

PLAN

APPROVED
M. Tellalian 3-7-97
 CBI DATE
[Signature] 10/2/97
 CALTECH DATE

NOTES:

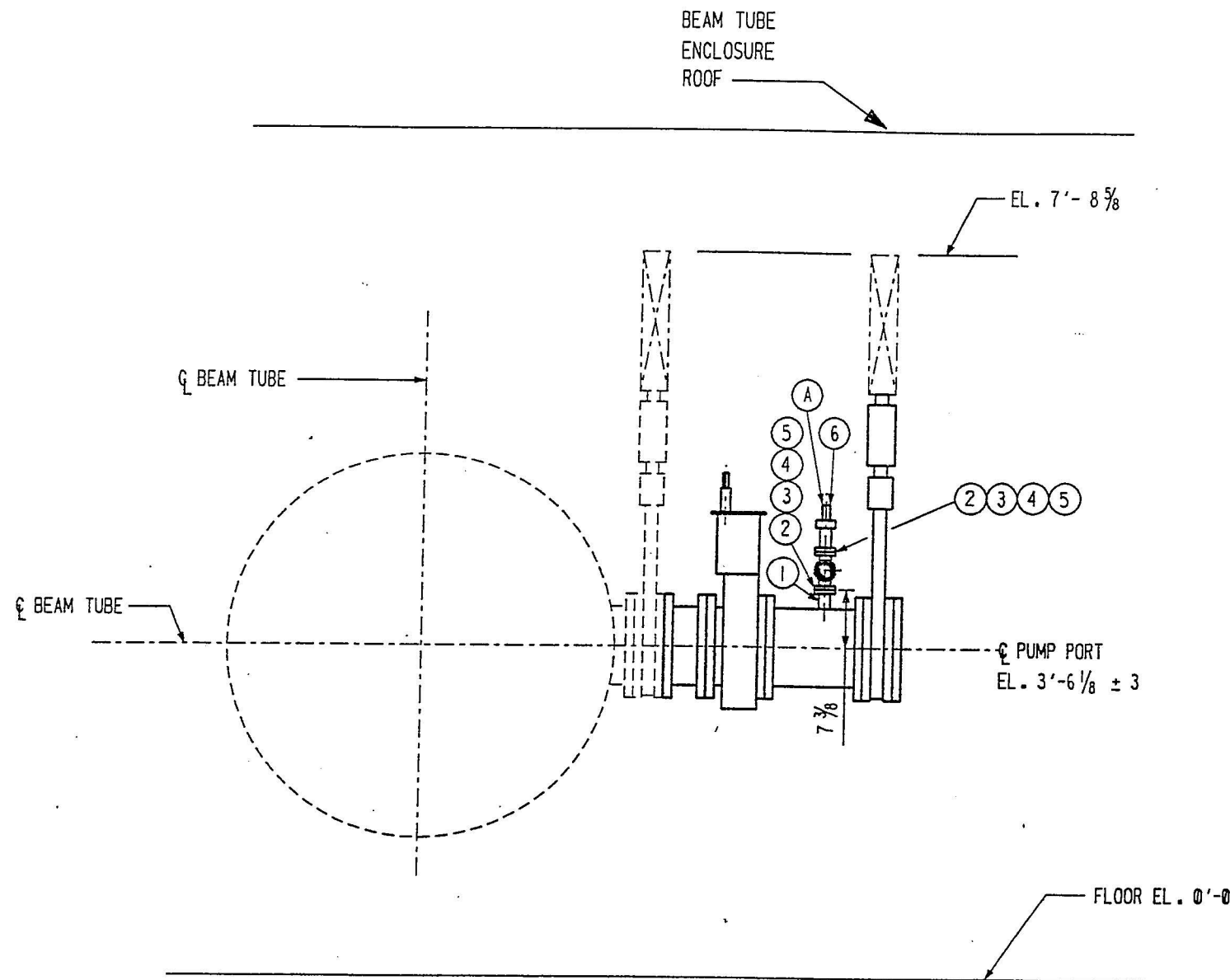
1. WORK WITH DRAWINGS 101 SH. 2 - 6.
2. NINE SKIDS REQUIRED. TEN SETS OF MAJOR COMPONENTS (VALVES, INSTRUMENTS, ETC.) ARE PROVIDED. THE SPARE MAJOR COMPONENTS WILL BE SHIPPED ALONG WITH THE SKIDS TO THE JOB SITE.

BY: [Signature] DATE: 11/30/97		REVISIONS		REMARKS	
BY: [Signature] DATE: 11/30/97	BY: [Signature] DATE: 11/30/97	BY: [Signature] DATE: 11/30/97	BY: [Signature] DATE: 11/30/97	BY: [Signature] DATE: 11/30/97	BY: [Signature] DATE: 11/30/97
CUSTOMER'S NO BY RKZ CHWD WAC DATE 3/11/96 M.J. TELLALIAN ENGINEERING ASSIGNED				SUPPLIER'S / PURCHASER'S NO CBI LIGO BEAM TUBE HANFORD, WA AND LIVINGSTON, LA PUMP PORT HARDWARE TYPE "B" PLAN "A" CONTRACT NO 953571 DWG 101 REV 4 SHT 1	
LIGO-D961302-04-B					

INDICATES CHANGE FROM PREVIOUS ISSUE

57101101.DGN

SHIP PC	MARK	ASSM PC	DESCRIPTION	LENGTH		SPEC	D
				FT	N		
	101-2-A	9	TYPE "B" PUMP PORT HARDWARE				
			SECTION "A-A" ASSEMBLY				
			(SHOP ASSEMBLE TO 101-4-A)				
	101-2-1	9	HALF NIPPLE 2.75 DIA CF	0	2.46	SS	PA
	101-2-2	115	BOLT 1/4-28 (INCLUDES 7 SPARES)	0	1 1/2	*	PE
	101-2-3	60	PLATE NUT 1/4-28 UNF			SS	PE
			(INCLUDES 6 SPARES)				
	101-2-4	20	GSKT 2.75 DIA CF (INCLUDES 2 SPARES)			COPPER	PA
	101-2-5	115	WASHER 1/4 DIA (INCLUDES 7 SPARES)			SS	PE
	101-2-6	10**	HPS COLD CATHODE GAGE				PC
			* = SILVER PLATED SS				
			** = ONE SPARE PROVIDED. SPARE TO SHIP WITH SKIDS.				



