US Army Corps
of Engineers
Savannah District

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.: -
ISSUE DATE: NOVEMBER 2023

SIGNATURES AFFIXED BELOW INDICATE OFFICIAL RECOMMENDATION AND APPROVAL OF ALL DRAWINGS IN THIS SET AS INDEXED ON THIS SHEET.

REVIEWED BY:*
DEACON.JENNIFER.HERRIG.1597032648 Digitally signed by DEACON.JENNIFER.HERRIG.1597032648 Date: 2023.12.04 14:50:38 -05'00' 12/4/23
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APPROVAL RECOMMENDED:*
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR
FY23, PN 96182
VOLUME 2 - BUILDING
COVER SHEET

SHEET ID
G-001

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SHEET ID.	TITLE
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US Army Corps of Engineers®

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DESIGNED BY: J. HAIRE
DRAWN BY: J. HAIRE
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CG132	SITE, GRADING, & DRAINAGE PLAN
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CG150	SITE, GRADING, & DRAINAGE PLAN
CG151	SITE, GRADING, & DRAINAGE PLAN
CG152	SITE, GRADING, & DRAINAGE PLAN
CG153	SITE, GRADING, & DRAINAGE PLAN
CG154	SITE, GRADING, & DRAINAGE PLAN
CG155	SITE, GRADING, & DRAINAGE PLAN
CG156	SITE, GRADING, & DRAINAGE PLAN
CG157	SITE, GRADING, & DRAINAGE PLAN
CG158	SITE, GRADING, & DRAINAGE PLAN
CG159	SITE, GRADING, & DRAINAGE PLAN
CG160	SITE, GRADING, & DRAINAGE PLAN
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CG735	E&SC PLAN
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CG737	E&SC PLAN
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CG739	E&SC PLAN
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CG741	E&SC PLAN
CG742	E&SC PLAN
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CG744	E&SC PLAN
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CG746	E&SC PLAN
CG747	E&SC PLAN
CG748	E&SC PLAN
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CG751	E&SC PLAN
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

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AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
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INDEX OF DRAWINGS

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DRAWING ABBREVIATIONS

A	----------
A LABEL	CLASS A DOOR
A/C	AIR CONDITION
A/C UNIT	AIR CONDITIONING UNIT
A/E	ARCHITECT/ENGINEER
AB	ANCHOR BOLT
ABV	ABOVE
ACC	ACCESSIBLE
ACS	AUTOMATIC CONTROL SYSTEM
ACS DR	ACCESS DOOR
ACS PNL	ACCESS PANEL
ACT	ACOUSTICAL CEILING TILE
ADA	AMERICANS WITH DIDISABILITIES ACT
ADJ	ADJACENT
ADMIN	ADMINISTRATION
AFC	ABOVE FINISHED COUNTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFS	ABOVE FINISHED SLAB
AGGR	AGGREGATE
AHU	AIR HANDLING UNIT
AIB	AIR INFILTRATION BARRIER
ALT	ALTERNATE
ALUM	ALUMINUM
ANOD	ANODIZE
APPROX	APPROXIMATE
AR	AS REQUIRED
ARCH	ARCHITECT
ASC	ABOVE SUSPENDED CEILING
ASSY	ASSEMBLY
ATC	ACOUSTICAL TILE CEILING
AVG	AVERAGE
AWT	ACOUSTICAL WALL TREATMENT
B	----------
B LABEL	CLASS B DOOR
BALC	BALCONY
BD	BOARD
BDRY	BOUNDARY
BEJ	BRICK EXPANSION JOINT
BFF	BELOW FINISH FLOOR
BHMA	BUILDER'S HARDWARE MANUFACTURER'S ASSOCIATION
BLDG	BUILDING
BLKG	BLOCKING
BLT IN	BUILT-IN
BN	BULLNOSE
BOS	BOTTOM OF STEEL
BOT	BOTTOM
BRG	BEARING
BRKT	BRACKET
BSMT	BASEMENT
BTWN	BETWEEN
BUR	BUILT-UP ROOFING
C	----------
C LABEL	CLASS C DOOR
CAB	CABINET
CATW	CATWALK
CAV	CAVITY
CBB	CEMENTITIOUS (BACKER) BOARD
CD	CONSTRUCTION DOCUMENTS
CDW	CHILLED DRINKING WATER
CEM PLAS	CEMENT PLASTER
CER	CERAMIC
CF	CONTRACTOR FURNISHED
CFCI	CONTRACTOR FURNISHED/ CONTRACTOR INSTALLED
CFE	CONTRACTOR FURNISHED EQUIPMENT
CFM	CUBIC FEET PER MINUTE
CFMF	COLD-FORMED METAL FRAMING
CFS	CUBIC FEET PER SECOND
CG	CORNER GUARD
CI	CAST IRON
CIP	CAST-IN-PLACE
CJ	CONTROL JOINT
CL	CENTER LINE
CLG	CEILING
CLG DIFF	CEILING DIFFUSER
CLG HT	CEILING HEIGHT
CLL	COLUMN LINE
CLO	CLOSET
CLR	COLOR
CMU	CONCRETE MASONRY UNIT
CNDS	CONDENSATE
CDR	CARD READER
CO	CLEANOUT
COL	COLUMN
COMM	COMMUNICATION
CONC	CONCRETE
CONC FLR	CONCRETE FLOOR
CONF	CONFERENCE
CONT	CONTINUE, CONTINUOUS
COORD	COORDINATE

C (cont)	----------
CORR	CORRIDOR
CP	CONCRETE PIPE
CPT	CARPET
CR	CONTROL ROOM
CS	CAST STONE
CSWK	CASEWORK
CT	CERAMIC TILE
CTB	CERAMIC TILE BASE
CTF	CERAMIC TILE FLOOR
CTR	CENTER
CU FT	CUBIC FEET
CW	CASEMENT WINDOW
D	----------
D	DEPTH
D LABEL	CLASS D DOOR
DBL	DOUBLE
DEMO	DEMOLITION
DEPT	DEPARTMENT
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIR	DIRECTION
DIST	DISTANCE
DOC	DOCUMENT
DR	DOOR
DS	DOWNSPOUT
E	----------
E LABEL	CLASS E DOOR
EA	EACH
EF	EACH FACE
EIFS	EXTERIOR INSULATION AND FINISH SYSTEM
EJ	EXPANSION JOINT
ES	EACH SIDE
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
ENTR	ENTRANCE
EPS	EXPANDED POLYSTYRENE
EQ	EQUAL
EWC	ELECTRIC WATER COOLER
EXP	EXPOSED, EXPANSION
EXT	EXTERIOR, EXTINGUISHER
EXT GR	EXTERIOR GRADE
F	----------
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FAS BD	FASCIA BOARD
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FDTN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FED	FEDERAL
FF	FINISH FLOOR
FFE	FINISH FLOOR ELEVATION
FF INSUL	FOIL BACKED INSULATION
FGL	FIBERGLASS
FH	FIRE HOSE
FHP	FULL HEIGHT PARTITION
FIN	FINISH
FIN BS	FINISH BOTH SIDES
FIN FLR	FINISH FLOOR
FIN GR	FINISH GRADE
FIXT	FIXTURE
FLDG	FOLDING
FLEX	FLEXIBLE
FLG	FLOORING
FLMT	FLUSH MOUNT
FLR	FLOOR
FM	FACTORY MUTUAL
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FR	FIRE RESISTANT
FRG	FIBER REINFORCED GYPSUM
FRMG	FRAMING
FRP	FIBERGLASS REINFORCED PLASTIC
FRTW	FIRE RETARDANT TREATED WOOD
FS	FEDERAL SPECIFICATION
FSTNR	FASTENER
FT	FEET
FTG	FOOTING
FWC	FABRIC WALLCOVERING
G	----------
G	NATURAL GAS
GALV	GALVANIZED
GB	GRAB BAR
GEJ	GUTTER EXPANSION JOINT

G (cont)	----------
GFCI	GOVERNMENT FURNISHED CONTRACTOR INSTALLED
GFGI	GOVERNMENT FURNISHED GOVERNMENT INSTALLED
GFRG	GLASS-FIBER-REINFORCED GYPSUM
GLZ	GLAZING
GR FL	GROUND FLOOR
GUT	GUTTER
GWB	GYPSUM WALL BOARD
GYP BD	GYPSUM BOARD
GYP PLAS	GYPSUM PLASTER
H	----------
HB	HOSE BIBB
HC	HANDICAPPED
HDPE	HIGH DENSITY POLYETHYLENE
HDW	HARDWARE
HDWD	HARDWOOD
HEPA	HIGH EFFICIENCY PARTICULATE AIR (FILTER)
HM	HOLLOW METAL
HMD	HOLLOW METAL DOOR
HORIZ	HORIZONTAL
HR	HOUR
HT	HEIGHT
HYDR	HYDRAULIC
I	----------
IBC	INTERNATIONAL BUILDING CODE
INSUL	INSULATION
INT	INTERIOR
ILO	IN LIEU OF
J	----------
JAN	JANITOR
JT	JOINT
K	----------
KPD	KEYPAD
KIT	KITCHEN
KPL	KICKPLATE
L	----------
LAM	LAMINATE
LAV	LAVATORY
LBR	LUMBER
LBS	POUND
LDG	LANDING
LF	LINEAR FEET (FOOT)
LG	LIGHT GAUGE
LIB	LIBRARY
LIN	LINEAR
LKR	LOCKER
LOC	LOCATION
LT	LIGHT
LVDR	LOUVER DOOR
LVR	LOUVER
M	----------
MACH RM	MACHINE ROOM
MATL	MATERIAL
MAX	MAXIMUM
MC	MOISTURE CONTENT
MD	METAL DECK
MECH	MECHANICAL
MECH RM	MECHANICAL ROOM
MEMB	MEMBRANE
MF	MILL FINISH
MFR	MANUFACTURER
MID	MIDDLE
MIN	MINIMUM, MINUTE
MIRR	MIRROR
MISC	MISCELLANEOUS
MLDG	MOLDING (MOULDING)
MO	MASONRY OPENING
MOD	MODIFY
MB	MOISTURE BARRIER
MTD	MOUNTED
MTG	MOUNTING
MTL	METAL
MVBL	MOVABLE
MWP	MEMBRANE WATERPROOFING
N	----------
N	NORTH
NA	NOT APPLICABLE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NO	NUMBER

N (cont)	----------
NOM	NOMINAL
NP	NO PAINT
NRC	NOISE REDUCTION COEFFICIENT
NTS	NOT TO SCALE
O	----------
OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFD	OVERFLOW DRAIN
OFF	OFFICE
OGL	OBSCURE GLASS
OPH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
OPQ	OPAQUE
OWSJ	OPEN WEB STEEL JOIST
OPR	OPERABLE
ORD	OVERFLOW ROOF DRAIN
ORIG	ORIGINAL
P	----------
PA	PUBLIC ADDRESS
PAR	PARAPET
PAT	PATTERN
PB	PULL BOX
PBD	PARTICLEBOARD
PCC	PRECAST CONCRETE
PCF	POUNDS PER CUBIC FOOT
PCT	PERCENT
PERF	PERFORATED
PERIM	PERIMETER
PH	PHASE
PIL	PILASTER
PL	PROPERTY LINE
PL GL	PLATE GLASS
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLBG	PLUMBING
PLG	PILING
PLYWD	PLYWOOD
PNL	PANEL
PP PL	PUSH/PULL PLATE
PR	PAIR
PRCST	PRECAST
PREFIN	PREFINISHED
PRKG	PARKING
PS CONC	PRESTRESSED CONCRETE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PTD	PAPER TOWEL DISPENSER
PTDR	PAPER TOWEL DISPENSER AND RECEPTACLE
PTN	PARTITION
PWR	POWER
Q	----------
QT	QUARRY TILE
QTY	QUANTITY
R	----------
RB	RESILIENT BASE
RBM	REINFORCED BRICK MASONRY
RBR	RUBBER
RC	REINFORCED CONCRETE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
RDG INS	RIGID INSULATION, SOLID
REC	RECESSED
REF	REFERENCE
REM	REMOVABLE
REP	REPAIR
REPL	REPLACE
REQ	REQUIRE
REQD	REQUIRED
RESIL	RESILIENT
REST	RESTROOM
RF	RESILIENT FLOORING
RFG	ROOFING
RH	ROOF HATCH
RHR	RIGHT HAND REVERSE
RL	ROOF LEADER
RLG	RAILING
RM	ROOM
RO	ROUGH OPENING
RSD	ROLLING STEEL DOOR
RV	ROOF VENT
RVL	REVEAL
S	----------
SB	SPLASH BLOCK
SCHED	SCHEDULE
SD	SMOKE DETECTOR

S (cont)	----------
SF	SQUARE FOOT (FEET)
SFTWD	SOFTWOOD
SGL	SINGLE
SHT MTL	SHEET METAL
FLASH	(FLASHING)
SHTHG	SHEATHING
SHV	SHELVING
SIM	SIMILAR
SJ	SCORED JOINT
SKLT	SKYLIGHT
SLNT	SEALANT
SMK	SMOKE
SMLS	SEAMLESS
SP EL	SPOT ELEVATION
SPEC	SPECIFICATION
SQ	SQUARE
SQ IN	SQUARE INCH
SQ YD	SQUARE YARD
SS	STAINLESS STEEL
SSMR	STANDING SEAM METAL ROOF
ST	STAIRS
STC	SOUND TRANSMISSION COEFFICIENT
STD	STANDARD
STL	STEEL
STL JST	STEEL JOIST
STL RF DK	STEEL ROOF DECK
STOR	STORAGE
STR	STRINGERS
STRB/HRN	STROBE/HORN
STRUC	STRUCTURAL
SUB FL	SUBFLOOR
SUSP	SUSPENDED
SV	SHEET VINYL
SW	SIDEWALK
T	----------
T	TREAD
T/S	TUB/SHOWER
TD	TRENCH DRAIN
TEL	TELEPHONE
TEMP	TEMPORARY
TER	TERRAZZO
TFF	TOP OF FINISH FLOOR
TH	THICK
THK	THICKNESS
TK BD	TACKBOARD
TMPD GL	TEMPERED GLASS
TN	TRUE NORTH
TOF	TOP OF FOOTING
TOM	TOP OF MASONRY
TOP	TOP OF PARAPET
TOPO	TOPOGRAPHY
TOS	TOP OF SLAB
TRANS	TRANSOM
TRTD	TREATED
TV	TELEVISION
TYP	TYPICAL
U	----------
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITER LABORATORIES
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SYSTEM
V	----------
VAV	VARIABLE AIR VOLUME/UNIT
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VTR	VENT THRU ROOF
W	----------
W/	WITH
WC	WATER CLOSET
WD	WOOD
WDW	WINDOW
W/O	WITHOUT
WWF	WELDED WIRE FABRIC
X	----------
XFMR	TRANSFORMER

GENERAL NOTES

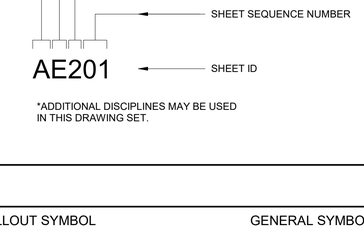
1. THESE LEGENDS ARE COMPOSED OF STANDARD SYMBOLS AND ARE PERTINENT TO THE CONDITIONS ON THIS SET OF DRAWINGS TO THE EXTENT APPLICABLE.
2. ADDITIONAL LEGENDS AND/OR ABBREVIATIONS MAY APPEAR IN THIS SET OF DRAWINGS TO INDICATE SPECIFIC CONDITIONS IN LIEU OF SYMBOLS SHOWN ON THIS SHEET.

MATERIALS

- EARTH
- SAND
- CONCRETE/ PRECAST CONCRETE
- STONE
- BRICK
- CMU
- PLYWOOD
- RIGID INSULATION
- BATT INSULATION
- GYPSUM BOARD, PLASTER
- EIFS

SHEET LOGIC

DRAWING NAMING CONVENTION

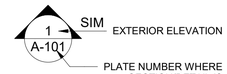


*ADDITIONAL DISCIPLINES MAY BE USED IN THIS DRAWING SET.

SYMBOLS

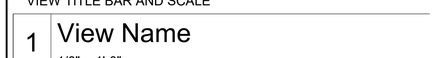
INTERIOR ELEVATION SYMBOL

EXTERIOR ELEVATION SYMBOL

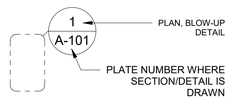


SECTION SYMBOL

VIEW TITLE BAR AND SCALE

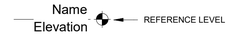


CALLOUT SYMBOL

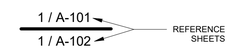


ELEVATION SYMBOL

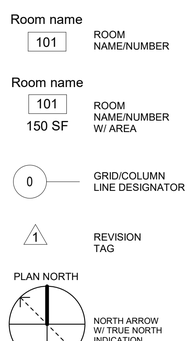
LEVEL SYMBOL



MATCHLINE INDICATOR



GENERAL SYMBOLS



US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	J. HAIRE
DRAWN BY:	J. HAIRE
CHECKED BY:	J. MCTIERNAN
SUBMITTED BY:	J. DEACON
SIZE:	ANSI D
ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	-
CATEGORY CODE:	178-65-01
FILE NAME:	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

GENERAL NOTES, ABBREVIATIONS

SHEET ID

GI004

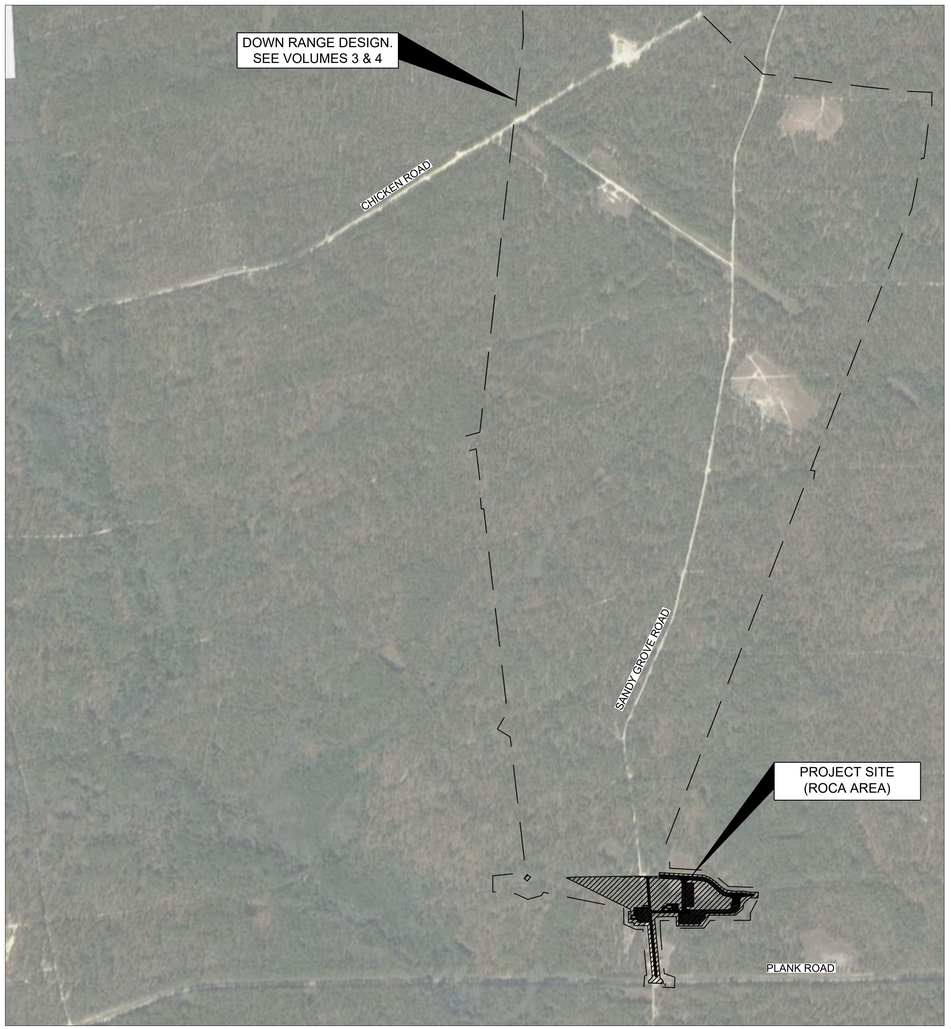
READY TO ADVERTISE (RTA)

File Path: C:\Users\k6enxjlh\Documents\FY23_PN96182_MPTR-AAR_PROJ_R21_k6enxjlh.rvt

Plot Date: 5/4/2022 7:20:02 AM

GENERAL NOTES

1.) THIS SHEET IS FOR REFERENCE ONLY AND NOT FOR CONSTRUCTION.

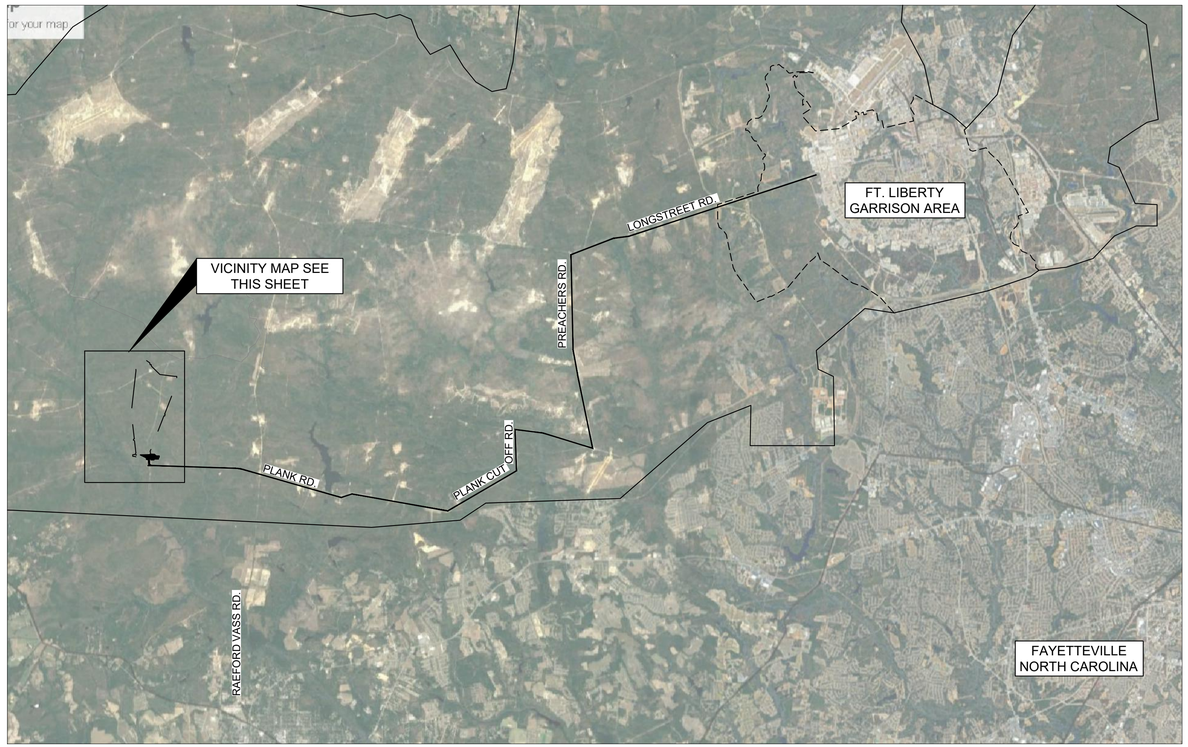


VICINITY MAP

N

0' 800' 1,600'

SCALE: 1" = 800'



LOCATION MAP

N

0' 8,000' 16,000'

SCALE: 1" = 8,000'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

P:\CIVIL\3D PROJECTS\BRA1331\05_CIVIL\CAD\PLAN SHEETS\PN96182_A-002-A-003.DWG K6END.JW6
11/29/2023 4:03:44 PM
AEC_NCS_4_MONO.STB

DESIGNED BY: G. OGREN	ISSUE DATE: NOVEMBER 2023
DRAWN BY: G. OGREN	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. RADTKE	CONTRACT NO.: _
SUBMITTED BY: DEACON	CATEGORY CODE: 174-45-01
SIZE: ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

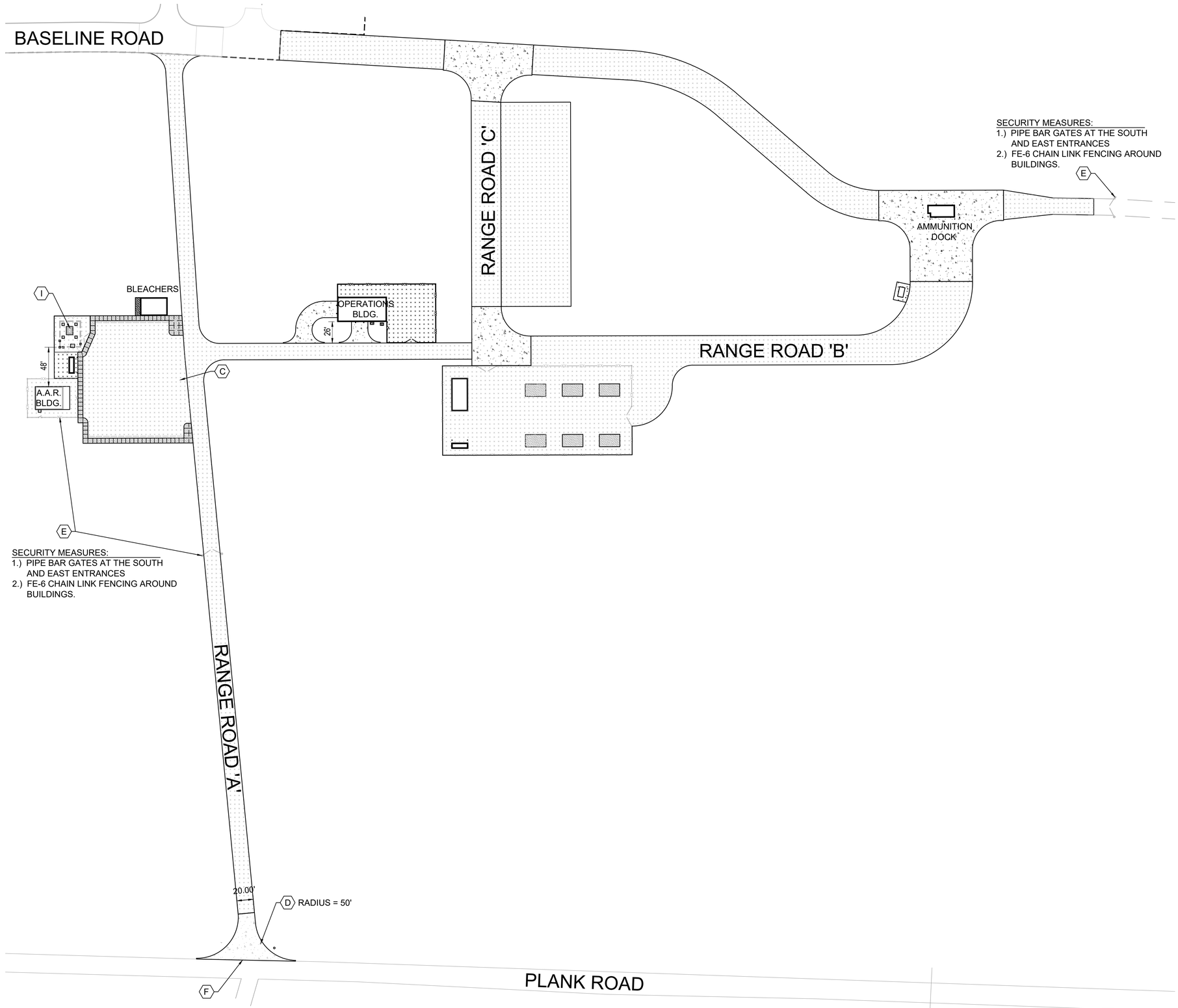
FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

FIRE PROTECTION
FIRE ACCESS PLAN

SHEET ID

A-802

READY TO ADVERTISE (RTA)



GENERAL NOTES

1.) THIS PLAN COMPLIES WITH UFC 03-600-01 FIRE PROTECTION ENGINEERING FOR FACILITIES SECTION 1-7.2.4.2 ITEMS A - L. THIS DRAWING IS TO BE USED AS A REFERENCE ONLY, AND IS NOT PART OF THE CONSTRUCTION CONTRACT. ALL INFORMATION SHOWN IS CALLED OUT IN THE DESIGN PLANS WHERE APPLICABLE.

(A) LINE OF ENCROACHMENT IDENTIFYING ASSUMED PROPERTY LINES AND MINIMUM SEPARATION DISTANCES FROM ADJACENT BUILDINGS.

(**NOT APPLICABLE)**

(B) BUILDING PERIMETER USED FOR FRONTAGE INCREASES.

(**NOT APPLICABLE)**

(C) FIRE DEPARTMENT ACCESS.

(D) TYPE AND QUANTITY OF ANTITERRORISM SECURE ACCESS.

(E) INTENDED FIRE DEPARTMENT MAIN ENTRANCE TO FACILITY.

(F) LOCATION OF FIRE DEPARTMENT CONNECTIONS.

(G) FIRE HYDRANTS, POST INDICATOR VALVE OR VALVES AND THEIR CONNECTED WATER DISTRIBUTION MAINS SERVING FACILITY.

(**NOT APPLICABLE)**

(H) FIRE PUMP ROOM.

(**NOT APPLICABLE)**

(I) WATER STORAGE TANKS.

(J) HAZRDOUS MATERIAL SPILL CONTAINMENT\6\ /6/.

(**NOT APPLICABLE)**

(K) BACKFLOW PREVENTION ASSEMBLY OR ASSEMBLIES SERVING WATER-BASED FIRE PROTECTION FIRE PROTECTION SYSTEMS (IF LOCATED OUTSIDE OF BUILDING).

(**NOT APPLICABLE)**

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

P:\CIVIL3D PROJECTS\BRA1331\05_CIVIL\CADD\PLAN SHEETS\PN96182_A-002-A-003.DWG K6END.JW6
11/29/2023 4:03:45 PM
AEC_NCS_4_MONO.STB

DESIGNED BY:	G. OGREN
DRAWN BY:	G. OGREN
CHECKED BY:	R. RADTKE
SUBMITTED BY:	J. DEACON
SIZE:	ANSI D
ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	-
CATEGORY CODE:	178-65-01

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

FIRE PROTECTION CODE COMPLIANCE PLAN

SHEET ID

A-803

READY TO ADVERTISE (RTA)

DESIGN CODE NOTES:

D-1. STRUCTURAL DESIGN IS IN ACCORDANCE WITH THE FOLLOWING CODES AND SPECIFICATIONS:

A. IBC 2018, INTERNATIONAL BUILDING CODE

B. ASCE 7-16, MINIMUM DESIGN LOADS FOR BUILDINGS AND STRUCTURES

C. ACI 318-14, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

D. TMS 402-16, BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES

E. AISC 360-16, SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS

F. AISI S100-12, NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS.

G. AWS, AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE

H. SDI, STEEL DECK INSTITUTE: DESIGN MANUAL FOR COMPOSITE DECK, FORM DECK, & ROOF DECK

I. UFC 1-200-01, GENERAL BUILDING REQUIREMENTS (01 OCT 2020)

J. UFC 3-301-01, STRUCTURAL ENGINEERING, (01 OCT 2019)

K. UFC 4-010-01, DOD MINIMUM ANTI-TERRORISM STANDARDS FOR BUILDINGS, (19 AUG 2020)

DESIGN LOAD CRITERIA:

D-2. LIVE LOADS:

ELEVATED SLABS / WALKWAYS / STAIRS	100 PSF
ROOF LIVE LOAD	20 PSF

D-3. SNOW LOADS:

RISK CATEGORY	II
SNOW IMPORTANCE FACTOR, I_s	1.0
MINIMUM GROUND SNOW LOAD, P_g	10 PSF
FROST PENETRATION DEPTH	0 IN
SNOW EXPOSURE FACTOR, C_e	0.9
SNOW THERMAL FACTOR, C_t	1.0
ROOF SLOPE FACTOR, C_S	0.8
FLAT ROOF SNOW LOAD, P_f	6.3 PSF
SLOPED ROOF SNOW LOAD, P_S	5 PSF

D-4. WIND LOADS:

RISK CATEGORY	II
BASIC WIND SPEED, *V*	119 MPH (ULTIMATE) 93 MPH (SERVICE)
WIND EXPOSURE CATEGORY	C
GUST EFFECT FACTOR, *G*	0.85
INTERNAL PRESSURE COEFFICIENTS, *GCpi*	+/- 0.18

D-5. SEISMIC LOADS:

RISK CATEGORY	II
SEISMIC IMPORTANCE FACTOR, *Ie*	1.0
MAPPED SPECTRAL RESPONSE ACCELERATION, *Ss*	0.154
MAPPED SPECTRAL RESPONSE ACCELERATION, *S1*	0.072
SITE CLASS	D
DESIGN SPECTRAL RESPONSE ACCELERATION, *Sds*	0.16
DESIGN SPECTRAL RESPONSE ACCELERATION, *Sd1*	0.12
SEISMIC DESIGN CATEGORY	B

CONTROL TOWER:

SEISMIC ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE
SEISMIC-FORCE RESISTING SYSTEM	STEEL NOT DETAILED FOR SEISMIC
RESPONSE MODIFICATION FACTOR, *R*	3.0
SYSTEM OVERSTRENGTH FACTOR	3.0
DEFLECTION AMPLIFICATION FACTOR, Cd	3.0
SEISMIC RESPONSE COEFFICIENT, Cs	0.055
SEISMIC BASE SHEAR	6.5 KIPS

PUMP HOUSE:

SEISMIC ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE
SEISMIC-FORCE RESISTING SYSTEM	LIGHT-FRAME WALL SIWTH SHEAR PANELS OF ALL OTHER MATERIALS
RESPONSE MODIFICATION FACTOR, *R*	2.0
SYSTEM OVERSTRENGTH FACTOR	2.5
DEFLECTION AMPLIFICATION FACTOR, Cd	2.0
SEISMIC RESPONSE COEFFICIENT, Cs	0.082
SEISMIC BASE SHEAR	0.5 KIPS

D-6. ANTI-TERRORISM/FORCE PROTECTION CRITERIA:

ANTI-TERRORISM/FORCE PROTECTION IS NOT REQUIRED FOR THIS FACILITY BASED ON THE INTENDED OCCUPANCY.

SPECIAL INSPECTION NOTES:

SI-1. INSPECTION OF FABRICATORS SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1704.2.5.

SI-2. INSPECTION OF STEEL CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.2.

SI-3. INSPECTION OF CONCRETE CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.3 AND TABLE 1705.3.

SI-4. INSPECTIONS FOR SEISMIC RESISTANCE SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.12.

SI-5. INCLUDE SPECIAL INSPECTIONS REQUIREMENTS IN CONTRACTOR'S QUALITY CONTROL (CQC) PLAN.

SI-6. THE CONTRACTOR SHALL RETAIN THIRD PARTY QUALITY ASSURANCE AGENCIES TO CONDUCT SPECIAL INSPECTIONS REQUIRED BY IBC. INSPECTING AGENCY SHALL PROVIDE REPORTS OF SPECIAL INSPECTIONS DIRECTLY TO THE GOVERNMENT.

GENERAL NOTES:

G-1. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER ALL BUILDING CONSTRUCTION IS COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCES TO ENSURE SAFETY OF THE BUILDING AND ITS COMPONENTS DURING ERECTION. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS, OR TIE-DOWNS.

G-2. THE CONTRACT DOCUMENTS DO NOT INDICATE THE MEANS AND METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK DURING ERECTION AND CONSTRUCTION AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES, SEQUENCES, LOADINGS AND SAFETY.

G-3. USE STRUCTURAL DRAWINGS IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SPECIFICATIONS. COORDINATE THE WORK OF OTHER TRADES INCLUDING, BUT NOT LIMITED TO, THE REQUIREMENTS FOR SLEEVES, INSERTS, HOLES, HANGERS, AND ANCHORS.

G-4. REPORT DISCREPANCIES IN DIMENSIONS BETWEEN DIFFERENT DRAWINGS TO THE CONTRACTING OFFICER PRIOR TO BEGINNING WORK IN IMPACTED AREAS.

G-5. ELEVATIONS ON THE STRUCTURAL DRAWINGS ARE DENOTED AS [±X'-X"] REFERENCED TO THE FINISHED FIRST FLOOR ELEVATION DATUM [0'-0"]. SEE CIVIL DRAWINGS FOR ACTUAL DATUM ELEVATION.

G-6. DETAILS TITLED OR NOTED AS "TYPICAL" APPLY NOT ONLY WHERE SPECIFICALLY INDICATED OR REFERENCED, BUT ALSO IN ALL OTHER CASES WHERE THE NATURE OF THE CONSTRUCTION REQUIRES THEIR USE. DETERMINE APPLICABILITY OF TYPICAL DETAILS FROM DESCRIPTIVE TITLES OR FROM THE SIMILARITY OF A CONSTRUCTION CONDITION TO ANOTHER CONDITION WHERE THE DETAIL IS SPECIFICALLY INDICATED OR REFERENCED.

G-7. WHERE A DETAIL OR SECTION IS SHOWN FOR ONE CONDITION, IT SHALL APPLY TO ALL LIKE OR SIMILAR CONDITIONS EVEN THOUGH NOT SPECIFICALLY MARKED ON THE PLANS.

G-8. REPRODUCTION OF CONTRACT DRAWINGS SHALL NOT BE USED AS SHOP DRAWINGS UNDER ANY CIRCUMSTANCE.

G-9. DO NOT SCALE THE DRAWINGS.

FOUNDATION AND SLAB NOTES:

F-1. FOUNDATIONS FOR THIS PROJECT HAVE BEEN DESIGNED IN ACCORDANCE WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT PREPARED BY THE SAVANNAH DISTRICT TITLED "SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING REPORT", DATED MARCH 2022.

F-2. FOUNDATIONS HAVE BEEN DESIGNED TO BEAR ON SOIL CAPABLE OF SUPPORTING AN ALLOWABLE BEARING PRESSURE OF 3000 PSF, PER THE GEOTECHNICAL REPORT REFERENCED ABOVE.

F-3. THE CONTRACTOR SHALL HIRE AN INDEPENDENT TESTING LABORATORY AND GEOTECHNICAL ENGINEER, REGISTERED AND LICENSED IN THE STATE WHERE THE WORK WILL BE ACCOMPLISHED, TO VERIFY THAT ALL OF THE REQUIREMENTS CONTAINED IN SPECIFICATION 31 00 00, EARTHWORK, HAVE BEEN FOLLOWED AND ACCOMPLISHED.

F-4. CONTRACTOR SHALL BE PREPARED FOR AND SHALL INCLUDE COST OF FORMING FOUNDATIONS SHOULD THE EARTH NOT PROVIDE ADEQUATE BANK STABILITY.

F-5. ALL EXCAVATIONS SHALL BE PERFORMED SO THAT THE SITE AND THE AREA IMMEDIATELY SURROUNDING THE SITE WHICH AFFECTS CONSTRUCTION OPERATIONS WILL BE CONTINUALLY AND EFFECTIVELY DRAINED. THE CONTRACTOR SHALL PROVIDE DRAINAGE AND DEWATERING AS REQUIRED TO ENSURE THAT ALL FOOTING EXCAVATIONS ARE ACCOMPLISHED WITH THE SUBGRADE SOILS REMAINING DRY AND FIRM UNTIL AFTER FOOTINGS ARE PLACED AND BACKFILLED. REMOVAL OF SURFACE WATER, GROUNDWATER, AND ANY PERCHED WATER CONDITIONS WHICH MIGHT BE ENCOUNTERED DURING EXCAVATIONS, SHALL BE ACCOMPLISHED BY APPROVED MEANS. REFER TO SPECIFICATION SECTION 31 00 00, EARTHWORK, AND TO SHEET S-101 FOR ADDITIONAL EXCAVATION REQUIREMENTS.

F-6. PLACE FOUNDATION CONCRETE THE SAME DAY EXCAVATIONS ARE MADE OR AS SOON AS PRACTICAL THEREAFTER.

F-7. DO NOT PLACE FOUNDATION CONCRETE ON FROZEN OR SATURATED SUBGRADES.

F-8. ENSURE THAT EARTH-FORMED FOOTINGS CONFORM TO THE SHAPE, LINES, AND THICKNESS INDICATED ON THE FOUNDATION PLAN, SECTIONS, AND FOOTING SCHEDULES. EXCAVATION WIDTHS SHALL BE A MINIMUM OF 4" GREATER THAN DIMENSIONS INDICATED.

F-9. DO NOT INSTALL FOUNDATIONS UNTIL FOUNDATION WORK HAS BEEN COORDINATED WITH ADJACENT UNDERGROUND UTILITIES.

CONCRETE CONSTRUCTION NOTES CONTINUED:

C-1. ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-14) AND THE SPECIFICATIONS FOR STRUCTURAL CONCRETE (ACI 301-14) OF THE AMERICAN CONCRETE INSTITUTE (ACI).

C-2. ALL CAST-IN-PLACE CONCRETE SHALL ATTAIN MINIMUM 28-DAY COMPRESSIVE STRENGTH (f'c) OF 4000 PSI.

C-3. CONCRETE DENSITY SHALL BE NORMAL WEIGHT WITH A DENSITY OF 140 PCF TO 150 PCF UNLESS NOTED OTHERWISE ON PLANS. CONCRETE NOTED TO BE LIGHTWEIGHT SHALL HAVE DENSITY OF 105 PCF TO 115 PCF.

C-4. CONCRETE REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615/A615M, GRADE 60 AND SHALL HAVE FABRICATION TOLERANCES IN ACCORDANCE WITH ACI 315. SHOP FABRICATE REINFORCING BARS WHICH ARE INDICATED TO BE BENT OR HOOKED.

C-5. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 OR ASTM A497. PROVIDE SHEET-TYPE WELDED WIRE FABRIC. SHEET LAPS SHALL BE TIED AND LAPPED ONE FULL MESH SPACING PLUS 2".

C-6. CONCRETE REINFORCING STEEL SHALL BE CONTINUOUS UNLESS OTHERWISE INDICATED. CONTINUOUS REINFORCING STEEL SHALL BE SPLICED AS SHOWN IN SCHEDULE ON SB601 UNO ON PLANS. REINFORCING STEEL SHALL BE PLACED SO THAT SPACING IS GREATER THAN OR EQUAL TO 2X BAR DIAMETER.

C-7. MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE AS INDICATED. IN NO CASE SHALL REINFORCEMENT COVER BE LESS THAN THE REQUIREMENTS OF ACI 301.

A.	CONCRETE DEPOSITED AGAINST THE GROUND	3"
B.	CONCRETE EXPOSED TO EARTH OR WEATHER	2"
C.	SLABS AND WALLS	1"

C-8. CONCRETE REINFORCING STEEL MARKED STANDARD HOOK SHALL HAVE A 90° HOOK A MINIMUM OF 12 BAR DIAMETERS IN LENGTH, UNLESS OTHERWISE NOTED. STIRRUPS, TIES, AND 180° HOOKS SHALL CONFORM TO THE REQUIREMENTS OF ACI 318.

C-9. PROVIDE 1/2" THICK PRE-MOLDED JOINT FILLER MATERIAL WHERE SLABS ON GRADE ABUT VERTICAL SURFACES.

C-10. ALL EMBEDDED ITEMS SHALL BE PROPERLY PLACED, ACCURATELY POSITIONED AND MAINTAINED SECURELY IN PLACE PRIOR TO AND DURING CONCRETE PLACEMENT.

C-11. REINFORCING STEEL SHALL BE SPREAD AT SLEEVES, ANCHORS, RECESSES AND OTHER EMBEDDED ITEMS UNLESS OTHERWISE INDICATED. REINFORCEMENT SHALL NOT BE CUT TO FACILITATE PLACEMENT OF EMBEDDED ITEMS, UNLESS INDICATED.

C-12. NO CONCRETE SHALL BE PLACED UNTIL THE OWNER OR THE CONTRACTING OFFICER'S DESIGNATED REPRESENTATIVE HAS INSPECTED ALL EMBEDDED WORK, INCLUDING REINFORCEMENT.

C-13. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 3/4" OR AS INDICATED.

C-14. ALUMINUM SHALL NOT BE PLACED IN DIRECT CONTACT WITH CONCRETE UNLESS EFFECTIVELY COATED OR COVERED TO PREVENT ALUMINUM-CONCRETE REACTION AND ELECTROLYTIC ACTION BETWEEN ALUMINUM AND STEEL.

C-15. CONCRETE SLAB ON GRADE JOINTS INDICATED ARE DIAGRAMMATIC AND DO NOT REPRESENT ALL OF THE JOINTS REQUIRED FOR SLAB-ON-GRADE CONSTRUCTION. SLAB PANELS BETWEEN JOINTS SHALL BE EQUALLY SPACED OR NEARLY SO, WITH A MAXIMUM SPACING OF 15'-0". SLAB PANELS BETWEEN JOINTS SHALL BE SQUARE OR NEARLY SO AND SHALL NOT EXCEED AN ASPECT RATIO WITH PANEL LENGTH GREATER THAN 1.5 TIMES THE PANEL WIDTH.

C-16. CONTRACTOR SHALL PROVIDE JOINTS AT ALL RE-ENTRANT CORNERS INCLUDING, BUT NOT LIMITED TO, COLUMNS AND SLAB RECESSES.

C-17. IN ADDITION, CONTRACTOR SHALL COORDINATE SLAB ON GRADE JOINT REQUIREMENTS WITH SLAB-ON-GRADE CONSTRUCTION SEQUENCING. CONTRACTOR SHALL SHOW JOINT LAYOUT ON REINFORCING SHOP DRAWING SUBMITTAL FOR APPROVAL.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
A. SCOTT	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
A. SCOTT	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
J. WHITTAKER	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER GENERAL STRUCTURAL NOTES

SHEET ID
BLDG 1
S-001

File Path: C:\Users\kbendhn\Documents\FY23_PN96182_MPTR-TOWER_STRUCT_R21_kBendhn.rvt

Plot Date: 11/28/2023 3:41:52 PM

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STEEL CONSTRUCTION NOTES:

S-1. FABRICATION AND ERECTION OF STRUCTURAL STEEL AND DESIGN OF CONNECTIONS SHALL BE IN ACCORDANCE WITH AISC 360-16, "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" AND AISC 303-16, "CODE OF STANDARD PRACTICE FOR BUILDING AND BRIDGES". THE STRUCTURAL STEEL MEMBERS SHOWN IN THESE DRAWINGS HAVE BEEN ANALYZED AND DESIGNED USING AISC 360-16, LRFD METHOD.

S-2. UNLESS OTHERWISE NOTED, STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE ABOVE-LISTED AISC SPECIFICATION AND THE FOLLOWING:

A. WIDE FLANGE SHAPES (50 KSI)	ASTM A992, GRADE B
B. HSS HOLLOW SHAPES (50 KSI)	ASTM A500, GRADE C
C. HSS HOLLOW ROUND SHAPES (46 KSI)	ASTM A500, GRADE C
D. CHANNELS, PLATES AND ANGLES	ASTM A36
E. HIGH STRENGTH BOLTS	ASTM F3125, GRADE A325
F. ANCHOR RODS W/ NUT AND WASHER	ASTM F1554, GRADE 55

S-3. IT IS THE INTENTION OF THESE DESIGN DOCUMENTS TO DELEGATE THE DESIGN OF ALL STRUCTURAL STEEL SHEAR CONNECTIONS THAT ARE NOT ASSOCIATED WITH THE LATERAL FORCE RESISTING SYSTEM (IE. MOMENT CONNECTION AND BRACED FRAME CONNECTIONS) TO A QUALIFIED REGISTERED ENGINEER RETAINED BY THE CONTRACTOR AND/OR FABRICATOR. SIGNED AND SEALED CALCULATIONS FOR CONNECTION DESIGNS SHALL BE SUBMITTED SIMULTANEOUSLY WITH FABRICATION DRAWINGS FOR REVIEW. ALL SHEAR CONNECTIONS FOR SIMPLY SUPPORTED BEAMS SHALL BE DESIGNED TO DEVELOP THE FACTORED DESIGN REACTION PER 5/SF502 FOR THE BEAM SIZE AND SPAN SHOWN. ALL STEEL SHEAR CONNECTIONS SHOWN ON THE DRAWINGS ARE CONCEPTUAL IN NATURE AND DO NOT DICTATE DESIGN INTENT IN TERMS OF NUMBER OF BOLTS, WELD SIZES, ANGLE SIZE, ETC. THE DELEGATED ENGINEER IS SOLELY RESPONSIBLE FOR THE DESIGN OF THE CONNECTIONS FOR THE CRITERIA INDICATED ON THE DRAWINGS. CONNECTIONS SHALL HAVE A MINIMUM OF 2 BOLTS.

S-4. ALL SHOP AND FIELD WELDING SHALL BE BY CERTIFIED WELDERS AND SHALL CONFORM TO AWS STANDARDS. USE E70XX ELECTRODES UNLESS OTHERWISE NOTED. MINIMUM WELD SIZE FOR STRUCTURAL STEEL IS 3/16 IN FILLET, UNLESS OTHERWISE NOTED. CURRENT AWS CERTIFICATIONS SHALL BE AVAILABLE AT THE JOB SITE FOR REVIEW BY THE OWNERS' REPRESENTATIVE.

S-5. ALL BOLTED CONNECTIONS, UNLESS OTHERWISE NOTED, SHALL USE 3/4" DIAMETER HIGH STRENGTH BOLTS WITH HARDENED CARBON STEEL WASHERS AS REQUIRED FOR THE CONNECTION LOADS.

S-6. ALL FIELD-BOLTED SHEAR CONNECTIONS SHALL BE SNUG TIGHT BEARING-TYPE CONNECTIONS, THREADS INCLUDED IN THE SHEAR PLANE.

S-7. FIELD CUTTING OF STRUCTURAL STEEL MEMBERS BY ANY TRADE IS NOT PERMITTED. BOLT HOLES SHALL NOT BE CUT OR ENLARGED BY FLAME CUTTING IN THE FIELD.

S-8. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL DRAWINGS AND DESIGN CALCULATIONS FOR ANY ALTERNATE DETAILS AND MEMBER SPLICES.

S-9. SHOP OR FIELD SPLICES OF STRUCTURAL STEEL MEMBERS ARE PROHIBITED EXCEPT AS DETAILED ON THE DRAWINGS, PERMITTED IN THE SPECIFICATIONS, AS INDICATED ON APPROVED SUBMITTALS, AND AS SPECIFICALLY APPROVED ON SHOP DRAWINGS PRIOR TO FABRICATION.

S-10. ALL STEEL EXPOSED TO WEATHER SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 FOR MEMBERS AND ASTM A153 FOR CONNECTION ELEMENTS. COORDINATE ALL STEEL FINISHES WITH ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

S-11. ALL ANGLES AND BENT PLATES INDICATED TO BE CONTINUOUS SHALL HAVE SPLICES FULLY WELDED.

S-12. PROVIDE STEEL CAP PLATE TO ALL HSS AND PIPE MEMBERS.

STEEL DECK NOTES:

SD-1. ROOF DECK SHALL BE GALVANIZED STEEL CONFORMING TO ASTM A653 WITH A MINIMUM YIELD STRENGTH OF 33 KSI. STEEL ROOF DECK SHALL BE AS SHOWN ON DRAWINGS. FASTENERS FOR ROOF DECK SHALL UTILIZE #12 SELF TAPPING SCREWS AT A 36/7 PATTERN TO SUPPORT STRUCTURE AND #12 SELF TAPPING SCREWS AT SIDE LAP CONNECTIONS. THE NUMBER OF SIDELAPS VARIES PER ROOF PLAN. SEE ROOF PLANS FOR NUMBER OF SIDELAPS REQUIRED. SEE ROOF EAVE/RAKE SECTIONS FOR PERIMETER FASTENING REQUIREMENTS.

SD-2. COMPOSITE FLOOR DECK SHALL BE GALVANIZED STEEL CONFORMING TO ASTM 653 WITH A MINIMUM YIELD STRENGTH OF 50 KSI. COMPOSITE STEEL FLOOR DECK SHALL BE AS SHOWN ON DRAWINGS. COMPOSITE FLOOR DECK SHALL BE FASTENED TO THE SUPPORTING STRUCTURE WITH 5/8" DIAMETER PUDDLE WELDS AT A 36/4 PATTERN AND #10 SELF TAPPING SCREWS AT SIDELAPS AT A MINIMUM OF 8 LOCATIONS. FASTEN PERIMETER AND DISCONTINUOUS SIDE OF FLOOR DECK TO SUPPORTING STRUCTURE WITH 5/8" DIAMETER PUDDLE WELDS AT 12" OC UNO.

SD-3. PROVIDE ALL RIDGE PLATES, VALLEY PLATES, CLOSURE PLATES, POUR STOPS, AND ALL OTHER ACCESSORIES REQUIRED FOR COMPLETE INSTALLATION IN ACCORDANCE WITH THE DECK MANUFACTURER'S RECOMMENDATIONS.

SD-4. CONTRACTOR SHALL COORDINATE OPENINGS IN STEEL DECK WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS PRIOR TO DECK PLACEMENT.

SD-5. HANGING LOADS DIRECTLY FROM ROOF DECK IS PROHIBITED.

SD-6. STEEL DECK SHALL SPAN CONTINUOUSLY OVER A MINIMUM OF 4 SUPPORTS (3 SPANS) UNO.

LIGHT GAUGE STEEL NOTES:

LG-1. THE ROOF LAYOUT AND COMPONENTS SHOWN ON THE DRAWINGS ARE FOR GENERAL CONFIGURATION ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL QUANTITIES, DIMENSIONS, CONNECTION DETAILS, ETC. NECESSARY FOR THE COMPLETE DESIGN, FABRICATION, AND ERECTION OF THE ROOF FRAMING SYSTEM. THE CONTRACTOR SHALL COORDINATE THE DESIGN WITH THE ARCHITECTURAL PLANS, ELEVATIONS, AND DETAILS.

LG-2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL TOWER EXTERIOR STUD WALL FRAMING TO INCLUDE ALL ELEVATIONS, QUANTITIES, DIMENSIONS, CONNECTION DETAILS, ETC. NECESSARY FOR THE COMPLETE DESIGN, FABRICATION, AND ERECTION OF THE CONTROL TOWER EXTERIOR STUD WALL FRAMING. THE CONTRACTOR SHALL COORDINATE THE DESIGN WITH THE ARCHITECTURAL PLANS, ELEVATIONS, AND DETAILS.

LG-3. COLD-FORMED TRUSSES AND CONTROL TOWER EXTERIOR STUD WALLS SHALL BE DESIGNED IN ACCORDANCE WITH THE AMERICAN IRON AND STEEL INSTITUTE (AISI) SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS.

LG-4. ALL CALCULATIONS AND DRAWINGS USED IN THE DESIGN OF COLD-FORMED TRUSSES AND CONTROL TOWER EXTERIOR STUD WALLS MUST BE SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA AND SUBMITTED FOR APPROVAL. IN ADDITION TO THE CALCULATIONS, THE SUBMITTAL SHALL INCLUDE DETAILS OF THE LAYOUT, ERECTION PLAN, BOTH TEMPORARY AND PERMANENT BRACING, BRIDGING, OUTRIGGERS, CONNECTIONS INCLUDING DIAPHRAGM FORCES, HEADERS, SILLS, AND JAMBS.

LG-5. THE CONTRACTOR SHALL SUBMIT COMPLETE PRODUCT CATALOGS FROM THE MATERIAL MANUFACTURER FOR REVIEW PRIOR TO FABRICATION. THE CATALOGS SHALL INDICATE QUALIFICATION, MATERIAL SPECIFICATIONS, DESIGN REFERENCES, ETC.

LG-6. ALL COLD-FORMED STEEL MEMBERS, THEIR COMPONENTS, AND CONNECTION MATERIAL SHALL BE GALVANIZED. PREPARE AND REPAIR DAMAGED GALVANIZED COATINGS ON FABRICATED AND INSTALLED LIGHT GAUGE METAL FRAMING WITH GALVANIZING REPAIR PAINT ACCORDING TO ASTM A780 AND/OR THE MANUFACTURER'S RECOMMENDATIONS.

LG-7. COLD-FORMED STEEL MEMBERS SHALL BE Fy=33KSI FOR MEMBERS 43 MILS (18 GA) AND LIGHTER AND Fy=50KSI FOR MEMBERS 54 MILS (16 GA) AND HEAVIER. USE MIN 6" WIDE STUDS AT ONTROL TOWER EXTERIOR WALLS UNO.

LG-8. ALL WELDING OF COLD-FORMED STEEL SHALL COMPLY WITH AWS D1.1 AND AWS D1.3 FOR WELDING BASE MATERIAL LESS THAN 1/8" THICK.

LG-9. COLD-FORMED STEEL STUD MEMBERS SHALL BE DESIGNED TO ACCOMMODATE VERTICAL AND HORIZONTAL LOADS DUE TO ARCHITECTURAL VENEER AND FEATURES. COORDINATE DESIGN CRITERIA WITH ARCHITECTURAL DRAWINGS AND DETAILS.

LG-10. CONTROL TOWER COLD-FORMED STEEL STUD MEMBERS SHALL UTILIZE A DEFLECTION TRACK ALLOWING FOR 1" DEFLECTION OF BEAM ABOVE.

LG-11. TRUSS LOADING:
- TOP CHORD:
  - DEAD: 8 PSF
  - LIVE ROOF: 20 PSF
  - WIND: SEE S-003
- BOTTOM CHORD:
  - DEAD: 8 PSF
  - LIVE: 10 PSF

LG-12. TRUSS DEFLECTION SHALL BE LIMITED TO:
- LIVE LOAD - L/360
- SNOW LOAD OR WIND LOAD - L/360
- DEAD LOAD + LIVE LOAD - L/240

LG-13. BRIDGING AND BRACING OF TRUSS COMPRESSION MEMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE TRUSS MANUFACTURERS DESIGN AND DIRECTIONS. TRUSSES SHALL BE BRACED SECURELY BOTH DURING ERECTION AND AFTER PERMANENT INSTALLATION BY THE CONTRACTOR. ERECTION BRACING SHALL HOLD TRUSSES STRAIGHT AND PLUMB UNTIL DECKING AND PERMANENT TRUSS BRACING HAVE BEEN INSTALLED. ALL BRACING SHALL BE INSTALLED PRIOR TO THE LOADING OF THE TRUSSES.

ADDITIONAL NOTES FOR PUMP HOUSE LIGHT GAUGE STEEL:

LG-14. STUDS SHALL BE 400S162-43 (33 KSI) SPACED AT 16" OC. STUDS SHALL BE BRACED AT 4'-0" MAX. TRACKS SHALL BE 400T200-43 (33 KSI). USE #8 SCREWS.

LG-15. TYPICAL SHEAR WALLS SHALL BE SHEATHED ON ONE SIDE WITH 5/8" GYPSUM SHEATHING WITH #8 SCREWS IN A 8/12 PATTERN. ALL SHEATHING EDGES MUST BE ATTACHED TO STRUCTURAL MEMBERS. SHEATHING PANELS MAY NOT BE LESS THAN 12 INCHES WIDE.

GRATING NOTES:

G-1. STEEL GRATING SHALL BE 1 1/2" DEEP INTERMEDIATE WELDED TYPE 19-W-4 UNO. PANELS SHALL BE FABRICATED WITH 3/16" BEARING BARS AT 1 3/16" OC. PROVIDE CROSS BARS AT 4" OC. BEARING BARS SHALL HAVE A SERRATED SURFACE. GRATING PANELS SHALL BE ATTACHED TO SUPPORTING MEMBERS WITH MANUFACTURER'S STANDARD GALVANIZED HOLD DOWN CLIPS WITH A MINIMUM OF 4 CLIPS PER PANEL. ALL GRATING SHALL BE HOT DIPPED GALVANIZED. ALL EDGES OF GRATING SHALL BE BANDED.

G-2. GRATING IS DESIGNED FOR 100 PSF FOR PEDESTRIAN TRAFFIC ONLY.

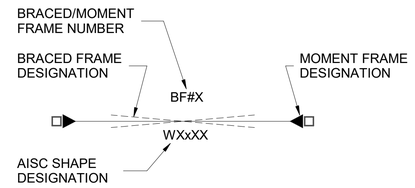
STRUCTURAL ABBREVIATIONS

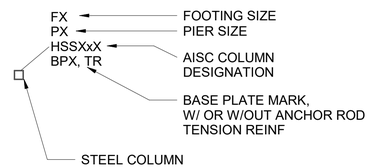
AFF	ABOVE FINISHED FLOOR	JS	JOIST SEAT
APPROX	APPROXIMATELY	KIP (k)	1000 POUNDS
ARCH	ARCHITECTURAL	LG	LONG
BCX	BOTTOM CHORD EXTENSION	LLH	LONG LEG HORIZONTAL
BOC	BOTTOM OF CONCRETE	LLV	LONG LEG VERTICAL
BOF	BOTTOM OF FOOTING	MAX	MAXIMUM
BOS	BOTTOM OF STEEL	MECH	MECHANICAL
BOT	BOTTOM	MEP	MECHANICAL, ELECTRICAL, PLUMBING
BRG	BEARING	MNFR	MANUFACTURER
BTWN	BETWEEN	MIN	MINIMUM
CFS	COLD-FORMED STEEL	NTS	NOT TO SCALE
CJ	CONTRACTION JOINT	OC	ON CENTER
CL	CENTER LINE	OPP	OPPOSITE
CLR	CLEAR	PJF	PREMOLDED JOINT FILLER
COL	COLUMN	PL	PLATE
CONN	CONNECTION	PLF	POUNDS PER LINEAR FOOT
CONC	CONCRETE	PSF	POUNDS PER SQUARE FOOT
CONT	CONTINUOUS	PSI	POUNDS PER SQUARE INCH
CONSTR	CONSTRUCTION	REINF	REINFORCEMENT
DEG	DEGREE	REQD	REQUIRED
DIA	DIAMETER	SCHED	SCHEDULE
DWG(S)	DRAWING(S)	SE	SLAB EDGE
EA	EACH	SJI	STEEL JOIST INSTITUTE
EF	EACH FACE	SIM	SIMILAR
EJ	EXPANSION JOINT	SOG	SLAB ON GRADE
EL	ELEVATION	SPCG	SPACING
EOD	EDGE OF DECK	STD	STANDARD
EOS	EDGE OF SLAB	T&B	TOP AND BOTTOM
ES	EACH SIDE	TO	TOP OF
EQ	EQUAL	TOC	TOP OF CONCRETE
EW	EACH WAY	TOF	TOP OF FOOTING
FF	FINISHED FLOOR	TOS	TOP OF SLAB
FTG	FOOTING	TR	TENSION REINFORCEMENT
GA	GAGE	TYP	TYPICAL
GALV	GALVANIZED	UNO	UNLESS NOTED OTHERWISE
HGT	HEIGHT	VERT	VERTICAL
HORIZ	HORIZONTAL	WP	WORKING POINT
IS	ISOLATION JOINT	WWF	WELDED WIRE FABRIC

STRUCTURAL LEGEND

- DN → SLOPE DIRECTION
- [+/- X'-X"] — INDICATES ELEVATION REFERENCED TO FINISHED FLOOR
- X — KEYED PLAN NOTE
- X — COLUMN REFERENCE LINE (CENTER LINE OF COLUMN)
- [+/- X'-X"] — SPOT ELEVATION
- SLAB DEPRESSION
- BRICK WALL
- CONCRETE ELEMENT
- EARTH FILL
- GROUT
- CONCRETE MASONRY UNIT (CMU)
- POROUS FILL
- WELDED WIRE FABRIC (WWF)

STRUCTURAL FRAMING REFERENCE





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MARK	DESCRIPTION	DATE

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DESIGN BY:	A. SCOTT
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U.S. ARMY CORPS OF ENGINEERS
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER GENERAL STRUCTURAL NOTES

SHEET ID
BLDG 1
S-002

READY TO ADVERTISE (RTA)

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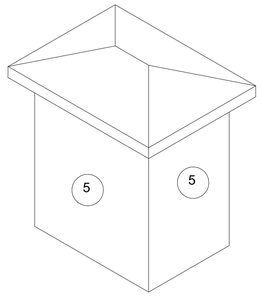
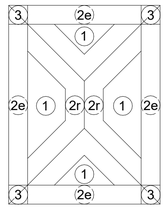




WALL ZONES - PUMP HOUSE

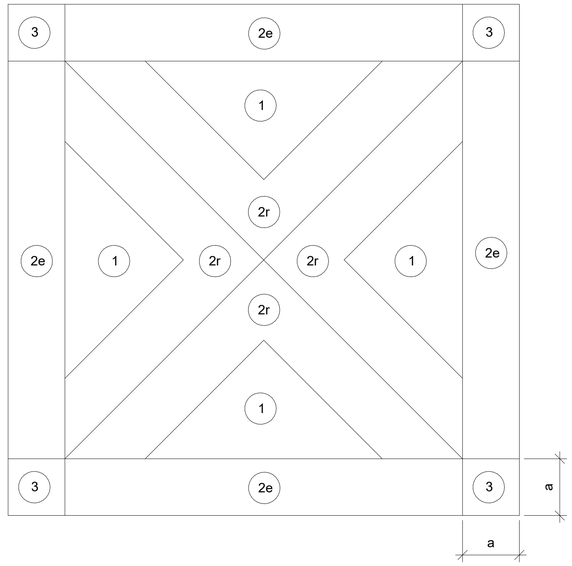
ROOF ZONES - PUMP HOUSE

COMPONENT AND CLADDING WIND PRESSURES - PUMP HOUSE

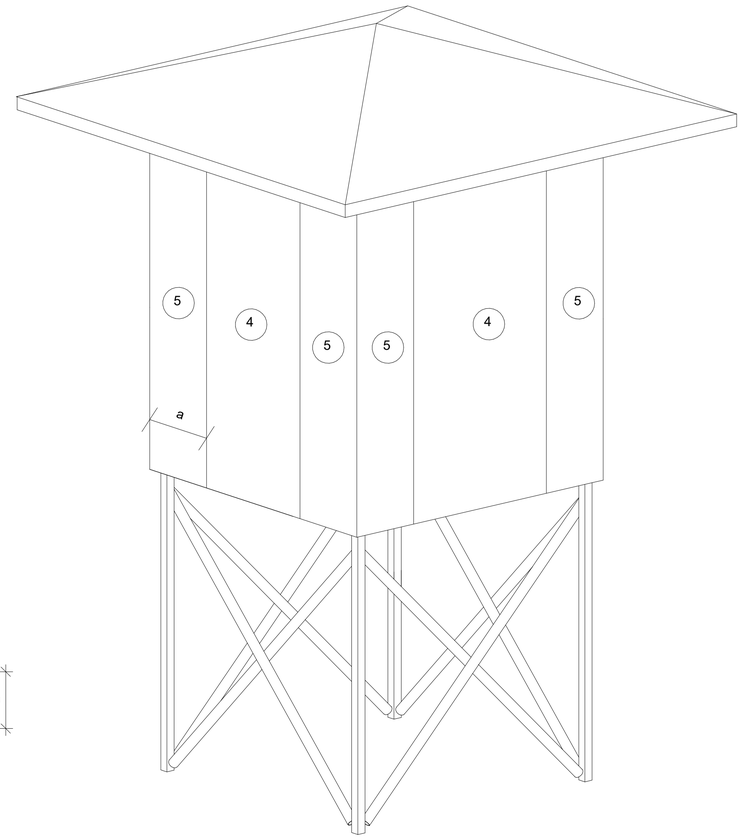
EFFECTIVE WIND AREA	ROOF ZONES			OVERHANG ZONES				WALLS ZONES	
	1	2R	2E, 3	1	2E	2R	3	4	5
10 SF	+23 / -52	+23 / -68	+23 / -73	-65	-86	-68	-73	+31 / -34	+31 / -41
20 SF	+20 / -52	+20 / -61	+20 / -66	-65	-82	-61	-66	+30 / -39	+30 / -39
50 SF	+16 / -40	+16 / -52	+16 / -56	-60	-76	-52	-56	+28 / -30	+28 / -35

NOTES:

1. GROSS WIND PRESSURES SHOWN ABOVE ARE PREDICATED ON ULTIMATE WIND SPEED.
2. EDGE ZONES: 'a' = 3'-0"
3. WIND PRESSURES SHOWN SHALL BE USED IN CONJUNCTION WITH LRFD LOAD COMBINATIONS SPECIFIED IN SECTIONS 2.3 AND 2.4 OF ASCE 7-16.
4. POSITIVE WIND PRESSURES REPRESENT WIND PRESSURES ACTING TOWARDS THE COMPONENT AND CLADDING SURFACES.
5. NEGATIVE WIND PRESSURES REPRESENT WIND PRESSURES ACTING AWAY FROM THE COMPONENT AND CLADDING SURFACES.



ROOF ZONES



WALL ZONES

COMPONENT AND CLADDING WIND PRESSURES

EFFECTIVE WIND AREA	ROOF ZONES			OVERHANG ZONES				WALLS ZONES	
	1	2R	2E, 3	1	2E	2R	3	4	5
10 SF	+28 / -63	+28 / -82	+28 / -89	-79	-105	-98	-124	+38 / -41	+38 / -51
20 SF	+25 / -63	+25 / -74	+25 / -80	-79	-99	-94	-110	+36 / -39	+36 / -48
50 SF	+19 / -49	+20 / -64	+19 / -68	-74	-93	-88	-93	+34 / -37	+34 / -43
100 SF	+16 / -38	+16 / -55	+16 / -59	-70	-87	-84	-80	+32 / -35	+32 / -39
200 SF	+16 / -38	+16 / -47	+16 / -51	-70	-82	-79	-66	+31 / -34	+31 / -36
500 SF	+16 / -38	+16 / -47	+16 / -51	-70	-82	-79	-66	+28 / -32	+28 / -32

1 COMPONENT AND CLADDING WIND PRESSURES
NOT TO SCALE

US Army Corps of Engineers ®

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DESIGN BY: A. SCOTT
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SUBMITTED BY: J. DEACON
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VOLUME 2 - BUILDING

CONTROL TOWER COMPONENTS AND CLADDING

SHEET ID
BLDG 1
S-003

READY TO ADVERTISE (RTA)

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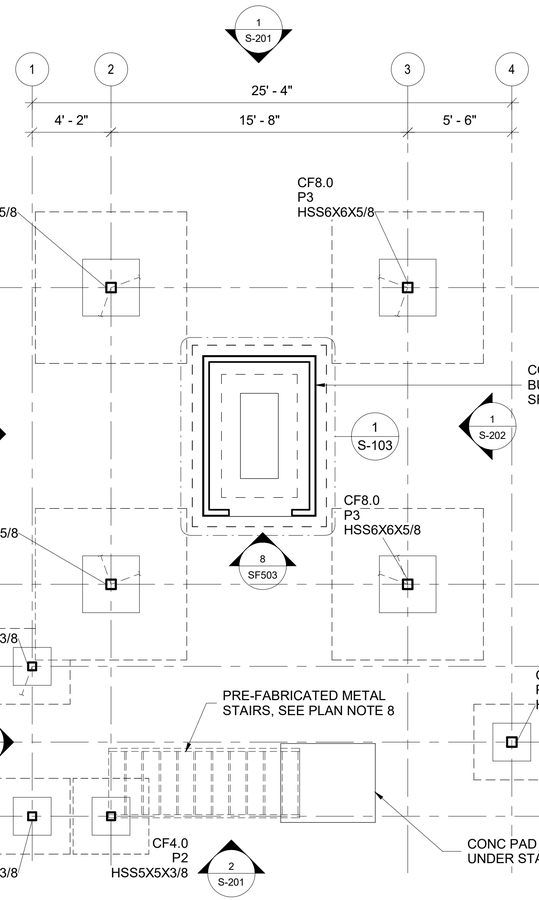
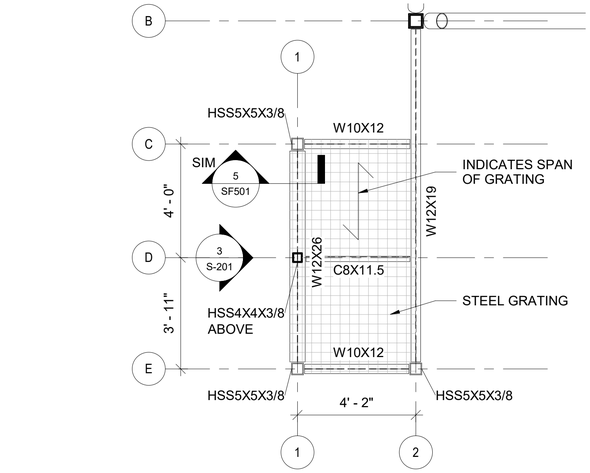


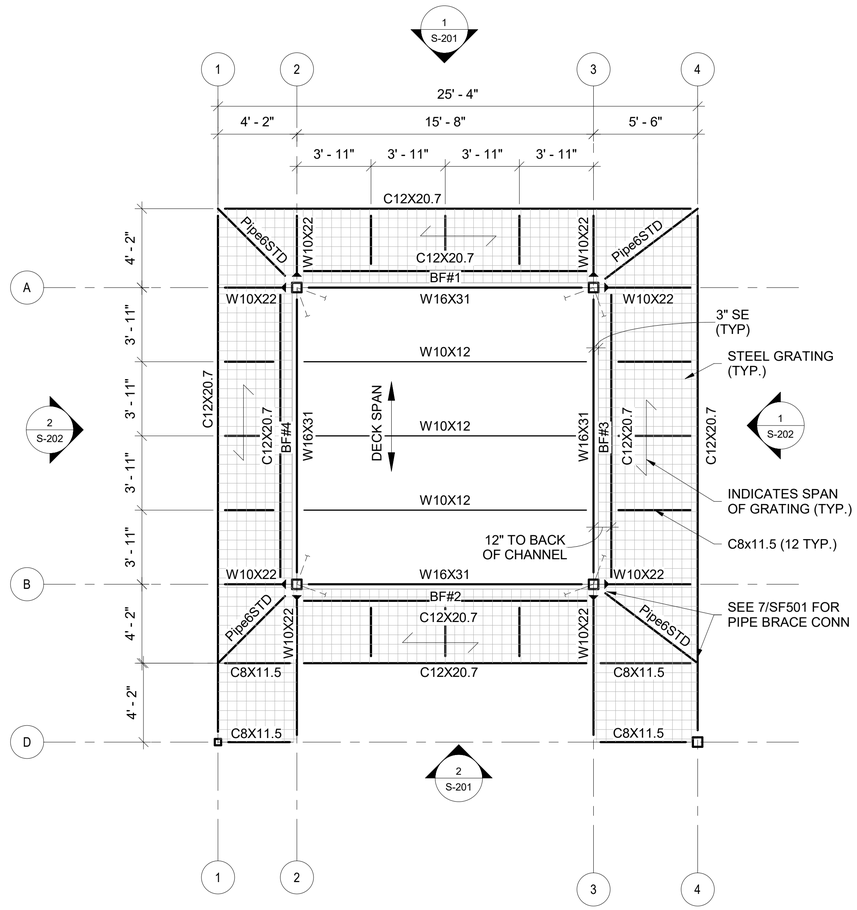
1 FOUNDATION PLAN

1/4" = 1'-0"



3 STAIR LANDING - ENLARGED FRAMING PLAN

3/8" = 1'-0"



2 FIRST FLOOR FRAMING PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

FOUNDATION PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. TOP OF GRADE ELEVATION = 0'-0". ALL ELEVATIONS INDICATED FROM THIS DATUM. SEE CIVIL DRAWINGS FOR EXACT ELEVATION.
3. TOP OF PEDESTAL = (+) 0'-6" UNO.
4. TOP OF FTG = (-) 1'-6" UNO.
5. ALL FOOTINGS SHALL BE CENTERED UNDER COLUMNS.
6. CFX.X INDICATE FOOTINGS FOUNDED IN SOIL WITH AN ASSUMED ALLOWABLE BEARING CAPACITY OF 3,000 PSF AS DEFINED IN THE FOUNDATION NOTES ON S-001. SEE FOOTING SCHEDULE ON SB601 FOR SIZE AND REINFORCEMENT.
7. P# DENOTES PEDESTAL. SEE PEDESTAL DETAIL ON SHEET SB501.
8. PRE-FABRICATED METAL STAIRS AND CONNECTIONS TO THE BUILDING STRUCTURE SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER EMPLOYED BY THE STAIR FABRICATOR. COORDINATE ALL DIMENSIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.
9. WITHIN THE AREA OF THE BUILDING FOOTINGS, THE SOILS SHALL BE TESTED FOR IN-SITU ALLOWABLE BEARING PRESSURE BY METHOD OF HAND AUGER AND DYNAMIC CONE PENETROMETER METHOD, IN ACCORDANCE WITH ASTM SPECIAL TECHNICAL PUBLICATION #399. SOILS WHICH ARE IDENTIFIED TO HAVE A NET ALLOWABLE BEARING PRESSURE BELOW 3,000 PSF, OR WHICH ARE DEEMED TO BE UNSATISFACTORY FOR OTHER REASONS (E.G., EXCESSIVE DEBRIS OR ORGANIC CONTENT), SHALL BE OVER-EXCAVATED AND REPLACED WITH ADDITIONAL CONCRETE DURING THE CONCRETING OR REPLACED TO DESIGN SUBGRADE WITH NO. 57 OR NO. 67 STONE, COMPACTED TO A NON-YIELDING CONDITION. OVER-EXCAVATION SHALL BE PERFORMED IN ACCORDANCE WITH EM 385-1-1 AND OSHA 29 CFR 1926.652. BACKFILLING SHALL BE IN ACCORDANCE WITH SECTION 31 00 00, EARTHWORK. IT IS POSSIBLE THAT PERCHED GROUNDWATER WILL BE ENCOUNTERED DURING OVER-EXCAVATION. DEWATERING SHOULD BE DONE IN ACCORDANCE WITH SPECIFICATIONS.

ELEVATED FLOOR FRAMING PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. TOP OF FINISHED FLOOR SLAB ELEVATION SHALL BE:
   1ST FLOOR = (+) 17'-0"
   2ND FLOOR = (+) 27'-0"
3. TOP OF STEEL ELEVATION SHALL BE:
   1ST FLOOR = (+) 16'-8"
   2ND FLOOR = (+) 26'-8"
4. TOP OF STEEL ELEVATION FOR WALKWAY SUPPORT SHALL BE: STAIR LANDING = (+) 6'-10 1/2"
   1ST FLOOR = (+) 16'-9 1/2"
   2ND FLOOR = (+) 26'-9 1/2"
5. FLOOR FRAMING CONSISTS OF 3" LIGHT WEIGHT CONCRETE SUPPORTED BY 1.0C22 GAUGE METAL DECK (4" TOTAL THICKNESS) OVER STEEL BEAMS. REINFORCE SLAB WITH MINIMUM 6X6-W2.9XW2.9 WELDED WIRE FABRIC MESH. SLAB SHALL BE PLACED SO THAT MAXIMUM SLAB DEPTH DOES NOT EXCEED 4".
6. STEEL GRATING SHALL BE 1 1/2" DEEP. SEE GRATING NOTES ON S-002.
7. BF INDICATES BRACED FRAMES. SEE SHEETS S-201 AND S-202 FOR ELEVATIONS.

NORTH ARROW

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	
CATEGORY CODE:	178-85-01
FILE NAME:	

DESIGN BY:	A. SCOTT
DRAWN BY:	A. SCOTT
CHECKED BY:	J. WHITTAKER
SUBMITTED BY:	J. DEACON
SIZE:	ANSI D

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER FOUNDATION AND FIRST FLOOR PLANS

SHEET ID
BLDG 1
S-101

READY TO ADVERTISE (RTA)

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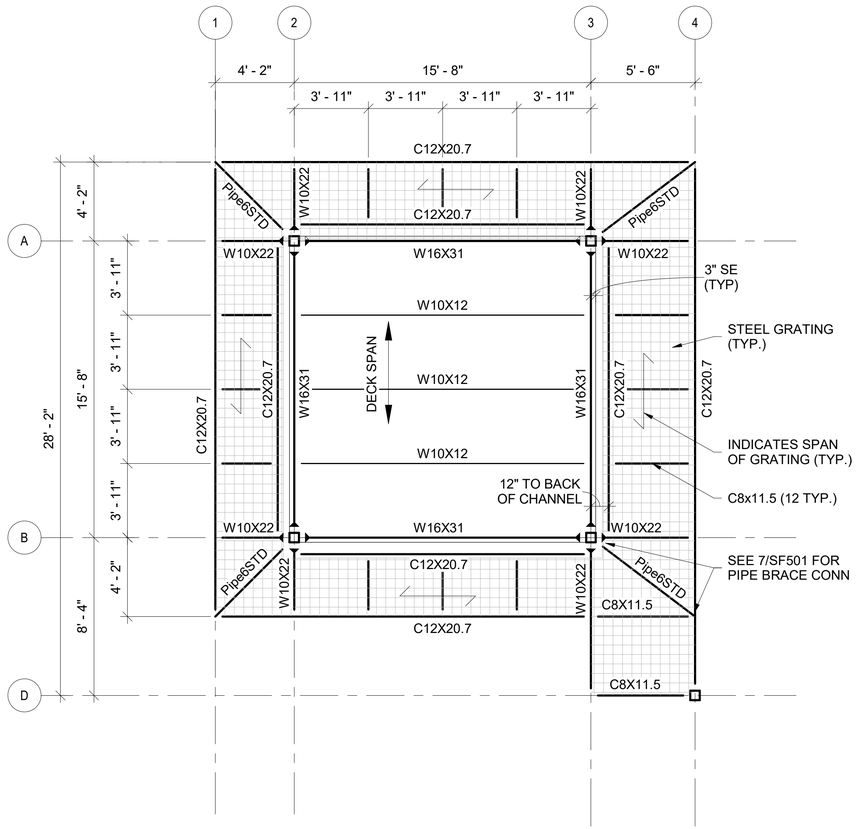
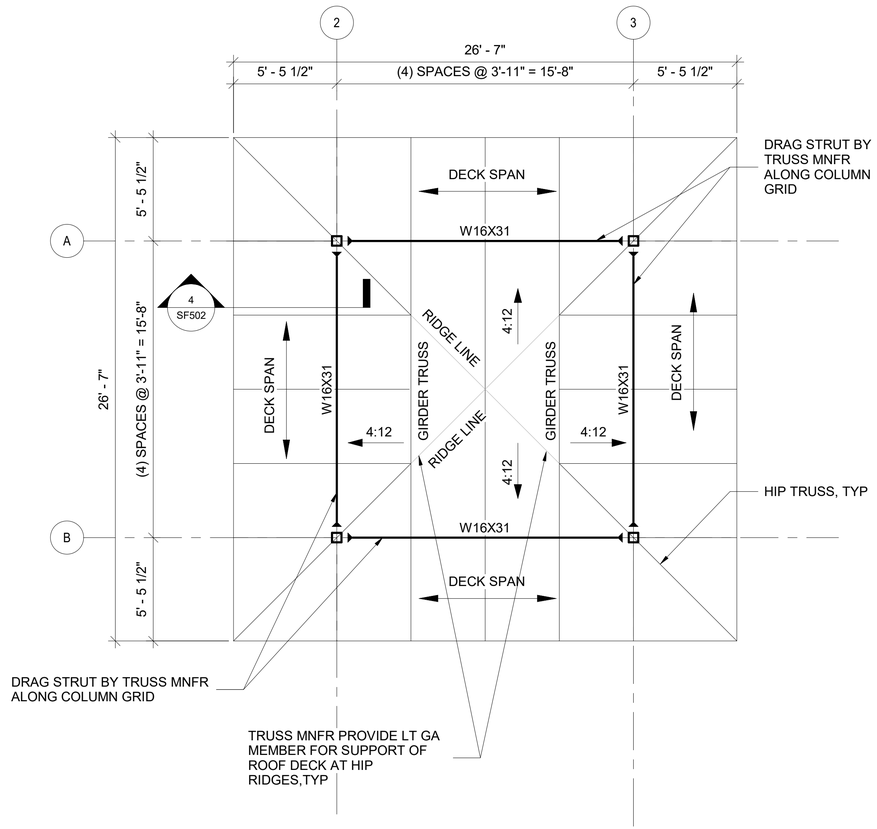


1 SECOND FLOOR FRAMING PLAN

1/4" = 1'-0"



2 ROOF FRAMING PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

ELEVATED FLOOR FRAMING PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. TOP OF FINISHED FLOOR SLAB ELEVATION SHALL BE:
   1ST FLOOR = (+) 17'-0"
   2ND FLOOR = (+) 27'-0"
3. TOP OF STEEL ELEVATION SHALL BE:
   1ST FLOOR = (+) 16'-8"
   2ND FLOOR = (+) 26'-8"
4. TOP OF STEEL ELEVATION FOR WALKWAY SUPPORT SHALL BE: STAIR LANDING = (+) 6'-10 1/2"
   1ST FLOOR = (+) 16'-9 1/2"
   2ND FLOOR = (+) 26'-9 1/2"
5. FLOOR FRAMING CONSISTS OF 3" LIGHT WEIGHT CONCRETE SUPPORTED BY 1.0C22 GAUGE METAL DECK (4" TOTAL THICKNESS) OVER STEEL BEAMS. REINFORCE SLAB WITH MINIMUM 6X6-W2.9XW2.9 WELDED WIRE FABRIC MESH. SLAB SHALL BE PLACED SO THAT MAXIMUM SLAB DEPTH DOES NOT EXCEED 4".
6. STEEL GRATING SHALL BE 1 1/2" DEEP. SEE GRATING NOTES ON S-002.
7. BF INDICATES BRACED FRAMES. SEE SHEETS S-201 AND S-202 FOR ELEVATIONS.

ROOF FRAMING PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. TOP OF STEEL FOR TRUSS BEARING SHALL BE (+) 36'-4"
3. FOR MOMENT CONNECTION DETAILS SEE SHEET SF-501.
4. LT GA STEEL TRUSS SPACING SHALL NOT EXCEED 4'-0" OC UNO.
5. ◄——— DENOTES ROOF SLOPE. SEE ARCHITECTURAL.
6. ROOF DECK SHALL BE 1.5B22 GAUGE METAL DECK WITH A 36/7 FASTENING PATTERN WITH 4 SIDELAPS. SUPPORT AND SIDELAP FASTENERS ARE TO BE #12 TEK SCREWS.
7. TRUSSES SHALL BE DESIGNED BY THE TRUSS MNFR TO TRANSFER 300 LBS (ULTIMATE) HORIZONTAL SHEAR FROM THE BEAMS DUE TO WIND LOAD ON WALL.
8. DRAG STRUTS ALONG ALL ROOF EAVES SHALL BE DESIGNED AND PROVIDED BY THE TRUSS MNFR TO TRANSFER 200 PLF HORIZONTAL SHEAR TO BEAMS. CONNECTION TO BEAMS SHALL BE BY TRUSS MNFR.
9. PROVIDE CONT 4X4X5/16" BENT PLATE AT ALL RIDGES.
10. PROVIDE STRUCTURAL MEMBER ALONG ALL RIDGES TO SECURE BENT PLATE.
11. PROVIDE CONT. BENT PLATE DECK CLOSURE AT THE EDGE OF ALL ROOF DECK. SEE 2/SF502 FOR DETAILS.
12. COORDINATE ALL ROOF DIMENSIONS, ELEVATIONS, OPENINGS AND PENETRATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS. SEE ARCHITECTURAL FOR ROOF PENETRATION WATERPROOFING DETAILS.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
A. SCOTT	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
A. SCOTT	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
J. WHITTAKER	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

CONTROL TOWER SECOND FLOOR AND ROOF FRAMING PLANS

SHEET ID
BLDG 1
S-102

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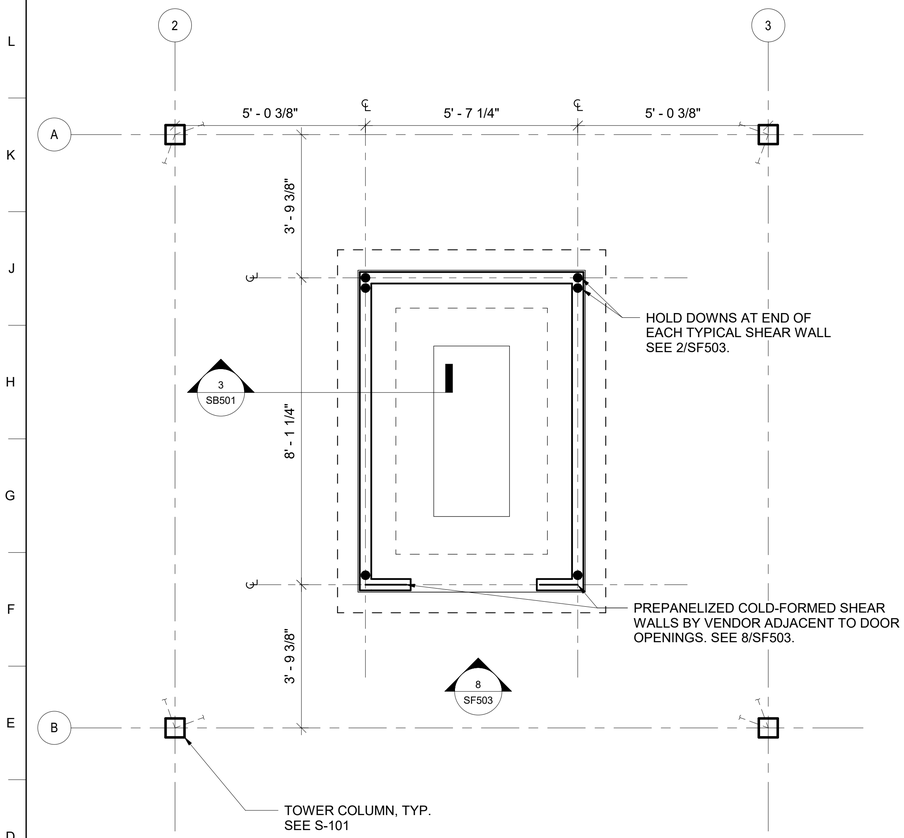
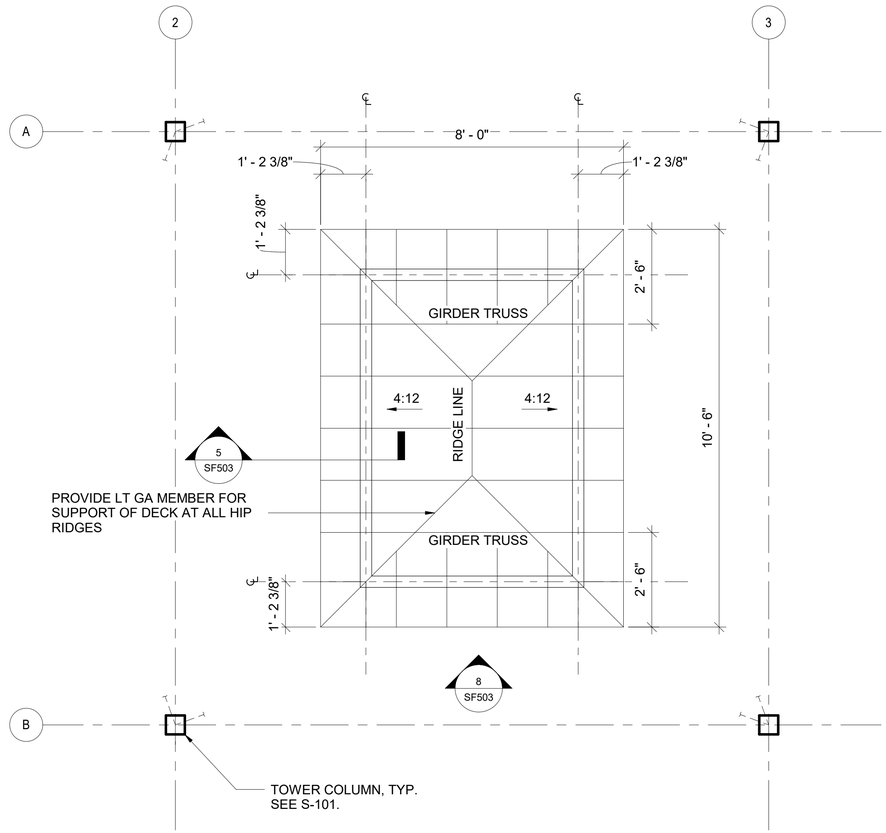


1 PUMP HOUSE FOUNDATION PLAN

1/2" = 1'-0"



2 PUMPHOUSE ROOF FRAMING PLAN

1/2" = 1'-0"

GENERAL SHEET NOTES

PUMP HOUSE FOUNDATION PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. TOP OF CONCRETE SLAB-ON-GRADE ELEVATION = 0'-0". ALL ELEVATIONS INDICATED FROM THIS DATUM. SEE CIVIL DRAWINGS FOR EXACT ELEVATION.
3. SLAB ON GRADE SHALL CONSIST OF 6" THICK CONCRETE REINFORCED WITH 6X6 W2.9XW2.9 WWF LOCATED AT 1/3 DEPTH FROM TOP OF SLAB.
4. SLAB ON GRADE SHALL BEAR ON 10 MIL VAPOR RETARDER ON CAPILLARY WATER BARRIER ON PROPERLY PREPARED SUBGRADE OR COMPACTED FILL.
5. WITHIN THE AREA OF THE BUILDING FOOTINGS, THE SOILS SHALL BE TESTED FOR IN-SITU ALLOWABLE BEARING PRESSURE BY METHOD OF HAND AUGER AND DYNAMIC CONE PENETROMETER METHOD, IN ACCORDANCE WITH ASTM SPECIAL TECHNICAL PUBLICATION #399. SOILS WHICH ARE IDENTIFIED TO HAVE A NET ALLOWABLE BEARING PRESSURE BELOW 3,000 PSF, OR WHICH ARE DEEMED TO BE UNSATISFACTORY FOR OTHER REASONS (E.G., EXCESSIVE DEBRIS OR ORGANIC CONTENT), SHALL BE OVER-EXCAVATED AND REPLACED WITH ADDITIONAL CONCRETE DURING THE CONCRETING OR REPLACED TO DESIGN SUBGRADE WITH NO. 57 OR NO. 67 STONE, COMPACTED TO A NON-YIELDING CONDITION. OVER-EXCAVATION SHALL BE PERFORMED IN ACCORDANCE WITH EM 385-1-1 AND OSHA 29 CFR 1926.652. BACKFILLING SHALL BE IN ACCORDANCE WITH SECTION 31 00 00, EARTHWORK. IT IS POSSIBLE THAT PERCHED GROUNDWATER WILL BE ENCOUNTERED DURING OVER-EXCAVATION. DEWATERING SHOULD BE DONE IN ACCORDANCE WITH SPECIFICATIONS.

PUMP HOUSE ROOF FRAMING PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. TOP OF STEEL FOR TRUSS BEARING SHALL BE (+) 8'-0".
3. LT GA STEEL TRUSS SPACING SHALL NOT EXCEED 1'-4" OC UNO.
4. ◄——— DENOTES ROOF SLOPE. SEE ARCHITECTURAL.
5. ROOF DECK SHALL BE 1.5B22 GAUGE METAL DECK WITH A 36/4 FASTENING PATTERN WITH 2 SIDELAPS. SUPPORT AND SIDELAP FASTENERS ARE TO BE #12 TEK SCREWS.
6. TRUSSES SHALL BE DESIGNED BY THE TRUSS MNFR TO TRANSFER 360 LBS (ULTIMATE) HORIZONTAL SHEAR DUE TO WIND LOAD ON WALL. CONNECTION TO HSS DRAG STRUT SHALL BE BY THE TRUSS MNFR.
7. DRAG STRUTS ALONG ALL ROOF EAVES SHALL BE DESIGNED AND PROVIDED BY THE TRUSS MNFR TO TRANSFER 200 PLF HORIZONTAL SHEAR TO BEAMS. CONNECTION TO BEAMS SHALL BE BY TRUSS MNFR.
8. PROVIDE CONT 4X4X5/16" BENT PLATE AT ALL RIDGES.
9. PROVIDE STRUCTURAL MEMBER ALONG ALL RIDGES TO SECURE BENT PLATE.
10. PROVIDE CONT. BENT PLATE DECK CLOSURE AT THE EDGE OF ALL ROOF DECK. SEE 2/SF502 FOR DETAILS.
11. COORDINATE ALL ROOF DIMENSIONS, ELEVATIONS, OPENINGS AND PENETRATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS. SEE ARCHITECTURAL FOR ROOF PENETRATION WATERPROOFING DETAILS.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. HERRINGTON	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. HERRINGTON	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: J. WHITTAKER	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

PUMP HOUSE PLANS

SHEET ID
BLDG 1
S-103

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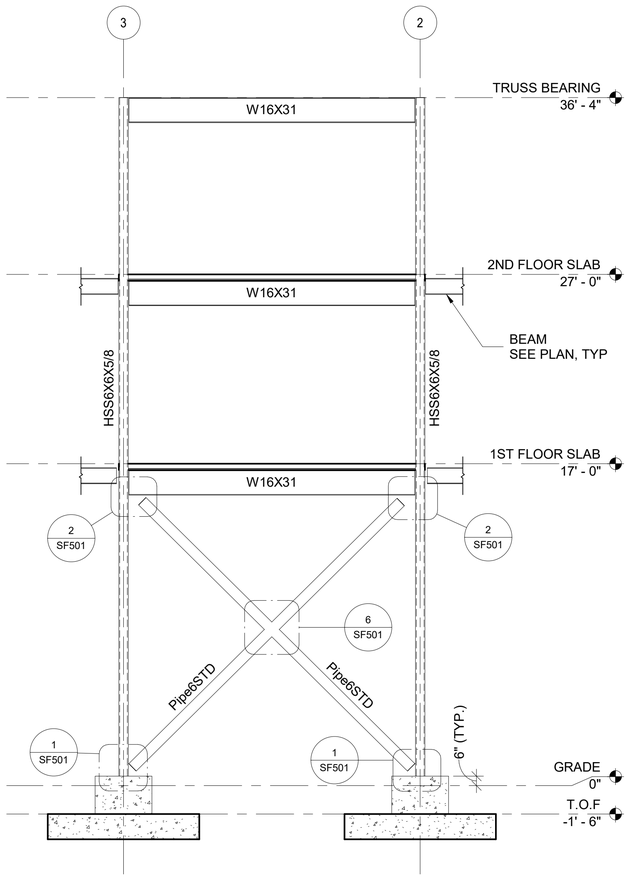
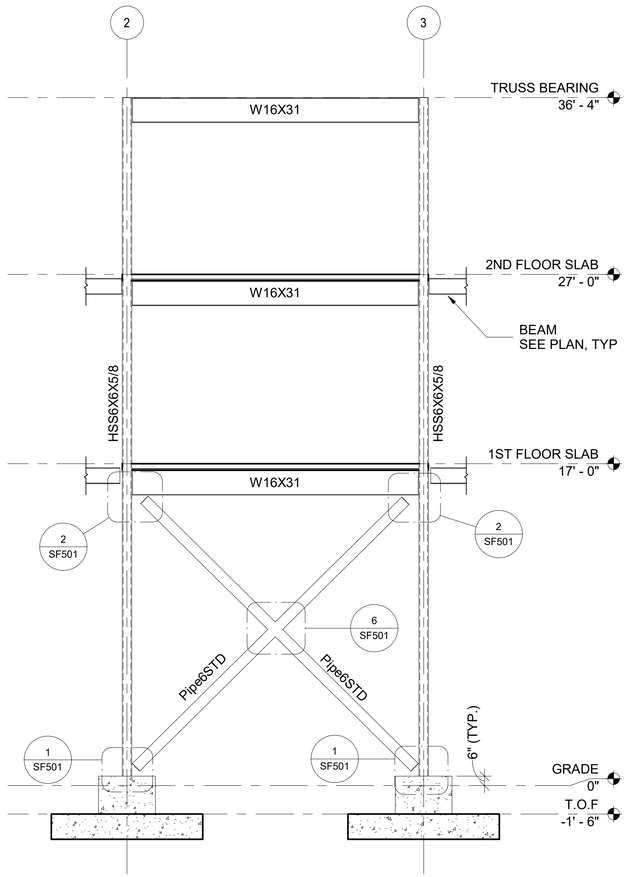


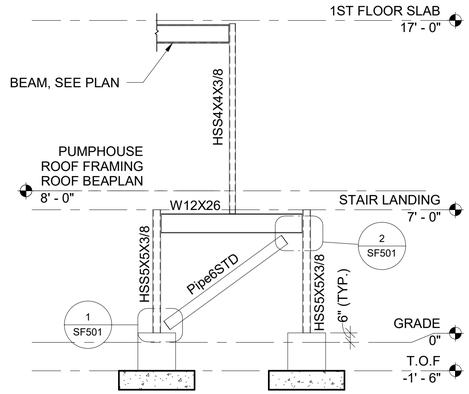
1 BRACED FRAME 1

1/4" = 1'-0"



2 BRACED FRAME 2

1/4" = 1'-0"



3 BRACED FRAME STAIR

1/4" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
DRAWN BY: A. SCOTT	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: J. WHITTAKER	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

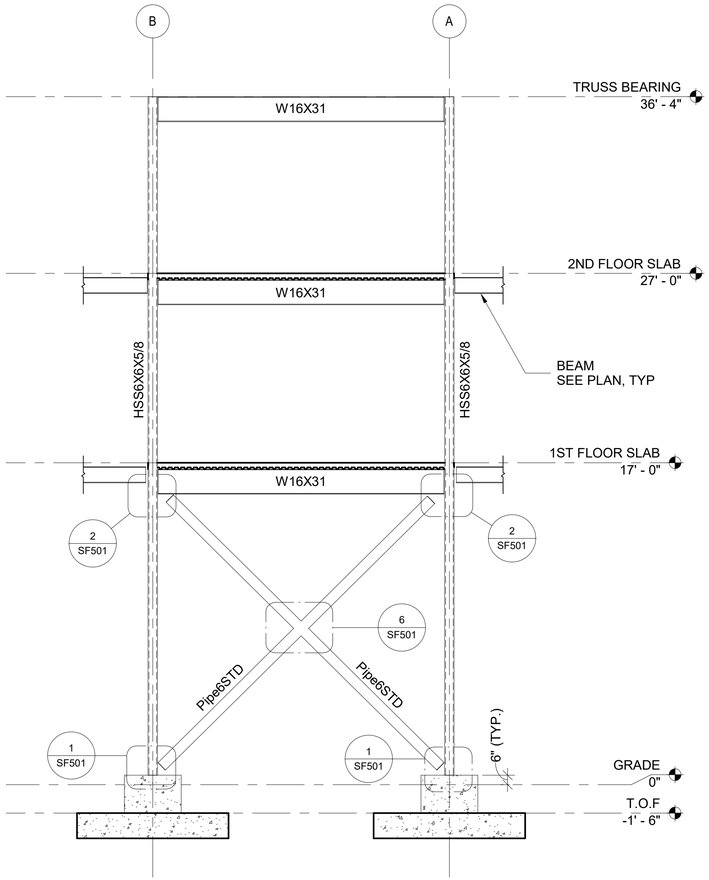
CONTROL TOWER FRAME ELEVATIONS

SHEET ID
BLDG 1
S-201

READY TO ADVERTISE (RTA)

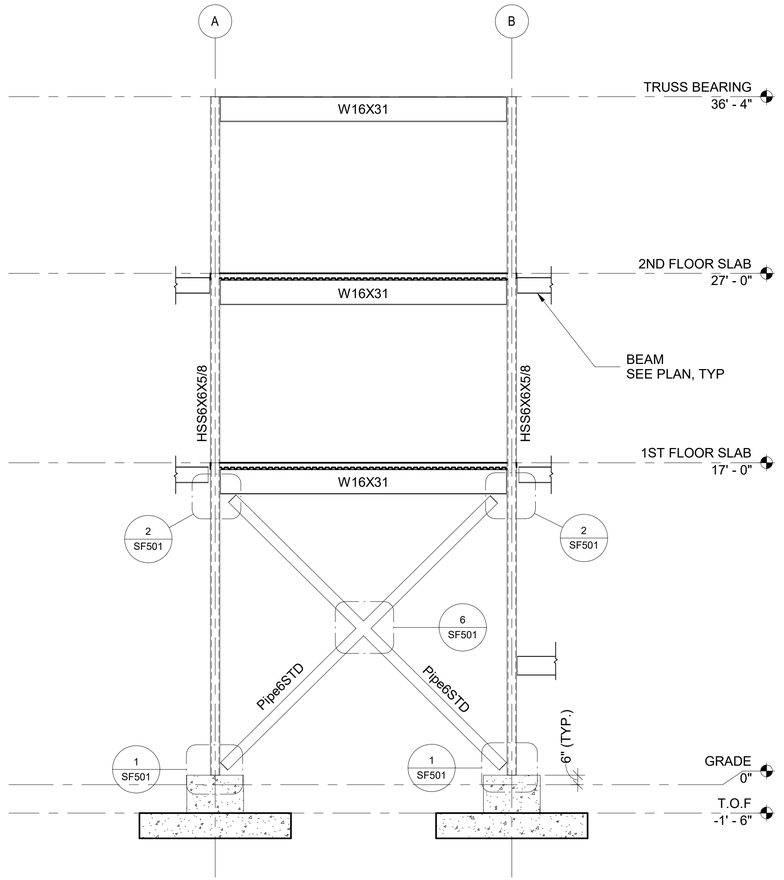
Plot Date: 11/28/2023 3:41:55 PM

File Path: C:\Users\k6endhrh\Documents\FY23_PN96182_MPTR-TOWER_STRUCT_R21_k6endhrh.rvt



1 BRACED FRAME 3

1/4" = 1'-0"



2 BRACED FRAME 4

1/4" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

DESIGN BY:	ISSUE DATE:
A. SCOTT	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
A. SCOTT	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
J. WHITTAKER	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
SIZE:	FILE NAME:
ANSI D	

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER FRAME ELEVATIONS

SHEET ID
BLDG 1
S-202

READY TO ADVERTISE (RTA)

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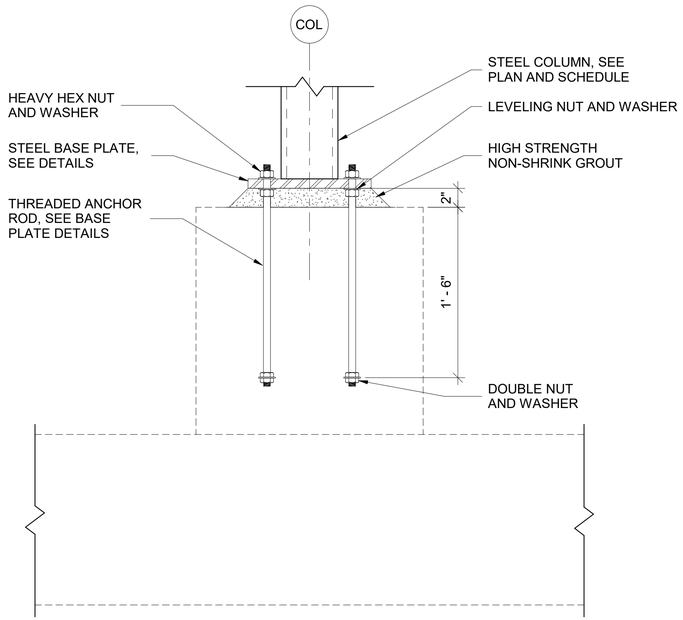
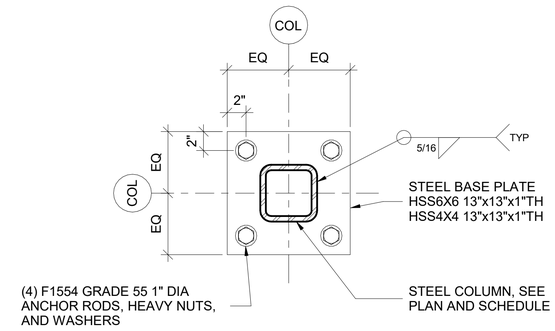
Plot Date: 11/28/2023 3:41:56 PM

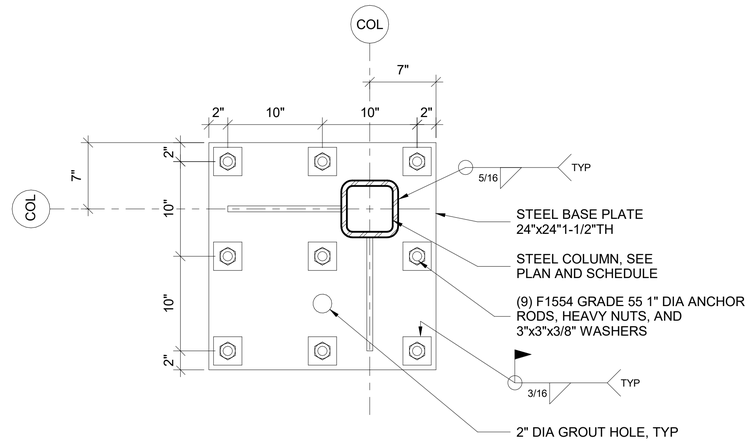


1 ANCHOR ROD DETAIL

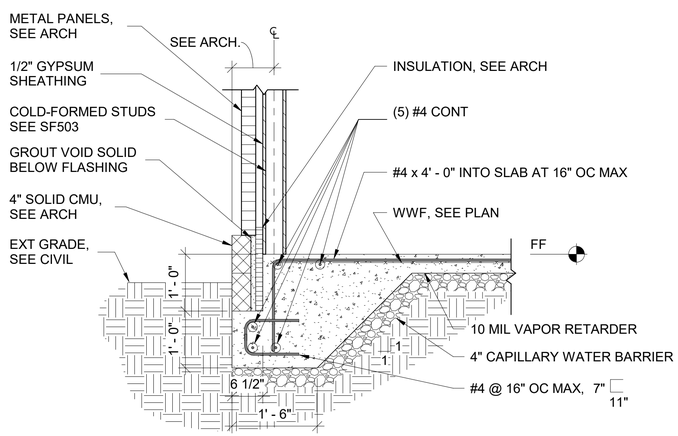
1 1/2" = 1'-0"



UNBRACED HSS COLUMN BASE PLATE

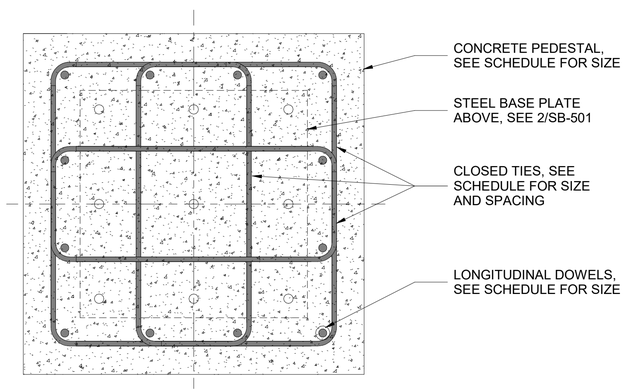


BRACED COLUMN BASE PLATE

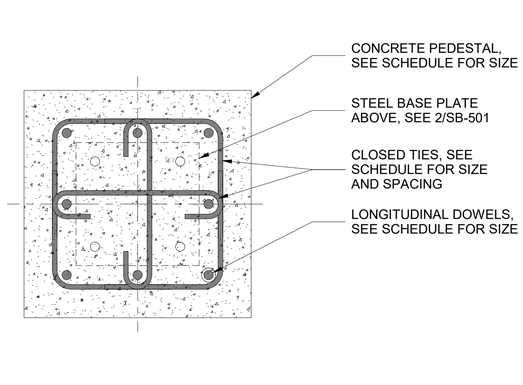


3 PUMPHOUSE TYPICAL SLAB EDGE DETAIL

3/4" = 1'-0"



P3 - PEDESTAL REINFORCEMENT LAYOUT



P2 - PEDESTAL REINFORCEMENT LAYOUT

4 CONCRETE PEDESTAL SECTION DETAIL

1 1/2" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER STRUCTURAL DETAILS

SHEET ID
BLDG 1
SB501

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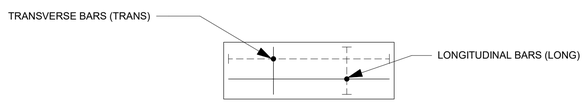
Plot Date: 11/28/2023 3:41:56 PM

File Path: C:\Users\kbendhn\Documents\FY23_PN96182_MPTR-TOWER_STRUCT_R21_kbendhn.rvt

CONCRETE PEDESTAL SCHEDULE					
MARK	DIMENSIONS			REINFORCING	
	WIDTH	LENGTH	DEPTH	LONGITUDINAL DOWELS, HOOKED @ ENDS	SHEAR REINFORCEMENT
P2	2' - 0"	2' - 0"	2' - 0"	(8) #8	#4 CLOSED TIES @ 5-1/2" MAX SPACING
P3	3' - 0"	3' - 0"	2' - 0"	(12) #7	#4 CLOSED TIES @ 5-1/2" MAX SPACING

NOTE: SEE 4/SB501 FOR LAYOUT AND OTHER INFORMATION

COLUMN FOOTING SCHEDULE					
MARK	DIMENSIONS			REINFORCING	
	WIDTH	LENGTH	DEPTH	BOTTOM, HOOKED @ ENDS	TOP, HOOKED @ ENDS
CF4	4' - 0"	4' - 0"	1' - 6"	(9) #4 EW	(9) #4 EW
CF8	8' - 0"	8' - 0"	1' - 6"	(8) #6 EW	(8) #6 EW



FOOTING REINFORCEMENT DIAGRAM

1 CONCRETE FOOTING AND PEDESTAL SCHEDULE
NOT TO SCALE

CONCRETE REINFORCING BAR DEVELOPMENT AND SPLICE LENGTH SCHEDULE (F'c = 4000 PSI)					
BAR SIZE	OTHER BARS		TOP/HORIZ BARS		HOOKED BARS
	Ld	SPLICE	Ld	SPLICE	Ldh
#3	15	19	19	25	6
#4	19	25	25	33	7
#5	24	31	31	41	9
#6	29	37	37	49	10
#7	42	54	54	71	12
#8	47	62	62	81	14
#9	54	70	70	91	15

NOTES:
1. LENGTHS SHOWN IN THIS SCHEDULE SHALL BE USED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
2. LENGTHS SHOWN IN THIS SCHEDULE ARE BASED ON CLASS B TENSION LAP SLICES FOR NORMAL WEIGHT CONCRETE STRENGTH AND GRADE 60 (Fy = 60,000 PSI) REINFORCING STEEL WITH CONCRETE COVER AND SPACING AS DEFINED IN CONCRETE SECTION OF GENERAL NOTES ON SHEET S-001 AND ACI 318-14, SECTION 25.
3. Ld = TENSION DEVELOPMENT/EMBEDMENT LENGTH FOR STRAIGHT BARS.
4. Ldh = TENSION DEVELOPMENT/EMBEDMENT LENGTH FOR HOOKED BARS.
5. LAP SPLICES SHALL BE WIRED IN CONTACT.
6. TOP BARS ARE HORIZONTAL BARS IN BEAMS, FOOTINGS, SLABS, AND WALLS WHERE MORE THAN 12" OF FRESH CONCRETE IS CAST BELOW THE BAR.
7. ALL TABULATED VALUES ARE IN INCHES.
8. MULTIPLY VALUES BY 1.3 FOR LIGHTWEIGHT CONCRETE

2 REBAR SPLICE LENGTH SCHEDULES
NOT TO SCALE

US Army Corps of Engineers ®

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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

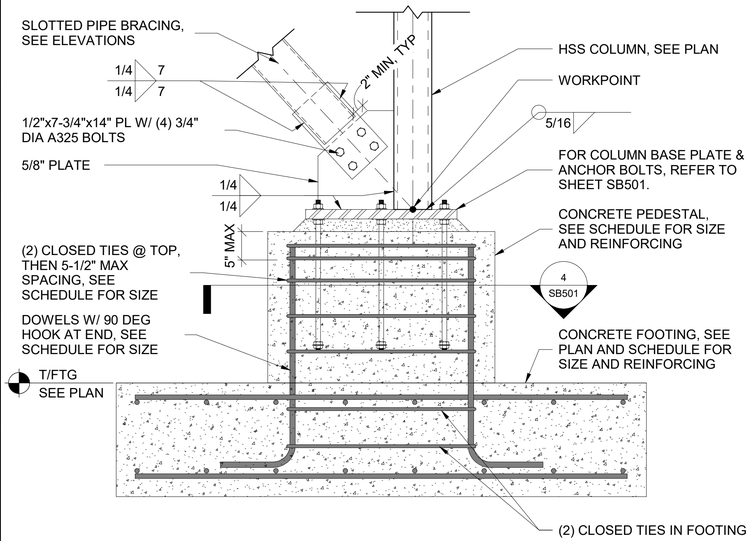
CONTROL TOWER FOUNDATION AND SPLICE LENGTH SCHEDULES

SHEET ID
BLDG 1
SB601

READY TO ADVERTISE (RTA)

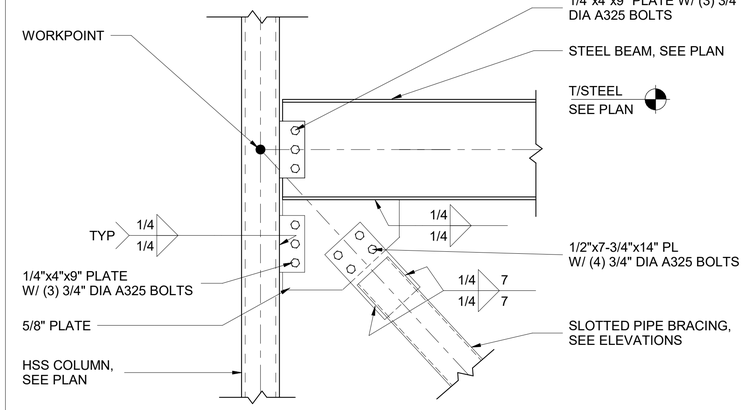
File Path: C:\Users\k6endhrh\Documents\FY23_PN96182_MPTR-TOWER_STRUCT_R21_k6endhrh.rvt
Plot Date: 11/28/2023 3:41:57 PM

NOTE: INTERSECTING TIES NOT SHOWN FOR CLARITY, SEE SB501



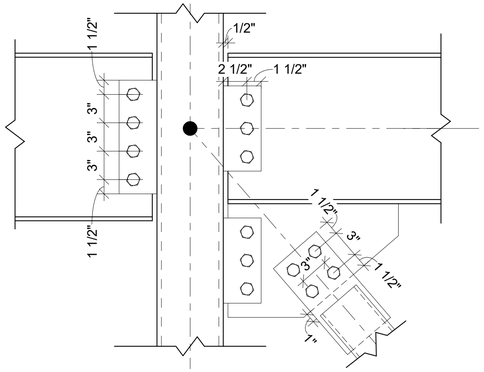
1 PIPE BRACE AT BASE OF HSS COLUMN

1" = 1'-0"



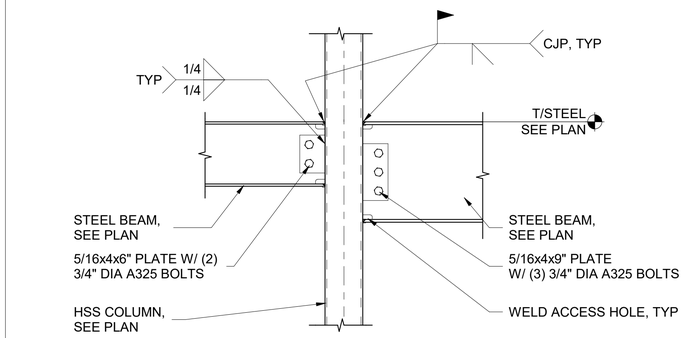
2 PIPE BRACE AT HSS COLUMN, FLOOR LEVEL

1" = 1'-0"



3 TYPICAL CONNECTION DIMENSIONING

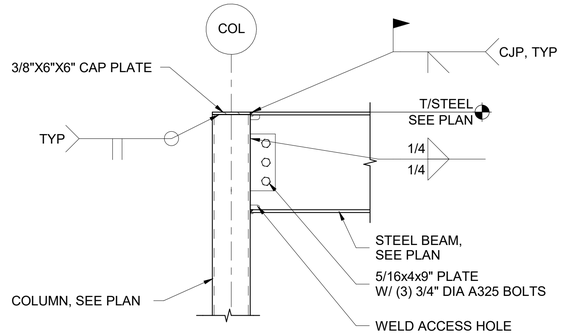
1 1/2" = 1'-0"



NOTE:
INTERSECTING STEEL BEAM NOT SHOWN FOR CLARITY
CONCRETE ATOP METAL DECK AND STEEL GRATING NOT SHOWN FOR CLARITY

4 MOMENT CONN AT HSS COLUMN

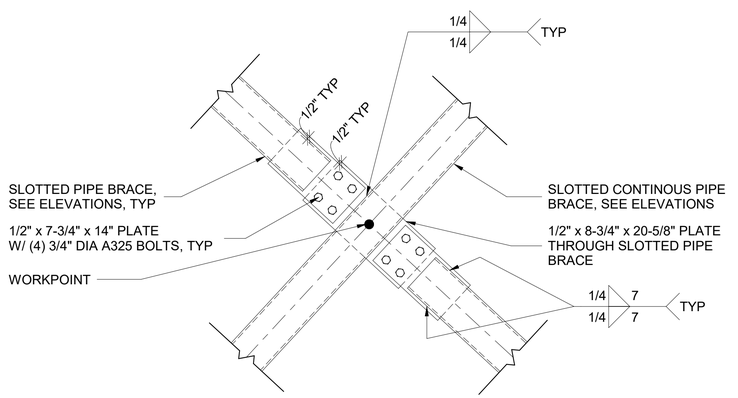
1" = 1'-0"



NOTE:
INTERSECTING STEEL BEAM NOT SHOWN FOR CLARITY

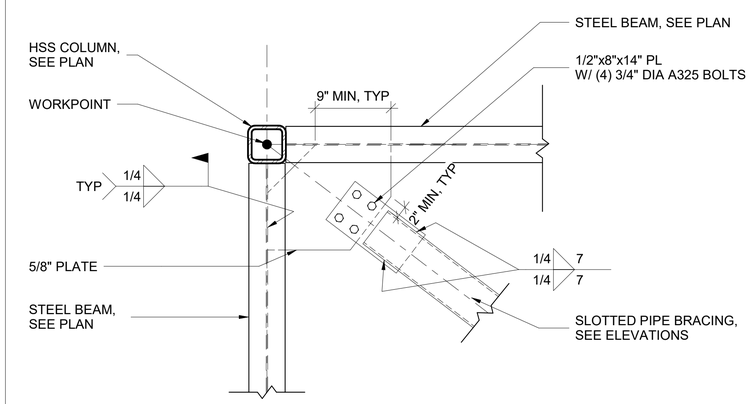
5 MOMENT CONN AT HSS COLUMN, ROOF LEVEL

1" = 1'-0"



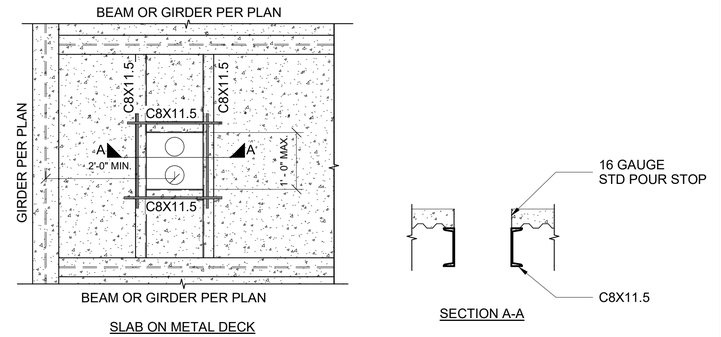
6 PIPE BRACE AT MID-HEIGHT

1" = 1'-0"



7 HORIZONTAL PIPE BRACE AT WALKWAY

1" = 1'-0"



SLAB ON METAL DECK

SECTION A-A

NOTE:
1. REINFORCEMENT FRAMING APPLIES TO FLOOR PENETRATIONS OR GROUPS OF FLOOR PENETRATIONS THAT REQUIRE OPENINGS GREATER THAN 4".
2. TACK WELD CHANNELS TO WEBS W BEAMS OR GIRDERS.
3. ADD #4 BARS AROUND PERIMETER OF OPENING TO EXTEND 4" BEYOND OPENING.

8 TYPICAL CONDUIT FLOOR OPENINGS

3/4" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	A. SCOTT
DRAWN BY:	A. SCOTT
CHECKED BY:	J. WHITTAKER
SUBMITTED BY:	J. DEACON
SIZE:	ANSI D
ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	
CATEGORY CODE:	178-65-01
FILE NAME:	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER FRAMING DETAILS

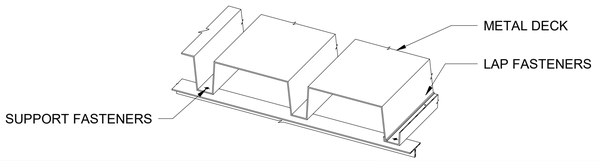
SHEET ID
BLDG 1
SF501

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:41:59 PM

File Path: C:\Users\kbendhn\Documents\FY23_PN96182_MPTR-TOWER_STRUCT_R21_kBendhn.rvt

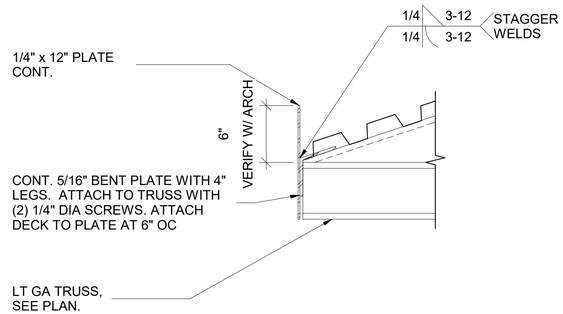
MINIMUM PROPERTIES OF METAL DECK		
METAL DECK	(ROOF DECK) 1.5 TYPE B	(FLOOR DECK) 1" FORM
GAGE	22	22
MOMENT OF INERTIA OF STEEL SECTION, Ip (IN4)	0.155	0.073
SECTION MODULUS OF STEEL SECTION POSITIVE BENDING, Sp (IN3)	0.186	0.130
MOMENT OF INERTIA OF STEEL SECTION, In (IN4)	0.183	0.073
SECTION MODULUS OF STEEL SECTION POSITIVE BENDING, Sn (IN3)	0.192	0.134



1 TYPICAL METAL DECK PROPERTIES

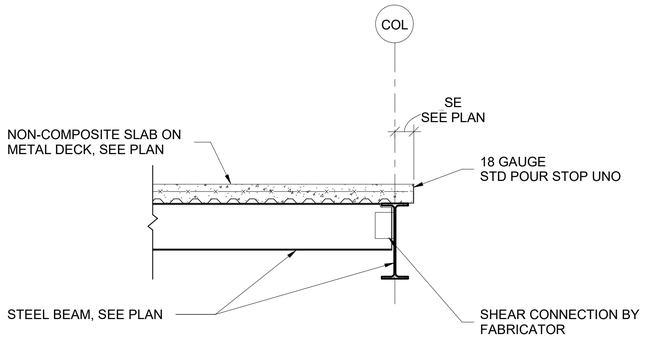
3/4" = 1'-0"

SEE 4/SF502 AND ARCH FOR ADDITIONAL INFORMATION



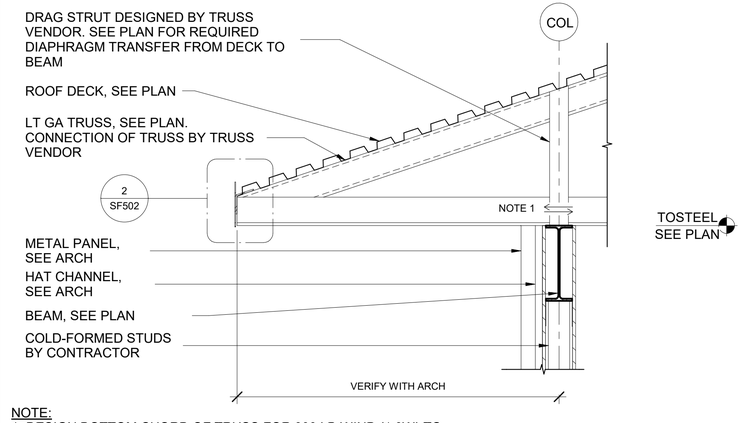
2 TYPICAL EAVE PLATE DETAIL

1 1/2" = 1'-0"



3 TYPICAL SLAB EDGE

3/4" = 1'-0"



NOTE:
1. DESIGN BOTTOM CHORD OF TRUSS FOR 300 LB WIND (1.0W) TO BE INCLUDED WITH ALL WIND COMBINATIONS.

4 TYPICAL WALL SECTION AT ROOF

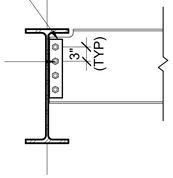
3/4" = 1'-0"

DELEGATE ENGINEER SHALL DESIGN WELDS TO DEVELOP 100% OF THE BEAM REACTIONS SHOWN IN THE STEEL BEAM REACTION SCHEDULE

3/4" DIA, A325 BOLTS IN SLOTTED HOLES WITH BEARING TYPE CONNECTIONS AS REQUIRED BY AISC STANDARD CONNECTION DESIGN. DELEGATE ENGINEER SHALL DESIGN THE BOLTS, ANGLES, AND WELDS TO DEVELOP 100% OF THE BEAM REACTIONS SHOWN IN THE STEEL BEAM REACTION SCHEDULE.

PROVIDE A MINIMUM OF (2) BOLTS AT ALL BEAM CONNECTIONS.

NOTE TO STEEL DETAILER: BOLTS SHOWN IN THIS DETAIL ARE FOR ILLUSTRATION PURPOSES ONLY. ACTUAL QUANTITY OF BOLTS TO BE DETERMINED BY CONNECTION DESIGNER.



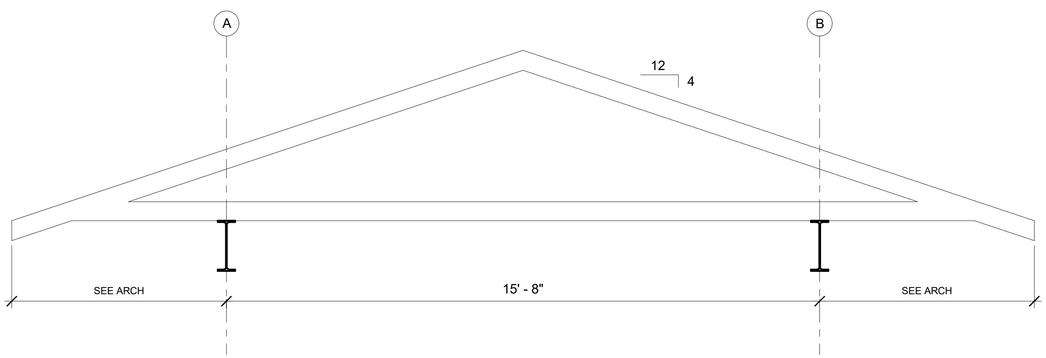
STEEL BEAM CONNECTION SCHEDULE	
BEAM SIZE	FACTORED DESIGN REACTION
C12X20.7	10 KIPS
C8X11.5	10 KIPS
W8X10	10 KIPS
W10X12	10 KIPS
W10X22	20 KIPS
W12X19	20 KIPS
W12X26	20 KIPS

STEEL BEAM CONNECTION DESIGN NOTES:

1. SEE GENERAL NOTES SHEET S-001 AND SPECIFICATION SECTION 05 12 00 FOR ADDITIONAL INFORMATION.
2. THE EFFECT OF CAMBER SETTLING SHALL BE CONSIDERED BY STEEL SUPPLIER IN BEAM CONNECTION DESIGN. HORIZONTAL SLOTTED HOLE MAY BE REQUIRED AT ANGLE CONNECTIONS TO ACCOUNT FOR BEAM HORIZONTAL MOVEMENT.
3. SEE FRAMING ELEVATION SHEETS FOR ADDITIONAL INFORMATION AT MOMENT CONNECTIONS.

5 STEEL BEAM CONNECTION SCHEDULE

3/4" = 1'-0"



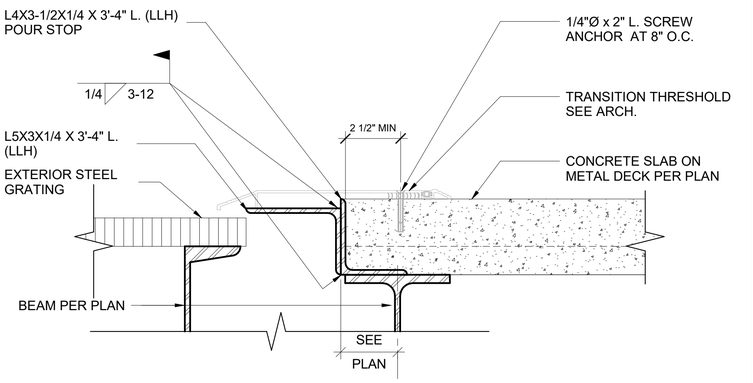
TRUSS NOTES:

1. FINAL TRUSS AND TRUSS MEMBER DESIGN IS THE RESPONSIBILITY OF THE TRUSS MANUFACTURER.
2. TRUSS MANUFACTURER TO PROVIDE DESIGN AND DETAILS FOR TRUSS TO BEAM CONNECTIONS. CONNECTIONS SHALL BE DESIGNED TO RESIST BEARING AND UPLIFT FORCES CONCURRENT WITH THE HORIZONTAL SHEAR FORCE NOTED.
3. SEE SHEET S-003 FOR COMPONENT AND CLADDING WIND PRESSURES.
4. SEE SHEET S-002 FOR TRUSS LOADING.
5. TRUSS WEB CONFIGURATION NOT SHOWN IN PROFILE FOR CLARITY.

TOSTEEL
SEE PLAN

6 TYPICAL TRUSS PROFILE

1/2" = 1'-0"



7 THRESHOLD DETAIL

3" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
A. SCOTT	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
A. SCOTT	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
J. WHITTAKER	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

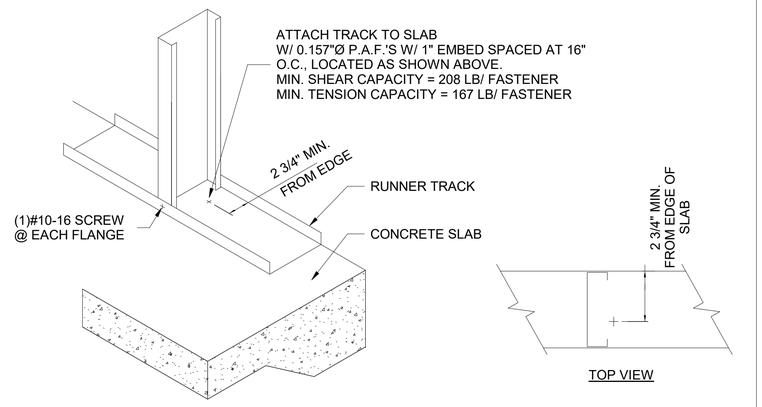
CONTROL TOWER FRAMING DETAILS

SHEET ID
BLDG 1
SF502

READY TO ADVERTISE (RTA)

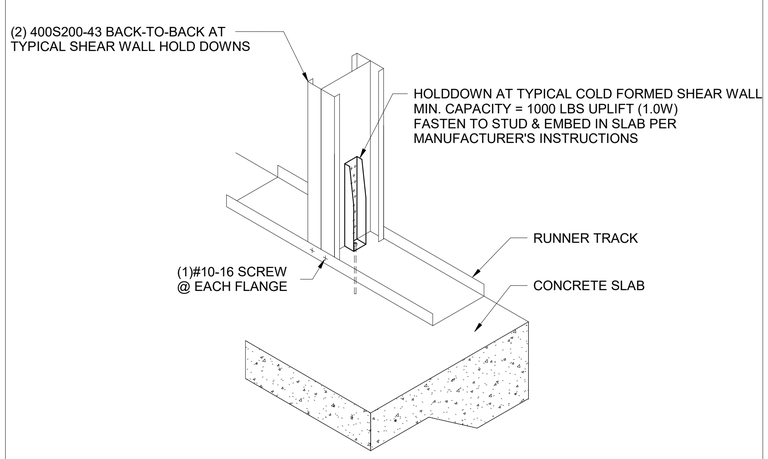
File Path: C:\Users\kbendhn\Documents\FY23_PN96182_MPTR-TOWER_STRUCT_R21_kBendhn.rvt

Plot Date: 11/28/2023 3:42:00 PM



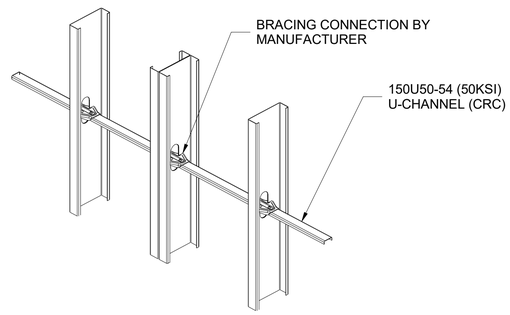
1 PUMP HOUSE COLD-FORMED SILL ANCHORAGE

1" = 1'-0"



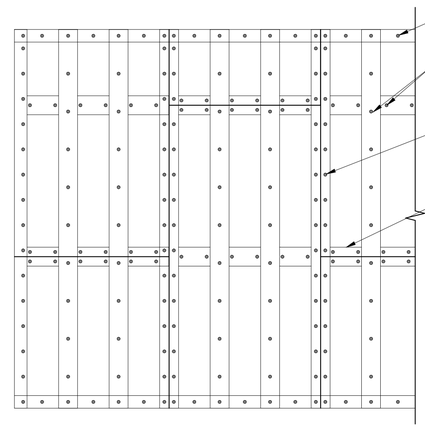
2 PUMP HOUSE CFS SHEAR WALL HOLDDOWN

1" = 1'-0"



3 PUMP HOUSE LATERAL BRACING DETAIL

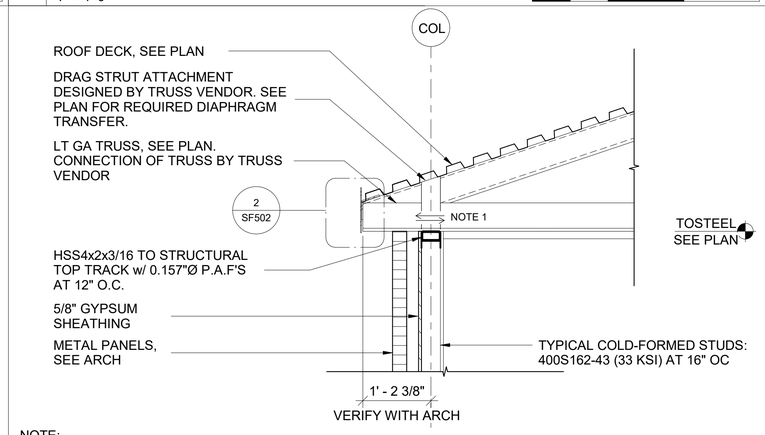
NOT TO SCALE



NOTE:
1. 5/8" GYPSUM SHEATHING TO BE ATTACHED WITH #8 SCREWS MIN. U.N.O. AT EXTERIOR WALL FACE.
2. ALL SHEATHING EDGES MUST BE ATTACHED TO STRUCTURAL MEMBERS OR PANEL BLOCKING.

4 SHEAR WALL SHEATHING APPLICATION @ CFS WALL

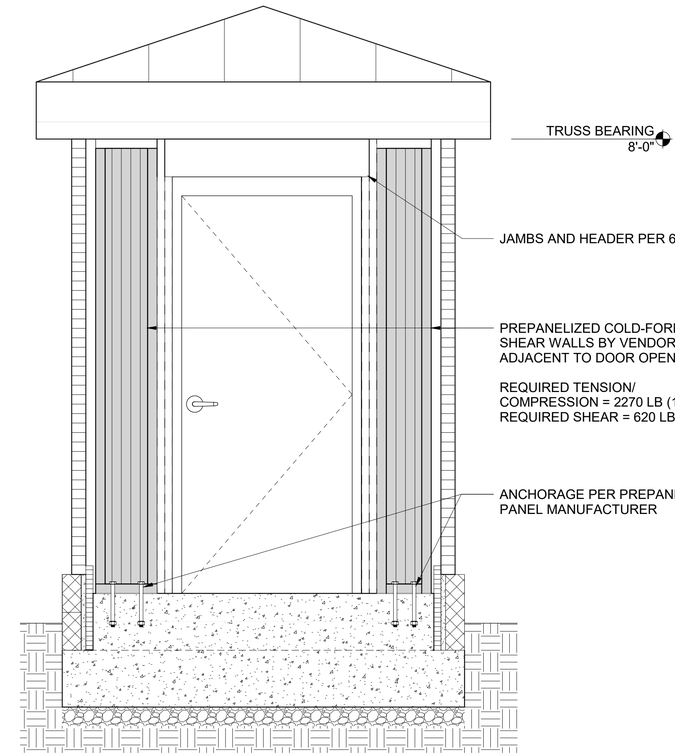
1/2" = 1'-0"

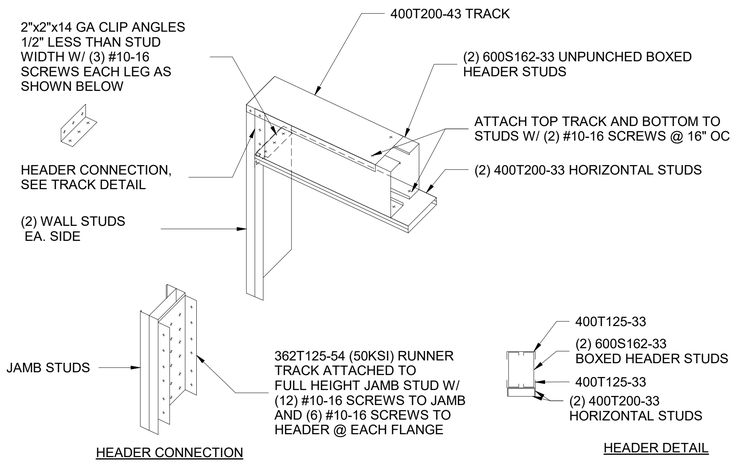


NOTE:
1. DESIGN BOTTOM CHORD OF TRUSS FOR 360 LB WIND (1.0W) TO BE INCLUDED WITH ALL WIND COMBINATIONS.

5 TYPICAL WALL SECTION AT PUMP HOUSE ROOF

3/4" = 1'-0"





HEADER CONNECTION

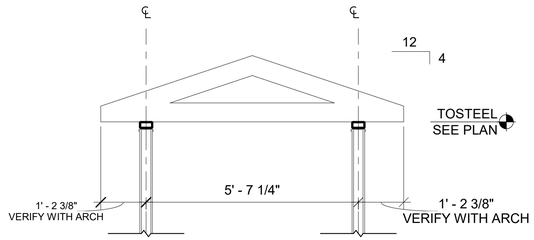
HEADER DETAIL

6 PUMP HOUSE HEADER DETAIL

NOT TO SCALE

TRUSS NOTES:

1. FINAL TRUSS AND TRUSS MEMBER DESIGN IS THE RESPONSIBILITY OF THE TRUSS MANUFACTURER.
2. TRUSS MANUFACTURER TO PROVIDE DESIGN AND DETAILS FOR TRUSS TO COLLECTOR CONNECTIONS. CONNECTIONS SHALL BE DESIGNED TO RESIST BEARING AND UPLIFT FORCES CONCURRENT WITH THE HORIZONTAL SHEAR FORCE NOTED ON PUMP HOUSE ROOF FRAMING PLAN NOTES.
3. SEE SHEET S-003 FOR COMPONENT AND CLADDING WIND PRESSURES.
4. TRUSS WEB CONFIGURATION NOT SHOWN IN PROFILE FOR CLARITY.



7 TYPICAL PUMP HOUSE TRUSS PROFILE

1/2" = 1'-0"

8 SHEAR WALL WITH OPENING ELEVATION

3/4" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. HERRINGTON	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. HERRINGTON	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: J. WHITTAKER	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

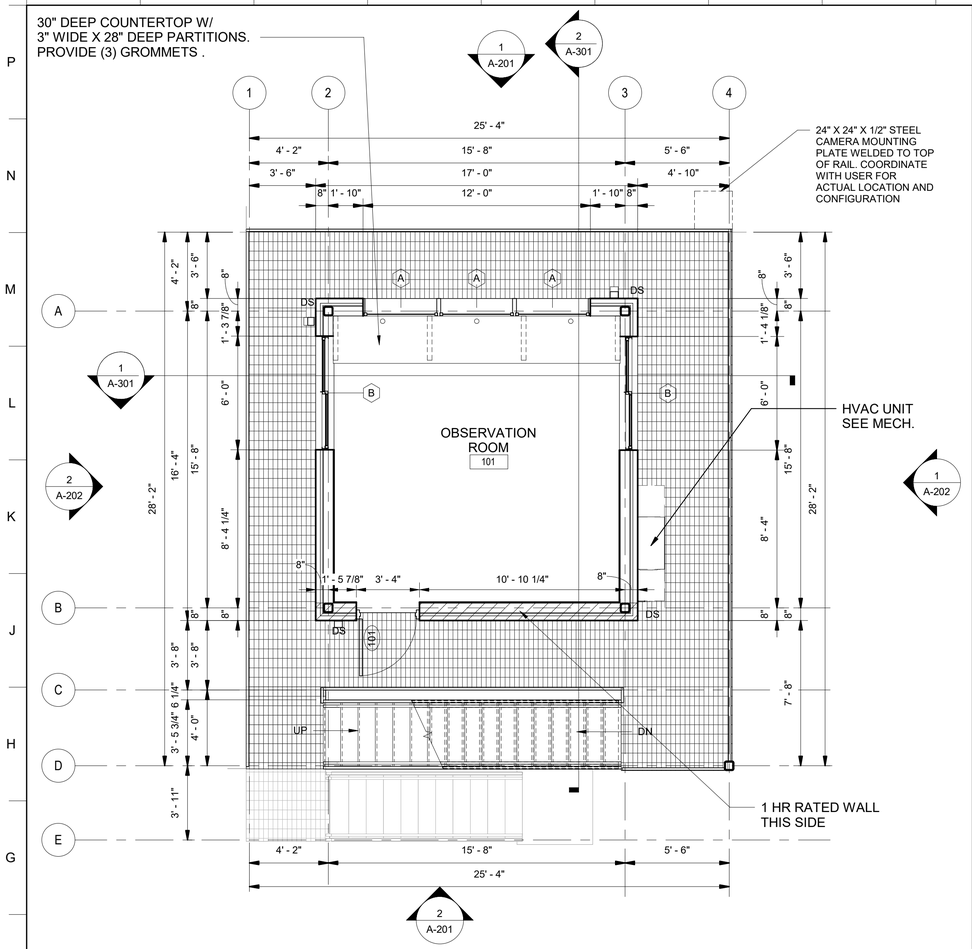
PUMPHOUSE FRAMING DETAILS

SHEET ID
BLDG 1
SF503

READY TO ADVERTISE (RTA)

File Path: C:\Users\kbendhn\Documents\FY23_PN96182_MPTR-TOWER_STRUCT_R21_kbendhn.rvt

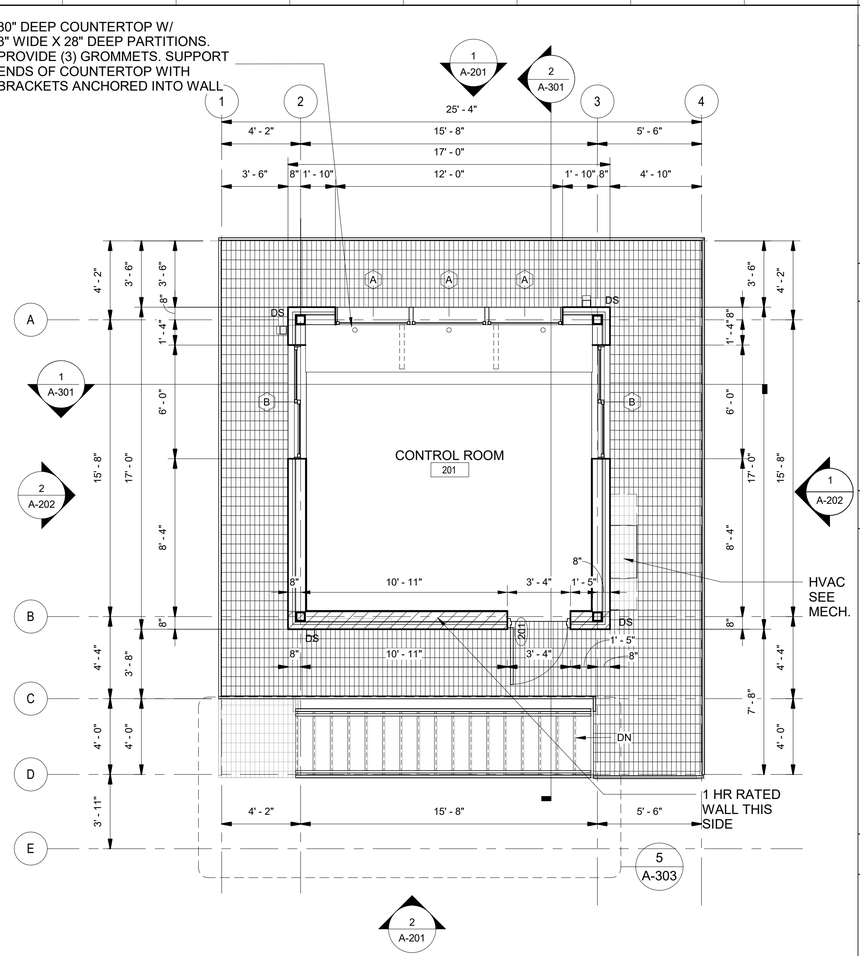
Plot Date: 11/28/2023 3:42:02 PM



1 FIRST FLOOR PLAN

1/4" = 1'-0"

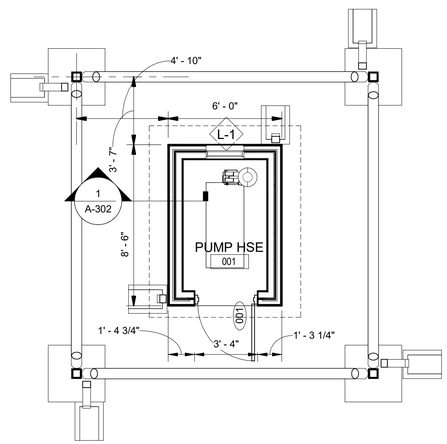
SCALE: 1/4"=1'-0"



2 SECOND FLOOR PLAN

1/4" = 1'-0"

SCALE: 1/4"=1'-0"



5 PUMP HOUSE PLAN

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

GENERAL SHEET NOTES

1. EXTERIOR DIMENSIONS ARE FROM FACE OF INSULATED METAL PANEL.

2. SEE CIVIL DRAWINGS FOR FINISHED FLOOR AND FINISHED GRADE ELEVATIONS. SEE STRUCTURAL DRAWINGS FOR FOUNDATION PLANS AND FLOOR SLABS.

3. SEE MECHANICAL DRAWINGS FOR LOCATION OF ALL MECHANICAL EQUIPMENT. COORDINATE WITH MECHANICAL FOR EXACT LOCATION AND SIZES OF ALL REQUIRED REINFORCED CONCRETE EQUIPMENT PADS, TYPICAL.

FLOOR PLAN NOTES

1. FIRE EXTINGUISHERS SHALL BE 2A:10B:C (GOVERNMENT FURNISHED, GOVERNMENT INSTALLED, NOT IN CONTRACT).

FLOOR PLAN LEGEND

?	WINDOW TAG - SEE PLATE 1A-601 FOR WINDOW TYPES
?	DOOR TAG - SEE PLATE 1A-601 FOR DOOR SCHEDULE
CG	CORNER GUARD
DS	DOWNSPOUT
FD	FLOOR DRAIN
FEC	FIRE EXTINGUISHER CABINET
FEB	FIRE EXTINGUISHER BRACKET - WALL MOUNTED - TOP @ 5'-0" AFF - FOR 2A:10B:C GFGI FIRE EXT.

GROSS BUILDING AREA

GROSS BUILDING AREA PER IBC=

FIRST FLOOR	590 SF
SECOND FLOOR	590 SF
TOTAL	1,180 SF

GROSS BUILDING AREA PER UFC 3-101-01 =

FIRST FLOOR 590 SF + 43 (1/2 EXIT STAIR)	633 SF
SECOND FLOOR 590 SF + 43 (1/2 EXIT STAIR)	633 SF
TOTAL	1,266 SF

GROSS FLOOR AREA PER NFPA 101
(FLOOR AREA INSIDE EXTERIOR WALLS):

FIRST FLOOR	233 SF
SECOND FLOOR	233 SF
TOTAL	466 SF

KEY PLAN

WALL LEGEND

NON-RATED METAL STUD WALL

1-HR RATED WALL

NORTH ARROW

PLAN NORTH

TRUE NORTH

US Army Corps of Engineers ®

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DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M.DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
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FY23, PN 98182
VOLUME 2 - BUILDING

CONTROL TOWER FLOOR PLANS

SHEET ID
BLDG 1
A-101

File Path: C:\Users\K6ENXT09\Documents\FY23_PN98182_MPTR-TOWER_ARCH_R21_K6ENXT09.rvt

Plot Date: 11/29/2023 11:53:51 AM

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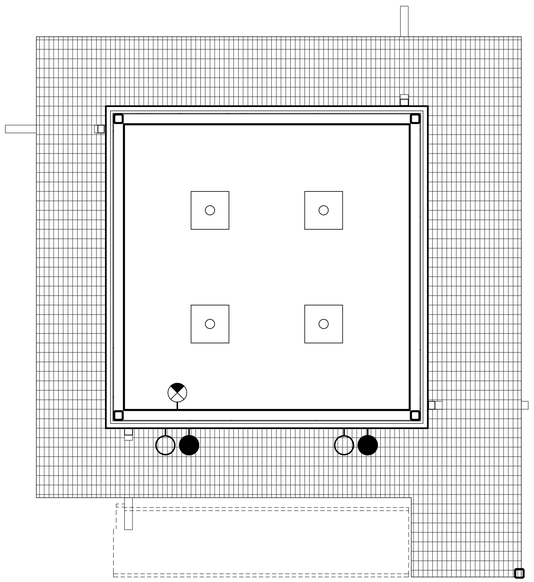
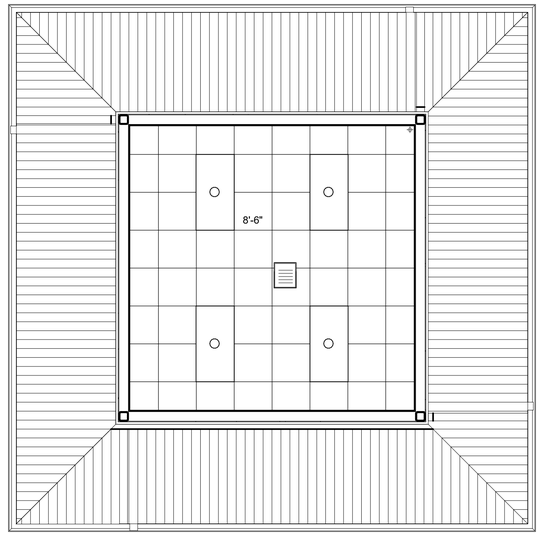


1 FIRST FLOOR REFLECTED CEILING PLAN

1/4" = 1'-0"

SCALE: 1/4"=1'-0"



2 SECOND FLOOR REFLECTED CEILING PLAN

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

GENERAL NOTES

1. EXTERIOR DIMENSIONS ARE FROM FACE OF INSULATED METAL PANEL.INTERIOR DIMENSIONS ARE FROM FACE OF STUD, UNLESS NOTED OTHERWISE.

2. SEE CIVIL DRAWINGS FOR FINISHED FLOOR AND FINISHED GRADE ELEVATIONS. SEE STRUCTURAL DRAWINGS FOR FOUNDATION PLANS AND FLOOR SLABS.

3. SEE MECHANICAL DRAWINGS FOR LOCATION OF ALL MECHANICAL EQUIPMENT. COORDINATE WITH MECHANICAL FOR EXACT LOCATION AND SIZES OF ALL REQUIRED REINFORCED CONCRETE EQUIPMENT PADS, TYPICAL.

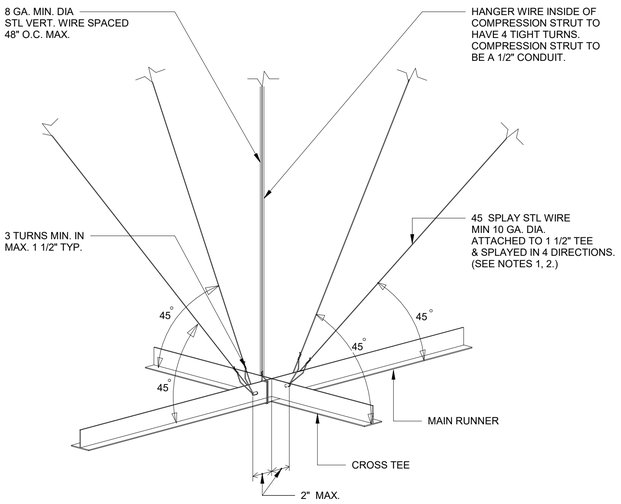
REFLECTED CEILING PLAN NOTES

1. FIXTURES ARE SHOWN FOR POSITIONING IN FINISHED CEILING. REFERENCE ELECTRICAL, MECHANICAL AND FIRE PROTECTION FOR
FIXTURE TYPES.

2. REFERENCE ROOF FINISH SCHEDULE FOR FINISHED CEILING HEIGHTS. CEILING HEIGHTS SHOWN IN THE FINISHED SCHEDULE ARE
MINIMUM AND SHALL BE MAINTAINED UNLESS OTHERWISE NOTED.

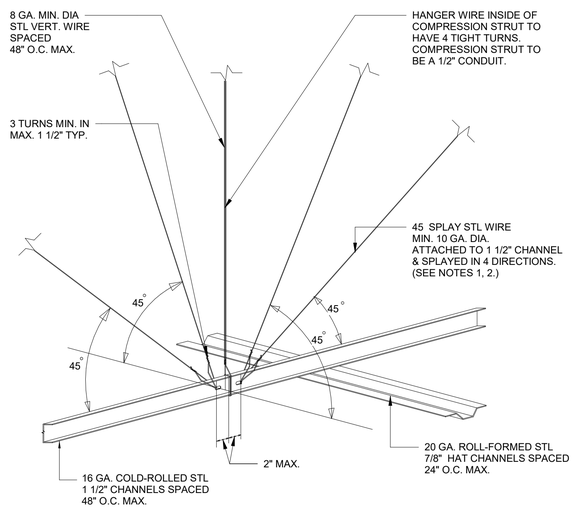
RCP LEGEND

- 2X2 CEILING GRID
- EXPOSED CEILING
- 2X4 LIGHTING FIXTURE
- 2X4 SURFACE MOUNT LIGHT FIXTURE
- WALL MOUNTED EXIT SIGN
- HEATER BOX
- METAL SOFFIT PANELS
- WALL MOUNTED LIGHT



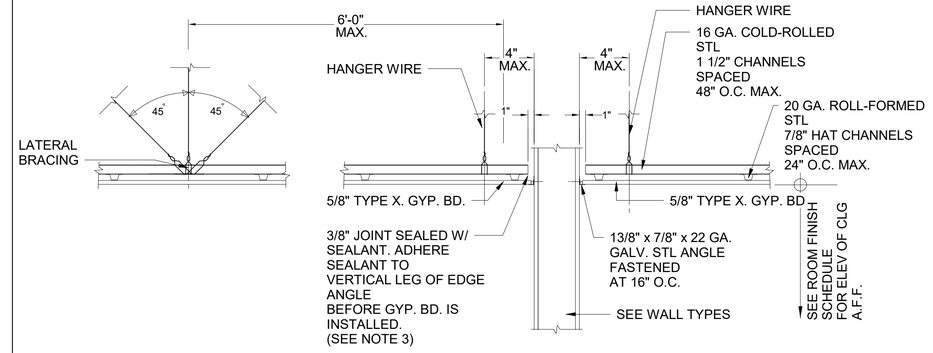
TYPICAL LATERAL BRACING DETAIL FOR LAY IN CEILING SYSTEM IN SEISMIC CATAGORY B.

5 CEILING BRACING DETAIL 1 NOT TO SCALE



TYPICAL LATERAL BRACING DETAIL FOR SUSPENDED GYPSUM BOARD CEILING SYSTEM IN SEISMIC CATAGORY B.

4 CEILING BRACING DETAIL 2 NOT TO SCALE



SUSPENDED GYPSUM BOARD CEILING SYSTEM

3 GYP BD CEILING DETAIL NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M.DEACON	CONTRACT NO.:
SUBMITTED BY: J DEACON	CATEGORY CODE: 178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT 100 W. OGLETHORPE AVE. SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

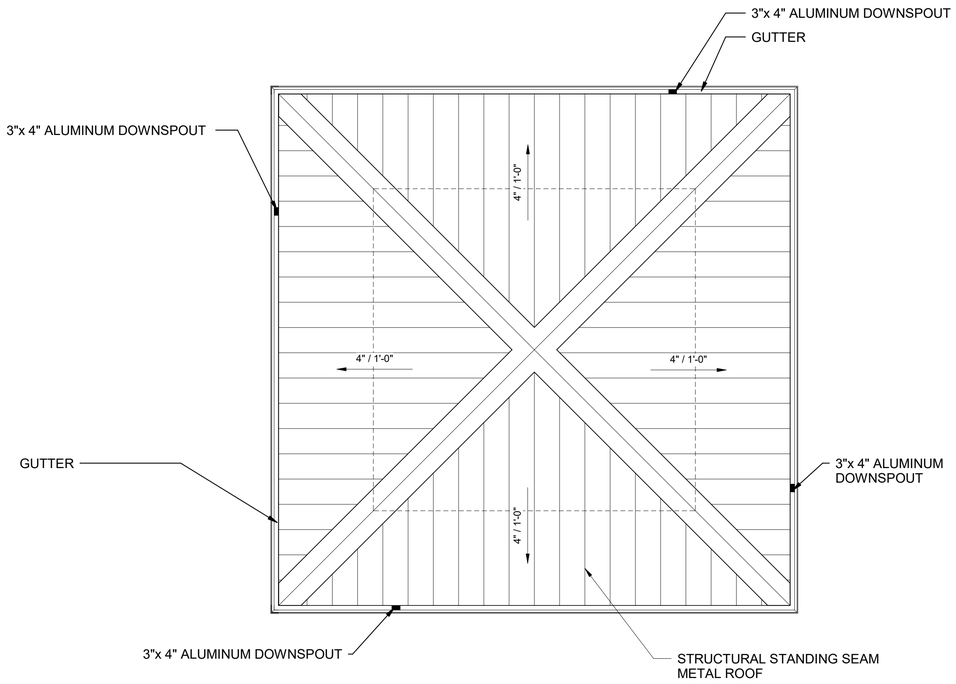
CONTROL TOWER REFLECTED CEILING PLANS

SHEET ID
BLDG 1
A-102

READY TO ADVERTISE (RTA)

File Path: C:\Users\K6ENXT09\Documents\FY23_PN86182_MPTR-TOWER_ARCH_R21_K6ENXT09.rvt

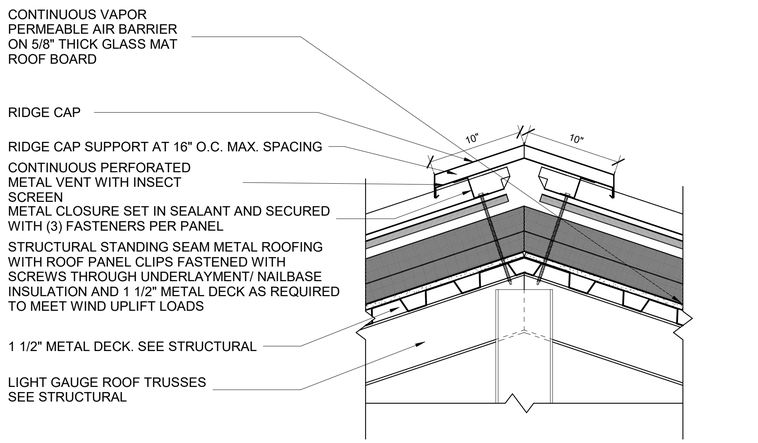
Plot Date: 11/29/2023 11:53:51 AM



1 ROOF PLAN

1/4" = 1'-0"

SCALE: 1/4"=1'-0"



2 TYPICAL RIDGE/ HIP VENT -SSMR (VENTED)

1 1/2" = 1'-0"

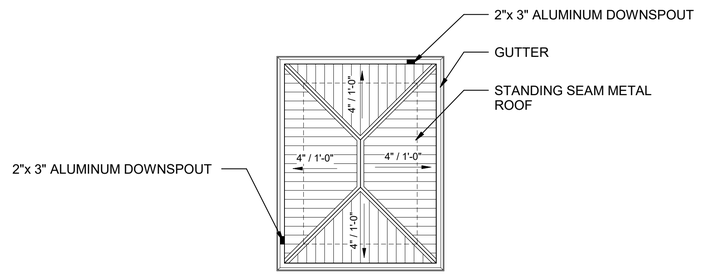
SCALE: 1 1/2"=1'-0"

GENERAL NOTES

1. EXTERIOR DIMENSIONS ARE FROM FACE OF INSULATED METAL PANEL.INTERIOR DIMENSIONS ARE FROM FACE OF STUD, UNLESS NOTED OTHERWISE.

2. SEE CIVIL DRAWINGS FOR FINISHED FLOOR AND FINISHED GRADE ELEVATIONS. SEE STRUCTURAL DRAWINGS FOR FOUNDATION PLANS AND FLOOR SLABS.

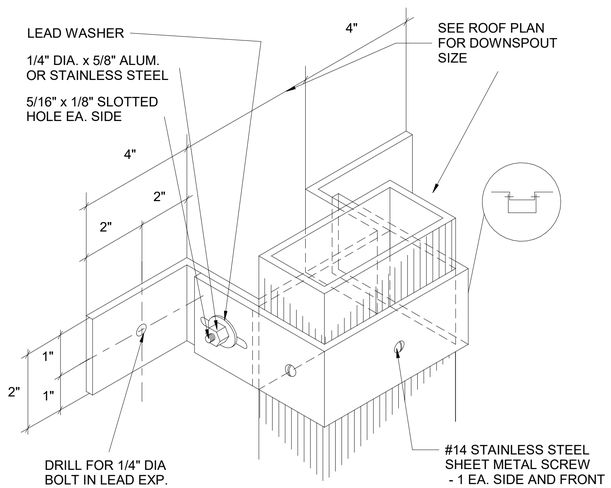
3. SEE MECHANICAL DRAWINGS FOR LOCATION OF ALL MECHANICAL EQUIPMENT. COORDINATE WITH MECHANICAL FOR EXACT LOCATION AND SIZES OF ALL REQUIRED REINFORCED CONCRETE EQUIPMENT PADS, TYPICAL.



3 PUMPHOUSE ROOF

1/4" = 1'-0"

SCALE: 1/4"=1'-0"



4 DOWNSPOUT STRAP

6" = 1'-0"

SCALE: 6"=1'-0"

ROOF PLAN NOTES

1. ROOF AND WALL PENETRATIONS/FLASHING SHALL CONFORM TO ACCEPTED ROOFING PRACTICES AS DESCRIBED AND DETAILED IN THE CURRENT EDITION OF THE NRCA ROOFING AND WATERPROOFING MANUALS AND THE SMACNA ARCHITECTURAL SHEET METAL MANUAL. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

2. LOCATE ALL ROOF PENETRATIONS AS REQUIRED TO AVOID CONFLICTS WITH MECHANICAL EQUIPMENT DUCTWORK.

3. COMPLETELY SEAL AROUND PENETRATIONS PER MANUFACTURERS RECOMMENDATIONS TO MAINTAIN AIR BARRIER/WEATHERTIGHT CONDITIONS.

4. ALL ITEMS PROTRUDING FROM THE FACE OF THE ROOF, INCLUDING VTR'S, SHALL BE PAINTED TO MATCH ROOF COLOR UNLESS OTHERWISE NOTED IN SPECIFICATION 09 06 00. ALL EXPOSED FASTNERS SHALL MATCH COLOR OF ADJACENT METAL.

5. SEE MECHANICAL DRAWINGS AND SPECIFICATIONS FOR ACTUAL SIZES OF MECHANICAL ITEMS.

6. ELIMINATION, PREVENTION OR CONTROL OF FALL HAZARDS SHALL COMPLY WITH THE PROVISIONS AND REQUIRMENTS OF ANSI/ASSE Z359 FALL PROTECTION CODE, ANSI/ASSE A1264.1 STANDARD AND DOL 29 CFR PART 1910 SUBPART D.

7. TOWER DOWNSPOUTS TO BE 3" X 4" MIN. PUMP HOUSE DOWNSPOUTS TO BE 2"X 3". REFERENCE ROOF PLAN FOR DOWNSPOU LOCATIONS. QUANTITY SHOWN ON ROOF PLAN SHALL BE PROVIDED. DOWNSPOUTS SHOWN IN ELEVATIONS ARE FOR GENERAL WALL PLACEMENT.

8. SECURE DOWNSPOUT WITH PREFINISHED METAL STRAPS AND PREFINISHED METAL FASTENERS, COLOR TO MATCH DOWNSPOUT (2 PER DOWNSPOUT). FASTEN INTO MASONRY WITH EXPANSION ANCHORS.

