CONTRACTOR'S SUBMITTAL TRANSMITTAL

LANTDIV NORFOLK 4-4355/2 (Rev. 11-80)

ROUTING ORDER INT

CONTRACT NO.	TRANSMITTAL NO.	DATE
81-C-1766	~~30~~ 26A	1 AUG 83

FROM CONTRACTOR: Trader Construction Company

TO: Lockwood Greene/Six Associates

PROJECT TITLE AND LOCATION: Public Works 7 Helipad MCB Camp Lejeune, N.C.

30

CONTRACTOR USE ONLY

List only one specification division per form.

List only one of the following categories on each transmittal form, and indicate which is being submitted

[X] Contractor Approved [ ] OICC Approval [ ] Deviation/Substitution For OICC Approval

REVIEWER USE ONLY

**ACTION CODES
A-Approved
D-Disapproved
AN-Approved as noted
RA-Receipt acknowledged.
C-Comments
R-Resubmit

RETURN TO 02

ITEM NO.	PROJ. SPEC. SECT. & PARA. and/or PROJ. DWG. NO. *	ITEM IDENTIFICATION (Type, size, model no., Mfg. name, dwg. or brochure number)	NO. OF COPIES	ACTION CODES **	REVIEWER'S INITIALS CODE AND DATE
160	16301 1.3.3.1	Metal Frames & Covers, Dewey Bros.	7		
	16301 1.3.1	Precast Manhole	7		

CONTRACTOR'S COMMENTS

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC: ROICC, Camp Lejeune, N.C.

CONTRACTOR REPRESENTATIVE (Signature): Allen Mayo

DATE RECEIVED BY REVIEWER	FROM (Reviewer)	TO
	Six Associates, Inc.	Trader Construction Co.

[X] Submittals are returned with action indicated. Approval of an item does not include approval of any deviation from the contract requirements unless the contractor calls attention to and supports the deviation.

[ ] Submittals are forwarded to LANTDIV with A-E recommendations indicated in REVIEWER USE ONLY Section and in comments below on **ONE COPY** of the transmittal form.

REVIEWER'S COMMENTS

Concrete for precast work must have minimum 28-day compressive strength of 4,000 psi as shown in Section 16301, Item 3.1.11.2(*).

copy - fwd 9-6-83

29 AUG 1983 RECEIVED

COPIES TO: ROICC (2) LANTDIV (1) A-E (1)	DATE	SIGNATURE

GEORGE K. COFFIN AND ASSOCIATES

CONSULTING ENGINEERS

REV. 9 MAR 82

JOB 8'-0"X6'-0"X(6'-0",6'-6",7'-0"&8'-0")HIGH VAULTS BY GKC DATE 22 JAN 82 SHEET NO. 1 OF 6

UTILITY VAULT DESIGN for

PRECAST CONCRETE PRODUCTS CO.

Durham, N.C.

"It is hereby certified that the (equipment) (material) shown and marked in this submittal is that proposed to be incorporated into Contract Number N62472-81-C-1766, is in compliance with the Contract drawings and specifications, can be installed in the allocated spaces, and is submitted Government approval.

Certified by _____

Date 1 Aug 83 "

LOADS:

1. LIVE LOAD: HS20-44(MS18), 16,000# WHEEL LOAD
2. LIVE LOAD IMPACT FACTOR: 1.3
3. SOIL COVER: 1'-0" MINIMUM, 2'-0" MAXIMUM
4. SOIL DENSITY: 120 PCF DRY, 70 PCF SUBMERGED
5. EQUIVALENT FLUID PRESSURE COEFFICIENT OF SOIL: 0.50
6. WATER TABLE: AT TOP OF VAULT
7. SURCHARGE ON SIDE WALLS: 2'-0" OF SOIL

MATERIALS:

1. CONCRETE: 28-DAY COMPRESSIVE STRENGTH 5500 PSI @ 6'-0" HIGH VAULT,
   4000 PSI @ 6'-6" HIGH VAULT,
   3500 PSI @ 7'-0" HIGH VAULT,
   3500 PSI @ 8'-0" HIGH VAULT

THIS IS MINIMUM AS SHOWN IN SECTION 16301, 3.1.11.2 (a.) HDM 8/16/83

   MAXIMUM WATER/CEMENT RATIO BY WEIGHT 0.48
2. REINFORCING: ASTM A615, GRADE 60

DESIGN STANDARDS:

1. ACI BUILDING CODE FOR REINFORCED CONCRETE (ACI 318-77)
2. AASHTO SPECIFICATIONS FOR HIGHWAY BRIDGES, 1977

ULTIMATE LOAD FACTORS:

1. LIVE LOAD: 1.7
2. LATERAL SOIL PRESSURE: 1.7
3. DEAD LOAD: 1.4
4. FLUID PRESSURE: 1.4

REV. 9 MAR 82

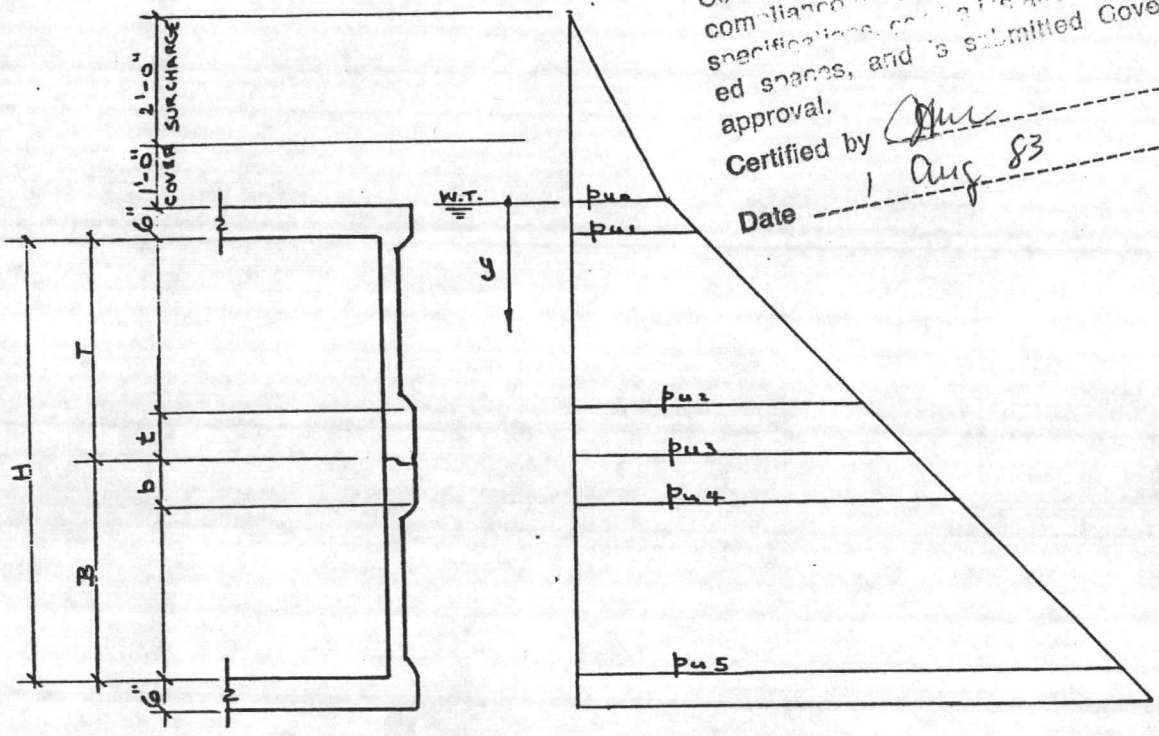
JOB 8'-0"X6'-0"X(6'-0",6'-6",7'-0"&8'-0")HIGH VAULTS BY GKC DATE 22 JAN 82 SHEET NO. 2 OF 6

"It is hereby certified that the (equipment) (material) shown and marked in this submittal is that proposed to be incorporated into Contract Number N62472-81-C-1766 is in compliance with the Contract drawings and specifications, covering installed in the allocated spaces, and is submitted Government approval.

