

REVISIONS		
SYM	DESCRIPTION	DATE APPROVED
A	REF. MATER. CHANGED	2/9/67 M.E.S.
B	REFERENCE NOTE ADDED & CHANGED	

REFERENCE MATERIAL

- THE FOLLOWING DOCUMENTS HAVE BEEN UTILIZED IN THE DEVELOPMENT OF THIS DESIGN.
1. D.O.D. DIRECTIVE NO. 4145.23 "QUANTITY-DISTANCE STANDARDS FOR MANUFACTURING, HANDLING AND STORAGE OF MASS-DETONATING EXPLOSIVES AND AMMUNITION"
  2. SFM-1 "ATOMIC WEAPONS STORAGE FACILITIES MANUAL"
  3. AFM-32-6 "EXPLOSIVE SAFETY MANUAL"
  4. ORD-M7-224 "ORDNANCE SAFETY MANUAL"

DESIGN GUIDE

- STRUCTURAL
1. RETAINING WALLS SHALL BE DESIGNED TO RESIST LOAD OF EARTH FILL INDICATED AND A UNIFORM LIVE LOAD ON FILL OF 40 PSF
  2. STEEL ARCHES SHALL BE NO. 1 US STD G.A. 8x6 ANNULAR CORRUGATED GALVANIZED STRUCTURAL PLATE CONFORMING TO AASHTO DES M-167-57
  3. ALL REINFORCED CONCRETE SHALL BE CLASS E 3000 PSI
  4. STRUCTURAL STEEL FOR DOORS AND FRAMES TO BE A36
  5. REINFORCING STEEL SHALL BE  $f_s = 24000$  PSI
  6. FLOORS SHALL SLOPE TO FRONT FOR DRAINAGE AT PITCH OF 1" ON 15'
  7. PERIPHERAL FOOTING DRAINS SHALL BE PROVIDED
  8. EARTH COVERING SHALL BE COMPACTED TO EXTENT REQUIRED FOR STABILITY OF ARCHES; SHALL NOT BE LESS THAN 2 FT THICK AT CROWN OF ARCHES, GRADED TO DRAIN AND WHERE UNSUPPORTED BY VERTICAL HEADWALLS, SLOPED TO GRADE AT NOT LESS THAN 1 ON 2.
  9. DOLLY WHEEL LOADINGS ON MAGAZINE FLOORS WILL NOT EXCEED 2000 LBS PER WHEEL ON SMALL PNEUMATIC OR SOLID RUBBER TIRES.
  10. EXTERIOR SURFACES OF MAGAZINES SHALL BE WATERPROOFED
  11. SOIL BEARING PRESSURE UNDER FOOTINGS MUST BE SUITABLE FOR 3500# PER SQ FT WITH INSIGNIFICANT SETTLEMENT AT THIS PRESSURE OR FOOTING MUST BE REDESIGNED.
  12. DESIGN OF MAGAZINE BASED ON ACTUAL TEST PERFORMED AT N.O.T.S. DEC. 18, 1963

SEEDING

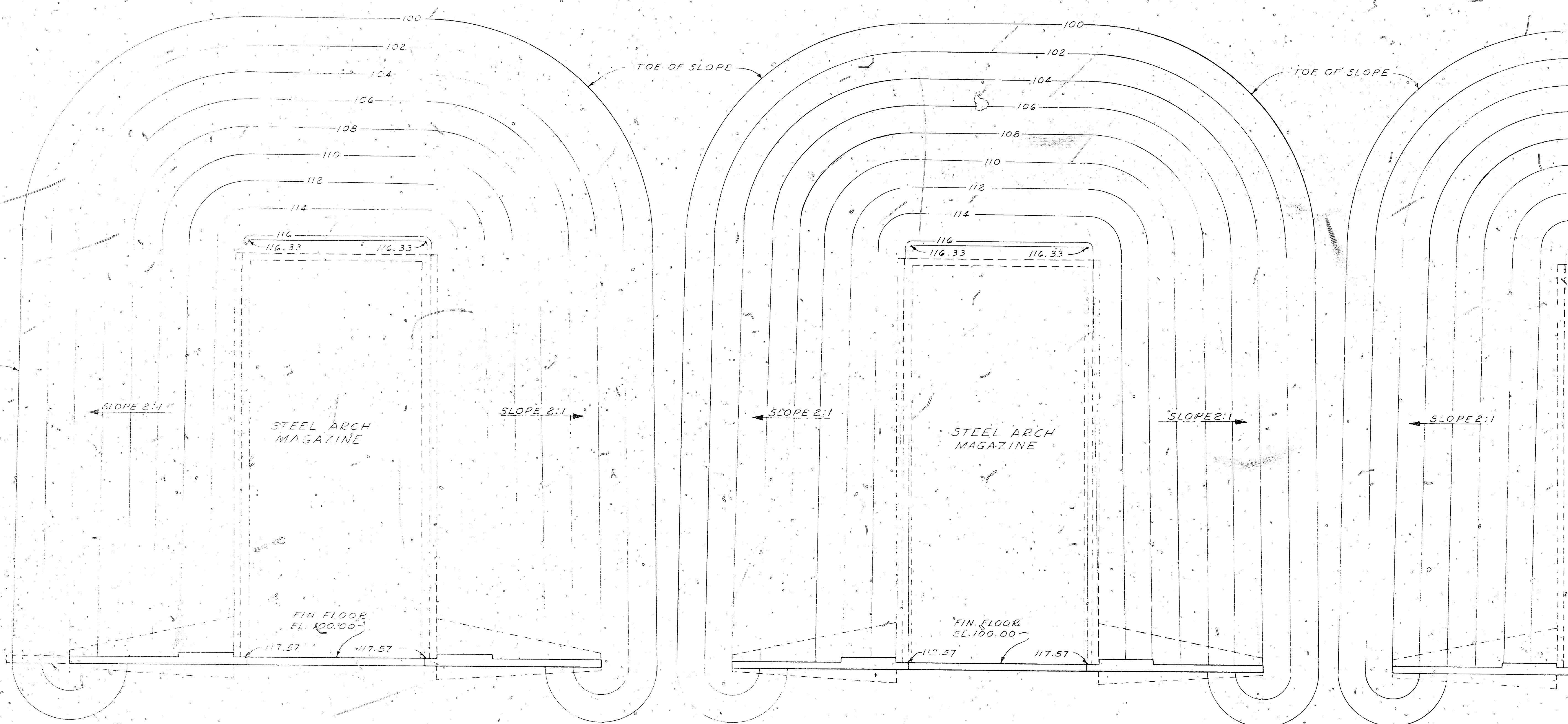
1. WHERE PRACTICAL, EARTH COVERING OVER STRUCTURES SHALL BE SEED TO PREVENT SOIL EROSION
2. WHERE RAINFALL IS INSUFFICIENT TO MAINTAIN GRASS COVER, A LAYER OF CRUSHED ROCK OR GRAVEL MAY BE SUBSTITUTED.

VENTILATION

MAGAZINES INTENDED FOR WEAPONS CONTAINING CERTAIN ACTIVE MATERIALS MUST BE VENTILATED. VENTILATION OF OTHERS IS OPTIONAL. SEE VENTILATION SCHEDULE AND DATA SFM-1

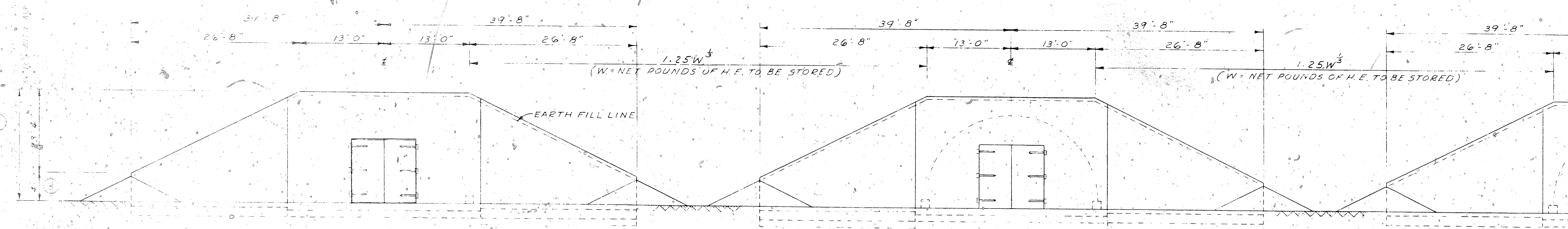
REFERENCE NOTE

FOR CR UNAL ARCH DESIGN SEE DRAWING 1059128 MATERIAL WITH DEF. CORRUGATION SEE 13" NAVFAC DRAWING 541

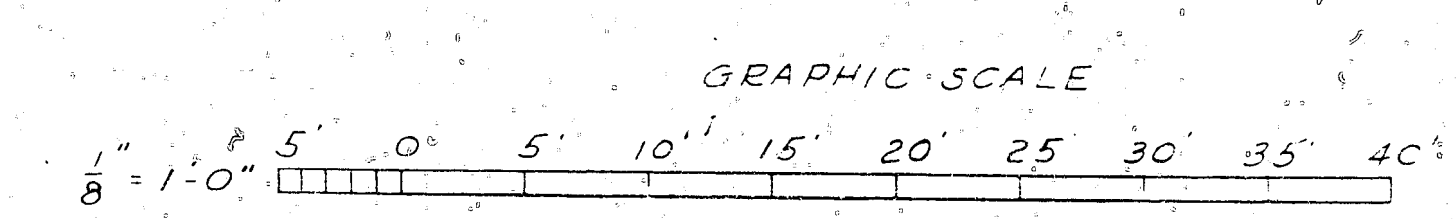


SITING PLAN  
SCALE: 1/8" = 1'-0"

IF EARTH BETWEEN IS NOT DESIRABLE CONTINUE RETAINING WALL TO TOE OF SLOPE AS SHOWN.



ELEVATION  
SCALE: 1/8" = 1'-0"



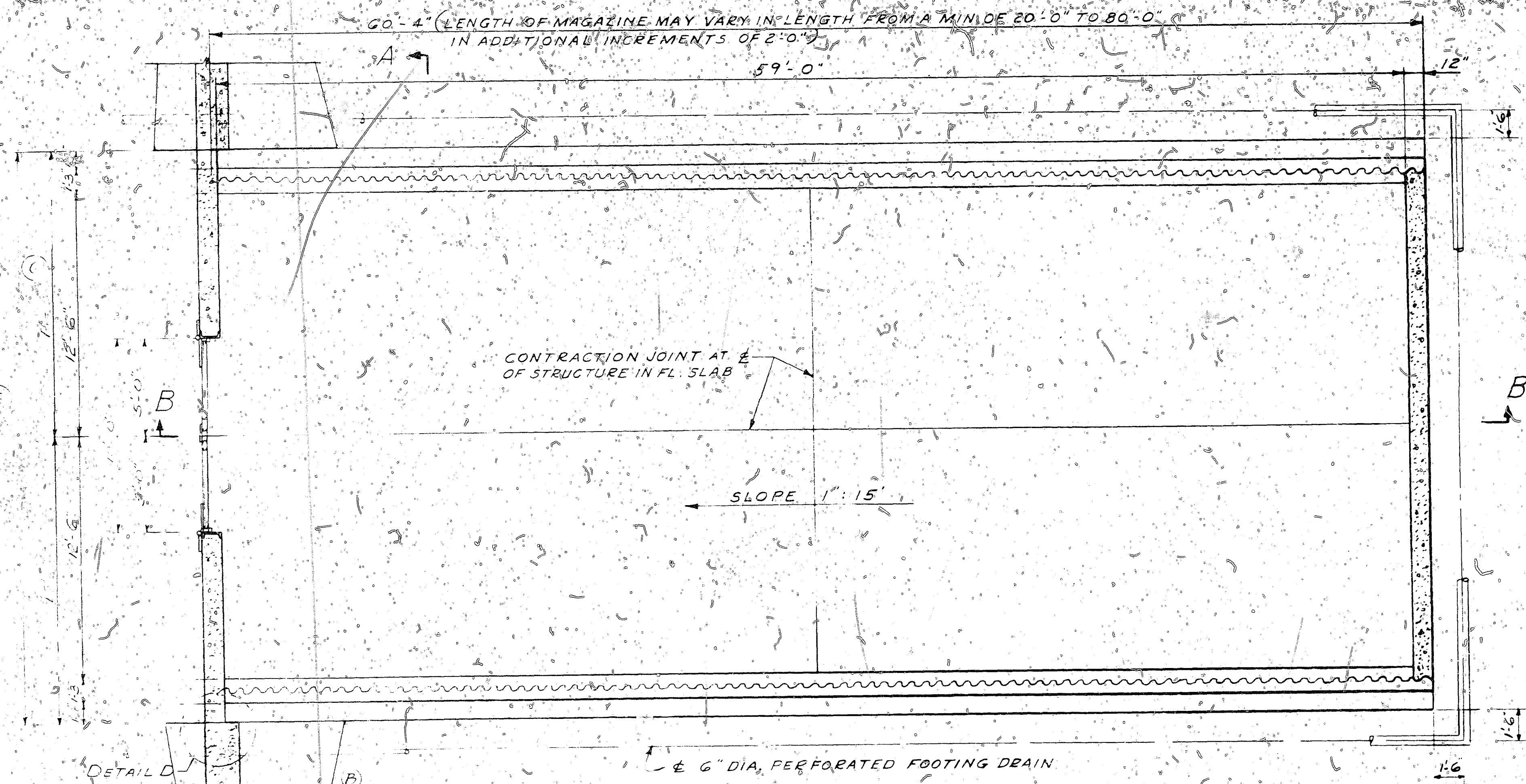
THIS IS AN ORIGINAL DRAWING

DES: <i>[Signature]</i>	DEPARTMENT OF THE NAVY WASHINGTON, D. C.
DR: <i>[Signature]</i>	BUREAU OF YARDS & DOCKS
CHK: <i>[Signature]</i>	<b>STANDARD</b>
HEAD: <i>[Signature]</i>	EARTH COVERED STEEL ARCH MAGAZINES
MGR: <i>[Signature]</i>	25'-0" WIDTH x LENGTH OF 20'-0" THRU 80'-0"
ENGR CONS: <i>[Signature]</i>	SITING PLAN
PROJ MGT: <i>[Signature]</i>	CODE IDENT NO. 80091
DIRECTOR: <i>[Signature]</i>	SIZE Y & D DRAWING NO. F 1059128
APPROVED: <i>[Signature]</i>	DATE 3/18/64
FOR CHIEF OF BUREAU	SCALE AS NOTED SPEC NBY SHEET 1 OF 6

