

# CENTER OF STANDARDIZATION FOR NON-PERMANENT FACILITIES CATALOG

## Dale Hartmann, P.E.

Chief CoS

NIPRNet: dale.r.hartmann@usace.army.mil

SIPRNet: dale.r.hartmann.civ@mail.smil.mil

Phone: 540-665-2684 DSN: 312-265-2684

## Tricia Torok, P.E.

CoS Program Manager

NIPRNet: patricia.l.torok@usace.army.mil

Phone: 540-665-4067 DSN: 312-265-4067

## Ivelisse Ayala, VMA

CoS Project Manager

NIPRNet: evy.ayala@usace.army.mil

Phone: 540-665-3244 DSN: 312-265-3726

## Gary Baker, R.A

CoS Project Manager

NIPRNet: gary.d.baker@usace.army.mil

Phone: 540-665-2638 DSN: 312-265-2638



US Army Corps  
of Engineers®



SAFE1



SAFE



MUTE

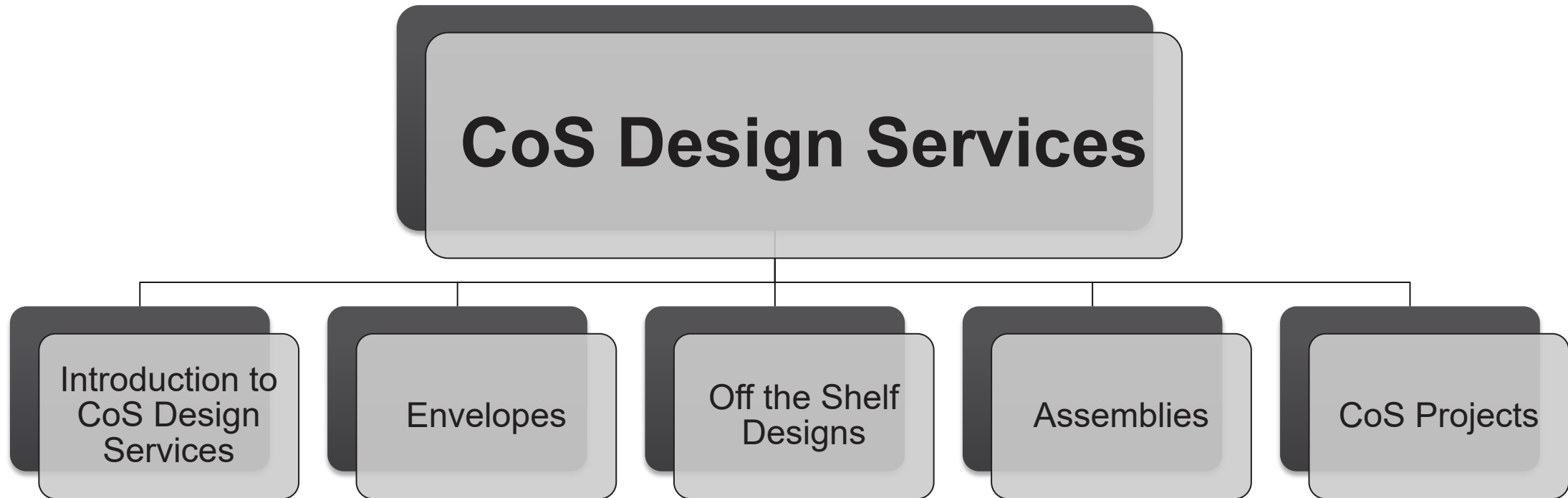


U.S. ARMY



US Army Corps  
of Engineers®

# TABLE OF CONTENTS





U.S. ARMY



US Army Corps  
of Engineers®

# INTRODUCTION TO CoS DESIGN SERVICES



U.S. ARMY



US Army Corps  
of Engineers®

# CoS FOR NON-PERMANENT FACILITIES

Standard Designs Available for Execution, in Any Envelope

Standard  
Adaptive  
Facility  
Envelope



Single or Two story structure  
with integral ballistic protection

Multi  
Use  
Tall  
Envelope



Single Story Metal Frame

Tactically  
Earthen  
Rapidly  
Raised  
Assembly Hut



Single story constructed with  
onsite soil

Common  
Uniform  
Building  
Envelope

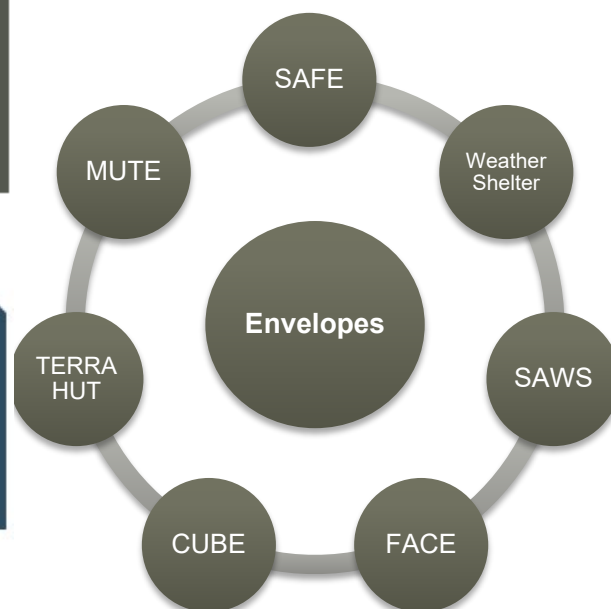


Single story, panelized,  
modular facility

Four  
Area  
CMU  
Envelope



Single story CMU envelope  
with direct fire protection



Weather  
Shelter



Metal Hangar or Warehouse Space

Standard  
Adaptive  
Wood  
Structure



Single or Two story wood  
structure

## INTERIOR LAYOUTS READY TO USE

### Operations

Administration  
Armory  
Headquarters  
Tactical Operations Center  
Joint Operations Center  
Vehicle Maintenance

### Life Support

Barracks  
Cold Storage  
Dining  
Latrines

### Medical

Troop Medical Center  
ROLE -1  
ROLE -2  
ROLE -2+  
Blood Storage

### Services

Laundry  
MWR  
Physical Fitness Center  
Barber Shop  
Exchange  
Post Office  
Religious Facility  
Fire Station

### Reduced Design Cost

Standard Design: 1% of PA  
New Design: ~6-10% of PA





U.S. ARMY

# HOW TO USE THIS CATALOG FOR NON-PERMANENT FACILITIES

5



DECIDE WHICH TYPE  
OF CONSTRUCTION  
LEVEL

1

- I. Initial: (tents, containers and fabric structures) occupied for **6 months**.
- II. Temporary: (low cost, expedient and local material) occupied **5 years**.
- III. Semi-Permanent: (enduring presence, like permanent) occupied for **25 years**.

CONSIDERATIONS IN  
SELECTING A  
DESIGN

2

- What local **material** is available? (Wood, Concrete, CMU, Soil rich in Clay...)
- What is the time frame you need this constructed?

SELECT YOUR  
DESIGN

3

- Choose an envelope
- Choose an interior layout

**Rough Order of Magnitude (ROM):** Each slide presents a ROM cost for either the envelope or interior layout. To calculate the total ROM cost the formula is:

+ Envelope Cost  
+ Assembly Cost (Interior)  
+ Area Cost Factor  
+ 1% (CoS Oversight)

Total ROM=



U.S. ARMY







US Army Corps  
of Engineers®

# ENVELOPES SUMMARY – MASONRY STRUCTURES, NON-COMBUSTIBLE

\*Area Cost Factor = 1.0

6

	TERRA HUT <i>Option 1</i>	TERRA HUT <i>Option 2</i>	FACE	SAFE
				
Occupied Duration	Up to 25 years	Up to 25 years	Up to 25 years	Up to 25 years
Construction Material	Compressed Earth Block Structure	Compressed Earth Block Structure	CMU	Concrete Framing w/ CMU infill
Default Dimensions	3 Bay, 8m x 14.7m 118.3m <sup>2</sup>	14 Bay, 12.9m x 34.3m 442.5m <sup>2</sup>	14 Bay, 12.9m x 34.3m 442.5 m <sup>2</sup>	14 Bay, 12.9m x 34.3m 442.5 m <sup>2</sup> Single 885m <sup>2</sup> Two Story
Stories	Single	Single	Single	Single/Two Story
Envelope ROM Contractor	\$95k	\$424k (additional options available)	\$767k	Single - \$838k Double - \$1.3M
Envelope ROM Troop Labor	\$75k	\$353k	\$469k	Single - \$522k Double - \$782k
R Value	Wall 20; Roof 40	Wall 20; Roof 40	Wall 20; Roof 40	Wall 21; Roof 40
Roof Options	Thatch, wood truss, metal truss, protected	Wood truss, metal truss, protected	Wood truss or Metal truss	Protected roof with or without parapet







U.S. ARMY



US Army Corps  
of Engineers®

# ENVELOPES SUMMARY – METAL STRUCTURES, NON-COMBUSTIBLE

\*Area Cost Factor = 1.0

	<b>MUTE 4</b> 	<b>MUTE 6</b> 	<b>Weather Shelter Hangar</b> 	<b>Weather Shelter Warehouse</b> 
Occupied Duration	Up to 25 years	Up to 25 years	Up to 25 years	Up to 25 years
Default Dimensions	5 Bay 12.8m x 30.5m 390 m2	5 Bay 12.8m x 30.5m 390 m2	26m x 38.3m 961m2	26m x 38.3m 961m2
Eave Height	4 m	6 m	9.35 m	9.35 m, can be shortened
Envelope ROM Contractor	\$1.3M	\$1.5M	\$1.9M	\$1.3M
Envelope ROM Troop Labor	877K	\$988K	\$1.4M	\$1.0M
R Value	Wall 20; Roof 40	Wall 20; Roof 40	Wall 20; Roof 40	Wall 20; Roof 40
Additional Information	Metal building primary use is warehouse – eave height complies with fire code	Metal building primary use is non-warehouse uses, for ex. Vehicle maintenance	Hangar space for aircraft, has large hangar door and office space	Warehouse or vehicle maintenance space. Eave height can be shortened to comply with fire code







U.S. ARMY



US Army Corps  
of Engineers®

## ENVELOPES SUMMARY – WOODEN STRUCTURES

\*Area Cost Factor = 1.0

	CUBE 	CUBE Tower 	CUBE Wide 	SAWS 
Occupied Duration	Up to 5 years	Up to 5 years	Up to 5 years	Up to 25 Years
Default Dimensions	1 Bay, 7.3m x 4.9m 35.77m <sup>2</sup>	1 Bay 4.9m x 4.9m 24 m <sup>2</sup>	2 Bay, 12.2m x 7.3m 89.2 m <sup>2</sup>	14 Bay, 12.9m x 34.3m 442.5 m <sup>2</sup> per Story 885m <sup>2</sup> Total
Stories	Single	3-4 Story	Single	Single/Two Story
Envelope ROM Contractor	NSN: \$11k US Comm: \$18k	\$43k	\$30k	\$419k
Envelope ROM Troop Labor	\$13k	\$30k	\$25k	\$368k
R Value	Wall 20; Roof 40	Wall 20; Roof 40	Wall 20; Roof 40	Wall 20; Roof 40
Additional Information	Original CUBE design	Currently under design, for watch tower purposes	Currently under design, for more space than CUBE, but occupied duration not as long as SAWS	Only wooden envelope designed to semi-permanent. Concrete foundation

# Cost of Services/Use of Standard Designs

## Design Standards Review

CoS performs  
at no cost

## UFC Compliance review

CoS performs  
at cost

Use of CoS  
Standard  
Design No Cost

## Use of Standard CoS design

CoS Receives  
1% of  
Construction PA




Construction  
oversight if  
needed

Contracting at  
Cost

## Site Adaptation of CoS design

At cost by  
Geographical  
District, CoS, or  
other entity

CoS review of  
Site  
Adaptations at  
cost

 No Cost  
 1% of PA  
 At Cost





U.S. ARMY  
US Army Corps  
of Engineers®

# CoS Non-Permanent Design Builder

10

Utilize our easy-to-use Design Builder, which is an excel file that provides pricing, a design preview, and a detailed description based on your selections. The database can be accessed at <https://mrsi.erdc.dren.mil.cos.tam.aspx>

### Non-Permanent Design Menu

**Facility Envelope Type**  
**Single Bay Envelope**

- ☐ Common Uniform Building Envelope (CUBE)
- Single Story Envelopes**
- ☒ Four Area CMU Envelope (FACE)
- ☐ Multi Use Tall Envelope (MUTE)
- ☐ Standard Adaptive Facility Envelope (SAFE1) Single Story
- ☐ Tactical Earthen Rapidly Raised Assembly Hut (TERRA HUT)
- Two Story Options**
- ☐ Standard Adaptive Wood Structure (SAWS) Two Story
- ☐ Standard Adaptive Facility Envelope (SAFE)Two Story

**Off the Shelf Designs**

Blank Floor Plan  
Housing 14 Bay, 48 PN with Latrine/shower  
Housing, 14 bay, 56 PN full floor open  
Low Density Barracks, 14 Bay, 24PN  
Low Density Barracks, 14 Bay, w/Bath, 12PN  
**Operations Center, 14 Bay, Full Floor**  
Operations Center, 14 Bay, Full Floor, Option 2  
Headquarters, 14 Bay, Full Floor, 41PN  
Dining Facility, 500 PN, 14 Bay, 72PN  
Dining Facility, 224PN, 14 Bay, Full Floor Seating  
Joint Operations Center, 14Bay, Full Floor  
Joint Operations Center, 14 Bay, Option 2  
Fitness Center, 14 Bay  
Mosque, 14 bay, Full floor  
Latrine/Shower, 240 PN, 14 Bay, Full Floor  
Laundry, 300 PN, 14 Bay, Full Floor  
Role 2+ Medical Facility, 22 Bay, Full Floor  
Role 1 Medical Facility, 14 Bay, Full Floor  
Fire Station Admin Facility

**Roof Type**

Metal Truss  
Wood Truss

**Labor Execution**

☒ Troop Labor  
☐ Contractor

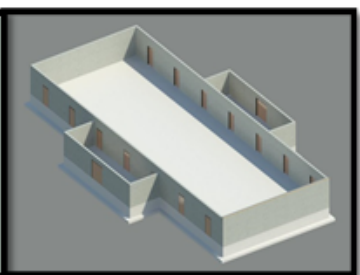
**Proposed Location**

Bahamas  
Bahrain  
Belarus  
Belize  
Bolivia  
Bosnia  
Brazil  
Bulgaria  
Cambodia  
Chile  
Columbia  
Costa Rica  
**Croatia**  
Croatia  
Cuba  
Czech Republic  
Diego Garcia

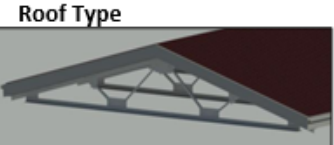
### CoS NP Design Builder

**Envelope**

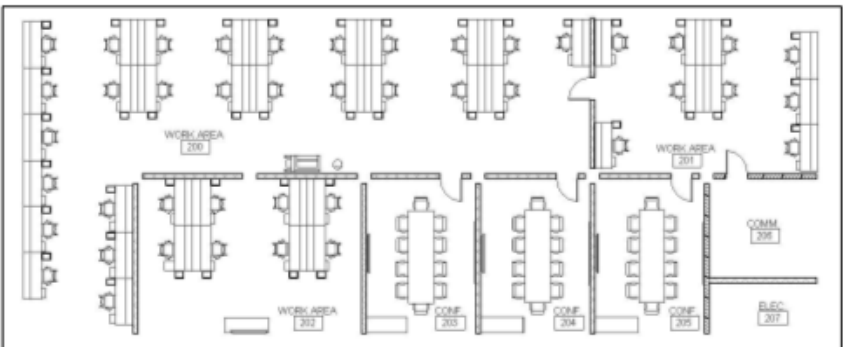
Four Area CMU Envelope



**Roof Type**





**Interior Layout**



**Design Selection Criteria**

<b>Roof Type:</b>	Metal Truss	<b>Stories</b>	Single Story
<b>Proposed Loc:</b>	Crete	<b>Dimensions</b>	14 Bay, 9.8m x 34.3m, 442.5 m2
<b>Labor</b>	Troop Labor	<b>R-value</b>	Wall 20; Roof 40
<b>Interior Layout Detail</b>	Open Office Area with 3 Conference Rooms	<b>Construction Material</b>	CMU



**US Army Corps of Engineers®**  
Center of Standardization for Nonpermanent Facilities

**Design Title**

Operations Center, 14 Bay, Full Floor

**High Order of Magnitude (ROM)**

ACF	1.13
\$/Unit	\$1,808
Size (M2)	442.5
<b>ROM Breakdown</b>	
Roof	\$113,000
Envelope	\$412,450
Interior	\$274,703
<b>Total Facility</b>	<b>\$800,153</b>
<b>CoS Oversight (1)</b>	<b>\$8,002</b>
<b>Total ROM</b>	<b>\$808,155</b>

NOTE: This ROM does not include any FF&E, site work or utility connections. Area Cost Factors are based on 2018 P&X Newsletter

**Description**

a "bay" consists of a 24'x16' section. The default FACE Envelope consists of 14 Bays. The facilities can be stretched or shortened modularly per "bay" width

Construction Material: Load Bearing CMU

Occupancy: semi-permanent facility to be occupied no more than 25 years



U.S. ARMY



US Army Corps  
of Engineers®

# ENVELOPES



# Standard Adaptive Facility Envelope

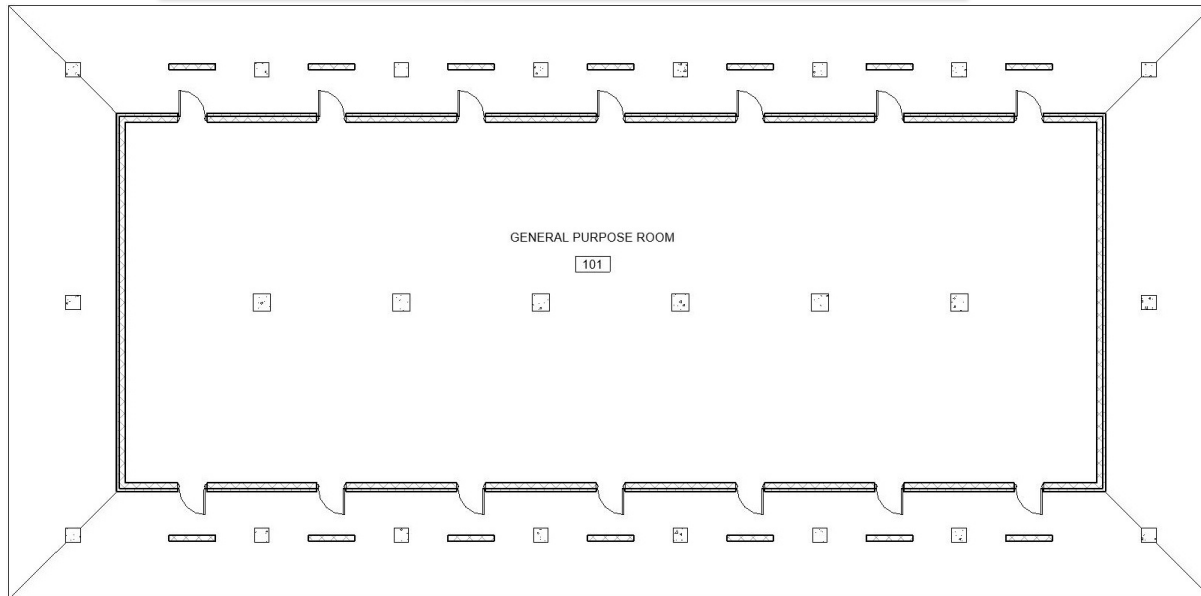


*Two Story Option*

# Standard Adaptive Facility Envelope 1



*Single Story Option*



Last Updated 17 January 2024



*Two Story Option*



*Single Story Option*

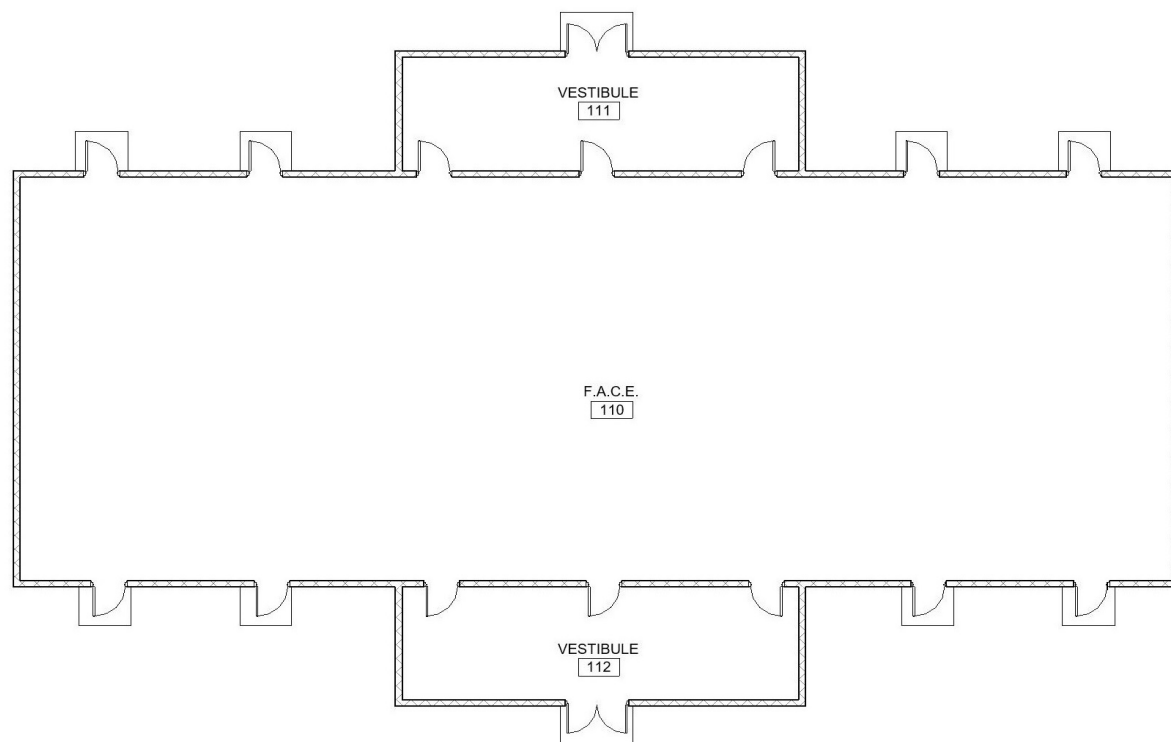
Description	
Occupied Duration	Up to 25 years
Construction Material	Concrete Framing w/ CMU infill
Default Dimensions	14 Bay, 9.8m x 34.3m, 442.5 m2 Single 885 m2 Two Story
Stories	Single/Two Story
Envelope ROM (ACF of 1.0) Contractor	Single - \$838k Double - \$1.3M
Envelope ROM (ACF = 1.0) Troop Labor	Single - \$522k Double - \$782k
R Value	Wall 21; Roof 40
Ceiling Height	3m



U.S. ARMY



# Four Area CMU Envelope



Description	
Occupied Duration	Up to 25 years
Construction Material	CMU
Default Dimensions	14 Bay, 9.8m x 34.3m, 442.5 m2
Stories	Single
Envelope ROM (ACF of 1.0) Contractor	\$767K
Envelope ROM (ACF = 1.0) Troop Labor	\$469K
R Value	Wall 20; Roof 40
Ceiling Height	3m

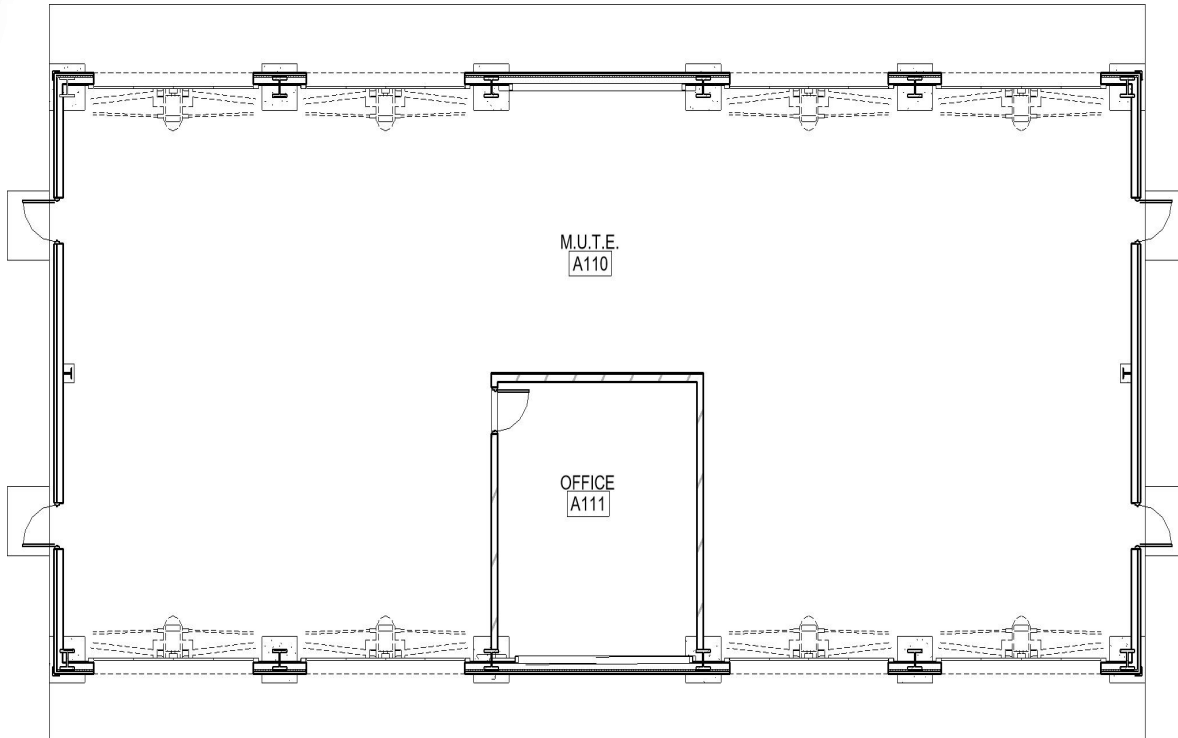


U.S. ARMY



# M U T E

Multi  
Use  
Tall  
Envelope



## Description

Occupied Duration	Up to 25 years
Construction Material	Metal
Default Dimensions	5 Bay, 12.8m x 30.5m, 390m2
Stories	Single
Envelope ROM (ACF of 1.0) Contractor	Mute 4 \$1.3M / Mute 6 \$1.5M
Envelope ROM (ACF = 1.0) Troop Labor	Mute 4 \$877K/ Mute 6 \$988K
R Value	Wall 20; Roof 40

## Options

MUTE 4	4 m eave height for warehouse use (complies with 12' high stacking max)
MUTE 6	6 m eave height for non-warehouse purposes (e.g. vehicle maintenance)

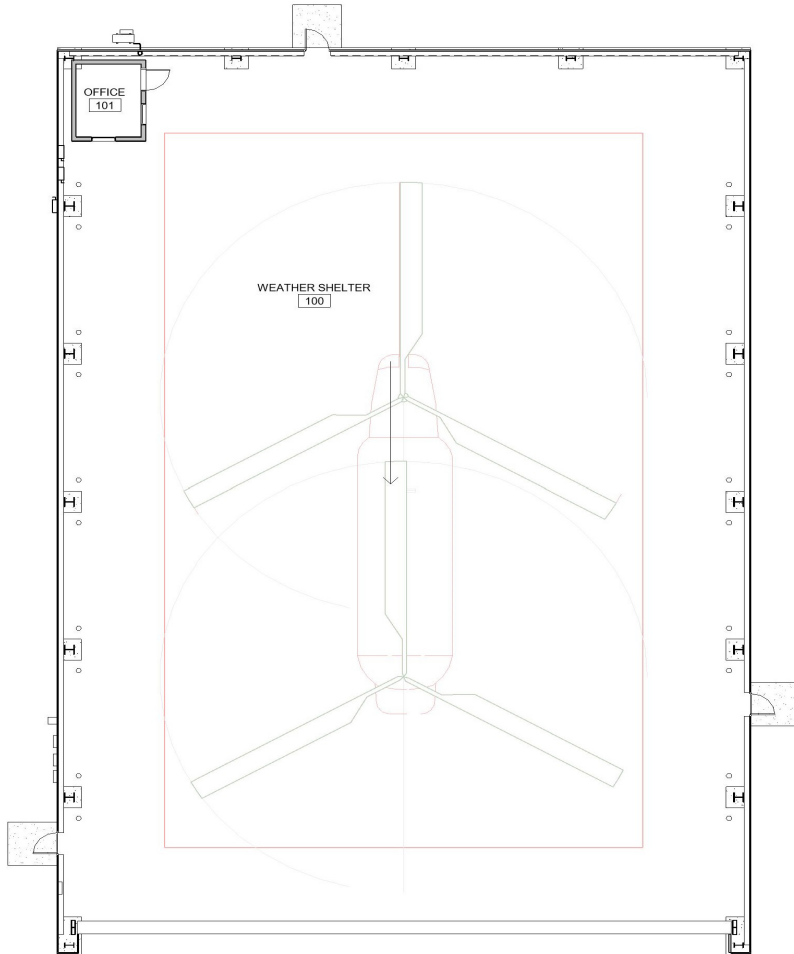




# Weather Shelter



*Hangar Version*



Description	
Construction Material	Metal with concrete columns
Size	26m x 38.3 m, 961m2
Details	Weather shelter for CH-47 Chinook Helicopter with office space.
ROM with Contractor Labor	\$1.4M
ROM with Troop Labor	\$1M