9. ALL GUTTERS TO BE 5" WIDE BY 5" DEEP. HANG ALL GUTTERS TO A SLOPE OF O.5% TO DOWNSPOUTS.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M.DEACON	CONTRACT NO.:
SUBMITTED BY: J DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT 100 W. OGLETHORPE AVE. SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

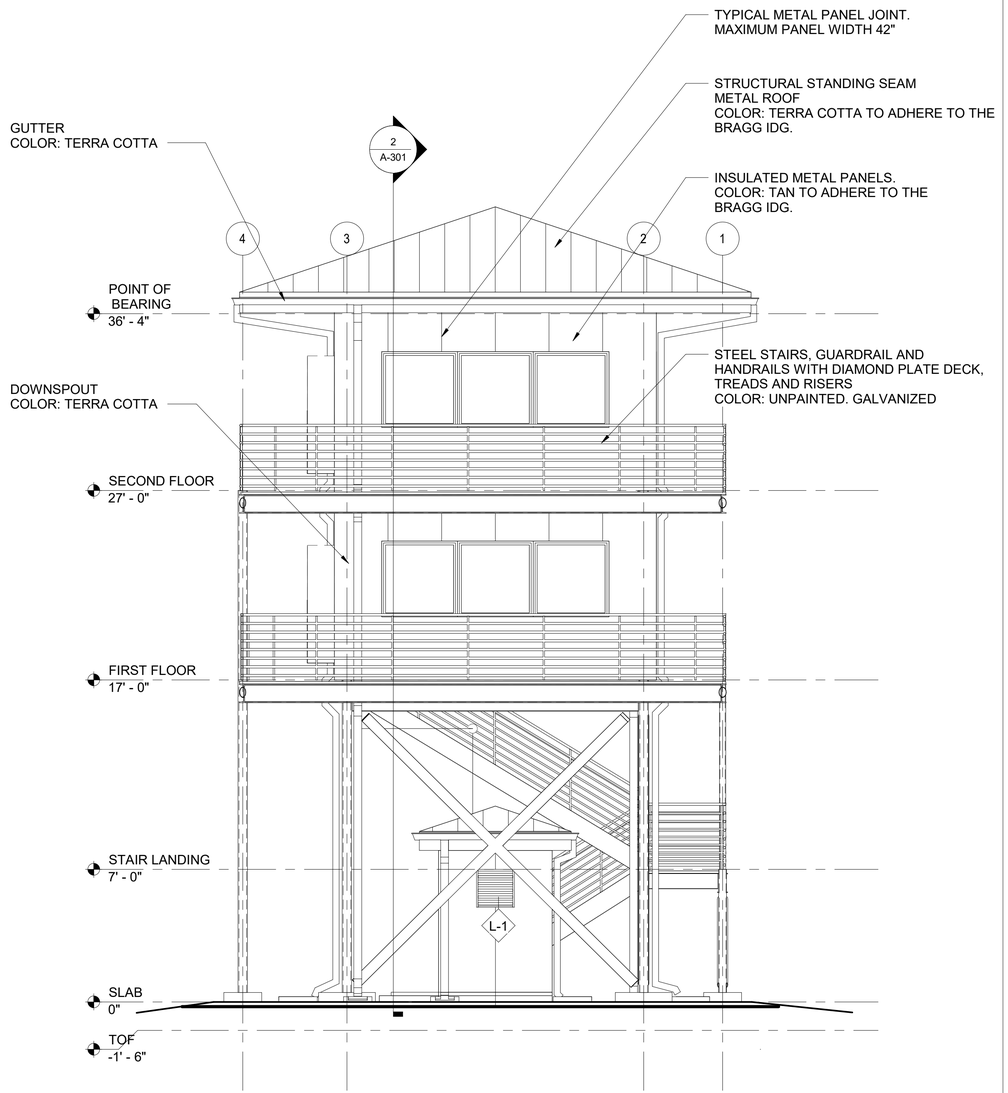
CONTROL TOWER ROOF PLAN & DETAILS

SHEET ID
BLDG 1
A-103

Plot Date: 11/29/2023 11:53:52 AM

File Path: C:\Users\K6ENXTO9\Documents\FY23_PN86182_MPTR-TOWER_ARCH_R21_K6ENXTO9.rvt

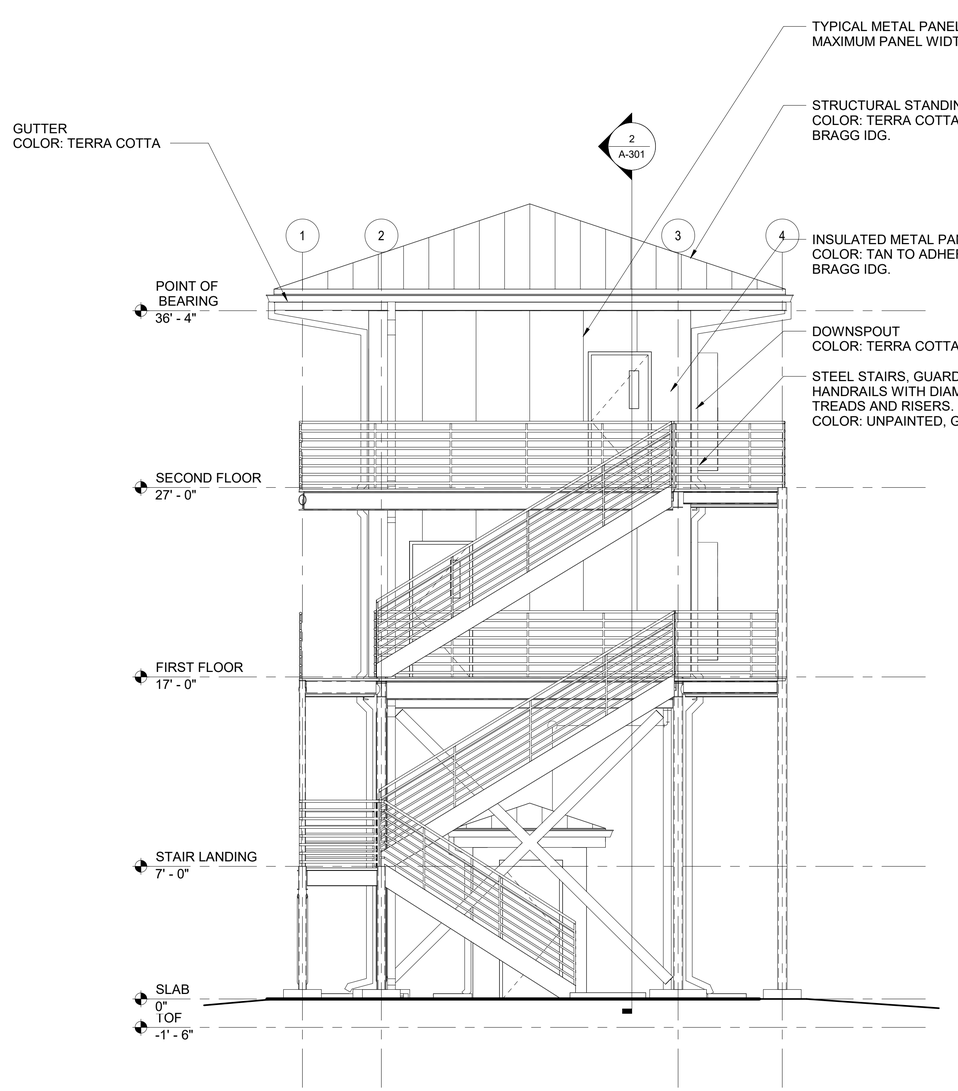
READY TO ADVERTISE (RTA)



1 NORTH ELEVATION

1/4" = 1'-0"

SCALE: 1/4"=1'-0"



2 SOUTH ELEVATION

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M. DEACON	CONTRACT NO.:
SUBMITTED BY: J DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

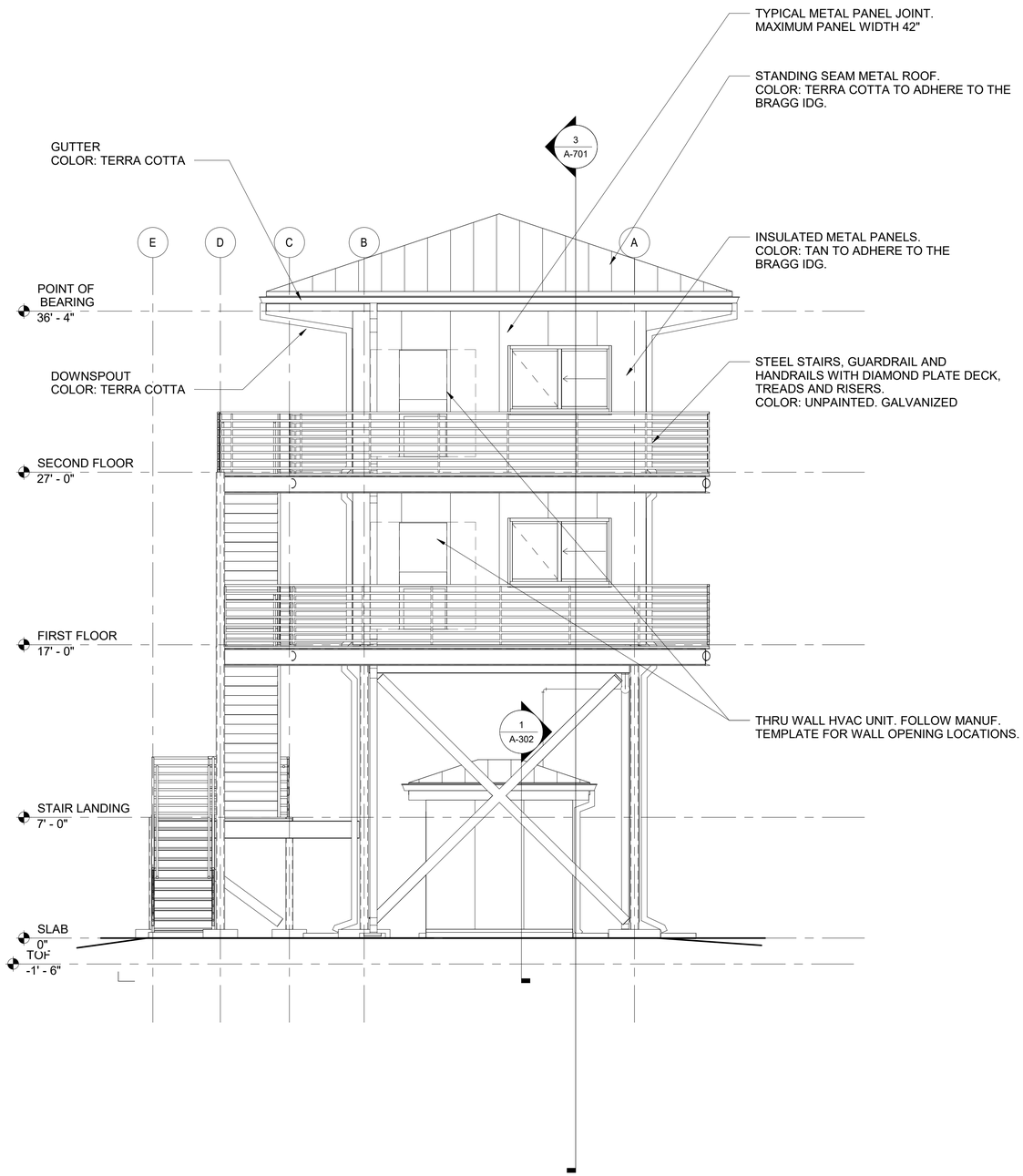
CONTROL TOWER NORTH AND SOUTH ELEVATIONS

SHEET ID
BLDG 1
A-201

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 11:57:24 AM

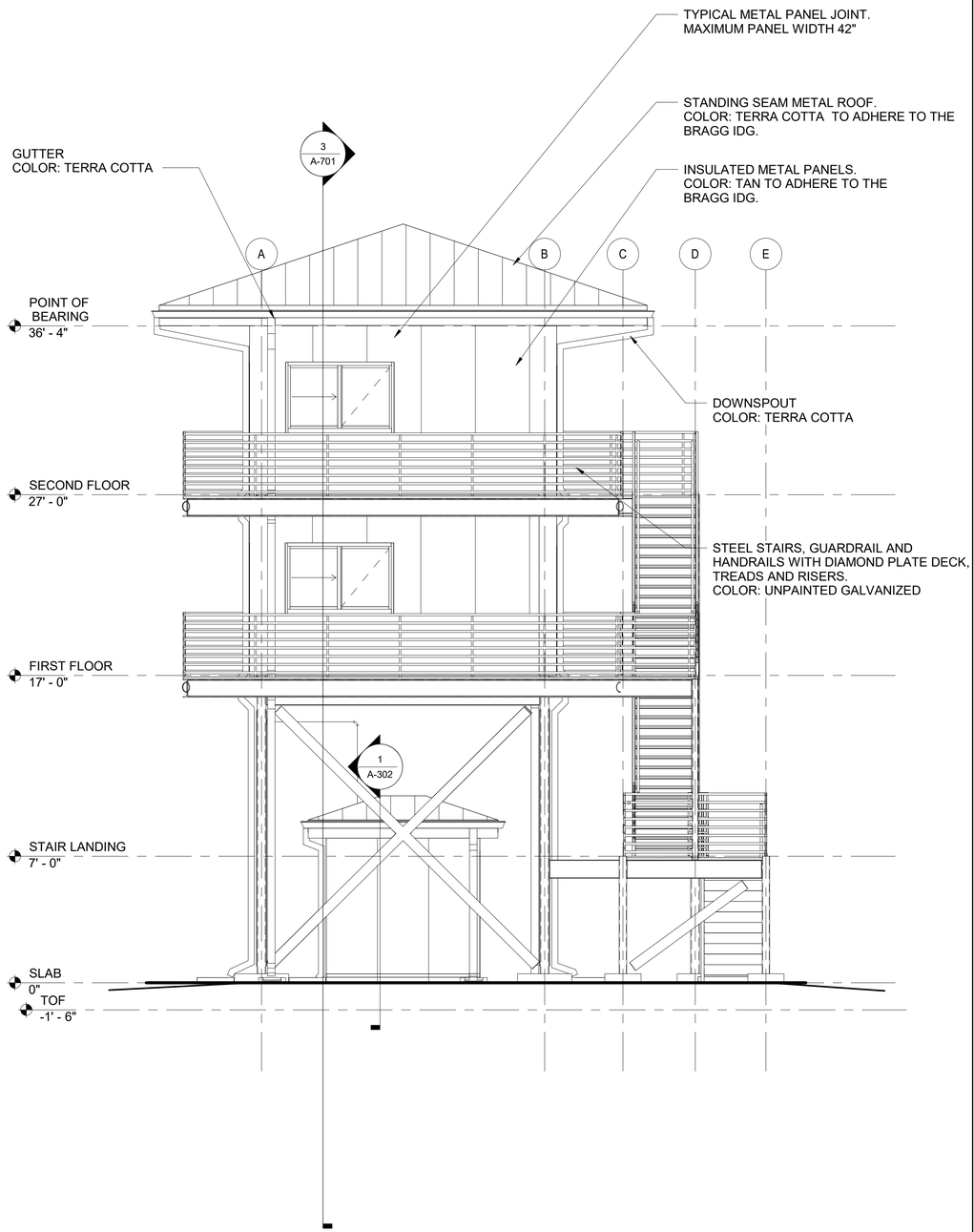
File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-TOWER_ARCH_R21_K6ENXT09.rvt



1 EAST ELEVATION

1/4" = 1'-0"

SCALE: 1/4"=1'-0"



2 WEST ELEVATION

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M. DEACON	CONTRACT NO.:
SUBMITTED BY: J DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

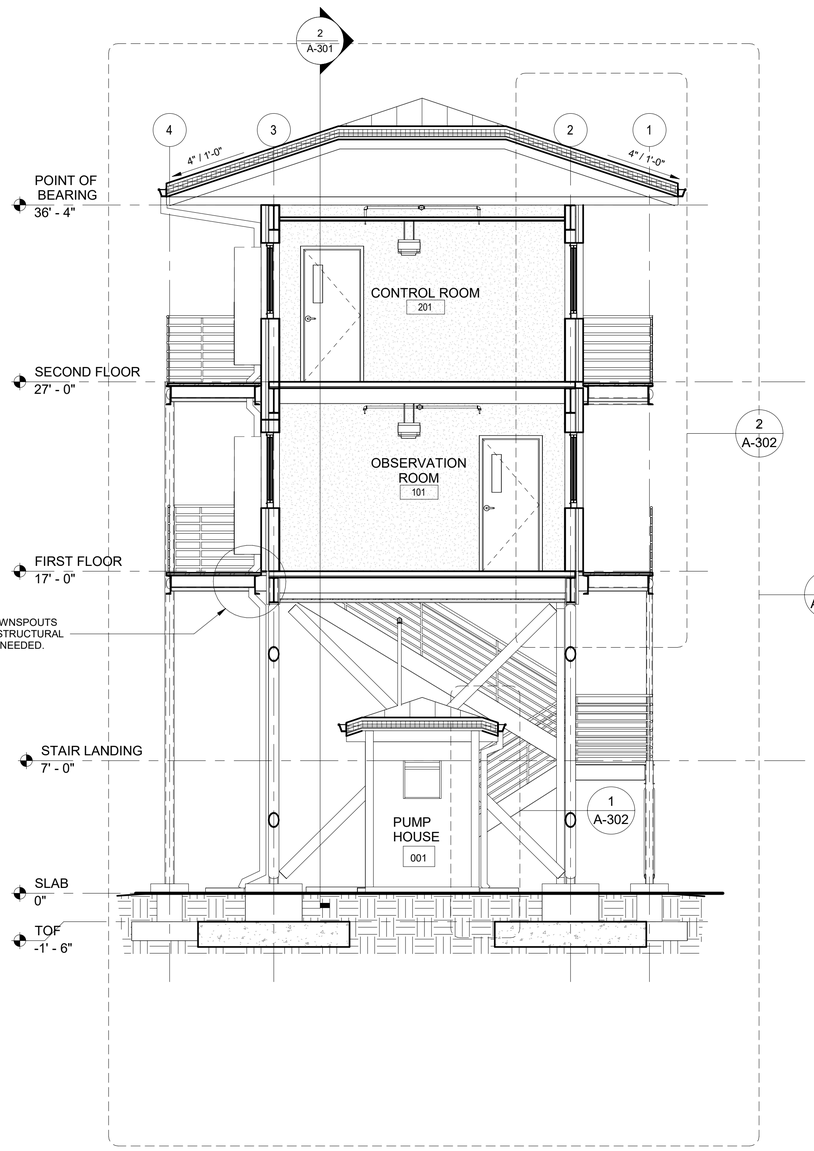
CONTROL TOWER EAST AND WEST ELEVATIONS

SHEET ID
BLDG 1
A-202

READY TO ADVERTISE (RTA)

Plot Date: 11/29/2023 11:53:56 AM

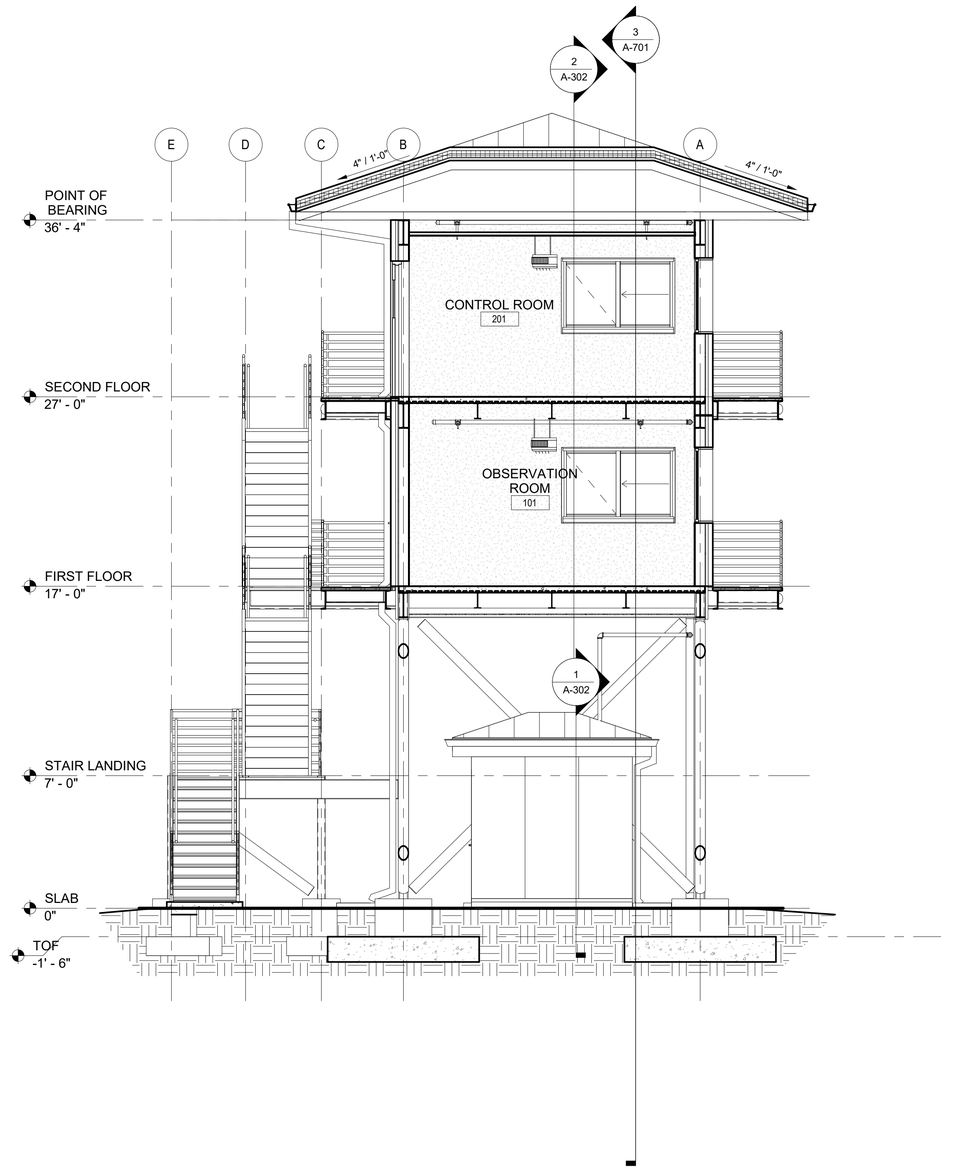
File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-TOWER_ARCH_R21_K6ENXT09.rvt



1 BUILDING CROSS SECTION 1

1/4" = 1'-0"

SCALE: 1/4"=1'-0"



2 BUILDING CROSS SECTION 2

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	
CATEGORY CODE:	178-65-01
FILE NAME:	

DESIGN BY:	T. ODELL
DRAWN BY:	T.ODELL
CHECKED BY:	M. DEACON
SUBMITTED BY:	J DEACON
SIZE:	ANSI D

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

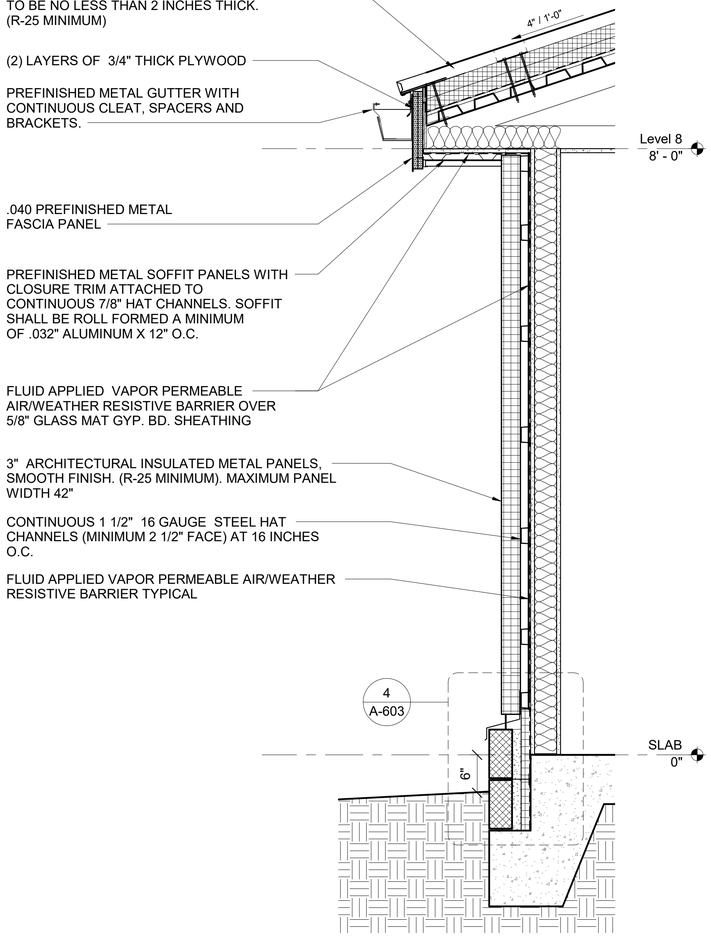
CONTROL TOWER BUILDING CROSS SECTION

SHEET ID
BLDG 1
A-301

READY TO ADVERTISE (RTA)

Plot Date: 11/29/2023 11:53:58 AM

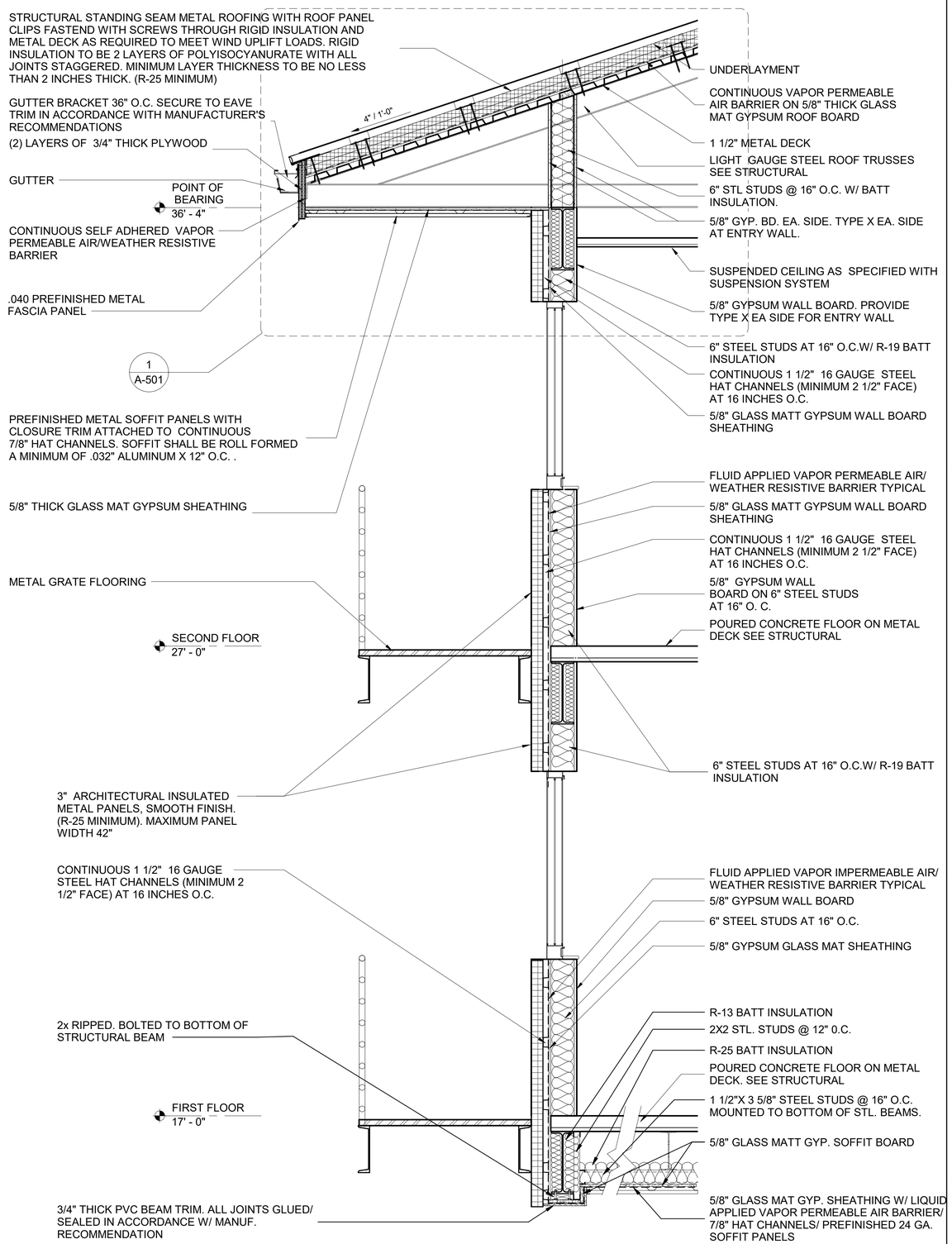
File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-TOWER_ARCH_R21_K6ENXT09.rvt



1 PUMP HOUSE WALL SECTION

1" = 1'-0"

SCALE: 1"=1'-0"



2 WALL SECTION 1

3/4" = 1'-0"

SCALE: 3/4"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.ODELL	SOLICITATION NO.: W912HN-24-R-3002
CHECKED BY: M.DEACON	CONTRACT NO.:
SUBMITTED BY: J DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT 100 W. OGLETHORPE AVE. SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

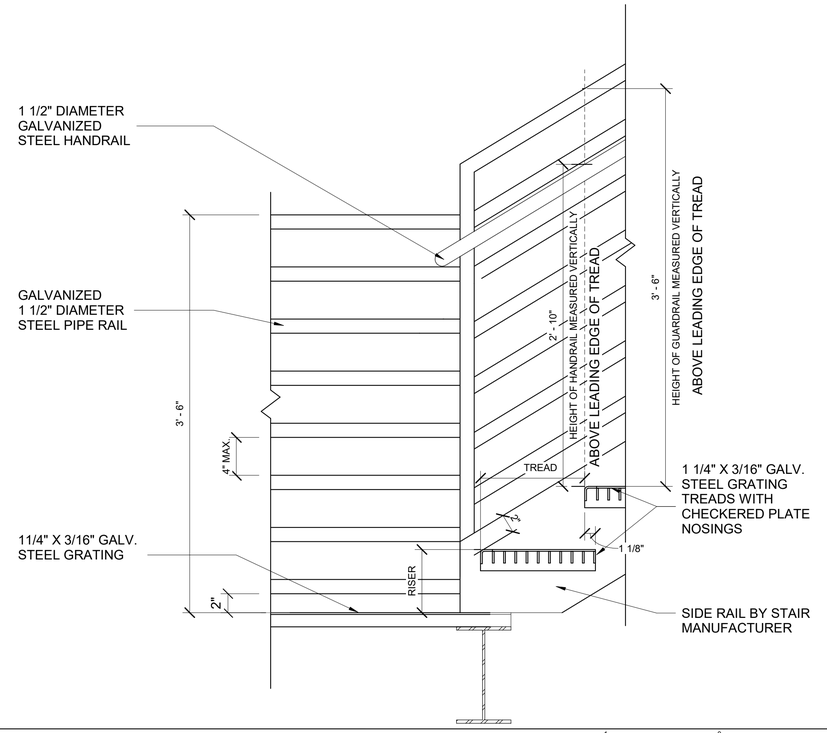
CONTROL TOWER WALL SECTIONS

SHEET ID
BLDG 1
A-302

READY TO ADVERTISE (RTA)

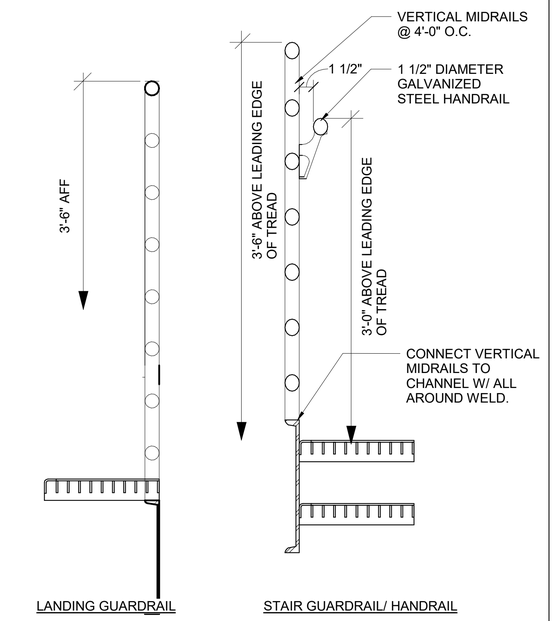
Plot Date: 11/28/2023 11:53:59 AM

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-TOWER_ARCH_R21_K6ENXT09.rvt



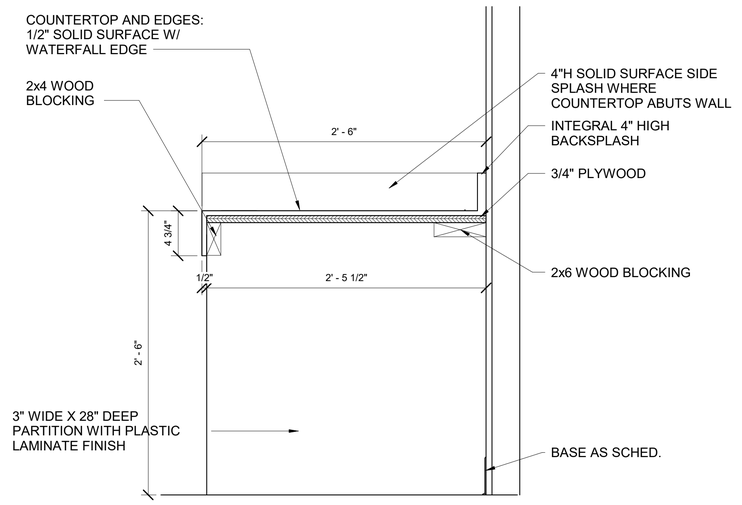
1 TYPICAL STAIR DETAIL AT BOTTOM LANDING

SCALE: 1 1/2"=1'-0"



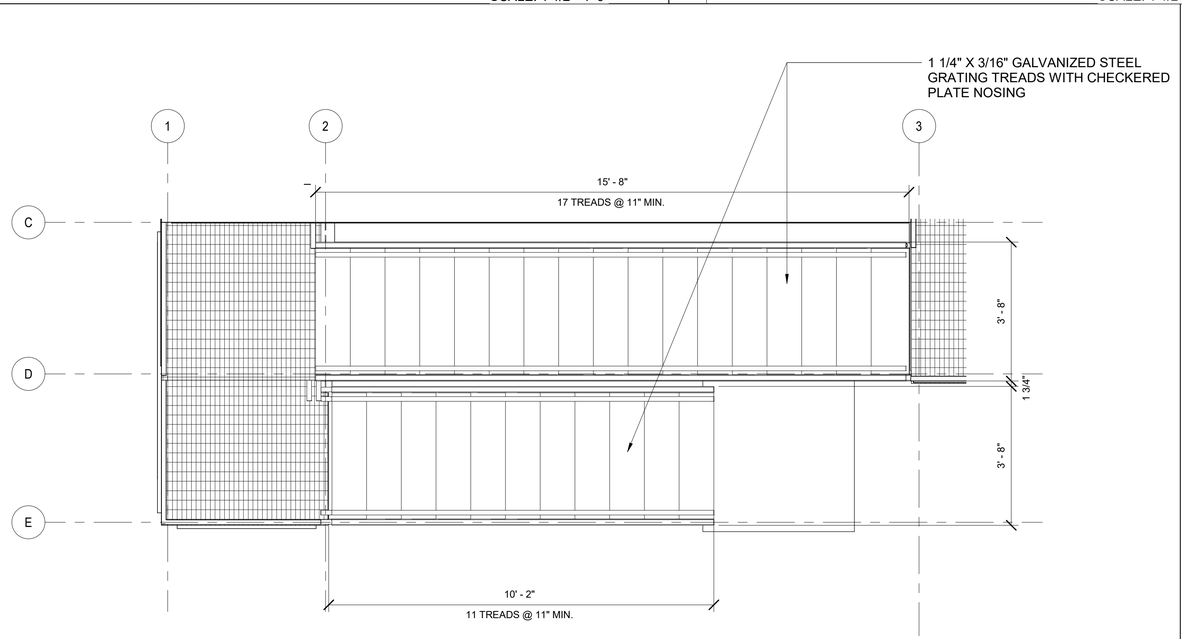
2 GUARDRAIL/HANDRAILS

SCALE: 1 1/2"=1'-0"



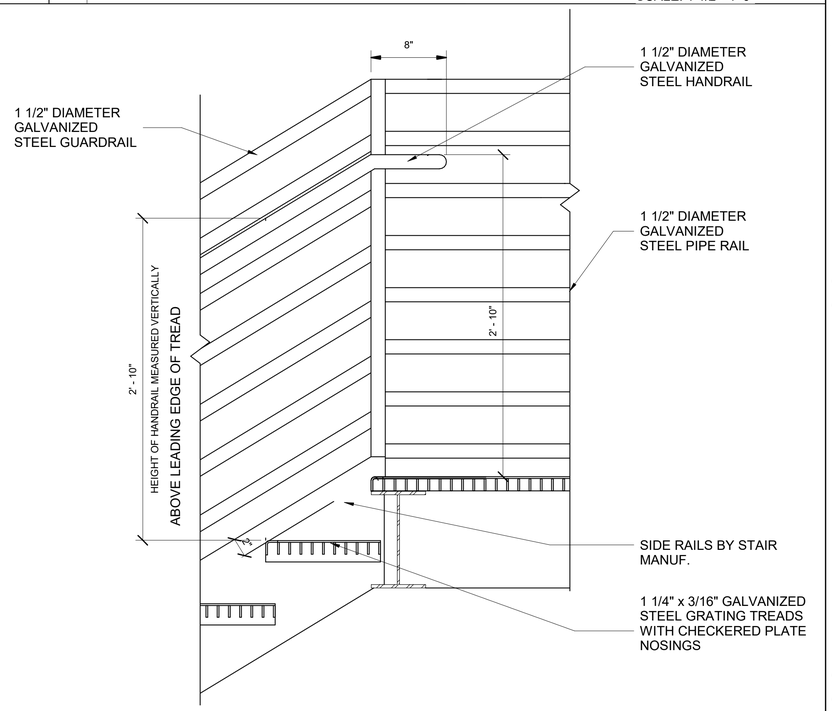
3 TYPICAL COUNTERTOP DETAIL

SCALE: 1 1/2"=1'-0"



5 STAIR PLAN

SCALE: 1/2"=1'-0"



4 TYPICAL STAIR TREAD DETAIL AT TOP LANDING

SCALE: 1 1/2"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	T. ODELL
DRAWN BY:	T. ODELL
CHECKED BY:	M. DEACON
SUBMITTED BY:	J DEACON
SIZE:	ANSI D
ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	-
CATEGORY CODE:	178-65-01
FILE NAME:	

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER DETAILS

SHEET ID
BLDG 1
A-303

READY TO ADVERTISE (RTA)

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-TOWER_ARCH_R21_K6ENXT09.rvt

Plot Date: 11/28/2023 11:53:59 AM

15 LB FELT UNDERLAYMENT FOR ENTIRE ROOF. IN ADDITION, SELF ADHERED MODIFIED BITUMINOUS LAYER FROM EAVE LINE BACK TO INTERIOR, EXTENDING 2'-0" ABOVE INTERIOR SPACE AS MEASURED FROM THE EXTERIOR WALL.

STRUCTURAL STANDING SEAM METAL ROOFING WITH ROOF PANEL CLIPS FASTEND WITH SCREWS THROUGH RIGID INSULATION AND METAL DECK AS REQUIRED TO MEET WIND UPLIFT LOADS. RIGID INSULATION TO BE 2 LAYERS OF POLYISOCYANURATE WITH ALL JOINTS STAGGERED. MINIMUM LAYER THICKNESS TO BE NO LESS THAN 2 INCHES THICK. (R-25 MINIMUM)

CONTINUOUS SELF ADHERED VAPOR PERMEABLE AIR/WEATHER RESISTIVE BARRIER. SEE A-702 FOR TYPICAL AIR BARRIER DETAILS

STEEL BENT PLATES. SEE STRUCTURAL

GUTTER BRACKET 36" O.C. SECURE TO EAVE TRIM IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS

GUTTER

GUTTER SUPPORT STRAP W/ FLASHING TO MATCH GUTTER

(2) LAYERS OF 3/4" THICK PLYWOOD FASTENED TO CONT. STEEL PLATE

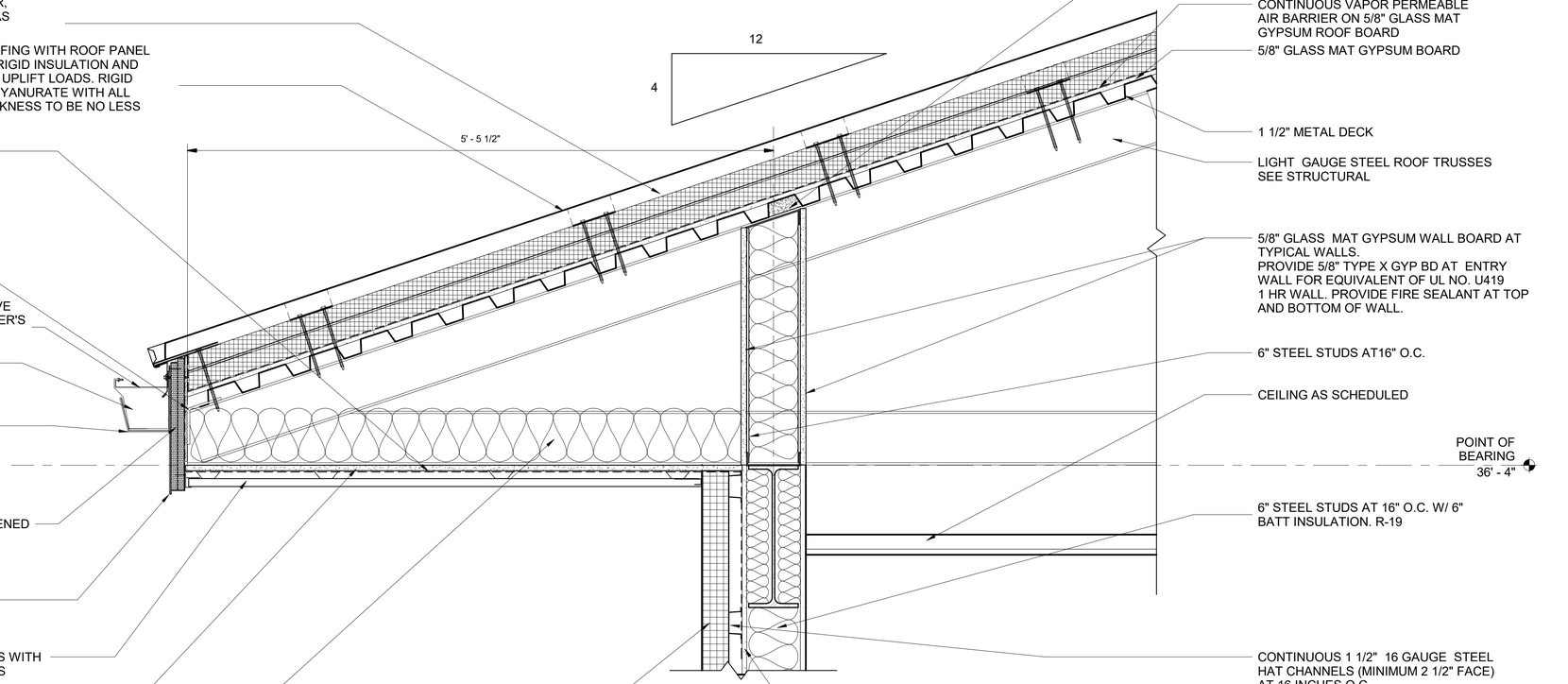
.040 PREFINISHED METAL FASCIA PANEL

PREFINISHED 24 GA. METAL SOFFIT PANELS WITH CLOSURE TRIM ATTACHED TO CONTINUOUS 7/8" HAT CHANNELS AT 12" O.C.

5/8" THICK GLASS MAT GYPSUM SHEATHING

R-19 BATT INSULATION

3" ARCHITECTURAL INSULATED METAL PANELS



MINERAL WOOL INSULATION

CONTINUOUS VAPOR PERMEABLE AIR BARRIER ON 5/8" GLASS MAT GYPSUM ROOF BOARD

5/8" GLASS MAT GYPSUM BOARD

1 1/2" METAL DECK

LIGHT GAUGE STEEL ROOF TRUSSES SEE STRUCTURAL

5/8" GLASS MAT GYPSUM WALL BOARD AT TYPICAL WALLS.
PROVIDE 5/8" TYPE X GYP BD AT ENTRY WALL FOR EQUIVALENT OF UL NO. U419 1 HR WALL. PROVIDE FIRE SEALANT AT TOP AND BOTTOM OF WALL.

6" STEEL STUDS AT16" O.C.

CEILING AS SCHEDULED

6" STEEL STUDS AT 16" O.C. W/ 6" BATT INSULATION. R-19

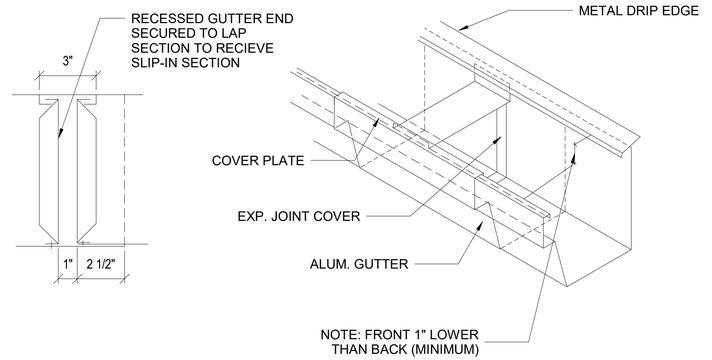
CONTINUOUS 1 1/2" 16 GAUGE STEEL HAT CHANNELS (MINIMUM 2 1/2" FACE) AT 16 INCHES O.C.

5/8" GYPSUM WALL BOARD SHEATHING.
5/8" TYPE X GP BD EA SIDE AT ENTRY 1 HR WALL.

1 EAVE DETAIL

1 1/2" = 1'-0"

SCALE: 1 1/2"=1'-0"



2 GUTTER EXPANSION JOINT

NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M.DEACON	CONTRACT NO.:
SUBMITTED BY: J DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

CONTROL TOWER ROOF DETAILS

SHEET ID
BLDG 1
A-501

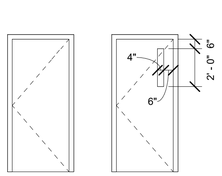
READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 11:54:00 AM

File Path: C:\Users\K6ENXT09\Documents\FY23_PN86182_MPTR-TOWER_ARCH_R21_K6ENXT09.rvt

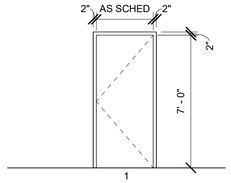
DOOR SCHEDULE

DOOR NO.	TYPE	DOOR SIZE WIDTH	DOOR SIZE HEIGHT	DOOR THICKNESS	DOOR MATERIAL	DOOR FINISH	FIRE RATING	FRAME TYPE	FRAME MATERIAL	FRAME DETAIL HEAD	FRAME DETAIL JAMB	FRAME DETAIL SILL	HARDWARE	COMMENTS:
201	R	3' - 0"	7' - 0"	1 3/4"	MTL	PT	3/4	1	HM	1-A602	4-A602	7-A602	1	CLOSER ON INTERIOR
001	F	3' - 0"	7' - 0"	1 3/4"	MTL	PT	NA	1	HM	1-A602	4-A602	7-A602	2	
101	R	3' - 0"	7' - 0"	1 3/4"	MTL	PT	3/4	1	HM	1-A602	4-A602	7-A602	1	CLOSER ON INTERIOR



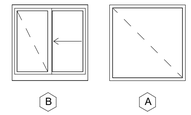
TYPE F TYPE R

DOOR TYPES
NOT TO SCALE

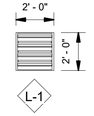


SINGLE DOORS

FRAME TYPES
NOT TO SCALE



WINDOW TYPES
NOT TO SCALE



LOUVER TYPES
NOT TO SCALE

USACE_WINDOW SCHEDULE

Count	Mark	R.O. Width	R.O. Height	Type	FRAME Finish	FRAME Material	DETAILS Head	DETAILS Jamb	DETAILS Window_Sill	Head Height	Remarks (See Notes Below)
6	A	4' - 0"	4' - 0"	Window_Fixed	Anodized	Aluminum	2/A602	5/A602	8/A602	7' - 4"	
4	B	6' - 0"	4' - 0"	SAS_Window-Horizontal_Slider	Anodized	Aluminum	3/A602	6/A602	9/A602	7' - 4"	

CONTROL TOWER LOUVER SCHEDULE

Mark	R.O. Width	R.O. Height	Type	FRAME Material	DETAILS Head	DETAILS Jamb	DETAILS Sill	Head Height	REMARKS
L-1	2'-0"	2'-0"	Louver/ Aluminum	Alum	1/A-603	2/A-603	3/A-603	7'-0"	

USACE_FINISH SCHEDULE

ROOM NO	ROOM NAME	FLOOR MAT.	WALL FINISH NORTH	WALL FINISH EAST	WALL FINISH SOUTH	WALL FINISH WEST	BASE FINISH NORTH	BASE FINISH EAST	BASE FINISH SOUTH	BASE FINISH WEST	FLOOR FIN.	CEILING MAT.	CEILING HEIGHT	NOTES & REMARKS (SEE NOTES)
001	PUMP HSE	CONC.	GYP BD	GYP BD	GYP BD	GYP BD	NA	NA	NA	NA	SEALED CONC	GYP. BD	8' - 0"	
101	OBSERVATION ROOM	CONC.	GYP BD	GYP BD	GYP BD	GYP BD	RB	RB	RB	RB	SEALED CONC	EXPOSED	8' - 8"	
201	CONTROL ROOM	CONC.	GYP BD	GYP BD	GYP BD	GYP BD	RB	RB	RB	RB	SEALED CONC	ACT	8' - 6"	

WINDOW NOTES

1. REFER TO FLOOR PLANS FOR LOCATIONS OF WINDOWS.
2. REFERENCE SPECIFICATIONS FOR GLAZING REQUIREMENTS.
3. PROVIDE SEALANT AROUND FULL PERIMETER OF FRAMES, BOTH SIDES OF WALL.
4. PROVIDE SCREENS FOR B TYPE WINDOWS

DOOR NOTES

1. ALL DOORS SHALL BE 1 3/4" THICK UNLESS OTHERWISE NOTED.
2. REFERENCE SPECIFICATION SECTION 08 11 13 FOR STEEL DOORS AND FRAMES.
3. REFERENCE SPECIFICATION SECTION 08 71 00 FOR DOOR HARDWARE.
4. SEE FLOOR PLANS FOR DOOR QUANTITIES, LOCATIONS, AND SWINGS.
5. PROVIDE SEALANT AROUND FULL PERIMETER OF FRAMES, BOTH SIDES OF WALL.

ROOM FINISH LEGEND

ACT ACOUSTICAL CEILING TILE

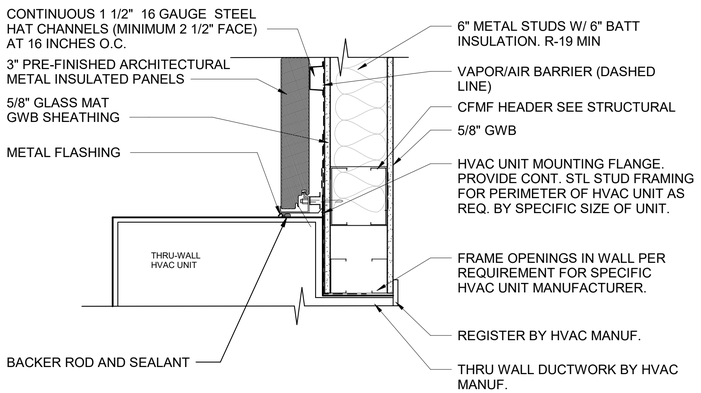
EXP EXPOSED

GWB GYPSUM WALL BOARD

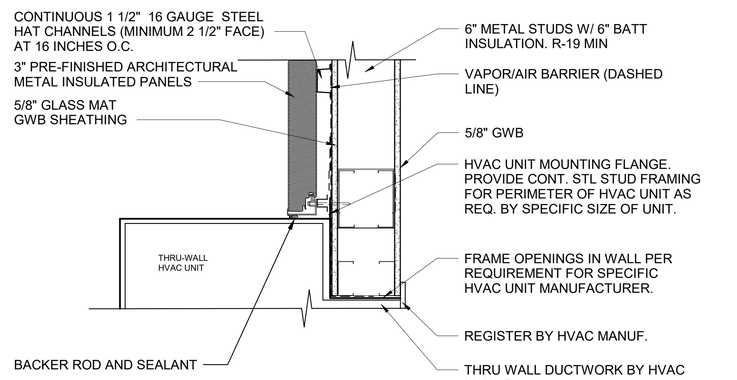
PT PAINT

RB RESILIENT BASE

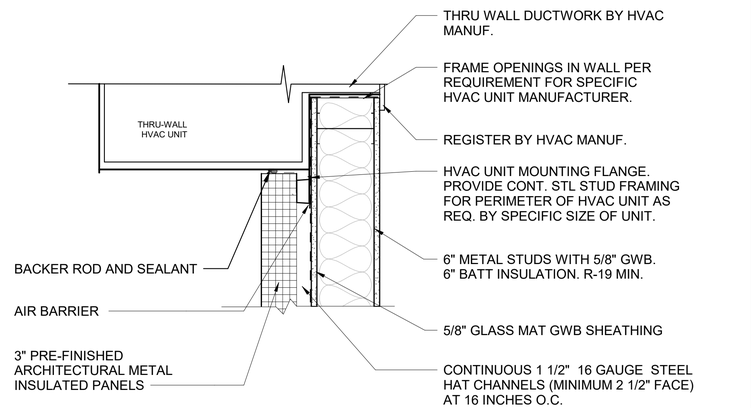
SC SEALED CONCRETE: SOLVENT BASED, CLEAR SEALER, ACRYLIC TYPE. NO SHEEN, MEETING VOC REG.REQUIREMENTS. (EXT..32G CONCRETE HORZ. SURFACES. INT.3.2F CONCRETE HORIZ. SURFACES.- MPI-104)



1 HVAC THRU WALL HEAD
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



2 HVAC THRU WALL JAMB
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



3 HVAC THRU WALL SILL
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL
DRAWN BY: T.ODELL
CHECKED BY: M.DEACON
SUBMITTED BY: J DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.: -
CATEGORY CODE: 178-85-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT 100 W. OGLETHORPE AVE. SAVANNAH, GA 31401

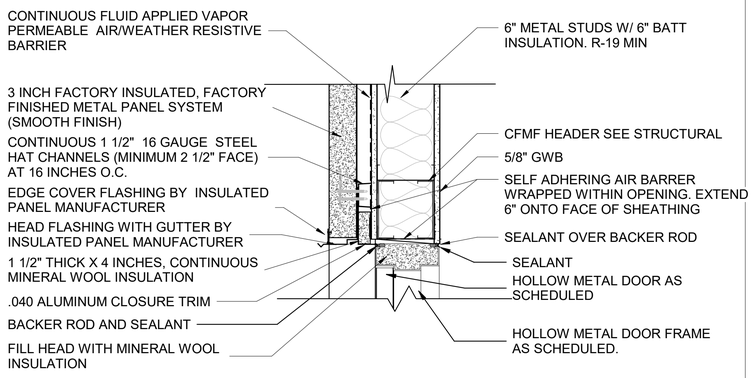
FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

CONTROL TOWER DOOR SCHEDULE AND DETAILS

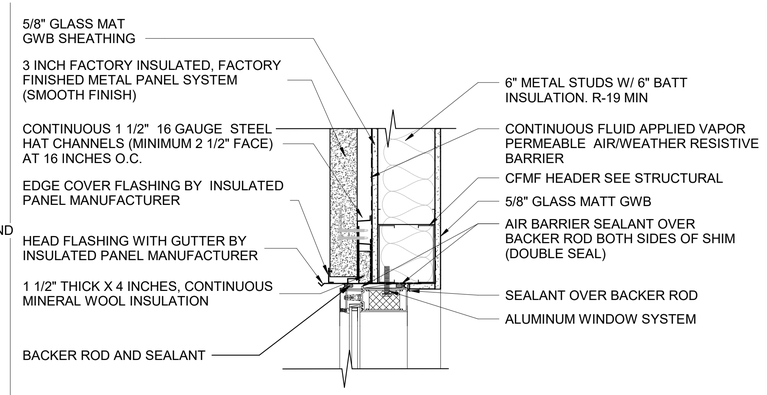
SHEET ID
BLDG 1
A-601

READY TO ADVERTISE (RTA)

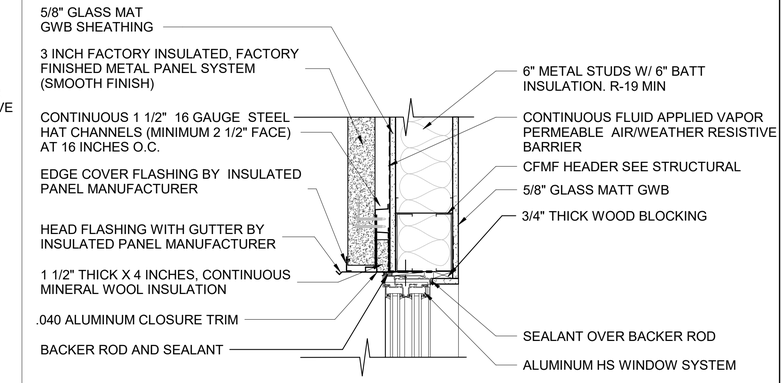
Plot Date: 11/29/2023 11:54:01 AM
File Path: C:\Users\K6ENXT09\Documents\FY23_PN86182_MPTR-TOWER_ARCH_R21_K6ENXT09.rvt



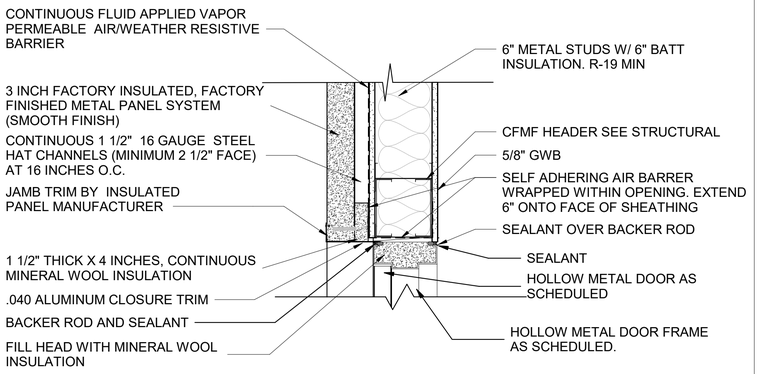
1 CT EXT. HM DOOR HEAD DETAIL
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



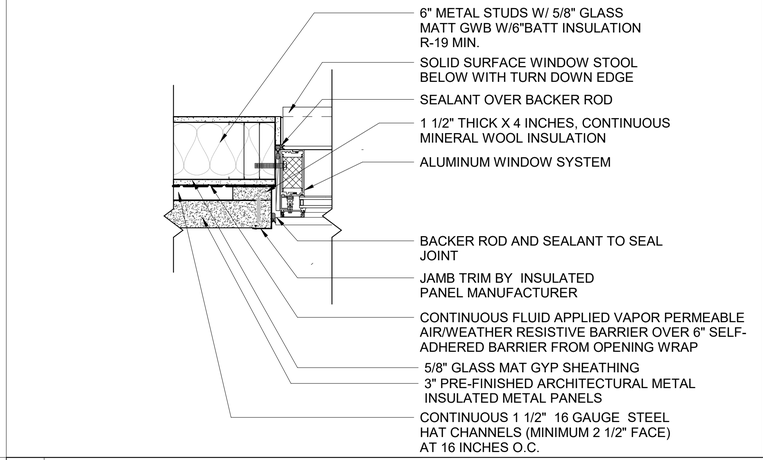
2 CT FIXED WINDOW HEAD DETAIL
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



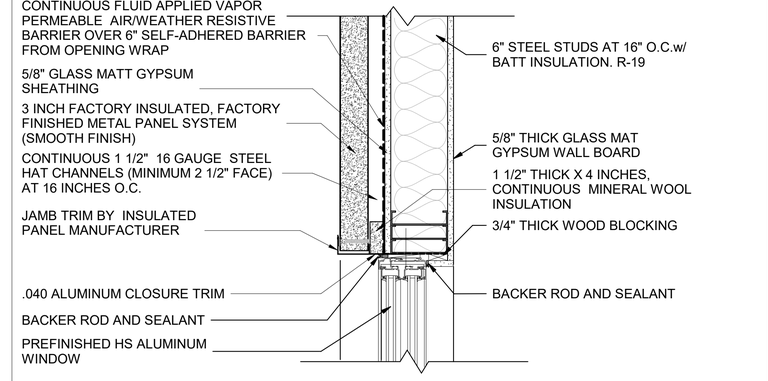
3 CT SLIDING WINDOW HEAD DETAIL
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



4 CT EXT. HM DOOR JAMB DETAIL
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"

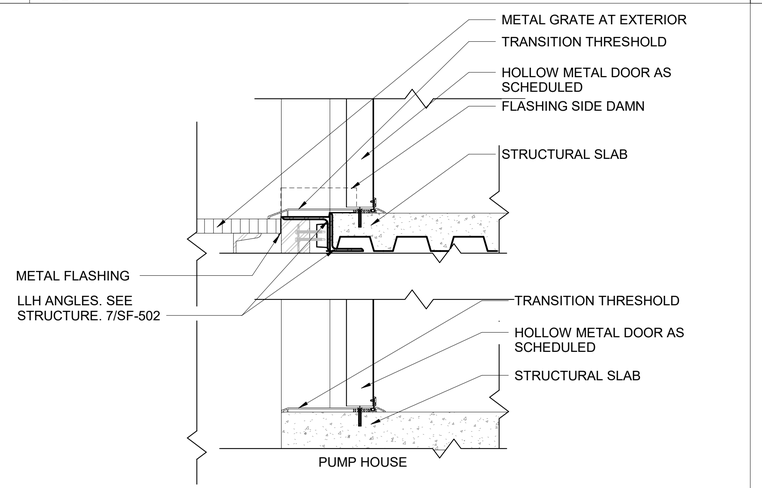


5 CT FIXED WINDOW JAMB DETAIL
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



NOTE: SEE A-700 SERIES PLATES FOR AIR BARRIER GUIDANCE

6 CT SLIDING WINDOW JAMB DETAIL
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



7 DOOR THRESHOLD
1 1/2" = 1'-0"
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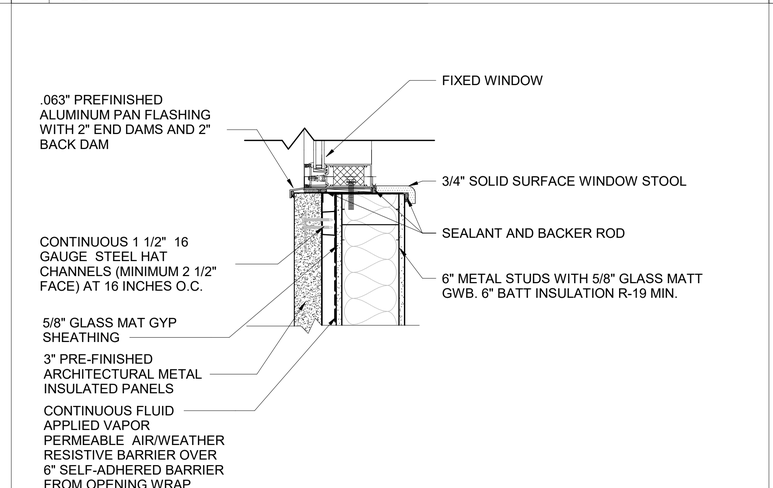
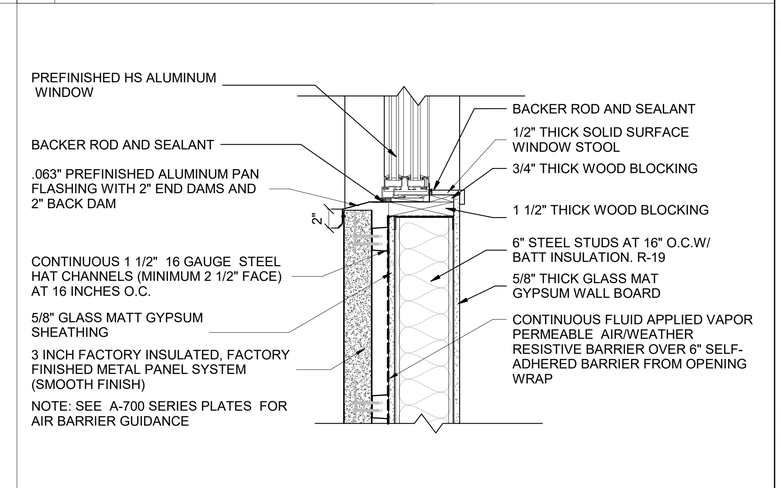


8 CT FIXED WINDOW SILL DETAIL
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



NOTE: SEE A-700 SERIES PLATES FOR AIR BARRIER GUIDANCE

9 CT SLIDING WINDOW SILL DETAIL
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	
CATEGORY CODE:	178-85-01
FILE NAME:	

DESIGN BY:	T. ODELL
DRAWN BY:	T. ODELL
CHECKED BY:	M. DEACON
SUBMITTED BY:	J DEACON
SIZE:	ANSI D

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

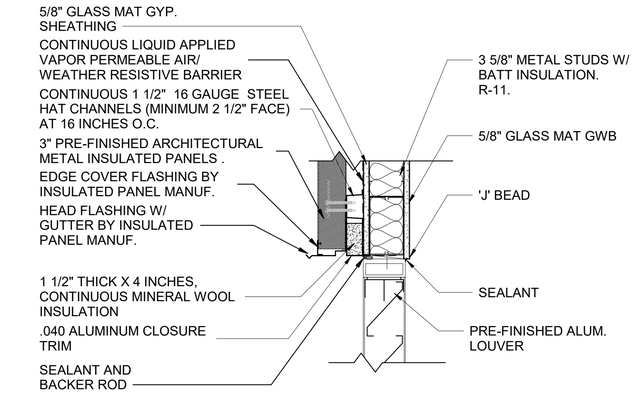
CONTROL TOWER DOOR & WINDOW DETAILS

SHEET ID
BLDG 1
A-602

READY TO ADVERTISE (RTA)

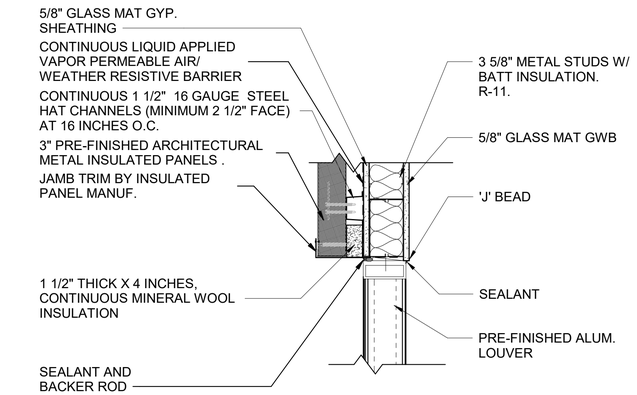
Plot Date: 11/28/2023 11:54:01 AM

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-TOWER_ARCH_R21_K6ENXT09.rvt



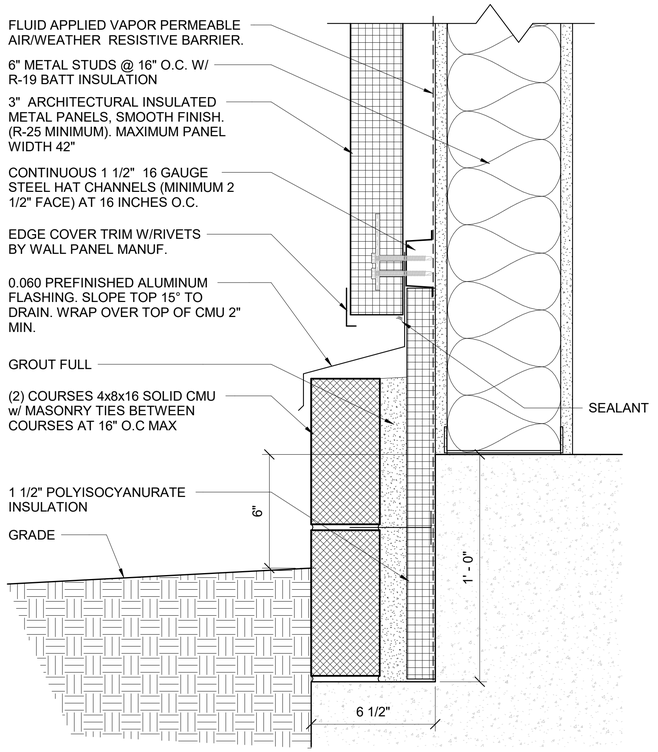
1 LOUVER HEAD

1 1/2" = 1'-0"



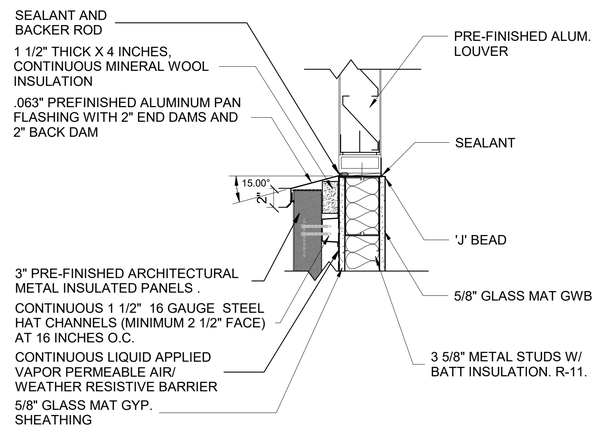
2 LOUVER JAMB

1 1/2" = 1'-0"



4 EXTERIOR WALL BASE

3" = 1'-0"



3 LOUVER SILL

1 1/2" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-R-3002
CONTRACT NO.:	
CATEGORY CODE:	178-85-01
FILE NAME:	

DESIGN BY:	T. O'DELL
DRAWN BY:	T. O'DELL
CHECKED BY:	M. DEACON
SUBMITTED BY:	J DEACON
SIZE:	ANSI D

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

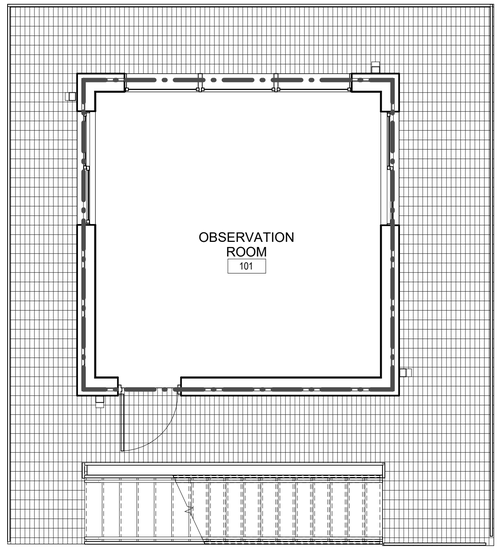
CONTROL TOWER DETAILS

SHEET ID
BLDG 1
A-603

READY TO ADVERTISE (RTA)

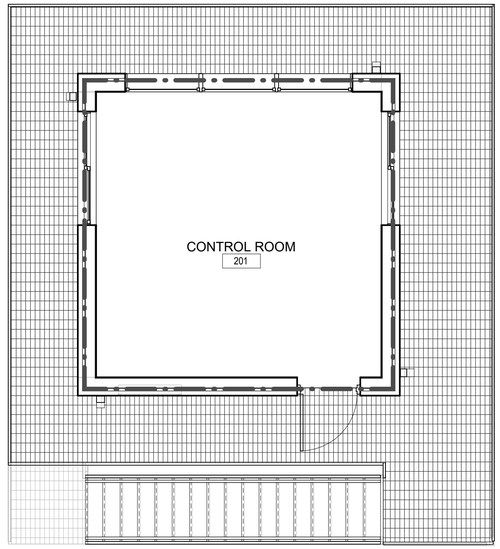
Plot Date: 11/28/2023 11:54:02 AM

File Path: C:\Users\K6ENXTO9\Documents\FY23_PN96182_MPTR-TOWER_ARCH_R21_K6ENXTO9.rvt



4 3 2 1 0 4 8
SCALE: 1/4"=1'-0"

1 FIRST FLOOR - AIR BARRIER
1/4" = 1'-0"



4 3 2 1 0 4 8
SCALE: 1/4"=1'-0"

2 SECOND FLOOR- AIR BARRIER
1/4" = 1'-0"

GENERAL NOTES

1. AIR BARRIER REQUIREMENTS: UFC 3-101-01 PARAGRAPH 3-6 REQUIRES THE BUILDING ENCLOSURE TO BE DESIGNED AND CONSTRUCTED WITH A CONTINUOUS SIX SIDED AIR BARRIER TO CONTROL AIR LEAKAGE IN ACCORDANCE WITH THE REQUIREMENTS OF ANSI/ASHRAE/USGBC/IES 189.1-2009 NORMATIVE APPENDIX B, "PRESCRIPTIVE CONTINUOUS AIR BARRIER".

2. THE PRIMARY AIR BARRIER MATERIALS ARE LIQUID APPLIED VAPOR PERMEABLE AIR/WEATHER RESISTIVE BARRIER, AND SELF-ADHERED (PEEL AND STICK) MEMBRANE. AIRBARRIER COMPONENT MATERIALS ARE SEALANTS, METAL (EXTERIOR DOORS, WINDOWS,GLAZING, FRAMES AND MECHANICAL LOUVERS WITH TIGHT SEALING MOTORIZED DAMPERS),POURED CONCRETE, FACTORY PREFINISHED PRE-INSULATED METAL WALL PANELS AND EXTERIOR WEATHER STRIPPING AT EXTERIOR DOORS.

3. THE AIR BARRIER SYSTEM CONSISTS OF PRIMARY AIR BARRIER MATERIALS COMBINED WITH AIR BARRIER COMPONENTS. MATERIAL TRANSITIONS SHALL BE FLEXIBLE TO ACCOMMODATE THERMAL AND MOISTURE MOVEMENT WITH ALL MOVEMENT JOINTS SEALED.CONNECTIONS SHALL BE MADE BETWEEN THE POURED CONCRETE FOUNDATION WALLS AND POURED CONCRETE FLOOR SLAB AND THE EXTERIOR WALLS, BETWEEN THE EXTERIOR WALLS AND EXTERIOR DOORS, EXTERIOR WINDOWS AND MECHANICAL LOUVERS, BETWEENTHE EXTERIOR WALLS AND SOFFIT, FASCIA AND ROOF AS FOLLOWS:

A) POURED CONCRETE FLOOR SLAB WITH VAPOR BARRIER TURNED UP POURED CONCRETE SLAB EDGE AND SEALED TO THE FACE OF THE POURED CONCRETE FOUNDATION WALL. THE TOP OF THE POURED CONCRETE FOUNDATION WALL PROVIDES THE CONNCETION BETWEEN THE FLOOR SLAB AND THE EXTERIOR WALL.

B) AT THE 4" CMU AND FACTORY PREFINISHED PREINSULATED METAL WALL PANEL TRANSITION SELF ADHERED (PEEL AND STICK) AIR BARRIER MEMBRANE IS LAPPED VERTICALLY WITH AN 8" LAP OVER THE LIQUID APPLIED VAPOR PERMEABLE AIR BARRIER OF THE WALL. THE BOTTOM OF THE FACTORY PREFINISHED INSULATED METAL WALL PANELS ARE SEALED TO THE TOP OF THE POURED CONCRETE FOUNDATION IN TWO ROWS OF CONTINOUS SEALANT. THE FACTORY PREFINISHED INSULATED METAL WALL PANELS (VAPOR IMPERMEABLE SYSTEM) EXTEND TO THE UNDERSIDE OF ROOF STRUCTURE. PANELS ARE SEALED TO THE EAVE, RAKE OR COPING STRUCTURE.

C) AT EXTERIOR DOOR AND WINDOW OPENINGS- ROUGH OPENINGS ARE WRAPPED WITH SELF ADHERED (PEEL AND STICK) MEMBRANE. A MINIMUM 3 INCH LAP OVER THE LIQUID APPLIED VAPOR PERMEABLE AIR/WEATHER RESISTIVE BARRIER/8" CMU AT WINDOW HEADS, JAMBS AND SILLS WILL BE PROVIDED. SELF ADHERED (PEEL AND STICK) AIR BARRIER MEMBRANE WILL BE EXTENDED THROUGH THE ROUGH OPENING TO ABUT THE INTERIOR GLASS MAT GYPSUM WALL BOARD. EXTERIOR METAL DOOR JAMBS ARE SEALED TO THE TOP OF THE POURED CONCRETE FLOOR SLAB WITH CONTINOUS BEADS OF SEALANT. DOOR THRESHOLDS ARE SEALED TO THE POURED CONCRETE FLOOR SLAB WITH CONTINOUS BEADS OF SEALANT. THE METAL DOOR HEADS AND JAM CONNECTIONS TO THE WALLS ARE SEALED TO THE WALL SELF ADHERED AIR BARRIER MEMBRANE.

D) AT EXTERIOR MECHANCIAL LOUVER OPENINGS- ROUGH OPENINGS ARE WRAPPED WITH SELF ADHERED (PEEL AND STICK) AIR BARRIER MEMEBRANE. A MINIMUM 3 INCH LAP OVER THE LIQUID APPLIED VAPOR PERMEABLE AIR /WEATHER RESISTIVE BARRIER/8" CMU AT HEADS,JAMBS AND SILLS WILL BE PROVIDED. SELF ADHERED 9PEEL AND STICK0 AIR BARRIER MEMBRANE WILL BE EXTENDED THROUGH THE ROUGH OPENING. EXTERIOR METAL LOUVER HEADS, JAMBS AND SILL CONNECTIONS TO THE WALLS ARE SEALED TO THE WALL AIR BARRIER MEMBRANE. LOUVERS ARE PROVIDED WITH TIGHT SEALING MOTORIZED DAMPERS.

E) ALL JOINTS AT OPENINGS,TRANSITIONS AND PENETRATIONS SHALL BE SEALED WITH BACKER ROD AND SEALANT.

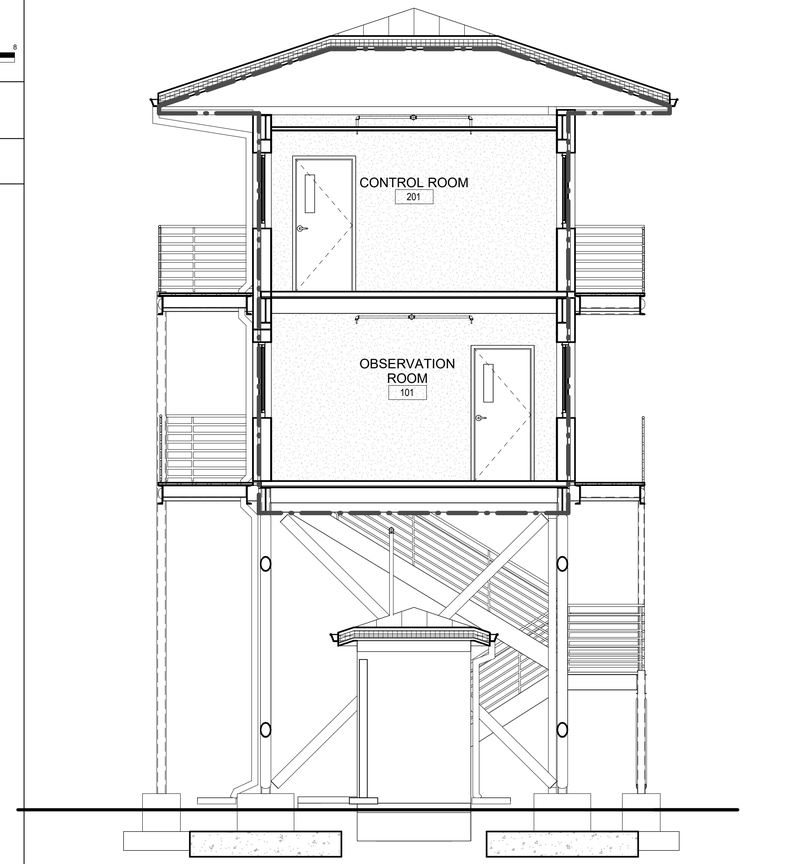
F) ALL ELECTRICAL,PLUMBING AND MECHANCIAL PENETRATIONS SHALL BE SEALED TO THE AIR BARRIER IN ACCORDANCE WITH THE AIR BARRIER MANUFACTURER'S RECOMMENDATIONS.

GENERAL NOTES

1. AIR BARRIER INSTALLATION AND INSPECTION ARE PART OF CONSTRUCTION. TESTING OF AIR BARRIER IS NOT REQUIRED.
2. INSIDE AND OUTSIDE CORNERS AND JOINTS BETWEEN METAL FURRING SHALL BE SEALED IN ACCORDANCE WITH THE PRIMARY AIR BARRIER MANUFACTURER'S RECOMMENDATIONS.
3. ALL JOINTS AT OPENINGS, TRANSITIONS, AND PENETRATIONS SHALL BE SEALED WITH BACKER ROD AND SEALANT.
4. ALL ELECTRICAL, PLUMBING, AND MECHANICAL PENETRATIONS SHALL BE SEALED TO THE AIR BARRIER IN ACCORDANCE WITH THE AIR BARRIER MANUFACTURER'S RECOMMENDATIONS.

LEGEND

INDICATES BOUNDARY OF AIR BARRIER



4 3 2 1 0 4 8
SCALE: 1/4"=1'-0"

3 BUILDING CROSS SECTION AIR BARRIER
1/4" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.ODELL	SOLICITATION NO.: W912HN-24-R-3002
CHECKED BY: M.DEACON	CONTRACT NO.:
SUBMITTED BY: J DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

CONTROL TOWER AIR BARRIER BOUNDARY

SHEET ID
BLDG 1
A-701

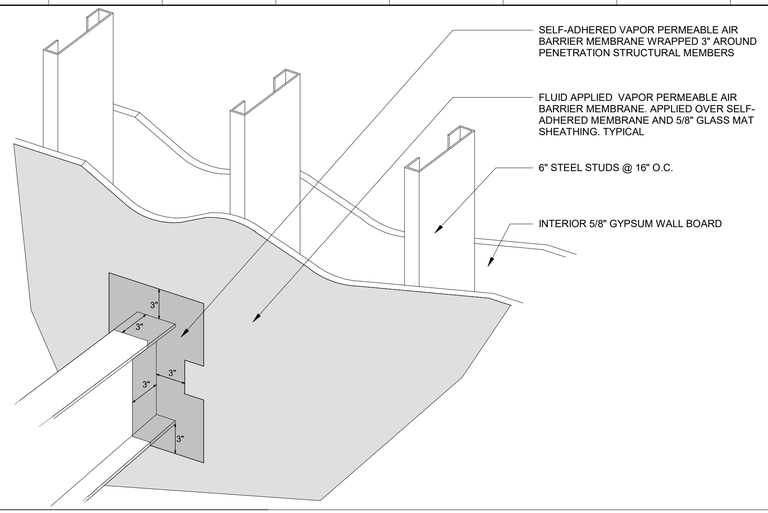
READY TO ADVERTISE (RTA)

Plot Date: 11/29/2023 11:54:04 AM

File Path: C:\Users\K6ENXT09\Documents\FY23_PN98182_MPTR-TOWER_ARCH_R21_K6ENXT09.rvt

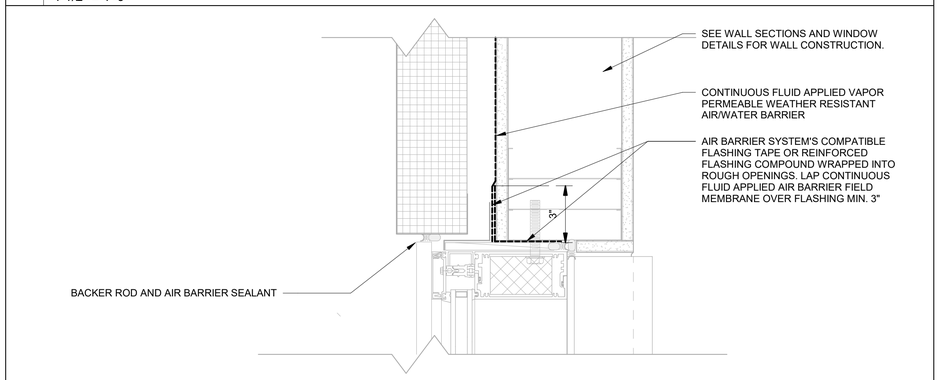
GENERAL NOTES

AT EXTERIOR DOOR AND WINDOW OPENINGS- ROUGH OPENINGS ARE WRAPPED WITH SELF ADHERED (PEEL AND STICK) MEMBRANE. A MINIMUM 3 INCH LAP OVER THE LIQUID APPLIED VAPOR PERMEABLE AIR/WEATHER RESISTIVE BARRIER/8" CMU AT WINDOW HEADS, JAMBS AND SILLS WILL BE PROVIDED. SELF ADHERED (PEEL AND STICK) AIR BARRIER MEMBRANE WILL BE EXTENDED THROUGH THE ROUGH OPENING TO ABUT THE INTERIOR GLASS MAT GYPSUM WALL BOARD. EXTERIOR METAL DOOR JAMBS ARE SEALED TO THE TOP OF THE POURED CONCRETE FLOOR SLAB WITH CONTINOUS BEADS OF SEALANT. DOOR THRESHOLDS ARE SEALED TO THE POURED CONCRETE FLOOR SLAB WITH CONTINOUS BEADS OF SEALANT. THE METAL DOOR HEADS AND JAM CONNECTIONS TO THE WALLS ARE SEALED TO THE WALL SELF ADHERED AIR BARRIER MEMBRANE.



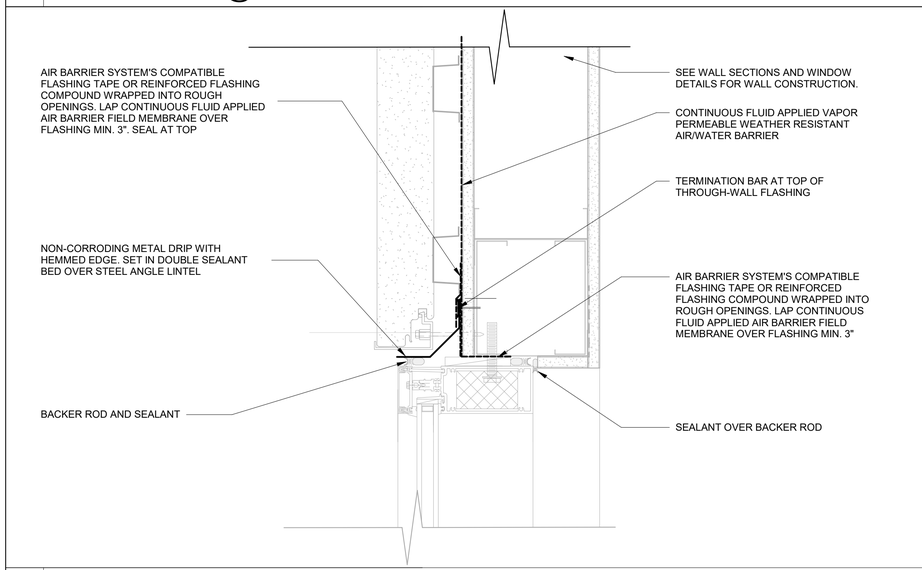
6 BEAM BARRIER WRAP

1 1/2" = 1'-0"



2 AIR BARRIER @ JAMB

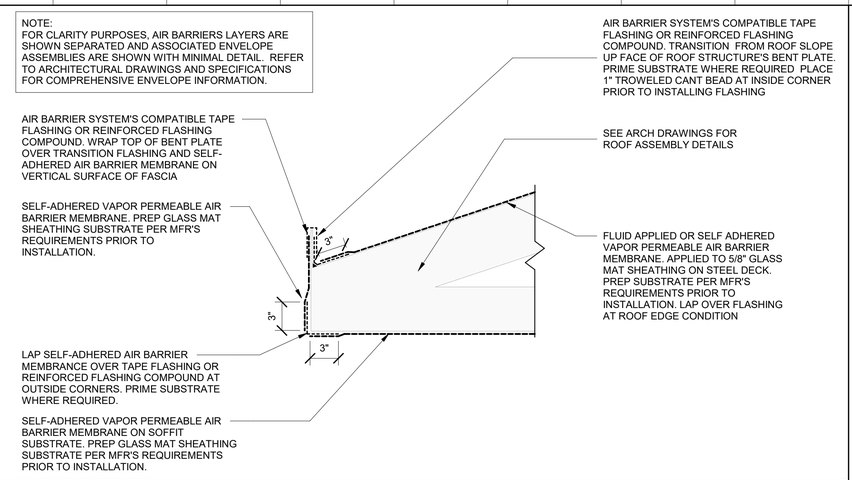
SCALE: 3"=1'-0"



4 AIR BARRIER @ HEAD

SCALE: 3"=1'-0"

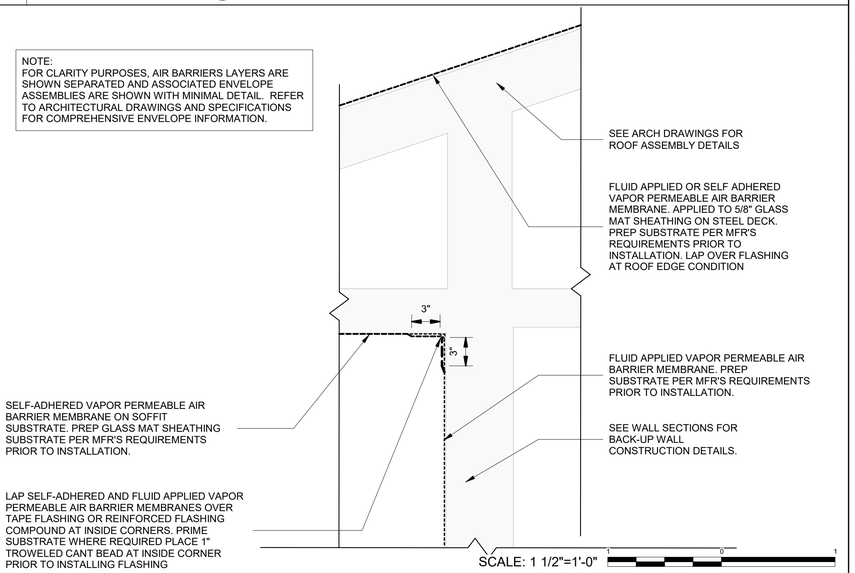
NOTE:
FOR CLARITY PURPOSES, AIR BARRIERS LAYERS ARE SHOWN SEPARATED AND ASSOCIATED ENVELOPE ASSEMBLIES ARE SHOWN WITH MINIMAL DETAIL. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR COMPREHENSIVE ENVELOPE INFORMATION.



1 AIR BARRIER @ FASCIA

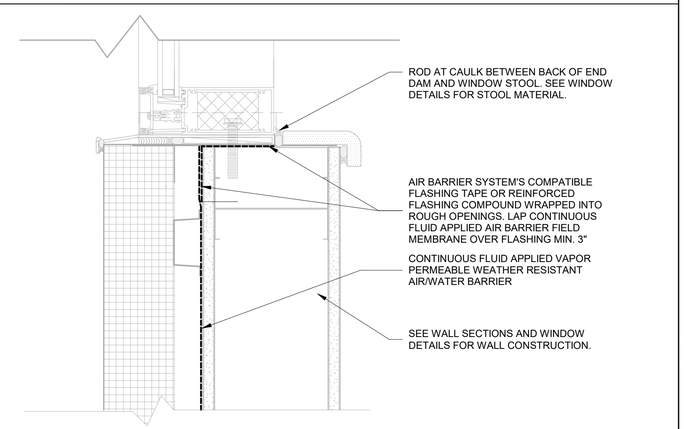
SCALE: 1 1/2"=1'-0"

NOTE:
FOR CLARITY PURPOSES, AIR BARRIERS LAYERS ARE SHOWN SEPARATED AND ASSOCIATED ENVELOPE ASSEMBLIES ARE SHOWN WITH MINIMAL DETAIL. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR COMPREHENSIVE ENVELOPE INFORMATION.



SCALE: 1 1/2"=1'-0"

3 AIR BARRIER @WALL/SOFFIT INTERSECTION



5 AIR BARRIER @ SILLS

SCALE: 3"=1'-0"

US Army Corps of Engineers

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T. ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M. DEACON	CONTRACT NO.: -
SUBMITTED BY: J DEACON	CATEGORY CODE: 178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER AIR BARRIER DETAILS

SHEET ID
BLDG 1
A-702

READY TO ADVERTISE (RTA)

Plot Date: 11/29/2023 11:54:04 AM

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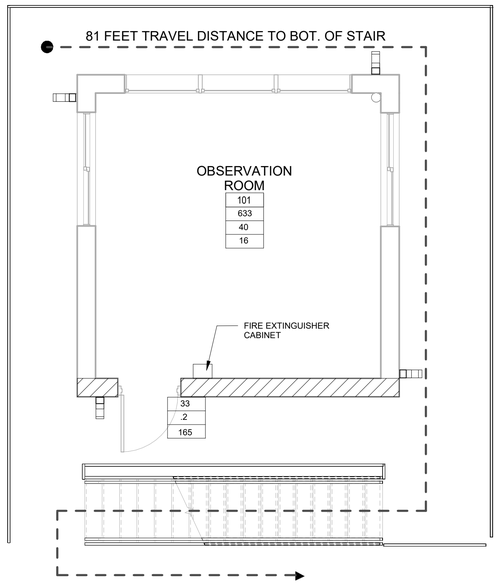
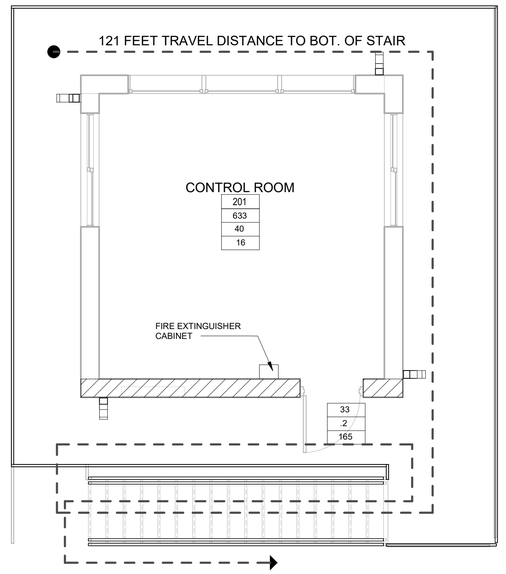


1 FIRST FLOOR LIFE SAFETY ANALYSIS

SCALE: 1/4"=1'-0"



2 SECOND FLOOR LIFE SAFETY ANALYSIS

SCALE: 1/4"=1'-0"

LIFE SAFETY CODE ANALYSIS

REFERENCES:

UNIFIED FACILITIES CRITERIA - UFC 1-200-01 GENERAL BUILDING REQUIREMENTS, OCTOBER 2020

UNIFIED FACILITIES CRITERIA- UFC 3-600-01 FIRE PROTECTION FOR FACILITIES, 8 AUGUST 2016 W/ Change 5

NFPA 101 LIFE SAFETY CODE, 2018 EDITION

NFPA 220 STANDARD ON TYPES OF BUILDING CONSTRUCTION, 2012 EDITION

NFPA 10, INSTALLATION OF PORTABLE FIRE EXTINGUISHERS

NFPA 1141 STANDARD FOR FIRE PROTECTION INFRASTRUCTURE FOR LAND DEVELOPMENT IN WILDLAND, RURAL, AND SUBURBAN AREAS

INTERNATIONAL BUILDING CODE (IBC), 2021

TW0 STORY, 1,266 SQUARE FEET , SPRINKLERED BUILDING

OCCUPANCY PER IBC:

IBC OCCUPANCY SECTION 312 UTILITY AND MISCELLANIOUS

CONSTRUCTION TYPE PER IBC:

REQUIREMENTS FOR CONSTRUCTION TYPE IIB SPRINKLERED: TABLE 504.3 ALLOWABLE BUILDING HEIGHT AND AREAS-69,000 sf, 3 STORIES MAXIMUM HEIGHT 75 FEET
ACTUAL BUILDING HEIGHT= 41'-9" FEET

FIRE RESISTANCE RATING REQUIREMENTS BASED UPON CONSTRUCTION TYPE IIB (TABLE 601): NO RATING REQUIRED FOR PRIMARY STRUCTUAL FRAME, BEARING WALLS (EXTERIOR, INTERIOR), NON- BEARING WALLS (EXTERIOR, INTERIOR), FLOOR CONSTRUCTION AND ROOF CONSTRUCTION.

FIRE PROTECTION REQUIREMENTS BASED UPON LOCATION ON PROPERTY:
NO RATING REQUIREMENT IF DISTANCE TO IMAGINARY PROPERTY LINE IS 10 FEET OR GREATER.

MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED UPON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION (705.8.1 EXCEPTION 2): BUILDINGS WHOSE EXTERIOR BEARING WALLS, EXTERIOR NON BEARING WALLS, AND EXTERIOR PRIMARY STRUCTURAL FRAME ARE NOT REQUIRED TO BE FIRE RESISTANCE RATED SHALL BE PERMITTED TO HAVE UNLIMITED, UNPROTECTED OPENINGS.

NFPA 101 MEANS OF EGRESS:

OCCUPANCY PER NFPA 101: BUSINESS (CHAPTER 38)

CLASSIFICATION OF HAZARD CONTENTS: ORDINARY HAZARD (38.1.5 & 6.2.2.3)

OCCUPANT LOAD : TABLE 7.3.1.2) BUSINESS, 100 SF/PERSON & BUSINESS AIR TRAFFIC CONTROL TOWER OBSERVATION 40 SF/PERSON- TOTAL 32 PERSONS

EGRESS CAPACITY (TABLE 7.3.3.1) LEVEL TRAVEL: 0.2 INCH PER PERSON X 32 = 7 INCHES REQUIRED
ACTUAL LEVEL TRAVEL CAPACITY- 1 OPENING 36 INCH WIDE DOORS (33 INCHES CLEAR)=
33 INCHES TOTAL EGRESS CAPACITY PROVIDED PER FLOOR.

MINIMUM EXIT STAIR WIDTH (TABLE 7.3.3.1) : 0.3 INCH PER PER PERSON X 6 MAXIMUM PER FLOOR= 1.8 INCHES REQUIRED. MINIMUM NEW STAIR WIDTH SHALL BE 36 INCHES WHERE THE TOTAL OCCUPANT LOAD OF ALL STORIES SERVED BY THE STAIR IS FEWER THAN 50 (7.2.2.2.1.2).

NUMBER OF EXITS: SINGLE EXIT PERMITTED (38.2.4.4), A SINGLE OUTSIDE STAIR IN ACCORDANCE WITH 7.2.2 SHALL BE PERMITTED TO SERVICE ALL STORIES.

SEPARATION AND PROTECTION OF OUTSIDE STAIRS (7.2.2.6.3.1) - OUTSIDE STAIRS SHALL BE SEPARATED FROM THE INTERIOR OF THE BUILDING BY CONSTRUCTION WITH THE FIRE RESISTANCE RATING REQUIRED FOR ENCLOSED STAIRS WITH FIXED OR SELF- CLOSING OPENING PROTECTIVES. THE FIRE RESISTIVE RATING OF A SEPARATION EXTENDING 10 FEET FROM THE STAIRS SHALL NOT BE REQUIRED TO EXCEED 1 HOUR WHERE OPENINGS HAVE A 3/4 HOUR FIRE PROTECTION RATING.

MAXIMUM TRAVEL DISTANCE: 300 FEET SPRINKLERED BUILDING (TABLE A7.6))

MAXIMUM DEAD END CORRIDOR: 50 FEET UNSPRINKLERED BUILDING (TABLE A7.6)

MAXIMUM COMMON PATH OF TRAVEL: 100 FEET UNSPRINKLERED BUILDING (TABLE A7.6)

SOLID TREADS AND LANDINGS ARE REQUIRED (7.2.2.3.3, 38.2.2.3)
AHJ, FIRE PROTECTION ENGINEER, HQ USACE/CECW-CE UFC 3-600-01 (1-8,2-1.3) HAS PROVIDED AN EXEMPTION.

PROTECTION PER NFPA 101

INTERIOR WALL AND CEILING FINISHES SHALL BE CLASS A OR B IN EXITS AND EXIT ACCESS CORRIDORS (38.3.3..2.1)

FLOOR FINISH MUST BE NO LESS THAN CLASS II IN EXIT ENCLOSURES (38.3.3.3.2)

PORTABLE FIRE EXTINGUISHERS SHALL BE PROVIDED (38.3.5)

REQUIREMENTS PER UFC 1-200-01

SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY- USE UFC 3-600-01 INSTEAD OF IBC CHAPTER 4

REQUIREMENTS PER UFC 3-600-01
AUTOMATIC SPRINKLER PROTECTION MUST BE PROVIDED PER SECTION 9-7.2.1.2
SYSTEM ALLOWED TO BE AN NFPA 13D SYSTEM SUPPLIED BY FEMA TANK AND PUMP SYSTEM BY SECTION 4-40.2.

REQUIREMENTS PER NFPA 10
CLASSIFICATION OF HAZARD FOR FIRE EXTINGUISHERS:

LIGHT HAZARD- MINIMUM FIRE EXTINGUISHER RATING 2-A, MAXIMUM OF 75 FEET TRAVEL TO FIRE EXTINGUISHER

REQUIRMENTS FOR NFPA 1141
MINIMUM DISTANCE TO ADJACENT BUILDINGS AND PROPERTY LINES = 30 FEET (6.2.1)

GROSS BUILDING AREA

GROSS BUILDING AREA PER IBC=

FIRST FLOOR	289 ENCLOSED/301 BALCONY	590 SF
SECOND FLOOR	289 ENCLOSED/301 BALCONY	590 SF
TOTAL		1,180 SF

GROSS BUILDING AREA PER UFC 3-101-01 =

FIRST FLOOR	590 SF + 43 (1/2 EXIT STAIR)	633 SF
SECOND FLOOR	590 SF + 43 (1/2 EXIT STAIR)	633 SF
TOTAL		1,266 SF

GROSS FLOOR AREA PER NFPA 101
(FLOOR AREA INSIDE EXTERIOR WALLS):

FIRST FLOOR	233 SF
SECOND FLOOR	233 SF
TOTAL	466 SF

GENERAL NOTES

1. THIS DRAWING IS TO BE USED AS REFERENCE ONLY. IT IS NOT PART OF THE CONSTRUCTION CONTRACT. ALL INFORMATION CONTAINED ON IT IS CALLED FOR ELSEWHERE.

PLAN LEGEND

FEC FIRE EXTINGUISHER CABINET

EGRESS PATH

REQUIRED EXIT

OCCUPANT LOAD KEY

OCCUPANT LOAD TAG

XXX ROOM NUMBER
XXX GROSS SQUARE FOOTAGE
XXX OCCUPANT LOAD FACTOR
XXX OCCUPANT LOAD

REQUIRED EXIT CAPACITY TAG

NOMINAL WIDTH, IN
WIDTH FACTOR, IN/PERSON (*)
CALCULATED CAPACITY

WALL LEGEND

NON RATED METAL STUD WALL

1 HR RATED METAL STUD WALL

US Army Corps of Engineers ®

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CHECKED BY: M.DEACON	CONTRACT NO.: -
SUBMITTED BY: J DEACON	CATEGORY CODE: 178-65-01
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER LIFE SAFETY ANALYSIS

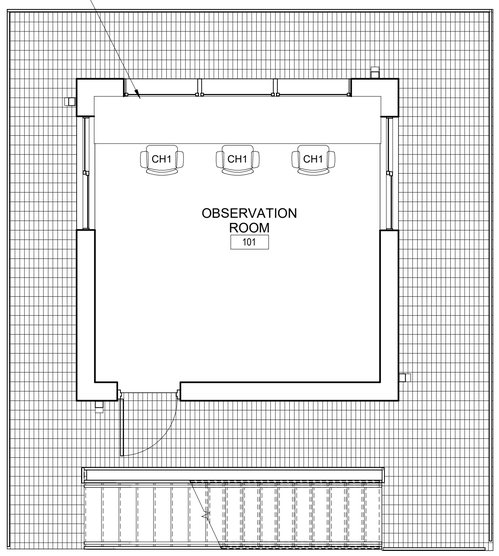
SHEET ID
BLDG 1
A-801

Plot Date: 11/29/2023 11:54:05 AM

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-TOWER_ARCH_R21_K6ENXT09.rvt

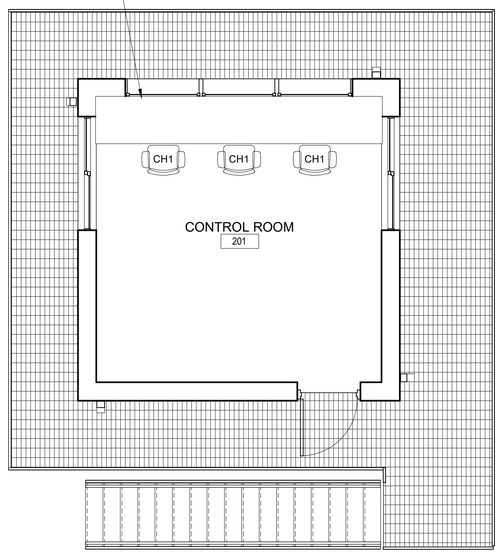
READY TO ADVERTISE (RTA)

30" DEEP COUNTERTOP W/
3" WIDE X 28" DEEP PARTITIONS.
PROVIDE (3) GROMMETS CENTERED
BETWEEN DIRECTLY ADJACENT TO
WALL



1 FIRST FLOOR FURNITURE PLAN
1/4" = 1'-0"

30" DEEP COUNTERTOP W/
3" WIDE X 28" DEEP PARTITIONS.
PROVIDE (3) GROMMETS CENTERED
BETWEEN DIRECTLY ADJACENT TO
WALL



2 SECOND FLOOR FURNITURE PLAN
1/4" = 1'-0"

GENERAL SHEET NOTES

FURNITURE LEGEND
*Furniture is for reference only; purchased under separate contract.

SEATING	
CH1	Task Chair
CH2	Classroom Chair with Tablet Arm
DESKS	
D1	L-Shaped Desk (Non-Handed); 30"D x 66"L Desk, 24"D x 48"L Return; Steel/Laminate
D2	Lectern
D3	Work Bench; Wood Top, 36"W x 72"L
FILES AND STORAGE	
S1	Lateral File Cabinet; 36"W, 5DR; Steel
S2	Bookcase; 36"W, 72"H; Steel
S3	Storage Cabinet; 24"D x 36"W x 87"H; Steel
S4	Heavy Duty Industrial Shelving; 36"D x 96"W x 84"H

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: V. ROBERSON	ISSUE DATE: NOVEMBER 2023
DRAWN BY: V. ROBERSON	SOLICITATION NO.: W912HN-23-B-3001
CHECKED BY: M. DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER FURNITURE PLANS

SHEET ID
BLDG 1
IN101

READY TO ADVERTISE (RTA)

Plot Date: 11/15/2023 10:01:23 AM
File Path: C:\Users\K6ENXVDR\Documents\FY23_PN96182_MPTR-TOWER_INT_R21_K6ENXVDR.rvt

INTERIOR ROOM FINISH SCHEDULE												
		WALL FINISH				BASE FINISH				FLOOR	CEILING	
ROOM NO	ROOM NAME	NORTH	EAST	SOUTH	WEST	NORTH	EAST	SOUTH	WEST	FIN.	FIN.	NOTES & REMARKS (SEE NOTES)
101	OBSERVATION ROOM	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	SEALED CONCRETE	PT-2	
201	CONTROL ROOM	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	SEALED CONCRETE	ACT-1	

INTERIOR FINISH LEGEND

ACOUSTICAL CEILING TILE	**RESILIENT BASE**
ACT-1: Armstrong; Calla 2824; 9/16IN; White; 24x24, SQ Tegular; Grid: Prelude ML 15/16" Exposed Tee, White	RB-1: Tarkett; Traditional Vinyl 1/8" Wall Base (Type TV); 4"H; Color: 80 Fawn
OPERABLE PARTITIONS	**SOLID SURFACING**
OP-1 Panelfold; Operable Partitions; Moduflex Series; Standard Vinyl Covering - Pathway, Limestone	SS-1: Wilsonart Solid Surface; Designer White D354SL (Sills)
PAINT	**WINDOW BLINDS**
PT-1: Sherwin Williams; SW7042 Shoji White; Eggshell (Main) PT-2: Sherwin Williams; SW7042 Shoji White; Flat (Ceiling) PT-3: Sherwin Williams; SW6174 Andiron; Semi-Gloss (Stair Trim) PT-4: Sherwin Williams; SW7533 Khaki Shade; Semi-Gloss (Trim & Doors)	WB-1: Levelor; Riviera 1" Metal Blinds; Alabaster (NOT USED IN CONTROL TOWER)

GENERAL SHEET NOTES

1. REFERENCE SPECIFICATION SECTION 09 06 00 "SCHEDULE FOR FINISHES" FOR INFORMATION REGARDING COLOR AND FINISH.
2. ALL EXTERIOR AND INTERIOR COLORS SHALL BE SUBMITTED FOR APPROVAL PER DIRECTIONS IN SPECIFICATION 09 06 00. COLOR BOARDS AND PROPOSED SAMPLES SHALL NOT BE SUBMITTED INDIVIDUALLY BUT IN A COMPLETE SET WITH ALL SAMPLES.
3. EXPOSED CONCRETE SLABS SHALL HAVE THE FOLLOWING:

   - INTERIOR SLABS NOT RECEIVING A FINISH SHALL HAVE A SEALER AND A TROWEL FINISH.

   - INTERIOR SLABS WITH VCT OR CARPET SHALL HAVE A TROWEL FINISH. A FILLER SHALL BE ADDED AS NEEDED AT CONCRETE CONTROL JOINTS TO ENSURE THAT JOINTS DO NOT BLEED THROUGH.

   - INTERIOR SLABS WITH CERAMIC TILE SHALL HAVE A STEEL TROWEL AND FINE BROOM FINISH FREE OF CURING COMPOUNDS.
4. WINDOW BLINDS WB-1 SHALL BE INSTALLED ON ALL EXTERIOR WINDOWS, EXCEPTING CONTROL TOWER WINDOWS.

US Army Corps of Engineers ®

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CHECKED BY: M. DEACON	CONTRACT NO.: ?
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SIZE: ANSI D	FILE NAME: ?

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER ROOM FINISH SCHEDULE & FINISH LEGEND

SHEET ID
BLDG 1
IN601

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FIRE ALARM SYSTEM SYMBOLS

F	FIRE ALARM MANUAL DOUBLE ACTION PULL STATION. MOUNTED 42" AFF MEASURED TO THE OPERATING HANDLE.
15	SINGLE CLEAR VISUAL INDICATOR DEVICE MARKED WITH THE WORD "ALERT". WALL MOUNTED AT 7'-6" AFF OR 6" BELOW CEILING, WHICHEVER IS LOWER. THE DEFAULT CANDELA RATING IS 15 CD UNLESS OTHERWISE INDICATED.
WP	FIRE ALARM HORN. MOUNTED 8'-0" AFF. "WP" INDICATES RATED FOR OUTDOOR LOCATIONS.
	PHOTOELECTRIC SMOKE SENSOR.
	FIRE ALARM CONTROL PANEL. MOUNTED 60" AFF TO CENTER OF CONTROLS.
	TAMPER SWITCH.
	FLOW SWITCH.
FTR	FIRE ALARM OR MNS TRANSMITTER.
SPD	SURGE PROTECTIVE DEVICE.
AIM	ADDRESSABLE INPUT MODULE.

GENERAL NOTES

1. ALL FIRE ALARM CONDUIT SHALL BE FACTORY-PAINTED RED AND SHALL BE CONCEALED ABOVE CEILINGS OR AND IN WALLS UNLESS OTHERWISE INDICATED. JUNCTION BOXES, COVERS, COUPLING, ETC. SHALL BE FACTORY-PAINTED OR FIELD-PAINTED RED.

2. SEAL PENETRATIONS THROUGH FLOORS OR FIRE WALLS TO MAINTAIN THE INTEGRITY OF THE FIRE AND ACOUSTIC RATINGS OF THE WALLS AND FLOORS.

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
C	CONDUIT
CU	COPPER
FACP	FIRE ALARM CONTROL PANEL
FEB	FIRE EXTINGUISHER BRACKET
FEC	FIRE EXTINGUISHER CABINET
LED	LIGHT EMITTING DIODE
MFR	MANUFACTURER
MH	MOUNTING HEIGHT
MNS	MASS NOTIFICATION SYSTEM
NEC	NATIONAL ELECTRICAL CODE
NO.	NUMBER
PAF	PAINTED AFTER FABRICATION
PIR	PASSIVE INFRARED
R/W	RACEWAY
SPD	SURGE PROTECTIVE DEVICE
TPS	TANK AND PUMP SYSTEM
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UOI	UNLESS OTHERWISE INDICATED
UON	UNLESS OTHERWISE NOTED
V	VOLT
W, WP	WEATHERPROOF

FIRE ALARM SYSTEM OPERATIONS MATRIX

SYSTEM INPUTS	SYSTEM OUTPUTS: FACP DISPLAY: ALARM INDICATOR AUDIO-VISUAL	FACP DISPLAY: SUPERVISORY INDICATOR AUDIO-VISUAL	FACP DISPLAY: TROUBLE INDICATOR AUDIO-VISUAL	TRANSMIT SIGNAL BY DEVICE: TRANSMIT ALARM SIGNAL TO BASE 911 CENTER BY DEVICE	TRANSMIT SIGNAL BY DEVICE: TRANSMIT SUPERVISORY SIGNAL TO BASE 911 CENTER	TRANSMIT SIGNAL BY DEVICE: TRANSMIT TROUBLE SIGNAL TO BASE 911 CENTER	NOTIFICATION APPLIANCES: BROADCAST ALL AUDIBLE EVACUATION SIGNALS	NOTIFICATION APPLIANCES: ACTIVATE CLEAR FIRE ALARM NOTIFICATION STROBES	AUXILIARY FUNCTIONS
FIRE ALARMS									
MANUAL FIRE ALARM PULL STATIONS	●			●			●	●	
SMOKE DETECTOR	●			●			●	●	
WATER FLOW SWITCH	●			●			●	●	
FIRE PUMP RUNNING	●			●			●	●	
SUPERVISORY SIGNALS									
TPS CONTROL VALVE TAMPER SWITCH		●			●				
TPS WATER TANK LEVEL		●			●				
TPS LOW TEMPERATURE SENSOR		●			●				
TPS HEAT TRACE		●			●				
FIRE PUMP PHASE REVERSAL		●			●				
FIRE PUMP LOSS OF POWER		●			●				
TROUBLE SIGNALS									
FIRE PUMP TROUBLE			●			●			
IDC OPEN			●			●			
IDC SHORT			●			●			
IDC GROUND			●			●			
NAC OPEN			●			●			
NAC SHORT			●			●			
NAC GROUND			●			●			
AC POWER FAILURE			●			●			
LOW BATTERY VOLTAGE			●			●			
REMOVAL OF ALARM OR SUPERVISORY MODULES			●			●			
TEST MODE			●			●			

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

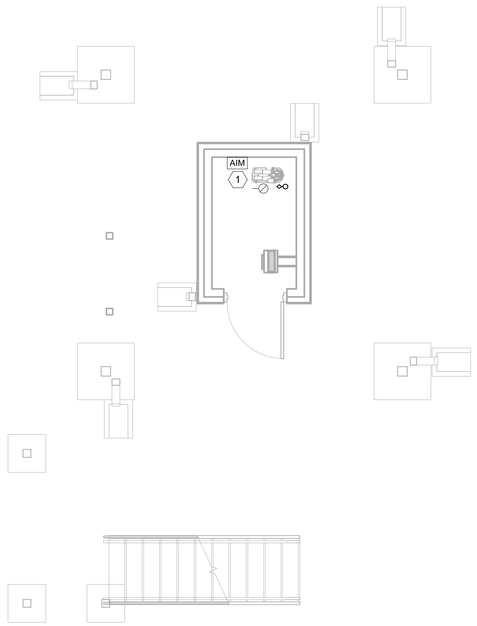
CONTROL TOWER FIRE ALARM LEGEND AND OPERATIONS MATRIX

SHEET ID
BLDG 1
FA001

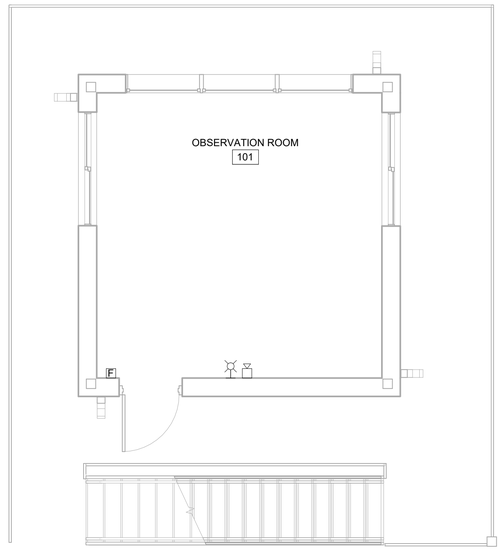
Plot Date: 11/28/2023 3:30:14 PM

File Path: C:\Users\kbenxhit\Documents\FY23_PN96182_MPTR-STDETAILS_ELEC_R21_hunter.t.taylor.rvt

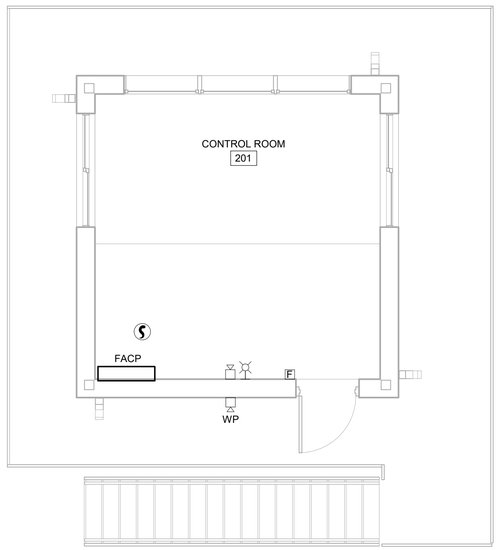
READY TO ADVERTISE (RTA)



1 GROUND LEVEL FIRE ALARM PLAN
1/4" = 1'-0"



2 FIRST FLOOR FIRE ALARM PLAN
1/4" = 1'-0"



3 SECOND FLOOR FIRE ALARM PLAN
1/4" = 1'-0"

GENERAL SHEET NOTES

KEYED NOTES ⟨#⟩

1	PROVIDE QUANTITIES OF ADDRESSABLE INPUT MODULES AS REQUIRED TO MEET THE REQUIREMENTS OF THE FIRE ALARM SYSTEM OPERATIONS MATRIX AND SPECIFICATIONS.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

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AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
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CONTROL TOWER FIRE ALARM AND MNS PLAN

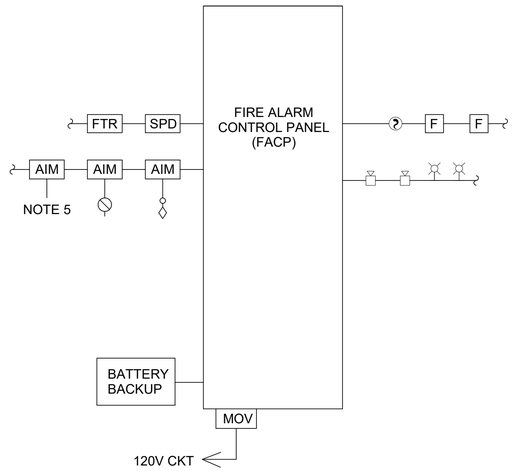
SHEET ID
BLDG 1
FA101

File Path: C:\Users\kfeinxhit\Documents\FY23_PN96182_MPTR-TOWER_ELEC_R21_hunter.l.taylor.rvt

Plot Date: 11/28/2023 4:03:55 PM

READY TO ADVERTISE (RTA)

FIRE ALARM SYSTEM RISER



FIRE ALARM SYSTEM NOTES

1. THE FIRE ALARM SYSTEM SHALL BE A COMPLETE, CLASS B, ADDRESSABLE SYSTEM.

2. THE FIRE ALARM SYSTEM SHALL BE COMPATIBLE WITH AND BE CAPABLE OF COMMUNICATING WITH THE EXISTING BASE WIDE FIRE ALARM NOTIFICATION SYSTEM. EXISTING SYSTEM CONSISTS OF A MONACO D21 FIRE MANAGEMENT SYSTEM AND A HONEYWELL EBI NETWORK BASED REPORTING SYSTEM. THE SYSTEM SHALL COMMUNICATE USING A MONACO SHORT WAVE RADIO TRANSCEIVER.

3. PROVIDE A CABINET-MOUNTED METAL OXIDE VARISTOR (MOV) SURGE PROTECTION DEVICE (SPD) AT THE FACP POWER INPUT. THE DEVICE SHALL SUPPLEMENT THE SPD INTEGRAL TO THE FACP. THE DEVICE SHALL BE UL 1449 LISTED (3RD EDITION) AND SHALL SATISFY THE REQUIREMENTS OF IEEE C62.41.

4. BATTERY BACK-UP SHALL BE SIZED IN ACCORDANCE WITH UFC 3-600-01.

5. REFER TO FIRE ALARM MATRIX, PLANS AND SPECIFICATIONS FOR QUANTITY AND LOCATION OF INITIATION AND NOTIFICATION DEVICES. PROVIDE ADDRESSABLE INPUT MODULES AND CONNECTIONS TO ALL DEVICES (E.G., TAMPER SWITCHES) EVEN IF THE DEVICE IS PROVIDED UNDER A DIFFERENT SECTION. PROVIDE REQUIRED PROGRAMMING TO INCORPORATE SIGNALS FOR ALL DEVICES EVEN IF THE DEVICE IS FURNISHED UNDER A DIFFERENT SECTION.

6. FIRE ALARM SHOP DRAWINGS MUST BE STAMPED BY THE QFPE. THE QFPE MUST ALSO CERTIFY THE SYSTEM INSTALLATION.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

CONTROL TOWER FIRE ALARM DIAGRAM

SHEET ID
BLDG 1
FA601

Plot Date: 11/28/2023 3:30:15 PM

File Path: C:\Users\kfeinxhit\Documents\FY23_PN98182_MPTR-STIDETAILS_ELEC_R21_hunter.t.taylor.rvt

READY TO ADVERTISE (RTA)

FIRE PROTECTION SYMBOL LEGEND

SYMBOL	ITEM
	ALARM CHECK VALVE
	WALL MTD FIRE DEPT CONN
	BALL VALVE
	GATE VALVE
	GLOBE VALVE
	CHECK VALVE
	REDUCER
TC	INSPECTOR'S TEST CONNECTION
	TEE, OUTLET TURNED UP
	TEE, OUTLET TURNED DOWN
	ELBOW, 90°, OUTLET TURNED UP
	ELBOW, 90° OUTLET TURNED DOWN
	SPRINKLER RISER
	TEST HEADER
FPCP	FIRE PUMP CONTROL PANEL
JPCP	JOCKEY PUMP CONTROL PANEL
	SPRINKLER, HORIZONTAL SIDEWALL
	SPRINKLER, HORIZONTAL SIDEWALL WITH GUARD
	SPRINKLER, PENDANT ON DROP
	SPRINKLER, UPRIGHT ON SPRIG
	SPRINKLER, UPRIGHT ON SPRIG WITH GUARD
	SPRINKLER, UPRIGHT
	UNION

FIRE SUPPRESSION SYSTEM GENERAL NOTES

1. PROVIDE A COMPLETE AUTOMATIC WET PIPE SPRINKLER SYSTEM THROUGHOUT THE CONTROL TOWER BUILDING. THE SYSTEM SHALL BE DESIGNED IN ACCORDANCE WITH UFC 3-600-01 AND THE ADDITIONAL CRITERIA REFERENCED THEREIN. ALL OTHER BUILDINGS IN THIS PROJECT SHALL NOT BE PROVIDED WITH SPRINKLER PROTECTION.
2. ANY SUPPRESSION SYSTEM PIPING, SYSTEM APPURTENANCES, AND FIRE SUPPRESSION EQUIPMENT SHOWN IS GENERIC. IT IS SHOWN ONLY FOR DESIGN INTENT, TO VERIFY CLEARANCES, AND DEMONSTRATE GENERAL PIPE ROUTING. ALL ASPECTS OF THE DESIGN AND INSTALLATION SHALL BE PROVIDED BY THE CONTRACTOR'S QUALIFIED FIRE PROTECTION ENGINEER AND THE FIRE SPRINKLER CONTRACTOR.
3. THE FIRE SPRINKLER CONTRACTOR SHALL PROVIDE A COMPLETE BUILDING FIRE SUPPRESSION SYSTEM. THE CONTRACTOR'S FIRE PROTECTION ENGINEER AND FIRE SPRINKLER CONTRACTOR SHALL PROVIDE ALL ASSOCIATED SUPPRESSION SYSTEM HYDRAULIC CALCULATIONS AND SHOP DRAWINGS. HYDRAULIC CALCULATIONS, SHOP DRAWINGS, AND SYSTEM INSTALLATION SHALL BE STAMPED BY THE QFPE.
4. SPRINKLER DISCHARGE DESIGN CRITERIA SHALL BE IN ACCORDANCE WITH NFPA 13D.
5. ACTIVATION OF THE FLOW SWITCH SHALL RESULT IN ACTIVATION OF THE TPS LOCAL ALARM AND SEND A SIGNAL TO THE FIRE ALARM.
6. PROVIDE AUXILLIARY DRAINS FOR ALL TRAPPED PIPING. AUXILLIARY DRAIN LINES SHALL BE PROVIDED WITH SIGNS AS REQUIRED BY NFPA 13D, AND SHALL BE PIPED TO THE BUILDING EXTERIOR OR TO AN APPROPRIATELY SIZED BUILDING DRAIN.
7. SPRINKLERS IN THE CONTROL TOWER SHALL BE RECESSED, CHROME PENDENT TYPE HEADS WITH ESCUTCHEONS THAT MATCH THE CEILING OR WALL COLOR AS CLOSELY AS POSSIBLE.
8. SEISMIC DESIGN CATEGORY FOR THIS FACILITY IS ASSUMED TO BE B, PENDING RESULTS OF GEOTECHNICAL REPORT.
9. SPRINKLER SYSTEM SHALL BE DESIGNED IN ACCORDANCE WITH NFPA 13D. SPRINKLERS SHALL BE PROVIDED THROUGHOUT, EXCEPT WHERE PERMITTED BY NFPA 13D TO BE OMITTED.
10. SPRINKLER PIPING EXPOSED TO THE ELEMENTS SHALL BE PROVIDED WITH LISTED HEAT TRACING.

TANK AND PUMP SCHEDULE				
MARK	CAPACITY (GAL)	FLOW RATE (GPM)	HEAD (PSI)	V/HZ/PH
TPS	250	30	40	240/60/1

NOTES:
1. PROVIDE FEMA APPROVED TANK AND PUMP SYSTEM, IAW UFC 3-600-01 CHANGE 5, 4-40.2

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
L WRIGHT	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
L WRIGHT	W912HN-24-B-30002
CHECKED BY:	CONTRACT NO.:
S. MARKO	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-85-01
SIZE:	FILE NAME:
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER FIRE PROTECTION LEGEND AND GENERAL NOTES

SHEET ID
BLDG 1
FX001

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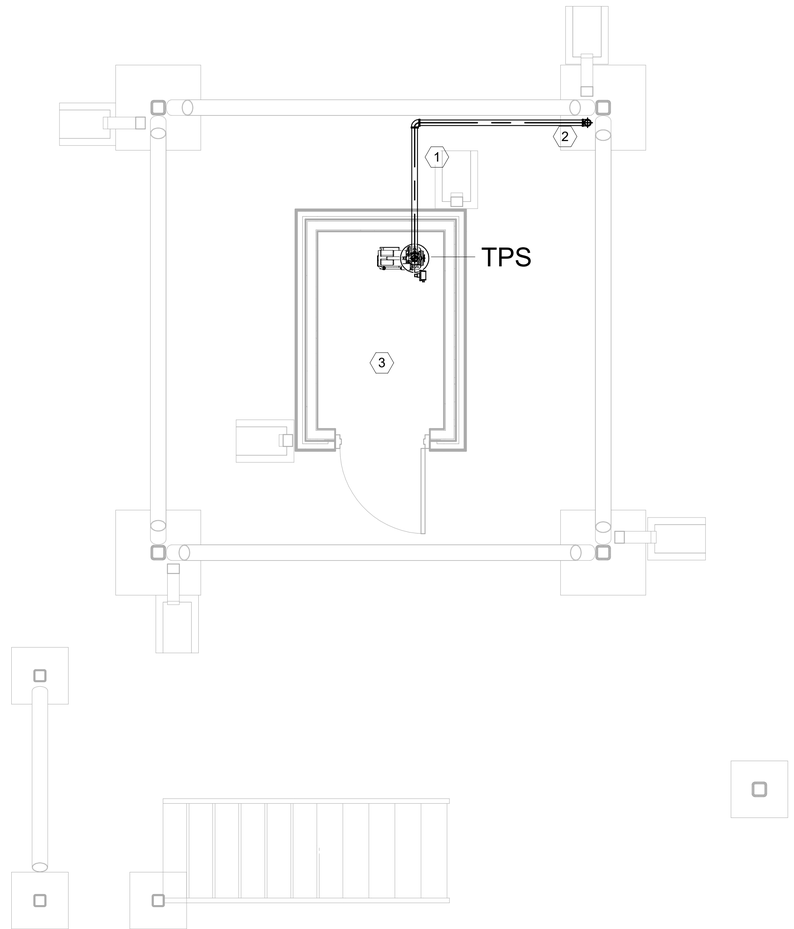

1 GROUND LEVEL PROTECTION PLAN

3/8" = 1'-0"

4 2 0 4

GENERAL SHEET NOTES

1. THE PLANS AND TYPICAL SPRINKLER PLACEMENTS ON THIS DRAWING ARE CONCEPTUAL IN NATURE AND ARE NOT INTENDED FOR CONSTRUCTION. THE CONTRACTOR'S QUALIFIED FIRE PROTECTION ENGINEER (QFPE) SHALL ULTIMATELY BE RESPONSIBLE FOR PERFORMING HYDRAULIC CALCULATIONS AND DEVELOPING SHOP DRAWINGS BASED ON SPECIFICATIONS, APPLICABLE CODES & CRITERIA, AND DATA OBTAINED FROM THEIR OWN TESTS.

KEYNOTES

1. PROVIDE LISTED HEAT TRACING ON ALL EXPOSED PIPING. HEAT TRACE IS ANTICIPATED TO BE AT 3 W PER LINEAR FOOT. QFPE SHALL CALCULATE AND PROVIDE HEAT TRACING BASED UPON THEIR CALCULATIONS.
2. SECURE PIPING TO COLUMN. PROVIDE SUPPORTS IN ACCORDANCE WITH THE LISTING OF THE PIPING. PIPING SHALL NOT BE SECURED TO BRACING.
3. PROVIDE SPRINKLER PROTECTION WITHIN PUMP HOUSE.

KEY PLAN

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
I. WRIGHT	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
I. WRIGHT	W912HN-24-B-30002
CHECKED BY:	CONTRACT NO.:
S. MARKO	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-85-01
SIZE:	FILE NAME:
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER FIRE PROTECTION GROUND FLOOR PLAN

SHEET ID
BLDG 1
FX101

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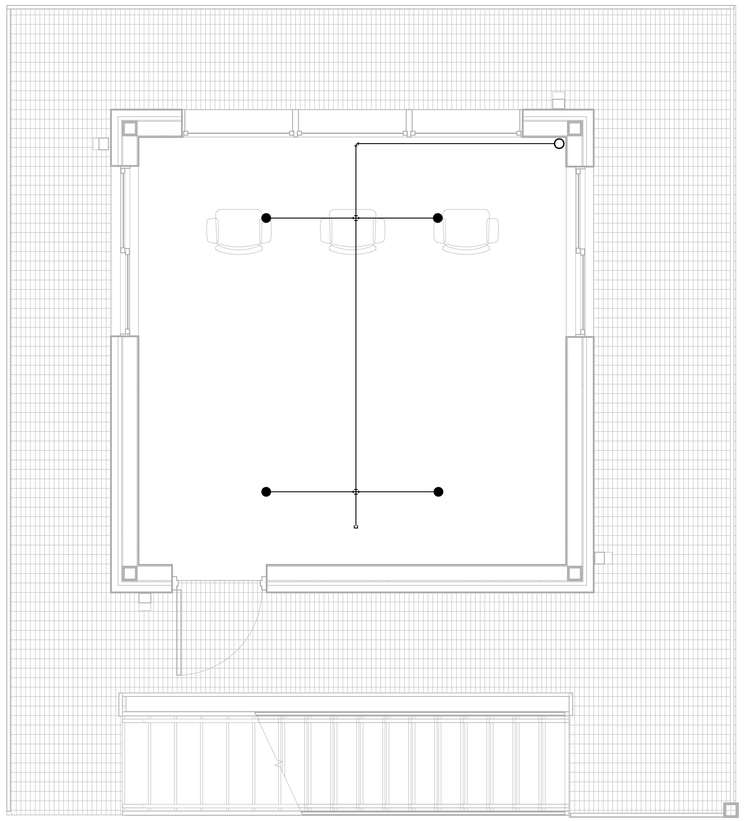
READY TO ADVERTISE (RTA)



1 FIRST FLOOR SPRINKLER PLAN
3/8" = 1'-0"

4 2 0 4

GENERAL SHEET NOTES

1. THE PLANS AND TYPICAL SPRINKLER PLACEMENTS ON THIS DRAWING ARE CONCEPTUAL IN NATURE AND ARE NOT INTENDED FOR CONSTRUCTION. THE CONTRACTOR'S QUALIFIED FIRE PROTECTION ENGINEER (QFPE) SHALL ULTIMATELY BE RESPONSIBLE FOR PERFORMING HYDRAULIC CALCULATIONS AND DEVELOPING SHOP DRAWINGS BASED ON SPECIFICATIONS, APPLICABLE CODES & CRITERIA, AND DATA OBTAINED FROM THEIR OWN TESTS.

KEY PLAN

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: L WRIGHT	ISSUE DATE: NOVEMBER 2023
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SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

CONTROL TOWER FIRE PROTECTION 1ST FLOOR PLAN

SHEET ID
BLDG 1
FX102

READY TO ADVERTISE (RTA)

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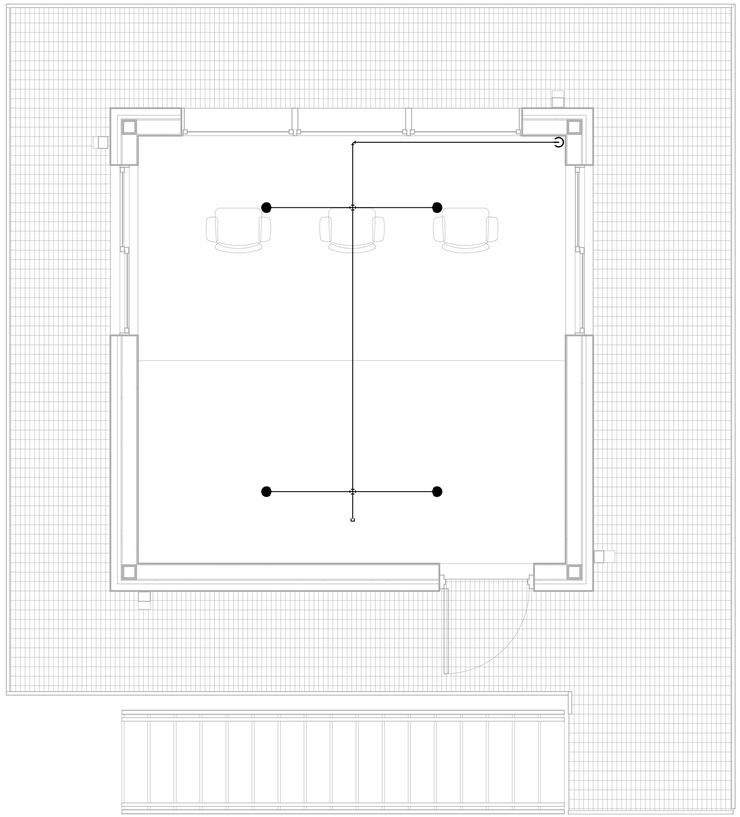

1 SECOND FLOOR SPRINKLER PLAN
3/8" = 1'-0"

4 2 0 4

GENERAL SHEET NOTES

1. THE PLANS AND TYPICAL SPRINKLER PLACEMENTS ON THIS DRAWING ARE CONCEPTUAL IN NATURE AND ARE NOT INTENDED FOR CONSTRUCTION. THE CONTRACTOR'S QUALIFIED FIRE PROTECTION ENGINEER (QFPE) SHALL ULTIMATELY BE RESPONSIBLE FOR PERFORMING HYDRAULIC CALCULATIONS AND DEVELOPING SHOP DRAWINGS BASED ON SPECIFICATIONS, APPLICABLE CODES & CRITERIA, AND DATA OBTAINED FROM THEIR OWN TESTS.

KEY PLAN

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: L WRIGHT
DRAWN BY: L WRIGHT
CHECKED BY: S. MARKO
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-30002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER FIRE PROTECTION 2ND FLOOR PLAN

SHEET ID
BLDG 1
FX103

Plot Date: 11/28/2023 8:48:54 AM
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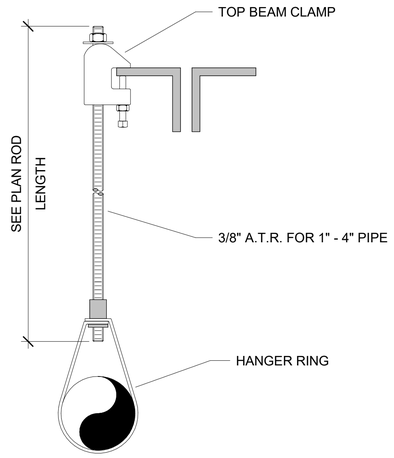
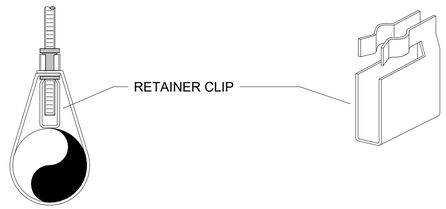


1 PIPE HANGER DETAIL

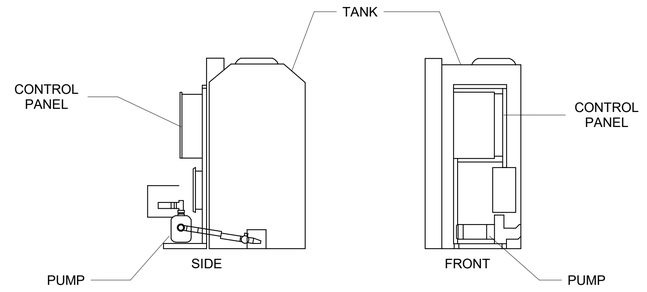
NOT TO SCALE



RETAINER CLIP IS DESIGNED TO RESTRICT THE UPWARD MOVEMENT OF PIPE THAT COMMONLY OCCURS DURING SPRINKLER HEAD ACTIVATION OR SEISMIC ACTIVITY.

2 END OF LINE RESTRAINT

NOT TO SCALE



3 TPS Detail

NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: L.WRIGHT	ISSUE DATE: NOVEMBER 2023
DRAWN BY: L.WRIGHT	SOLICITATION NO.: W912HN-24-B-30002
CHECKED BY: S. MARKO	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER FIRE PROTECTIONS DETAILS

SHEET ID
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FX501

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PIPING SYMBOLS

- GSS — GROUND SOURCE WATER SUPPLY
- GSR — GROUND SOURCE WATER RETURN
- MU — MAKE-UP WATER
- HG — REFRIGERANT HOT GAS
- RS — REFRIGERANT SUCTION
- RL — REFRIGERANT LIQUID
- PA — PIPE ANCHOR
- PG — PIPE GUIDE
- EXPANSION JOINT
- VENTURI
- GATE VALVE
- GLOBE VALVE
- HOSE VALVE WITH CAP
- BUTTERFLY VALVE
- CHECK VALVE
- BALANCING VALVE
- CALIBRATED BALANCING VALVE
- BALL VALVE
- PLUG VALVE
- S — SOLENOID VALVE
- SAFETY OR PRESSURE RELIEF, ANGLE VALVE
- SAFETY OR PRESSURE RELIEF, STRAIGHT THRU VALVE
- PRESSURE REDUCING VALVE (PRV)
- AUTOMATIC CONTROL VALVE, 2 WAY
- AUTOMATIC CONTROL VALVE, 3 WAY
- ELECTRICALLY OPERATED VALVE
- BLIND FLANGE
- LATERAL Y
- CAP
- ELBOW, 90°
- ELBOW, 90° TURNED UP
- ELBOW, 90° TURNED DOWN
- ELBOW, 45°
- TEE
- TEE, OUTLET TURNED UP
- TEE, OUTLET TURNED DOWN
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER (STRAIGHT INVERT)
- UNION
- FLEXIBLE PIPE CONNECTION
- PRESSURE GAGE
- TEMPERATURE GAGE
- THERMOMETER
- PT — PRESSURE/TEMPERATURE TEST PORT
- SANITARY DRAIN
- SD — STORM DRAIN
- VENT
- AW — ACID WASTE DRAIN
- AV — ACID VENT
- D — DRAINLINE
- DOMESTIC COLD WATER
- DOMESTIC HOT WATER
- DOMESTIC HOT WATER CIRCULATING
- G — GAS
- GV — GAS VENT
- A — COMPRESSED AIR
- AIR — MEDICAL AIR
- OXY — MEDICAL OXYGEN
- VAC — MEDICAL VACUUM
- NIT — NITROGEN
- NOX — NITROUS OXIDE
- FP — FIRE PROTECTION WATER SUPPLY
- FIRE DEPARTMENT CONNECTION

* PROVIDE SHUT OFF COCK WITH SIPHON OR PULSATION DAMPENER.

PIPING SYMBOLS

- WFD — WATERFLOW DETECTOR
- OS&Y VALVE
- PLUG
- FD — FLOOR DRAIN W/TRAP
- WCO — WALL CLEAN OUT (FCO, FLOOR CLEAN OUT)
- WHA — WATER HAMMER ARRESTER
- HB — HOSE BIBB
- WH — WALL HYDRANT
- DOUBLE CHECK VALVE BACKFLOW PREVENTER
- REDUCED PRESSURE BACKFLOW PREVENTER
- Y-TYPE STRAINER
- Y-TYPE STRAINER WITH HOSE DRAIN VALVE
- UPRIGHT FIRE SPRINKLER HEAD
- PENDANT FIRE SPRINKLER HEAD
- SIDEWALL FIRE SPRINKLER HEAD
- VACUUM GAGE

*PROVIDE SHUT OFF COCK WITH SIPHON OR PULSATION DAMPENER.

SINGLE LINE DUCTWORK SYMBOLS

- 12x6 — RECTANGULAR DUCT (FIRST FIGURE IS FOR SIDE SHOWN, SECOND FIGURE IS FOR SIDE NOT SHOWN)
- 36"Ø — ROUND DUCT
- 36x18 — FLAT OVAL DUCT (FIRST FIGURE IS FOR SIDE SHOWN, SECOND FIGURE IS FOR SIDE NOT SHOWN)
- FLEXIBLE ROUND DUCT
- FLEXIBLE DUCT CONNECTION
- VD — MANUAL OPPOSED BLADE VOLUME DAMPER
- MOTORIZED DAMPER
- BDD — BACK DRAFT DAMPER
- FD — FIRE DAMPER, 1 1/2 HOUR FIRE RATED
- 3FD — FIRE DAMPER, 3 HOUR FIRE RATED
- FSD — COMBINATION FIRE/SMOKE DAMPER
- SD — SMOKE DAMPER
- DUCT TRANSITION
- R — INCLINED RISE W/RESPECT TO AIR FLOW, RECTANGULAR
- D — INCLINED DROP W/RESPECT TO AIR FLOW, RECTANGULAR
- R — INCLINED RISE W/RESPECT TO AIR FLOW, ROUND OR FLAT OVAL
- D — INCLINED DROP W/RESPECT TO AIR FLOW, ROUND OR FLAT OVAL
- 90° ELBOW, RECTANGULAR
- 90° ELBOW, ROUND OR FLAT OVAL (SMOOTH OR 5-PIECE ELBOWS)
- 45° ELBOW, RECTANGULAR
- 45° ELBOW, ROUND OR FLAT OVAL (SMOOTH OR 3-PIECE ELBOWS)
- DF — DIVIDED FLOW FITTING, RECTANGULAR
- RECTANGULAR TAP-IN BRANCH OR ROUND OR FLAT OVAL CONICAL TEE
- INCLINED CONICAL TAKE-OFF, ROUND OR FLAT OVAL
- "Y" FITTING, ROUND OR FLAT OVAL
- 90° ELBOW TURNED UP, RECTANGULAR
- 90° ELBOW TURNED DOWN, RECTANGULAR
- 90° ELBOW TURNED UP, ROUND; FLAT OVAL SIMILAR
- 90° ELBOW TURNED DOWN, ROUND; FLAT OVAL SIMILAR
- CEILING DIFFUSER (ARROWS INDICATE THROW DIRECTIONS)
- CEILING REGISTER OR GRILLE, EXHAUST OR RETURN
- CEILING REGISTER OR GRILLE, SUPPLY
- STATIC PRESSURE SENSOR
- SPS — END OF DUCT RUN

MISC SYMBOLS

- 0000 — ROOM NUMBER
- ROUND DUCT
- FLAT OVAL DUCT
- POINT OF CONNECTION BETWEEN NEW AND EXISTING WORK
- POINT BETWEEN EXISTING WORK TO REMAIN AND EXISTING WORK TO BE REMOVED
- EXISTING WORK TO BE REMOVED
- EXISTING WORK TO REMAIN
- WATER SENSOR (LOCATED BELOW ACCESS FLOOR)
- ES — HVAC SYSTEM EMERG SHUT-OFF SWITCH
- SD — SMOKE DETECTOR
- INTERVAL TIMER
- H — HUMIDISTAT
- T — THERMOSTAT / TEMPERATURE SENSOR
- N — NIGHT THERMOSTAT
- CO — CARBON MONOXIDE SENSOR
- WALL SWITCH
- UC — DOOR UNDERCUT, SEE DOOR SCHEDULES FOR SIZE

DOUBLE LINE DUCTWORK SYMBOLS

- 12x6 — RECTANGULAR DUCT (FIRST FIGURE IS FOR SIDE SHOWN, SECOND FIGURE IS FOR SIDE NOT SHOWN)
- 12"Ø — ROUND DUCT
- 12x6 — FLAT OVAL DUCT (FIRST FIGURE IS FOR SIDE SHOWN, SECOND FIGURE IS FOR SIDE NOT SHOWN)
- FLEXIBLE ROUND DUCT
- FLEXIBLE DUCT CONNECTION
- VD — MANUAL OPPOSED BLADE VOLUME DAMPER
- MOTORIZED DAMPER
- BDD — BACK DRAFT DAMPER
- FD — FIRE DAMPER, 1 1/2 HOUR FIRE RATED
- 3FD — FIRE DAMPER, 3 HOUR FIRE RATED
- FSD — COMBINATION FIRE/SMOKE DAMPER
- SD — SMOKE DAMPER
- DUCT TRANSITION, ROUND OR FLAT OVAL TO RECTANGULAR
- DUCT TRANSITION, RECTANGULAR TO ROUND OR FLAT OVAL
- DUCT TRANSITION, RECTANGULAR, ROUND, OR FLAT OVAL
- R — INCLINED RISE W/RESPECT TO AIR FLOW, RECTANGULAR
- D — INCLINED DROP W/RESPECT TO AIR FLOW, RECTANGULAR
- R — INCLINED RISE W/RESPECT TO AIR FLOW, ROUND OR FLAT OVAL
- D — INCLINED DROP W/RESPECT TO AIR FLOW, ROUND OR FLAT OVAL
- 90° ELBOW, RECTANGULAR WITH TURNING VANES
- 45° ELBOW, RECTANGULAR WITH TURNING VANES

DOUBLE LINE DUCTWORK SYMBOLS

- 90° ELBOW, ROUND OR FLAT OVAL (SMOOTH OR 5 PIECE ELBOWS)
- MITERED 90° ELBOW, ROUND OR FLAT OVAL
- 12X6(L) — RECTANGULAR DUCT WITH 1" INTERNAL LINER DUCT SIZE IS THE CLEAR INSIDE DIMENSION
- 45° ELBOW, ROUND OR FLAT OVAL (SMOOTH OR 3 PIECE ELBOWS)
- VD — DIVIDED FLOW FITTING
- TAP-IN BRANCH, RECTANGULAR
- BRANCH DUCT, CONICAL LATERAL FITTING, ROUND OR FLAT OVAL
- BRANCH DUCT, CONICAL TEE FITTING, ROUND OR FLAT OVAL
- BRANCH DUCT, "Y" FITTING, ROUND OR FLAT OVAL
- SUPPLY DUCT SECTION, RECTANGULAR
- EXHAUST OR RETURN DUCT SECTION, RECTANGULAR
- 90° ELBOW TURNED UP, RECTANGULAR
- 90° ELBOW TURNED DOWN, RECTANGULAR
- 90° ELBOW TURNED UP, ROUND; FLAT OVAL SIMILAR
- 90° ELBOW TURNED DOWN, ROUND; FLAT OVAL SIMILAR
- CEILING DIFFUSER (ARROWS INDICATE THROW DIRECTIONS)
- CEILING DIFFUSER (ARROWS INDICATE THROW DIRECTIONS)
- CEILING REGISTER OR GRILLE (RETURN OR EXHAUST)
- CEILING REGISTER OR GRILLE (SUPPLY)
- REGISTER OR GRILLE
- CEILING DIFFUSER WITH FLEXIBLE DUCT CONNECTION (ARROWS INDICATE THROW DIRECTION)
- S-000 — LIGHT TROFFER WITH FLEXIBLE DUCT CONNECTION. "S" INDICATES SUPPLY, NUMBER INDICATES CFM
- CEILING LINEAR SLOT OR INTEGRATED CEILING DIFFUSER (CLSD) WITH FLEXIBLE DUCT CONNECTION (ARROWS INDICATE THROW DIRECTION)
- SPS — STATIC PRESSURE SENSOR
- HUMIDIFIER
- SB — SECURITY BAR
- 24x24 DW — DOUBLE WALL DUCTWORK (2" INTERNAL INSULATION WITH PERFORATED LINER) DUCT DIMENSIONS ARE OUTSIDE SHEETMETAL DIMENSIONS

GENERAL NOTES

1. ALL EQUIPMENT, DUCTWORK, AND PIPING SHOWN ON DRAWINGS ARE DIAGRAMMATIC. CONTRACTOR SHALL VERIFY EXACT SIZE AND LOCATION IN FIELD.
2. MECHANICAL LAYOUTS ARE SCHEMATIC. PROVIDE ANY ADDITIONAL DROPS, RISES, OR OFFSETS REQUIRED FOR A COMPLETE INSTALLATION. COORDINATE EXACT ROUTING OF WORK WITH ALL OTHER TRADES AND OBSTRUCTIONS. COORDINATE EXACT LOCATIONS OF CEILING MOUNTED WORK WITH LIGHTS, CEILING GRID, AND OTHER OBSTRUCTIONS.
3. ALL WORK INDICATED IS NEW UNLESS INDICATED AS EXISTING.
4. SOME SYMBOLS INDICATED ON THIS LEGEND SHEET MAY NOT APPEAR ON THE DRAWINGS.
5. DO NOT LOCATE MECHANICAL WORK IN ELECTRICAL OR COMMUNICATION ROOMS, EXCEPT FOR RUNOUTS SPECIFICALLY SERVING THE RESPECTIVE ROOMS.
6. DRAWING REFLECTED DIMENSIONS OF THE DESIGN MFG. EQUIPMENT ALLOWABLE ALTERNATES, WHILE EQUAL IN CAPACITY WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MEET THE SPACE REQUIREMENT AND PROVIDE EQUALITY WITH THE DESIGN MFG. EQUIPMENT.
7. THE MECHANICAL SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS, SPECIFICATIONS, AND THE INTERNATIONAL MECHANICAL CODE. MANUFACTURERS RECOMMENDATIONS SHALL BE CONSIDERED MANDATORY

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
C.MELENDEZ NARVAEZ	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
C.MELENDEZ NARVAEZ	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
S.MARKO	-
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
SIZE:	FILE NAME:
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

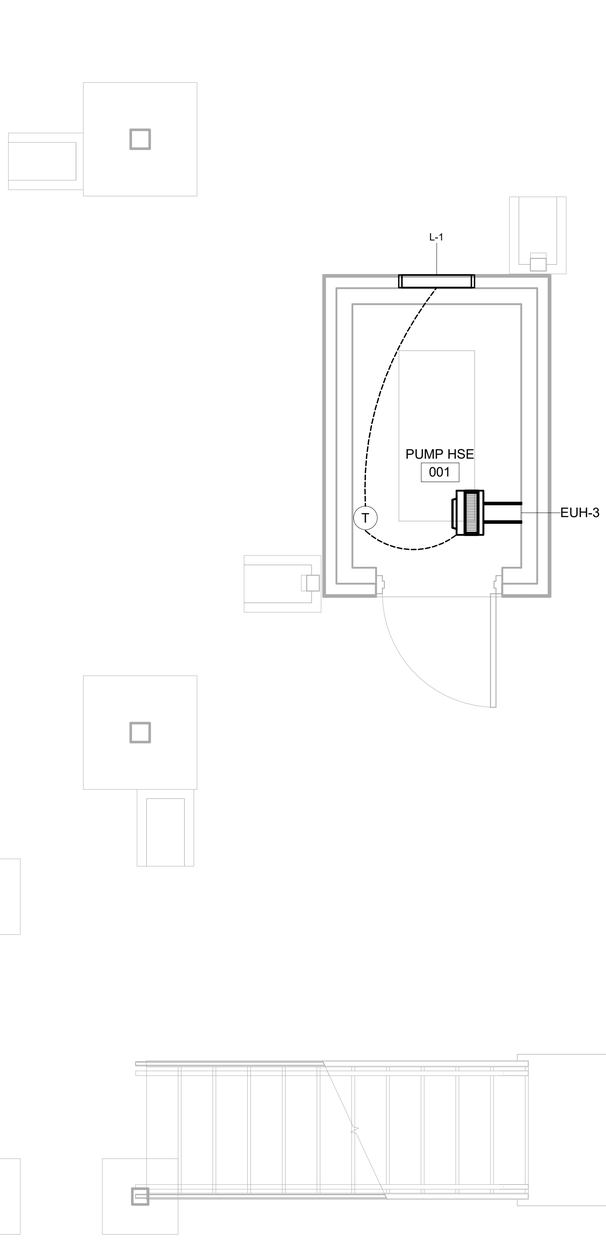
CONTROL TOWER HVAC LEGEND

SHEET ID
BLDG 1
M-001

READY TO ADVERTISE (RTA)

File Path: C:\Users\k6endom9\Documents\FY23_PN96182_MPTR-TOWER_HVAC_R21_k6endom9.rvt

Plot Date: 11/28/2023 8:06:17 AM



1 GROUND LEVEL HVAC PLAN
1/2" = 1'-0"

2 1 0 2 4

GENERAL SHEET NOTES

1. ELECTRIC UNIT HEATER SHALL BE WALL MOUNTED. EUH-3 SHALL BE INSTALLED 7' 2" A.F.F. REFER TO SCHEDULE FOR SIZE AND CAPACITY.

2. INSTALL EUH-3 CLOSE TO THE WALL AND OUT OF THE PATH OF TRAVEL.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ
DRAWN BY: C.MELENDEZ NARVAEZ
CHECKED BY: S.MARKO
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

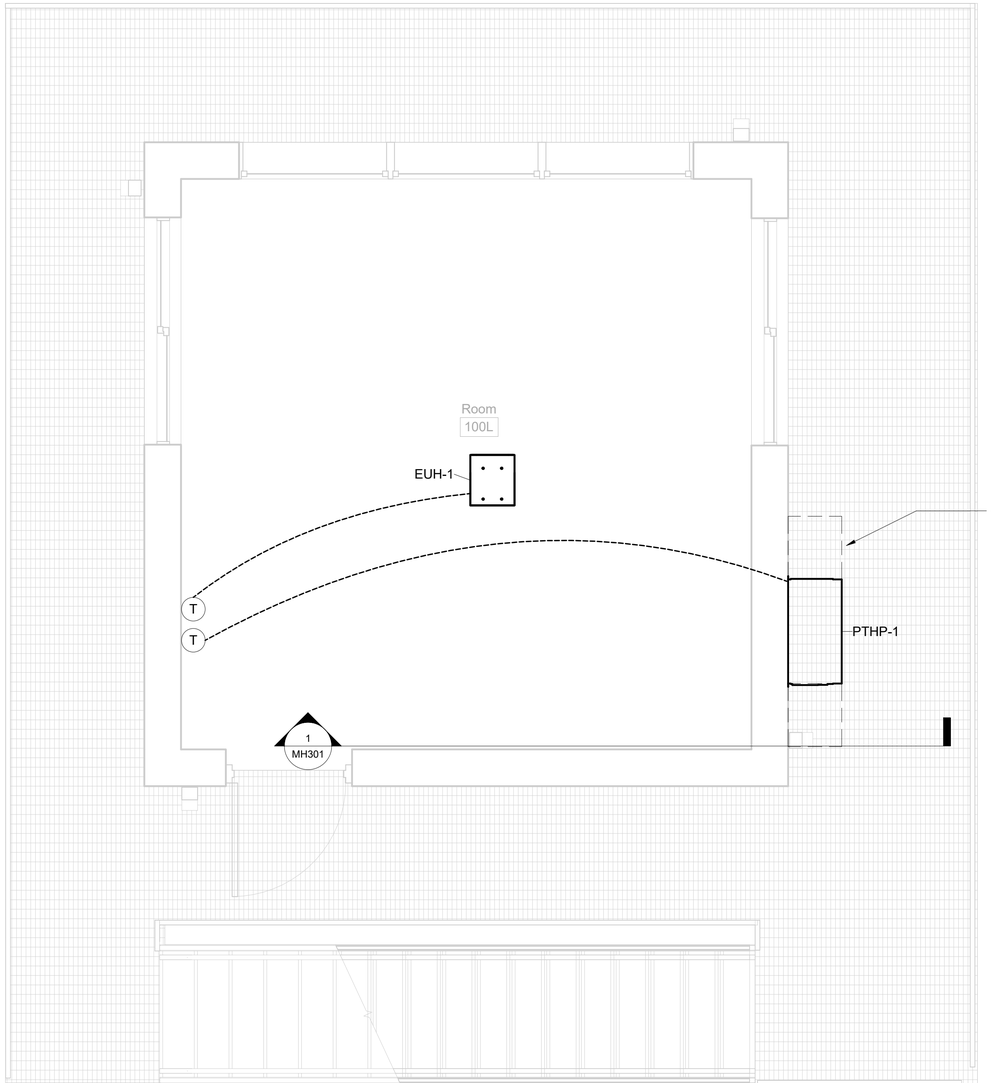
CONTROL TOWER HVAC GROUND FLOOR PLAN

SHEET ID
BLDG 1
MH101

Plot Date: 11/28/2023 8:06:20 AM

File Path: C:\Users\k6endcm9\Documents\FY23_PN96182_MPTR-TOWER_HVAC_R21_k6endcm9.rvt

READY TO ADVERTISE (RTA)



1 FIRST FLOOR HVAC PLAN
1/2" = 1'-0"

GENERAL SHEET NOTES

1. PROVIDE CONDENSATE PIPING FOR HEAT PUMP ROUTED TO OUTSIDE OF BUILDING, DOWN WALL, THROUGH FLOOR SLAB, AND DOWN COLUMN, TERMINATE 12" ABOVE A SPLASH BLOCK. DO NOT DISCHARGE CONDENSATE OVER WALKWAYS OR NEAR TPS LOCATION.

2. COORDINATE PACKAGED TERMINAL HEAT PUMP INSTALLATION WITH ARCHITECTURAL OPENING.

3. PTHP-1 SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.

4. ELECTRIC UNIT HEATER SUPPORTED FROM STRUCTURE ABOVE. REFER TO DETAIL 1/MH501. REFER TO SCHEDULE FOR SIZE AND CAPACITY.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ
DRAWN BY: C.MELENDEZ NARVAEZ
CHECKED BY: S.MARKO
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

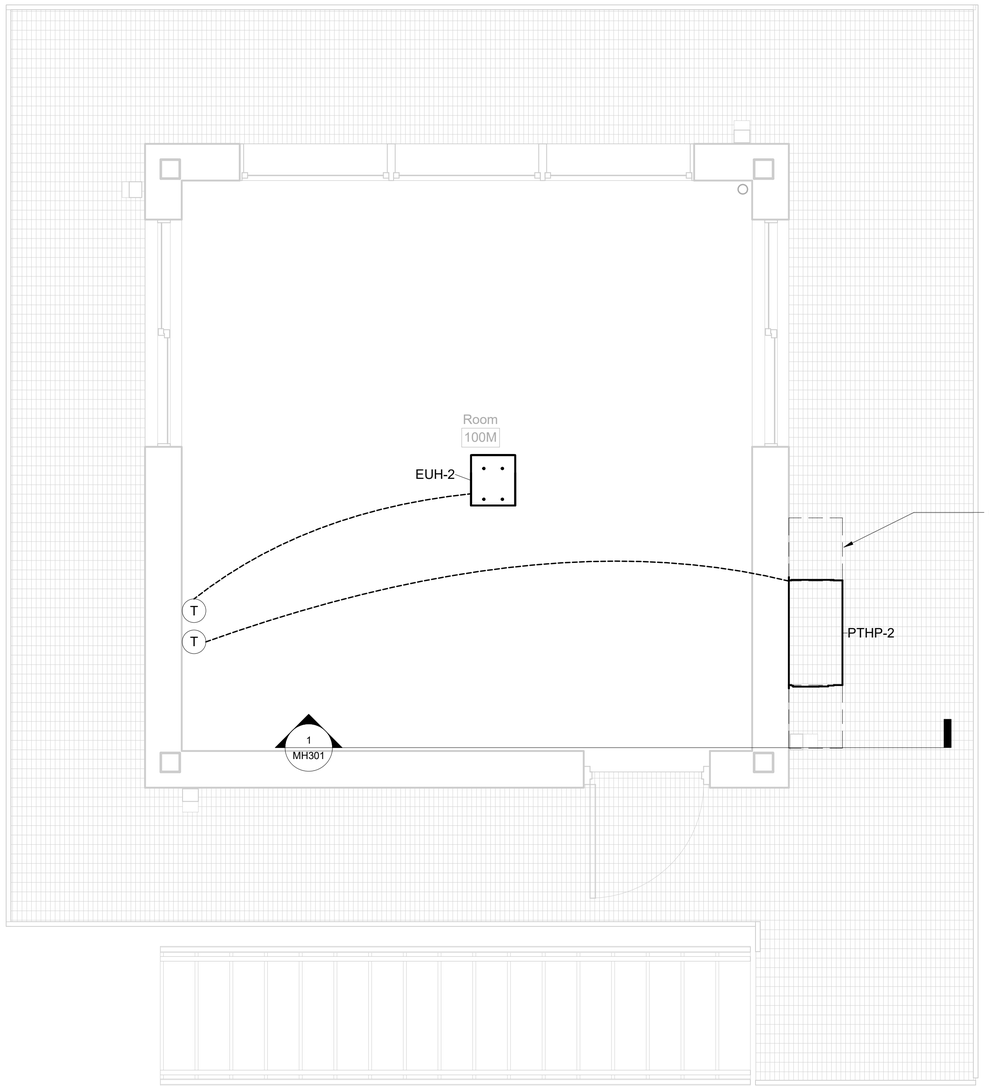
FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER HVAC FIRST FLOOR PLAN

SHEET ID
BLDG 1
MH102

Plot Date: 11/28/2023 8:06:23 AM
File Path: C:\Users\k6endcm9\Documents\FY23_PN96182_MPTR-TOWER_HVAC_R21_k6endcm9.rvt

READY TO ADVERTISE (RTA)



1 SECOND FLOOR HVAC PLAN
1/2" = 1'-0"

2 1 0 2 4

GENERAL SHEET NOTES

1. PROVIDE CONDENSATE PIPING FOR HEAT PUMP ROUTED TO OUTSIDE OF BUILDING, DOWN WALL, THROUGH FLOOR SLAB, AND DOWN COLUMN, TERMINATE 6" ABOVE A SPLASH BLOCK. DO NOT DISCHARGE CONDENSATE OVER WALKWAYS OR NEAR TPS LOCATION. CONDENSATE PIPE SHALL HAVE PROTECTIVE ALUMINUM JACKET AND INSULATION.

2. COORDINATE PACKAGED TERMINAL HEAT PUMP INSTALLATION WITH ARCHITECTURAL OPENING.

3. PTHP-2 SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.

4. ELECTRIC UNIT HEATER SUPPORTED FROM STRUCTURE ABOVE. REFER TO DETAIL 1/MH501. REFER TO SCHEDULE FOR SIZE AND CAPACITY.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ
DRAWN BY: C.MELENDEZ NARVAEZ
CHECKED BY: S. MARKO
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

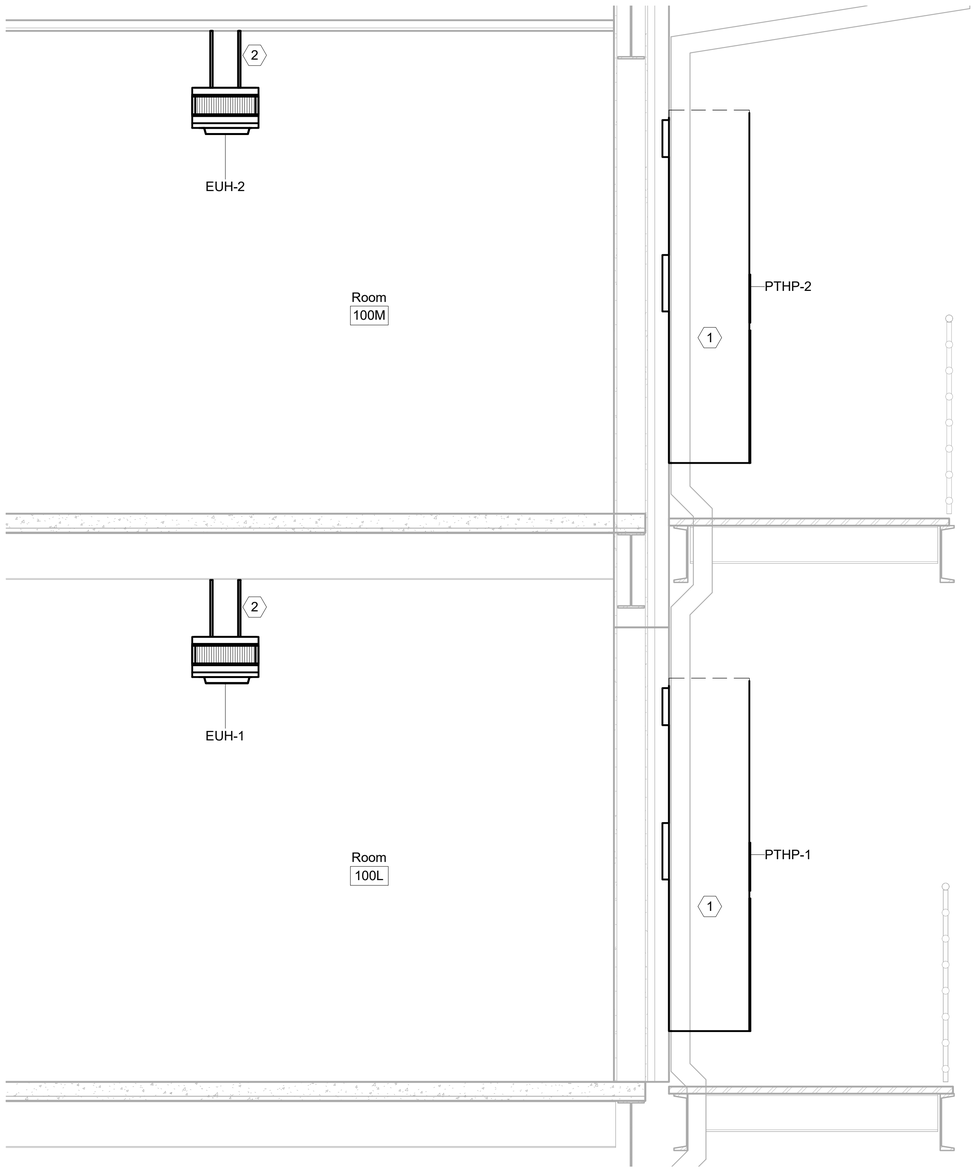
CONTROL TOWER HVAC SECOND FLOOR PLAN

SHEET ID
BLDG 1
MH103

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 8:06:25 AM

File Path: C:\Users\kfendom9\Documents\FY23_PN96182_MPTR-TOWER_HVAC_R21_kfendom9.rvt



KEYED NOTES

1. INSTALL UNIT ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.
2. ELECTRIC UNIT HEATER SUPPORTED FROM STRUCTURE ABOVE. REFER TO DETAIL 1/MH501. REFER TO SCHEDULE FOR SIZE AND CAPACITY.

1 EXTERIOR WALL MOUNTED PTHP

3/4" = 1'-0"

2 1 0 2

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ	ISSUE DATE: NOVEMBER 2023
DRAWN BY: C.MELENDEZ NARVAEZ	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: S.MARKO	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

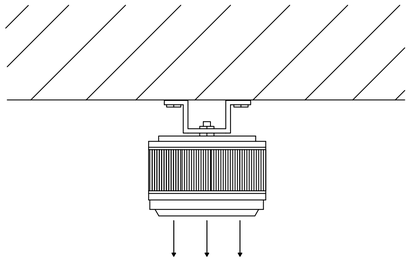
CONTROL TOWER HVAC SECTIONS

SHEET ID
BLDG 1
MH301

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 8:06:28 AM

File Path: C:\Users\kfendom9\Documents\FY23_PN96182_MPTR-TOWER_HVAC_R21_kfendom9.rvt

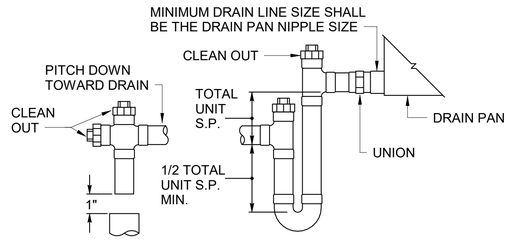


NOTE:

1. INSTALL ACCORDING TO MANUFACTURER'S INSTRUCTIONS AND/OR RECOMMENDATIONS.

1 ELECTRIC UNIT HEATER HORIZONTAL DETAIL

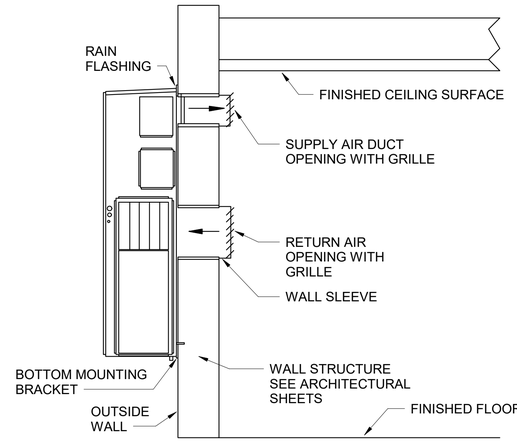
NOT TO SCALE



NOTE:
1. FLOOR DRAIN. COORDINATE LOCATION W/AHU CONDENSATE OUTLET

2 TYPICAL CONDENSATE DRAIN DETAIL

NOT TO SCALE

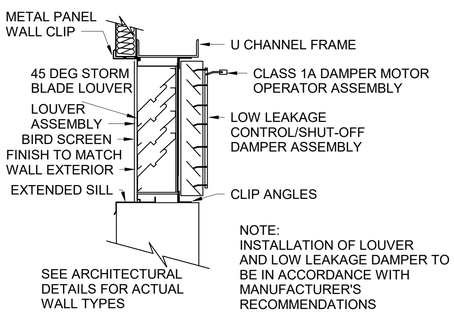


NOTE:

1. INSTALL UNIT ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS

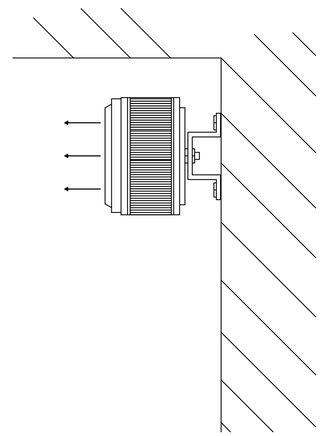
3 PACKAGED TERMINAL UNIT INSTALLATION DETAIL

NOT TO SCALE



4 DRAINABLE LOUVER DETAIL

NOT TO SCALE



NOTE:

1. INSTALL ACCORDING TO MANUFACTURER'S INSTRUCTIONS AND/OR RECOMMENDATIONS.

5 ELECTRIC UNIT HEATER VERTICAL DETAIL

NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ	ISSUE DATE: NOVEMBER 2023
DRAWN BY: C.MELENDEZ NARVAEZ	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: S.MARKO	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER HVAC DETAILS

SHEET ID
BLDG 1
MH501

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 8:06:31 AM

File Path: C:\Users\kbendom9\Documents\FY23_PN96182_MPTR-TOWER_HVAC_R21_kbendom9.rvt

PACKAGED TERMINAL HEAT PUMP SCHEDULE															
						HEATING COIL			COOLING COIL				MIN. ELECTRIC HEAT CAPACITY (KW)		
UNIT MARK	LOCATION	TYPE	MIN SEER	MIN. CFM	OA VENT (CFM)	MIN. TOTAL CAP (MBh)	EA DB	LA DB	MIN. TOTAL CAP (MBh)	EA DB	EA WB	LA DB		V/HZ/PH	NOTES
PTHP-1	ROOM 100L	EXTERIOR WALL MOUNT	11	366	32	10.7	63.9 °F	90.0 °F	12.2	79.8 °F	64.2 °F	55.0 °F	8.0	SEE ELECTRICAL	1, 2, 3, 4, 5, 6, 7
PTHP-2	ROOM 100M	EXTERIOR WALL MOUNT	11	794	32	21.2	66.1 °F	90.0 °F	23.5	79.0 °F	62.6 °F	55.0 °F	8.0	SEE ELECTRICAL	1, 2, 3, 4, 5, 6, 7

NOTES

1. SUPPLY WALL-MOUNTED THERMOSTAT WITH UNIT.
2. ROUTE CONDENSATE TO OUTSIDE AND TERMINATE ONE FOOT ABOVE SPLASH BLOCK.
3. COOLING CAPACITY BASED ON OUTDOOR AIR TEMPERATURE OF 95 DEGREES F. HEATING CAPACITY BASED ON OUTDOOR AIR TEMPERATURE OF 20 DEGREES F.
4. FILTER THE COMBINED SUPPLY AIR, INCLUDING RETURN AND OUTSIDE AIR, WITH A COMBINATION OF PREFILTER(S) WITH A MERV OF 8 AND FINAL FILTER(S) WITH A MERV OF 13.
5. PROVIDE WITH HOT GAS REHEAT AND HUMIDITY CONTROL.
6. RUN FAN CONTINUOUSLY DURING OCCUPIED TIMES REGARDLESS OF HEATING/COOLING DEMAND. CYCLE HEATING AND COOLING ON/OFF TO SATISFY SPACE DEMAND.
7. PROVIDE WITH EMERGENCY ELECTRIC HEAT STRIP.

ELECTRICAL UNIT HEATER SCHEDULE						
MARK	DESCRIPTION	LOCATION	AIR DELIVERY CFM	V/HZ/PH	KW	NOTES
EUH-1	CEILING MOUNTED	ROOM 100L	350	SEE ELECTRICAL	5	1, 2
EUH-2	CEILING MOUNTED	ROOM 100M	650	SEE ELECTRICAL	7.5	1, 2
EUH-3	WALL MOUNTED	PUMP HSE 001	350	SEE ELECTRICAL	3	1, 2

NOTES

1. SUPPLY WALL-MOUNTED THERMOSTAT WITH UNIT.
2. UHs ARE FOR FREEZE PROTECTION AND SHALL HAVE A 55 DEGREES F SETPOINT (ADJUSTABLE).

LOUVER SCHEDULE								
MARK	LOCATION	SERVICE	FLOW (CFM)	WIDTH (IN)	HEIGHT (IN)	FACE VELOCITY (FT/MIN)	MINIMUM FREE AREA (%)	NOTES
L-1	PUMP HSE	INTAKE	250	24	24	500	50	1, 2, 3, 4, 5

NOTES

1. SEE ARCHITECTURAL ELEVATIONS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS.
2. PROVIDE WITH WIRE MESH BIRD SCREEN.
3. COLOR PER ARCHITECTURAL; TO MATCH ADJACENT EXTERIOR SURFACE.
4. LOUVER SHALL BE RAIN RESISTANT, DRAINABLE BLADE STATIONARY LOUVER TYPE.
5. PROVIDE CLASS 1 MOTOR OPERATED LOW LEAKAGE CONTROL/SHUT-OFF DAMPER ATTACHED TO REAR OF LOUVER.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ
DRAWN BY: C.MELENDEZ NARVAEZ
CHECKED BY: S.MARKO
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

CONTROL TOWER HVAC SCHEDULES

SHEET ID
BLDG 1
MH601

File Path: C:\Users\k6endm9\Documents\FY23_PN96182_MPTR-TOWER_HVAC_R21_k6endm9.rvt

Plot Date: 11/28/2023 8:06:34 AM

READY TO ADVERTISE (RTA)

W-X-Y-Z ##
DEVICE SYMBOL, GENERIC
USED TO REPRESENT SENSORS, INSTRUMENTS SAFETIES, AND OTHER CONTROL DEVICES
W-X-Y-Z : (SEE ABBREVIATIONS AND ACRONYMS)

GENERIC USAGE TO SHOW LOCATION OF DEVICE; PROCESS OR DEVICE BEING MEASURED OR CONTROLLED; SIGNAL TYPE; MODIFIERS AND OTHER APPLICATION INFORMATION

W-X-Y-Z ##
DEVICE SYMBOL, GENERIC
MULTIPLE OUTPUT DEVICE WHERE AT LEAST 1 OUTPUT IS ALWAYS SAFETY INTERLOCK

W-X-Y-Z
DDC ##
DIR
REV
DEVICE SYMBOL, CONTROLLER
DDC : DIRECT DIGITAL CONTROL
: DEVICE NUMBER
DIR : DIRECT CONTROL ACTION, OR
REV : REVERSE CONTROL ACTION
W-X-Y-Z : (SEE ABBREVIATIONS AND ACRONYMS)

GENERIC USAGE TO SHOW LOCATION OF DEVICE; PROCESS OR DEVICE BEING MEASURED OR CONTROLLED; SIGNAL TYPE; MODIFIERS AND OTHER APPLICATION INFORMATION

ACTUATOR, ELECTRIC

P
ACTUATOR, PNEUMATIC
WITH LOCALLY MOUNTED
PRESSURE GAGE

P
PP
M
ACTUATOR, PNEUMATIC
WITH POSITIVE POSITIONER
AND LOCALLY MOUNTED
PRESSURE GAGE

AFMA
AIR FLOW MEASUREMENT ARRAY,
WITH FLOW TRANSMITTER
SEE "DEVICE SYMBOL, GENERIC"

~~BOILER~~

~~CHILLER~~

C
COIL, COOLING

DX
COIL, COOLING, DIRECT-EXPANSION

HC
COIL, HEAT/COOL (DUAL TEMPERATURE)

H
COIL, HEATING

PC
COIL, PRECOOL

PH
COIL, PREHEAT

CONTACT, PRESSURE, HIGH LIMIT (HL)
SHOWN IN ACTIVATED POSITION
OPEN WHEN PRESSURE IS ABOVE SETPOINT
CLOSED WHEN PRESSURE IS BELOW SETPOINT

CONTACT, PRESSURE, HIGH LIMIT (HL)
SHOWN IN UNACTIVATED POSITION
OPEN WHEN PRESSURE IS ABOVE SETPOINT
CLOSED WHEN PRESSURE IS BELOW SETPOINT

CONTACT, PRESSURE, LOW LIMIT (LL)
SHOWN IN ACTIVATED POSITION
OPEN WHEN PRESSURE IS BELOW SETPOINT
CLOSED WHEN PRESSURE IS ABOVE SETPOINT

CONTACT, PRESSURE, LOW LIMIT (LL)
SHOWN IN UNACTIVATED POSITION
OPEN WHEN PRESSURE IS BELOW SETPOINT
CLOSED WHEN PRESSURE IS ABOVE SETPOINT

CONTACT, TEMPERATURE, HIGH LIMIT (HL)
SHOWN IN ACTIVATED POSITION
OPEN WHEN TEMPERATURE IS ABOVE SETPOINT
CLOSED WHEN TEMPERATURE IS BELOW SETPOINT

CONTACT, TEMPERATURE, HIGH LIMIT (HL)
SHOWN IN UNACTIVATED POSITION
OPEN WHEN TEMPERATURE IS ABOVE SETPOINT

CONTACT, TEMPERATURE, LOW LIMIT (LL)
SHOWN IN ACTIVATED POSITION
OPEN WHEN TEMPERATURE IS BELOW SETPOINT
CLOSED WHEN TEMPERATURE IS ABOVE SETPOINT

CONTACT, TEMPERATURE, LOW LIMIT (LL)
SHOWN IN UNACTIVATED POSITION
OPEN WHEN TEMPERATURE IS BELOW SETPOINT
CLOSED WHEN TEMPERATURE IS ABOVE SETPOINT

CONTROL SIGNAL LINE, LOW VOLTAGE

CURRENT TRANSFORMER/SWITCH

DAMPER, BALANCING

D-##
DAMPER, PARALLEL BLADE
NORMALLY OPEN OR CLOSED AS SHOWN
= DAMPER NUMBER AS SHOWN
IN DAMPER SCHEDULE

D-##
DAMPER, OPPOSED BLADE
NORMALLY OPEN OR CLOSED AS SHOWN
= DAMPER NUMBER AS SHOWN
IN DAMPER SCHEDULE

HEAT EXCHANGER

MAIN AIR
MAIN AIR

M#
MOTOR

MS-#
MOTOR STARTER

Rxx
RELAY COIL
xx = SEQUENTIAL RELAY
(SOLENOID NUMBER)

Rxx-YY
RELAY COIL CONTACT
NORMALLY OPEN
xx = RELAY COIL NUMBER
YY = CONTACT NUMBER

Rxx-YY
RELAY COIL CONTACT
NORMALLY CLOSED
xx = RELAY COIL NUMBER
YY = CONTACT NUMBER

EPS ##
ELECTRIC-TO-PNEUMATIC SWITCH
(SOLENOID ACTUATED PNEUMATIC VALVE)
= SEQUENTIAL NUMBER
(WHEN MORE THAN 1 EPS)

EP ##
ELECTRIC-TO-PNEUMATIC TRANSDUCER
VDC OR mA INPUT / 3-15 PSI OUTPUT
= SEQUENTIAL NUMBER
(WHEN MORE THAN 1 EP)

FAN

FILTER

LDP ##
LOCAL DISPLAY PANEL
= SEQUENTIAL NUMBER
(WHEN MORE THAN 1 LDP)

PP
POSITIVE POSITIONER
SEE "ACTUATOR, PNEUMATIC"

P
PRESSURE GAGE

P
H
L
PRESSURE SWITCH, DIFFERENTIAL, WITH GAGE
H = HIGH PRESSURE TAP
L = LOW PRESSURE TAP
SEE "DEVICE SYMBOL, GENERIC"

PUMP

RADIATOR

RST-BUT
RESET BUTTON FOR SAFETY RESET

SMOKE DETECTOR, DUCT-MOUNTED
SEE "DEVICE SYMBOL, GENERIC"

SWITCH, MANUAL

T
TEMPERATURE GAGE

TEMPERATURE SENSOR, AVERAGING
or TEMPERATURE LOW LIMIT / FREEZESTAT
SEE "DEVICE SYMBOL, GENERIC"

TEMPERATURE SENSOR, POINT
SEE "DEVICE SYMBOL, GENERIC"

STAT
THERMOSTAT WITH SPECIFIED I/O FUNCTIONS

THERMOWELL IN PIPE

VALVE, BALANCING

V-##
NC
VALVE, NORMALLY CLOSED
WITH SPRING RETURN FAILSAFE
= VALVE NUMBER AS SHOWN
IN VALVE SCHEDULE

V-##
NO
VALVE, NORMALLY CLOSED
WITH SPRING RETURN FAILSAFE
= VALVE NUMBER AS SHOWN
IN VALVE SCHEDULE

V-##
COM NO NC
VALVE, 3-WAY DIVERTING
WITH SPRING RETURN FAILSAFE
NO = NORMALLY OPEN
NC = NORMALLY CLOSED
COM = COMMON PORT
= VALVE NUMBER AS SHOWN
IN VALVE SCHEDULE

V-##
NO COM NC
VALVE, 3-WAY MIXING
WITH SPRING RETURN FAILSAFE
NO = NORMALLY OPEN
NC = NORMALLY CLOSED
COM = COMMON PORT
= VALVE NUMBER AS SHOWN
IN VALVE SCHEDULE

VFD
XX-C XX-SS XX-S
VARIABLE FREQUENCY DRIVE
XX = PROCESS/DEVICE BEING CONTROLLED

SS = START/STOP COMMAND
S = STATUS FEEDBACK (ON/OFF)
C = 4-20 mA, VDC, or SNVT CONTROL SIGNAL

CONTROL SCHEMATIC SYMBOLS

B BINARY HARDWARE INPUT
A ANALOG HARDWARE INPUT
B BINARY HARDWARE OUTPUT
A ANALOG HARDWARE OUTPUT
ANALOG OR BINARY SIGNAL INPUT
ANALOG OR BINARY SIGNAL OUTPUT
CONSTANT VALUE

IF _ _ _
CONDITIONAL STATEMENT

IN MATH OUT
GENERIC MATH FUNCTION AS DEFINED

IN MIN OUT
MINIMUM SIGNAL SELECTOR

IN MAX OUT
MAXIMUM SIGNAL SELECTOR

IN OUT
ADDITION FUNCTION

IN OUT
SUBTRACTION FUNCTION

IN RESET OUT
RESET SCHEDULE (OUTPUT INCREASES AS INPUT INCREASES)

IN RESET OUT
RESET SCHEDULE (OUTPUT DECREASES AS INPUT INCREASES)

IN OUT
LOGICAL NOT FUNCTION

IN IN OUT
LOGICAL OR FUNCTION

IN IN OUT
LOGICAL AND FUNCTION

IN1 IN2 COMP DB OUT
DB= _ _ _
COMPARATOR WITH DEADBAND (DB).
WHEN IN1 > IN2
OUTPUT IS TRUE

IN S LAT R B OUT
IN
BINARY LATCH
S=SET
R=REST

IN HAND OFF OUT
H-O-A SWITCH

IN OCC UNOCC OUT
H-O-A SWITCH

CONTROL
IN NO IN NC OUT COM
SWITCH

IN T=_ _ _ SEC OUT
ON DELAY TIMER
OUT=IN AFTER TIME DELAY

ENABLE
IN VALUE IN SETPOINT PID OUT
DEFAULT OUTPUT
PID LOOP WITH ENABLE AND DEFAULT OUTPUT WHEN NOT ENABLED

CONTROL LOGIC DIAGRAM SYMBOLS

2P	TWO-POSITION (CONTROL SIGNAL)	I/O	INPUT/OUTPUT
ADJ	ADJUSTABLE	LDP	LOCAL DISPLAY PANEL
AFMA	AIRFLOW MEASUREMENT ARRAY	LL	LOW LIMIT
ALM	ALARM	M&C	MONITORING & CONTROL (SOFTWARE)
BA	BYPASS AIR	MA	MIXED AIR
BLDG	BUILDING	MINOA	MINIMUM OUTSIDE AIR
BUT	BUTTON	MS	MOTOR STARTER
C	COMMAND (MODULATING CONTROL SIGNAL)	MTHW	MEDIUM TEMPERATURE HOT WATER
CD	COLD DECK	N/A	NOT APPLICABLE
CHLR	CHILLER	NC	NORMALLY CLOSED
CLG	COOLING	NO	NORMALLY OPEN
CO2	CARBON DIOXIDE	OA	OUTSIDE AIR
COM	COMMON	OCC	OCCUPIED
COMP	COMPARATOR	ODT	ON DELAY TIMER
CR	CONDENSER WATER RETURN	OWS	OPERATOR WORKSTATION
CS	CONDENSER WATER SUPPLY	P	PRESSURE
CT	CURRENT TRANSFORMER/SWITCH	PC	PRE-COOLING
CWR	CHILLED WATER RETURN	PCW	PRIMARY CHILLER WATER
CWS	CHILLED WATER SUPPLY	PCWR	PRIMARY CHILLER WATER RETURN
CW	CHILLED WATER	PCWS	PRIMARY CHILLER WATER SUPPLY
D	DAMPER	PH	PREHEAT
DA	DISCHARGE AIR	PMP	PUMP
DB	DEADBAND	PP	POSITIVE POSITIONER
DDC	DIRECT DIGITAL CONTROL(LER)	R	RELAY
DIFF	DIFFERENCE	RA	RETURN AIR
DIR	DIRECT (CONTROL ACTION)	REV	REVERSE (CONTROL ACTION)
DIS	DISABLE	RF	RETURN FAN
DT	DUAL TEMP	RH	RELATIVE HUMIDITY
DTWR	DUAL TEMP WATER RETURN	RLA	RELIEF AIR
DTWS	DUAL TEMP WATER SUPPLY	RM	ROOM
DX	DIRECT EXPANSION (UNIT)	RST	RESET
EA	EXHAUST AIR	S	STATUS
ECO	ECONOMIZER	SA	SUPPLY AIR
EF	EXHAUST FAN	SEC	SECONDARY
ENA	ENABLE	SF	SUPPLY FAN
EP	ELECTRIC TO PNEUMATIC TRANSDUCER	SMK	SMOKE
EPS	ELECTRIC TO PNEUMATIC SWITCH	SP	SETPOINT
ESS	EMERGENCY SHUTOFF SWITCH	SS	START/STOP COMMAND
F	FLOW	STAT	THERMOSTAT
FAP	FIRE ALARM PANEL	SYS	SYSTEM
FLT	FILTER	SCHD	SCHEDULER
HD	HOT DECK	T	TEMPERATURE
HL	HIGH LIMIT	TAP	TAP, PRESSURE
HTG	HEATING	UNOCC	UNOCCUPIED
HTHW	HIGH TEMPERATURE HOT WATER	V	VALVE
HUM	HUMIDIFIER	VAV	VARIABLE AIR VOLUME
HW	HOT WATER	VFD	VARIABLE FREQUENCY DRIVE
HWR	HOT WATER RETURN	WB	WET BULB (TEMPERATURE)
HWS	HOT WATER SUPPLY	ZN	ZONE
HX	HEAT EXCHANGER		

ABBREVIATIONS AND ACRONYMS

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ
DRAWN BY: C.MELENDEZ NARVAEZ
CHECKED BY: S.MARKO
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.: -
CATEGORY CODE: 178-85-01
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

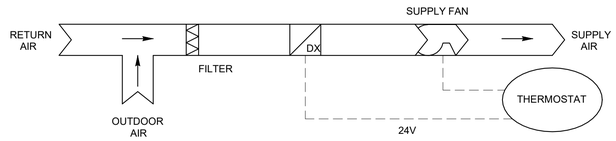
FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER HVAC CONTROLS LEGEND

SHEET ID
BLDG 1
MI801

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 8:06:38 AM
File Path: C:\Users\kbendm9\Documents\FY23_PN96182_MPTR-TOWER_HVAC_R21_kbendm9.rvt



PACKAGED TERMINAL HEAT PUMP SYSTEM SCHEMATIC

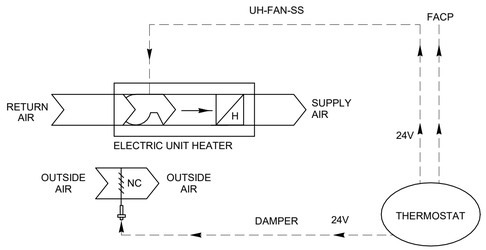
SEQUENCE OF OPERATION: PACKAGED TERMINAL HEAT PUMP SYSTEM

1. THE UNIT SHALL BE CONTROLLED BY A HEATING-OFF-COOLING SWITCH AS A PART OF THE UNIT THERMOSTAT.

2. UNIT SHALL OPERATE PER MANUFACTURER'S CONTROLS TO MAINTAIN THE SPACE TEMPERATURE SETPOINT OF 72 DEG F +/- 2 DEG F AND SUPPLY OUTDOOR AIR.

3. IN THE ON POSITION THE FAN SHALL RUN CONTINUOUSLY AND IN THE OFF POSITION THE UNIT AND THE FAN SHALL NOT RUN.

4. OUTSIDE AIR DAMPER CONTROLLED BY UNIT'S PACKAGED CONTROLS.



PUMP ROOM UNIT HEATER SCHEMATIC

SEQUENCE OF OPERATION: PUMP ROOM ELECTRIC UNIT HEATER

1. UNIT HEATERS SHALL BE CONTROLLED BY WALL MOUNTED THERMOSTATS. INITIAL SETPOINT SHALL BE 55°F (ADJUSTABLE).

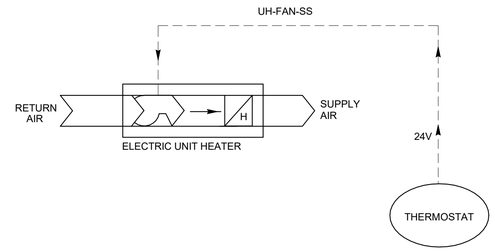
2. UPON A CALL FOR HEAT FROM THE THERMOSTAT, THE BLOWER FAN SHALL ENERGIZE AND THE ELECTRIC HEAT SHALL TURN ON TO SATISFY THE SPACE TEMPERATURE SETPOINT.

3. EUH-3 THERMOSTAT SHALL CONNECT TO THE FIRE ALARM CONTROL PANEL.

4. MOTOR-OPERATED DAMPER SHALL BE CONTROLLED BY WALL-MOUNTED THERMOSTAT.

5. WHEN THE SPACE TEMPERATURE DROPS BELOW 85 DEGREES F, THE OUTSIDE AIR DAMPER SHALL BE CLOSED.

6. WHEN THE SPACE TEMPERATURE RISES ABOVE 85 DEGREES F, THE OUTSIDE AIR DAMPER SHALL BE OPENED.



UNIT HEATER SCHEMATIC

SEQUENCE OF OPERATION: ELECTRIC UNIT HEATER

1. UNIT HEATERS SHALL BE CONTROLLED BY WALL MOUNTED THERMOSTATS. INITIAL SETPOINT SHALL BE 55°F (ADJUSTABLE).

2. UPON A CALL FOR HEAT FROM THE THERMOSTAT, THE BLOWER FAN SHALL ENERGIZE AND THE ELECTRIC HEAT SHALL TURN ON TO SATISFY THE SPACE TEMPERATURE SETPOINT.

US Army Corps of Engineers ®

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VOLUME 2 - BUILDING

CONTROL TOWER SYSTEM CONTROLS

SHEET ID
BLDG 1
MI802

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ELECTRICAL LEGEND

LIGHTING AND LIGHTING CONTROLS SYSTEM LEGEND

- LOWER CASE LETTER DENOTES THE SWITCH THAT CONTROLS FIXTURE
- A2 — LUMINAIRE TYPE DESIGNATION
- SYMBOL DENOTES GENERAL TYPE OF LUMINAIRE
- NT — UNSWITCHED NIGHT LIGHT (ON 24 HOURS)

2x2 LED LUMINAIRES.

2x4 LED LUMINAIRES.

CEILING-MOUNTED LUMINAIRE. SHADING INDICATES SUPPLIED FROM AN EMERGENCY LIGHTING INVERTER (ELI).

SUSPENDED LED LUMINAIRE.

WALL-MOUNTED LED LUMINAIRE. SHADING INDICATES SUPPLIED FROM AN EMERGENCY LIGHTING INVERTER (ELI).

LIGHTING CONTROL STRATEGY.

EMERGENCY LIGHTING UNIT. MH = 8' AFF UOI.

ELI — 250W EMERGENCY LIGHTING INVERTER (ELI). MOUNT ABOVE ACCESSIBLE CEILING.

EXIT LIGHT, CEILING MOUNTED. SHADING INDICATES FACES. PROVIDE DIRECTIONAL ARROWS WHEN INDICATED.

EXIT LIGHT, WALL MOUNTED. SHADING INDICATES FACES. PROVIDE DIRECTIONAL ARROWS WHEN INDICATED. ALIGN WITH CENTERLINE OF DOOR AND MOUNT CENTERLINE OF EXIT SIGN 5" ABOVE TOP OF DOOR FRAME UOI.

S — WALL SWITCH, SINGLE POLE, 20A SWITCH. MH = 46" AFF UOI. WHERE SUBSCRIPT IS PRESENT, IT DENOTES THE FOLLOWING:
- 3 - THREE WAY SWITCH.
- 4 - FOUR WAY SWITCH
- a - SINGLE LOWER CASE LETTER (EXCEPT LETTER "m") DENOTE THE SWITCH THAT CONTROLS THE FIXTURES.
- WP - WEATHERPROOF (GASKETED).
- lv - LOW VOLTAGE
- lv5 - LOW VOLTAGE DIMMING

S_V — WALL SWITCH SENSOR, LINE VOLTAGE. MH = 46" AFF UOI.

S_T — TIMER SWITCH, LINE VOLTAGE. SWITCH SHALL BE WEATHERPROOF RATED WITH 0-2 HOUR TIME RANGE. MH = 46" AFF UOI.

S_{lvx} — LOW VOLTAGE, MULTI-BUTTON WALLSTATION CONNECTED TO ROOM CONTROLLER. 'x' INDICATES NUMBER OF BUTTONS. MH = 46" AFF UOI.

OCCUPANCY SENSOR, WALL MOUNTED, DUAL TECHNOLOGY (ULTRASONIC AND PIR) SENSOR UOI. MOUNT 6" BELOW CEILING BUT NO MORE THAN 9'-6" AFF UOI.

OS — OCCUPANCY OR VACANCY SENSOR AS INDICATED BY LIGHTING CONTROL STRATEGIES, CEILING OR JUNCTION BOX MOUNTED, DUAL TECHNOLOGY (ULTRASONIC AND PIR) SENSOR UOI.

DS — DAYLIGHT SENSOR.

LC — LIGHTING CONTACTOR. MH = 60" AFF.

LIGHTNING PROTECTION & GROUNDING SYSTEM LEGEND

TW — GROUND ROD. "TW" INDICATES TEST WELL.

EXPOSED MAIN ROOF CONDUCTOR UOI.

BONDING CONNECTION TO TOP OF DOWN CONDUCTOR.

BONDING CONNECTION TO BOTTOM OF DOWN CONDUCTOR OR COUNTERPOISE.

DOWN CONDUCTOR IN SCHEDULE 40 PVC CONDUIT EXPOSED OUTSIDE OF BUILDING.

AIR TERMINAL.

POWER SYSTEM LEGEND

Φ_X — NEMA 5-20R DUPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPT 'X' (WHERE PRESENT) DENOTES THE FOLLOWING:
- G - GROUND FAULT CIRCUIT INTERRUPTER (GFCI) RECEPTACLE.
- WP - GFCI RECEPTACLE WITH WEATHER PROOF WHILE-IN-USE HOUSING.
- C - GFCI RECEPTACLE, BOTTOM OF RECEPTACLE MOUNTED 2" ABOVE BACKSPLASH.
- E - GFCI RECEPTACLE, MH COORDINATED WITH ELECTRIC WATER COOLER.
- OS - CONTROLLED BY ROOM OCCUPANCY SENSORS VIA RECEPTACLE-RATED SWITCHPACK. RECEPTACLES SHALL BE MARKED IN ACCORDANCE WITH NEC 406.3(E).
- R - MOUNTED ON COMMUNICATIONS RACK AS INDICATED ON EP501.
- T - RECEPTACLE, MOUNTED ADJACENT TO CATV OUTLET.

$\Phi\Phi_X$ — NEMA 5-20R DOUBLE DUPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPTS IDENTIFIED FOR DUPLEX RECEPTACLES ARE ALSO APPLICABLE TO QUADRAPLEX RECEPTACLES.

Φ_X — NEMA 5-20R SIMPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPTS IDENTIFIED FOR DUPLEX RECEPTACLES ARE ALSO APPLICABLE TO SIMPLEX RECEPTACLES.

Φ_X — SPECIAL RECEPTACLE. SUBSCRIPT 'X' (WHERE PRESENT) DENOTES THE FOLLOWING:
- A - NEMA L14-20R RECEPTACLE FOR TARGET MAINTENANCE. MH = 18" UOI.
- R1 - NEMA L5-20R RECEPTACLE. MOUNTED AS INDICATED ON EP501.
- R2 - NEMA L6-30R RECEPTACLE. PROVIDE 2#10, 1#10G, 1/2"C. MOUNTED AS INDICATED ON EP501.

NEMA 5-20R CEILING MOUNTED DUPLEX RECEPTACLE.

JUNCTION BOX, WALL MTD. MH = 18" UOI.

S_{ps} — 3-POSITION SWITCH FOR PROJECTOR SCREEN. MH = 46" AFF UOI.

S_m — MOTOR RATED SWITCH. MH = 46" AFF UOI.

MOTOR DISCONNECT/SAFETY SWITCH SHALL BE RATED 30/3/NF/1 UNLESS OTHERWISE INDICATED.
- '30' DENOTES SWITCH AMPERE RATING;
- '3' DENOTES NUMBER OF POLES;
- 'NF' DENOTES NON-FUSED ('F' DENOTES FUSED);
- '1' DENOTES SWITCH ENCLOSURE'S NEMA RATING;
- FUSE RATING SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

LP-1 — HOMERUN TO PANELBOARD. "LP" INDICATES THE PANELBOARD THAT THE HOMERUN IS SERVED FROM. "1" INDICATES THE CIRCUIT NUMBER IN THE PANELBOARD FOR CONNECTION.

PANELBOARD.

SWITCHBOARD.

ELECTRICAL EQUIPMENT AS INDICATED.

THREE BUTTON, PUSH BUTTON SWITCH (OPEN, CLOSE, AND STOP) FOR ROLLING SERVICE DOORS. MH = 46" AFF UOI.

VIDEO SURVEILLANCE SYSTEM LEGEND

GFGI CAMERA. PROVIDE 1-1/4" RGS CONDUIT TO DTR RACK. REFER TO VOLUME 4 ES517 FOR MOUNTING DETAILS.

ABBREVIATIONS

ACS	ACCESS CONTROL SYSTEM
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ATS	AUTOMATIC TRANSFER SWITCH
C	CONDUIT
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CKT	CIRCUIT
COR	CONTRACTING OFFICER'S REPRESENTATIVE
CU	COPPER
DLC	DESIGNLIGHTS CONSORTIUM
DTR	DATA TERMINATION RACK
EGC	EQUIPMENT GROUNDING CONDUCTOR
ELI	EMERGENCY LIGHTING INVERTER
EPT	ELECTRIC POWER TRANSFER
ESS	ELECTRONIC SECURITY SYSTEMS
EWC	ELECTRIC WATER COOLER
FACP	FIRE ALARM CONTROL PANEL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
HACR	HEATING, AIR CONDITIONING, REFRIGERATION
IDS	INTRUSION DETECTION SYSTEM
LVS	LOW VOLTAGE SWITCH
MFR	MANUFACTURER
MH	MOUNTING HEIGHT
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTS	MANUAL TRANSFER SWITCH
NATS	NON-AUTOMATIC TRANSFER SWITCH
NEC	NATIONAL ELECTRICAL CODE
NF	NON FUSED
NTS	NOT TO SCALE
OS	OCCUPANCY SENSOR
PBB	PRIMARY BONDING BUSBAR
PIR	PASSIVE INFRARED
QTY	QUANTITY
SBB	SECONDARY BONDING BUSBAR
SER	SERVICE ENTRANCE RATED
SPD	SURGE PROTECTIVE DEVICE
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UOI	UNLESS OTHERWISE INDICATED
UON	UNLESS OTHERWISE NOTED
V	VOLT
W, WP	WEATHERPROOF

GENERAL NOTES

1. SEE PLATE G-002 TO G-002A FOR ABBREVIATIONS AND GENERAL LEGEND.

2. MOUNTING HEIGHT, UNLESS OTHERWISE NOTED, IS TO CENTER LINE OF EQUIPMENT.

3. OUTLET BOXES MOUNTED ON OPPOSITE SIDES OF WALLS SHALL BE INSTALLED SUCH THAT NO BOXES ARE BACK-TO-BACK TO MINIMIZE SOUND TRANSMISSION. MAINTAIN A 6-INCH SEPARATION WHERE POSSIBLE.

