machine Room		160	131
	Unassigned		770	1060
NET TOTAL:		14,484	30,440	25,081

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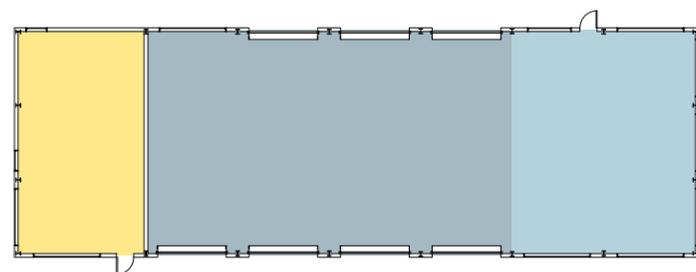
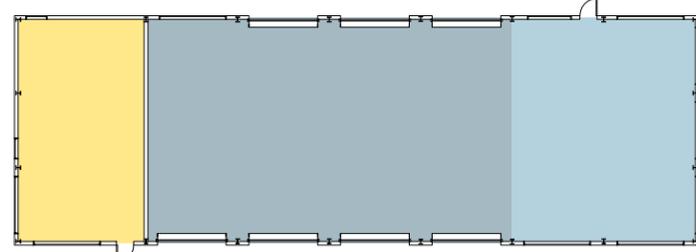
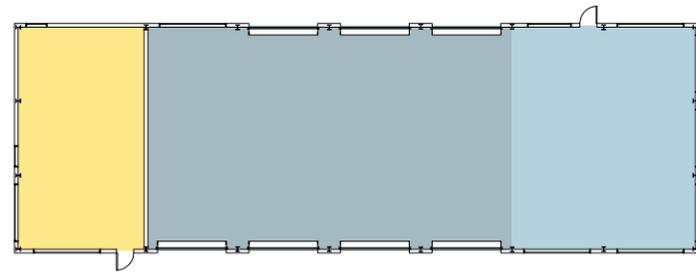
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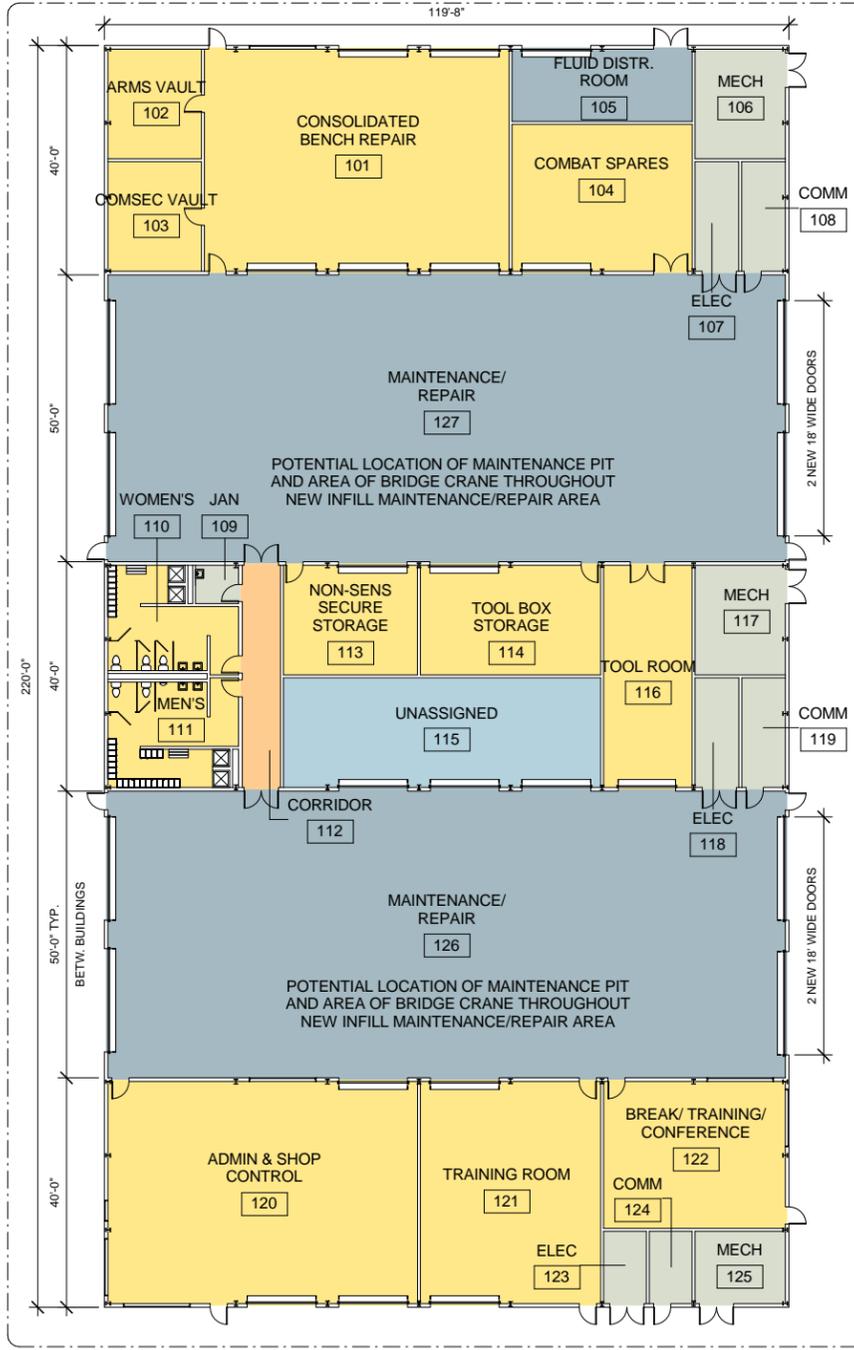
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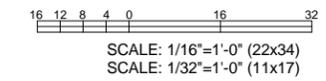
2 EXISTING FIRST FLOOR PLAN
 3-101 1/16" = 1'-0"



SPACE LEGEND

- CIRCULATION
- CORE
- MAINTENANCE / REPAIR
- UNASSIGNED
- UTILITY

1 FIRST FLOOR PLAN
 3-101 1/16" = 1'-0"



ISSUE DATE:	FEB 2013
DESIGN BY:	NFD
DRAWN BY:	NFD
CHECK BY:	CKK
DATE:	2/26/13
APPROVED:	
DESCRIPTION:	

US ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT	ISSUE DATE: FEB 2013	SOLICITATION NO.:	CONTRACT NO.:
KNIGHT ARCHITECTS, INC. 220 ATLANTA, GEORGIA 30341 TEL: 770-452-0101	DESIGN BY: NFD	FILE NUMBER:	FILE NAME: file name
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	CHECK BY: CKK	SCALE:	SCALE:
	DATE:	SCALE:	SCALE:

TEMP NOTIONAL STANDARD
DESIGNS

OVERALL FLOOR PLANS
TEMP 3
FORT BRAGG

SHEET IDENTIFICATION
3-101
SHEET 28 OF 60

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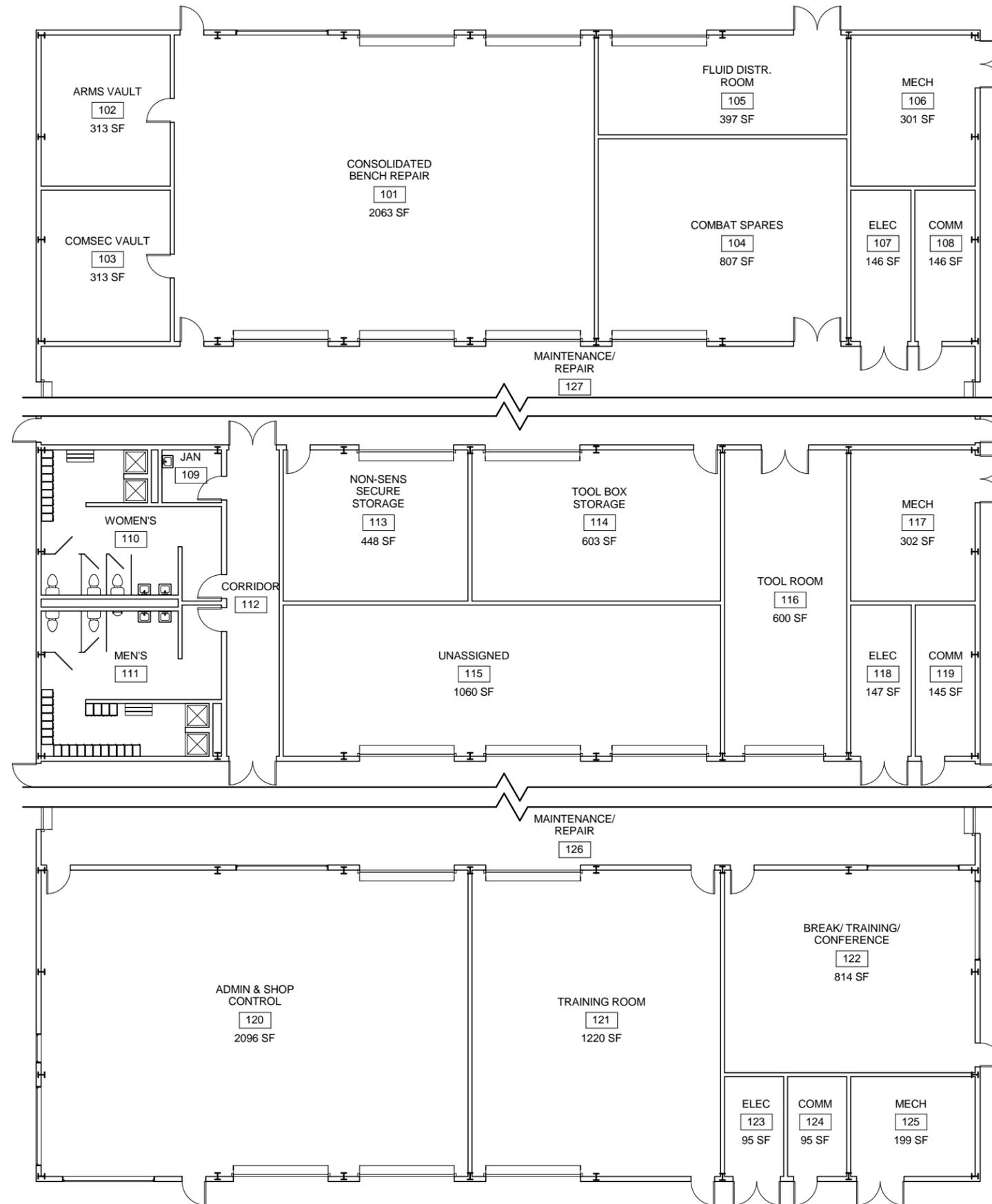
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3-102 1/8" = 1'-0"

FIRST FLOOR ENLARGED PLAN

8 6 4 2 0 8 16

SCALE: 1/8"=1'-0" (22x34)
SCALE: 1/16"=1'-0" (11x17)



MARKS	CORRECTED FINAL SUBMITTAL	DESCRIPTION	DATE	APPRO
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DESIGN BY: NFD	ISSUE DATE: FEB 2013	DESIGNED BY: NFD	ISSUE NO.:
DRAWN BY: NFD	CHECKED BY: CCK	PLANNED BY: NFD	SOLICITATION NO.:
DATE: NFD	DATE: NFD	DATE: NFD	CONTRACT NO.:
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US ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT

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TEMP NOTIONAL STANDARD
DESIGNS

ENLARGED PLANS
TEMP 3
FORT BRAGG

SHEET IDENTIFICATION
3-102
SHEET 27 OF 60

3-102-

TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

TEMF 4

TEMF 4 (Building H3057)

TEMF 4 was built in the 1970's and is characterized as a cross-shaped building with existing 2nd floor spaces. Two cross-shaped TEMF's were identified at Ft. Bragg. The 2nd appears to have a slightly different footprint. The layout shown in this study can be adapted for use with other cross-shaped TEMFs.



There is an existing 5-ton overhead crane in one wing. In addition portable lifts have been purchased and are in use (Steril KONI-Lift).



*Above: exterior images from northwest;
Below: interior view showing overhead crane.*

TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

Description of Renovation

The renovation design scheme consolidates core functions at the center of the floor plan. Where existing core spaces have been removed new high bay spaces will be created providing an opportunity for bridge crane, wider overhead doors, and maintenance pit.

The current floor plan has an interior stair to the second floor space from each of the four wings. This creates a disorienting floor plan. The renovation design eliminates these existing stairs and creates two new stairs and an elevator. These are located outside the existing building foot print and simplify the second floor plan.

Tier Matrix

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

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

TIER MATRIX			
TIER 1	Accommodates mandatory Core Areas & Repair/Maintenance Area functions	X	
	Open structural bay w/column free space of 16' x 32'	X	
	Minimum bay door size of 14'(h) x 16'(w)	X	
	Capability to support interior power & data upgrade	X	
	Concrete paving with controlled fenced area	X	
TIER 2	Min. 7-1/2 and preferably a 10 ton bridge crane	X	May require new construction. Feasibility should be reviewed for each project.
	Additional Core spaces including break/ training room, weapons vault, COMSEC vault, non-sensitive secure storage	X	
	Out-building accommodation for POL, Hazmat, Organization Equipment, UAV Storage, and Distribution Company Storage and fenced Secure Open Storage (when authorized)	X	May require new construction. Feasibility should be reviewed for each project.
	Open structural bay w/column free space of 32' x 32'	X	
TIER 3	Maintenance pit	X	Requires new construction. Feasibility should be reviewed for each project.
	Open structural bay w/column free space of 64' x 32'		

**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

- The 10 ton bridge crane and maintenance pit should be evaluated for each Legacy Facility taking into consideration the existing building, users' needs, and overall cost of renovation in comparison to new construction cost.
- The floor plans on the following pages identify areas where a bridge crane could be added but each facility should be evaluated in regard to structural loading. The existing or new framing will need to support new vertical loads along with new lateral and horizontal loads. The crane structure will need to be coordinated with existing building foundations and services.
- The TEMF toured at Fort Bragg had various out-building structures surrounding the facility. These could be adapted to accommodate the items listed in the matrix above but should be further studied.