SECTION "A-A"

NOTES:

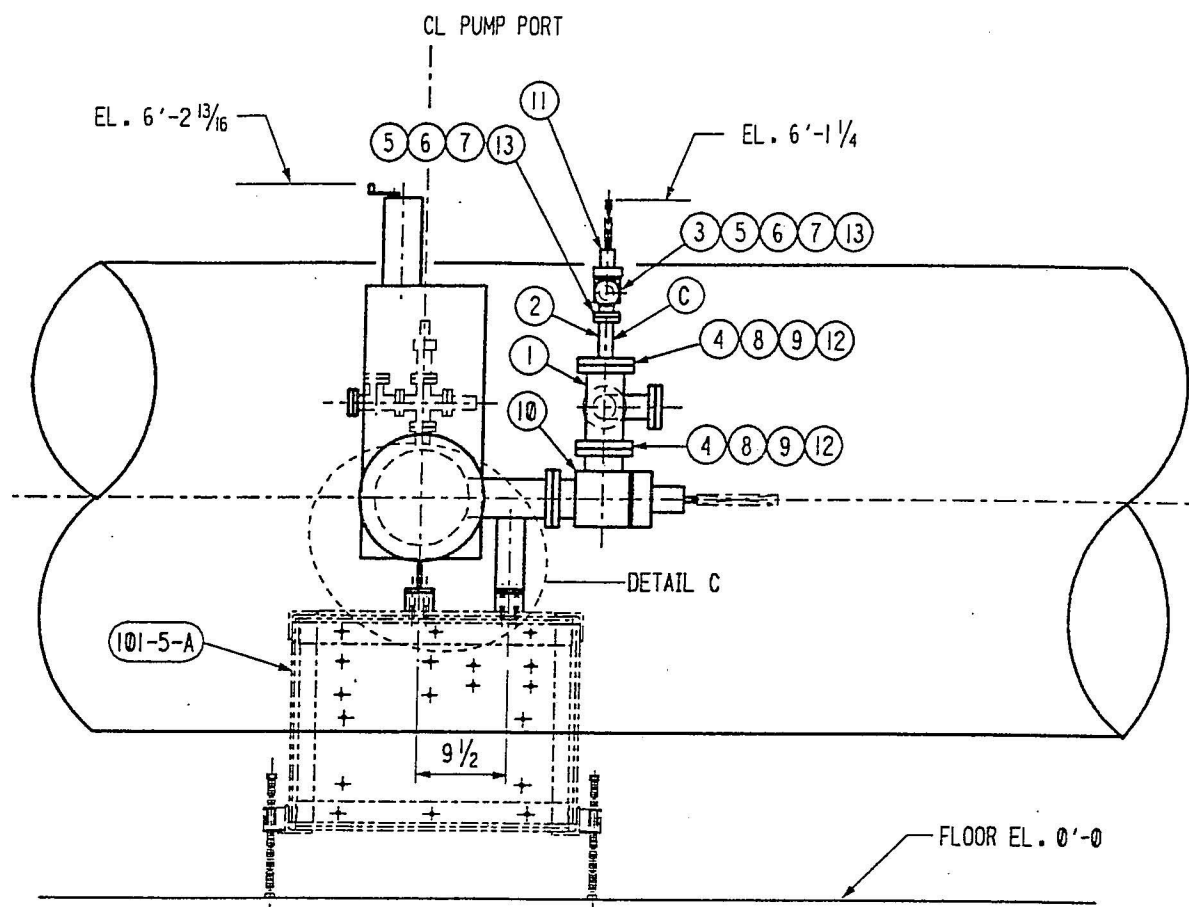
- 1. USE WITH DRAWINGS 101 SH. 1, 3 - 6

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<i>M. Tellalian</i>	3-7-97
CBI	DATE
<i>J. Jones</i>	10/2/97
CALTECH	DATE

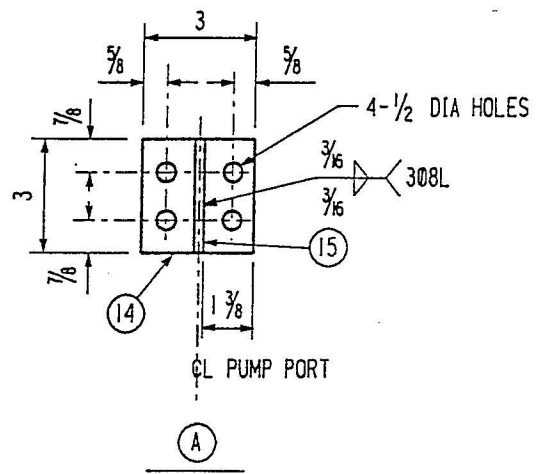
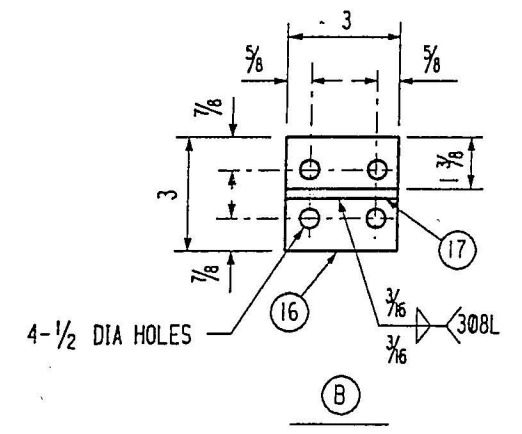
REVISIONS		REMARKS	
BY	DATE		
CHKD	DATE		
DIR	DATE		
REV.	DATE		
OTHER	DATE		
SITS.	DATE		

CBI		SUPPLIER'S / PURCHASER'S NO	
LIGO BEAM TUBE			
HANFORD, WA AND LIVINGSTON, LA			
PUMP PORT HARDWARE TYPE "B"			
SECTION "A-A"			
CUSTOMER'S NO		CONTRACT NO	
BY RKZ CHKD WAC DATE 3/11/96		953571	
M. L. TELLALIAN		DWG 101	REV
ENGINEERING ASSIGNED		SHT 2	4
LIGO-D961302-04-B			

INDICATES CHANGE FROM PREVIOUS ISSUE



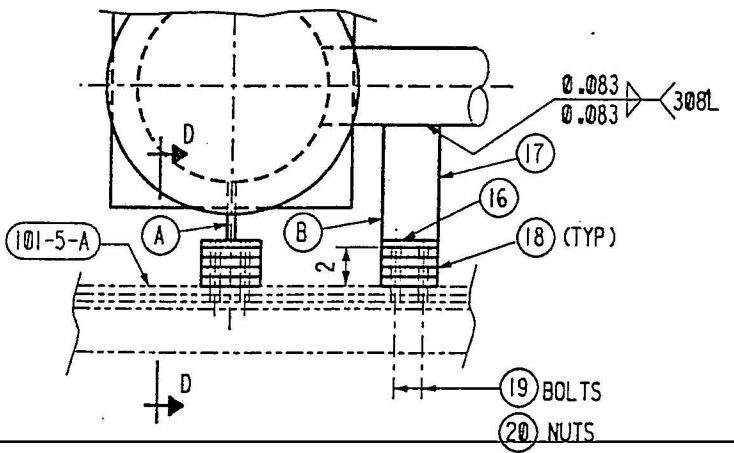
SECTION "B-B"