4. MECHANICAL EQUIPMENT IS SHOWN IN APPROXIMATE LOCATIONS. FOR EXACT LOCATIONS OF MECHANICAL EQUIPMENT AND PIPING, SEE MECHANICAL DRAWINGS. PROVIDE DISCONNECT SWITCHES AS REQUIRED BY THE NATIONAL ELECTRICAL CODE EVEN IF NOT INDICATED ON THE ELECTRICAL DRAWINGS.

5. COORDINATE THE LOCATIONS AND MOUNTING HEIGHTS OF LUMINAIRES IN MECHANICAL AND ELECTRICAL ROOMS WITH THE FINAL LOCATIONS OF PIPES, DUCTS AND OTHER EQUIPMENT FOR BEST ARRANGEMENT. FIXTURES SHALL BE EASILY ACCESSIBLE FOR RELAMPING.

6. CONDUCTOR AND CONDUIT SIZES ARE BASED ON COPPER CONDUCTORS WITH THWN INSULATION IN EMT CONDUIT. MINIMUM SIZE SHALL BE #12 AWG CONDUCTORS WITH #12 AWG EGC IN 1/2" CONDUIT UNLESS OTHERWISE INDICATED. LIGHTING AND POWER BRANCH CIRCUITS THAT RUN OVER 100 FEET SHALL BE MINIMUM #10 AWG. CIRCUIT BREAKERS, TERMINALS, ETC. SHALL BE RATED AND MARKED FOR 75 DEGREES MINIMUM. THE CONTRACTOR SHALL ADJUST CONDUIT SIZES BASED ON ACTUAL TYPE OF CONDUCTORS AND CONDUIT INSTALLED.

7. PROVIDE EQUIPMENT GROUNDING CONDUCTORS IN ALL CONDUITS.

8. UP TO 3 SINGLE-PHASE, BRANCH CIRCUITS RATED 20A OR LESS MAY BE ROUTED IN A SINGLE CONDUIT TO MINIMIZE THE NUMBER OF HOMERUNS. CIRCUITS SHALL BE SUPPLIED FROM ADJACENT CIRCUIT BREAKERS AND DIFFERENT PHASES (E.G., 1, 3, 5 OR 2, 4, 6). NEUTRAL CONDUCTORS SHALL NOT BE SHARED OR COMBINED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DERATING CONDUCTOR CAPACITY ACCORDING TO THE NUMBER OF CURRENT CARRYING CONDUCTORS AND OTHER ADJUSTMENT FACTORS IN ACCORDANCE WITH THE NEC. THE CONTRACTOR SHALL UTILIZE A MAXIMUM FILL RATE OF 40% WHEN SIZING CONDUITS AND SHALL INCLUDE THE REQUIRED EQUIPMENT GROUNDING CONDUCTOR. ALL OTHER CIRCUITS SHALL HAVE DEDICATED HOMERUNS.

9. CIRCUIT NUMBERS ARE SHOWN ADJACENT TO ELECTRICAL DEVICES. WIRING SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND NEC REQUIREMENTS.

10. CONDUITS SHALL BE CONCEALED ABOVE CEILINGS AND IN WALLS, EXCEPT IN MECHANICAL ROOMS, ELECTRICAL ROOMS, AND WHERE SPECIFICALLY INDICATED OTHERWISE ON THE DRAWINGS. CONDUITS SHALL NOT BE RUN IN ANY UL RATED SLAB. CONDUITS SHALL NOT BE RUN IN ANY FILLED CMU BLOCKS.

11. LOCATE ALL RACEWAYS TO AVOID INTERFERENCE WITH DUCTS, PIPES, MECHANICAL EQUIPMENT, WITH REMOVAL OF CEILING TILES, OR WITH ACCESS TO EQUIPMENT WHICH REQUIRES PERIODIC ADJUSTMENT OR MAINTENANCE.

12. SEAL PENETRATIONS THROUGH ROOFS, CEILINGS, FLOORS, WALLS AND FIRE WALLS TO MAINTAIN THE INTEGRITY OF THE AIR BARRIER, FIRE AND ACOUSTIC RATINGS OF THE ROOF, CEILINGS, WALLS AND FLOORS.

13. REVISE PANELBOARD SCHEDULES ON AS-BUILT-DRAWING AND PANEL DIRECTORIES TO REFLECT FINAL INSTALLATION CONDITIONS.

14. PROVIDE NAMEPLATES ON THE EXTERIOR OF ALL ELECTRICAL PANELS AND ENCLOSURES AS FOLLOWS: DEVICE ID, DEVICE RATING, POWER SOURCE, ARC FAULT DATA.

15. FOR DISCONNECT SWITCHES AND MOTOR STARTERS THE TOP LINE SHALL BE THE NAME/DESIGNATIONOF THE EQUIPMENT BEING FED BY THE SWITCH/STARTER.

16. PROVIDE SEPARATE NEUTRALS FOR EACH CIRCUIT UTILIZING A NEUTRAL CONDUCTOR (DO NOT COMBINE NEUTRALS).

17. PROVIDE EQUIVALENT CONDUIT PATHWAYS WHERE CABLE TRAY IS INTERRUPTED BY NONACCESSIBLE CEILINGS.

18. THE INTERRUPTING RATING OF THE PANELBOARD AND ELECTRICAL EQUIPMENT SHALL BE INCREASED TO THE NEXT AVAILABLE RATING WHERE THERE IS NOT A RATING THAT IS EQUAL TO THE EQUIPMENT'S LISTED SHORT CIRCUIT RATING.

19. NOT ALL SYMBOLS SHOWN ON THE LEGEND ARE USED IN THE PROJECT.

20. RECEPTACLES THAT HAVE GFCI PROTECTION ARE TO BE WIRED SUCH THAT THE LOSS OF POWER ON ONE RECEPTACLE DOES NOT AFFECT DOWNSTREAM RECEPTACLES.

21. COMPONENTS WHICH CONSTITUTE AN ELECTRICAL SYSTEM SHALL BE FULLY COMPATIBLE WITH ONE ANOTHER AND SHALL BE APPROVED BY THE VARIOUS MANUFACTURERS FOR USE WITH ALL OTHER COMPONENTS WITHIN THE SYSTEM. (ONE EXAMPLE OF AN ELECTRICAL SYSTEM IS THE BUILDING LIGHTING SYSTEM COMPRISED OF FIXTURES, LAMPS, SWITCHES, DRIVERS, OCCUPANCY SENSORS AND DIMMING EQUIPMENT).

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
H. TAYLOR	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
H. TAYLOR	W91ZHN-24-B-3002
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R. DAVIS	
SUBMITTED BY:	CATEGORY CODE:
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

CONTROL TOWER LEGEND AND NOTES

SHEET ID
BLDG 1
E-001

Plot Date: 11/28/2023 3:30:09 PM

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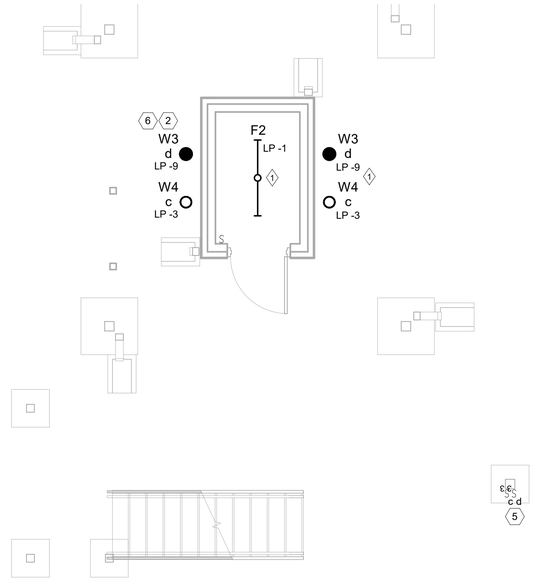
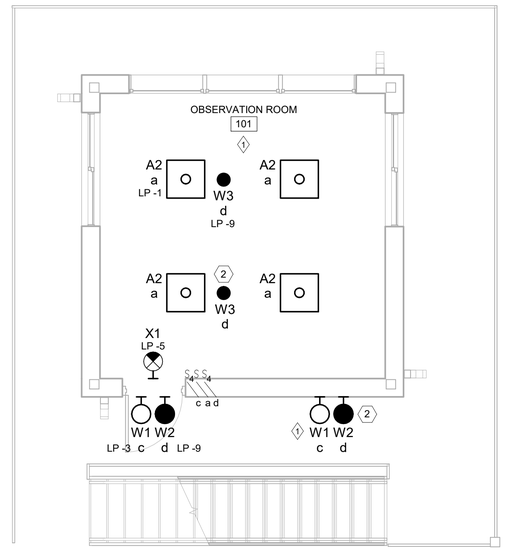


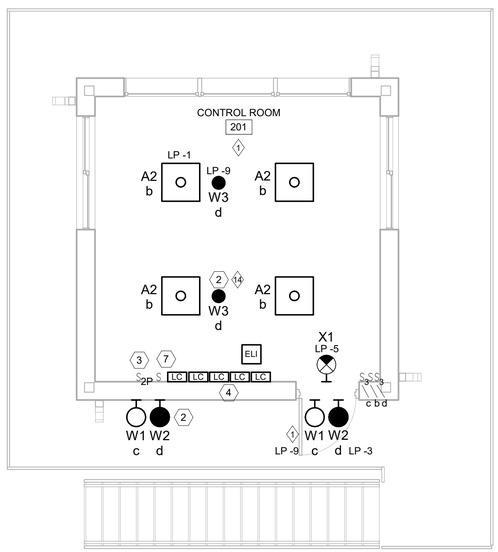
1 GROUND LEVEL LIGHTING PLAN

1/4" = 1'-0"



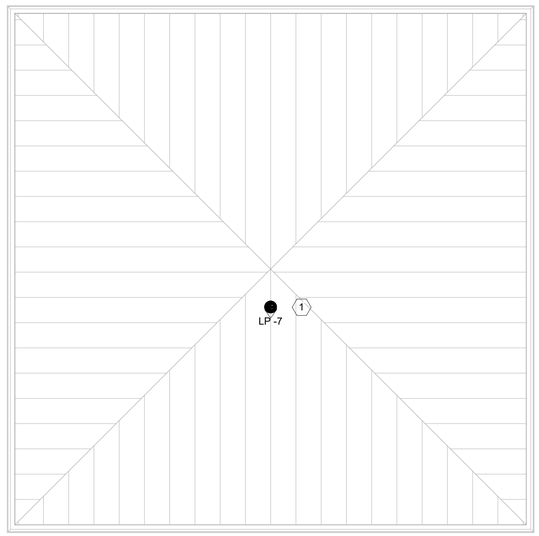
2 FIRST FLOOR LIGHTING PLAN

1/4" = 1'-0"



3 SECOND FLOOR LIGHTING PLAN

1/4" = 1'-0"



4 ROOF LIGHTING PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

1. ALL SWITCHES SHALL BE PERMANENTLY LABELED WITH A DESCRIPTION OF ITS USE.
2. ALL SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR AND SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE.
3. ALL SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR.

KEYED NOTES (#)

1	MOUNT OBSTRUCTION LIGHT ABOVE PEAK OF ROOF TO ENSURE VISIBILITY FROM ALL SIDES.
2	ALL CONTROL TOWER RED LIGHTING (BUILDING-MOUNTED, GROUND LEVEL, FIRST FLOOR, SECOND FLOOR) IS CONTROLLED TOGETHER BY THE SAME SET OF SWITCHES. ADDITIONALLY, ALL RED LIGHTING PROVIDES EMERGENCY LIGHTING ILLUMINATION AND IS CONNECTED TO THE EMERGENCY LIGHTING INVERTER.
3	PROVIDE ON/OFF TOGGLE TYPE NEMA SIZE M-1P, 2-POLE, 230V MANUAL STARTER CONTROL SWITCH FOR RANGE LIMIT MARKERS. SEE RANGE LIMIT MARKER CONTROL DIAGRAM IN VOLUME 4, SHEET ES519.
4	SEE VOLUME 1, SHEET ES503 FOR ROCA WHITE SITE LIGHTING AND ROCA RED SITE LIGHTING CONTACTOR DIAGRAMS. SEE VOLUME 2, BLDG 1, SHEET EL602 FOR CONTROL TOWER LIGHTING CONTACTORS.
5	SWITCHES SHALL BE WEATHERPROOF (GASKETED).
6	PENDANT MOUNT W3 & W4 LUMINAIRES 16' AFF.
7	PROVIDE WALL SWITCH AND LIGHTING CONTACTOR FOR FLAG POLE LIGHTING. SEE FLAG POLE LIGHTING CONTACTOR DIAGRAM IN VOLUME 1, SHEET ES503.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

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1	REVISED IN ACCORDANCE WITH AMENDMENT 0004	17AUG2023

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CONTROL TOWER LIGHTING PLAN

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EL101

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READY TO ADVERTISE (RTA)

LIGHT FIXTURE SCHEDULE

TYPE	DFESCRIPTION	FIXTURE VOLTAGE	LIGHT SOURCE	NOMINAL WATTS	MINIMUM LUMENS	MOUNTING TYPE	MOUNTING HEIGHT	REMARKS
A2	2x2 FLAT PANEL LED LUMINAIRE	120 V	LED	38 W	4400	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
A3	2x4 FLAT PANEL LED LUMINAIRE	120 V	LED	41 W	4600	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
A4	2x4 FLAT PANEL LED LUMINAIRE	120 V	LED	62 W	6500	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
ELU	LED EMERGENCY LIGHTING UNIT	120 V	LED	4 W	600	WALL	SEE PLANS	
F2	ENCLOSED GASKETED LUMINAIRE	120 V	LED	30 W	4000	SUSPENDED	SEE PLANS	
OB	OBSTRUCTION LIGHT L-810	120 V	INCANDESCENT	70 W	-	THREADED HUB	N/A	STEADY BURNING; PROVIDE PHOTOCELL; PROVIDE SPD
W1	WALL MOUNTED VAPERPROOF (WHITE)	120 V	LED	17 W	1200	WALL	SEE PLANS	PROVIDE CLEAR HEAT TREATED GLASS LENS
W2	WALL MOUNTED VAPORPROOF (RED)	120 V	LED	17 W	1200	WALL	SEE PLANS	PROVIDE RED HEAT TREATED GLASS LENS
W3	CEILING MOUNTED VAPORPROOF (RED)	120 V	LED	17 W	1200	SURFACE	N/A	PROVIDE RED HEAT TREATED GLASS LENS
W4	CEILING MOUNTED VAPORPROOF (WHITE)	120 V	LED	17 W	1200	SURFACE	N/A	PROVIDE CLEAR HEAT TREATED GLASS LENS
X1	EXIT LIGHT - WALL MOUNTED	120 V	LED	1 W	N/A	WALL	N/A	

LED FLAT PANEL
2'x2' LED LUMINAIRE

FEATURES

REFLECTORS: HIGH REFLECTANCE GLOSS WHITE

SHIELDING: WHITE FROST LENS WITH SMOOTH PATTERN FOR UNIFORM ILLUMINATION

GENERAL DESCRIPTION

HOUSING: DIE FORMED CODE-GAUGE STEEL; SEAMLESS CORNERS MAXIMIZE LIGHT EMITTING SURFACE AREA

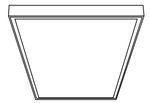
DIMENSIONS: 24" x 48" x 3" (W x L x D)

OTHER: DLC QUALIFIED

LUMEN MAINTENANCE: L70 AT 60,000 HOURS

1 TYPE A2

LED FLAT PANEL
2'x4' LED LUMINAIRE



FEATURES

REFLECTORS: HIGH REFLECTANCE GLOSS WHITE

SHIELDING: WHITE FROST LENS WITH SMOOTH PATTERN FOR UNIFORM ILLUMINATION

GENERAL DESCRIPTION

HOUSING: DIE FORMED CODE-GAUGE STEEL; SEAMLESS CORNERS MAXIMIZE LIGHT EMITTING SURFACE AREA

DIMENSIONS: 24" x 48" x 3" (W x L x D)

OTHER: DLC QUALIFIED

LUMEN MAINTENANCE: L70 AT 60,000 HOURS

2 TYPE A3 & A4

ENCLOSED AND GASKETED
LED LUMINAIRE

FEATURES

REFLECTORS: HIGH REFLECTANCE WHITE

SHIELDING: HIGH IMPACT LINEAR FROSTED ACRYLIC LENS

GENERAL DESCRIPTION

HOUSING: IMPACT RESISTANT, UV STABILIZED, FIBERGLASS WITH REMOVABLE GEAR TRAY FOR MODULE REPLACEMENT; NON-POROUS GASKET; STAINLESS STEEL LATCHES; INCLUDE SURFACE-MOUNTING BRACKETS

DIMENSIONS: 52"x7"x5" (LxWxD)

LISTING: UL LISTED FOR WET LOCATIONS

OTHER: DLC QUALIFIED

3 TYPE F2

SURFACE MOUNTED
THIN PROFILE LED EXIT LIGHT

FEATURES

MOUNTING: UNIVERSAL

SHIELDING: FLAT SHEET ACRYLIC

LETTERS: RED

BATTERY: NICKEL CADMIUM

OTHER: SELF DIAGNOSTICS; NEMA PREMIUM CERTIFIED; TAMPERPROOF HARDWARE

GENERAL DESCRIPTION

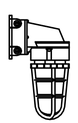
HOUSING: SOLID DIE-CAST ALUMINUM HOUSING AND FACE WITH DIRECTIONAL CHEVRON ARROWS AS REQUIRED

FINISH: BLACK HOUSING AND BRUSHED ALUMINUM FACE

DIMENSIONS: 12"x8"x1.75" (LxWxD, MAXIMUM, BACK MOUNTED)

4 TYPE X1

WALL MOUNTED
VAPORPROOF LUMINAIRE



FEATURES

DIFFUSER: GLOBE WITH DIE CAST GUARD
W1: (CLEAR GLOBE)
W2: (RED GLOBE)

GENERAL DESCRIPTION

HOUSING: DIE-CAST LED HOUSING DESIGNED FOR MAXIMUM HEAT DISSIPATION WITH HIGH TEMPERATURE SILICON INTERNAL GASKETS

FINISH: NATURAL UNPAINTED FINISH

LISTING: UL LISTED FOR WET LOCATIONS

DIMENSIONS: 8" x 13" (D x H)

5 TYPES W1 & W2

CEILING MOUNTED
VAPORPROOF LUMINAIRE

FEATURES

DIFFUSER: GLOBE WITH DIE CAST GUARD
W4: (CLEAR GLOBE)
W3: (RED GLOBE)

GENERAL DESCRIPTION

HOUSING: DIE-CAST LED HOUSING DESIGNED FOR MAXIMUM HEAT DISSIPATION WITH HIGH TEMPERATURE SILICON INTERNAL GASKETS

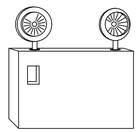
FINISH: NATURAL UNPAINTED FINISH

LISTING: UL LISTED FOR WET LOCATIONS

DIMENSIONS: 5" x 12" (D x H)

6 TYPES W3 & W4

LED EMERGENCY LIGHTING UNIT



FEATURES

LAMPS: FULLY ADJUSTABLE WHITE LED HEADS

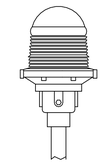
BATTERY: NICKEL CADMIUM
OUTPUT: HIGH OUTPUT OPTION FOR REMOTE HEADS
DURATION: 90 MINUTES AND >87.5% NOMINAL VOLTAGE

GENERAL DESCRIPTION

HOUSING: INJECTION MOLDED, HIGH IMPACT UV-STABLIZED THERMOPLASTIC MATERIAL; WHITE FINISH

7 TYPE ELU

INCANDESCENT OBSTRUCTION LIGHT L-810



FEATURES

DIFFUSER: RED POLYCARBONATE LENS

GENERAL DESCRIPTION

HOUSING: IP66/NEMA 4X; THREADED 1" BOTTOM HUB

LISTING: IP66 AND NEMA 4X

CERTIFICATIONS: FAA AC #: 150/5345-43H

DIMENSIONS: 5" x 5" x 9" (L x W x H)

8 TYPE OB

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.: -
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER LIGHT FIXTURE SCHEDULE & DETAILS

SHEET ID
BLDG 1
EL501

READY TO ADVERTISE (RTA)

File Path: C:\Users\kbenxhit\Documents\FY23_PN96182_MPTR-STDETAILS_ELEC_R21_hunter.t.taylor.rvt

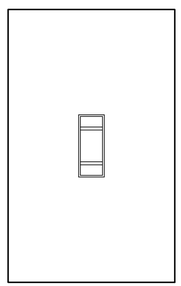
Plot Date: 11/28/2023 3:30:10 PM

LIGHTING CONTROL STRATEGIES

STRATEGY	DESCRIPTION OF OPERATION	LIGHTING CONTROL EQUIPMENT	SWITCHES
1	MANUAL ON/OFF	LINE VOLTAGE TOGGLE SWITCHES	S, S3, S4
2	MANUAL ON/OFF AUTO SENSOR OFF	LINE VOLTAGE WALL SWITCH SENSOR	Sv
3	AUTO SENSOR ON (HALF) MANUAL ON (HALF) MANUAL ON (FULL) MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS OCCUPANCY SENSORS ROOM CONTROLLERS	SLV3
6	LIGHTING SCENES (ZONE 1 | ZONE 2) FULL: 100% | 100% AV: 100% | 30% DIM: 1% | 1% MANUAL RAISE MANUAL LOWER MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS VACANCY SENSORS ROOM CONTROLLERS	SLV6
7	MANUAL ON/OFF AUTO SENSOR ON (HALF) AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS OCCUPANCY SENSORS ROOM CONTROLLERS	SLV2
12	PARTITION CONTROL LIGHTING SCENES (ZONE 1 | ZONE 2) FULL: 100% | 100% AV: 100% | 30% DIM: 1% | 1% MANUAL RAISE MANUAL LOWER MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS VACANCY SENSORS ROOM CONTROLLERS PARTITION CONTROL SENSORS/INTERFACE	SLV6
14	PHOTOCELL CONTROL ON WHEN NORTHERN SKY ILLUMINANCE REACHING A VERTICAL SURFACE FALLS BELOW 50 FC. PHOTOCELL CONTROL ON WHEN NORTHERN SKY ILLUMINANCE REACHING A VERTICAL SURFACE RISES ABOVE 50 FC.	PHOTOCELL	

LIGHTING CONTROL STRATEGY NOTES:

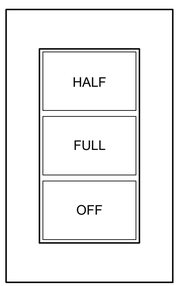
1. IN ADDITION TO THE STRATEGIES IDENTIFIED ABOVE, A MASTER OVERRIDE OFF CONTROL INSIDE THE CONTROL TOWER SHALL BE PROVIDED TO SHUT OFF ALL ANCILLARY BUILDING AND SITE WHITE LIGHTING THAT MAY INTERFERE WITH RANGE NIGHT OPERATIONS. SEE LIGHTING CONTACTOR DIAGRAMS FOR ADDITIONAL INFORMATION.



DETAIL NOTES:

1. SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR. WHERE INDICATED, THEY SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE. SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR. ALL SWITCHES SHALL BE PERMANTENTLY LABELED WITH A DESCRIPTION OF ITS USE.

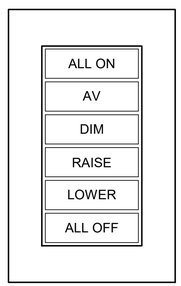
1 WALL SWITCHES S, S3, & S4



DETAIL NOTES:

1. SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR. WHERE INDICATED, THEY SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE. SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR. ALL SWITCHES SHALL BE PERMANTENTLY LABELED WITH A DESCRIPTION OF ITS USE.

2 WALLSTATION SLV3



DETAIL NOTES:

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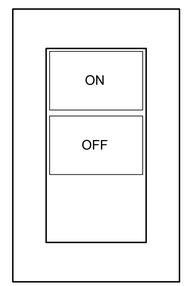
3 WALLSTATION SLV6



DETAIL NOTES:

1. SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR. WHERE INDICATED, THEY SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE. SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR. ALL SWITCHES SHALL BE PERMANTENTLY LABELED WITH A DESCRIPTION OF ITS USE.

3 WALLSTATION SLV2

US Army Corps of Engineers ®

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DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.: -
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

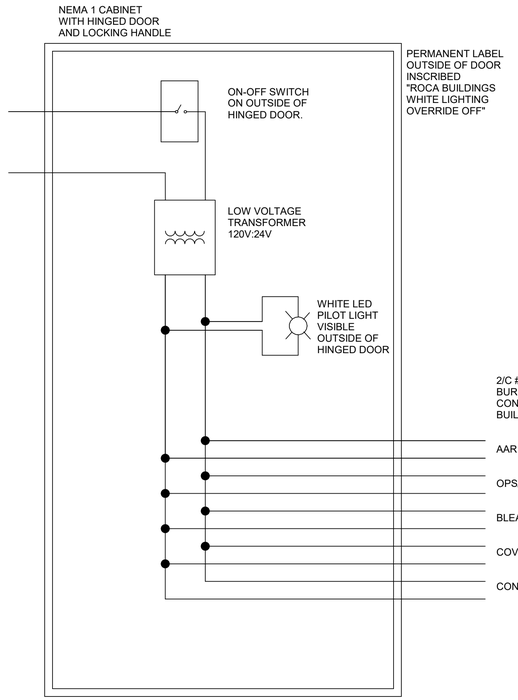
CONTROL TOWER LIGHTING CONTROL SCHEDULES AND DETAILS

SHEET ID
BLDG 1
EL601

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:30:11 PM

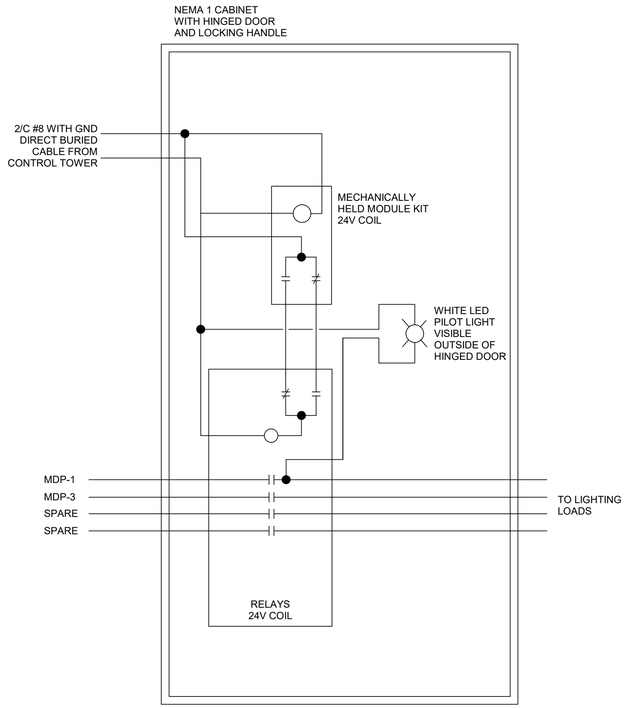
File Path: C:\Users\k6enxhil\Documents\FY23_PN96182_MPTR-STDETAILS_ELEC_R21_hunter.taylor.rvt



LIGHTING CONTACTOR DIAGRAM NOTES:

1. THE DESIGN INTENT IS TO PROVIDE A MASTER OVERRIDE OFF CONTROL INSIDE THE CONTROL TOWER TO SHUT OFF ALL BUILDING WHITE LIGHTING THAT MAY INTERFERE WITH RANGE NIGHT OPERATIONS. NORMAL SWITCH POSITION IN THE "ON" POSITION WILL ALLOW LOCAL LIGHTING CONTROL AT EACH BUILDING.

2. HAND-OFF-AUTO CONTROL OF ALL SITE WHITE AND RED LIGHTING IS ACCOMPLISHED VIA ADDITIONAL CONTACTORS INSIDE THE CONTROL TOWER.



LIGHTING CONTACTOR DIAGRAM NOTES:

1. THE DESIGN INTENT IS TO PROVIDE A MASTER OVERRIDE OFF CONTROL INSIDE THE CONTROL TOWER TO SHUT OFF ALL BUILDING WHITE LIGHTING THAT MAY INTERFERE WITH RANGE NIGHT OPERATIONS.

2. ADDITIONAL BUILDING LIGHTING CONTROLS ARE PROVIDED ON THE LOAD SIDE OF THE CONTACTOR TO PROVIDE TYPICAL BUILDING LIGHTING CONTROLS. SEE OTHER EL SHEETS FOR ADDITIONAL LIGHTING CONTROL REQUIREMENTS.

1 LIGHTING CONTACTOR DIAGRAMS

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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H. TAYLOR	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
H. TAYLOR	W912HN-24-B-3002
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R. DAVIS	
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J. DEACON	178-65-01
SIZE:	FILE NAME:
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

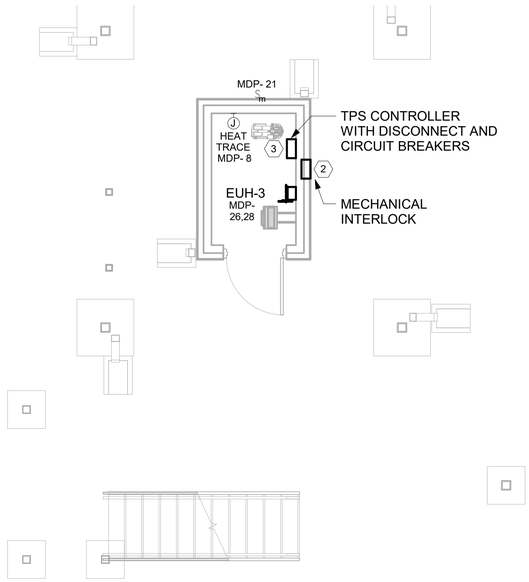
CONTROL TOWER LIGHTING CONTACTOR DIAGRAMS

SHEET ID
BLDG 1
EL602

Plot Date: 11/28/2023 3:30:12 PM

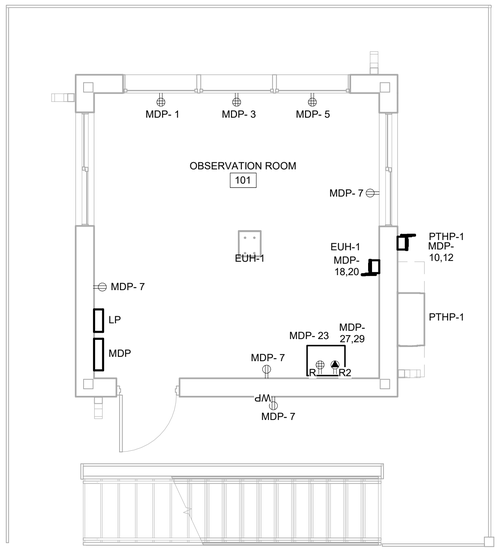
File Path: C:\Users\k6enxhit\Documents\FY23_PN96182_MPTR-STIDETAILS_ELEC_R21_hunter.t.taylor.rvt

READY TO ADVERTISE (RTA)



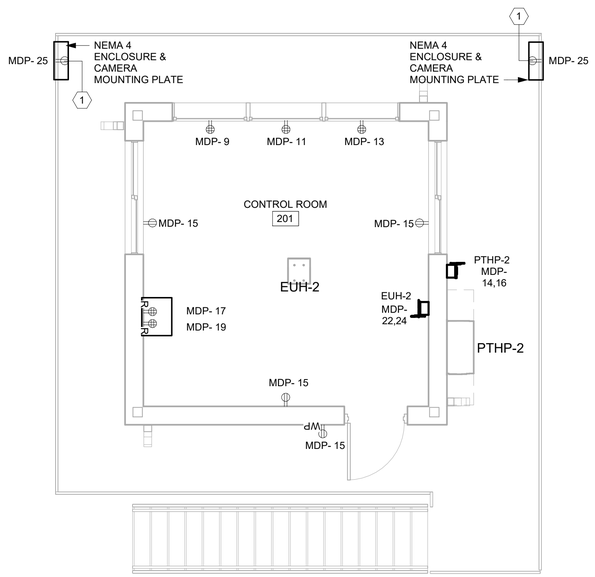
1 GROUND LEVEL POWER PLAN

1/4" = 1'-0"



2 FIRST FLOOR POWER PLAN

1/4" = 1'-0"



3 SECOND FLOOR POWER PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

KEYED NOTES (#)

1	FOR CAMERA AND RECEPTACLE MOUNTING DETAILS, SEE VOLUME 4 SHEET ES521.
2	PROVIDE MALE IEC 60-309-2 PIN AND SLEEVE MECHANICAL INTERLOCK ON OUTSIDE OF TPS BUILDING, RATED 30A, 120/240V, 3 POLE, 4 WIRE AND IP67. PROVIDE MATCHING FEMALE CONNECTOR ON SERVICE CONDUCTORS. SEE SPEC 21 21 00, ATTACHMENT, PARAGRAPH 2.9, ELECTRICAL REQUIREMENTS, FOR ADDITIONAL REQUIREMENTS.
3	CONNECT INTERLOCK TO TPS CONTROLLER DISCONNECT PER SPEC 21 21 00, ATTACHMENT, PARAGRAPH 2.10, ELECTRICAL WIRING ASSEMBLY. PROVIDE IDENTIFICATION OF ELECTRICAL SERVICE AT TPS CONTROLLER PER NEC, 230.2(E).

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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H. TAYLOR	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
H. TAYLOR	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
R. DAVIS	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
SIZE:	FILE NAME:
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER POWER PLAN

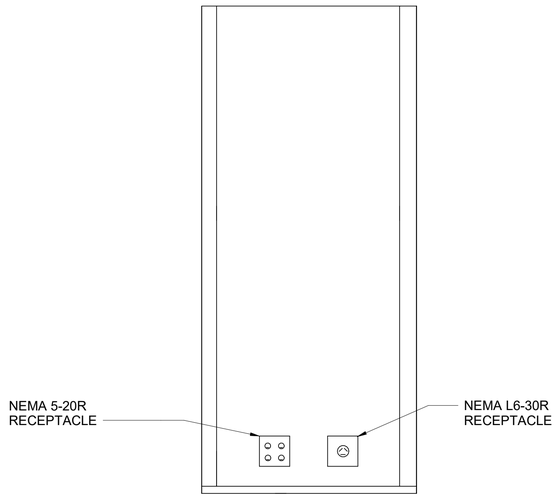
SHEET ID
BLDG 1
EP101

File Path: C:\Users\kfeinxhit\Documents\FY23_PN96182_MPTR-TOWER_ELEC_R21_hunter.l.taylor.rvt

Plot Date: 11/28/2023 4:03:51 PM

READY TO ADVERTISE (RTA)

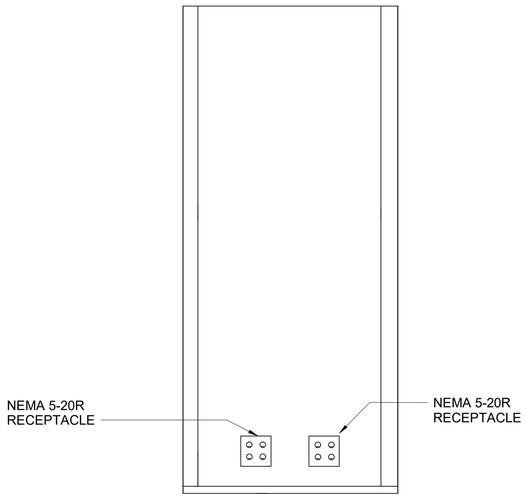
NEC CABINET



CABINET-MOUNTED RECEPTACLE DETAIL NOTES:

1. OUTLETS SHALL BE MOUNTED INSIDE THE NEC ENCLOSURE 4 INCHES ABOVE THE BOTTOM OF THE ENCLOSURE.

DTR CABINET



CABINET-MOUNTED RECEPTACLE DETAIL NOTES:

1. OUTLETS SHALL BE MOUNTED INSIDE THE DTR ENCLOSURE 4 INCHES ABOVE THE BOTTOM OF THE ENCLOSURE.

1 RACK MOUNTED RECEPTACLE DETAIL

NOT TO SCALE

US Army Corps of Engineers ®

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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

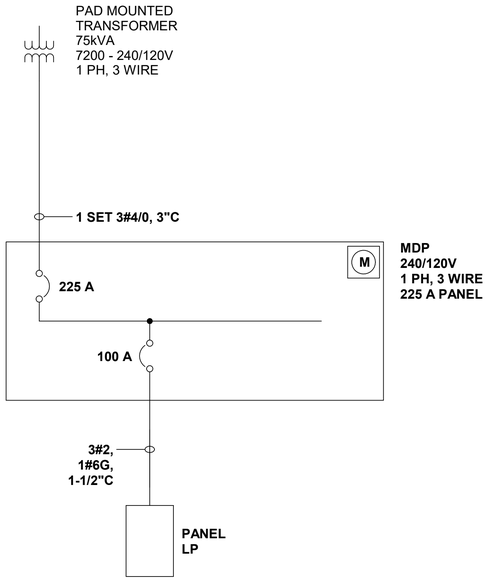
CONTROL TOWER ELECTRICAL DETAILS

SHEET ID
BLDG 1
EP501

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:30:13 PM

File Path: C:\Users\k6enxhit\Documents\FY23_PN96182_MPTR-STDETAILS_ELEC_R21_hunter.t.taylor.rvt



MDP
240/120V
1 PH, 3 WIRE
225 A PANEL

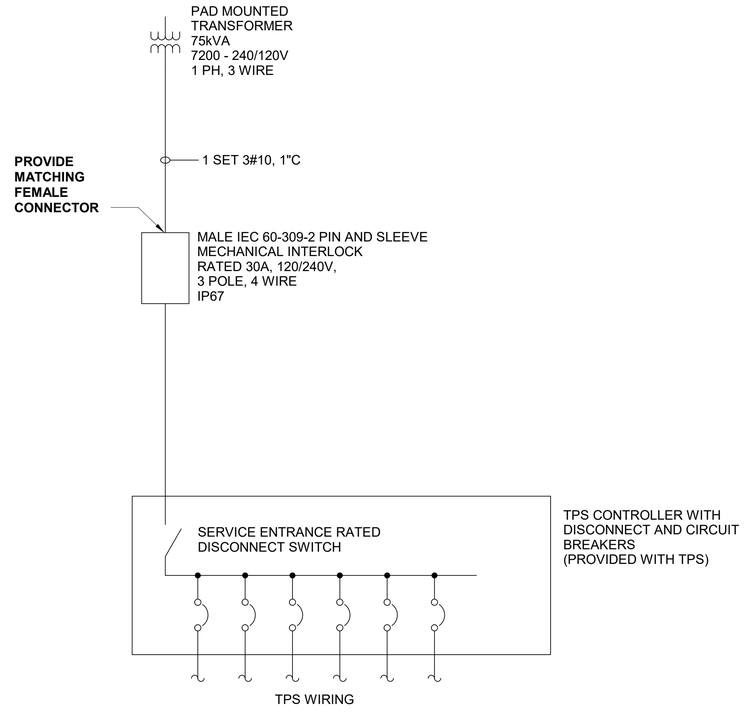
NOTES, POWER ONE-LINE DIAGRAM:

1. SANDHILLS UTILITY SERVICES (SUS) SHALL PROVIDE THE TRANSFORMER, TRANSFORMER PAD, AND PRIMARY DISTRIBUTION CABLES. SUS TO PROVIDE FINAL DETERMINATION OF TRANSFORMER SIZE. SEE SITE ELECTRICAL DRAWINGS FOR MORE INFORMATION AND ADDITIONAL REQUIREMENTS.

2. THE CONTRACTOR SHALL FURNISH AND INSTALL THE SECONDARY CONDUCTORS AND CONDUITS FROM THE MAIN DISTRIBUTION PANEL (MDP) TO THE SECONDARY COMPARTMENT OF THE TRANSFORMER. THE CABLES SHALL BE OF SUFFICIENT LENGTH TO FACILITATE THEIR CONNECTION TO THE SECONDARY LUGS OF THE TRANSFORMER.

3. SEE DETAIL ON EG501 FOR SERVICE ENTRANCE GROUNDING REQUIREMENTS.

1 POWER ONE-LINE DIAGRAM
NOT TO SCALE



NOTES, POWER ONE-LINE DIAGRAM:

1. SANDHILLS UTILITY SERVICES (SUS) SHALL FURNISH AND INSTALL THE TRANSFORMER, TRANSFORMER PAD, AND PRIMARY DISTRIBUTION CABLES. SUS TO PROVIDE FINAL DETERMINATION OF TRANSFORMER SIZE. SEE SITE ELECTRICAL DRAWINGS FOR MORE INFORMATION AND ADDITIONAL REQUIREMENTS.

2. THE CONTRACTOR SHALL FURNISH AND INSTALL THE SECONDARY CONDUCTORS AND CONDUITS FROM THE TPS TO THE SECONDARY COMPARTMENT OF THE TRANSFORMER. THE CABLES SHALL BE OF SUFFICIENT LENGTH TO FACILITATE THEIR CONNECTION TO THE SECONDARY LUGS OF THE TRANSFORMER.

3. SEE SPEC 21 21 00, ATTACHMENT, PARAGRAPHS 2.9, ELECTRICAL REQUIREMENTS AND 2.10, ELECTRICAL WIRING ASSEMBLY, FOR ADDITIONAL REQUIREMENTS.

4. SEE DETAIL ON EG501 FOR SERVICE ENTRANCE GROUNDING REQUIREMENTS

2 POWER ONE-LINE DIAGRAM TANK AND PUMP
NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE MACHINE GUN RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER POWER RISER DIAGRAM

SHEET ID
BLDG 1
EP601

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 4:03:52 PM

File Path: C:\Users\kfeinxhit\Documents\FY23_PN96182_MPTR-TOWER_ELEC_R21_hunter.l.taylor.rvt

Panel: MDP

Location: OBSERVATION ROOM 101
Supply From:
Mounting: Surface
Enclosure: NEMA 1

Volts: 120/240 Single
Phases: 1
Wires: 3

A.I.C. Rating: 10k
Mains Type: MCB
Mains Rating: 225 A
MCB Rating: 225 A

Notes:

CKT	Circuit Description	Trip	Poles	Remarks	A		B		Remarks	Poles	Trip	Circuit Description	CKT
1	Room 101 Quad Receptacle 1	20 A	1		360 VA	2547 VA				2	100 A	Panel LP	2
3	Room 101 Quad Receptacle 2	20 A	1				360 VA	2248 VA	--	--	--	--	4
5	Room 101 Quad Receptacle 3	20 A	1		360 VA	500 VA			FLK	1	20 A	FACP	6
7	Room 101 General Purpose Receptacles	20 A	1				720 VA	50 VA		1	20 A	TPS Heat Trace	8
9	Room 201 Quad Receptacle 1	20 A	1		360 VA	1704 VA				2	20 A	PTHP-1	10
11	Room 201 Quad Receptacle 2	20 A	1				360 VA	1704 VA	--	--	--	--	12
13	Room 201 Quad Receptacle 3	20 A	1		360 VA	1080 VA				2	15 A	PTHP-2	14
15	Room 201 General Purpose Receptacles	20 A	1				720 VA	1080 VA	--	--	--	--	16
17	DTR Rack Receptacle 1	20 A	1		1000 VA	2520 VA				2	25 A	EUH-1	18
19	DTR Rack Receptacle 2	20 A	1				1000 VA	2520 VA	--	--	--	--	20
21	Louver Motor Control	20 A	1		8 VA	3756 VA				2	35 A	EUH-2	22
23	NEC Rack Receptacle 2	20 A	1				1000 VA	3756 VA	--	--	--	--	24
25	Range Cameras	20 A	1		360 VA	5040 VA				2	50 A	EUH-3	26
27	NEC Rack Receptacle 1	30 A	2				500 VA	5040 VA	--	--	--	--	28
29	--	--	--	--	500 VA								30
31													32
33	Spare	20 A	1	--	0 VA	0 VA			--	1	20 A	Spare	34
35	Spare	20 A	1	--			0 VA	0 VA	--	2	20 A	Spare	36
37	Spare	20 A	1	--	0 VA	0 VA			--	--	--	--	38
39	Spare	20 A	1	--			0 VA	0 VA	--	2	30 A	SPD	40
41	Spare	20 A	1	--	0 VA	0 VA			--	--	--	--	42
			Total Load:		20454 VA		21058 VA						
			Total Amps:		170 A		175 A						

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting	735 VA	125.00%	919 VA		
Motor	28208 VA	100.00%	28208 VA	**Total Conn. Load:**	41512 VA
IT	4000 VA	100.00%	4000 VA	**Total Est. Demand:**	42711 VA
General Loads	500 VA	100.00%	500 VA	**Total Conn. Current:**	173 A
Receptacle	3960 VA	100.00%	3960 VA	**Total Est. Demand Current:**	178 A
Fire Protection	50 VA	100.00%	50 VA		
Exterior Lighting	4060 VA	125.00%	5075 VA		

Panel: LP

Location: OBSERVATION ROOM 101
Supply From: MDP
Mounting: Surface
Enclosure: NEMA 1

Volts: 120/240 Single
Phases: 1
Wires: 3

A.I.C. Rating: 10k
Mains Type: MCB
Mains Rating: 100 A
MCB Rating: 100 A

Notes:

CKT	Circuit Description	Trip	Poles	Remarks	A		B		Remarks	Poles	Trip	Circuit Description	CKT
1	Interior White Lighting	20 A	1		337 VA	540 VA			--	2	20 A	Range Limit Markers	2
3	Exterior White Lighting	20 A	1				102 VA	540 VA	--	--	--	--	4
5	Exit Signs	20 A	1		10 VA	247 VA			--	2	20 A	Parking Lighting White	6
7	Obstruction Light	20 A	1				116 VA	247 VA	--	--	--	--	8
9	Control Tower Red Lighting	20 A	1		170 VA	240 VA			--	2	20 A	Parking Lighting Red	10
11								240 VA	--	--	--	--	12
13						366 VA			--	2	20 A	Muster Lighting White	14
15								366 VA	--	--	--	--	16
17						360 VA			--	2	20 A	Muster Lighting Red	18
19								360 VA	--	--	--	--	20
21						122 VA			--	2	20 A	Ammo Dock Lighting White	22
23								122 VA	--	--	--	--	24
25						120 VA			--	2	20 A	Ammo Dock Lighting Red	26
27								120 VA	--	--	--	--	28
29						35 A			--	2	20 A	Flag Pole Lighting Red	30
31								35 VA	--	--	--	--	32
33						0 VA			--	2	20 A	Spare	34
35	Spare	20 A	1	--			0 VA	0 VA	--	--	--	--	36
37	Spare	20 A	1	--	0 VA								38
39	Spare	20 A	1	--			0 VA	0 VA	--	2	30 A	SPD	40
41	Spare	20 A	1	--	0 VA	0 VA			--	--	--	--	42
			Total Load:		2547 VA		2248 VA						
			Total Amps:		21 A		19 A						

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting	735 VA	125.00%	919 VA		
Exterior Lighting	4060 VA	125.00%	5075 VA	**Total Conn. Load:**	4795 VA
				Total Est. Demand:	5994 VA
				Total Conn. Current:	20 A
				Total Est. Demand Current:	25 A

ELECTRICAL CONNECTION SCHEDULE

EQUIPMENT INFORMATION						CONDUCTORS AND RACEWAY			DISCONNECTING MEANS			
MARK	DESCRIPTION	VOLTAGE	PHASE	# OF RUNS	PHASE	GROUND	CONDUIT	TYPE	AMPS	POLES	FUSE	NEMA
EUH-1	ELECTRIC UNIT HEATER	240 V	1	1	2#10	#12	1/2" C	DISC	30 A	2	NF	1
EUH-2	ELECTRIC UNIT HEATER	240 V	1	1	2#8	#12	1" C	DISC	60 A	2	NF	1
EUH-3	ELECTRIC UNIT HEATER	240 V	1	1	2#6	#12	1" C	DISC	60 A	2	NF	1
PTHP-1	HEAT PUMP	240 V	1	1	2#12	#12	1/2" C	DISC	30 A	2	NF	3R
PTHP-2	HEAT PUMP	240 V	1	1	2#12	#12	1/2" C	DISC	30 A	2	NF	3R

PANEL SCHEDULE NOTES:

1. REVISE PANEL SCHEDULE DIRECTORIES TO REFLECT FINAL INSTALLATION CONDITIONS. THE CONTRACTOR SHALL LEGIBLY IDENTIFY EACH CIRCUIT IN THE PANEL SCHEDULE DIRECTORY WITH A DESCRIPTION OF EACH LOAD SERVED AND THEIR RESPECTIVE ROOM LOCATIONS. THE IDENTIFICATION SHALL INCLUDE AN APPROVED DEGREE OF DETAIL THAT ALLOWS EACH CIRCUIT TO BE DISTINGUISHED FROM ALL OTHERS. SPARE BREAKERS SHALL BE LABELED AS SUCH. THE AS-BUILT DRAWINGS SHALL REFLECT THE FIELD LABELED CIRCUIT DIRECTORIES.

2. IF THE AIC RATINGS INDICATED DO NOT CORRESPOND TO A STANDARD BREAKER RATING, THE NEXT HIGHER STANDARD RATING SHALL BE USED.

3. THE REMARKS COLUMN OF PANEL SCHEDULES INDICATES THAT CIRCUIT BREAKERS FOR RESPECTIVE CIRCUITS SHALL BE PROVIDED WITH THE FOLLOWING FUNCTIONS:
   A - CIRCUIT BREAKER SHALL BE COMBINATION TYPE AFCI BREAKER PER NEC 210.12.
   A/G - CIRCUIT BREAKER SHALL BE DUAL-FUNCTION COMBINATION TYPE AFCI & GFCI.
   FA - NFPA-COMPLIANT CIRCUIT BREAKER LOCK KIT WITH CIRCUIT LOCKOUT TAB, HEX KEY, AND LABELS.
   G - CIRCUIT BREAKER SHALL BE GFCI.

4. PERMANENT ARC FLASH LABELS SHALL BE INSTALLED ON ALL EQUIPMENT IN ACCORDANCE WITH SPEC 26 28 01.00 10. LABELS SHALL INCLUDE DEVICE NAME, DEVICE RATING, POWER SOURCE, AND ARC FLASH DATA.

US Army Corps of Engineers ®

MARK	DATE	DESCRIPTION
1	17AUG2023	REVISED IN ACCORDANCE WITH AMENDMENT 0004

DESIGN BY: H. TAYLOR
DRAWN BY: H. TAYLOR
CHECKED BY: R. DAVIS
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-85-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER PANEL SCHEDULES

SHEET ID
BLDG 1
EP701

READY TO ADVERTISE (RTA)

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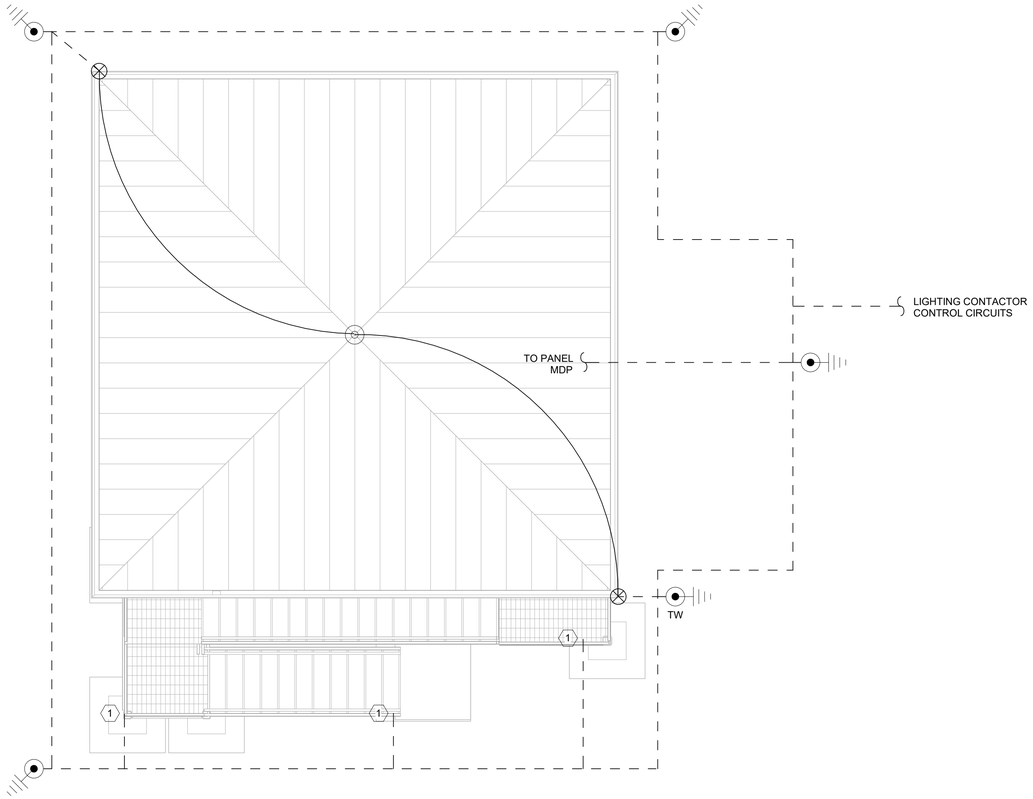

1 LIGHTNING PROTECTION PLAN
1/4" = 1'-0"

4 3 2 1 0 4 8

GENERAL SHEET NOTES

1. LIGHTNING PROTECTION CONDUCTORS PASSING THROUGH CONCRETE FOUNDATION, SLABS OR PADS SHALL BE ROUTED IN CONDUIT.

2. INSTALLED LIGHTNING PROTECTION SYSTEM SHALL BE FIELD INSPECTED BY CONTRACTOR-PROVIDED INDEPENDENT TESTING AGENCY AND FURNISHED WITH A UL MASTER LABEL FOR LIGHTNING PROTECTION SYSTEM.

3. CONDUIT FOR DOWN CONDUCTORS SHALL ROUTE DOWN THE EXTERIOR WALL. PAINT CONDUITS TO MATCH EXTERIOR WALL COLOR.

KEYED NOTES ⟨#⟩

1	COUNTERPOISE SHALL BE ELECTRICALLY BONDED WITH THE METALLIC STAIRWAY.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

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CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
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SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN #6182
VOLUME 2 - BUILDING

CONTROL TOWER LIGHTNING PROTECTION PLAN

SHEET ID
BLDG 1
EG101

Plot Date: 11/28/2023 4:03:45 PM

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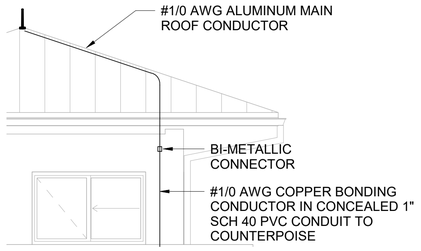


NOTES:

1. DOWN CONDUCTORS SHALL BE ROUTED TO AVOID WINDOWS.

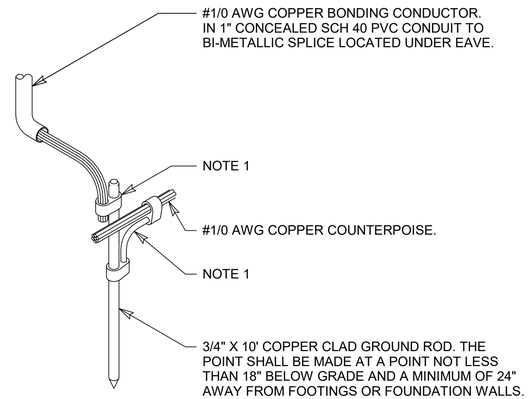
2. NO BEND OF A CONDUCTOR SHALL FORM AN INCLUDED ANGLE OF LESS THAN 90 DEGREES, NOR SHALL IT HAVE A RADIUS OF BEND LESS THAN 8 INCHES.

3. CONDUCTORS SHALL BE PERMITTED TO BE COURSED THROUGH AIR WITHOUT SUPPORT FOR A DISTANCE OF 3 FEET OR LESS.

4. CONDUIT FOR DOWN CONDUCTORS SHALL ROUTE DOWN THE EXTERIOR WALL. PAINT CONDUITS TO MATCH EXTERIOR WALL COLOR.

1 DOWN CONDUCTOR AT EAVES

NOT TO SCALE

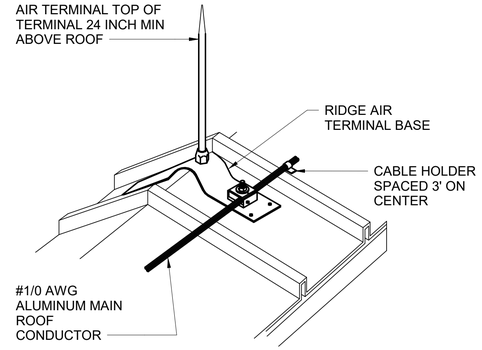


NOTES:

1. ALL CONNECTIONS TO GROUND RODS BELOW GROUND LEVEL MUST BE BY EXOTHERMIC WELD CONNECTION.

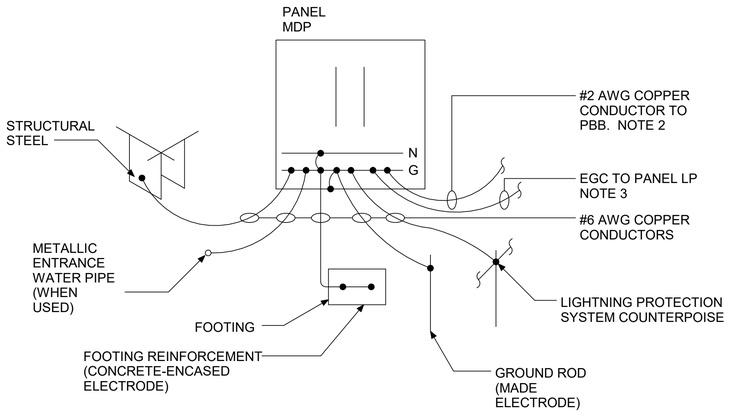
2 DOWN CONDUCTOR & COUNTERPOISE CONNECTION

NOT TO SCALE



3 SSMR RIDGE ROOF AIR TERMINAL

NOT TO SCALE



NOTES:

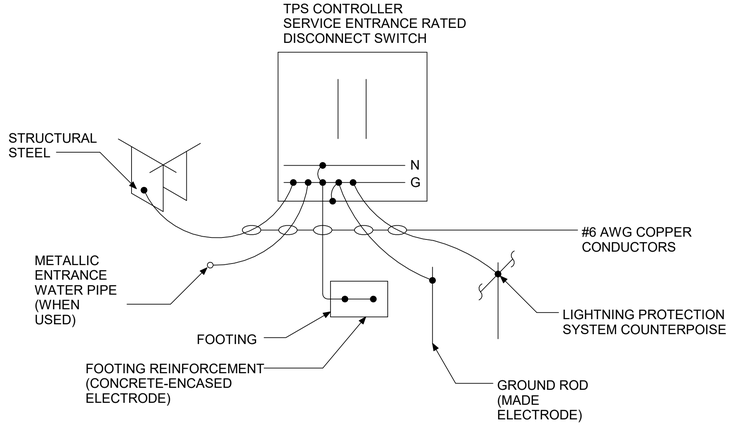
1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC, ARTICLE 250. VARIATIONS TO GROUNDING SHOWN SHALL BE APPROVED BY THE COR.

2. SEE TN603 FOR ADDITIONAL GROUNDING REQUIREMENTS FOR COMMUNICATIONS.

3. PANEL LP SHALL BE GROUNDED TO PANEL MDP GROUND BUS VIA EQUIPMENT GROUNDING CONDUCTOR (EGC). SIZE INDICATED ON POWER ONE-LINE DIAGRAM.

4 SERVICE ENTRANCE GROUNDING DETAIL

NOT TO SCALE



NOTES:

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC, ARTICLE 250. VARIATIONS TO GROUNDING SHOWN SHALL BE APPROVED BY THE COR.

5 TPS SERVICE ENTRANCE GROUNDING DETAIL

NOT TO SCALE

US Army Corps of Engineers ®

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DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
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CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

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SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

CONTROL TOWER GROUNDING DETAILS

SHEET ID
BLDG 1
EG501

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COMMUNICATIONS LEGEND

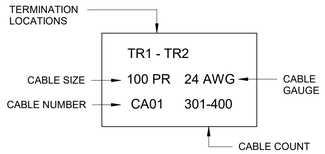
WP	VOIP TELEPHONE OUTLET WITH (1) CATEGORY 6, 8P8C CONNECTOR. "WP" INDICATES A WEATHERPROOF COVER. MH = 54" AFF UOI.
	NIPR OUTLET WITH (2) CATEGORY 6, 8P8C CONNECTORS AND (2) BLANK POSITIONS. OUTLET HOMERUNS TO NEC RACK. MH = 18" AFF UOI.
	DTR OUTLET WITH (2) CATEGORY 6, 8P8C CONNECTORS AND (2) BLANK POSITIONS. OUTLET HOMERUNS TO DTR. MH = 18" AFF UOI.
	3/4" A-C, VOID-FREE, FIRE-RETARDANT PLYWOOD BACKBOARD WITH NO ADDED UREA FORMALDEHYDE. SEE SPECIFICATION 01 33 29 FOR FOREST STEWARDSHIP COUNCIL (FSC) CERTIFICATION REQUIREMENTS.
	7-FT, 19-INCH ALUMINUM RACK WITH VERTICAL WIRE MANAGEMENT ASSEMBLY.
	48"H X 24"W X 30"D WALL-MOUNTED CABINET.
	CABLE RUNWAY OR WIREWAY, TYPE AND SIZE AS INDICATED.
PBB	TELECOMMUNICATIONS MAIN GROUND BAR, MH 18" AFF.
SBB	TELECOMMUNICATIONS GROUND BAR, MH 18" AFF.
J	JUNCTION BOX, WALL MOUNTED, MH 18" AFF UOI.
J	JUNCTION BOX, CEILING MOUNTED.

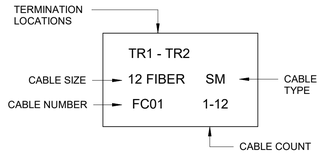
VIDEO SURVEILLANCE SYSTEM LEGEND

GFGI CAMERA. PROVIDE 1-1/4" RGS CONDUIT TO DTR RACK. REFER TO VOLUME 4 ES517 FOR MOUNTING DETAILS.

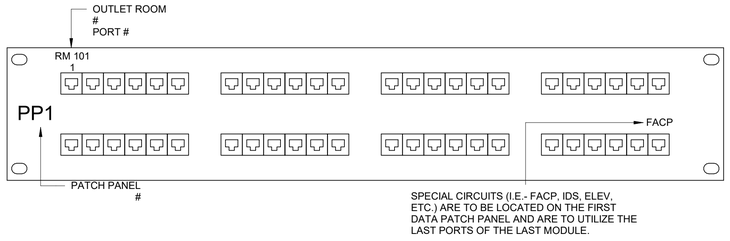
COMMUNICATION LABELING SCHEME

BACKBONE CABLES LABELING SCHEME

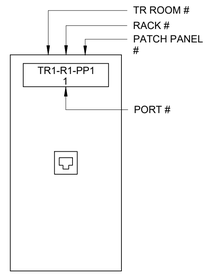


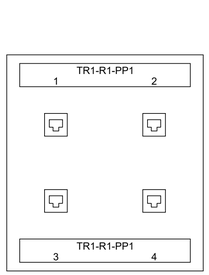


PATCH PANELS LABELING SCHEME



OUTLETS LABELING SCHEME





JACKS SHALL BE ARRANGED AND LABELED ACCORDING TO THEIR LOCATIONS IN A ROOM. THEY SHALL BE ARRANGED CLOCKWISE IN ASCENDING ORDER AROUND THE ROOM WHILE STANDING IN THE DOORWAY LOOKING INTO THE ROOM. FLOOR JACK NUMBER ARRANGEMENT SHOULD WORK IN CLOCKWISE ORDER LOOKING OUT THE TR DOORWAY. THIS LABELING SCHEME ADHERES TO THE REQUIRMENTS OUTLINED IN THE ANSI/TIA 606-B TELECOMMUNICATION STANDARD.

GENERAL NOTES

NOTES, COMMUNICATIONS:

1. ALL COMMUNICATIONS WORK SHALL BE MEET THE REQUIREMENTS OF THE I3A CRITERIA, EIA/TIA STANDARDS, AND THE NEC.

2. VOICE AND DATA OUTLET CABLING RATED CATEGORY 6 PER ANSI/TIA 568-D STANDARD.

3. FOR CATEGORY 6 CABLING, A MINIMUM OF 10 FT OF CABLE SLACK SHALL BE PROVIDED AT THE COMMUNICATIONS ROOM AND A MINIMUM OF 1 FT OF CABLE SLACK SHALL BE PROVIDED IN THE SUSPENDED CEILING FOR THE TELECOMMUNICATIONS OUTLET. THE REQUIRED CABLE SLACK LENGTHS ARE IN ADDITION TO THE TOTAL CABLE LENGTHS REQUIRED TO REACH THE TELECOMMUNICATIONS OUTLETS.

4. ALL CONDUIT TO COMMUNICATIONS OUTLET BOXES SHALL BE A MINIMUM OF 1" EMT UNLESS OTHERWISE INDICATED. CONDUITS SHALL BE CONCEALED IN CEILINGS AND WALLS, EXCEPT WHERE SPECIFICALLY OTHERWISE INDICATED.

5. PULL BOXES SHALL BE PLACED IN CONDUIT RUNS WHERE A CONTINUOUS CONDUIT LENGTH EXCEEDS 100 FEET, OR WHERE THERE ARE MORE THAN TWO 90 DEGREE BENDS. PULL BOXES SHALL BE PLACED IN STRAIGHT, ALIGNED RUNS OF CONDUIT AND NOT BE USED IN LIEU OF A BEND. PULLBOXES SHALL BE DIRECTLY ACCESSIBLE.

6. ALL COMMUNICATIONS CABLE TRAY, CONDUITS, AND WIRING SHALL BE INSTALLED AND ROUTED IAW THE TIA 569-D, UFC 3-580-01, AND THE FT. BRAGG IDC, 2017.

7. PROVIDE PIPE SLEEVES FOR POWER AND COMMUNICATIONS ENTRANCE AND EXIT CONDUITS THROUGH SLABS AT THE TIME OF THE CONSTRUCTION OF THE SLAB. NO DRILLING OR PUNCHING THROUGH SLABS WILL BE ALLOWED. ALL COMMUNICATIONS CONDUITS IN OR BELOW THE SLAB MUST RISE THROUGH THE SLAB USING RIGID STEEL CONDUIT. THE TRANSITION FROM PVC TO RIGID STEEL CONDUIT MUST TAKE PLACE PRIOR TO THE SWEEP UP TO THE BLDG. (AT THE 90-DEGREE BEND).

8. SEAL PENETRATIONS THROUGH FLOORS AND FIRE WALLS TO MAINTAIN THE INTEGRITY OF THE FIRE AND ACOUSTIC RATINGS OF THE WALLS AND FLOORS.

9. LAN ELECTRONICS SHALL BE GOVERNMENT-FURNISHED, GOVERNMENT-INSTALLED EQUIPMENT. ALL OTHER EQUIPMENT, CABLING, AND COMPONENTS NECESSARY TO PROVIDE A COMPLETE AND FULLY FUNCTIONAL TELECOMMUNICATIONS SYSTEM SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. TESTING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE I3A, ANSI/TIA STANDARDS, AND SHALL BE COMPLETED BY THE CONTRACTOR AND APPROVED BY THE COMMISSIONING AGENT THROUGH THE CONTRACTING OFFICER'S REPRESENTATIVE (COR).

10. A MINIMUM OF 36 INCHES OF SPACE SHALL BE PROVIDED BOTH IN FRONT OF AND BEHIND THE RACK AND BEHIND ANY INSTALLED EQUIPMENT. A MINIMUM SIDE CLEARANCE OF 24 INCHES SHALL BE PROVIDED ON THE END OF THE RACKS. PROVIDE 100 PERCENT SPARE RACK CAPACITY BASED ON THE AMOUNT OF RACK CAPACITY UTILIZED BY THE PATCH PANELS PROVIDED.

ABBREVIATIONS

ACS	ACCESS CONTROL SYSTEM
AFF	ABOVE FINISHED FLOOR
C	CONDUIT
CATV	CABLE TELEVISION
CKT	CIRCUIT
CFCI	CONTRACTOR-FURNISHED, CONTRACTOR-INSTALLED
COR	CONTRACTING OFFICER'S REPRESENTATIVE
CU	COPPER
DMS	DOOR MONITORING SYSTEM
DTR	DATA TERMINATION RACK
DVI	DIGITAL VIDEO INPUT
FACP	FIRE ALARM CONTROL PANEL
GFCI	GOVERNMENT-FURNISHED, GOVERNMENT-INSTALLED
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFGI	GOVERNMENT-FURNISHED, GOVERNMENT-INSTALLED
G	GROUND
GND	GROUND
HZ	HERTZ
I3A	TECHNICAL CRITERIA FOR THE INSTALLATION INFORMATION INSTALLATION ARCHITECTURE, FEB 2010
IDS	INTRUSION DETECTION SYSTEM
MFR	MANUFACTURER
MH	MOUNTING HEIGHT
MNS	MASS NOTIFICATION SYSTEM
MTD	MOUNTED
NEC	NFPA 70, NATIONAL ELECTRICAL CODE, 2014
NO	NUMBER
NTS	NOT TO SCALE
SPD	SURGE PROTECTIVE DEVICE
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UOI	UNLESS OTHERWISE INDICATED
UON	UNLESS OTHERWISE NOTED
W, WP	WEATHERPROOF

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER LEGEND AND NOTES

SHEET ID
BLDG 1
T-001

READY TO ADVERTISE (RTA)

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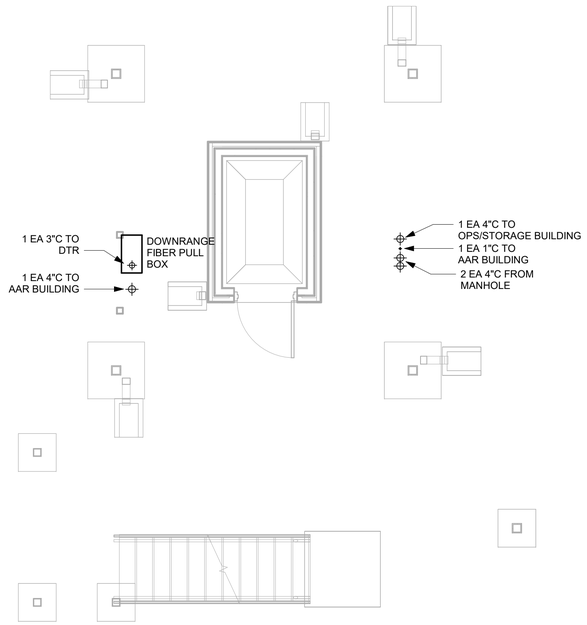
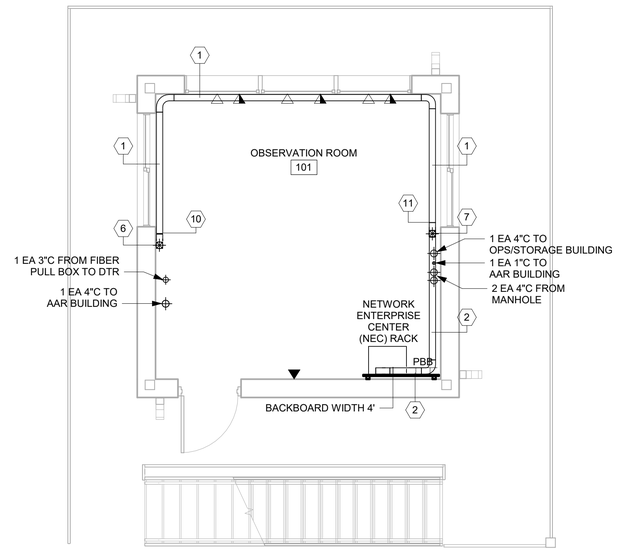
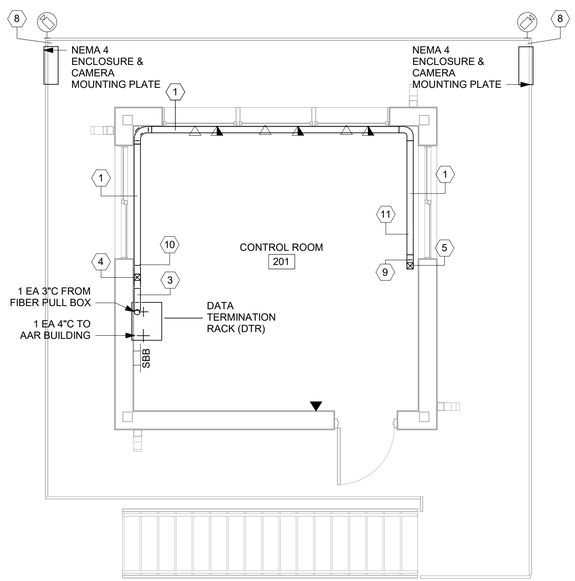
Plot Date: 11/28/2023 3:30:16 PM



1 GROUND FLOOR TELECOMMUNICATIONS PLAN
1/4" = 1'-0"



2 FIRST FLOOR TELECOMMUNICATIONS PLAN
1/4" = 1'-0"



3 SECOND FLOOR TELECOMMUNICATIONS PLAN
1/4" = 1'-0"

GENERAL SHEET NOTES

KEYED NOTES

1	2 EACH 4" x 4" ENCLOSED WIREWAY. MOUNTING HEIGHTS AT 24" AFF FOR DTR RACK WIREWAY AND 6" AFF FOR NEC RACK WIREWAY.
2	4" x 4" ENCLOSED WIREWAY TO NEC RACK. MOUNTED AT 8' 6".
3	4" x 4" ENCLOSED WIREWAY TO DTR RACK. MOUNTED AT 8' 6".
4	4" x 4" VERTICAL ENCLOSED DTR WIREWAY TO 1ST FLOOR. PROVIDE WIREWAY TEE CONNECTION TO CONNECT TO HORIZONTAL WIREWAYS.
5	4" x 4" VERTICAL ENCLOSED NEC WIREWAY FROM 1ST FLOOR.
6	4" x 4" VERTICAL ENCLOSED DTR WIREWAY FROM 2ND FLOOR.
7	4" x 4" VERTICAL ENCLOSED NEC WIREWAY TO 2ND FLOOR. PROVIDE WIREWAY TEE CONNECTION TO CONNECT TO HORIZONTAL WIREWAYS.
8	FOR CAMERA AND CAMERA ENCLOSURE MOUNTING DETAILS, SEE VOLUME 4 SHEET ES517.
9	4" x 4" VERTICAL ENCLOSED WIREWAY ELBOW FROM NEC RACK. CONNECTS TO NEC RACK WIREWAY.
10	NEC WIREWAY STOPS HERE.
11	DTR WIREWAY STOPS HERE.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR
DRAWN BY: H. TAYLOR
CHECKED BY: R. DAVIS
SUBMITTED BY: J. DEACON
SIZE: ANSI D
FILE NAME:
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

CONTROL TOWER COMMUNICATIONS PLAN

SHEET ID
BLDG 1
TN101

File Path: C:\Users\k6enxhit\Documents\FY23_PN98182_MPTR-TOWER_ELEC_R21_hunter.l.taylor.rvt
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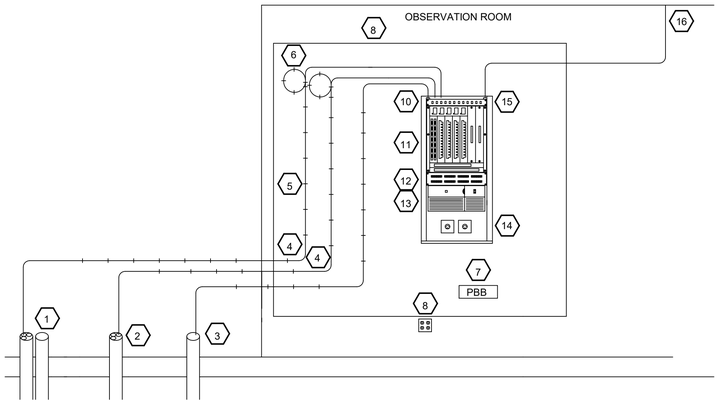


NEC COMMUNICATIONS RACK DIAGRAM AND KEYED NOTES

1. TWO (2) EACH 4-INCH CONDUITS TO MANHOLE. ONE CONDUIT SHALL CONTAIN3 EACH 3-INCH 3-CELL FABRIC MESH WITH TRACER WIRE ATTACHED AND PULL STRING IN ALL VACANT CELLS. ALL VACANT DUCTS SHALL HAVE PULL STRINGS.

2. ONE (1) EACH 4-INCH CONDUIT TO OPERATIONS/STORAGE BUILDING. CONDUIT SHALL CONTAIN1 EACH 3-CELL FABRIC MESH WITH TRACER WIRE ATTACHED AND PULL STRING IN ALL VACANT CELLS. ALL VACANT DUCTS SHALL HAVE PULL STRINGS.

3. ONE (1) EACH 1-INCH CONDUIT TO AAR BUILDING CONTAINING TWO CATEGORY 6 CABLES TO AAR BUILDING NIPR OUTLET.

4. FIBER OPTIC CABLES. SEE VOLUME 1, SHEET ES604 FOR QUANTITIES.

5. CABLE MANAGEMENT RINGS.

6. 20-FT FIBER MAINTENANCE LOOP.

7. TELECOMMUNICATIONS PRIMARY BONDING BUSBAR (PBB). ALL GROUND LUGS SHALL BE TWO-HOLE COMPRESSION CRIMP-TYPE LUG FITTINGS.

8. QUAD 120VAC RECEPTACLES, MOUNTED 18" AFF (TYP). QUANTITIES AND LOCATIONS PER POWER PLANS.

9. FIRE-RETARDANT, 3/4" THICK, 8' TALL, WIDTH AS INDICATED ON PLANS, TYPE A/C PLYWOOD BACKBOARD. PLYWOOD MUST BE APPROVED BY NEC QA/QC BEFORE INSTALLATION. INSTALL PLYWOOD BACKBOARDS WITH THE "A" SIDE FACING OUT AND THE MANUFACTURER'S FIRE RETARDENT STAMP SHALL BE VISIBLE

10. 12-PORT (1U), SINGLE-MODE, FIBER OPTIC PATCH PANEL WITH FIBER TRAY AND DUPLEX LC CONNECTORS FOR SERVICE ENTRANCE FIBER OPTIC CABLES.

11. LOCAL AREA NETWORK (LAN) ELECTRONICS SHALL BE GFGI. CONTRACTOR SHALL PROVIDE AND INSTALL FIBER OPTIC PATCH CABLES PLUS 25% SPARE.

12. CABINET-MOUNTED, CATEGORY 6, 48-PORT, RJ45 PATCH PANELS FOR DATA, QUANTITIES AS REQUIRED.

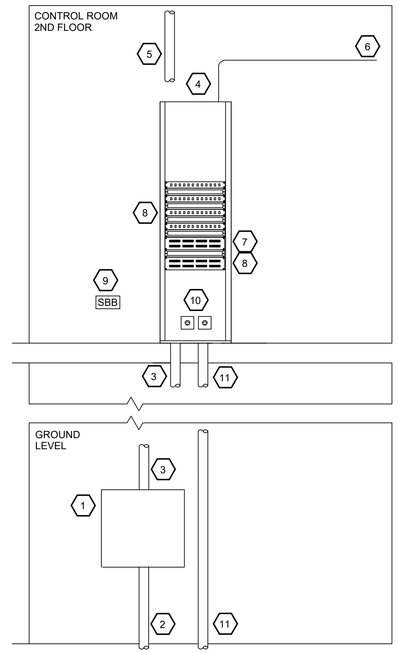
13. CABINET-MOUNTED, UNINTERRUPTIBLE POWER SUPPLY (UPS) SHALL BE GFCI.

14. AC POWER RECEPTACLES, MOUNTED PER DETAIL ON SHEET EP501. TYPES AND QUANTITIES PER POWER PLANS.

15. NEC CABINET. 42"H x 24"W x 30"D WALL-MOUNT CABINET.

16. CATEGORY 6 CABLING IN WIREWAY TO OUTLET. OUTLET LOCATIONS PER COMMUNICATIONS PLANS.

1 DIAGRAM - CONTROL TOWER NEC
NOT TO SCALE



DTR COMMUNICATIONS RACK DIAGRAM AND KEYED NOTES

1. 24" W x 24" H x 12" D NEMA 4 FIBER PULL BOX MOUNTED BELOW TOWER. THE RANGE DATA CABLES WILL ENTER THE CONTROL TOWER THROUGH THE FIBER PULL BOX. COIL THE DATA CABLING FOR THE SERVICE LOOP INSIDE THE PULL BOX. ROUTE THE CABLING THROUGH CONDUITS TO THE DATA TERMINATION RACK (DTR) ON THE 2ND FLOOR.

2. CONDUIT FROM DOWNRANGE TARGETS. FOR SIZE AND ROUTING OF CONDUIT, SEE VOLUME 4, SHEET TN400.

3. ONE (1) EACH 3-INCH CONDUIT.

4. THE DATA TERMINATION RACK (DTR) SHALL BE HINGED, WALL-MOUNTED, 30-INCH DEEP, 24-INCH WIDE CABINET WITH 68-INCH RACKING HEIGHT. THE DTR SHALL HAVE REMOVABLE SIDE PANELS AND VENTED DOORS. TERMINATE THE RANGE DATA CABLES ON FIBER OPTIC PATCH PANELS. BOND THE DTR TO THE SBB WITH A #6 AWG CU BONDING CONDUCTOR.

5. CONDUIT TO TOWER MOUNTED CAMERAS. FOR SIZE AND TYPE, SEE VOLUME 4 SHEET ES521.

6. CATEGORY 6 CABLING IN PATHWAYS TO WIREWAY. OUTLET LOCATIONS PER COMMUNICATIONS PLANS.

7. RACK-MOUNTED, CATEGORY 6, 48-PORT, RJ45 PATCH PANEL FOR DTR OUTLETS.

8. CABLE WIRE MANAGEMENT PANELS, QUANTITIES AS REQUIRED.

9. TELECOMMUNICATIONS SECONDARY BONDING BUSBAR (SBB). ALL GROUND LUGS SHALL BE TWO-HOLE COMPRESSION CRIMP-TYPE LUG FITTINGS.

10. RACK-MOUNTED RECEPTACLES, SEE EP501 FOR DETAIL.

11. ONE (1) EACH 4-INCH CONDUIT TO AAR BUILDING DTR.

2 DIAGRAM - CONTROL TOWER DTR
NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
H. TAYLOR	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
H. TAYLOR	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
R. DAVIS	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER COMMUNICATIONS DETAILS

SHEET ID
BLDG 1
TN501

READY TO ADVERTISE (RTA)

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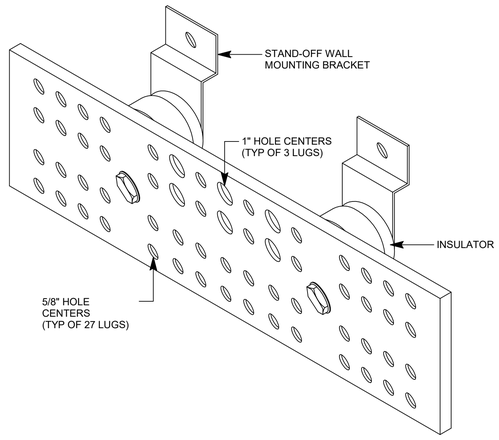
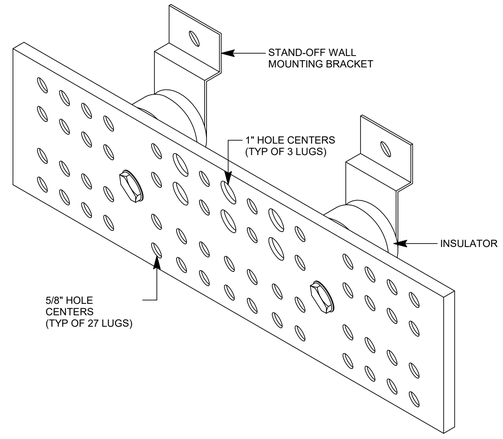


NOTES:

1. THE PBB DIMENSIONS SHALL BE 20" L x 4" W x 1/4" H.
2. THE PBB SHALL BE UL LISTED.
3. THE PBB MOUNTING BRACKETS SHALL BE STAINLESS STEEL.
4. ALL CONNECTIONS TO THE PBB SHALL BE MADE USING TWO-HOLE COMPRESSION CRIMP-TYPE LUG FITTINGS.

1 DETAIL - PRIMARY BONDING BUSBAR (PBB)
NOT TO SCALE



NOTES:

1. THE SBB DIMENSIONS SHALL BE 20" L x 4" W x 1/4" H.
2. THE SBB SHALL BE UL LISTED.
3. THE SBB MOUNTING BRACKETS SHALL BE STAINLESS STEEL.
4. ALL CONNECTIONS TO THE SBB SHALL BE MADE USING TWO-HOLE COMPRESSION CRIMP-TYPE LUG FITTINGS.

2 DETAIL - SECONDARY BONDING BUSBAR (SBB)
NOT TO SCALE

US Army Corps of Engineers ®

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DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
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CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

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100 W. OGLETHORPE AVE.
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

CONTROL TOWER COMMUNICATIONS DETAILS

SHEET ID
BLDG 1
TN502

READY TO ADVERTISE (RTA)

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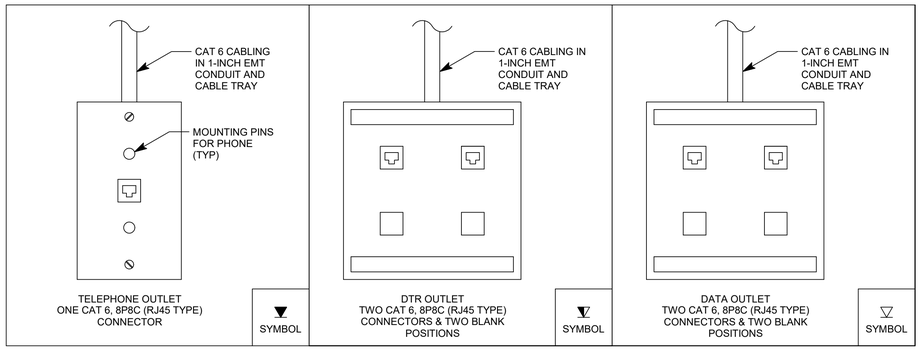
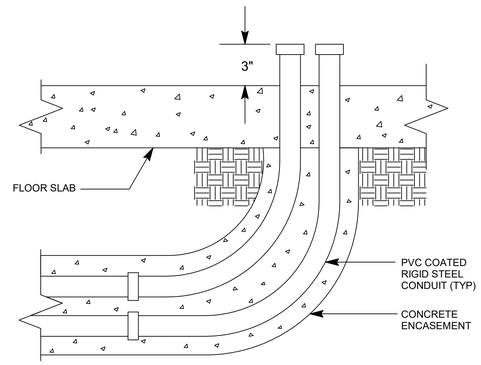


1 TYPICAL COMMUNICATIONS WALL OUTLET DETAIL

NOT TO SCALE



TELECOMMUNICATIONS SERVICE ENTRANCE DETAIL

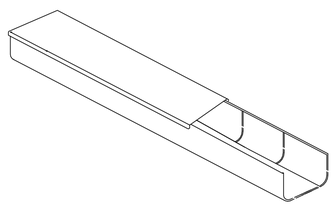
NOT TO SCALE

NOTES:

1. PROVIDE NUMBER OF CONDUITS AS SHOWN ON CONDUIT RISER DIAGRAM, TN601.
2. BOND CONDUITS TO PBB/SBB.
3. PROVIDE MECHANICAL PLUGS FOR EMPTY CONDUITS.

2 TELECOMMUNICATIONS SERVICE ENTRANCE DETAIL

NOT TO SCALE



NOTES:

1. DIMENSIONS AS INDICATED ON PLANS

3 DETAIL - WIREWAY

NOT TO SCALE

US Army Corps of Engineers ®

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SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER COMMUNICATIONS DETAILS

SHEET ID
BLDG 1
TN503

File Path: C:\Users\k6enxhil\Documents\FY23_PN96182_MPTR-STDETAILS_ELEC_R21_hunter.t.taylor.rvt

Plot Date: 11/28/2023 3:30:19 PM

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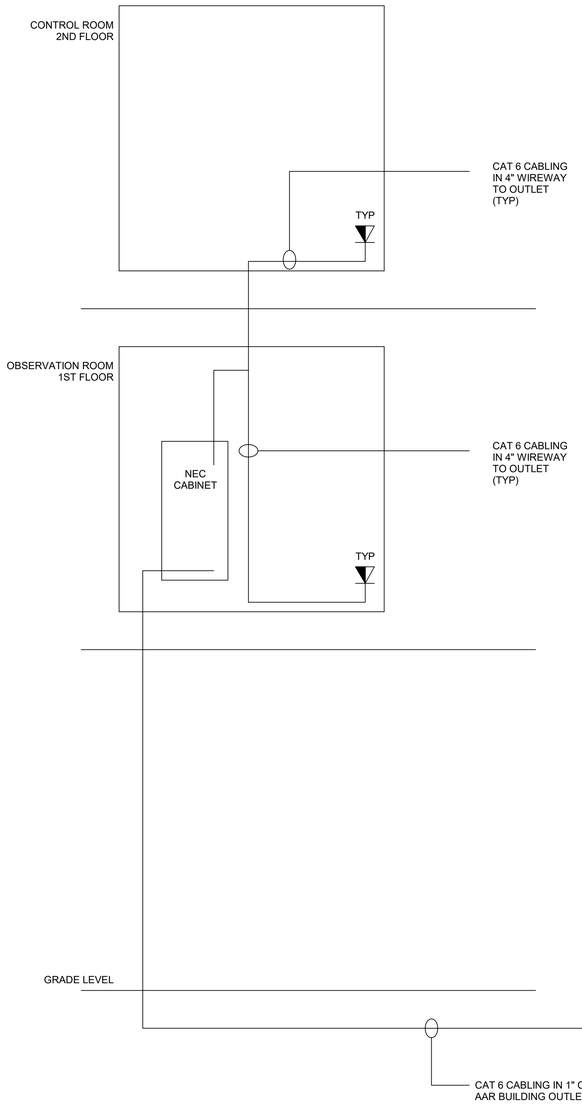
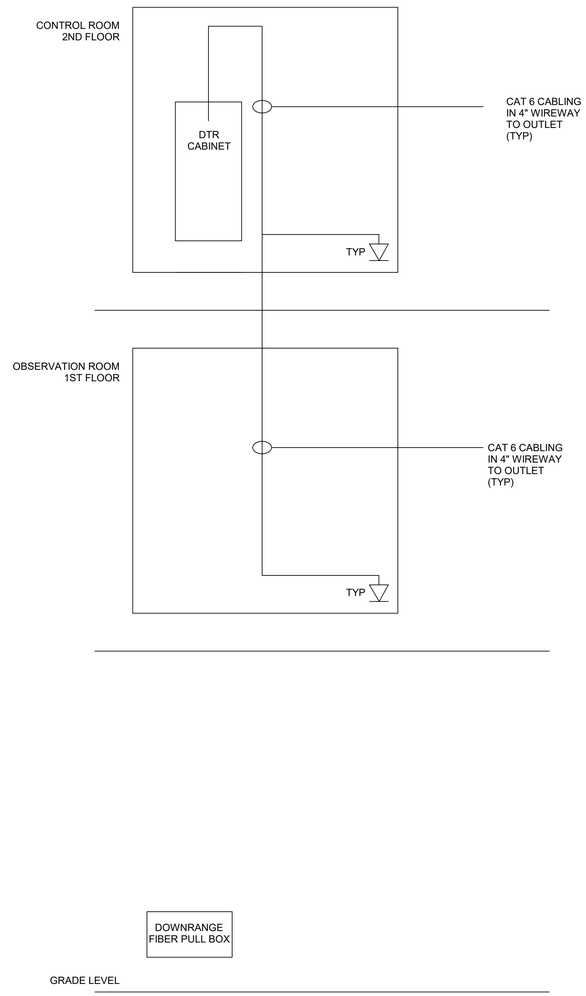


1 TELECOMMUNICATIONS - NEC COPPER RISER

NOT TO SCALE



2 TELECOMMUNICATIONS - DTR COPPER RISER

NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

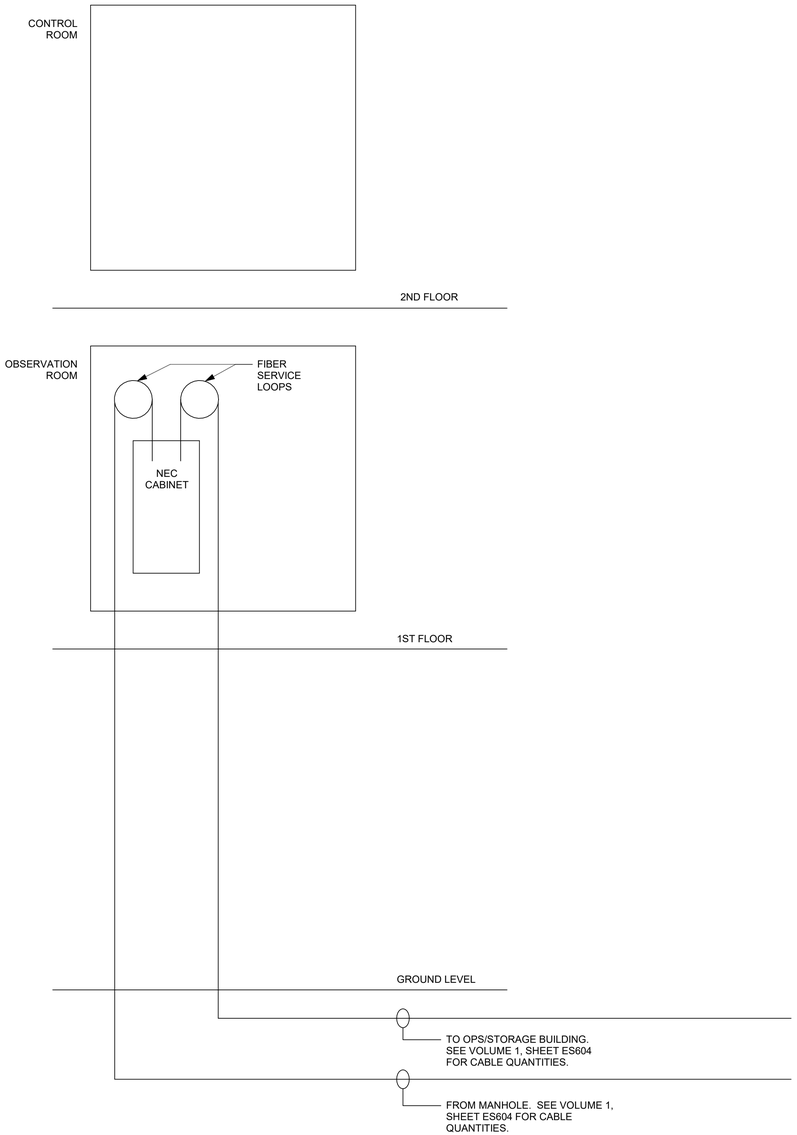
CONTROL TOWER COMMUNICATIONS DIAGRAMS

SHEET ID
BLDG 1
TN601

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 4:03:57 PM

File Path: C:\Users\kfeinxhit\Documents\FY23_PN96182_MPTR-TOWER_ELEC_R21_hunter.l.taylor.rvt

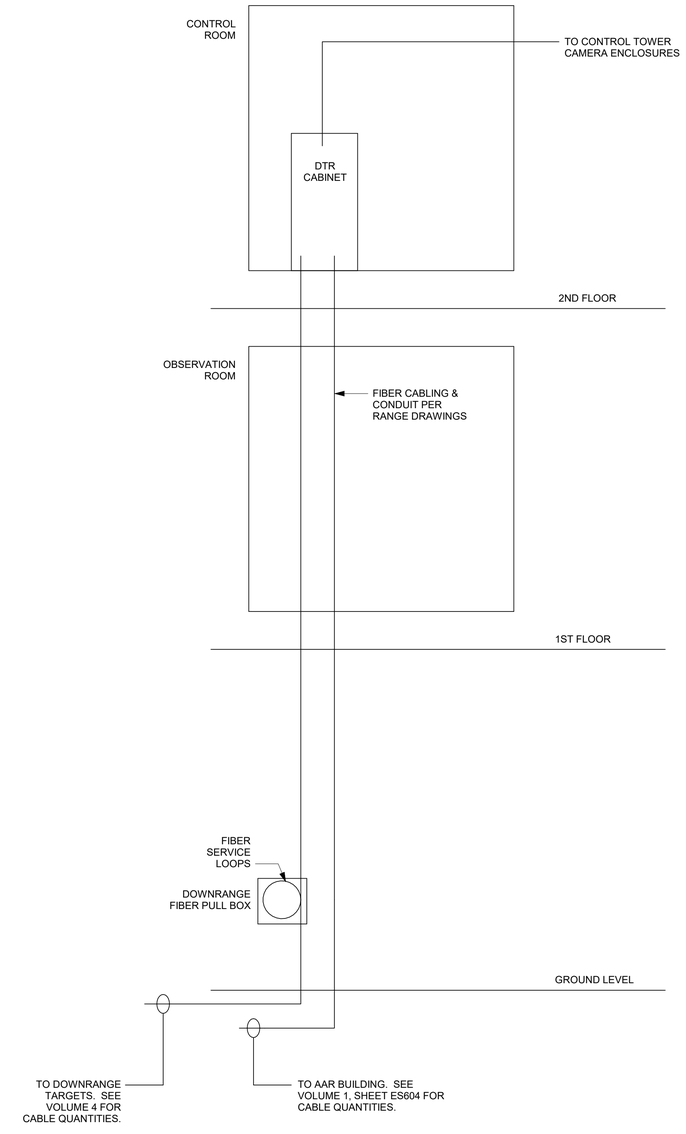


NOTES:

1. SEE SHEET TN501 FOR INFORMATION ON FIBER OPTIC CABLE SERVICE LOOP INSTALLATION.

1 TELECOMMUNICATIONS - NEC FIBER RISER

NOT TO SCALE



NOTES:

1. SEE SHEET TN501 FOR INFORMATION ON FIBER OPTIC CABLE SERVICE LOOP INSTALLATION.

2 TELECOMMUNICATIONS - DTR FIBER RISER

NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER COMMUNICATIONS DIAGRAMS

SHEET ID
BLDG 1
TN602

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 4:03:57 PM

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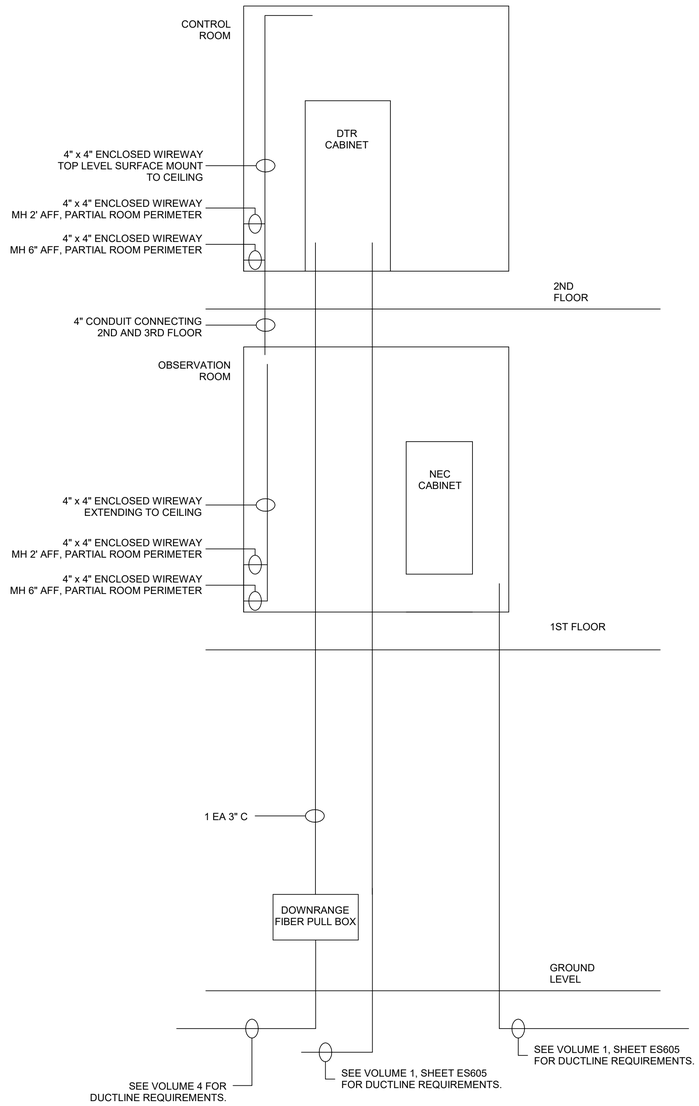
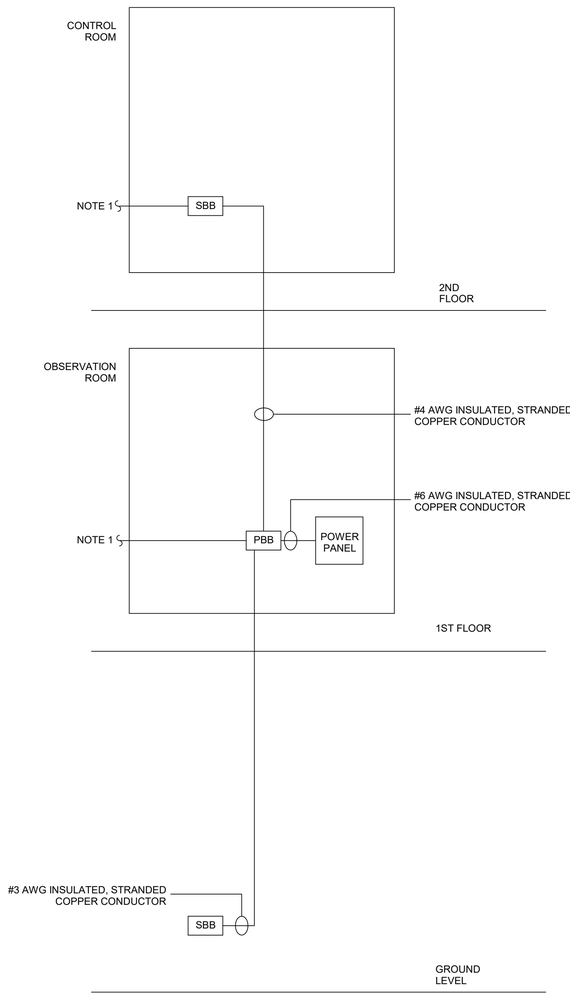


1 TELECOMMUNICATIONS CONDUIT RISER DIAGRAM
NOT TO SCALE



2 TELECOMMUNICATIONS GROUNDING DIAGRAM
NOT TO SCALE

TELECOMMUNICATIONS GROUNDING RISER DIAGRAM NOTES:

1. BOND RACKS, EQUIPMENT ENCLOSURES, FOC ARMOR, AND METALLIC CONDUITS TO THE PBB (OR SBB) WITH #6 AWG CONDUCTOR. EACH BONDING CONDUCTOR SHALL HAVE ITS OWN DEDICATED BONDING CONDUCTOR TO THE PBB OR SBB.

US Army Corps of Engineers ®

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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23 - PN 96182
VOLUME 2 - BUILDING

CONTROL TOWER COMMUNICATIONS DIAGRAM

SHEET ID
BLDG 1
TN603

File Path: C:\Users\kbenxhill\Documents\FY23_PN96182_MPTR-TOWER_ELEC_R21_hunter.l.taylor.rvt

Plot Date: 11/28/2023 4:03:58 PM

READY TO ADVERTISE (RTA)

DESIGN CODE NOTES:

D-1. STRUCTURAL DESIGN IS IN ACCORDANCE WITH THE FOLLOWING CODES AND SPECIFICATIONS:

A. IBC 2018, INTERNATIONAL BUILDING CODE

B. ASCE 7-16, MINIMUM DESIGN LOADS FOR BUILDINGS AND STRUCTURES

C. ACI 318-14, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

D. TMS 402-16, BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES

E. AISC 360-16, SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS

F. AISI S100-12, NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS.

G. AWS, AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE

H. SDI, STEEL DECK INSTITUTE: DESIGN MANUAL FOR COMPOSITE DECK, FORM DECK, & ROOF DECK

I. UFC 1-200-01, GENERAL BUILDING REQUIREMENTS (01 OCT 2020)

J. UFC 3-301-01, STRUCTURAL ENGINEERING, (01 OCT 2019)

K. UFC 4-010-01, DOD MINIMUM ANTI-TERRORISM STANDARDS FOR BUILDINGS, (19 AUG 2020)

DESIGN LOAD CRITERIA:

D-2. LIVE LOADS:

FIRST FLOOR SLAB-ON-GRADE	100 PSF
ROOF LIVE LOAD	20 PSF

D-3. SNOW LOADS:

RISK CATEGORY	II
SNOW IMPORTANCE FACTOR, I_s	1.0
MINIMUM GROUND SNOW LOAD, P_g	10 PSF
FROST PENETRATION DEPTH	0 IN
SNOW EXPOSURE FACTOR, C_e	0.9
SNOW THERMAL FACTOR, C_t	1.0
ROOF SLOPE FACTOR, C_s	0.8
FLAT ROOF SNOW LOAD, P_f	6.3 PSF
SLOPED ROOF SNOW LOAD, P_S	5 PSF

D-4. WIND LOADS:

RISK CATEGORY	II
BASIC WIND SPEED, *V*	119 MPH (ULTIMATE) 93 MPH (SERVICE)
WIND EXPOSURE CATEGORY	C
GUST EFFECT FACTOR, *G*	0.85
INTERNAL PRESSURE COEFFICIENTS, *GCpi*	+/- 0.18

D-5. SEISMIC LOADS:

RISK CATEGORY	II
SEISMIC IMPORTANCE FACTOR, *Ie*	1.0
MAPPED SPECTRAL RESPONSE ACCELERATION, *Ss*	0.154
MAPPED SPECTRAL RESPONSE ACCELERATION, *S1*	0.072
SITE CLASS	D
DESIGN SPECTRAL RESPONSE ACCELERATION, *Sds*	0.16
DESIGN SPECTRAL RESPONSE ACCELERATION, *Sd1*	0.12
SEISMIC DESIGN CATEGORY	B
SEISMIC ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE
SEISMIC-FORCE RESISTING SYSTEM	STEEL NOT DETAILED FOR SEISMIC
RESPONSE MODIFICATION FACTOR, *R*	3.0
SYSTEM OVERSTRENGTH FACTOR	3.0
DEFLECTION AMPLIFICATION FACTOR, Cd	3.0
SEISMIC RESPONSE COEFFICIENT, Cs	0.055
SEISMIC BASE SHEAR	1.86 KIPS

D-6. ANTI-TERRORISM/FORCE PROTECTION CRITERIA:

ANTI-TERRORISM/FORCE PROTECTION IS NOT REQUIRED FOR THIS FACILITY BASED ON THE INTENDED OCCUPANCY.

SPECIAL INSPECTION NOTES:

SI-1. INSPECTION OF FABRICATORS SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1704.2.5.

SI-2. INSPECTION OF STEEL CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.2.

SI-3. INSPECTION OF CONCRETE CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.3 AND TABLE 1705.3.

SI-4. INSPECTIONS FOR SEISMIC RESISTANCE SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.12.

SI-5. INCLUDE SPECIAL INSPECTIONS REQUIREMENTS IN CONTRACTOR'S QUALITY CONTROL (CQC) PLAN.

SI-6. THE CONTRACTOR SHALL RETAIN THIRD PARTY QUALITY ASSURANCE AGENCIES TO CONDUCT SPECIAL INSPECTIONS REQUIRED BY IBC. INSPECTING AGENCY SHALL PROVIDE REPORTS OF SPECIAL INSPECTIONS DIRECTLY TO THE GOVERNMENT.

GENERAL NOTES:

G-1. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER ALL BUILDING CONSTRUCTION IS COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCES TO ENSURE SAFETY OF THE BUILDING AND ITS COMPONENTS DURING ERECTION. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS, OR TIE-DOWNS.

G-2. THE CONTRACT DOCUMENTS DO NOT INDICATE THE MEANS AND METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK DURING ERECTION AND CONSTRUCTION AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES, SEQUENCES, LOADINGS AND SAFETY.

G-3. USE STRUCTURAL DRAWINGS IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SPECIFICATIONS. COORDINATE THE WORK OF OTHER TRADES INCLUDING, BUT NOT LIMITED TO, THE REQUIREMENTS FOR SLEEVES, INSERTS, HOLES, HANGERS, AND ANCHORS.

G-4. REPORT DISCREPANCIES IN DIMENSIONS BETWEEN DIFFERENT DRAWINGS TO THE CONTRACTING OFFICER PRIOR TO BEGINNING WORK IN IMPACTED AREAS.

G-5. ELEVATIONS ON THE STRUCTURAL DRAWINGS ARE DENOTED AS [±X'-X"] REFERENCED TO THE FINISHED FIRST FLOOR ELEVATION DATUM [0'-0"]. SEE CIVIL DRAWINGS FOR ACTUAL DATUM ELEVATION.

G-6. DETAILS TITLED OR NOTED AS "TYPICAL" APPLY NOT ONLY WHERE SPECIFICALLY INDICATED OR REFERENCED, BUT ALSO IN ALL OTHER CASES WHERE THE NATURE OF THE CONSTRUCTION REQUIRES THEIR USE. DETERMINE APPLICABILITY OF TYPICAL DETAILS FROM DESCRIPTIVE TITLES OR FROM THE SIMILARITY OF A CONSTRUCTION CONDITION TO ANOTHER CONDITION WHERE THE DETAIL IS SPECIFICALLY INDICATED OR REFERENCED.

G-7. WHERE A DETAIL OR SECTION IS SHOWN FOR ONE CONDITION, IT SHALL APPLY TO ALL LIKE OR SIMILAR CONDITIONS EVEN THOUGH NOT SPECIFICALLY MARKED ON THE PLANS.

G-8. REPRODUCTION OF CONTRACT DRAWINGS SHALL NOT BE USED AS SHOP DRAWINGS UNDER ANY CIRCUMSTANCE.

G-9. DO NOT SCALE THE DRAWINGS.

FOUNDATION AND SLAB NOTES:

F-1. FOUNDATIONS FOR THIS PROJECT HAVE BEEN DESIGNED IN ACCORDANCE WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT PREPARED BY THE SAVANNAH DISTRICT TITLED "SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING REPORT", DATED MARCH 2022.

F-2. FOUNDATIONS HAVE BEEN DESIGNED TO BEAR ON SOIL CAPABLE OF SUPPORTING AN ALLOWABLE BEARING PRESSURE OF 3000 PSF, PER THE GEOTECHNICAL REPORT REFERENCED ABOVE.

F-3. THE CONTRACTOR SHALL HIRE AN INDEPENDENT TESTING LABORATORY AND GEOTECHNICAL ENGINEER, REGISTERED AND LICENSED IN THE STATE WHERE THE WORK WILL BE ACCOMPLISHED, TO VERIFY THAT ALL OF THE REQUIREMENTS CONTAINED IN SPECIFICATION 31 00 00, EARTHWORK, HAVE BEEN FOLLOWED AND ACCOMPLISHED.

F-4. CONTRACTOR SHALL BE PREPARED FOR AND SHALL INCLUDE COST OF FORMING FOUNDATIONS SHOULD THE EARTH NOT PROVIDE ADEQUATE BANK STABILITY.

F-5. ALL EXCAVATIONS SHALL BE PERFORMED SO THAT THE SITE AND THE AREA IMMEDIATELY SURROUNDING THE SITE WHICH AFFECTS CONSTRUCTION OPERATIONS WILL BE CONTINUALLY AND EFFECTIVELY DRAINED. THE CONTRACTOR SHALL PROVIDE DRAINAGE AND DEWATERING AS REQUIRED TO ENSURE THAT ALL FOOTING EXCAVATIONS ARE ACCOMPLISHED WITH THE SUBGRADE SOILS REMAINING DRY AND FIRM UNTIL AFTER FOOTINGS ARE PLACED AND BACKFILLED. REMOVAL OF SURFACE WATER, GROUNDWATER, AND ANY PERCHED WATER CONDITIONS WHICH MIGHT BE ENCOUNTERED DURING EXCAVATIONS, SHALL BE ACCOMPLISHED BY APPROVED MEANS. REFER TO SPECIFICATION SECTION 31 00 00, EARTHWORK, AND TO SHEET S-101 FOR ADDITIONAL EXCAVATION REQUIREMENTS.

F-6. PLACE FOUNDATION CONCRETE THE SAME DAY EXCAVATIONS ARE MADE OR AS SOON AS PRACTICAL THEREAFTER.

F-7. DO NOT PLACE FOUNDATION CONCRETE ON FROZEN OR SATURATED SUBGRADES.

F-8. ENSURE THAT EARTH-FORMED FOOTINGS CONFORM TO THE SHAPE, LINES, AND THICKNESS INDICATED ON THE FOUNDATION PLAN, SECTIONS, AND FOOTING SCHEDULES. EXCAVATION WIDTHS SHALL BE A MINIMUM OF 4" GREATER THAN DIMENSIONS INDICATED.

F-9. DO NOT INSTALL FOUNDATIONS UNTIL FOUNDATION WORK HAS BEEN COORDINATED WITH ADJACENT UNDERGROUND UTILITIES.

F-10. PLACE 10 MIL VAPOR RETARDER AND 4" CAPILLARY WATER BARRIER UNDER ALL INTERIOR SLABS-ON-GRADE.

CONCRETE CONSTRUCTION NOTES:

C-1. ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-14) AND THE SPECIFICATIONS FOR STRUCTURAL CONCRETE (ACI 301-14) OF THE AMERICAN CONCRETE INSTITUTE (ACI).

C-2. ALL CAST-IN-PLACE CONCRETE SHALL ATTAIN MINIMUM 28-DAY COMPRESSIVE STRENGTH (f'c) OF 4000 PSI.

C-3. CONCRETE DENSITY SHALL BE NORMAL WEIGHT WITH A DENSITY OF 140 PCF TO 150 PCF UNLESS NOTED OTHERWISE ON PLANS. CONCRETE NOTED TO BE LIGHTWEIGHT SHALL HAVE DENSITY OF 105 PCF TO 115 PCF.

C-4. CONCRETE REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615/A615M, GRADE 60 AND SHALL HAVE FABRICATION TOLERANCES IN ACCORDANCE WITH ACI 315. SHOP FABRICATE REINFORCING BARS WHICH ARE INDICATED TO BE BENT OR HOOKED.

CONCRETE CONSTRUCTION NOTES CONTINUED:

C-5. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 OR ASTM A497. PROVIDE SHEET-TYPE WELDED WIRE FABRIC. SHEET LAPS SHALL BE TIED AND LAPPED ONE FULL MESH SPACING PLUS 2".

C-6. CONCRETE REINFORCING STEEL SHALL BE CONTINUOUS UNLESS OTHERWISE INDICATED. CONTINUOUS REINFORCING STEEL SHALL BE SPLICED AS SHOWN IN SCHEDULE ON SB601 UNO ON PLANS. REINFORCING STEEL SHALL BE PLACED SO THAT SPACING IS GREATER THAN OR EQUAL TO 2X BAR DIAMETER.

C-7. MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE AS INDICATED. IN NO CASE SHALL REINFORCEMENT COVER BE LESS THAN THE REQUIREMENTS OF ACI 301.

A.	CONCRETE DEPOSITED AGAINST THE GROUND	3"
B.	CONCRETE EXPOSED TO EARTH OR WEATHER	2"
C.	SLABS AND WALLS	1"

C-8. CONCRETE REINFORCING STEEL MARKED STANDARD HOOK SHALL HAVE A 90° HOOK A MINIMUM OF 12 BAR DIAMETERS IN LENGTH, UNLESS OTHERWISE NOTED. STIRRUPS, TIES, AND 180° HOOKS SHALL CONFORM TO THE REQUIREMENTS OF ACI 318.

C-9. PROVIDE 1/2" THICK PRE-MOLDED JOINT FILLER MATERIAL WHERE SLABS ON GRADE ABUT VERTICAL SURFACES.

C-10. ALL EMBEDDED ITEMS SHALL BE PROPERLY PLACED, ACCURATELY POSITIONED AND MAINTAINED SECURELY IN PLACE PRIOR TO AND DURING CONCRETE PLACEMENT.

C-11. REINFORCING STEEL SHALL BE SPREAD AT SLEEVES, ANCHORS, RECESSES AND OTHER EMBEDDED ITEMS UNLESS OTHERWISE INDICATED. REINFORCEMENT SHALL NOT BE CUT TO FACILITATE PLACEMENT OF EMBEDDED ITEMS, UNLESS INDICATED.

C-12. NO CONCRETE SHALL BE PLACED UNTIL THE OWNER OR THE CONTRACTING OFFICER'S DESIGNATED REPRESENTATIVE HAS INSPECTED ALL EMBEDDED WORK, INCLUDING REINFORCEMENT.

C-13. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 3/4" OR AS INDICATED.

C-14. ALUMINUM SHALL NOT BE PLACED IN DIRECT CONTACT WITH CONCRETE UNLESS EFFECTIVELY COATED OR COVERED TO PREVENT ALUMINUM-CONCRETE REACTION AND ELECTROLYTIC ACTION BETWEEN ALUMINUM AND STEEL.

C-15. CONCRETE SLAB ON GRADE JOINTS INDICATED ARE DIAGRAMMATIC AND DO NOT REPRESENT ALL OF THE JOINTS REQUIRED FOR SLAB-ON-GRADE CONSTRUCTION. SLAB PANELS BETWEEN JOINTS SHALL BE EQUALLY SPACED OR NEARLY SO, WITH A MAXIMUM SPACING OF 15'-0". SLAB PANELS BETWEEN JOINTS SHALL BE SQUARE OR NEARLY SO AND SHALL NOT EXCEED AN ASPECT RATIO WITH PANEL LENGTH GREATER THAN 1.5 TIMES THE PANEL WIDTH.

C-16. CONTRACTOR SHALL PROVIDE JOINTS AT ALL RE-ENTRANT CORNERS INCLUDING, BUT NOT LIMITED TO, COLUMNS AND SLAB RECESSES.

C-17. IN ADDITION, CONTRACTOR SHALL COORDINATE SLAB ON GRADE JOINT REQUIREMENTS WITH SLAB-ON-GRADE CONSTRUCTION SEQUENCING. CONTRACTOR SHALL SHOW JOINT LAYOUT ON REINFORCING SHOP DRAWING SUBMITTAL FOR APPROVAL.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT
DRAWN BY: A. SCOTT
CHECKED BY: J. WHITTAKER
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING GENERAL STRUCTURAL NOTES

SHEET ID
BLDG 2
S-001

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STEEL CONSTRUCTION NOTES:

S-1. FABRICATION AND ERECTION OF STRUCTURAL STEEL AND DESIGN OF CONNECTIONS SHALL BE IN ACCORDANCE WITH AISC 360-16, "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" AND AISC 303-16, "CODE OF STANDARD PRACTICE FOR BUILDING AND BRIDGES". THE STRUCTURAL STEEL MEMBERS SHOWN IN THESE DRAWINGS HAVE BEEN ANALYZED AND DESIGNED USING AISC 360-16, LRFD METHOD.

S-2. UNLESS OTHERWISE NOTED, STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE ABOVE-LISTED AISC SPECIFICATION AND THE FOLLOWING:

A. WIDE FLANGE SHAPES (50 KSI)	ASTM A992, GRADE B
B. HSS HOLLOW SHAPES (50 KSI)	ASTM A500, GRADE C
C. HSS HOLLOW ROUND SHAPES (46 KSI)	ASTM A500, GRADE C
D. PLATES AND ANGLES	ASTM A36
E. HIGH STRENGTH BOLTS	ASTM F3125, GRADE A325
F. ANCHOR RODS W/ NUT AND WASHER	ASTM F1554, GRADE 55

S-3. IT IS THE INTENTION OF THESE DESIGN DOCUMENTS TO DELEGATE THE DESIGN OF ALL STRUCTURAL STEEL SHEAR CONNECTIONS THAT ARE NOT ASSOCIATED WITH THE LATERAL FORCE RESISTING SYSTEM (IE. MOMENT CONNECTION AND BRACED FRAME CONNECTIONS) TO A QUALIFIED REGISTERED ENGINEER RETAINED BY THE CONTRACTOR AND/OR FABRICATOR. SIGNED AND SEALED CALCULATIONS FOR CONNECTION DESIGNS SHALL BE SUBMITTED SIMULTANEOUSLY WITH FABRICATION DRAWINGS FOR REVIEW. ALL SHEAR CONNECTIONS FOR SIMPLY SUPPORTED BEAMS SHALL BE DESIGNED TO DEVELOP THE FACTORED DESIGN REACTION PER 5/SF502 FOR THE BEAM SIZE AND SPAN SHOWN. ALL STEEL SHEAR CONNECTIONS SHOWN ON THE DRAWINGS ARE CONCEPTUAL IN NATURE AND DO NOT DICTATE DESIGN INTENT IN TERMS OF NUMBER OF BOLTS, WELD SIZES, ANGLE SIZE, ETC. THE DELEGATED ENGINEER IS SOLELY RESPONSIBLE FOR THE DESIGN OF THE CONNECTIONS FOR THE CRITERIA INDICATED ON THE DRAWINGS. CONNECTIONS SHALL HAVE A MINIMUM OF 2 BOLTS.

S-4. ALL SHOP AND FIELD WELDING SHALL BE BY CERTIFIED WELDERS AND SHALL CONFORM TO AWS STANDARDS. USE E70XX ELECTRODES UNLESS OTHERWISE NOTED. MINIMUM WELD SIZE FOR STRUCTURAL STEEL IS 3/16 IN FILLET, UNLESS OTHERWISE NOTED. CURRENT AWS CERTIFICATIONS SHALL BE AVAILABLE AT THE JOB SITE FOR REVIEW BY THE OWNERS' REPRESENTATIVE.

S-5. ALL BOLTED CONNECTIONS, UNLESS OTHERWISE NOTED, SHALL USE 3/4" DIAMETER HIGH STRENGTH BOLTS WITH HARDENED CARBON STEEL WASHERS AS REQUIRED FOR THE CONNECTION LOADS.

S-6. ALL FIELD-BOLTED SHEAR CONNECTIONS SHALL BE SNUG TIGHT BEARING-TYPE CONNECTIONS, THREADS INCLUDED IN THE SHEAR PLANE.

S-7. FIELD CUTTING OF STRUCTURAL STEEL MEMBERS BY ANY TRADE IS NOT PERMITTED. BOLT HOLES SHALL NOT BE CUT OR ENLARGED BY FLAME CUTTING IN THE FIELD.

S-8. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL DRAWINGS AND DESIGN CALCULATIONS FOR ANY ALTERNATE DETAILS AND MEMBER SPLICES.

S-9. SHOP OR FIELD SPLICES OF STRUCTURAL STEEL MEMBERS ARE PROHIBITED EXCEPT AS DETAILED ON THE DRAWINGS, PERMITTED IN THE SPECIFICATIONS, AS INDICATED ON APPROVED SUBMITTALS, AND AS SPECIFICALLY APPROVED ON SHOP DRAWINGS PRIOR TO FABRICATION.

S-10. ALL STEEL EXPOSED TO WEATHER SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 FOR MEMBERS AND ASTM A153 FOR CONNECTION ELEMENTS. COORDINATE ALL STEEL FINISHES WITH ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

S-11. ALL ANGLES AND BENT PLATES INDICATED TO BE CONTINUOUS SHALL HAVE SPLICES FULLY WELDED.

S-12. PROVIDE STEEL CAP PLATE TO ALL HSS MEMBERS EACH END.

STEEL DECK NOTES:

SD-1. ROOF DECK SHALL BE GALVANIZED STEEL CONFORMING TO ASTM A653 WITH A MINIMUM YIELD STRENGTH OF 33 KSI. STEEL ROOF DECK SHALL BE AS SHOWN ON DRAWINGS. FASTENERS FOR ROOF DECK SHALL UTILIZE #12 SELF TAPPING SCREWS AT A 36/4 PATTERN TO SUPPORT STRUCTURE AND #12 SELF TAPPING SCREWS AT SIDE LAP CONNECTIONS. THE NUMBER OF SIDELAPS VARIES PER ROOF PLAN. SEE ROOF PLANS FOR NUMBER OF SIDELAPS REQUIRED. SEE ROOF EAVE/RAKE SECTIONS FOR PERIMETER FASTENING REQUIREMENTS.

SD-2. PROVIDE ALL RIDGE PLATES, VALLEY PLATES, CLOSURE PLATES, POUR STOPS, AND ALL OTHER ACCESSORIES REQUIRED FOR COMPLETE INSTALLATION IN ACCORDANCE WITH THE DECK MANUFACTURER'S RECOMMENDATIONS.

SD-3. CONTRACTOR SHALL COORDINATE OPENINGS IN STEEL DECK WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS PRIOR TO DECK PLACEMENT.

SD-4. HANGING LOADS DIRECTLY FROM ROOF DECK IS PROHIBITED.

SD-5. STEEL DECK SHALL SPAN CONTINUOUSLY OVER A MINIMUM OF 4 SUPPORTS (3 SPANS) UNO.

LIGHT GAUGE STEEL NOTES:

LG-1. THE ROOF LAYOUT AND COMPONENTS SHOWN ON THE DRAWINGS ARE FOR GENERAL CONFIGURATION ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL QUANTITIES, DIMENSIONS, CONNECTION DETAILS, ETC. NECESSARY FOR THE COMPLETE DESIGN, FABRICATION, AND ERECTION OF THE ROOF FRAMING SYSTEM. THE CONTRACTOR SHALL COORDINATE THE DESIGN WITH THE ARCHITECTURAL PLANS, ELEVATIONS, AND DETAILS.

LG-2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXTERIOR STUD WALL FRAMING TO INCLUDE ALL ELEVATIONS, QUANTITIES, DIMENSIONS, CONNECTION DETAILS, ETC. NECESSARY FOR THE COMPLETE DESIGN, FABRICATION, AND ERECTION OF THE EXTERIOR STUD WALL FRAMING. THE CONTRACTOR SHALL COORDINATE THE DESIGN WITH THE ARCHITECTURAL PLANS, ELEVATIONS, AND DETAILS.

LG-3. COLD-FORMED TRUSSES AND EXTERIOR STUD WALLS SHALL BE DESIGNED IN ACCORDANCE WITH THE AMERICAN IRON AND STEEL INSTITUTE (AISI) SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS.

LG-4. ALL CALCULATIONS AND DRAWINGS USED IN THE DESIGN OF COLD-FORMED TRUSSES AND EXTERIOR STUD WALLS MUST BE SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER AND SUBMITTED FOR APPROVAL. IN ADDITION TO THE CALCULATIONS, THE SUBMITTAL SHALL INCLUDE DETAILS OF THE LAYOUT, ERECTION PLAN, BOTH TEMPORARY AND PERMANENT BRACING, BRIDGING, OUTRIGGERS, CONNECTIONS INCLUDING DIAPHRAGM FORCES, HEADERS, SILLS, AND JAMBS.

LG-5. THE CONTRACTOR SHALL SUBMIT COMPLETE PRODUCT CATALOGS FROM THE MATERIAL MANUFACTURER FOR REVIEW PRIOR TO FABRICATION. THE CATALOGS SHALL INDICATE QUALIFICATION, MATERIAL SPECIFICATIONS, DESIGN REFERENCES, ETC.

LG-6. ALL COLD-FORMED STEEL MEMBERS, THEIR COMPONENTS, AND CONNECTION MATERIAL SHALL BE GALVANIZED. PREPARE AND REPAIR DAMAGED GALVANIZED COATINGS ON FABRICATED AND INSTALLED LIGHT GAUGE METAL FRAMING WITH GALVANIZING REPAIR PAINT ACCORDING TO ASTM A780 AND/OR THE MANUFACTURER'S RECOMMENDATIONS.

LG-7. COLD-FORMED STEEL MEMBERS SHALL BE Fy=33KSI FOR MEMBERS 43 MILS (18 GA) AND LIGHTER AND Fy=50KSI FOR MEMBERS 54 MILS (16 GA) AND HEAVIER. USE MIN 6" WIDE STUDS AT EXTERIOR WALLS UNO.

LG-8. ALL WELDING OF COLD-FORMED STEEL SHALL COMPLY WITH AWS D1.1 AND AWS D1.3 FOR WELDING BASE MATERIAL LESS THAN 1/8" THICK.

LG-9. TRUSS LOADING:
- TOP CHORD:
  - DEAD: 8 PSF
  - LIVE ROOF: 20 PSF
  - WIND: SEE S-003
- BOTTOM CHORD:
  - DEAD: 8 PSF
  - LIVE: 10 PSF

LG-9. TRUSS DEFLECTION SHALL BE LIMITED TO:
- LIVE LOAD - L/360
- SNOW LOAD OR WIND LOAD - L/360
- DEAD LOAD + LIVE LOAD - L/240

LG-10. BRIDGING AND BRACING OF TRUSS COMPRESSION MEMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE TRUSS MANUFACTURERS DESIGN AND DIRECTIONS. TRUSSES SHALL BE BRACED SECURELY BOTH DURING ERECTION AND AFTER PERMANENT INSTALLATION BY THE CONTRACTOR. ERECTION BRACING SHALL HOLD TRUSSES STRAIGHT AND PLUMB UNTIL DECKING AND PERMANENT TRUSS BRACING HAVE BEEN INSTALLED. ALL BRACING SHALL BE INSTALLED PRIOR TO THE LOADING OF THE TRUSSES.

LG-12. COLD-FORMED STEEL STUD MEMBERS SHALL BE DESIGNED TO ACCOMMODATE VERTICAL AND HORIZONTAL LOADS DUE TO ARCHITECTURAL VENEER AND FEATURES. COORDINATE DESIGN CRITERIA WITH ARCHITECTURAL DRAWINGS AND DETAILS.

LG-13. COLD-FORMED STEEL STUD MEMBERS SHALL UTILIZE A DEFLECTION TRACK ALLOWING FOR 1" DEFLECTION OF BEAM ABOVE..

LG-14. TOP CHORD OF TRUSSES SHALL BE 54 MILS (16 GAUGE) MIN.

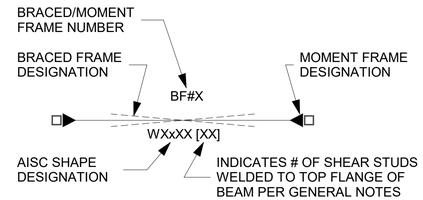
STRUCTURAL ABBREVIATIONS

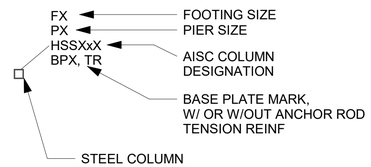
AFF	ABOVE FINISHED FLOOR	JS	JOIST SEAT
APPROX	APPROXIMATELY	KIP (k)	1000 POUNDS
ARCH	ARCHITECTURAL	LG	LONG
BCX	BOTTOM CHORD EXTENSION	LLH	LONG LEG HORIZONTAL
BOC	BOTTOM OF CONCRETE	LLV	LONG LEG VERTICAL
BOF	BOTTOM OF FOOTING	MAX	MAXIMUM
BOS	BOTTOM OF STEEL	MECH	MECHANICAL
BOT	BOTTOM	MEP	MECHANICAL, ELECTRICAL, PLUMBING
BRG	BEARING	MNFR	MANUFACTURER
BTWN	BETWEEN	MIN	MINIMUM
CFS	COLD-FORMED STEEL	NTS	NOT TO SCALE
CJ	CONTRACTION JOINT	OC	ON CENTER
CL	CENTER LINE	OPP	OPPOSITE
CLR	CLEAR	PJF	PREMOLDED JOINT FILLER
COL	COLUMN	PL	PLATE
CONN	CONNECTION	PLF	POUNDS PER LINEAR FOOT
CONC	CONCRETE	PSF	POUNDS PER SQUARE FOOT
CONT	CONTINUOUS	PSI	POUNDS PER SQUARE INCH
CONSTR	CONSTRUCTION	REINF	REINFORCEMENT
DEG	DEGREE	REQD	REQUIRED
DIA	DIAMETER	SCHED	SCHEDULE
DWG(S)	DRAWING(S)	SE	SLAB EDGE
EA	EACH	SJI	STEEL JOIST INSTITUTE
EF	EACH FACE	SIM	SIMILAR
EJ	EXPANSION JOINT	SOG	SLAB ON GRADE
EL	ELEVATION	SPCG	SPACING
EOD	EDGE OF DECK	STD	STANDARD
EOS	EDGE OF SLAB	T&B	TOP AND BOTTOM
ES	EACH SIDE	TO	TOP OF
EQ	EQUAL	TOC	TOP OF CONCRETE
EW	EACH WAY	TOF	TOP OF FOOTING
FF	FINISHED FLOOR	TOS	TOP OF SLAB
FTG	FOOTING	TR	TENSION REINFORCEMENT
GA	GAGE	TYP	TYPICAL
GALV	GALVANIZED	UNO	UNLESS NOTED OTHERWISE
HGT	HEIGHT	VERT	VERTICAL
HORIZ	HORIZONTAL	WP	WORKING POINT
IS	ISOLATION JOINT	WWF	WELDED WIRE FABRIC

STRUCTURAL LEGEND

- DN → SLOPE DIRECTION
- [+/- X'-X"] INDICATES ELEVATION REFERENCED TO FINISHED FLOOR
- X KEYED PLAN NOTE
- X COLUMN REFERENCE LINE (CENTER LINE OF COLUMN)
- [+/- X'-X"] SPOT ELEVATION
- SLAB DEPRESSION
- BRICK WALL
- CONCRETE ELEMENT
- EARTH FILL
- GROUT
- CONCRETE MASONRY UNIT (CMU)
- POROUS FILL
- WELDED WIRE FABRIC (WWF)

STRUCTURAL FRAMING REFERENCE





US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT
DRAWN BY: A. SCOTT
CHECKED BY: J. WHITTAKER
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W91PHN-24-B-3002
CONTRACT NO.: -
CATEGORY CODE: 178-85-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING GENERAL STRUCTURAL NOTES

SHEET ID
BLDG 2
S-002

READY TO ADVERTISE (RTA)

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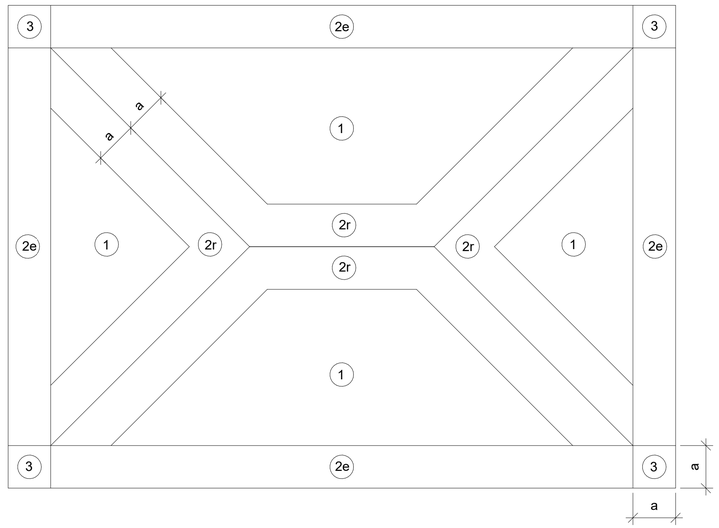
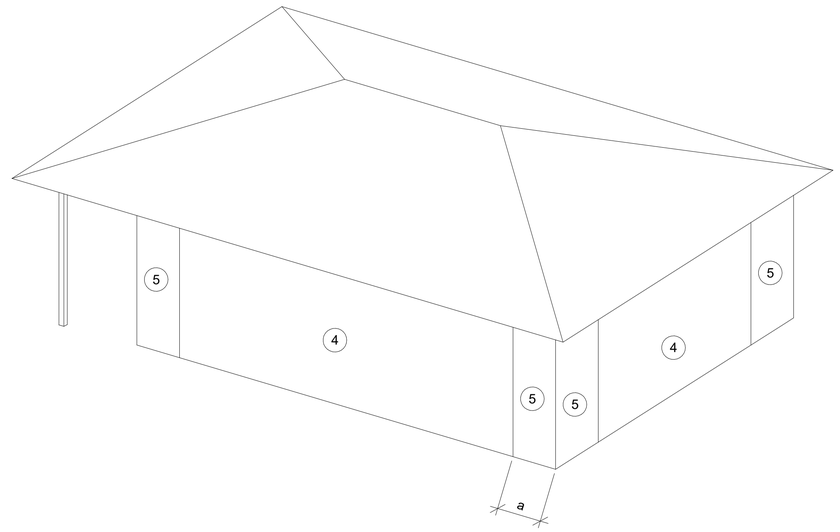


ROOF ZONES



WALL ZONES

COMPONENT AND CLADDING WIND PRESSURES									
EFFECTIVE WIND AREA	ROOF ZONES			OVERHANG ZONES				WALLS ZONES	
	1	2R	2E, 3	1	2E	2R	3	4	5
10 SF	+23 / -39	+23 / -68	+23 / -52	-52	-65	-81	-81	+31 / -34	+31 / -42
20 SF	+20 / -39	+20 / -61	+20 / -48	-52	-64	-77	-73	+30 / -33	+30 / -39
50 SF	+16 / -35	+16 / -53	+16 / -42	-55	-63	-73	-63	+28 / -31	+28 / -35
100 SF	+16 / -31	+16 / -46	+16 / -38	-58	-61	-69	-55	+27 / -29	+27 / -33
200 SF	+16 / -31	+16 / -39	+16 / -34	-58	-60	-65	-47	+25 / -28	+25 / -30
500 SF	+16 / -31	+16 / -39	+16 / -34	-58	-60	-65	-47	+23 / -26	+23 / -26

1. GROSS WIND PRESSURES SHOWN ABOVE ARE PREDICATED ON ULTIMATE WIND SPEED.
2. EDGE ZONES: 'a' = 3'-0"
3. WIND PRESSURES SHOWN SHALL BE USED IN CONJUNCTION WITH LRFD LOAD COMBINATIONS SPECIFIED IN SECTIONS 2.3 AND 2.4 OF ASCE 7-16.
4. POSITIVE WIND PRESSURES REPRESENT WIND PRESSURES ACTING TOWARDS THE COMPONENT AND CLADDING SURFACES.
5. NEGATIVE WIND PRESSURES REPRESENT WIND PRESSURES ACTING AWAY FROM THE COMPONENT AND CLADDING SURFACES.

1 COMPONENT AND CLADDING WIND PRESSURES
NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
DRAWN BY: A. SCOTT	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: J. WHITTAKER	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING COMPONENTS AND CLADDING

SHEET ID
BLDG 2
S-003

READY TO ADVERTISE (RTA)

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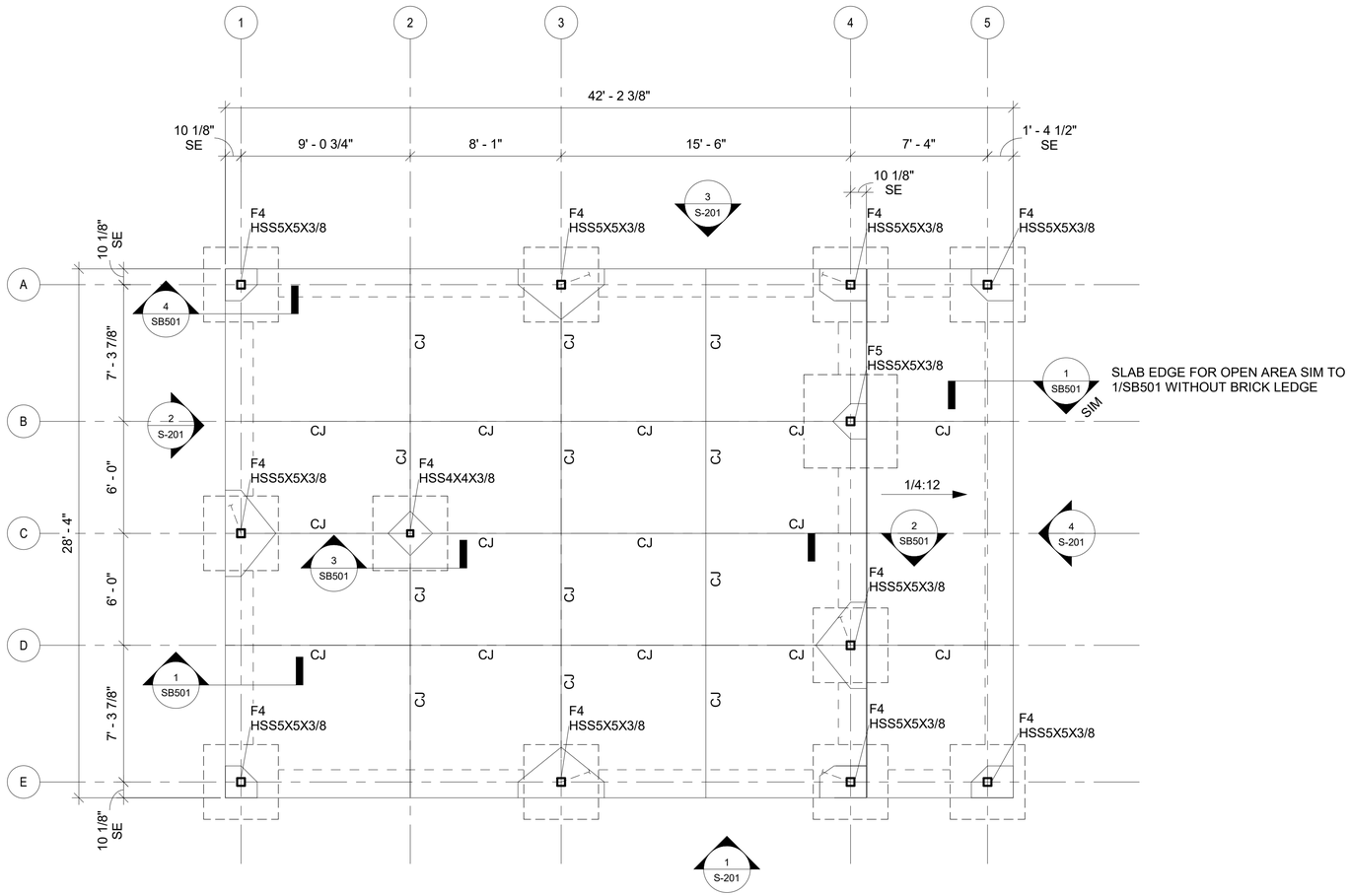

1 FOUNDATION PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

FOUNDATION AND SLAB PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. TOP OF CONCRETE SLAB-ON-GRADE ELEVATION = 0'-0". ALL ELEVATIONS INDICATED FROM THIS DATUM. SEE CIVIL DRAWINGS FOR EXACT ELEVATION.
3. TOP OF FTG = (-) 1'-6" UNO.
4. ALL FOOTINGS SHALL BE CENTERED UNDER COLUMNS.
5. SLAB-ON-GRADE SHALL CONSIST OF 4" THICK CONCRETE REINFORCED WITH 6X6 W2.9XW2.9 WWF LOCATED AT 1/3-DEPTH FROM TOP OF SLAB.
6. PROVIDE (1) #5 X 4'-0" LONG AT TOP AND BOTTOM IN SLAB-ON-GRADE AT ALL RE-ENTRANT CORNERS AND WHERE A CONTROL JOINT TERMINATES AT A JOINT.
7. SLAB-ON-GRADE SHALL BEAR ON 10 MIL VAPOR RETARDER ON CAPILLARY WATER BARRIER ON PROPERLY PREPARED SUBGRADE OR COMPACTED FILL.
8. CONTROL JOINT LOCATIONS ARE DIAGRAMMATIC ONLY AND DO NOT REPRESENT ALL JOINTS REQUIRED FOR SLAB CONSTRUCTION. CONTRACTOR SHALL COORDINATE SLAB-ON-GRADE REQUIREMENTS WITH SLAB-ON-GRADE CONSTRUCTION SEQUENCING AND SLAB DETAILS. SPACING SHALL NOT EXCEED MAXIMUM JOINT SPACING PER ACI REQUIREMENTS.
9. COORDINATE UNDERGROUND UTILITY LINES WITH CIVIL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION DRAWINGS PRIOR TO CONSTRUCTION OF FOOTINGS AND SLABS-ON-GRADE.
10. ◄—— INDICATES SLAB SLOPE.
11. WITHIN THE AREA OF THE STRUCTURE FOOTINGS, THE SOILS SHALL BE TESTED FOR IN-SITU ALLOWABLE BEARING PRESSURE BY METHOD OF HAND AUGER AND DYNAMIC CONE PENETROMETER METHOD, IN ACCORDANCE WITH ASTM SPECIAL TECHNICAL PUBLICATION #399. SOILS WHICH ARE IDENTIFIED TO HAVE A NET ALLOWABLE BEARING PRESSURE BELOW 3,000 PSF, OR WHICH ARE DEEMED TO BE UNSATISFACTORY FOR OTHER REASONS E.G., EXCESSIVE DEBRIS OR ORGANIC CONTENT), SHALL BE OVER-EXCAVATED AND REPLACED WITH ADDITIONAL CONCRETE DURING THE CONCRETING OR REPLACED TO DESIGN SUBGRADE WITH NO. 57 OR NO. 67 STONE, COMPACTED TO A NON-YIELDING CONDITION. OVER-EXCAVATION SHALL BE PERFORMED IN ACCORDANCE WITH EM 385-1-1 AND OSHA 29 CFR 1926.652. BACKFILLING SHALL BE IN ACCORDANCE WITH SECTION 31 00 00, EARTHWORK. IT IS POSSIBLE THAT PERCHED GROUNDWATER WILL BE ENCOUNTERED DURING OVER-EXCAVATION. DEWATERING SHOULD BE DONE IN ACCORDANCE WITH SPECIFICATIONS.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

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SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING FOUNDATION PLAN

SHEET ID
BLDG 2
S-101

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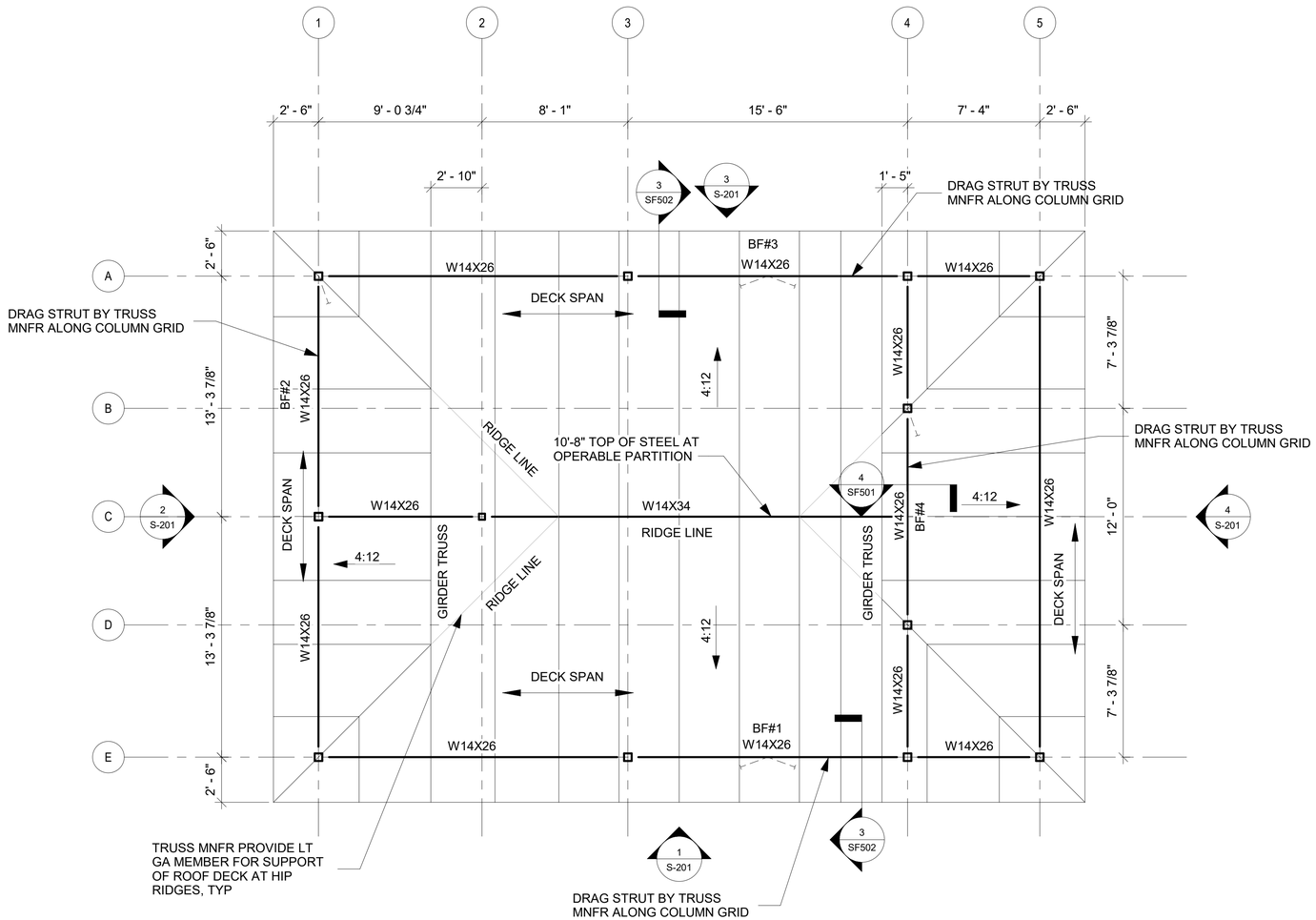

GENERAL SHEET NOTES

FRAMING PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. TOP OF STEEL FOR TRUSS BEARING SHALL BE (+) 9'-6" UNO.
3. ROOF DECK SHALL BE 1.5B22 GAUGE METAL DECK WITH A 36/4 FASTENING PATTERN WITH 4 SIDELAPS. SUPPORT FASTENERS ARE TO BE #12 TEK SCREWS AND SIDELAP FASTENERS ARE TO BE #12 TEK SCREWS.
4. LT GA STEEL TRUSS SPACING SHALL NOT EXCEED 4'-0" OC UNO.
5. ◄——— DENOTES ROOF SLOPE. SEE ARCHITECTURAL.
6. TRUSSES SHALL BE DESIGNED BY THE TRUSS MNFR TO TRANSFER 300 LBS (ULTIMATE) HORIZONTAL SHEAR FROM THE BEAMS DUE TO WIND LOAD ON WALL. CONNECTION TO BEAMS SHALL BE BY THE TRUSS MNFR.
7. DRAG STRUTS ALONG ALL ROOF EAVES SHALL BE DESIGNED AND PROVIDED BY THE TRUSS MNFR TO TRANSFER 200 PLF HORIZONTAL SHEAR TO BEAMS. CONNECTION TO BEAMS SHALL BE BY TRUSS MNFR.
8. PROVIDE CONT 4X4X5/16" BENT PLATE AT ALL RIDGES.
9. AT THE EDGE OF ROOF DECK PROVIDE CONT. BENT PLATE CLOSURE AS DETAILED ON 1/SF502.
10. COORDINATE ALL ROOF DIMENSIONS, ELEVATIONS, OPENINGS AND PENETRATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS. SEE ARCHITECTURAL FOR ROOF PENETRATION WATERPROOFING DETAILS.
11. GIRDER TRUSS BEARING/ANCHORAGE SHALL OCCUR OVER EVERY BEAM PERPENDICULAR TO TRUSS SPAN. SEE 4/SF502 FOR DETAIL.
12. TRUSS BEARING/ANCHORAGE SHALL OCCUR OVER EVERY BEAM PERPENDICULAR TO TRUSS SPAN. SEE 3/SF502 FOR DETAIL.

NORTH ARROW

PLAN NORTH

1 ROOF FRAMING PLAN

1/4" = 1'-0"

4 3 2 1 0 4 8

US Army Corps of Engineers ®

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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING ROOF FRAMING PLAN

SHEET ID
BLDG 2
S-102

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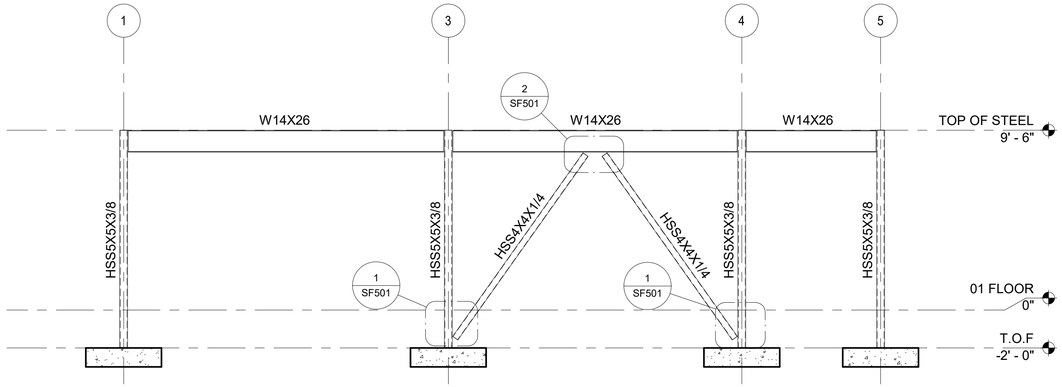
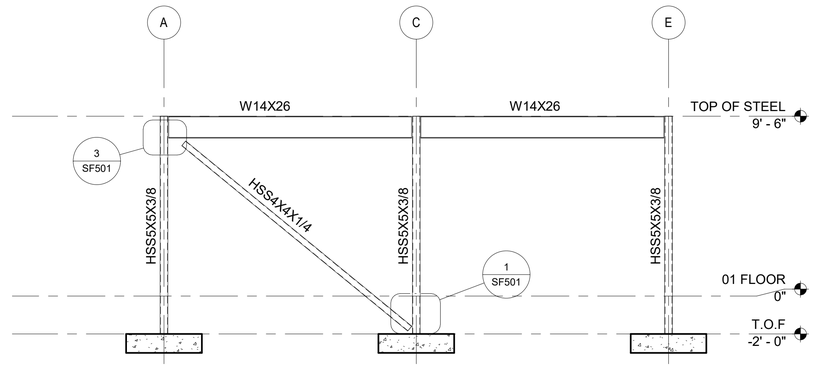


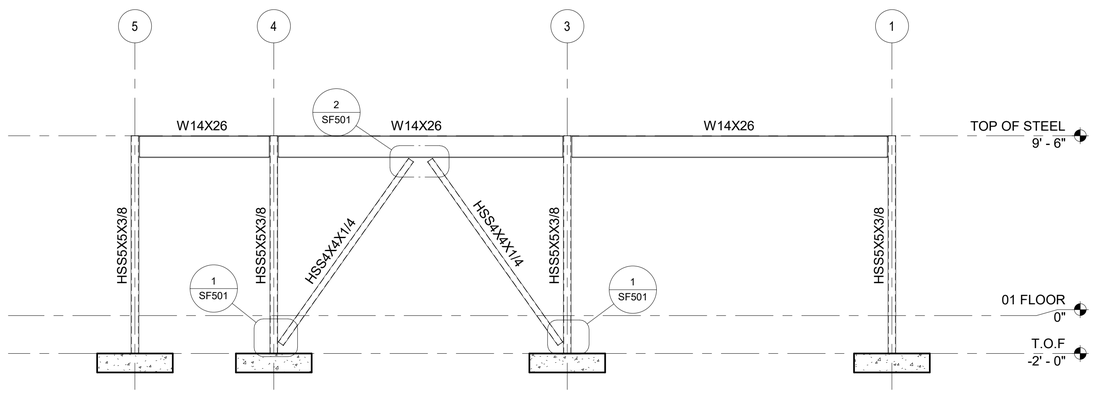
1 BRACED FRAME 1

1/4" = 1'-0"



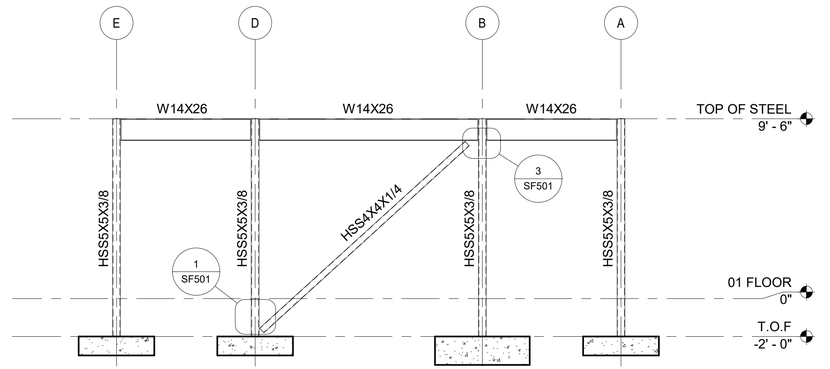
2 BRACED FRAME 2

1/4" = 1'-0"



3 BRACED FRAME 3

1/4" = 1'-0"



4 BRACED FRAME 4

1/4" = 1'-0"

US Army Corps of Engineers ®

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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING BRACED FRAME ELEVATIONS

SHEET ID
BLDG 2
S-201

READY TO ADVERTISE (RTA)

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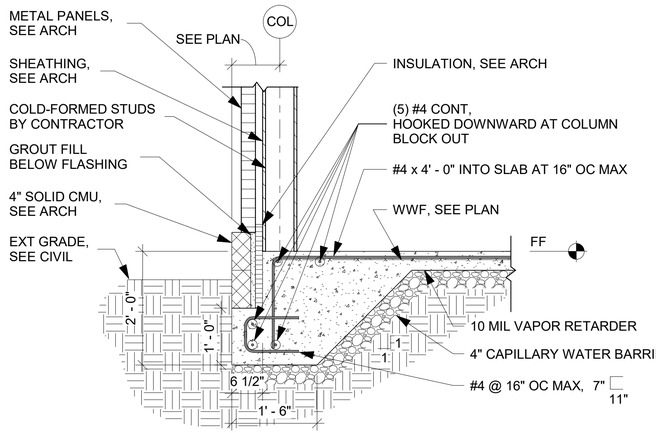
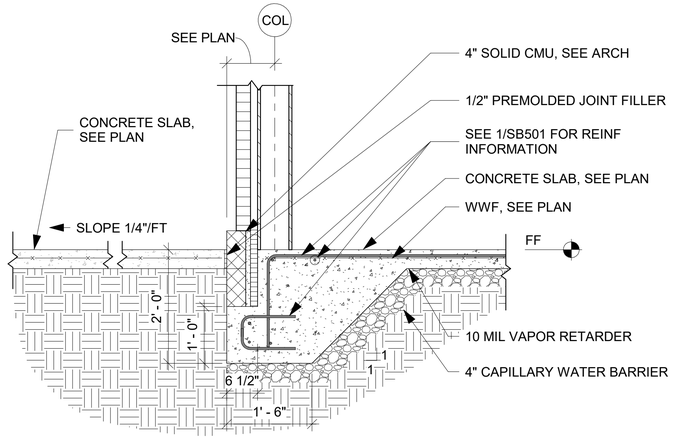


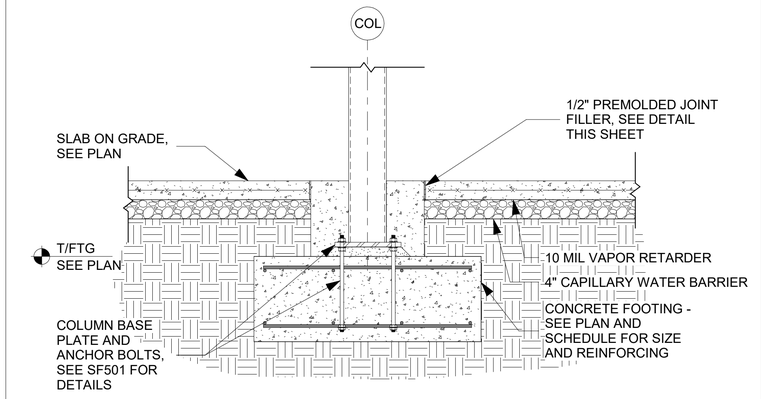
1 TYPICAL SLAB EDGE DETAIL

3/4" = 1'-0"



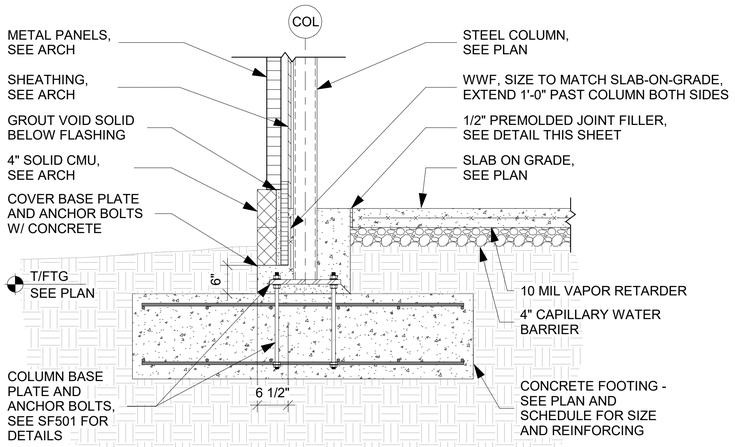
2 TYPICAL THICKENED SLAB EDGE AT ENTRY DETAIL

3/4" = 1'-0"



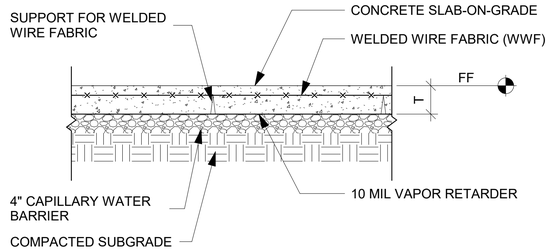
3 TYPICAL INTERIOR COLUMN FOOTING

3/4" = 1'-0"



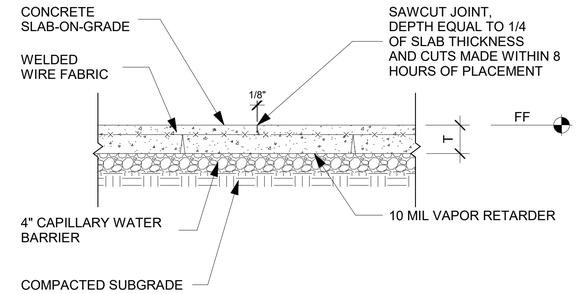
4 TYPICAL EXTERIOR COLUMN FOOTING

3/4" = 1'-0"



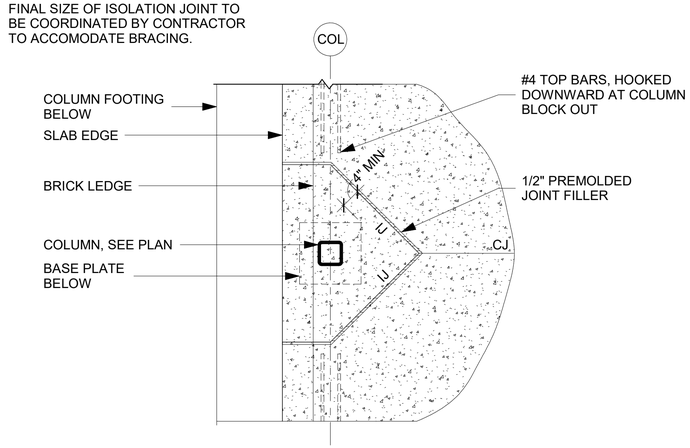
5 TYPICAL SLAB ON GRADE DETAIL

3/4" = 1'-0"



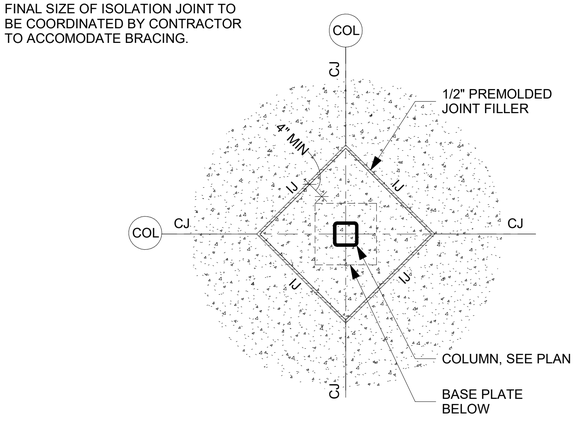
6 TYPICAL SAWED CONTRACTION JOINT DETAIL (CJ)

3/4" = 1'-0"



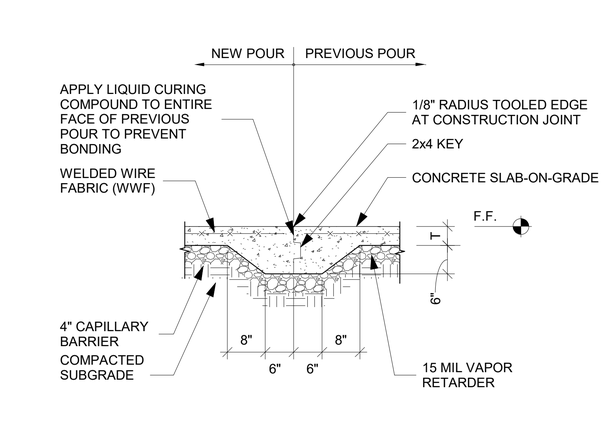
7 TYPICAL EXTERIOR COLUMN PLAN VIEW

3/4" = 1'-0"



8 TYPICAL INTERIOR COLUMN PLAN VIEW

3/4" = 1'-0"



9 TYPICAL SOG SHEAR KEY CONSTR JOINT DETAIL

3/4" = 1'-0"

US Army Corps of Engineers ®

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A. SCOTT	NOVEMBER 2023
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J. DEACON	178-65-01
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING FOUNDATION AND SLAB DETAILS

SHEET ID
BLDG 2
SB501

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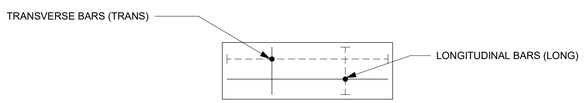
COLUMN FOOTING SCHEDULE					
MARK	DIMENSIONS			REINFORCING	
	WIDTH	LENGTH	DEPTH	BOTTOM, HOOKED @ ENDS	TOP, HOOKED @ ENDS
F4	4' - 0"	4' - 0"	1' - 6"	(11) #4 EW	(11) #4 EW
F5	5' - 0"	5' - 0"	1' - 6"	(10) #4 EW	(10) #4 EW



FOOTING REINFORCEMENT DIAGRAM

1 CONCRETE FOOTING SCHEDULE
NOT TO SCALE

CONCRETE REINFORCING BAR DEVELOPMENT AND SPLICE LENGTH SCHEDULE (F'c = 4000 PSI)					
BAR SIZE	OTHER BARS		TOP/HORIZ BARS		HOOKED BARS
	Ld	SPLICE	Ld	SPLICE	Ldh
#3	15	19	19	25	6
#4	19	25	25	33	7
#5	24	31	31	41	9
#6	29	37	37	49	10
#7	42	54	54	71	12
#8	47	62	62	81	14
#9	54	70	70	91	15

NOTES:
1. LENGTHS SHOWN IN THIS SCHEDULE SHALL BE USED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
2. LENGTHS SHOWN IN THIS SCHEDULE ARE BASED ON CLASS B TENSION LAP SLICES FOR NORMAL WEIGHT CONCRETE STRENGTH AND GRADE 60 (Fy = 60,000 PSI) REINFORCING STEEL WITH CONCRETE COVER AND SPACING AS DEFINED IN CONCRETE SECTION OF GENERAL NOTES ON SHEET S-001 AND ACI 318-14, SECTION 25.
3. Ld = TENSION DEVELOPMENT/EMBEDMENT LENGTH FOR STRAIGHT BARS.
4. Ldh = TENSION DEVELOPMENT/EMBEDMENT LENGTH FOR HOOKED BARS.
5. LAP SPLICES SHALL BE WIRED IN CONTACT.
6. TOP BARS ARE HORIZONTAL BARS IN BEAMS, FOOTINGS, SLABS, AND WALLS WHERE MORE THAN 12" OF FRESH CONCRETE IS CAST BELOW THE BAR.
7. ALL TABULATED VALUES ARE IN INCHES.
8. MULTIPLY VALUES BY 1.3 FOR LIGHTWEIGHT CONCRETE

2 REBAR SPLICE LENGTH SCHEDULES
NOT TO SCALE

US Army Corps of Engineers ®

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SUBMITTED BY: J. DEACON
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING FOUNDATION AND SPLICE LENGTH SCHEDULES

SHEET ID
BLDG 2
SB601

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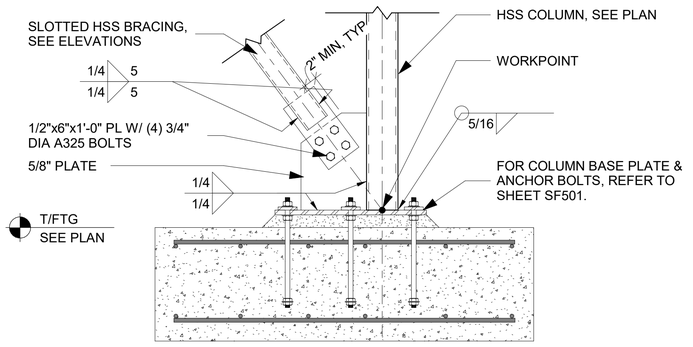
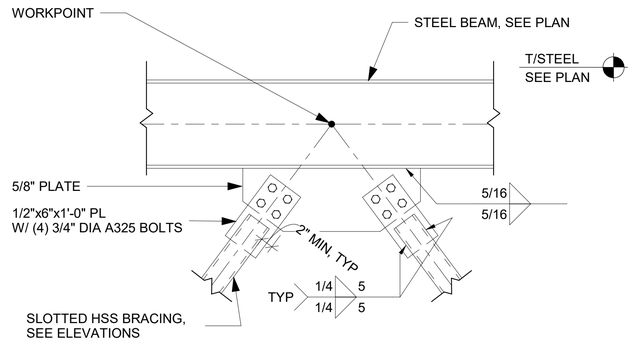


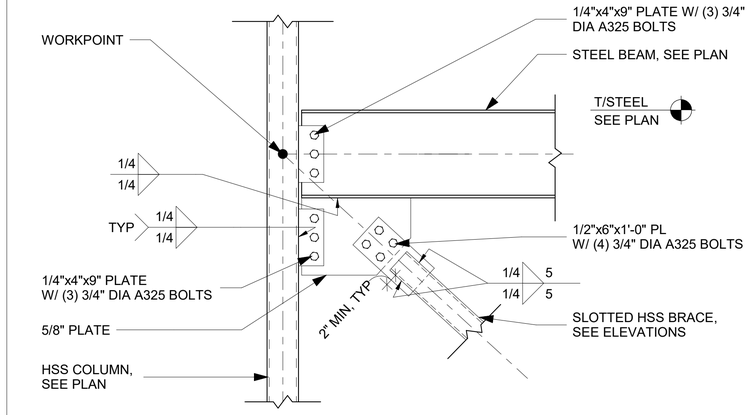
1 HSS BRACE AT BASE OF HSS COLUMN

1" = 1'-0"



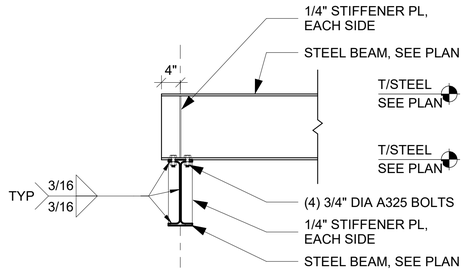
2 HSS BRACE AT MID-SPAN

1" = 1'-0"



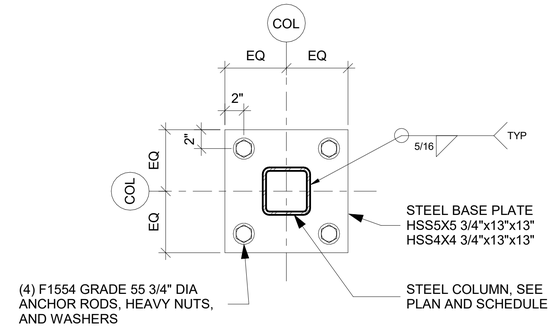
3 HSS BRACE AT HSS COLUMN

1" = 1'-0"

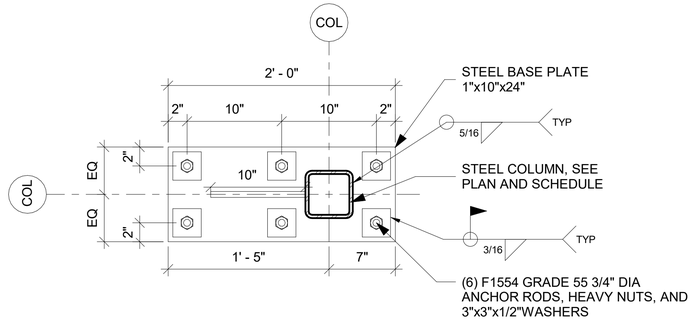


4 STEEL BEAM BEARING DETAIL

3/4" = 1'-0"



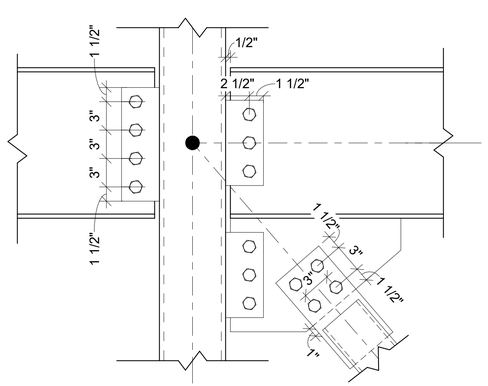
UNBRACED HSS COLUMN BASE PLATE



BRACED COLUMN BASE PLATE

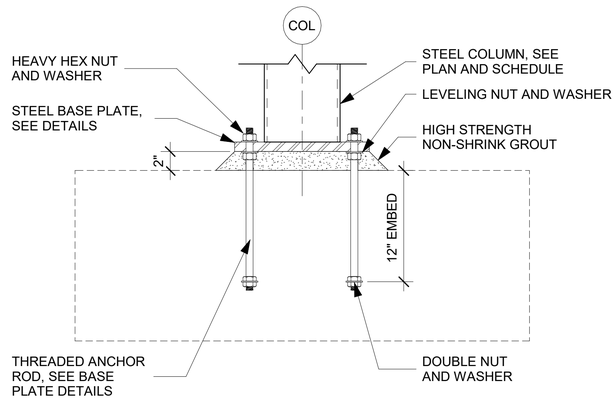
5 BASE PLATE DETAILS

1 1/2" = 1'-0"



6 TYPICAL CONNECTION DIMENSIONING

1 1/2" = 1'-0"



7 ANCHOR ROD DETAIL

1 1/2" = 1'-0"

US Army Corps of Engineers ®

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SAVANNAH DISTRICT
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING FRAMING DETAILS

SHEET ID
BLDG 2
SF501

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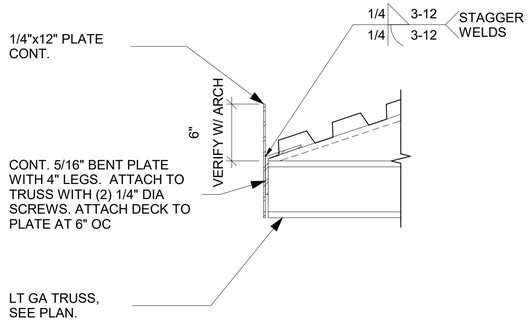
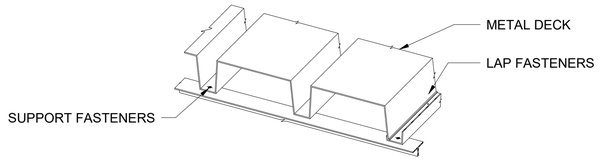


1 TYPICAL EAVE PLATE DETAIL

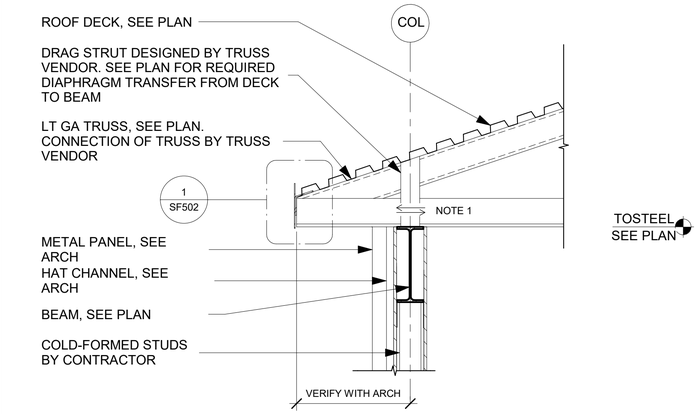
1 1/2" = 1'-0"

MINIMUM PROPERTIES OF METAL DECK	
METAL DECK	(ROOF DECK) 1.5 TYPE B
GAGE	22
MOMENT OF INERTIA OF STEEL SECTION, Ip (IN4)	0.155
SECTION MODULUS OF STEEL SECTION POSITIVE BENDING, Sp (IN3)	0.186
MOMENT OF INERTIA OF STEEL SECTION, In (IN4)	0.183
SECTION MODULUS OF STEEL SECTION POSITIVE BENDING, Sn (IN3)	0.192



2 TYPICAL METAL DECK PROPERTIES

3/4" = 1'-0"

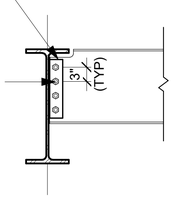


NOTE:
1. DESIGN BOTTOM CHORD OF TRUSS FOR 300 LB WIND (1.0W) TO BE INCLUDED WITH ALL WIND COMBINATIONS.

3 TYPICAL WALL SECTION AT ROOF

3/4" = 1'-0"

DELEGATE ENGINEER SHALL DESIGN WELDS TO DEVELOP 100% OF THE BEAM REACTIONS SHOWN IN THE STEEL BEAM REACTION SCHEDULE



3/4" DIA, A325 BOLTS IN SLOTTED HOLES WITH BEARING TYPE CONNECTIONS AS REQUIRED BY AISC STANDARD CONNECTION DESIGN. DELEGATE ENGINEER SHALL DESIGN THE BOLTS, ANGLES, AND WELDS TO DEVELOP 100% OF THE BEAM REACTIONS SHOWN IN THE STEEL BEAM REACTION SCHEDULE.

PROVIDE A MINIMUM OF (2) BOLTS AT ALL BEAM CONNECTIONS.

NOTE TO STEEL DETAILER: BOLTS SHOWN IN THIS DETAIL ARE FOR ILLUSTRATION PURPOSES ONLY. ACTUAL QUANTITY OF BOLTS TO BE DETERMINED BY CONNECTION DESIGNER.

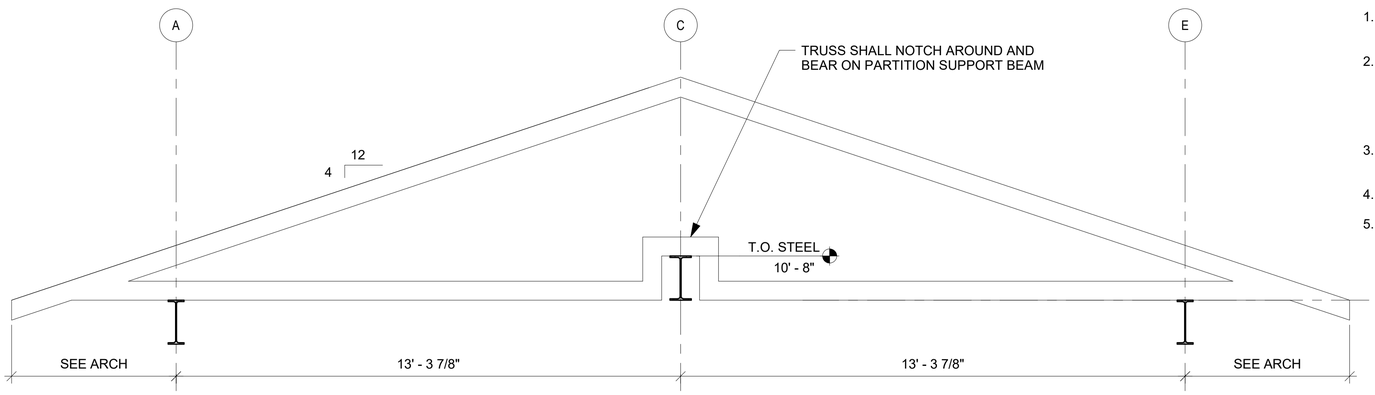
STEEL BEAM CONNECTION SCHEDULE	
BEAM SIZE	FACTORED DESIGN REACTION
W14X26	10 KIPS
W14X34	16 KIPS

STEEL BEAM CONNECTION DESIGN NOTES:

1. SEE GENERAL NOTES SHEET S-001 AND SPECIFICATION SECTION 05 12 00 FOR ADDITIONAL INFORMATION.
2. THE EFFECT OF CAMBER SETTLING SHALL BE CONSIDERED BY STEEL SUPPLIER IN BEAM CONNECTION DESIGN. HORIZONTAL SLOTTED HOLE MAY BE REQUIRED AT ANGLE CONNECTIONS TO ACCOUNT FOR BEAM HORIZONTAL MOVEMENT.
3. SEE FRAMING ELEVATION SHEETS FOR ADDITIONAL INFORMATION AT MOMENT CONNECTIONS.

4 STEEL BEAM CONNECTION SCHEDULE

3/4" = 1'-0"



TRUSS NOTES:

1. FINAL TRUSS AND TRUSS MEMBER DESIGN IS THE RESPONSIBILITY OF THE TRUSS MANUFACTURER.
2. TRUSS MANUFACTURER TO PROVIDE DESIGN AND DETAILS FOR TRUSS TO BEAM CONNECTIONS. CONNECTIONS SHALL BE DESIGNED TO RESIST BEARING AND UPLIFT FORCE CONCURRENT WITH THE HORIZONAL SHEAR FORCE NOTED.
3. SEE SHEET S-003 FOR COMPONENT AND CLADDING WIND PRESSURES.
4. SEE SHEET S-002 FOR TRUSS LOADS.
5. TRUSS WEB CONFIGURATION NOT SHOWN IN PROFILE FOR CLARITY.

5 TYPICAL TRUSS PROFILE

1/2" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
A. SCOTT	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
A. SCOTT	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
J. WHITTAKER	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
SIZE:	FILE NAME:
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

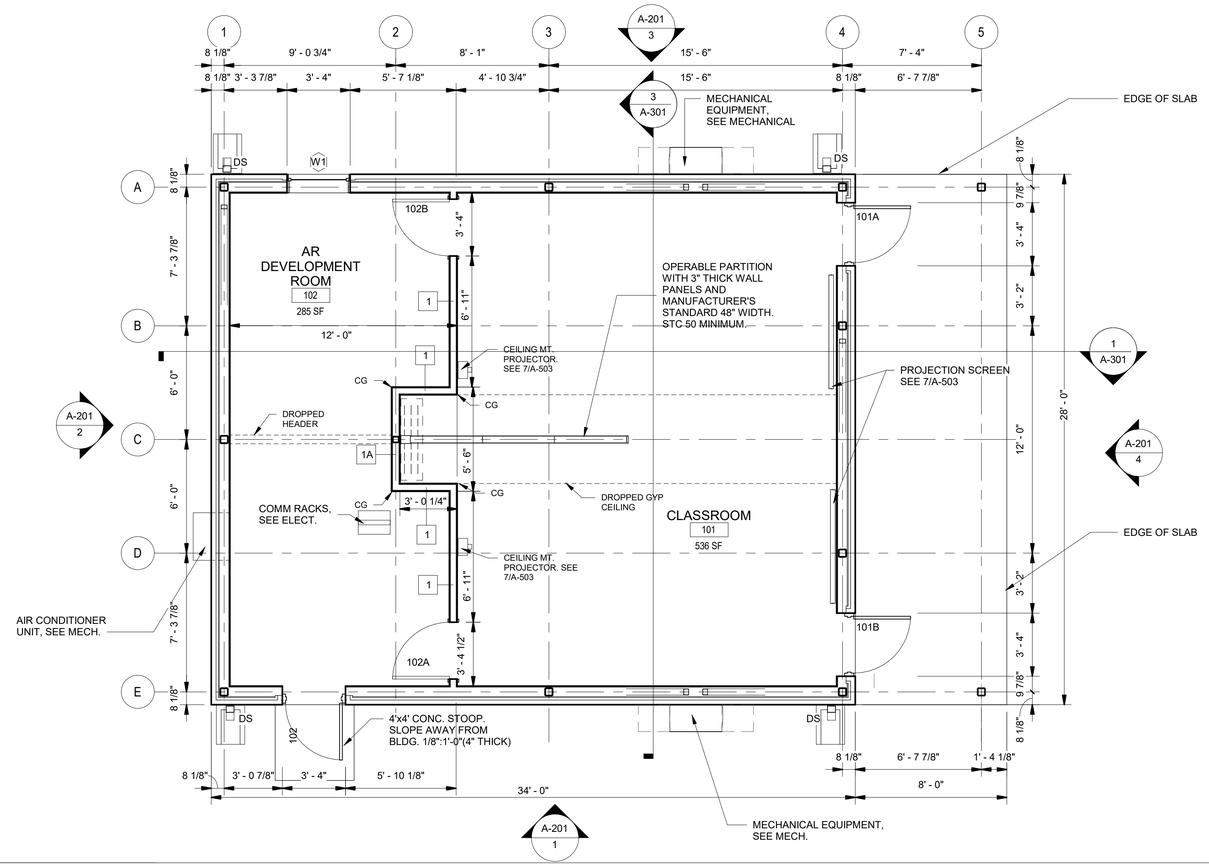
AAR BUILDING FRAMING DETAILS

SHEET ID
BLDG 2
SF502

File Path: C:\Users\k6endhrh\Documents\FY23_PN96182_MPTR-AAR_STRUCT_R21_k6endhrh.rvt

Plot Date: 11/27/2023 11:24:54 AM

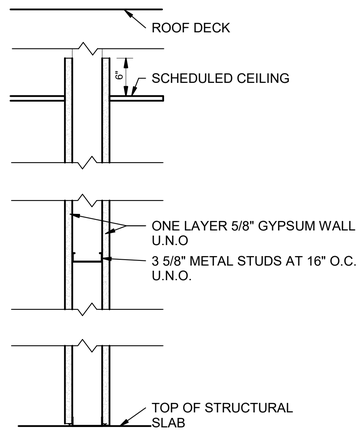
READY TO ADVERTISE (RTA)



1 FLOOR PLAN

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

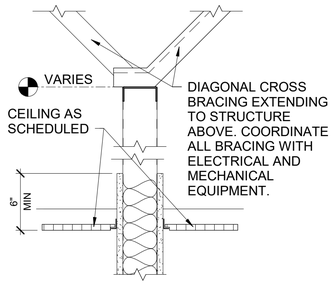


PARTITION TYPE 1 - 3 5/8" METAL STUD NON FIRE RATED PARTITION

PARTITION TYPE 1A - 4" METAL STUD NON FIRE RATED PARTITION

2 PARTITION TYPE 1

NOT TO SCALE



3 TYP ABOVE WALL TERMN.

NOT TO SCALE

GENERAL SHEET NOTES

1. EXTERIOR DIMENSIONS ARE FROM FACE OF INSULATED METAL PANELS, INTERIOR DIMENSIONS ARE FROM FACE OF STUD UNLESS NOTED OTHERWISE.