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

AREA COMPARISON				
		SMALL TEMF	MEDIUM TEMF	TEMF 4
CORE AREA	Admin & Shop Control	800	2,150	1,899
	Training Room	1,080	1,080	1,227
	Consolidated Bench	580	1,380	1,131
	Combat Spares	500	970	623
	Tool Room	400	840	586
	Tool Box Storage / Secure Tool Storage	192	384	193
	Latrine	480	1,340	800
	Break, Training & Conference	250	600	742
	Weapons Vault	300	300	271
	COMSEC Vault	300	300	271
	Secure Storage	150	300	193
	Telecomm (NIPRNet)	150	150	144
	Telecomm (SIPRNet)	150	150	94
	Core Total		5,332	9,944
REPAIR/ MAINT AREA	Fluid Distribution Room	260	320	214
	Maintenance/Repair Area	8,192	17,536	15,780
	Maintenance/Repair Area Total	8,452	17,856	15,994
UTILITY	Mechanical	460	1,460	1,228
	Electrical	240	250	151
	Elevator Machine Room		160	142
	Unassigned		770	410
NET TOTAL:		14,484	30,440	26,099

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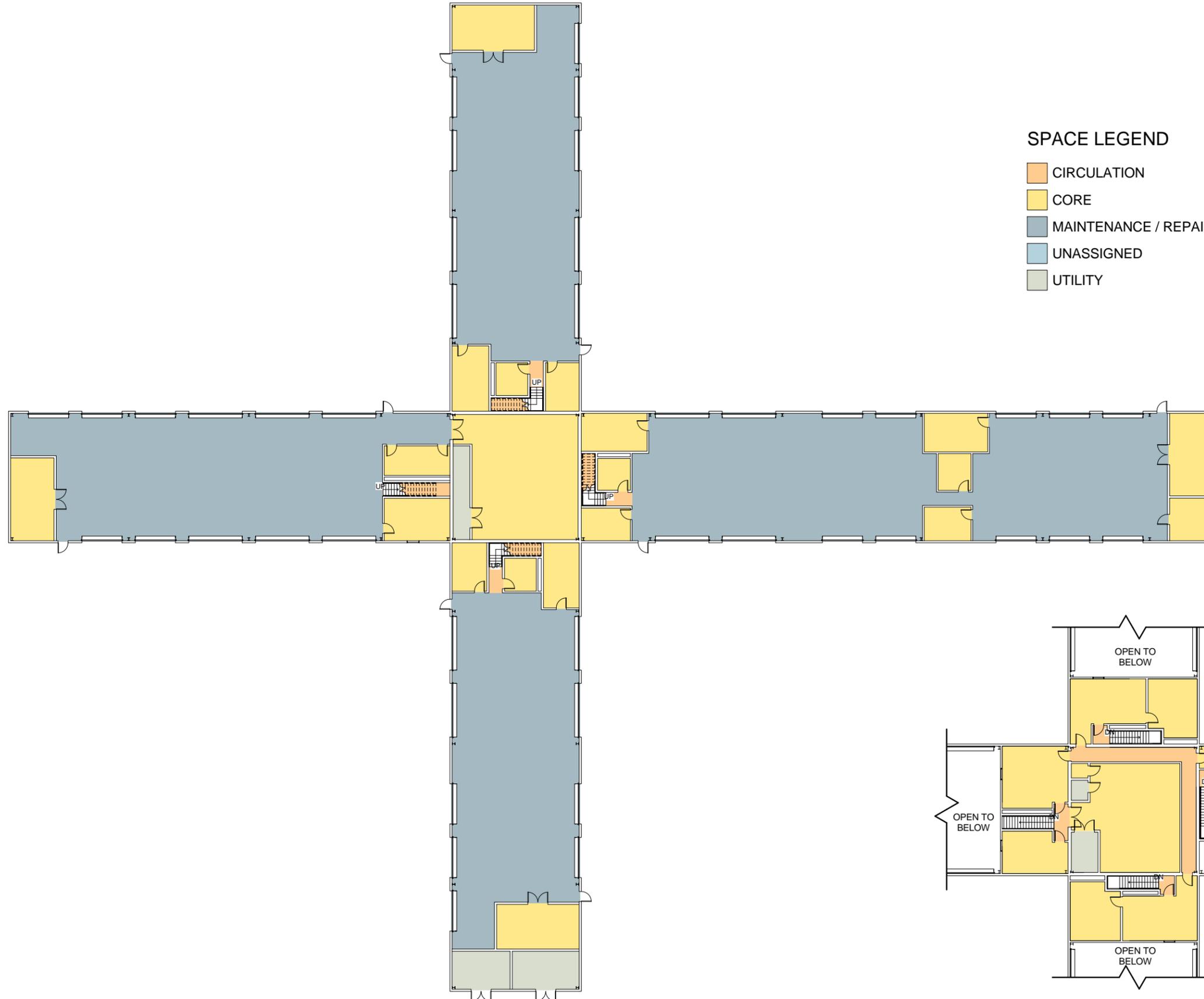
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SPACE LEGEND

- CIRCULATION
- CORE
- MAINTENANCE / REPAIR
- UNASSIGNED
- UTILITY

1
4-100 1/16" = 1'-0"

EXISTING FIRST FLOOR PLAN

2
4-100 1/16" = 1'-0"

EXISTING SECOND FLOOR PLAN

16 12 8 4 0 16 32

SCALE: 1/16"=1'-0" (22x34)
SCALE: 1/32"=1'-0" (11x17)



ISSUE DATE:	FEB 2013
DESIGN BY:	NFD
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DATE:	2/26/13
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DESCRIPTION:	CORRECTED FINAL SUBMITTAL
MARKS:	

DESIGN BY:	NFD	ISSUE DATE:	FEB 2013
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CHECK BY:	CKK	CONTRACT NO.:	
DATE:	2/26/13	FILE NUMBER:	
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TEL: 770-452-0101

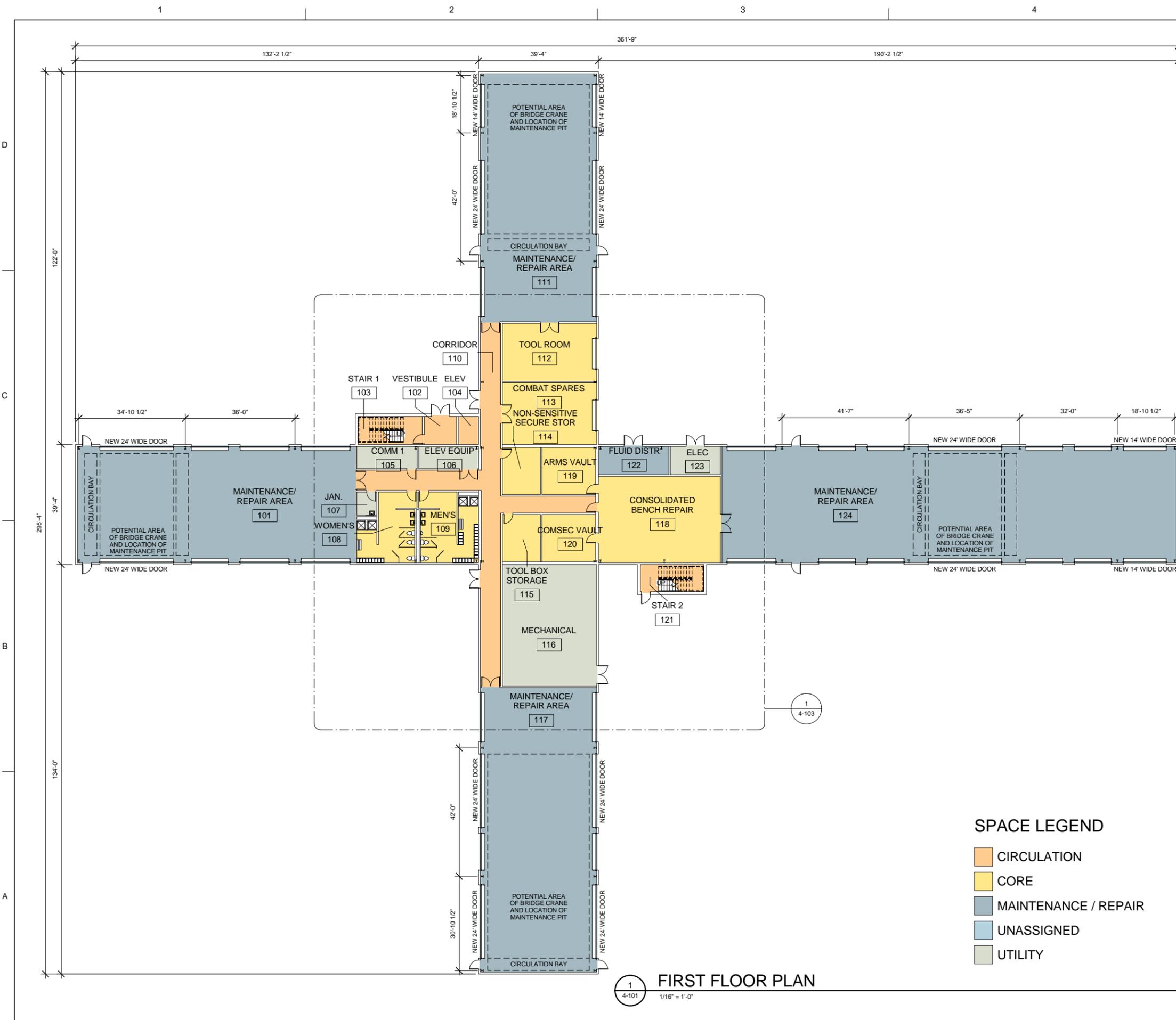
TEMP NOTIONAL STANDARD
DESIGNS

EXISTING FLOOR PLANS
TEMP 4
FORT BRAGG

SHEET IDENTIFICATION
4-100
SHEET 31 OF 60

4-100-

4-101-



SPACE LEGEND

- CIRCULATION
- CORE
- MAINTENANCE / REPAIR
- UNASSIGNED
- UTILITY

FIRST FLOOR PLAN
 1/16" = 1'-0"

SCALE: 1/16"=1'-0" (22x34)
 SCALE: 1/32"=1'-0" (11x17)



DATE	DESCRIPTION
2/26/13	APPR
	MARKS
	CORRECTED FINAL SUBMITTAL

DESIGN BY: NFD	ISSUE DATE: FEB 2013
DRAWN BY: GCK	SOLICITATION NO.:
CHECKED BY: NFD	CONTRACT NO.:
DATE: 1/16/13	FILE NUMBER:
SCALE: 1/16" = 1'-0"	FILE NAME:
SIZE: 27" x 34"	

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KNIGHT ARCHITECTS, INC.
 225 W. PINE STREET
 ATLANTA, GEORGIA 30334
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TEMP NOTIONAL STANDARD
 DESIGNS

