

0033358



Mr. John Grantham
State of Washington
Department of Ecology
Nuclear & Mixed Waste Program
P. O. Box 47600
Olympia, WA 98504-7600

FLUOR DANIEL, INC.

Date: SEPTEMBER 15, 1993

Reference: Hanford Waste Vitrification Plant
DOE Contract DE-AC06-86RL10838
Fluor Contract 8457

Transmittal No.: WDOE-612

Dear Mr. Grantham:

TRANSMITTAL

We enclose * copy of the items listed below. These are issued per US-DOE request.

* - 2 FULLSIZE ROLLED, 1 REDUCED, 2 SPECIFICATION

Response due to Fluor: N/A

Responds to: P06A PACKAGE

NUMBER	REV	DATE	TITLE
SEE TRANSMITTAL ATTACHMENTS: ATT. A - GENERAL NOTES ATT. B - RECONCILIATION NOTES ATT. C - SPECIFICATIONS ATT. D - DRAWINGS	-----	-----	P06A PACKAGE - MELTER VESSEL ASSEMBLY REV. 1
			REV. 1 ISSUED PER CR #0981.



Distribution:

Reference: FRP-1184, FUP-631
R. L. Long: DOE-RL, w/0
TWP/AME Corresp Cntrl Cntr, MSIN A5-10
(P06A PACKAGE), w/0
P. Felise, WHC-RL (MSIN G6-06), w/1F & 1 SPEC
Environmental Data Management Center
(MSIN H6-08), w/1F & 1 SPEC
D. Duncan, US EPA, Region X, w/0

Very truly yours,

Rosalie Cadenas for
R. S. Poulter
Project Director

RSP:BED:dw

Attachment A

General Notes

Procurement Package P06A Rev 1

The following three previously AFC issued specifications have been voided from this package (copies enclosed). These specifications will be reissued as new documents in the corresponding P37A and P37B Bulk Materials package's.

05010 Rev 1 (void) Modified Inconel Alloy 690 Material
05011 Rev 1 (void) Modified Inconel Alloy 690 Weld Wire
17915 Rev 1 (void) Thermocouple Furnished with Melter

The following new documents have been added:

Specifications

13249 Rev 0 Melter Top Head Turning Fixture.

Related Document

Related Document No. 1 Rev 0 Melter Model and Design Criteria

Drawings

H-2-125551 sh 1 Rev 0 Melter Frame/Vessel Piping Conn. ID
H-2-125551 sh 2 Rev 0 Melter Frame/Vessel Elec and Instr Conn. ID
H-2-125551 sh 3 Rev 0 Melter Frame/Vessel Elec and Instr Conn. ID
H-2-157459 sh 1 Rev 0 Piping Isometric
H-2-157459 sh 2 Rev 0 Piping Isometric

See Attachment's C and D for complete listing of documents issued with this revision.

Attachment B
Reconciliation List
Procurement Package P06A Rev 1

There were no reconciliation comments against the Rev 1 issue.

ATTACHMENT C

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09/14/93

TRANSMITTAL ATTACHMENT FOR PACKAGE SPECIFICATIONS

<u>SPEC NUMBER</u>	<u>PKG SIGN DATE</u>	<u>PKG REV</u>	<u>SECT REV</u>	<u>SECTION</u>	<u>SECTION TITLE</u>
B-595-P-P06A	P06A	1		MELTER VESSEL ASSEMBLY	
	09/10/93		1	05010	MODIFIED INCONEL ALLOY 690 MATERIAL
	09/10/93		1	05011	MODIFIED INCONEL ALLOY 690 WELD WIRE
	09/10/93		1	05063	WELDING - PRESSURE VESSELS
	09/10/93		0	13249	MELTER TOP HEAD TURNING FIXTURE
	09/10/93		1	13250	FABRICATION OF MELTER AND FRAME ASSEMBLY
	09/10/93		1	14400	MELTER FRAME LIFTING YOKE FABRICATION
	09/10/93		1	17915	THERMOCOUPLE FURNISHED WITH MELTER
	09/10/93		0	RD-1	RELATED DOCUMENT NO. 1 "PLASTIC" MELTER MODEL AND DESIGN CRITERIA

ATTACHMENT D

Page 1
09/14/93

TRANSMITTAL ATTACHMENT FOR PACKAGE DRAWINGS

PACKAGE NUMBER: P06A

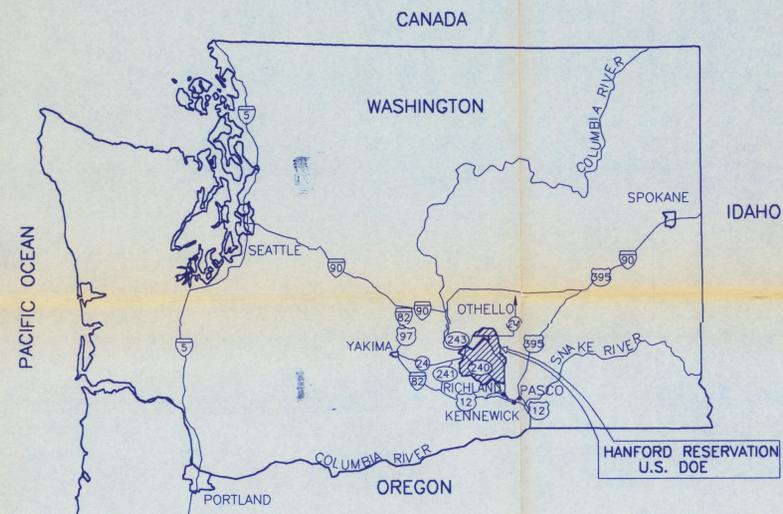
<u>DRAWING NUMBER</u>	<u>SHT NO.</u>	<u>REV</u>	<u>DATE</u>	<u>DRAWING TITLE</u>	<u>SOFTWARE</u>
H-2-116009	1	1	09/10/93	MELTER VESSEL ASSEMBLY TITLE SHEET	A
H-2-116010	1	1	09/10/93	MELTER VESSEL ASSEMBLY DRAWING INDEX	A
H-2-120052	1	1	09/10/92	ME-130-001 MELTER VESSEL/FRAME ASSY, PARTS LIST & NOTES	A
H-2-120075	1	1	09/10/93	ME-130-001 MELTER SHELL INCONEL DAM WELDMENT	A
H-2-120194	1	1	09/10/93	ME-130-001 MELTER SHELL POUR SPOUT ADAPTER ASSY & PARTS LIST	A
H-2-120235	1	1	09/10/93	ME-130-001 MELTER TOP HEAD PARTS LIST AND NOTES	A
H-2-120239	1	1	09/10/93	HD-130-002 MELTER FRAME LIFTING YOKE ASSEMBLY	A
H-2-120242	1	1	09/10/93	ME-130-001 MELTER RFRC/INSUL PRTS LIST & NOTES	A
H-2-120242	2	1	09/10/93	ME-130-001 MELTER RFRC/INSUL ASSEMBLY	A
H-2-125551	1	0	09/10/93	MELTER FRAME/VESSEL PIPING CONNECTION IDENTIFICATION	A
H-2-125551	2	0	09/10/93	MELTER FRAME/VESSEL ELEC & INSTR CONNECTION IDENTIFICATION	A
H-2-125551	3	0	09/10/93	MELTER FRAME/VESSEL ELEC & INSTR CONNECTION IDENTIFICATION	A
H-2-127459	1	0	09/10/93	PIPING ISOMETRIC	A
H-2-127459	2	0	09/10/93	PIPING ISOMETRIC	A

PROJECT TITLE:
**B-595 HWVP-HANFORD WASTE
 VITRIFICATION PLANT**

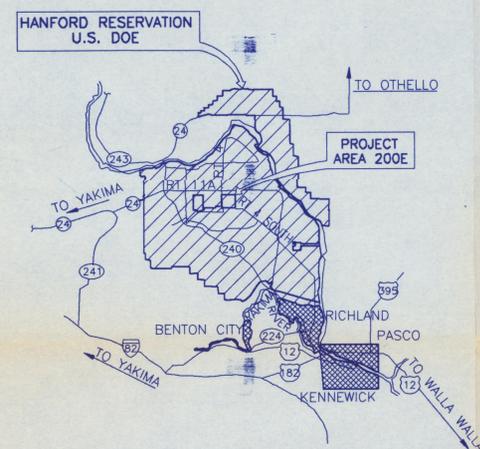
**CWBS P06A
 MELTER VESSEL ASSEMBLY**

FOR:
**U.S. DEPARTMENT OF ENERGY
 RICHLAND OPERATIONS OFFICE**

BY:
FLUOR DANIEL, INC



REGIONAL MAP
 0 20 40 60 80 100
 GRAPHIC SCALE
 1" = 40 MILES



VICINITY MAP
 0 5 10 15 20 25
 GRAPHIC SCALE
 1" = 10 MILES

LEGEND
 [Hatched Box] DENOTES HANFORD RESERVATION U.S. DOE
 [Dotted Box] DENOTES CITY LIMITS

1	12/18/92	REVISION PER CR-HWVP-0981	LK	SS	LK	[Signature]
0	12/18/92	APPROVED FOR CONSTRUCTION	JLD	JLD	JLD	[Signature]
			HLR	JHM	BER	RSP

DATE	B116009A	REVISION DESCRIPTION	2B:IBM:ACD2:12.C1:SS
ENGINEERING RELEASE			
REV	DATE	U.S. DEPARTMENT OF ENERGY Richland Field Office DE - AC06-86RL10839	
SIGNATURE			
PROJ DIR	R.S. POULTER	12/18/92	FLUOR DANIEL, INC. ADVANCED TECHNOLOGY DIVISION MELTER VESSEL ASSEMBLY TITLE SHEET
OR MGR	B.E. RITTBERG	12/18/92	
INDEPENDENT SAFETY MGR	J. MARTIN	12/18/92	
PROJECT MGR	H.L. ROBERTSON	12/18/92	
SYSTEMS MGR	J.L. SMETS	12/18/92	
ENGINEERING MGR	P.J. SPEIDEL	12/18/92	
SUPERVISOR	J.L. DATTE	12/16/92	
DESIGN ENGINEER	S. SAM	12/16/92	
CHECKED	J.L. DATTE	12/16/92	
DRAWN	S. SAM	09/23/92	
PROJECT TITLE		HANFORD WASTE VITRIFICATION PLANT	
CWBS NO.	B-595	FLUOR CONTRACT NO.	8457
INDEX NO.	P06A	SCALE	NONE
SHEET	1	OF	1
REV	1	OF	1

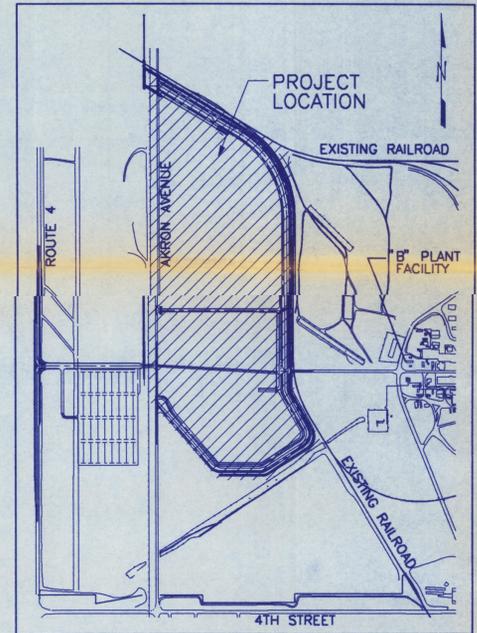
DWG NO.		DRAWING TITLE	
REFERENCE DRAWINGS			
NEXT USED ON			

DRAWING INDEX

DRAWING NO.	CODE NO.	TITLE	REV
GENERAL			
H-2-116009	T1	MELTER VESSEL ASSEMBLY TITLE SHEET	1
H-2-116010	T2	MELTER VESSEL ASSEMBLY DWG INDEX	1
MECHANICAL			
H-2-120052 SH 1	M1	ME-130-001 MELTER VESSEL/FRAME ASSEMBLY, PARTS LIST & NOTES	1
H-2-120052 SH 2	M2	ME-130-001 MELTER VESSEL/FRAME ASSY MELTER & FRAME ASSY	0
H-2-120052 SH 3	M3	ME-130-001 MELTER VESSEL/FRAME ASSY MELTER ASSY/CONN LOC	0
H-2-120052 SH 4	M4	ME-130-001 MELTER VESSEL/FRAME ASSEMBLY SECTIONS	0
H-2-120052 SH 5	M5	ME-130-001 MELTER VESSEL/FRAME ASSEMBLY TABLES & NOTES	0
H-2-120075	M6	ME-130-001 MELTER SHELL INCONEL DAM WELDMENT	1
H-2-120076	M7	ME-130-001 MELTER VESSEL/FRAME ASSY MISC PIPING	0
H-2-120086 SH 1	M8	ME-130-001 POUR SPOUT HEATER SPRT ASSEMBLY AND PARTS LIST	0
H-2-120086 SH 2	M9	ME-130-001 POUR SPOUT HEATER SPRT CARRIAGE ALIGNMENT BRACKET	0
H-2-120086 SH 3	M10	ME-130-001 POUR SPOUT HEATER SPRT ACTIVE RAIL BRACKET	0
H-2-120086 SH 4	M11	ME-130-001 POUR SPOUT HEATER SPRT PASSIVE RAIL BRACKET	0
H-2-120086 SH 5	M12	ME-130-001 POUR SPOUT HEATER SPRT PASSIVE RAIL KEY GUIDE	0
H-2-120086 SH 6	M13	ME-130-001 POUR SPOUT HEATER SPRT ACTIVE RAIL KEY GUIDE	0
H-2-120086 SH 7	M14	ME-130-001 POUR SPOUT HEATER SPRT DETAILS AND SECTION	0
H-2-120086 SH 8	M15	ME-130-001 POUR SPOUT HEATER SPRT PASSIVE RAIL ASSEMBLY	0
H-2-120086 SH 9	M16	ME-130-001 POUR SPOUT HEATER SPRT ACTIVE RAIL ASSEMBLY	0
H-2-120086 SH 10	M17	ME-130-001 POUR SPOUT HEATER SPRT MODIFIED GEAR BOX	0
H-2-120122 SH 1	M18	ME-130-001 POUR SPOUT DUMMY HEATER ASSEMBLY	0
H-2-120122 SH 2	M19	ME-130-001 POUR SPOUT DUMMY HEATER SUB-ASSY & DETAIL	0
H-2-120123 SH 1	M20	ME-130-001 DUMMY INCONEL TUBE ASSEMBLY & PARTS LIST	0
H-2-120123 SH 2	M21	ME-130-001 DUMMY INCONEL TUBE DETAILS	0
H-2-120124	M22	ME-130-001 MELTER SHELL DUMMY DRAIN PLUG ASSY & PARTS LIST	0
H-2-120153 SH 1	M23	MY-130-004 MELTER FRAME PARTS LIST & NOTES	0
H-2-120153 SH 2	M24	MY-130-004 MELTER FRAME NOZZLE INSTALLATION	0
H-2-120153 SH 3	M25	MY-130-004 MELTER FRAME ASSEMBLY & DETAILS	0
H-2-120153 SH 4	M26	MY-130-004 MELTER FRAME HOLE LOCATION DETAILS	0
H-2-120153 SH 5	M27	MY-130-004 MELTER FRAME SECTIONS AND DETAILS	0
H-2-120153 SH 6	M28	MY-130-004 MELTER FRAME SECTION AND VIEWS	0
H-2-120153 SH 7	M29	MY-130-004 MELTER FRAME SECTIONS & DETAILS	0
H-2-120153 SH 8	M30	MY-130-004 MELTER FRAME SECTION AND DETAILS	0
H-2-120153 SH 9	M31	MY-130-004 MELTER FRAME NOZZLE DETAILS	0
H-2-120194 SH 1	M32	ME-130-001 MELTER SHELL POUR SPOUT ADAPTER ASSY & PARTS LIST	1
H-2-120194 SH 2	M33	ME-130-001 MELTER SHELL POUR SPOUT ADAPTER WELDMENT & DETAIL	0
H-2-120194 SH 3	M34	ME-130-001 MELTER SHELL POUR SPOUT ADAPTER DETAILS	0
H-2-120235 SH 1	M35	ME-130-001 MELTER TOP HEAD PARTS LIST AND NOTES	1
H-2-120235 SH 2	M36	ME-130-001 MELTER TOP HEAD ASSEMBLY	0
H-2-120235 SH 3	M37	ME-130-001 MELTER TOP HEAD COOLING JACKET	0
H-2-120235 SH 4	M38	ME-130-001 MELTER TOP HEAD LIFTING LUGS	0
H-2-120235 SH 5	M39	ME-130-001 MELTER TOP HEAD NOZZLES E, G1, G6, G10	0
H-2-120235 SH 6	M40	ME-130-001 MELTER TOP HEAD NOZZLES F1, F6, G18	0
H-2-120235 SH 7	M41	ME-130-001 MELTER TOP HEAD NOZZLES PLAN VIEW	0
H-2-120235 SH 8	M42	ME-130-001 MELTER TOP HEAD NOZZLES SECTIONS	0
H-2-120235 SH 9	M43	ME-130-001 MELTER TOP HEAD NOZZLE-A-DETAILS	0
H-2-120235 SH 10	M44	ME-130-001 MELTER TOP HEAD NOZZLE-T-DETAILS	0
H-2-120235 SH 11	M45	ME-130-001 MELTER TOP HEAD FEED TUBE SUPPORTS	0
H-2-120235 SH 12	M46	ME-130-001 MELTER TOP HEAD FEED TUBE SUPPORT DETAILS	0
H-2-120236 SH 1	M47	ME-130-001 MELTER SHELL PARTS LIST & NOTES	0
H-2-120236 SH 2	M48	ME-130-001 MELTER SHELL PLAN VIEW	0
H-2-120236 SH 3	M49	ME-130-001 MELTER SHELL SECTIONS	0
H-2-120236 SH 4	M50	ME-130-001 MELTER SHELL BOTTOM VIEW	0
H-2-120236 SH 5	M51	ME-130-001 MELTER SHELL ELECTRODE NOZZLE SECTION	0
H-2-120236 SH 6	M52	ME-130-001 MELTER SHELL DOME HEATER NOZZLE DETAILS	0
H-2-120236 SH 7	M53	ME-130-001 MELTER SHELL DOME HEATER NOZZLE DETAILS	0
H-2-120236 SH 8	M54	ME-130-001 MELTER SHELL COOLING JACKET LAYOUT	0
H-2-120236 SH 9	M55	ME-130-001 MELTER SHELL COOLING JACKET SECTIONS	0
H-2-120236 SH 10	M56	ME-130-001 MELTER SHELL COOLING JACKET	0
H-2-120236 SH 11	M57	ME-130-001 MELTER SHELL JACKET MANIFOLD OUTLETS	0
H-2-120236 SH 12	M58	ME-130-001 MELTER SHELL RISER SECTION	0
H-2-120236 SH 13	M59	ME-130-001 MELTER SHELL POUR SPOUT JACKET	0
H-2-120236 SH 14	M60	ME-130-001 MELTER SHELL RISER END	0
H-2-120236 SH 15	M61	ME-130-001 MELTER SHELL RISER END SECTIONS	0
H-2-120236 SH 16	M62	ME-130-001 MELTER SHELL RISER PAD DETAILS	0
H-2-120236 SH 17	M63	ME-130-001 MELTER SHELL RISER JACKET	0
H-2-120236 SH 18	M64	ME-130-001 MELTER SHELL RISER DETAILS	0
H-2-120236 SH 19	M65	ME-130-001 MELTER SHELL RISER JACKET PIPING	0
H-2-120236 SH 20	M66	ME-130-001 MELTER SHELL RISER MANIFOLD	0
H-2-120236 SH 21	M67	ME-130-001 MELTER SHELL BOTTOM JACKET MANIFOLD	0
H-2-120236 SH 22	M68	ME-130-001 MELTER SHELL NOZZLE N SECTIONS	0
H-2-120236 SH 23	M69	ME-130-001 MELTER SHELL DRAIN VALVE SUPPORTS	0

DRAWING INDEX

DRAWING NO.	CODE NO.	TITLE	REV
MECHANICAL			
H-2-120237 SH 1	M70	MECHANICAL MELTER VESSEL ASSEMBLY DIMENSIONAL RECORD	0
H-2-120237 SH 2	M71	MECHANICAL MELTER VESSEL ASSEMBLY DIMENSIONAL RECORD	0
H-2-120237 SH 3	M72	MECHANICAL MELTER VESSEL ASSEMBLY DIMENSIONAL RECORD	0
H-2-120237 SH 4	M73	MECHANICAL MELTER VESSEL ASSEMBLY DIMENSIONAL RECORD	0
H-2-120237 SH 5	M74	MECHANICAL MELTER VESSEL ASSEMBLY DIMENSIONAL RECORD	0
H-2-120237 SH 6	M75	MECHANICAL MELTER VESSEL ASSEMBLY DIMENSIONAL RECORD	0
H-2-120238 SH 1	M76	BB-130-003,4,5,6 MELTER BUS BARS PARTS LIST & NOTES	0
H-2-120238 SH 2	M77	BB-130-003,4,5,6 MELTER BUS BARS ELECTRODES L2 & L4	0
H-2-120238 SH 3	M78	BB-130-003,4,5,6 MELTER BUS BARS ELECTRODES L1 & L3	0
H-2-120238 SH 4	M79	BB-130-003,4,5,6 MELTER BUS BARS DETAILS	0
H-2-120239 SH 1	M80	HD-130-002 MELTER FRAME LIFTING YOKE ASSEMBLY	0
H-2-120239 SH 2	M81	HD-130-002 MELTER FRAME LIFTING YOKE PARTS DETAILS	0
H-2-120242 SH 1	M82	ME-130-001 MELTER REFRACTORY/INSUL PRTS LIST & GENERAL NOTES	1
H-2-120242 SH 2	M83	ME-130-001 MELTER REFRACTORY/INSUL ASSEMBLY	0
H-2-120242 SH 3	M84	ME-130-001 MELTER REFC/INSUL INSTALLATION DIMENSIONS	0
H-2-120242 SH 4	M85	ME-130-001 MELTER REFC/INSUL INSTALLATION DIMENSIONS	0
H-2-120242 SH 5	M86	ME-130-001 MELTER REFRACTORY/INSUL SUPERSTRUCTURE REFR	0
H-2-120242 SH 6	M87	ME-130-001 MELTER REFRACTORY/INSUL SUPERSTRUCTURE REFR	0
H-2-120242 SH 7	M88	ME-130-001 MELTER REFC/INSUL SUPERSTRUCTURE REFR	0
H-2-120242 SH 8	M89	ME-130-001 MELTER REFRACTORY/INSUL K3 REFRACTORY	0
H-2-120242 SH 9	M90	ME-130-001 MELTER REFRACTORY/INSUL K3 REFRACTORY	0
H-2-120242 SH 10	M91	ME-130-001 MELTER REFRACTORY/INSUL ZIRNUL REFRACTORY	0
H-2-120242 SH 11	M92	ME-130-001 MELTER REFRACTORY/INSUL HEAD LINER DETAILS	0
H-2-120242 SH 12	M93	ME-130-001 MELTER REFRACTORY/INSUL SIDE LINER DETAILS	0
H-2-120242 SH 13	M94	ME-130-001 MELTER REFRACTORY/INSUL RING & SLEEVE DETAILS	0
H-2-120242 SH 14	M95	ME-130-001 MELTER REFR/INSUL RISER OUTER INSULATION	0
H-2-120242 SH 15	M96	ME-130-001 MELTER REFR/INSUL RISER INNER INSULATION	0
H-2-120242 SH 16	M97	ME-130-001 MELTER REFR/INSUL POUR SPOUT OUTER INSUL	0
H-2-120242 SH 17	M98	ME-130-001 MELTER REFR/INSUL POUR SPOUT INNER INSUL	0
H-2-120242 SH 18	M99	ME-130-001 MELTER REFR/INSUL RISER-END DETAILS	0
H-2-120249 SH 1	M100	ME-130-001 MELTER ARGON FEEDING TUBE ASSY	0
H-2-120249 SH 2	M101	ME-130-001 MELTER ARGON FEEDING TUBE T/C SUPPORT BRACKET	0
H-2-120249 SH 3	M102	ME-130-001 MELTER ARGON FEEDING TUBE PACKING ASSY	0
H-2-120249 SH 4	M103	ME-130-001 MELTER ARGON FEEDING TUBE DETAILS	0
H-2-120249 SH 5	M104	ME-130-001 MELTER ARGON FEEDING TUBE SECTIONS & DETAILS	0
H-2-120365	M105	ME-130-001 RISER DUMMY HEATER ASSEMBLY	0
H-2-120403 SH 1	M106	MY-130-001 MELTER SUPPORT BEAM PARTS LIST & NOTES	0
H-2-120403 SH 2	M107	MY-130-001 MELTER SUPPORT BEAM ASSEMBLY	0
H-2-120403 SH 3	M108	MY-130-001 MELTER SUPPORT BEAM SECTIONS & SECTIONS	0
H-2-120403 SH 4	M109	MY-130-001 MELTER SUPPORT BEAM SECTIONS & DETAILS	0
ELECTRICAL			
H-2-122420 SH 1	E1	ELECTRICAL GENERAL NOTES, SYMBOLS & DETAILS	0
H-2-122420 SH 2	E2	ELECTRICAL GENERAL NOTES, SYMBOLS & DETAILS	0
H-2-122421	E3	ELECTRICAL MELTER VESSEL ASSY BLOCK DIAGRAM	0
H-2-122422 SH 1	E4	ELECTRICAL CONNECTION DIAGRAM ME-130-001	0
H-2-122422 SH 2	E5	ELECTRICAL CONNECTION DIAGRAM ME-130-001	0
H-2-122422 SH 3	E6	ELECTRICAL CONNECTION DIAGRAM ME-130-001	0
H-2-122422 SH 4	E7	ELECTRICAL CONNECTION DIAGRAM ME-130-001	0
H-2-122422 SH 5	E8	ELECTRICAL CONNECTION DIAGRAM ME-130-001	0
H-2-122422 SH 6	E9	ELECTRICAL CONNECTION DIAGRAM ME-130-001	0
H-2-122422 SH 7	E10	ELECTRICAL CONNECTION DIAGRAM ME-130-001	0
H-2-122422 SH 8	E11	ELECTRICAL CONNECTION DIAGRAM ME-130-001	0
H-2-122422 SH 9	E12	ELECTRICAL CONNECTION DIAGRAM ME-130-001	0
H-2-122422 SH 10	E13	ELECTRICAL CONNECTION DIAGRAM ME-130-001	0
H-2-122422 SH 11	E14	ELECTRICAL CONNECTION DIAGRAM ME-130-001	0
PIPING			
H-2-125551 SH 1	P1	MELTER FRAME/VESSEL PIPING CONNECTION IDENTIFICATION	0
H-2-125551 SH 2	P2	MELTER FRAME/VESSEL ELEC & INSTR CONNECTION IDENTIFICATION	0
H-2-125551 SH 3	P3	MELTER FRAME/VESSEL ELEC & INSTR CONNECTION IDENTIFICATION	0
H-2-127459 SH 1	-	PIPING ISOMETRIC	0
H-2-127459 SH 2	-	PIPING ISOMETRIC	0



PROJECT AREA MAP
SCALE : NONE

1	2/10/92	REVISION PER CR-HWVP-0981	LK	SS	LK	JS
0	12/18/92	APPROVED FOR CONSTRUCTION	JLD	JLD	JLD	JS
REV NO.	DATE	REVISION DESCRIPTION	APPROVAL INITIALS			
DRAWING NO. B116010A		UNIQUE NO. 2B:IBM:ACD2:12.C1:SS				
ENGINEERING RELEASE						
REV _____ DATE _____			U.S. DEPARTMENT OF ENERGY			
ERD			Richard Field Office DE - AC06-86R110838			
SIGNATURE		DATE				
PROJ. DIR. R.S. POULTER		12/18/92				
QA MGR. B.E. RITBERG		12/18/92				
INDEPENDENT SAFETY MGR. J. MARTIN		12/18/92				
PROJECT MGR. H.L. ROBERTSON		12/18/92				
SYSTEMS MGR. J.L. SMETS		12/18/92				
ENGINEERING MGR. P.J. SPEIDEL		12/18/92				
SUPERVISOR J.L. DATTE		12/16/92				
DESIGN ENGINEER S. SAM		12/16/92				
CHECKED J.L. DATTE		12/16/92				
DRAWN S.SAM		09/24/92				
CLASSIFICATION		BY				
NONE		NOT RECD				
DRAWING NUMBER		H-2-116010				
SHEET		1				
OF		1				
REV		1				

DWG NO.	DRAWING TITLE
	REFERENCE DRAWINGS
NEXT USED ON	

TORQUE TABLE			
SCREW SIZE	SOCKET HD CAP SCREWS	HEX NUTS & MACH SCREWS	CAPTIVE BOLTS
7/8	TORQUE FT LBS ± 5% 121	TORQUE FT LBS ± 5% —	TORQUE FT LBS ± 5% —
1	—	420	—

GENERAL NOTES: UNLESS OTHERWISE SPECIFIED

- INTERPRET DIMENSIONING & TOLERANCING PER ANSI Y14.5-1982
- ALL MATERIALS SHALL BE AS SPECIFIED. ANY MATERIAL SUBSTITUTION REQUIRES WRITTEN APPROVAL OF THE BUYER.
- FABRICATION AND ASSEMBLY OF THIS EQUIPMENT PER SPECIFICATION B-595-P-P06A-13250.
- TEST GASKETS:
 - HEAD/SHELL GASKET TO BE SILVER PLATED STAINLESS STEEL O-RING:
 - 1/2" OD X .050 WALL 304 SST TUBING X 105.968 +.010/-0.000 OD.
 - SILVER PLATED .004/.006 THICK.
 - 8 ENERGIZING SLOTS IN ID.
 - NOZZLES "A" & "T" GASKETS TO BE SILVER PLATED C RINGS:
 - SELLER SHALL FURNISH 1/8" THICK NEOPRENE FOR ALL OTHER NOZZLES.
- TEST BLIND FLANGES:
 - SELLER TO FURNISH ALL NOZZLE CLOSURES (BLIND FLANGES, ETC.) DURING TESTING.
 - BLIND FLANGES FOR NOZZLES "A" & "T" SHOULD BE MINIMUM OF 1-7/8" THICK "C" CLAMPED AS REQUIRED TO PROVIDE METAL TO METAL CONTACT.
 - C-RING GROOVE & FLANGE FACE:
 - GROOVE I.D. TO BE 13.160/13.170
 - GROOVE WIDTH TO BE .30/.32
 - GROOVE DEPTH TO BE .195/.200
 - GROOVE FINISH TO BE 32 RMS
 - CORNER RADII TO BE .05
 - BOTTOM OF GROOVE TO BE PARALLEL TO FLANGE FACE WITHIN .002
 - GROOVE TO BE FLAT WITHIN .0005/ INCH, .005 TOTAL.
 - FLANGE FACE TO BE FLAT WITHIN .0005/ INCH, .005 TOTAL, AND FINISHED TO 32 RMS IN THE SEAL AREA.
 - ANY TOOL MARKS MUST BE CONCENTRIC.
- TORQUE ALL FASTENERS PER TORQUE TABLE.
- LUBRICATE ALL THREADED FASTENERS WITH CHEVRON NRR GREASE 235 OR EQUAL PRIOR TO FINAL ASSEMBLY.
- B-TYPE THERMOCOUPLE ASSEMBLY WILL BE BUYER SUPPLIED.
- REFER TO DRAWING H-2-120237 FOR MELTER TOP HEAD NUT TORQUE AND TORQUEING SEQUENCE.
- THE MELTER FRAME AND SUPPORT BEAMS ARE DESIGNED FOR OPERATING LOADS, CRANE LIFT LOADS AND SEISMIC LOADS BASED ON SAFETY CLASS 1 DESIGN BASIS EARTHQUAKE (DBE) WITH A MAXIMUM FREE FIELD HORIZONTAL GROUND ACCELERATION OF 0.2g AND A SIMULTANEOUS VERTICAL GROUND ACCELERATION OF 2/3 THE HORIZONTAL ACCELERATION.
- ABBREVIATIONS ARE IN ACCORDANCE WITH ASME Y1.1-1989.