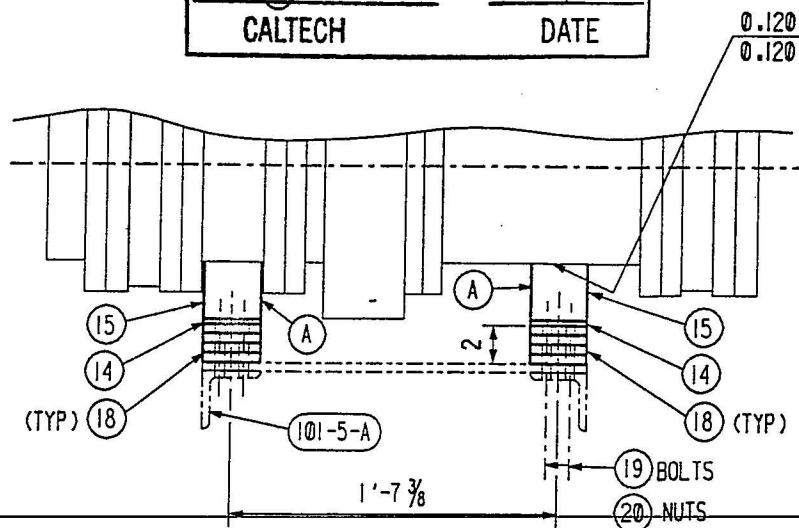
APPROVED

M. Tellalian 3-7-97
CBI DATE

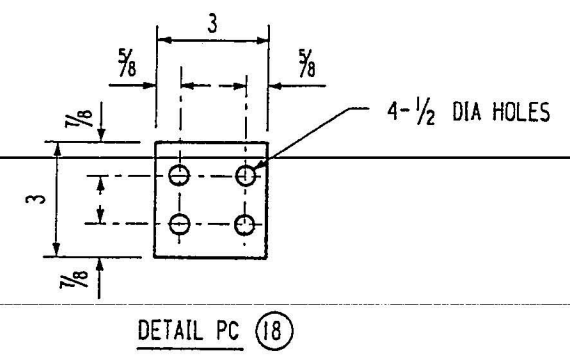
J. Jones 10/2/97
CALTECH DATE



DETAIL "C"



VIEW "D-D"



DETAIL PC (18)

SHP PC	MARK	ASSM PC	DESCRIPTION	LENGTH		SPEC	D
				FT	IN		
101-3-A		18	ASSEMBLY A (SHOP ATTACH TO 101-4-A)				
101-3-14		18	PL 3 X 1/4 X SK	0	3	SS	PE
101-3-15		18	PL 3 X 1/4	0	3	SS	PE
101-3-B		9	ASSEMBLY B (SHOP ATTACH TO 101-4-A)				
101-3-16		9	PL 3 X 1/4 X SK	0	3	SS	PE
101-3-17		9	PL 3 X 1/4	0	6	SS	PE
101-3-C		9	TYPE "B" PUMP PORT HARDWARE SECTION "B-B" ASSEMBLY (SHOP ATTACH TO 101-4-A)				
101-3-1		9	6 X 4 1/2 CF REDUCING TEE	0	8.64	SS	PA
101-3-2		9	6 X 2.75 CF REDUCING NIPPLE	0	5	SS	PA
101-3-3		9	BLD FLG 2.75 DIA CF			SS	PA
101-3-4		300	BOLT 5/16-24 (INCLUDES 12 SPARES)	0	2 1/4	*	PE
101-3-5		115	BOLT 1/4-28 (INCLUDES 7 SPARES)	0	1 1/2	*	PE
101-3-6		60	PLATE NUT 1/4-28 UNF (INCLUDES 6 SPARES)			SS	PE
101-3-7		20	GSKT 2.75 DIA CF (INCLUDES 2 SPARES)			COPPER	PA
101-3-8		149	PLATE NUT 5/16-24 UNF (INCLUDES 5 SPARES)			SS	PE
101-3-9		20	GSKT 6 DIA CF (INCLUDES 2 SPARES)			COPPER	PA
101-3-10	**10	100	MM VAT ANGLE VALVE WITH 6 DIA CF FLG			SS	PC
101-3-11	**10	40	MM NOR-CAL ANGLE VALVE OR EQUAL WITH 2.75 DIA CF FLG			SS	PC
101-3-12	303		WASHER 5/16 DIA (INCLUDES 15 SPARES)			SS	PE
101-3-13	115		WASHER 1/4 DIA (INCLUDES 7 SPARES)			SS	PE
101-3-18	108		SILICONE BLOCKS 3 X 1/2 X SK MCMASTER-CARR CATALOGUE NO. 8632K48, 40 DUROMETER	0	3		PE
101-3-19	110		BOLT 3/8-16 HEX (INCLUDES 2 SPARES)	0	3 1/2	A307B GALV	PE
101-3-20	110		NUT 3/8-16 HEX (INCLUDES 2 SPARES)			A307B GALV	PE
			** SILVER PLATED SS				
			** = ONE SPARE PROVIDED. SPARE TO SHIP WITH SKIDS.				

