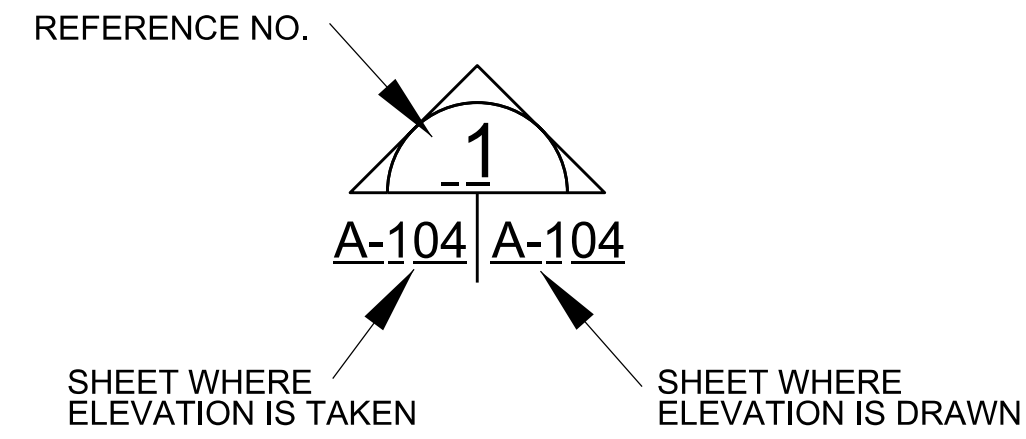


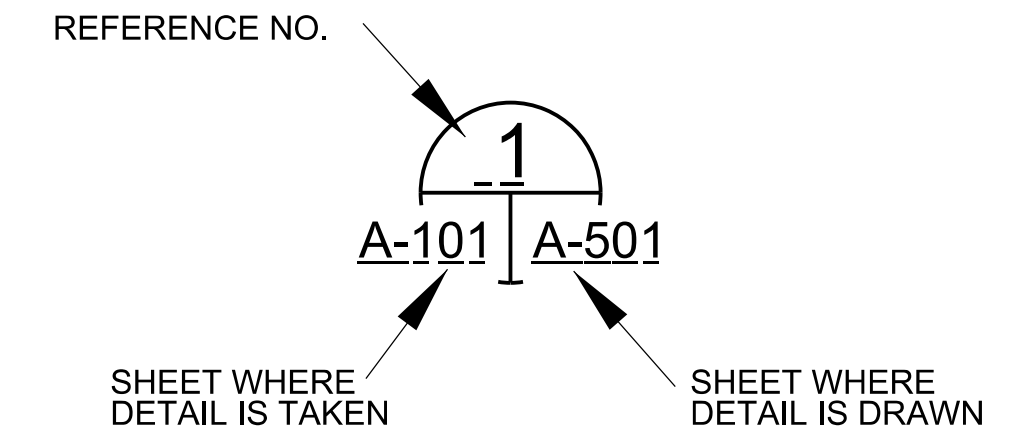
GENERAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
ALUM	ALUMINUM
APPROX	APPROXIMATELY
BLDG	BUILDING
BOTT	BOTTOM
BRG	BEARING
CIP	CAST-IN-PLACE
CJ	CONTROL JOINT
CL	CENTER LINE
CMU	CONCRETE MASONRY UNIT
CP	CENTER POINT
COL	COLUMN
COORD	COORDINATE
CONC	CONCRETE
CONT	CONTINUE, CONTINUOUS
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
EA	EACH
ELEV	ELEVATION
EF	EACH FACE
EJ	EXPANSION JOINT
EQ	EQUAL
E.W.	EACH WAY
(E) OR EXIST	EXISTING
EXT	EXTERIOR
FTG	FOOTING
FV	FIELD VERIFY
GALV	GALVANIZED
HD	HEADED
HT	HEIGHT
INT	INTERIOR
ID	INSIDE DIAMETER
LLH	LONG-LEG HORIZONTAL
LLV	LONG-LEG VERTICAL
MIN	MINIMUM
MANF	MANUFACTURER
NTS	NOT TO SCALE
O.C.	ON CENTER
OD	OUTSIDE DIAMETER
OH	OPPOSITE HAND
R	RADIUS
REINF	REINFORCEMENT
REQ'D	REQUIRED
SF	SQUARE FEET
SHT	SHEET
SIM	SIMILAR
SOG	SLAB-ON-GRADE
STIFF	STIFFENER
TYP	TYPICAL
UNO	UNLESS OTHERWISE NOTED
VIF	VERIFY IN FIELD
WWF	WELDED WIRE FABRIC
WWR	WELDED WIRE REINFORCEMENT
W/	WITH
WP	WORKING POINT

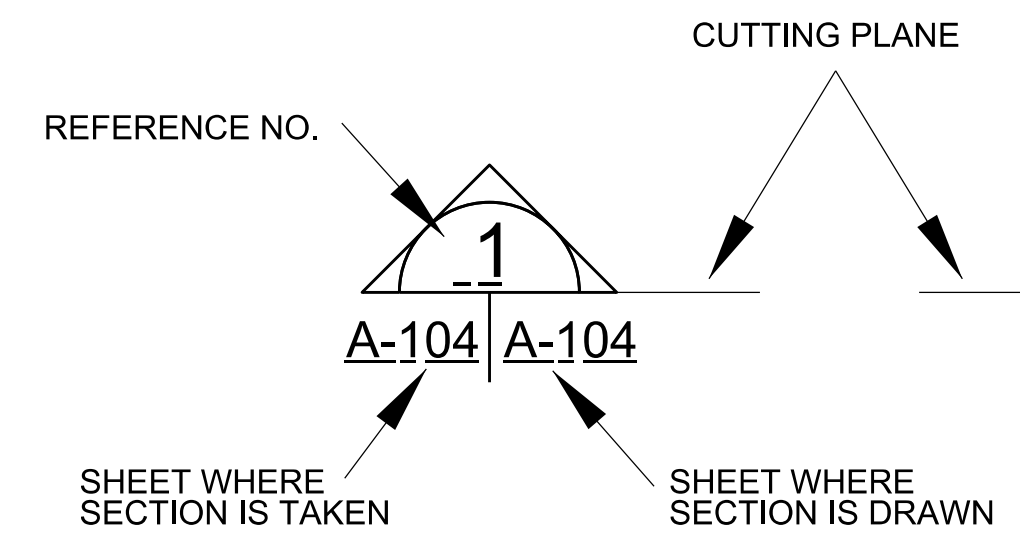
DRAWING SYMBOLS



ELEVATION REFERENCE



DETAIL REFERENCE



SECTION CUT

DRAWING INDEX

DISCIPLINE	SHEET NO.	SHEET REF. NO.	DRAWING CODE	SHEET TITLE	
GENERAL	G-001	1	XXXXXX	COVER SHEET	
	G-002	2	XXXXXX	INDEX, SYMBOLS, & ABBREVIATIONS	
	S-001	3	XXXXXX	GENERAL NOTES	
STRUCTURAL	S-101	4	XXXXXX	FOUNDATION PLAN	
	S-102	5	XXXXXX	ROOF FRAMING PLAN	
	S-201	6	XXXXXX	ELEVATIONS	
	S-202	7	XXXXXX	ELEVATIONS	
	S-301	8	XXXXXX	BUILDING SECTION	
	S-302	9	XXXXXX	BUILDING SECTION	
	S-303	10	XXXXXX	SECTIONS	
	S-501	11	XXXXXX	TYPICAL DETAILS	
	S-701	12	XXXXXX	DOOR FRAME ELEVATION & DETAILS	
	S-701 (A)	13	XXXXXX	DOOR FRAME ELEVATION & DETAILS	
	S-702	14	XXXXXX	DOOR ELEVATIONS	
	S-702 (A)	15	XXXXXX	DOOR ELEVATIONS	
	S-703	16	XXXXXX	DOOR SECTIONS	
	S-703 (A)	17	XXXXXX	DOOR SECTIONS	
	S-704	18	XXXXXX	DOOR DETAILS	
	S-704 (A)	19	XXXXXX	DOOR DETAILS	
	S-705	20	XXXXXX	HIGH SECURITY HASP	
	S-705 (A)	21	XXXXXX	INTERNAL LOCKING DEVICES	
	ELECTRICAL	E-101	22	XXXXXX	LIGHTNING PROTECTION SYSTEM
		E-102	23	XXXXXX	LIGHTNING PROTECTION SYSTEM
E-103		24	XXXXXX	LIGHTNING PROTECTION SYSTEM	



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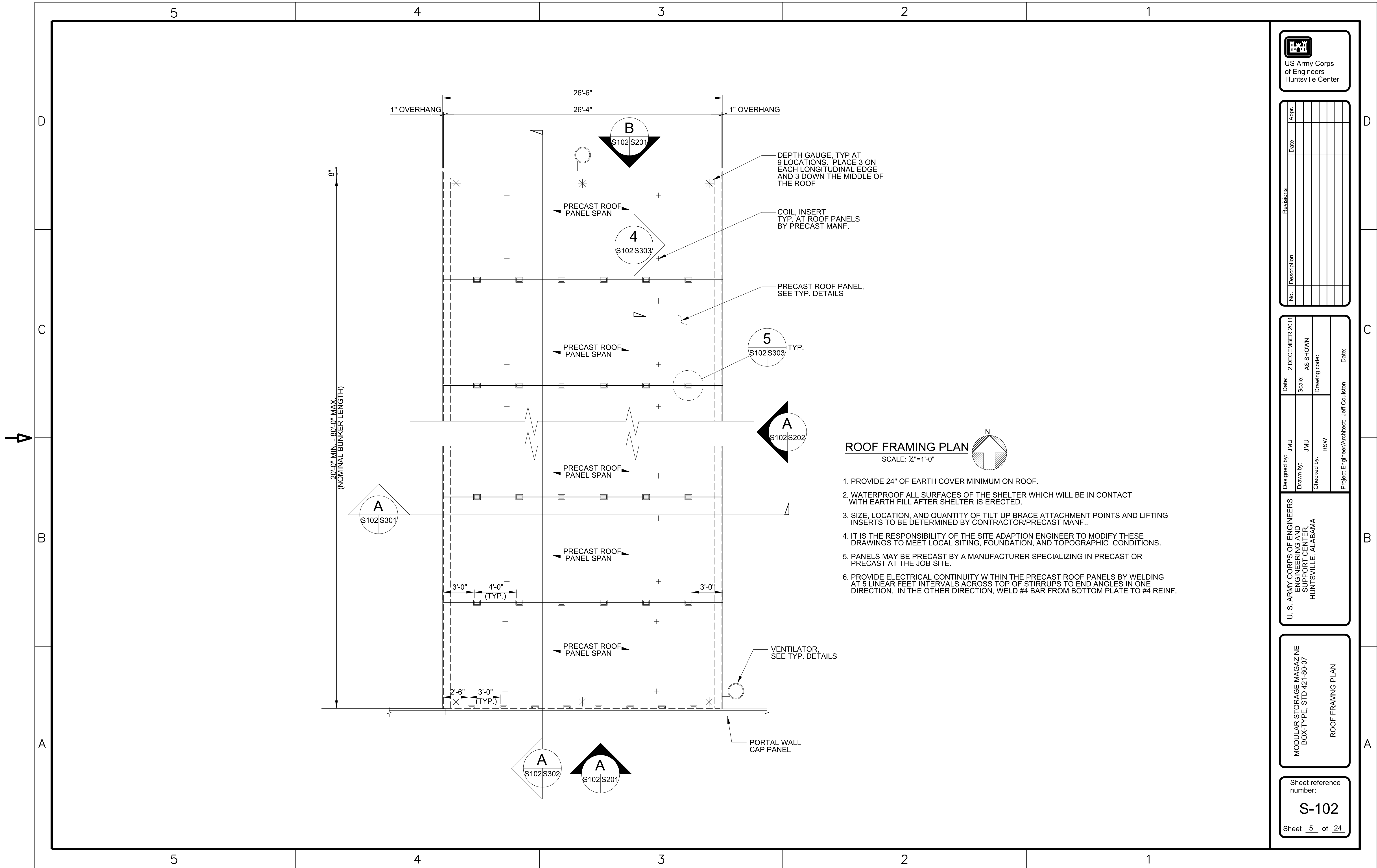
No.	Description	Date	Appr.

Designed by: JMU	Date: 2 DECEMBER 2011
Drawn by: JMU	Scale: AS SHOWN
Checked by: RSW	Drawing code:
Project Engineer/Architect: Jeff Coulston	
Date:	

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MODULAR STORAGE MAGAZINE
BOX-TYPE, STD 421-80-07
INDEX, SYMBOLS, & ABBREVIATIONS

Sheet reference number:
G-002
Sheet 2 of 24



ROOF FRAMING PLAN
SCALE: 1/4"=1'-0"

1. PROVIDE 24" OF EARTH COVER MINIMUM ON ROOF.
2. WATERPROOF ALL SURFACES OF THE SHELTER WHICH WILL BE IN CONTACT WITH EARTH FILL AFTER SHELTER IS ERECTED.
3. SIZE, LOCATION, AND QUANTITY OF TILT-UP BRACE ATTACHMENT POINTS AND LIFTING INSERTS TO BE DETERMINED BY CONTRACTOR/PRECAST MANF..
4. IT IS THE RESPONSIBILITY OF THE SITE ADAPTION ENGINEER TO MODIFY THESE DRAWINGS TO MEET LOCAL SITING, FOUNDATION, AND TOPOGRAPHIC CONDITIONS.
5. PANELS MAY BE PRECAST BY A MANUFACTURER SPECIALIZING IN PRECAST OR PRECAST AT THE JOB-SITE.
6. PROVIDE ELECTRICAL CONTINUITY WITHIN THE PRECAST ROOF PANELS BY WELDING AT 5 LINEAR FEET INTERVALS ACROSS TOP OF STIRRUPS TO END ANGLES IN ONE DIRECTION. IN THE OTHER DIRECTION, WELD #4 BAR FROM BOTTOM PLATE TO #4 REINF.



No.	Description	Date	Appr.

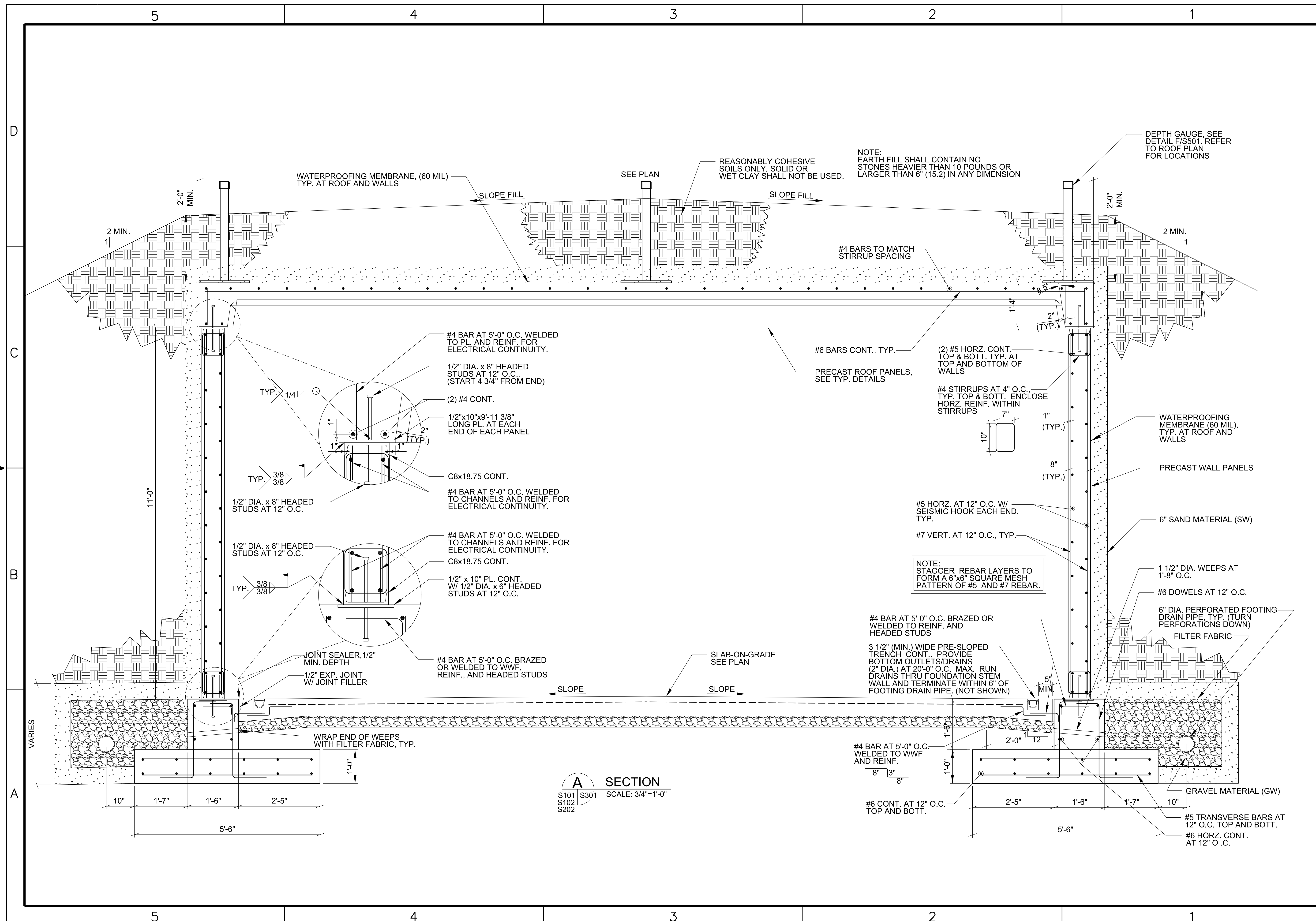
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Drawn by: JMU	Scale: AS SHOWN
Checked by: RSW	Drawing code:
Project Engineer/Architect: Jeff Coulston Date:	

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MODULAR STORAGE MAGAZINE
BOX-TYPE, STD 421-80-07
ROOF FRAMING PLAN

Sheet reference number:
S-102
Sheet 5 of 24

STANDARD DESIGN DRAWINGS - FINAL



A SECTION
 S101 S301 SCALE: 3/4"=1'-0"
 S102 S202



No.	Description	Date	Appr.

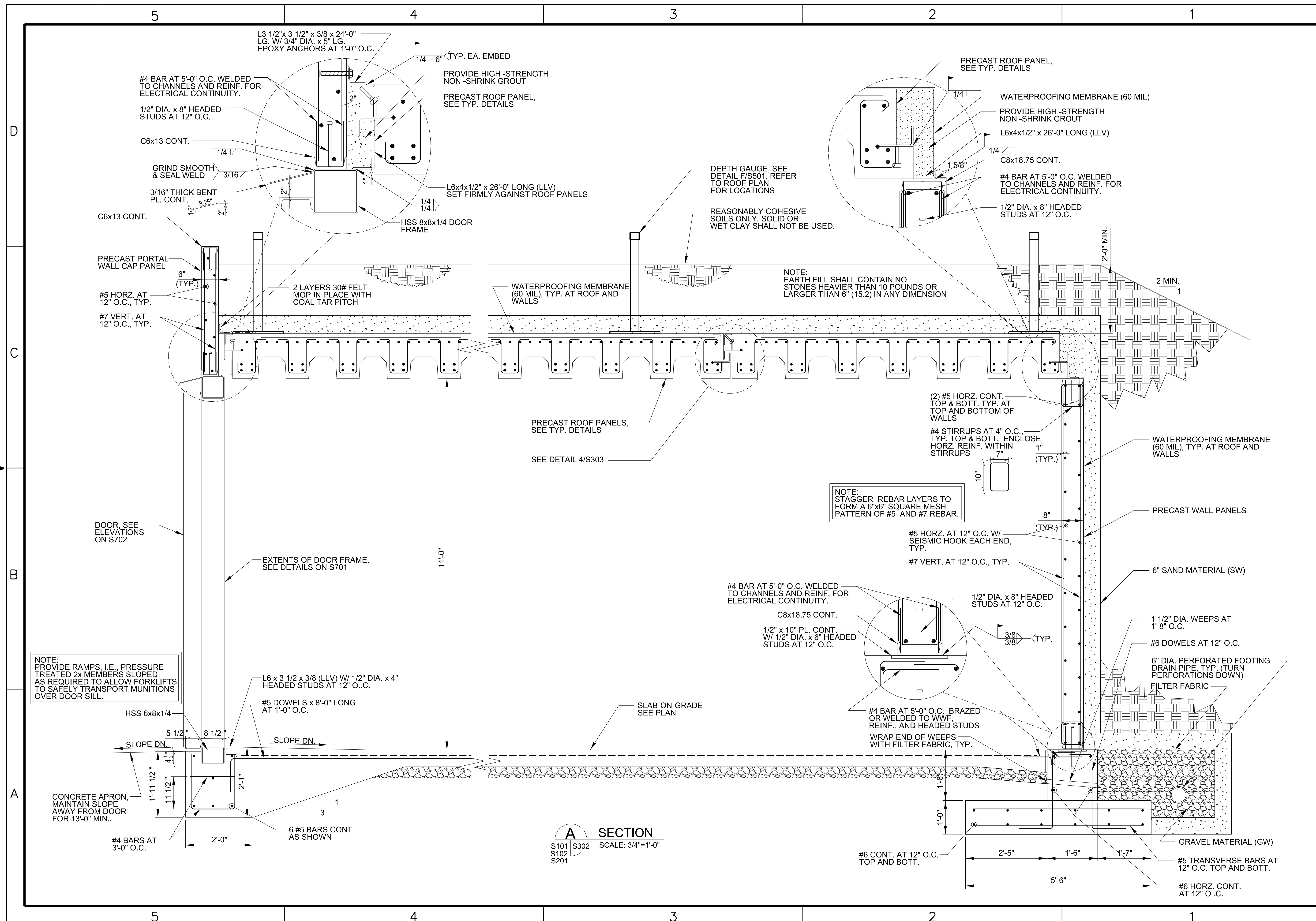
Date:	2 DECEMBER 2011
Scale:	AS SHOWN
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Designed by:	JMU
Drawn by:	JMU
Checked by:	RSW
Project Engineer/Architect:	Jeff Coulston
Date:	

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 BUILDING SECTION

Sheet reference number:
S-301
 Sheet 8 of 24

STANDARD DESIGN DRAWINGS - FINAL



No.	Description	Revisions	Date	Appr.