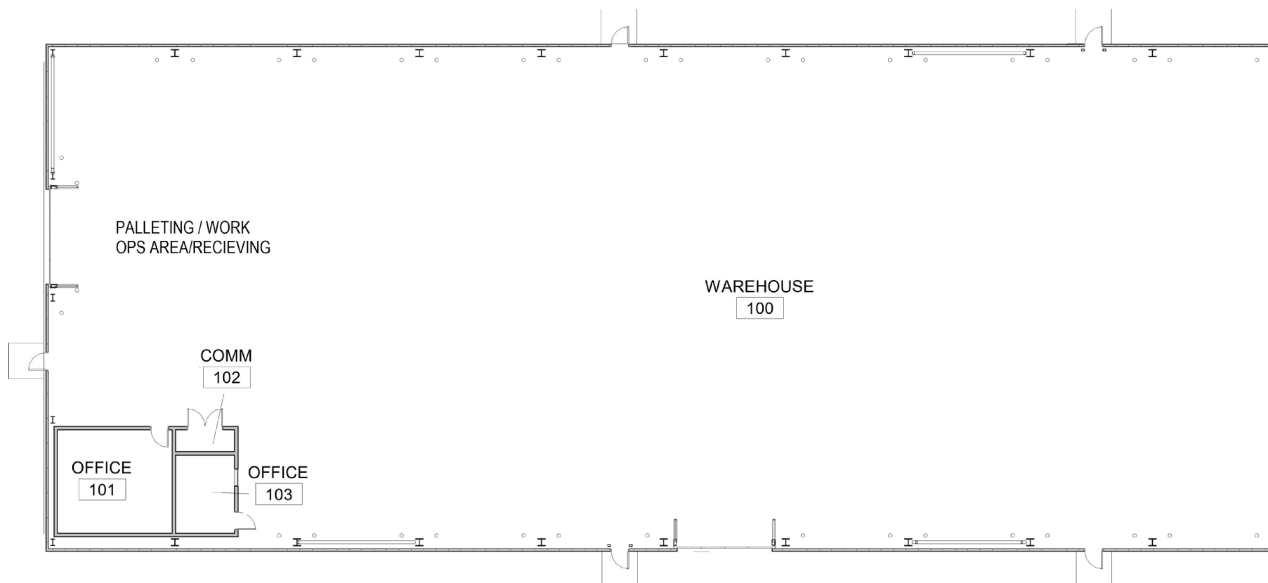
U.S. ARMY



# Weather Shelter



*Warehouse Version*



Description	
Construction Material	Metal with concrete columns
Size	26m x 38.3 m, 961m2
Details	One-story version for use as non-hangar space/warehouse.
ROM with Contractor Labor	\$1.9M
ROM with Troop Labor	\$1.4M



U.S. ARMY



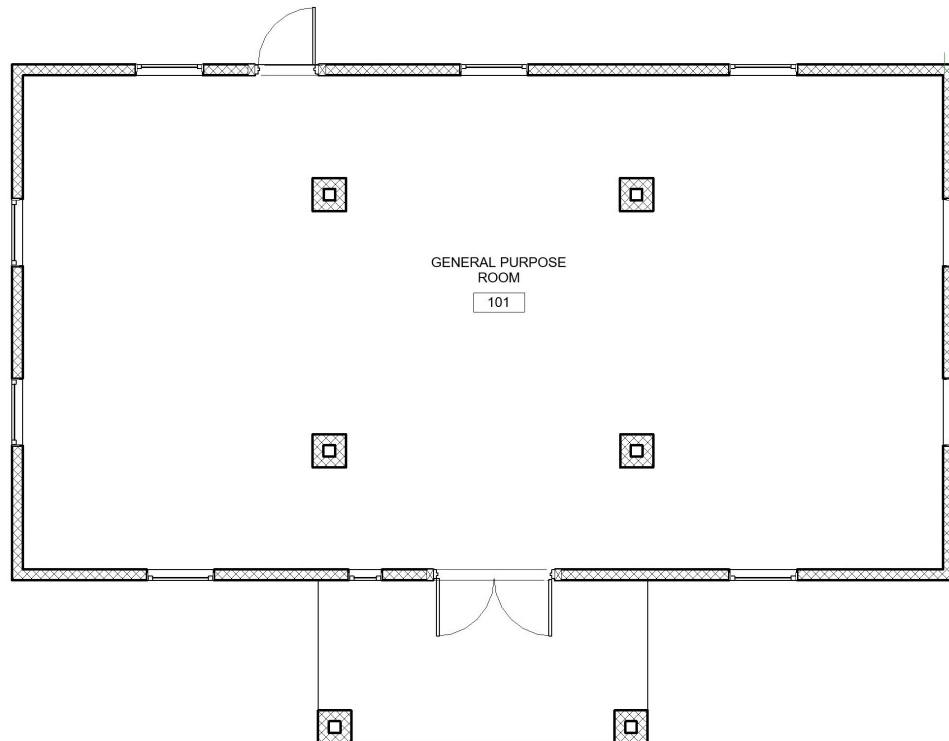
**T**actically  
**E**arthen  
**R**apidly  
**R**aised  
**A**ssembly  
**HUT**



OPTION 1



TERRA Hut Under Construction



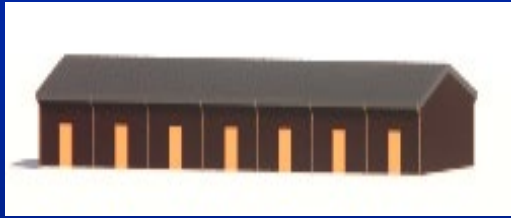
## Description

Occupied Duration	Up to 25 years
Construction Material	Compressed Earth Block Structure, with Wood Roof Frame
Default Dimensions	Option 1: 3 Bay, 8m x 14.7m 118.3m2
Stories	Single
Envelope ROM (ACF of 1.0) Contractor	\$95k (additional options available)
Envelope ROM (ACF = 1.0) Troop Labor	\$75k (additional options available)
R Value	Wall 20; Roof 40
Ceiling Height	3m

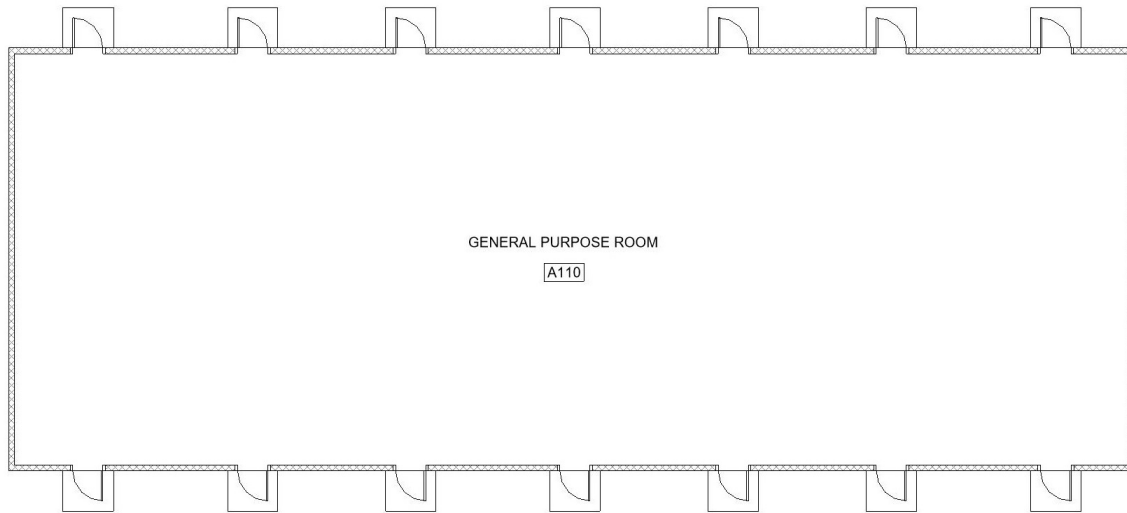


U.S. ARMY

**T**actically  
**E**arthen  
**R**apidly  
**R**aised  
**A**ssembly  
**H**UT



OPTION 2



Description	
Occupied Duration	Up to 25 years
Construction Material	Compressed Earth Block Structure, with Wood Roof Frame
Default Dimensions	Option 2: 14 Bay, 12.9m x 34.3m 442.5m2
Stories	Single
Envelope ROM (ACF of 1.0)Contractor	14 Bay - \$424k (additional options available)
Envelope ROM (ACF = 1.0)Troop Labor	14 Bay - \$353k (additional options available)
R Value	Wall 20; Roof 40
Ceiling Height	3m
Roof Options	Steel truss, wood truss, thatch with wood truss, protected roof
Foundation	Concrete or compressed earth block mixture



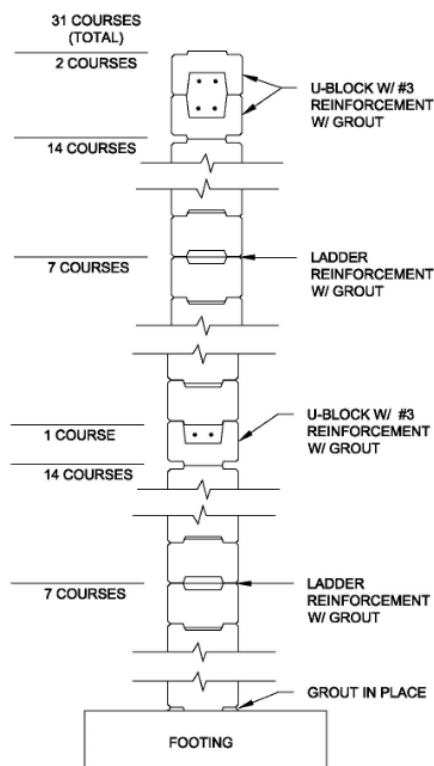


U.S. ARMY

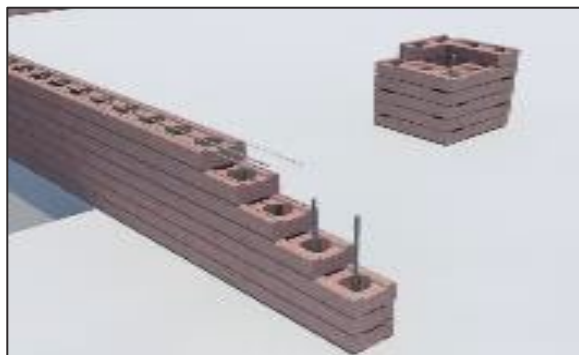


# TERRA HUT CONSTRUCTION PROCESS

## Tactically Earthen Rapidly Raised Assembly Hut



TYPICAL WALL SECTION  
(NTS)



### Equipment Needed

Dwell Earth block machine	\$16k-60k
---------------------------	-----------

### Description

Brick material	Onsite soils, min. 15% clay, 30% sand, 7% cement
Brick production rate	Machine makes 240 bricks+/hr, to be cured for 7 days
Bricks needed for 3-bay TERRA Hut (Option 1)	Non-Protected – 2,720 bricks, non-hardened, 3,825 lbs of cement (11 hours of continuous brick making)
Bricks needed for 3-bay TERRA Hut SAFE protective roof	Protected – 6,000 bricks, hardened, 8,438 lbs of cement (25 hours of continuous brick making)
Bricks needed for 14-bay TERRA SAFE (Option 2)	Non-Protected – 12,700 bricks, non-hardened, 17,900 lbs of cement (53 hours of continuous brick making)





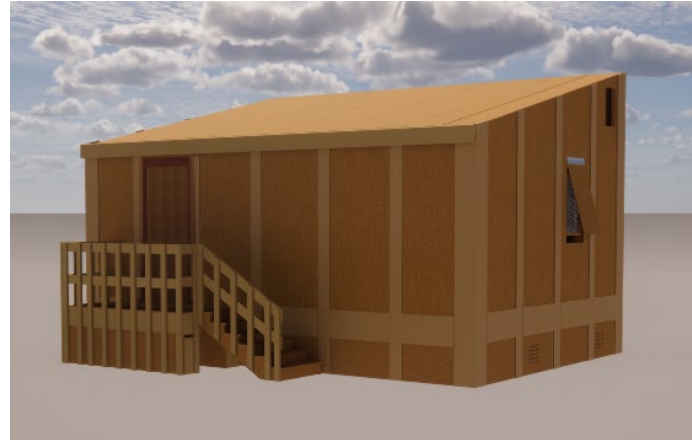
U.S. ARMY



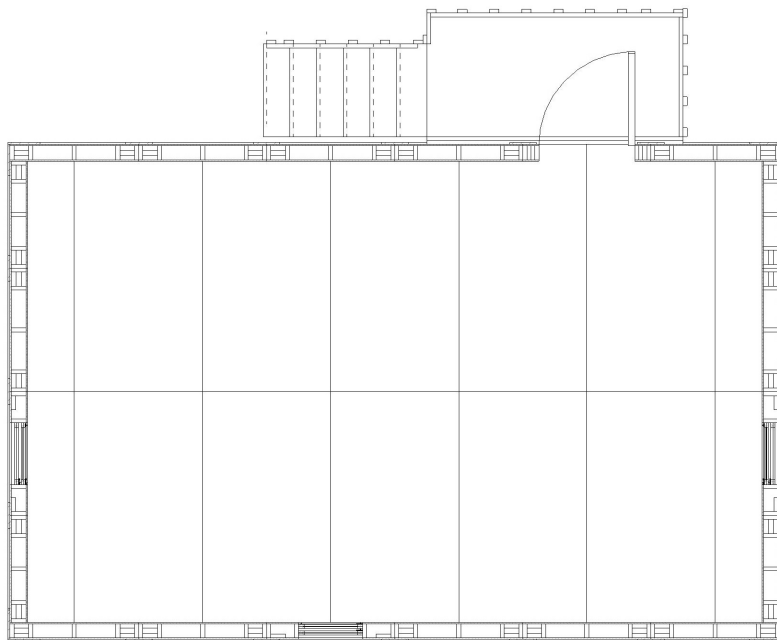
## Common Uniform Building Envelope



Patented 19 May 2020  
Patent #10655350



*CUBE Under Construction*



### Description

Occupied Duration	Up to 5 years
Construction Material	Panelized Wood
Default Dimensions	1 Bay, 7.3m x 4.9m, 35.77m <sup>2</sup>
Stories	Single
Envelope ROM (ACF of 1.0) Contractor	\$11K-18K
Envelope ROM (ACF = 1.0) Troop Labor	\$13K
R Value	Wall 20; Roof 40
Ceiling Height	2.4m

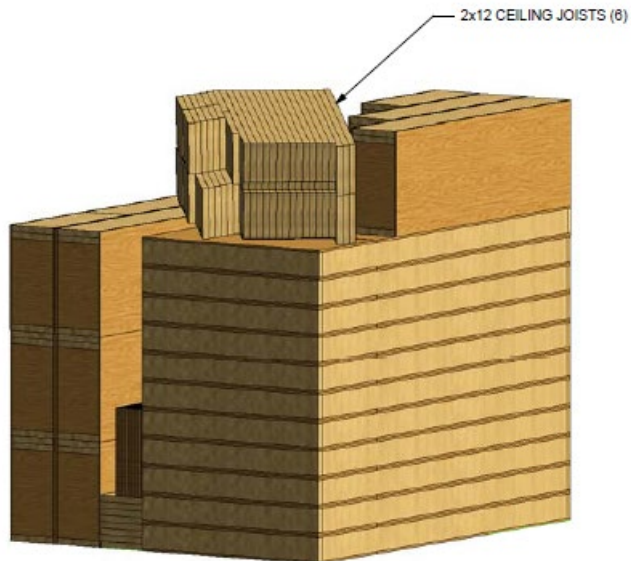


U.S. ARMY

## Common Uniform Building Envelope



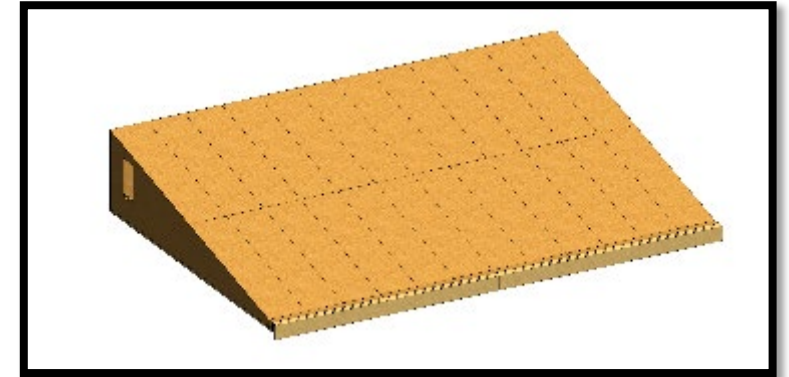
Patented 19 May 2020  
Patent #10655350



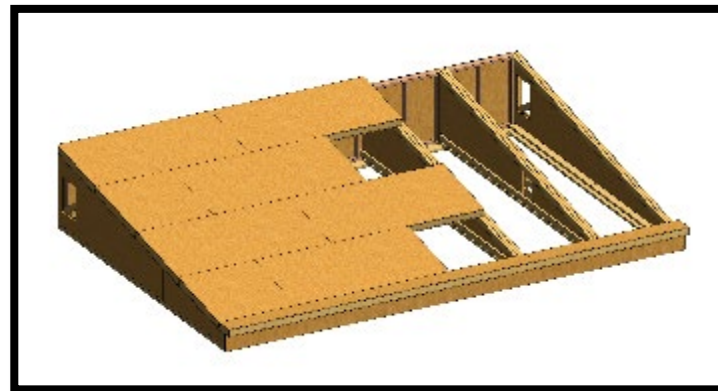
PALLET 2 - FRONT ISO

## NEW ROOF OPTIONS

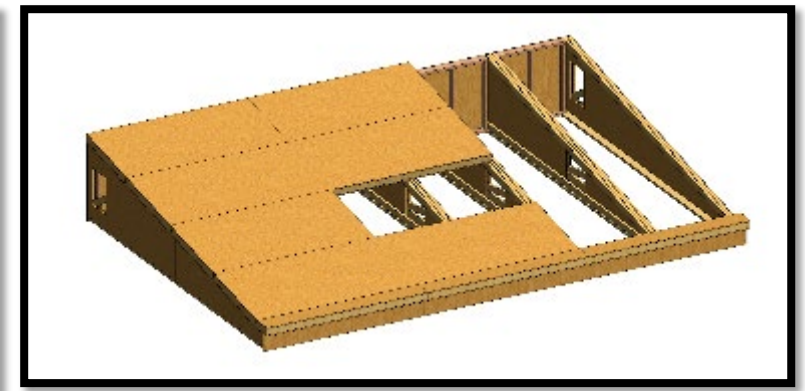
- Lighter than the previous truss roof
- Less complicated fabrication
- Easier to install



Truss Assembly Roof



16' Spliced Truss Panel



16' Truss Assembly

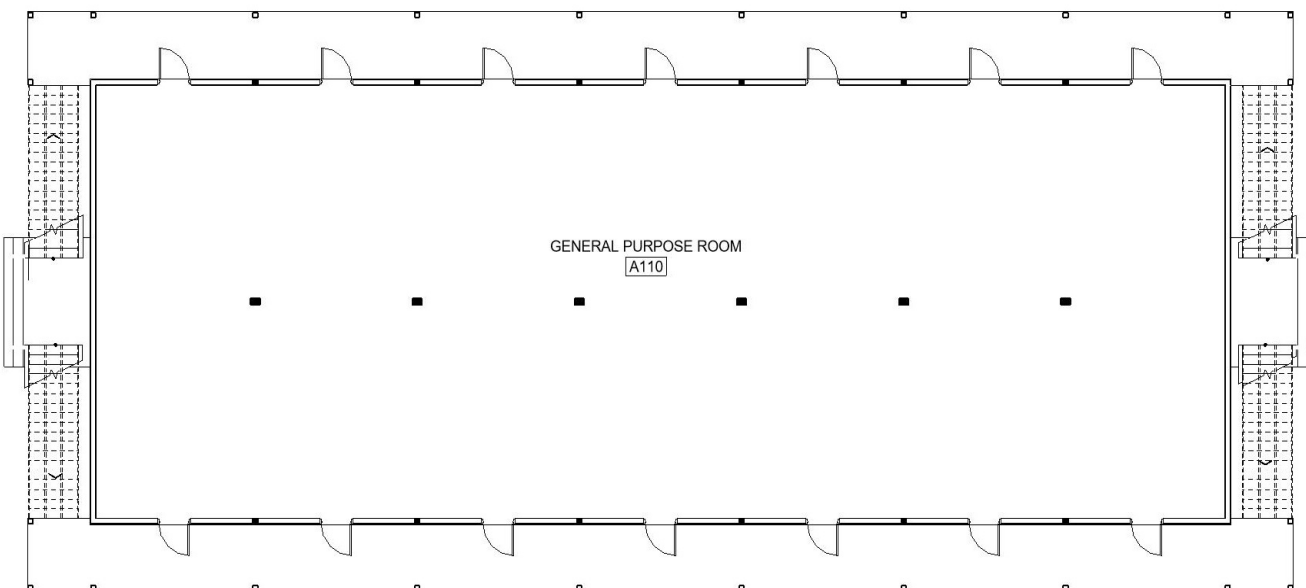




U.S. ARMY



# Standard Adaptive Wood Structure



Description	
Occupied Duration	Up to 25 years
Construction Material	Wood
Default Dimensions	14 Bay, 9.8m x 34.3m, 442.5 m2 885 m2 Total
Stories	Single/Two Story
Envelope ROM (ACF of 1.0) Contractor	Single - \$250k Double- \$416k
Envelope ROM (ACF = 1.0) Troop Labor	Single - \$221k Double - \$368k
R Value	Wall 20; Roof 40
Ceiling Height	3m



U.S. ARMY



# OFF THE SHELF DESIGNS

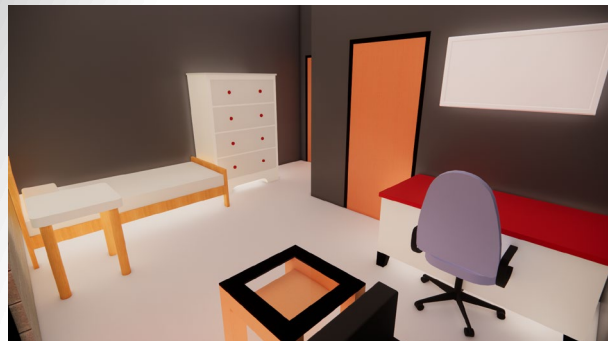




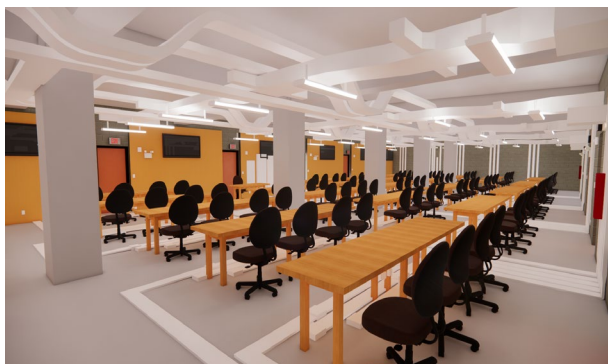
U.S. ARMY

# OFF THE SHELF DESIGNS READY FOR USE

24



Barracks



Operations Center



Latrine

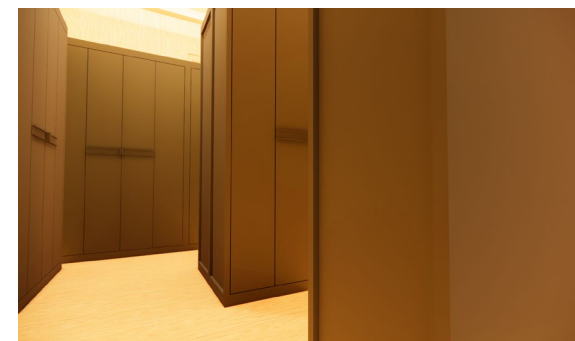
Design	# of Options
Admin	2
Billeting	2
Low Density Barracks	2
Operations Center	2
Headquarters	1
DFAC	2
Joint Operations Center	2
Fitness	1
Latrine	3
Laundry	1
Religious	2
Medical Facility	4
Lounge Area	5
Weapons Storage	1
Tactical Operations Center	1
Fire Station	1
Vehicle Maintenance	1



Headquarters



Dining Facility



Weapons Storage



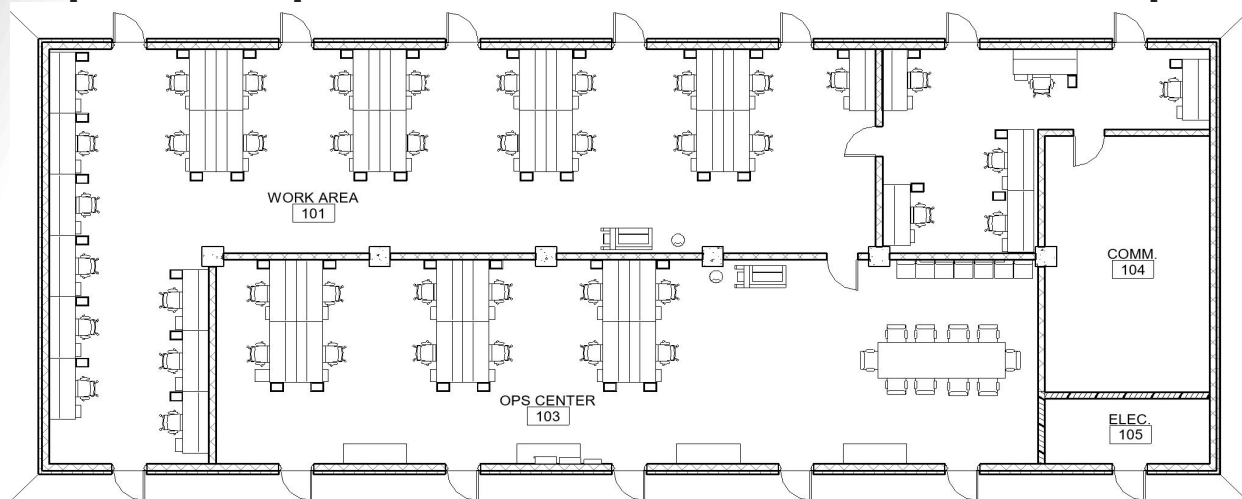


U.S. ARMY Admin

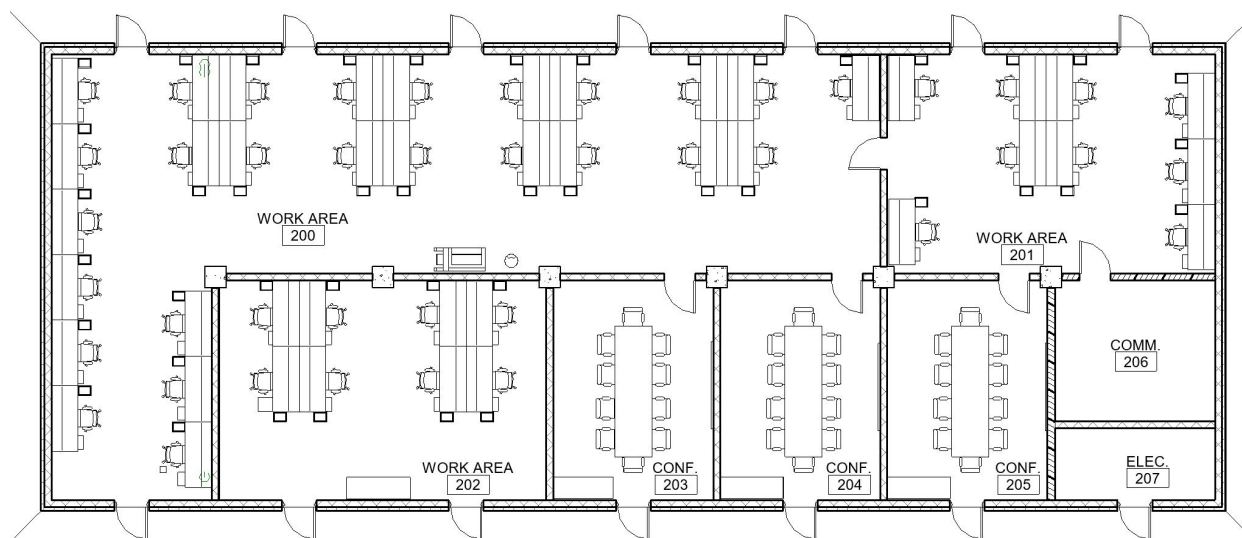
# Off the Shelf Designs

CUBE Admin layout available upon request

## Option 1: Open office area with one conference space



## Option 2: Open office area with three conference spaces



Description	
Size	43 PN
Details	Desks for 43 PN, space for one conference table
ROM with Contractor Labor	\$372K
ROM with Troop Labor	\$286K

