

1. BOOTS

UV-resistant, weather-resistant polymer coated fabric. Light grey color.

TEST/METHOD	US FEDERAL STANDARD 191A OR ASTM	REQUIREMENT
Finished Weight (oz./sq. yd. min to max)	US Fed Std 191A & Method 5041	59.0 to 69.0 oz./yd2
Gauge (in.)	Method ASTM D-751	0.055 in. to 0.0625 in.
Breaking Strength (lbs. min "Grab")	Method ASTM D-751	Warp 400 Fill 350
Tearing Strength (lbs. min "Tongue")	Method ASTM D-751	Warp 25.0 Fill 25.0
Coating Adhesions (lbs/inch width)	Method ASTM D-751	15.0
Flame Resistance	US Fed Std 191A & Method MVSS302	Pass

DESIGNS AVAILABLE:	ZIPPERS AVAILABLE:
Concentric Conical	Heavy Duty Brass
Eccentric Conical	Water Seal Coil
Cylindrical	Zipper Sealant
Special Transition	

2. SPLIT COLLARS

Materials: Aluminum, SS 304, PTFE, Other

Supplied **Bored by APTD** to suit valve extension outer diameter or supplied **Non-Bored by APTD** (to be bored by Purchaser)

3. JOINT TAPE

Materials: Rubber Sealant, PTFE, Fire-Stop Caulking, Other

4. STAINLESS STEEL (SS 316) BAND CLAMPS

5. BOLTING

Materials: Carbon Steel, SS 304, SS 316, Carbon Steel XYLAN® coated, Other

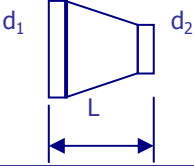
6. COLD BOX CASING BULKHEAD SLEEVE

Material: SS 304 } Sleeve Ring – 1 piece ; Angle Ring – 1 piece, 1 piece split or 2 pieces
 Other

7. EXPANDED METAL INSULATION BARRIER

Materials: 16 ga. Carbon Steel – Unpainted or Galvanized, 16 ga. SS 304, 16 ga. SS 316, Other

BOOT COMPONENTS	STYLE & MATERIALS	CODE
Boot	Concentric Conical	C1
	Eccentric Conical	C2
	Cylindrical	C3
	Special Transition	C4
Zipper	Heavy Duty Brass	B
	Water Seal Coil	C
	Zipper Sealant	ZS
Stem Collar	Aluminium	AL
	Stainless Steel SS 304	SS304
	PTFE	PTFE
	Other	OT
	Bored	B
	Non-Bored	NB
Joint Tape	Rubber Sealant	RB
	PTFE	PTFE
	Fire-Stop Caulking	
	Other	OT
Band Clamps	SS 316	SS16
Bolting	Carbon steel	CS
	Stainless Steel SS 304	SS4
	Stainless Steel SS 316	SS16
	Carbon Steel XYLAN® coated	CX
	Other	OT
Coldbox Casing Bulkhead Sleeve/Ring	SS 304 Sleeve ring	SR4
	SS 304 Angle ring	AR4
	Other	OT
	1pc or 2pc split/segment	1 or 2
Expanded Metal Insulation Barrier	16 ga Carbon Steel - Unpainted or Galvanized	CSU
	Other	OT

Boot Dimensions in inches (Large End d_1 - Small End d_2 - Length L) 	Boot Style	Boot Material Category
6.625-1.5(300#)-8		SD1
8.625-3(150#)-6		
8.625-6-6		
8.625-7.5-6		
8.625-4-10		
10.75-6-8		
10.75-6-8		
10.75-6.25-10		
10.75-6.286-10		
10.75-8.75-8		
12.75-9.3-15		
12.75-6-10		
12.75-8.75-10		
12.75-8.625-10		
14 -6-10		
14-8-10		
14-10.75-10		
14.125-8.125-8		
16-8.625-9		SD2
16-8.75-8		
18-6-10		
20-10(300#)-12		
22-18-10		
24-20-10		SD3
25-20-16		
25-10(600#)-12		
30-16-16		
36-24(150#)-10		
40-24-12		SDC
99.8-80-24		

Notes:

- 1) Standard Boot means pattern developed and prototype accepted.
- 2) Any size boot can be supplied. A 2-3 week lead time may be required for pattern development/pattern verification.

