STANDARD BUILDING DEFINITIVE DESIGNS

STANDARD BUILDING PACKAGES

FCC	RANGE	No Buildings Required	Range Operations Center (ROC)			Operations Storage	General Instruction	Latrine	Bleacher Enclosure	Covered Mess	Ammo Breakdown	After Action Review		Ammo Loading Dock	Bivouac Area	Unit Staging Area
			Tower	Small Bldg	Large Bldg							Small	Large			
17801	25m Zero		X			X	X	X	X	X	X					
17803	AFF		X			X	X	X	X	X	X					
17805	ARF		X			X	X	X	X	X	X					
17806	MRF		X			X	X	X	X	X	X					
17808	Automated Night Fire	*														
17809	QTR		X			X	2	X	X	X	2					
17812	Automated Sniper Field Fire		X			X	X	X	X	X	X					
17816	Bayonet Assault Course					X										
17822	CP/MPQC		X			X	X	X	X	X	X					
17829	Heavy Sniper		X			X	X	X	X	X	X					
17833	MPMG		X			X	X	X	X	X	X					
17834	MK-19		X			X	X	X	X	X	X					
17845	AAT&LF			X	-	X	X	X	X	X	-	-		X	X	X
17852	Mortar Range							X						X		
17856	Field Artillery Indirect Range	X														
17858	Scout/Recce Gunnery Complex			X	-	X	X	X	X	X	X	X		X	X	X
17859	DMPTR				X	X	X	X	X	X	X	X		X	X	X
17860	DMPRC				X	X	-	X	X	X	X	-	X	X	X	X
17863	Stationary Gunnery				X	X	X	X	X	X	-	X		X	X	X
17865	MPTR				X	X	X	X	X	X	X	X		X	X	X
17868	MPRC(Heavy)				X	X	X	X	X	X	X	X		X	X	X
17870	BAX				X	X	-	X	X	X	X	-	X	X	X	X
17872	Air Defense Missile Range			X		X			X							
17882	Hand Grenade Qualification Course		-			X	X	X	X	X	X					
17883	Hand Grenade Familiarization Range		-			X	X	X	X	X	X					
17884	Grenade Launcher Range		X			X	X	X	X	X	X					
17885	Light Demolition Range	X														
17889	Automated Engineer Qualification Range		-	X		X	X	X	X	X	X	X				
17891	Infiltration Range					X										
17892	Fire and Movement Range			X		X			X		X					
17893	Squad Defense Range		X			X	X	X	X	X	X					
17895	ISBC		-	X		X	X	X	X	X	X					
17897	IPBC		-	X		X	X	X	X	X	X					
17901	CACTF				X	X		X		X			X			
17902	UAC					X		X								
17903	Live Fire Exercise Shoothouse					X		X				X				
17904	Live Fire Exercise Breach Facility	X														
17908	Target Detection Range	X														
17910	Gunship Harmonization Range	**														

* overlaid on MRF or ARF

** overlaid on MPRC

Sheet Number	Title
A-01	ROC - Tower
A-02	ROC - Small
A-03	ROC - Large
A-04	Operations / Storage Building
A-05	General Instruction Building
A-06	Latrine - With Aerated Vault
A-07	Latrine - With Water Closets
A-08	Covered Mess
A-09	Ammo Breakdown Building
A-10	Bleacher Enclosure
A-11	After Action Review - Small
A-12	After Action Review - Large
ALD-1	Ammo Loading Dock

RANGE AND TRAINING LAND PROGRAM MANDATORY CENTER OF EXPERTISE RANGE DESIGN MANUAL

U. S. ARMY ENGINEERING AND
SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

06 June, 2003

US Army Corps of Engineers

Rev. *	Description	Date	Approved

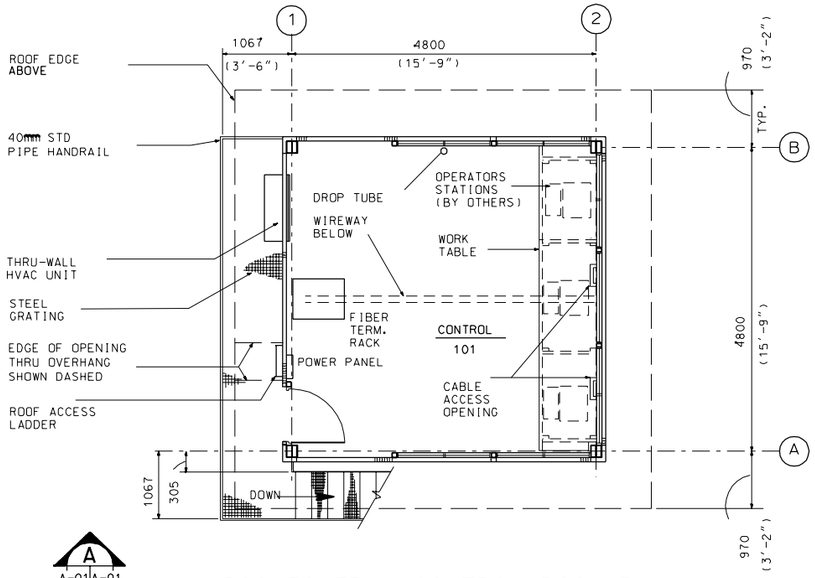
Designed by: | Date: | Rev.
Dwn by: | Ckd by: | Design file no.
Reviewed by: | Drawing code:
Submitted by: | File name: Plot scale: Plot date:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL
COVER SHEET

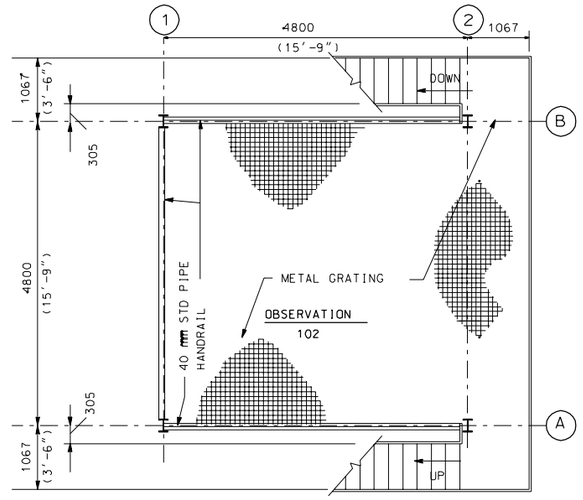
Sheet reference number: G-01

Sheet of



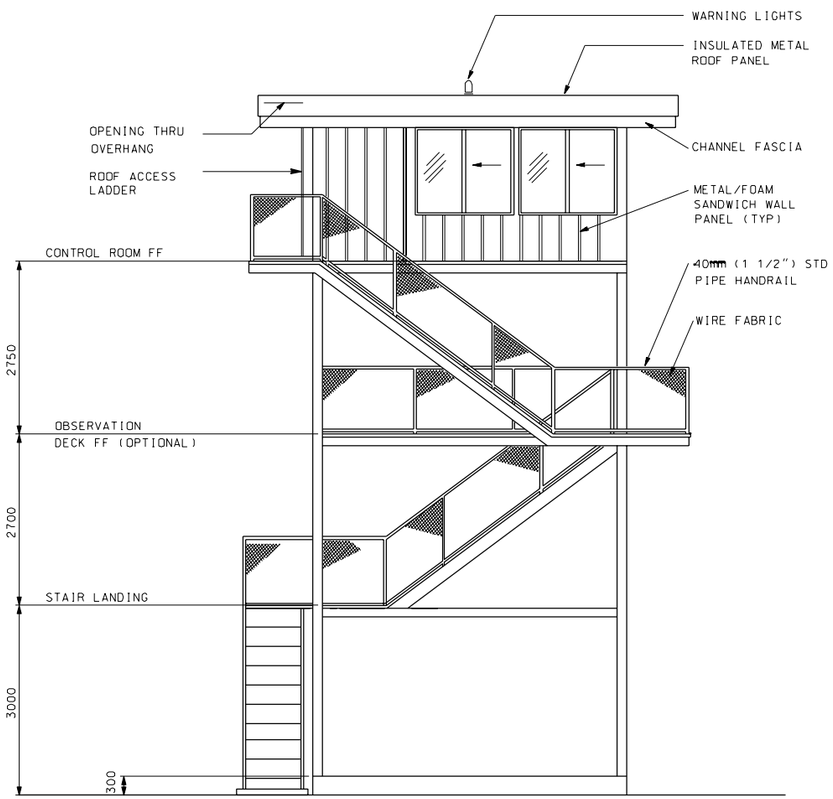
ROC-TOWER - CONTROL ROOM PLAN

SCALE : 1:100



OBSERVATION DECK

SCALE : 1:100



ELEVATION

SCALE : 1:100

A
A-01 A-01

GENERAL

The Range Operations Center (ROC) Tower provides office space for personnel conducting training exercises and space for the installation of the required electronics and communications equipment. An optional observation platform can be constructed below the control room. enclosure of this level is also an option. The occupant load factor is 9.3 net sq. meters (100 sq. feet) (per person) based on a business use. See NFPA 101 table 7.3.1.2. The height of the tower is based on providing line of sight to the firing line and down range areas where required. All dimensions not labeled are in millimeters.

SITE ADAPTATION

This standard definitive design should be adapted to local conditions such as climate, available construction materials and techniques, topography, seismic zone and the existing character of surrounding buildings. These factors may affect plans, elevations and building systems. The building foundation must be designed based on the results of a geotechnical investigation.

REFERENCE CRITERIA

The design and construction must comply with applicable codes and standards including: technical instruction TI 800-01, "Design Criteria"; Department of the Army regulations, technical manuals, handbooks, standards, and specifications; IBC, NEMA, ANSI/TIA/EIA, UL, ASTM, NFPA, etc..

FUNCTIONAL REQUIREMENTS

A work surface is provided for monitors, computers, printers and associated equipment. Windows are fixed and horizontal sliding to meet functional requirements. Provide polycarbonate security glazing in the door. Ice guards may be necessary in northern climates. The tower is accessed only by able-bodied personnel and does not require ADA compliance unless dictated by local criteria.

MECHANICAL

The Mechanical Equipment shall be selected and sized based on site requirements, local weather design criteria, available energy sources, and building construction materials. The mechanical system must maintain an equipment operating temperature of 16 C to 27 C (60 F to 80 F). U-Factor requirements are based on the local climatic conditions in accordance with TI 800-1. Provide a drain to prevent condensate dripping on observation level and stairs below.

ELECTRICAL

The Tower shall be served by 120/240V, 1 phase, 3-wire secondary power. Rigid Steel conduit shall extend a minimum of 1524mm (5') outside of the building foundation for power and communication circuits entering and leaving the building. Voltage drop shall comply with standards in NEC and Army technical manuals. Grounding will be installed in accordance with NFPA 70, the NEC, and other applicable standards.
Receptacles shall be general purpose, 120V, 20A Duplex mounted 450mm (18") above the finished floor. Provide 120/240V power for the HVAC unit.
Illumination levels will be designed in accordance with IES. Interior lighting shall consist of fluorescent lamps at a level of 50 foot-candles. Incandescent fixtures with red lamps on separate switching shall be placed near each fluorescent lamp in the Control Room and on exterior walls of entrance. Exterior lighting shall be provided with separate switching located near points of egress.
The emergency electrical system shall comply with NFPA 70 and NFPA 101. Emergency lighting shall be provided to ensure adequate illumination to egress building in the event of a power outage.
Lightning protection is required for this building in the form of either mast protection or air terminals on the building.

TELEPHONE

Telephone service is not a requirement for range operations. However, service should be provided to the ROC if it is available in the area.

TARGETRY SYSTEM INTERFACE

In addition to the targetry fiber, the targetry system requires a fiber optic connection between the ROC and the AAR if one is included. A fiber optic connection may also be required between the ROC and the Operations Storage Building for target maintenance. The size of the Fiber Termination Rack depends on the type of range and the number of targets. Coordinate with the Targetry Supplier.

FIRE PROTECTION

Fire protection is not required per fire codes for this building. Consult local Fire Marshall for compliance with local requirements.

GRAPHIC SCALES

1:100

1000 500 0 1000 2000

US Army Corps of Engineers

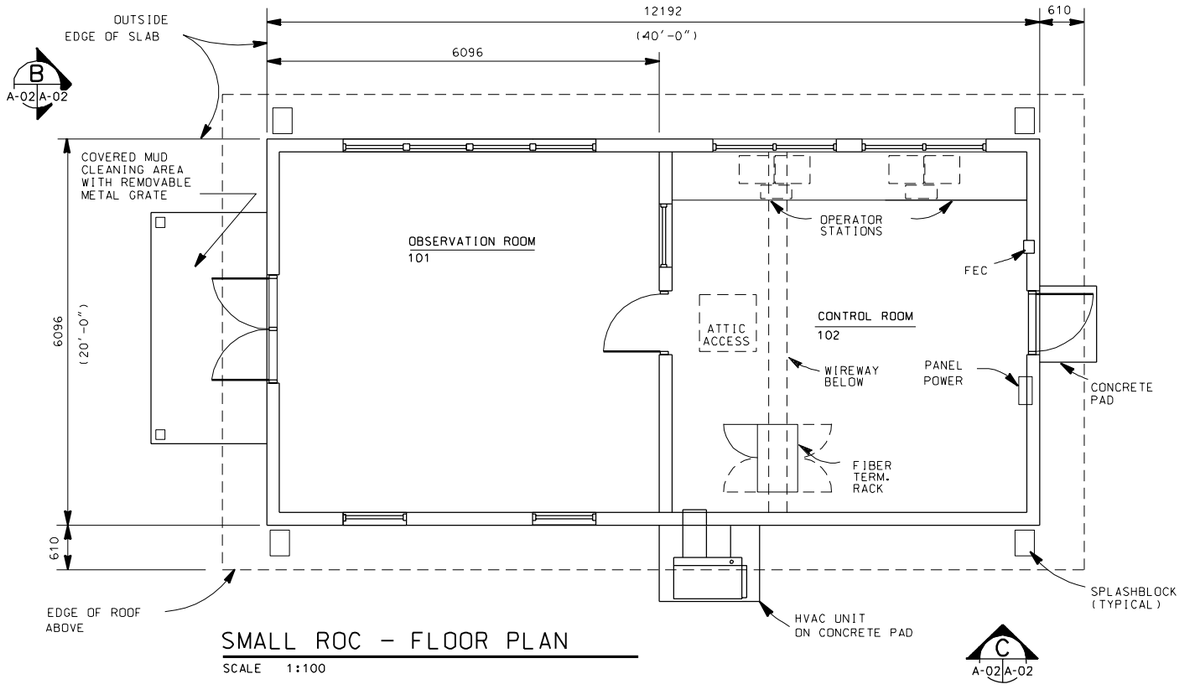
Rev. *	Description	Date	Approved

Designed by:
Date:
Rev.
Own by:
Cad by:
Design file no.
Drawing code:
Reviewed by:
Submitted by:
File name:
Plot date:
Plot scale:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