Description	
Size	43 PN
Details	Desks for 43 PN, three separate conference rooms
ROM with Contractor Labor	\$372K
ROM with Troop Labor	\$286K

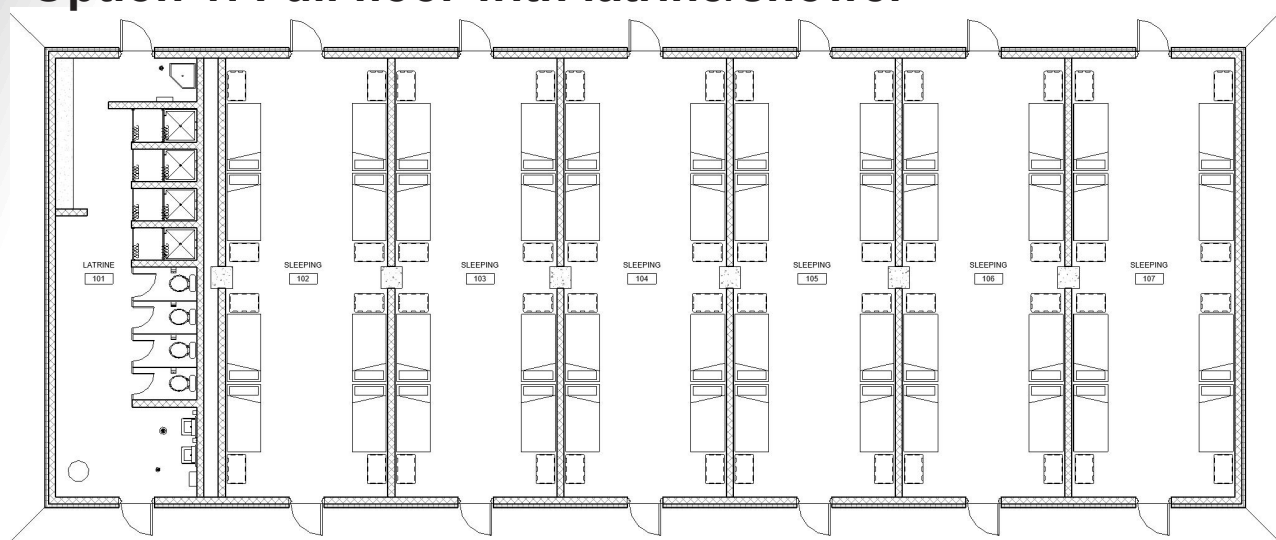


U.S. ARMY

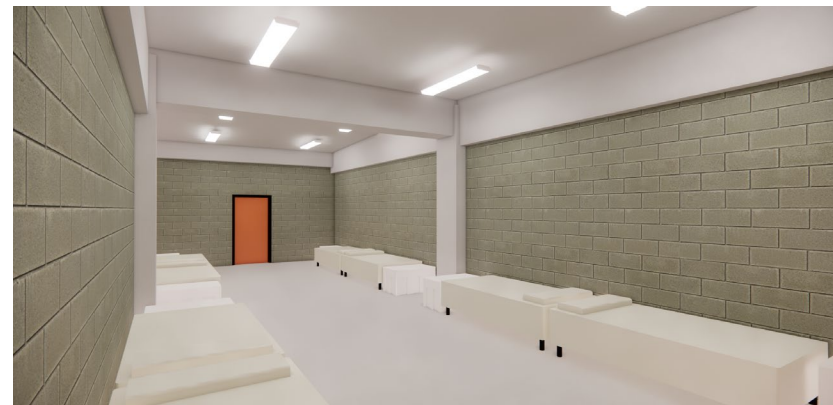
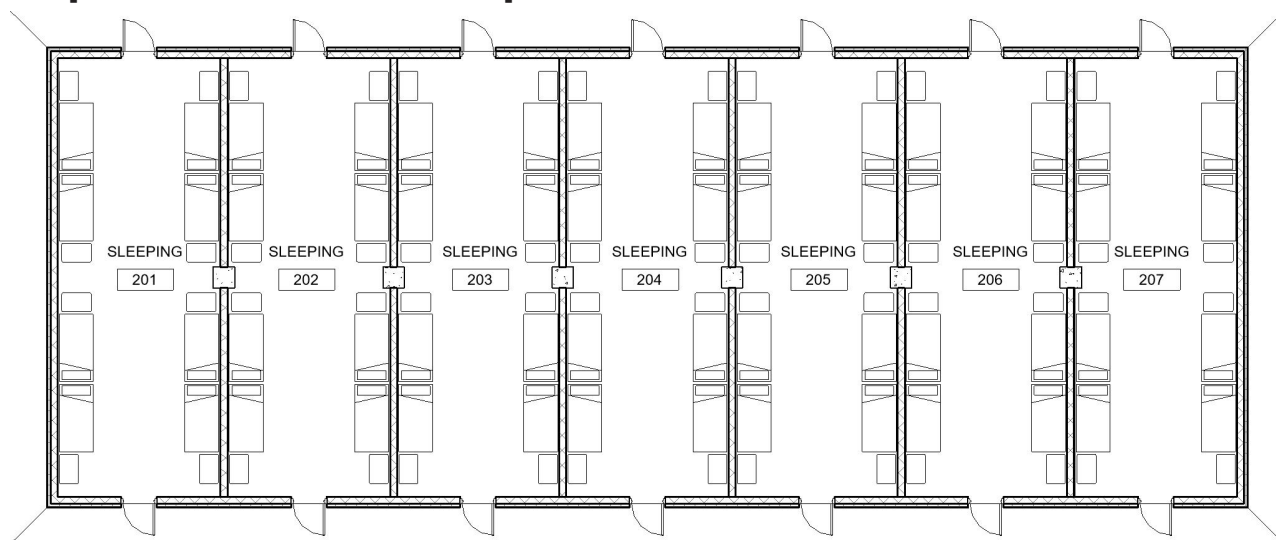
# Off the Shelf Designs

## BILLETING

### Option 1: Full floor with latrine/shower



### Option 2: Full floor open



Description	
Size	48 PN
Details	Semi open bay with Latrine & Showers
ROM with Contractor Labor	\$303k
ROM with Troop Labor	\$198k

Description	
Size	56 PN
Details	Semi open bay
ROM with Contractor Labor	\$255k
ROM with Troop Labor	\$167k



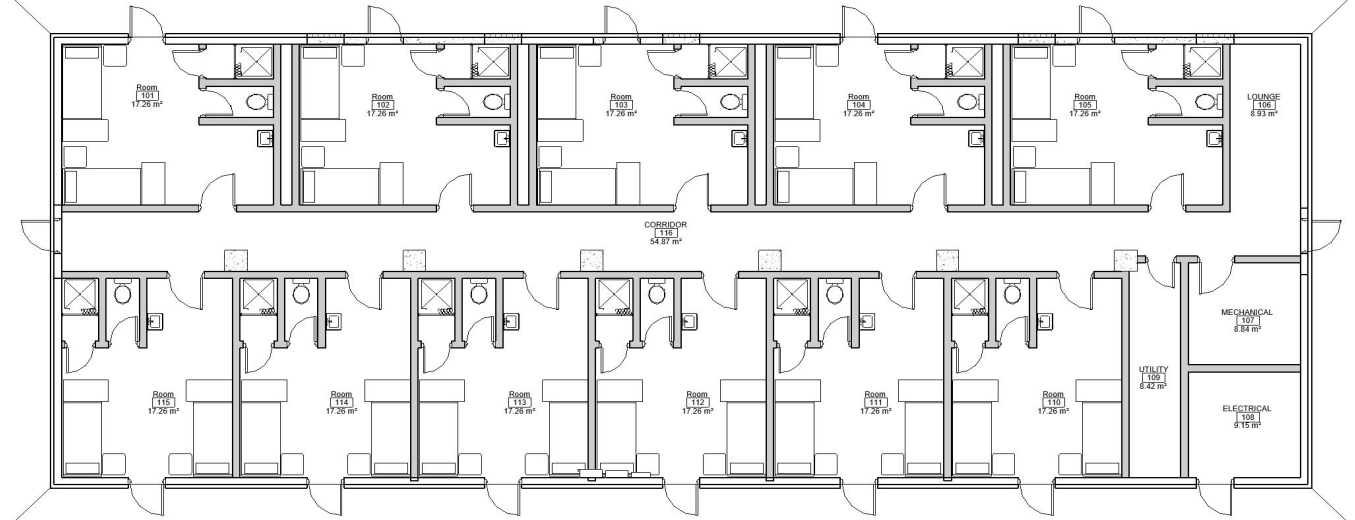
# Off the Shelf Designs

U.S. ARMY LOW DENSITY BARRACKS\*

## Option 1: Dry Facility



## Option 2: Wet Facility



Description	
Size	38 PN
Details	19 Rooms, 2 Beds per room, with Office Area
ROM with Contractor Labor	\$465k
ROM with Troop Labor	\$303k

Description	
Size	22 PN
Details	11 Rooms, 2 Beds per room, with Office Area & Bathrooms
ROM with Contractor Labor	\$543k
ROM with Troop Labor	\$355k

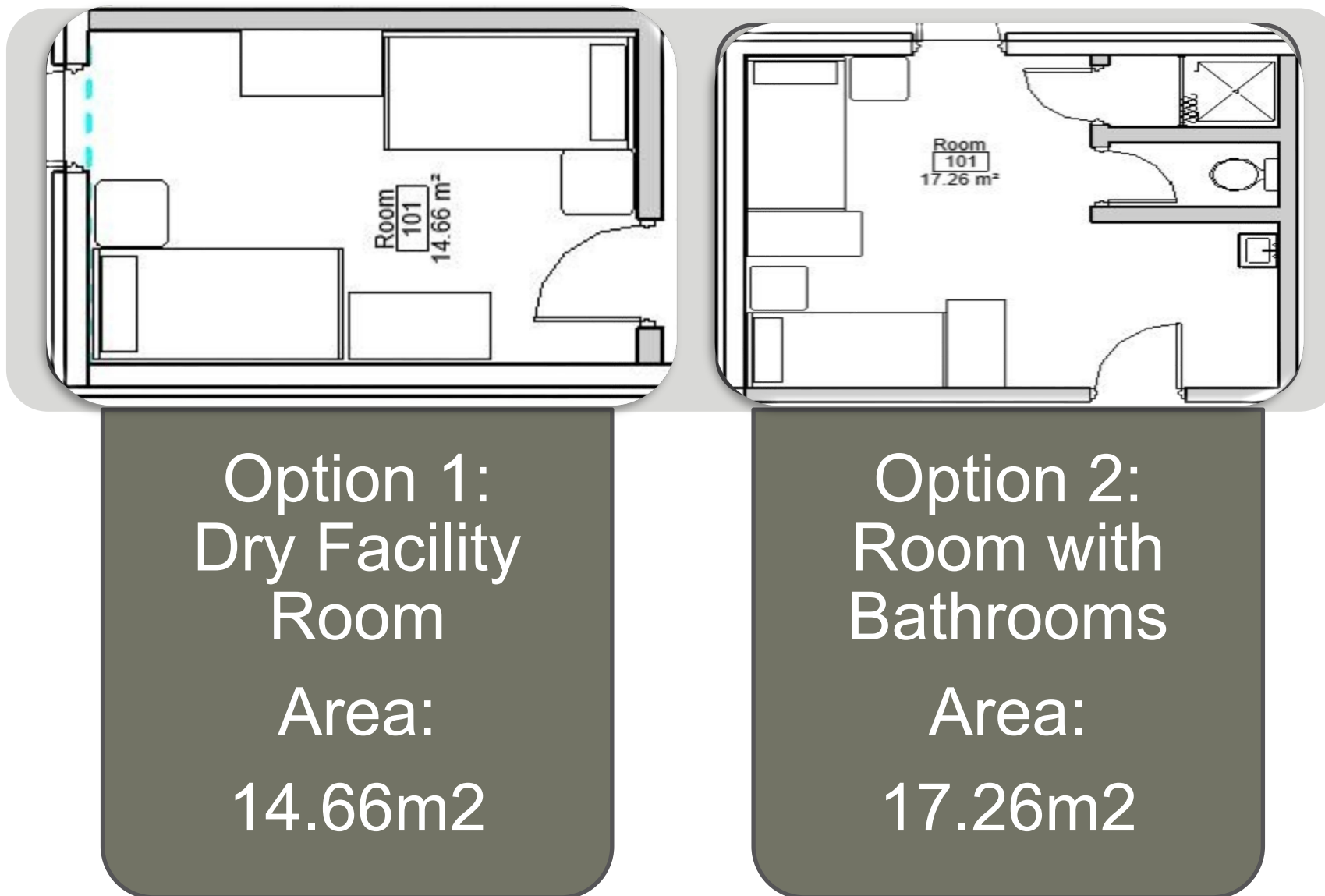


U.S. ARMY

# Off the Shelf Designs

LOW DENSITY BARRACKS, Closer Look at rooms

28





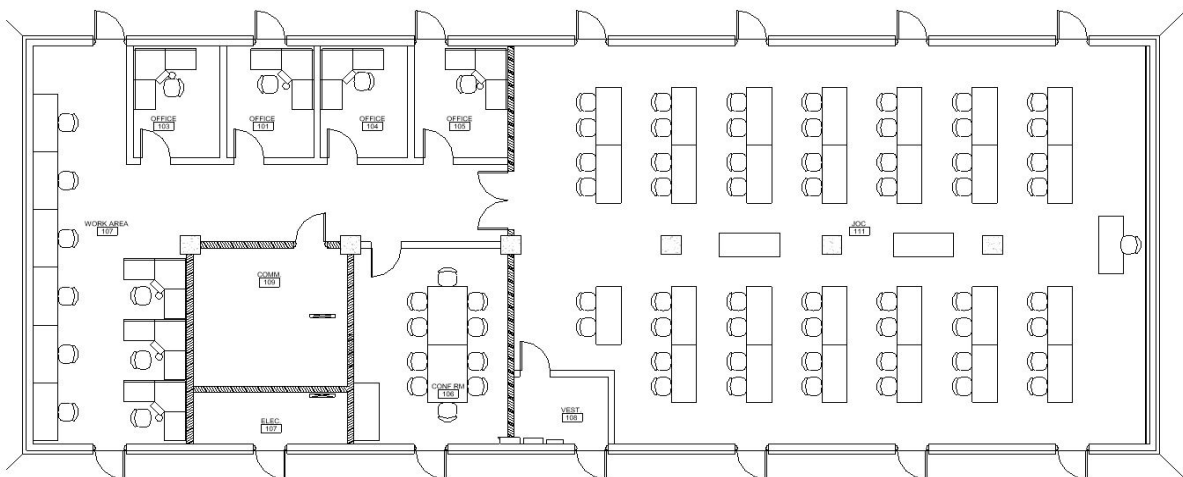


U.S. ARMY

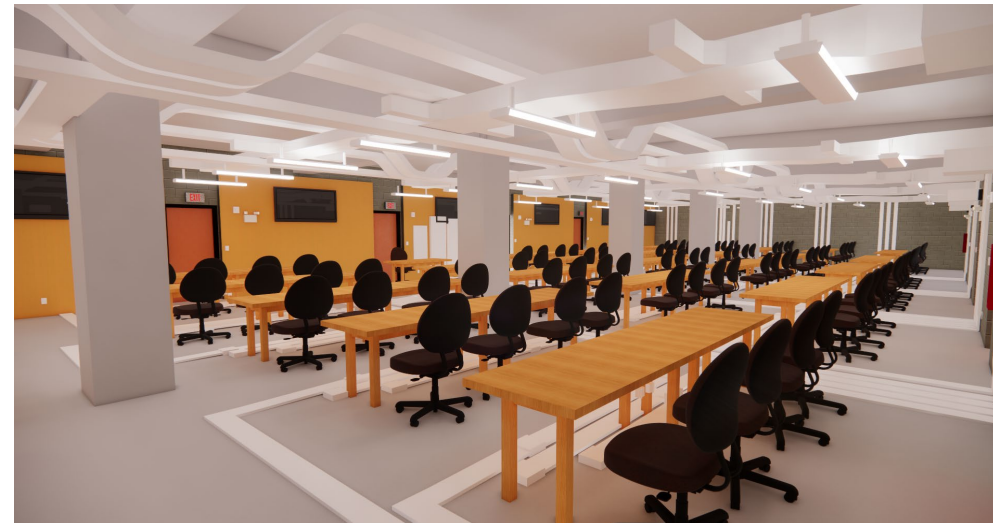
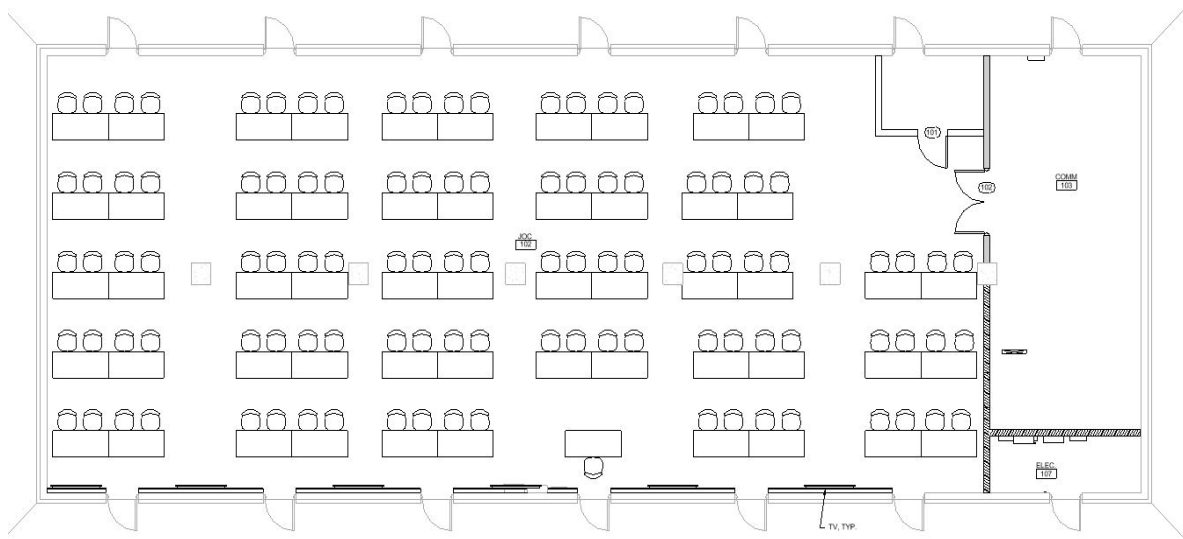
# Off the Shelf Designs

## JOINT OPERATIONS CENTER

### Option 1: 14 bay, Open Floor, with Conference Rooms



### Option 2: 14 bay, Open Floor



Description	
Size	107 PN
Details	Open Seating with Offices and Conference Rooms
ROM with Contractor Labor	\$393k
ROM with Troop Labor	\$302k

Description	
Size	109 PN
Details	Open Seating
ROM with Contractor Labor	\$357k
ROM with Troop Labor	\$275k



U.S. ARMY

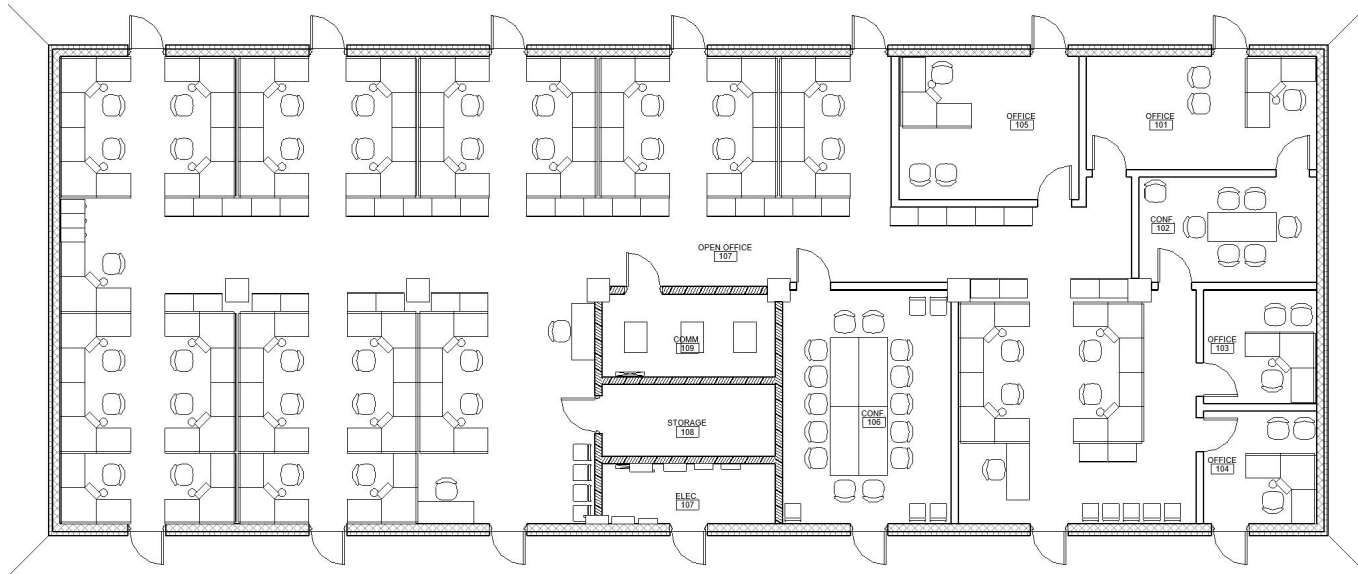
# Off the Shelf Designs

## HEADQUARTERS

30



### Option 1: Open Office and Private Office Spaces



Description	
Size	44 PN
Details	Open Area seating, 4 offices, and multiple conference space
ROM with Contractor Labor	\$429k
ROM with Troop Labor	\$280k

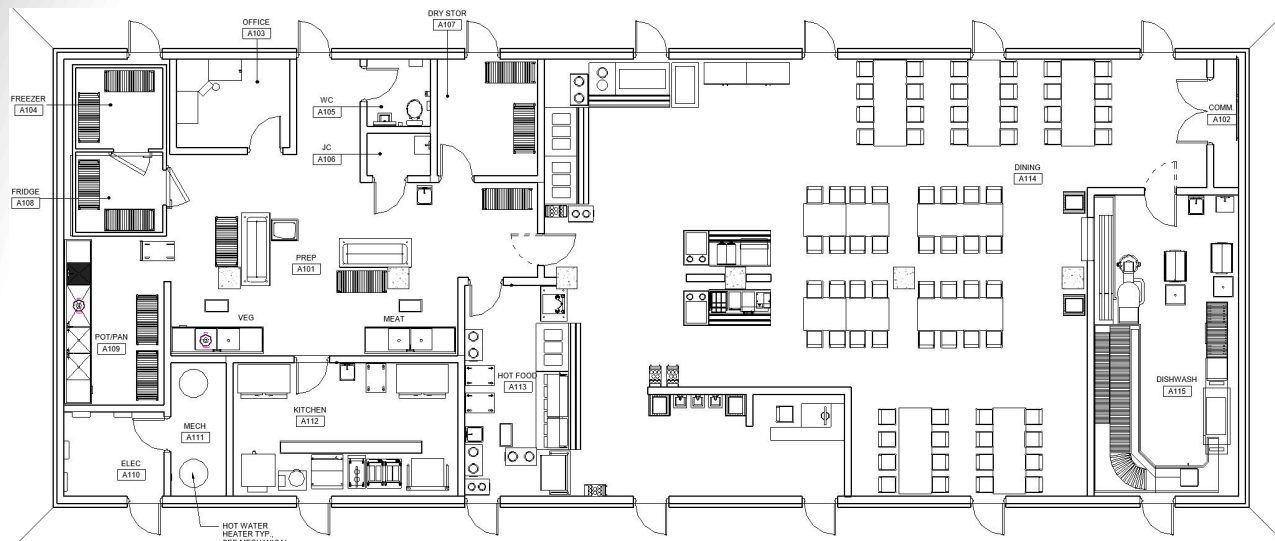


U.S. ARMY

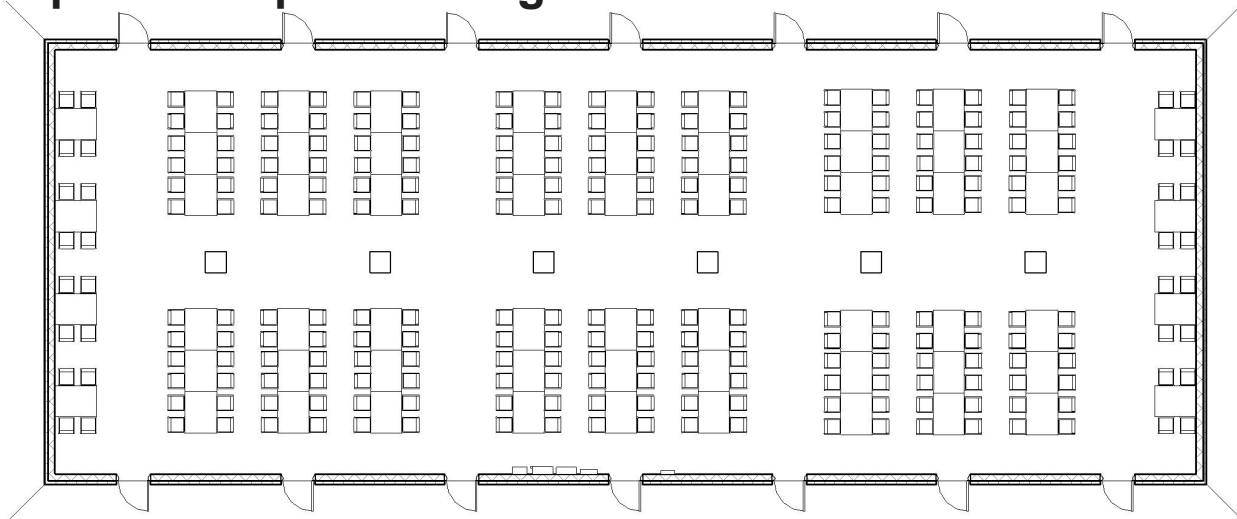
# Off the Shelf Designs

## DINING FACILITY

### Option 1: Open Seating with Full Kitchen



### Option 2: Open Seating



Description	
Size	500 PN Kitchen
Details	Open Seating with kitchen & Serving space
ROM with Contractor Labor	\$500k
ROM with Troop Labor	\$327k

Description	
Size	224 PN
Details	Open Seating
ROM with Contractor Labor	\$286k
ROM with Troop Labor	\$187k

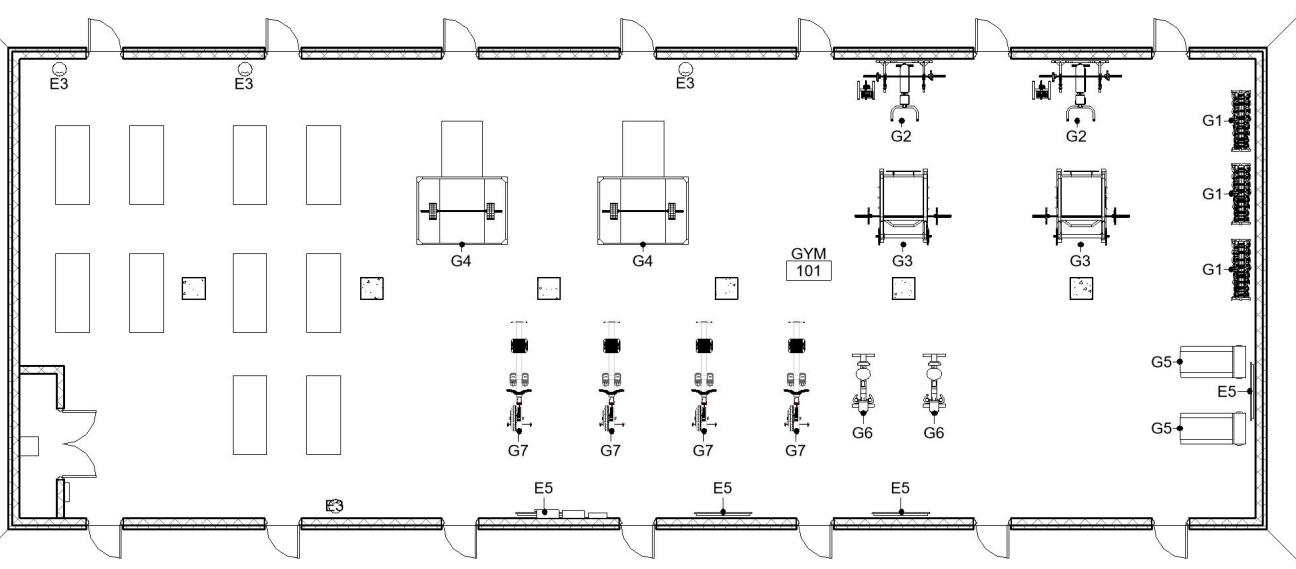


# Off the Shelf Designs

## Fitness Center



### Option 1: Fitness Area



Description	
Size	442.5m2
Details	Open Area with HVAC, TVs, & Laundry Room
ROM with Contractor Labor	\$250k
ROM with Troop Labor	\$192k