2. SEE CIVIL DRAWINGS FOR FINISHED FLOOR AND FINISHED GRADE ELEVATIONS. SEE STRUCTURAL DRAWINGS FOR FOUNDATION PLANS AND FLOOR SLABS.

3. SEE MECHANICAL DRAWINGS FOR LOCATION OF ALL MECHANICAL EQUIPMENT. COORDINATE WITH MECHANICAL FOR EXACT LOCATION AND SIZES OF ALL REQUIRED REINFORCED CONCRETE EQUIPMENT PADS, TYPICAL.

FLOOR PLAN NOTES

1. SLOPE ALL EXTERIOR SLABS 1/8" PER FOOT FROM BUILDING FACE TO SLAB EDGE. SLOPE ALL INTERIOR SLABS TO FLOOR DRAINS AS INDICATED. COORDINATE WITH STRUCTURAL.

FLOOR PLAN LEGEND

3	WINDOW TAG
#	WALL TAG
101	DOOR TAG
CG	CORNER GUARD
CSB	CONCRETE SPLASH BLOCK
DS	DOWNSPOUT
FEC	FIRE EXTINGUISHER CABINET
PS	PROJECTION SCREEN

GROSS BUILDING AREA

GROSS BUILDING AREA PER IBC=

FIRST FLOOR	952 SF
TOTAL	952 SF

GROSS BUILDING AREA PER UFC 3-101-01 =

FIRST FLOOR	952 SF +112 (1/2 EXT. COVERED) 1,064 SF
TOTAL	1,064 SF

GROSS FLOOR AREA PER NFPA 101
(FLOOR AREA INSIDE EXTERIOR WALLS):

FIRST FLOOR	832 SF
TOTAL	832 SF

NORTH ARROW

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M.DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

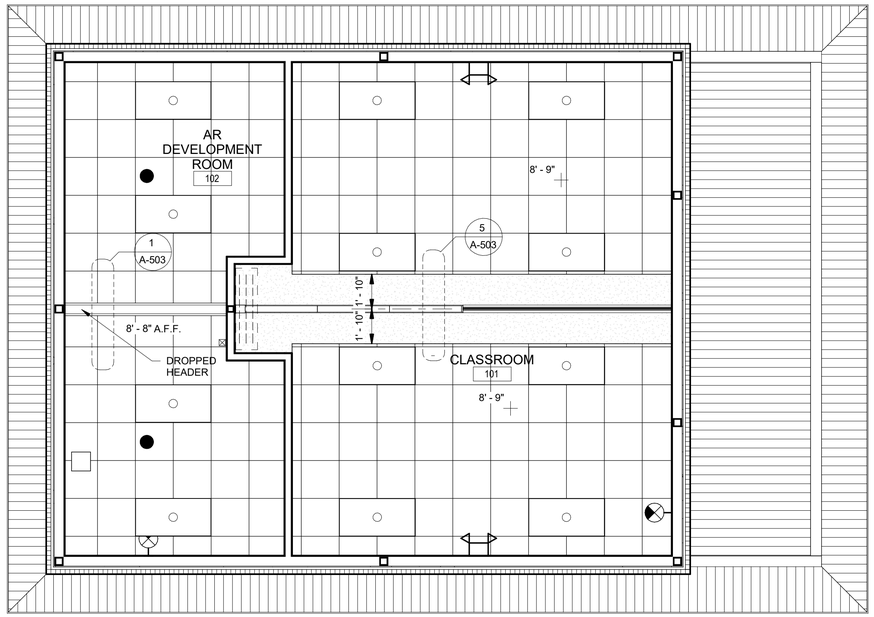
AAR BUILDING FLOOR PLAN

SHEET ID
BLDG 2
A-101

Plot Date: 11/28/2023 11:49:25 AM

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-AAR_ARCH_R21_K6ENXT09.rvt

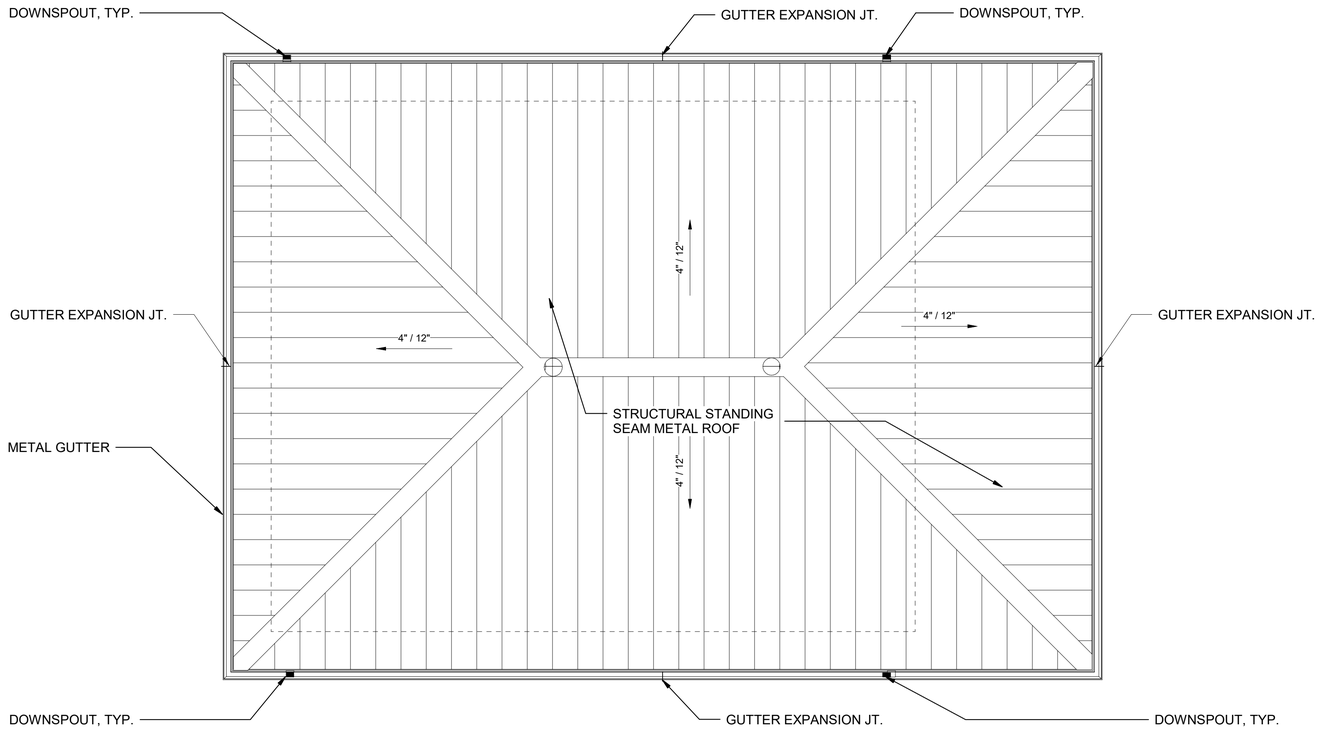
READY TO ADVERTISE (RTA)



1 REFLECTED CEILING PLAN

1/4" = 1'-0"

SCALE: 1/4"=1'-0"



2 AAR ROOF PLAN

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

RCP LEGEND

- ACCOUSTICAL CEILING TILE
- GWB CEILING
- SD — SMOKE DETECTOR (REFER TO FA DWGS)
- EXIT SIGN LOCATION (REFER TO FA DWGS)
- RECESSED CAN LIGHTING FIXTURE
- 1' X 4' PENDANT
- 2' x 4' DOWNLIGHT
- 6'-0" — PROJECTION SCREEN
- DIFFUSER
- RETURN
- 1'-0" A.F.F. — CEILING HEIGHT, ABOVE FINISH FLOOR
- Room name / 101 — ROOM NUMBER
- PREFINISHED VENTILATED ALUMINUM SOFFIT

GENERAL NOTES

1. EXTERIOR DIMENSIONS ARE FROM FACE OF INSULATED METAL PANELS, INTERIOR DIMENSIONS ARE FROM FACE OF STUD,OR FACE OF GYPSUM WALLBOARD, UNLESS NOTED OTHERWISE.

2. SEE CIVIL DRAWINGS FOR FINISHED FLOOR AND FINISHED GRADE ELEVATIONS. SEE STRUCTURAL DRAWINGS FOR FOUNDATION PLANS AND FLOOR SLABS.

3. SEE MECHANICAL DRAWINGS FOR LOCATION OF ALL MECHANICAL EQUIPMENT. COORDINATE WITH MECHANICAL FOR EXACT LOCATION AND SIZES OF ALL REQUIRED REINFORCED CONCRETE EQUIPMENT PADS, TYPICAL.

REFLECTED CEILING PLAN NOTES

1. FIXTURES ARE SHOWN FOR POSITIONING IN FINISHED CEILING. REFERENCE ELECTRICAL, MECHANICAL AND FIRE PROTECTION FOR FIXTURE TYPES.

2. REFERENCE FINISH SCHEDULE FOR FINISHED CEILING HEIGHTS. CEILING HEIGHTS SHOWN IN THE FINISHED SCHEDULE ARE MINIMUM AND SHALL BE MAINTAINED UNLESS OTHERWISE NOTED.

ROOF PLAN NOTES

1. ROOF AND WALL PENETRATIONS/FLASHING SHALL CONFORM TO ACCEPTED ROOFING PRACTICES AS DESCRIBED AND DETAILED IN THE CURRENT EDITION OF THE NRCA ROOFING AND WATERPROOFING MANUALS AND THE SMACNA ARCHITECTURAL SHEET METAL MANUAL. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

2. LOCATE ALL ROOF PENETRATIONS AS REQUIRED TO AVOID CONFLICTS WITH MECHANICAL EQUIPMENT DUCTWORK.

3. COMPLETELY SEAL AROUND PENETRATIONS PER MANUFACTURERS RECOMMENDATIONS TO MAINTAIN AIR BARRIER/WEATHERTIGHT CONDITIONS.

4. ALL ITEMS PROTRUDING FROM THE FACE OF THE ROOF, INCLUDING VTR'S, SHALL BE PAINTED TO MATCH ROOF COLOR UNLESS OTHERWISE NOTED IN SPECIFICATION 09 06 00. ALL EXPOSED FASTNERS SHALL MATCH COLOR OF ADJACENT METAL.

5. SEE MECHANICAL DRAWINGS AND SPECIFICATIONS FOR ACTUAL SIZES OF MECHANICAL ITEMS.

6. ELIMINATION, PREVENTION OR CONTROL OF FALL HAZARDS SHALL COMPLY WITH THE PROVISIONS AND REQUIRMENTS OF ANSI/ASSE Z359 FALL PROTECTION CODE, ANSI/ASSE A1264.1 STANDARD AND DOL 29 CFR PART 1910 SUBPART D.

7. ALL DOWNSPOUTS TO BE 3" X 4" MIN. REFERENCE ROOF PLAN FOR DOWNSPOUT LOCATIONS. QUANTITY SHOWN ON ROOF PLAN SHALL BE PROVIDED. DOWNSPOUTS SHOWN IN ELEVATIONS ARE FOR GENERAL WALL PLACEMENT.

8. SECURE DOWNSPOUT WITH PREFINISHED METAL STRAPS AND PREFINISHED METAL FASTENERS, COLOR TO MATCH DOWNSPOUT (2 PER DOWNSPOUT). FASTEN INTO MASONRY WITH EXPANSION ANCHORS.

9. ALL GUTTERS TO BE 5" WIDE BY 5" DEEP. HANG ALL GUTTERS TO A SLOPE OF O.5% TO DOWNSPOUTS.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
T.O'DELL	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
T. O'DELL	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
M. DEACON	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

AAR BUILDING REFLECTED CEILING PLAN & ROOF PLAN

SHEET ID
BLDG 2
A-102

READY TO ADVERTISE (RTA)

File Path: C:\Users\K6ENXTO9\Documents\FY23_PN98182_MPTR-AAR_ARCH_R21_K6ENXTO9.rvt

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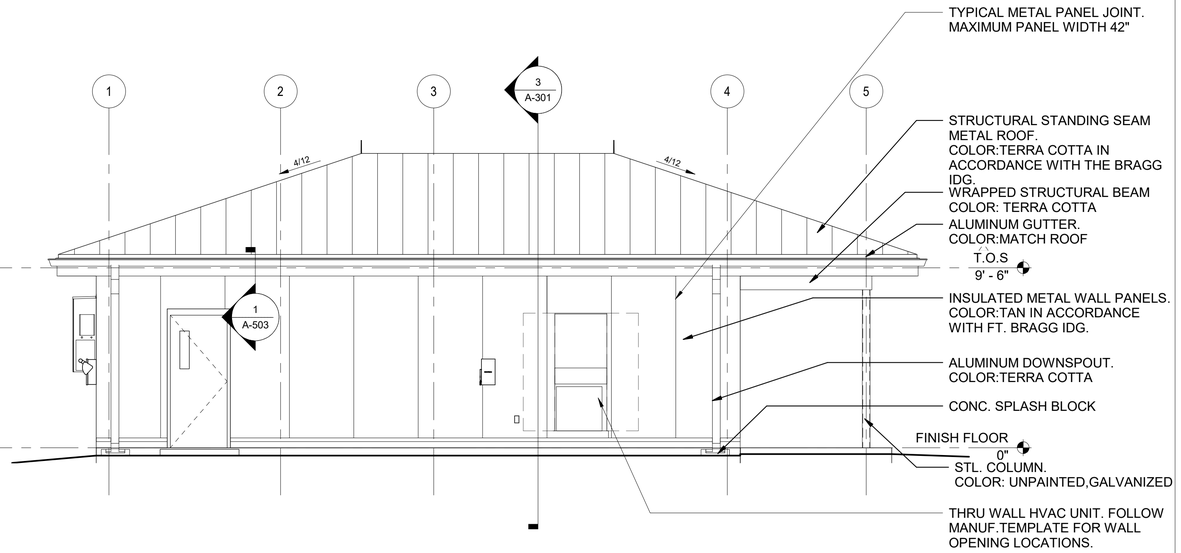
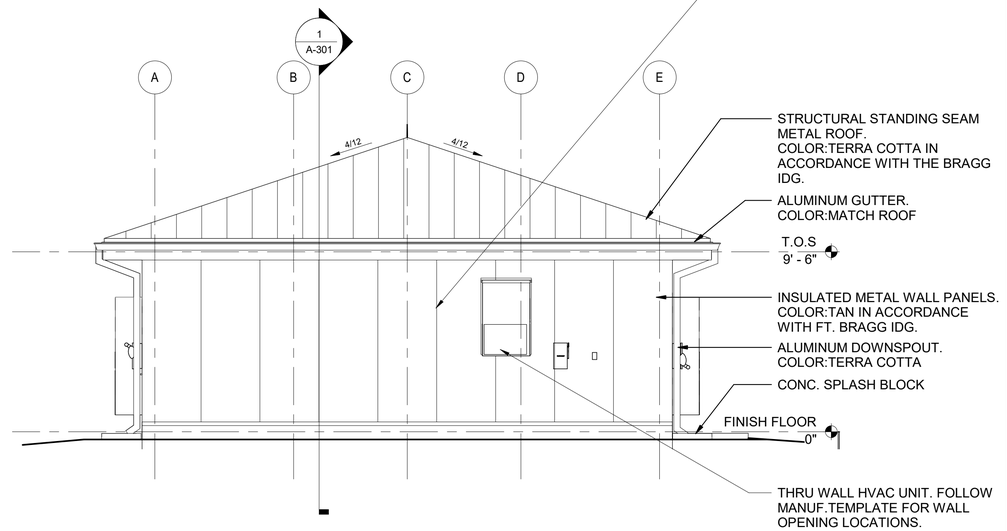


1 SOUTH ELEVATION

1/4" = 1'-0"

4 3 2 1 0 4 8

SCALE: 1/4"=1'-0"

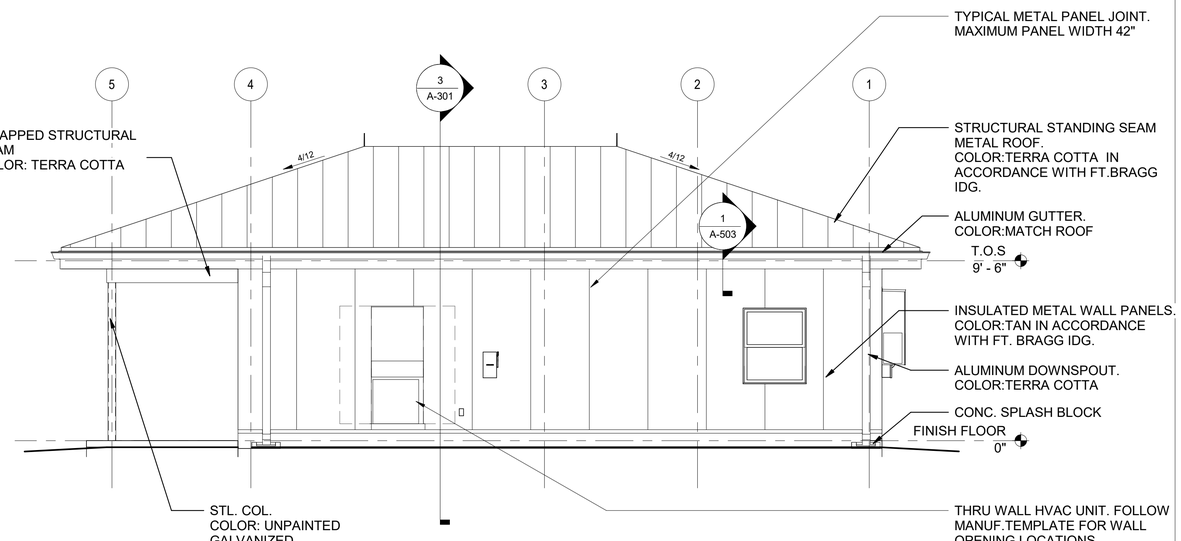


2 WEST ELEVATION

1/4" = 1'-0"

4 3 2 1 0 4 8

SCALE: 1/4"=1'-0"

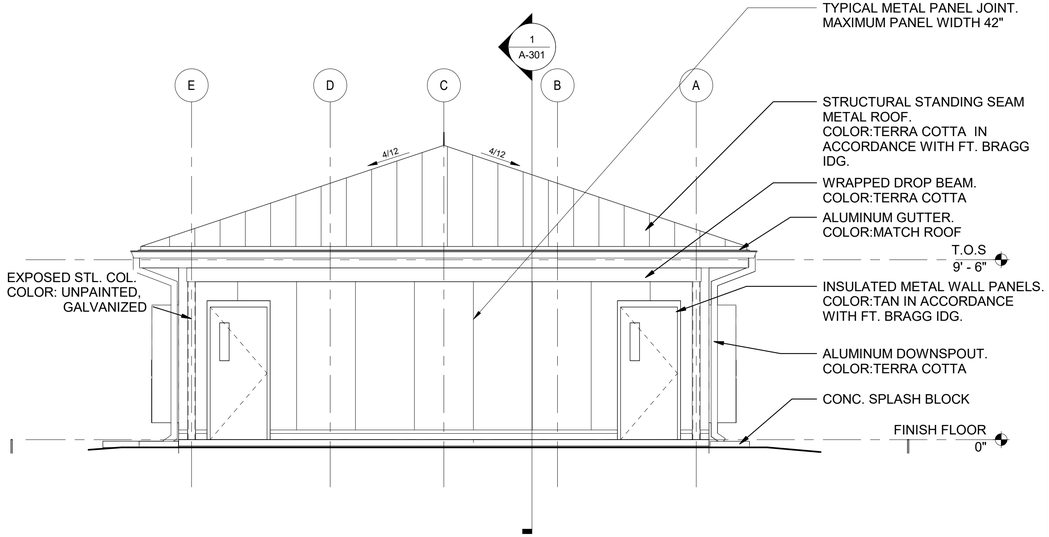


3 NORTH ELEVATION

1/4" = 1'-0"

4 3 2 1 0 4 8

SCALE: 1/4"=1'-0"



4 EAST ELEVATION

1/4" = 1'-0"

4 3 2 1 0 4 8

SCALE: 1/4"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T.O'DELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.O'DELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M.DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT 100 W. OGLETHORPE AVE. SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

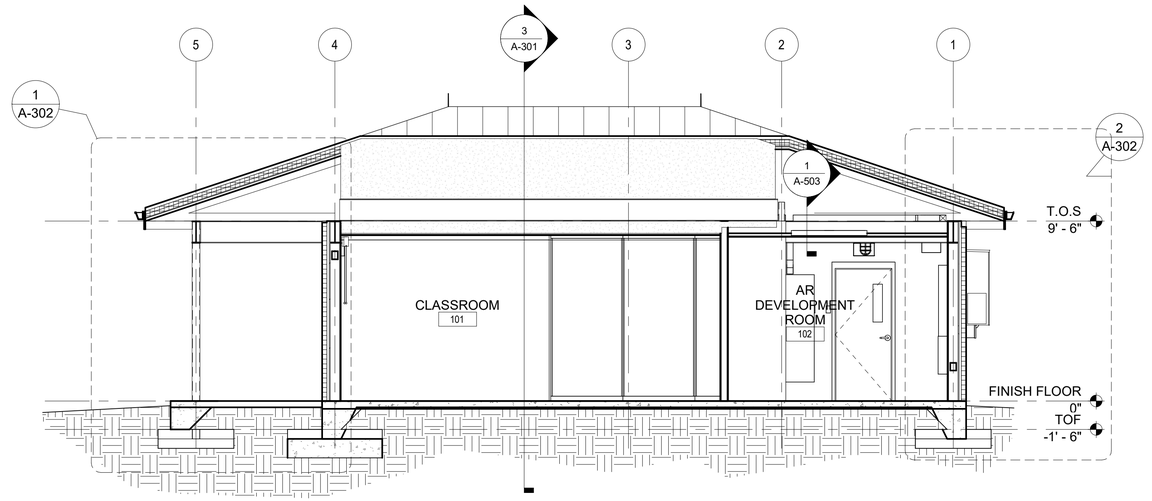
AAR BUILDING ELEVATIONS

SHEET ID
BLDG 2
A-201

READY TO ADVERTISE (RTA)

Plot Date: 11/29/2023 11:49:29 AM

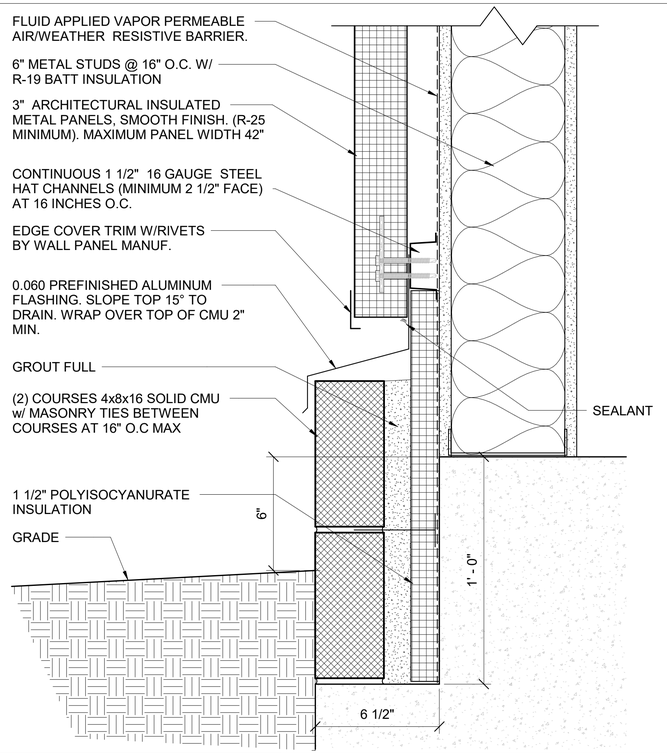
File Path: C:\Users\K6ENXT09\Documents\FY23_PN86182_MPTR-AAR_ARCH_R21_K6ENXT09.rvt



1 AAR EAST-WEST BLDG SECTION

1/4" = 1'-0"

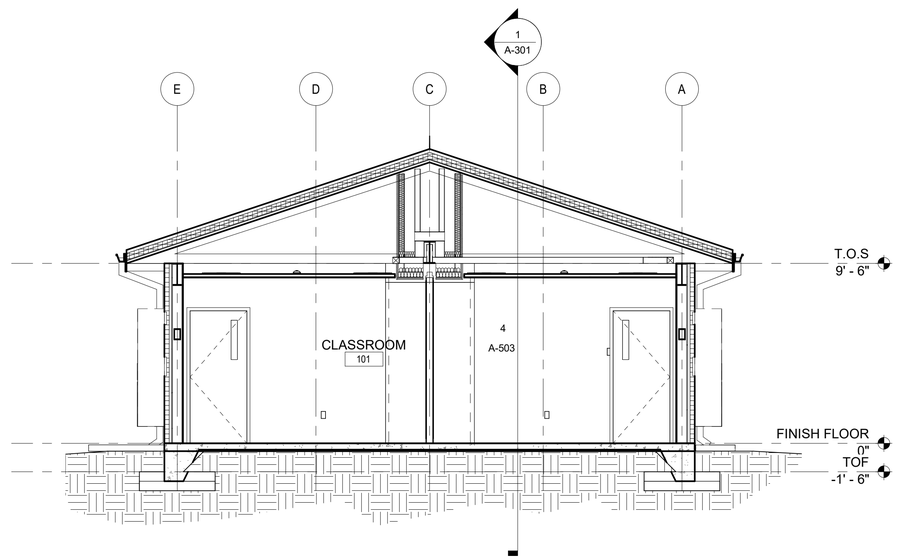
SCALE: 1/4"=1'-0"



2 EXTERIOR WALL BASE

3" = 1'-0"

SCALE: 3"=1'-0"



3 AAR NORTH-SOUTH BLDG SECTION

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	
CATEGORY CODE:	178-65-01
FILE NAME:	

DESIGN BY:	T.O'DELL
DRAWN BY:	T.O'DELL
CHECKED BY:	M.DEACON
SUBMITTED BY:	J. DEACON
SIZE:	ANSI D

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

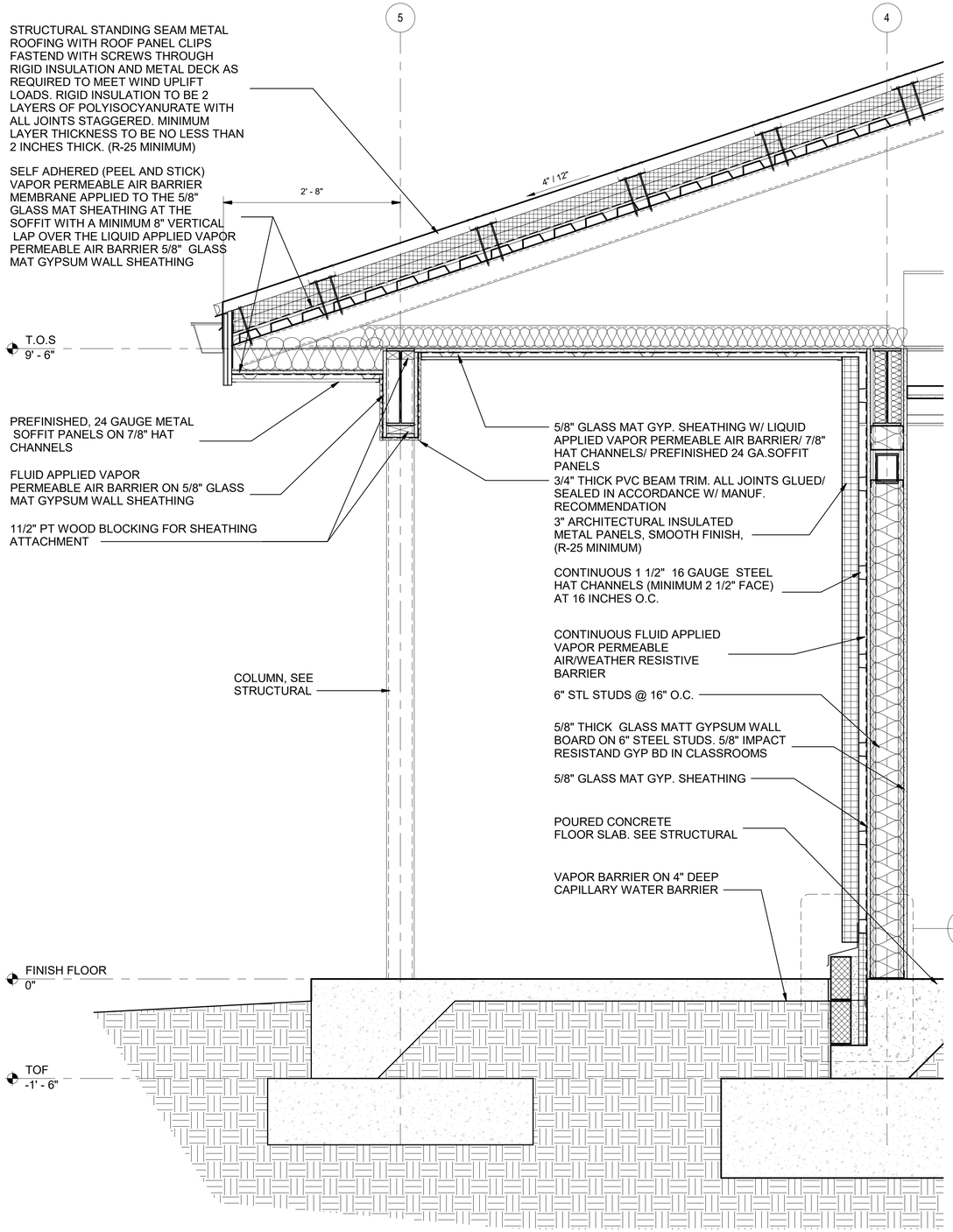
AAR BUILDING CROSS & LONGITUDINAL SECTION

SHEET ID
BLDG 2
A-301

READY TO ADVERTISE (RTA)

Plot Date: 11/29/2023 11:49:30 AM

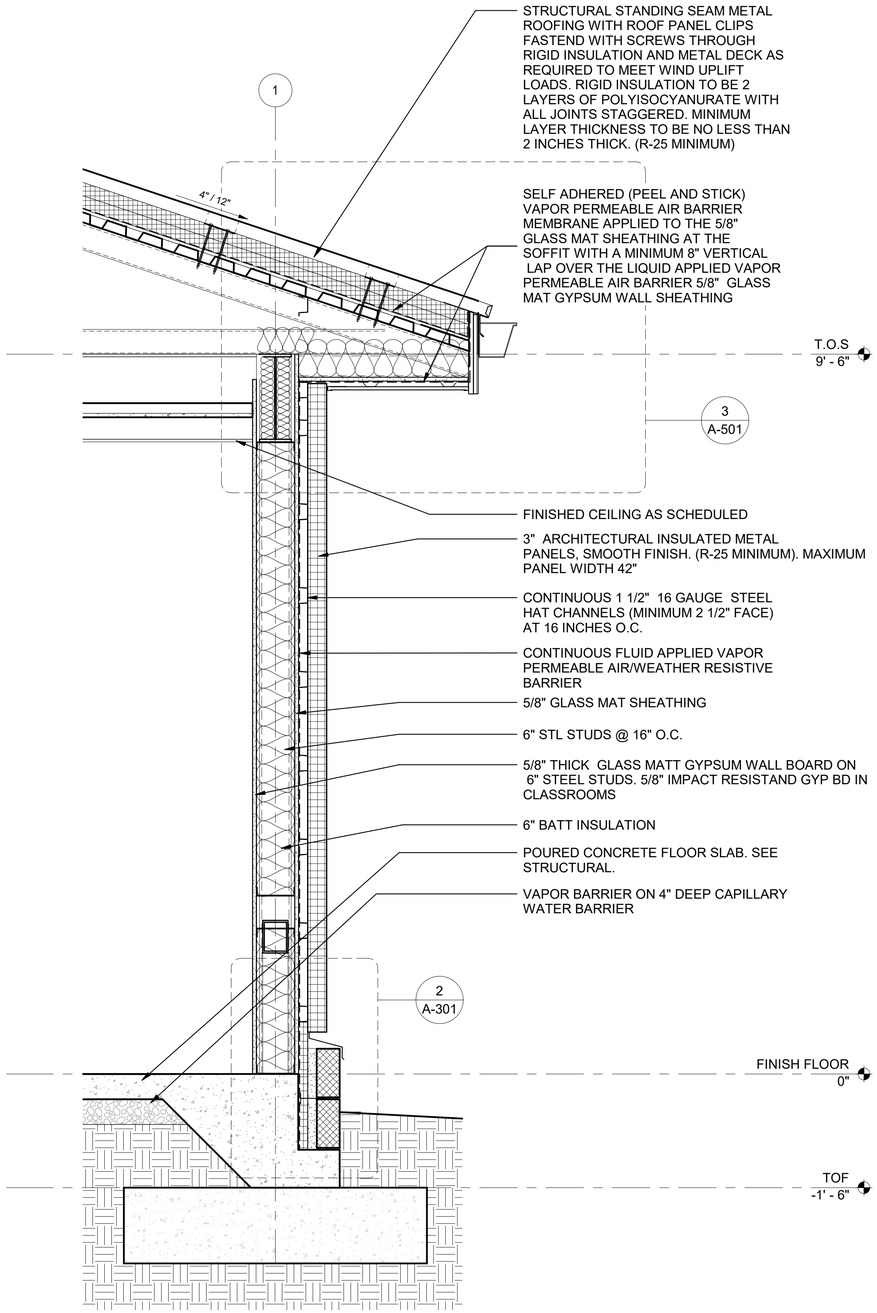
File Path: C:\Users\K6ENXTO9\Documents\FY23_PN96182_MPTR-AAR_ARCH_R21_K6ENXTO9.rvt



1 AAR WALL SECTION 1

1" = 1'-0"

SCALE: 1"=1'-0"



2 AAR WALL SECTION 2

1" = 1'-0"

SCALE: 1"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T.O'DELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.O'DELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M.DEACON	CONTRACT NO.: -
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT 100 W. OGLETHORPE AVE. SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

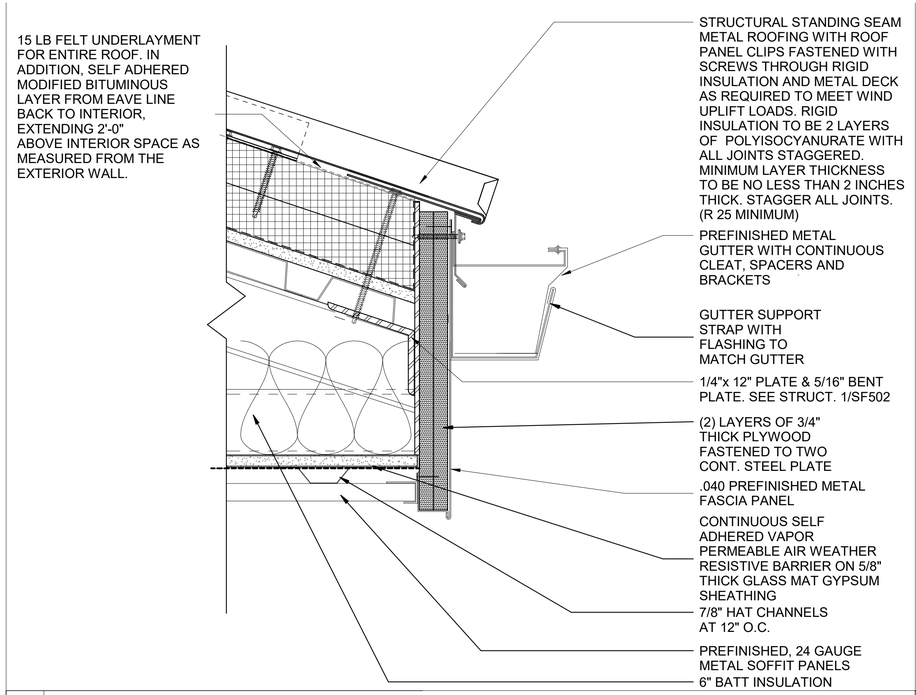
AAR WALL SECTIONS

SHEET ID
BLDG 2
A-302

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 11:49:30 AM

File Path: C:\Users\K6ENXT09\Documents\FY23_PN98182_MPTR-AAR_ARCH_R21_K6ENXT09.rvt

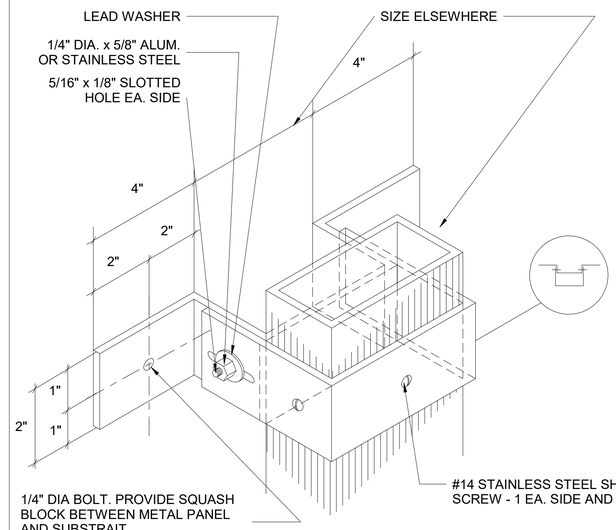


1 TYPICAL GUTTER DETAIL

3" = 1'-0"

6" 4 2 0 6"

SCALE: 3"=1'-0"

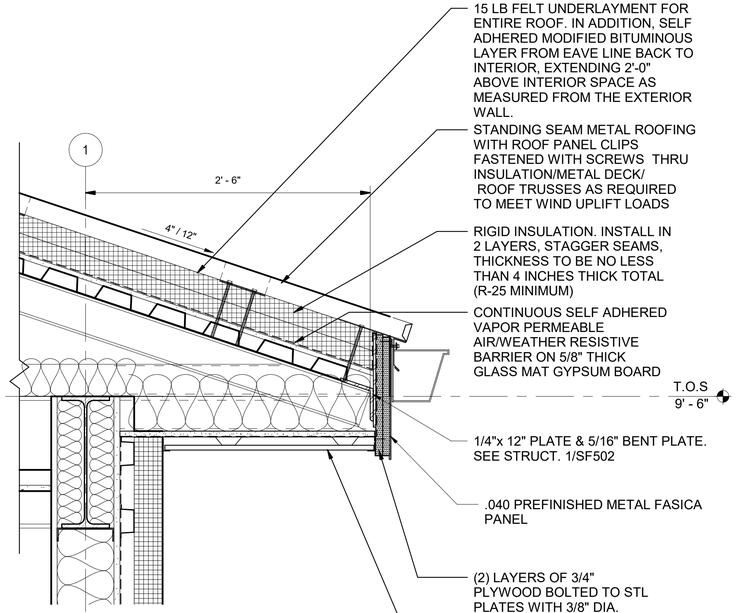


2 DOWNSPOUT STRAP DETAIL

6" = 1'-0"

3" 2 1 0 3"

SCALE: 6"=1'-0"

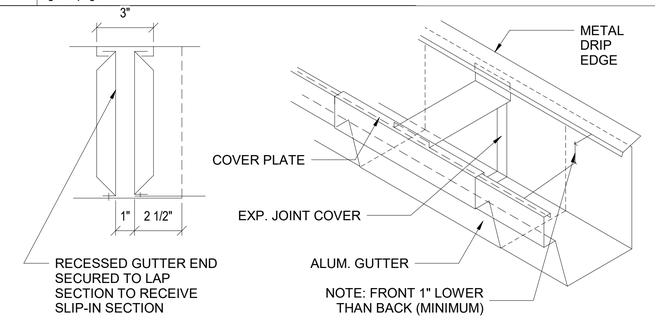


3 TYPICAL EAVE DETAIL

1 1/2" = 1'-0"

1 0 1

SCALE: 1 1/2"=1'-0"

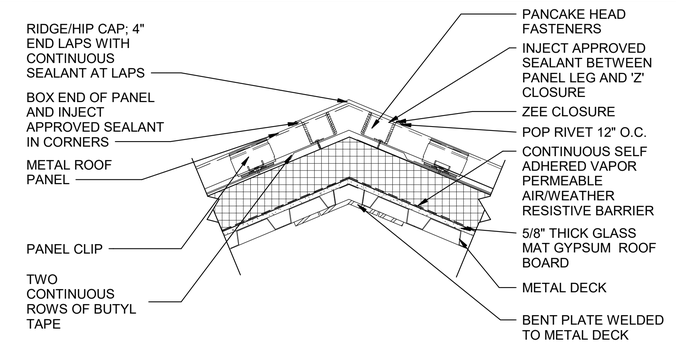


4 GUTTER EXPANSION JOINT

3" = 1'-0"

6" 4 2 0 6"

SCALE: 3"=1'-0"



5 RIDGE CAP DETAIL

1 1/2" = 1'-0"

1 0 1

SCALE: 1 1/2"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T.ODELL
DRAWN BY: T.ODELL
CHECKED BY: M.DEACON
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
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U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT 100 W. OGLETHORPE AVE. SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

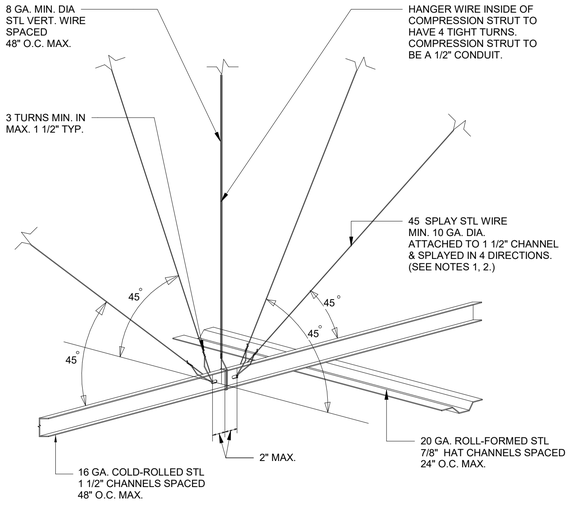
AAR ROOF DETAILS

SHEET ID
BLDG 2
A-501

READY TO ADVERTISE (RTA)

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-AAR_ARCH_R21_K6ENXT09.rvt

Plot Date: 11/29/2023 11:49:31 AM

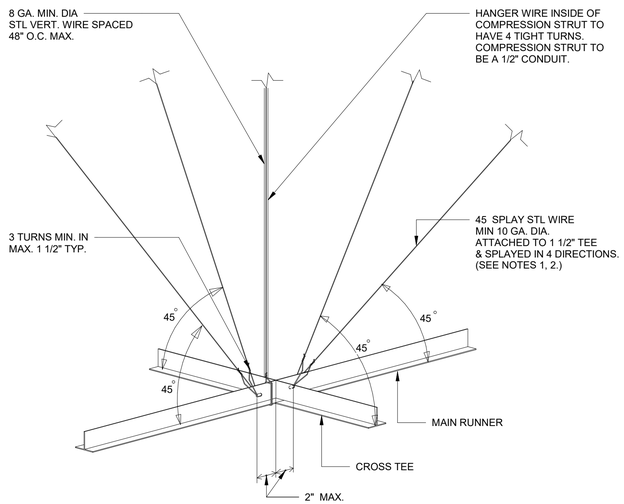


TYPICAL LATERAL BRACING DETAIL FOR SUSPENDED GYPSUM BOARD CEILING SYSTEM

1 CEILING BRACE 1

1/8" = 1'-0"

SCALE: 1/8"=1'-0"



TYPICAL LATERAL BRACING DETAIL FOR SUSPENDED ACOUSTICAL CEILING SYSTEM

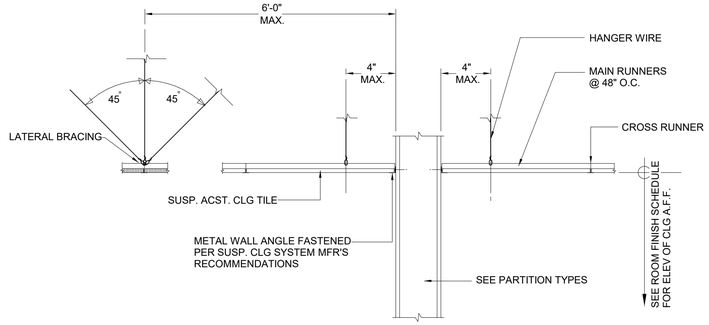
2 CEILING BRACE 2

1/8" = 1'-0"

SCALE: 1/8"=1'-0"

GENERAL NOTES

1. PROVIDE SPLAY BRACING AT 12'-0" O.C. MAX. IN EACH DIRECTION W/ THE FIRST POINT WITHIN 6'-0" OF EACH PERIMETER WALL.
2. CEILING AREA OF 144 SQUARE FEET OR LESS SURROUNDED BY WALLS WHICH CONNECT TO THE STRUCTURE SHALL NOT REQUIRE SPLAYED WIRES.
3. SEALANT SHALL BE A POLYISOBUTYLENE-BASED OR ISOPRENE-ISOBUTYLENE-BASED PRESSURE-SENSITIVE TAPE OR BEAD.
4. SEISMIC RESTRAINTS SHALL COMPLY WITH INTERNATIONAL BUILDING CODE.

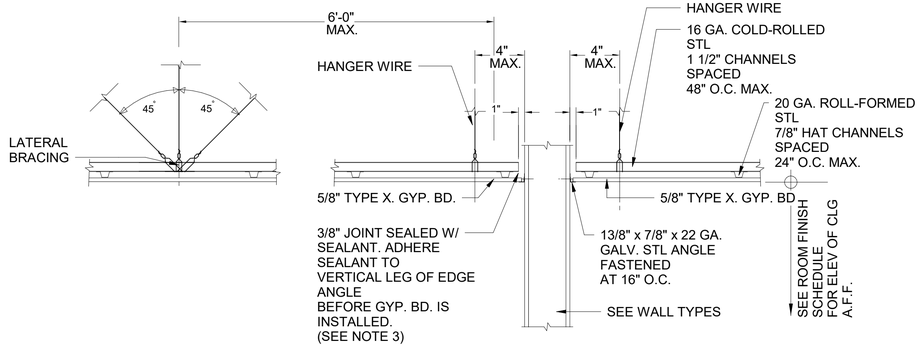


SUSPENDED ACOUSTICAL CEILING SYSTEM

3 CEILING CONSTRUCTION 1

1/8" = 1'-0"

SCALE: 1/8"=1'-0"



SUSPENDED GYPSUM BOARD CEILING SYSTEM

6 CEILING SUSPENSION 1

1/8" = 1'-0"

SCALE: 1/8"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T.O'DELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.O'DELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M.DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT 100 W. OGLETHORPE AVE. SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

AAR CEILING DETAILS

SHEET ID
BLDG 2
A-502

READY TO ADVERTISE (RTA)

Plot Date: 11/29/2023 11:49:31 AM

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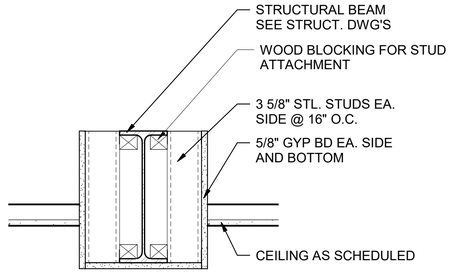
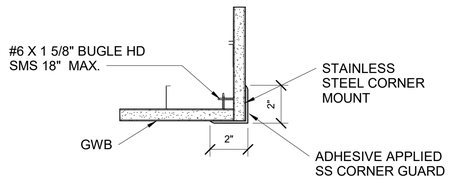


1 DROP BEAM
1 1/2" = 1'-0"

SCALE: 1"=1'-0"

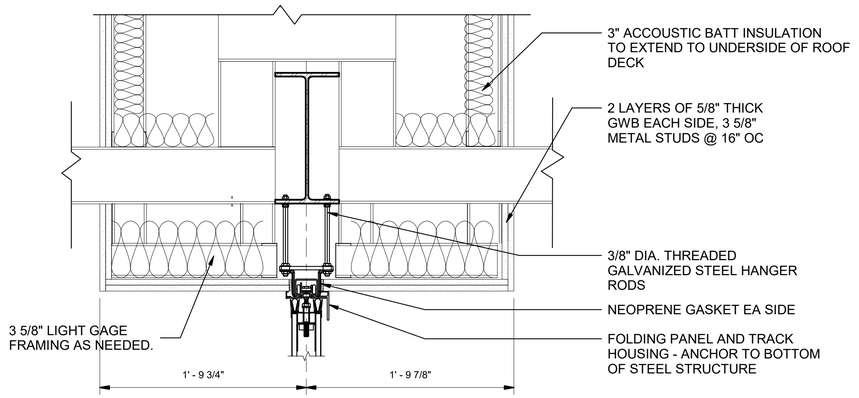


SSCG

NOTES:
1. SEE FLOOR PLANS FOR LOCATIONS.
2. ALL SSCG SHALL EXTEND FROM FLOOR TO 6'-0" ABOVE FINISHED FLOOR

2 CORNER GUARD
3" = 1'-0"

SCALE: 3"=1'-0"



3 OPERABLE PARTITION HEAD DETAIL
1 1/2" = 1'-0"

SCALE: 1 1/2"=1'-0"

PROJECTOR MOUNTING BRACKET:

PROVIDE A UNIVERSAL PROJECTOR MOUNT BRACKET FOR ABOVE ACOUSTICAL CEILING TILE THAT WILL:
1) HOLD A MIN LOAD OF 50 LBS.
2) HAS A WHITE FINISH ESCUTCHEON.
3). PROVIDE TWO ELECTRICAL KNOCKOUTS MIN .
4) ACCOMMODATE ANY PROJECTOR MOUNT WITH 1-1/2" NPT (NATIONAL PIPE THREAD) PIPE.
5) FIT WITHIN 1 CEILING GRID TILE.

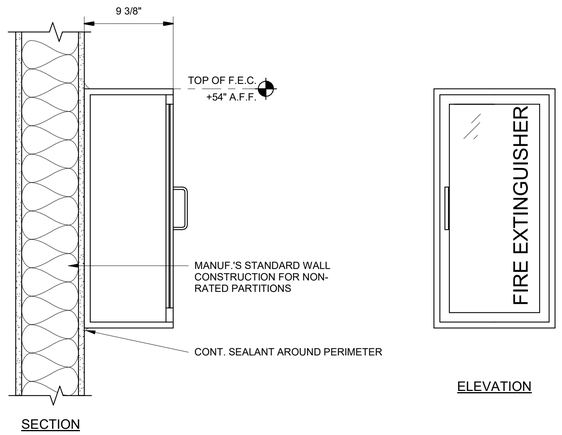
UNIVERSAL PROJECTOR MOUNT:

PROVIDE A UNIVERSAL PROJECTOR MOUNT THAT WILL ATTACH TO THE PROJECTOR MOUNTING BRACKET USING A MIN 6" 1-1/2" NPT .(NATIONAL PIPE THREAD). UNIVERSAL MOUNT SHALL:
1) SUPPORT A PROJECTOR WITH A MIN LOAD CAPACITY OF 50 LBS.
2) ROLL PLUS OR MINUS 20 DEGREES.
3). PITCH PLUS OR MINUS 15 DEGREES.
4) ACCOMMODATE ANY PROJECTOR THAT WILL WORK WITH 1-1/2" NPT PIPE.
5) SWIVEL 360 DEGREES
6) MATERIAL SHALL BE STEEL.
7) GROOVED COUPLING 11/2 " NPT STEEL HALF PIPE.

PROJECTOR SCREEN KEYNOTES:

MOTORIZED PROJECTION SCREENS SHALL BE:
1) RECESSED CEILING MOUNTED
2) WITH WHITE EXTRUDED ALUMINUM CASE
3) PROVIDE TAB GUIDED CABLE SYSTEM FOR EVEN LATERAL TENSION AND FLAT SUFRACE
4) VIEWING SURFACE FLAME AND MILDEW RESISTANT
5) WITH ELECTRICALLY OPERATED 110-120 AV, 60HZ 3 WIRE
6) MOTOR MOUNTED INSIDE SCREEN ROOLER
7) WITH A 3-POSITION WHITE WALL SWITCH
   A HDTV FORMAT (16:9) PROJECTION SCREENS, SIZE 54"H X 96"W (LOW VOLTAGE CONTROLLER)
   B HDTV FORMAT (16:9) PROJECTION SCREENS, SIZE 65"H X 116"W (LOW VOLTAGE CONTROLLER)

7 PROJECTOR NOTES

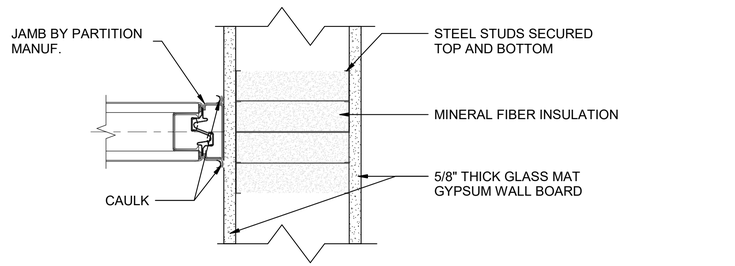


SURFACE MOUNTED

*WOOD BLOCKING SHALL BE PROVIDED IN WALL ASSEMBLY FOR FEC

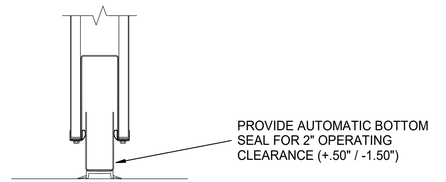
4 FIRE EXTINGUISHER
1 1/2" = 1'-0"

SCALE: 1 1/2"=1'-0"



5 OPERABLE PARTITION JAMB DETAIL
3" = 1'-0"

SCALE: 3"=1'-0"



6 OPERABLE PARTITION SILL
3" = 1'-0"

SCALE: 3"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T.O'DELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.O'DELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M.DEACON	CONTRACT NO.:
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SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING INTERIOR DETAILS

SHEET ID
BLDG 2
A-503

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 11:49:32 AM

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-AAR_ARCH_R21_K6ENXT09.rvt

AAR BLDG FINISH SCHEDULE

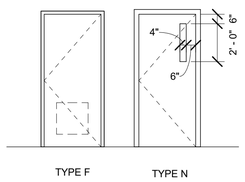
ROOM NO	ROOM NAME	WALL FINISH				BASE FINISH				FLOOR	CEILING		NOTES & REMARKS (SEE NOTES)
		NORTH	EAST	SOUTH	WEST	NORTH	EAST	SOUTH	WEST	FIN.	FIN.	HEIGHT	
101	CLASSROOM	PT	PT	PT	PT	RB	RB	RB	RB	SC	ACT	8' - 9"	
102	AR DEVELOPMENT ROOM	PT	PT	PT	PT	RB	RB	RB	RB	SC	ACT	8' - 8"	

AAR DOOR SCHEDULE

DOOR NO.	TYPE	DOOR SIZE WIDTH	HEIGHT	THICKNESS	MATERIAL	FINISH	FIRE RATING	FRAME TYPE	MATERIAL	DETAILS HEAD	JAMB	SILL	HARDWARE	COMMENTS:
101A	N	3' - 0"	7' - 0"	1 3/4"	HM	PT		1	HM	1/A-602	2/A-602	3/A-602	3	
101B	N	3' - 0"	7' - 0"	1 3/4"	HM	PT		1	HM	1/A-602	2/A-602	3/A-602	3	
102	N	3' - 0"	7' - 0"	1 3/4"	HM	PT		1	HM	1/A-602	2/A-602	3/A-602	3	
102A	N	3' - 0"	7' - 0"	1 3/4"	WOOD	STAIN	-	1	HM	1/A-602	5/A-602	6/A-602	4	
102B	N	3' - 0"	7' - 0"	1 3/4"	WOOD	STAIN	-	1	HM	4/A-602	5/A-602	6/A-602	4	

AAR WINDOW SCHEDULE

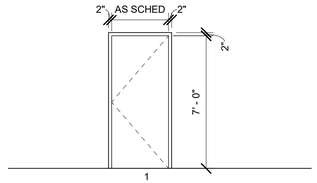
Count	Mark	R.O. Width	Height	Type	FRAME Material	DETAILS Head	Jamb	Sill	Head Height	Remarks (See Notes Below)
1	W1	3' - 4"	4' - 0"	Double Hung	ALUMN	7/A-602	9/A-602	10/A-602	7' - 0"	



TYPE F TYPE N

DOOR TYPES

NOT TO SCALE

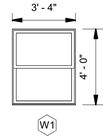


1
EXTERIOR/INTERIOR
SINGLE DOORS

FRAME TYPES

1/4" = 1'-0"

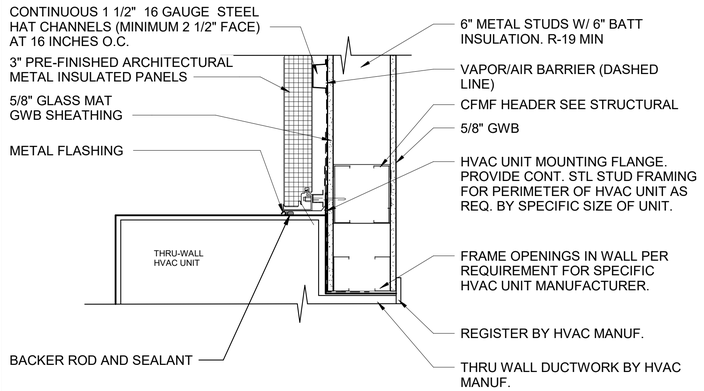
4 3 2 1 0 4 8
SCALE: 1/4"=1'-0"



WINDOW TYPES

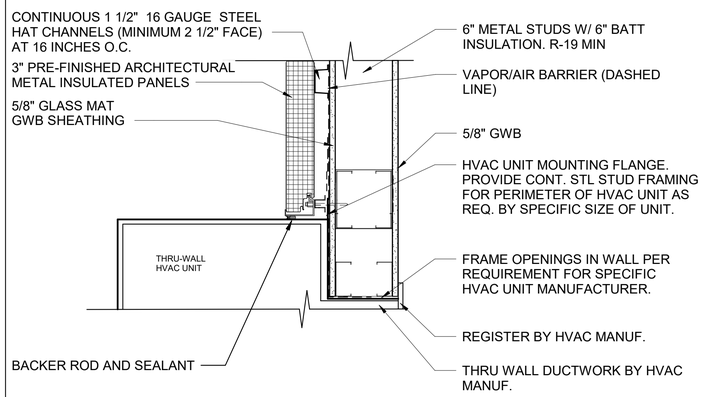
1/4" = 1'-0"

4 3 2 1 0 4 8
SCALE: 1/4"=1'-0"



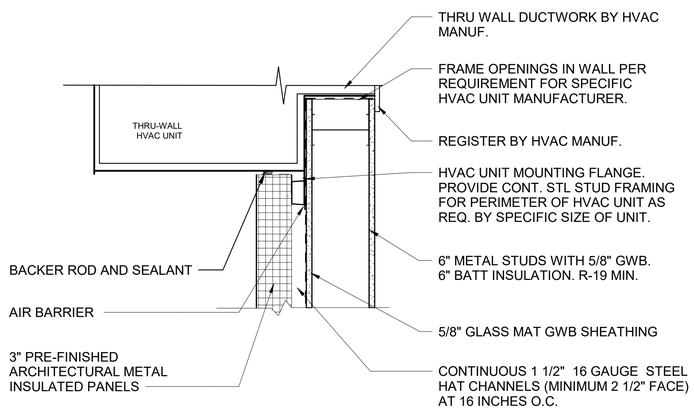
1 HVAC THRU WALL HEAD

1 1/2" = 1'-0"



2 HVAC THRU WALL JAMB

1 1/2" = 1'-0"



3 HVAC THRU WALL SILL

1 1/2" = 1'-0"

GENERAL NOTES

1. CORNER GUARDS SHALL BE LOCATED AT ALL EXPOSED CORNERS IN THE AR DEVELOPMENT AND CLASSROOMS

2. REFERENCE SPECIFICATION SECTON 08 11 13 FOR STEEL DOORS AND FRAMES.

3. REFERENCE SPECIFICATION SECTION 08 71 00 FOR DOOR HARDWARE .

ROOM FINISH SCHEDULE LEGEND

ACT	ACOUSTICAL CEILING TILE	RB	RESILIENT BASE
EXP	EXPOSED	SC	SEALED CONC.
PT	PAINT		

DOOR NOTES

1. SEE FLOOR PLANS FOR DOOR QUANTITIES, LOCATIONS, AND SWINGS.

2. ALL EXTERIOR "HM" DOORS SHALL BE INSULATED STEEL DOOR SYSTEMS AND SHALL COMPLY WITH UFC 4-010-01 AND ASTM F2248.

3. ALL INTERIOR DOORS SHALL BE HEAVY DUTY U.N.O.

4. PROVIDE SEALANT AROUND FULL PERIMETER OF FRAMES, BOTH SIDES OR PARTITIONS, ECT.

5. ALL GLAZING UNITS IN DOORS SHALL BE AS INDICATED AND SPECIFIED.

6. PROVIDE GROUTED FRAMES WHERE NEEDED FOR FIRE OR SOUND RATING PER SPECIFIED ASSEMBLY REQUIREMENTS.

7. PROVIDE GASKET WEATHER STRIPPING SEAL AND DOOR BOTTOM AT INTERIOR DOORS FOR AIR BARRIER SEAL AT DOORS THAT PENETRATE AIR BARRIER TESTING PERIMETER.

8. ALL DOORS PENETRATING AIR BARRIER TESTING ENVELOPE MUST MEET AIR BARRIER REQUIREMENTS.

DOOR SCHEDULE LEGEND

HM	HOLLOW METAL
PT	PAINT
STAIN	STAIN

WINDOW NOTES

1. REFER TO FLOOR PLANS FOR LOCATIONS OF WINDOWS

2. REFERENCE SPECIFICATION FOR GLAZING REQUIREMENTS.

3. PROVIDE SEALANT AROUND FULL PERIMETER OF FRAMES, BOTH SIDES OF WALL.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T O'DELL
DRAWN BY: T O'DELL
CHECKED BY: M DEACON
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

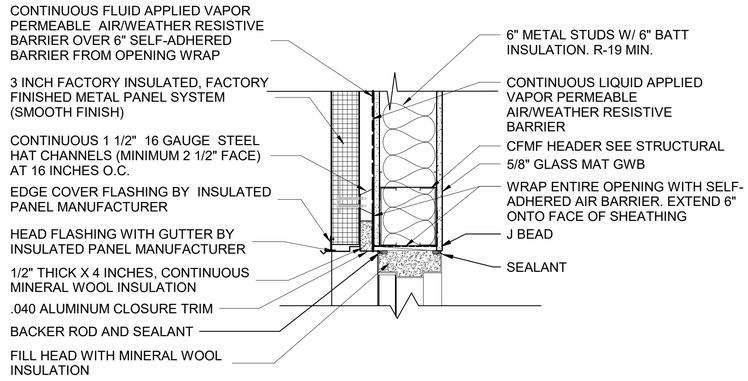
AAR SCHEDULES

SHEET ID
BLDG 2
A-601

READY TO ADVERTISE (RTA)

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-AAR_ARCH_R21_K6ENXT09.rvt

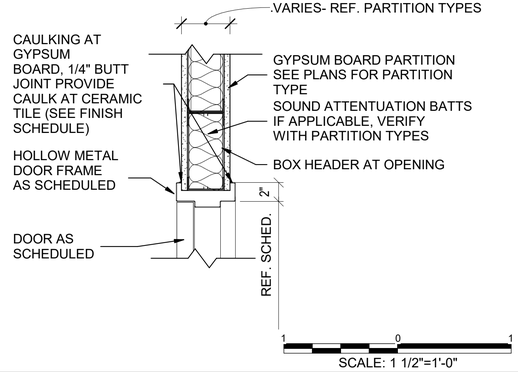
Plot Date: 11/28/2023 11:49:32 AM



1 HM DOOR HEAD

1 1/2" = 1'-0"

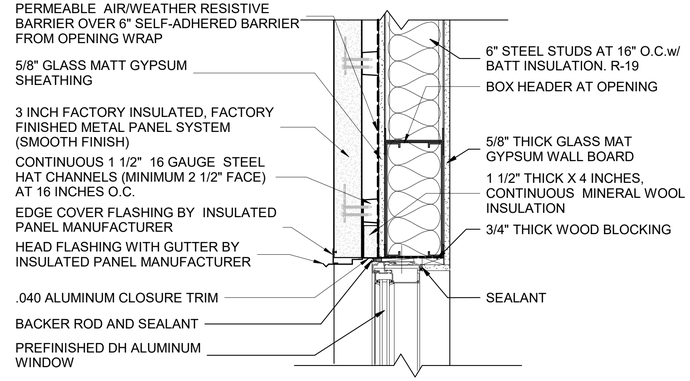
SCALE: 1 1/2"=1'-0"



SCALE: 1 1/2"=1'-0"

4 INTERIOR DOOR HEAD

1 1/2" = 1'-0"

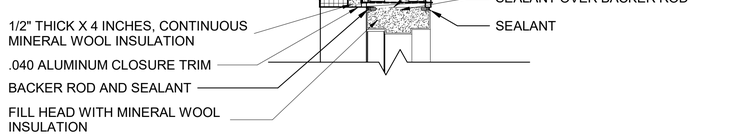


NOTE: SEE A-700 SERIES PLATES FOR AIR BARRIER GUIDANCE

7 DBL HUNG WINDOW HEAD DETAIL

1 1/2" = 1'-0"

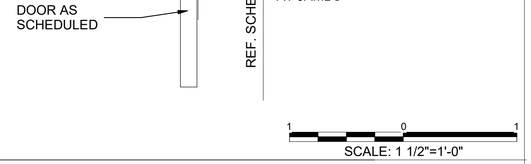
SCALE: 1 1/2"=1'-0"



2 HM DOOR JAMB

1 1/2" = 1'-0"

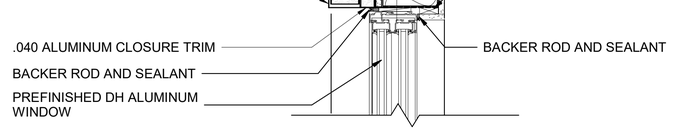
SCALE: 1 1/2"=1'-0"



SCALE: 1 1/2"=1'-0"

5 INTERIOR DOOR JAMB

1 1/2" = 1'-0"



NOTE: SEE A-700 SERIES PLATES FOR AIR BARRIER GUIDANCE

9 DBL HUNG WINDOW JAMB DETAIL

1 1/2" = 1'-0"

SCALE: 1 1/2"=1'-0"

3 HM DOOR SILL

1 1/2" = 1'-0"

SCALE: 1 1/2"=1'-0"

6 INTERIOR DOOR SILL

1 1/2" = 1'-0"

SCALE: 1 1/2"=1'-0"

NOTE: SEE A-700 SERIES PLATES FOR AIR BARRIER GUIDANCE

10 DBL HUNG WINDOW SILL DETAIL

1 1/2" = 1'-0"

SCALE: 1 1/2"=1'-0"

US Army Corps of Engineers ®

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T.O'DELL	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
T.O'DELL	W912HN-24-B-3002
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ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
PY'23, PN 96182
VOLUME 2 - BUILDING

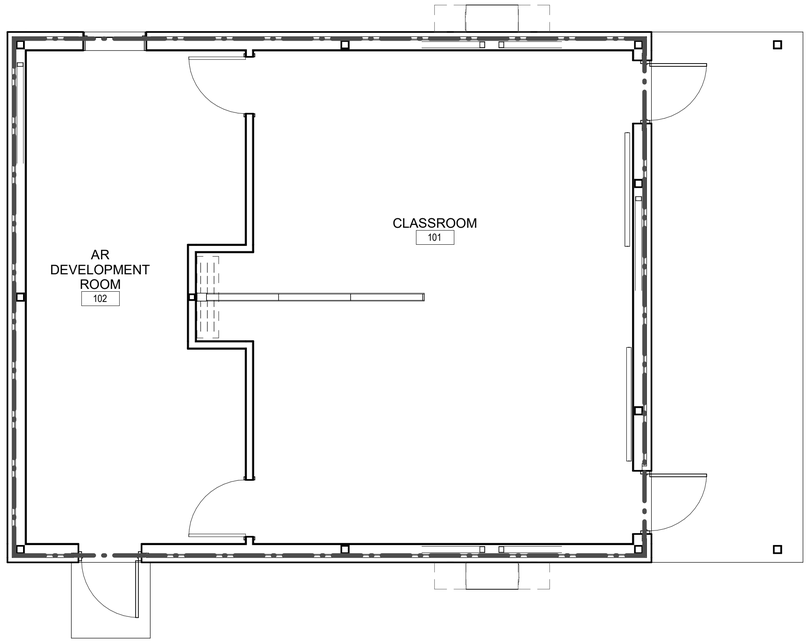
AAR DOOR AND WINDOW DETAILS

SHEET ID
BLDG 2
A-602

READY TO ADVERTISE (RTA)

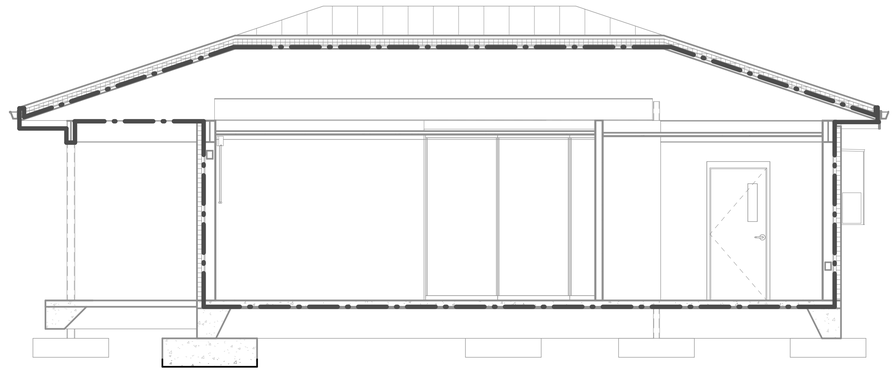
Plot Date: 11/28/2023 11:49:33 AM

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-AAR_ARCH_R21_K6ENXT09.rvt



1 AIR BARRIER BOUNDERY PLAN
1/4" = 1'-0"

SCALE: 1/4"=1'-0"



2 AAR EAST-WEST BLDG SECTION
1/4" = 1'-0"

SCALE: 1/4"=1'-0"

GENERAL NOTES

1. AIR BARRIER INSTALLATION AND INSPECTION ARE PART OF CONSTRUCTION. TESTING OF AIR BARRIER IS NOT REQUIRED.
2. INSIDE AND OUTSIDE CORNERS AND JOINTS BETWEEN METAL FURRING SHALL BE SEALED IN ACCORDANCE WITH THE PRIMARY AIR BARRIER MANUFACTURER'S RECOMMENDATIONS.
3. ALL JOINTS AT OPENINGS, TRANSITIONS, AND PENETRATIONS SHALL BE SEALED WITH BACKER ROD AND SEALANT.
4. ALL ELECTRICAL, PLUMBING, AND MECHANICAL PENETRATIONS SHALL BE SEALED TO THE AIR BARRIER IN ACCORDANCE WITH THE AIR BARRIER MANUFACTURER'S RECOMMENDATIONS.

LEGEND

INDICATES BOUNDARY OF AIR BARRIER

GENERAL NOTES

1. AIR BARRIER REQUIREMENTS: UFC 3-101-01 PARAGRAPH 3-6 REQUIRES THE BUILDING ENCLOSURE TO BE DESIGNED AND CONSTRUCTED WITH A CONTINUOUS SIX SIDED AIR BARRIER TO CONTROL AIR LEAKAGE IN ACCORDANCE WITH THE REQUIREMENTS OF ANSI/ASHRAE/USGBC/IES 189.1-2009 NORMATIVE APPENDIX B, "PRESCRIPTIVE CONTINUOUS AIR BARRIER".

2. THE PRIMARY AIR BARRIER MATERIALS ARE LIQUID APPLIED VAPOR PERMEABLE AIR/WEATHER RESISTIVE BARRIER, AND SELF-ADHERED (PEEL AND STICK) MEMBRANE. AIRBARRIER COMPONENT MATERIALS ARE SEALANTS, METAL (EXTERIOR DOORS, WINDOWS,GLAZING, FRAMES AND MECHANICAL LOUVERS WITH TIGHT SEALING MOTORIZED DAMPERS),POURED CONCRETE, FACTORY PREFINISHED PRE-INSULATED METAL WALL PANELS AND EXTERIOR WEATHER STRIPPING AT EXTERIOR DOORS.

3. THE AIR BARRIER SYSTEM CONSISTS OF PRIMARY AIR BARRIER MATERIALS COMBINED WITH AIR BARRIER COMPONENTS. MATERIAL TRANSITIONS SHALL BE FLEXIBLE TO ACCOMMODATE THERMAL AND MOISTURE MOVEMENT WITH ALL MOVEMENT JOINTS SEALED.CONNECTIONS SHALL BE MADE BETWEEN THE POURED CONCRETE FOUNDATION WALLS AND POURED CONCRETE FLOOR SLAB AND THE EXTERIOR WALLS, BETWEEN THE EXTERIOR WALLS AND EXTERIOR DOORS, EXTERIOR WINDOWS AND MECHANICAL LOUVERS, BETWEENTHE EXTERIOR WALLS AND SOFFIT, FASCIA AND ROOF AS FOLLOWS:

A) POURED CONCRETE FLOOR SLAB WITH VAPOR BARRIER TURNED UP POURED CONCRETE SLAB EDGE AND SEALED TO THE FACE OF THE POURED CONCRETE FOUNDATION WALL. THE TOP OF THE POURED CONCRETE FOUNDATION WALL PROVIDES THE CONNCETION BETWEEN THE FLOOR SLAB AND THE EXTERIOR WALL.

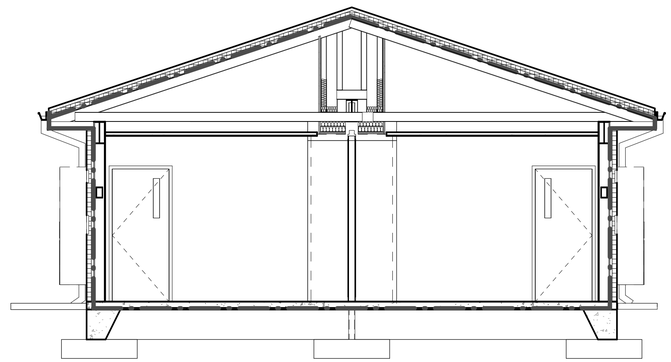
B) AT THE 4" CMU AND FACTORY PREFINISHED PREINSULATED METAL WALL PANEL TRANSITION SELF ADHERED (PEEL AND STICK) AIR BARRIER MEMBRANE IS LAPPED VERTICALLY WITH AN 8" LAP OVER THE LIQUID APPLIED VAPOR PERMEABLE AIR BARRIER OF THE WALL. THE BOTTOM OF THE FACTORY PREFINISHED INSULATED METAL WALL PANELS ARE SEALED TO THE TOP OF THE POURED CONCRETE FOUNDATION IN TWO ROWS OF CONTINOUS SEALANT. THE FACTORY PREFINISHED INSULATED METAL WALL PANELS (VAPOR IMPERMEABLE SYSTEM) EXTEND TO THE UNDERSIDE OF ROOF STRUCTURE. PANELS ARE SEALED TO THE EAVE, RAKE OR COPING STRUCTURE.

C) AT EXTERIOR DOOR AND WINDOW OPENINGS- ROUGH OPENINGS ARE WRAPPED WITH SELF ADHERED (PEEL AND STICK) MEMBRANE. A MINIMUM 3 INCH LAP OVER THE LIQUID APPLIED VAPOR PERMEABLE AIR/WEATHER RESISTIVE BARRIER/8" CMU AT WINDOW HEADS, JAMBS AND SILLS WILL BE PROVIDED. SELF ADHERED (PEEL AND STICK) AIR BARRIER MEMBRANE WILL BE EXTENDED THROUGH THE ROUGH OPENING TO ABUT THE INTERIOR GLASS MAT GYPSUM WALL BOARD. EXTERIOR METAL DOOR JAMBS ARE SEALED TO THE TOP OF THE POURED CONCRETE FLOOR SLAB WITH CONTINOUS BEADS OF SEALANT. DOOR THRESHOLDS ARE SEALED TO THE POURED CONCRETE FLOOR SLAB WITH CONTINOUS BEADS OF SEALANT. THE METAL DOOR HEADS AND JAM CONNECTIONS TO THE WALLS ARE SEALED TO THE WALL SELF ADHERED AIR BARRIER MEMBRANE.

D) AT EXTERIOR MECHANCIAL LOUVER OPENINGS- ROUGH OPENINGS ARE WRAPPED WITH SELF ADHERED (PEEL AND STICK) AIR BARRIER MEMEBRANE. A MINIMUM 3 INCH LAP OVER THE LIQUID APPLIED VAPOR PERMEABLE AIR /WEATHER RESISTIVE BARRIER/8" CMU AT HEADS,JAMBS AND SILLS WILL BE PROVIDED. SELF ADHERED 9PEEL AND STICK0 AIR BARRIER MEMBRANE WILL BE EXTENDED THROUGH THE ROUGH OPENING. EXTERIOR METAL LOUVER HEADS, JAMBS AND SILL CONNECTIONS TO THE WALLS ARE SEALED TO THE WALL AIR BARRIER MEMBRANE. LOUVERS ARE PROVIDED WITH TIGHT SEALING MOTORIZED DAMPERS.

E) ALL JOINTS AT OPENINGS,TRANSITIONS AND PENETRATIONS SHALL BE SEALED WITH BACKER ROD AND SEALANT.

F) ALL ELECTRICAL,PLUMBING AND MECHANCIAL PENETRATIONS SHALL BE SEALED TO THE AIR BARRIER IN ACCORDANCE WITH THE AIR BARRIER MANUFACTURER'S RECOMMENDATIONS.



3 AAR NORTH-SOUTH BLDG SECTION
1/4" = 1'-0"

SCALE: 1/4"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T O'DELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T O'DELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M DEACON	CONTRACT NO.:
QA/QC BY: M DEACON	
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
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AAR AIR BARRIER BOUNDERY FLOOR PLAN & BUILDING SECTIONS

SHEET ID
BLDG 2
A-701

READY TO ADVERTISE (RTA)

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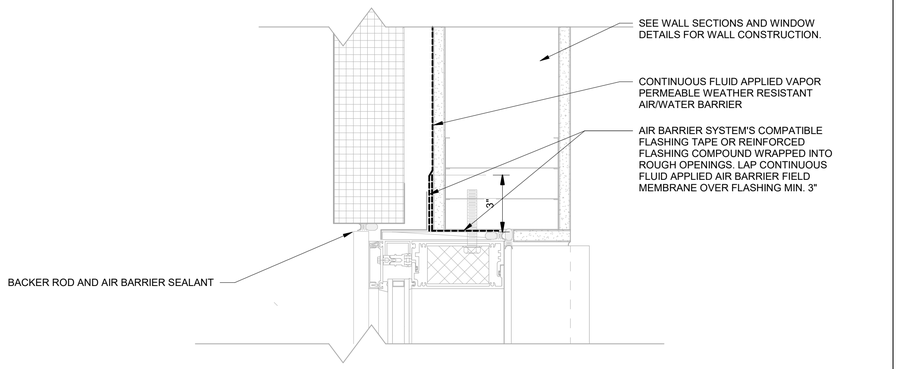
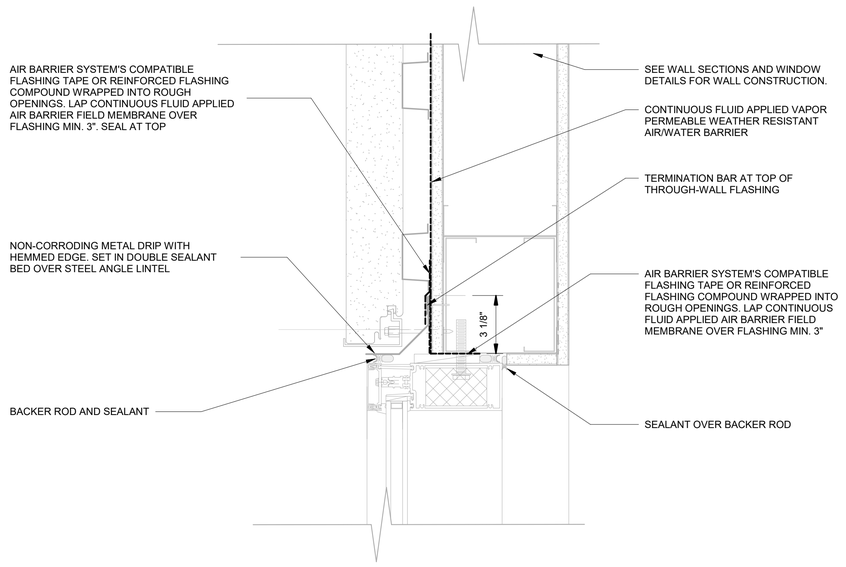
GENERAL NOTES

AT EXTERIOR DOOR AND WINDOW OPENINGS- ROUGH OPENINGS ARE WRAPPED WITH SELF ADHERED (PEEL AND STICK) MEMBRANE. A MINIMUM 3 INCH LAP OVER THE LIQUID APPLIED VAPOR PERMEABLE AIR/WEATHER RESISTIVE BARRIER/8" CMU AT WINDOW HEADS, JAMBS AND SILLS WILL BE PROVIDED. SELF ADHERED (PEEL AND STICK) AIR BARRIER MEMBRANE WILL BE EXTENDED THROUGH THE ROUGH OPENING TO ABUT THE INTERIOR GLASS MAT GYPSUM WALL BOARD. EXTERIOR METAL DOOR JAMBS ARE SEALED TO THE TOP OF THE POURED CONCRETE FLOOR SLAB WITH CONTINOUS BEADS OF SEALANT. DOOR THRESHOLDS ARE SEALED TO THE POURED CONCRETE FLOOR SLAB WITH CONTINOUS BEADS OF SEALANT. THE METAL DOOR HEADS AND JAM CONNECTIONS TO THE WALLS ARE SEALED TO THE WALL SELF ADHERED AIR BARRIER MEMBRANE.

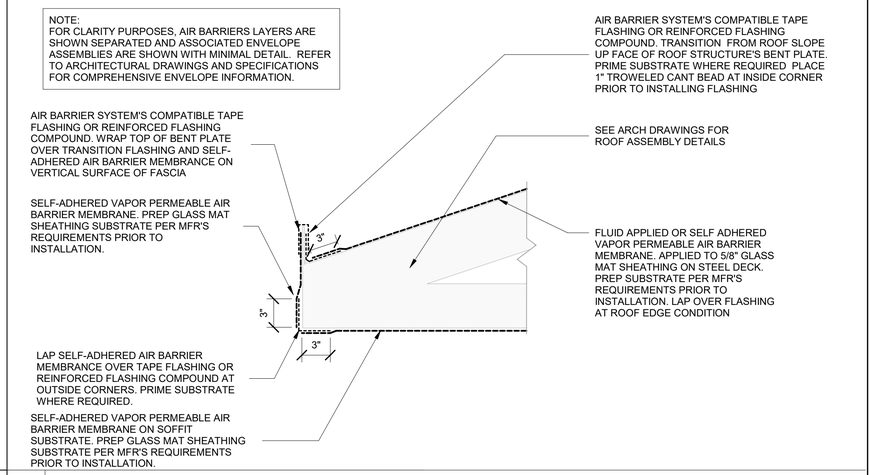


2 AIR BARRIER @ JAMB SCALE: 1"=1'-0"



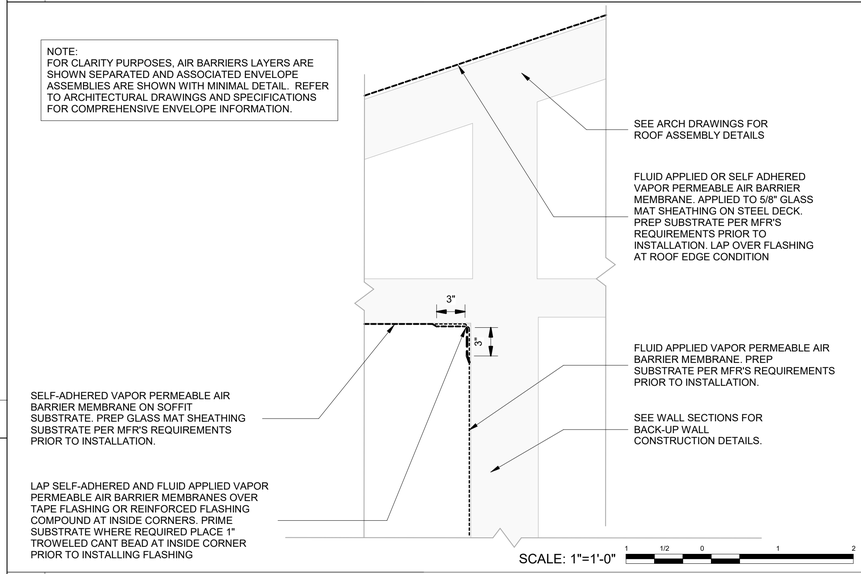
4 AIR BARRIER @ HEAD SCALE: 1"=1'-0"

NOTE:
FOR CLARITY PURPOSES, AIR BARRIERS LAYERS ARE SHOWN SEPARATED AND ASSOCIATED ENVELOPE ASSEMBLIES ARE SHOWN WITH MINIMAL DETAIL. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR COMPREHENSIVE ENVELOPE INFORMATION.



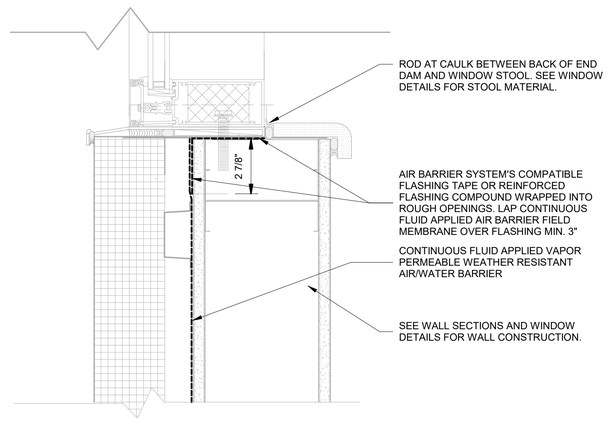
1 AIR BARRIER FASCIA DETAIL SCALE: 1"=1'-0"

NOTE:
FOR CLARITY PURPOSES, AIR BARRIERS LAYERS ARE SHOWN SEPARATED AND ASSOCIATED ENVELOPE ASSEMBLIES ARE SHOWN WITH MINIMAL DETAIL. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR COMPREHENSIVE ENVELOPE INFORMATION.



SCALE: 1"=1'-0"

3 AIR BARRIER @ WALL/SOFFIT INTERSECTION



5 AIR BARRIER @ SILL SCALE: 1"=1'-0"

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DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
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SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-85-01
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
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VOLUME 2 - BUILDING

AAR BUILDING AIR BARRIER DETAILS

SHEET ID
BLDG 2
A-702

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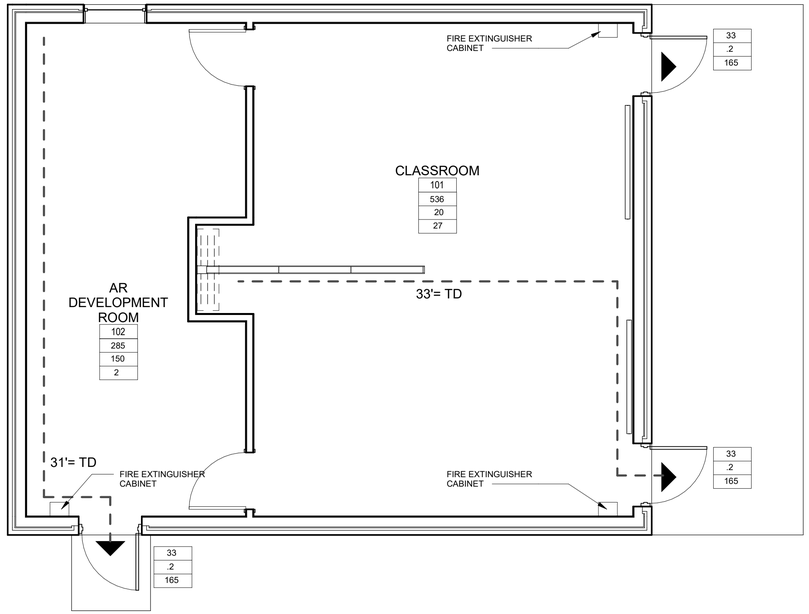

1 AAR LIFE SAFETY PLAN

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

LIFE SAFETY CODE ANALYSIS

UNIFIED FACILITIES CRITERIA - UFC 1-200-01 GENERAL BUILDING REQUIREMENTS, WITH CHANGE 1, 1 OCTOBER 2020

UNIFIED FACILITIES CRITERIA- UFC 3-600-01 FIRE PROTECTION FOR FACILITIES, WITH CHANGE 5, 24 SEPTEMBER 2020

NFPA 101 LIFE SAFETY CODE, 2021 EDITION

NFPA 220 STANDARD ON TYPES OF BUILDING CONSTRUCTION, 2018 EDITION

NFPA 10, INSTALLATION OF PORTABLE FIRE EXTINGUISHERS

NFPA 1141 STANDARD FOR FIRE PROTECTION INFRASTRUCTURE FOR LAND DEVELOPMENT IN WILDLAND, RURAL, AND SUBURBAN AREAS

INTERNATIONAL BUILDING CODE (IBC), 2018 EDITION

ONE STORY,938 SQUARE FEET , NON SPRINKLERED BUILDING

OCCUPANCY PER IBC:

IBC OCCUPANCY SECTION 304 BUSINESS GROUP B

CONSTRUCTION TYPE PER IBC:

REQUIREMENTS FOR CONSTRUCTION TYPE IIB: TABLE 504.3 ALLOWABLE BUILDING HEIGHT AND AREAS- 23,000 sf, 3 STORIES MAXIMUM HEIGHT 55 FEET
ACTUAL BUILDING HEIGHT= 15' 11"

FIRE RESISTANCE RATING REQUIREMENTS BASED UPON CONSTRUCTION TYPE IIB (TABLE 601): NO RATING REQUIRED FOR PRIMARY STRUCTUAL FRAME, BEARING WALLS (EXTERIOR, INTERIOR), NON- BEARING WALLS (EXTERIOR, INTERIOR), FLOOR CONSTRUCTION AND ROOF CONSTRUCTION.

FIRE PROTECTION REQUIREMENTS BASED UPON LOCATION ON PROPERTY:
NO RATING REQUIREMENT IF DISTANCE TO IMAGINARY PROPERTY LINE IS 10 FEET OR GREATER.

MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED UPON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION (705.8.1 EXCEPTION 2): BUILDINGS WHOSE EXTERIOR BEARING WALLS, EXTERIOR NON BEARING WALLS, AND EXTERIOR PRIMARY STRUCTURAL FRAME ARE NOT REQUIRED TO BE FIRE RESISTANCE RATED SHALL BE PERMITTED TO HAVE UNLIMITED, UNPROTECTED OPENINGS.

NFPA 101 MEANS OF EGRESS:

OCCUPANCY PER NFPA 101: BUSINESS AND EDUCATIONAL (CHAPTER 38)

CLASSIFICATION OF HAZARD CONTENTS: ORDINARY HAZARD (38.1.5 & 42.1.5 & 6.2.2.3)

OCCUPANT LOAD : TABLE 7.3.1.2) BUSINESS: 150 GROSS SF PER PERSON
285 SF/150 GROSS SF PER PERSON= 2 PERSONS. EDUCATIONAL: 20 GROSS SF PER PERSON
536 SF/20 GROSS SF PER PERSON= 27 PERSONS.

EGRESS CAPACITY (TABLE 7.3.3.1) LEVEL TRAVEL: 0.2 INCH PER PERSON X 33 = 6.6 INCHES REQUIRED

ACTUAL LEVEL TRAVEL CAPACITY- 3 OPENINGS 36 INCH WIDE DOORS (32 INCHES CLEAR)= 96+ INCHES TOTAL EGRESS CAPACITY PROVIDED.

NUMBER OF EXITS: SINGLE EXIT PERMITTED (7.4.1.1.1, 38.2.4.3, 42.2.4.2)- 3 EXITS PROVIDED.

MAXIMUM TRAVEL DISTANCE: BUSINESS- 200 FEET UNSPRINKLERED BUILDING (TABLE A7.6)

MAXIMUM DEAD END CORRIDOR: BUSINESS -20 FEET UNSPRINKLERED BUILDING (TABLE A7.6)

MAXIMUM COMMON PATH OF TRAVEL: STORAGE -50 FEET UNSPRINKLERED BUILDING (TABLE A7.6)

PROTECTION PER NFPA 101

INTERIOR WALL AND CEILING FINISHES SHALL BE CLASS A OR B IN EXITS AND EXIT ACCESS CORRIDORS (38.3.3..2.1)

FLOOR FINISH MUST BE NO LESS THAN CLASS II IN EXIT ENCLOSURES (38.3.3.3.2)

PORTABLE FIRE EXTINGUISHERS SHALL BE PROVIDED (38.3.5)

REQUIREMENTS PER UFC 1-200-01

SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY- USE UFC 3-600-01 INSTEAD OF IBC CHAPTER 4

REQUIREMENTS PER UFC 3-600-01
COMPLETE AUTOMATIC SPRINKLER PROTECTION MUST BE PROVIDED IN SINGLE STORY TYPE I OR II CONSTRUCTION GREATER THAN 15,000 SF

REQUIREMENTS PER NFPA 10
CLASSIFICATION OF HAZARD FOR FIRE EXTINGUISHERS:

LIGHT HAZARD- MINIMUM FIRE EXTINGUISHER RATING 2-A, MAXIMUM OF 75 FEET TRAVEL TO FIRE EXTINGUISHER

REQUIRMENTS FOR NFPA 1141
MINIMUM DISTANCE TO ADJACENT BUILDINGS AND PROPERTY LINES = 30 FEET (6.2.1)

GROSS BUILDING AREA

GROSS BUILDING AREA PER IBC=

FIRST FLOOR	952 SF
TOTAL	952 SF

GROSS BUILDING AREA PER UFC 3-101-01 =

FIRST FLOOR 952 SF +112 (1/2 EXT. COVERED)	1,064 SF
TOTAL	1,064 SF

GROSS FLOOR AREA PER NFPA 101
(FLOOR AREA INSIDE EXTERIOR WALLS):

FIRST FLOOR	832 SF
TOTAL	832 SF

GENERAL NOTES

1. THIS DRAWING IS TO BE USED AS REFERENCE ONLY. IT IS NOT PART OF THE CONSTRUCTION CONTRACT. ALL INFORMATION CONTAINED ON IT IS CALLED FOR ELSEWHERE.

PLAN LEGEND

FEB FIRE EXTINGUISHER BRACKET
- WALL MOUNTED - TOP AT 5'-0" A.F.F.
FIRE EXTINGUISHER TO BE 2A:10B:C (GFGI)

FEC FIRE EXTINGUISHER CABINET - SEE PLATE A-512 FOR TYPICAL DETAILS

EGRESS PATH

REQUIRED EXIT

OCCUPANT LOAD KEY

OCCUPANT LOAD TAG

XXX ROOM NUMBER
XXX NET SQUARE FOOTAGE
XXX OCCUPANT LOAD FACTOR
XXX OCCUPANT LOAD

REQUIRED EXIT CAPACITY TAG

NOMINAL WIDTH, IN
WIDTH FACTOR, IN/PERSON (*)
CALCULATED CAPACITY

WALL LEGEND

NON RATED METAL STUD WALL

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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Plot Date: 11/28/2023 11:49:35 AM

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DRAWN BY: T ODELL
CHECKED BY: M. DEACON
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.: -
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

AAR BUILDING LIFE SAFETY PLAN

SHEET ID
BLDG 2
A-801

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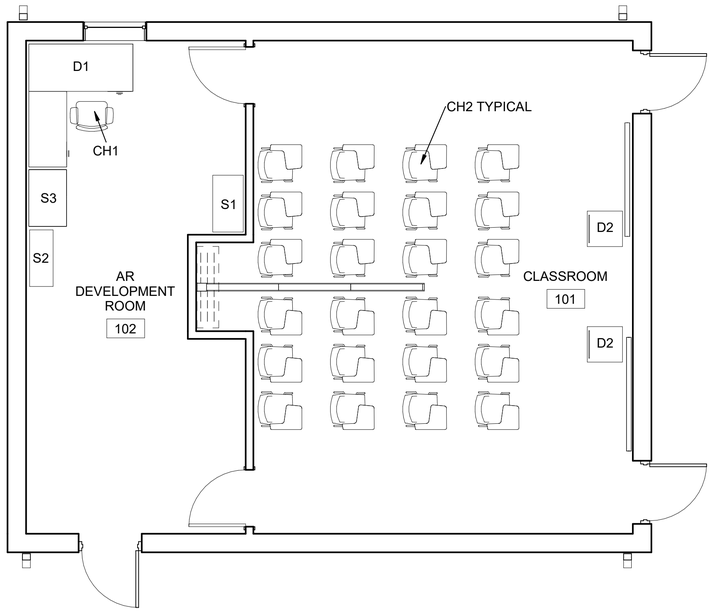

1 FURNITURE PLAN
1/4" = 1'-0"

4 3 2 1 0 4 8

FURNITURE LEGEND
*Furniture is for reference only; purchased under separate contract.

SEATING	
CH1	Task Chair
CH2	Classroom Chair with Tablet Arm
DESKS	
D1	L-Shaped Desk (Non-Handed); 30"D x 66"L Desk, 24"D x 48"L Return; Steel/Laminate
D2	Lectern
D3	Work Bench; Wood Top, 36"W x 72"L
FILES AND STORAGE	
S1	Lateral File Cabinet; 36"W, 5DR; Steel
S2	Bookcase; 36"W, 72"H; Steel
S3	Storage Cabinet; 24"D x 36"W x 87"H; Steel
S4	Heavy Duty Industrial Shelving; 36"D x 96"W x 84"H

NORTH ARROW

PLAN NORTH

GENERAL SHEET NOTES

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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DRAWN BY: V. ROBERSON	SOLICITATION NO.: W912HN-23-B-3001
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SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR FURNITURE PLAN

SHEET ID
BLDG 2
IN101

READY TO ADVERTISE (RTA)

INTERIOR ROOM FINISH SCHEDULE												
		WALL FINISH				BASE FINISH				FLOOR	CEILING	
ROOM NO	ROOM NAME	NORTH	EAST	SOUTH	WEST	NORTH	EAST	SOUTH	WEST	FIN.	FIN.	NOTES & REMARKS (SEE NOTES)
101	CLASSROOM	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	SEALED CONCRETE	ACT-1	
102	AR DEVELOPMENT ROOM	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	SEALED CONCRETE	PT-2	

INTERIOR FINISH LEGEND

ACOUSTICAL CEILING TILE

ACT-1: Armstrong; Calla 2824; 9/16IN; White; 24x24, SQ Tegular; Grid: Prelude ML 15/16" Exposed Tee, White

RESILIENT BASE

RB-1: Tarkett; Traditional Vinyl 1/8" Wall Base (Type TV); 4"H; Color: 80 Fawn

OPERABLE PARTITIONS

OP-1 Panelfold; Operable Partitions; Moduflex Series; Standard Vinyl Covering - Pathway, Limestone

SOLID SURFACING

SS-1: Wilsonart Solid Surface; Designer White D354SL (Sills)

PAINT

PT-1: Sherwin Williams; SW7042 Shoji White; Eggshell (Main)

PT-2: Sherwin Williams; SW7042 Shoji White; Flat (Ceiling)

PT-3: Sherwin Williams; SW6174 Andiron; Semi-Gloss (Stair Trim)

PT-4: Sherwin Williams; SW7533 Khaki Shade; Semi-Gloss (Trim & Doors)

WINDOW BLINDS

WB-1: Levelor; Riviera 1" Metal Blinds; Alabaster
(NOT USED IN CONTROL TOWER)

GENERAL SHEET NOTES

1. REFERENCE SPECIFICATION SECTION 09 06 00 "SCHEDULE FOR FINISHES" FOR INFORMATION REGARDING COLOR AND FINISH.
2. ALL EXTERIOR AND INTERIOR COLORS SHALL BE SUBMITTED FOR APPROVAL PER DIRECTIONS IN SPECIFICATION 09 06 00. COLOR BOARDS AND PROPOSED SAMPLES SHALL NOT BE SUBMITTED INDIVIDUALLY BUT IN A COMPLETE SET WITH ALL SAMPLES.
3. EXPOSED CONCRETE SLABS SHALL HAVE THE FOLLOWING:

   - INTERIOR SLABS NOT RECEIVING A FINISH SHALL HAVE A SEALER AND A TROWEL FINISH.

   - INTERIOR SLABS WITH VCT OR CARPET SHALL HAVE A TROWEL FINISH. A FILLER SHALL BE ADDED AS NEEDED AT CONCRETE CONTROL JOINTS TO ENSURE THAT JOINTS DO NOT BLEED THROUGH.

   - INTERIOR SLABS WITH CERAMIC TILE SHALL HAVE A STEEL TROWEL AND FINE BROOM FINISH FREE OF CURING COMPOUNDS.
4. WINDOW BLINDS WB-1 SHALL BE INSTALLED ON ALL EXTERIOR WINDOWS, EXCEPTING CONTROL TOWER WINDOWS.

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MARK	DESCRIPTION	DATE

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DRAWN BY: V.ROBERSON
CHECKED BY: M.DEACON
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FORT LIBERTY, NORTH CAROLINA
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VOLUME 2 - BUILDING

AAR BUILDING ROOM FINISH SCHEDULE & FINISH LEGEND

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PIPING SYMBOLS

GSS	GROUND SOURCE WATER SUPPLY
GSR	GROUND SOURCE WATER RETURN
MU	MAKE-UP WATER
HG	REFRIGERANT HOT GAS
RS	REFRIGERANT SUCTION
RL	REFRIGERANT LIQUID
PA	PIPE ANCHOR
PG	PIPE GUIDE
	EXPANSION JOINT
	VENTURI
	GATE VALVE
	GLOBE VALVE
	HOSE VALVE WITH CAP
	BUTTERFLY VALVE
	CHECK VALVE
	BALANCING VALVE
	CALIBRATED BALANCING VALVE
	BALL VALVE
	PLUG VALVE
S	SOLENOID VALVE
	SAFETY OR PRESSURE RELIEF, ANGLE VALVE
	SAFETY OR PRESSURE RELIEF, STRAIGHT THRU VALVE
	PRESSURE REDUCING VALVE (PRV)
	AUTOMATIC CONTROL VALVE, 2 WAY
	AUTOMATIC CONTROL VALVE, 3 WAY
	ELECTRICALLY OPERATED VALVE
	BLIND FLANGE
	LATERAL Y
	CAP
	ELBOW, 90°
	ELBOW, 90° TURNED UP
	ELBOW, 90° TURNED DOWN
	ELBOW, 45°
	TEE
	TEE, OUTLET TURNED UP
	TEE, OUTLET TURNED DOWN
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER (STRAIGHT INVERT)
	UNION
	FLEXIBLE PIPE CONNECTION
	PRESSURE GAGE
	TEMPERATURE GAGE
	THERMOMETER
PT	PRESSURE/TEMPERATURE TEST PORT
	SANITARY DRAIN
SD	STORM DRAIN
	VENT
AW	ACID WASTE DRAIN
AV	ACID VENT
D	DRAINLINE
	DOMESTIC COLD WATER
	DOMESTIC HOT WATER
	DOMESTIC HOT WATER CIRCULATING
G	GAS
GV	GAS VENT
A	COMPRESSED AIR
AIR	MEDICAL AIR
OXY	MEDICAL OXYGEN
VAC	MEDICAL VACUUM
NIT	NITROGEN
NOX	NITROUS OXIDE
FP	FIRE PROTECTION WATER SUPPLY
	FIRE DEPARTMENT CONNECTION

* PROVIDE SHUT OFF COCK WITH SIPHON OR PULSATION DAMPENER.

PIPING SYMBOLS

WFD	WATERFLOW DETECTOR
	OS&Y VALVE
	PLUG
FD	FLOOR DRAIN W/TRAP
WCO	WALL CLEAN OUT (FCO, FLOOR CLEAN OUT)
WHA	WATER HAMMER ARRESTER
HB	HOSE BIBB
WH	WALL HYDRANT
	DOUBLE CHECK VALVE BACKFLOW PREVENTER
	REDUCED PRESSURE BACKFLOW PREVENTER
	Y-TYPE STRAINER
	Y-TYPE STRAINER WITH HOSE DRAIN VALVE
	UPRIGHT FIRE SPRINKLER HEAD
	PENDANT FIRE SPRINKLER HEAD
	SIDEWALL FIRE SPRINKLER HEAD
	VACUUM GAGE

*PROVIDE SHUT OFF COCK WITH SIPHON OR PULSATION DAMPENER.

SINGLE LINE DUCTWORK SYMBOLS

12x6	RECTANGULAR DUCT (FIRST FIGURE IS FOR SIDE SHOWN, SECOND FIGURE IS FOR SIDE NOT SHOWN)
36"Ø	ROUND DUCT
36x18	FLAT OVAL DUCT (FIRST FIGURE IS FOR SIDE SHOWN, SECOND FIGURE IS FOR SIDE NOT SHOWN)
	FLEXIBLE ROUND DUCT
	FLEXIBLE DUCT CONNECTION
VD	MANUAL OPPOSED BLADE VOLUME DAMPER
	MOTORIZED DAMPER
BDD	BACK DRAFT DAMPER
FD	FIRE DAMPER, 1 1/2 HOUR FIRE RATED
3FD	FIRE DAMPER, 3 HOUR FIRE RATED
FSD	COMBINATION FIRE/SMOKE DAMPER
SD	SMOKE DAMPER
	DUCT TRANSITION
R	INCLINED RISE W/RESPECT TO AIR FLOW, RECTANGULAR
D	INCLINED DROP W/RESPECT TO AIR FLOW, RECTANGULAR
R	INCLINED RISE W/RESPECT TO AIR FLOW, ROUND OR FLAT OVAL
D	INCLINED DROP W/RESPECT TO AIR FLOW, ROUND OR FLAT OVAL
	90° ELBOW, RECTANGULAR
	90° ELBOW, ROUND OR FLAT OVAL (SMOOTH OR 5-PIECE ELBOWS)
	45° ELBOW, RECTANGULAR
	45° ELBOW, ROUND OR FLAT OVAL (SMOOTH OR 3-PIECE ELBOWS)
DF	DIVIDED FLOW FITTING, RECTANGULAR
	RECTANGULAR TAP-IN BRANCH OR ROUND OR FLAT OVAL CONICAL TEE
	INCLINED CONICAL TAKE-OFF, ROUND OR FLAT OVAL
	"Y" FITTING, ROUND OR FLAT OVAL
	90° ELBOW TURNED UP, RECTANGULAR
	90° ELBOW TURNED DOWN, RECTANGULAR
	90° ELBOW TURNED UP, ROUND; FLAT OVAL SIMILAR
	90° ELBOW TURNED DOWN, ROUND; FLAT OVAL SIMILAR
	CEILING DIFFUSER (ARROWS INDICATE THROW DIRECTIONS)
	CEILING REGISTER OR GRILLE, EXHAUST OR RETURN
	CEILING REGISTER OR GRILLE, SUPPLY
	STATIC PRESSURE SENSOR
SPS	END OF DUCT RUN

MISC SYMBOLS

0000	ROOM NUMBER
	ROUND DUCT
	FLAT OVAL DUCT
	POINT OF CONNECTION BETWEEN NEW AND EXISTING WORK
	POINT BETWEEN EXISTING WORK TO REMAIN AND EXISTING WORK TO BE REMOVED
	EXISTING WORK TO BE REMOVED
	EXISTING WORK TO REMAIN
	WATER SENSOR (LOCATED BELOW ACCESS FLOOR)
ES	HVAC SYSTEM EMERG SHUT-OFF SWITCH
SD	SMOKE DETECTOR
	INTERVAL TIMER
H	HUMIDISTAT
T	THERMOSTAT / TEMPERATURE SENSOR
N	NIGHT THERMOSTAT
CO	CARBON MONOXIDE SENSOR
	WALL SWITCH
UC	DOOR UNDERCUT, SEE DOOR SCHEDULES FOR SIZE

DOUBLE LINE DUCTWORK SYMBOLS

12x6	RECTANGULAR DUCT (FIRST FIGURE IS FOR SIDE SHOWN, SECOND FIGURE IS FOR SIDE NOT SHOWN)
12"Ø	ROUND DUCT
12x6	FLAT OVAL DUCT (FIRST FIGURE IS FOR SIDE SHOWN, SECOND FIGURE IS FOR SIDE NOT SHOWN)
	FLEXIBLE ROUND DUCT
	FLEXIBLE DUCT CONNECTION
VD	MANUAL OPPOSED BLADE VOLUME DAMPER
	MOTORIZED DAMPER
BDD	BACK DRAFT DAMPER
FD	FIRE DAMPER, 1 1/2 HOUR FIRE RATED
3FD	FIRE DAMPER, 3 HOUR FIRE RATED
FSD	COMBINATION FIRE/SMOKE DAMPER
SD	SMOKE DAMPER
	DUCT TRANSITION, ROUND OR FLAT OVAL TO RECTANGULAR
	DUCT TRANSITION, RECTANGULAR TO ROUND OR FLAT OVAL
	DUCT TRANSITION, RECTANGULAR, ROUND, OR FLAT OVAL
R	INCLINED RISE W/RESPECT TO AIR FLOW, RECTANGULAR
D	INCLINED DROP W/RESPECT TO AIR FLOW, RECTANGULAR
R	INCLINED RISE W/RESPECT TO AIR FLOW, ROUND OR FLAT OVAL
D	INCLINED DROP W/RESPECT TO AIR FLOW, ROUND OR FLAT OVAL
	90° ELBOW, RECTANGULAR WITH TURNING VANES
	45° ELBOW, RECTANGULAR WITH TURNING VANES

DOUBLE LINE DUCTWORK SYMBOLS

	90° ELBOW, ROUND OR FLAT OVAL (SMOOTH OR 5 PIECE ELBOWS)
	MITERED 90° ELBOW, ROUND OR FLAT OVAL
12X6(L)	RECTANGULAR DUCT WITH 1" INTERNAL LINER DUCT SIZE IS THE CLEAR INSIDE DIMENSION
	45° ELBOW, ROUND OR FLAT OVAL (SMOOTH OR 3 PIECE ELBOWS)
VD VD	DIVIDED FLOW FITTING
VD	TAP-IN BRANCH, RECTANGULAR
	BRANCH DUCT, CONICAL LATERAL FITTING, ROUND OR FLAT OVAL
	BRANCH DUCT, CONICAL TEE FITTING, ROUND OR FLAT OVAL
	BRANCH DUCT, "Y" FITTING, ROUND OR FLAT OVAL
	SUPPLY DUCT SECTION, RECTANGULAR
	EXHAUST OR RETURN DUCT SECTION, RECTANGULAR
	90° ELBOW TURNED UP, RECTANGULAR
	90° ELBOW TURNED DOWN, RECTANGULAR
	90° ELBOW TURNED UP, ROUND; FLAT OVAL SIMILAR
	90° ELBOW TURNED DOWN, ROUND; FLAT OVAL SIMILAR
	CEILING DIFFUSER (ARROWS INDICATE THROW DIRECTIONS)
	CEILING DIFFUSER (ARROWS INDICATE THROW DIRECTIONS)
	CEILING REGISTER OR GRILLE (RETURN OR EXHAUST)
	CEILING REGISTER OR GRILLE (SUPPLY)
	REGISTER OR GRILLE
	CEILING DIFFUSER WITH FLEXIBLE DUCT CONNECTION (ARROWS INDICATE THROW DIRECTION)
S-000	LIGHT TROFFER WITH FLEXIBLE DUCT CONNECTION. "S" INDICATES SUPPLY, NUMBER INDICATES CFM
	CEILING LINEAR SLOT OR INTEGRATED CEILING DIFFUSER (CLSD) WITH FLEXIBLE DUCT CONNECTION (ARROWS INDICATE THROW DIRECTION)
SPS	STATIC PRESSURE SENSOR
	HUMIDIFIER
SB	SECURITY BAR
24x24 DW	DOUBLE WALL DUCTWORK (2" INTERNAL INSULATION WITH PERFORATED LINER) DUCT DIMENSIONS ARE OUTSIDE SHEETMETAL DIMENSIONS

GENERAL NOTES

1. ALL EQUIPMENT AND PIPING SHOWN ON DRAWINGS ARE DIAGRAMMATIC. CONTRACTOR SHALL VERIFY EXACT SIZE AND LOCATION IN FIELD.
2. MECHANICAL LAYOUTS ARE SCHEMATIC. PROVIDE ANY ADDITIONAL DROPS, RISES, OR OFFSETS REQUIRED FOR A COMPLETE INSTALLATION. COORDINATE EXACT ROUTING OF WORK WITH ALL OTHER TRADES AND OBSTRUCTIONS. COORDINATE EXACT LOCATIONS OF CEILING MOUNTED WORK WITH LIGHTS, CEILING GRID, AND OTHER OBSTRUCTIONS.
3. ALL WORK INDICATED IS NEW UNLESS INDICATED AS EXISTING.
4. SOME SYMBOLS INDICATED ON THIS LEGEND SHEET MAY NOT APPEAR ON THE DRAWINGS.
5. DO NOT LOCATE MECHANICAL WORK IN ELECTRICAL OR COMMUNICATION ROOMS, EXCEPT FOR RUNOUTS SPECIFICALLY SERVING THE RESPECTIVE ROOMS.
6. ALL PIPING PENETRATIONS THROUGH FIRE RATED ASSEMBLY SHALL BE SEALED WITH UL FIRESTOP SYSTEM LISTED FOR THAT RATED ASSEMBLY. SEE ARCH DRAWINGS FOR RATING AND LOCATION.
7. DRAWING REFLECTED DIMENSIONS OF THE DESIGN MFG. EQUIPMENT ALLOWABLE ALTERNATES, WHILE EQUAL IN CAPACITY WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MEET THE SPACE REQUIREMENT AND PROVIDE EQUALITY WITH THE DESIGN MFG. EQUIPMENT.
8. CONTRACTOR SHALL NOT INSTALL ANY EQUIPMENT PRIOR TO VERIFICATION OF ROUTING AND AVAILABILITY SPACE. COORDINATE SPACE REQUIREMENT WITH ALL TRADES.
9. THE MECHANICAL SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS, SPECIFICATIONS, AND THE INTERNATIONAL MECHANICAL CODE. MANUFACTURERS RECOMMENDATIONS SHALL BE CONSIDERED MANDATORY

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	C.MELENDEZ NARVAEZ
DRAWN BY:	C.MELENDEZ NARVAEZ
CHECKED BY:	S.MARKO
SUBMITTED BY:	J. DEACON
SIZE:	ANSI D
ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	-
CATEGORY CODE:	178-85-01
FILE NAME:	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING HVAC LEGEND

SHEET ID
BLDG 2
M-001

READY TO ADVERTISE (RTA)

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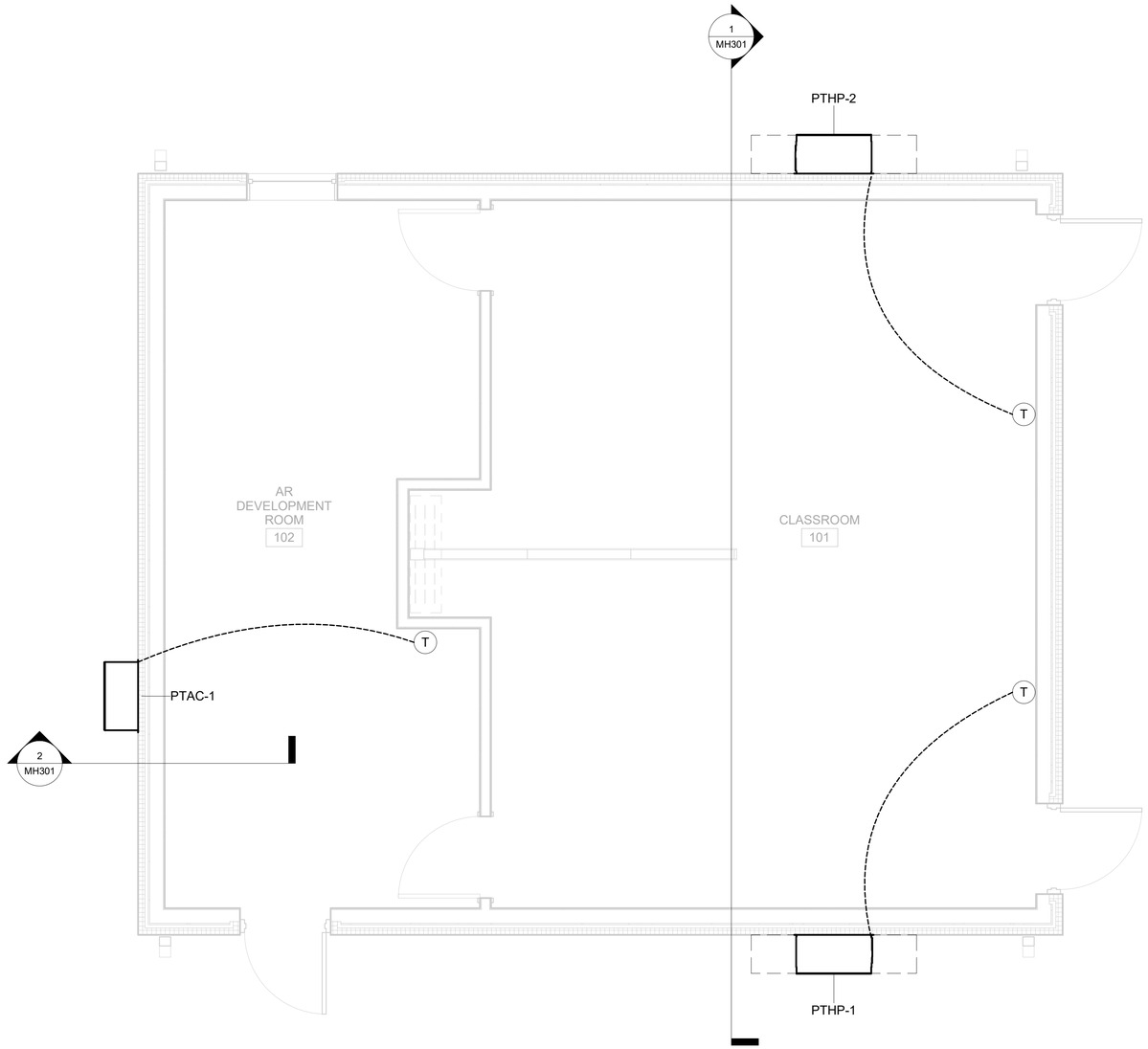

1 HVAC FLOOR PLAN

3/8" = 1'-0"

GENERAL SHEET NOTES

1. COORDINATE PACKAGED TERMINAL HEAT PUMP INSTALLATION WITH ARCHITECTURAL OPENING.

2. PTAC-1, PTHP-1, AND PTHP-2 SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ
DRAWN BY: C.MELENDEZ NARVAEZ
CHECKED BY: S.MARKO
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING HVAC FLOOR PLAN

SHEET ID
BLDG 2
MH101

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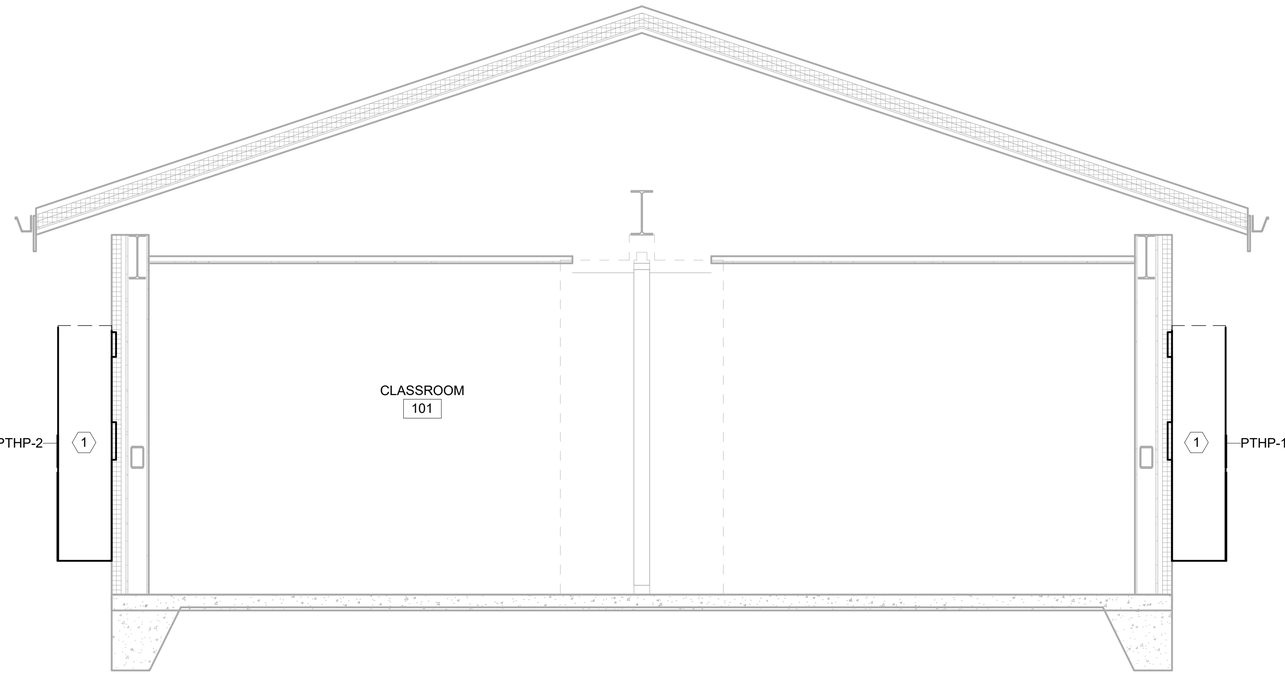
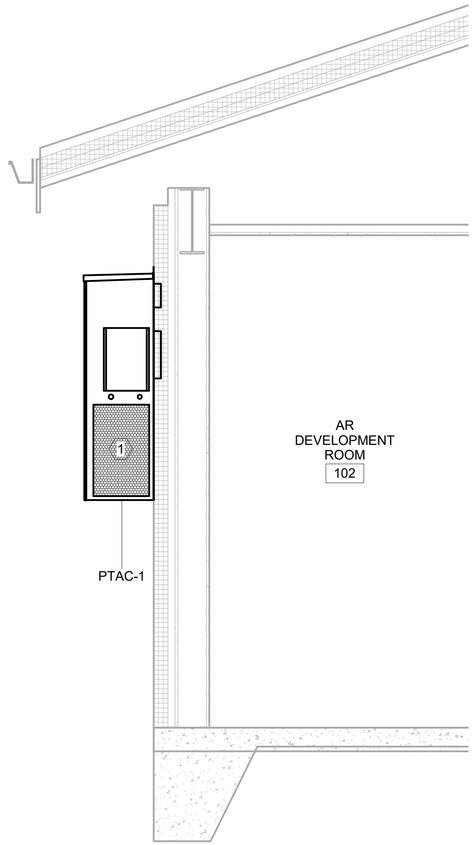


KEYED NOTES

1. INSTALL UNIT ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.

1 CLASSROOM SECTION VIEW

1/2" = 1'-0"



KEYED NOTES

1. INSTALL UNIT ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.

2 AR DEVELOPMENT ROOM SECTION VIEW

3/4" = 1'-0"

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CHECKED BY: S.MARKO
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING HVAC SECTIONS

SHEET ID
BLDG 2
MH301

Plot Date: 11/28/2023 7:47:03 AM

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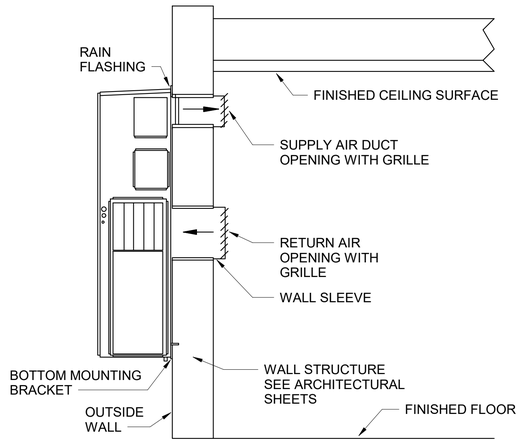

NOTE:

1. INSTALL UNIT ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS

1 PACKAGED TERMINAL UNIT INSTALLATION DETAIL

NOT TO SCALE

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MARK	DESCRIPTION	DATE

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CHECKED BY: S.MARKO	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING HVAC DETAILS

SHEET ID
BLDG 2
MH501

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PACKAGED TERMINAL HEAT PUMP SCHEDULE															
						HEATING COIL			COOLING COIL				MIN. ELECTRIC HEAT CAPACITY (KW)		
UNIT MARK	LOCATION	TYPE	MIN SEER	MIN. CFM	OA VENT (CFM)	MIN. TOTAL CAP (MBh)	EA DB	LA DB	MIN. TOTAL CAP (MBh)	EA DB	EA WB	LA DB		V/HZ/PH	NOTES
PTHP-1	CLASSROOM 101	EXTERIOR WALL MOUNTED	11	633	151	23.5	52.2 °F	90.0 °F	24.1	83.6 °F	69.4 °F	55.0 °F	8.0	SEE ELECTRICAL	1, 2, 3, 4, 5, 6
PTHP-2	CLASSROOM 101	EXTERIOR WALL MOUNTED	11	539	151	21.2	49.3 °F	90.0 °F	22.1	84.5 °F	70.4 °F	55.0 °F	8.0	SEE ELECTRICAL	1, 2, 3, 4, 5, 6

NOTES

1. PROVIDE UNIT WITH WALL MOUNTED THERMOSTAT.
2. COOLING CAPACITY BASED ON OUTDOOR AIR TEMPERATURE OF 95 DEGREES F. HEATING CAPACITY BASED ON OUTDOOR AIR TEMPERATURE OF 20 DEGREES F.
3. FILTER THE COMBINED SUPPLY AIR, INCLUDING RETURN AND OUTSIDE AIR, WITH A COMBINATION OF PREFILTER(S) WITH A MERV OF 8 AND FINAL FILTER(S) WITH A MERV OF 13.
4. PROVIDE HOT GAS REHEAT AND HUMIDITY CONTROL.
5. RUN FAN CONTINUOUSLY DURING OCCUPIED TIMES REGARDLESS OF HEATING/COOLING DEMAND. CYCLE HEATING AND COOLING ON/OFF TO SATISFY SPACE DEMAND.
6. PROVIDE WITH EMERGENCY ELECTRIC HEAT STRIP.

PACKAGED TERMINAL AIR CONDITIONER SCHEDULE															
						HEATING COIL			COOLING COIL				MIN. ELECTRIC HEAT CAPACITY (KW)		
UNIT MARK	LOCATION	TYPE	MIN SEER	MIN. CFM	OA VENT (CFM)	MIN. TOTAL CAP (MBh)	EA DB	LA DB	MIN. TOTAL CAP (MBh)	EA DB	EA WB	LA DB		V/HZ/PH	NOTES
PTAC-1	AR DEVELOPMENT ROOM 102	EXTERIOR WALL MOUNTED	11	262	27	7.9	63.1 °F	90.0 °F	9.0	80.2 °F	64 °F	55.0 °F	3.0	SEE ELECTRICAL	1, 2, 3, 4

NOTES

1. PROVIDE UNIT WITH WALL MOUNTED THERMOSTAT.
2. PROVIDE PTAC WITH MANUFACTURER ELECTRIC HEAT STRIP.
3. COOLING CAPACITY BASED ON OUTDOOR AIR TEMPERATURE OF 95 DEGREES F. HEATING CAPACITY BASED ON OUTDOOR AIR TEMPERATURE OF 20 DEGREES F.
4. FILTER THE COMBINED SUPPLY AIR, INCLUDING RETURN AND OUTSIDE AIR, WITH A COMBINATION OF PREFILTER(S) WITH A MERV OF 8 AND FINAL FILTER(S) WITH A MERV OF 13.

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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING HVAC SCHEDULES

SHEET ID
BLDG 2
MH601

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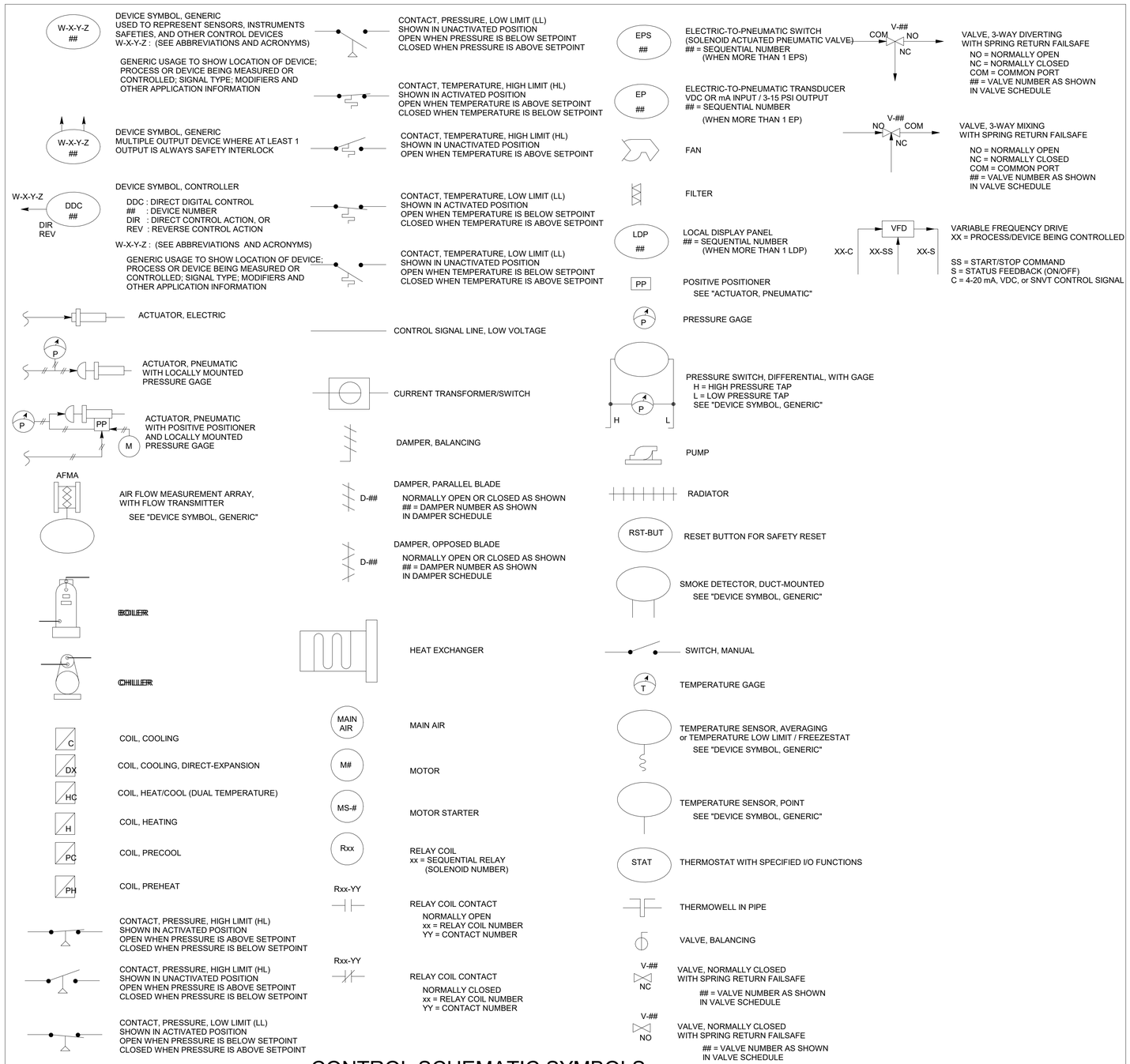
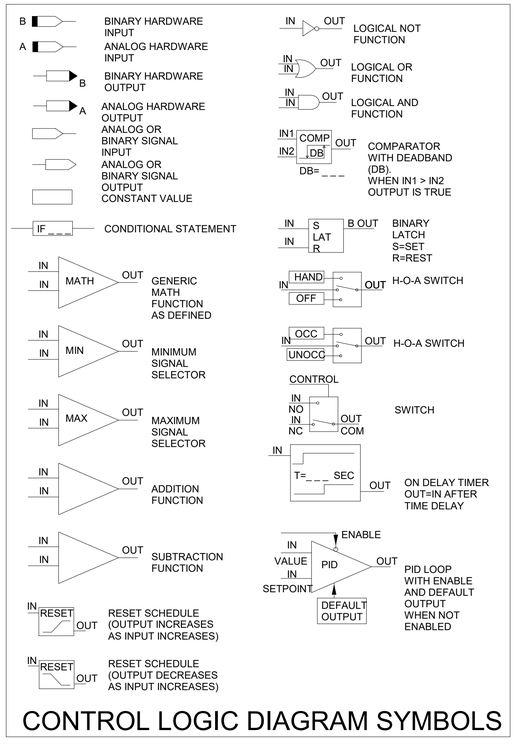


CONTROL SCHEMATIC SYMBOLS



CONTROL LOGIC DIAGRAM SYMBOLS

2P	TWO-POSITION (CONTROL SIGNAL)	I/O	INPUT/OUTPUT
ADJ	ADJUSTABLE	LDP	LOCAL DISPLAY PANEL
AFMA	AIRFLOW MEASUREMENT ARRAY	LL	LOW LIMIT
ALM	ALARM	M&C	MONITORING & CONTROL (SOFTWARE)
BA	BYPASS AIR	MA	MIXED AIR
BLDG	BUILDING	MINOA	MINIMUM OUTSIDE AIR
BUT	BUTTON	MS	MOTOR STARTER
C	COMMAND (MODULATING CONTROL SIGNAL)	MTHW	MEDIUM TEMPERATURE HOT WATER
CD	COLD DECK	N/A	NOT APPLICABLE
CHLR	CHILLER	NC	NORMALLY CLOSED
CLG	COOLING	NO	NORMALLY OPEN
CO2	CARBON DIOXIDE	OA	OUTSIDE AIR
COM	COMMON	OCC	OCCUPIED
COMP	COMPARATOR	ODT	ON DELAY TIMER
CR	CONDENSER WATER RETURN	OWS	OPERATOR WORKSTATION
CS	CONDENSER WATER SUPPLY	P	PRESSURE
CT	CURRENT TRANSFORMER/SWITCH	PC	PRE-COOLING
CWR	CHILLED WATER RETURN	PCW	PRIMARY CHILLER WATER
CWS	CHILLED WATER SUPPLY	PCWR	PRIMARY CHILLER WATER RETURN
CW	CHILLED WATER	PCWS	PRIMARY CHILLER WATER SUPPLY
D	DAMPER	PH	PREHEAT
DA	DISCHARGE AIR	PMP	PUMP
DB	DEADBAND	PP	POSITIVE POSITIONER
DDC	DIRECT DIGITAL CONTROL(LER)	R	RELAY
DIFF	DIFFERENCE	RA	RETURN AIR
DIR	DIRECT (CONTROL ACTION)	REV	REVERSE (CONTROL ACTION)
DIS	DISABLE	RF	RETURN FAN
DT	DUAL TEMP	RH	RELATIVE HUMIDITY
DTWR	DUAL TEMP WATER RETURN	RLA	RELIEF AIR
DTWS	DUAL TEMP WATER SUPPLY	RM	ROOM
DX	DIRECT EXPANSION (UNIT)	RST	RESET
EA	EXHAUST AIR	S	STATUS
ECO	ECONOMIZER	SA	SUPPLY AIR
EF	EXHAUST FAN	SEC	SECONDARY
ENA	ENABLE	SF	SUPPLY FAN
EP	ELECTRIC TO PNEUMATIC TRANSDUCER	SMK	SMOKE
EPS	ELECTRIC TO PNEUMATIC SWITCH	SP	SETPOINT
ESS	EMERGENCY SHUTOFF SWITCH	SS	START/STOP COMMAND
F	FLOW	STAT	THERMOSTAT
FAP	FIRE ALARM PANEL	SYS	SYSTEM
FLT	FILTER	SCHD	SCHEDULER
HD	HOT DECK	T	TEMPERATURE
HL	HIGH LIMIT	TAP	TAP, PRESSURE
HTG	HEATING	UNOCC	UNOCCUPIED
HTHW	HIGH TEMPERATURE HOT WATER	V	VALVE
HUM	HUMIDIFIER	VAV	VARIABLE AIR VOLUME
HW	HOT WATER	VFD	VARIABLE FREQUENCY DRIVE
HWR	HOT WATER RETURN	WB	WET BULB (TEMPERATURE)
HWS	HOT WATER SUPPLY	ZN	ZONE
HX	HEAT EXCHANGER		

ABBREVIATIONS AND ACRONYMS

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ
DRAWN BY: C.MELENDEZ NARVAEZ
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SUBMITTED BY: J. DEACON
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

AAR BUILDING HVAC CONTROLS LEGEND

SHEET ID
BLDG 2
MI801

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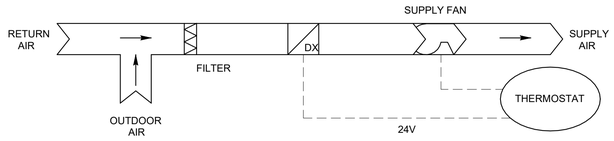


PACKAGED TERMINAL AIR CONDITIONER SYSTEM SCHEMATIC

SEQUENCE OF OPERATION: PACKAGED TERMINAL AIR CONDITIONER SYSTEM

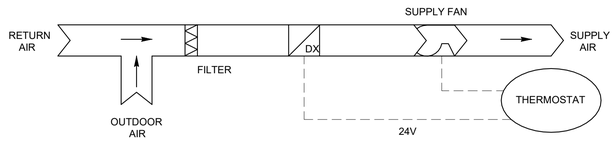
THE UNIT SHALL BE CONTROLLED BY AN OFF-ON-AUTO SWITCH AND A HEAT-COOL SWITCH AS A PART OF THE UNIT THERMOSTAT.

IN THE AUTO POSITION THE FAN SHALL CYCLE ON AND OFF ON A CALL FOR HEATING OR COOLING.

UNIT SHALL OPERATE PER MANUFACTURER'S CONTROLS TO MAINTAIN THE SPACE TEMPERATURE SETPOINT OF 72 DEG F +/- 2 DEG F AND SUPPLY OUTDOOR AIR.

IN THE ON POSITION THE FAN SHALL RUN CONTINUOUSLY AND IN THE OFF POSITION THE UNIT AND THE FAN SHALL CYCLE ON A CALL FOR HEATING OR COOLING.

OUTSIDE AIR DAMPER CONTROLLED BY UNIT'S PACKAGED CONTROLS.



PACKAGED TERMINAL HEAT PUMP SYSTEM SCHEMATIC

SEQUENCE OF OPERATION: PACKAGED TERMINAL HEAT PUMP SYSTEM

THE UNIT SHALL BE CONTROLLED BY AN OFF-ON-AUTO SWITCH AND A HEAT-COOL SWITCH AS A PART OF THE UNIT THERMOSTAT.

IN THE AUTO POSITION THE FAN SHALL CYCLE ON AND OFF ON A CALL FOR HEATING OR COOLING.

UNIT SHALL OPERATE PER MANUFACTURER'S CONTROLS TO MAINTAIN THE COOLING SPACE TEMPERATURE SETPOINTS OF 72 DEG F TO 78 DEG F (ADJ) AND THE HEATING SPACE TEMPERATURE OF 68 DEG F (ADJ) AND SUPPLY OUTDOOR AIR.

IN THE ON POSITION THE FAN SHALL RUN CONTINUOUSLY AND IN THE OFF POSITION THE UNIT AND THE FAN SHALL CYCLE ON A CALL FOR HEATING OR COOLING.

OUTSIDE AIR DAMPER CONTROLLED BY UNIT'S PACKAGED CONTROLS.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ
DRAWN BY: C.MELENDEZ NARVAEZ
CHECKED BY: S.MARKO
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING SYSTEM CONTROLS

SHEET ID
BLDG 2
MI802

Plot Date: 11/28/2023 7:47:12 AM

File Path: C:\Users\k6endcm9\Documents\FY23_PN96182_MPTR-AAR_HVAC_R21_k6endcm9.rvt

READY TO ADVERTISE (RTA)

ELECTRICAL LEGEND

LIGHTING AND LIGHTING CONTROLS SYSTEM LEGEND

- LOWER CASE LETTER DENOTES THE SWITCH THAT CONTROLS FIXTURE
- A2 — LUMINAIRE TYPE DESIGNATION
- SYMBOL DENOTES GENERAL TYPE OF LUMINAIRE
- NT — UNSWITCHED NIGHT LIGHT (ON 24 HOURS)
- 2x2 LED LUMINAIRES.
- 2x4 LED LUMINAIRES.
- CEILING-MOUNTED LUMINAIRE. SHADING INDICATES SUPPLIED FROM AN EMERGENCY LIGHTING INVERTER (ELI).
- SUSPENDED LED LUMINAIRE.
- WALL-MOUNTED LED LUMINAIRE. SHADING INDICATES SUPPLIED FROM AN EMERGENCY LIGHTING INVERTER (ELI).
- LIGHTING CONTROL STRATEGY.
- EMERGENCY LIGHTING UNIT. MH = 8' AFF UOI.
- ELI — 250W EMERGENCY LIGHTING INVERTER (ELI). MOUNT ABOVE ACCESSIBLE CEILING.
- EXIT LIGHT, CEILING MOUNTED. SHADING INDICATES FACES. PROVIDE DIRECTIONAL ARROWS WHEN INDICATED.
- EXIT LIGHT, WALL MOUNTED. SHADING INDICATES FACES. PROVIDE DIRECTIONAL ARROWS WHEN INDICATED. ALIGN WITH CENTERLINE OF DOOR AND MOUNT CENTERLINE OF EXIT SIGN 5" ABOVE TOP OF DOOR FRAME UOI.
- S — WALL SWITCH, SINGLE POLE, 20A SWITCH. MH = 46" AFF UOI. WHERE SUBSCRIPT IS PRESENT, IT DENOTES THE FOLLOWING:
  - 3 - THREE WAY SWITCH.
  - 4 - FOUR WAY SWITCH
  - a - SINGLE LOWER CASE LETTER (EXCEPT LETTER "m") DENOTE THE SWITCH THAT CONTROLS THE FIXTURES.
  - WP - WEATHERPROOF (GASKETED).
  - lv - LOW VOLTAGE
  - lv5 - LOW VOLTAGE DIMMING
- S_V — WALL SWITCH SENSOR, LINE VOLTAGE. MH = 46" AFF UOI.
- S_T — TIMER SWITCH, LINE VOLTAGE. SWITCH SHALL BE WEATHERPROOF RATED WITH 0-2 HOUR TIME RANGE. MH = 46" AFF UOI.
- S_{lvx} — LOW VOLTAGE, MULTI-BUTTON WALLSTATION CONNECTED TO ROOM CONTROLLER. 'x' INDICATES NUMBER OF BUTTONS. MH = 46" AFF UOI.
- OCCUPANCY SENSOR, WALL MOUNTED, DUAL TECHNOLOGY (ULTRASONIC AND PIR) SENSOR UOI. MOUNT 6" BELOW CEILING BUT NO MORE THAN 9'-6" AFF UOI.
- OS — OCCUPANCY OR VACANCY SENSOR AS INDICATED BY LIGHTING CONTROL STRATEGIES, CEILING OR JUNCTION BOX MOUNTED, DUAL TECHNOLOGY (ULTRASONIC AND PIR) SENSOR UOI.
- DS — DAYLIGHT SENSOR.
- LC — LIGHTING CONTACTOR. MH = 60" AFF.

LIGHTNING PROTECTION & GROUNDING SYSTEM LEGEND

- TW — GROUND ROD. "TW" INDICATES TEST WELL.
- EXPOSED MAIN ROOF CONDUCTOR UOI.
- BONDING CONNECTION TO TOP OF DOWN CONDUCTOR.
- BONDING CONNECTION TO BOTTOM OF DOWN CONDUCTOR OR COUNTERPOISE.
- DOWN CONDUCTOR IN SCHEDULE 40 PVC CONDUIT EXPOSED OUTSIDE OF BUILDING.
- AIR TERMINAL.

POWER SYSTEM LEGEND

- $\oplus_X$ — NEMA 5-20R DUPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPT 'X' (WHERE PRESENT) DENOTES THE FOLLOWING:
  - G - GROUND FAULT CIRCUIT INTERRUPTER (GFCI) RECEPTACLE.
  - WP - GFCI RECEPTACLE WITH WEATHER PROOF WHILE-IN-USE HOUSING.
  - C - GFCI RECEPTACLE, BOTTOM OF RECEPTACLE MOUNTED 2" ABOVE BACKSPLASH.
  - E - GFCI RECEPTACLE, MH COORDINATED WITH ELECTRIC WATER COOLER.
  - OS - CONTROLLED BY ROOM OCCUPANCY SENSORS VIA RECEPTACLE-RATED SWITCHPACK. RECEPTACLES SHALL BE MARKED IN ACCORDANCE WITH NEC 406.3(E).
  - R - MOUNTED ON COMMUNICATIONS RACK AS INDICATED ON EP501.
  - T - RECEPTACLE, MOUNTED ADJACENT TO CATV OUTLET.
- $\oplus\!\!\oplus_X$ — NEMA 5-20R DOUBLE DUPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPTS IDENTIFIED FOR DUPLEX RECEPTACLES ARE ALSO APPLICABLE TO QUADRAPLEX RECEPTACLES.
- $\ominus_X$ — NEMA 5-20R SIMPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPTS IDENTIFIED FOR DUPLEX RECEPTACLES ARE ALSO APPLICABLE TO SIMPLEX RECEPTACLES.
- $\blacktriangleleft_X$ — SPECIAL RECEPTACLE. SUBSCRIPT 'X' (WHERE PRESENT) DENOTES THE FOLLOWING:
  - A - NEMA L14-20R RECEPTACLE FOR TARGET MAINTENANCE. MH = 18" UOI.
  - R1 - NEMA L5-20R RECEPTACLE. MOUNTED AS INDICATED ON EP501.
  - R2 - NEMA L6-30R RECEPTACLE. PROVIDE 2#10, 1#10G, 1/2"C. MOUNTED AS INDICATED ON EP501.
- NEMA 5-20R CEILING MOUNTED DUPLEX RECEPTACLE.
- JUNCTION BOX, WALL MTD. MH = 18" UOI.
- S_{ps} — 3-POSITION SWITCH FOR PROJECTOR SCREEN. MH = 46" AFF UOI.
- S_m — MOTOR RATED SWITCH. MH = 46" AFF UOI.
- MOTOR DISCONNECT/SAFETY SWITCH SHALL BE RATED 30/3/NF/1 UNLESS OTHERWISE INDICATED.
  - '30' DENOTES SWITCH AMPERE RATING;
  - '3' DENOTES NUMBER OF POLES;
  - 'NF' DENOTES NON-FUSED ('F' DENOTES FUSED);
  - '1' DENOTES SWITCH ENCLOSURE'S NEMA RATING;
  - FUSE RATING SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- LP-1 — HOMERUN TO PANELBOARD. "LP" INDICATES THE PANELBOARD THAT THE HOMERUN IS SERVED FROM. "1" INDICATES THE CIRCUIT NUMBER IN THE PANELBOARD FOR CONNECTION.
- PANELBOARD.
- SWITCHBOARD.
- ELECTRICAL EQUIPMENT AS INDICATED.
- THREE BUTTON, PUSH BUTTON SWITCH (OPEN, CLOSE, AND STOP) FOR ROLLING SERVICE DOORS. MH = 46" AFF UOI.

VIDEO SURVEILLANCE SYSTEM LEGEND

- GFGI CAMERA. PROVIDE 1-1/4" RGS CONDUIT TO DTR RACK. REFER TO VOLUME 4 ES517 FOR MOUNTING DETAILS.

ABBREVIATIONS

ACS	ACCESS CONTROL SYSTEM
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ATS	AUTOMATIC TRANSFER SWITCH
C	CONDUIT
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CKT	CIRCUIT
COR	CONTRACTING OFFICER'S REPRESENTATIVE
CU	COPPER
DLC	DESIGNLIGHTS CONSORTIUM
DTR	DATA TERMINATION RACK
EGC	EQUIPMENT GROUNDING CONDUCTOR
ELI	EMERGENCY LIGHTING INVERTER
EPT	ELECTRIC POWER TRANSFER
ESS	ELECTRONIC SECURITY SYSTEMS
EWC	ELECTRIC WATER COOLER
FACP	FIRE ALARM CONTROL PANEL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
HACR	HEATING, AIR CONDITIONING, REFRIGERATION
IDS	INTRUSION DETECTION SYSTEM
LVS	LOW VOLTAGE SWITCH
MFR	MANUFACTURER
MH	MOUNTING HEIGHT
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTS	MANUAL TRANSFER SWITCH
NATS	NON-AUTOMATIC TRANSFER SWITCH
NEC	NATIONAL ELECTRICAL CODE
NF	NON FUSED
NTS	NOT TO SCALE
OS	OCCUPANCY SENSOR
PBB	PRIMARY BONDING BUSBAR
PIR	PASSIVE INFRARED
QTY	QUANTITY
SBB	SECONDARY BONDING BUSBAR
SER	SERVICE ENTRANCE RATED
SPD	SURGE PROTECTIVE DEVICE
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UOI	UNLESS OTHERWISE INDICATED
UON	UNLESS OTHERWISE NOTED
V	VOLT
W, WP	WEATHERPROOF

GENERAL NOTES

1. SEE PLATE G-002 TO G-002A FOR ABBREVIATIONS AND GENERAL LEGEND.

2. MOUNTING HEIGHT, UNLESS OTHERWISE NOTED, IS TO CENTER LINE OF EQUIPMENT.

3. OUTLET BOXES MOUNTED ON OPPOSITE SIDES OF WALLS SHALL BE INSTALLED SUCH THAT NO BOXES ARE BACK-TO-BACK TO MINIMIZE SOUND TRANSMISSION. MAINTAIN A 6-INCH SEPARATION WHERE POSSIBLE.

4. MECHANICAL EQUIPMENT IS SHOWN IN APPROXIMATE LOCATIONS. FOR EXACT LOCATIONS OF MECHANICAL EQUIPMENT AND PIPING, SEE MECHANICAL DRAWINGS. PROVIDE DISCONNECT SWITCHES AS REQUIRED BY THE NATIONAL ELECTRICAL CODE EVEN IF NOT INDICATED ON THE ELECTRICAL DRAWINGS.

5. COORDINATE THE LOCATIONS AND MOUNTING HEIGHTS OF LUMINAIRES IN MECHANICAL AND ELECTRICAL ROOMS WITH THE FINAL LOCATIONS OF PIPES, DUCTS AND OTHER EQUIPMENT FOR BEST ARRANGEMENT. FIXTURES SHALL BE EASILY ACCESSIBLE FOR RELAMPING.

6. CONDUCTOR AND CONDUIT SIZES ARE BASED ON COPPER CONDUCTORS WITH THWN INSULATION IN EMT CONDUIT. MINIMUM SIZE SHALL BE #12 AWG CONDUCTORS WITH #12 AWG EGC IN 1/2" CONDUIT UNLESS OTHERWISE INDICATED. LIGHTING AND POWER BRANCH CIRCUITS THAT RUN OVER 100 FEET SHALL BE MINIMUM #10 AWG. CIRCUIT BREAKERS, TERMINALS, ETC. SHALL BE RATED AND MARKED FOR 75 DEGREES MINIMUM. THE CONTRACTOR SHALL ADJUST CONDUIT SIZES BASED ON ACTUAL TYPE OF CONDUCTORS AND CONDUIT INSTALLED.

7. PROVIDE EQUIPMENT GROUNDING CONDUCTORS IN ALL CONDUITS.

8. UP TO 3 SINGLE-PHASE, BRANCH CIRCUITS RATED 20A OR LESS MAY BE ROUTED IN A SINGLE CONDUIT TO MINIMIZE THE NUMBER OF HOMERUNS. CIRCUITS SHALL BE SUPPLIED FROM ADJACENT CIRCUIT BREAKERS AND DIFFERENT PHASES (E.G., 1, 3, 5 OR 2, 4, 6). NEUTRAL CONDUCTORS SHALL NOT BE SHARED OR COMBINED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DERATING CONDUCTOR CAPACITY ACCORDING TO THE NUMBER OF CURRENT CARRYING CONDUCTORS AND OTHER ADJUSTMENT FACTORS IN ACCORDANCE WITH THE NEC. THE CONTRACTOR SHALL UTILIZE A MAXIMUM FILL RATE OF 40% WHEN SIZING CONDUITS AND SHALL INCLUDE THE REQUIRED EQUIPMENT GROUNDING CONDUCTOR. ALL OTHER CIRCUITS SHALL HAVE DEDICATED HOMERUNS.

9. CIRCUIT NUMBERS ARE SHOWN ADJACENT TO ELECTRICAL DEVICES. WIRING SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND NEC REQUIREMENTS.

10. CONDUITS SHALL BE CONCEALED ABOVE CEILINGS AND IN WALLS, EXCEPT IN MECHANICAL ROOMS, ELECTRICAL ROOMS, AND WHERE SPECIFICALLY INDICATED OTHERWISE ON THE DRAWINGS. CONDUITS SHALL NOT BE RUN IN ANY UL RATED SLAB. CONDUITS SHALL NOT BE RUN IN ANY FILLED CMU BLOCKS.

11. LOCATE ALL RACEWAYS TO AVOID INTERFERENCE WITH DUCTS, PIPES, MECHANICAL EQUIPMENT, WITH REMOVAL OF CEILING TILES, OR WITH ACCESS TO EQUIPMENT WHICH REQUIRES PERIODIC ADJUSTMENT OR MAINTENANCE.

12. SEAL PENETRATIONS THROUGH ROOFS, CEILINGS, FLOORS, WALLS AND FIRE WALLS TO MAINTAIN THE INTEGRITY OF THE AIR BARRIER, FIRE AND ACOUSTIC RATINGS OF THE ROOF, CEILINGS, WALLS AND FLOORS.

13. REVISE PANELBOARD SCHEDULES ON AS-BUILT-DRAWING AND PANEL DIRECTORIES TO REFLECT FINAL INSTALLATION CONDITIONS.

14. PROVIDE NAMEPLATES ON THE EXTERIOR OF ALL ELECTRICAL PANELS AND ENCLOSURES AS FOLLOWS: DEVICE ID, DEVICE RATING, POWER SOURCE, ARC FAULT DATA.

15. FOR DISCONNECT SWITCHES AND MOTOR STARTERS THE TOP LINE SHALL BE THE NAME/DESIGNATIONOF THE EQUIPMENT BEING FED BY THE SWITCH/STARTER.

16. PROVIDE SEPARATE NEUTRALS FOR EACH CIRCUIT UTILIZING A NEUTRAL CONDUCTOR (DO NOT COMBINE NEUTRALS).

17. PROVIDE EQUIVALENT CONDUIT PATHWAYS WHERE CABLE TRAY IS INTERRUPTED BY NONACCESSIBLE CEILINGS.

18. THE INTERRUPTING RATING OF THE PANELBOARD AND ELECTRICAL EQUIPMENT SHALL BE INCREASED TO THE NEXT AVAILABLE RATING WHERE THERE IS NOT A RATING THAT IS EQUAL TO THE EQUIPMENT'S LISTED SHORT CIRCUIT RATING.

19. NOT ALL SYMBOLS SHOWN ON THE LEGEND ARE USED IN THE PROJECT.

20. RECEPTACLES THAT HAVE GFCI PROTECTION ARE TO BE WIRED SUCH THAT THE LOSS OF POWER ON ONE RECEPTACLE DOES NOT AFFECT DOWNSTREAM RECEPTACLES.

21. COMPONENTS WHICH CONSTITUTE AN ELECTRICAL SYSTEM SHALL BE FULLY COMPATIBLE WITH ONE ANOTHER AND SHALL BE APPROVED BY THE VARIOUS MANUFACTURERS FOR USE WITH ALL OTHER COMPONENTS WITHIN THE SYSTEM. (ONE EXAMPLE OF AN ELECTRICAL SYSTEM IS THE BUILDING LIGHTING SYSTEM COMPRISED OF FIXTURES, LAMPS, SWITCHES, DRIVERS, OCCUPANCY SENSORS AND DIMMING EQUIPMENT).

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
H. TAYLOR	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
H. TAYLOR	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
R. DAVIS	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
SIZE:	FILE NAME:
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

AAR BUILDING LEGEND AND NOTES

SHEET ID
BLDG 2
E-001

READY TO ADVERTISE (RTA)

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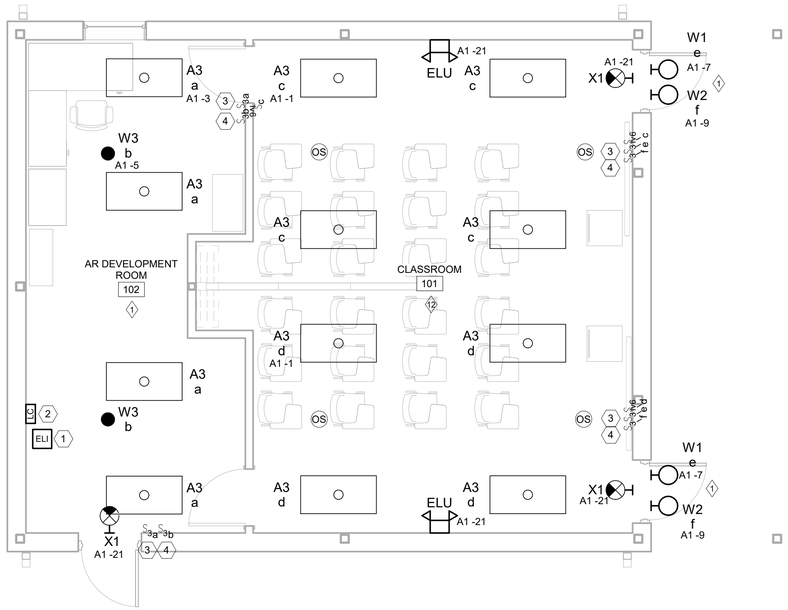
Plot Date: 11/28/2023 3:28:07 PM



1 LIGHTING PLAN

1/4" = 1'-0"

4 3 2 1 0 4 8

GENERAL SHEET NOTES

KEYED NOTES ⟨#⟩

1	RED LIGHTING PROVIDES EMERGENCY LIGHTING ILLUMINATION AND IS CONNECTED TO THE EMERGENCY LIGHTING INVERTER.
2	A MASTER OVERRIDE OFF CONTROL INSIDE THE CONTROL TOWER SHALL BE PROVIDED TO SHUT OFF ALL ANCILLARY BUILDING WHITE LIGHTING THAT MAY INTERFERE WITH RANGE NIGHT OPERATIONS. SEE LIGHTING CONTACTOR DIAGRAMS FOR ADDITIONAL INFORMATION.
3	SWITCHES FOR INDICATED WHITE LIGHTING SHALL BE WHITE IN COLOR AND SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE.
4	SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	H. TAYLOR
DRAWN BY:	H. TAYLOR
CHECKED BY:	R. DAVIS
SUBMITTED BY:	J. DEACON
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING LIGHTING PLAN

SHEET ID
BLDG 2
EL101

READY TO ADVERTISE (RTA)

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LIGHT FIXTURE SCHEDULE								
TYPE	DFESCRIPTION	FIXTURE VOLTAGE	LIGHT SOURCE	NOMINAL WATTS	MINIMUM LUMENS	MOUNTING TYPE	MOUNTING HEIGHT	REMARKS
A2	2x2 FLAT PANEL LED LUMINAIRE	120 V	LED	38 W	4400	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
A3	2x4 FLAT PANEL LED LUMINAIRE	120 V	LED	41 W	4600	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
A4	2x4 FLAT PANEL LED LUMINAIRE	120 V	LED	62 W	6500	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
ELU	LED EMERGENCY LIGHTING UNIT	120 V	LED	4 W	600	WALL	SEE PLANS	
F2	ENCLOSED GASKETED LUMINAIRE	120 V	LED	30 W	4000	SUSPENDED	SEE PLANS	
OB	OBSTRUCTION LIGHT L-810	120 V	INCANDESCENT	70 W	-	THREADED HUB	N/A	STEADY BURNING; PROVIDE PHOTOCELL; PROVIDE SPD
W1	WALL MOUNTED VAPERPROOF (WHITE)	120 V	LED	17 W	1200	WALL	SEE PLANS	PROVIDE CLEAR HEAT TREATED GLASS LENS
W2	WALL MOUNTED VAPORPROOF (RED)	120 V	LED	17 W	1200	WALL	SEE PLANS	PROVIDE RED HEAT TREATED GLASS LENS
W3	CEILING MOUNTED VAPORPROOF (RED)	120 V	LED	17 W	1200	SURFACE	N/A	PROVIDE RED HEAT TREATED GLASS LENS
W4	CEILING MOUNTED VAPORPROOF (WHITE)	120 V	LED	17 W	1200	SURFACE	N/A	PROVIDE CLEAR HEAT TREATED GLASS LENS
X1	EXIT LIGHT - WALL MOUNTED	120 V	LED	1 W	N/A	WALL	N/A	

LED FLAT PANEL
2'x2' LED LUMINAIRE

FEATURES

REFLECTORS: HIGH REFLECTANCE GLOSS WHITE

SHIELDING: WHITE FROST LENS WITH SMOOTH PATTERN FOR UNIFORM ILLUMINATION

GENERAL DESCRIPTION

HOUSING: DIE FORMED CODE-GAUGE STEEL; SEAMLESS CORNERS MAXIMIZE LIGHT EMITTING SURFACE AREA

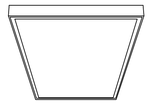
DIMENSIONS: 24" x 48" x 3" (W x L x D)

OTHER: DLC QUALIFIED

LUMEN MAINTENANCE: L70 AT 60,000 HOURS

1 TYPE A2

LED FLAT PANEL
2'x4' LED LUMINAIRE



FEATURES

REFLECTORS: HIGH REFLECTANCE GLOSS WHITE

SHIELDING: WHITE FROST LENS WITH SMOOTH PATTERN FOR UNIFORM ILLUMINATION

GENERAL DESCRIPTION

HOUSING: DIE FORMED CODE-GAUGE STEEL; SEAMLESS CORNERS MAXIMIZE LIGHT EMITTING SURFACE AREA

DIMENSIONS: 24" x 48" x 3" (W x L x D)

OTHER: DLC QUALIFIED

LUMEN MAINTENANCE: L70 AT 60,000 HOURS

2 TYPE A3 & A4

ENCLOSED AND GASKETED
LED LUMINAIRE

FEATURES

REFLECTORS: HIGH REFLECTANCE WHITE

SHIELDING: HIGH IMPACT LINEAR FROSTED ACRYLIC LENS

GENERAL DESCRIPTION

HOUSING: IMPACT RESISTANT, UV STABILIZED, FIBERGLASS WITH REMOVABLE GEAR TRAY FOR MODULE REPLACEMENT; NON-POROUS GASKET; STAINLESS STEEL LATCHES; INCLUDE SURFACE-MOUNTING BRACKETS

DIMENSIONS: 52"x7"x5" (LxWxD)

LISTING: UL LISTED FOR WET LOCATIONS

OTHER: DLC QUALIFIED

3 TYPE F2

SURFACE MOUNTED
THIN PROFILE LED EXIT LIGHT

FEATURES

MOUNTING: UNIVERSAL

SHIELDING: FLAT SHEET ACRYLIC

LETTERS: RED

BATTERY: NICKEL CADMIUM

OTHER: SELF DIAGNOSTICS; NEMA PREMIUM CERTIFIED; TAMPERPROOF HARDWARE

GENERAL DESCRIPTION

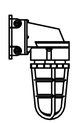
HOUSING: SOLID DIE-CAST ALUMINUM HOUSING AND FACE WITH DIRECTIONAL CHEVRON ARROWS AS REQUIRED

FINISH: BLACK HOUSING AND BRUSHED ALUMINUM FACE

DIMENSIONS: 12"x8"x1.75" (LxWxD, MAXIMUM, BACK MOUNTED)

4 TYPE X1

WALL MOUNTED
VAPORPROOF LUMINAIRE



FEATURES

DIFFUSER: GLOBE WITH DIE CAST GUARD
W1: (CLEAR GLOBE)
W2: (RED GLOBE)

GENERAL DESCRIPTION

HOUSING: DIE-CAST LED HOUSING DESIGNED FOR MAXIMUM HEAT DISSIPATION WITH HIGH TEMPERATURE SILICON INTERNAL GASKETS

FINISH: NATURAL UNPAINTED FINISH

LISTING: UL LISTED FOR WET LOCATIONS

DIMENSIONS: 8" x 13" (D x H)

5 TYPES W1 & W2

CEILING MOUNTED
VAPORPROOF LUMINAIRE

FEATURES

DIFFUSER: GLOBE WITH DIE CAST GUARD
W4: (CLEAR GLOBE)
W3: (RED GLOBE)

GENERAL DESCRIPTION

HOUSING: DIE-CAST LED HOUSING DESIGNED FOR MAXIMUM HEAT DISSIPATION WITH HIGH TEMPERATURE SILICON INTERNAL GASKETS

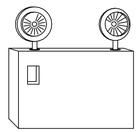
FINISH: NATURAL UNPAINTED FINISH

LISTING: UL LISTED FOR WET LOCATIONS

DIMENSIONS: 5" x 12" (D x H)

6 TYPES W3 & W4

LED EMERGENCY LIGHTING UNIT



FEATURES

LAMPS: FULLY ADJUSTABLE WHITE LED HEADS

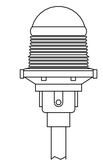
BATTERY: NICKEL CADMIUM
OUTPUT: HIGH OUTPUT OPTION FOR REMOTE HEADS
DURATION: 90 MINUTES AND >87.5% NOMINAL VOLTAGE

GENERAL DESCRIPTION

HOUSING: INJECTION MOLDED, HIGH IMPACT UV-STABLIZED THERMOPLASTIC MATERIAL; WHITE FINISH

7 TYPE ELU

INCANDESCENT OBSTRUCTION LIGHT L-810



FEATURES

DIFFUSER: RED POLYCARBONATE LENS

GENERAL DESCRIPTION

HOUSING: IP66/NEMA 4X; THREADED 1" BOTTOM HUB

LISTING: IP66 AND NEMA 4X

CERTIFICATIONS: FAA AC #: 150/5345-43H

DIMENSIONS: 5" x 5" x 9" (L x W x H)

8 TYPE OB

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING LIGHT FIXTURE SCHEDULE & DETAILS

SHEET ID
BLDG 2
EL501

READY TO ADVERTISE (RTA)

File Path: C:\Users\kbenxhit\Documents\FY23_PN96182_MPTR-STDETAILS_ELEC_R21_hunter.t.taylor.rvt

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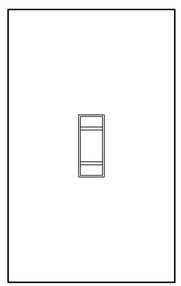
LIGHTING CONTROL STRATEGIES

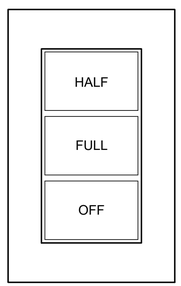
STRATEGY	DESCRIPTION OF OPERATION	LIGHTING CONTROL EQUIPMENT	SWITCHES
1	MANUAL ON/OFF	LINE VOLTAGE TOGGLE SWITCHES	S, S3, S4
2	MANUAL ON/OFF AUTO SENSOR OFF	LINE VOLTAGE WALL SWITCH SENSOR	Sv
3	AUTO SENSOR ON (HALF) MANUAL ON (HALF) MANUAL ON (FULL) MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS OCCUPANCY SENSORS ROOM CONTROLLERS	SLV3
6	LIGHTING SCENES (ZONE 1 | ZONE 2) FULL: 100% | 100% AV: 100% | 30% DIM: 1% | 1% MANUAL RAISE MANUAL LOWER MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS VACANCY SENSORS ROOM CONTROLLERS	SLV6
7	MANUAL ON/OFF AUTO SENSOR ON (HALF) AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS OCCUPANCY SENSORS ROOM CONTROLLERS	SLV2
12	PARTITION CONTROL LIGHTING SCENES (ZONE 1 | ZONE 2) FULL: 100% | 100% AV: 100% | 30% DIM: 1% | 1% MANUAL RAISE MANUAL LOWER MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS VACANCY SENSORS ROOM CONTROLLERS PARTITION CONTROL SENSORS/INTERFACE	SLV6
14	PHOTOCELL CONTROL ON WHEN NORTHERN SKY ILLUMINANCE REACHING A VERTICAL SURFACE FALLS BELOW 50 FC. PHOTOCELL CONTROL ON WHEN NORTHERN SKY ILLUMINANCE REACHING A VERTICAL SURFACE RISES ABOVE 50 FC.	PHOTOCELL	



DETAIL NOTES:

1. SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR. WHERE INDICATED, THEY SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE. SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR. ALL SWITCHES SHALL BE PERMANTENTLY LABELED WITH A DESCRIPTION OF ITS USE.

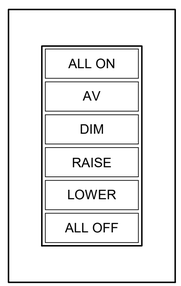
1 WALL SWITCHES S, S3, & S4



DETAIL NOTES:

1. SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR. WHERE INDICATED, THEY SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE. SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR. ALL SWITCHES SHALL BE PERMANTENTLY LABELED WITH A DESCRIPTION OF ITS USE.

2 WALLSTATION SLV3



DETAIL NOTES:

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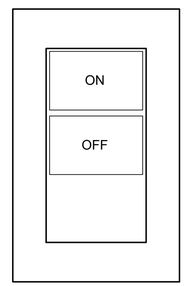
3 WALLSTATION SLV6



DETAIL NOTES:

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3 WALLSTATION SLV2

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.: -
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

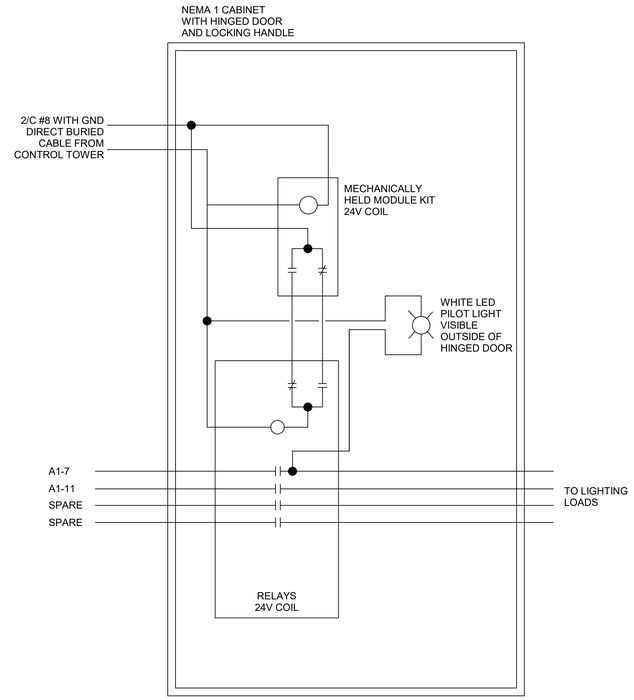
AAR BUILDING LIGHTING CONTROL SCHEDULES AND DETAILS

SHEET ID
BLDG 2
EL601

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:28:09 PM

File Path: C:\Users\k6enxhit\Documents\FY23_PN96182_MPTR-STDETAILS_ELEC_R21_hunter.t.taylor.rvt



LIGHTING CONTACTOR DIAGRAM NOTES:

1. THE DESIGN INTENT IS TO PROVIDE A MASTER OVERRIDE OFF CONTROL INSIDE THE CONTROL TOWER TO SHUT OFF ALL BUILDING WHITE LIGHTING THAT MAY INTERFERE WITH RANGE NIGHT OPERATIONS.

2. ADDITIONAL BUILDING LIGHTING CONTROLS ARE PROVIDED ON THE LOAD SIDE OF THE CONTACTOR TO PROVIDE TYPICAL BUILDING LIGHTING CONTROLS. SEE OTHER EL SHEETS FOR ADDITIONAL LIGHTING CONTROL REQUIREMENTS.

1 LIGHTING CONTACTOR DIAGRAMS

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

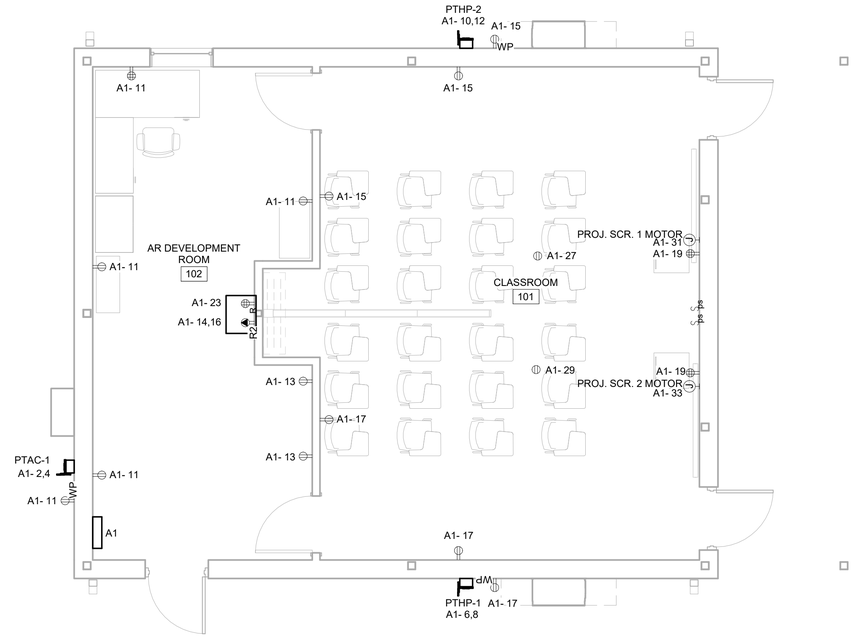
AAR BUILDING LIGHTING CONTROL DIAGRAMS

SHEET ID
BLDG 2
EL602

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:28:10 PM

File Path: C:\Users\kfeinxhit\Documents\FY23_PN96182_MPTR-STIDETAILS_ELEC_R21_hunter.t.taylor.rvt



1 POWER PLAN

1/4" = 1'-0"

4 3 2 1 0 4 8

GENERAL SHEET NOTES

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

Plot Date: 11/28/2023 3:45:40 PM

File Path: C:\Users\k6enxhlit\Documents\FY23_PN96182_MPTR-AAR_ELEC_R21_hunter.ltaylor.rvt

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SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

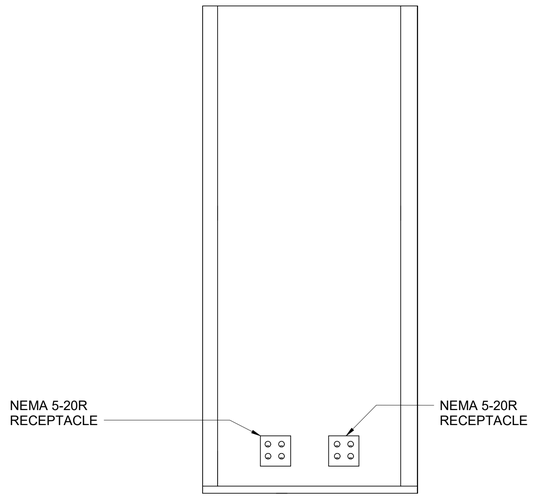
FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING POWER PLAN

SHEET ID
BLDG 2
EP101

READY TO ADVERTISE (RTA)

DTR CABINET



CABINET-MOUNTED RECEPTACLE DETAIL NOTES:

1. OUTLETS SHALL BE MOUNTED INSIDE THE DTR ENCLOSURE 4 INCHES ABOVE THE BOTTOM OF THE ENCLOSURE.

RACK MOUNTED RECEPTACLE DETAIL AAR

NOT TO SCALE

US Army Corps of Engineers ®

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CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

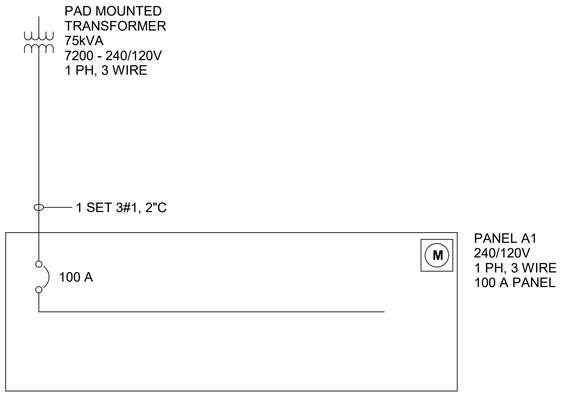
AAR BUILDING ELECTRICAL DETAILS

SHEET ID
BLDG 2
EP501

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:28:11 PM

File Path: C:\Users\kfeinxhit\Documents\FY23_PN96182_MPTR-STDETAILS_ELEC_R21_hunter.t.taylor.rvt



NOTES, POWER ONE-LINE DIAGRAM:

1. SANDHILLS UTILITY SERVICES (SUS) SHALL FURNISH AND INSTALL THE TRANSFORMER, TRANSFORMER PAD, AND PRIMARY DISTRIBUTION CABLES. SEE SITE ELECTRICAL DRAWINGS FOR MORE INFORMATION AND ADDITIONAL REQUIREMENTS.

2. THE CONTRACTOR SHALL FURNISH AND INSTALL THE SECONDARY CONDUCTORS AND CONDUITS FROM THE MAIN DISTRIBUTION PANEL (MDP) TO THE SECONDARY COMPARTMENT OF THE TRANSFORMER. THE CABLES SHALL BE OF SUFFICIENT LENGTH TO FACILITATE THEIR CONNECTION TO THE SECONDARY LUGS OF THE TRANSFORMER.

3. SEE DETAIL ON EG501 FOR SERVICE ENTRANCE GROUNDING REQUIREMENTS.

1 POWER ONE-LINE DIAGRAM
NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING POWER RISER DIAGRAM

SHEET ID
BLDG 2
EP601

Plot Date: 11/28/2023 3:45:41 PM

File Path: C:\Users\k6enxhit\Documents\FY23_PN96182_MPTR-AAR_ELEC_R21_hunter.l.taylor.rvt

READY TO ADVERTISE (RTA)

Branch Panel: A1

Location:
Supply From:
Mounting: Recessed
Enclosure: NEMA 1

Volts: 120/240 Single
Phases: 1
Wires: 3

A.I.C. Rating: 10k
Mains Type: MCB
Mains Rating: 100 A
MCB Rating: 100 A

Notes:

CKT	Circuit Description	Trip	Poles	Remarks	A		B		Remarks	Poles	Trip	Circuit Description	CKT
1	Classroom Interior White Lighting 1	20 A	1		331 VA	660 VA				2	15 A	PTAC-1	2
3	AR Dev Interior White Lighting	20 A	1				166 VA	660 VA	--	--	--	--	4
5	Interior Red Lighting	20 A	1		34 VA	1704 VA				2	20 A	PTHP-1	6
7	Exterior White Lighting	20 A	1				34 VA	1704 VA	--	--	--	--	8
9	Exterior Red Lighting	20 A	1		34 VA	1704 VA				2	20 A	PTHP-2	10
11	AR Dev Quad Receptacle	20 A	1				1080 VA	1704 VA	--	--	--	--	12
13	AR Dev Receptacle	20 A	1		360 VA	500 VA				2	30 A	DTR Receptacle 2	14
15	Classroom Receptacles 1	20 A	1				540 VA	500 VA	--	--	--	--	16
17	Classroom Receptacles 2	20 A	1		540 VA								18
19	Quad Receptacles	20 A	1				720 VA						20
21	Emergency Lighting Units	20 A	1		74 VA								22
23	DTR Receptacle 1	20 A	1				1000 VA						24
25													26
27	Classroom Projector Rec. 1	20 A	1				180 VA						28
29	Classroom Projector Rec. 2	20 A	1		180 VA	0 VA			--	1	20 A	Spare	30
31	Projector Screen 1 Motor	20 A	1				180 VA	0 VA	--	1	20 A	Spare	32
33	Projector Screen 2 Motor	20 A	1		180 VA	0 VA			--	1	20 A	Spare	34
35								0 VA	--	2	30 A	Spare	36
37	Spare	20 A	1	--	0 VA	0 VA			--	--	--	--	38
39	Spare	20 A	1	--			0 VA	0 VA	--	2	30 A	SPD	40
41	Spare	20 A	1	--	0 VA	0 VA			--	--	--	--	42
	Total Load:				6023 VA		8020 VA						
	Total Amps:				50 A		67 A						

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting	626 VA	125.00%	782 VA		
Motor	8136 VA	100.00%	8136 VA	**Total Conn. Load:**	14016 VA
Other	360 VA	100.00%	360 VA	**Total Est. Demand:**	14173 VA
IT	2000 VA	100.00%	2000 VA	**Total Conn. Current:**	58 A
Receptacle	3600 VA	100.00%	3600 VA	**Total Est. Demand Current:**	59 A

ELECTRICAL CONNECTION SCHEDULE

EQUIPMENT INFORMATION					CONDUCTORS AND RACEWAY			DISCONNECTING MEANS			
MARK	DESCRIPTION	VOLTAGE	PHASE	# OF RUNS	PHASE	GROUND	CONDUIT	TYPE	AMPS	POLES	FUSE	NEMA
PTAC-1	Wall-Mount Air Conditioner	240 V	1	1	3#12	#12	1/2" C	DISC	30 A	2	NF	3R
PTHP-1	Heat Pump	240 V	1	1	3#12	#12	1/2" C	DISC	30 A	2	NF	3R
PTHP-2	Heat Pump	240 V	1	1	3#12	#12	1/2" C	DISC	30 A	2	NF	3R

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR
DRAWN BY: H. TAYLOR
CHECKED BY: R. DAVIS
SUBMITTED BY: J. DEACON
SIZE: ANSI D
FILE NAME:
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

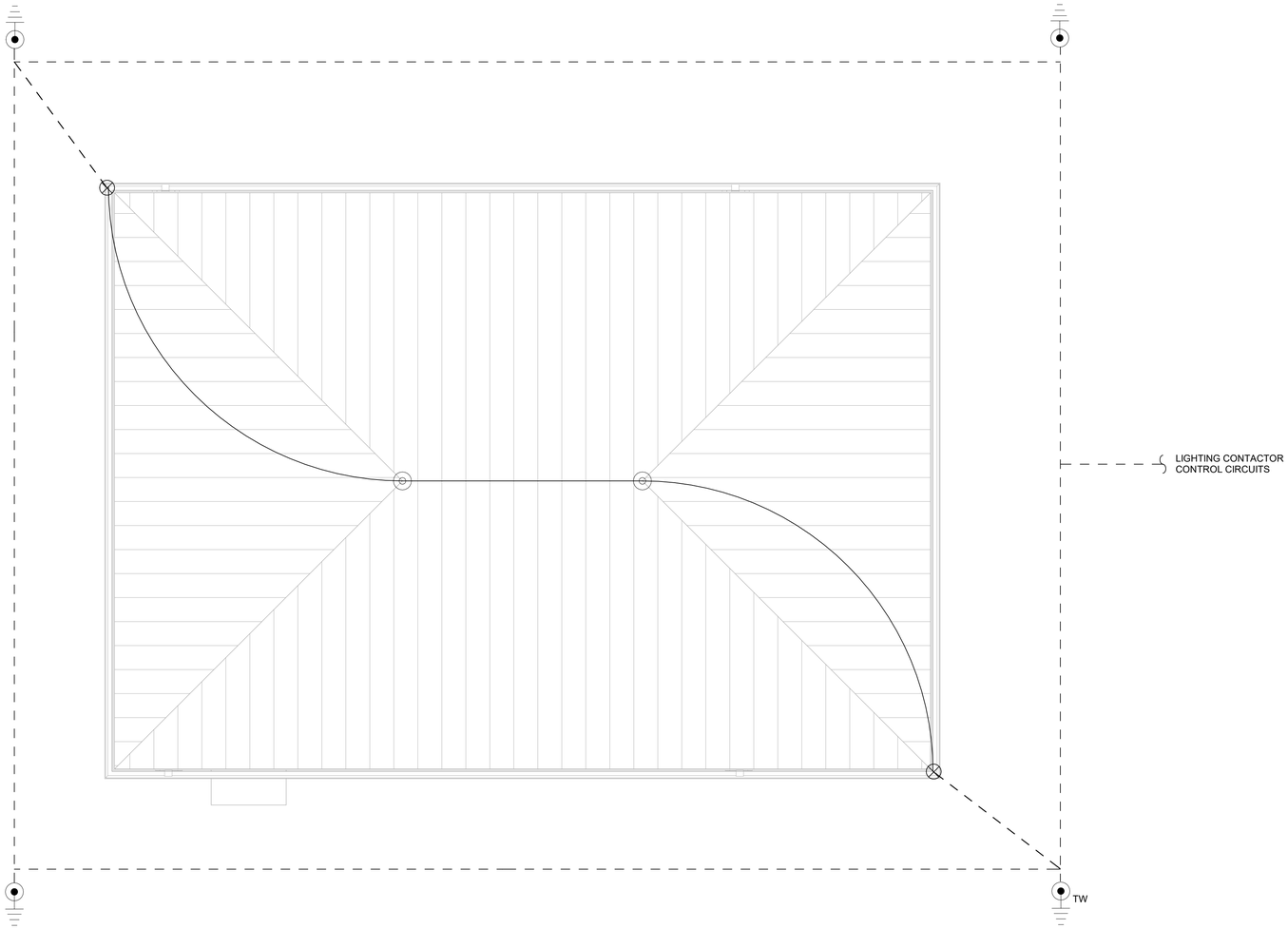
FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING PANEL SCHEDULES

SHEET ID
BLDG 2
EP701

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:45:42 PM
File Path: C:\Users\k6enxhit\Documents\FY23_PN96182_MPTR-AAR_ELEC_R21_hunter.ltaylor.rvt



1 LIGHTNING PROTECTION PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

1. THE LIGHTNING PROTECTION INSTALLER SHALL COORDINATE ROOF PENETRATIONS WITH THE ROOF INSTALLER. PENETRATIONS SHALL COMPLY WITH THE ROOF MANUFACTURER'S RECOMMENDATIONS. SEALING AND FLASHING OF PENETRATIONS SHALL BE BY THE ROOF INSTALLER.

