
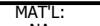


SHEET INDEX



REV: 0	TOLERANCES	UNLESS OTHERWISE SPECIFIED	 SANFORD UNDERGROUND RESEARCH FACILITY <small>(SOUTHERN REGIONAL SCIENTIFIC CENTER TECHNOLOGICAL SUBSTATION)</small>	<div>COVER SHEET</div> <div>4850L SUBSTATION</div> <div>12478</div>	REV
DRAWN BY: KJ		DIMENSIONS IN INCHES			
DATE: 4/23/2025		$\pm .1$.XX \pm .02 .XX \pm .005 ANGLES: $\pm 1^\circ$			
CHECKED BY:		SURFACE FINISH:			
CHECKED DATE:		DIMENSIONING AND TOLERANCING PER ASME Y14.5-2009 BREAK EDGES SHOWN REMOVE BURNS, WELD SPATTER & LOOSE SCALE			
APPROVED BY:	WEIGHT: NA	MAYL: NA	<div>SHEET NUMBER: G-101</div> <div>SIZE: D</div> <div>SCALE: PER VIEW</div>	REV	
APPROVED DATE:	THIRD ANGLE PROJECTION				
COMMENTS:					

SYMBOL	DESCRIPTION
	DOUBLE-LINE AND SINGLE-LINE RECTANGULAR DUCT, FIRST NUMBER INDICATES SIDE IN VIEW IN INCHES, SECOND NUMBER INDICATES SIDE IN DEPTH IN INCHES
	DOUBLE-LINE AND SINGLE-LINE ROUND DUCT, NUMBER INDICATES DIAMETER IN INCHES
	TRANSITION / REDUCER
	RADIUS ELBOW WITH TURNING VANES & MITERED ELBOW WITH TURNING VANES
	VANED ELBOW OR RADIUS ELBOW (USE VANED ELBOW WHERE SPACE WILL NOT PERMIT THE USE OF LONG RADIUS ELBOW)
	RECTANGULAR RETURN AIR DUCT (UP AND DOWN)
	ROUND EXHAUST AIR DUCT (UP AND DOWN)
	COMBINATION FIRE/SMOKE DAMPER
	ACCESS DOOR
	TRANSFER DUCT WITH GRILLES
	AIR FLOW ARROW (SUPPLY)
	AIR FLOW ARROW (RETURN/EXHAUST)
	FAN-CENTRIFUGAL
	THERMOSTAT

SYMBOL	DESCRIPTION
AD	ACCESS DOOR
EA	EXHAUST AIR
ESP	EXTERNAL STATIC PRESSURE
FSD	COMBINATION FIRE/SMOKE DAMPER
HP	HORSEPOWER
HZ	HERTZ
IN	INCHES
LB	POUND
PH	PHASE
RPM	REVOLUTIONS PER MINUTE
STL	STEEL
TA	TRANSFER AIR
TYP	TYPICAL
VFD	VARIABLE FREQUENCY DRIVE/CONTROLLER
VIF	VERIFY IN FIELD
WG	WATER GAUGE OR WALL GRILLE
WMS	WIRE MESH SCREEN

1. WHERE DOCUMENTS ARE REFERENCED IN THE GENERAL AND DESIGN NOTES, THEY SHALL BE THE LATEST APPLICABLE EDITIONS, UNLESS OTHERWISE NOTED.
2. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE 2021 INTERNATIONAL BUILDING CODE, INCLUDING REFERENCE STANDARDS, ADDENDA AND APPENDICES.
3. IN ADDITION, THE FOLLOWING CODES, STANDARDS AND SPECIFICATIONS SHALL APPLY WHERE MORE STRINGENT AND AS MODIFIED BY THE BUILDING CODE:
 - 3.1. ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE AND COMMENTARY"
 - 3.2. ACI 530/530.1 "BUILDING CODE REQUIREMENTS AND SPECIFICATIONS FOR MASONRY STRUCTURES AND RELATED COMMENTARIES"
 - 3.3. AISC "STEEL CONSTRUCTION MANUAL AND AISC 360 "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS"
 - 3.4. AISC "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
 - 3.5. AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS"
 - 3.6. AWS D1.1 "STRUCTURAL WELDING CODE"
 - 3.7. AWS D1.4 "STRUCTURAL WELDING CODE- REINFORCING STEEL"
 - 3.8. AISI "SPECIFICATION FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS"

1. VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AT THE JOB SITE. THE CONTRACTOR SHALL NOTIFY THE SDSTA PROJECT MANAGER OF ANY DISCREPANCIES REQUIRING CLARIFICATION OR REVISION.
2. SCALES NOTED ON THE DRAWINGS ARE FOR GENERAL INFORMATION ONLY. NO DIMENSIONAL INFORMATION SHALL BE OBTAINED BY SCALING FROM THE DRAWINGS.
3. IN THE EVENT THAT CERTAIN DETAILS OF THE CONSTRUCTION ARE NOT FULLY SHOWN OR NOTED ON DRAWINGS, THEIR CONSTRUCTION SHALL BE OF THE SAME TYPE AS FOR SIMILAR CONDITIONS THAT ARE SHOWN OR NOTED, SUBJECT TO THE ENGINEER'S [PRIOR WRITTEN] APPROVAL.
4. REFER TO DRAWINGS FOR THE FOLLOWING:
 - 4.1. SIZE AND LOCATION OF ALL DOOR OPENINGS, EXCEPT AS NOTED.
 - 4.2. SIZE AND LOCATION OF ALL INTERIOR NON-BEARING PARTITIONS.
 - 4.3. SIZE AND LOCATION OF ALL CONCRETE HOUSEKEEPING PADS.
 - 4.4. DUCT RUNS.

1. STRUCTURAL CONCRETE STRENGTHS AND TYPES USED IN THIS PROJECT SHALL BE AS FOLLOWS:

CALL OUT IN DOCUMENTS	fc (PSI)	AGGREGATE
STANDARD CONCRETE	5000	NORMAL WEIGHT

2. ALL CONCRETE MIXES SHALL COMPLY WITH THE REQUIREMENTS OF THE BUILDING CODE AND THE ACI 318. MIX DESIGNS FOR EACH TYPE AND STRENGTH SHALL BE PREPARED BY CONTRACTOR AND TESTED BY AN INDEPENDENT TESTING LABORATORY. THE MIX DESIGNS SHALL THEN BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
3. PORTLAND CEMENT SHALL CONFORM TO ASTM C150. WHERE CONCRETE IS IN CONTACT WITH ROCK, THE TYPE OF EXPOSURE SHALL DETERMINE THE CEMENT TYPE. THE CONTRACT REQUIREMENT IS FOR ALL CONCRETE IN CONTACT WITH ROCK TO MEET: MODERATE SULPHATE EXPOSURE TYPE II
4. NORMAL WEIGHT AGGREGATE SHALL CONFORM TO THE REQUIREMENTS OF ASTM C33.
5. LIGHTWEIGHT AGGREGATE SHALL CONFORM TO THE REQUIREMENTS OF ASTM C330 AND ASTM C157.
6. CONCRETE FORMS SHALL BE LAID OUT AND CONSTRUCTED TO PROVIDE THE SPECIFIED CAMBERS INDICATED ON THE DRAWINGS AND SHALL COMPLY WITH REQUIREMENTS OF ACI 318.
7. THE PROJECTING CORNERS OF COLUMNS, BEAMS, WALLS, ETC. SHALL BE FORMED WITH $\frac{3}{4}$ INCH CHAMFER, UNLESS OTHERWISE NOTED.
8. CONSTRUCTION JOINTS SHALL BE DOWELED, KEYED AND THE SURFACES SHALL BE CLEANED AND LAITANCE REMOVED. ALTERNATIVELY, WHERE APPROVED BY SDSTA, PROVIDE JOINTS CLEANED AND ROUGHENED TO $\frac{1}{4}$ INCH AMPLITUDE BY MECHANICAL METHODS.
9. REINFORCING BARS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615, GRADE 60. REINFORCING BARS, WHICH ARE TO BE WELDED, SHALL CONFORM TO APPLICABLE ASTM AND AWS SPECIFICATIONS.
10. DOWEL TO WALLS AND COLUMNS SHALL MATCH THE CORRESPONDING REINFORCING OF THE WALL OR COLUMN.
11. ALL REINFORCING STEEL SHALL BE SECURELY HELD IN ORDER TO MAINTAIN ITS POSITION WHILE CONCRETE IS POURED. CHAIRS, TIES, SPACERS, ADDITIONAL BARS AND STIRRUPS, ETC. SHALL BE PROVIDED BY THE CONTRACTOR.
12. COORDINATE AND INSTALL ALL REQUIRED EMBEDDED ITEMS, SLEEVES, POCKETS, PENETRATIONS, ELECTRICAL GROUNDING CONDUCTORS, ETC. PRIOR TO CONCRETE PLACEMENT. REFER TO TYPICAL DETAILS OF PENETRATIONS FOR LIMITATIONS ON THEIR POSITIONING IN RESPECT TO REINFORCING. DO NOT CUT ANY REINFORCING THAT MIGHT INTERFERE WITH EMBEDDED ITEMS PLACEMENT.
13. MECHANICAL PIPES AND/OR ELECTRICAL CONDUITS SHALL NOT PASS THROUGH CONCRETE COLUMNS AND BEAMS, UNLESS SPECIFICALLY DETAILED ON DRAWINGS.
14. CONTRACTOR SHALL COORDINATE FINAL DIMENSIONS AND LOCATIONS OF HOUSEKEEPING PADS UPON FINAL SELECTION AND PROCUREMENT OF EQUIPMENT.
15. NO ALUMINUM SHALL BE EMBEDDED IN CONCRETE.
16. NOTIFY SDSTA PROJECT MANAGER 24 HOURS BEFORE POURING OF CONCRETE FOR INSPECTION OF REINFORCEMENT LAYOUT. NO CONCRETE SHALL BE POURED UNLESS ALL REINFORCEMENT AND INSTALLATIONS HAVE BEEN INSPECTED AND APPROVED.

1. ALL EXPANSION ANCHOR AND ADHESIVE ANCHOR PRODUCTS SHALL BE SUBMITTED FOR REVIEW PRIOR TO USE. SUBMITTALS SHALL CONTAIN APPLICABLE PRODUCT LITERATURE AND AN ICC-ES EVALUATION REPORT.
2. ALL EXPANSION ANCHORS AND ADHESIVE ANCHORS INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURER REQUIREMENTS. SPECIAL INSPECTION AS STIPULATED IN THE APPLICABLE ICC-ES REPORT AND IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE IS REQUIRED.
3. EPOXY ANCHORS INSTALLED AT AN UPWARDLY INCLINED ANGLE (INCLUDING VERTICAL) SHALL BE INSTALLED BY PERSONNEL CERTIFIED BY AN APPLICABLE CERTIFICATION PROGRAM, SUCH AS THE ACI/CRSI ADHESIVE INSTALLER CERTIFICATION PROGRAM, OR AN APPROVED EQUIVALENT, AND SHALL HAVE CONTINUOUS SPECIAL INSPECTION.

1. MASONRY WORK SHALL CONFORM TO REQUIREMENTS OF THE BUILDING CODE AND ACI 530/530.1 "BUILDING CODE REQUIREMENTS AND SPECIFICATIONS FOR MASONRY STRUCTURES AND RELATED COMMENTARIES".
2. MASONRY MATERIAL TYPES AND STRENGTHS USED IN THIS PROJECT SHALL BE AS FOLLOWS:

MATERIAL	ASTM STANDARD	TYPE
MORTAR	C270	TYPE N
GROUT	C476	f _g = 2500 PSI
REINFORCING BARS	A615	GRADE 60
3. THE NET AREA COMPRESSIVE STRENGTH OF THE MASONRY ASSEMBLY (f_m) SHALL NOT BE LESS THAN 2000 PSI.
4. GROUT SHALL BE FINE GROUT. GROUT SHALL BE FLUID ENOUGH IN ORDER TO FLOW IN ALL JOINTS OF THE MASONRY WITHOUT SEGREGATION.
5. ALL CELLS AND BOND BEAMS WITH REINFORCING SHALL BE FILLED SOLID WITH GROUT.
6. MORTAR AND GROUT MIX DESIGNS FOR EACH TYPE AND STRENGTH SHALL BE PREPARED BY CONTRACTOR AND TESTED BY AN INDEPENDENT TESTING LABORATORY. THE MIX DESIGNS SHALL THEN BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
7. FOR DIMENSIONS OF UNITS, SURFACE FINISHES, COURSE PATTERNS AND JOINT TYPES, REFER TO DRAWINGS.
8. CORING OPENINGS IN GROUTED MASONRY IS NOT PERMITTED.
9. NO PIPES OR ELECTRICAL CONDUITS SHALL PASS THROUGH MASONRY LINTELS AND/OR REINFORCED, GROUTED CELLS.
10. SEE DRAWINGS FOR NON-LOAD BEARING WALLS DIMENSIONS AND LOCATIONS.
11. PROVIDE LATERAL SUPPORT AT THE TOP OF NON LOAD-BEARING MASONRY WALLS, ACCORDING TO TYPICAL DETAILS.
12. SEE MASONRY TYPICAL DETAILS FOR DETAILING OF NON LOAD-BEARING WALLS.

1. ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED ACCORDING TO ASTM A123. WEATHERING STEEL MAY BE USED IN LIEU OF HOT-DIP GALVANIZED STEEL AT CONTRACTOR'S OPTION.
2. STRUCTURAL STEEL SHALL BE PROVIDED AS FOLLOWS:

SHAPE	ASTM STANDARD	Fy (KSI)
WIDE FLANGES	A992	50
CHANNELS	A36	36
HSS (RECTANGULAR AND SQUARE)	A500 GRADE B	46
HSS (ROUND)	A500 GRADE B	42
PIPES	A53 GRADE B	35
ANGLES	A36	36
PLATES -TYPICAL	A36	36
PLATES -WHERE NOTED	ASTM A572 GRADE 50	50
TEES	A992	50
WEATHERING STEEL (CONTRACTOR OPTION)	A588	50

Fy IS THE MINIMUM TENSILE YIELDING STRESS TO BE PROVIDED UNLESS NOTED.