OVERALL FLOOR PLAN
 TEMP 4
 FORT BRAGG

SHEET IDENTIFICATION
 4-101

SHEET 32 OF 60

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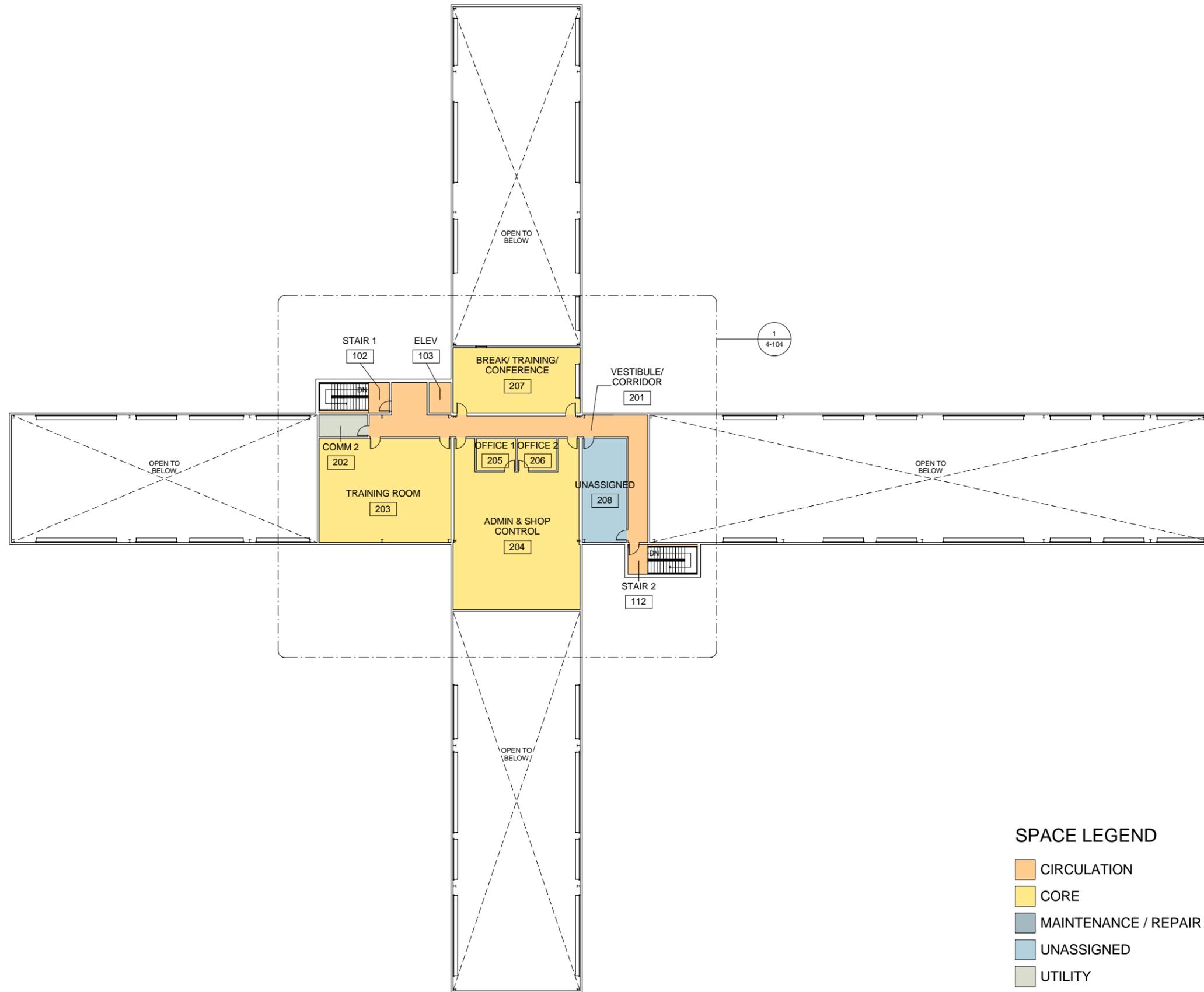
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SPACE LEGEND

- CIRCULATION
- CORE
- MAINTENANCE / REPAIR
- UNASSIGNED
- UTILITY

1
 4-102 SECOND FLOOR PLAN
 1/16" = 1'-0"

16 12 8 4 0 16 32
 SCALE: 1/16"=1'-0" (22x34)
 SCALE: 1/32"=1'-0" (11x17)



ISSUE DATE:	FEB 2013
DESIGN BY:	NFD
DRAWN BY:	NFD
CHECK BY:	CKK
DATE:	2/26/13
APPROVED:	
DESCRIPTION:	
MARKS:	

US ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT	ISSUE DATE: FEB 2013
KNIGHT ARCHITECTS, INC. 220 W. PINE STREET ATLANTA, GEORGIA 30331 TEL: 770-452-0101	SOLICITATION NO.:
	CONTRACT NO.:
	FILE NUMBER:
	FILE NAME:
	SIZE: 27" x 34"
	DATE: 2/26/13

TEMP NOTIONAL STANDARD
DESIGNS
 OVERALL FLOOR PLAN
 TEMP 4
 FORT BRAGG

SHEET IDENTIFICATION
4-102
 SHEET 33 OF 60

4-102-

1

2

3

4

5

D

C

B

A



MARKS	DATE	DESCRIPTION
	2/26/13	CORRECTED FINAL SUBMITTAL

DESIGN BY: NFD	ISSUE DATE: FEB 2013	DESIGNED BY: GCK	SOLICITATION NO.:
DRAWN BY: NFD	CHK BY: GCK	PLT BY: NFD	CONTRACT NO.:
DATE: NFD	FILE NUMBER:	PLT DATE: 1:34:48 PM	FILE NAME:
SIZE: 27 x 34"			

US ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT

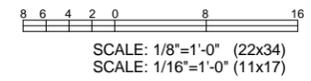
KNIGHT ARCHITECTS, INC.
2200 W. BROAD ST.
ATLANTA, GEORGIA 30331
TEL: 770-452-0101

TEMP NOTIONAL STANDARD
DESIGNS

ENLARGED PLANS
TEMP 4
FORT BRAGG

SHEET IDENTIFICATION
4-103
SHEET 34 OF 60

1 FIRST FLOOR ENLARGED PLAN
4-103 1/8" = 1'-0"



4-103-

1

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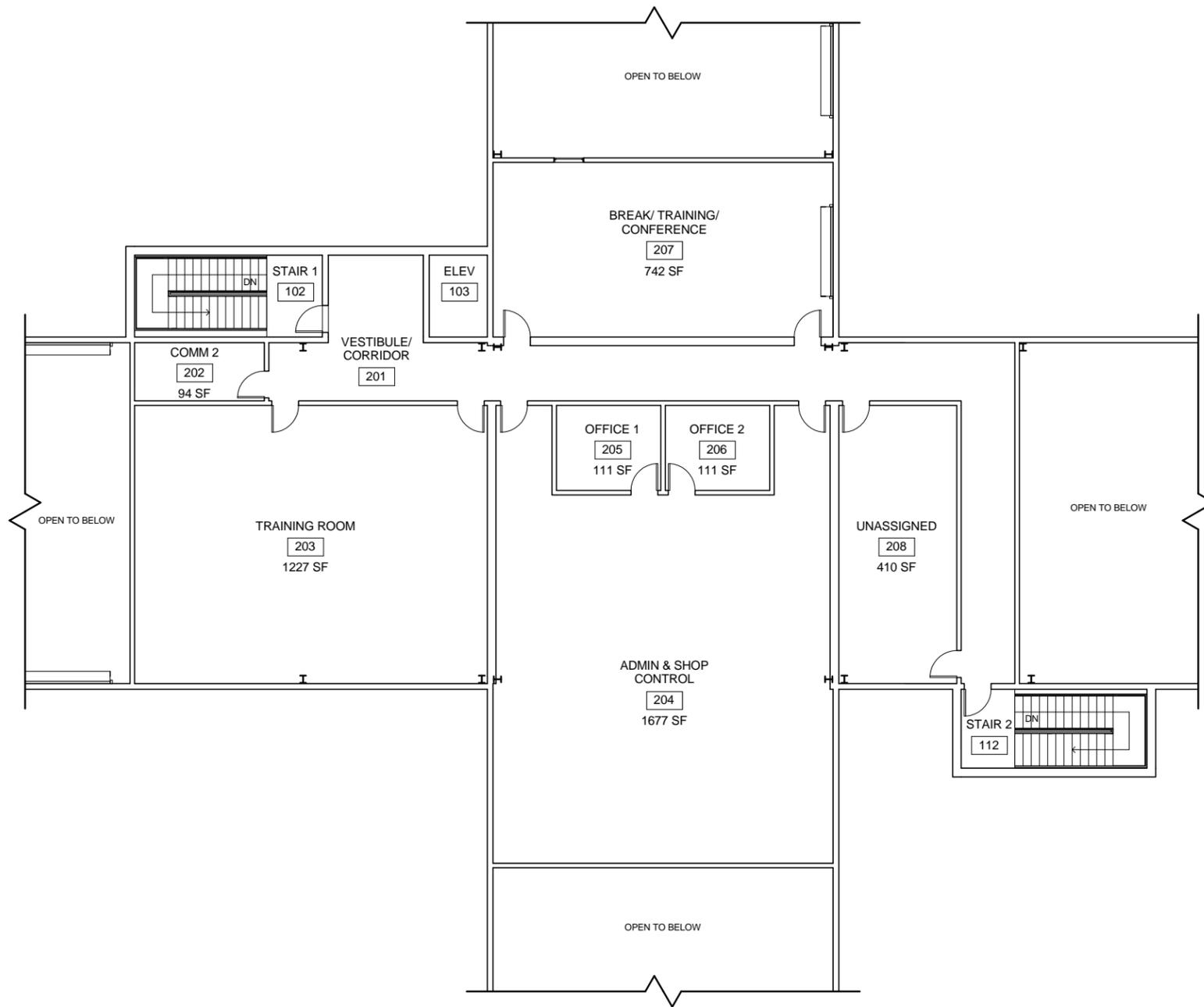
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1
4-104

SECOND FLOOR ENLARGED PLAN

1/8" = 1'-0"



SCALE: 1/8"=1'-0" (22x34)
SCALE: 1/16"=1'-0" (11x17)



DATE	DESCRIPTION
2/26/13	APPR
	MARK
	CORRECTED FINAL SUBMITTAL

DESIGN BY: NFD	ISSUE DATE: FEB 2013
DRAWN BY: GCK	SOLICITATION NO.:
CHK BY: GCK	CONTRACT NO.:
DATE: NFD	FILE NUMBER:
PLT DATE: 11-14-09 AM	FILE NAME:
PLT SCALE: 1/8" = 1'-0"	
SIZE: 27" x 34"	

US ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT

KNIGHT ARCHITECTS, INC.
2200 WASHINGTON AVENUE
ATLANTA, GEORGIA 30341
TEL: 770-452-0101

TEMP NOTIONAL STANDARD
DESIGNS

ENLARGED PLANS
TEMP 4
FORT BRAGG

SHEET IDENTIFICATION
4-104
SHEET 35 OF 60

4-104-

TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

TEMF 5

TEMF 5 (Building D2340)

TEMF 5 is characterized by a U-shaped floor plan. There are 3 similar U-shaped TEMFs at Fort Bragg. The existing floor plan has core and admin functions in the corners of the U but these functions have expanded into the maintenance bays.

The facility has a 1-ton overhead monorail. A makeshift welding area constructed of wire mesh has been added in one bay.



*Above, left: interior image showing makeshift welding area;
Above, right; exterior image;
Below: interior image*

**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

Description of Renovation

The renovation design scheme consolidates core functions within the U-shaped footprint. Where existing core spaces have been removed new high bay spaces will be created providing an opportunity for bridge crane, wider overhead doors, and maintenance pit.

Tier Matrix

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

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

TIER MATRIX			
TIER 1	Accommodates mandatory Core Areas & Repair/Maintenance Area functions	X	
	Open structural bay w/column free space of 16' x 32'	X	
	Minimum bay door size of 14'(h) x 16'(w)	X	
	Capability to support interior power & data upgrade	X	
	Concrete paving with controlled fenced area	X	
TIER 2	Min. 7-1/2 and preferably a 10 ton bridge crane	X	May require new construction. Feasibility should be reviewed for each project.
	Additional Core spaces including break/ training room, weapons vault, COMSEC vault, non-sensitive secure storage	X	
	Out-building accommodation for POL, Hazmat, Organization Equipment, UAV Storage, and Distribution Company Storage and fenced Secure Open Storage (when authorized)	X	May require new construction. Feasibility should be reviewed for each project.
	Open structural bay w/column free space of 32' x 32'	X	
TIER 3	Maintenance pit	X	Requires new construction. Feasibility should be reviewed for each project.
	Open structural bay w/column free space of 64' x 32'		

- The 10 ton bridge crane and maintenance pit should be evaluated for each Legacy Facility taking into consideration the existing building, users' needs, and overall cost of renovation in comparison to new construction cost.

**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

- The floor plans on the following pages identify areas where a bridge crane could be added but each facility should be evaluated in regard to structural loading. The existing or new framing will need to support new vertical loads along with new lateral and horizontal loads. The crane structure will need to be coordinated with existing building foundations and services.
- The TEMF toured at Fort Bragg had various out-building structures surrounding the facility. These could be adapted to accommodate the items listed in the matrix above but should be further studied.

Area Comparison

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

AREA COMPARISON				
		SMALL TEMF	MEDIUM TEMF	TEMF 5
CORE AREA	Admin & Shop Control	800	2,150	970
	Training Room	1,080	1,080	723
	Consolidated Bench	580	1,380	863
	Combat Spares	500	970	709
	Tool Room	400	840	577
	Tool Box Storage / Secure Tool Storage	192	384	397
	Latrine	480	1,340	800
	Break, Training & Conference	250	600	484
	Weapons Vault	300	300	300
	COMSEC Vault	300	300	300
	Secure Storage	150	300	315
	Telecomm (NIPRNet)	150	150	146
	Telecomm (SIPRNet)	150	150	150
	Core Total		5,332	9,944
REPAIR/ MAINT AREA	Fluid Distribution Room	260	320	367
	Maintenance/Repair Area	8,192	17,536	10,099
	Maintenance/Repair Area Total	8,452	17,856	10,466
UTILITY	Mechanical	460	1,460	765
	Electrical	240	250	148
	Elevator Machine Room		160	
	Unassigned		770	
NET TOTAL:		14,484	30,440	18,113

**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

APPENDICES

MEETING MINUTES:

- IMCOM
- Ft. Hood
- Ft. Bragg
- Preliminary Submittal Review
- Final Submittal Review

SITE VISIT NOTES:

- Ft. Hood
- Ft. Bragg

TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

MEETING MINUTES

IMCOM – SEPTEMBER 5, 2012

Overall Scope Description

- CESAS went over the SOW dated 12 July 2012. In general, notional designs will be performed which update existing 70's-vintage facilities to incorporate latest standard designs.
- Potential code updates will not be included in the fieldwork and notional designs.
- The \$750,000 limit was discussed at length, and will need additional clarification for proposed renovations and new work.
- It was suggested that the preliminary design package be presented to the review participants, in lieu of document submittals and then collection of review comments.