Designed by: JMU	Date: 2 DECEMBER 2011
Drawn by: JMU	Scale: AS SHOWN
Checked by: RSW	Drawing code:
Project Engineer/Architect: Jeff Coulston	Date:

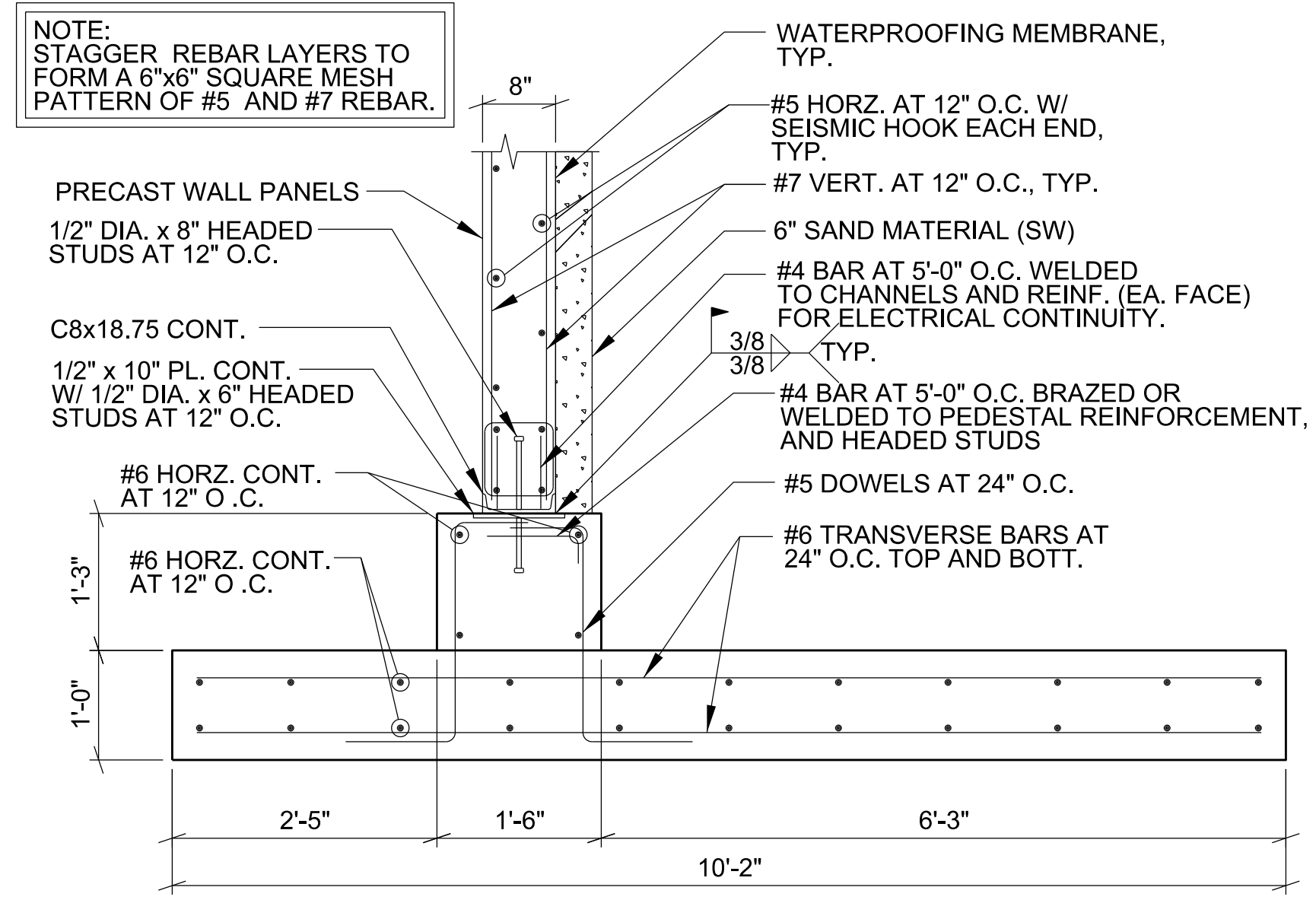
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BOX-TYPE, STD 421-80-07
BUILDING SECTION

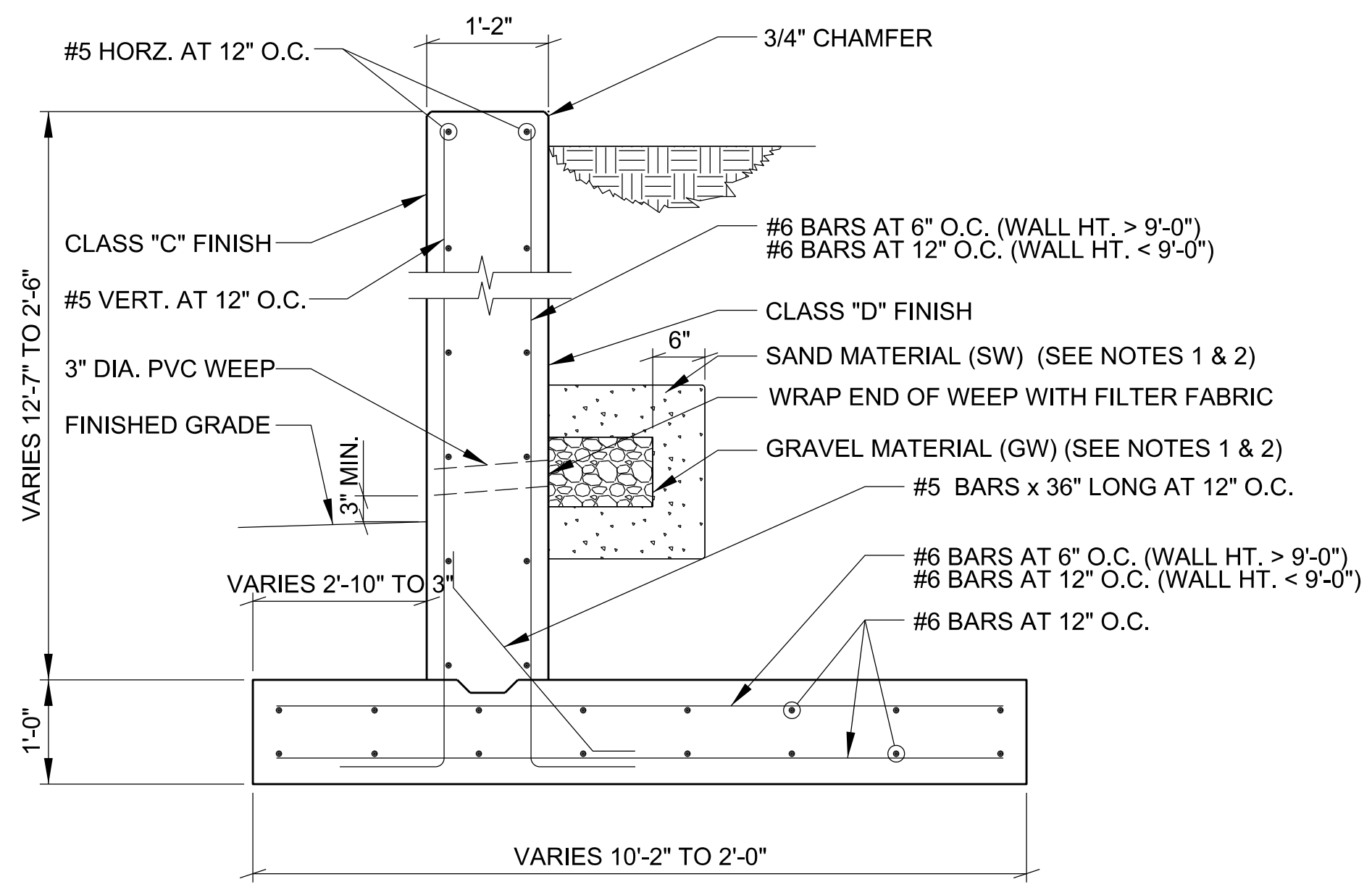
Sheet reference number:
S-302
Sheet 9 of 24

A SECTION
SCALE: 3/4"=1'-0"
S101 S302
S102 S201

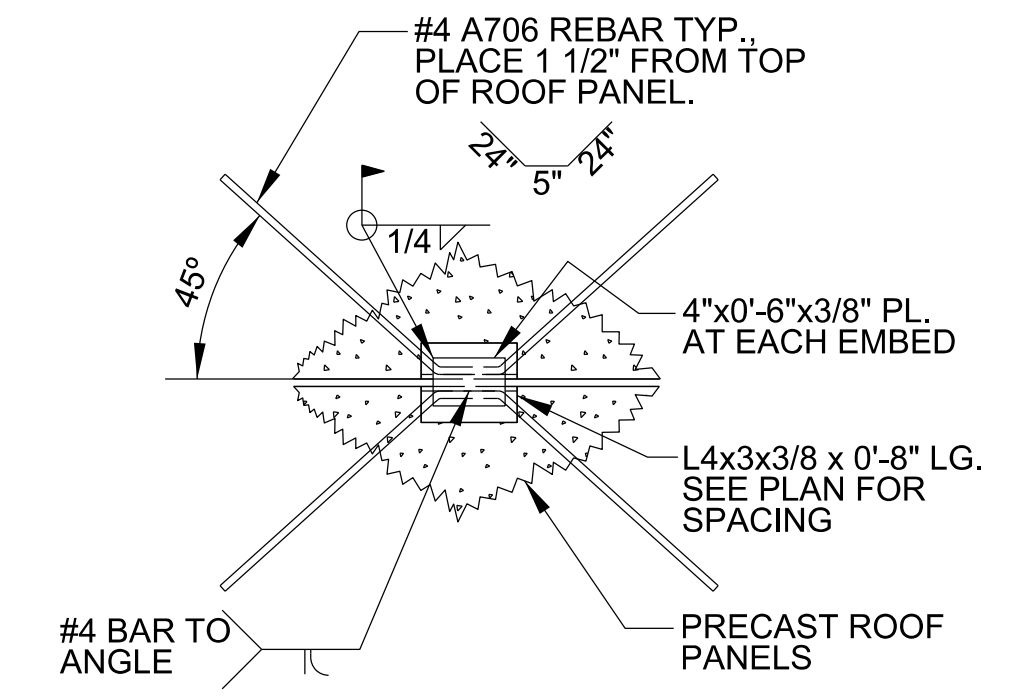
NOTE:
STAGGER REBAR LAYERS TO FORM A 6"x6" SQUARE MESH PATTERN OF #5 AND #7 REBAR.



A SECTION
S101 S303 S201 SCALE: 3/4"=1'-0"



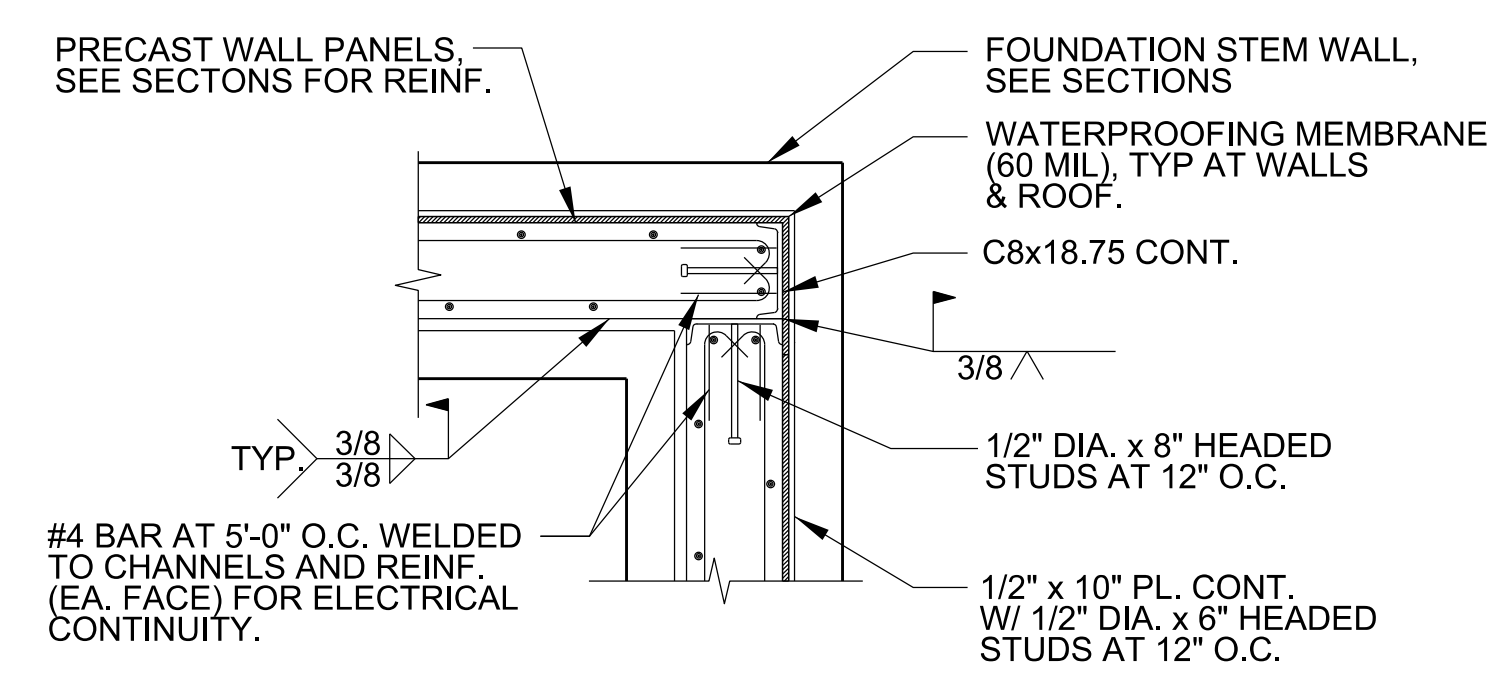
B SECTION
S101 S303 S201 SCALE: 3/4"=1'-0"



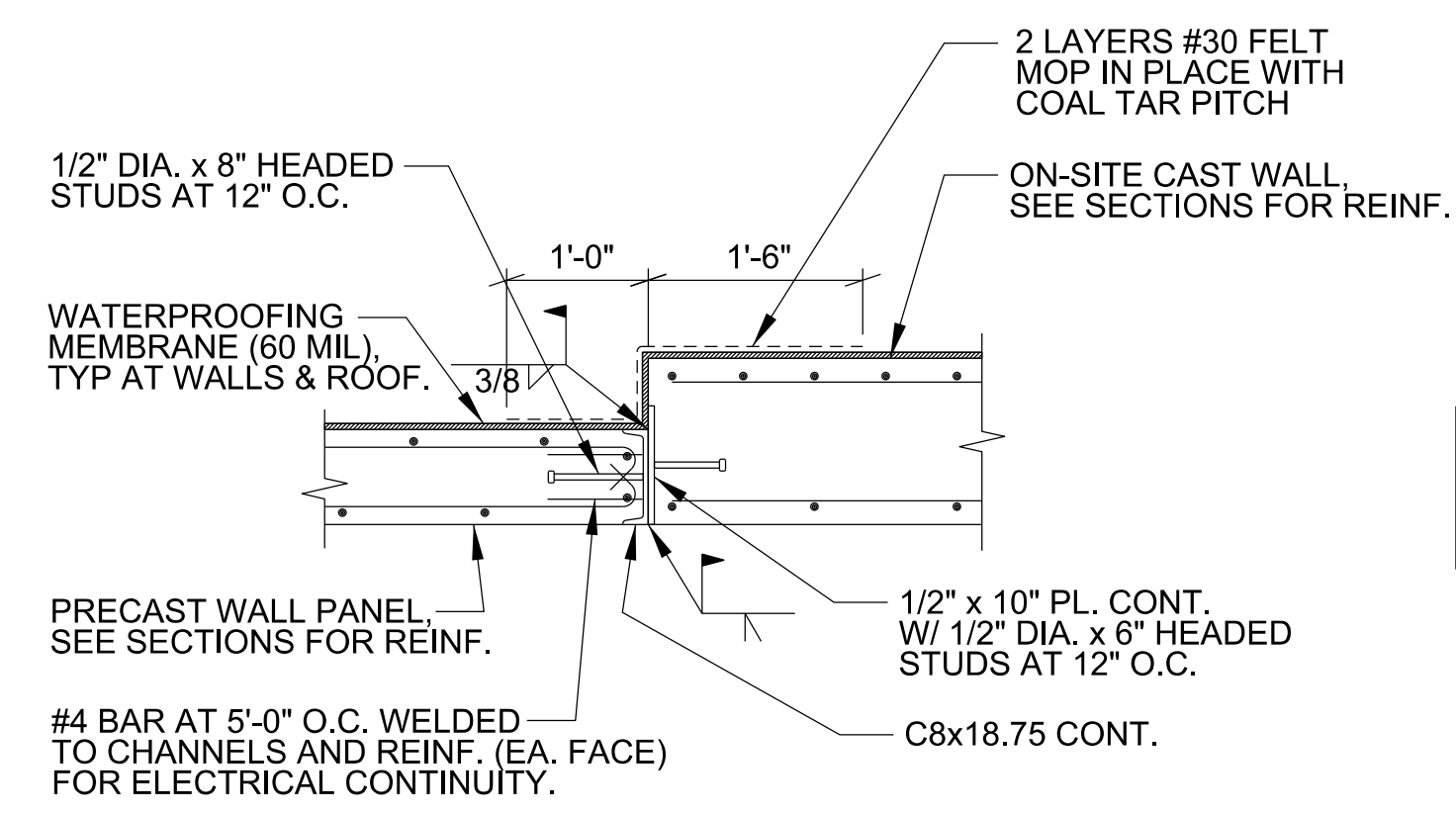
5 DETAIL
S102 S303 SCALE: 3/4"=1'-0"

NOTES:

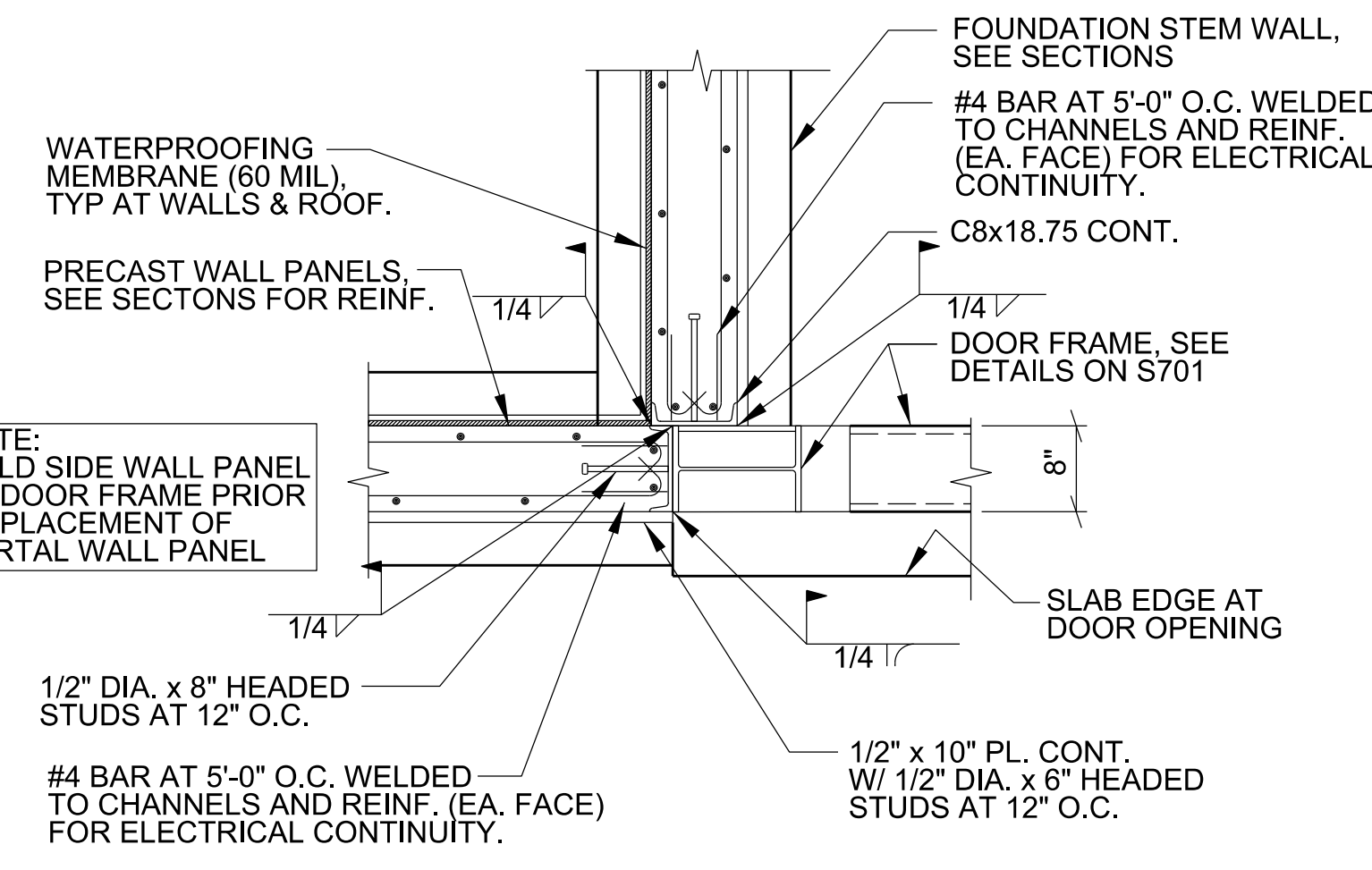
1. THE SAND AND GRAVEL MATERIALS SHOWN IN THE SECTIONAL VIEW THROUGH WING WALL SHOULD BE TERMINATED AT THE POINT WHERE THE WING WALL HEIGHT IS INSUFFICIENT TO MAINTAIN THE 2'-3" COHESIONLESS FILL MATERIAL. PLACE COVER OVER AT LEAST 6" OF SAND MATERIAL. PAST THIS POINT, AN ADDITIONAL 6" OF SAND MATERIAL SHOULD BE ADDED TO "CLOSE IN" THE END OF GRAVEL MATERIAL.
2. AS AN OPTION, DEPENDING ON THE SITE SPECIFIC CONDITIONS, THE WEEPHOLES THROUGH THE WING WALLS MAY BE REPLACED WITH PERFORATED PIPE DRAINS PLACED IN THE GRAVEL MATERIAL RUNNING LATERALLY BEHIND THE WING WALLS AND PORTAL WALL PANELS AND CONNECTED TO THE PERIMETER FOOTING DRAIN.