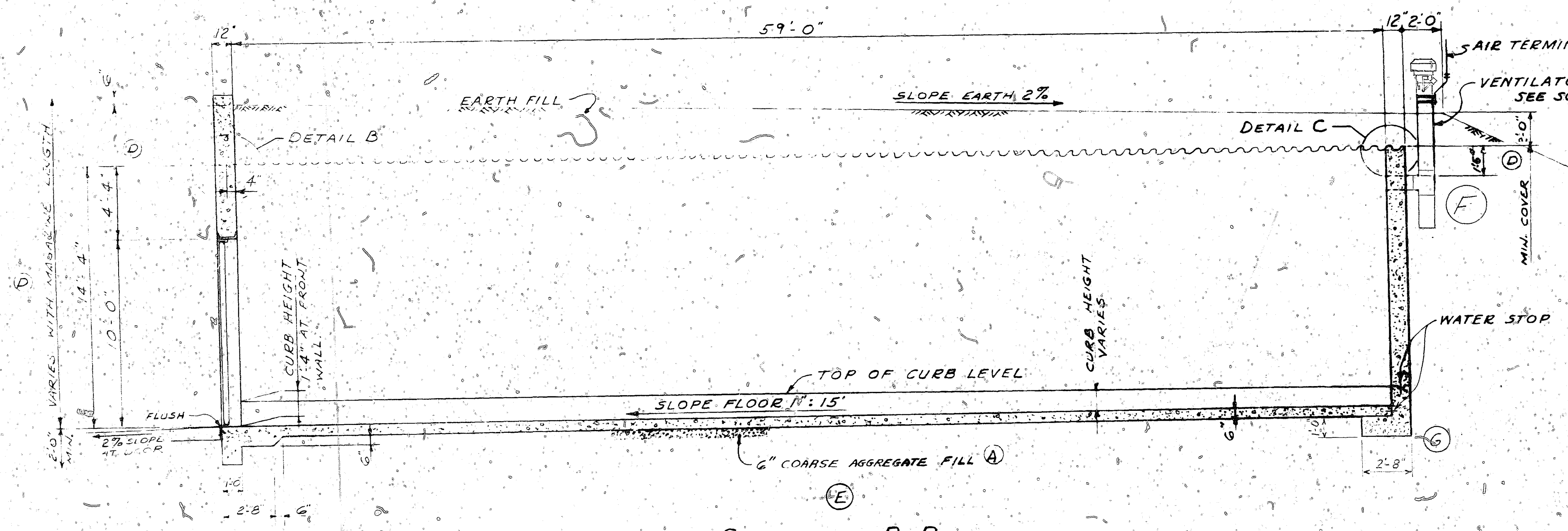
WR 4-106

1-27-64

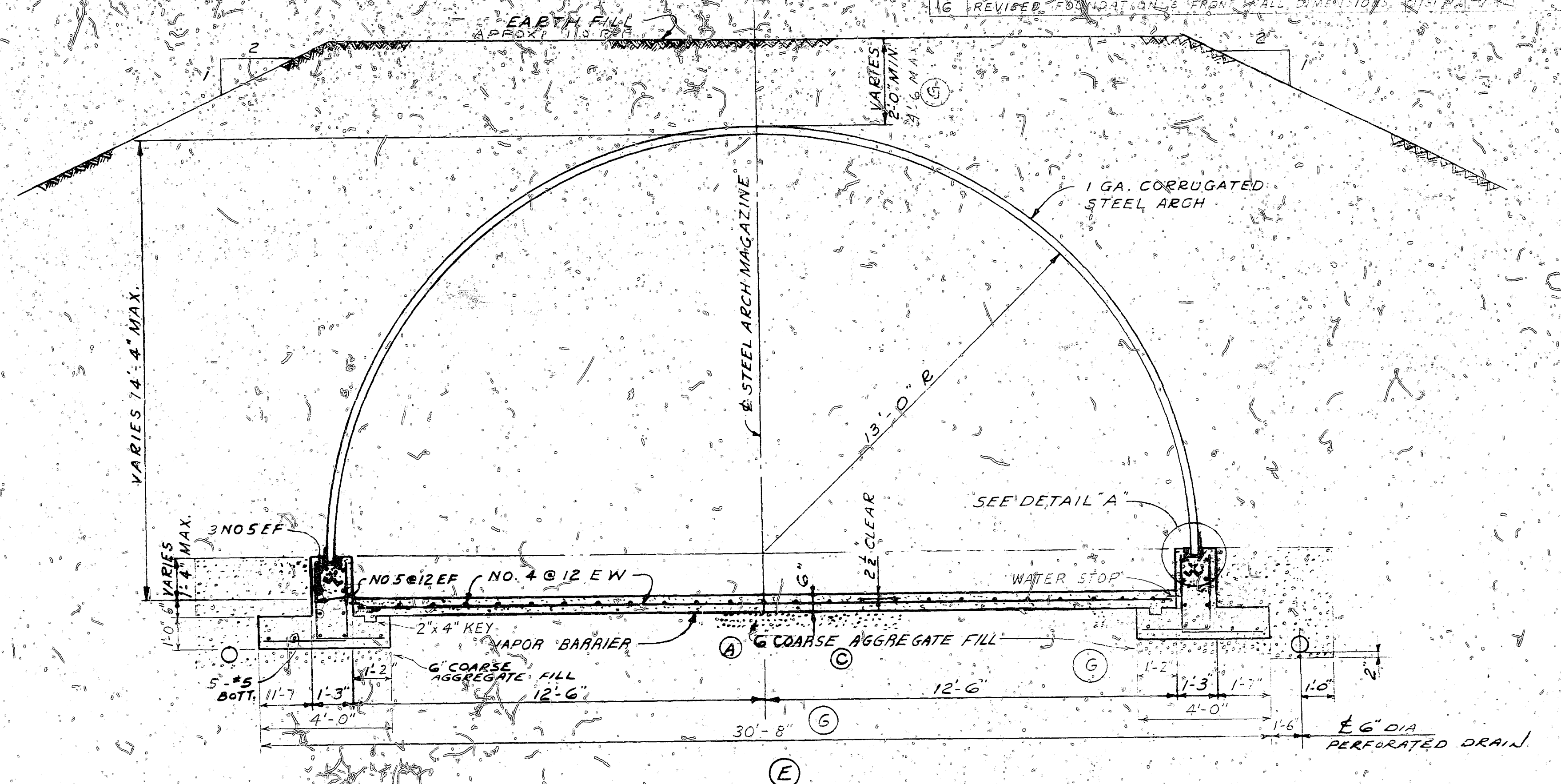
SYM	DESCRIPTION	DATE	APPROVAL
A	CHANGE IN DIMENSIONS AND SUB-BASE DETAIL	6/1/64	WBS
B	FOUND. REVISED DRAIN REL OCATED FOUND DET. AND	11/1/65	WBS
C	DRAINAGE FILL REVISED COARSE AGG. FILL CORRECTED	9/27/65	WBS
D	CHANGED DETAIL A & SUB-B & CHANGED DIMENSIONS	1/1/67	WBS
E	CHANGED PLAN & SECS. AND B-D IN FOUNDATIONAL REVISIONS	5/2/67	WBS
F	CHANGED VENTILATOR SCHEDULE AND FOUNDATIONAL REVISIONS	12/30/70	WBS
G	VENTILATOR STACK	12/30/70	WBS
H	REVISED FOUNDATIONAL FRONT WALL DIMENSIONS	12/30/70	WBS



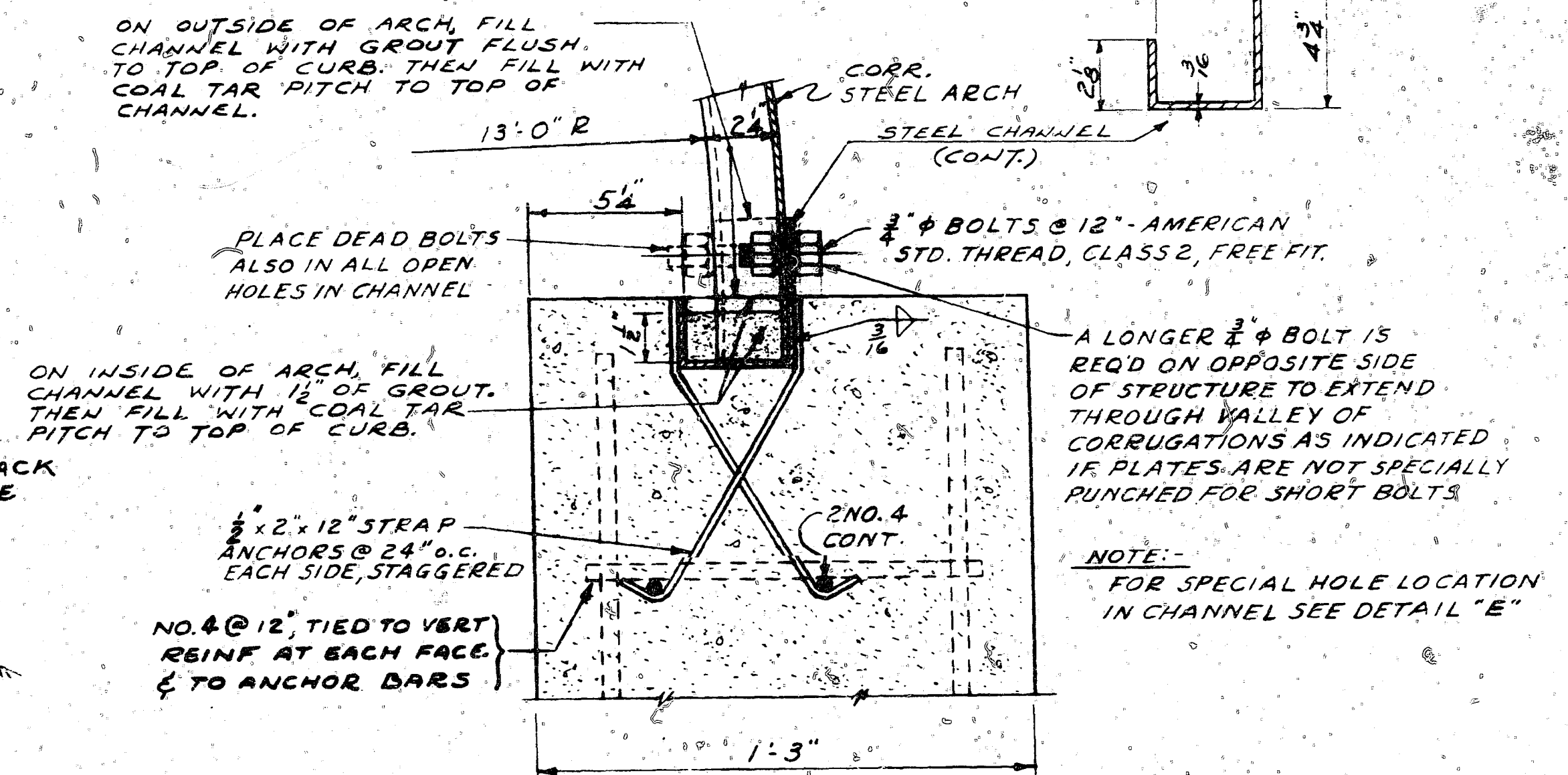
PLAN  
SCALE: 1/4" = 1'-0"



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

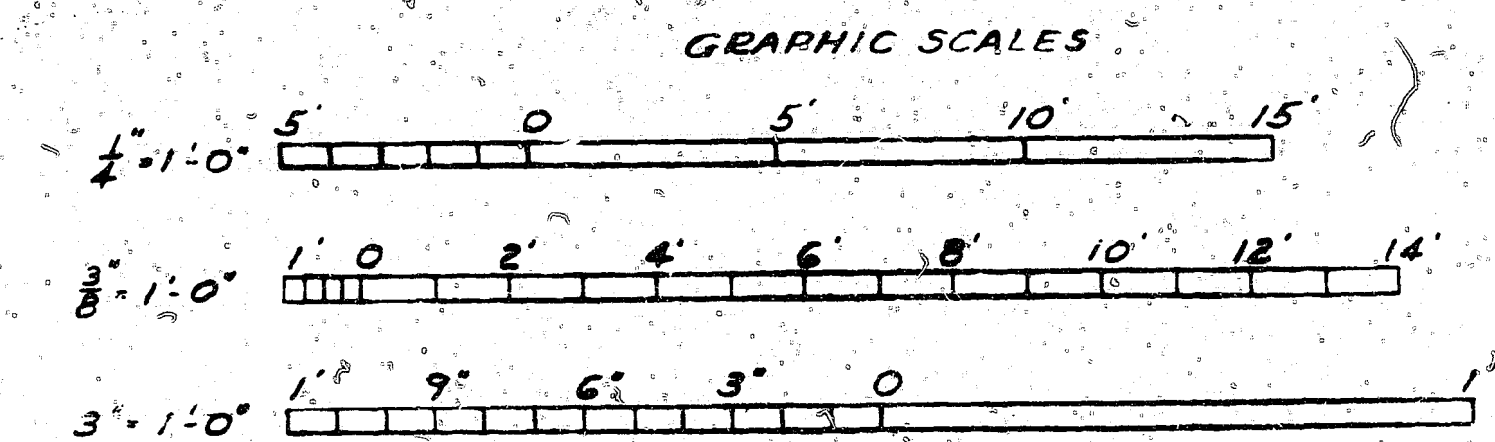


SECTION A-A  
SCALE: 3/8" = 1'-0"



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

FOR REFERENCE MATERIAL & DESIGN GUIDE, SEE Y&D DWG NO. 1059128  
FOR VENTILATOR SCHEDULE, SEE Y&D DWG NO. 1059132  
FOR DETAIL B, SEE Y&D DWG NO. 1059130  
FOR DETAILS C, D & E, SEE Y&D DWG NO. 1059132

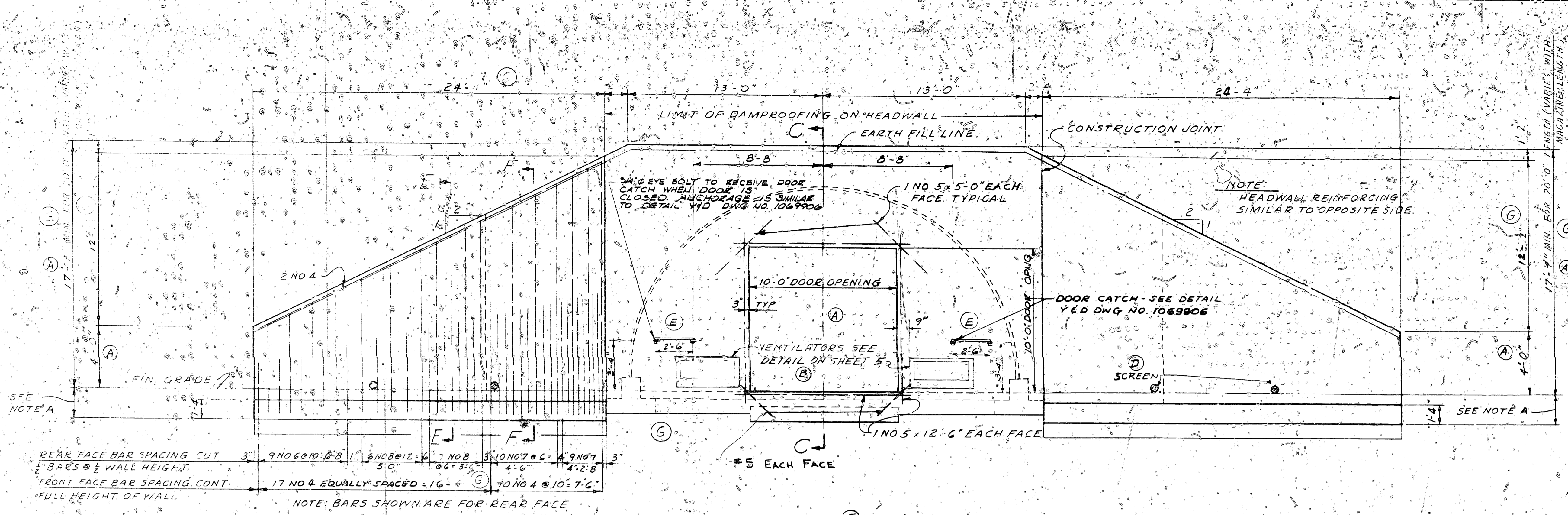


THIS IS AN ORIGINAL DRAWING DEC 29, 1970

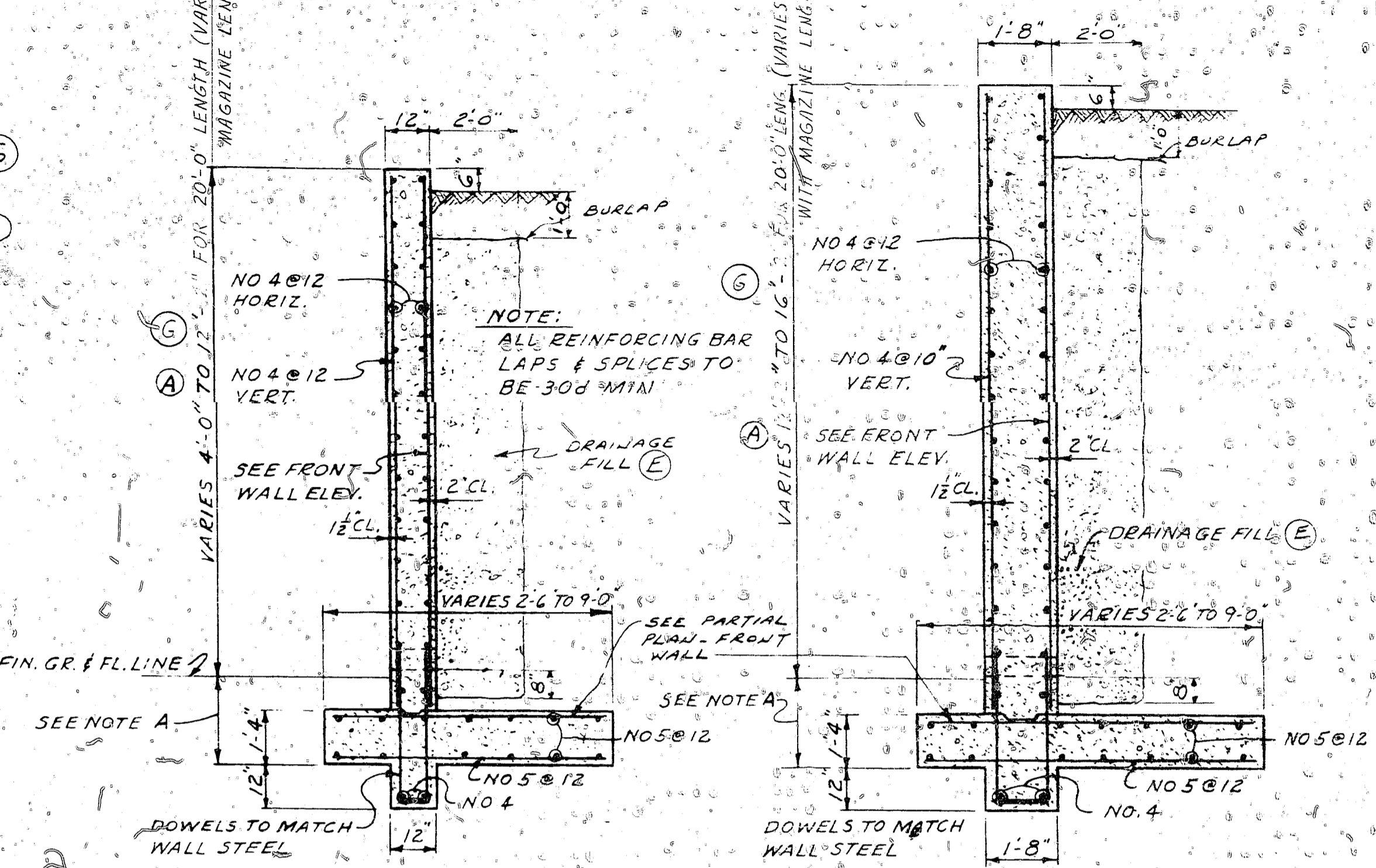
DES	WBS	DEPARTMENT OF THE NAVY	WASHINGTON, D. C.
CHK	WBS	BUREAU OF YARDS & DOCKS	
HEAD	WBS	<b>STANDARD</b> <b>EARTH COVERED STEEL ARCH MAGAZINES</b> 26'-0" WIDTH x LENGTH OF 20'-0" THRU 80'-0" PLANS & SECTIONS	
INCR	WBS		
ENGR	WBS		
PROJ	WBS		
DATE	3/18/64	CODE IDENT. NO.	Y & D DRAWING NO.
BY	WBS	80091	F 1059129
SCALE	AS NOTED	SPEC	NAVY SHEET 2 OF 6