PARTS/MATERIAL LIST						
QTY	RECD	PART/DASH NUMBER	NOMENCLATURE/DESCRIPTION	MATERIAL/REFERENCE	SHEET	ITEM NO.
020	010	-010	MELTER VESSEL/FRAME ASSEMBLY		2	1
						2
						3
						4
1		H-2-120153-010	MELTER FRAME & NOZZLE ASSEMBLY			5
1		H-2-120403-010	MELTER SUPPORT BEAM ASSEMBLY			6
1		H-2-120235-010	MELTER TOP HEAD ASSEMBLY			7
1		H-2-120236-010	MELTER SHELL ASSEMBLY			8
1		H-2-120238-010	BUS BAR ELECTRODE L4			9
1		H-2-120238-020	BUS BAR ELECTRODE L2			10
1		H-2-120238-030	BUS BAR ELECTRODE L3			11
1		H-2-120238-040	BUS BAR ELECTRODE L1			12
1		H-2-120086-010	POUR SPOUT HEATER SUPPORT ASSEMBLY			13
1		H-2-120122-010	POUR SPOUT DUMMY HEATER ASSEMBLY			14
1		H-2-120123-010	DUMMY INCONEL TUBE ASSEMBLY			15
1		H-2-120124-010	DUMMY DRAIN PLUG WELDMENT			16
1		H-2-120242-010	MELTER REFRACTORY/INSULATION			17
1		H-2-120249-010	ARGON FEEDING TUBE ASSEMBLY			18
1		H-2-120365-010	DUMMY HEATER INSULATION ASSEMBLY			19
1		H-2-120075-010	INCONEL DAM ASSEMBLY			20
1		H-2-120194-010	POUR SPOUT ADAPTER ASSEMBLY			21
						22
						23
						24
1		①	B-TYPE THERMOCOUPLE ASSEMBLY	②		25
						26
						27
						28
56			WASHER, FLAT, 1" TYPE B, SERIES N	ANSI B18.22.1 304 SST		29
56		⑨	HEX NUT, 1-BUNC-2B	ASME-SA194 304 SST GRADE 8F		30
4			SCREW, HEX HD 7/8-9UNC-2A X 2L	ASME-SA193 GRADE BBS		31
1			HEX NUT, 3 1/2-BUNF-2B	6061-T651 ALUMINUM ALLOY		32

UNLESS OTHERWISE SPECIFIED	
1. DIMENSIONS AND TOLERANCES ARE IN INCHES	TOLERANCES: DECIMALS: .X = ± .1 .XX = ± .01 .XXX = ± .005
2. ALL MACHINED SURFACES SHALL BE 125 MAXIMUM	FRACTIONS: ± 1/16"
3. REMOVE BURRS AND BREAK ALL SHARP EDGES .03 MAX	ANGULAR: ± 0'30'

DWG NO.	DRAWING TITLE
H-2-116010	MELTER VESSEL ASSEMBLY DRAWING INDEX
	REFERENCE DRAWINGS
	NEXT USED ON

QUALITY LEVEL 1
SAFETY CLASS 3

1	9/10/92	REVISED PER CR HWVP-0981	JL	ELC	CP	NA	NA
0	12/18/92	ADDED DESCRIPTION	NA	NA	NA	NA	NA
		APPROVED FOR CONSTRUCTION	JH	AR	CJD	NA	NA

REV NO.	DATE	REVISION DESCRIPTION	APPROVAL INITIALS

CADFILE: B120052A CACODE: 2B:IBM:ACD2:12.C1:SS

ENGINEERING RELEASE
REV _____ DATE _____

ERO _____

SIGNATURE _____ DATE _____

PROJ DIR: NA
QA MGR: NA
INDEPENDENT SAFETY MGR: NA
PROJECT MGR: NA
SYSTEMS MGR: NA
ENGINEERING MGR: NA
SUPERVISOR: C.J.DIVONA 12/18/92
DESIGN ENGINEER: A.RUSSEL 12/18/92
CHECKED: J.HERBRAND 12/18/92
DRAWN: J.KAPPELLER 3-3-92

PROJECT TITLE: HANFORD WASTE VITRIFICATION PLANT
PROJECT: B-595 FLUOR CONTRACT NO.: 8457 CHSR NO.: P06A
SCALE: NONE BLDG NO.: 1 INDEX NO.:
DRAWING NUMBER: H-2-120052 SHEET: 1 OF: 5 REV: 1

U.S. DEPARTMENT OF ENERGY
Richland Field Office
DE - AC06-B6RL10838

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

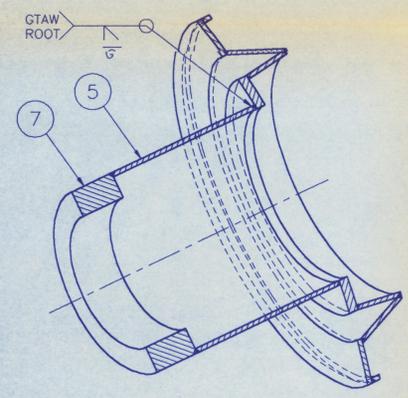
ME-130-001
MELTER VESSEL/FRAME ASSY
PARTS LIST & NOTES

DISTRIBUTION CODE: 402 M1 ACAD INITIALS: TS DATE: 08/19/93

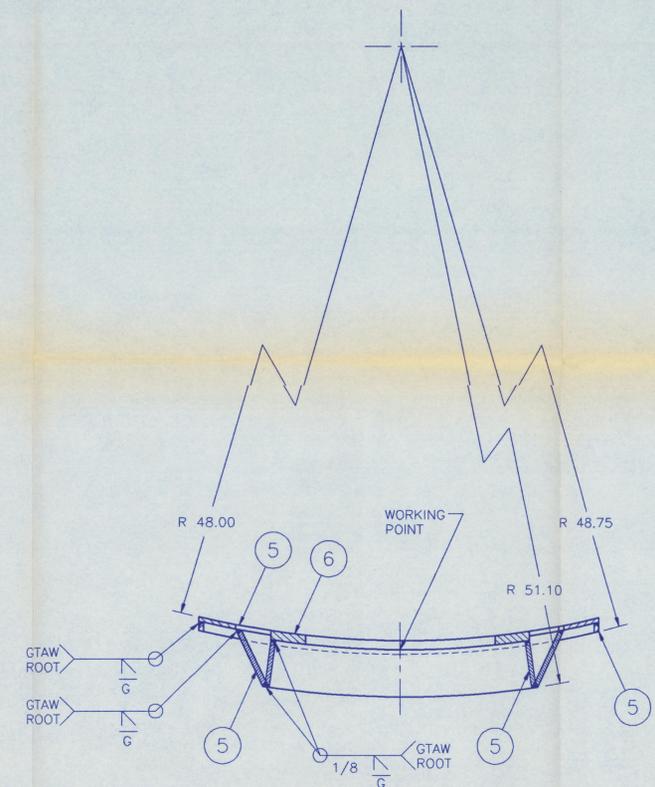
PARTS/MATERIAL LIST					
QTY REQD	PART/DASH NUMBER	NOMENCLATURE/DESCRIPTION	MATERIAL/REFERENCE	SHEET	ITEM NO.
1	-010	INCONEL DAM WELDMENT		1	1
					2
					3
					4
AR		PLATE, 1/4 THK			5
AR		PLATE, 1/2 THK			6
AR		PLATE, 1 1/2 THK			7
					8
					9

GENERAL NOTES: UNLESS OTHERWISE SPECIFIED

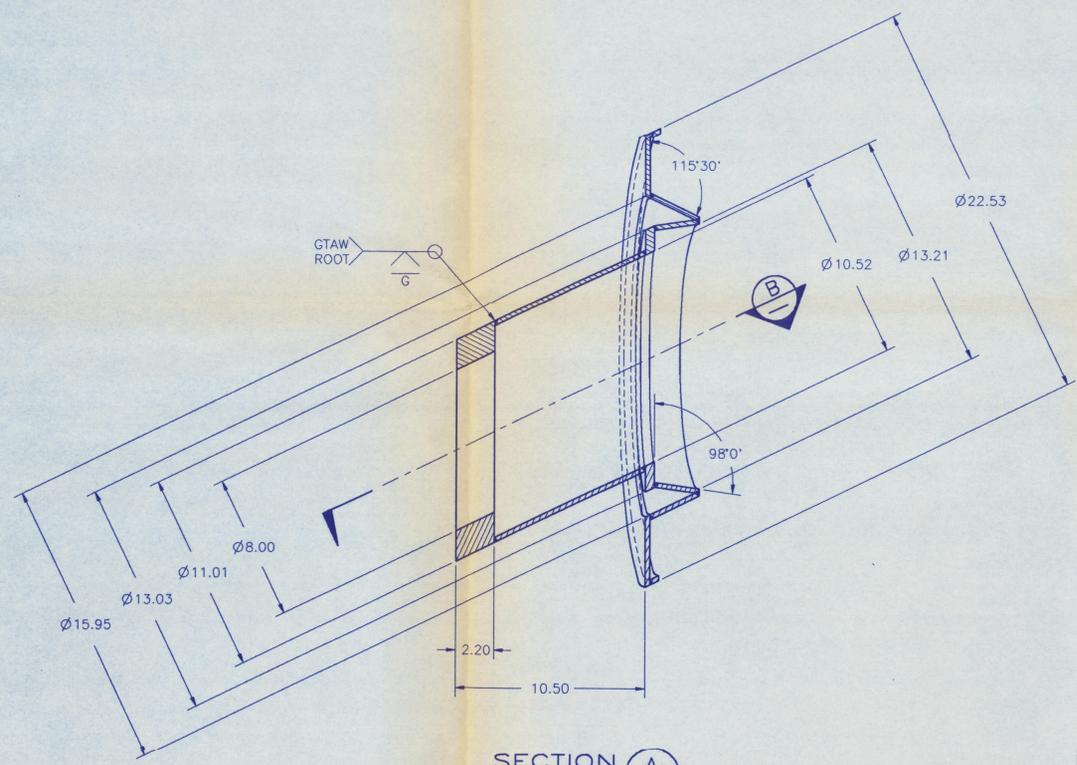
- INTERPRET DIMENSIONING & TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1982.
 - ABBREVIATIONS ARE IN ACCORDANCE WITH ASME Y1.1-1989.
 - FILLET RADII .015 MAXIMUM FOR MACHINED PARTS.
 - WELDING SYMBOLS ARE IN ACCORDANCE WITH ANSI/AWS A2.4-86.
 - ALL MATERIALS SHALL BE AS SPECIFIED. ANY MATERIAL SUBSTITUTION REQUIRES WRITTEN APPROVAL FROM THE BUYER.
 - FABRICATION AND ASSEMBLY OF THIS EQUIPMENT IN ACCORDANCE WITH SPECIFICATION B-595-P-PO6A-13250.
- MODIFIED INCONEL ALLOY 690 MATERIAL AND WELDING FILLER WILL BE BUYER SUPPLIED.



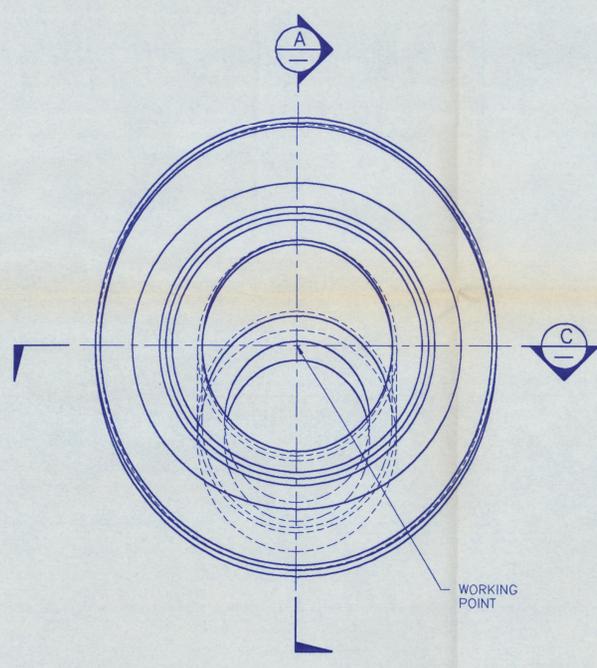
SECTION B



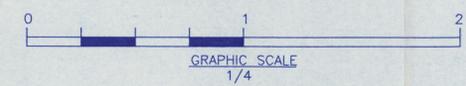
SECTION C



SECTION A



1 INCONEL DAM WELDMENT



UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS AND TOLERANCES ARE IN INCHES	TOLERANCES:
	DECIMALS: .X = ± .1
	.XX = ± .03
	.XXX = ± .010
2. ALL MACHINED SURFACES SHALL BE 125/ MAXIMUM	
3. REMOVE BURRS AND BREAK ALL SHARP EDGES .03 MAX	FRACTIONS: ±
	ANGULAR: ± 1°

QUALITY LEVEL 1
SAFETY CLASS 3

1	8/10/92	REVISED PER CR HWVP-0981	JL	AKR	CJD	NA	NA
		ADDED DESCRIPTION	NA	NA	NA	NA	NA
0	12/18/92	APPROVED FOR CONSTRUCTION	JH	AC	CJD	NA	NA
			NA	NA	NA	NA	NA

CADFILE	B120075A	CHGCODE	2B:IBM:ACD2:12.C1:SS
ENGINEERING RELEASE	REV	DATE	
ERD			
SIGNATURE	DATE		
DESIGN ENGR	NA		
PROJECT MGR	NA		
INDEPENDENT SAFETY MGR	NA		
SYSTEMS MGR	NA		
ENGINEERING MGR	NA		
SUPERVISOR	C.J. DIVONA	12/18/92	
DESIGN ENGINEER	A. CHEN	12/18/92	
CHECKED	J. HERBRAND	12/18/92	
DRAWN	L.C. SANVICTORES	02-28-92	
CLASSIFICATION	NONE	BY	NOT REQD
DWG NO.	H-2-116010	DRAWING TITLE	MELTER VESSEL ASSEMBLY DRAWING INDEX
REFERENCE DRAWINGS			
NEXT USED ON			
PROJECT TITLE	HANFORD WASTE VITRIFICATION PLANT		
FLUOR CONTRACT NO.	B-595	CHBS NO.	P06A
SCALE	1/4	BLDG NO.	1
DRAWING NUMBER	H-2-120075	SHEET	1
		OF	1
		REV	1

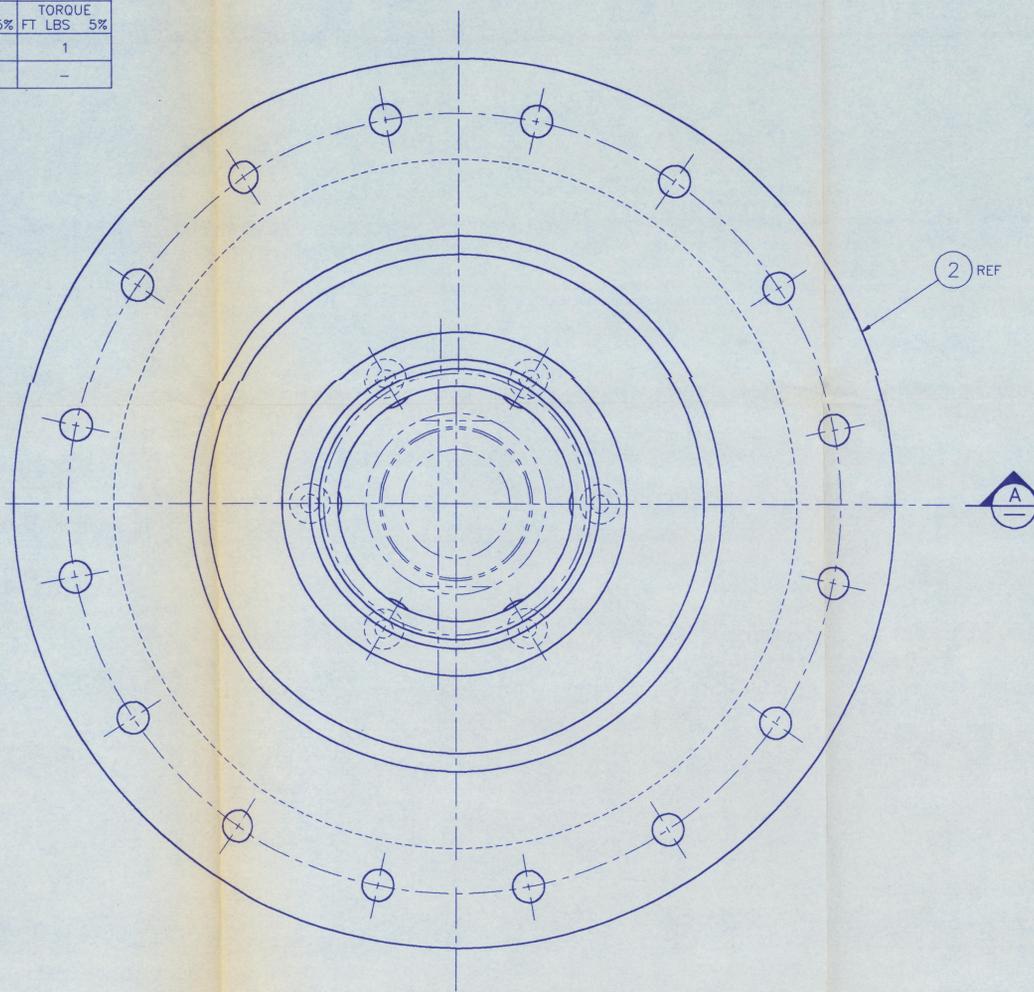
U.S. DEPARTMENT OF ENERGY
Richland Field Office
DE - AC06-86RL10838

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

ME-130-001
MELTER SHELL
INCONEL DAM WELDMENT

TORQUE TABLE

SCREW SIZE	SOCKET HD CAP SCREWS	HEX NUTS & MACH SCREWS	CAPTIVE BOLTS	PAN HD SCREWS
	TORQUE FT LBS ± 5%	TORQUE FT LBS ± 5%	TORQUE FT LBS ± 5%	TORQUE FT LBS ± 5%
#10	-	-	-	1
1/2	-	67	-	-



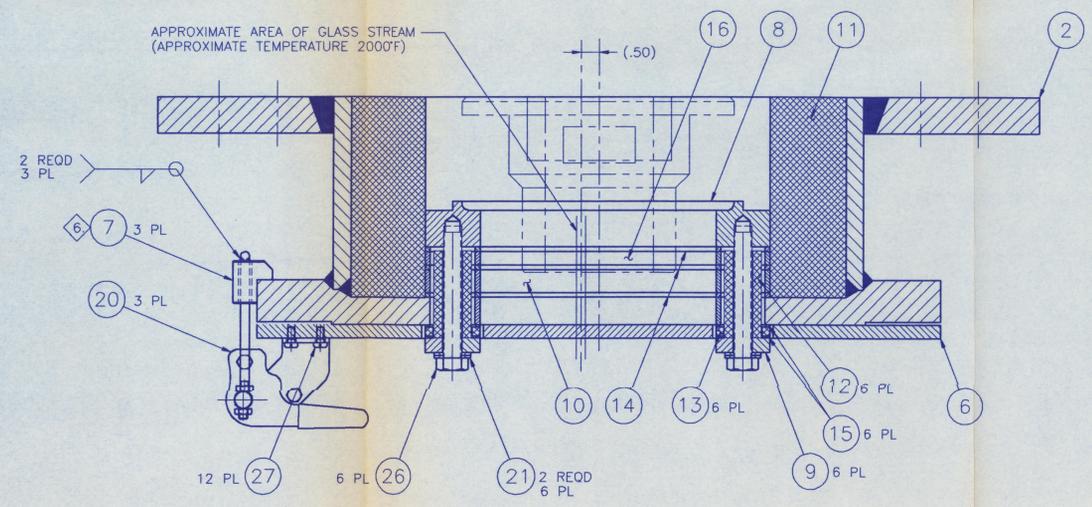
GENERAL NOTES: UNLESS OTHERWISE SPECIFIED

- INTERPRET DIMENSIONING & TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1982.
- ABBREVIATIONS ARE IN ACCORDANCE WITH ASME Y1.1-1989.
- FILLET RADII .015 MAXIMUM FOR MACHINED PARTS.
- ALL MATERIALS SHALL BE AS SPECIFIED. ANY MATERIAL SUBSTITUTION REQUIRES WRITTEN APPROVAL FROM THE BUYER.
- SCREW THREADS SHALL BE IN ACCORDANCE WITH ANSI B1.1. ALL THREADED HOLES SHALL HAVE A LEAD IN CHAMFER OF 90° TO 108° INCLUDED ANGLE EQUAL TO OR .030 LARGER THAN THE MAJOR THREAD DIAMETER.
- ASSEMBLE ITEM 7 TO ITEM 6. INSTALL THE ASSEMBLY ON TO ITEM 2 SO THAT ITEM 7 GRIPS NOZZLE FLANGE PROPERLY BY THE EDGE. INSTALL 2 OTHER CLAMPS LIKEWISE WITH EVEN SPACING OF 120° APART.
- FABRICATION AND ASSEMBLY OF THIS EQUIPMENT IN ACCORDANCE WITH SPECIFICATION B-595-P-P06A-13250
- LUBRICATE ALL THREADED FASTENERS WITH CHEVRON NRR GREASE 235 OR EQUAL PRIOR TO FINAL ASSEMBLY.
- TORQUE ALL FASTENERS PER TORQUE TABLE.
- MATERIAL TO BE ALUMINA, 99.5% IMPERVIOUS HIGH STRENGTH ELECTRICAL GRADE CERAMIC.
- INCONEL ALLOY 690 MATERIAL WILL BE BUYER SUPPLIED.

PARTS/MATERIAL LIST

QTY	REQD	PART/DASH NUMBER	NOMENCLATURE/DESCRIPTION	MATERIAL/REFERENCE	SHEET	ITEM NO.
1	X	-010	POUR SPOUT ADAPTER ASSEMBLY		1	1
1	X	-020	ADAPTER		2	2
						3
						4
						5
1		-001	PLATE, COVER 3/8 THK	ASTM B209 TYPE 6061-T651	2	6
3		-002	CLAMP, DUMMY	ASTM-A240 304L SST	2	7
1		-003	HOLDER, BELLOWS	ASTM-A240 304L SST	3	8
6		-004	RETAINER	ASTM-A276 304 SST	3	9
1		-005	ISOLATOR	10	3	10
1		-006	INSULATOR	ZIRCAR, TYPE AL-30	3	11
6		-007	INSULATOR	10	3	12
6		-008	INSULATOR	10	3	13
3		-009	GASKET, 1/8 THK	ZIRCAR, TYPE 99R	3	14
12		-011	GASKET, 1/16 THK	ZIRCAR, TYPE 99R	3	15
1		-012	ISOLATOR	10	3	16
						17
						18
						19
3		5135A35	PERPENDICULAR PULL CLAMP	McMASTER-CARR OR EQUAL		20
12		9713K77	WASHER, BELLEVILLE DISC	McMASTER-CARR OR EQUAL		21
						22
						23
						24
AR			PLATE, 1/2 THK	HASTELOY C-276		25
6			BOLT, HEXAGONAL HEAD, 1/2-13 UNC-2A X 3.75 LG	10		26
12			SCREW, PAN HD 10-24 UNC-2A X 3/8 LG	10		27
AR			PLATE, 1 1/4 THK	HASTELOY C-276		28
AR			PLATE, 1 THK	HASTELOY C-276		29

1 POUR SPOUT ADAPTER ASSEMBLY



- UNLESS OTHERWISE SPECIFIED
- DIMENSIONS AND TOLERANCES ARE IN INCHES
 - ALL MACHINED SURFACES SHALL BE 12 $\sqrt{3}$ MAXIMUM
 - REMOVE BURRS AND BREAK ALL SHARP EDGES .03 MAX
- TOLERANCES:
 DECIMALS: .X = ± .1
 .XX = ± .03
 .XXX = ± .010
 FRACTIONS: ± 1/4"
 ANGULAR: ± 1°

QUALITY LEVEL 1 SAFETY CLASS 3

1	10/10/92	REVISED PER CR HWVP-0981	DL	AKL	CJS	NA	NA
0	12/18/92	APPROVED FOR CONSTRUCTION	JH	AC	CJD	NA	NA

REV NO. DATE REVISION DESCRIPTION APPROVAL INITIALS

CADFILE: B120194A CADCODE: 2B:IBM:ACD2:12.C1:SS

ENGINEERING RELEASE
 REV _____ DATE _____
 ERO _____

SIGNATURE _____ DATE _____

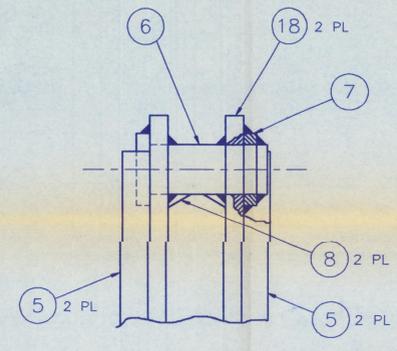
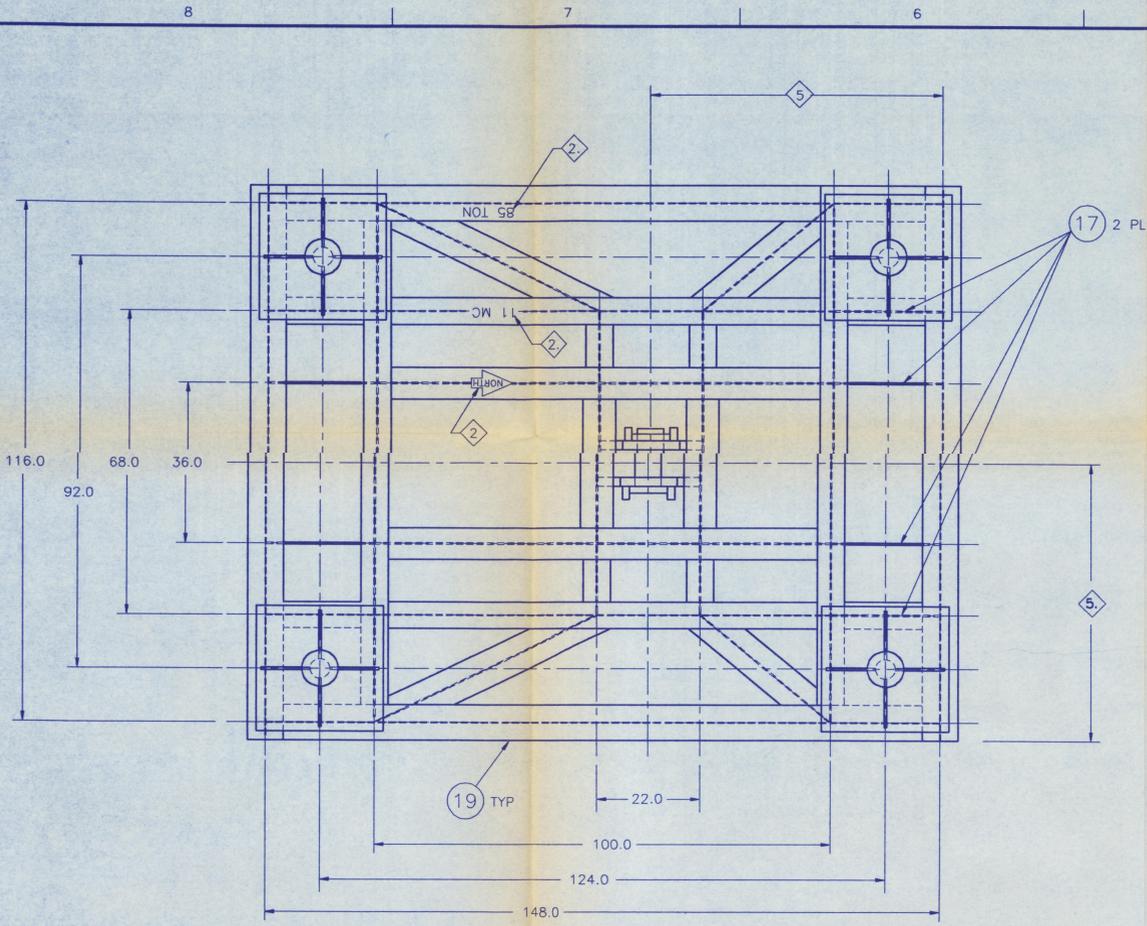
PROJ DIR NA
 SR MGR NA
 INDEPENDENT SAFETY MGR NA
 PROJECT MGR NA
 SYSTEMS MGR NA
 ENGINEERING MGR NA

SUPERVISOR C.J. DIVONA 12/18/92
 DESIGN ENGINEER A. CHEN 12/18/92

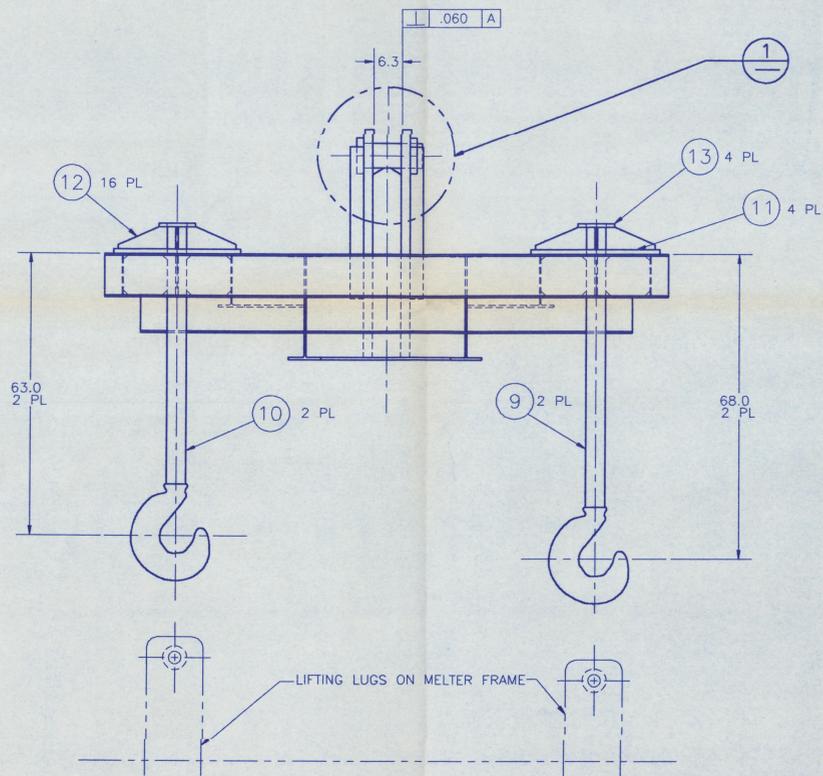
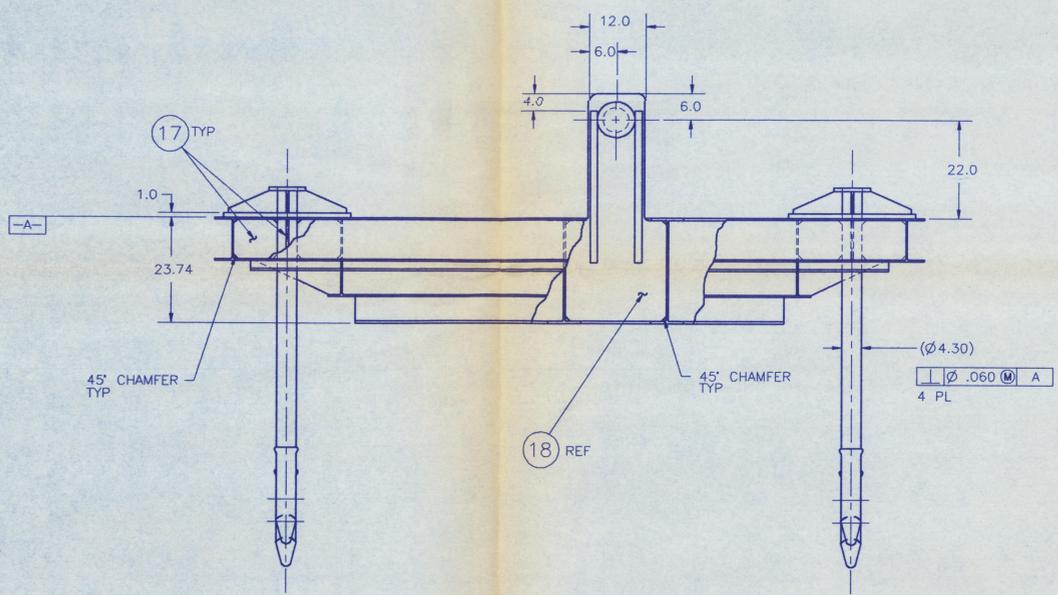
PROJECT TITLE: HANFORD WASTE VITRIFICATION PLANT
 PROJECT B-595 FLUOR CONTRACT NO. 8457 CWSB NO. P06A
 CHECKED J. HERBRAND 12/18/92 SCALE 1/2 BLDG NO. 1 INDEX NO.
 DRAWN L.C. SANVICTORES 04/08/92

CLASSIFICATION BY DRAWING NUMBER SHEET OF REV
 NONE NOT REQD H-2-120194 1 3 1

H-2-116010	MELTER VESSEL ASSEMBLY DRAWING INDEX
DWG NO.	DRAWING TITLE
REFERENCE DRAWINGS	
NEXT USED ON	



DETAIL 1
SCALE: 1/8



1 MELTER FRAME LIFTING YOKE

UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS AND TOLERANCES ARE IN INCHES
TOLERANCES:
DECIMALS: .X = ± .06
.XX = ± .03
.XXX = ± .010

2. ALL MACHINED SURFACES SHALL BE 125/ MAXIMUM

3. REMOVE BURRS AND BREAK ALL SHARP EDGES .03 MAX
FRACTIONS: ± 1/8"
ANGULAR: ± 0°30'

PARTS/MATERIAL LIST						
QTY	REQD	PART/DASH NUMBER	NOMENCLATURE/DESCRIPTION	MATERIAL/REFERENCE	SHEET	ITEM NO.
	X	-010	MELTER FRAME LIFTING YOKE		1	1
						2
						3
						4
4		-001	PLATE, STIFFENER	ASTM-A572	2	5
1		-002	PIN, HOOK	ASTM-A668 CLASS-K	2	6
1		-003	CAP, HOOK PIN	ASTM-A572	2	7
2		-004	PLATE, GUSSET	ASTM-A572	2	8
2		-005	HOOK, LONG	ALLOY STEEL	2	9
2		-006	HOOK, SHORT	ALLOY STEEL	2	10
4		-007	PLATE, TOP	ASTM-A572	2	11
16		-008	PLATE, GUSSET	ASTM-A572	2	12
4		-009	PLATE, CAP	ASTM-A572	2	13
						14
						15
						16
AR			PLATE, 1/2 THK	ASTM-A572		17
AR			PLATE, 2 THK	ASTM-A572		18
AR			STRUCTURAL FRAME MEMBER	ASTM-A572		19

- NOTES: UNLESS OTHERWISE SPECIFIED.
- APPROXIMATE WEIGHT 10,000 POUNDS.
 - YOKE IS TO BE CLEARLY LABELED TO SHOW NORTH-SOUTH ORIENTATION, YOKE NUMBER AND CAPACITY.
 - FABRICATION AND ASSEMBLY OF THIS EQUIPMENT IN ACCORDANCE WITH SPECIFICATION B-595-P-PO6A-14400.
 - LIFTING YOKE CAPACITY 87 TONS.
 - TO BE DETERMINED BY THE SELLER IN ACCORDANCE WITH SPECIFICATION B-595-P-PO6A-14400.

QUALITY LEVEL 1
SAFETY CLASS 3

1	10/4/92	REVISED PER CR HWVP-0981	JL	AR	CJD	NA	NA	NA	NA
0	12/18/92	APPROVED FOR CONSTRUCTION	JH	AR	CJD	NA	NA	NA	NA

REV NO.	DATE	REVISION DESCRIPTION	APPROVAL INITIALS

CADFILE	B120239A	CADCODE	2B:IBM:ACD2:12.C1:SS
ENGINEERING RELEASE	REV	DATE	
ERD			
SIGNATURE	DATE		
PROJ DIR	NA		
DESIGN ENGR	NA		
INDEPENDENT SAFETY MGR	NA		
PROJECT MGR	NA		
SYSTEMS MGR	NA		
ENGINEERING MGR	NA		
SUPERVISOR	C.J. DIVONA	12/18/92	
DESIGN ENGINEER	A. RUSSEL	12/18/92	
CHECKED	J. HERBRAND	12/18/92	
DRAWN	R. MOREL	5/11/92	
CLASSIFICATION	NONE	NOT RECD	

PROJECT TITLE	HANFORD WASTE VITRIFICATION PLANT
PROJECT NO.	H-2-116010
PROJECT CODE	B-595
PROJECT NAME	MELTER VESSEL ASSEMBLY DRAWING INDEX
PROJECT NUMBER	8457
PROJECT CODE	PO6A
SCALE	1/16
SHEET	1
OF	2
REV	1

DWG NO.	H-2-116010
DRAWING TITLE	MELTER VESSEL ASSEMBLY DRAWING INDEX
REFERENCE DRAWINGS	
NEXT USED ON	

PARTS/MATERIAL LIST						
QTY	REQ'D	PART/DASH NUMBER	NOMENCLATURE/DESCRIPTION	MATERIAL/REFERENCE	SHEET	ITEM NO
	<input checked="" type="checkbox"/>	-010	MELTER REFRACTORY ASSEMBLY		2	1
						2
						3
						4
1		-001	TOP HEAD LINER	ALUMINA-SILICA CERAMIC FIBER	11	5
1		-002	BOTTOM HEAD LINER	ALUMINA-SILICA CERAMIC FIBER	11	6
12		-003	SIDE WALL LINER	ALUMINA-SILICA CERAMIC FIBER	12	7
1		-004	INNER INSULATION RING	ZIRCAR AL-30	13	8
1		-005	OUTER INSULATION RING	ZIRCAR AL-30	13	9
1		-006	RISER OUTER INSULATION	ZIRCAR ALC	14	10
1		-007	INCONEL DAM OUTER	ZIRCAR ALC	16	11
1		-008	RISER-END OUTER INSULATION	ZIRCAR ALC	18	12
1		-009	INNER INSULATION SLEEVE	ZIRCAR ALC	13	13
1		-011	POUR SPOUT OUTER INSUL	ZIRCAR RS-100	16	14
1		-012	RISER-END PLATE	ZIRCAR ALC	18	15
1		-013	RISER INNER INSULATION	ZIRCAR AL-30	15	16
1		-014	RISER-END INNER INSULATION	ZIRCAR AL-30	18	17
1		-015	POUR SPOUT INNER INSUL	ZIRCAR AL-30	17	18
						19
						20
						21
AR			FIBERFRAX PAPER 1/8" THK INSULATION PAPER	CARBORUNDUM OR EQUAL	2	22
AR			FIBERFRAX BLANKET 1/2" NOM. THK 8#/CU FT DENSITY	CARBORUNDUM OR EQUAL	2	23
AR			DSM 24 FIBERFRAX LDS MOLDABLE WITH 24% COLLOIDAL	CARBORUNDUM OR EQUAL	2	24
AR			SUPERSTRUCTURE REFRACTORY BLKS MONOFRAX K3 REFRACTORY BLOCK FUSED CST CHROME ALUMINA	88% (MIN) ALUMINA OR EQUAL	2	25
AR			ZIRMUL REFRACTORY BLK. MORTAR CHROME ALUMINA SHAMROCK 391	ALUMINA-ZIRCONIA-SILICA DIDER TAYLOR OR EQUAL	2	26
AR						27
AR						28
						29
						30
						31
1		H-2-120075-010	INCONEL DAM WELDMENT			32

GENERAL NOTES: UNLESS OTHERWISE SPECIFIED

- NOTES TO REFRACTORY INSTALLER
- THE REFRACTORY AND INSULATION SHALL BE INSTALLED AT THE VESSEL FABRICATOR'S SHOP.
 - ALL NOZZLE WALLS, NOZZLE FLANGE FACES, SHELL FLANGE FACE AND TOP HEAD FLANGE FACE MUST BE FREE OF ANY REFRACTORY INSTALLATION MATERIALS.
 - ALL MATERIALS SHALL BE AS SPECIFIED. ANY MATERIAL SUBSTITUTION REQUIRES WRITTEN APPROVAL OF THE BUYER.
 - FABRICATION AND ASSEMBLY OF THIS EQUIPMENT IN ACCORDANCE WITH SPECIFICATION B-595-P-P06A-13251 AND B-595-P-P06A-13254W.
 - WAPA ITEM REFERENCE SPECIFICATION SECTION 13254W.
 - ABBREVIATIONS ARE IN ACCORDANCE WITH ASME Y1.1-1989.