2. LIGHTNING PROTECTION CONDUCTORS PASSING THROUGH CONCRETE FOUNDATION, SLABS OR PADS SHALL BE ROUTED IN CONDUIT.

3. INSTALLED LIGHTNING PROTECTION SYSTEM SHALL BE FIELD INSPECTED BY CONTRACTOR-PROVIDED INDEPENDENT TESTING AGENCY AND FURNISHED WITH A UL MASTER LABEL FOR LIGHTNING PROTECTION SYSTEM.

4. CONDUIT FOR DOWN CONDUCTORS SHALL ROUTE DOWN THE EXTERIOR WALL. PAINT CONDUITS TO MATCH EXTERIOR WALL COLOR.

NORTH ARROW

US Army Corps of Engineers ®

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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

AAR BUILDING LIGHTNING PROTECTION PLAN

SHEET ID
BLDG 2
EG101

Plot Date: 11/28/2023 3:45:36 PM

File Path: C:\Users\kfeinxhi\Documents\FY23_PN98182_MPTR-AAR_ELEC_R21_hunter.ltaylor.rvt

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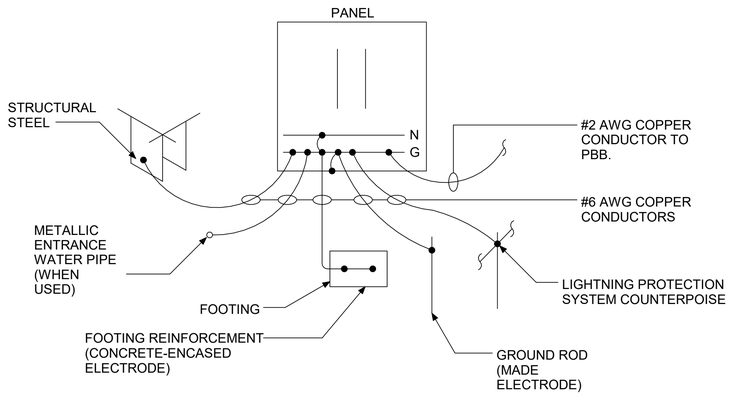
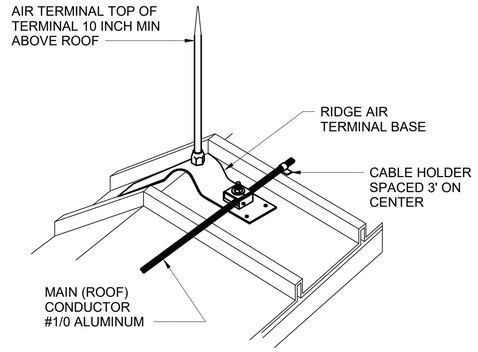


NOTES:

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC, ARTICLE 250. VARIATIONS TO GROUNDING SHOWN SHALL BE APPROVED BY THE COR.

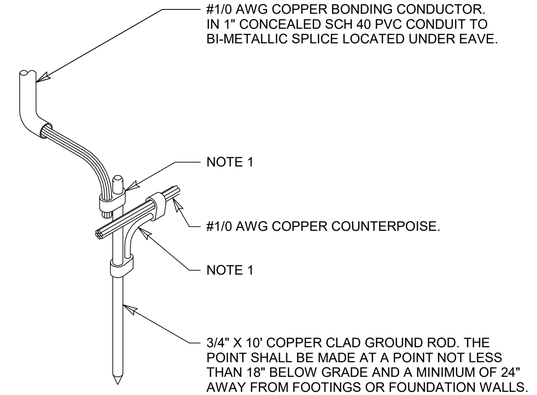
1 SERVICE ENTRANCE GROUNDING DETAIL

NOT TO SCALE



2 RIDGE ROOF AIR TERMINAL DETAIL

NOT TO SCALE



NOTES:

1. ALL CONNECTIONS TO GROUND RODS BELOW GROUND LEVEL MUST BE BY EXOTHERMIC WELD CONNECTION OR WITH A HIGH COMPRESSION CONNECTION USING A HYDRAULIC OR ELECTRIC COMPRESSION TOOL TO PROVIDE THE CORRECT CIRCUMFERENTIAL PRESSURE.

3 DOWN CONDUCTOR & COUNTERPOISE CONNECTION DETAIL

NOT TO SCALE

US Army Corps of Engineers ®

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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING MISC GROUNDING DETAILS

SHEET ID
BLDG 2
EG501

Plot Date: 11/28/2023 3:45:38 PM

File Path: C:\Users\kfeinxhi\Documents\FY23_PN96182_MPTR-AAR_ELEC_R21_hunter.ltaylor.rvt

READY TO ADVERTISE (RTA)

COMMUNICATIONS LEGEND

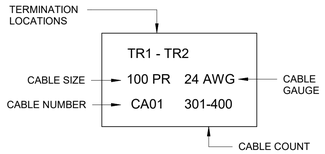
WP	VOIP TELEPHONE OUTLET WITH (1) CATEGORY 6, 8P8C CONNECTOR. "WP" INDICATES A WEATHERPROOF COVER. MH = 54" AFF UOI.
	NIPR OUTLET WITH (2) CATEGORY 6, 8P8C CONNECTORS AND (2) BLANK POSITIONS. OUTLET HOMERUNS TO NEC RACK. MH = 18" AFF UOI.
	DTR OUTLET WITH (2) CATEGORY 6, 8P8C CONNECTORS AND (2) BLANK POSITIONS. OUTLET HOMERUNS TO DTR. MH = 18" AFF UOI.
	3/4" A-C, VOID-FREE, FIRE-RETARDANT PLYWOOD BACKBOARD WITH NO ADDED UREA FORMALDEHYDE. SEE SPECIFICATION 01 33 29 FOR FOREST STEWARDSHIP COUNCIL (FSC) CERTIFICATION REQUIREMENTS.
	7-FT, 19-INCH ALUMINUM RACK WITH VERTICAL WIRE MANAGEMENT ASSEMBLY.
	48"H X 24"W X 30"D WALL-MOUNTED CABINET.
	CABLE RUNWAY OR WIREWAY, TYPE AND SIZE AS INDICATED.
PBB	TELECOMMUNICATIONS MAIN GROUND BAR, MH 18" AFF.
SBB	TELECOMMUNICATIONS GROUND BAR, MH 18" AFF.
J	JUNCTION BOX, WALL MOUNTED, MH 18" AFF UOI.
J	JUNCTION BOX, CEILING MOUNTED.

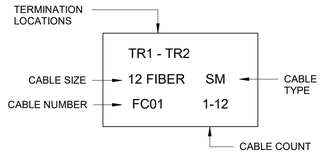
VIDEO SURVEILLANCE SYSTEM LEGEND

	GFGI CAMERA. PROVIDE 1-1/4" RGS CONDUIT TO DTR RACK. REFER TO VOLUME 4 ES517 FOR MOUNTING DETAILS.

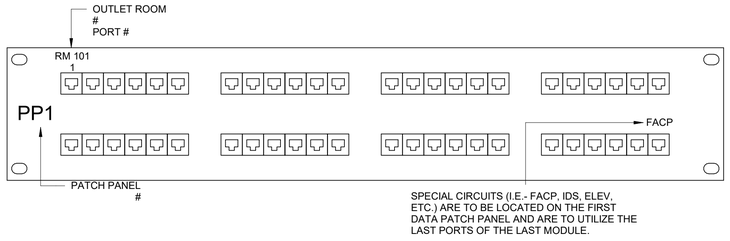
COMMUNICATION LABELING SCHEME

BACKBONE CABLES LABELING SCHEME

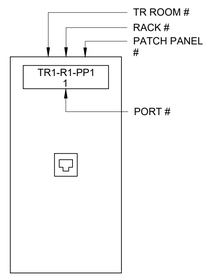


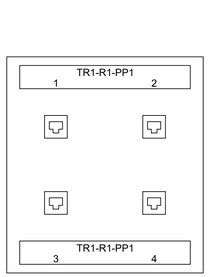


PATCH PANELS LABELING SCHEME



OUTLETS LABELING SCHEME





JACKS SHALL BE ARRANGED AND LABELED ACCORDING TO THEIR LOCATIONS IN A ROOM. THEY SHALL BE ARRANGED CLOCKWISE IN ASCENDING ORDER AROUND THE ROOM WHILE STANDING IN THE DOORWAY LOOKING INTO THE ROOM. FLOOR JACK NUMBER ARRANGEMENT SHOULD WORK IN CLOCKWISE ORDER LOOKING OUT THE TR DOORWAY. THIS LABELING SCHEME ADHERES TO THE REQUIRMENTS OUTLINED IN THE ANSI/TIA 606-B TELECOMMUNICATION STANDARD.

GENERAL NOTES

NOTES, COMMUNICATIONS:

1. ALL COMMUNICATIONS WORK SHALL BE MEET THE REQUIREMENTS OF THE I3A CRITERIA, EIA/TIA STANDARDS, AND THE NEC.

2. VOICE AND DATA OUTLET CABLING RATED CATEGORY 6 PER ANSI/TIA 568-D STANDARD.

3. FOR CATEGORY 6 CABLING, A MINIMUM OF 10 FT OF CABLE SLACK SHALL BE PROVIDED AT THE COMMUNICATIONS ROOM AND A MINIMUM OF 1 FT OF CABLE SLACK SHALL BE PROVIDED IN THE SUSPENDED CEILING FOR THE TELECOMMUNICATIONS OUTLET. THE REQUIRED CABLE SLACK LENGTHS ARE IN ADDITION TO THE TOTAL CABLE LENGTHS REQUIRED TO REACH THE TELECOMMUNICATIONS OUTLETS.

4. ALL CONDUIT TO COMMUNICATIONS OUTLET BOXES SHALL BE A MINIMUM OF 1" EMT UNLESS OTHERWISE INDICATED. CONDUITS SHALL BE CONCEALED IN CEILINGS AND WALLS, EXCEPT WHERE SPECIFICALLY OTHERWISE INDICATED.

5. PULL BOXES SHALL BE PLACED IN CONDUIT RUNS WHERE A CONTINUOUS CONDUIT LENGTH EXCEEDS 100 FEET, OR WHERE THERE ARE MORE THAN TWO 90 DEGREE BENDS. PULL BOXES SHALL BE PLACED IN STRAIGHT, ALIGNED RUNS OF CONDUIT AND NOT BE USED IN LIEU OF A BEND. PULLBOXES SHALL BE DIRECTLY ACCESSIBLE.

6. ALL COMMUNICATIONS CABLE TRAY, CONDUITS, AND WIRING SHALL BE INSTALLED AND ROUTED IAW THE TIA 569-D, UFC 3-580-01, AND THE FT. BRAGG IDC, 2017.

7. PROVIDE PIPE SLEEVES FOR POWER AND COMMUNICATIONS ENTRANCE AND EXIT CONDUITS THROUGH SLABS AT THE TIME OF THE CONSTRUCTION OF THE SLAB. NO DRILLING OR PUNCHING THROUGH SLABS WILL BE ALLOWED. ALL COMMUNICATIONS CONDUITS IN OR BELOW THE SLAB MUST RISE THROUGH THE SLAB USING RIGID STEEL CONDUIT. THE TRANSITION FROM PVC TO RIGID STEEL CONDUIT MUST TAKE PLACE PRIOR TO THE SWEEP UP TO THE BLDG. (AT THE 90-DEGREE BEND).

8. SEAL PENETRATIONS THROUGH FLOORS AND FIRE WALLS TO MAINTAIN THE INTEGRITY OF THE FIRE AND ACOUSTIC RATINGS OF THE WALLS AND FLOORS.

9. LAN ELECTRONICS SHALL BE GOVERNMENT-FURNISHED, GOVERNMENT-INSTALLED EQUIPMENT. ALL OTHER EQUIPMENT, CABLING, AND COMPONENTS NECESSARY TO PROVIDE A COMPLETE AND FULLY FUNCTIONAL TELECOMMUNICATIONS SYSTEM SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. TESTING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE I3A, ANSI/TIA STANDARDS, AND SHALL BE COMPLETED BY THE CONTRACTOR AND APPROVED BY THE COMMISSIONING AGENT THROUGH THE CONTRACTING OFFICER'S REPRESENTATIVE (COR).

10. A MINIMUM OF 36 INCHES OF SPACE SHALL BE PROVIDED BOTH IN FRONT OF AND BEHIND THE RACK AND BEHIND ANY INSTALLED EQUIPMENT. A MINIMUM SIDE CLEARANCE OF 24 INCHES SHALL BE PROVIDED ON THE END OF THE RACKS. PROVIDE 100 PERCENT SPARE RACK CAPACITY BASED ON THE AMOUNT OF RACK CAPACITY UTILIZED BY THE PATCH PANELS PROVIDED.

ABBREVIATIONS

ACS	ACCESS CONTROL SYSTEM
AFF	ABOVE FINISHED FLOOR
C	CONDUIT
CATV	CABLE TELEVISION
CKT	CIRCUIT
CFCI	CONTRACTOR-FURNISHED, CONTRACTOR-INSTALLED
COR	CONTRACTING OFFICER'S REPRESENTATIVE
CU	COPPER
DMS	DOOR MONITORING SYSTEM
DTR	DATA TERMINATION RACK
DVI	DIGITAL VIDEO INPUT
FACP	FIRE ALARM CONTROL PANEL
GFCI	GOVERNMENT-FURNISHED, GOVERNMENT-INSTALLED
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFGI	GOVERNMENT-FURNISHED, GOVERNMENT-INSTALLED
G	GROUND
GND	GROUND
HZ	HERTZ
I3A	TECHNICAL CRITERIA FOR THE INSTALLATION INFORMATION INSTALLATION ARCHITECTURE, FEB 2010
IDS	INTRUSION DETECTION SYSTEM
MFR	MANUFACTURER
MH	MOUNTING HEIGHT
MNS	MASS NOTIFICATION SYSTEM
MTD	MOUNTED
NEC	NFPA 70, NATIONAL ELECTRICAL CODE, 2014
NO	NUMBER
NTS	NOT TO SCALE
SPD	SURGE PROTECTIVE DEVICE
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UOI	UNLESS OTHERWISE INDICATED
UON	UNLESS OTHERWISE NOTED
W, WP	WEATHERPROOF

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING LEGEND AND NOTES

SHEET ID
BLDG 2
T-001

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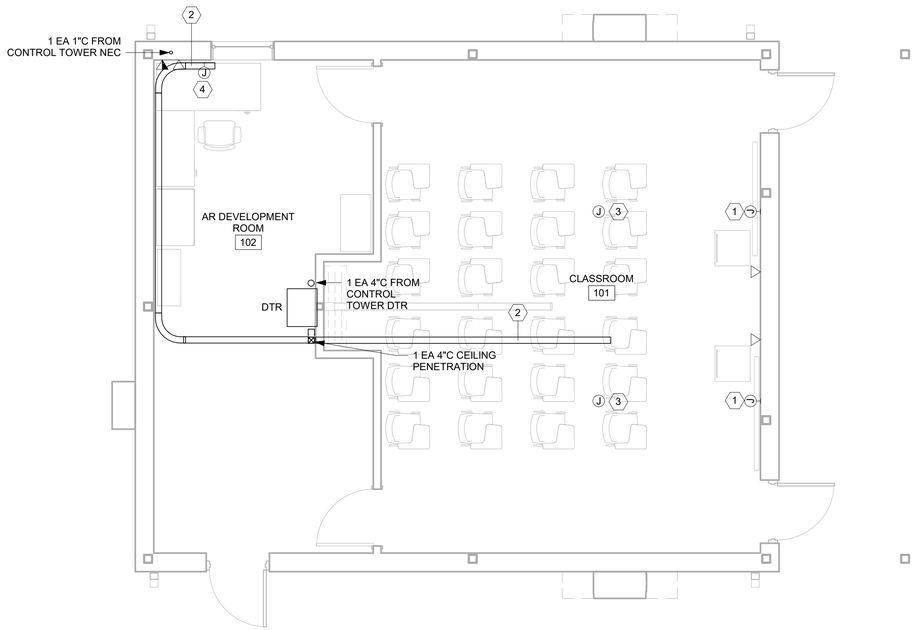

1 TELECOMMUNICATIONS PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

KEYED NOTES (#)

1	4-11/16" x 4-11/16" JUNCTION BOX CONNECTS TO CEILING JUNCTION BOX VIA 1-1/4" CONDUIT. FOR CONNECTION TO CLASSROOM PODIUM.
2	6" x 4" LADDER TYPE CABLE TRAY.MOUNTED AT 9' 6" AFF.
3	4-11/16" x 4-11/16" JUNCTION BOX CONNECTS TO CABLE TRAY AND PODIUM JUNCTION BOXES VIA 1-1/4" CONDUIT.
4	4-11/16" x 4-11/16" JUNCTION BOX CONNECTS TO CABLE TRAY VIA 1-1/4" CONDUIT. FOR FUTURE CONNECTION TO AR DEV WORKSTATION.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

AAR BUILDING TELECOMMUNICATIONS PLAN

SHEET ID
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TN101

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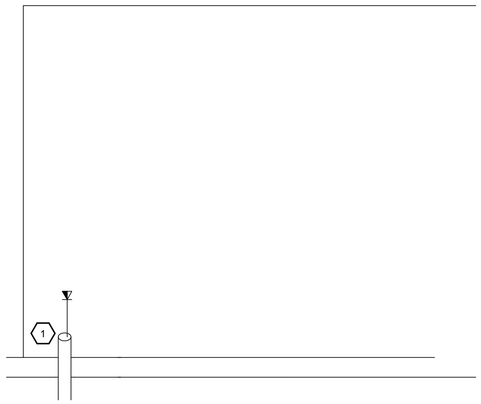
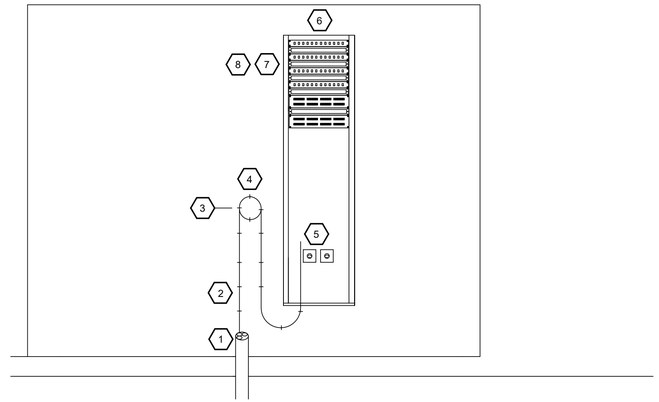


NEC COMMUNICATIONS DIAGRAM AND KEYED NOTES

1. ONE (1) EACH 1-INCH CONDUIT TO CONTROL TOWER.

1 DIAGRAM - AAR NEC
NOT TO SCALE



DTR COMMUNICATIONS CABINET DIAGRAM AND KEYED NOTES

1. ONE (1) EACH 4-INCH CONDUITS. ONE CONDUIT SHALL CONTAIN 3 EACH 3-INCH 3-CELL FABRIC MESH WITH TRACER WIRE ATTACHED AND PULL STRING IN ALL VACANT CELLS. ALL VACANT DUCTS SHALL HAVE PULL STRINGS.

2. FIBER OPTIC CABLES. SEE T-601 FOR QUANTITIES.

3. CABLE MANAGEMENT RINGS.

4. 20-FT FIBER MAINTENANCE LOOP.

5. RACK-MOUNTED RECEPTACLES, SEE EP501 FOR DETAIL.

6. THE DATA TERMINATION RACK (DTR) SHALL BE HINGED, WALL-MOUNTED, 30-INCH DEEP, 24-INCH WIDE CABINET WITH 68-INCH RACKING HEIGHT. THE DTR SHALL HAVE REMOVABLE SIDE PANELS AND VENTED DOORS.

7. RACK-MOUNTED, CATEGORY 6, 48-PORT, RJ45 PATCH PANEL FOR DTR OUTLETS.

8. CABLE WIRE MANAGEMENT PANELS, QUANTITIES AS REQUIRED.

2 DIAGRAM - AAR DTR
NOT TO SCALE

US Army Corps of Engineers ®

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DRAWN BY:	SOLICITATION NO.:
H. TAYLOR	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
R. DAVIS	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
SIZE:	FILE NAME:
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

AAR BUILDING COMMUNICATIONS DETAILS

SHEET ID
BLDG 2
TN501

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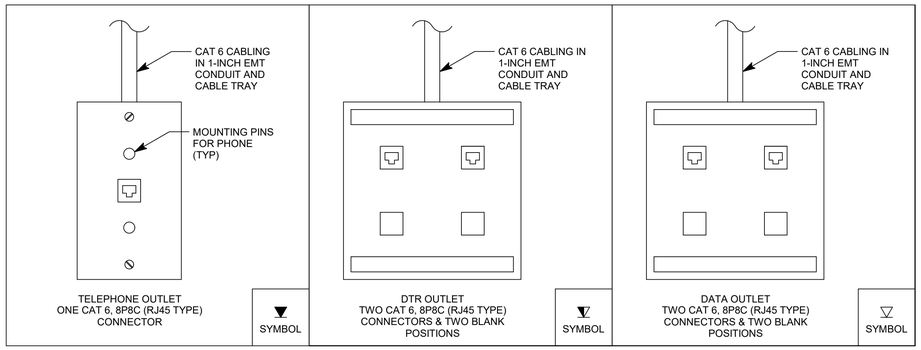
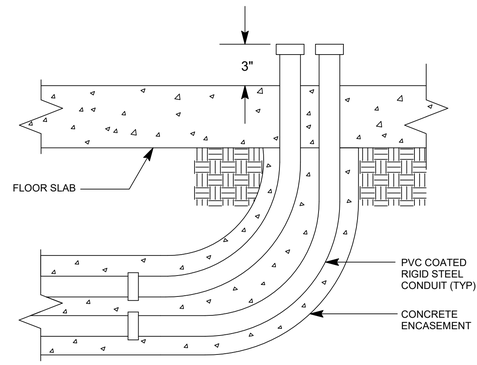


1 TYPICAL COMMUNICATIONS WALL OUTLET DETAIL

NOT TO SCALE



TELECOMMUNICATIONS SERVICE ENTRANCE DETAIL

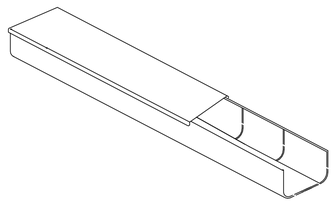
NOT TO SCALE

NOTES:

1. PROVIDE NUMBER OF CONDUITS AS SHOWN ON CONDUIT RISER DIAGRAM, TN601.
2. BOND CONDUITS TO PBB/SBB.
3. PROVIDE MECHANICAL PLUGS FOR EMPTY CONDUITS.

2 TELECOMMUNICATIONS SERVICE ENTRANCE DETAIL

NOT TO SCALE

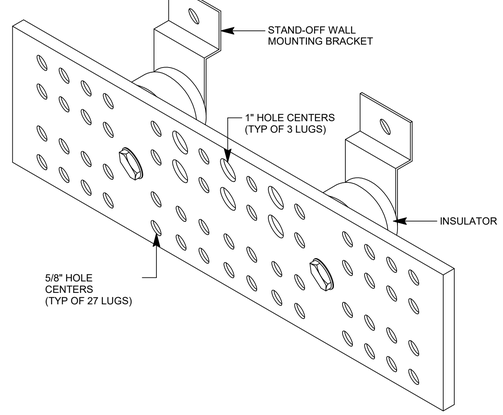


NOTES:

1. DIMENSIONS AS INDICATED ON PLANS

3 DETAIL - WIREWAY

NOT TO SCALE



NOTES:

1. THE PBB DIMENSIONS SHALL BE 20" L x 4" W x 1/4" H.
2. THE PBB SHALL BE UL LISTED.
3. THE PBB MOUNTING BRACKETS SHALL BE STAINLESS STEEL.
4. ALL CONNECTIONS TO THE PBB SHALL BE MADE USING TWO-HOLE COMPRESSION CRIMP-TYPE LUG FITTINGS.

DETAIL - PRIMARY BONDING BUSBAR (PBB)

NOT TO SCALE

US Army Corps of Engineers ®

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CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

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SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

AAR BUILDING COMMUNICATIONS DETAILS

SHEET ID
BLDG 2
TN502

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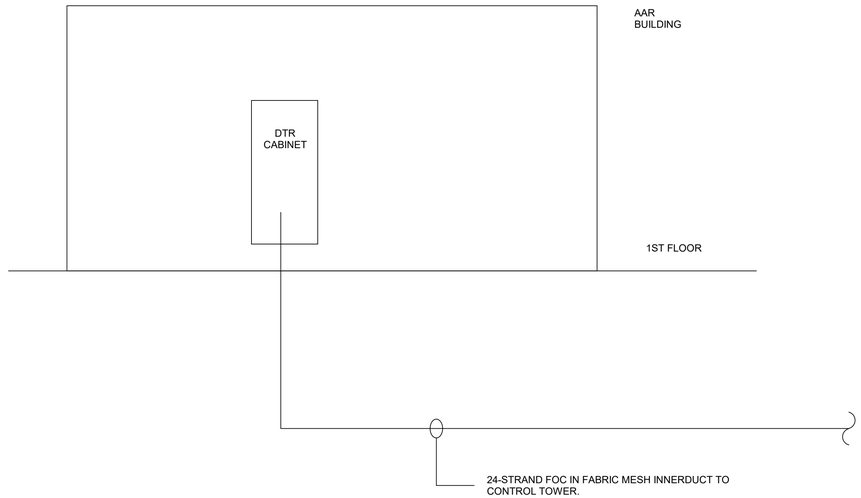
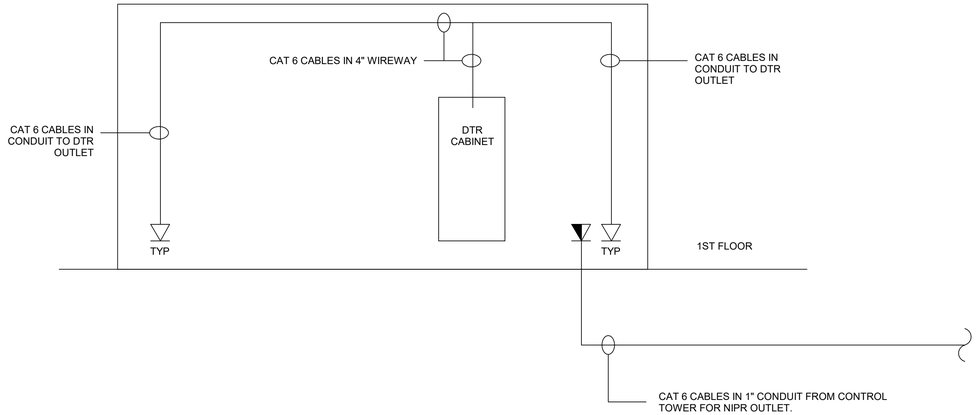


1 RISER DIAGRAM - FIBER OPTIC CABLING
NOT TO SCALE



2 RISER DIAGRAM - COPPER CABLING
NOT TO SCALE

US Army Corps of Engineers ®

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SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

AAR BUILDING COMMUNICATIONS DIAGRAMS

SHEET ID
BLDG 2
TN601

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:45:44 PM

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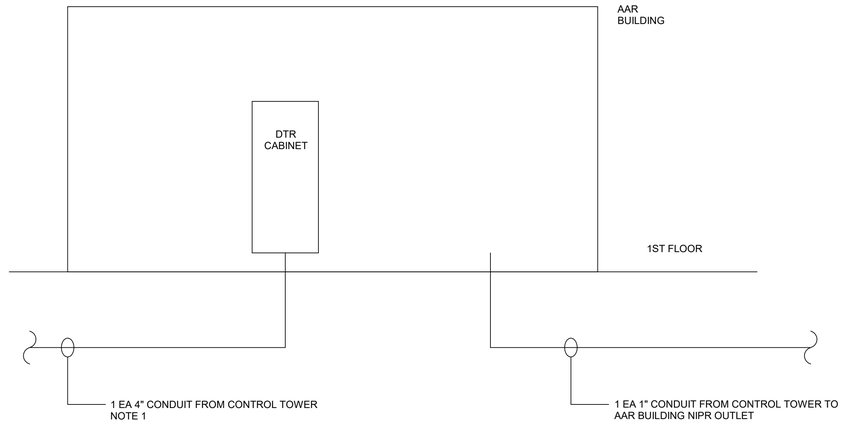

CONDUIT RISER DIAGRAM NOTES

1. PROVIDE CONDUIT WITH 3-INCH, 3-CELL FABRIC MESH INERDUCT WITH TRACER WIRE. ALL EMPTY CELLS SHALL CONTAIN A PULL STRING.

1 CONDUIT RISER DIAGRAM
NOT TO SCALE

US Army Corps of Engineers ®

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VOLUME 2 - BUILDING

AAR BUILDING COMMUNICATIONS CONDUIT RISER DIAGRAM

SHEET ID
BLDG 2
TN602

Plot Date: 11/28/2023 3:45:45 PM

File Path: C:\Users\k6exhilt\Documents\FY23_PN96182_MPTR-AAR_ELEC_R21_hunter.ltaylor.rvt

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DESIGN CODE NOTES:

D-1. STRUCTURAL DESIGN IS IN ACCORDANCE WITH THE FOLLOWING CODES AND SPECIFICATIONS:

A. IBC 2018, INTERNATIONAL BUILDING CODE

B. ASCE 7-16, MINIMUM DESIGN LOADS FOR BUILDINGS AND STRUCTURES

C. ACI 318-14, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

D. TMS 402-16, BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES

E. AISC 360-16, SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS

F. AISI S100-12, NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS.

G. AWS, AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE

H. SDI, STEEL DECK INSTITUTE: DESIGN MANUAL FOR COMPOSITE DECK, FORM DECK, & ROOF DECK

I. UFC 1-200-01, GENERAL BUILDING REQUIREMENTS (01 OCT 2020)

J. UFC 3-301-01, STRUCTURAL ENGINEERING, (01 OCT 2019)

K. UFC 4-010-01, DOD MINIMUM ANTI-TERRORISM STANDARDS FOR BUILDINGS, (19 AUG 2020)

DESIGN LOAD CRITERIA:

D-2. LIVE LOADS:

FIRST FLOOR SLAB-ON-GRADE	150 PSF
ROOF LIVE LOAD:	20 PSF

D-3. SNOW LOADS:

RISK CATEGORY	II
SNOW IMPORTANCE FACTOR, I_s	1.0
MINIMUM GROUND SNOW LOAD, P_g	10 PSF
FROST PENETRATION DEPTH	0 IN
SNOW EXPOSURE FACTOR, C_e	0.9
SNOW THERMAL FACTOR, C_t	1.0
ROOF SLOPE FACTOR, C_s	0.8
FLAT ROOF SNOW LOAD, P_f	6.3 PSF
SLOPED ROOF SNOW LOAD, P_s	5.0 PSF

D-4. WIND LOADS:

RISK CATEGORY	II
BASIC WIND SPEED, *V*	119 MPH (ULTIMATE) 93 MPH (SERVICE)
WIND EXPOSURE CATEGORY	C
GUST EFFECT FACTOR, *G*	0.85
INTERNAL PRESSURE COEFFICIENTS, *GCpi*	+/- 0.18

D-5. SEISMIC LOADS:

RISK CATEGORY	II
SEISMIC IMPORTANCE FACTOR, *Ie*	1.0
MAPPED SPECTRAL RESPONSE ACCELERATION, *Ss*	0.154
MAPPED SPECTRAL RESPONSE ACCELERATION, *S1*	0.072
SITE CLASS	D
DESIGN SPECTRAL RESPONSE ACCELERATION, *Sds*	0.16
DESIGN SPECTRAL RESPONSE ACCELERATION, *Sd1*	0.12
SEISMIC DESIGN CATEGORY	B
SEISMIC ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE
SEISMIC-FORCE RESISTING SYSTEM	STEEL NOT DETAILED FOR SEISMIC
RESPONSE MODIFICATION FACTOR, *R*	3.0
SYSTEM OVERSTRENGTH FACTOR	3.0
DEFLECTION AMPLIFICATION FACTOR, Cd	3.0
SEISMIC RESPONSE COEFFICIENT, Cs	0.055
SEISMIC BASE SHEAR	2.75 KIPS

D-6. ANTI-TERRORISM/FORCE PROTECTION CRITERIA:

ANTI-TERRORISM/FORCE PROTECTION IS NOT REQUIRED FOR THIS FACILITY BASED ON THE INTENDED OCCUPANCY.

SPECIAL INSPECTION NOTES:

SI-1. INSPECTION OF FABRICATORS SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1704.2.5.

SI-2. INSPECTION OF STEEL CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.2.

SI-3. INSPECTION OF CONCRETE CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.3 AND TABLE 1705.3.

SI-4. INSPECTIONS FOR SEISMIC RESISTANCE SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.12.

SI-5. INCLUDE SPECIAL INSPECTIONS REQUIREMENTS IN CONTRACTOR'S QUALITY CONTROL (CQC) PLAN.

SI-6. THE CONTRACTOR SHALL RETAIN THIRD PARTY QUALITY ASSURANCE AGENCIES TO CONDUCT SPECIAL INSPECTIONS REQUIRED BY IBC. INSPECTING AGENCY SHALL PROVIDE REPORTS OF SPECIAL INSPECTIONS DIRECTLY TO THE GOVERNMENT.

GENERAL NOTES:

G-1. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER ALL BUILDING CONSTRUCTION IS COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCES TO ENSURE SAFETY OF THE BUILDING AND ITS COMPONENTS DURING ERECTION. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS, OR TIE-DOWNS.

G-2. THE CONTRACT DOCUMENTS DO NOT INDICATE THE MEANS AND METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK DURING ERECTION AND CONSTRUCTION AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES, SEQUENCES, LOADINGS AND SAFETY.

G-3. USE STRUCTURAL DRAWINGS IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SPECIFICATIONS. COORDINATE THE WORK OF OTHER TRADES INCLUDING, BUT NOT LIMITED TO, THE REQUIREMENTS FOR SLEEVES, INSERTS, HOLES, HANGERS, AND ANCHORS.

G-4. REPORT DISCREPANCIES IN DIMENSIONS BETWEEN DIFFERENT DRAWINGS TO THE CONTRACTING OFFICER PRIOR TO BEGINNING WORK IN IMPACTED AREAS.

G-5. ELEVATIONS ON THE STRUCTURAL DRAWINGS ARE DENOTED AS [±X'-X"] REFERENCED TO THE FINISHED FIRST FLOOR ELEVATION DATUM [0'-0"]. SEE CIVIL DRAWINGS FOR ACTUAL DATUM ELEVATION.

G-6. DETAILS TITLED OR NOTED AS "TYPICAL" APPLY NOT ONLY WHERE SPECIFICALLY INDICATED OR REFERENCED, BUT ALSO IN ALL OTHER CASES WHERE THE NATURE OF THE CONSTRUCTION REQUIRES THEIR USE. DETERMINE APPLICABILITY OF TYPICAL DETAILS FROM DESCRIPTIVE TITLES OR FROM THE SIMILARITY OF A CONSTRUCTION CONDITION TO ANOTHER CONDITION WHERE THE DETAIL IS SPECIFICALLY INDICATED OR REFERENCED.

G-7. WHERE A DETAIL OR SECTION IS SHOWN FOR ONE CONDITION, IT SHALL APPLY TO ALL LIKE OR SIMILAR CONDITIONS EVEN THOUGH NOT SPECIFICALLY MARKED ON THE PLANS.

G-8. REPRODUCTION OF CONTRACT DRAWINGS SHALL NOT BE USED AS SHOP DRAWINGS UNDER ANY CIRCUMSTANCE.

G-9. DO NOT SCALE THE DRAWINGS.

FOUNDATION AND SLAB NOTES:

F-1. FOUNDATIONS FOR THIS PROJECT HAVE BEEN DESIGNED IN ACCORDANCE WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT PREPARED BY THE SAVANNAH DISTRICT TITLED "SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING REPORT", DATED MARCH 2022.

F-2. FOUNDATIONS HAVE BEEN DESIGNED TO BEAR ON SOIL CAPABLE OF SUPPORTING AN ALLOWABLE BEARING PRESSURE OF 3000 PSF, PER THE GEOTECHNICAL REPORT REFERENCED ABOVE.

F-3. THE CONTRACTOR SHALL HIRE AN INDEPENDENT TESTING LABORATORY AND GEOTECHNICAL ENGINEER, REGISTERED AND LICENSED IN THE STATE WHERE THE WORK WILL BE ACCOMPLISHED, TO VERIFY THAT ALL OF THE REQUIREMENTS CONTAINED IN SPECIFICATION 31 00 00, EARTHWORK, HAVE BEEN FOLLOWED AND ACCOMPLISHED.

F-4. CONTRACTOR SHALL BE PREPARED FOR AND SHALL INCLUDE COST OF FORMING FOUNDATIONS SHOULD THE EARTH NOT PROVIDE ADEQUATE BANK STABILITY.

F-5. ALL EXCAVATIONS SHALL BE PERFORMED SO THAT THE SITE AND THE AREA IMMEDIATELY SURROUNDING THE SITE WHICH AFFECTS CONSTRUCTION OPERATIONS WILL BE CONTINUALLY AND EFFECTIVELY DRAINED. THE CONTRACTOR SHALL PROVIDE DRAINAGE AND DEWATERING AS REQUIRED TO ENSURE THAT ALL FOOTING EXCAVATIONS ARE ACCOMPLISHED WITH THE SUBGRADE SOILS REMAINING DRY AND FIRM UNTIL AFTER FOOTINGS ARE PLACED AND BACKFILLED. REMOVAL OF SURFACE WATER, GROUNDWATER, AND ANY PERCHED WATER CONDITIONS WHICH MIGHT BE ENCOUNTERED DURING EXCAVATIONS, SHALL BE ACCOMPLISHED BY APPROVED MEANS. REFER TO SPECIFICATION SECTION 31 00 00, EARTHWORK, AND TO SHEET S-101 FOR ADDITIONAL EXCAVATION REQUIREMENTS.

F-6. PLACE FOUNDATION CONCRETE THE SAME DAY EXCAVATIONS ARE MADE OR AS SOON AS PRACTICAL THEREAFTER.

F-7. DO NOT PLACE FOUNDATION CONCRETE ON FROZEN OR SATURATED SUBGRADES.

F-8. ENSURE THAT EARTH-FORMED FOOTINGS CONFORM TO THE SHAPE, LINES, AND THICKNESS INDICATED ON THE FOUNDATION PLAN, SECTIONS, AND FOOTING SCHEDULES. EXCAVATION WIDTHS SHALL BE A MINIMUM OF 4" GREATER THAN DIMENSIONS INDICATED.

F-9. DO NOT INSTALL FOUNDATIONS UNTIL FOUNDATION WORK HAS BEEN COORDINATED WITH ADJACENT UNDERGROUND UTILITIES.

F-10. PLACE 10 MIL VAPOR RETARDER AND 4" CAPILLARY WATER BARRIER UNDER ALL INTERIOR SLABS-ON-GRADE.

CONCRETE CONSTRUCTION NOTES:

C-1. ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-14) AND THE SPECIFICATIONS FOR STRUCTURAL CONCRETE (ACI 301-14) OF THE AMERICAN CONCRETE INSTITUTE (ACI).

C-2. ALL CAST-IN-PLACE CONCRETE SHALL ATTAIN MINIMUM 28-DAY COMPRESSIVE STRENGTH (f'c) OF 4000 PSI.

C-3. CONCRETE DENSITY SHALL BE NORMAL WEIGHT WITH A DENSITY OF 140 PCF TO 150 PCF UNLESS NOTED OTHERWISE ON PLANS. CONCRETE NOTED TO BE LIGHTWEIGHT SHALL HAVE DENSITY OF 105 PCF TO 115 PCF.

C-4. CONCRETE REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615/A615M, GRADE 60 AND SHALL HAVE FABRICATION TOLERANCES IN ACCORDANCE WITH ACI 315. SHOP FABRICATE REINFORCING BARS WHICH ARE INDICATED TO BE BENT OR HOOKED.

CONCRETE CONSTRUCTION NOTES CONTINUED:

C-5. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 OR ASTM A497. PROVIDE SHEET-TYPE WELDED WIRE FABRIC. SHEET LAPS SHALL BE TIED AND LAPPED ONE FULL MESH SPACING PLUS 2".

C-6. CONCRETE REINFORCING STEEL SHALL BE CONTINUOUS UNLESS OTHERWISE INDICATED. CONTINUOUS REINFORCING STEEL SHALL BE SPLICED AS SHOWN IN SCHEDULE ON SB601 UNO ON PLANS. REINFORCING STEEL SHALL BE PLACED SO THAT SPACING IS GREATER THAN OR EQUAL TO 2X BAR DIAMETER.

C-7. MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE AS INDICATED. IN NO CASE SHALL REINFORCEMENT COVER BE LESS THAN THE REQUIREMENTS OF ACI 301.

A.	CONCRETE DEPOSITED AGAINST THE GROUND	3"
B.	CONCRETE EXPOSED TO EARTH OR WEATHER	2"
C.	SLABS AND WALLS	1"

C-8. CONCRETE REINFORCING STEEL MARKED STANDARD HOOK SHALL HAVE A 90° HOOK A MINIMUM OF 12 BAR DIAMETERS IN LENGTH, UNLESS OTHERWISE NOTED. STIRRUPS, TIES, AND 180° HOOKS SHALL CONFORM TO THE REQUIREMENTS OF ACI 318.

C-9. PROVIDE 1/2" THICK PRE-MOLDED JOINT FILLER MATERIAL WHERE SLABS ON GRADE ABUT VERTICAL SURFACES.

C-10. ALL EMBEDDED ITEMS SHALL BE PROPERLY PLACED, ACCURATELY POSITIONED AND MAINTAINED SECURELY IN PLACE PRIOR TO AND DURING CONCRETE PLACEMENT.

C-11. REINFORCING STEEL SHALL BE SPREAD AT SLEEVES, ANCHORS, RECESSES AND OTHER EMBEDDED ITEMS UNLESS OTHERWISE INDICATED. REINFORCEMENT SHALL NOT BE CUT TO FACILITATE PLACEMENT OF EMBEDDED ITEMS, UNLESS INDICATED.

C-12. NO CONCRETE SHALL BE PLACED UNTIL THE OWNER OR THE CONTRACTING OFFICER'S DESIGNATED REPRESENTATIVE HAS INSPECTED ALL EMBEDDED WORK, INCLUDING REINFORCEMENT.

C-13. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 3/4" OR AS INDICATED.

C-14. ALUMINUM SHALL NOT BE PLACED IN DIRECT CONTACT WITH CONCRETE UNLESS EFFECTIVELY COATED OR COVERED TO PREVENT ALUMINUM-CONCRETE REACTION AND ELECTROLYTIC ACTION BETWEEN ALUMINUM AND STEEL.

C-15. CONCRETE SLAB ON GRADE JOINTS INDICATED ARE DIAGRAMMATIC AND DO NOT REPRESENT ALL OF THE JOINTS REQUIRED FOR SLAB-ON-GRADE CONSTRUCTION. SLAB PANELS BETWEEN JOINTS SHALL BE EQUALLY SPACED OR NEARLY SO, WITH A MAXIMUM SPACING OF 15'-0". SLAB PANELS BETWEEN JOINTS SHALL BE SQUARE OR NEARLY SO AND SHALL NOT EXCEED AN ASPECT RATIO WITH PANEL LENGTH GREATER THAN 1.5 TIMES THE PANEL WIDTH.

C-16. CONTRACTOR SHALL PROVIDE JOINTS AT ALL RE-ENTRANT CORNERS INCLUDING, BUT NOT LIMITED TO, COLUMNS AND SLAB RECESSES.

C-17. IN ADDITION, CONTRACTOR SHALL COORDINATE SLAB ON GRADE JOINT REQUIREMENTS WITH SLAB-ON-GRADE CONSTRUCTION SEQUENCING. CONTRACTOR SHALL SHOW JOINT LAYOUT ON REINFORCING SHOP DRAWING SUBMITTAL FOR APPROVAL.

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MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT
DRAWN BY: A. SCOTT
CHECKED BY: J. WHITTAKER
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING GENERAL STRUCTURAL NOTES

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STEEL CONSTRUCTION NOTES:

S-1. FABRICATION AND ERECTION OF STRUCTURAL STEEL AND DESIGN OF CONNECTIONS SHALL BE IN ACCORDANCE WITH AISC 360-16, "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" AND AISC 303-16, "CODE OF STANDARD PRACTICE FOR BUILDING AND BRIDGES". THE STRUCTURAL STEEL MEMBERS SHOWN IN THESE DRAWINGS HAVE BEEN ANALYZED AND DESIGNED USING AISC 360-16, LRFD METHOD.

S-2. UNLESS OTHERWISE NOTED, STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE ABOVE-LISTED AISC SPECIFICATION AND THE FOLLOWING:

A. WIDE FLANGE SHAPES (50 KSI)	ASTM A992, GRADE B
B. HSS HOLLOW SHAPES (50 KSI)	ASTM A500, GRADE C
C. HSS HOLLOW ROUND SHAPES (46 KSI)	ASTM A500, GRADE C
D. PLATES AND ANGLES	ASTM A36
E. HIGH STRENGTH BOLTS	ASTM F3125, GRADE A325
F. ANCHOR RODS W/ NUT AND WASHER	ASTM F1554, GRADE 55

S-3. IT IS THE INTENTION OF THESE DESIGN DOCUMENTS TO DELEGATE THE DESIGN OF ALL STRUCTURAL STEEL SHEAR CONNECTIONS THAT ARE NOT ASSOCIATED WITH THE LATERAL FORCE RESISTING SYSTEM (IE. MOMENT CONNECTION AND BRACED FRAME CONNECTIONS) TO A QUALIFIED REGISTERED ENGINEER RETAINED BY THE CONTRACTOR AND/OR FABRICATOR. SIGNED AND SEALED CALCULATIONS FOR CONNECTION DESIGNS SHALL BE SUBMITTED SIMULTANEOUSLY WITH FABRICATION DRAWINGS FOR REVIEW. ALL SHEAR CONNECTIONS FOR SIMPLY SUPPORTED BEAMS SHALL BE DESIGNED TO DEVELOP THE FACTORED DESIGN REACTION PER 5/SF502 FOR THE BEAM SIZE AND SPAN SHOWN. ALL STEEL SHEAR CONNECTIONS SHOWN ON THE DRAWINGS ARE CONCEPTUAL IN NATURE AND DO NOT DICTATE DESIGN INTENT IN TERMS OF NUMBER OF BOLTS, WELD SIZES, ANGLE SIZE, ETC. THE DELEGATED ENGINEER IS SOLELYRESPONSIBLE FOR THE DESIGN OF THE CONNECTIONS FOR THE CRITERIA INDICATED ON THE DRAWINGS. CONNECTIONS SHALL HAVE A MINIMUM OF 2 BOLTS.

S-4. ALL SHOP AND FIELD WELDING SHALL BE BY CERTIFIED WELDERS AND SHALL CONFORM TO AWS STANDARDS. USE E70XX ELECTRODES UNLESS OTHERWISE NOTED. MINIMUM WELD SIZE FOR STRUCTURAL STEEL IS 3/16 IN FILLET, UNLESS OTHERWISE NOTED. CURRENT AWS CERTIFICATIONS SHALL BE AVAILABLE AT THE JOB SITE FOR REVIEW BY THE OWNERS' REPRESENTATIVE.

S-5. ALL BOLTED CONNECTIONS, UNLESS OTHERWISE NOTED, SHALL USE 3/4" DIAMETER HIGH STRENGTH BOLTS WITH HARDENED CARBON STEEL WASHERS AS REQUIRED FOR THE CONNECTION LOADS.

S-6. ALL FIELD-BOLTED SHEAR CONNECTIONS SHALL BE SNUG TIGHT BEARING-TYPE CONNECTIONS, THREADS INCLUDED IN THE SHEAR PLANE.

S-7. FIELD CUTTING OF STRUCTURAL STEEL MEMBERS BY ANY TRADE IS NOT PERMITTED. BOLT HOLES SHALL NOT BE CUT OR ENLARGED BY FLAME CUTTING IN THE FIELD.

S-8. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL DRAWINGS AND DESIGN CALCULATIONS FOR ANY ALTERNATE DETAILS AND MEMBER SPLICES.

S-9. SHOP OR FIELD SPLICES OF STRUCTURAL STEEL MEMBERS ARE PROHIBITED EXCEPT AS DETAILED ON THE DRAWINGS, PERMITTED IN THE SPECIFICATIONS, AS INDICATED ON APPROVED SUBMITTALS, AND AS SPECIFICALLY APPROVED ON SHOP DRAWINGS PRIOR TO FABRICATION.

S-10. PAINT ALL STEEL BELOW FINISH FLOOR WITH BITUMINOUS COATING.

S-11. ALL STEEL EXPOSED TO WEATHER SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 FOR MEMBERS AND ASTM A153 FOR CONNECTION ELEMENTS, EXCEPT THAT ARCHITECTURALLY EXPOSED STRUCTURAL STEEL SHALL BE BLAST CLEANED AND COATED IN ACCORDANCE WITH THE STRUCTURAL STEEL AND PAINT SPECIFICATIONS. COORDINATE ALL STEEL FINISHES WITH ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

S-12. ALL ANGLES AND BENT PLATES INDICATED TO BE CONTINUOUS SHALL HAVE SPLICES FULLY WELDED.

S-13. PROVIDE STEEL CAP PLATE TO ALL HSS MEMBERS EACH END.

STEEL DECK NOTES:

SD-1. ROOF DECK SHALL BE GALVANIZED STEEL CONFORMING TO ASTM A653 WITH A MINIMUM YIELD STRENGTH OF 33 KSI. STEEL ROOF DECK SHALL BE AS SHOWN ON DRAWINGS. FASTENERS FOR ROOF DECK SHALL UTILIZE #12 SELF TAPPING SCREWS AT A 36/4 PATTERN TO SUPPORT STRUCTURE AND #12 SELF TAPPING SCREWS AT SIDE LAP CONNECTIONS. THE NUMBER OF SIDELAPS VARIES PER ROOF PLAN. SEE ROOF PLANS FOR NUMBER OF SIDELAPS REQUIRED. SEE ROOF EAVE/RAKE SECTIONS FOR PERIMETER FASTENING REQUIREMENTS.

SD-2. PROVIDE ALL RIDGE PLATES, VALLEY PLATES, CLOSURE PLATES, POUR STOPS, AND ALL OTHER ACCESSORIES REQUIRED FOR COMPLETE INSTALLATION IN ACCORDANCE WITH THE DECK MANUFACTURER'S RECOMMENDATIONS.

SD-3. CONTRACTOR SHALL COORDINATE OPENINGS IN STEEL DECK WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS PRIOR TO DECK PLACEMENT.

SD-4. HANGING LOADS DIRECTLY FROM ROOF DECK IS PROHIBITED.

SD-5. STEEL DECK SHALL SPAN CONTINUOUSLY OVER A MINIMUM OF 4 SUPPORTS (3 SPANS) UNO.

LIGHT GAUGE STEEL NOTES:

LG-1. THE ROOF LAYOUT AND COMPONENTS SHOWN ON THE DRAWINGS ARE FOR GENERAL CONFIGURATION ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL QUANTITIES, DIMENSIONS, CONNECTION DETAILS, ETC. NECESSARY FOR THE COMPLETE DESIGN, FABRICATION, AND ERECTION OF THE ROOF FRAMING SYSTEM. THE CONTRACTOR SHALL COORDINATE THE DESIGN WITH THE ARCHITECTURAL PLANS, ELEVATIONS, AND DETAILS.

LG-2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXTERIOR STUD WALL FRAMING TO INCLUDE ALL ELEVATIONS, QUANTITIES, DIMENSIONS, CONNECTION DETAILS, ETC. NECESSARY FOR THE COMPLETE DESIGN, FABRICATION, AND ERECTION OF THE EXTERIOR STUD WALL FRAMING. THE CONTRACTOR SHALL COORDINATE THE DESIGN WITH THE ARCHITECTURAL PLANS, ELEVATIONS, AND DETAILS.

LG-3. COLD-FORMED TRUSSES AND EXTERIOR STUD WALLS SHALL BE DESIGNED IN ACCORDANCE WITH THE AMERICAN IRON AND STEEL INSTITUTE (AISI) SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS.

LG-4. ALL CALCULATIONS AND DRAWINGS USED IN THE DESIGN OF COLD-FORMED TRUSSES AND EXTERIOR STUD WALLS MUST BE SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER AND SUBMITTED FOR APPROVAL. IN ADDITION TO THE CALCULATIONS, THE SUBMITTAL SHALL INCLUDE DETAILS OF THE LAYOUT, ERECTION PLAN, BOTH TEMPORARY AND PERMANENT BRACING, BRIDGING, OUTRIGGERS, CONNECTIONS INCLUDING DIAPHRAGM FORCES, HEADERS, SILLS, AND JAMBS.

LG-5. THE CONTRACTOR SHALL SUBMIT COMPLETE PRODUCT CATALOGS FROM THE MATERIAL MANUFACTURER FOR REVIEW PRIOR TO FABRICATION. THE CATALOGS SHALL INDICATE QUALIFICATION, MATERIAL SPECIFICATIONS, DESIGN REFERENCES, ETC.

LG-6. ALL COLD-FORMED STEEL MEMBERS, THEIR COMPONENTS, AND CONNECTION MATERIAL SHALL BE GALVANIZED. PREPARE AND REPAIR DAMAGED GALVANIZED COATINGS ON FABRICATED AND INSTALLED LIGHT GAUGE METAL FRAMING WITH GALVANIZING REPAIR PAINT ACCORDING TO ASTM A780 AND/OR THE MANUFACTURER'S RECOMMENDATIONS.

LG-7. COLD-FORMED STEEL MEMBERS SHALL BE Fy=33KSI FOR MEMBERS 43 MILS (18 GA) AND LIGHTER AND Fy=50KSI FOR MEMBERS 54 MILS (16 GA) AND HEAVIER. USE MIN 6" WIDE STUDS AT EXTERIOR WALLS UNO.

LG-8. ALL WELDING OF COLD-FORMED STEEL SHALL COMPLY WITH AWS D1.1 AND AWS D1.3 FOR WELDING BASE MATERIAL LESS THAN 1/8" THICK.

LG-9. TRUSS LOADING:
TOP CHORD:
DEAD: 8 PSF
ROOF LIVE: 20 PSF
WIND: SEE S-003
BOTTOM CHORD:
DEAD: 8 PSF
LIVE: 10 PSF

LG-9. TRUSS DEFLECTION SHALL BE LIMITED TO:
LIVE LOAD - L/360
SNOW LOAD OR WIND LOAD - L/360
DEAD LOAD + LIVE LOAD - L/240

LG-10. BRIDGING AND BRACING OF TRUSS COMPRESSION MEMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE TRUSS MANUFACTURERS DESIGN AND DIRECTIONS. TRUSSES SHALL BE BRACED SECURELY BOTH DURING ERECTION AND AFTER PERMANENT INSTALLATION BY THE CONTRACTOR. ERECTION BRACING SHALL HOLD TRUSSES STRAIGHT AND PLUMB UNTIL DECKING AND PERMANENT TRUSS BRACING HAVE BEEN INSTALLED. ALL BRACING SHALL BE INSTALLED PRIOR TO THE LOADING OF THE TRUSSES.

LG-12. COLD-FORMED STEEL STUD MEMBERS SHALL BE DESIGNED TO ACCOMMODATE VERTICAL AND HORIZONTAL LOADS DUE TO ARCHITECTURAL VENEER AND FEATURES. COORDINATE DESIGN CRITERIA WITH ARCHITECTURAL DRAWINGS AND DETAILS.

LG-13 COLD-FORMED STEEL STUD MEMBERS SHALL UTILIZE A DEFLECTION TRACK ALLOWING FOR 1" DEFLECTION OF BEAM ABOVE..

STRUCTURAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	JS	JOIST SEAT
APPROX	APPROXIMATELY	KIP (k)	1000 POUNDS
ARCH	ARCHITECTURAL	LG	LONG
BCX	BOTTOM CHORD EXTENSION	LLH	LONG LEG HORIZONTAL
BOC	BOTTOM OF CONCRETE	LLV	LONG LEG VERTICAL
BOF	BOTTOM OF FOOTING	MAX	MAXIMUM
BOS	BOTTOM OF STEEL	MECH	MECHANICAL
BOT	BOTTOM	MEP	MECHANICAL, ELECTRICAL, PLUMBING
BRG	BEARING	MNFR	MANUFACTURER
BTWN	BETWEEN	MIN	MINIMUM
CFS	COLD-FORMED STEEL	NTS	NOT TO SCALE
CJ	CONTRACTION JOINT	OC	ON CENTER
CL	CENTER LINE	OPP	OPPOSITE
CLR	CLEAR	PJF	PREMOLDED JOINT FILLER
COL	COLUMN	PL	PLATE
CONN	CONNECTION	PLF	POUNDS PER LINEAR FOOT
CONC	CONCRETE	PSF	POUNDS PER SQUARE FOOT
CONT	CONTINUOUS	PSI	POUNDS PER SQUARE INCH
CONSTR	CONSTRUCTION	REINF	REINFORCEMENT
DEG	DEGREE	REQD	REQUIRED
DIA	DIAMETER	SCHED	SCHEDULE
DWG(S)	DRAWING(S)	SE	SLAB EDGE
EA	EACH	SJI	STEEL JOIST INSTITUTE
EF	EACH FACE	SIM	SIMILAR
EJ	EXPANSION JOINT	SOG	SLAB ON GRADE
EL	ELEVATION	SPCG	SPACING
EOD	EDGE OF DECK	STD	STANDARD
EOS	EDGE OF SLAB	T&B	TOP AND BOTTOM
ES	EACH SIDE	TO	TOP OF
EQ	EQUAL	TOC	TOP OF CONCRETE
EW	EACH WAY	TOF	TOP OF FOOTING
FF	FINISHED FLOOR	TOS	TOP OF SLAB
FTG	FOOTING	TR	TENSION REINFORCEMENT
GA	GAGE	TYP	TYPICAL
GALV	GALVANIZED	UNO	UNLESS NOTED OTHERWISE
HGT	HEIGHT	VERT	VERTICAL
HORIZ	HORIZONTAL	WP	WORKING POINT
IS	ISOLATION JOINT	WWF	WELDED WIRE FABRIC

STRUCTURAL LEGEND

DN → SLOPE DIRECTION

[+/- X'-X"] INDICATES ELEVATION REFERENCED TO FINISHED FLOOR

X KEYED PLAN NOTE

X COLUMN REFERENCE LINE (CENTER LINE OF COLUMN)

[+/- X'-X"] SPOT ELEVATION

SLAB DEPRESSION

BRICK WALL

CONCRETE ELEMENT

EARTH FILL

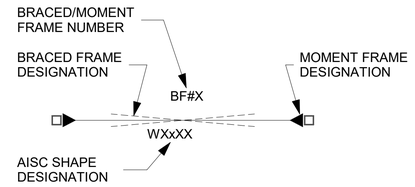
GROUT

CONCRETE MASONRY UNIT (CMU)

POROUS FILL

WELDED WIRE FABRIC (WWF)

STRUCTURAL FRAMING REFERENCE



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DRAWN BY: A. SCOTT
CHECKED BY: J. WHITTAKER
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W91PHN-24-B-3002
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING GENERAL
STRUCTURAL NOTES

SHEET ID
BLDG 3
S-002

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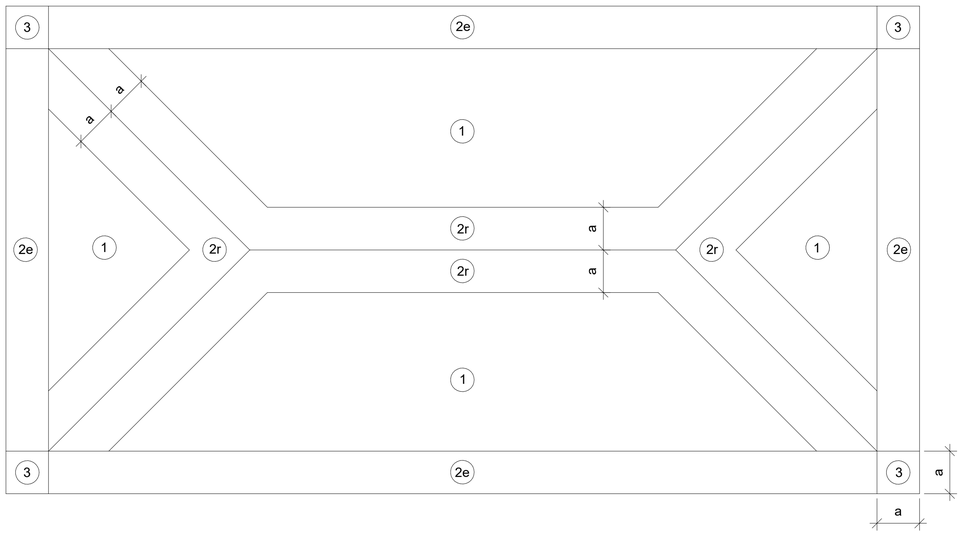
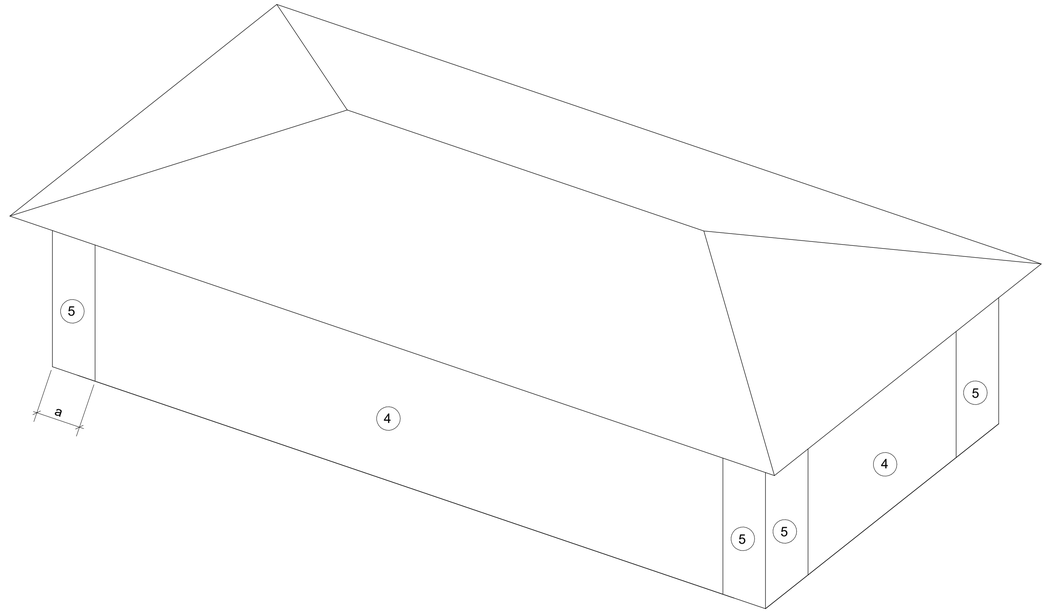


ROOF ZONES



WALL ZONES

COMPONENT AND CLADDING WIND PRESSURES									
EFFECTIVE WIND AREA	ROOF ZONES			OVERHANG ZONES				WALLS ZONES	
	1	2R	2E, 3	1	2E	2R	3	4	5
10 SF	+23 / -39	+23 / -68	+23 / -52	-52	-65	-81	-81	+31 / -34	+31 / -42
20 SF	+20 / -39	+20 / -61	+20 / -48	-52	-64	-77	-73	+30 / -33	+30 / -39
50 SF	+16 / -35	+16 / -53	+16 / -42	-55	-63	-73	-63	+28 / -31	+28 / -35
100 SF	+16 / -31	+16 / -46	+16 / -38	-58	-61	-69	-55	+27 / -29	+27 / -33
200 SF	+16 / -31	+16 / -39	+16 / -34	-58	-60	-65	-47	+25 / -28	+25 / -30
500 SF	+16 / -31	+16 / -39	+16 / -34	-58	-60	-65	-47	+23 / -26	+23 / -26

1. GROSS WIND PRESSURES SHOWN ABOVE ARE PREDICATED ON ULTIMATE WIND SPEED.
2. EDGE ZONES: 'a' = 3'-0"
3. WIND PRESSURES SHOWN SHALL BE USED IN CONJUNCTION WITH LRFD LOAD COMBINATIONS SPECIFIED IN SECTIONS 2.3 AND 2.4 OF ASCE 7-16.
4. POSITIVE WIND PRESSURES REPRESENT WIND PRESSURES ACTING TOWARDS THE COMPONENT AND CLADDING SURFACES.
5. NEGATIVE WIND PRESSURES REPRESENT WIND PRESSURES ACTING AWAY FROM THE COMPONENT AND CLADDING SURFACES.

1 COMPONENT AND CLADDING WIND PRESSURES
NOT TO SCALE

US Army Corps of Engineers ®

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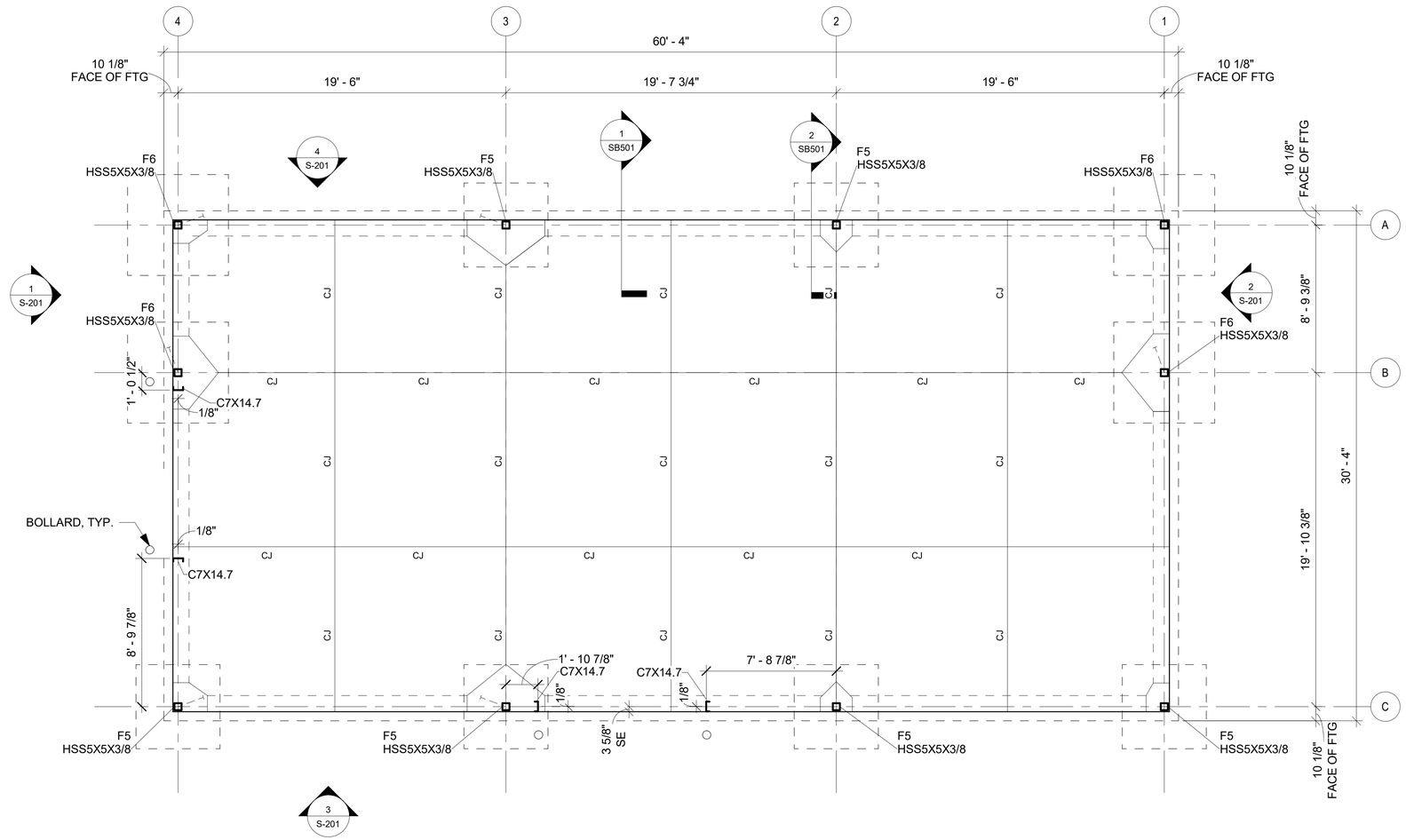


1 FOUNDATION PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

FOUNDATION AND SLAB PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. TOP OF CONCRETE SLAB-ON-GRADE ELEVATION = 0'-0". ALL ELEVATIONS INDICATED FROM THIS DATUM. SEE CIVIL DRAWINGS FOR EXACT ELEVATION.
3. TOP OF FTG = (-) 1'-6" UNO.
4. ALL FOOTINGS SHALL BE CENTERED UNDER COLUMNS.
5. SLAB-ON-GRADE SHALL CONSIST OF 5" THICK CONCRETE REINFORCED WITH 6X6 W2.9XW2.9 WWF LOCATED AT 1/3-DEPTH FROM TOP OF SLAB.
6. PROVIDE (1) #4 X 4'-0" LONG AT TOP AND BOTTOM IN SLAB-ON-GRADE AT ALL RE-ENTRANT CORNERS AND WHERE A CONTROL JOINT TERMINATES AT A JOINT.
7. SLAB-ON-GRADE SHALL BEAR ON 10 MIL VAPOR RETARDER ON CAPILLARY WATER BARRIER ON PROPERLY PREPARED SUBGRADE OR COMPACTED FILL.
8. CONTROL JOINT LOCATIONS ARE DIAGRAMMATIC ONLY AND DO NOT REPRESENT ALL JOINTS REQUIRED FOR SLAB CONSTRUCTION. CONTRACTOR SHALL COORDINATE SLAB-ON-GRADE REQUIREMENTS WITH SLAB-ON-GRADE CONSTRUCTION SEQUENCING AND SLAB DETAILS. SPACING SHALL NOT EXCEED MAXIMUM JOINT SPACING PER ACI REQUIREMENTS.
9. COORDINATE UNDERGROUND UTILITY LINES WITH CIVIL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION DRAWINGS PRIOR TO CONSTRUCTION OF FOOTINGS AND SLABS-ON-GRADE.
10. WITHIN THE AREA OF THE BUILDING FOOTINGS, THE SOILS SHALL BE TESTED FOR IN-SITU ALLOWABLE BEARING PRESSURE BY METHOD OF HAND AUGER AND DYNAMIC CONE PENETROMETER METHOD, IN ACCORDANCE WITH ASTM SPECIAL TECHNICAL PUBLICATION #399. SOILS WHICH ARE IDENTIFIED TO HAVE A NET ALLOWABLE BEARING PRESSURE BELOW 3,000 PSF, OR WHICH ARE DEEMED TO BE UNSATISFACTORY FOR OTHER REASONS (E.G., EXCESSIVE DEBRIS OR ORGANIC CONTENT), SHALL BE OVER-EXCAVATED AND REPLACED WITH ADDITIONAL CONCRETE DURING THE CONCRETING OR REPLACED TO DESIGN SUBGRADE WITH NO. 57 OR NO. 67 STONE, COMPACTED TO A NON-YIELDING CONDITION. OVER-EXCAVATION SHALL BE PERFORMED IN ACCORDANCE WITH EM 385-1-1 AND OSHA 29 CFR 1926.652. BACKFILLING SHALL BE IN ACCORDANCE WITH SECTION 31 00 00, EARTHWORK. IT IS POSSIBLE THAT PERCHED GROUNDWATER WILL BE ENCOUNTERED DURING OVER-EXCAVATION. DEWATERING SHOULD BE DONE INACCORDANCE WITH SPECIFICATIONS.
11. DIMENSIONS PERPENDICULAR TO CHANNEL WEBS ARE TO BACK FACE OF CHANNEL. DIMENSIONS PARALLEL TO CHANNEL WEBS ARE TO WEB CENTERLINE.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
DRAWN BY: A. SCOTT	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: J. WHITTAKER	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

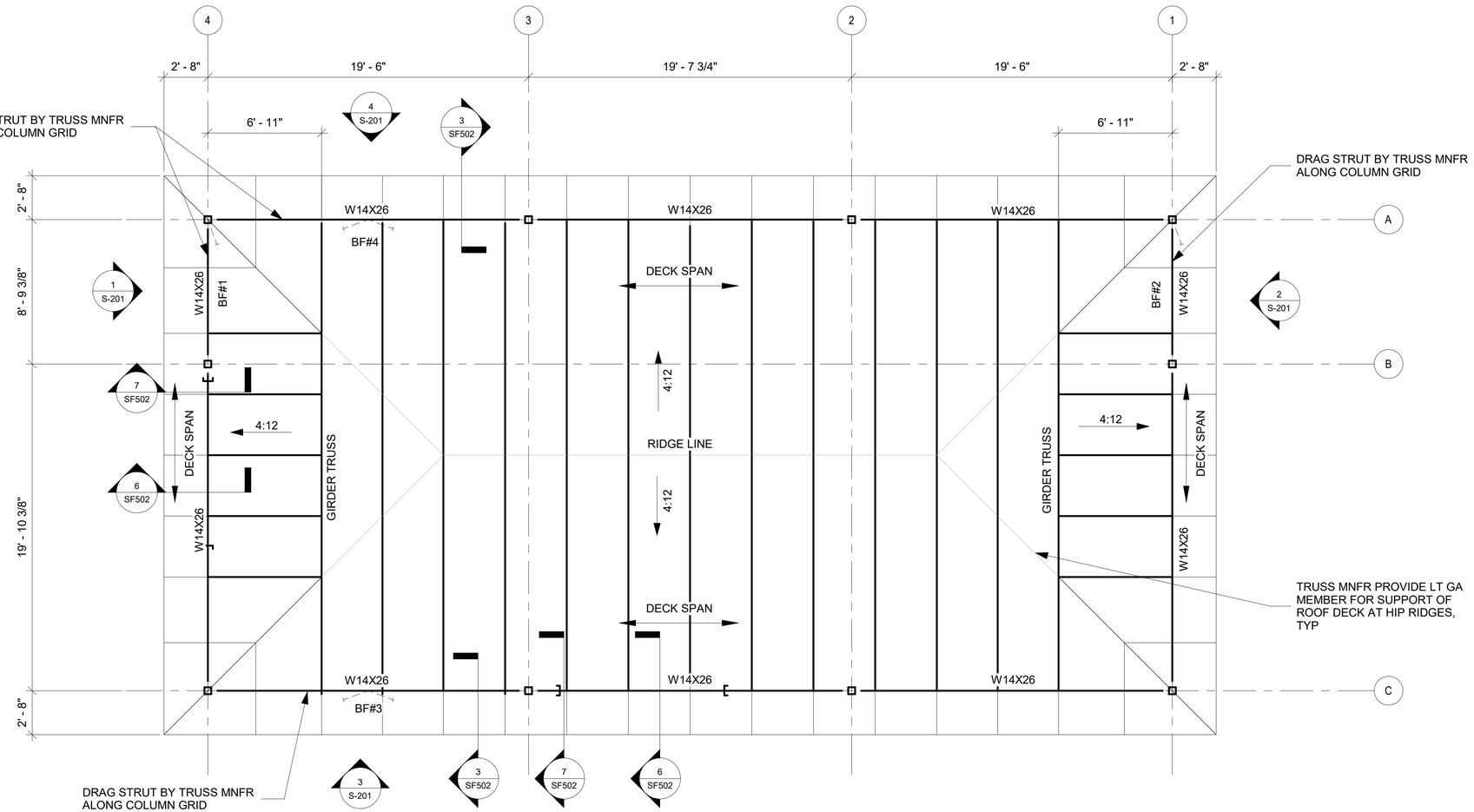
OPERATIONS/STORAGE BUILDING FOUNDATION PLAN

SHEET ID
BLDG 3
S-101

File Path: C:\Users\k6endhrh\Documents\FY23_PN96182_MPTR-STORAGE_STRUCT_R21_k6endhrh.rvt

Plot Date: 12/5/2023 2:45:23 PM

READY TO ADVERTISE (RTA)



1 ROOF FRAMING PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

FRAMING PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. TOP OF STEEL FOR TRUSS BEARING SHALL BE (+) 12'-0" UNO.
3. ROOF DECK SHALL BE 1.5B22 GAUGE METAL DECK WITH A 36/4 FASTENING PATTERN WITH 4 SIDELAPS. SUPPORT FASTENERS ARE TO BE #12 TEK SCREWS AND SIDELAP FASTENERS ARE TO BE #12 TEK SCREWS.
4. COLD FORMED STEEL TRUSS SPACING SHALL NOT EXCEED 4'-0" OC UNO.
5. ◄——— DENOTES ROOF SLOPE. SEE ARCHITECTURAL.
6. TRUSSES SHALL BE DESIGNED BY THE TRUSS MNFR TO TRANSFER 320 LBS (ULTIMATE) HORIZONTAL SHEAR FROM THE BEAMS DUE TO WIND LOAD ON WALL. CONNECTION TO BEAMS SHALL BE BY THE TRUSS MNFR.
7. DRAG STRUTS ALONG ALL ROOF EAVES SHALL BE DESIGNED AND PROVIDED BY THE TRUSS MNFR TO TRANSFER 250 PLF HORIZONTAL SHEAR TO BEAMS. CONNECTION TO BEAMS SHALL BE BY TRUSS MNFR.
8. PROVIDE CONT 4X4X5/16" BENT PLATE AT ALL RIDGES.
9. AT THE EDGE OF ROOF DECK PROVIDE CONT. BENT PLATE CLOSURE AS DETAILED ON 1/SF502.
10. COORDINATE ALL ROOF DIMENSIONS, ELEVATIONS, OPENINGS AND PENETRATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS. SEE ARCHITECTURAL FOR ROOF PENETRATION WATERPROOFING DETAILS.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
DRAWN BY: A. SCOTT	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: J. WHITTAKER	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING ROOF FRAMING PLAN

SHEET ID
BLDG 3
S-102

File Path: C:\Users\k6endhrh\Documents\FY23_PN96182_MPTR-STORAGE_STRUCT_R21_k6endhrh.rvt

Plot Date: 12/5/2023 2:45:23 PM

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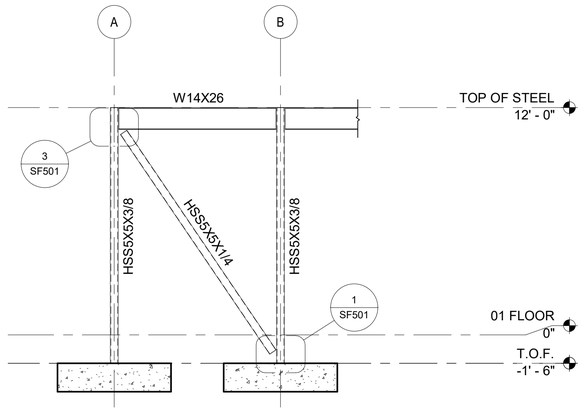
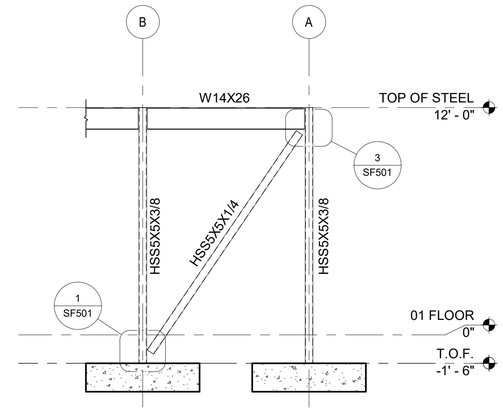


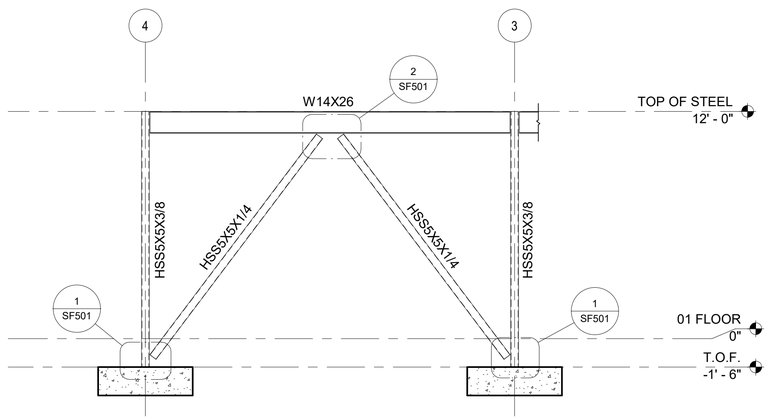
1 BRACED FRAME 1

1/4" = 1'-0"



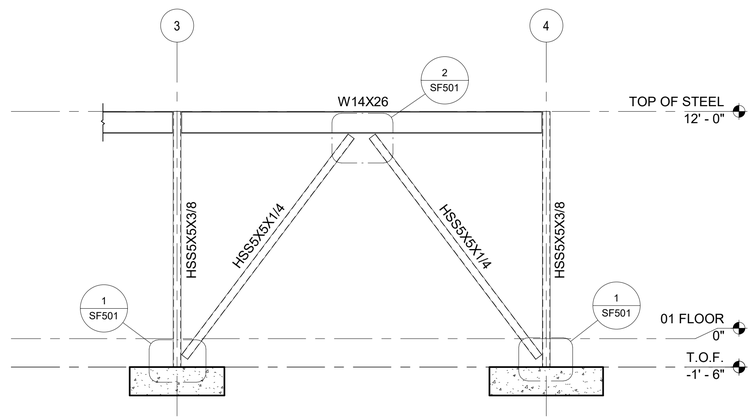
2 BRACED FRAME 2

1/4" = 1'-0"



3 BRACED FRAME 3

1/4" = 1'-0"



4 BRACED FRAME 4

1/4" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
A. SCOTT	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
A. SCOTT	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
J. WHITTAKER	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
SIZE:	FILE NAME:
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

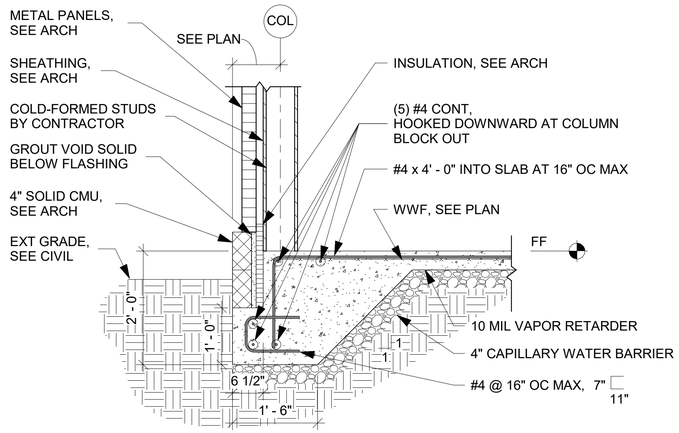
OPERATIONS/STORAGE BUILDING BRACED FRAME ELEVATIONS

SHEET ID
BLDG 3
S-201

READY TO ADVERTISE (RTA)

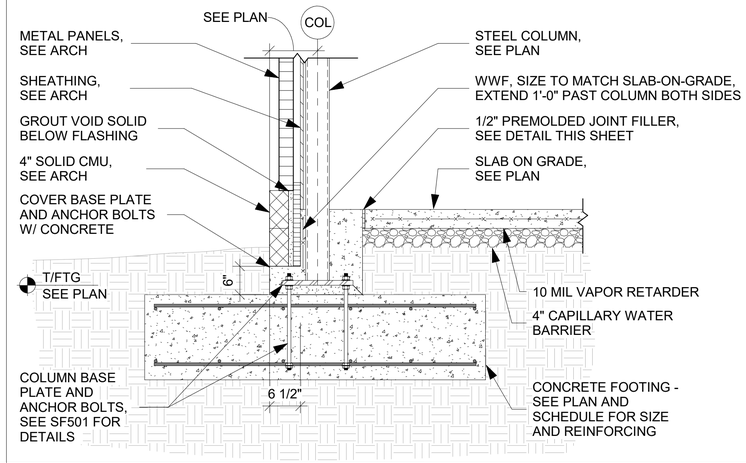
Plot Date: 12/5/2023 2:45:23 PM

File Path: C:\Users\kbendhn\Documents\FY23_PN96182_MPTR-STORAGE_STRUCT_R21_kbendhn.rvt



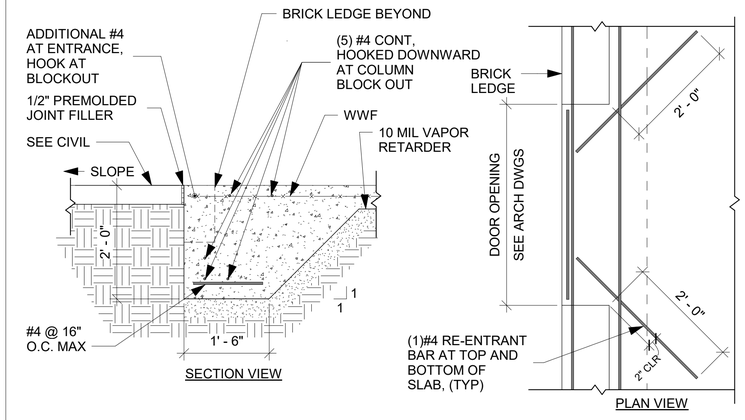
1 TYPICAL SLAB EDGE DETAIL

3/4" = 1'-0"



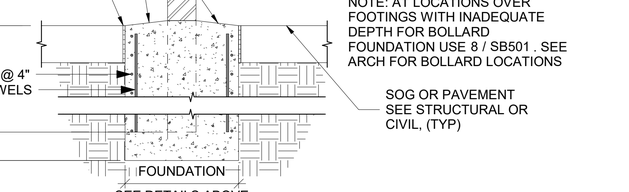
2 TYPICAL EXTERIOR COLUMN FOOTING

3/4" = 1'-0"

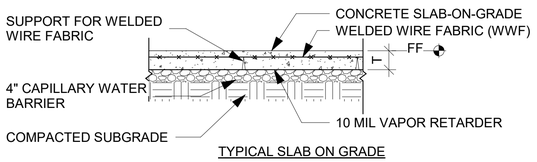


3 TYPICAL THICKENED SLAB EDGE AT ENTRANCE

3/4" = 1'-0"



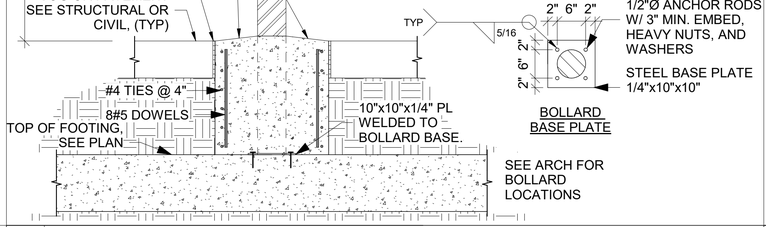
TYPICAL SAWED CONTRACTION JOINT DETAIL (CJ)



TYPICAL SLAB ON GRADE

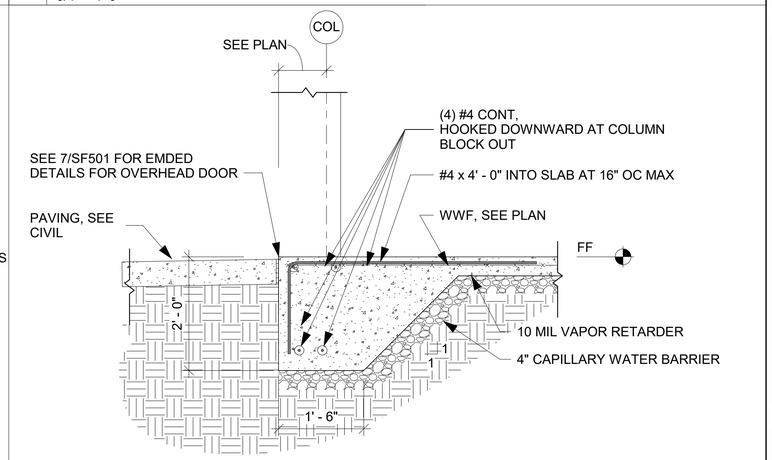
4 TYPICAL SLAB ON GRADE DETAILS

1/2" = 1'-0"



5 TYPICAL EXTERIOR COLUMN PLAN VIEW

3/4" = 1'-0"



6 TYPICAL SOG SHEAR KEY CONSTR JOINT DETAIL

3/4" = 1'-0"

7 TYPICAL BOLLARD FOUNDATION DETAIL

3/4" = 1'-0"

8 TYPICAL BOLLARD @ COLUMN FOOTINGS

3/4" = 1'-0"

9 TYPICAL SLAB EDGE DETAIL AT OVERHEAD DOORS

3/4" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	A. SCOTT
DRAWN BY:	A. SCOTT
CHECKED BY:	J. WHITTAKER
SUBMITTED BY:	J. DEACON
SIZE:	ANSI D
ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	
CATEGORY CODE:	178-65-01
FILE NAME:	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING FOUNDATION AND SLAB DETAILS

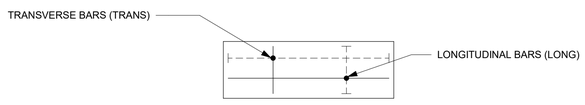
SHEET ID
BLDG 3
SB501

READY TO ADVERTISE (RTA)

File Path: C:\Users\kbendhn\Documents\FY23_PN86182_MPTR-STORAGE_STRUCT_R21_kbendhn.rvt

Plot Date: 12/5/2023 2:45:24 PM

COLUMN FOOTING SCHEDULE					
MARK	DIMENSIONS			REINFORCING	
	WIDTH	LENGTH	DEPTH	BOTTOM, HOOKED @ ENDS	TOP, HOOKED @ ENDS
F5	5' - 0"	5' - 0"	1' - 6"	(10) #4 EW	(10) #4 EW
F6	6' - 0"	6' - 0"	1' - 6"	(8) #5 EW	(8) #5 EW



FOOTING REINFORCEMENT DIAGRAM

CONCRETE REINFORCING BAR DEVELOPMENT AND SPLICE LENGTH SCHEDULE (F'c = 4000 PSI)					
BAR SIZE	OTHER BARS		TOP/HORIZ BARS		HOOKED BARS
	Ld	SPLICE	Ld	SPLICE	Ldh
#3	15	19	19	25	6
#4	19	25	25	33	7
#5	24	31	31	41	9
#6	29	37	37	49	10
#7	42	54	54	71	12
#8	47	62	62	81	14
#9	54	70	70	91	15

NOTES:
1. LENGTHS SHOWN IN THIS SCHEDULE SHALL BE USED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
2. LENGTHS SHOWN IN THIS SCHEDULE ARE BASED ON CLASS B TENSION LAP SLICES FOR NORMAL WEIGHT CONCRETE STRENGTH AND GRADE 60 (Fy = 60,000 PSI) REINFORCING STEEL WITH CONCRETE COVER AND SPACING AS DEFINED IN CONCRETE SECTION OF GENERAL NOTES ON SHEET S-001 AND ACI 318-14, SECTION 25.
3. Ld = TENSION DEVELOPMENT/EMBEDMENT LENGTH FOR STRAIGHT BARS.
4. Ldh = TENSION DEVELOPMENT/EMBEDMENT LENGTH FOR HOOKED BARS.
5. LAP SPLICES SHALL BE WIRED IN CONTACT.
6. TOP BARS ARE HORIZONTAL BARS IN BEAMS, FOOTINGS, SLABS, AND WALLS WHERE MORE THAN 12" OF FRESH CONCRETE IS CAST BELOW THE BAR.
7. ALL TABULATED VALUES ARE IN INCHES.
8. MULTIPLY VALUES BY 1.3 FOR LIGHTWEIGHT CONCRETE

1 CONCRETE FOOTING / WALL SCHEDULES STORAGE
NOT TO SCALE

2 REBAR SPLICE LENGTH SCHEDULES
NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
DRAWN BY: A. SCOTT	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: J. WHITTAKER	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING FOUNDATION SCHEDULES

SHEET ID
BLDG 3
SB601

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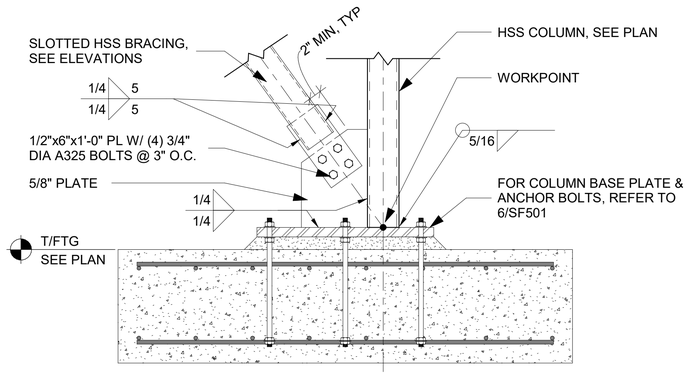
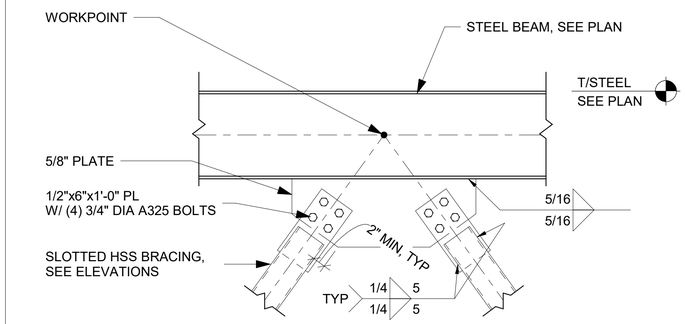


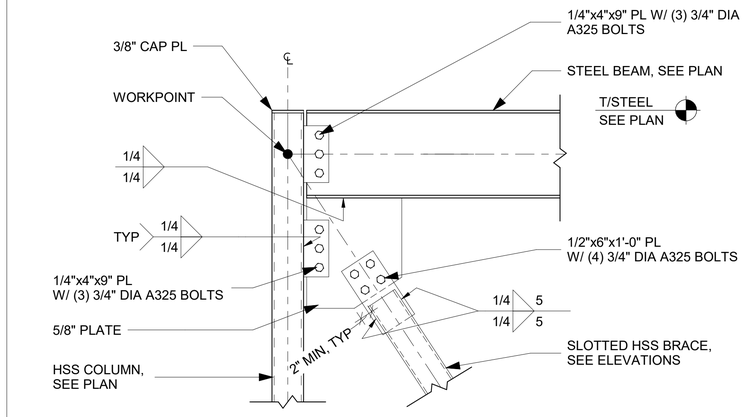
1 HSS BRACE AT BASE OF HSS COLUMN

1" = 1'-0"



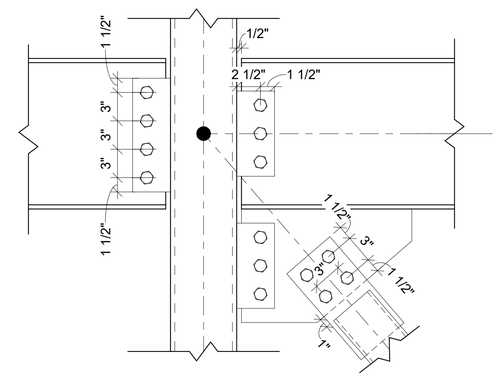
2 HSS BRACE AT MID-SPAN

1" = 1'-0"



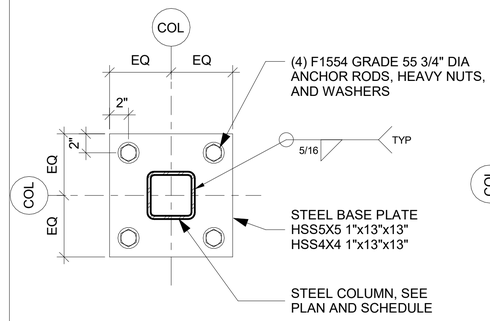
3 HSS BRACE AT HSS COLUMN

1" = 1'-0"

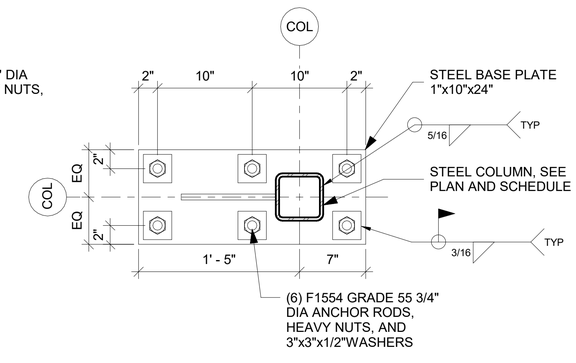


4 TYPICAL CONNECTION DIMENSIONING

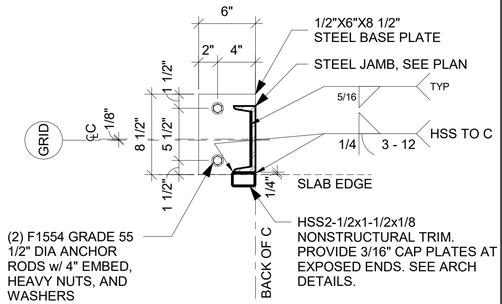
1 1/2" = 1'-0"



UNBRACED HSS COLUMN BASE PLATE



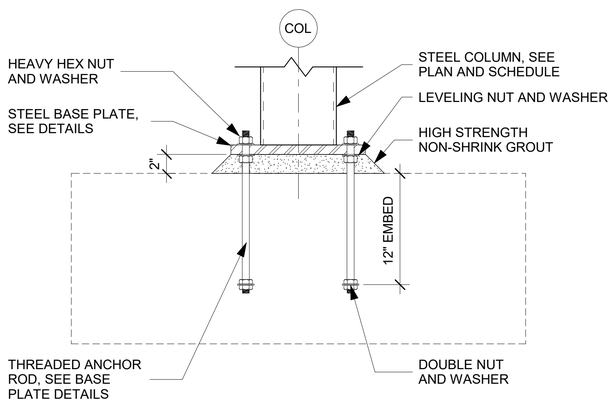
BRACED COLUMN BASE PLATE



CHANNEL JAMB BASE PLATE AT OVERHEAD DOOR

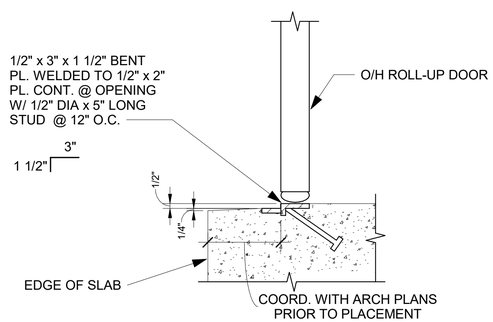
5 BASE PLATE DETAILS

1 1/2" = 1'-0"



6 ANCHOR ROD DETAIL

1 1/2" = 1'-0"



7 TYPICAL DETAIL AT OVERHEAD DOOR

1 1/2" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
A. SCOTT	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
A. SCOTT	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
J. WHITTAKER	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
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ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING FRAMING DETAILS

SHEET ID
BLDG 3
SF501

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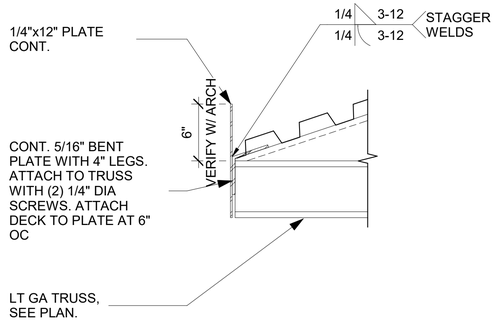
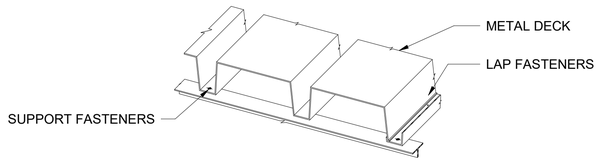


1 TYPICAL EAVE PLATE DETAIL

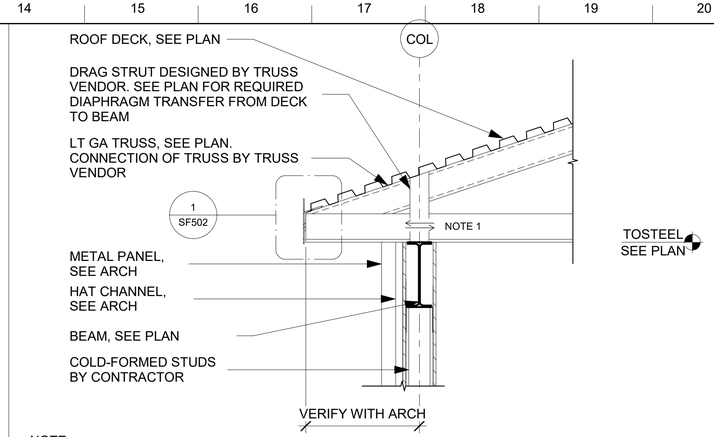
1 1/2" = 1'-0"

MINIMUM PROPERTIES OF METAL DECK	
METAL DECK	(ROOF DECK) 1.5 TYPE B
GAGE	22
MOMENT OF INERTIA OF STEEL SECTION, Ip (IN4)	0.155
SECTION MODULUS OF STEEL SECTION POSITIVE BENDING, Sp (IN3)	0.186
MOMENT OF INERTIA OF STEEL SECTION, In (IN4)	0.183
SECTION MODULUS OF STEEL SECTION POSITIVE BENDING, Sn (IN3)	0.192



2 TYPICAL METAL DECK PROPERTIES

NOT TO SCALE

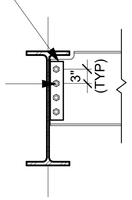


NOTE:
1. DESIGN BOTTOM CHORD OF TRUSS FOR 320 LB WIND (1.0W) TO BE INCLUDED WITH ALL WIND COMBINATIONS.

3 TYPICAL WALL SECTION AT ROOF

3/4" = 1'-0"

DELEGATE ENGINEER SHALL DESIGN WELDS TO DEVELOP 100% OF THE BEAM REACTIONS SHOWN IN THE STEEL BEAM REACTION SCHEDULE



3/4" DIA, A325 BOLTS IN SLOTTED HOLES WITH BEARING TYPE CONNECTIONS AS REQUIRED BY AISC STANDARD CONNECTION DESIGN. DELEGATE ENGINEER SHALL DESIGN THE BOLTS, ANGLES, AND WELDS TO DEVELOP 100% OF THE BEAM REACTIONS SHOWN IN THE STEEL BEAM REACTION SCHEDULE.

PROVIDE A MINIMUM OF (2) BOLTS AT ALL BEAM CONNECTIONS.

NOTE TO STEEL DETAILER: BOLTS SHOWN IN THIS DETAIL ARE FOR ILLUSTRATION PURPOSES ONLY. ACTUAL QUANTITY OF BOLTS TO BE DETERMINED BY CONNECTION DESIGNER.

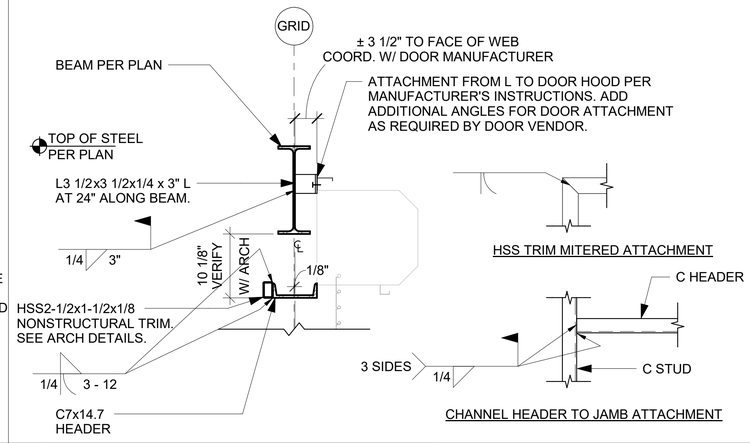
STEEL BEAM CONNECTION SCHEDULE	
BEAM SIZE	FACTORED DESIGN REACTION
W14X26	12 KIPS

STEEL BEAM CONNECTION DESIGN NOTES:

1. SEE GENERAL NOTES SHEET S-001 AND SPECIFICATION SECTION 05 12 00 FOR ADDITIONAL INFORMATION.
2. THE EFFECT OF CAMBER SETTLING SHALL BE CONSIDERED BY STEEL SUPPLIER IN BEAM CONNECTION DESIGN. HORIZONTAL SLOTTED HOLE MAY BE REQUIRED AT ANGLE CONNECTIONS TO ACCOUNT FOR BEAM HORIZONTAL MOVEMENT.
3. SEE FRAMING ELEVATION SHEETS FOR ADDITIONAL INFORMATION AT MOMENT CONNECTIONS.

4 STEEL BEAM CONNECTION SCHEDULE

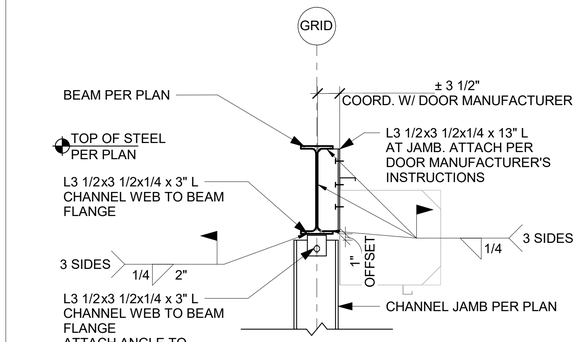
3/4" = 1'-0"



6 OVERHEAD DOOR SECTION

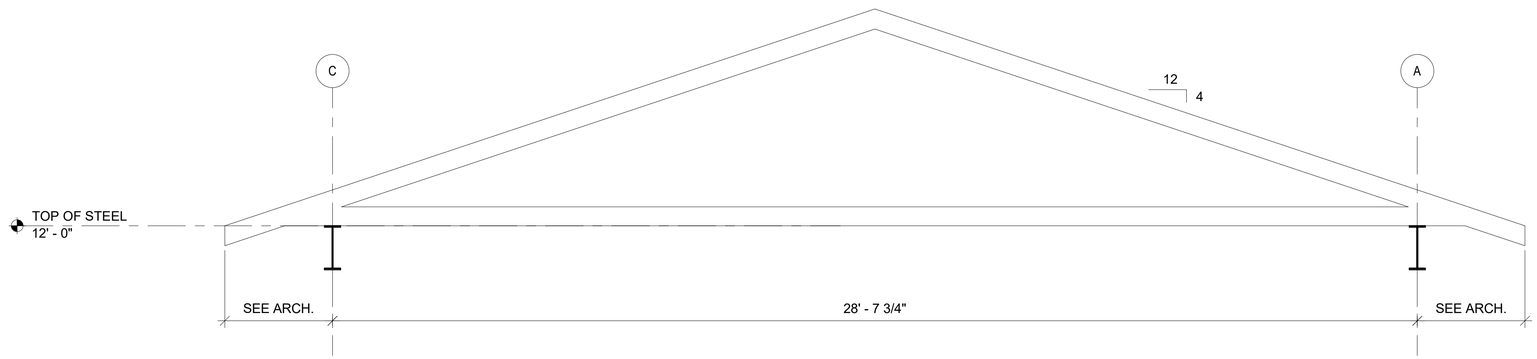
1" = 1'-0"

CHANNEL HEADER TO JAMB ATTACHMENT



7 OVERHEAD DOOR SECTION AT JAMB

1" = 1'-0"



5 TYPICAL TRUSS PROFILE

1/2" = 1'-0"

TRUSS NOTES:

1. FINAL TRUSS AND TRUSS MEMBER DESIGN IS THE RESPONSIBILITY OF THE TRUSS MANUFACTURER.
2. TRUSS MANUFACTURER TO PROVIDE DESIGN AND DETAILS FOR TRUSS TO BEAM CONNECTIONS. CONNECTIONS SHALL BE DESIGNED TO RESIST BEARING AND UPLIFT FORCES CONCURRENT WITH THE HORIZONTAL SHEAR FORCE NOTED.
3. SEE SHEET S-003 FOR COMPONENT AND CLADDING WIND PRESSURES.
4. SEE SHEET S-002 FOR TRUSS LOADS.
5. TRUSS WEB CONFIGURATION NOT SHOWN IN PROFILE FOR CLARITY.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
A. SCOTT	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
A. SCOTT	W91PHN-24-B-3002
CHECKED BY:	CONTRACT NO.:
J. WHITTAKER	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

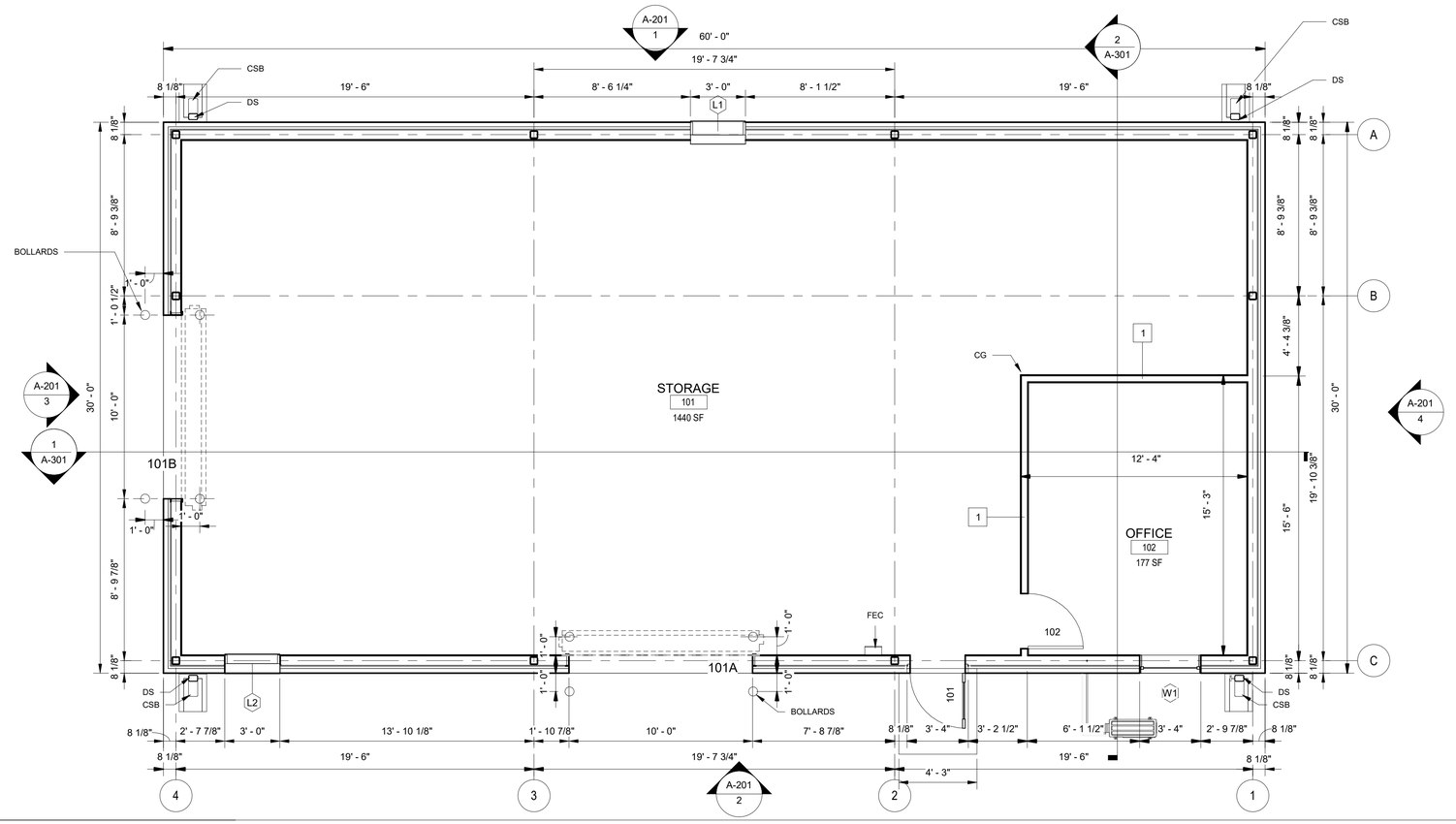
OPERATIONS/STORAGE BUILDING FRAMING DETAILS

SHEET ID
BLDG 3
SF502

READY TO ADVERTISE (RTA)

File Path: C:\Users\k6endhrh\Documents\FY23_PN96182_MPTR-STORAGE_STRUCT_R21_k6endhrh.rvt

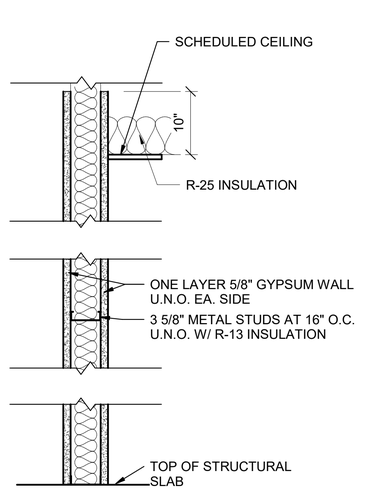
Plot Date: 11/29/2023 9:57:40 AM



1 FLOOR PLAN

1/4" = 1'-0"

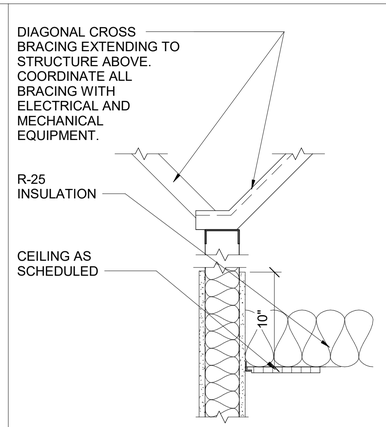
SCALE: 1/4"=1'-0"



PARTITION TYPE 1 - 3 5/8" METAL STUD NON FIRE RATED PARTITION

2 PARTITION TYPE 1

NOT TO SCALE



3 TYP ABOVE WALL TERMN.

NOT TO SCALE

GENERAL SHEET NOTES

1. EXTERIOR DIMENSIONS ARE TO FACE OF INSULATED METAL PANELS, INTERIOR DIMENSIONS ARE TO FACE OF STUD,OR FACE OF GYPSUM WALLBOARD, UNLESS NOTED OTHERWISE.
2. SEE CIVIL DRAWINGS FOR FINISHED FLOOR AND FINISHED GRADE ELEVATIONS. SEE STRUCTURAL DRAWINGS FOR FOUNDATION PLANS AND FLOOR SLABS.
3. SEE MECHANICAL DRAWINGS FOR LOCATION OF ALL MECHANICAL EQUIPMENT. COORDINATE WITH MECHANICAL FOR EXACT LOCATION AND SIZES OF ALL REQUIRED REINFORCED CONCRETE EQUIPMENT PADS, TYPICAL.

FLOOR PLAN NOTES

1. SLOPE ALL EXTERIOR SLABS 1/8" PER FOOT FROM BUILDING FACE TO SLAB EDGE. SLOPE ALL INTERIOR SLABS TO FLOOR DRAINS AS INDICATED. COORDINATE WITH STRUCTURAL.

FLOOR PLAN LEGEND

3	WINDOW TAG
#	WALL TAG
L#	LOUVER TAG
101	DOOR TAG
CG	CORNER GUARD
CSB	CONCRETE SPLASH BLOCK
DS	DOWNSPOUT
FEC	FIRE EXTINGUISHER CABINET

GROSS BUILDING AREA

GROSS BUILDING AREA PER IBC= 1,800SF

GROSS BUILDING AREA PER UFC 3-101-01= 1,800SF

DD1391 AUTHORIZED SF= 1,800SF

NORTH ARROW

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T.O'DELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.O'DELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M.DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

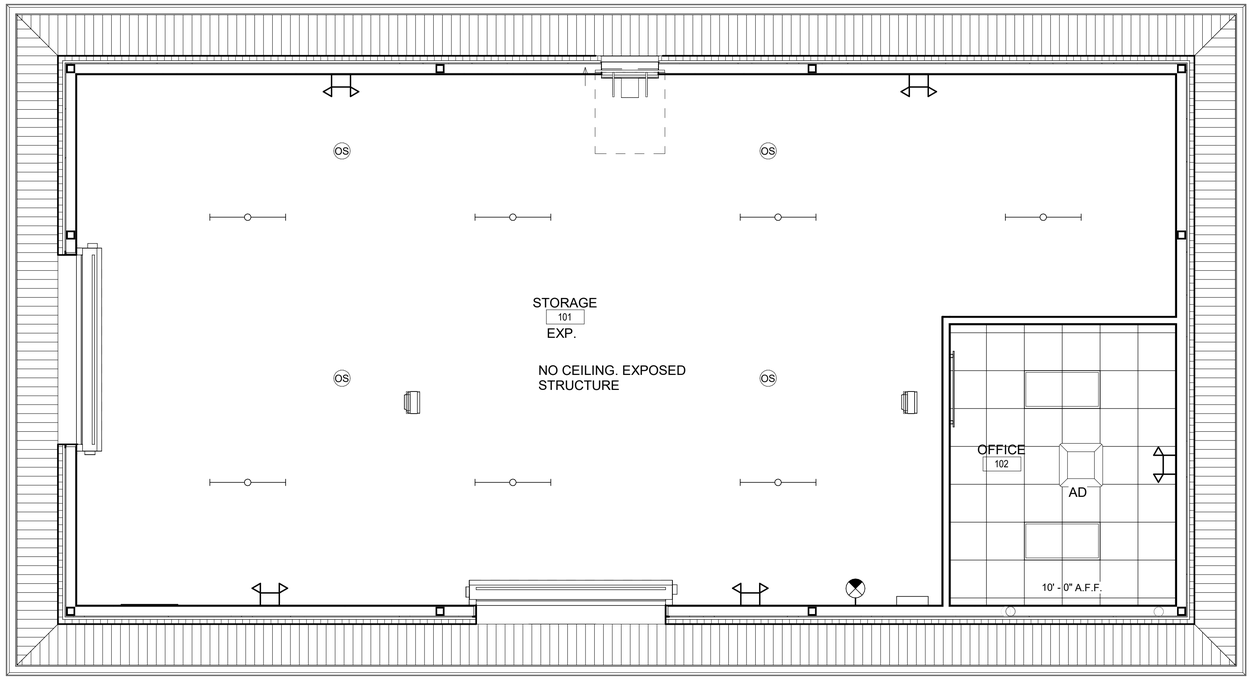
OPERATIONS/STORAGE BUILDING FLOOR PLAN

SHEET ID
BLDG 3
A-101

Plot Date: 11/28/2023 3:20:23 PM

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-STORAGE_ARCH_R21_K6ENXT09.rvt

READY TO ADVERTISE (RTA)



1 REFLECTED CEILING PLAN

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

RCP LEGEND

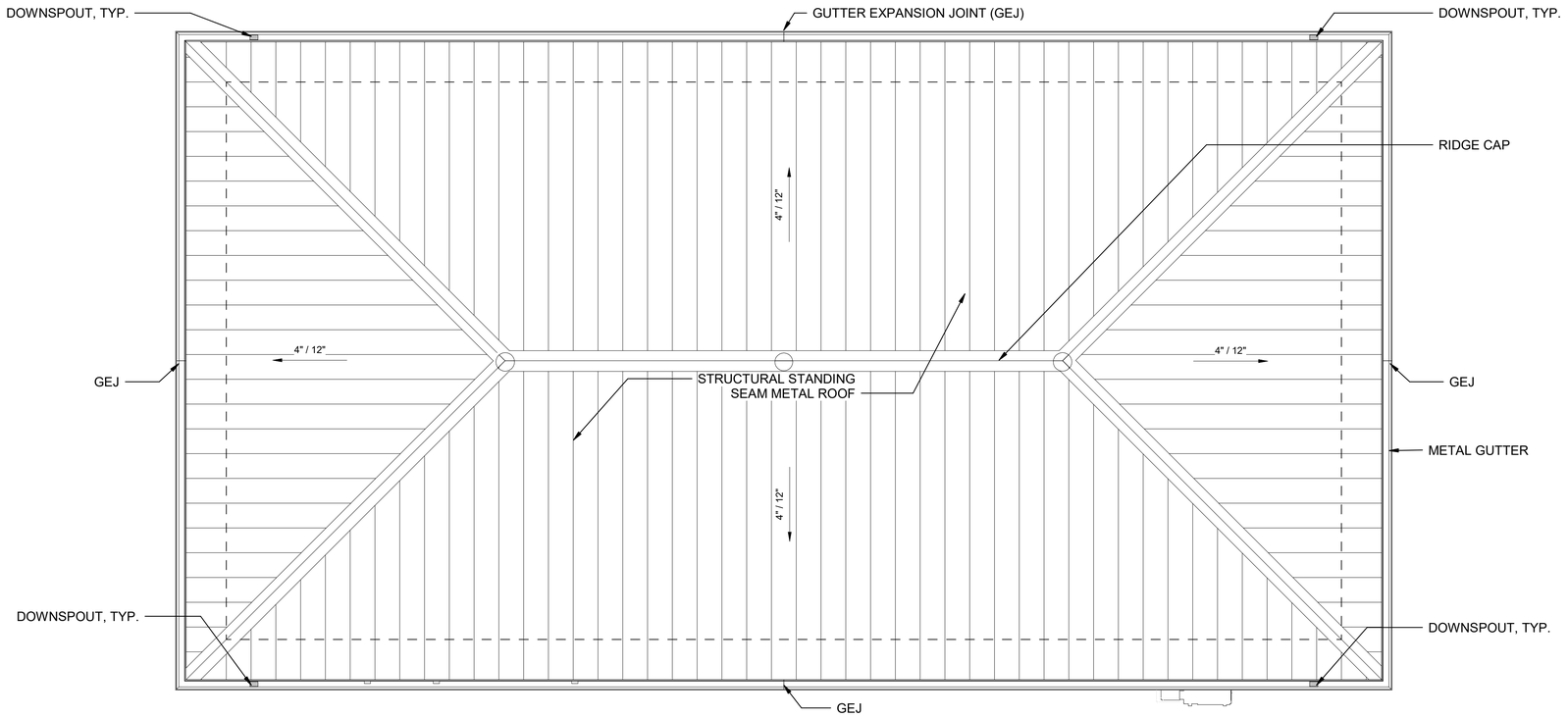
- ACCOUSTICAL CEILING TILE
- SD — SMOKE DETECTOR (REFER TO FA DWGS)
- EXIT SIGN LOCATION (REFER TO FA DWGS)
- 1' X 4' PENDANT
- 2' x 4' DOWNLIGHT
- DIFFUSER
- RETURN
- 1'-0" A.F.F. — CEILING HEIGHT, ABOVE FINISH FLOOR
- Room name 101 — ROOM NUMBER
- EXPOSED STRUCTURE
- PREFINISHED ALUMINUM SOFFIT

GENERAL NOTES

1. EXTERIOR DIMENSIONS ARE FROM FACE OF INSULATED METAL PANELS, INTERIOR DIMENSIONS ARE FROM FACE OF STUD,OR FACE OF GYPSUM WALLBOARD, UNLESS NOTED OTHERWISE.
2. SEE CIVIL DRAWINGS FOR FINISHED FLOOR AND FINISHED GRADE ELEVATIONS. SEE STRUCTURAL DRAWINGS FOR FOUNDATION PLANS AND FLOOR SLABS.
3. SEE MECHANICAL DRAWINGS FOR LOCATION OF ALL MECHANICAL EQUIPMENT. COORDINATE WITH MECHANICAL FOR EXACT LOCATION AND SIZES OF ALL REQUIRED REINFORCED CONCRETE EQUIPMENT PADS, TYPICAL.

REFLECTED CEILING PLAN NOTES

1. CENTER FIXTURES AND ACCESORIES IN CEILING TILES, U.N.O.
2. FIXTURES ARE SHOWN FOR POSITIONING IN FINISHED CEILING. REFERENCE ELECTRICAL, MECHANICAL AND FIRE PROTECTION FOR FIXTURE TYPES.
3. REFERENCE ROOF FINISH SCHEDULE FOR FINISHED CEILING HEIGHTS. CEILING HEIGHTS SHOWN IN THE FINISHED SCHEDULE ARE MINIMUM AND SHALL BE MAINTAINED UNLESS OTHERWISE NOTED.



2 ROOF PLAN

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

ROOF PLAN NOTES

1. ROOF AND WALL PENETRATIONS/FLASHING SHALL CONFORM TO ACCEPTED ROOFING PRACTICES AS DESCRIBED AND DETAILED IN THE CURRENT EDITION OF THE NRCA ROOFING AND WATERPROOFING MANUALS AND THE SMACNA ARCHITECTURAL SHEET METAL MANUAL. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. LOCATE ALL ROOF PENETRATIONS AS REQUIRED TO AVOID CONFLICTS WITH MECHANICAL EQUIPMENT DUCTWORK.
3. COMPLETELY SEAL AROUND PENETRATIONS PER MANUFACTURERS RECOMMENDATIONS TO MAINTAIN AIR BARRIER/WEATHERTIGHT CONDITIONS.
4. ALL ITEMS PROTRUDING FROM THE FACE OF THE ROOF, INCLUDING VTR'S, SHALL BE PAINTED TO MATCH ROOF COLOR UNLESS OTHERWISE NOTED IN SPECIFICATION 09 06 00. ALL EXPOSED FASTNERS SHALL MATCH COLOR OF ADJACENT METAL.
5. SEE MECHANICAL DRAWINGS AND SPECIFICATIONS FOR ACTUAL SIZES OF MECHANICAL ITEMS.
6. ELIMINATION, PREVENTION OR CONTROL OF FALL HAZARDS SHALL COMPLY WITH THE PROVISIONS AND REQUIRMENTS OF ANSI/ASSE Z359 FALL PROTECTION CODE, ANSI/ASSE A1264.1 STANDARD AND DOL 29 CFR PART 1910 SUBPART D.
7. ALL DOWNSPOUTS TO BE 3" X 4" MIN. REFERENCE ROOF PLAN FOR DOWNSPOU LOCATIONS. QUANTITY SHOWN ON ROOF PLAN SHALL BE PROVIDED. DOWNSPOUTS SHOWN IN ELEVATIONS ARE FOR GENERAL WALL PLACEMENT.
8. SECURE DOWNSPOUT WITH PREFINISHED METAL STRAPS AND PREFINISHED METAL FASTENERS, COLOR TO MATCH DOWNSPOUT (2 PER DOWNSPOUT). FASTEN INTO MASONRY WITH EXPANSION ANCHORS.
9. ALL GUTTERS TO BE 5" WIDE BY 5" DEEP. HANG ALL GUTTERS TO A SLOPE OF O.5% TO DOWNSPOUTS.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	
CATEGORY CODE:	178-65-01
FILE NAME:	
DESIGN BY:	T O'DELL
DRAWN BY:	T O'DELL
CHECKED BY:	M DEACON
SUBMITTED BY:	J. DEACON
SIZE: ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING REFLECTED CEILING PLAN & ROOF PLAN

SHEET ID
BLDG 3
A-102

READY TO ADVERTISE (RTA)

File Path: C:\Users\K6ENXTO9\Documents\FY23_PN96182_MPTR-STORAGE_ARCH_R21_K6ENXTO9.rvt

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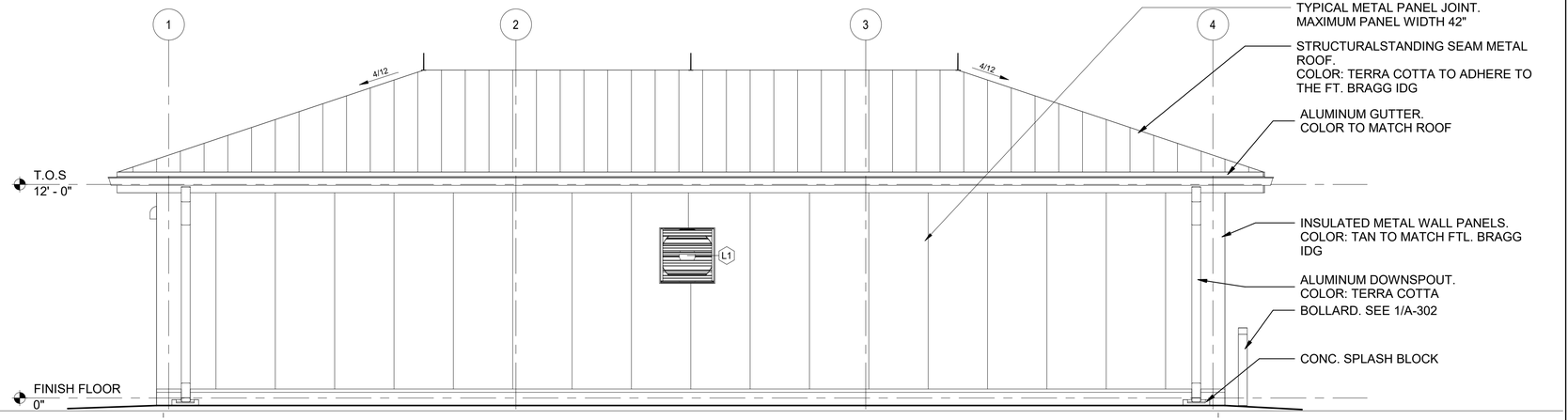


1 SOUTH ELEVATION

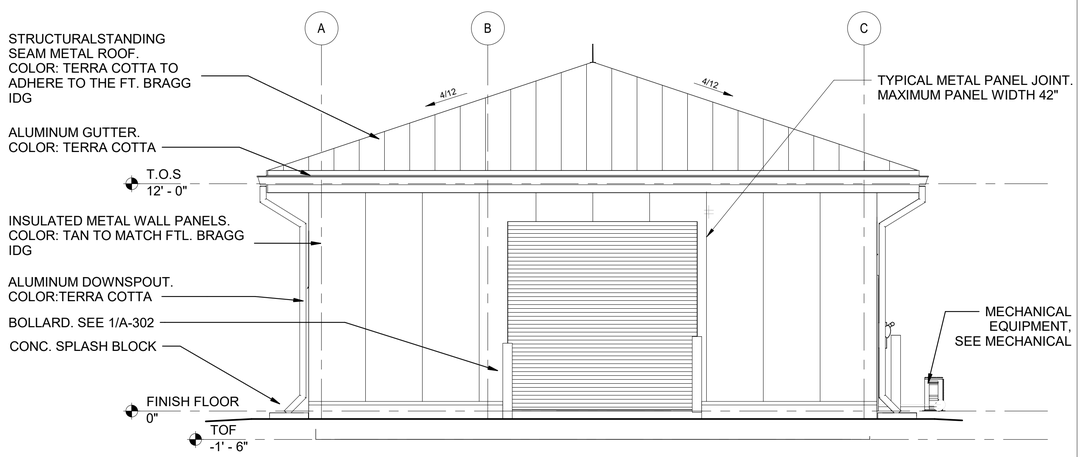
1/4" = 1'-0"

SCALE: 1/4"=1'-0"

2 NORTH ELEVATION

1/4" = 1'-0"

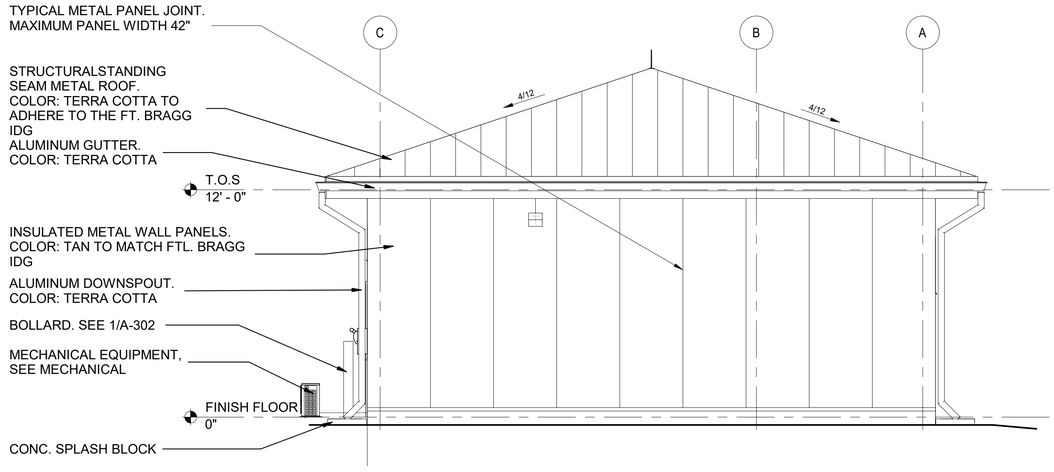
SCALE: 1/4"=1'-0"



3 WEST ELEVATION

1/4" = 1'-0"

SCALE: 1/4"=1'-0"



4 EAST ELEVATION

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	
CATEGORY CODE:	178-65-01
FILE NAME:	

DESIGN BY:	T O'DELL
DRAWN BY:	T O'DELL
CHECKED BY:	M DEACON
SUBMITTED BY:	J. DEACON
SIZE:	ANSI D

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

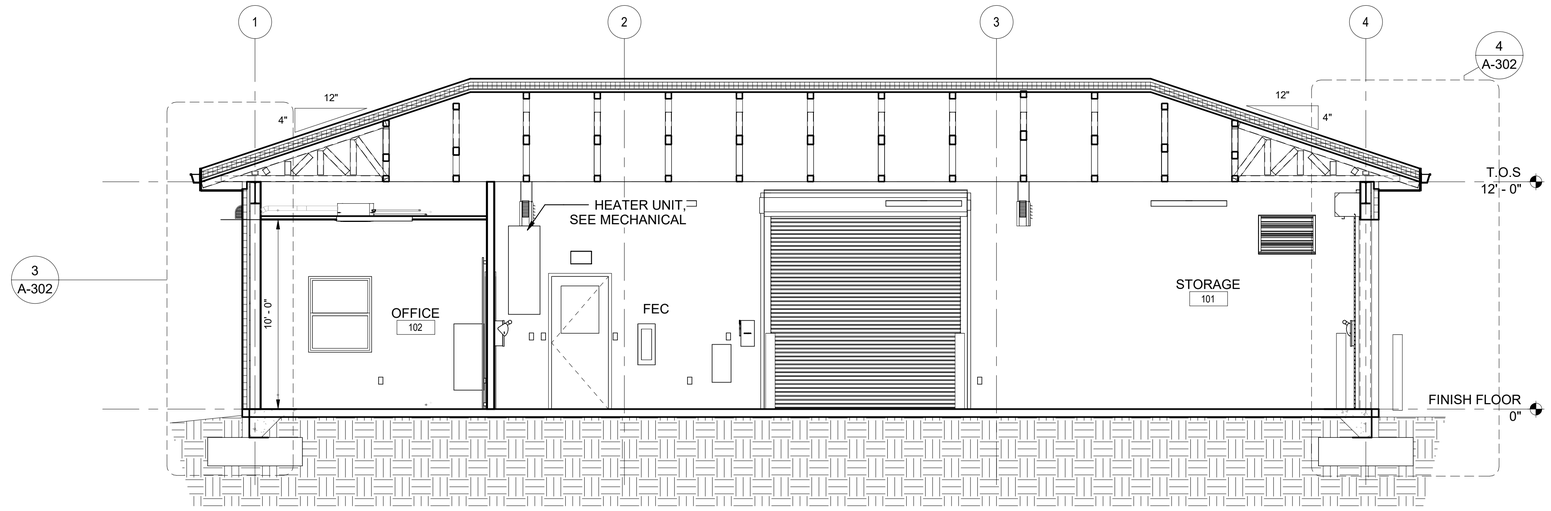
OPERATIONS/STORAGE BUILDING ELEVATIONS

SHEET ID
BLDG 3
A-201

READY TO ADVERTISE (RTA)

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-STORAGE_ARCH_R21_K6ENXT09.rvt

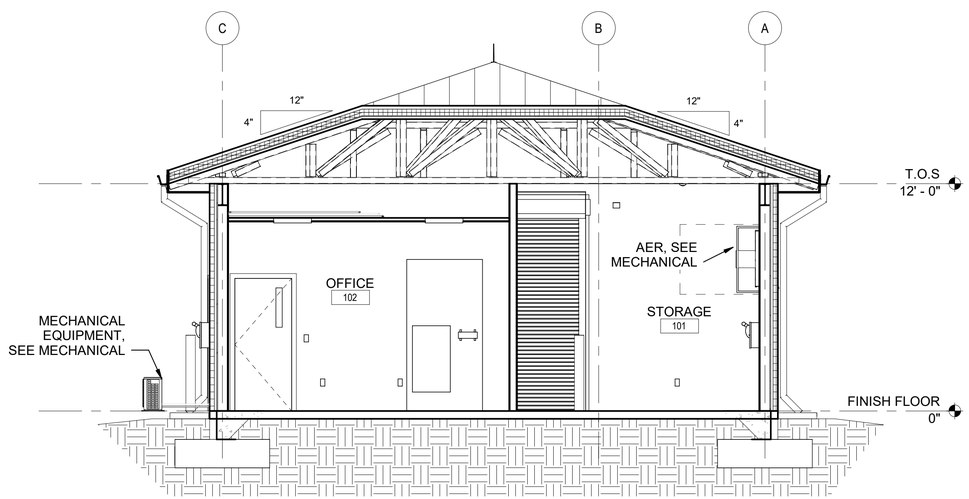
Plot Date: 11/28/2023 3:20:26 PM



1 OPS/STORAGE NORTH-SOUTH BLDG SECTION

1/4" = 1'-0"

SCALE: 1/4"=1'-0"



2 OPS/STORAGE EAST-WEST BLDG SECTION

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T.O'DELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.O'DELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M.DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

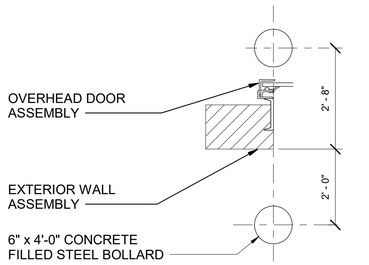
OPERATIONS/STORAGE BUILDING CROSS & LONGITUDINAL SECTION

SHEET ID
BLDG 3
A-301

READY TO ADVERTISE (RTA)

Plot Date: 11/29/2023 3:20:27 PM

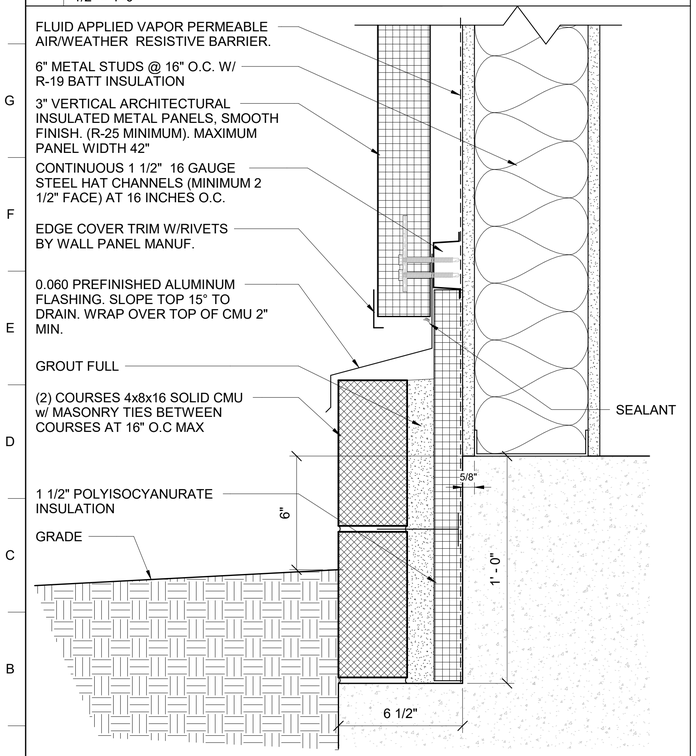
File Path: C:\Users\K6ENXT09\Documents\FY23_PN86182_MPTR-STORAGE_ARCH_R21_K6ENXT09.rvt



AT OVERHEAD DOOR

1 BOLLARD DETAILS

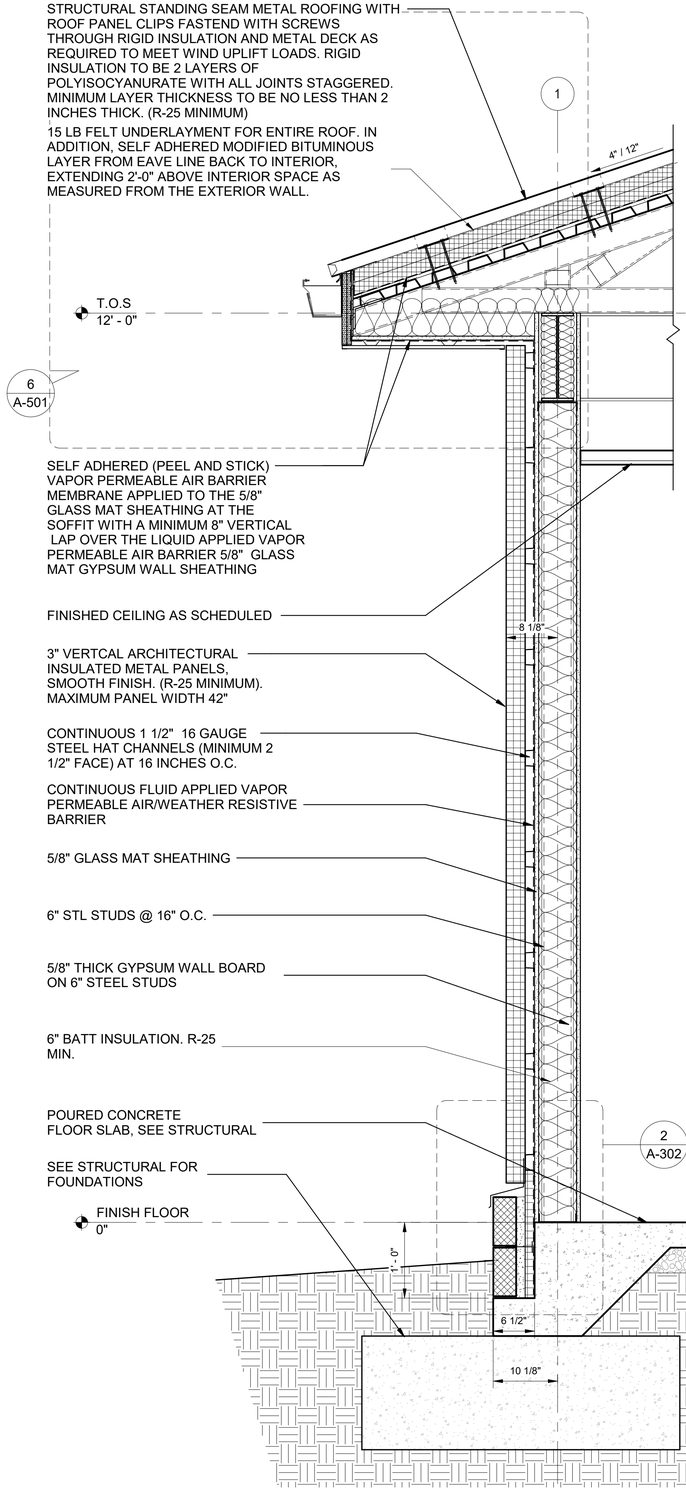
1/2" = 1'-0"



2 EXTERIOR WALL BASE

3" = 1'-0"

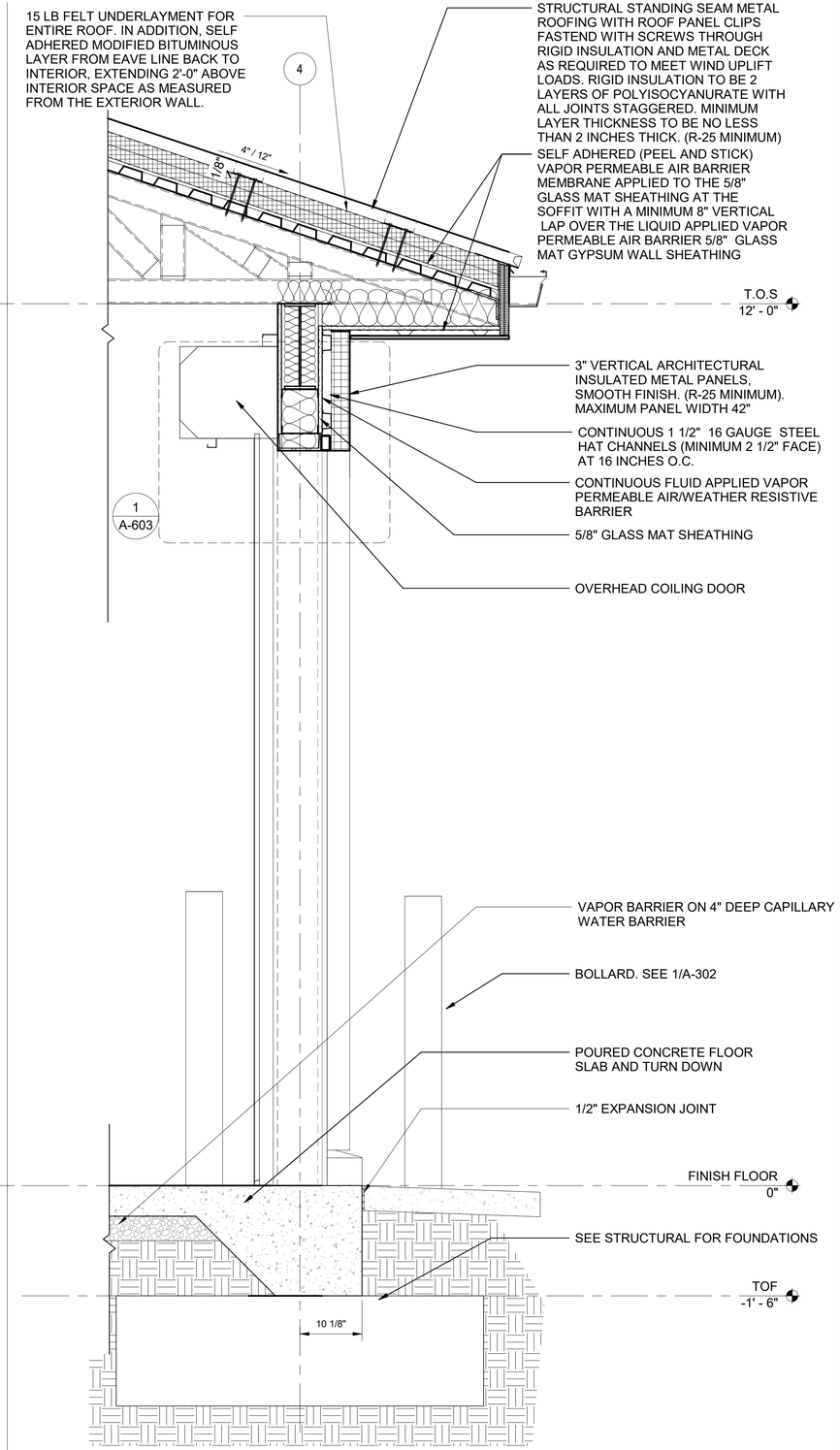
SCALE: 3"=1'-0"



3 OPS/STORAGE WALL SECTION 1

1" = 1'-0"

SCALE: 1"=1'-0"



4 OPS/STORAGE WALL SECTION 2

1" = 1'-0"

SCALE: 1"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	
CATEGORY CODE:	178-85-01
FILE NAME:	

DESIGN BY:	T O'DELL
DRAWN BY:	T O'DELL
CHECKED BY:	M. DEACON
SUBMITTED BY:	J. DEACON
SIZE:	ANSI D

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

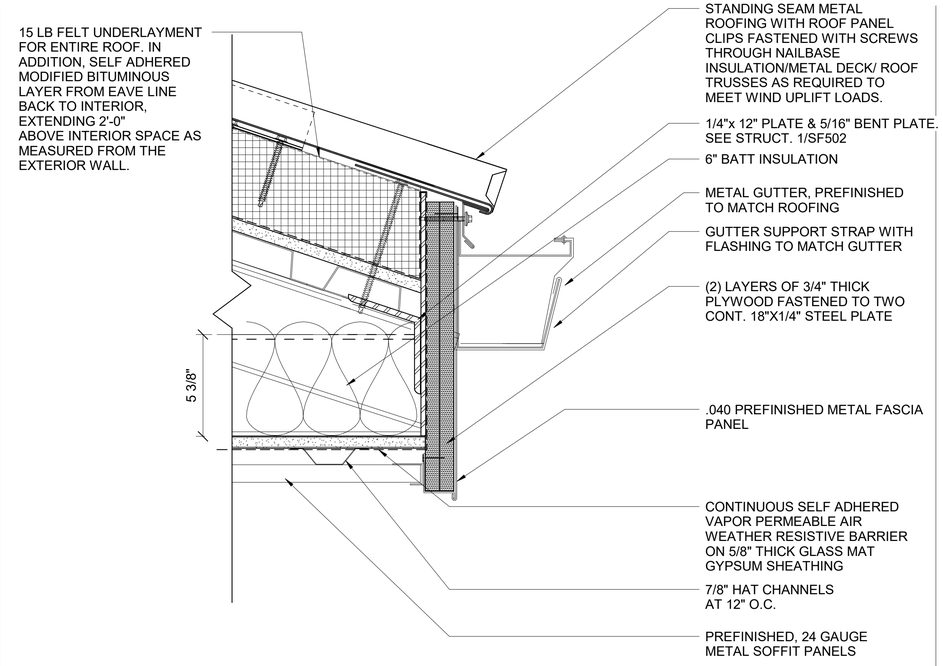
OPERATIONS/STORAGE BUILDING WALL SECTIONS

SHEET ID
BLDG 3
A-302

READY TO ADVERTISE (RTA)

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-STORAGE_ARCH_R21_K6ENXT09.rvt

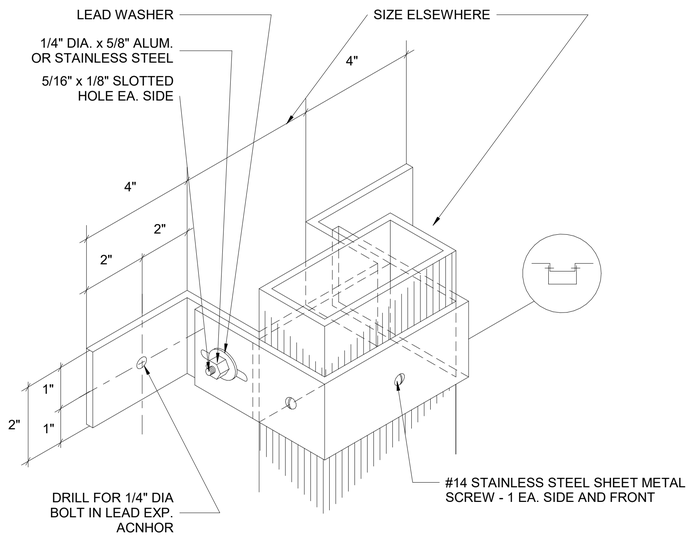
Plot Date: 11/28/2023 3:20:27 PM



2 TYPICAL GUTTER

3" = 1'-0"

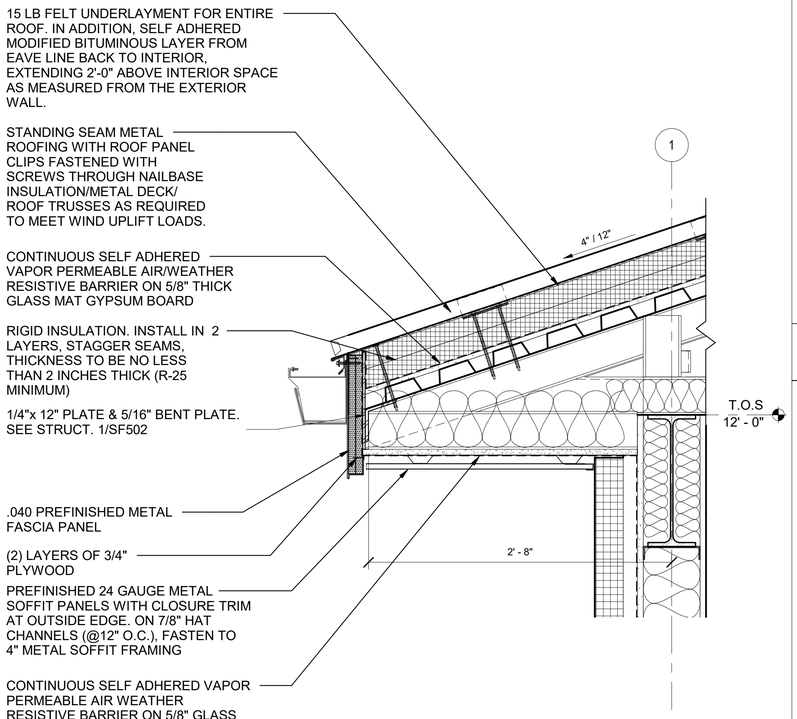
SCALE: 3"=1'-0"



3 DOWNSPOUT STRAP

6" = 1'-0"

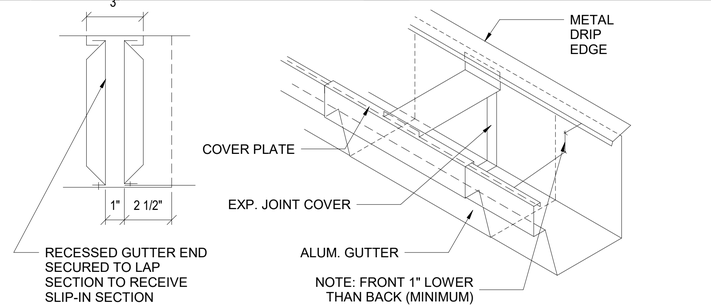
SCALE: 6"=1'-0"



6 TYPICAL EAVE DETAIL

1 1/2" = 1'-0"

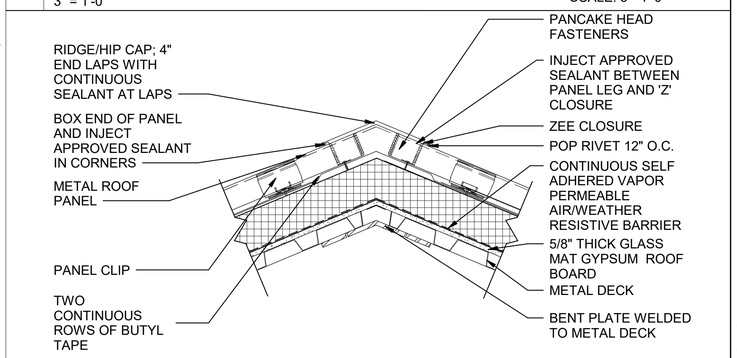
SCALE: 1 1/2"=1'-0"



4 GUTTER EXPANSION JOINT

3" = 1'-0"

SCALE: 3"=1'-0"



5 RIDGE CAP NO VENT DETAIL

1 1/2" = 1'-0"

SCALE: 1 1/2"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T O'DELL
DRAWN BY: T O'DELL
CHECKED BY: M DEACON
QA/QC BY: M DEACON
SUBMITTED BY: J DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

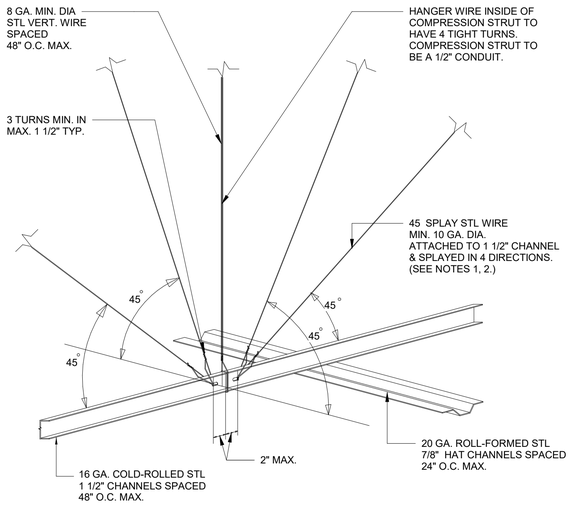
OPERATIONS/STORAGE BUILDING ROOF DETAILS

SHEET ID
BLDG 3
A-501

READY TO ADVERTISE (RTA)

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-STORAGE_ARCH_R21_K6ENXT09.rvt

Plot Date: 11/29/2023 3:20:28 PM

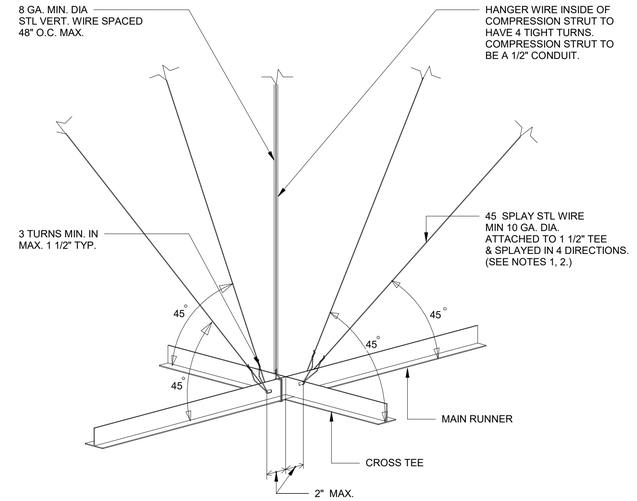


TYPICAL LATERAL BRACING DETAIL FOR SUSPENDED GYPSUM BOARD CEILING SYSTEM

1 CEILING BRACE 1

1/8" = 1'-0"

SCALE: 1/8"=1'-0"



TYPICAL LATERAL BRACING DETAIL FOR SUSPENDED ACOUSTICAL CEILING SYSTEM

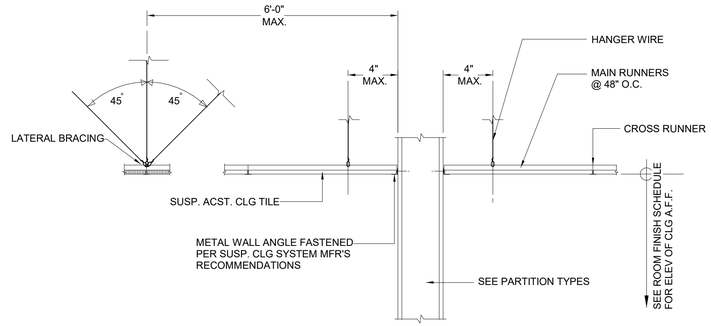
2 CEILING BRACE 2

1/8" = 1'-0"

SCALE: 1/8"=1'-0"

GENERAL NOTES

1. PROVIDE SPLAY BRACING AT 12'-0" O.C. MAX. IN EACH DIRECTION W/ THE FIRST POINT WITHIN 6'-0" OF EACH PERIMETER WALL.
2. CEILING AREA OF 144 SQUARE FEET OR LESS SURROUNDED BY WALLS WHICH CONNECT TO THE STRUCTURE SHALL NOT REQUIRE SPLAYED WIRES.
3. SEALANT SHALL BE A POLYISOBUTYLENE-BASED OR ISOPRENE-ISOBUTYLENE-BASED PRESSURE-SENSITIVE TAPE OR BEAD.
4. SEISMIC RESTRAINTS SHALL COMPLY WITH INTERNATIONAL BUILDING CODE.



SUSPENDED ACOUSTICAL CEILING SYSTEM

3 CEILING CONSTRUCTION 1

1/8" = 1'-0"

SCALE: 1/8"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T O'DELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T O'DELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

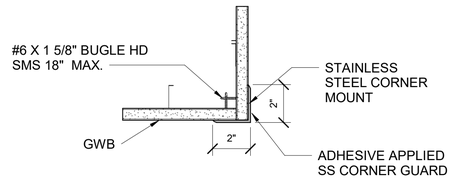
OPERATIONS/STORAGE BUILDING CEILING DETAILS

SHEET ID
BLDG 3
A-502

READY TO ADVERTISE (RTA)

File Path: C:\Users\K6ENXT09\Documents\FY23_PN86182_MPTR-STORAGE_ARCH_R21_K6ENXT09.rvt

Plot Date: 11/29/2023 3:20:28 PM



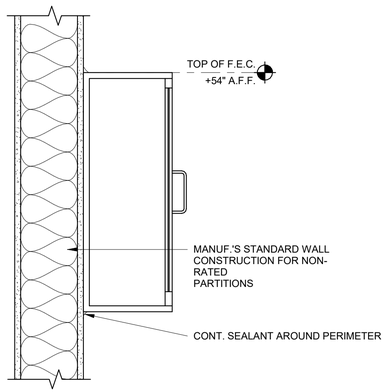
SSCG

NOTES:
1. SEE FLOOR PLANS FOR LOCATIONS.
2. ALL SSCG SHALL EXTEND FROM FLOOR TO 6'-0" ABOVE FINISHED FLOOR

1 CORNER GUARD

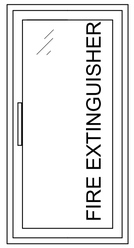
3" = 1'-0"

SCALE: 3"=1'-0"



SECTION

SURFACE MOUNTED



ELEVATION

*WOOD BLOCKING SHALL BE PROVIDED IN WALL ASSEMBLY FOR FEC

2 FIRE EXTINGUISHER

1 1/2" = 1'-0"

SCALE: 1 1/2"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T O'DELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T O'DELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M DEACON	CONTRACT NO.:
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SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING INTERIOR DETAILS

SHEET ID
BLDG 3
A-503

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:20:28 PM

File Path: C:\Users\K6ENXTO9\Documents\FY23_PN86182_MPTR-STORAGE_ARCH_R21_K6ENXTO9.rvt

OPS/STORAGE BLDG FINISH SCHEDULE

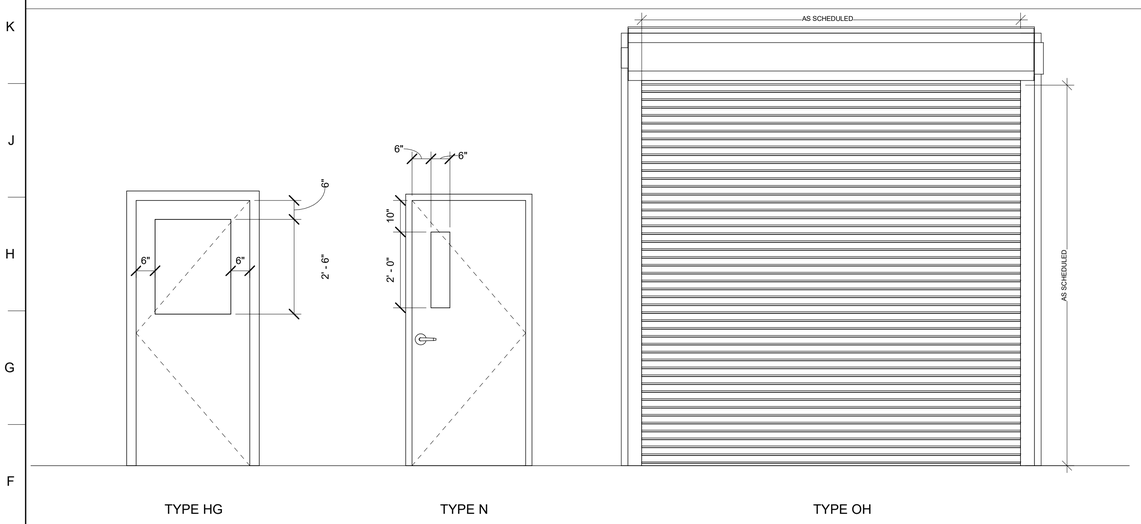
ROOM NO	ROOM NAME	WALL FINISH				BASE FINISH				FLOOR	CEILING		NOTES & REMARKS (SEE NOTES)
		NORTH	EAST	SOUTH	WEST	NORTH	EAST	SOUTH	WEST	FIN.	FIN.	HEIGHT	
101	STORAGE	PT	PT	PT	PT	RB	RB	RB	RB	SC	EXP		
102	OFFICE	PT	PT	PT	PT	RB	RB	RB	RB	SC	ACT	10' - 0"	

OPS/STORAGE DOOR SCHEDULE

DOOR NO.	TYPE	DOOR SIZE WIDTH	DOOR SIZE HEIGHT	DOOR SIZE THICKNESS	DOOR MATERIAL	DOOR FINISH	FIRE RATING	FRAME TYPE	FRAME MATERIAL	FRAME DOOR DETAILS HEAD	FRAME DOOR DETAILS JAMB	FRAME DOOR DETAILS SILL	COMMENTS:
101A	OH	10' - 0"	10' - 0"	1 3/4"	MTL	MFR	-	MFR	STL	1/A-603	4/A-603	7/A-603	COLOR: DARK BRONZE
101	HG	3' - 0"	7' - 0"	1 3/4"	HM	PT	-	1	HM	2/A-603	5/A-603	8/A-603	Hardware Set #3. COLOR:DARK BRONZE
102	N	3' - 0"	7' - 0"	1 3/4"	HM	PT		1	HM	3/A-603	6/A-603	9/A-603	Hardware Set #5 COLOR:DARK BRONZE
101D	OH	10' - 0"	10' - 0"	1 3/4"	MTL	MFR	-	MFR	STL	1/A-603	4/A-603	7/A-603	COLOR: DARK BRONZE

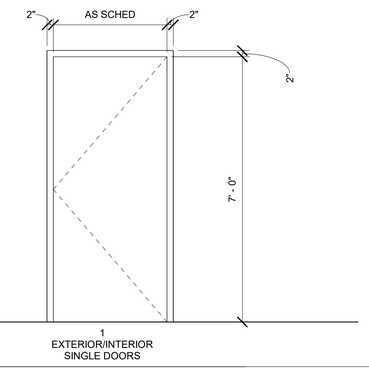
OPS/ STORAGE LOUVER & WINDOW SCHEDULE

Mark	R.O. Width	R.O. Height	Type	FRAME Material	DETAILS Head	DETAILS Jamb	DETAILS Sill	Head Height	REMARKS (See Notes Below)
L1	3' - 0"	3' - 0"	Louver-Aluminum	ALUM	5/A-602	6/A-602	7/A-602	9' - 6 1/2"	COLOR: DARK BRONZE
L2	3' - 0"	2' - 0"	Louver-Aluminum	ALUM	5/A-602	6/A-602	7/A-602	10' - 3"	COLOR: DARK BRONZE
W1	3' - 4"	4' - 0"	Double Hung	ALUM	1/A-602	3/A-602	4/A-602	7' - 0"	COLOR: DARK BRONZE



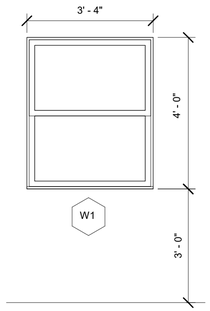
TYPE HG TYPE N TYPE OH

DOOR TYPES
NOT TO SCALE



1
EXTERIOR/INTERIOR
SINGLE DOORS

FRAME TYPES
NOT TO SCALE



WINDOW TYPES
NOT TO SCALE

L1 L2

LOUVER TYPES
NOT TO SCALE

GENERAL NOTES

1. CORNER GUARDS SHALL BE LOCATED AT ALL EXPOSED CORNERS IN THE STORAGE AREA U.N.O.

2. ALL DOORS SHALL BE 1 3/4" THICK U.N.O.

3. REFERENCE SPECIFICATION SECTON 08 11 13 FOR STEEL DOORS AND FRAMES.

4. REFERENCE SPECIFICATION SECTION 08 71 00 FOR DOOR HARDWARE .

ROOM FINISH SCHEDULE LEGEND

ACT	ACOUSTICAL CEILING TILE	RB	RESILIENT BASE
EXP	EXPOSED	SC	SEALED CONC.
PT	PAINT-GYP BD		

DOOR NOTES

1. SEE FLOOR PLANS FOR DOOR QUANTITIES, LOCATIONS, AND SWINGS.

2. ALL EXTERIOR "HM" DOORS SHALL BE INSULATED STEEL DOOR SYSTEMS AND SHALL COMPLY WITH UFC 4-010-01 AND ASTM F2248.

3. ALL INTERIOR DOORS SHALL BE HEAVY DUTY U.N.O.

4. PROVIDE SEALANT AROUND FULL PERIMETER OF FRAMES, BOTH SIDES OR PARTITIONS, ECT.

5. ALL GLAZING UNITS IN DOORS SHALL BE AS INDICATED AND SPECIFIED.

6. PROVIDE GROUTED FRAMES WHERE NEEDED FOR FIRE OR SOUND RATING PER SPECIFIED ASSEMBLY REQUIREMENTS.

7. PROVIDE GASKET WEATHER STRIPPING SEAL AND DOOR BOTTOM AT INTERIOR DOORS FOR AIR BARRIER SEAL AT DOORS THAT PENETRATE AIR BARRIER TESTING PERIMETER.

8. ALL DOORS PENETRATING AIR BARRIER TESTING ENVELOPE MUST MEET AIR BARRIER REQUIREMENTS.

DOOR SCHEDULE LEGEND

HM	HOLLOW METAL	MTL	METAL
PT	PAINT	MFR	MANUFACTURER
STL	STEEL		

WINDOW NOTES

1. REFER TO FLOOR PLANS FOR LOCATIONS OF WINDOWS

2. REFERENCE SPECIFICATION FOR GLAZING REQUIREMENTS.

3. PROVIDE SEALANT AROUND FULL PERIMETER OF FRAMES, BOTH SIDES OF WALL.

LOUVER NOTES

1. REFER TO BUILDING ELEVATIONS FOR LOCATIONS OF LOUVERS.

2. LOUVER SIZES SHOWN IN SCHEDULE REFER TO OPENING.

3. COORDINATE WITH MECHANICAL EQUIPMENT FOR FINAL LOCATION OF LOUVERS.

4. REFER TO MECHANICAL FOR PERFORMANCE REQUIRMENTS.

5. PROVIDE SEALANT AROUND FULL PERIMETER OF FRAMES, BOTH SIDES OF PARTITIONS,ETC.

6. PROVIDE INSULATED BLANKOFF PANELS FOR UNUSED LOUVER AREA (COORDINATE WITH MECHANCIAL REQUIRMENTS).

7.PROVIDE BIRD SCREENS AT ALL LOUVERS, TYPICAL.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T O'DELL
DRAWN BY: R. SMITH
CHECKED BY: M. DEACON
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

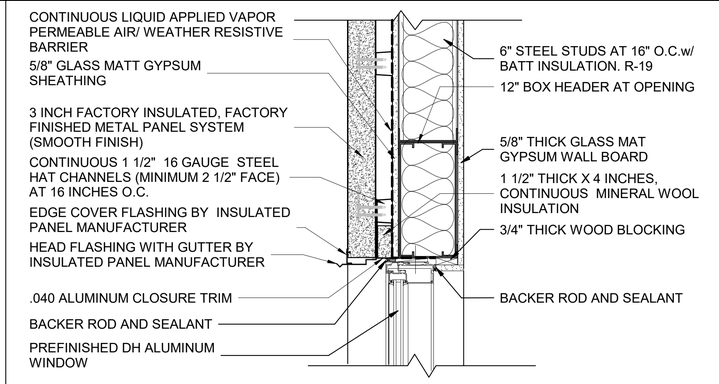
OPERATIONS/STORAGE BUILDING SCHEDULES AND DOORS/WINDOW ELEVATIONS

SHEET ID
BLDG 3
A-601

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:20:29 PM

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-STORAGE_ARCH_R21_K6ENXT09.rvt

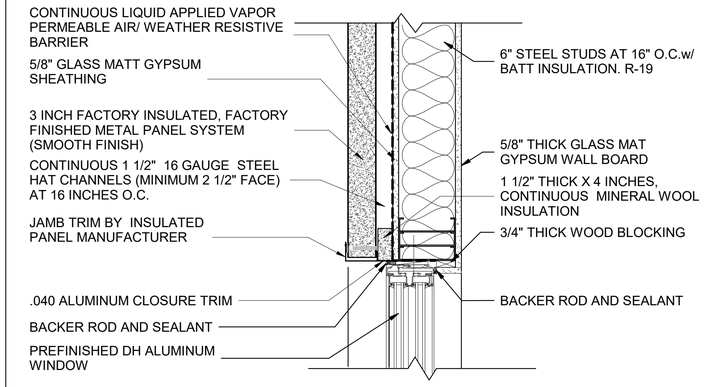


NOTE: SEE A-700 SERIES PLATES FOR AIR BARRIER GUIDANCE

1 DBL HUNG WINDOW HEAD

1 1/2" = 1'-0"

SCALE: 1 1/2"=1'-0"

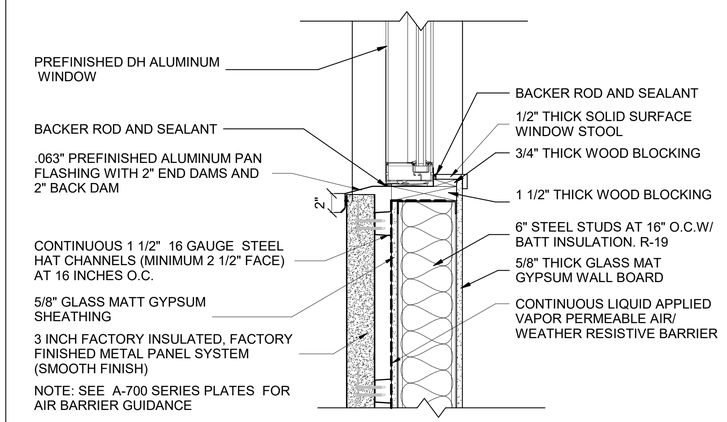


NOTE: SEE A-700 SERIES PLATES FOR AIR BARRIER GUIDANCE

3 DBL HUNG WINDOW JAMB

1 1/2" = 1'-0"

SCALE: 1 1/2"=1'-0"

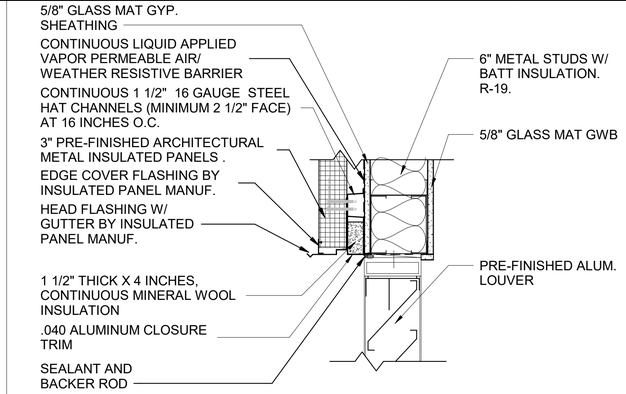


NOTE: SEE A-700 SERIES PLATES FOR AIR BARRIER GUIDANCE

4 DBL HUNG WINDOW SILL

1 1/2" = 1'-0"

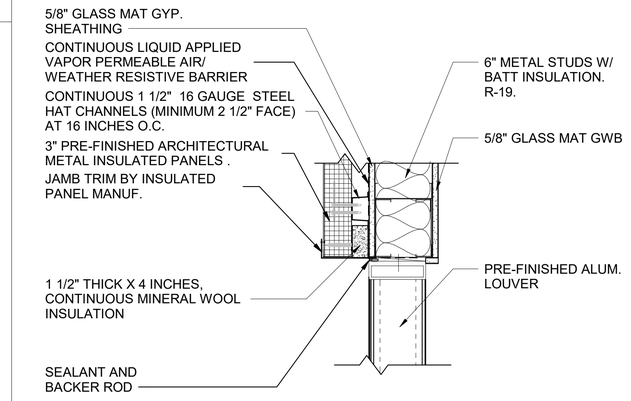
SCALE: 1 1/2"=1'-0"



5 LOUVER HEAD

1 1/2" = 1'-0"

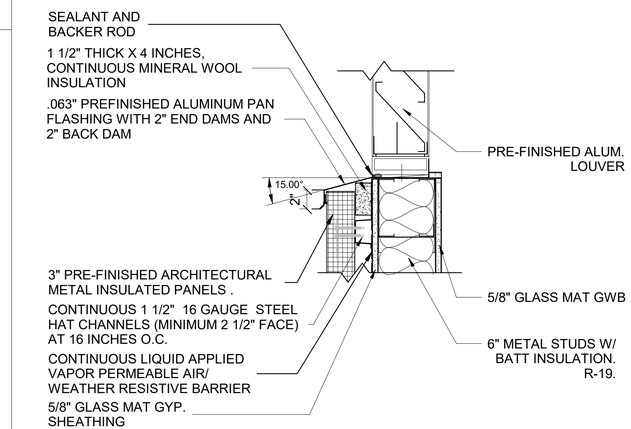
SCALE: 1 1/2"=1'-0"



6 LOUVER JAMB

1 1/2" = 1'-0"

SCALE: 1 1/2"=1'-0"



7 LOUVER SILL

1 1/2" = 1'-0"

SCALE: 1 1/2"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T O'DELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T O'DELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT 100 W. OGLETHORPE AVE. SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

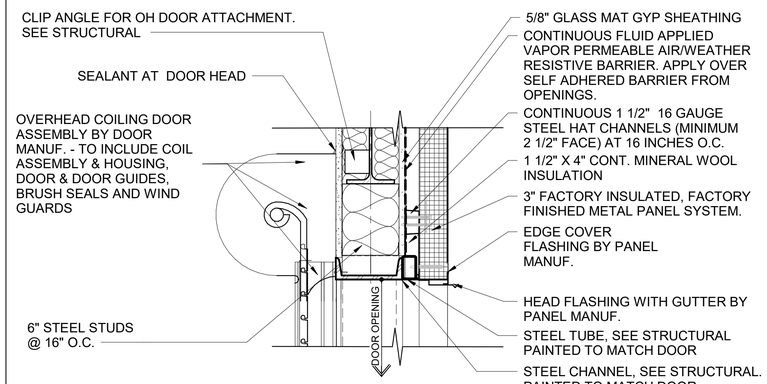
OPERATIONS/STORAGE BUILDING WINDOW AND LOUVER DETAILS

SHEET ID
BLDG 3
A-602

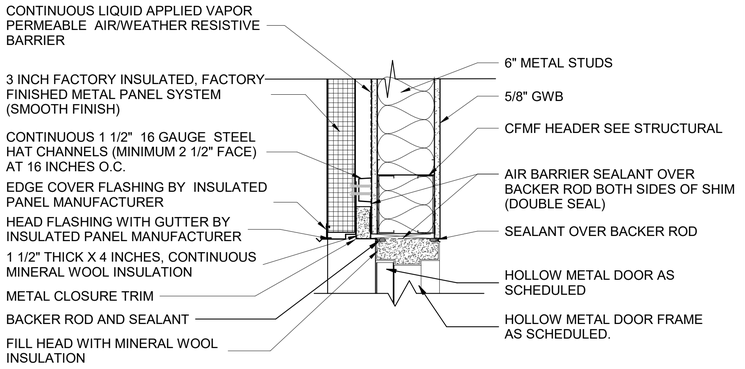
READY TO ADVERTISE (RTA)

Plot Date: 11/29/2023 3:20:30 PM

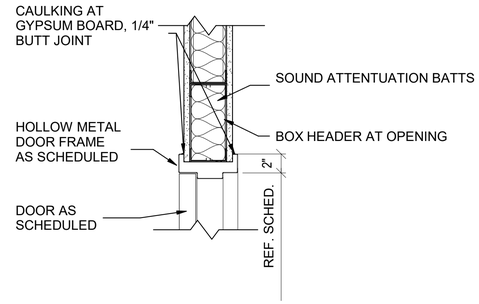
File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-STORAGE_ARCH_R21_K6ENXT09.rvt



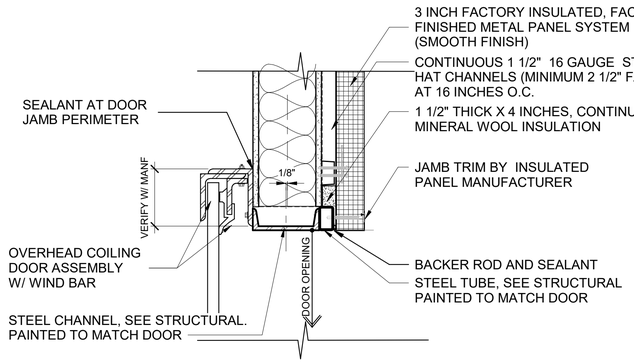
1 OH DOOR HEAD
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



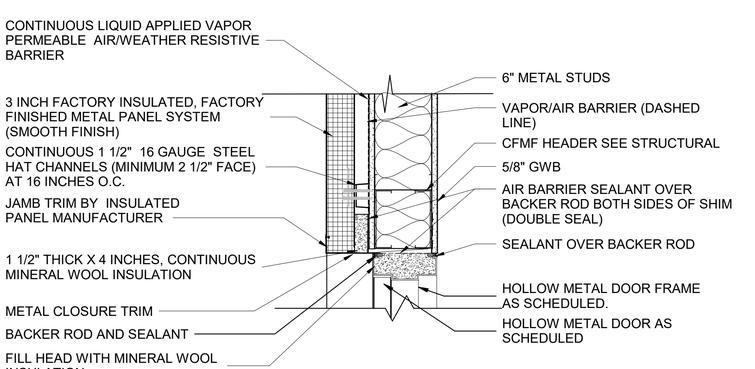
2 HM DOOR HEAD
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



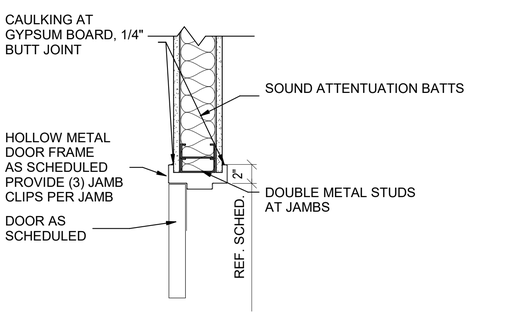
3 INTERIOR DOOR HEAD DETAIL
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



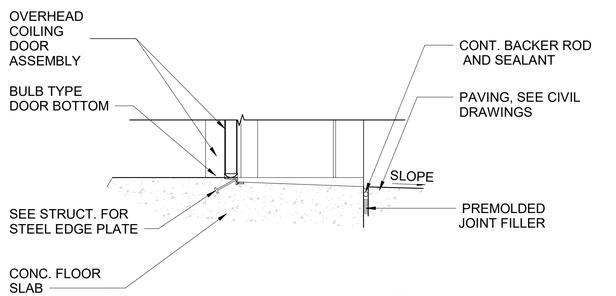
4 OH DOOR JAMB
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



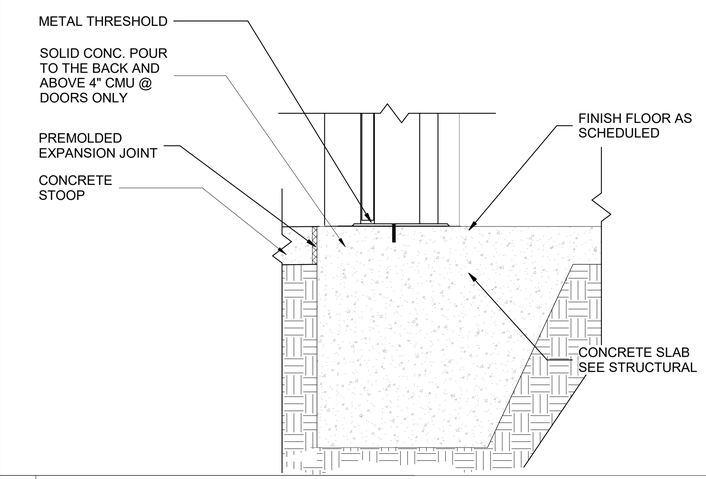
5 HM DOOR JAMB
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



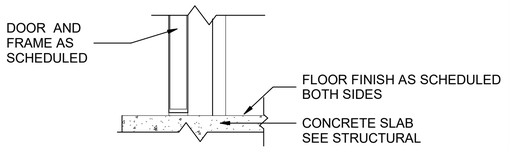
6 INTERIOR DOOR JAMB DETAIL
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



7 OH DOOR SILL
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



8 HM DOOR SILL
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"



9 INTERIOR DOOR SILL DETAIL
1 1/2" = 1'-0"
SCALE: 1 1/2"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	
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DESIGN BY:	T O'DELL
DRAWN BY:	T O'DELL
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SUBMITTED BY:	J. DEACON
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U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING DOOR DETAILS

SHEET ID
BLDG 3
A-603

READY TO ADVERTISE (RTA)

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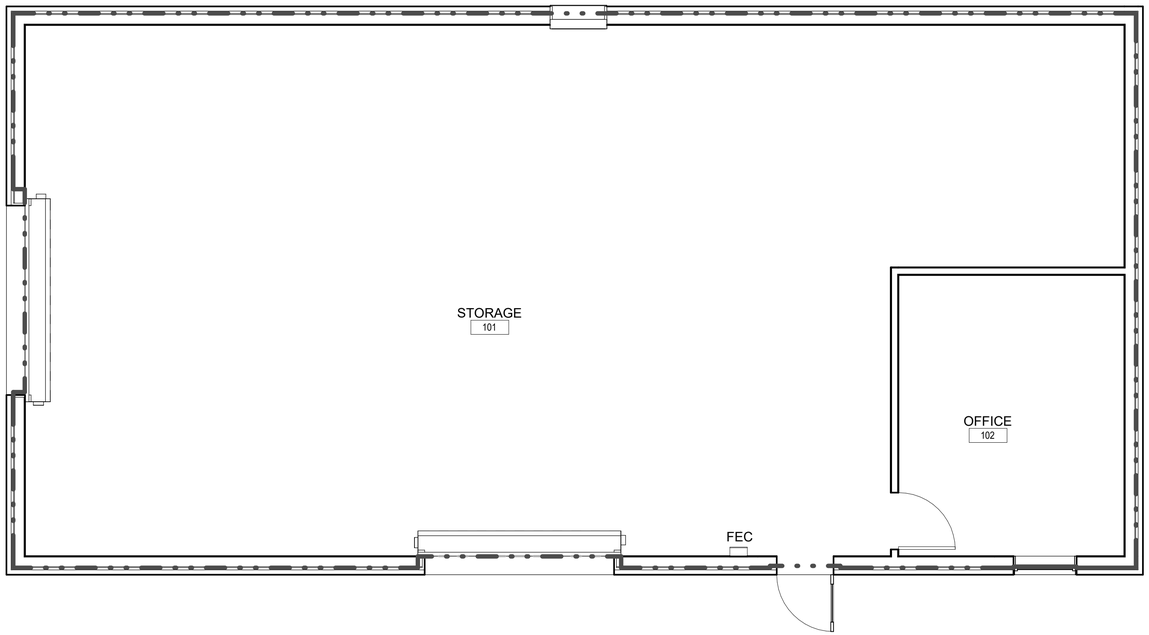
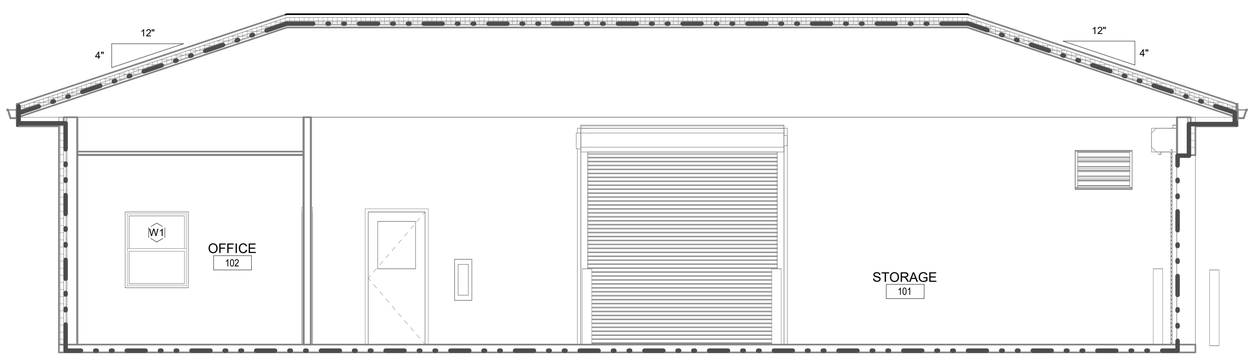
Plot Date: 12/5/2023 2:30:03 PM



1 OPS/STORAGE AIR BARRIER PLAN

1/4" = 1'-0"

SCALE: 1/4"=1'-0"



2 OPS/STORAGE EAST-WEST BLDG SECTION

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

GENERAL NOTES

1. AIR BARRIER REQUIREMENTS: UFC 3-101-01 PARAGRAPH 3-6 REQUIRES THE BUILDING ENCLOSURE TO BE DESIGNED AND CONSTRUCTED WITH A CONTINUOUS SIX SIDED AIR BARRIER TO CONTROL AIR LEAKAGE IN ACCORDANCE WITH THE REQUIREMENTS OF ANSI/ASHRAE/USGBC/IES 189.1-2009 NORMATIVE APPENDIX B, "PRESCRIPTIVE CONTINUOUS AIR BARRIER".

