



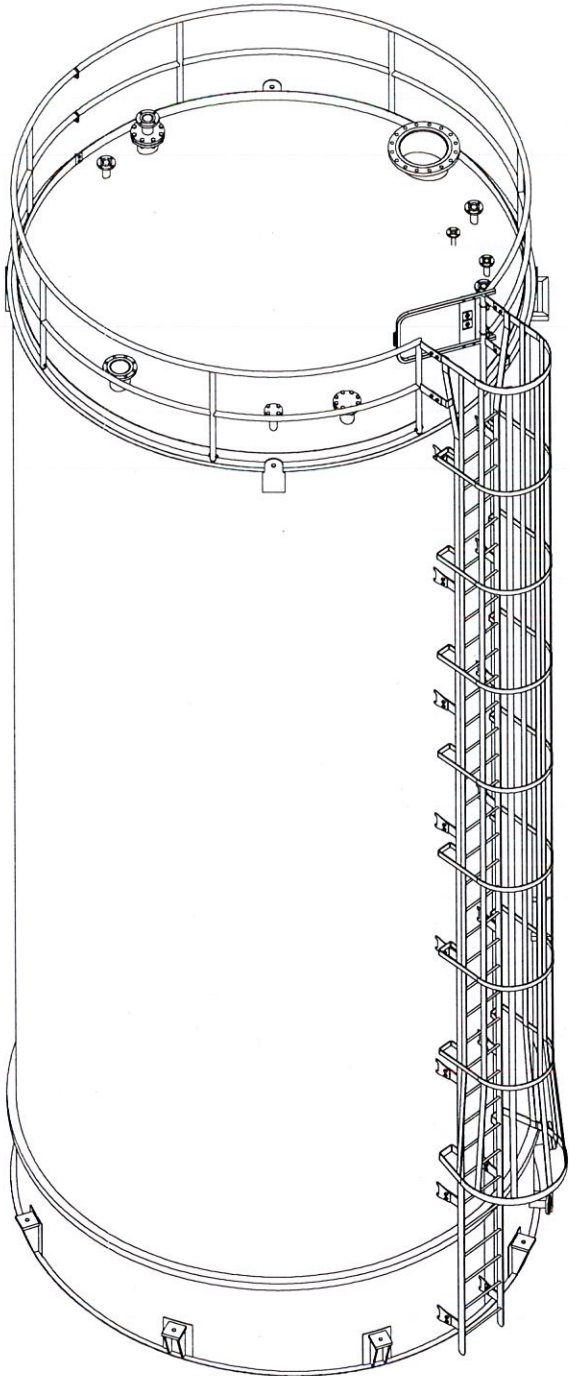
STAINLESS FABRICATION, INC.