3. ALL BOLTED CONNECTIONS SHALL BE MADE WITH HIGH STRENGTH BOLTS CONFORMING TO ASTM A325 OR ASTM A490. ALL CONNECTIONS SHALL BE TYPE N UNLESS OTHERWISE NOTED. FASTENERS AND CONNECTING PARTS SHALL BE HOT-DIP GALVANIZED ACCORDING TO ASTM A153. BOLTS DENOTED AS A325-SC R A490-SC SHALL BE SLIP CRITICAL.
4. NUTS CONFORM TO ASTM A563, DH OR ASTM A194, 2H. PROVIDE WASHERS CONFORMING TO ASTM F436 AT EACH THREADED ROD OR BOLT. NUTS AND WASHERS SHALL BE HOT-DIP GALVANIZED ACCORDING TO ASTM A153.
5. BOLT HOLES IN STEEL MEMBERS, WITH THE EXCEPTION OF BASE PLATES, SHALL BE $\frac{1}{16}$ INCH LARGER IN DIAMETER THAN THE NOMINAL SIZE OF THE BOLT USED, UNLESS NOTED OTHERWISE.



6. ANCHOR BOLTS SHALL BE ROUND BAR STOCK, THREADED, CONFORMING TO ASTM F1554, GRADE 36 UNLESS OTHERWISE NOTED. ANCHOR BOLTS SHALL BE SUPPLIED WITH CORRESPONDING NUTS AND WASHERS. ANCHOR BOLTS SHALL BE HOT-DIP GALVANIZED.
7. STRUCTURAL THREADED RODS SHALL HAVE THREADS CONFORMING TO UNC CLASS 2A (EXTERNAL THREADS) AND 2B (INTERNAL THREADS). THREADED RODS SHALL BE HOT-DIP GALVANIZED.
8. WELDING MATERIALS SHALL CONFORM TO AWS D1.1 ELECTRODES SHALL HAVE A MINIMUM TENSILE STRENGTH OF 70 KSI AND BE LOW-HYDROGEN TYPE.
9. PROVIDE ALL NECESSARY TEMPORARY BRACING, GUYING AND CONNECTING MEMBERS REQUIRED TO ERECT THE STRUCTURE, MAINTAIN CORRECT ALIGNMENT AND SAFELY RESIST ALL POSSIBLE COMBINATIONS OF DEAD, CONSTRUCTION, ERECTION, WIND, AND OTHER LATERAL LOADS.
10. CLEAN AREAS IN ALL LOCATIONS WHERE GALVANIZING IS DAMAGED OR MISSING AND REPAIR GALVANIZING TO COMPLY WITH ASTM A780/A780M. GALVANIZING TO BE REPAIRED AT ALL LOCATIONS WHERE FIELD WELDING IS REQUIRED.

1. STEEL MEMBERS ARE ASSUMED TO BE DIMENSIONED TO THEIR CENTERLINE UNLESS OTHERWISE INDICATED. STEEL COLUMNS ARE ASSUMED TO BE PLUMB AND STEEL BEAMS ARE ASSUMED TO BE LEVEL UNLESS OTHERWISE INDICATED.
2. STEEL MEMBERS NOT LOCATED IN PLAN BY A DIMENSION LINE SHALL BE EQUALLY SPACED BETWEEN DIMENSIONED MEMBERS.

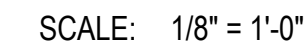
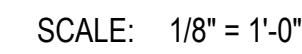
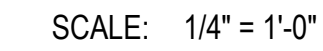
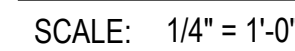
1. ALL FASTENERS AND CONNECTING PARTS SHALL BE HOT-DIP GALVANIZED ACCORDING TO ASTM A153, EXCEPT A490 BOLTS, WHICH SHALL HAVE A ZINC/ALUMINUM CORROSION PROTECTIVE COATING IN ACCORDANCE WITH ASTM F1136/F1136M GRADE 3.
2. CONTRACTOR SHALL PROVIDE THE DESIGN FOR ALL STRUCTURAL STEEL CONNECTIONS NOT COMPLETELY DEFINED IN THE DRAWINGS. CONTRACTOR SHALL RETAIN A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF SOUTH DAKOTA TO DESIGN SUCH CONNECTIONS.


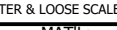
1. CONTRACTOR TO VERIFY IN FIELD ALL EXISTING STRUCTURE AND CRITICAL DIMENSIONS.
2. CONTRACTOR TO COORDINATE ALL INSTALLS TO AVOID KNOWN INSTRUMENTATION CABLING BEHIND THE SHOTCRETE.

1. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. PROVIDE ALL FITTINGS, TRANSITIONS, DAMPERS, VALVES, AND OTHER DEVICES REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.
2. ALL DUCTWORK SHALL BE CONSTRUCTED, ERECTED, AND TESTED IN ACCORDANCE WITH THE MOST RESTRICTIVE OF LOCAL REGULATIONS, PROCEDURES DETAILED IN THE ASHRAE HANDBOOK OF FUNDAMENTALS, OR THE APPLICABLE STANDARDS ADOPTED BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION.
3. PROVIDE FIRE, FIRE AND SMOKE AND SMOKE DAMPERS AS REQUIRED FOR FIRE SEPARATION AS NOTED ON DRAWINGS.

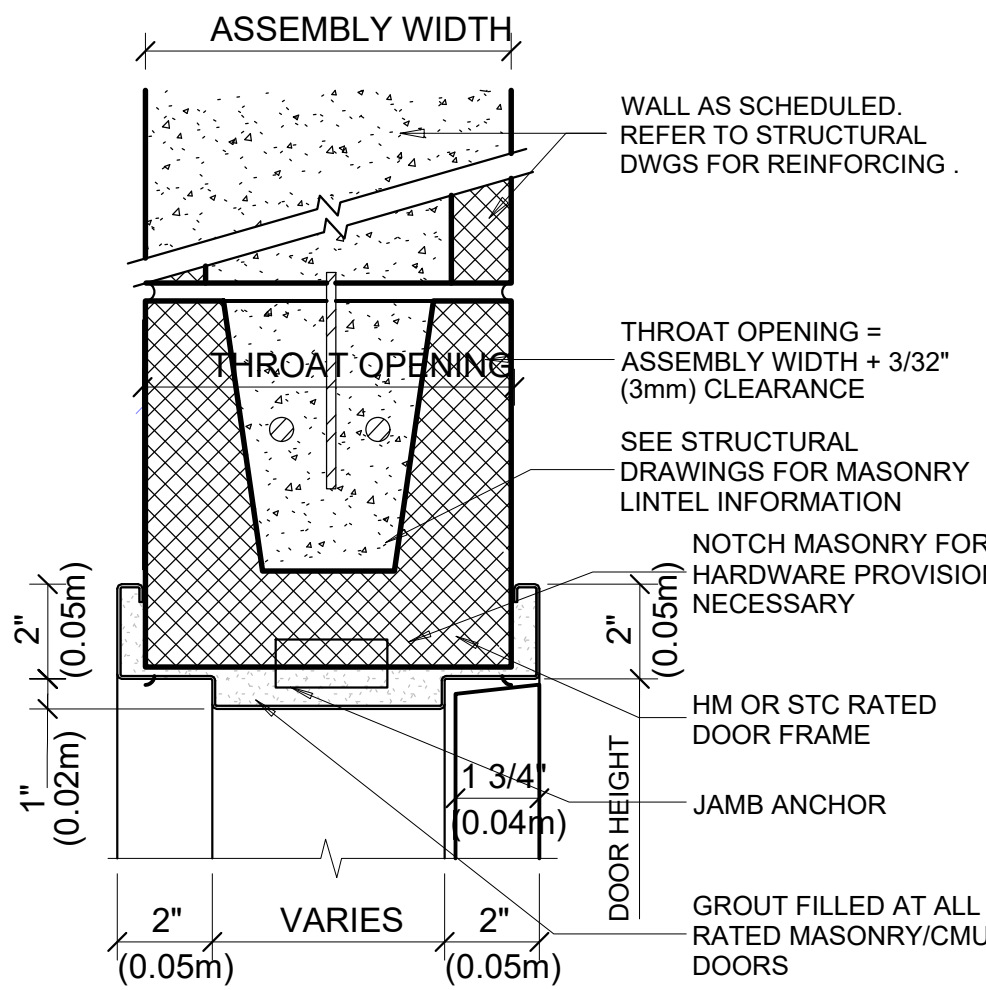
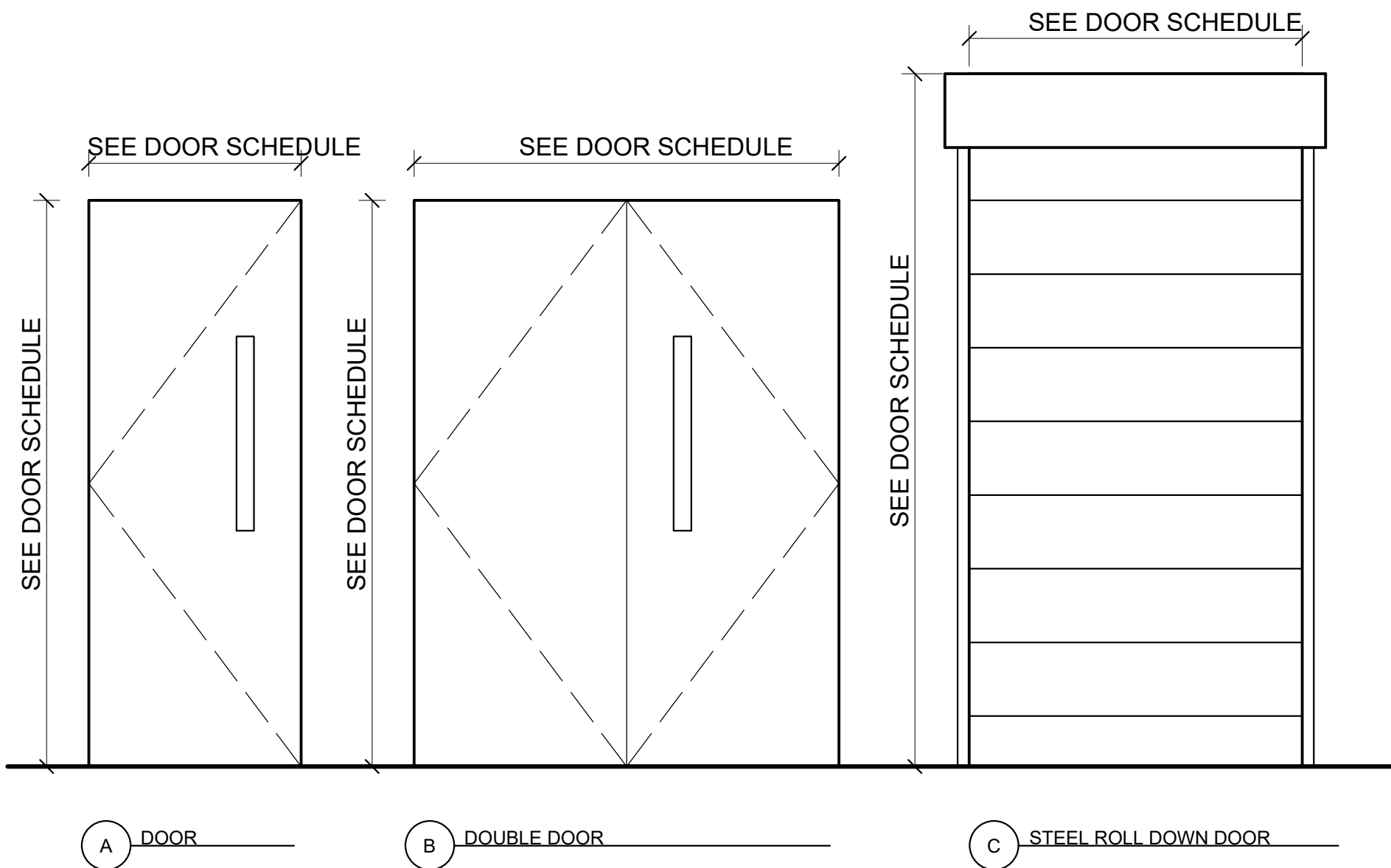
REV: 0	UNLESS OTHERWISE SPECIFIED		 <div>SANFORD UNDERGROUND RESEARCH FACILITY</div> <div>SOUTHERN BRACHYLOGIC MINING AND TECHNOLOGY AUTHORITY</div>		
DRAWN BY: KJ	DIMENSIONS IN INCHES				
DATE: 4/23/2025	X±.1 .XX±.02 .XXX±.005				
CHECKED BY:	ANGLES: ± 1°				
CHECKED DATE:	SURFACE FINISH:		NOTES, SYMBOLS, & ABBREVIATIONS 4850L SUBSTATION 12478		
APPROVED BY:	DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009 REBAR EDOES (SEE PLAN) REMOVE BURRS, WELD SPATTER & LOOSE SCALE				
APPROVED DATE:	WEIGHT: NO.	MAT'L: NO.			
COMMENTS:	THIRD ANGLE PROJECTION				
					
		SHEET NUMBER: G-102	SIZE D	SCALE: PER VIEW	REV 0

1. MEP DUCTS AND EQUIPMENT GENERALLY NOT SHOWN FOR CLARITY, OR SHOWN FOR REFERENCE ONLY. SEE MEP AND STRUCTURAL DWGS FOR ALL EQUIPMENT, DUCT, CONDUIT SIZE & LOCATIONS, AND FOR STRUCTURAL ELEMENTS.
2. ALL PARTITION WALLS TO BE 2 HR RATED PTD. CONCRETE MASONRY UNIT TYPE WALLS.
3. ALL DOORS TO BE 1 1/2 HR RATED.
4. ALL DIMENSIONS TO BE VERIFIED IN FIELD BY CONTRACTOR.
5. REFER TO STRUCTURAL DWGS FOR BOND BEAM DETAILS.
6. ALL CMU WALLS TO BE FULLY GROUTED AND FINISHED TO CAVERN EDGE CUTS.
7. PROVIDE SMOOTH CLEAN GROUTED BLOCKS AT SILL, SIDES, AND TOP OF ALL DOOR OPENINGS.