2. THE PRIMARY AIR BARRIER MATERIALS ARE LIQUID APPLIED VAPOR PERMEABLE AIR/WEATHER RESISTIVE BARRIER, AND SELF-ADHERED (PEEL AND STICK) MEMBRANE. AIRBARRIER COMPONENT MATERIALS ARE SEALANTS, METAL (EXTERIOR DOORS, WINDOWS,GLAZING, FRAMES AND MECHANICAL LOUVERS WITH TIGHT SEALING MOTORIZED DAMPERS),POURED CONCRETE, FACTORY PREFINISHED PRE-INSULATED METAL WALL PANELS AND EXTERIOR WEATHER STRIPPING AT EXTERIOR DOORS.

3. THE AIR BARRIER SYSTEM CONSISTS OF PRIMARY AIR BARRIER MATERIALS COMBINED WITH AIR BARRIER COMPONENTS. MATERIAL TRANSITIONS SHALL BE FLEXIBLE TO ACCOMMODATE THERMAL AND MOISTURE MOVEMENT WITH ALL MOVEMENT JOINTS SEALED.CONNECTIONS SHALL BE MADE BETWEEN THE POURED CONCRETE FOUNDATION WALLS AND POURED CONCRETE FLOOR SLAB AND THE EXTERIOR WALLS, BETWEEN THE EXTERIOR WALLS AND EXTERIOR DOORS, EXTERIOR WINDOWS AND MECHANICAL LOUVERS, BETWEENTHE EXTERIOR WALLS AND SOFFIT, FASCIA AND ROOF AS FOLLOWS:

A) POURED CONCRETE FLOOR SLAB WITH VAPOR BARRIER TURNED UP THE POURED CONCRETE SLAB EDGE AND SEALED TO THE FACE OF THE FOUNDATION WALL. THE TOP OF THE FOUNDATION WALL PROVIDES THE CONNECTION BETWEEN THE FLOOR SLAB AND THE EXTERIOR WALL.

B) AT THE 4" CMU AND FACTORY PREFINISHED PREINSULATED METAL WALL PANEL TRANSITION SELF ADHERED (PEEL AND STICK) AIR BARRIER MEMBRANE IS LAPPED VERTICALLY WITH AN 8" LAP OVER THE LIQUID APPLIED VAPOR PERMEABLE AIR BARRIER OF THE WALL. THE BOTTOM OF THE FACTORY PREFINISHED INSULATED METAL WALL PANELS ARE SEALED TO THE TOP THE POURED CONCRETE FOUNDATION IN TWO ROWS OF CONTINOUS SEALANT. THE FACTORY PREFINISHED INSULATED METAL WALL PANELS (VAPOR IMPERMEABLE SYSTEM) EXTEND TO THE UNDERSIDE OF ROOF STRUCTURE. PANELS ARE SEALED TO THE EAVE, RAKE OR COPING STRUCTURE.

C) AT EXTERIOR DOOR AND WINDOW OPENINGS- ROUGH OPENINGS ARE WRAPPED WITH SELF ADHERED (PEEL AND STICK) MEMBRANE. A MINIMUM 3 INCH LAP OVER THE LIQUID APPLIED VAPOR PERMEABLE AIR/WEATHER RESISTIVE BARRIER/8" CMU AT WINDOW HEADS, JAMBS AND SILLS WILL BE PROVIDED. SELF ADHERED (PEEL AND STICK) AIR BARRIER MEMBRANE WILL BE EXTENDED THROUGH THE ROUGH OPENING TO ABUT THE INTERIOR GLASS MAT GYPSUM WALL BOARD. EXTERIOR METAL DOOR JAMBS ARE SEALED TO THE TOP OF THE POURED CONCRETE FLOOR SLAB WITH CONTINOUS BEADS OF SEALANT. DOOR THRESHOLDS ARE SEALED TO THE POURED CONCRETE FLOOR SLAB WITH CONTINOUS BEADS OF SEALANT. THE METAL DOOR HEADS AND JAM CONNECTIONS TO THE WALLS ARE SEALED TO THE WALL SELF ADHERED AIR BARRIER MEMBRANE.

D) AT EXTERIOR MECHANCIAL LOUVER OPENINGS- ROUGH OPENINGS ARE WRAPPED WITH SELF ADHERED (PEEL AND STICK) AIR BARRIER MEMEBRANE. A MINIMUM 3 INCH LAP OVER THE LIQUID APPLIED VAPOR PERMEABLE AIR /WEATHER RESISTIVE BARRIER/8" CMU AT HEADS,JAMBS AND SILLS WILL BE PROVIDED. SELF ADHERED 9PEEL AND STICK0 AIR BARRIER MEMBRANE WILL BE EXTENDED THROUGH THE ROUGH OPENING. EXTERIOR METAL LOUVER HEADS, JAMBS AND SILL CONNECTIONS TO THE WALLS ARE SEALED TO THE WALL AIR BARRIER MEMBRANE. LOUVERS ARE PROVIDED WITH TIGHT SEALING MOTORIZED DAMPERS.

E) ALL JOINTS AT OPENINGS,TRANSITIONS AND PENETRATIONS SHALL BE SEALED WITH BACKER ROD AND SEALANT.

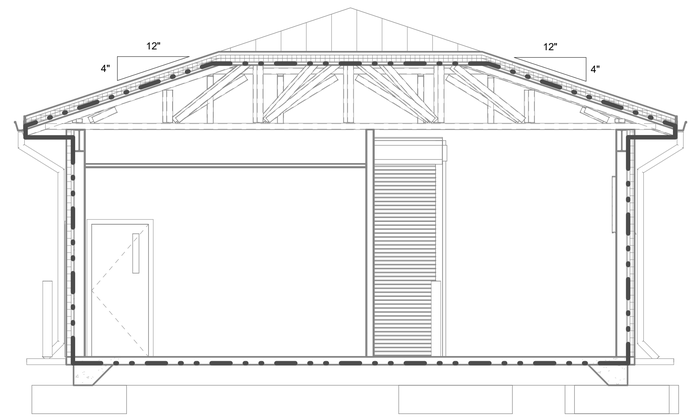
F) ALL ELECTRICAL,PLUMBING AND MECHANCIAL PENETRATIONS SHALL BE SEALED TO THE AIR BARRIER IN ACCORDANCE WITH THE AIR BARRIER MANUFACTURER'S RECOMMENDATIONS.

4. AIR BARRIER INSTALLATION AND INSPECTION ARE PART OF CONSTRUCTION. TESTING OF AIR BARRER IS NOT REQUIRED.

5. INSIDE AND OUTSIDE CORNERS AND JOINTS BETWEEN METAL FURRING SHALL BE SEALED IN ACCORDANCE WITH THE PRIMARY AIR BARRIER MANUFACTURER'S RECOMMENDATIONS.

6. ALL JOINTS AT OPENINGS, TRANSITIONS, AND PENETRATIONS SHALL BE SEALED WITH BACKER ROD AND SEALANT.

7.ALL ELECTRICAL, PLUMBING, AND MECHANICAL PENETRATIONS SHALL BE SEALED TO THE AIR BARRIER IN ACCORDANCE WITH THE AIR BARRIER MANUFACTURER'S RECOMMENDATIONS.



3 OPS/STORAGE NORTH-SOUTH BLDG SECTION

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T.O'DELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.O'DELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M.DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING AIR BARRIER
BOUNDERY FLOOR PLAN & BUILDING SECTIONS

SHEET ID
BLDG 3
A-701

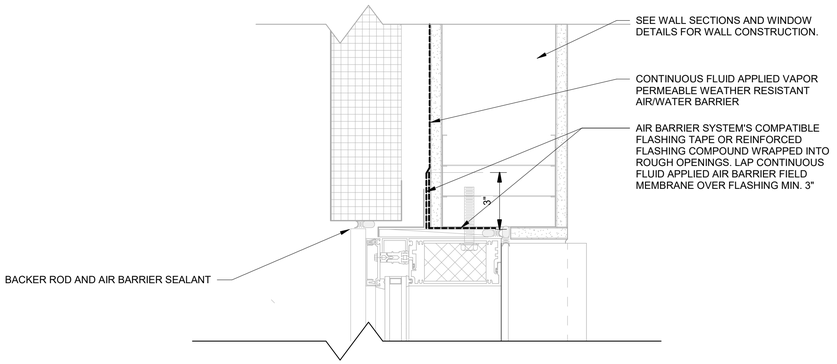
READY TO ADVERTISE (RTA)

Plot Date: 11/29/2023 3:20:31 PM

File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-STORAGE_ARCH_R21_K6ENXT09.rvt

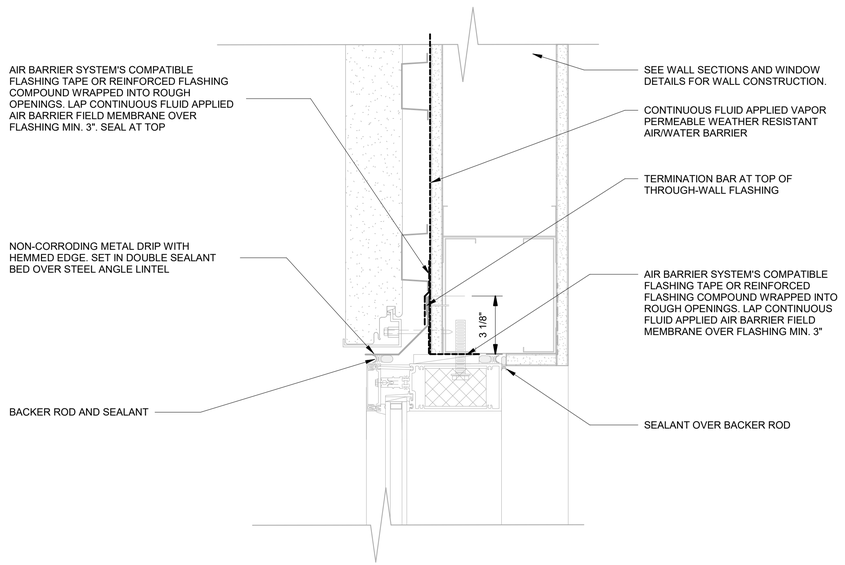
GENERAL NOTES

AT EXTERIOR DOOR AND WINDOW OPENINGS- ROUGH OPENINGS ARE WRAPPED WITH SELF ADHERED (PEEL AND STICK) MEMBRANE. A MINIMUM 3 INCH LAP OVER THE LIQUID APPLIED VAPOR PERMEABLE AIR/WEATHER RESISTIVE BARRIER/8" CMU AT WINDOW HEADS, JAMBS AND SILLS WILL BE PROVIDED. SELF ADHERED (PEEL AND STICK) AIR BARRIER MEMBRANE WILL BE EXTENDED THROUGH THE ROUGH OPENING TO ABUT THE INTERIOR GLASS MAT GYPSUM WALL BOARD. EXTERIOR METAL DOOR JAMBS ARE SEALED TO THE TOP OF THE POURED CONCRETE FLOOR SLAB WITH CONTINOUS BEADS OF SEALANT. DOOR THRESHOLDS ARE SEALED TO THE POURED CONCRETE FLOOR SLAB WITH CONTINOUS BEADS OF SEALANT. THE METAL DOOR HEADS AND JAM CONNECTIONS TO THE WALLS ARE SEALED TO THE WALL SELF ADHERED AIR BARRIER MEMBRANE.



2 AIR BARRIER @ JAMB

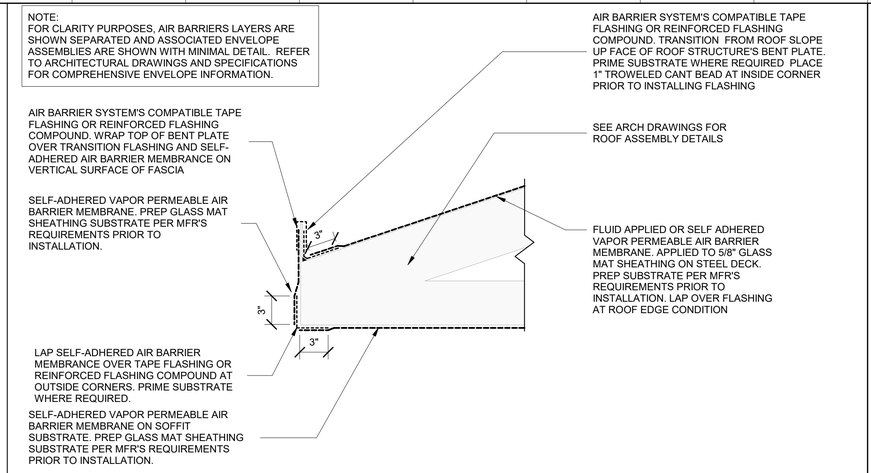
SCALE: 3"=1'-0"



4 AIR BARRIER @ HEAD

SCALE: 3"=1'-0"

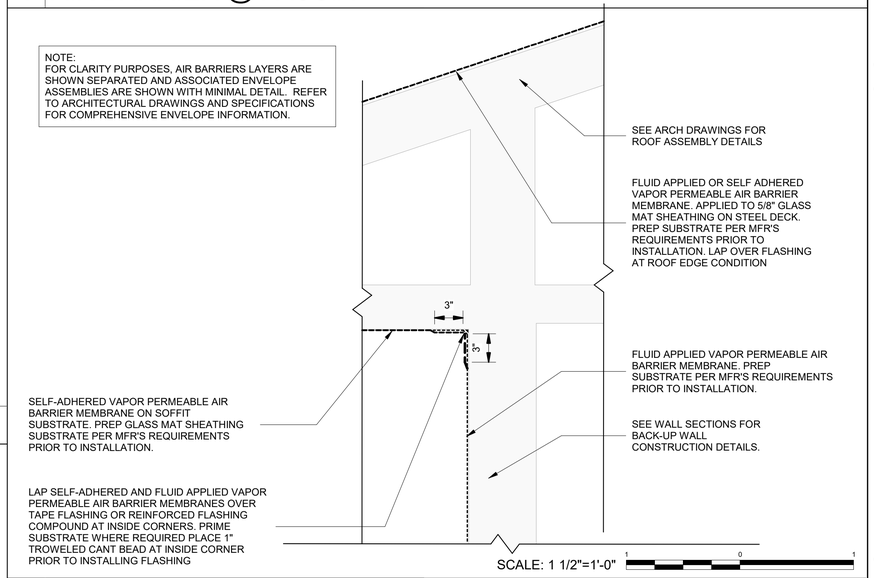
NOTE:
FOR CLARITY PURPOSES, AIR BARRIERS LAYERS ARE SHOWN SEPARATED AND ASSOCIATED ENVELOPE ASSEMBLIES ARE SHOWN WITH MINIMAL DETAIL. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR COMPREHENSIVE ENVELOPE INFORMATION.



1 AIR BARRIER @ FASCIA

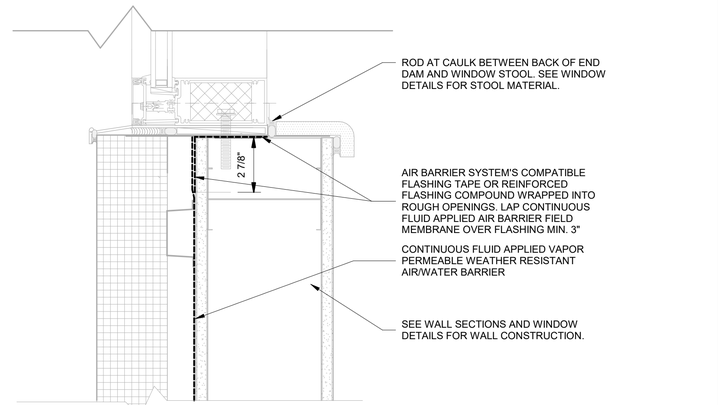
SCALE: 1 1/2"=1'-0"

NOTE:
FOR CLARITY PURPOSES, AIR BARRIERS LAYERS ARE SHOWN SEPARATED AND ASSOCIATED ENVELOPE ASSEMBLIES ARE SHOWN WITH MINIMAL DETAIL. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR COMPREHENSIVE ENVELOPE INFORMATION.



SCALE: 1 1/2"=1'-0"

3 AIR BARRIER @ WALL/SOFFIT INTERSECTION



5 AIR BARRIER @ SILL

SCALE: 3"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T O'DELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T O'DELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

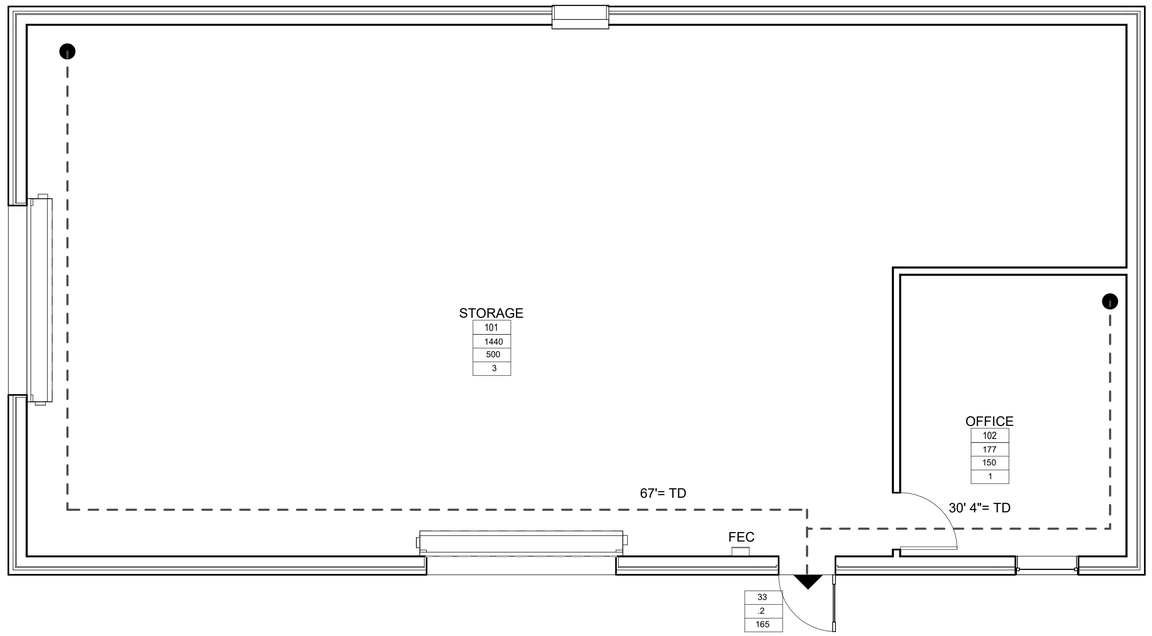
OPERATIONS/STORAGE BUILDING AIR BARRIER DETAILS

SHEET ID
BLDG 3
A-702

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:20:32 PM

File Path: C:\Users\K6ENXT09\Documents\FY23_PN86182_MPTR-STORAGE_ARCH_R21_K6ENXT09.rvt



1 OPS/STORAGE LIFE SAFETY PLAN
1/4" = 1'-0"

SCALE: 1/4"=1'-0"

LIFE SAFETY CODE ANALYSIS

UNIFIED FACILITIES CRITERIA - UFC 1-200-01 GENERAL BUILDING REQUIREMENTS, WITH CHANGE 1, 1 OCTOBER 2020

UNIFIED FACILITIES CRITERIA- UFC 3-600-01 FIRE PROTECTION FOR FACILITIES, WITH CHANGE 5, 24 SEPTEMBER 2020

NFPA 101 LIFE SAFETY CODE, 2021 EDITION

NFPA 220 STANDARD ON TYPES OF BUILDING CONSTRUCTION, 2018 EDITION

NFPA 10, INSTALLATION OF PORTABLE FIRE EXTINGUISHERS

NFPA 1141 STANDARD FOR FIRE PROTECTION INFRASTRUCTURE FOR LAND DEVELOPMENT IN WILDLAND, RURAL, AND SUBURBAN AREAS

INTERNATIONAL BUILDING CODE (IBC), 2021 EDITION

ONE STORY, 1800 SQUARE FEET , NON SPRINKLERED BUILDING

OCCUPANCY PER IBC:

IBC OCCUPANCY SECTION 304 BUSINESS GROUP B

CONSTRUCTION TYPE PER IBC:

REQUIREMENTS FOR CONSTRUCTION TYPE IIB: TABLE 504.3 ALLOWABLE BUILDING HEIGHT AND AREAS- 23,000 sf, 3 STORIES MAXIMUM HEIGHT 55 FEET
ACTUAL BUILDING HEIGHT= 18' 6

FIRE RESISTANCE RATING REQUIREMENTS BASED UPON CONSTRUCTION TYPE IIB (TABLE 601): NO RATING REQUIRED FOR PRIMARY STRUCTUAL FRAME, BEARING WALLS (EXTERIOR, INTERIOR), NON- BEARING WALLS (EXTERIOR, INTERIOR), FLOOR CONSTRUCTION AND ROOF CONSTRUCTION.

FIRE PROTECTION REQUIREMENTS BASED UPON LOCATION ON PROPERTY:
NO RATING REQUIREMENT IF DISTANCE TO IMAGINARY PROPERTY LINE IS 10 FEET OR GREATER.

MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED UPON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION (705.8.1 EXCEPTION 2): BUILDINGS WHOSE EXTERIOR BEARING WALLS, EXTERIOR NON BEARING WALLS, AND EXTERIOR PRIMARY STRUCTURAL FRAME ARE NOT REQUIRED TO BE FIRE RESISTANCE RATED SHALL BE PERMITTED TO HAVE UNLIMITED, UNPROTECTED OPENINGS.

NFPA 101 MEANS OF EGRESS:

OCCUPANCY PER NFPA 101: BUSINESS (CHAPTER 38), STORAGE (CHAPTER 42, NEW STORAGE)

CLASSIFICATION OF HAZARD CONTENTS: ORDINARY HAZARD (38.1.5 & 42.1.5 & 6.2.2.3)

OCCUPANT LOAD : TABLE 7.3.1.2) BUSINESS 150 GROSS SF PER PERSON & STORAGE 500 GROSS SF/PERSON
177 SF/150 GROSS SF PER PERSON= 1 PERSONS, 1440 SF/500 GSF PER PERSON= 3 PERSONS

EGRESS CAPACITY (TABLE 7.3.3.1) LEVEL TRAVEL: 0.2 INCH PER PERSON X 5 = 1INCH REQUIRED

ACTUAL LEVEL TRAVEL CAPACITY- 1 OPENINGS 36 INCH WIDE DOORS (32 INCHES CLEAR)= 32 INCHES TOTAL EGRESS CAPACITY PROVIDED.

NUMBER OF EXITS: SINGLE EXIT PERMITTED (7.4.1.1.1, 38.2.4.3, 42.2.4.2)- 1 EXIT PROVIDED.

MAXIMUM TRAVEL DISTANCE: BUSINESS- 200 FEET UNSPRINKLERED BUILDING (TABLE A7.6)

MAXIMUM DEAD END CORRIDOR: BUSINESS -20 FEET UNSPRINKLERED BUILDING (TABLE A7.6)

MAXIMUM COMMON PATH OF TRAVEL: STORAGE -50 FEET UNSPRINKLERED BUILDING (TABLE A7.6)

PROTECTION PER NFPA 101

INTERIOR WALL AND CEILING FINISHES SHALL BE CLASS A OR B IN EXITS AND EXIT ACCESS CORRIDORS (38.3.3..2.1)

FLOOR FINISH MUST BE NO LESS THAN CLASS II IN EXIT ENCLOSURES (38.3.3.3.2)

PORTABLE FIRE EXTINGUISHERS SHALL BE PROVIDED (38.3.5)

REQUIREMENTS PER UFC 1-200-01

SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY- USE UFC 3-600-01 INSTEAD OF IBC CHAPTER 4

REQUIREMENTS PER NFPA 10
CLASSIFICATION OF HAZARD FOR FIRE EXTINGUISHERS:

LIGHT HAZARD- MINIMUM FIRE EXTINGUISHER RATING 2-A, MAXIMUM OF 75 FEET TRAVEL TO FIRE EXTINGUISHER

REQUIRMENTS FOR NFPA 1141
MINIMUM DISTANCE TO ADJACENT BUILDINGS AND PROPERTY LINES = 30 FEET (6.2.1)

GROSS BUILDING AREA

GROSS BUILDING AREA PER IBC= 1800 SQUARE FEET

GROSS BUILDING AREA PER UFC 3-101-01 = 1800 SQUARE FEET

GENERAL NOTES

1. THIS DRAWING IS TO BE USED AS REFERENCE ONLY. IT IS NOT PART OF THE CONSTRUCTION CONTRACT. ALL INFORMATION CONTAINED ON IT IS CALLED FOR ELSEWHERE.

PLAN LEGEND

FEB	FIRE EXTINGUISHER BRACKET - WALL MOUNTED - TOP AT 5'-0" A.F.F. FIRE EXTINGUISHER TO BE 2A:10B:C (GFGI)
FEC	FIRE EXTINGUISHER CABINET - SEE PLATE A-512 FOR TYPICAL DETAILS
– – –	EGRESS PATH
▲	REQUIRED EXIT

OCCUPANT LOAD KEY

OCCUPANT LOAD TAG

XXX
XXX
XXX
XXX

- ROOM NUMBER
- NET SQUARE FOOTAGE
- OCCUPANT LOAD FACTOR
- OCCUPANT LOAD

REQUIRED EXIT CAPACITY TAG
NOMINAL WIDTH, IN
WIDTH FACTOR, IN/PERSON (*)
CALCULATED CAPACITY

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T O'DELL
DRAWN BY: T O'DELL
CHECKED BY: M DEACON
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

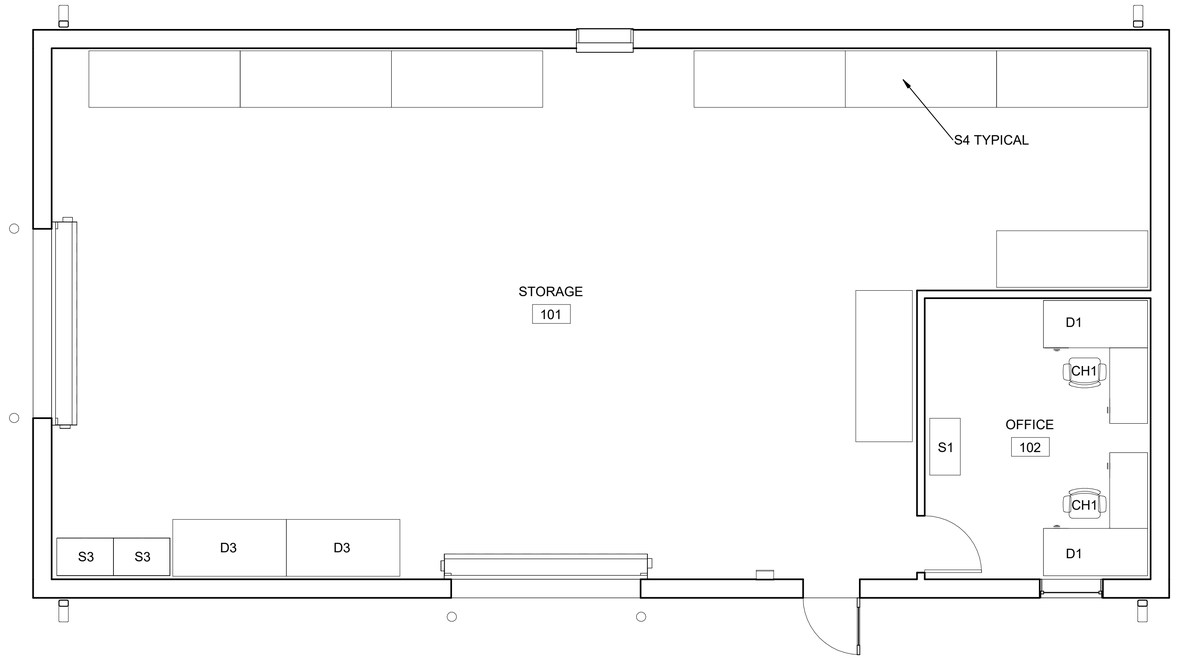
OPERATIONS/ STORAGE BUILDING LIFE SAFETY PLAN
(FOR REFERENCE ONLY)

SHEET ID
BLDG 3
A-801

READY TO ADVERTISE (RTA)

File Path: C:\Users\K6ENXTO9\Documents\FY23_PN96182_MPTR-STORAGE_ARCH_R21_K6ENXTO9.rvt

Plot Date: 11/29/2023 3:20:32 PM



1 FURNITURE PLAN
1/4" = 1'-0"

4 3 2 1 0 4 8

GENERAL SHEET NOTES

FURNITURE LEGEND
*Furniture is for reference only; purchased under separate contract.

SEATING	
CH1	Task Chair
CH2	Classroom Chair with Tablet Arm
DESKS	
D1	L-Shaped Desk (Non-Handed); 30"D x 66"L Desk, 24"D x 48"L Return; Steel/Laminate
D2	Lectern
D3	Work Bench; Wood Top, 36"W x 72"L
FILES AND STORAGE	
S1	Lateral File Cabinet; 36"W, 5DR; Steel
S2	Bookcase; 36"W, 72"H; Steel
S3	Storage Cabinet; 24"D x 36"W x 87"H; Steel
S4	Heavy Duty Industrial Shelving; 36"D x 96"W x 84"H

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: V. ROBERSON
DRAWN BY: V. ROBERSON
CHECKED BY: M. DEACON
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W91PHN-23-B-3001
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE FURNITURE PLAN

SHEET ID
BLDG 3
IN101

READY TO ADVERTISE (RTA)

Plot Date: 11/15/2023 9:58:52 AM
File Path: C:\Users\K6ENXVDR\Documents\FY23_PN96182_MPTR-STORAGE_INT_R21_K6ENXVDR.rvt

INTERIOR ROOM FINISH SCHEDULE												
		WALL FINISH				BASE FINISH				FLOOR	CEILING	
ROOM NO	ROOM NAME	NORTH	EAST	SOUTH	WEST	NORTH	EAST	SOUTH	WEST	FIN.	FIN.	NOTES & REMARKS (SEE NOTES)
101	STORAGE	PT-1	PT-1	PT-1	PT-1	RB-1	RB-1	RB-1	RB-1	SEALED CONCRETE	EXP	
102	OFFICE	PT	PT	PT	PT	RB	RB	RB	RB	SEALED CONCRETE	ACT-1	

INTERIOR FINISH LEGEND

ACOUSTICAL CEILING TILE	**RESILIENT BASE**
ACT-1: Armstrong; Calla 2824; 9/16IN; White; 24x24, SQ Tegular; Grid: Prelude ML 15/16" Exposed Tee, White	RB-1: Tarkett; Traditional Vinyl 1/8" Wall Base (Type TV); 4"H; Color: 80 Fawn
OPERABLE PARTITIONS	**SOLID SURFACING**
OP-1 Panelfold; Operable Partitions; Moduflex Series; Standard Vinyl Covering - Pathway, Limestone	SS-1: Wilsonart Solid Surface; Designer White D354SL (Sills)
PAINT	**WINDOW BLINDS**
PT-1: Sherwin Williams; SW7042 Shoji White; Eggshell (Main) PT-2: Sherwin Williams; SW7042 Shoji White; Flat (Ceiling) PT-3: Sherwin Williams; SW6174 Andiron; Semi-Gloss (Stair Trim) PT-4: Sherwin Williams; SW7533 Khaki Shade; Semi-Gloss (Trim & Doors)	WB-1: Levelor; Riviera 1" Metal Blinds; Alabaster (NOT USED IN CONTROL TOWER)

GENERAL SHEET NOTES

1. REFERENCE SPECIFICATION SECTION 09 06 00 "SCHEDULE FOR FINISHES" FOR INFORMATION REGARDING COLOR AND FINISH.
2. ALL EXTERIOR AND INTERIOR COLORS SHALL BE SUBMITTED FOR APPROVAL PER DIRECTIONS IN SPECIFICATION 09 06 00. COLOR BOARDS AND PROPOSED SAMPLES SHALL NOT BE SUBMITTED INDIVIDUALLY BUT IN A COMPLETE SET WITH ALL SAMPLES.
3. EXPOSED CONCRETE SLABS SHALL HAVE THE FOLLOWING:

   - INTERIOR SLABS NOT RECEIVING A FINISH SHALL HAVE A SEALER AND A TROWEL FINISH.

   - INTERIOR SLABS WITH VCT OR CARPET SHALL HAVE A TROWEL FINISH. A FILLER SHALL BE ADDED AS NEEDED AT CONCRETE CONTROL JOINTS TO ENSURE THAT JOINTS DO NOT BLEED THROUGH.

   - INTERIOR SLABS WITH CERAMIC TILE SHALL HAVE A STEEL TROWEL AND FINE BROOM FINISH FREE OF CURING COMPOUNDS.
4. WINDOW BLINDS WB-1 SHALL BE INSTALLED ON ALL EXTERIOR WINDOWS, EXCEPTING CONTROL TOWER WINDOWS.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: V. ROBERSON	ISSUE DATE: NOVEMBER 2023
DRAWN BY: V. ROBERSON	SOLICITATION NO.: W912HN-23-B-3001
CHECKED BY: M. DEACON	CONTRACT NO.:
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SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE ROOM FINISH SCHEDULE & FINISH LEGEND

SHEET ID
BLDG 3
IN601

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PIPING SYMBOLS

- GSS — GROUND SOURCE WATER SUPPLY
- GSR — GROUND SOURCE WATER RETURN
- MU — MAKE-UP WATER
- HG — REFRIGERANT HOT GAS
- RS — REFRIGERANT SUCTION
- RL — REFRIGERANT LIQUID
- PA — PIPE ANCHOR
- PG — PIPE GUIDE
- EXPANSION JOINT
- VENTURI
- GATE VALVE
- GLOBE VALVE
- HOSE VALVE WITH CAP
- BUTTERFLY VALVE
- CHECK VALVE
- BALANCING VALVE
- CALIBRATED BALANCING VALVE
- BALL VALVE
- PLUG VALVE
- S — SOLENOID VALVE
- SAFETY OR PRESSURE RELIEF, ANGLE VALVE
- SAFETY OR PRESSURE RELIEF, STRAIGHT THRU VALVE
- PRESSURE REDUCING VALVE (PRV)
- AUTOMATIC CONTROL VALVE, 2 WAY
- AUTOMATIC CONTROL VALVE, 3 WAY
- ELECTRICALLY OPERATED VALVE
- BLIND FLANGE
- LATERAL Y
- CAP
- ELBOW, 90°
- ELBOW, 90° TURNED UP
- ELBOW, 90° TURNED DOWN
- ELBOW, 45°
- TEE
- TEE, OUTLET TURNED UP
- TEE, OUTLET TURNED DOWN
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER (STRAIGHT INVERT)
- UNION
- FLEXIBLE PIPE CONNECTION
- PRESSURE GAGE
- TEMPERATURE GAGE
- THERMOMETER
- PT — PRESSURE/TEMPERATURE TEST PORT
- SANITARY DRAIN
- SD — STORM DRAIN
- VENT
- AW — ACID WASTE DRAIN
- AV — ACID VENT
- D — DRAINLINE
- DOMESTIC COLD WATER
- DOMESTIC HOT WATER
- DOMESTIC HOT WATER CIRCULATING
- G — GAS
- GV — GAS VENT
- A — COMPRESSED AIR
- AIR — MEDICAL AIR
- OXY — MEDICAL OXYGEN
- VAC — MEDICAL VACUUM
- NIT — NITROGEN
- NOX — NITROUS OXIDE
- FP — FIRE PROTECTION WATER SUPPLY
- FIRE DEPARTMENT CONNECTION

* PROVIDE SHUT OFF COCK WITH SIPHON OR PULSATION DAMPENER.

PIPING SYMBOLS

- WFD — WATERFLOW DETECTOR
- OS&Y VALVE
- PLUG
- FD — FLOOR DRAIN W/TRAP
- WCO — WALL CLEAN OUT (FCO, FLOOR CLEAN OUT)
- WHA — WATER HAMMER ARRESTER
- HB — HOSE BIBB
- WH — WALL HYDRANT
- DOUBLE CHECK VALVE BACKFLOW PREVENTER
- REDUCED PRESSURE BACKFLOW PREVENTER
- Y-TYPE STRAINER
- Y-TYPE STRAINER WITH HOSE DRAIN VALVE
- UPRIGHT FIRE SPRINKLER HEAD
- PENDANT FIRE SPRINKLER HEAD
- SIDEWALL FIRE SPRINKLER HEAD
- VACUUM GAGE

*PROVIDE SHUT OFF COCK WITH SIPHON OR PULSATION DAMPENER.

SINGLE LINE DUCTWORK SYMBOLS

- 12x6 — RECTANGULAR DUCT (FIRST FIGURE IS FOR SIDE SHOWN, SECOND FIGURE IS FOR SIDE NOT SHOWN)
- 36"Ø — ROUND DUCT
- 36x18 — FLAT OVAL DUCT (FIRST FIGURE IS FOR SIDE SHOWN, SECOND FIGURE IS FOR SIDE NOT SHOWN)
- FLEXIBLE ROUND DUCT
- FLEXIBLE DUCT CONNECTION
- VD — MANUAL OPPOSED BLADE VOLUME DAMPER
- MOTORIZED DAMPER
- BDD — BACK DRAFT DAMPER
- FD — FIRE DAMPER, 1 1/2 HOUR FIRE RATED
- 3FD — FIRE DAMPER, 3 HOUR FIRE RATED
- FSD — COMBINATION FIRE/SMOKE DAMPER
- SD — SMOKE DAMPER
- DUCT TRANSITION
- R — INCLINED RISE W/RESPECT TO AIR FLOW, RECTANGULAR
- D — INCLINED DROP W/RESPECT TO AIR FLOW, RECTANGULAR
- R — INCLINED RISE W/RESPECT TO AIR FLOW, ROUND OR FLAT OVAL
- D — INCLINED DROP W/RESPECT TO AIR FLOW, ROUND OR FLAT OVAL
- 90° ELBOW, RECTANGULAR
- 90° ELBOW, ROUND OR FLAT OVAL (SMOOTH OR 5-PIECE ELBOWS)
- 45° ELBOW, RECTANGULAR
- 45° ELBOW, ROUND OR FLAT OVAL (SMOOTH OR 3-PIECE ELBOWS)
- DF — DIVIDED FLOW FITTING, RECTANGULAR
- RECTANGULAR TAP-IN BRANCH OR ROUND OR FLAT OVAL CONICAL TEE
- INCLINED CONICAL TAKE-OFF, ROUND OR FLAT OVAL
- "Y" FITTING, ROUND OR FLAT OVAL
- 90° ELBOW TURNED UP, RECTANGULAR
- 90° ELBOW TURNED DOWN, RECTANGULAR
- 90° ELBOW TURNED UP, ROUND; FLAT OVAL SIMILAR
- 90° ELBOW TURNED DOWN, ROUND; FLAT OVAL SIMILAR
- CEILING DIFFUSER (ARROWS INDICATE THROW DIRECTIONS)
- CEILING REGISTER OR GRILLE, EXHAUST OR RETURN
- CEILING REGISTER OR GRILLE, SUPPLY
- STATIC PRESSURE SENSOR
- SPS — END OF DUCT RUN

MISC SYMBOLS

- 0000 — ROOM NUMBER
- ROUND DUCT
- FLAT OVAL DUCT
- POINT OF CONNECTION BETWEEN NEW AND EXISTING WORK
- POINT BETWEEN EXISTING WORK TO REMAIN AND EXISTING WORK TO BE REMOVED
- EXISTING WORK TO BE REMOVED
- EXISTING WORK TO REMAIN
- WATER SENSOR (LOCATED BELOW ACCESS FLOOR)
- ES — HVAC SYSTEM EMERG SHUT-OFF SWITCH
- SD — SMOKE DETECTOR
- INTERVAL TIMER
- H — HUMIDISTAT
- T — THERMOSTAT / TEMPERATURE SENSOR
- N — NIGHT THERMOSTAT
- CO — CARBON MONOXIDE SENSOR
- WALL SWITCH
- UC — DOOR UNDERCUT, SEE DOOR SCHEDULES FOR SIZE

DOUBLE LINE DUCTWORK SYMBOLS

- 12x6 — RECTANGULAR DUCT (FIRST FIGURE IS FOR SIDE SHOWN, SECOND FIGURE IS FOR SIDE NOT SHOWN)
- 12"Ø — ROUND DUCT
- 12x6 — FLAT OVAL DUCT (FIRST FIGURE IS FOR SIDE SHOWN, SECOND FIGURE IS FOR SIDE NOT SHOWN)
- FLEXIBLE ROUND DUCT
- FLEXIBLE DUCT CONNECTION
- VD — MANUAL OPPOSED BLADE VOLUME DAMPER
- MOTORIZED DAMPER
- BDD — BACK DRAFT DAMPER
- FD — FIRE DAMPER, 1 1/2 HOUR FIRE RATED
- 3FD — FIRE DAMPER, 3 HOUR FIRE RATED
- FSD — COMBINATION FIRE/SMOKE DAMPER
- SD — SMOKE DAMPER
- DUCT TRANSITION, ROUND OR FLAT OVAL TO RECTANGULAR
- DUCT TRANSITION, RECTANGULAR TO ROUND OR FLAT OVAL
- DUCT TRANSITION, RECTANGULAR, ROUND, OR FLAT OVAL
- R — INCLINED RISE W/RESPECT TO AIR FLOW, RECTANGULAR
- D — INCLINED DROP W/RESPECT TO AIR FLOW, RECTANGULAR
- R — INCLINED RISE W/RESPECT TO AIR FLOW, ROUND OR FLAT OVAL
- D — INCLINED DROP W/RESPECT TO AIR FLOW, ROUND OR FLAT OVAL
- 90° ELBOW, RECTANGULAR WITH TURNING VANES
- 45° ELBOW, RECTANGULAR WITH TURNING VANES

DOUBLE LINE DUCTWORK SYMBOLS

- 90° ELBOW, ROUND OR FLAT OVAL (SMOOTH OR 5 PIECE ELBOWS)
- MITERED 90° ELBOW, ROUND OR FLAT OVAL
- 12X6(L) — RECTANGULAR DUCT WITH 1" INTERNAL LINER DUCT SIZE IS THE CLEAR INSIDE DIMENSION
- 45° ELBOW, ROUND OR FLAT OVAL (SMOOTH OR 3 PIECE ELBOWS)
- VD — DIVIDED FLOW FITTING
- TAP-IN BRANCH, RECTANGULAR
- BRANCH DUCT, CONICAL LATERAL FITTING, ROUND OR FLAT OVAL
- BRANCH DUCT, CONICAL TEE FITTING, ROUND OR FLAT OVAL
- BRANCH DUCT, "Y" FITTING, ROUND OR FLAT OVAL
- SUPPLY DUCT SECTION, RECTANGULAR
- EXHAUST OR RETURN DUCT SECTION, RECTANGULAR
- 90° ELBOW TURNED UP, RECTANGULAR
- 90° ELBOW TURNED DOWN, RECTANGULAR
- 90° ELBOW TURNED UP, ROUND; FLAT OVAL SIMILAR
- 90° ELBOW TURNED DOWN, ROUND; FLAT OVAL SIMILAR
- CEILING DIFFUSER (ARROWS INDICATE THROW DIRECTIONS)
- CEILING DIFFUSER (ARROWS INDICATE THROW DIRECTIONS)
- CEILING REGISTER OR GRILLE (RETURN OR EXHAUST)
- CEILING REGISTER OR GRILLE (SUPPLY)
- REGISTER OR GRILLE
- CEILING DIFFUSER WITH FLEXIBLE DUCT CONNECTION (ARROWS INDICATE THROW DIRECTION)
- S-000 — LIGHT TROFFER WITH FLEXIBLE DUCT CONNECTION. "S" INDICATES SUPPLY, NUMBER INDICATES CFM
- CEILING LINEAR SLOT OR INTEGRATED CEILING DIFFUSER (CLSD) WITH FLEXIBLE DUCT CONNECTION (ARROWS INDICATE THROW DIRECTION)
- SPS — STATIC PRESSURE SENSOR
- HUMIDIFIER
- SB — SECURITY BAR
- 24x24 DW — DOUBLE WALL DUCTWORK (2" INTERNAL INSULATION WITH PERFORATED LINER) DUCT DIMENSIONS ARE OUTSIDE SHEETMETAL DIMENSIONS

GENERAL NOTES

1. ALL EQUIPMENT, DUCTWORK, AND PIPING SHOWN ON DRAWINGS ARE DIAGRAMMATIC. CONTRACTOR SHALL VERIFY EXACT SIZE AND LOCATION IN FIELD.
2. MECHANICAL LAYOUTS ARE SCHEMATIC. PROVIDE ANY ADDITIONAL DROPS, RISES, OR OFFSETS REQUIRED FOR A COMPLETE INSTALLATION. COORDINATE EXACT ROUTING OF WORK WITH ALL OTHER TRADES AND OBSTRUCTIONS. COORDINATE EXACT LOCATIONS OF CEILING MOUNTED WORK WITH LIGHTS, CEILING GRID, AND OTHER OBSTRUCTIONS.
3. UNLESS OTHERWISE INDICATED, ROUTE ALL DUCTWORK AND PIPING ABOVE CEILINGS. ROUTE ALL DUCTWORK AND PIPING AS HIGH AS POSSIBLE IN AREAS WITHOUT CEILINGS.
4. DUCT DIMENSIONS ARE OUTSIDE SHEETMETAL DIMENSIONS.
5. ALL DUCTWORK SYSTEMS SHALL MEET THE REQUIREMENTS OF SEAL CLASS A. DUCT STATIC PRESSURE CLASSIFICATION PER SMACNA DUCT CONSTRUCTION STANDARDS SHALL BE AS FOLLOWS: 2 IN. W.G. FOR OUTSIDE AIR.
6. UNLESS OTHERWISE INDICATED, PROVIDE DUCT RUNOUTS TO AIR DISTRIBUTION DEVICES SAME SIZE AS NECK SIZE.
7. ALL WORK INDICATED IS NEW UNLESS INDICATED AS EXISTING.
8. SOME SYMBOLS INDICATED ON THIS LEGEND SHEET MAY NOT APPEAR ON THE DRAWINGS.
9. DO NOT LOCATE MECHANICAL WORK IN ELECTRICAL OR COMMUNICATION ROOMS, EXCEPT FOR RUNOUTS SPECIFICALLY SERVING THE RESPECTIVE ROOMS.
10. ALL PIPING PENETRATIONS THROUGH FIRE RATED ASSEMBLY SHALL BE SEALED WITH UL FIRESTOP SYSTEM LISTED FOR THAT RATED ASSEMBLY. SEE ARCH DRAWINGS FOR RATING AND LOCATION.
11. DRAWING REFLECTED DIMENSIONS OF THE DESIGN MFG. EQUIPMENT ALLOWABLE ALTERNATES, WHILE EQUAL IN CAPACITY WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MEET THE SPACE REQUIREMENT AND PROVIDE EQUALITY WITH THE DESIGN MFG. EQUIPMENT.
12. ALL RECTANGULAR DUCT ELBOWS SHALL HAVE TURNING VANES. ALL ROUND DUCT ELBOWS SHALL BE FULL RADIUS ELBOWS.
13. CONTRACTOR SHALL NOT INSTALL ANY EQUIPMENT OR FABRICATE ANY DUCTWORK PRIOR TO VERIFICATION OF ROUTING AND AVAILABLE SPACE. COORDINATE SPACE REQUIREMENT WITH ALL TRADES.
14. ALL MATERIALS INSTALLED IN THE RETURN AIR PLENUM (CEILING OR ROOM) MUST BE RATED FOR AIR PLENUM INSTALLATION, COORD. WITH ALL TRADES.
15. THE MECHANICAL SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS, SPECIFICATIONS, AND THE INTERNATIONAL MECHANICAL CODE. MANUFACTURERS RECOMMENDATIONS SHALL BE CONSIDERED MANDATORY.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ
DRAWN BY: C.MELENDEZ NARVAEZ
CHECKED BY: S.MARKO
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.: -
CATEGORY CODE: 178-85-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

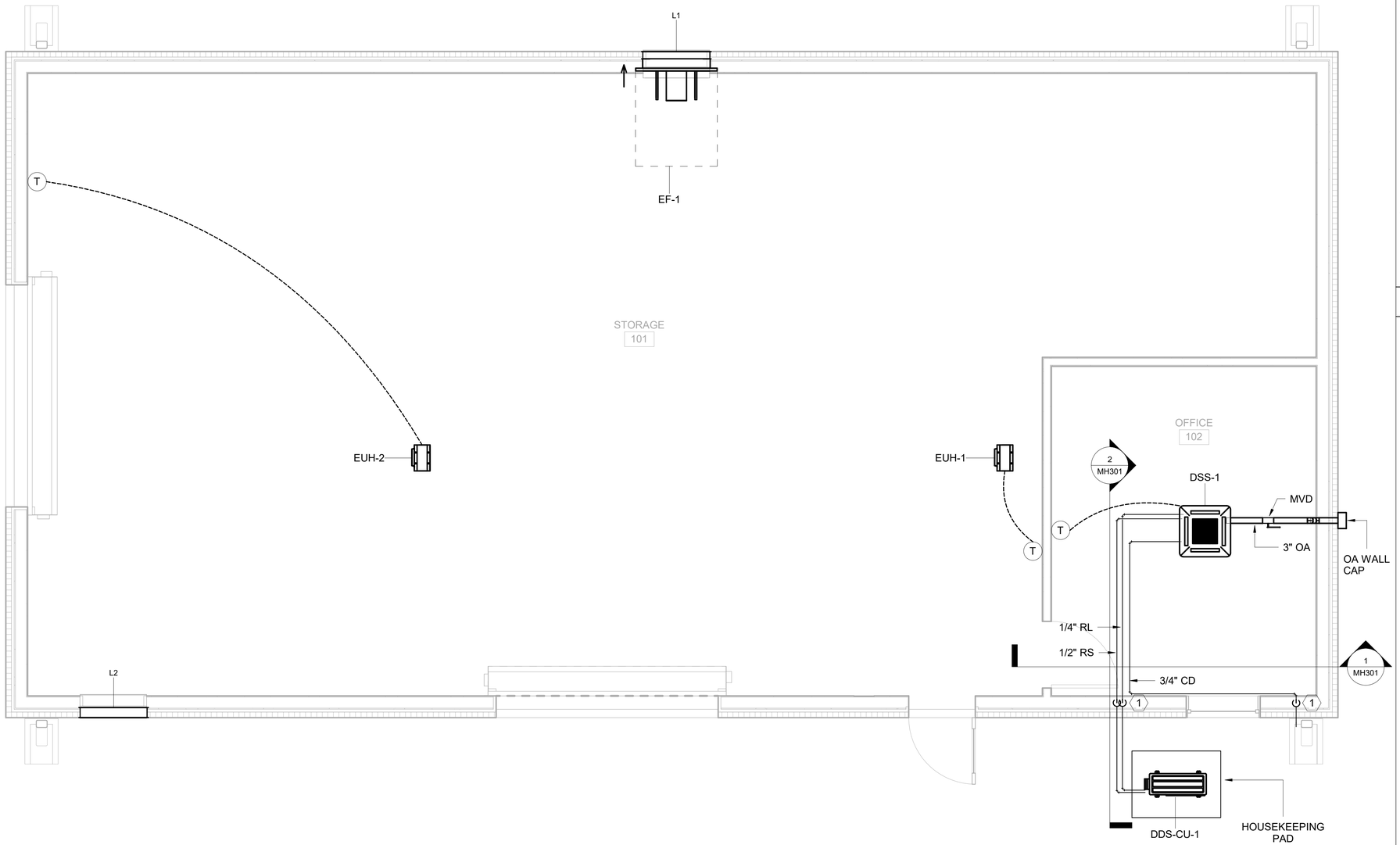
OPERATIONS/STORAGE BUILDING HVAC LEGEND

SHEET ID
BLDG 3
M-001

READY TO ADVERTISE (RTA)

File Path: C:\Users\k6endcm9\Documents\FY23_PN96182_MPTR-STORAGE_HVAC_R21_k6endcm9.rvt

Plot Date: 11/28/2023 7:57:15 AM



1 HVAC FLOOR PLAN

3/8" = 1'-0"

GENERAL SHEET NOTES

1. ALL PIPING SHOWN OFFSET FOR CLARITY.
2. SIZE ALL PIPING PER MANUFACTURER'S RECOMMENDATION.
3. SPLASH BLOCK WILL BE PROVIDED FOR CONDENSATE DRAIN AT FINISHED GRADE. CONDENSATE PIPE SHALL TERMINATE MINIMUM 6" ABOVE GRADE.
4. PROVIDE HOUSEKEEPING PAD. PAD SHALL BE 6" LARGER THAN UNIT IN ALL DIMENSIONS. SEE CIVIL PLANS FOR LOCATION.
5. SIZE ALL DUCT PER MANUFACTURER'S RECOMMENDATION.
6. CONTRACTOR SHALL PROVIDE DSS-1 WITH MANUFACTURER RECOMMENDED OUTDOOR AIR DUCT WITH MANUAL VOLUME DAMPER. CONTRACTOR SHALL SIZE OA PER MANUFACTURER'S RECOMMENDATION. CONTRACTOR SHALL PROVIDE OA DUCT WITH MANUFACTURER RECOMMENDED WALL CAP WITH INSECT SCREEN, FINISH TO BE APPROVED BY CONTRACTING OFFICER REPRESENTATIVE (COR).
7. ELECTRIC UNIT HEATER SUPPORTED FROM STRUCTURE ABOVE. REFER TO DETAIL 1/MH501. REFER TO SCHEDULE FOR SIZE AND CAPACITY.

KEYED NOTES

1. SEE PIPE SLEEVE DETAIL 1/MH502.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ
DRAWN BY: C.MELENDEZ NARVAEZ
CHECKED BY: S. MARKO
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING HVAC FLOOR PLAN

SHEET ID
BLDG 3
MH101

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 7:57:18 AM

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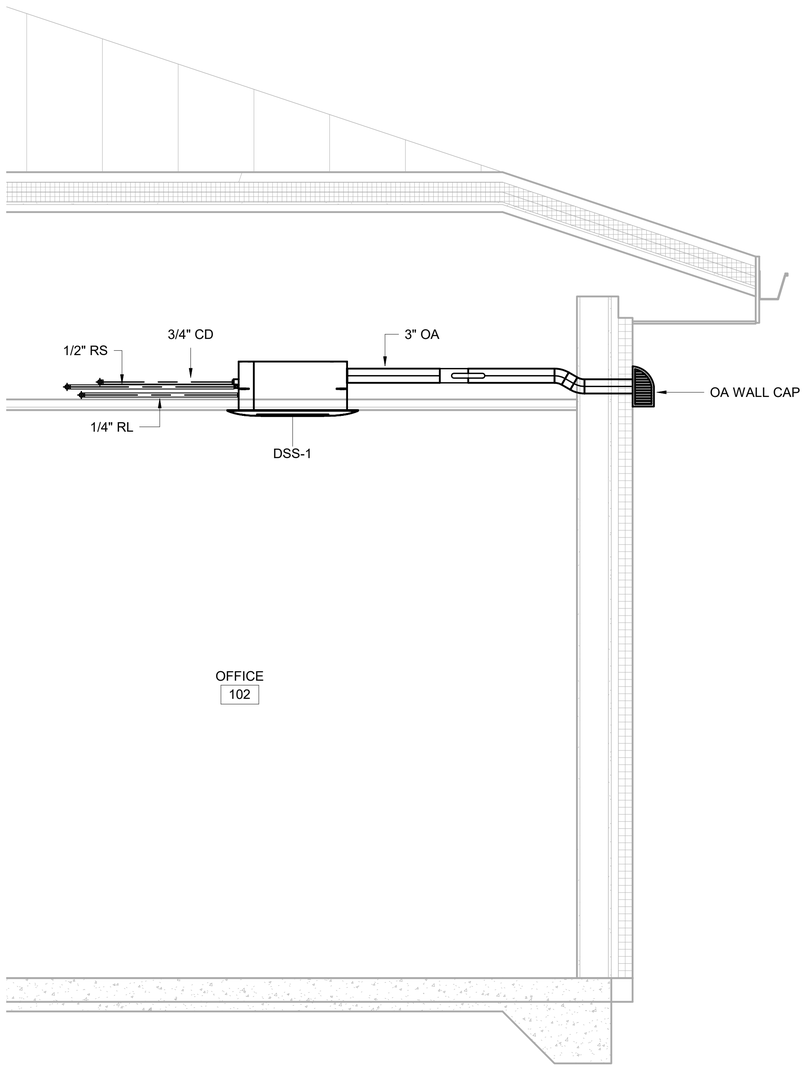
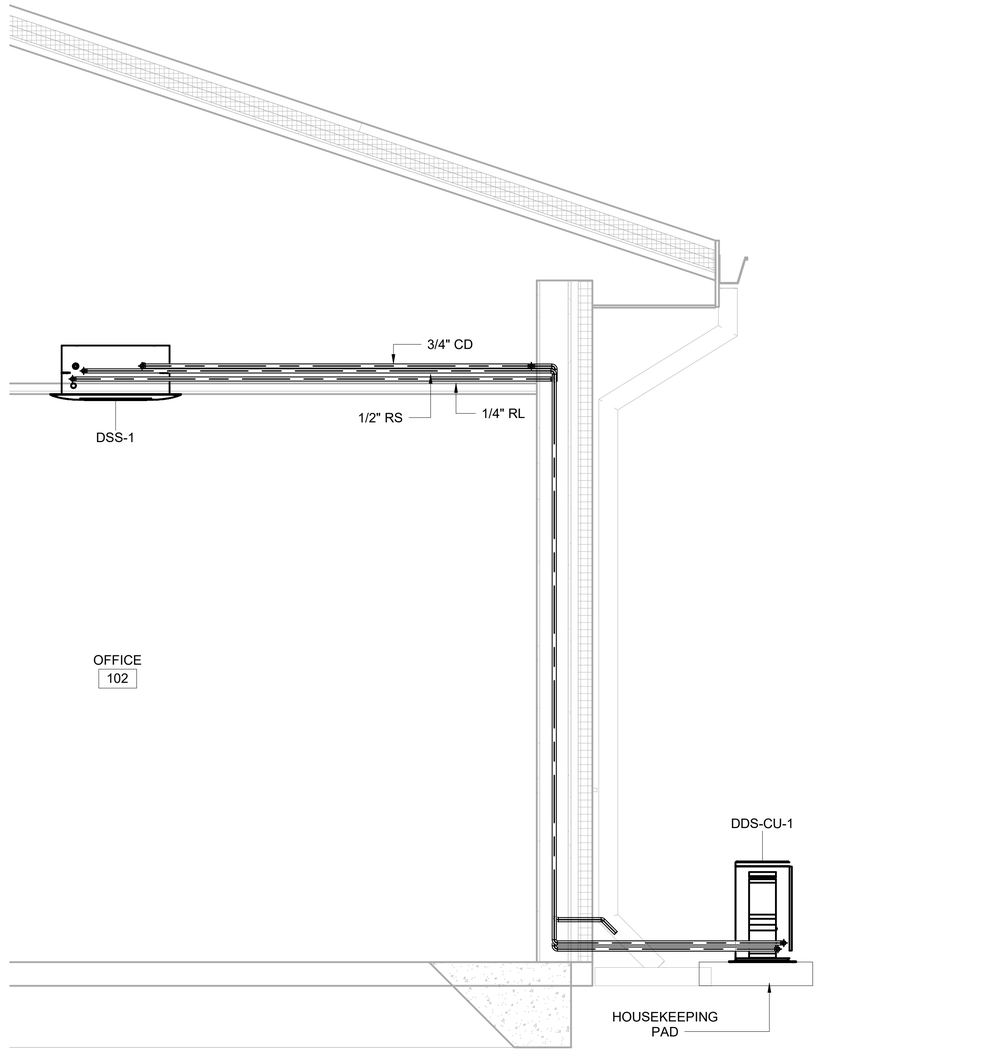


GENERAL NOTES:

1. ALL PIPING SHOWN OFFSET FOR CLARITY.

1 EAST-WEST BLDG SECTION

3/4" = 1'-0"



GENERAL NOTES:

1. ALL PIPING SHOWN OFFSET FOR CLARITY.

2 SOUTH-NORTH BLDG SECTION

3/4" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ
DRAWN BY: C.MELENDEZ NARVAEZ
CHECKED BY: S.MARKO
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING HVAC SECTIONS

SHEET ID
BLDG 3
MH301

Plot Date: 11/28/2023 7:57:21 AM

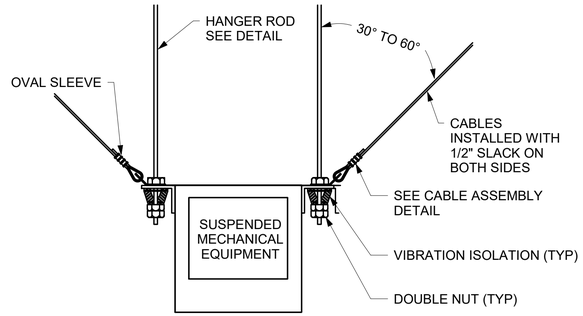
File Path: C:\Users\k6endcm9\Documents\FY23_PN96182_MPTR-STORAGE_HVAC_R21_k6endcm9.rvt

READY TO ADVERTISE (RTA)

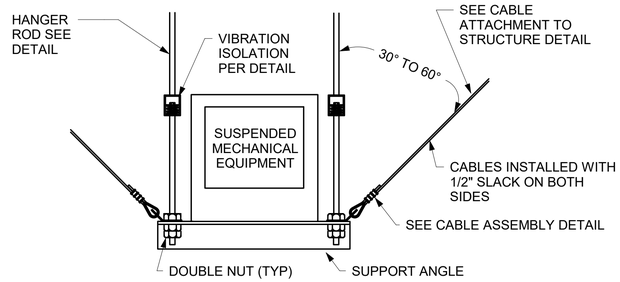
NOTES:
ALL DETAILS THIS SHEET

SUSPENDED EQUIPMENT:

1. ALL SUSPENDED MECHANICAL EQUIPMENT WEIGHING OVER 31 POUNDS SHALL BE INSTALLED TO RESIST FORCES OF 0.5 TIMES THE EQUIPMENT WEIGHT IN ANY DIRECTION AND 1.5 TIMES THE EQUIPMENT WEIGHT IN THE DOWNWARD DIRECTION.
2. THESE DETAILS ARE PROVIDED AS GUIDANCE FOR THE SUPPORT OF SUSPENDED MECHANICAL EQUIPMENT FINAL DETAILS BY MECHANICAL VENDOR.
3. MATERIAL USED FOR PLATES, RODS, AND ROLLED SHAPES MUST BE STRUCTURAL STEEL CONFORMING TO ASTM A36/A36M. MATERIAL USED FOR WIRE ROPE MUST BE STRUCTURAL STEEL CONFORMING TO ASTM A603 PER-STRETCHED. CLASS C GALVANIZED COATING FERRULE CLAMPS MUST BE QUALIFIED BY TESTING FOR USE IN SEISMIC APPLICATIONS PER VISCMA 412. A MINIMUM OF TWO CLAMPS ARE REQUIRED ON EACH END OF WIRE ROPE.
4. USE 1/2" DIA FOR ALL HANGERS. USE 1/4" DIA FOR CABLES.



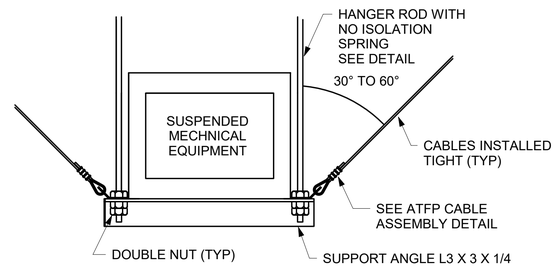
ELEVATION



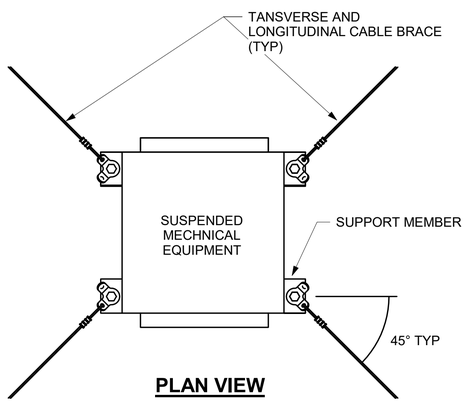
ELEVATION

1 BRACING FOR EQUIPMENT NOT INTERNALLY ISOLATED

NOT TO SCALE



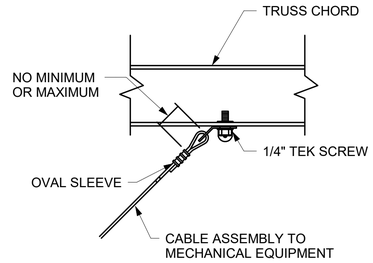
ELEVATION



PLAN VIEW

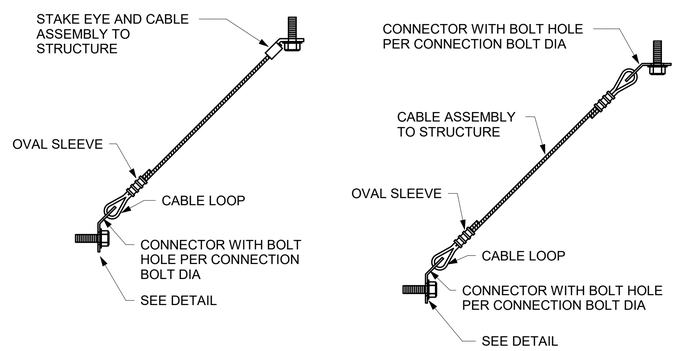
2 BRACING FOR INTERNALLY ISOLATED EQUIPMENT DETAIL

NOT TO SCALE



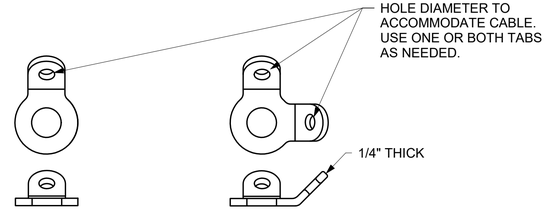
3 CABLE BRACING ATTACHMENT TO STRUCTURE

NOT TO SCALE



5 CABLE BRACING ASSEMBLY

NOT TO SCALE



4 BRACING CONNECTOR DETAIL

NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ
DRAWN BY: C.MELENDEZ NARVAEZ
CHECKED BY: S.MARKO
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING HVAC DETAILS

SHEET ID
BLDG 3
MH501

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 7:57:24 AM

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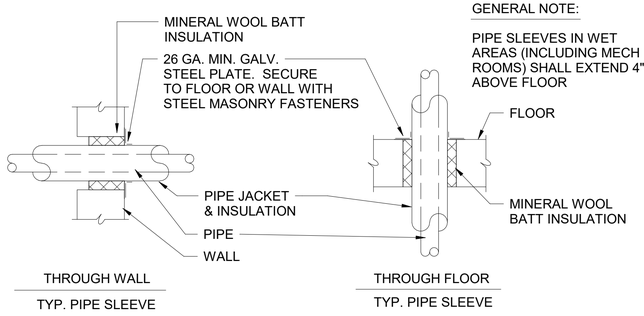
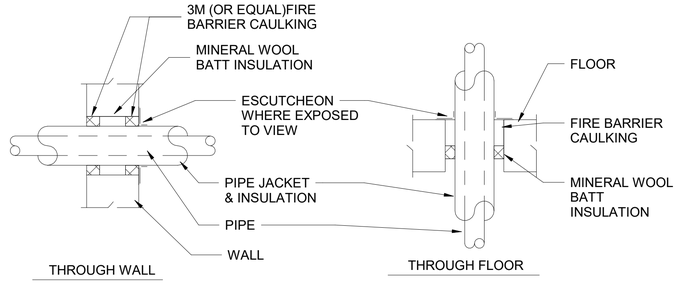


GENERAL NOTE:

PIPE SLEEVES IN WET AREAS (INCLUDING MECH ROOMS) SHALL EXTEND 4" ABOVE FLOOR



NOTE :

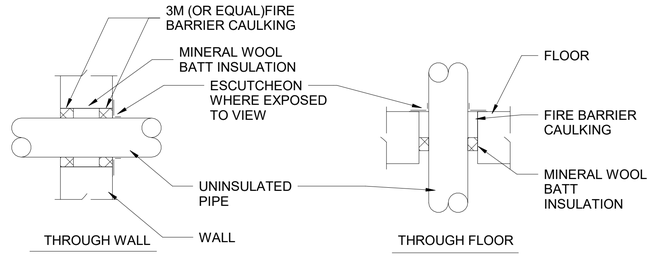
THE ASSEMBLY ABOVE IS BASED ON U.L. PENETRATION ASSEMBLY NO. 91 INSTALL PENETRATION ASSEMBLY IN ACCORDANCE WITH ITS LISTING.

INSULATED PIPE

FIRE RATED PIPE SLEEVE

GENERAL NOTE:

PIPE SLEEVES IN WET AREAS (INCLUDING MECH ROOMS) SHALL EXTEND 4" ABOVE FLOOR



NOTE :

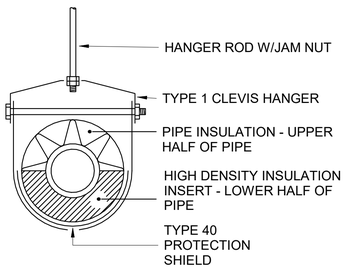
THE ASSEMBLY ABOVE IS BASED ON U.L. PENETRATION ASSEMBLY NO. 49 INSTALL PENETRATION ASSEMBLY IN ACCORDANCE WITH ITS LISTING.

UNINSULATED PIPE

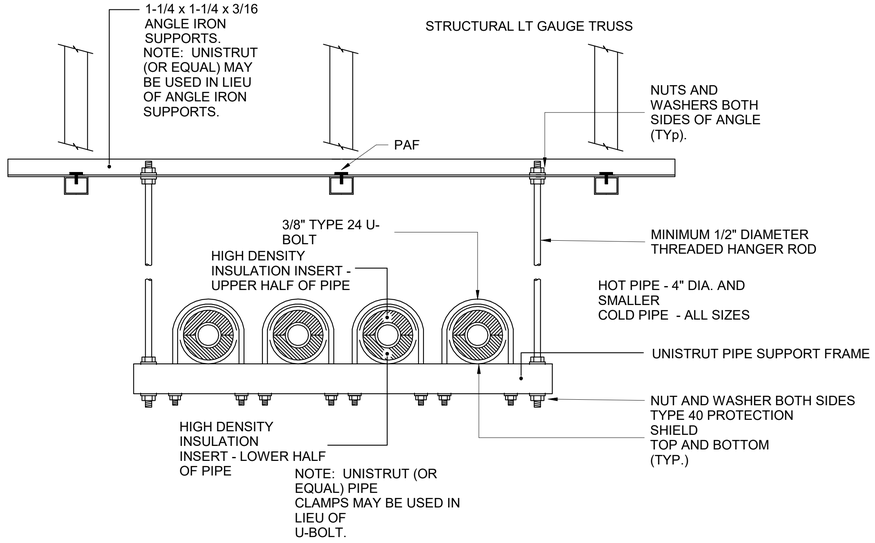
FIRE RATED PIPE SLEEVE

1 PIPE SLEEVE DETAILS

NOT TO SCALE



HOT PIPE - 4" DIA. AND SMALLER
COLD PIPE - ALL SIZES



2 HORIZONTAL PIPE SUPPORT DETAIL

NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ	ISSUE DATE: NOVEMBER 2023
DRAWN BY: C.MELENDEZ NARVAEZ	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: S.MARKO	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

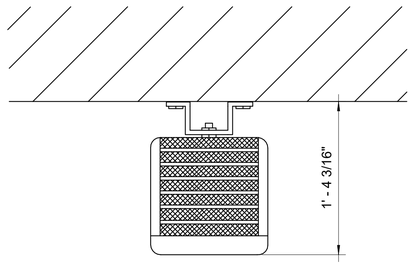
OPERATIONS/STORAGE BUILDING HVAC DETAILS

SHEET ID
BLDG 3
MH502

READY TO ADVERTISE (RTA)

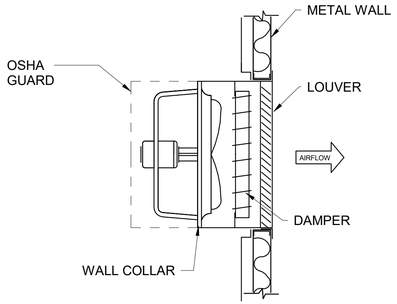
Plot Date: 11/28/2023 7:57:27 AM

File Path: C:\Users\kbendcm9\Documents\FY23_PN96182_MPTR-STORAGE_HVAC_R21_kbendcm9.rvt



1 ELECTRIC UNIT HEATER DETAIL

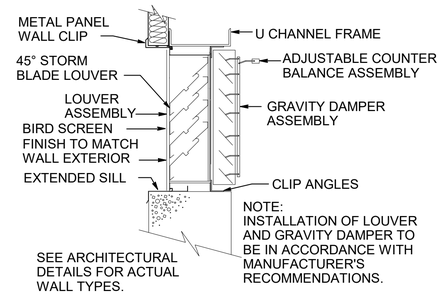
NOT TO SCALE



PROVIDE AUXILARY FRAMING AS REQUIRED TO SUPPORT FRAME.

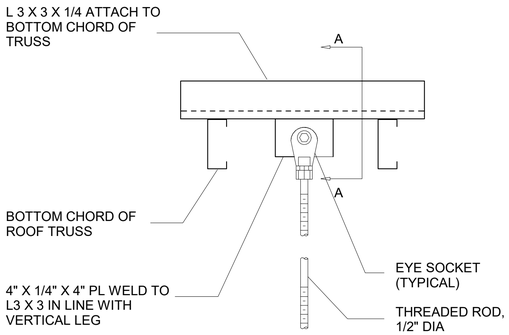
2 WALL MOUNTED EXHAUST FAN DETAIL

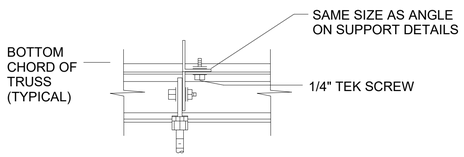
NOT TO SCALE



3 DRAINABLE LOUVER DETAIL

NOT TO SCALE





SECTION A-A

NOTE:

1. MATERIAL USED FOR PLATES, RODS, AND ROLLED SHAPES MUST BE STRUCTURAL STEEL CONFORMING TO ASTM A36/A36M.

2. MATERIAL USED FOR WIRE ROPE MUST BE STRUCTURAL STEEL CONFORMING TO ASTM A603 PER-STRETCHED.

3. CLASS C GALVANIZED COATING FERRULE CLAMPS MUST BE QUALIFIED BY TESTING FOR USE IN SEISMIC APPLICATIONS PER VISCMA 412. A MINIMUM OF TWO CLAMPS ARE REQUIRED ON EACH END OF WIRE ROPE.

4 STRUCTURAL CONNECTION

NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: C.MELENDEZ NARVAEZ	ISSUE DATE: NOVEMBER 2023
DRAWN BY: C.MELENDEZ NARVAEZ	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: S.MARKO	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING HVAC DETAILS

SHEET ID
BLDG 3
MH503

READY TO ADVERTISE (RTA)

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DUCTLESS SPLIT SYSTEM SCHEDULE																
						HEATING COIL										
UNIT MARK	LOCATION	TYPE	MIN SEER	MIN. CFM	OA VENT (CFM)	MIN. TOTAL CAP (MBh)	EA DB	LA DB	MIN. TOTAL CAP (MBh)	EA DB	EA WB	LA DB	MARK	LOCATION	V/HZ/PH	NOTES
DSS-1	OFFICE 102	CEILING MOUNTED	14	365	21	10.1	65.3 °F	90.0 °F	11.3	79.3 °F	63 °F	55.0 °F	DSS-CU-1	AT GRADE	SEE ELECTRICAL	1, 2, 3, 4, 5, 6

NOTES

1. PROVIDE WITH MANUFACTURER WALL MOUNTED WIRED THERMOSTAT.
2. INDOOR UNIT SHALL BE SUPPLIED WITH EQUIPMENT MANUFACTURER'S RECOMMENDED, FACTORY MOUNTED CONDENSATE PUMP AND CONDENSATE FLOAT ALARM.
3. ROUTE CONDENSATE FROM INDOOR UNIT TO AN OUTSIDE SPLASH BLOCK. CONDENSATE LINE SHALL BE SIZED AND SLOPED PER MANUFACTURER'S RECOMMENDATIONS. AVOID RUNNING CONDENSATE PIPING OVER ELECTRICAL EQUIPMENT AND TELECOMMUNICATION EQUIPMENT.
4. DESIGN BASED ON UNIT THAT HAS POWER CONNECTION AT THE OUTDOOR UNIT, AND THE INDOOR UNIT IS PROVIDED POWER FROM THE OUTDOOR UNIT.
5. PROVIDE WITH MANUFACTURER PROVIDED FILTER.
6. DSS SHALL BE PROVIDED WITH MANUFACTURER RECOMMENDED OUTDOOR AIR DUCT WITH MANUAL VOLUME DAMPER. PROVIDE OA DUCT WITH MANUFACTURER RECOMMENDED WALL CAP WITH INSECT SCREEN, FINISH TO BE APPROVED BY CONTRACTING OFFICER REPRESENTATIVE (COR).

ELECTRIC UNIT HEATER SCHEDULE							
MARK	LOCATION	TYPE	AIRFLOW (CFM)	CAPACITY (kW)	MAX MOUNTING HEIGHT (FT)	V/HZ/PH	NOTES
EUH-1	STORAGE 101	CEILING MOUNTED	650	10	12	SEE ELECTRICAL	1, 2
EUH-2	STORAGE 101	CEILING MOUNTED	650	10	12	SEE ELECTRICAL	1, 2

NOTES

1. PROVIDE WITH UNIT MOUNTED DISCONNECT SWITCH.
2. PROVIDE WITH REMOTE 24V THERMOSTAT.

FAN SCHEDULE									
MARK	SERVICE	TYPE	FAN TYPE	AIRFLOW (CFM)	EXT. SP (IN)	FAN SPEED (RPM)	DRIVE TYPE	MOTOR (HP)	NOTES
EF-1	STORAGE 101	WALL MOUNTED	EXHAUST	1500	0.257	860	DIRECT	0.5	1, 2, 3

NOTES

1. PROVIDE UNIT MOUNTED STARTER/DISCONNECT IF NOT PROVIDED BY MANUFACTURER.
2. SEE ARCHITECTUAL ELEVATIONS FOR EXACT LOCATION AND MOUNTING HEIGHT.
3. PROVIDE WITH SPEED CONTROLLER.

LOUVER SCHEDULE								
MARK	LOCATION	SERVICE	FLOW (CFM)	WIDTH (IN)	HEIGHT (IN)	FACE VELOCITY (FT/MIN)	MINIMUM FREE AREA (%)	NOTES
L1	STORAGE 101	EXHAUST	1500	36	36	500	50	1, 2, 3, 4, 5, 6
L2	STORAGE 101	INTAKE	1500	36	24	500	50	1, 2, 3, 4, 5, 6

NOTES

1. SEE ARCHITECTURAL ELEVATIONS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS.
2. PROVIDE WITH WIRE MESH BIRD SCREEN.
3. COLOR PER ARCHITECTURAL; TO MATCH ADJACENT EXTERIOR SURFACE.
4. LOUVER SHALL BE RAIN RESISTANT, DRAINABLE BLADE STATIONARY LOUVER TYPE.
5. PROVIDE GRAVITY DAMPER ATTACHED TO REAR OF LOUVER.

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W-X-Y-Z
##
DEVICE SYMBOL, GENERIC
USED TO REPRESENT SENSORS, INSTRUMENTS SAFETIES, AND OTHER CONTROL DEVICES
W-X-Y-Z : (SEE ABBREVIATIONS AND ACRONYMS)

GENERIC USAGE TO SHOW LOCATION OF DEVICE; PROCESS OR DEVICE BEING MEASURED OR CONTROLLED; SIGNAL TYPE; MODIFIERS AND OTHER APPLICATION INFORMATION

W-X-Y-Z
##
DEVICE SYMBOL, GENERIC
MULTIPLE OUTPUT DEVICE WHERE AT LEAST 1 OUTPUT IS ALWAYS SAFETY INTERLOCK

W-X-Y-Z
DDC
##
DIR
REV
DEVICE SYMBOL, CONTROLLER
DDC : DIRECT DIGITAL CONTROL
: DEVICE NUMBER
DIR : DIRECT CONTROL ACTION, OR
REV : REVERSE CONTROL ACTION

W-X-Y-Z : (SEE ABBREVIATIONS AND ACRONYMS)

GENERIC USAGE TO SHOW LOCATION OF DEVICE; PROCESS OR DEVICE BEING MEASURED OR CONTROLLED; SIGNAL TYPE; MODIFIERS AND OTHER APPLICATION INFORMATION

ACTUATOR, ELECTRIC

P
ACTUATOR, PNEUMATIC
WITH LOCALLY MOUNTED PRESSURE GAGE

P
PP
M
ACTUATOR, PNEUMATIC
WITH POSITIVE POSITIONER AND LOCALLY MOUNTED PRESSURE GAGE

AFMA
AIR FLOW MEASUREMENT ARRAY, WITH FLOW TRANSMITTER
SEE "DEVICE SYMBOL, GENERIC"

BOILER

CHILLER

C
COIL, COOLING

DX
COIL, COOLING, DIRECT-EXPANSION

HC
COIL, HEAT/COOL (DUAL TEMPERATURE)

H
COIL, HEATING

PC
COIL, PRECOOL

PH
COIL, PREHEAT

CONTACT, PRESSURE, HIGH LIMIT (HL)
SHOWN IN ACTIVATED POSITION
OPEN WHEN PRESSURE IS ABOVE SETPOINT
CLOSED WHEN PRESSURE IS BELOW SETPOINT

CONTACT, PRESSURE, HIGH LIMIT (HL)
SHOWN IN UNACTIVATED POSITION
OPEN WHEN PRESSURE IS ABOVE SETPOINT
CLOSED WHEN PRESSURE IS BELOW SETPOINT

CONTACT, PRESSURE, LOW LIMIT (LL)
SHOWN IN ACTIVATED POSITION
OPEN WHEN PRESSURE IS BELOW SETPOINT
CLOSED WHEN PRESSURE IS ABOVE SETPOINT

CONTACT, PRESSURE, LOW LIMIT (LL)
SHOWN IN UNACTIVATED POSITION
OPEN WHEN PRESSURE IS BELOW SETPOINT
CLOSED WHEN PRESSURE IS ABOVE SETPOINT

CONTACT, TEMPERATURE, HIGH LIMIT (HL)
SHOWN IN ACTIVATED POSITION
OPEN WHEN TEMPERATURE IS ABOVE SETPOINT
CLOSED WHEN TEMPERATURE IS BELOW SETPOINT

CONTACT, TEMPERATURE, HIGH LIMIT (HL)
SHOWN IN UNACTIVATED POSITION
OPEN WHEN TEMPERATURE IS ABOVE SETPOINT

CONTACT, TEMPERATURE, LOW LIMIT (LL)
SHOWN IN ACTIVATED POSITION
OPEN WHEN TEMPERATURE IS BELOW SETPOINT
CLOSED WHEN TEMPERATURE IS ABOVE SETPOINT

CONTACT, TEMPERATURE, LOW LIMIT (LL)
SHOWN IN UNACTIVATED POSITION
OPEN WHEN TEMPERATURE IS BELOW SETPOINT
CLOSED WHEN TEMPERATURE IS ABOVE SETPOINT

CONTROL SIGNAL LINE, LOW VOLTAGE

CURRENT TRANSFORMER/SWITCH

DAMPER, BALANCING

D-##
DAMPER, PARALLEL BLADE
NORMALLY OPEN OR CLOSED AS SHOWN
= DAMPER NUMBER AS SHOWN
IN DAMPER SCHEDULE

D-##
DAMPER, OPPOSED BLADE
NORMALLY OPEN OR CLOSED AS SHOWN
= DAMPER NUMBER AS SHOWN
IN DAMPER SCHEDULE

HEAT EXCHANGER

MAIN AIR
MAIN AIR

M#
MOTOR

MS-#
MOTOR STARTER

Rxx
RELAY COIL
xx = SEQUENTIAL RELAY
(SOLENOID NUMBER)

Rxx-YY
RELAY COIL CONTACT
NORMALLY OPEN
xx = RELAY COIL NUMBER
YY = CONTACT NUMBER

Rxx-YY
RELAY COIL CONTACT
NORMALLY CLOSED
xx = RELAY COIL NUMBER
YY = CONTACT NUMBER

EPS
##
ELECTRIC-TO-PNEUMATIC SWITCH
(SOLENOID ACTUATED PNEUMATIC VALVE)
= SEQUENTIAL NUMBER
(WHEN MORE THAN 1 EPS)

EP
##
ELECTRIC-TO-PNEUMATIC TRANSDUCER
VDC OR mA INPUT / 3-15 PSI OUTPUT
= SEQUENTIAL NUMBER
(WHEN MORE THAN 1 EP)

FAN

FILTER

LDP
##
LOCAL DISPLAY PANEL
= SEQUENTIAL NUMBER
(WHEN MORE THAN 1 LDP)

PP
POSITIVE POSITIONER
SEE "ACTUATOR, PNEUMATIC"

P
PRESSURE GAGE

P
H
L
PRESSURE SWITCH, DIFFERENTIAL, WITH GAGE
H = HIGH PRESSURE TAP
L = LOW PRESSURE TAP
SEE "DEVICE SYMBOL, GENERIC"

PUMP

RADIATOR

RST-BUT
RESET BUTTON FOR SAFETY RESET

SMOKE DETECTOR, DUCT-MOUNTED
SEE "DEVICE SYMBOL, GENERIC"

SWITCH, MANUAL

T
TEMPERATURE GAGE

TEMPERATURE SENSOR, AVERAGING
or TEMPERATURE LOW LIMIT / FREEZESTAT
SEE "DEVICE SYMBOL, GENERIC"

TEMPERATURE SENSOR, POINT
SEE "DEVICE SYMBOL, GENERIC"

STAT
THERMOSTAT WITH SPECIFIED I/O FUNCTIONS

THERMOWELL IN PIPE

VALVE, BALANCING

V-##
NC
VALVE, NORMALLY CLOSED
WITH SPRING RETURN FAILSAFE
= VALVE NUMBER AS SHOWN
IN VALVE SCHEDULE

V-##
NO
VALVE, NORMALLY CLOSED
WITH SPRING RETURN FAILSAFE
= VALVE NUMBER AS SHOWN
IN VALVE SCHEDULE

V-##
COM
NO
NC
VALVE, 3-WAY DIVERTING
WITH SPRING RETURN FAILSAFE
NO = NORMALLY OPEN
NC = NORMALLY CLOSED
COM = COMMON PORT
= VALVE NUMBER AS SHOWN
IN VALVE SCHEDULE

V-##
NO
COM
NC
VALVE, 3-WAY MIXING
WITH SPRING RETURN FAILSAFE
NO = NORMALLY OPEN
NC = NORMALLY CLOSED
COM = COMMON PORT
= VALVE NUMBER AS SHOWN
IN VALVE SCHEDULE

VFD
XX-C
XX-SS
XX-S
VARIABLE FREQUENCY DRIVE
XX = PROCESS/DEVICE BEING CONTROLLED

SS = START/STOP COMMAND
S = STATUS FEEDBACK (ON/OFF)
C = 4-20 mA, VDC, or SNVT CONTROL SIGNAL

CONTROL SCHEMATIC SYMBOLS

B
BINARY HARDWARE INPUT
A
ANALOG HARDWARE INPUT
B
BINARY HARDWARE OUTPUT
A
ANALOG HARDWARE OUTPUT
ANALOG OR BINARY SIGNAL INPUT
ANALOG OR BINARY SIGNAL OUTPUT
CONSTANT VALUE

IF _ _ _
CONDITIONAL STATEMENT

IN
IN
MATH
OUT
GENERIC MATH FUNCTION AS DEFINED

IN
IN
MIN
OUT
MINIMUM SIGNAL SELECTOR

IN
IN
MAX
OUT
MAXIMUM SIGNAL SELECTOR

IN
IN
OUT
ADDITION FUNCTION

IN
IN
OUT
SUBTRACTION FUNCTION

IN
RESET
OUT
RESET SCHEDULE (OUTPUT INCREASES AS INPUT INCREASES)

IN
RESET
OUT
RESET SCHEDULE (OUTPUT DECREASES AS INPUT INCREASES)

IN
OUT
LOGICAL NOT FUNCTION

IN
IN
OUT
LOGICAL OR FUNCTION

IN
IN
OUT
LOGICAL AND FUNCTION

IN1
IN2
COMP
DB
DB= _ _ _
OUT
COMPARATOR WITH DEADBAND (DB).
WHEN IN1 > IN2
OUTPUT IS TRUE

IN
IN
S
LAT
R
B OUT
BINARY LATCH
S=SET
R=REST

IN
HAND
OFF
OUT
H-O-A SWITCH

IN
OCC
UNOCC
OUT
H-O-A SWITCH

CONTROL
IN
NO
IN
NC
OUT
COM
SWITCH

IN
T= _ _ _
SEC
OUT
ON DELAY TIMER
OUT=IN AFTER
TIME DELAY

ENABLE
IN
VALUE
IN
SETPOINT
PID
OUT
DEFAULT OUTPUT
PID LOOP
WITH ENABLE
AND DEFAULT
OUTPUT
WHEN NOT
ENABLED

CONTROL LOGIC DIAGRAM SYMBOLS

2P	TWO-POSITION (CONTROL SIGNAL)
ADJ	ADJUSTABLE
AFMA	AIRFLOW MEASUREMENT ARRAY
ALM	ALARM
BA	BYPASS AIR
BLDG	BUILDING
BUT	BUTTON
C	COMMAND (MODULATING CONTROL SIGNAL)
CD	COLD DECK
CHLR	CHILLER
CLG	COOLING
CO2	CARBON DIOXIDE
COM	COMMON
COMP	COMPARATOR
CR	CONDENSER WATER RETURN
CS	CONDENSER WATER SUPPLY
CT	CURRENT TRANSFORMER/SWITCH
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
CW	CHILLED WATER
D	DAMPER
DA	DISCHARGE AIR
DB	DEADBAND
DDC	DIRECT DIGITAL CONTROL(LER)
DIFF	DIFFERENCE
DIR	DIRECT (CONTROL ACTION)
DIS	DISABLE
DT	DUAL TEMP
DTWR	DUAL TEMP WATER RETURN
DTWS	DUAL TEMP WATER SUPPLY
DX	DIRECT EXPANSION (UNIT)
EA	EXHAUST AIR
ECO	ECONOMIZER
EF	EXHAUST FAN
ENA	ENABLE
EP	ELECTRIC TO PNEUMATIC TRANSDUCER
EPS	ELECTRIC TO PNEUMATIC SWITCH
ESS	EMERGENCY SHUTOFF SWITCH
F	FLOW
FAP	FIRE ALARM PANEL
FLT	FILTER
HD	HOT DECK
HL	HIGH LIMIT
HTG	HEATING
HTHW	HIGH TEMPERATURE HOT WATER
HUM	HUMIDIFIER
HW	HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HX	HEAT EXCHANGER
I/O	INPUT/OUTPUT
LDP	LOCAL DISPLAY PANEL
LL	LOW LIMIT
M&C	MONITORING & CONTROL (SOFTWARE)
MA	MIXED AIR
MINOA	MINIMUM OUTSIDE AIR
MS	MOTOR STARTER
MTHW	MEDIUM TEMPERATURE HOT WATER
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
OCC	OCCUPIED
ODT	ON DELAY TIMER
OWS	OPERATOR WORKSTATION
P	PRESSURE
PC	PRE-COOLING
PCW	PRIMARY CHILLER WATER
PCWR	PRIMARY CHILLER WATER RETURN
PCWS	PRIMARY CHILLER WATER SUPPLY
PH	PREHEAT
PMP	PUMP
PP	POSITIVE POSITIONER
R	RELAY
RA	RETURN AIR
REV	REVERSE (CONTROL ACTION)
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RLA	RELIEF AIR
RM	ROOM
RST	RESET
S	STATUS
SA	SUPPLY AIR
SEC	SECONDARY
SF	SUPPLY FAN
SMK	SMOKE
SP	SETPOINT
SS	START/STOP COMMAND
STAT	THERMOSTAT
SYS	SYSTEM
SCHD	SCHEDULER
T	TEMPERATURE
TAP	TAP, PRESSURE
UNOCC	UNOCCUPIED
V	VALVE
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE
WB	WET BULB (TEMPERATURE)
ZN	ZONE

ABBREVIATIONS AND ACRONYMS

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LEGEND

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BLDG 3
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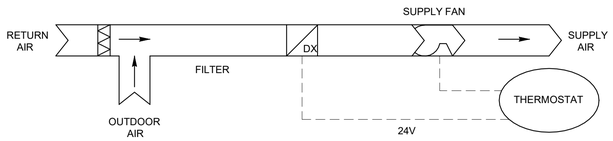


DUCTLESS SPLIT SYSTEM SCHEMATIC

SEQUENCE OF OPERATION: DUCTLESS SPLIT SYSTEM

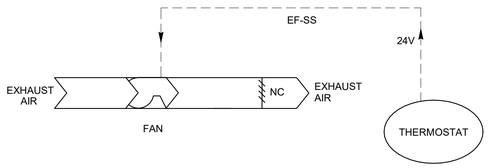
1. THE UNIT SHALL BE CONTROLLED BY AN OFF-ON-AUTO SWITCH AND A HEAT-COOL SWITCH AS A PART OF THE UNIT THERMOSTAT.

2. IN THE AUTO POSITION THE FAN SHALL CYCLE ON AND OFF ON A CALL FOR HEATING OR COOLING.

3. UNIT SHALL OPERATE PER MANUFACTURER'S CONTROLS TO MAINTAIN THE THE COOLING SPACE TEMPERATURE SETPOINTS OF 78 DEG F (ADJ) AND THE HEATING SPACE TEMPERATURE OF 68 DEG F (ADJ) AND SUPPLY OUTDOOR AIR.

4. IN THE ON POSITION THE FAN SHALL RUN CONTINUOUSLY AND IN THE OFF POSITION THE UNIT AND THE FAN SHALL CYCLE ON A CALL FOR HEATING OR COOLING.

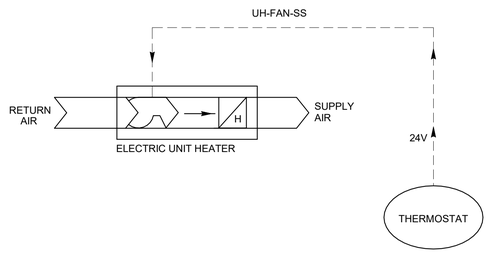
5. OUTSIDE AIR DAMPER CONTROLLED BY UNIT'S PACKAGED CONTROLS.



EXHAUST FAN SCHEMATIC (W/ OA DAMPER)

SEQUENCE OF OPERATION: THERMOSTATICALLY CONTROLLED EXHAUST FAN (W/ OA DAMPER)

FANS AND MOTOR-OPERATED DAMPERS SHALL BE CONTROLLED BY A WALL-MOUNTED ON/OFF/AUTO 24V THERMOSTAT.
1. WHEN INDEXED TO "OFF", THE FAN SHALL BE DENERGIZED AND THE TWO-WAY, TWO-POSITION EXHAUST AIR AND OUTSIDE AIR DAMPERS SHALL BE CLOSED.
2. WHEN INDEXED TO "ON", EXHAUST AIR AND OUTSIDE AIR DAMPERS SHALL OPEN AND THE FAN SHALL BE ENERGIZED AND SHALL RUN CONTINUOUSLY AT ITS HIGH SPEED SETTING.
3. WHEN INDEXED TO "AUTO", WHEN SPACE TEMPERATURE RISES ABOVE 85°F (ADJUSTABLE), THE DAMPERS SHALL OPEN AND THE FAN SHALL BE ENERGIZED AND RUN CONTINUOUSLY AT ITS LOW SPEED SETTING. ON A FURTHER RISE IN SPACE TEMPERATURE ABOVE 90°F (ADJUSTABLE), THE FAN SPEED CONTROLLER SHALL INCREASE THE FAN SPEED TO ITS HIGH SETTING AND THE FAN SHALL RUN CONTINUOUSLY. AS THE SPACE TEMPERATURE FALLS BELOW THE SETPOINTS THE REVERSE SHALL OCCUR.



UNIT HEATER SCHEMATIC

SEQUENCE OF OPERATION: ELECTRIC UNIT HEATER

1. UNIT HEATERS SHALL BE CONTROLLED BY WALL MOUNTED THERMOSTATS. INITIAL SETPOINT SHALL BE 55°F (ADJUSTABLE).

2. UPON A CALL FOR HEAT FROM THE THERMOSTAT, THE BLOWER FAN SHALL ENERGIZE AND THE ELECTRIC HEAT SHALL TURN ON TO SATISFY THE SPACE TEMPERATURE SETPOINT.

3. WHEN THE ROOM TEMPERATURE EXCEEDS THE SETPOINT TEMPERATURE, THE COIL AND THE FAN SHALL BE DEENERGIZED AND REMAIN OFF UNTIL THE NEXT CALL FOR HEAT.

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ELECTRICAL LEGEND

LIGHTING AND LIGHTING CONTROLS SYSTEM LEGEND

- LOWER CASE LETTER DENOTES THE SWITCH THAT CONTROLS FIXTURE
- A2 — LUMINAIRE TYPE DESIGNATION
- SYMBOL DENOTES GENERAL TYPE OF LUMINAIRE
- NT — UNSWITCHED NIGHT LIGHT (ON 24 HOURS)
- 2x2 LED LUMINAIRES.
- 2x4 LED LUMINAIRES.
- CEILING-MOUNTED LUMINAIRE. SHADING INDICATES SUPPLIED FROM AN EMERGENCY LIGHTING INVERTER (ELI).
- SUSPENDED LED LUMINAIRE.
- WALL-MOUNTED LED LUMINAIRE. SHADING INDICATES SUPPLIED FROM AN EMERGENCY LIGHTING INVERTER (ELI).
- LIGHTING CONTROL STRATEGY.
- EMERGENCY LIGHTING UNIT. MH = 8' AFF UOI.
- ELI — 250W EMERGENCY LIGHTING INVERTER (ELI). MOUNT ABOVE ACCESSIBLE CEILING.
- EXIT LIGHT, CEILING MOUNTED. SHADING INDICATES FACES. PROVIDE DIRECTIONAL ARROWS WHEN INDICATED.
- EXIT LIGHT, WALL MOUNTED. SHADING INDICATES FACES. PROVIDE DIRECTIONAL ARROWS WHEN INDICATED. ALIGN WITH CENTERLINE OF DOOR AND MOUNT CENTERLINE OF EXIT SIGN 5" ABOVE TOP OF DOOR FRAME UOI.
- S — WALL SWITCH, SINGLE POLE, 20A SWITCH. MH = 46" AFF UOI. WHERE SUBSCRIPT IS PRESENT, IT DENOTES THE FOLLOWING:
  - 3 - THREE WAY SWITCH.
  - 4 - FOUR WAY SWITCH
  - a - SINGLE LOWER CASE LETTER (EXCEPT LETTER "m") DENOTE THE SWITCH THAT CONTROLS THE FIXTURES.
  - WP - WEATHERPROOF (GASKETED).
  - lv - LOW VOLTAGE
  - lv5 - LOW VOLTAGE DIMMING
- S_V — WALL SWITCH SENSOR, LINE VOLTAGE. MH = 46" AFF UOI.
- S_T — TIMER SWITCH, LINE VOLTAGE. SWITCH SHALL BE WEATHERPROOF RATED WITH 0-2 HOUR TIME RANGE. MH = 46" AFF UOI.
- S_{lvx} — LOW VOLTAGE, MULTI-BUTTON WALLSTATION CONNECTED TO ROOM CONTROLLER. 'x' INDICATES NUMBER OF BUTTONS. MH = 46" AFF UOI.
- OCCUPANCY SENSOR, WALL MOUNTED, DUAL TECHNOLOGY (ULTRASONIC AND PIR) SENSOR UOI. MOUNT 6" BELOW CEILING BUT NO MORE THAN 9'-6" AFF UOI.
- OS — OCCUPANCY OR VACANCY SENSOR AS INDICATED BY LIGHTING CONTROL STRATEGIES, CEILING OR JUNCTION BOX MOUNTED, DUAL TECHNOLOGY (ULTRASONIC AND PIR) SENSOR UOI.
- DS — DAYLIGHT SENSOR.
- LC — LIGHTING CONTACTOR. MH = 60" AFF.

LIGHTNING PROTECTION & GROUNDING SYSTEM LEGEND

- TW — GROUND ROD. "TW" INDICATES TEST WELL.
- EXPOSED MAIN ROOF CONDUCTOR UOI.
- BONDING CONNECTION TO TOP OF DOWN CONDUCTOR.
- BONDING CONNECTION TO BOTTOM OF DOWN CONDUCTOR OR COUNTERPOISE.
- DOWN CONDUCTOR IN SCHEDULE 40 PVC CONDUIT EXPOSED OUTSIDE OF BUILDING.
- AIR TERMINAL.

POWER SYSTEM LEGEND

- Φ_X — NEMA 5-20R DUPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPT 'X' (WHERE PRESENT) DENOTES THE FOLLOWING:
  - G - GROUND FAULT CIRCUIT INTERRUPTER (GFCI) RECEPTACLE.
  - WP - GFCI RECEPTACLE WITH WEATHER PROOF WHILE-IN-USE HOUSING.
  - C - GFCI RECEPTACLE, BOTTOM OF RECEPTACLE MOUNTED 2" ABOVE BACKSPLASH.
  - E - GFCI RECEPTACLE, MH COORDINATED WITH ELECTRIC WATER COOLER.
  - OS - CONTROLLED BY ROOM OCCUPANCY SENSORS VIA RECEPTACLE-RATED SWITCHPACK. RECEPTACLES SHALL BE MARKED IN ACCORDANCE WITH NEC 406.3(E).
  - R - MOUNTED ON COMMUNICATIONS RACK AS INDICATED ON EP501.
  - T - RECEPTACLE, MOUNTED ADJACENT TO CATV OUTLET.
- $\Phi\Phi_X$ — NEMA 5-20R DOUBLE DUPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPTS IDENTIFIED FOR DUPLEX RECEPTACLES ARE ALSO APPLICABLE TO QUADRAPLEX RECEPTACLES.
- Φ_X — NEMA 5-20R SIMPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPTS IDENTIFIED FOR DUPLEX RECEPTACLES ARE ALSO APPLICABLE TO SIMPLEX RECEPTACLES.
- Φ_X — SPECIAL RECEPTACLE. SUBSCRIPT 'X' (WHERE PRESENT) DENOTES THE FOLLOWING:
  - A - NEMA L14-20R RECEPTACLE FOR TARGET MAINTENANCE. MH = 18" UOI.
  - R1 - NEMA L5-20R RECEPTACLE. MOUNTED AS INDICATED ON EP501.
  - R2 - NEMA L6-30R RECEPTACLE. PROVIDE 2#10, 1#10G, 1/2"C. MOUNTED AS INDICATED ON EP501.
- NEMA 5-20R CEILING MOUNTED DUPLEX RECEPTACLE.
- J — JUNCTION BOX, WALL MTD. MH = 18" UOI.
- S_{ps} — 3-POSITION SWITCH FOR PROJECTOR SCREEN. MH = 46" AFF UOI.
- S_m — MOTOR RATED SWITCH. MH = 46" AFF UOI.
- MOTOR DISCONNECT/SAFETY SWITCH SHALL BE RATED 30/3/NF/1 UNLESS OTHERWISE INDICATED.
  - '30' DENOTES SWITCH AMPERE RATING;
  - '3' DENOTES NUMBER OF POLES;
  - 'NF' DENOTES NON-FUSED ('F' DENOTES FUSED);
  - '1' DENOTES SWITCH ENCLOSURE'S NEMA RATING;
  - FUSE RATING SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- LP-1 — HOMERUN TO PANELBOARD. "LP" INDICATES THE PANELBOARD THAT THE HOMERUN IS SERVED FROM. "1" INDICATES THE CIRCUIT NUMBER IN THE PANELBOARD FOR CONNECTION.
- PANELBOARD.
- SWITCHBOARD.
- ELECTRICAL EQUIPMENT AS INDICATED.
- THREE BUTTON, PUSH BUTTON SWITCH (OPEN, CLOSE, AND STOP) FOR ROLLING SERVICE DOORS. MH = 46" AFF UOI.

VIDEO SURVEILLANCE SYSTEM LEGEND

- GFGI CAMERA. PROVIDE 1-1/4" RGS CONDUIT TO DTR RACK. REFER TO VOLUME 4 ES517 FOR MOUNTING DETAILS.

ABBREVIATIONS

ACS	ACCESS CONTROL SYSTEM
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ATS	AUTOMATIC TRANSFER SWITCH
C	CONDUIT
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CKT	CIRCUIT
COR	CONTRACTING OFFICER'S REPRESENTATIVE
CU	COPPER
DLC	DESIGNLIGHTS CONSORTIUM
DTR	DATA TERMINATION RACK
EGC	EQUIPMENT GROUNDING CONDUCTOR
ELI	EMERGENCY LIGHTING INVERTER
EPT	ELECTRIC POWER TRANSFER
ESS	ELECTRONIC SECURITY SYSTEMS
EWC	ELECTRIC WATER COOLER
FACP	FIRE ALARM CONTROL PANEL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
HACR	HEATING, AIR CONDITIONING, REFRIGERATION
IDS	INTRUSION DETECTION SYSTEM
LVS	LOW VOLTAGE SWITCH
MFR	MANUFACTURER
MH	MOUNTING HEIGHT
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTS	MANUAL TRANSFER SWITCH
NATS	NON-AUTOMATIC TRANSFER SWITCH
NEC	NATIONAL ELECTRICAL CODE
NF	NON FUSED
NTS	NOT TO SCALE
OS	OCCUPANCY SENSOR
PBB	PRIMARY BONDING BUSBAR
PIR	PASSIVE INFRARED
QTY	QUANTITY
SBB	SECONDARY BONDING BUSBAR
SER	SERVICE ENTRANCE RATED
SPD	SURGE PROTECTIVE DEVICE
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UOI	UNLESS OTHERWISE INDICATED
UON	UNLESS OTHERWISE NOTED
V	VOLT
W, WP	WEATHERPROOF

GENERAL NOTES

1. SEE PLATE G-002 TO G-002A FOR ABBREVIATIONS AND GENERAL LEGEND.

2. MOUNTING HEIGHT, UNLESS OTHERWISE NOTED, IS TO CENTER LINE OF EQUIPMENT.

3. OUTLET BOXES MOUNTED ON OPPOSITE SIDES OF WALLS SHALL BE INSTALLED SUCH THAT NO BOXES ARE BACK-TO-BACK TO MINIMIZE SOUND TRANSMISSION. MAINTAIN A 6-INCH SEPARATION WHERE POSSIBLE.

4. MECHANICAL EQUIPMENT IS SHOWN IN APPROXIMATE LOCATIONS. FOR EXACT LOCATIONS OF MECHANICAL EQUIPMENT AND PIPING, SEE MECHANICAL DRAWINGS. PROVIDE DISCONNECT SWITCHES AS REQUIRED BY THE NATIONAL ELECTRICAL CODE EVEN IF NOT INDICATED ON THE ELECTRICAL DRAWINGS.

5. COORDINATE THE LOCATIONS AND MOUNTING HEIGHTS OF LUMINAIRES IN MECHANICAL AND ELECTRICAL ROOMS WITH THE FINAL LOCATIONS OF PIPES, DUCTS AND OTHER EQUIPMENT FOR BEST ARRANGEMENT. FIXTURES SHALL BE EASILY ACCESSIBLE FOR RELAMPING.

6. CONDUCTOR AND CONDUIT SIZES ARE BASED ON COPPER CONDUCTORS WITH THWN INSULATION IN EMT CONDUIT. MINIMUM SIZE SHALL BE #12 AWG CONDUCTORS WITH #12 AWG EGC IN 1/2" CONDUIT UNLESS OTHERWISE INDICATED. LIGHTING AND POWER BRANCH CIRCUITS THAT RUN OVER 100 FEET SHALL BE MINIMUM #10 AWG. CIRCUIT BREAKERS, TERMINALS, ETC. SHALL BE RATED AND MARKED FOR 75 DEGREES MINIMUM. THE CONTRACTOR SHALL ADJUST CONDUIT SIZES BASED ON ACTUAL TYPE OF CONDUCTORS AND CONDUIT INSTALLED.

7. PROVIDE EQUIPMENT GROUNDING CONDUCTORS IN ALL CONDUITS.

8. UP TO 3 SINGLE-PHASE, BRANCH CIRCUITS RATED 20A OR LESS MAY BE ROUTED IN A SINGLE CONDUIT TO MINIMIZE THE NUMBER OF HOMERUNS. CIRCUITS SHALL BE SUPPLIED FROM ADJACENT CIRCUIT BREAKERS AND DIFFERENT PHASES (E.G., 1, 3, 5 OR 2, 4, 6). NEUTRAL CONDUCTORS SHALL NOT BE SHARED OR COMBINED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DERATING CONDUCTOR CAPACITY ACCORDING TO THE NUMBER OF CURRENT CARRYING CONDUCTORS AND OTHER ADJUSTMENT FACTORS IN ACCORDANCE WITH THE NEC. THE CONTRACTOR SHALL UTILIZE A MAXIMUM FILL RATE OF 40% WHEN SIZING CONDUITS AND SHALL INCLUDE THE REQUIRED EQUIPMENT GROUNDING CONDUCTOR. ALL OTHER CIRCUITS SHALL HAVE DEDICATED HOMERUNS.

9. CIRCUIT NUMBERS ARE SHOWN ADJACENT TO ELECTRICAL DEVICES. WIRING SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND NEC REQUIREMENTS.

10. CONDUITS SHALL BE CONCEALED ABOVE CEILINGS AND IN WALLS, EXCEPT IN MECHANICAL ROOMS, ELECTRICAL ROOMS, AND WHERE SPECIFICALLY INDICATED OTHERWISE ON THE DRAWINGS. CONDUITS SHALL NOT BE RUN IN ANY UL RATED SLAB. CONDUITS SHALL NOT BE RUN IN ANY FILLED CMU BLOCKS.

11. LOCATE ALL RACEWAYS TO AVOID INTERFERENCE WITH DUCTS, PIPES, MECHANICAL EQUIPMENT, WITH REMOVAL OF CEILING TILES, OR WITH ACCESS TO EQUIPMENT WHICH REQUIRES PERIODIC ADJUSTMENT OR MAINTENANCE.

12. SEAL PENETRATIONS THROUGH ROOFS, CEILINGS, FLOORS, WALLS AND FIRE WALLS TO MAINTAIN THE INTEGRITY OF THE AIR BARRIER, FIRE AND ACOUSTIC RATINGS OF THE ROOF, CEILINGS, WALLS AND FLOORS.

13. REVISE PANELBOARD SCHEDULES ON AS-BUILT-DRAWING AND PANEL DIRECTORIES TO REFLECT FINAL INSTALLATION CONDITIONS.

14. PROVIDE NAMEPLATES ON THE EXTERIOR OF ALL ELECTRICAL PANELS AND ENCLOSURES AS FOLLOWS: DEVICE ID, DEVICE RATING, POWER SOURCE, ARC FAULT DATA.

15. FOR DISCONNECT SWITCHES AND MOTOR STARTERS THE TOP LINE SHALL BE THE NAME/DESIGNATIONOF THE EQUIPMENT BEING FED BY THE SWITCH/STARTER.

16. PROVIDE SEPARATE NEUTRALS FOR EACH CIRCUIT UTILIZING A NEUTRAL CONDUCTOR (DO NOT COMBINE NEUTRALS).

17. PROVIDE EQUIVALENT CONDUIT PATHWAYS WHERE CABLE TRAY IS INTERRUPTED BY NONACCESSIBLE CEILINGS.

18. THE INTERRUPTING RATING OF THE PANELBOARD AND ELECTRICAL EQUIPMENT SHALL BE INCREASED TO THE NEXT AVAILABLE RATING WHERE THERE IS NOT A RATING THAT IS EQUAL TO THE EQUIPMENT'S LISTED SHORT CIRCUIT RATING.

19. NOT ALL SYMBOLS SHOWN ON THE LEGEND ARE USED IN THE PROJECT.

20. RECEPTACLES THAT HAVE GFCI PROTECTION ARE TO BE WIRED SUCH THAT THE LOSS OF POWER ON ONE RECEPTACLE DOES NOT AFFECT DOWNSTREAM RECEPTACLES.

21. COMPONENTS WHICH CONSTITUTE AN ELECTRICAL SYSTEM SHALL BE FULLY COMPATIBLE WITH ONE ANOTHER AND SHALL BE APPROVED BY THE VARIOUS MANUFACTURERS FOR USE WITH ALL OTHER COMPONENTS WITHIN THE SYSTEM. (ONE EXAMPLE OF AN ELECTRICAL SYSTEM IS THE BUILDING LIGHTING SYSTEM COMPRISED OF FIXTURES, LAMPS, SWITCHES, DRIVERS, OCCUPANCY SENSORS AND DIMMING EQUIPMENT).

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
H. TAYLOR	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
H. TAYLOR	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
R. DAVIS	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-85-01
SIZE:	FILE NAME:
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING LEGEND AND NOTES

SHEET ID
BLDG 3
E-001

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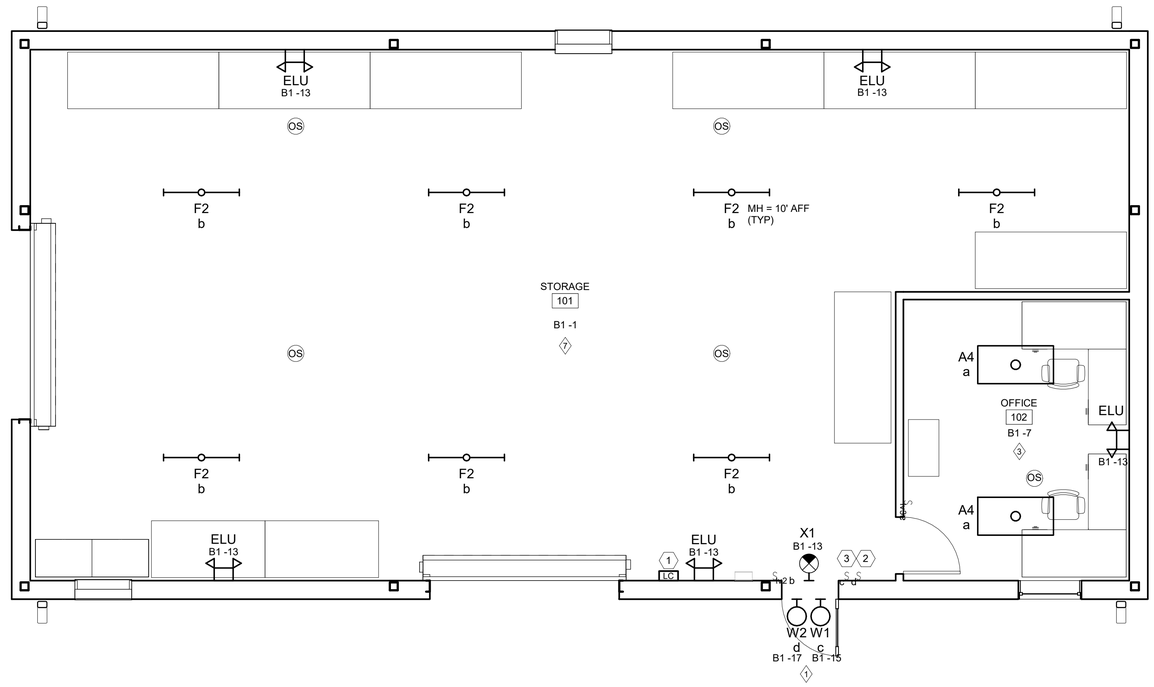

1 LIGHTING PLAN

1/4" = 1'-0"

4 3 2 1 0 4 8

GENERAL SHEET NOTES

KEYED NOTES

1	A MASTER OVERRIDE OFF CONTROL INSIDE THE CONTROL TOWER SHALL BE PROVIDED TO SHUT OFF ALL ANCILLARY BUILDING WHITE LIGHTING THAT MAY INTERFERE WITH RANGE NIGHT OPERATIONS. SEE LIGHTING CONTACTOR DIAGRAMS FOR ADDITIONAL INFORMATION.
2	SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR.
3	SWITCHES FOR INDICATED WHITE LIGHTING SHALL BE WHITE IN COLOR AND SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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DRAWN BY: H. TAYLOR
CHECKED BY: R. DAVIS
SUBMITTED BY: J. DEACON
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING LIGHTING PLAN

SHEET ID
BLDG 3
EL101

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LIGHT FIXTURE SCHEDULE

TYPE	DFESCRIPTION	FIXTURE VOLTAGE	LIGHT SOURCE	NOMINAL WATTS	MINIMUM LUMENS	MOUNTING TYPE	MOUNTING HEIGHT	REMARKS
A2	2x2 FLAT PANEL LED LUMINAIRE	120 V	LED	38 W	4400	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
A3	2x4 FLAT PANEL LED LUMINAIRE	120 V	LED	41 W	4600	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
A4	2x4 FLAT PANEL LED LUMINAIRE	120 V	LED	62 W	6500	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
ELU	LED EMERGENCY LIGHTING UNIT	120 V	LED	4 W	600	WALL	SEE PLANS	
F2	ENCLOSED GASKETED LUMINAIRE	120 V	LED	30 W	4000	SUSPENDED	SEE PLANS	
OB	OBSTRUCTION LIGHT L-810	120 V	INCANDESCENT	70 W	-	THREADED HUB	N/A	STEADY BURNING; PROVIDE PHOTOCELL; PROVIDE SPD
W1	WALL MOUNTED VAPERPROOF (WHITE)	120 V	LED	17 W	1200	WALL	SEE PLANS	PROVIDE CLEAR HEAT TREATED GLASS LENS
W2	WALL MOUNTED VAPORPROOF (RED)	120 V	LED	17 W	1200	WALL	SEE PLANS	PROVIDE RED HEAT TREATED GLASS LENS
W3	CEILING MOUNTED VAPORPROOF (RED)	120 V	LED	17 W	1200	SURFACE	N/A	PROVIDE RED HEAT TREATED GLASS LENS
W4	CEILING MOUNTED VAPORPROOF (WHITE)	120 V	LED	17 W	1200	SURFACE	N/A	PROVIDE CLEAR HEAT TREATED GLASS LENS
X1	EXIT LIGHT - WALL MOUNTED	120 V	LED	1 W	N/A	WALL	N/A	

LED FLAT PANEL
2'x2' LED LUMINAIRE

FEATURES

REFLECTORS: HIGH REFLECTANCE GLOSS WHITE

SHIELDING: WHITE FROST LENS WITH SMOOTH PATTERN FOR UNIFORM ILLUMINATION

GENERAL DESCRIPTION

HOUSING: DIE FORMED CODE-GAUGE STEEL; SEAMLESS CORNERS MAXIMIZE LIGHT EMITTING SURFACE AREA

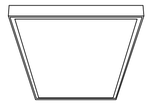
DIMENSIONS: 24" x 48" x 3" (W x L x D)

OTHER: DLC QUALIFIED

LUMEN MAINTENANCE: L70 AT 60,000 HOURS

1 TYPE A2

LED FLAT PANEL
2'x4' LED LUMINAIRE



FEATURES

REFLECTORS: HIGH REFLECTANCE GLOSS WHITE

SHIELDING: WHITE FROST LENS WITH SMOOTH PATTERN FOR UNIFORM ILLUMINATION

GENERAL DESCRIPTION

HOUSING: DIE FORMED CODE-GAUGE STEEL; SEAMLESS CORNERS MAXIMIZE LIGHT EMITTING SURFACE AREA

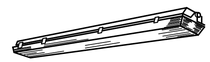
DIMENSIONS: 24" x 48" x 3" (W x L x D)

OTHER: DLC QUALIFIED

LUMEN MAINTENANCE: L70 AT 60,000 HOURS

2 TYPE A3 & A4

ENCLOSED AND GASKETED
LED LUMINAIRE



FEATURES

REFLECTORS: HIGH REFLECTANCE WHITE

SHIELDING: HIGH IMPACT LINEAR FROSTED ACRYLIC LENS

GENERAL DESCRIPTION

HOUSING: IMPACT RESISTANT, UV STABILIZED, FIBERGLASS WITH REMOVABLE GEAR TRAY FOR MODULE REPLACEMENT; NON-POROUS GASKET; STAINLESS STEEL LATCHES; INCLUDE SURFACE-MOUNTING BRACKETS

DIMENSIONS: 52"x7"x5" (LxWxD)

LISTING: UL LISTED FOR WET LOCATIONS

OTHER: DLC QUALIFIED

3 TYPE F2

SURFACE MOUNTED
THIN PROFILE LED EXIT LIGHT

FEATURES

MOUNTING: UNIVERSAL

SHIELDING: FLAT SHEET ACRYLIC

LETTERS: RED

BATTERY: NICKEL CADMIUM

OTHER: SELF DIAGNOSTICS; NEMA PREMIUM CERTIFIED; TAMPERPROOF HARDWARE

GENERAL DESCRIPTION

HOUSING: SOLID DIE-CAST ALUMINUM HOUSING AND FACE WITH DIRECTIONAL CHEVRON ARROWS AS REQUIRED

FINISH: BLACK HOUSING AND BRUSHED ALUMINUM FACE

DIMENSIONS: 12"x8"x1.75" (LxWxD, MAXIMUM, BACK MOUNTED)

4 TYPE X1

WALL MOUNTED
VAPORPROOF LUMINAIRE

FEATURES

DIFFUSER: GLOBE WITH DIE CAST GUARD
W1: (CLEAR GLOBE)
W2: (RED GLOBE)

GENERAL DESCRIPTION

HOUSING: DIE-CAST LED HOUSING DESIGNED FOR MAXIMUM HEAT DISSIPATION WITH HIGH TEMPERATURE SILICON INTERNAL GASKETS

FINISH: NATURAL UNPAINTED FINISH

LISTING: UL LISTED FOR WET LOCATIONS

DIMENSIONS: 8" x 13" (D x H)

5 TYPES W1 & W2

CEILING MOUNTED
VAPORPROOF LUMINAIRE

FEATURES

DIFFUSER: GLOBE WITH DIE CAST GUARD
W4: (CLEAR GLOBE)
W3: (RED GLOBE)

GENERAL DESCRIPTION

HOUSING: DIE-CAST LED HOUSING DESIGNED FOR MAXIMUM HEAT DISSIPATION WITH HIGH TEMPERATURE SILICON INTERNAL GASKETS

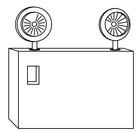
FINISH: NATURAL UNPAINTED FINISH

LISTING: UL LISTED FOR WET LOCATIONS

DIMENSIONS: 5" x 12" (D x H)

6 TYPES W3 & W4

LED EMERGENCY LIGHTING UNIT



FEATURES

LAMPS: FULLY ADJUSTABLE WHITE LED HEADS

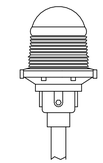
BATTERY: NICKEL CADMIUM
OUTPUT: HIGH OUTPUT OPTION FOR REMOTE HEADS
DURATION: 90 MINUTES AND >87.5% NOMINAL VOLTAGE

GENERAL DESCRIPTION

HOUSING: INJECTION MOLDED, HIGH IMPACT UV-STABLIZED THERMOPLASTIC MATERIAL; WHITE FINISH

7 TYPE ELU

INCANDESCENT OBSTRUCTION LIGHT L-810



FEATURES

DIFFUSER: RED POLYCARBONATE LENS

GENERAL DESCRIPTION

HOUSING: IP66/NEMA 4X; THREADED 1" BOTTOM HUB

LISTING: IP66 AND NEMA 4X

CERTIFICATIONS: FAA AC #: 150/5345-43H

DIMENSIONS: 5" x 5" x 9" (L x W x H)

8 TYPE OB

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
H. TAYLOR	NOVEMBER 2023
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H. TAYLOR	W912HN-24-B-3002
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING LIGHT FIXTURE SCHEDULE & DETAILS

SHEET ID
BLDG 3
EL501

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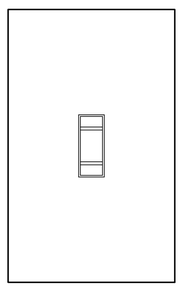
LIGHTING CONTROL STRATEGIES

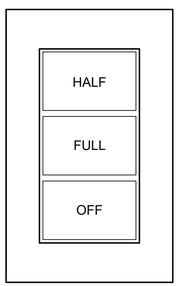
STRATEGY	DESCRIPTION OF OPERATION	LIGHTING CONTROL EQUIPMENT	SWITCHES
1	MANUAL ON/OFF	LINE VOLTAGE TOGGLE SWITCHES	S, S3, S4
2	MANUAL ON/OFF AUTO SENSOR OFF	LINE VOLTAGE WALL SWITCH SENSOR	Sv
3	AUTO SENSOR ON (HALF) MANUAL ON (HALF) MANUAL ON (FULL) MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS OCCUPANCY SENSORS ROOM CONTROLLERS	SLV3
6	LIGHTING SCENES (ZONE 1 | ZONE 2) FULL: 100% | 100% AV: 100% | 30% DIM: 1% | 1% MANUAL RAISE MANUAL LOWER MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS VACANCY SENSORS ROOM CONTROLLERS	SLV6
7	MANUAL ON/OFF AUTO SENSOR ON (HALF) AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS OCCUPANCY SENSORS ROOM CONTROLLERS	SLV2
12	PARTITION CONTROL LIGHTING SCENES (ZONE 1 | ZONE 2) FULL: 100% | 100% AV: 100% | 30% DIM: 1% | 1% MANUAL RAISE MANUAL LOWER MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS VACANCY SENSORS ROOM CONTROLLERS PARTITION CONTROL SENSORS/INTERFACE	SLV6
14	PHOTOCELL CONTROL ON WHEN NORTHERN SKY ILLUMINANCE REACHING A VERTICAL SURFACE FALLS BELOW 50 FC. PHOTOCELL CONTROL ON WHEN NORTHERN SKY ILLUMINANCE REACHING A VERTICAL SURFACE RISES ABOVE 50 FC.	PHOTOCELL	



DETAIL NOTES:

1. SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR. WHERE INDICATED, THEY SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE. SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR. ALL SWITCHES SHALL BE PERMANTENTLY LABELED WITH A DESCRIPTION OF ITS USE.

1 WALL SWITCHES S, S3, & S4



DETAIL NOTES:

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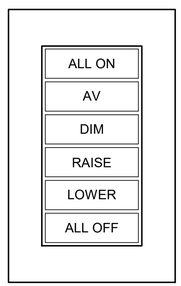
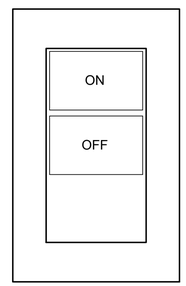
2 WALLSTATION SLV3



DETAIL NOTES:

1. SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR. WHERE INDICATED, THEY SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE. SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR. ALL SWITCHES SHALL BE PERMANTENTLY LABELED WITH A DESCRIPTION OF ITS USE.

3 WALLSTATION SLV6



DETAIL NOTES:

1. SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR. WHERE INDICATED, THEY SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE. SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR. ALL SWITCHES SHALL BE PERMANTENTLY LABELED WITH A DESCRIPTION OF ITS USE.

3 WALLSTATION SLV2

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

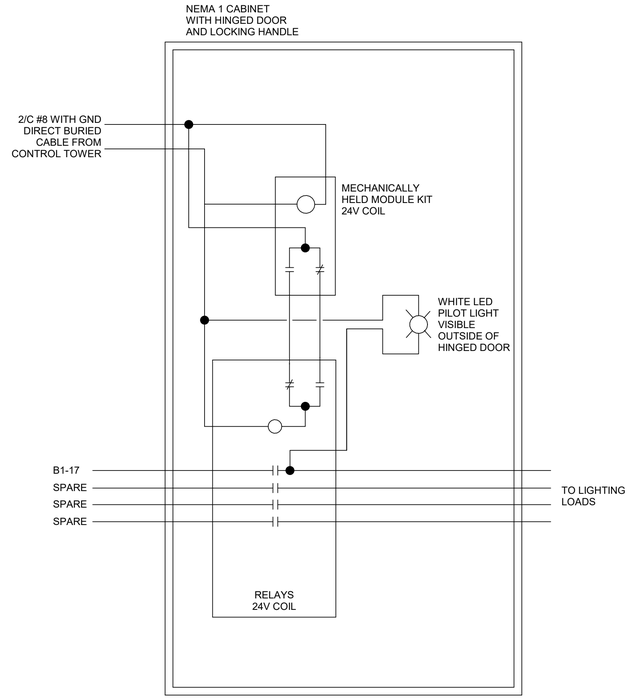
OPERATIONS/STORAGE BUILDING LIGHTING CONTROL SCHEDULES AND DETAILS

SHEET ID
BLDG 3
EL601

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:25:58 PM

File Path: C:\Users\k6enxhit\Documents\FY23_PN96182_MPTR-STDETAILS_ELEC_R21_hunter.taylor.rvt

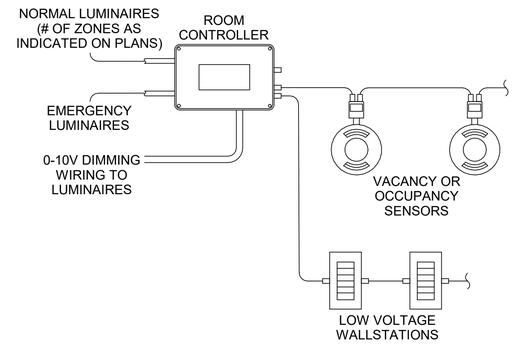


LIGHTING CONTACTOR DIAGRAM NOTES:

1. THE DESIGN INTENT IS TO PROVIDE A MASTER OVERRIDE OFF CONTROL INSIDE THE CONTROL TOWER TO SHUT OFF ALL BUILDING WHITE LIGHTING THAT MAY INTERFERE WITH RANGE NIGHT OPERATIONS.

2. ADDITIONAL BUILDING LIGHTING CONTROLS ARE PROVIDED ON THE LOAD SIDE OF THE CONTACTOR TO PROVIDE TYPICAL BUILDING LIGHTING CONTROLS. SEE OTHER EL SHEETS FOR ADDITIONAL LIGHTING CONTROL REQUIREMENTS.

1 LIGHTING CONTACTOR DIAGRAMS



2 ROOM CONTROLLER WIRING DIAGRAM

US Army Corps of Engineers ®

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SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

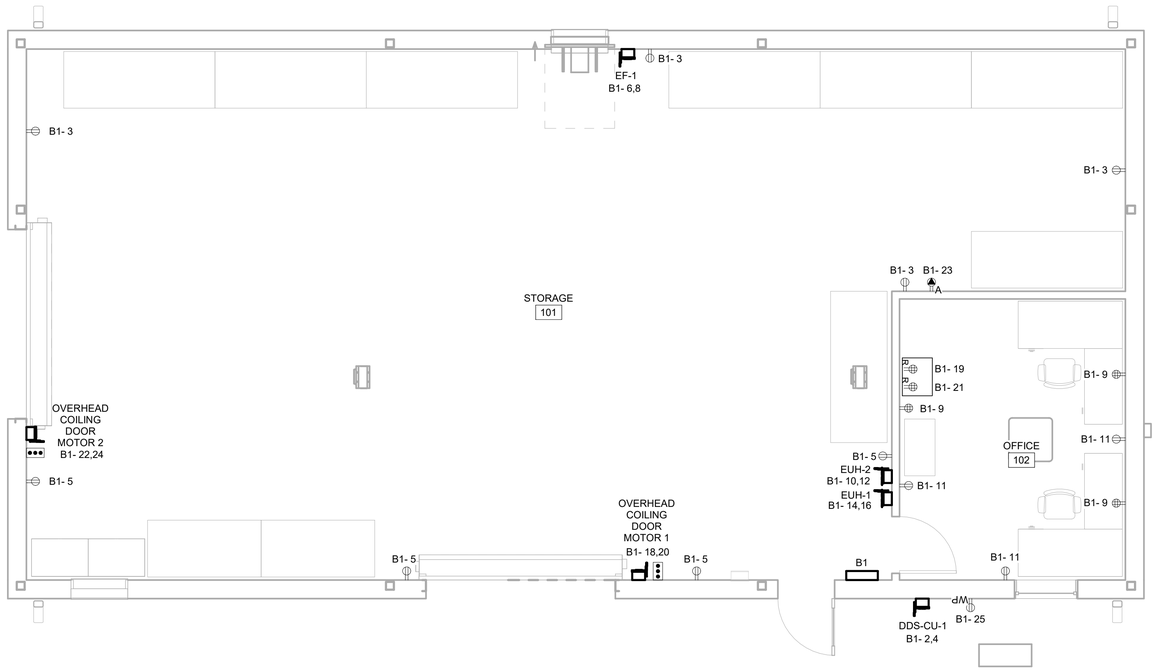
OPERATIONS/STORAGE BUILDING LIGHTING CONTROL DIAGRAMS

SHEET ID
BLDG 3
EL602

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:25:59 PM

File Path: C:\Users\kbenxhit\Documents\FY23_PN96182_MPTR-STDETAILS_ELEC_R21_hunter.t.taylor.rvt



1 POWER PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
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CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

Plot Date: 11/28/2023 3:58:55 PM

File Path: C:\Users\kfeinxhit\Documents\FY23_PN96182_MPTR-STORAGE_ELEC_R21_hunter.l.taylor.rvt

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100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

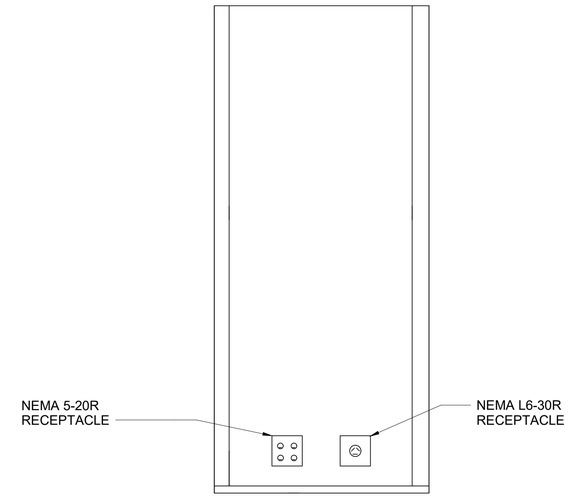
FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING POWER PLAN

SHEET ID
BLDG 3
EP101

READY TO ADVERTISE (RTA)

NEC CABINET



CABINET-MOUNTED RECEPTACLE DETAIL NOTES:

1. OUTLETS SHALL BE MOUNTED INSIDE THE NEC ENCLOSURE 4 INCHES ABOVE THE BOTTOM OF THE ENCLOSURE.

1 RACK MOUNTED RECEPTACLE DETAIL OPS/STORAGE
NOT TO SCALE

US Army Corps of Engineers ®

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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

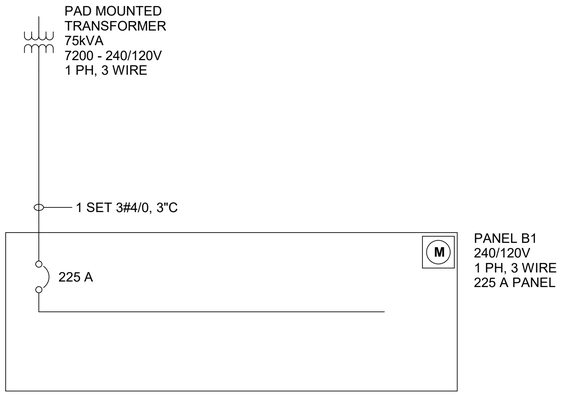
OPERATIONS/STORAGE BUILDING ELECTRICAL DETAILS

SHEET ID
BLDG 3
EP501

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:26:00 PM

File Path: C:\Users\kfeinxhit\Documents\FY23_PN96182_MPTR-STDETAILS_ELEC_R21_hunter.t.taylor.rvt



NOTES, POWER ONE-LINE DIAGRAM:

1. SANDHILLS UTILITY SERVICES (SUS) SHALL FURNISH AND INSTALL THE TRANSFORMER, TRANSFORMER PAD, AND PRIMARY DISTRIBUTION CABLES. SEE SITE ELECTRICAL DRAWINGS FOR MORE INFORMATION AND ADDITIONAL REQUIREMENTS.

2. THE CONTRACTOR SHALL FURNISH AND INSTALL THE SECONDARY CONDUCTORS AND CONDUITS FROM THE MAIN DISTRIBUTION PANEL (MDP) TO THE SECONDARY COMPARTMENT OF THE TRANSFORMER. THE CABLES SHALL BE OF SUFFICIENT LENGTH TO FACILITATE THEIR CONNECTION TO THE SECONDARY LUGS OF THE TRANSFORMER.

3. SEE DETAIL ON EG501 FOR SERVICE ENTRANCE GROUNDING REQUIREMENTS.

1 POWER ONE-LINE DIAGRAM
NOT TO SCALE

US Army Corps of Engineers ®

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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING POWER RISER DIAGRAM

SHEET ID
BLDG 3
EP601

Plot Date: 11/28/2023 3:58:56 PM

File Path: C:\Users\k6enxhit\Documents\FY23_PN96182_MPTR-STORAGE_ELEC_R21_hunter.l.taylor.rvt

READY TO ADVERTISE (RTA)

Branch Panel: B1

Location:
Supply From:
Mounting: Recessed
Enclosure: NEMA 1

Volts: 120/240 Single
Phases: 1
Wires: 3

A.I.C. Rating: 10k
Mains Type: MCB
Mains Rating: 225 A
MCB Rating: 225 A

Notes:

CKT	Circuit Description	Trip	Poles	Remarks	A		B		Remarks	Poles	Trip	Circuit Description	CKT
1	Warehouse Internal Lighting	20 A	1		210 VA	1080 VA				2	15 A	DSS-CU-1	2
3	Storage Receptacles 1	20 A	1				720 VA	1080 VA	--	--	--	--	4
5	Storage Receptacles 2	20 A	1		720 VA	588 VA				2	15 A	EF-1	6
7	Office Internal Lighting	20 A	1				124 VA	588 VA	--	--	--	--	8
9	Office Quad Receptacles	20 A	1		1080 VA	5040 VA				2	50 A	EUH-1	10
11	Office Receptacles	20 A	1				540 VA	5040 VA	--	--	--	--	12
13	Emergency Lighting	20 A	1		155 VA	5040 VA				2	50 A	EUH-2	14
15	Exterior White Lighting	20 A	1				17 VA	5040 VA	--	--	--	--	16
17	Exterior Red Lighting	20 A	1		17 VA	960 VA				2	20 A	Overhead Coiling Door Motor 1	18
19	NEC Receptacle 1	20 A	1				1000 VA	960 VA	--	--	--	--	20
21	NEC Receptacle 2	20 A	1		1000 VA	960 VA				2	20 A	Overhead Coiling Door Motor 2	22
23	Target Test Receptacle	20 A	1				1000 VA	960 VA	--	--	--	--	24
25	Exterior Weatherproof Receptacle	20 A	1		180 VA								26
27													28
29													30
31	Spare	20 A	1	--			0 VA						32
33	Spare	20 A	1	--	0 VA								34
35	Spare	20 A	1	--			0 VA	0 VA	--	2	30 A	Spare	36
37	Spare	20 A	1	--	0 VA	0 VA			--	--	--	--	38
39	Spare	20 A	1	--			0 VA	0 VA	--	2	30 A	SPD	40
41	Spare	20 A	1	--	0 VA	0 VA			--	--	--	--	42
			Total Load:		16516 VA		16523 VA						
			Total Amps:		138 A		138 A						

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting	501 VA	125.00%	626 VA		
Motor	27336 VA	100.00%	27336 VA	**Total Conn. Load:**	33039 VA
IT	3000 VA	100.00%	3000 VA	**Total Est. Demand:**	33163 VA
Receptacle	3240 VA	100.00%	3240 VA	**Total Conn. Current:**	138 A
				Total Est. Demand Current:	138 A

ELECTRICAL CONNECTION SCHEDULE

EQUIPMENT INFORMATION					CONDUCTORS AND RACEWAY				DISCONNECTING MEANS			
MARK	DESCRIPTION	VOLTAGE	PHASE	# OF RUNS	PHASE	GROUND	CONDUIT	TYPE	AMPS	POLES	FUSE	NEMA
DDS-CU-1	Heat Pump Split-System	240 V	1	1	2#12	#12	1/2" C	DISC	30 A	2	NF	3R
EF-1	Fan	240 V	1	1	2#12	#12	1/2" C	DISC	30 A	2	NF	1
EUH-1	Unit Heater	240 V	1	1	2#6	#10	1" C	DISC	60 A	2	NF	1
EUH-2	Unit Heater	240 V	1	1	2#6	#10	1" C	DISC	60 A	2	NF	1
MTR-1	Overhead Coiling Door Motor	240 V	1	1	2#12	#12	1/2" C	DISC	30 A	2	NF	1
MTR-2	Overhead Coiling Door Motor	240 V	1	1	2#12	#12	1/2" C	DISC	30 A	2	NF	1

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING PANEL SCHEDULES

SHEET ID
BLDG 3
EP701

READY TO ADVERTISE (RTA)

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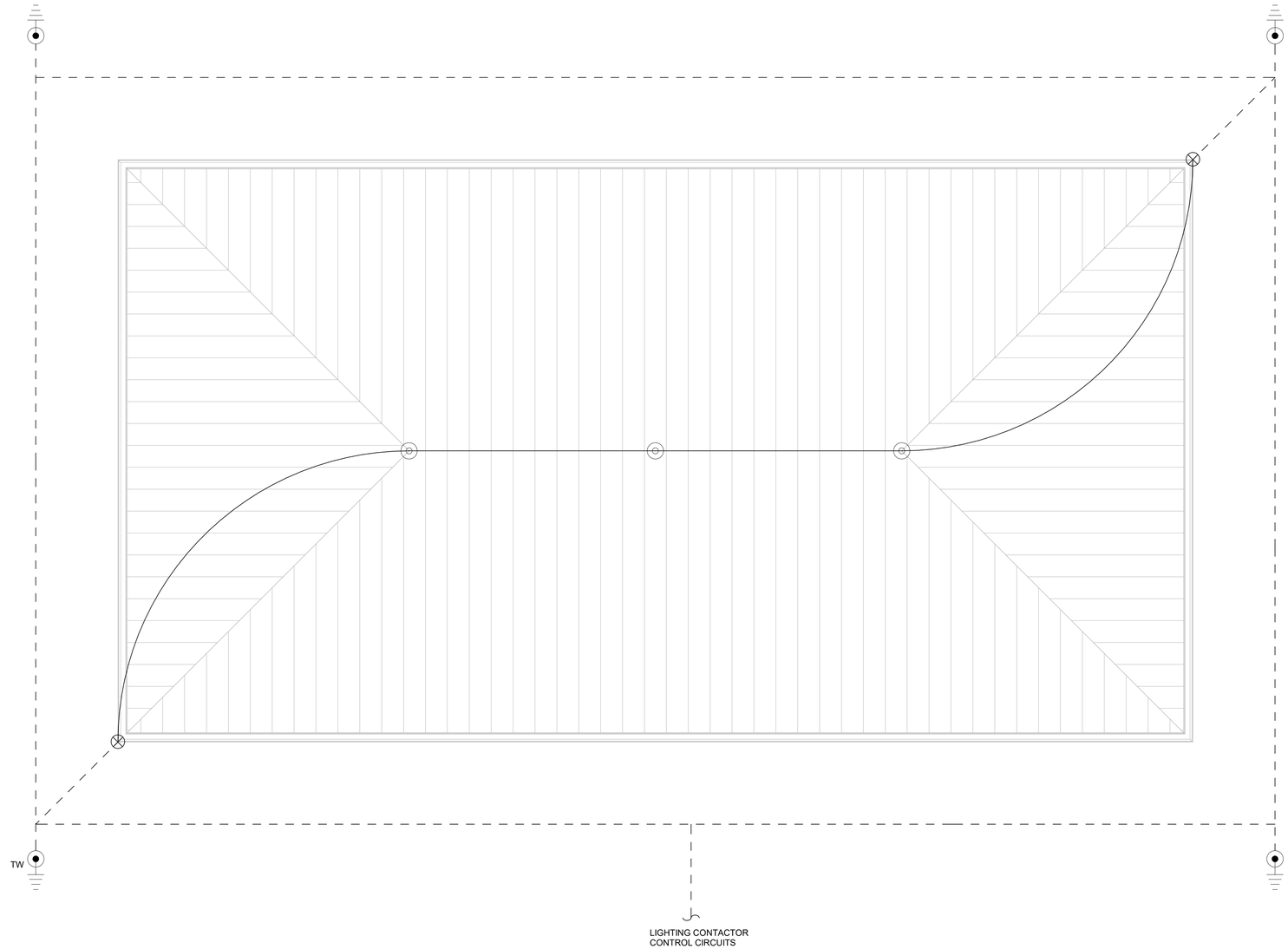

1 LIGHTNING PROTECTION PLAN

1/4" = 1'-0"

4 3 2 1 0 4 8

GENERAL SHEET NOTES

1. THE LIGHTNING PROTECTION INSTALLER SHALL COORDINATE ROOF PENETRATIONS WITH THE ROOF INSTALLER. PENETRATIONS SHALL COMPLY WITH THE ROOF MANUFACTURER'S RECOMMENDATIONS. SEALING AND FLASHING OF PENETRATIONS SHALL BE BY THE ROOF INSTALLER.

2. LIGHTNING PROTECTION CONDUCTORS PASSING THROUGH CONCRETE FOUNDATION, SLABS OR PADS SHALL BE ROUTED IN CONDUIT.

3. INSTALLED LIGHTNING PROTECTION SYSTEM SHALL BE FIELD INSPECTED BY CONTRACTOR-PROVIDED INDEPENDENT TESTING AGENCY AND FURNISHED WITH A UL MASTER LABEL FOR LIGHTNING PROTECTION SYSTEM.

4. CONDUIT FOR DOWN CONDUCTORS SHALL ROUTE DOWN THE EXTERIOR WALL. PAINT CONDUITS TO MATCH EXTERIOR WALL COLOR.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

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FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING LIGHTNING PROTECTION PLAN

SHEET ID
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EG101

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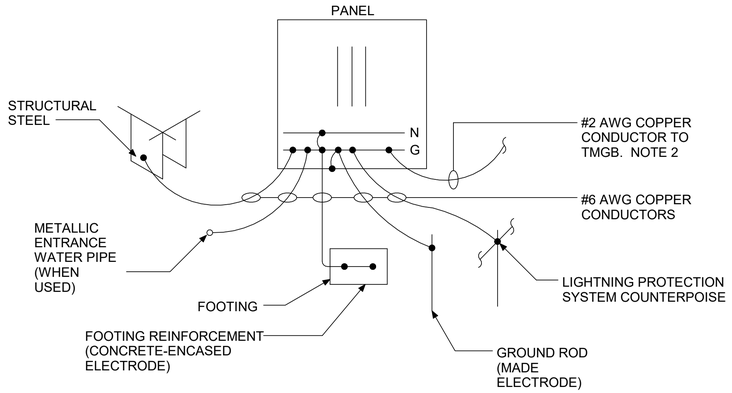
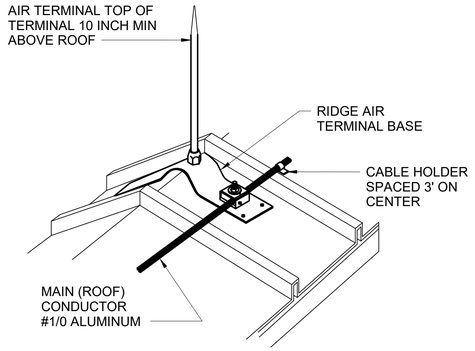


NOTES:

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC, ARTICLE 250. VARIATIONS TO GROUNDING SHOWN SHALL BE APPROVED BY THE COR.

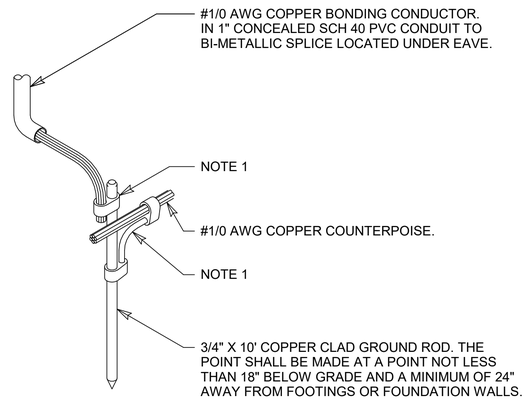
1 SERVICE ENTRANCE GROUNDING DETAIL

NOT TO SCALE



2 RIDGE ROOF AIR TERMINAL DETAIL

NOT TO SCALE



NOTES:

1. ALL CONNECTIONS TO GROUND RODS BELOW GROUND LEVEL MUST BE BY EXOTHERMIC WELD CONNECTION OR WITH A HIGH COMPRESSION CONNECTION USING A HYDRAULIC OR ELECTRIC COMPRESSION TOOL TO PROVIDE THE CORRECT CIRCUMFERENTIAL PRESSURE.

3 DOWN CONDUCTOR & COUNTERPOISE CONNECTION DETAIL

NOT TO SCALE

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FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING MISC GROUNDING DETAILS

SHEET ID
BLDG 3
EG501

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READY TO ADVERTISE (RTA)

COMMUNICATIONS LEGEND

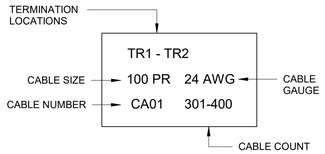
WP	VOIP TELEPHONE OUTLET WITH (1) CATEGORY 6, 8P8C CONNECTOR. "WP" INDICATES A WEATHERPROOF COVER. MH = 54" AFF UOI.
	NIPR OUTLET WITH (2) CATEGORY 6, 8P8C CONNECTORS AND (2) BLANK POSITIONS. OUTLET HOMERUNS TO NEC RACK. MH = 18" AFF UOI.
	DTR OUTLET WITH (2) CATEGORY 6, 8P8C CONNECTORS AND (2) BLANK POSITIONS. OUTLET HOMERUNS TO DTR. MH = 18" AFF UOI.
	3/4" A-C, VOID-FREE, FIRE-RETARDANT PLYWOOD BACKBOARD WITH NO ADDED UREA FORMALDEHYDE. SEE SPECIFICATION 01 33 29 FOR FOREST STEWARDSHIP COUNCIL (FSC) CERTIFICATION REQUIREMENTS.
	7-FT, 19-INCH ALUMINUM RACK WITH VERTICAL WIRE MANAGEMENT ASSEMBLY.
	48"H X 24"W X 30"D WALL-MOUNTED CABINET.
	CABLE RUNWAY OR WIREWAY, TYPE AND SIZE AS INDICATED.
PBB	TELECOMMUNICATIONS MAIN GROUND BAR, MH 18" AFF.
SBB	TELECOMMUNICATIONS GROUND BAR, MH 18" AFF.
J	JUNCTION BOX, WALL MOUNTED, MH 18" AFF UOI.
J	JUNCTION BOX, CEILING MOUNTED.

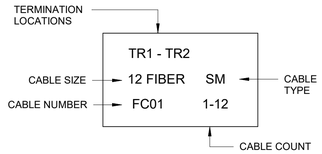
VIDEO SURVEILLANCE SYSTEM LEGEND

	GFGI CAMERA. PROVIDE 1-1/4" RGS CONDUIT TO DTR RACK. REFER TO VOLUME 4 ES517 FOR MOUNTING DETAILS.

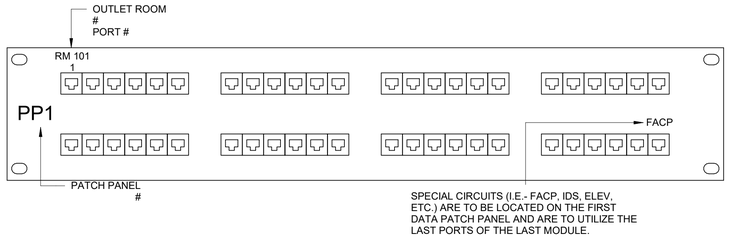
COMMUNICATION LABELING SCHEME

BACKBONE CABLES LABELING SCHEME

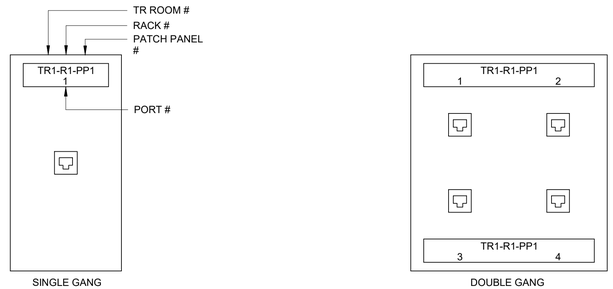




PATCH PANELS LABELING SCHEME



OUTLETS LABELING SCHEME



JACKS SHALL BE ARRANGED AND LABELED ACCORDING TO THEIR LOCATIONS IN A ROOM. THEY SHALL BE ARRANGED CLOCKWISE IN ASCENDING ORDER AROUND THE ROOM WHILE STANDING IN THE DOORWAY LOOKING INTO THE ROOM. FLOOR JACK NUMBER ARRANGEMENT SHOULD WORK IN CLOCKWISE ORDER LOOKING OUT THE TR DOORWAY. THIS LABELING SCHEME ADHERES TO THE REQUIRMENTS OUTLINED IN THE ANSI/TIA 606-B TELECOMMUNICATION STANDARD.

GENERAL NOTES

NOTES, COMMUNICATIONS:

1. ALL COMMUNICATIONS WORK SHALL BE MEET THE REQUIREMENTS OF THE I3A CRITERIA, EIA/TIA STANDARDS, AND THE NEC.

2. VOICE AND DATA OUTLET CABLING RATED CATEGORY 6 PER ANSI/TIA 568-D STANDARD.

3. FOR CATEGORY 6 CABLING, A MINIMUM OF 10 FT OF CABLE SLACK SHALL BE PROVIDED AT THE COMMUNICATIONS ROOM AND A MINIMUM OF 1 FT OF CABLE SLACK SHALL BE PROVIDED IN THE SUSPENDED CEILING FOR THE TELECOMMUNICATIONS OUTLET. THE REQUIRED CABLE SLACK LENGTHS ARE IN ADDITION TO THE TOTAL CABLE LENGTHS REQUIRED TO REACH THE TELECOMMUNICATIONS OUTLETS.

4. ALL CONDUIT TO COMMUNICATIONS OUTLET BOXES SHALL BE A MINIMUM OF 1" EMT UNLESS OTHERWISE INDICATED. CONDUITS SHALL BE CONCEALED IN CEILINGS AND WALLS, EXCEPT WHERE SPECIFICALLY OTHERWISE INDICATED.

5. PULL BOXES SHALL BE PLACED IN CONDUIT RUNS WHERE A CONTINUOUS CONDUIT LENGTH EXCEEDS 100 FEET, OR WHERE THERE ARE MORE THAN TWO 90 DEGREE BENDS. PULL BOXES SHALL BE PLACED IN STRAIGHT, ALIGNED RUNS OF CONDUIT AND NOT BE USED IN LIEU OF A BEND. PULLBOXES SHALL BE DIRECTLY ACCESSIBLE.

6. ALL COMMUNICATIONS CABLE TRAY, CONDUITS, AND WIRING SHALL BE INSTALLED AND ROUTED IAW THE TIA 569-D, UFC 3-580-01, AND THE FT. BRAGG IDC, 2017.

7. PROVIDE PIPE SLEEVES FOR POWER AND COMMUNICATIONS ENTRANCE AND EXIT CONDUITS THROUGH SLABS AT THE TIME OF THE CONSTRUCTION OF THE SLAB. NO DRILLING OR PUNCHING THROUGH SLABS WILL BE ALLOWED. ALL COMMUNICATIONS CONDUITS IN OR BELOW THE SLAB MUST RISE THROUGH THE SLAB USING RIGID STEEL CONDUIT. THE TRANSITION FROM PVC TO RIGID STEEL CONDUIT MUST TAKE PLACE PRIOR TO THE SWEEP UP TO THE BLDG. (AT THE 90-DEGREE BEND).

8. SEAL PENETRATIONS THROUGH FLOORS AND FIRE WALLS TO MAINTAIN THE INTEGRITY OF THE FIRE AND ACOUSTIC RATINGS OF THE WALLS AND FLOORS.

9. LAN ELECTRONICS SHALL BE GOVERNMENT-FURNISHED, GOVERNMENT-INSTALLED EQUIPMENT. ALL OTHER EQUIPMENT, CABLING, AND COMPONENTS NECESSARY TO PROVIDE A COMPLETE AND FULLY FUNCTIONAL TELECOMMUNICATIONS SYSTEM SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. TESTING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE I3A, ANSI/TIA STANDARDS, AND SHALL BE COMPLETED BY THE CONTRACTOR AND APPROVED BY THE COMMISSIONING AGENT THROUGH THE CONTRACTING OFFICER'S REPRESENTATIVE (COR).

10. A MINIMUM OF 36 INCHES OF SPACE SHALL BE PROVIDED BOTH IN FRONT OF AND BEHIND THE RACK AND BEHIND ANY INSTALLED EQUIPMENT. A MINIMUM SIDE CLEARANCE OF 24 INCHES SHALL BE PROVIDED ON THE END OF THE RACKS. PROVIDE 100 PERCENT SPARE RACK CAPACITY BASED ON THE AMOUNT OF RACK CAPACITY UTILIZED BY THE PATCH PANELS PROVIDED.

ABBREVIATIONS

ACS	ACCESS CONTROL SYSTEM
AFF	ABOVE FINISHED FLOOR
C	CONDUIT
CATV	CABLE TELEVISION
CKT	CIRCUIT
CFCI	CONTRACTOR-FURNISHED, CONTRACTOR-INSTALLED
COR	CONTRACTING OFFICER'S REPRESENTATIVE
CU	COPPER
DMS	DOOR MONITORING SYSTEM
DTR	DATA TERMINATION RACK
DVI	DIGITAL VIDEO INPUT
FACP	FIRE ALARM CONTROL PANEL
GFCI	GOVERNMENT-FURNISHED, GOVERNMENT-INSTALLED
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFGI	GOVERNMENT-FURNISHED, GOVERNMENT-INSTALLED
G	GROUND
GND	GROUND
HZ	HERTZ
I3A	TECHNICAL CRITERIA FOR THE INSTALLATION INFORMATION INSTALLATION ARCHITECTURE, FEB 2010
IDS	INTRUSION DETECTION SYSTEM
MFR	MANUFACTURER
MH	MOUNTING HEIGHT
MNS	MASS NOTIFICATION SYSTEM
MTD	MOUNTED
NEC	NFPA 70, NATIONAL ELECTRICAL CODE, 2014
NO	NUMBER
NTS	NOT TO SCALE
SPD	SURGE PROTECTIVE DEVICE
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UOI	UNLESS OTHERWISE INDICATED
UON	UNLESS OTHERWISE NOTED
W, WP	WEATHERPROOF

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING LEGEND AND NOTES

SHEET ID
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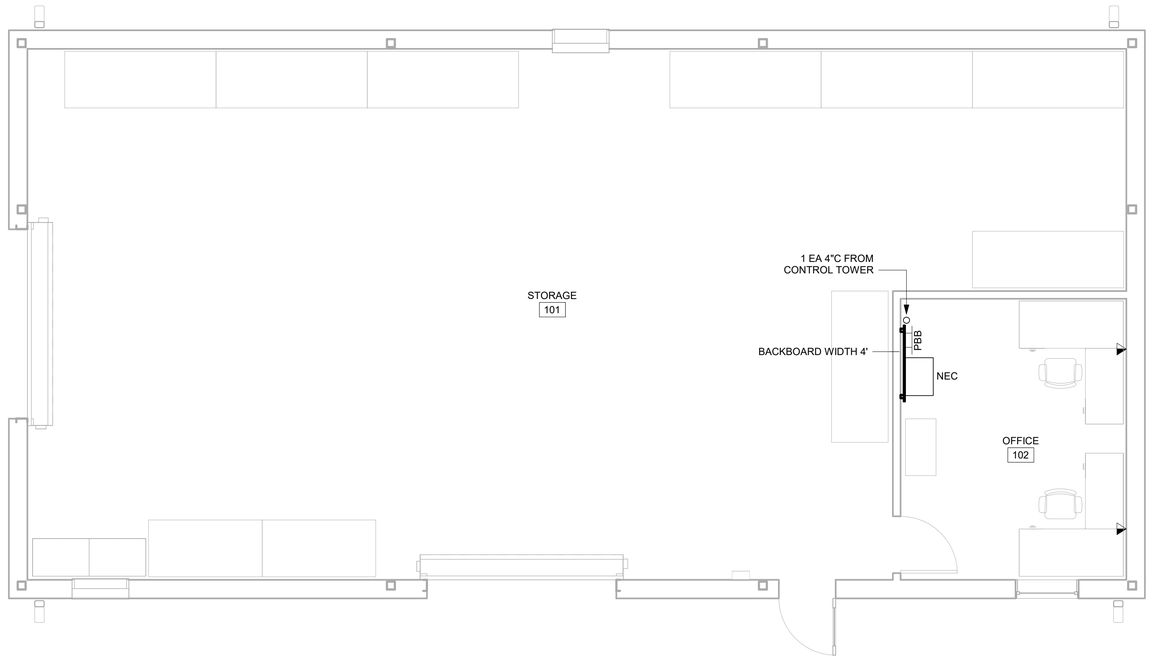

1 TELECOMMUNICATIONS PLAN
1/4" = 1'-0"

GENERAL SHEET NOTES

KEYED NOTES ⟨#⟩

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

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OPERATIONS/STORAGE BUILDING
TELECOMMUNICATIONS PLAN

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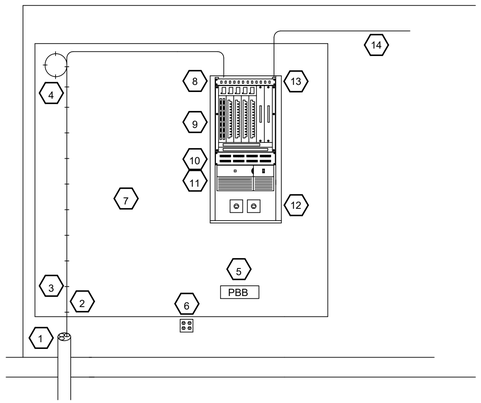


NEC COMMUNICATIONS CABINET DIAGRAM AND KEYED NOTES

1. ONE (1) EACH 4-INCH CONDUITS TO HANDHOLE. ONE CONDUIT SHALL CONTAIN 3 EACH 3-INCH 3-CELL FABRIC MESH WITH TRACER WIRE ATTACHED AND PULL STRING IN ALL VACANT CELLS. ALL VACANT DUCTS SHALL HAVE PULL STRINGS.

2. FIBER OPTIC CABLES. SEE VOLUME 1, SHEET ES604 FOR QUANTITIES.

3. CABLE MANAGEMENT RINGS.

4. 20-FT FIBER MAINTENANCE LOOP.

5. TELECOMMUNICATIONS PRIMARY BONDING BUSBAR (PBB). ALL GROUND LUGS SHALL BE TWO-HOLE COMPRESSION CRIMP-TYPE LUG FITTINGS.

6. QUAD 120VAC RECEPTACLES, MOUNTED 18" AFF (TYP). QUANTITIES AND LOCATIONS PER POWER PLANS.

7. FIRE-RETARDANT, 3/4" THICK, 8' TALL, WIDTH AS INDICATED ON PLANS, TYPE A/C PLYWOOD BACKBOARD. PLYWOOD MUST BE APPROVED BY NEC QA/QC BEFORE INSTALLATION. INSTALL PLYWOOD BACKBOARDS WITH THE "A" SIDE FACING OUT AND THE MANUFACTURER'S FIRE RETARDENT STAMP SHALL BE VISIBLE

8. 12-PORT (1U), SINGLE-MODE, FIBER OPTIC PATCH PANEL WITH FIBER TRAY AND DUPLEX LC CONNECTORS FOR SERVICE ENTRANCE FIBER OPTIC CABLES.

9. LOCAL AREA NETWORK (LAN) ELECTRONICS SHALL BE GFGI. CONTRACTOR SHALL PROVIDE AND INSTALL FIBER OPTIC PATCH CABLES PLUS 25% SPARE.

10. CABINET-MOUNTED, CATEGORY 6, 48-PORT, RJ45 PATCH PANELS FOR DATA, QUANTITIES AS REQUIRED.

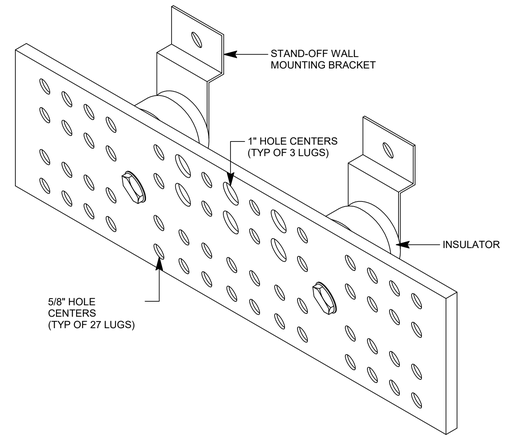
11. CABINET-MOUNTED, UNINTERRUPTIBLE POWER SUPPLY (UPS) SHALL BE GFCI.

12. AC POWER RECEPTACLES, MOUNTED PER DETAIL ON SHEET EP501. TYPES AND QUANTITIES PER POWER PLANS.

13. NEC CABINET. 42"H x 24"W x 30"D WALL-MOUNT CABINET.

14. CATEGORY 6 CABLING IN PATHWAYS TO WIREWAY. OUTLET LOCATIONS PER COMMUNICATIONS PLANS.

1 DIAGRAM - OPS/STORAGE NEC
NOT TO SCALE



NOTES:

1. THE PBB DIMENSIONS SHALL BE 20" L x 4" W x 1/4" H.

2. THE PBB SHALL BE UL LISTED.

3. THE PBB MOUNTING BRACKETS SHALL BE STAINLESS STEEL.

4. ALL CONNECTIONS TO THE PBB SHALL BE MADE USING TWO-HOLE COMPRESSION CRIMP-TYPE LUG FITTINGS.

2 DETAIL - PRIMARY BONDING BUSBAR (PBB)
NOT TO SCALE

US Army Corps of Engineers ®

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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
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OPERATIONS/STORAGE BUILDING COMMUNICATIONS DETAILS

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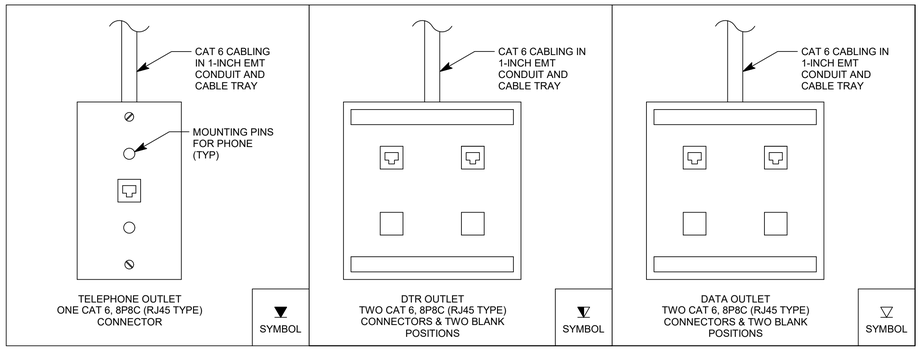
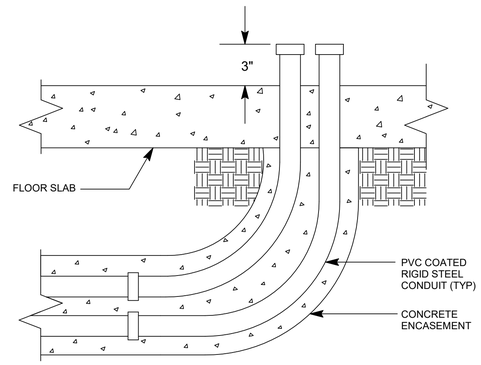


1 TYPICAL COMMUNICATIONS WALL OUTLET DETAIL

NOT TO SCALE

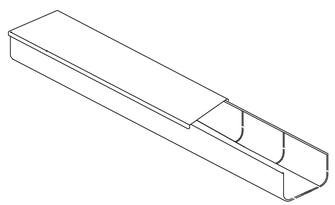


2 TELECOMMUNICATIONS SERVICE ENTRANCE DETAIL

NOT TO SCALE

NOTES:

1. PROVIDE NUMBER OF CONDUITS AS SHOWN ON CONDUIT RISER DIAGRAM, TN601.
2. BOND CONDUITS TO PBB/SBB.
3. PROVIDE MECHANICAL PLUGS FOR EMPTY CONDUITS.



NOTES:

1. DIMENSIONS AS INDICATED ON PLANS

3 DETAIL - WIREWAY

NOT TO SCALE

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100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING COMMUNICATIONS DETAILS

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TN502

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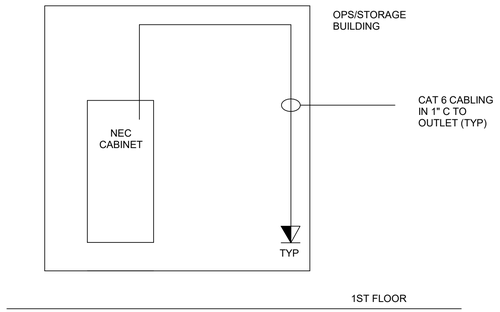
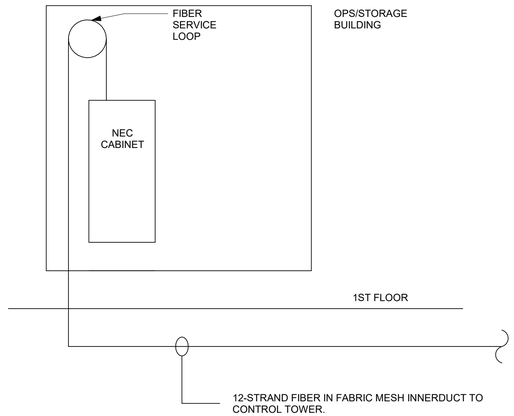


1 RISER DIAGRAM - COPPER CABLING
NOT TO SCALE



2 RISER DIAGRAM - FIBER OPTIC CABLING
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OPERATIONS/STORAGE BUILDING COMMUNICATIONS DIAGRAMS

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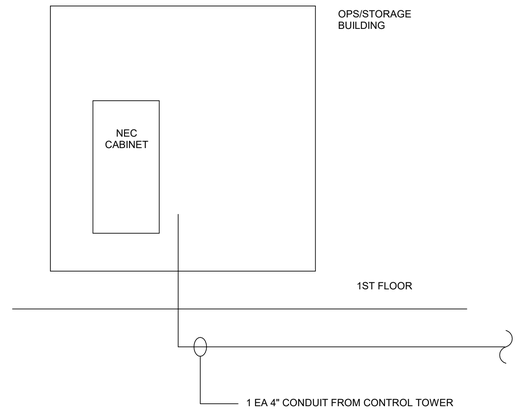

1 CONDUIT RISER DIAGRAM
NOT TO SCALE

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VOLUME 2 - BUILDING

OPERATIONS/STORAGE BUILDING CONDUIT RISER DIAGRAM

SHEET ID
BLDG 3
TN602

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DESIGN CODE NOTES:

D-1. STRUCTURAL DESIGN IS IN ACCORDANCE WITH THE FOLLOWING CODES AND SPECIFICATIONS:

A. IBC 2018, INTERNATIONAL BUILDING CODE

B. ASCE 7-16, MINIMUM DESIGN LOADS FOR BUILDINGS AND STRUCTURES

C. ACI 318-14, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

D. TMS 402-16, BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES

E. AISC 360-16, SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS

F. AISI S100-12, NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS.

G. AWS, AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE

H. SDI, STEEL DECK INSTITUTE: DESIGN MANUAL FOR COMPOSITE DECK, FORM DECK, & ROOF DECK

I. UFC 1-200-01, GENERAL BUILDING REQUIREMENTS (01 OCT 2020)

J. UFC 3-301-01, STRUCTURAL ENGINEERING, (01 OCT 2019)

K. UFC 4-010-01, DOD MINIMUM ANTI-TERRORISM STANDARDS FOR BUILDINGS, (19 AUG 2020)

DESIGN LOAD CRITERIA:

D-2. LIVE LOADS:

SLAB-ON-GRADE	100 PSF
ROOF LIVE LOAD	20 PSF

D-3. SNOW LOADS:

RISK CATEGORY	II
SNOW IMPORTANCE FACTOR, I_s	1.0
MINIMUM GROUND SNOW LOAD, P_g	10 PSF
FROST PENETRATION DEPTH	0 IN
SNOW EXPOSURE FACTOR, C_e	0.9
SNOW THERMAL FACTOR, C_t	1.0
ROOF SLOPE FACTOR, C_S	0.8
FLAT ROOF SNOW LOAD, P_f	6.3 PSF
SLOPED ROOF SNOW LOAD, P_S	5 PSF

D-4. WIND LOADS:

RISK CATEGORY	II
BASIC WIND SPEED, *V*	119 MPH (ULTIMATE) 93 MPH (SERVICE)
WIND EXPOSURE CATEGORY	C
GUST EFFECT FACTOR, *G*	0.85
INTERNAL PRESSURE COEFFICIENTS, *GCpi*	0

D-5. SEISMIC LOADS:

RISK CATEGORY	II
SEISMIC IMPORTANCE FACTOR, *Ie*	1.0
MAPPED SPECTRAL RESPONSE ACCELERATION, *Ss*	0.154
MAPPED SPECTRAL RESPONSE ACCELERATION, *S1*	0.072
SITE CLASS	D
DESIGN SPECTRAL RESPONSE ACCELERATION, *Sds*	0.16
DESIGN SPECTRAL RESPONSE ACCELERATION, *Sd1*	0.12
SEISMIC DESIGN CATEGORY	B
SEISMIC ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE
SEISMIC-FORCE RESISTING SYSTEM	STEEL NOT DETAILED FOR SEISMIC
RESPONSE MODIFICATION FACTOR, *R*	3.0
SYSTEM OVERSTRENGTH FACTOR	3.0
DEFLECTION AMPLIFICATION FACTOR, Cd	3.0
SEISMIC RESPONSE COEFFICIENT, Cs	0.055
SEISMIC BASE SHEAR	2 KIPS

D-6. ANTI-TERRORISM/FORCE PROTECTION CRITERIA:

ANTI-TERRORISM/FORCE PROTECTION IS NOT REQUIRED FOR THIS FACILITY BASED ON THE INTENDED OCCUPANCY.

SPECIAL INSPECTION NOTES:

SI-1. INSPECTION OF FABRICATORS SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1704.2.5.

SI-2. INSPECTION OF STEEL CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.2.

SI-3. INSPECTION OF CONCRETE CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.3 AND TABLE 1705.3.

SI-4. INSPECTIONS FOR SEISMIC RESISTANCE SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.12.

SI-5. INCLUDE SPECIAL INSPECTIONS REQUIREMENTS IN CONTRACTOR'S QUALITY CONTROL (CQC) PLAN.

SI-6. THE CONTRACTOR SHALL RETAIN THIRD PARTY QUALITY ASSURANCE AGENCIES TO CONDUCT SPECIAL INSPECTIONS REQUIRED BY IBC. INSPECTING AGENCY SHALL PROVIDE REPORTS OF SPECIAL INSPECTIONS DIRECTLY TO THE GOVERNMENT.

GENERAL NOTES:

G-1. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER ALL BUILDING CONSTRUCTION IS COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCES TO ENSURE SAFETY OF THE BUILDING AND ITS COMPONENTS DURING ERECTION. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS, OR TIE-DOWNS.

G-2. THE CONTRACT DOCUMENTS DO NOT INDICATE THE MEANS AND METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK DURING ERECTION AND CONSTRUCTION AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES, SEQUENCES, LOADINGS AND SAFETY.

G-3. USE STRUCTURAL DRAWINGS IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SPECIFICATIONS. COORDINATE THE WORK OF OTHER TRADES INCLUDING, BUT NOT LIMITED TO, THE REQUIREMENTS FOR SLEEVES, INSERTS, HOLES, HANGERS, AND ANCHORS.

G-4. REPORT DISCREPANCIES IN DIMENSIONS BETWEEN DIFFERENT DRAWINGS TO THE CONTRACTING OFFICER PRIOR TO BEGINNING WORK IN IMPACTED AREAS.

G-5. ELEVATIONS ON THE STRUCTURAL DRAWINGS ARE DENOTED AS [±X'-X"] REFERENCED TO THE FINISHED FIRST FLOOR ELEVATION DATUM [0'-0"]. SEE CIVIL DRAWINGS FOR ACTUAL DATUM ELEVATION.

G-6. DETAILS TITLED OR NOTED AS "TYPICAL" APPLY NOT ONLY WHERE SPECIFICALLY INDICATED OR REFERENCED, BUT ALSO IN ALL OTHER CASES WHERE THE NATURE OF THE CONSTRUCTION REQUIRES THEIR USE. DETERMINE APPLICABILITY OF TYPICAL DETAILS FROM DESCRIPTIVE TITLES OR FROM THE SIMILARITY OF A CONSTRUCTION CONDITION TO ANOTHER CONDITION WHERE THE DETAIL IS SPECIFICALLY INDICATED OR REFERENCED.

G-7. WHERE A DETAIL OR SECTION IS SHOWN FOR ONE CONDITION, IT SHALL APPLY TO ALL LIKE OR SIMILAR CONDITIONS EVEN THOUGH NOT SPECIFICALLY MARKED ON THE PLANS.

G-8. REPRODUCTION OF CONTRACT DRAWINGS SHALL NOT BE USED AS SHOP DRAWINGS UNDER ANY CIRCUMSTANCE.

G-9. DO NOT SCALE THE DRAWINGS.

FOUNDATION AND SLAB NOTES:

F-1. FOUNDATIONS FOR THIS PROJECT HAVE BEEN DESIGNED IN ACCORDANCE WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT PREPARED BY THE SAVANNAH DISTRICT TITLED "SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING REPORT", DATED MARCH 2022.

F-2. FOUNDATIONS HAVE BEEN DESIGNED TO BEAR ON SOIL CAPABLE OF SUPPORTING AN ALLOWABLE BEARING PRESSURE OF 3000 PSF, PER THE GEOTECHNICAL REPORT REFERENCED ABOVE.

F-3. THE CONTRACTOR SHALL HIRE AN INDEPENDENT TESTING LABORATORY AND GEOTECHNICAL ENGINEER, REGISTERED AND LICENSED IN THE STATE WHERE THE WORK WILL BE ACCOMPLISHED, TO VERIFY THAT ALL OF THE REQUIREMENTS CONTAINED IN SPECIFICATION 31 00 00, EARTHWORK, HAVE BEEN FOLLOWED AND ACCOMPLISHED.

F-4. CONTRACTOR SHALL BE PREPARED FOR AND SHALL INCLUDE COST OF FORMING FOUNDATIONS SHOULD THE EARTH NOT PROVIDE ADEQUATE BANK STABILITY.

F-5. ALL EXCAVATIONS SHALL BE PERFORMED SO THAT THE SITE AND THE AREA IMMEDIATELY SURROUNDING THE SITE WHICH AFFECTS CONSTRUCTION OPERATIONS WILL BE CONTINUALLY AND EFFECTIVELY DRAINED. THE CONTRACTOR SHALL PROVIDE DRAINAGE AND DEWATERING AS REQUIRED TO ENSURE THAT ALL FOOTING EXCAVATIONS ARE ACCOMPLISHED WITH THE SUBGRADE SOILS REMAINING DRY AND FIRM UNTIL AFTER FOOTINGS ARE PLACED AND BACKFILLED. REMOVAL OF SURFACE WATER, GROUNDWATER, AND ANY PERCHED WATER CONDITIONS WHICH MIGHT BE ENCOUNTERED DURING EXCAVATIONS, SHALL BE ACCOMPLISHED BY APPROVED MEANS. REFER TO SPECIFICATION SECTION 31 00 00, EARTHWORK, AND TO SHEET S-101 FOR ADDITIONAL EXCAVATION REQUIREMENTS.

F-6. PLACE FOUNDATION CONCRETE THE SAME DAY EXCAVATIONS ARE MADE OR AS SOON AS PRACTICAL THEREAFTER.

F-7. DO NOT PLACE FOUNDATION CONCRETE ON FROZEN OR SATURATED SUBGRADES.

F-8. ENSURE THAT EARTH-FORMED FOOTINGS CONFORM TO THE SHAPE, LINES, AND THICKNESS INDICATED ON THE FOUNDATION PLAN, SECTIONS, AND FOOTING SCHEDULES. EXCAVATION WIDTHS SHALL BE A MINIMUM OF 4" GREATER THAN DIMENSIONS INDICATED.

F-9. DO NOT INSTALL FOUNDATIONS UNTIL FOUNDATION WORK HAS BEEN COORDINATED WITH ADJACENT UNDERGROUND UTILITIES.

CONCRETE CONSTRUCTION NOTES:

C-1. ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-14) AND THE SPECIFICATIONS FOR STRUCTURAL CONCRETE (ACI 301-14) OF THE AMERICAN CONCRETE INSTITUTE (ACI).

C-2. ALL CAST-IN-PLACE CONCRETE SHALL ATTAIN MINIMUM 28-DAY COMPRESSIVE STRENGTH (f'c) OF 4000 PSI.

C-3. CONCRETE DENSITY SHALL BE NORMAL WEIGHT WITH A DENSITY OF 140 PCF TO 150 PCF UNLESS NOTED OTHERWISE ON PLANS. CONCRETE NOTED TO BE LIGHTWEIGHT SHALL HAVE DENSITY OF 105 PCF TO 115 PCF.

C-4. CONCRETE REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615/A615M, GRADE 60 AND SHALL HAVE FABRICATION TOLERANCES IN ACCORDANCE WITH ACI 315. SHOP FABRICATE REINFORCING BARS WHICH ARE INDICATED TO BE BENT OR HOOKED.

CONCRETE CONSTRUCTION NOTES CONTINUED:

C-5. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 OR ASTM A497. PROVIDE SHEET-TYPE WELDED WIRE FABRIC. SHEET LAPS SHALL BE TIED AND LAPPED ONE FULL MESH SPACING PLUS 2".

C-6. CONCRETE REINFORCING STEEL SHALL BE CONTINUOUS UNLESS OTHERWISE INDICATED. CONTINUOUS REINFORCING STEEL SHALL BE SPLICED AS SHOWN IN SCHEDULE ON SB601 UNO ON PLANS. REINFORCING STEEL SHALL BE PLACED SO THAT SPACING IS GREATER THAN OR EQUAL TO 2X BAR DIAMETER.

C-7. MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE AS INDICATED. IN NO CASE SHALL REINFORCEMENT COVER BE LESS THAN THE REQUIREMENTS OF ACI 301.

A.	CONCRETE DEPOSITED AGAINST THE GROUND	3"
B.	CONCRETE EXPOSED TO EARTH OR WEATHER	2"
C.	SLABS AND WALLS	1"

C-8. CONCRETE REINFORCING STEEL MARKED STANDARD HOOK SHALL HAVE A 90° HOOK A MINIMUM OF 12 BAR DIAMETERS IN LENGTH, UNLESS OTHERWISE NOTED. STIRRUPS, TIES, AND 180° HOOKS SHALL CONFORM TO THE REQUIREMENTS OF ACI 318.

C-9. PROVIDE 1/2" THICK PRE-MOLDED JOINT FILLER MATERIAL WHERE SLABS ON GRADE ABUT VERTICAL SURFACES.

C-10. ALL EMBEDDED ITEMS SHALL BE PROPERLY PLACED, ACCURATELY POSITIONED AND MAINTAINED SECURELY IN PLACE PRIOR TO AND DURING CONCRETE PLACEMENT.

C-11. REINFORCING STEEL SHALL BE SPREAD AT SLEEVES, ANCHORS, RECESSES AND OTHER EMBEDDED ITEMS UNLESS OTHERWISE INDICATED. REINFORCEMENT SHALL NOT BE CUT TO FACILITATE PLACEMENT OF EMBEDDED ITEMS, UNLESS INDICATED.

C-12. NO CONCRETE SHALL BE PLACED UNTIL THE OWNER OR THE CONTRACTING OFFICER'S DESIGNATED REPRESENTATIVE HAS INSPECTED ALL EMBEDDED WORK, INCLUDING REINFORCEMENT.

C-13. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 3/4" OR AS INDICATED.

C-14. ALUMINUM SHALL NOT BE PLACED IN DIRECT CONTACT WITH CONCRETE UNLESS EFFECTIVELY COATED OR COVERED TO PREVENT ALUMINUM-CONCRETE REACTION AND ELECTROLYTIC ACTION BETWEEN ALUMINUM AND STEEL.