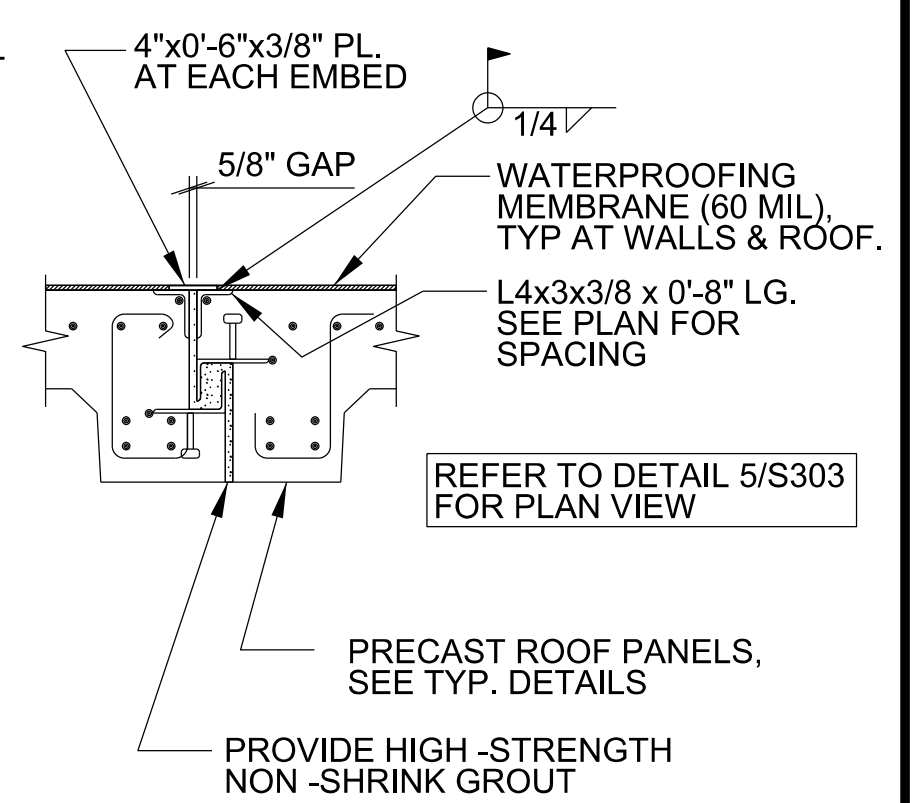
1 DETAIL
S101 S303 SCALE: 3/4"=1'-0"



2 DETAIL
S101 S303 SCALE: 3/4"=1'-0"



3 DETAIL
S101 S303 SCALE: 3/4"=1'-0"



4 DETAIL
S102 S303 S202 S302 SCALE: 3/4"=1'-0"



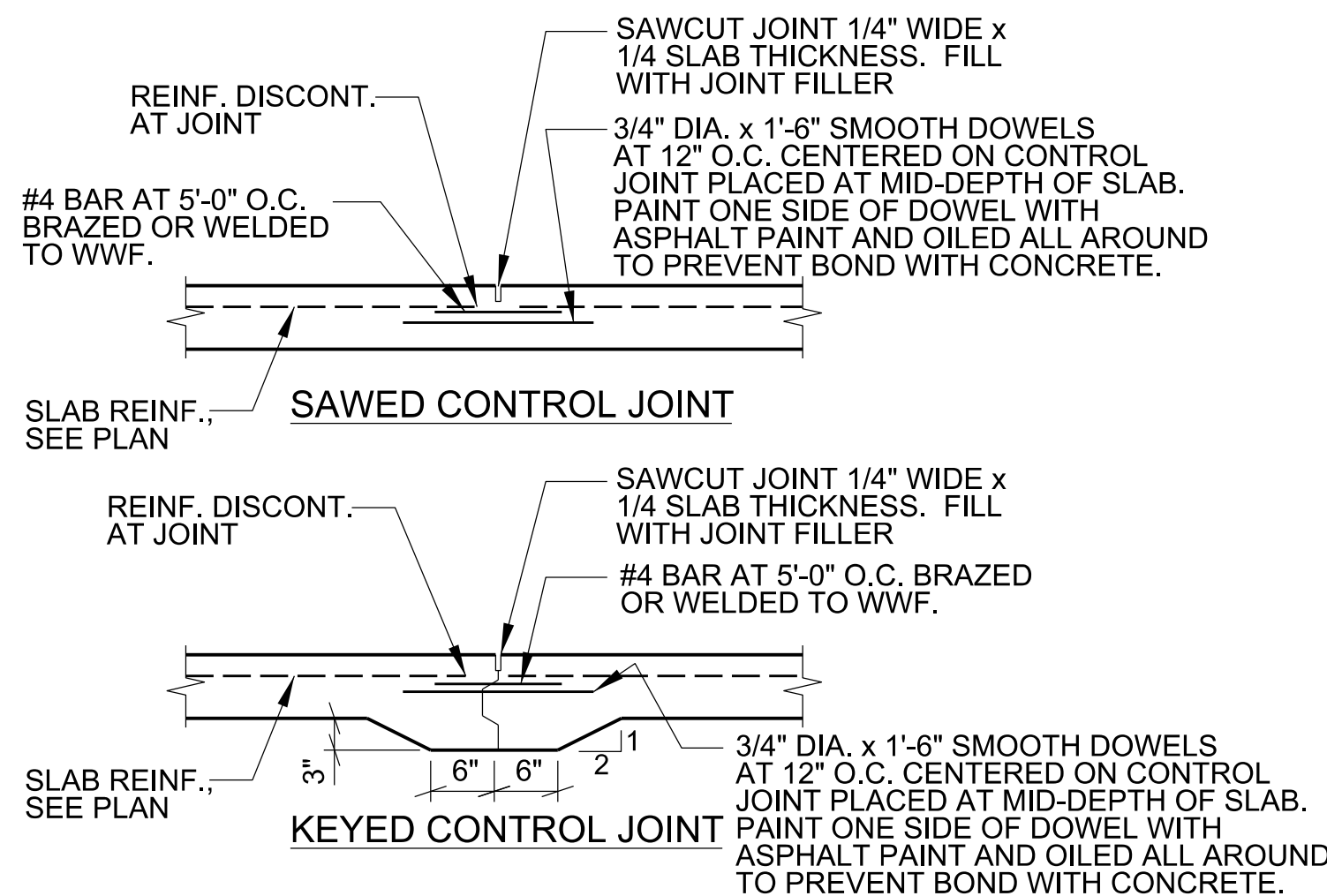
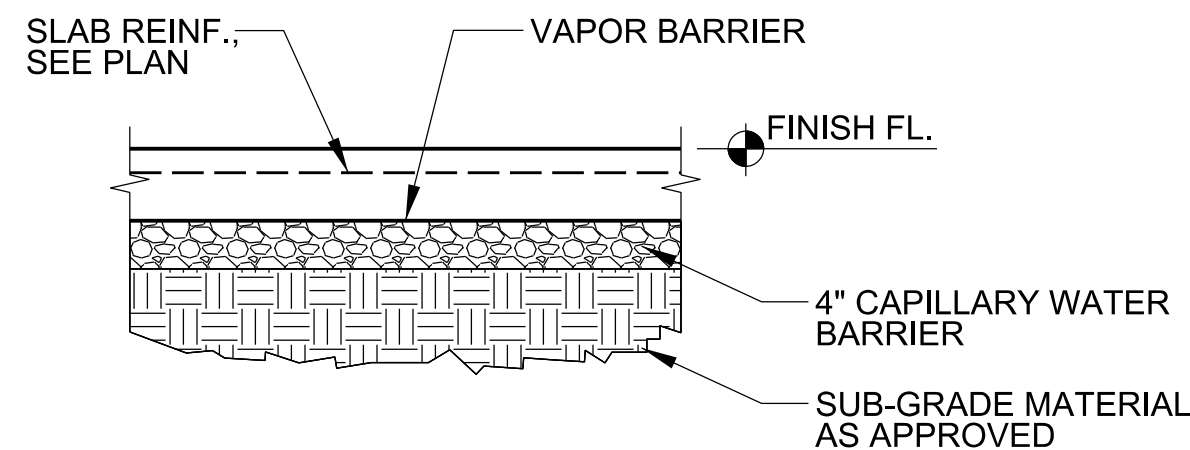
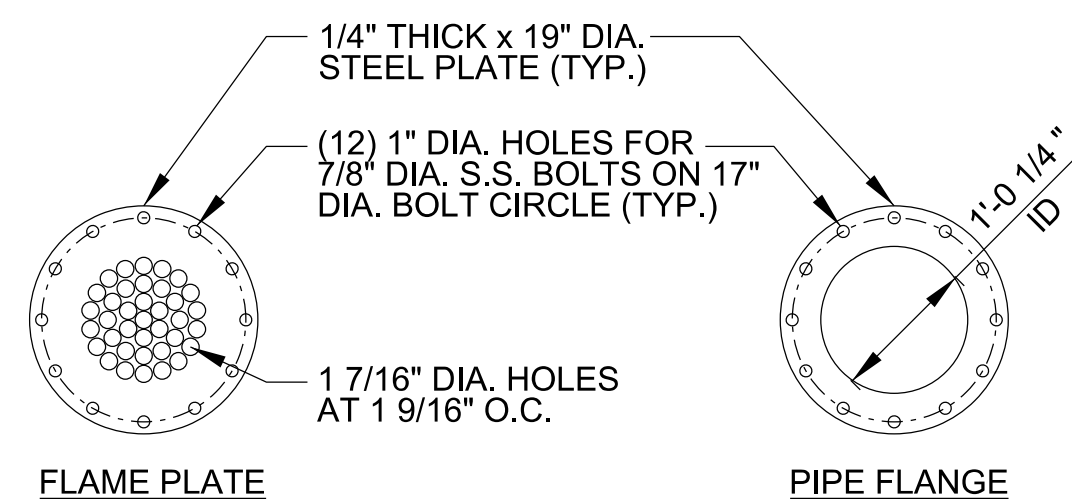
No.	Description	Date	Appr.

Date:	2 DECEMBER 2011	Scale:	AS SHOWN	Date:	
Designed by:	JMU	Checked by:	RSW	Project Engineer/Architect:	Jeff Coulston
Drawn by:	JMU	Drawing code:			

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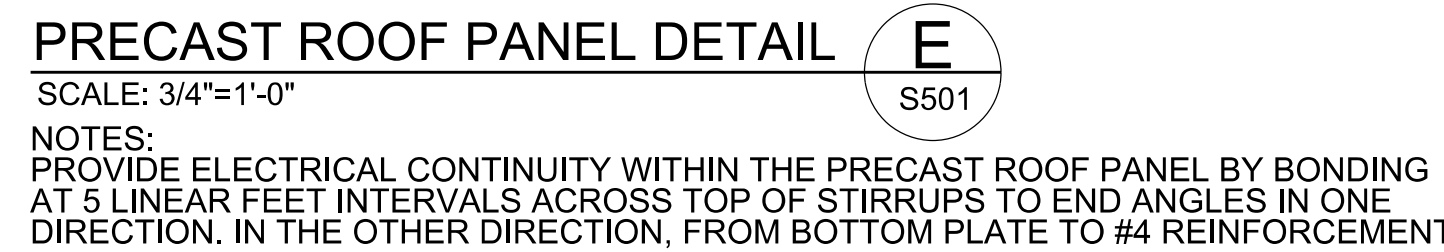
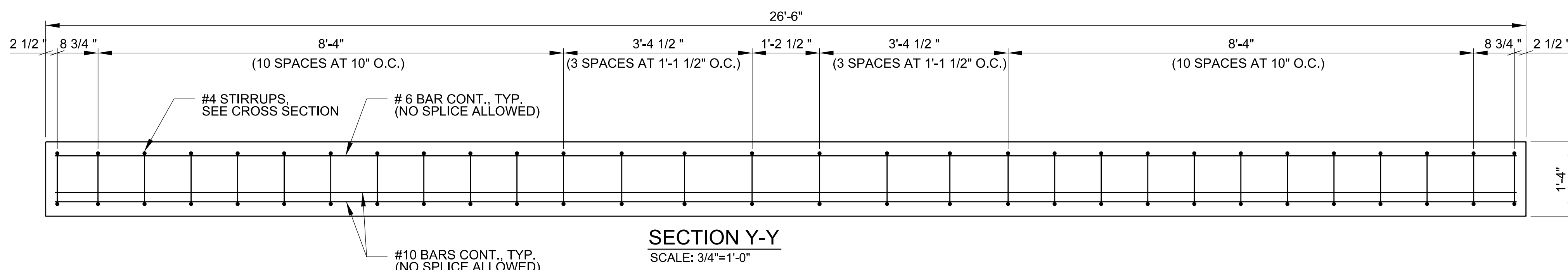
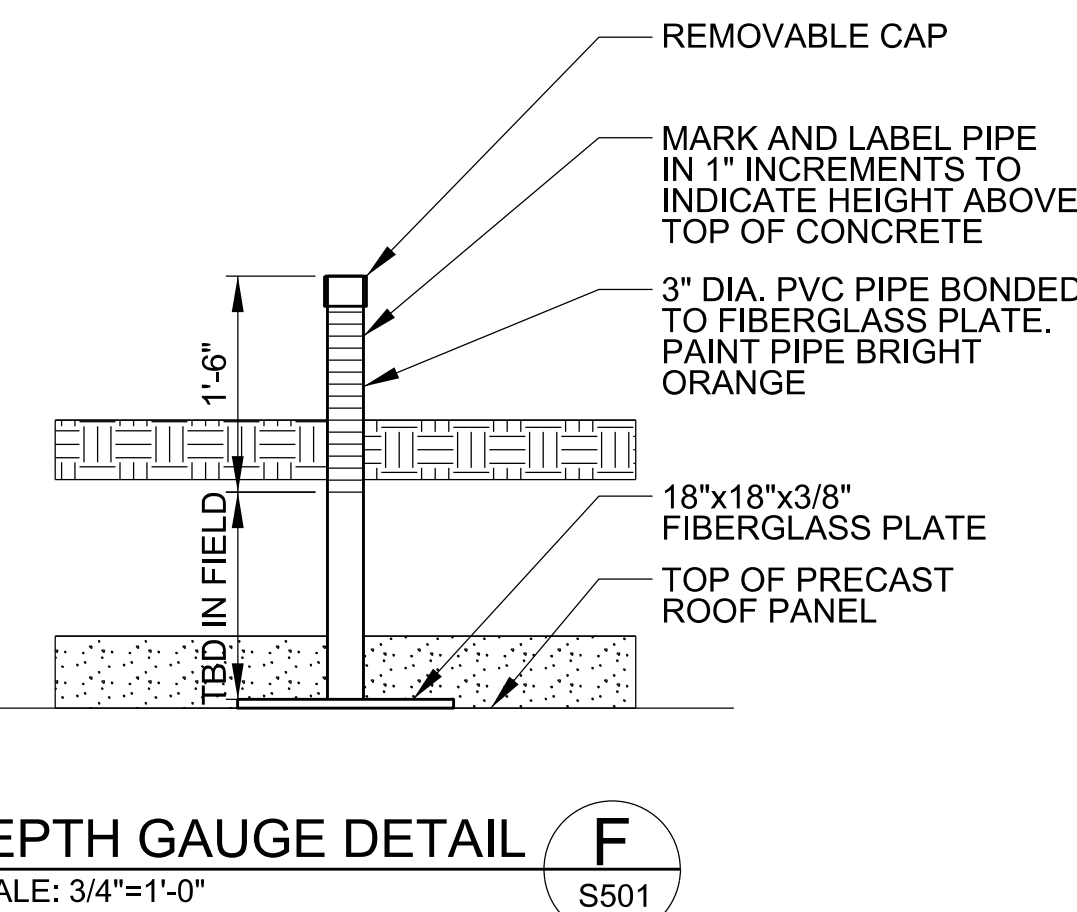
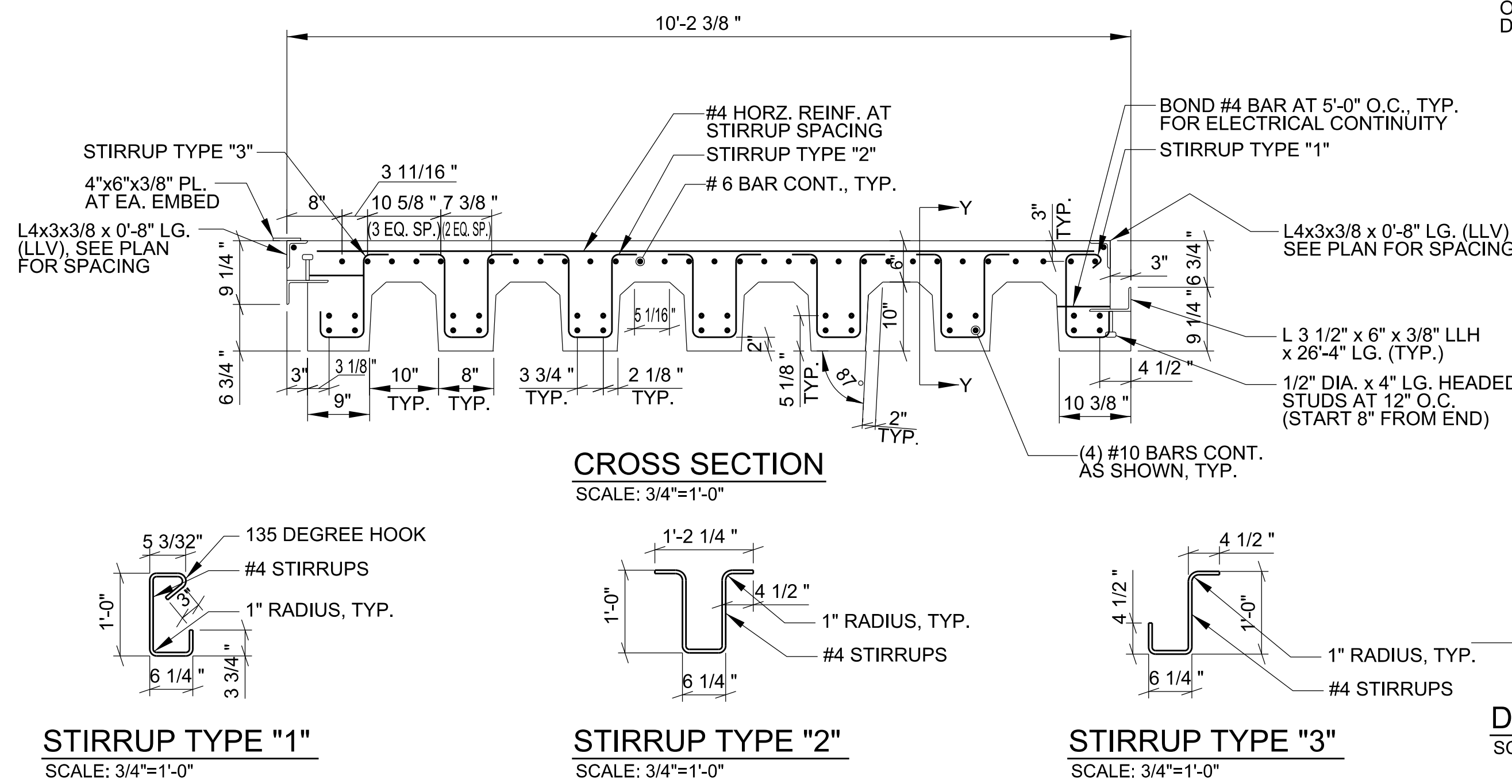
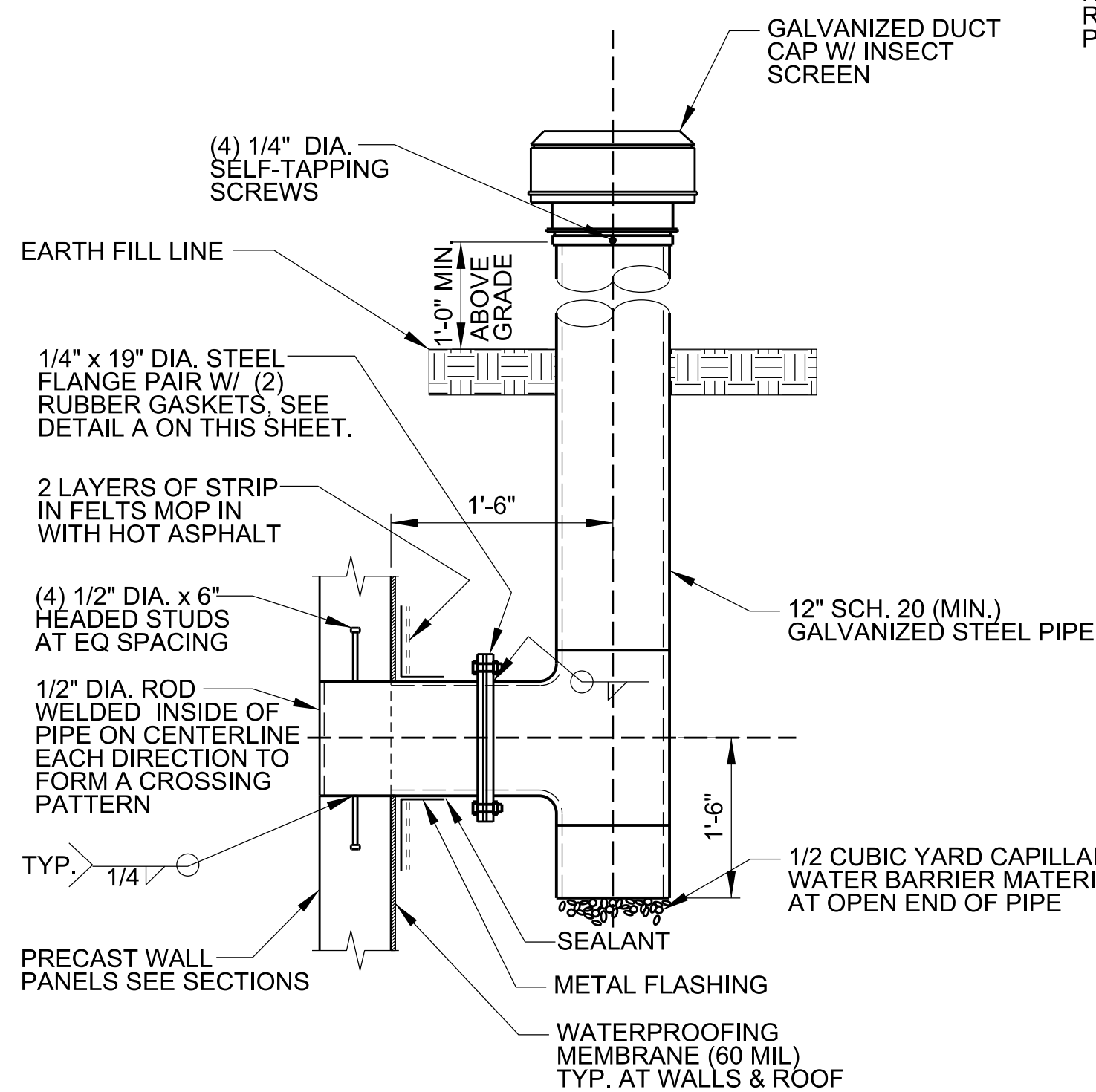
MODULAR STORAGE MAGAZINE
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Sheet reference number:
S-303
Sheet 10 of 24



BAR SIZE	f _c = 4000 PSI				DEVELOPMENT LENGTHS	
	TOP BARS		OTHER BARS		TOP BARS	OTHER BARS
#3	19"	24"	15"	19"	19"	15"
#4	25"	32"	19"	25"	25"	19"
#5	31"	40"	24"	31"	31"	24"
#6	37"	48"	29"	37"	37"	29"
#7	54"	70"	42"	54"	54"	42"
#8	62"	80"	48"	60"	62"	48"
#9	78"	101"	60"	78"	70"	54"
#10	85"	111"	66"	85"	79"	61"

TOP BARS ARE HORIZONTAL REINF. WITH MORE THAN 12" ON CONCRETE CAST BELOW THE REINF.
CONCRETE LAP LENGTHS SHALL BE INCREASED 20 PERCENT WHERE EPOXY COATING IS USED.
WHEN LAPPING TWO DIFFERENT SIZE BARS, USE THE LARGER OF THE LAP SPLICE DIMENSION OF THE SMALLER BAR OR THE DEVELOPMENT LENGTH OF THE LARGER BARS



No.	Description	Date	Appr.