BOOT ASSEMBLY CODE (VBA – VALVE BOOTSSY) (PBA – PIPE BOOT ASSY)	BOOT MATL QTY CATEGORY			COLLAR (COL)					COLD BOX RING (CBR)	JOINT TAPE	CLAMPS
				MATERIAL			BORED/NON-BORED				
	SD1	SD2	SD3	AL	SS	PTFE	B	NB			
VBA-SD1	X									X	X
VBA-SD1-COL-AL-B	X			X			X			X	X
VBA-SD1-COL-AL-NB	X			X				X		X	X
VBA-SD1-COL-SS-B	X				X		X			X	X
VBA-SD1-COL-SS-NB	X				X			X		X	X
VBA-SD1-COL-PTFE-B	X					X	X			X	X
VBA-SD1-COL-PTFE-NB	X					X		X		X	X
VBA-SD1-COL-AL-B-CBR	X			X			X		X	X	X
VBA-SD1-COL-AL-NB-CBR	X			X				X	X	X	X
VBA-SD1-COL-SS-B-CBR	X				X		X		X	X	X
VBA-SD1-COL-SS-NB-CBR	X				X			X	X	X	X
VBA-SD1-COL-PTFE-B-CBR	X					X	X		X	X	X
VBA-SD1-COL-PTFE-NB-CBR	X					X		X	X	X	X
VBA-SD2-COL-AL-B		X		X			X			X	X
VBA-SD2-COL-AL-NB		X		X				X		X	X
VBA-SD2-COL-SS-B		X			X		X			X	X
VBA-SD2-COL-SS-NB		X			X			X		X	X
VBA-SD2-COL-PTFE-B		X				X	X			X	X
VBA-SD2-COL-PTFE-NB		X				X		X		X	X
VBA-SD2-COL-AL-B-CBR		X		X			X		X	X	X
VBA-SD2-COL-AL-NB-CBR		X		X				X	X	X	X
VBA-SD2-COL-SS-B-CBR		X			X		X		X	X	X
VBA-SD2-COL-SS-NB-CBR		X			X			X	X	X	X
VBA-SD2-COL-PTFE-B-CBR		X				X	X		X	X	X
VBA-SD2-COL-PTFE-NB-CBR		X				X		X	X	X	X

Continued

BOOT ASSEMBLY CODE (VBA – VALVE BOOT ASSY) (PBA – PIPE BOOT ASSY)	BOOT MATL QTY CATEGORY			COLLAR (COL)					COLD BOX RING (CBR)	JOINT TAPE	CLAMPS
				MATERIAL			BORED/NON-BORED				
	SD1	SD2	SD3	AL	SS	PTFE	B	NB			
VBA-SD3			X							X	X
VBA-SD3-COL-AL-B			X	X			X			X	X
VBA-SD3-COL-AL-NB			X	X				X		X	X
VBA-SD3-COL-SS-B			X		X		X			X	X
VBA-SD3-COL-SS-NB			X		X			X		X	X
VBA-SD3-COL-PTFE-B			X			X	X			X	X
VBA-SD3-COL-PTFE-NB			X			X		X		X	X
VBA-SD3-COL-AL-B-CBR			X	X			X		X	X	X
VBA-SD3-COL-AL-NB-CBR			X	X				X	X	X	X
VBA-SD3-COL-SS-B-CBR			X		X		X		X	X	X
VBA-SD3-COL-SS-NB-CBR			X		X			X	X	X	X
VBA-SD3-COL-PTFE-B-CBR			X			X	X		X	X	X
VBA-SD3-COL-PTFE-NB-CBR			X			X		X	X	X	X
PBA-SD1	X										X
PBA-SD1-CBR	X								X		X
PBA-SD2		X									X
PBA-SD2-CBR		X							X		X
PBA-SD3			X								X