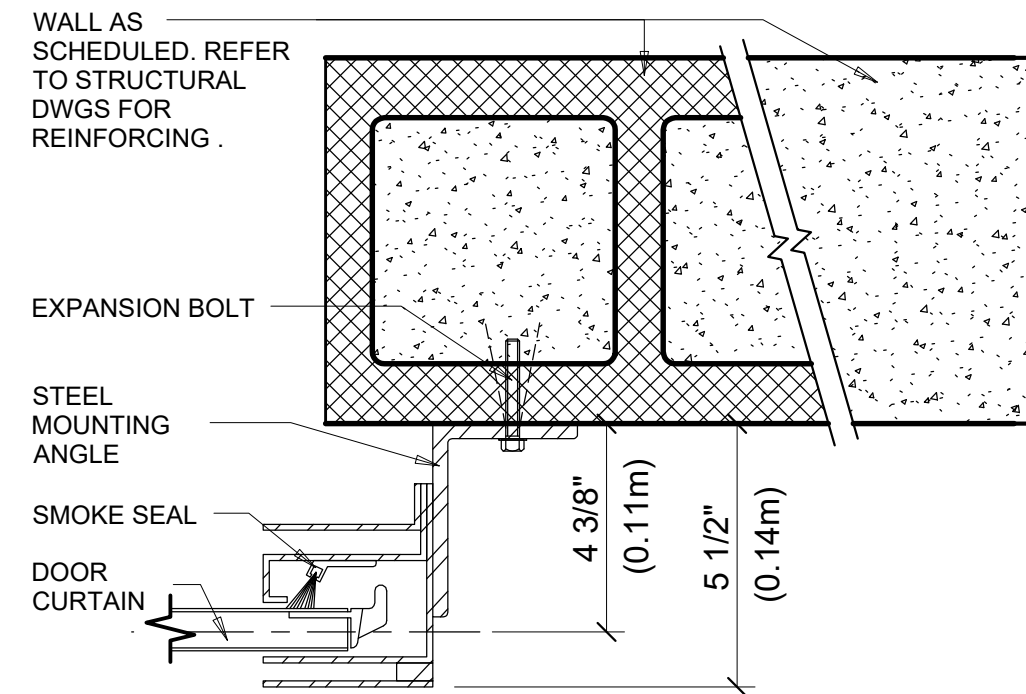


REV: 0	TOLERANCES:	UNLESS OTHERWISE SPECIFIED	 SANFORD UNDERGROUND RESEARCH FACILITY <small>(SOUTHERN BRIDGES SCIENTIFIC CATALYTIC TECHNOLOGICAL SUBSYSTEM)</small>			
DRAWN BY: KJ		DIMENSIONS IN INCHES	SUBSTATION PLAN, SECTION, & ELEVATIONS 4850L SUBSTATION 12478			
DATE: 4/23/2025		$\pm .1$.XX \pm .02 .XXX \pm .005 ANGLES: $\pm 1^\circ$				
CHECKED BY:		SURFACE FINISH:				
CHECKED DATE:		DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009 BREAK EDGES: 0.04 MAX REMOVE BURRS, WELD SPATTER & LOOSE SCALE		4850L SUBSTATION 12478		
APPROVED BY:	WEIGHT: NA	MAYL: NA				
APPROVED DATE:	THIRD ANGLE PROJECTION 					
COMMENTS:			SHEET NUMBER: A-101	SIZE: 1/2"	SCALE: PER VIEW	REV

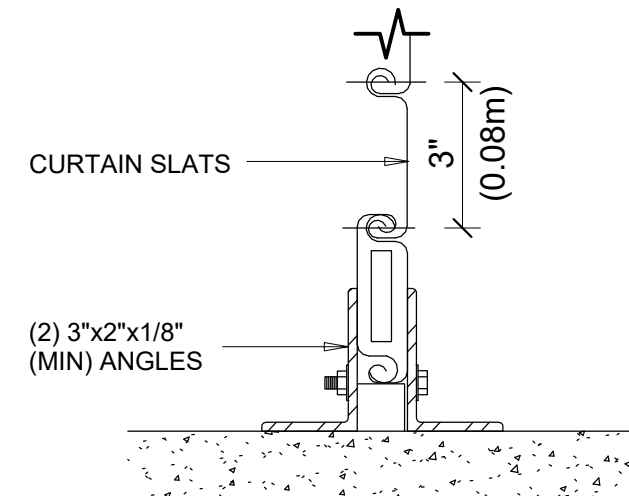
DOOR SCHEDULE																			
DOOR #	ROOM	DOOR	DESCRIPTION	DOOR SIZE			DOOR		FRAME	FRAME DETAIL			FIRE RATING	ELEC LOCK	EMERGENCY TRIGGER	CARD READER	FAIL SECURE	HARD WARE SET	
		TYPE		WIDTH	HEIGHT	THKNS	MATL	FIN	MATL	FIN	HEAD	JAMB							SILL
08A	SUBSTATION CAVERN	A	1 1/2HR 3'-0"W x 7'-0"H ACCESS DOOR	3' - 0"	7' - 0"	0" - 1 3/4"	HM	PTD	HM	PTD	H01	J01	S01	1 1/2HR	No	NONE	No	No	1.0
08B	SUBSTATION CAVERN	C	1 1/2HR 8'-0"W x 10'-0"H ROLL-UP OVERHEAD DOOR	8' - 0"	10' - 0"	0" - 5 1/2"	STL	PTD	STL	PTD	H02	J02	S02	1 1/2HR	No	FUSIBLE LINK	No	No	NA
08C	SUBSTATION CAVERN	B	1 1/2HR 6'-0"W x 7'-0"H DOUBLE ACCESS DOOR	6' - 0"	7' - 0"	0" - 1 3/4"	HM	PTD	HM	PTD	H01	J01	S01	1 1/2HR	No	NONE	No	No	2.0



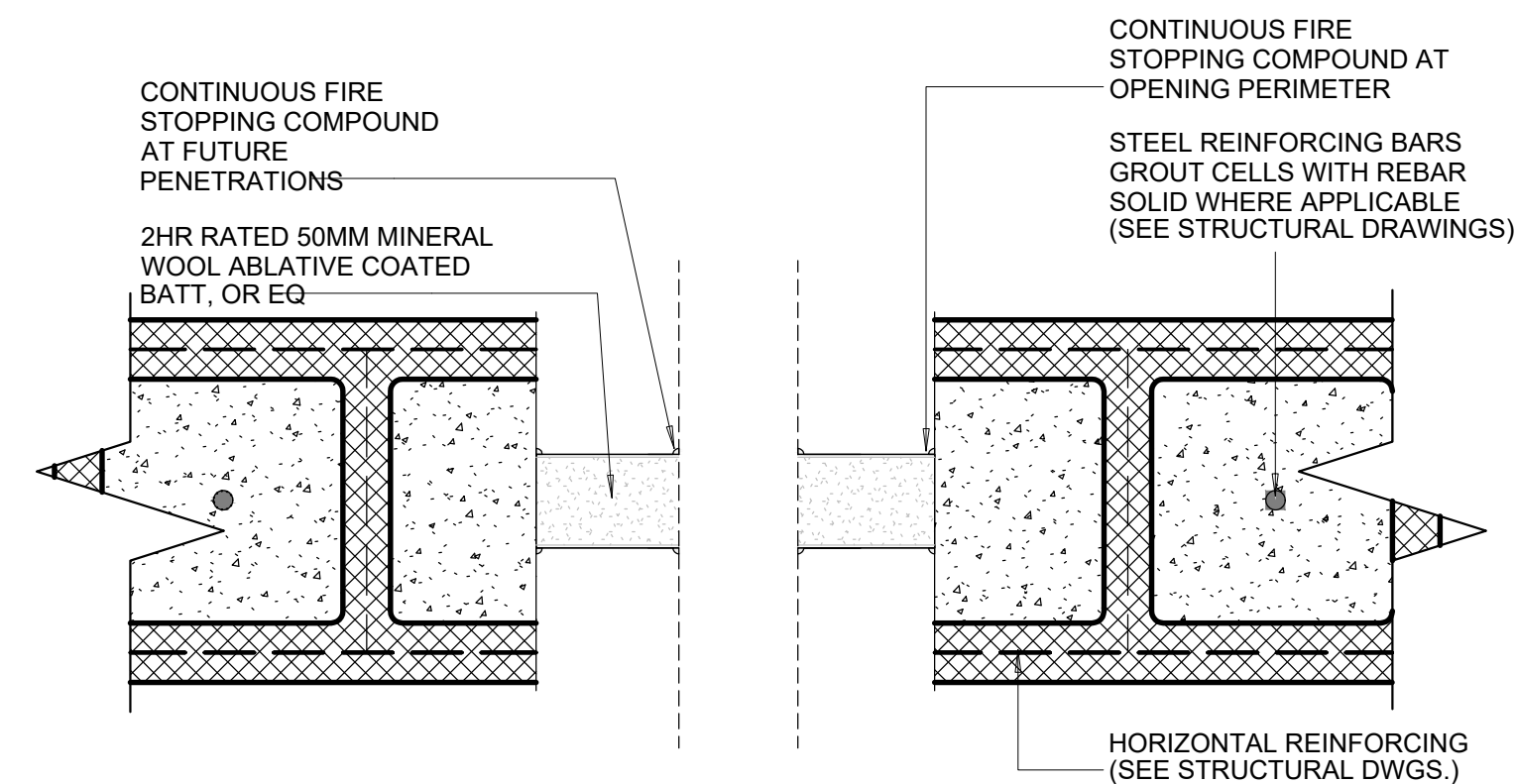
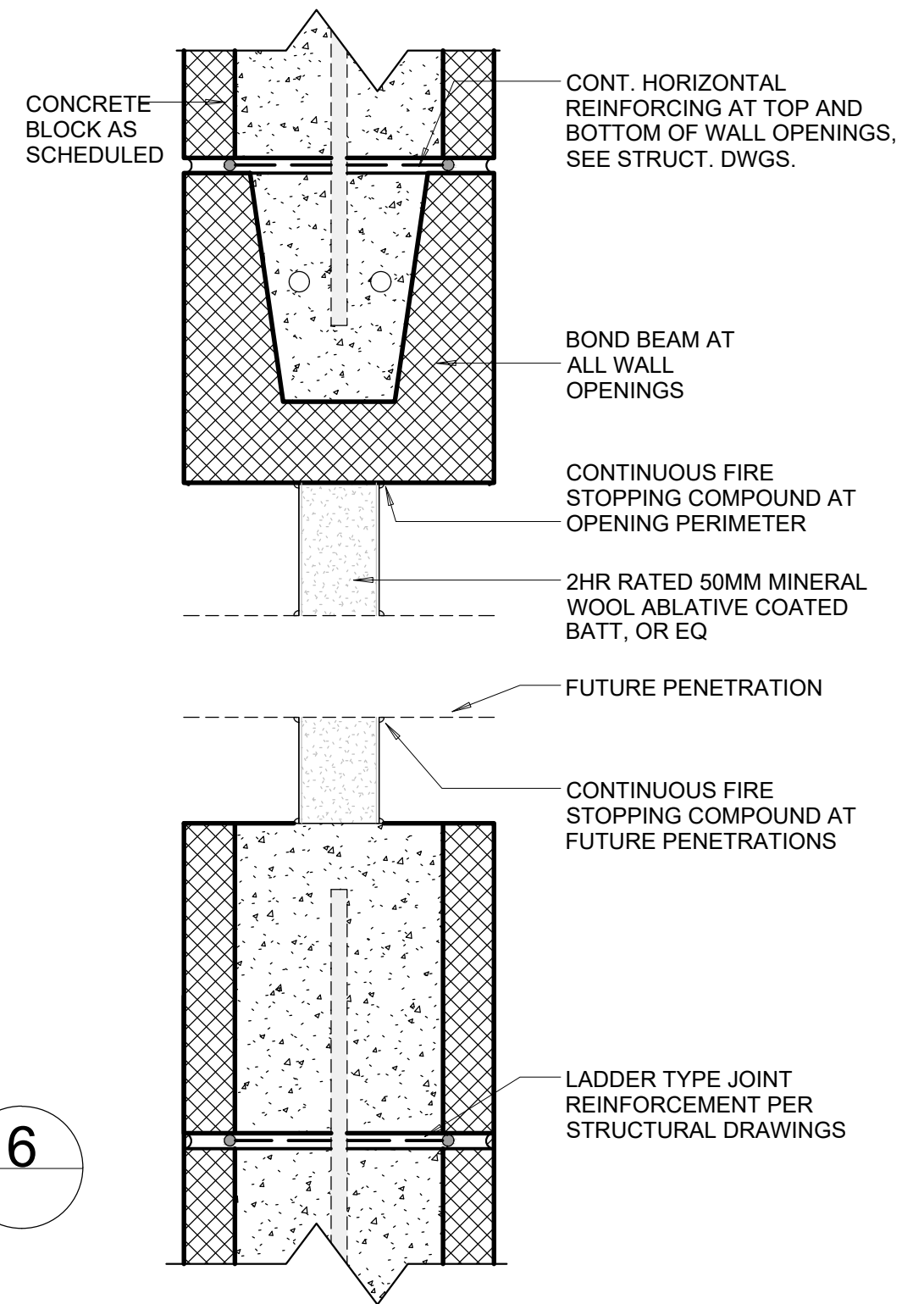
J01 - HEAD DETAIL - HM FRAME
SCALE: 3" = 1'-0"



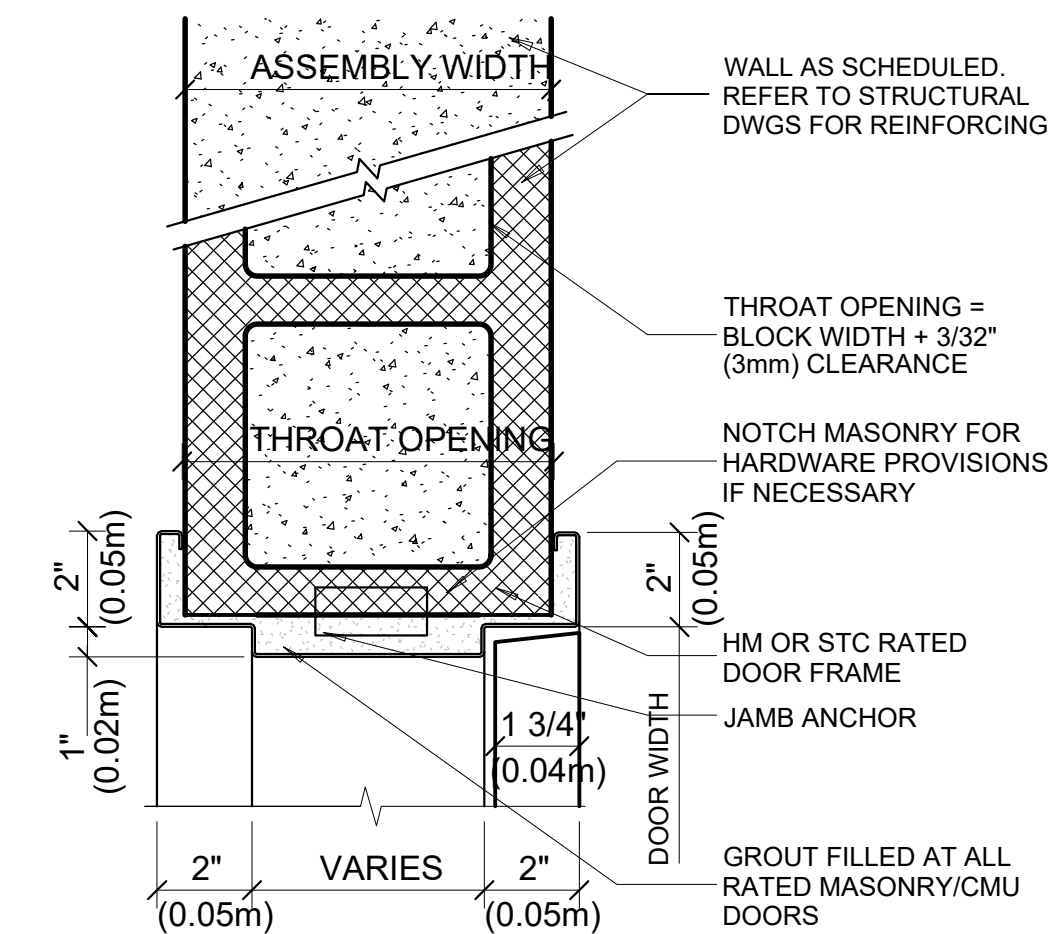
J02 - JAMB DETAIL - COILING FRAME
SCALE: 3" = 1'-0"



