

WASHINGTON SITE
INSTALLATION CONTRACTOR
QA DATA

CONTRACT NO.: PC 175730
PROGRAM I.D.: LIGO VACUUM EQUIPMENT
PSI DOCUMENT NO.: V049-8-863
V049-8-864
V049-8-865
V049-8-866
V049-8-867

SUBMITTED TO:

California Institute of Technology
391 South Holliston Avenue
Pasadena, CA 91125

SUBMITTED BY:

Process Systems International, Inc.
20 Walkup Drive
Westborough, MA 01581



COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WBSC-1

Component Name: BEAM SPLITTER

Component S/N: S/N-09

Vacuum Sealing Surfaces Inspection

By: ~~Bubba~~ 2-19-98

Buyer: MS 19 FEB 98

Cleanliness Inspection

By: ~~Bubba~~ 2-19-98

Buyer: MS 19 FEB 98

-Rings Installed

By: ~~Bubba~~ 2-19-98

Buyer: MS 19 FEB 98

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

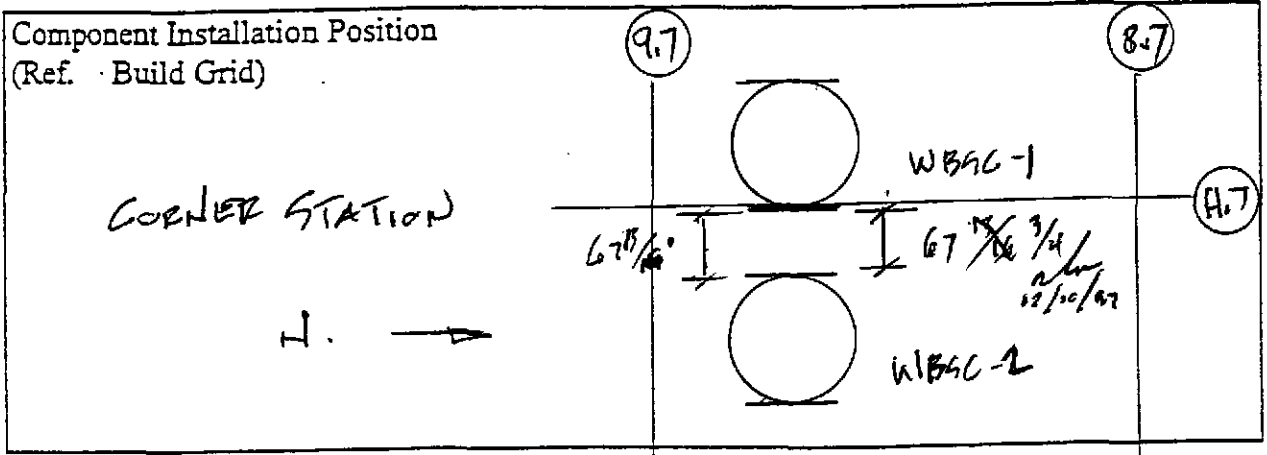
COMPONENT INSTALLATION DATA SHEET

Component Tag Number WBSC 1

Component Name BEAM SPLITTER

Component S/N S/N 09

Component Installation Weight (lb.) 20,000 LBS.

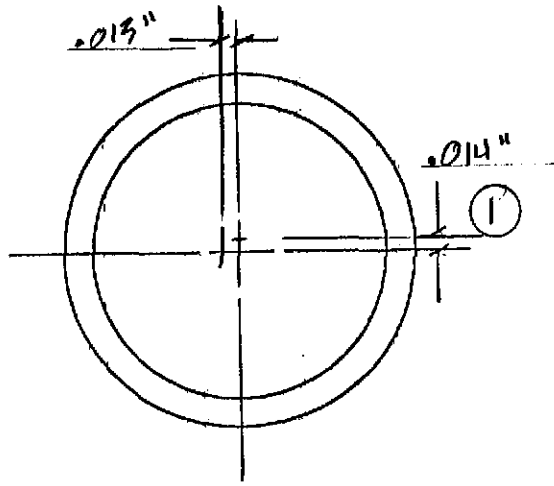


Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<i>[Signature]</i>	12/10/97
2. Component Located For Anchor Bolt Marking	<i>[Signature]</i>	12/10/97
	Buyer <i>[Signature]</i>	10 DEC 97
3. Final Component Location Complete	<i>[Signature]</i>	12/22/97
	Buyer <i>[Signature]</i>	28 DEC 97

Number

Rev.

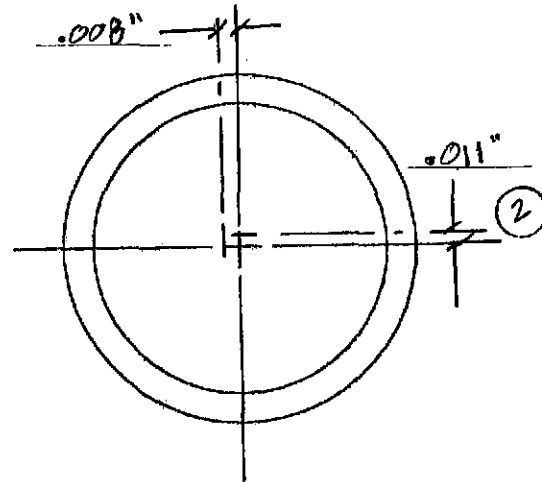
SPECIFICATION		
Number	V040-2-173	Rev.
A		1
Page 1 of 1		



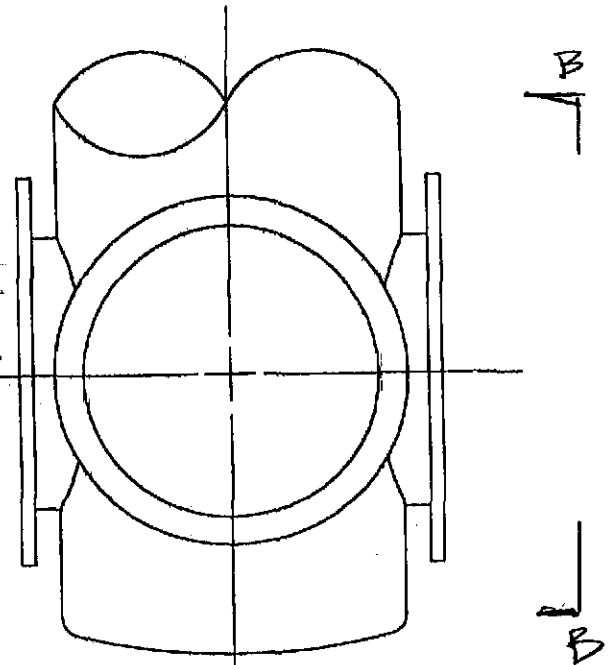
A-A

WES
PSI
3/10/69

MACHINE LEVEL N-S
 WAS ESTABLISHED USING
 STREET 98 LEVELS.
 UNIT IS PLUMB TO WITHIN
 .005/FT. OR N.035" OVER ALL



B-B



Looking North

Component ID: WBSC-1

Serial No.: S/N 09

B46-1	(1)	(2)	△
DESIGN	"0"	"0"	"0"
SHOT	.014"	.011"	.003"

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: BEAM SPLITTER
 INSTALLED POSITION

Job No.: M-126

Project: LIGO Equipment Set

Scale: None

Dwn By: *M/evoy*
12/10/69

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126		
Drawing: V049-5-001	Rev. 4	Date: 12/10/97		
Item Anchored: WBSG-1	No. of Anchors: 16	Size: 1/2"	Type: HVA	
Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super)		ok		12/11/97
Spacing & Location		ok		12/11/97
Anchor Size & Length		ok		12/11/97
Hole Size		ok		12/11/97
Hole & Core Condition (no voids, etc.)		ok		12/11/97
Embedment (minus 0 plus 1/8")		ok		12/11/97
Angle (90 deg. + 1deg.)		ok		12/11/97
Floor Scarified (DIMITS)		ok		12/22/97
Proper Nut Engagement		ok		3/11/98
Tightening 250 FT LB		ok		3/11/98
Torque Device Identification: AP-9				

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Completed) <i>John T. W. [Signature]</i>	Date: 3/11/98
--	---------------

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WBSC 2

Component Name

Beam Splitter #2

Component S/N

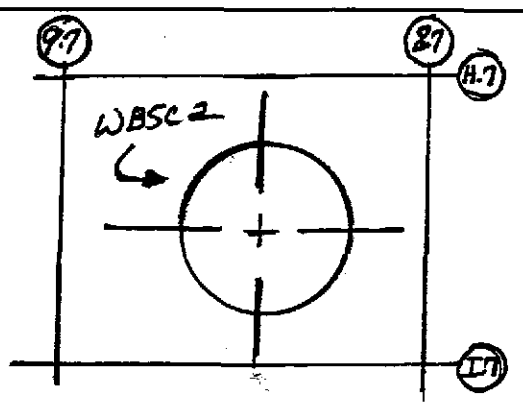
02

Component Installation Weight (lb.)

20,000 Lbs

Component Installation Position
(Ref. Build Grid)

CORNER Station

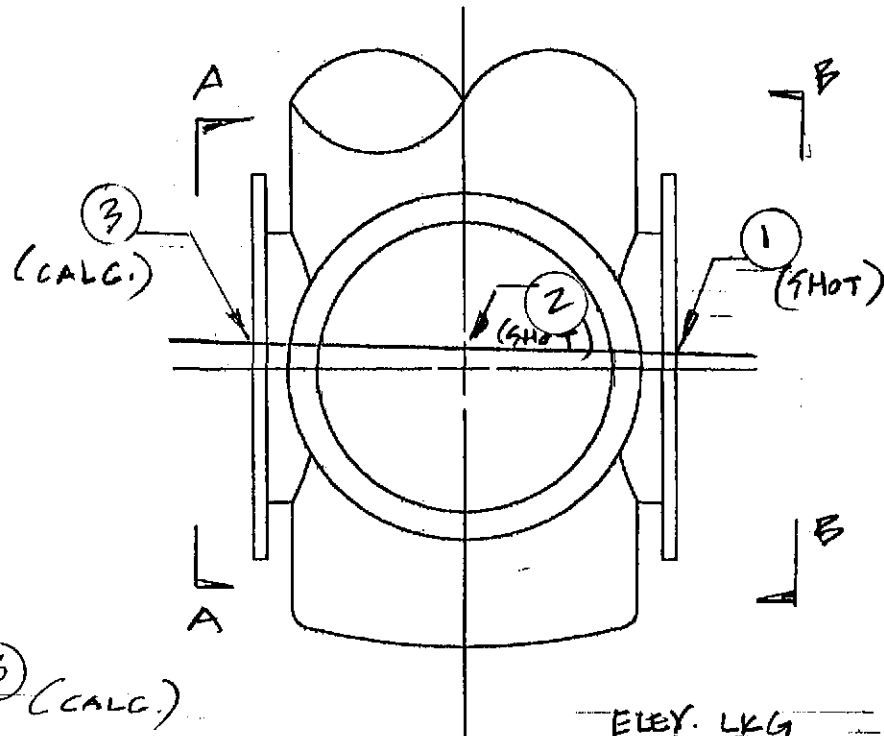
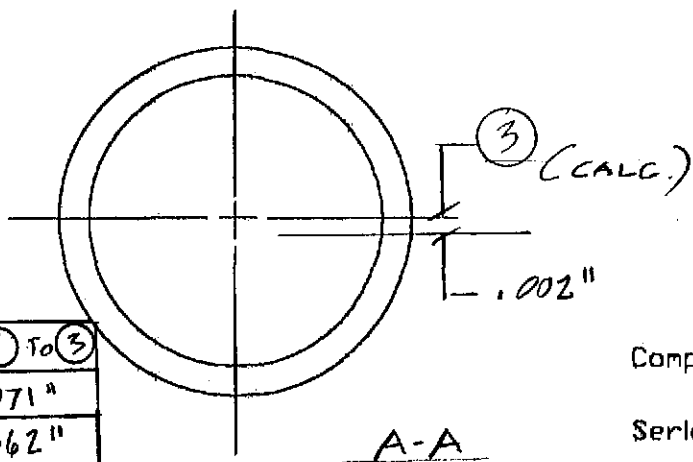
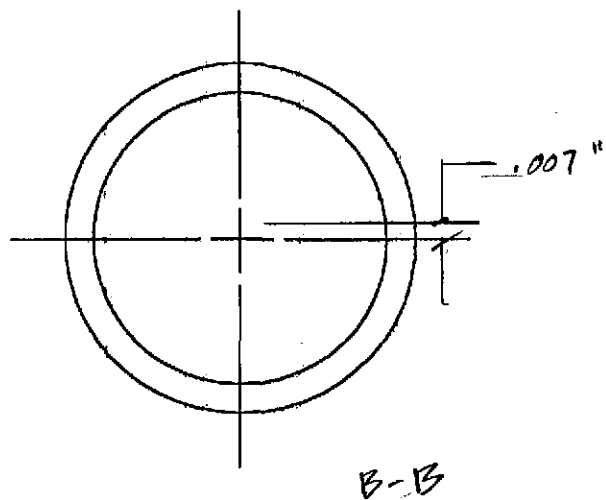


Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<i>R. J. McCoy</i>	11-25-97
2. Component Located For Anchor Bolt Marking	<i>Vern Coyne</i>	11-25-97
	<i>Rick Danchit</i>	
3. Final Component Location Complete	Buyer <i>NUS</i>	25 NOV 97
	Buyer <i>W. J. Meloy</i>	12/19/97
	Buyer <i>NUS</i>	19 DEC 97

SPECIFICATION

Number	Rev.
A	1

Number
Rev.



BGC-2	①	②	③	Δ① To ③
MODEL	3.641	3.676	3.712	.071"
SHOT	3.648	3.679	3.710	.062"
Δ	.007	.003	.002	.009" ✓

(DATA FROM APOLLO SURVEY.)

Component ID: WBSG-2

Serial No.: S/N 02

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: BEAM SPLITTER
INSTALLED POSITION

Job No.: M-126

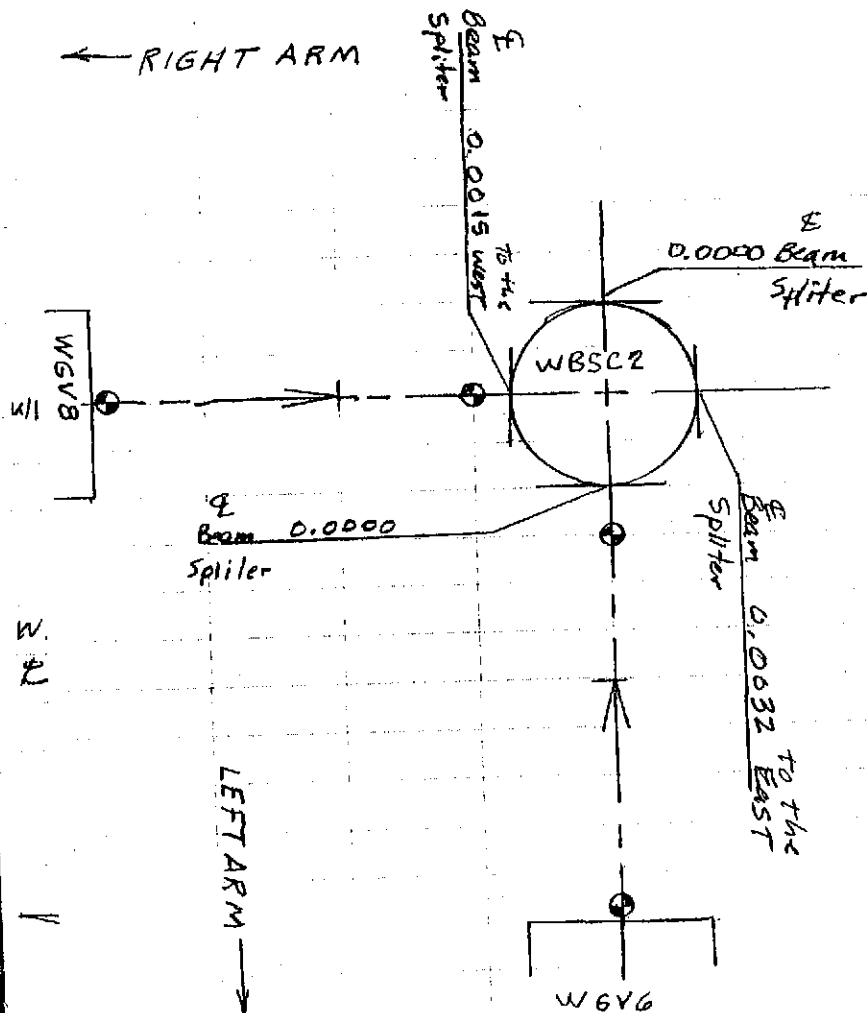
Project: LIGO Equipment Set

Scale:
None

Dwn By: W. Mayo
1/13/90

BLDG NORTH

← RIGHT ARM



#9783 LIGO Corner station

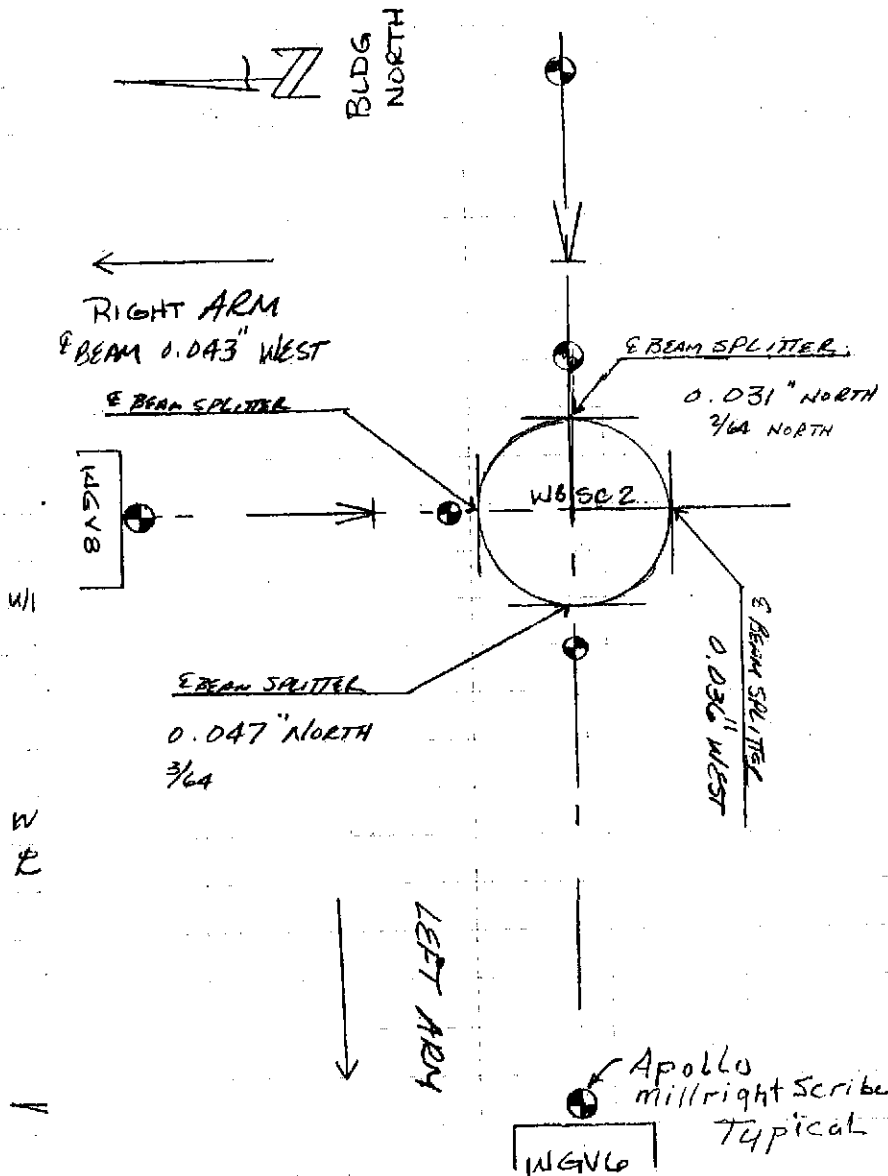
11-25-97

Before Anchor Bolts installed (INITIAL SET)

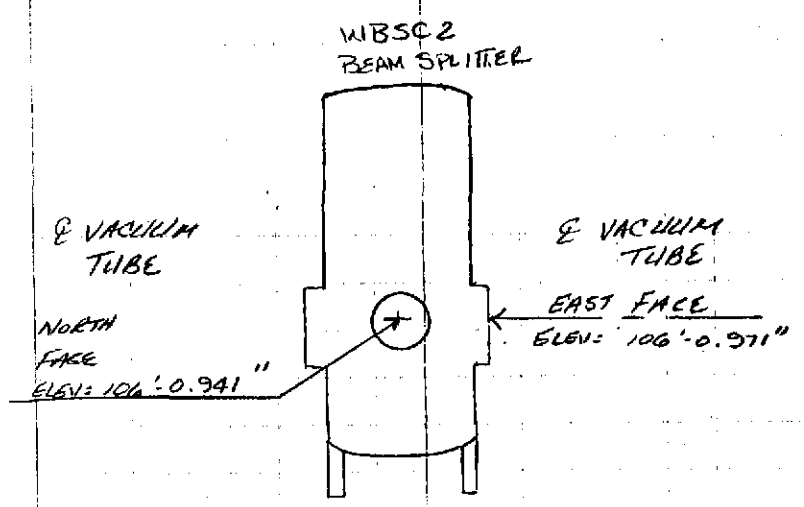
V. Coyne
K. Sarchet



Note: E WBSC2 Left Leg alignment is $\pm 1/4$ " south of RSI E alignment and monumentation & scribe lines



9783 LIGO Cor. STA
 AFTER ANCHOR BOLTS
 INSTALLED (FINAL SET).
 12-8-97
 Coyne
 Poister



BM = 106'-0.984" E WGV6
 AS PER PLANS.

	T	HI	ROD	ELEN
BM				106'-0.984"
			2.582	105'-10.402"
No.	2.539	106'-0.941"		
EAST	2.569	106'-0.971"		

9783 LIGO COR STA 12-8-97
 Q VACUUM TUBE @ WGVG AS PER PLAN COYNE
 DWG # V049-5-001 SHT. 2 of 2 POLSTER
 Q VACUUM TUBE
 Q VACUUM TUBE

W.
 W
 W
 W

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V04A-5-001	Rev.: 4	Date: 12/01/97	
Item Anchored: WBS02	No. of Anchors: 16	Size: 1"	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super)		ahp		12/1/97
Spacing & Location		ahp		12/1/97
Anchor Size & Length #		ahp		12/1/97
Hoop Size		ahp		12/1/97
Hoop Core Condition (no voids, etc.)		ahp		12/1/97
Embedment (minus 0 plus 1/8")		ahp		12/1/97
Angle 90 deg. ± 1deg.)		ahp		12/1/97
Fixer Scarified (DIVITS)		ahp		12/2/97
Prose Nut Engagement		ahp		3/11/98
Tightening 250 FT. LB		ahp		3/11/98
Tools Device Identification: AP-9				

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

1 ANCHOR BOLT AT SOUTH CORNER OF NORTH-EAST PLATE IS APPROX. 3/4 IN. LONGER THAN SPEC.; HENCE THE UNEQUAL PROTRUSION. / CONSIDERED PROPER EMBEDMENT BY VERIFYING PROPER LOCATION OF REFERENCE CONSTRUCTION MARKINGS ON THE ANCHOR ITSELF. ah 12/22/97

Inspection by: (Completed) ah T. McElroy	Date: 3/11/98
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COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WBSC-3

Component Name:

BEAM SPLITTER

Component S/N:

S/N-03

Vacuum Sealing Surfaces Inspection

By:

Bulba ~~Katerina~~ 1-21-98

Buyer:

WSE JI TAUSSE

Cleanliness Inspection

By:

Bulba ~~Katerina~~ 1-21-98

Buyer:

WSE JI TAUSSE

Rings Installed

By:

Bulba ~~Katerina~~ 1-21-98

Buyer:

WSE JI TAUSSE

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WBSC-3

Component Name

BEAM SPLITTER

Component S/N

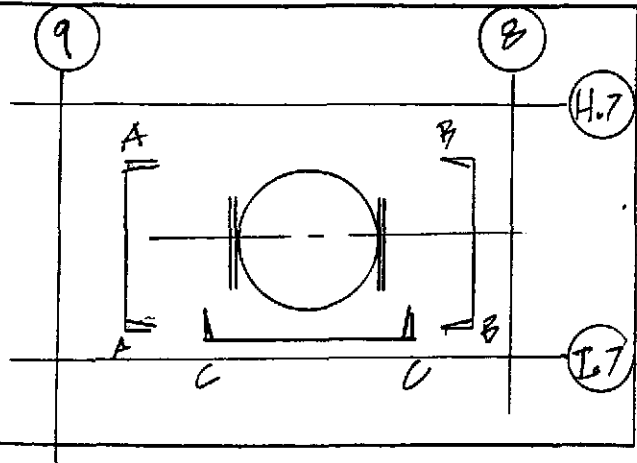
S/N 03

Component Installation Weight (lb.)

20,000 LB.

Component Installation Position
(Ref. Build Grid)

CORNER STATION

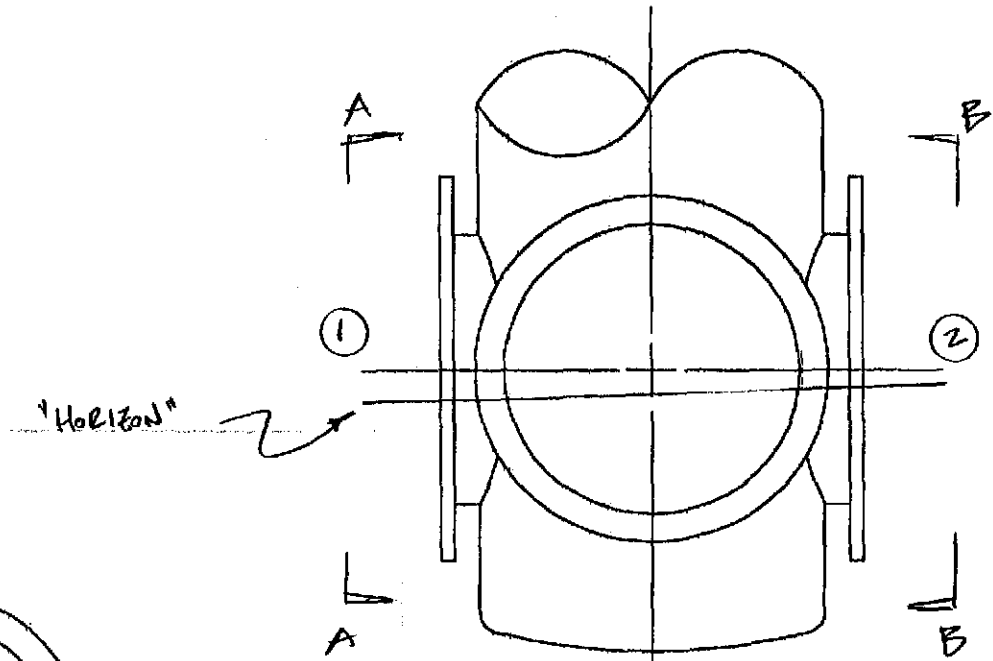
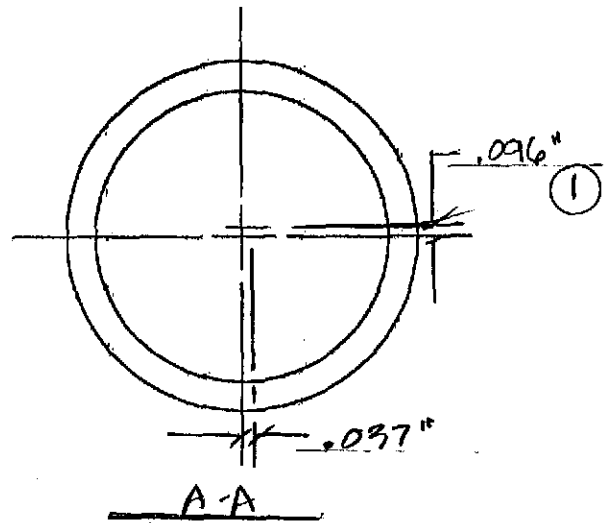


Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<i>[Signature]</i>	12-9-97
2. Component Located For Anchor Bolt Marking	<i>[Signature]</i>	12/9/97
	Buyer <i>[Signature]</i>	9 DEC 97
3. Final Component Location Complete	<i>[Signature]</i>	12/23/97
	Buyer <i>[Signature]</i>	23 DEC 97

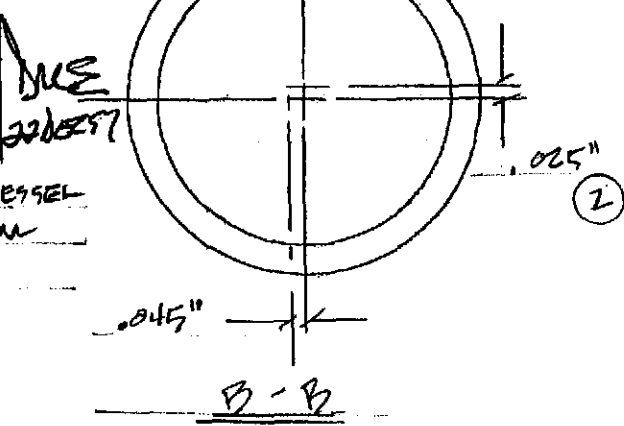
Number
Rev.