ON 105 FILM

SYM.	DESCRIPTION	DATE	APPROVAL
A	CHANGE IN DIMENSIONS & DOOR DETAILS	6/1/64	WRS
B	DELETED LOUVERS, ADDED VENTILATORS	11/19/64	WRS
C	SCREEN ADDED WEEP HOLE PIPES, FOUND, REVISED	7/1/65	WRS
D	FOOTING DRAIN RELOCATED - STRAINER CHANGED TO SCREEN	9/10/65	WRS
E	ADDED DRAINAGE FILL, SECTS. E-E, F-F, C-C	2/1/67	WRS
F	CHANGED LOCATION DOOR CATCH, ADDED EYE BOLT	5/1/67	WRS
G	REVISED FOUNDATION & FRONT WALL DIMENSIONS	10/1/72	WRS

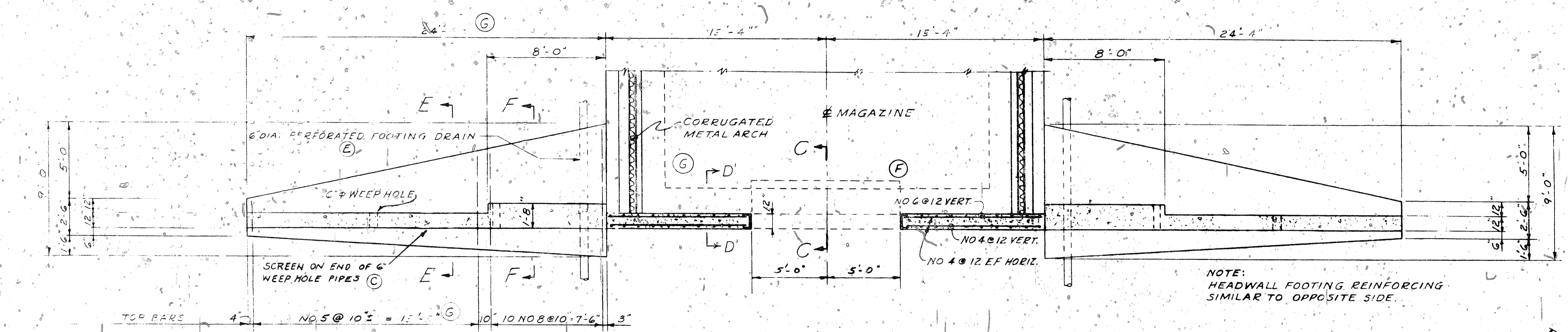


**FRONT WALL ELEVATION**  
SCALE: 1/4" = 1'-0"

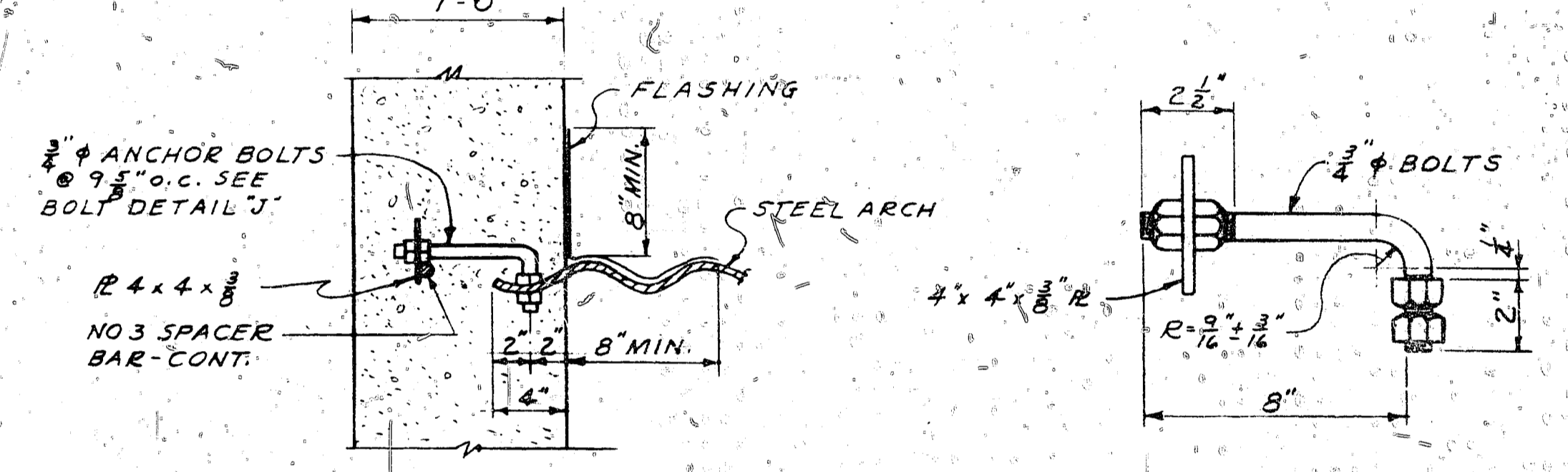


**SECTION E-E**  
SCALE: 3/8" = 1'-0"

**SECTION F-F**  
SCALE: 3/8" = 1'-0"

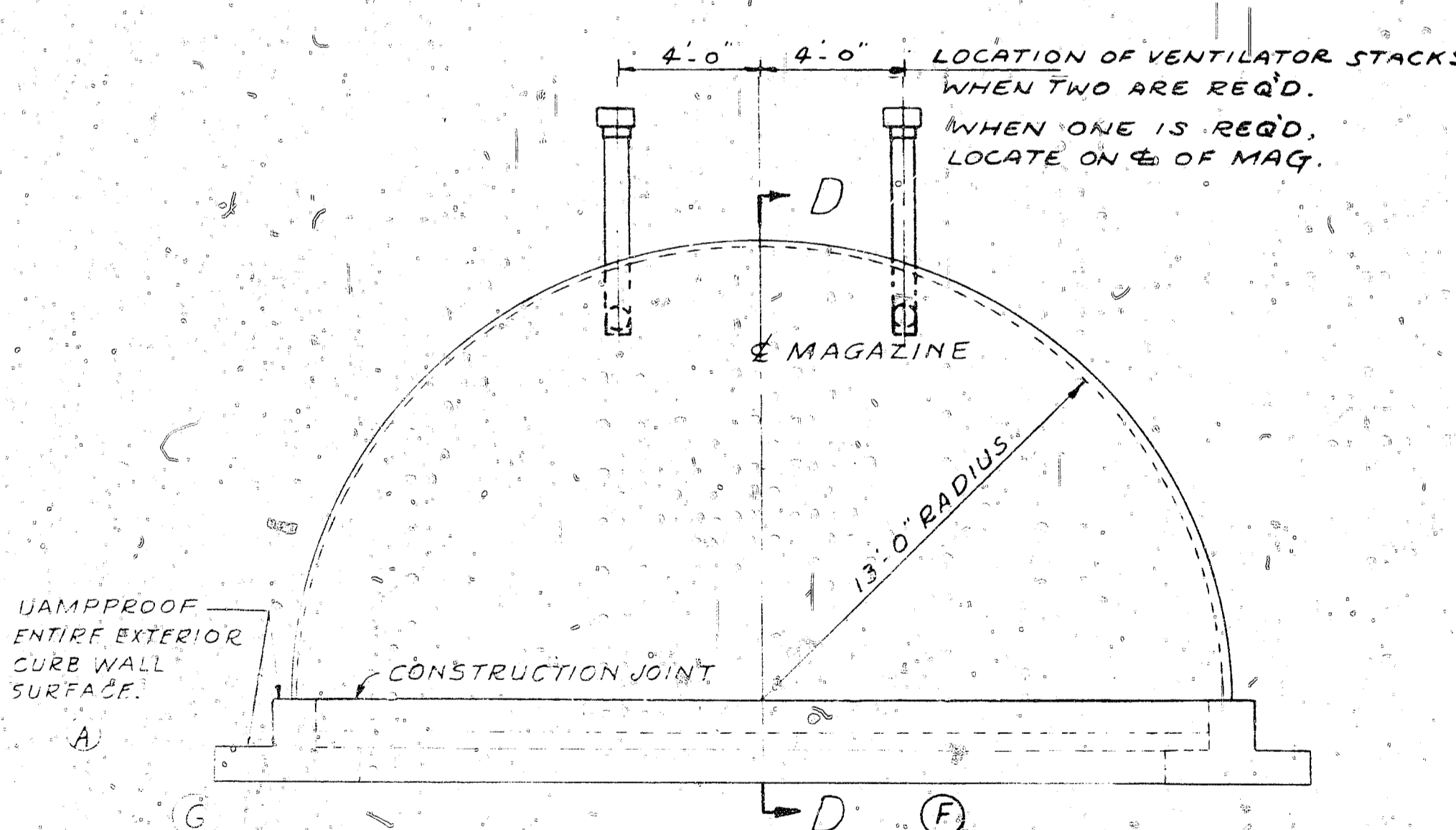


**PARTIAL PLAN - FRONT WALL**  
SCALE: 1/4" = 1'-0"

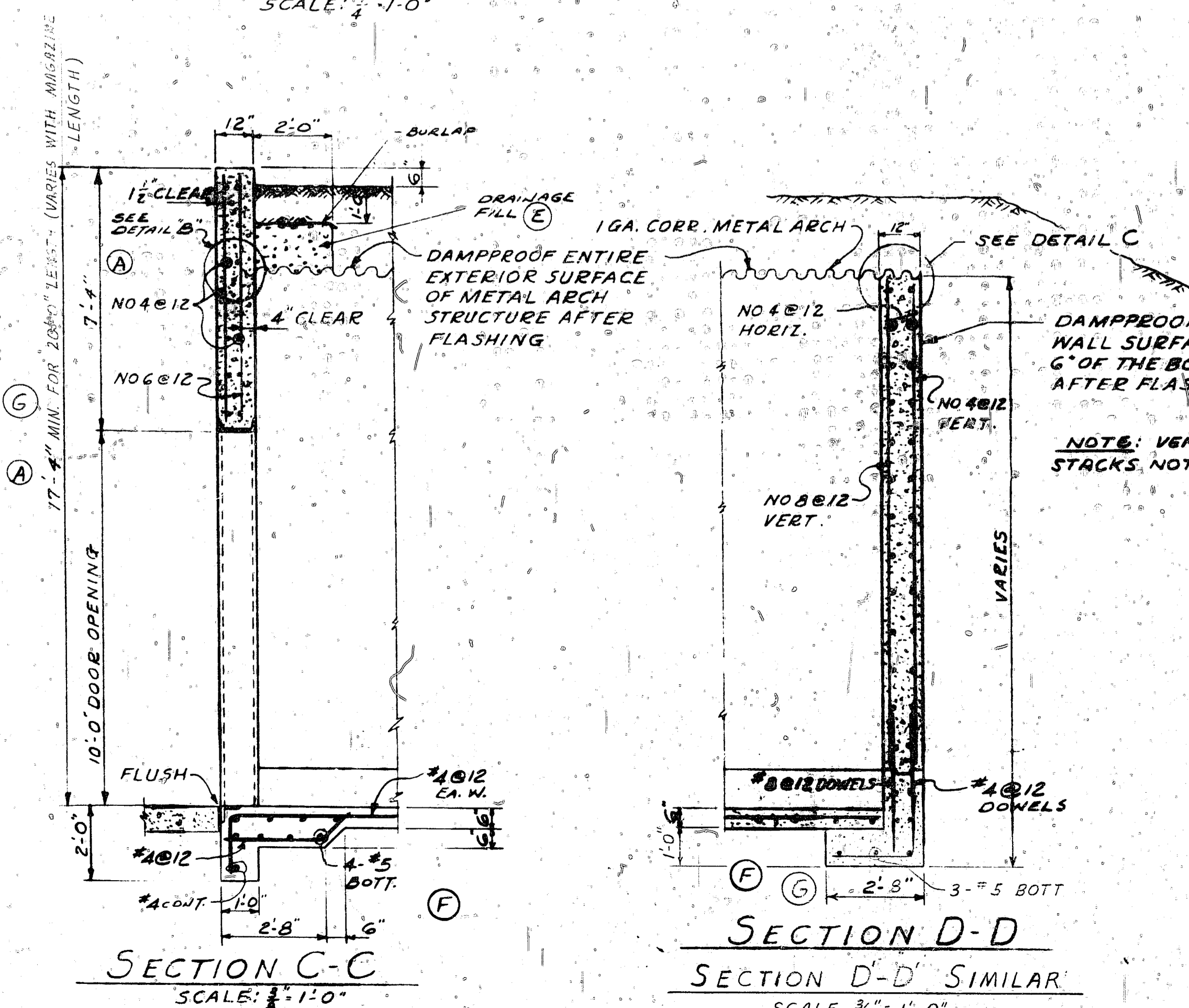


**DETAIL 'B'**  
SCALE: 1/2" = 1'-0"

**DETAIL 'J'**  
SCALE: 3/4" = 1'-0"

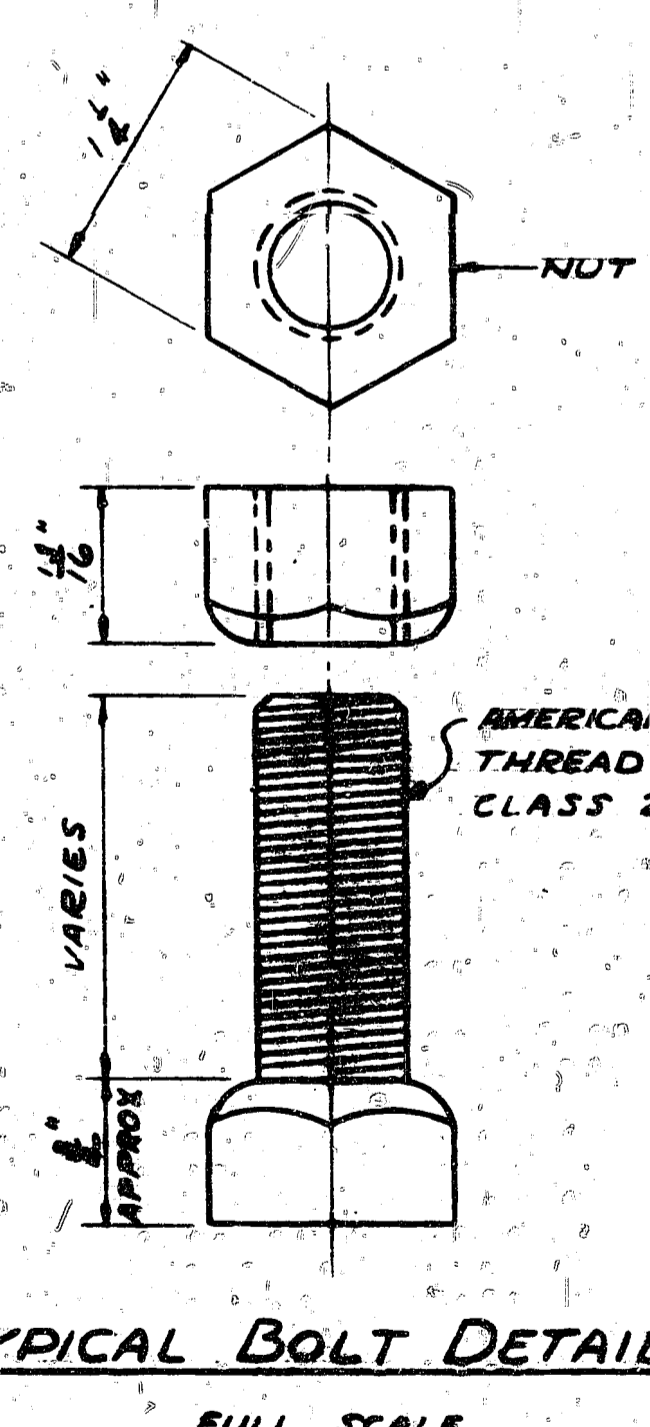


**REAR WALL ELEVATION**  
SCALE: 1/4" = 1'-0"



**SECTION C-C**  
SCALE: 3/8" = 1'-0"

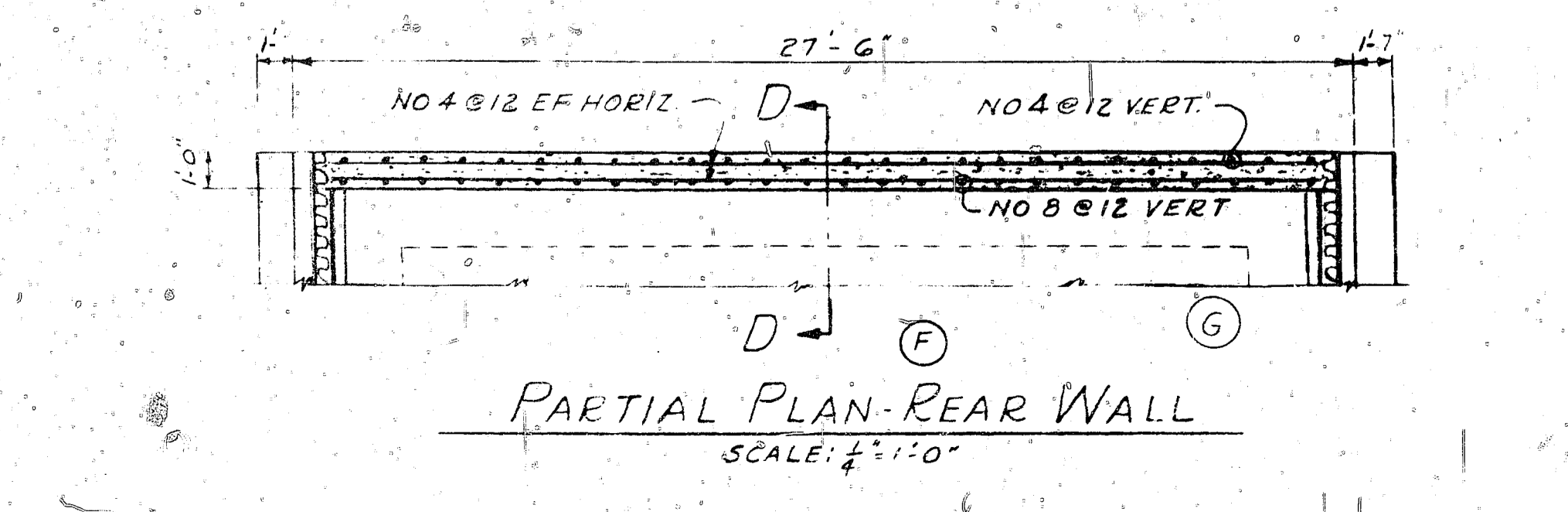
**SECTION D-D SIMILAR**  
SCALE: 3/8" = 1'-0"