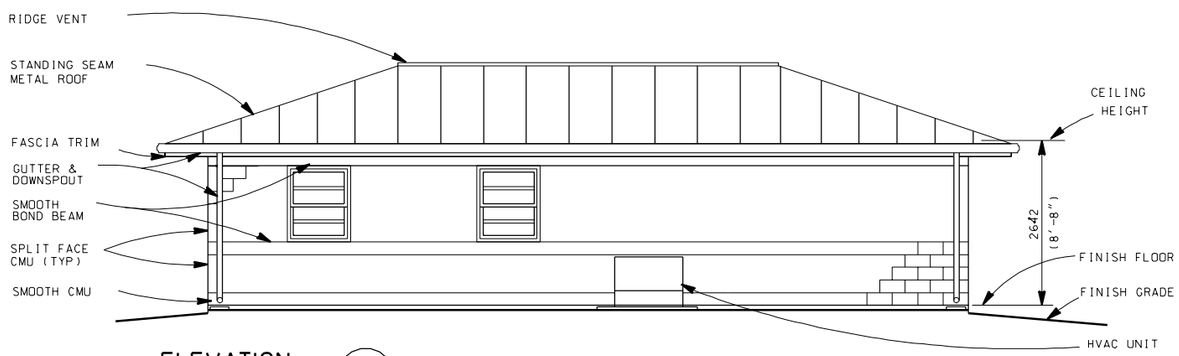
RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL
RANGE OPERATIONS CENTER (ROC)
TOWER

Sheet reference number:
A -01



SMALL ROC - FLOOR PLAN

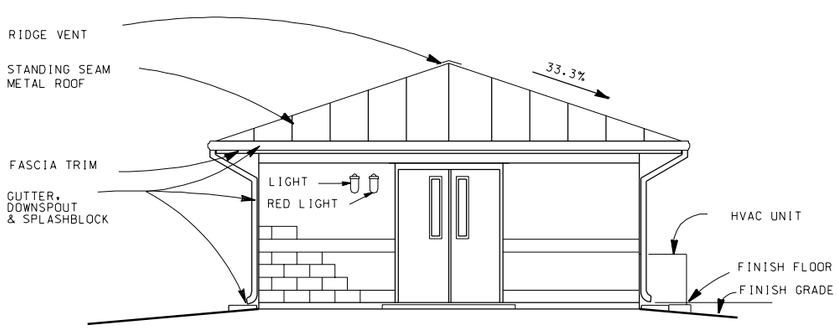
SCALE 1:100



ELEVATION A

SCALE : 1:100

A-02 A-02



ELEVATION B

SCALE : 1:100

A-02 A-02

GENERAL

The Range Operations Center (ROC) provides office space for personnel conduct training exercises and space for the installation of required electronics and communications equipment. The occupant load factor is 9.3 net sq. meters (100 sq. feet) (per person) based on a business use. See NFPA 101 table 7.3.1.2. All dimensions not labeled are in millimeters.

SITE ADAPTATION

This standard definitive design should be adapted to local conditions such as climate, available construction materials and techniques, topography, seismic zone and the existing character of surrounding buildings. These factors may affect plans, elevations and building systems. The building foundation must be designed based on the results of a geotechnical investigation.

REFERENCE CRITERIA

The design and construction must comply with applicable codes and standards including: technical instruction TI 800-01, "Design Criteria"; Department of the Army regulations, technical manuals, handbooks, standards, and specifications; IBC, NEMA, ANSI/TIA/EIA, UL, ASTM, NFPA, etc.

FUNCTIONAL REQUIREMENTS

A work surface is provided for monitors, computers, printers and associated equipment. Where topography allows viewing down range from the control room, windows can be placed above the counter.Windows are double hung to meet functional requirements providing viewing, natural light and ventilation. Windows have forced entry resistant metal frames and are provided with insect screens. Provide polycarbonate security glazing in windows and doors. Floors should be sealed concrete or vinyl tile for ease of cleaning, with gyp. board ceilings.
Gutters, downspouts and splash blocks should be provided where required by climatic conditions. Covered entries and ice guards may be necessary in northern climates. The ROC is accessed only by able-bodied personnel and does not require ADA compliance unless dictated by local criteria.

MECHANICAL

The Mechanical Equipment shall be selected and sized based on site requirements, local weather design criteria, available energy sources, and building construction materials. The mechanical system must maintain an equipment operating temperature of 16 C to 27 C (60 F to 80 F) in the control room. U-factor requirements are based on the local climatic conditions in accordance with TI 800-1.

ELECTRICAL

The ROC shall be served by 120/240V, 1 phase, 3-wire secondary power. Rigid Steel conduit shall extend a minimum of 1524mm (5') outside of the building foundation for power and communication circuits entering and leaving the building. Voltage drop shall comply with standards in NEC and Army technical manuals. Grounding will be installed in accordance with NFPA 70, the NEC, and other applicable standards.
The panelboards shall be recess mounted in finished areas. Receptacles shall be general purpose, 120V, 20A Duplex mounted 450mm (18") above the finished floor. All outlets, receptacles, and conduit shall be recess mounted in finished areas. Provide 120/240V power for the HVAC unit.
Illumination levels will be designed in accordance with IES. Interior lighting shall consist of fluorescent lamps at a level of 50 foot-candles. Incandescent fixtures with red lamps on separate switching shall be placed near each fluorescent lamp in the Control Room and on exterior walls of entrance. Exterior lighting shall be provided with separate switching located near points of egress.
The emergency electrical system shall comply with NFPA 70 and NFPA 101. Emergency lighting shall be provided to ensure adequate illumination to egress building in the event of a power outage.
Lightning protection is required for this building in the form of either mast protection or air terminals on the building.

TELEPHONE

Telephone service is not a requirement for range operations. However, service should be provided to the ROC if it is available in the area.

TARGETRY SYSTEM INTERFACE

In addition to the targetry fiber, the targetry system requires a fiber optic connection between the ROC and the AAR if one is included. A fiber optic connection may also be required between the ROC and the Operations Storage Building for target maintenance. The size of the Fiber Termination Rack depends on the type of range and the number of targets. Coordinate with the Targetry Supplier.

FIRE PROTECTION

Fire protection is not required per fire codes for this building. Consult local Fire Marshall for compliance with local requirements.

GRAPHIC SCALES

1:100 1000 500 0 1000 2000

US Army Corps of Engineers

Rev.	Description	Date	Approved

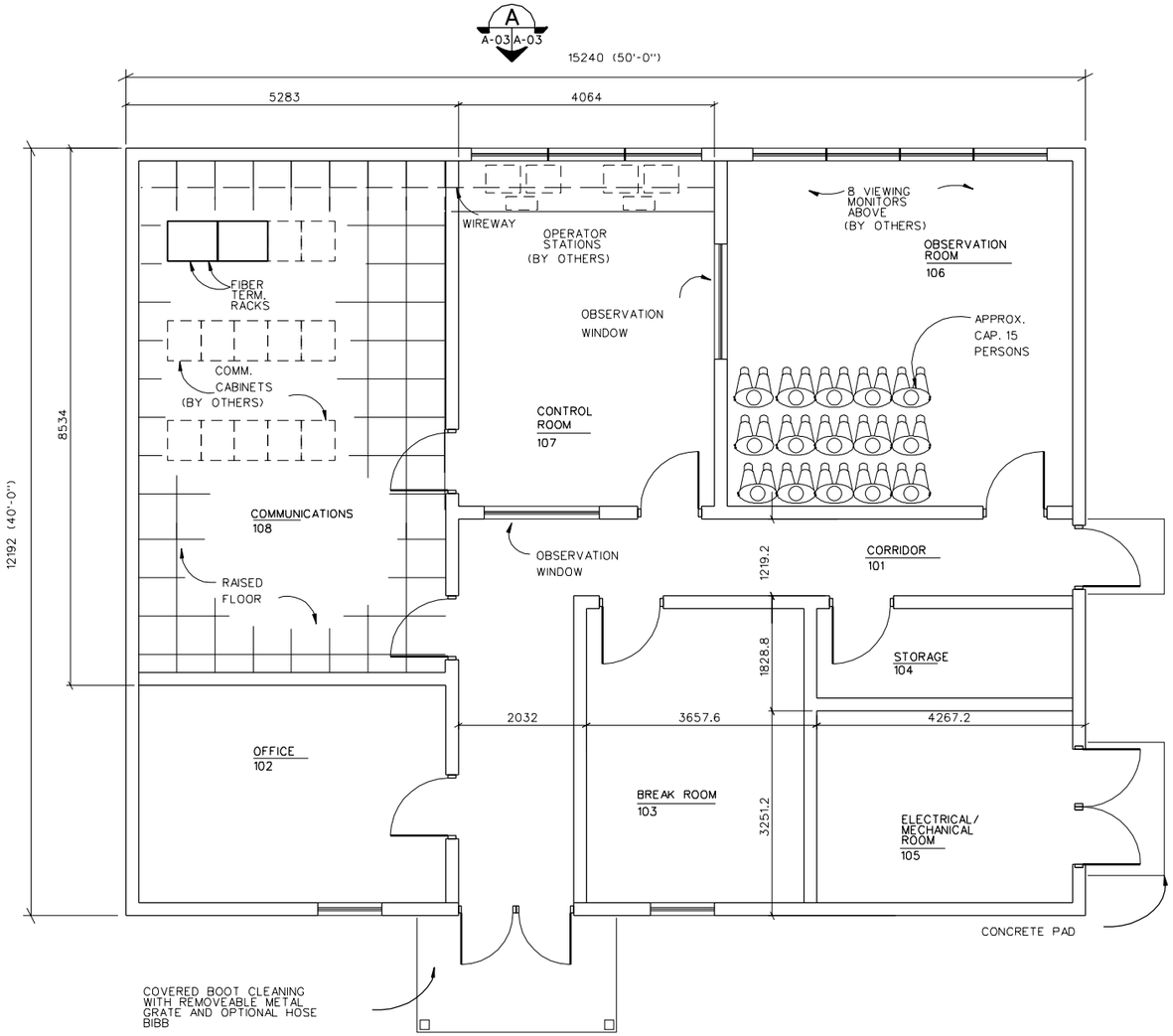
Designed by: Date: Rev.
Dwn by: Ckd by: Design file no.
Reviewed by: Drawing code:
Submitted by: File name: Plot date: Plot scale:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

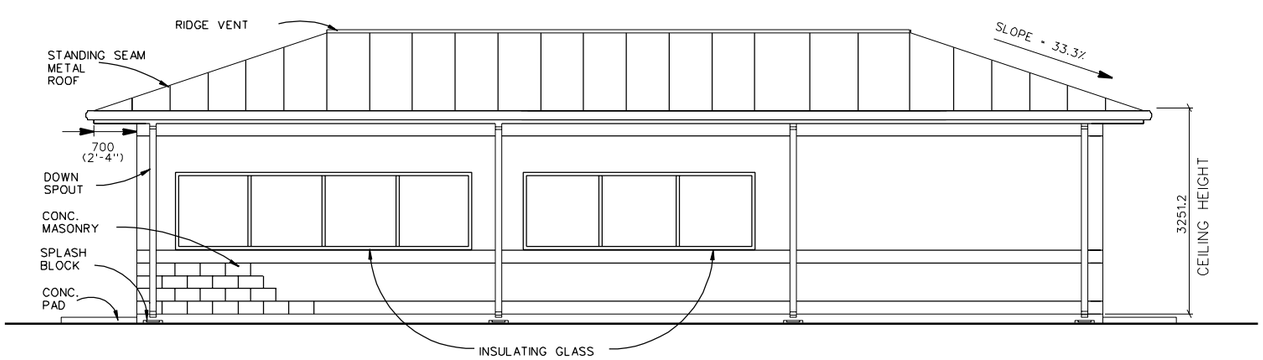
RANGE OPERATIONS CENTER (ROC)
SMALL

Sheet reference number:
A -02



LARGE ROC - FLOOR PLAN

SCALE 1:100



ELEVATION A

SCALE 1:100 A-03|A-03

GENERAL

The Large Range Operations Center (ROC) provides office space for personnel conducting training exercises. Space is also provided for the installation of the required electronics, communications and mechanical equipment. An observation room is provided to view down range exercises. The occupant load factor is 9.3 net sq. meters (100 sq. feet) (per person) based on a business use. See NFPA 101 table 7.3.1.2. All dimensions not labeled are in millimeters.

SITE ADAPTATION

This standard definitive design should be adapted to local conditions such as climate, available construction materials and techniques, topography, seismic zone and the existing character of surrounding buildings. These factors may affect plans, elevations and building systems. The building foundation must be designed based on the results of a geotechnical investigation.

REFERENCE CRITERIA

The design and construction must comply with applicable codes and standards including: technical instruction TI 800-01, "Design Criteria"; Department of the Army regulations, technical manuals, handbooks, standards, and specifications; IBC, NEMA, ANSI/TIA/EIA, UL, ASTM, NFPA, etc.

FUNCTIONAL REQUIREMENTS

All dimensions not labeled are in millimeters. Floors should be vinyl composition tile with vinyl base in all areas except the floor in the electrical/mechanical room should be sealed concrete. Acoustical tile ceilings are used through out the facility expect the ceiling in the mechanical/electrical room should be left exposed to the structure above. Windows are fixed to meet functional requirements providing natural lighting and viewing. Windows have forced entry resistant metal frames and polycarbonate security glazing. Floors should be sealed concrete or vinyl tile for ease of cleaning, with acoustical drop ceilings.
Gutters, downspouts and splash blocks should be provided where required by climatic conditions. Covered entries and ice guards may be necessary in northern climates. The Large ROCA is accessed only by able-bodied personnel and does not require ADA compliance unless dictated by local criteria.