Date:	2 DECEMBER 2011
Scale:	AS SHOWN
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Project Engineer/Architect:	Jeff Coulston
Date:	

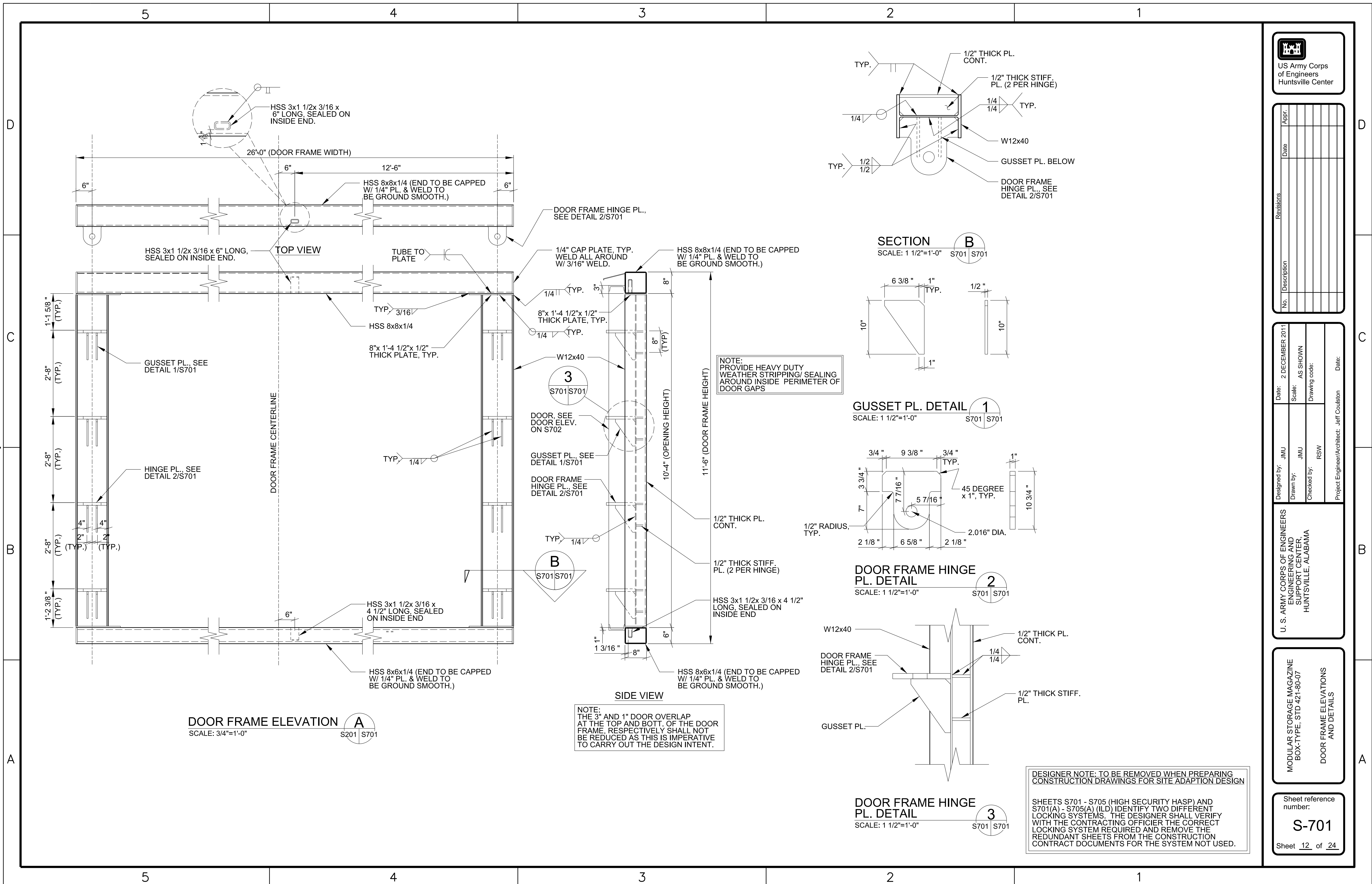
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Drawn by:	JMU
Checked by:	RSW
Project Engineer/Architect:	Jeff Coulston
Date:	

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MODULAR STORAGE MAGAZINE
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TYPICAL DETAILS

Sheet reference number:
S-501
Sheet 11 of 24



No.	Description	Date	Appr.

Date:	2 DECEMBER 2011
Scale:	AS SHOWN
Drawing code:	

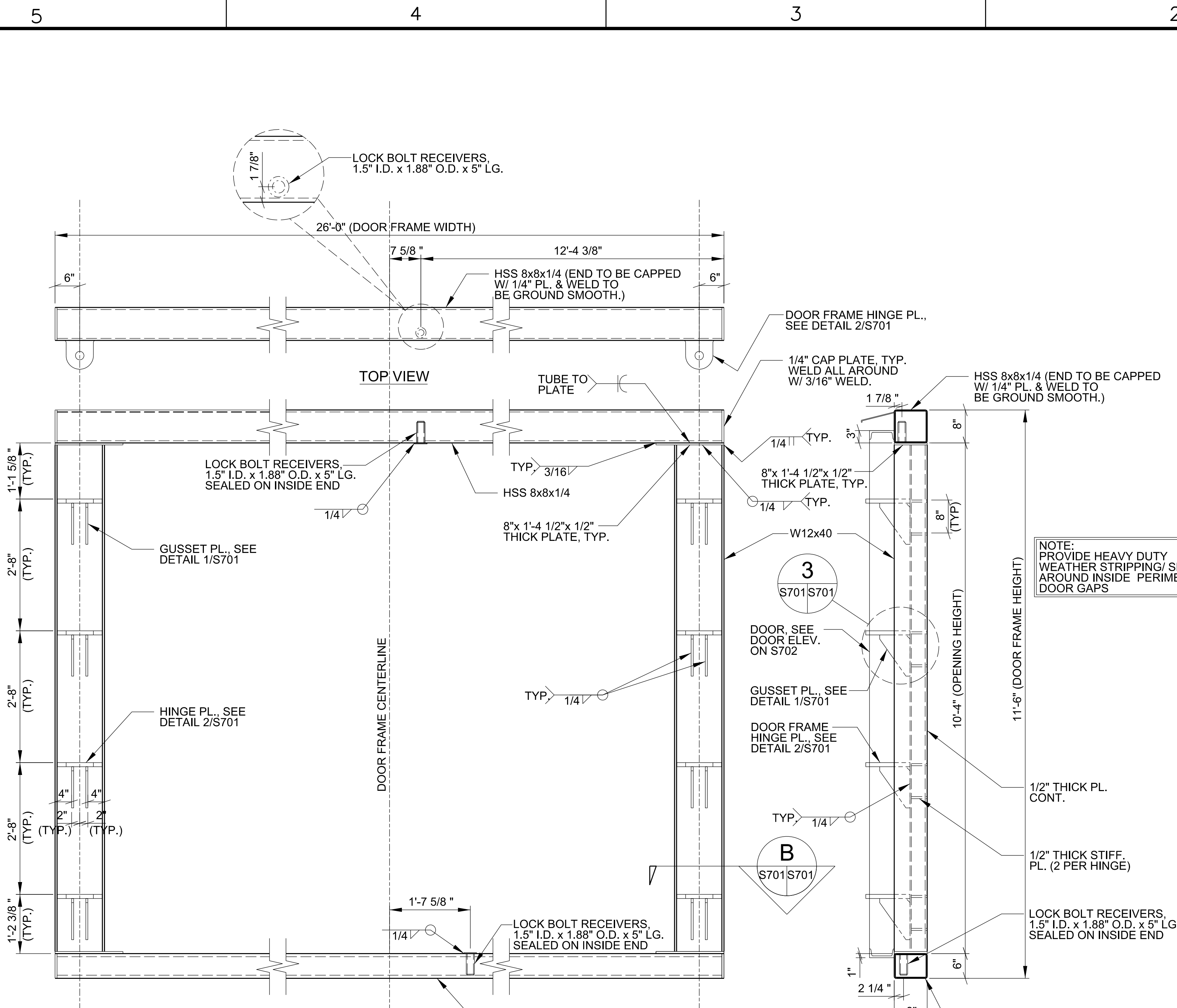
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Drawn by:	JMU
Checked by:	RSW
Project Engineer/Architect:	Jeff Coulston
Date:	

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BOX-TYPE, STD 42-80-07

DOOR FRAME ELEVATIONS
AND DETAILS

Sheet reference number:
S-701
Sheet 12 of 24

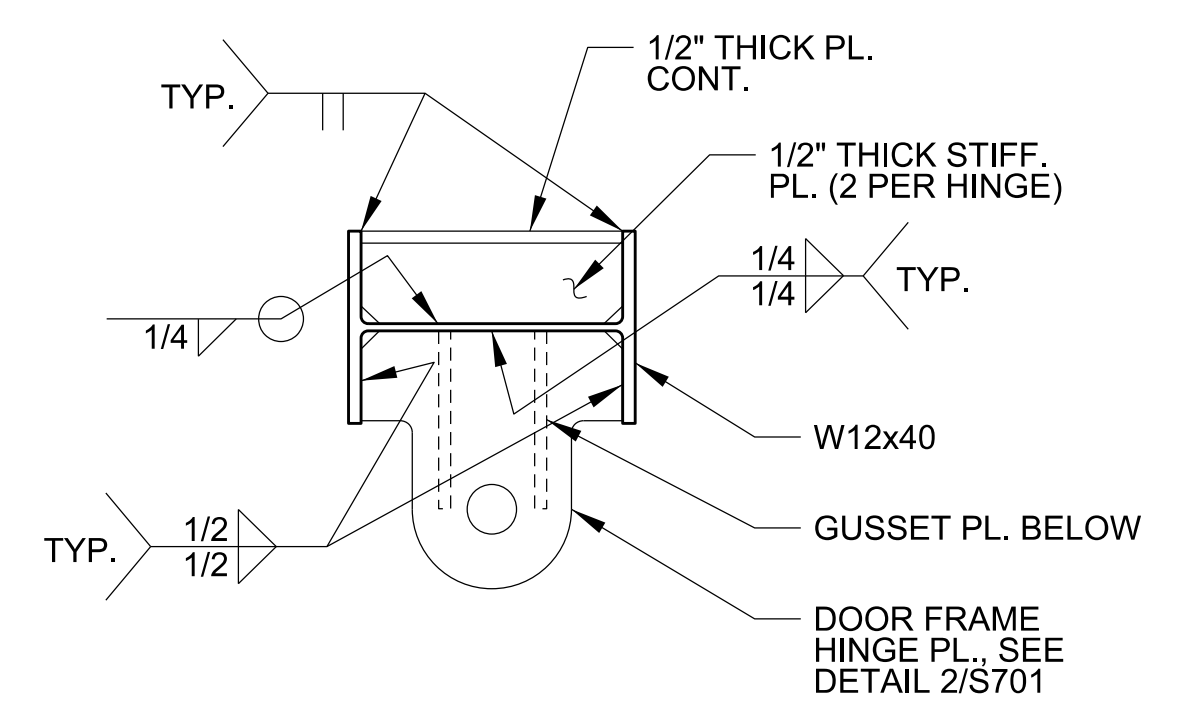


DOOR FRAME ELEVATION A
 SCALE: 3/4"=1'-0"
 S201 S701

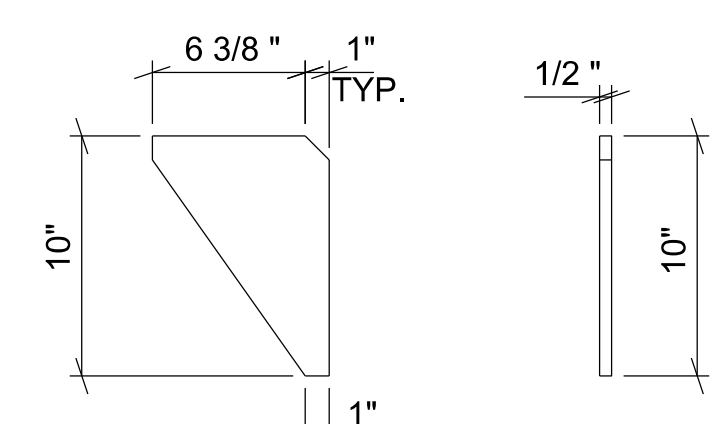
NOTE: THE 3" AND 1" DOOR OVERLAP AT THE TOP AND BOTT. OF THE DOOR FRAME, RESPECTIVELY SHALL NOT BE REDUCED AS THIS IS IMPERATIVE TO CARRY OUT THE DESIGN INTENT.

DESIGNER NOTE: TO BE REMOVED WHEN PREPARING CONSTRUCTION DRAWINGS FOR SITE ADAPTION DESIGN

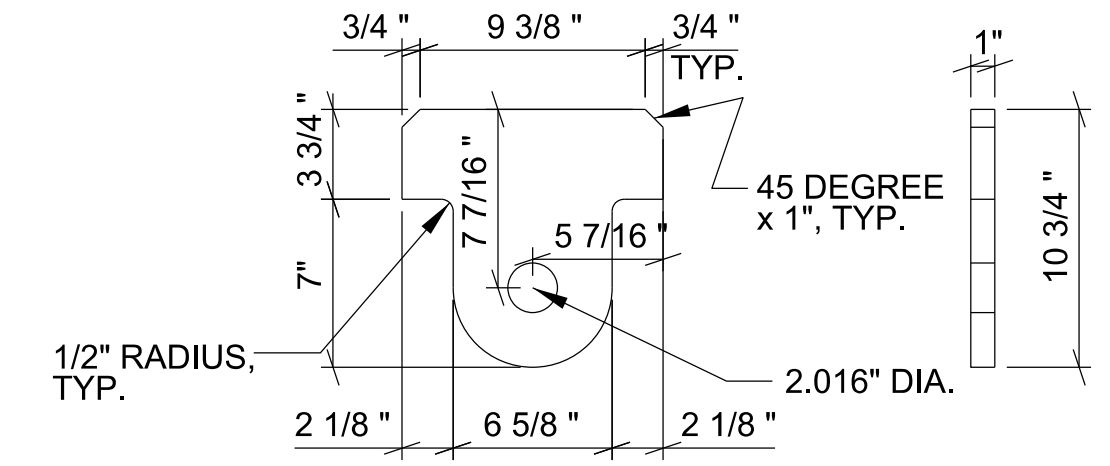
SHEETS S701 - S705 (HIGH SECURITY HASP) AND S701(A) - S705(A) (ILD) IDENTIFY TWO DIFFERENT LOCKING SYSTEMS. THE DESIGNER SHALL VERIFY WITH THE CONTRACTING OFFICIER THE CORRECT LOCKING SYSTEM REQUIRED AND REMOVE THE REDUNDANT SHEETS FROM THE CONSTRUCTION CONTRACT DOCUMENTS FOR THE SYSTEM NOT USED.



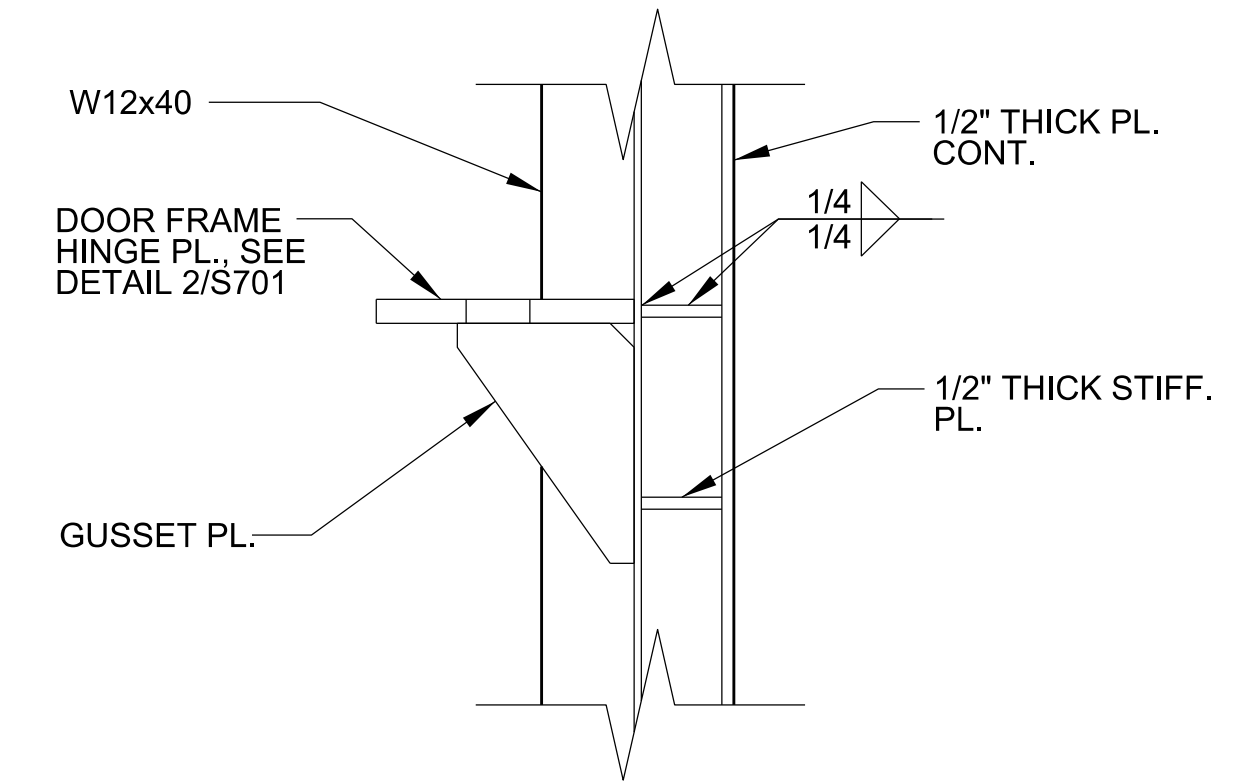
SECTION B
 SCALE: 1 1/2"=1'-0"
 S701 S701



GUSSET PL. DETAIL 1
 SCALE: 1 1/2"=1'-0"
 S701 S701



DOOR FRAME HINGE PL. DETAIL 2
 SCALE: 1 1/2"=1'-0"
 S701 S701



DOOR FRAME HINGE PL. DETAIL 3
 SCALE: 1 1/2"=1'-0"
 S701 S701



No.	Description	Date	Appr.

Designed by: JMU	Date: 2 DECEMBER 2011
Drawn by: JMU	Scale: AS SHOWN
Checked by: RSW	Drawing code: S701
Project Engineer/Architect: Jeff Coulston Date: S701	

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MODULAR STORAGE MAGAZINE
 BOX-TYPE, STD 421-80-07
 DOOR FRAME ELEVATIONS AND DETAILS

Sheet reference number:
S-701 (A)
 Sheet 13 of 24



No.	Description	Date	Appr.

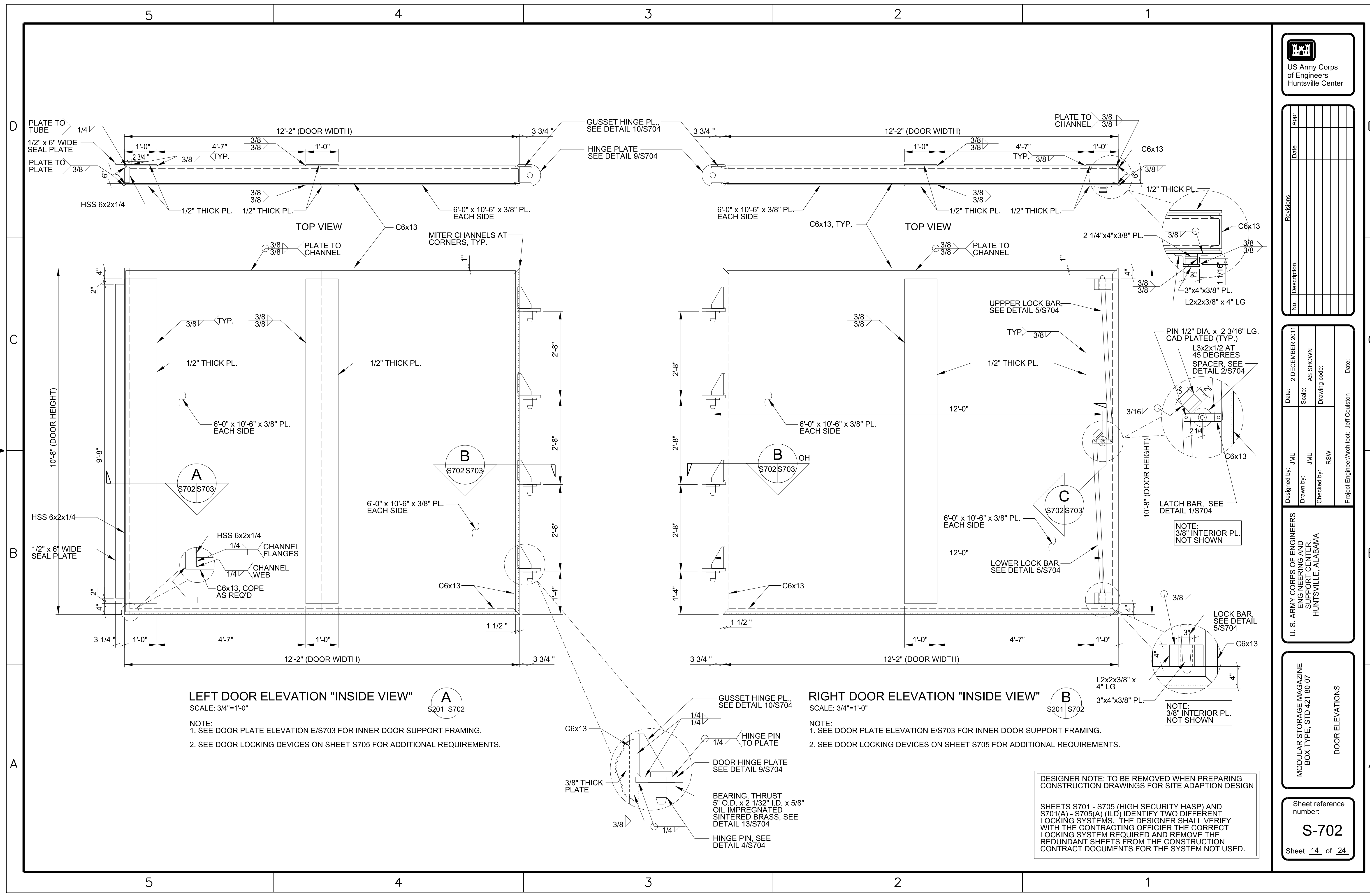
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Project Engineer/Architect: Jeff Coulston	Date:

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BOX-TYPE, STD 421-80-07

DOOR ELEVATIONS

Sheet reference number:
S-702
Sheet 14 of 24



LEFT DOOR ELEVATION "INSIDE VIEW"
SCALE: 3/4"=1'-0"
NOTE:
1. SEE DOOR PLATE ELEVATION E/S703 FOR INNER DOOR SUPPORT FRAMING.
2. SEE DOOR LOCKING DEVICES ON SHEET S705 FOR ADDITIONAL REQUIREMENTS.

RIGHT DOOR ELEVATION "INSIDE VIEW"
SCALE: 3/4"=1'-0"
NOTE:
1. SEE DOOR PLATE ELEVATION E/S703 FOR INNER DOOR SUPPORT FRAMING.
2. SEE DOOR LOCKING DEVICES ON SHEET S705 FOR ADDITIONAL REQUIREMENTS.

DESIGNER NOTE: TO BE REMOVED WHEN PREPARING CONSTRUCTION DRAWINGS FOR SITE ADAPTION DESIGN

SHEETS S701 - S705 (HIGH SECURITY HASP) AND S701(A) - S705(A) (ILD) IDENTIFY TWO DIFFERENT LOCKING SYSTEMS. THE DESIGNER SHALL VERIFY WITH THE CONTRACTING OFFICIER THE CORRECT LOCKING SYSTEM REQUIRED AND REMOVE THE REDUNDANT SHEETS FROM THE CONSTRUCTION CONTRACT DOCUMENTS FOR THE SYSTEM NOT USED.