TEMF's

- Fort Hood and Fort Bragg DPW's will provide information on the current TEMF's which will be candidates for renovation. CESAS/IMCOM will provide this information to KAI.
- In general, only facilities older than 1986 +/- will be reviewed, since newer TEMF's utilize modern standard designs.
- It will need to be determined if a maintenance pit is required for renovated facilities.
- It will need to be determined if a crane is required for existing facilities, and further if legacy 7-1/2 ton cranes are adequate in lieu of current 10 ton capacity cranes.

Technical Requirements:

- Min. 32'x32' open structural bay. If unavailable, it may not be beneficial to renovate the existing structure.
- Min. 14' height doors
- Capability to support interior power and data
- Concrete hardstand
- Capability to support SATS & ASLMS
- Capability to support exterior building storage
- Clarification that a maintenance pit should be provided.

FORT HOOD – SEPTEMBER 6, 2012

Overall Scope Description Discussion

- Fort Hood DPW provided electronic files to KAI for the existing buildings to be visited.
- Clarification is needed on the criteria which will be required to be met by the proposed renovations, for example ADA, ASHRAE 189.1, AT/FP, etc.
- Teams visited representative existing COF's and TEMF's.

TEMF Overarching Needs

- Cranes in the maintenance bays, if feasible. If not, adjacent crane structures can be provided.
- Additional administration space.
- Additional bench and storage space. This can potentially be achieved through converting current administrative space into shop space, then potentially capturing added administrative space in adjacent structures.
- Additional latrine, shower, and locker space.

TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

- Additional storage for communication gear, tools, and high-dollar items.

The design team was directed to focus on the following design types:

- Building 38014. As this facility consists of double height space throughout the structure an alternate version of this design scheme will be provided for facilities similar to Building 35023.
- Building 38023.

FORT BRAGG – SEPTEMBER 27, 2012

Three TEMF schemes were discussed for Fort Bragg:

- The existing TEMFs that are made up of a combination of several rectangular buildings will require a multiple building solution. This will be applicable for approximately six existing locations. This solution repurposes/renovates some buildings in a complex, demolishes others, and adds new in-fill high-bay spaces with material handling capability.
- U-shaped facility, which seems to be applicable for approximately three existing locations.
- Cross-shaped facility, which seems to be applicable for approximately two existing locations.

Draft schemes for Fort Hood were reviewed:

- Attempt to group the new second floor spaces together in a central core area.
- Second floor spaces will require stairs and elevators.
- Look at the potential of adding a crane to some of the existing bays.
- Two-story mechanical spaces can be utilized.

IMCOM – DECEMBER 10, 2012 Preliminary Submittal Review Meeting

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.
- Include page numbers.
- Final document should be PDF with bookmarks for each section.
- Drawings should be 11x17.
- Show existing or as-built floor plans for each facility.
- SAS will note reference to legacy studies in applicable standard designs.
- 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.

TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

- Note that schemes are predicated on surveys of typical facilities at Hood and Bragg, but are meant to be applicable for similar facilities worldwide.
- The potential solutions provided satisfy the approved Army renovation requirement, but adjustments are possible to satisfy site specific requirements.
- Intent is to satisfy Army Standard and Standard Design requirements to the extent feasible within SRM limits.
- IMCOM will provide guidance on O&M vs. new construction funding classification for SRM work.

TEMF Notes/Comments:

- Change description of crane within tiers. Specify a minimum 10 ton crane for buildings requiring structural renovation, otherwise an existing 7-1/2 ton crane is acceptable as a Tier 2 requirement; take out reference to 50% of work area.
- Group the L-shape buildings together and describe how the renovation schemes could be adapted for various facilities with similar footprints.
- Briefly describe each TEMF type on the table of contents page with small outline of floor plan to make the report easier to navigate: L-shape facility; Facility consisting of several small rectangular buildings; Cross shape facility; U-shape facility.
- Add to exec summary overall statement about the goal to consolidate core functions in order to maximize efficiency of floor plans. An elevator is required for the addition of 2nd floor space. Having several groups of core areas would be inefficient for circulation and the layout of utilities (Mech, Elec, Comm).
- Clarify that the overall square footage of maintenance/repair areas in the existing facilities remains the same in the renovation floor plans.
- Qualify limitations of 16' door for TEMFs.
- Show potential in-fill solution for TEMF 3 maintenance/repair areas.

Final Report Organization:

Table of contents

- Executive summary
 - Intent
 - Describe decision tiers; overall tier matrix
 - General information about facility types (organized to reference page numbers where each building is described)
- TEMF 1A
 - 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
- TEMF 1B
- TEMF 2...
- Meeting minutes/Trip report

**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

**IMCOM – FEBRUARY 12, 2012
Final Submittal Review Meeting**

Attendees:

- Tom Brockbank, Jeff Stein and Frank King from SAS
- Anne de la Sierra and Dan Seastrum from IMCOM
- Joe Knight and Narra DeMichina from Knight Architects

The following Dr. Checks comments were discussed. This report reflects these discussions:

- 5021093, 5021113, 5021122, and 5021130: These comments deal with the need for an interior corridor in each design scheme to provide access to the tool room, combat spares, tool box storage, latrines and non-sensitive secure storage from at least one set of maintenance/repair bays. Revised floor plans were reviewed. The following comments were made and were incorporated into the plans presented in the Corrected Final Report:
 - For all designs it was desirable that the Tool Room have immediate access to a maintenance/repair bay.
 - TEMF 1B: The mechanical room location and size were discussed. It was decided that a mechanical chase be added on the 2nd floor adjacent to Comm Room 206.
 - TEMF 2: The mechanical room location and size were discussed. It was decided that a mechanical chase be added on the 2nd floor along the exterior wall of Break/Training/Conference Room 201.
 - TEMF 4: It was decided that at least three of the maintenance/repair areas should have interior access to the latrines.
- 5021101: This comment requests that values be provided for the small and medium maintenance/repair areas within each area comparison chart. The appropriate values from the standard design were identified and are included in this report.
- 5021107: The introductory information provided for TEMFs 1A, 1B, and 2 was discussed. Although this information is repetitive in reading the full report it was decided that it should be included within all three of the TEMF sections so that all relevant information for each facility be together.
- 5024024: This comment requests clarification regarding bridge cranes, specifically about capacity, existing vs. new construction, separate building vs. area indicated on floor plans. It was agreed that the tier matrix will require a “minimum 7-1/2 and preferably a 10 ton bridge crane”. For the TEMFs at Ft. Hood the possibility of existing exterior crane structures will be added as a consideration to be evaluated for each Legacy Facility.

TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF) LEGACY FACILITIES RENOVATION STUDY

DATE: September 6, 2012

TIME: 0900-1530

LOCATION: Ft. Hood, TX

RE: Tour of TEMFs

PARTICIPANTS:

Tom Brockbank	Savannah District	thomas.r.brockbank@usace.army.mil
Dan Seastrum	HQ IMCOM G4 PW	daniel.j.seastrum.civ@mail.mil
Ravin Howell	HQ USACE / CRST	ravin.l.howell@usace.army.mil
Mike Biscotte	Knight Architects, Inc.	mike.biscotte@gmail.com
Narra DeMichina	Knight Architects, Inc.	ndemichina@kai-atl.com
Charles A. Witt	DPW, Ft. Hood	Charles.a.witt4.civ@mail.mil

Following our meeting at DPW Ft. Hood, Charles Witt escorted the TEMF team on a visit to six (6) separate facilities. The map on the following page shows the buildings visited on Main Post.

Debrief/Results of TEMF tours:

TEMF Overarching Needs

- Cranes needed in maintenance bays if feasible. Otherwise, adjacent crane structures should be provided.
- Additional administration space was requested at each facility.
- Additional bench and storage space, preferably in proximity to the maintenance bays was an issue at each facility.
- Additional latrine, shower and locker spaces are required.
- Additional storage for communication gear, tools, and high-dollar items.

The design team was directed to focus on the following design types:

- Building 38014. As this facility consists of double height space throughout the structure an alternate version of this design scheme will be provided for facilities similar to Building 35023.
- Building 38023.

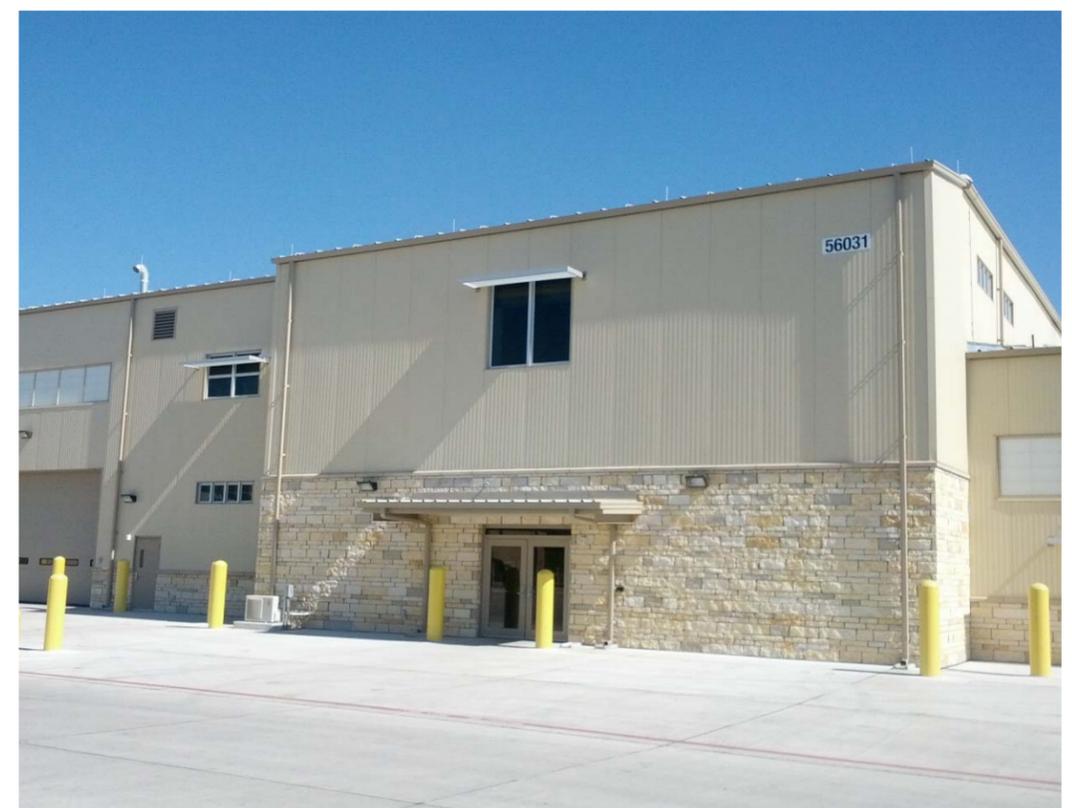
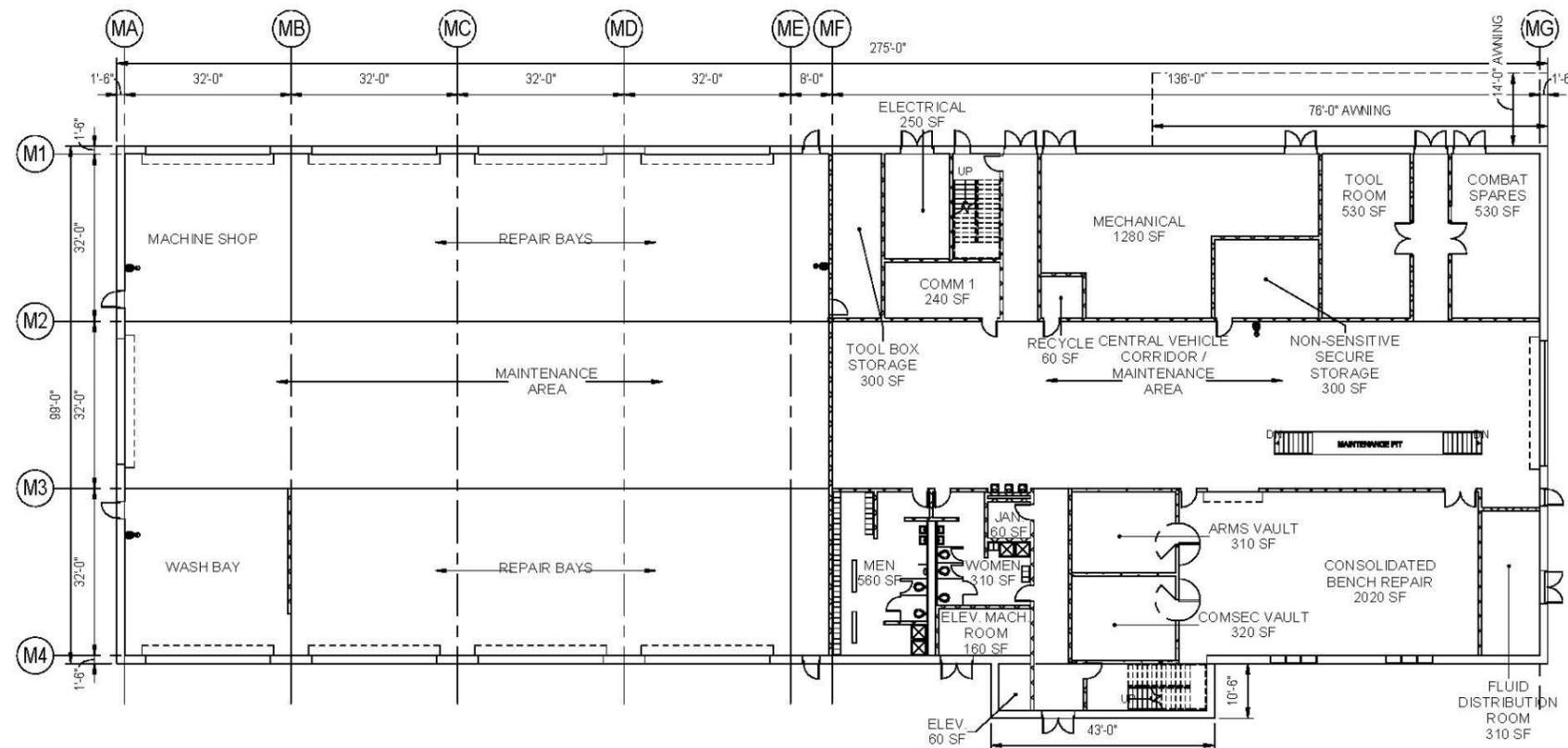


1. TEMF 69th ADA Brigade:

This is a new facility, meeting the current TEMF standard design requirements. The facility is based on the Medium TEMF standard design. It was noted that there is a new requirement for an approximately 4-foot wide area between repair bays to allow space for work tables, desks, and benches adjacent to the bay doors.