SPECIFICATION

Number A V040-2-174 Rev. 1



B96-3	(1)	(2)	Δ
MODEL	1.043	.9715	.072
SHOT	.096	.025	.071



(TO ESTABLISH THAT VESSEL
CORRESPONDS TO BEAM
LINE ALONG AXIS)

LKG. WEST
C-C

Component ID: WB96-3
Serial No: S/N 03

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: BEAM SPLITTER
INSTALLED POSITION

Job No: M-126

Project: LIGO Equipment Set

Scale: None

Dwn By: Meloy
12/23/97

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V04A-5-001	Rev. 4	Date: 12/10/97	
Item Anchored: WBAC 3	No. of Anchors 16	Size: 1"	Type: HVA
Attribute	a. Installer	b. Accepted	c. N/A
Anchor Type (HAS Std or Super)		<i>ahy</i>	12/10/97
Spacing & Location		<i>ahy</i>	12/10/97
Anchor Size & Length		<i>ahy</i>	12/10/97
Hole Size		<i>ahy</i>	12/10/97
Hole & Core Condition (no voids, etc.)		<i>ahy</i>	12/10/97
Embedment (minus 0 plus 1/8")		<i>ahy</i>	12/10/97
Angle (90 deg. ± 1deg.)		<i>ahy</i>	12/10/97
Floor Scarified (DIVITS)		<i>ahy</i>	12/11/97
Proper Nut Engagement		<i>ahy</i>	3/11/98
Tightening 250 FT LB		<i>ahy</i>	3/11/98
Torque Device Identification: AP-9			

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Completed) <i>John T. McElroy</i>	Date: 3-11-98
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COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WBSC-4

Component Name: BEAM SPLITTER

Component S/N: G/N-06

Vacuum Sealing Surfaces Inspection

By: ~~Babbar~~ 1-13-98

Buyer: ~~MS~~ BJAWS

Cleanliness Inspection

By: ~~Babbar~~ 1-13-98

Buyer: ~~MS~~ BJAWS

Rings Installed

By: ~~Babbar~~ 1-13-98

Buyer: ~~MS~~ BJAWS

Comments:

Rework Required:

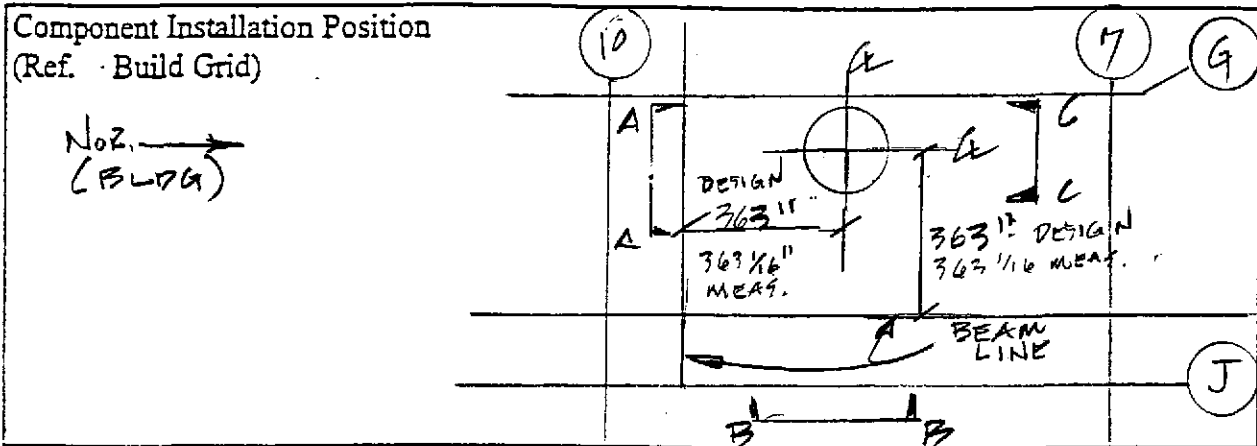
Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

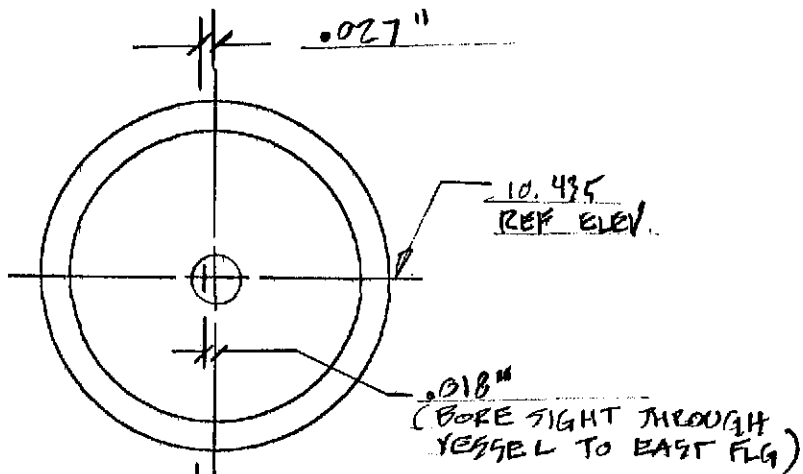
Component Tag Number WBSL 4
 Component Name BEAM SPLITTER
 Component S/N 9/11 06
 Component Installation Weight (lb.) 20,000 LB.



Signoffs (Contractor Unless Otherwise Noted)		By	Date
1.	Shipping Cover Cross Hairs Verified	<i>Buller</i>	12-16-97
2.	Component Located For Anchor Bolt Marking	<i>WSE</i>	12/16/97
		Buyer <i>WSE</i>	16 DEC 97
3.	Final Component Location Complete	<i>WSE</i>	12/19/97
		Buyer <i>WSE</i>	19 DEC 97

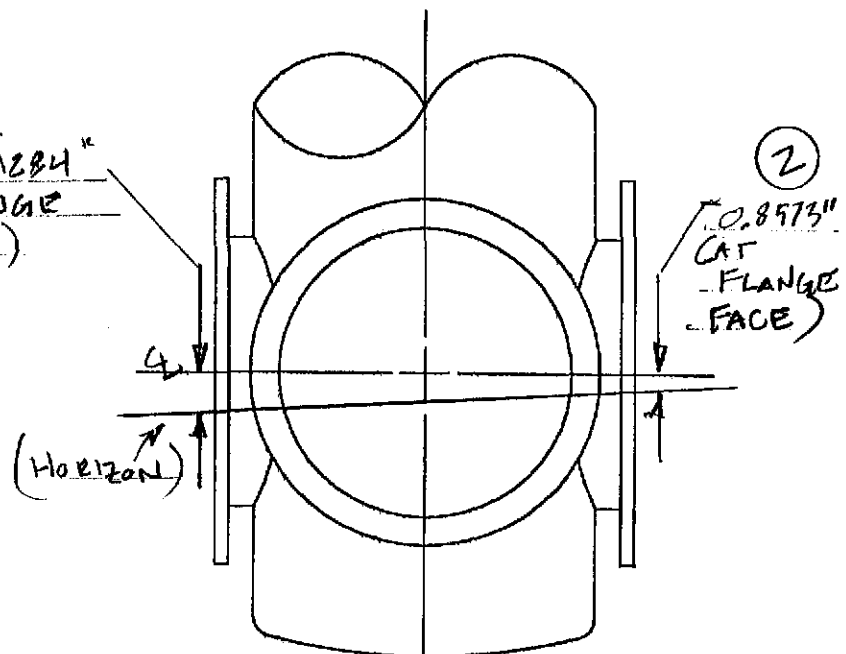
Number
Rev.

SPECIFICATION		
Number	Rev.	
A	1	V040-2-174

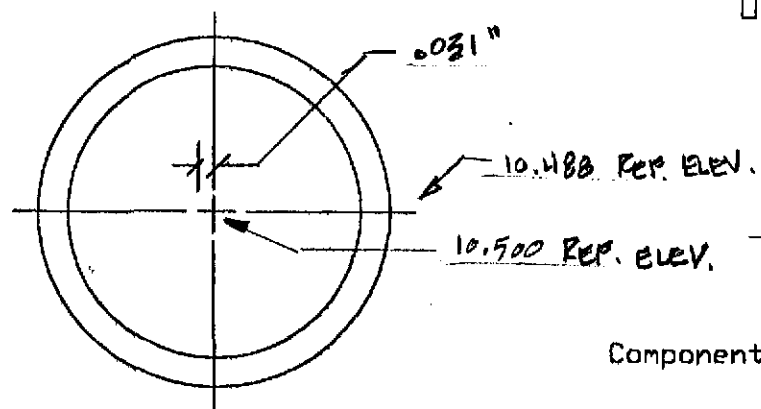


FLG. A-A
(LOOKING EAST)

① REF. 10.9284"
(AT FLANGE FACE)



ELEV. LOOKING WEST



FLG. B-B
(LOOKING SOUTH)

Component ID: WBSC-4

Serial No.: 5/A 06

BSC-4	①	②	△
MODEL	.192	.263	.071" ✓
SHOT	.928	.857	.071" ✓

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: BEAM SPLITTER
INSTALLED POSITION

Job No.: M-126

Project: LIGO Equipment Set

Scale: None

Dwn By: MELDY
11/19/41

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126/	
Drawing: 1049-F-001	Rev. 4	Date: 12/16/97	
Item Anchored: B5G 4	No. of Anchors 16	Size: 1"	Type: HVA
Attribute	a. Installer	b. Accepted	c. N/A
Anchor Type (HAS Std or Super)		<i>abm</i>	12/17/97
Spacing & Location		<i>abm</i>	12/16/97
Anchor Size & Length		<i>abm</i>	12/17/97
Hole Size		<i>abm</i>	12/17/97
Hole & Core Condition (no voids, etc.)		<i>abm</i>	12/17/97
Embedment (minus 0 plus 1/8")		<i>abm</i>	12/17/97
Angle (90 deg. ± 1deg.)		<i>abm</i>	12/17/97
Floor Scarified (CRIVITS)		<i>abm</i>	12/18/97
Proper Nut Engagement		<i>abm</i>	3-11-98
Tightening 250 FT LB.		<i>abm</i>	3-11-98
Torque Device Identification: AP-9			

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Completed) [Signature]	Date: 3-11-98
---	----------------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WB56-7

Component Name: BEAM SPLITTER

Component S/N: S/N.05

Vacuum Sealing Surfaces Inspection

By: Bubba [signature] 1-21-98

Buyer: JOE J. JAWES

Cleanliness Inspection

By: Bubba [signature] 1-21-98

Buyer: JOE J. JAWES

O-Rings Installed

By: Bubba [signature] 1-21-98

Buyer: JOE J. JAWES

Comments:

Rework Required:

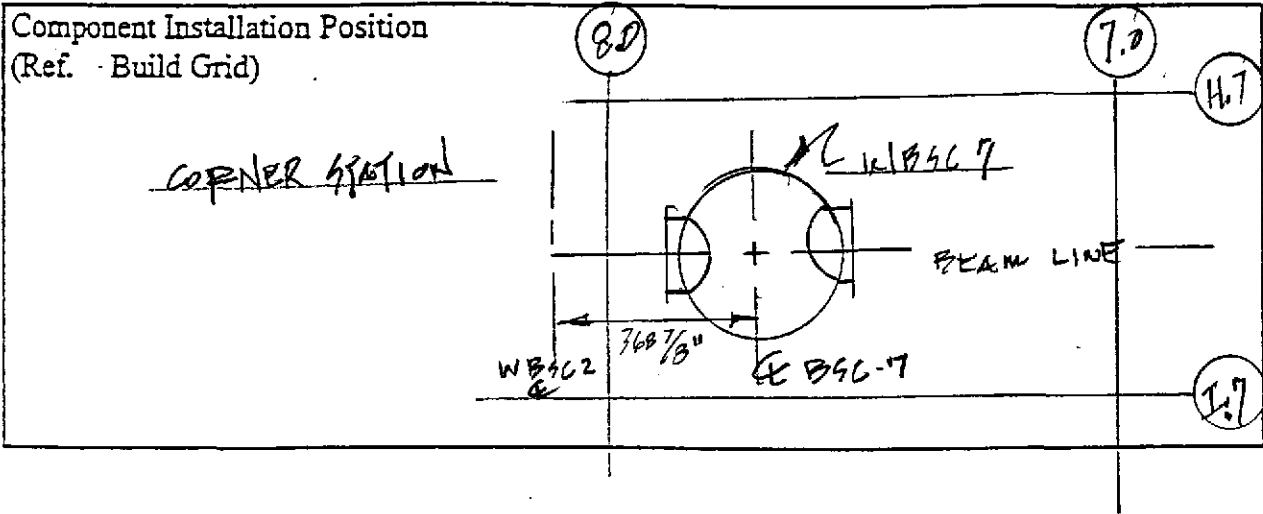
Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number WB967
 Component Name BEAM SPLITTER
 Component S/N S/N 05
 Component Installation Weight (lb.) 20,000 LB.



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<i>Baldwin</i>	12-18-97
2. Component Located For Anchor Bolt Marking	<i>John J. Miller</i>	12/18/97
	Buyer <i>NUSE</i>	18 DEC 97
3. Final Component Location Complete	<i>John J. Miller</i>	12/24/97
	Buyer <i>NUSE</i>	24 DEC 97

Number

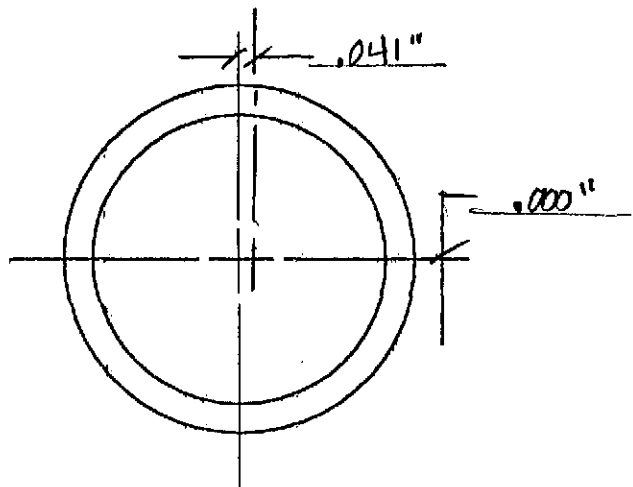
Rev.

SPECIFICATION

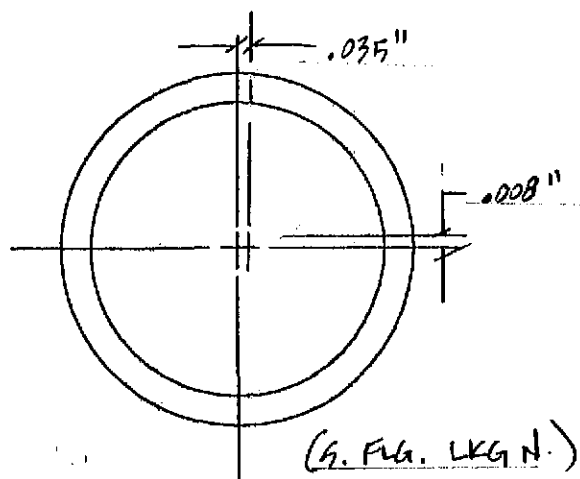
Number **A**

V049-2-173

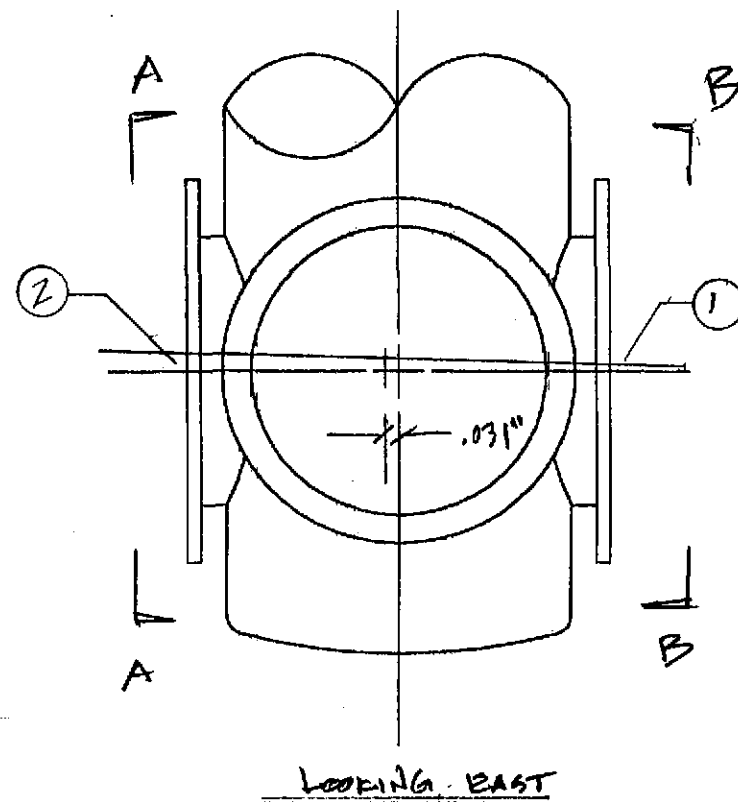
Rev. **1**



A-A
(N. FLG. LKGN 6.)



B-B



Component ID: WB56-7
 Serial No.: 9/N 05

B56-7	(1)	(2)	Δ
MODEL	.263	.192"	.071"
SHOT	.210	.195"	.015"

Apollo
 1207 W. Columbia Dr. Kennewick, Wa 99336

Title: BEAM SPLITTER
 INSTALLED POSITION
 Project: LIGO Equipment Set

Job No.: M-126
 Scale: None
 Dwn By: *Meloy*
 12/24/87

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WBSC-9
Component Name: BEAM SPLITTER
Component S/N: S/N-08

Vacuum Sealing Surfaces Inspection

By: Bubba Peters 1-20-98
Buyer: MS JOTAWSE

Clearness Inspection

By: Bubba Peters 1-20-98
Buyer: MS JOTAWSE

R Installed

By: Bubba Peters 1-20-98
Buyer: MS JOTAWSE

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

12896-B

Component Name

BEAM SPLITTER

Component S/N

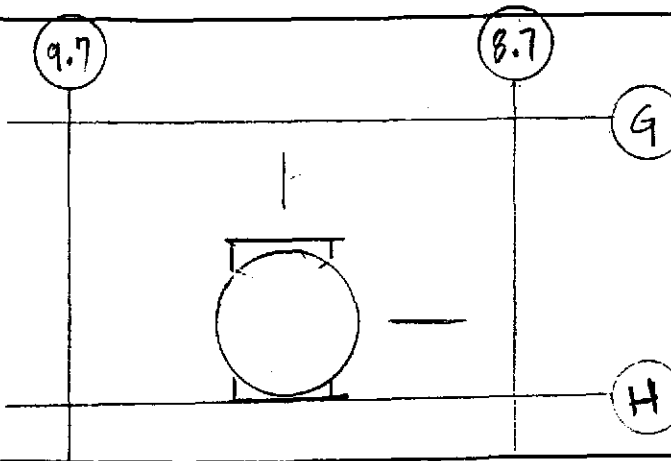
S/N 08

Component Installation Weight (lb.)

20,000 LB

Component Installation Position
(Ref. Build Grid)

CORNER STATION



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<i>Bob...</i>	12-19-97
2. Component Located For Anchor Bolt Marking	<i>John T. Melny</i>	12/19/97
	Buyer <i>NLS</i>	12/19/97
3. Final Component Location Complete	<i>John T. Melny</i>	12/22/97
	Buyer <i>NLS</i>	12/22/97

Number
Rev.

SPECIFICATION

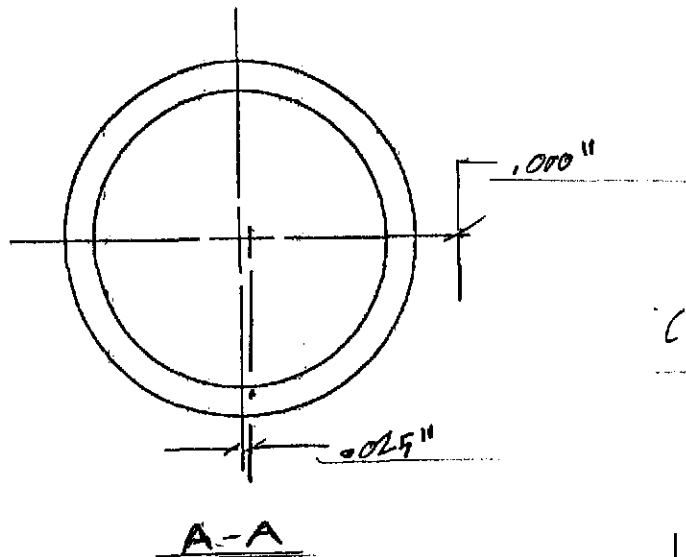
Number

A

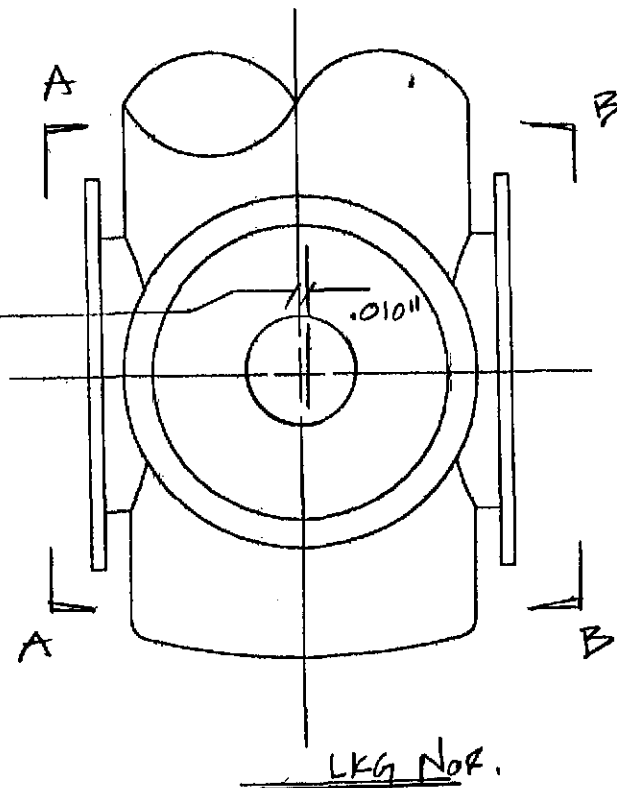
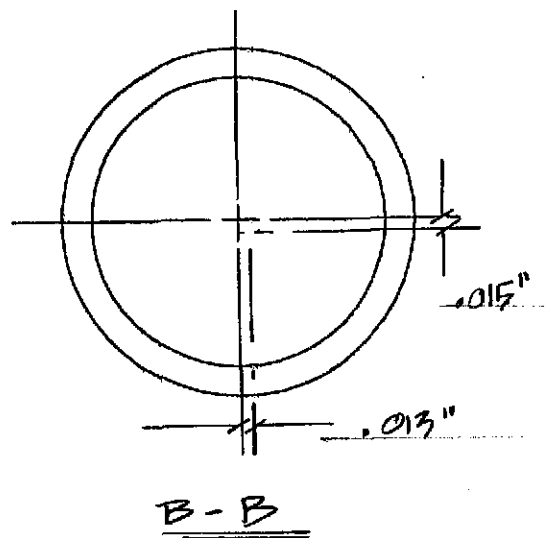
V049-2-174

Rev.

1



VALUE SHOWN
(0.010") IS FOR NORTH
FLG.



Component ID: WB56-B
Serial No.: SIN 08

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: BEAM SPLITTER
INSTALLED POSITION

Job No.: M-126

Project: LIGO Equipment Set

Scale:
None

Dwn By: M. ELOY

12/29/97

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126		
Drawing: V044-5-001	Rev. 4	Date: 12/22/97		
Item Anchored: WBSC-B	No. of Anchors: 16	Size: 1"	Type: HVA	

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or <u>Super</u>)		rlp		12/22/97
Spacing & Location		rlp		12/22/97
Anchor Size & Length		rlp		12/22/97
Hole Size		rlp		12/22/97
Hole & Core Condition (no voids, etc.)		rlp		12/22/97
Embedment (minus 0 plus 1/8")		rlp		12/22/97
Angle (90 deg. ± 1deg.)		rlp		12/22/97
Floor Scarified (DIPS)		rlp		2/4/98
Proper Nut Engagement		rlp		3/11/98
Tightening 400 FT. LB		rlp		3/11/98

Torque Device Identification: UWSI #10

Open Items

Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Completed) rlp T. Meloy	Date: 3-11-98
---	---------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WCP-1/WBE 4F

Component Name: CRYO PUMP

Component S/N: S/N 01 S/N 06

Vacuum Sealing Surfaces Inspection

By: Bubba Hatten 1-28-98

Buyer: NSE JS TAW 58

Cleanliness Inspection

By: Bubba Hatten 1-28-98

Buyer: NSE JS TAW 58

O-Rings Installed

By: Bubba Hatten 1-28-98

Buyer: NSE JS TAW 58

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WCP - 1

Component Name

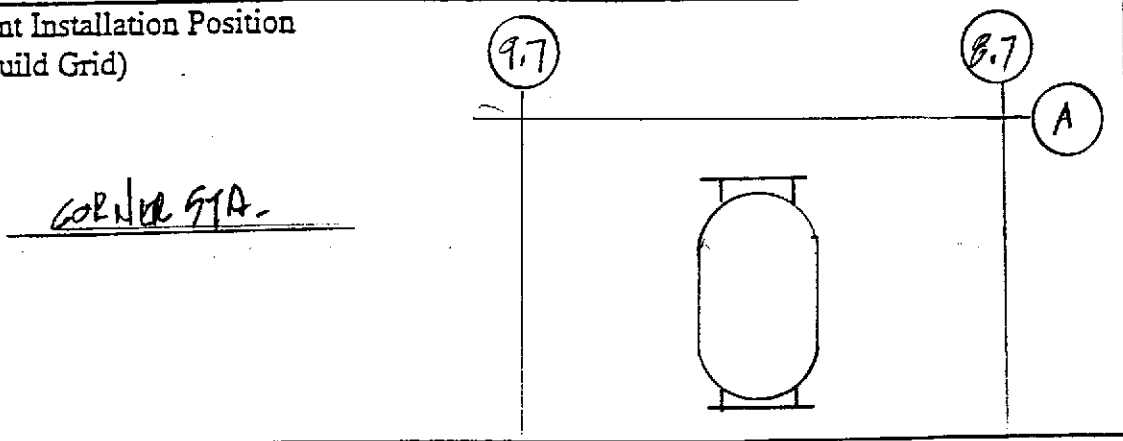
CRYO PUMP

Component S/N

S/N 01

Component Installation Weight (lb.)

Component Installation Position
(Ref. - Build Grid)



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<i>Robert J. [Signature]</i>	1-28-98
2. Component Located For Anchor Bolt Marking	<i>[Signature]</i>	1/28/98
	Buyer <i>[Signature]</i>	28 FEB 98
3. Final Component Location Complete	<i>[Signature]</i>	2/3/98
	Buyer <i>[Signature]</i>	3 FEB 98

Number
Rev.

SPECIFICATION

Number

A

V049.2-174

Rev.