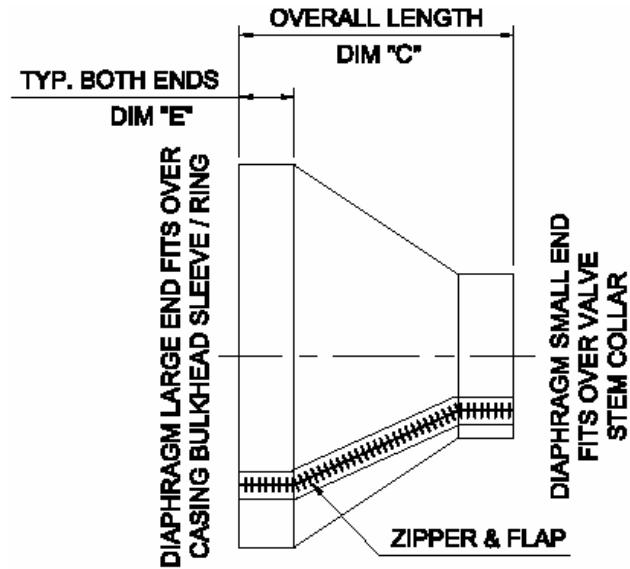


Figure 103.1

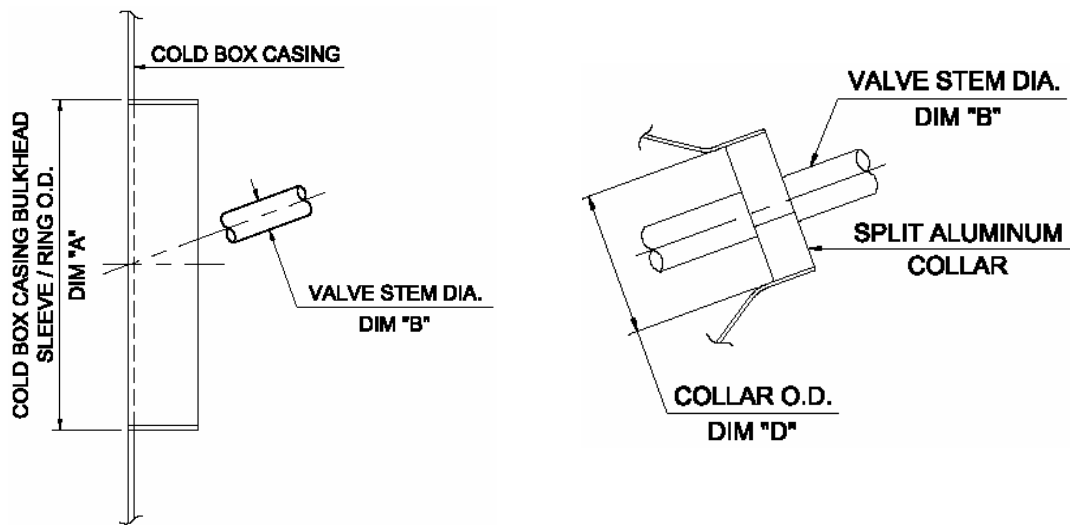


Figure 103.2

Figure 103.3

Form 200 Valve Boot Data

Item	Coldbox Sleeve/ Ring OD	Valve Stem Dia.	Boot Overall Length	Collar OD	Sleeve/Ring Length	Notes/Details
	Dim A	Dim B	Dim C	Dim D	Dim E	
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
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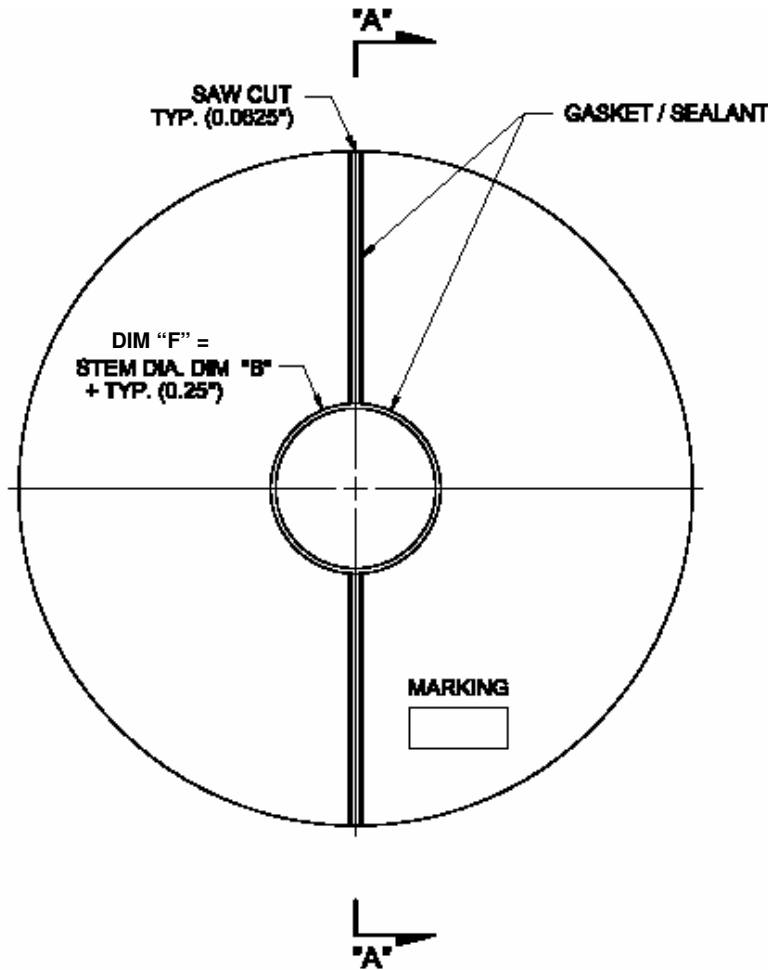