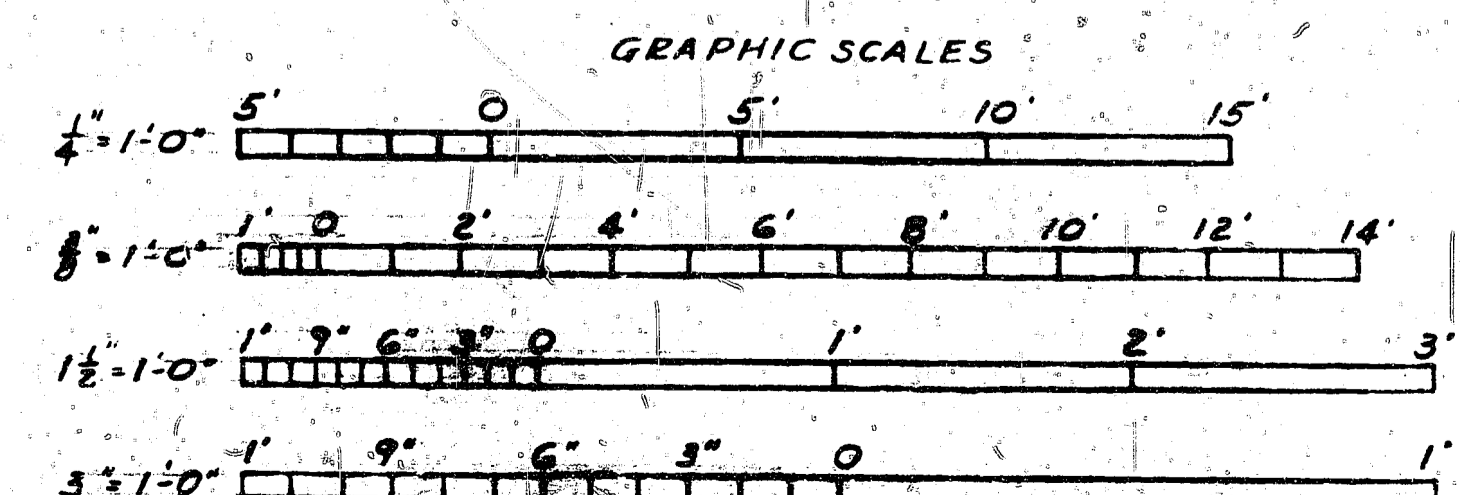
**TYPICAL BOLT DETAIL**  
FULL SCALE

**NOTE A:** THE BOTTOM OF RETAINING WALL FOOTINGS SHALL BE AT A MINIMUM DEPTH OF 1'-0" INTO NATURAL GROUND, AND IN NO CASE LESS THAN 2'-0" BELOW THE FLOOR LINE.

FOR REFERENCE MATERIAL & DESIGN GUIDE, SEE Y&D DWG. NO. 059122  
FOR DETAIL C, SEE Y&D DWG. NO. 1059132



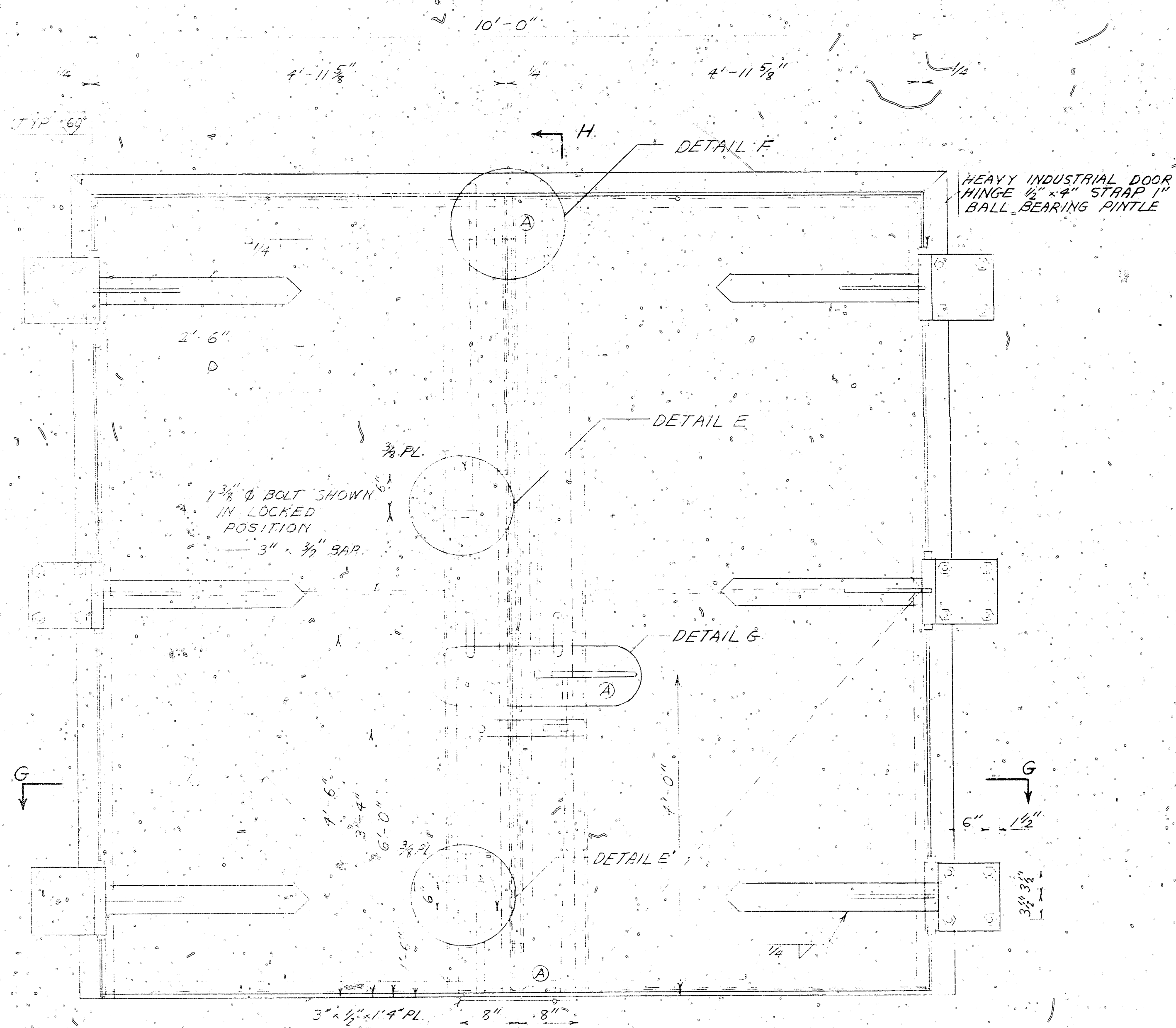
**PARTIAL PLAN - REAR WALL**  
SCALE: 1/4" = 1'-0"



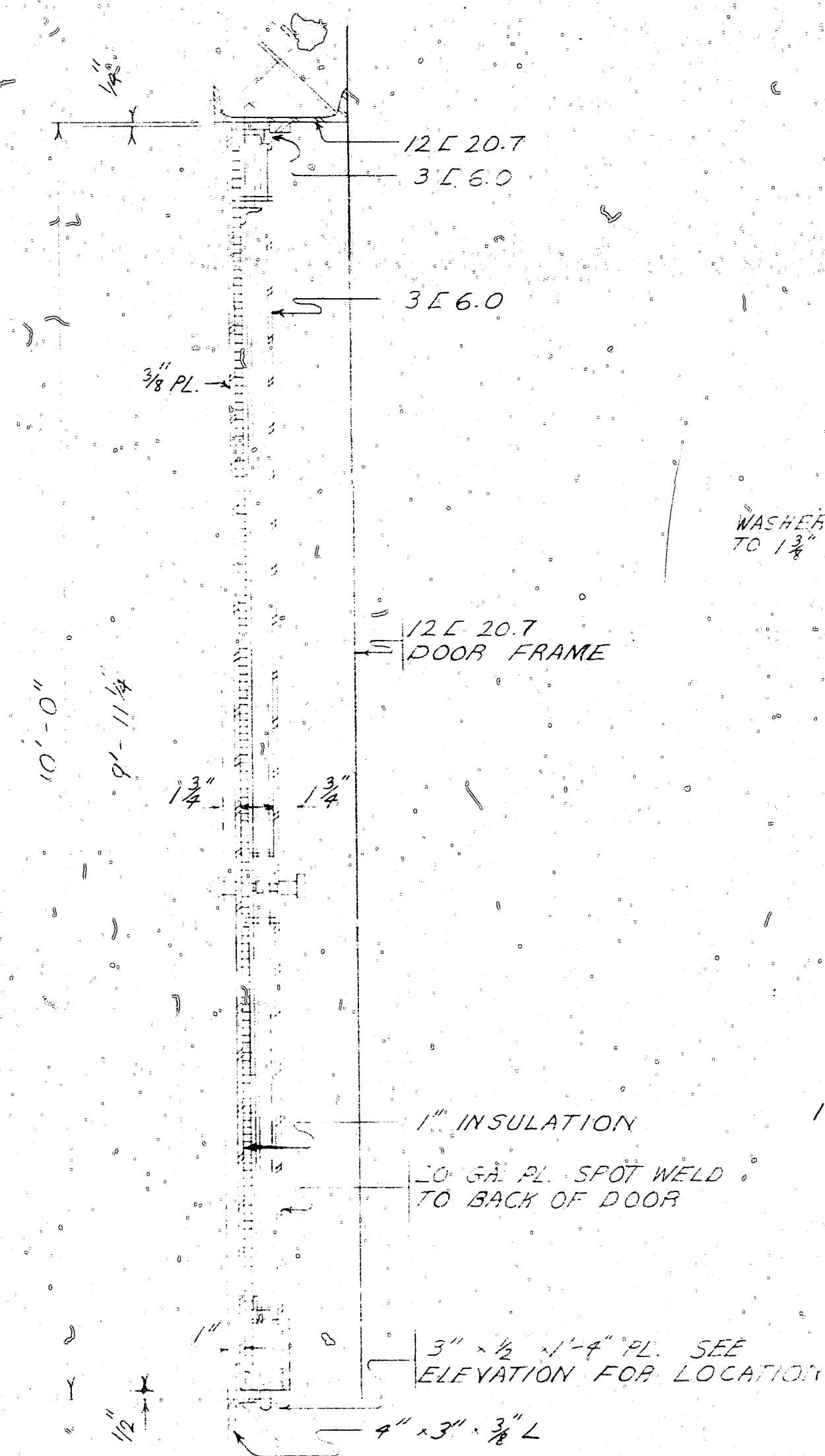
THIS IS AN ORIGINAL DRAWING DEC 29, 1970

DES: J. H. ...	DEPARTMENT OF THE NAVY	WASHINGTON, D. C.
DR: J. H. ...	BUREAU OF YARDS & DOCKS	
CHEK: J. H. ...	<b>STANDARD</b>	
HEAD: M. ...	EARTH COVERED STEEL ARCH MAGAZINES	
BR: J. H. ...	26'-0" WIDTH x LENGTH OF 20'-0" THRU 80'-0"	
DR: J. H. ...	ELEVATIONS & SECTIONS	
CONTRACTOR: J. H. ...	CODE IDENT NO. 80091	SIZE Y & D DRAWING NO. 1059130
DATE: 11/18/64	SCALE: AS NOTED	SHEET 3 OF 3

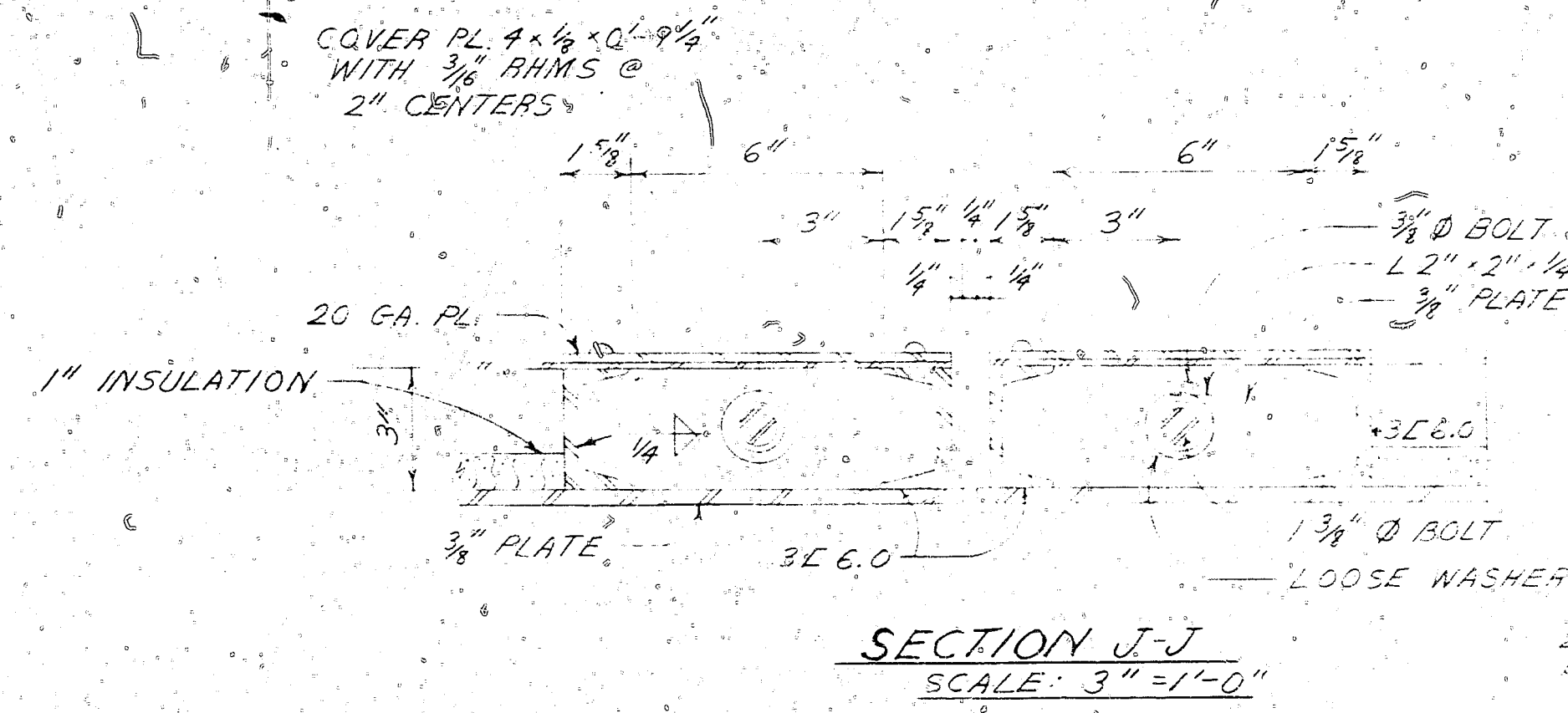
1-32-544



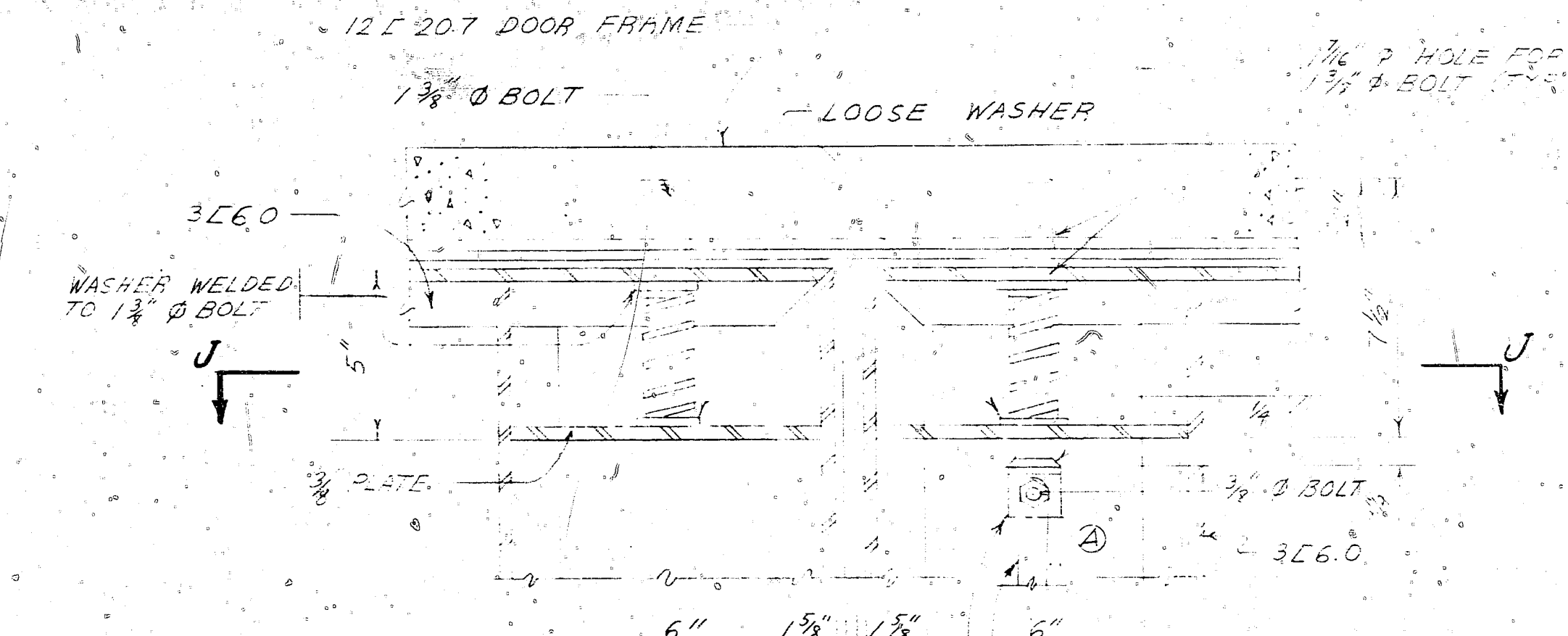
ELEVATION  
SCALE: 1"=1'-0"



