National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, California 94035-1000

June 6, 2008

Reference: RFP No. NNA08253597R
Demolition of the 14 foot Wind Tunnel Test Chamber

Ammendment No. 1; N218, Demolition of 14 Foot Wind Tunnel, Phase 3 .

Remove and dispose of one large diameter vacuum sphere, one small diameter tank (blowdown muffler), and adjacent piping and valves, at the Arc Jet complex at Ames Research Center. The Arc Jet complex is located at Boyd Road and Mark Avenue. See the attached layout drawing dated June 6, 2008.

Related information can be found on the attached construction drawings 331-5903-M1, M3, M5, M6, M7, M9, M11,& M15. The structures/equipment are shown on the attached photos.

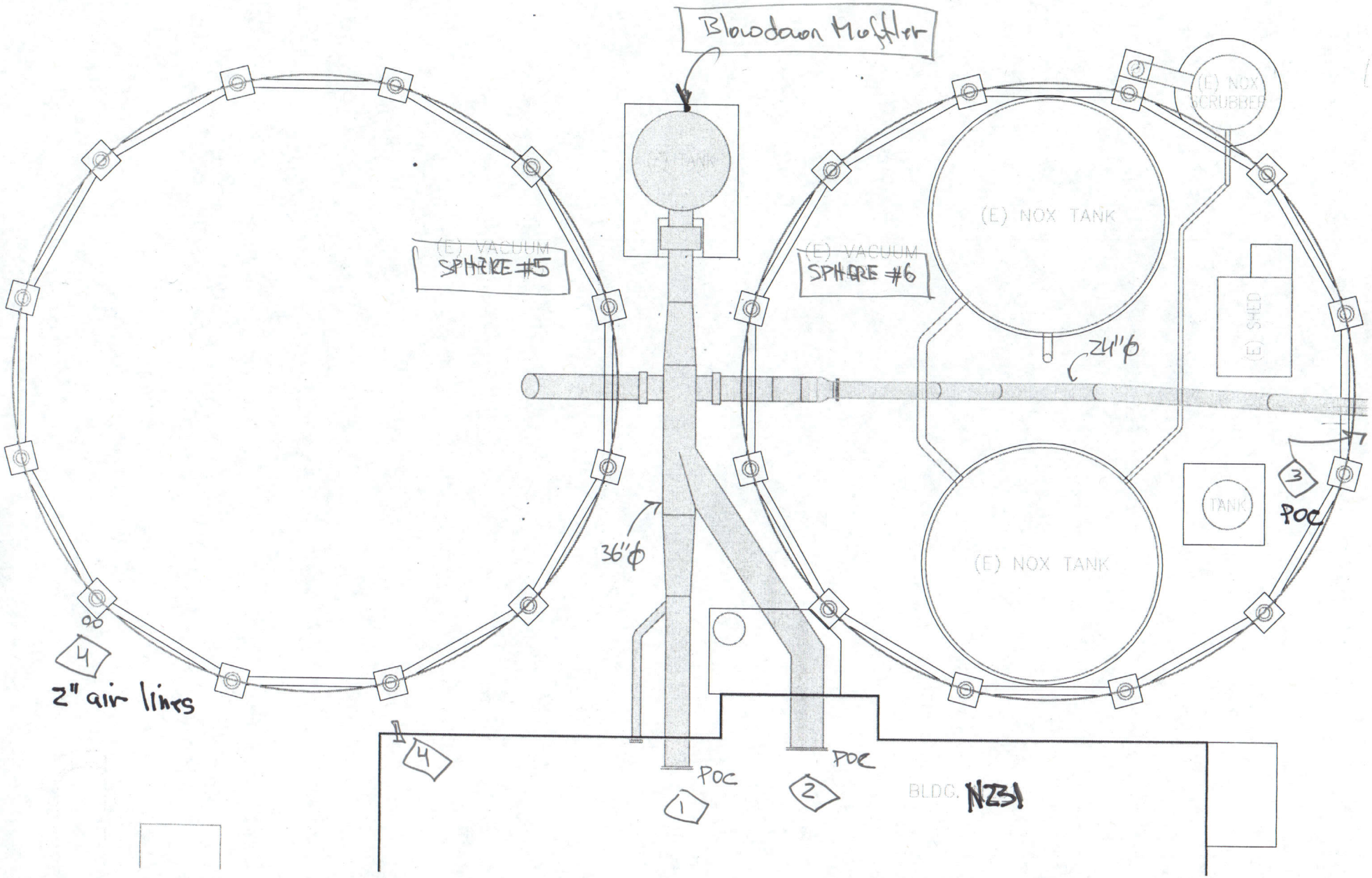
A: The vacuum sphere is identified as Sphere #5. It is a "Hortonsphere" built by Chicago Bridge & Iron Co. It's of carbon steel with a diameter of 75'-4 1/4"; shell thickness is 1- 5/16" thick; on concrete pier foundations. The exterior of the sphere is painted with lead based paint; all torched surfaces are to have paint removed as required by the Ames Standards referenced on proposal drawing 218-0700-D1. The interior of the shell surface is not painted.
B: The blowdown muffler is a 12' diameter by 12' high vertical tank; manufactured by Riley Maxim Silencer tank. All painted surfaces are assumed to contain lead based paint.
C: Remove all associated piping, valves, supports, to the concrete foundations. Point of disconnections (POCs) at building N231 are flanged joints. Support remaining piping on 6" wood cribbing; cover building openings with weatherproof siding. POC of 24"diameter is at elevated SVS plenum, at flanged joint. This line runs under Sphere #6. Install salvaged blind flange at POC to remaining vessel (see photo). Remove 4000# jib crane outside N231. All painted surfaces are assumed to contain lead based paint.
D: Disconnect and cap 2" diameter air lines (2) at sphere #5 and at building N231.

Field Measurements:
1: Measurements taken of the sphere indicate a shell thickness of 1.350" (middle of 3 measurements).
2: Measurements taken indicate vertical 15" diameter supports are 0.245" thick (middle of 3 measurements).
3: Measurements taken of the adjacent blowdown muffler, indicate a shell thickness of 0.375" (middle of 3).
4: Measurements of the connecting large diameter pipe to N231 indicate a 0.600" wall thickness.

The Contractor is to install signage and pedestrian barricades 20' from and around the sphere and at work areas while work is being performed to keep pedestrians away from the work. The Government will monitor air quality around the site to determine if additional safety measures will be required.

June 6, 2008

Ammendment No. 1; N218, Demolition of 14' GT; Phase 3.