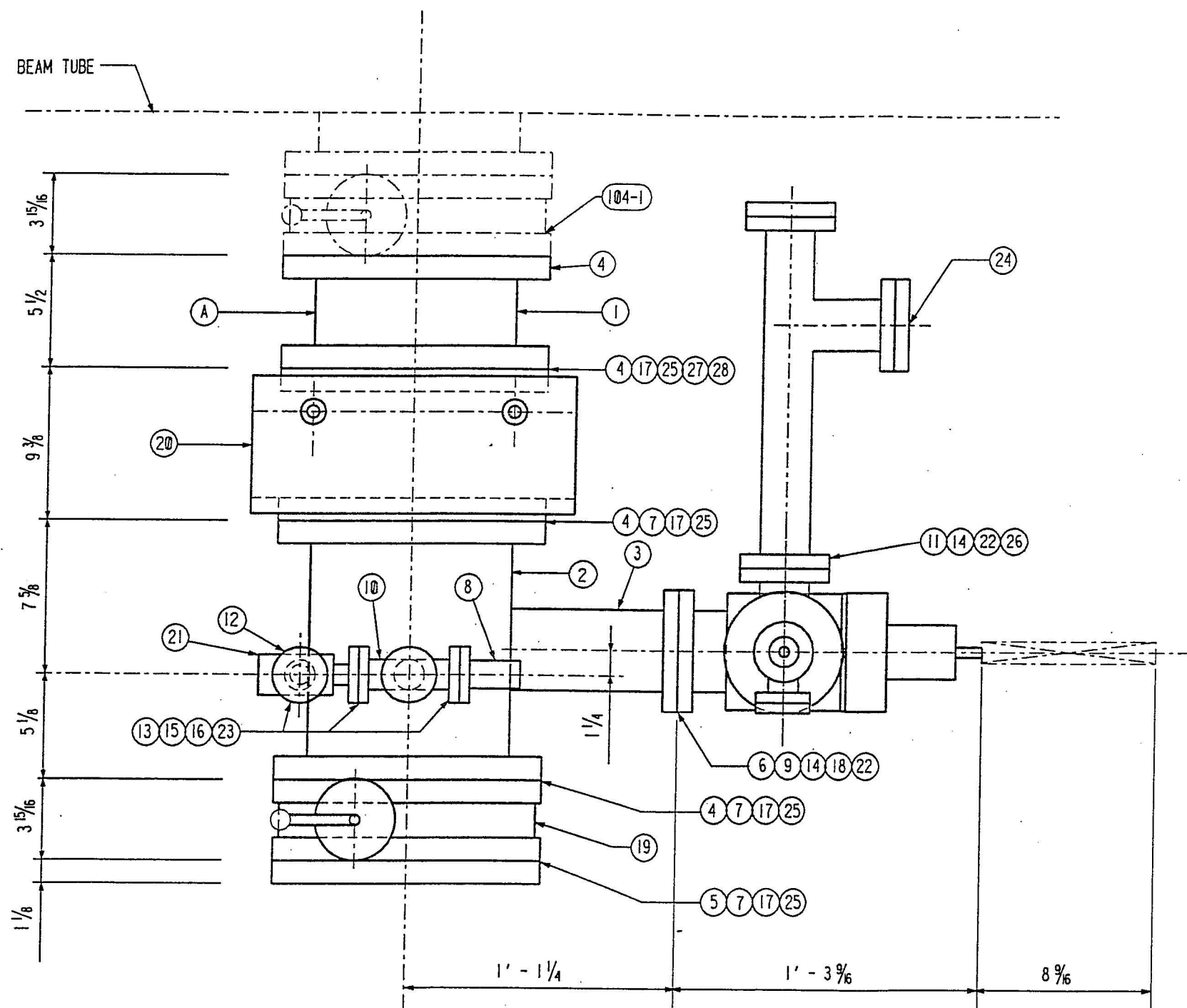
NOTES :

- USE WITH DRAWINGS 101 SH. 1, 2, 4, 5 AND 6

DTR 11/2/96 9/30/96 11/7/97		REV. WELD SIZE OF PC. TO TUBE. REV. HEIGHT OF PC. 17. REV. BILLING, ADDED ASST. C. REVISED OTHER SHIT.		REMARKS SUPPLIER'S / PURCHASER'S NO CBI	
LIGO BEAM TUBE HANFORD, WA AND LIVINGSTON, LA PUMP PORT HARDWARE TYPE "B" SECTION "B-B"				CUSTOMER'S NO BY RKZ CHKD WAC DATE 3/11/96 M. L. TELLALIAN ENGINEERING ASSIGNED	
LIGO-D961302-04-B				CONTRACT NO 953571 DWG 101 REV 4 SHT 3	

INDICATES CHANGE FROM PREVIOUS ISSUE

57103101.DGN



DETAIL I

SHIP PC	MARK	ASSM PC	DESCRIPTION	LENGTH		SPEC	D
				FT	IN		
9	101-4-A		PUMP PORT HARDWARE TYPE "B" ASSEMBLY				
	101-4-1	9	TUBE 10 OD X .120 WALL	0	4 1/2	SS	PA
	101-4-2	9	TUBE 10 OD X .120 WALL	0	11 3/4	SS	PA
	101-4-3	9	TUBE 4 OD X .083 WALL	0	8 3/8	SS	PA
	101-4-4	36	FLG 13.25 DIA CF ROTATABLE			SS	PA
	101-4-5	9	BLD FLG 13.25 DIA CF			SS	PA
	101-4-6	9	FLG 6 DIA CF ROTATABLE			SS	PA
	101-4-7	850	BOLT 3/8-24	0	1 5/8	*	PE
			(INCLUDES 40 SPARES)				
	101-4-8	**10	HPS CONVECTION GAGE WITH 2.75 DIA CF FLG			SS	PC
	101-4-9	154	BOLT 5/16-24	0	2 1/4	*	PE
			(INCLUDES 10 SPARES)				
	101-4-10	9	FOUR WAY CROSS 2.75 DIA CF			SS	PA
	101-4-11	11	GSKT 4.5 DIA CF (INCLUDES 2 SPARES)			COPPER	PA
	101-4-12	9	BLD FLG 2.75 DIA CF			SS	PA
	101-4-13	172	BOLT 1/4-28	0	1 1/2	*	PE
			(INCLUDES 10 SPARES)				
	101-4-14	118	PLATE NUT 5/16-24			SS	PE
			(INCLUDES 10 SPARES)				
	101-4-15	90	PLATE NUT 1/4-28 UNF			SS	PE
			(INCLUDES 9 SPARES)				
	101-4-16	30	GSKT 2.75 DIA CF			COPPER	PA
			(INCLUDES 3 SPARES)				
	101-4-17	40	GSKT 13.25 DIA CF			COPPER	PA
			(INCLUDES 4 SPARES)				
	101-4-18	10	GSKT 6 DIA CF (INCLUDES 2 SPARES)			COPPER	PA
	101-4-19	**10	250MM SERIES 10 YAT VALVE			SS	PC
			WITH 13.25 DIA CF FLG				
	101-4-20	**10	GND LN2 TRAP 10 DIA			SS	PC
			WITH 13.25 DIA CF FLG				
	101-4-21	**10	40 MM NOR-CAL ANGLE VALVE			SS	PC
			NUMBER AMV-1502-CF (OR EQUAL)				
	101-4-22	230	WASHER 5/16 DIA (INCLUDES 14 SPARES)			SS	PE
	101-4-23	170	WASHER 1/4 DIA (INCLUDES 8 SPARES)			SS	PE
	101-4-24	**10	BALZERS RGA				PC
	101-4-25	1130	WASHER 3/8 DIA (INCLUDES 50 SPARES)			SS	PE
	101-4-26	80	BOLT 5/16-24 (INCLUDES 8 SPARES)	0	2	*	PE
	101-4-27	280	NUT 3/8-24 UNF (INCLUDES 10 SPARES)			SS	PE
	101-4-28	280	BOLT 3/8-24 (INCLUDES 10 SPARES)	0	3	*	PE
	101-2-A	9	SECTION "A-A" ASSEMBLY				
	101-3-A	18	ASSEMBLY A				
	101-3-B	9	ASSEMBLY B				
	101-3-C	9	SECTION "B-B" ASSEMBLY				
	101-5-A	9	PUMP PORT HARDWARE FRAME ASSEMBLY				
			* = SILVER PLATED SS				
			** = ONE SPARE PROVIDED. SPARE TO SHIP WITH SKIDS.				