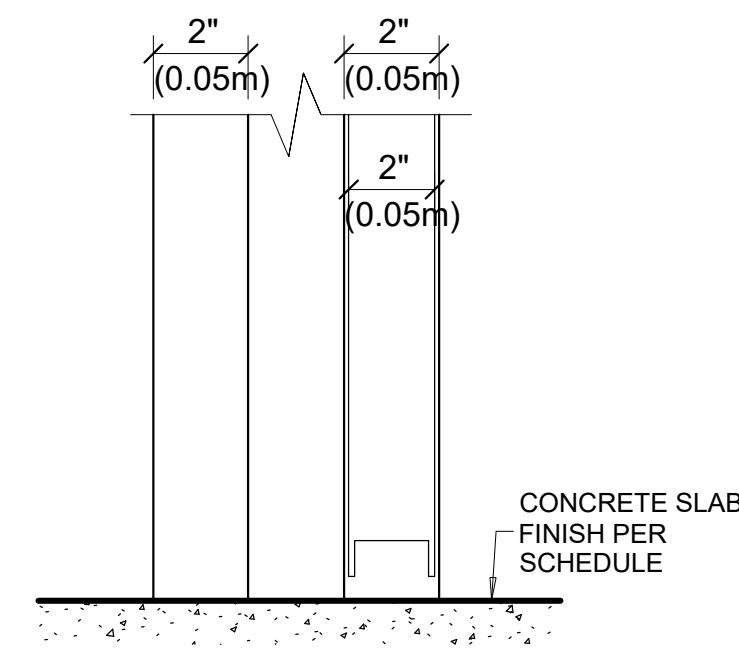
S02 - SILL DETAIL - COILING DOOR @ CONC. TO CONC.
SCALE: 3" = 1'-0"



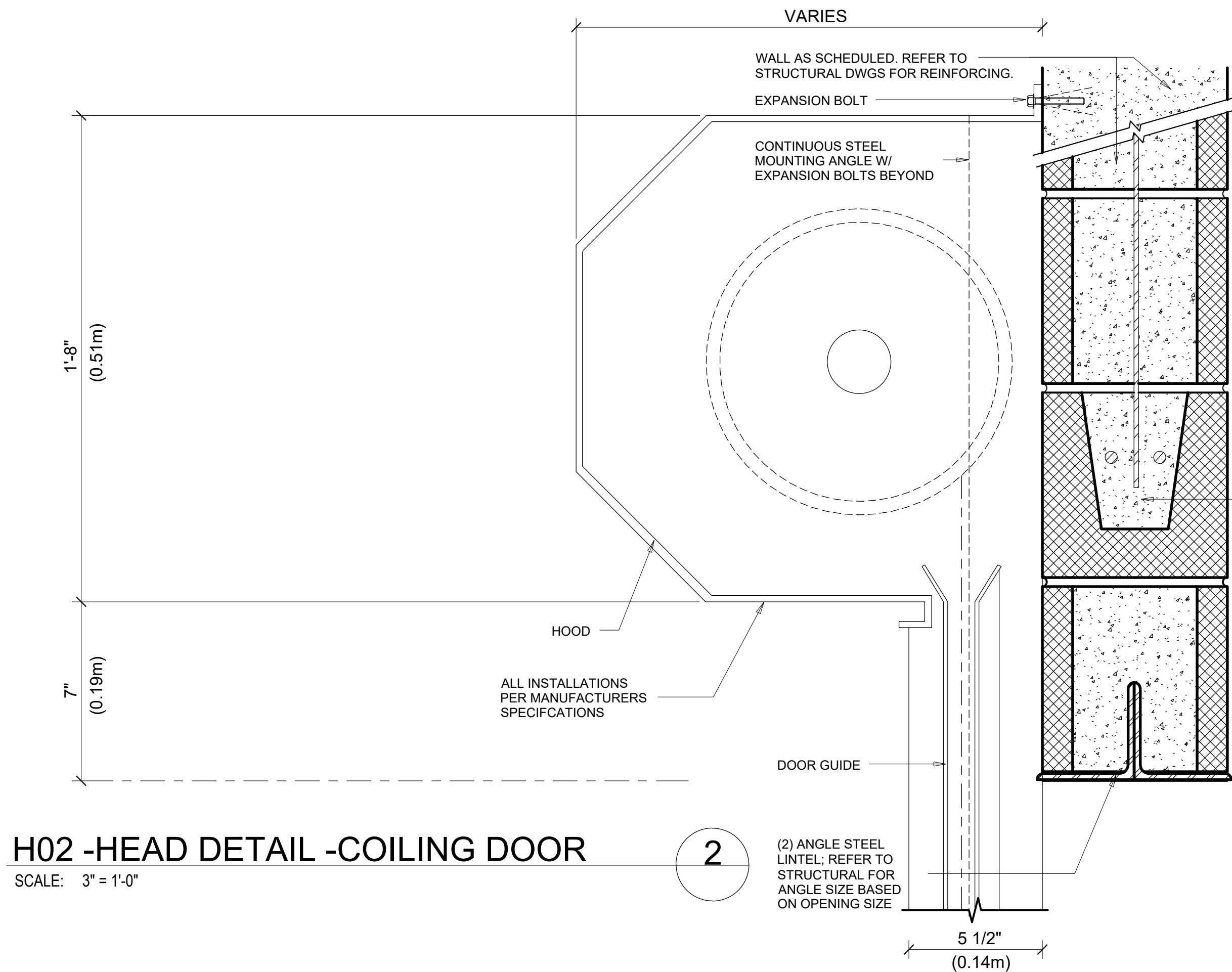
DETAIL @ CMU FUTURE PENETRATION
SCALE: 3" = 1'-0"



J01 - JAMB DETAIL - HM FRAME
SCALE: 3" = 1'-0"

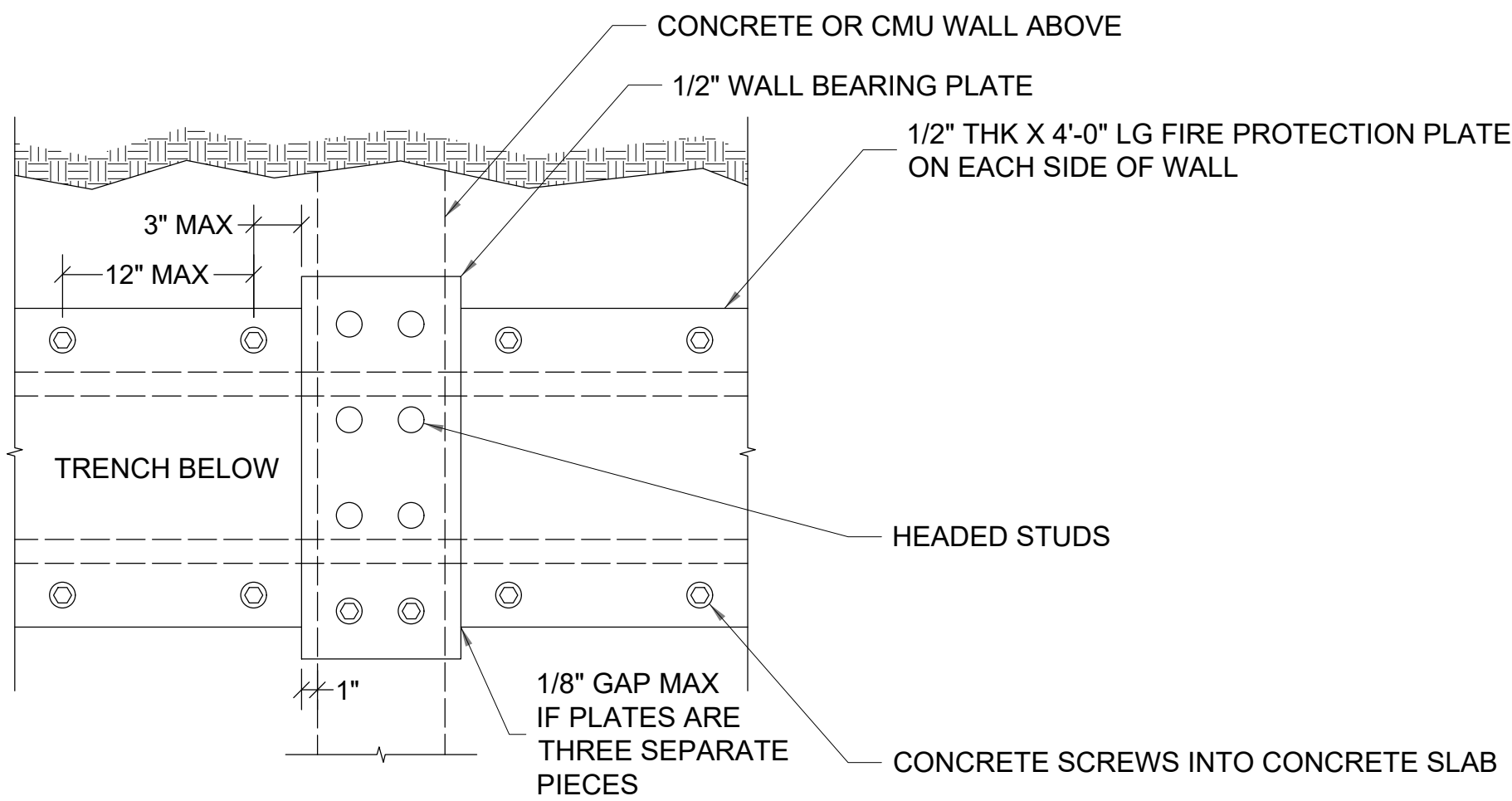


S01 - SILL DETAIL - HM FRAME @ CONC. TO CONC.
SCALE: 3" = 1'-0"



H02 - HEAD DETAIL - COILING DOOR
SCALE: 3" = 1'-0"

REV: 0	UNLESS OTHERWISE SPECIFIED		
DRAWN BY: KJ	DIMENSIONS IN INCHES		
DATE: 4/23/2025	$\times \pm .1$ $\times \pm .02$ $\times \pm .005$	DOOR SCHEDULE & DETAILS	
CHECKED BY:	ANGLES: $\pm 1^\circ$	4850L SUBSTATION	
CHECKED DATE:	SURFACE FINISH:	12478	
APPROVED BY:	WEIGHT: NA	SHEET NUMBER: A-102	
APPROVED DATE:	THIRD ANGLE PROJECTION	SIZE: D	
COMMENTS:		SCALE: PER VIEW	



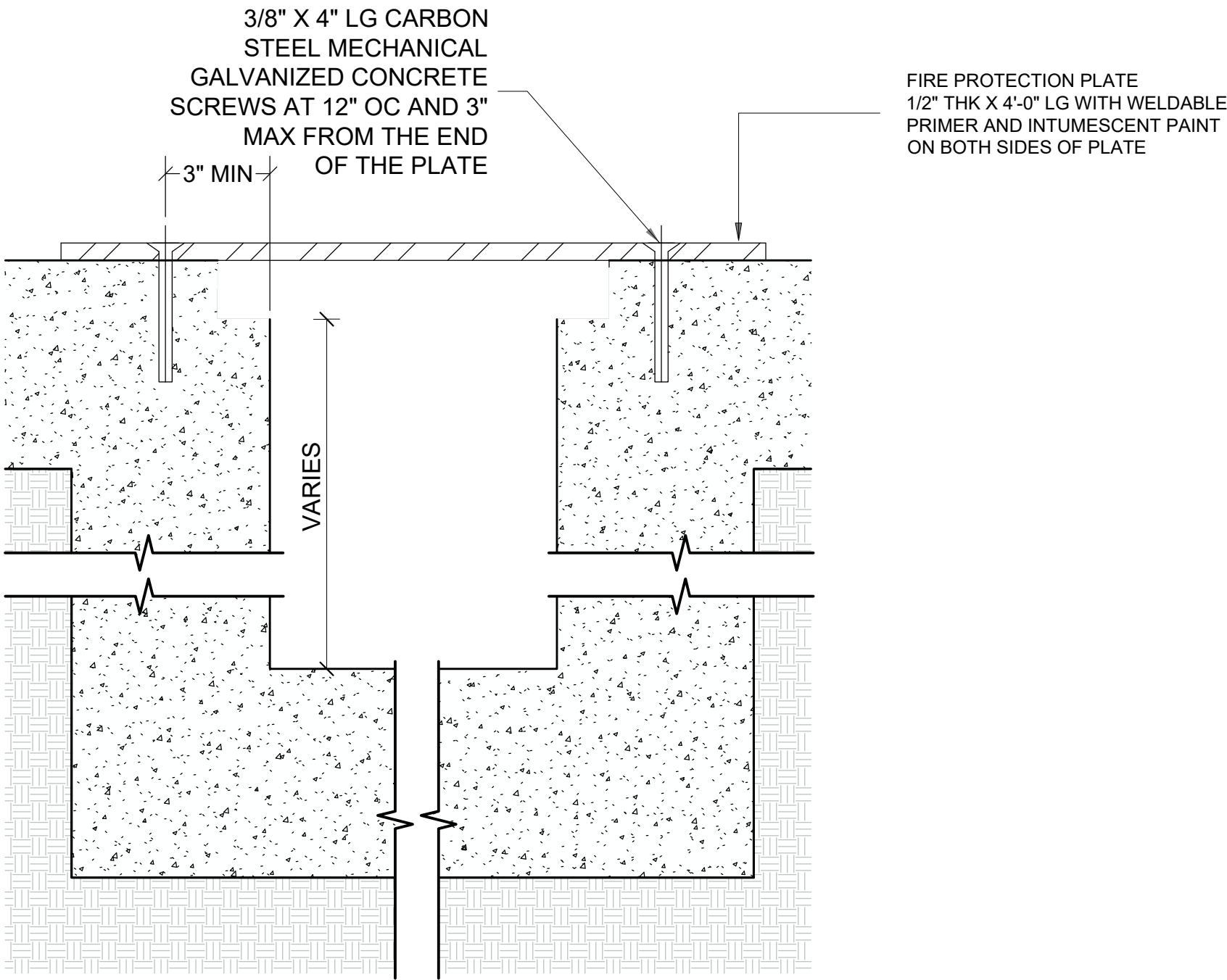
NOTES:

1. AT CONTRACTOR'S OPTION, THE WALL BEARING PLATE AND THE FIRE PROTECTION PLATES CAN BE A SINGLE PIECE OF PLATE OR CAN BE DIVIDED IN THREE SEPARATE PIECES. FOR EITHER OPTION, FIRE PROTECTION PLATE SHALL EXTEND 4'-0" FROM WALL ON BOTH SIDES.