U.S. ARMY

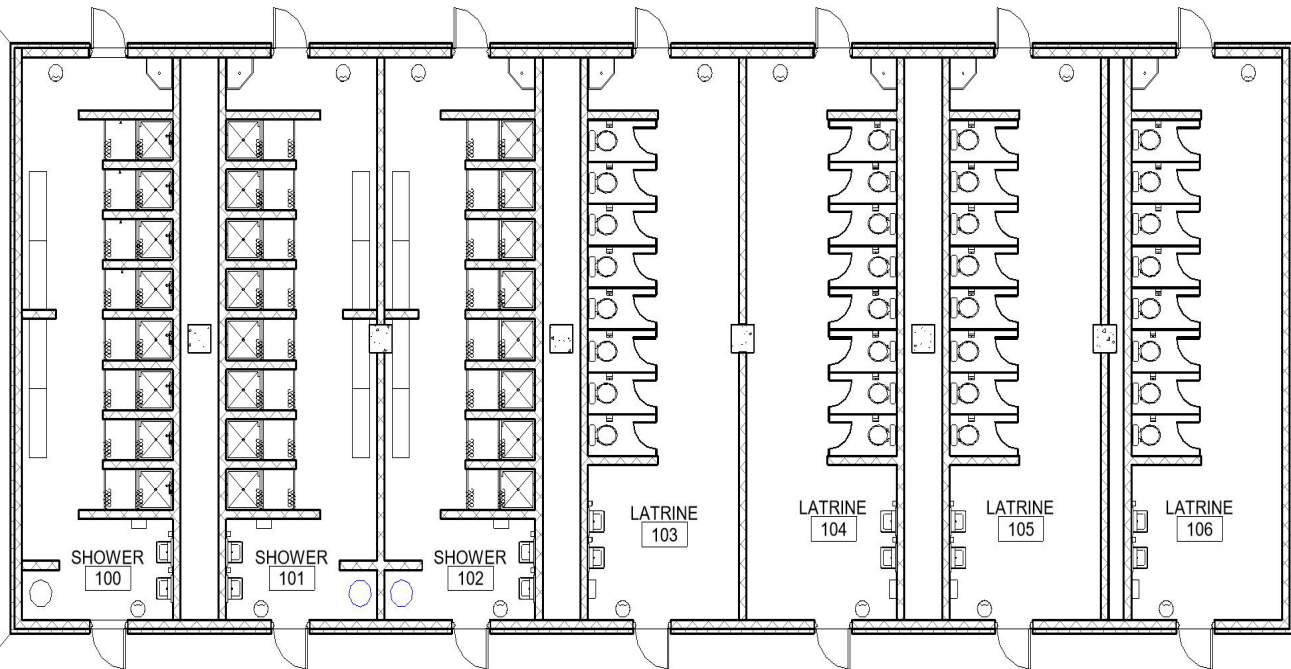
# Off the Shelf Designs

## LATRINE

33



### Option 1: 7 Section Latrine/Shower Combined spaces



Description	
Size	240 PN
Details	7 separate latrine areas, inclusive of showers, toilets, and wash areas
ROM with Contractor Labor	\$450k
ROM with Troop Labor	\$346k

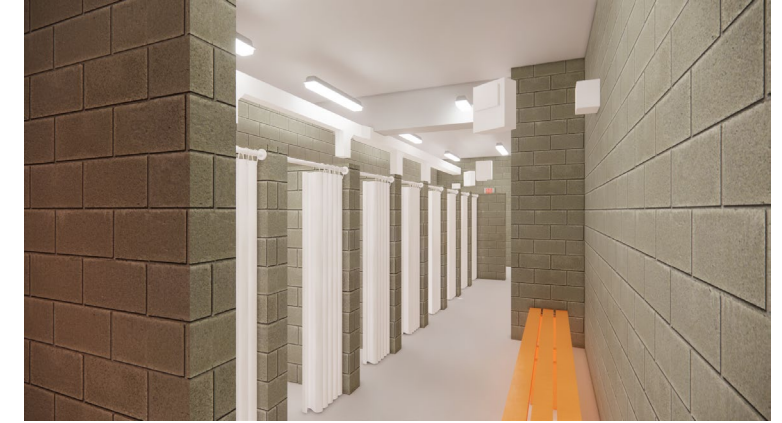


U.S. ARMY

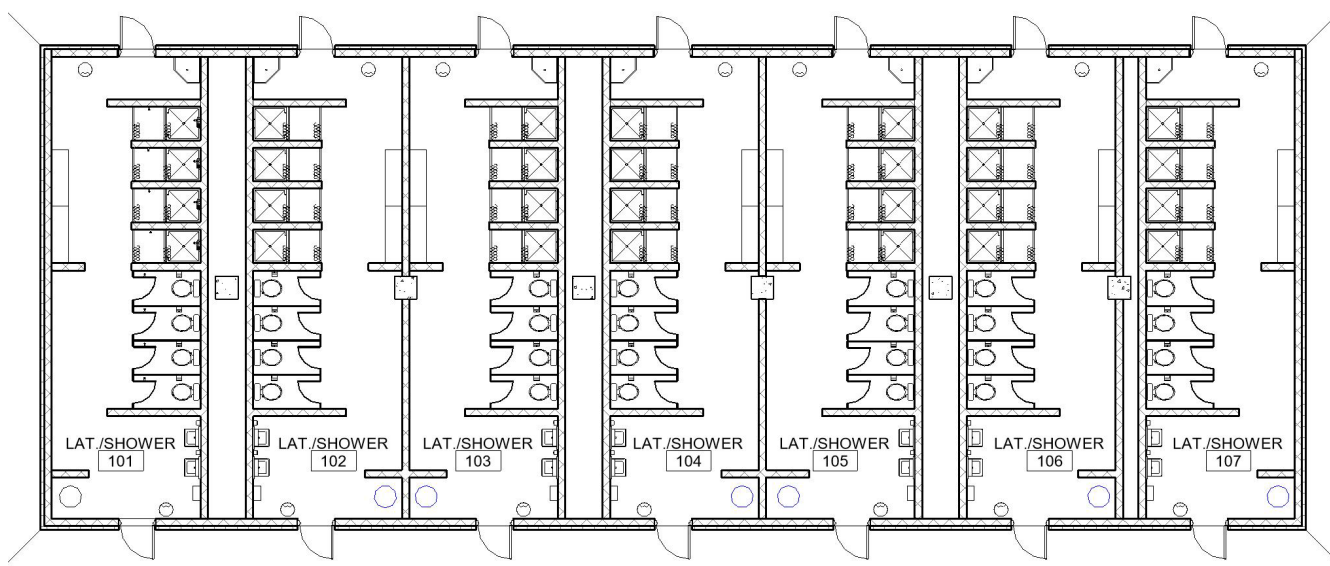
# Off the Shelf Designs

## LATRINE

34



### Option 2: Latrine and Shower Separate Spaces



Description	
Size	240 PN
Details	3 separate shower areas and 4 separate latrine areas
ROM with Contractor Labor	\$450k
ROM with Troop Labor	\$346k



U.S. ARMY

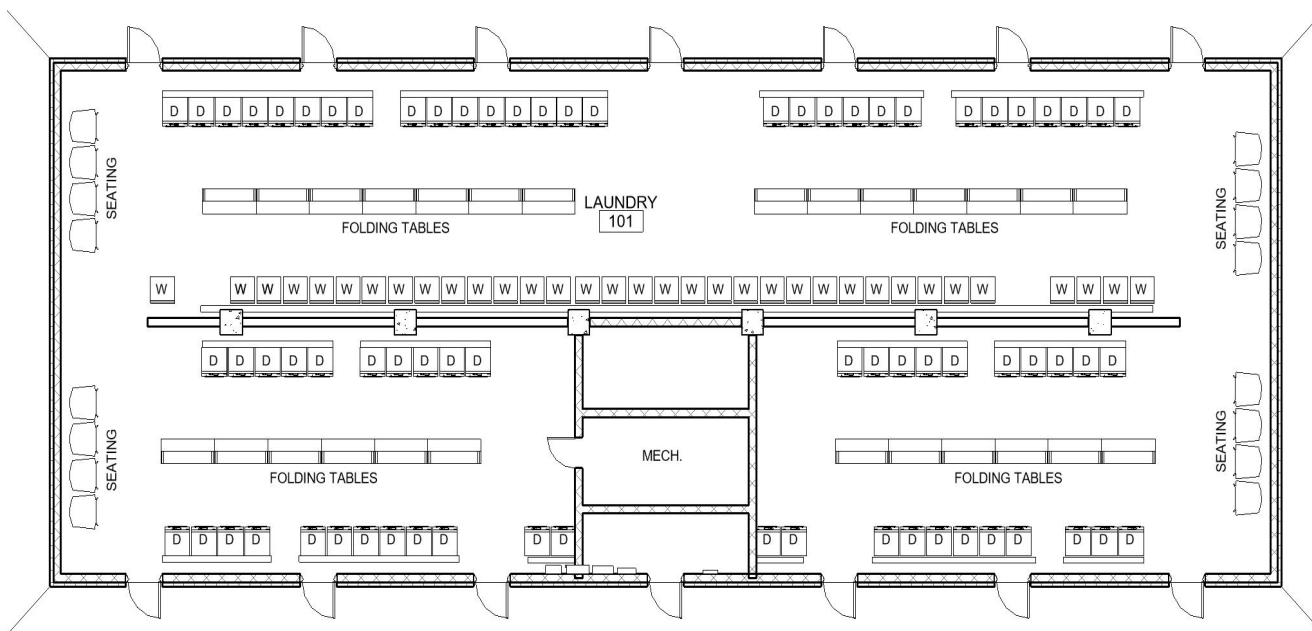
# Off the Shelf Designs

## Laundry

35



### Option 1: 14 bay, Open Area Laundry Space



Description	
Size	900 PN
Details	Open Laundry Space
ROM with Contractor Labor	\$443k
ROM with Troop Labor	\$341k





U.S. ARMY

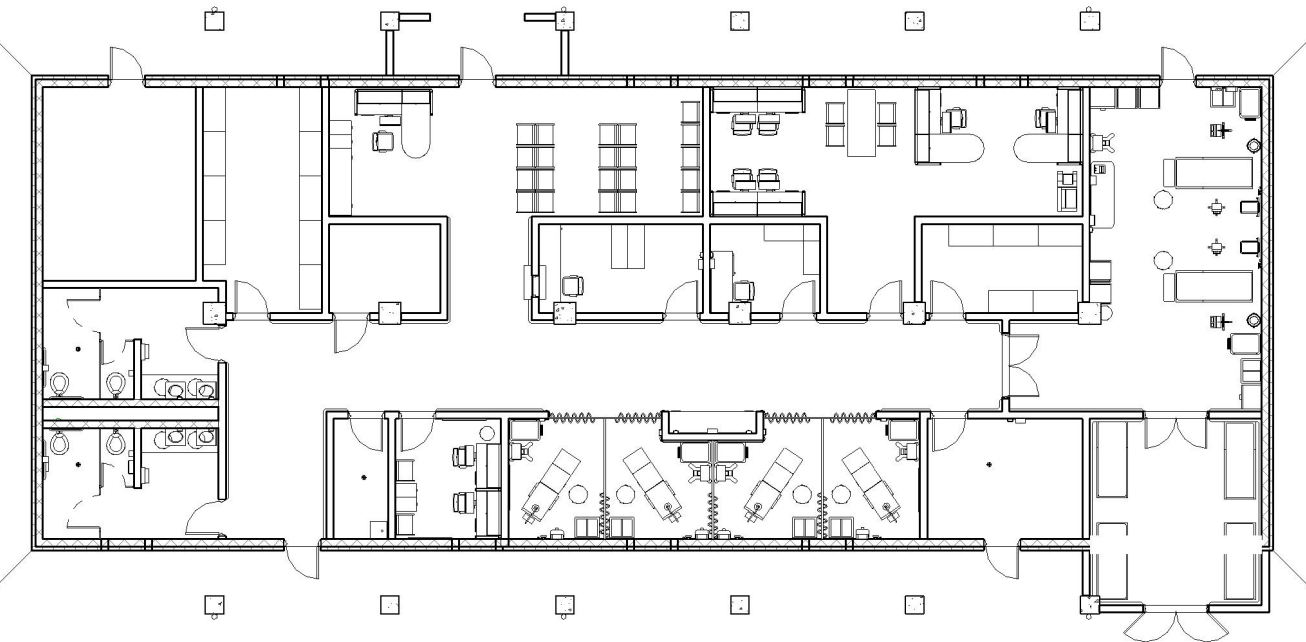
# Off the Shelf Designs

## Medical Facility

36



### Option 1: Role 1 Medical Facility



Description	
Size	426m2
Details	Trauma Room, Exam Rooms, Pharmacy, Utilities, Laboratory
ROM with Contractor Labor	\$536k
ROM with Troop Labor	\$412k



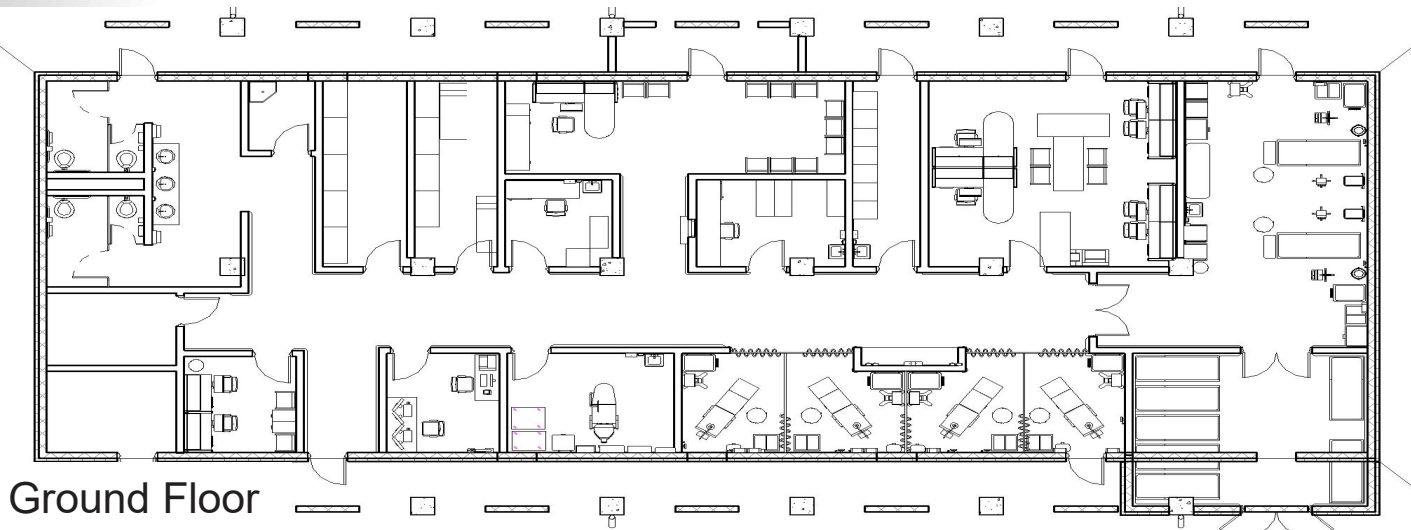
U.S. ARMY

# Off the Shelf Designs

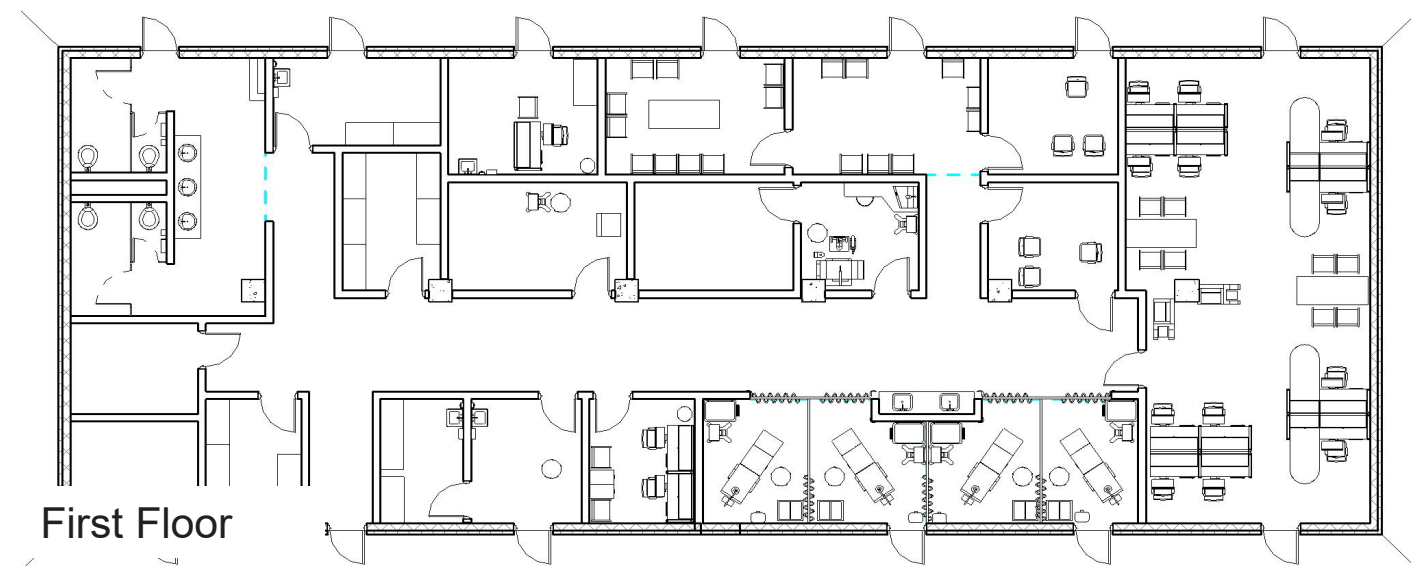
## Medical Facility

### Option 2: Role 2 Medical Facility

37



Ground Floor



First Floor



Description	
Size	850m2
Details	Trauma Room, Exam Rooms, X-Ray, Blood Storage, Utilities, Laboratory
ROM with Contractor Labor	\$1.07M
ROM with Troop Labor	\$825k





U.S. ARMY

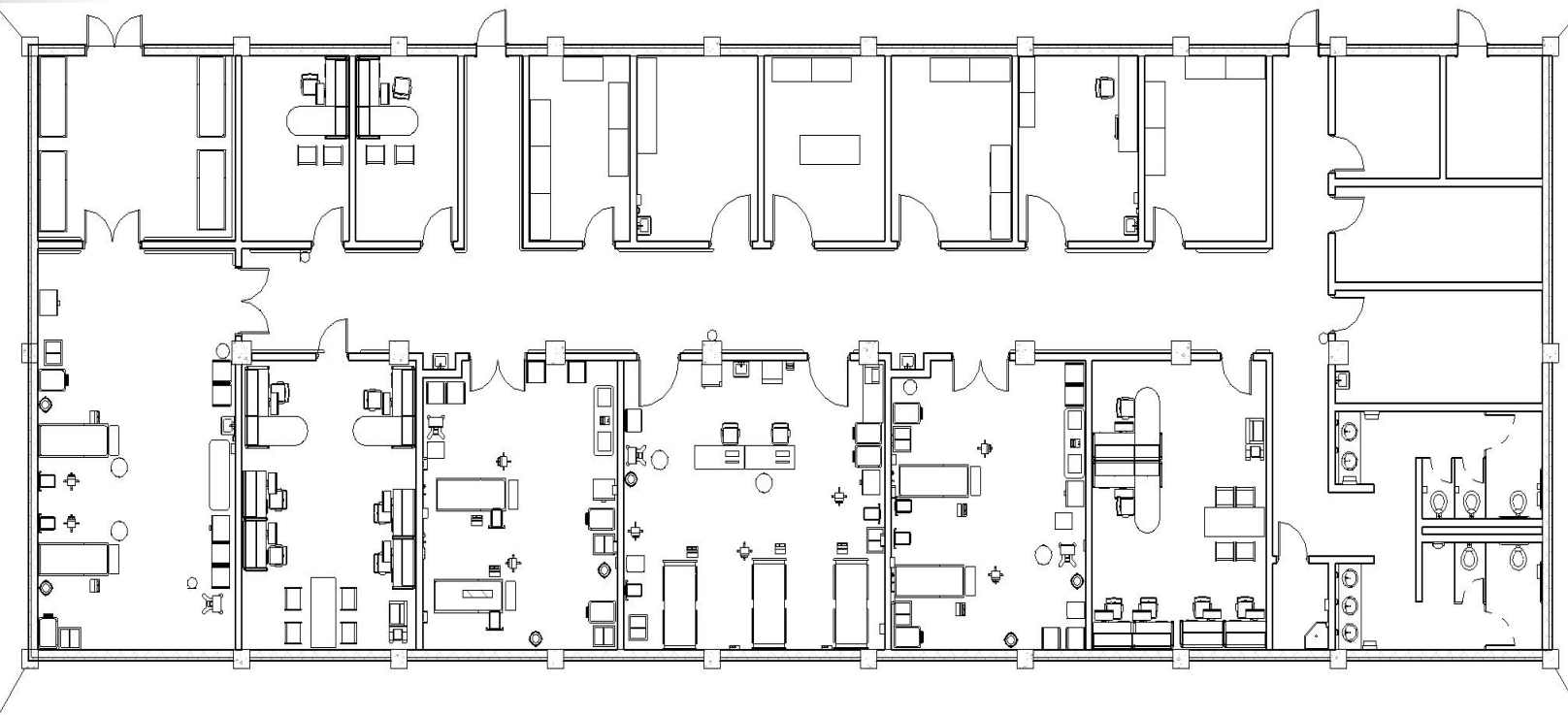
# Off the Shelf Designs

## Medical Facility

38



### Option 3: Role 2+ Medical Facility



Description	
Size	665m2
Details	Trauma Room, Exam Rooms, Operating Room, Recovery, Utilities, Laboratory
ROM with Contractor Labor	\$1.57M
ROM with Troop Labor	\$889k

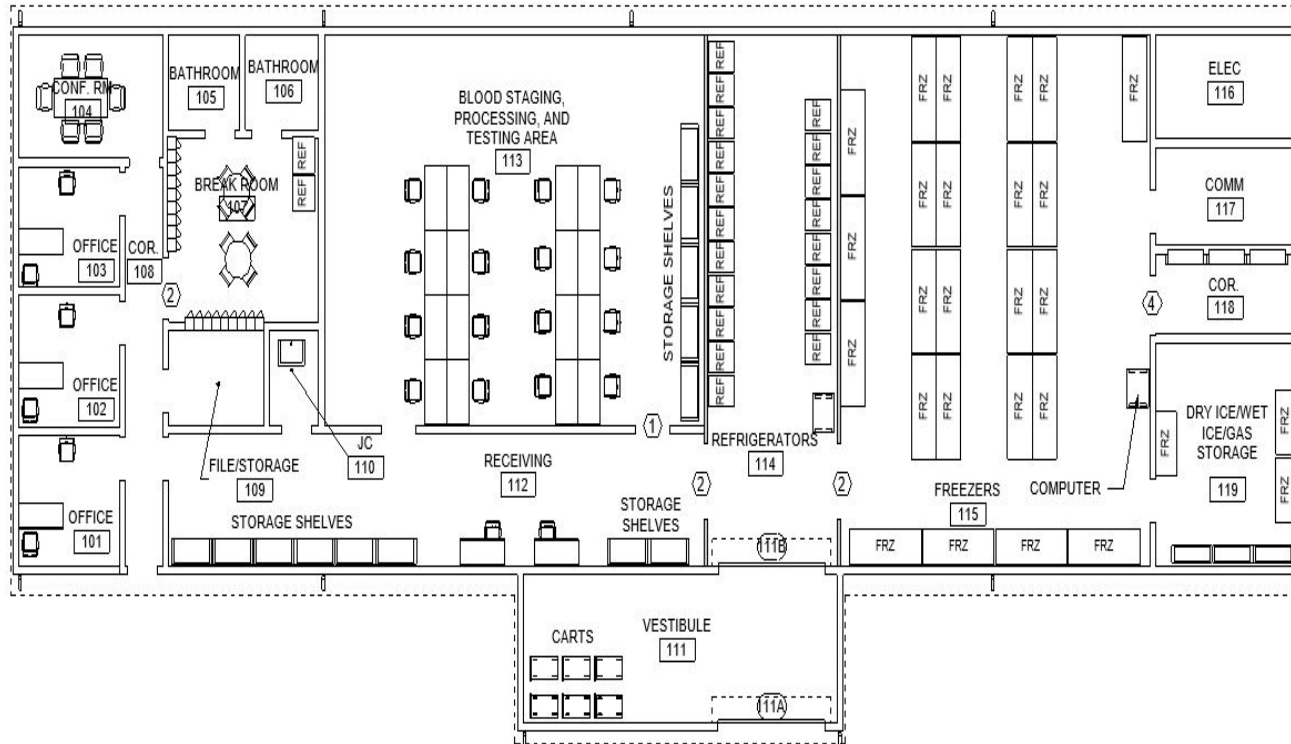
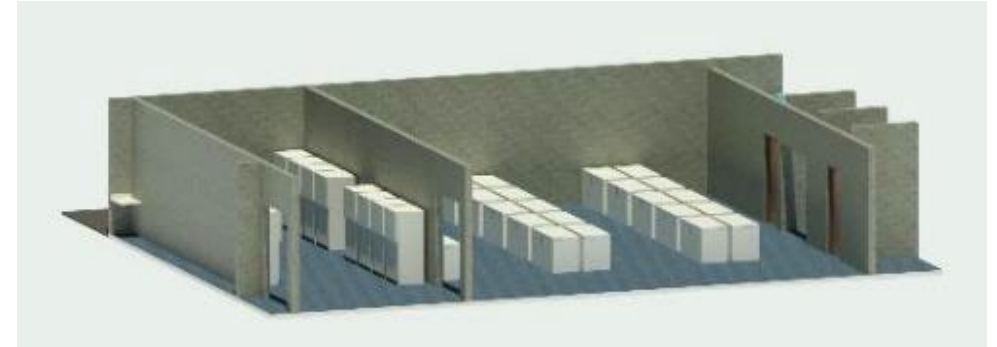
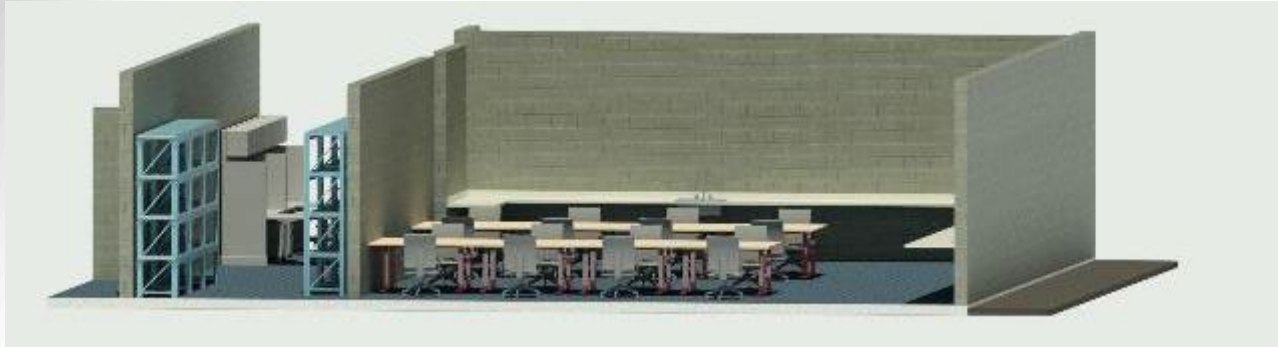