1

Apollo Concrete Anchor Installation Report

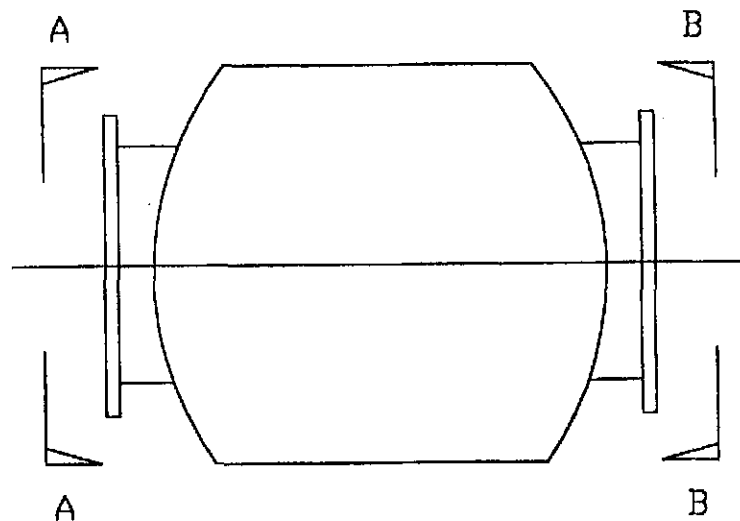
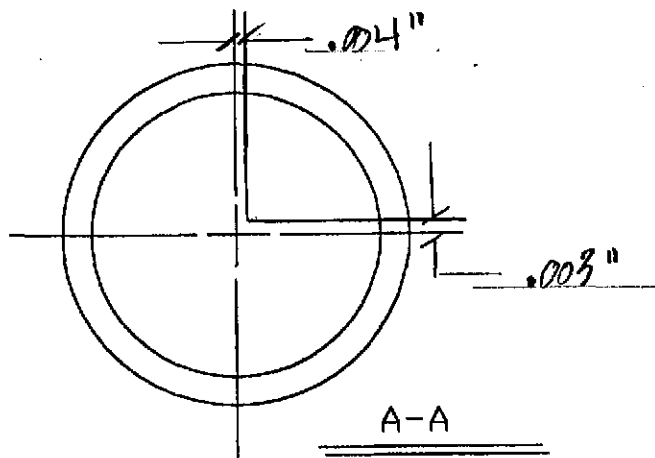
Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V045-5-001	Rev. 4	Date:	
Item Anchored: WCF-01	No. of Anchors: 16	Size: 1"	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super)		✓		2-2-98
Spacing & Location		✓		2-2-98
Anchor Size & Length 1 x 19 3/4"		✓		2-2-98
Hole Size 1 1/8"		✓		2-2-98
Hole & Core Condition (no voids, etc.)		✓		2-2-98
Embedment (minus 0 plus 1/8") 12 3/8"		✓		2-2-98
Angle (90 deg. + 1deg.)		✓		2-2-98
Floor Scarified (PINITS)		✓		2-2-98
Proper Nut Engagement		✓		3-11-98
Tightening 400 FT. LB.		✓		3-11-98
Torque Device Identification:				

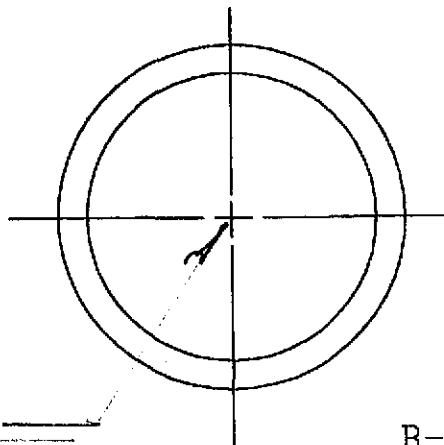
Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Completed) T. K. Meloy	Date: 3-11-98
--	---------------



LOOKING SOUTH



MATCHED TO
GATE VALVE.

Component ID: WCP-1
Serial No.: S/N-01

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: CRYO PUMP
INSTALLED POSITION

Job No.: M-126

Project: LIGO Equipment Set

Scale:
None

Dwn By:

Mercy

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WCP-2

Component Name: CRYOGENIC PUMP

Component S/N: S/N-01

Vacuum Sealing Surfaces Inspection

By: Bubba ~~Water~~ 2-10-98

Buyer: MS 10 FEB 98

Qualiness Inspection

By: Bubba ~~Water~~ 2-10-98

Buyer: MS 10 FEB 98

Tags Installed

By: Bubba ~~Water~~ 2-10-98

Buyer: MS 10 FEB 98

Comments:

Work Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WCP-2

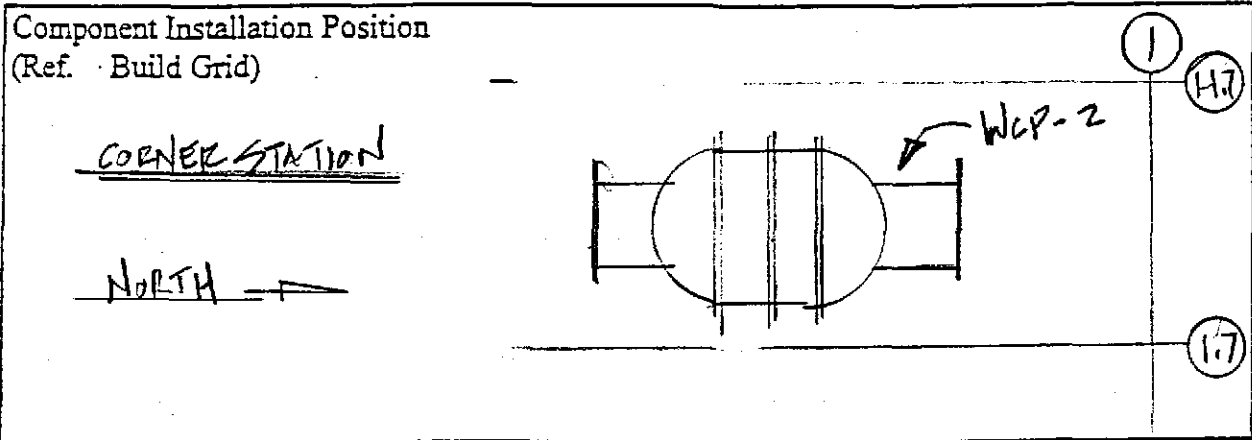
Component Name

GEYGENIC PUMP

Component S/N

S/N

Component Installation Weight (lb.)



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<i>[Signature]</i>	2-10-98
2. Component Located For Anchor Bolt Marking	<i>[Signature]</i>	2/10/98
3. Final Component Location Complete	Buyer <i>[Signature]</i>	10 FEB 98
	<i>[Signature]</i>	2/18/98
	Buyer <i>[Signature]</i>	2-19-98

* REBT 2/23/98 DUE TO DISCREPANCY WITH ROGER'S SURVEY.

SPECIFICATION

Number

A

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1

Number

Rev.

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V01A-5-001	Rev. 4	Date: 2/10/98	
Item Anchored: WCP-2	No. of Anchors 16	Size: 1"	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super) (ALL)		nm		2/17/98
Spacing & Location		nm		2/17/98
Anchor Size & Length $\approx 19 \frac{3}{4}$		nm		2/17/98
Hole Size 1 1/8		nm		2/17/98
Hole & Core Condition (no voids, etc.)		nm		2/17/98
Embedment (minus 0 plus 1/8") 12 3/8"		nm		2/17/98
Angle (90 deg. + 1 deg.)		nm		2/17/98
Floor Scarified (DIVITS)		* nm		3/11/98
Proper Nut Engagement		nm		4/11/98
Tightening 400 FT. Lb.		nm		4/1/98

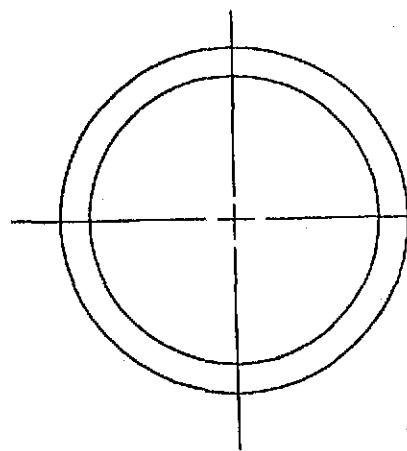
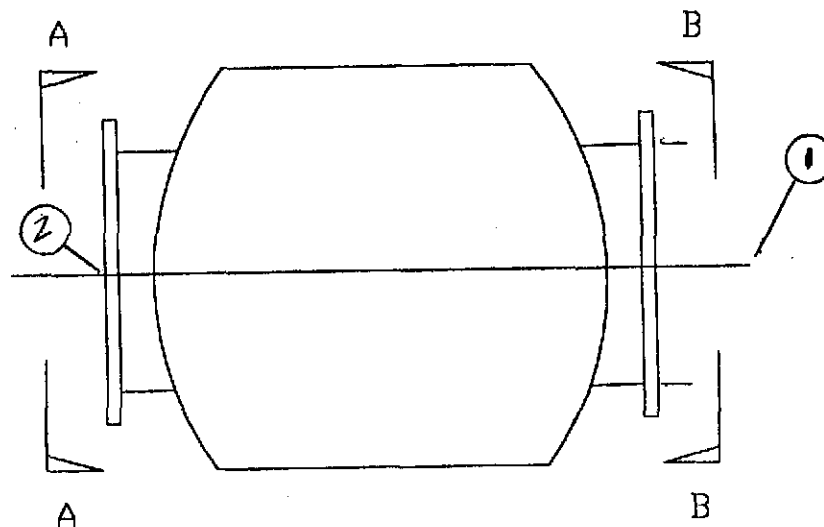
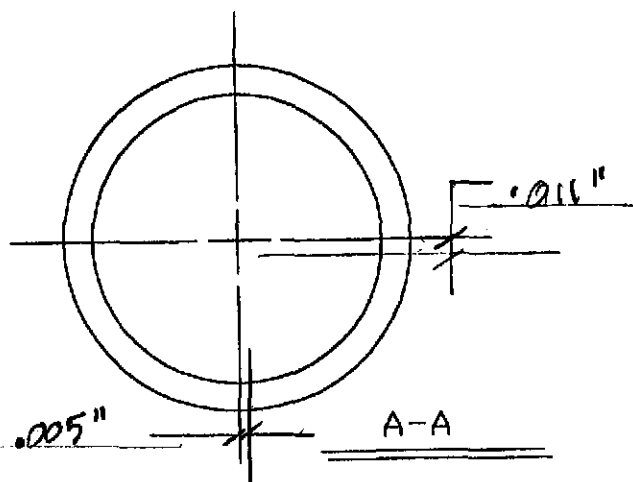
Torque Device Identification: UNSE # 10

Open Items				
Item No.	Description	Corrective Action	Accept	Date
1	DIVITS NEEDED @ NORTH PADS	INSTALL	* nm	3/11/98

Comments:

* BASED ON INFORMATION PROVIDED BY CRAFT PERSONNEL

Inspection by: (Complete) nm T. M. J. / J. J.	Date: 4/1/98
---	--------------



THIS END
MATED TO
GATE VALVE
WGV-B

LFG WEST

AT WGV-B

	①	②	△
MODEL	.050	.200	.150"
SHOT	.050	.203	.161"

B-B

Component ID:

WCP-2

Serial No.:

S/N-01

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: CRYO PUMP
INSTALLED POSITION

Job No. M-126

Project: LIGO Equipment Set

Scale:
None

Dwn By: *W. M. M. M. M.*

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: HHAM 1
Component Name: HORIZONTAL ACCESS MODULE
Component S/N: S/N 01

Vacuum Sealing Surfaces Inspection

By: (AFM) Bubba Kater 1-7-98
Buyer: (PSI) WSE 7 JAN 98

Cleanliness Inspection

By: Bubba Kater 1-7-98
Buyer: WSE 7 JAN 98

Rings Installed

By: Bubba Kater 1-7-98
Buyer: WSE 7 JAN 98

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WHAM - 1

Component Name

HORIZONTAL ACCESS MODULE

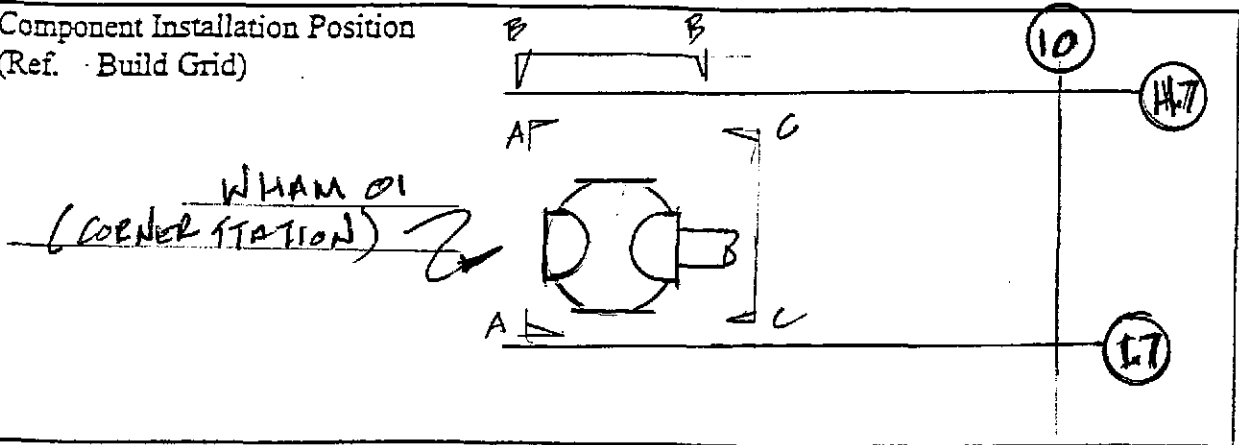
Component S/N

5/A-01

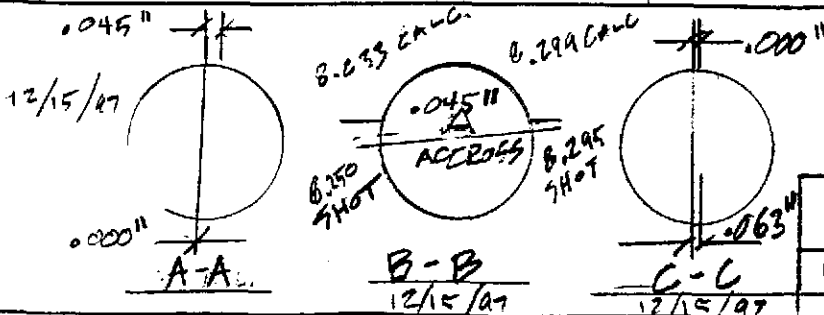
Component Installation Weight (lb.)

9,000 LB

Component Installation Position
(Ref. Build Grid)

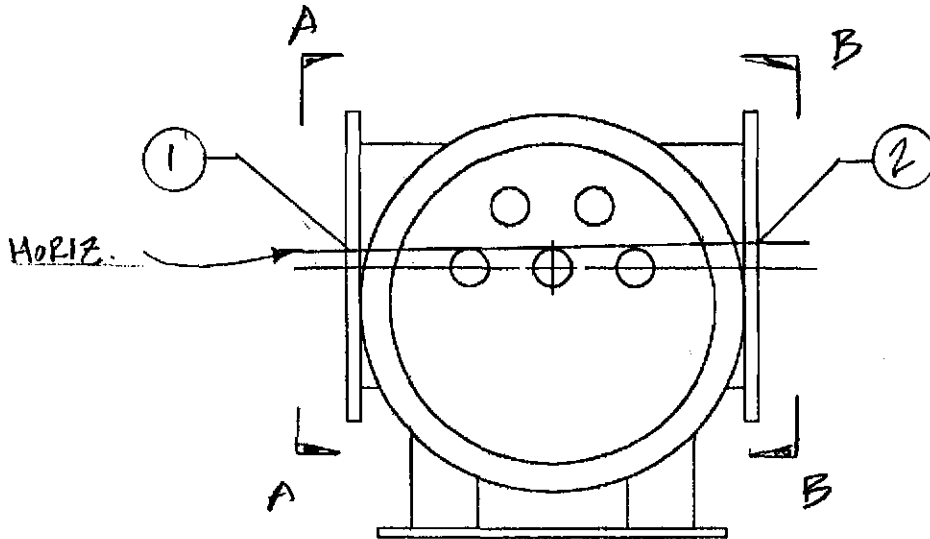
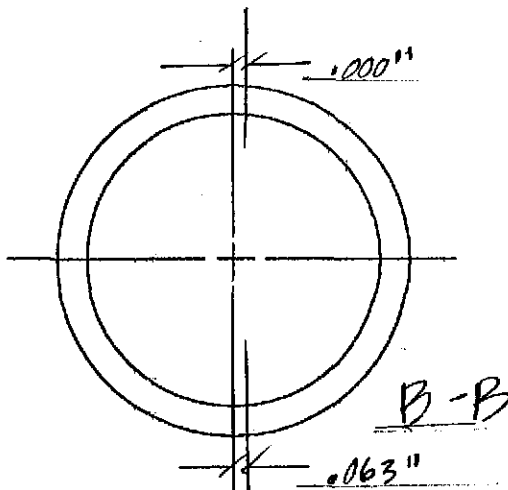
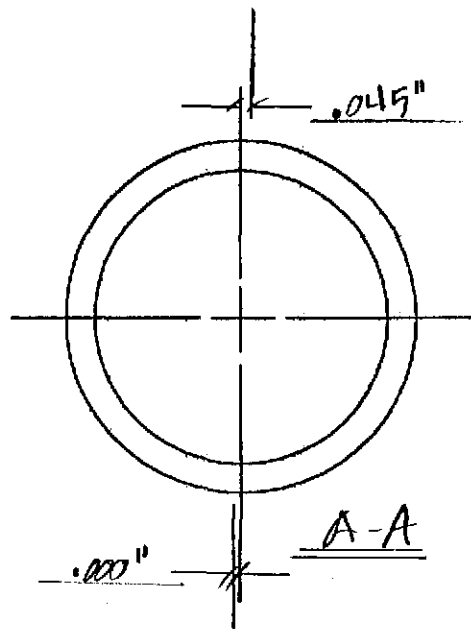


Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	Bill Wigg	11-21-97
2. Component Located For Anchor Bolt Marking	John T. Melny	11-21-97
	Buyer: NSE	21 NOV 97
3. Final Component Location Complete	John T. Melny	12-15-97
	Buyer: NSE	15 DEC 97



SPECIFICATION	
Number	Rev.
A	1
V040-2-174	

Number
Rev.



HAM-1	(1)	(2)	△
MODEL	3.4070	3.4763	.067"
SHOT	3.255	3.295	.045
(SLOPE)			.022"

Component ID: WHAM-1
 Serial No.: S/N-01

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: HORIZ ACCESS MODULE INSTALLED POSITION	Job No.: M-126	
Project: LIGO Equipment Set	Scale: None	Dwn By: MELoy

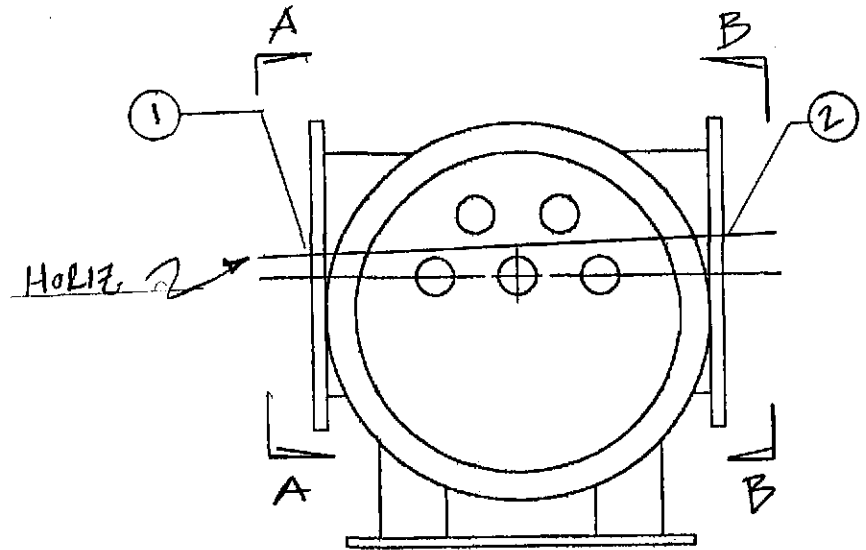
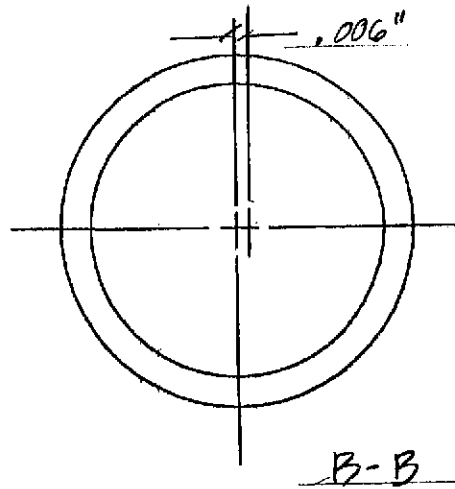
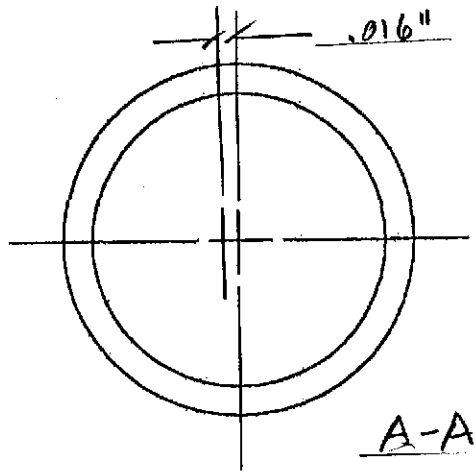
Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126		
Drawing: 11-049-15-001	Rev. 4	Date: 11/21/97		
Item Anchored: WHAM.01	No. of Anchors 24	Size: 1"	Type: HVA	
Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super)		BWS		11/25/97
Spacing & Location		BWS		11/21/97
Anchor Size & Length		BWS		11/25/97
Hole Size		BWS		11/25/97
Hole & Core Condition (no voids, etc.)		BWS		11/25/97
Embedment (minus 0 plus 1/8")		BWS		11/25/97
Angle (90 deg. ± 1deg.)		BWS		11/25/97
Floor Scarified (roughen)		BWS		11/25/97
Proper Nut Engagement		BWS		3/11/98
Tightening 250 FT LB		BWS		3/12/98
Torque Device Identification: AP-9				

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Complete) <i>Shirley M. Long</i>	Date: 3/11/98
--	---------------



HAM-2	①	②	Δ
MODEL	3.748	3.812	.064 ✓
SHOT	6.984	6.903	.081 ✓

Δ 9.017" ✓

Component ID: WHAM-2
 Serial No: S/N-03

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: **HORIZ ACCESS MODULE
 INSTALLED POSITION**

Job No: **M-126**

Project: **LIGO Equipment Set**

Scale: **None**

Dwn By: **MELOY**

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126
Drawing: <i>VOLA-5-001</i>	Rev. <i>4</i>	Date: <i>12/2/97</i>
Item Anchored: <i>WHAM 2</i>	No. of Anchors <i>24</i>	Size: <i>1"</i> Type: <i>HVA</i>

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super)		<i>BW</i>		<i>11/26/97</i>
Spacing & Location		<i>BW</i>		<i>11/26/97</i>
Anchor Size & Length		<i>BW</i>		<i>11/26/97</i>
Hole Size		<i>BW</i>		<i>11/26/97</i>
Hole & Core Condition (no voids, etc.)		<i>BW</i>		<i>11/26/97</i>
Embedment (minus 0 plus 1/8")		<i>BW</i>		<i>11/26/97</i>
Angle (90 deg. ± 1deg.)		<i>BW</i>		<i>11/26/97</i>
Floor Scarified (<i>Roughen</i>)		<i>BW</i>		<i>11/26/97</i>
Proper Nut Engagement		<i>nlp</i>		<i>3/11/98</i>
Tightening <i>250 FT. LB.</i>		<i>nlp</i>		<i>3/11/98</i>

Torque Device Identification: *AP-9*

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments: *T.B.M. 10.727" MEAN ELEV. 6.790"*
SOUTH FLANGE ELEV. CALC. 6.976"
NORTH " " : CALC 6.913"

Inspection by: <i>(complete) abt T. Melan</i>	Date: <i>3-11-98</i>
---	----------------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WHAM 3
Component Name: HORIZONTAL ACCESS MODULE
Component S/N: S/N 04

Vacuum Sealing Surfaces Inspection

By: Bubba ~~Water~~ 1-8-98
Buyer: DWE STAUS

Cleanliness Inspection

By: Bubba ~~Water~~ 1-8-98
Buyer: DWE STAUS

-Rings Installed

By: Bubba ~~Water~~ 1-8-98
Buyer: DWE STAUS

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WHAM 3

Component Name

HORIZONTAL ACCESS MODULE

Component S/N

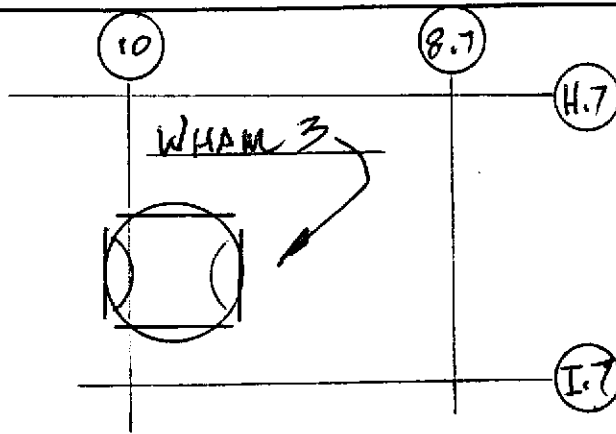
S/N 04

Component Installation Weight (lb.)

9,000 LB.

Component Installation Position
(Ref. Build Grid)

CORNER STATION



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<u>[Signature]</u>	<u>12-3-97</u>
2. Component Located For Anchor Bolt Marking	<u>[Signature]</u>	<u>12-3-97</u>
	Buyer <u>[Signature]</u>	<u>3 DEC 97</u>
3. Final Component Location Complete	<u>[Signature]</u>	<u>1/6/98</u>
	Buyer <u>[Signature]</u>	<u>3 DEC 97</u>

SPECIFICATION

Number

A

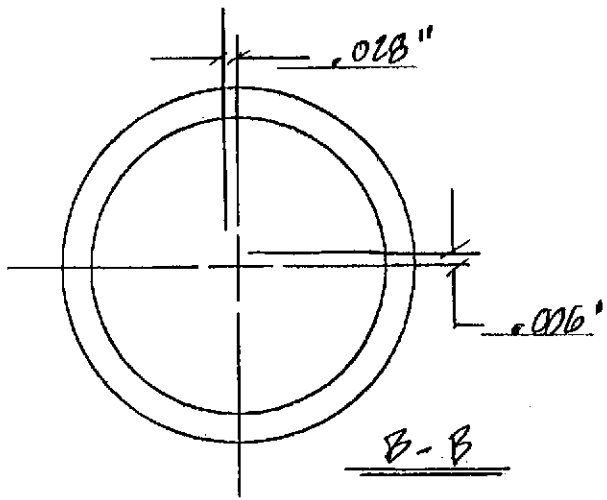
V040-2-174

Rev.

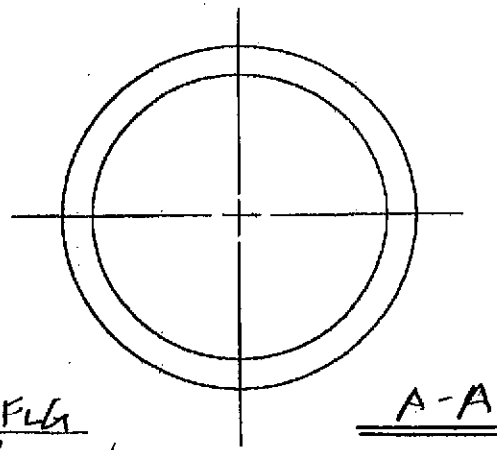
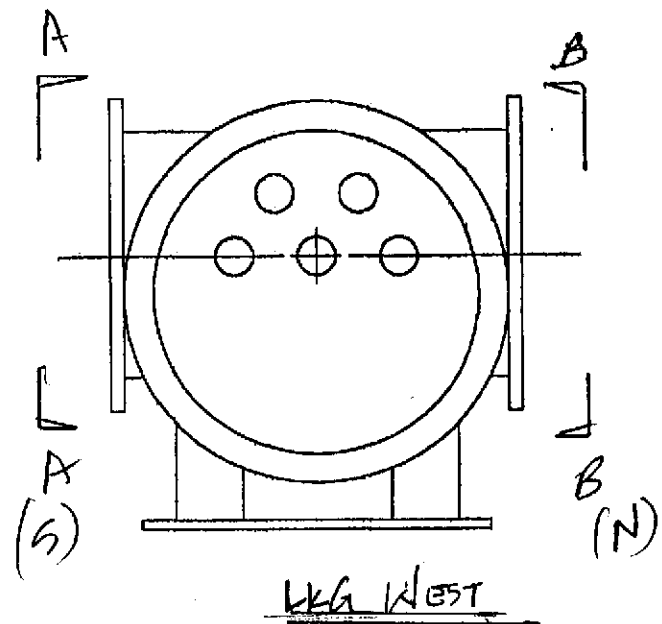
1

Number

Rev.



LKG 5.



A-A

THIS FLG
MATCH SET TO
S. FLG HAM. 4.