NOTES:

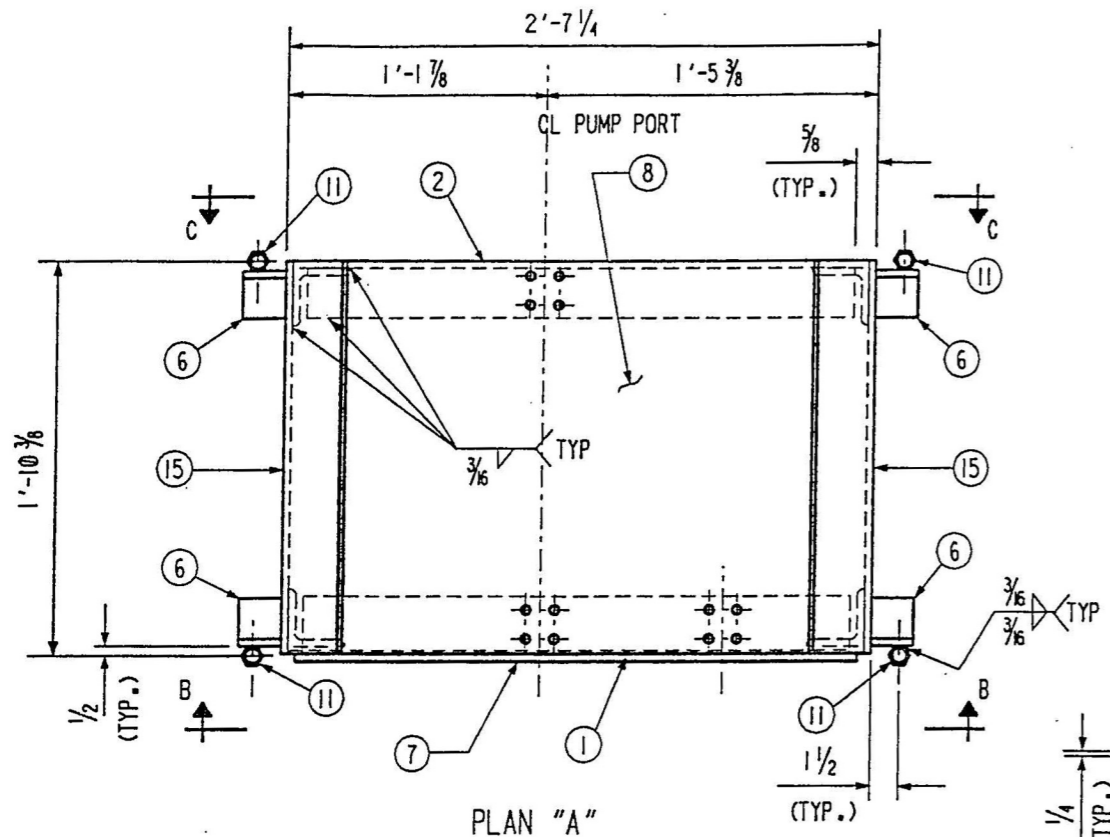
1. USE WITH DRAWING 101 SH. 1, 2, 3, 5 AND 6

APPROVED	
<i>M. Tellalian</i>	3-1-97
CBI	DATE
<i>S. Jones</i>	10/2/97
CALTECH	DATE

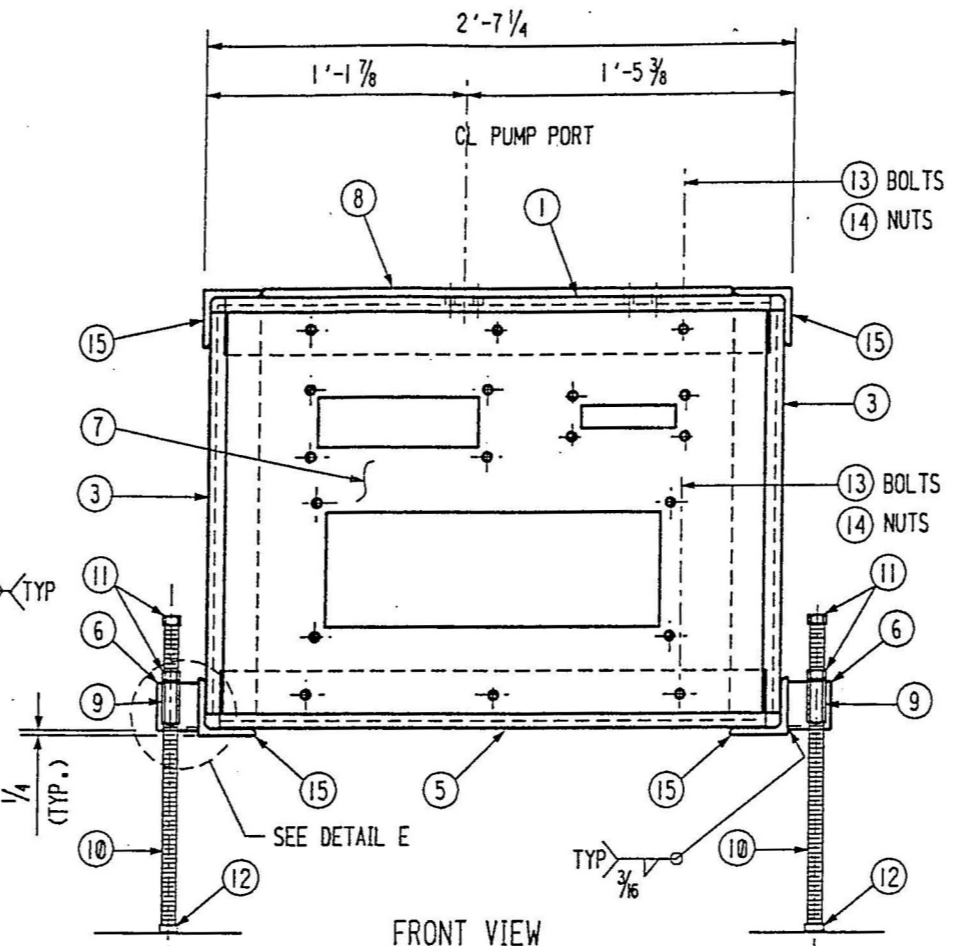
CBI		SUPPLIER'S / PURCHASER'S NO	
LIGO PROJECT			
HANFORD, WA AND LIVINGSTON, LA			
PUMP PORT HARDWARE TYPE "B"			
PLAN "A" - DETAIL I			
CUSTOMER'S NO		CONTRACT NO	
BY RKZ CHKD WAC DATE 3/11/96		953571	
M. L. TELLALIAN		DWG 101	REV 4
ENGINEERING ASSIGNED		SHT 4	4
LIGO-D961302-04-B			