(Left)- Central maintenance area with the floor pit shown in the background;
(Right)- Repair bays shown with equipment stored between bays, illustrating the need for the increased spaced between bays;
(Below, Left)- First floor plan;
(Below, Right)- Exterior view.

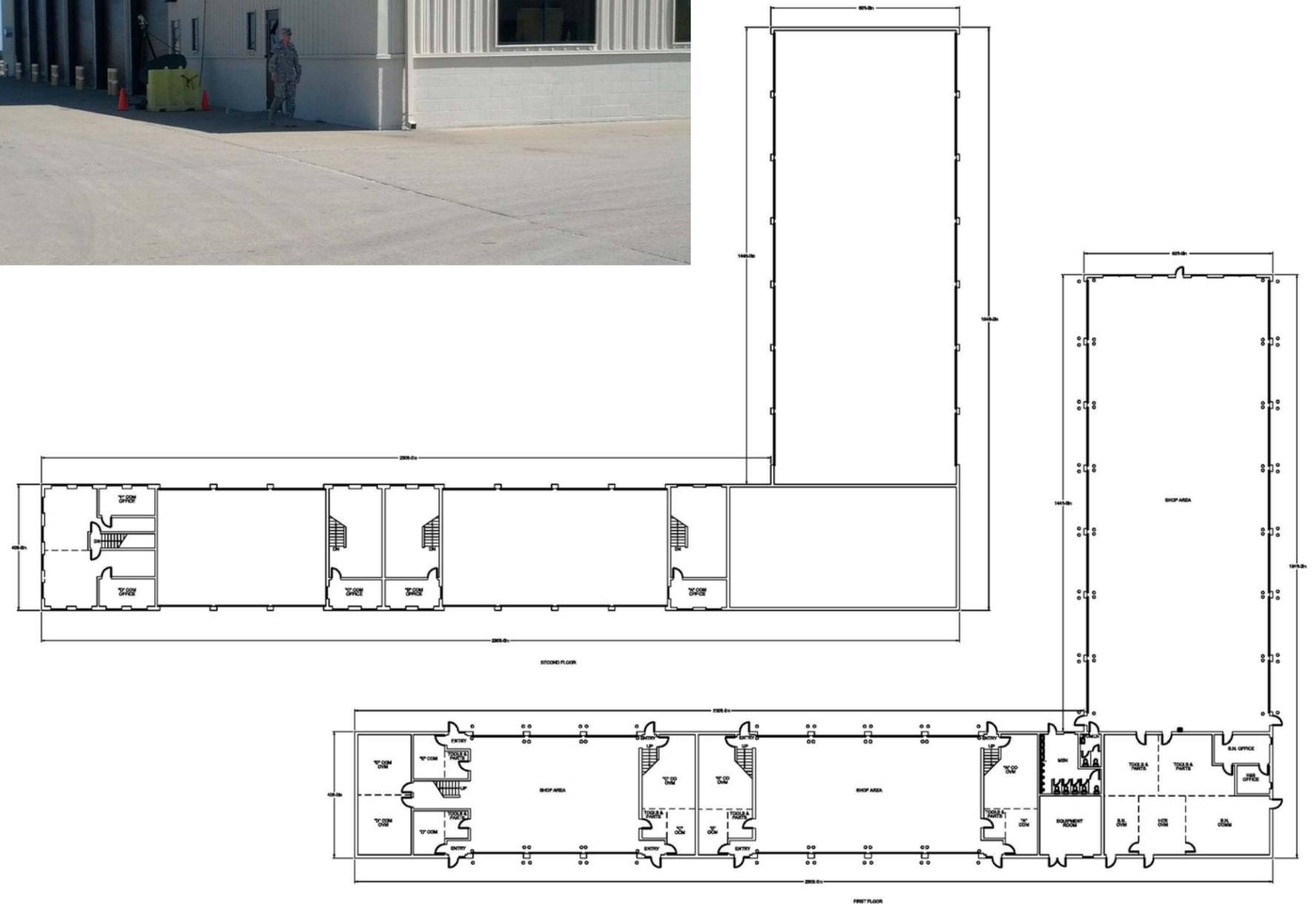


**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

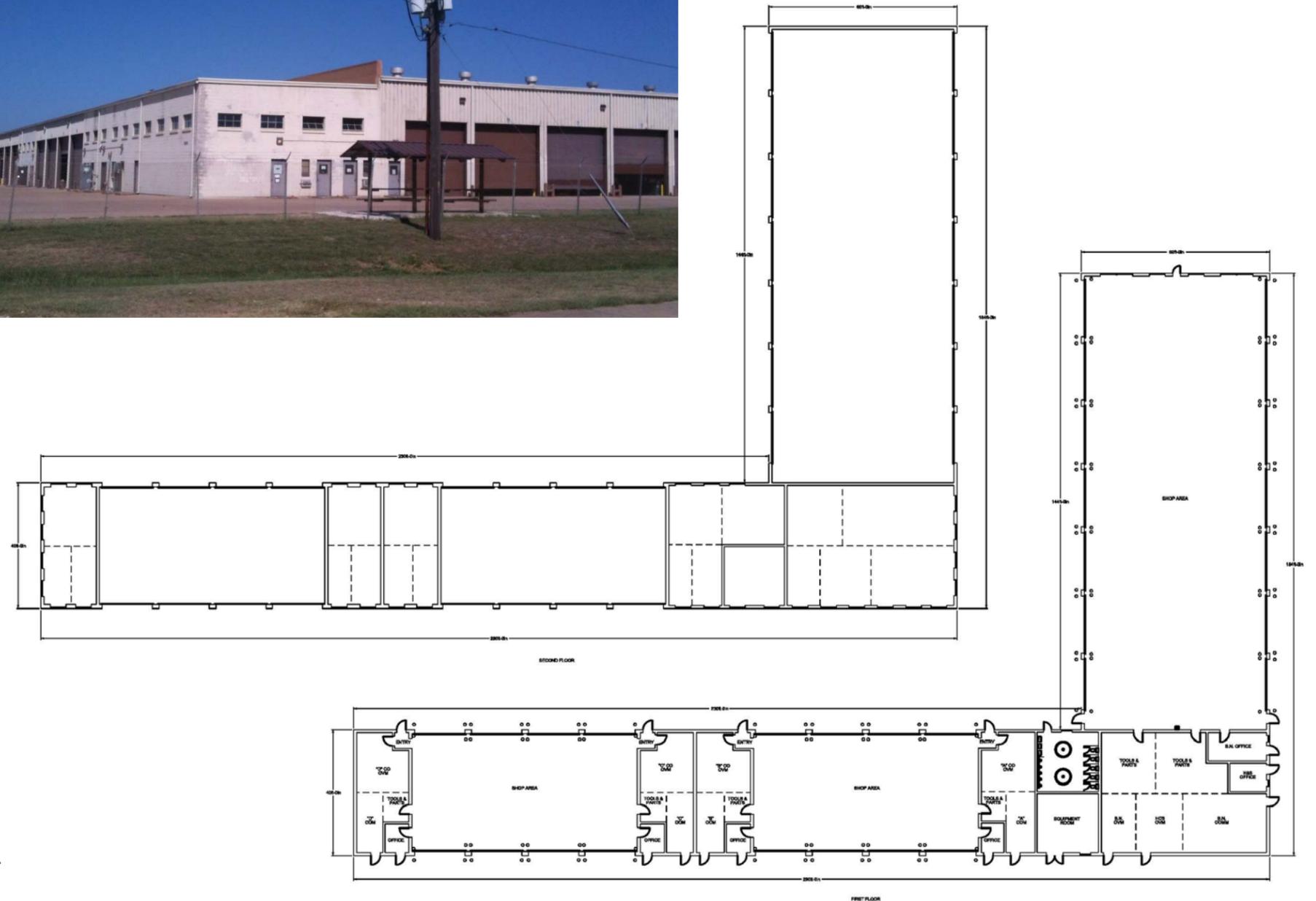
2. **Building 35023:** This is a fairly typical L-shaped TEMF built in the 1970's. The facility has newly renovated space created by adding second-floor space above first floor admin spaces. This facility represents one type of L-shaped TEMF seen throughout Ft. Hood. The admin area at the corner of the first floor is only 1-story in height while the 2 wings on either side have double height space.



(Top)- Exterior views of building 35023;
(Bottom, Left)- Interior view of maintenance bays and bridge crane added during recent additions;
(Bottom, Right)- First floor and second floor plans showing areas of second floor space created during renovations.

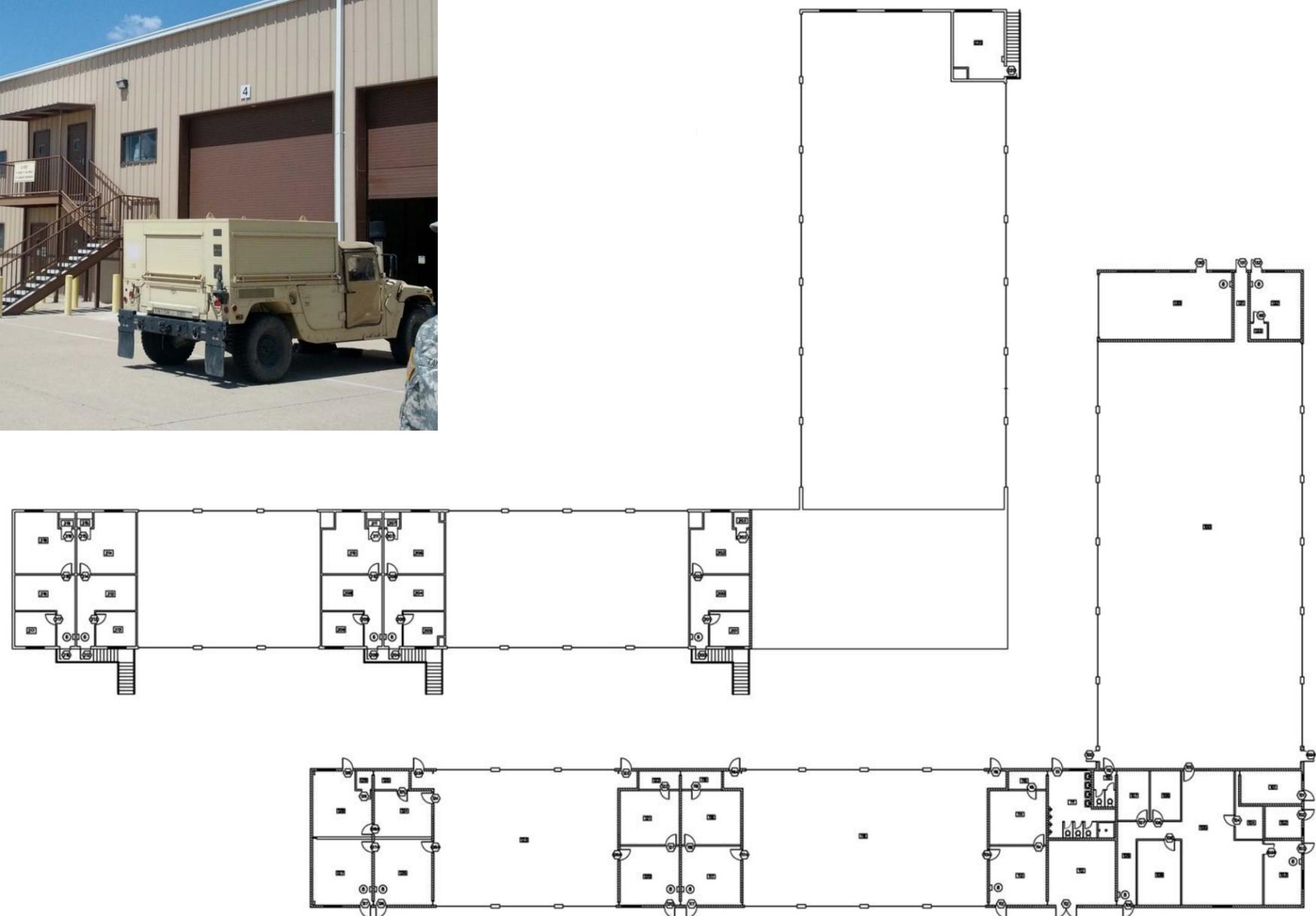
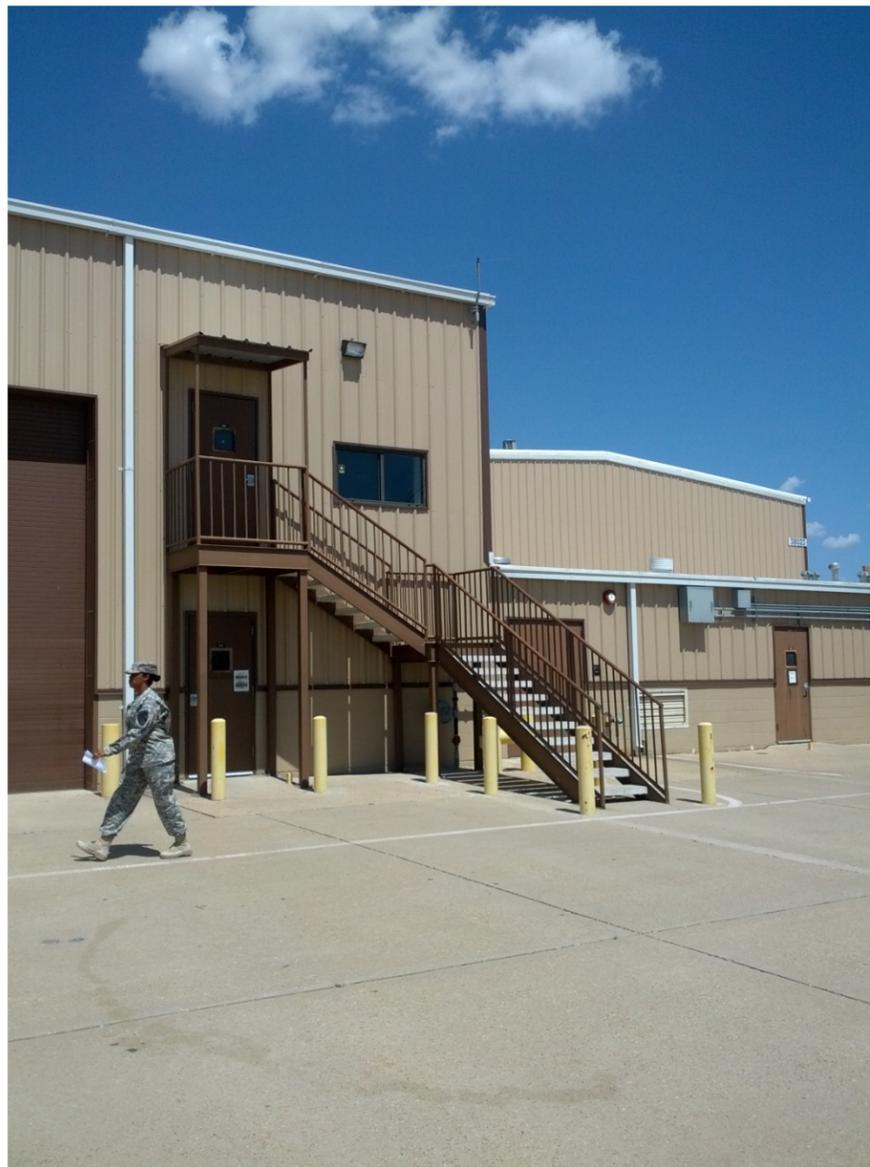