Certified by _____

Date 1 Aug 83

ULTIMATE SIDE WALL PRESSURES



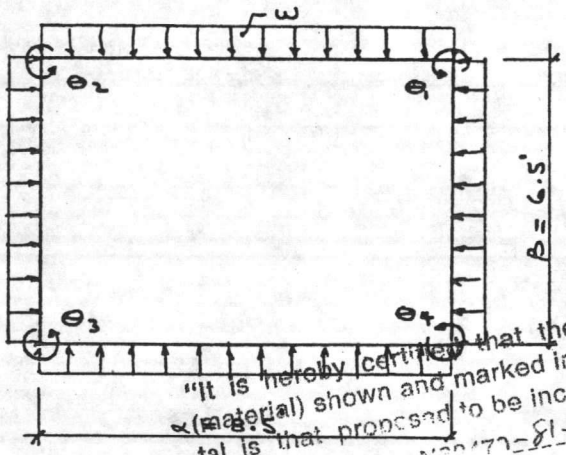
$p_{u0} = 1.7 \times 0.50 \times 120 \times 3' = 306$ PSF

$p_{uy} = p_{u0} + (1.7 \times 0.5 \times 70 + 1.4 \times 63)y = 306 + 148y$ (PSF, y IN FEET)

H	T	t	B	b	p_{u1}	p_{u2}	p_{u3}	p_{u4}	p_{u5}
6'-0"	3'-0"	0'-6"	3'-0"	0'-6"	380	750	824	898	1268
6'-6"	3'-3"	0'-9"	3'-3"	0'-9"	380	750	824	972	1342
7'-0"	3'-6"	1'-0"	3'-6"	1'-0"	380	750	898	1046	1416
8'-0"	4'-0"	1'-6"	4'-0"	1'-6"	380	750	972	1194	1564

HORIZONTAL EDGE BEAM AT TOP & BOTTOM JOINT

$$\begin{bmatrix} k_{11} & k_{12} & 0 & k_{14} \\ k_{21} & k_{22} & k_{23} & 0 \\ 0 & k_{32} & k_{33} & k_{34} \\ k_{41} & 0 & k_{42} & k_{44} \end{bmatrix} \cdot \begin{bmatrix} \theta_1 \\ \theta_2 \\ \theta_3 \\ \theta_4 \end{bmatrix} = \begin{bmatrix} \bar{M}_1 \\ \bar{M}_2 \\ \bar{M}_3 \\ \bar{M}_4 \end{bmatrix}$$



k_{ij} = MOMENT @ JOINT i DUE TO UNIT ROTATION AT JOINT j

θ_i = ROTATION AT JOINT i

$\bar{M}_i$ = SUM OF FIXED-END MOMENTS AT JOINT i, + ↻

"It is hereby certified that the (equipment) (material) shown and marked in this submittal is that proposed to be incorporated in Contract Number [illegible]-81-C-1766 and is in compliance with the Contract drawings and specifications, and is submitted Government approval.

Certified by _____

Date 1 Aug 83

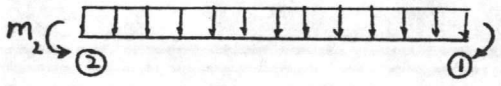
$k_{11} = k_{22} = k_{33} = k_{44} = 4EI\left(\frac{1}{\alpha} + \frac{1}{\beta}\right)$; $k_{12} = k_{21} = k_{34} = k_{43} = 2EI\left(\frac{1}{\alpha}\right)$

$k_{14} = k_{41} = k_{23} = k_{32} = -2EI\left(\frac{1}{\beta}\right)$; $\bar{M}_1 = \bar{M}_3 = \frac{w}{12}(\alpha^2 - \beta^2)$

$\theta_2 = -\theta_1$; $\theta_3 = \theta_1$; $\theta_4 = -\theta_1$ BY INSPECTION

$k_{11}\theta_1 + k_{12}\theta_2 + k_{14}\theta_4 = \bar{M}_1$

$$4EI\left(\frac{1}{\alpha} + \frac{1}{\beta}\right)\theta_1 + 2EI\left(\frac{1}{\alpha}\right)\theta_1 + 2EI\left(\frac{1}{\beta}\right)\theta_1 = \frac{w}{12}(\alpha^2 - \beta^2) \rightarrow \theta_1 = \frac{w(\alpha^2 - \beta^2)}{72EI\left(\frac{1}{\alpha} + \frac{1}{\beta}\right)}$$

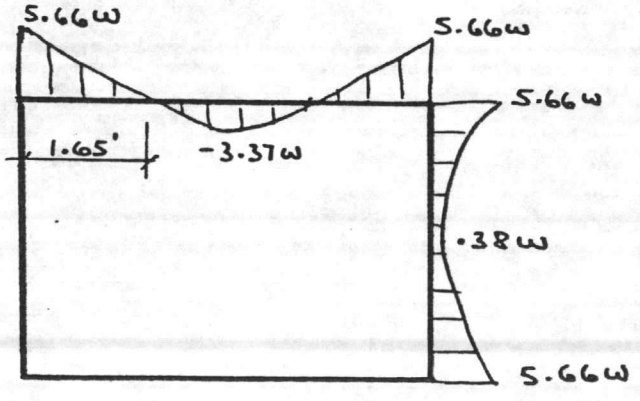


$$M_1 = M_2 = \frac{w}{12}\alpha^2 - \frac{4EI}{\alpha}\theta_1 - \frac{2EI}{\alpha}\theta_2$$

$$M_1 = M_3 = \frac{w\alpha^2}{12} - \frac{w(\alpha^2 - \beta^2)}{36\left(\frac{1}{\alpha} + \frac{1}{\beta}\right)\alpha}$$

$\alpha = 8.5'$, $\beta = 6.5'$

$M_1 = M_2 = 5.66w$; w #/FT ; M #-FT

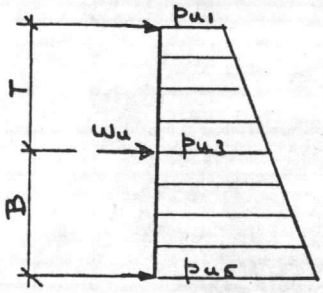


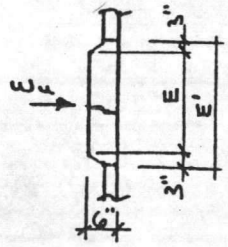
MOMENTS

REV. 9 MAR 82

JOB 8'-0"X6'-0"X(6'-0",6'-6",7'-0"&8'-0")HIGH VAULTS BY GKC DATE 22 JAN 82 SHEET NO. 4 OF 6

HORIZONTAL EDGE BEAM (CONT'D)





E' = BEAM WIDTH @ CORNERS = E + 6".

E = BEAM WIDTH @ ℄ SPAN = b + t

d = EFFECTIVE DEPTH OF BEAM
= 6" − 1.5" − 0.25" = 4.25"

$$Wu = Pu1\,(B+T)/2 + \tfrac{1}{2}(Pu3-Pu1)(T)(\tfrac{2}{3}) + \tfrac{1}{2}(Pu3-Pu1)B + \tfrac{1}{2}(Pu5-Pu3)B(\tfrac{1}{3})$$

$$Vu = Wu\,(8.0' - d/12)/2 = 3.82\,Wu$$

$$\nu u = Vu / (.85\,E'd) \le 2\sqrt{fc'}$$

$$Mu^{+} = 5.66\,Wu \text{ (@ CORNERS)}; \quad Mu^{-} = 3.37\,Wu \text{ (@ ℄ OF SPAN)}$$

H	E	Wu #/FT	M_u^+ #-FT	A_s^+ in²	A_s^+ USE	M_u^- #-FT	A_s^- in²	A_s^- USE	ν_u PSI	$2\sqrt{fc'}$
6'-0"	12"	2472	13,992	.82	6#4	8,331	.46	4#4	145	< 148 OK
6'-6"	18"	2758	15,611	.91	6#4	9,295	.52	4#4	122	< 126 OK
7'-0"	24"	3143	17,789	1.04	6#4	10,592	.59	4#4	111	< 118 OK
8'-0"	36"	3880	22,006	1.25	8#4	13,103	.72	6#4	98	< 118 OK

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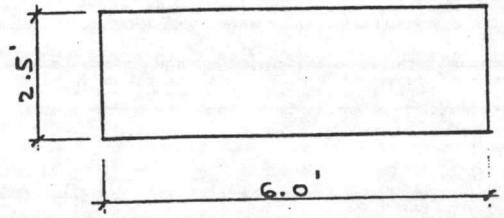
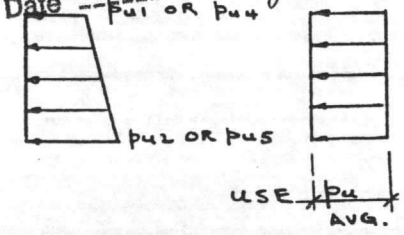
Certified by _____"