4455 W Kearney St | Springfield MO 65803 | 417-865-5696 | www.stainlessfab.com

Section 3

ENGINEERING DRAWINGS

NzI	SERVICE	ITEM	QTY	PART #	DESCRIPTION	MATERIAL
		1.00	1		SHELL, 3/16" PL. X 168" I.D. X 416 7/8" S.W.	SA240-304/304L
		2.00	1		TOP HEAD, 3/16" PL. CONICAL X 169 3/16" I.D. X 150° I.A.	SA240-304/304L
		2.01	1		RIM ANGLE, 2" X 2" X 1/4" THK. ANGLE X 168 3/8" I.D. (ROLL LEG OUT)	SA479-304/304L
		3.00	1		BOTTOM HEAD, 1/4" PL. FLAT & PITCHED X 172 3/8" O.D.	SA240-304/304L
		4.00	8		TOP PLATE, 1" THK. X 6" LG. X 6" WD. W/ (1) 1 1/4" DIA. HOLE	SA240-304/304L
		4.01	16		GUSSET, 1/2" PL. X 6" WD. X 12" LG. (TRIM A/R)	SA240-304/304L
		4.02	8		REPAD, 1/4" PL. X 10" WD. X 14" LG.	SA240-304/304L
		5.00	1		VACUUM RING, 1/4" X 3" X 3" ANGLE X 84 1/4" I.S.R. (ROLL LEG IN)	SA479-304/304L
N1	TOP MANWAY/ EMERGENCY VENT	6.00	1	FL-12-01600010	16" CLASS 150 ASME B16.5 R.F. SLIP-ON FLANGE	SA182-304/304L
		6.01	1	CO-12-160003751300	COLLAR, 3/8" PL. X 16" O.D. X 13" S.W.	SA240-304/304L
N2	LEVEL TRANSMITTER	7.00	1	FL-12-00200010	2" CLASS 150 ASME B16.5 R.F. SLIP-ON FLANGE	SA182-304/304L
		7.01	1	PI-12-020008010700	2" SCH. 80S PIPE X 7" LG.	SA312-304/304L
N3	VAPOR RECOVERY	8.00	1	FL-12-00200010	2" CLASS 150 ASME B16.5 R.F. SLIP-ON FLANGE	SA182-304/304L
		8.01	1	PI-12-020008010700	2" SCH. 80S PIPE X 7" LG.	SA312-304/304L
N4	PV VENT	9.00	1	FL-12-00600010	6" CLASS 150 ASME B16.5 R.F. SLIP-ON FLANGE	SA182-304/304L
		9.01	1	PI-12-060004010900	6" SCH. 40S PIPE X 9" LG.	SA312-304/304L
N5	PRESSURE/ LEVEL TRANSMITTER	10.00	1	FL-12-00200010	2" CLASS 150 ASME B16.5 R.F. SLIP-ON FLANGE	SA182-304/304L
		10.01	1	PI-12-020008010900	2" SCH. 80S PIPE X 9" LG.	SA312-304/304L
N6	LEVEL SWITCH	11.00	1	FL-12-00200010	2" CLASS 150 ASME B16.5 R.F. SLIP-ON FLANGE	SA182-304/304L
		11.01	1	PI-12-020008010900	2" SCH. 80S PIPE X 9" LG.	SA312-304/304L
N7	NITROGEN	12.00	1	FL-12-00150010	1 1/2" CLASS 150 ASME B16.5 R.F. SLIP-ON FLANGE	SA182-304/304L
		12.01	1	PI-12-015008010700	1 1/2" SCH. 80S PIPE X 7" LG.	SA312-304/304L
N8	THERMOWELL	13.00	1		THERMOWELL, 1 1/2" X 7 1/2" STM X 6" INS X .260" BORE (LAG INC) 1 1/2"-260WELD-IN-U6	304/304L
N9	BELOW SURFACE ADDITION	14.00	1	FL-12-00600010	6" CLASS 150 ASME B16.5 R.F. SLIP-ON FLANGE	SA182-304/304L
		14.01	1	PI-12-060004010900	6" SCH. 40S PIPE X 9" LG.	SA312-304/304L
		14.02	1	FL-12-00300010	3" CLASS 150 ASME B16.5 R.F. SLIP-ON FLANGE	SA182-304/304L
		14.03	1		6" CLASS 150 ASME B16.5 R.F. BLIND FLANGE W/ (1) 3 9/16" DIA. HOLE	SA182-304/304L
		14.04	1		3" SCH. 40S PIPE X 421 1/8" LG.	SA312-304/304L
		14.05	1	FL-82-00600010	6" CLASS 150 FLANGE GASKET	BLACK EPDM
		14.06	8	FS-61-07530010	BOLT, 3/4"-10UNC HEX X 3" LG.	SA193-B8
		14.07	8	FS-64-07500030	NUT, 3/4"-10UNC HEAVY HEX	SA194-Gr. 8
		14.08	3		DIP PIPE GUIDE, 4" SCH 10S X 4" LG. (SWAGE A/R)	SA312-304/304L
		14.09	6		PIPE GUIDE BRACE, 1/4" X 2" F.B. X 13 1/2" LG.	SA240-304/304L
N10	BOTTOM OUTLET	15.00	1	FL-12-10000100	4" CLASS 150 ASME B16.5 R.F. SLIP-ON FLANGE	SA182-304/304L
		15.01	1	PI-12-040004011300	4" SCH. 40S PIPE X 13" LG.	SA312-304/304L
N11	SIDE MANWAY	16.00	1	MW-API-024-2	24" API-650 MANWAY W/ BLACK EPDM GASKET & (28) 3/4"-10 X 2 3/4" LG. HEAVY HEX BOLTS & 3/4"-10 HEAVY HEX NUTS	304/304L
		16.01	1	EX-DVT-124	DAVIT ARM ASSEMBLY FOR 24" API-650 DESIGN MANWAY	
N12	SPARE	17.00	1	FL-12-00200010	2" CLASS 150 ASME B16.5 R.F. SLIP-ON FLANGE	SA182-304/304L
		17.01	1	PI-12-020008010900	2" SCH. 80S PIPE X 9" LG.	SA312-304/304L
N13	SPARE	18.00	1	FL-12-10000100	4" CLASS 150 ASME B16.5 R.F. SLIP-ON FLANGE	SA182-304/304L
		18.01	1	PI-12-040004010900	4" SCH. 40S PIPE X 9" LG.	SA312-304/304L
N14	BOTTOM OUTLET SPARE	19.00	1	FL-12-10000100	4" CLASS 150 ASME B16.5 R.F. SLIP-ON FLANGE	SA182-304/304L
		19.01	1	PI-12-040004010700	4" SCH. 40S PIPE X 7" LG.	SA312-304/304L
		20.00	1		DATA PLATE, STD. SFI DATA PLATE	316/316L
		21.00	1		NAME PLATE, STD. SFI SHOP NAME PLATE	316/316L
		22.00	4	LL-12-20000082	LIFTING LUG, CHANNEL STYLE FOR 20,000 LB TANK (REF. DWG. NO. EX-LLG-008)	SA240-304/304L
		23.00	1	FL-12-00200011	2" CLASS 150 ASME B16.5 R.F. BLIND FLANGE	SA182-304/304L
		24.00	2	FL-12-10000100	4" CLASS 150 ASME B16.5 R.F. R.F. BLIND FLANGE	SA182-304/304L
		25.00	2	FL-82-00400010	4" CLASS 150 FLANGE GASKET	BLACK EPDM
		26.00	1	FL-82-00200010	2" CLASS 150 FLANGE GASKET	BLACK EPDM
		27.00	4	FS-61-06325010	BOLT, 5/8"-11UNC HEAVY HEX X 2 1/2" LG.	SA193-B8
		28.00	20	FS-64-06300030	NUT, 5/8"-11UNC HEAVY HEX	SA194-Gr. 8
		29.00	16	FS-61-06330010	BOLT, 5/8"-11UNC HEAVY HEX X 3" LG.	SA193-B8
N15	PILOT SENSING LINE	30.00	1	FL-12-00100010	1" CLASS 150 ASME B16.5 R.F. SLIP-ON FLANGE	SA182-304/304L
		30.01	1	PI-12-010008010700	1" SCH. 80S PIPE X 7" LG.	SA312-304/304L
		31.00	4		PIPE SUPPORT, 2" X 2" X 1/4" ANGLE X 18" LG. (MITER ENDS)	SA479-304/304L
		31.01	4		PIPE SUPPORT, 2" X 2" X 1/4" ANGLE X 6 1/2" LG. (MITER ONE END)	SA479-304/304L
		31.02	4		PIPE SUPPORT, 2" X 2" X 1/4" ANGLE X 6 1/2" LG. (MITER ONE END)	SA479-304/304L
		32.00	1		LADDER (REF.)	
		33.00	1		HANDRAIL (REF.)	