Component ID: WHAM-3
 Serial No.: 9/N-04

<h1>Apollo</h1> <p>1207 W. Columbia Dr. Kennewick, Wa 99336</p>	Title: HORIZ ACCESS MODULE INSTALLED POSITION	Job No.: M-126	
	Project: LIGO Equipment Set	Scale: None	Dwn By: <i>Meloy</i>

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V049-5-001	Rev. 4	Date: 12/2/97	
Item Anchored: WHAM 3	No. of Anchors: 24	Size: 1"	Type: HVA
Attribute	a. Installer	b. Accepted	c. N/A
Anchor Type (HAS Std or Super)		ahw	12/8/97
Spacing & Location		ahw	12/5/97
Anchor Size & Length		ahw	12/5/97
Hole Size		ahw	12/5/97
Hole & Core Condition (no voids, etc.)		ahw	12/5/97
Embedment (minus 0 plus 1/8")		ahw	12/8/97
Angle (90 deg. ± 1deg.)		ahw	12/8/97
Floor Scarified (Roughen)		ahw	12/12/97
Proper Nut Engagement		ahw	3/11/98
Tightening 250 FT-LB.		ahw	3/11/98
Torque Device Identification: AP-9			

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Complete) ahw	Date: 3/11/98
-------------------------------	---------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WHAM 4

Component Name: HORIZONTAL ACCESS MODULE

Component S/N: 5/2 05

Vacuum Sealing Surfaces Inspection

By: Bubler [Signature] 1-12-98

Buyer: NUS 12 JAN 98

Cleanliness Inspection

By: [Signature] 1-12-98

Buyer: NUS 12 JAN 98

-Rings Installed

By: Bubler [Signature] 1-12-98

Buyer: NUS 12 JAN 98

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

14HAM-4

Component Name

HORIZONTAL ACCESS MODULE

Component S/N

9/1 05

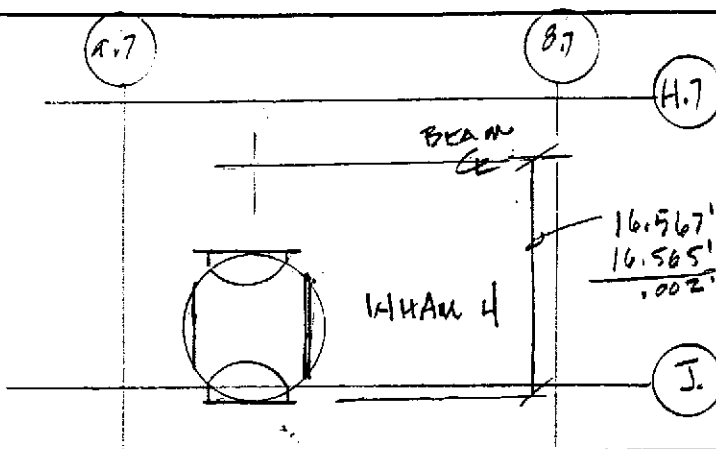
Component Installation Weight (lb.)

9,000 LB

Component Installation Position
(Ref. Build Grid)

CORNER 91A.

NOE. →



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<i>Bubba [Signature]</i>	12-16-97
2. Component Located For Anchor Bolt Marking	<i>[Signature]</i>	12/16/97
	Buyer <i>[Signature]</i>	16 DEC 97
3. Final Component Location Complete	<i>[Signature]</i>	12/30/97
	Buyer <i>[Signature]</i>	30 DEC 97

Number

Rev.

SPECIFICATION

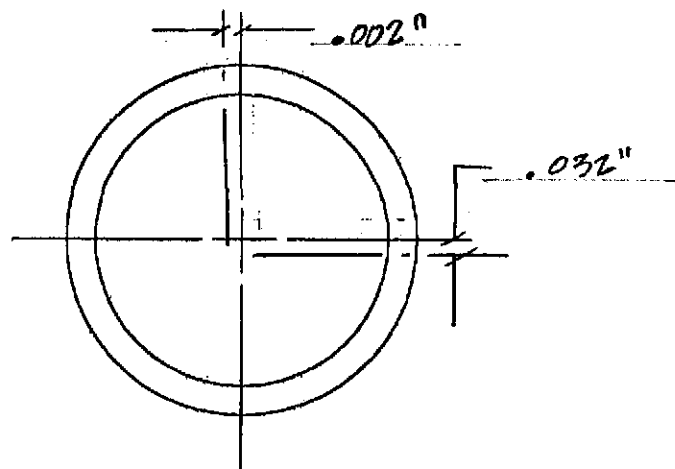
Number

A

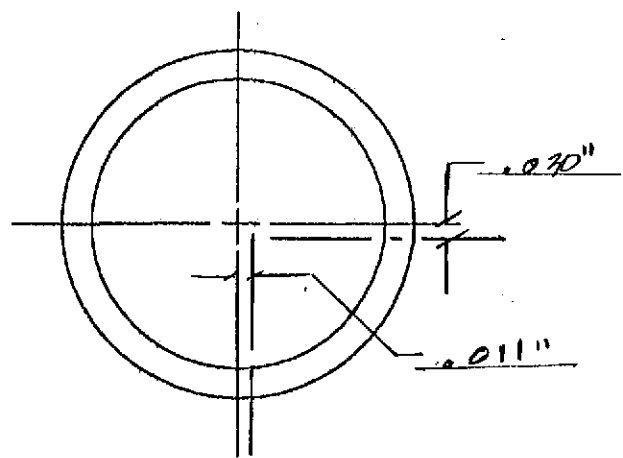
V049-2-173

Rev.

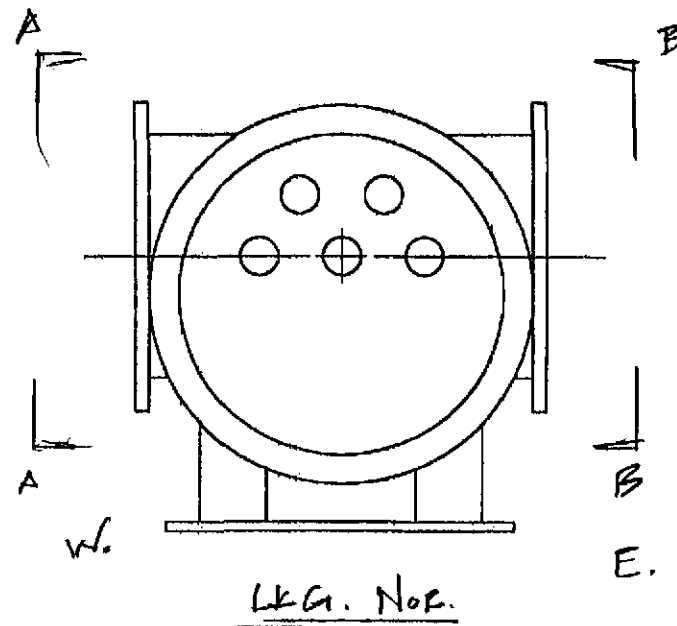
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A-A (W)
(CLKG EAST)



B-B (E)
(CLKG WEST)



Component ID: HAM 4

Serial No.: 9/1 05

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: **HORIZ ACCESS MODULE
INSTALLED POSITION**

Job No.: **M-126**

Project: **LIGD Equipment Set**

Scale: **None**

Dwn By: **Meloy**

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: <i>V019-5-001</i>	Rev. <i>A</i>	Date: <i>12/16/97</i>	
Item Anchored: <i>HAM 4</i>	No. of Anchors <i>24 *</i>	Size: <i>1"</i>	Type: <i>HVA</i>

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super)		<i>albm</i>		<i>12/17/97</i>
Spacing & Location		<i>albm</i>		<i>12/17/97</i>
Anchor Size & Length		<i>albm</i>		<i>12/17/97</i>
Hole Size		<i>albm</i>		<i>12/17/97</i>
Hole & Core Condition (no voids, etc.)		<i>albm</i>		<i>12/17/97</i>
Embedment (minus 0 plus 1/8")		<i>albm</i>		<i>12/17/97</i>
Angle (90 deg. + 1deg.)		<i>albm</i>		<i>12/17/97</i>
Floor Scarified (<i>Roughen</i>)		<i>albm</i>		<i>12/22/97</i>
Proper Nut Engagement		<i>albm</i>		<i>4-1-98</i>
Tightening <i>250 FT LB</i>	<i>**</i>	<i>albm</i>		<i>4-1-98</i>
Torque Device Identification: <i>AP-9</i>				

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

** 8 ANCHORS PREVIOUSLY INSTALLED*

REFERENCE NUC-01

*** - TORQUE VALUES WITNESSED BY DAVE EVERS PSI AT EARLIER DATE; RANDOM CHECKS DONE 4-1-98 TO VERIFY.*

Inspection by: <i>(Complete) Whit. Meloy</i>	Date: <i>4-1-98</i>
--	---------------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WHAM 5

Component Name: HORIZONTAL ACCESS MODULE

Component S/N: S/N 07

Vacuum Sealing Surfaces Inspection

By: Bulla ~~test~~ 1-13-98

Buyer: MS 13 JAN 98

Cleanliness Inspection

By: John T. May 1-13-98

Buyer: MS 13 JAN 98

O-Rings Installed

By: Bulla ~~test~~ 1-13-98

Buyer: MS 13 JAN 98

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WHAM 5

Component Name

HORIZONTAL ACCESS MODULE

Component S/N

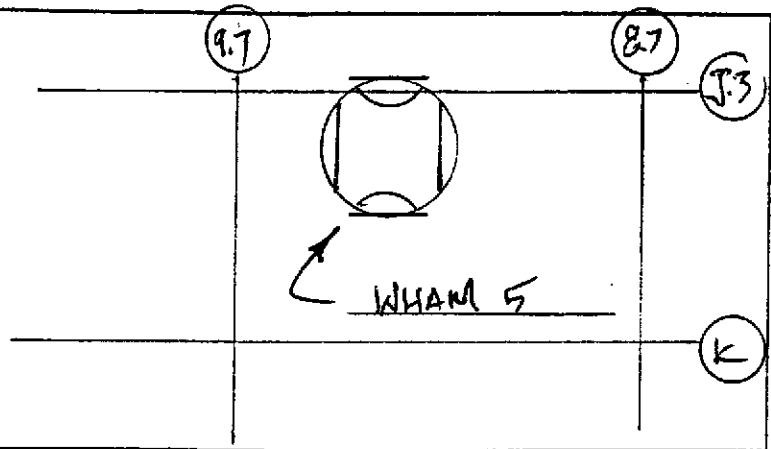
7/N 07

Component Installation Weight (lb.)

9,000 LB.

Component Installation Position
(Ref. Build Grid)

CORNER STATION.



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<u>BYG 11/97</u>	<u>12-3-97</u>
2. Component Located For Anchor Bolt Marking	<u>BYG 11/97</u>	<u>12-3-97</u>
	Buyer <u>NUSE</u>	<u>3/15/97</u>
3. Final Component Location Complete	<u>W/T M/Say</u>	<u>1/13/98</u>
	Buyer <u>NUSE</u>	<u>1/31/98</u>

SPECIFICATION

Number

A

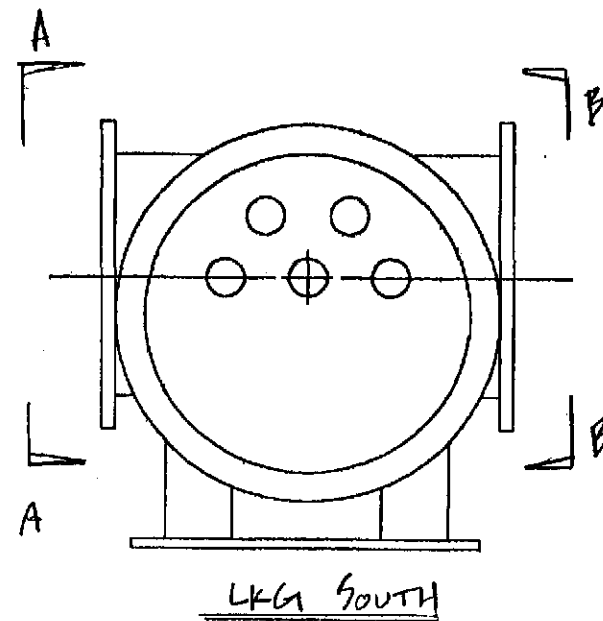
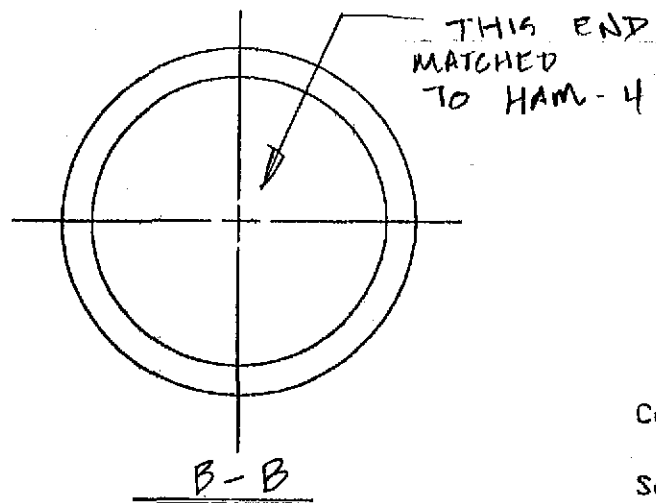
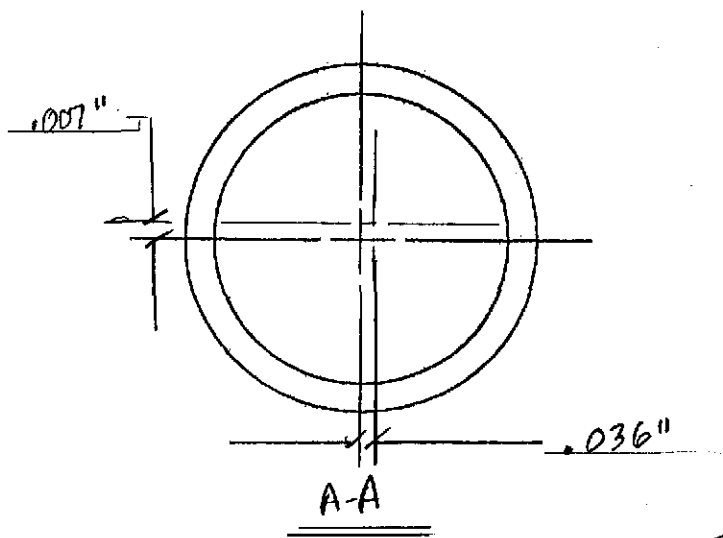
VN30-2-173

Rev.

1

Number

Rev.



Component ID: WHAM 5
 Serial No.: S/N - 07

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: **HORIZ ACCESS MODULE
 INSTALLED POSITION**

Job No.: **M-126**

Project: **LIGO Equipment Set**

Scale:
 None

Dwn By: *Meloy*

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-125
Drawing: Y049-5-001	Rev. 4	Date: 12/4/97
Item Anchored: WHAM 5	No. of Anchors 24	Size: 1" Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super)		<i>alw</i>		12-4-97
Spacing & Location		<i>alw</i>		12-4-97
Anchor Size & Length		<i>alw</i>		12-4-97
Hole Size		<i>alw</i>		12-4-97
Hole & Core Condition (no voids, etc.)		<i>alw</i>		12-4-97
Embedment (minus 0 plus 1/8")		<i>alw</i>		12-4-97
Angle (90 deg. ± 1deg.)		<i>alw</i>		12-8-97
Floor Scarified (1/8" Roughen)		<i>alw</i>		12-8-97
Proper Nut Engagement		<i>alw</i>		4-1-98
Tightening 250 FT-LB.		* <i>alw</i>		4-1-98
Torque Device Identification: AP-9				

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

* TORQUE WITNESSED BY DAVE EVERETT, PSI AT EARLIER DATE; RANDOM CHECKS DONE 4-1-98 TO VERIFY.

Inspection by: (COMPLETE) <i>W. H. Meloy</i>	Date: 4-1-98
--	--------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WHAM 6

Component Name: HORIZONTAL ACCESS MODULE

Component S/N: 5/N 02

Vacuum Sealing Surfaces Inspection

By: [Signature] 1/14/98

Buyer: [Signature] 14 JAN 98

Cleanliness Inspection

By: [Signature] 1/14/98

Buyer: [Signature] 14 JAN 98

Rings Installed

By: [Signature] 1/12/98

Buyer: [Signature] 14 JAN 98

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WHAM 6

Component Name

HORIZONTAL ACCESS MODULE

Component S/N

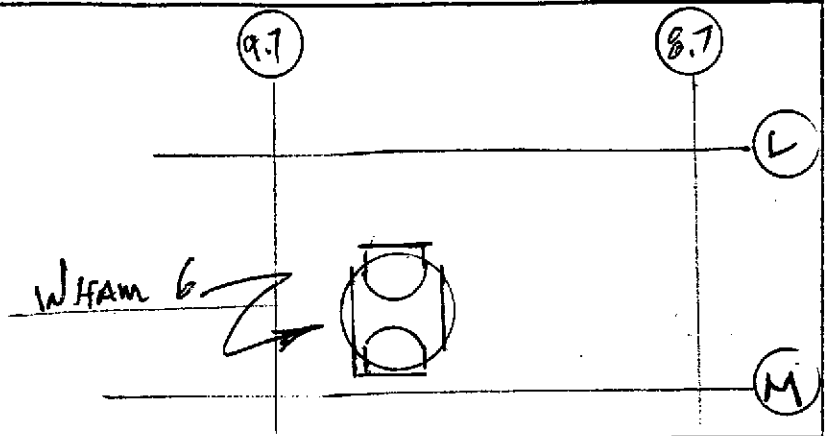
S/N 02

Component Installation Weight (lb.)

9,000 LB.

Component Installation Position
(Ref. Build Grid)

CORNER STATION



	Signoffs (Contractor Unless Otherwise Noted)	By	Date
1.	Shipping Cover Cross Hairs Verified	<i>[Signature]</i>	11-21-97
2.	Component Located For Anchor Bolt Marking	<i>[Signature]</i>	11-21-97
		Buyer	31 NOV 97
3.	Final Component Location Complete	<i>[Signature]</i>	12-2-97
		Buyer	12-2-97

SPECIFICATION

Number

A

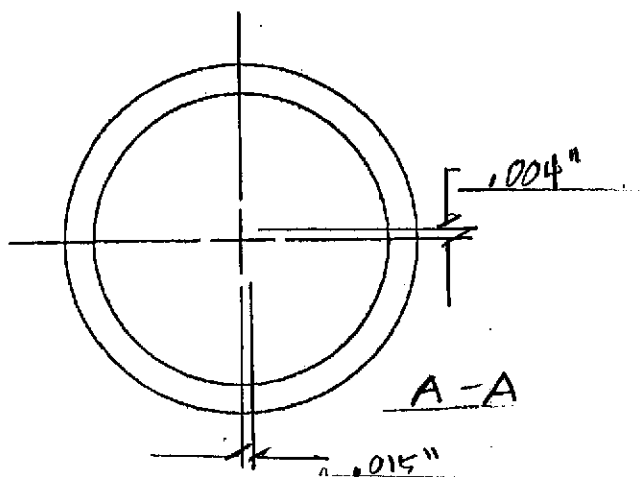
V049.2-173

Rev.

1

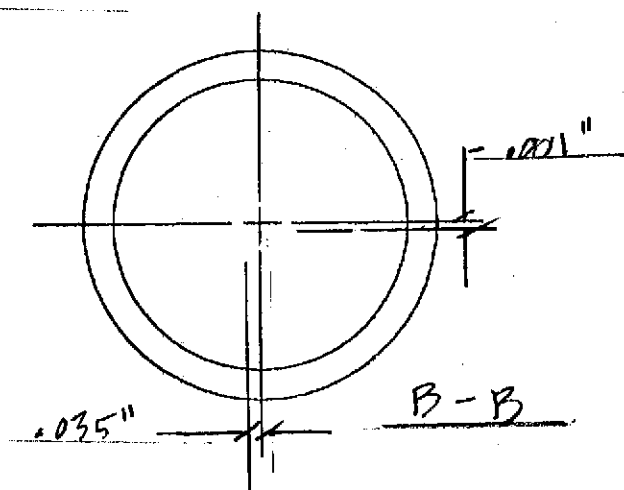
Number

Rev.



A-A

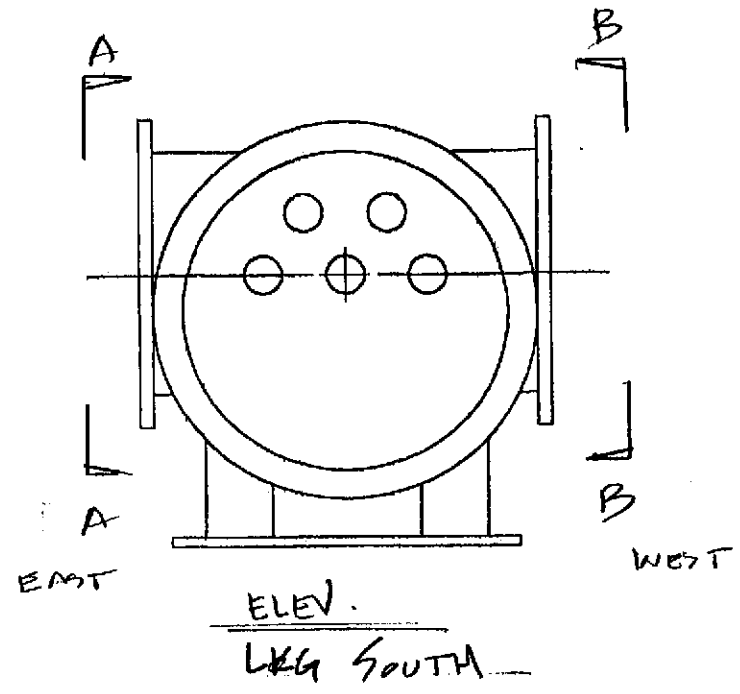
.015"



B-B

.035"

(LKG EAST)



Component ID: WHAM. 6
 Serial No.: S/A 02

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: **HORIZ ACCESS MODULE
 INSTALLED POSITION**

Job No.: **M-126**

Project: **LIGO Equipment Set**

Scale: **None**

Dwn By: **MELOY**

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V-049-5-001	Rev. 4	Date: 11/21/97	
Item Anchored: WHAM-06	No. of Anchors 24	Size: 1"	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super)		JBN		11/26/97
Spacing & Location		nlm		11/21/97
Anchor Size & Length		JBN		11/26/97
Hole Size		JBN		11/26/97
Hole & Core Condition (no voids, etc.)		JBN		11/26/97
Embedment (minus 0 plus 1/8")		JBN		11/26/97
Angle (90 deg. ± 1deg.)		JBN		11/26/97
Floor Scarified (Roughen)		JBN		11/26/97
Proper Nut Engagement		nlm		9-1-98
Tightening 250 FT. LB		nlm		4-1-98
Torque Device Identification: AP-9				

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Complete) <i>nlm</i>	Date: 4-1-98
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COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WHAM 7

Component Name:

HORIZONTAL ACCESS MODULE

Component S/N:

5/N-11

Vacuum Sealing Surfaces Inspection

By:

~~Paula Roberts~~ 2-18-98

Buyer:

~~MS~~ 18 FEB 98

Cleanliness Inspection

By:

~~Paula Roberts~~ 2-18-98

Buyer:

~~MS~~ 18 FEB 98

Rings Installed

By:

~~Paula Roberts~~ 2-18-98

Buyer:

~~MS~~ 18 FEB 98

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

W/HAM 7

Component Name

HORIZONTAL ACCESS MODULE

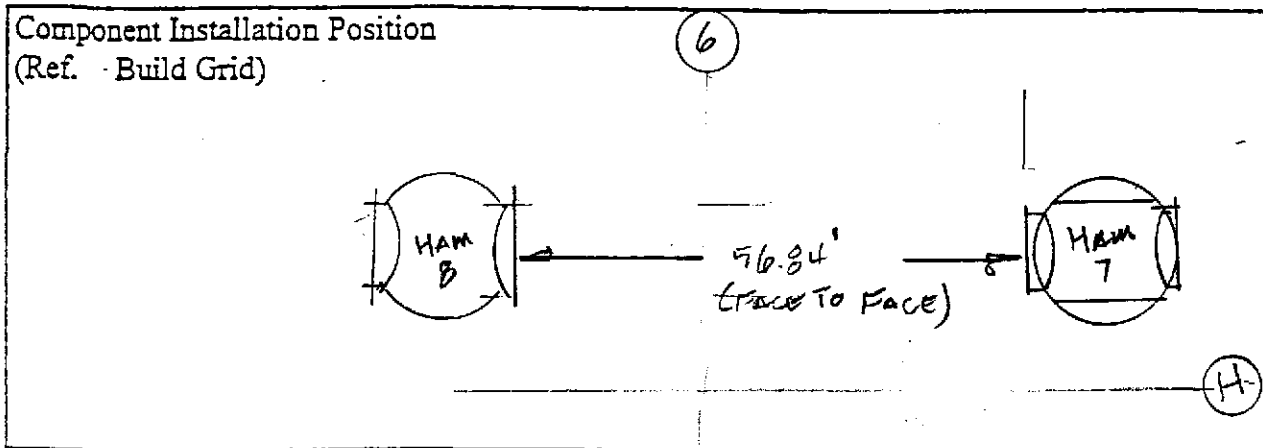
Component S/N

S/N 11

Component Installation Weight (lb.)

9,000 lb.

Component Installation Position
(Ref. - Build Grid)



	Signoffs (Contractor Unless Otherwise Noted)	By	Date
1.	Shipping Cover Cross Hairs Verified	<i>Robert Halpern</i>	12-30-97
2.	Component Located For Anchor Bolt Marking	<i>John T. Maloy</i>	12/30/97
		<i>NSE</i>	30 DEC 97
3.	Final Component Location Complete	<i>John T. Maloy</i>	4/17/98
		<i>SM</i>	2/17/98

Number
Rev.

SPECIFICATION

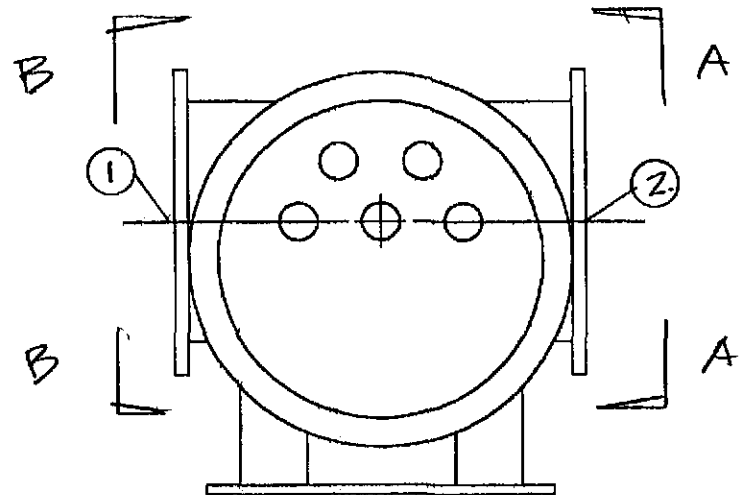
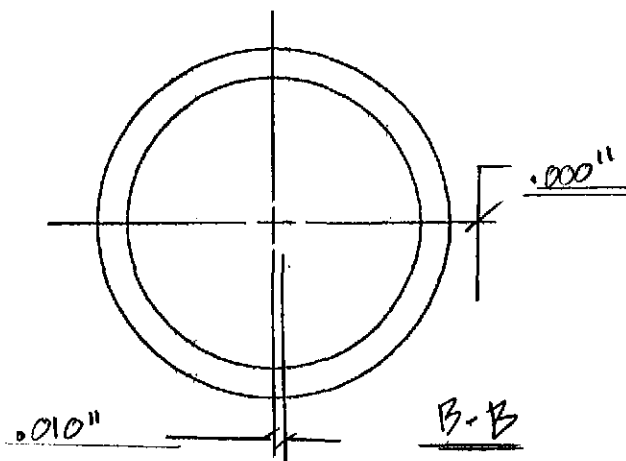
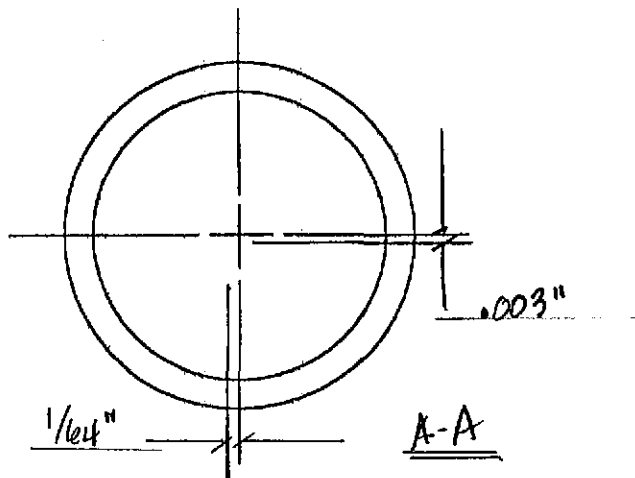
Number

A

V049-2-173

Rev.