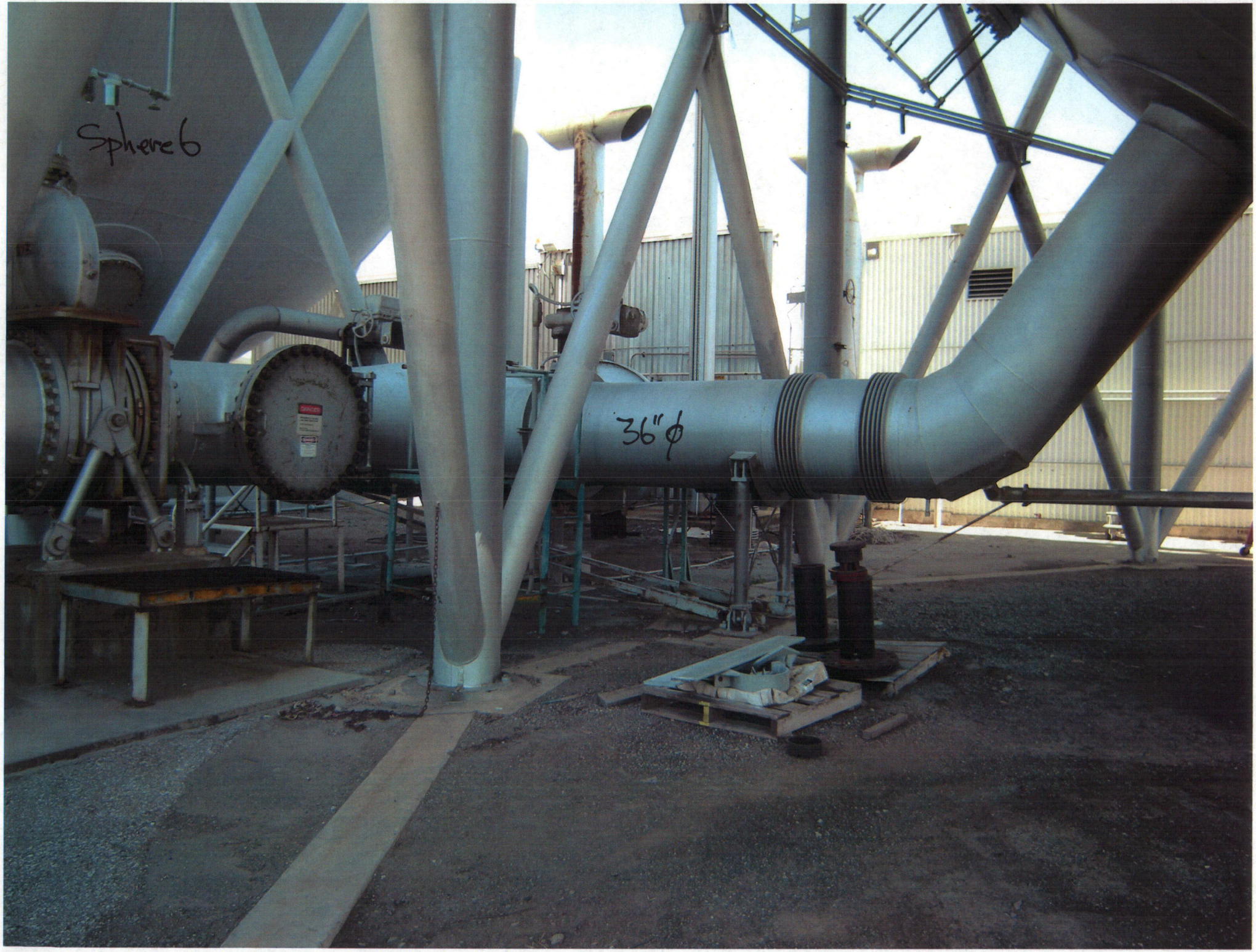
Arc Jet Spheres
Sphere5
Sphere6
N231

Sphere 5
Sphere 6

Sphere 5
CAUTION
Blowdown
Muffler.

Blowdown
Muffler
DANGER

DANGER
CAUSTIC
Blowdown
Muffler


Sphere 6
36" ϕ

Sphere 5

N231
36"ϕ

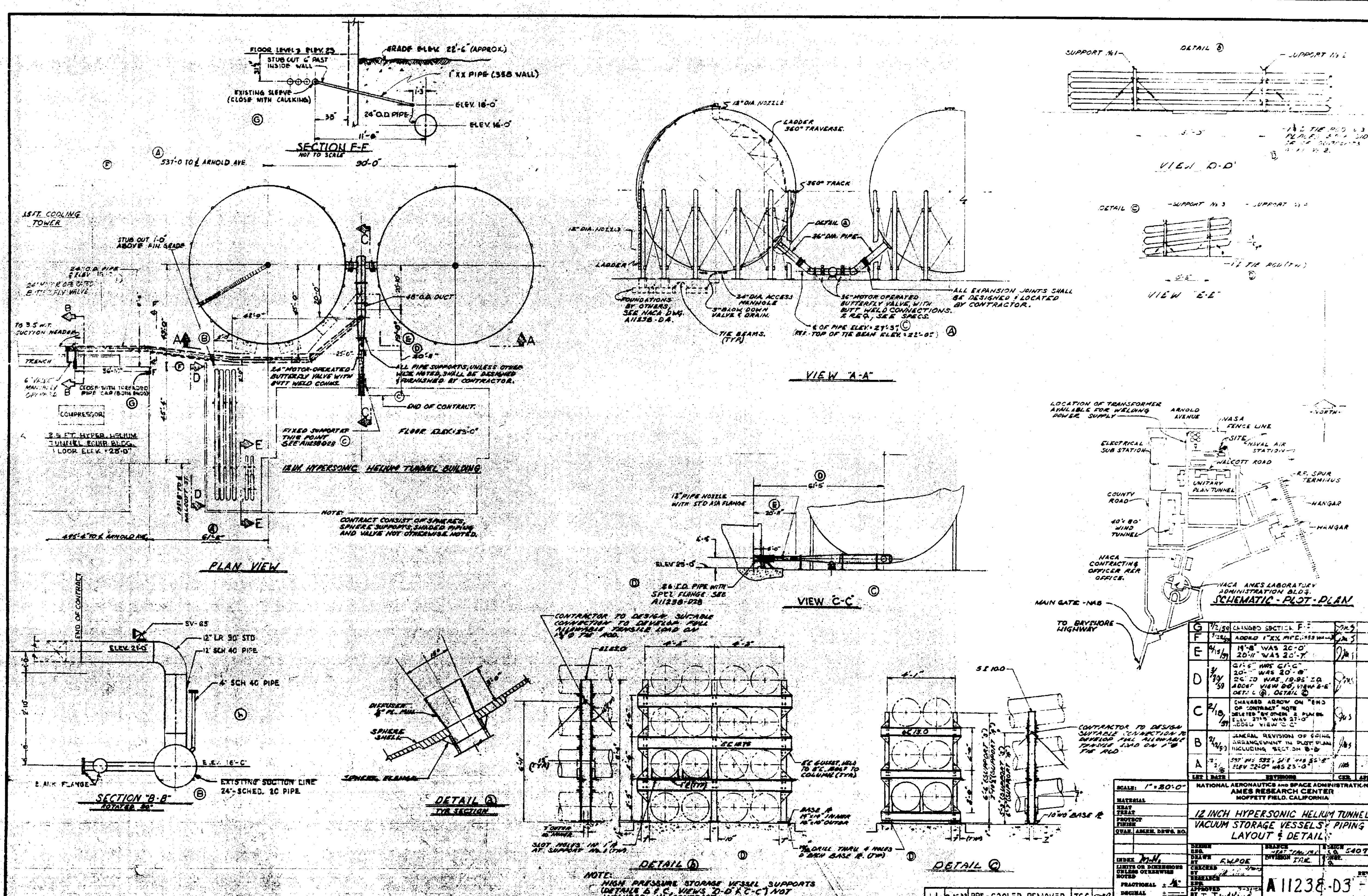
24" ϕ
POC (3)