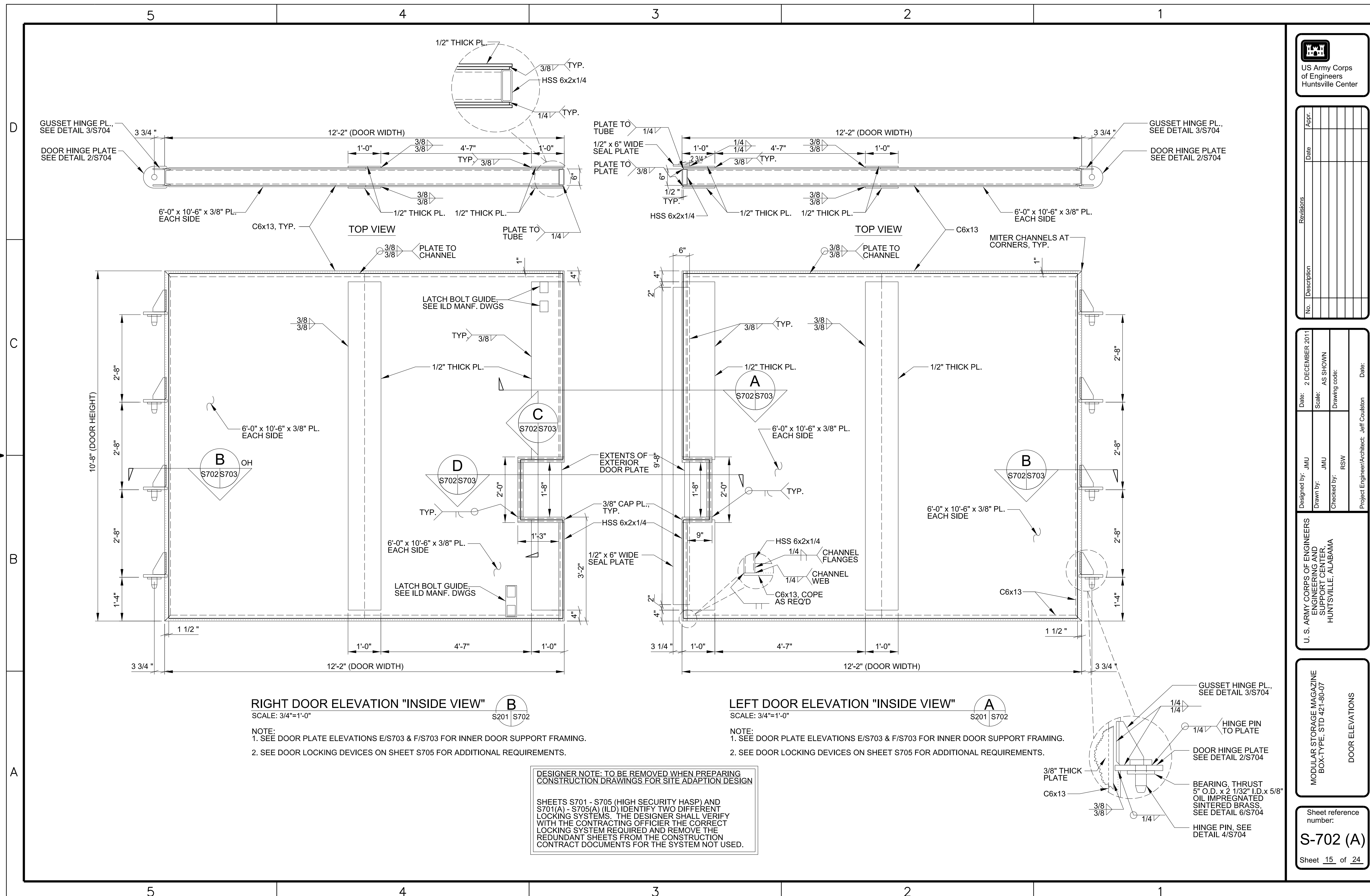
No.	Description	Date	Appr.

Designed by: JMU	Date: 2 DECEMBER 2011
Drawn by: JMU	Scale: AS SHOWN
Checked by: RSW	Drawing code: S702S703
Project Engineer/Architect: Jeff Coulston	Date:

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MODULAR STORAGE MAGAZINE
BOX-TYPE, STD 421-80-07
DOOR ELEVATIONS

Sheet reference number:
S-702 (A)
Sheet 15 of 24



RIGHT DOOR ELEVATION "INSIDE VIEW"
SCALE: 3/4"=1'-0"
S201 S702

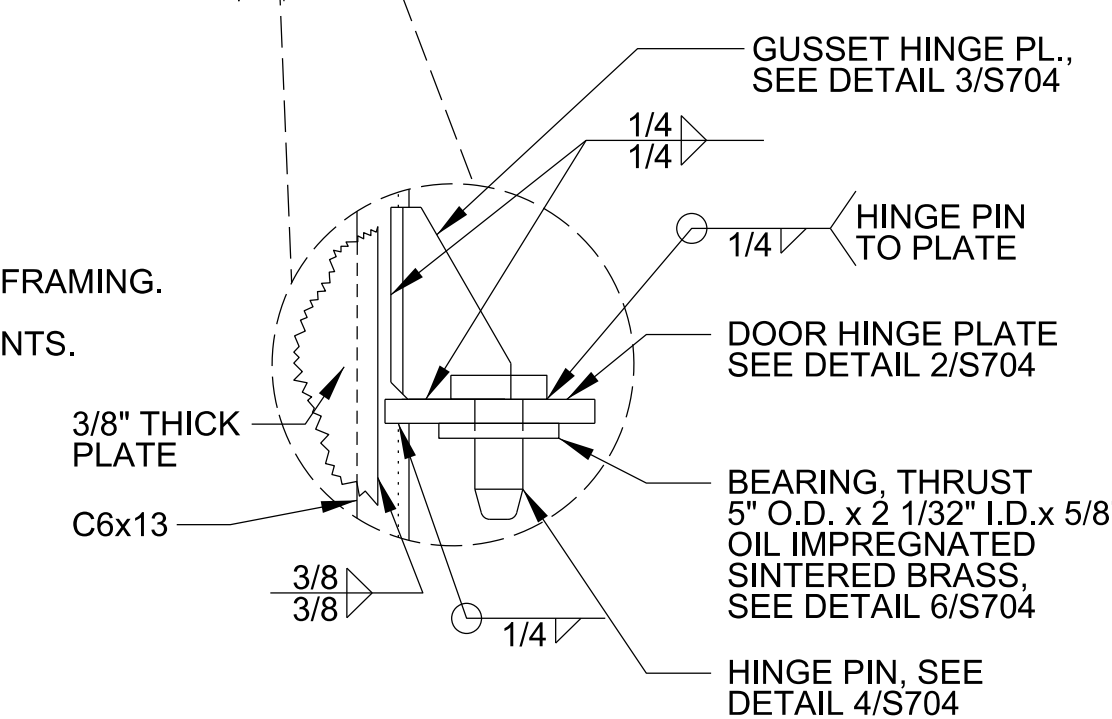
- NOTE:
1. SEE DOOR PLATE ELEVATIONS E/S703 & F/S703 FOR INNER DOOR SUPPORT FRAMING.
2. SEE DOOR LOCKING DEVICES ON SHEET S705 FOR ADDITIONAL REQUIREMENTS.

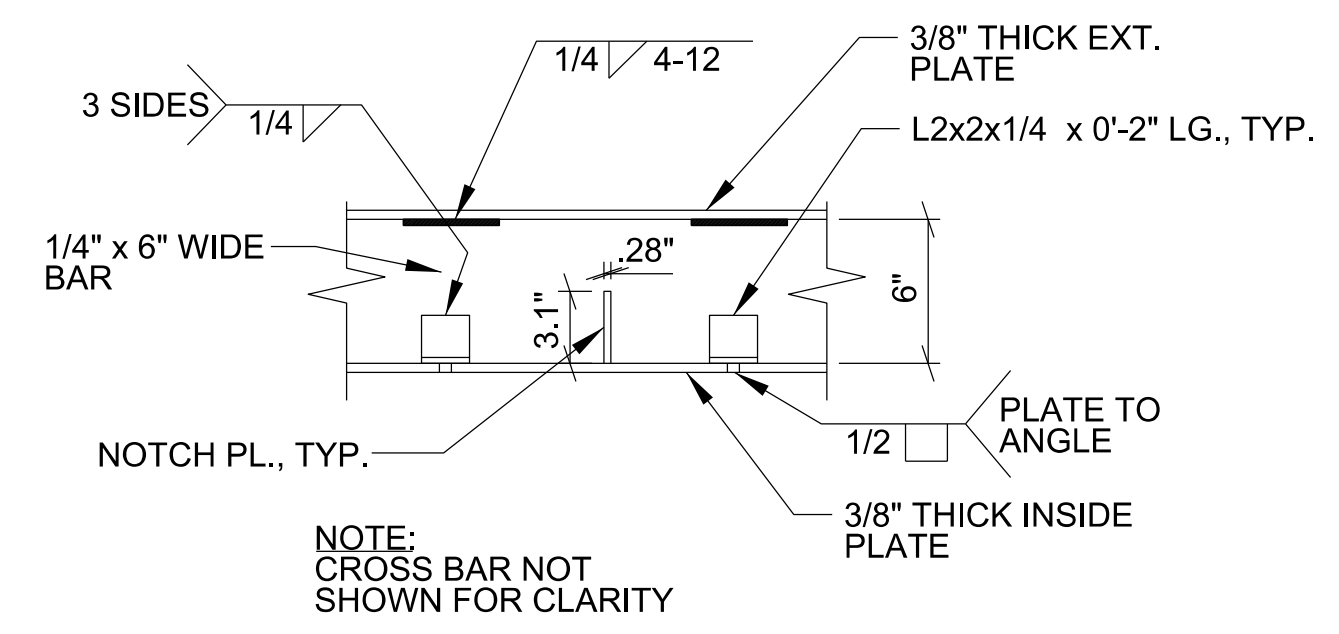
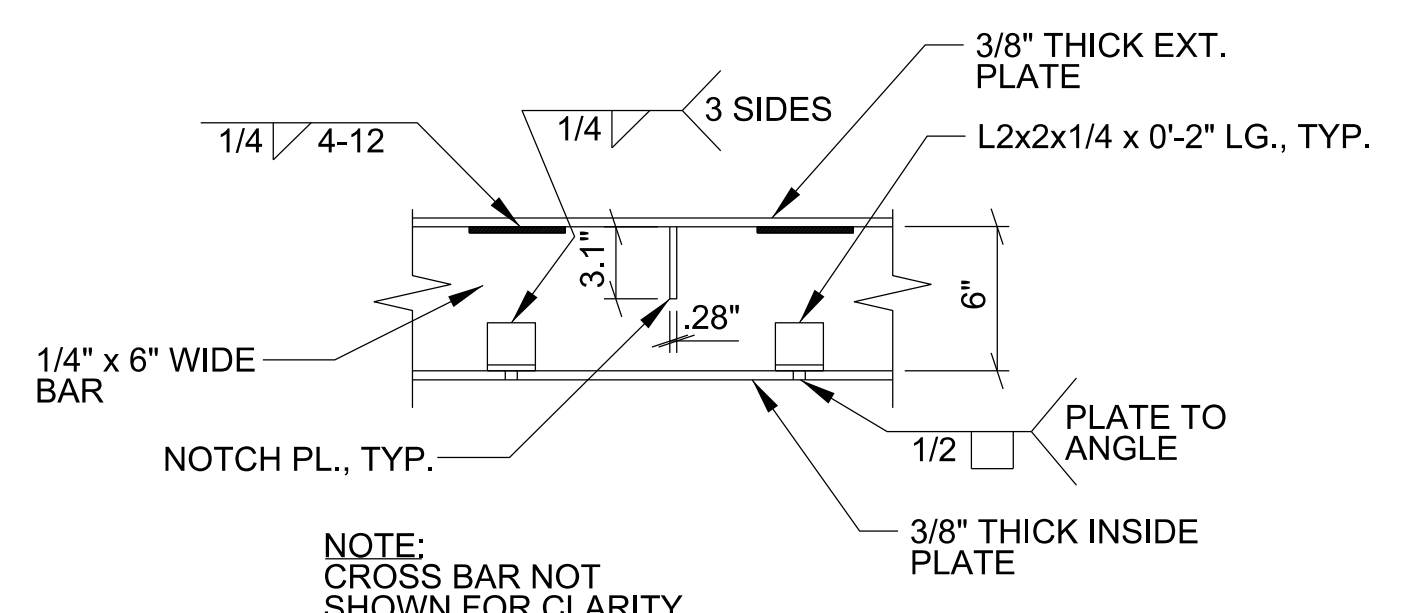
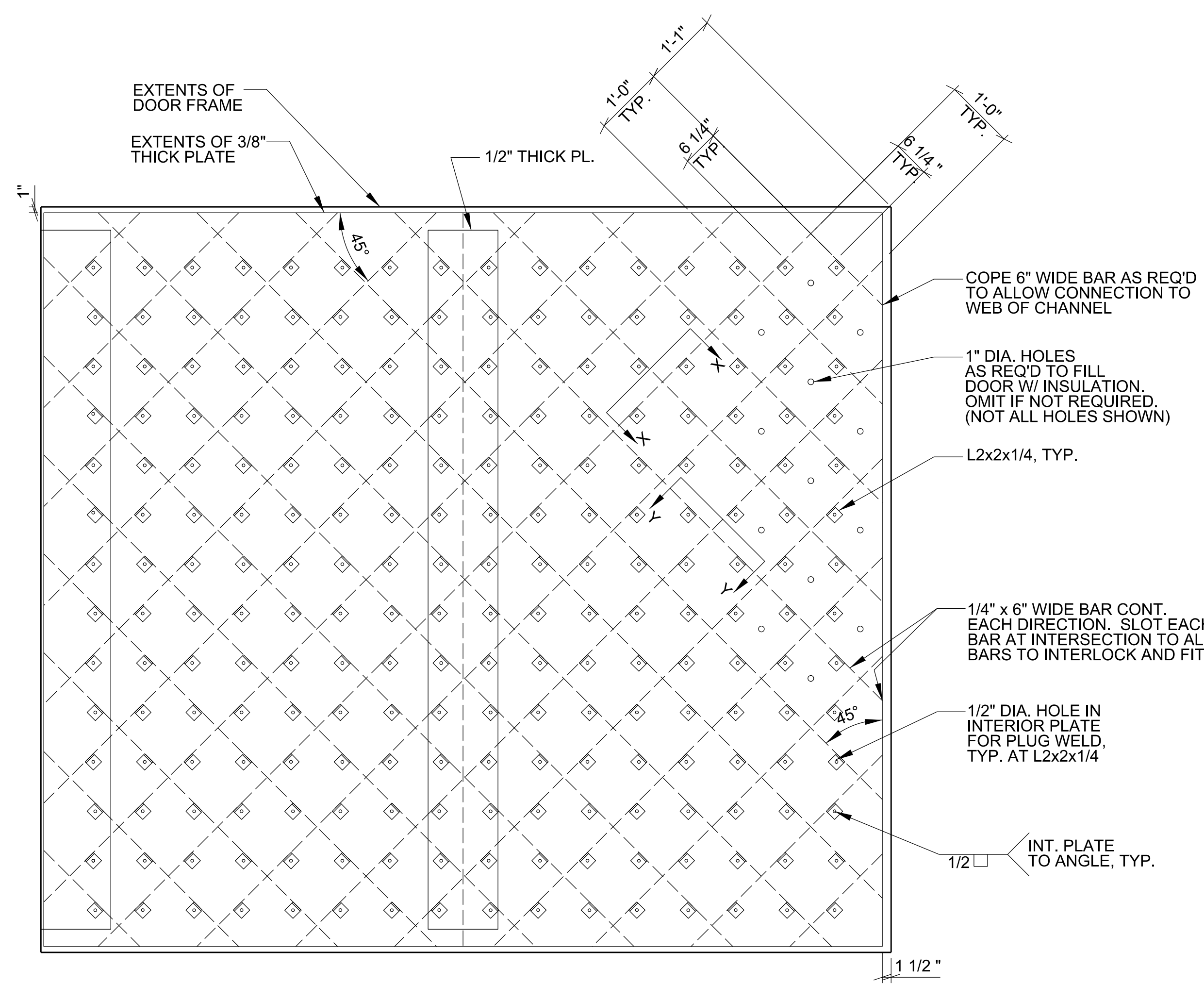
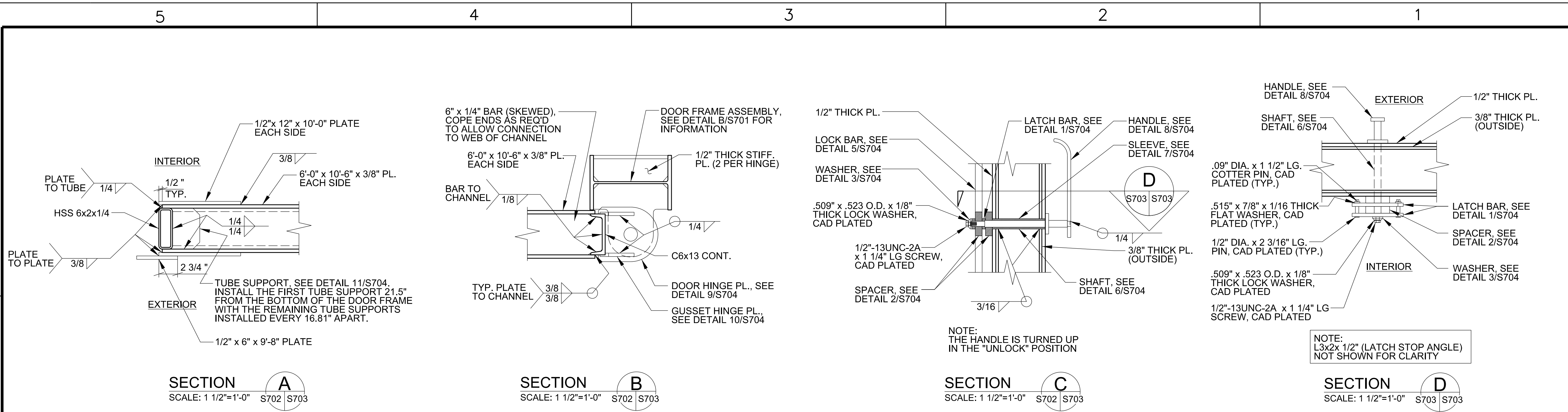
LEFT DOOR ELEVATION "INSIDE VIEW"
SCALE: 3/4"=1'-0"
S201 S702

- NOTE:
1. SEE DOOR PLATE ELEVATIONS E/S703 & F/S703 FOR INNER DOOR SUPPORT FRAMING.
2. SEE DOOR LOCKING DEVICES ON SHEET S705 FOR ADDITIONAL REQUIREMENTS.

DESIGNER NOTE: TO BE REMOVED WHEN PREPARING CONSTRUCTION DRAWINGS FOR SITE ADAPTION DESIGN

SHEETS S701 - S705 (HIGH SECURITY HASP) AND S701(A) - S705(A) (ILD) IDENTIFY TWO DIFFERENT LOCKING SYSTEMS. THE DESIGNER SHALL VERIFY WITH THE CONTRACTING OFFICIER THE CORRECT LOCKING SYSTEM REQUIRED AND REMOVE THE REDUNDANT SHEETS FROM THE CONSTRUCTION CONTRACT DOCUMENTS FOR THE SYSTEM NOT USED.





DESIGNER NOTE: TO BE REMOVED WHEN PREPARING CONSTRUCTION DRAWINGS FOR SITE ADAPTION DESIGN

SHEETS S701 - S705 (HIGH SECURITY HASP) AND S701(A) - S705(A) (ILD) IDENTIFY TWO DIFFERENT LOCKING SYSTEMS. THE DESIGNER SHALL VERIFY WITH THE CONTRACTING OFFICIER THE CORRECT LOCKING SYSTEM REQUIRED AND REMOVE THE REDUNDANT SHEETS FROM THE CONSTRUCTION CONTRACT DOCUMENTS FOR THE SYSTEM NOT USED.



No.	Description	Date	Appr.