WAPA
QUALITY LEVEL 1
SAFETY CLASS 3

1	10/43	REVISED PER CR HWVP-0981	JH	AR	CJD	NA	NA
0	12/18/92	ADDED DESCRIPTION	NA	AR	CJD	NA	NA
0	12/18/92	APPROVED FOR CONSTRUCTION	JH	AR	CJD	NA	NA

REV NO.	DATE	REVISION DESCRIPTION	APPROVAL INITIALS

CHARIT: B120242A CADCODE: 2B:IBM:ACD2:12.C1:SS

ENGINEERING RELEASE

REV _____ DATE _____

ERO _____

U.S. DEPARTMENT OF ENERGY
Richland Field Office
OC - AC06-89R1.0836

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

ME-130-001
MELTER RFRC / INSUL
PARTS LIST & NOTES

PROJECT TITLE	HANFORD WASTE VITRIFICATION PLANT
PROJECT	B-595
FLUOR CONTRACT NO.	8457
CHGS NO.	P06A
DWG NO.	H-2-116010
DRAWING TITLE	MELTER VESSEL ASSEMBLY DRAWING INDEX
DRAWN	R. JONES
CHECKED	J. HERBRAND
DATE	12/18/92
SCALE	NONE
BUILDING NO.	1
INDEX NO.	P06A
DRAWING NUMBER	H-2-120242
SHEET	1
OF	18
REV	1

UNLESS OTHERWISE SPECIFIED

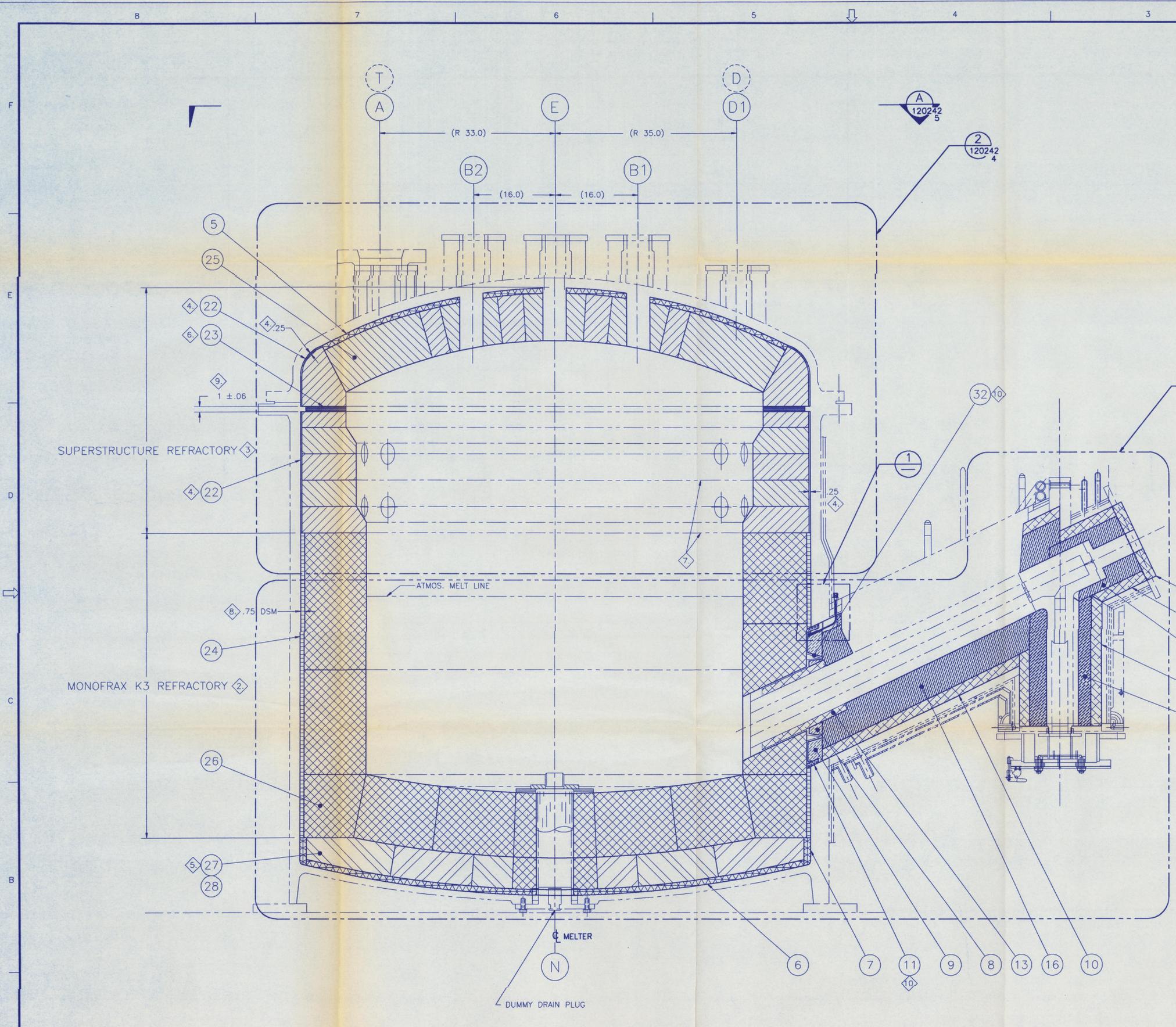
1. DIMENSIONS AND TOLERANCES ARE IN INCHES

2. REMOVE BURRS AND BREAK ALL SHARP EDGES .03 MAX

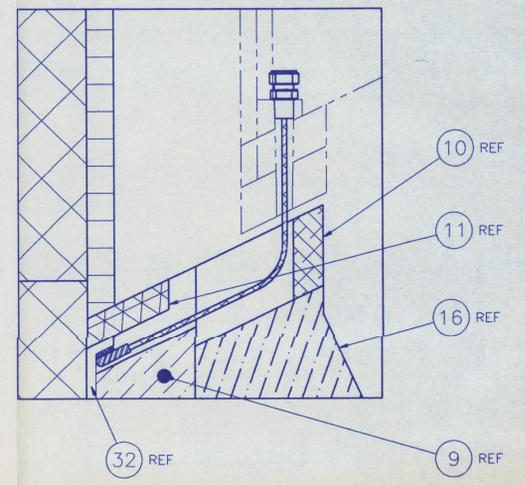
TOLERANCES:
DECIMALS: .X = ± .05
.XX = ± .01

FRACTIONS: ±
ANGULAR: ± 0° 30'

DWG NO.	H-2-116010	DRAWING TITLE	MELTER VESSEL ASSEMBLY DRAWING INDEX
REFERENCE DRAWINGS			
NEXT USED ON			



- NOTES: UNLESS OTHERWISE SPECIFIED
1. SEE SHEET 1 FOR GENERAL NOTES.
 2. MORTAR FOR MONOFRAX K-3 REFRACTORY JOINTS SHALL BE MONOFRAX "K" HEAT SET CEMENT. WAPA ITEM REFERENCE SPECIFICATION SECTION 13254W.
 3. MORTAR FOR SUPERSTRUCTURE REFRACTORY JOINTS, COURSES AND INTERFACE WITH MONOFRAX K-3 REFRACTORY SHALL BE COMPATIBLE WITH REFRACTORY SUPPLIER'S MATERIAL.
 4. INSTALL TWO LAYERS OF FIBERFRAX 970-JH PAPER, 1/8 INCH THICK, BETWEEN SUPERSTRUCTURE REFRACTORY AND VESSEL WALL AS SHOWN. BOND TO VESSEL WALL WITH FIBERFRAX COATING CEMENT OF-130.
 5. MORTAR FOR ZIRMUL REFRACTORY JOINTS SHALL BE SHAMROCK 391 CHROME ALUMINA AS MANUFACTURED BY DIDIER TAYLOR REFRACTORIES CORP., CINCINNATI, OHIO, OR EQUAL.
 6. FURNISH AND CUT 6 LAYERS OF 1/2" (NOMINAL) THICK FIBERFRAX DURABLANKET, 8#/CU FT DENSITY, 95" O.D. X 80" I.D.
 7. HEIGHT OF SUPERSTRUCTURE REFRACTORY DOME HEATER BLOCKS, NUMBERS 25 THRU 28 (SH-6 SECTION G), SHALL BE TRIMMED ON BOTTOM TO ALIGN REFRACTORY HOLES WITH SHELL NOZZLES.
 8. ITEM 24 IS TO BE PUMPED & RODDED TO ELIMINATE AIR POCKETS.
 9. 1.06 BLANKET SPACE TO BE OBTAINED BY TRIMMING TOP COURSE OF SUPERSTRUCTURE REFRACTORY AT ASSEMBLY.
 10. BASIC ASSEMBLY SEQUENCE OF INCONEL DAM (ITEM 32):
 - 1.) INSTALL ITEMS 26 & 11
 - 2.) INSTALL PREASSEMBLY OF ITEMS 32 & 8
 - 3.) WELD BUYER SUPPLIED B-TYPE THERMOCOUPLE.
 - 4.) INSTALL ITEMS 9 & 13.



DETAIL 1
SCALE: 1/2

1 MELTER REFRACTORY ASSEMBLY
SCALE: 1/8

UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS AND TOLERANCES ARE IN INCHES	TOLERANCES: DECIMALS: .X = ± .05 .XX = ± .01
2. ALL MACHINED SURFACES SHALL BE 125/ MAXIMUM	
3. REMOVE BURRS AND BREAK ALL SHARP EDGES .03 MAX	FRACTIONS: ± ANGULAR: ± 0° 30'

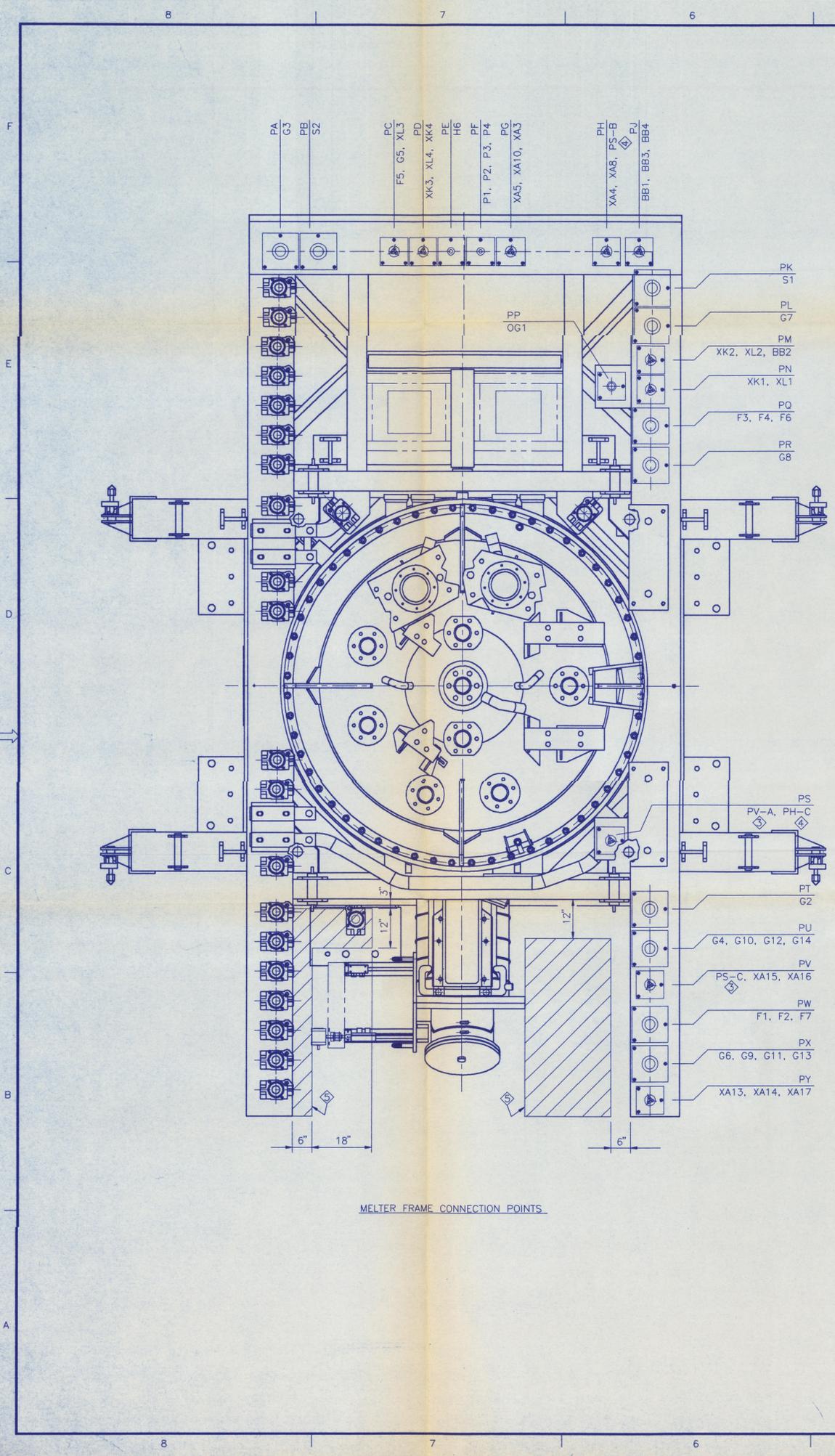
DWG NO.	H-2-116010	DRAWING TITLE	MELTER VESSEL ASSEMBLY DRAWING INDEX
CLASSIFICATION	NONE	BY	NOT RECD
REFERENCE DRAWINGS			
NEXT USED ON			

WAPA
QUALITY LEVEL 1
SAFETY CLASS 3

1	9/10/92	REVISED PER CR HHWP-0981	JH	AR	CJD	NA	NA
0	12/18/92	APPROVED FOR CONSTRUCTION	JH	AR	CJD	NA	NA

REV. NO.	DATE	REVISION DESCRIPTION	APPROVAL INITIALS
1	12/18/92	REVISED PER CR HHWP-0981	JH AR CJD
0	12/18/92	APPROVED FOR CONSTRUCTION	JH AR CJD

CAOFILE	B120242B	CAOCODE	2B:IBM:ACD2:12.C1:SS
ENGINEERING RELEASE	REV	DATE	
ERD			
SIGNATURE	DATE	U.S. DEPARTMENT OF ENERGY Richland Field Office DE - AC06-86RL10838	
PROJ DIR	NA	FLUOR DANIEL, INC. ADVANCED TECHNOLOGY DIVISION	
ENGR	NA		
INDEPENDENT SAFETY MGR	NA		
PROJECT MGR	NA		
SYSTEMS MGR	NA		
SUPERVISOR	C.J. DIVONA	12/18/92	PROJECT TITLE
DESIGN ENGINEER	A. RUSSEL	12/18/92	HANFORD WASTE VITRIFICATION PLANT
CHECKED	J. HERBRAND	12/18/92	PROJECT
DRAWN	R. JONES	05/05/92	FLUOR CONTRACT NO.
CLASSIFICATION	NONE	BY	NOT RECD
DRAWING NUMBER	H-2-120242	SHEET	OF
		2	18
		1	1



MELTER FRAME/VESSEL PIPE CONNECTIONS				REFERENCES		
FRAME CONN	MELTER NOZZLE	LINE NUMBER	P&ID NUMBER	REV NO	PIPING DESCRIPTION	
PA	G3	MRW-3"-PA-1	H-2-123150-18	5	MRW FROM SHELL (B PATH)	
PB	S2	MPS-3"-PB-1-IH	H-2-123250-1	5	AIR/STEAM TO BACKUP OFFGAS LINE IN NOZZLE T	
PC-A	F5	MSW-1/2"-PC-1	H-2-123150-21	5	MSW TO DRAIN VALVE PAD "N"	
PC-B	G5	MRW-1/2"-PC-2			MRW FROM DRAIN VALVE PAD "N"	
PC-C	XL3	MRW-1/2"-PC-3			MRW FROM DOME HEATER TRANSFORMER XT-130-003	
PD-A	XK3	MSW-1/2"-PD-1	H-2-123150-21	5	MSW TO DOME HEATER TRANSFORMER XT-130-003	
PD-B	XL4	MRW-1/2"-PD-2			MRW FM DOME HEATER TRANSFORMER XT-130-004	
PD-C	XK4	MSW-1/2"-PD-3			MSW TO DOME HEATER TRANSFORMER XT-130-004	
PE-C	H6	ARX-1/2"-PE-1	H-2-123150-6	5	ARGON SIPHON BREAK IN RISER	
PF	P1	MSW-1/2"-PF-1	H-2-123150-20	5	MSW TO ELECTRODE L1 PAD	
PF	P2				MSW TO ELECTRODE L2 PAD	
PF	P3				MSW TO ELECTRODE L3 PAD	
PF	P4				MSW TO ELECTRODE L4 PAD	
PG-C	XA3	IAX-1/2"-PG-3	H-2-123150-5	4	AIR TO OPEN/CL DR VALVE BACKUP PLUG BELLOWS	
PG-A	XA5	IAX-1/2"-PG-1			AIR TO OPEN/CLOSE DRAIN VALVE PROBE BELLOWS	
PG-B	XA10	IAX-1/2"-PG-2			AIR TO OPEN/CLOSE DRAIN VALVE PROBE BELLOWS	
PH-A	XA4	IAX-1/2"-PH-1	H-2-123150-5	4	AIR TO OPEN/CL DR VALVE BACKUP PLUG BELLOWS	
PH-B	XA8	IAX-1/2"-PH-2			AIR TO OPEN/CLOSE DRAIN BELLOWS	
PH-C	PS-B	IAX-1/2"-PH-3	H-2-123150-5 & 6	4 & 5	AIR TO CONTROLLER ON VALVE YV 006	
PJ-A	BB1	MRW-1/2"-PJ-1	H-2-123150-20	5	MRW FROM ELECTRODE L1	
PJ-B	BB3	MRW-1/2"-PJ-2			MRW FROM ELECTRODE L3	
PJ-C	BB4	MRW-1/2"-PJ-3			MRW FROM ELECTRODE L4	
PK	S1	MPS-3"-PK-1	H-2-123250-13	5	AIR/STEAM TO BACK UP OFFGAS LINE IN NOZ A	
PL	G7	MRW-3"-PL-1	H-2-123150-17	5	MRW FROM SHELL (A PATH)	
PM-C	BB2	MRW-1/2"-PM-3	H-2-123150-20	5	MRW FROM ELECTRODE L2	
PM-A	XK2	MSW-1/2"-PM-1			MSW TO DOME HEATER TRANSFORMER XT-130-002	
PM-B	XL2	MRW-1/2"-PM-2			MRW FROM DOME HEATER TRANSFORMER XT-130-002	
PN-B	XK1	MSW-1/2"-PN-2	H-2-123150-20	5	MSW TO DOME HEATER TRANSFORMER XT-130-001	
PN-A	XL1	MRW-1/2"-PN-1			MRW FROM DOME HEATER TRANSFORMER XT-130-001	
PP	OG1	MOG-2"-PP-1	H-2-123150-5	4	DRAIN BELLOWS VENT TO PW-5BS	
PQ	F3	MSW-3"-PQ-1	H-2-123150-17	5	MSW TO SHELL (A PATH)	
	F4	MSW-1 1/2"-PQ-1			MSW TO BOTTOM HEAD (A PATH)	
	F6	MSW-2"-PQ-1			MSW TO TOP HEAD (A PATH)	
	DOME HTR	MSW-3/4"-PQ-1			MSW TO DOME HEATER COVER (A PATH)	
PR	G8	MRW-3"-PR-1	H-2-123150-17	5	MRW FROM SHELL (A PATH)	
PR	DOME HTR	MRW-3/4"-PR-1	H-2-123150-17	5	MRW FROM DOME HEATER COVER (A PATH)	
PS-C	PV-A	IAX-1/2"-PV-1	H-2-123150-6	5	AIR TO CONTROLLER ON VALVE YV-008	
PS-B	PH-C	IAX-1/2"-PH-3	H-2-123150-6	5	AIR TO CONTROLLER ON VALVE YV-006	
PT	G2	MRW-3"-PT-1	H-2-123150-18	5	MRW FROM SHELL (B PATH)	
PT	DOME HTR	MRW-3/4"-PT-1	H-2-123150-18	5	MRW FROM DOME HEATER COVER ((B PATH)	
PU	G4	MRW-2"-PU-1			MRW FROM BOTTOM HEAD (B PATH)	
	G10	MRW-3"-PU-1			MRW FROM TOP HEAD (B PATH)	
	G12	MRW-3/4"-PU-1			MRW FROM RISER & POUR SPOUT END CAP (B PATH)	
	G14	MRW-1 1/2"-PU-1			MRW FROM RISER & POUR SPOUT (B PATH)	
3	PV-A	PS-C	IAX-1/2"-PV-1	H-2-123150-7	5	AIR TO CONTROLLER ON VALVE YV 008
4	PV-B	XA15	PAC-1/2"-PV-2			AIR TO NOZ D FOR MELTER TV CAMERA B
5	PV-C	XA16	MPS-1/2"-PV-3			STEAM TO NOZ D FOR MELTER TV CAMERA B
	PW	F1	MSW-2"-PW-1	H-2-123150-18	5	MSW TO TOP HEAD (B PATH)
		F2	MSW-3"-PW-1			MSW TO SHELL (B PATH)
		F7	MSW-1 1/2"-PW-1			MSW TO BOTTOM HEAD (B PATH)
		DOME HTR	MSW-3/4"-PW-1			MSW TO DOME HEATER COVER (B PATH)
	PX	G1	MRW-2"-PX-1	H-2-123150-17	5	MRW FROM TOP HEAD (A PATH)
		G6	MRW-2"-PX-1			MRW FROM TOP HEAD (A PATH)
		G9	MRW-2"-PX-1			MRW FROM BOTTOM HEAD (A PATH)
		G11	MRW-3/4"-PX-1			MRW FROM RISER & POUR SPOUT END CAP (A PATH)
		G13	MRW-1 1/2"-PX-1			MRW FROM RISER & POUR SPOUT (A PATH)
6	PY-A	XA13	PAC-1/2"-PY-1	H-2-123150-7	5	AIR TO NOZ D1 FOR MELTER TV CAMERA A
7	PY-B	XA14	MPS-1/2"-PY-2			STEAM TO NOZ D1 FOR MELTER TV CAMERA A
8	PY-C	XA17	IAX-1/2"-PY-3			MELTER PRESSURE TAP IN NOZ D1

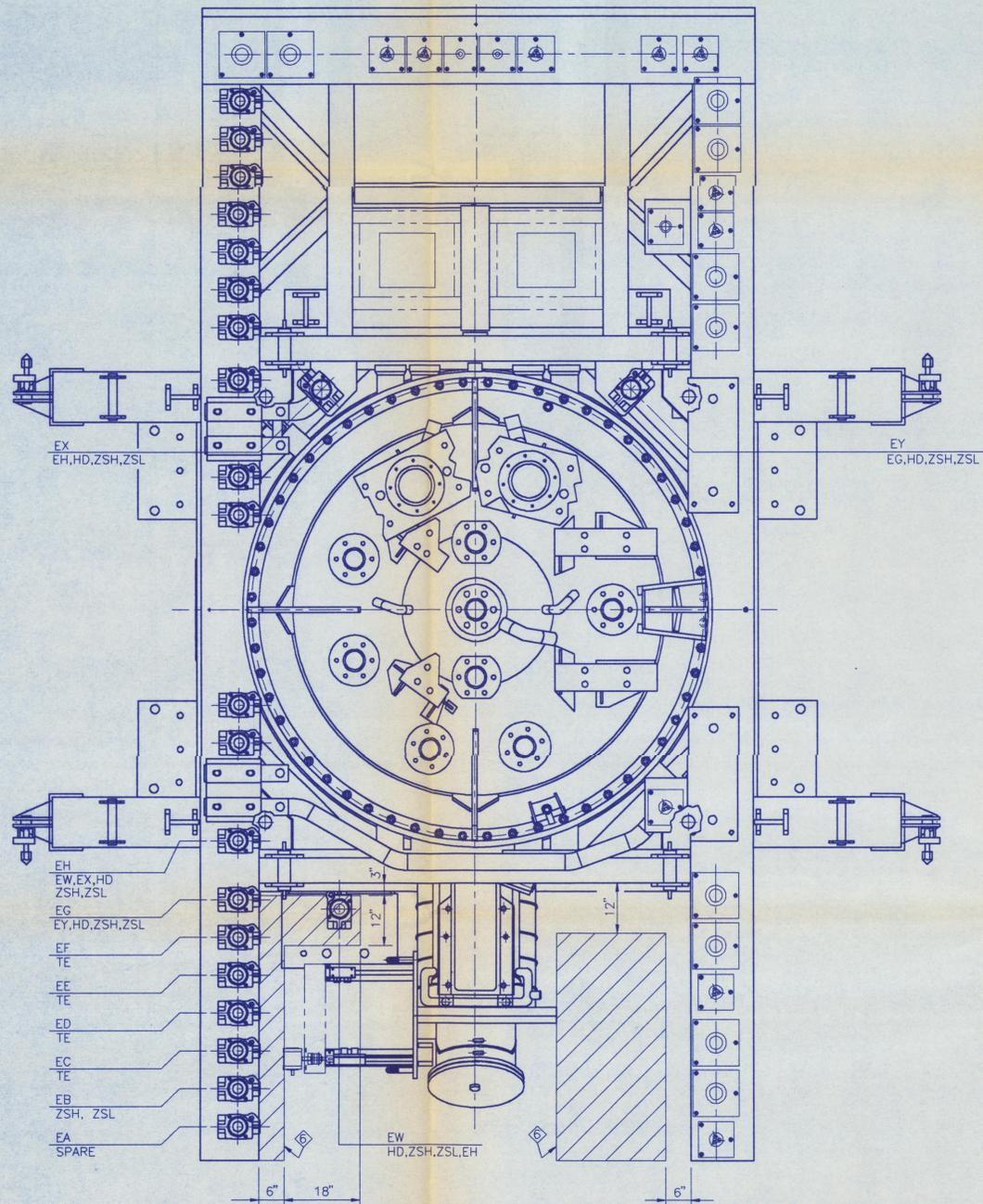
NOTE:

- FOR MELTER FRAME AND MELTER VESSEL CONNECTION LOCATION SEE DRAWING H-2-120153 SHEET 4 AND DRAWING H-2-120052 SHEETS 2 AND 3.
- ABBREVIATIONS ARE IN ACCORDANCE WITH ASME-Y1.1-1989.
- THIS IS A FRAME TO FRAME CONNECTION, NOT A FRAME TO MELTER CONNECTION.
- FRAME CONNECTION TAG IS PREFIXED WITH MY-130-004 IDENTIFICATION.
- THESE ZONES SHALL REMAIN CLEAR OF ALL PIPE, CONDUIT, PULL BOXES, RELATED SUPPORTS, GUIDES AND ANCHORS FROM THE TOP OF THE MELTER FRAME TO A DEPTH OF 8 FEET. ACCESS FOR MAINTENANCE PURPOSES AND INSTALLATION OF MELTER COMPONENT ASSEMBLIES IS REQUIRED IN THESE ZONES.
- FOR IDENTIFICATION AND ORIENTATION OF NOZZLE PORTS A, B AND C IN 3 PORT PROCESS NOZZLES SEE DRAWING H-2-120153 SHEETS 2 AND 9.

QUALITY LEVEL 1
SAFETY CLASS 3

0	APPROVED FOR CONSTRUCTION	M.L.	9/10	NA	NA
REV NO.	DATE	REVISION DESCRIPTION	APPROVAL INITIALS		
CADFILE	B125551A	CADCODE	2B:IBM:ACD2:12.C1:SS		
ENGINEERING RELEASE					
REV	DATE	U.S. DEPARTMENT OF ENERGY			
ERO		Richland Field Office DE - AC06-B6RL10838			
SIGNATURE	DATE	FLUOR DANIEL, INC. ADVANCED TECHNOLOGY DIVISION			
PROJECT MGR		MELTER FRAME/VESSEL PIPING CONNECTION IDENTIFICATION			
SYSTEMS MGR		PROJECT TITLE			
ENGINEERING MGR		HANFORD WASTE VITRIFICATION PLANT			
SUPPLIER		PROJECT NO.	FLOOR COVERING NO.	DWGS NO.	INDEX NO.
DESIGN ENGINEER	7-22-93	B-595	8457	P06A	
CHECKED	7-22-93	SCALE	BLDG NO.	SHEET	OF
DRAWN	J.D. BRIDGEFORD	6-17-92	NONE	1	3
CLASSIFICATION		DRAWING NUMBER	SHEET	OF	REV
NONE	NOT RECD	H-2-125551	1	3	0

DWG NO.	DRAWING TITLE
	REFERENCE DRAWINGS
	NEXT USED ON



MELTER FRAME CONNECTION POINTS

MELTER FRAME CONNECTIONS WITH ASSOCIATED MELTER INSTRUMENT IDENTIFICATION				REFERENCES	
FRAME CONN	MELTER INSTR NO.	P&ID NUMBER	REV NO.	INSTRUMENT DESCRIPTION	
EA				SPARE	
EB	ZSH-IAX-037A	H-2-123150-5	4	LIMIT SWITCH ON DRAIN VALVE BACKUP PLUG BELLOWS	
	ZSH-IAX-037B				
	ZSL-IAX-037A				
	ZSL-IAX-037B				
	ZSH-IAX-075A			LIMIT SWITCH ON DRAIN VALVE BELLOWS	
	ZSH-IAX-075B				
EC	TE-321	H-2-123150-8	5	T/C IN ELECTRODE L3	
	TE-527	H-2-123150-11	5	T/C IN DRAIN VALVE ZONE 5 HEATER	
	TE-530			T/C IN DRAIN VALVE ZONE 3 HEATER	
	TE-535			T/C IN DRAIN VALVE ZONE 2 HEATER	
	TE-703	H-2-123150-15	5	T/C IN DOME HEATER M11	
	TE-320	H-2-123150-8	5	T/C IN ELECTRODE L1	
ED	TE-352	H-2-123150-9	5	T/C IN ELECTRODE L4	
	TE-526	H-2-123150-11	5	T/C IN DRAIN VALVE ZONE 5 HEATER	
	TE-528	H-2-123150-11	5	T/C IN DRAIN VALVE ZONE 4 HEATER	
	TE-534	H-2-123150-11	5	T/C IN DRAIN VALVE ZONE 3 HEATER	
	TE-536	H-2-123150-11	5	T/C IN DRAIN VALVE ZONE 1 HEATER	
	TE-656B	H-2-123150-13	5	T/C IN DOME HEATER TRANSFORMER XT-130-001	
EE	TE-351	H-2-123150-9	5	T/C IN ELECTRODE L2	
	TE-529	H-2-123150-11	5	T/C IN DRAIN VALVE ZONE 4 HEATER	
	TE-533	H-2-123150-11	5	T/C IN DRAIN VALVE ZONE 2 HEATER	
	TE-702	H-2-123150-15	5	T/C IN DOME HEATER M9	
	TE-728	H-2-123150-16	5	T/C IN DOME HEATER M15	
	TE-730B	H-2-123150-16	5	T/C IN DOME HEATER TRANSFORMER XT-130-004	
EF	TE-582	H-2-123150-12	5	T/C IN RISER INCONEL TUBE	
	TE-583	H-2-123150-12	5	T/C IN RISER INCONEL TUBE	
	TE-584	H-2-123150-12	5	T/C IN RISER INCONEL DAM	
	TE-585	H-2-123150-12	5	T/C IN POUR SPOUT INCONEL TUBE	
	EG/EY	HD-14A-001B	H-2-123250-13	5	POWER TO BACKUP OFFGAS LINE BRUSH MOTORS
		ZSH-550	H-2-123250-13	5	LIMIT SWITCH ON BACKUP OFFGAS LINE BRUSH
ZSL-550		H-2-123250-13	5	LIMIT SWITCH ON BACKUP OFFGAS LINE BRUSH	
EG	ZSH-IAX-056A	H-2-123150-5	4	LIMIT SWITCH ON DRAIN VALVE PROBE BELLOWS	
	ZSH-IAX-056B			LIMIT SWITCH ON DRAIN VALVE PROBE BELLOWS	
	ZSL-IAX-056A			LIMIT SWITCH ON DRAIN VALVE PROBE BELLOWS	
EH/EW	HD-130-001	H-2-123150-2	4	POWER TO CANISTER POSITIONING ARM MOTORS	
	ZSH-051A	H-2-123150-2	4	LIMIT SWITCH ON CANISTER POSITIONING ARM	
	ZSH-051B	H-2-123150-2	4	LIMIT SWITCH ON CANISTER POSITIONING ARM	
EH/EX	ZSL-051A	H-2-123150-2	4	LIMIT SWITCH ON CANISTER POSITIONING ARM	
	ZSL-051B	H-2-123150-2	4	LIMIT SWITCH ON CANISTER POSITIONING ARM	
	HD-14A-001A	H-2-123250-1	5	POWER TO OFFGAS LINE BRUSH MOTOR	
	ZSH-110	H-2-123250-1	5	LIMIT SWITCH ON OFFGAS LINE BRUSH	
	ZSL-110	H-2-123250-1	5	LIMIT SWITCH ON OFFGAS LINE BRUSH	

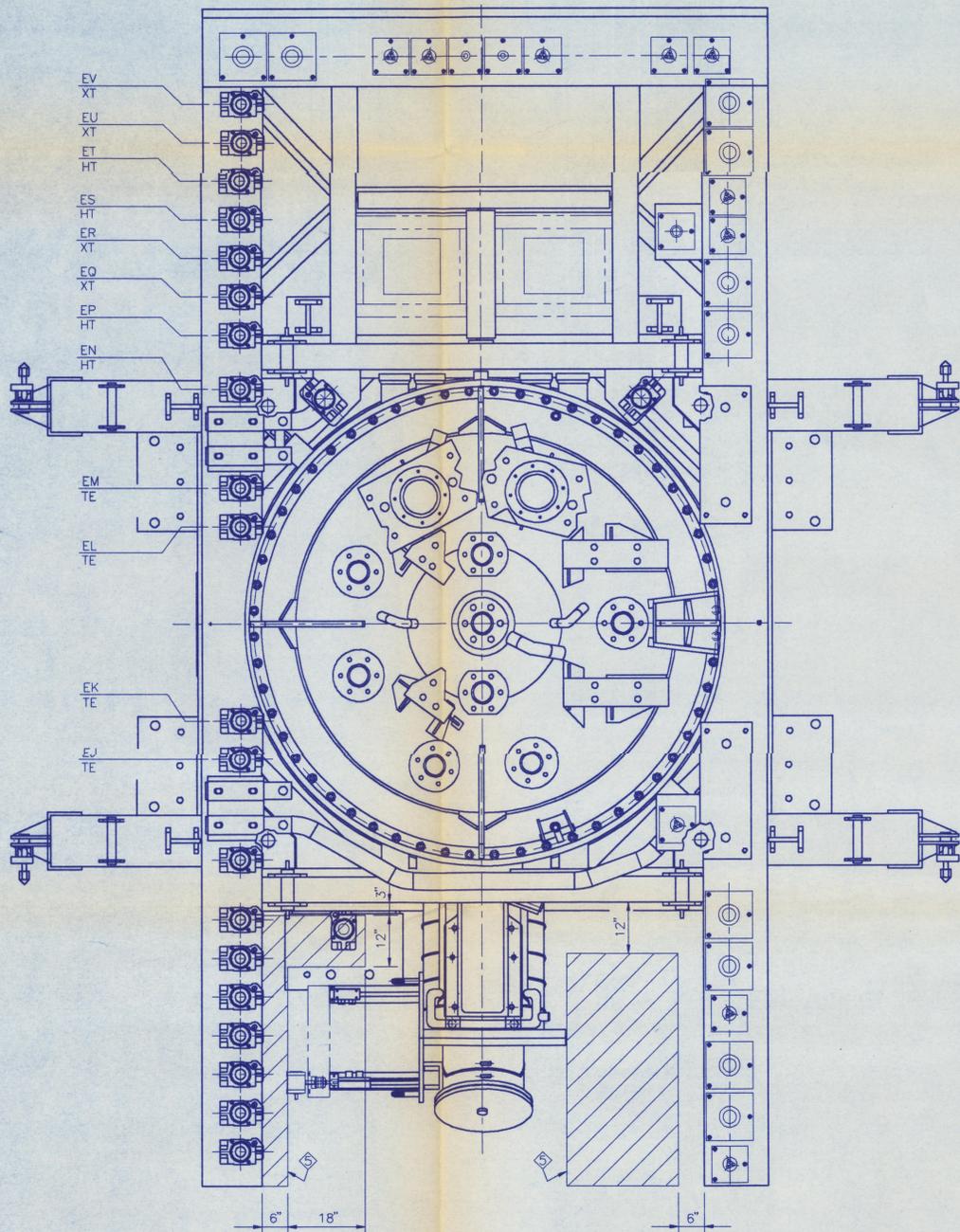
NOTE:

- FOR CONDUIT NUMBERING AND ROUTING SCHEMATIC SEE DRAWING H-2-122421 SHEET 1.
- FOR MELTER FRAME AND MELTER VESSEL CONNECTION LOCATION SEE DRAWING H-2-120153 SHEET 2, AND DRAWING H-2-120052 SHEETS 2 & 3.
- FRAME CONNECTION TAG IS PREFIXED WITH MY-130-004 IDENTIFICATION.
- ABBREVIATIONS ARE IN ACCORDANCE WITH ASME-Y1.1-1989.
- THIS IS A FRAME TO FRAME CONNECTION, NOT A FRAME TO MELTER CONNECTION.
- THESE ZONES SHALL REMAIN CLEAR OF ALL PIPE, CONDUIT, PULL BOXES, RELATED SUPPORTS, GUIDES AND ANCHORS FROM THE TOP OF THE MELTER FRAME TO A DEPTH OF 8 FEET. ACCESS FOR MAINTENANCE PURPOSES AND INSTALLATION OF MELTER COMPONENT ASSEMBLIES IS REQUIRED IN THESE ZONES.