SSI-5903 m-1

GENERAL PLAN & ELEVATION SPHERES

331-5903m-3

12" H.H.T. VACUUM STORAGE VESSELS & PIPING



LTR	DATE	REVISIONS	CHK.	APP.
H	9-15-83	PRE-COOLER REMOVED	JCC	
G	7/2/59	CHANGED SECTION F-F		
F		ADDED 1" XX PIPE, .358 WALL		
E	4/15/59	19'-8" WAS 20'-0", 20'-11" WAS 20'-7"		
D	3/30/59	61'-5" WAS 61'-0", 20'-" WAS 20'-8", 20'-10 WAS 19.95' I.D., ADDED VIEW D-D, VIEW E-E, DETAIL Ⓑ, DETAIL Ⓒ		
C	2/18/59	CHANGED ARROW ON "END OF CONTRACT" NOTE, DELETED "BY OTHERS" & PLACED ELEV. 27'-5" WAS 27'-0", ADDED VIEW C-C		
B	2/2/59	GENERAL REVISION OF PIPING ARRANGEMENT IN PLOT PLAN INCLUDING SECTION B-B		
A		537' WAS 532', 24'-8" WAS 25'-6", ELEV. 22'-0" WAS 23'-0"		

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AMES RESEARCH CENTER
MOFFETT FIELD, CALIFORNIA

12 INCH HYPERSONIC HELIUM TUNNEL
VACUUM STORAGE VESSELS, PIPING
LAYOUT & DETAILS

SCALE: 1" = 80'-0"

DRAWN BY: E.W.POE

DIVISION: TRE

A11238-D3

331-5903

* Spec.	Mark		Description	Length ft	Length in
	p 53	12	Post Section		
A283C	p 301	12	Base PL 22"ϕ x ⅜" ½ Holes		
do	p 302	24	PL 5½ x ⅜ ϕ (1½ & 1½ x 1'-10½")		
do	p 303	12	PL 15⅞" ϕ x ⅜" ½ Hole		
do	p 304	12	PL 105½" x ¼ Roll to ϕ (weld)	4	3⅛
do	p 305	24	PL 120⅛" x ¼ (")	4	3⅛
A7		24	Spec. Bookup Bar ½" x 3	4	2½
Job 75	2H3	42	Bar 2½" x ⅝ Bent ½ Hole Top 330 2H3	0	5
Job 75	1H51	12	Conterpin 1⅛ ϕ x 5'	0	5½
A7	b 301	12	Bar 2"-11"	2	1
A7	b 302	24	Bar 2"-11"	1	0
A283C	p 308	12	PL 15⅝" ϕ x ⅜		
			Top Post Section - Ship Attach to ϕ 6'-6"		
A283C	p 306	12	PL 120⅛" x ¼ Roll to ϕ (weld)	4	3⅛
A7		6	Spec. Bookup Bar ½" x 3	4	2½
A283C	p 303	12	PL 15⅛" ϕ x ⅜		
do	p 307	12	PL 5½ x 4" (½ ϕ p 306)		
do	p 309	24	PL 5½ x ⅜" (½ ϕ 28" x 1'-7¾")		
Job 75	2H3	48	Bar 2½" x ⅝ Bent ½ Hole Top 330 2H3	0	5
A283C	p 310 *	12	PL 15⅞" ϕ x ⅜" Ship Loose		
CQ	48		Bolts 1" ϕ ½ H.S. Hex Nut	8"	6½
CQ	96		1" ϕ Washer		