1



Component ID: WHAM 7
Serial No.: S/N 11

	①	②	△	
MODEL	3.505	3.56A	.064	✓
SHOT	3.505	3.56B	.063	✓

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: **HORIZ ACCESS MODULE
INSTALLED POSITION**

Job No.: **M-126**

Project: **LIGO Equipment Set**

Scale:
None

Dwn By:
Melroy

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: <i>Y04A-5-001</i>	Rev. <i>4</i>	Date: <i>12/31/97</i>	
Item Anchored: <i>HAM 7</i>	No. of Anchors <i>24</i>	Size: <i>1"</i>	Type: <i>HVA</i>

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS <u>Std</u> or Super)		<i>ahp</i>		<i>1/5/98</i>
Spacing & Location		<i>ahp</i>		<i>1/5/98</i>
Anchor Size & Length		<i>ahp</i>		<i>1/5/98</i>
Hole Size		<i>ahp</i>		<i>1/5/98</i>
Hole & Core Condition (no voids, etc.)		<i>ahp</i>		<i>1/5/98</i>
Embedment (minus 0 plus 1/8")		<i>ahp</i>		<i>1/5/98</i>
Angle (90 deg. ± 1deg.)		<i>ahp</i>		<i>1/5/98</i>
Floor Scarified (<i>Roughen</i>)		<i>ahp</i>		<i>2/17/98</i>
Proper Nut Engagement		<i>ahp</i>		<i>4-1-98</i>
Tightening <i>250 FT LB</i>		<i>ahp</i>		<i>4-1-98</i>

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: <i>(Complete) Alan J. McElroy</i>	Date: <i>4-1-98</i>
--	---------------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WHAM-8
Component Name: HORIZONTAL ACCESS MODULE
Component S/N: S/N. 06

Vacuum Sealing Surfaces Inspection

By: Bebler ~~John~~ 2-18-98
Buyer: DWE 18 FEB 98

Cleanliness Inspection

By: Bebler ~~John~~ 2-18-98
Buyer: DWE 18 FEB 98

Rings Installed

By: Bebler ~~John~~ 2-18-98
Buyer: DWE 18 FEB 98

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WHAM B

Component Name

HORIZONTAL ACCESS MODULE

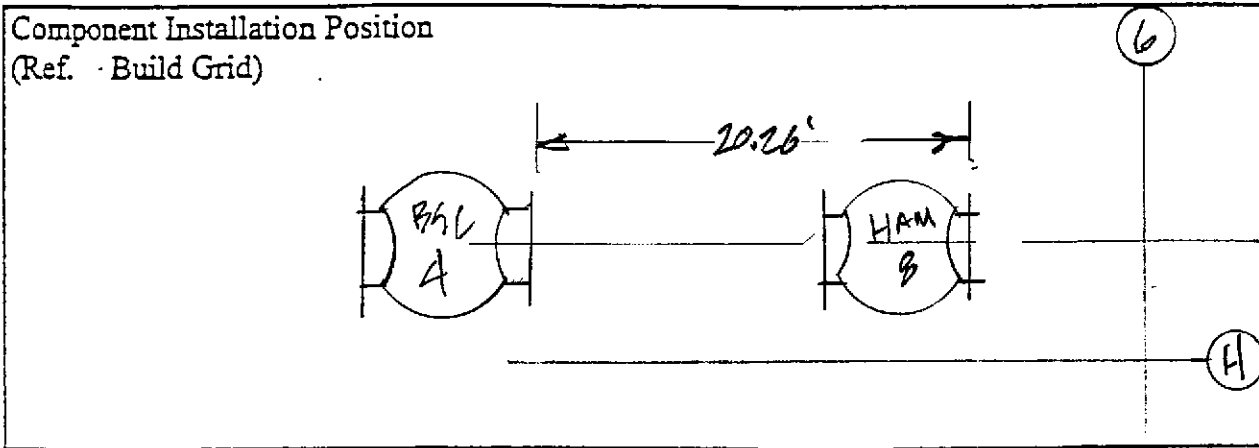
Component S/N

S/N 06

Component Installation Weight (lb.)

9,000 lb.

Component Installation Position
(Ref. Build Grid)



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<i>Bella Tolson</i>	12-31-97
2. Component Located For Anchor Bolt Marking	<i>[Signature]</i>	12/31/97
	Buyer <i>NOE</i>	31 DEC 97
3. Final Component Location Complete	<i>[Signature]</i>	2/18/98
	Buyer <i>[Signature]</i>	2-18-98

Number

Rev.

SPECIFICATION

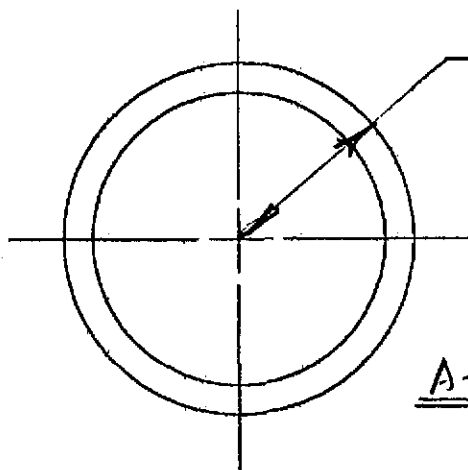
Number

A

V049-2-174

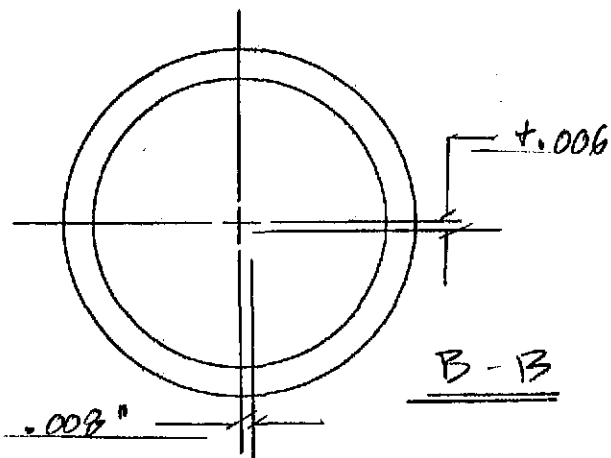
Rev.

1

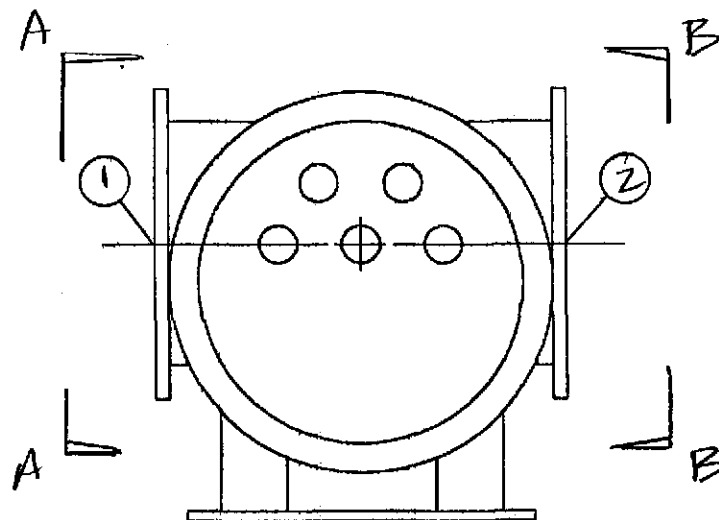


A-A

MATCH MATED
TO NORTH FLG.
HAM-9



B-B



LKG WEST

	(1)	(2)	Δ
SHAFT	3.166	3.223	.057
MODEL	3.169	3.232	.063

.003 ✓ .009 ✓ .006 ✓

Component ID:

WHAM-8

Serial No.:

S/A 06

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: **HORIZ ACCESS MODULE
INSTALLED POSITION**

Job No.: **M-126**

Project: **LIGO Equipment Set**

Scale:
None

Dwn By:
Meby

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V049-5-001	Rev. 4	Date: 12/31/97	
Item Anchored: WHAM 8	No. of Anchors 24	Size: 1	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super)		a.hg		1/6/98
Spacing & Location		a.hg		1/6/98
Anchor Size & Length		a.hg		1/6/98
Hole Size		a.hg		1/6/98
Hole & Core Condition (no voids, etc.)		a.hg		1/6/98
Embedment (minus 0 plus 1/8")		a.hg		1/6/98
Angle (90 deg. ± 1deg.)		a.hg		1/6/98
Floor Scarified (Roughen)		a.hg		2/17/98
Proper Nut Engagement		a.hg		4-1-98
Tightening 250 FT. LB		a.hg		4-1-98

Torque Device Identification: AP-9

Open Items

Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Complete) <i>John T. Meloy</i>	Date: 4-1-98
--	--------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WHAM 09

Component Name: HORIZ. ACCESS MODULE

Component S/N: 9/N-08

Vacuum Sealing Surfaces Inspection

By: Bubler [Signature] 2-18-98

Buyer: [Signature] 18 FEB 98

Cleanliness Inspection

By: Bubler [Signature] 2-18-98

Buyer: [Signature] 18 FEB 98

O-Rings Installed

By: Bubler [Signature] 2-18-98

Buyer: [Signature] 18 FEB 98

Comments:

Rework Required:

Apollo Concrete Anchor Installation Report

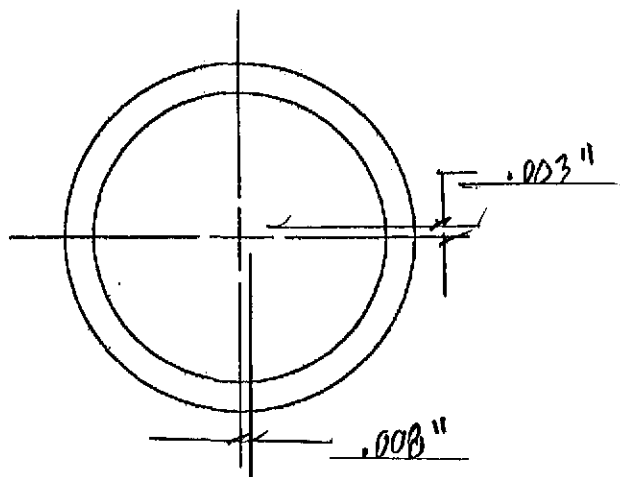
Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V049-5-001	Rev. 5	Date: 2-9-98	
Item Anchored: W/HAM-09	No. of Anchors: 24	Size: 1"	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS <u>Std</u> or Super)		<i>abm</i>		2/12/98
Spacing & Location		<i>abm</i>		2/12/98
Anchor Size & Length 1 x 15 5/8"		<i>abm</i>		2/12/98
Hole Size 1 1/8"		<i>abm</i>		2/12/98
Hole & Core Condition (no voids, etc.)		<i>abm</i>		2/12/98
Embedment (minus 0 plus 1/8") 8 1/4"		<i>abm</i>		2/12/98
Angle (90 deg. ± 1deg.)		<i>abm</i>		2/12/98
Floor Scarified (ROUGHEN)		<i>abm</i>		2/17/98
Proper Nut Engagement		<i>abm</i>		4-1-98
Tightening 250 FT/LB		<i>abm</i>		4-1-98

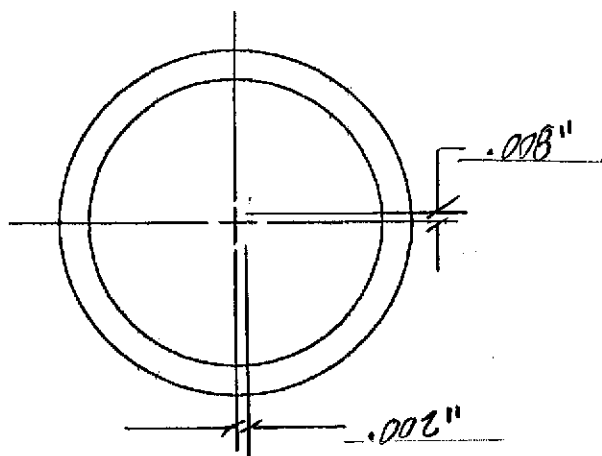
Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

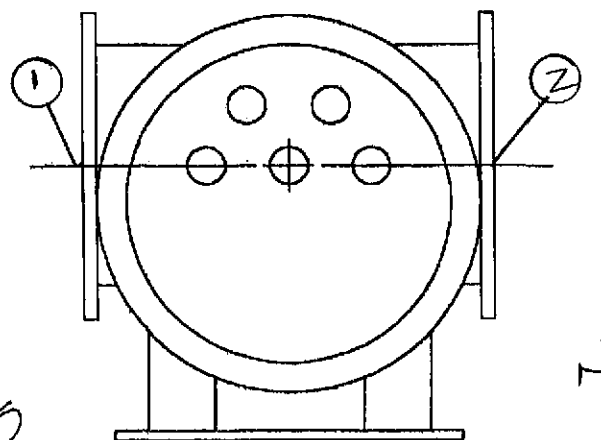
Inspection by: (Completed) <i>John T. McLaughlin</i>	Date: 4-1-98
--	--------------



LKG NOR.



LKG SOUTH



LKG WEST

	①	②	Δ
MODEL	.352	.288	.064
SHOT	.003	.069	.066

Component ID: WHAM-09
 Serial No.: S/N-08

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: **HORIZ ACCESS MODULE
 INSTALLED POSITION**

Job No.: **M-126**

Project: **LIGO Equipment Set**

Scale:
 None

Dwn By:
MURLOY

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WHAM-10

Component Name: HORIZONTAL ACCESS MODULE

Component S/N: S/N: 11

Vacuum Sealing Surfaces Inspection

By: Bubba [Signature] 2-12-98

Buyer: ME 12 FEB 98

Cleanliness Inspection

By: Bubba [Signature] 2-12-98

Buyer: ME 12 FEB 98

-Rings Installed

By: Bubba [Signature] 2-12-98

Buyer: ME 12 FEB 98

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WHAM-10

Component Name

HORIZONTAL ACCESS MODULE

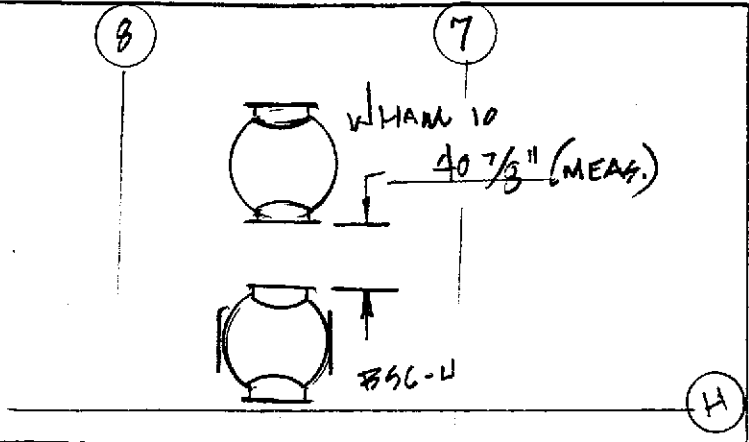
Component S/N

S/N 11

Component Installation Weight (lb.)

9,000 LB.

Component Installation Position
(Ref. - Build Grid)



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<i>Bobba Talley</i>	1-5-98
2. Component Located For Anchor Bolt Marking	<i>W. T. W. Day</i>	1/5/98
	Buyer <i>NOE</i>	5/27/98
3. Final Component Location Complete	<i>W. T. W. Day</i>	2/10/98
	Buyer <i>NOE</i>	10/23/98

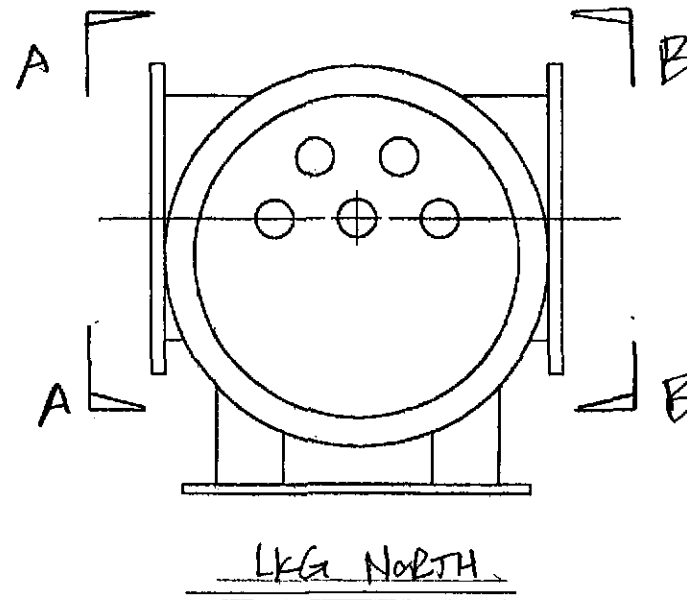
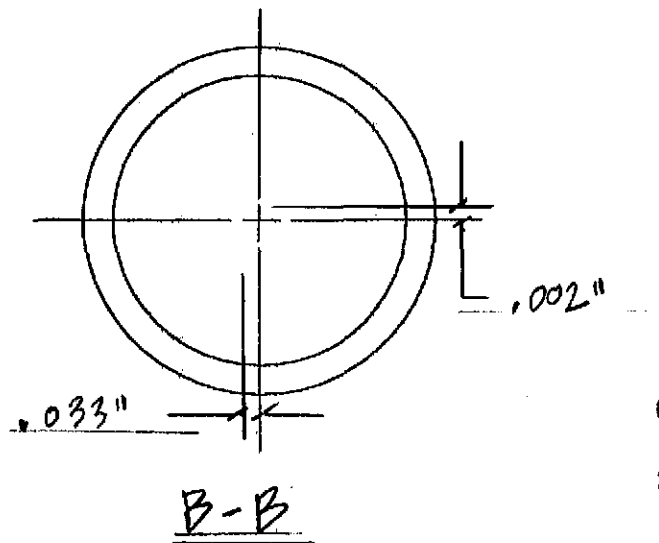
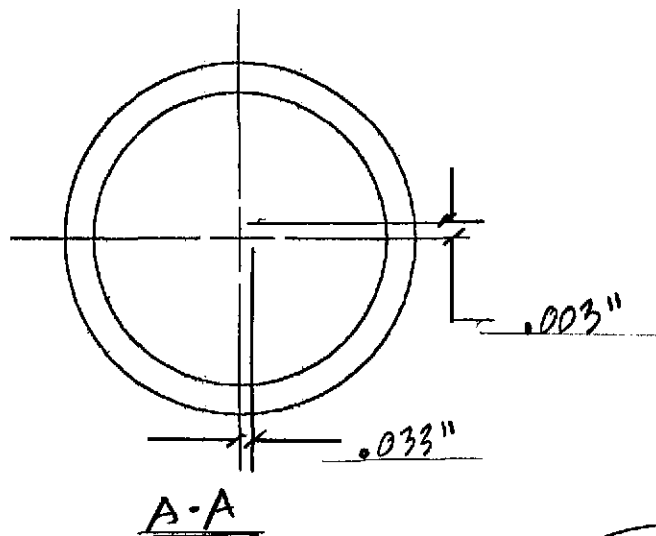
Number

Rev.

SPECIFICATION

Number	Rev.
A	1

V040-2-174



Component ID: W4AM-10
 Serial No.: 9/A. 11

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: **HORIZ ACCESS MODULE
 INSTALLED POSITION**

Job No.: **M-126**

Project: **LIGO Equipment Set**

Scale: **None**

Dwn By: *W. J. Day*

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V049-5-001	Rev. A	Date: 1/5/98	
Item Anchored: WHAM 10	No. of Anchors 2A	Size: 1"	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super)		<i>BW</i>		<i>BW 2/16/98</i>
Spacing & Location		<i>FW</i>		<i>2W 2/10/98</i>
Anchor Size & Length x 15 5/8		<i>FW</i>		<i>BW 2/10/98</i>
Hole Size 1 1/8"		<i>FW</i>		<i>BW 2/10/98</i>
Hole & Core Condition (no voids, etc.)		<i>FW</i>		<i>BW 2/10/98</i>
Embedment (minus 0 plus 1/8") 6 1/4"		<i>FW</i>		<i>BW 2/10/98</i>
Angle (90 deg. ± 1deg.)		<i>FW</i>		<i>BW 2/10/98</i>
Floor Scarified (Roughen)		<i>Whip</i>		<i>2/17/98</i>
Proper Nut Engagement		<i>Whip</i>		<i>A-1-98</i>
Tightening 250 FT. LBS		<i>Whip</i>		<i>A-1-98</i>
Torque Device Identification: AP-9				

Open Items

Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Completed) <i>Whip</i>	Date: 4-1-98
---	---------------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WHAM-11

Component Name: HORIZ. ACCESS MODULE

Component S/N: S/N-10

Vacuum Sealing Surfaces Inspection

By: ~~Bubba Hester~~ 2-11-98 (see comments)

Buyer: JMS 11 FEB 98

Cleanliness Inspection

By: ~~Bubba Hester~~ 2-11-98

Buyer: JMS 11 FEB 98

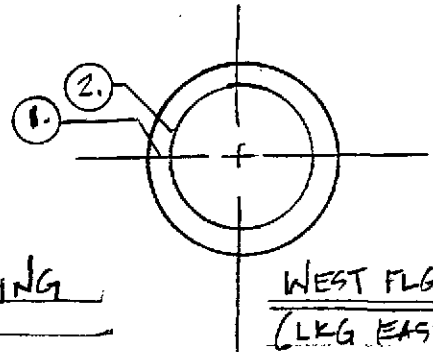
O-Rings Installed

By: ~~Bubba Hester~~ 2-11-98

Buyer: JMS 11 FEB 98

Comments:

- ① SCRATCH ACROSS SEALING SURFACE FOUND THIS LOCATION.
- ② SCRATCH FOUND THIS LOCATION DOES NOT APPEAR TO EXTEND INTO SEAL AREA.



Rework Required:

POLISHED AFFECTED AREAS ITEMS ① & ② USING STONES PROVIDED BY PSI.

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

HAM - 11

Component Name

HORIZ ACCESS MODULE

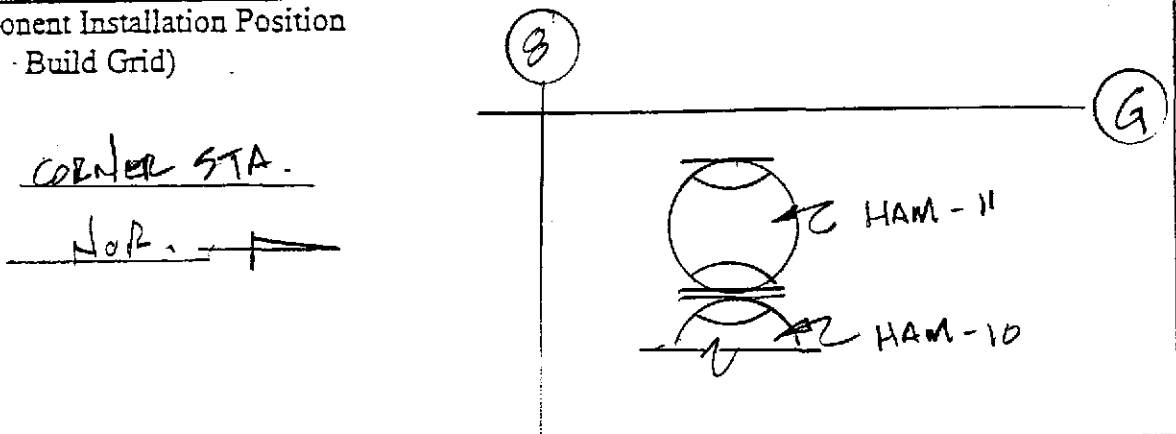
Component S/N

S/N - 10

Component Installation Weight (lb.)

9,000 LB

Component Installation Position
(Ref. Build Grid)



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<i>Paula Peters</i>	2-4-98
2. Component Located For Anchor Bolt Marking	<i>Ann S. Wilkey</i>	2-4-98
	Buyer <i>MS</i>	4 FEB 98
3. Final Component Location Complete	<i>Ann T. Wilkey</i>	2-12-98
	Buyer <i>MS</i>	12 FEB 98

Number

Rev.

SPECIFICATION

Number

A

Rev.

V0490-110

Apollo Concrete Anchor Installation Report

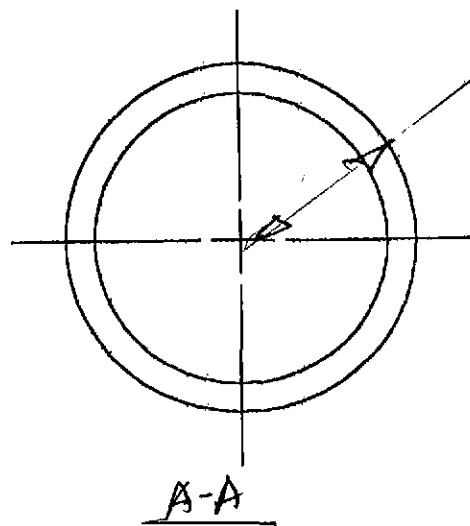
Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V049-5-001	Rev. 4	Date: 2/4/98	
Item Anchored: WHAM-11	No. of Anchors: 24	Size: 1"	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS <u>Std</u> or Super)		BW		2/9/98
Spacing & Location		BW		2/9/98
Anchor Size & Length 1" x 15 5/8"		BW		2/9/98
Hole Size 1 1/8"		BW		2/9/98
Hole & Core Condition (no voids, etc.)		BW		2/9/98 2/9/98
Embedment (minus 0 plus 1/8") 3/4"		BW		2/9/98
Angle (90 deg. + 1deg.)		BW		2/9/98
Floor Scarified (Roughen)		mp		2/12/98
Proper Nut Engagement		mp		A-1-98
Tightening 250 FT LB.		mp		A-1-98
Torque Device Identification: AP-9				

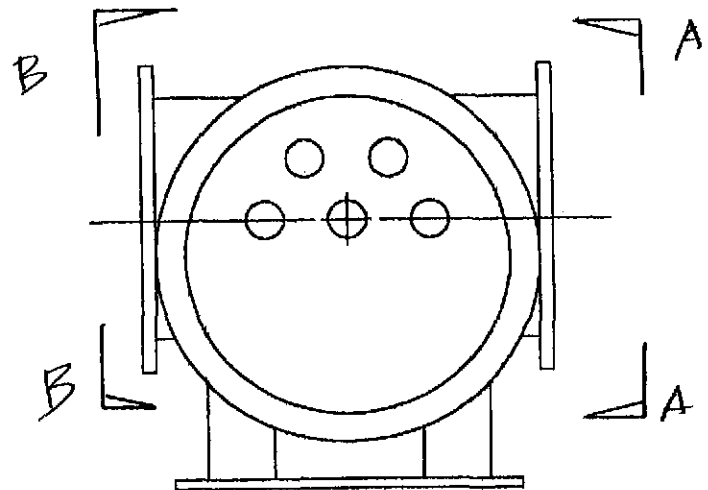
Item No.	Description	Open Items		
		Corrective Action	Accept	Date

Comments:

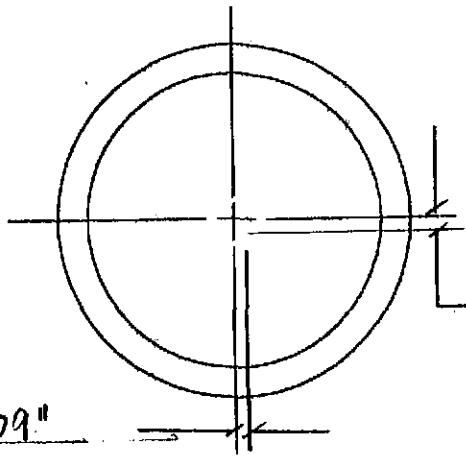
Inspection by: <i>Robert Meloy (Completed)</i>	Date: 4-1-98
--	--------------



THIS END
MATED TO
HAM-10



LGA NORTH



t.007"

.009"

Component ID: WHAM-11
Serial No.: S/N-12

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: HORIZ ACCESS MODULE INSTALLED POSITION	Job No.: M-126	
Project: LIGO Equipment Set	Scale: None	Dwn By: <i>Melay</i>

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WUAM-12

Component Name:

HORIZONTAL ACCESS MODULE

Component S/N:

S/N.12

Vacuum Sealing Surfaces Inspection

By:

Bahia J. [Signature] 2-16-98

Buyer:

MS 16 FEB 98

Cleanliness Inspection

By:

Bahia J. [Signature] 2-16-98

Buyer:

MS 16 FEB 98

O-Rings Installed

By:

Bahia J. [Signature] 2-16-98

Buyer:

MS 16 FEB 98

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WHAM-12

Component Name

HORIZONTAL ACCESS MODULE

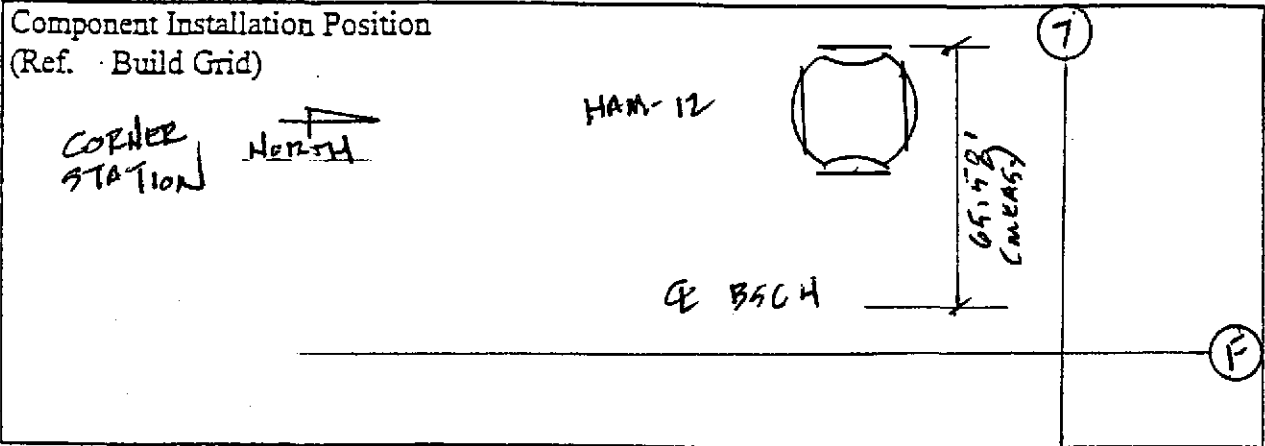
Component S/N

S/N-12

Component Installation Weight (lb.)