QUALITY LEVEL 1
SAFETY CLASS 3

APPROVED FOR CONSTRUCTION	M.L. 120 9/11/93	NA	NA
REV NO. DATE	REVISION DESCRIPTION	APPROVAL INITIALS	
CADFILE B125551B	DACODE 2B:IBM:ACD2:12.C1:SS		
ENGINEERING RELEASE	REV DATE	U.S. DEPARTMENT OF ENERGY	
ERD		Richland Field Office OE - AC06-BPRC 10036	
SIGNATURE	DATE	FLUOR DANIEL, INC. ADVANCED TECHNOLOGY DIVISION	
PROJ DIR		MELTER FRAME/VESSEL ELEC & INSTR CONN IDENTIFICATION	
QA MGR		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT	
INDEPENDENT SAFETY MGR		PROJECT B-595 FLUOR CONTRACT NO. 8457 CWS NO. P06A	
PROJECT MGR		SCALE NONE BLDG NO. 1 INDEX NO.	
SYSTEMS MGR		DRAWING NUMBER H-2-125551 2 3 0	
ENGINEERING MGR		DRAWING NUMBER H-2-125551 2 3 0	
SUPERVISOR	DATE	PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT	
DESIGN ENGINEER	DATE	PROJECT B-595 FLUOR CONTRACT NO. 8457 CWS NO. P06A	
CHECKER	DATE	SCALE NONE BLDG NO. 1 INDEX NO.	
DRAWN	DATE	DRAWING NUMBER H-2-125551 2 3 0	
J.D. BRIDGEFORD	3-12-92	DRAWING NUMBER H-2-125551 2 3 0	
CHECKED	DATE	PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT	
CLASSIFICATION	DATE	PROJECT B-595 FLUOR CONTRACT NO. 8457 CWS NO. P06A	
NONE	NOT RECD	SCALE NONE BLDG NO. 1 INDEX NO.	
		DRAWING NUMBER H-2-125551 2 3 0	

DWG NO.	DRAWING TITLE
	REFERENCE DRAWINGS
NEXT USED ON	



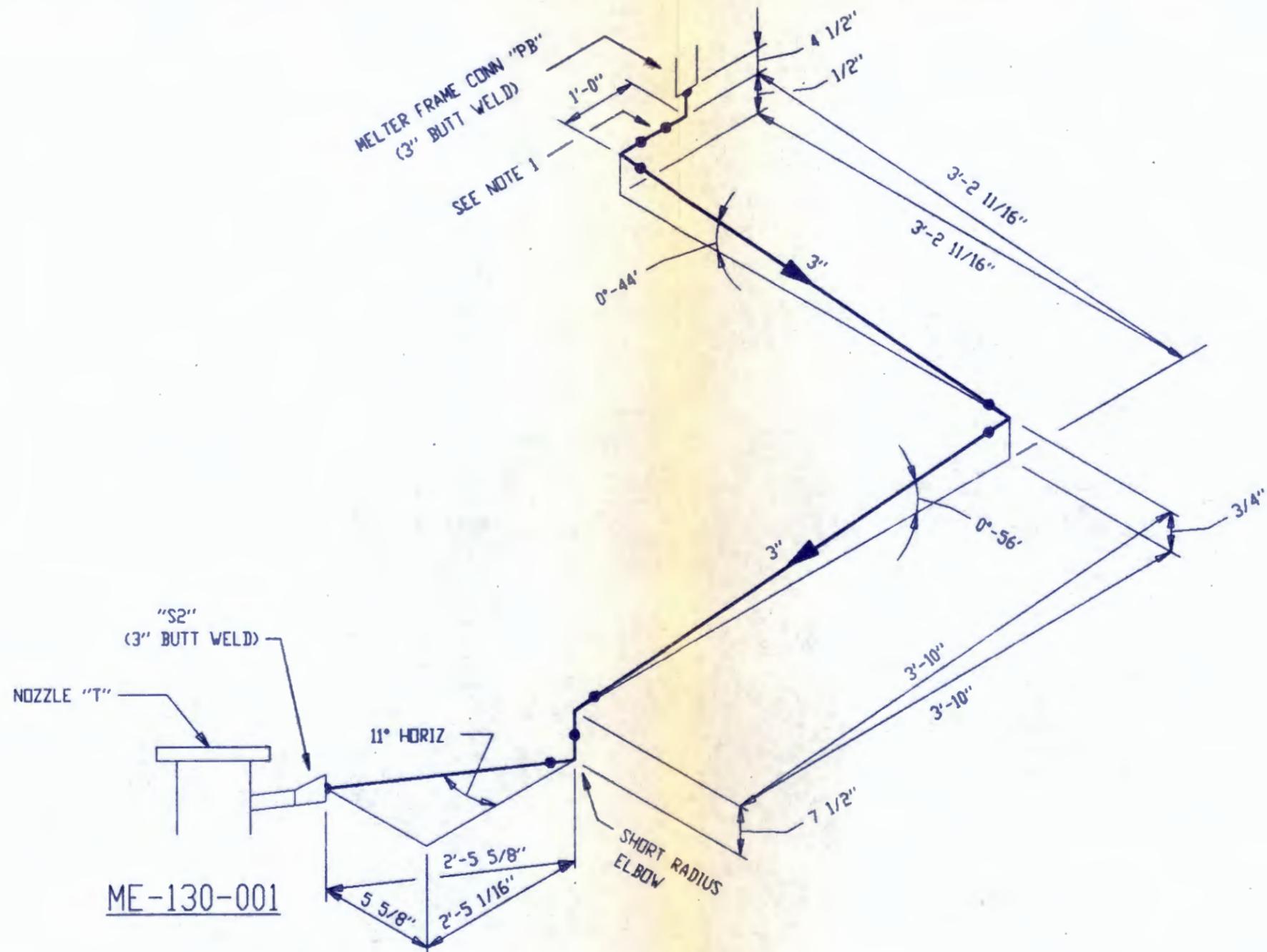
MELTER FRAME CONNECTIONS WITH ASSOCIATED MELTER INSTRUMENT IDENTIFICATION				REFERENCES
FRAME CONN	MELTER INSTR. NO.	P&ID NUMBER	REV NO.	INSTRUMENT DESCRIPTION
EJ	TE-654	H-2-123150-13	5	T/C IN DOME HEATER M3
	TE-676A	H-2-123150-14	5	T/C IN DOME HEATER TRANSFORMER XT-130-002
	TE-678			T/C IN DOME HEATER M5
	TE-705A	H-2-123150-15	5	T/C IN DOME HEATER TRANSFORMER XT-130-003
EK	TE-537	H-2-123150-11	5	T/C IN DRAIN VALVE ZONE 1 HEATER
	TE-653	H-2-123150-13	5	T/C IN DOME HEATER M3
	TE-656A			T/C IN DOME HEATER TRANSFORMER XT-130-001
	TE-668			T/C IN MELTER REFRACTORY (NOZZLE C7)
	TE-677	H-2-123150-14	5	T/C IN DOME HEATER M5
	TE-680			T/C IN DOME HEATER M7
EL	TE-726	H-2-123150-16	5	T/C IN DOME HEATER M13
	TE-729			T/C IN DOME HEATER M15
	TE-730A			T/C IN DOME HEATER TRANSFORMER XT-130-004
	TE-651	H-2-123150-13	5	T/C IN DOME HEATER M1
	TE-652			T/C IN DOME HEATER M1
	TE-655			T/C IN MELTER REFRACTORY (NOZZLE C6)
EM	TE-676B	H-2-123150-14	5	T/C IN DOME HEATER TRANSFORMER XT-130-002
	TE-679			T/C IN DOME HEATER M7
	TE-701	H-2-123150-15	5	T/C IN DOME HEATER M9
	TE-704			T/C IN DOME HEATER M11
	TE-705B			T/C IN DOME HEATER TRANSFORMER XT-130-003
	TE-727	H-2-123150-16	5	T/C IN DOME HEATER M13
EN	HT-130-011	H-2-123150-10	5	POWER TO DRAIN VALVE ZONE 1 HEATER
EP	HT-130-012	H-2-123150-10	5	POWER TO DRAIN VALVE ZONE 2 HEATER
EQ	XT-130-001	H-2-123150-13	5	POWER TO DOME "A" HEATER TRANSFORMER
ER	XT-130-002	H-2-123150-14	5	POWER TO DOME "B" HEATER TRANSFORMER
ES	HT-130-013	H-2-123150-10	5	POWER TO DRAIN VALVE ZONE 3 HEATER
ET	HT-130-014	H-2-123150-10	5	POWER TO DRAIN VALVE ZONE 4 HEATER
ES,ET	HT-130-015	H-2-123150-10	5	POWER TO DRAIN VALVE ZONE 5 HEATER
EU	XT-130-003	H-2-123150-15	5	POWER TO DOME "C" HEATER TRANSFORMER
EV	XT-130-004	H-2-123150-16	5	POWER TO DOME "D" HEATER TRANSFORMER

NOTE:

- FOR CONDUIT NUMBERING AND ROUTING SCHEMATIC SEE DRAWING H-2-122421 SHEET 1.
 - FOR MELTER FRAME AND MELTER VESSEL CONNECTION LOCATION SEE DRAWING H-2-120153 SHEET 4 AND DRAWING H-2-120052 SHEETS 2 AND 3.
 - ABBREVIATIONS ARE IN ACCORDANCE WITH ASME-Y1.1-1989.
 - FRAME CONNECTION TAG IS PREFIXED WITH MY-130-004 IDENTIFICATION.
- Ⓢ THESE ZONES SHALL REMAIN CLEAR OF ALL PIPE, CONDUIT, PULL BOXES, RELATED SUPPORTS, GUIDES AND ANCHORS FROM THE TOP OF THE MELTER FRAME TO A DEPTH OF 8 FEET. ACCESS FOR MAINTENANCE PURPOSES AND INSTALLATION OF MELTER COMPONENT ASSEMBLIES IS REQUIRED IN THESE ZONES.

QUALITY LEVEL 1
SAFETY CLASS 3

REV NO.	DATE	REVISION DESCRIPTION	APPROVAL INITIALS
0	9/10/93	APPROVED FOR CONSTRUCTION	M.L. 400 NA NA NA NA
SAMPLE B125551C		CADD CODE 2B:IBM:ACD2:12.C1:SS	
ENGINEERING RELEASE		U.S. DEPARTMENT OF ENERGY	
REV DATE		Richland Field Office DE - AC06-86RL10838	
SIGNATURE DATE		FLUOR DANIEL, INC. ADVANCED TECHNOLOGY DIVISION	
PROJ. DIR.		MELTER FRAME/VESSEL ELEC & INSTR CONN IDENTIFICATION	
TIA MGR.		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT	
INDEPENDENT SAFETY MGR.		PROJECT NO. B-595 FLUOR CONTRACT NO. 8457 OWS NO. P06A	
PROJECT MGR.		SCALE NONE BLDG NO. 1 INDEX NO.	
SYSTEMS MGR.		DRAWN BY J.D. BRIDGEFORD 6-8-92	
ENGINEERING MGR.		CLASSIFICATION BY NONE NOT REQD SHEET NUMBER H-2-125551	
SUPERVISOR		SHEET OF 3 3 0	
DESIGN ENGINEER		REV	
CHECKED		DISTRIBUTION CODE: 501	
DRAWN		ACAD	
CLASSIFICATION		INITIALS: R.R.H. DATE: 7/19/93	

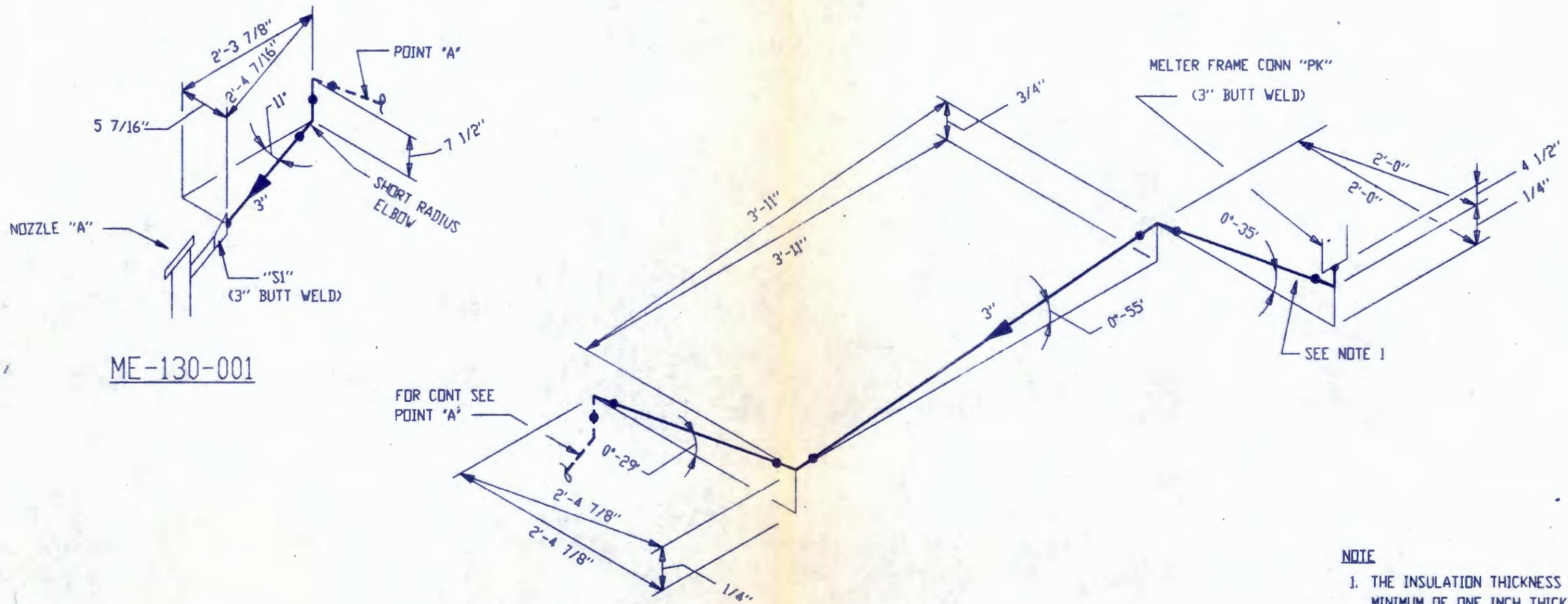


ME-130-001

NOTE
 1. THE INSULATION THICKNESS SHALL BE A MINIMUM OF ONE INCH THICK WITHIN THE ENCLOSURE BOX AT FRAME CONNECTION PB.

QUALITY LEVEL 1
 SAFETY CLASS 3

REV.	TYPE	BY	DATE	CHK'D	APPV'D	MAT'L	STRESS	INSULATION	IH	IS	IC	IA	NONE	FABRICATION SPECIFICATION				FLUOR DANIEL, INC. ADVANCED TECHNOLOGY DIVISION		U.S. DEPARTMENT OF ENERGY Richland Operations Office DE-AC06-86RL 10838												
								TOTAL ISO	X					B-595-P-P06A-13250				CADFILE B127459A		CADCODE 2B:IBM:ACD2:10.C2:SN		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT										
								PARTIAL ISO						HEAT TRACING REQUIREMENTS				DRAWN BY: R. A. CELAYA		DATE 9-29-92		PROJECT B-595			FLUOR CONTRACT NO. 8457		CWBS NO. P06A					
														TRACING MEDIUM				OPERATING		155		375		VAPOR		X		LIQUID		BUILDING NO. 1		
														TRACER: QTY _____ SIZE _____				CLASSIFICATION		NONE		BY		NOT REQUIRED		INDEX NO.						
														ELECTRIC TRACE				SECTION		A5		LINE NUMBER AND CLASS MPS-3"-PB-1-		SHEET 1		OF 1		DRAWING NUMBER H-2-127459				
0	AFC	RAC	9/19/92	mm	gld	NA	kw							HEAT TRANSFER CEMENT REQUIRED				SHEET		1		OF		1		REV. 0						



ME-130-001

NOTE

1. THE INSULATION THICKNESS SHALL BE A MINIMUM OF ONE INCH THICK WITHIN THE ENCLOSURE BOX AT FRAME CONNECTION PK.

QUALITY LEVEL 1
SAFETY CLASS 3

REV.	TYPE	BY	DATE	CHK'D	APPV'D	MAT'L	STRESS	INSULATION	IH	IS	IC	IA	NONE	FABRICATION SPECIFICATION				FLUOR DANIEL, INC. ADVANCED TECHNOLOGY DIVISION		U.S. DEPARTMENT OF ENERGY Richland Operations Office DE-ACD6-86RL 10838											
								TOTAL ISO	X					B-595-P-P06A-13250				CADFILE B127459B		CADCODE 2B:IBM:ACD2:10.C2:SN		PROJECT TITLE HANFORD WASTE VITRIFICATION PLANT									
								PARTIAL ISO						HEAT TRACING REQUIREMENTS		YES	NO	CONDITION	PRESS.(PSIG)	TEMP.(°F)	SERVICE		PROJECT B-595								
														TRACING MEDIUM			X	DESIGN	200	388	MDM PRESS ST		FLUOR CONTRACT NO. 8457		CWBS NO. P06A						
														TRACER: QTY			X	OPERATING	155	375	VAPOR	X	LIQUID	DRAWN BY: R. A. CELAYA		DATE 10-7-92		BUILDING NO. 1		INDEX NO.	
														ELECTRIC TRACE			X	REFERENCE PLAN DVG		REFERENCE P&ID H-2-123250-13		CLASSIFICATION <u>NONE</u>		BY <u>NOT REQUIRED</u>		DRAWING NUMBER H-2-127459					
0	AFC	RAC	9/10/93	M.L.	RO	NA	Kw							HEAT TRANSFER CEMENT REQUIRED			X	SECTION B6		LINE NUMBER AND CLASS MSP-3"-PK-1-		SHEET 1	OF 1	SHEET 2		OF 2	REV. 0				

06A H-2-127459 0 2 2 AFC 7776 79 80

DISTRIBUTION CODE: 504 ACAD R.R.H. 7-19-93

SPECIFICATIONS

MELTER VESSEL ASSEMBLY B-595-P-P06A

**HANFORD WASTE
VITRIFICATION PLANT**

**U.S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE**



**FLUOR DANIEL
ADVANCED TECHNOLOGY DIVISION
CONTRACT 8457**

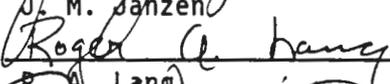
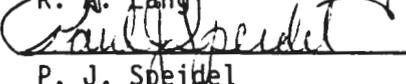
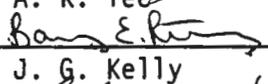
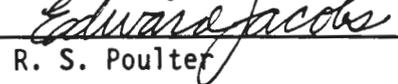
**DOE CONTRACT NO.
DE-AC06-86RL10838**

MELTER VESSEL ASSEMBLY
SPECIFICATION B-595-P-P06A

APPROVED FOR CONSTRUCTION

REVISION 1 PER CR HWVP-0981
ISSUE DATE SEP 10 1993

APPROVED BY:

 _____ J. M. Janzen	Project Package Engineer	<u>Sept. 10, 1993</u> Date
 _____ R. A. Lang	Area Project Manager	<u>Sept. 10, 1993</u> Date
 _____ P. J. Speidel	Project Engineering Manager	<u>Sept 11, 1993</u> Date
 _____ David Johnson for J.S.	Systems Manager	<u>9/10/93</u> Date
 _____ J. L. Smets	Systems Manager	<u>9-10-93</u> Date
 _____ A. K. Yee	Independent Safety Manager	<u>9-10-93</u> Date
 _____ J. G. Kelly	Quality Assurance Manager	<u>9-10-93</u> Date
 _____ R. S. Poulter	Project Director	<u>9-10-93</u> Date

MELTER VESSEL ASSEMBLY
B-595-P-P06A

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DIVISION 5 - METALS

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05011	Modified Inconel Alloy 690 Weld Wire (VOID)	1
05060	Welding Structural	0
05063	Welding Pressure Vessels	1

DIVISION 13 - SPECIAL CONSTRUCTION

Section	Title	Rev.
13249	Melter Top Head Turning Fixture	0
13250	Fabrication of Melter Frame and Assembly	1
RD-1	Related Document No. 1, "Plastic" Melter Model and Design Criteria	0
13251	Fabrication and Installation of Melter Refractory and Insulation	0
13252	Precautions for Fabrication, Handling and Storage of Stainless Steel and Nickel Alloys	0
13253	Fabrication of Melter Bus Bars	0
13254W	Fabrication and Installation of Monofrax K3 Refractory	0

DIVISION 14 - CONVEYING SYSTEMS

Section	Title	Rev.
14400	Melter Frame Lifting Yoke Fabrication	1

DIVISION 16 - ELECTRICAL

Section	Title	Rev.
16120	Soldering - Electrical	0
16610	Electrical Requirements for Packaged Equipment	0
17915	Thermocouple Furnished With Melter (VOID)	1

U.S. DEPARTMENT OF ENERGY
Hanford Waste Vitrification Plant
Richland, Washington
DOE Contract DE-AC06-86RL10838

FLUOR DANIEL, INC.
Advanced Technology Division
Fluor Contract 8457

SECTION 05010
MODIFIED INCONEL ALLOY 690 MATERIAL
B-595-P-P06A-05010

VOID

REVISION 1 VOID PER CR HWVP-0981
ISSUE DATE SEP 10 1993

WAPA YES NO
QUALITY LEVEL I II
SAFETY CLASS 1 2 3 4

ORIGINATOR(S):

CHECKER(S):

R. Hulskamp 9/9/93
R. Hulskamp, Mechanical Engineer

D. A. Buzzelli 9-9-93
D. A. Buzzelli, Lead Discipline Checker

APPROVED BY:

C. J. Divona
C. J. Divona

Lead Discipline Engineer

9-9-93
Date

SECTION 05010
 MODIFIED INCONEL ALLOY 690 MATERIAL
 B-595-P-P06A-05010

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1.6 SUBMITTALS	2
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ATTACHMENTS

<u>ATTACHMENT</u>	<u>TITLE</u>
A	CUT LIST FOR INCONEL 690 MATERIAL FOR ONE MELTER ASSEMBLY

SECTION 05010
MODIFIED INCONEL ALLOY 690 MATERIAL

PART 1 GENERAL

1.1 SUMMARY

This specification section covers the requirements for quantity, configuration, chemical and physical properties, testing and certification of modified Alloy UNS N06690 (Inconel 690) material in accordance with ASTM B166, B167 and B168.

1.2 REFERENCES

The publications listed below form a part of this specification section to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B166	1990 Standard Specification for Nickel-Chromium-Iron Alloys (UNS N06600, N06601, and N06690) Rod, Bar, and Wire.
ASTM B167	1990 Standard Specification for Nickel-Chromium-Iron Alloys (UNS N06600, N06601, and N06690) Seamless Pipe and Tube.
ASTM B168	1991 Standard Specification for Nickel-Chromium-Iron Alloys (UNS N06600, N06601, and N06690) Plate, Sheet, and Strip.
ASTM E587	1982 Standard Practice for Ultrasonic Angle-Beam Examination by the Contact Method.

1.3 RELATED REQUIREMENTS

Specification Section 13252 Precautions for Fabrication, Handling and Storage of Stainless Steel and Nickel Alloys.

1.4 DEFINITIONS

(Not Used)

1.5 SYSTEM DESCRIPTION

This material will be used to fabricate heating elements, instruments and other critical sub-assemblies which will control and monitor the performance of a glass melter. The melter will be operated in the Hanford Waste Vitrification Plant (HWVP).

The melter assembly consists of internal insulation, refractory lining and auxiliary equipment as fabricated from Inconel 690. This alloy was selected based on the following unique operating conditions of the HWVP melter:

- A. Once started-up, the melter must operate continuously for several years and as a minimum for 2 years. Some of the Inconel 690 assemblies are a permanent part of the melter and cannot be repaired or replaced after start-up. Premature failure of these items would require the entire melter to be removed from service.
- B. Inconel 690 will be subjected to a very corrosive environment at temperatures up to 1170 °C.

1.6 SUBMITTALS

Submit the following in accordance with the Vendor Drawing and Data Requirements section of the Order/Subcontract.

1.6.1 Certifications

Certified Material Test Reports (CMTRs) shall be submitted for Buyer's review. CMTRs shall be traceable to each heat number. The CMTRs shall include the standard certification data required by ASTM B166, ASTM B167 and ASTM B168. Specific emphasis shall be placed on the following:

- A. Chemical composition for each heat. Refer to Paragraph 2.1.2.1.
- B. Physical properties for each heat. Refer to Paragraph 2.1.2.2.
- C. Grain size for each item. Refer to Paragraph 2.1.2.3.
- D. Ultrasonic test results for each item. Refer to Paragraph 2.1.2.5.

- 1.6.2 Seller shall prepare and submit for Buyer approval ultrasonic testing procedures for bar stock, plate, rod material, tube, sheet and pipe. These procedures shall be used in support of Paragraph 2.1.2.5. They shall be prepared in accordance with ASTM E587.

1.6.3 Seller shall submit recommended storage and handling procedures for Buyer approval.

1.7 CLASSIFICATION OF SYSTEMS AND COMPONENTS

(Not Used)

1.8 PROJECT OR SITE ENVIRONMENTAL CONDITIONS

(Not Used)

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

2.1.1 Quantities and Configurations

All material shall be delivered in the sizes, configurations and quantities as listed in Attachment A.

2.1.1.1 All material shall be clearly segregated, protected, controlled, marked and stored in accordance with Specification Section 13252. Marking shall be in accordance with Paragraph 2.2.1. All stainless steel and nickel-based alloy materials shall be identified with a heat number prior to and during fabrication. Material withdrawal and use shall be made only against written procedures. No unauthorized persons shall have access to material. There shall be no possibility of mixing materials. Materials for other jobs shall not be stored in the same area.

2.1.2 Chemical and Physical Properties

All material shall be Alloy UNS N06690 in accordance with ASTM B166, ASTM B167 and ASTM B168 modified as follows.

2.1.2.1 Chemical Composition

It has been determined that the corrosion resistance of Alloy 690, in this application, is sensitive to chromium content. Therefore, all material on this order shall be in accordance with the chemical composition requirements of ASTM B166, ASTM B167 and ASTM B168, except that the chromium content shall be not less than 29% by weight.

The chemical composition by weight percentage values shall be as follows:

- | | |
|--------------|--------------|
| A. Chromium: | 29.0 to 31.0 |
| B. Nickel: | 58.0 minimum |

C.	Iron:	7.0 to 11.0
D.	Manganese:	0.50 maximum
E.	Copper:	0.50 maximum
F.	Silicon:	0.50 maximum
G.	Carbon:	0.05 maximum
H.	Sulfur:	0.015 maximum

2.1.2.2 Physical Properties

After solution annealing, the following mechanical properties shall be determined for each heat.

- A. Elongation (this shall be 30% min. in 2")
- B. Ultimate Tensile Strength
- C. Yield Strength
- D. Reduction of Area

2.1.2.3 Grain Size

The average grain size of all items (plates, sheets, bars, pipes, etc.) shall be determined after solution annealing. The grain size shall be ASTM Avg #5 or finer.

2.1.2.4 Condition

All material shall be solution annealed and finished as follows:

- A. All bar stock and rod material shall be hot finished, rough turned or rough ground and annealed.
- B. All pipe shall be hot finished, descaled and annealed.
- C. All tubes shall be cold drawn, descaled and annealed.
- D. All plate shall be hot rolled, descaled and annealed.
- E. All sheet shall be cold rolled, descaled and annealed.

2.1.2.5 Ultrasonic Testing

All items (plates, sheets, bars, pipes, etc.) in each heat lot shall be ultrasonically tested in accordance with Buyer-approved procedures. No pits, voids, inclusions, cracks or splits shall be permitted.

These tests shall be carried out on descaled surfaces prior to solution annealing.

2.2 FABRICATION AND MANUFACTURE

2.2.1 Identification Marking

All items shall be identified by a continuous marking method in accordance with ASTM B166, ASTM B167 and ASTM B168. The following information shall be included:

- A. UNS Alloy No.
- B. Inconel 690
- C. Heat Number
- D. Lot Number
- E. Buyer Purchase Order Number

A vibrotool may be used to mark this information only where continuous marking is physically impossible.

2.2.2 Shipping

All material on this order including any excess material from each heat shall be divided, sorted and shipped to various fabrication vendors who are under separate contracts with Buyer. Detailed instructions for sorting, tagging and shipping will be furnished by Buyer.