Figure 104.1 Plan View

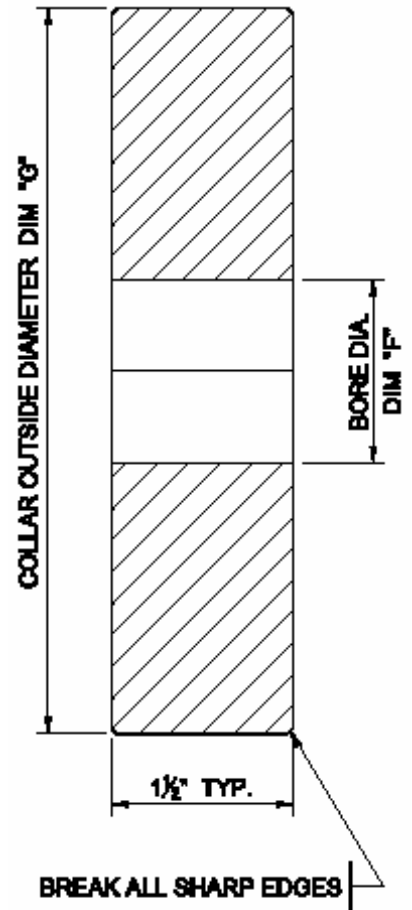


Figure 104.2 Side View

Form 104 Collar Data

Item	Valve Stem Diameter	Collar Outside Diameter	Collar Bore Diameter	Material	Notes / Details
	Dim B	Dim G	Dim F		
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
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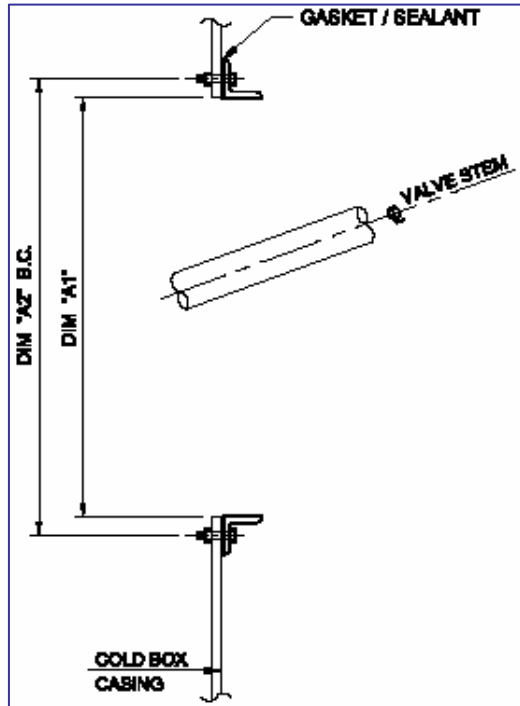