TYPICAL PLAN VIEW OF PARTITION
OVER TRENCH

SCALE: N.T.S.

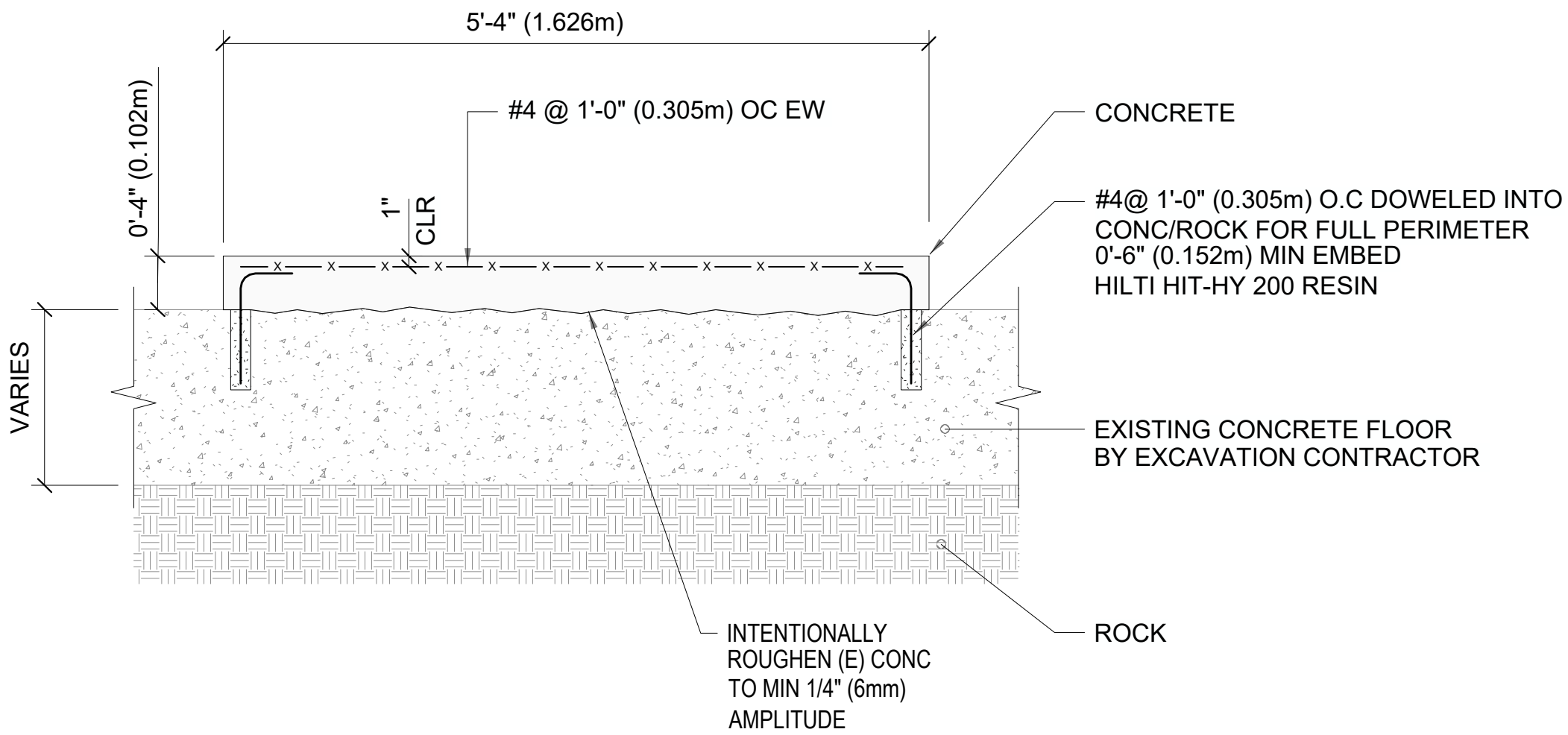
1



TYPICAL
FIRE PROTECTION
DETAIL OVER TRENCH

SCALE: 3" = 1'-0"

4



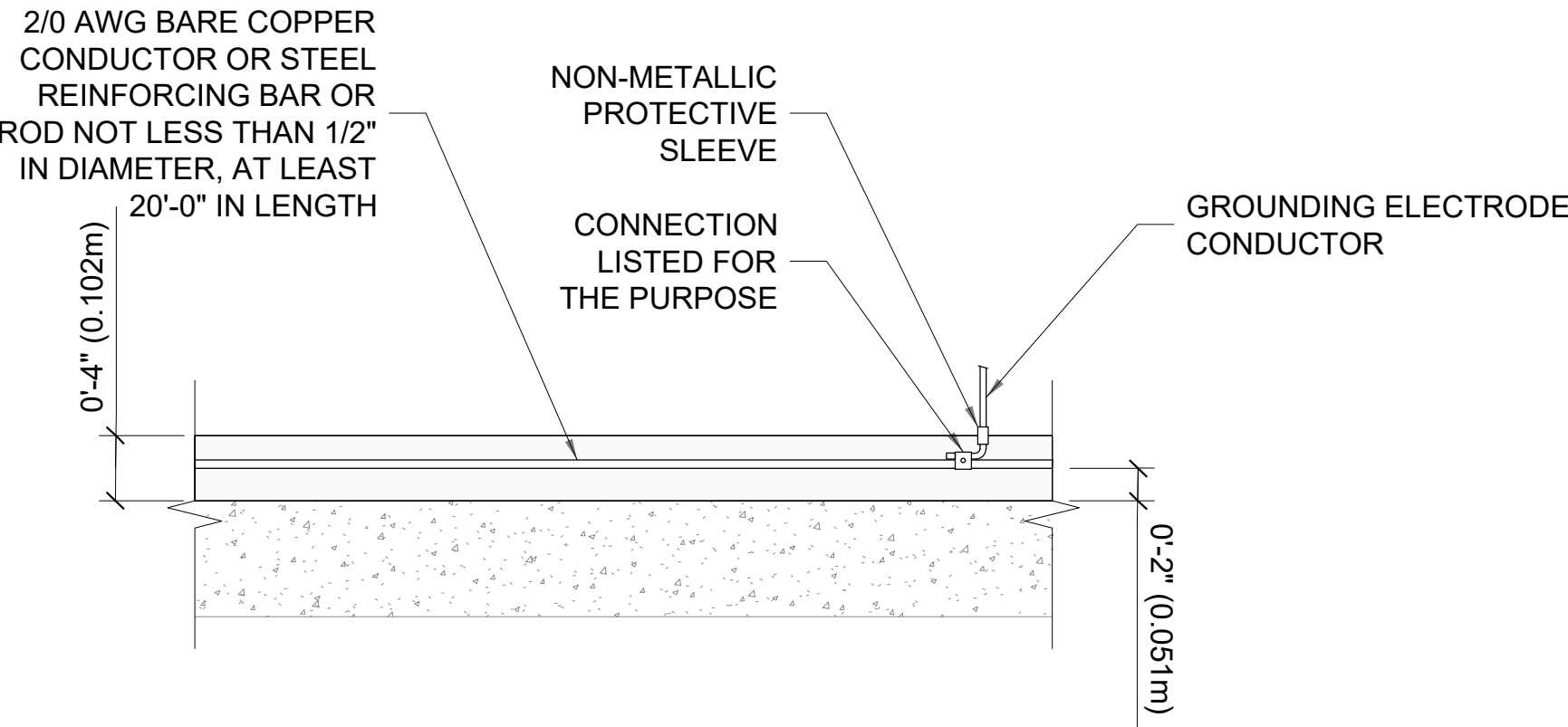
NOTES:

1. CONTRACTOR TO VERIFY ALL HOUSEKEEPING PAD DIMENSIONS SHOWN IN DRAWINGS FOR COMPATIBILITY WITH ACTUAL SELECTED EQUIPMENT.
2. SEE SHEET A-101 FOR LENGTH AND POSITION OF PAD.
3. UFER GROUND REQUIRED. SEE DETAIL 3.

TYPICAL HOUSEKEEPING PAD

SCALE: N.T.S.


2



HOUSEKEEPING PAD UFER GROUND

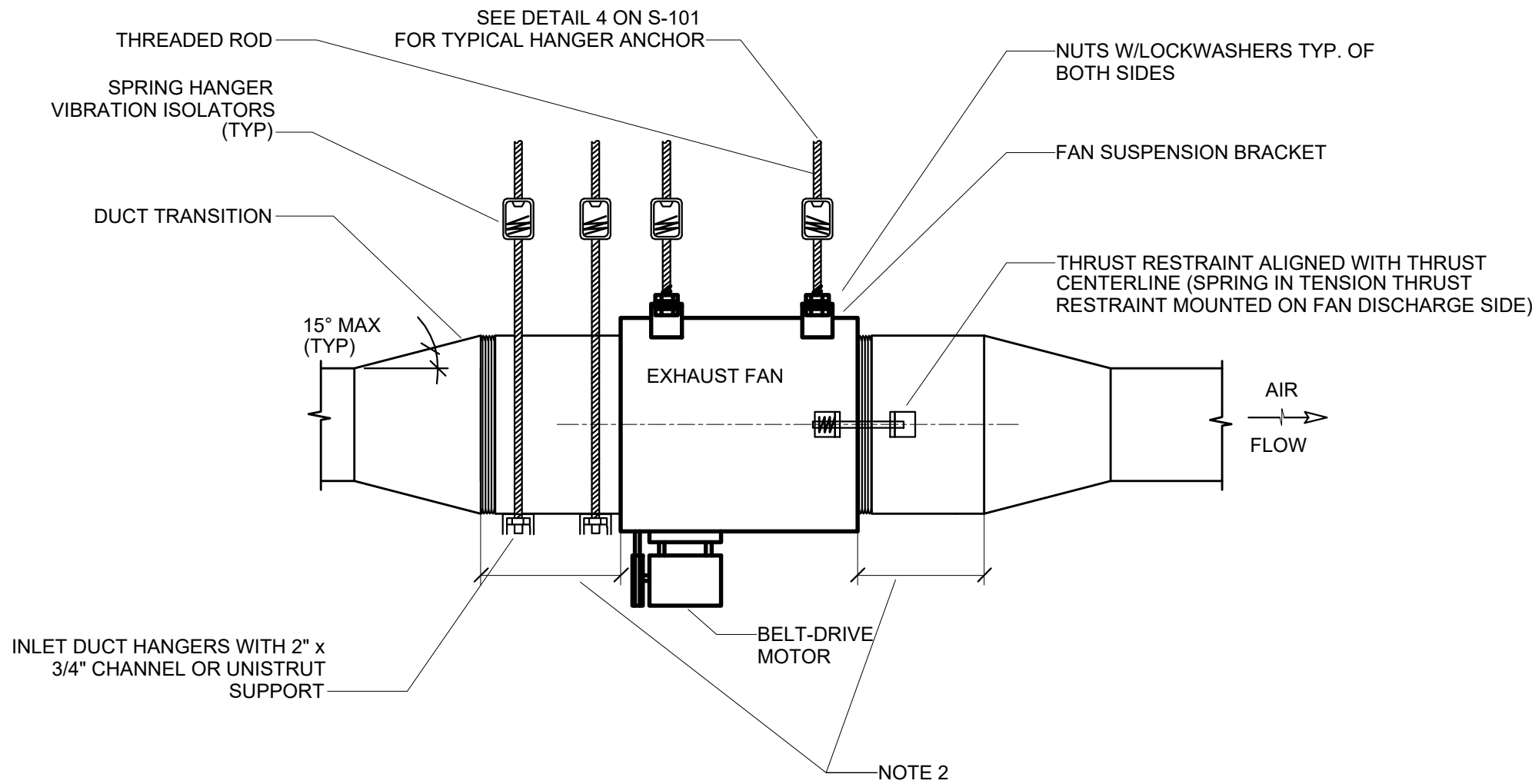
SCALE: N.T.S.