PART 3 EXECUTION

(Not Used)

END OF SECTION

ATTACHMENT A
 CUT LIST FOR INCONEL 690 MATERIAL FOR ONE MELTER ASSEMBLY
 NOZZLES A & T

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Flange	Plate	3.00 THK x 17.50 x 26.50	3
Nozzle-Neck	Pipe	φ11.00 x φ7.00 x 16.00 LG.	3

RISER/POUR SPOUT HEATER - CORE

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Inclined section	Rod	φ8.50 x 63.00 LG.	2
Vertical section	Rod	φ5.50 x 28.00 LG.	2
Intersection	Bar	8.50 x 10.50 x 18.00	2
Fitting		Fall-off elsewhere	

INCONEL DAM ASSEMBLY

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Inner Fitting	Plate	3.00 THK x φ15.00	2
Tube	Tube	12.50 OD x .50 WALL x 20 LG.	2
Inner Flange	Plate	.50 THK x 20.00 SQ	2
Inner Cone	Plate	.25 THK x 6.00 x 54.00	2
Outer Cone	Plate	.25 THK x 8.00 x 54.00	2
Outer Flange	Plate	.25 THK x φ28.00	2

RISER/POUR SPOUT - DETAILS

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Shield (Tube)	Tube	4.25 OD x .19 WALL x 6.50 LG.	2
Shield (Flange)	Sheet	.19 x 10.0 x 10.0	2

DOME HEATERS

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Heater Element Flanged Sleeve	Pipe	φ3.50 x φ2.50 x 27.00 LG.	10
Heater Element Center Section	Pipe	φ3.50 x φ2.00 x 74.00 LG.	10
Heater Element Stepped Section	Pipe	φ3.50 x φ2.00 x 30.00 LG.	10
Heater Element Flange Plate	Plate	1.00 THK x 8.00 SQ	10
Jumpers	Bar	5.00 x 6.50 x 13.5	5

LEVEL INDICATOR DIP TUBES

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Random Tube Sections	Rod	φ3.75 x 71.00 LG.	4
Connector Flange	Plate	2.00 THK x φ6.00	2
Bracket (under flange)	Plate	.75 THK x 12.00 x 12.00	2
Gussets (for bracket)	Plate	.50 THK x 3.00 x 8.00	2
Trunnion Pads	Rod	φ2.00 x 1.50 LG.	2
Cam Pad	Plate	1.00 THK x 3.00 x 4.00	2

T/C CONDUCTIVITY PROBE

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Thermowell Tube	Rod	φ3.75 x 72.00 LG.	2
Tube Flange	Bar	8.00 x 7.50 x 8.00	2

T/C NOZZLE C-4

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Thermowell Tube	Rod	φ3.75 x 114.00 LG.	2
Tube Flange	Bar	8.00 x 7.50 x 8.00	2

T/C NOZZLE E

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Thermowell Tube	Rod	φ3.75 x 114.00 LG.	2
Tube Flange	Bar	8.00 x 7.50 x 8.00	2

COMMON MISCELLANEOUS PARTS

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Support Sleeve	Rod	φ5.00 x 7.00 LG.	6
Retainer	Rod	φ5.00 x 3.00 LG.	6

BOROSCOPE TV

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Boroscope Tube	Tube	φ4.00 x φ2.50 x 29.00 LG.	3
Bottom Cap	Plate	2.25 THK x φ4.00	3
Top Fitting	Plate	2.25 THK x φ6.50	3

FEED TUBES

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Insulation Cover	Tube	φ3.38 x .160 WALL x 57.00 LG.	3
Insulation Cover Ring	Plate	.18 THK x φ4.00	3
Bottom Cap	Rod	φ3.75 x 6.00 LG.	3
Support Sleeve	Rod	φ5.00 x 8.00 LG.	3
Retainer	Rod	φ5.00 x 4.00 LG.	3

FILM COOLER "A" NOZZLE

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Lower Base Plate	Plate	3.00 THK x 16.00 x 27.00	2
Inner Base Plate	Plate	1.00 THK x 15.00 x 15.00	2
Outer Sleeve	Pipe	φ8.00 x φ6.50 x 26.00 LG.	2
Circular Bevels	Pipe	φ6.50 x φ5.00 x 48.00 LG.	2
End Ring	Plate	1.25 THK x 10.00 x 10.00	2
Bevel Support/Spacer	Sheet	.14 THK x 48.00 x 48.00	2
End Stops		FALL-OFF ELSEWHERE	2

FILM COOLER "T" NOZZLE

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Lower Base Plate	Plate	3.00 THK x 16.00 x 27.00	2
Inner Base Plate	Plate	1.00 THK x 15.00 x 15.00	2
Outer Sleeve	Pipe	φ8.00 x φ6.50 x 26.00 LG.	2
Inner Sleeve	Pipe	φ6.50 x φ5.00 x 48.00 LG.	2
End Ring	Plate	.50 THK x 10.00 x 10.00	2
End Stops		FALL-OFF ELSEWHERE	2

ELECTRODES

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
End Plate	Plate	4.00 THK x 16.00 x 41.00	6
Lead	Rod	φ5.00 x 15.00 LG.	6
Lead	Rod	φ5.00 x 25.00 LG.	6

OFF-GAS BRUSH

ITEM DESCRIPTION	FORM	MAKE FROM	QTY
Retainer	Plate	.25 THK x φ6.00 LG	3
Housing	Plate	4.00 THK x φ13.00	3
Retainer	Plate	.50 THK x φ6.00	3
Tube	Tube	φ2.083 x φ1.706 x 55.00 LG.	3
Tube Flange	Plate	.50 THK x φ4.00	3

U.S. DEPARTMENT OF ENERGY
Hanford Waste Vitrification Plant
Richland, Washington
DOE Contract DE-AC06-86RL10838

FLUOR DANIEL, INC.
Advanced Technology Division
Fluor Contract 8457

SECTION 05011
MODIFIED INCONEL ALLOY 690 WELD WIRE
B-595-P-P06A-05011

VOID

REVISION 1 VOID PER CR HWVP-0981
ISSUE DATE SEP 10 1993

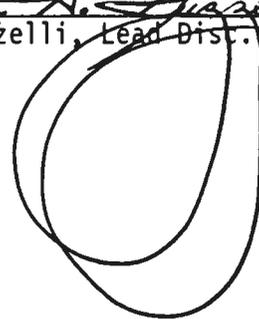
WAPA YES NO
QUALITY LEVEL I II
SAFETY CLASS 1 2 3 4

ORIGINATOR:

CHECKER:

R. Hulskamp 9/9/93
R. Hulskamp, Mech. Engineer Date

D. A. Buzzelli 9-9-93
D. A. Buzzelli, Lead Dist. Checker Date



APPROVED BY:

C. J. Diveria
C. J. Diveria Lead Discipline Engineer

9/9/93
Date

SECTION 05011
MODIFIED INCONEL ALLOY 690 WELD WIRE
B-595-P-P06A-05011

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PART 3	EXECUTION	4

SECTION 05011
MODIFIED INCONEL ALLOY 690 WELD WIRE

PART 1 GENERAL

1.1 SUMMARY

This specification section covers the requirements for quantity, size, chemical composition and certification of Modified Alloy UNS N06690 welding material. This material shall be used for the welding of modified Alloy UNS N06690 base material to like material, to Type 304L stainless steel and to Nickel 200 material.

1.2 REFERENCES

The publications listed below form a part of this specification section to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN WELDING SOCIETY (AWS)

AWS A5.14 1989 Nickel and Nickel Alloy Bare Welding
Electrodes and Rods

1.3 RELATED REQUIREMENTS

(Not Used)

1.4 DEFINITIONS

(Not Used)

1.5 SYSTEM DESCRIPTION

This material will be used in the fabrication of heating elements, instruments and other critical sub-assemblies which will control and monitor the performance of a glass melter. The melter will be operated in the Hanford Waste Vitrification Plant (HWVP).

The melter assembly consists of internal insulation, refractory lining and auxiliary equipment as fabricated from Inconel 690. This alloy was selected based on the following unique operating conditions of the HWVP melter:

- A. Once started-up, the melter must operate continuously for several years. Some of the Inconel 690 assemblies are a permanent part of the melter and cannot be repaired or replaced after start-up. Premature failure of these items would require the entire melter to be removed from service.

- B. Inconel 690 will be subjected to a very corrosive environment at temperatures up to 1170 °C.

1.6 SUBMITTALS

Submit the following in accordance with the Vendor Drawing and Data Requirements section of the Order/Subcontract.

- 1.6.1 Seller shall prepare and submit, for Buyer's review, a Certified Material Test Report (CMTR) for each heat. These CMTRs shall be in accordance with Paragraph 16 of AWS A5.14. Chemical composition shall be in accordance with Paragraph 2.1.2.1.

1.7 CLASSIFICATION OF SYSTEMS AND COMPONENTS

(Not Used)

1.8 PROJECT OR SITE ENVIRONMENTAL CONDITIONS

(Not Used)

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

2.1.1 Quantities and Sizes

The following sizes and amounts of weld wire shall be delivered:

- A. .062" diameter (180) lbs.
B. .093" diameter (1300) lbs.
C. .125" diameter (1200) lbs.

2.1.2 Chemical and Physical Properties

2.1.2.1 Chemical Composition

It has been determined that the corrosion resistance of Alloy 690, in this application, is sensitive to chromium content. Therefore, all weld wire on this order shall be processed in accordance with AWS A5.14 Classification ERNiCrMo-3 (UNS N06625). Exception: the required chemical composition resembles that of Alloy 690 with chromium content not less than 30% by weight.

The modified chemical composition by weight percentage values shall be as follows:

Chromium:	30.0 to 32.0
Nickel:	Balance
Iron:	8.0 to 11.0
Carbon:	0.02 to 0.08
Manganese:	0.05 to 0.30
Silicon:	0.05 to 0.30
Aluminum:	0.50 to 1.10
Titanium:	0.20 to 0.70
Copper:	0.50 maximum
Oxygen:	0.0100 maximum
Hydrogen:	0.0010 maximum
Nitrogen:	0.0100 maximum
Magnesium:	Add .03
Boron:	None added
Sulfur:	0.015 maximum
Phosphorus:	0.015 maximum
Lead:	0.001 maximum

2.2 FABRICATION AND MANUFACTURE

2.2.1 Identification Marking

Identification, packaging and marking shall be in accordance with AWS A5.14, Paragraphs 11, 12 and 13. Exception: all markings shall include the following additional information:

Buyer Purchase Order No.
Project: HWVP
Weld Wire for Alloy 690

2.2.2 Packaging and Shipping

The weld wire on this order shall be divided, sorted and shipped to various fabrication vendors who are under separate contracts with the Buyer. Detailed instructions for sorting and shipping destinations will be furnished by Buyer.

2.2.2.1 The .062" diameter weld wire shall be delivered on spools. These spools shall be approximately 12 inches in diameter. Each spool shall contain not more than 25 pounds of weld wire.

2.2.2.2 The .093" and .125" diameter weld wire shall be delivered in straight lengths of 36 inches. These lengths of wire shall be packed in standard packages. Each package shall contain not more than 10 pounds of weld wire.

U.S. DEPARTMENT OF ENERGY
Hanford Waste Vitrification Plant
Richland, Washington
DOE Contract DE-AC06-86RL10838

FLUOR DANIEL, INC.
Advanced Technology Division
Fluor Contract 8457

Rev. 1

PART 3 EXECUTION

(Not Used)

END OF SECTION

U.S. DEPARTMENT OF ENERGY
Hanford Waste Vitrification Plant
Richland, Washington
DOE Contract DE-AC06-86RL10838

FLUOR DANIEL, INC.
Advanced Technology Division
Fluor Contract 8457

SECTION 05063
WELDING PRESSURE VESSELS
B-595-P-P06A-05063

APPROVED FOR CONSTRUCTION

REVISION 1 PER CR HWVP-0981
ISSUE DATE SEP 10 1993

WAPA YES NO
QUALITY LEVEL I II
SAFETY CLASS 1 2 3 4

ORIGINATOR:

CHECKER:

A. Estrada 9/9/93
A. Estrada, Welding Engineer Date

D. A. Buzzelli 9-9-93
D. A. Buzzelli, Lead Disc. Checker Date

APPROVED BY:

C. J. Divona
C. J. Divona Lead Discipline Engineer

9/9/93
Date

SECTION 05063
 WELDING PRESSURE VESSELS
 B-595-P-P06A-05063

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ATTACHMENTS

<u>ATTACHMENT</u>	<u>TITLE</u>
A	WELD MAP DATA SHEET
B	WELDING PROCEDURE SUMMARY
C	FORM E-651, SUMMARY OF HEAT TREATMENT, NDE AND RELATED REQUIREMENTS FOR WELDED PIPING

AWS A3.0	1989 Welding Terms and Definitions
AWS D10.11	1987 Recommended Practice for Root Pass Welding of Pipe without Backing
AWS QC1	1988 Standard and Guide for Qualification and Certification of Welding Inspectors

1.3 RELATED REQUIREMENTS

Specification Section 13252 Precautions for the Fabrication, Handling and Storage of Stainless Steel and Nickel Alloys

1.4 DEFINITIONS

CMTR - Certified Material Test Report

NDE - Nondestructive Examination

1.5 SYSTEM DESCRIPTION

(Not Used)

1.6 SUBMITTALS

Submit the following in accordance with the Vendor Drawing and Data Requirements section of the Order/Subcontract.

1.6.1 Welding Procedure Specifications (ASME Form QW-482 or equivalent) and Procedure Qualification Records (ASME Form QW-483 or equivalent) shall be submitted for Buyer approval. This requirement shall also pertain to purchased items contracted by Seller. They shall be in accordance both with the requirements of ASME Section IX and this specification section. Seller shall review the contractor's procedures to verify their conformance to the requirements of this specification section.

1.6.2 Welder Performance Qualifications (ASME Form QW-484 or equivalent) shall be submitted for Buyer review. This requirement shall also pertain to purchased items contracted by Seller.

1.6.3 Certified Material Test Reports (CMTRs) for weld filler metal shall be submitted for Buyer review.

- 1.6.4 Weld repair procedures shall be submitted for Buyer approval in accordance with Paragraph 3.4.1.
- 1.6.5 Final nondestructive examination (NDE) and inspection reports shall be submitted for Buyer review. These shall include visual inspection reports and radiography film.
- 1.6.6 Weld maps and weld procedure summary sheets shall be submitted for Buyer approval. They specifically identify each weld joint, weld procedure to be used and NDE requirement (see Attachment A and Attachment B for sample forms).
- 1.6.7 Attachment C (Form E-651) summarizing application of individual welding procedures with regards to types of joints and piping material line class shall be submitted for Buyer approval.
- 1.7 **CLASSIFICATION OF SYSTEMS AND COMPONENTS**
(Not Used)
- 1.8 **PROJECT OR SITE ENVIRONMENTAL CONDITIONS**
(Not Used)

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- 2.1.1 Weld filler materials shall be in accordance with ASME Section II, Part C.
- 2.1.2 Weld filler materials shall be used so that the principal elements in the deposited weld metal shall be of the same nominal composition as the base metal.
- 2.1.3 Solid wires for automatic welding processes shall contain the principal alloying elements required for the deposited weld metal. Welds deposited by the submerged arc process shall not derive any principal element from the flux.
- 2.1.4 Fluxes that the flux manufacturer recommends for single-pass shall not be used for multiple-pass welds.
- 2.1.5 Submerged arc welding shall be performed using the same name brand flux and the same name brand of ASME classification wire as used for the procedure qualifications.

- 2.1.6 Storage and handling of electrodes, fluxes and other welding materials after shipping containers are opened shall be in accordance with Seller's filler material control procedure. This procedure shall be in accordance with the guidelines of ASME Section II, Part C and the filler metal manufacturer's recommendation. At minimum, nickel alloy-covered electrode shall be stored in an electrode oven before use. Oven temperature shall be between 200°F and 300°F, inclusive.
- 2.1.7 Tack welds shall be made with the equivalent type of electrode filler wire that is used for the root pass.
- 2.1.8 Filler metal for welding Modified Inconel 690 shall be as supplied by Buyer.
- 2.1.9 For dissimilar welding between Type 304L stainless steel and duplex stainless steel nozzles the filler metal shall be duplex filler metal.
- 2.2 FABRICATION AND MANUFACTURE
- 2.2.1 General Requirements
- 2.2.1.1 Fabrication to this specification section shall be in accordance with the requirements of ASME Section VIII, Division 1 for vessels and ASME B31.3 for piping. Compliance with this specification section and authorization of Welding Procedure Specifications and Procedure Qualification Records shall in no way relieve Seller of the responsibility to provide welds which are sound and suited to the services for which they are intended.
- 2.2.1.2 Welding and nondestructive test symbols shall be in accordance with AWS A2.4.
- 2.2.1.3 Welding terms and definitions shall be in accordance with AWS A3.0.
- 2.2.1.4 Cleanliness shall be maintained during welding. All stubs, rods, flux, slag and other foreign material shall be removed from the weld area.
- 2.2.1.5 Peening is not permitted.
- 2.2.1.6 All weld spatter, burrs, etc., shall be ground to a smooth contour.
- 2.2.1.7 Fabrication aids, temporary supporting lugs, etc., that are removed by gouging or cutting shall not be cut closer than 1/8 inch from the vessel or piping surface. The remaining material shall then be ground flush with the base metal. The ground area shall be inspected for possible cracks or porosity by liquid pene-

trant examination. Examination shall be in accordance with Paragraph 3.2.7.

- 2.2.1.8 Arc strikes, weld starts and stops shall be confined to the weld joint. Arc strikes found outside the weld joint that are deeper than 1/16 inch shall be welded and then ground to a smooth contour. Those less than 1/16 inch shall be ground to a smooth contour.
- 2.2.1.9 Nozzles, lugs, support rings and similar items shall not be located on a weld seam unless unavoidable. Buyer authorization shall be required if any attachment is to be located on weld seam.
- 2.2.1.10 Where double welded butt joints cannot be utilized the root pass welds shall be made with the GTAW process. Back purging gas shall be used during welding. The purge shall be maintained until at least 0.250 inch depth of weld metal has been deposited, or the weld joint is filled, whichever is less. Purging shall be in accordance with AWS D10.11.
- 2.2.1.11 Tack welds in open butt joints shall be feathered into surrounding material. Cracked tack welds shall be removed.
- 2.2.2 Welding Qualifications
 - 2.2.2.1 Welding Procedure Specifications, Procedure Qualification Records and Welder's Performance Qualifications shall be in accordance both with the requirements of ASME Section IX and this specification section.
 - 2.2.2.2 Welding shall not start until Welding Procedure Specifications, Procedure Qualification Records and weld repair procedure are returned to Seller from Buyer, with authorization to proceed.
 - 2.2.2.3 Welds deposited by procedures differing from those authorized shall be rejected and completely removed at Seller's cost.
 - 2.2.2.4 Any welder shall be retested and recertified when the work of said welder creates a reasonable doubt as to the quality of his/her workmanship.
 - 2.2.2.5 Seller shall qualify Welding Procedure Specification and Procedure Qualification Records for welding Inconel 690. The Seller shall use base material and filler metal as supplied by Buyer. Qualification shall be in accordance both with ASME Section IX and this specification section.
- 2.2.3 Acceptable Welding Processes
 - 2.2.3.1 Welding may be achieved by any one or combination of the following welding processes:

<u>Welding Process</u>	<u>AWS Letter Designation</u>
Shielded Metal Arc Welding	SMAW
Manual and Automatic Gas Tungsten Arc Welding	GTAW
Automatic Submerged Arc Welding	SAW

2.2.3.2 Other welding processes such as Gas Metal Arc, Manual Submerged Arc and processes employing flux-cored electrodes require specific written authorization by the Buyer. Submit all pertinent data and intended application of said process for evaluation.

2.2.3.3 SAW process shall not be used on nickel alloys.

PART 3 EXECUTION

3.1 PREPARATION

- 3.1.1 Weld joint preparation shall be made by mechanical means or thermal cutting. When thermal cutting is performed, the joint surfaces shall be ground to bright metal prior to welding. Oxy-fuel cutting of stainless steel, nickel alloy and Inconel 690 is not acceptable.
- 3.1.2 Permanent backup strips are not permitted without specific written authorization from the Buyer. If temporary backup rings are used and then removed, the weld area shall be dressed and examined for cracks and other defects. Examination of the weld surfaces shall be performed visually and by the liquid penetrant method. Liquid penetrant examination shall be in accordance with Paragraph 3.2.7.
- 3.1.3 To minimize the contamination of Type 304L stainless steel, duplex stainless steel, nickel alloy and Inconel 690 the Seller shall follow the requirements of Specification Section 13252 prior to and after welding.
- 3.1.4 All surfaces to be welded shall be free of paint, oil, grease, dirt, scale and other foreign materials detrimental to weld soundness.
- 3.1.5 Joint edges and adjacent surfaces to be welded shall be wire-brushed. They shall then be cleaned with an ethyl alcohol or acetone dampened lint-free cloth before welding begins.
- 3.1.6 Wire brushes shall be made of 300 series austenitic stainless steel. Clearly mark mechanical cleaning tools such as grinding wheels, files, deburring tools and wire brushes. Marking shall identify tools to be used on stainless steel and nickel alloys only.

- 3.1.7 Grinding shall be done in such a method that overheating of base and weld metal is minimized. Heat tint is an indication of overheating. Abrasive disks and abrasive flapper wheels are preferred over grinding disks or continuous-belt grinders.
- 3.1.8 For Inconel 690 and nickel alloy, an area 1 inch wide minimum on each side of a weld joint including backside of the joint shall be ground to bright metal with 80 grit abrasive disk prior to welding.
- 3.1.9 For Inconel 690 and nickel alloy, the design of weld joints shall take into consideration the low fluidity and low penetration characteristics inherent in nickel alloys.
- 3.1.10 When specific details of fabrication are not shown on the Contract Documents, fabrication shall be in accordance with the requirements of ASME B31.3.
- 3.1.11 When welded joints involving two different pipe wall thicknesses are to be made, a 4 to 1 taper shall be made on the inside of the thicker pipe to avoid any detrimental mechanical notches in the piping system.
- 3.1.12 To ensure accurate cutting and proper fit-up of piping, a template shall be used to lay out header, laterals and other irregular details.

3.2 INSTALLATION, APPLICATION AND ERECTION

- 3.2.1 All welds shall be made in accordance both with Contract Documents and Seller's fabrication drawings.
- 3.2.2 Flux, weld spatter and any slag shall be removed from each weld bead prior to depositing each succeeding pass.
- 3.2.3 Welding starts and stops in welds shall be held to a minimum. Each such stop shall be properly conditioned before continuing the welding. The use of starting and stopping plates is recommended where possible.
- 3.2.4 Each weld shall be uniform in width and size through its full length. Welds shall be free of coarse ripples, grooves, overlap and undercut. Intermittent welds are not permitted because of increased chance of stress corrosion cracking.
- 3.2.5 To prevent oxidation of nickel alloy and Inconel 690 filler metal during the GTAW process, the filler metal tip shall remain in the shielding gas until the weld is complete or the tip is allowed to cool. If the tip is oxidized, the oxidized portion shall be cut off before welding is resumed.

3.2.6 Preheat and Interpass Temperature Control

3.2.6.1 For 304L stainless steel and duplex stainless steel, the minimum preheat shall be 50°F. The maximum interpass temperature shall not exceed 350°F.

3.2.6.2 For nickel alloy and Inconel 690, the minimum preheat shall be 60°F.

3.2.7 Inspection and Nondestructive Examination

3.2.7.1 General Requirement

Specific nondestructive examination (NDE) shall be as noted on Contract Documents and Form E-651. NDE methods, acceptance criteria and additional general requirements shall be in accordance with the following subparagraphs. All NDE, except visual examination, shall be performed by personnel certified in accordance with ASNT SNT-TC-1A.

3.2.7.2 Inspection

- A. Seller's welding inspector shall be qualified and certified in accordance with AWS QC1 or equal authorized by Buyer.
- B. All weld inspection reports shall be maintained and submitted in accordance with Paragraph 1.6.

3.2.7.3 Visual Examination (VT)

- A. Visual examination shall be performed in accordance both with ASME Section V, Article 9 and this specification section.
- B. The welds to be examined, the evaluation of indications and the acceptance criteria shall be in accordance with ASME Section V, Article 9, Paragraphs T-950-1 and T-950-2, and ASME Section VIII, Division 1, Paragraph UW-35.
- C. For piping, the acceptance criteria shall be in accordance with ASME B31.3, Paragraphs 341.3.2.
- D. Visual examination shall be performed on accessible surface of all completed welds.
- E. In addition to visual examination of completed welds, visual examination is required for all ground and blended welds.
- F. Groove and fillet welds shall have a uniform transition from the base material into the weld deposit. They shall be free of undercut and unfused overlap.

3.2.7.4 Liquid Penetrant Examination (PT)

- A. Liquid penetrant examination (PT) procedures shall be in accordance with the requirements and methods specified in ASME Section V, Article 6.
- B. Penetrant materials shall meet the requirements of Paragraph T-625 of Article 6, ASME Section V for sulfur and halogen content regardless of the type of material to be examined.
- C. PT shall include a band of base metal at least 1 inch wide on each side of the weld.
- D. The evaluation of indications and the acceptance criteria shall be in accordance with ASME Section VIII, Division 1, Appendix 8, Paragraphs 8.3 and 8.4 and Part UHA Paragraph UHA-34.
- E. For piping, the evaluation of indications and the acceptance criteria shall be in accordance with ASME B31.3, Paragraph 341.3.2.

3.2.7.5 Radiographic Examination (RT)

- A. Radiographic examination procedures and techniques shall be in accordance with ASME Section V, Article 2.
- B. The acceptance criteria and extent of examination shall be in accordance with ASME Section VIII, Division 1, Paragraph UHA-33.
- C. For piping, the acceptance criteria and examination methods shall be in accordance with ASME B31.3, Paragraph 341.3.2 and 344.5.

3.2.7.6 Ultrasonic Examination (UT)

- A. Ultrasonic examination procedures and techniques shall be in accordance with the requirements and methods specified in ASME Section V, Article 5.
- B. The acceptance criteria shall be in accordance with ASME Section VIII, Division 1.

3.2.8 Charpy Impact Testing

3.2.8.1 Procedure Qualification Record (PQR)

- A. Testing is only required when welding duplex stainless steel remote connector nozzles to stainless steel piping.
- B. Deposited weld metal and both heat affected zones shall be tested with results recorded on the PQR.

- C. Testing shall be in accordance with ASME Section VIII, Paragraph UG-84.
- D. The minimum impact energy shall be 18 ft.-lbs. at room temperature.

3.3 **FIELD QUALITY CONTROL**

(Not Used)

3.4 **ADJUSTMENTS**

3.4.1 **Weld Repairs**

3.4.1.1 All weld repairs shall be performed in accordance with the approved weld repair procedure.

3.4.1.2 Unacceptable indications shall be completely removed by chipping, gouging, grinding or other authorized methods (for the type of material being repaired) to clean, sound metal. The excavated areas shall be examined by the liquid penetrant method to assure complete removal of defects. Liquid penetrant examination shall be in accordance with Paragraph 3.2.7.

3.4.1.3 The repaired areas shall be reexamined using the same inspection procedures by which the defect was originally detected, along with all other inspection called out for the particular weld.

3.4.1.4 Two repair attempts will be allowed on any one defective area. No further repair attempts shall be carried out without the authorization of Buyer.

3.5 **CLEANING**

(Not Used)

3.6 **PROTECTION**

(Not Used)

3.7 **DEMONSTRATION**

(Not Used)

3.8 **SCHEDULES**

(Not Used)

END OF SECTION

ATTACHMENT A
WELD MAP DATA SHEET

Buyer P.O. No. _____

Item No. _____

Buyer Weld Specification No. _____

1. Draw a single line sketch of the pressure-retaining parts.
2. Identify each qualified welding procedure.

SKETCH

<p>Seller Address Buyer PO#</p>	
---	--

This Form Completed By _____

Telephone No. _____

Revisions _____

Date _____

Buyer Welding Eng. Review Block

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ATTACHMENT B
WELDING PROCEDURE SUMMARY DATA

<u>Space No.</u>	<u>Action to be Taken</u>
1	Enter the Buyer's Purchase Order number. A separate summary must be completed for each P.O. and suborder.
2	Enter the Buyer's item number(s). The summary sheet must reflect all items of similar construction that will have common welding procedures. Items of markedly different materials or methods of manufacture should be entered on separate WPS's.
3	Enter Seller's name.
4	Enter Seller's shop location where work will be performed.
5	Enter date summary is compiled.
6	Enter Buyer serial number and revision (Buyer's use only).
7	Enter Welding Procedure Specification (WPS) number.
8	Enter Procedure Qualification Record (PQR) number(s) supporting the WPS.
9	Enter the welding process(es) used in performing (PQR).
10	Enter type of joint as referenced in Legend. Where (E) is used, state type of joint or overlay in space 17.
11	Enter ASME-ASTM materials to be used in fabrication.
12	Enter base metal thickness range qualified by PQR.
13	Enter post weld heat treatment information in appropriate box.
14	Enter other pertinent information in this space. Such as impacts, etc.
15	Enter current review status of weld procedure (Buyer's use only).
16	Enter date of current review status of weld procedure (Buyer's use only).
17	Enter any special design or process information regarding the item of construction in this box.

ATTACHMENT C
FORM E-651
SUMMARY OF HEAT TREATMENT, NDE AND RELATED
REQUIREMENTS FOR WELDED PIPING

GENERAL REQUIREMENTS

- 1a. For stainless steel: Preheat base metal to 50°F for all thicknesses. Maximum interpass temperature shall not exceed 350°F
- 2a. 100% radiographic examination (RT) of butt welds shall be performed in accordance both with this specification section and ASME B31.3, Paragraphs 341.3.2 and 344.5, for Normal Fluid Service.
- 3a. 100% visual examination (VT) of piping shall be performed in accordance both with this specification section and ASME B31.3, Paragraph 341.4.1, for Normal Fluid Service.

U.S. DEPARTMENT OF ENERGY
Hanford Waste Vitrification Plant
Richland, Washington
DOE Contract DE-AC06-86RL10838

FLUOR DANIEL, INC.
Advanced Technology Division
Fluor Contract 8457

SECTION 13249
MELTER TOP HEAD TURNING FIXTURE
B-595-P-P06A-13249

APPROVED FOR CONSTRUCTION

REVISION 0 PER CR HWVP-0981
ISSUE DATE SEP 10 1993

WAPA YES NO
QUALITY LEVEL I II
SAFETY CLASS 1 2 3 4

ORIGINATOR:

CHECKER:

P. Lally 9-9-93
P. Lally, Mechanical Engineer Date

D. A. Buzzelli 9-9-93
D. A. Buzzelli, Lead Dist. Checker Date

APPROVED BY:

C. J. Divona
C. J. Divona Lead Discipline Engineer

9/9/93
Date

SECTION 13249
 MELTER TOP HEAD TURNING FIXTURE
 B-595-P-P06A-13249

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ATTACHMENTS

ATTACHMENT TITLE

- A LIST OF DWPF VENDOR DRAWINGS AND MACHINE PARTS LIST
- B COLORS
- C NAMEPLATES

SECTION 13249
MELTER TOP HEAD TURNING FIXTURE

PART 1 GENERAL

1.1 SUMMARY

This specification section covers the technical requirements for design, stress analysis, fabrication, manufacture, inspection, load test and functional testing of the melter top head turning fixture.

1.2 REFERENCES

The publications listed below form a part of this specification section to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC M016 1989 Manual of Steel Construction - Allowable
Stress Design, 9th Edition

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI B15.1a 1986 Safety Standard for Mechanical Power
Transmission Apparatus

ANSI Y14.5M 1982 Dimensioning and Tolerancing

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
and/or

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ANSI/ASME B1.20.1 1983 Pipe Threads, General Purpose (Inch)
Revision and Redesignation of ANSI B2.1 -
1968

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
and/or

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

ANSI/NEMA 250 1985 (Rev. 2 - 88) Enclosures for Electrical
Equipment (1000 Volts Maximum)

AMERICAN WELDING SOCIETY (AWS)

AWS A2.4 1986 Symbols for Welding, Brazing and
Nondestructive Examination

AWS D1.1 1990 Structural Welding Code - Steel

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1992 Title 29, Chapter XVII, Part 1910 -
Occupational Safety and Health Standards

FACTORY MUTUAL (FM)

Directory 1991 Approval Guide

FEDERAL STANDARDS (FED-STD)

FED-STD-595B 1989 Colors Used in Government Procurement

INSTRUMENT SOCIETY OF AMERICA (ISA)

ISA RP60.6 1984 Nameplates, Labels and Tags for Control
Centers

MILITARY STANDARDS (MIL-STD)

MIL-STD-1472D 1989 Human Engineering Design Criteria for
Military Systems, Equipment and Facilities

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 1990 National Electric Code

STEEL STRUCTURES PAINTING COUNCIL (SSPC)

SSPC PA-2 1982 Paint Application Specification No. 2,
Measurement of Dry Paint Thickness with
Magnetic Gauges

SSPC SP-10 1989 Surface Preparation Specification
No. 10, Near-White Blast Cleaning

UNDERWRITERS LABORATORIES INC. (UL)

Directory 1991 Electrical Appliance and Utilization
Equipment Directory

Directory 1991 Recognized Component Directory

UL 83 1983 Thermoplastic-Insulated Wires and
Cables, 10th Edition

UL 360 1986 Liquid-Tight Flexible Steel Conduit, 3rd
Edition

UL 486A 1989 Wire Connectors and Soldering Lugs for
Use with Copper Conductors, 8th Edition

UL 514B	1989 Fittings for Conduit and Outlet Boxes, 2nd Edition
UL 1059	1988 Standard Terminal Blocks, 2nd Edition
UL 1242	1983 Intermediate Metal Conduit, 1st Edition

U.S. NUCLEAR REGULATORY COMMISSION (NUREG)

NUREG-0700	1981 Guidelines for Control Room Design Reviews
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1.3 RELATED REQUIREMENTS

Drawing H-2-120235	Melter Top Head
Drawing H-2-120242, Sheet 4	Melter RFRC/INSUL Installation Dimensions
Drawing H-2-120242, Sheet 5	Melter RFRC/INSUL Superstructure RFRC
Drawing H-2-120242, Sheet 7	Melter RFRC/INSUL Superstructure RFRC

RELATED DRAWINGS

DWPF Vendor (Keller Technology) Drawings and Machine Parts List as listed in Attachment A.

1.4 DEFINITIONS

AWG - American Wire Gauge
CMTR - Certified Material Test Report
DWPF - Defense Waste Processing Facility
IOM - Installation, Operation and Maintenance
MTW - Machine Tool Wire
NDE - Nondestructive Examination
PVC - Polyvinyl Chloride
TEFC - Totally Enclosed Fan Cooled
VA - Volt-Ampere
VAC - Volts Alternating Current

1.5 SYSTEM DESCRIPTION

- 1.5.1 The melter top head turning fixture shall be a reusable permanent fixture used for shipping, handling and storage of the melter top head.

- 1.5.2 The melter top head turning fixture will be used for the following purposes:
- A. Rotation of uninsulated melter top head (H-2-120235) to inverted position.
 - B. Work platform for the installation of refractory (H-2-120242).
 - C. Shipping, handling and storage of insulated melter top head (in inverted position).
 - D. Rotation of insulated melter top head to upright position prior to assembly onto melter vessel.
- 1.5.3 The melter top head turning fixture shall be similar in form, fabricated from similar materials and have the same basic operational features as the Defense Waste Processing Facility (DWPF) melter top head turning fixture. Reduced copies of DWPF vendor (Keller Technology) drawing package are attached for reference. Seller shall ignore references to vendor Specs, BPF files, P.O. Numbers, etc. shown on the DWPF Drawing Package.
- 1.5.4 Requirements of this specification section shall take precedence over the DWPF vendor data.

1.6 SUBMITTALS

Submit the following in accordance with the Vendor Drawing and Data Requirements section of the Order/Subcontract.

- 1.6.1 A design and stress analysis shall be submitted for Buyer review. The stress analysis shall be in accordance both with AISC M016 and AWS D1.1.
- 1.6.2 Complete shop fabrication and manufacturing drawings shall be submitted for Buyer approval prior to fabrication. Shop drawings shall be prepared in accordance with the following practices:
- A. Structural members described shall be in accordance with AISC M016.
 - B. Weld joint symbols shall be in accordance with AWS A2.4.
 - C. Dimensioning and tolerancing shall be in accordance with ANSI Y14.5M.
 - D. Bill of materials for the structural members shall contain complete material specifications.