Figure 105.1 Side View

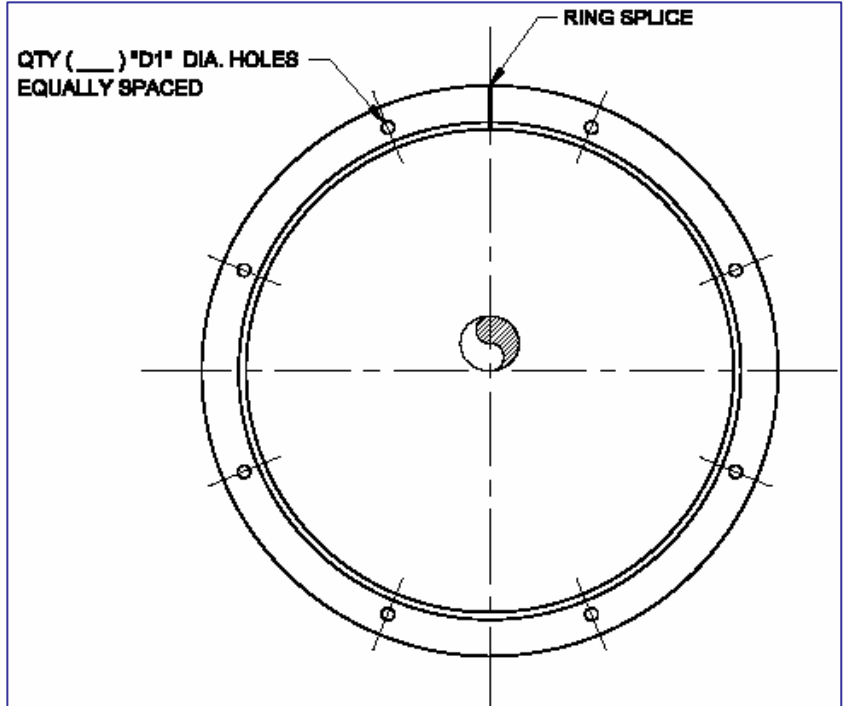


Figure 105.2 One Piece Split or Unsplit Arrangement

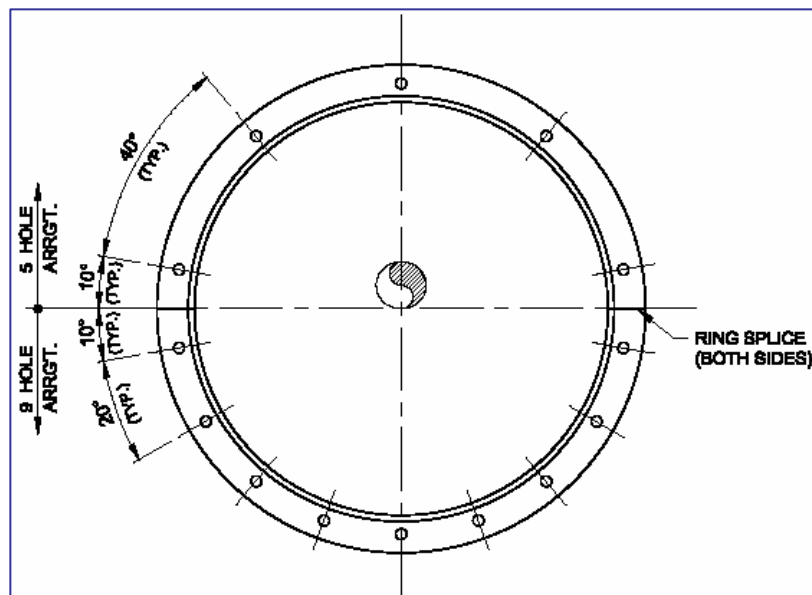


FIGURE 105.3 Two Piece Arrangement

Form 105 Coldbox Bulkhead Angle Ring Data

Item	Angle Size	1 Pc.	1 Pc. Split	2 Pc.	Opening Dia.	Bolt Circle	Bolt Qty	Bolt Dia.	Notes / Details
					Dim A1	Dim A2		Dim D1	
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
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14									
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16									
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18									
19									
20									

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Figure 110.1 Valve Actuator Position (Minimum) Extension from Cold Box Face



Figure 110.3 Valve Actuator Position (Maximum) Extension from Cold Box Face



Figure 110.2 Valve Stem at Highest Elevation Position



Figure 110.4 Valve Stem at Lowest Elevation Position



Figure 110.5 Inverse Installation



Figure 110.7 Inverse Installation



Figure 110.6 Conventional Installation



Figure 110.8 Conventional Installation



Figure 120.1 Old Cold Box without CB Casing Bulkhead Sleeve/Ring



Figure 120.3 Completed Installation of CB Casing Bulkhead Ring



Figure 120.2 Installation of CB Casing Bulkhead Ring



Figure 120.4 Installation of Stem Collar



Figure 120.5 CB Boot Installation Complete



Figure 120.7 CB Boot Installation Complete