MECHANICAL

The Mechanical Equipment shall be selected and sized based on site requirements, local weather design criteria, available energy sources, and building construction materials. The mechanical system must maintain an equipment operating temperature of 16 C to 27 C (60 F to 80 F) in the Communication and Control Rooms. U-Factor requirements are based on the local climatic conditions in accordance with TI 800-1. Install appropriate heating and air conditioning equipment in the mechanical room with fans, ductwork, and controls. Route ductwork to provide an even distribution of conditioned air throughout the building to meet occupant comfort and outdoor air requirements. Provide diffusers and dampers to allow for manual balancing

ELECTRICAL/COMMUNICATIONS

The Large ROC shall be served by either 120/240V, 1 phase, 3-wire secondary power or 277/480V, 3 phase, 4-wire and 120/240V, 1 phase, 3-wire secondary power. Rigid Steel conduit shall extend a minimum of 1524mm (5') outside of the building foundation for power and communication circuits entering and leaving the building. Voltage drop shall comply with standards in NEC and Army technical manuals. Grounding will be installed in accordance with NFPA 70, the NEC, and other applicable standards.
The panelboards shall be recess mounted in finished areas. Receptacles shall be general purpose, 120V, 20A Duplex mounted 450mm (18") above the finished floor. All outlets, receptacles, and conduit shall be recess mounted in finished areas. Provide 277/480V or 120/240V power for the HVAC unit.
Illumination levels will be designed in accordance with IES. Interior lighting shall consist of fluorescent lamps at a level of 50 foot-candles. Incandescent fixtures with red lamps on separate switching shall be placed near each fluorescent lamp in the Observation Room, the Control Room, and on exterior walls of entrances. Exterior lighting shall be provided with separate switching located near points of egress.
The emergency electrical system shall comply with NFPA 70 and NFPA 101. Exit signs will be provided in accordance with NFPA 101. Emergency lighting shall be provided to ensure adequate illumination to egress building in the event of a power outage.
Lightning protection is required for this building in the form of either mast protection or air terminals on the building.

TELEPHONE

Telephone service is not a requirement for range operations. However, service should be provided to the ROC if it is available in the area.

TARGETRY SYSTEM INTERFACE

In addition to the targetry fiber, the targetry system requires a fiber optic connection between the ROC and the AAR if one is included. A fiber optic connection may also be required between the ROC and the Operations Storage Building for target maintenance. The size of the Fiber Termination Rack depends on the type of range and the number of targets. Coordinate with the Targetry Supplier.

FIRE PROTECTION

Fire Protection is not required per fire codes for this building. Consult local Fire Marshall for compliance with local laws.

GRAPHIC SCALES

1:100 1000 500 0 1000 2000

US Army Corps of Engineers

Rev.	Description	Date	Approved

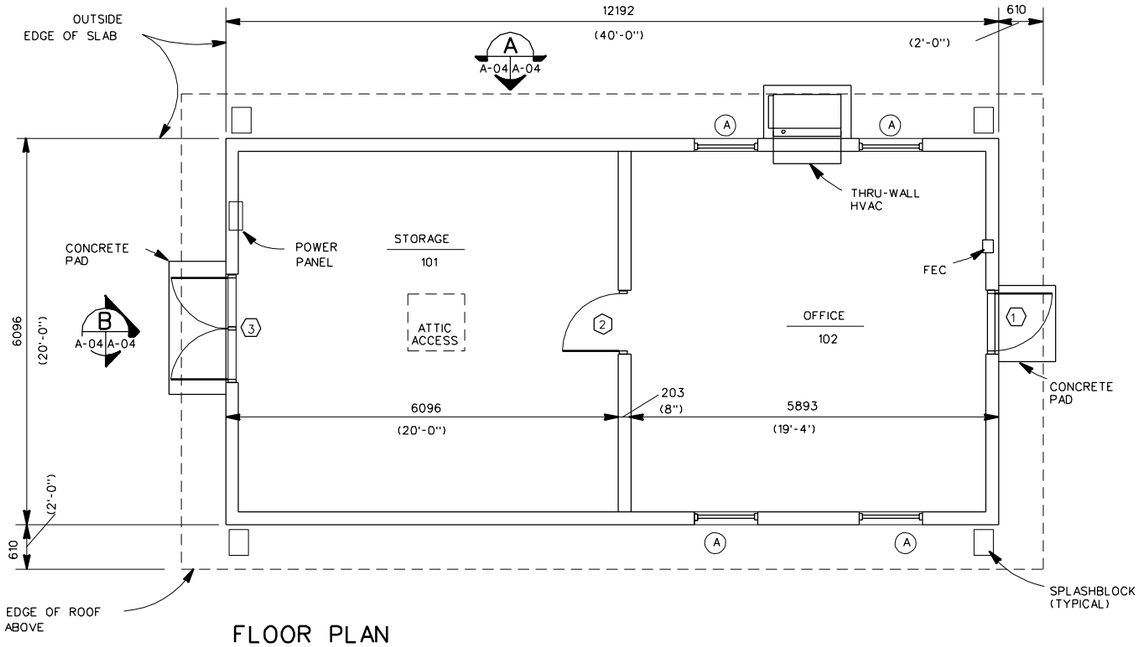
Designed by: Date: Rev.
Dwn by: Ckd by: Design file no.
Reviewed by: Drawing code:
Submitted by: File name: Plot date: Plot scale:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

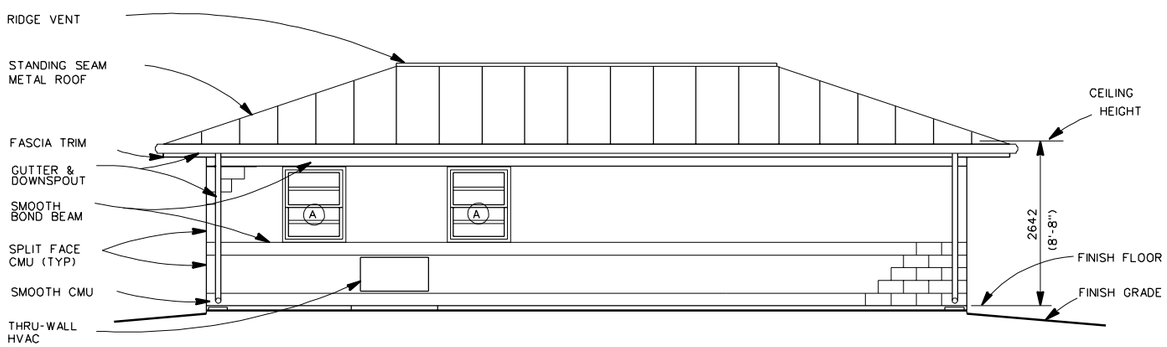
RANGE OPERATIONS CENTER (ROC)
LARGE

Sheet reference number:
A-03



FLOOR PLAN

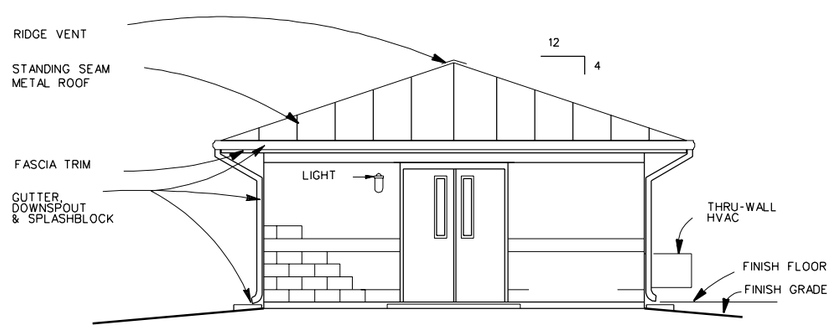
SCALE : 1:100



ELEVATION A

SCALE : 1:100

A-04 A-04



ELEVATION B

SCALE : 1:100

A-04 A-04

GENERAL

The Operations/Storage Building provides office space for range personnel and stores supplies, spare parts and tools. Target maintenance is also accomplished in the facility. The office and storage areas each require 37.2 square meters (400 square feet) for a total of 74.3 square meters (800 square feet). The occupant load factor is 9.3 net sq. meters (100 sq. feet) (per person) based on a business use. See NFPA 101 table 7.3.1.2.

SITE ADAPTATION

This standard definitive design should be adapted to local conditions such as climate, available construction materials and techniques, topography, seismic zone and the existing character of surrounding buildings. These factors may affect plans, elevations and building systems. The building foundation must be designed based on the results of a geotechnical investigation.

REFERENCE CRITERIA

The design and construction must comply with applicable codes and standards including: technical instruction TI 800-01, "Design Criteria"; Department of the Army regulations, technical manuals, handbooks, standards, and specifications; IBC, NEMA, ANSI/TIA/EIA, UL, ASTM, NFPA, etc.

FUNCTIONAL REQUIREMENTS

All dimensions not labeled are in millimeters. Windows are double hung to meet functional requirements providing natural lighting and ventilation. Windows have forced entry resistant metal frames and are provided with insect screens. Provide polycarbonate security glazing in windows and doors. Gutters, downspouts and splash blocks should be provided where required by climatic conditions. Provide concrete pad at ground level below A/C unit for ground maintenance. Extend 150 mm (6") beyond edge of unit on three sides. Covered entries and ice guards may be necessary in northern climates. The office area should be provided with a finished ceiling.
The Operations/Storage Building is accessed only by able-bodied personnel and does not require ADA compliance unless dictated by local criteria.

MECHANICAL

The Mechanical Equipment shall be selected and sized based on site requirements, local weather design criteria, available energy sources, and building construction materials. The addition of a Mechanical Room may be necessary to accommodate certain types of mechanical equipment. U-Factor requirements are based on the local climatic conditions in accordance with TI 800-1.

ELECTRICAL

The Operations/Storage Building shall be served by 120/240V, 1 phase, 3-wire secondary power. Rigid Steel conduit shall extend a minimum of 1524mm (5') outside the building for power and communication circuits entering and leaving the building. Voltage drop shall comply with standards in NEC and Army technical manuals. Grounding will be installed in accordance with NFPA 70, the NEC, and other applicable standards. The panel board shall be 120/240V single phase, mounted inside building.
Receptacles shall be general purpose, 120V, 20A Duplex mounted 450mm (18") above the finished floor. Two special 4-wire, twist-lock, 120/240 V receptacles for target maintenance shall be mounted in each room in accessible locations. All outlets, receptacles, and conduit in the office area shall be recess mounted. Provide 120/240V power for the HVAC unit
Illumination levels will be designed in accordance with IES. Interior lighting shall consist of fluorescent lamps at a level of 50 foot-candles. Exterior lighting shall be provided with separate switching located near points of egress.
The emergency electrical system shall comply with NFPA 70 and NFPA 101. Exit signs will be provided in accordance with NFPA 101. Emergency lighting shall be provided to ensure adequate illumination to egress building in the event of a power outage.
Lightning Protection is not required for this building.

TELEPHONE

Telephone service is not a requirement for range operations. However, service should be provided to the Ops/Stg Building if it is available in the area.

TARGETRY SYSTEM INTERFACE

A fiber optic connection may be required to the ROC in order to perform target maintenance, coordinate with targetry supplier.

FIRE PROTECTION

Fire Protection is not required per fire codes for this building. Consult local Fire Marshall for compliance with ocal laws.

GRAPHIC SCALES

1:100 1000 500 0 1000 2000

US Army Corps of Engineers

Rev.	Description	Date	Approved
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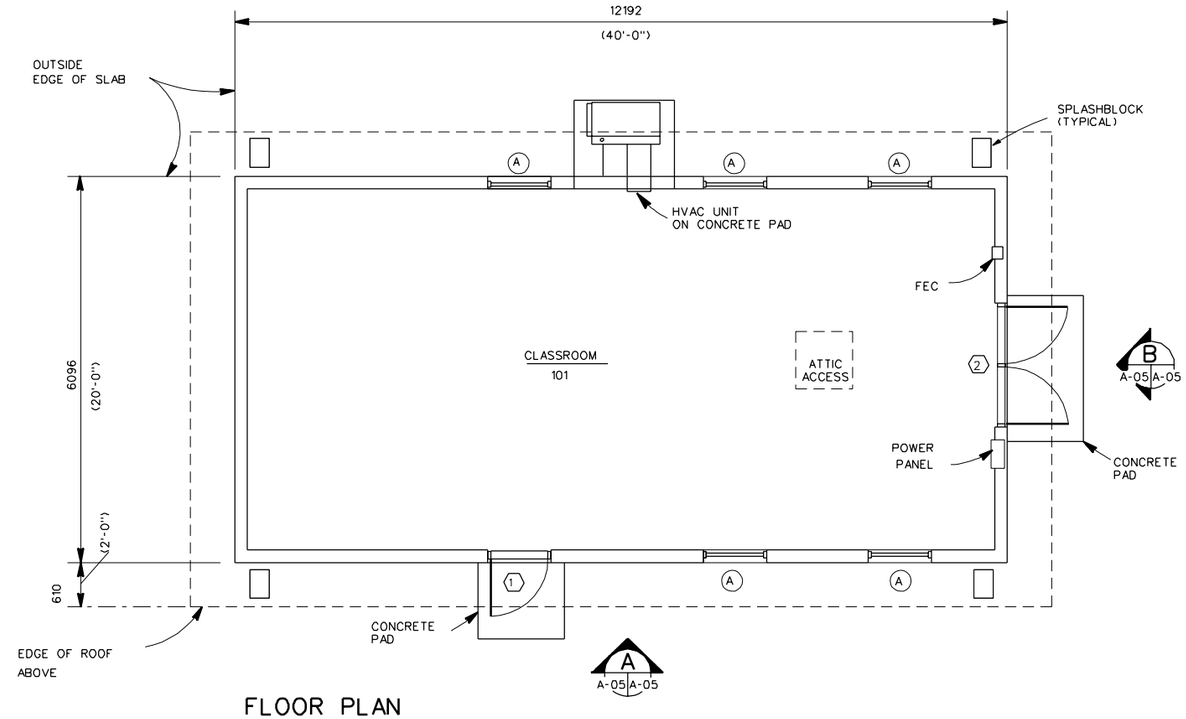
Designed by: Date: Rev.
Dwn by: Ckd by: Design file no.
Reviewed by: Drawing code: STD 171-23-01
Submitted by: File name: STDATLDGN
Rev date:
Plot date:
Plot scale:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

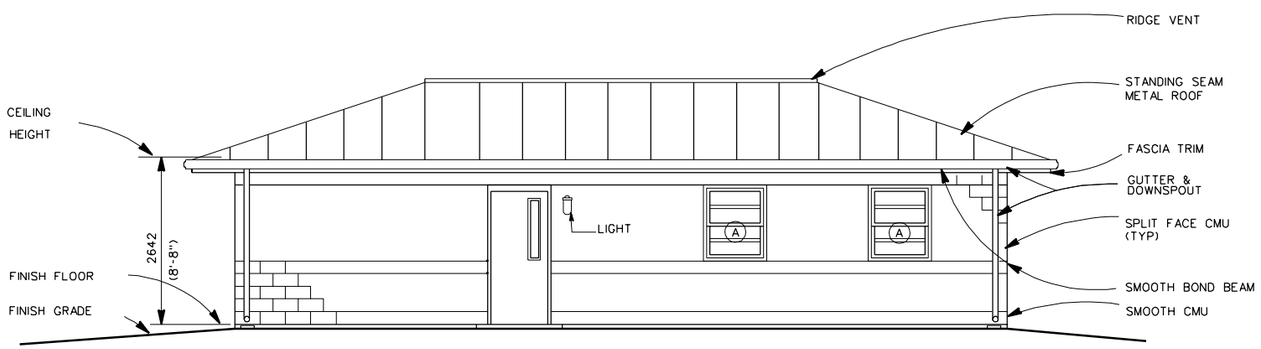
OPERATIONS / STORAGE BUILDING

Sheet reference number:
A -04



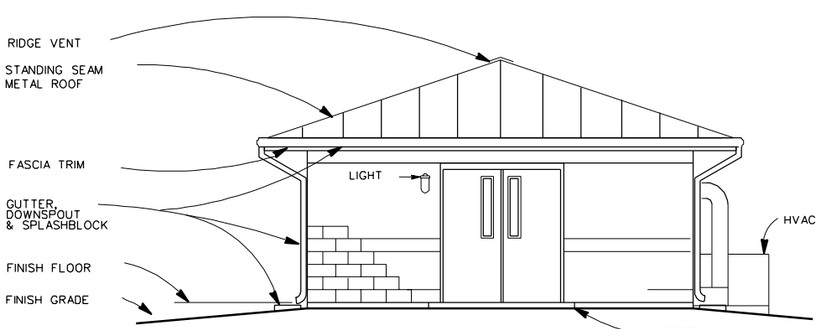
FLOOR PLAN

SCALE : 1:100



ELEVATION A

SCALE : 1:100 A-05 A-05



ELEVATION B

SCALE : 1:100 A-05 A-05

GENERAL

The General Instruction Building is used for troop instruction before and after training exercises. The facility is 74.3 square meters (1600 square feet) in area. The building will provide space for 40 desks and approximately 1.2 square meters (12.7 square feet) per person for circulation. The occupant load factor is 1.4 net sq. meters (15 net sq. Feet) per person based on an assembly use, less concentrated, without fixed seating. See NFPA 101 table 7.3.1.2.