Box for shipment

* ⅛ Added to long ℄ & width for shrinkage

Top Edge of 6'-6" ϕ

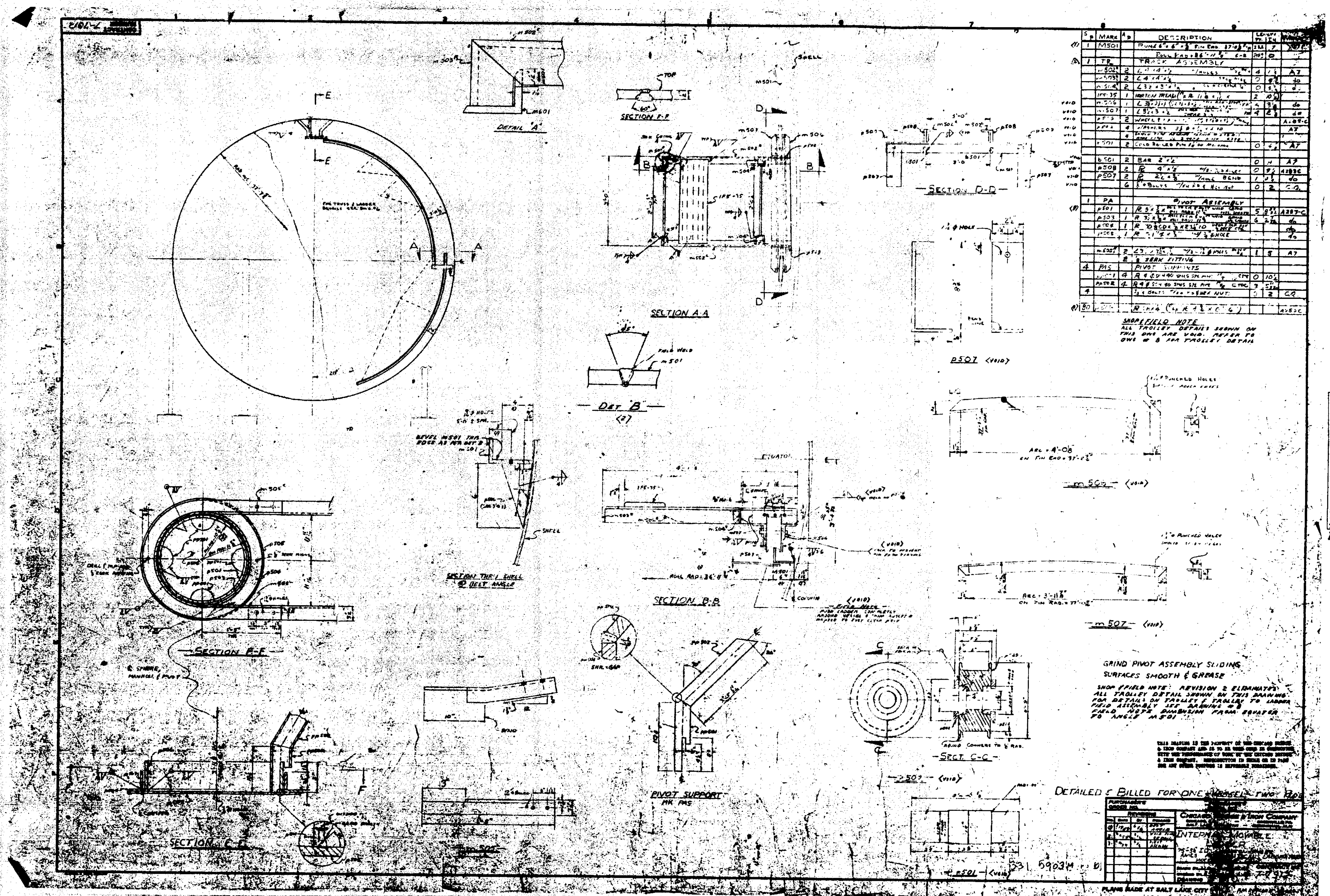
Equator

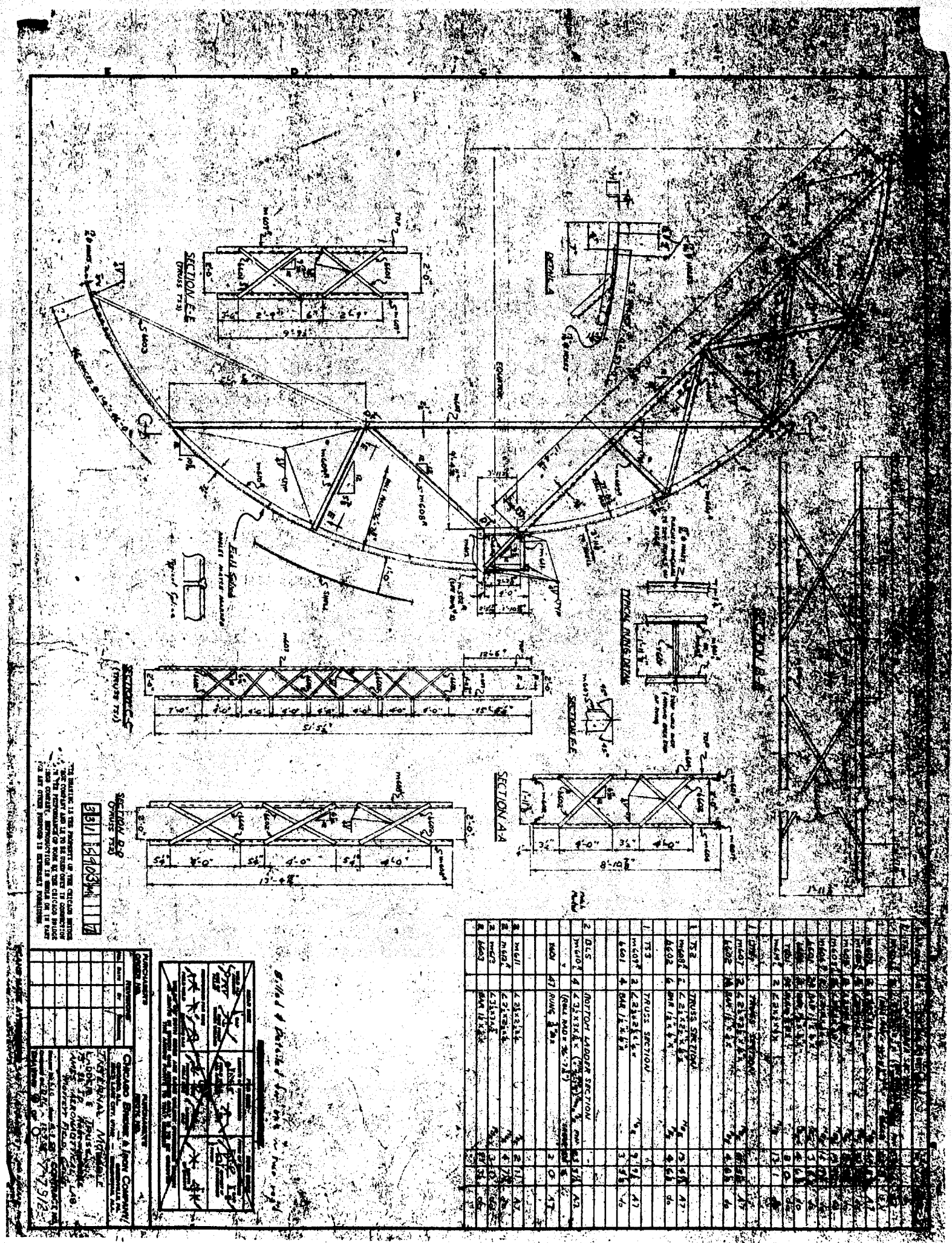
Location of Post Section at "19b"