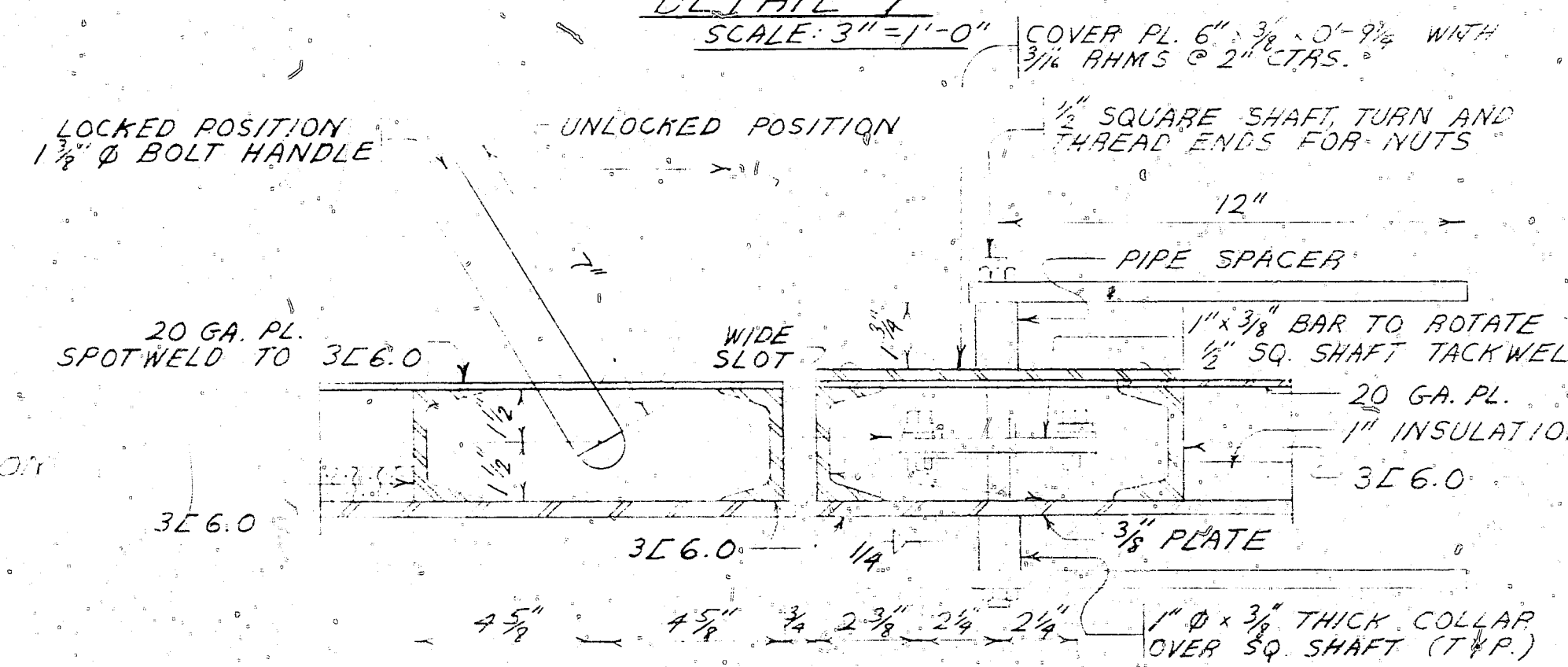
SECTION H-H  
SCALE: 1"=1'-0"



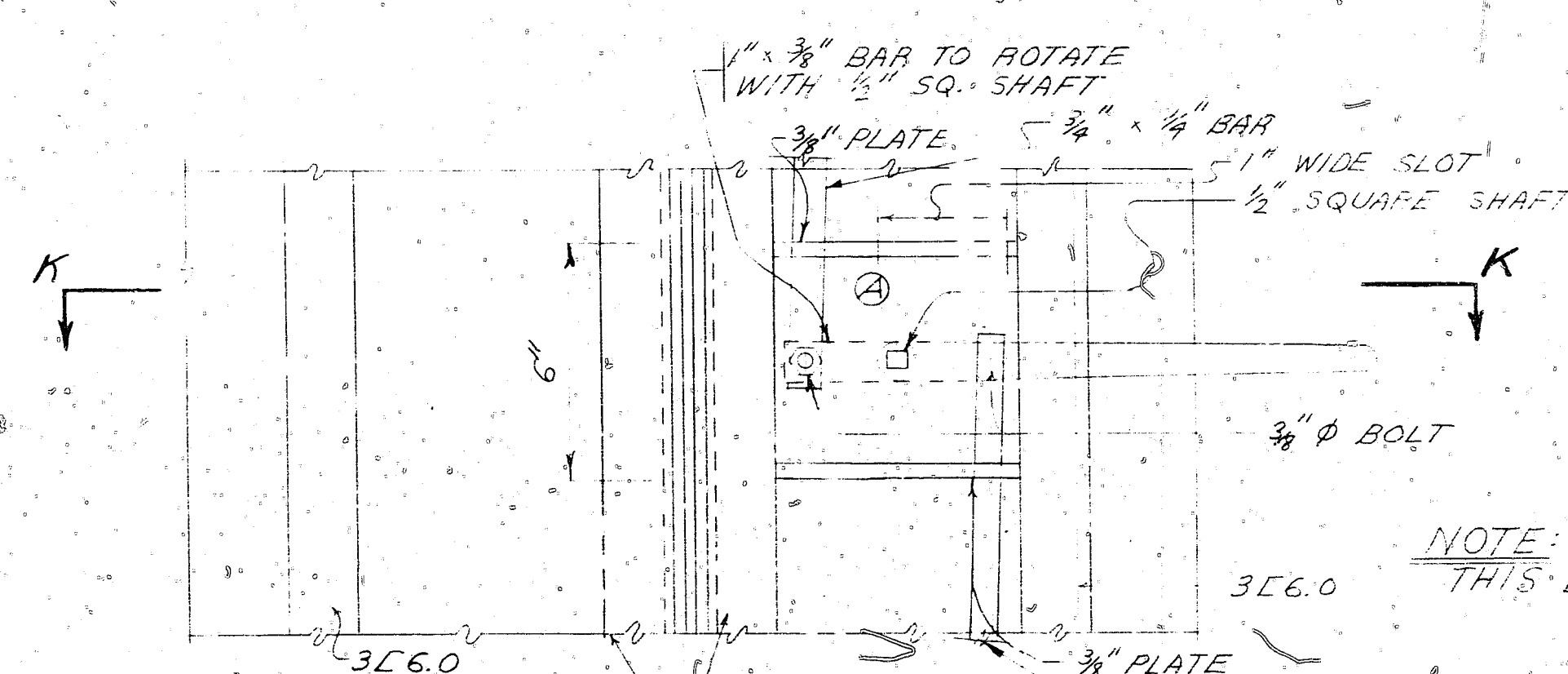
SECTION J-J  
SCALE: 3"=1'-0"



ELEVATION  
DETAIL E  
SCALE: 3"=1'-0"

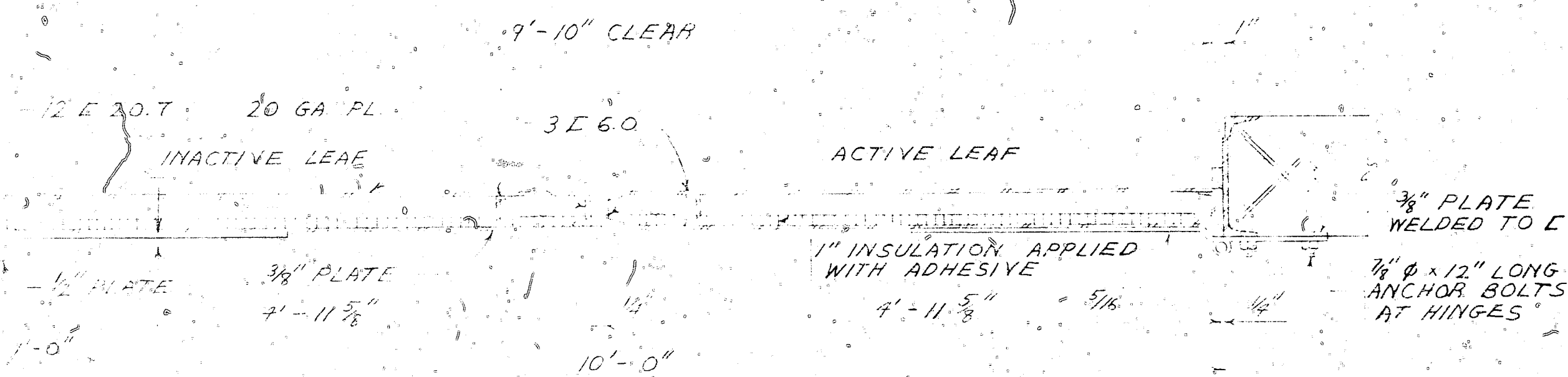


SECTION K-K  
SCALE: 3"=1'-0"

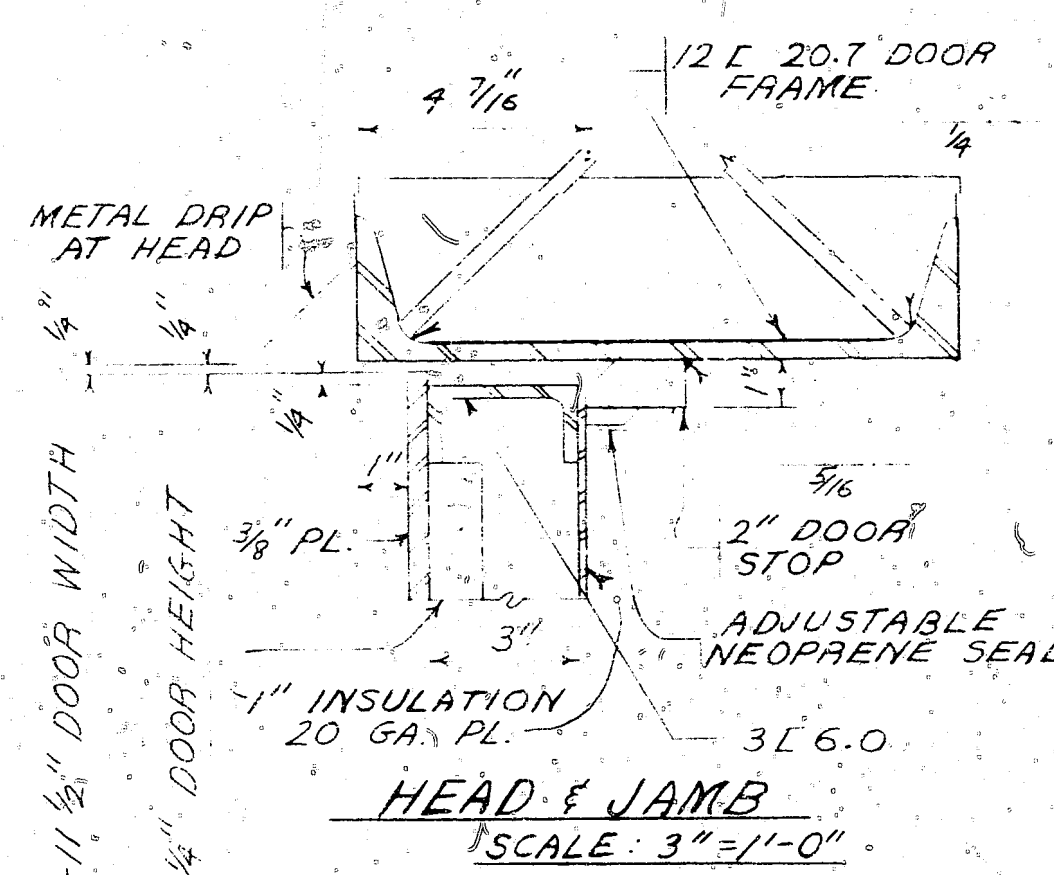


ELEVATION  
DETAIL G  
SCALE: 3"=1'-0"

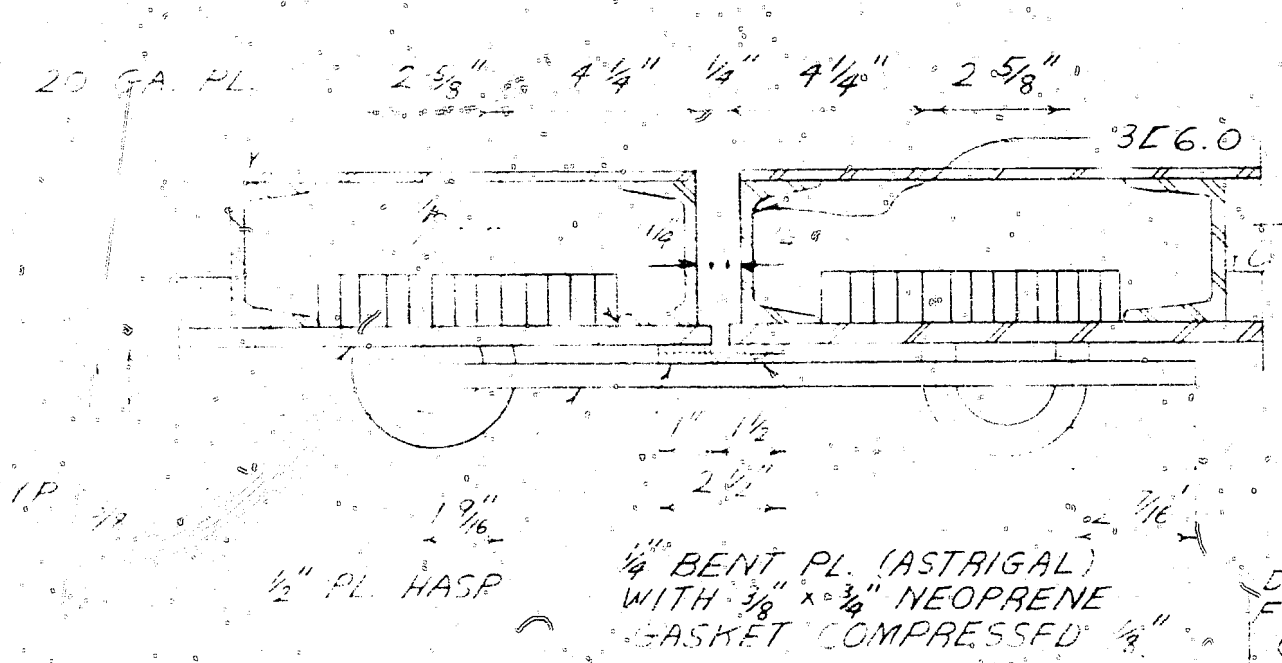
DOOR LATCH HOOP DETAIL  
SCALE: 3"=1'-0"



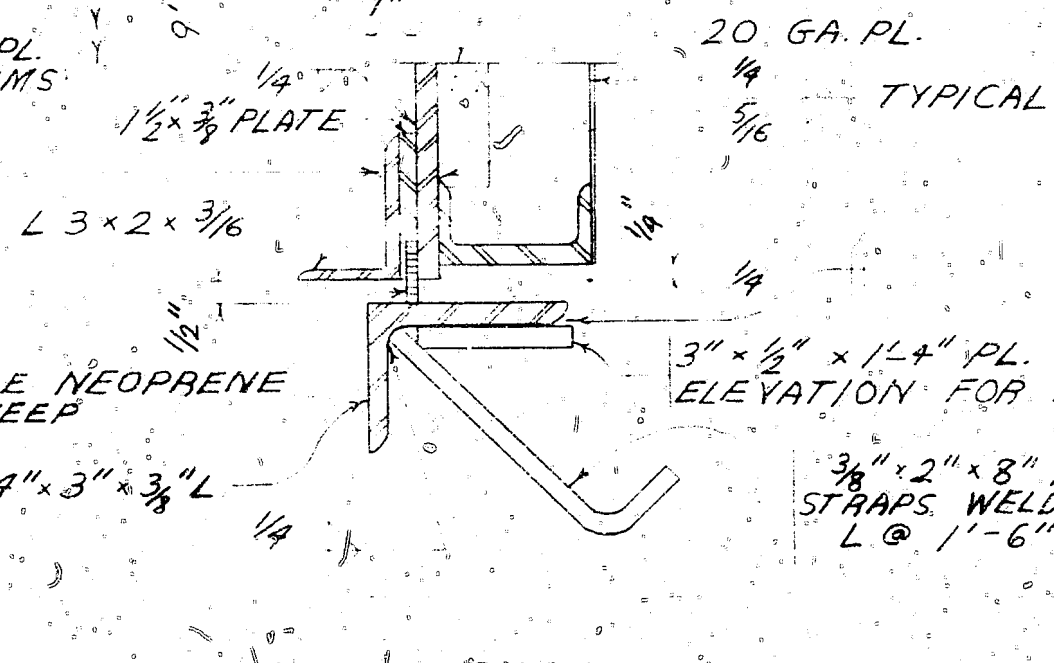
SECTION G-G  
SCALE: 1"=1'-0"



HEAD & JAMB  
SCALE: 3"=1'-0"