SITE ADAPTATION

This standard definitive design should be adapted to local conditions such as climate, topography, seismic zone, available construction materials and techniques and the existing character of surrounding buildings. These factors may affect plans, elevations and building systems. The building foundation must be designed based on the results of a geotechnical investigation.

REFERENCE CRITERIA

The design and construction must comply with applicable codes and standards including: technical instruction TI 800-01, "Design Criteria"; Department of the Army regulations, technical manuals, handbooks, standards, and specifications: IBC, NEMA, ANSI/TIA/EIA, UL, ASTM, NFPA, etc.

FUNCTIONAL REQUIREMENTS

All dimensions not labeled are in millimeters. Windows are double hung to meet functional requirements providing natural lighting and ventilation. Windows have forced entry resistant metal frames and are provided with insect screens. Provide polycarbonate security glazing in windows and doors. Gutters, downspouts and splash blocks should be provided where required by climatic conditions. Covered entries and ice guards may be necessary in northern climates. Floors should be vinyl tile r sealed concrete for ease of cleaning, ceilings should be finished.
The General Instruction Building is accessed only by able-bodied personnel and does not require ADA compliance unless dictated by local criteria.

MECHANICAL

The mechanical equipment shall be sized in accordance with site requirements, local weather design criteria and the material of building construction. Building dimensions may be changed to include a mechanical room to accommodate a more advantageous form of heating such as a gas furnace in lieu of a heat pump. Provide concrete pad below A/C unit. Pad shall extend 6" beyond edge of unit on 3 sides.

ELECTRICAL

The instruction building shall be served by 120/240V, 1 phase, 3-wire secondary power. Rigid Steel conduit shall extend a minimum of 1524mm (5') outside the building for power and communication circuits entering and leaving the building. Voltage drop shall comply with NEC standards and Army technical manuals. Grounding will be installed in accordance with NFPA 70, the NEC, and other applicable standards.
The panel board shall be 120/240V single phase, mounted inside building. Receptacles shall be general purpose, 120V, 20A Duplex mounted 450mm (18") above the finished floor. All outlets, receptacles, and conduit shall be recess mounted. Provide 120/240V power for the HVAC unit.

Illumination levels will be designed in accordance with IES. Interior lighting shall consist of fluorescent lamps at a level of 50 foot-candles. Exterior lighting shall be provided with separate switching located near points of egress.
The emergency electrical system shall comply with NFPA 70 and NFPA 101. Exit signs will be provided in accordance with NFPA 101. Emergency lighting shall be provided to ensure adequate illumination to egress building in the event of a power outage.
Lightning Protection is NOT required for this building.

FIRE PROTECTION

Fire Protection is NOT required per fire codes for this building. Consult local Fire Marshall for compliance with local laws.

GRAPHIC SCALES

1:100 1000 500 0 1000 2000

US Army Corps of Engineers

Rev. #	Description	Date	Approved

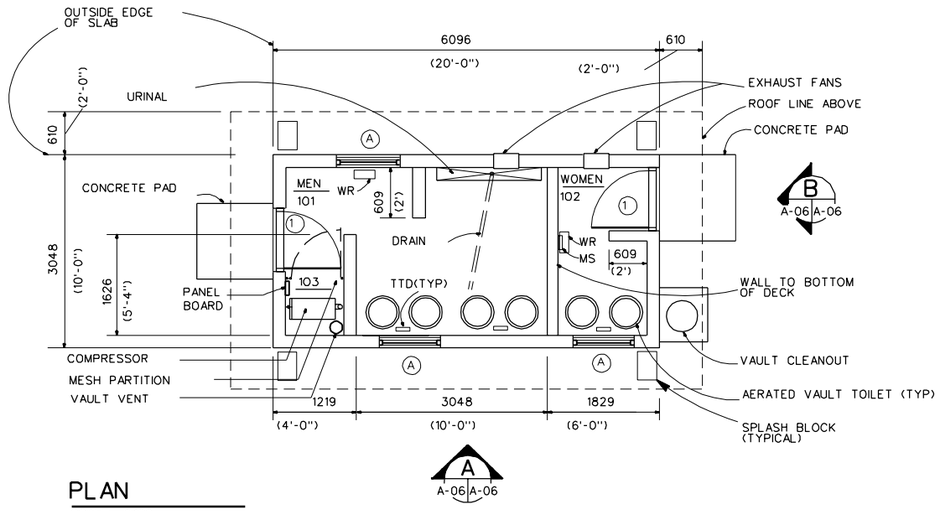
Designed by: | Date: | Rev.
Dwn by: | Ckd by: | Design file no.
Reviewed by: | Drawing code: STD 171-20-01
Submitted by: | File name: S1DA02.DGN
Plot scale:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

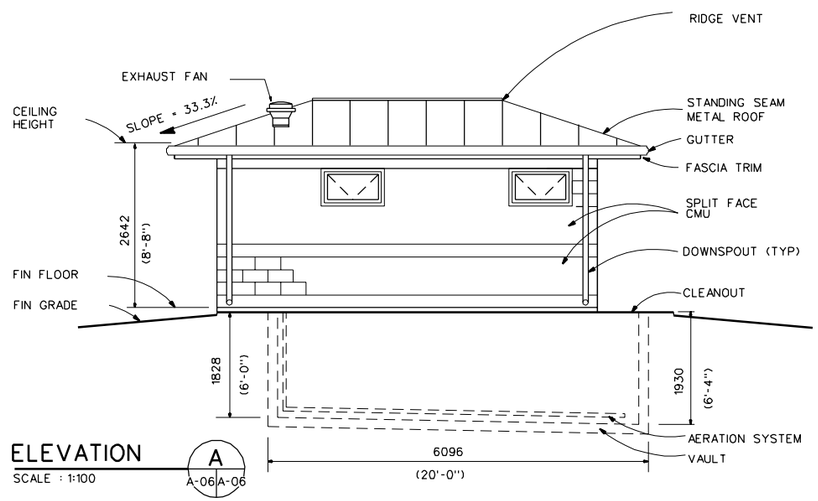
GENERAL INSTRUCTION BUILDING

Sheet reference number:
A -05



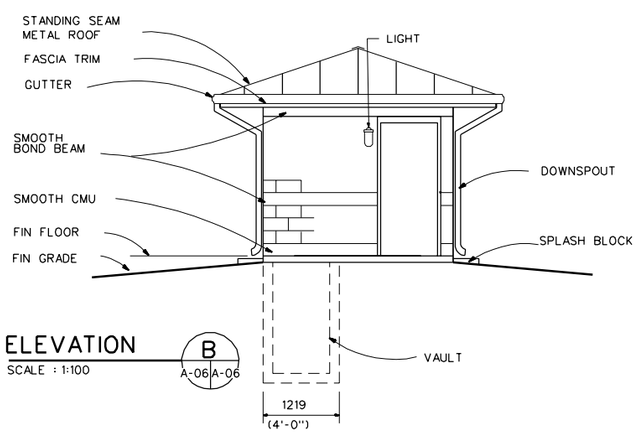
PLAN

SCALE : 1:100



ELEVATION

SCALE : 1:100



ELEVATION

SCALE : 1:100

GENERAL

The latrine with an aerated vault provides restroom facilities for men and women. The latrine will accommodate a training unit of up to 190 men and 35 women based on OSHA standards. An aerated vault is constructed beneath the building.

SITE ADAPTATION

This standard definitive design should be adapted to local conditions such as climate, available construction materials and techniques, topography, seismic zone and the existing character of surrounding buildings. These factors may affect plans, elevations and building systems. The building foundation must be designed based on the results of a geotechnical investigation.

REFERENCE CRITERIA

The design and construction must comply with applicable codes and standards including: technical instruction TI 800-01, "Design Criteria"; Department of the Army regulations, technical manuals, handbooks, standards, and specifications; IBC, NEMA, ANSI/TIA/EIA, UL, ASTM, NFPA, etc.

FUNCTIONAL REQUIREMENTS

All dimensions are in millimeters unless otherwise labeled. Windows are bottom hinged inswinging to meet functional requirements providing natural lighting and ventilation. Windows have forced entry resistant metal frames and are provided with insect screens. Provide polycarbonate security translucent glazing in windows. An 18-gauge diamond mesh partition 2438 mm (8'-0") high with a 762mm (2'-6") x 2133 mm (7'-0") diamond mesh door encloses the mechanical area. Gutters, downspouts and splash blocks should be provided where required by climatic conditions. Covered entries and ice guards may be necessary in northern climates. Floors shuld be sealed for ease of cleaning. Ceilings shild be finished.
The latrine is accessed only by able-bodied personnel and does not require ADA compliance unless dictated by local criteria.

MECHANICAL

No HVAC is required for the facility; however, some installations may wish to include comfort heating. Exhaust fans and louvers provide ventilation to the rooms. An additional larger roof mounted exhaust fan draws air directly out of the Vault.
The Aerated Vault is designed to use an aeration system to reduce the volume of waste. Air from the compressor is piped to a 20mm PVC pipe distribution system 150mm above the bottom of the vault. The water level must be maintained a minimum of 150mm above the aeration system piping. Chemical and other foreign substances must not be put into the vault. The vault must include an exterior cast iron manhole cover to provide access for pumping the tank. The compressor and vault exhaust fan should run continuously, the room exhaust fans should be switched with the lights.

ELECTRICAL

The latrine shall be served by 120/240V, 1 phase, 3-wire secondary power. Rigid steel conduit shall extend a minimum of 1524mm (5') outside the building for power circuits entering and leaving the building. Voltage drop shall comply with standards in NEC and Army technical manuals. Grounding will be installed in accordance with NFPA 70, the NEC, and other applicable standards.
The panel board shall be 120/240V single phase, mounted inside building. Receptacles shall be GFCI, 120V, 20A Duplex mounted 305mm (12") above the finished floor.
Illumination levels will be designed in accordance with IES. Interior lighting shall consist of fluorescent lamps at a level of 20 foot-candles. Each room shall be provided with separate switching. Exterior lighting shall be provided with separate switching located near points of egress.
Per NFPA 101 annex A, exit signs are not required for the latrine.
Lightning protection is not required for this building.

FIRE PROTECTION

Fire protection is not required per fire codes for this building. Consult local Fire Marshall for compliance with local laws.

ABBREVIATIONS

MS - Mirror with shelf TTD - toilet tissue dispenser WR - waste receptacle

GRAPHIC SCALES

1:100 1000 500 0 1000 2000

US Army Corps of Engineers

Rev.	Description	Date	Approved
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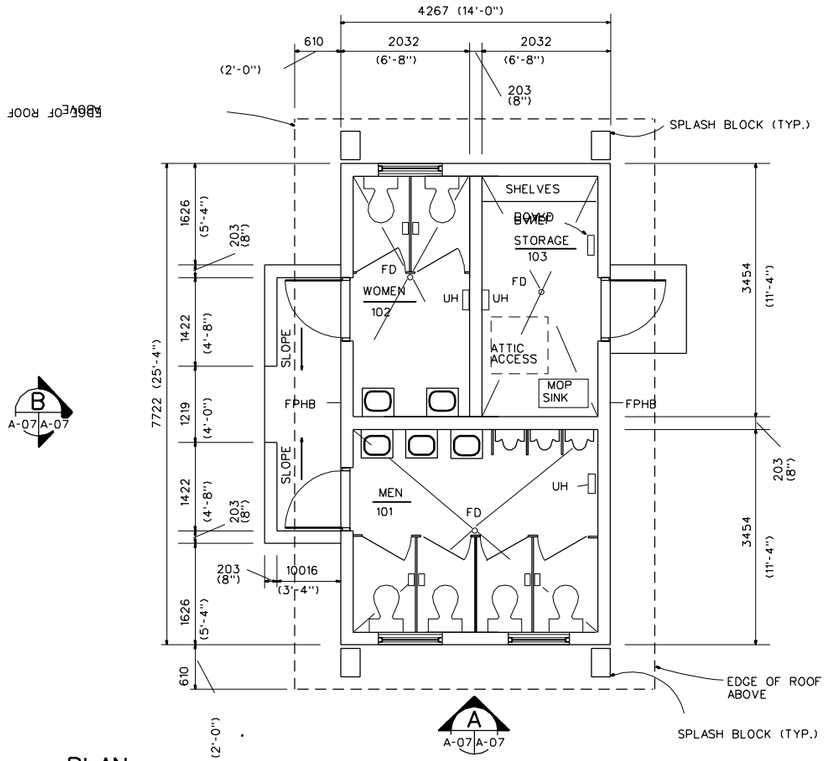
Designed by:
Dwn by:
Ckd by:
Date:
Rev.
Reviewed by:
Submitted by:
Design file no.
Drawing code: STD. 171-90-01
File name: STDA15.DGN
Plot date:
Plot scale:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