Date 1 Aug 83

K.O. PANELS AT END (6'-0") WALLS





USE p_u AVG. = ½(p_{u1} + p_{u2}) @ TOP ; ½(p_{u4} + p_{u5}) @ BOTTOM

USE MOMENT COEF. FROM TABLE III PCA "RECTANGULAR TANKS", 1969

RATIO OF PANEL DIMENSIONS = 6.0/2.5 = 2.4 SAY 2.5

$M_u = .112\ p_u (2.5)^2 = .7\ p_u$, d = 1.5"

H	TOP K.O. PANELS				BOTTOM K.O. PANELS			
	p_u AVG. PSF	M_u #-FT/FT	As #"/FT	USE	p_u AVG. PSF	M_u #-FT/FT	As #"/FT	USE
6'-0"	565	396	.06	6x6 W4xW4	1083	758	.12	2-6x6 W4xW4
6'-6"	565	396	.06	6x6 W4xW4	1157	810	.13	2-6x6 W4xW4
7'-0"	565	396	.06	6x6 W4xW4	1231	862	.14	2-6x6 W4xW4
8'-0"	565	396	.06	6x6 W4xW4	1379	965	.16	2-6x6 W4xW4

K.O. PANELS AT SIDE (8'-0") WALLS

RATIO OF PANEL DIMENSIONS = 3.5/2.5 = 1.4 SAY 1.5 → COEF. = .078

@ H = 8'-0" p_u AVG = ½(1194+1564) = 1379 → M_u = .078x1379 $(2.5)^2$ = 672 #-FT/FT

As = .11 USE 6x6-W4xW4 FOR ALL CASES TOP & BOTTOM

"It is hereby certified that the equipment (material) shown and marked in this submittal is REV. 4 APR 82 REV. 10 APR 82 REV. 9 MAR 82 not exceed to be incorporated into Contract #73-81-C-1766. is in compliance with the drawings and specifications, and is submitted in the allocated spaces, and is submitted Government approval.

Certified by _____

Date 1 Aug 83 "

8'-0"X6'-0"X(6'-0",6'-6",7'-0"&8'-0")HIGH VAULTS BY GKC DATE 22 JAN 82 SHEET NO. 6 OF 6

BOTTOM SLAB

p_u = 863 PSF = 1.7 x 2 x 16000 / 9'x7' = ~~ULTIMATE~~ LL 2 WHEELS

+ 336 = 1.4 x 120 x 2' = SOIL COVER

+ 610 = 1.4(150)(7'x9'x9' - 6'x8'x8')/9'x7' = CONC. WT. @ H=8'

− 75 = 1.4 x (6/12)150 DEDUCT SLAB WT.

+ 794 = 1.4 x 9' x 63 = DUE TO WATER TABLE @ H=8'

p_u = 2528 PSF USE MOMENT COEF. FROM TABLE III PCA "RECTANGULAR TANKS", 1969

SLAB DIMENSION RATIO = 8.5/6.5 = 1.31

$M_u = 2528 \times .070 \times (6.5)^2 = 7477$ #-FT/FT, d = 4.5" → A_s = .40 #"/FT
USE 16 #4 SHORT

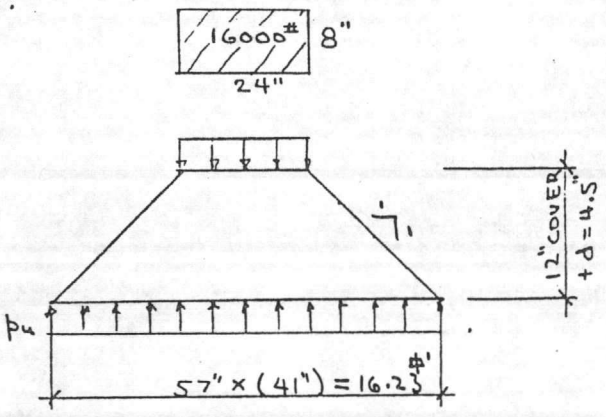
$M_u = 2528 \times .050 \times (6.5)^2 = 5340$ #-FT/FT, d = 4.0" → A_s = .32 #"/FT
USE 10 #4 LONG

$V_u = (1/64)/(1/64+1/84)\,2528\,(6'-2\times4.5/2)/2 = .76 \times 6636 = 5043$ #/FT

$v_u = 5043/.85\times12\times4.5 = 110$ PSI < $2\sqrt{3500} = 118$ OK

TOP SLAB

ASSUME WHEEL LOAD DISTRIBUTED THUS:



p_u = 1.3 x 1.7 x 16000/16.23 = 2179 PSF LL

+ 1.4 x (120 SOIL + 75 SLAB) = 273 DL

p_u = 2451 PSF

$M_u = 2451 \times .070 (6.5)^2 = 7249$ #-FT/FT
d = 4.5"
A_s = .39 #"/FT USE 16#4 SHORT

$M_u = 2451 \times .050 (6.5)^2 = 5178$ #-FT/FT
d = 4"
A_s = .31 #"/FT USE 10#4 LONG

V_u OK - SEE BOTTOM SLAB

CHECK FLOTATION

VAULT WEIGHT	=	27,450#	= 150(7'x9'x9' − 6'x8'x8')
MINIMUM SOIL COVER	=	9,720#	= 120 (1'x9'x9')
DEAD LOAD DOWN	=	37,170 #	
FLOTATION FORCE UP	=	35,721 #	= 63x7'x9'x9' (W.T. AT TOP OF VAULT)
NET FORCE DOWN	=	1,449#	(NEGLECTING ANY SIDE WALL FRICTION)

∴ VAULT WILL NOT FLOAT

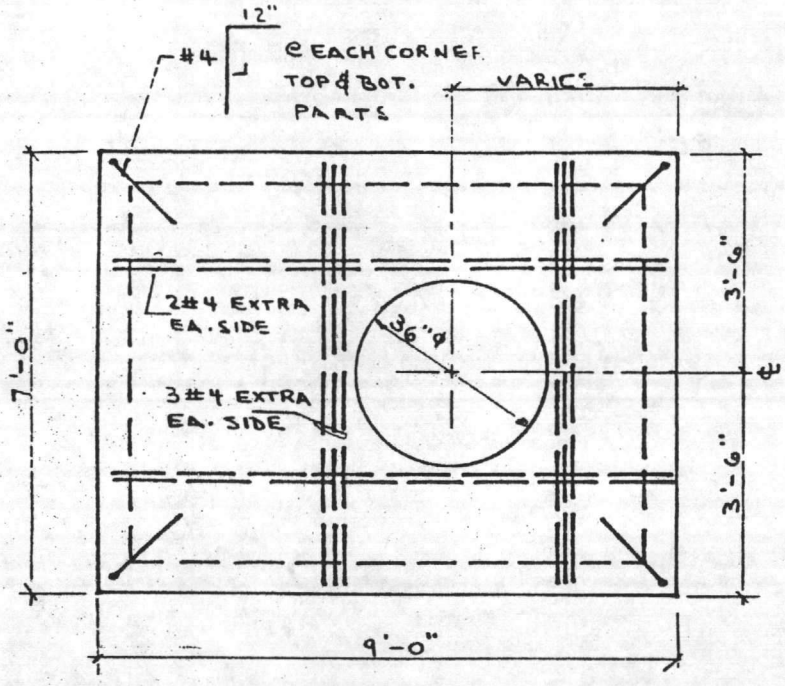
GEORGE R. COTTIN AND ASSOCIATES
CONSULTING ENGINEERS

"It is hereby certified that the (equipment) (material) shown and marked in this submittal is that proposed to be incorporated into [illegible] 81-C-1266 is in compliance with the Contract drawings and specifications, can be installed in the allocated spaces, and is submitted Government approval.