3

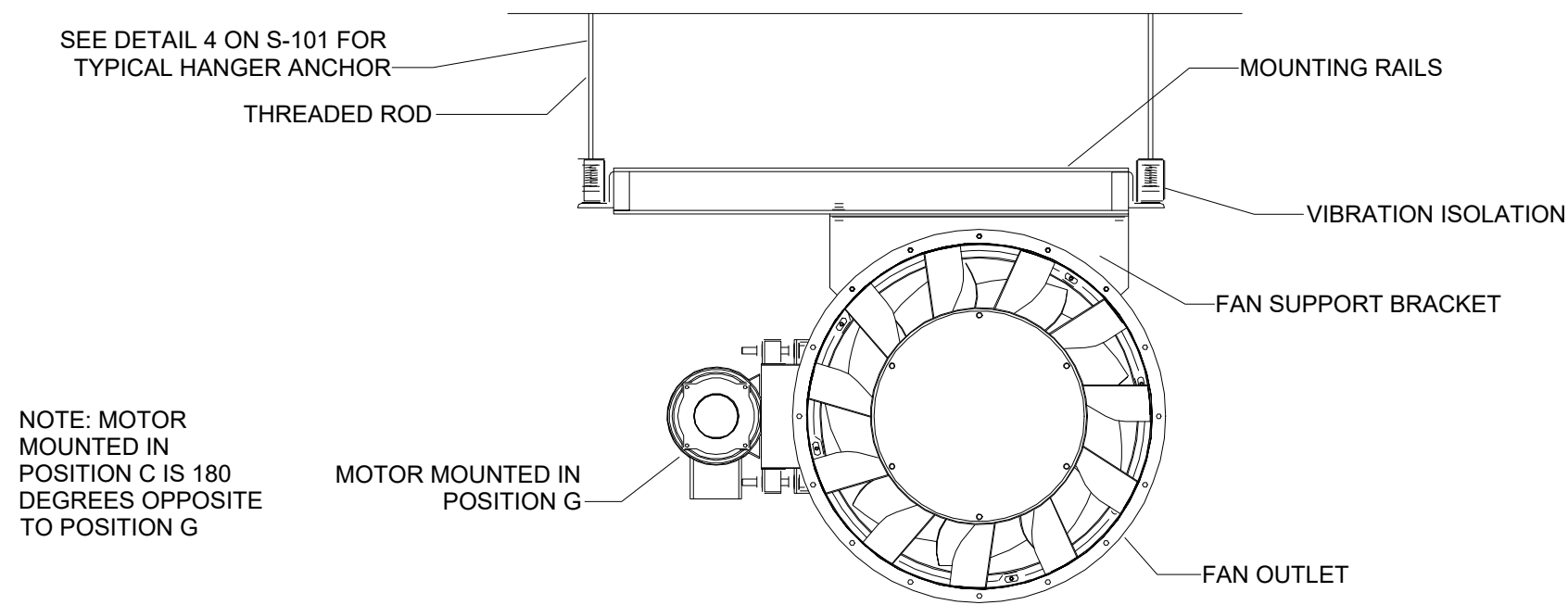
REV: 0	UNLESS OTHERWISE SPECIFIED	 SANFORD UNDERGROUND RESEARCH FACILITY LOW-LEVEL RADIOACTIVE WASTE TREATMENT FACILITY		
DRAWN BY: KJ	DIMENSIONS IN INCHES			
DATE: 4/23/2025	$\pm .1$ $\pm .02$ $\pm .005$	GRATING & PAD DETAILS		
CHECKED BY:	ANGLES: $\pm 1^\circ$	4850L SUBSTATION		
CHECKED DATE:	SURFACE FINISH:	12478		
APPROVED BY:	CONSIDERING AND TOLERANCING PER ASME Y14.5M-2009	SHEET NUMBER: A-103		
APPROVED DATE:	BREAK EDGES: 216 MAX	SIZE D		
COMMENTS:	REMOVE BURRS, WELD SPATTER & LOOSE SCALE	SCALE: PER VIEW		
	WEIGHT: NA	REV 0		
	MATERIAL: NA			
	THIRD ANGLE PROJECTION			

FAN SCHEDULE																				
ITEM	MANUFACTURER	TYPE	MODEL	LOCATION	AREA SERVED	FLOW RATE	ESP	SPEED	MOTOR				VFD	NORMAL POWER	EMERGENCY POWER	OPERATION	VIBRATION ISOLATION		WEIGHT	NOTES
									(CFM)	(IN WG)	(RPM)	(HP)					(V)	(PH)		
EF-05	COOK	MIXED FLOW INLINE	300QMX	4850-09	4850-08-ES	30,000	1.00	1,465	20	460	3	60	N	Y	N	DUTY	SPRING HANGER	0.75	-	1-7

- NOTES:
- EF-05 REJECTS HEAT FROM 4850-08-ES DURING NORMAL OPERATION.
 - FAN EXHAUSTS VENTILATION AIR DURING NORMAL OPERATION.
 - MAXIMUM SHIPPING SPLIT SIZE MUST FIT WITHIN ENVELOPES SPECIFIED ON SHEET M-103, DETAIL 4, TO BE DELIVERED DOWN ROSS SHAFT TO 4850 LEVEL.
LISTED SHIPPING SPLITS THAT EXCEED THESE ENVELOPE DIMENSIONS ARE TO BE DISASSEMBLED ON SITE WITH GUIDANCE FROM THE MANUFACTURER.
 - UNIT TO BE SUSPENDED FROM ROCK.
 - FAN SUPPLIES AIR FROM ADJACENT DRIFT TO MAINTAIN TEMPERATURE WITHIN SPACE.
 - FAN SHALL BE INSTALLED WITH THRUST RESTRAINTS.
 - ALL EF'S TO BE PROVIDED WITH COMBO STARTERS.



- NOTES:
- PROVIDE ADEQUATE SERVICE SPACE AROUND FAN FOR FAN REMOVAL, MOTOR, BELT & DRIVE ACCESS.
 - PROVIDE MINIMUM 3 HYDRAULIC DUCT DIAMETERS OF STRAIGHT DUCT ON INLET AND OUTLET OF FAN WHERE POSSIBLE.
 - PROVIDE VIBRATION ISOLATION FOR STRAIGHT DUCT BETWEEN FAN AND FLEXIBLE CONNECTION.
 - WHEN MOTOR IS MOUNTED IN POSITION G, FAN SHOULD BE INSTALLED WITH MOUNTING RAILS PER MANUFACTURER RECOMMENDATION.



HORIZONTAL SUSPENDED FAN (MOTOR MOUNTED IN POSITION G)

EF-05 MOUNTING DETAILS

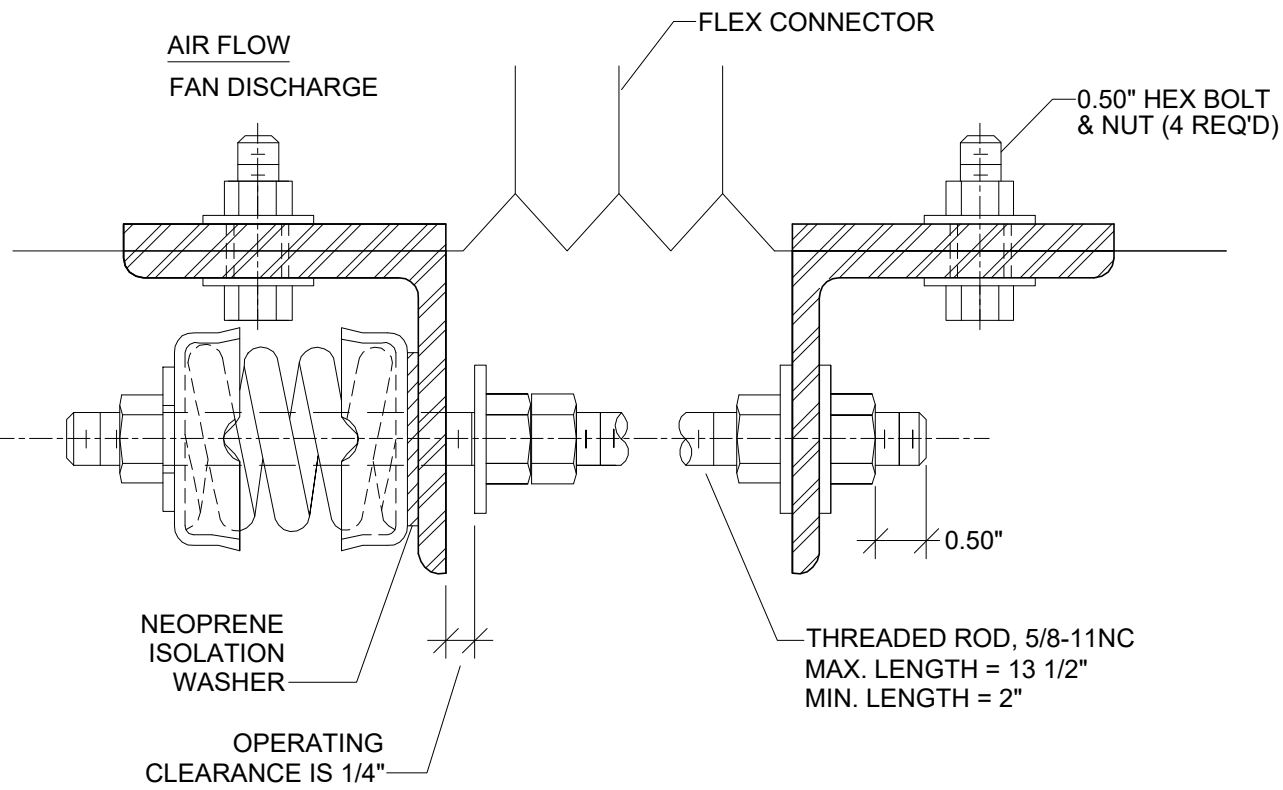
SCALE: NTS

1


THRUST RESTRAINT

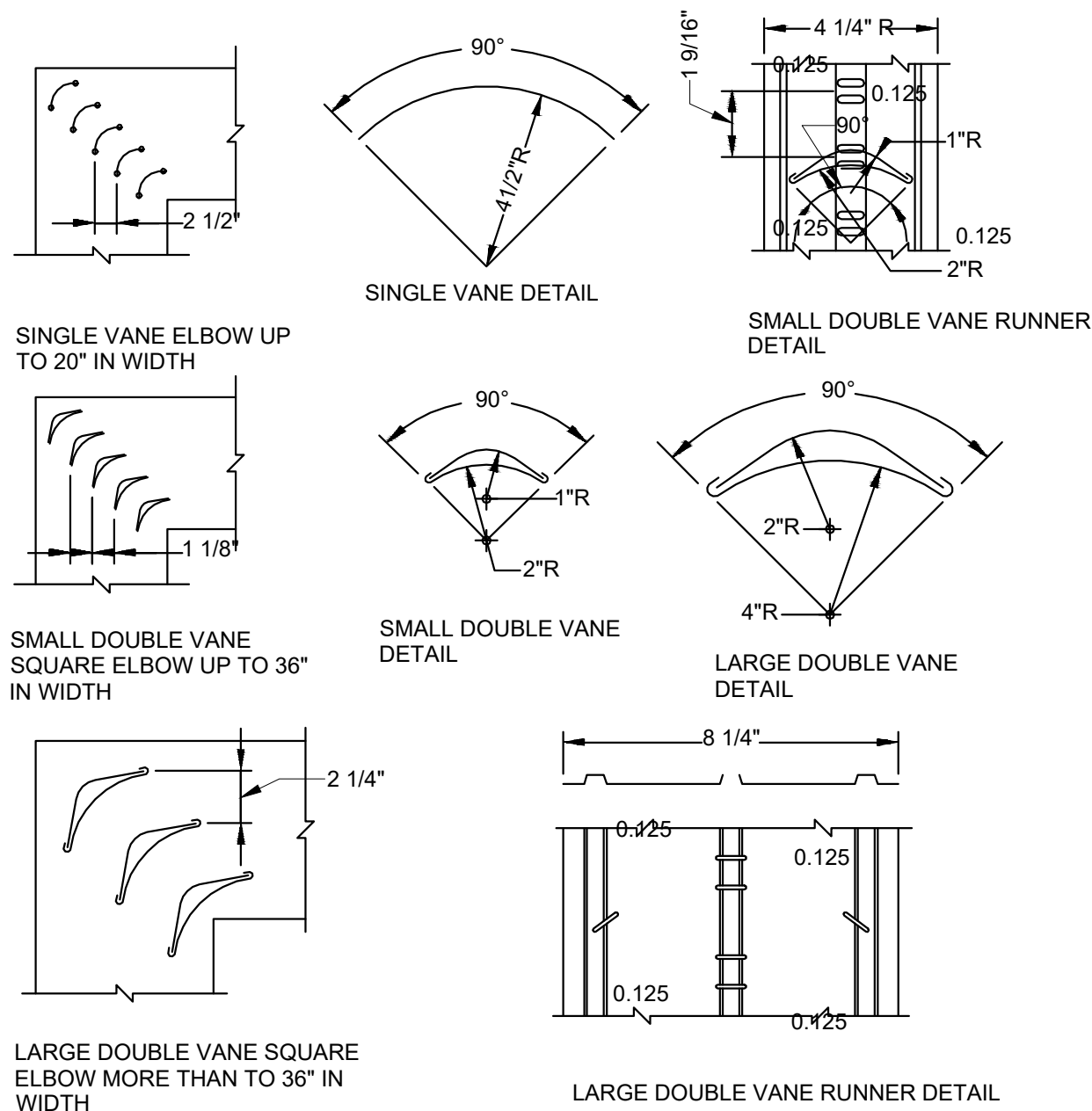
SCALE: NTS

2



- NOTES:
- THRUST RESTRAINT SHOWN WITH SPRING IN TENSION.
 - SPRING IN TENSION CONFIGURATION SHALL BE MOUNTED ON DISCHARGE SIDE OF FAN.
 - REFER TO MANUFACTURER'S GUIDELINES WHEN USING DIFFERENT OPERATING CLEARANCE.

REV: 0	UNLESS OTHERWISE SPECIFIED			 <div>SANFORD UNDERGROUND RESEARCH FACILITY</div> <div>LOUISIANA STATE UNIVERSITY AND TECHNOLOGY CENTER</div>	FAN SCHEDULE & DETAILS	
DRAWN BY: KJ	DIMENSIONS IN INCHES					
DATE: 4/23/2025	X± .1 .XX± .02 .XXX± .005					
CHECKED BY:	ANGLES: ± 1°					
CHECKED DATE:	SURFACE FINISH:					
APPROVED BY:	DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009 BREAK EDGES: .015 MAX. REMOVE RISKS, WELD SPATTER & LOOSE SCALE			4850L SUBSTATION		
APPROVED DATE:	THIRD ANGLE PROJECTION			12478		
COMMENTS:	DRAWING SYMBOL			SHEET NUMBER: M-102		SCALE: PER VIEW
				SIZE: D		REV: 0