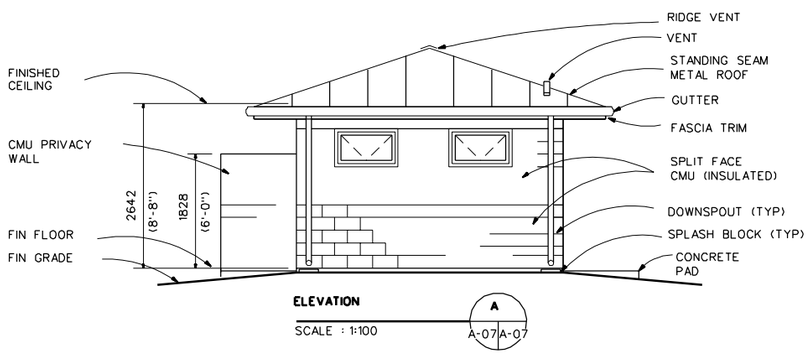
LATRINE
WITH AERATED VAULT

Sheet reference number:
A-06



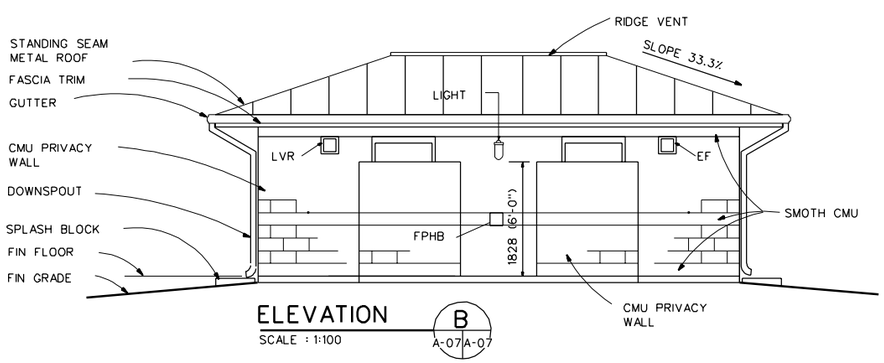
PLAN

SCALE : 1:100



ELEVATION

SCALE : 1:100



ELEVATION

SCALE : 1:100

GENERAL

The latrine with potable water provides restroom facilities for men and women. The latrine will accommodate a training unit of up to 190 men and 35 women based on OSHA standards. The facility has an area of 33 square meters (355 square feet).

SITE ADAPTATION

This standard definitive design should be adapted to local conditions such as climate, available construction materials and techniques, topography, seismic zone and the existing character of surrounding buildings. These factors may affect plans, elevations and building systems. The building foundation must be designed based on the results of a geotechnical investigation.

REFERENCE CRITERIA

The design and construction must comply with applicable codes and standards including: technical instruction TI 800-01, "Design Criteria"; Department of the Army regulations, technical manuals, handbooks, standards, and specifications; IBC, NEMA, ANSI/TIA/EIA, UL, ASTM, NFPA, etc.

FUNCTIONAL REQUIREMENTS

All dimensions are in millimeters unless otherwise labeled. A mop sink and shelves are provided in the storage room. Windows are bottom hinged inswinging to meet functional requirements providing natural lighting and ventilation. Windows have forced entry resistant metal frames and are provided with insect screens. Provide polycarbonate security translucent glazing in windows. Gutters, downspouts and splash blocks should be provided where required by climatic conditions. Covered entries and ice guards may be necessary in northern climates. Floors should be sealed for ease of cleaning. Ceilings should be finished.
The latrine is accessed only by able-bodied personnel and does not require ADA compliance for the handicapped unless dictated by local criteria.

MECHANICAL

The mechanical equipment shall be sized in accordance with site requirements, local weather design criteria and the material of building construction. Provide sufficient exhaust fans and louvers for fresh air requirements. Switch the exhaust fans to come on/off when the lights are turned on/off. Route water supply piping under the slab and ensure all pipe work is pressure tested prior to the slab being poured. The latrine is heated for freeze protection.

ELECTRICAL

The latrine shall be served by 120/240V, 1 phase, 3-wire secondary power. Rigid Steel conduit shall extend a minimum of 1524mm (5') outside the building for power circuits entering and leaving the building. Voltage drop shall comply with standards in NEC and Army technical manuals. Grounding will be installed in accordance with NFPA 70, the NEC, and other applicable standards.
The panel board shall be 120/240V single phase, mounted in an accessible location. Receptacles shall be GFCI, 120V, 20A duplex mounted 305 mm (12") above the sinks.
Illumination levels will be designed in accordance with IES. Interior lighting shall consist of fluorescent lamps at a level of 20 foot-candles. Each room shall be provided with separate switching. Exterior lighting shall be provided with separate switching located near points of egress.
Per NFPA 101 annex A, exit signs are not required for the latrine.
Lightning protection is not required for this building.

FIRE PROTECTION

Fire protection is not required per fire codes for this building. Consult local Fire Marshall for compliance with local laws.

ABBREVIATIONS

CMU - concrete masonry unit
EF - exhaust fan
FD - floor drain
FPHB - freeze poof hose bib
LVR - louver
UH - unit heater

GRAPHIC SCALES

1000 500 0 1000 2000

1:100

US Army Corps of Engineers

Rev.	Description	Date	Approved
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Designed by: | Date: | Rev.
Dwn by: | Ckd by: | Design file no.
Reviewed by: | Drawing code: STD 171-24-01
Submitted by: | File name: STDA13.DGN
Plot date:
Plot scale:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

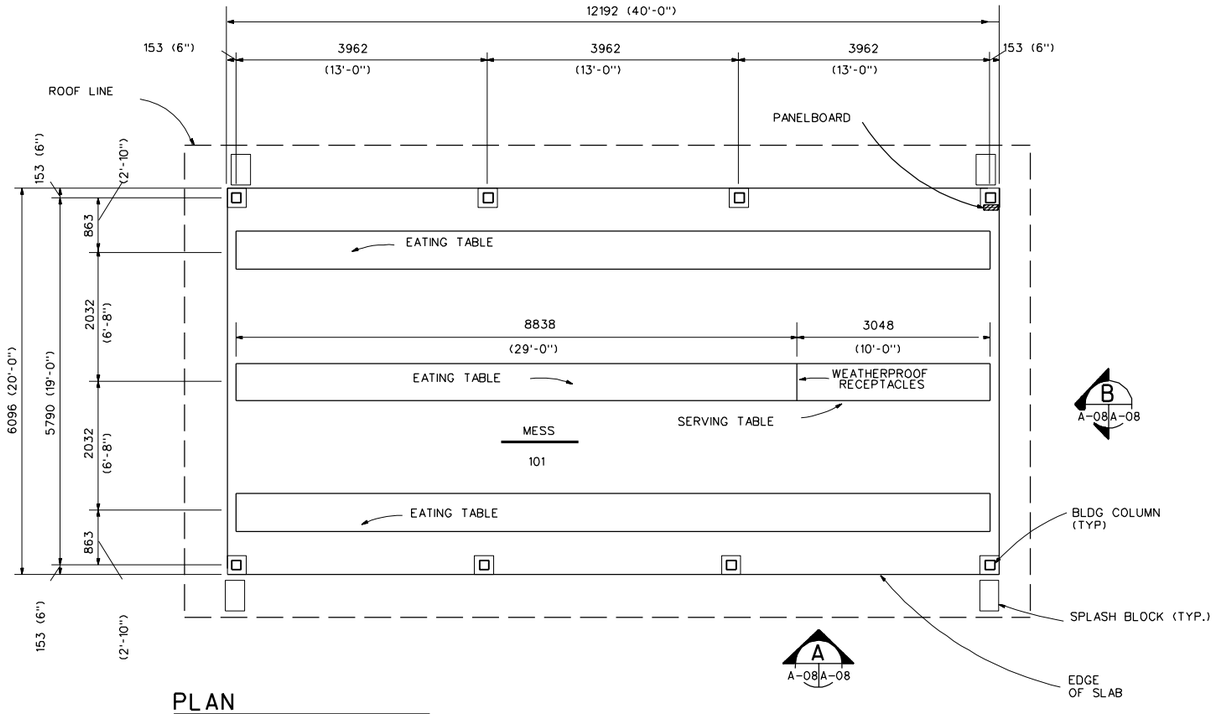
RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

LATRINE

WITH WATER CLOSETS

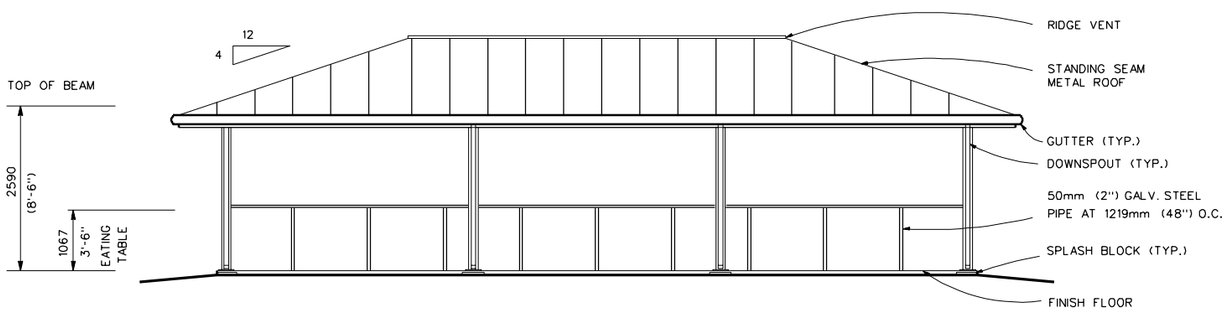
Sheet reference number:

A -07



PLAN

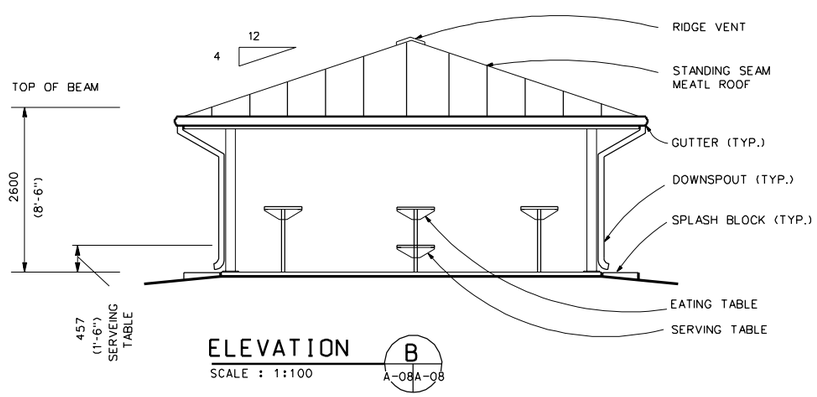
SCALE : 1:100



ELEVATION A

SCALE : 1:100

A-08 A-08



ELEVATION B

SCALE : 1:100

A-08 A-08

GENERAL

The Covered Mess provides an area for troop messing during training. The facility is also used as an area for weapon cleaning. The covered facility has a concrete floor and has a standing seam metal roof supported on columns and a wood framing system. The sides are left open. Stand-up eating tables and serving tables are provided.

SITE ADAPTATION

This standard definitive design should be adapted to local conditions such as climate, topography, seismic zone, available construction materials and techniques and the existing character of surrounding buildings. These factors may affect plans and elevations. The building foundation must be designed based on the results of a geotechnical investigation.

REFERENCE CRITERIA

The design and construction must comply with applicable codes and standards including: technical instruction TI 800-01, "Design Criteria": Department of the Army regulations, technical manuals, handbooks, standards, and specifications: IBC, NEMA, ANSI/TIA/EIA, UL, ASTM, NFPA, etc.

FUNCTIONAL REQUIREMENTS

All dimensions not labeled are in millimeters. Louvers are included to provide natural ventilation. Gutters, downspouts and splash blocks should be provided where required by climatic conditions. Ice guards may be necessary in northern climates.
The serving and eating tables should be constructed with galvanized or stainless steel shelves as required by the installation. The shelves are supported with galvanized steel pipes and galvanized structural shapes. The floor of the mess is sloped from the center to the perimeter to provide drainage.
The Covered Mess is accessed only by able-bodied personnel and does not require ADA compliance unless dictated by local criteria.

MECHANICAL

No mechanical systems are required for the Covered Mess.

ELECTRICAL

The Covered Mess shall be served by 120/240V, 1 phase, 3-wire secondary power. Rigid steel conduit shall extend a minimum of 1524mm (5') outside the building for power circuits entering and leaving the building. Voltage drop shall comply with NEC standards and Army technical manuals. Grounding will be installed in accordance with NFPA 70, the NEC, and other applicable standards.
The panel board shall be 120/240V single phase, mounted inside the building. Receptacles shall be general purpose, GFCI weatherproof, 120V, 20A duplex mounted a minimum of 450mm (24") above the finished floor.
Illumination levels will be designed in accordance with IES. Lighting shall consist of white lamps providing a level of 15 foot-candles and red lamps for lower level night light. Separate switching shall be provided for white lamps and red lamps.
The emergency electrical system shall comply with NFPA 70 and NFPA 101.
Lightning protection is not required for this building.

FIRE PROTECTION

Fire protection is not required per fire codes for this building. Consult local Fire Marshall for compliance with local laws.