- E. Reference shall be made by notes to applicable procedures for fabrication, welding, stress relief, nondestructive examination, load testing and painting.
- 1.6.3 Welding Procedure Specification and Procedure Qualification Records shall be submitted for Buyer approval. This requirement shall also pertain to purchased items contracted by Seller. They shall be in accordance with the requirements of AWS D1.1. Seller shall review the subcontractor's procedures to verify their conformance to the requirements of this specification section.
- 1.6.4 Final weld examination and inspection reports shall be submitted for Buyer review. These shall include visual Nondestructive Examination (NDE) reports.
- 1.6.5 A load testing procedure shall be submitted for Buyer approval prior to testing. A test report shall be submitted for Buyer review after final testing.
- 1.6.6 Installation, Operation and Maintenance (IOM) instructions shall be submitted for Buyer review. These shall include lubrication requirements and recommended spare parts.
- 1.6.7 "As-Built" drawing package shall be submitted for Buyer review.
- 1.6.8 Dimensional electrical outline drawings shall be submitted for Buyer review. These drawings shall show the location of all electrical equipment, control panel installation details, emergency stop stations, limit switches and conduit routing.
- 1.6.9 Detailed Electrical Bills of Materials shall be submitted for Buyer review. These shall include the manufacturer's name and catalog number for all components.
- 1.6.10 Elementary electrical circuit diagrams shall be submitted for Buyer review.
- 1.6.11 Electrical connection and wiring diagrams for all electrical equipment shall be submitted for Buyer review. These diagrams shall include equipment identifications with terminal block numbers, terminal point numbers and wire numbers.
- 1.6.12 Certified Material Test Reports (CMTRs) for materials selected and used in the fabrication of the melter top head turning fixture shall be submitted for information.
- 1.7 **CLASSIFICATION OF SYSTEMS AND COMPONENTS**
(Not Used)

1.8 PROJECT OR SITE ENVIRONMENTAL CONDITIONS

1.8.1 Climatic and Geographic Site Conditions

- A. Site Elevation 714 feet above sea level
- B. Barometric Pressure 14.3 psia
- C. Outside Design Temperature
 - 1) Maximum Design Temperature 110°F
 - 2) Minimum Design Temperature -20°F
 - 3) Wet Bulb Design Temperature 68°F

1.8.2 Operating Environment

- A. Normal Temperature 60°F to 104°F
- B. Maximum Temperature 104°F
- C. Relative Humidity Not controlled

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- 2.1.1 Unless otherwise specified, materials of construction shall be the Seller's standard materials.
- 2.1.2 Carbon steel shall not be used for components which directly contact the stainless steel melter top head shown in Drawing H-2-120235.
- 2.1.3 Seller shall design, manufacture and test a melter top head turning fixture in accordance with the requirements of this specification section.
- 2.1.4 Because of the fragile nature of the melter top head refractory, the fixture shall be designed and manufactured to minimize forces transferred to the melter top head during the turning operation.
- 2.1.5 The melter top head turning fixture shall be transportable by either truck or rail car.
- 2.1.6 The melter top head turning fixture shall be designed and manufactured with work platforms, access ladders, safety railings and guards.

- 2.1.7 The melter top head turning fixture shall include means for the melter top head, shown in Drawing H-2-120235, to be bolted securely in place.
- 2.1.8 Seller shall furnish a watertight gasketed top head cover for use when shipping and storing the melter top head.
- 2.1.9 Operation cycle for the melter top head turning fixture shall be assumed to be 2 cycles per year over a 40-year operational life.
- 2.1.10 The fixture shall include means for being handled by overhead crane.
- 2.1.11 The fixture shall invert the melter top head 180 degrees.
- 2.1.12 Rotation shall be powered by electric motor (see Paragraph 2.4.3.)
- 2.1.13 Rotation time shall be less than 10 minutes and shall not exceed a velocity of 0.135 rpm.
- 2.1.14 Electrical Materials
 - 2.1.14.1 When two or more components of the same specifications are required, the components shall be identical. They shall have the same manufacturer and catalog number.
 - 2.1.14.2 Conduit shall be intermediate metal conduit, hot-dipped and galvanized, in accordance with UL 1242.
 - 2.1.14.3 Liquid-tight flexible metal conduit shall be galvanized steel flexible tubing. The tubing shall be covered with a synthetic polyvinyl chloride (PVC) jacket extending over the tubing. This conduit shall be in accordance with UL 360.
 - 2.1.14.4 Cast malleable iron or steel fittings used with intermediate metal conduit shall be coated with metallic zinc or cadmium. This shall be done after all machine work is completed. Covers shall be of the same material as fittings. Coating shall be in accordance with UL 514B.
 - 2.1.14.5 Fittings used with liquid-tight flexible metal conduit shall be malleable iron/steel construction. These fittings shall be electro-zinc plated inside and outside. They shall be furnished with a nylon-insulated throat, taper-threaded hub and an external ground lug (Appleton Series STB or equal).
 - 2.1.14.6 Metallic insulation-type bushing used on intermediate metal conduit shall be Appleton Type BU or equal.
 - 2.1.14.7 Boxes/pull boxes shall be liquid-tight with gasketed covers (Appleton Type JIC or equal).

- 2.1.14.8 Conduit clamps shall be malleable iron, hot-dipped and galvanized (Appleton Series PC or equal).
- 2.1.14.9 Power and control cables installed in the conduit system shall be single-conductor stranded copper with 600V insulation. These cables shall be UL listed Type XHHW or Type THHN.
- 2.1.14.10 The portable cord used (with grounding plug) to provide 120V power to the melter top head turning fixture control cabinet shall be Type SO, flexible stranded copper conductors, #12 AWG with ground wire. This cord shall be UL listed and shall be 10 feet long. It shall have 600V insulation and be rated for 90°C.
- 2.1.14.11 The male plug shall be of the twist-lock type, 20A/125V, NEMA Configuration 5-20P.
- 2.1.15 Welding Materials
Matching weld filler material shall be in accordance with AWS D1.1, Table 4.1. A minimum 70 ksi filler metal shall be used.

2.2 FABRICATION AND MANUFACTURE

- 2.2.1 Welding of steel structure shall be in accordance with the requirements of AWS D1.1.
- 2.2.2 The system shall be fully assembled, prewired and functionally tested at Seller's shop. This is to minimize field set-up time.
- 2.2.3 The system shall provide means for lubrication of all bearings, bushings, sliding surfaces, etc.
- 2.2.4 Seller shall submit lubrication requirements as part of the IOM instructions.
- 2.2.5 Electrical Fabrication
 - 2.2.5.1 Electrical equipment, components and materials shall be sized and installed in accordance with NFPA 70.
 - 2.2.5.2 Flexible conduit shall be used to avoid transmission of vibration from equipment to the rigid conduit system.
 - 2.2.5.3 Wiring between electrical components shall be routed in conduit.
 - 2.2.5.4 Exposed conduit shall be run vertically, horizontally or parallel to the packaged equipment. Boxes/pull boxes shall be supported independently of the conduit system.
 - 2.2.5.5 Conductors for power circuits shall not be smaller than #12 AWG. Conductors for control circuits shall not be smaller than #14 AWG.

2.2.5.6 All conduit containing 120V circuit shall be equipped with a ground wire.

2.3 SAFETY AND MAINTAINABILITY

2.3.1 The system as supplied shall conform with all applicable Federal Occupational Safety and Health Administration requirements (29 CFR).

2.3.2 The system as supplied shall be in accordance with the requirements of ANSI B15.1a.

2.3.3 The sound level during operation of the system shall not exceed 85 dBA measured at three feet in any direction from the fully assembled fixture.

2.3.4 All lifting and handling points shall be clearly marked.

2.3.5 The melter top head turning fixture shall allow for safe interruption of rotation at any position. Rotation shall not continue (i.e., melter top head shall not move in any direction) unless push button is held down, emergency stop buttons are in the out position, and torque limiting device is clear.

2.3.6 The melter top head turning fixture shall be designed with mechanical overtravel limit stops.

2.3.7 The melter top head turning fixture shall be designed such that the drive mechanism is protected with a torque limiting device. Overload protection on the motor, although required, will not be sufficient to satisfy this requirement.

2.3.8 Guards shall be installed to preclude personnel access to the underside of the melter top head turning fixture.

2.3.9 When installed, all external and internal components requiring manipulation, observation and maintenance shall be readily and safely accessible to operating and maintenance personnel.

2.4 ELECTRICAL

2.4.1 The electrical design and equipment used in the design and manufacture of the melter top head turning fixture shall be similar to that shown on the DWPF vendor drawings. Requirements specified in Paragraph 2.5 and elsewhere in this specification section shall take precedence over the DWPF vendor drawings.

2.4.2 When applicable, all materials and equipment shall be listed by Underwriters Laboratories, Inc. Such materials and equipment shall bear the UL label.

- 2.4.3 The fixture's motor shall be 120 VAC, single-phase operation. It shall be totally enclosed, fan cooled (TEFC).
- 2.5 INSTRUMENTS AND CONTROLS
- 2.5.1 General
- 2.5.1.1 The control panel, accessories, materials and instrumentation shall operate under the conditions stated in Paragraph 1.8.
- 2.5.1.2 Provide accessories, materials and methods of manufacture not included in this specification section, but which are necessary to complete the fabrication of the control panel.
- 2.5.1.3 Electrical components or devices which operate at voltage higher than 30 volts or energy greater than 100 VA shall be UL listed, UL Recognized Components or FM Approved Devices (refer to UL and FM directories).
- 2.5.2 Panel and Accessories
- 2.5.2.1 The basic panel shall be a factory-made standard panel. Its enclosure shall be Type 4 in accordance with ANSI/NEMA 250.
- 2.5.2.2 Two push button boxes shall be provided for mounting to the fixture. These boxes shall be factory-made standard boxes, Type 4 in accordance with ANSI/NEMA 250 .
- 2.5.2.3 The panel shall be modified as necessary to support the instrumentation and accessories mounted in it. The panel shall remain in accordance with ANSI/NEMA 250, Type 4 after the modifications have been made.
- 2.5.2.4 The operating temperature shall be prevented from exceeding instrument/equipment manufacturer's operating limits.
- 2.5.2.5 Condensation during the panel's shipping, storage and operation shall be prevented.
- 2.5.2.6 Instruments shall be mounted and supported in accordance with manufacturers' installation documents.
- 2.5.2.7 The panel instrument layout shall be in accordance both with MIL-STD 1472D and NUREG 0700. Hand switches and indicators shall be provided with colors in accordance with Attachment B.
- 2.5.2.8 #14 AWG stranded copper wire shall be used. Machine Tool Wire (MTW) insulation shall be in accordance with UL 83.

- 2.5.2.9 Conductors on screw terminals shall be terminated with tin-plated copper, compression ring-tongue, nylon-insulated terminals in accordance with UL 486A. (Thomas and Betts Catalog No. RB-14 (#18-14 AWG) and RC-10 (#12-10 AWG) or equal.)
- 2.5.2.10 Wires shall be identified at both ends with white tubular, shrink-on sleeves. These sleeves shall be marked with permanently-imprinted black characters. The same identification number shall be used throughout the run of daisy-chained wires.
- 2.5.2.11 Wiring shall be supported either in metal or plastic raceways or in conduit.
- 2.5.2.12 Channel-mounted terminal blocks shall be provided. These blocks shall be equipped with number 8 screws and be rated for 600 volts. They shall be in accordance with UL 1059 (Allen-Bradley Catalog number 1492-CD3 or equal). Provide an even number of spare terminals greater than 25 percent of the number of terminals used.
- 2.5.2.13 A copper safety ground bus shall be provided. The ground bus shall be bolted to the panel frame. It shall have screws to connect 8 or more 10-14 AWG ground wires.
- 2.5.2.14 Nameplates and Tagging
- A. Nameplates shall be provided on the front of the panel. They shall be fabricated from 1/16-inch thick laminated plastic with white surface and black core. Edges shall be beveled and all burrs removed. Refer to Attachment C for sizes.
 - B. Nameplates shall be engraved with Helvetica Bold Condensed capital letters. Abbreviations (when required) shall be in accordance with ISA RP60.6. Other abbreviations are subject to Buyer approval.
 - C. Nameplates shall be fastened to the panel with number 4-40 stainless steel screws or 1/8-inch stainless steel drive rivets.
 - D. Nameplates shall be provided on the back of the panel above each instrument. The instrument tag number shall be engraved on each nameplate in 1/8-inch high capital letters.

2.5.3 Instruments

Seller-provided instruments shall include the features listed by instrument type below:

2.5.3.1 Limit Switches

- A. Double Pole, Double Throw (DPDT) contacts.
- B. Screw terminals for wiring.
- C. Contacts rated for applied load.
- D. Minimum 3/4 inch female conduit hub in accordance with ANSI/ASME B1.20.1.
- E. NEMA Type 4 enclosure.

LIMIT SWITCH MODEL	LIMIT SWITCH USAGE
Micro Switch BAF1 series or equal	Used to detect platform retraction position
Micro Switch E6/V6 series or equal	Used for motor (FWD/REV travel) position
Micro switch LS/200LS series or equal	Used for torque limit switch

2.5.3.2 Electrical Selector Switches

- A. Heavy-duty, oil-tight, water-tight, manual return, 2 position, black knob operated selector switches (Square D Company KS11B*** or equal).

* = Contact block and cam code as required by Seller.

- B. Contact blocks with screw terminal, rated for the load to be switched.

2.5.3.3 Push Button Switches

- A. Heavy-duty, oil-tight, water-tight, full guard, black momentary push button switch (Square D Company KR1B*** or equal).

* = Contact block as required by Seller.

- B. Contact blocks with screw terminal, rated for the load to be switched.

2.5.3.4 Push-Pull Switches

- A. Heavy-duty, oil-tight, water-tight, illuminated, red mushroom head, maintained switches (Square D Company KR9P35R***, or equal).

* = Contact block as required by Seller.

B. Contact blocks with screw terminal, rated for the load to be switched.

C. Type number 757, 28-volt lamp operated at 24 volts.

2.5.3.5 Status Indicators

A. Heavy-duty, oil-tight, water-tight, pilot light (Square D Company KP35W9 (white translucent) or equal).

B. Type number 757, 28-volt lamp operated at 24 volts.

2.5.4 Controls

2.5.4.1 Seller shall design the control configurations and interlock logic to implement the specific control system required for safe and efficient operation of the melter top head turning fixture.

2.5.4.2 The control circuits shall be designed to fail in a safe condition on loss of power and remain open upon power recovery.

2.5.4.3 Discrete circuits shall be designed to operate on 120 Vac, have contacts closed (powered) during normal operation and to have contacts open on abnormal conditions to cause alarms and shutdowns.

2.5.4.4 The melter top head turning fixture shall be designed so that the drive mechanism automatically stops in the upright and inverted positions.

2.5.4.5 The operator control panel on the melter top head turning fixture frame in a location which will permit the operator to observe the head rotation.

2.5.4.6 The control panel power indicating light (white) shall be ON as long as the power is applied to the panel and the power selector switch is in ON position.

2.5.4.7 Interlock circuits shall be provided between limit switches and the motor. They shall be designed such that the drive mechanism will not operate unless work platforms are retracted.

2.5.4.8 Interlock circuits shall be provided between emergency stop push buttons and the motor. They shall be designed such that the drive mechanism will not operate unless push buttons are in the pull out (RUN) position.

2.5.4.9 Emergency stop push buttons shall be designed and configured to indicate their status when any one of emergency stop push buttons are in the pushed-in (STOP) position.

2.5.4.10 Interlock circuits shall be provided between limit switches and the motor. They shall be designed such that the motor will stop in both the forward and reverse ends of travel position and still permit driving back out of the limit region.

2.6 SURFACE PREPARATION AND PAINTING

2.6.1 The surfaces of the melter top head turning fixture shall be cleaned and painted in accordance both with SSPC SP-10 and the paint manufacturer's recommended methods.

2.6.2 The primer coat shall be an inorganic zinc-rich primer, applied to a minimum dry film thickness of 3 mils.

2.6.3 The finish coat shall be a high-build polyamide epoxy paint, applied in two coats to a total dry film thickness of at least 10 mils.

2.6.4 The dry film thickness shall be inspected with a magnetic thickness gauge (Nordson "Mikrotest" or equal) in accordance with SSPC PA-2.

2.6.5 The following paint colors and color numbers are in accordance with FED-STD-595B. They are applicable to the melter top head turning fixture as follows:

- A. The melter top head turning fixture frame shall be Gray #16492.
- B. The railings, ladder(s) and safety guards shall be Yellow #13655.

2.6.6 Seller shall provide one gallon of each color paint for field touch-up:

2.6.7 Stainless steel, electroplated steel and/or plastic surfaces shall not be painted.

2.7 INSPECTION AND TESTING

2.7.1 The melter top head turning fixture shall be functionally tested as follows:

- A. Turning mechanism shall be cycled with melter top head turning fixture empty.
- B. Turning mechanism shall be cycled with a simulated top head load weight of 24,000 lbs.
- C. Turning mechanism shall be lifted by the lifting lugs with a simulated top head load weight of 24,000 lbs in place.

- D. Seller shall provide test load (top head simulator). Top head simulator shall not be shipped to Buyer.
- 2.7.2 Weld quality assurance and inspection shall be in accordance with the requirements of AWS D1.1 (Paragraphs 8.15.1, 9.25.1 and 10.17.1). They shall be conducted after the function tests have been performed as noted in Paragraph 2.7.1.
- 2.8 **PREPARATION FOR SHIPMENT**
- 2.8.1 Any spare parts that are required for installation, testing and start-up shall be included.
- 2.8.2 Spare parts list shall be provided (with anticipated replacement intervals) as part of the IOM instructions.
- 2.8.3 The melter top head turning fixture shall be equipped with a stainless steel identification plate permanently attached to the frame. The plate shall be engraved with the following information:
 - A. Manufacturer's name or logo.
 - B. Buyer P.O. number.
 - C. HWVP equipment number (HD-720-001).
 - D. Fixture net weight and rated capacity.
- 2.8.4 Seller shall be solely responsible for providing adequate preparation for shipment. Preparation will be subject to inspection and rejection by Buyer. Minimum preparation for shipment shall be as described in the following paragraphs:
 - A. Adequate protection shall be provided against mechanical damage and atmospheric corrosion in transit, and for indefinite outdoor storage at jobsite.
 - B. Separate, loose and spare parts shall be completely boxed or secured to pallets. All pieces of equipment and spare parts shall be identified by item number and service. They shall be marked with Buyer's order number, item number and weight both inside and outside of each individual package or container.
 - C. A minimum of one set of installation, operating and maintenance instructions shall be sent with the equipment (in a sealed, waterproof package). This is in addition to the number required by the Vendor Drawing and Data Requirements section of the Order/Subcontract.

- D. Except for stainless steel surfaces, all exposed unpainted surfaces (including bolts) shall be coated with rust-inhibiting compound.
- E. Condensation inside the electrical panel shall be prevented during shipping and storage.

PART 3 EXECUTION

(Not Used)

END OF SECTION

ATTACHMENT A
 LIST OF DWPF VENDOR DRAWINGS
 AND MACHINE PARTS LIST

DRAWING NUMBER	SHEET	OF	KELLER TECHNOLOGY DRAWING TITLE
3944-00	1	3	Final Assembly Work Position
3944-00	2	3	Final Assembly Load/Rotate Position
3944-00	3	3	Final Assembly Ship Positions
3944-02	1	1	Drive Guard, Top Head Turning Fixture
3944-03-A	1	1	Shroud, Top Head Turning Fixture
3944-03-B	1	1	Shroud, Top Head Turning Fixture
3944-04	1	1	Details, Top Head Turning Fixture
3944-05	1	1	Ring, Top Head Turning Fixture
3944-06	1	1	Stud, Top Head Turning Fixture
3944-08	1	1	Mounting Plates, Top Head Turning Fixture
3944-09	1	1	End Shroud
3944-10	1	4	Frame
3944-10	2	4	Frame
3944-10	3	4	Frame
3944-10	4	4	Frame Ref Dwg.
3944-20	1	3	Gimbal (Welded Assy)
3944-20	2	3	Gimbal (Welded Assy)
3944-20	3	3	Gimbal
3944-21	1	2	Template For Gimbal
3944-21	2	2	Template For Gimbal
3944-22	1	2	Template (Outside), Top Head Turning Fixture
3944-22	2	2	Template (Outside)

DRAWING NUMBER	SHEET	OF	KELLER TECHNOLOGY DRAWING TITLE
3944-23	1	1	Template (Inside)
3944-30	1	1	Drive Assy, Top Head Turning Fixture
3944-31	1	1	Coupling (Altered Part) Top Head Turning Fixture
3944-32	1	1	Block
3944-40	1	1	Top Head Turning Fixture Plan Electrical Install
3944-41	1	1	Top Head Turning Fixture Schematic
3944-42	1	1	Top Head Turning Fixture Control Panel
3944-50	1	1	Ladder, Top Head Turning Fixture
3944-60	1	1	Platform - Small, Top Head Turning Fixture
3944-61	1	1	Platform - Large, Top Head Turning Fixture
3944-70	1	1	Railing Assy (Long), Top Head Turning Fixture
3944-71	1	1	Railing Assy (Short), Top Head Turning Fixture
3944-80	1	1	Cover, Top Head Turning Fixture
3944-81	1	1	Gasket, Top Head Turning Fixture
3944-90	1	1	Test Load, Top Head Turning Fixture

MACHINE PARTS LIST

DRAWING NUMBER	SHEET	OF	KELLER TECHNOLOGY DRAWING TITLE
3944-00	1	3	Machine Parts List
3944-00	2	3	Machine Parts List
3944-00	3	3	Machine Parts List

DRAWING NUMBER	SHEET	OF	KELLER TECHNOLOGY DRAWING TITLE
3944-20	1	1	Machine Parts List
3944-30	1	2	Machine Parts List
3944-30	2	2	Machine Parts List
3944-40	1	1	Machine Parts List
3944-42	1	1	Machine Parts List
3944-80	1	1	Machine Parts List

ATTACHMENT B
COLORS

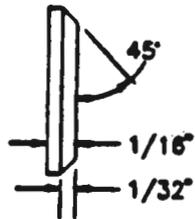
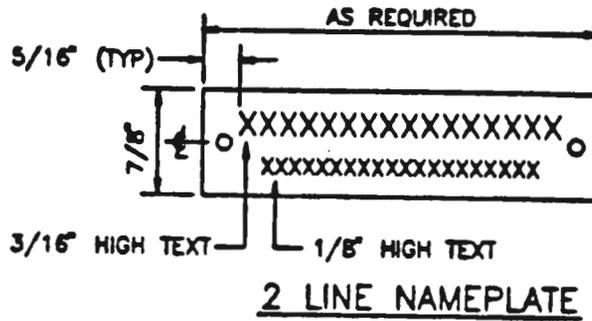
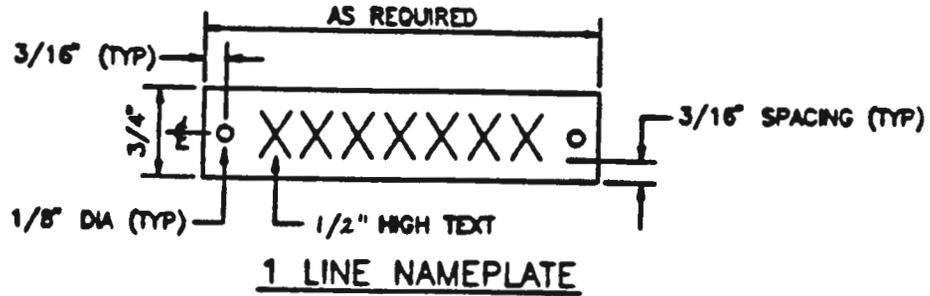
INDICATOR LIGHTS

COLOR	MEANING	NOTES/EXAMPLES
WHITE - MAINTAINED	NORMAL CONDITION, STATUS, OR INFORMATION	POWER ON
AMBER - MAINTAINED	CAUTION, ACTIVE STATE	MOTOR RUNNING
GREEN - MAINTAINED	SAFE, NORMAL CONDITION	MOTOR STOPPED

PUSHBUTTONS AND SELECTOR SWITCHES

COLOR	MEANING	NOTES/EXAMPLES
BLACK	GENERAL PURPOSE	START MOTOR
RED	HAZARD, DANGER, CAUTION	EMERGENCY STOP

ATTACHMENT C
NAMEPLATES



DETAIL OF EDGES

NOTES:

1. Where space allows, abbreviations shall not be used. If they are needed, they shall be in accordance with ISA RP60.6.
2. The one-line nameplate shall be used for panel numbers and panel titles. Panel number nameplates and panel title nameplates shall be placed at the top of their respective panels with the panel number nameplate above the panel title nameplate.
3. The two-line nameplate shall be used for labeling and tagging instruments on the front of the panels. The top line shall have a short description of the instrument and the bottom line shall be the instrument tag number. Name plates shall be placed above each instrument (e.g. panel hand switches).

U.S. DEPARTMENT OF ENERGY
Hanford Waste Vitrification Plant
Richland, Washington
DOE Contract DE-AC06-86RL10838

FLUOR DANIEL, INC.
Advanced Technology Division
Fluor Contract 8457

SECTION 13250
FABRICATION OF MELTER AND FRAME ASSEMBLY
B-595-P-P06A-13250

APPROVED FOR CONSTRUCTION

REVISION 1 PER CR HWVP-0981
ISSUE DATE SEP 10 1993

WAPA YES NO
QUALITY LEVEL I II
SAFETY CLASS 1 2 3 4

ORIGINATOR:

CHECKER:

A Russell 9/9/93
A. Russell, Mechanical Engineer Date

D. A. Buzzelli 9-9-93
D. A. Buzzelli, Lead Disc. Checker Date

APPROVED BY:

C J Divona
C. J. Divona Lead Discipline Engineer

9/9/93
Date

SECTION 13250
 FABRICATION OF MELTER AND FRAME ASSEMBLY
 B-595-P-P06A-13250

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ATTACHMENTS

<u>ATTACHMENT</u>	<u>TITLE</u>
A	MELTER/FRAME FABRICATION AND ASSEMBLY DRAWINGS
B	RELATED DRAWINGS
C	PROCEDURE FOR EPOXY COATING OF MELTER VESSEL

SECTION 13250
FABRICATION OF MELTER AND FRAME ASSEMBLY

PART 1 GENERAL

1.1 SUMMARY

This specification section covers the general requirements for fabrication, assembly, test and delivery of major elements of a glass melter to vitrify radioactive liquid waste for the Hanford Waste Vitrification Plant (HWVP). This specification section does not include additional melter components which will be installed and connected at the HWVP site.

1.2 REFERENCES

The publications listed below form a part of this specification section to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

- | | |
|------------|---|
| ANSI B31.3 | 1990 Chemical Plant and Petroleum Refinery Piping |
| ANSI B46.1 | 1985 Surface Texture, Surface Roughness, Waviness and Lay |

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- | | |
|-----------------|---|
| ASTM A480/A480M | 1991 General Requirements for Flat-Rolled Stainless and Heat Resisting Steel Plate, Sheet, and Strip |
| ASTM A269 | 1990 Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service |
| ASTM A240 | 1991 Standard Specification for Heat Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels |

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
Boiler and Pressure Vessel Code

- | | |
|----------------------------|---|
| ASME Section II,
Part A | 1989 Material Specifications -
Ferrous Materials |
| SA-312/SA-312M | 1989 Specification for Seamless and Welded
Austenitic Stainless Steel Pipe |

SA-358/SA-358M 1989 Specification for Electric-Fusion-
Welded Austenitic Chromium-Nickel Alloy
Steel for High-Temperature Service

SA-403/SA-403M 1989 Specification for Wrought Austenitic
Stainless Steel Piping Fittings

ASME Section VIII, 1989 Rules for Construction of Pressure
Division 1 Vessels

PIPE FABRICATION INSTITUTE (PFI)

PFI ES-24 1990 Pipe Bending Methods, Tolerances,
Process and Material Requirements

STEEL STRUCTURES PAINTING COUNCIL (SSPC)

SSPC SP-10 1989 Surface Preparation Specification
No. 10, Near-White Blast Cleaning

1.3 RELATED REQUIREMENTS

Related Document No. 1 "Plastic" Melter Model and Design
Criteria

Specification Section 05060 Welding Structural

Specification Section 05063 Welding Pressure Vessels

Specification Section 13249 Melter Top Head Turning Fixture

Specification Section 13251 Fabrication and Installation of
Melter Refractory and Insulation

Specification Section 13252 Precautions for Fabrication,
Handling and Storage of Stainless
Steel and Nickel Alloys

Specification Section 13253 Fabrication of Melter Bus Bars

Specification Section 13254W Fabrication and Installation of
Monofrax K3 Refractory

Specification Section 14400 Melter Frame Lifting Yoke
Fabrication

Specification Section 16120 Soldering - Electrical

Specification Section 16610 Electrical Requirements for Packaged
Equipment

CONTRACT DRAWINGS

Drawings as listed in Attachment A.

RELATED DRAWINGS

Drawings as listed in Attachment B.

1.4 DEFINITIONS

CMTR - Certified Material Test Report

NDE - Nondestructive Examination

1.5 SYSTEM DESCRIPTION

The HWVP is designed to immobilize high-level radioactive waste by converting it into a stable borosilicate glass form. This conversion process takes place in the glass melter. This is a refractory-lined, water-cooled, stamped ASME Section VIII vessel designed for a production rate of 220 pounds of glass per hour.

Energy for the glass melt is provided by passing electric current between two pairs of plate electrodes immersed in the glass. The resistance of the glass to current flow generates heat by the joule effect. Additional heat energy is furnished by eight dome heaters located above the melt pool. Molten glass is poured via differential pressure from the melter pour spout into stainless steel canisters.

The feed material consists of a slurry composed of approximately 13 percent waste material, 37 percent glass frit and 50 percent water. This is metered at a gallon per minute through two feed tubes to the glass melt. The feed is continuous during the canister fill cycle. After a canister is filled, glass pouring is stopped while a new empty canister is rotated into position by a turntable.

All top head-mounted instruments are designed to be removed and replaced by a remotely-operated impact wrench and overhead crane. Required process fluids and electrical power are supplied by jumpers that connect each component to the wall nozzles in the melt cell.

The melter vessel is assembled into a large frame that provides lifting lugs for installation and connectors for the process and electrical jumpers. The vessel is hard-piped to the frame and becomes a permanent part of it.

The Melter Vessel Assembly is replaced periodically. Therefore the Melter Vessel Assembly is designed to be remotely removable and replaceable. Prior to removal it is intended to empty the glass through a drain valve at the bottom.

1.6 SUBMITTALS

Submit the following in accordance with the Vendor Drawing and Data Requirements section of the Order/Subcontract.

1.6.1 Shop detail and fabrication drawings based on the Contract Drawings shall be submitted for Buyer approval. These drawings shall show:

- A. Weld symbols and Nondestructive Examination (NDE) symbols.
- B. Member sizes, dimensions and tolerances, threaded fasteners, dowel pins, studs, etc. necessary for fabrication if not already shown on the Contract Drawings.

1.6.2 In lieu of preparing the above drawings, Seller may request a copy of the Buyer's Contract Drawings on electronic media (Auto Cad - Release 10). Seller may then add the above information and any additional fabrication details.

1.6.3 Submit the following procedures for Buyer approval:

- A. Cutting, forming and shaping each piece.
- B. Procedures for material control and handling during fabrication in accordance with Paragraph 2.1.4.
- C. Methods to reduce or control residual stresses and improve dimensional stability. These procedures shall be in accordance with Paragraph 2.2.1.2.
- D. Proof load testing procedures of melter frame in accordance with Paragraph 2.7.2.3.
- E. Cleaning procedures in accordance with Paragraph 2.10.
- F. Helium leak testing and hydrostatic testing procedures in accordance with Paragraphs 2.4.2, 2.6.2 and 2.9.
- G. NDE procedures in accordance with Paragraph 2.3.1.
- H. Attachment and electrical isolation of Buyer-Supplied B-type thermocouple (see Drawing H-2-120052, Sheet 4 for arrangement).

- 1.6.4 Certified Material Test Reports (CMTRs) shall be submitted for Buyer review. These shall be in accordance with Paragraph 2.1.6.3.
- 1.6.5 Samples for surface finish shall be submitted for Buyer approval. These shall be in accordance with Paragraphs 2.1.5.6 and 2.1.5.7.
- 1.6.6 Thread lubricant technical data shall be submitted for Buyer approval. This data shall be in accordance with Paragraph 2.7.3.2.
- 1.6.7 Procedures which define how such features as centerlines, critical contours, dimensions, flatness and parallelism will be established, measured and controlled shall be submitted for Buyer approval. At minimum, the procedures shall define the techniques to be used by Seller to perform the following:
 - 1.6.7.1 Facility descriptions and machining equipment to be used in fabrication and assembly shall be submitted for Buyer information.
 - 1.6.7.2 Procedures to be used by Seller during welding in order to maintain dimensional stability and to achieve tolerance requirements shall be submitted for Buyer approval.
 - 1.6.7.3 Preheat and postweld heat treatment and/or stress-relieving procedures to be used by Seller in fabrication in accordance with Paragraph 2.2.1.2 shall be submitted for Buyer approval.
 - 1.6.7.4 Seller-furnished methods and optical/electronic equipment to maintain and verify dimensional and tolerance control requirements shall be submitted for Buyer information.
 - 1.6.7.5 Methods, frequency and verification of precision measurement instrument calibration shall be submitted for Buyer information.
- 1.6.8 Procedures for shipment to maintain dimensional and tolerance requirements, preclude damage to refractory, projecting dowel pins, threaded studs, etc., shall be submitted for Buyer approval.
- 1.6.9 Records and test reports such as leak testing, NDE, dimensional records, electrical continuity, equipment balancing, etc, shall be submitted for Buyer review.
- 1.6.10 Seller shall submit for Buyer review an accounting of all Buyer-supplied materials as to the use, fabrication and waste.
- 1.6.11 Procedures for final dimensional check in accordance with Paragraph 2.3.3.3 shall be submitted for Buyer approval.

1.7 CLASSIFICATION OF SYSTEMS AND COMPONENTS

(Not Used)

1.8 PROJECT OR SITE ENVIRONMENTAL CONDITIONS

1.8.1 Climatic and Geographic Site Conditions

A. Site Elevation 714 feet above sea level

B. Barometric Pressure 14.3 psia

1.8.2 Operating Environment

A. Normal Temperature 60°F to 104°F

B. Maximum Temperature 104°F

C. Relative Humidity Not controlled

1.8.3 Radiation

Equipment located outside of the vessel but inside the Melter Vessel Assembly is subject to a maximum unshielded total integrated dose of 3×10^8 Rads over a 10-year period.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

2.1.1 Scope of Work

2.1.1.1 Fabrication of the following melter components in accordance with Contract Drawings listed in Attachment A of this specification section.

A. Shell

B. Head

C. Frame

D. Bus bars

E. Melter support beam

F. Melter frame lifting yoke

G. Various shipping supports and fixtures

H. Melter Top Head Turning Fixture

- 2.1.1.2 Installation of the melter shell in the melter frame.
- 2.1.1.3 Installation of bus bars.
- 2.1.1.4 Installation of Buyer-furnished nozzles and electrical connectors.
- 2.1.1.5 Installation of piping, conduit and wiring.
- 2.1.1.6 Hydrostatic leak testing of vessel cooling passages and piping.
- 2.1.1.7 Preparation of pipe spool pieces for installation by others at the HWVP site.
- 2.1.1.8 Design and fabrication of any special equipment such as hangers, supports, fittings, etc. not shown on the Contract Drawings or melter model.
- 2.1.1.9 Fitup check of components shipped separately to assure proper alignment when received at the HWVP site.
- 2.1.1.10 Preparation for shipment to the HWVP site.
- 2.1.1.11 Installation of B-type thermocouple, supplied by Buyer, in the Inconel dam.
- 2.1.1.12 Facilities for installation and dryout of refractory and insulation by others.
- 2.1.2 Items provided by Buyer
 - A. Lower electrical connector housings.
 - B. Insulator plates, pins, connectors and miscellaneous internals for lower electrical connector housings.
 - C. Process nozzles and inserts.
 - D. B-type thermocouple.
 - E. Modified Inconel alloy 690 material.
 - F. Modified Inconel alloy 690 weld wire.
- 2.1.2.1 Seller shall account for all Buyer-supplied items and materials. Seller shall return all unused items and materials to Buyer.