U.S. ARMY



# BLOOD STORAGE INTERIOR DESIGNS, WORLDWIDE

*Currently Under Design*



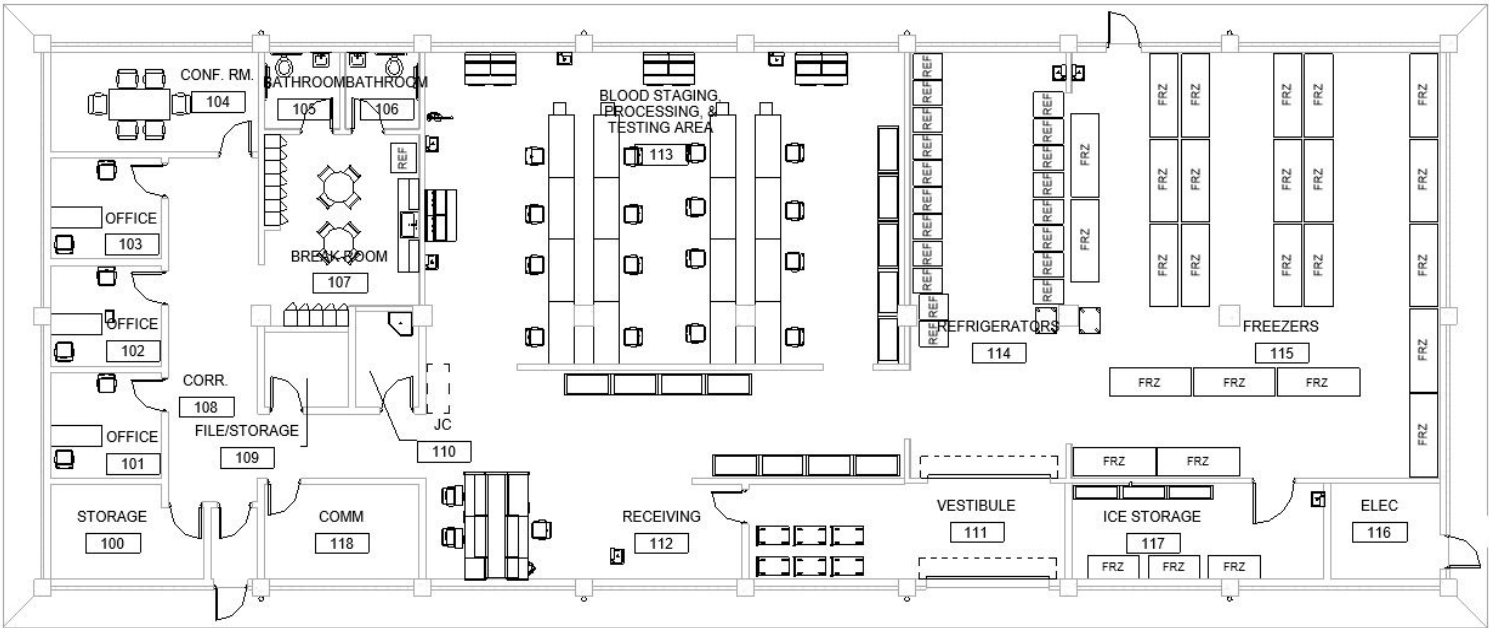
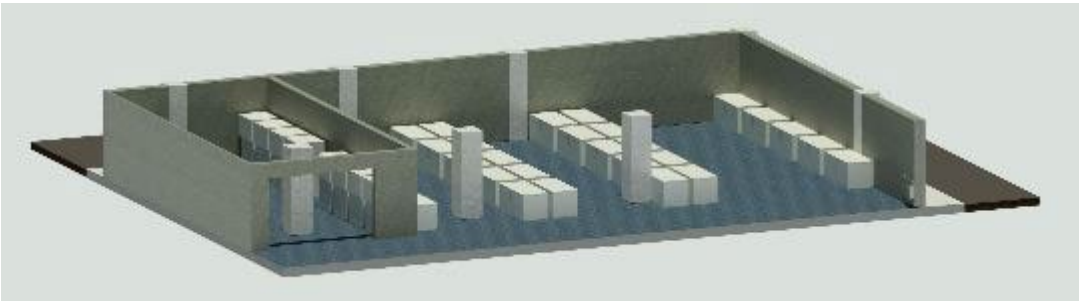
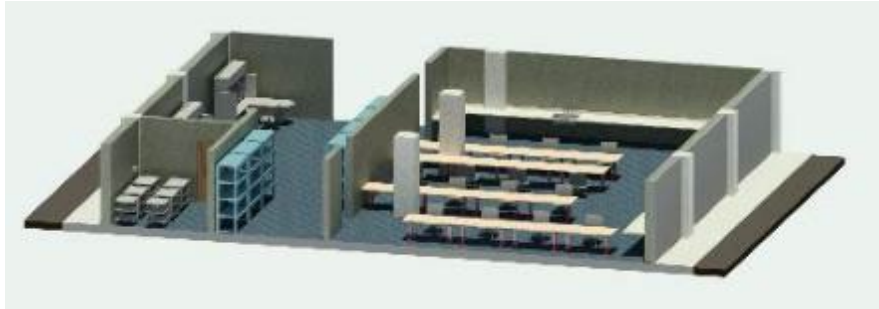
Description	
Size	570m2
Details	Developed in coordination with HFGA and JMSLA white paper. Includes separate offices spaces, conference room, blood processing, testing and storage.
ROM with Contractor Labor	TBD
ROM with Troop Labor	TBD



**FACE**

# BLOOD STORAGE INTERIOR DESIGNS, WORLDWIDE

Currently Under Design



Description	
Size	668m2
Details	Developed in coordination with HFGA and JMSLA white paper. Includes separate offices spaces, conference room, blood processing, testing and storage.
ROM with Contractor Labor	TBD
ROM with Troop Labor	TBD



SAFE1



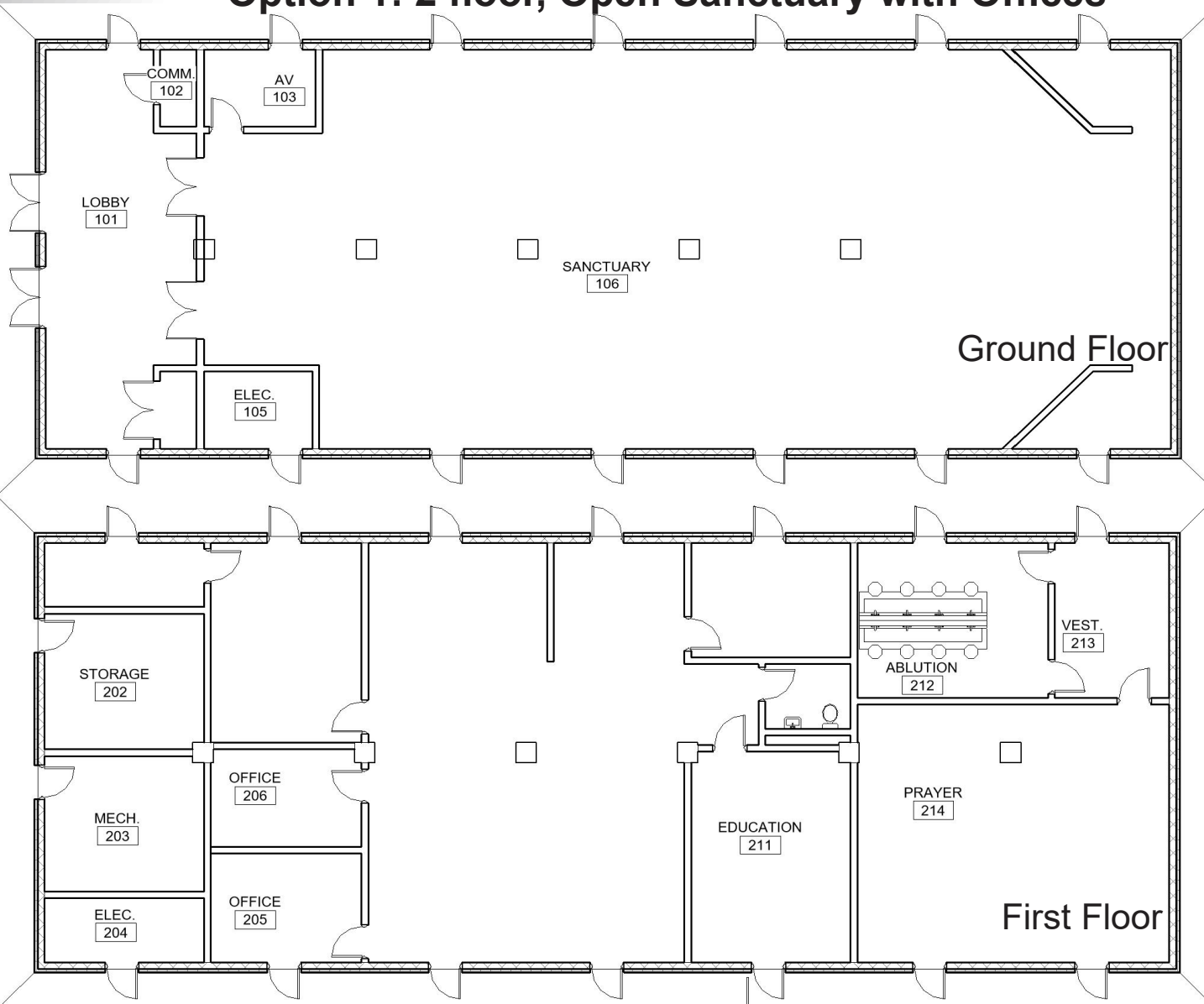
U.S. ARMY

# Off the Shelf Designs

## RELIGIOUS FACILITY

### Option 1: 2 floor, Open Sanctuary with Offices

41



Description	
Size	850 m2
Details	Open Seating Sanctuary on Ground Floor and Offices/Classrooms/Storage/Prayer on First Floor
ROM with Contractor Labor	\$572k
ROM with Troop Labor	\$440k





U.S. ARMY

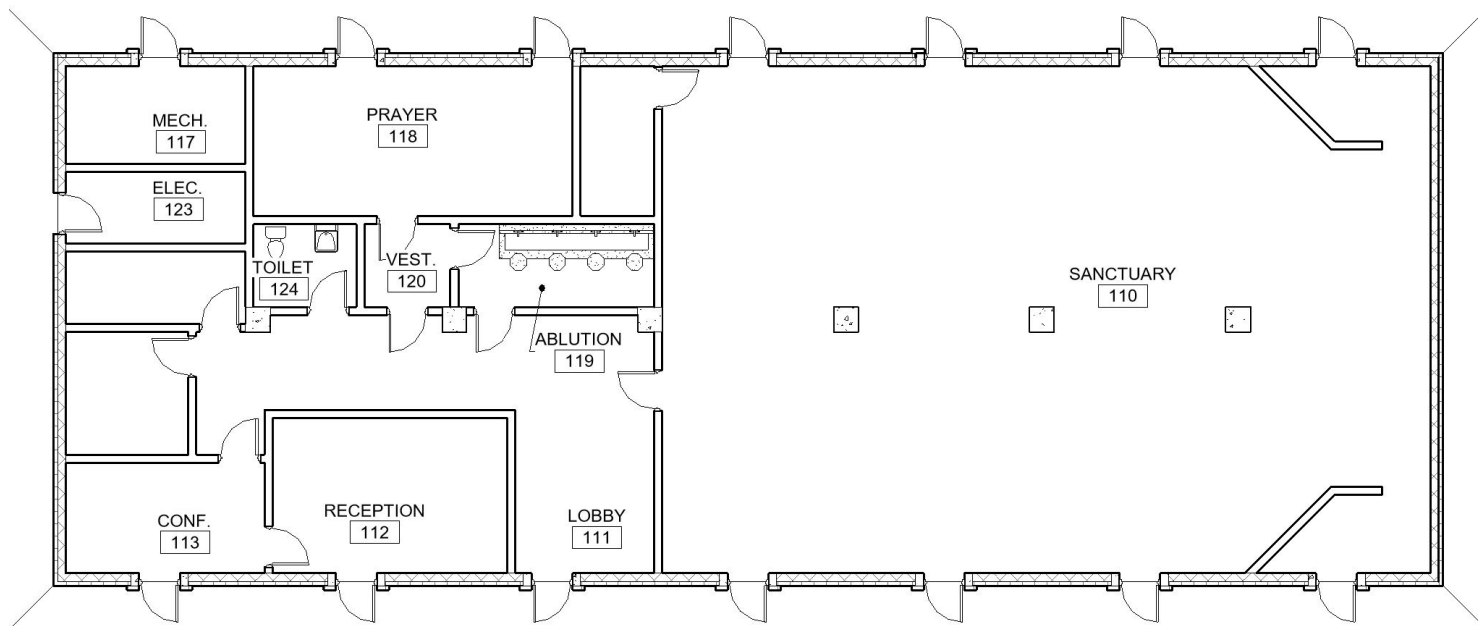
# Off the Shelf Designs

## RELIGIOUS FACILITY

42



### Option 2: 14 bay, 1 floor, Open Sanctuary with Offices



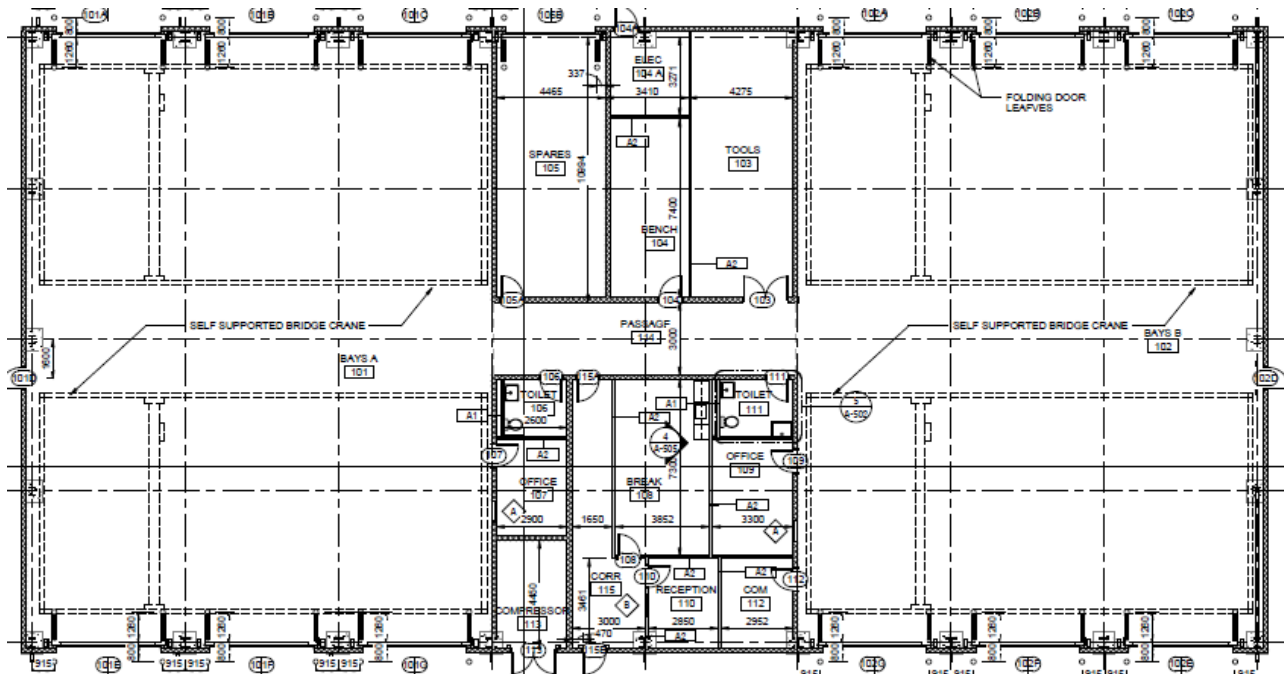
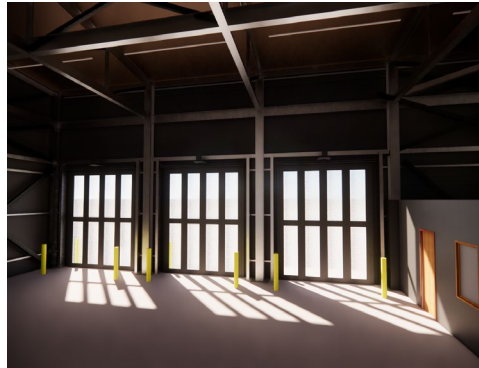
Description	
Size	850 m2
Details	Open Sanctuary, with offices, restrooms, prayer room, and conference room
ROM with Contractor Labor	\$286k
ROM with Troop Labor	\$220k



U.S. ARMY

## Vehicle Maintenance Facility

43



Description	
Size	1,300 m2
Details	Two separate working bays, offices, restrooms, break room and tools storage.
ROM with Contractor Labor	\$5.7M
ROM with Troop Labor	\$3.9M





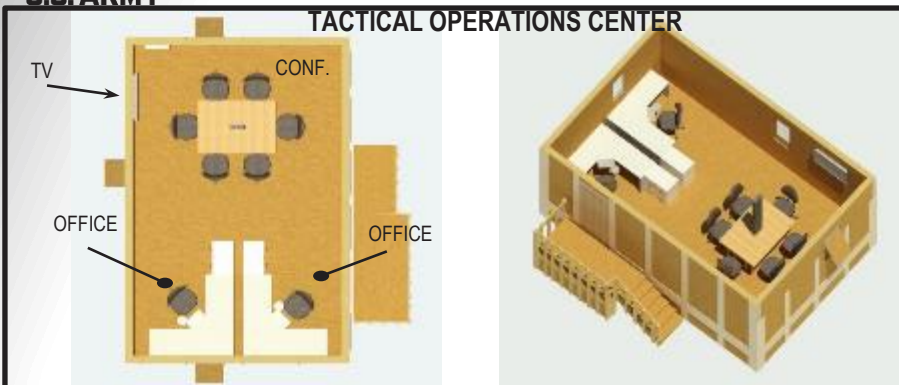
U.S. ARMY

# Off the Shelf CUBE Designs

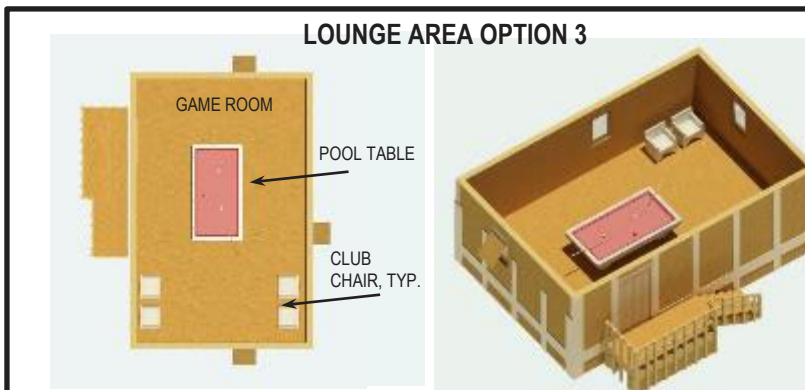
44



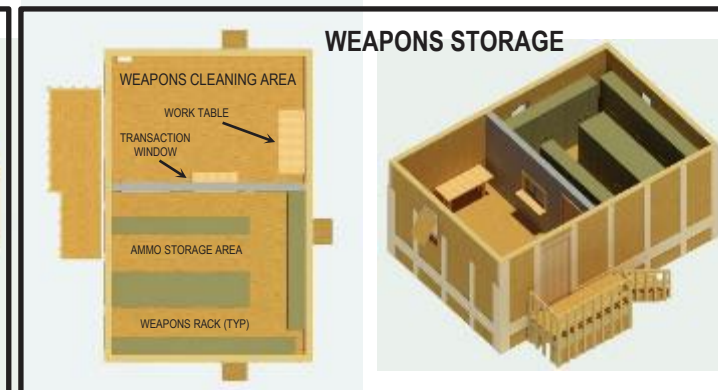
TACTICAL OPERATIONS CENTER



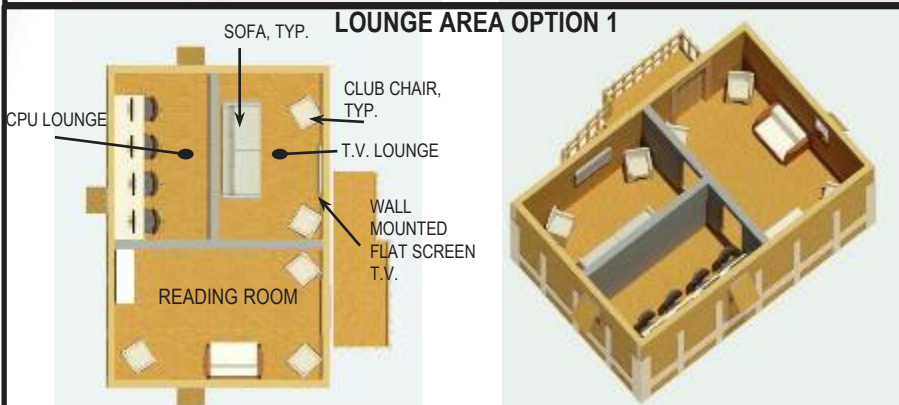
LOUNGE AREA OPTION 3



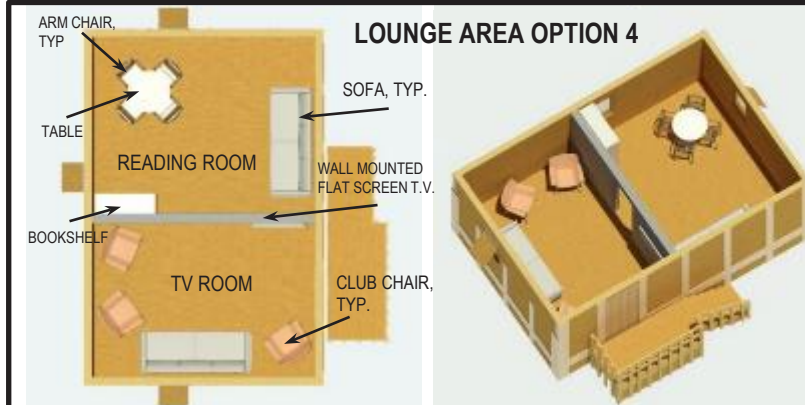
WEAPONS STORAGE



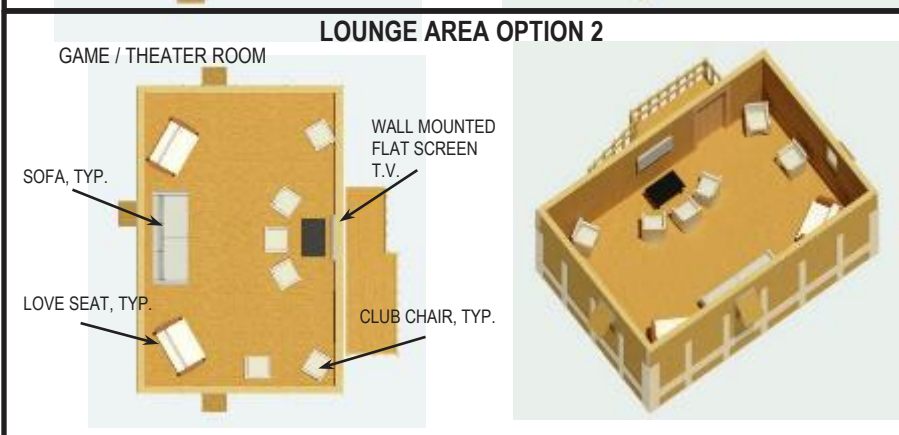
LOUNGE AREA OPTION 1



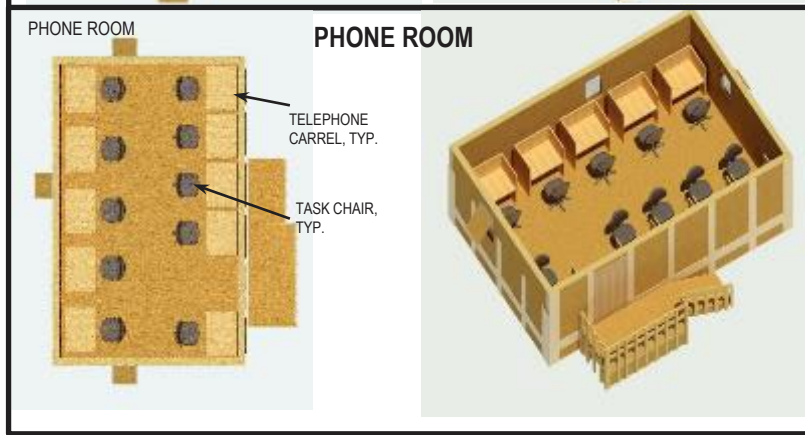
LOUNGE AREA OPTION 4



LOUNGE AREA OPTION 2



PHONE ROOM



CUBE Designs

1	Tactical Operations Center
2	Lounge Area Option 1
3	Lounge Area Option 2
4	Lounge Area Option 3
5	Lounge Area Option 4
6	Phone Room
7	Weapons Storage
8	DFAC



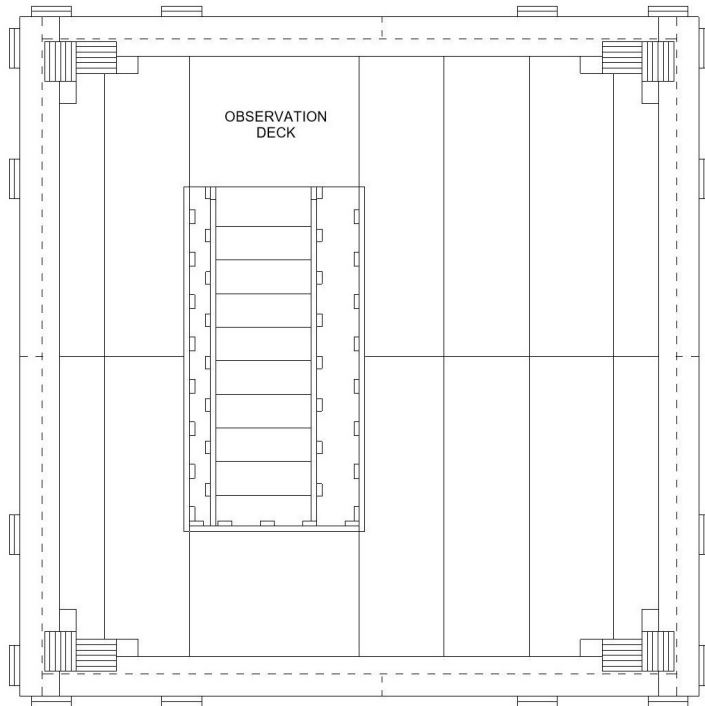
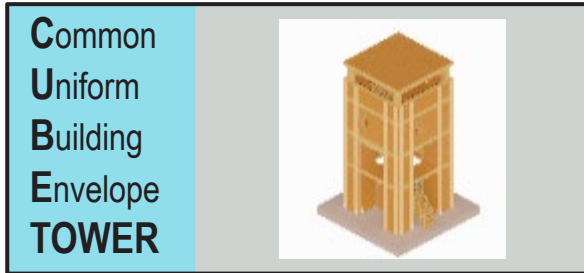
U.S. ARMY

# ADDITIONAL CUBE DESIGNS

45



*Currently Under Design*



Description	
Occupied Duration	Up to 5 years
Construction Material	Panelized Wood
Default Dimensions	1 Bay, 4.9m x 4.9m, 24 m2
Stories	Four
Envelope ROM (ACF of 1.0) Contractor	\$43K
Envelope ROM (ACF = 1.0) Troop Labor	\$30K
R Value	Wall 20; Roof 40
Additional Information	Maintains as many original CUBE parts as possible, Cab on top floor can be 16' – no outer walkway (as shown in the rendering), or 10' to 8' for an outer walkway (as shown in the floorplan)
Observation Distance	6+ miles

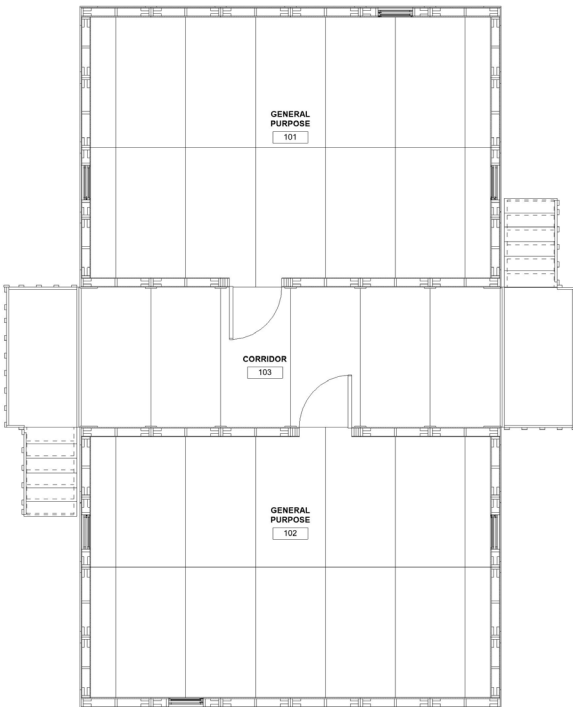


U.S. ARMY

# ADDITIONAL CUBE DESIGNS

*Currently Under Design*

Common  
Uniform  
Building  
Envelope  
WIDE



Description	
Occupied Duration	Up to 5 years
Construction Material	Panelized Wood
Default Dimensions	2 Bay, 12.2m x 7.3m 89.2 m2
Envelope ROM (ACF of 1.0) Contractor	\$30k
Envelope ROM (ACF = 1.0) Troop Labor	\$25k
R Value	Wall 20; Roof 40
Additional Information	Maintains as many original CUBE parts as possible. Similar to SAWS, but does not have a concrete foundation





U.S. ARMY

# Off the Shelf Designs

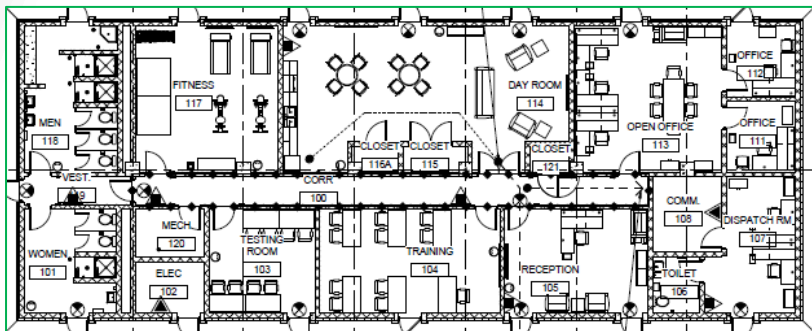
## Fire Station Complex

**\*Scalable\***

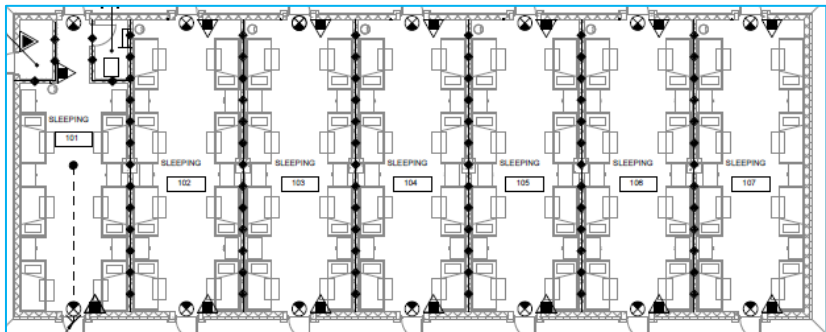
47



### Administrative Building

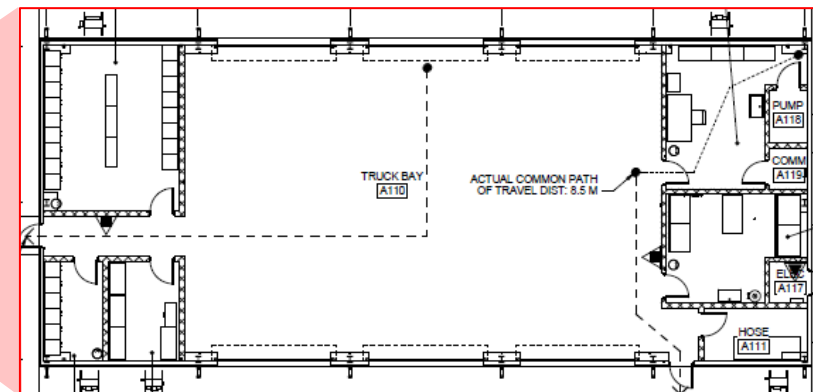


### Barracks



Description	
Size	442.5 m2, 442.5 m2, 374 m2
Details	Training Area, Fitness, Offices, Dispatch, Barracks, Truck Bay
ROM with Contractor Labor or Troop Labor	Under MILCON limit

### Apparatus Bay



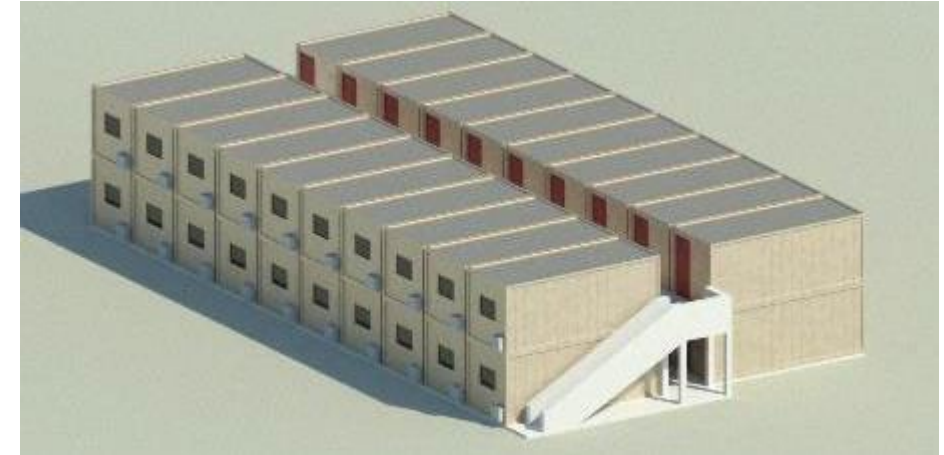


U.S. ARMY

## Relocatable Building Units , WORLDWIDE

Relocatable Building (RLB) , prefabricated structures manufactured to be deployable (transportable over public roads), erected, disassembled, stored.