Figure 120.6 CB Boot Installation Complete



Figure 120.8 New and Old CB Boot



Figure 130.1 Pipe to Pipe Boots.
Finished Product.



Figure 130.3 Valve Boots.
Finished Product.



Figure 130.2 Pipe to Pipe Boots.
Finished Product.



Figure 130.4 Valve Boots.
Finished Product.



Figure 130.5 96" – 98" Pipe to Pipe Boot Size Verification



Figure 130.6 96" – 98" Pipe to Pipe Boot Size Verification

Table 140.1 Typical Field Audit Data Report

Item	Tag No. & Valve Mfg.	Location	Stem Dia.	Special S/S Collar	Boot Length	Remarks
1	LV 836 NJ	Liquefier Box Ground level	2 ½"	18 ½" OD (17 ½" BOC)	6"	Purged line interference.
2	FV 309 NJ	Liquefier Box 1 st Platform	3 ½"	18 ½" OD (17 ½" BOC)	5"	New bulkhead sleeve required.
3	TV 847 NJ	Liquefier Box 1 st Platform	2 ½"	18 ½" OD (17 ½" BOC)	Max 5"	
4	LV 830B NJ	Liquefier Box Ground level	2 ½"	18 ½" OD (17 ½" BOC)	7 ½"	Purged line interference.
5	LV 830A NJ	Liquefier Box Ground level	2 ½"	18 ½" OD (17 ½" BOC)	7"	
6	Xv 851B Unknown	Liquefier Box Ground level	2"	18 ½" OD (17 ½" BOC)	Max 2"	Bolts interference from packing gland.
7	FV 310 ST	Liquefier Box Ground level	1 3/8"	14 ½" OD (13 ½" BOC)	Max 5"	
8	W-N392 ST	Liquefier Box Ground level	1 3/4"	18 ½" OD (17 ½" BOC)	Max 3 ½"	Collar inside box.
9	FV 819 ST	Liquefier Box Ground level	2 5/8"	18 ½" OD (17 ½" BOC)	Max 1"	Stem resting on collar sleeve base.
10	LV 529 A NJ	ASU Cold Box 1 st Platform	2"	18 ½" OD (17 ½" BOC)	7"	Need to move bolts upward to avoid 6" hub.