2.1.3 Types of Materials

All materials of construction are identified on the Contract Drawings listed in Attachment A. In addition:

- 2.1.3.1 All stainless steel plate, sheet and strip shall be ASTM A240 supplied hot rolled, annealed and pickled. Blasting as a descaling method shall not be permitted.
- 2.1.3.2 All stainless steel bars and shapes shall be conditioned Class A.
- 2.1.3.3 All stainless steel pipe shall be in accordance both with ASME SA-312/SA-312M Type 304L and ASME SA-358/SA-358M Type 304L. SA-312 pipe shall be seamless hot finished, annealed and pickled. SA-358 pipe shall be Class 1 or 3 welded, annealed, radiographed and pickled.
- 2.1.3.4 All fittings shall be in accordance with ASME SA-403/SA-403M Grade 304L. Fittings shall either be Class WP-S or WP-WX.
- 2.1.3.5 All mechanical tubing shall be supplied in the welded, annealed and pickled condition and shall be in accordance with ASTM A269.
- 2.1.3.6 ASTM material specifications may be used in place of ASME Section II, Part A material specifications when allowed by the ASME Boiler and Pressure Vessel Code.
- 2.1.4 Contamination of Materials
 - 2.1.4.1 There shall be minimal contamination of the stainless steel or nickel-based alloys with carbon steels. Contact with clean carbon steel racks, bed plates, cutting tables, boring mills, etc., is permitted, but only when a complete inspection of the contact surfaces is done prior to any material laydown. Any of the above carbon steel surfaces shall be brushed and wiped clean of loose scale, rust or steel particles that could become embedded in the stainless steels or nickel alloys. Wood supports are preferred to minimize risk of damage to the melter vessel plates during placing and removal.
 - 2.1.4.2 Specification Section 13252 provides requirements for materials used in contact with austenitic stainless steel and non-ferrous metals. This specification applies to all materials (e.g., carbon steel, lubricants, coolants, NDE materials, cleaners, hydrotest water, packing materials, etc.) which come in contact with the Melter Vessel Assembly and/or its components. These requirements shall be implemented by Seller.
 - 2.1.4.3 Direct surface contact under pressure of carbon steel against stainless steel or nickel-based alloys, such as when forming, shall not be permitted during fabrication. A durable separation layer that maintains its surface integrity during the pressure/forming operation shall be provided. This requirement may, at Buyer's discretion, be waived if the area of pressure contact with carbon steel is subsequently removed by machining.

2.1.4.4 Upon completion of fabrication, examination and tests of metal surfaces shall be in accordance with the requirements of Specification Section 13252. Seller's Material Control Procedures shall describe the actions to be taken in the event of material contamination. They shall also address the cleaning and protection of materials as required.

2.1.5 Surface Finish

2.1.5.1 At the end of each Melter Vessel Assembly's service life the equipment will be decommissioned, decontaminated and eventually interred in a suitable disposal facility. In order to permit maximum decontamination, the material surface finishes described below shall be required for all Melter Vessel Assembly material.

2.1.5.2 Unless otherwise specified on Contract Drawings, surface finish for various material forms shall be as follows: Plates shall be finished in accordance with ASTM A480/A480M Section 10, Paragraph 10.1.2, hot-rolled, annealed and pickled No. 1 finish. A shot or grit-blasted surface is not acceptable. Sheets shall be finished in accordance with ASTM A480/A480M Section 8, Paragraph 8.1.1, No. 2D finish. Strips shall be finished in accordance with ASTM A480/A480M Section 9, Paragraph 9.1.1, No. 1 finish.

2.1.5.3 Unless otherwise specified on Contract Drawings, machined surfaces shall have a 125 finish or better in accordance with ANSI B46.1.

2.1.5.4 Nicks, gouges or other surface defects shall not be permitted. Defects greater than 1/16 inch in depth shall be repaired by welding and grinding to restore original surface contour. Defects of lesser depth shall be removed by grinding or polishing. 125 grit or finer abrasive wheels shall be used for grinding. No defects or grinding marks deeper than those left by a 125 grit abrasive wheel are permitted.

2.1.5.5 All welds shall be continuous throughout the entire length. No skip welds shall be permitted. Welds shall be smooth and blended into the base metal.

2.1.5.6 To ensure that a mutually-agreeable interpretation of surface finish requirements is established prior to start of fabrication, samples of stainless steel material and weldments (for each material type and for each weld type) shall be submitted for Buyer approval. Upon Buyer acceptance these samples will be used by Buyer's Representative as comparators to determine acceptable finish quality in the supplied equipment.

2.1.5.7 Abrasive blasting as a means of descaling new material shall not be permitted. Blasting using glass beads may be acceptable for the removal of scale resulting from heat treatment of assembled components which cannot practically be pickled. A sample of the surface finish which results from the Seller's intended procedure shall be submitted for Buyer review prior to blasting on assembly components.

2.1.5.8 Surface finish of other items not specifically addressed herein shall be similar to that described above.

2.1.6 Material Control

2.1.6.1 All material shall be clearly segregated, protected, controlled, marked and stored. All stainless steel and nickel-based alloy materials shall be identified with a heat number prior to and during fabrication. Material withdrawal and use shall be made only against approved material control procedures. No unauthorized persons shall have access to materials. There shall be no possibility of mixing materials. Materials for other jobs shall not be stored in the same area.

2.1.6.2 Seller shall identify all materials (plate, forging, pipe, bolting, etc.) by ASME/ASTM designation, ASME/ASTM alloy designation, respective ASME/ASTM class and UNS NUMBER (unified numbering system). The mill ASME or ASTM ink marking should remain to the extent possible on the fabricated components. Identifying marks made by die stamping using low-stress metal stamps is acceptable. They shall be placed on the material side that will not be exposed to process fluid after the vessel is placed in service. No stamping is permitted on the process side. Vibrotool markings shall not be permitted except for workmanship samples.

2.1.6.3 One (1) copy of CMTRs shall be provided for all material.

2.2 FABRICATION AND MANUFACTURE

2.2.1 General Requirements

2.2.1.1 Since the melter contains highly-radioactive materials, equipment in the Melter Cell will be installed and removed remotely using an overhead crane and impact wrench. This includes the Melter Vessel Assembly, all auxiliary equipment mounted on the melter top head nozzles and the service connections (jumpers). Each auxiliary assembly on the top head as well as its respective jumper must be interchangeable with spare equipment and with spare melter vessel assemblies. This requires that all mounting surfaces be precisely located in three planes.

To ensure interchangeability of subsequent assemblies the close tolerance requirements shown in Contract Drawings shall be strictly adhered to. Seller must conduct all close tolerance work with respect to established datum references. Work in the Seller's shop shall be performed under controlled temperature conditions as deemed necessary in order to achieve and maintain specified dimensions and tolerances.

2.2.1.2 Seller may elect to use braces, forms or similar means to preserve the vessel shape during fabrication. Seller shall perform stress relief operations to reduce residual stresses and improve dimensional stability. Detailed descriptions of the stress relief procedures shall be submitted for Buyer approval.

2.2.1.3 To minimize potential stack-up of tolerances Buyer recommends that the final elevation of nozzle flange faces on the top head be machined with the vessel installed on the lower support frame and the head installed and torqued in accordance with Drawing H-2-120237, Sheet 4. This requires Seller to assemble the vessel to the lower frame as well as allow excess flange face material to be removed during this operation. Note that nozzle elevations are specified with respect to the datum plane established by the support pads on the bottom of the lower frame. Metal O-ring used for this operation cannot be reused. A new O-ring shall be supplied for plant use.

2.2.1.4 Seller shall maintain cleanliness standards in and around the melter during fabrication. Nozzles, etc., shall be kept covered as required to prevent ingress of any dirt, water, cuttings or similar substances. Particular care shall be taken to prevent the refractory from becoming wet or damaged.

2.2.1.5 Fabrication of all components and assemblies shall minimize pockets, absorbent materials or similar voids where contaminants can be trapped. All pockets and voids shall be seal-welded, to the extent possible.

2.2.2 Welding

2.2.2.1 All stainless steel welding and repairs shall be in accordance with Specification Sections 05060 and 05063.

2.3 INSPECTION

2.3.1 Nondestructive Examination (NDE)

Seller shall perform NDE of welds in accordance with Seller's written procedures for radiographic examination, ultrasonic examination or liquid penetrant examination. NDE shall also be in accordance with Specification Sections 05060 and 05063.

2.3.1.1 Radiographic Examination (RT)

All full penetration welds shall be inspected over their entire length by radiographic examination. Radiographic examination shall be performed after stress relief (if any).

2.3.1.2 Ultrasonic Examination (UT)

Welds which cannot be inspected by radiographic examination because of geometry or configuration shall be inspected by ultrasonic examination. Ultrasonic examination shall be performed after stress relief (if any).

2.3.1.3 Liquid Penetrant Examination (PT)

PT shall be performed on each weld layer of any and all welds not examined radiographically or ultrasonically.

PT, when performed:

- A. Shall include areas where temporary attachments are made to parent metal.
- B. Shall include all machined welds after final machining. This may take the place of the cover pass PT.
- C. Shall include intermediate inspection of thick sections (such as the riser boss or bottom ring forging on the melter shell).
- D. Shall be performed after stress relief (if any).
- E. Shall be repeated on the melter frame lifting lugs after load testing as described in Paragraph 2.7.2.

2.3.2 Facilities for Dimensional Measurement

Seller shall provide a measurement area that includes:

- A. A surface with areas of support for the melter support frame level within $\pm .0025$ inch.
- B. 30 feet of head room to the bottom of the crane hook.
- C. Enclosures or partitions.
- D. Temperature controlled at $68^{\circ}\text{F} \pm 5^{\circ}\text{F}$ during measurement for Dimensional Record Drawings. Seller shall furnish thermometers and temperature recorders with 7-day recording capability.

- E. Clear space of at least 7 feet surrounding the melter vessel assembly.
- F. Rigid supports for optical transits and tables. These shall be set up perpendicular to the melter centerlines, shall not be less than 7 feet away from the frame and not less than 3 feet higher than the frame.
- G. Platforms, ladders, stairs and handrails.
- H. Lighting suitable for optical measurements. There shall be an average of 100 footcandles in the area where measurements will be made.

2.3.3 Measurements by Seller

- 2.3.3.1 Seller shall measure critical dimensions of the melter, frame nozzles and head after fabrication and assembly are complete. Measurements shall be made with the head and metal O-ring bolted to the melter vessel and with the vessel installed in the frame. The "as-built" dimension shall be recorded on the "Dimensional Record Drawings" listed in Attachment A.
- 2.3.3.2 Seller shall use calibrated precision measuring devices and techniques. Optical alignment and measuring devices shall be used. At minimum, these shall include jig transits and levels with optical micrometers and precision alignment scales.
- 2.3.3.3 Seller shall submit detailed final dimensional check procedures for Buyer approval. These shall include:
 - A. Methods of measurement applicable to specific components or assemblies.
 - B. Type of measuring device used.
 - C. Methods, frequency and verification of calibration for the precision measurement devices.

2.3.4 Measurements by Buyer

Buyer shall be notified 10 days in advance by Seller prior to dimensional measurement. Buyer reserves the right to attend and witness Seller's final dimensional measurements.

2.4 MELTER HEAD

2.4.1 Fabrication

Design details of the top head are shown in the Contract Drawings listed in Attachment A.

2.4.2 Leak Testing

2.4.2.1 The vessel shell, bottom head and top head have two independent water passages each. These are identified "A" and "B" on the vessel drawings. Each passage is fed by an independent manifold. This redundancy reduces the risk of loss of the vessel through coolant failure. To ensure the integrity of this dual path system the "A" and "B" passages shall be separately tested for not less than 10 minutes.

2.4.2.2 Each manifold surrounding nozzles "A" and "T" shall be helium leak tested to 10^{-6} std cc/sec prior to installation on the top head.

A helium leak testing procedure for these nozzles and for the "A" and "B" cooling passages of the top head and shell shall be prepared by Seller and submitted for Buyer approval.

2.4.2.3 The "B" manifolds and flow channels shall be welded to the head after it and the nozzles are fabricated. The manifolds and flow channels shall then be helium leak-tested. This test shall be followed by a hydrostatic test. Water meeting the requirements of Specification Section 13252 shall be used for testing. The test pressure shall be 90 psig.

2.4.2.4 The "A" manifolds and flow channels shall be welded to the head after the tests in Paragraph 2.4.2.3 are completed. Paragraph 2.4.2.3 tests shall be repeated on the "A" manifolds and flow channels. This sequence is necessary because the "B" channel is partially covered over by the "A" channel.

2.4.2.5 Dry the flow passages in accordance with Specification Section 13252. Seal all relevant pipe openings with plastic caps.

2.4.3 Deleted.

2.5 MELTER TOP HEAD TURNING FIXTURE

2.5.1 Design details of the Melter Top Head Turning Fixture are provided in Specification Section 13249.

2.5.2 Fabrication of the Melter Top Head Turning Fixture shall be in accordance with Specification Section 13249. This fixture will be capable of carrying the completed top head in either upright or inverted orientation. It will also be capable of rotating the head between these two positions. Seller shall install the head into this fixture after head fabrication is complete. This shall be done prior to refractory installation.

2.5.3 Subsequent epoxy coating and refractory installation shall be done with the head in the inverted orientation. The head shall remain in the inverted position in the handling fixture for shipping to the HWVP site.

2.6 MELTER SHELL, BOTTOM HEAD AND RISER

2.6.1 Design details of the melter shell, bottom head and riser section are listed in Attachment A.

2.6.2 Leak Testing of Shell and Riser

2.6.2.1 The "B" manifolds and flow channels shall be welded to the shell after the shell and nozzles are fabricated. The manifolds and flow channels shall then be helium leak-tested. This test shall be followed by a hydrostatic test. Water meeting the requirements of Specification Section 13252 shall be used for testing. The test pressure shall be 90 psig.

2.6.2.2 The "A" manifolds and flow channels shall be welded to the shell after the tests in Paragraph 2.6.2.1 are completed. Paragraph 2.6.2.1 tests shall be repeated on the "A" manifolds and flow channels.

2.6.2.3 Dry the flow passages in accordance with Specification Section 13252. Seal all relevant pipe openings with plastic caps.

2.6.3 Leak Testing of Bottom Head

On the bottom head the "A" channel does not partially cover the "B" channel. Therefore, it is not necessary to complete "B" channel testing before completion of the "A" channel fabrication. Both channels shall be tested in accordance with Paragraph 2.6.2.1.

2.6.3.1 Dry the flow passages in accordance with Specification Section 13252. Seal all relevant pipe openings with plastic caps.

2.7 MELTER FRAME

2.7.1 The melter frame is constructed in 2 pieces: a lower half on which the melter is placed, and an upper half which is bolted to the lower half. It is not possible to install the electrode bus bars with the frame intact around the melter. Thus the upper half is fabricated separately and the bus bars are installed on the upper half. The upper frame is then lowered over the melter and bolted to the lower frame. Fabrication and installation of the bus bars is described in Paragraph 2.13.

2.7.2 Lifting Load Test

2.7.2.1 The frame assembly shall be tested by adding 226,000 pounds, uniformly distributed, onto the melter support ring. When added to the approximate 36,000 pound weight of the frame the total weight of 131 tons represents 150 percent of the combined load of the melter, frame, water, glass and melter attachments. The assembly shall be lifted off the floor not less than six inches. It shall be held in this position for not less than ten minutes. Inspections and NDE re-examination of all lug welds shall be performed to detect any permanent deformation and/or cracking after completion of the proof load test.

2.7.2.2 Lifting lug welds shall be 100 percent liquid penetrant examined after completion of the proof load test. Any crack shall be cause for rejection.

2.7.2.3 Seller shall provide a written Proof Load Test procedure for Buyer approval prior to test performance.

2.7.2.4 Seller shall provide NDE and Verification Reports for all lifting lug welds re-examined and inspected after completion of the proof load test.

2.7.3 Bolting and Lifting Lug Pin Materials

2.7.3.1 Seller shall furnish CMTRs of all high-strength stainless steel structural bolting materials and lifting lug pins for Buyer review. The final tempering temperature used and the results of hardness tests and NDE, if any, shall be shown on the test reports. These shall be in addition to other required properties.

2.7.3.2 High strength stainless steel bolts shall not be reused after having been once tightened to the full extent. Seller shall submit thread lubricant technical data for Buyer approval.

2.7.4 Nozzle and Electrical Connector Installation

2.7.4.1 Electrical connector heads and process nozzles will be provided by Buyer. When received, Seller shall modify the connectors and nozzles and mount them on the frame as shown on the Contract Drawings.

2.7.4.2 Connectors and nozzles shall be mounted and dimensioned in accordance with the Contract Drawings. The half-inch nozzle hold-down nuts shall be tightened to only 50 percent of their final torque value to allow for possible nozzle adjustments at the HWVP site. In addition, epoxy grout will not be added until final assembly at the HWVP site in case adjustments are necessary.

2.7.5 Studs and Alignment Dowels

Steel alignment dowels and studs shall be fabricated in accordance with Contract Drawings.

2.8 MELTER FRAME LIFTING YOKE AND LUGS

2.8.1 Design details of the melter frame lifting yoke are listed both in Attachment A and Specification Section 14400.

2.8.2 The lifting yoke is intended to lift the melter assembly in its entirety. This consists of the upper frame, lower frame, melter vessel (including refractory, insulation, glass and water) and various melter attachments. The total combined weight of the melter assembly at loadout will be approximately 87 tons.

After the 4 lifting lugs have been installed on the upper frame, the lifting yoke shall be used for subsequent handling operations.

2.8.3 Seller shall determine the location of the lifting yoke lug by calculation for the canyon crane. Seller shall base the lifting yoke lug location on the following requirement:

- A. The combined Melter Vessel Assembly as described in Paragraph 2.8.2. shall hang within 2° of level when supported from the canyon crane by the lifting yoke lug.
- B. The actual weight of the frame, shell, head, refractory, insulation, piping, conduit, lifting yoke and other components for which Seller is responsible. Determination of weights and moments shall be the Seller's responsibility.
- C. Weights and locations of attachments which will be added to the Melter Vessel Assembly at a later time will be provided by Buyer.

2.8.4 After the lifting yoke has been fabricated and the lifting lug attached in accordance with Paragraph 2.8.3, the lifting yoke shall be counterweighted. Seller shall base the location of the lifting yoke counterweight on the following requirement:

The lifting yoke shall hang within 2° of level when supported from the canyon crane by the lifting yoke lug.

2.9 VESSEL HYDROSTATIC TESTING

After all welding and final machining is completed a hydrostatic test shall be performed as follows:

- A. Install the head to the shell using a new stainless steel O-ring.

- B. Install blind flanges and C-rings on the A and T nozzles. Refer to Drawing H-2-120052 Sheet 1 for flange and gasket details.
- C. Install riser end cap, flange, pour spout adapter and rubber gaskets.
- D. Install blind flanges and rubber gaskets on the riser and pour spout heater openings.
- E. Install blind flanges and rubber gaskets on all other nozzles.
- F. Perform vessel hydrostatic testing at 18 psig. Maintain pressure for not less than 10 minutes.
- G. Remove the top head.
- H. Drain and dry the shell and head. Swab all residual water from both components.

Water used for hydrostatic testing and drying shall be in accordance with the requirements of Specification Section 13252.

2.10 CLEANING

Interior and exterior surfaces shall be thoroughly cleaned of all mill scale, cuttings, weld spatter, grease, oil and other foreign matter. A cleaning procedure shall be submitted for Buyer approval. Stainless steel equipment shall not be painted.

2.11 EPOXY COATING

After leak testing and cleaning, the inside surfaces of the head (including nozzles), shell, bottom head and riser barrel shall be coated with an epoxy coating in accordance with Attachment C.

2.12 REFRACTORY

2.12.1 Installation

The melter head, shell and riser shall be lined with refractory and insulation after fabrication and hydrostatic testing are complete. Refractory shall be installed by a refractory contractor in accordance both with Specification Section 13251 and Specification Section 13254W at Seller's shop.

2.12.2 Assembly and Storage Area

Seller shall provide free access to the vessel for the refractory contractor's personnel.

Seller shall furnish support facilities for the refractory contractor's use. Requirements are as follows:

- A. Sufficient indoor, clean, dry storage area for refractory materials (approximately 2000 sq. ft.). In addition, a storage area maintained above 40°F and large enough to store approximately 20 5-gallon containers of pumpable insulation shall be provided.
- B. A work area shall be provided. This work area shall provide approximately 7 feet clear on all sides of the melter vessel and lid. Temperature of the work area and melter shell shall be maintained between 60°F and 100°F during refractory installation.
- C. Electrical service, both 110 volt single-phase and 440 volt 3-phase in the near area.
- D. Compressed air in the near area.
- E. Unloading dock with a truck-high dock to receive and ship the refractory contractor's shipments as required.
- F. 2000-pound capacity jib crane. The crane shall be mounted to reach all areas of vessel and lid to lift refractory pieces to a height approximately 8 feet above top of vessel.
- G. Lighting is to be nominal building lighting in good operating condition.

2.12.3 After refractory dryout of the shell has been completed by the refractory contractor in accordance with Specification Section 13251, Seller shall seal the vessel to minimize moisture absorption and stabilize for shipment. Seller shall provide and install the following:

- A. Steel cover and gasket on the shell main flange.
- B. Dummy riser/pour spout tube.
- C. Dummy riser heater and gasket.
- D. Dummy pour spout heater and gasket.
- E. Drain valve plug, plywood washer and nut.
- F. Riser end flange assembly.
- G. Pour spout lower flange and plywood cover.

2.13 **BUS BARS**

2.13.1 Seller shall fabricate the melter bus bars, electrode clamps and attachment hardware in accordance both with Specification Section 13253 and the Contract Drawings listed in Attachment A.

After fabrication, the melter bus bars shall be insulated and installed on the melter frame as described on the Contract Drawings.

2.13.2 **Installation**

The melter bus bars must first be attached to the upper frame assembly. The upper frame assembly shall then be lowered over the melter and bolted to the lower frame assembly.

Seller will provide and connect all hangers, insulators, and attachments to secure the bus bars to the melter frame. Seller shall supply the connector clamps and hardware as shown on the Contract Drawings.

2.14 **PIPING CONNECTIONS**

2.14.1 Seller shall provide stainless steel piping connections between the frame nozzles and services on the melter and between various services on the melter. At some locations, Seller will completely install and test the piping assemblies. At other locations, Seller will

A. Install only portion of the piping and provide spool pieces for final assembly by others at the HWVP site.

B. Install only portions of the piping with the balance of piping provided by others and installed at the HWVP site.

These locations are identified in Table II of Drawing H-2-120052.

2.14.2 The location, size and routing of piping is identified on a plastic model, 1-1/2 inch = 1 foot scale, of the Melter Vessel assembly. The plastic melter model demonstrates that the depicted pipe and conduit routing configuration are technically feasible. The routing criteria used to demonstrate the technical feasibility of the pipe and conduit routing is provided in Related Document No. 1. This model shall be furnished by Buyer. Seller shall use the model as a pattern for piping and conduit routings and equipment placement. Model shall be returned to Buyer in its original condition upon order completion, for use by others for fabrication and installation of remaining piping, conduit and electrical connectors.

The model will identify:

- A. Piping to be assembled and installed by Seller;
- B. Piping to be provided by Seller as spool pieces;
- C. Piping to be provided and installed by others at HWVP site.

Spool pieces shall be weld-prepped on the end to be connected to the Seller-installed piping. Additional length shall be provided on the other end to permit trimming and weld prep in the field. Spool pieces shall be checked for fit-up on the melter/frame assembly, then shipped to the HWVP site. All components shall be labeled and packaged to permit identification in the field.

2.14.3 Seller shall provide all piping materials except for the piping provided by others referenced in Paragraph 2.14.1(B). This shall include pipe, fittings, pipe supports, flow orifices and dielectric connectors. All welding shall be in accordance with Specification Section 05063.

Nozzles on the melter frame to which the piping is welded will be provided by the Buyer as noted in Paragraph 2.76.4.1.

2.14.4 Seller shall provide a short, removable coupling as shown on Drawing H-2-120076. This coupling contains an orifice for flow balancing to be done at the HWVP site by others after all melter piping has been installed. The removable coupling with test orifices shall be removed and the permanent orifices shall be welded into the line by others after flow balance tests are completed. Specific lines to be fitted with orifices are shown in the following table:

<u>Cooling Water Supply to</u>	<u>Orifice Size, Inches, +/- 1/64</u>
Top Head (Connection F6)	55/64
Dome Heater Covers Supplied from A Path	7/16
Bottom Head (Connection F4)	15/32
Top Head (Connection F1)	49/64
Bottom Head (Connection F7)	35/64
Electrode 2 (Connection P2)	11/32
Electrode 3 (Connection P3)	3/8
Electrode 4 (Connection P4)	3/8
Dome Heater Covers Supplied from B Path	7/16

2.14.5 Seller shall provide (and install where identified on the model) all components for the dielectric connectors shown on Drawing H-2-120076, which electrically isolate piping connected to electrified components on the melter.

2.14.6 All piping installed by Seller shall be hydrotested at 90 psig for not less than 10 minutes.

Test water shall be in accordance with the requirements of Specification Section 13252.

2.14.7 90-degree elbows may be substituted for "3D" bends. Bends shall be in accordance with PFI ES-24. Minimum wall thickness after bending shall be as follows:

TYPE OF BEND	MINIMUM THICKNESS AFTER BEND
3D Furnace Blend	80 percent of initial wall
3D Induction and Incremental Blend	87.7 percent of initial wall
3D Rotary Draw Blend	78 percent of initial wall
3D Ram and Roll Blend	85 percent of initial wall

2.14.8 Piping shall be within the 11 foot width and 22 foot-10 inch length of the melter frame.

2.14.9 All 1½ inch and larger piping shall be Schedule 10s. Smaller piping shall be Schedule 40.

2.15 ELECTRICAL CONNECTIONS

Seller shall:

2.15.1 Provide all connectors (except those on the melter frame identified in Paragraphs 2.1.2D & E), conduit, pullboxes, supports, etc. in accordance with Specification Section 16610.

2.15.2 Solder wiring to pin connectors, clean and test in accordance with Specification Section 16120. Install wiring in electrical connector housings on the melter frame.

2.15.3 Pull wiring through conduit and pull boxes as identified both on the wiring diagrams listed in Attachment A and the model. Seller shall perform either A or B below:

A. Complete the connections identified on Sheet 5 of Drawing H-2-120052.

B. Leave sufficient excess wiring extending from the conduit for final connection by others to equipment installed at the HWVP site. Wire ends shall be wrapped and protected for shipment.

2.15.4 Seal wiring extending from the conduit with heat shrink tubing and compatible potting compound to prevent intrusion of moisture or contaminants into the conduit.

- 2.15.5 Label all wire ends in accordance with Specification Section 16610 and as shown on Contract Drawings.
- 2.15.6 Install cover plates on pull boxes to provide moisture protection during shipment. Cover plates will be removed at the HWVP site for additional wiring and continuity tests.
- 2.15.7 Conduct electrical isolation and continuity tests in accordance with Specification Section 16610.
- 2.15.8 Install Inconel dam and attach the Buyer-supplied B-type thermocouple in accordance with Buyer-approved procedures. Since this operation must be done during installation of insulation in the riser, Seller must coordinate with the refractory contractor.

2.16 SHIPPING

Seller shall perform all necessary packing to prepare the partially-assembled Melter Vessel Assembly, Melter Top Head Turning Fixture with melter head, lifting yoke and other items for shipment to the HWVP site.

All flanges shall be protected by wood covers bolted in place, weld ends by caps, socket connections by plastic plugs and threaded connections with plastic thread protectors. All closures shall be adequate to prevent corrosion and damage of the equipment both while in transit to the worksite and in storage while awaiting erection.

The preferred method of shipment for the Melter Vessel Assembly is by dedicated truck. Shipment by dedicated train is permitted if local regulations prohibit truck shipment. Other shipment methods may be acceptable but shall have prior Buyer approval.

Seller shall provide detailed procedures for Buyer approval of the packaging, shipping and protection of refractory.

Estimated shipping weights are as follows:

Melter Vessel and Frame Assembly: 120,000 pounds.

- Includes refractory in vessel shell.
- Does not include melter head.

Melter Head: 50,000 pounds.

- Includes refractory and Melter Top Head Turning Fixture.

U.S. DEPARTMENT OF ENERGY
Hanford Waste Vitrification Plant
Richland, Washington
DOE Contract DE-AC06-86RL10838

FLUOR DANIEL, INC.
Advanced Technology Division
Fluor Contract 8457

Rev. 1

PART 3 EXECUTION

(Not Used)

END OF SECTION

ATTACHMENT A
 CONTRACT DRAWINGS

DRAWING NO.	SHT	OF	TITLE		
MELTER/FRAME ASSEMBLY					
H-2-120052	1	5	ME-130-001	MELTER VESSEL/FRAME ASSEMBLY	PARTS LIST AND NOTES
H-2-120052	2	5	ME-130-001	MELTER VESSEL/FRAME ASSEMBLY	MELTER AND FRAME ASSEMBLY
H-2-120052	3	5	ME-130-001	MELTER VESSEL/FRAME ASSEMBLY	MELTER ASSEMBLY AND CONNECTION LOCATIONS
H-2-120052	4	5	ME-130-001	MELTER VESSEL/FRAME ASSEMBLY	SECTIONS
H-2-120052	5	5	ME-130-001	MELTER VESSEL/FRAME ASSEMBLY	TABLES AND NOTES
H-2-120076	1	1	ME-130-001	MELTER VESSEL/FRAME ASSEMBLY	MISC. PIPING DETAILS
H-2-127459	1	2	ME-130-001	MELTER VESSEL/FRAME ASSEMBLY	PIPING ISOMETRIC
H-2-127459	2	2	ME-130-001	MELTER VESSEL/FRAME ASSEMBLY	PIPING ISOMETRIC
TOP HEAD					
H-2-120235	1	12	ME-130-001	MELTER TOP HEAD	PARTS LIST AND NOTES
H-2-120235	2	12	ME-130-001	MELTER TOP HEAD	ASSEMBLY
H-2-120235	3	12	ME-130-001	MELTER TOP HEAD	COOLING JACKET
H-2-120235	4	12	ME-130-001	MELTER TOP HEAD	LIFTING LUGS
H-2-120235	5	12	ME-130-001	MELTER TOP HEAD	NOZZLES - E, G1, G6, G10
H-2-120235	6	12	ME-130-001	MELTER TOP HEAD	NOZZLES - F1, F6, G18
H-2-120235	7	12	ME-130-001	MELTER TOP HEAD	NOZZLES - PLAN VIEW
H-2-120235	8	12	ME-130-001	MELTER TOP HEAD	NOZZLES - SECTIONS
H-2-120235	9	12	ME-130-001	MELTER TOP HEAD	NOZZLE A - DETAILS
H-2-120235	10	12	ME-130-001	MELTER TOP HEAD	NOZZLE T - DETAILS
H-2-120235	11	12	ME-130-001	MELTER TOP HEAD	FEED TUBE SUPPORTS
H-2-120235	12	12	ME-130-001	MELTER TOP HEAD	FEED TUBE SUPPORT DETAILS
SHELL					
H-2-120236	1	23	ME-130-001	MELTER SHELL	PARTS LIST AND NOTES
H-2-120236	2	23	ME-130-001	MELTER SHELL	PLAN VIEW
H-2-120236	3	23	ME-130-001	MELTER SHELL	SECTIONS
H-2-120236	4	23	ME-130-001	MELTER SHELL	BOTTOM VIEW
H-2-120236	5	23	ME-130-001	MELTER SHELL	ELECTRODE NOZZLE SECTION
H-2-120236	6	23	ME-130-001	MELTER SHELL	DOME HEATER NOZZLE DETAILS
H-2-120236	7	23	ME-130-001	MELTER SHELL	DOME HEATER NOZZLE DETAILS
H-2-120236	8	23	ME-130-001	MELTER SHELL	COOLING JACKET LAYOUT
H-2-120236	9	23	ME-130-001	MELTER SHELL	COOLING JACKET SECTIONS
H-2-120236	10	23	ME-130-001	MELTER SHELL	COOLING JACKET
H-2-120236	11	23	ME-130-001	MELTER SHELL	JACKET MANIFOLD OUTLETS

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DRAWING NO.	SHT	OF	TITLE		
MELTER/FRAME ASSEMBLY					
H-2-120236	12	23	ME-130-001	MELTER SHELL	RISER SECTION
H-2-120236	13	23	ME-130-001	MELTER SHELL	POUR SPOUT JACKET
H-2-120236	14	23	ME-130-001	MELTER SHELL	RISER END
H-2-120236	15	23	ME-130-001	MELTER SHELL	RISER END SECTIONS
H-2-120236	16	23	ME-130-001	MELTER SHELL	RISER PAD DETAILS
H-2-120236	17	23	ME-130-001	MELTER SHELL	RISER JACKET
H-2-120236	18	23	ME-130-001	MELTER SHELL	RISER DETAILS
H-2-120236	19	23	ME-130-001	MELTER SHELL	RISER JACKET PIPING
H-2-120236	20	23	ME-130-001	MELTER SHELL	RISER MANIFOLD
H-2-120236	21	23	ME-130-001	MELTER SHELL	BOTTOM JACKET MANIFOLD
H-2-120236	22	23	ME-130-001	MELTER SHELL	NOZZLE N SECTIONS
H-2-120236	23	23	ME-130-001	MELTER SHELL	DRAIN VALVE SUPPORTS
H-2-120086	1	10	ME-130-001	POUR SPOUT HEATER SUPPORT	ASSEMBLY AND PARTS LIST
H-2-120086	2	10	ME-130-001	POUR SPOUT HEATER SUPPORT	CARRIAGE ALIGN. BRACKET
H-2-120086	3	10	ME-130-001	POUR SPOUT HEATER SUPPORT	ACTIVE RAIL BRACKET
H-2-120086	4	10	ME-130-001	POUR SPOUT HEATER SUPPORT	PASSIVE RAIL BRACKET
H-2-120086	5	10	ME-130-001	POUR SPOUT HEATER SUPPORT	PASSIVE RAIL KEY GUIDE
H-2-120086	6	10	ME-130-001	POUR SPOUT HEATER SUPPORT	ACTIVE RAIL KEY GUIDE
H-2-120086	7	10	ME-130-001	POUR SPOUT HEATER SUPPORT	DETAILS AND SECTION
H-2-120086	8	10	ME-130-001	POUR SPOUT HEATER SUPPORT	PASSIVE RAIL ASSEMBLY
H-2-120086	9	10	ME-130-001	POUR SPOUT HEATER SUPPORT	ACTIVE RAIL ASSEMBLY
H-2-120086	10	10	ME-130-001	POUR SPOUT HEATER SUPPORT	MODIFIED GEAR BOX
H-2-120075	1	1	ME-130-001	MELTER SHELL	INCONEL DAM
H-2-120249	1	5	ME-130-001	MELTER	ARGON FEEDING TUBE
H-2-120249	2	5	ME-130-001	MELTER	ARGON FEEDING TUBE
H-2-120249	3	5	ME-130-001	MELTER	ARGON FEEDING TUBE
H-2-120249	4	5	ME-130-001	MELTER	ARGON FEEDING TUBE
H-2-120249	5	5	ME-130-001	MELTER	ARGON FEEDING TUBE
H-2-120194	1	3	ME-130-001	MELTER SHELL	POUR SPOUT ADAPTER
H-2-120194	2	3	ME-130-001	MELTER SHELL	POUR SPOUT ADAPTER
H-2-120194	3	3	ME-130-001	MELTER SHELL	POUR SPOUT ADAPTER
FRAME					
H-2-120153	1	9	MY-130-004	MELTER FRAME	PARTS LIST AND NOTES
H-2-120153	2	9	MY-130-004	MELTER FRAME	NOZZLE INSTALLATION
H-2-120153	3	9	MY-130-004	MELTER FRAME	ASSEMBLY AND DETAILS