SECTION  
SCALE: 3"=1'-0"



SILL  
SCALE: 3"=1'-0"

DOOR HANDLE DETAIL  
SCALE: 3"=1'-0"

DOOR CATCH DETAIL  
SCALE: 3"=1'-0"

HASP & STAPLE DETAIL  
SCALE: 3"=1'-0"

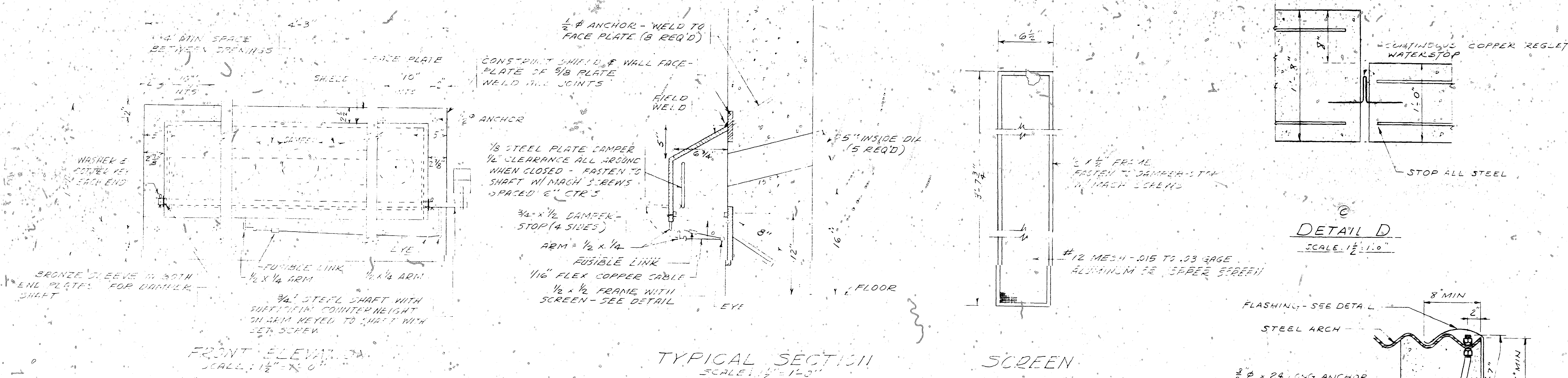
GRAPHIC SCALES

NOTE: THIS DWG. SUPERSEDES Y.E.D. DWG. NO. 106990

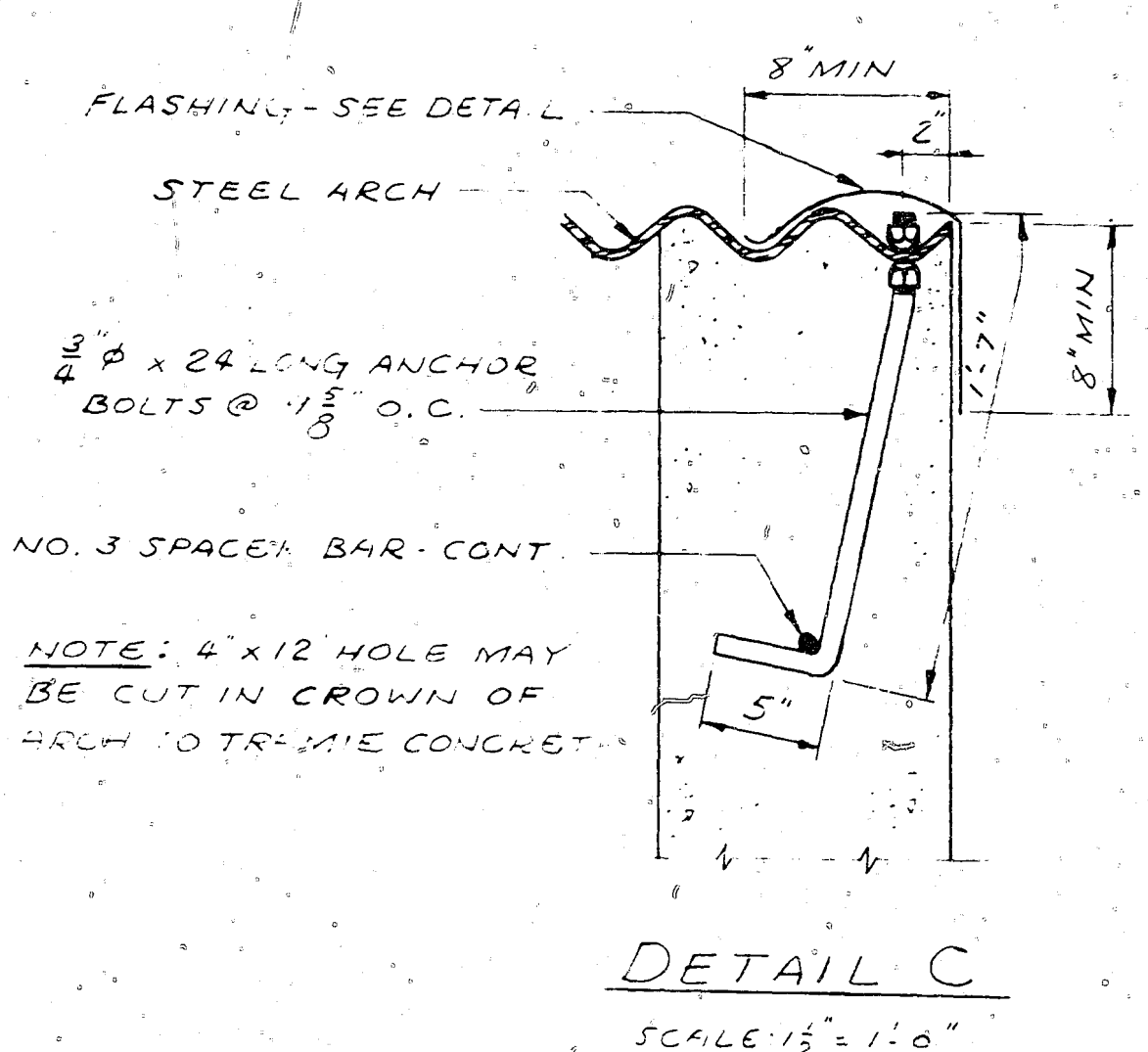
REVISIONS		DEPARTMENT OF THE NAVY WASHINGTON, D. C.	
DES	DR	BUREAU OF YARDS & DOCKS	
CHK	HEAD	STANDARD	
MGR	ENGR	EARTH COVERED STEEL ARCH MAGAZINES	
ENGR	PROJ	26'-0" WIDTH x LENGTH OF 20'-0" THRU 80'-0"	
DIRECTOR	DATE	DOOR DETAILS	
FOR CHIEF OF BUREAU		CODE IDENT NO.	Y & D DRAWING NO.
		80091	F 1069906
SCALE	SPEC	NBY	SHEET - OF

SYM	REVISIONS DESCRIPTION	DATE APPROVED
A	CHANGE IN LOWER DETAIL	6/1/64
B	DELETED LOWER DETAIL, ADDED DETAILS OF WALL VENTILATOR	11/15/64
C	CHANGED DETAILS D & E	2/7/65
D	EXTENDED VENTILATOR STACK EA END, ADDED FIRE DAMPER TO VENTILATOR STACK, ADDED DET. F, SUBSTITUTED BUTT WELDED TEE FOR SERVICE TEE	10/31/65

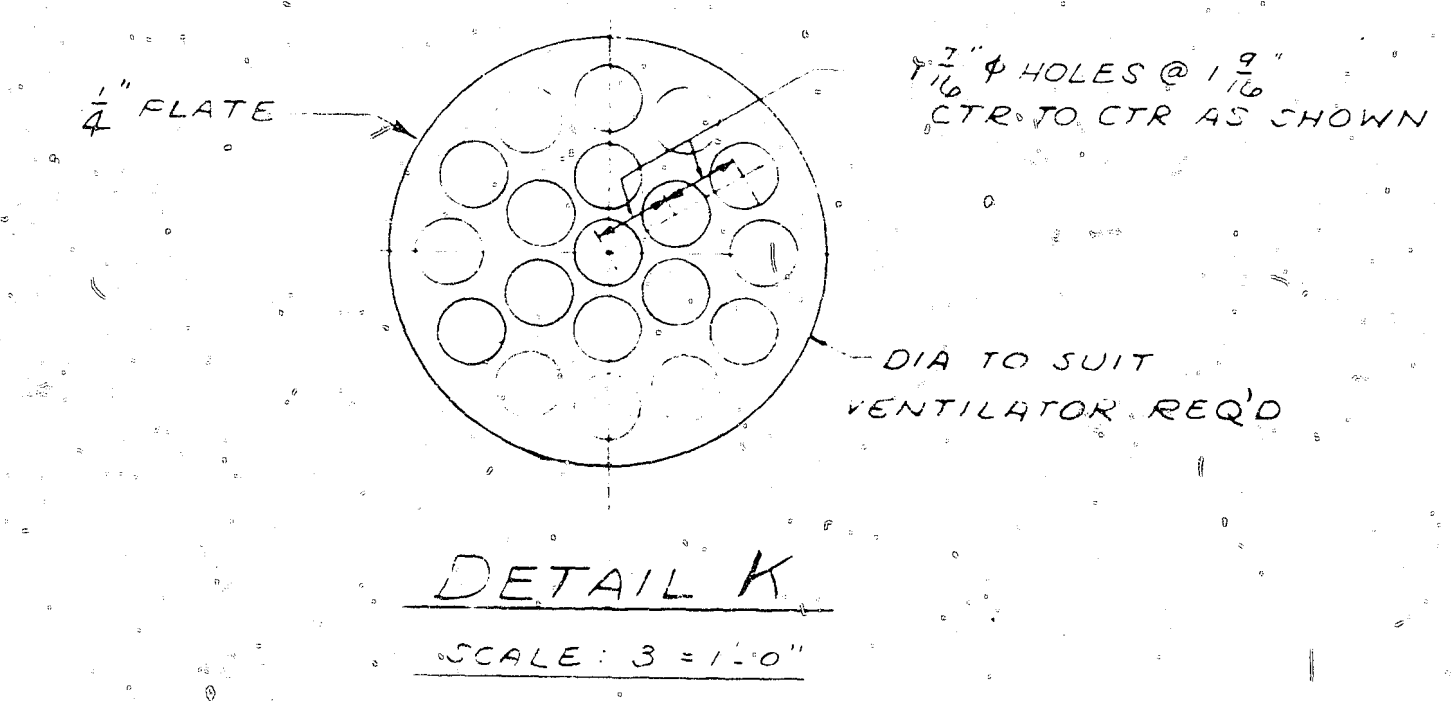
OUTSIDE DESIGN TEMPERATURE	VENTILATION SCHEDULE		
		LENGTH OF MAGAZINE	
		50' TO 80'	LESS THAN 50'
ABOVE 90°F	STACK	2-10" Ø	2-8" Ø
30°F TO 90°F	STACK	2-8" Ø	1-10" Ø
BELOW 30°F	STACK	1-10" Ø	1-8" Ø



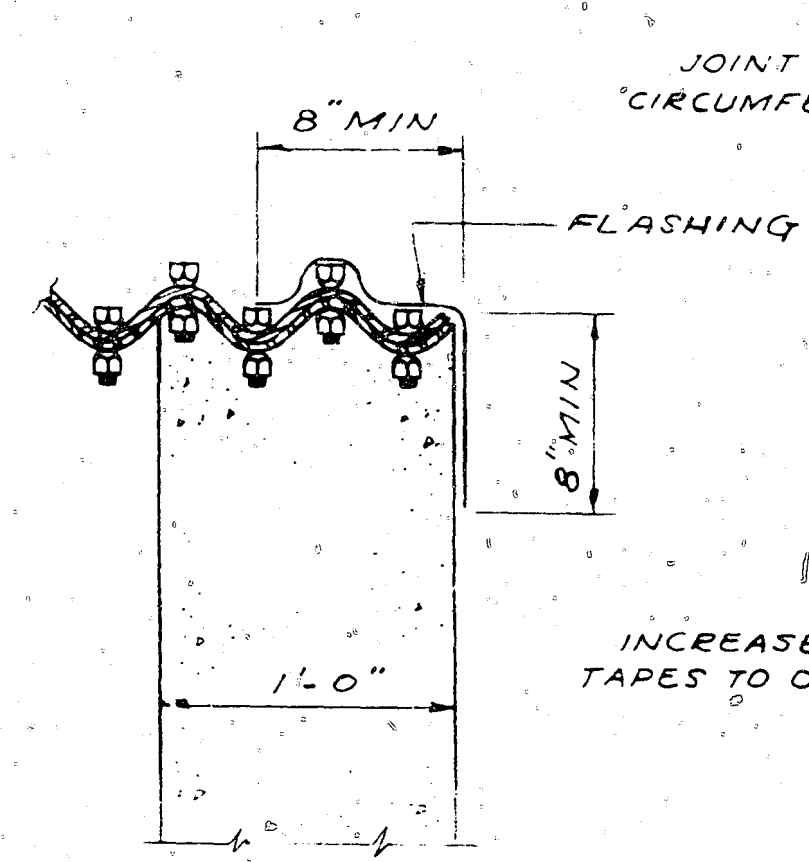
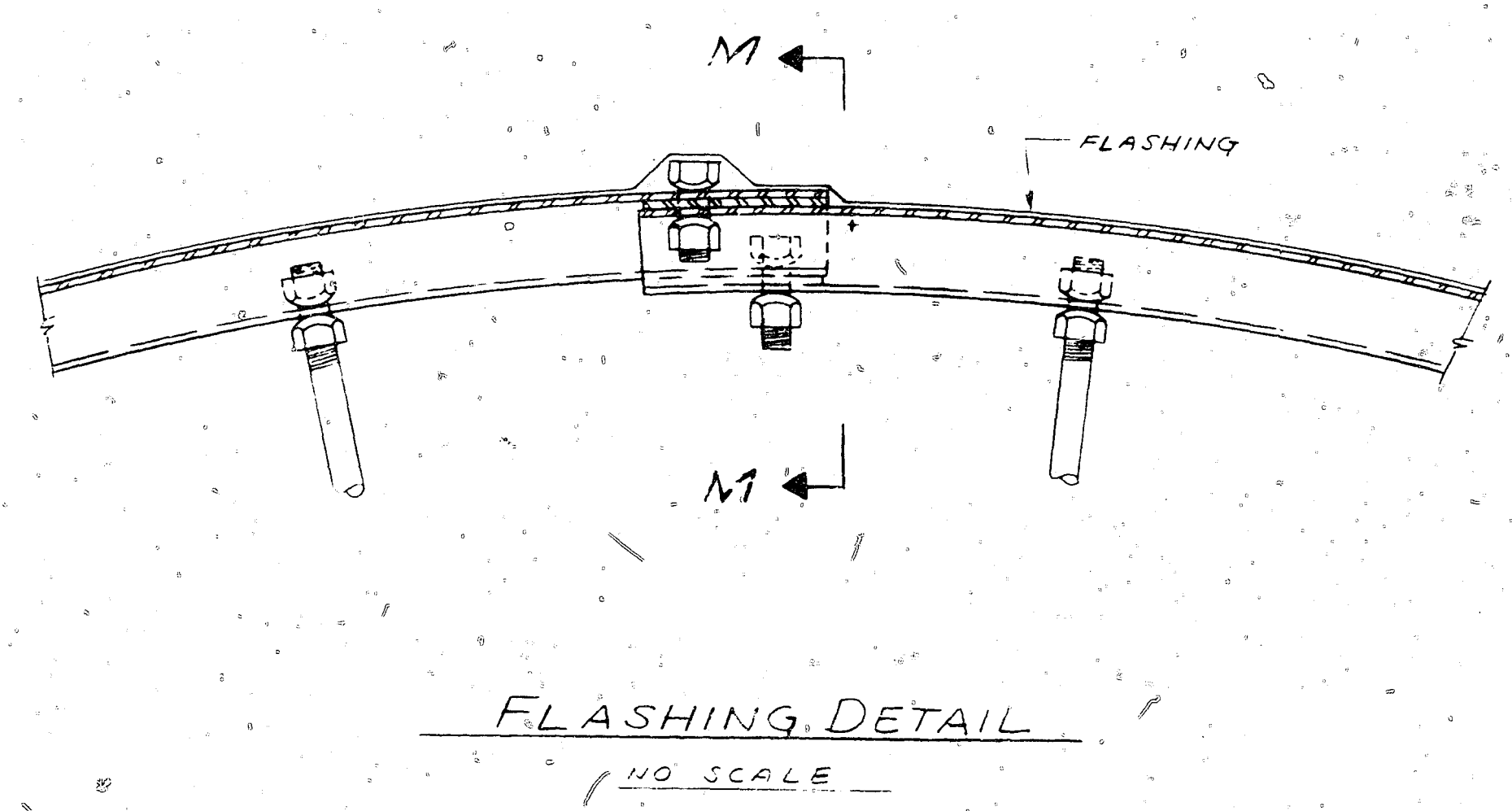
**DETAIL D**  
SCALE: 1/2" = 1'-0"