9,000 LB.

Component Installation Position
(Ref. Build Grid)



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<i>Beal</i>	1-6-98
2. Component Located For Anchor Bolt Marking	<i>A. T. M. / J. M.</i>	1/6/98
	Buyer <i>J. M.</i>	6/2/98
3. Final Component Location Complete	<i>A. T. M. / J. M.</i>	2/11/98
	Buyer <i>J. M.</i>	11/11/98

Number
Rev.

SPECIFICATION

Number

A

V049-2-174

Rev.

1

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V049-5-001	Rev. 4	Date: 1/7/98	
Item Anchored: WHAM-12	No. of Anchors: 24	Size: 1"	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS <u>Std</u> or Super)		alw		1/7/98
Spacing & Location		alw		1/7/98
Anchor Size & Length <i>See Comments</i>		alw		1/7/98
Hole Size 1 1/8"		alw		1/7/98
Hole & Core Condition (no voids, etc.)		alw		1/7/98
Embedment (minus 0 plus 1/8") <i>see comments</i>		alw		1/7/98
Angle (90 deg. + 1deg.)		alw		1/7/98
Floor Scarified <i>(roughen)</i>		alw		1/12/98
Proper Nut Engagement		alw		3/12/98
Tightening 250 FT LB		alw		3/12/98

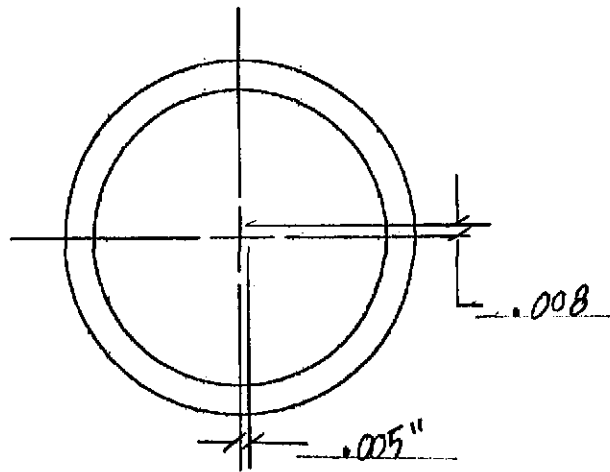
Torque Device Identification: AP-9

Open Items				
Item No.	Description	Corrective Action	Accept	Date

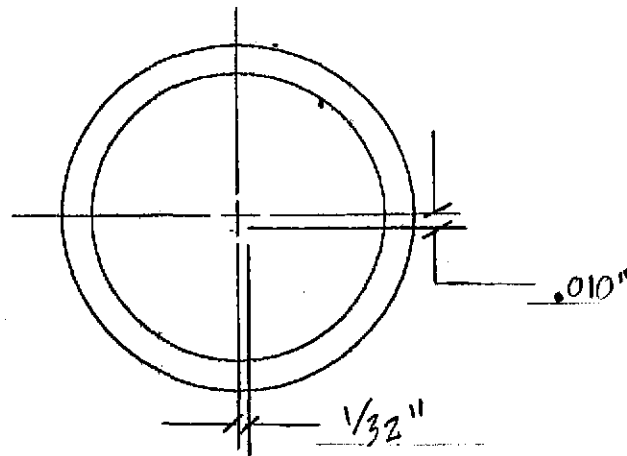
Comments:

Anchor Size: 20 ea @ 15 7/8"
 4 ea @ 12 3/4" (END OF ARM)
 Embed Depth: 20 ea @ 8 1/4"
 4 ea @ 12 3/8" (END OF ARM)

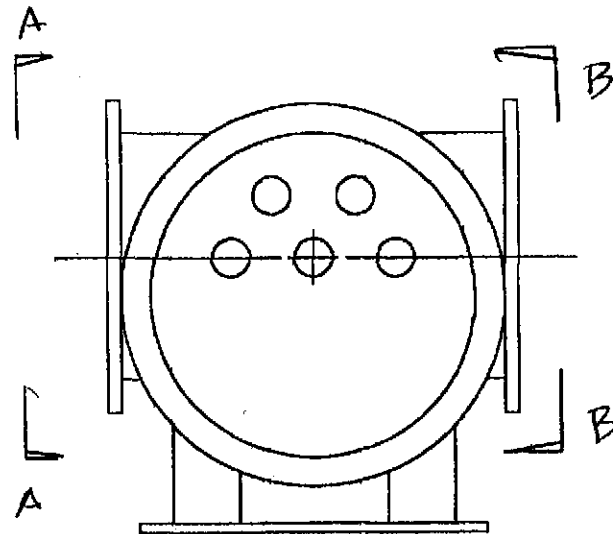
Inspection by: (COMPLETED) <i>alw</i>	Date: 3/12/98
---------------------------------------	---------------



B-B



A-A



LGA. NORTH

Component ID: WHAM-12
 Serial No.: S/N-12

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: **HORIZ ACCESS MODULE
 INSTALLED POSITION**

Job No.: M-126

Project: **LIGO Equipment Set**

Scale: **None**

Dwn By: *Wesley*

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WHAM - 13

Component Name

HORIZONTAL ACCESS MODULE

Component S/N

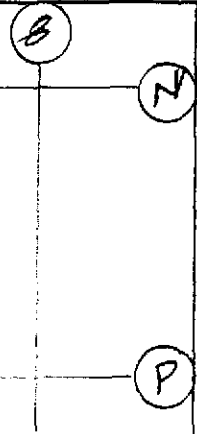
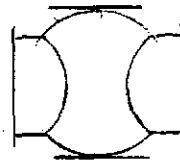
Component Installation Weight (lb.)

9,000 LBS

Component Installation Position
(Ref. Build Grid)

CORNER STATION

HAM - 13



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	N/A	N/A
2. Component Located For Anchor Bolt Marking	<i>[Signature]</i>	3/9/98
	Buyer <i>[Signature]</i>	SMARSS
3. Final Component Location Complete	<i>[Signature]</i>	3/9/98
	Buyer <i>[Signature]</i>	SMARSS

"MOCK-UP" UNIT

SPECIFICATION

Number

A

V049-2-174

Rev.

1

Number

Rev.

F/H
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or Sc
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N.

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: W/GV-01

Component Name: GATE VALVE

Component S/N: S/N - 17

Vacuum Sealing Surfaces Inspection

By: ~~Bubba~~ 1-21-98

Buyer: NOE JI TAUSF

Cleanliness Inspection

By: ~~Bubba~~ 1-21-98

Buyer: NOE JI TAUSF

O-Rings Installed

By: ~~Bubba~~ 1-21-98

Buyer: NOE JI TAUSF

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WGV-01

Component Name

GATE VALVE

Component S/N

S/N 17

Component Installation Weight (lb.)

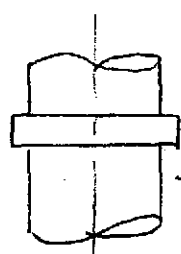
9,000 LB.

Component Installation Position
(Ref. Build Grid)

CORNER STA.

NORTH →

9.7



WGV-01

A.7

Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	Public Relations	1-21-98
2. Component Located For Anchor Bolt Marking	W.T. Melny	1/21/98
	Buyer: MGE	J. K. H. S.
3. Final Component Location Complete	W.T. Melny	1/21/98
	Buyer: MGE	J. K. H. S.

Number
Rev.

SPECIFICATION

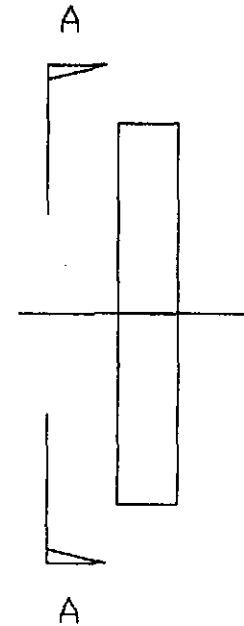
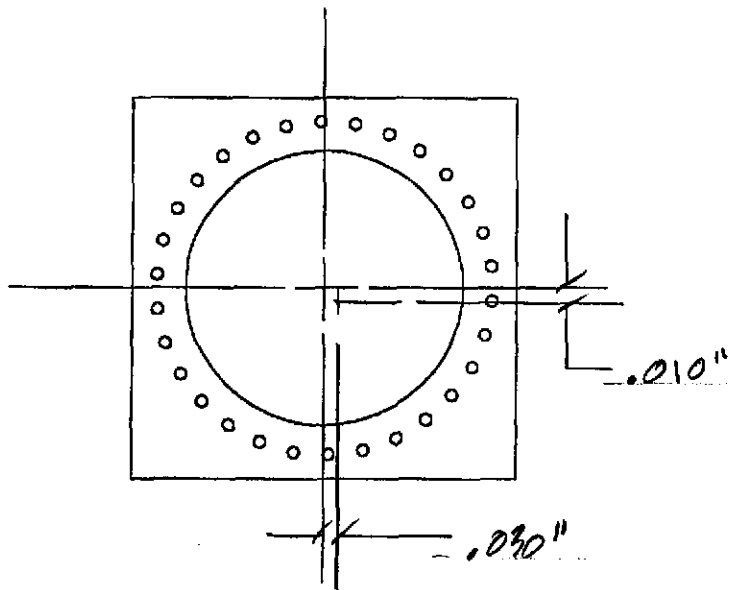
Number

A

V049-2-173

Rev.

1



A-A
(LH & WEST)

Component ID:

WGV-01

Serial No.:

S/N. 17

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title:

GATE VALVE
INSTALLED POSITION

Job No.: M-126

Project: LIGD Equipment Set

Scale:
None

Dwn By:

Melay

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WGV-02
Component Name: GATE VALVE
Component S/N: S/N. 18

Vacuum Sealing Surfaces Inspection

By: Babbar Maitra 1-22-98
Buyer: JOE JAWES

Cleanliness Inspection

By: Babbar Maitra 1-22-98
Buyer: JOE JAWES

-Rings Installed

By: Babbar Maitra 1-22-98
Buyer: JOE JAWES

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WGV-02

Component Name

GATE VALVE

Component S/N

S/N 18

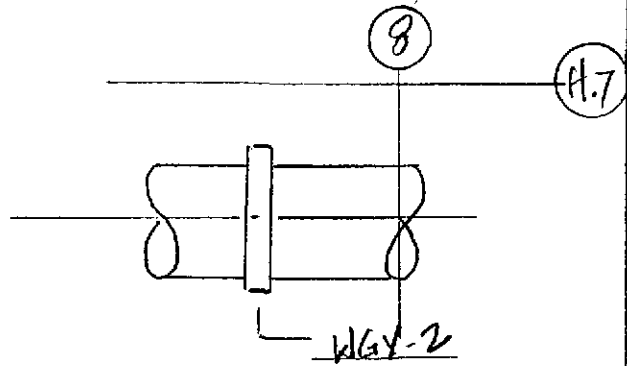
Component Installation Weight (lb.)

9,000 lb.

Component Installation Position
(Ref. Build Grid)

CORNER STATION

NORTH →



Signoffs (Contractor Unless Otherwise Noted)		By	Date
1.	Shipping Cover Cross Hairs Verified	<i>Robert Talley</i>	1-22-98
2.	Component Located For Anchor Bolt Marking	<i>Robert Talley</i>	1/22/98
	Buyer	<i>NOE</i>	<i>STAWSE</i>
3.	Final Component Location Complete	<i>Robert Talley</i>	1-22-98
	Buyer	<i>NOE</i>	<i>STAWSE</i>

Number
Rev.

SPECIFICATION

Number

A

V040-2-174

Rev.

1

Apollo Concrete Anchor Installation Report

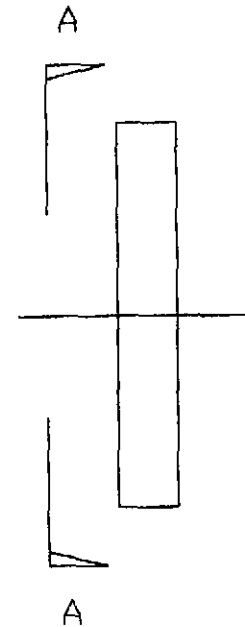
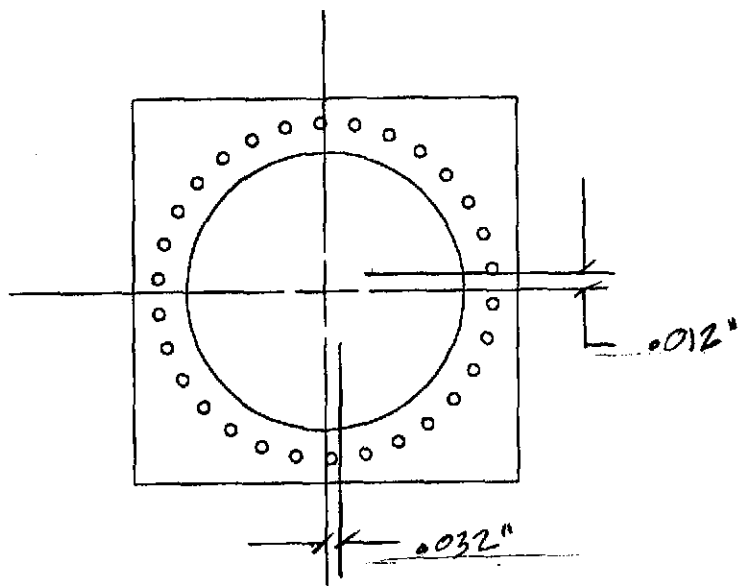
Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V049-F-001	Rev. 4	Date: 1/27/98	
Item Anchored: WGV 02	No. of Anchors 6	Size: 3/4"	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super)		alby		1-30-98
Spacing & Location		alby		1-21-98
Anchor Size & Length		alby		1-21-98
Hole Size		alby		1-21-98
Hole & Core Condition (no voids, etc.)		alby		1-21-98
Embedment (minus 0 plus 1/8")		alby		1-21-98
Angle (90 deg. ± 1deg.)		alby		1-21-98
Floor Scarified (Roughened)		alby		1-30-98
Proper Nut Engagement		alby		2-1-98
Tightening (AISC) "SOME TIGHT"		alby		2-1-98
Torque Device Identification: N/A				

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Completed) alby T. Melan	Date: 4-1-98
--	--------------



A-A
CLKG NORTH

Component ID: WGV-002
Serial No: 9/1 018

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: GATE VALVE INSTALLED POSITION	Job No: M-126	
Project: LIGO Equipment Set	Scale: None	Dwn By: <i>Meley</i>

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WGV-3

Component Name:

GATE VALVE

Component S/N:

S/N 021

Vacuum Sealing Surfaces Inspection

By:

~~Barbara Patton~~ 1-29-98

Buyer:

MSE STANUS

Cleanliness Inspection

By:

W. T. M. M. 1/29/98

Buyer:

MSE STANUS

O-Rings Installed

By:

~~Barbara Patton~~ 1-29-98

Buyer:

MSE STANUS

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WGV-3

Component Name

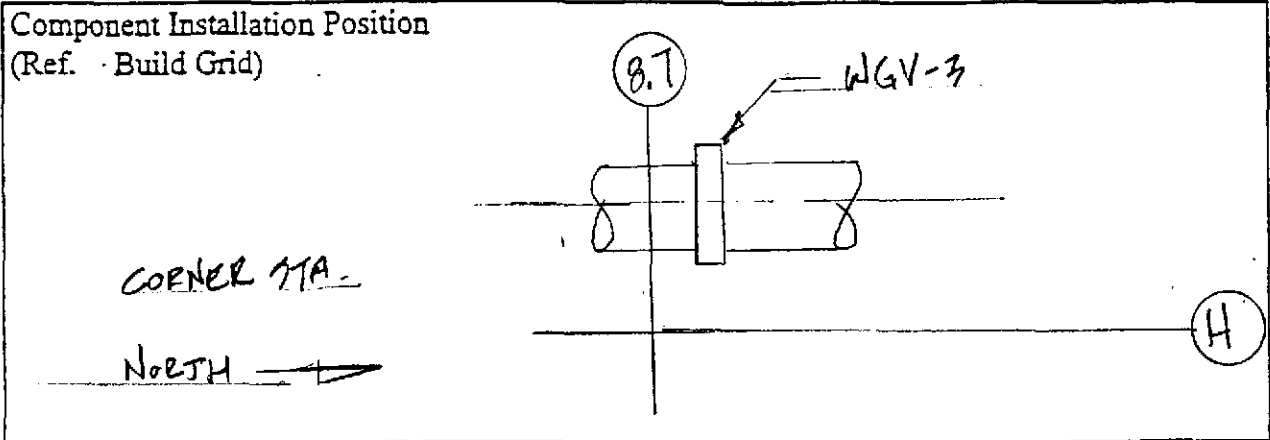
GATE VALVE

Component S/N

Component Installation Weight (lb.)

9,000 LB.

Component Installation Position
(Ref. Build Grid)



	Signoffs (Contractor Unless Otherwise Noted)	By	Date
1.	Shipping Cover Cross Hairs Verified	<i>Bobbea Talley</i>	1-29-98
2.	Component Located For Anchor Bolt Marking	<i>John W. May</i>	1/27/98
		Buyer <i>WSE</i>	27 JAN 98
3.	Final Component Location Complete	<i>John W. May</i>	1/29/98
		Buyer <i>WSE</i>	29 JAN 98

Number
Rev.

SPECIFICATION

Number **A** V049-2-17J Rev. **1**

Apollo Concrete Anchor Installation Report

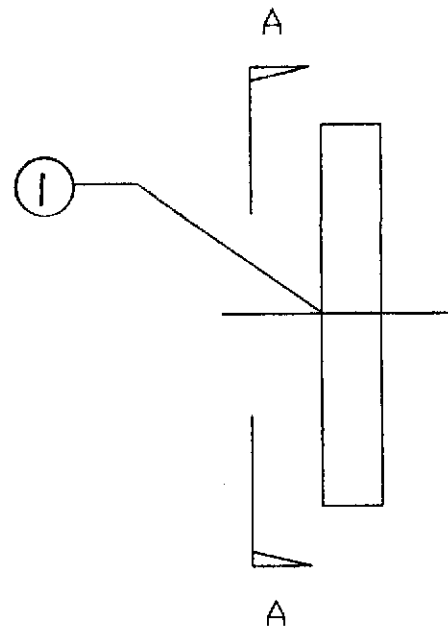
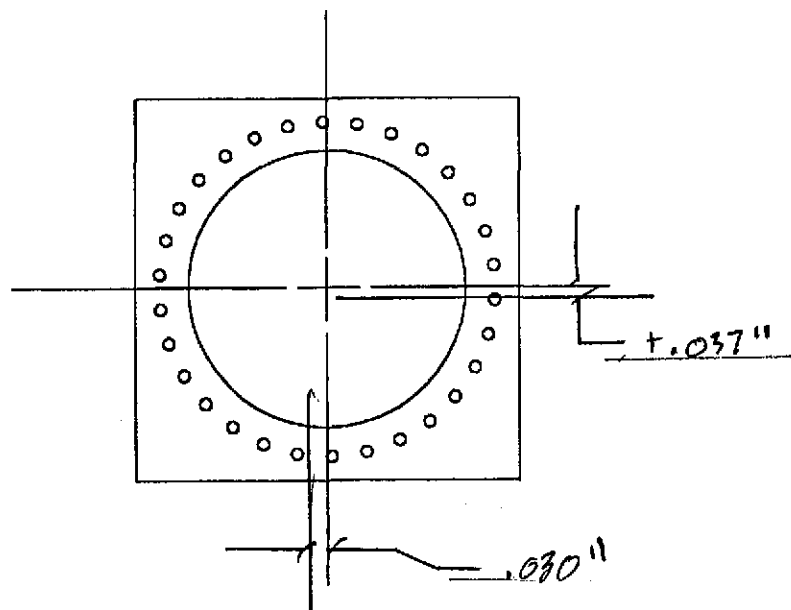
Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V049-5-001	Rev. 4	Date: 1/27/98	
Item Anchored: WGV-3	No. of Anchors 8	Size: 3/4" II	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super)		why		1/28/98
Spacing & Location		why		1/27/98
Anchor Size & Length		why		1/28/98
Hole Size		why		1/27/98
Hole & Core Condition (no voids, etc.)		why		1/27/98
Embedment (minus 0 plus 1/8")		why		1/27/98
Angle (90 deg. +1deg.)		why		1/28/98
Floor Scarified (roughened)		why		1/30/98
Proper Nut Engagement		why		1/30/98
Tightening (AISC) 5/16" TIGHT"		why		1/30/98
Torque Device Identification: N/A				

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Completed) Robert M. Jay	Date: 1-1-98
--	--------------



A-A

LKG No. 1

	MODEL	940T	Δ
(1)	.102"	.065	.037"

Component ID:

Serial No.:

WGV-3

S/N 021

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: GATE VALVE
INSTALLED POSITION

Job No.: M-126

Project: LIGD Equipment Set

Scale:
None

Dwn By:

Merry

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WGV-04

Component Name:

GATE VALVE

Component S/N:

9/A-022

Vacuum Sealing Surfaces Inspection

By:

~~Bubba Hattery~~ 1-26-98

Buyer:

~~NIS 36 JAWSS~~

Cleanliness Inspection

By:

~~Bubba Hattery~~ 1-26-98

Buyer:

~~NIS 36 JAWSS~~

O-Rings Installed

By:

~~Bubba Hattery~~ 1-26-98

Buyer:

~~NIS 36 JAWSS~~

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WGV-5

Component Name

GATE VALVE

Component S/N

S/N-12

Component Installation Weight (lb.)

Component Installation Position
(Ref. Build Grid)

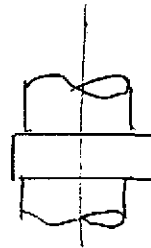
CORNER STA.

NORTH →

9.7

8.7

A



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	<i>[Signature]</i>	2-2-98
2. Component Located For Anchor Bolt Marking	<i>[Signature]</i>	2-2-98
	Buyer <i>[Signature]</i>	JFB/SS
3. Final Component Location Complete	<i>[Signature]</i>	2-3-98
	Buyer <i>[Signature]</i>	JFB/SS

Number

Rev.

SPECIFICATION

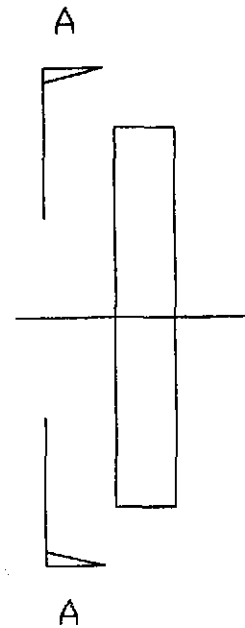
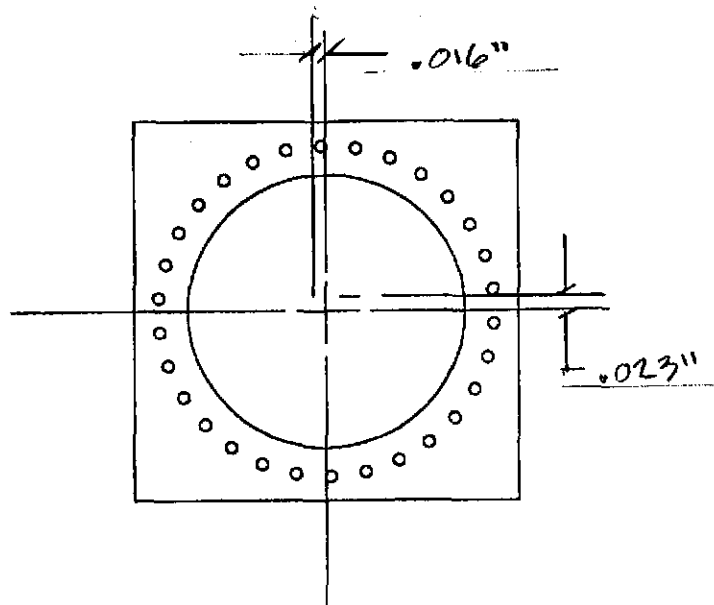
Number

A

V040-2.174

Rev.

1



A-A
(Left West)

Component ID: WGV-5
 Serial No: S/N-12

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: GATE VALVE
 INSTALLED POSITION

Job No: M-126

Project: LIGO Equipment Set

Scale:
 None

Dwn By:
Melay

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WGV-7

Component Name: GATE VALVE

Component S/N: S/N - 013

Vacuum Sealing Surfaces Inspection

By: [Signature] 2-24-98

Buyer: [Signature] 24 FEB 98

Cleanliness Inspection

By: [Signature] 2-24-98

Buyer: [Signature] 24 FEB 98

O-Rings Installed

By: N/A

Buyer: _____

Comments:

Rework Required:

NONE

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WGV-07

Component Name

GATE VALVE

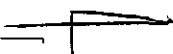
Component S/N

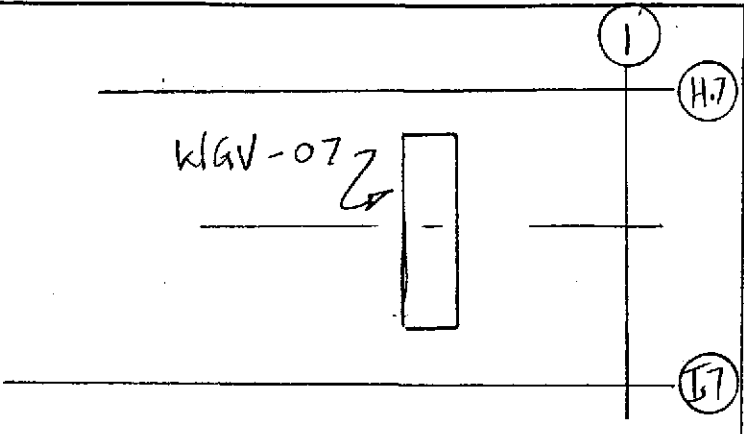
S/N: 13

Component Installation Weight (lb.)

Component Installation Position
(Ref. Build Grid)

CORNER STA.

NOR. 

WGV-07


Signoffs (Contractor Unless Otherwise Noted)		By	Date
1.	Shipping Cover Cross Hairs Verified	<i>Beulah Peters</i>	2-24-98
2.	Component Located For Anchor Bolt Marking	<i>John T. Meloy</i>	2-25-98
	Buyer	<i>NOS</i>	25 FEB 98
3.	Final Component Location Complete	<i>John T. Meloy</i>	2-24-98
	Buyer	<i>NOS</i>	24 FEB 98

Number

Rev.

SPECIFICATION

Number

A

V049-2-174

Rev.