Certified by _____

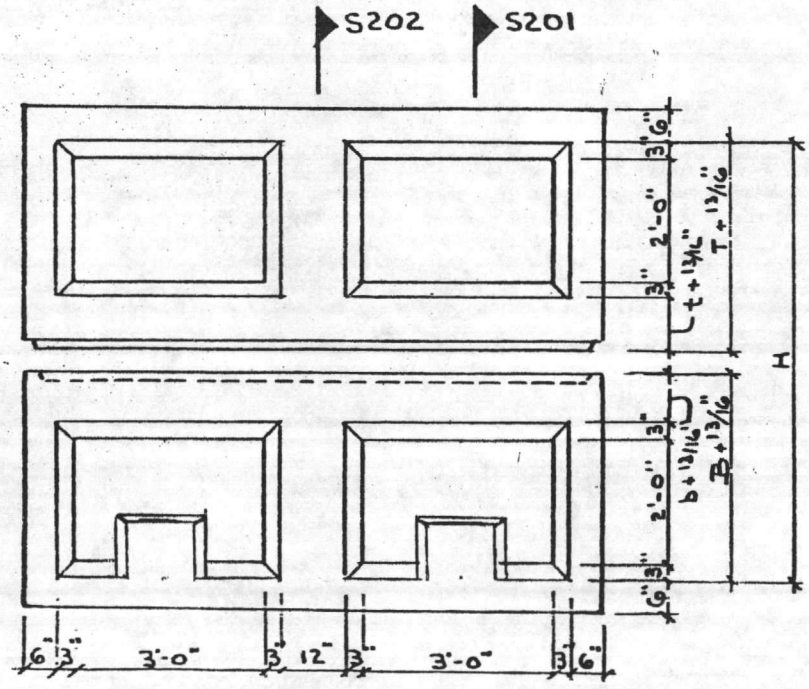
Date 1 Aug 83 "

JOB 8'-0"X6'-0"X(6'-0",6'-6",7'-0"&8'-0")HIGH VAULTS BY GKG DATE 22 JAN 82 SHEET NO. S1 OF 3

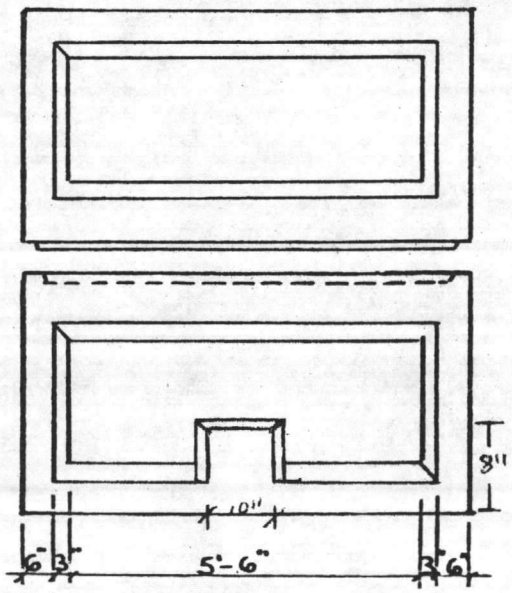


TOP PLAN

	TOP			BOTTOM		
H	T	t	L	B	b	L
6'-0"	3'-0"	0'-6"	3'-3"	3'-0"	0'-6"	3'-3"
6'-6"	3'-3"	0'-9"	3'-6"	3'-3"	0'-9"	3'-6"
7'-0"	3'-6"	1'-0"	3'-9"	3'-6"	1'-0"	3'-9"
8'-0"	4'-0"	1'-6"	4'-3"	4'-0"	1'-6"	4'-3"



SIDE ELEVATION



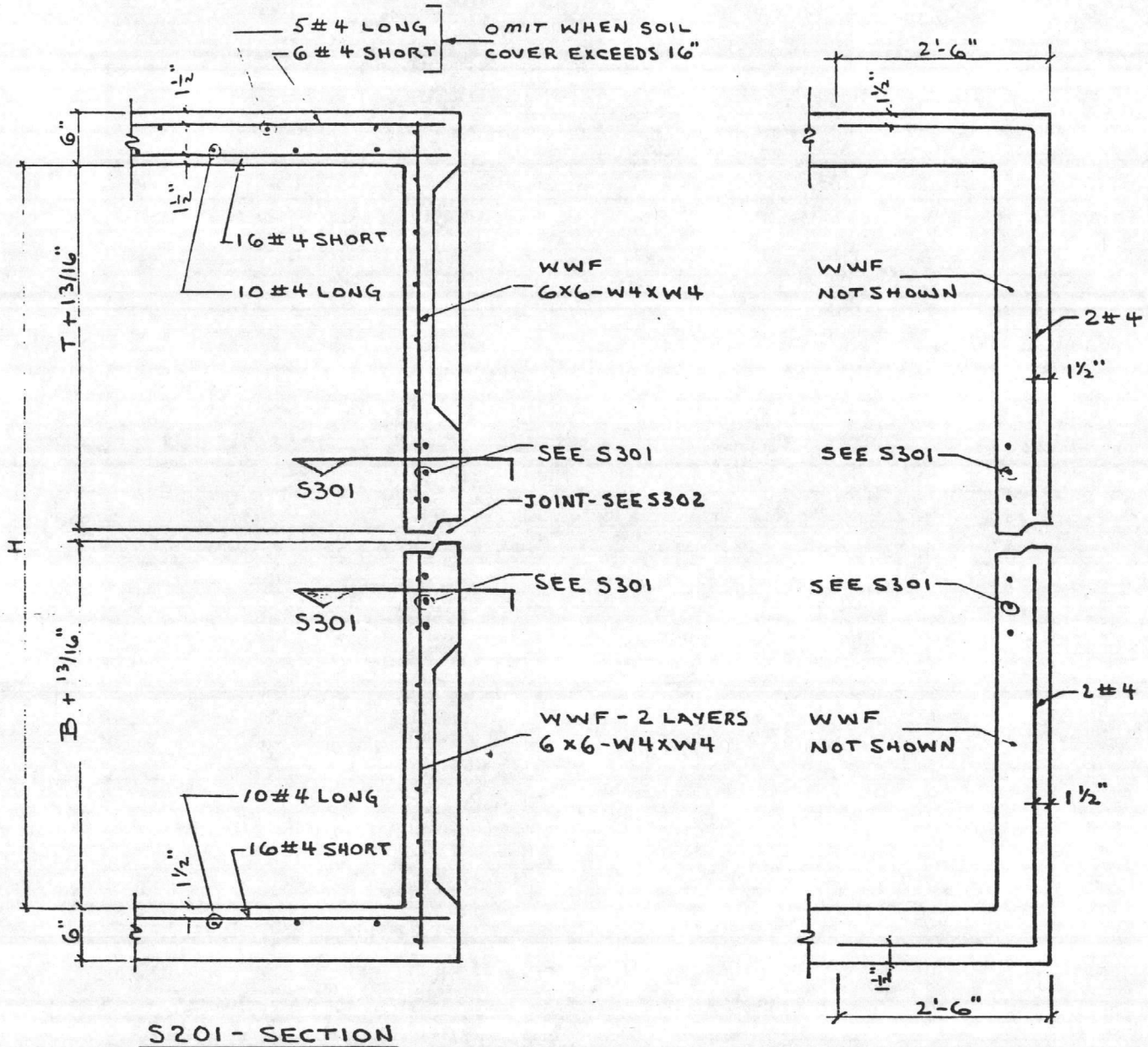
END ELEVATION

GEORGE K. COFFIN AND ASSOCIATES

CONSULTING ENGINEERS

REV. 9 MAR 82

JOB 8'-0"X6'-0"X(6'-0",6'-6",7'-0"&8'-0")HIGH VAULTS BY GKC DATE 22 JAN 82 SHEET NO S2 OF 3



S201 - SECTION

S202 - SECTION

"It is hereby certified that the (equipment) (material) shown and marked in this submittal is that proposed to be incorporated into Contract Number N62470-81-C-1766. is in compliance with the Contract drawings and specifications, can be installed in the allocated spaces, and is submitted Government approval.