GRAPHIC SCALES

1:100 1000 500 0 1000 2000

US Army Corps of Engineers

Rev. *	Description	Date	Approved

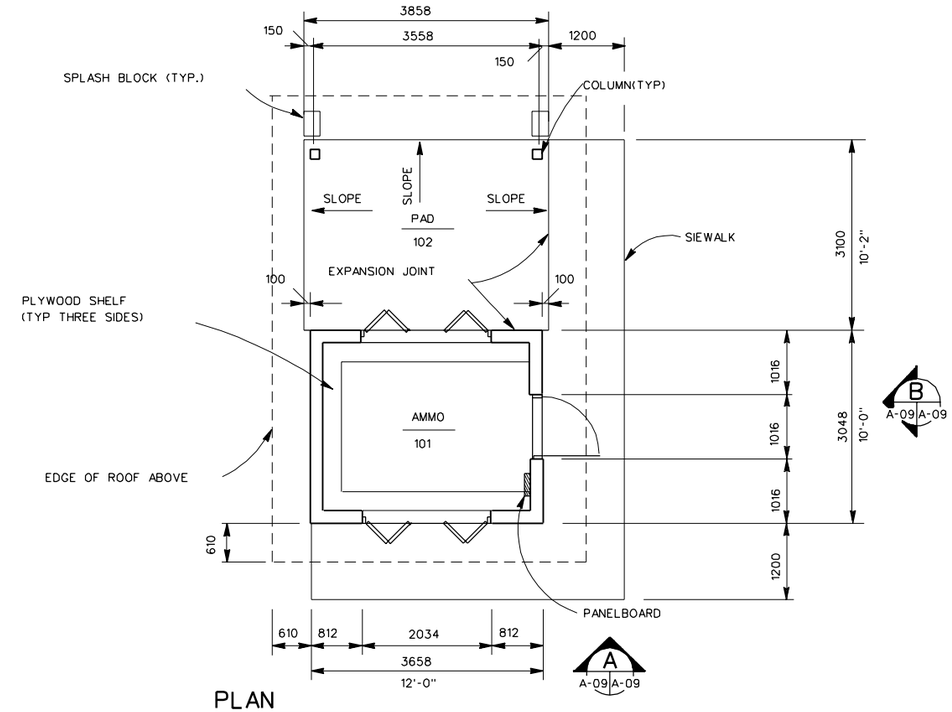
Designed by: | Date: | Rev.
Dwn by: | Ckd by: | Design file no.
Reviewed by: | Drawing code: STD 171-90-01
Submitted by: | File name: STDA17.DGN
Plot scale:
Plot date:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

COVERED MESS

Sheet reference number:
A -08



PLAN

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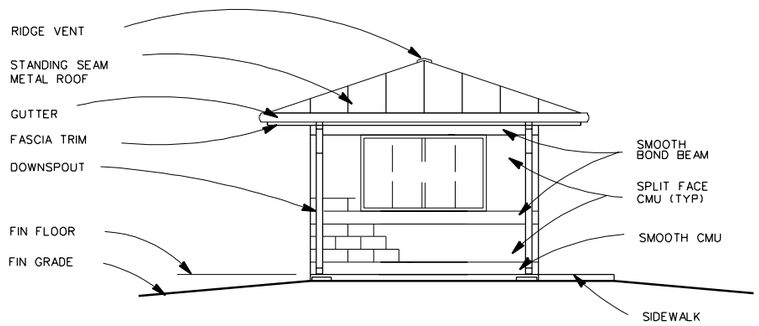
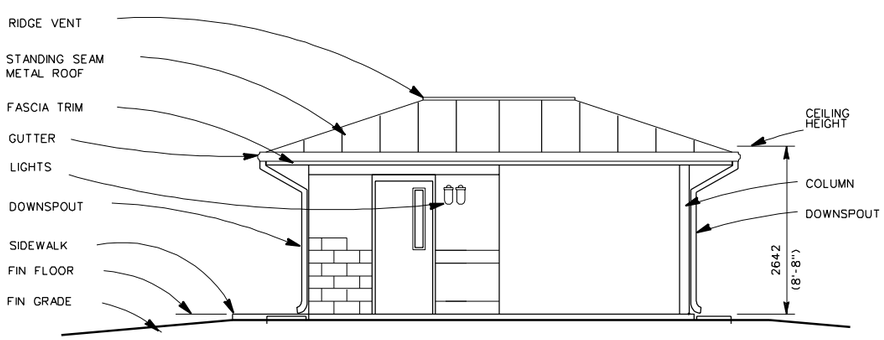


ELEVATION A

SCALE : 1:100

A-09 A-09



ELEVATION B

SCALE : 1:100

A-09 A-09

GENERAL

The Ammo Breakdown Building provides space for breaking down and issuing ammunition to the personnel involved in range training exercises. A canopy is provided at one of the issuing windows to protect personnel during periods of inclement weather. The enclosed area required for the ammunition breakdown building is 11 square meters (120 square feet).

SITE ADAPTATION

This standard definitive design should be adapted to local conditions such as climate, available construction materials and techniques, topography, seismic zone and the existing character of surrounding buildings. These factors may affect plans, elevations and building systems. The building foundation must be designed based on the results of a geotechnical investigation.

REFERENCE CRITERIA

The design and construction must comply with applicable codes and standards including: technical instruction TI 800-01, "Design Criteria"; Department of the Army regulations, technical manuals, handbooks, standards, and specifications; IBC, NEMA, ANSI/TIA/EIA, UL, ASTM, NFPA, etc.

FUNCTIONAL REQUIREMENTS

All dimensions not labeled are in millimeters. Issuing windows are hollow metal door panels secured with flush bolts and overlapping astragals. Windows have forced entry resistant metal frames. Gutters, downspouts and splash blocks should be provided where required by climatic conditions. Ice guards may be necessary in northern climates. Ceilings should be finished.
The Ammo Breakdown Building is accessed only by able-bodied personnel and does not require ADA compliance unless dictated by local criteria.

MECHANICAL

No HVAC is provided for this facility.

ELECTRICAL

The Ammo Breakdown Building shall be served by 120/240V, 1 phase, 3-wire secondary power. Rigid Steel conduit shall extend a minimum of 1524mm (5') outside the building for power circuits entering and leaving the building. Voltage drop shall comply with standards in NEC and Army Technical Manuals. Grounding will be installed in accordance with NFPA 70, the National Electrical Code, and other applicable standards.
The panelboard shall be 120/240V single phase mounted inside building.
Illumination levels will be designed in accordance with IES. Interior lighting shall consist of white incandescent fixtures at a level of 20 foot-candles. Incandescent fixtures with red lamps on separate switching shall be placed near each white incandescent lamp. Incandescent fixtures shall be gasket, vapor-proof enclosed with guard. Exterior white and red lighting shall be provided with separate switching located near the points of egress.
A telephone system is not required.
Lightning protection is required for this building.

FIRE PROTECTION

Fire protection is not required per fire codes for this building. Consult installation Fire Marshall for compliance with local laws.

GRAPHIC SCALES

1:100 1000 500 0 1000 2000

US Army Corps of Engineers

Rev.	Description	Date	Approved
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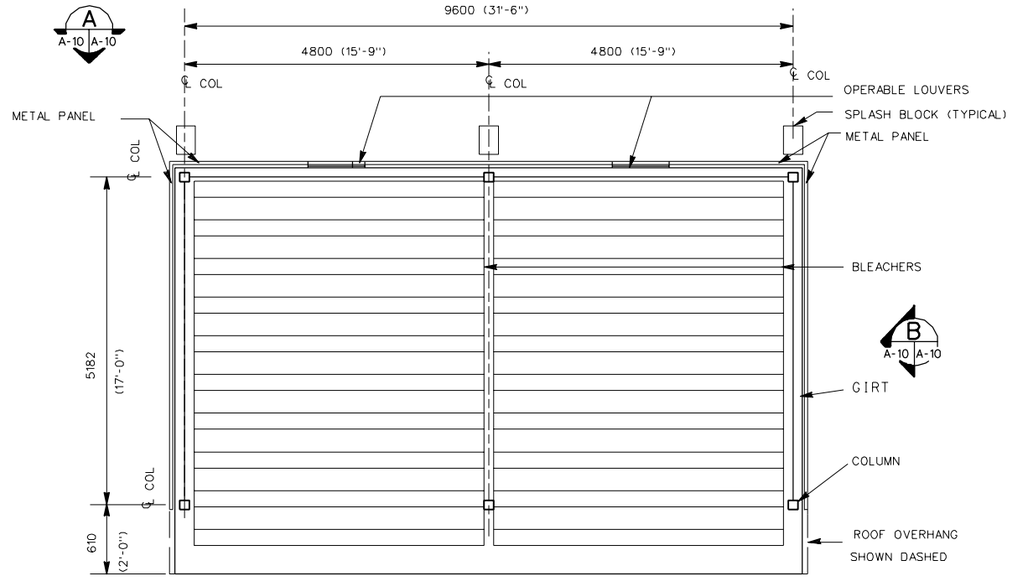
Designed by: Date: Rev.
Dwn by: Ckd by: Design file no.
Reviewed by: Drawing code:
Submitted by: File name: Plot date: Plot scale:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

AMMO BREAKDOWN BUILDING

Sheet reference number:
A -09



PLAN

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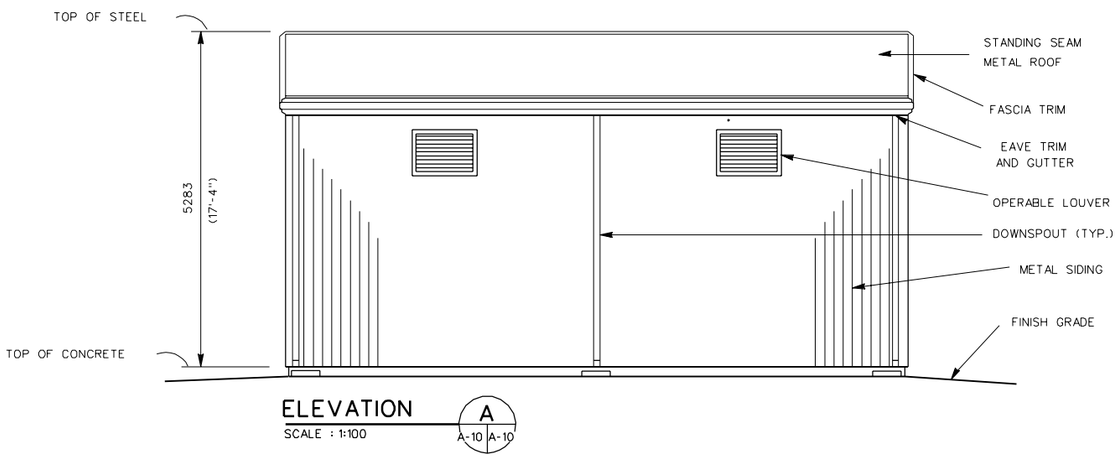
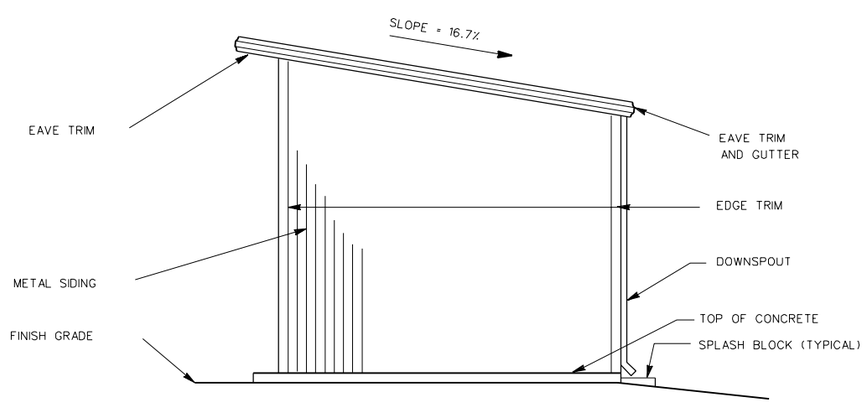


ELEVATION A (A-10 / A-10)

SCALE : 1:100



ELEVATION B (A-10 / A-10)

SCALE : 1:100

GENERAL

The Bleacher Enclosure provides an area for troop instruction before and after training exercises. The covered facility has a concrete floor and is enclosed on three sides for weather protection. The remaining side is left open to view the firing line and down the range. The enclosure is 49.75 square meters (535.5 square feet) in area. Two sets of bleachers are installed each having 10 rows and a length of4.6 meters (15 feet. The bleachers provide seating for 200 troops.

SITE ADAPTATION

This standard definitive design should be adapted to local conditions such as climate, topography, seismic zone, available construction materials and techniques and the existing character of surrounding buildings. These factors may affect plans and elevations. The building foundation must be designed based on the results of a geotechnical investigation.

REFERENCE CRITERIA

The design and construction must comply with applicable codes and standards including: technical instruction TI 800-01, "Design Criteria"; Department of the Army regulations, technical manuals, handbooks, standards, and specifications; IBC, NEMA, ANSI/TIA/EIA, UL, ASTM, NFPA, etc.

FUNCTIONAL REQUIREMENTS

All dimensions not labeled are in millimeters. Louvers are included to provide natural ventilation. Gutters, downspouts and splash blocks should be provided where required by climatic conditions. Ice guards may be necessary in northern climates.

The Bleacher Enclosure is accessed only by able-bodied personnel and does not require ADA compliance unless dictated by local criteria.

MECHANICAL

No mechanical systems are required for the Bleacher Enclosure.

ELECTRICAL

The bleacher enclosure shall be served by 120/240V, 1 phase, 3-wire secondary power. Rigid Steel Conduit shall extend a minimum of 1524mm (5') outside the building for power circuits entering and leaving the building. Voltage drop shall comply with NEC standards and Army technical manuals. Grounding will be installed in accordance with NFPA 70, the NEC, and other applicable standards. The panel board shall be 120/240V single phase, mounted inside the building. Receptacles shall be general purpose, GFCI, 120V, 20A Duplex mounted a minimum of 450mm (18") above the finished floor.
Illumination levels will be designed in accordance with IES. Interior lighting shall consist of white lamps providing a level of 15 foot-candles and red lamps for lower level night light.
Separate switching shall be provided for white lamps and red lamps.
The emergency electrical system shall comply with NFPA 70 and NFPA 101.
Lightning Protection is not required for this building.

FIRE PROTECTION

Fire Protection is not required per fire codes for this building. Consult local Fire Marshall for compliance with local laws.