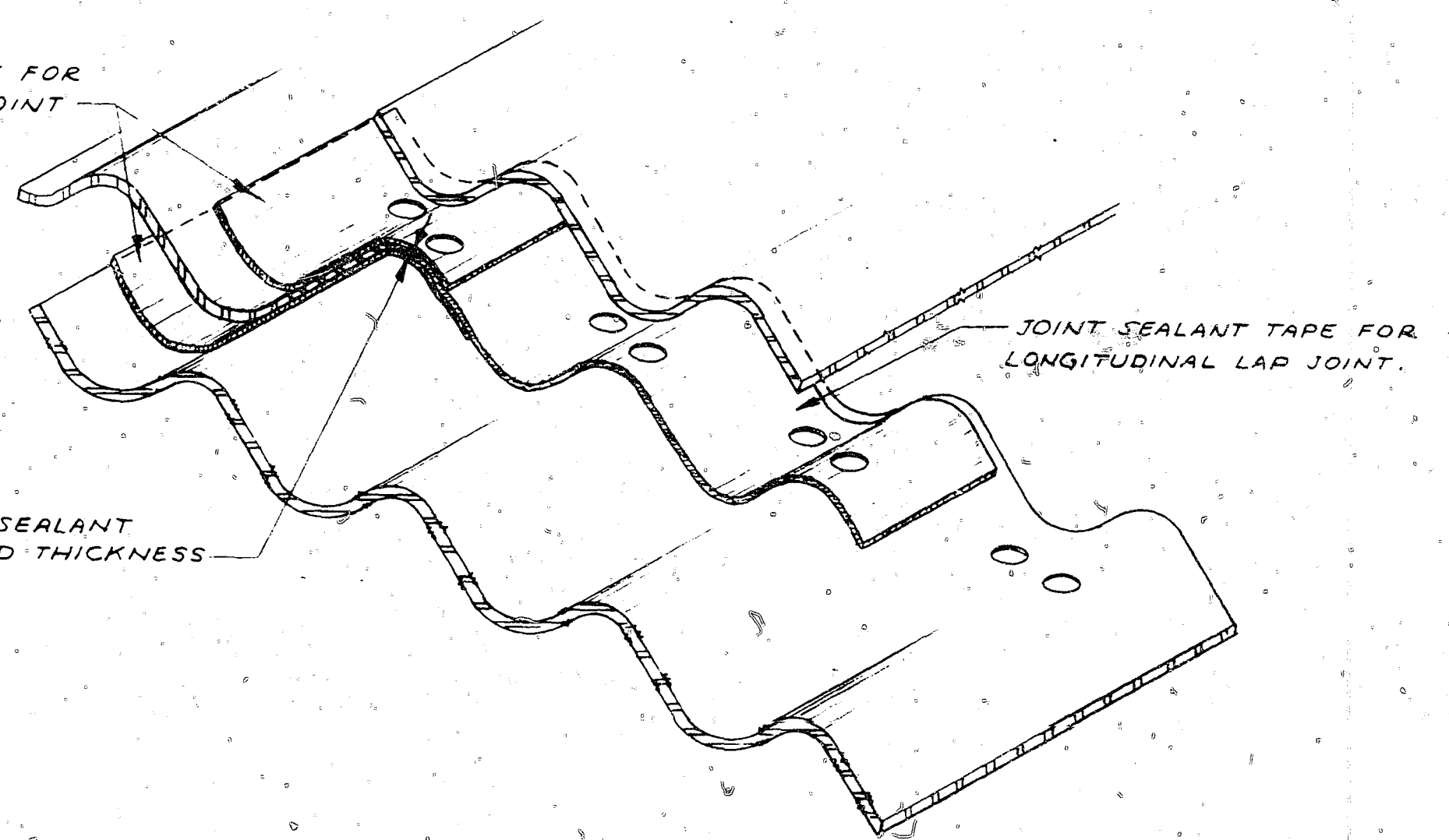
**DETAIL C**  
SCALE: 1/2" = 1'-0"



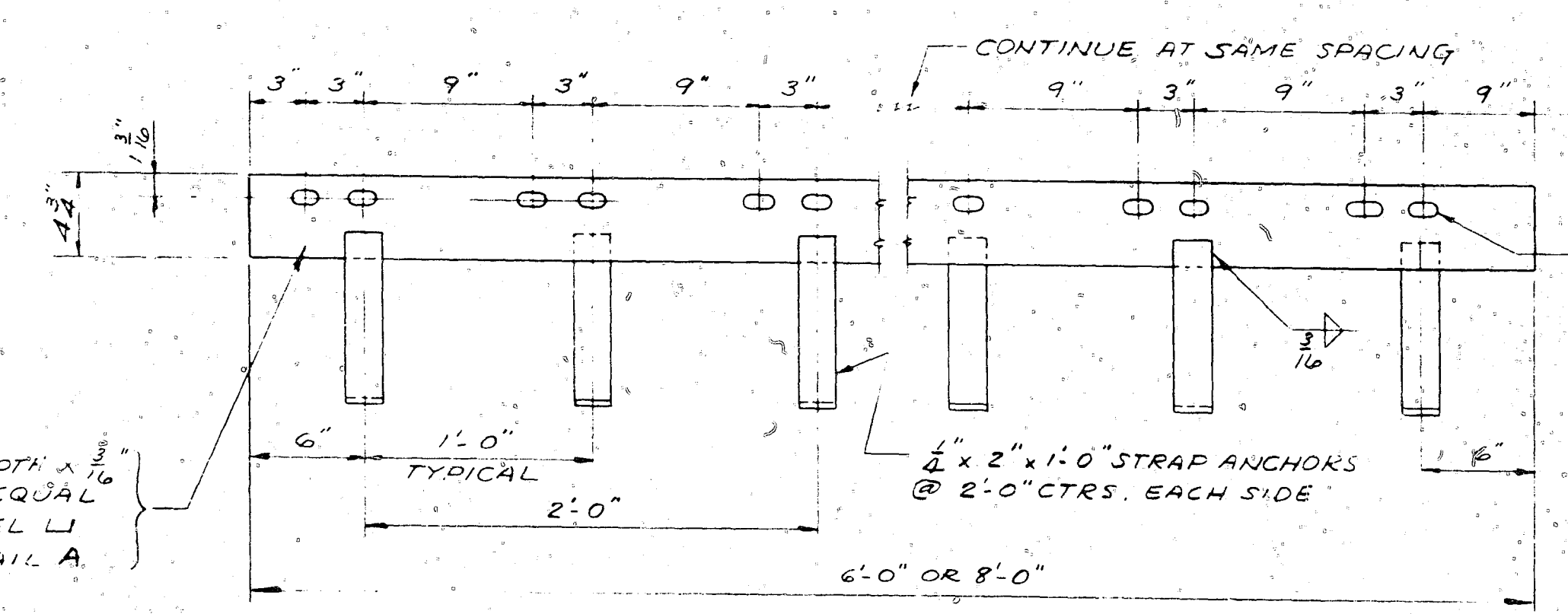
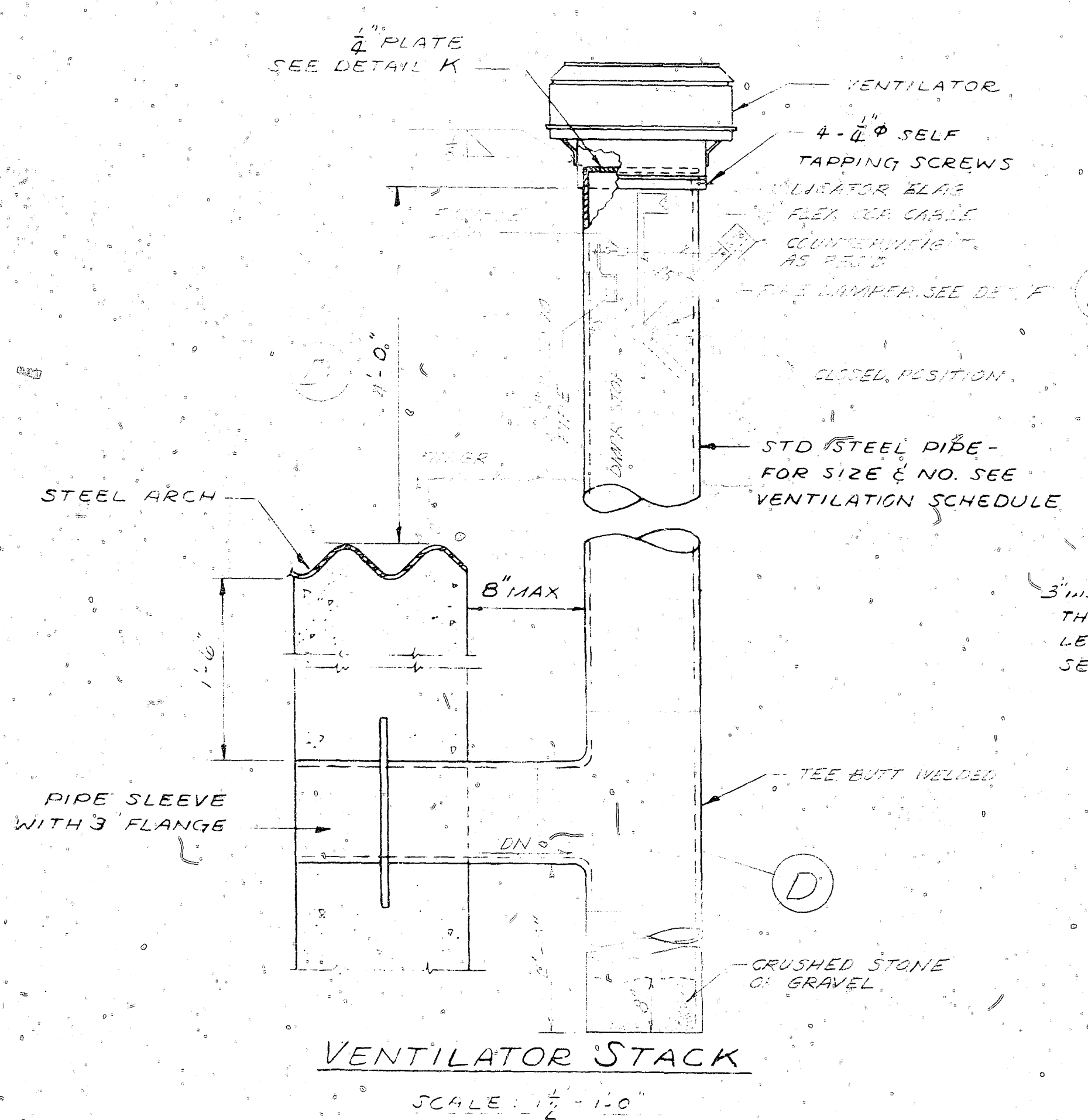
**DETAIL K**  
SCALE: 3/4" = 1'-0"



**SECTION M-M**  
SCALE: 1/2" = 1'-0"



**JOINT SEALANT INSTALLATION DETAIL**  
NO SCALE



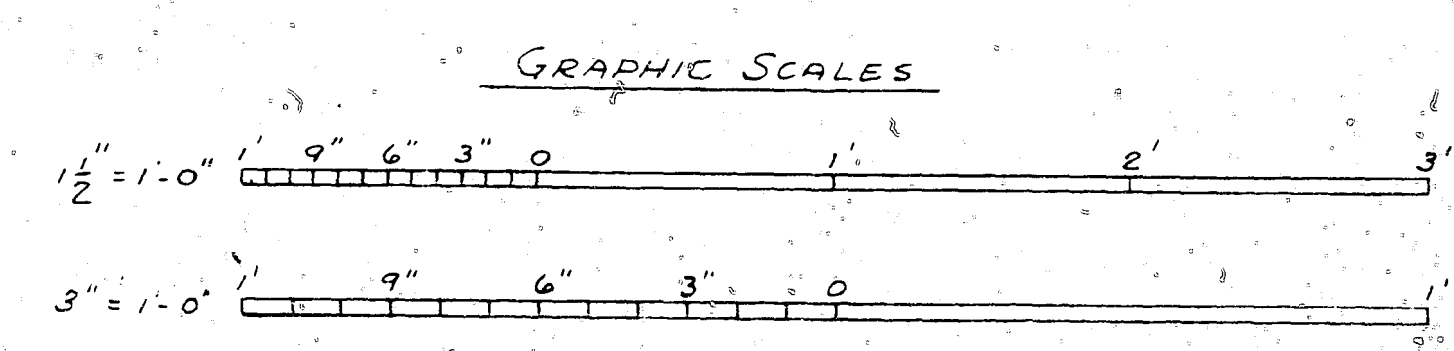
**DETAIL E**  
SCALE: 1/2" = 1'-0"

**DETAIL F**  
FIRE DAMPER  
SCALE: NONE

FOR REFERENCE MATERIAL AND DESIGN GUIDE, SEE Y&D DWG NO. 1059128.  
FOR LOCATION OF DETAILS C & D, SEE Y&D DWG NO. 1059129.  
FOR DETAIL A, SEE Y&D DWG NO. 1059129.

THIS IS AN ORIGINAL DRAWING DEC 29, 1970

STRUCT	MECH	DEPARTMENT OF THE NAVY WASHINGTON, D. C.
DES	DR	BUREAU OF YARDS & DOCKS
CHK	HEAD	<b>STANDARD</b>
MGR	ENGR CONS	EARTH COVERED STEEL ARCH MAGAZINES
PROJ MGT	DIRECTOR	26' 0" WIDTH x LENGTH OF 20'-0" THRU 80'-0"
APPROVED	DATE	VENTILATION DETAILS
FOR CHIEF OF BUREAU	3/18/64	
CODE IDENT NO.	SIZE	Y & D DRAWING NO.
80091	F	1059132
SCALE: AS NOTED	SPEC	NBY
		SHEET 5 OF 6