331-5903 m-5

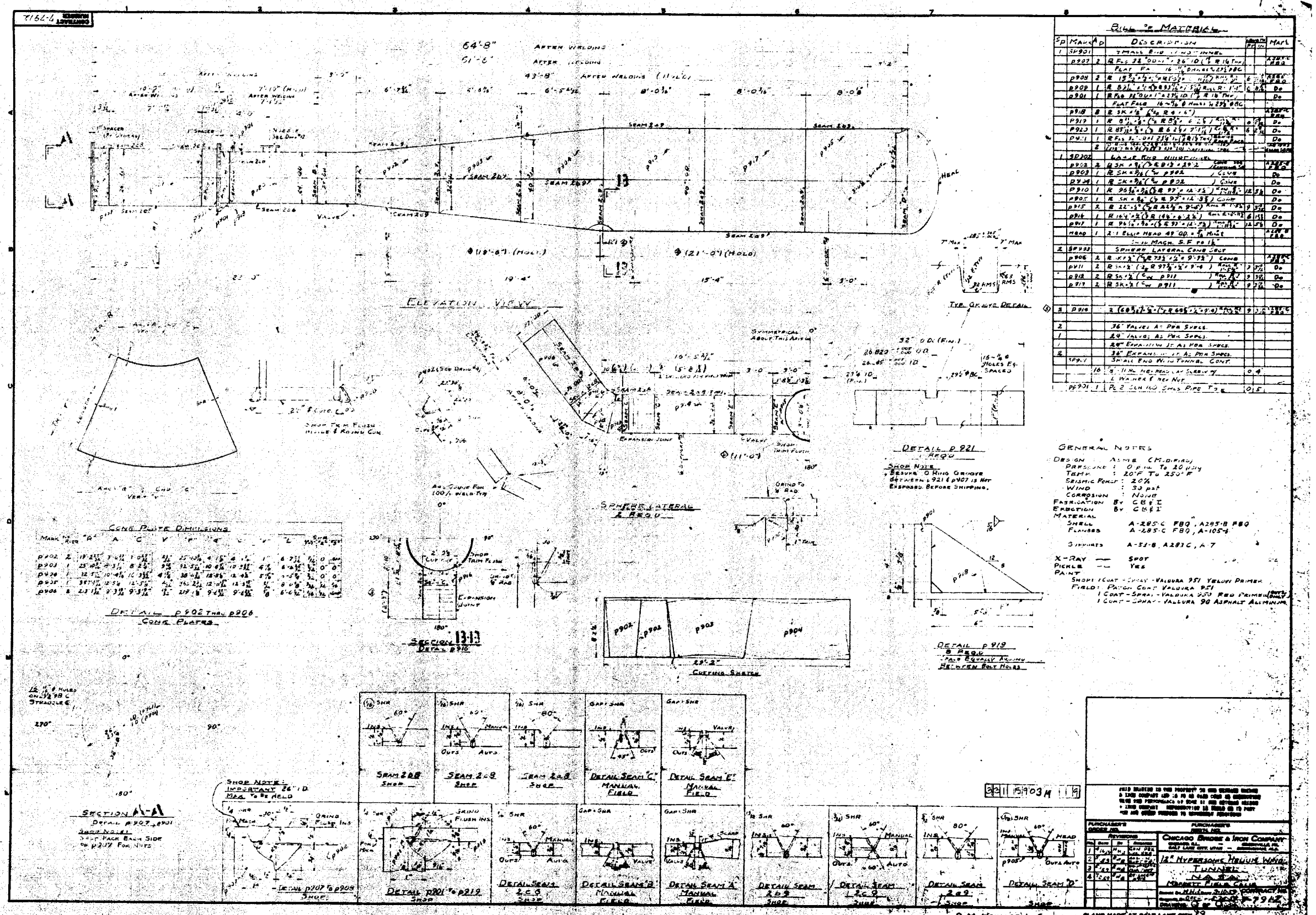
Ornamental Post, for 19' Luminaire

THOMAS STEEL CO. NEW CASTLE, PA.


331-5903M-6
INTERNAL MOVABLE LADDER
DETAIL "A"
SECTION F-F
SECTION A-A
SECTION D-D
DET "B"
P507 (VOID)
SHOP & FIELD NOTE
ALL TROLLEY DETAILS SHOWN ON THIS DWG ARE VOID. REFER TO DWG # 8 FOR TROLLEY DETAIL
m 506 (VOID)
m 507 (VOID)
SECTION THR'U SHELL @ BELT ANGLE
SECTION B-B
SECTION E-E
PIVOT SUPPORT
MK PAS
SECT. C-C
P509 (VOID)
P501 (VOID)
SECTION G-G
GRIND PIVOT ASSEMBLY SLIDING SURFACES SMOOTH & GREASE
DETAILED & BILLED FOR ONE
CHICAGO BRIDGE & IRON COMPANY
INTERNAL MOVABLE LADDER
PLANS MADE AT SALT LAKE CITY
7-7912



NOT MOVABLE WITHOUT PERMIT
TSIC 5903 M-7



BILL OF MATERIAL

Sp	Mark	Ap	Description	Length Ft	Length In	Mark
1	SP901		SMALL END WINDTUNNEL			
	p907	2	R FLG 32" OD x 1" x 26" ID (1/4 R 1/4 THK)			A285-C FBQ
			FLAT FA 16 - 11/16 DIAMETER x 29 1/2 BC			
	p908	2	R 15 3/4 x 1/2 x 1/4 x 1/4 x 1/2	6	3 1/2	A285-C FBQ
	p909	1	R 83 1/2 x 1/2 x 1/4 x 1/4 x 1/2 x 1/4	6	3 1/2	Do
	p901	1	R FLG 32" OD x 1" x 23 1/2 ID (1/4 R 1/4 THK)			Do
			FLAT FALG 16 - 11/16 ⌀ HOLES x 29 1/2 BC			
	p918	8	R SK x 1/2 (1/4 R 4 x 6")			A285-C FBQ
	P919	1	R 8 1/2 x 1/2 x 1/4 x 1/4 x 1/2	6	3 1/2	Do
	P920	1	R 85 1/2 x 1/2 x 1/4 x 1/4 x 1/2	6	3 1/2	Do
	P921	1	R FLG 32" OD x 1" x 23 1/2 ID (1/4 R 1/4 THK)			Do
		2	[illegible]			[illegible]
1	SP902		LARGE END WINDTUNNEL			
	p902	2	R SK x 1/2 (1/4 R 8 1/2 x 29 1/2) CONE			A285-C FBQ
	p903	1	R SK x 1/2 (1/4 p902) CONE			Do
	p904	1	R SK x 1/2 (1/4 p902) CONE			Do
	P910	1	R 96 3/4 x 1/2 (1/4 R 97 x 12 - 5 1/2) CONE	12	5 1/2	Do
	p905	1	R SK x 1/2 (1/4 R 97 x 12 - 3 1/2) CONE			Do
	p915	2	R 22 - 1/2 (1/4 R 22 1/2 x 9 - 5/8)	9	3 1/2	Do
	p916	1	R 16 1/2 x 1/2 (1/4 R 16 1/2 x 6 - 2 1/2)	6	1 1/2	Do
	p917	1	R 96 1/2 x 1/2 x 1/4 x 1/4 x 1/2	12	5 1/2	Do
	HEAD	1	2:1 ELLIP HEAD 49" OD x 5/16 MINT			A285-C FBQ
			SHOP MACH. S.F. TO 1 1/2"			
2	SP903		SPHERE LATERAL CONE SECT			
	p906	2	R SK x 1/2 (1/4 R 73 1/2 x 1/2 x 9 - 7 1/2) CONE			A285-C FBQ
	p911	2	R SK x 1/2 (1/4 R 97 1/2 x 1/2 x 9 - 4)	9	3 1/2	Do
	p912	2	R SK x 1/2 (1/4 p911)	9	3 1/2	Do
	p913	2	R SK x 1/2 (1/4 p911)	9	3 1/2	Do
3	P914		2 (68 3/4 x 1/2 x 1/4 x 68 3/4 x 1/2 x 9 - 4)	9	3 1/2	A285-C FBQ
2			36" VALVES AS PER SPECS.			
1			24" VALVES AS PER SPECS.			
1			24" EXPANSION JT AS PER SPECS.			
2			36" EXPANSION JT AS PER SPECS.			
	SP901		SMALL END WINDTUNNEL CONT.			
		16	3/8 - 11 NC HEX HEAD CAP SCREW W/	0	4	
			L WASHER & HEX NUT			
	PP901	1	PL 2 SCH 160 SMLS PIPE TO	0	5	

GENERAL NOTES

DESIGN: ASME (MODIFIED)
PRESSURE: 0 psig TO 20 psig
TEMP: 20°F TO 250°F
SEISMIC FORCE: 20%
WIND: 30 psf
CORROSION: NONE
FABRICATION BY CB&I
ERECTION BY CB&I
MATERIAL
SHELL: A-285-C FBQ, A285-B FBQ
FLANGES: A-285-C FBQ, A-105-4
SUPPORTS: A-53-B, A283C, A-7
X-RAY — SPOT
PICKLE — YES
PAINT
SHOP: 1 COAT - SPRAY - VALDURA 951 YELLOW PRIMER
FIELD: PATCH COAT VALDURA 951
1 COAT - SPRAY - VALDURA 950 RED PRIMER (SHOP ONLY)
1 COAT - SPRAY - VALDURA 90 ASPHALT ALUMINUM

PURCHASER'S ORDER NO. | PURCHASER'S REQ'N NO.