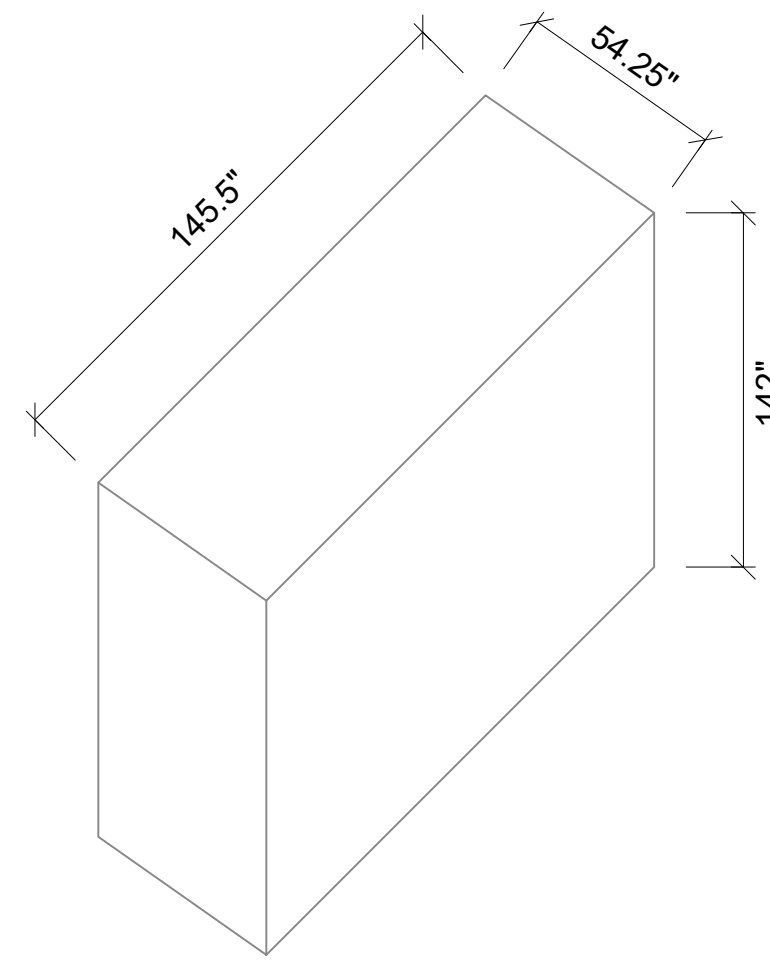


SQUARE AND RECTANGULAR ELBOWS FOR LOW VELOCITY

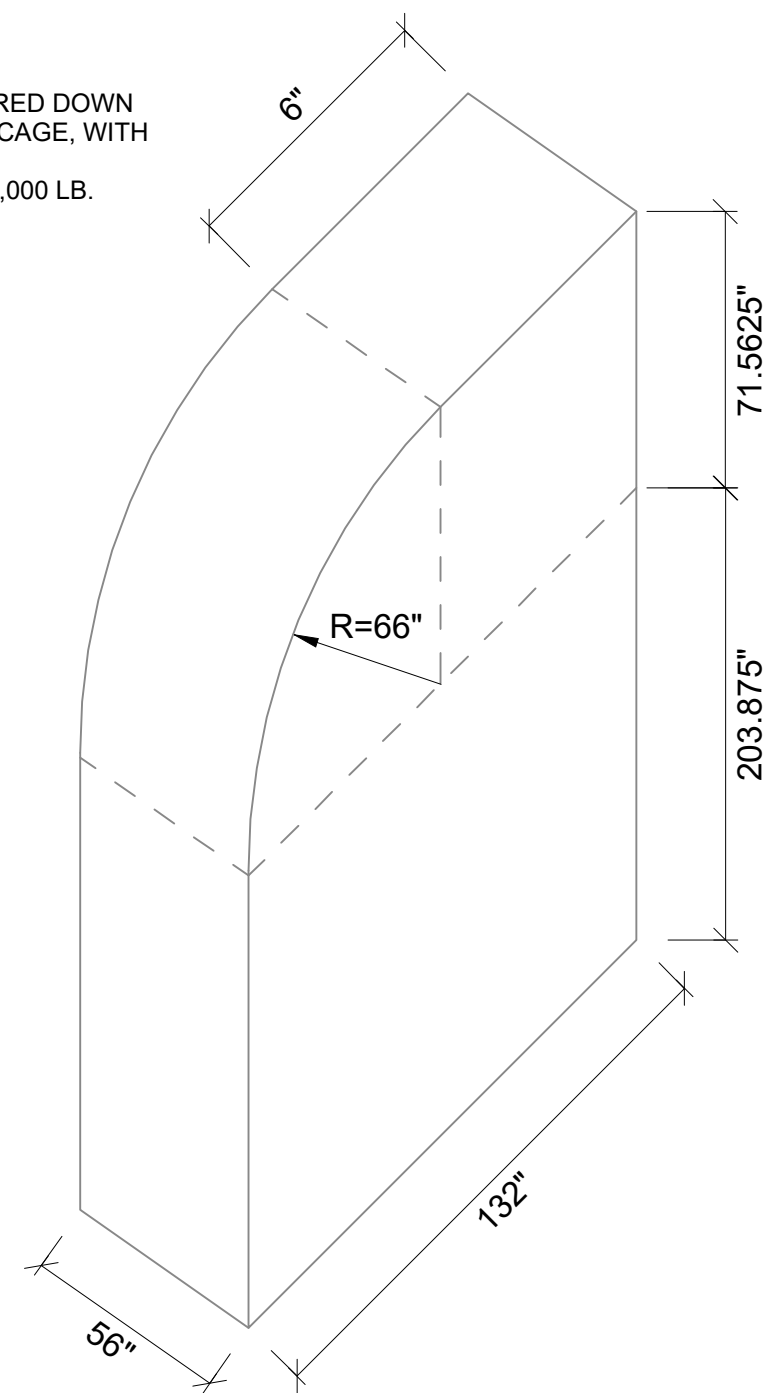
SCALE: NTS

1

- NOTES:
1. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPEWORK DELIVERED DOWN ROSS SHAFT CAN BE DELIVERED INSIDE CAGE OR SLUNG UNDER CAGE, WITH CLEAR ENVELOPE DIMENSIONS PROVIDED.
 2. MAXIMUM PAYLOAD INSIDE CAGE OR SLUNG UNDER CAGE IS 13,000 LB.



PAYLOAD INSIDE CAGE

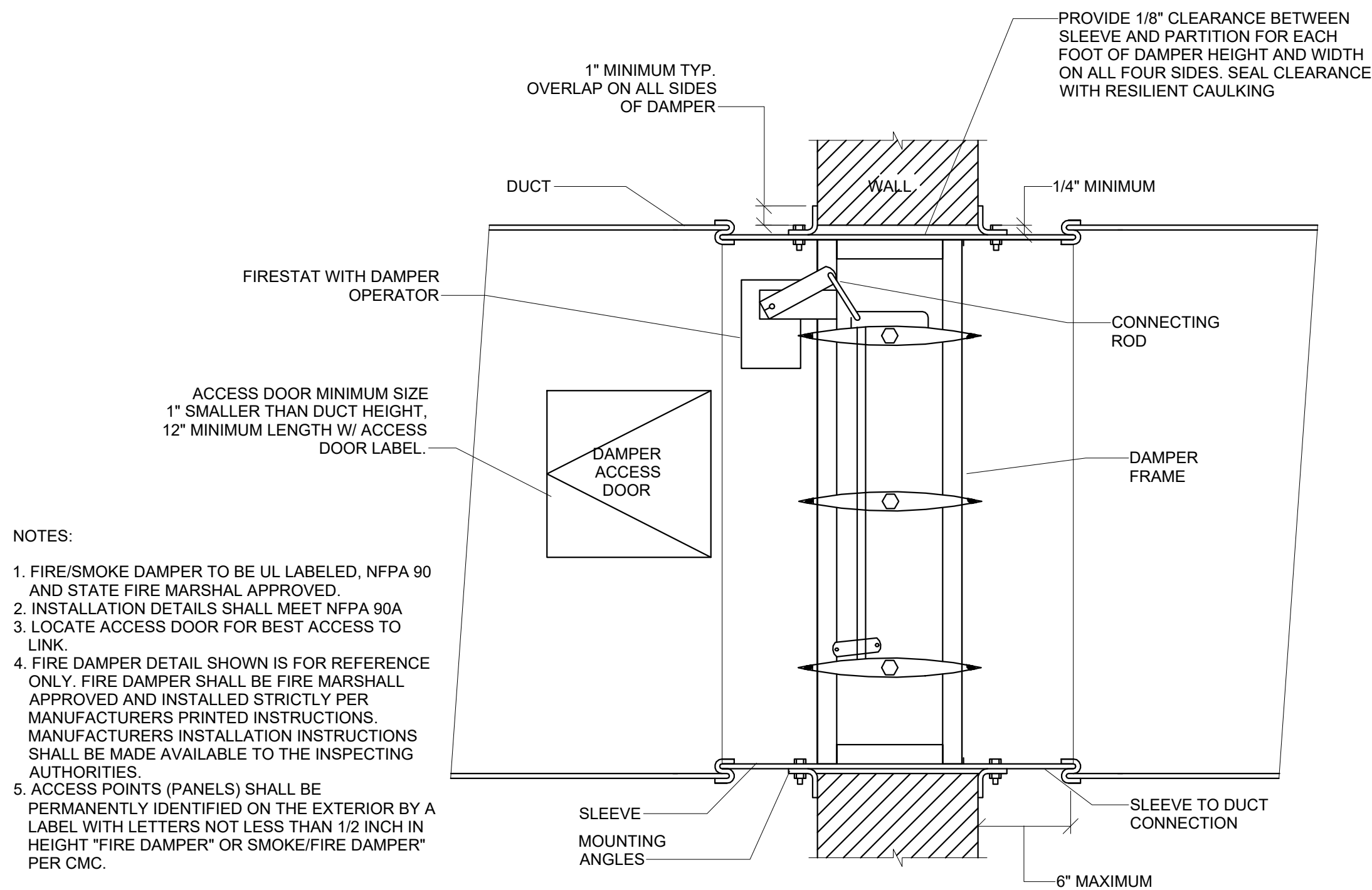


PAYLOAD SLUNG UNDER CAGE

ROSS SHAFT CLEARANCE ENVELOPES

SCALE: NTS

4



DAMPER -FIRE AND SMOKE (VERTICAL)

SCALE: NTS

2

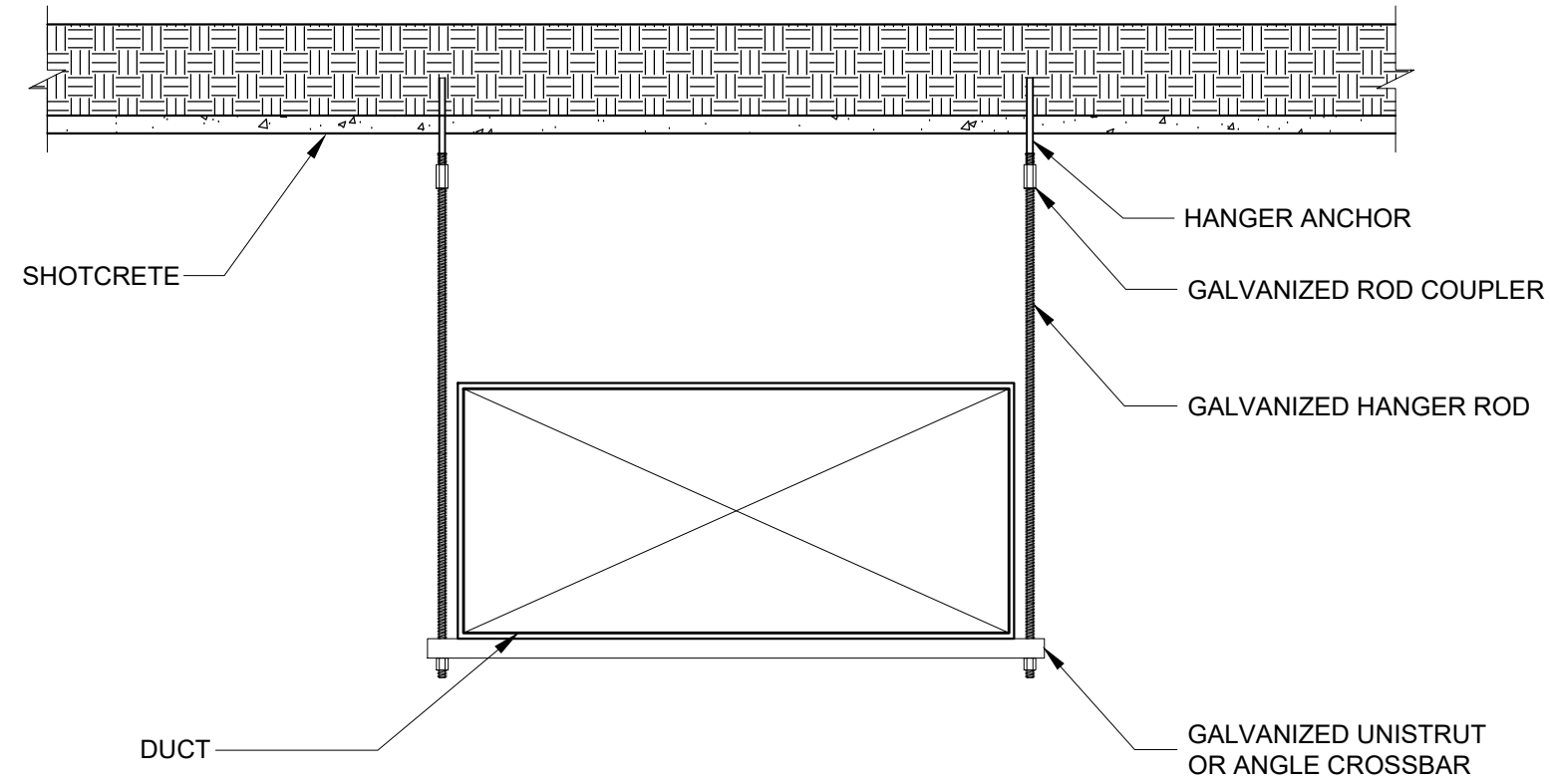
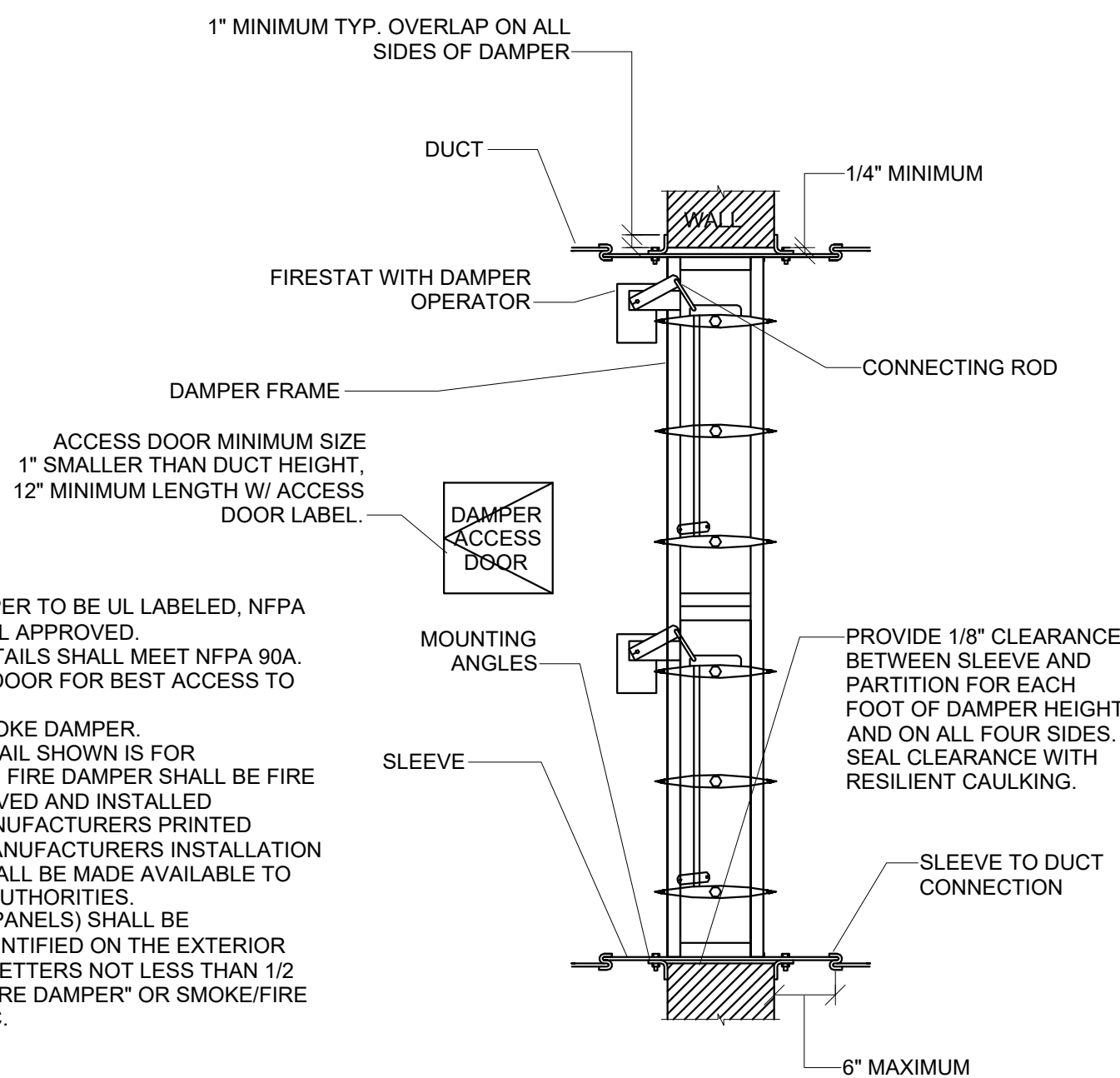
MULTIPLE DAMPER -FIRE AND SMOKE FOR LARGE OPENINGS