1

Apollo Concrete Anchor Installation Report

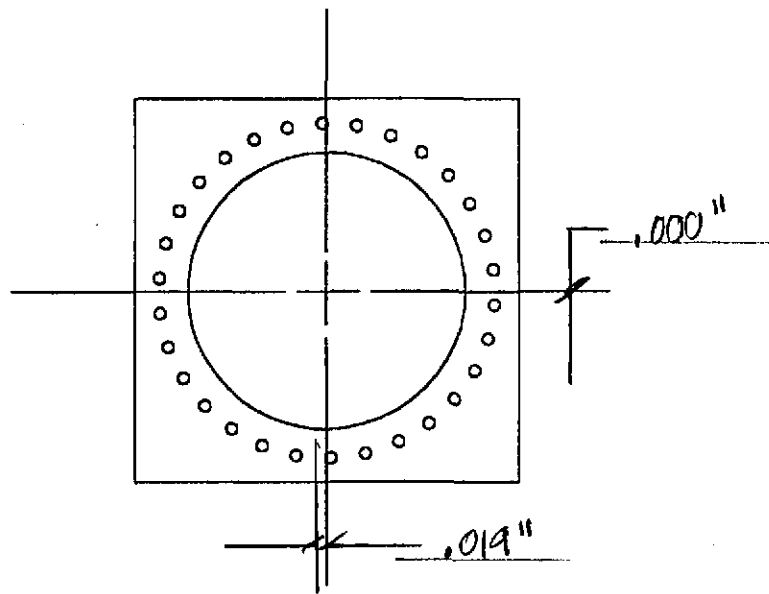
Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V049-5-001	Rev. 4	Date: 2-25-98	
Item Anchored: WGV-7	No. of Anchors 4	Size: 3/4"	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super)		<i>ahp</i>		2-25-98
Spacing & Location		<i>ahp</i>		2-25-98
Anchor Size & Length 3/4 x 14"		<i>ahp</i>		2-25-98
Hole Size # 7/8"		<i>ahp</i>		2-25-98
Hole & Core Condition (no voids, etc.) ✓		<i>ahp</i>		2-25-98
Embedment (minus 0 plus 1/8") 6 5/8"		<i>ahp</i>		2-25-98
Angle (90 deg. ± 1deg.) ✓		<i>ahp</i>		2-26-98
Floor Scarified (ROUGHEN)		<i>ahp</i>		2-26-98
Proper Nut Engagement		<i>ahp</i>		4-1-98
Tightening (AKC) "SNOW TIGHT"		<i>ahp</i>		4-1-98
Torque Device Identification: N/A				

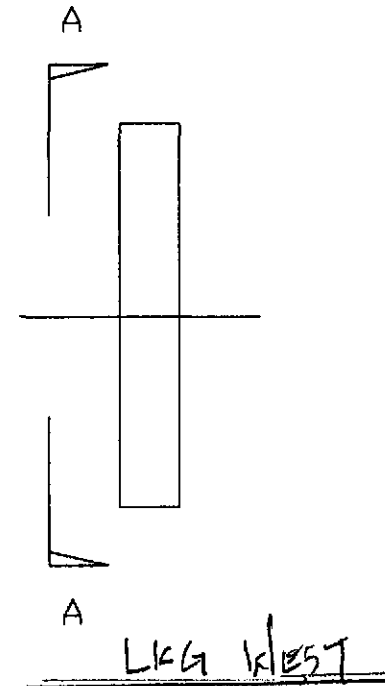
Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Completed) <i>ahp T. McFarland</i>	Date: 4-1-98
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A-A



LEG VIEW

Component ID: WGV-07
 Serial No.: 9/W-013

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: GATE VALVE
 INSTALLED POSITION

Job No.: M-126

Project: LIGO Equipment Set

Scale:
 None

Dwn By:
Murray

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WA3A / WA15A

Component Name:

Shim Piece

Component S/N:

S/N 01 S/N 01

Vacuum Sealing Surfaces Inspection

By:

~~Bubler~~ 1-21-98

Buyer:

JOE STANUS

Cleanliness Inspection

By:

~~Bubler~~ 1-21-98

Buyer:

JOE STANUS

O-Rings Installed

By:

~~Bubler~~ 1-21-98

Buyer:

JOE STANUS

Comments:

Rework Required:

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WA3B

Component Name:

spool piece (Belouze)

Component S/N:

7/N 02

Vacuum Sealing Surfaces Inspection

By:

~~Bobbie Hatcher~~ 1-22-98

Buyer:

NOR J2TAN98

Cleanliness Inspection

By:

~~Bobbie Hatcher~~ 1-22-98

Buyer:

NOR J2TAN98

O-Rings Installed

By:

~~Bobbie Hatcher~~ 1-22-98

Buyer:

NOR J2TAN98

Comments:

Rework Required:

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WA12B / WB4B

Component Name:

Spool Piece

Component S/N:

9/N 2

9/W 02

Vacuum Sealing Surfaces Inspection

By:

Prabha Kattar 1-29-98

Buyer:

JOE JSTAWES

Cleanliness Inspection

By:

Prabha Kattar 1/29/98

Buyer:

JOE JSTAWES

O-Rings Installed

By:

Prabha Kattar 1-29-98

Buyer:

JOE JSTAWES

Comments:

Spool PC. WA12B WAS MATED TO WB4B 180° OUT OF ROTATION (AT PLANT) CONDITION WAS COLLECTED IN FIELD. *Prabha Kattar*
JOE

Rework Required:

(SEE ABOVE)

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WA 15E

Component Name: Stool Piece

Component S/N: S/N - 02

Vacuum Sealing Surfaces Inspection

By: ~~Rubba~~ 1-20-98

Buyer: MSR JOTAWSE

Cleanliness Inspection

By: ~~Rubba~~ 1-20-98

Buyer: MSR JOTAWSE

O-Rings Installed

By: ~~Rubba~~ 1-20-98

Buyer: MSR JOTAWSE

Comments:

Rework Required:

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WB 1A / WA 8A / NA 13A

Component Name:

SPOOLS

Component S/N:

Vacuum Sealing Surfaces Inspection

By:

Barbara Matlock 2-9-98

Buyer:

NIS 9 FEB 98

Cleanliness Inspection

By:

Barbara Matlock 2-9-98

Buyer:

NIS 9 FEB 98

O-Rings Installed

By:

Barbara Matlock 2-9-98

Buyer:

NIS 9 FEB 98

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WB1A/WA-8A/WA13A

Component Name

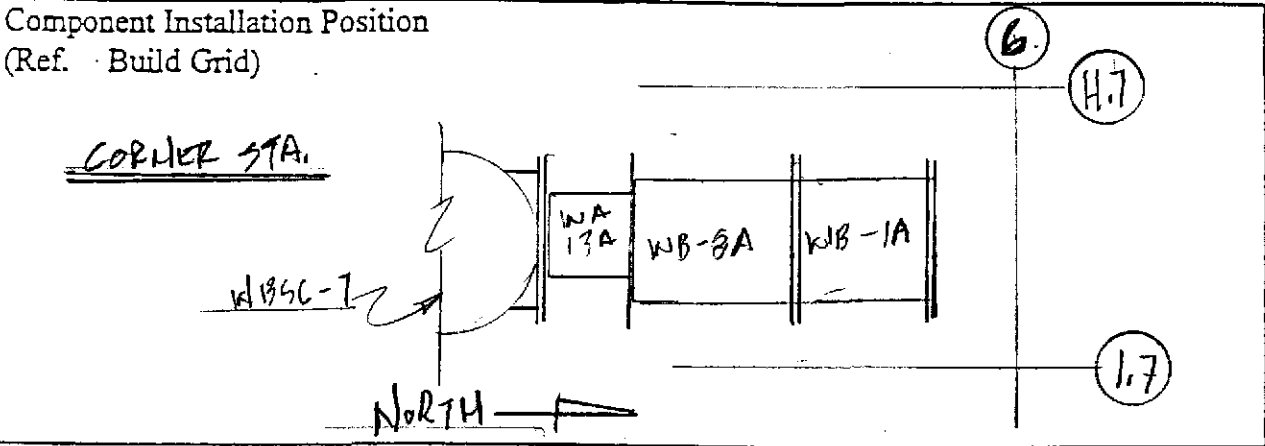
SPOOLS

Component S/N

1/N-01 / -01 / -01

Component Installation Weight (lb.)

Component Installation Position
(Ref. Build Grid)



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	Bobber Peters	2-9-98
2. Component Located For Anchor Bolt Marking	John T. Meloy	2/9/98
	Buyer NUSE	9 FEB 98
3. Final Component Location Complete	John T. Meloy	2/17/98
	Buyer Ruffley	2-12-98

Number

Rev.

SPECIFICATION

Number

A

V049-2-174

Rev.

1

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126		
Drawing: V049-5-001	Rev. 4	Date: 2-9-98		
Item Anchored: WB-1A	No. of Anchors 16	Size: 1"	Type: HVA	
Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS (Std or Super)		<i>nm</i>		2/12/98
Spacing & Location 15" x 15"		<i>nm</i>		2/12/98
Anchor Size & Length 1 x 15 5/8"		<i>nm</i>		2/12/98
Hole Size 1 1/8"		<i>nm</i>		2/12/98
Hole & Core Condition (no voids, etc.)		<i>nm</i>		2/12/98
Embedment (minus 0 plus 1/8") 8 1/4"		<i>nm</i>		2/12/98
Angle (90 deg. ± 1deg.)		<i>nm</i>		2/12/98
Floor Scarified (DIMITS @ DIAGS)		<i>nm</i>		2/17/98
Proper Nut Engagement		<i>nm</i>		2/12/98
Tightening 250 FT/LB		<i>nm</i>		2/12/98
Torque Device Identification: AP-9				

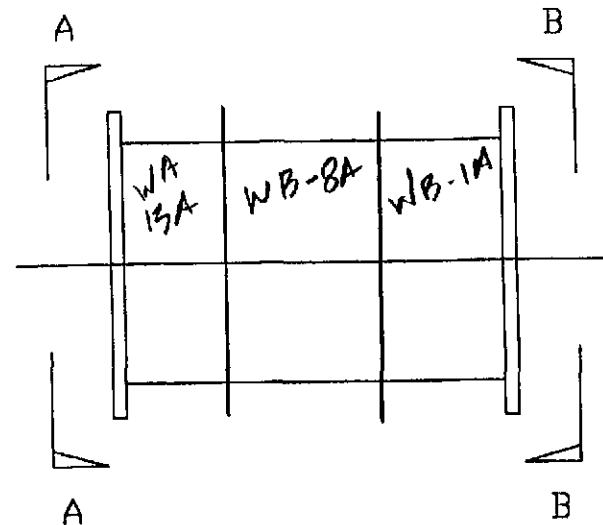
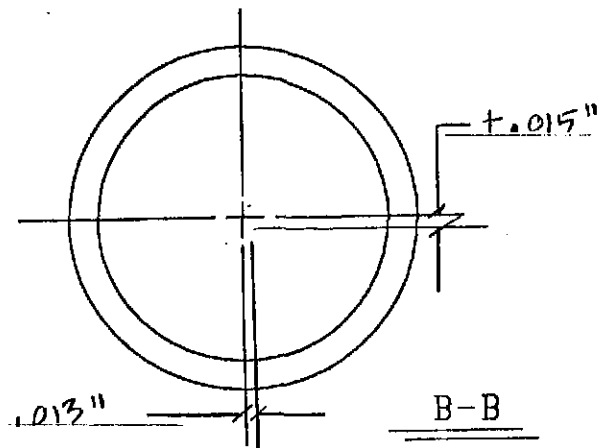
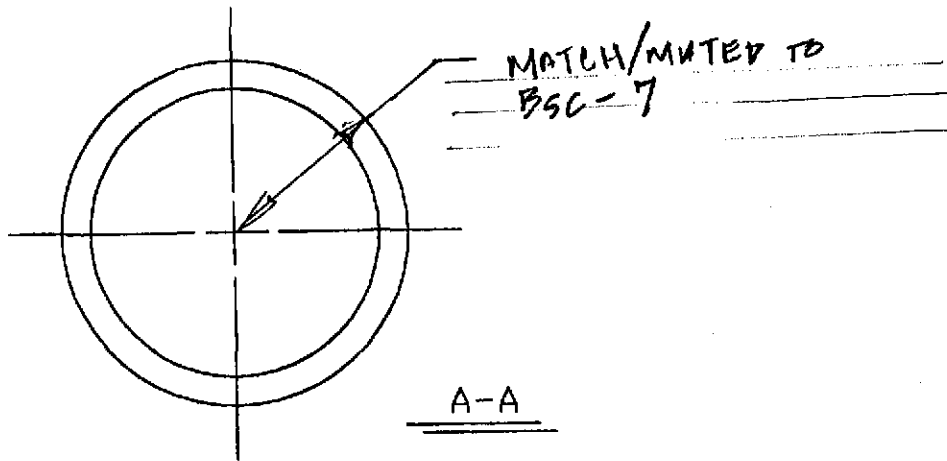
Open Items

Item No.	Description	Corrective Action	Accept	Date
1	ONE ANCHOR INSUFFICIENT EMBED	REPLACE	<i>nm</i>	2/17/98

Comments:

1) ANCHOR LOCATED AT S.E. CORNER OF N.W. PAD.

Inspection by: (Completed) nm T. W.elay	Date: 4-1-98
--	---------------------



Component ID:

WB1A

Serial No.:

9/A-01

Apollo

1297 W. Columbia Dr. Kennewick, Wa 99336

Title:

SPOOL PIECE
INSTALLED POSITION

Job No.: M-126

Prepared by:

W.A. [unclear]

Scale:

1:1

Dwn By:

W.A. [unclear]

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WBZA
Component Name: Flare Piece
Component S/N: S/N-01

Vacuum Sealing Surfaces Inspection

By: ~~Bulba~~ 2-18-98
Buyer: NUE 18 FEB 98

Cleanliness Inspection

By: ~~Bulba~~ 2-18-98
Buyer: NUE 18 FEB 98

O-Rings Installed

By: ~~Bulba~~ 2-19-98
Buyer: NUE 18 FEB 98

Comments:

(BETWEEN HAM-7 & 8)

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WBZA

Component Name

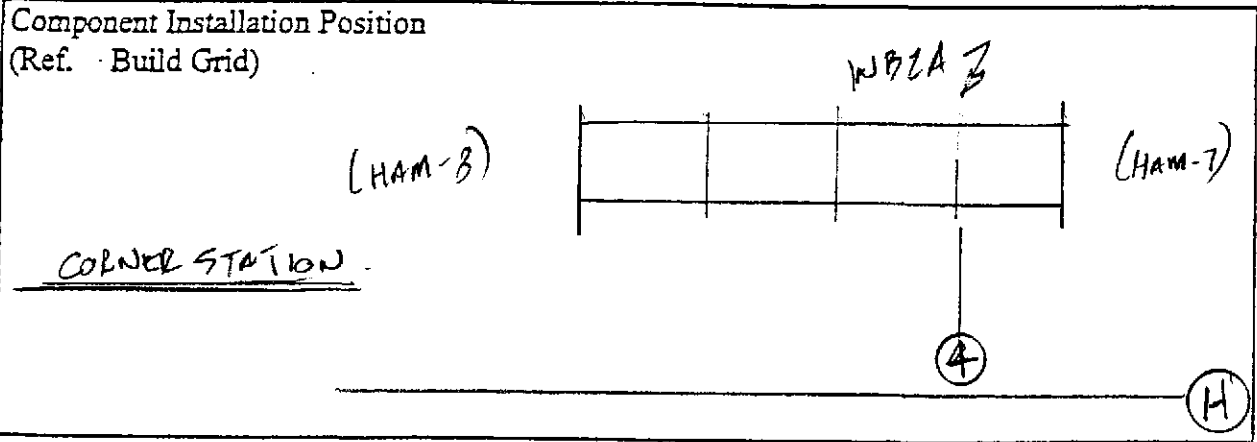
5'00" PIECE

Component S/N

9/N-01

Component Installation Weight (lb.)

Component Installation Position
(Ref. - Build Grid)



Signoffs (Contractor Unless Otherwise Noted)		By	Date
1.	Shipping Cover Cross Hairs Verified	N/A	
2.	Component Located For Anchor Bolt Marking	<i>[Signature]</i>	2/29/08
	Buyer	<i>[Signature]</i>	JR FELISS
3.	Final Component Location Complete	<i>[Signature]</i>	2/29/08
	Buyer	<i>[Signature]</i>	JR FELISS

Number

Rev.

SPECIFICATION

Number

A

V049-2-174

Rev.

1

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V04A-5-001	Rev. 4	Date: 2/23/98	
Item Anchored: 5 POOL WBZA	No. of Anchors: 20	Size:	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super) *		<i>ahp</i>		2-23-98
Spacing & Location		<i>ahp</i>		2-23-98
Anchor Size & Length 1 x 15 5/8"		<i>ahp</i>		2-23-98
Hole Size 1 5/8"		<i>ahp</i>		2-23-98
Hole & Core Condition (no voids, etc.)		<i>ahp</i>		2-23-98
Embedment (minus 0 plus 1/8") 8 1/4"		<i>ahp</i>		2-23-98
Angle (90 deg. ± 1deg.)		<i>ahp</i>		2-23-98
Floor Scarified ** (DIVITS/ROUGH)		<i>ahp</i>		2-26-98
Proper Nut Engagement		<i>ahp</i>		4-1-98
Tightening 400/250 FT LB		<i>ahp</i>		4-1-98
Torque Device Identification: LNS1 #10 / AP-9				

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

* SUPERS @ DIAGS.

** DIVITS @ DIAGS; ROUGHEN OTHERS.

Inspection by: (Completed) <i>ahp</i>	Date: 4-1-98
---------------------------------------	--------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: 1WB2B

Component Name: SPOOL PIECE

Component S/N: S/N - 01

Vacuum Sealing Surfaces Inspection

By: ~~Bubler~~ 2-17-98

Buyer: NIS 17 FEB 98

Cleanliness Inspection

By: ~~Bubler~~ 2-17-98

Buyer: NIS 17 FEB 98

O-Rings Installed

By: ~~Bubler~~ 2-17-98

Buyer: NIS 17 FEB 98

Comments:

Rework Required:

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V049-5-001	Rev. 4	Date: 2/16/98	
Item Anchored: WB2B	No. of Anchors 20	Size: 1"	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super) *		why		2-20-98
Spacing & Location		why		2-19-98
Anchor Size & Length 1" x 5 5/8"		why		2-20-98
Hole Size 1 1/2"		why		2-19-98
Hole & Core Condition (no voids, etc.)		why		2-19-98
Embedment (minus 0 plus 1/8") 3 1/4"		why		2-19-98
Angle (90 deg. ± 1deg.)		why		2-20-98
Floor Scarified **		why		2-26-98
Proper Nut Engagement		why		2-1-98
Tightening ***		why		2-1-98

Torque Device Identification: UNSI #10 / AP-9

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

* USE SUPERS @ DIAGONALS.

** SCARIFY @ DIAGONALS ROUGHEN ALL OTHERS.

*** 250 FT/LB FOR STANDARDS, 400 FT/LB FOR SUPERS.

LOCATED BETWEEN HAM 12 & HAM 11

Inspection by: (Completed) R. T. W. Meloy	Date: 2-1-98
---	--------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WB 3A

Component Name: SPOON PIECE

Component S/N: 9/N - 01

Vacuum Sealing Surfaces Inspection

By: ~~Bella~~ 1-7-98

Buyer: ~~NIS~~ 7 JAN 98

Cleanliness Inspection

By: ~~Bella~~ 1-7-98

Buyer: ~~NIS~~ 7 JAN 98

O-Rings Installed

By: ~~Bella~~ 1-7-98

Buyer: ~~NIS~~ 7 JAN 98

Comments:

Rework Required:

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V04A-5-001	Rev. 4	Date:	
Item Anchored: 3 POOL WB-3A	No. of Anchors 20	Size:	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super) *		BW		1/8/98
Spacing & Location		BW		1/8/98
Anchor Size & Length 1x15 5/8"		BW		1/8/98
Hole Size 1 1/8"		BW		1/8/98
Hole & Core Condition (no voids, etc.)		BW		1/8/98
Embedment (minus 0 plus 1/8") 8 1/4"		BW		1/8/98
Angle (90 deg. + 1deg.)		BW		1/8/98
Floor Scarified **		Mony		2/13/98
Proper Nut Engagement		Mony		4-1-98
Tightening ***		ALW		4-1-98

Torque Device Identification: UNS1 #10/AP-9

Open Items

Item No.	Description	Corrective Action	Accept	Date

Comments:

LOCATED BETWEEN HAM-1 & 2

* SUPERS @ DIAGONALS

** SCARIFY @ DIAGONALS; ROUGHEN @ OTHERS

*** 400 FT LB @ DIAGONALS; 250 FT LB @ OTHERS.

Inspection by:

(Completed) *Robert W. May*

Date

4-1-98

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WB6/WAB6

Component Name:

SPOOL PIECE

Component S/N:

Vacuum Sealing Surfaces Inspection

By:

~~Bubba Hatten~~ 1-28-98

Buyer:

NIS JSTANES

Cleanliness Inspection

By:

~~Bubba Hatten~~ 1/28/98

Buyer:

NIS JSTANES

O-Rings Installed

By:

~~Bubba Hatten~~ 1-28-98

Buyer:

NIS JSTANES

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WB6 / WA6B

Component Name

Spool Piece

Component S/N

S/N 01 S/N 02

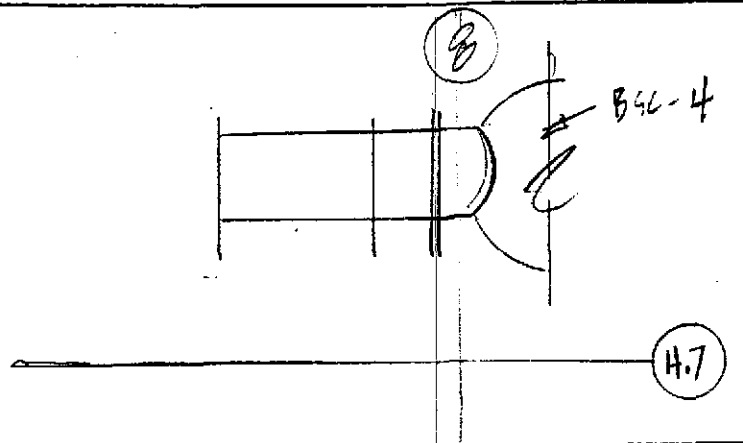
Component Installation Weight (lb.)

2,282 + 1,204 = 3,486

Component Installation Position
(Ref. Build Grid)

CORNER STATION

NORTH →



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	Proble...	1-13-98
2. Component Located For Anchor Bolt Marking	John T. Meloy	1/14/98
3. Final Component Location Complete	Buyer JOE	1/29/98
	Buyer JOE	4/30/98

SPECIFICATION

Number

rev.

Number

Rev.

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V049-5-001	Rev. 4	Date: 1/27/98	
Item Anchored: WAGG/WAGB	No. of Anchors: 16	Size: 1" \times	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or <u>Super</u>)		ok		1/27/98
Spacing & Location		ok		1/27/98
Anchor Size & Length		ok		1/27/98
Hole Size		ok		1/27/98
Hole & Core Condition (no voids, etc.)		ok		1/27/98
Embedment (minus 0 plus 1/8")		ok		1/27/98
Angle (90 deg. \pm 1deg.)		ok		1/27/98
Floor Scarified (<u>CRUIT9</u>)		ok		2/4/98
Proper Nut Engagement		ok		3-11-98
Tightening <u>400 FT. LB.</u>		ok		3-11-98

Torque Device Identification:

Open Items

Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Completed) <i>John H. Meloy</i>	Date: 3-11-98
---	---------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WB7/WAGA

Component Name:

Stool Piece

Component S/N:

S/N-01 / S/N-01

Vacuum Sealing Surfaces Inspection

By:

Bubba ~~Latton~~ 1-12-98

Buyer:

NSE / STAUSS

Cleanliness Inspection

By:

Bubba ~~Latton~~ 1-12-98

Buyer:

NSE / STAUSS

O-Rings Installed

By:

Bubba ~~Latton~~ 1-12-98

Buyer:

NSE / STAUSS

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WB7/WA6A

Component Name

SPOOL PIECE

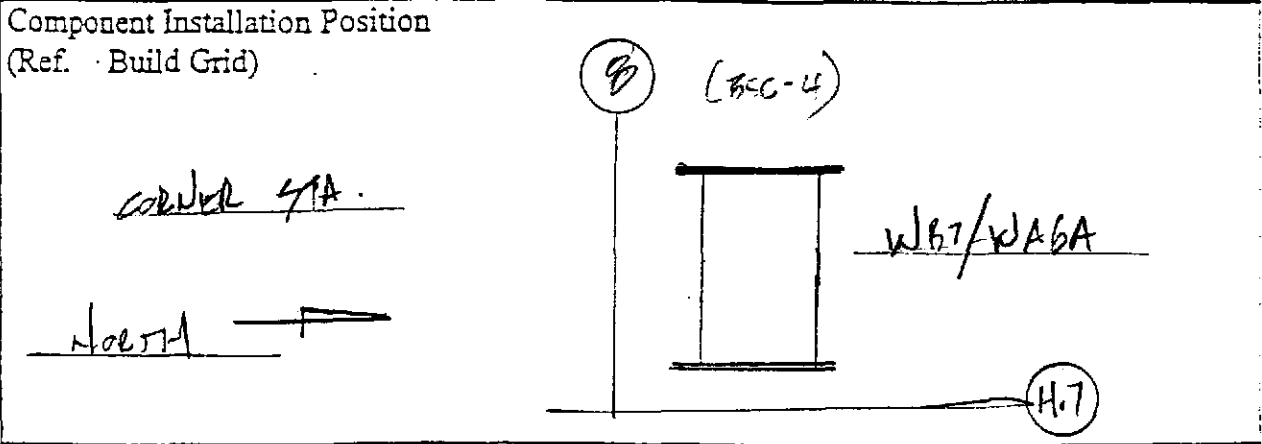
Component S/N

SN/01 SN 01

Component Installation Weight (lb.)

2,323 + 1,204 = 3,527

Component Installation Position
(Ref. Build Grid)



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	Bulbar... ..	1-12-98
2. Component Located For Anchor Bolt Marking	John T. W... ..	1/21/98
	Buyer NCE	2/12/98
3. Final Component Location Complete	John T. W... ..	1/21/98
	Buyer NCE	2/12/98

SPECIFICATION

Number

A

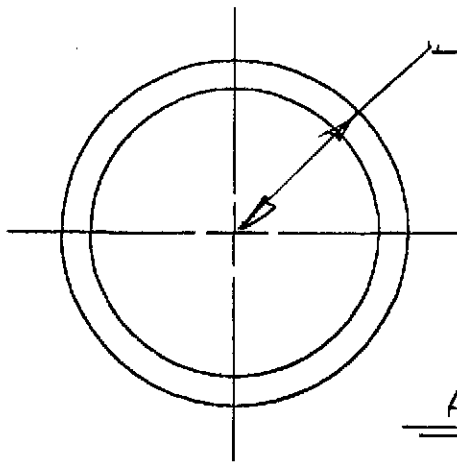
V049-2-174

Rev.

1

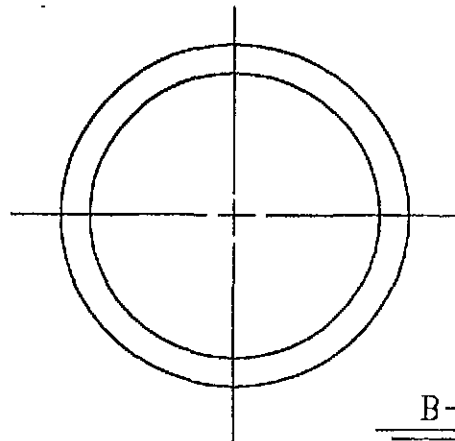
Number

Rev.

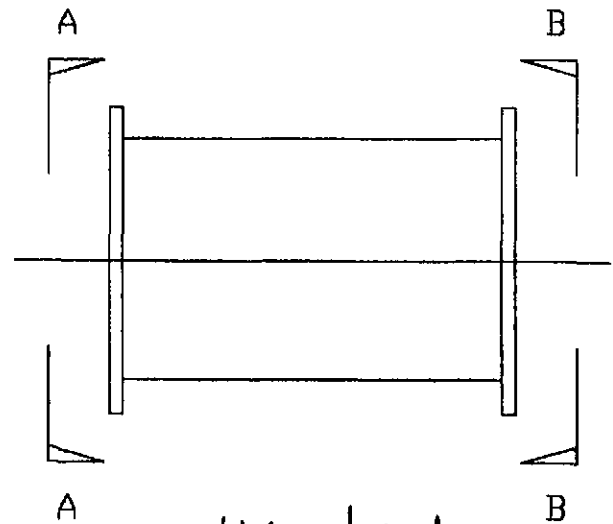


MATCHED
TO B9C-4
EAST FLG.

A-A



B-B



LFG NORTH.

Component ID:

WBT/WA6A

Serial No.:

S/N-01 S/N-01

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: **SPOOL PIECE
INSTALLED POSITION**

Job No.: M-126

Scale:

Drawn By: *[Signature]*

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V049-5-001	Rev. 4	Date: 1/21/98	
Item Anchored: WBT/WA 6A	No. of Anchors: 16	Size: 1" ^H	Type: HVA

Attribute	a. installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or <u>Super</u>)		<i>ahw</i>		1-21-98
Spacing & Location		<i>ahw</i>		1-21-98
Anchor Size & Length		<i>ahw</i>		1-21-98
Hole Size		<i>ahw</i>		1-21-98
Hole & Core Condition (no voids, etc.)		<i>ahw</i>		1-21-98
Embedment (minus 0 plus 1/8")		<i>ahw</i>		1-21-98
Angle (90 deg. ± 1deg.)		<i>ahw</i>		1-21-98
Floor Scarified (<u>DIMITS</u>) (<u>REQ'D</u>)		<i>ahw</i>		2-19-98
Proper Nut Engagement		<i>ahw</i>		3-11-98
Tightening <u>400 FT LB</u>		<i>ahw</i>		3-11-98

Torque Device Identification: UN51 # 10

Open Items

Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: <u>(Completed) ahw T.M.elay</u>	Date: <u>3-11-98</u>
--	----------------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WB4A / WA12A

Component Name:

Flare Piece

Component S/N:

S/N 01 S/N 01

Vacuum Sealing Surfaces Inspection

By:

Bubba Katelyn 1-26-98

Buyer:

NIS J6TAW 98

Cleanliness Inspection

By:

Bubba Katelyn 1-26-98

Buyer:

NIS J6TAW 98

O-Rings Installed

By:

Bubba Katelyn 1-26-98

Buyer:

NIS J6TAW 98

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WB4A / WA12A

Component Name

slon piece

Component S/N

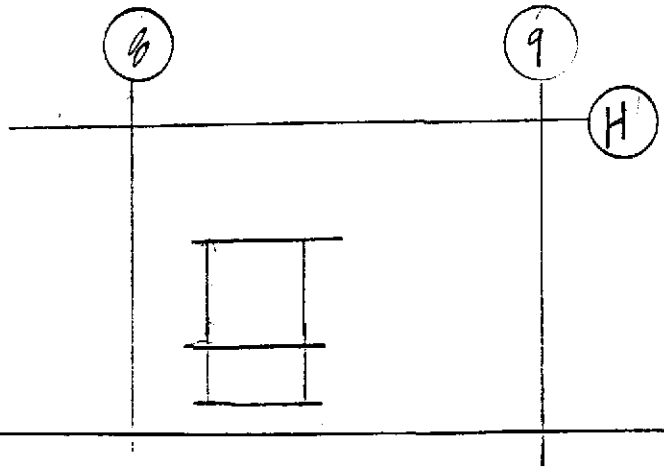
S/N 01 S/N 01

Component Installation Weight (lb.)