INDICATES CHANGE FROM PREVIOUS ISSUE

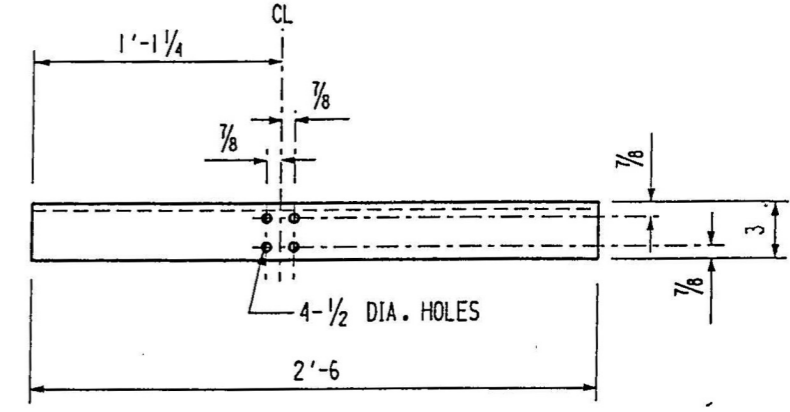
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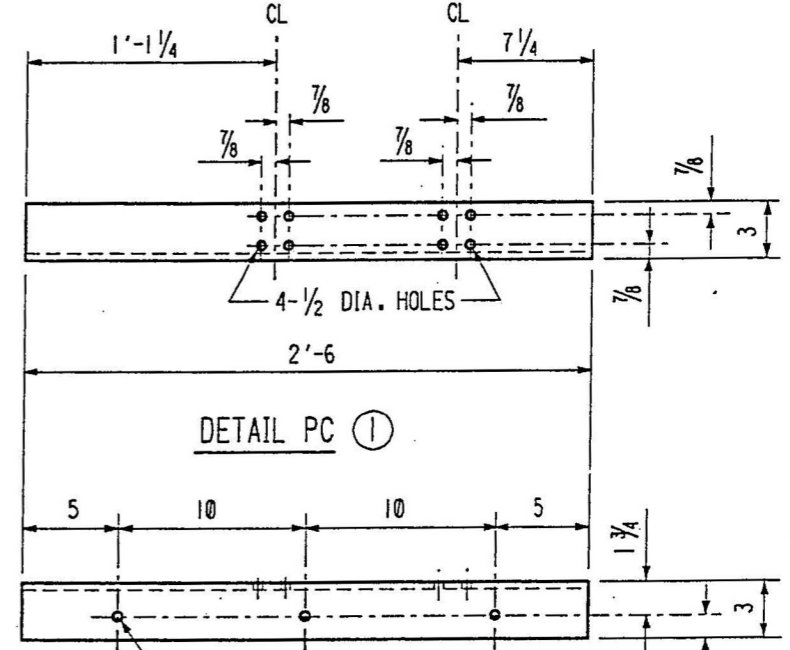
PLAN "A"



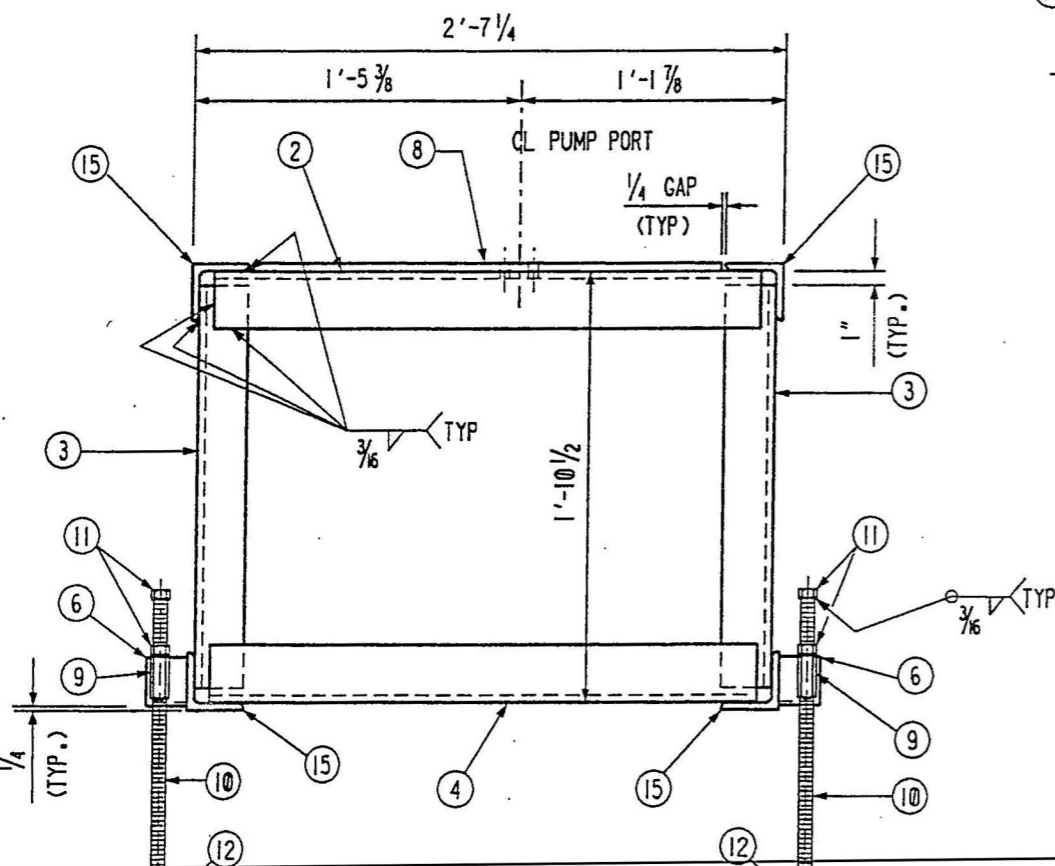
FRONT VIEW
ELEVATION "B" - "B"