DRAWING NO.	SHT	OF	TITLE		
MELTER/FRAME ASSEMBLY					
H-2-120153	4	9	MY-130-004	MELTER FRAME	HOLE LOCATION DETAILS
H-2-120153	5	9	MY-130-004	MELTER FRAME	SECTIONS AND DETAILS
H-2-120153	6	9	MY-130-004	MELTER FRAME	SECTIONS AND VIEWS
H-2-120153	7	9	MY-130-004	MELTER FRAME	SECTIONS AND DETAILS
H-2-120153	8	9	MY-130-004	MELTER FRAME	SECTIONS AND DETAILS
H-2-120153	9	9	MY-130-004	MELTER FRAME	NOZZLE DETAILS
H-2-125551	1	3		MELTER FRAME/VESSEL	PIPING CONNECTION IDENTIFICATION
H-2-125551	2	3		MELTER FRAME/VESSEL	ELEC & INSTR CONN IDENTIFICATION
H-2-125551	3	3		MELTER FRAME/VESSEL	ELEC & INSTR CONN IDENTIFICATION
BUS BARS					
H-2-120238	1	4	BB-130-003,4,5,6	MELTER BUS BARS	PARTS LIST AND NOTES
H-2-120238	2	4	BB-130-003,4,5,6	MELTER BUS BARS	ELECTRODES L2 AND L4
H-2-120238	3	4	BB-130-003,4,5,6	MELTER BUS BARS	ELECTRODES L1 AND L3
H-2-120238	4	4	BB-130-003,4,5,6	MELTER BUS BARS	DETAILS
MELTER SUPPORT BEAM					
H-2-120403	1	4	MY-130-001	MELTER SUPPORT BEAM	PARTS LIST AND NOTES
H-2-120403	2	4	MY-130-001	MELTER SUPPORT BEAM	ASSEMBLY
H-2-120403	3	4	MY-130-001	MELTER SUPPORT BEAM	ASSEMBLY AND SECTIONS
H-2-120403	4	4	MY-130-001	MELTER SUPPORT BEAM	SECTIONS AND DETAILS
DIMENSIONAL RECORD DRAWINGS					
H-2-120237	1	6	MECHANICAL	MELTER VESSEL ASSEMBLY	DIMENSIONAL RECORD
H-2-120237	2	6	MECHANICAL	MELTER VESSEL ASSEMBLY	DIMENSIONAL RECORD
H-2-120237	3	6	MECHANICAL	MELTER VESSEL ASSEMBLY	DIMENSIONAL RECORD
H-2-120237	4	6	MECHANICAL	MELTER VESSEL ASSEMBLY	DIMENSIONAL RECORD
H-2-120237	5	6	MECHANICAL	MELTER VESSEL ASSEMBLY	DIMENSIONAL RECORD
H-2-120237	6	6	MECHANICAL	MELTER VESSEL ASSEMBLY	DIMENSIONAL RECORD

DRAWING NO	SHT	OF			
ELECTRICAL DRAWINGS					
H-2-122420	1	2	ELECTRICAL	GENERAL NOTES	AND SYMBOLS
H-2-122420	2	2	ELECTRICAL	WIRE TERMINATION	DETAILS
H-2-122421	1	1	ELECTRICAL	MELTER VESSEL ASSEMBLY	BLOCK DIAGRAMS
H-2-122422	1	11	ELECTRICAL	CONNECTION DIAGRAM	ME-130-001
H-2-122422	2	11	ELECTRICAL	CONNECTION DIAGRAM	ME-130-001
H-2-122422	3	11	ELECTRICAL	CONNECTION DIAGRAM	ME-130-001
H-2-122422	4	11	ELECTRICAL	CONNECTION DIAGRAM	ME-130-001
H-2-122422	5	11	ELECTRICAL	CONNECTION DIAGRAM	ME-130-001
H-2-122422	6	11	ELECTRICAL	CONNECTION DIAGRAM	ME-130-001
H-2-122422	7	11	ELECTRICAL	CONNECTION DIAGRAM	ME-130-001
H-2-122422	8	11	ELECTRICAL	CONNECTION DIAGRAM	ME-130-001
H-2-122422	9	11	ELECTRICAL	CONNECTION DIAGRAM	ME-130-001
H-2-122422	10	11	ELECTRICAL	CONNECTION DIAGRAM	ME-130-001
H-2-122422	11	11	ELECTRICAL	CONNECTION DIAGRAM	ME-130-001
LIFTING YOKE					
H-2-120239	1	2	HD-130-002	MELTER FRAME LIFTING YOKE	ASSEMBLY
H-2-120239	2	2	HD-130-002	MELTER FRAME LIFTING YOKE	PARTS DETAILS
SHIPPING FIXTURES					
H-2-120122	1	2	ME-130-001	POUR SPOUT DUMMY HEATER	ASSEMBLY
H-2-120122	2	2	ME-130-001	POUR SPOUT DUMMY HEATER	SUB-ASSEMBLY AND DETAIL
H-2-120123	1	2	ME-130-001	DUMMY INCONEL TUBE	ASSEMBLY AND PARTS LIST
H-2-120123	2	2	ME-130-001	DUMMY INCONEL TUBE	DETAILS
H-2-120124	1	1	ME-130-001	DUMMY DRAIN PLUG	ASSEMBLY AND PARTS LIST
H-2-120365	1	1	ME-130-001	RISER DUMMY HEATER	ASSEMBLY
H-2-120231	1	1	STANDARD PART	DOWEL PIN	
H-2-120232	1	1	STANDARD PART	ACME STUD	

ATTACHMENT B
 RELATED DRAWINGS

DRAWING NO.	SHT	OF	TITLE		
H-2-68225	1	2	EQUIPMENT RECEPTACLE HOUSING ELECTRICAL CONNECTOR PUREX/REDOX TYPE		
H-2-68225	2	2	EQUIPMENT RECEPTACLE HOUSING ELECTRICAL CONNECTOR PUREX/REDOX TYPE		
H-2-83577	1	2	DETAILS AND ASSEMBLY 2 INCH - 3 WAY NOZZLE		
H-2-83577	2	2	DETAILS - 2 INCH - 3 WAY NOZZLE		
H-2-90185	2	2	MALE NOZZLE, 2 INCH PUREX		
H-2-90186	2	2	MALE NOZZLE, 3 INCH PUREX		
H-2-83399	1	1	ASSEMBLY	UPPER ELECTRICAL	EQUIPMENT CONNECTOR
H-2-83401	1	1	LOWER ELECTRICAL	CONNECTION COMPONENTS	(FLOATING PINS)
H-2-83402	1	3	ELECTRICAL	EQUIPMENT CONNECTOR	PARTS
H-2-83402	2	3	ELECTRICAL	EQUIPMENT CONNECTOR	PARTS
H-2-83402	3	3	ELECTRICAL	EQUIPMENT CONNECTOR	PARTS

DRAWING NO	SHT	OF	TITLE			
PIPING AND INSTRUMENT DIAGRAMS						
H-2-123150	2	22	P&ID	SYSTEM 13	POUR TURNTABLE	
H-2-123150	5	22	P&ID	SYSTEM 13	MELTER DRAIN VALVE	AND DRAIN BELLOWS
H-2-123150	6	22	P&ID	SYSTEM 13	MELTER PRESSURE LEVEL	AND POUR CONTROLS
H-2-123150	7	22	P&ID	SYSTEM 13	MELTER TV CAMERA	COOLING AND CLEANING
H-2-123150	8	22	P&ID	SYSTEM 13	POWER AND CONTROL	FOR MELTER ELECTRODES
H-2-123150	9	22	P&ID	SYSTEM 13	PARTS AND CONTROL	FOR MELTER ELECTRODES
H-2-123150	10	22	P&ID	SYSTEM 13	DRAIN VALVE HEATERS	
H-2-123150	11	22	P&ID	SYSTEM 13	CCTV AND DRAIN VALVE	HEATER CONTROLS
H-2-123150	12	22	P&ID	SYSTEM 13	RISER AND POUR SPOUT	HEATER
H-2-123150	13	22	P&ID	SYSTEM 13	REFRACTORY TEMP.	MELTER DOME HEATERS
H-2-123150	14	22	P&ID	SYSTEM 13	MELTER DOME HEATERS	
H-2-123150	15	22	P&ID	SYSTEM 13	MELTER DOME HEATERS	
H-2-123150	16	22	P&ID	SYSTEM 13	MELTER COOLING WATER	
H-2-123150	17	22	P&ID	SYSTEM 13, PATH A	MELTER COOLING WATER	TOP AND BOTTOM HEADS AND SHELL
H-2-123150	18	22	P&ID	SYSTEM 13, PATH B	MELTER COOLING WATER	TOP AND BOTTOM HEADS AND SHELL
H-2-123150	20	22	P&ID	SYSTEM 13	MELTER COOLING WATER	ELECTRODES, PADS AND DOME HEATER TRANSFORMERS
H-2-123150	21	22	P&ID	SYSTEM 13	MELTER COOLING WATER	DOME HEATERS AND BOTTOM PAD
H-2-123250	1	15	P&ID	SYSTEM 14A	FILM COOLER	
H-2-123250	13	15	P&ID	SYSTEM 14A	BACKUP FILM COOLER	

ATTACHMENT C
PROCEDURE FOR EPOXY COATING OF MELTER VESSEL

1.0 SCOPE

1.1 This appendix covers surface preparation, epoxy coating and coating inspection procedures for the interior surfaces of melter vessels.

2.0 PURPOSE

2.1 The epoxy coating is designed to isolate the melter vessel wall from electric current in the glass melt pool. This provides a back-up to the primary refractory and ceramic fiber insulation layers. To satisfy stringent requirements for electrical isolation the epoxy must meet the highest standards for adhesion, freedom from defects and coating thickness. No deviation from the following procedures shall be permitted.

3.0 SURFACE PREPARATION

3.1 The surfaces to be coated include all internal surfaces of the shell, head and all nozzles. The nozzle flange faces or the bores of the "A" and "T" nozzles shall not be coated.

3.2 Buyer shall witness surface preparation in accordance with Paragraphs 3.3 and 3.4.

3.3 Remove oil and grease by detergent steam cleaning. Flush surfaces with demineralized water. Refer to Specification Section 13252 to remove alkaline residue.

3.4 Abrasive blast all surfaces to be coated in accordance with the following:

A. Schedule abrasive blasting to occur the same day the first coat is applied.

B. Abrasive blast in accordance with SSPC SP-10, Near White, all surfaces to be coated. DuPont Starblast® abrasive (or equal) shall be used, at 90-100 psi air pressure.

C. Buyer shall furnish a sample piece of Starblasted 304L stainless steel. This shall be used by Seller to ensure a proper anchor pattern for applying the first coat.

- D. Remove all dust and abrasive from the surfaces prior to coating. Keep bare hands off the finished, cleaned surface.
- E. After the surfaces have been blasted and cleaned, representative surface profile measurements shall be made using Press-O-Film or equal. The surface profile shall be 1 mil minimum. Buyer shall witness this surface profile check.

4.0 EPOXY COATING - Two-Component Solvent-Based Materials:

4.1 The coating system is based on Keeler & Long Inc. nuclear grade epoxy enamels and activators. The system is defined in the table below. A total minimum dry film thickness of 16 mils is required.

4.2 Table A

COAT NO.	LINING SYSTEM NUMBERS EPOXY ENAMEL	COLOR	WET FILM THICKNESS, MIN	DRY FILM THICKNESS, MIN
1	Primer: 6548/7107	White	9 mil	4 mil
2	Interim: 6548/7107	White Tinted	9 mil	4 mil
3	Finish Coat: E-2-0056	Medium Green	9 mil	4 mil
4	Topcoat: E-2-7975	Dawn Grey	9 mil	4 mil

- 4.3 Mix four volumes of epoxy base and one volume of activator. Allow to stand two hours before spraying.
- 4.4 Minimum recoating time is four hours.
- 4.5 The minimum surface temperature of the parts shall be 60°F just before spraying.
- 4.6 Minimum total dry film thickness shall be 16 mils. Because the paint is applied to a nonmagnetic (stainless steel) surface, a measuring device using eddy currents is required.
- 4.7 Wet film thickness may be checked at the time of application with a wet film thickness gauge to establish total dry film thickness to be obtained.

5.0 INSPECTION

- 5.1 Buyer shall witness and approve the blasted and cleaned surfaces in accordance with Paragraphs 3.4A and 3.4D.
- 5.2 A check for discontinuities or pinholes in the coating shall be made. A Tinker and Razor Holiday Detector, Model M-1 (67 Volts) or equal shall be used. A small amount of household detergent shall be added to the water for this test. This test shall be witnessed by Buyer.
- 5.3 Pinholes or discontinuities shall be repaired as follows. Buyer shall witness and approve all repairs and the final check.
- A. Determine whether pinholes are caused by defects in the metal substrate such as sharp corners, crevices, pits or weld spatter. If so, remove defects.
 - B. Wipe abraded areas with clean solvent (Keeler & Long Thinner #4093 or equal) in accordance with Specification Section 13252. Remove any dust or foreign matter.
 - C. Brush apply one coat of topcoat to affected area. Allow to dry tack-free for not less than four hours. Repeat this step until at least four coats have been applied.
 - D. Recheck for pinholes.

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Hanford Waste Vitrification Plant
Richland, Washington
DOE Contract DE-AC06-86RL10838

FLUOR DANIEL, INC.
Advanced Technology Division
Fluor Contract 8457

RELATED DOCUMENT NO. 1
"PLASTIC" MELTER MODEL AND DESIGN CRITERIA
B-595-P-P06A-RD-1

APPROVED FOR CONSTRUCTION

REVISION 0 PER CR HWVP-0981
ISSUE DATE SEP 10 1993

WAPA	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
QUALITY LEVEL	I	<input checked="" type="checkbox"/>	II	<input type="checkbox"/>
SAFETY CLASS	1	<input type="checkbox"/>	2	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	3	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	4	<input type="checkbox"/>

ORIGINATOR:

CHECKER:

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J. C. Duss, Piping Supervisor Date

R. A. Celaya 9-9-93
R. A. Celaya, Piping Date

APPROVED BY:

G. Barauskas
G. Barauskas Lead Discipline Engineer

9-9-93
Date

RELATED DOCUMENT NO. 1
"PLASTIC" MELTER MODEL AND DESIGN CRITERIA
B-595-P-P06A-RD-1

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RELATED DOCUMENT NO. 1
"PLASTIC" MELTER MODEL AND DESIGN CRITERIA

1.0 MODEL SCOPE

This procedure covers the function, extent of presentation and design criteria of the melter model.

1.1 Model Function

The design model is a three dimensional tool to be used for the routing of pipe and conduit runs within the melter base frame. The design model demonstrates that the routing of pipe and conduit is feasible. The Buyer strongly recommends that the Seller follow the pipe and conduit routing as shown in the design model. This recommendation includes the shop and field breaks.

1.2 Presentation

a) Model Scale

Scale is 1 1/2" = 1'-0." Because of the limitations of commercially available plastic materials, exact scale is not always possible to the extent noted in the Contract Drawings. Every attempt was made to hold variances to a minimum.

b) Melter Vessel and Components

1. Melter vessel and components are fabricated from plastic. Cylindrical equipment is modeled from plastic tube to the nearest commercially available size. Other equipment are modeled in block form representing outside extremities of the equipment envelope.
2. Equipment nozzles and other attachments are modeled in simplified form.
3. Equipment is color-coded as follows:

<u>DISCIPLINE/ITEM</u>	<u>COLOR</u>
ELECTRICAL/CONDUIT & PULL BOXES	GREEN
MECHANICAL	VESSEL AND STEEL GRAY
4. All model components color coded in steel grey or vessel grey are to be fabricated and installed as indicated on the P06A Contract Drawings.

c) Melter Frame and Pipe/Conduit

1. Melter Frame is fabricated from plastic structural shapes.
2. Pipe and conduit supports required for plastic modeling purposes only are fabricated from clear plastic.

d) Pipe

1. Pipe is represented by full diameter scale plastic pipe.
2. The following piping items are not shown on the model but are the Seller's responsibility:

- Hydrostatic vents and drains
- Pipe supports and guides

3. The model pipe color code is as follows:

Blue	-	Air and Argon Gas
Green	-	Steam
Orange	-	Melter Offgas
Yellow	-	Cooling Water
Clear	-	Ghost Supports/Melter Support Beam

e) Fittings

1. Commercially available fittings are installed in line color.
2. Bends are installed to scale.

f) Electrical

Electrical equipment including pull boxes are installed on the model in block form representing the extreme outline of the equipment.

1. Conduit is represented by full diameter scale plastic pipe with 5 diameter bends. Pipe bends less than 5 diameters are noted.
2. Bus bars are fabricated from plastic showing width, depth and routing.

3. The following electrical items are not shown but are the Seller's responsibility:

- Supports and guides.
- Individual conduit wires.

g) Instruments

1. All in-line instruments that are shown on the Process and Instrument Diagrams (P&ID's) are installed on the model. (See Attachment B of Specification Section 13250 for P&ID list).

h) Tagging

The identification of items or physical features of the model are identified by tagging components.

1. Melter Vessel and Components

Each piece of equipment is tagged with its equipment number.

2. Pipe

Each line is tagged with its service, size and line number designation as identified on the P&ID's. Where space is limited, only the line size is given.

3. Electrical

All electrical conduit and pull boxes are tagged with numbers.

4. Instruments

All instruments are identified by their instrument numbers.

5. Miscellaneous

- All miscellaneous equipment is tagged with a name or equipment number for identification purposes.
- Pipe and conduit shop and field construction breaks are identified.

6. A model board legend is provided to aid in identifying the model components and shop/field scope.

2.0

DESIGN CRITERIA

- a) Piping should be in accordance with the American National Standard Institute Code for Pressure Piping, ANSI B31.3.
- b) Maintain a minimum clearance of two inches between the outside diameter of pipe/insulation or conduit and structural members.
- c) Maintain a minimum clearance of three inches between welds.
- d) Maintain a minimum clearance of one inch between the outside diameter of pipe/insulation and pipe/insulation, and electrical bus bar.
- e) A significant amount of current passes through the melter bus bars which will induce a current in any surrounding ferritic-bearing component. The result of this induced current could increase the surface temperature of a conduit that is within effect of this induction field. Exposure of the electrical conductors in conduits to elevated temperatures will reduce the overall life expectancy of the insulation and increase the risk of fire and short circuits. Therefore, it is of extreme importance that consideration be given to the routing and minimum clearances of conduit with the melter bus bars.

The following criteria shall be implemented:

1. The preferred routing for thermocouple conduit that crosses the melter bus bars should pass at right angles with a minimum clearance of 12 inches.
 2. A minimum clearance of 24 inches shall be provided for thermocouple conduit routed parallel to the melter bus bars.
 3. Thermocouple conduits shall be separated from power/control conduits by a minimum of 12 inches for parallel routing and 6 inches for perpendicular routing.
- f) The following drawings are to be used in conjunction with the model and P&ID's:
1. Drawing H-2-127459 Sheets 1 and 2

These drawings represent two medium pressure steam lines for fabrication and installation as shown. These lines have been stress analyzed and approved by the Buyer.

2. Drawing H-2-125551 Sheets 1, 2 and 3

These drawings represent piping and electrical conduit connections. These drawings identify the melter frame nozzle number, melter nozzle, instrument number, piping line number and makes reference to the P&ID's. For conduit numbers shown on the model, refer to the Electrical Melter Assembly Block Diagram Drawing (H-2-122421). These drawings also identify areas to be kept clear of equipment and components to allow for melter component installation and remote replacement.

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Advanced Technology Division
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SECTION 14400
MELTER FRAME LIFTING YOKE FABRICATION
B-595-P-P06A-14400

APPROVED FOR CONSTRUCTION

REVISION 1 PER CR HWVP-0981
ISSUE DATE SEP 10 1993

WAPA YES NO X
QUALITY LEVEL I X II
SAFETY CLASS 1 2 3 X 4

ORIGINATOR:

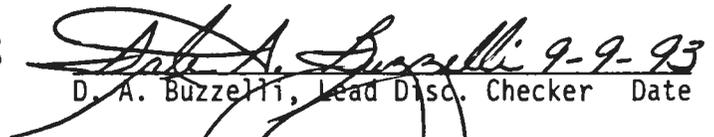


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Date

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Lead Discipline Engineer

9/9/93

Date

SECTION 14400
MELTER FRAME LIFTING YOKE FABRICATION
B-595-P-P06A-14400

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SECTION 14400
MELTER FRAME LIFTING YOKE FABRICATION

PART 1 GENERAL

1.1 SUMMARY

This specification section covers the technical requirements for design, stress analysis, fabrication, manufacture, inspection, load test and testing of the melter frame lifting yoke.

1.2 REFERENCES

The publications listed below form a part of this specification section to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC M016 1989 Manual of Steel Construction -
Allowable Stress Design, Ninth Edition

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI B30.10 1987 Hooks

ANSI Y14.5M 1982 Dimensioning and Tolerancing

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A572/A572M 1991 Standard Specification for High-
Strength Low-Alloy Columbium-Vanadium
Steels of Structural Quality

ASTM A578/A578M 1990 Standard Specification for Straight-
Beam Ultrasonic Examination of Plain and
Clad Steel Plates for Special Application

ASTM A668 1990 Standard Specification for Steel
Forgings, Carbon and Alloy for General
Industrial Use

AMERICAN WELDING SOCIETY (AWS)

AWS A2.4 1986 Symbols for Welding, Brazing and
Nondestructive Examination

AWS D1.1 1990 Structural Welding Code

FEDERAL STANDARDS (FED-STD)

FED-STD-595B 1989 Colors Used in Government
Procurement

STEEL STRUCTURES PAINTING COUNCIL (SSPC)

SSPC PA-2 1989 Paint Application Specification
No. 2 - Measurement of Dry Paint
Thickness with Magnetic Gauges

SSPC SP-10 1989 Surface Preparation
Specification No. 10 - Near White
Blast Cleaning

1.3 RELATED REQUIREMENTS

Specification Section 05060 Welding Structural

Specification Section 13250 Fabrication of Melter and Frame
Assembly

Drawing H-2-120239 Melter Vessel Lifting Yoke

1.4 DEFINITIONS

CG - Center of Gravity

1.5 SYSTEM DESCRIPTION

The melter frame lifting yoke, in conjunction with the canyon crane, is used to install or remove the melter frame assembly into or from its location in the melter cell. The yoke contains a single lifting lug which is engaged by the canyon crane hook above, and four shank hooks which are engaged with four lift lugs on the melter frame below.

The yoke's single lifting lug is offset with respect to the center of the yoke frame. This is due to the location of the melter frame assembly's center of gravity. The yoke shall be counterweighted so that it will be level as it is suspended from the canyon crane hook. This is to enhance ease of engagement of the four hooks with the lift lugs on the melter frame.

1.6 SUBMITTALS

Submit the following in accordance with the Vendor Drawing and Data Requirements section of the Order/Subcontract.

1.6.1 A design and stress analysis shall be submitted for Buyer approval prior to preparation of shop fabrication and manufacturing drawings. This analysis shall establish the following:

- A. The location of the lifting lug on the yoke must coincide with the CG location of the Melter Frame Assembly as described in Specification Section 13250. This provides a level lift of the melter frame assembly.
- B. A design layout of the structural frame, complete with sizes of structural members and sizes of weld joints. This layout shall be accompanied by a complete stress analysis.

The yoke shall be designed for a load factor of 150% of the rated load shown on H-2-120239. The calculated maximum static stresses shall not exceed 20% of the ultimate tensile strength of the material.

The stress analysis shall be in accordance both with AISC M016 and AWS D1.1.

The four hooks shall be designed in accordance with ANSI B30.10.

All interface control dimensions shown on Drawing H-2-120239 shall not be violated.

- C. Dimensions, material, location and weld joint details for the counterweight. This is to provide a level lift of the yoke when it is empty.

It is anticipated that the addition of this counterweight will have an insignificant effect on the level lift established in accordance with Subparagraph A above. Seller is required to incorporate this counterweight in the analysis associated with Paragraph 1.6.1A.

1.6.2 Complete shop fabrication and manufacturing drawings shall be submitted for Buyer approval prior to fabrication. Shop drawings shall be prepared in accordance with the following practices:

- A. Structural members described shall be in accordance with AISC M016.
- B. Weld joint symbols shall be in accordance with AWS A2.4.
- C. Dimensioning and tolerancing shall be in accordance with ANSI Y14.5M.

- D. Bill of materials with complete material specifications shall be in accordance with Paragraphs 2.1.1 and 2.1.2. This shall include all supplementary requirements.
- E. References by notes to applicable procedures for fabrication, welding, stress relief, nondestructive examination, load testing and painting.

1.6.3 Certified Material Test Reports (CMTR) for all materials and weld wire used in the yoke shall be submitted for Buyer review after receipt from the steel supplier.

In addition to the standard data required by the applicable material specifications, the CMTRs must include all supplementary certifications required in accordance with Paragraphs 2.1.1 and 2.1.2.

1.6.4 Welding and nondestructive examination (NDE) procedures shall be in accordance with Specification Section 05060.

1.6.5 A stress relief procedure shall be submitted for Buyer approval prior to fabrication. This procedure shall be prepared in accordance with Specification Section 05060.

1.6.6 A load testing procedure shall be submitted for Buyer approval prior to fabrication. This procedure shall be in accordance with the requirements of Paragraph 2.2.7.3.

1.7 CLASSIFICATION OF SYSTEMS AND COMPONENTS

(Not Used)

1.8 PROJECT OR SITE ENVIRONMENTAL CONDITIONS

(Not Used)

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

2.1.1 All structural shapes, gussets and stiffeners shall be in accordance with ASTM A572, Grades 42 and 50.

All plate material used for the upper lift lug shall be ultrasonically tested in accordance with ASTM A578, with Level I acceptance criteria and the following supplementary requirements:

- S1 Continuous 100 % scanning
- S3 Procedure submittal
- S4 Operator's qualification

2.1.2 The four forged shank hooks and the hook pin in the lifting lug shall be in accordance with ASTM A668, Class K, with the following supplementary requirements:

- S4 Carbon content for welding
- S6 Magnetic particle inspection
- S7 Ultrasonic testing

2.2 FABRICATION AND MANUFACTURE

2.2.1 Fabrication of the yoke shall be in accordance both with the requirements of Specification Section 05060 and the Buyer-approved shop fabrication and manufacturing drawings.

2.2.1.1 The rolling direction of plates and shapes shall be oriented in a direction parallel to the direction of principal tensile stresses.

2.2.1.2 Structural members, gussets and stiffeners shall fit-up snugly. No ratholes shall be allowed.

2.2.2 The shank hooks shall be manufactured, nondestructively examined and load-tested in accordance with ANSI B30.10 prior to welding.

2.2.3 Weld joint and welder qualifications, welding and NDE shall be in accordance both with the requirements of Specification Section 05060 and the following:

2.2.3.1 All principal stress-carrying joints shall be full penetration welds. These welds shall be examined by either of the following methods:

- A. Ultrasonic testing.
- B. Radiographic examination.
- C. Progressive magnetic particle examination on each layer.

2.2.3.2 All fillet and partial penetration welds shall be examined by progressive magnetic particle examination on each layer.

2.2.3.3 The acceptance criteria for NDE shall be in accordance with Specification Section 05060.

2.2.4 The yoke shall be stress-relieved in accordance with Specification Section 05060. This shall be performed after completion of all welding and prior to load testing.

All welds shall be re-inspected by magnetic particle examination following stress relief operations.

2.2.5 The yoke shall be subjected to a dimensional inspection after stress relief to verify positional and elevational requirements of the four hooks. If straightening of the shank hooks and/or the structural frame is needed to correct out-of-tolerance conditions this shall be done without the application of heat.

2.2.6 The yoke shall be equipped with a stainless steel identification plate. The plate shall be engraved with the following information:

Manufacturer's name or logo.
Buyer P.O. number.
HWVP equipment number.
Rated capacity.

The plate shall be seal-welded to the yoke frame.

2.2.7 Inspection and Testing

2.2.7.1 Tolerance requirements for all dimensional characteristics shown on the Buyer-approved shop drawings shall be inspected for conformance. This shall include those requirements implied by the weld joint symbols.

2.2.7.2 The yoke shall be functionally tested for two separate operating conditions as follows:

A. The unloaded yoke shall be level within 2 degrees when suspended from an overhead crane that is outfitted with a 117-ton hook.

This test may be performed in conjunction with the test fixture described in Paragraph 2.2.7.2B. In this case the acceptable criteria shall be that the four hooks can be made to engage freely with the four lift lugs on the test fixture.

B. A test fixture, described below, shall be level within 2 degrees when suspended from an overhead crane via the yoke.

Seller shall design and fabricate a test fixture which resembles the melter frame assembly in terms of total weight, CG location and lifting lugs as described in Specification Section 13250.

2.2.7.3 The yoke shall be proof load-tested to 131 +1/-0 tons (150% of rated capacity) for a period of not less than 10 minutes.

This test may be performed using the fixture described in Paragraph 2.2.7.2B. In this instance, the fixture shall be weighted to over 131 tons (or anchored). The pull force shall be applied via a load-indicating device.

All welds shall be re-inspected by magnetic particle examination in accordance with Paragraph 2.2.4 after the load test is completed.

2.2.8 Surface Preparation and Painting

The surfaces of the yoke shall be cleaned and painted in accordance with SSPC SP-10 and the paint manufacturer's recommended methods, respectively.

The primer coat shall be an inorganic zinc-rich primer (Ameron Dimetcote 9 or equal) with a total dry film thickness of 2.5 +/- .5 mils that has a minimum of 6 grams of zinc per square foot of dried film.

The finish coat shall be a high-build polyamide epoxy paint (Amercoat 66 or equal) two coats, with a total dry film thickness of 10 +/- .5 mils.

The total thickness of primer and finish coats shall be 12.5 +/- 1.0 mils.

The following paint colors and color numbers are in accordance with FED-STD-595B and are applicable to the Melter Frame Lifting Yoke as follows:

- A. The yoke frame shall be Gray #16492.
- B. The hooks shall be Red #21105.
- C. The lifting eye shall be Yellow #13655.
- D. The yoke number and capacity (see Drawing H-2-120239) shall be Yellow #13655 in 3 inch high characters.
- E. The "NORTH" arrow and text (see Drawing H-2-120239) shall be Yellow #13655.

The dry film thickness shall be inspected with a magnetic thickness gauge (Nordson "Mikrotest" or equal) in accordance with SSPC PA-2.

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Rev. 1

PART 3 EXECUTION

(Not Used)

END OF SECTION

U.S. DEPARTMENT OF ENERGY
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Richland, Washington
DOE Contract DE-AC06-86RL10838

FLUOR DANIEL, INC.
Advanced Technology Division
Fluor Contract 8457

SECTION 17915
THERMOCOUPLE FURNISHED WITH MELTER
B-595-P-P06A-17915

VOID

REVISION 1 VOID PER CR HWVP-0981
ISSUE DATE SEP 10 1993

WAPA YES NO
QUALITY LEVEL I II
SAFETY CLASS 1 2 3 4

ORIGINATOR:

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J. B. Bunning for R. J. Lewis 09/09/93
R. J. Lewis, Contr. Sys. Engr. Date

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APPROVED BY:

J. B. Bunning
J. B. Bunning Lead Discipline Engineer

09/09/93
Date

SECTION 17915
THERMOCOUPLE FURNISHED WITH MELTER
B-595-P-P06A-17915

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SECTION 17915
THERMOCOUPLE FURNISHED WITH MELTER

PART 1 GENERAL

1.1 SUMMARY

This section defines the requirements for the supply, inspection and testing of the thermocouple furnished with Melter ME-130-001 specified in Specification Section 13250.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI-MC96.1 1982 Temperature Measurement Thermocouples
(Revision of ANSI-MC96.1 - 1975)

INSTRUMENT SOCIETY OF AMERICA (ISA)

ISA-S20 1981 Specification Forms for Process
Measurement and Control Instruments,
Primary Elements and Control Valves

1.3 RELATED REQUIREMENTS

Specification Section 01730 Operation and Maintenance Data
Specification Section 13250 Fabrication and Melter Frame
Assembly

1.4 DEFINITIONS

(Not Used)

1.5 SYSTEMS DESCRIPTION

(Not Used)

1.6 SUBMITTALS

Submit the following in accordance with the Vendor Drawing and Data Requirements section of the Order/Subcontract:

Use only the following drawing sizes:

- A 8-1/2 inches by 11 inches
- B 11 inches by 17 inches
- D 28 inches by 40 inches

- 1.6.1 Catalog cuts describing the thermocouple.
- 1.6.2 Manufacturer's certified dimensional outline and installation drawings.
- 1.6.3 Manufacturer's operation and maintenance manuals in accordance with Specification Section 01730.
- 1.6.4 Instrument data sheet similar to ISA S20, completed in accordance with ISA S20 instructions.
- 1.6.5 Drawing showing location and identification of terminals, conduit sizes, and entrance locations.
- 1.6.6 Document showing tag number, service, manufacturer, model number, and range.
- 1.6.7 Factory Acceptance Test procedure (FAT) including requirements in Paragraph 2.3.1.
- 1.6.8 Report confirming the FAT procedure was executed and the results.

1.7 CLASSIFICATION OF SYSTEMS AND COMPONENTS

(Not Used)

1.8 PROJECT OR SITE ENVIRONMENTAL CONDITIONS

1.8.1 Climatic and Geographic Site Conditions

- A. Site Elevation 714 feet above sea level
- B. Barometric Pressure 14.3 psia

1.8.2 Operating Environment

- A. Normal Temperature 60°F to 104°F
- B. Maximum Temperature 104°F

1.8.3 Radiation

Equipment located outside of the vessel but inside the Melter Vessel Assembly is subject to a maximum unshielded total integrated dose of 3×10^8 Rads.

1.9 UTILITIES

(Not Used)

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

2.1.1 Provide a thermocouple (TE-130-584) Thermo Electric Model No. B18U-P10R-W-5-LSP-9.5-12-19A, LSP=convex bend radius 22.5 inches or equal. Include the following features:

- A. Fabrication in accordance with ANSI MC96.1.
- B. B type, ungrounded, platinum 10 percent rhodium sheath, MgO insulated, measuring temperature between 1300°F and 1500°F.
- C. Weld pad, 1/2 inch x 1/2 inch x 1/8 inch, longitudinal convex bend radius 22.5 inches.
- D. Total length from tip of weld pad to end of transition junction 11.625 inches \pm 1/16 inch, diameter of 1/8 inch \pm .002 inch.
- E. Transition junction of Inconel 600 with transition O.D. less than or equal to sheath O.D.
- F. Lead wires, 12 inches minimum, with CEFIR insulation and CEFIR overall.
- G. Positive wire color coded grey and negative wire color coded red.
- H. Packing gland, Conax EG-125-A-XX-L or equal to be attached during installation. Thermocouple must seal in packing gland specified.

2.1.2 Labeling

Stamp or engrave instrument tag number on transition junction.

2.2 FABRICATION AND MANUFACTURE

2.2.1 Instrument Mounting

Mount and support instruments in accordance with manufacturer's installation documents and Contract Drawings.

2.3 **FACTORY ACCEPTANCE TEST (FAT)**

2.3.1 Prepare a FAT procedure and submit it for approval. Include inspection/tests in accordance with ANSI MC96.1 to demonstrate that the fabrication and assembly of the materials meet the requirements of the specification.

2.3.2 Inspect and test the thermocouple according to the Buyer approved FAT procedure.

2.3.3 Submit a test report confirming that the FAT procedure has been completed and the results.

2.4 **PACKAGING AND SHIPPING**

(Not Used)

PART 3 EXECUTION

(Not Used)

END OF SECTION