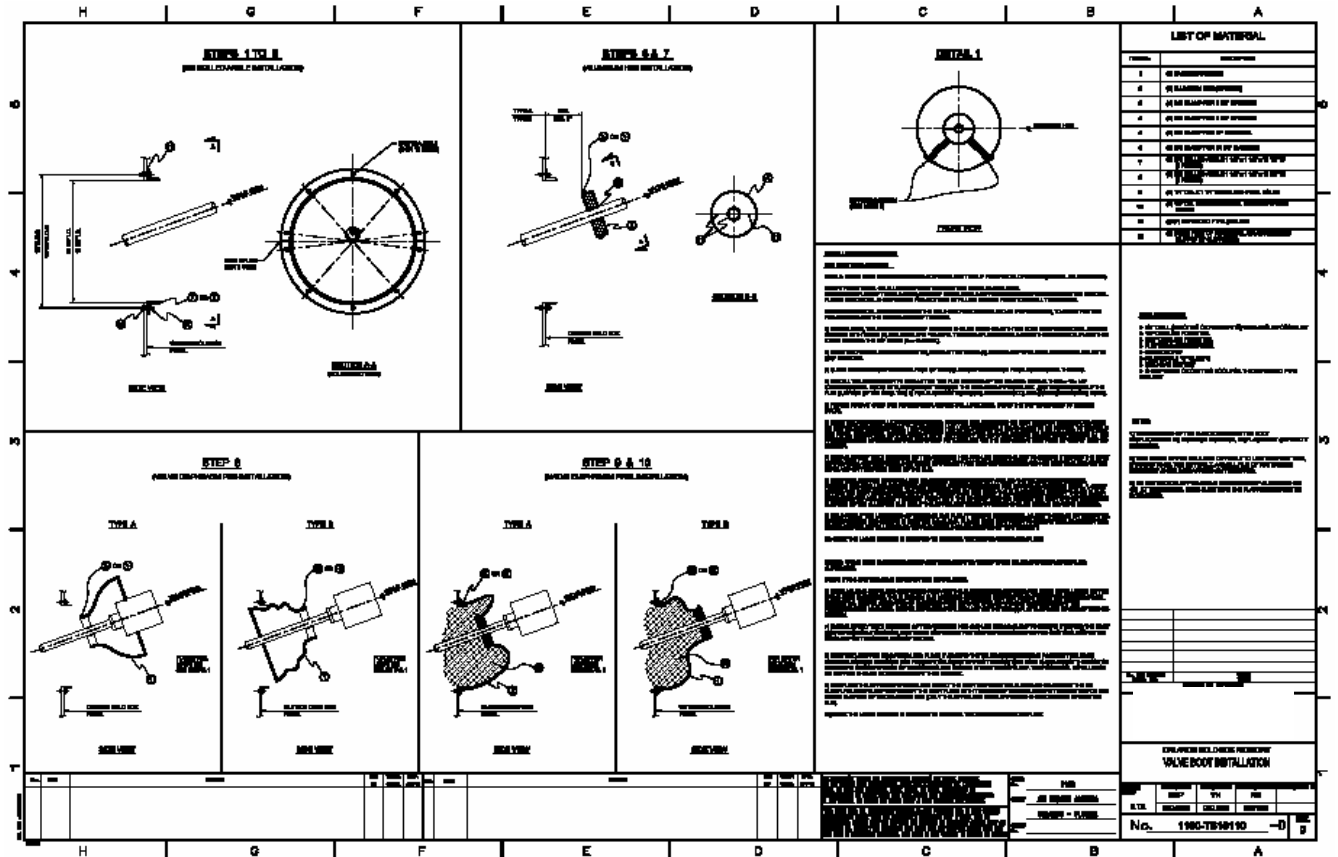


Figure 140.2 Typical As Built Drawing with Installation Instructions