- Dimensions: 7' 8" (2300 mm) W x 19' 5" (5900 mm) L x 7' 8" (2300 mm) H.
- Insulation: Walls and floor R-20; Roof R-40.
- Expected Life: 15 years, can be re-deployed up to 3 times.
- Systems: Includes Mechanical, Electrical and Communication systems.
- Warranty: 1-, 5-, 10- or 15-year options.
- Assembly: can be performed by untrained personnel.
- Compliance: **UFC 1-201-01** Non-Permanent DoD Facilities in Support of Military Operations are Semi-Permanent.



Description	
Description	<b>RLB Type A:</b> Billeting or Administrative <b>RLB Type B:</b> Latrine, Shower/Shave (LSS). <b>RLB Type C:</b> Laundry Services <b>RLB Type D/E:</b> Medical and Dental Clinics <b>RLB Type F:</b> MWR, Religious, Open Space Admin, Fitness, DFAC, etc.
ROM with Contractor Labor	TBD
ROM with Troop Labor	TBD



# MATOC Relocatable Building Units , CENTCOM

*Contract Awarded*

## Relocatable Building Type Options

**RLB Type A:** Single 160 SF (14.8 SM) Billeting or Administrative space.

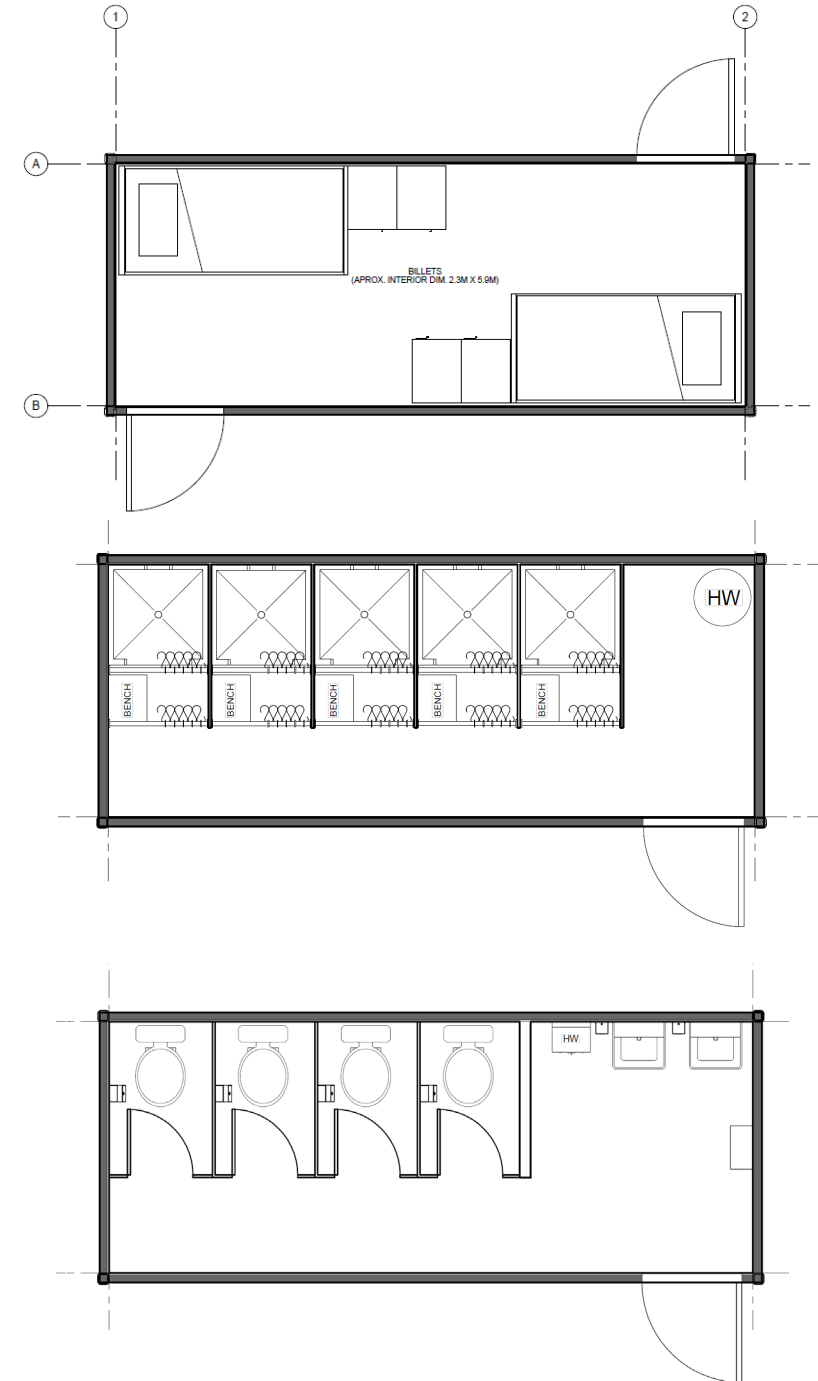
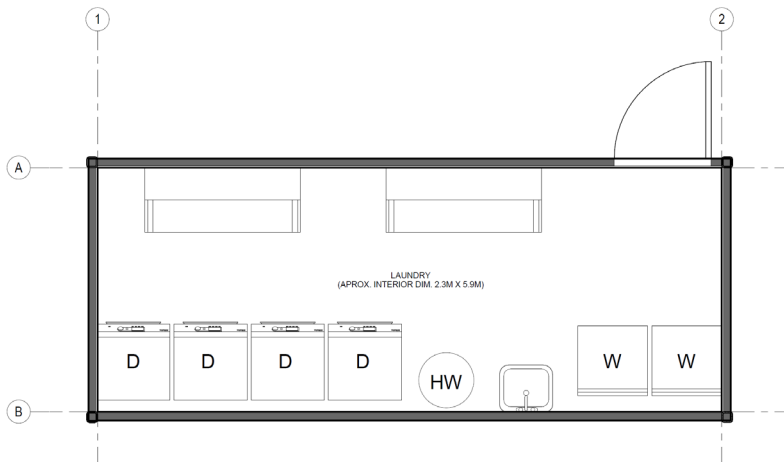
**RLB Type B:** Two 320 SF latrine, shower, and shave (LSS) units.

**RLB Type C:** Single 160 SF (14.8 SM) Laundry.

**RLB Type D/E:** Four 640 SF (59.5 SM) Medical and Dental clinics. (Type D- Risk category 2 / Type E- Risk Category 3).

**RLB Type F:** Four 640 SF (59.5 SM) MWR, Religious, Open Admin, Fitness, DFAC etc.

\* Type A & B can be stacked or connected to other units to increase space.







U.S. ARMY



# ASSEMBLIES



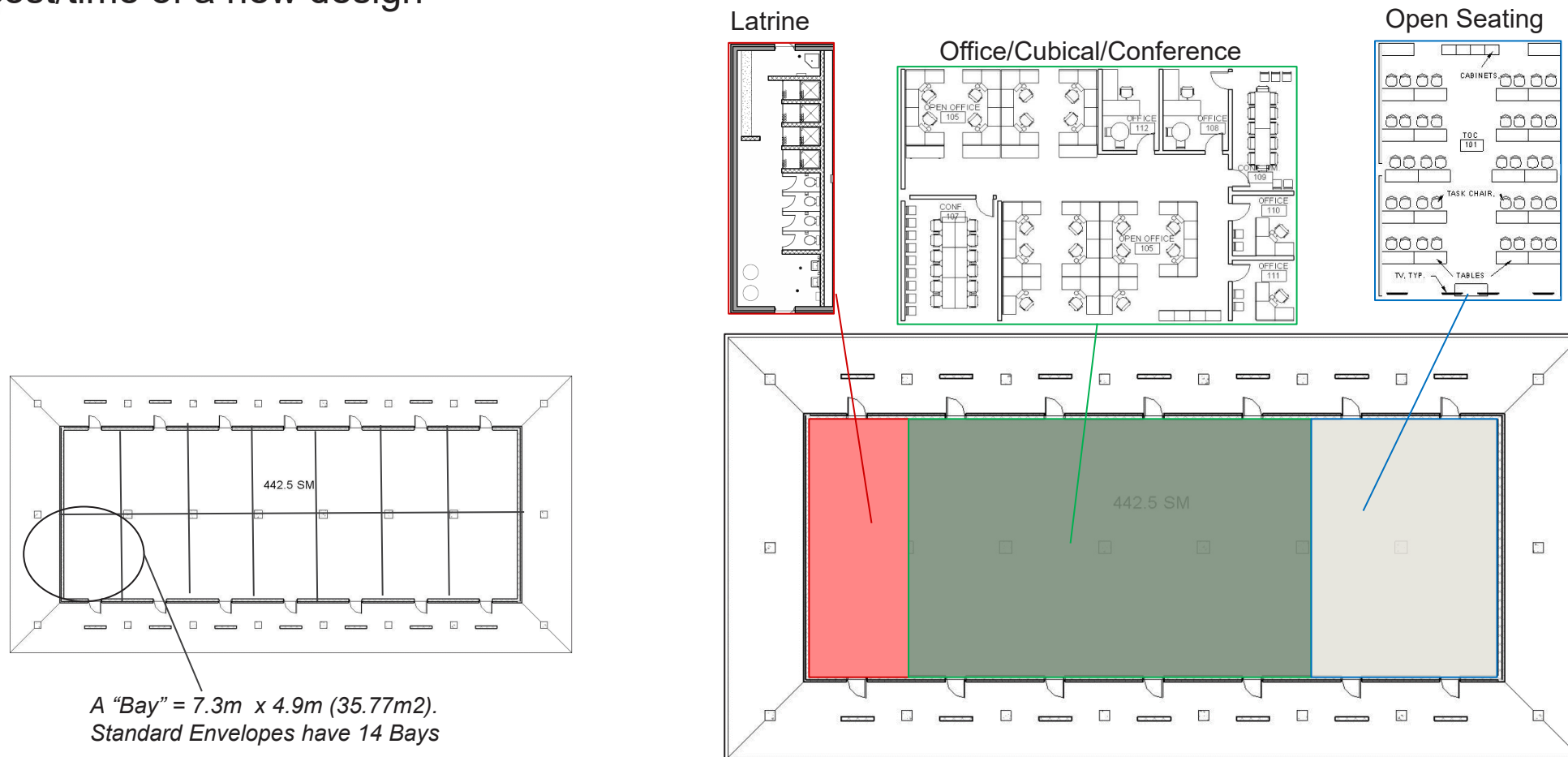
U.S. ARMY

51



## CUSTOMIZABLE ASSEMBLIES

All Envelopes are designed to be elongated or shorted by the standard “bay” length. The CoS offers a wide variety of compartmental assemblies that can be tailored to the desired requirements at a fraction of the cost/time of a new design



NOTE: Some Occupation restrictions may apply

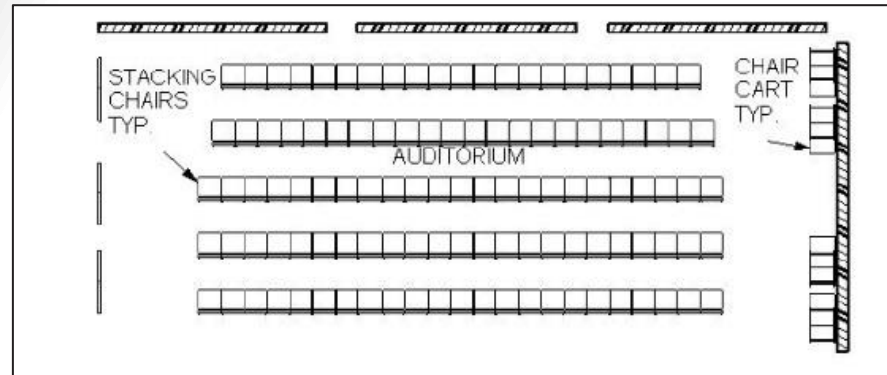


U.S. ARMY

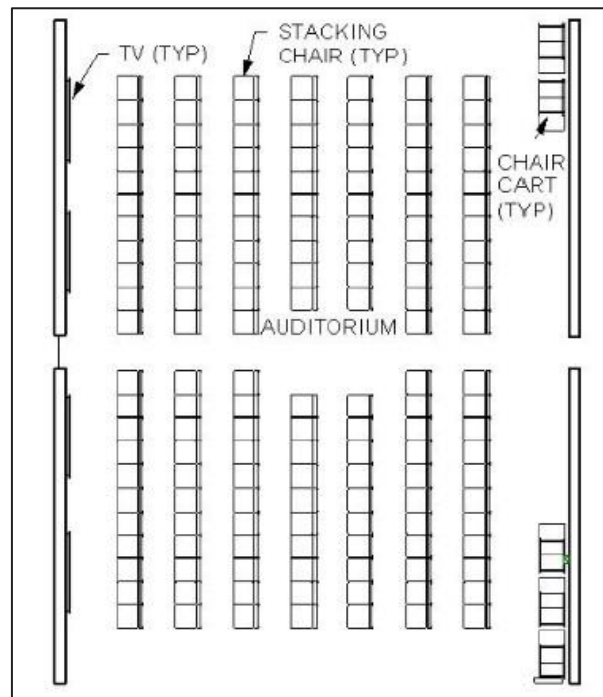
# ASSEMBLIES

## Briefing/Assembly

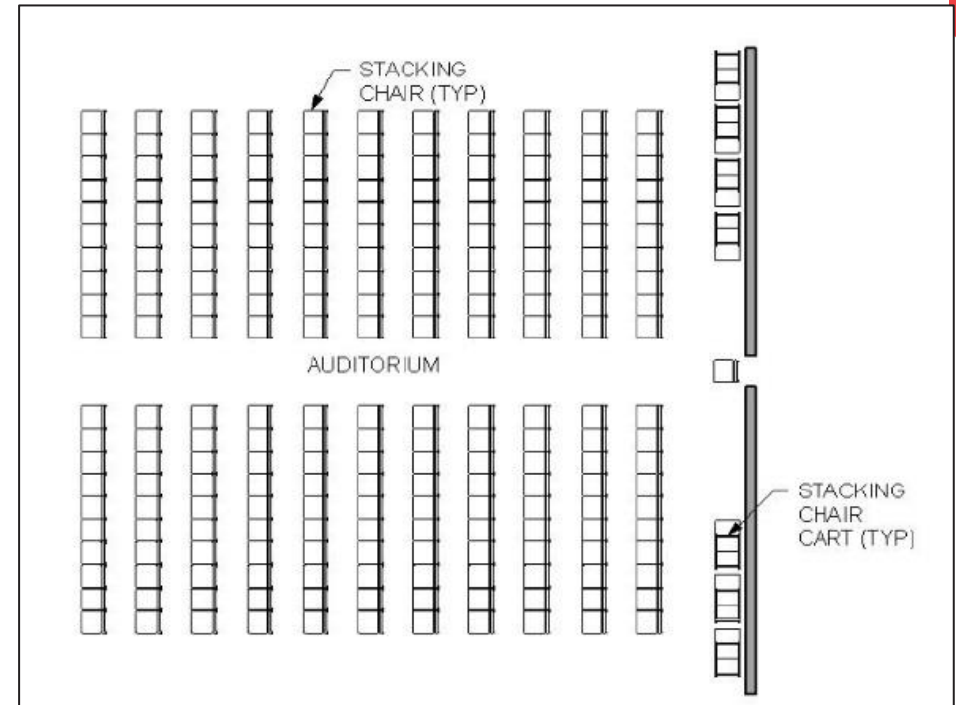
52



Option 1



Option 2



Option 3

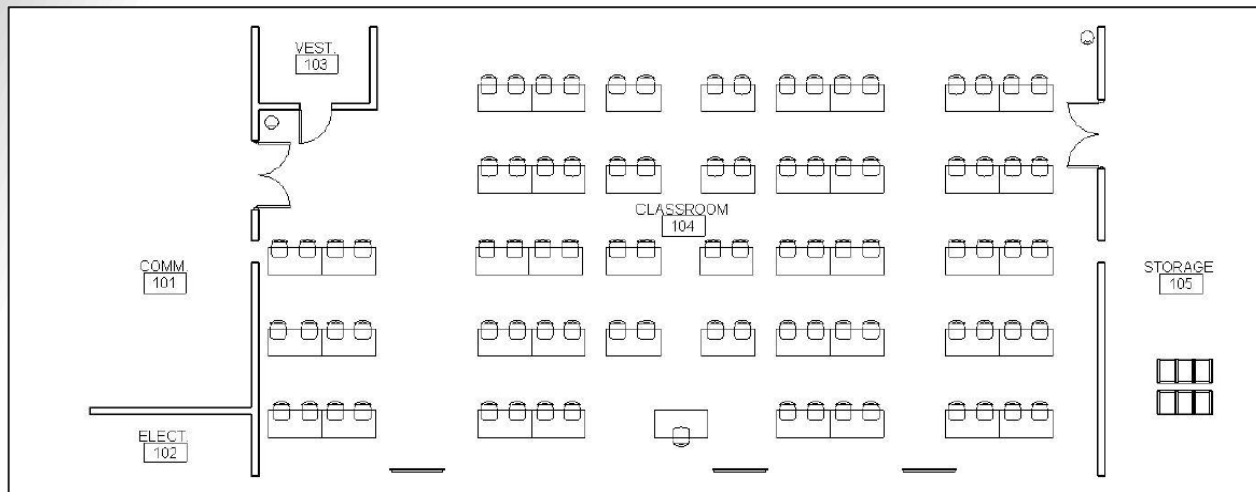
Description	
Option 1	112 PN
Option 2	150 PN
Option 3	220 PN



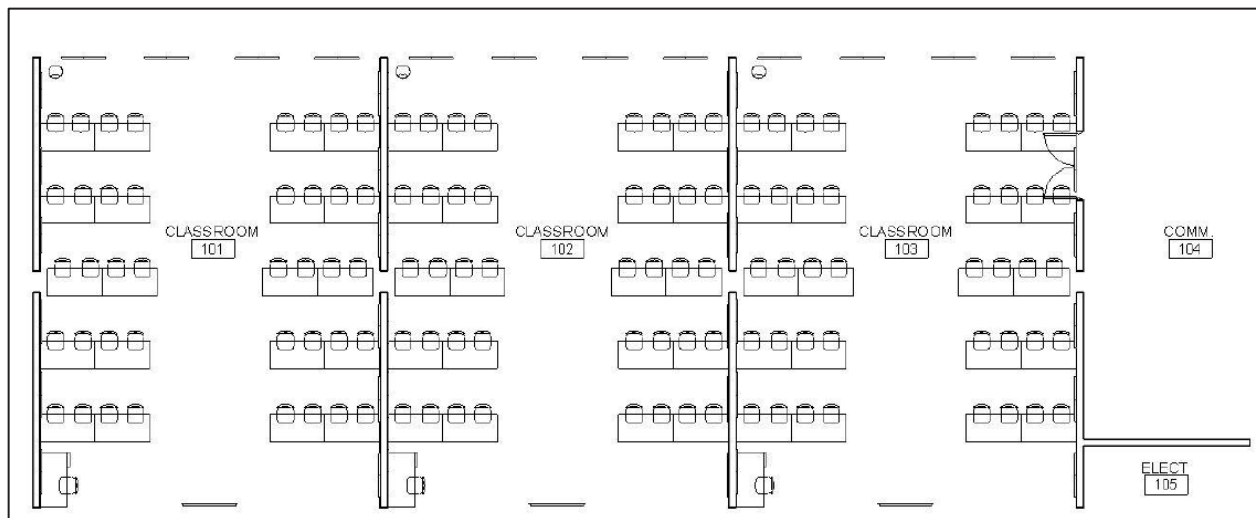
U.S. ARMY

# ASSEMBLIES

## Classroom



Option 1



Option 2

Description	
Size	88 students, 1 teacher
Additional Information	Open classroom space, comm room, electrical, storage, and vestibule

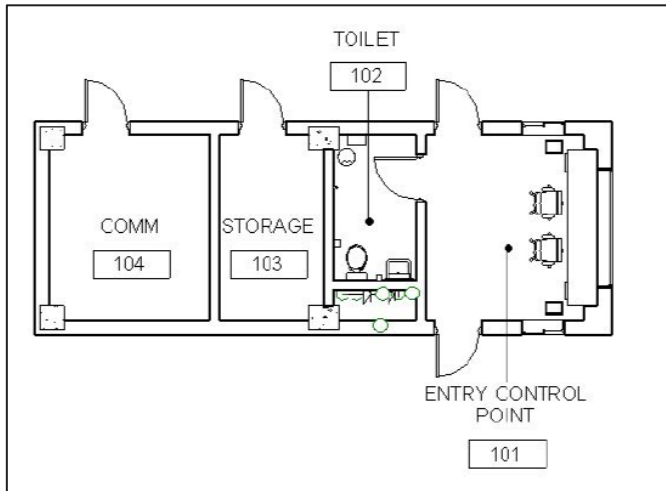
Description	
Size	120 students, 3 teachers
Additional Information	Three separate classrooms, comm and electric room



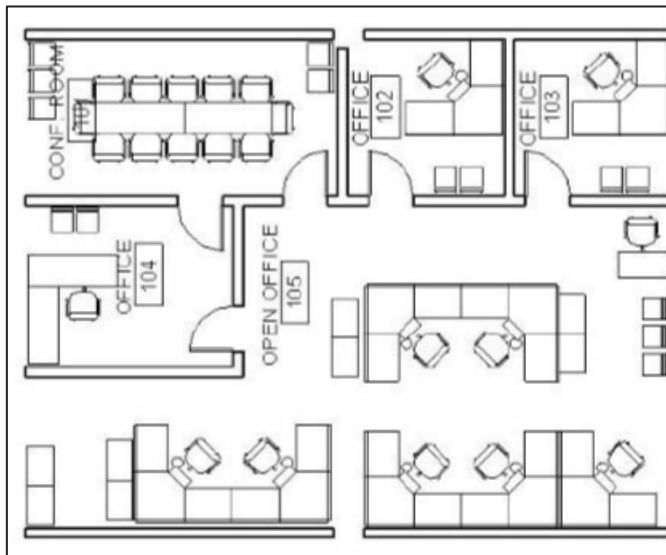
U.S. ARMY

# ASSEMBLIES

## Guard House/HQ



Guard House



HQ Option 1



Description	
Size	2 bays
Capacity	2 PN
Details	Comm and storage accessible from the outside, latrine for 1 PN, entry control point room for 2 PN

Description	
Size	4 bays
Capacity	11 PN
Details	Closed office for 3 PN, open office space for 8 PN. Conference space for 10-15 PN



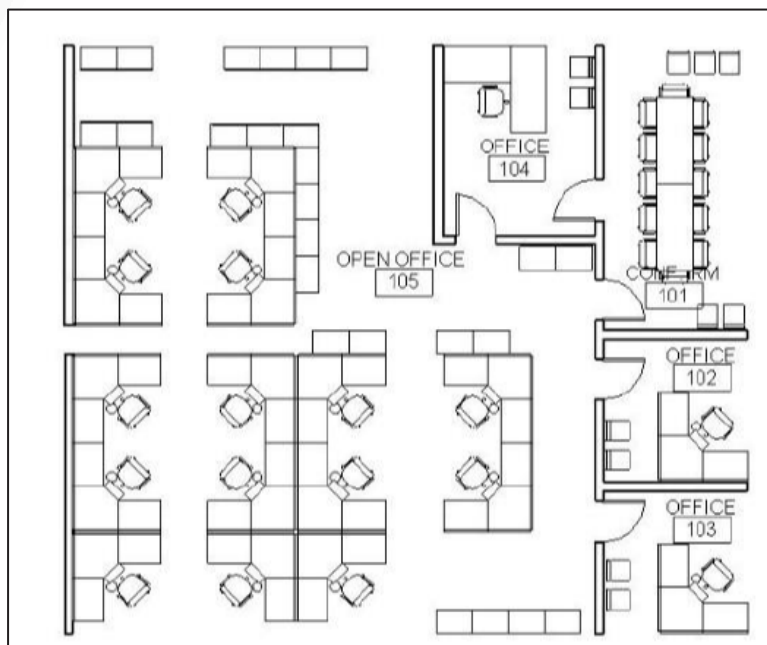


U.S. ARMY

# ASSEMBLIES

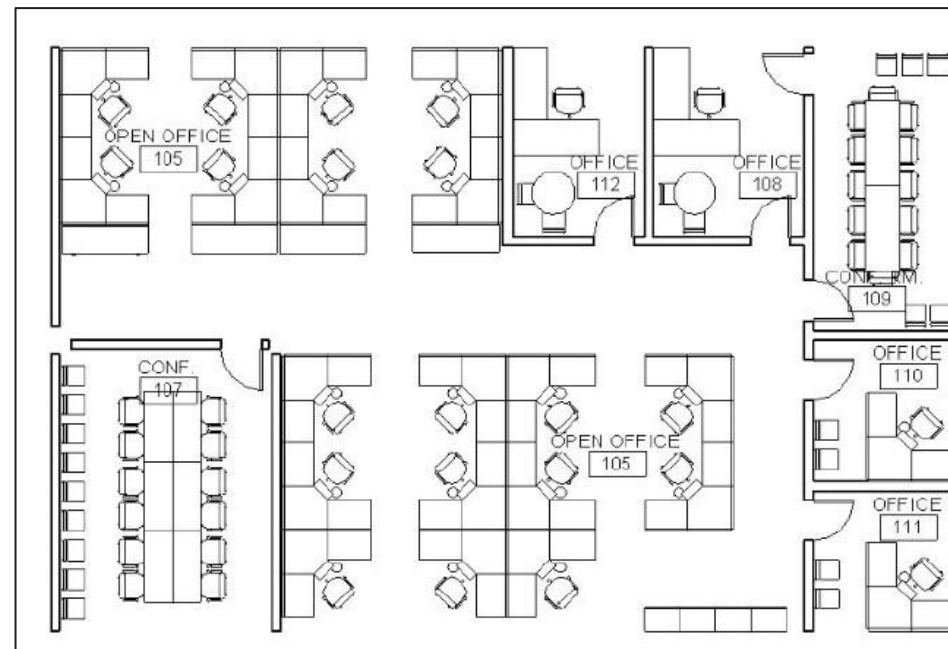
## Headquarters

55



Option 2

Description	
Size	6 bays
Capacity	18 PN
Details	Closed office for 3 PN, open office space for 15 PN. Conference space for 10-15 PN