GRAPHIC SCALES

1:100 1000 500 0 1000 2000

US Army Corps of Engineers

Rev. *	Description	Date	Approved

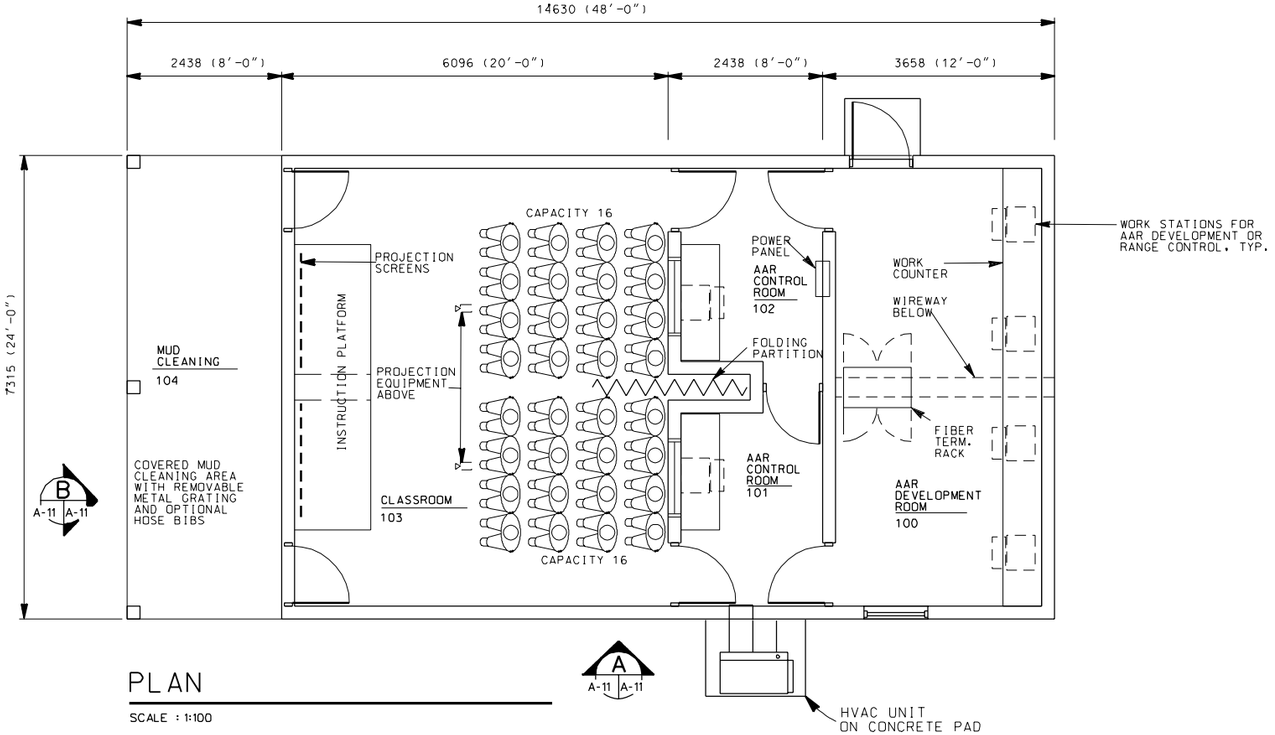
Designed by: | Date: | Rev.
Dwn by: | Ckd by: | Design file no.
Reviewed by: | Drawing code: STD 179-72-01
Submitted by: | File name: STDA19.DGN
Plot date:
Plot scale:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

BLEACHER ENCLOSURE

Sheet reference number:
A -10



PLAN

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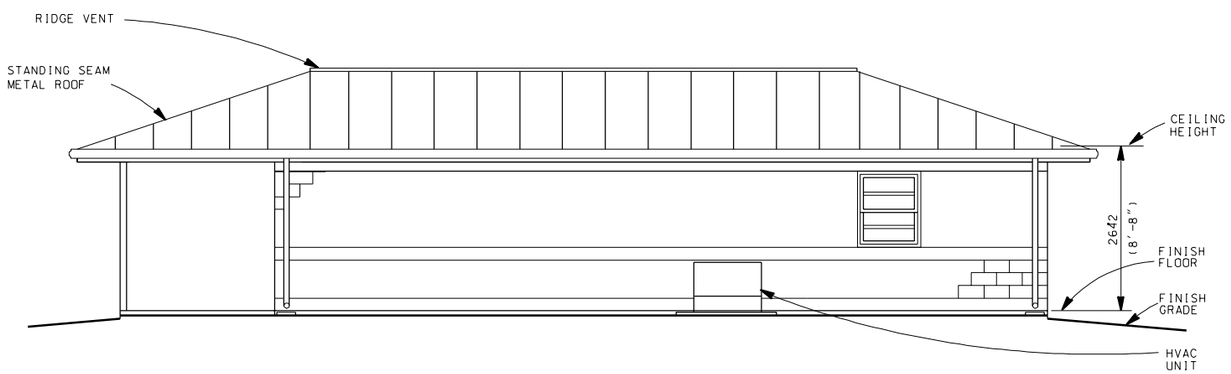
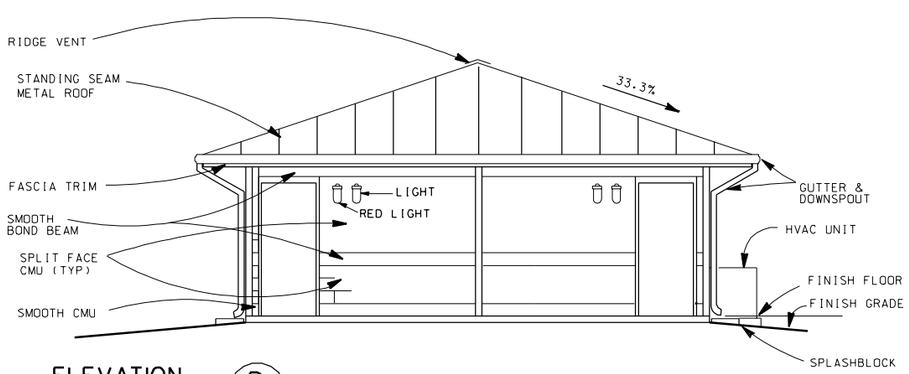


ELEVATION A

SCALE : 1:100

A-11 A-11



ELEVATION B

SCALE : 1:100

A-11 A-11

GENERAL

The After Action Review (AAR) facility provides space for personnel to review training exercises. Space is also provided for the installation of required electronics and communications equipment to prepare the review presentations and control rooms to monitor the presentations. An optional covered area for gear cleaning can be provided. The occupant load factor is 9.3 net sq. meters (100 sq. feet) (per person) for the control room and 32 occupants for the classroom based on a business use. See NFPA 101 table 7.3.1.2.
All dimensions not labeled are in millimeters.

SITE ADAPTATION

This standard definitive design should be adapted to local conditions such as climate, available construction materials and techniques, topography, seismic zone and the existing character of surrounding buildings. These factors may affect plans, elevations and building systems. The building foundation must be designed based on the results of a geotechnical investigation.

REFERENCE CRITERIA

The design and construction must comply with applicable codes and standards including: technical instruction TI 800-01, "Design Criteria"; Department of the Army regulations, technical manuals, handbooks, standards, and specifications; IBC, NEMA, ANSI/TIA/EIA, UL, ASTM, NFPA, etc.

FUNCTIONAL REQUIREMENTS

A folding partition is provided in the classroom to provide the option for two smaller classrooms. A work surface is provided for monitors, computers, printers and associated equipment. Where topography allows viewing down range from the control room, windows can be placed above the counter. Windows are double hung to meet functional requirements providing viewing, natural light and ventilation. Windows have forced entry resistant metal frames and are provided with insect screens. Provide polycarbonate security glazing in windows and doors. One way glazing is provided between the control rooms and the classroom. Floors should be sealed concrete or vinyl tile for ease of cleaning, with gyp. board ceilings.
Gutters, downspouts and splash blocks should be provided where required by climatic conditions. Covered entries and ice guards may be necessary in northern climatesThe AAR is accessed only by able-bodied personnel and does not require ADA compliance unless dictated by local criteria.

MECHANICAL

The Mechanical Equipment shall be selected and sized based on site requirements, local weather design criteria, available energy sources, and building construction materials. The addition of a Mechanical Room may be necessary to accommodate certain types of mechanical equipment. U-Factor requirements are based on the local climatic conditions in accordance with TI 800-1. The mechanical system must maintain an equipment operating temperature of 16 C to 27 C (60 F to 80 F). Route ductwork to provide an even distribution of conditioned air throughout the building to meet occupant comfort and outdoor air requirements. Provide diffusers and dampers to allow for manual balancing

ELECTRICAL

The AAR shall be served by 120/240V, 1 phase, 3-wire secondary power. Rigid steel conduit shall extend a minimum of 1524mm (5') outside of the building foundation for power and communication circuits entering and leaving the building. Voltage drop shall comply with standards in NEC and Army technical manuals. Grounding will be installed in accordance with NFPA 70, the NEC, and other applicable standards.
The panelboards shall be recess mounted in finished areas. Receptacles shall be general purpose, 120V, 20A Duplex mounted 450mm (18") above the finished floor. All outlets, receptacles, and conduit shall be recess mounted in finished areas. Provide 120/240V power for the HVAC unit.
Illumination levels will be designed in accordance with IES. Interior lighting shall consist of fluorescent lamps at a level of 50 foot-candles. Incandescent fixtures with red lamps on separate switching shall be placed near each fluorescent lamp in the Control Room and on exterior walls of entrance. Exterior lighting shall be provided with separate switching located near points of egress.
The emergency electrical system shall comply with NFPA 70 and NFPA 101. Emergency lighting shall be provided to ensure adequate illumination to egress building in the event of a power outage.
Lightning protection is required for this building in the form of either mast protection or air terminals on the building.

TELEPHONE

Telephone service is not a requirement for range operations. However, service should be provided to the AAR if it is available in the area.

TARGETRY SYSTEM INTERFACE

The targetry system requires a fiber optic connection between the ROC and the AAR. The size of the Fiber Termination Rack depends on the type of range and the number of targets. Coordinate with the Targetry Supplier.

FIRE PROTECTION

Fire protection is not required per fire codes for this building. Consult local Fire Marshall for compliance with local requirements.

GRAPHIC SCALES

1:100 1000 500 0 1000 2000

US Army Corps of Engineers

Rev. *	Description	Date	Approved

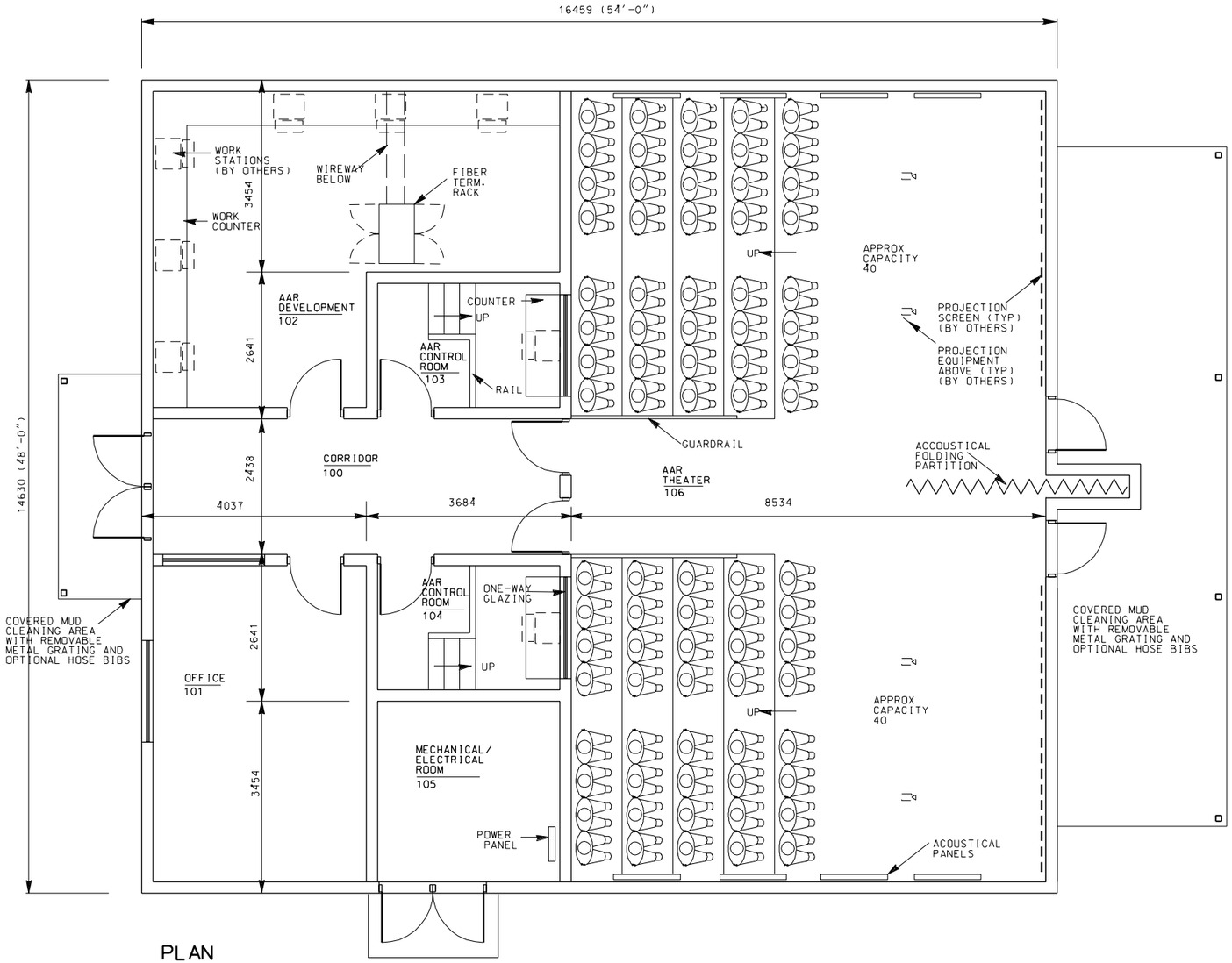
Designed by:
Dwn by:
Ckd by:
Reviewed by:
Submitted by:
Date:
Rev.
Design file no.
Drawing code: STD 171-23-01
File name: STDAATLDGN
Plot date:
Plot scale:

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

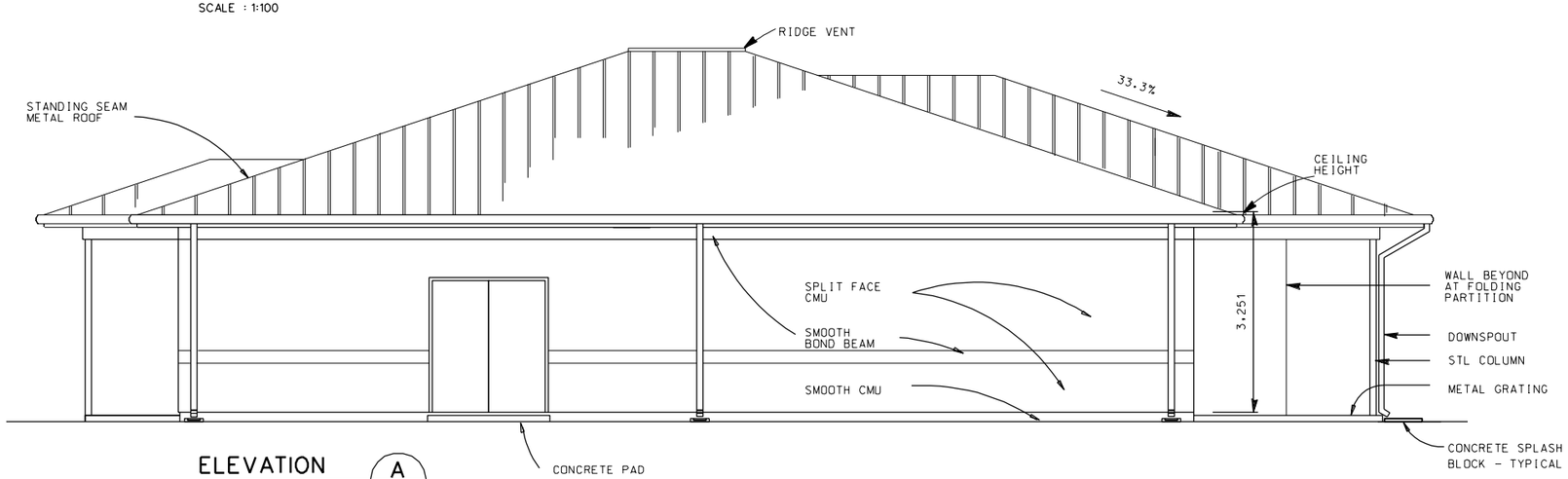
AFTER ACTION REVIEW (AAR)
SMALL

Sheet reference number:
A -11



PLAN

SCALE : 1:100



ELEVATION A

SCALE : 1:100

A-12 | A-12

GENERAL

The Large After Action Review (AAR) facility provides space for personnel to review training exercises. Space is also provided for the installation of required electronics and communications equipment to prepare the review presentations and control rooms to monitor the presentations. An optional covered area for gear cleaning can be provided. The occupant load factor is 9.3 net sq. meters (100 sq. feet) (per person) for the development room, control room, offices. The occupant load for the classroom is100 based on an assembly occupancy, less concentrated use, without fixed seating. See NFPA 101 table 7.3.1.2.