C-15. CONCRETE SLAB ON GRADE JOINTS INDICATED ARE DIAGRAMMATIC AND DO NOT REPRESENT ALL OF THE JOINTS REQUIRED FOR SLAB-ON-GRADE CONSTRUCTION. SLAB PANELS BETWEEN JOINTS SHALL BE EQUALLY SPACED OR NEARLY SO, WITH A MAXIMUM SPACING OF 15'-0". SLAB PANELS BETWEEN JOINTS SHALL BE SQUARE OR NEARLY SO AND SHALL NOT EXCEED AN ASPECT RATIO WITH PANEL LENGTH GREATER THAN 1.5 TIMES THE PANEL WIDTH.

C-16. CONTRACTOR SHALL PROVIDE JOINTS AT ALL RE-ENTRANT CORNERS INCLUDING, BUT NOT LIMITED TO, COLUMNS AND SLAB RECESSES.

C-17. IN ADDITION, CONTRACTOR SHALL COORDINATE SLAB ON GRADE JOINT REQUIREMENTS WITH SLAB-ON-GRADE CONSTRUCTION SEQUENCING. CONTRACTOR SHALL SHOW JOINT LAYOUT ON REINFORCING SHOP DRAWING SUBMITTAL FOR APPROVAL.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

BLEACHER ENCLOSURE GENERAL STRUCTURAL NOTES

SHEET ID
BLDG 4
S-001

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STEEL CONSTRUCTION NOTES:

S-1. FABRICATION AND ERECTION OF STRUCTURAL STEEL AND DESIGN OF CONNECTIONS SHALL BE IN ACCORDANCE WITH AISC 360-16, "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" AND AISC 303-16, "CODE OF STANDARD PRACTICE FOR BUILDING AND BRIDGES". THE STRUCTURAL STEEL MEMBERS SHOWN IN THESE DRAWINGS HAVE BEEN ANALYZED AND DESIGNED USING AISC 360-16, LRFD METHOD.

S-2. UNLESS OTHERWISE NOTED, STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE ABOVE-LISTED AISC SPECIFICATION AND THE FOLLOWING:

A. WIDE FLANGE SHAPES (50 KSI)	ASTM A992, GRADE B
B. HSS HOLLOW SHAPES (50 KSI)	ASTM A500, GRADE C
C. HSS HOLLOW ROUND SHAPES (46 KSI)	ASTM A500, GRADE C
D. PLATES AND ANGLES	ASTM A36
E. HIGH STRENGTH BOLTS	ASTM F3125, GRADE A325
F. ANCHOR RODS W/ NUT AND WASHER	ASTM F1554, GRADE 55

S-3. ALL SHOP AND FIELD WELDING SHALL BE BY CERTIFIED WELDERS AND SHALL CONFORM TO AWS STANDARDS. USE E70XX ELECTRODES UNLESS OTHERWISE NOTED. MINIMUM WELD SIZE FOR STRUCTURAL STEEL IS 3/16 IN FILLET, UNLESS OTHERWISE NOTED. CURRENT AWS CERTIFICATIONS SHALL BE AVAILABLE AT THE JOB SITE FOR REVIEW BY THE OWNERS' REPRESENTATIVE.

S-4. ALL BOLTED CONNECTIONS, UNLESS OTHERWISE NOTED, SHALL USE 3/4" DIAMETER HIGH STRENGTH BOLTS WITH HARDENED CARBON STEEL WASHERS AS REQUIRED FOR THE CONNECTION LOADS.

S-5. ALL FIELD-BOLTED SHEAR CONNECTIONS SHALL BE SNUG TIGHT BEARING-TYPE CONNECTIONS, THREADS INCLUDED IN THE SHEAR PLANE.

S-6. FIELD CUTTING OF STRUCTURAL STEEL MEMBERS BY ANY TRADE IS NOT PERMITTED. BOLT HOLES SHALL NOT BE CUT OR ENLARGED BY FLAME CUTTING IN THE FIELD.

S-7. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL DRAWINGS AND DESIGN CALCULATIONS FOR ANY ALTERNATE DETAILS AND MEMBER SPLICES.

S-8. SHOP OR FIELD SPLICES OF STRUCTURAL STEEL MEMBERS ARE PROHIBITED EXCEPT AS DETAILED ON THE DRAWINGS, PERMITTED IN THE SPECIFICATIONS, AS INDICATED ON APPROVED SUBMITTALS, AND AS SPECIFICALLY APPROVED ON SHOP DRAWINGS PRIOR TO FABRICATION.

S-9. PAINT ALL STEEL BELOW FINISH FLOOR WITH BITUMINOUS COATING.

S-10. ALL STEEL EXPOSED TO WEATHER SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 FOR MEMBERS AND ASTM A153 FOR CONNECTION ELEMENTS, EXCEPT THAT ARCHITECTURALLY EXPOSED STRUCTURAL STEEL SHALL BE BLAST CLEANED AND COATED IN ACCORDANCE WITH THE STRUCTURAL STEEL AND PAINT SPECIFICATIONS. COORDINATE ALL STEEL FINISHES WITH ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

S-11. ALL ANGLES AND BENT PLATES INDICATED TO BE CONTINUOUS SHALL HAVE SPLICES FULLY WELDED.

S-12. PROVIDE STEEL CAP PLATE TO ALL EXPOSED HSS MEMBERS AT EACH END..

STEEL DECK NOTES:

SD-1. ROOF DECK SHALL BE GALVANIZED STEEL CONFORMING TO ASTM A653 WITH A MINIMUM YIELD STRENGTH OF 33 KSI. STEEL ROOF DECK SHALL BE AS SHOWN ON DRAWINGS. FASTENERS FOR ROOF DECK SHALL UTILIZE 5/8" DIA PUDDLE WELDS AT A 36/7 PATTERN TO SUPPORT STRUCTURE AND #10 SELF TAPPING SCREWS AT SIDE LAP CONNECTIONS. THE NUMBER OF SIDELAPS VARIES PER ROOF PLAN. SEE ROOF PLANS FOR NUMBER OF SIDELAPS REQUIRED. SEE ROOF EAVE/RAKE SECTIONS FOR PERIMETER FASTENING REQUIREMENTS.

SD-2. PROVIDE ALL RIDGE PLATES, VALLEY PLATES, CLOSURE PLATES, POUR STOPS, AND ALL OTHER ACCESSORIES REQUIRED FOR COMPLETE INSTALLATION IN ACCORDANCE WITH THE DECK MANUFACTURER'S RECOMMENDATIONS.

SD-3. CONTRACTOR SHALL COORDINATE OPENINGS IN STEEL DECK WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS PRIOR TO DECK PLACEMENT.

SD-4. HANGING LOADS DIRECTLY FROM ROOF DECK IS PROHIBITED.

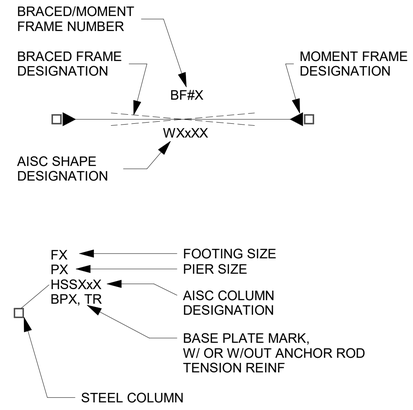
SD-5. STEEL DECK SHALL SPAN CONTINUOUSLY OVER A MINIMUM OF 4 SUPPORTS (3 SPANS) UNO.

STRUCTURAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	JS	JOIST SEAT
APPROX	APPROXIMATELY	KIP (k)	1000 POUNDS
ARCH	ARCHITECTURAL	LG	LONG
BCX	BOTTOM CHORD EXTENSION	LLH	LONG LEG HORIZONTAL
BOC	BOTTOM OF CONCRETE	LLV	LONG LEG VERTICAL
BOF	BOTTOM OF FOOTING	MAX	MAXIMUM
BOS	BOTTOM OF STEEL	MECH	MECHANICAL
BOT	BOTTOM	MEP	MECHANICAL, ELECTRICAL, PLUMBING
BRG	BEARING	MNFR	MANUFACTURER
BTWN	BETWEEN	MIN	MINIMUM
CFS	COLD-FORMED STEEL	NTS	NOT TO SCALE
CJ	CONTRACTION JOINT	OC	ON CENTER
CL	CENTER LINE	OPP	OPPOSITE
CLR	CLEAR	PJF	PREMOLDED JOINT FILLER
COL	COLUMN	PL	PLATE
CONN	CONNECTION	PLF	POUNDS PER LINEAR FOOT
CONC	CONCRETE	PSF	POUNDS PER SQUARE FOOT
CONT	CONTINUOUS	PSI	POUNDS PER SQUARE INCH
CONSTR	CONSTRUCTION	REINF	REINFORCEMENT
DEG	DEGREE	REQD	REQUIRED
DIA	DIAMETER	SCHED	SCHEDULE
DWG(S)	DRAWING(S)	SE	SLAB EDGE
EA	EACH	SJI	STEEL JOIST INSTITUTE
EF	EACH FACE	SIM	SIMILAR
EJ	EXPANSION JOINT	SOG	SLAB ON GRADE
EL	ELEVATION	SPCG	SPACING
EOD	EDGE OF DECK	STD	STANDARD
EOS	EDGE OF SLAB	T&B	TOP AND BOTTOM
ES	EACH SIDE	TO	TOP OF
EQ	EQUAL	TOC	TOP OF CONCRETE
EW	EACH WAY	TOF	TOP OF FOOTING
FF	FINISHED FLOOR	TOS	TOP OF SLAB
FTG	FOOTING	TR	TENSION REINFORCEMENT
GA	GAGE	TYP	TYPICAL
GALV	GALVANIZED	UNO	UNLESS NOTED OTHERWISE
HGT	HEIGHT	VERT	VERTICAL
HORIZ	HORIZONTAL	WP	WORKING POINT
IS	ISOLATION JOINT	WWF	WELDED WIRE FABRIC

STRUCTURAL LEGEND

STRUCTURAL FRAMING REFERENCE



US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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A. SCOTT	NOVEMBER 2023
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A. SCOTT	W91PHN-24-B-3002
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J. WHITTAKER	
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

BLEACHER ENCLOSURE GENERAL STRUCTURAL NOTES

SHEET ID
BLDG 4
S-002

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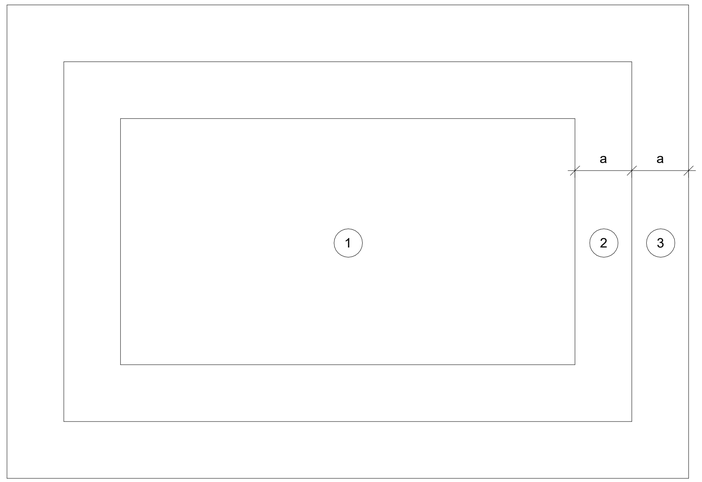
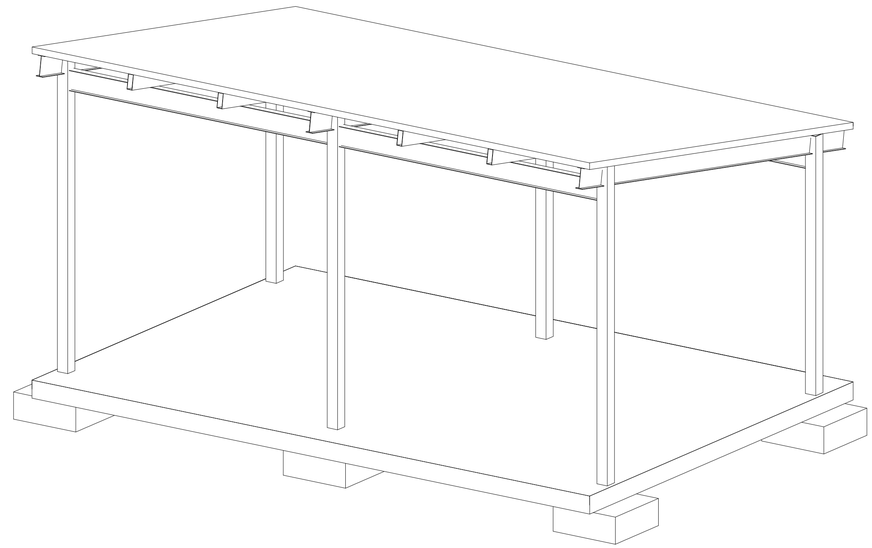


ROOF ZONES



ISOMETRIC

COMPONENT AND CLADDING WIND PRESSURES			
EFFECTIVE WIND AREA	ROOF ZONES		
	1	2	3
AREA <= 9 SF	+38 / -35	+57/ -53	+76 / -94
9 SF < AREA <= 36 SF	+38 / -35	+57 / -53	+57 / -53
AREA > 36 SF	+38 / -35	+38 / -35	+38 / -35

1. GROSS WIND PRESSURES SHOWN ABOVE ARE PREDICATED ON ULTIMATE WIND SPEED.
2. EDGE ZONES: 'a' = 3'-0"
3. WIND PRESSURES SHOWN SHALL BE USED IN CONJUNCTION WITH LRFD LOAD COMBINATIONS SPECIFIED IN SECTIONS 2.3 AND 2.4 OF ASCE 7-16.
4. POSITIVE WIND PRESSURES REPRESENT WIND PRESSURES ACTING TOWARDS THE COMPONENT AND CLADDING SURFACES.
5. NEGATIVE WIND PRESSURES REPRESENT WIND PRESSURES ACTING AWAY FROM THE COMPONENT AND CLADDING SURFACES.

1 COMPONENT AND CLADDING WIND PRESSURES
NOT TO SCALE

US Army Corps of Engineers ®

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SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

BLEACHER ENCLOSURE COMPONENTS AND CLADDING

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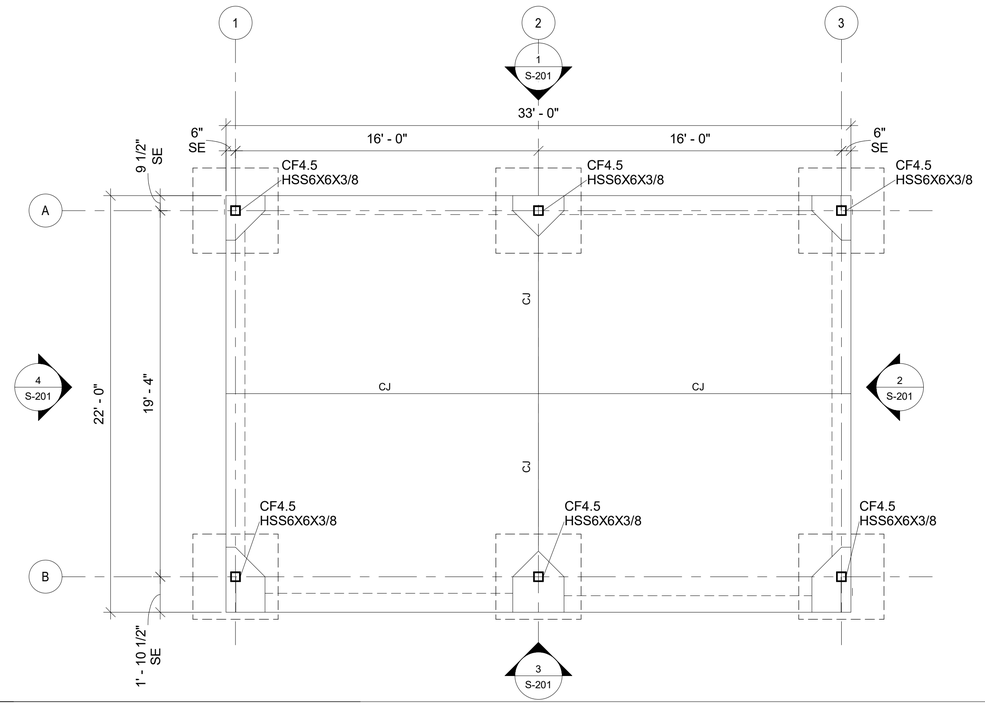
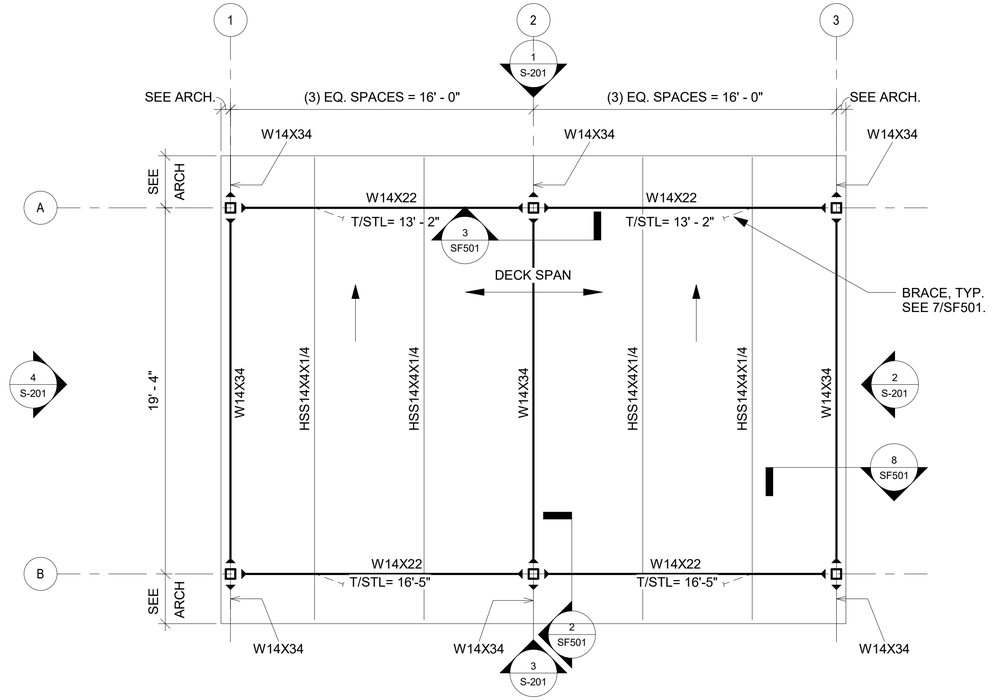


1 FOUNDATION PLAN

1/4" = 1'-0"



2 ROOF FRAMING PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

FOUNDATION AND SLAB PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. TOP OF CONCRETE SLAB-ON-GRADE ELEVATION = 0'-0". ALL ELEVATIONS INDICATED FROM THIS DATUM. SEE CIVIL DRAWINGS FOR EXACT ELEVATION.
3. TOP OF FTG = (-) 1'-0" UNO.
4. ALL FOOTINGS SHALL BE CENTERED UNDER COLUMNS.
5. SLAB-ON-GRADE SHALL CONSIST OF 6" THICK CONCRETE REINFORCED WITH 6X6 W2.9XW2.9 WWF LOCATED AT 1/3-DEPTH FROM TOP OF SLAB.
6. PROVIDE (1) #5 X 4'-0" LONG AT TOP AND BOTTOM IN SLAB-ON-GRADE AT ALL RE-ENTRANT CORNERS AND WHERE A CONTROL JOINT TERMINATES AT A JOINT.
7. SLAB-ON-GRADE SHALL BEAR ON CAPILLARY WATER BARRIER ON PROPERLY PREPARED SUBGRADE OR COMPACTED FILL.
8. CONTRACTOR SHALL COORDINATE SLAB-ON-GRADE REQUIREMENTS WITH SLAB-ON-GRADE CONSTRUCTION SEQUENCING AND SLAB DETAILS.
9. COORDINATE UNDERGROUND UTILITY LINES WITH CIVIL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION DRAWINGS PRIOR TO CONSTRUCTION OF FOOTINGS AND SLABS-ON-GRADE.
10. ◄—— INDICATES SLAB SLOPE
11. WITHIN THE AREA OF THE BUILDING FOOTINGS, THE SOILS SHALL BE TESTED FOR IN-SITU ALLOWABLE BEARING PRESSURE BY METHOD OF HAND AUGER AND DYNAMIC CONE PENETROMETER METHOD, IN ACCORDANCE WITH ASTM SPECIAL TECHNICAL PUBLICATION #399. SOILS WHICH ARE IDENTIFIED TO HAVE A NET ALLOWABLE BEARING PRESSURE BELOW 3,000 PSF, OR WHICH ARE DEEMED TO BE UNSATISFACTORY FOR OTHER REASONS (E.G., EXCESSIVE DEBRIS OR ORGANIC CONTENT), SHALL BE OVER-EXCAVATED AND REPLACED WITH ADDITIONAL CONCRETE DURING THE CONCRETING OR REPLACED TO DESIGN SUBGRADE WITH NO. 57 OR NO. 67 STONE, COMPACTED TO A NON-YIELDING CONDITION. OVER-EXCAVATION SHALL BE PERFORMED IN ACCORDANCE WITH EM 385-1-1 AND OSHA 29 CFR 1926.652. BACKFILLING SHALL BE IN ACCORDANCE WITH SECTION 31 00 00, EARTHWORK. IT IS POSSIBLE THAT PERCHED GROUNDWATER WILL BE ENCOUNTERED DURING OVER-EXCAVATION. DEWATERING SHOULD BE DONE IN ACCORDANCE WITH SPECIFICATIONS.

FRAMING PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. T/STL DENOTES TOP OF STEEL ELEVATION FROM FINISH FLOOR.
3. SEE MOMENT CONNECTION DETAIL SHEET SF501.
4. ROOF DECK SHALL BE 1.5B22 GAUGE METAL DECK WITH A 36/7 FASTENING PATTERN WITH 6 SIDELAPS. SUPPORT FASTENERS ARE TO BE 5/8" DIA PUDDLE WELDS AND SIDELAP FASTENERS ARE TO BE #10 TEK SCREWS.
5. AT THE EDGE OF ROOF EAVES, PROVIDE CONT. BENT PLATE AS DETAILED ON SF501.
6. COORDINATE ALL ROOF DIMENSIONS, ELEVATIONS, OPENINGS AND PENETRATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS. SEE ARCHITECTURAL FOR ROOF PENETRATION WATERPROOFING DETAILS.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

BLEACHER ENCLOSURE FOUNDATION AND ROOF PLANS

SHEET ID
BLDG 4
S-101

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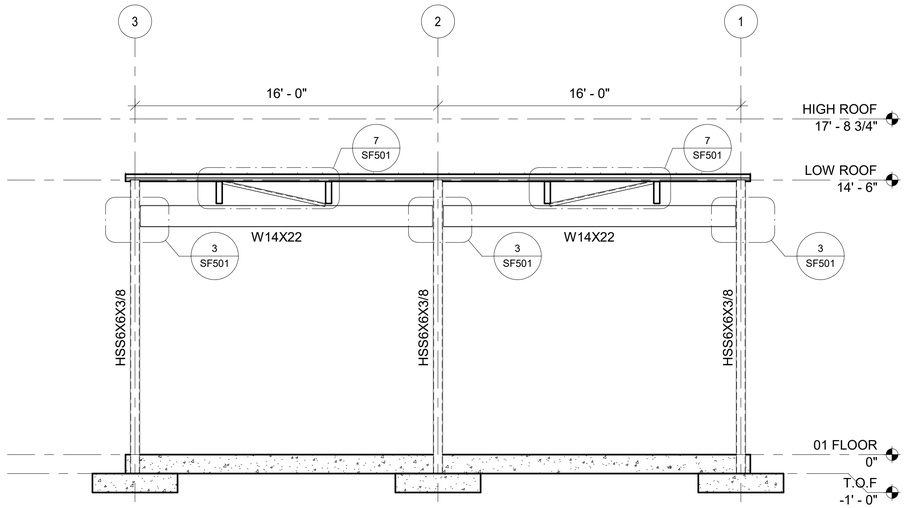
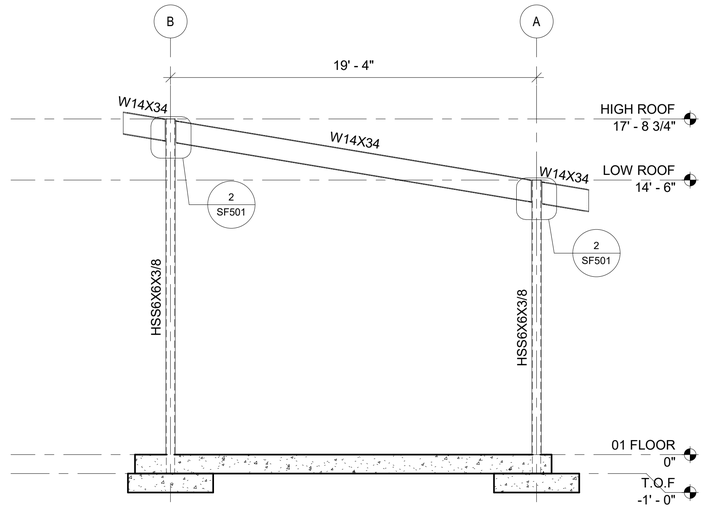


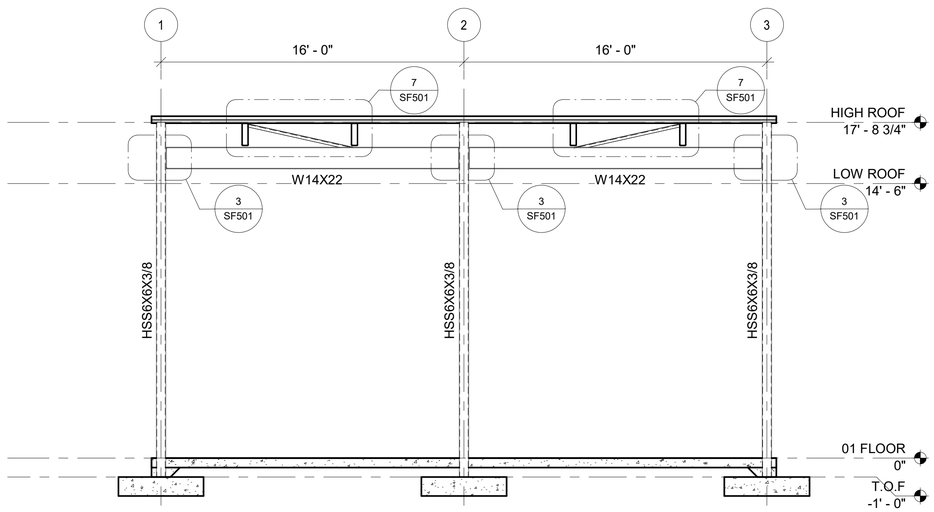
1 PLAN NORTH ELEVATION

1/4" = 1'-0"



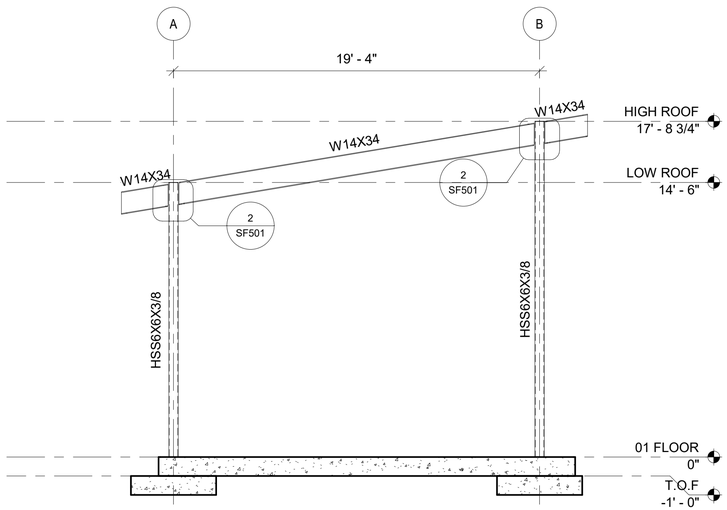
2 PLAN EAST ELEVATION

1/4" = 1'-0"



3 PLAN SOUTH ELEVATION

1/4" = 1'-0"



4 PLAN WEST ELEVATION

1/4" = 1'-0"

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DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

BLEACHER ENCLOSURE FRAMING ELEVATIONS

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S-201

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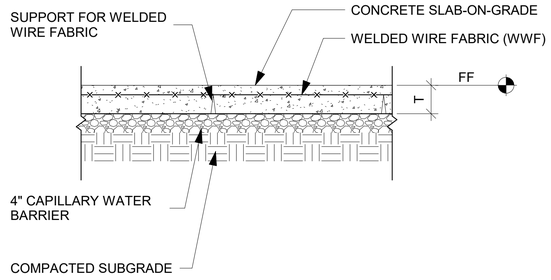
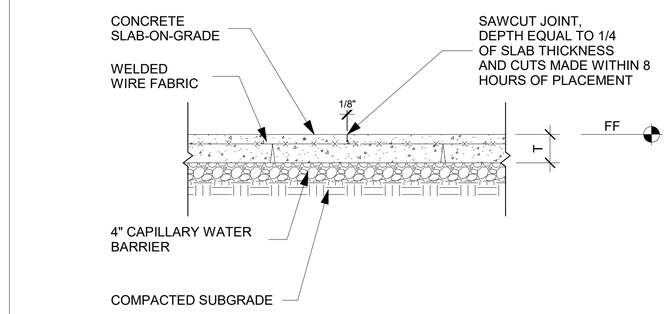


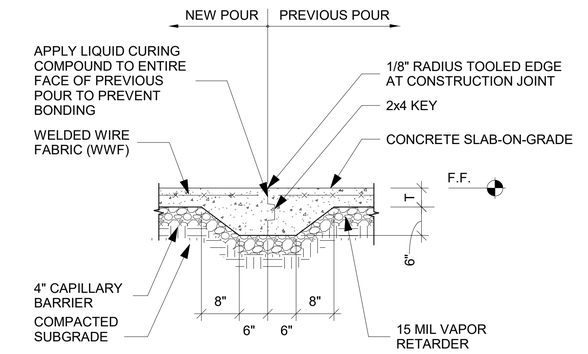
1 TYPICAL SLAB ON GRADE DETAIL

3/4" = 1'-0"



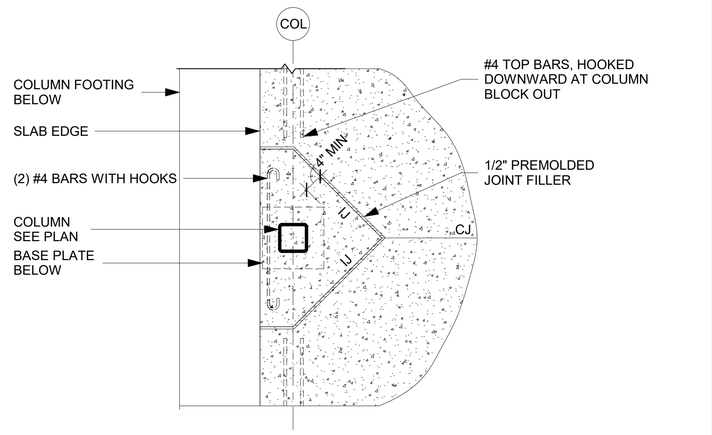
2 TYPICAL SAWED CONTRACTION JOINT DETAIL (CJ)

3/4" = 1'-0"



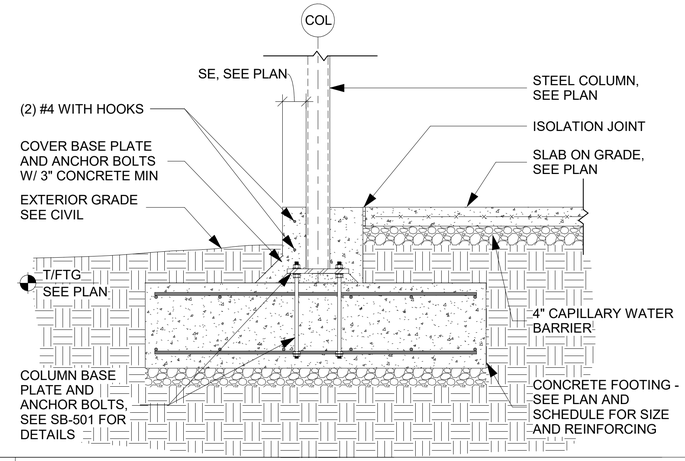
3 TYPICAL SOG SHEAR KEY CONSTR JOINT DETAIL

3/4" = 1'-0"



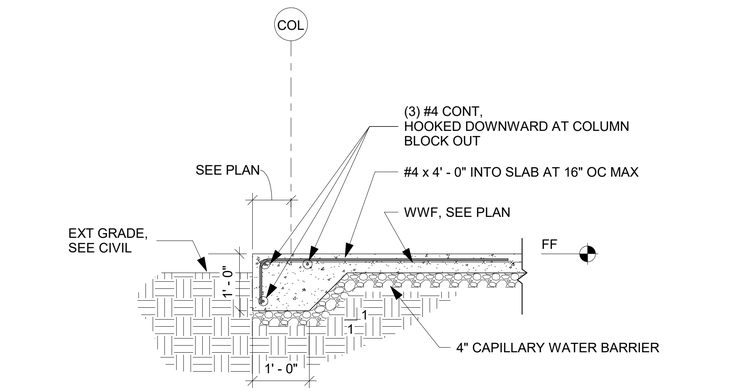
4 TYPICAL EXTERIOR COLUMN PLAN VIEW

3/4" = 1'-0"



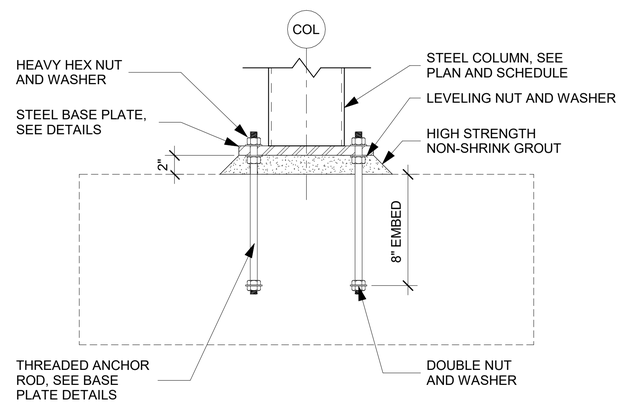
5 TYPICAL EXTERIOR COLUMN FOOTING

3/4" = 1'-0"



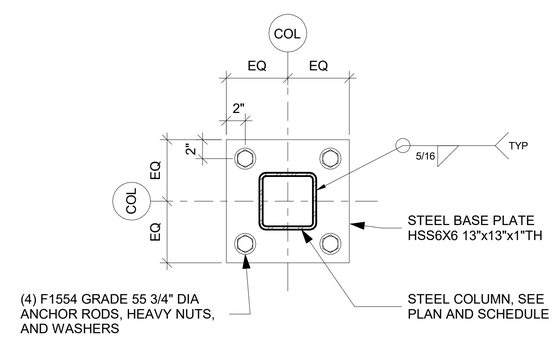
6 TYPICAL SLAB EDGE DETAIL

3/4" = 1'-0"



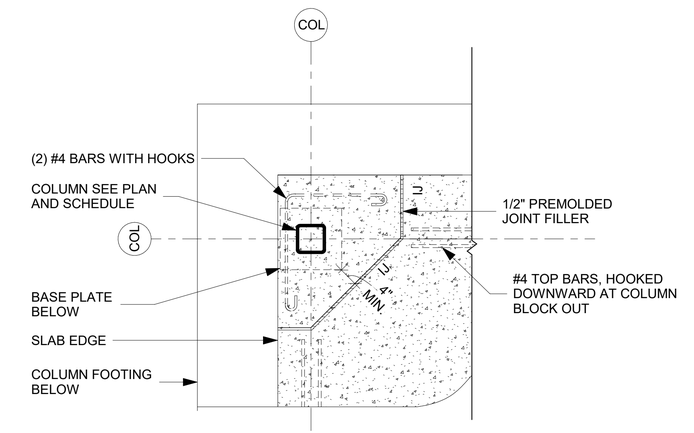
7 ANCHOR ROD DETAIL

1 1/2" = 1'-0"



8 BASE PLATE DETAILS

1 1/2" = 1'-0"



9 TYPICAL CORNER COLUMN PLAN VIEW

3/4" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT
DRAWN BY: A. SCOTT
CHECKED BY: J. WHITTAKER
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

BLEACHER ENCLOSURE FOUNDATION AND SLAB DETAILS

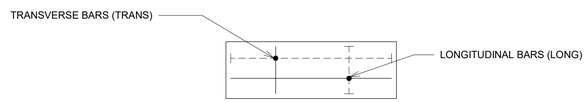
SHEET ID
BLDG 4
SB501

READY TO ADVERTISE (RTA)

File Path: C:\Users\kbendrih\Documents\FY23_PN96182_MPTR-COVBLEACHERS_STRUCT_R21_kbendrih.rvt

Plot Date: 11/27/2023 12:18:15 PM

COLUMN FOOTING SCHEDULE					
MARK	DIMENSIONS			REINFORCING	
	WIDTH	LENGTH	DEPTH	BOTTOM, HOOKED @ ENDS	TOP, HOOKED @ ENDS
CF4.5	4' - 6"	4' - 6"	1' - 0"	(5) #5 EW	(5) #5 EW



FOOTING REINFORCEMENT DIAGRAM

1 CONCRETE FOOTING SCHEDULE
NOT TO SCALE

CONCRETE REINFORCING BAR DEVELOPMENT AND SPLICE LENGTH SCHEDULE (F'c = 4000 PSI)					
BAR SIZE	OTHER BARS		TOP/HORIZ BARS		HOOKED BARS
	Ld	SPLICE	Ld	SPLICE	Ldh
#3	15	19	19	25	6
#4	19	25	25	33	7
#5	24	31	31	41	9
#6	29	37	37	49	10
#7	42	54	54	71	12
#8	47	62	62	81	14
#9	54	70	70	91	15

NOTES:
1. LENGTHS SHOWN IN THIS SCHEDULE SHALL BE USED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
2. LENGTHS SHOWN IN THIS SCHEDULE ARE BASED ON CLASS B TENSION LAP SLICES FOR NORMAL WEIGHT CONCRETE STRENGTH AND GRADE 60 (Fy = 60,000 PSI) REINFORCING STEEL WITH CONCRETE COVER AND SPACING AS DEFINED IN CONCRETE SECTION OF GENERAL NOTES ON SHEET S-001 AND ACI 318-14, SECTION 25.
3. Ld = TENSION DEVELOPMENT/EMBEDMENT LENGTH FOR STRAIGHT BARS.
4. Ldh = TENSION DEVELOPMENT/EMBEDMENT LENGTH FOR HOOKED BARS.
5. LAP SPLICES SHALL BE WIRED IN CONTACT.
6. TOP BARS ARE HORIZONTAL BARS IN BEAMS, FOOTINGS, SLABS, AND WALLS WHERE MORE THAN 12" OF FRESH CONCRETE IS CAST BELOW THE BAR.
7. ALL TABULATED VALUES ARE IN INCHES.
8. MULTIPLY VALUES BY 1.3 FOR LIGHTWEIGHT CONCRETE

2 REBAR SPLICE LENGTH SCHEDULES
NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT
DRAWN BY: A. SCOTT
CHECKED BY: J. WHITTAKER
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

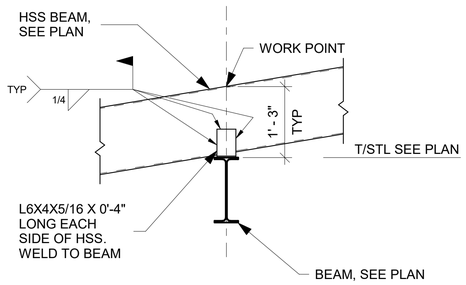
FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23: PN 96182
VOLUME 2 - BUILDING

BLEACHER ENCLOSURE FOUNDATION SCHEDULES

SHEET ID
BLDG 4
SB601

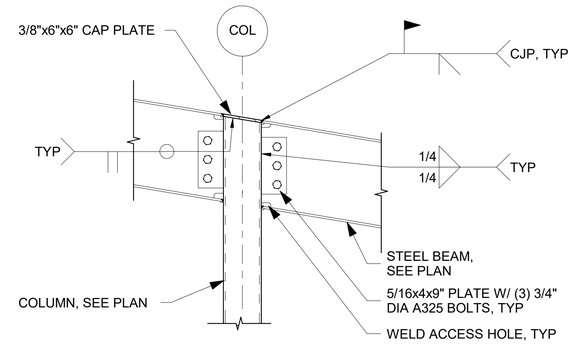
Plot Date: 11/27/2023 12:18:15 PM
File Path: C:\Users\k6endrih\Documents\FY23_PN96182_MPTR-COVBLEACHERS_STRUCT_R21_k6endrih.rvt

READY TO ADVERTISE (RTA)



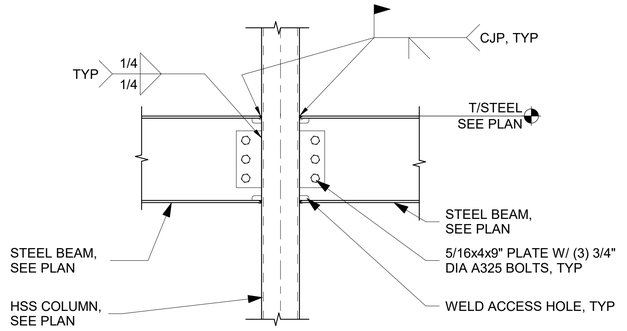
1 TYPICAL HSS BEAM TO WF GIRDER

3/4" = 1'-0"



2 MOMENT CONN AT HSS COLUMN

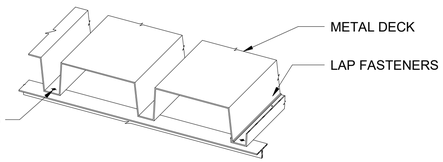
1" = 1'-0"



3 MOMENT CONN AT GIRDER TO HSS COLUMN

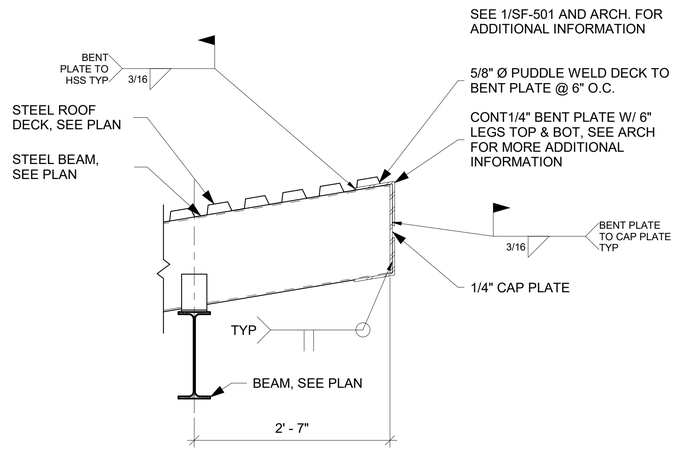
1" = 1'-0"

MINIMUM PROPERTIES OF METAL DECK	
METAL DECK	(ROOF DECK) 1.5 TYPE B
GAGE	22
MOMENT OF INERTIA OF STEEL SECTION, Ip (IN4)	0.155
SECTION MODULUS OF STEEL SECTION POSITIVE BENDING, Sp (IN3)	0.186
MOMENT OF INERTIA OF STEEL SECTION, In (IN4)	0.183
SECTION MODULUS OF STEEL SECTION POSITIVE BENDING, Sn (IN3)	0.192



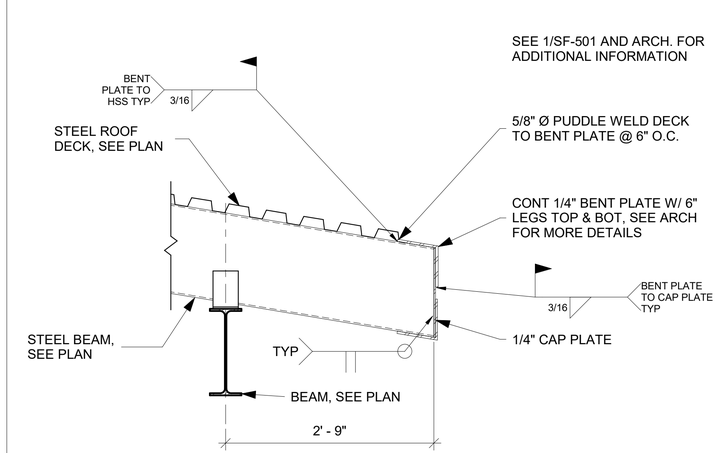
4 TYPICAL METAL DECK PROPERTIES

NOT TO SCALE



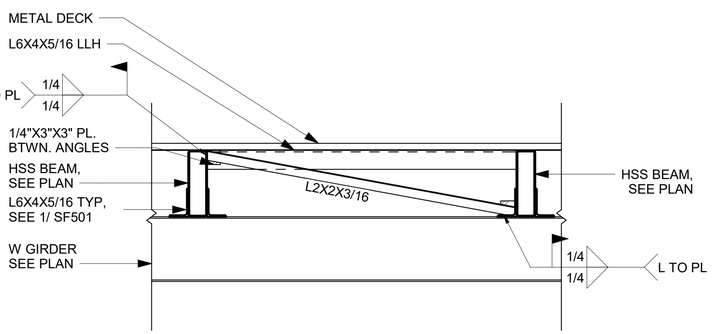
5 TYPICAL EAVE DETAIL AT HIGH END

1" = 1'-0"



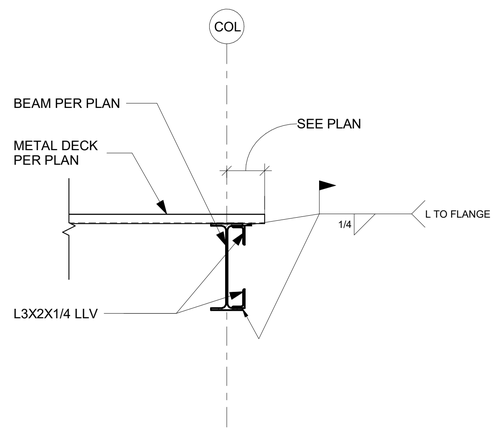
6 TYPICAL EAVE DETAIL AT LOW END

1" = 1'-0"



7 ROOF BRACING DETAILS

3/4" = 1'-0"



8 ROOF EDGE PARALLEL TO SLOPE

1" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
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CHECKED BY: J. WHITTAKER	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

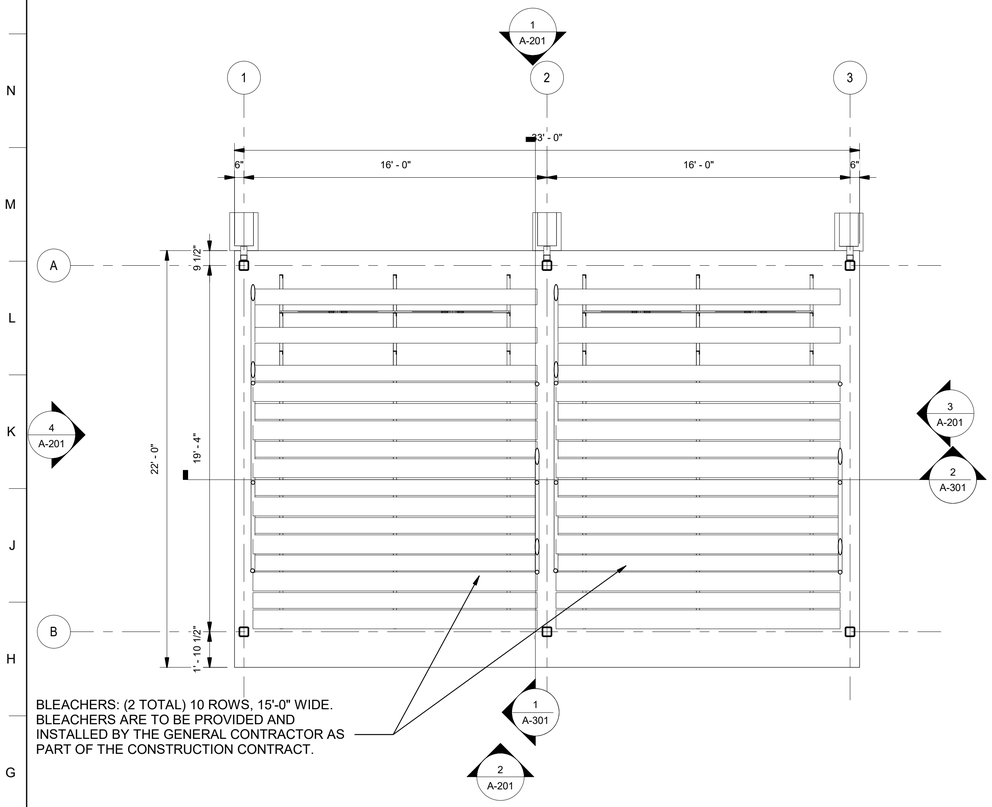
BLEACHER ENCLOSURE FRAMING DETAILS

SHEET ID
BLDG 4
SF501

READY TO ADVERTISE (RTA)

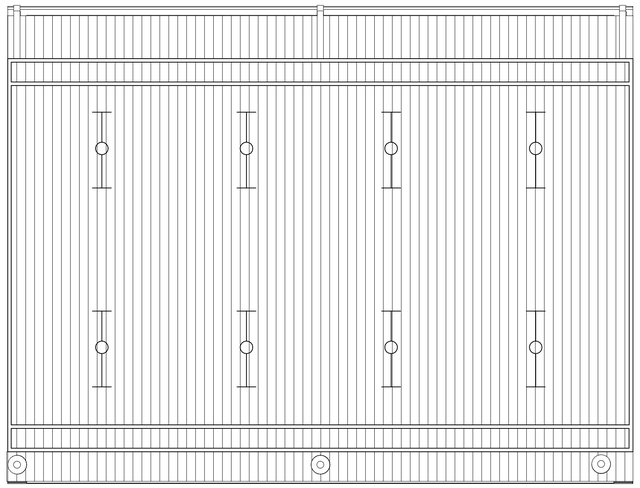
Plot Date: 11/27/2023 12:18:16 PM

File Path: C:\Users\k6endrih\Documents\FY23_PN96182_MPTR-COVBLEACHERS_STRUCT_R21_k6endrih.rvt



1 PLAN

1/4" = 1'-0"



2 REFLECTED CEILING PLAN

1/4" = 1'-0"

REFLECTED CEILING PLAN LEGEND

- SMOKE DETECTOR (REFER TO FA DWGS)
- EXIT SIGN LOCATION (REFER TO FA DWGS)
- RECESSED CAN LIGHTING FIXTURE
- 1' X 4' PENDANT
- PREFINISHED VENTILATED ALUMINUM SOFFIT

GENERAL SHEET NOTES

1. EXTERIOR DIMENSIONS ARE SLAB EDGE AND COLUMN CENTERLINE UNLESS NOTED OTHERWISE.
2. SEE CIVIL DRAWINGS FOR FINISHED FLOOR AND FINISHED GRADE ELEVATIONS. SEE STRUCTURAL DRAWINGS FOR FOUNDATION PLANS AND FLOOR SLABS.
3. SEE MECHANICAL DRAWINGS FOR LOCATION OF ALL MECHANICAL EQUIPMENT. COORDINATE WITH MECHANICAL FOR EXACT LOCATION AND SIZES OF ALL REQUIRED REINFORCED CONCRETE EQUIPMENT PADS, TYPICAL.

FLOOR PLAN NOTES

1. SLOPE ALL EXTERIOR SLABS 1/8" PER FOOT TO SLAB EDGE. OORDINATE WITH STRUCTURAL.
2. FIRE EXTINGUISHERS SHALL BE 2A:10B:C (GOVERNMENT FURNISHED, GOVERNMENT INSTALLED, NOT IN CONTRACT).

REFLECTED CEILING PLAN NOTES

1. FIXTURES ARE SHOWN FOR POSITIONING IN FINISHED CEILING. REFERENCE ELECTRICAL, MECHANICAL AND FIRE PROTECTION FOR FIXTURE TYPES.
2. REFERENCE ROOF FINISH SCHEDULE FOR FINISHED CEILING HEIGHTS. CEILING HEIGHTS SHOWN IN THE FINISHED SCHEDULE ARE MINIMUM AND SHALL BE MAINTAINED UNLESS OTHERWISE NOTED.

GROSS BUILDING PLAN

GROSS BUILDING AREA PER IBC= 660 SQUARE FEET

GROSS BUILDING AREA PER UFC 3-101-01 = 660 SQUARE FEET

GROSS FLOOR AREA PER NFPA 101
(FLOOR AREA INSIDE EXTERIOR WALLS) = 594 SQUARE FEET

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T. ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M. DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

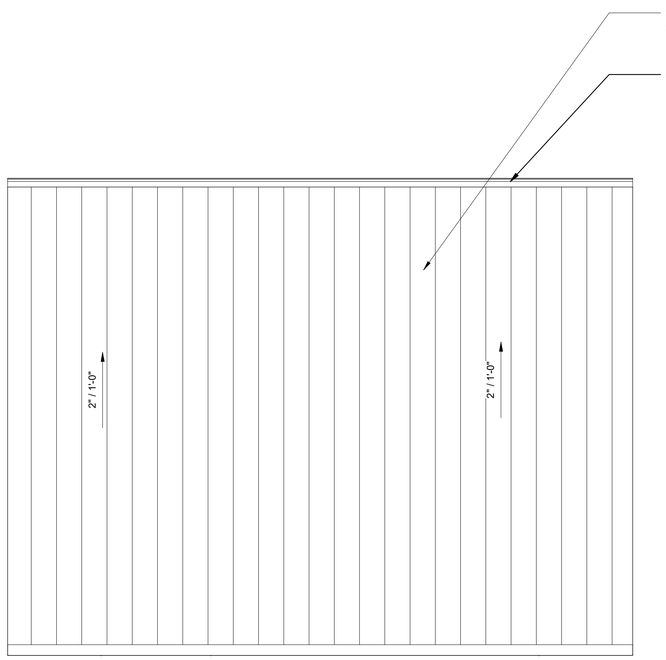
BLEACHER ENCLOSURE FLOOR PLAN

SHEET ID
BLDG 4
A-101

Plot Date: 11/29/2023 11:59:42 AM

File Path: C:\Users\K6ENXTO9\Documents\FY23_PN96182_MPTR-COVBLEACHERS_ARCH_R21_K6ENXTO9.rvt

READY TO ADVERTISE (RTA)



1 ROOF PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

1. ALL DOWNSPOUTS TO BE BE SMOOTH 3" X 4" MIN. REFERENCE ROOF PLAN FOR DOWNSPOUT LOCATIONS. QUANTITY SHOWN ON ROOF PLAN SHALL BE PROVIDED. DOWNSPOUTS SHOWN ON BUILDING ELEVATIONS ARE FOR GENERAL WALL PLACEMENT.
2. SECURE DOWNSPOUT WITH PREFINISHED METAL STRAPS AND PREFINISHED FASTENERS, COLOR TO MATCH DOWNSPOUT, 2 PER DOWNSPOUT, FASTEN INTO MASONRY WITH EXPANSION ANCHORS.
3. ALL GUTTERS TO BE 5" WIDE BY 5" DEEP. HANG ALL GUTTERS TO SLOPE 0.5% TO DOWNSPOUTS.
4. ALL ROOFING SHOWN IS STRUCTURAL STANDING SEAM METAL ROOFING. SLOPE AS NOTED.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
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CHECKED BY: M. DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

BID OPTION #1
BLEACHER ENCLOSURE ROOF PLAN

SHEET ID
BLDG 4
A-102

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 11:59:43 AM

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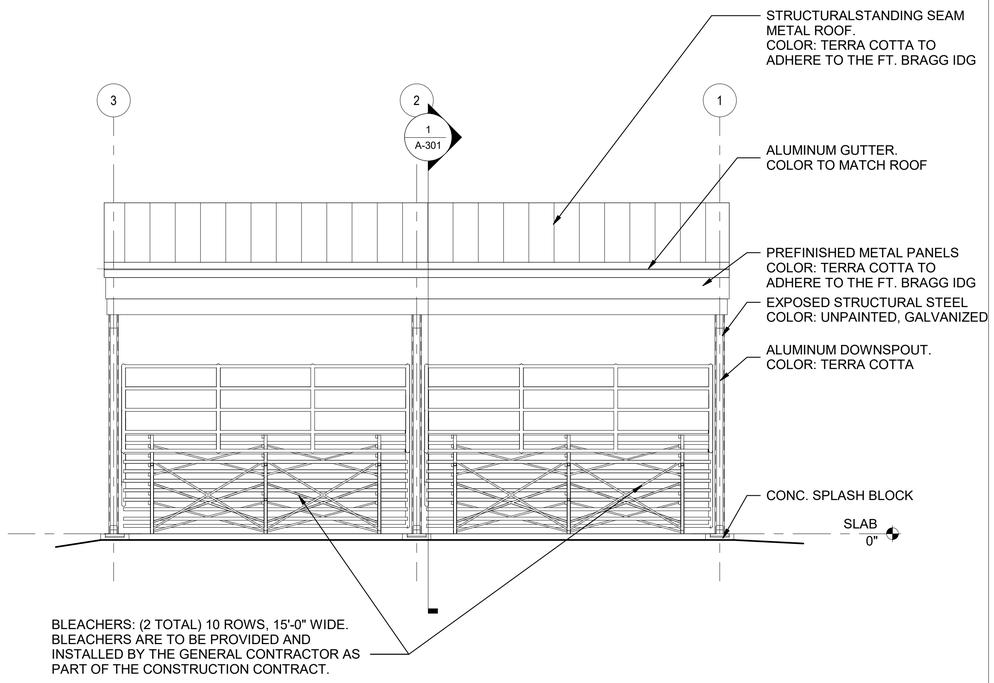
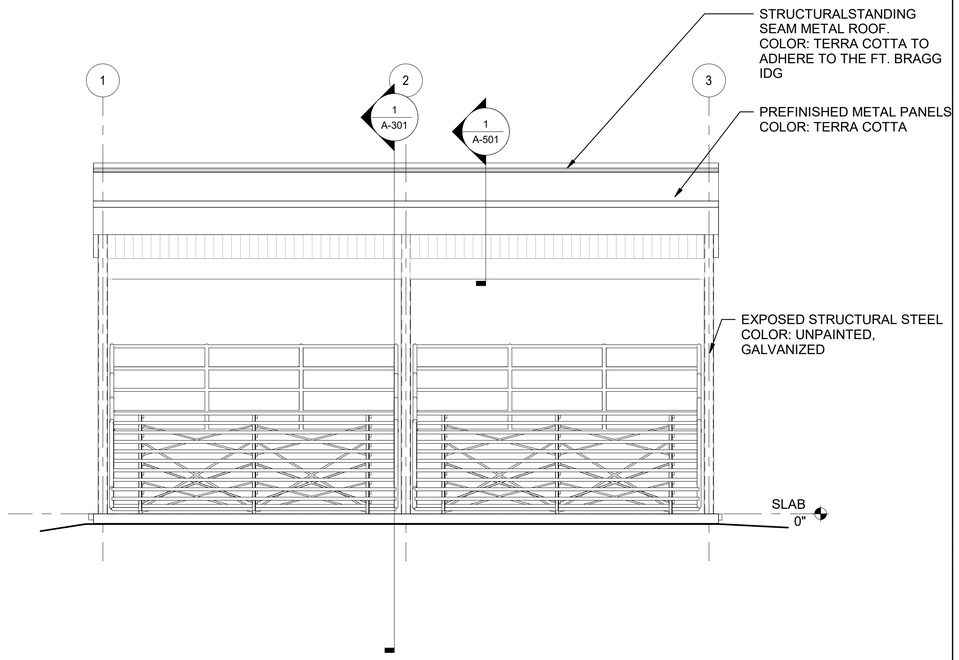


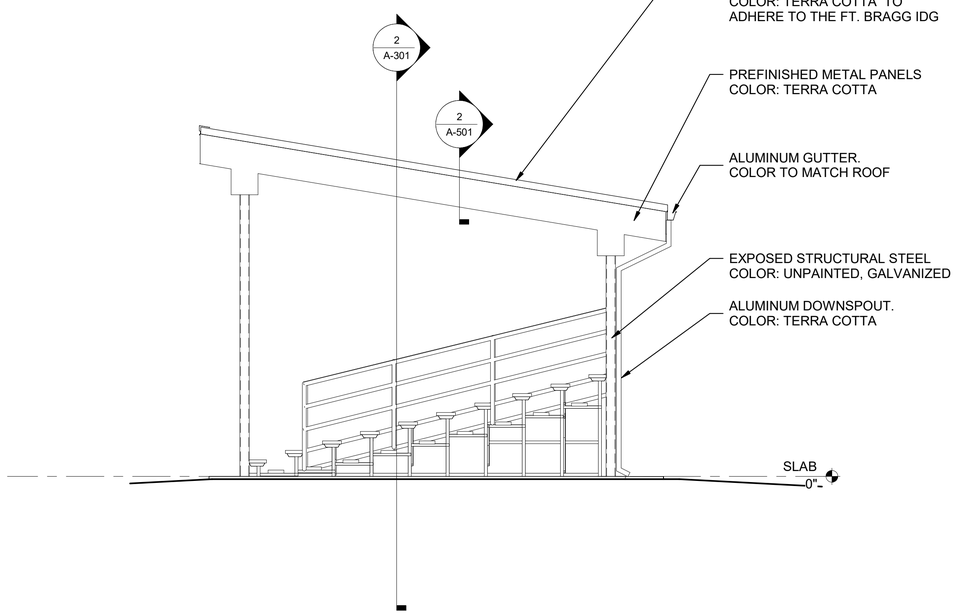
1 NORTH ELEVATION

1/4" = 1'-0"



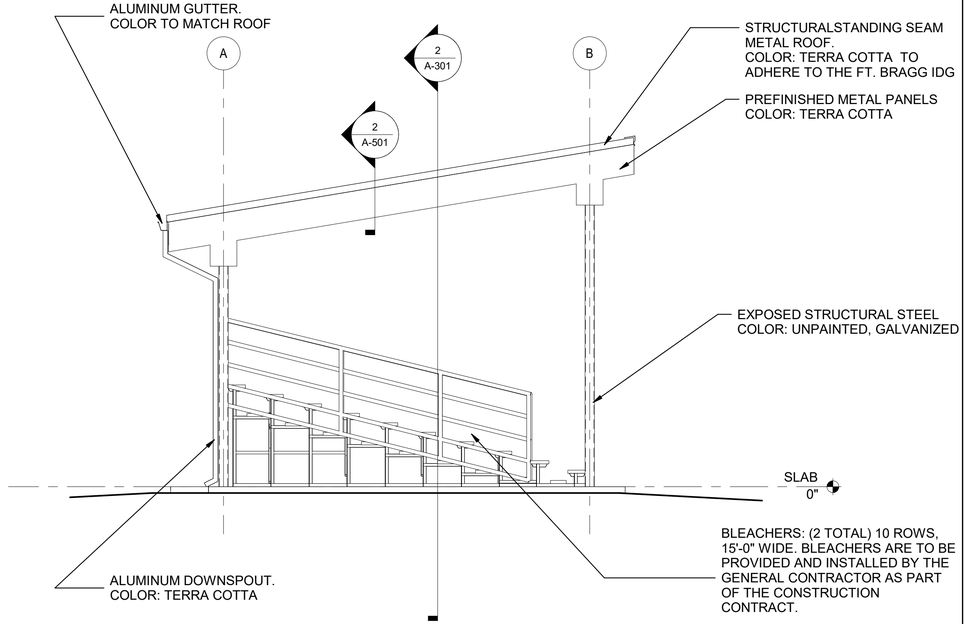
2 SOUTH ELEVATION

1/4" = 1'-0"



3 EAST ELEVATION

1/4" = 1'-0"



4 WEST ELEVATION

1/4" = 1'-0"

US Army Corps of Engineers ®

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DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T. ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M. DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT 100 W. OGLETHORPE AVE. SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

BID OPTION #1
BLEACHER ENCLOSURE ELEVATIONS

SHEET ID
BLDG 4
A-201

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 11:59:44 AM

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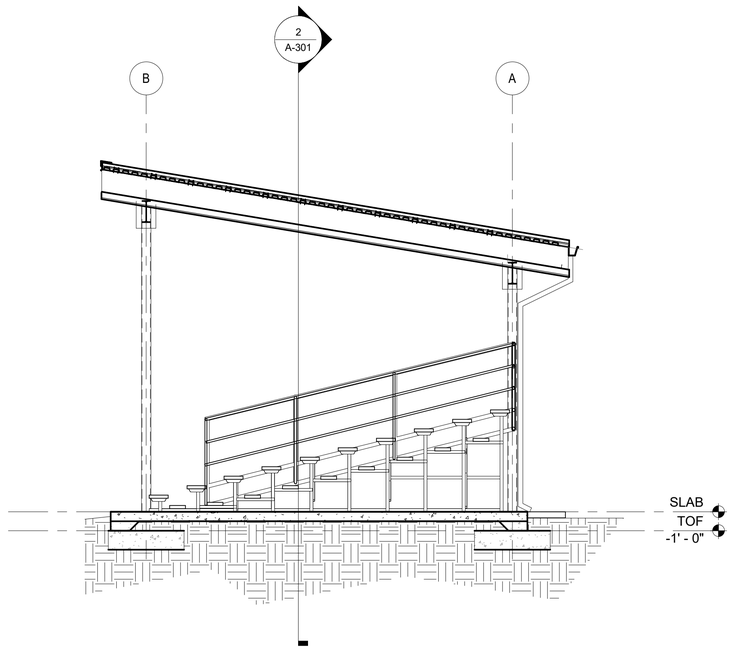
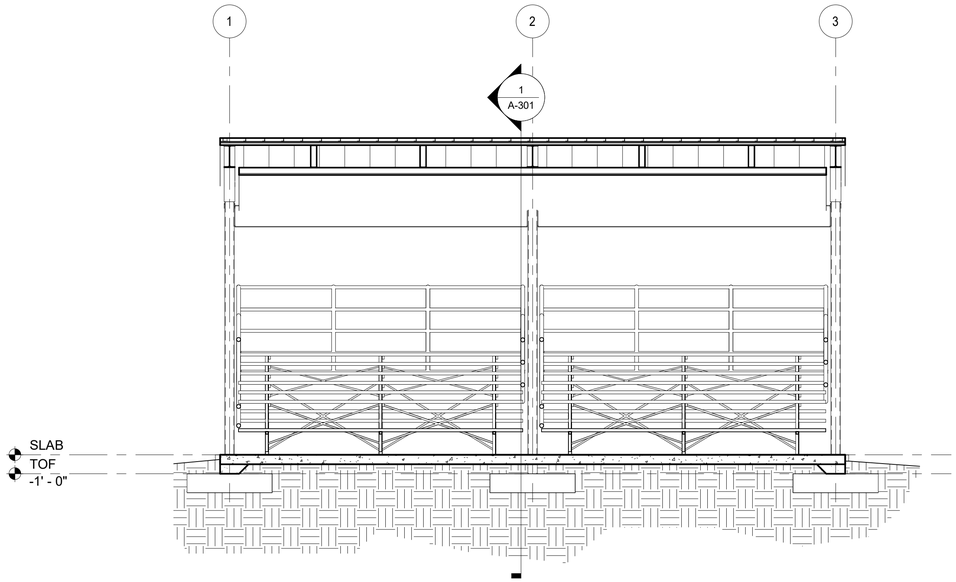


1 EAST WEST SECTION
1/4" = 1'-0"



2 NORTH SOUTH SECTION
1/4" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

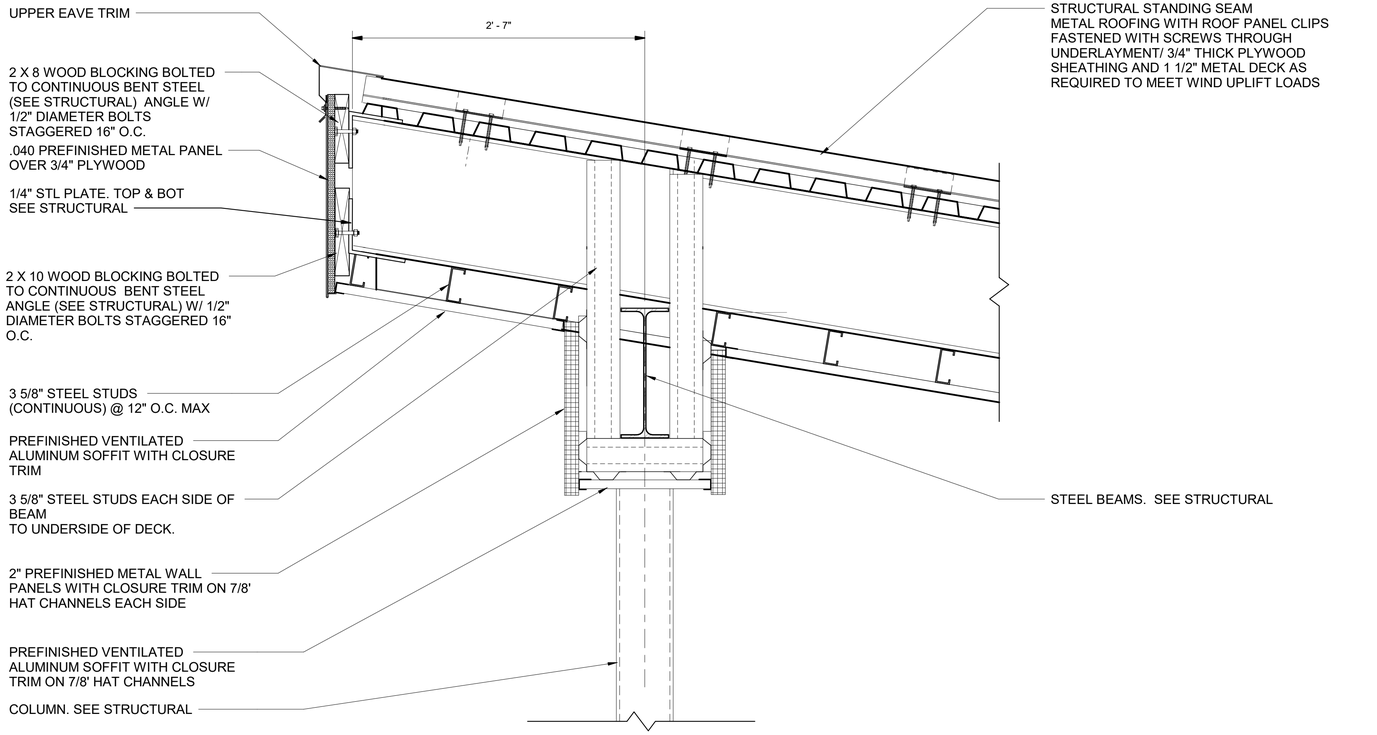
BID OPTION #1
BLEACHER ENCLOSURE BUILDING SECTIONS

SHEET ID
BLDG 4
A-301

READY TO ADVERTISE (RTA)

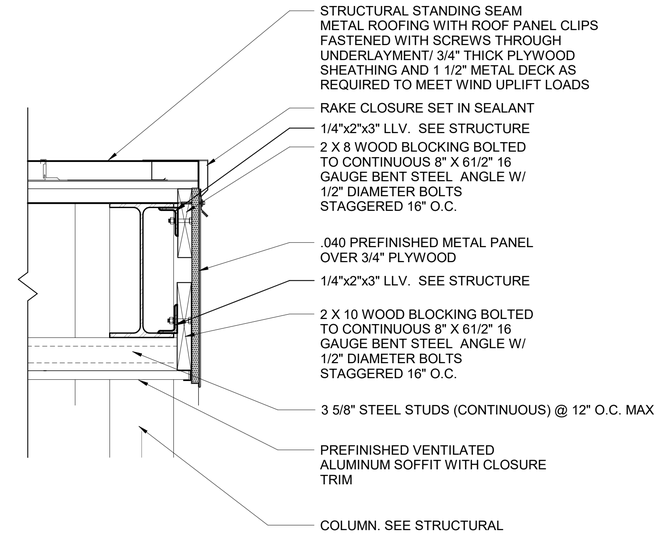
Plot Date: 11/29/2023 11:59:44 AM

File Path: C:\Users\K6ENXTO9\Documents\FY23_PN86182_MPTR-COVBLEACHERS_ARCH_R21_K6ENXTO9.rvt



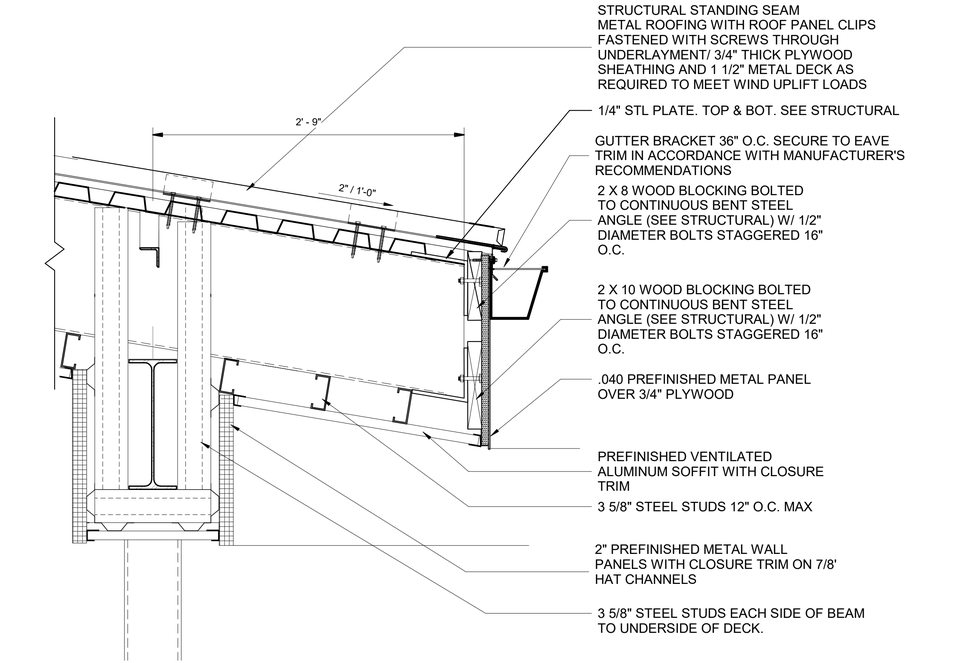
1 EAVE DETAIL AT HIGH END

1 1/2" = 1'-0"



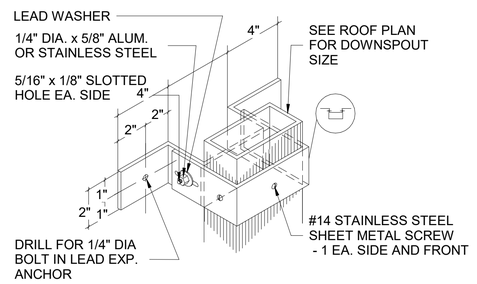
2 RAKE DETAIL

1 1/2" = 1'-0"



3 EAVE DETAIL AT LOW END

1 1/2" = 1'-0"



4 DOWNSPOUT STRAP

3" = 1'-0"

US Army Corps of Engineers ®

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SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

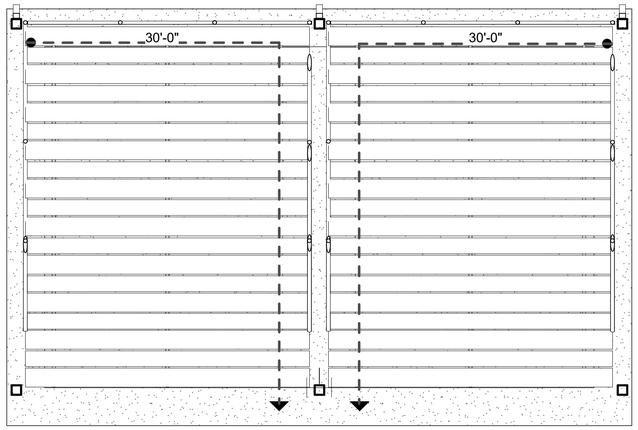
FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

BID OPTION #1
BLEACHER ENCLOSURE ROOF DETAILS

SHEET ID
BLDG 4
A-501

READY TO ADVERTISE (RTA)

File Path: C:\Users\K6ENXTO9\Documents\FY23_PN96182_MPTR-COVBLEACHERS_ARCH_R21_K6ENXTO9.rvt
Plot Date: 11/29/2023 11:59:45 AM



1 LIFE SAFETY PLAN

8 6 4 2 0 8 16

LIFE SAFETY CODE ANALYSIS

REFERENCES:

UNIFIED FACILITIES CRITERIA - UFC 1-200-01 GENERAL BUILDING REQUIREMENTS, WITH CHANGE 1, 1 OCTOBER 2020

UNIFIED FACILITIES CRITERIA- UFC 3-600-01 FIRE PROTECTION FOR FACILITIES, WITH CHANGE 5, 24 SEPTEMBER 2020

NFPA 101 LIFE SAFETY CODE, 2018 EDITION

NFPA 220 STANDARD ON TYPES OF BUILDING CONSTRUCTION, 2018 EDITION

NFPA 10, INSTALLATION OF PORTABLE FIRE EXTINGUISHERS

NFPA 1141 STANDARD FOR FIRE PROTECTION INFRASTRUCTURE FOR LAND DEVELOPMENT IN WILDLAND, RURAL, AND SUBURBAN AREAS

INTERNATIONAL BUILDING CODE (IBC), 2018

OCCUPANCY PER IBC:

IBC OCCUPANCY SECTION 303.6 ASSEMBLY GROUP A-5

CONSTRUCTION TYPE PER IBC:

REQUIREMENTS FOR CONSTRUCTION TYPE IIB: TABLE 503 ALLOWABLE BUILDING HEIGHT AND AREAS- 23,000 sf, 3 STORIES MAXIMUM HEIGHT 55 FEET
ACTUAL BUILDING HEIGHT= 13 FEET

FIRE RESISTANCE RATING REQUIREMENTS BASED UPON CONSTRUCTION TYPE IIB (TABLE 601): NO RATING REQUIRED FOR PRIMARY STRUCTUAL FRAME, BEARING WALLS (EXTERIOR, INTERIOR), NON- BEARING WALLS (EXTERIOR, INTERIOR), FLOOR CONSTRUCTION AND ROOF CONSTRUCTION.

FIRE PROTECTION REQUIREMENTS BASED UPON LOCATION ON PROPERTY:
NO RATING REQUIREMENT IF DISTANCE TO IMAGINARY PROPERTY LINE IS 10 FEET OR GREATER.

MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED UPON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION (705.8.1 EXCEPTION 2): BUILDINGS WHOSE EXTERIOR BEARING WALLS, EXTERIOR NON BEARING WALLS, AND EXTERIOR PRIMARY STRUCTURAL FRAME ARE NOT REQUIRED TO BE FIRE RESISTANCE RATED SHALL BE PERMITTED TO HAVE UNLIMITED, UNPROTECTED OPENINGS.

NFPA 101 MEANS OF EGRESS:

OCCUPANCY PER NFPA 101: NEW ASSEMBLY (CHAPTER 12, GRANDSTANDS (EXTERIOR BLEACHERS-12.4.9)

CLASSIFICATION OF HAZARD CONTENTS: LOW HAZARD (12.1.5 & 6.2.2.2)

OCCUPANT LOAD TABLE 7.3.1.2) BLEACHERS 18 LINEAR INCHES PER PERSON
ONE SECTION OF BLEACHERS - 13 LINEAR FEET PER ROW/1.5 LINEAR FOOT PER PERSON= 8 PERSONS PER ROW. 8 PERSONS PER ROW X 10 PERSONS PER ROW = 80 PERSONS FOR 1 SECTION OF BLEACHERS. 2 BLEACHER SECTIONS = 160 PERSONS MAXIMUM SEATING CAPACITY

EGRESS REQUIREMENTS: MAXIMUM NUMBER OF SEATS BETWEEN FARHEST SEAT AND AISLE= 20 (TABLE 12.4.9.2.5).

AISLES (12.2.5.6.1.2)AISLES SHALL NOT BE REQUIRED IN BLEACHERS PROVIDED THAT ALL OF THE FOLLOWING CONDITIONS ARE MET:
(1) EGRESS FROM THE FRONT ROW SHALL NOT BE OBSTRUCTED BY A RAIL, A GUARD , OR OTHER OBSTRUCTION.

(2) THE ROW SPACING SHALL BE 28 INCHES OR LESS.

(3) THE RISE PER ROW SHALL BE 6 INCHES OR LESS INCLUDING THE FIRST ROW.

(4) THE NUMBER OF ROWS SHALL NOT EXCEED 16.

(5) THE SEATS SHALL NOT BE PHYSICALLY DEFINED.

(6) SEAT BOARDS THAT ARE ALSO USED AS STEPPING SURFACES FOR DESCENT SHALL PROVIDE A WALKING SURFACE WITH A WIDTH NOT LESS THAN 12 INCHES, AND , WHERE A DEPRESSED FOOT BOARD EXISTS THE GAP BETWEEN THE SEAT BOARDS OF ADJACENT
ROWS SHALL NOT EXCEED 12 INCHES HORIZONTALLY.

(7) THE LEADING EDGES OF SEAT BOARDS USED AS STEPPING SURFACES SHALL BE PROVIDED WITH A CONTRASTING MARKING STRIPE SO THAT THE LOCATION OF THE LEADING EDGE IS READILY APPARENT, PARTICULARLY WHERE VIEWED IN DESCENT, AND THE FOLLOWING SHALL ALSO APPLY:
(A) THE MARKING STRIPE SHALL NOT BE LESS THAN 1 INCH WIDE AND SHALL NOT EXCEED 2 INCHES IN WIDTH.

(B) THE MARKING STRIPE SHALL NOT BE REQUIRED WHERE BLEACHER SURFACES AND ENVIRONMENTAL CONDITIONS OF USE ARE SUCH THAT THE LOCATION OF THE LEADING EDGE IS READILY APPARENT, PARTICULARILY WHEN VIEWED IN DESCENT.

REQUIREMENTS PER UFC 1-200-01

SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY- USE UFC 3-600-01 INSTEAD OF IBC CHAPTER 4

REQUIREMENTS PER UFC 3-600-01
COMPLETE AUTOMATIC SPRINKLER PROTECTION MUST BE PROVIDED IN SINGLE STORY TYPE I OR II CONSTRUCTION GREATER THAN 15,000 SF
BUILDING IS NOT SPRINKLERED

REQUIREMENTS FOR NFPA 1141
MINIMUM DISTANCE TO ADJACENT BUILDINGS AND PROPERTY LINES = 30 FEET (6.2.1)

GROSS BUILDING AREA

GROSS BUILDING AREA PER IBC= 660 SQUARE FEET

GROSS BUILDING AREA PER UFC 3-101-01 = 660 SQUARE FEET

GENERAL NOTES

1. THIS DRAWING IS TO BE USED AS REFERENCE ONLY. IT IS NOT PART OF THE CONSTRUCTION CONTRACT. ALL INFORMATION CONTAINED ON IT IS CALLED FOR ELSEWHERE.

LIFE SAFETY LEGEND

FEC	FIRE EXTINGUISHER CABINET - SEE PLATE A-512 FOR TYPICAL DETAILS
FEB	FIRE EXTINGUISHER BRACKET - WALL MOUNTED - TOP AT 5'-0" A.F.F. FIRE EXTINGUISHER TO BE 2A:10B:C (GFGI)
- - -	EGRESS PATH
▲	REQUIRED EXIT

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL
DRAWN BY: T. ODELL
CHECKED BY: M. DEACON
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

BLEACHER ENCLOSURE LIFE SAFETY ANALYSIS

SHEET ID
BLDG 4
A-801

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 11:59:46 AM

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ELECTRICAL LEGEND

LIGHTING AND LIGHTING CONTROLS SYSTEM LEGEND

- LOWER CASE LETTER DENOTES THE SWITCH THAT CONTROLS FIXTURE
- A2 — LUMINAIRE TYPE DESIGNATION
- SYMBOL DENOTES GENERAL TYPE OF LUMINAIRE
- NT — UNSWITCHED NIGHT LIGHT (ON 24 HOURS)
- 2x2 LED LUMINAIRES.
- 2x4 LED LUMINAIRES.
- CEILING-MOUNTED LUMINAIRE. SHADING INDICATES SUPPLIED FROM AN EMERGENCY LIGHTING INVERTER (ELI).
- SUSPENDED LED LUMINAIRE.
- WALL-MOUNTED LED LUMINAIRE. SHADING INDICATES SUPPLIED FROM AN EMERGENCY LIGHTING INVERTER (ELI).
- LIGHTING CONTROL STRATEGY.
- EMERGENCY LIGHTING UNIT. MH = 8' AFF UOI.
- ELI — 250W EMERGENCY LIGHTING INVERTER (ELI). MOUNT ABOVE ACCESSIBLE CEILING.
- EXIT LIGHT, CEILING MOUNTED. SHADING INDICATES FACES. PROVIDE DIRECTIONAL ARROWS WHEN INDICATED.
- EXIT LIGHT, WALL MOUNTED. SHADING INDICATES FACES. PROVIDE DIRECTIONAL ARROWS WHEN INDICATED. ALIGN WITH CENTERLINE OF DOOR AND MOUNT CENTERLINE OF EXIT SIGN 5" ABOVE TOP OF DOOR FRAME UOI.
- S — WALL SWITCH, SINGLE POLE, 20A SWITCH. MH = 46" AFF UOI. WHERE SUBSCRIPT IS PRESENT, IT DENOTES THE FOLLOWING:
  - 3 - THREE WAY SWITCH.
  - 4 - FOUR WAY SWITCH
  - a - SINGLE LOWER CASE LETTER (EXCEPT LETTER "m") DENOTE THE SWITCH THAT CONTROLS THE FIXTURES.
  - WP - WEATHERPROOF (GASKETED).
  - lv - LOW VOLTAGE
  - lv5 - LOW VOLTAGE DIMMING
- S_V — WALL SWITCH SENSOR, LINE VOLTAGE. MH = 46" AFF UOI.
- S_T — TIMER SWITCH, LINE VOLTAGE. SWITCH SHALL BE WEATHERPROOF RATED WITH 0-2 HOUR TIME RANGE. MH = 46" AFF UOI.
- S_{lvx} — LOW VOLTAGE, MULTI-BUTTON WALLSTATION CONNECTED TO ROOM CONTROLLER. 'x' INDICATES NUMBER OF BUTTONS. MH = 46" AFF UOI.
- OCCUPANCY SENSOR, WALL MOUNTED, DUAL TECHNOLOGY (ULTRASONIC AND PIR) SENSOR UOI. MOUNT 6" BELOW CEILING BUT NO MORE THAN 9'-6" AFF UOI.
- OS — OCCUPANCY OR VACANCY SENSOR AS INDICATED BY LIGHTING CONTROL STRATEGIES, CEILING OR JUNCTION BOX MOUNTED, DUAL TECHNOLOGY (ULTRASONIC AND PIR) SENSOR UOI.
- DS — DAYLIGHT SENSOR.
- LC — LIGHTING CONTACTOR. MH = 60" AFF.

LIGHTNING PROTECTION & GROUNDING SYSTEM LEGEND

- TW — GROUND ROD. "TW" INDICATES TEST WELL.
- EXPOSED MAIN ROOF CONDUCTOR UOI.
- BONDING CONNECTION TO TOP OF DOWN CONDUCTOR.
- BONDING CONNECTION TO BOTTOM OF DOWN CONDUCTOR OR COUNTERPOISE.
- DOWN CONDUCTOR IN SCHEDULE 40 PVC CONDUIT EXPOSED OUTSIDE OF BUILDING.
- AIR TERMINAL.

POWER SYSTEM LEGEND

- $\oplus_X$ — NEMA 5-20R DUPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPT 'X' (WHERE PRESENT) DENOTES THE FOLLOWING:
  - G - GROUND FAULT CIRCUIT INTERRUPTER (GFCI) RECEPTACLE.
  - WP - GFCI RECEPTACLE WITH WEATHER PROOF WHILE-IN-USE HOUSING.
  - C - GFCI RECEPTACLE, BOTTOM OF RECEPTACLE MOUNTED 2" ABOVE BACKSPLASH.
  - E - GFCI RECEPTACLE, MH COORDINATED WITH ELECTRIC WATER COOLER.
  - OS - CONTROLLED BY ROOM OCCUPANCY SENSORS VIA RECEPTACLE-RATED SWITCHPACK. RECEPTACLES SHALL BE MARKED IN ACCORDANCE WITH NEC 406.3(E).
  - R - MOUNTED ON COMMUNICATIONS RACK AS INDICATED ON EP501.
  - T - RECEPTACLE, MOUNTED ADJACENT TO CATV OUTLET.
- $\oplus\!\!\oplus_X$ — NEMA 5-20R DOUBLE DUPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPTS IDENTIFIED FOR DUPLEX RECEPTACLES ARE ALSO APPLICABLE TO QUADRAPLEX RECEPTACLES.
- $\ominus_X$ — NEMA 5-20R SIMPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPTS IDENTIFIED FOR DUPLEX RECEPTACLES ARE ALSO APPLICABLE TO SIMPLEX RECEPTACLES.
- $\ominus_X$ — SPECIAL RECEPTACLE. SUBSCRIPT 'X' (WHERE PRESENT) DENOTES THE FOLLOWING:
  - A - NEMA L14-20R RECEPTACLE FOR TARGET MAINTENANCE. MH = 18" UOI.
  - R1 - NEMA L5-20R RECEPTACLE. MOUNTED AS INDICATED ON EP501.
  - R2 - NEMA L6-30R RECEPTACLE. PROVIDE 2#10, 1#10G, 1/2"C. MOUNTED AS INDICATED ON EP501.
- NEMA 5-20R CEILING MOUNTED DUPLEX RECEPTACLE.
- JUNCTION BOX, WALL MTD. MH = 18" UOI.
- S_{ps} — 3-POSITION SWITCH FOR PROJECTOR SCREEN. MH = 46" AFF UOI.
- S_m — MOTOR RATED SWITCH. MH = 46" AFF UOI.
- MOTOR DISCONNECT/SAFETY SWITCH SHALL BE RATED 30/3/NF/1 UNLESS OTHERWISE INDICATED.
  - '30' DENOTES SWITCH AMPERE RATING;
  - '3' DENOTES NUMBER OF POLES;
  - 'NF' DENOTES NON-FUSED ('F' DENOTES FUSED);
  - '1' DENOTES SWITCH ENCLOSURE'S NEMA RATING;
  - FUSE RATING SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- LP-1 — HOMERUN TO PANELBOARD. "LP" INDICATES THE PANELBOARD THAT THE HOMERUN IS SERVED FROM. "1" INDICATES THE CIRCUIT NUMBER IN THE PANELBOARD FOR CONNECTION.
- PANELBOARD.
- SWITCHBOARD.
- ELECTRICAL EQUIPMENT AS INDICATED.
- THREE BUTTON, PUSH BUTTON SWITCH (OPEN, CLOSE, AND STOP) FOR ROLLING SERVICE DOORS. MH = 46" AFF UOI.

VIDEO SURVEILLANCE SYSTEM LEGEND

- GFGI CAMERA. PROVIDE 1-1/4" RGS CONDUIT TO DTR RACK. REFER TO VOLUME 4 ES517 FOR MOUNTING DETAILS.

ABBREVIATIONS

ACS	ACCESS CONTROL SYSTEM
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ATS	AUTOMATIC TRANSFER SWITCH
C	CONDUIT
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CKT	CIRCUIT
COR	CONTRACTING OFFICER'S REPRESENTATIVE
CU	COPPER
DLC	DESIGNLIGHTS CONSORTIUM
DTR	DATA TERMINATION RACK
EGC	EQUIPMENT GROUNDING CONDUCTOR
ELI	EMERGENCY LIGHTING INVERTER
EPT	ELECTRIC POWER TRANSFER
ESS	ELECTRONIC SECURITY SYSTEMS
EWC	ELECTRIC WATER COOLER
FACP	FIRE ALARM CONTROL PANEL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
HACR	HEATING, AIR CONDITIONING, REFRIGERATION
IDS	INTRUSION DETECTION SYSTEM
LVS	LOW VOLTAGE SWITCH
MFR	MANUFACTURER
MH	MOUNTING HEIGHT
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTS	MANUAL TRANSFER SWITCH
NATS	NON-AUTOMATIC TRANSFER SWITCH
NEC	NATIONAL ELECTRICAL CODE
NF	NON FUSED
NTS	NOT TO SCALE
OS	OCCUPANCY SENSOR
PBB	PRIMARY BONDING BUSBAR
PIR	PASSIVE INFRARED
QTY	QUANTITY
SBB	SECONDARY BONDING BUSBAR
SER	SERVICE ENTRANCE RATED
SPD	SURGE PROTECTIVE DEVICE
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UOI	UNLESS OTHERWISE INDICATED
UON	UNLESS OTHERWISE NOTED
V	VOLT
W, WP	WEATHERPROOF

GENERAL NOTES

1. SEE PLATE G-002 TO G-002A FOR ABBREVIATIONS AND GENERAL LEGEND.

2. MOUNTING HEIGHT, UNLESS OTHERWISE NOTED, IS TO CENTER LINE OF EQUIPMENT.

3. OUTLET BOXES MOUNTED ON OPPOSITE SIDES OF WALLS SHALL BE INSTALLED SUCH THAT NO BOXES ARE BACK-TO-BACK TO MINIMIZE SOUND TRANSMISSION. MAINTAIN A 6-INCH SEPARATION WHERE POSSIBLE.

4. MECHANICAL EQUIPMENT IS SHOWN IN APPROXIMATE LOCATIONS. FOR EXACT LOCATIONS OF MECHANICAL EQUIPMENT AND PIPING, SEE MECHANICAL DRAWINGS. PROVIDE DISCONNECT SWITCHES AS REQUIRED BY THE NATIONAL ELECTRICAL CODE EVEN IF NOT INDICATED ON THE ELECTRICAL DRAWINGS.

5. COORDINATE THE LOCATIONS AND MOUNTING HEIGHTS OF LUMINAIRES IN MECHANICAL AND ELECTRICAL ROOMS WITH THE FINAL LOCATIONS OF PIPES, DUCTS AND OTHER EQUIPMENT FOR BEST ARRANGEMENT. FIXTURES SHALL BE EASILY ACCESSIBLE FOR RELAMPING.

6. CONDUCTOR AND CONDUIT SIZES ARE BASED ON COPPER CONDUCTORS WITH THWN INSULATION IN EMT CONDUIT. MINIMUM SIZE SHALL BE #12 AWG CONDUCTORS WITH #12 AWG EGC IN 1/2" CONDUIT UNLESS OTHERWISE INDICATED. LIGHTING AND POWER BRANCH CIRCUITS THAT RUN OVER 100 FEET SHALL BE MINIMUM #10 AWG. CIRCUIT BREAKERS, TERMINALS, ETC. SHALL BE RATED AND MARKED FOR 75 DEGREES MINIMUM. THE CONTRACTOR SHALL ADJUST CONDUIT SIZES BASED ON ACTUAL TYPE OF CONDUCTORS AND CONDUIT INSTALLED.

7. PROVIDE EQUIPMENT GROUNDING CONDUCTORS IN ALL CONDUITS.

8. UP TO 3 SINGLE-PHASE, BRANCH CIRCUITS RATED 20A OR LESS MAY BE ROUTED IN A SINGLE CONDUIT TO MINIMIZE THE NUMBER OF HOMERUNS. CIRCUITS SHALL BE SUPPLIED FROM ADJACENT CIRCUIT BREAKERS AND DIFFERENT PHASES (E.G., 1, 3, 5 OR 2, 4, 6). NEUTRAL CONDUCTORS SHALL NOT BE SHARED OR COMBINED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DERATING CONDUCTOR CAPACITY ACCORDING TO THE NUMBER OF CURRENT CARRYING CONDUCTORS AND OTHER ADJUSTMENT FACTORS IN ACCORDANCE WITH THE NEC. THE CONTRACTOR SHALL UTILIZE A MAXIMUM FILL RATE OF 40% WHEN SIZING CONDUITS AND SHALL INCLUDE THE REQUIRED EQUIPMENT GROUNDING CONDUCTOR. ALL OTHER CIRCUITS SHALL HAVE DEDICATED HOMERUNS.

9. CIRCUIT NUMBERS ARE SHOWN ADJACENT TO ELECTRICAL DEVICES. WIRING SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND NEC REQUIREMENTS.

10. CONDUITS SHALL BE CONCEALED ABOVE CEILINGS AND IN WALLS, EXCEPT IN MECHANICAL ROOMS, ELECTRICAL ROOMS, AND WHERE SPECIFICALLY INDICATED OTHERWISE ON THE DRAWINGS. CONDUITS SHALL NOT BE RUN IN ANY UL RATED SLAB. CONDUITS SHALL NOT BE RUN IN ANY FILLED CMU BLOCKS.

11. LOCATE ALL RACEWAYS TO AVOID INTERFERENCE WITH DUCTS, PIPES, MECHANICAL EQUIPMENT, WITH REMOVAL OF CEILING TILES, OR WITH ACCESS TO EQUIPMENT WHICH REQUIRES PERIODIC ADJUSTMENT OR MAINTENANCE.

12. SEAL PENETRATIONS THROUGH ROOFS, CEILINGS, FLOORS, WALLS AND FIRE WALLS TO MAINTAIN THE INTEGRITY OF THE AIR BARRIER, FIRE AND ACOUSTIC RATINGS OF THE ROOF, CEILINGS, WALLS AND FLOORS.

13. REVISE PANELBOARD SCHEDULES ON AS-BUILT-DRAWING AND PANEL DIRECTORIES TO REFLECT FINAL INSTALLATION CONDITIONS.

14. PROVIDE NAMEPLATES ON THE EXTERIOR OF ALL ELECTRICAL PANELS AND ENCLOSURES AS FOLLOWS: DEVICE ID, DEVICE RATING, POWER SOURCE, ARC FAULT DATA.

15. FOR DISCONNECT SWITCHES AND MOTOR STARTERS THE TOP LINE SHALL BE THE NAME/DESIGNATIONOF THE EQUIPMENT BEING FED BY THE SWITCH/STARTER.

16. PROVIDE SEPARATE NEUTRALS FOR EACH CIRCUIT UTILIZING A NEUTRAL CONDUCTOR (DO NOT COMBINE NEUTRALS).

17. PROVIDE EQUIVALENT CONDUIT PATHWAYS WHERE CABLE TRAY IS INTERRUPTED BY NONACCESSIBLE CEILINGS.

18. THE INTERRUPTING RATING OF THE PANELBOARD AND ELECTRICAL EQUIPMENT SHALL BE INCREASED TO THE NEXT AVAILABLE RATING WHERE THERE IS NOT A RATING THAT IS EQUAL TO THE EQUIPMENT'S LISTED SHORT CIRCUIT RATING.

19. NOT ALL SYMBOLS SHOWN ON THE LEGEND ARE USED IN THE PROJECT.

20. RECEPTACLES THAT HAVE GFCI PROTECTION ARE TO BE WIRED SUCH THAT THE LOSS OF POWER ON ONE RECEPTACLE DOES NOT AFFECT DOWNSTREAM RECEPTACLES.

21. COMPONENTS WHICH CONSTITUTE AN ELECTRICAL SYSTEM SHALL BE FULLY COMPATIBLE WITH ONE ANOTHER AND SHALL BE APPROVED BY THE VARIOUS MANUFACTURERS FOR USE WITH ALL OTHER COMPONENTS WITHIN THE SYSTEM. (ONE EXAMPLE OF AN ELECTRICAL SYSTEM IS THE BUILDING LIGHTING SYSTEM COMPRISED OF FIXTURES, LAMPS, SWITCHES, DRIVERS, OCCUPANCY SENSORS AND DIMMING EQUIPMENT).

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
H. TAYLOR	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
H. TAYLOR	W91PHN-24-B-3002
CHECKED BY:	CONTRACT NO.:
R. DAVIS	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-85-01
SIZE:	FILE NAME:
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

BLEACHER ENCLOSURE LEGEND AND NOTES

SHEET ID
BLDG 4
E-001

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:10:13 PM

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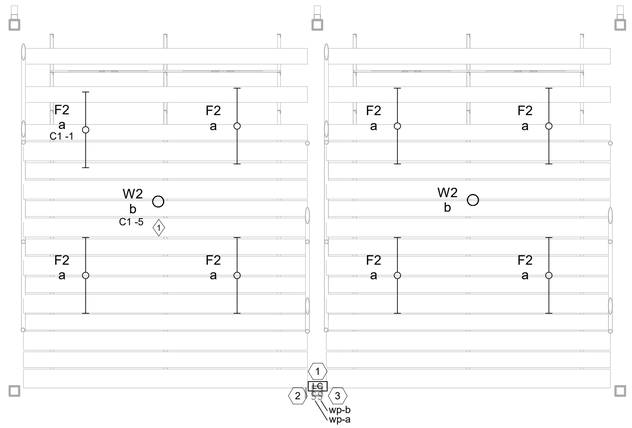

1 LIGHTING PLAN

1/4" = 1'-0"

4 3 2 1 0 4 8

GENERAL SHEET NOTES

1. PENDANT MOUNT ALL LUMINAIRES AT 12' 6" AFF.

KEYED NOTES ⟨#⟩

1	A MASTER OVERRIDE OFF CONTROL INSIDE THE CONTROL TOWER SHALL BE PROVIDED TO SHUT OFF ALL ANCILLARY BUILDING WHITE LIGHTING THAT MAY INTERFERE WITH RANGE NIGHT OPERATIONS. SEE LIGHTING CONTACTOR DIAGRAMS FOR ADDITIONAL INFORMATION.
2	SWITCHES FOR INDICATED WHITE LIGHTING SHALL BE WHITE IN COLOR AND SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE.
3	SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR
DRAWN BY: H. TAYLOR
CHECKED BY: R. DAVIS
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

BLEACHER ENCLOSURE LIGHTING PLAN

SHEET ID
BLDG 4
EL101

File Path: C:\Users\kfeinxhit\Documents\FY23_PN98182_MPTR-COVBLEACHERS_ELEC_R21_hunter.t.taylor.rvt

Plot Date: 11/28/2023 4:05:10 PM

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LIGHT FIXTURE SCHEDULE

TYPE	DFESCRIPTION	FIXTURE VOLTAGE	LIGHT SOURCE	NOMINAL WATTS	MINIMUM LUMENS	MOUNTING TYPE	MOUNTING HEIGHT	REMARKS
A2	2x2 FLAT PANEL LED LUMINAIRE	120 V	LED	38 W	4400	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
A3	2x4 FLAT PANEL LED LUMINAIRE	120 V	LED	41 W	4600	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
A4	2x4 FLAT PANEL LED LUMINAIRE	120 V	LED	62 W	6500	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
ELU	LED EMERGENCY LIGHTING UNIT	120 V	LED	4 W	600	WALL	SEE PLANS	
F2	ENCLOSED GASKETED LUMINAIRE	120 V	LED	30 W	4000	SUSPENDED	SEE PLANS	
OB	OBSTRUCTION LIGHT L-810	120 V	INCANDESCENT	70 W	-	THREADED HUB	N/A	STEADY BURNING; PROVIDE PHOTOCELL; PROVIDE SPD
W1	WALL MOUNTED VAPERPROOF (WHITE)	120 V	LED	17 W	1200	WALL	SEE PLANS	PROVIDE CLEAR HEAT TREATED GLASS LENS
W2	WALL MOUNTED VAPORPROOF (RED)	120 V	LED	17 W	1200	WALL	SEE PLANS	PROVIDE RED HEAT TREATED GLASS LENS
W3	CEILING MOUNTED VAPORPROOF (RED)	120 V	LED	17 W	1200	SURFACE	N/A	PROVIDE RED HEAT TREATED GLASS LENS
W4	CEILING MOUNTED VAPORPROOF (WHITE)	120 V	LED	17 W	1200	SURFACE	N/A	PROVIDE CLEAR HEAT TREATED GLASS LENS
X1	EXIT LIGHT - WALL MOUNTED	120 V	LED	1 W	N/A	WALL	N/A	

LED FLAT PANEL
2'x2' LED LUMINAIRE

FEATURES

REFLECTORS: HIGH REFLECTANCE GLOSS WHITE

SHIELDING: WHITE FROST LENS WITH SMOOTH PATTERN FOR UNIFORM ILLUMINATION

GENERAL DESCRIPTION

HOUSING: DIE FORMED CODE-GAUGE STEEL; SEAMLESS CORNERS MAXIMIZE LIGHT EMITTING SURFACE AREA

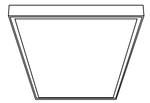
DIMENSIONS: 24" x 48" x 3" (W x L x D)

OTHER: DLC QUALIFIED

LUMEN MAINTENANCE: L70 AT 60,000 HOURS

1 TYPE A2

LED FLAT PANEL
2'x4' LED LUMINAIRE



FEATURES

REFLECTORS: HIGH REFLECTANCE GLOSS WHITE

SHIELDING: WHITE FROST LENS WITH SMOOTH PATTERN FOR UNIFORM ILLUMINATION

GENERAL DESCRIPTION

HOUSING: DIE FORMED CODE-GAUGE STEEL; SEAMLESS CORNERS MAXIMIZE LIGHT EMITTING SURFACE AREA

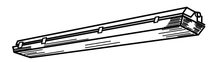
DIMENSIONS: 24" x 48" x 3" (W x L x D)

OTHER: DLC QUALIFIED

LUMEN MAINTENANCE: L70 AT 60,000 HOURS

2 TYPE A3 & A4

ENCLOSED AND GASKETED
LED LUMINAIRE



FEATURES

REFLECTORS: HIGH REFLECTANCE WHITE

SHIELDING: HIGH IMPACT LINEAR FROSTED ACRYLIC LENS

GENERAL DESCRIPTION

HOUSING: IMPACT RESISTANT, UV STABILIZED, FIBERGLASS WITH REMOVABLE GEAR TRAY FOR MODULE REPLACEMENT; NON-POROUS GASKET; STAINLESS STEEL LATCHES; INCLUDE SURFACE-MOUNTING BRACKETS

DIMENSIONS: 52"x7"x5" (LxWxD)

LISTING: UL LISTED FOR WET LOCATIONS

OTHER: DLC QUALIFIED

3 TYPE F2

SURFACE MOUNTED
THIN PROFILE LED EXIT LIGHT

FEATURES

MOUNTING: UNIVERSAL

SHIELDING: FLAT SHEET ACRYLIC

LETTERS: RED

BATTERY: NICKEL CADMIUM

OTHER: SELF DIAGNOSTICS; NEMA PREMIUM CERTIFIED; TAMPERPROOF HARDWARE

GENERAL DESCRIPTION

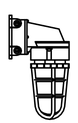
HOUSING: SOLID DIE-CAST ALUMINUM HOUSING AND FACE WITH DIRECTIONAL CHEVRON ARROWS AS REQUIRED

FINISH: BLACK HOUSING AND BRUSHED ALUMINUM FACE

DIMENSIONS: 12"x8"x1.75" (LxWxD, MAXIMUM, BACK MOUNTED)

4 TYPE X1

WALL MOUNTED
VAPORPROOF LUMINAIRE



FEATURES

DIFFUSER: GLOBE WITH DIE CAST GUARD
W1: (CLEAR GLOBE)
W2: (RED GLOBE)

GENERAL DESCRIPTION

HOUSING: DIE-CAST LED HOUSING DESIGNED FOR MAXIMUM HEAT DISSIPATION WITH HIGH TEMPERATURE SILICON INTERNAL GASKETS

FINISH: NATURAL UNPAINTED FINISH

LISTING: UL LISTED FOR WET LOCATIONS

DIMENSIONS: 8" x 13" (D x H)

5 TYPES W1 & W2

CEILING MOUNTED
VAPORPROOF LUMINAIRE

FEATURES

DIFFUSER: GLOBE WITH DIE CAST GUARD
W4: (CLEAR GLOBE)
W3: (RED GLOBE)

GENERAL DESCRIPTION

HOUSING: DIE-CAST LED HOUSING DESIGNED FOR MAXIMUM HEAT DISSIPATION WITH HIGH TEMPERATURE SILICON INTERNAL GASKETS

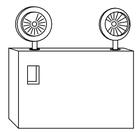
FINISH: NATURAL UNPAINTED FINISH

LISTING: UL LISTED FOR WET LOCATIONS

DIMENSIONS: 5" x 12" (D x H)

6 TYPES W3 & W4

LED EMERGENCY LIGHTING UNIT



FEATURES

LAMPS: FULLY ADJUSTABLE WHITE LED HEADS

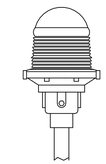
BATTERY: NICKEL CADMIUM
OUTPUT: HIGH OUTPUT OPTION FOR REMOTE HEADS
DURATION: 90 MINUTES AND >87.5% NOMINAL VOLTAGE

GENERAL DESCRIPTION

HOUSING: INJECTION MOLDED, HIGH IMPACT UV-STABLIZED THERMOPLASTIC MATERIAL; WHITE FINISH

7 TYPE ELU

INCANDESCENT OBSTRUCTION LIGHT L-810



FEATURES

DIFFUSER: RED POLYCARBONATE LENS

GENERAL DESCRIPTION

HOUSING: IP66/NEMA 4X; THREADED 1" BOTTOM HUB

LISTING: IP66 AND NEMA 4X

CERTIFICATIONS: FAA AC #: 150/5345-43H

DIMENSIONS: 5" x 5" x 9" (L x W x H)

8 TYPE OB

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.: -
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

BLEACHER ENCLOSURE LIGHT FIXTURE SCHEDULE & DETAILS

SHEET ID
BLDG 4
EL501

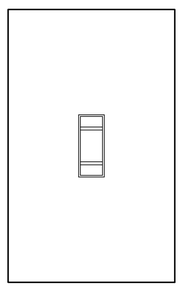
READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:10:14 PM

File Path: C:\Users\kbenxhit\Documents\FY23_PN86182_MPTR-STDETAILS_ELEC_R21_hunter.t.taylor.rvt

LIGHTING CONTROL STRATEGIES

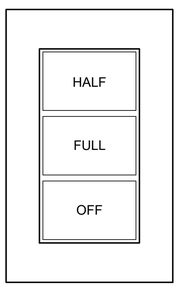
STRATEGY	DESCRIPTION OF OPERATION	LIGHTING CONTROL EQUIPMENT	SWITCHES
1	MANUAL ON/OFF	LINE VOLTAGE TOGGLE SWITCHES	S, S3, S4
2	MANUAL ON/OFF AUTO SENSOR OFF	LINE VOLTAGE WALL SWITCH SENSOR	Sv
3	AUTO SENSOR ON (HALF) MANUAL ON (HALF) MANUAL ON (FULL) MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS OCCUPANCY SENSORS ROOM CONTROLLERS	SLV3
6	LIGHTING SCENES (ZONE 1 | ZONE 2) FULL: 100% | 100% AV: 100% | 30% DIM: 1% | 1% MANUAL RAISE MANUAL LOWER MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS VACANCY SENSORS ROOM CONTROLLERS	SLV6
7	MANUAL ON/OFF AUTO SENSOR ON (HALF) AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS OCCUPANCY SENSORS ROOM CONTROLLERS	SLV2
12	PARTITION CONTROL LIGHTING SCENES (ZONE 1 | ZONE 2) FULL: 100% | 100% AV: 100% | 30% DIM: 1% | 1% MANUAL RAISE MANUAL LOWER MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS VACANCY SENSORS ROOM CONTROLLERS PARTITION CONTROL SENSORS/INTERFACE	SLV6
14	PHOTOCELL CONTROL ON WHEN NORTHERN SKY ILLUMINANCE REACHING A VERTICAL SURFACE FALLS BELOW 50 FC. PHOTOCELL CONTROL ON WHEN NORTHERN SKY ILLUMINANCE REACHING A VERTICAL SURFACE RISES ABOVE 50 FC.	PHOTOCELL	



DETAIL NOTES:

1. SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR. WHERE INDICATED, THEY SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE. SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR. ALL SWITCHES SHALL BE PERMANTENTLY LABELED WITH A DESCRIPTION OF ITS USE.

1 WALL SWITCHES S, S3, & S4



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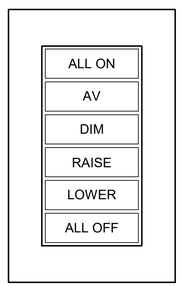
2 WALLSTATION SLV3



DETAIL NOTES:

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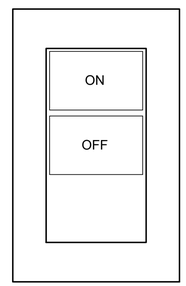
3 WALLSTATION SLV6



DETAIL NOTES:

1. SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR. WHERE INDICATED, THEY SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE. SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR. ALL SWITCHES SHALL BE PERMANTENTLY LABELED WITH A DESCRIPTION OF ITS USE.

3 WALLSTATION SLV2

US Army Corps of Engineers ®

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DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

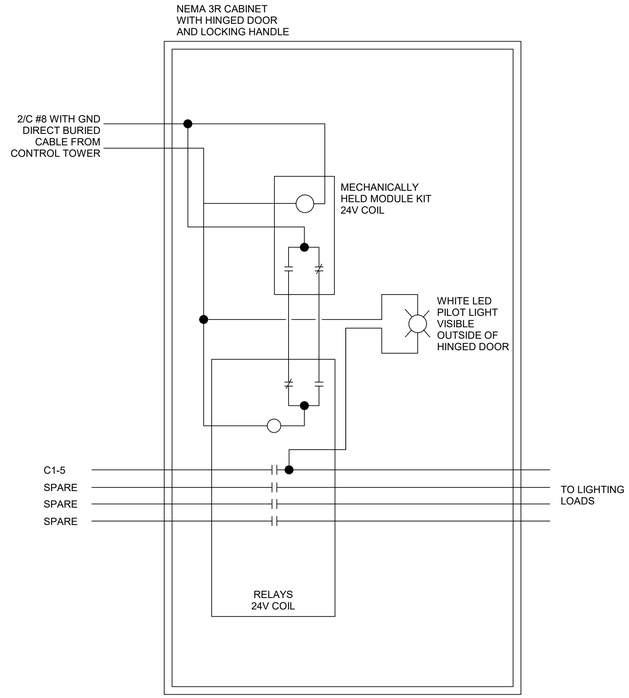
BLEACHER ENCLOSURE LIGHTING CONTROL SCHEDULES AND DETAILS

SHEET ID
BLDG 4
EL601

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:10:14 PM

File Path: C:\Users\k6enxhit\Documents\FY23_PN96182_MPTR-STDETAILS_ELEC_R21_hunter.t.taylor.rvt



LIGHTING CONTACTOR DIAGRAM NOTES:

1. THE DESIGN INTENT IS TO PROVIDE A MASTER OVERRIDE OFF CONTROL INSIDE THE CONTROL TOWER TO SHUT OFF ALL BUILDING WHITE LIGHTING THAT MAY INTERFERE WITH RANGE NIGHT OPERATIONS.

2. ADDITIONAL BUILDING LIGHTING CONTROLS ARE PROVIDED ON THE LOAD SIDE OF THE CONTACTOR TO PROVIDE TYPICAL BUILDING LIGHTING CONTROLS. SEE OTHER EL SHEETS FOR ADDITIONAL LIGHTING CONTROL REQUIREMENTS.

1 LIGHTING CONTACTOR DIAGRAMS

US Army Corps of Engineers ®

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SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

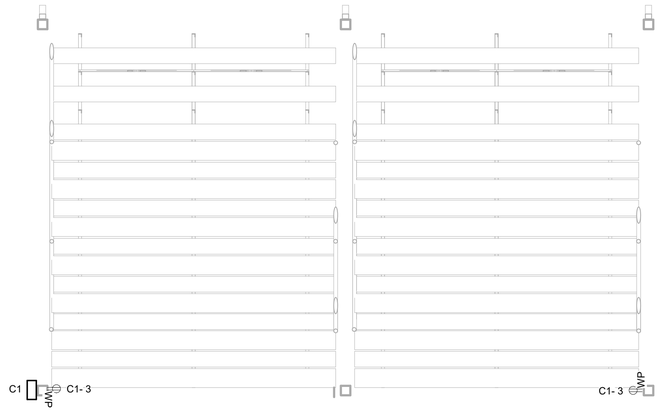
BLEACHER ENCLOSURE LIGHTING CONTACTOR DIAGRAMS

SHEET ID
BLDG 4
EL602

Plot Date: 11/28/2023 3:10:15 PM

File Path: C:\Users\kfeinxhit\Documents\FY23_PN96182_MPTR-STIDETAILS_ELEC_R21_hunter.t.taylor.rvt

READY TO ADVERTISE (RTA)



1 POWER PLAN

1/4" = 1'-0"

4 3 2 1 0 4 8

GENERAL SHEET NOTES

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

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CHECKED BY: R. DAVIS	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

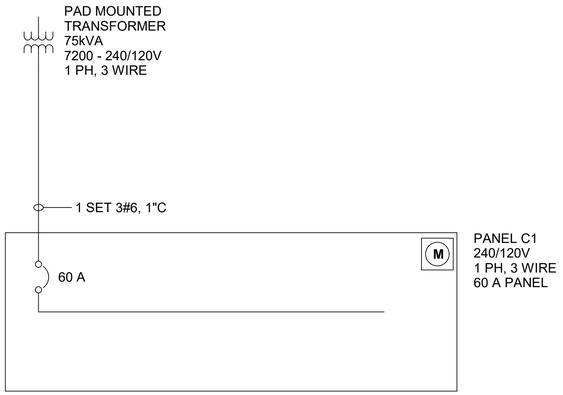
BLEACHER ENCLOSURE POWER PLAN

SHEET ID
BLDG 4
EP101

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 4:05:10 PM

File Path: C:\Users\k6exhilt\Documents\FY23_PN98182_MPTR-COVBLEACHERS_ELEC_R21_hunter.t.taylor.rvt



NOTES, POWER ONE-LINE DIAGRAM:

1. SANDHILLS UTILITY SERVICES (SUS) SHALL FURNISH AND INSTALL THE TRANSFORMER, TRANSFORMER PAD, AND PRIMARY DISTRIBUTION CABLES. SEE SITE ELECTRICAL DRAWINGS FOR MORE INFORMATION AND ADDITIONAL REQUIREMENTS.

2. THE CONTRACTOR SHALL FURNISH AND INSTALL THE SECONDARY CONDUCTORS AND CONDUITS FROM THE MAIN DISTRIBUTION PANEL (MDP) TO THE SECONDARY COMPARTMENT OF THE TRANSFORMER. THE CABLES SHALL BE OF SUFFICIENT LENGTH TO FACILITATE THEIR CONNECTION TO THE SECONDARY LUGS OF THE TRANSFORMER.

3. SEE DETAIL ON EG501 FOR SERVICE ENTRANCE GROUNDING REQUIREMENTS.

1 POWER ONE-LINE DIAGRAM
NOT TO SCALE

US Army Corps of Engineers ®

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SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

BLEACHER ENCLOSURE POWER RISER DIAGRAM

SHEET ID
BLDG 4
EP601

Plot Date: 11/28/2023 4:05:11 PM

File Path: C:\Users\kfeinxhit\Documents\FY23_PN96182_MPTR-COVBLEACHERS_ELEC_R21_hunter.t.taylor.rvt

READY TO ADVERTISE (RTA)

Branch Panel: C1

Location:
Supply From:
Mounting: Surface
Enclosure: NEMA 3R

Volts: 120/240 Single
Phases: 1
Wires: 3

A.I.C. Rating: 10k
Mains Type: MCB
Mains Rating: 60 A
MCB Rating: 60 A

Notes:

CKT	Circuit Description	Trip	Poles	Remarks	A		B		Remarks	Poles	Trip	Circuit Description	CKT
1	Covered Bleachers White Lighting	20 A	1		240 VA								2
3	Receptacles	20 A	1				360 VA						4
5	Covered Bleachers Red Lighting	20 A	1		34 VA	0 VA			--	2	30 A	SPD	6
7								0 VA	--	--	--	--	8
	Total Load:				273 VA		360 VA						
	Total Amps:				2 A		3 A						

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting	273 VA	125.00%	341 VA		
Receptacle	360 VA	100.00%	360 VA	**Total Conn. Load:**	626 VA
				Total Est. Demand:	694 VA
				Total Conn. Current:	3 A
				Total Est. Demand Current:	3 A

US Army Corps of Engineers ®

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SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

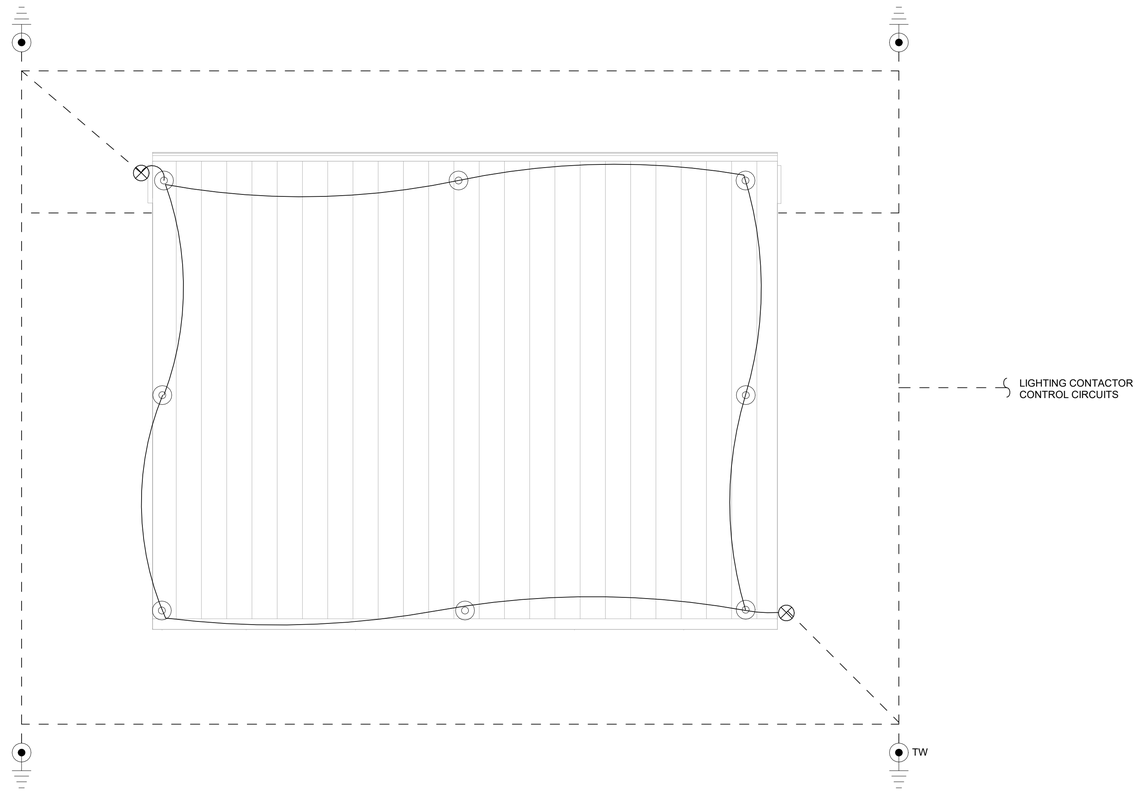
FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

BLEACHER ENCLOSURE PANEL SCHEDULES

SHEET ID
BLDG 4
EP701

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 4:05:11 PM
File Path: C:\Users\kfeinxhit\Documents\FY23_PN98182_MPTR-COVBLEACHERS_ELEC_R21_hunter.t.taylor.rvt



1 LIGHTNING PROTECTION PLAN
1/4" = 1'-0"

GENERAL SHEET NOTES

1. THE LIGHTNING PROTECTION INSTALLER SHALL COORDINATE ROOF PENETRATIONS WITH THE ROOF INSTALLER. PENETRATIONS SHALL COMPLY WITH THE ROOF MANUFACTURER'S RECOMMENDATIONS. SEALING AND FLASHING OF PENETRATIONS SHALL BE BY THE ROOF INSTALLER.

2. LIGHTNING PROTECTION CONDUCTORS PASSING THROUGH CONCRETE FOUNDATION, SLABS OR PADS SHALL BE ROUTED IN CONDUIT.

3. INSTALLED LIGHTNING PROTECTION SYSTEM SHALL BE FIELD INSPECTED BY CONTRACTOR-PROVIDED INDEPENDENT TESTING AGENCY AND FURNISHED WITH A UL MASTER LABEL FOR LIGHTNING PROTECTION SYSTEM.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

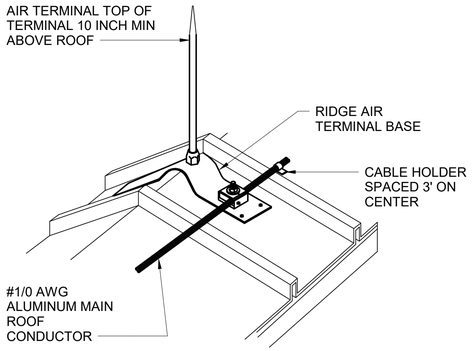
BLEACHER ENCLOSURE LIGHTNING PROTECTION PLAN

SHEET ID
BLDG 4
EG101

Plot Date: 11/28/2023 4:05:08 PM

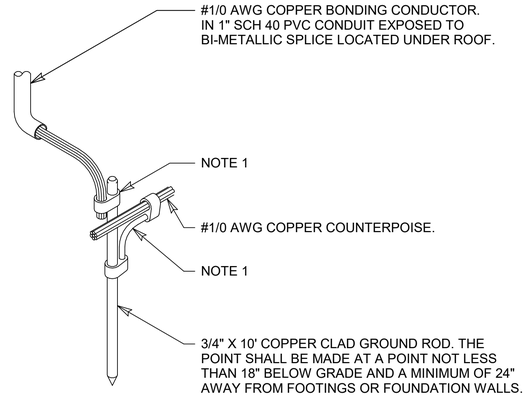
File Path: C:\Users\kfeinxhit\Documents\FY23_PN96182_MPTR-COVBLEACHERS_ELEC_R21_hunter.t.taylor.rvt

READY TO ADVERTISE (RTA)



1 RIDGE ROOF AIR TERMINAL DETAIL

NOT TO SCALE

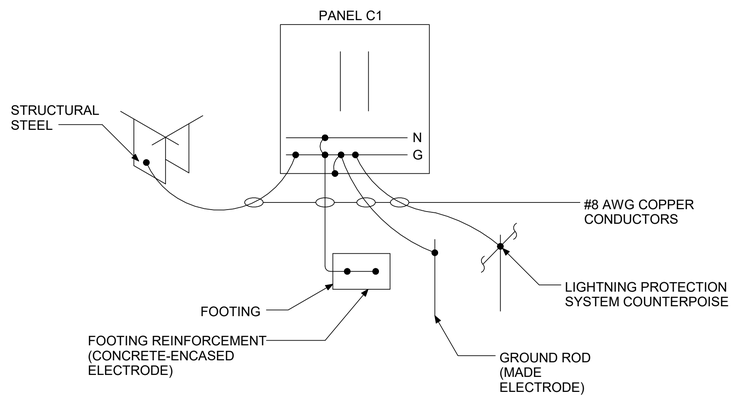


NOTES:

1. ALL CONNECTIONS TO GROUND RODS BELOW GROUND LEVEL MUST BE BY EXOTHERMIC WELD CONNECTION OR WITH A HIGH COMPRESSION CONNECTION USING A HYDRAULIC OR ELECTRIC COMPRESSION TOOL TO PROVIDE THE CORRECT CIRCUMFERENTIAL PRESSURE.

2 DOWN CONDUCTOR & COUNTERPOISE CONNECTION DETAIL

NOT TO SCALE



NOTES:

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC, ARTICLE 250. VARIATIONS TO GROUNDING SHOWN SHALL BE APPROVED BY THE COR.

3 SERVICE ENTRANCE GROUNDING DETAIL

NOT TO SCALE

US Army Corps of Engineers ®

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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

BLEACHER ENCLOSURE MISC GROUNDING DETAILS

SHEET ID
BLDG 4
EG501

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 4:05:09 PM

File Path: C:\Users\kbenxhih\Documents\FY23_PN96182_MPTR-COVBLEACHERS_ELEC_R21_hunter.t.taylor.rvt

DESIGN CODE NOTES:

D-1. STRUCTURAL DESIGN IS IN ACCORDANCE WITH THE FOLLOWING CODES AND SPECIFICATIONS:

A. IBC 2018, INTERNATIONAL BUILDING CODE

B. ASCE 7-16, MINIMUM DESIGN LOADS FOR BUILDINGS AND STRUCTURES

C. ACI 318-14, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

D. TMS 402-16, BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES

E. AISC 360-16, SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS

F. AISI S100-12, NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS.

G. AWS, AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE

H. SDI, STEEL DECK INSTITUTE: DESIGN MANUAL FOR COMPOSITE DECK, FORM DECK, & ROOF DECK

I. UFC 1-200-01, GENERAL BUILDING REQUIREMENTS (01 OCT 2020)

J. UFC 3-301-01, STRUCTURAL ENGINEERING, (01 OCT 2019)

K. UFC 4-010-01, DOD MINIMUM ANTI-TERRORISM STANDARDS FOR BUILDINGS, (19 AUG 2020)

DESIGN LOAD CRITERIA:

D-2. LIVE LOADS:

FIRST FLOOR SLAB-ON-GRADE	100 PSF
ROOF LIVE LOAD	20 PSF

D-3. SNOW LOADS:

RISK CATEGORY	II
SNOW IMPORTANCE FACTOR, I_s	1.0
MINIMUM GROUND SNOW LOAD, P_g	10 PSF
FROST PENETRATION DEPTH	0 IN
SNOW EXPOSURE FACTOR, C_e	0.9
SNOW THERMAL FACTOR, C_t	1.2
ROOF SLOPE FACTOR, C_s	0.95
FLAT ROOF SNOW LOAD, P_f	7.6 PSF
SLOPED ROOF SNOW LOAD, P_s	7.2 PSF

D-4. WIND LOADS:

RISK CATEGORY	II
BASIC WIND SPEED, *V*	119 MPH (ULTIMATE) 93 MPH (SERVICE)
WIND EXPOSURE CATEGORY	C
GUST EFFECT FACTOR, *G*	0.85
INTERNAL PRESSURE COEFFICIENTS, *GCpi*	0

D-5. SEISMIC LOADS:

RISK CATEGORY	II
SEISMIC IMPORTANCE FACTOR, *Ie*	1.0
MAPPED SPECTRAL RESPONSE ACCELERATION, *Ss*	0.154
MAPPED SPECTRAL RESPONSE ACCELERATION, *S1*	0.072
SITE CLASS	D
DESIGN SPECTRAL RESPONSE ACCELERATION, *Sds*	0.16
DESIGN SPECTRAL RESPONSE ACCELERATION, *Sd1*	0.12
SEISMIC DESIGN CATEGORY	B
SEISMIC ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE
SEISMIC-FORCE RESISTING SYSTEM	STEEL NOT DETAILED FOR SEISMIC
RESPONSE MODIFICATION FACTOR, *R*	3.0
SYSTEM OVERSTRENGTH FACTOR	3.0
DEFLECTION AMPLIFICATION FACTOR, Cd	3.0
SEISMIC RESPONSE COEFFICIENT, Cs	0.055
SEISMIC BASE SHEAR	1.4 KIPS

D-6. ANTI-TERRORISM/FORCE PROTECTION CRITERIA:

ANTI-TERRORISM/FORCE PROTECTION IS NOT REQUIRED FOR THIS FACILITY BASED ON THE INTENDED OCCUPANCY.

SPECIAL INSPECTION NOTES:

SI-1. INSPECTION OF FABRICATORS SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1704.2.5.

SI-2. INSPECTION OF STEEL CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.2.

SI-3. INSPECTION OF CONCRETE CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.3 AND TABLE 1705.3.

SI-4. INSPECTIONS FOR SEISMIC RESISTANCE SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.12.

SI-5. INCLUDE SPECIAL INSPECTIONS REQUIREMENTS IN CONTRACTOR'S QUALITY CONTROL (CQC) PLAN.

SI-6. THE CONTRACTOR SHALL RETAIN THIRD PARTY QUALITY ASSURANCE AGENCIES TO CONDUCT SPECIAL INSPECTIONS REQUIRED BY IBC. INSPECTING AGENCY SHALL PROVIDE REPORTS OF SPECIAL INSPECTIONS DIRECTLY TO THE GOVERNMENT.

GENERAL NOTES:

G-1. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER ALL BUILDING CONSTRUCTION IS COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCES TO ENSURE SAFETY OF THE BUILDING AND ITS COMPONENTS DURING ERECTION. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS, OR TIE-DOWNS.

G-2. THE CONTRACT DOCUMENTS DO NOT INDICATE THE MEANS AND METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK DURING ERECTION AND CONSTRUCTION AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES, SEQUENCES, LOADINGS AND SAFETY.

G-3. USE STRUCTURAL DRAWINGS IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SPECIFICATIONS. COORDINATE THE WORK OF OTHER TRADES INCLUDING, BUT NOT LIMITED TO, THE REQUIREMENTS FOR SLEEVES, INSERTS, HOLES, HANGERS, AND ANCHORS.

G-4. REPORT DISCREPANCIES IN DIMENSIONS BETWEEN DIFFERENT DRAWINGS TO THE CONTRACTING OFFICER PRIOR TO BEGINNING WORK IN IMPACTED AREAS.

G-5. ELEVATIONS ON THE STRUCTURAL DRAWINGS ARE DENOTED AS [±X'-X"] REFERENCED TO THE FINISHED FIRST FLOOR ELEVATION DATUM [0'-0"]. SEE CIVIL DRAWINGS FOR ACTUAL DATUM ELEVATION.

G-6. DETAILS TITLED OR NOTED AS "TYPICAL" APPLY NOT ONLY WHERE SPECIFICALLY INDICATED OR REFERENCED, BUT ALSO IN ALL OTHER CASES WHERE THE NATURE OF THE CONSTRUCTION REQUIRES THEIR USE. DETERMINE APPLICABILITY OF TYPICAL DETAILS FROM DESCRIPTIVE TITLES OR FROM THE SIMILARITY OF A CONSTRUCTION CONDITION TO ANOTHER CONDITION WHERE THE DETAIL IS SPECIFICALLY INDICATED OR REFERENCED.

G-7. WHERE A DETAIL OR SECTION IS SHOWN FOR ONE CONDITION, IT SHALL APPLY TO ALL LIKE OR SIMILAR CONDITIONS EVEN THOUGH NOT SPECIFICALLY MARKED ON THE PLANS.

G-8. REPRODUCTION OF CONTRACT DRAWINGS SHALL NOT BE USED AS SHOP DRAWINGS UNDER ANY CIRCUMSTANCE.

G-9. DO NOT SCALE THE DRAWINGS.

FOUNDATION AND SLAB NOTES:

F-1. FOUNDATIONS FOR THIS PROJECT HAVE BEEN DESIGNED IN ACCORDANCE WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT PREPARED BY THE SAVANNAH DISTRICT TITLED "SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING REPORT", DATED MARCH 2022.

F-2. FOUNDATIONS HAVE BEEN DESIGNED TO BEAR ON SOIL CAPABLE OF SUPPORTING AN ALLOWABLE BEARING PRESSURE OF 3000 PSF, PER THE GEOTECHNICAL REPORT REFERENCED ABOVE.

F-3. THE CONTRACTOR SHALL HIRE AN INDEPENDENT TESTING LABORATORY AND GEOTECHNICAL ENGINEER, REGISTERED AND LICENSED IN THE STATE WHERE THE WORK WILL BE ACCOMPLISHED, TO VERIFY THAT ALL OF THE REQUIREMENTS CONTAINED IN SPECIFICATION 31 00 00, EARTHWORK, HAVE BEEN FOLLOWED AND ACCOMPLISHED.

F-4. CONTRACTOR SHALL BE PREPARED FOR AND SHALL INCLUDE COST OF FORMING FOUNDATIONS SHOULD THE EARTH NOT PROVIDE ADEQUATE BANK STABILITY.

F-5. ALL EXCAVATIONS SHALL BE PERFORMED SO THAT THE SITE AND THE AREA IMMEDIATELY SURROUNDING THE SITE WHICH AFFECTS CONSTRUCTION OPERATIONS WILL BE CONTINUALLY AND EFFECTIVELY DRAINED. THE CONTRACTOR SHALL PROVIDE DRAINAGE AND DEWATERING AS REQUIRED TO ENSURE THAT ALL FOOTING EXCAVATIONS ARE ACCOMPLISHED WITH THE SUBGRADE SOILS REMAINING DRY AND FIRM UNTIL AFTER FOOTINGS ARE PLACED AND BACKFILLED. REMOVAL OF SURFACE WATER, GROUNDWATER, AND ANY PERCHED WATER CONDITIONS WHICH MIGHT BE ENCOUNTERED DURING EXCAVATIONS, SHALL BE ACCOMPLISHED BY APPROVED MEANS. REFER TO SPECIFICATION SECTION 31 00 00, EARTHWORK, AND TO SHEET S-101 FOR ADDITIONAL EXCAVATION REQUIREMENTS.

F-6. PLACE FOUNDATION CONCRETE THE SAME DAY EXCAVATIONS ARE MADE OR AS SOON AS PRACTICAL THEREAFTER.

F-7. DO NOT PLACE FOUNDATION CONCRETE ON FROZEN OR SATURATED SUBGRADES.

F-8. ENSURE THAT EARTH-FORMED FOOTINGS CONFORM TO THE SHAPE, LINES, AND THICKNESS INDICATED ON THE FOUNDATION PLAN, SECTIONS, AND FOOTING SCHEDULES. EXCAVATION WIDTHS SHALL BE A MINIMUM OF 4" GREATER THAN DIMENSIONS INDICATED.

F-9. DO NOT INSTALL FOUNDATIONS UNTIL FOUNDATION WORK HAS BEEN COORDINATED WITH ADJACENT UNDERGROUND UTILITIES.

CONCRETE CONSTRUCTION NOTES:

C-1. ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-14) AND THE SPECIFICATIONS FOR STRUCTURAL CONCRETE (ACI 301-14) OF THE AMERICAN CONCRETE INSTITUTE (ACI).

C-2. ALL CAST-IN-PLACE CONCRETE SHALL ATTAIN MINIMUM 28-DAY COMPRESSIVE STRENGTH (f'c) OF 4000 PSI.

C-3. CONCRETE DENSITY SHALL BE NORMAL WEIGHT WITH A DENSITY OF 140 PCF TO 150 PCF UNLESS NOTED OTHERWISE ON PLANS. CONCRETE NOTED TO BE LIGHTWEIGHT SHALL HAVE DENSITY OF 105 PCF TO 115 PCF.

C-4. CONCRETE REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615/A615M, GRADE 60 AND SHALL HAVE FABRICATION TOLERANCES IN ACCORDANCE WITH ACI 315. SHOP FABRICATE REINFORCING BARS WHICH ARE INDICATED TO BE BENT OR HOOKED.

CONCRETE CONSTRUCTION NOTES CONTINUED:

C-5. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 OR ASTM A497. PROVIDE SHEET-TYPE WELDED WIRE FABRIC. SHEET LAPS SHALL BE TIED AND LAPPED ONE FULL MESH SPACING PLUS 2".

C-6. CONCRETE REINFORCING STEEL SHALL BE CONTINUOUS UNLESS OTHERWISE INDICATED. CONTINUOUS REINFORCING STEEL SHALL BE SPLICED AS SHOWN IN SCHEDULE ON SB601 UNO ON PLANS. REINFORCING STEEL SHALL BE PLACED SO THAT SPACING IS GREATER THAN OR EQUAL TO 2X BAR DIAMETER.

C-7. MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE AS INDICATED. IN NO CASE SHALL REINFORCEMENT COVER BE LESS THAN THE REQUIREMENTS OF ACI 301.

A.	CONCRETE DEPOSITED AGAINST THE GROUND	3"
B.	CONCRETE EXPOSED TO EARTH OR WEATHER	2"
C.	SLABS AND WALLS	1"

C-8. CONCRETE REINFORCING STEEL MARKED STANDARD HOOK SHALL HAVE A 90° HOOK A MINIMUM OF 12 BAR DIAMETERS IN LENGTH, UNLESS OTHERWISE NOTED. STIRRUPS, TIES, AND 180° HOOKS SHALL CONFORM TO THE REQUIREMENTS OF ACI 318.

C-9. PROVIDE 1/2" THICK PRE-MOLDED JOINT FILLER MATERIAL WHERE SLABS ON GRADE ABUT VERTICAL SURFACES.

C-10. ALL EMBEDDED ITEMS SHALL BE PROPERLY PLACED, ACCURATELY POSITIONED AND MAINTAINED SECURELY IN PLACE PRIOR TO AND DURING CONCRETE PLACEMENT.

C-11. REINFORCING STEEL SHALL BE SPREAD AT SLEEVES, ANCHORS, RECESSES AND OTHER EMBEDDED ITEMS UNLESS OTHERWISE INDICATED. REINFORCEMENT SHALL NOT BE CUT TO FACILITATE PLACEMENT OF EMBEDDED ITEMS, UNLESS INDICATED.

C-12. NO CONCRETE SHALL BE PLACED UNTIL THE OWNER OR THE CONTRACTING OFFICER'S DESIGNATED REPRESENTATIVE HAS INSPECTED ALL EMBEDDED WORK, INCLUDING REINFORCEMENT.

C-13. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 3/4" OR AS INDICATED.

C-14. ALUMINUM SHALL NOT BE PLACED IN DIRECT CONTACT WITH CONCRETE UNLESS EFFECTIVELY COATED OR COVERED TO PREVENT ALUMINUM-CONCRETE REACTION AND ELECTROLYTIC ACTION BETWEEN ALUMINUM AND STEEL.

C-15. CONCRETE SLAB ON GRADE JOINTS INDICATED ARE DIAGRAMMATIC AND DO NOT REPRESENT ALL OF THE JOINTS REQUIRED FOR SLAB-ON-GRADE CONSTRUCTION. SLAB PANELS BETWEEN JOINTS SHALL BE EQUALLY SPACED OR NEARLY SO, WITH A MAXIMUM SPACING OF 15'-0". SLAB PANELS BETWEEN JOINTS SHALL BE SQUARE OR NEARLY SO AND SHALL NOT EXCEED AN ASPECT RATIO WITH PANEL LENGTH GREATER THAN 1.5 TIMES THE PANEL WIDTH.

C-16. CONTRACTOR SHALL PROVIDE JOINTS AT ALL RE-ENTRANT CORNERS INCLUDING, BUT NOT LIMITED TO, COLUMNS AND SLAB RECESSES.

C-17. IN ADDITION, CONTRACTOR SHALL COORDINATE SLAB ON GRADE JOINT REQUIREMENTS WITH SLAB-ON-GRADE CONSTRUCTION SEQUENCING. CONTRACTOR SHALL SHOW JOINT LAYOUT ON REINFORCING SHOP DRAWING SUBMITTAL FOR APPROVAL.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
A. SCOTT	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
A. SCOTT	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
J. WHITTAKER	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-85-01
SIZE:	FILE NAME:
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

COVERED MESS GENERAL STRUCTURAL NOTES

SHEET ID
BLDG 5
S-001

READY TO ADVERTISE (RTA)

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STEEL CONSTRUCTION NOTES:

S-1. FABRICATION AND ERECTION OF STRUCTURAL STEEL AND DESIGN OF CONNECTIONS SHALL BE IN ACCORDANCE WITH AISC 360-16, "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" AND AISC 303-16, "CODE OF STANDARD PRACTICE FOR BUILDING AND BRIDGES". THE STRUCTURAL STEEL MEMBERS SHOWN IN THESE DRAWINGS HAVE BEEN ANALYZED AND DESIGNED USING AISC 360-16, LRFD METHOD.

S-2. UNLESS OTHERWISE NOTED, STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE ABOVE-LISTED AISC SPECIFICATION AND THE FOLLOWING:

A. WIDE FLANGE SHAPES (50 KSI)	ASTM A992, GRADE B
B. HSS HOLLOW SHAPES (50 KSI)	ASTM A500, GRADE C
C. HSS HOLLOW ROUND SHAPES (46 KSI)	ASTM A500, GRADE C
D. PLATES AND ANGLES	ASTM A36
E. HIGH STRENGTH BOLTS	ASTM F3125, GRADE A325
F. ANCHOR RODS W/ NUT AND WASHER	ASTM F1554, GRADE 55

S-3. ALL SHOP AND FIELD WELDING SHALL BE BY CERTIFIED WELDERS AND SHALL CONFORM TO AWS STANDARDS. USE E70XX ELECTRODES UNLESS OTHERWISE NOTED. MINIMUM WELD SIZE FOR STRUCTURAL STEEL IS 3/16 IN FILLET, UNLESS OTHERWISE NOTED. CURRENT AWS CERTIFICATIONS SHALL BE AVAILABLE AT THE JOB SITE FOR REVIEW BY THE OWNERS' REPRESENTATIVE.

S-4. ALL BOLTED CONNECTIONS, UNLESS OTHERWISE NOTED, SHALL USE 3/4" DIAMETER HIGH STRENGTH BOLTS WITH HARDENED CARBON STEEL WASHERS AS REQUIRED FOR THE CONNECTION LOADS.

S-5. ALL FIELD-BOLTED SHEAR CONNECTIONS SHALL BE SNUG TIGHT BEARING-TYPE CONNECTIONS, THREADS INCLUDED IN THE SHEAR PLANE.

S-6. FIELD CUTTING OF STRUCTURAL STEEL MEMBERS BY ANY TRADE IS NOT PERMITTED. BOLT HOLES SHALL NOT BE CUT OR ENLARGED BY FLAME CUTTING IN THE FIELD.

S-7. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL DRAWINGS AND DESIGN CALCULATIONS FOR ANY ALTERNATE DETAILS AND MEMBER SPLICES.

S-8. SHOP OR FIELD SPLICES OF STRUCTURAL STEEL MEMBERS ARE PROHIBITED EXCEPT AS DETAILED ON THE DRAWINGS, PERMITTED IN THE SPECIFICATIONS, AS INDICATED ON APPROVED SUBMITTALS, AND AS SPECIFICALLY APPROVED ON SHOP DRAWINGS PRIOR TO FABRICATION.

S-9. PAINT ALL STEEL BELOW FINISH FLOOR WITH BITUMINOUS COATING.

S-10. ALL STEEL EXPOSED TO WEATHER SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 FOR MEMBERS AND ASTM A153 FOR CONNECTION ELEMENTS, EXCEPT THAT ARCHITECTURALLY EXPOSED STRUCTURAL STEEL SHALL BE BLAST CLEANED AND COATED IN ACCORDANCE WITH THE STRUCTURAL STEEL AND PAINT SPECIFICATIONS. COORDINATE ALL STEEL FINISHES WITH ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

S-11. ALL ANGLES AND BENT PLATES INDICATED TO BE CONTINUOUS SHALL HAVE SPLICES FULLY WELDED.

S-12. PROVIDE CAP PLATES TO ALL EXPOSED HSS MEMBERS.

STEEL DECK NOTES:

SD-1. ROOF DECK SHALL BE GALVANIZED STEEL CONFORMING TO ASTM A653 WITH A MINIMUM YIELD STRENGTH OF 33 KSI. STEEL ROOF DECK SHALL BE AS SHOWN ON DRAWINGS. FASTENERS FOR ROOF DECK SHALL UTILIZE #12 SELF TAPPING SCREWS AT A 36/4 PATTERN TO SUPPORT STRUCTURE AND #12 SELF TAPPING SCREWS AT SIDE LAP CONNECTIONS. THE NUMBER OF SIDELAPS VARIES PER ROOF PLAN. SEE ROOF PLANS FOR NUMBER OF SIDELAPS REQUIRED. SEE ROOF EAVE/RAKE SECTIONS FOR PERIMETER FASTENING REQUIREMENTS.

SD-2. PROVIDE ALL RIDGE PLATES, VALLEY PLATES, CLOSURE PLATES, POUR STOPS, AND ALL OTHER ACCESSORIES REQUIRED FOR COMPLETE INSTALLATION IN ACCORDANCE WITH THE DECK MANUFACTURER'S RECOMMENDATIONS.

SD-3. CONTRACTOR SHALL COORDINATE OPENINGS IN STEEL DECK WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS PRIOR TO DECK PLACEMENT.

SD-4. HANGING LOADS DIRECTLY FROM ROOF DECK IS PROHIBITED.

SD-5. STEEL DECK SHALL SPAN CONTINUOUSLY OVER A MINIMUM OF 4 SUPPORTS (3 SPANS) UNO.

LIGHT GAUGE STEEL NOTES:

LG-1. THE ROOF LAYOUT AND COMPONENTS SHOWN ON THE DRAWINGS ARE FOR GENERAL CONFIGURATION ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL QUANTITIES, DIMENSIONS, CONNECTION DETAILS, ETC. NECESSARY FOR THE COMPLETE DESIGN, FABRICATION, AND ERECTION OF THE ROOF FRAMING SYSTEM. THE CONTRACTOR SHALL COORDINATE THE DESIGN WITH THE ARCHITECTURAL PLANS, ELEVATIONS, AND DETAILS.

LG-2. COLD-FORMED TRUSSES SHALL BE DESIGNED IN ACCORDANCE WITH THE AMERICAN IRON AND STEEL INSTITUTE (AISI) SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS.

LG-3. ALL CALCULATIONS AND DRAWINGS USED IN THE DESIGN OF COLD-FORMED TRUSSES MUST BE SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER AND SUBMITTED FOR APPROVAL. IN ADDITION TO THE CALCULATIONS, THE SUBMITTAL SHALL INCLUDE DETAILS OF THE LAYOUT, ERECTION PLAN, BOTH TEMPORARY AND PERMANENT BRACING, BRIDGING, OUTRIGGERS, CONNECTIONS INCLUDING DIAPHRAGM FORCES, HEADERS, SILLS, AND JAMBS.

LG-4. THE CONTRACTOR SHALL SUBMIT COMPLETE PRODUCT CATALOGS FROM THE MATERIAL MANUFACTURER FOR REVIEW PRIOR TO FABRICATION. THE CATALOGS SHALL INDICATE QUALIFICATION, MATERIAL SPECIFICATIONS, DESIGN REFERENCES, ETC.

LG-5. ALL COLD-FORMED STEEL MEMBERS, THEIR COMPONENTS, AND CONNECTION MATERIAL SHALL BE GALVANIZED. PREPARE AND REPAIR DAMAGED GALVANIZED COATINGS ON FABRICATED AND INSTALLED LIGHT GAUGE METAL FRAMING WITH GALVANIZING REPAIR PAINT ACCORDING TO ASTM A780 AND/OR THE MANUFACTURER'S RECOMMENDATIONS.

LG-6. COLD-FORMED STEEL MEMBERS SHALL BE Fy=33KSI FOR MEMBERS 43 MILS (18 GA) AND LIGHTER AND Fy=50KSI FOR MEMBERS 54 MILS (16 GA) AND HEAVIER. USE MIN 6" WIDE STUDS AT EXTERIOR WALLS UNO.

LG-7. ALL WELDING OF COLD-FORMED STEEL SHALL COMPLY WITH AWS D1.1 AND AWS D1.3 FOR WELDING BASE MATERIAL LESS THAN 1/8" THICK.

LG-8. TRUSS LOADS:
TOP CHORD:
DEAD: 8 PSF
ROOF LIVE: 20 PSF
WIND: SEE S-003
BOTTOM CHORD:
DEAD: 4 PSF
LIVE: 10 PSF

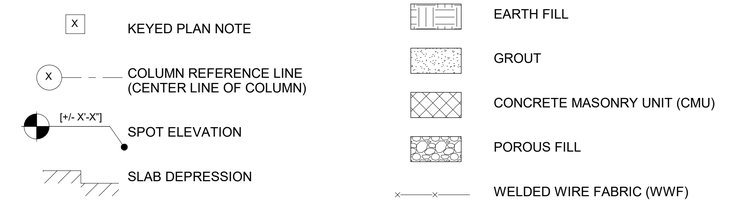
LG-9. TRUSS DEFLECTION SHALL BE LIMITED TO:
LIVE LOAD - L/360
SNOW LOAD OR WIND LOAD - L/360
DEAD LOAD + LIVE LOAD - L/240

LG-10. BRIDGING AND BRACING OF TRUSS COMPRESSION MEMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE TRUSS MANUFACTURERS DESIGN AND DIRECTIONS. TRUSSES SHALL BE BRACED SECURELY BOTH DURING ERECTION AND AFTER PERMANENT INSTALLATION BY THE CONTRACTOR. ERECTION BRACING SHALL HOLD TRUSSES STRAIGHT AND PLUMB UNTIL DECKING AND PERMANENT TRUSS BRACING HAVE BEEN INSTALLED. ALL BRACING SHALL BE INSTALLED PRIOR TO THE LOADING OF THE TRUSSES.

STRUCTURAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	JS	JOIST SEAT
APPROX	APPROXIMATELY	KIP (k)	1000 POUNDS
ARCH	ARCHITECTURAL	LG	LONG
BCX	BOTTOM CHORD EXTENSION	LLH	LONG LEG HORIZONTAL
BOC	BOTTOM OF CONCRETE	LLV	LONG LEG VERTICAL
BOF	BOTTOM OF FOOTING	MAX	MAXIMUM
BOS	BOTTOM OF STEEL	MECH	MECHANICAL
BOT	BOTTOM	MEP	MECHANICAL, ELECTRICAL, PLUMBING
BRG	BEARING	MNFR	MANUFACTURER
BTWN	BETWEEN	MIN	MINIMUM
CFS	COLD-FORMED STEEL	NTS	NOT TO SCALE
CJ	CONTRACTION JOINT	OC	ON CENTER
CL	CENTER LINE	OPP	OPPOSITE
CLR	CLEAR	PJF	PREMOLDED JOINT FILLER
COL	COLUMN	PL	PLATE
CONN	CONNECTION	PLF	POUNDS PER LINEAR FOOT
CONC	CONCRETE	PSF	POUNDS PER SQUARE FOOT
CONT	CONTINUOUS	PSI	POUNDS PER SQUARE INCH
CONSTR	CONSTRUCTION	REINF	REINFORCEMENT
DEG	DEGREE	REQD	REQUIRED
DIA	DIAMETER	SCHED	SCHEDULE
DWG(S)	DRAWING(S)	SE	SLAB EDGE
EA	EACH	SJI	STEEL JOIST INSTITUTE
EF	EACH FACE	SIM	SIMILAR
EJ	EXPANSION JOINT	SOG	SLAB ON GRADE
EL	ELEVATION	SPCG	SPACING
EOD	EDGE OF DECK	STD	STANDARD
EOS	EDGE OF SLAB	T&B	TOP AND BOTTOM
ES	EACH SIDE	TO	TOP OF
EQ	EQUAL	TOC	TOP OF CONCRETE
EW	EACH WAY	TOF	TOP OF FOOTING
FF	FINISHED FLOOR	TOS	TOP OF SLAB
FTG	FOOTING	TR	TENSION REINFORCEMENT
GA	GAGE	TYP	TYPICAL
GALV	GALVANIZED	UNO	UNLESS NOTED OTHERWISE
HGT	HEIGHT	VERT	VERTICAL
HORIZ	HORIZONTAL	WP	WORKING POINT
IS	ISOLATION JOINT	WWF	WELDED WIRE FABRIC

STRUCTURAL LEGEND



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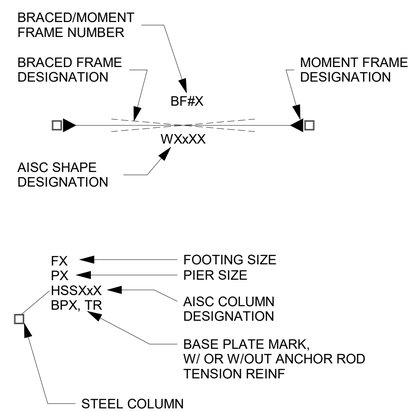

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
A. SCOTT	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
A. SCOTT	W91PHN-24-B-3002
CHECKED BY:	CONTRACT NO.:
J. WHITTAKER	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-85-01
SIZE:	FILE NAME:
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

COVERED MESS GENERAL STRUCTURAL NOTES

SHEET ID
BLDG 5
S-002

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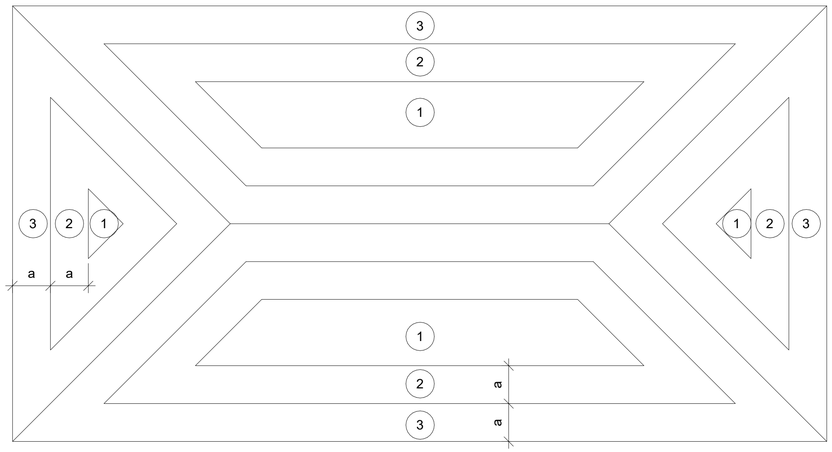
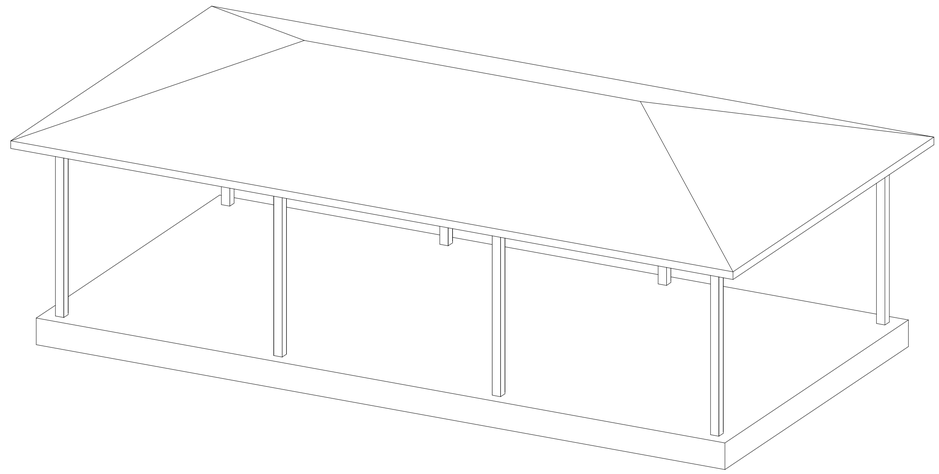


ROOF ZONES



ISOMETRIC

COMPONENT AND CLADDING WIND PRESSURES			
EFFECTIVE WIND AREA	ROOF ZONES		
	1	2	3
AREA <= 9 SF	+26 / -24	+40/ -37	+51 / -47
9 SF < AREA <= 36 SF	+26 / -24	+40 / -37	+40 / -37
AREA > 36 SF	+26 / -24	+26 / -24	+26 / -24

1. GROSS WIND PRESSURES SHOWN ABOVE ARE PREDICATED ON ULTIMATE WIND SPEED.
2. EDGE ZONES: 'a' = 3'-0"
3. WIND PRESSURES SHOWN SHALL BE USED IN CONJUNCTION WITH LRFD LOAD COMBINATIONS SPECIFIED IN SECTIONS 2.3 AND 2.4 OF ASCE 7-16.
4. POSITIVE WIND PRESSURES REPRESENT WIND PRESSURES ACTING TOWARDS THE COMPONENT AND CLADDING SURFACES.
5. NEGATIVE WIND PRESSURES REPRESENT WIND PRESSURES ACTING AWAY FROM THE COMPONENT AND CLADDING SURFACES.

1 COMPONENTS AND CLADDING WIND PRESSURES
NOT TO SCALE

US Army Corps of Engineers ®

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DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
DRAWN BY: A. SCOTT	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: J. WHITTAKER	CONTRACT NO.:
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
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COVERED MESS COMPONENTS AND CLADDING

SHEET ID
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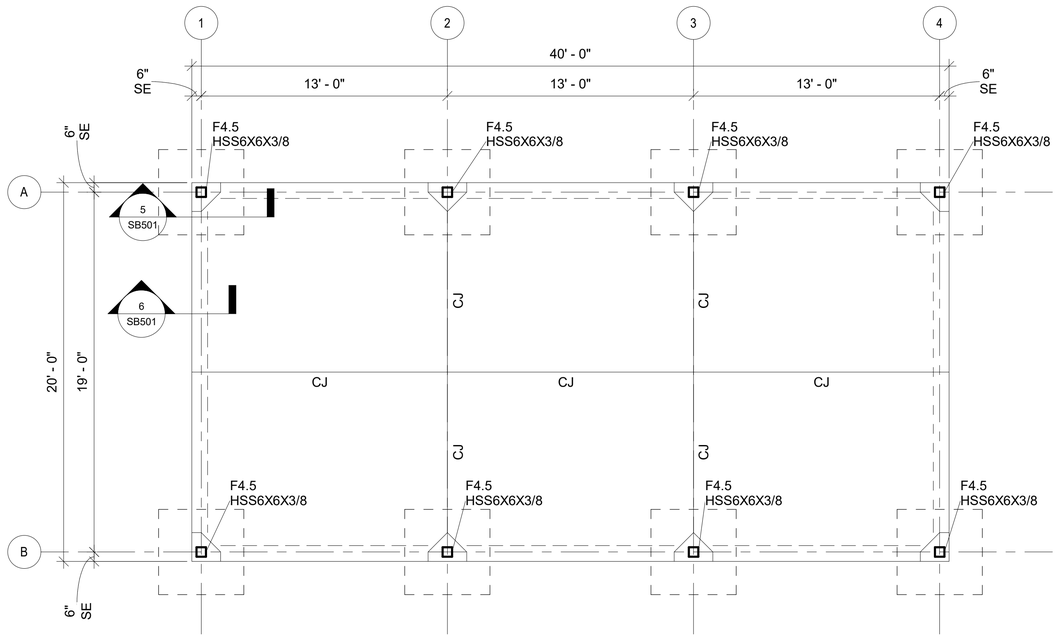


1 FOUNDATION PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

FOUNDATION AND SLAB PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. TOP OF CONCRETE SLAB-ON-GRADE ELEVATION = 0'-0". ALL ELEVATIONS INDICATED FROM THIS DATUM. SEE CIVIL DRAWINGS FOR EXACT ELEVATION.
3. TOP OF FTG = (-) 1'-6" UNO.
4. ALL FOOTINGS SHALL BE CENTERED UNDER COLUMNS.
5. SLAB-ON-GRADE SHALL CONSIST OF 4" THICK CONCRETE REINFORCED WITH 6X6 W2.9XW2.9 WWF LOCATED AT 1/3-DEPTH FROM TOP OF SLAB.
6. PROVIDE (1) #5 X 4'-0" LONG AT TOP AND BOTTOM IN SLAB-ON-GRADE AT ALL RE-ENTRANT CORNERS AND WHERE A CONTROL JOINT TERMINATES AT A JOINT.
7. SLAB-ON-GRADE SHALL BEAR ON CAPILLARY WATER BARRIER ON PROPERLY PREPARED SUBGRADE OR COMPACTED FILL.
8. CONTROL JOINT LOCATIONS ARE DIAGRAMMATIC ONLY AND DO NOT REPRESENT ALL JOINTS REQUIRED FOR SLAB CONSTRUCTION. CONTRACTOR SHALL COORDINATE SLAB-ON-GRADE REQUIREMENTS WITH SLAB-ON-GRADE CONSTRUCTION SEQUENCING AND SLAB DETAILS. SPACING SHALL NOT EXCEED MAXIMUM JOINT SPACING PER ACI REQUIREMENTS.
9. COORDINATE UNDERGROUND UTILITY LINES WITH CIVIL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION DRAWINGS PRIOR TO CONSTRUCTION OF FOOTINGS AND SLABS-ON-GRADE.
10. WITHIN THE AREA OF THE BUILDING FOOTINGS, THE SOILS SHALL BE TESTED FOR IN-SITU ALLOWABLE BEARING PRESSURE BY METHOD OF HAND AUGER AND DYNAMIC CONE PENETROMETER METHOD, IN ACCORDANCE WITH ASTM SPECIAL TECHNICAL PUBLICATION #399. SOILS WHICH ARE IDENTIFIED TO HAVE A NET ALLOWABLE BEARING PRESSURE BELOW 3,000 PSF, OR WHICH ARE DEEMED TO BE UNSATISFACTORY FOR OTHER REASONS (E.G., EXCESSIVE DEBRIS OR ORGANIC CONTENT), SHALL BE OVER-EXCAVATED AND REPLACED WITH ADDITIONAL CONCRETE DURING THE CONCRETING OR REPLACED TO DESIGN SUBGRADE WITH NO. 57 OR NO. 67 STONE, COMPACTED TO A NON-YIELDING CONDITION. OVER-EXCAVATION SHALL BE PERFORMED IN ACCORDANCE WITH EM 385-1-1 AND OSHA 29 CFR 1926.652. BACKFILLING SHALL BE IN ACCORDANCE WITH SECTION 31 00 00, EARTHWORK. IT IS POSSIBLE THAT PERCHED GROUNDWATER WILL BE ENCOUNTERED DURING OVER-EXCAVATION. DEWATERING SHOULD BE DONE IN ACCORDANCE WITH SPECIFICATIONS.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
DRAWN BY: A. SCOTT	SOLICITATION NO.: W91PHN-24-B-3002
CHECKED BY: J. WHITTAKER	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

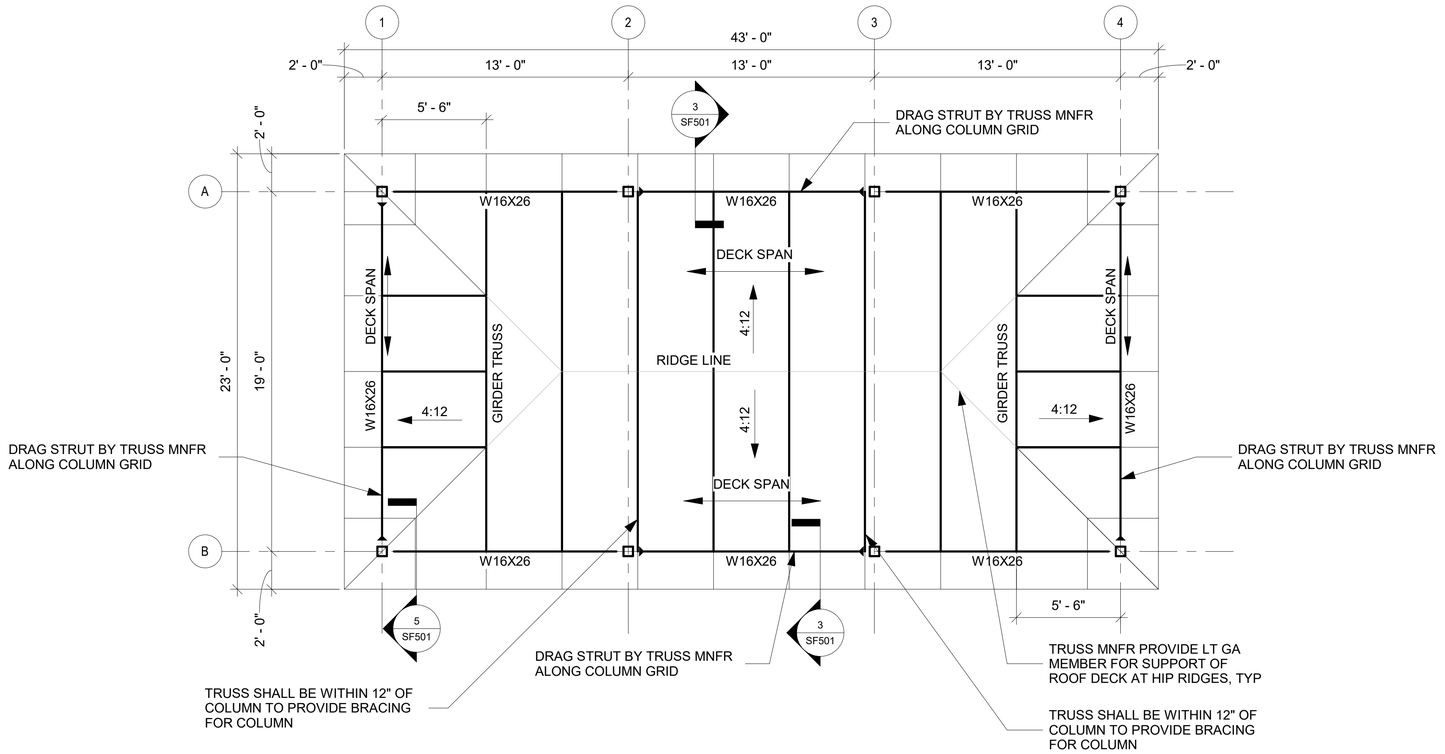
COVERED MESS FOUNDATION PLAN

SHEET ID
BLDG 5
S-101

Plot Date: 11/27/2023 11:33:23 AM

File Path: C:\Users\k6endhrh\Documents\FY23_PN98182_MPTR-COVMESS_STRUCT_R21_k6endhrh.rvt

READY TO ADVERTISE (RTA)



1 ROOF FRAMING PLAN

1/4" = 1'-0"

4 3 2 1 0 4 8

GENERAL SHEET NOTES

FRAMING PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. TOP OF STEEL FOR TRUSS BEARING SHALL BE (+) 9'-4" UNO.
3. SEE MOMENT CONNECTION DETAIL SHEET SF501.
4. ROOF DECK SHALL BE 1.5B22 GAUGE METAL DECK WITH A 36/4 FASTENING PATTERN WITH 6 SIDELAPS. SUPPORT AND SIDELAP FASTENERS ARE TO BE #12 TEK SCREWS.
5. LIGHT GAUGE STEEL TRUSS SPACING SHALL NOT EXCEED 4'-0" OC UNO.
6. ◄——— DENOTES ROOF SLOPE. SEE ARCHITECTURAL.
7. TRUSSES SHALL BE DESIGNED BY THE TRUSS MNFR TO TRANSFER 250 LBS (ULTIMATE) HORIZONTAL SHEAR DUE TO WIND LOAD ON BEAMS. CONNECTION TO BEAMS SHALL BE BY THE TRUSS MNFR.
8. DRAG STRUTS ALONG ALL ROOF EAVES SHALL BE DESIGNED AND PROVIDED BY THE TRUSS MNFR TO TRANSFER 150 PLF HORIZONTAL SHEAR TO BEAMS. CONNECTION TO BEAMS SHALL BE BY TRUSS MNFR.
9. PROVIDE CONT 4X4X5/16" BENT PLATE AT ALL RIDGES.
10. AT THE EDGE OF ROOF DECK PROVIDE CONT. BENT PLATE CLOSURE AS DETAILED ON 1/SF501.
11. COORDINATE ALL ROOF DIMENSIONS, ELEVATIONS, OPENINGS AND PENETRATIONS WITH ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS. SEE ARCHITECTURAL FOR ROOF PENETRATION WATERPROOFING DETAILS.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	
CATEGORY CODE:	178-65-01
FILE NAME:	

DESIGN BY:	A. SCOTT
DRAWN BY:	A. SCOTT
CHECKED BY:	C. WHITTAKER
SUBMITTED BY:	J. DEACON
SIZE:	ANSI D

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

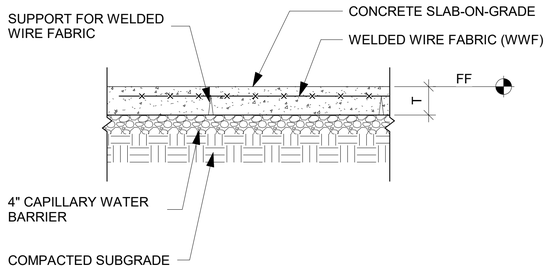
COVERED MESS ROOF FRAMING PLAN

SHEET ID
BLDG 5
S-102

READY TO ADVERTISE (RTA)

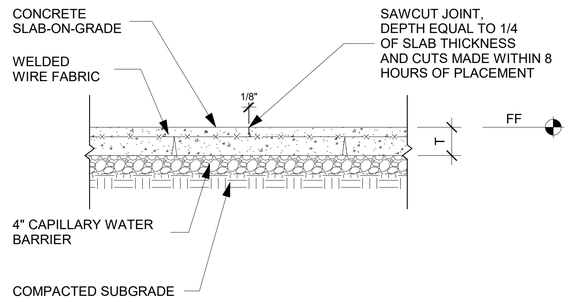
Plot Date: 11/27/2023 11:33:23 AM

File Path: C:\Users\k6endhrh\Documents\FY23_PN96182_MPTR-COVMESS_STRUCT_R21_k6endhrh.rvt



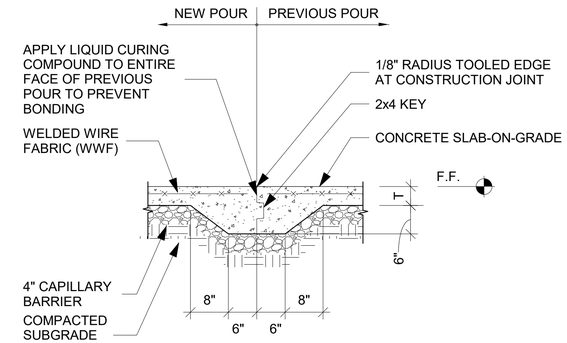
1 TYPICAL SLAB ON GRADE DETAIL

3/4" = 1'-0"



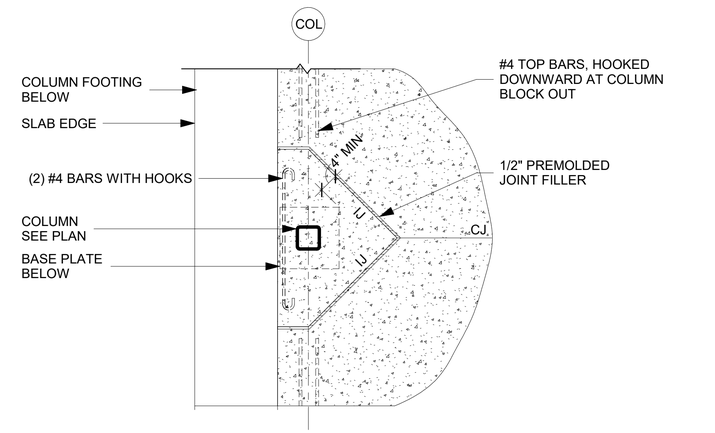
2 TYPICAL SAWED CONTRACTION JOINT DETAIL (CJ)

3/4" = 1'-0"



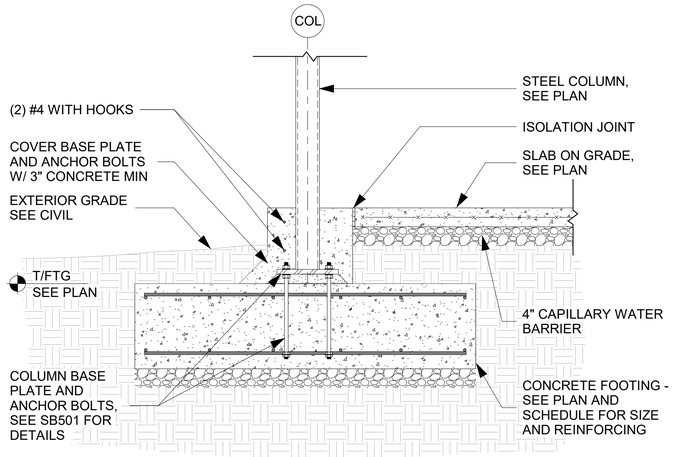
3 TYPICAL SOG SHEAR KEY CONSTR JOINT DETAIL

3/4" = 1'-0"



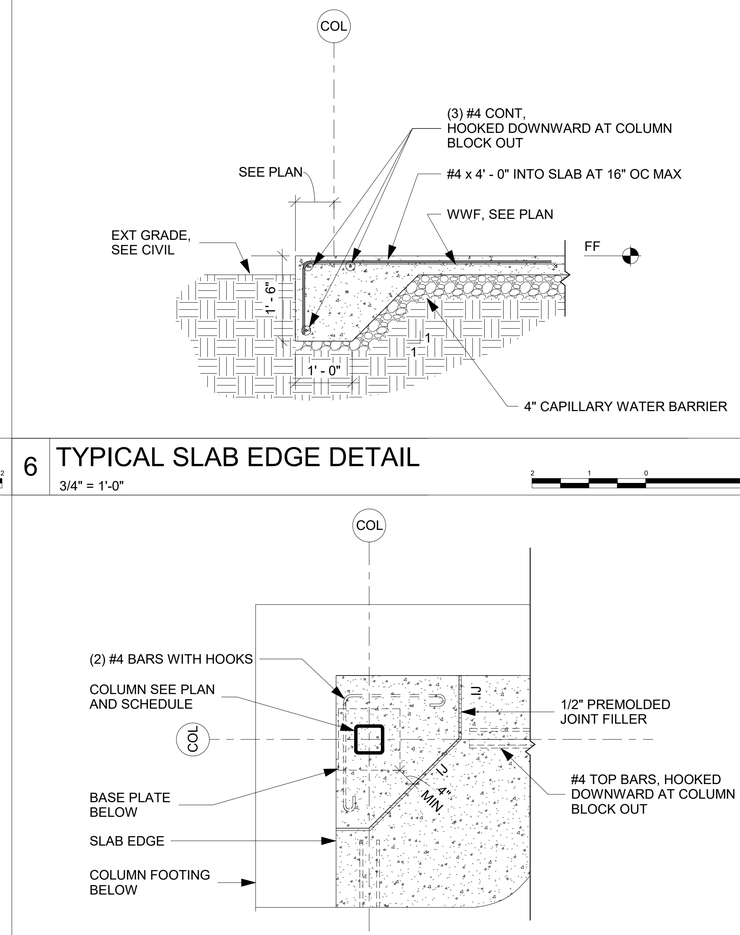
4 TYPICAL EXTERIOR COLUMN PLAN VIEW

3/4" = 1'-0"



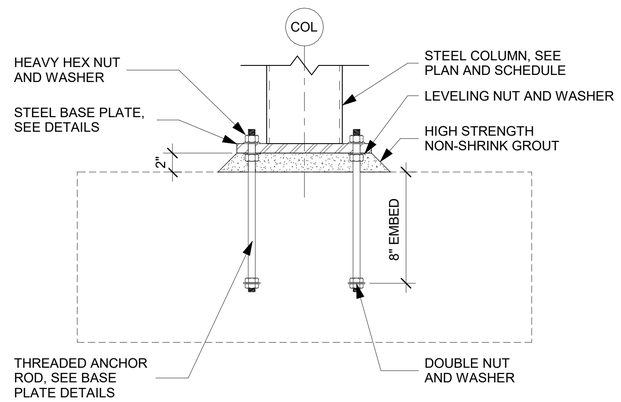
5 TYPICAL EXTERIOR COLUMN FOOTING

3/4" = 1'-0"



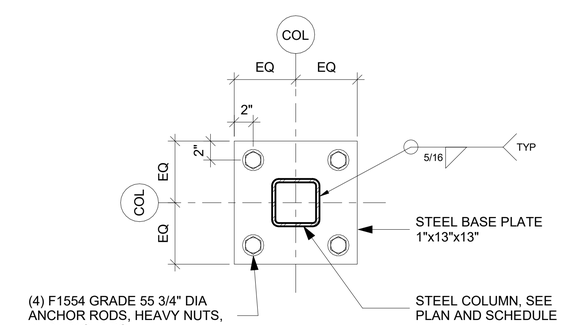
6 TYPICAL SLAB EDGE DETAIL

3/4" = 1'-0"



7 ANCHOR ROD DETAIL

1 1/2" = 1'-0"



8 BASE PLATE DETAILS

1 1/2" = 1'-0"

9 TYPICAL CORNER COLUMN PLAN VIEW

3/4" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE:	NOVEMBER 2023
SOLICITATION NO.:	W912HN-24-B-3002
CONTRACT NO.:	
CATEGORY CODE:	178-65-01
FILE NAME:	
DESIGN BY:	A. SCOTT
DRAWN BY:	A. SCOTT
CHECKED BY:	J. WHITTAKER
SUBMITTED BY:	J. DEACON
SIZE:	ANSI D

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

COVERED MESS FOUNDATION AND SLAB DETAILS

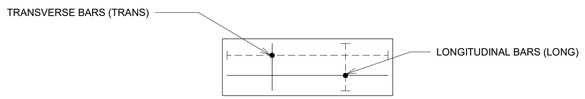
SHEET ID
BLDG 5
SB501

READY TO ADVERTISE (RTA)

File Path: C:\Users\kbendhn\Documents\FY23_PN96182_MPTR-COVMESS_STRUCT_R21_kbendhn.rvt

Plot Date: 11/27/2023 11:33:24 AM

COLUMN FOOTING SCHEDULE					
MARK	DIMENSIONS			REINFORCING	
	WIDTH	LENGTH	DEPTH	BOTTOM, HOOKED @ ENDS	TOP, HOOKED @ ENDS
F4.5	4' - 6"	4' - 6"	1' - 0"	(6) #5 EW	(6) #5 EW



FOOTING REINFORCEMENT DIAGRAM

1 CONCRETE FOOTING SCHEDULE
NOT TO SCALE

CONCRETE REINFORCING BAR DEVELOPMENT AND SPLICE LENGTH SCHEDULE (F'c = 4000 PSI)					
BAR SIZE	OTHER BARS		TOP/HORIZ BARS		HOOKED BARS
	Ld	SPLICE	Ld	SPLICE	Ldh
#3	15	19	19	25	6
#4	19	25	25	33	7
#5	24	31	31	41	9
#6	29	37	37	49	10
#7	42	54	54	71	12
#8	47	62	62	81	14
#9	54	70	70	91	15

NOTES:
1. LENGTHS SHOWN IN THIS SCHEDULE SHALL BE USED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
2. LENGTHS SHOWN IN THIS SCHEDULE ARE BASED ON CLASS B TENSION LAP SLICES FOR NORMAL WEIGHT CONCRETE STRENGTH AND GRADE 60 (Fy = 60,000 PSI) REINFORCING STEEL WITH CONCRETE COVER AND SPACING AS DEFINED IN CONCRETE SECTION OF GENERAL NOTES ON SHEET S-001 AND ACI 318-14, SECTION 25.
3. Ld = TENSION DEVELOPMENT/EMBEDMENT LENGTH FOR STRAIGHT BARS.
4. Ldh = TENSION DEVELOPMENT/EMBEDMENT LENGTH FOR HOOKED BARS.
5. LAP SPLICES SHALL BE WIRED IN CONTACT.
6. TOP BARS ARE HORIZONTAL BARS IN BEAMS, FOOTINGS, SLABS, AND WALLS WHERE MORE THAN 12" OF FRESH CONCRETE IS CAST BELOW THE BAR.
7. ALL TABULATED VALUES ARE IN INCHES.
8. MULTIPLY VALUES BY 1.3 FOR LIGHTWEIGHT CONCRETE

2 REBAR SPLICE LENGTH SCHEDULES
NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
A. SCOTT	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
A. SCOTT	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
J. WHITTAKER	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
SIZE:	FILE NAME:
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

COVERED MESS FOUNDATION SCHEDULES

SHEET ID
BLDG 5
SB601

READY TO ADVERTISE (RTA)

Plot Date: 11/27/2023 11:33:24 AM

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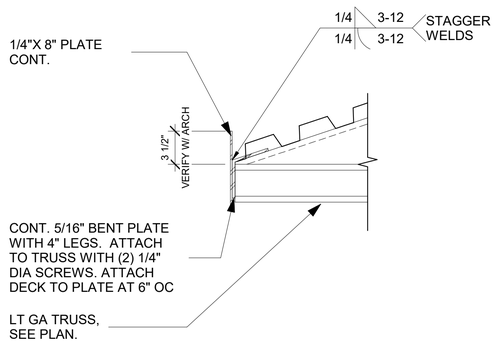
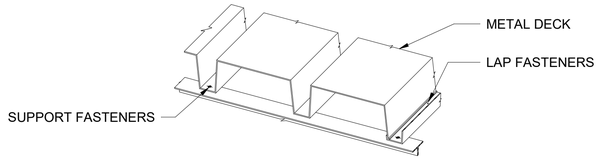


1 TYPICAL EAVE PLATE DETAIL

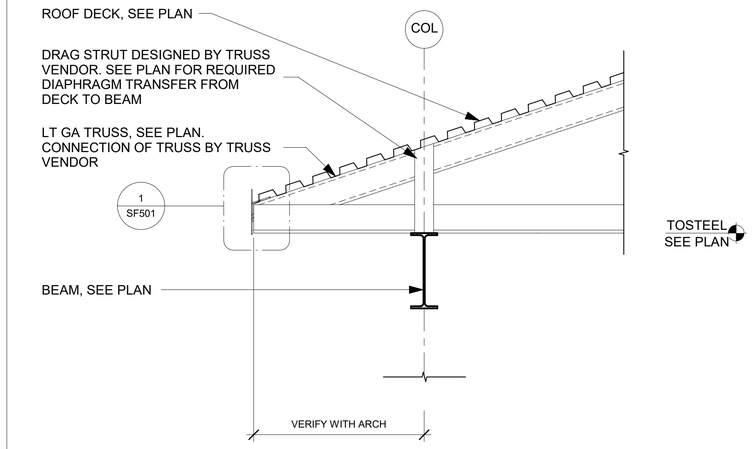
1 1/2" = 1'-0"

MINIMUM PROPERTIES OF METAL DECK	
METAL DECK	(ROOF DECK) 1.5 TYPE B
GAGE	22
MOMENT OF INERTIA OF STEEL SECTION, Ip (IN4)	0.155
SECTION MODULUS OF STEEL SECTION POSITIVE BENDING, Sp (IN3)	0.186
MOMENT OF INERTIA OF STEEL SECTION, In (IN4)	0.183
SECTION MODULUS OF STEEL SECTION POSITIVE BENDING, Sn (IN3)	0.192



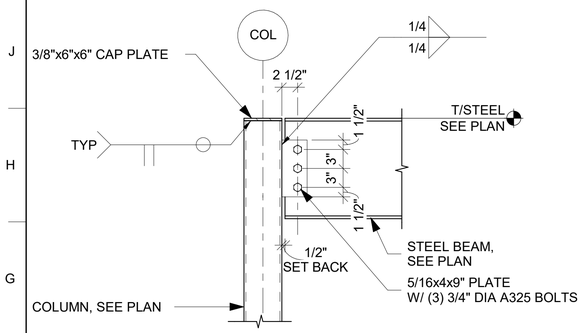
2 TYPICAL METAL DECK PROPERTIES

NOT TO SCALE



3 TYPICAL WALL SECTION AT ROOF

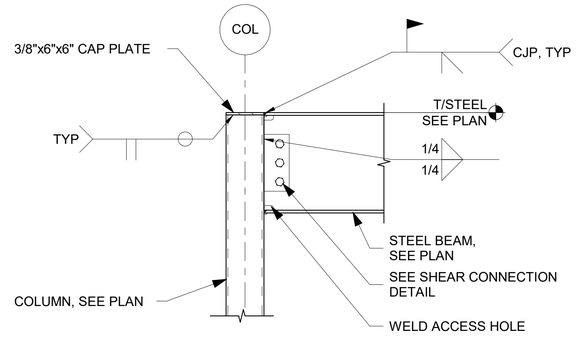
3/4" = 1'-0"



NOTE:
INTERSECTING STEEL BEAM NOT SHOWN FOR CLARITY

4 SHEAR CONNECTION AT HSS COLUMN

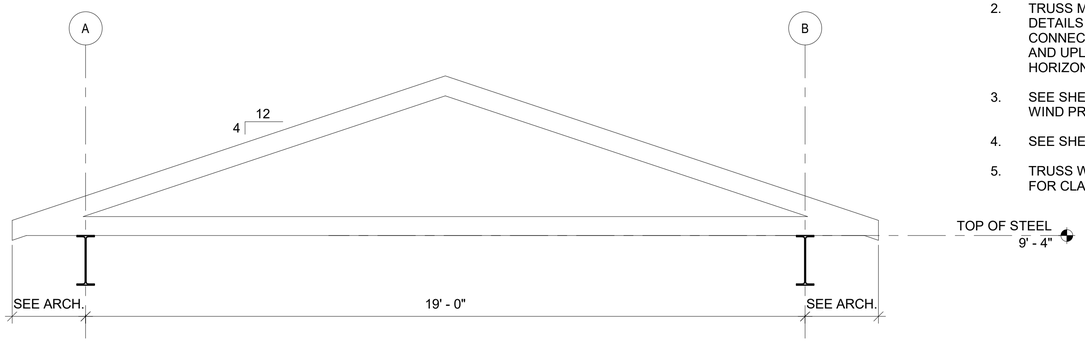
1" = 1'-0"



NOTE:
INTERSECTING STEEL BEAM NOT SHOWN FOR CLARITY

5 MOMENT CONNECTION AT HSS COLUMN

1" = 1'-0"



6 TYPICAL TRUSS PROFILE

1/2" = 1'-0"

TRUSS NOTES:

1. FINAL TRUSS AND TRUSS MEMBER DESIGN IS THE RESPONSIBILITY OF THE TRUSS MANUFACTURER.
2. TRUSS MANUFACTURER TO PROVIDE DESIGN AND DETAILS FOR TRUSS TO BEAM CONNECTIONS. CONNECTIONS SHALL BE DESIGNED TO RESIST BEARING AND UPLIFT FORCES CONCURRENT WITH THE HORIZONTAL SHEAR FORCE NOTED.
3. SEE SHEET S-003 FOR COMPONENT AND CLADDING WIND PRESSURES.
4. SEE SHEET S-002 FOR TRUSS LOADS.
5. TRUSS WEB CONFIGURATION NOT SHOWN IN PROFILE FOR CLARITY.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
DRAWN BY: A. SCOTT	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: J. WHITTAKER	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

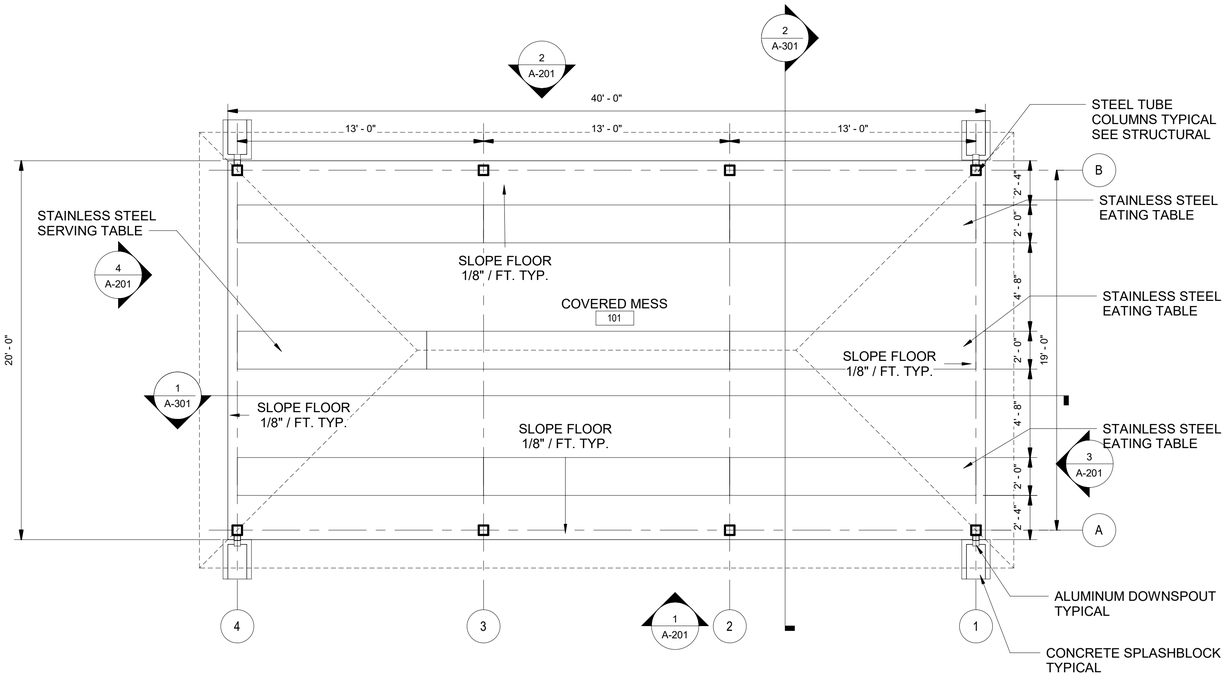
COVERED MESS FRAMING DETAILS

SHEET ID
BLDG 5
SF501

READY TO ADVERTISE (RTA)

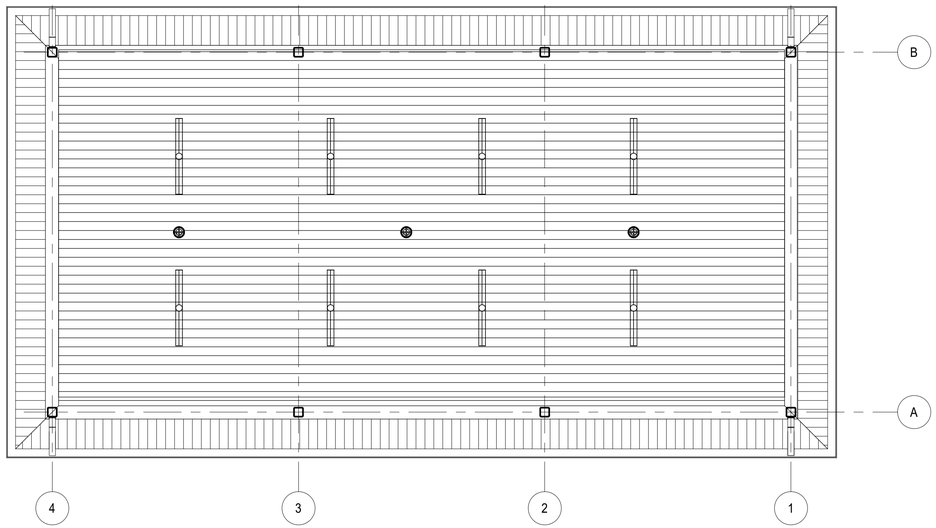
Plot Date: 11/27/2023 11:33:24 AM

File Path: C:\Users\k6endhrh\Documents\FY23_PN98182_MPTR-COVMESS_STRUCT_R21_k6endhrh.rvt



1 FLOOR PLAN

1/4" = 1'-0"



2 REFLECTED CELING PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

1. EXTERIOR DIMENSIONS ARE FROM EDGE OF SLAB OR CENTERLINE OF COLUMNS UNLESS NOTED OTHERWISE.

2. SEE CIVIL DRAWINGS FOR FINISHED FLOOR AND FINISHED GRADE ELEVATIONS. SEE STRUCTURAL DRAWINGS FOR FOUNDATION PLANS AND FLOOR SLABS.