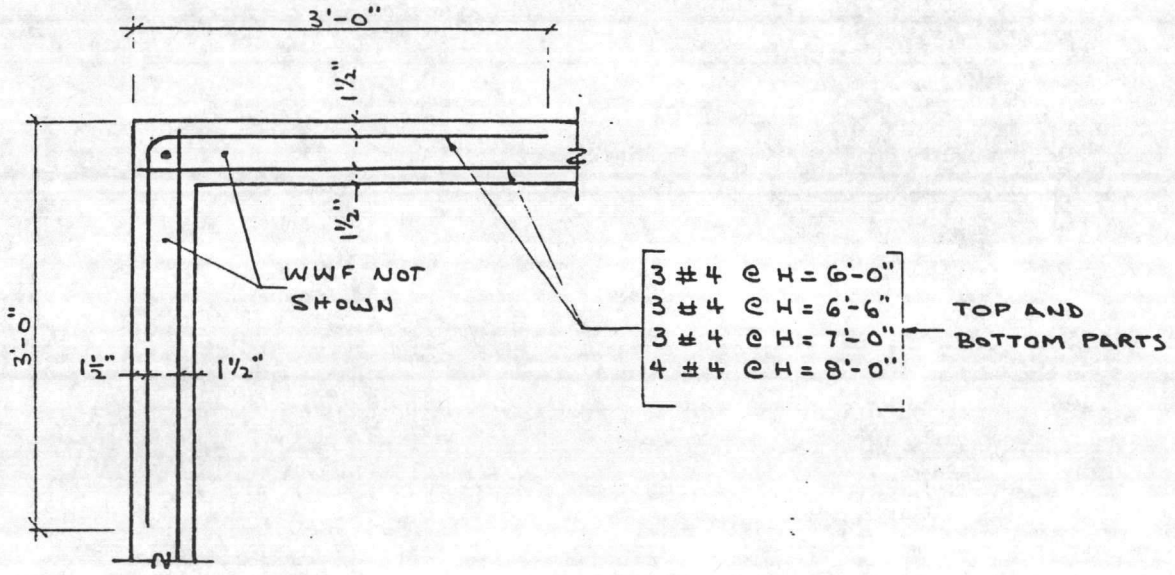
Certified by ---------- "

Date 1 Aug 83

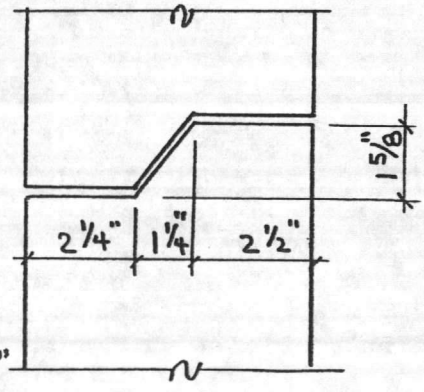
906 CCB BUILDING DURHAM, NORTH CAROLINA 27701 919-682-7040

REV. 9 MAR 82

JOB 8'-0"X6'-0"X(6'-0",6'-6",7'-0"&8'-0")HIGH VAULTS BY GKC DATE 22 JAN 82 SHEET NO S3 OF 3



S301 PLAN SECTION - HORIZONTAL EDGE BEAM REINFORCING

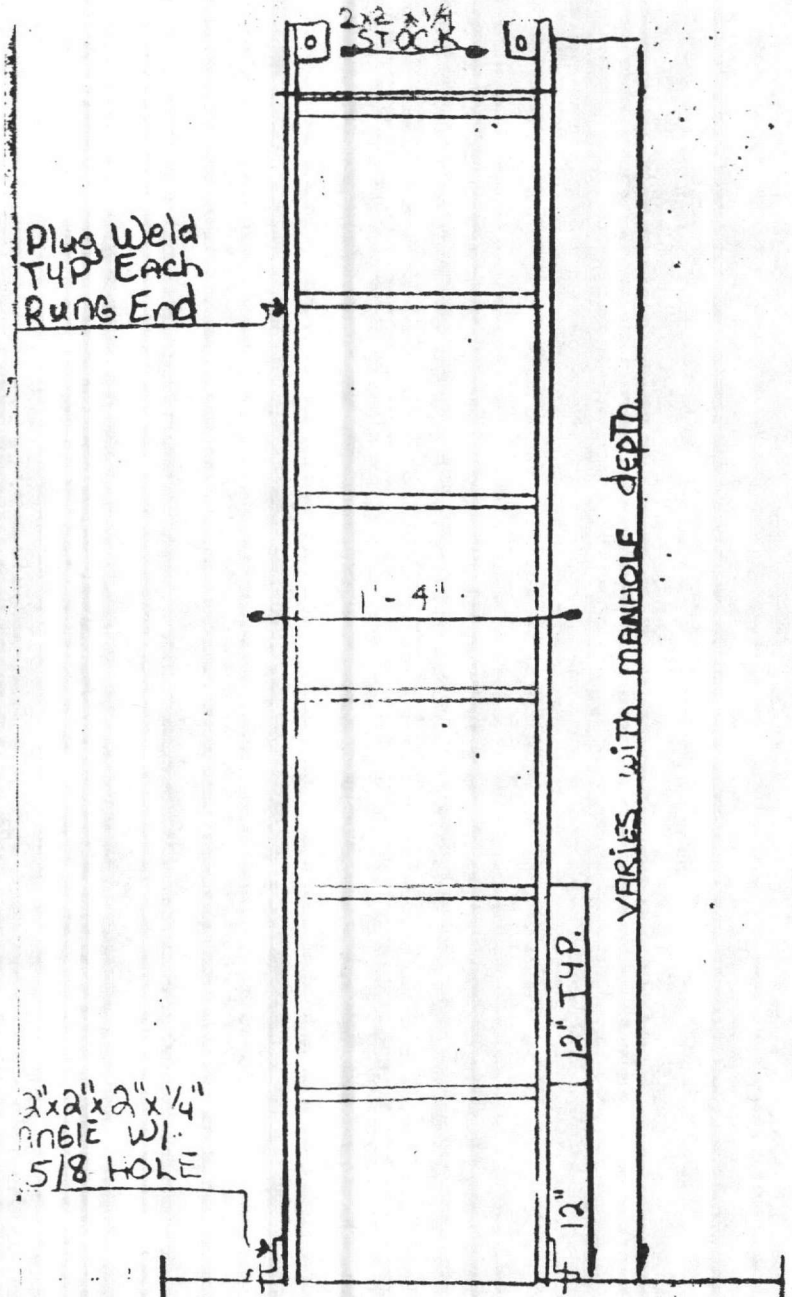


S302 SECTION - TYPICAL JOINT

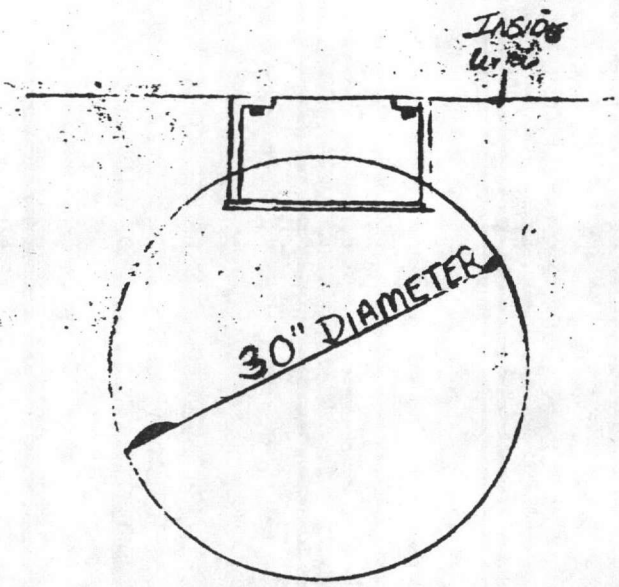
It is hereby certified that the (equipment) (material) shown and marked in this submittal is that proposed to be incorporated into Contract Number N62470-81-C-1766 is in compliance with the Contract drawings and specifications, can be installed in the allocated spaces, and is submitted Government approval.

Certified by _____

Date 1 Aug 83



ELEVATION



EM-1A
"-1B
"-2A
"-2B
"-3A

EM-3B
"-4A
"-4B
"-5A
"-5B

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Certified by _____

Date 1 Aug 83

GALVANIZED STEEL LADDER

PRECAST CONCRETE
PRODUCTS COMPANY

GEORGE K. COFFIN AND ASSOCIATES

CONSULTING ENGINEERS

JOB VAULT PULLING IRON BY GKE DATE 7JUL83 SHEET NO. 1 OF 2

FOR: PRECAST, INC., DURHAM, NORTH CAROLINA

"It is hereby certified that the (equipment) (material) shown and marked in this submittal is that proposed to be incorporated into Contract Number N62472-81-C-1764 is in compliance with the Contract drawings and specifications, can be installed in the allocated spaces, and is submitted Government approval.