Option 3

Description	
Size	8 bays
Capacity	23 PN
Details	Closed office for 4 PN, open office space for 19 PN. Conference space for 22-36 PN

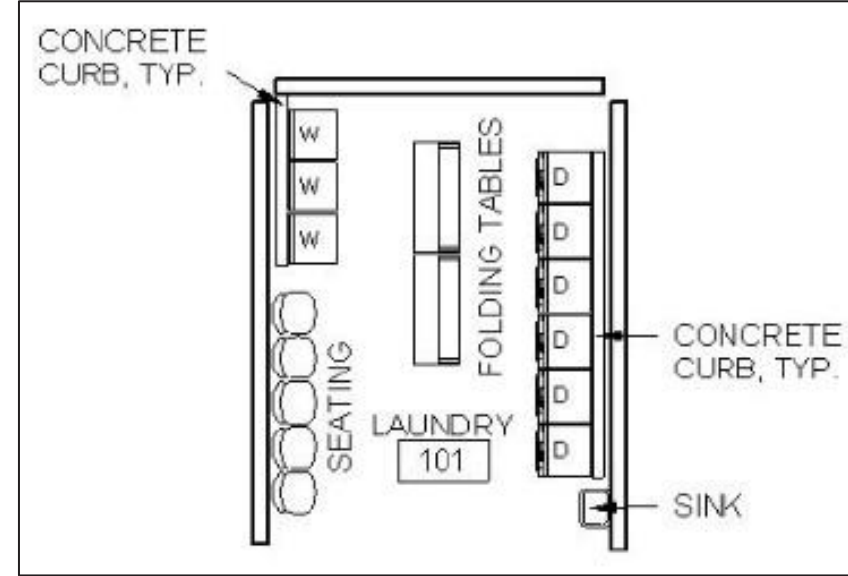
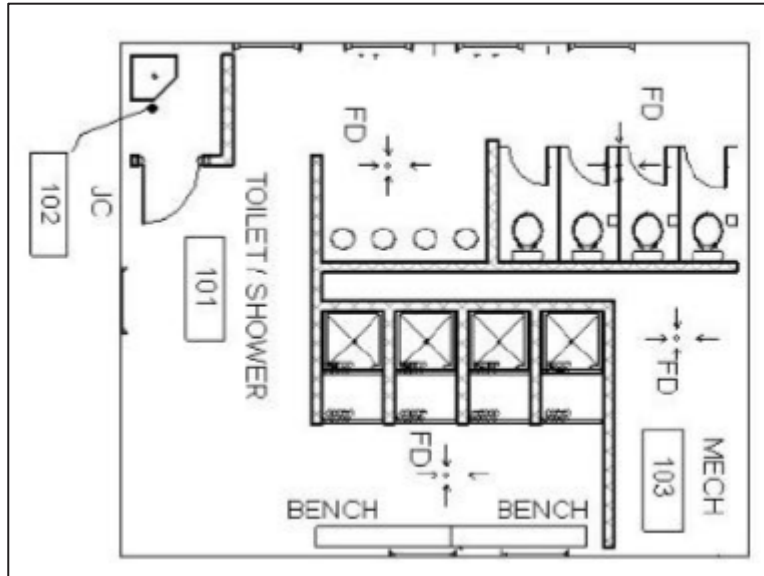


U.S. ARMY

# ASSEMBLIES

## Latrine & Shower/Laundry

56



Description	
Size	2 bays
Capacity	5 PN
Details	Four showers, four toilets, four sinks

Description	
Size	1 bay
Details	3 washing machines, seating for 5, two folding tables, 6 dryers, sink

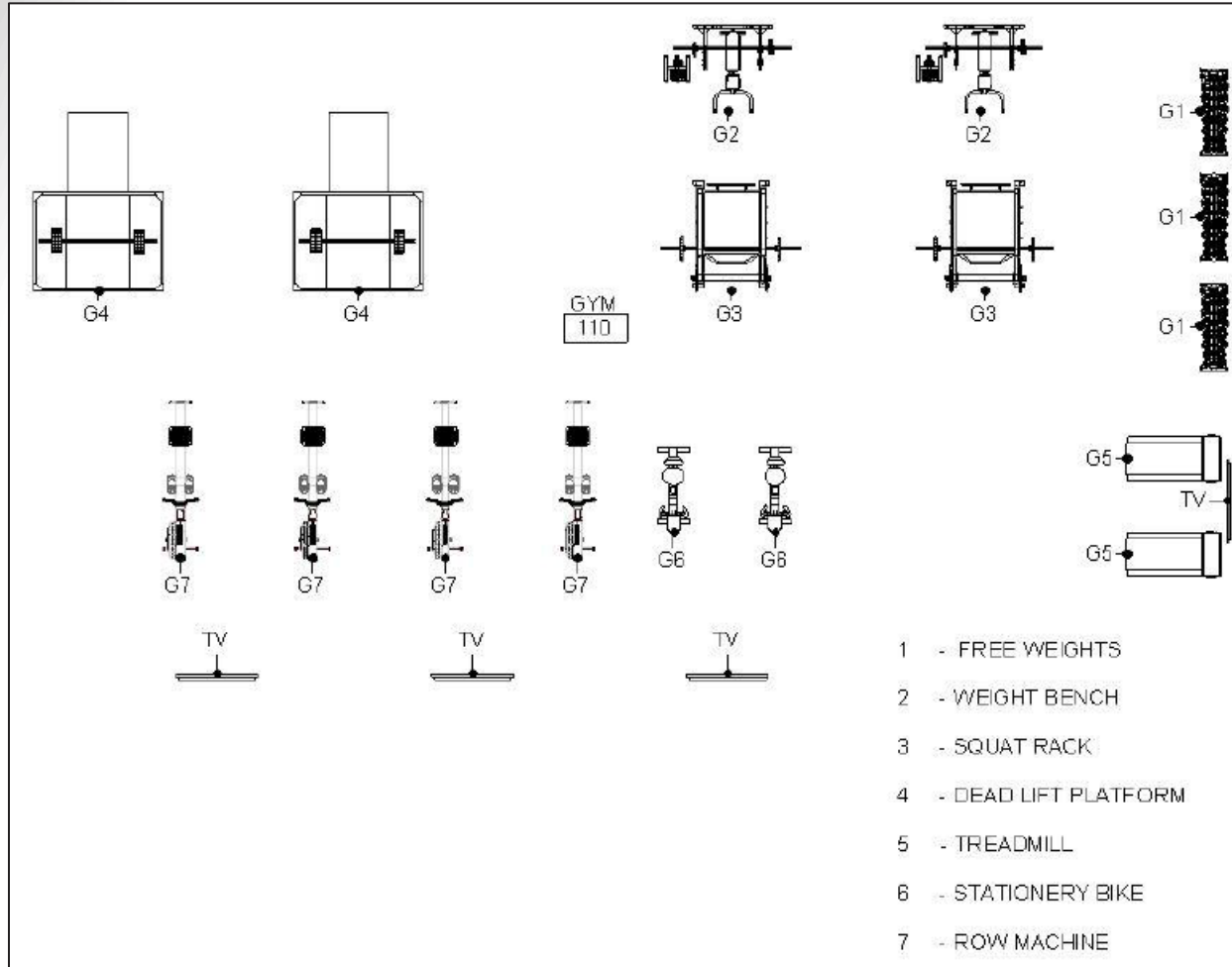


U.S. ARMY

# ASSEMBLIES

## Fitness

57



Description	
Size/ Capacity	Varies by population served
Details	3 free weights stations, weight benches, 2 squat racks, 2 deadlift platforms, 2 treadmills, 2 stationary bikes, 4 row machines

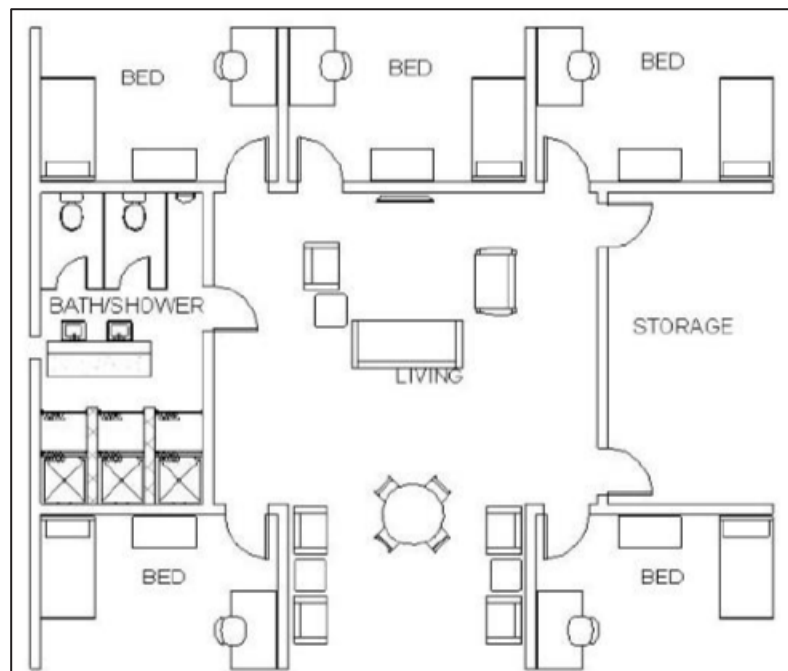


U.S. ARMY

# ASSEMBLIES

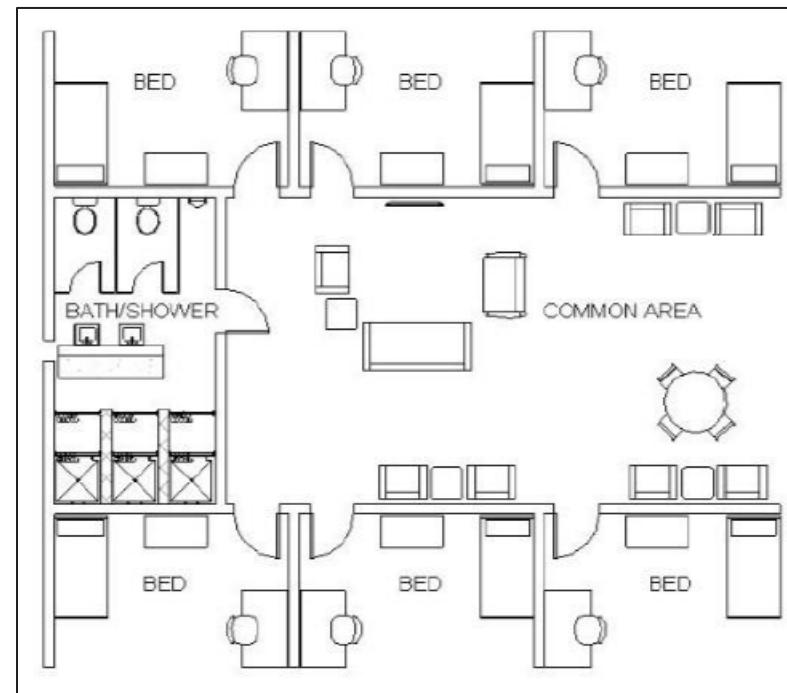
## Officers' Quarters

58



Option 1

Description	
Capacity	5 PN
Details	5 rooms each with bed and desk for 1 PN, storage area, common living area, 3 showers, 2 toilets



Option 2

Description	
Capacity	6 PN
Details	6 rooms each with bed and desk for 1 PN, common living area, 3 showers, 2 toilets

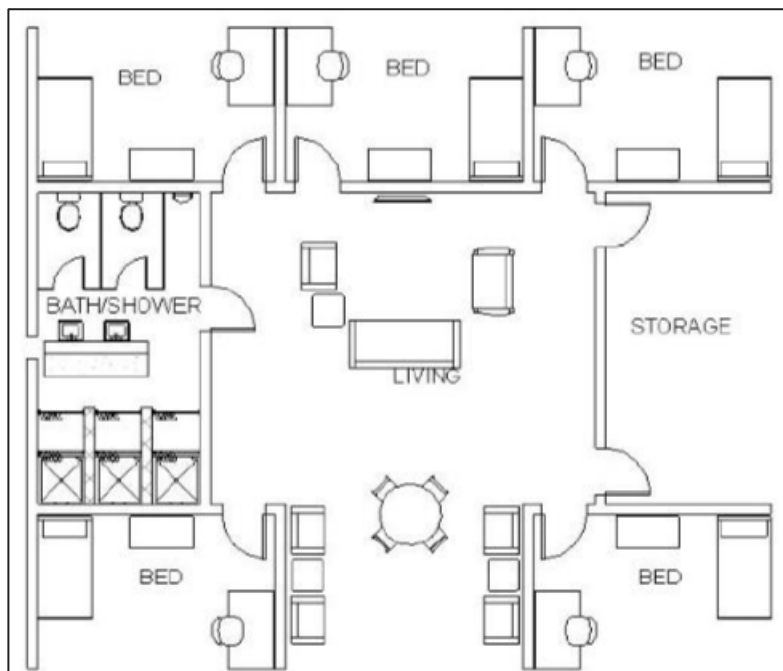


U.S. ARMY

# ASSEMBLIES

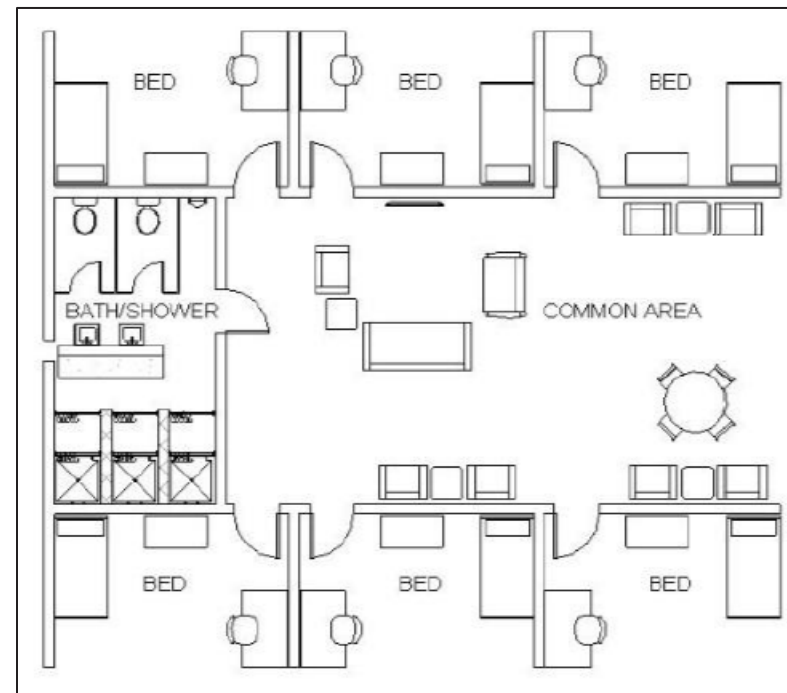
## Officers' Quarters

59



Option 1

Description	
Capacity	5 PN
Details	5 rooms each with bed and desk for 1 PN, storage area, common living area, 3 showers, 2 toilets



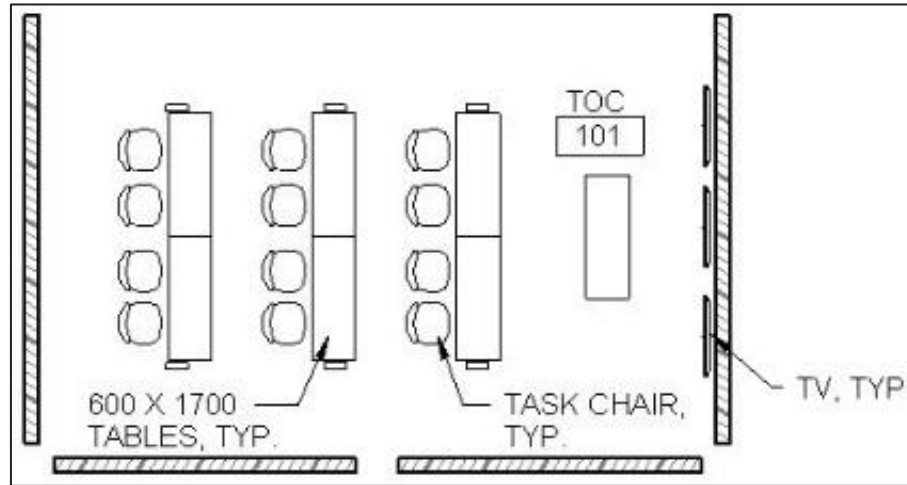
Option 2

Description	
Capacity	6 PN
Details	6 rooms each with bed and desk for 1 PN, common living area, 3 showers, 2 toilets



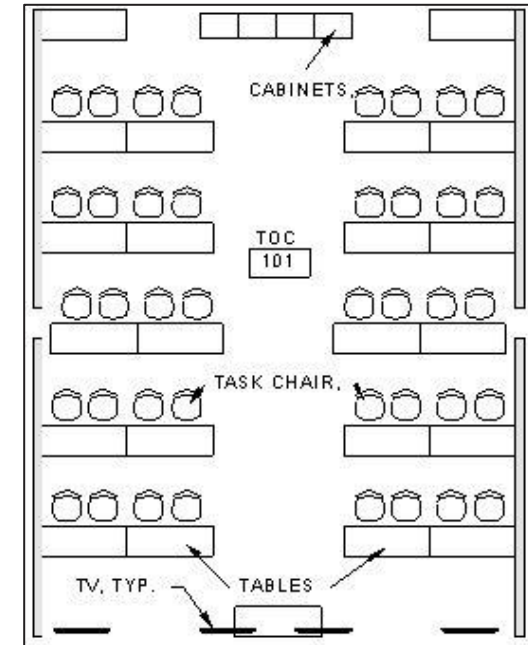
# ASSEMBLIES

## Tactical Operations Center



Option 1

Description	
Capacity	12 PN



Option 2

Description	
Capacity	40 PN



U.S. ARMY



# PROJECTS



U.S. ARMY

# Joint Logistics Operations Center, Kuwait (FACE)

62

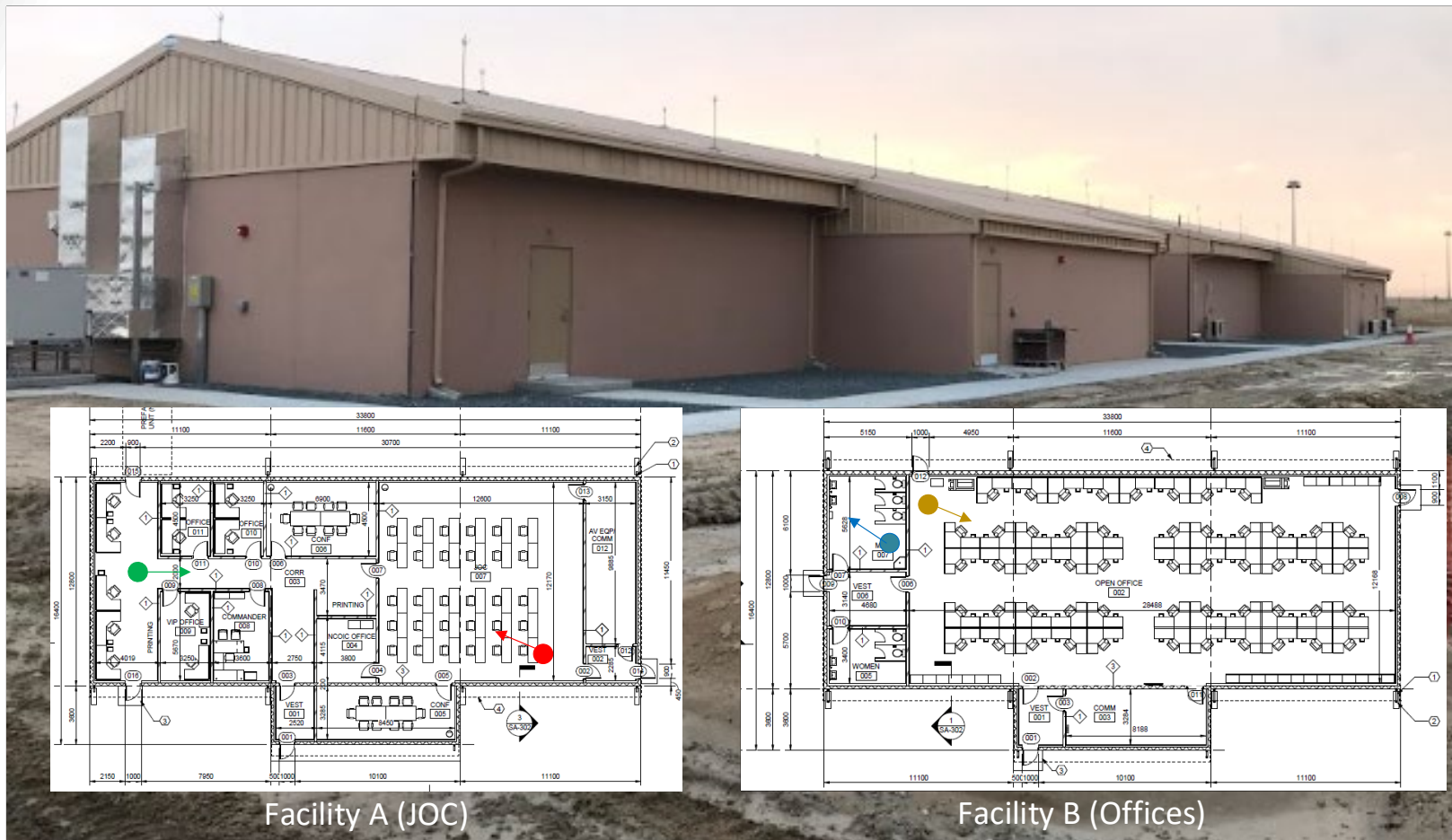


## Project Information

Design Type	
CoS Design	Four Area CMU Envelope (FACE)
Interior Layout	Joint Operations
Design Costs	
Site Adapt. & Design Revisions	\$200k
CoS Fee	\$23k
Construction	
Labor Execution	Contractor
Duration	~12 Months
Cost	\$2.19M
Facility A	\$945k
Facility B	\$1.25M

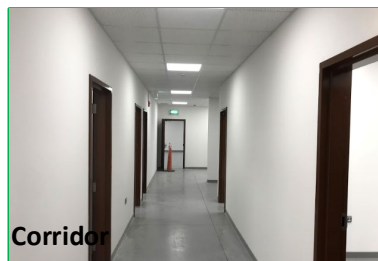


FACE

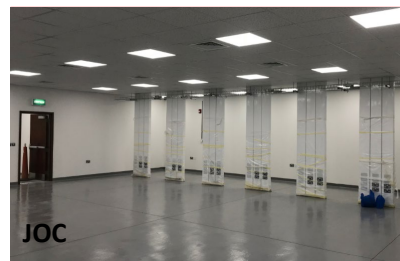


Facility A (JOC)

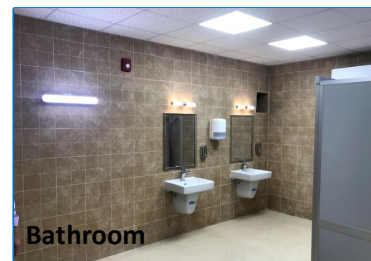
Facility B (Offices)



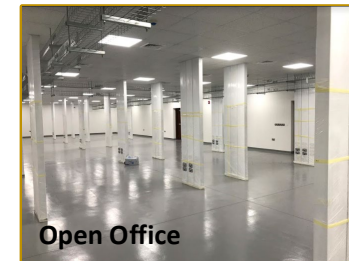
Corridor



JOC



Bathroom



Open Office



U.S. ARMY

## 23 TERRA Huts, Undisclosed Location



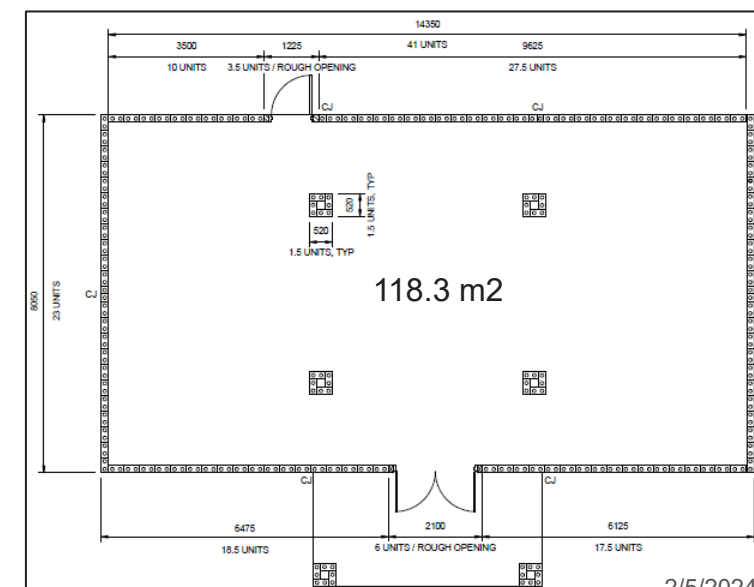
Machine Used to Make Blocks

Blocks after Curing



## Project Information

Design Type	
CoS Design	Tactical Earthen Rapidly Raised Assembly Hut (TERRA Hut)
Interior Layout	N/A
Design Costs	
Site Adapt. & Design Revisions	\$0
CoS Fee	\$10k
Construction	
Labor Execution	Troop Labor
Duration	~6 Months
Cost	~\$1.75M







## Project Information

Design Type	
CoS Design	Common Uniform Building Envelope (CUBE)
Interior Layout	N/A
Design Costs	
Site Adapt. & Design Revisions	\$0
CoS Fee	\$1k
Construction	
Labor Execution	Troop Labor
Duration	48 Hours
Cost	\$15k



First Assembly



Third Assembly



CUBE





U.S. ARMY

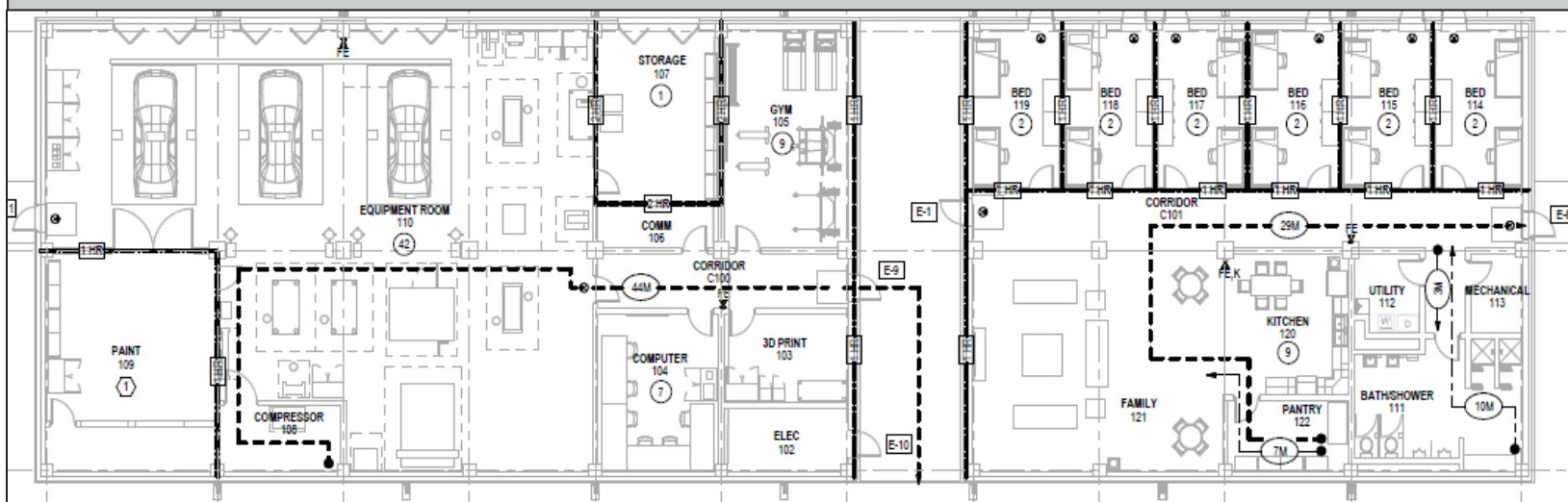
## Machine Shop, Undisclosed Location

65



### Project Information

Design Type	
CoS Design	Standard Adaptive Facility Envelope Single Story (SAFE1)
Interior Layout	Customized Machine Shop & Housing
Design Costs	
Site Adapt. & Design Revisions	\$354,996
CoS Fee	\$20k
Construction	
Labor Execution	Troop Labor
Duration	~12 Months
Cost	~\$2.4M