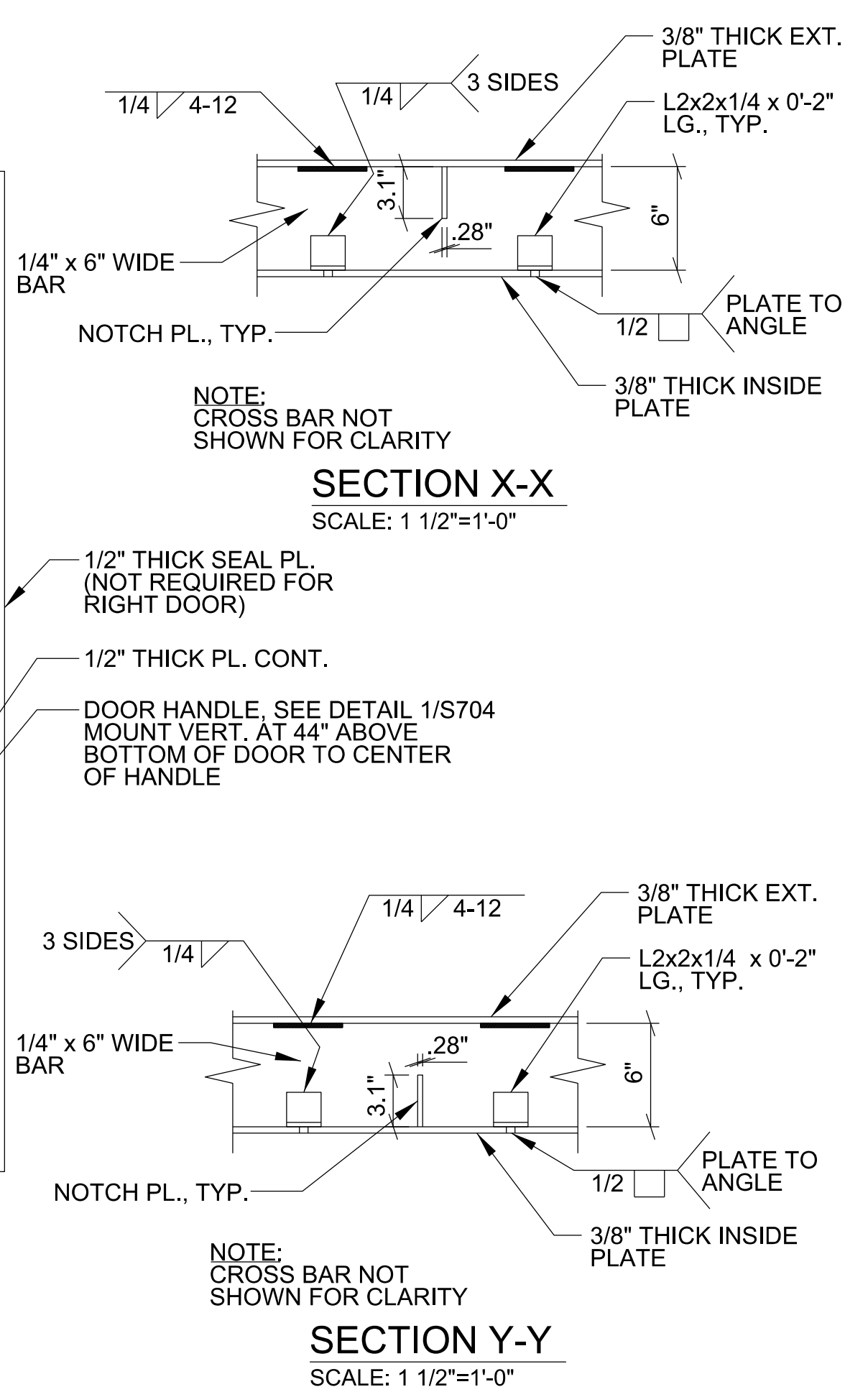
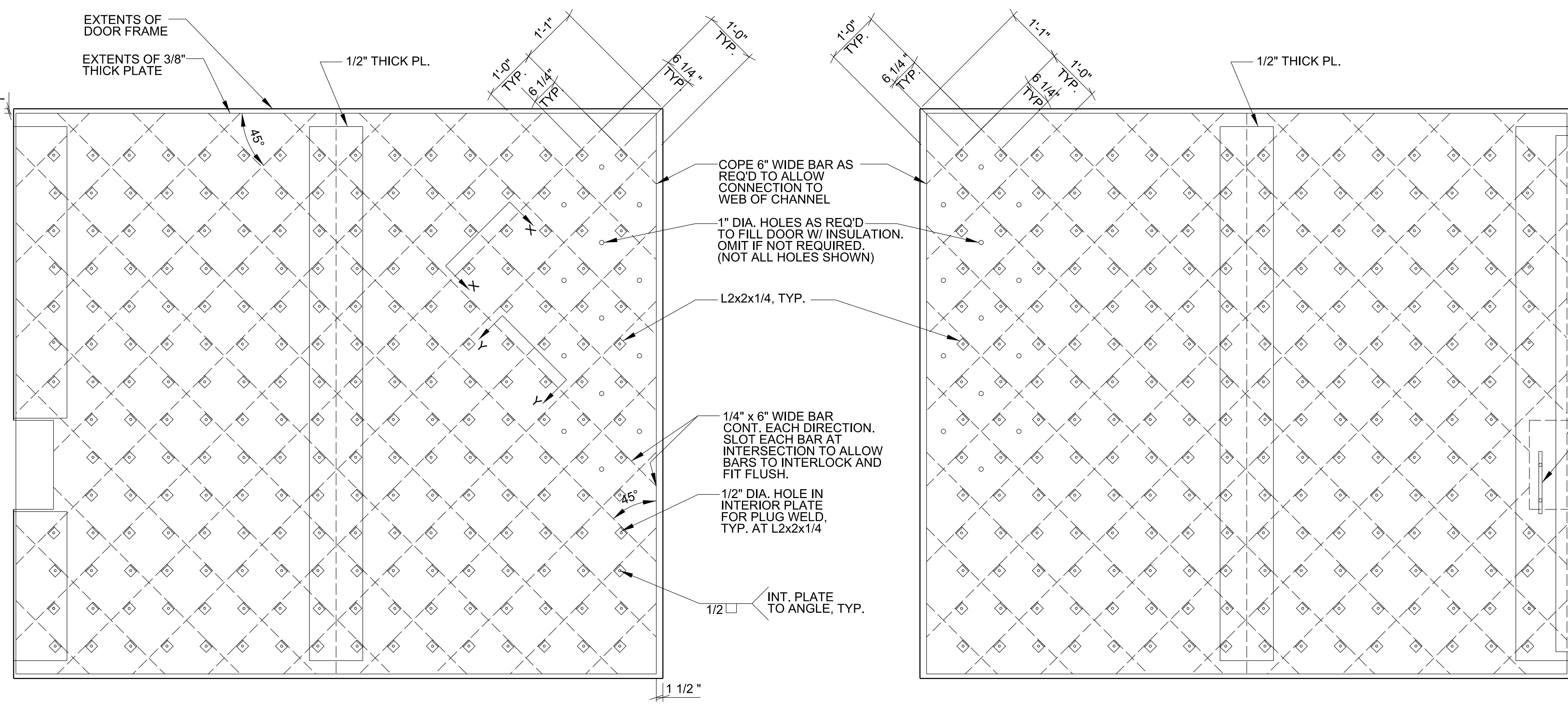
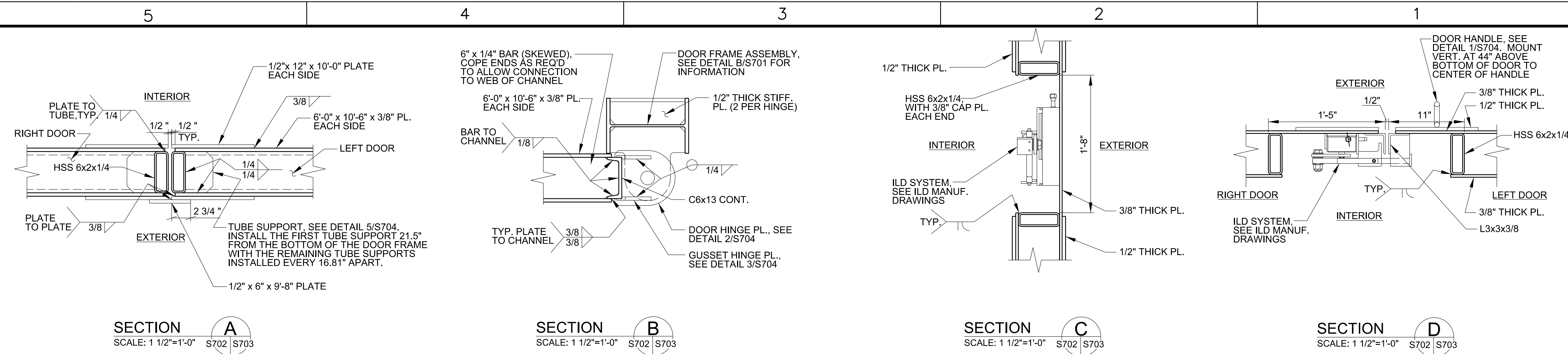
Date:	2 DECEMBER 2011
Scale:	AS SHOWN
Drawing code:	
Designed by:	JMU
Drawn by:	JMU
Checked by:	RSW
Project Engineer/Architect:	Jeff Coulston
Date:	

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ENGINEERING AND SUPPORT CENTER,
HUNTSVILLE, ALABAMA

MODULAR STORAGE MAGAZINE
BOX-TYPE, STD 421-80-07

DOOR SECTIONS

Sheet reference number:
S-703
Sheet 16 of 24



LEFT DOOR PLATE ELEVATION "INSIDE VIEW"
 SCALE: 3/4"=1'-0"
 NOTE: RIGHT DOOR PLATE ELEVATION IS SIMILAR (DOOR NOTCH IS GREATER)

LEFT DOOR PLATE ELEVATION "OUTSIDE VIEW"
 SCALE: 3/4"=1'-0"
 NOTE: RIGHT DOOR PLATE ELEVATION IS SIMILAR (DOOR NOTCH IS GREATER & 1/2" THICK COVER PL. TERMINATES FOR ILD HANDLE AND KEYS)

DESIGNER NOTE: TO BE REMOVED WHEN PREPARING CONSTRUCTION DRAWINGS FOR SITE ADAPTION DESIGN

SHEETS S701 - S705 (HIGH SECURITY HASP) AND S701(A) - S705(A) (ILD) IDENTIFY TWO DIFFERENT LOCKING SYSTEMS. THE DESIGNER SHALL VERIFY WITH THE CONTRACTING OFFICER THE CORRECT LOCKING SYSTEM REQUIRED AND REMOVE THE REDUNDANT SHEETS FROM THE CONSTRUCTION CONTRACT DOCUMENTS FOR THE SYSTEM NOT USED.



No.	Description	Date	Appr.

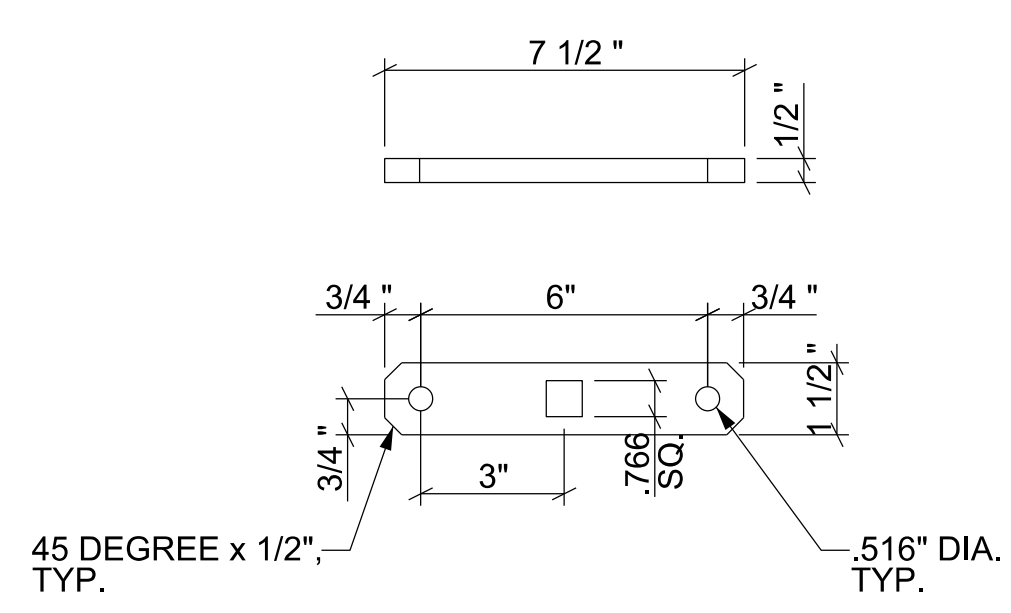
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Designed by: JMU	Checked by: RSW	Project Engineer/Architect: Jeff Coulston
Drawn by: JMU	Drawing code:	Date:

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 HUNTSVILLE, ALABAMA

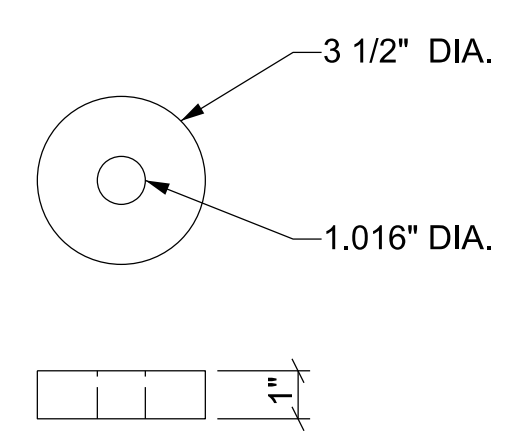
MODULAR STORAGE MAGAZINE
 BOX-TYPE, STD 421-80-07

DOOR SECTIONS

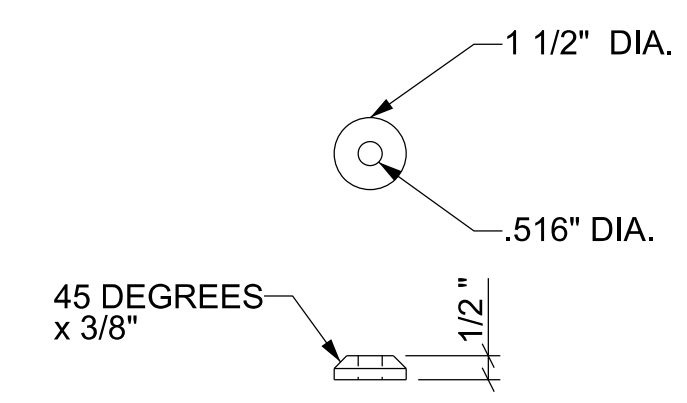
Sheet reference number:
S-703 (A)
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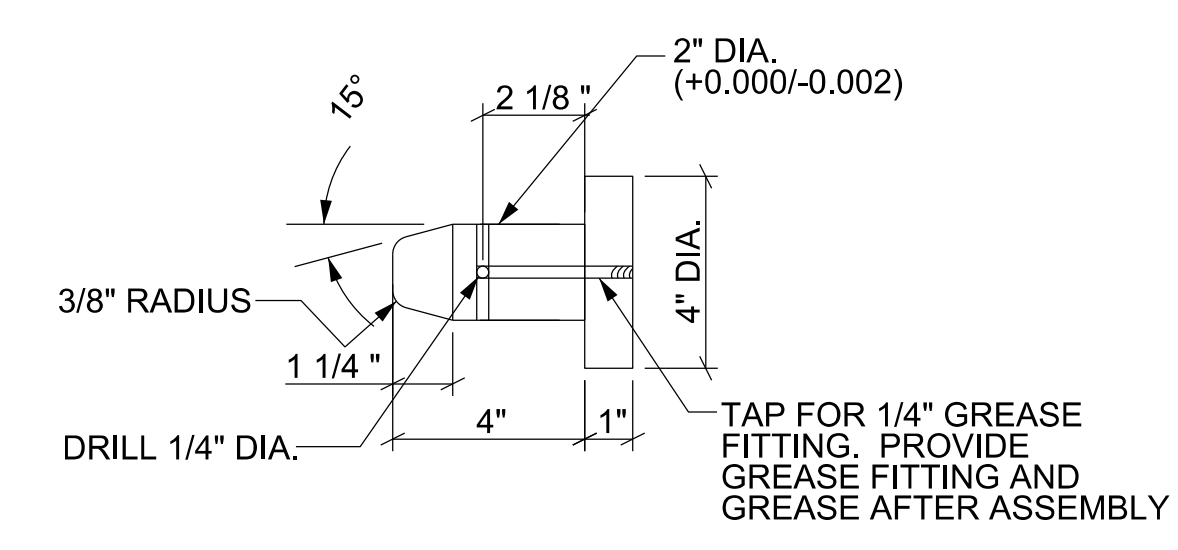
LATCH BAR DETAIL 1
SCALE: 3"=1'-0"
S702 S704



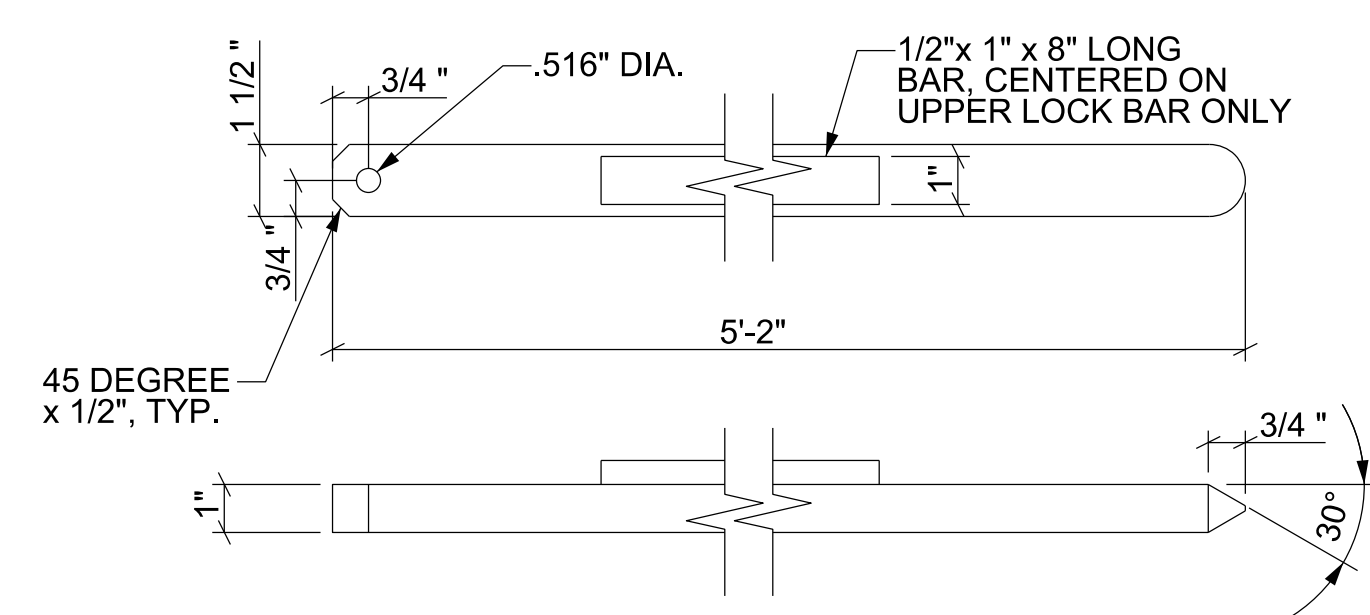
SPACER DETAIL 2
SCALE: 3"=1'-0"
S702 S704



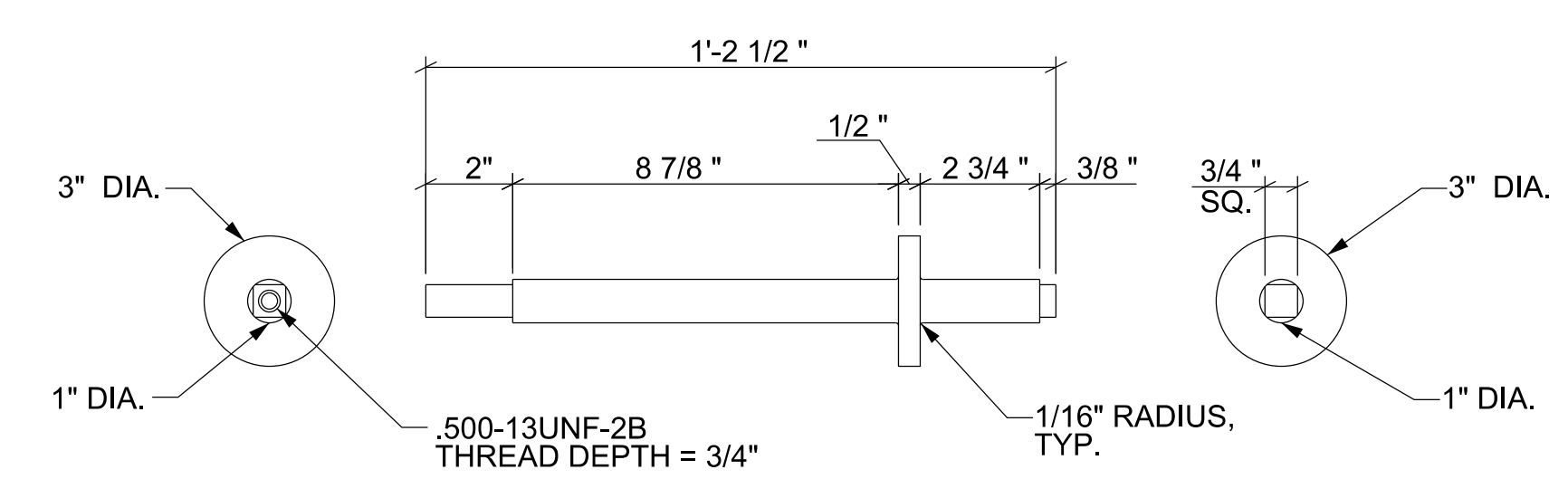
WASHER DETAIL 3
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S702 S704



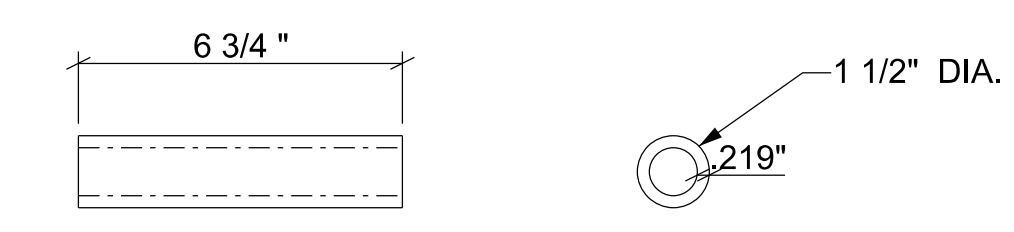
HINGE PIN DETAIL 4
SCALE: 3"=1'-0"
S702 S704



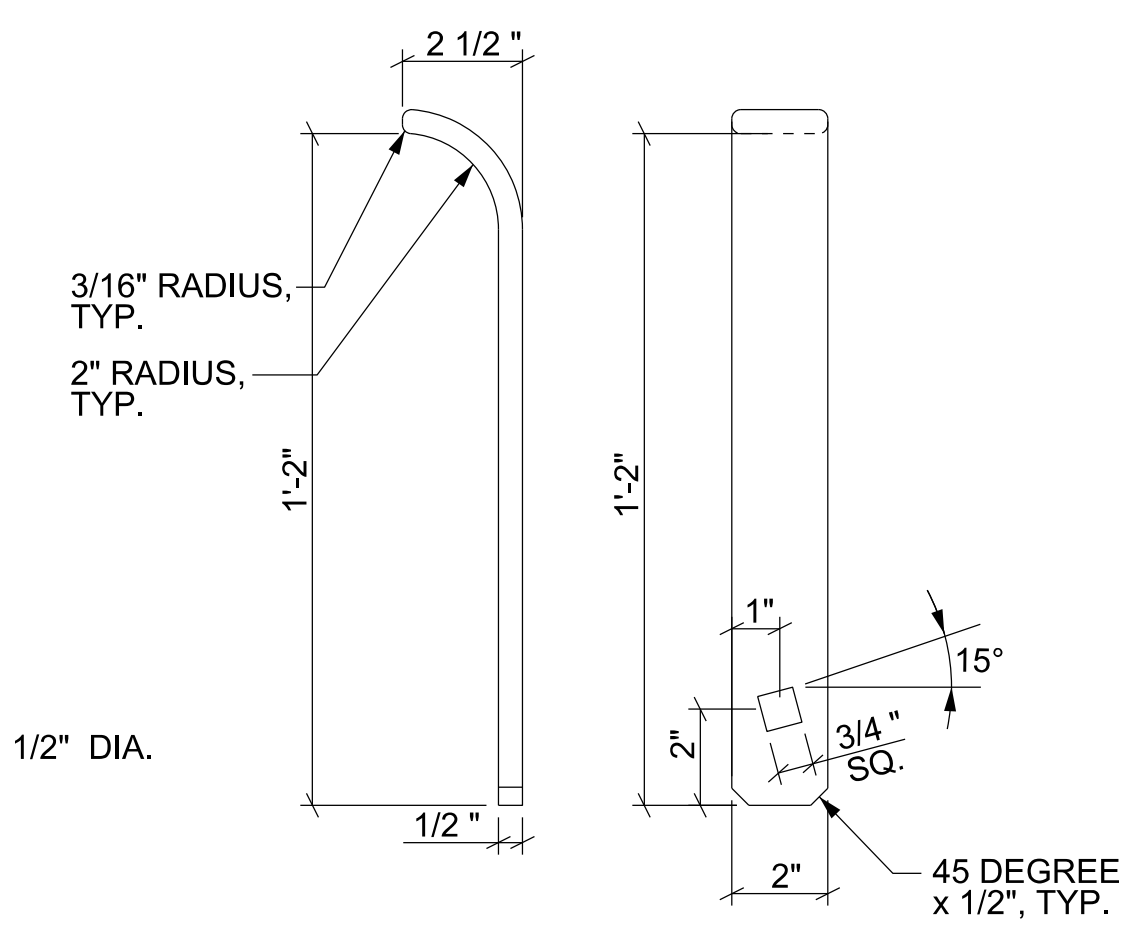
LOCK BAR DETAIL 5
SCALE: 3"=1'-0"
S702 S704