Certified by _____

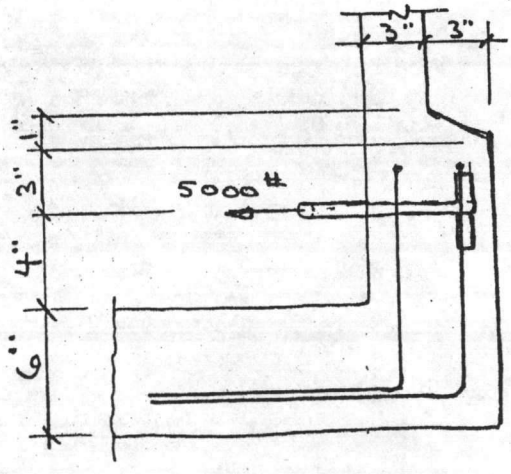
Date 1 Aug 83

TYPICAL PULLING IRON CALCULATIONS

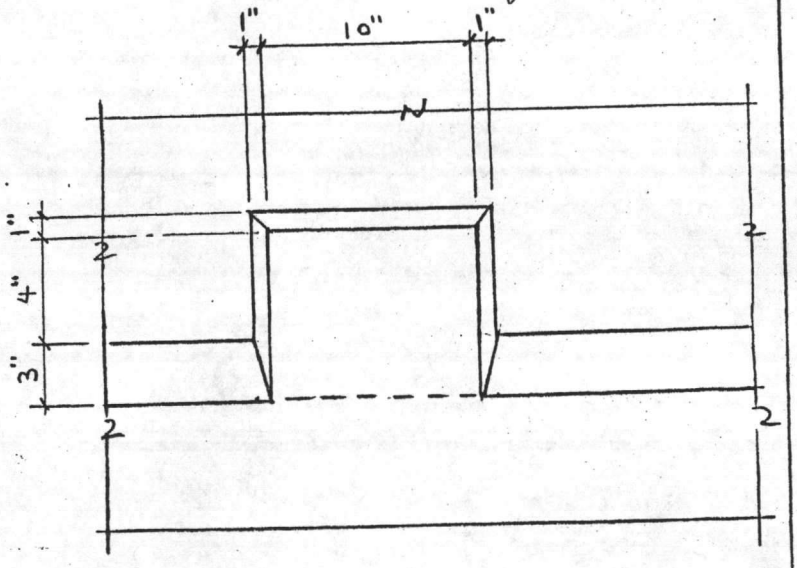
PULLING FORCE = 5000 #

$f_c' \geq 3500$ PSI

$f_y = 60000$ PSI



SECTION



EXTERIOR ELEVATION

$M_u = 1.7 \times 5 \times 4/12 = 2.83$ K-FT

$b = 10"$, $d = 4" \rightarrow A_s = 0.16$ USE 2#3

$V_u = 1.7 \times 5000 / .85 \times 10 \times 4 = 250$ PSI $> 2\sqrt{f_c'}$

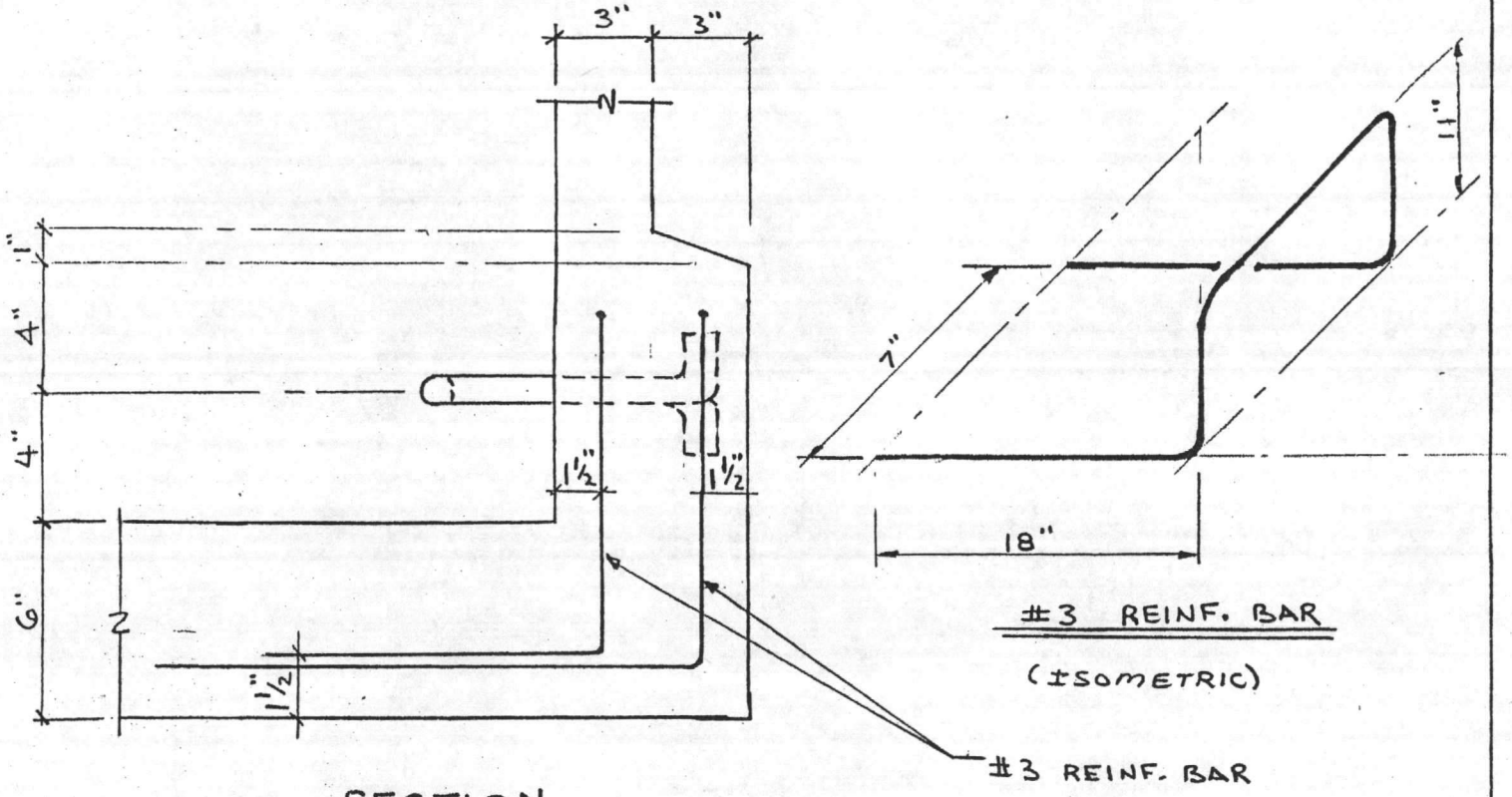
USE SHEAR FRICTION

$A_{sv} = 1.7 \times 5000 / .85 \times 60000 = 0.17$ USE 2#3

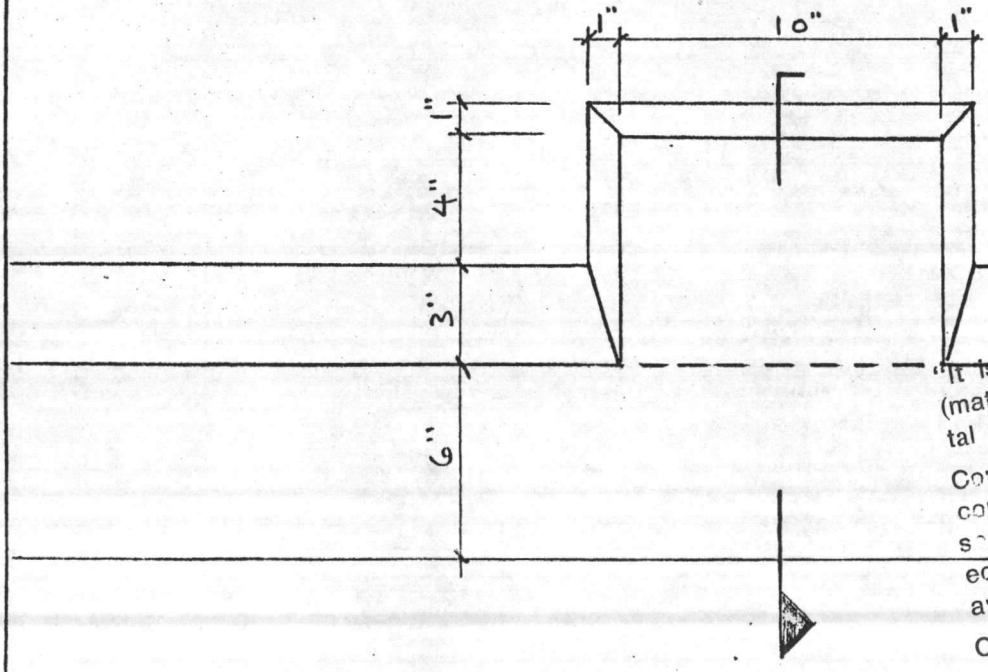
NORTH CAROLINA PROFESSIONAL SEAL 4396 ENGINEER GEORGE K. COFFIN

8/7/83

JOB VAULT PULLING IRON BY GKC DATE 7JUL83 SHEET NO. 2 OF 2



SECTION



EXTERIOR ELEVATION

"It is hereby certified that the (equipment) (material) shown and marked in this submittal is that proposed to be incorporated into Contract Number N62472-81-C-1766 in compliance with the Contract drawings and specifications, can be installed in the allocated spaces, and is submitted Government approval.

Certified by _____

Date 1 Aug 83"

CONCRETE SEALANTS

Any Size, Shape, Length, or Material to meet specified requirements.

Butyl Resin CONSEAL CS-102 & CS-202

APPLICATION AND SEALING PROPERTIES

- Provides permanently flexible watertight joints.
- Low to high temperature workability:
  - ☐ CS-102 . . . . 30 °F to 130 °F
  - ☐ CS-202 . . . . 10 °F to 130 °F
- Rugged service temperature resistance of −30 °F to +200 °F.
- Excellent chemical and mechanical adhesion to clean and dry surfaces.