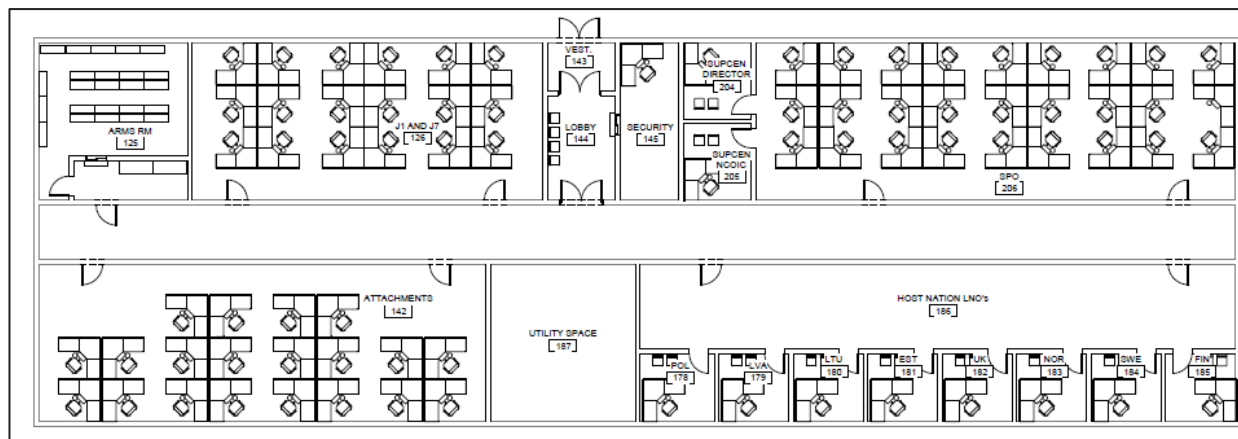
**SAFE1**



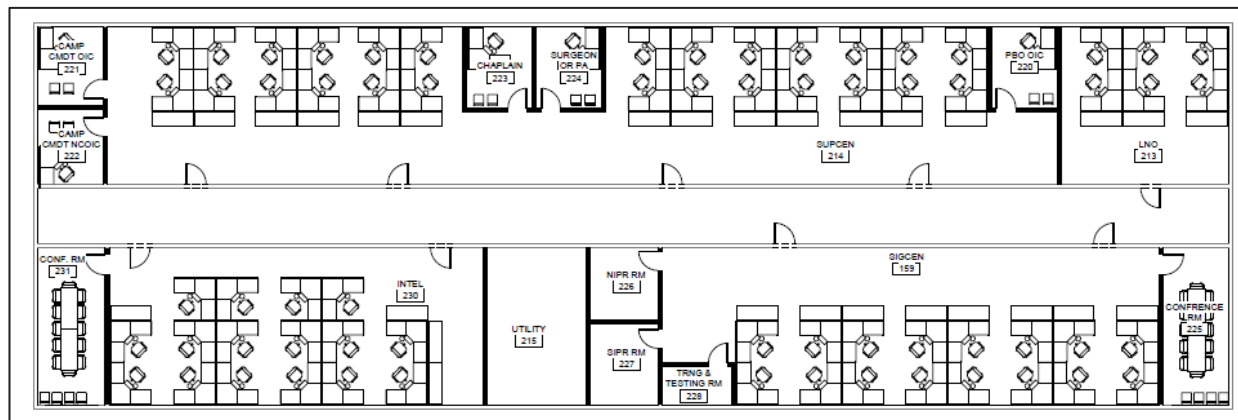
U.S. ARMY

# SOCEUR HQ Design, Undisclosed Location

168 PN  
Two Story SAFE



First Floor



Ground Floor



## Project Information

Design Type	
CoS Design	Standard Adaptive Facility Envelope Two Story (SAFE)
Interior Layout	Customized Headquarters Layout
Design Costs	
Site Adapt. & Design Revisions	\$300k
CoS Fee	\$20k
Construction	
Labor Execution	Contractor
Duration	~18 Months
Cost	N/A



SAFE



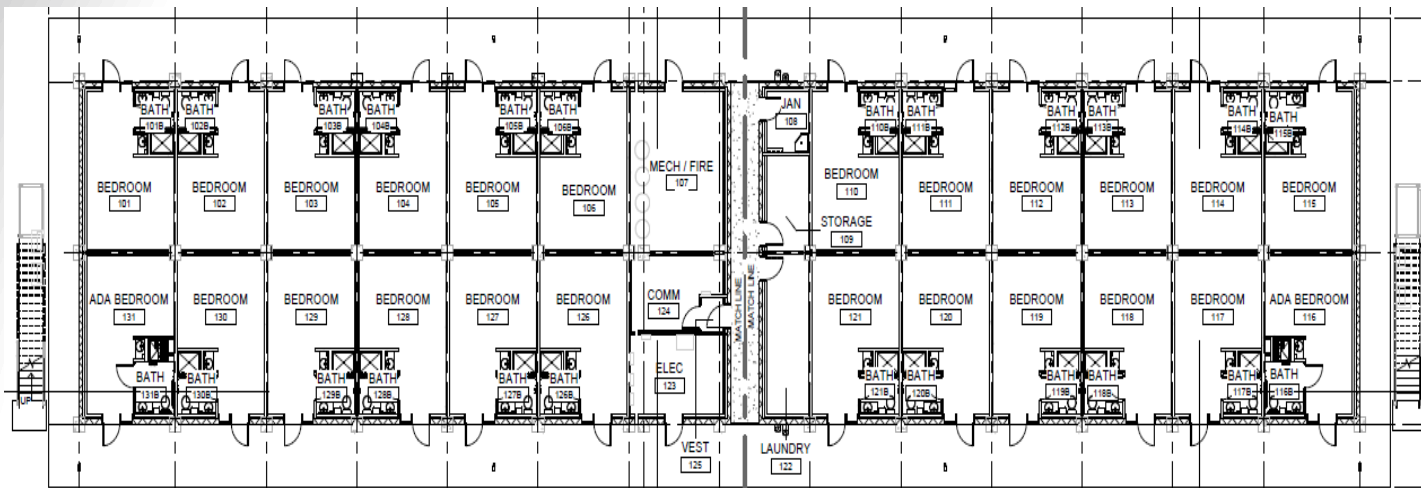


U.S. ARMY

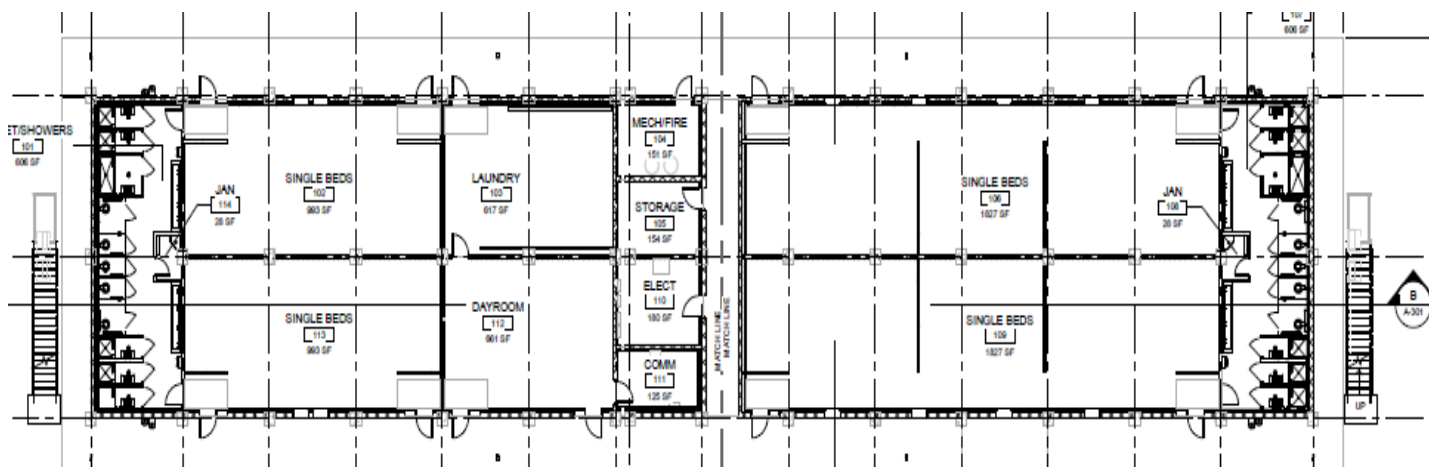
# Camp Santiago Joint Training Center, Puerto Rico

Two Story SAFE- 2+2 Barracks, Open Barracks and  
Private Barack interior layout

67



First Floor- B1 2 + 2 Barracks



Ground Floor- B2- Open Barracks



## Project Information

Design Type	
CoS Design	Two Story (SAFE), converted to permanent construction per customer request
Interior Layout	Customized Barracks with 3 different Layout layouts for 10 buildings total
Construction	
Labor Execution	Contractor
Duration	~24 Months
Cost	\$195M



SAFE



U.S. ARMY

# Camp Santiago Joint Training Center, Puerto Rico

*Two Story SAFE- 2+2 Barracks, Open Barracks and  
Private Barrack interior layout*

68



*B1 2+2 Barracks Room*



*B3 Private Barracks Room*

## Project Information

Design Type	
CoS Design	Two Story (SAFE), converted to permanent construction per customer request
Interior Layout	Customized Barracks with 3 different Layout layouts for 10 buildings total
Construction	
Labor Execution	Contractor
Duration	~24 Months



SAFE



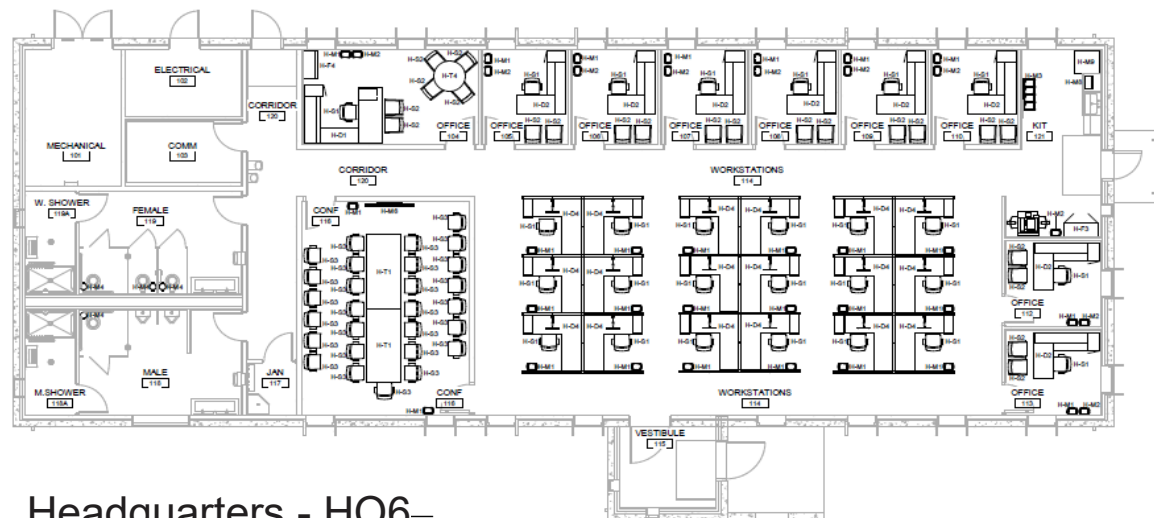


U.S. ARMY

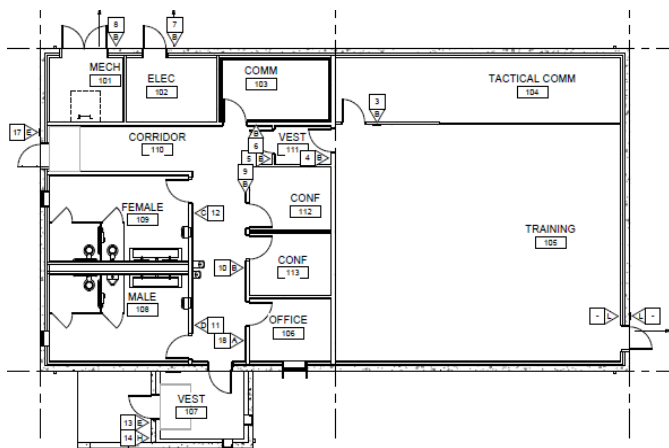
# Camp Santiago Joint Training Center, Puerto Rico

Modified FACE- Headquarters (HQ1, HQ2, HQ4, HQ5 & HQ6)

69



Headquarters - HQ6-



Headquarters-HQ1



## Project Information

Design Type	
CoS Design	(FACE), converted to permanent construction per customer request
Interior Layout	Customized Headquarters with 5 different layouts for 17 buildings total
Construction	
Labor Execution	Contractor
Duration	~24 Months
Cost	\$81M



FACE

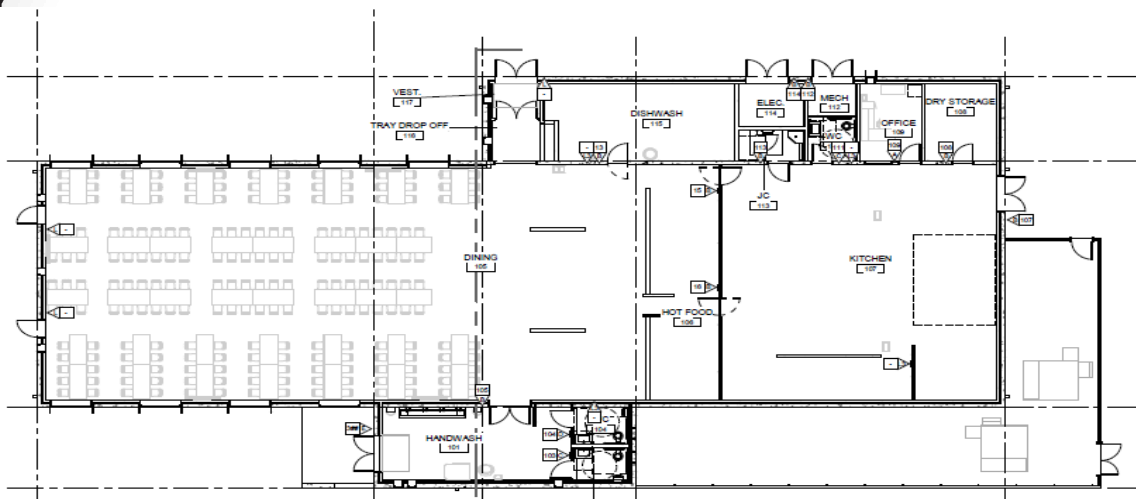




U.S. ARMY

# Camp Santiago Joint Training Center, Puerto Rico

Modified FACE- DFAC



DFAC- D1/D2

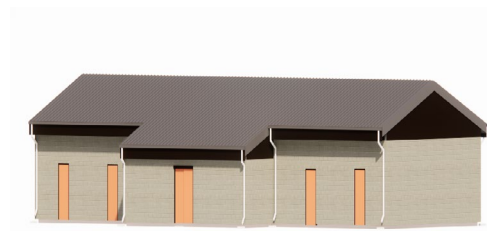


Camp Santiago Joint Training Center (CSJTC)  
Camp Santiago, Salinas, Puerto Rico



## Project Information

Design Type	
CoS Design	(FACE), converted to permanent construction per customer request
Interior Layout	Customized DFAC with 2 different layout
Construction	
Labor Execution	Contractor
Duration	~24 Months
Cost	\$21M

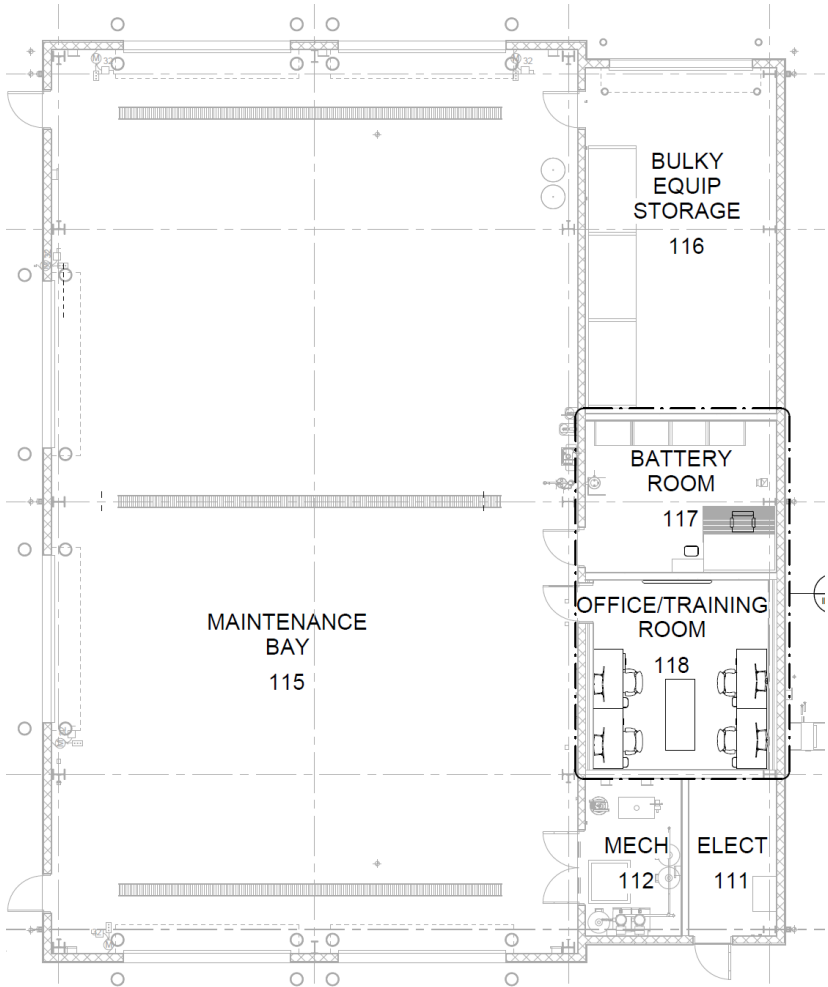


FACE





Modified MUTE for Vehicle Maintenance shop



STX-St. Thomas Vehicle Maintenance Shop



Project Information

Design Type	
CoS Design	(MUTE) converted to permanent construction per customer request
Interior Layout	Customized interior
Design Costs	
Site Adapt. & Design Revisions	\$330K
Construction	
Labor Execution	Contractor
Duration	~12 Months
Estimate Cost	\$4M



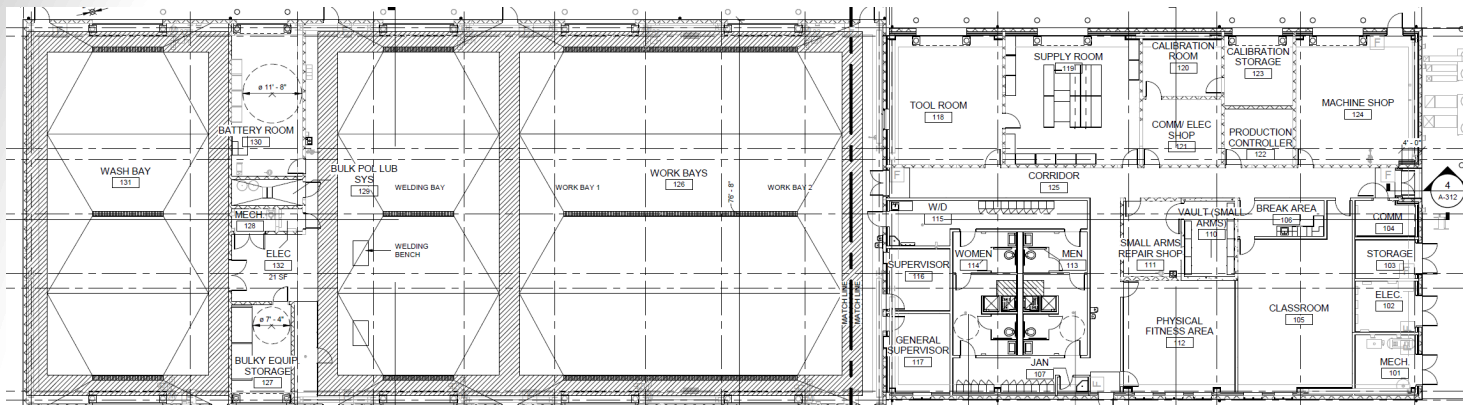
MUTE



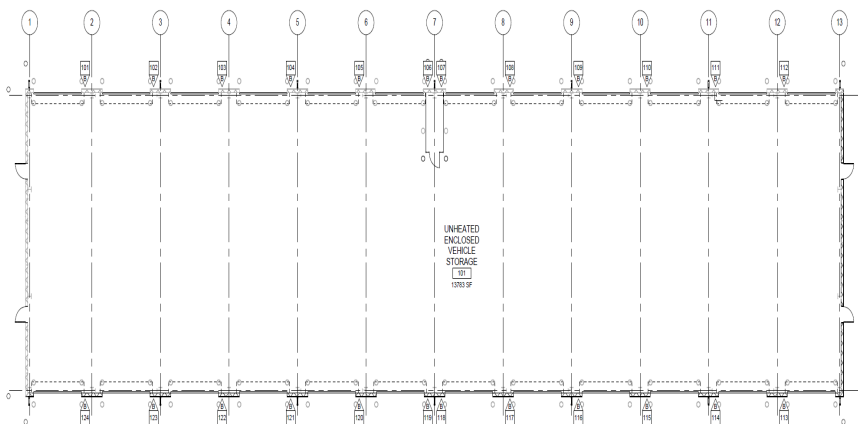
U.S. ARMY

# Virgin Island Army National Guard, US Virgin Islands

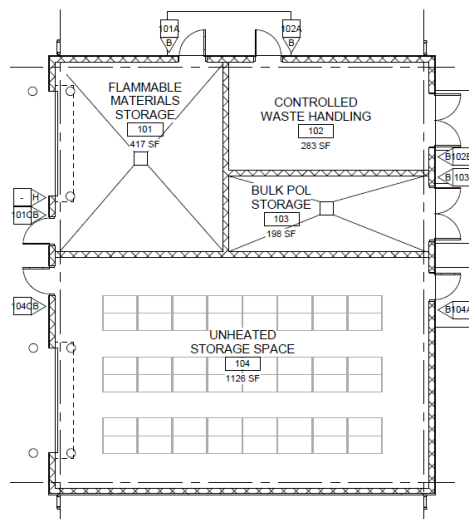
*Modified for Vehicle Maintenance Shop, Vehicle Storage, Enclosed Storage and Fire Pump House*



STX-St. Croix Vehicle Maintenance Shop



STX-St. Croix- Vehicle Storage



STX-St. Croix Enclosed Storage



## Project Information

Design Type	
CoS Design	(MUTE) converted to permanent construction per customer request
Interior Layout	Customized interiors
Design Costs	
Site Adapt. & Design Revisions	\$770K
Construction	
Labor Execution	Contractor
Duration	~22 Months
Estimated Cost	\$29M



MUTE

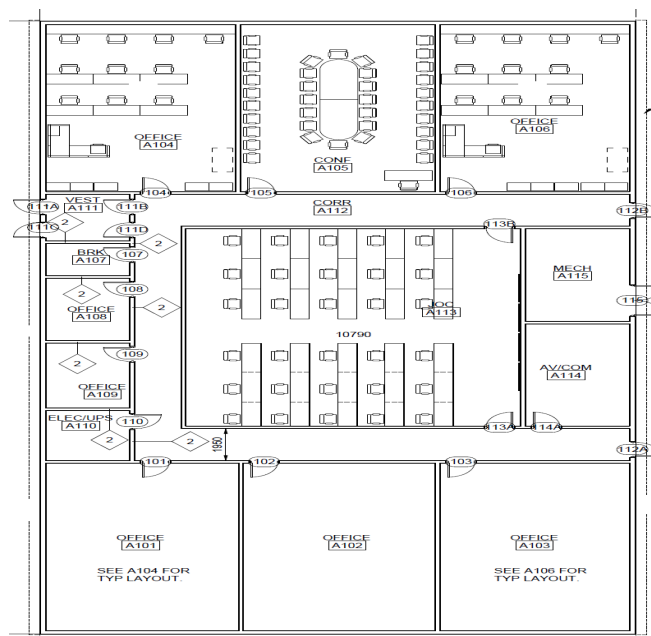


U.S. ARMY

# Automated Cold Form Metal Framing System, Undisclosed Location



## Barracks



## Admin



## Project Information

Design Type	
CoS Design	New Cold Form Design
Interior Layout	Customized Barracks and Admin layouts
Design Costs	
Design	\$300K
Construction	
Labor Execution	Troop Labor
Duration	~18 Months



U.S. ARMY



# ADDITIONAL INFORMATION





U.S. ARMY

# Area Cost Factors

PAX Newsletter, Dated 5-25-2022

<https://www.usace.army.mil/Cost-Engineering/Area-Cost-Factors/>



Alabama	0.88
Alaska	1.95
Arizona	0.85
Arkansas	0.74
California	1.23
Colorado	.99
Connecticut	1.15
Delaware	1.15
Florida	0.86
Georgia	0.87
Hawaii	2.33
Idaho	1.00
Illinois	1.07
Indiana	0.98
Iowa	1.02
Kansas	.89
Kentucky	0.86
Louisiana	0.84
Maine	.99
Maryland	1.03
Massachusetts	1.24
Michigan	.99
Minnesota	1.09
Mississippi	.71
Missouri	1.0
Montana	1.12
Nebraska	0.92
Nevada	1.16
New Hampshire	1.07
New Jersey	1.26
New Mexico	0.92
New York	1.08
North Carolina	0.91
North Dakota	1.11

Ohio	0.94
Oklahoma	0.83
Oregon	1.16
Pennsylvania	1.16
Rhode Island	1.23
South Carolina	0.88
South Dakota	0.97
Tennessee	0.86
Texas	0.88
Utah	1.07
Vermont	1.01
Virginia	0.82
Washington	1.11
Washington DC	1.08
West Virginia	1.05
Wisconsin	1.14
Wyoming	1.00
Afghanistan	1.89
Albania	1.03
American Samoa	1.97
Argentina	0.89
Australia	1.43
Azerbaijan	1.03
Azores	1.50
Bahamas	1.81
Bahrain	1.03
Belgium	0.82
Belize	1.13
Bolivia	1.20
Bosnia	1.02
Brazil	1.09
Bulgaria	0.83
Cambodia	1.12
Chile	0.83

Columbia	0.77
Costa Rica	1.03
Crete	1.33
Croatia	0.74
Cuba	2.31
Czech Republic	0.97
Diego Garcia	2.86
Ecuador	1.11
Egypt	1.08
El Salvador	1.25
Estonia	1.01
Georgia Republic	1.07
Germany	.97
Greece	0.87
Greenland	3.21
Guam	2.75
Guatemala	1.00
Guyana	1.17
Haiti	1.22
Honduras	1.07
Horn Of Africa	1.57
Hungary	0.94
Iceland	1.84
India	0.94
Iraq	1.70
Israel	1.04
Italy	0.91
Japan	2.04
Jordan	1.80
Kenya	1.10
Korea, South	1.12
Kosovo	1.12

Kuwait	1.20
Kwajalein	3.59
Latvia	0.86
Lebanon	1.26
Lithuania	0.80
Netherlands	1.10
Nicaragua	0.93
Northern Marianas	3.42
Oman	1.12
Panama	1.01
Paraguay	0.86
Peru	0.82
Philippines	1.22
Poland	1.01
Puerto Rico	1.38
Qatar	1.16
Romania	0.86
Saudi Arabia	1.23
Singapore	1.19
Spain	1.23
Thailand	0.74
Turkey	1.02
Ukraine	0.99
United Arab Emirates	1.12
United Kingdom	1.19
Uruguay	0.93



# SQUARE FOOTAGE LIMITS FOR OCCUPANCY CATEGORIES

## Assembly – 4-4.3

Description	50+ Persons
Combustible Construction Limit	6000 sf (557 m2)
Non-combustible Construction Limit	9,500 sf (883 m2)
Story Limit	1, 2 if there are sprinklers

## Business – 4-4.4

Description	Transaction of business other than mercantile
Combustible Construction Limit	9,000 sf (836 m2)
Non-combustible Construction Limit	23,000 sf (2,137 m2)
Story Limit	3

## Industrial – 4-4.5

Description	Storage and Vehicle Maintenance
Combustible Construction Limit	8,500 sf (790 m2) 1 story limit
Non-combustible Construction Limit	15,500 sf (1,440 m2) 2 story limit
Additional	Mezzanines may only be used for storage or mechanical/electrical rooms

## Residential – 4-4.6

Description	Sleeping accommodations not for healthcare or detention
Combustible Construction Limit	7,000 sf (650 m2) 2 story limit
Non-combustible Construction Limit	15,000 sf (1,394 m2) 4 story limit

## Aircraft Hangar– 4-4.7

Protect hangar as followed if it exceeds sq(m2) listed	Fire Protection Required?
Single hangar over 15,000 sf (1,394 m2)	YES
Multiple hangars, <15,000 sf per hangar, <50 ft separation	YES
Within 100 ft of a normally occupied structure	YES