3. **Building 38014:** This is another typical L-shaped TEMF, built in the late 1960's. Unlike the previous L-shape facility this one has not been renovated. This facility represents a second type of L-shaped TEMF seen throughout Ft. Hood. Unlike Building 35023, the entire facility consists of double height space. Currently there is no second floor within the facility, but the envelope of the facility will allow for a 2-story renovation. The facility does not have a bridge crane within the structure. A separate crane structure is located at the rear of the facility. The crane is a 7.5 ton capacity and the structure consists of a 50' span with four 32' bays. Floor plans for building 30017 and 32002 which were provided to the design team are similar in plan to 38014.



(Above, Left)- Separate crane structure; (Above, Right)- Exterior view of building 38014.
(Below, Left)- Exterior view of 38014 from separate crane structure;
(Below, Right)- First floor and second floor plans.

4. **Building 38023:** Another typical L-shape TEMF built in the 1970's. The building has been renovated to include second floor space by adding exterior stairs. While this allows for more admin and storage space, the layout of the second floor spaces choppy and does not fit the users' needs. The items requested by the users during our site visit include:
- Permanent eye wash and hand wash stations
 - 10 ton capacity bridge crane
 - More space between or at the sides of bays for tool storage
 - More space for wall lockers or a separate locker room
 - Showers



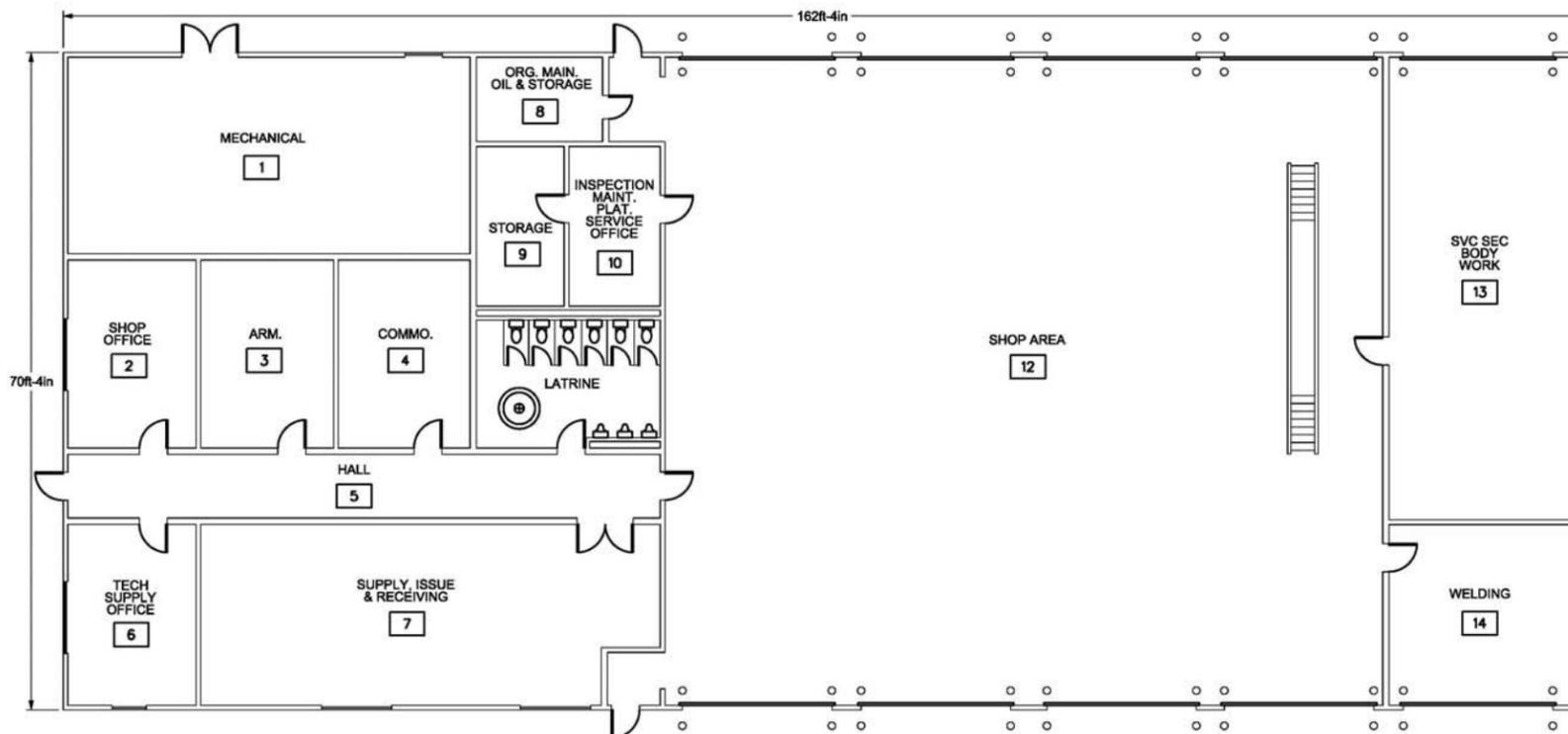
(Above, Left, Right)- Exterior views of facility showing separate exterior stairs;
(Right)- First floor and second floor plans.

5. **Building 32016:**

This is a newly renovated TEMF, built in the 1970's. There are 6 examples of this type of TEMF at Ft. Hood, arranged in two groups of three. While this group of three TEMFs has been renovated, the other has not. The renovated TEMFs include a 10 ton capacity bridge crane and a floor pit.

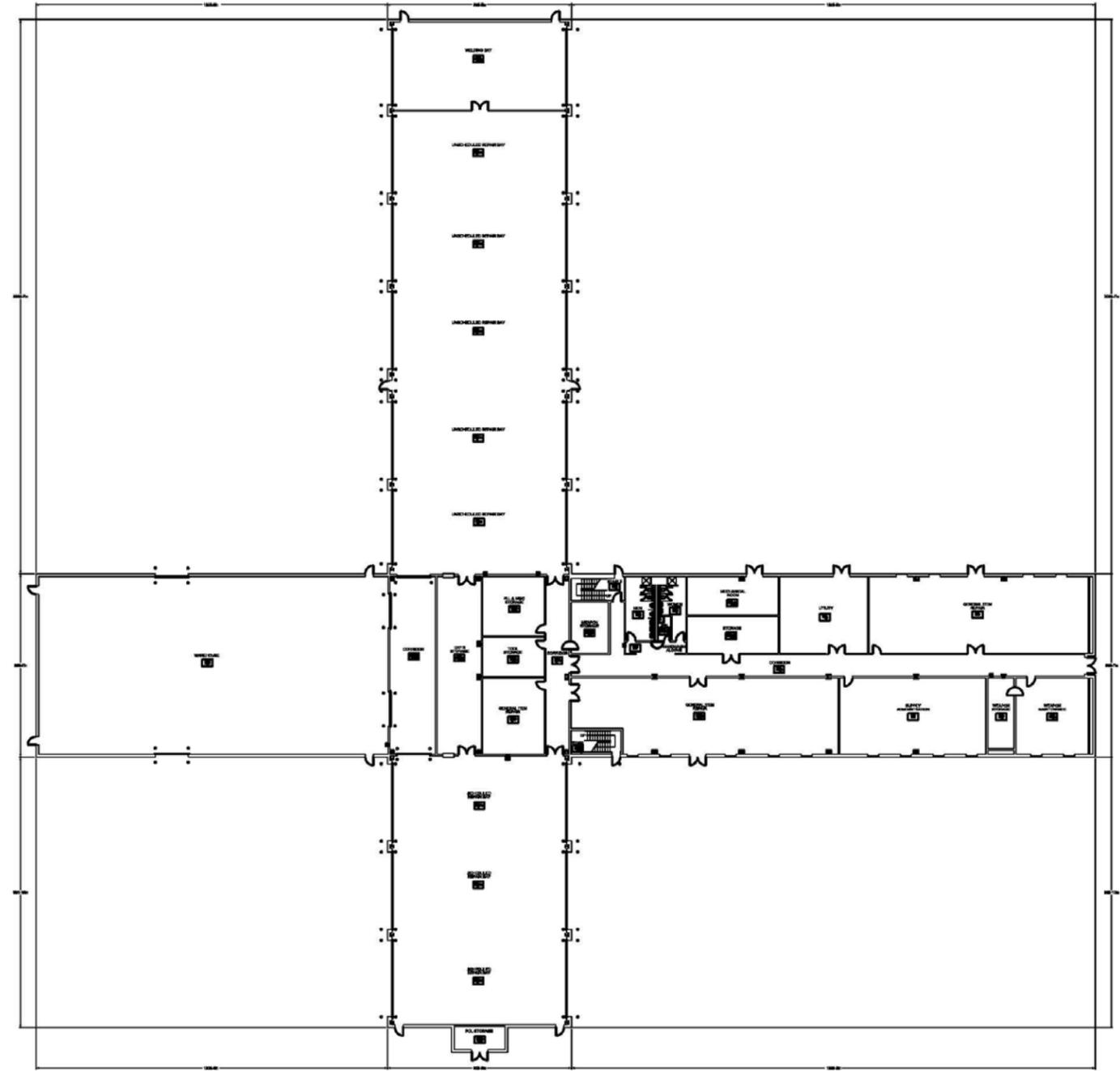
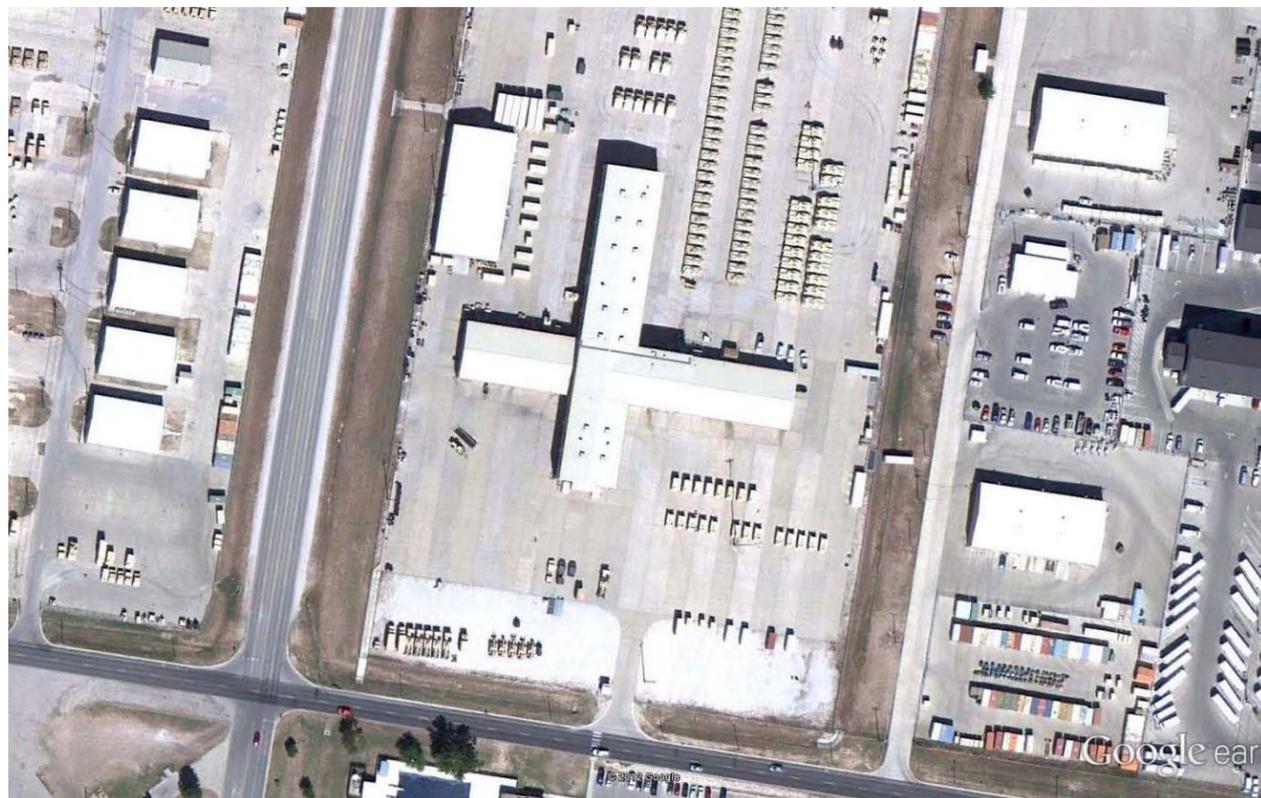