- Greater cohesive and adhesive strengths.
- Sealed joints will not shrink, harden or oxidize upon aging.
- Available in numerous standard sizes:
  - ☐ Specific area cross sections designed for specific joint requirements.
  - ☐ Lengths from 36-inch strips to 21-foot rolls.
  - ☐ Custom cut lengths at minimum costs.
  - ☐ Lower sealing costs resulting from use of proper sizes.
- Controlled flow resistance for application ease.
- No priming normally necessary. However, on vertical and overhead horizontal joints, when temperature is below 40 °F, or installation is in a wet hole, a good primer on joint before installation is recommended.
- Meets Federal Specification SS-S-00210 (210-A) and AASHTO M-198.

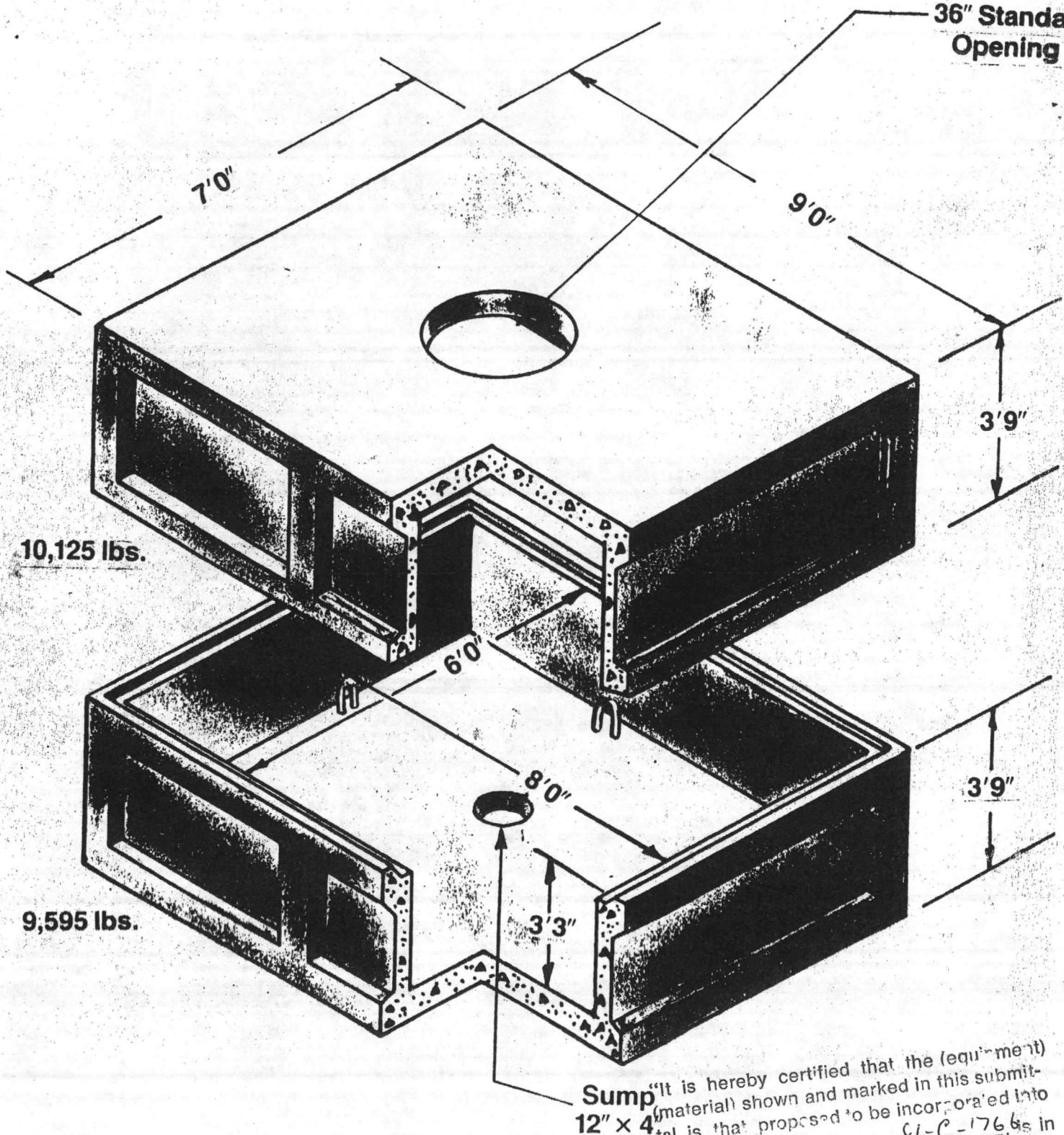
"It is hereby certified that [illegible] (material) shown and marked in this submittal is that proposed to be incorporated into Contract Number N62470-81-C-1766 is in compliance with the Contract drawings and specifications, can be installed in the allocated spaces, and is submitted Government approval.

Certified by ---------- Date 1 Aug 83

For self-sealing joints in:

CONCRETE MANHOLES • CONCRETE PIPES • VAULTS
UTILITY BOXES • SEWER CONSTRUCTION • SEPTIC TANKS
BOX CULVERTS • VERTICAL PANEL STRUCTURES

PROVEN SEALANTS FOR THE PRECAST CONCRETE INDUS[illegible]



Model #8060

Inside Dimensions: 6′ × 8′
Depths (Interior) 6′, 6′6″, 7′8″
Knockouts: Long Wall: 3′0″ × 2′0″, four each side.
Short Wall: 5′6″ × 2″, two each side.
H-20 Bridgeload