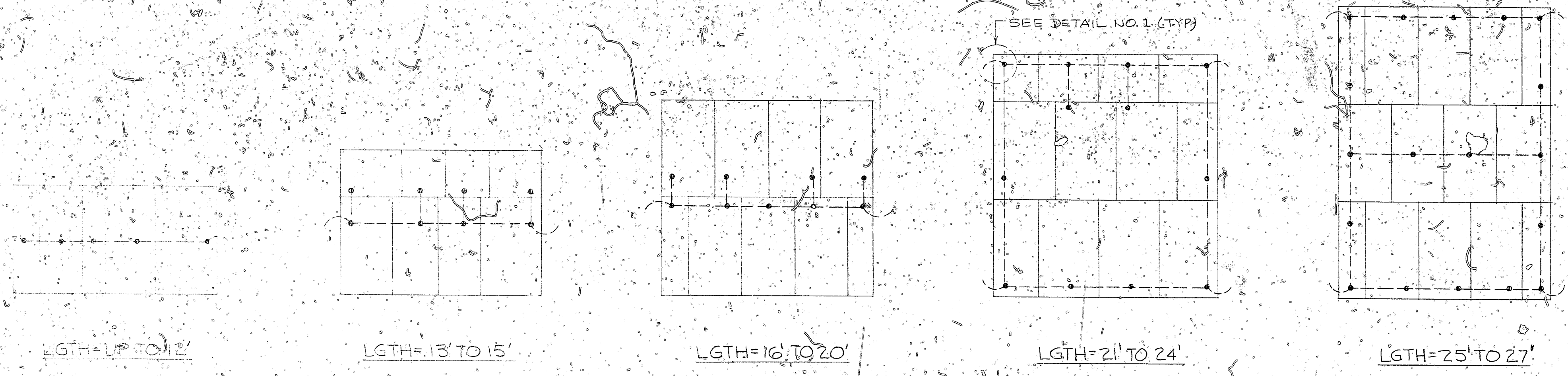


EARTH COVERED STEEL ARCH MAGAZINES - VENT. DETAILS

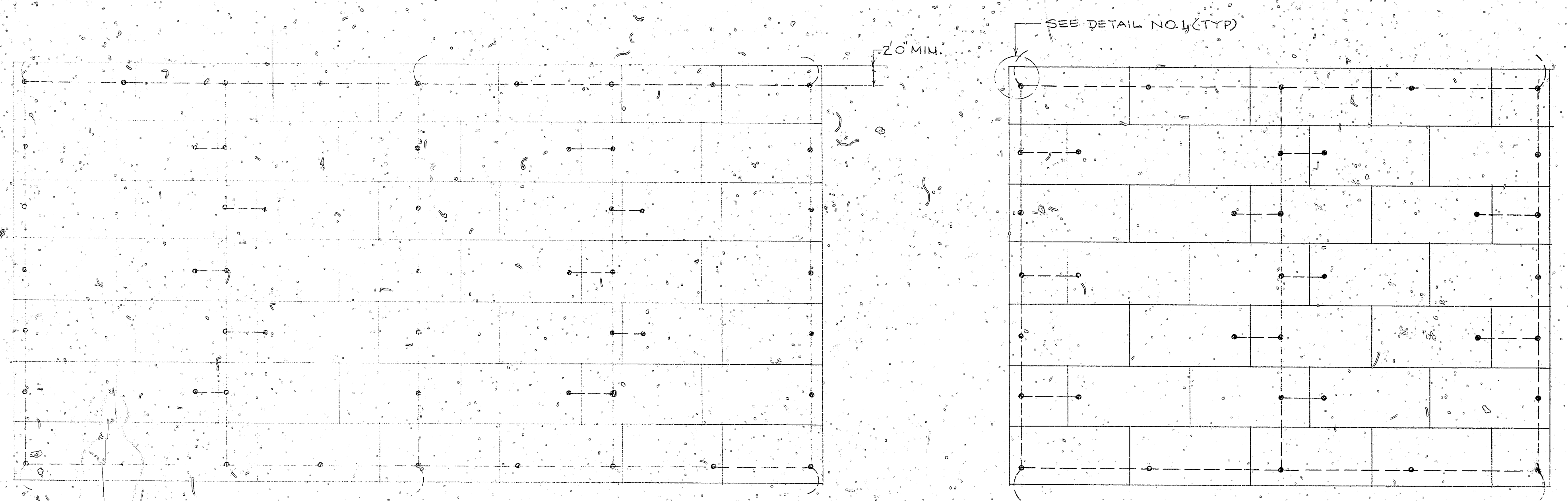
ON 105 FILM

61-37-546

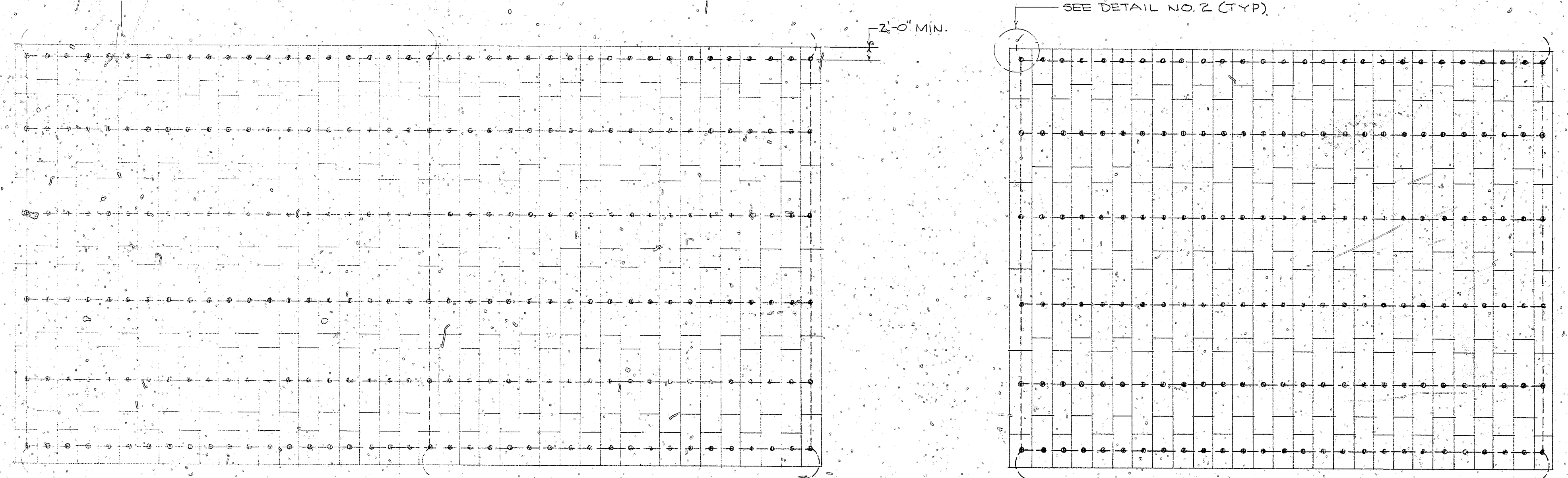




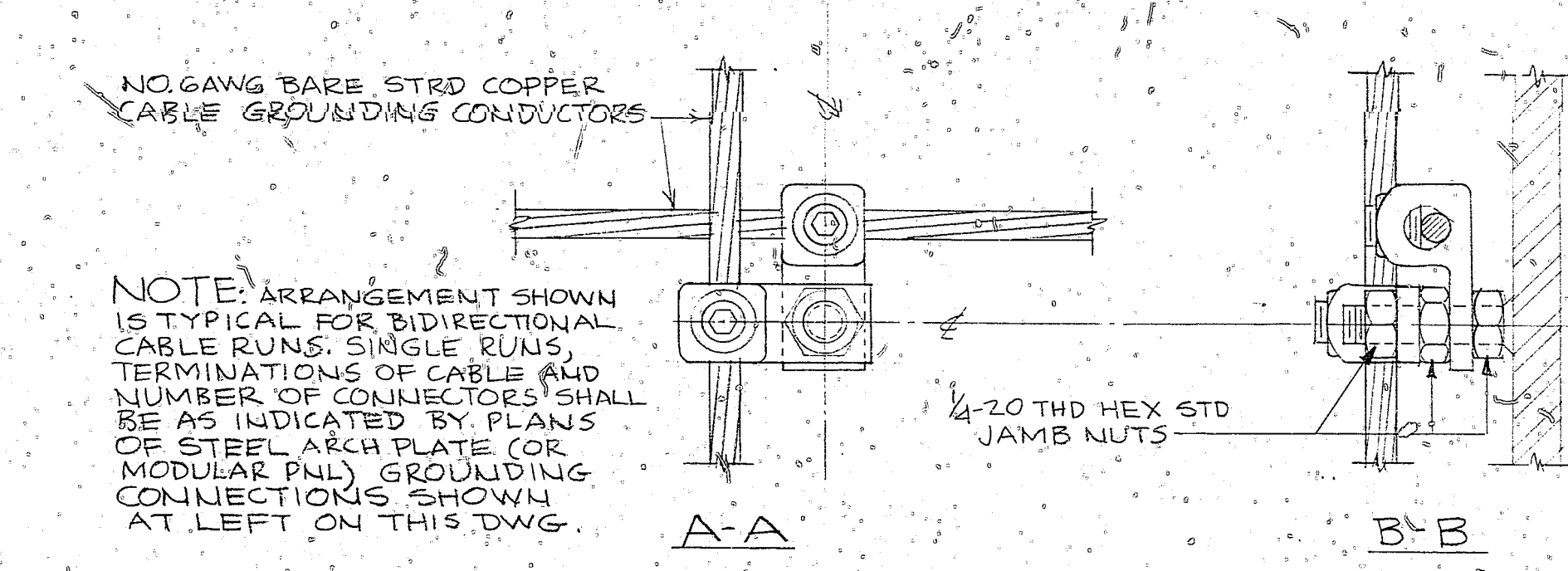
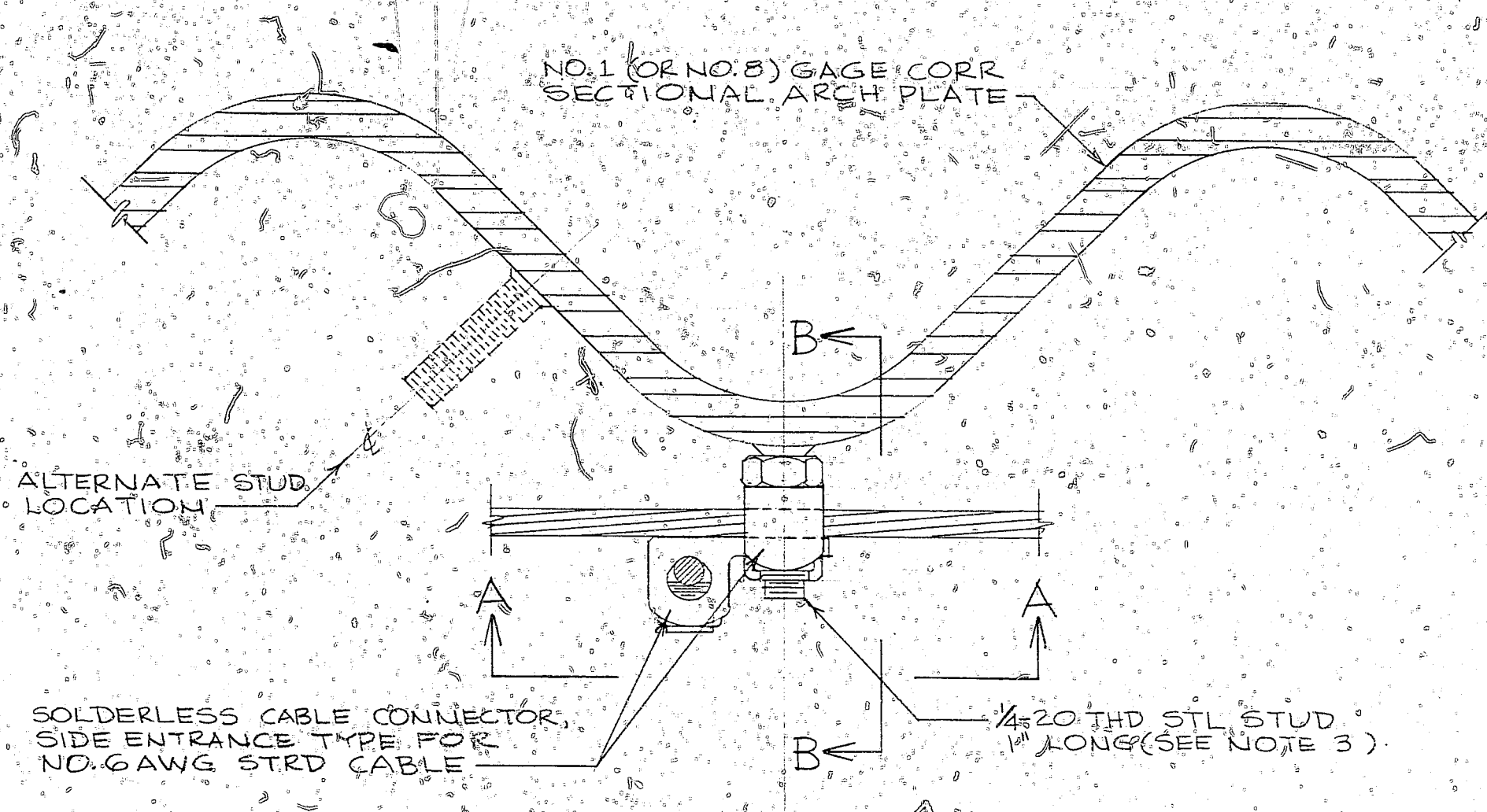
PLANS FOR STEEL ARCH GROUNDING CONNECTIONS  
SMALL MAGAZINES (NO. 8 GAGE CORR SECTIONAL PLATE ARCH) WIDTHS = 8'-0", 10'-0", 12'-0" & 14'-0" SCALE: 1/8" = 1'-0"



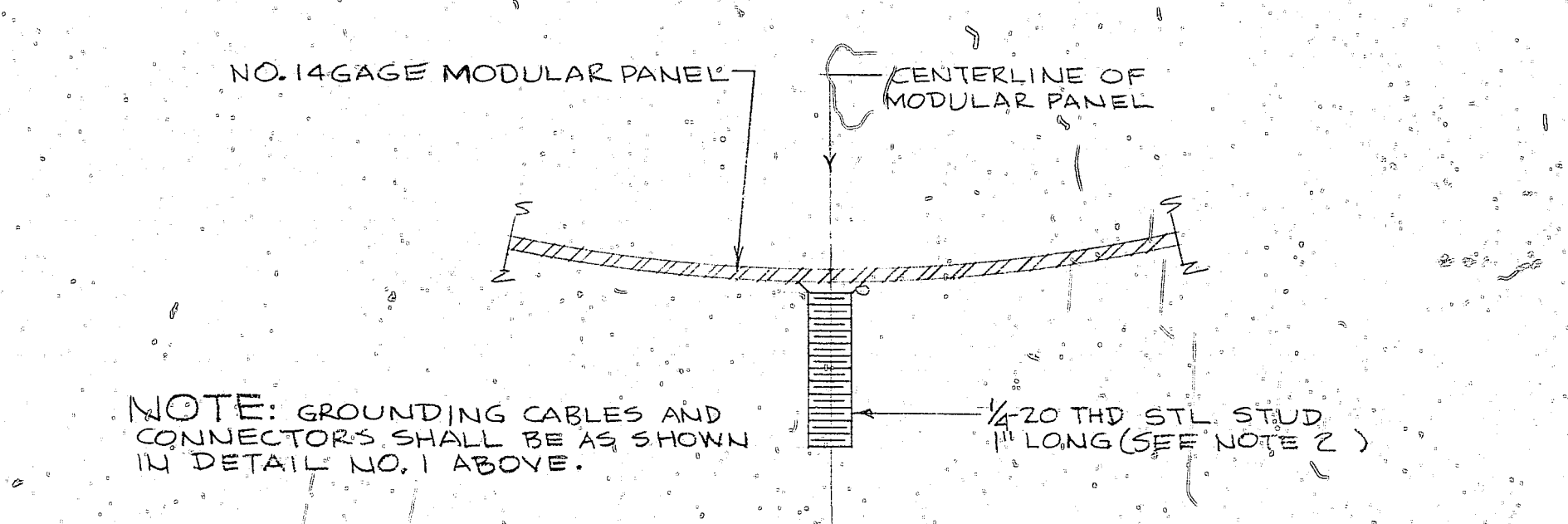
PLANS FOR STEEL ARCH GROUNDING CONNECTIONS  
LARGE MAGAZINES (NO. 14 GAGE CORR SECTIONAL PLATE ARCH) WIDTH = 26'-0" SCALE: 1/8" = 1'-0"



PLANS FOR STEEL ARCH GROUNDING CONNECTIONS  
LARGE MAGAZINES (NO. 14 GAGE DBL CURVE MODULAR ARCH PANEL OPTIONAL DESIGN) WIDTH = 26'-0" SCALE: 1/8" = 1'-0"



DETAIL NO. 1  
WELDED STUD GND CONNECTION  
SCALE: FULL



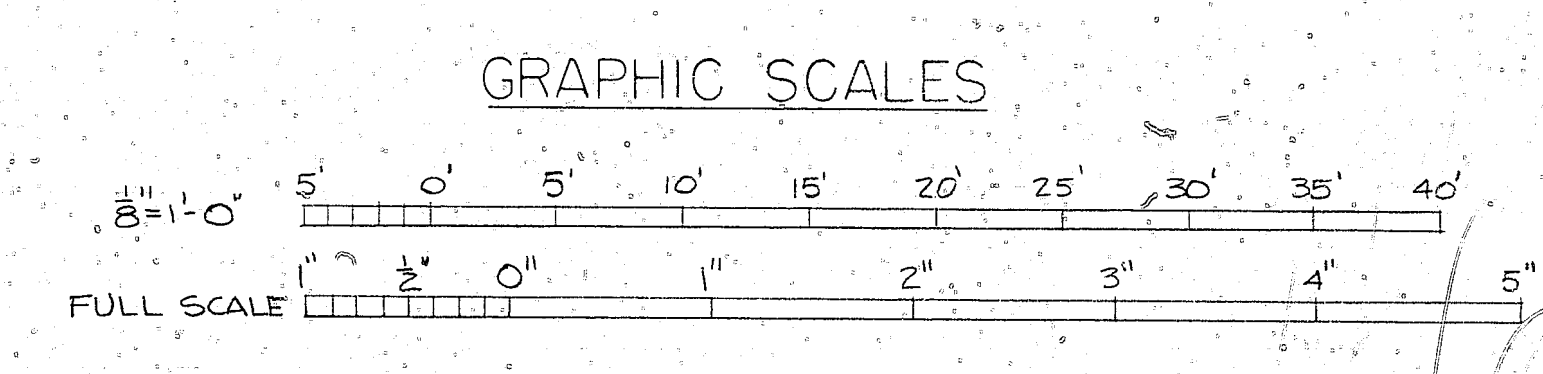
DETAIL NO. 2  
WELDED STUD GND CONNECTION  
SCALE: FULL

REVISIONS			
NO.	DESCRIPTION	DATE	APPROVED
1	REVISE UP		SW

- SYMBOLS**
- WELDED STUD CONNECTION ON STEEL ARCH
  - GROUNDING CONDUCTOR - NO. 6 AWG BARE STRD COPPER
  - GND INTERCONNECTION AS SHOWN ON STANDARD PLANS - SEE NOTE 2.

- NOTES**
1. REQUIREMENT: DUE TO SEALING OF JOINTS AND DAMP-PROOFING REQUIRED BY NAVFAC STANDARD SPECIFICATIONS (S-MIG AND S-M17) INDIVIDUAL STEEL ARCH PLATES (OR MODULAR PANELS) ARE EFFECTIVELY ELECTRICALLY ISOLATED FROM EACH OTHER AND FROM THE EARTH. THE GROUNDING CONNECTIONS SHOWN ON THIS DRAWING SHALL BE APPLIED TO MEET THE ELECTRICAL BONDING REQUIREMENTS OF THE STANDARD SPECIFICATIONS.

2. CONNECTIONS: THE GROUNDING CONNECTIONS SHOWN SHALL BE INSTALLED ON THE INTERIOR SURFACE OF THE STEEL ARCH. FOR DETAILS OF INTERCONNECTION BETWEEN STEEL ARCH AND GROUNDING SYSTEM SEE STANDARD DRAWINGS NAVFAC NO. 155495361355400.
3. WELDED STUDS: WELDED STUDS SHALL BE OF THE SIZE AND TYPE SHOWN AND SHALL BE INSTALLED BY THE SHIELDED ELECTRIC ARC OR CAPACITOR-DISCHARGE STUD WELDING PROCESS AS APPROPRIATE FOR MATERIAL THICKNESS, BY MEANS OF MANUAL PORTABLE STUD WELDING EQUIPMENT DESIGNED FOR THE PURPOSE. STUDS SHALL BE LOCATED AS SHOWN ON THE PLANS, WITH A MINIMUM OF ONE STUD PER PLATE OR PANEL AND ADDITIONAL STUDS AS REQUIRED TO PROVIDE ADEQUATE SUPPORT OF THE GROUNDING CONDUCTORS. WHERE THE WELDING PROCESS DESTROYS THE GALVANIZING ON THE ARCH STEEL, THE EFFECTED AREAS SHALL BE RECOATED BY ZINC SPRAYING TO PROVIDE PROTECTION AGAINST CORROSION WHILE MAINTAINING ELECTRICAL CONDUCTIVITY.



DSGN: <i>[Signature]</i>	DEPARTMENT OF THE NAVY	WASHINGTON, D. C.
DR: <i>[Signature]</i>	NAVFACILITIES ENGINEERING COMMAND	
CHK: <i>[Signature]</i>	STANDARD	
PROJ: LOR	EARTH COVERED STEEL ARCH MAGAZINES	
BR. HD: <i>[Signature]</i>	STEEL ARCH GROUNDING	
SPEC. DES. HD:	ELECTRICAL	
DIRECTOR: <i>[Signature]</i>	DATE: 4/22/72	SIZE: F
APPROVED: <i>[Signature]</i>	DATE: 4-28-72	CODE IDENT NO.: 80091
FOR COMMANDER, NAVFAC	SCALE: AS NOTED	NAVFAC DRAWING NO.: 1355461
		CONSER. CONTR. NO.:
		SHEET 1 OF 1

1355461  
 EARTH COVERED STEEL ARCH MAGAZINES  
 STEEL ARCH GROUNDING CONNECTION  
 4/28/72  
 NUMBER 3344