(Top, Left)- Exterior view of facility;
(Top, Right)- Interior image of shop area showing bridge cranes;
(Below, Left)- Floor plan of building 32016;
(Below, Right)- Aerial view of the 3 TEMFs.



6. Building 25020:

This is a TEMF built in the late 1980's in accordance with the pre-1986 standard design. As this facility meets most of the current standards and given its date of construction it is not a candidate for renovation.



(Above, Left)- Exterior image of facility;
(Above, Right)- Interior image of shop area showing bridge crane;
(Below, Left)- Aerial view of building 25020;
(Right)- First floor plan

**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
LEGACY FACILITIES RENOVATION STUDY**

DATE: September 26, 2012

TIME: 1300-1700

LOCATION: Ft. Bragg, NC

RE: Tour of TEMFs

PARTICIPANTS:

Tom Brockbank	COE, Savannah District	thomas.r.brockbank@usace.army.mil
Dan Seastrum	HQ IMCOM G4 PW	daniel.j.seastrum.civ@mail.mil
Jeff Stein	COE, Savannah District	jeffrey.stein@usace.army.mil
Mike Biscotte	Knight Architects, Inc.	mike.biscotte@gmail.com
Narra DeMichina	Knight Architects, Inc.	ndemichina@kai-atl.com
Scott Boulton	DPW, Ft. Bragg	r.s.boulton.civ@mail.mil

Following our meeting at DPW Ft. Bragg, Scott Boulton escorted the TEMF team on a visit to five (5) separate facilities. The map on the following page shows the buildings visited on Main Post.

Debrief/Results of TEMF tours:

TEMF Overarching Needs

- Cranes in the maintenance bays, if feasible. If not, adjacent crane structures or portable lifts can be provided.
- Additional administration space.
- Additional bench and storage space. This can potentially be achieved through converting current administrative space into shop space, then potentially capturing added administrative space in adjacent structures.
- Additional latrine, shower, and locker space.
- Additional storage for communication gear, tools, and high-dollar items.

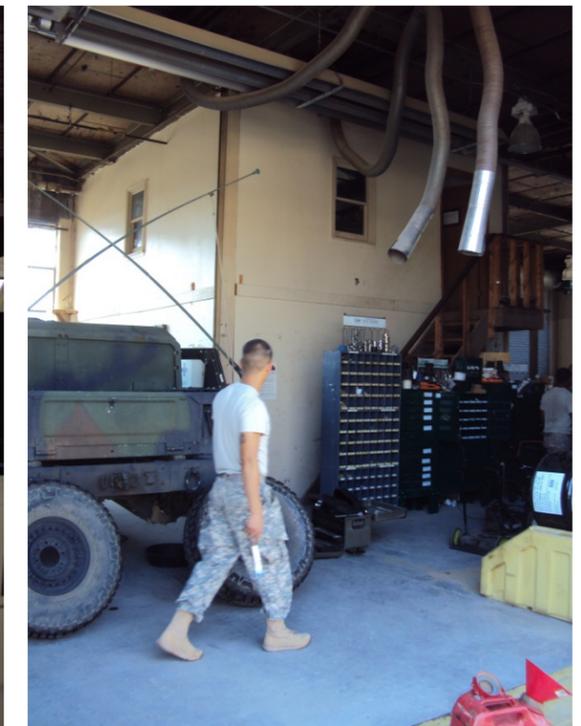
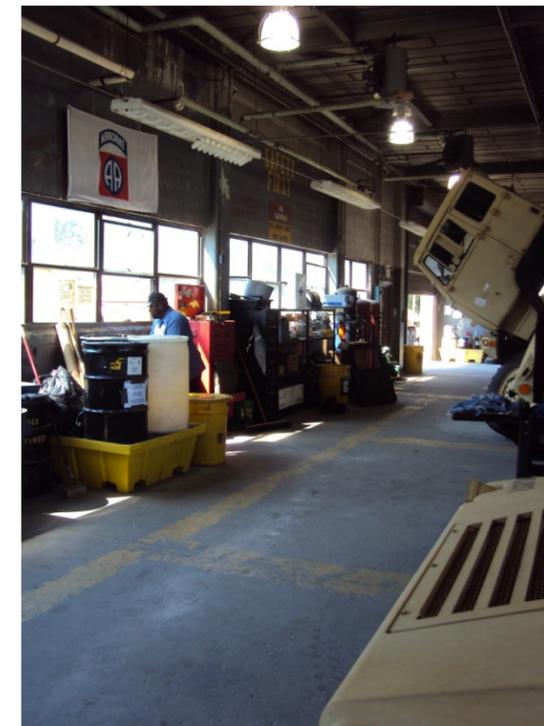
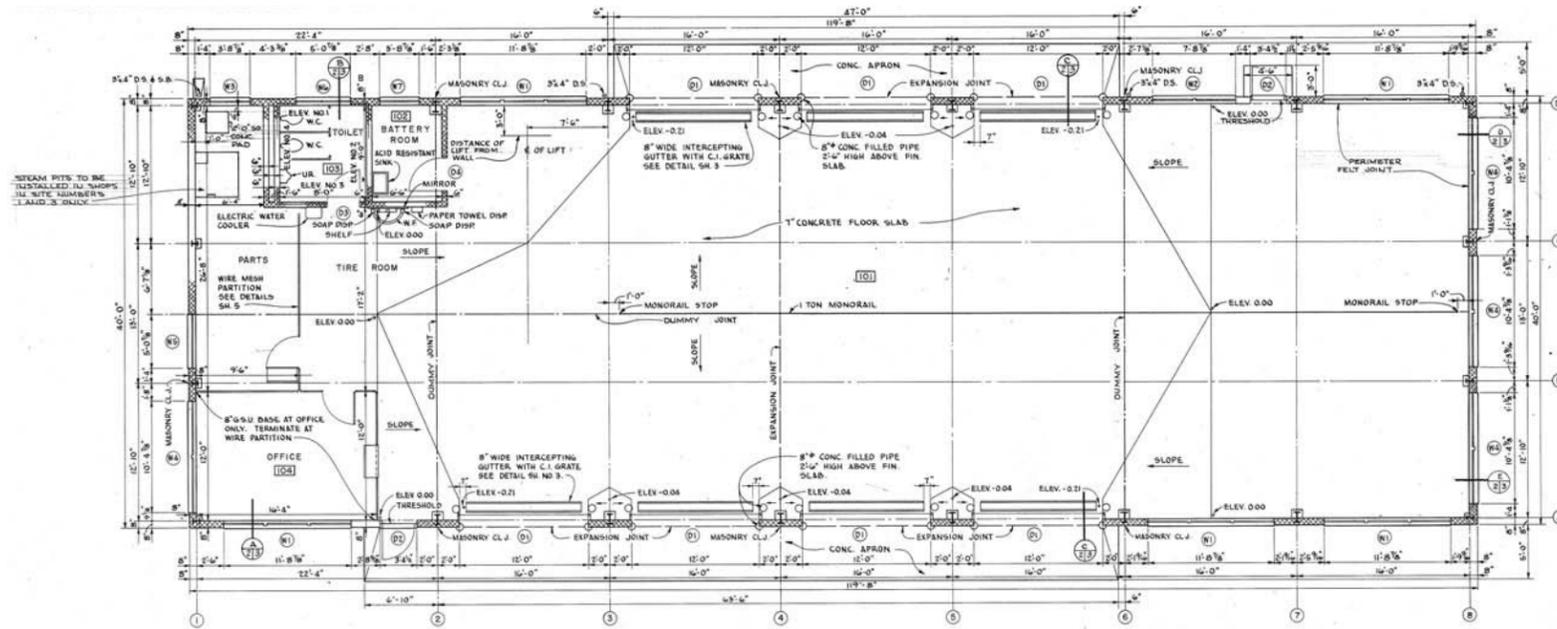
The design team was directed to focus on the following design types:

- The existing TEMFs that are made up of a combination of several rectangular buildings will require a multiple building solution. This will be applicable for approximately six existing locations. This solution repurposes/renovates some buildings in a complex, demolishes others, and adds new in-fill high-bay spaces with material handling capability.
- U-shaped facility, which seems to be applicable for approximately three existing locations.
- Cross-shaped facility, which seems to be applicable for approximately two existing locations.



1. Buildings C3515, C3514, C3513, C3512, C3511, C3510, C3509:

These are rectangular-shaped TEMF's built in the late 1950's. The group of 7 buildings combines to provide the functions of one TEMF. The buildings are all in relatively poor condition and have interior columns at approximately 20-foot center with overhead doors typically 12-feet wide by 14-feet tall. There is no overhead materials handling equipment and existing lifts have been abandoned. External tool and vault containers are being used adjacent to the buildings.



(Top, Left)- Typical floor plan;

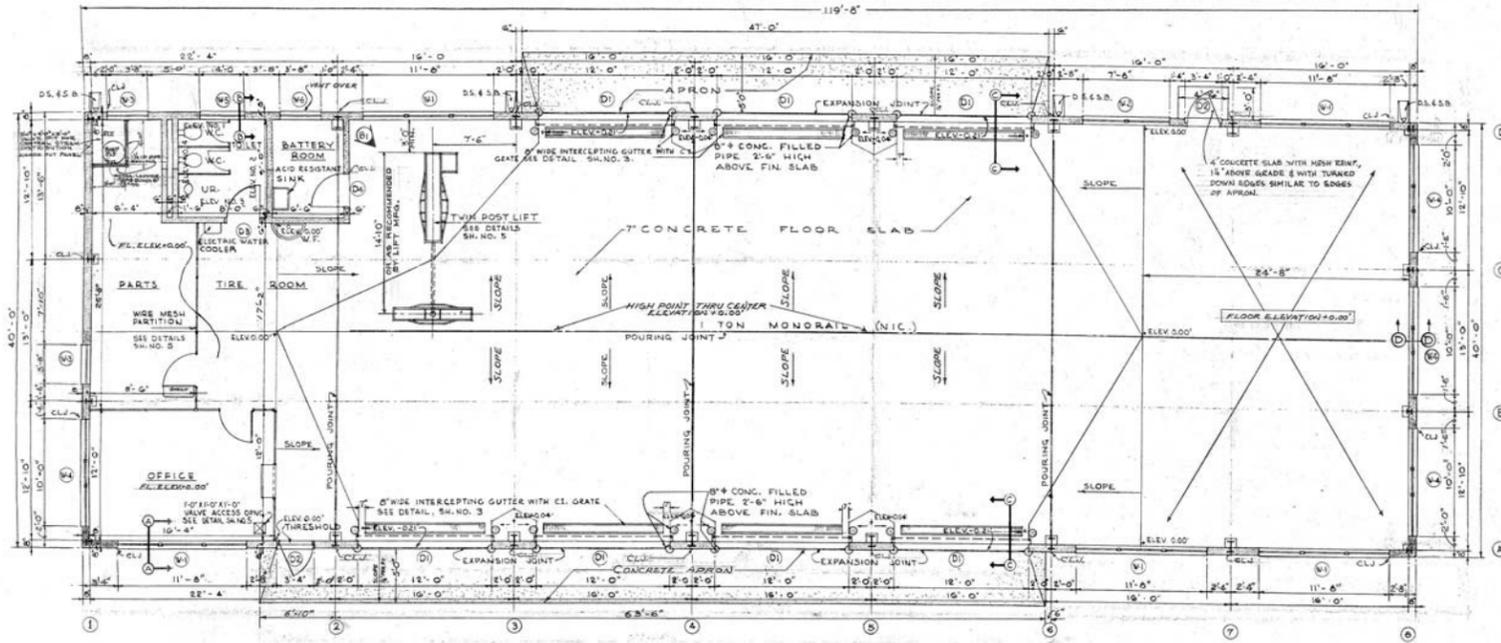
(Top, Right)- Exterior image of C3515;

(Below, Left)- Aerial view showing the group of buildings;

(Below, Center & Right)- Interior views. Image at right shows makeshift double height space added to maximize space.