REVISIONS

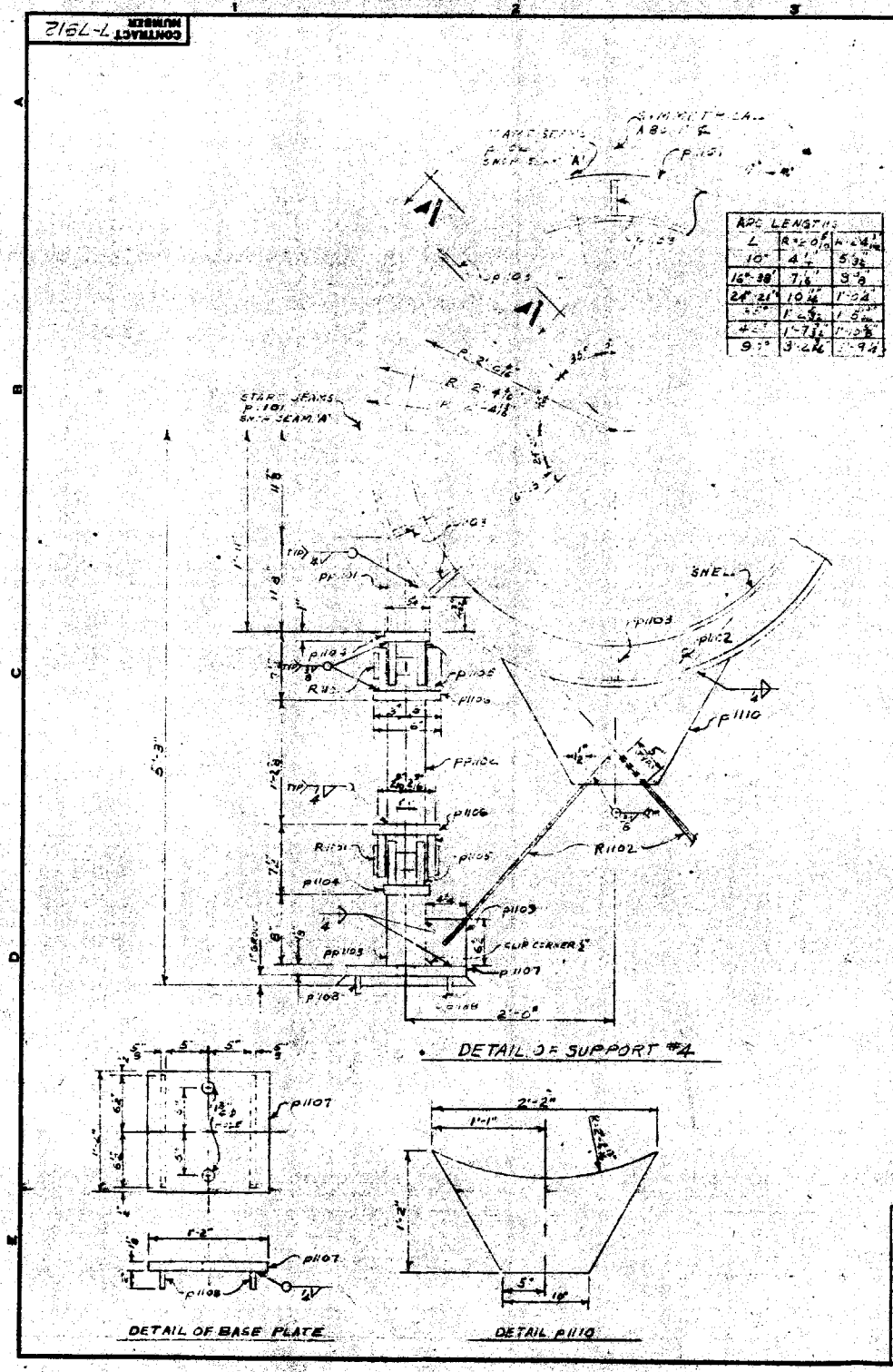
No.	Date	By	Remarks
1	4/16/59	H.H.	[illegible]
2	4/23	[illegible]	[illegible]
3	4/29	[illegible]	[illegible]
4	5/29	[illegible]	[illegible]

CHICAGO BRIDGE & IRON COMPANY
CHICAGO, ILL. — SALT LAKE CITY, UTAH — BIRMINGHAM, ALA.
12" HYPERSONIC HELIUM WIND TUNNEL
NASA
MOFFETT FIELD CALIF.
Drawn by H.H. Scale 3/16 Contract No. 7912
Designed by [illegible] Drawing No. [illegible]

R M HOWARD IN CHARGE — PLANE MADE AT SALT LAKE CITY 19

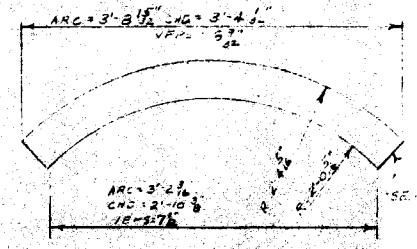
331-5903 M-9
12" N.H.T.

CONTRACT NUMBER 7-7912

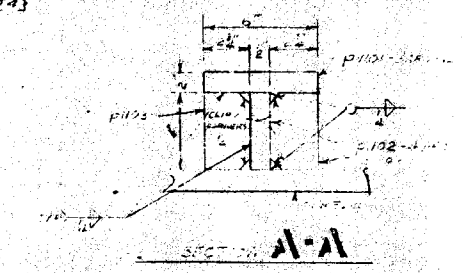


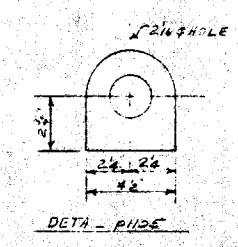
DETAIL OF SUPPORT #4

APC LENGTHS		
L	R=2.0	A=4
10°	4"	5 3/4"
16° 38'	7 1/8"	9 3/8"
24° 21'	10 1/4"	1'-0 1/4"
45°	1'-8 1/2"	1'-6"
47°	1'-7 1/2"	1'-10 5/8"
91°	3'-2 1/2"	3'-9"