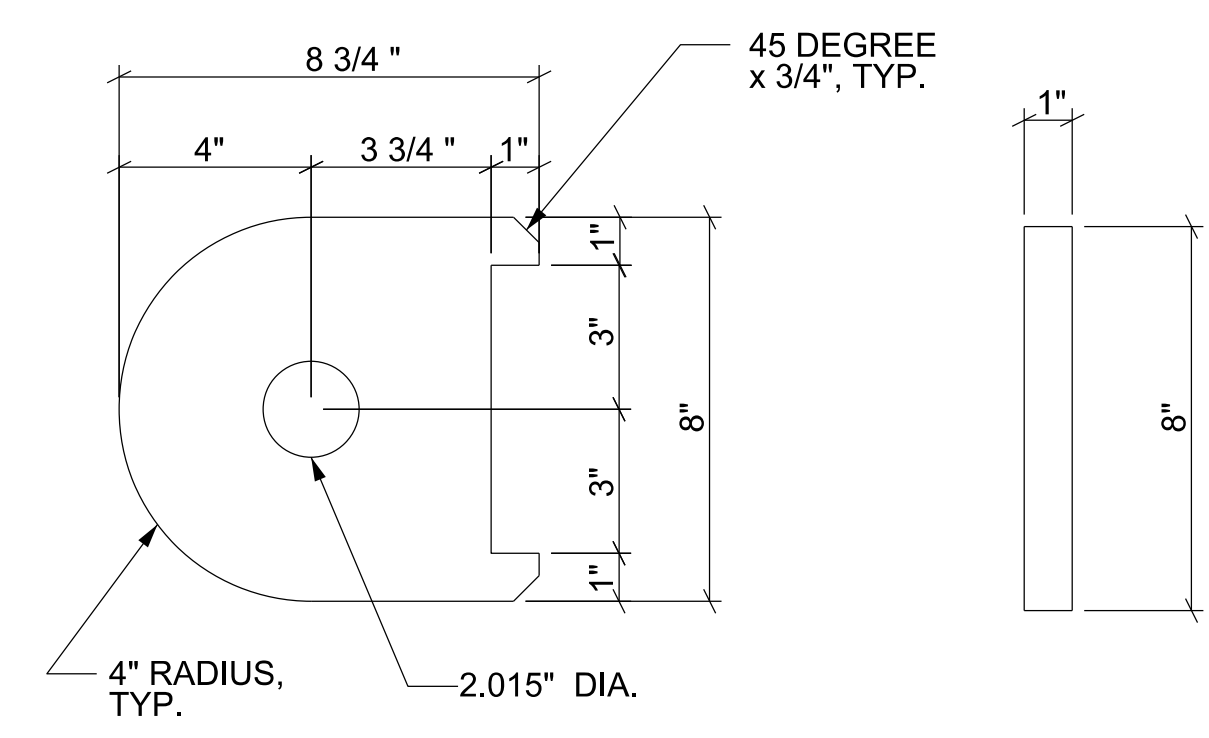
SHAFT DETAIL 6
SCALE: 3"=1'-0"
S703 S704



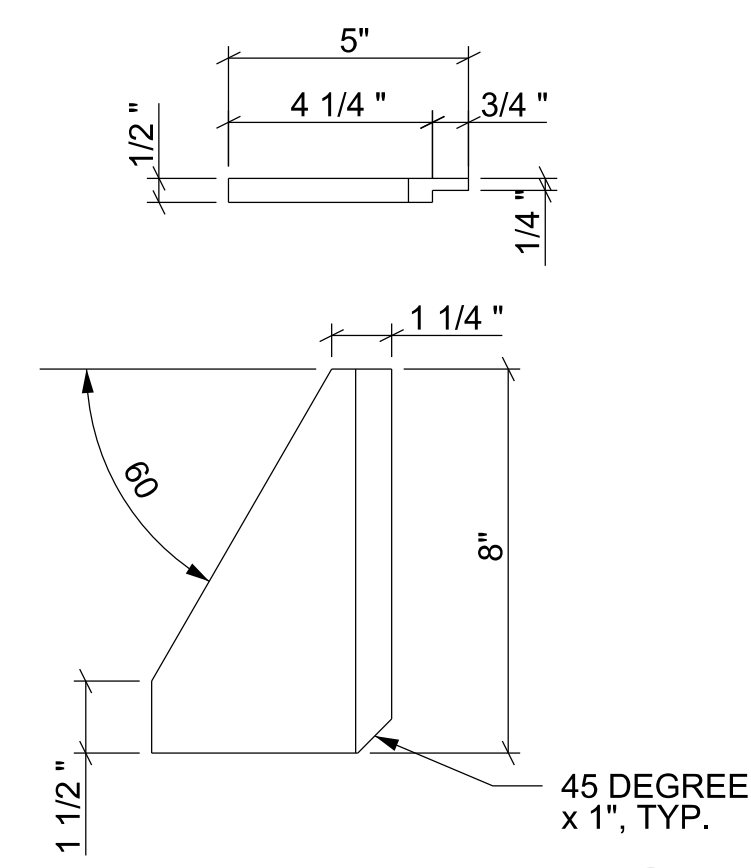
SLEEVE DETAIL 7
SCALE: 3"=1'-0"
S702 S704



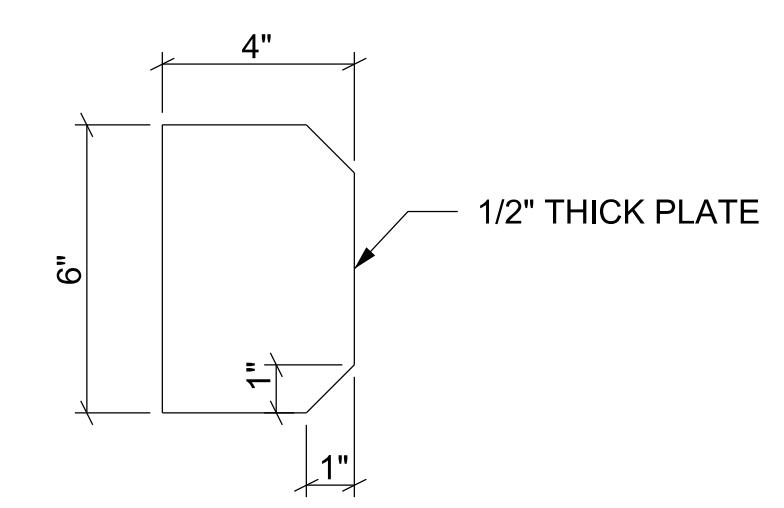
HANDLE DETAIL 8
SCALE: 3"=1'-0"
S703 S704



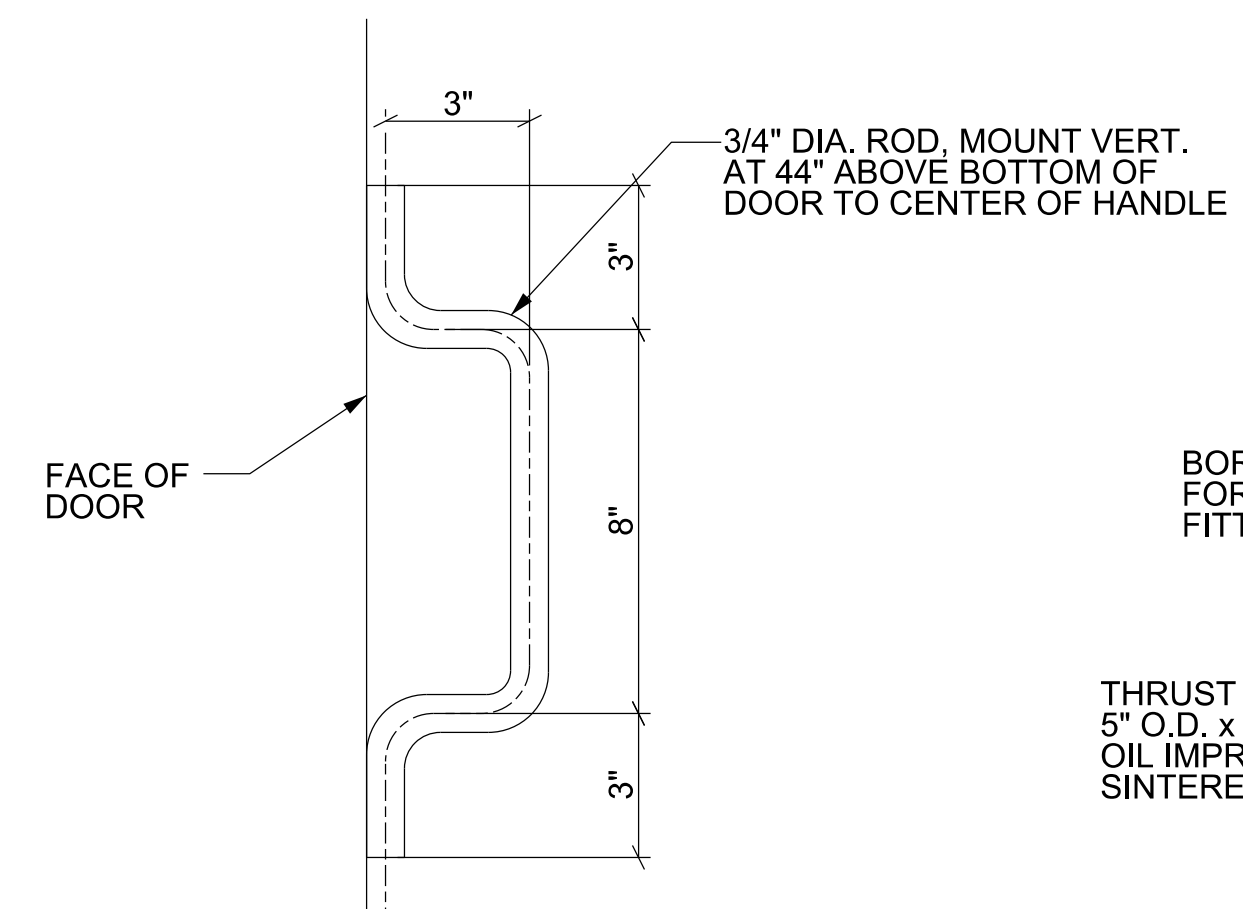
DOOR HINGE PL. DETAIL 9
SCALE: 3"=1'-0"
S702 S704



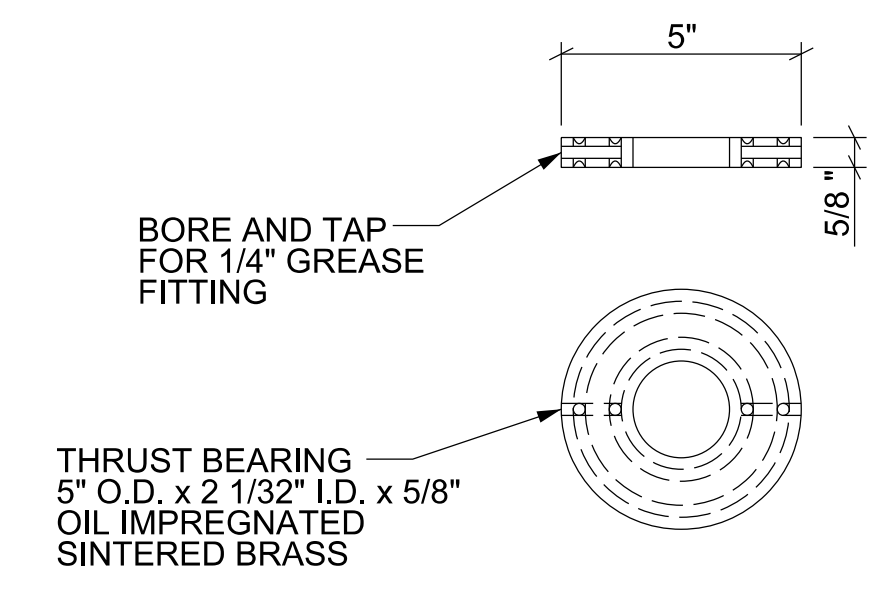
GUSSET HINGE PL. DETAIL 10
SCALE: 3"=1'-0"
S702 S704



TUBE SUPPORT PL. DETAIL 11
SCALE: 3"=1'-0"
S703 S704



HANDLE DETAIL 12
SCALE: 3"=1'-0"
S201 S704



THRUST BEARING DETAIL 13
SCALE: 3"=1'-0"
S702 S704

DESIGNER NOTE: TO BE REMOVED WHEN PREPARING CONSTRUCTION DRAWINGS FOR SITE ADAPTION DESIGN

SHEETS S701 - S705 (HIGH SECURITY HASP) AND S701(A) - S705(A) (ILD) IDENTIFY TWO DIFFERENT LOCKING SYSTEMS. THE DESIGNER SHALL VERIFY WITH THE CONTRACTING OFFICIER THE CORRECT LOCKING SYSTEM REQUIRED AND REMOVE THE REDUNDANT SHEETS FROM THE CONSTRUCTION CONTRACT DOCUMENTS FOR THE SYSTEM NOT USED.



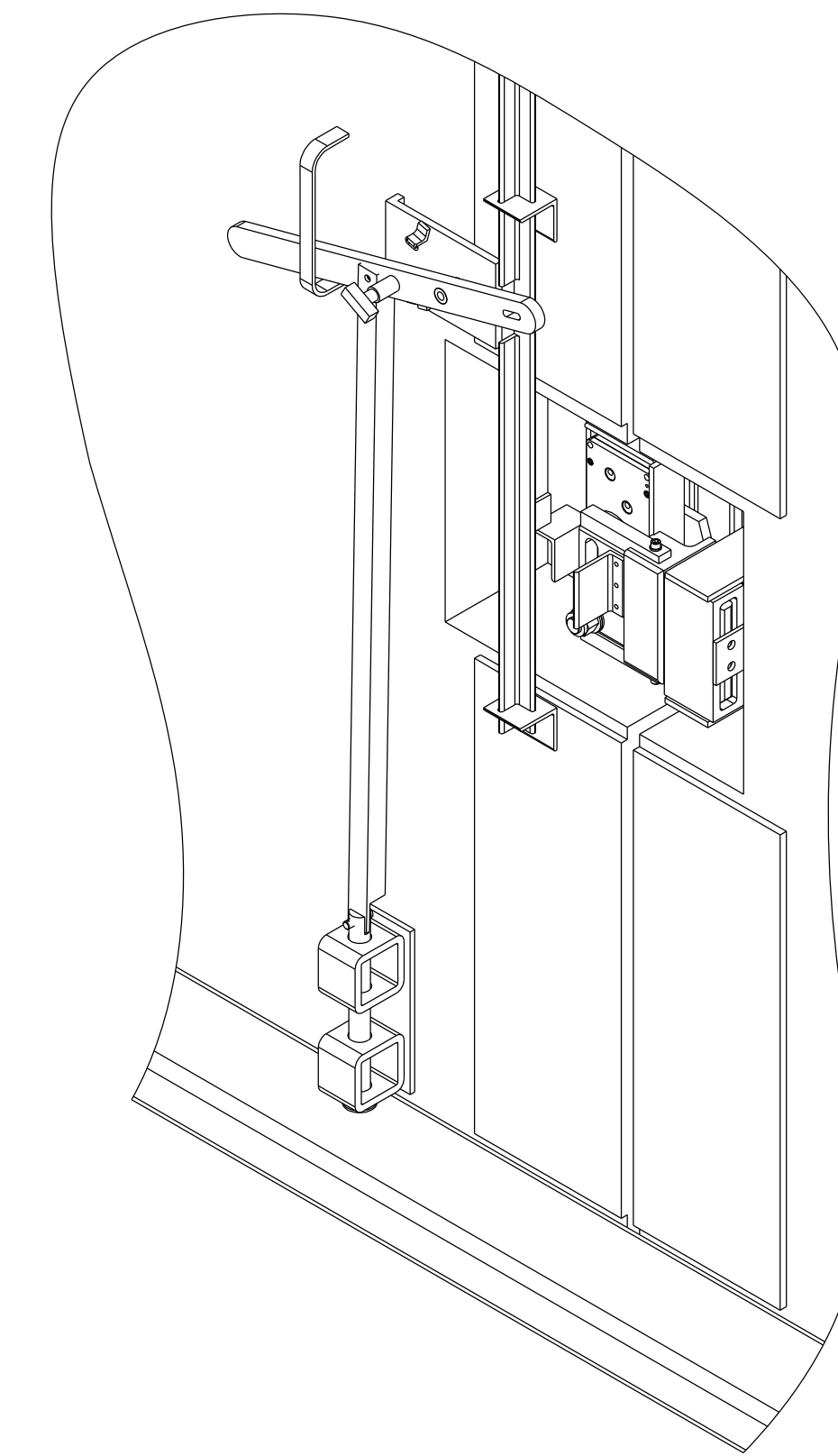
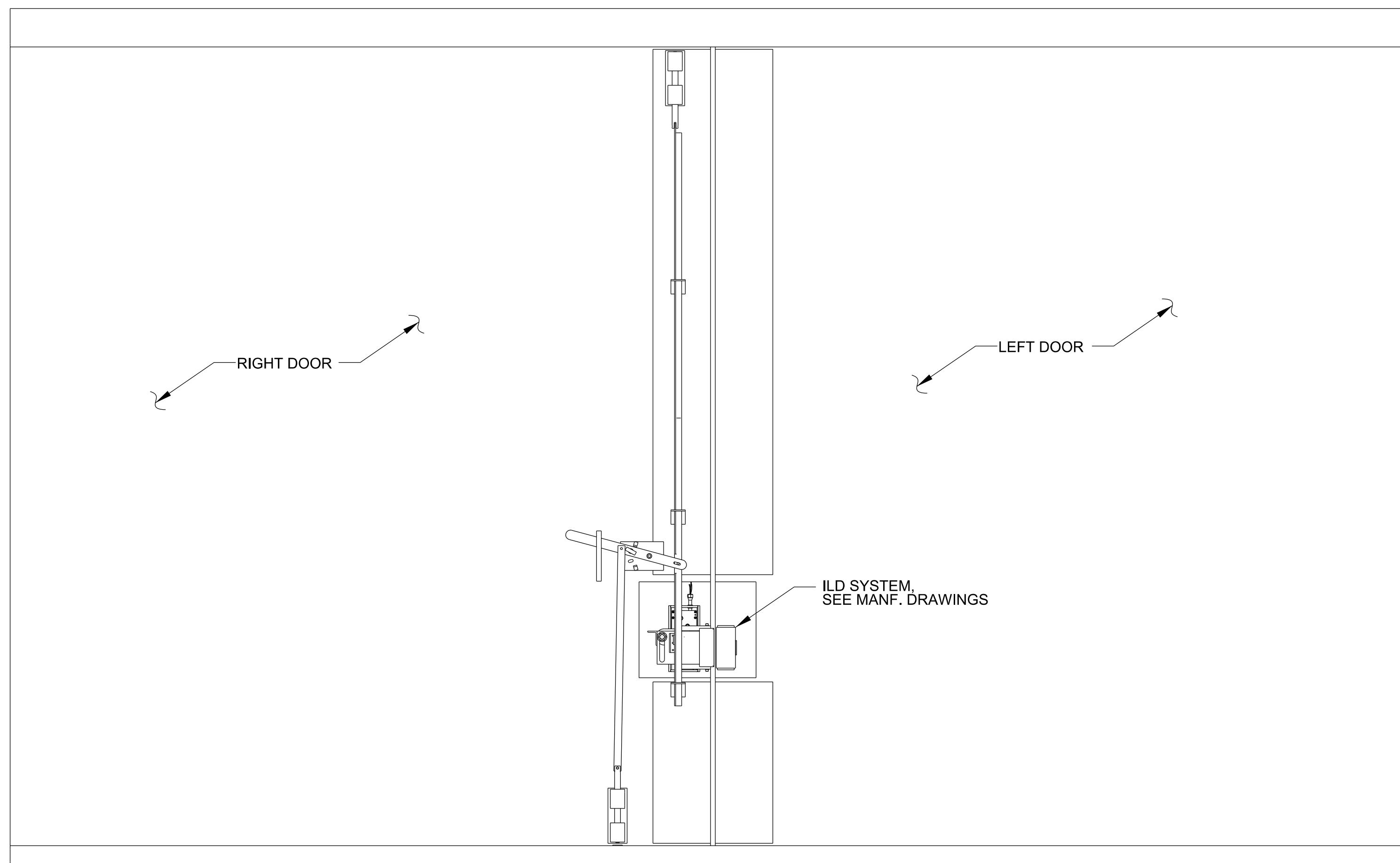
No.	Description	Date	Appr.

Date:	2 DECEMBER 2011
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Designed by:	JMU
Drawn by:	JMU
Checked by:	RSW
Project Engineer/Architect:	Jeff Coulston
Date:	

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ENGINEERING AND SUPPORT CENTER
HUNTSVILLE, ALABAMA

MODULAR STORAGE MAGAZINE
BOX-TYPE, STD 421-80-07
DOOR DETAILS

Sheet reference number:
S-704
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INTERNAL LOCKING DEVICE (ILD)

SCALE: NTS
VIEW FROM INSIDE OF MAGAZINE
FOOT & HEAD BOLT SHOWN DISENGAGED

A
S705

DETAILS ARE SHOWN FOR GENERAL INFORMATION ONLY. SEE ILD MANUF. DRAWINGS FOR A COMPLETE SET OF DETAILS AND REQUIREMENTS.

INTERNAL LOCKING DEVICE (ILD)

SCALE: NTS
VIEW FROM INSIDE OF MAGAZINE
FOOT & HEAD BOLT SHOWN DISENGAGED

B
S705

INTERNAL LOCKING DEVICE (ILD) NOTES:

- INTERNAL LOCKING DEVICE IS A U.S. GOVERNMENT DESIGNED AND PATENTED LOCKING SYSTEM. THE ILD SYSTEM SHALL BE PURCHASED FROM A GOVERNMENT APPROVED ILD MANUFACTURER WITH COORDINATION OF NAVAL FACILITIES ENGINEERING SERVICE CENTER (NAVFAC ESC) SECURITY ENGINEERING DIVISION. CONTACT CAN BE MADE VIA PHONE BY CALLING 805-982-1212 OR THEIR WEBSITE (https://portal.navy.mil/portal/page/portal/navfac/navfac_ww_pp/navfac_nfesc_pp/locks/) FOR ORDERING INFORMATION.
- NO MODIFICATIONS AND/OR DEVIATIONS TO THE DOOR CONSTRUCTION SHOWN IN THE STANDARD DRAWINGS ARE PERMITTED TO ACCOMMODATE THE ILD UNLESS APPROVED BY THE U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE (STRUCTURAL BRANCH).
- DOOR MANUFACTURER WILL COORDINATE WITH THE GOVERNMENT ON INSTALLATION AND ATTACHMENT DETAILS OF THE ILD AND PROVIDE THE NECESSARY STIFFENERS AND ADDITIONAL FRAMING (IF REQUIRED) TO ACCOMMODATE THE ILD.
- SEE ILD MANUFACTURERS INSTALLATION DRAWINGS FOR ADDITIONAL INFORMATION NOT SHOWN IN THESE DRAWINGS.
- SEE DOOR FRAME AND DOOR DETAILS ON SHEETS S701(A) - S704(A).

DESIGNER NOTE: TO BE REMOVED WHEN PREPARING CONSTRUCTION DRAWINGS FOR SITE ADAPTION DESIGN

SHEETS S701 - S705 (HIGH SECURITY HASP) AND S701(A) - S705(A) (ILD) IDENTIFY TWO DIFFERENT LOCKING SYSTEMS. THE DESIGNER SHALL VERIFY WITH THE CONTRACTING OFFICIER THE CORRECT LOCKING SYSTEM REQUIRED AND REMOVE THE REDUNDANT SHEETS FROM THE CONSTRUCTION CONTRACT DOCUMENTS FOR THE SYSTEM NOT USED.