2. Buildings D2026, D1926, D1826, D1727:

These are typical rectangular-shaped TEMF's built in the early 1960's. This is a nearly identical group of buildings to the ones previously seen. The group of 4 buildings combines to provide the functions of one TEMF. The buildings are all in relatively poor condition and have interior columns at approximately 20-foot centers with overhead doors typically 12-feet wide by 14-feet tall. There is no overhead materials handling equipment and existing lifts have been abandoned. External tool and vault containers are being used adjacent to the buildings.



(Top, Left)- Typical floor plan;

(Top, Right)- Aerial view showing the group of buildings;

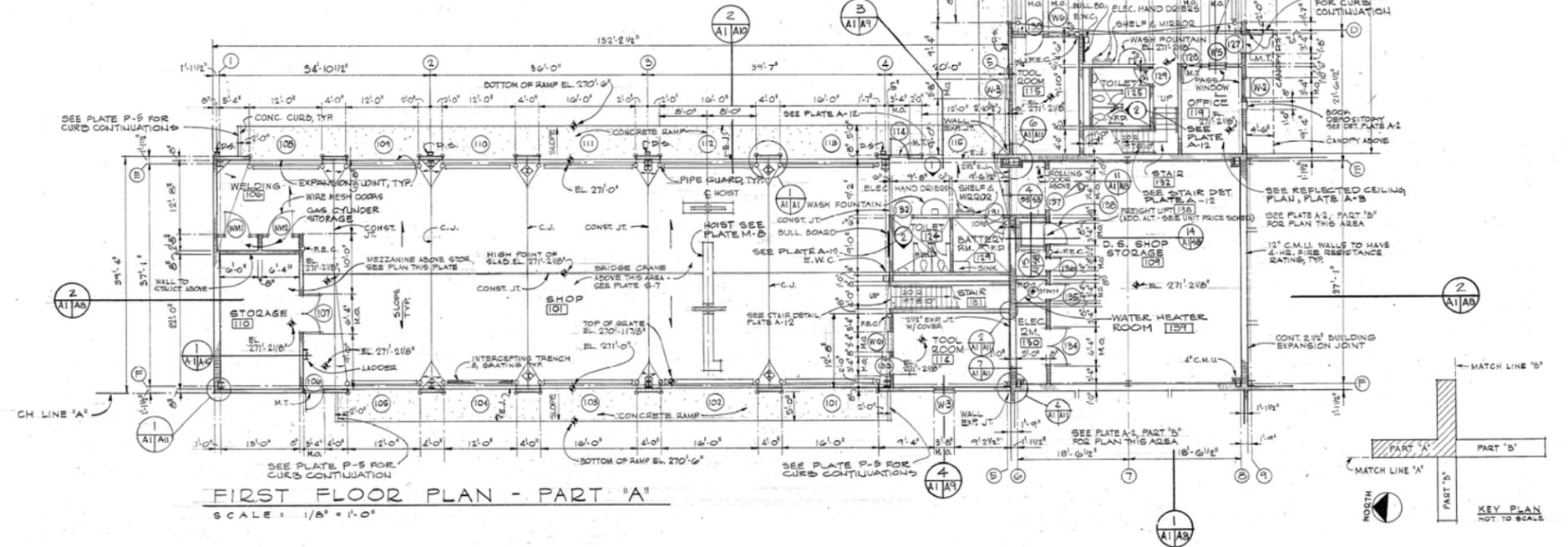
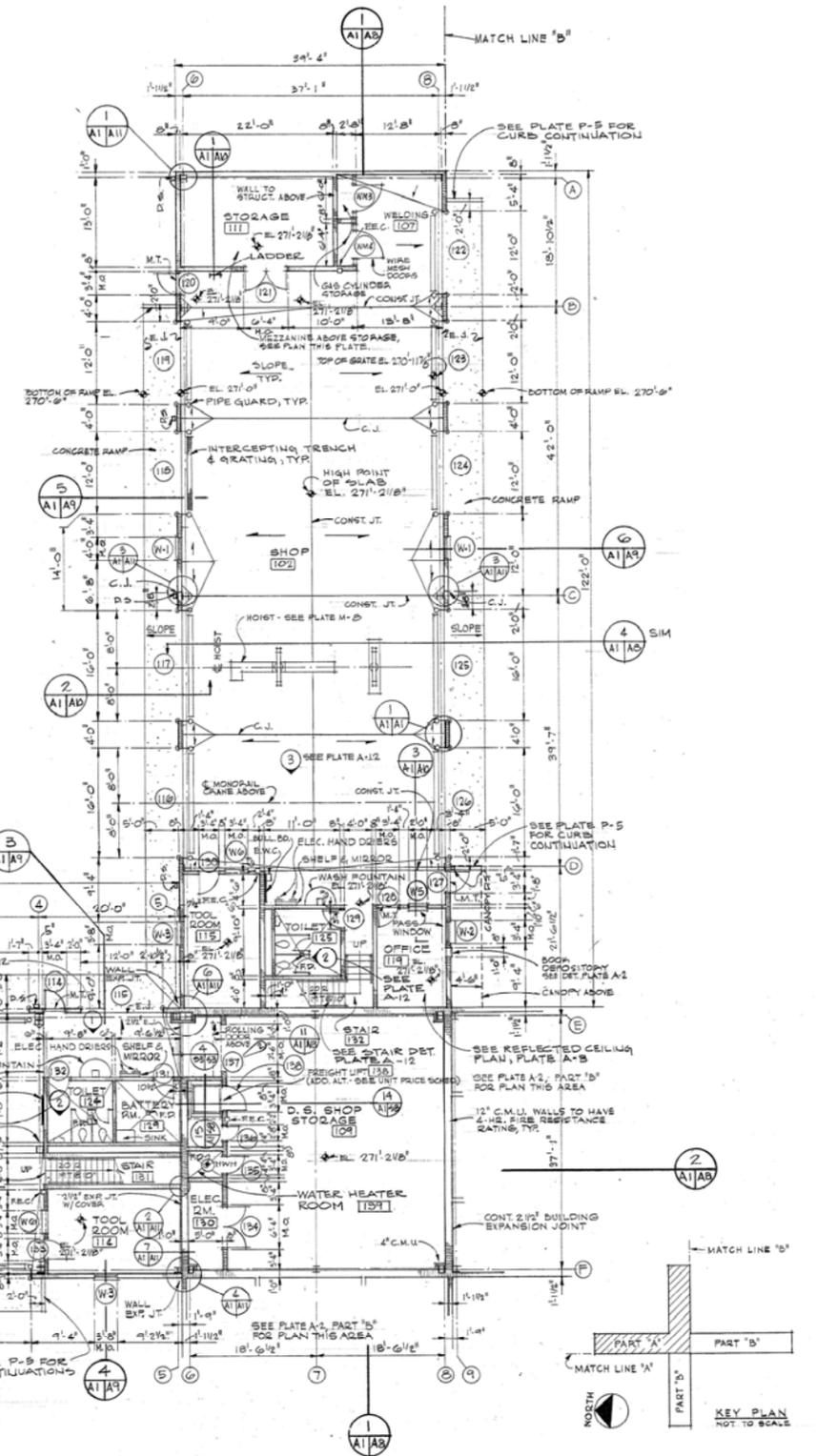
(Bottom, Left)- Exterior image of Building D1727;

(Bottom, Right)- Interior image of Building D1727;

**TACTICAL EQUIPMENT MAINTENANCE FACILITIES (TEMF)
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3. Building H3057:

This is a T-shaped TEMF built in the late 1970's in fair condition. There is an existing 5-ton overhead crane in one wing. In addition portable lifts have been purchased and are in use (Steril KONI-Lift).



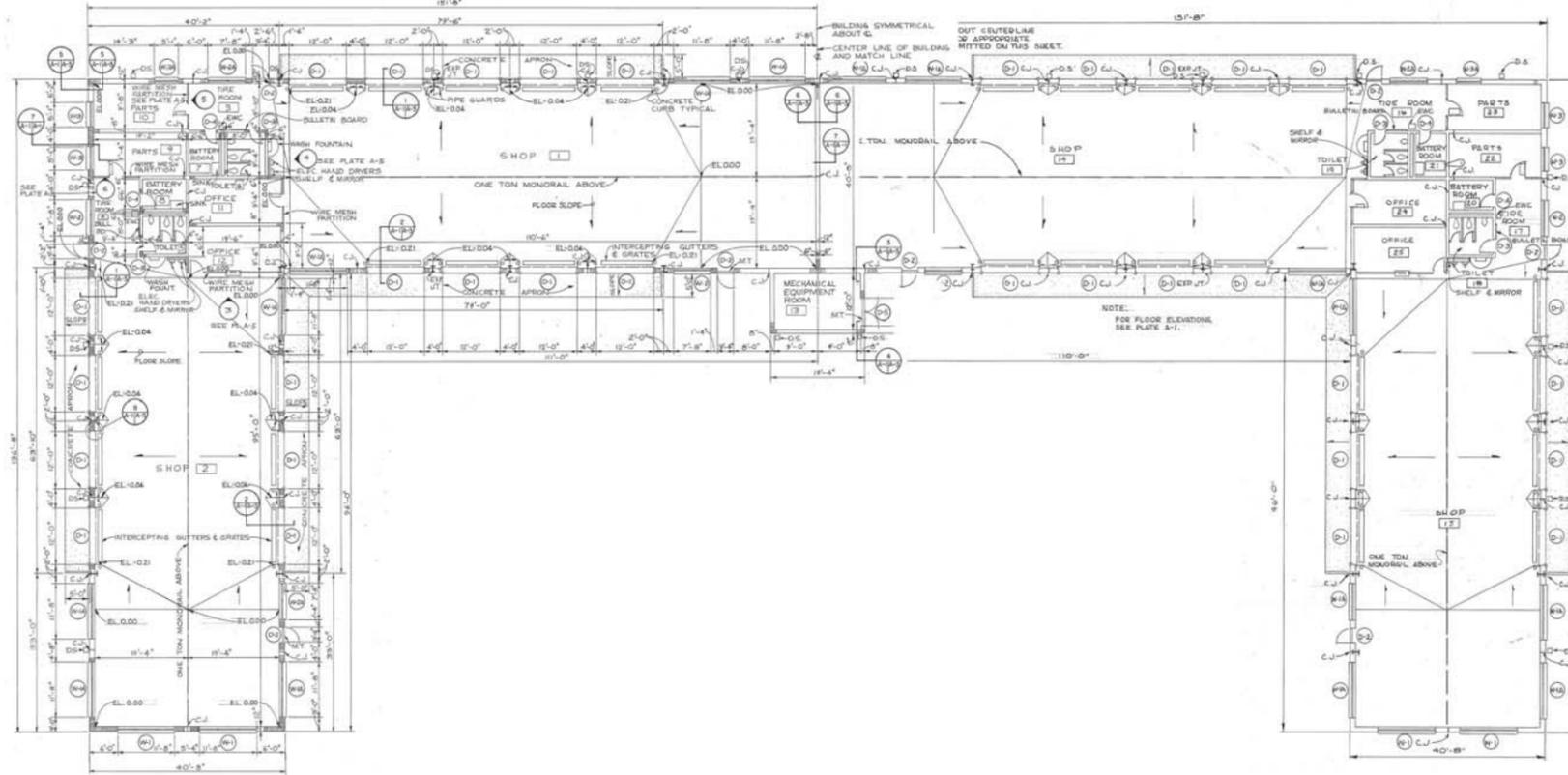
(Top, Left & Right)- Exterior images of H3057 from northwest;

(Below, Left)- Interior view showing overhead crane;

(Below, Right)- First floor plan showing 2 wings and central area.

4. **Building D2340:**

This is a U-shaped TEMF built in the late 1970's in fair condition. The facility has a 1-ton overhead monorail. A makeshift welding area constructed of wire mesh has been added in one bay.



(Above, Left)- floor plan;

(Above, Right)- Interior Image;

(Below, Left)- Interior Image showing makeshift welding area;

(Below, Right)- Exterior image of D2340.

5. **Building D2564:**

This TEMF facility was constructed by in-filling a new high-bay area between two existing 1950's rectangular buildings similar to those seen at the first two TEMFs visited. The infill area is 50'-0" wide. This spacing seems typical of the rectangular buildings visited. The overall combined building works well to provide maintenance and storage functions.



(Top)- Exterior view of facility showing high-bay space added between existing buildings;

(Below, Left)- Interior image;

(Below, Center & Right)- Interior images taken from infill space looking into adjacent existing buildings.