FLOOR PLAN NOTES

1. SLOPE ALL EXTERIOR SLABS 1/8" PER FOOT FROM BUILDING FACE TO SLAB EDGE. SLOPE ALL INTERIOR SLABS TO FLOOR DRAINS AS INDICATED. COORDINATE WITH STRUCTURAL.

2. FIRE EXTINGUISHERS SHALL BE 2A:10B:C (GOVERNMENT FURNISHED, GOVERNMENT INSTALLED, NOT IN CONTRACT).

REFLECTED CEILING PLAN LEGEND

PREFINISHED VENTILATED ALUMINUM SOFFIT

LIGHTING FIXTURE

LIGHTING FIXTURE

EXIT SIGN

WALL MOUNTED EXIT SIGN

REFLECTED CEILING PLAN NOTES

1. FIXTURES ARE SHOWN FOR POSITIONING IN FINISHED CEILING. REFERENCE ELECTRICAL, MECHANICAL AND FIRE PROTECTION FOR FIXTURE TYPES.

2. REFERENCE ROOM FINISH SCHEDULE FOR FINISHED CEILING HEIGHTS. CEILING HEIGHTS SHOWN IN THE FINISHED SCHEDULE ARE MINIMUM AND SHALL BE MAINTAINED UNLESS OTHERWISE NOTED.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M. DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - COVERED MESS, BUILDING 5

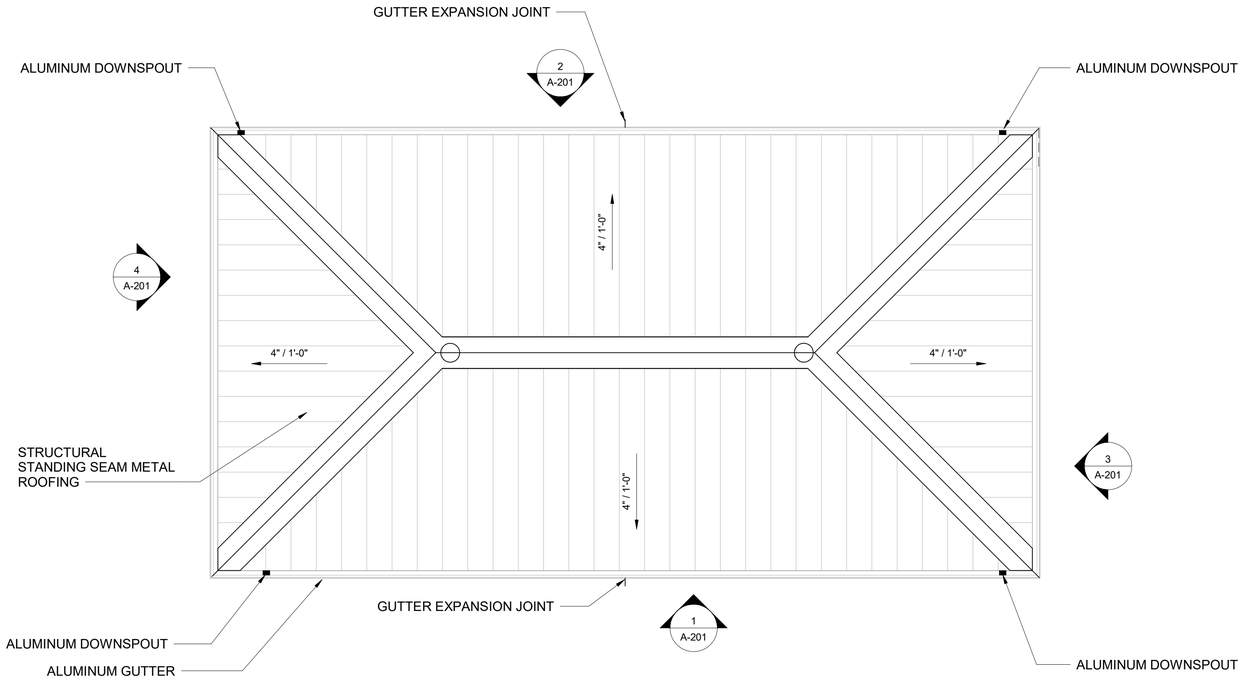
COVERED MESS FLOOR PLAN & REFLECTED CEILING PLAN

SHEET ID
BLDG 5
A-101

READY TO ADVERTISE (RTA)

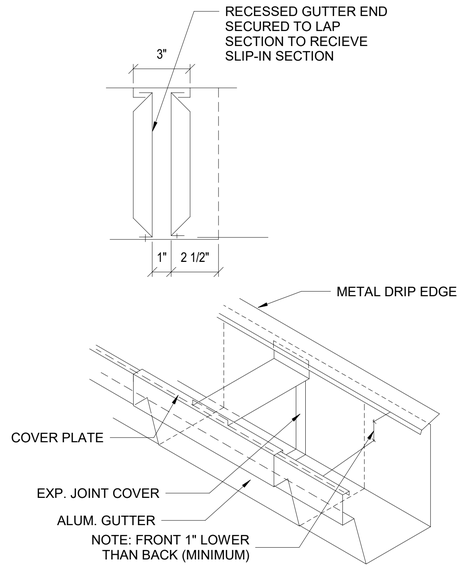
Plot Date: 11/29/2023 12:01:36 PM

File Path: C:\Users\K6ENXTO9\Documents\FY23_PN98182_MPTR-COVMESS_ARCH_R21_K6ENXTO9.rvt



1 COVERED MESS ROOF PLAN

1/4" = 1'-0"

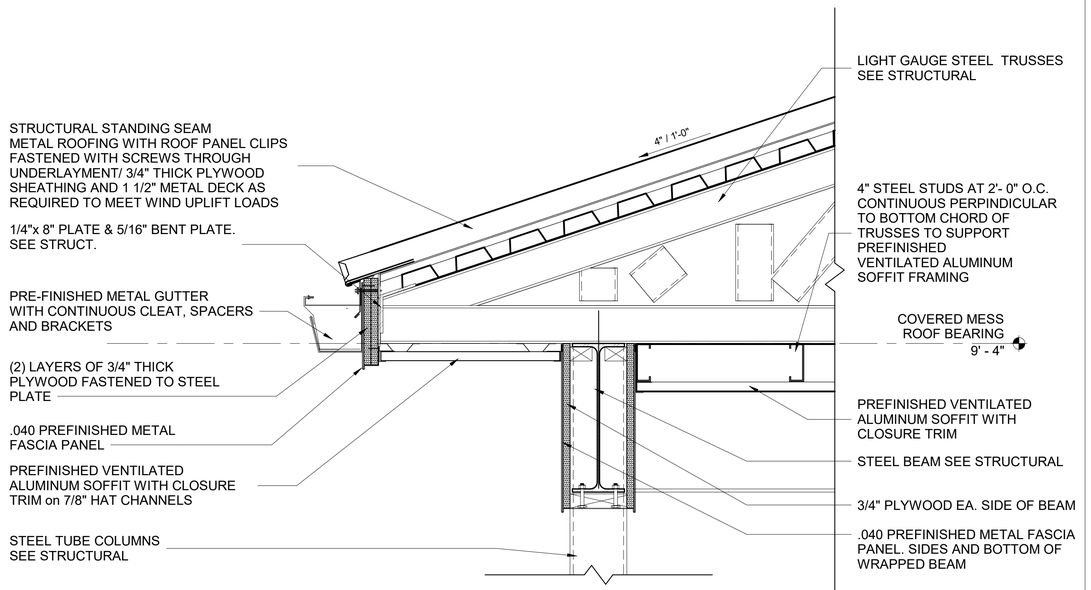


3 GUTTER EXPANSION JOINT DETAIL

3" = 1'-0"

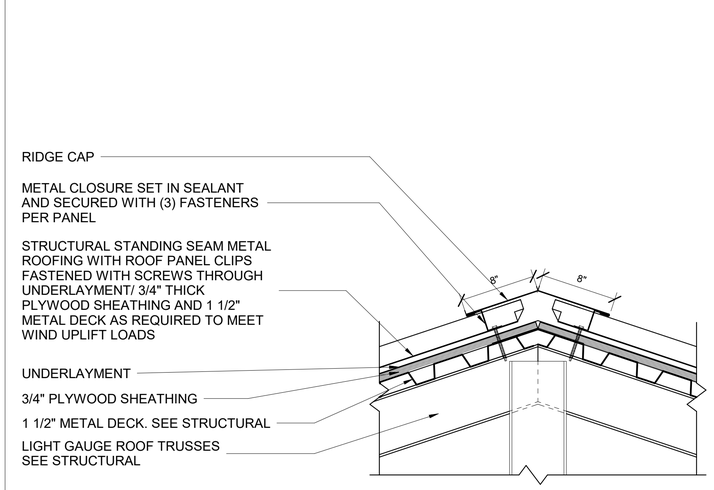
GENERAL SHEET NOTES

1. ALL DOWNSPOUTS TO BE BE SMOOTH 3" X 4" MIN. REFERENCE ROOF PLAN FOR DOWNSPOUT LOCATIONS. QUANTITY SHOWN ON ROOF PLAN SHALL BE PROVIDED. DOWNSPOUTS SHOWN ON BUILDING ELEVATIONS ARE FOR GENERAL WALL PLACEMENT.
2. SECURE DOWNSPOUT WITH PREFINISHED METAL STRAPS AND PREFINISHED FASTENERS, COLOR TO MATCH DOWNSPOUT, 2 PER DOWNSPOUT, FASTEN INTO MASONRY WITH EXPANSION ANCHORS.
3. ALL GUTTERS TO BE 6" WIDE BY 6" DEEP. HANG ALL GUTTERS TO SLOPE 0.5% TO DOWNSPOUTS.
4. ALL ROOFING SHOWN IS STRUCTURAL STANDING SEAM METAL ROOFING. SLOPE AS NOTED.



4 COVERED MESS EAVE DETAIL

1 1/2" = 1'-0"



2 ROOF HIP JOINT DETAIL

1 1/2" = 1'-0"

US Army Corps of Engineers ®

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CHECKED BY: M.DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - COVERED MESS, BUILDING 5

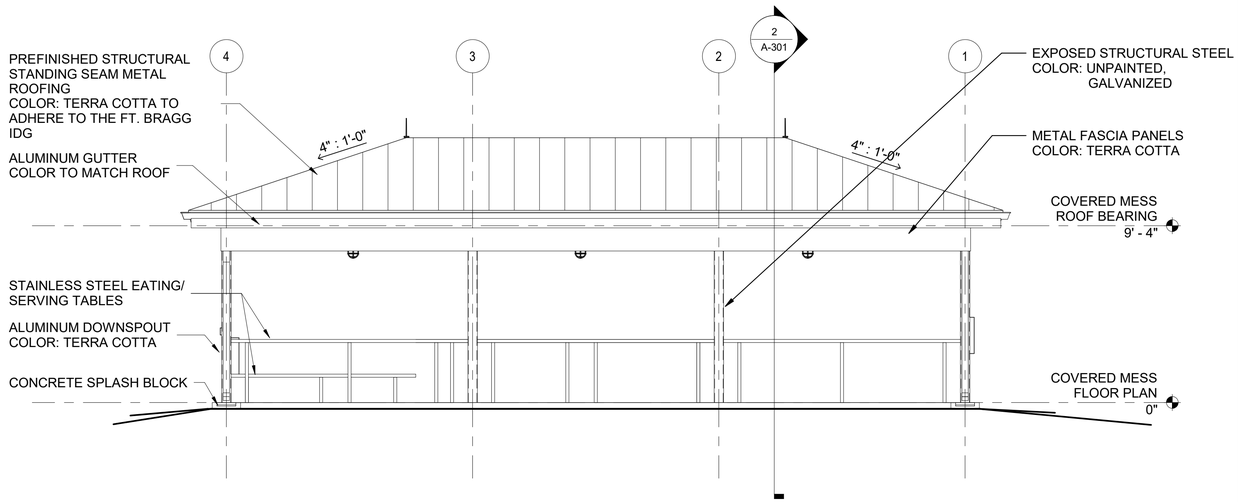
COVERED MESS ROOF PLAN AND DETAILS

SHEET ID
BLDG 5
A-102

READY TO ADVERTISE (RTA)

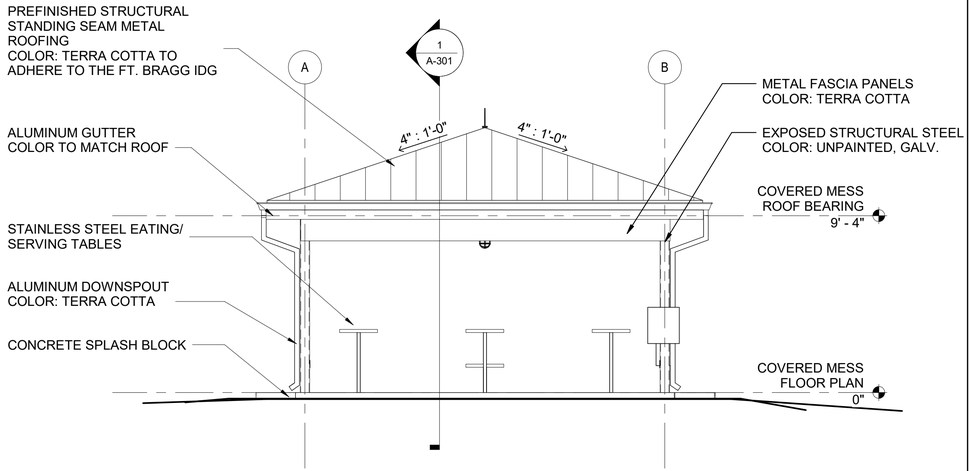
Plot Date: 11/29/2023 12:01:36 PM

File Path: C:\Users\K6ENXT09\Documents\FY23_PN86182_MPTR-COVMESS_ARCH_R21_K6ENXT09.rvt



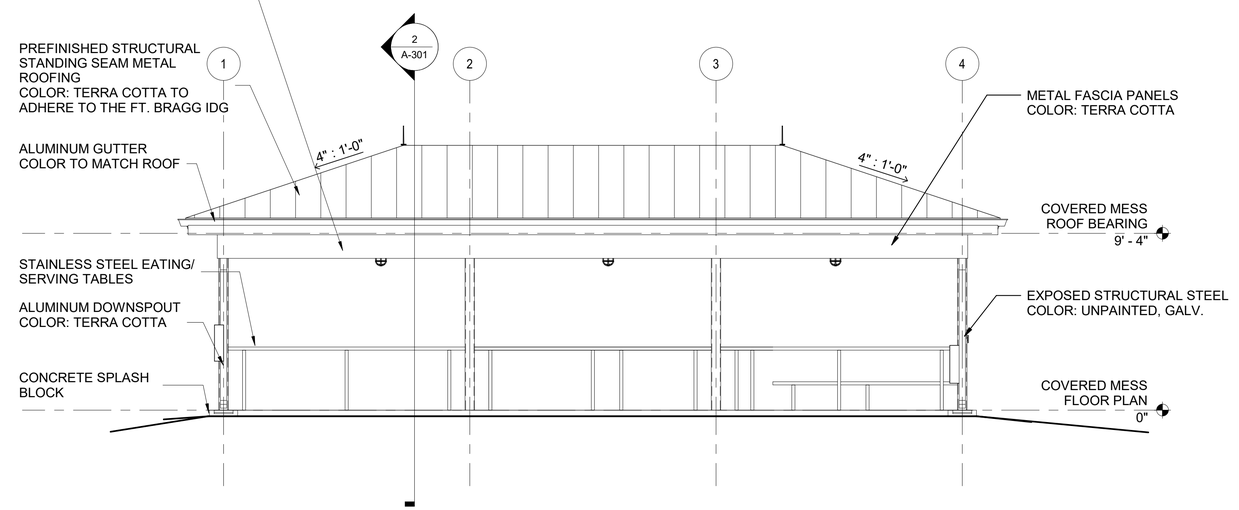
1 COVERED MESS SOUTH ELEVATION

1/4" = 1'-0"



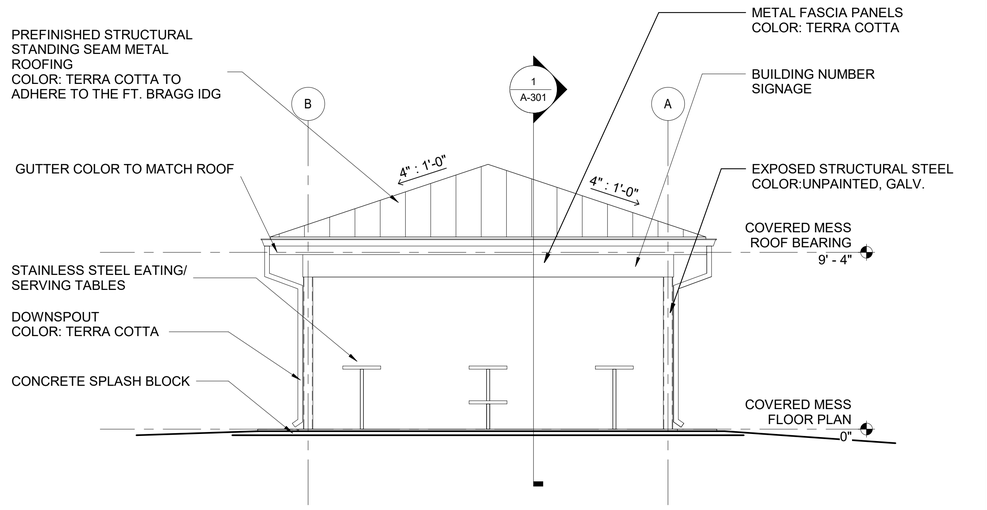
3 COVERED MESS EAST ELEVATION

1/4" = 1'-0"



2 COVERED MESS NORTH ELEVATION

1/4" = 1'-0"



4 COVERED MESS WEST ELEVATION

1/4" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T.ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M. DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - COVERED MESS, BUILDING 5

COVERED MESS ELEVATIONS

SHEET ID
BLDG 5
A-201

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 12:01:38 PM

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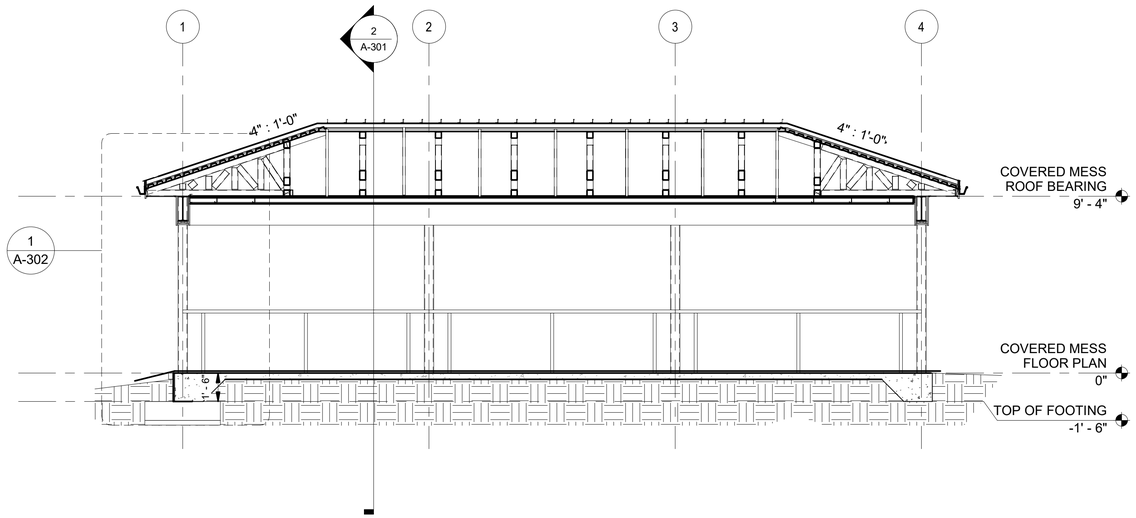
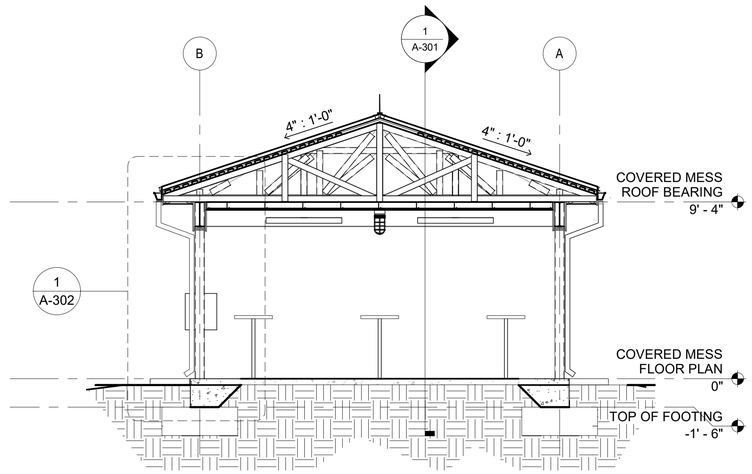


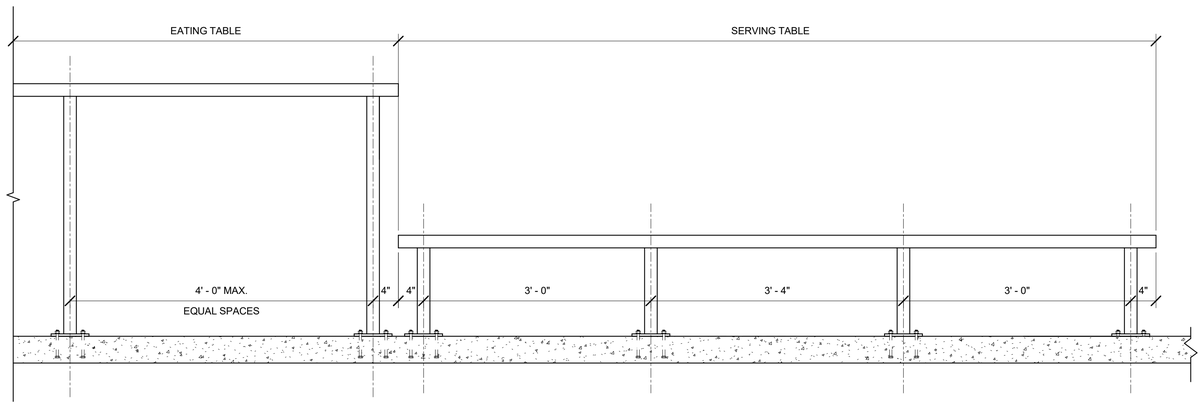
1 COVERED MESS EAST-WEST BUILDING SECTION

1/4" = 1'-0"



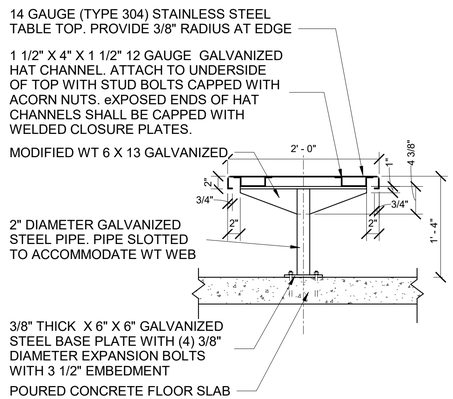
2 COVERED MESS NORTH-SOUTH BUILDING SECTION

1/4" = 1'-0"

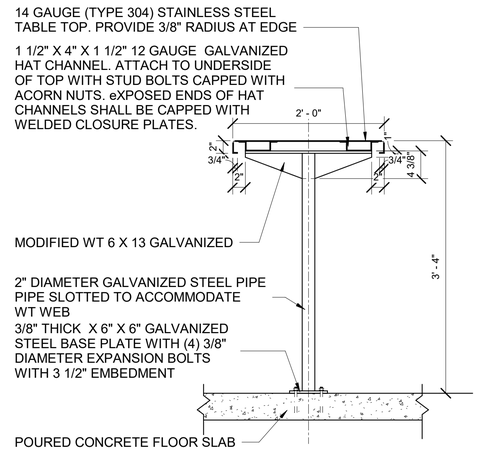


ELEVATION AT SERVING TABLE AND EATING TABLE

NOTE:
SERVING TABLES AND EATING TABLES ARE TO BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR AS PART OF THE CONSTRUCTION CONTRACT.



SECTION AT SERVING TABLE



SECTION AT EATING TABLE

3 STAINLESS STEEL EATING AND SERVING TABLE DETAILS

1" = 1'-0"

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MARK	DESCRIPTION	DATE

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SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - COVERED MESS, BUILDING 5

COVERED MESS BUILDING SECTIONS

SHEET ID
BLDG 5
A-301

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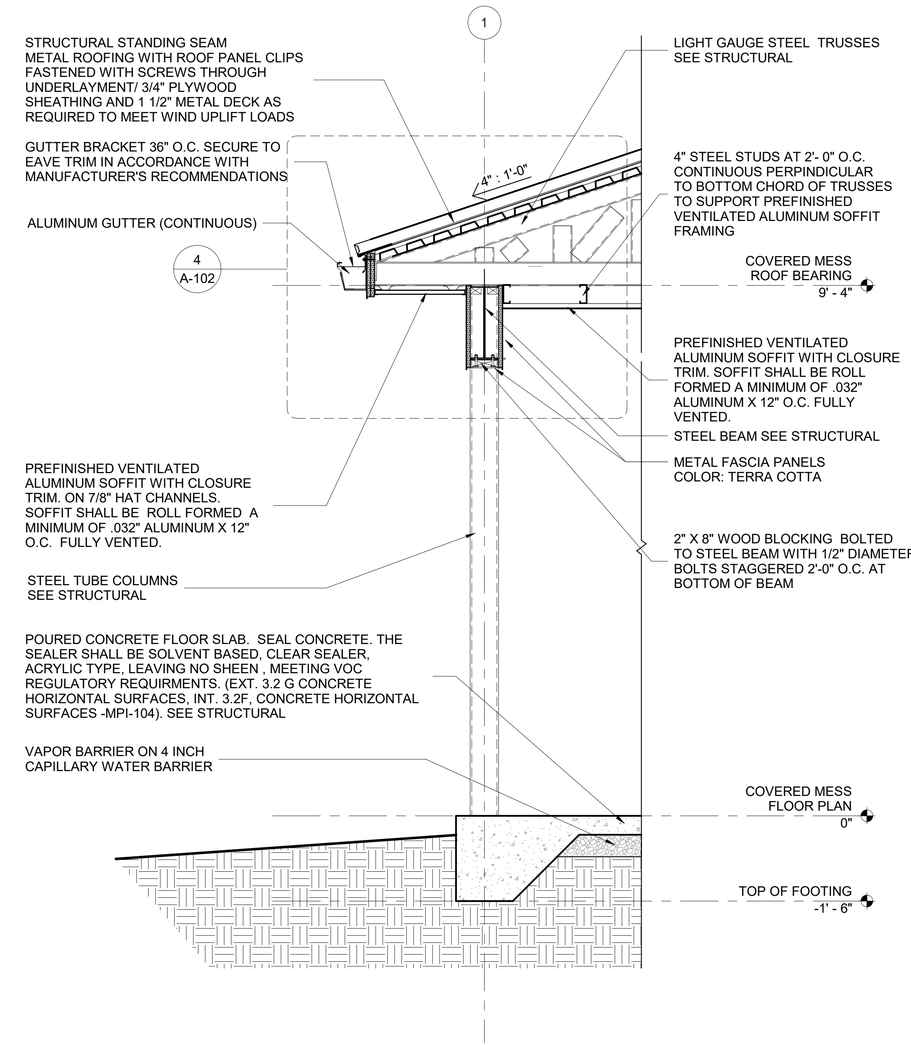

1 COVERED MESS WALL SECTION 1

3/4" = 1'-0"

2 1 0 2

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DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
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CHECKED BY: M. DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT 100 W. OGLETHORPE AVE. SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - COVERED MESS, BUILDING 5

COVERED MESS WALL SECTIONS

SHEET ID
BLDG 5
A-302

READY TO ADVERTISE (RTA)

Plot Date: 11/29/2023 12:01:39 PM

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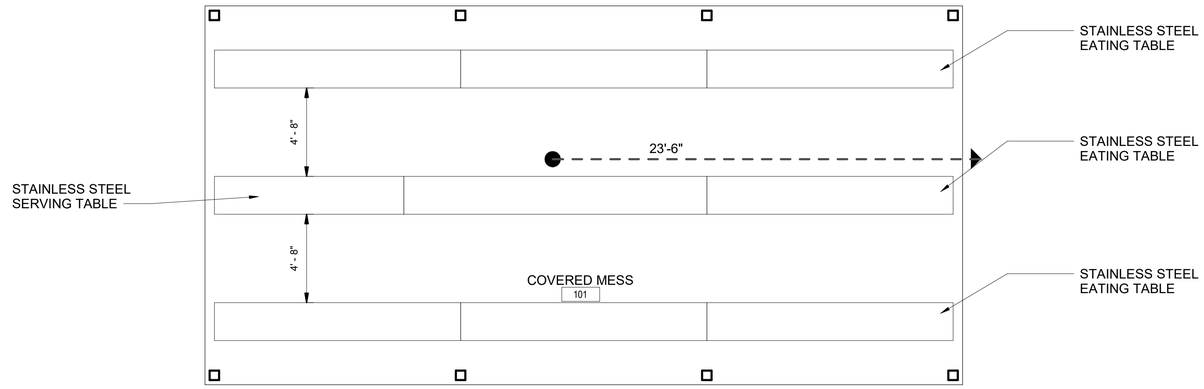

1 COVERED MESS LIFE SAFETY FLOOR PLAN

1/4" = 1'-0"

LIFE SAFETY CODE ANALYSIS

REFERENCES:

UNIFIED FACILITIES CRITERIA - UFC 1-200-01 GENERAL BUILDING REQUIREMENTS, WITH CHANGE 1, 1 OCTOBER 2020

UNIFIED FACILITIES CRITERIA- UFC 3-600-01 FIRE PROTECTION FOR FACILITIES, WITH CHANGE 5, 24 SEPTEMBER 2020

NFPA 101 LIFE SAFETY CODE, 2021 EDITION

NFPA 220 STANDARD ON TYPES OF BUILDING CONSTRUCTION, 2018 EDITION

NFPA 10, INSTALLATION OF PORTABLE FIRE EXTINGUISHERS

NFPA 1141 STANDARD FOR FIRE PROTECTION INFRASTRUCTURE FOR LAND DEVELOPMENT IN WILDLAND, RURAL, AND SUBURBAN AREAS

INTERNATIONAL BUILDING CODE (IBC), 2018

OCCUPANCY PER IBC:

IBC OCCUPANCY SECTION 303.6 ASSEMBLY GROUP A-2

CONSTRUCTION TYPE PER IBC:

REQUIREMENTS FOR CONSTRUCTION TYPE IIB: TABLE 503 ALLOWABLE BUILDING HEIGHT AND AREAS-
23,000 sf, 3 STORIES MAXIMUM HEIGHT 55 FEET
ACTUAL BUILDING HEIGHT= 13 FEET

FIRE RESISTANCE RATING REQUIREMENTS BASED UPON CONSTRUCTION TYPE IIB (TABLE 601): NO RATING REQUIRED FOR PRIMARY STRUCTUAL FRAME, BEARING WALLS (EXTERIOR, INTERIOR), NON- BEARING WALLS (EXTERIOR, INTERIOR), FLOOR CONSTRUCTION AND ROOF CONSTRUCTION.

FIRE PROTECTION REQUIREMENTS BASED UPON LOCATION ON PROPERTY:
NO RATING REQUIREMENT IF DISTANCE TO IMAGINARY PROPERTY LINE IS 10 FEET OR GREATER.

MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED UPON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION (705.8.1 EXCEPTION 2): BUILDINGS WHOSE EXTERIOR BEARING WALLS, EXTERIOR NON BEARING WALLS, AND EXTERIOR PRIMARY STRUCTURAL FRAME ARE NOT REQUIRED TO BE FIRE RESISTANCE RATED SHALL BE PERMITTED TO HAVE UNLIMITED, UNPROTECTED OPENINGS.

NFPA 101 MEANS OF EGRESS:

OCCUPANCY PER NFPA 101: NEW ASSEMBLY

CLASSIFICATION OF HAZARD CONTENTS: LOW HAZARD (12.1.5 & 6.2.2.2)

OCCUPANT LOAD TABLE 7.3.1.2) 7 GROSS SQUARE FEET PER PERSON
800 GROSS SQUARE FEET/ 7 GROSS SQUARE FEET PER PERSON = 115 PERSONS

EGRESS CAPACITY (TABLE 7.3.3.1) LEVEL TRAVEL: 0.2 INCH PER PERSON X 115 = 23 INCHES REQUIRED

MAXIMUM TRAVEL DISTANCE: 200 FEET UNSPRINKLERED BUILDING (TABLE A7.6)

MAXIMUM DEAD END CORRIDOR: 20 FEET UNSPRINKLERED BUILDING (TABLE A7.6)

MAXIMUM COMMON PATH OF TRAVEL: 75 FEET UNSPRINKLERED BUILDING (TABLE A7.6)

REQUIREMENTS PER UFC 1-200-01

SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY- USE UFC 3-600-01 INSTEAD OF IBC CHAPTER 4

REQUIREMENTS PER UFC 3-600-01
COMPLETE AUTOMATIC SPRINKLER PROTECTION MUST BE PROVIDED IN SINGLE STORY
TYPE I OR II CONSTRUCTION GREATER THAN 15,000 SF
BUILDING IS NOT SPRINKLERED

REQUIRMENTS FOR NFPA 1141
MINIMUM DISTANCE TO ADJACENT BUILDINGS AND PROPERTY LINES = 30 FEET (6.2.1)

GENERAL SHEET NOTES

1. THIS DRAWING IS TO BE USED AS REFERENCE ONLY. IT IS NOT PART OF THE CONSTRUCTION CONTRACT. ALL INFORMATION CONTAINED ON IT IS CALLED FOR ELSEWHERE.

GROSS BUILDING AREA

GROSS BUILDING AREA PER IBC= 800 SQUARE FEET

GROSS BUILDING AREA PER UFC 3-101-01 = 400 SQUARE FEET

GROSS FLOOR AREA PER NFPA 101
(FLOOR AREA INSIDE EXTERIOR WALLS) = 800 SQUARE FEET

PLAN LEGEND

FEC	FIRE EXTINGUISHER CABINET - SEE PLATE A-512 FOR TYPICAL DETAILS
FEB	FIRE EXTINGUISHER BRACKET - WALL MOUNTED - TOP AT 5'-0" A.F.F. FIRE EXTINGUISHER TO BE 2A:10B:C (GFGI)
- - -	EGRESS PATH
▲	REQUIRED EXIT

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL
DRAWN BY: T. ODELL
CHECKED BY: M. DEACON
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - COVERED MESS, BUILDING 5

COVERED MESS LIFE SAFETY PLAN

SHEET ID
BLDG 5
A-801

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 12:01:39 PM

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ELECTRICAL LEGEND

LIGHTING AND LIGHTING CONTROLS SYSTEM LEGEND

- LOWER CASE LETTER DENOTES THE SWITCH THAT CONTROLS FIXTURE
- A2 — LUMINAIRE TYPE DESIGNATION
- SYMBOL DENOTES GENERAL TYPE OF LUMINAIRE
- NT — UNSWITCHED NIGHT LIGHT (ON 24 HOURS)
- 2x2 LED LUMINAIRES.
- 2x4 LED LUMINAIRES.
- CEILING-MOUNTED LUMINAIRE. SHADING INDICATES SUPPLIED FROM AN EMERGENCY LIGHTING INVERTER (ELI).
- SUSPENDED LED LUMINAIRE.
- WALL-MOUNTED LED LUMINAIRE. SHADING INDICATES SUPPLIED FROM AN EMERGENCY LIGHTING INVERTER (ELI).
- LIGHTING CONTROL STRATEGY.
- EMERGENCY LIGHTING UNIT. MH = 8' AFF UOI.
- ELI — 250W EMERGENCY LIGHTING INVERTER (ELI). MOUNT ABOVE ACCESSIBLE CEILING.
- EXIT LIGHT, CEILING MOUNTED. SHADING INDICATES FACES. PROVIDE DIRECTIONAL ARROWS WHEN INDICATED.
- EXIT LIGHT, WALL MOUNTED. SHADING INDICATES FACES. PROVIDE DIRECTIONAL ARROWS WHEN INDICATED. ALIGN WITH CENTERLINE OF DOOR AND MOUNT CENTERLINE OF EXIT SIGN 5" ABOVE TOP OF DOOR FRAME UOI.
- S — WALL SWITCH, SINGLE POLE, 20A SWITCH. MH = 46" AFF UOI. WHERE SUBSCRIPT IS PRESENT, IT DENOTES THE FOLLOWING:
  - 3 - THREE WAY SWITCH.
  - 4 - FOUR WAY SWITCH
  - a - SINGLE LOWER CASE LETTER (EXCEPT LETTER "m") DENOTE THE SWITCH THAT CONTROLS THE FIXTURES.
  - WP - WEATHERPROOF (GASKETED).
  - lv - LOW VOLTAGE
  - lv5 - LOW VOLTAGE DIMMING
- S_V — WALL SWITCH SENSOR, LINE VOLTAGE. MH = 46" AFF UOI.
- S_T — TIMER SWITCH, LINE VOLTAGE. SWITCH SHALL BE WEATHERPROOF RATED WITH 0-2 HOUR TIME RANGE. MH = 46" AFF UOI.
- S_{lvx} — LOW VOLTAGE, MULTI-BUTTON WALLSTATION CONNECTED TO ROOM CONTROLLER. 'x' INDICATES NUMBER OF BUTTONS. MH = 46" AFF UOI.
- OCCUPANCY SENSOR, WALL MOUNTED, DUAL TECHNOLOGY (ULTRASONIC AND PIR) SENSOR UOI. MOUNT 6" BELOW CEILING BUT NO MORE THAN 9'-6" AFF UOI.
- OS — OCCUPANCY OR VACANCY SENSOR AS INDICATED BY LIGHTING CONTROL STRATEGIES, CEILING OR JUNCTION BOX MOUNTED, DUAL TECHNOLOGY (ULTRASONIC AND PIR) SENSOR UOI.
- DS — DAYLIGHT SENSOR.
- LC — LIGHTING CONTACTOR. MH = 60" AFF.

LIGHTNING PROTECTION & GROUNDING SYSTEM LEGEND

- TW — GROUND ROD. "TW" INDICATES TEST WELL.
- EXPOSED MAIN ROOF CONDUCTOR UOI.
- BONDING CONNECTION TO TOP OF DOWN CONDUCTOR.
- BONDING CONNECTION TO BOTTOM OF DOWN CONDUCTOR OR COUNTERPOISE.
- DOWN CONDUCTOR IN SCHEDULE 40 PVC CONDUIT EXPOSED OUTSIDE OF BUILDING.
- AIR TERMINAL.

POWER SYSTEM LEGEND

- $\oplus_X$ — NEMA 5-20R DUPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPT 'X' (WHERE PRESENT) DENOTES THE FOLLOWING:
  - G - GROUND FAULT CIRCUIT INTERRUPTER (GFCI) RECEPTACLE.
  - WP - GFCI RECEPTACLE WITH WEATHER PROOF WHILE-IN-USE HOUSING.
  - C - GFCI RECEPTACLE, BOTTOM OF RECEPTACLE MOUNTED 2" ABOVE BACKSPLASH.
  - E - GFCI RECEPTACLE, MH COORDINATED WITH ELECTRIC WATER COOLER.
  - OS - CONTROLLED BY ROOM OCCUPANCY SENSORS VIA RECEPTACLE-RATED SWITCHPACK. RECEPTACLES SHALL BE MARKED IN ACCORDANCE WITH NEC 406.3(E).
  - R - MOUNTED ON COMMUNICATIONS RACK AS INDICATED ON EP501.
  - T - RECEPTACLE, MOUNTED ADJACENT TO CATV OUTLET.
- $\oplus\!\!\oplus_X$ — NEMA 5-20R DOUBLE DUPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPTS IDENTIFIED FOR DUPLEX RECEPTACLES ARE ALSO APPLICABLE TO QUADRAPLEX RECEPTACLES.
- $\ominus_X$ — NEMA 5-20R SIMPLEX RECEPTACLE. MH = 18" AFF UOI. SUBSCRIPTS IDENTIFIED FOR DUPLEX RECEPTACLES ARE ALSO APPLICABLE TO SIMPLEX RECEPTACLES.
- $\ominus_X$ — SPECIAL RECEPTACLE. SUBSCRIPT 'X' (WHERE PRESENT) DENOTES THE FOLLOWING:
  - A - NEMA L14-20R RECEPTACLE FOR TARGET MAINTENANCE. MH = 18" UOI.
  - R1 - NEMA L5-20R RECEPTACLE. MOUNTED AS INDICATED ON EP501.
  - R2 - NEMA L6-30R RECEPTACLE. PROVIDE 2#10, 1#10G, 1/2"C. MOUNTED AS INDICATED ON EP501.
- NEMA 5-20R CEILING MOUNTED DUPLEX RECEPTACLE.
- JUNCTION BOX, WALL MTD. MH = 18" UOI.
- S_{ps} — 3-POSITION SWITCH FOR PROJECTOR SCREEN. MH = 46" AFF UOI.
- S_m — MOTOR RATED SWITCH. MH = 46" AFF UOI.
- MOTOR DISCONNECT/SAFETY SWITCH SHALL BE RATED 30/3/NF/1 UNLESS OTHERWISE INDICATED.
  - '30' DENOTES SWITCH AMPERE RATING;
  - '3' DENOTES NUMBER OF POLES;
  - 'NF' DENOTES NON-FUSED ('F' DENOTES FUSED);
  - '1' DENOTES SWITCH ENCLOSURE'S NEMA RATING;
  - FUSE RATING SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- LP-1 — HOMERUN TO PANELBOARD. "LP" INDICATES THE PANELBOARD THAT THE HOMERUN IS SERVED FROM. "1" INDICATES THE CIRCUIT NUMBER IN THE PANELBOARD FOR CONNECTION.
- PANELBOARD.
- SWITCHBOARD.
- ELECTRICAL EQUIPMENT AS INDICATED.
- THREE BUTTON, PUSH BUTTON SWITCH (OPEN, CLOSE, AND STOP) FOR ROLLING SERVICE DOORS. MH = 46" AFF UOI.

VIDEO SURVEILLANCE SYSTEM LEGEND

- GFGI CAMERA. PROVIDE 1-1/4" RGS CONDUIT TO DTR RACK. REFER TO VOLUME 4 ES517 FOR MOUNTING DETAILS.

ABBREVIATIONS

ACS	ACCESS CONTROL SYSTEM
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ATS	AUTOMATIC TRANSFER SWITCH
C	CONDUIT
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CKT	CIRCUIT
COR	CONTRACTING OFFICER'S REPRESENTATIVE
CU	COPPER
DLC	DESIGNLIGHTS CONSORTIUM
DTR	DATA TERMINATION RACK
EGC	EQUIPMENT GROUNDING CONDUCTOR
ELI	EMERGENCY LIGHTING INVERTER
EPT	ELECTRIC POWER TRANSFER
ESS	ELECTRONIC SECURITY SYSTEMS
EWC	ELECTRIC WATER COOLER
FACP	FIRE ALARM CONTROL PANEL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
HACR	HEATING, AIR CONDITIONING, REFRIGERATION
IDS	INTRUSION DETECTION SYSTEM
LVS	LOW VOLTAGE SWITCH
MFR	MANUFACTURER
MH	MOUNTING HEIGHT
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTS	MANUAL TRANSFER SWITCH
NATS	NON-AUTOMATIC TRANSFER SWITCH
NEC	NATIONAL ELECTRICAL CODE
NF	NON FUSED
NTS	NOT TO SCALE
OS	OCCUPANCY SENSOR
PBB	PRIMARY BONDING BUSBAR
PIR	PASSIVE INFRARED
QTY	QUANTITY
SBB	SECONDARY BONDING BUSBAR
SER	SERVICE ENTRANCE RATED
SPD	SURGE PROTECTIVE DEVICE
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UOI	UNLESS OTHERWISE INDICATED
UON	UNLESS OTHERWISE NOTED
V	VOLT
W, WP	WEATHERPROOF

GENERAL NOTES

1. SEE PLATE G-002 TO G-002A FOR ABBREVIATIONS AND GENERAL LEGEND.

2. MOUNTING HEIGHT, UNLESS OTHERWISE NOTED, IS TO CENTER LINE OF EQUIPMENT.

3. OUTLET BOXES MOUNTED ON OPPOSITE SIDES OF WALLS SHALL BE INSTALLED SUCH THAT NO BOXES ARE BACK-TO-BACK TO MINIMIZE SOUND TRANSMISSION. MAINTAIN A 6-INCH SEPARATION WHERE POSSIBLE.

4. MECHANICAL EQUIPMENT IS SHOWN IN APPROXIMATE LOCATIONS. FOR EXACT LOCATIONS OF MECHANICAL EQUIPMENT AND PIPING, SEE MECHANICAL DRAWINGS. PROVIDE DISCONNECT SWITCHES AS REQUIRED BY THE NATIONAL ELECTRICAL CODE EVEN IF NOT INDICATED ON THE ELECTRICAL DRAWINGS.

5. COORDINATE THE LOCATIONS AND MOUNTING HEIGHTS OF LUMINAIRES IN MECHANICAL AND ELECTRICAL ROOMS WITH THE FINAL LOCATIONS OF PIPES, DUCTS AND OTHER EQUIPMENT FOR BEST ARRANGEMENT. FIXTURES SHALL BE EASILY ACCESSIBLE FOR RELAMPING.

6. CONDUCTOR AND CONDUIT SIZES ARE BASED ON COPPER CONDUCTORS WITH THWN INSULATION IN EMT CONDUIT. MINIMUM SIZE SHALL BE #12 AWG CONDUCTORS WITH #12 AWG EGC IN 1/2" CONDUIT UNLESS OTHERWISE INDICATED. LIGHTING AND POWER BRANCH CIRCUITS THAT RUN OVER 100 FEET SHALL BE MINIMUM #10 AWG. CIRCUIT BREAKERS, TERMINALS, ETC. SHALL BE RATED AND MARKED FOR 75 DEGREES MINIMUM. THE CONTRACTOR SHALL ADJUST CONDUIT SIZES BASED ON ACTUAL TYPE OF CONDUCTORS AND CONDUIT INSTALLED.

7. PROVIDE EQUIPMENT GROUNDING CONDUCTORS IN ALL CONDUITS.

8. UP TO 3 SINGLE-PHASE, BRANCH CIRCUITS RATED 20A OR LESS MAY BE ROUTED IN A SINGLE CONDUIT TO MINIMIZE THE NUMBER OF HOMERUNS. CIRCUITS SHALL BE SUPPLIED FROM ADJACENT CIRCUIT BREAKERS AND DIFFERENT PHASES (E.G., 1, 3, 5 OR 2, 4, 6). NEUTRAL CONDUCTORS SHALL NOT BE SHARED OR COMBINED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DERATING CONDUCTOR CAPACITY ACCORDING TO THE NUMBER OF CURRENT CARRYING CONDUCTORS AND OTHER ADJUSTMENT FACTORS IN ACCORDANCE WITH THE NEC. THE CONTRACTOR SHALL UTILIZE A MAXIMUM FILL RATE OF 40% WHEN SIZING CONDUITS AND SHALL INCLUDE THE REQUIRED EQUIPMENT GROUNDING CONDUCTOR. ALL OTHER CIRCUITS SHALL HAVE DEDICATED HOMERUNS.

9. CIRCUIT NUMBERS ARE SHOWN ADJACENT TO ELECTRICAL DEVICES. WIRING SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND NEC REQUIREMENTS.

10. CONDUITS SHALL BE CONCEALED ABOVE CEILINGS AND IN WALLS, EXCEPT IN MECHANICAL ROOMS, ELECTRICAL ROOMS, AND WHERE SPECIFICALLY INDICATED OTHERWISE ON THE DRAWINGS. CONDUITS SHALL NOT BE RUN IN ANY UL RATED SLAB. CONDUITS SHALL NOT BE RUN IN ANY FILLED CMU BLOCKS.

11. LOCATE ALL RACEWAYS TO AVOID INTERFERENCE WITH DUCTS, PIPES, MECHANICAL EQUIPMENT, WITH REMOVAL OF CEILING TILES, OR WITH ACCESS TO EQUIPMENT WHICH REQUIRES PERIODIC ADJUSTMENT OR MAINTENANCE.

12. SEAL PENETRATIONS THROUGH ROOFS, CEILINGS, FLOORS, WALLS AND FIRE WALLS TO MAINTAIN THE INTEGRITY OF THE AIR BARRIER, FIRE AND ACOUSTIC RATINGS OF THE ROOF, CEILINGS, WALLS AND FLOORS.

13. REVISE PANELBOARD SCHEDULES ON AS-BUILT-DRAWING AND PANEL DIRECTORIES TO REFLECT FINAL INSTALLATION CONDITIONS.

14. PROVIDE NAMEPLATES ON THE EXTERIOR OF ALL ELECTRICAL PANELS AND ENCLOSURES AS FOLLOWS: DEVICE ID, DEVICE RATING, POWER SOURCE, ARC FAULT DATA.

15. FOR DISCONNECT SWITCHES AND MOTOR STARTERS THE TOP LINE SHALL BE THE NAME/DESIGNATIONOF THE EQUIPMENT BEING FED BY THE SWITCH/STARTER.

16. PROVIDE SEPARATE NEUTRALS FOR EACH CIRCUIT UTILIZING A NEUTRAL CONDUCTOR (DO NOT COMBINE NEUTRALS).

17. PROVIDE EQUIVALENT CONDUIT PATHWAYS WHERE CABLE TRAY IS INTERRUPTED BY NONACCESSIBLE CEILINGS.

18. THE INTERRUPTING RATING OF THE PANELBOARD AND ELECTRICAL EQUIPMENT SHALL BE INCREASED TO THE NEXT AVAILABLE RATING WHERE THERE IS NOT A RATING THAT IS EQUAL TO THE EQUIPMENT'S LISTED SHORT CIRCUIT RATING.

19. NOT ALL SYMBOLS SHOWN ON THE LEGEND ARE USED IN THE PROJECT.

20. RECEPTACLES THAT HAVE GFCI PROTECTION ARE TO BE WIRED SUCH THAT THE LOSS OF POWER ON ONE RECEPTACLE DOES NOT AFFECT DOWNSTREAM RECEPTACLES.

21. COMPONENTS WHICH CONSTITUTE AN ELECTRICAL SYSTEM SHALL BE FULLY COMPATIBLE WITH ONE ANOTHER AND SHALL BE APPROVED BY THE VARIOUS MANUFACTURERS FOR USE WITH ALL OTHER COMPONENTS WITHIN THE SYSTEM. (ONE EXAMPLE OF AN ELECTRICAL SYSTEM IS THE BUILDING LIGHTING SYSTEM COMPRISED OF FIXTURES, LAMPS, SWITCHES, DRIVERS, OCCUPANCY SENSORS AND DIMMING EQUIPMENT).

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
H. TAYLOR	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
H. TAYLOR	W91PHN-24-B-3002
CHECKED BY:	CONTRACT NO.:
R. DAVIS	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
SIZE:	FILE NAME:
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

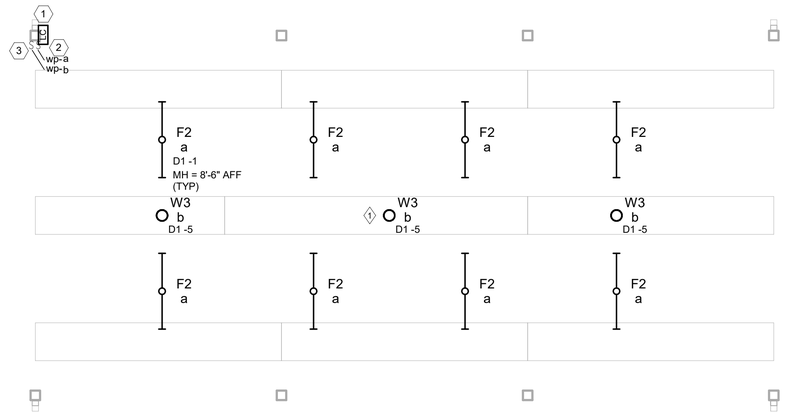
COVERED MESS LEGEND AND NOTES

SHEET ID
BLDG 5
E-001

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:11:58 PM

File Path: C:\Users\kbenxhit\Documents\FY23_PN98182_MPTR-STIDETAILS_ELEC_R21_hunter.taylor.rvt



1 LIGHTING PLAN

1/4" = 1'-0"

4 3 2 1 0 4 8

GENERAL SHEET NOTES

KEYED NOTES (#)

1	A MASTER OVERRIDE OFF CONTROL INSIDE THE CONTROL TOWER SHALL BE PROVIDED TO SHUT OFF ALL ANCILLARY BUILDING WHITE LIGHTING THAT MAY INTERFERE WITH RANGE NIGHT OPERATIONS. SEE LIGHTING CONTACTOR DIAGRAMS FOR ADDITIONAL INFORMATION.
2	SWITCHES FOR INDICATED WHITE LIGHTING SHALL BE WHITE IN COLOR AND SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE.
3	SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR
DRAWN BY: H. TAYLOR
CHECKED BY: R. DAVIS
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

COVERED MESS LIGHTING PLAN

SHEET ID
BLDG 5
EL101

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 4:05:48 PM

File Path: C:\Users\k6enxhit\Documents\FY23_PN96182_MPTR-COVMESS_ELEC_R21_hunter.t.taylor.rvt

LIGHT FIXTURE SCHEDULE								
TYPE	DFESCRIPTION	FIXTURE VOLTAGE	LIGHT SOURCE	NOMINAL WATTS	MINIMUM LUMENS	MOUNTING TYPE	MOUNTING HEIGHT	REMARKS
A2	2x2 FLAT PANEL LED LUMINAIRE	120 V	LED	38 W	4400	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
A3	2x4 FLAT PANEL LED LUMINAIRE	120 V	LED	41 W	4600	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
A4	2x4 FLAT PANEL LED LUMINAIRE	120 V	LED	62 W	6500	RECESSED	N/A	10% 0-10V DIMMING DRIVERS
ELU	LED EMERGENCY LIGHTING UNIT	120 V	LED	4 W	600	WALL	SEE PLANS	
F2	ENCLOSED GASKETED LUMINAIRE	120 V	LED	30 W	4000	SUSPENDED	SEE PLANS	
OB	OBSTRUCTION LIGHT L-810	120 V	INCANDESCENT	70 W	-	THREADED HUB	N/A	STEADY BURNING; PROVIDE PHOTOCELL; PROVIDE SPD
W1	WALL MOUNTED VAPERPROOF (WHITE)	120 V	LED	17 W	1200	WALL	SEE PLANS	PROVIDE CLEAR HEAT TREATED GLASS LENS
W2	WALL MOUNTED VAPORPROOF (RED)	120 V	LED	17 W	1200	WALL	SEE PLANS	PROVIDE RED HEAT TREATED GLASS LENS
W3	CEILING MOUNTED VAPORPROOF (RED)	120 V	LED	17 W	1200	SURFACE	N/A	PROVIDE RED HEAT TREATED GLASS LENS
W4	CEILING MOUNTED VAPORPROOF (WHITE)	120 V	LED	17 W	1200	SURFACE	N/A	PROVIDE CLEAR HEAT TREATED GLASS LENS
X1	EXIT LIGHT - WALL MOUNTED	120 V	LED	1 W	N/A	WALL	N/A	

LED FLAT PANEL
2'x2' LED LUMINAIRE

FEATURES

REFLECTORS: HIGH REFLECTANCE GLOSS WHITE

SHIELDING: WHITE FROST LENS WITH SMOOTH PATTERN FOR UNIFORM ILLUMINATION

GENERAL DESCRIPTION

HOUSING: DIE FORMED CODE-GAUGE STEEL; SEAMLESS CORNERS MAXIMIZE LIGHT EMITTING SURFACE AREA

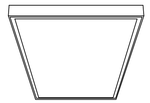
DIMENSIONS: 24" x 48" x 3" (W x L x D)

OTHER: DLC QUALIFIED

LUMEN MAINTENANCE: L70 AT 60,000 HOURS

1 TYPE A2

LED FLAT PANEL
2'x4' LED LUMINAIRE



FEATURES

REFLECTORS: HIGH REFLECTANCE GLOSS WHITE

SHIELDING: WHITE FROST LENS WITH SMOOTH PATTERN FOR UNIFORM ILLUMINATION

GENERAL DESCRIPTION

HOUSING: DIE FORMED CODE-GAUGE STEEL; SEAMLESS CORNERS MAXIMIZE LIGHT EMITTING SURFACE AREA

DIMENSIONS: 24" x 48" x 3" (W x L x D)

OTHER: DLC QUALIFIED

LUMEN MAINTENANCE: L70 AT 60,000 HOURS

2 TYPE A3 & A4

ENCLOSED AND GASKETED
LED LUMINAIRE

FEATURES

REFLECTORS: HIGH REFLECTANCE WHITE

SHIELDING: HIGH IMPACT LINEAR FROSTED ACRYLIC LENS

GENERAL DESCRIPTION

HOUSING: IMPACT RESISTANT, UV STABILIZED, FIBERGLASS WITH REMOVABLE GEAR TRAY FOR MODULE REPLACEMENT; NON-POROUS GASKET; STAINLESS STEEL LATCHES; INCLUDE SURFACE-MOUNTING BRACKETS

DIMENSIONS: 52"x7"x5" (LxWxD)

LISTING: UL LISTED FOR WET LOCATIONS

OTHER: DLC QUALIFIED

3 TYPE F2

SURFACE MOUNTED
THIN PROFILE LED EXIT LIGHT

FEATURES

MOUNTING: UNIVERSAL

SHIELDING: FLAT SHEET ACRYLIC

LETTERS: RED

BATTERY: NICKEL CADMIUM

OTHER: SELF DIAGNOSTICS; NEMA PREMIUM CERTIFIED; TAMPERPROOF HARDWARE

GENERAL DESCRIPTION

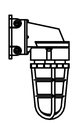
HOUSING: SOLID DIE-CAST ALUMINUM HOUSING AND FACE WITH DIRECTIONAL CHEVRON ARROWS AS REQUIRED

FINISH: BLACK HOUSING AND BRUSHED ALUMINUM FACE

DIMENSIONS: 12"x8"x1.75" (LxWxD, MAXIMUM, BACK MOUNTED)

4 TYPE X1

WALL MOUNTED
VAPORPROOF LUMINAIRE



FEATURES

DIFFUSER: GLOBE WITH DIE CAST GUARD
W1: (CLEAR GLOBE)
W2: (RED GLOBE)

GENERAL DESCRIPTION

HOUSING: DIE-CAST LED HOUSING DESIGNED FOR MAXIMUM HEAT DISSIPATION WITH HIGH TEMPERATURE SILICON INTERNAL GASKETS

FINISH: NATURAL UNPAINTED FINISH

LISTING: UL LISTED FOR WET LOCATIONS

DIMENSIONS: 8" x 13" (D x H)

5 TYPES W1 & W2

CEILING MOUNTED
VAPORPROOF LUMINAIRE

FEATURES

DIFFUSER: GLOBE WITH DIE CAST GUARD
W4: (CLEAR GLOBE)
W3: (RED GLOBE)

GENERAL DESCRIPTION

HOUSING: DIE-CAST LED HOUSING DESIGNED FOR MAXIMUM HEAT DISSIPATION WITH HIGH TEMPERATURE SILICON INTERNAL GASKETS

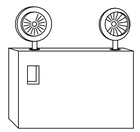
FINISH: NATURAL UNPAINTED FINISH

LISTING: UL LISTED FOR WET LOCATIONS

DIMENSIONS: 5" x 12" (D x H)

6 TYPES W3 & W4

LED EMERGENCY LIGHTING UNIT



FEATURES

LAMPS: FULLY ADJUSTABLE WHITE LED HEADS

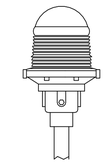
BATTERY: NICKEL CADMIUM
OUTPUT: HIGH OUTPUT OPTION FOR REMOTE HEADS
DURATION: 90 MINUTES AND >87.5% NOMINAL VOLTAGE

GENERAL DESCRIPTION

HOUSING: INJECTION MOLDED, HIGH IMPACT UV-STABLIZED THERMOPLASTIC MATERIAL; WHITE FINISH

7 TYPE ELU

INCANDESCENT OBSTRUCTION LIGHT L-810



FEATURES

DIFFUSER: RED POLYCARBONATE LENS

GENERAL DESCRIPTION

HOUSING: IP66/NEMA 4X; THREADED 1" BOTTOM HUB

LISTING: IP66 AND NEMA 4X

CERTIFICATIONS: FAA AC #: 150/5345-43H

DIMENSIONS: 5" x 5" x 9" (L x W x H)

8 TYPE OB

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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CHECKED BY: R. DAVIS	CONTRACT NO.: -
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

COVERED MESS LIGHT FIXTURE SCHEDULE & DETAILS

SHEET ID
BLDG 5
EL501

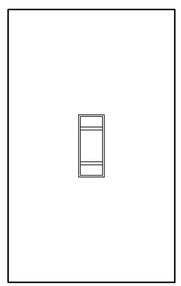
READY TO ADVERTISE (RTA)

File Path: C:\Users\kbenxhit\Documents\FY23_PN96182_MPTR-STDETAILS_ELEC_R21_hunter.t.taylor.rvt

Plot Date: 11/28/2023 3:11:59 PM

LIGHTING CONTROL STRATEGIES

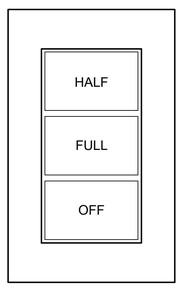
STRATEGY	DESCRIPTION OF OPERATION	LIGHTING CONTROL EQUIPMENT	SWITCHES
1	MANUAL ON/OFF	LINE VOLTAGE TOGGLE SWITCHES	S, S3, S4
2	MANUAL ON/OFF AUTO SENSOR OFF	LINE VOLTAGE WALL SWITCH SENSOR	Sv
3	AUTO SENSOR ON (HALF) MANUAL ON (HALF) MANUAL ON (FULL) MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS OCCUPANCY SENSORS ROOM CONTROLLERS	SLV3
6	LIGHTING SCENES (ZONE 1 | ZONE 2) FULL: 100% | 100% AV: 100% | 30% DIM: 1% | 1% MANUAL RAISE MANUAL LOWER MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS VACANCY SENSORS ROOM CONTROLLERS	SLV6
7	MANUAL ON/OFF AUTO SENSOR ON (HALF) AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS OCCUPANCY SENSORS ROOM CONTROLLERS	SLV2
12	PARTITION CONTROL LIGHTING SCENES (ZONE 1 | ZONE 2) FULL: 100% | 100% AV: 100% | 30% DIM: 1% | 1% MANUAL RAISE MANUAL LOWER MANUAL OFF AUTO SENSOR OFF	LOW VOLTAGE WALLSTATIONS VACANCY SENSORS ROOM CONTROLLERS PARTITION CONTROL SENSORS/INTERFACE	SLV6
14	PHOTOCELL CONTROL ON WHEN NORTHERN SKY ILLUMINANCE REACHING A VERTICAL SURFACE FALLS BELOW 50 FC. PHOTOCELL CONTROL ON WHEN NORTHERN SKY ILLUMINANCE REACHING A VERTICAL SURFACE RISES ABOVE 50 FC.	PHOTOCELL	



DETAIL NOTES:

1. SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR. WHERE INDICATED, THEY SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE. SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR. ALL SWITCHES SHALL BE PERMANTENTLY LABELED WITH A DESCRIPTION OF ITS USE.

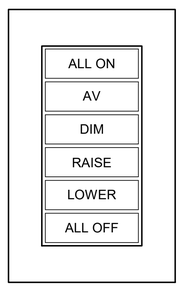
1 WALL SWITCHES S, S3, & S4



DETAIL NOTES:

1. SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR. WHERE INDICATED, THEY SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE. SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR. ALL SWITCHES SHALL BE PERMANTENTLY LABELED WITH A DESCRIPTION OF ITS USE.

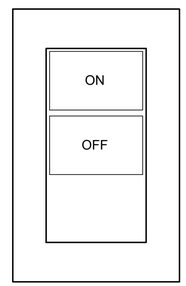
2 WALLSTATION SLV3



DETAIL NOTES:

1. SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR. WHERE INDICATED, THEY SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE. SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR. ALL SWITCHES SHALL BE PERMANTENTLY LABELED WITH A DESCRIPTION OF ITS USE.

3 WALLSTATION SLV6



DETAIL NOTES:

1. SWITCHES FOR WHITE LIGHTING SHALL BE WHITE IN COLOR. WHERE INDICATED, THEY SHALL HAVE A COVER TO DETER OCCUPANTS FROM TURNING THEM ON WHILE RED LIGHTS ARE IN USE. SWITCHES FOR RED LIGHTING SHALL BE RED IN COLOR. ALL SWITCHES SHALL BE PERMANTENTLY LABELED WITH A DESCRIPTION OF ITS USE.

3 WALLSTATION SLV2

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR	ISSUE DATE: NOVEMBER 2023
DRAWN BY: H. TAYLOR	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: R. DAVIS	CONTRACT NO.: -
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-85-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

COVERED MESS LIGHTING CONTROL SCHEDULES AND DETAILS

SHEET ID
BLDG 5
EL601

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:12:00 PM

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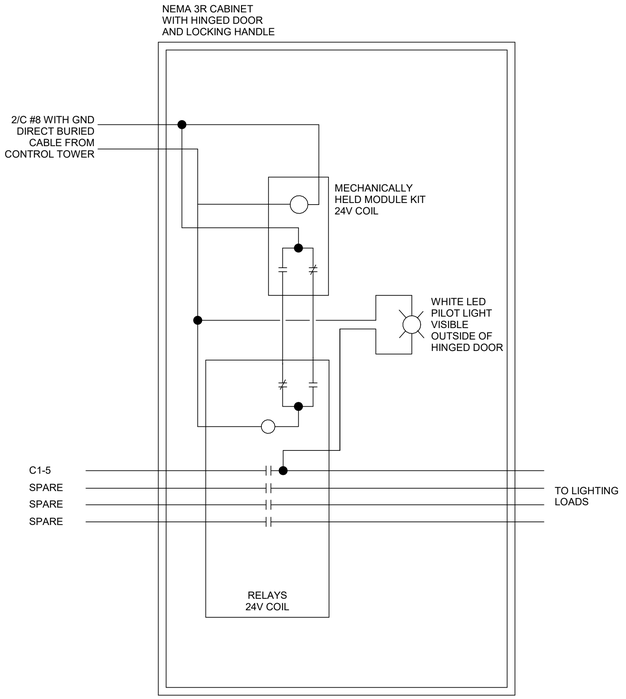
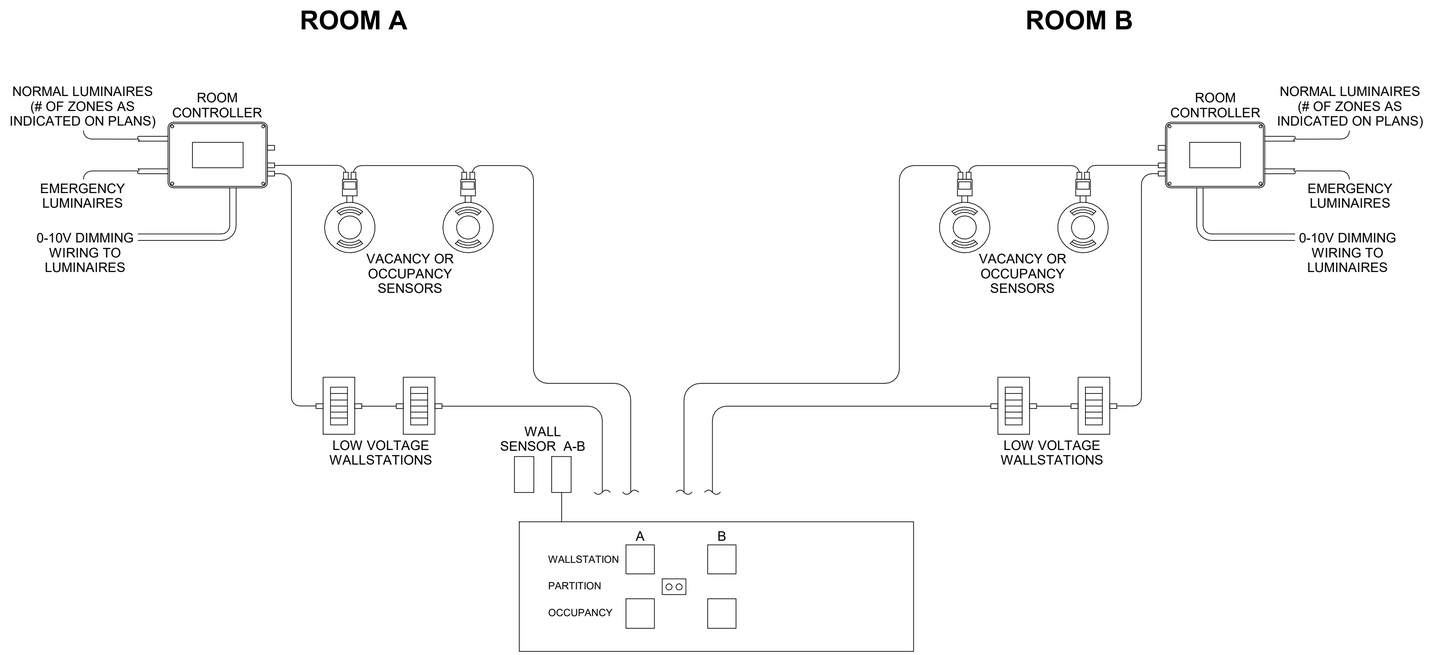


LIGHTING CONTACTOR DIAGRAM NOTES:

1. THE DESIGN INTENT IS TO PROVIDE A MASTER OVERRIDE OFF CONTROL INSIDE THE CONTROL TOWER TO SHUT OFF ALL BUILDING WHITE LIGHTING THAT MAY INTERFERE WITH RANGE NIGHT OPERATIONS.

2. ADDITIONAL BUILDING LIGHTING CONTROLS ARE PROVIDED ON THE LOAD SIDE OF THE CONTACTOR TO PROVIDE TYPICAL BUILDING LIGHTING CONTROLS. SEE OTHER EL SHEETS FOR ADDITIONAL LIGHTING CONTROL REQUIREMENTS.

1 LIGHTING CONTACTOR DIAGRAMS



2 ROOM CONTROLLER PARTITIONS WIRING DIAGRAM

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

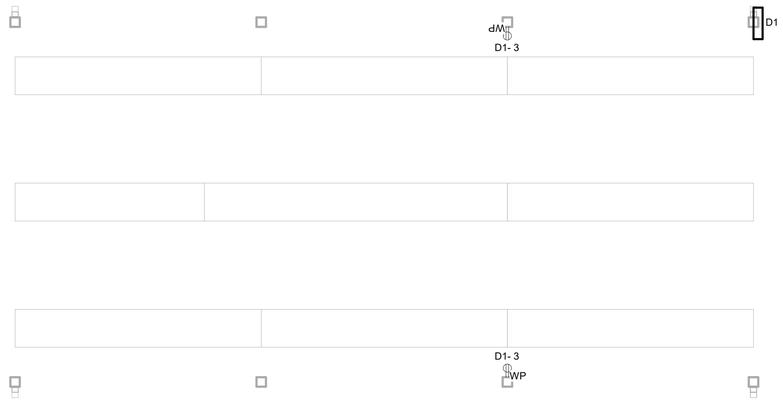
COVERED MESS LIGHTING CONTACTOR DIAGRAMS

SHEET ID
BLDG 5
EL602

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 3:12:00 PM

File Path: C:\Users\kbenxhit\Documents\FY23_PN98182_MPTR-STDETAILS_ELEC_R21_hunter.t.taylor.rvt



1 POWER PLAN

1/4" = 1'-0"

4 3 2 1 0 4 8

GENERAL SHEET NOTES

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

COVERED MESS POWER PLAN

SHEET ID
BLDG 5
EP101

Plot Date: 11/28/2023 4:05:49 PM

File Path: C:\Users\k6enxhit\Documents\FY23_PN96182_MPTR-COVMESS_ELEC_R21_hunter.ltaylor.rvt

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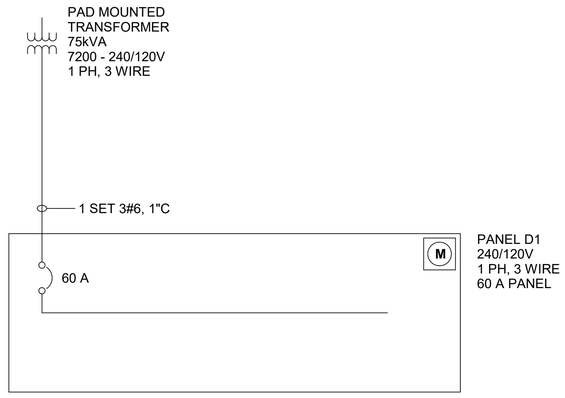

NOTES, POWER ONE-LINE DIAGRAM:

1. SANDHILLS UTILITY SERVICES (SUS) SHALL FURNISH AND INSTALL THE TRANSFORMER, TRANSFORMER PAD, AND PRIMARY DISTRIBUTION CABLES. SEE SITE ELECTRICAL DRAWINGS FOR MORE INFORMATION AND ADDITIONAL REQUIREMENTS.

2. THE CONTRACTOR SHALL FURNISH AND INSTALL THE SECONDARY CONDUCTORS AND CONDUITS FROM THE MAIN DISTRIBUTION PANEL (MDP) TO THE SECONDARY COMPARTMENT OF THE TRANSFORMER. THE CABLES SHALL BE OF SUFFICIENT LENGTH TO FACILITATE THEIR CONNECTION TO THE SECONDARY LUGS OF THE TRANSFORMER.

3. SEE DETAIL ON EG501 FOR SERVICE ENTRANCE GROUNDING REQUIREMENTS.

1 POWER ONE-LINE DIAGRAM
NOT TO SCALE

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

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100 W. OGLETHORPE AVE.
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

COVERED MESS POWER RISER DIAGRAM

SHEET ID
BLDG 5
EP601

Plot Date: 11/28/2023 4:05:49 PM
File Path: C:\Users\kBenxhit\Documents\FY23_PN96182_MPTR-COVMESS_ELEC_R21_hunter.t.taylor.rvt

READY TO ADVERTISE (RTA)

Branch Panel: D1

Location:
Supply From:
Mounting: Surface
Enclosure: NEMA 3R

Volts: 120/240 Single
Phases: 1
Wires: 3

A.I.C. Rating: 10k
Mains Type: MCB
Mains Rating: 60 A
MCB Rating: 60 A

Notes:

CKT	Circuit Description	Trip	Poles	Remarks	A		B		Remarks	Poles	Trip	Circuit Description	CKT
1	White Lighting	20 A	1		240 VA								2
3	Receptacle	20 A	1				360 VA						4
5	Red Lighting	20 A	1		51 VA	0 VA			--	2	30 A	SPD	6
7								0 VA	--	--	--	--	8
			Total Load:		289 VA		360 VA						
			Total Amps:		2 A		3 A						

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting	289 VA	125.00%	361 VA		
Receptacle	360 VA	100.00%	360 VA	**Total Conn. Load:**	643 VA
				Total Est. Demand:	715 VA
				Total Conn. Current:	3 A
				Total Est. Demand Current:	3 A

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: H. TAYLOR
DRAWN BY: H. TAYLOR
CHECKED BY: R. DAVIS
SUBMITTED BY: J. DEACON
SIZE: ANSI D
ISSUE DATE: NOVEMBER 2023
SOLICITATION NO.: W912HN-24-B-3002
CONTRACT NO.:
CATEGORY CODE: 178-65-01
FILE NAME:

Plot Date: 11/28/2023 4:05:50 PM
File Path: C:\Users\kfeinxhit\Documents\FY23_PN96182_MPTR-COVMESS_ELEC_R21_hunter.ltaylor.rvt

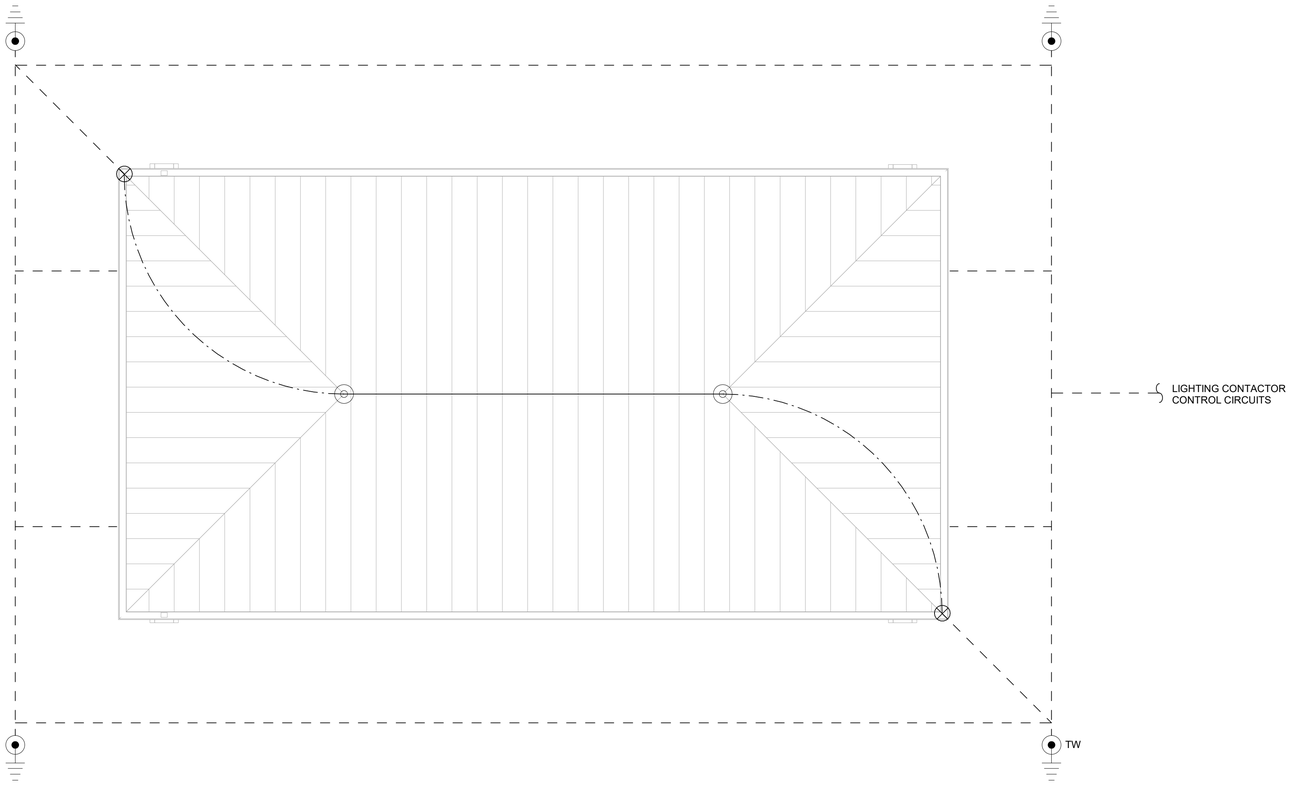
U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

COVERED MESS PANEL SCHEDULES

SHEET ID
BLDG 5
EP701

READY TO ADVERTISE (RTA)



1 LIGHTNING PROTECTION PLAN
1/4" = 1'-0"

GENERAL SHEET NOTES

1. THE LIGHTNING PROTECTION INSTALLER SHALL COORDINATE ROOF PENETRATIONS WITH THE ROOF INSTALLER. PENETRATIONS SHALL COMPLY WITH THE ROOF MANUFACTURER'S RECOMMENDATIONS. SEALING AND FLASHING OF PENETRATIONS SHALL BE BY THE ROOF INSTALLER.

2. LIGHTNING PROTECTION CONDUCTORS PASSING THROUGH CONCRETE FOUNDATION, SLABS OR PADS SHALL BE ROUTED IN CONDUIT.

3. INSTALLED LIGHTNING PROTECTION SYSTEM SHALL BE FIELD INSPECTED BY CONTRACTOR-PROVIDED INDEPENDENT TESTING AGENCY AND FURNISHED WITH A UL MASTER LABEL FOR LIGHTNING PROTECTION SYSTEM.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

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VOLUME 2 - BUILDING

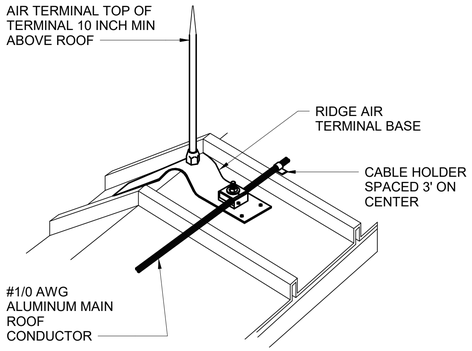
COVERED MESS LIGHTNING PROTECTION PLAN

SHEET ID
BLDG 5
EG101

Plot Date: 11/28/2023 4:05:47 PM

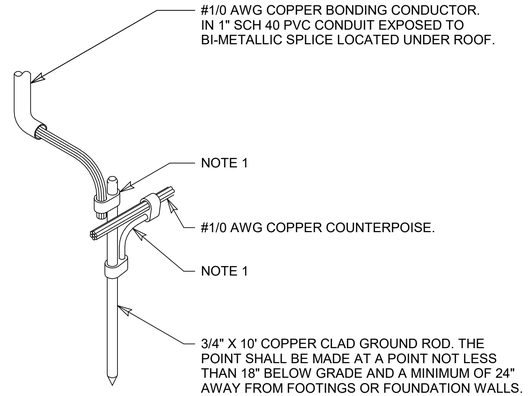
File Path: C:\Users\kfeinxhi\Documents\FY23_PN96182_MPTR-COVMESS_ELEC_R21_hunter.ltaylor.rvt

READY TO ADVERTISE (RTA)



1 RIDGE ROOF AIR TERMINAL DETAIL

NOT TO SCALE

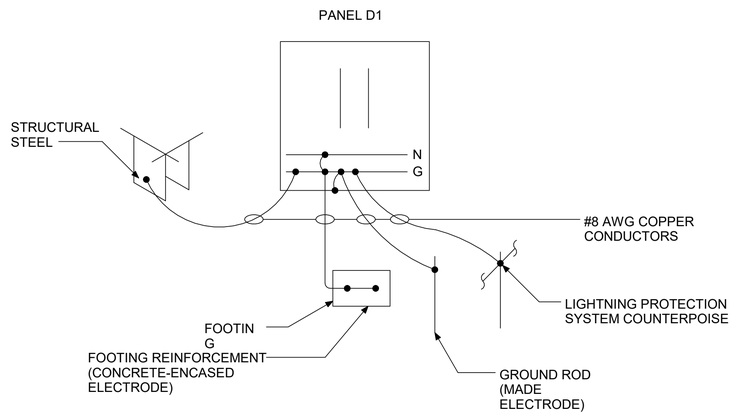


NOTES:

1. ALL CONNECTIONS TO GROUND RODS BELOW GROUND LEVEL MUST BE BY EXOTHERMIC WELD CONNECTION OR WITH A HIGH COMPRESSION CONNECTION USING A HYDRAULIC OR ELECTRIC COMPRESSION TOOL TO PROVIDE THE CORRECT CIRCUMFERENTIAL PRESSURE.

2 DOWN CONDUCTOR & COUNTERPOISE CONNECTION DETAIL

NOT TO SCALE



NOTES:

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC, ARTICLE 250. VARIATIONS TO GROUNDING SHOWN SHALL BE APPROVED BY THE COR.

3 SERVICE ENTRANCE GROUNDING DETAIL

NOT TO SCALE

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FY23, PN 96182
VOLUME 2 - BUILDING

COVERED MESS MISC GROUNDING DETAILS

SHEET ID
BLDG 5
EG501

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 4:05:48 PM

File Path: C:\Users\kbenxhiti\Documents\FY23_PN96182_MPTR-COVMESS_ELEC_R21_hunter.ltaylor.rvt

DESIGN CODE NOTES:

D-1. STRUCTURAL DESIGN IS IN ACCORDANCE WITH THE FOLLOWING CODES AND SPECIFICATIONS:

A. IBC 2018, INTERNATIONAL BUILDING CODE

B. ASCE 7-16, MINIMUM DESIGN LOADS FOR BUILDINGS AND STRUCTURES

C. ACI 318-14, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

D. TMS 402-16, BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES

E. AISC 360-16, SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS

F. AISI S100-12, NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS.

G. AWS, AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE

H. SDI, STEEL DECK INSTITUTE: DESIGN MANUAL FOR COMPOSITE DECK, FORM DECK, & ROOF DECK

I. UFC 1-200-01, GENERAL BUILDING REQUIREMENTS (01 OCT 2020)

J. UFC 3-301-01, STRUCTURAL ENGINEERING, (01 OCT 2019)

K. UFC 4-010-01, DOD MINIMUM ANTI-TERRORISM STANDARDS FOR BUILDINGS, (19 AUG 2020)

DESIGN LOAD CRITERIA:

D-2. LIVE LOADS:

SLAB-ON-GRADE	500 PSF

D-3. SNOW LOADS:

NOT APPLICABLE

D-4. WIND LOADS:

RISK CATEGORY	II
BASIC WIND SPEED, *V*	119 MPH (ULTIMATE) 93 MPH (SERVICE)
WIND EXPOSURE CATEGORY	C
GUST EFFECT FACTOR, *G*	0.85
INTERNAL PRESSURE COEFFICIENTS, *GCpi*	NA

D-5. SEISMIC LOADS:

RISK CATEGORY	II
SEISMIC IMPORTANCE FACTOR, *Ie*	1.0
MAPPED SPECTRAL RESPONSE ACCELERATION, *Ss*	0.154
MAPPED SPECTRAL RESPONSE ACCELERATION, *S1*	0.072
SITE CLASS	D
DESIGN SPECTRAL RESPONSE ACCELERATION, *Sds*	0.16
DESIGN SPECTRAL RESPONSE ACCELERATION, *Sd1*	0.12
SEISMIC DESIGN CATEGORY	B
SEISMIC ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE
SEISMIC-FORCE RESISTING SYSTEM	CANTILEVERED WALL AND SHEAR WALL
RESPONSE MODIFICATION FACTOR, *R*	2
SYSTEM OVERSTRENGTH FACTOR	2
DEFLECTION AMPLIFICATION FACTOR, Cd	2
SEISMIC RESPONSE COEFFICIENT, Cs	0.08
SEISMIC BASE SHEAR	2 KIPS

D-6. ANTI-TERRORISM/FORCE PROTECTION CRITERIA:

ANTI-TERRORISM/FORCE PROTECTION IS NOT REQUIRED FOR THIS FACILITY BASED ON THE INTENDED OCCUPANCY.

SPECIAL INSPECTION NOTES:

SI-1. INSPECTION OF FABRICATORS SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1704.2.5.

SI-2. INSPECTION OF STEEL CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.2.

SI-3. INSPECTION OF CONCRETE CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.3 AND TABLE 1705.3.

SI-4. INSPECTIONS FOR SEISMIC RESISTANCE SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.12.

SI-5. INCLUDE SPECIAL INSPECTIONS REQUIREMENTS IN CONTRACTOR'S QUALITY CONTROL (CQC) PLAN.

SI-6. THE CONTRACTOR SHALL RETAIN THIRD PARTY QUALITY ASSURANCE AGENCIES TO CONDUCT SPECIAL INSPECTIONS REQUIRED BY IBC. INSPECTING AGENCY SHALL PROVIDE REPORTS OF SPECIAL INSPECTIONS DIRECTLY TO THE GOVERNMENT.

GENERAL NOTES:

G-1. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER ALL BUILDING CONSTRUCTION IS COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCES TO ENSURE SAFETY OF THE BUILDING AND ITS COMPONENTS DURING ERECTION. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS, OR TIE-DOWNS.

G-2. THE CONTRACT DOCUMENTS DO NOT INDICATE THE MEANS AND METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK DURING ERECTION AND CONSTRUCTION AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES, SEQUENCES, LOADINGS AND SAFETY.

G-3. USE STRUCTURAL DRAWINGS IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SPECIFICATIONS. COORDINATE THE WORK OF OTHER TRADES INCLUDING, BUT NOT LIMITED TO, THE REQUIREMENTS FOR SLEEVES, INSERTS, HOLES, HANGERS, AND ANCHORS.

G-4. REPORT DISCREPANCIES IN DIMENSIONS BETWEEN DIFFERENT DRAWINGS TO THE CONTRACTING OFFICER PRIOR TO BEGINNING WORK IN IMPACTED AREAS.

G-5. ELEVATIONS ON THE STRUCTURAL DRAWINGS ARE DENOTED AS [±X'-X"] REFERENCED TO THE FINISHED FIRST FLOOR ELEVATION DATUM [0'-0"]. SEE CIVIL DRAWINGS FOR ACTUAL DATUM ELEVATION.

G-6. DETAILS TITLED OR NOTED AS "TYPICAL" APPLY NOT ONLY WHERE SPECIFICALLY INDICATED OR REFERENCED, BUT ALSO IN ALL OTHER CASES WHERE THE NATURE OF THE CONSTRUCTION REQUIRES THEIR USE. DETERMINE APPLICABILITY OF TYPICAL DETAILS FROM DESCRIPTIVE TITLES OR FROM THE SIMILARITY OF A CONSTRUCTION CONDITION TO ANOTHER CONDITION WHERE THE DETAIL IS SPECIFICALLY INDICATED OR REFERENCED.

G-7. WHERE A DETAIL OR SECTION IS SHOWN FOR ONE CONDITION, IT SHALL APPLY TO ALL LIKE OR SIMILAR CONDITIONS EVEN THOUGH NOT SPECIFICALLY MARKED ON THE PLANS.

G-8. REPRODUCTION OF CONTRACT DRAWINGS SHALL NOT BE USED AS SHOP DRAWINGS UNDER ANY CIRCUMSTANCE.

G-9. DO NOT SCALE THE DRAWINGS.

FOUNDATION AND SLAB NOTES:

F-1. FOUNDATIONS FOR THIS PROJECT HAVE BEEN DESIGNED IN ACCORDANCE WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT PREPARED BY THE SAVANNAH DISTRICT TITLED "SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING REPORT", DATED MARCH 2022.

F-2. FOUNDATIONS HAVE BEEN DESIGNED TO BEAR ON SOIL CAPABLE OF SUPPORTING AN ALLOWABLE BEARING PRESSURE OF 3000 PSF, PER THE GEOTECHNICAL REPORT REFERENCED ABOVE.

F-3. THE CONTRACTOR SHALL HIRE AN INDEPENDENT TESTING LABORATORY AND GEOTECHNICAL ENGINEER, REGISTERED AND LICENSED IN THE STATE WHERE THE WORK WILL BE ACCOMPLISHED, TO VERIFY THAT ALL OF THE REQUIREMENTS CONTAINED IN SPECIFICATION 31 00 00, EARTHWORK, HAVE BEEN FOLLOWED AND ACCOMPLISHED.

F-4. CONTRACTOR SHALL BE PREPARED FOR AND SHALL INCLUDE COST OF FORMING FOUNDATIONS SHOULD THE EARTH NOT PROVIDE ADEQUATE BANK STABILITY.

F-5. ALL EXCAVATIONS SHALL BE PERFORMED SO THAT THE SITE AND THE AREA IMMEDIATELY SURROUNDING THE SITE WHICH AFFECTS CONSTRUCTION OPERATIONS WILL BE CONTINUALLY AND EFFECTIVELY DRAINED. THE CONTRACTOR SHALL PROVIDE DRAINAGE AND DEWATERING AS REQUIRED TO ENSURE THAT ALL FOOTING EXCAVATIONS ARE ACCOMPLISHED WITH THE SUBGRADE SOILS REMAINING DRY AND FIRM UNTIL AFTER FOOTINGS ARE PLACED AND BACKFILLED. REMOVAL OF SURFACE WATER, GROUNDWATER, AND ANY PERCHED WATER CONDITIONS WHICH MIGHT BE ENCOUNTERED DURING EXCAVATIONS, SHALL BE ACCOMPLISHED BY APPROVED MEANS. REFER TO SPECIFICATION SECTION 31 00 00, EARTHWORK, AND TO SHEET S-101 FOR ADDITIONAL EXCAVATION REQUIREMENTS.

F-6. PLACE FOUNDATION CONCRETE THE SAME DAY EXCAVATIONS ARE MADE OR AS SOON AS PRACTICAL THEREAFTER.

F-7. DO NOT PLACE FOUNDATION CONCRETE ON FROZEN OR SATURATED SUBGRADES.

F-8. ENSURE THAT EARTH-FORMED FOOTINGS CONFORM TO THE SHAPE, LINES, AND THICKNESS INDICATED ON THE FOUNDATION PLAN, SECTIONS, AND FOOTING SCHEDULES. EXCAVATION WIDTHS SHALL BE A MINIMUM OF 4" GREATER THAN DIMENSIONS INDICATED.

F-9. DO NOT INSTALL FOUNDATIONS UNTIL FOUNDATION WORK HAS BEEN COORDINATED WITH ADJACENT UNDERGROUND UTILITIES.

CONCRETE CONSTRUCTION NOTES:

C-1. ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-14) AND THE SPECIFICATIONS FOR STRUCTURAL CONCRETE (ACI 301-14) OF THE AMERICAN CONCRETE INSTITUTE (ACI).

C-2. ALL CAST-IN-PLACE CONCRETE SHALL ATTAIN MINIMUM 28-DAY COMPRESSIVE STRENGTH (f'c) OF 4000 PSI.

C-3. CONCRETE DENSITY SHALL BE NORMAL WEIGHT WITH A DENSITY OF 140 PCF TO 150 PCF UNLESS NOTED OTHERWISE ON PLANS. CONCRETE NOTED TO BE LIGHTWEIGHT SHALL HAVE DENSITY OF 105 PCF TO 115 PCF.

C-4. CONCRETE REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615/A615M, GRADE 60 AND SHALL HAVE FABRICATION TOLERANCES IN ACCORDANCE WITH ACI 315. SHOP FABRICATE REINFORCING BARS WHICH ARE INDICATED TO BE BENT OR HOOKED.

CONCRETE CONSTRUCTION NOTES CONTINUED:

C-5. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 OR ASTM A497. PROVIDE SHEET-TYPE WELDED WIRE FABRIC. SHEET LAPS SHALL BE TIED AND LAPPED ONE FULL MESH SPACING PLUS 2".

C-6. CONCRETE REINFORCING STEEL SHALL BE CONTINUOUS UNLESS OTHERWISE INDICATED. CONTINUOUS REINFORCING STEEL SHALL BE SPLICED AS SHOWN IN SCHEDULE ON SB501 UNO ON PLANS. REINFORCING STEEL SHALL BE PLACED SO THAT SPACING IS GREATER THAN OR EQUAL TO 2X BAR DIAMETER.

C-7. MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE AS INDICATED. IN NO CASE SHALL REINFORCEMENT COVER BE LESS THAN THE REQUIREMENTS OF ACI 301.

A.	CONCRETE DEPOSITED AGAINST THE GROUND	3"
B.	CONCRETE EXPOSED TO EARTH OR WEATHER	2"
C.	SLABS AND WALLS	1"

C-8. CONCRETE REINFORCING STEEL MARKED STANDARD HOOK SHALL HAVE A 90° HOOK A MINIMUM OF 12 BAR DIAMETERS IN LENGTH, UNLESS OTHERWISE NOTED. STIRRUPS, TIES, AND 180° HOOKS SHALL CONFORM TO THE REQUIREMENTS OF ACI 318.

C-9. PROVIDE 1/2" THICK PRE-MOLDED JOINT FILLER MATERIAL WHERE SLABS ON GRADE ABUT VERTICAL SURFACES.

C-10. ALL EMBEDDED ITEMS SHALL BE PROPERLY PLACED, ACCURATELY POSITIONED AND MAINTAINED SECURELY IN PLACE PRIOR TO AND DURING CONCRETE PLACEMENT.

C-11. REINFORCING STEEL SHALL BE SPREAD AT SLEEVES, ANCHORS, RECESSES AND OTHER EMBEDDED ITEMS UNLESS OTHERWISE INDICATED. REINFORCEMENT SHALL NOT BE CUT TO FACILITATE PLACEMENT OF EMBEDDED ITEMS, UNLESS INDICATED.

C-12. NO CONCRETE SHALL BE PLACED UNTIL THE OWNER OR THE CONTRACTING OFFICER'S DESIGNATED REPRESENTATIVE HAS INSPECTED ALL EMBEDDED WORK, INCLUDING REINFORCEMENT.

C-13. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 3/4" OR AS INDICATED.

C-14. ALUMINUM SHALL NOT BE PLACED IN DIRECT CONTACT WITH CONCRETE UNLESS EFFECTIVELY COATED OR COVERED TO PREVENT ALUMINUM-CONCRETE REACTION AND ELECTROLYTIC ACTION BETWEEN ALUMINUM AND STEEL.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
DRAWN BY: A. SCOTT	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: J. WHITTAKER	CONTRACT NO.: -
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VOLUME 2 - BUILDING

AMMUNITION LOADING DOCK GENERAL STRUCTURAL NOTES

SHEET ID
BLDG 6
S-001

READY TO ADVERTISE (RTA)

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STRUCTURAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	JS	JOIST SEAT
APPROX	APPROXIMATELY	KIP (k)	1000 POUNDS
ARCH	ARCHITECTURAL	LG	LONG
BCX	BOTTOM CHORD EXTENSION	LLH	LONG LEG HORIZONTAL
BOC	BOTTOM OF CONCRETE	LLV	LONG LEG VERTICAL
BOF	BOTTOM OF FOOTING	MAX	MAXIMUM
BOS	BOTTOM OF STEEL	MECH	MECHANICAL
BOT	BOTTOM	MEP	MECHANICAL, ELECTRICAL, PLUMBING
BRG	BEARING	MNFR	MANUFACTURER
BTWN	BETWEEN	MIN	MINIMUM
CFS	COLD-FORMED STEEL	NTS	NOT TO SCALE
CJ	CONTRACTION JOINT	OC	ON CENTER
CL	CENTER LINE	OPP	OPPOSITE
CLR	CLEAR	PJF	PREMOLDED JOINT FILLER
COL	COLUMN	PL	PLATE
CONN	CONNECTION	PLF	POUNDS PER LINEAR FOOT
CONC	CONCRETE	PSF	POUNDS PER SQUARE FOOT
CONT	CONTINUOUS	PSI	POUNDS PER SQUARE INCH
CONSTR	CONSTRUCTION	REINF	REINFORCEMENT
DEG	DEGREE	REQD	REQUIRED
DIA	DIAMETER	SCHED	SCHEDULE
DWG(S)	DRAWING(S)	SE	SLAB EDGE
EA	EACH	SJI	STEEL JOIST INSTITUTE
EF	EACH FACE	SIM	SIMILAR
EJ	EXPANSION JOINT	SOG	SLAB ON GRADE
EL	ELEVATION	SPCG	SPACING
EOD	EDGE OF DECK	STD	STANDARD
EOS	EDGE OF SLAB	T&B	TOP AND BOTTOM
ES	EACH SIDE	TO	TOP OF
EQ	EQUAL	TOC	TOP OF CONCRETE
EW	EACH WAY	TOF	TOP OF FOOTING
FF	FINISHED FLOOR	TOS	TOP OF SLAB
FTG	FOOTING	TR	TENSION REINFORCEMENT
GA	GAGE	TYP	TYPICAL
GALV	GALVANIZED	UNO	UNLESS NOTED OTHERWISE
HGT	HEIGHT	VERT	VERTICAL
HORIZ	HORIZONTAL	WP	WORKING POINT
IS	ISOLATION JOINT	WWF	WELDED WIRE FABRIC

STRUCTURAL LEGEND

DN → SLOPE DIRECTION

[+/- X'-X"] INDICATES ELEVATION REFERENCED TO FINISHED FLOOR

X KEYED PLAN NOTE

X COLUMN REFERENCE LINE (CENTER LINE OF COLUMN)

[+/- X'-X"] SPOT ELEVATION

SLAB DEPRESSION

BRICK WALL

CONCRETE ELEMENT

EARTH FILL

GROUT

CONCRETE MASONRY UNIT (CMU)

POROUS FILL

WELDED WIRE FABRIC (WWF)

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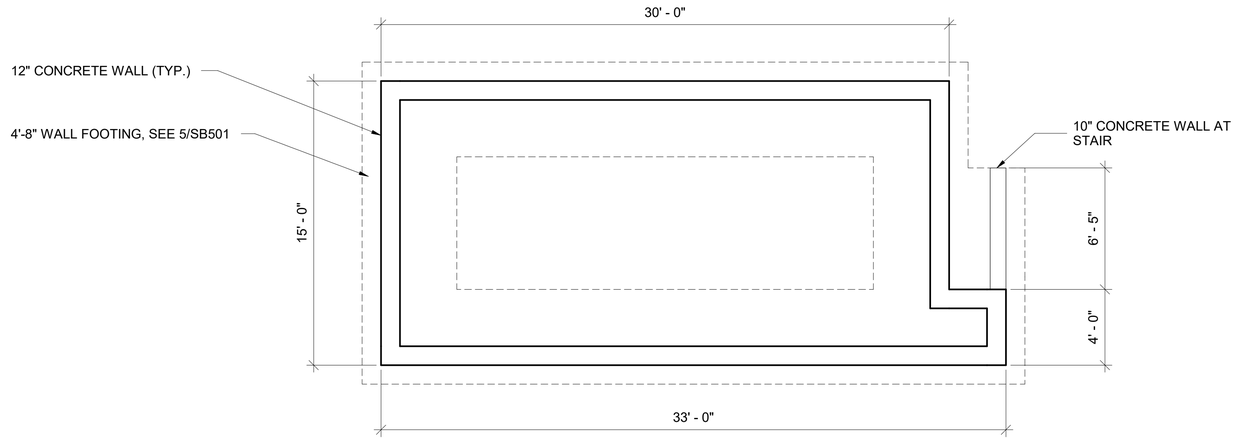
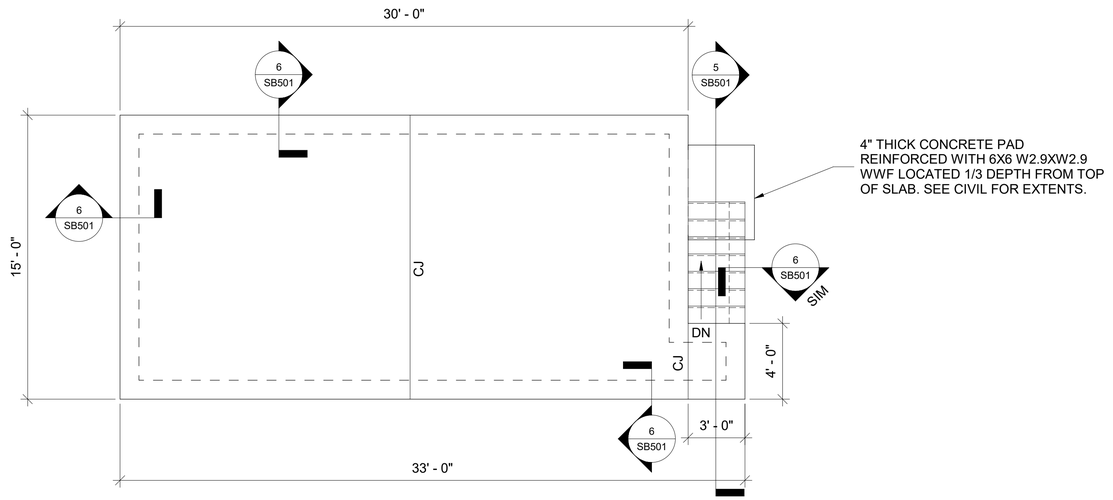


1 FOUNDATION PLAN

1/4" = 1'-0"



2 SLAB PLAN

1/4" = 1'-0"

GENERAL SHEET NOTES

FOUNDATION AND SLAB PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. GRADE ELEVATION = 0'-0". ALL ELEVATIONS INDICATED FROM THIS DATUM. SEE CIVIL DRAWINGS FOR EXACT ELEVATION.
3. TOP OF CONCRETE SLAB-ON-GRADE ELEVATION = 3'-11".
4. TOP OF FTG = (-) 1'-6" UNO.
5. ALL FOOTINGS SHALL BE POSITIONED UNDER CONCRETE WALLS AS SHOWN BY 5/SB501.
6. SLAB-ON-GRADE SHALL CONSIST OF 6" THICK CONCRETE REINFORCED WITH #4 @ 12" OC EW LOCATED AT 1/3-DEPTH FROM TOP OF SLAB.
7. PROVIDE (1) #5 X 4'-0" LONG AT TOP AND BOTTOM IN SLAB-ON-GRADE AT ALL RE-ENTRANT CORNERS AND WHERE A CONTROL JOINT TERMINATES AT A JOINT.
8. SLAB-ON-GRADE SHALL BEAR ON CAPILLARY WATER BARRIER ON PROPERLY PREPARED SUBGRADE OR COMPACTED FILL.
9. CONTROL JOINT LOCATIONS ARE DIAGRAMMATIC ONLY AND DO NOT REPRESENT ALL JOINTS REQUIRED FOR SLAB CONSTRUCTION. CONTRACTOR SHALL COORDINATE SLAB-ON-GRADE REQUIREMENTS WITH SLAB-ON-GRADE CONSTRUCTION SEQUENCING AND SLAB DETAILS. SPACING SHALL NOT EXCEED MAXIMUM JOINT SPACING PER ACI REQUIREMENTS.
10. COORDINATE UNDERGROUND UTILITY LINES WITH CIVIL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION DRAWINGS PRIOR TO CONSTRUCTION OF FOOTINGS AND SLABS-ON-GRADE.
11. WITHIN THE AREA OF THE STRUCTURE FOOTINGS, THE SOILS SHALL BE TESTED FOR IN-SITU ALLOWABLE BEARING PRESSURE BY METHOD OF HAND AUGER AND DYNAMIC CONE PENETROMETER METHOD, IN ACCORDANCE WITH ASTM SPECIAL TECHNICAL PUBLICATION #399. SOILS WHICH ARE IDENTIFIED TO HAVE A NET ALLOWABLE BEARING PRESSURE BELOW 3,000 PSF, OR WHICH ARE DEEMED TO BE UNSATISFACTORY FOR OTHER REASONS (E.G., EXCESSIVE DEBRIS OR ORGANIC CONTENT), SHALL BE OVER-EXCAVATED AND REPLACED WITH ADDITIONAL CONCRETE DURING THE CONCRETING OR REPLACED TO DESIGN SUBGRADE WITH NO. 57 OR NO. 67 STONE, COMPACTED TO A NON-YIELDING CONDITION. OVER-EXCAVATION SHALL BE PERFORMED IN ACCORDANCE WITH EM 385-1-1 AND OSHA 29 CFR 1926.652. BACKFILLING SHALL BE IN ACCORDANCE WITH SECTION 31 00 00, EARTHWORK. IT IS POSSIBLE THAT PERCHED GROUNDWATER WILL BE ENCOUNTERED DURING OVER-EXCAVATION. DEWATERING SHOULD BE DONE IN ACCORDANCE WITH SPECIFICATIONS.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

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J. WHITTAKER	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-85-01
SIZE:	FILE NAME:
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

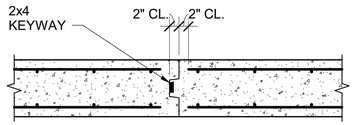
AMMUNITION LOADING DOCK SLAB AND FOUNDATION PLAN

SHEET ID
BLDG 6
S-101

READY TO ADVERTISE (RTA)

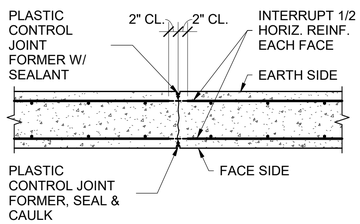
Plot Date: 11/27/2023 11:15:58 AM

File Path: C:\Users\kbendhn\Documents\FY23_PN96182_MPTR-AMMUNDOCK_STRUCT_R21_kBendhn.rvt



WALL CONSTRUCTION JOINT DETAIL

PROVIDE CONTROL JOINTS AT 25 FT MAX AND CONSTRUCTION JOINT AT 100 FT MAX.



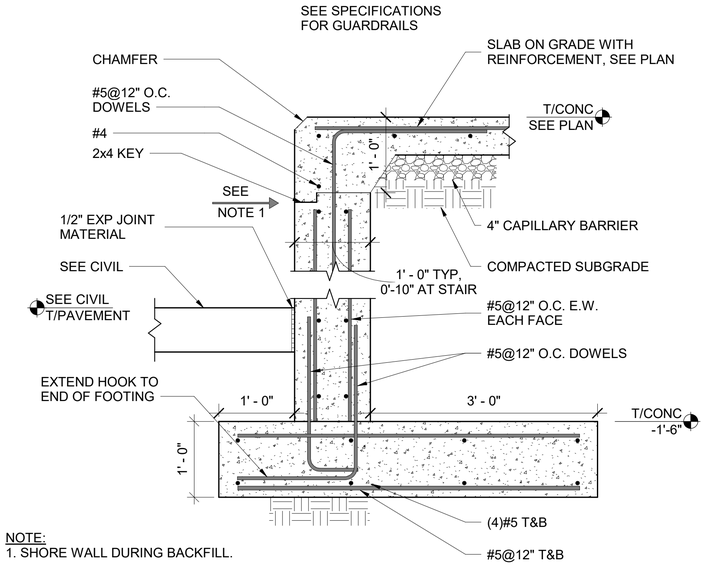
WALL CONTROL JOINT DETAIL

1 CONCRETE WALL CONTROL & CONSTR JOINT DETAIL

NOT TO SCALE

CONCRETE REINFORCING BAR DEVELOPMENT AND SPLICE LENGTH SCHEDULE (F'c = 4000 PSI)					
BAR SIZE	OTHER BARS		TOP/HORIZ BARS		HOOKED BARS
	Ld	SPLICE	Ld	SPLICE	Ldh
#3	15	19	19	25	6
#4	19	25	25	33	7
#5	24	31	31	41	9
#6	29	37	37	49	10
#7	42	54	54	71	12
#8	47	62	62	81	14
#9	54	70	70	91	15

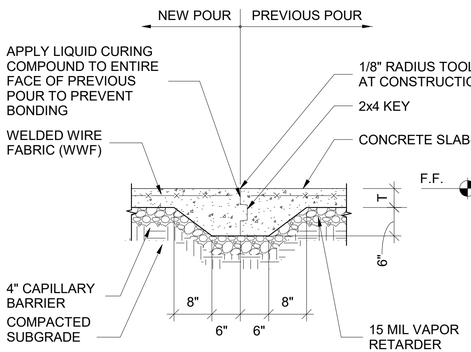
NOTES:
1. LENGTHS SHOWN IN THIS SCHEDULE SHALL BE USED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
2. LENGTHS SHOWN IN THIS SCHEDULE ARE BASED ON CLASS B TENSION LAP SLICES FOR NORMAL WEIGHT CONCRETE STRENGTH AND GRADE 60 (Fy = 60,000 PSI) REINFORCING STEEL WITH CONCRETE COVER AND SPACING AS DEFINED IN CONCRETE SECTION OF GENERAL NOTES ON SHEET S-001 AND ACI 318-14, SECTION 25.
3. Ld = TENSION DEVELOPMENT/EMBEDMENT LENGTH FOR STRAIGHT BARS.
4. Ldh = TENSION DEVELOPMENT/EMBEDMENT LENGTH FOR HOOKED BARS.
5. LAP SPLICES SHALL BE WIRED IN CONTACT.
6. TOP BARS ARE HORIZONTAL BARS IN BEAMS, FOOTINGS, SLABS, AND WALLS WHERE MORE THAN 12" OF FRESH CONCRETE IS CAST BELOW THE BAR.
7. ALL TABULATED VALUES ARE IN INCHES.



NOTE:
1. SHORE WALL DURING BACKFILL.

6 TYPICAL WALL SECTION

1" = 1'-0"

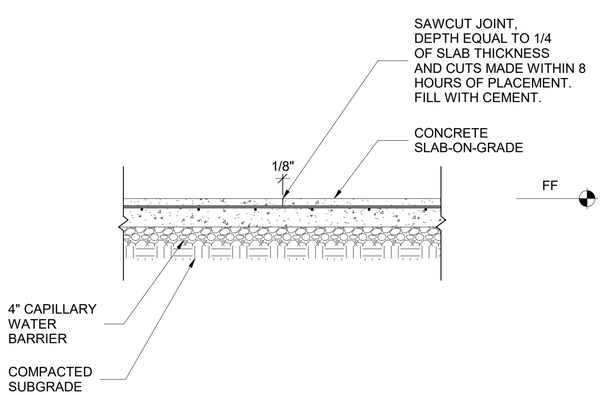


2 TYPICAL SOG SHEAR KEY CONSTR JOINT DETAIL

3/4" = 1'-0"

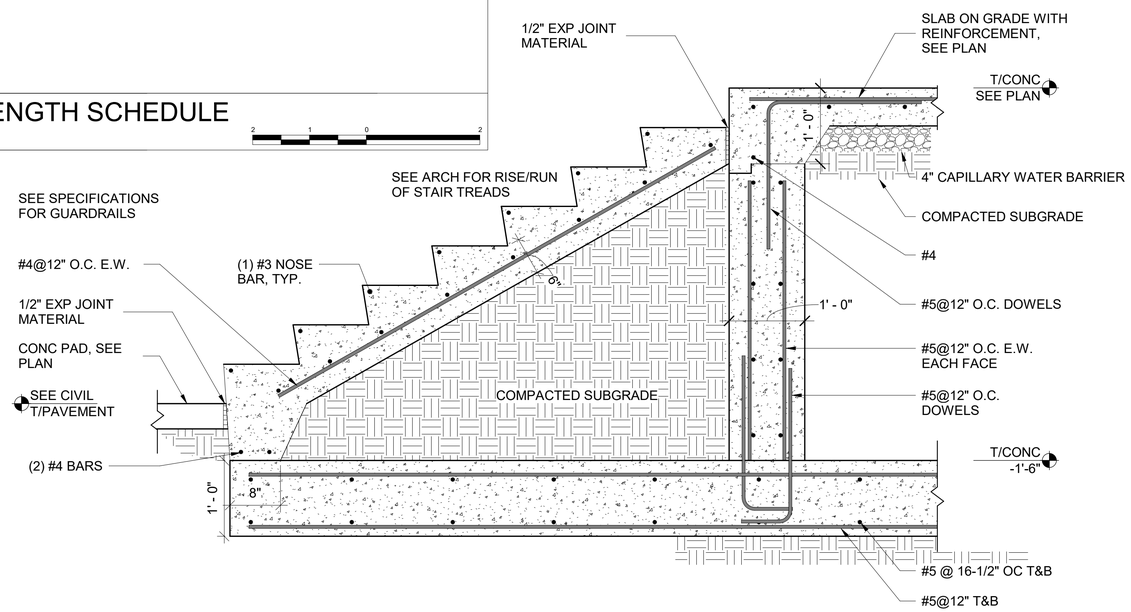
3 REBAR SPLICE LENGTH SCHEDULE

3/4" = 1'-0"



4 TYP SAWED CONTRACTION JOINT DETAIL (CJ)

3/4" = 1'-0"



5 TYPICAL STAIR AND WALL DETAIL

1" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
DRAWN BY: A. SCOTT	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: J. WHITTAKER	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

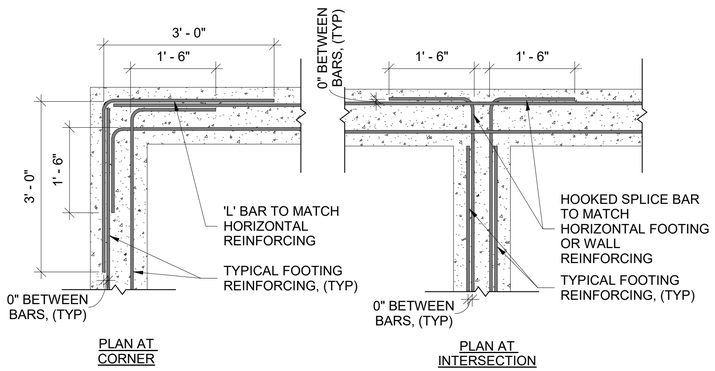
AMMUNITION LOADING DOCK FOUNDATION AND SLAB DETAILS

SHEET ID
BLDG 6
SB501

READY TO ADVERTISE (RTA)

Plot Date: 11/27/2023 11:15:59 AM

File Path: C:\Users\kbendhn\Documents\FY23_PN96182_MPTR-AMMUNDOCK_STRUCT_R21_kbendhn.rvt

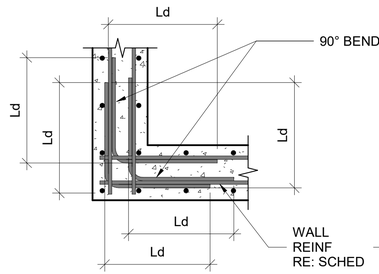


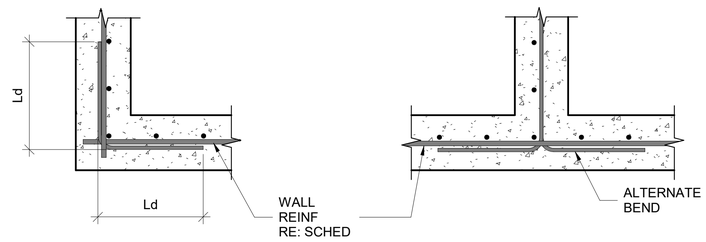
NOTES:

1. WHERE THREE BARS OCCUR, CENTER BAR SHALL BE HAVE 90 DEGREE STANDARD HOOK.

1 TYPICAL CONT. FTG REINFORCING DETAIL

3/4" = 1'-0"





NOTE:
1. ALL CORNER BARS SHALL MATCH SIZE AND SPACING OF HORIZONTAL WALL REINFORCEMENT.

2 TYPICAL CORNER BAR PLACEMENT IN WALL DETAIL

1 1/2" = 1'-0"

3 TYPICAL SLAB ON GRADE DETAIL

3/4" = 1'-0"

4 TYPICAL SOG RE-ENTRANT CORNER

3/4" = 1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
DRAWN BY: A. SCOTT	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: J. WHITTAKER	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

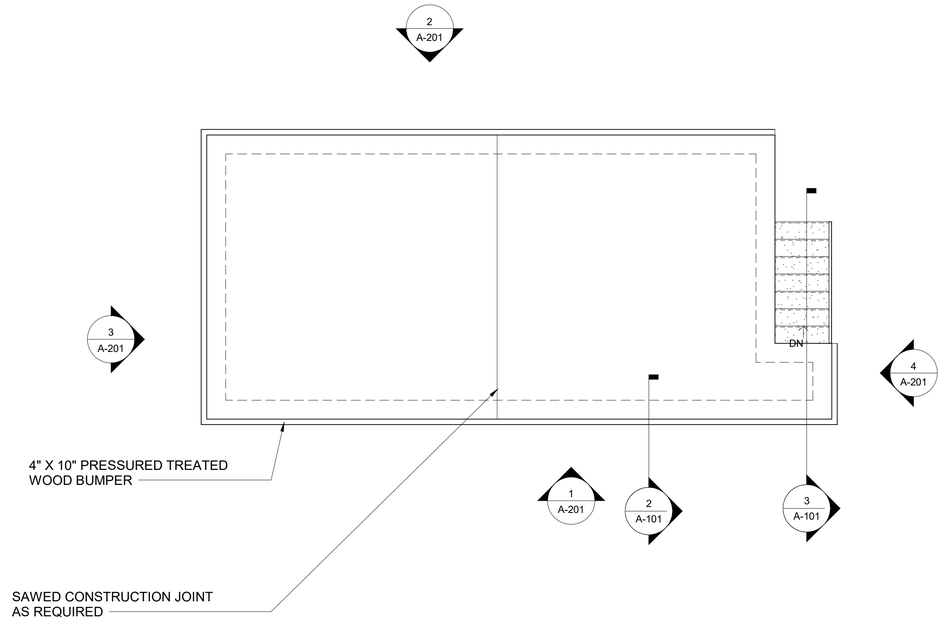
AMMUNITION LOADING DOCK FOUNDATION AND SLAB DETAILS

SHEET ID
BLDG 6
SB502

READY TO ADVERTISE (RTA)

Plot Date: 11/27/2023 11:15:59 AM

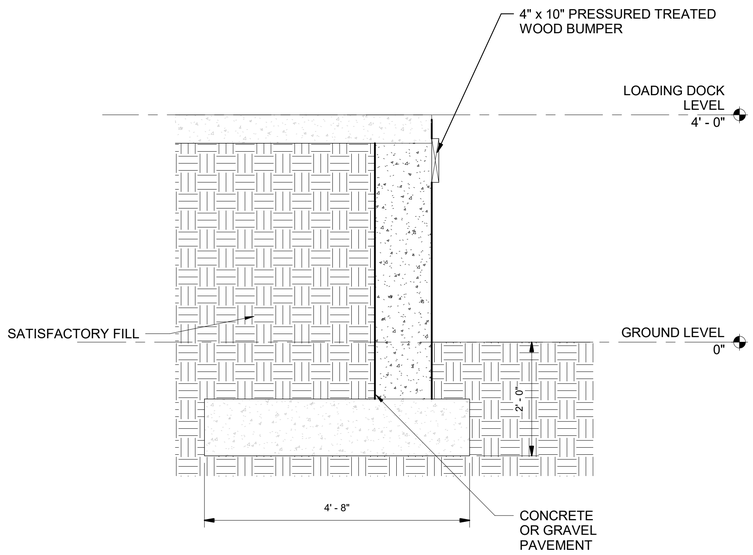
File Path: C:\Users\kbendhn\Documents\FY23_PN96182_MPTR-AMMUNDOCK_STRUCT_R21_kBendhn.rvt



1 PLAN

1/4" = 1'-0"

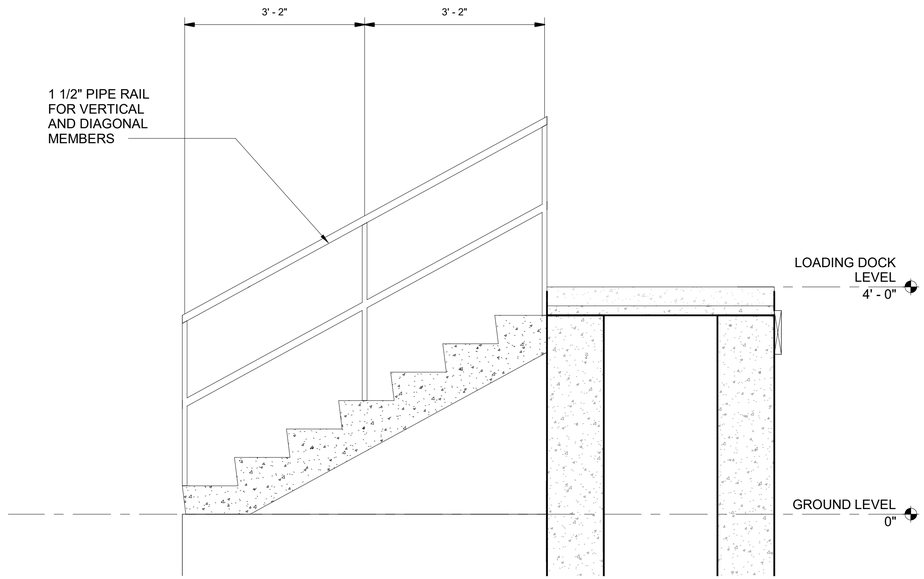
SCALE: 1/4"=1'-0"



2 WALL SECTION DETAIL

3/4" = 1'-0"

SCALE: 3/4"=1'-0"



3 STAIR SECTION DETAIL

3/4" = 1'-0"

SCALE: 3/4"=1'-0"

GENERAL SHEET NOTES

1. EXTERIOR DIMENSIONS ARE FROM FACE OF INSULATED METAL PANELS, INTERIOR DIMENSIONS ARE FROM FACE OF STUD,OR FACE OF GYPSUM WALLBOARD, UNLESS NOTED OTHERWISE.

2. SEE CIVIL DRAWINGS FOR FINISHED FLOOR AND FINISHED GRADE ELEVATIONS. SEE STRUCTURAL DRAWINGS FOR FOUNDATION PLANS AND FLOOR SLABS.

NORTH ARROW

PLAN NORTH

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T. ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M. DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPTR)
FY23, PN 86182
VOLUME 2 AMMUNITION LOADING DOCK, BUILDING 7

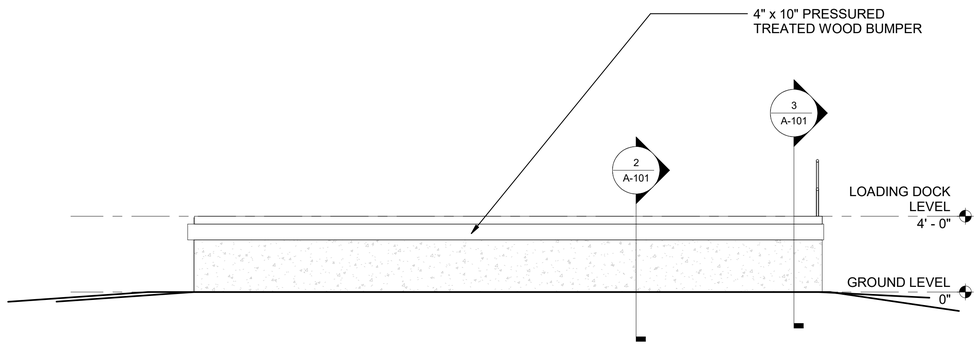
AMMUNITION LOADING DOCK FIRST FLOOR PLAN

SHEET ID
BLDG 6
A-101

READY TO ADVERTISE (RTA)

Plot Date: 11/29/2023 12:05:49 PM

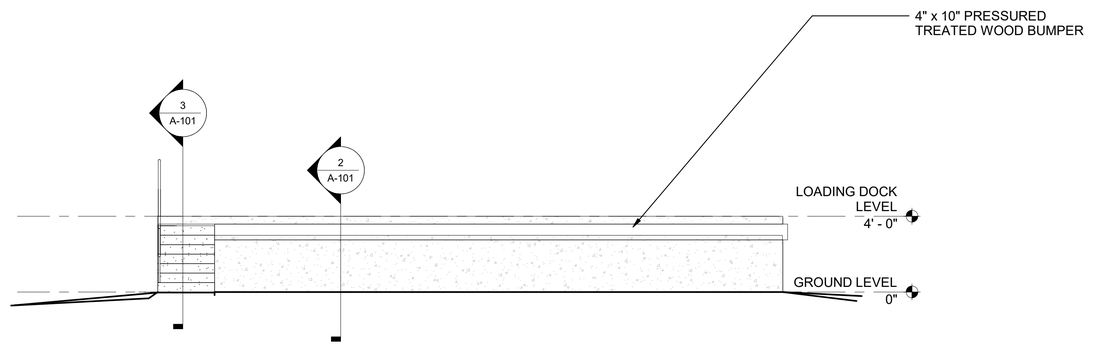
File Path: C:\Users\K6ENXT09\Documents\FY23_PN86182_MPTR-AMMUNDOCK_ARCH_R21_K6ENXT09.rvt



1 SOUTH LOADING DOCK ELEVATION

1/4" = 1'-0"

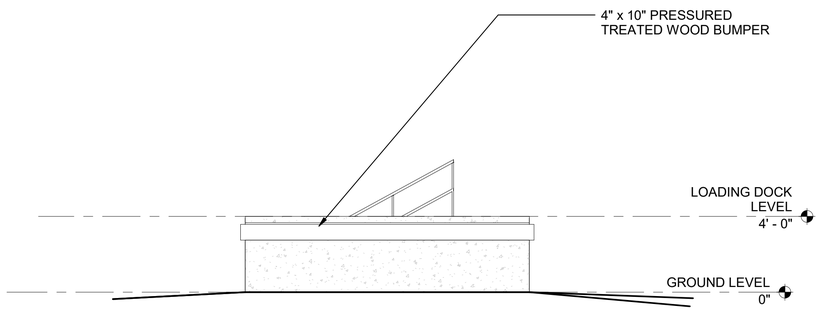
SCALE: 1/4"=1'-0"



2 NORTH LOADING DOCK ELEVATION

1/4" = 1'-0"

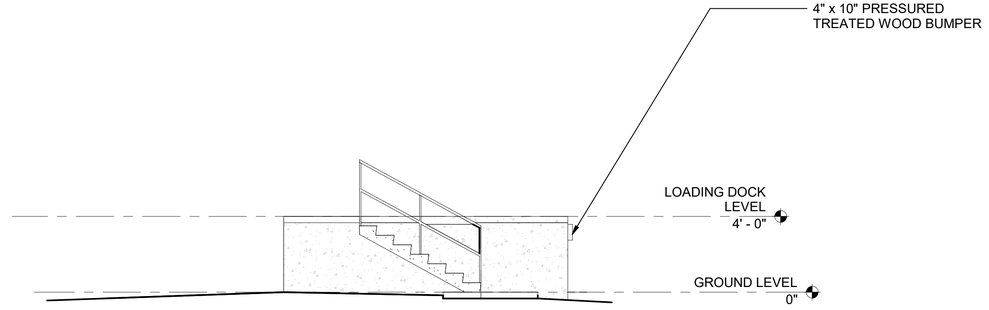
SCALE: 1/4"=1'-0"



3 WEST LOADING DOCK ELEVATION

1/4" = 1'-0"

SCALE: 1/8"=1'-0"



4 EAST LOADING DOCK ELEVATION

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T. ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M. DEACON	CONTRACT NO.:
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U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 AMMUNITION LOADING DOCK, BUILDING 7

AMMUNITION LOADING DOCK ELEVATIONS

SHEET ID
BLDG 6
A-201

READY TO ADVERTISE (RTA)

Plot Date: 11/29/2023 12:05:49 PM

File Path: C:\Users\K6ENXTO9\Documents\FY23_PN86182_MPTR-AMMUNDOCK_ARCH_R21_K6ENXTO9.rvt

DESIGN CODE NOTES:

D-1. STRUCTURAL DESIGN IS IN ACCORDANCE WITH THE FOLLOWING CODES AND SPECIFICATIONS:

A. IBC 2018, INTERNATIONAL BUILDING CODE

B. ASCE 7-16, MINIMUM DESIGN LOADS FOR BUILDINGS AND STRUCTURES

C. ACI 318-14, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

D. TMS 402-16, BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES

E. AISC 360-16, SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS

F. AISI S100-12, NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS.

G. AWS, AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE

H. SDI, STEEL DECK INSTITUTE: DESIGN MANUAL FOR COMPOSITE DECK, FORM DECK, & ROOF DECK

I. UFC 1-200-01, GENERAL BUILDING REQUIREMENTS (01 OCT 2020)

J. UFC 3-301-01, STRUCTURAL ENGINEERING, (01 OCT 2019)

K. UFC 4-010-01, DOD MINIMUM ANTI-TERRORISM STANDARDS FOR BUILDINGS, (19 AUG 2020)

DESIGN LOAD CRITERIA:

D-2. LIVE LOADS:

SLAB-ON-GRADE	100 PSF

D-3. SNOW LOADS:

NOT APPLICABLE

D-4. WIND LOADS:

RISK CATEGORY	II
BASIC WIND SPEED, *V*	119 MPH (ULTIMATE) 93 MPH (SERVICE)
WIND EXPOSURE CATEGORY	C
GUST EFFECT FACTOR, *G*	0.85
INTERNAL PRESSURE COEFFICIENTS, *GCpi*	NA

D-5. SEISMIC LOADS:

RISK CATEGORY	II
SEISMIC IMPORTANCE FACTOR, *Ie*	1.0
MAPPED SPECTRAL RESPONSE ACCELERATION, *Ss*	0.154
MAPPED SPECTRAL RESPONSE ACCELERATION, *S1*	0.072
SITE CLASS	D
DESIGN SPECTRAL RESPONSE ACCELERATION, *Sds*	0.16
DESIGN SPECTRAL RESPONSE ACCELERATION, *Sd1*	0.12
SEISMIC DESIGN CATEGORY	B
SEISMIC ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE
SEISMIC-FORCE RESISTING SYSTEM	CANTILEVERED WALL AND SHEAR WALL
RESPONSE MODIFICATION FACTOR, *R*	2
SYSTEM OVERSTRENGTH FACTOR	2
DEFLECTION AMPLIFICATION FACTOR, Cd	2
SEISMIC RESPONSE COEFFICIENT, Cs	0.08
SEISMIC BASE SHEAR	2 KIPS

D-6. ANTI-TERRORISM/FORCE PROTECTION CRITERIA:

ANTI-TERRORISM/FORCE PROTECTION IS NOT REQUIRED FOR THIS FACILITY BASED ON THE INTENDED OCCUPANCY.

SPECIAL INSPECTION NOTES:

SI-1. INSPECTION OF FABRICATORS SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1704.2.5.

SI-2. INSPECTION OF STEEL CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.2.

SI-3. INSPECTION OF CONCRETE CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.3 AND TABLE 1705.3.

SI-4. INSPECTION OF MASONRY CONSTRUCTION SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.4.

SI-5. INSPECTIONS FOR SEISMIC RESISTANCE SHALL BE CONDUCTED IN ACCORDANCE WITH IBC 2018, SECTION 1705.12.

SI-6. INCLUDE SPECIAL INSPECTIONS REQUIREMENTS IN CONTRACTOR'S QUALITY CONTROL (CQC) PLAN.

SI-7. THE CONTRACTOR SHALL RETAIN THIRD PARTY QUALITY ASSURANCE AGENCIES TO CONDUCT SPECIAL INSPECTIONS REQUIRED BY IBC. INSPECTING AGENCY SHALL PROVIDE REPORTS OF SPECIAL INSPECTIONS DIRECTLY TO THE GOVERNMENT.

GENERAL NOTES:

G-1. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER ALL BUILDING CONSTRUCTION IS COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCES TO ENSURE SAFETY OF THE BUILDING AND ITS COMPONENTS DURING ERECTION. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS, OR TIE-DOWNS.

G-2. THE CONTRACT DOCUMENTS DO NOT INDICATE THE MEANS AND METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK DURING ERECTION AND CONSTRUCTION AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES, SEQUENCES, LOADINGS AND SAFETY.

G-3. USE STRUCTURAL DRAWINGS IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SPECIFICATIONS. COORDINATE THE WORK OF OTHER TRADES INCLUDING, BUT NOT LIMITED TO, THE REQUIREMENTS FOR SLEEVES, INSERTS, HOLES, HANGERS, AND ANCHORS.

G-4. REPORT DISCREPANCIES IN DIMENSIONS BETWEEN DIFFERENT DRAWINGS TO THE CONTRACTING OFFICER PRIOR TO BEGINNING WORK IN IMPACTED AREAS.

G-5. ELEVATIONS ON THE STRUCTURAL DRAWINGS ARE DENOTED AS [±X'-X"] REFERENCED TO THE FINISHED FIRST FLOOR ELEVATION DATUM [0'-0"]. SEE CIVIL DRAWINGS FOR ACTUAL DATUM ELEVATION.

G-6. DETAILS TITLED OR NOTED AS "TYPICAL" APPLY NOT ONLY WHERE SPECIFICALLY INDICATED OR REFERENCED, BUT ALSO IN ALL OTHER CASES WHERE THE NATURE OF THE CONSTRUCTION REQUIRES THEIR USE. DETERMINE APPLICABILITY OF TYPICAL DETAILS FROM DESCRIPTIVE TITLES OR FROM THE SIMILARITY OF A CONSTRUCTION CONDITION TO ANOTHER CONDITION WHERE THE DETAIL IS SPECIFICALLY INDICATED OR REFERENCED.

G-7. WHERE A DETAIL OR SECTION IS SHOWN FOR ONE CONDITION, IT SHALL APPLY TO ALL LIKE OR SIMILAR CONDITIONS EVEN THOUGH NOT SPECIFICALLY MARKED ON THE PLANS.

G-8. REPRODUCTION OF CONTRACT DRAWINGS SHALL NOT BE USED AS SHOP DRAWINGS UNDER ANY CIRCUMSTANCE.

G-9. DO NOT SCALE THE DRAWINGS.

FOUNDATION AND SLAB NOTES:

F-1. FOUNDATIONS FOR THIS PROJECT HAVE BEEN DESIGNED IN ACCORDANCE WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT PREPARED BY THE SAVANNAH DISTRICT TITLED "SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING REPORT", DATED MARCH 2022.

F-2. FOUNDATIONS HAVE BEEN DESIGNED TO BEAR ON SOIL CAPABLE OF SUPPORTING AN ALLOWABLE BEARING PRESSURE OF 3000 PSF, PER THE GEOTECHNICAL REPORT REFERENCED ABOVE.

F-3. THE CONTRACTOR SHALL HIRE AN INDEPENDENT TESTING LABORATORY AND GEOTECHNICAL ENGINEER, REGISTERED AND LICENSED IN THE STATE WHERE THE WORK WILL BE ACCOMPLISHED, TO VERIFY THAT ALL OF THE REQUIREMENTS CONTAINED IN SPECIFICATION 31 00 00, EARTHWORK, HAVE BEEN FOLLOWED AND ACCOMPLISHED.

F-4. CONTRACTOR SHALL BE PREPARED FOR AND SHALL INCLUDE COST OF FORMING FOUNDATIONS SHOULD THE EARTH NOT PROVIDE ADEQUATE BANK STABILITY.

F-5. ALL EXCAVATIONS SHALL BE PERFORMED SO THAT THE SITE AND THE AREA IMMEDIATELY SURROUNDING THE SITE WHICH AFFECTS CONSTRUCTION OPERATIONS WILL BE CONTINUALLY AND EFFECTIVELY DRAINED. THE CONTRACTOR SHALL PROVIDE DRAINAGE AND DEWATERING AS REQUIRED TO ENSURE THAT ALL FOOTING EXCAVATIONS ARE ACCOMPLISHED WITH THE SUBGRADE SOILS REMAINING DRY AND FIRM UNTIL AFTER FOOTINGS ARE PLACED AND BACKFILLED. REMOVAL OF SURFACE WATER, GROUNDWATER, AND ANY PERCHED WATER CONDITIONS WHICH MIGHT BE ENCOUNTERED DURING EXCAVATIONS, SHALL BE ACCOMPLISHED BY APPROVED MEANS. REFER TO SPECIFICATION SECTION 31 00 00, EARTHWORK, AND TO SHEET S-101 FOR ADDITIONAL EXCAVATION REQUIREMENTS.

F-6. PLACE FOUNDATION CONCRETE THE SAME DAY EXCAVATIONS ARE MADE OR AS SOON AS PRACTICAL THEREAFTER.

F-7. DO NOT PLACE FOUNDATION CONCRETE ON FROZEN OR SATURATED SUBGRADES.

F-8. ENSURE THAT EARTH-FORMED FOOTINGS CONFORM TO THE SHAPE, LINES, AND THICKNESS INDICATED ON THE FOUNDATION PLAN, SECTIONS, AND FOOTING SCHEDULES. EXCAVATION WIDTHS SHALL BE A MINIMUM OF 4" GREATER THAN DIMENSIONS INDICATED.

F-9. DO NOT INSTALL FOUNDATIONS UNTIL FOUNDATION WORK HAS BEEN COORDINATED WITH ADJACENT UNDERGROUND UTILITIES.

CONCRETE CONSTRUCTION NOTES:

C-1. ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-14) AND THE SPECIFICATIONS FOR STRUCTURAL CONCRETE (ACI 301-14) OF THE AMERICAN CONCRETE INSTITUTE (ACI).

C-2. ALL CAST-IN-PLACE CONCRETE SHALL ATTAIN MINIMUM 28-DAY COMPRESSIVE STRENGTH (f'c) OF 4000 PSI.

C-3. CONCRETE DENSITY SHALL BE NORMAL WEIGHT WITH A DENSITY OF 140 PCF TO 150 PCF UNLESS NOTED OTHERWISE ON PLANS. CONCRETE NOTED TO BE LIGHTWEIGHT SHALL HAVE DENSITY OF 105 PCF TO 115 PCF.

C-4. CONCRETE REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615/A615M, GRADE 60 AND SHALL HAVE FABRICATION TOLERANCES IN ACCORDANCE WITH ACI 315. SHOP FABRICATE REINFORCING BARS WHICH ARE INDICATED TO BE BENT OR HOOKED.

CONCRETE CONSTRUCTION NOTES CONTINUED:

C-5. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 OR ASTM A497. PROVIDE SHEET-TYPE WELDED WIRE FABRIC. SHEET LAPS SHALL BE TIED AND LAPPED ONE FULL MESH SPACING PLUS 2".

C-6. CONCRETE REINFORCING STEEL SHALL BE CONTINUOUS UNLESS OTHERWISE INDICATED. CONTINUOUS REINFORCING STEEL SHALL BE SPLICED AS SHOWN IN SCHEDULE ON SB601 UNO ON PLANS. REINFORCING STEEL SHALL BE PLACED SO THAT SPACING IS GREATER THAN OR EQUAL TO 2X BAR DIAMETER.

C-7. MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE AS INDICATED. IN NO CASE SHALL REINFORCEMENT COVER BE LESS THAN THE REQUIREMENTS OF ACI 301.

A.	CONCRETE DEPOSITED AGAINST THE GROUND	3"
B.	CONCRETE EXPOSED TO EARTH OR WEATHER	2"
C.	SLABS AND WALLS	1"

C-8. CONCRETE REINFORCING STEEL MARKED STANDARD HOOK SHALL HAVE A 90° HOOK A MINIMUM OF 12 BAR DIAMETERS IN LENGTH, UNLESS OTHERWISE NOTED. STIRRUPS, TIES, AND 180° HOOKS SHALL CONFORM TO THE REQUIREMENTS OF ACI 318.

C-9. PROVIDE 1/2" THICK PRE-MOLDED JOINT FILLER MATERIAL WHERE SLABS ON GRADE ABUT VERTICAL SURFACES.

C-10. ALL EMBEDDED ITEMS SHALL BE PROPERLY PLACED, ACCURATELY POSITIONED AND MAINTAINED SECURELY IN PLACE PRIOR TO AND DURING CONCRETE PLACEMENT.

C-11. REINFORCING STEEL SHALL BE SPREAD AT SLEEVES, ANCHORS, RECESSES AND OTHER EMBEDDED ITEMS UNLESS OTHERWISE INDICATED. REINFORCEMENT SHALL NOT BE CUT TO FACILITATE PLACEMENT OF EMBEDDED ITEMS, UNLESS INDICATED.

C-12. NO CONCRETE SHALL BE PLACED UNTIL THE OWNER OR THE CONTRACTING OFFICER'S DESIGNATED REPRESENTATIVE HAS INSPECTED ALL EMBEDDED WORK, INCLUDING REINFORCEMENT.

C-13. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 3/4" OR AS INDICATED.

C-14. ALUMINUM SHALL NOT BE PLACED IN DIRECT CONTACT WITH CONCRETE UNLESS EFFECTIVELY COATED OR COVERED TO PREVENT ALUMINUM-CONCRETE REACTION AND ELECTROLYTIC ACTION BETWEEN ALUMINUM AND STEEL.

C-15. CONCRETE SLAB ON GRADE JOINTS INDICATED ARE DIAGRAMMATIC AND DO NOT REPRESENT ALL OF THE JOINTS REQUIRED FOR SLAB-ON-GRADE CONSTRUCTION. SLAB PANELS BETWEEN JOINTS SHALL BE EQUALLY SPACED OR NEARLY SO, WITH A MAXIMUM SPACING OF 15'-0". SLAB PANELS BETWEEN JOINTS SHALL BE SQUARE OR NEARLY SO AND SHALL NOT EXCEED AN ASPECT RATIO WITH PANEL LENGTH GREATER THAN 1.5 TIMES THE PANEL WIDTH.

C-16. CONTRACTOR SHALL PROVIDE JOINTS AT ALL RE-ENTRANT CORNERS INCLUDING, BUT NOT LIMITED TO, COLUMNS AND SLAB RECESSES.

C-17. IN ADDITION, CONTRACTOR SHALL COORDINATE SLAB ON GRADE JOINT REQUIREMENTS WITH SLAB-ON-GRADE CONSTRUCTION SEQUENCING. CONTRACTOR SHALL SHOW JOINT LAYOUT ON REINFORCING SHOP DRAWING SUBMITTAL FOR APPROVAL.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
A. SCOTT	NOVEMBER 2023
DRAWN BY:	SOLICITATION NO.:
A. SCOTT	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
J. WHITTAKER	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-85-01
SIZE:	FILE NAME:
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

LATRINE ENCLOSURE GENERAL STRUCTURAL NOTES

SHEET ID
BLDG 7
S-001

READY TO ADVERTISE (RTA)

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MASONRY CONSTRUCTION NOTES:

M-1. ALL MASONRY CONSTRUCTION SHALL BE IN ACCORDANCE WITH "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES" (ACI 530-16/ASCE 5-16/TMS 402-16) AND "SPECIFICATION FOR MASONRY STRUCTURES" (ACI 530.1-13/ASCE 6-13/TMS 602-13).

M-2. DESIGN MASONRY ASSEMBLAGE STRENGTH, f'm = 2000 PSI. NET AREA COMPRESSIVE STRENGTH OF CONCRETE MASONRY UNITS SHALL BE A MINIMUM OF 2800 PSI.

M-3. CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C90 AND BE MANUFACTURED WITH NORMAL WEIGHT AGGREGATE.

M-4. GROUT SHALL CONFORM TO ASTM C476 AND SHALL NOT CONTAIN ADMIXTURES. GROUT SHALL ATTAIN A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 2500 PSI. ALL CMU REINFORCED WITH REBAR SHALL BE FILLED WITH GROUT.

M-5. REINFORCEMENT SHALL BE DEFORMED BARS CONFORMING TO ASTM A615/A615M, GRADE 60 AND SHALL HAVE FABRICATION TOLERANCES IN ACCORDANCE WITH ACI 315. SHOP FABRICATE REINFORCING BARS WHICH ARE INDICATED TO BE BENT OR HOOKED.

M-6. LOCATE JOINT REINFORCEMENT 16 INCHES ON CENTER VERTICALLY AND ADDITIONALLY AT THE TOP OF ALL FOUNDATIONS AND IN THE TWO JOINTS IMMEDIATELY ABOVE AND BELOW ALL OPENINGS, EXTENDING A MINIMUM OF 24 INCHES BEYOND THE JAMB ON EACH SIDE.

M-7. PLACE PIPES AND CONDUITS PASSING HORIZONTALLY THROUGH MASONRY IN STEEL OR PVC SLEEVES OR CORED HOLES UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

M-8. ALUMINUM CONDUITS, PIPES, AND ACCESSORIES SHALL NOT BE EMBEDDED IN MASONRY GROUT, OR MORTAR, UNLESS EFFECTIVELY COATED OR COVERED TO PREVENT ALUMINUM-CEMENT CHEMICAL REACTION OR ELECTROLYTIC REACTION BETWEEN ALUMINUM AND STEEL.

M-9. PLACE REINFORCEMENT IN BLOCK CELLS USING NONMETALLIC BAR POSITIONERS TO ACHIEVE COVER REQUIREMENTS SHOWN IN MASONRY DETAILS AND SCHEDULES AND IN SPECIFICATIONS.

M-10. PROVIDE DOWEL REINFORCEMENT FROM WALLS INTO FOUNDATION OF SAME SIZE AND SPACING AS VERTICAL WALL REINFORCEMENT. LAP WALL REINFORCEMENT AS SPECIFIED IN SCHEDULE ON SHEET SB601.

M-11. UNLESS OTHERWISE NOTED OR DETAILED, CENTER WALL REINFORCEMENT IN BLOCK CELLS. USE NONMETALLIC BAR POSITIONERS.

M-12. REFER TO MASONRY SPECIFICATIONS FOR HOT AND COLD WEATHER CONSTRUCTION PROCEDURES.

M-13. ALL CMU WALL REINFORCEMENT SHALL HAVE STANDARD 90 DEGREE HOOKS AT TOP OF WALLS.

STRUCTURAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
APPROX	APPROXIMATELY
ARCH	ARCHITECTURAL
BCX	BOTTOM CHORD EXTENSION
BOC	BOTTOM OF CONCRETE
BOF	BOTTOM OF FOOTING
BOS	BOTTOM OF STEEL
BOT	BOTTOM
BRG	BEARING
BTWN	BETWEEN
CFS	COLD-FORMED STEEL
CJ	CONTRACTION JOINT
CL	CENTER LINE
CLR	CLEAR
COL	COLUMN
CONN	CONNECTION
CONC	CONCRETE
CONT	CONTINUOUS
CONSTR	CONSTRUCTION
DEG	DEGREE
DIA	DIAMETER
DWG(S)	DRAWING(S)
EA	EACH
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
EOD	EDGE OF DECK
EOS	EDGE OF SLAB
ES	EACH SIDE
EQ	EQUAL
EW	EACH WAY
FF	FINISHED FLOOR
FTG	FOOTING
GA	GAGE
GALV	GALVANIZED
HGT	HEIGHT
HORIZ	HORIZONTAL
IS	ISOLATION JOINT
JS	JOIST SEAT
KIP (k)	1000 POUNDS
LG	LONG
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
MAX	MAXIMUM
MECH	MECHANICAL
MEP	MECHANICAL, ELECTRICAL, PLUMBING
MNFR	MANUFACTURER
MIN	MINIMUM
NTS	NOT TO SCALE
OC	ON CENTER
OPP	OPPOSITE
PJF	PREMOLDED JOINT FILLER
PL	PLATE
PLF	POUNDS PER LINEAR FOOT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
REINF	REINFORCEMENT
REQD	REQUIRED
SCHED	SCHEDULE
SE	SLAB EDGE
SJI	STEEL JOIST INSTITUTE
SIM	SIMILAR
SOG	SLAB ON GRADE
SPCG	SPACING
STD	STANDARD
T&B	TOP AND BOTTOM
TO	TOP OF
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOS	TOP OF SLAB
TR	TENSION REINFORCEMENT
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
WP	WORKING POINT
WWF	WELDED WIRE FABRIC

STRUCTURAL LEGEND

DN → SLOPE DIRECTION

[+/- X'-X"] INDICATES ELEVATION REFERENCED TO FINISHED FLOOR

X KEYED PLAN NOTE

X COLUMN REFERENCE LINE (CENTER LINE OF COLUMN)

[+/- X'-X"] SPOT ELEVATION

SLAB DEPRESSION

BRICK WALL

CONCRETE ELEMENT

EARTH FILL

GROUT

CONCRETE MASONRY UNIT (CMU)

POROUS FILL

WELDED WIRE FABRIC (WWF)

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY:	ISSUE DATE:
A. SCOTT	NOVEMBER 2023
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A. SCOTT	W912HN-24-B-3002
CHECKED BY:	CONTRACT NO.:
J. WHITTAKER	
SUBMITTED BY:	CATEGORY CODE:
J. DEACON	178-65-01
SIZE:	FILE NAME:
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U.S. ARMY CORPS OF ENGINEERS
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SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

LATRINE ENCLOSURE GENERAL STRUCTURAL NOTES

SHEET ID
BLDG 7
S-002

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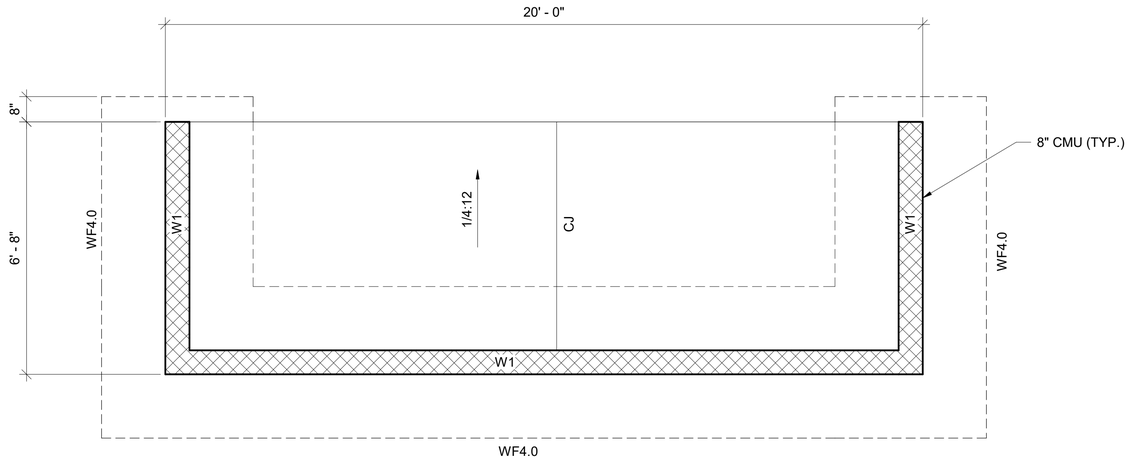
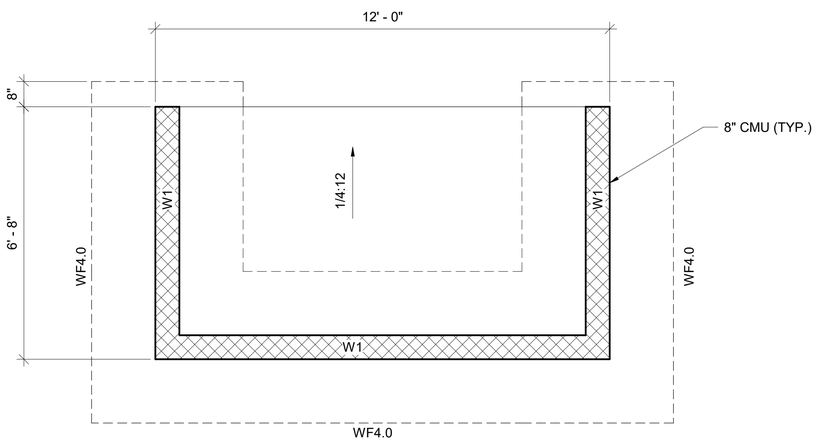


1 FOUNDATION AND SLAB PLAN

1/2" = 1'-0"



2 FOUNDATION AND SLAB PLAN

1/2" = 1'-0"

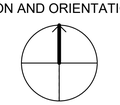
GENERAL SHEET NOTES

FOUNDATION AND SLAB PLAN NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND ABBREVIATIONS, SEE S-001 AND FOLLOWING.
2. TOP OF CONCRETE SLAB-ON-GRADE ELEVATION = 0'-0". ALL ELEVATIONS INDICATED FROM THIS DATUM. SEE CIVIL DRAWINGS FOR EXACT ELEVATION.
3. TOP OF FTG = (-) 2'-0" UNO.
4. ALL FOOTINGS SHALL BE CENTERED UNDER MASONRY WALLS.
5. SLAB-ON-GRADE SHALL CONSIST OF 4" THICK CONCRETE REINFORCED WITH 6X6 W2.9XW2.9 WWF LOCATED AT 1/3-DEPTH FROM TOP OF SLAB.
6. PROVIDE (1) #5 X 4'-0" LONG AT TOP AND BOTTOM IN SLAB-ON-GRADE AT ALL RE-ENTRANT CORNERS AND WHERE A CONTROL JOINT TERMINATES AT A JOINT.
7. SLAB-ON-GRADE SHALL BEAR ON CAPILLARY WATER BARRIER ON PROPERLY PREPARED SUBGRADE OR COMPACTED FILL.
8. THERE ARE SMALL LATRINE ENCLOSURE STRUCTURES AND LARGE LATRINE ENCLOSURE STRUCTURES. SEE CIVIL FOR LOCATIONS AND ORIENTATIONS.
9. WITHIN THE AREA OF THE BUILDING FOOTINGS, THE SOILS SHALL BE TESTED FOR IN-SITU ALLOWABLE BEARING PRESSURE BY METHOD OF HAND AUGER AND DYNAMIC CONE PENETROMETER METHOD, IN ACCORDANCE WITH ASTM SPECIAL TECHNICAL PUBLICATION #399. SOILS WHICH ARE IDENTIFIED TO HAVE A NET ALLOWABLE BEARING PRESSURE BELOW 3,000 PSF, OR WHICH ARE DEEMED TO BE UNSATISFACTORY FOR OTHER REASONS (E.G., EXCESSIVE DEBRIS OR ORGANIC CONTENT), SHALL BE OVER-EXCAVATED AND REPLACED WITH ADDITIONAL CONCRETE DURING THE CONCRETING OR REPLACED TO DESIGN SUBGRADE WITH NO. 57 OR NO. 67 STONE, COMPACTED TO A NON-YIELDING CONDITION. OVER-EXCAVATION SHALL BE PERFORMED IN ACCORDANCE WITH EM 385-1-1 AND OSHA 29 CFR 1926.652. BACKFILLING SHALL BE IN ACCORDANCE WITH SECTION 31 00 00, EARTHWORK. IT IS POSSIBLE THAT PERCHED GROUNDWATER WILL BE ENCOUNTERED DURING OVER-EXCAVATION. DEWATERING SHOULD BE DONE IN ACCORDANCE WITH SPECIFICATIONS.

NORTH ARROW

SEE CIVIL FOR LOCATION AND ORIENTATION OF ALL LATRINES



US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
DRAWN BY: A. SCOTT	SOLICITATION NO.: W91PHN-24-B-3002
CHECKED BY: J. WHITTAKER	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

LATRINE ENCLOSURE FOUNDATION AND SLAB PLANS

SHEET ID
BLDG 7
S-101

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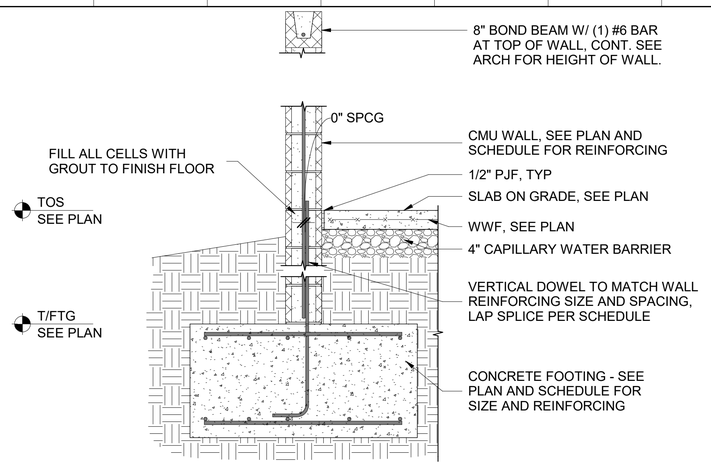
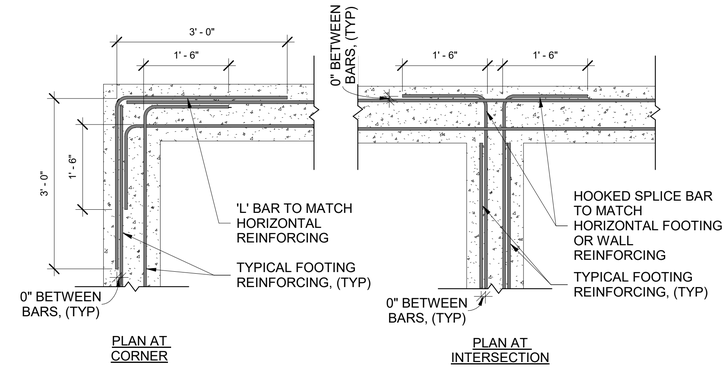


1 TYPICAL MASONRY WALL FOOTING SECTION

3/4" = 1'-0"

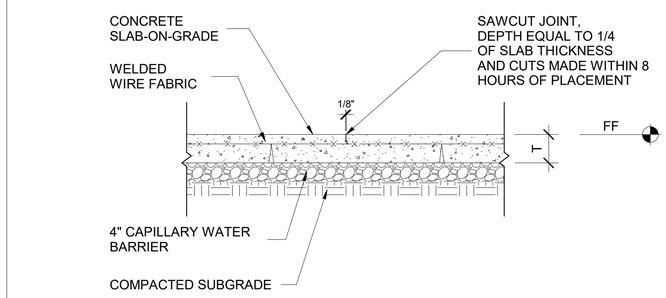


NOTES:

1. WHERE THREE BARS OCCUR, CENTER BAR SHALL BE HAVE 90 DEGREE STANDARD HOOK.

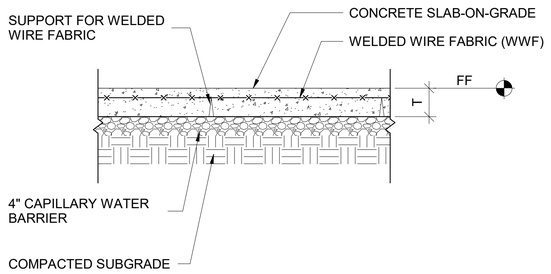
2 TYPICAL CONT. FTG REINFORCING DETAIL

3/4" = 1'-0"



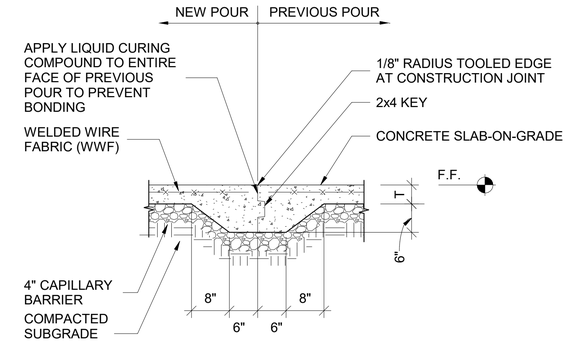
3 TYPICAL SAWED CONTRACTION JOINT DETAIL (CJ)

3/4" = 1'-0"



4 TYPICAL SLAB ON GRADE DETAIL

3/4" = 1'-0"



5 TYPICAL SOG SHEAR KEY CONSTR JOINT DETAIL

3/4" = 1'-0"

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DESIGN BY: A. SCOTT	ISSUE DATE: NOVEMBER 2023
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CHECKED BY: J. WHITTAKER	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
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U.S. ARMY CORPS OF ENGINEERS
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 98182
VOLUME 2 - BUILDING

LATRINE ENCLOSURE STRUCTURAL DETAILS

SHEET ID
BLDG 7
SB501

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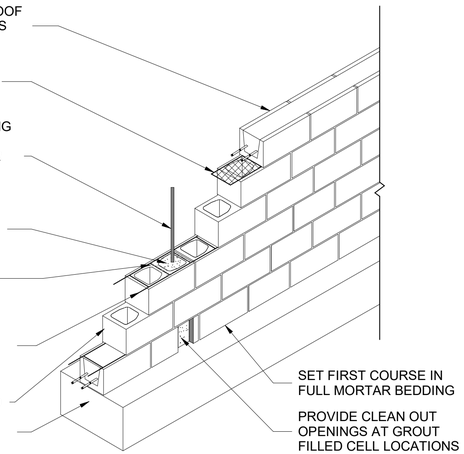
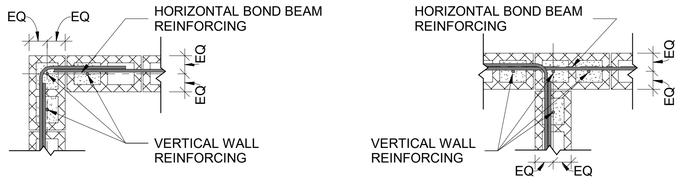


1 TYPICAL MASONRY CONSTRUCTION DETAIL

3/4" = 1'-0"

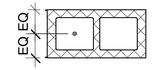


NOTES:

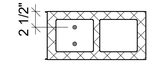
1. INTERMEDIATE HORIZONTAL BOND BEAM REINFORCING SHALL TERMINATE AT CMU CONTROL JOINTS. REINFORCING FOR BOND BEAMS AT TOP OF WALLS SHALL BE CONTINUOUS.
2. HORIZONTAL BARS SHALL BE ANCHORED AROUND VERTICAL BARS WITH A STANDARD HOOK.

2 TYPICAL CMU WALL REINFORCING DETAIL

3/4" = 1'-0"



SINGLE REINF IN 8" CMU



DOUBLE REINF IN 8" CMU

NOTES:

ALL CELLS WITH REBAR SHALL BE FILLED WITH GROUT.

BARS SHALL BE LOCATED WITH REBAR POSITIONERS AND SHALL BE ACCURATELY LOCATED PRIOR TO INSTALLATION OF GROUT.

LAP REBAR PER ACI 530.

3 CMU WALL REINFORCING DETAIL

1" = 1'-0"

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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 - BUILDING

LATRINE ENCLOSURE MASONRY DETAILS

SHEET ID
BLDG 7
SB510

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CONCRETE MASONRY WALL SCHEDULE			
MARK	WALL THICKNESS	WALL REINFORCING	
		VERTICAL	HORIZONTAL
W1	8"	#5 @ 16" OC	W1.7 @ 16" OC

WALL FOOTING SCHEDULE				
MARK	DIMENSIONS		REINFORCING (TOP & BOTTOM)	
	WIDTH	DEPTH	LONGITUDINAL	TRANSVERSE
WF4	4' - 0"	1' - 6"	(5) #5 BOT	#5 @ 12" OC

FOOTING REINFORCEMENT DIAGRAM

CONCRETE REINFORCING BAR DEVELOPMENT AND SPLICE LENGTH SCHEDULE (F'c = 4000 PSI)					
BAR SIZE	OTHER BARS		TOP/HORIZ BARS		HOOKED BARS
	Ld	SPLICE	Ld	SPLICE	Ldh
#3	15	19	19	25	6
#4	19	25	25	33	7
#5	24	31	31	41	9
#6	29	37	37	49	10
#7	42	54	54	71	12
#8	47	62	62	81	14
#9	54	70	70	91	15

NOTES:
1. LENGTHS SHOWN IN THIS SCHEDULE SHALL BE USED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
2. LENGTHS SHOWN IN THIS SCHEDULE ARE BASED ON CLASS B TENSION LAP SLICES FOR NORMAL WEIGHT CONCRETE STRENGTH AND GRADE 60 (Fy = 60,000 PSI) REINFORCING STEEL WITH CONCRETE COVER AND SPACING AS DEFINED IN CONCRETE SECTION OF GENERAL NOTES ON SHEET S-001 AND ACI 318-14, SECTION 25.
3. Ld = TENSION DEVELOPMENT/EMBEDMENT LENGTH FOR STRAIGHT BARS.
4. Ldh = TENSION DEVELOPMENT/EMBEDMENT LENGTH FOR HOOKED BARS.
5. LAP SPLICES SHALL BE WIRED IN CONTACT.
6. TOP BARS ARE HORIZONTAL BARS IN BEAMS, FOOTINGS, SLABS, AND WALLS WHERE MORE THAN 12" OF FRESH CONCRETE IS CAST BELOW THE BAR.
7. ALL TABULATED VALUES ARE IN INCHES.
8. MULTIPLY VALUES BY 1.3 FOR LIGHTWEIGHT CONCRETE

CMU REINFORCING SPLICE LENGTH SCHEDULE (f'm = 2500 PSI)		
BAR SIZE	REINFORCEMENT IN CENTER OF WALL	REINFORCEMENT OFF-CENTER 2-in MASONRY COVER
	8-in CMU	8-in CMU
	SPLICE LENGTH	SPLICE LENGTH
#3	12	15
#4	16	24
#5	24	35
#6	36	64
#7	48	NP
#8	73	NP
#9	NP	NP

NOTES:
1. LENGTHS SHOWN IN THIS SCHEDULE ARE IN INCHES AND SHALL BE USED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
2. LAPPED BARS SHALL BE WIRE TIED TO THE GREATEST EXTENT POSSIBLE.
3. REINFORCING MAY BE CONSIDERED TO BE SPLICED WHEN PLACED IN ADJACENT GROUTED CELLS AND IF THE BARS ARE SPACED NO FARTHER APART THAN 1/5 THE REQUIRED LENGTH INDICATED OR 8" MAX.
4. VERTICAL REINFORCEMENT SHALL BE HELD IN PLACE USING BAR POSITIONERS AS REQUIRED IN GENERAL NOTES AND SPECIFICATIONS.

1 CONCRETE WALL FOOTING SCHEDULE
NOT TO SCALE

2 REBAR SPLICE LENGTH SCHEDULES
NOT TO SCALE

US Army Corps of Engineers ®

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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTI-PURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 - BUILDING

LATRINE ENCLOSURE FOUNDATION AND SPLICE LENGTH SCHEDULES

SHEET ID
BLDG 7
SB601

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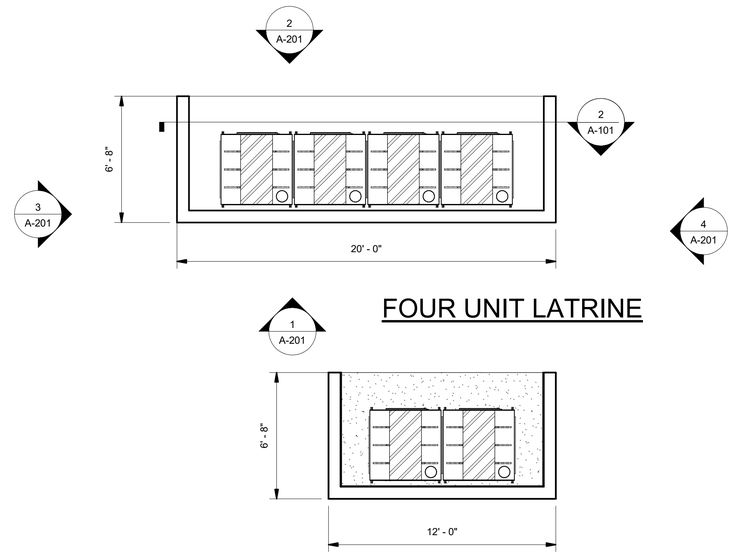


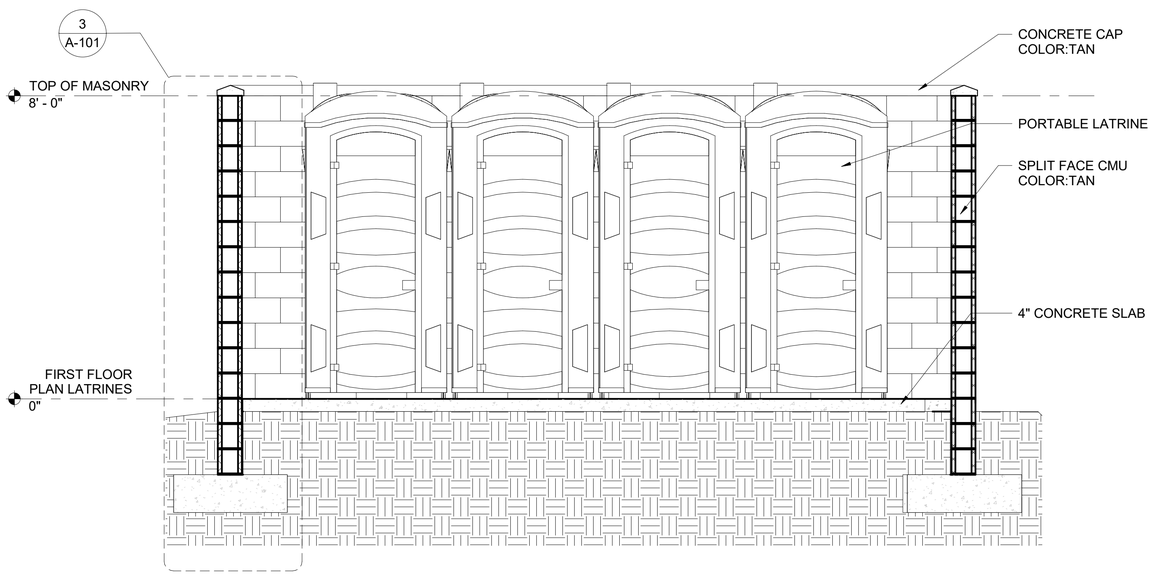
FOUR UNIT LATRINE

TWO UNIT LATRINE

1 FIRST FLOOR PLAN

1/4" = 1'-0"

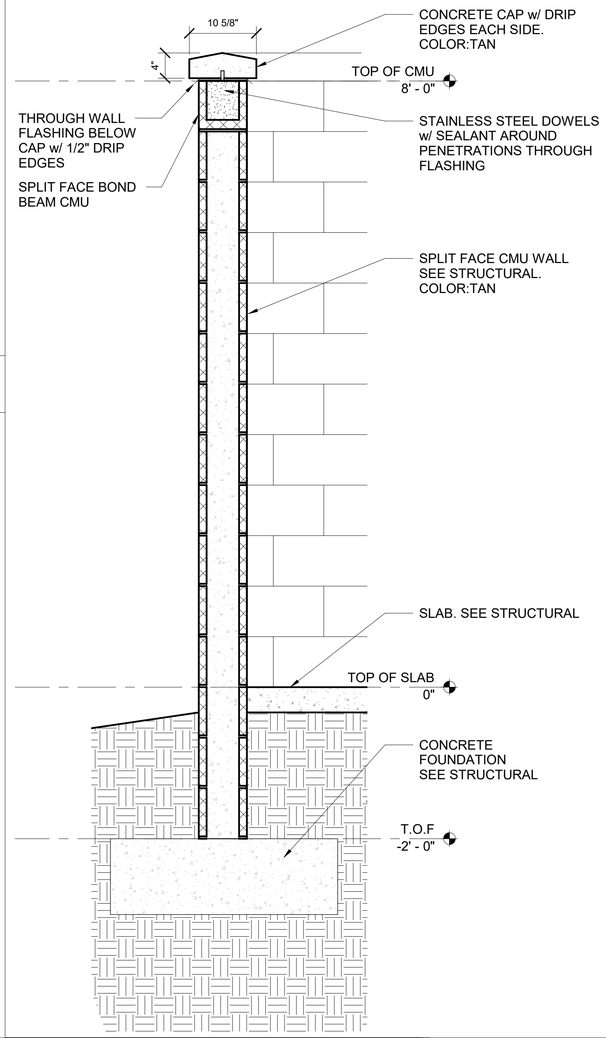
SCALE: 1/4"=1'-0"



2 4 UNIT CROSS SECTION

1/2" = 1'-0"

SCALE: 1/2"=1'-0"



3 WALL SECTION DETAIL

1" = 1'-0"

SCALE: 1"=1'-0"

GENERAL SHEET NOTES

1. EXTERIOR DIMENSIONS ARE FROM FACE OF SPLIT FACE BLOCK
2. SEE CIVIL DRAWINGS FOR FINISHED FLOOR AND FINISHED GRADE ELEVATIONS. SEE STRUCTURAL DRAWINGS FOR FOUNDATION PLANS AND FLOOR SLABS.

NORTH ARROW

SEE CIVIL FOR LOCATION AND ORIENTATION OF ALL LATRINES

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T. ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: M. DEACON	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
100 W. OGLETHORPE AVE.
SAVANNAH, GA 31401

FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 96182
VOLUME 2 -LATRINE ENCLOSURE, BUILDING 5

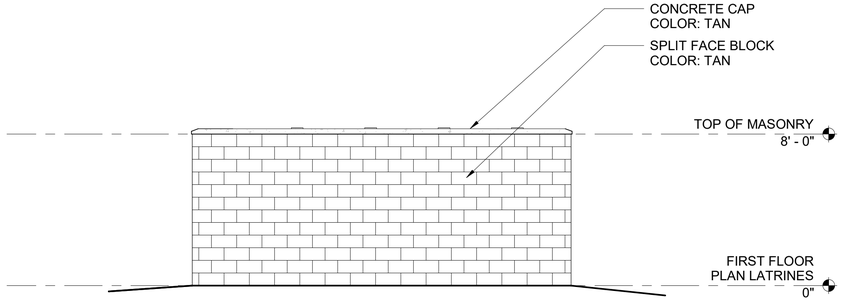
LATRINE ENCLOSURE FIRST FLOOR PLAN

SHEET ID
BLDG 7
A-101

READY TO ADVERTISE (RTA)

Plot Date: 11/28/2023 12:03:54 PM

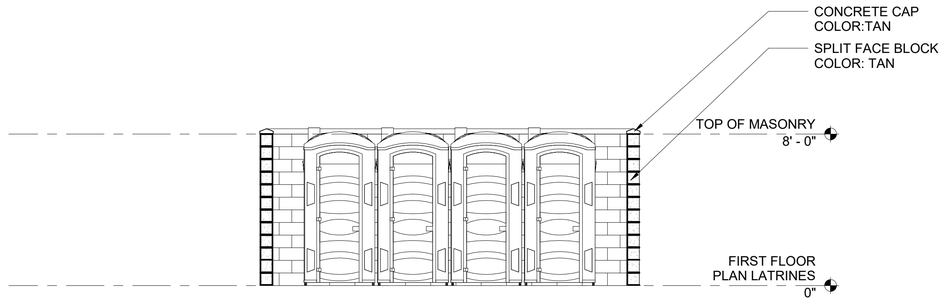
File Path: C:\Users\K6ENXT09\Documents\FY23_PN96182_MPTR-LATRINES_ARCH_R21_K6ENXT09.rvt



1 SOUTH LATRINE ELEVATION

1/4" = 1'-0"

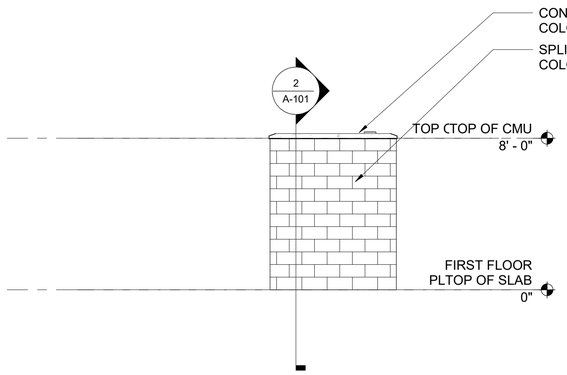
SCALE: 1/4"=1'-0"



2 NORTH LATRINE ELEVATION

1/4" = 1'-0"

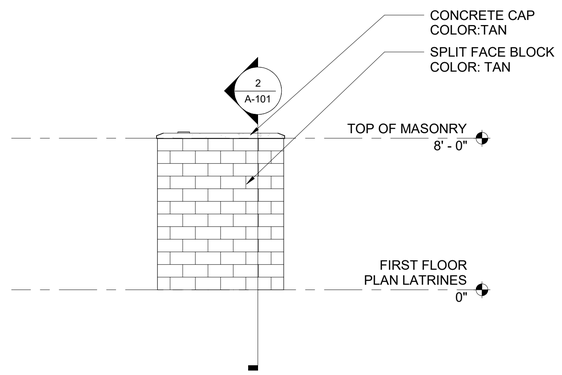
SCALE: 1/4"=1'-0"



3 WEST LATRINE ELEVATION

1/4" = 1'-0"

SCALE: 1/4"=1'-0"



4 EAST LATRINE ELEVATION

1/4" = 1'-0"

SCALE: 1/4"=1'-0"

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGN BY: T. ODELL	ISSUE DATE: NOVEMBER 2023
DRAWN BY: T. ODELL	SOLICITATION NO.: W912HN-24-B-3002
CHECKED BY: P. SULLIVAN	CONTRACT NO.:
SUBMITTED BY: J. DEACON	CATEGORY CODE: 178-65-01
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FORT LIBERTY, NORTH CAROLINA
AUTOMATED MULTIPURPOSE TRAINING RANGE (MPTR)
FY23, PN 86182
VOLUME 2 -LATRINE ENCLOSURE, BUILDING 5

LATRINE ENCLOSURE EXTERIOR ELEVATIONS

SHEET ID
BLDG 7
A-201

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Plot Date: 11/28/2023 12:03:54 PM

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