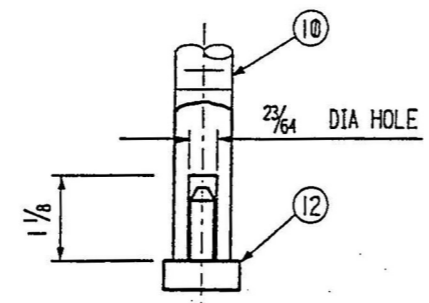
DETAIL PC ②



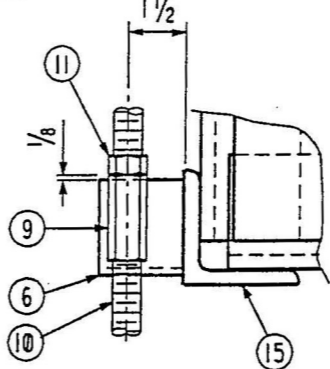
DETAIL PC ①



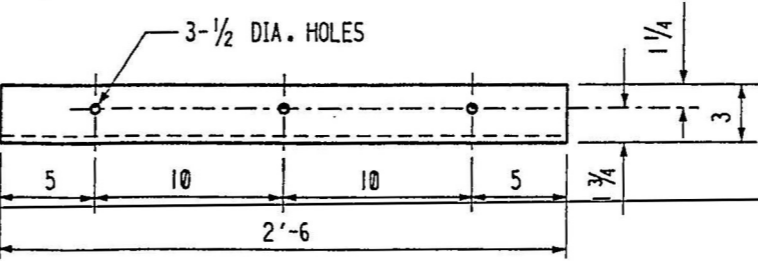
ELEVATION "C" - "C"



DETAIL "D"



DETAIL "E"



DETAIL PC ⑤

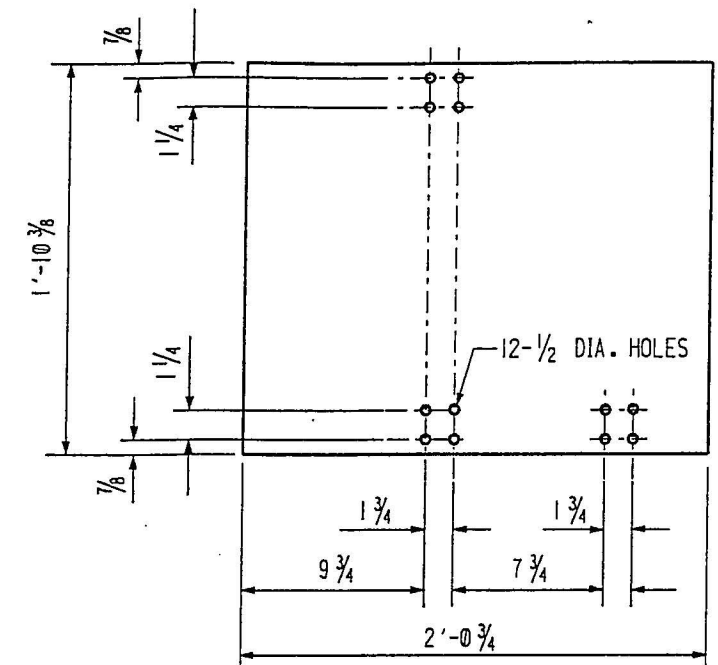
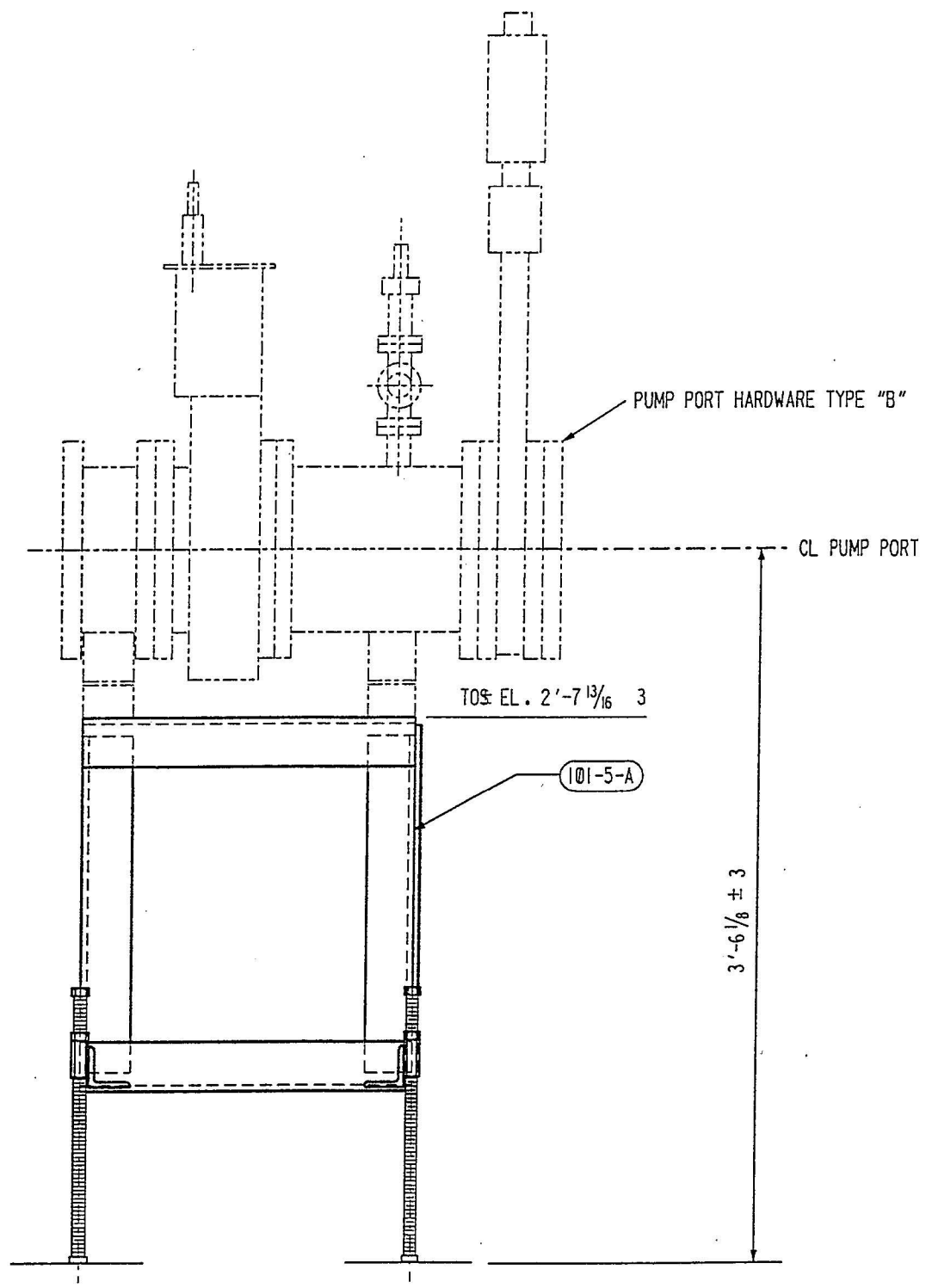
APPROVED
M. Tellalian 3-7-97
 CBI DATE
J. Jones 10/2/97
 CALTECH DATE