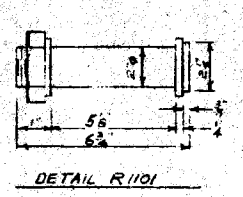


DETAIL P1102





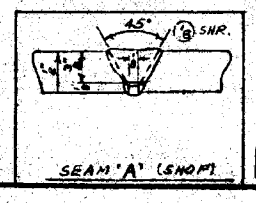
DETAIL P1105



DETAIL R1101

DETAIL OF BASE PLATE

DETAIL P1110



SPEC.	GRADE	MARK	QUAN.	DESCRIPTION	LENGTH FT	LENGTH IN
		SP		SUPPORT PLATE (SEE DWG #1)		
A283 C		P1101	3	PL 6" x 1/2" x ROLL TO R=2'-4.5"	4	1/2
do		P1102	4	PL 1/2" x 2 9/16" x 2'-4 1/2" CLIP		
do		P1103	12	PL 2 1/2" x 1/2"	0	4
A53 B		PP1101	6	PL 4.5 SQ. SMLS. PIPE	0	11.8
A283 C		P1104	2	PL 5 1/4 x 1/2 x	0	5 1/4
do		P1105	4	PL SQ. 1/2" x PL 4 1/2 x 2 1/2 x 10-5 1/4"		
do		P1110	1	PL SQ. 1/2" x PL 14 1/4 x 1/2 x 12 1/4"		
	2	CC-4		CENTER COL. SECTION & SUPT. #4		
A53 B		PP1102	2	PL 4.5 SQUARE SMLS. PIPE 2'-0"	1	2 1/8
A283 C		P1106	4	PL 6" x 1/2" x	0	6
do		P1108	8	PL SQ. 1/2" x PL 4 1/2" x 5 1/4"		
	2	LC-4		LOWER COL. SECTION & SUPT. #4		
A53 B		PP1103	6	PL 4.5 SQUARE SMLS. PIPE 2'-0"	0	9
A283 C		P1102	2	PL 5 1/2 x 1/2 x	0	5 1/4
do		P1105	4	PL SQ. 1/2" x PL 4 1/2" x 2 1/2" x 5 1/4"		
do		P1121	2	PL 4 x 1/2 x	1	2
do		P1103	4	PL 2 1/2 x 1/2 x	1	1
do		P1109	4	PL 4 1/2 x 1/2 x CLIP CORNER	0	6 1/2
A7	A	P1101		PL 2"x2"x4.5" SQ. 5/16" THK.	0	5 1/2
CQ			4	2" HEX NUT - 4 1/2 UNC-2B		
CQ			5	WASHER, 3.00 x .44 x .10 THK.		
A7	(2)	P1104		1 3/8 DIA.	0	6

SEE DWG #10 FOR LOCATION OF SUPPORT

DETAILED FOR ONE-ONE REQ'D.

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PURCHASER'S ORDER NO. | PURCHASER'S REQ'N. NO.

REVISIONS			
NO.	DATE	BY	REMARKS
1	4/29/59	EWB	CHG'D P'S TO SHOW P.

CHICAGO BRIDGE & IRON COMPANY
CHICAGO, ILL. - GREENVILLE, PA. - NEW CASTLE, DEL.
SALT LAKE CITY, UTAH - BIRMINGHAM, ALA.

SUPPORT #4
12"ϕ HYPERSONIC WIND TUNNEL
MOFFET FIELD CALIF.

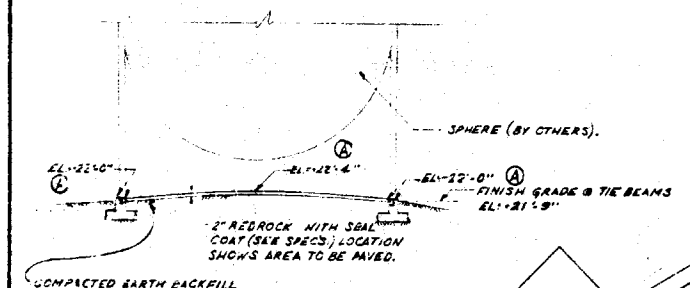
DRAWN BY EWB DATE 3-30-59 CONTRACT NO.
CHECKED BY DEL - 4-1-59
DRAWING 6 OF 8 7-7912

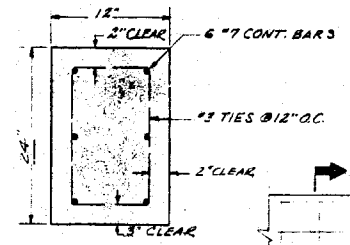
3311 590 3M 111

R.M. HOWARD-IN CHG.

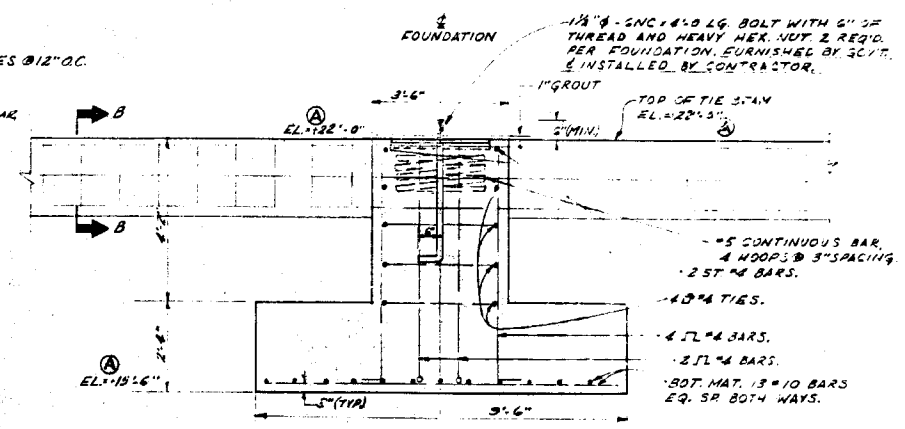
PLANS MADE AT SALT LAKE CITY

SUPPORT #4 SEAM 'A' (SHOP)