SCALE: NTS

3

NOTES:

1. FIRE/SMOKE DAMPER TO BE UL LABELED, NFPA AND FIRE MARSHAL APPROVED.
2. INSTALLATION DETAILS SHALL MEET NFPA 90A.
3. LOCATE ACCESS DOOR FOR BEST ACCESS TO LINK.
4. PROVIDE FIRE/SMOKE DAMPER.
5. FIRE DAMPER DETAIL SHOWN IS FOR REFERENCE ONLY. FIRE DAMPER SHALL BE FIRE MARSHALL APPROVED AND INSTALLED STRICTLY PER MANUFACTURERS PRINTED INSTRUCTIONS. MANUFACTURERS INSTALLATION INSTRUCTIONS SHALL BE MADE AVAILABLE TO THE INSPECTING AUTHORITIES.
6. ACCESS POINTS (PANELS) SHALL BE PERMANENTLY IDENTIFIED ON THE EXTERIOR BY A LABEL WITH LETTERS NOT LESS THAN 1/2 INCH IN HEIGHT "FIRE DAMPER" OR SMOKE/FIRE DAMPER" PER CMC.



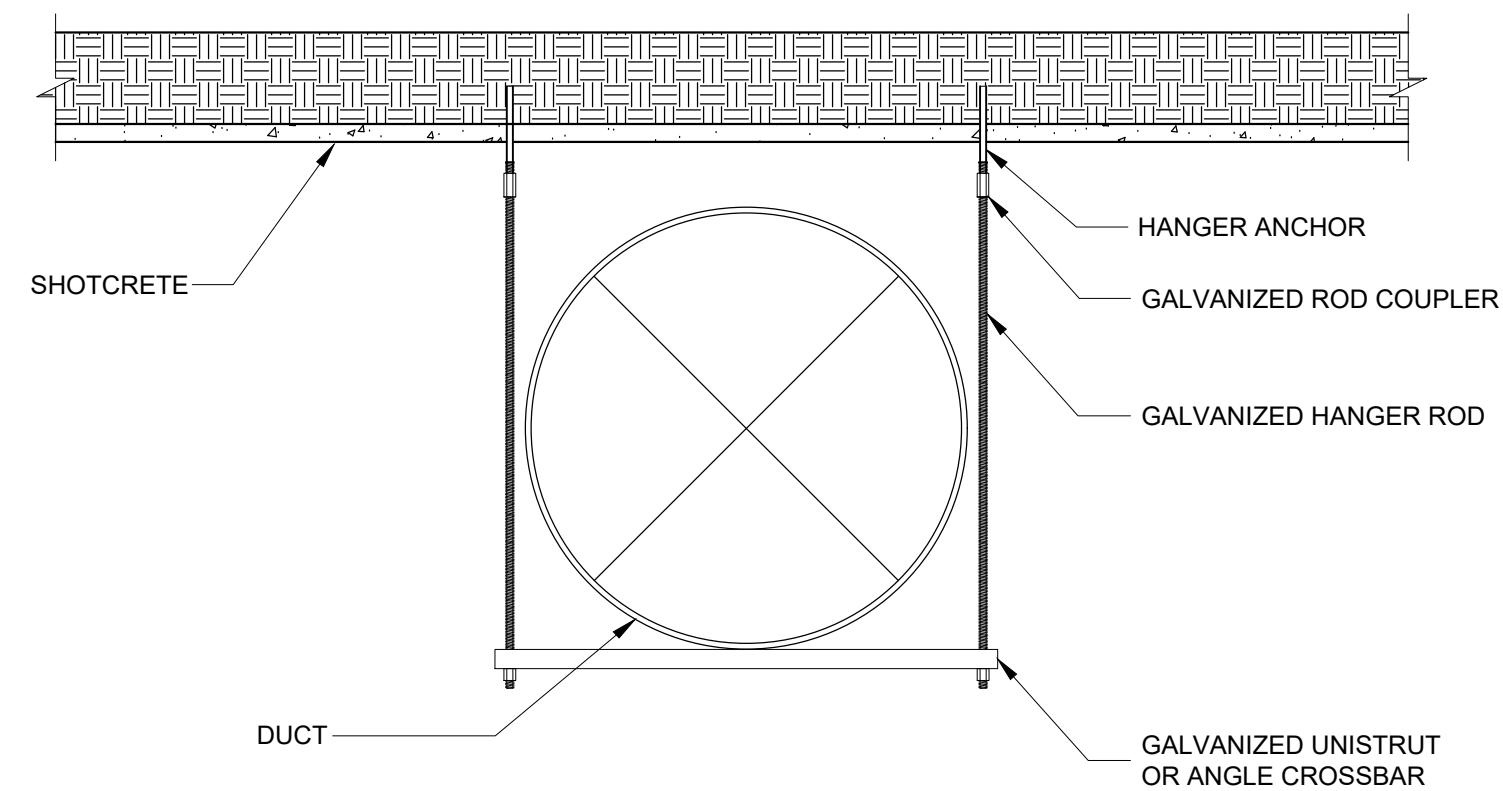
NOTES:

1. DUCT BRACING SHALL BE PROVIDED IN ACCORDANCE WITH SMACNA REQUIREMENTS.
2. MAXIMUM DUCT HANGER SPACING SHALL BE 8'-0".
3. SIZE HANGER RODS AND TRAPEZE CROSSBAR PER SMACNA "HVAC DUCT CONSTRUCTION STANDARDS- METAL AND FLEXIBLE" TABLE 5-1, "RECTANGULAR DUCT HANGERS MINIMUM SIZE".
4. SEE DETAIL 4, SHEET S-101 FOR HANGER ANCHOR DETAILS.
5. MINIMUM CLEARANCE FROM BOTTOM OF DUCT IS 4 METERS ABOVE FINISHED FLOOR. MAXIMUM HEIGHT TO TOP OF DUCTWORK IS 5.15 METERS ABOVE FINISHED FLOOR.

RECTANGULAR DUCT SUPPORT

SCALE: NTS

5




NOTES:

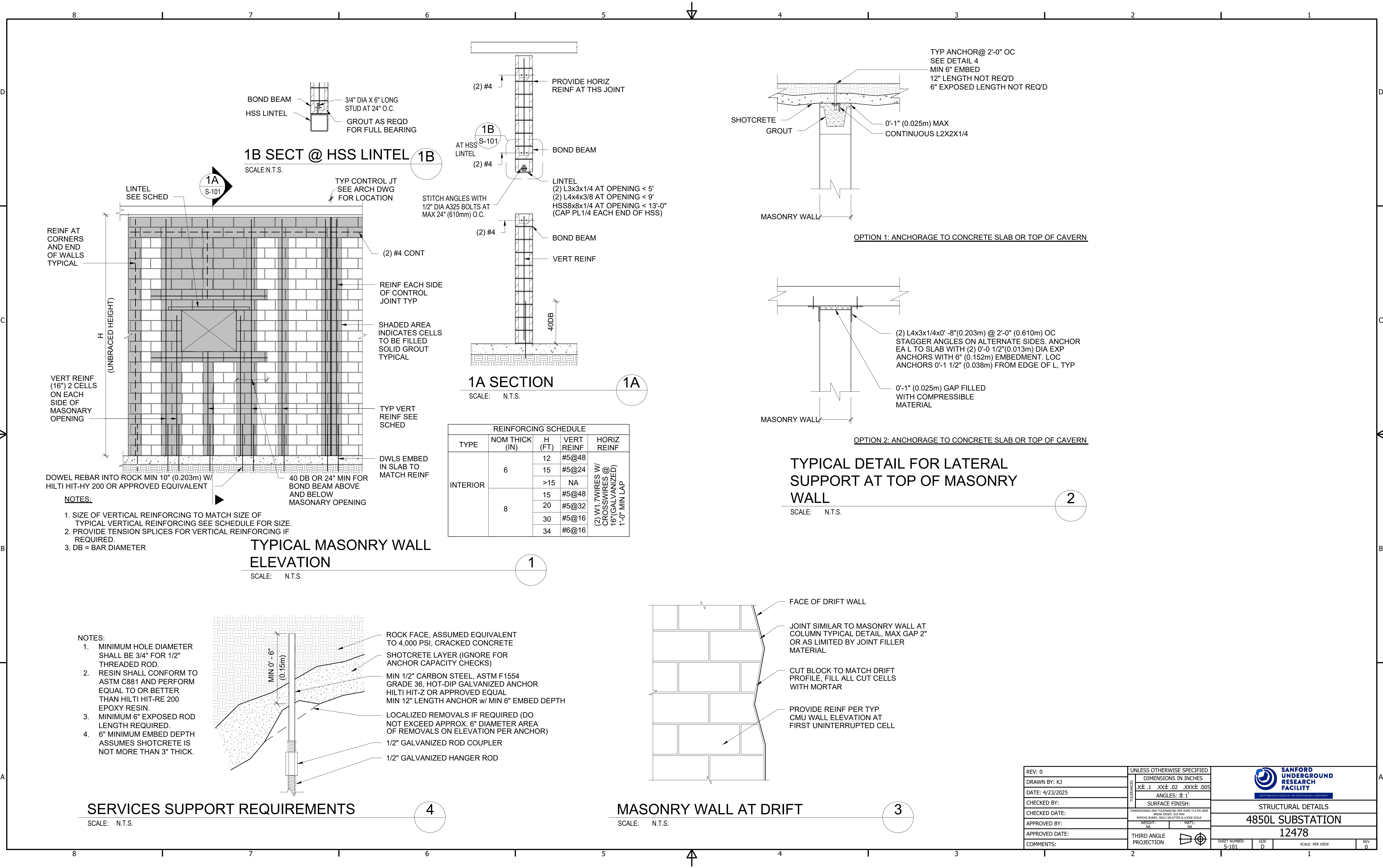
1. DUCT BRACING SHALL BE PROVIDED IN ACCORDANCE WITH SMACNA REQUIREMENTS.
2. MAXIMUM DUCT HANGER SPACING SHALL BE 8'-0".
3. SIZE HANGER RODS AND TRAPEZE CROSSBAR PER SMACNA "HVAC DUCT CONSTRUCTION STANDARDS- METAL AND FLEXIBLE" TABLE 5-2, "MINIMUM HANGER SIZES FOR ROUND DUCT".
4. SEE DETAIL 4, SHEET S-101 FOR HANGER ANCHOR DETAILS.
5. MINIMUM CLEARANCE FROM BOTTOM OF DUCT IS 4 METERS ABOVE FINISHED FLOOR. MAXIMUM HEIGHT TO TOP OF DUCTWORK IS 5.15 METERS ABOVE FINISHED FLOOR.

ROUND DUCT SUPPORT


SCALE: NTS

6

REV: 0	UNLESS OTHERWISE SPECIFIED	 MECHANICAL DETAILS		
DRAWN BY: KJ	DIMENSIONS IN INCHES			
DATE: 4/23/2025	$\times \pm .1$ $.xx \pm .02$ $.xxxx \pm .005$	4850L SUBSTATION		
CHECKED BY:	ANGLES: $\pm 1^\circ$	12478		
CHECKED DATE:	SURFACE FINISH:	SCALE: PER VIEW		
APPROVED BY:	CONFORMING AND TOLERANCING PER ASME Y14.5M-2009	REV 0		
APPROVED DATE:	BREAK EDGES .216 MAX.			
COMMENTS:	REMOVE BURRS, WELD SPATTER & LOOSE SCALE			
	WEIGHT: NA			
	MATERIAL: NA			
	THIRD ANGLE PROJECTION			



REINFORCING SCHEDULE				
TYPE	NOM THICK (IN)	H (FT)	VERT REINF	HORIZ REINF
INTERIOR	6	12	#5@48	(2) W1.7 WIRES W/ CROSSWIRES @ 16" (GALVANIZED) 1'-0" MIN LAP
		15	#5@24	
		>15	NA	
	8	15	#5@48	
		20	#5@32	
		30	#5@16	
		34	#6@16	

REV: 0	UNLESS OTHERWISE SPECIFIED	 SANFORD UNDERGROUND RESEARCH FACILITY <small>UNIVERSITY OF TEXAS AT AUSTIN</small>	
DRAWN BY: KJ	DIMENSIONS IN INCHES		
DATE: 4/23/2025	TOLERANCES X± .1 .XX± .02 .XXX± .005	STRUCTURAL DETAILS	
CHECKED BY:	ANGLES: ± 1°	4850L SUBSTATION	
CHECKED DATE:	SURFACE FINISH:	12478	
APPROVED BY:	CONCRETE AND TYPING PER AISC 308-2009 BREAK EDGES: 215 MAX REMOVE BURRS, WELD SPATTER & LOOSE SCALE	SHEET NUMBER: S-101	
APPROVED DATE:	WEIGHT: NA	SIZE: D	
COMMENTS:	THIRD ANGLE PROJECTION	SCALE: PER VIEW	
		REV: 0	