NOTES:
 1. WORK THIS DWG. WITH DRAWING 101, SHT. 1-4 AND 6

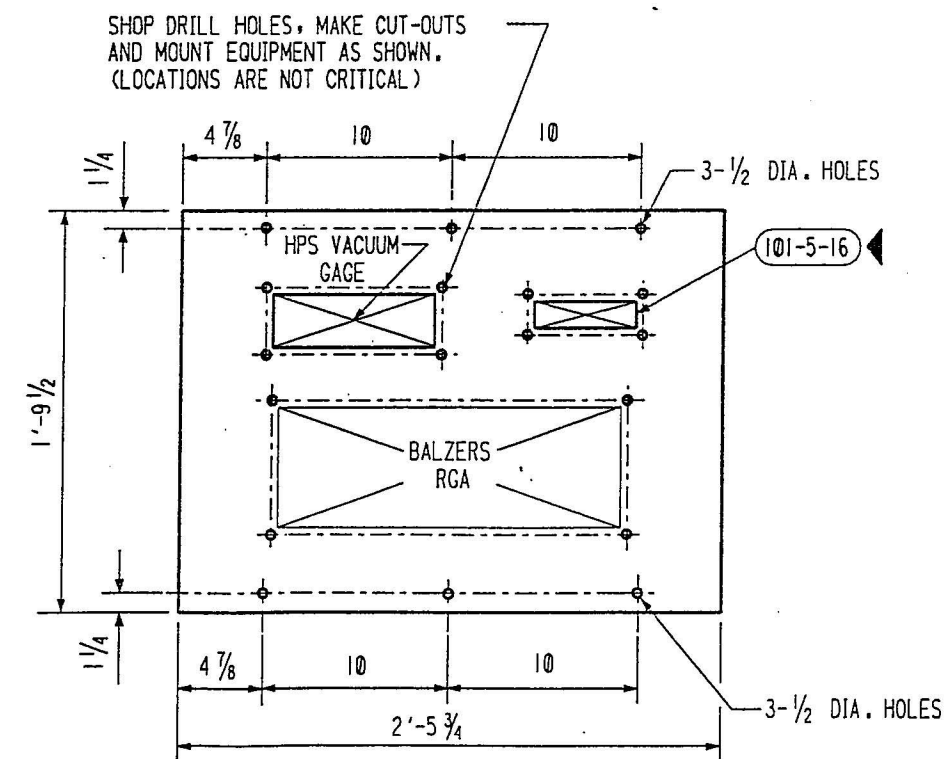
CBI		SUPPLIER'S / PURCHASER'S NO	
LIGO BEAM TUBE			
HANFORD, WA AND LIVINGSTON, LA			
PUMP PORT HARDWARE TYPE "B"			
SUPPORTS - PLAN "A"			
CUSTOMER'S NO		CONTRACT NO	
BY RKZ_CHKD WAC DATE 3/11/96		953571	
M. L. TELLALIAN		DWG 101	REV 4
ENGINEERING ASSIGNED		SHT 5	
LIGO-D961302-04-B			

INDICATES CHANGE FROM PREVIOUS ISSUE

57105101.DGN



DETAIL PC (101-5-8)



DETAIL PC (101-5-7)

SHP PC	MARK	ASSN PC	DESCRIPTION	LENGTH		SPEC	ID
				FT	IN		
	101-5-A	9	PUMP PORT HARDWARE FRAME (SHOP ATTACH TO 101-4-A)				
	101-5-1	9	L 3 X 3 X 3/16 W/HOLES	2	6	A36 GALV	PE
	101-5-2	9	L 3 X 3 X 3/16 W/HOLES	2	6	A36 GALV	PE
	101-5-3	36	L 3 X 3 X 3/16	1	8 1/2	A36 GALV	PE
	101-5-4	9	L 3 X 3 X 3/16	2	6	A36 GALV	PE
	101-5-5	9	L 3 X 3 X 3/16 W/HOLES	2	6	A36 GALV	PE
	101-5-6	36	L 2 1/2 X 2 1/2 X 3/16	0	2 1/4	A36 GALV	PE
	101-5-7	9	PL 1'-9 1/2 X 1/4 X SK	2	5 3/4	ALUMINUM	PE
	101-5-8	9	PL 1'-10 3/8 X 1/4 X SK	2	0 3/4	ALUMINUM	PE
	101-5-9	36	COUPLING NUT 3/4-5 ACME THREAD MCMaster-CARR CATALOGUE NO. 93023A664 OR EQUAL			CS	PE
	101-5-10	36	ACME THREADED ROD 3/4-5 X SK MCMaster-CARR CATALOGUE NO. 98935A218 OR EQUAL	1	6	CS	PE
	101-5-11	72	NUT 3/4-5 ACME THREAD			CS	PE
	101-5-12	36	BUMPER MCMaster-CARR CATALOGUE NO. 9310K14 OR EQUAL			RUBBER	PE
	101-5-13	54	BOLT 3/8-16 HEX	0	1	A307 GALV	PE
	101-5-14	54	NUT 3/8-16 HEX			A307 GALV	PE
	101-5-15	36	L 3 X 3 X 3/16	1	10 3/8	A36 GALV	PE
	101-5-16	**10	LEVEL CONTROL J.C. CRYOGENICS				PC

** = ONE SPARE PROVIDED. SPARE TO SHIP WITH SKIDS.

APPROVED

M. Tellalian 3-7-97
CBI DATE

J. Jones 10/2/97
CALTECH DATE

NOTES:
1. WORK THIS DWG. WITH DRAWING 101, SHT. 1-5

REMOVED CALY FROM PCS. 9-11.		REVISIONS		REMARKS	
BY	DATE	BY	DATE		
CHKD	11/21/96	CHKD	9/28/96		
DATE		DATE			
BY	11/21/96	BY	11/21/97		
DATE		DATE			
				ADDED PC. 16, REV. SHT. 5.	
				CBI	
				SUPPLIER'S / PURCHASER'S NO	
				LIGO BEAM TUBE	
				HANFORD, WA AND LIVINGSTON, LA	
				PUMP PORT HARDWARE TYPE "B"	
				SUPPORT - ELEVATION	
				CUSTOMER'S NO	
				CONTRACT NO	
				953571	
				BY RKZ CHKD WAC DATE 3/11/96	
				DWG 101 REV	
				M. L. TELLALIAN	
				ENGINEERING ASSIGNED	
				SHT 6 REV 4	
				LIGO-D961302-04-B	

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