Component Installation Position
(Ref. Build Grid)

CORNER STA.

Noe →



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified		
2. Component Located For Anchor Bolt Marking		
	Buyer	
3. Final Component Location Complete		
	Buyer	

SPECIFICATION

Number

Rev.

Number

Rev.

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WB5A

Component Name:

Slack Piece

Component S/N:

9/W 01

Vacuum Sealing Surfaces Inspection

By:

[Signature]

1-14-98

Buyer:

[Signature]

Cleanliness Inspection

By:

[Signature]

1/14/98

Buyer:

[Signature]

O-Rings Installed

By:

[Signature]

1-14-98

Buyer:

[Signature]

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WB5A

Component Name

Spool Piece

Component S/N

S/N - 01

Component Installation Weight (lb.)

Component Installation Position
(Ref. - Build Grid)

CORNER STA.

NORTH

10

J.3

M

Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	N/A	
2. Component Located For Anchor Bolt Marking	<i>T. W. Meloy</i>	1/28/08
	Buyer <i>NUR</i>	<i>SSMBSF</i>
3. Final Component Location Complete	<i>T. W. Meloy</i>	1/29/08
	Buyer <i>NUR</i>	<i>SSMBSF</i>

Number

Rev.

SPECIFICATION

Number

A

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COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WB-8B / WA-13B / WB1B

Component Name:

SPOOL PIECES

Component S/N:

S/N 02, S/N-02, S/N-02

Vacuum Sealing Surfaces Inspection

By:

Bubba Hattery 2-2-98

Buyer:

NLS JFERRE

Cleanliness Inspection

By:

Bubba Hattery 2-2-98

Buyer:

NLS JFERRE

O-Rings Installed

By:

Bubba Hattery 2-2-98

Buyer:

NLS JFERRE

Comments:

ON east flange of BE-6 looking west @ 11:00, there is ~~no apparent~~ what appears to be a small center punch mark that has been sanded down. (Location mark on flange (X))

ON east flange looking west ON B-9B there appears to be some small dings.

Both of these possible problem areas were found during the installation of the combination of spool pieces: B-8B/A-13B/B

Rework Required:

NLS

Title

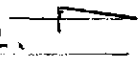
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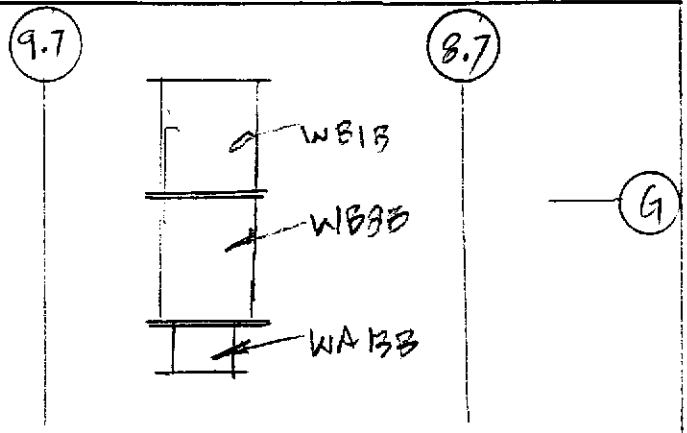
ATTACHMENT B

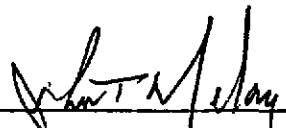

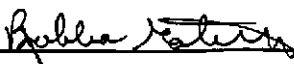

COMPONENT INSTALLATION DATA SHEET

Component Tag Number WB-8B/WA-13B / WB-1B
 Component Name 5 Pcs PIECES
 Component S/N 9/N-02, 5/N-02, 9/N-02
 Component Installation Weight (lb.) _____

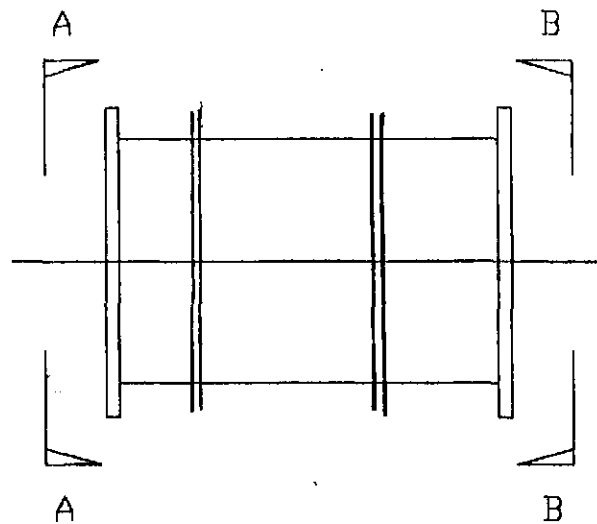
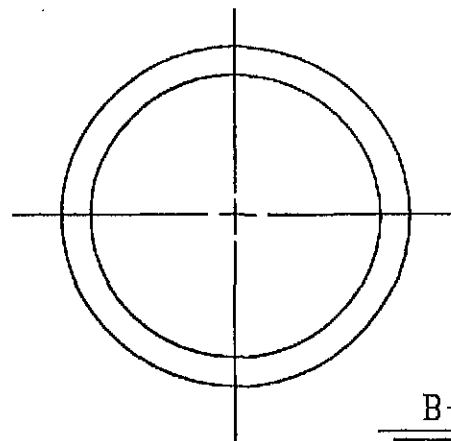
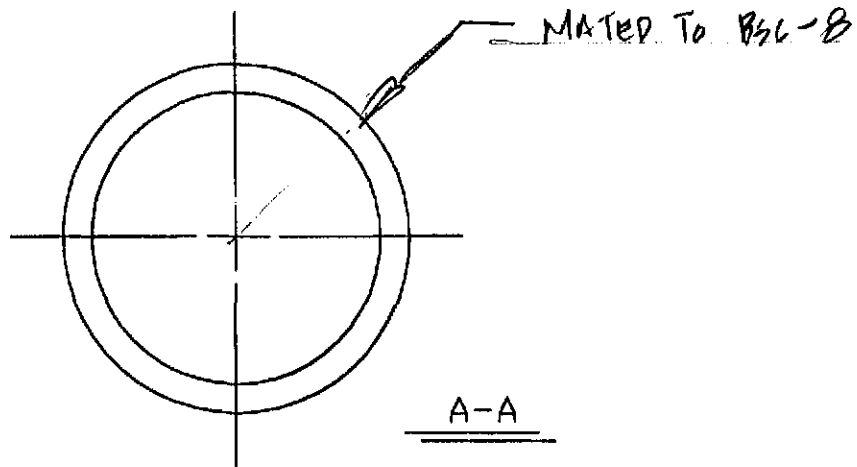
Component Installation Position
 (Ref. Build Grid)

NOR. 
CORNER STA.



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	N/A	
2. Component Located For Anchor Bolt Marking		2/3/98
	Buyer 	3 FEB 98
3. Final Component Location Complete		2-3-98
	Buyer 	3 FEB 98

SPECIFICATION
 Number A _____



Looking S.

Component ID: about WB-BB/WA13B/WB1B
 Serial No.: 9/N-02, 9/N-02, 9/N-02

Apollo

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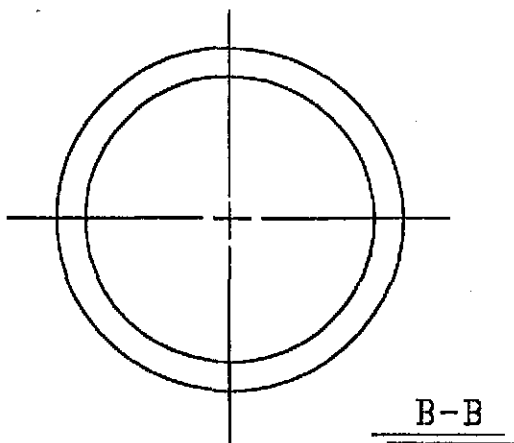
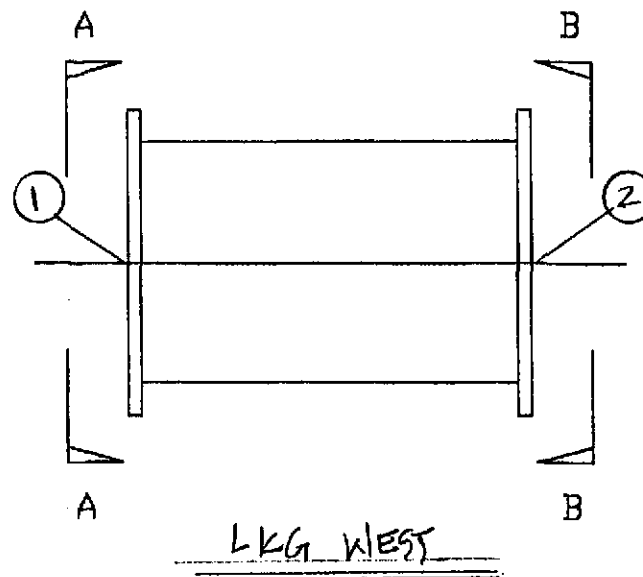
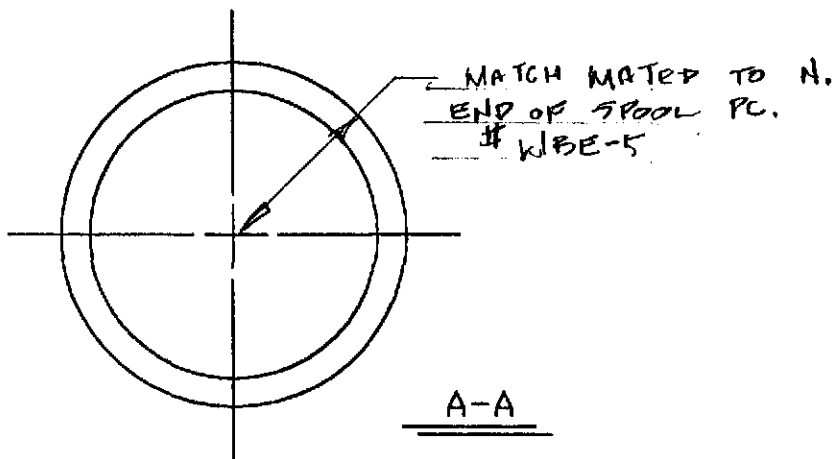
Title: **SPOOL PIECE
INSTALLED POSITION**

Job No.: M-126

Project: **LIGO Equipment Set**

Scale:
None

Dwn By:
v. A.elay



	①	②	△
SHOT	.451		
MODEL	.44B		

Component ID: WBE-9A

Serial No: _____

Apollo

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Title: **SPOOL PIECE
INSTALLED POSITION**

Job No.: M-126

Scale: _____

Drawn By: _____

[Signature]

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WB-9A / WA1C
Component Name: SPOOL PIECE
Component S/N: S/N-01 S/N-03

Vacuum Sealing Surfaces Inspection

By: [Signature] 2/25/98
Buyer: [Signature] 25 FEB 98

Cleanliness Inspection

By: [Signature] 2/25/98
Buyer: [Signature] 25 FEB 98

O-Rings Installed

By: [Signature] 2/25/98
Buyer: [Signature] 25 FEB 98

Comments:

Rework Required:

- NONE -

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WB-9A / WAIC

Component Name

SPOOL PIECE

Component S/N

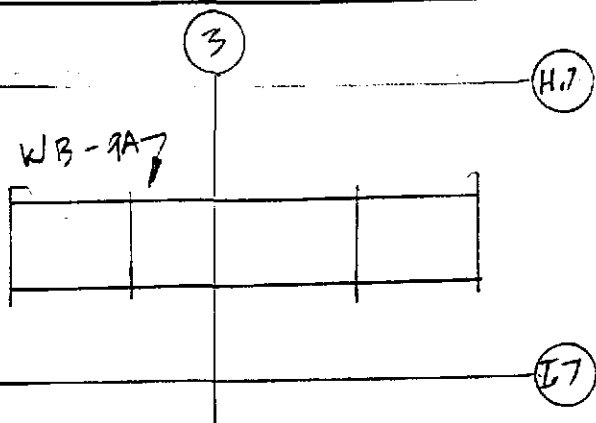
S/N 01 / SN-03

Component Installation Weight (lb.)

Component Installation Position
(Ref. Build Grid)

CORNER STA.

NORTH



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	N/A	
2. Component Located For Anchor Bolt Marking	John T. May	2/25/08
	Buyer: DW	25 FEB 98
3. Final Component Location Complete	John T. May	2/25/08
	Buyer: DW	25 FEB 98

SPECIFICATION

Number

A

V049-2-174

Rev.

1

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V049-5-001	Rev. 1	Date:	
Item Anchored: WB-9A	No. of Anchors	Size:	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super) *		abm		2-26-98
Spacing & Location		abm		2-26-98
Anchor Size & Length 1 x 15 5/8"		abm		2-26-98
Hole Size 1 1/8"		abm		2-26-98
Hole & Core Condition (no voids, etc.)		abm		2-26-98
Embedment (minus 0 plus 1/8") 8 1/4"		abm		2-26-98
Angle (90 deg. ± 1deg.)		abm		2-26-98
Floor Scarified **		abm		3-2-98
Proper Nut Engagement		abm		4-1-98
Tightening ***		abm		4-1-98

Torque Device Identification: UNSI # 10 / AP-9

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

* SUPERS @ DIAGS.
 ** 2 CARLEY (DIVITS) @ DIAGS.
 *** 40 FT LB @ DIAGS 250 FT LB ALL OTHERS.

Inspection by: (Completed) <i>John T. Meloy</i>	Date: 4-1-98
---	--------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WBAB/ WAIF

Component Name: SPOON PIECE

Component S/N: 9/N-02, 9/N-05

Vacuum Sealing Surfaces Inspection

By: Bubba Hatcher 2-3-98
Buyer: MR 3 FERSF

see comments
on B-8B/A-8B
B-1B

Cleanliness Inspection

By: Bubba Hatcher 2-3-98
Buyer: MR 3 FERSF

Rings Installed

By: Bubba Hatcher 2-3-98
Buyer: MR 3 FERSF

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

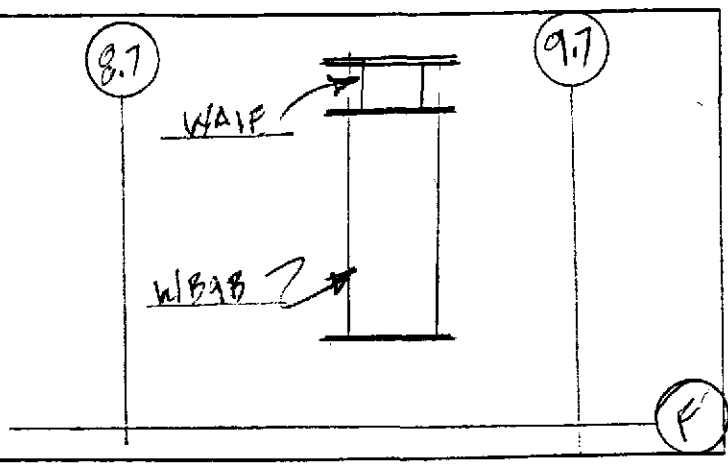
COMPONENT INSTALLATION DATA SHEET

Component Tag Number W189B / W1A1F
 Component Name SPool PIECE
 Component S/N S/N-02 ; S/N 05
 Component Installation Weight (lb.) 8,084 + 1,849 = 9,933

Component Installation Position
(Ref. - Build Grid)

CORNER STA.

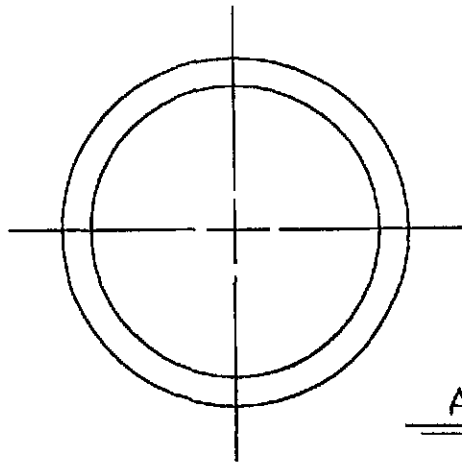
NORTH →



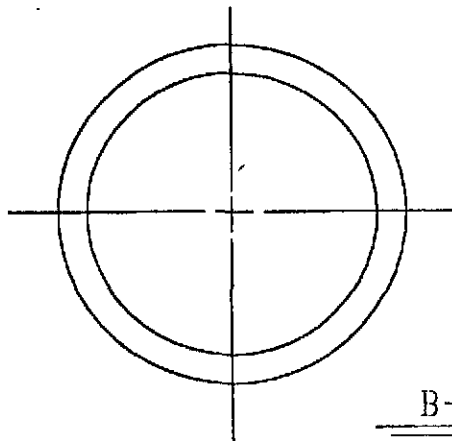
Signoffs (Contractor Unless Otherwise Noted)		By	Date
1.	Shipping Cover Cross Hairs Verified	<i>Bubba Hatcher</i>	2-3-98
2.	Component Located For Anchor Bolt Marking	<i>Whitney</i>	2/3/98
		Buyer <i>NOR</i>	3 FEB 98
3.	Final Component Location Complete	<i>Bubba Hatcher</i>	2-3-98
		Buyer <i>NOR</i>	3 FEB 98

Number
Date

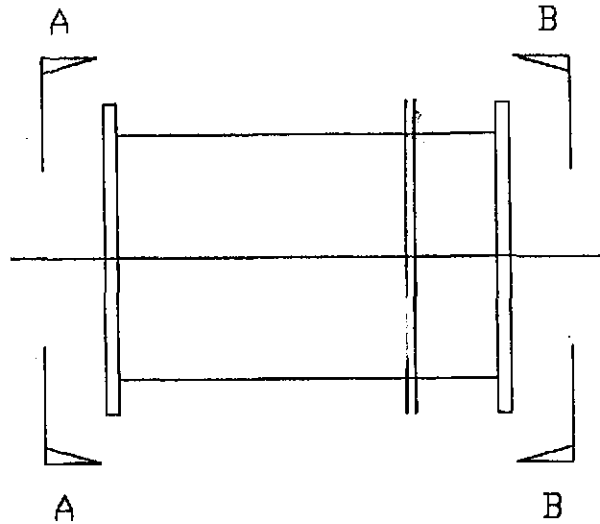
SPECIFICATION
 Number _____



A-A



B-B



LOOKING SOUTH

Component ID: WB9B/WALK
 Serial No: S/N 02, G/N 05

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title: SPOOL PIECE INSTALLED POSITION	Job No.: M-126	
Project: LIGO Equipment Set	Scale: None	Dwn By: <i>Meloy</i>

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126
Drawing: V049-E-001	Rev. 4	Date: 2/4/98
Item Anchored: Floor WB9B	No. of Anchors: 20	Size: 1" Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std Super) *		ok		2/4/98
Spacing & Location		ok	-2	2/4/98
Anchor Size & Length 1" x 15 5/8"		ok		2/4/98
Hole Size		ok		2/4/98
Hole & Core Condition (no voids, etc.)		ok		2/4/98
Embedment (minus 0 plus 1/8") 3 1/4"		ok		2/4/98
Angle (90 deg. ± 1deg.)		ok		2/4/98
Floor Scarified (DITS @ DIAGS)		ok		2/5/98
Proper Nut Engagement		ok		3-11-98
Tightening * *		ok		3-11-98

Torque Device Identification: AP-9 E UNSI #10.

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

* SUPERS @ DIAG.

* * 8 ea @ 400 FT LB; 12 ea @ 250 FT LB.

Inspection by: (Completed) <i>Robert M. Foley</i>	Date: 3-11-98
---	---------------

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WBEZA

Component Name: SPOOL PIECE

Component S/N: 5/N 01

Vacuum Sealing Surfaces Inspection

By: ~~Bulba~~ 1-21-98

Buyer: NTE 31 JAN 98

Cleanliness Inspection

By: ~~Bulba~~ 1-21-98

Buyer: NTE 31 JAN 98

O-Rings Installed

By: ~~Bulba~~ 1-21-98

Buyer: NTE 31 JAN 98

Comments:

Rework Required:

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WBE-3A2

Component Name: SPON PIECE

Component S/N: _____

Vacuum Sealing Surfaces Inspection

By: ~~Balbir Nataraj~~ 2-17-98

Buyer: NIS 17 FEB 98

Cleanliness Inspection

By: ~~Balbir Nataraj~~ 2-17-98

Buyer: NIS 17 FEB 98

O-Rings Installed

By: ~~Balbir Nataraj~~ 2-17-98

Buyer: NIS 17 FEB 98

Comments:

(BETWEEN BSC-4 & HAM-9. INSTALLED 2/17/98)

Rework Required:

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WBE-3C

Component Name:

SPOOL PIECE

Component S/N:

2,275 Lb.

Vacuum Sealing Surfaces Inspection

By:

~~Bubba~~ 2-12-98

Buyer:

NIS 12 FEB 98

Cleanliness Inspection

By:

~~W.T. Meloy~~ 2/12/98

Buyer:

NIS 12 FEB 98

O-Rings Installed

By:

~~Bubba~~ 2-12-98

Buyer:

NIS 12 FEB 98

Comments:

(BETWEEN BSC-4 & HAM-10)

Rework Required:

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number:

WBE2B

Component Name:

SPR PIECE

Component S/N:

9/W 02

Vacuum Sealing Surfaces Inspection

By:

~~Robert Matus~~ 2-17-98

Buyer:

NWE 17 FEB 98

Cleanliness Inspection

By:

~~Robert Matus~~ 2-17-98

Buyer:

NWE 17 FEB 98

O-Rings Installed

By:

~~Robert Matus~~ 2-17-98

Buyer:

NWE 17 FEB 98

Comments:

Rework Required:

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: WBE 5

Component Name: SPOOL PIECE

Component S/N: S/N - 01

Vacuum Sealing Surfaces Inspection

By: Bubba Matney 2-19-98

Buyer: MSE 19 FEB 98

Cleanliness Inspection

By: Bubba Matney 2-19-98

Buyer: MSE 19 FEB 98

O-Rings Installed

By: Bubba Matney 2-19-98

Buyer: MSE 19 FEB 98

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

WBE-5

Component Name

Spool Piece

Component S/N

9/W 01

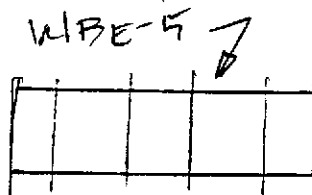
Component Installation Weight (lb.)

8,247

Component Installation Position
(Ref. Build Grid)

CORNER STATION.

NORTH. →



Signoffs (Contractor Unless Otherwise Noted)		By	Date
1.	Shipping Cover Cross Hairs Verified	<i>[Signature]</i>	2-19-98
2.	Component Located For Anchor Bolt Marking	<i>[Signature]</i>	2/19/98
		Buyer <i>[Signature]</i>	<i>[Signature]</i>
3.	Final Component Location Complete	<i>[Signature]</i>	2/23/98
		Buyer <i>[Signature]</i>	<i>[Signature]</i>

Number

Rev.

SPECIFICATION

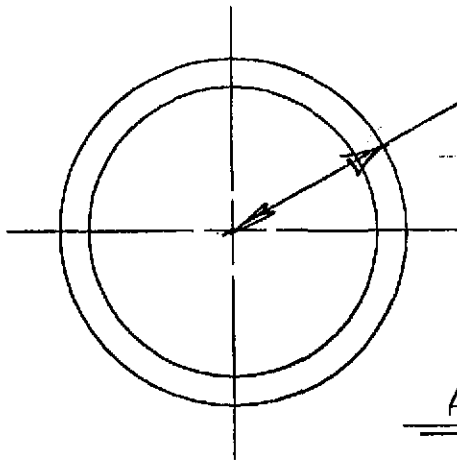
Number

A

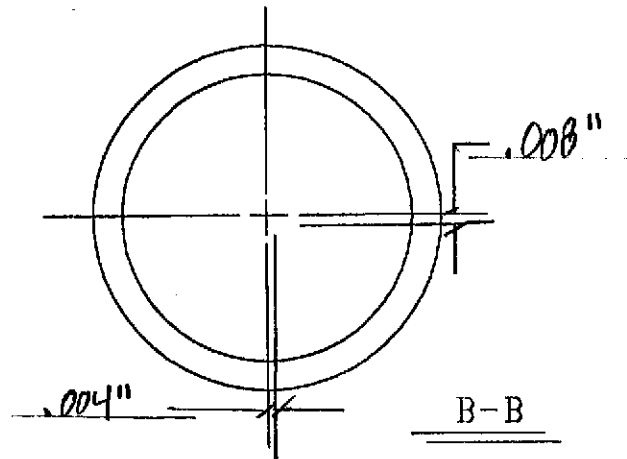
V040-2-174

Rev.

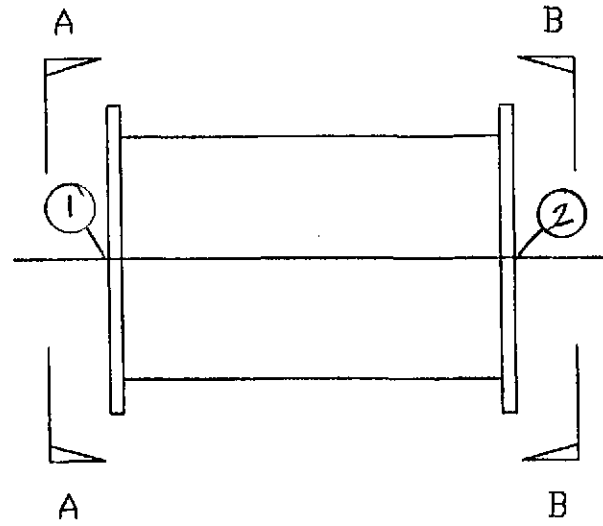
1



A-A



B-B



LFG WEST

	①	②	Δ
MODEL	.699	.448	.250 ✓
SHOT	.685	.451	.234 ✓
	.003"		.016 ✓

Component ID:

W/B E-5

Serial No.:

5/N 01

Apollo

1207 W. Columbia Dr. Kennewick, Wa 99336

Title:

SPOOL PIECE
INSTALLED POSITION

Job No. M-126

Project: LFG Equipment Set

Scale:
None

Dwn By:
M. Gray

COMPONENT CLOSE-OUT DATA SHEET

Component Tag Number: INBEB

Component Name: SPOOL PIECE

Component S/N: 9/N 01

Vacuum Sealing Surfaces Inspection

By: ~~Bubba~~ 2-5-98

Buyer: NUE SFERSF

Cleanliness Inspection

By: John W. Long 2/5/98

Buyer: NUE SFERSF

O-Rings Installed

By: ~~Bubba~~ 2-5-98

Buyer: NUE SFERSF

Comments:

Rework Required:

Title

COMPONENT ALIGNMENT PROCEDURE

ATTACHMENT B

COMPONENT INSTALLATION DATA SHEET

Component Tag Number

INBE6

Component Name

5000 Piece

Component S/N

S/N-01

Component Installation Weight (lb.)

Component Installation Position
(Ref. Build Grid)

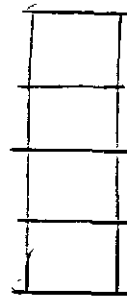
CORNER STA.

NORTH →

9.7

8.7

F



Signoffs (Contractor Unless Otherwise Noted)	By	Date
1. Shipping Cover Cross Hairs Verified	N/A	N/A
2. Component Located For Anchor Bolt Marking	Boblert	2-5-98
	Buyer: NUS	5 FEB 98
3. Final Component Location Complete	Boblert	2-5-98
	Buyer: NUS	5 FEB 98

Number

Rev.

SPECIFICATION

Number

A

V049-2-174

Rev.

1

Apollo Concrete Anchor Installation Report

Project: LIGO Vacuum Equipment Installation & Commissioning		Job No.: M-126	
Drawing: V049-5-001	Rev. A	Date: 2/9/98	
Item Anchored: WBEG	No. of Anchors: 4	Size: 1"	Type: HVA

Attribute	a. Installer	b. Accepted	c. N/A	d. Date
Anchor Type (HAS Std or Super)		BW		2/9/98
Spacing & Location		BW		2/9/98
Anchor Size & Length x 15 5/8"		BW		2/9/98
Hole Size 1 1/8"		BW		2/9/98
Hole & Core Condition (no voids, etc.)		BW		2/9/98
Embedment (minus 0 plus 1/8") 3 1/4"		BW		2/9/98
Angle (90 deg. ± 1deg.)		BW		2/9/98
Floor Scarified (ROVIAHEN)		WHR		2/17/98
Proper Nut Engagement		WHR		3-11-98
Tightening 250 FT. LB		WHR		3-11-98
Torque Device Identification: AP-9				

Open Items				
Item No.	Description	Corrective Action	Accept	Date

Comments:

Inspection by: (Completed) W.H. Meloy	Date: 3-11-98
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