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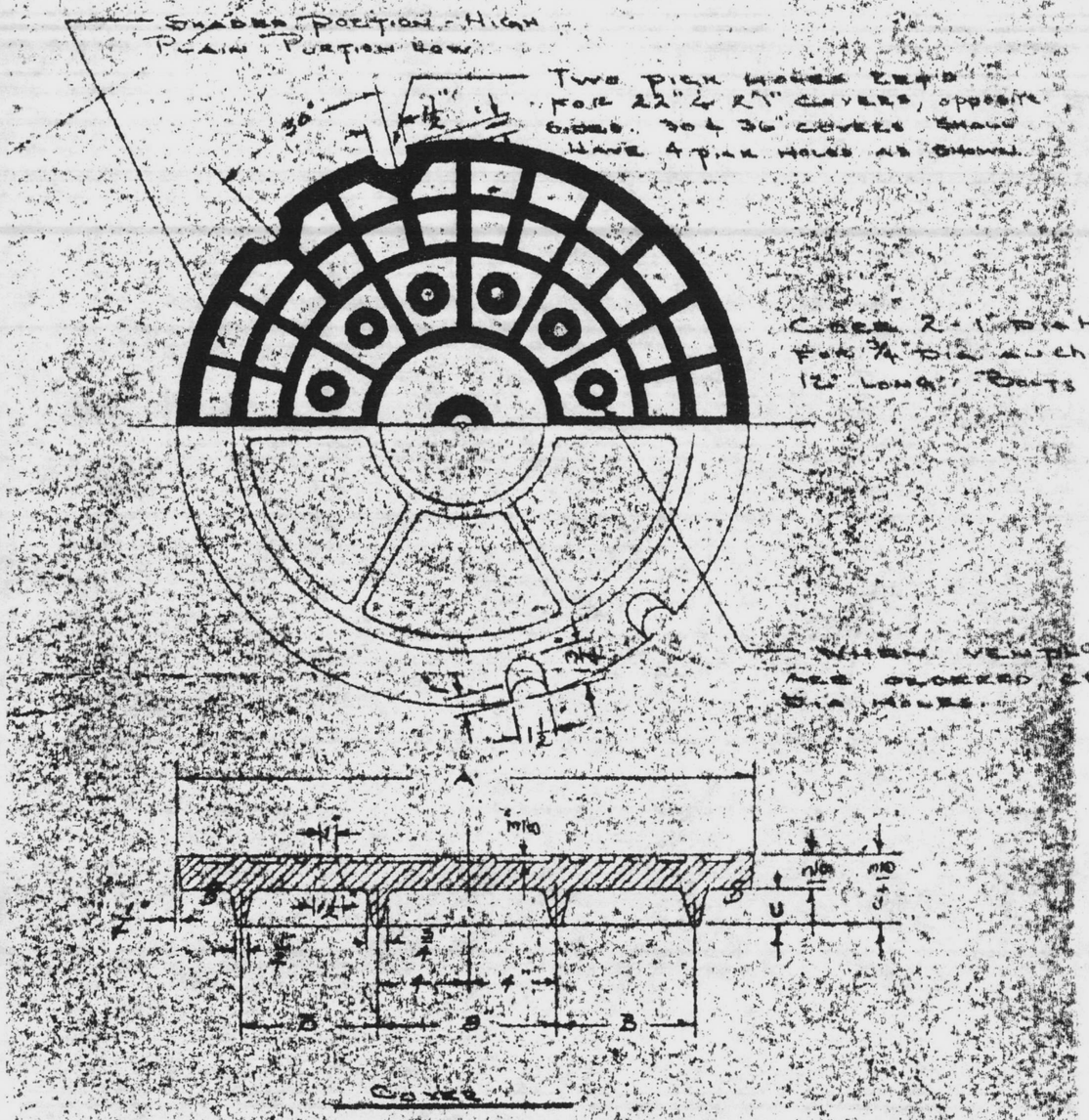
SHADED PORTION - HIGH
PLAIN PORTION - LOW

TWO PICK HOLES LOCATED FOR 22" & 27" COVERS, OPPOSITE SIDES. 30 & 36" COVERS SHALL HAVE 4 PICK HOLES AS SHOWN.

CORE 2 - 1" DIA HOLES FOR ¾" DIA ANCHOR BOLTS 12" LONG. BOLTS BY OTHERS

WHEN VENTILATED COVERS ARE SPECIFIED, CORE 12 - 1" DIA HOLES.



CODE	DESCRIPTION			
	A	B	C	D
MH-BCR-149	20½"	5⅛"	1⅝"	26"
MH-BCR-150	28½"	7⅜"	2"	31"
MH-BCR-151	31½"	9⅛"	2"	34"

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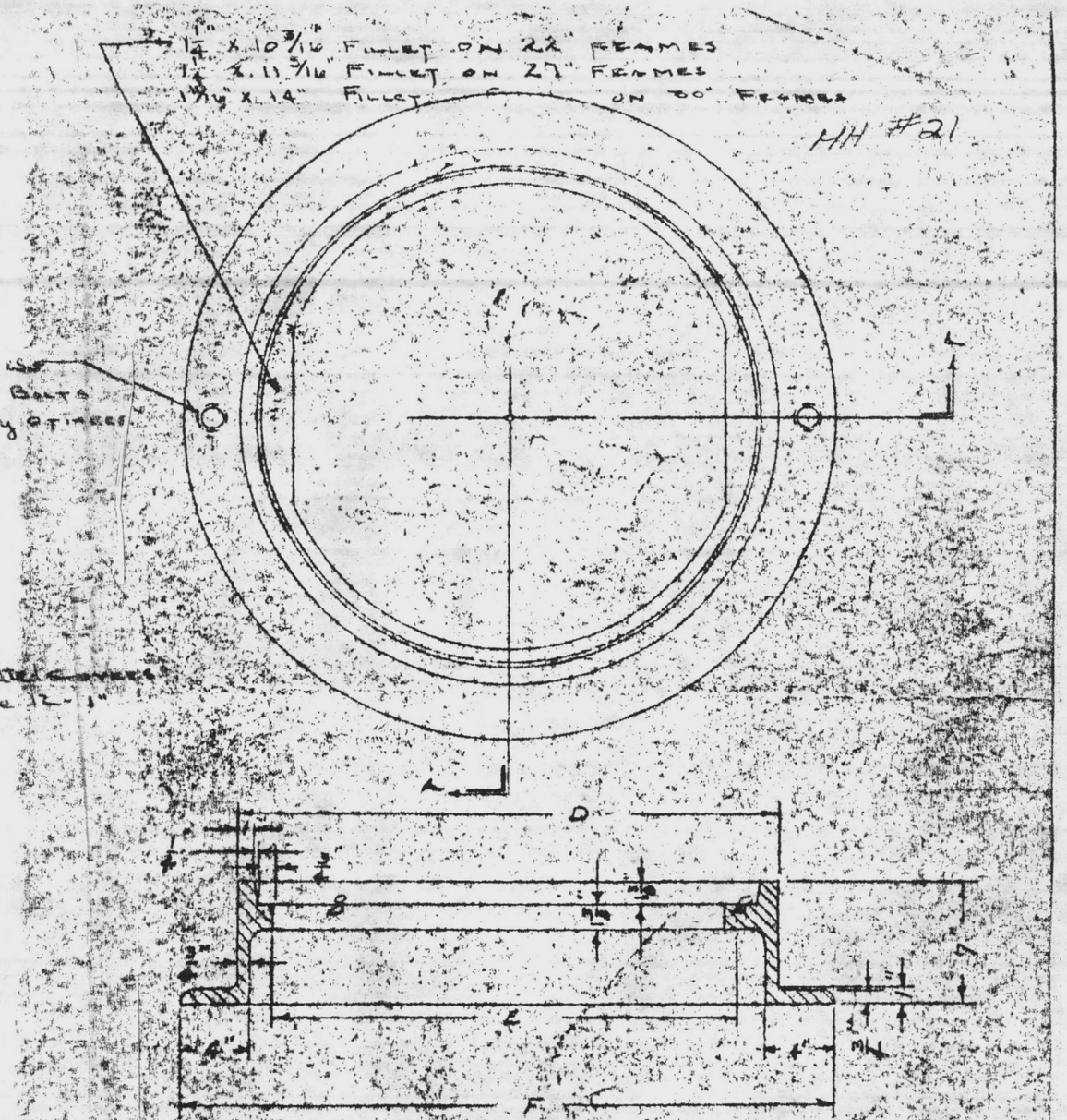
Certified by _____

Date 1 Aug 83 "

1" x 10 3/16" FILLET ON 22" FRAMES
1" x 11 3/16" FILLET ON 27" FRAMES
1 1/4" x 14" FILLET ON 30" FRAMES

MH #21



SCALE: 1 = 10 LBS	DRAWN BY: H	DEWEY BROS., INC. MUNICIPAL & CONSTRUCTION CASTINGS GOLDSBORO, N. C.	TOTAL WEIGHT	
CASTING CLASS: 20 TON & 35	APPROVED		DATA SHEET NO.	
MATERIAL: CAST IRON	DATE: 22 JUL 83	TITLE: MANHOLE RING & COVER	CODE NO.: MH-BCR-149, 150, 151	