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Project Engineer/Architect: Jeff Coulston Date:	

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HUNTSVILLE, ALABAMA

MODULAR STORAGE MAGAZINE
BOX-TYPE, STD 421-80-07
INTERNAL LOCKING DEVICES

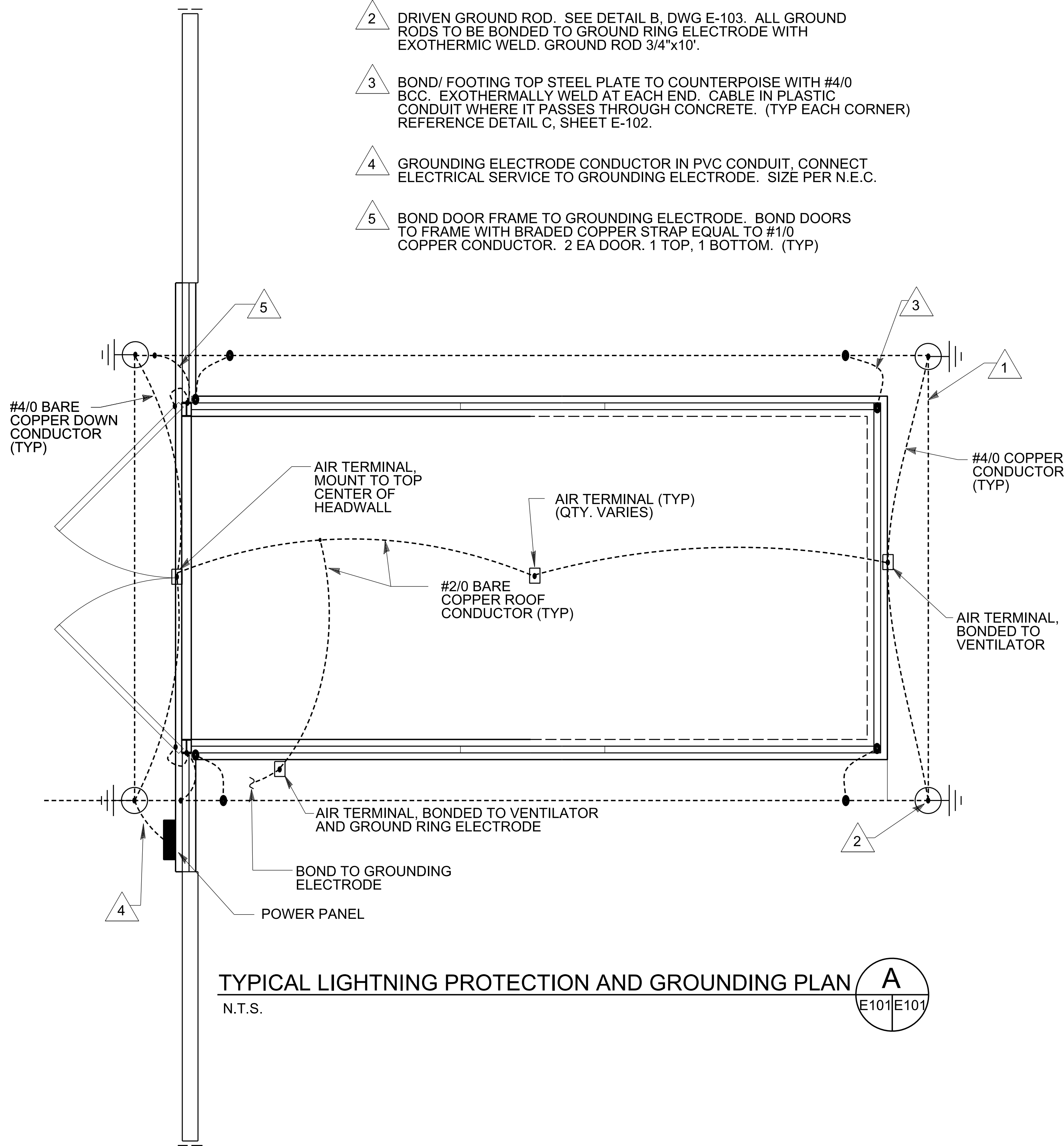
Sheet reference number:
S-705(A)
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KEYED NOTES

- 1 #4/0 BARE COPPER CONDUCTOR (BCC), GROUND RING ELECTRODE, ENCIRCLING BUILDING PERIMETER. INSTALL IN DIRECT EARTH CONTACT, 30" MINIMUM BELOW EARTH SURFACE AND 3' MINIMUM FROM EDGE OF GRADE BEAM.
- 2 DRIVEN GROUND ROD. SEE DETAIL B, DWG E-103. ALL GROUND RODS TO BE BONDED TO GROUND RING ELECTRODE WITH EXOTHERMIC WELD. GROUND ROD 3/4"x10'.
- 3 BOND/ FOOTING TOP STEEL PLATE TO COUNTERPOISE WITH #4/0 BCC. EXOTHERMICALLY WELD AT EACH END. CABLE IN PLASTIC CONDUIT WHERE IT PASSES THROUGH CONCRETE. (TYP EACH CORNER) REFERENCE DETAIL C, SHEET E-102.
- 4 GROUNDING ELECTRODE CONDUCTOR IN PVC CONDUIT, CONNECT ELECTRICAL SERVICE TO GROUNDING ELECTRODE. SIZE PER N.E.C.
- 5 BOND DOOR FRAME TO GROUNDING ELECTRODE. BOND DOORS TO FRAME WITH BRADED COPPER STRAP EQUAL TO #1/0 COPPER CONDUCTOR. 2 EA DOOR. 1 TOP, 1 BOTTOM. (TYP)

NOTES: (APPLICABLE TO DRAWINGS E-101, E-102, E-103)

- 1. THE FOLLOWING NOTES AND APPLICABLE DRAWINGS ARE PROVIDED AS STANDARD GUIDANCE FOR LIGHTNING PROTECTION DESIGN OF EARTH COVERED MAGAZINES (ECM). THE DRAWINGS, DETAILS, AND NOTES ARE NOT INTENDED TO CONSTITUTE A COMPLETE LIGHTNING PROTECTION SYSTEM DESIGN. DESIGNER SHALL CONSULT THE BELOW CRITERIA TO ENSURE A COMPLETE AND FUNCTIONAL DESIGN IS PROVIDED. THE COMPLETED INSTALLATION SHALL RECEIVE A UL MASTER LABEL CERTIFICATE.
- 2. THE LIGHTNING PROTECTION SYSTEM (LPS) MUST PROVIDE A 100 FT. ZONE OF PROTECTION. THE 100 FT. ZONE OF PROTECTION SHALL BE DOCUMENTED USING THE ROLLING SPHERE METHOD (RSM). SEE SHEET E-103 FOR TYPICAL RSM ANALYSIS.
- 3. THE LPS SHALL BE MADE OF MATERIALS ACCEPTABLY PROTECTED AGAINST CORROSION AS SPECIFIED IN UL 96.
- 4. MINIMUM AIR TERMINAL HEIGHT IS 24 INCHES, ABOVE THE PROTECTED OBJECT.
- 5. REINFORCING STEEL IN WALL, FLOOR AND ARCH/BOX MUST BE INTERCONNECTED, BONDED AND MUST HAVE A CONTINUOUS PATH TO THE PRIMARY GROUNDING SYSTEM. METAL VENTILATORS, STEEL DOORS, DOOR FRAMES ALSO SHALL BE BONDED TO THE PRIMARY GROUNDING SYSTEM.
- 6. INCOMING POWER AND COMM. MUST ENTER THE GROUND AT LEAST 50 FT. FROM THE FACILITY, MEASURED TO THE NEAREST POINT. CABLES AND WIRES MUST BE SHIELDED OR BE INSTALLED IN METALLIC PIPING THAT IS BONDED TO THE GROUND RING SYSTEM AT THE POINT OF ENTRY.
- 7. ANY METALLIC PENETRATION, I.E. WATER PIPE, CONDUIT, ETC., MUST BE BONDED TO THE REBAR AT THE POINT OF ENTRY.
- 8. PROVIDE SURGE PROTECTIVE DEVICES (SPD) FOR POWER, COMM, AND INSTRUMENTATION. UL 1449 APPROVED.
- 9. CONSIDER ALL MASSES FOR SIDEFASH HAZARD. METAL MASSES WITHIN THE SIDEFASH DISTANCE SHALL BE BONDED TO THE LPS, OR BE MOVED OUTSIDE THE SIDEFASH SEPARATION DISTANCE.
- 10. RESISTANCE OF COMPONENTS OF THE LPS SHALL NOT EXCEED THAT SPECIFIED IN TABLE 17-1 OF DA PAM 385-64.
- 11. EXOTHERMIC WELD ALL GROUNDING CONDUCTOR BONDS AND TERMINATIONS.
- 12. LOCATIONS OF COMPONENTS ARE APPROXIMATE. COORDINATE AND CONFIRM EQUIPMENT LOCATIONS BEFORE INSTALLATION.
- 13. INTERNAL ELECTRICAL SYSTEMS, I.E. LIGHTING, WIRING DEVICES, SIGNAL, ETC., SHALL BE RATED AND APPROVED FOR THE ENVIRONMENT AND HAZARDOUS CLASSIFICATION IN WHICH IT IS INSTALLED ACCORDING TO THE N.E.C., SECTION 500.
- 14. GROUND AND BONDING CABLE SIZES ARE BASED ON COPPER CONDUCTORS. ALUMINUM CONDUCTORS, IF USED, MUST BE SIZED TO THE COPPER EQUIPMENT.
- 15. WHERE CONFLICTS EXISTS BETWEEN THESE DRAWINGS AND THE BELOW CRITERIA, THE MOST STRINGENT REQUIREMENT SHALL APPLY.
- 16. DESIGN/INSTALLATION CRITERIA:
 - a. DA PAM 385-64 AMMUNITION AND EXPLOSIVES SAFETY STANDARDS
 - b. DOD 6055.09 - M, VOL.1 - AMMUNITION AND EXPLOSIVES SAFETY STANDARDS
 - c. NFPA 780 STANDARD FOR THE INSTALLATION OF LIGHTNING PROTECTION SYSTEMS
 - d. UL 96A INSTALLATION REQUIREMENTS FOR LIGHTNING PROTECTION SYSTEMS
 - e. UL 96 STANDARD FOR LIGHTNING PROTECTION COMPONENTS
 - f. NFPA 70 NATIONAL ELECTRICAL CODE (NEC)



TYPICAL LIGHTNING PROTECTION AND GROUNDING PLAN
N.T.S. A
E101E101



No.	Description	Date	Appr.

Date:	2 DECEMBER 2011
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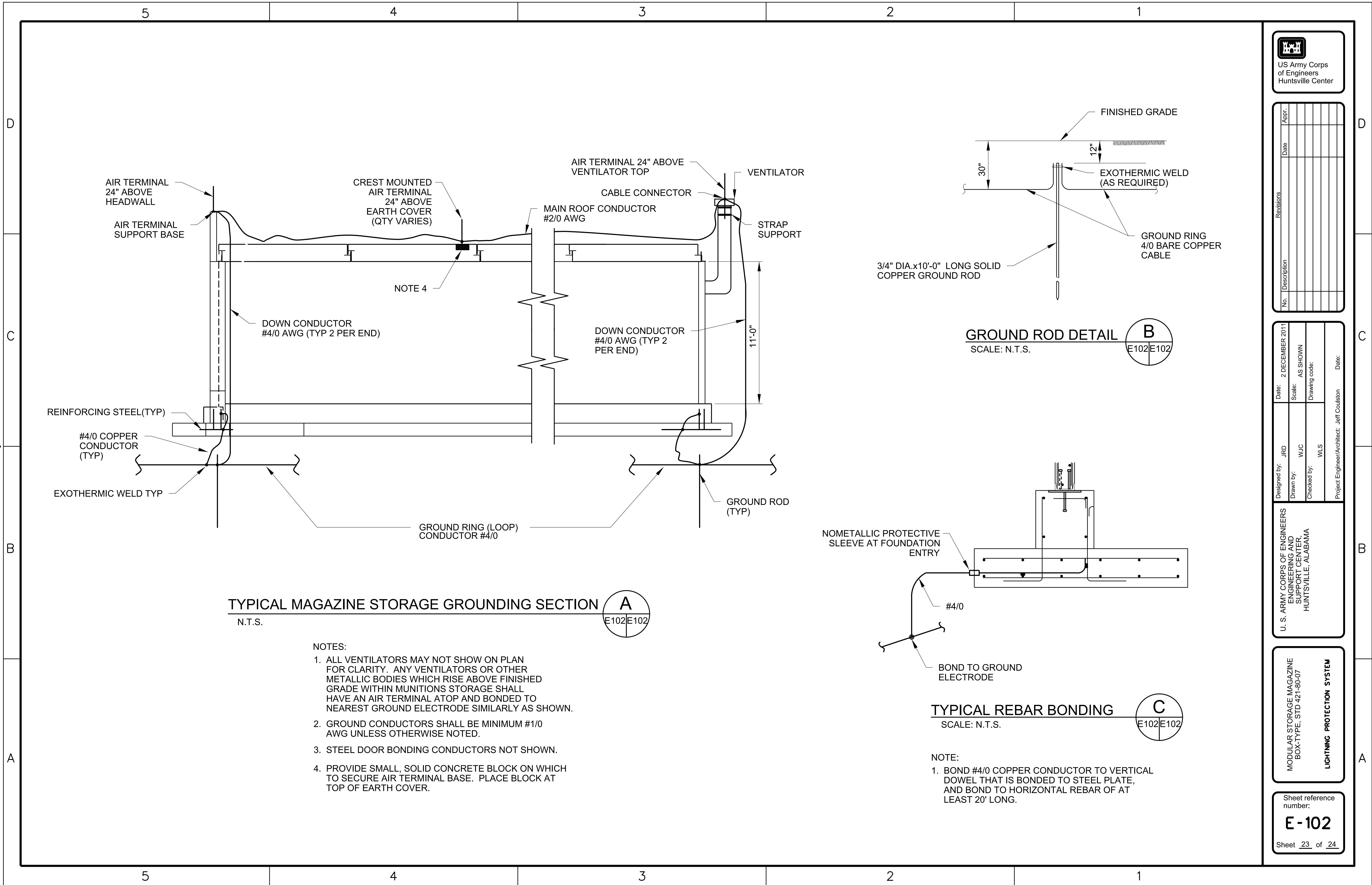
Designed by:	JRD	Project Engineer/Architect:	Jeff Coulston
Drawn by:	WJC	Date:	
Checked by:	WLS		

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BOX-TYPE, STD 421-80-07
LIGHTNING PROTECTION SYSTEM

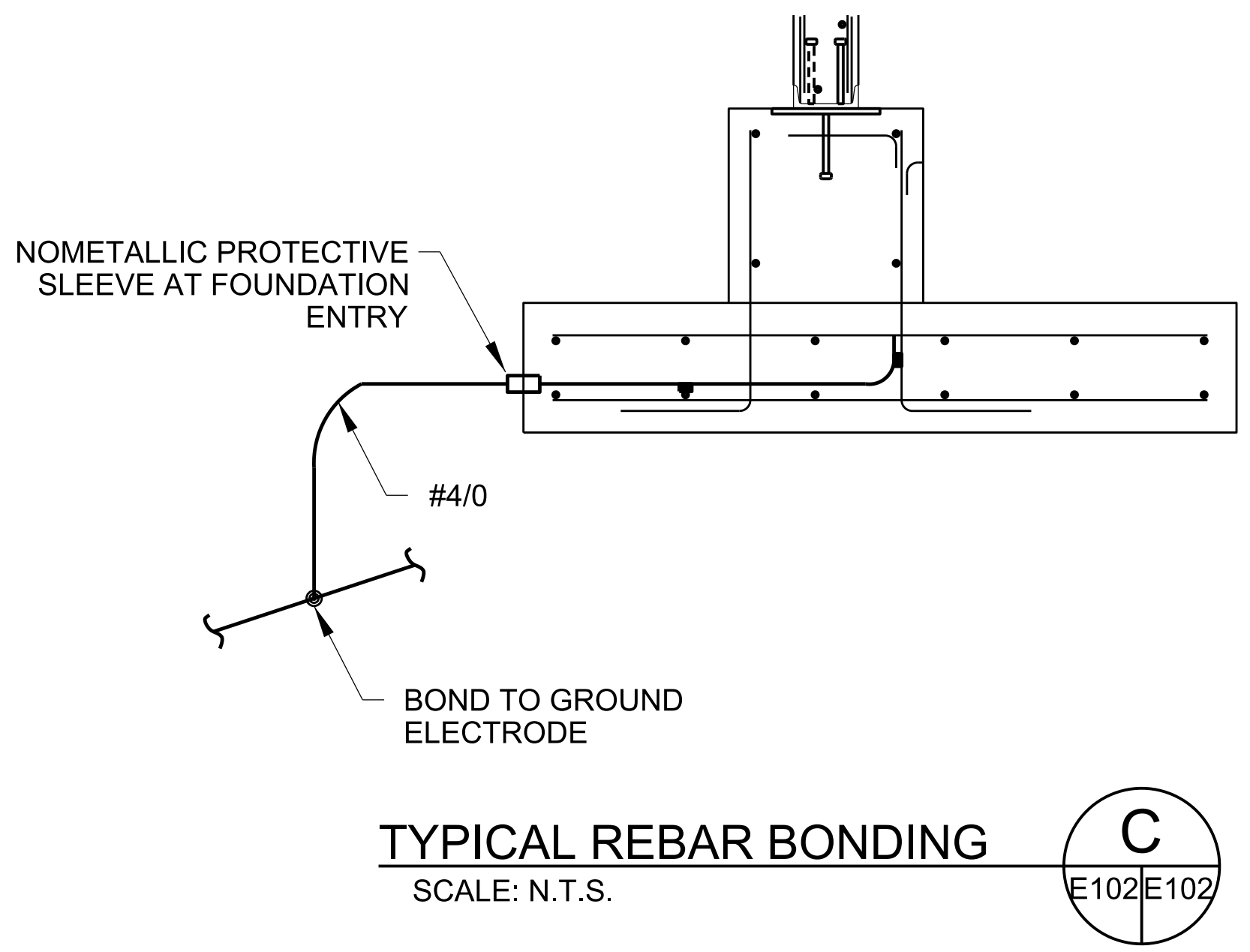
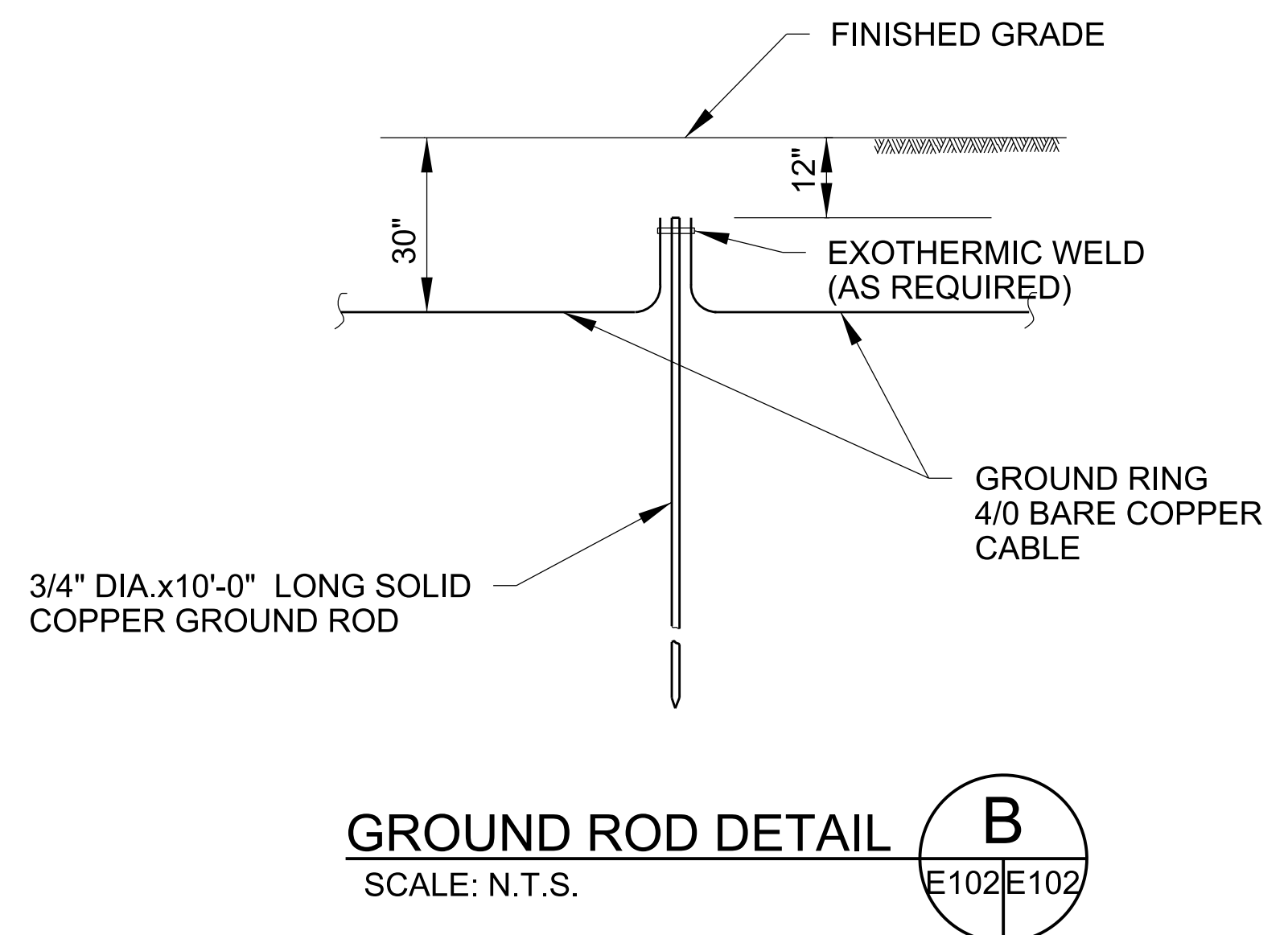
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STANDARD DESIGN DRAWINGS - FINAL



TYPICAL MAGAZINE STORAGE GROUNDING SECTION (A)
N.T.S. E102E102

- NOTES:
1. ALL VENTILATORS MAY NOT SHOW ON PLAN FOR CLARITY. ANY VENTILATORS OR OTHER METALLIC BODIES WHICH RISE ABOVE FINISHED GRADE WITHIN MUNITIONS STORAGE SHALL HAVE AN AIR TERMINAL ATOP AND BONDED TO NEAREST GROUND ELECTRODE SIMILARLY AS SHOWN.
 2. GROUND CONDUCTORS SHALL BE MINIMUM #1/0 AWG UNLESS OTHERWISE NOTED.
 3. STEEL DOOR BONDING CONDUCTORS NOT SHOWN.
 4. PROVIDE SMALL, SOLID CONCRETE BLOCK ON WHICH TO SECURE AIR TERMINAL BASE. PLACE BLOCK AT TOP OF EARTH COVER.



- NOTE:
1. BOND #4/0 COPPER CONDUCTOR TO VERTICAL DOWEL THAT IS BONDED TO STEEL PLATE, AND BOND TO HORIZONTAL REBAR OF AT LEAST 20' LONG.



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MODULAR STORAGE MAGAZINE
BOX-TYPE, STD 421-80-07
LIGHTNING PROTECTION SYSTEM

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