All dimensions not labeled are in millimeters.

SITE ADAPTATION

This standard definitive design should be adapted to local conditions such as climate, available construction materials and techniques, topography, seismic zone and the existing character of surrounding buildings. These factors may affect plans, elevations and building systems. The building foundation must be designed based on the results of a geotechnical investigation.

REFERENCE CRITERIA

The design and construction must comply with applicable codes and standards including: technical instruction TI 800-01, "Design Criteria"; Department of the Army regulations, technical manuals, handbooks, standards, and specifications: IBC, NEMA, ANSI/TIA/EIA, UL, ASTM, NFPA, etc.

FUNCTIONAL REQUIREMENTS

A folding partition is provided in the classroom to provide the option for two smaller classrooms. A work surface is provided for monitors, computers, printers and associated equipment. Where topography allows viewing down range from the control room, windows can be placed above the counter. Windows are double hung to meet functional requirements providing viewing, natural light and ventilation. Windows have forced entry resistant metal frames and are provided with inset screens. Provide polycarbonate security glazing in windows and doors. One way glazing is provided between the control rooms and the classroom. Floors should be sealed concrete or vinyl tile for ease of cleaning, with acoustical drop ceilings.
Gutters, downspouts and splash blocks should be provided where required by climatic conditions. Covered entries and ice guards may be necessary in northern climates. The AAR is accessed only by able-bodied personnel and does not require ADA compliance unless dictated by local criteria.

MECHANICAL

The Mechanical Equipment shall be selected and sized based on site requirements, local weather design criteria, available energy sources, and building construction materials. The mechanical system must maintain an equipment operating temperature of 16 C to 27 C (60 F to 80 F). U-Factor requirements are based on the local climatic conditions in accordance with TI 800-1. Install appropriate heating and air conditioning equipment in the mechanical room with fans, ductwork, and controls. Route ductwork to provide an even distribution of conditioned air throughout the building to meet occupant comfort and outdoor air requirements. Provide diffusers and dampers to allow for manual balancing.

ELECTRICAL

The AAR shall be served by 120/240V, 1 phase, 3-wire secondary power. Rigid steel conduit shall extend a minimum of 1524mm (5') outside of the building foundation for power and communication circuits entering and leaving the building. Voltage drop shall comply with standards in NEC and Army technical manuals. Grounding will be installed in accordance with NFPA 70, the NEC, and other applicable standards.
The panelboards shall be recess mounted in finished areas. Receptacles shall be general purpose, 120V, 20A Duplex mounted 450mm (18") above the finished floor. All outlets, receptacles, and conduit shall be recess mounted in finished areas. Provide 120/240V power for the HVAC unit.
Illumination levels will be designed in accordance with IES. Interior lighting shall consist of fluorescent lamps at a level of 50 foot-candles with dimmer control. Incandescent fixtures with red lamps on separate switching shall be placed near each fluorescent lamp in the AAR and on exterior walls of entrance. Exterior lighting shall be provided with separate switching located near points of egress.
The emergency electrical system shall comply with NFPA 70 and NFPA 101. Emergency lighting shall be provided to ensure adequate illumination to egress building in the event of a power outage.
Lightning protection is required for this building in the form of either mast protection or air terminals on the building.

TELEPHONE

Telephone service is not a requirement for range operations. However, service should be provided to the ROC if it is available in the area.

TARGETRY SYSTEM INTERFACE

A fiber optic connection is required between the ROC and the AAR. The size of the Fiber Termination Rack depends on the type of range and the number of targets. Coordinate with the Targetry Supplier.

FIRE PROTECTION

Fire protection is not required per fire codes for this building. Consult local Fire Marshall for compliance with local requirements.

GRAPHIC SCALES

1:100 — 1000 500 0 1000 2000

US Army Corps of Engineers

Rev.	Description	Date	Approved

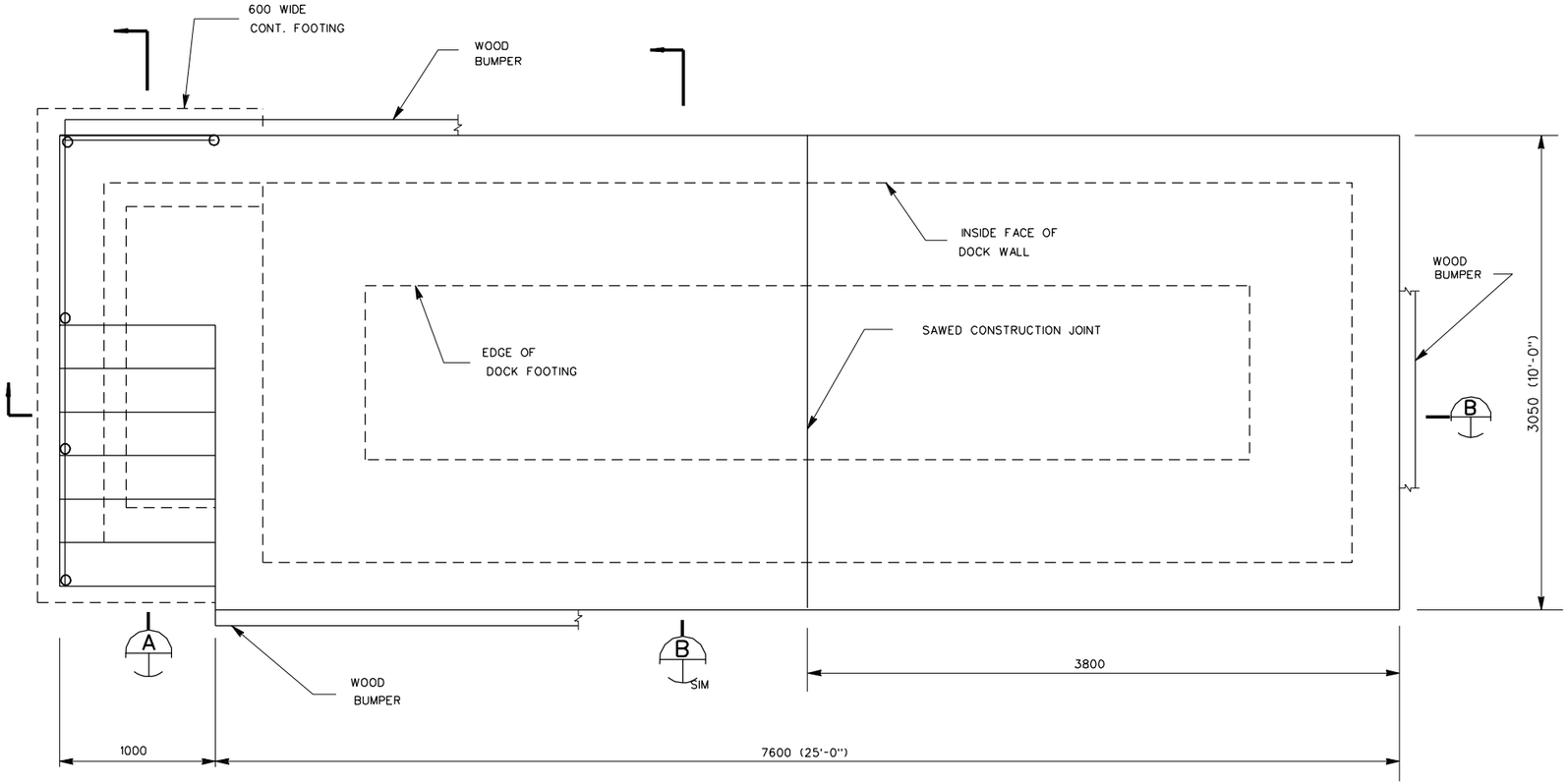
Designed by: | Date: | Rev.
Dwn by: | Ckd by: | Drawing code: | Design file no.
Reviewed by: | Submitted by: | File name: | Plot scale: | Plot date:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

AFTER ACTION REVIEW (AAR)
LARGE

Sheet reference number:
A-12



PLAN - AMMO LOADING DOCK

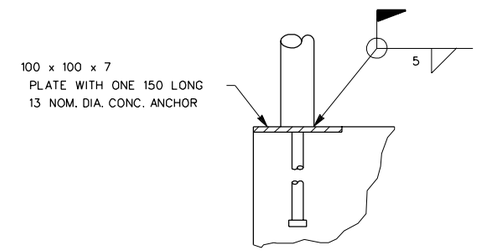
SCALE: 1:40

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

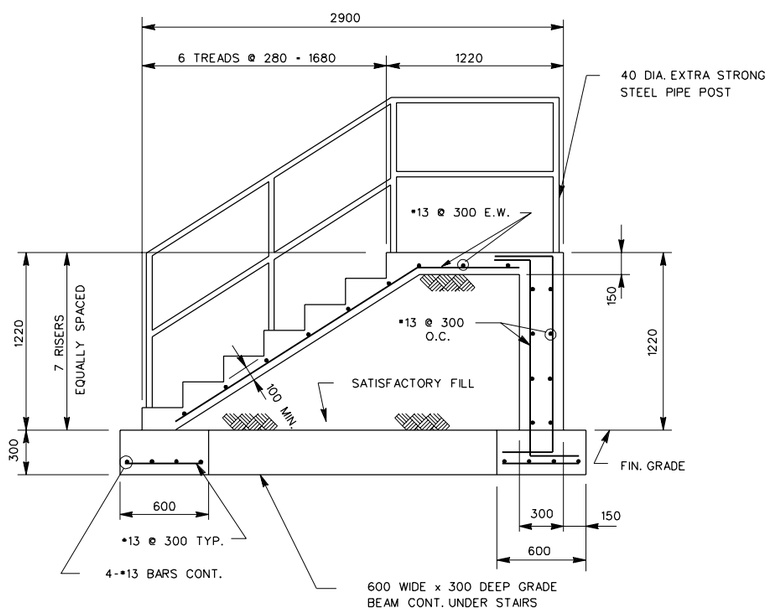
NOTES TO DESIGNER

1. DOCK IS DESIGNED TO LOAD 2 VEHICLES AT A TIME. DOCK SIZE MAY NEED TO BE INCREASED ON LARGE RANGES WITH A HIGH THROUGHPUT REQUIREMENT
2. A COVER MAY BE REQUIRED IN HOT CLIMATES



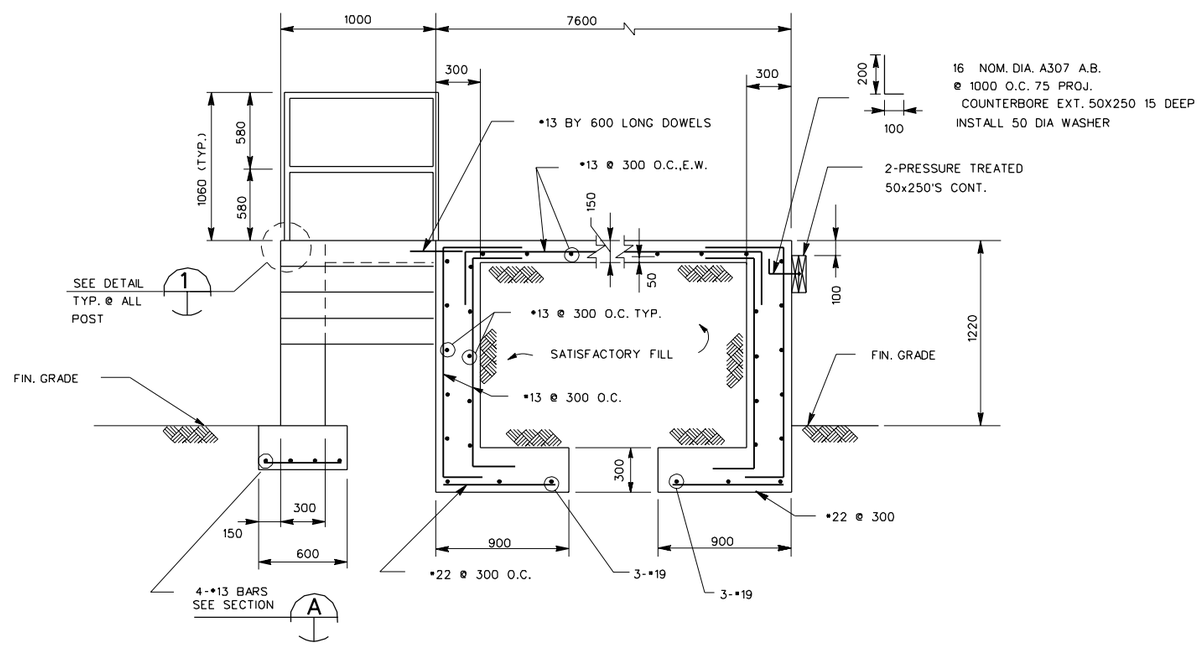
DETAIL 1

SCALE : N.T.S.



SECTION A

SCALE : N.T.S.



SECTION B

SCALE : N.T.S.

GRAPHIC SCALES

1:40 800 400 0 800 1600

US Army Corps of Engineers

Rev.	Description	Date	Approved
*			

Designed by: Date: Rev.
Dwn by: Ckd by: Design file no.
Reviewed by: Drawing code: STD 179 90 01
Submitted by: File name: Plot date: Plot scale:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL

AMMO LOADING DOCK

Sheet reference number:
ALD-1
Sheet of