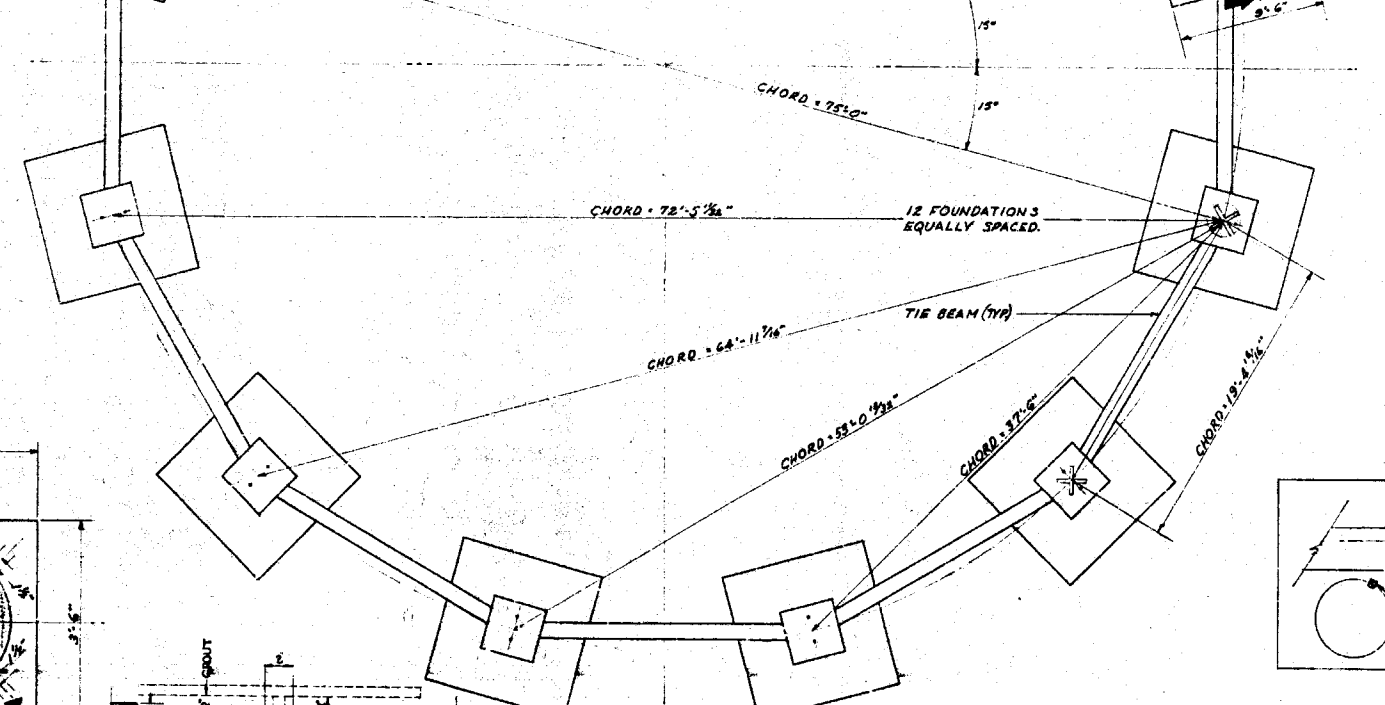




SECTION "B-B"
1½"=1'-0"

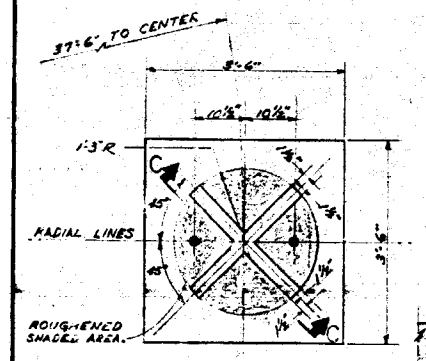


SECTION "A-A" (TYPICAL)
½"=1'-0"

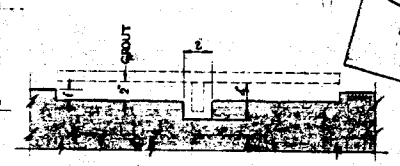


GENERAL PLAN (2 REQ'D)
1"=5'-0"

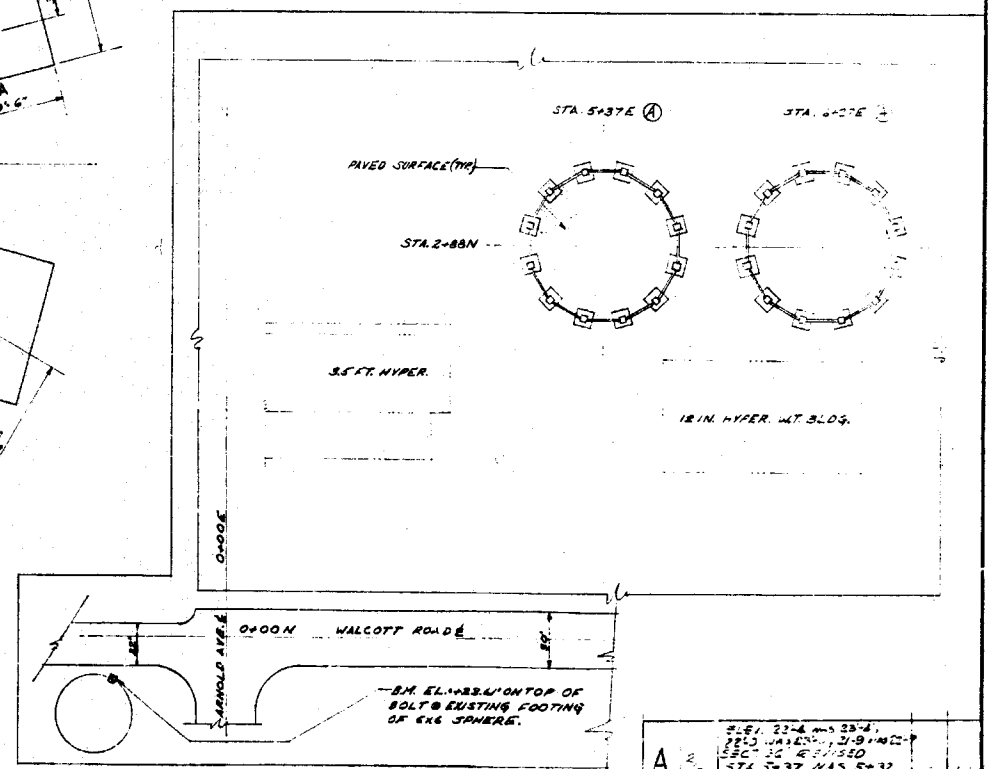
TOTAL VOLUME OF CONCRETE (1 SPHERE) = 135 CU. YDS. (APPROX.)



SHEAR SLOT & BOLT LOCATION DETAIL FOR ALL FOUNDATIONS
3/8" = 1'-0"



SECTION C-C Ⓐ
SCALE: 1½"=1'-0"



LOCATION PLAN
SCALE 1"=40'

LET	DATE	REVISIONS	CHK.	APP.
A	2-9	ELEV. 22'-6" and 22'-0"; ZERO AZIMUTH, 3'-9" and 22'-0" ADDED TO ELEVATION		
		STA. 3+37 N45 E+32		
		STA. 6+27 N45 E+32		

SCALE: NOTED	NATIONAL AERONAUTICS and SPACE ADMINISTRATION AMES RESEARCH CENTER MOFFETT FIELD, CALIFORNIA
MATERIAL NOTED	
HEAT-	
PROJECT FINISH	12 INCH HYPERSONIC HELIUM TUNNEL FOUNDATIONS FOR VACUUM SPHERES
QUAN. ASSEM. DWGS. NO.	
DESIGN G. WONG	BRANCH — DESIGN NO. 5407
DRAWN F.M. POE	DIVISION — CONST. NO.
LIMITS ON DIMENSIONS UNLESS OTHERWISE NOTED: FRACTIONAL ± DECIMAL ± ANGULAR ±	CHECKED BY — RESEARCH ENGR. — APPROVED BY — APPROVED BY — REV. A11238-D4A

Scale 1"=1'-0"

331-5403m-15
12" H.H.T. FNDTN. FOR VACUUM SPHERES

331-5403m-L15