13585-1
(ETHANOL STORAGE TANK)

CERTIFIED AS-BUILT

Drawing Set Reviewed, Checked And Approved By:

Jeffrey W Brunson

Digitally signed by Jeffrey W Brunson
DN: cn=Jeffrey W Brunson,
ou=Engineering,
o=Stainless Fabrication Inc.,
email=jbrunson@stainlessfab.com
Reason: I am approving this document
Location: your signing location here
Date: 2021-01-25 10:14:07
Foxit ReaderPDF Version: 9.7.2

E	CERTIFIED AS-BUILT	J3		SM	1/22/2021
D	ITEM 1.00 WAS 455 7/8" S.W., ITEM 14.04 WAS 321 7/8" LG., EST. EMPTY WEIGHT WAS 18641 lbs.	CD	SW	JB	1/4/2021
C	REVISED FOR CONSISTENCY	DS	SW	JB	10/29/2020
B	N04 (ITEMS 9.00 & 9.01) WERE 3" SCH 40S.	DS	JK	JB	10/27/2020
A	ELEVATION & PLAN VIEW MOVED TO PAGE -M2; N8 (ITEM 13.00) WAS 8" INSERTION; ADDED ITEMS 14.08 & 14.09; ADDED ITEMS 30.00 THRU 33.00; EMPTY WEIGHT WAS 17171 LBS.; ADDED ISOMETRIC VIEW; RELEASED FOR FABRICATION.	DS	SW	JB	9/28/2020
REV	DESCRIPTION	DESIGNER	CHECKED BY	ENGINEER	DATE

- GENERAL NOTES & SPECIFICATIONS
1. Flange Bolt Holes To Straddle Major Vertical & Horizontal Vessel Center Lines Unless Indicated Otherwise.

2. The Corrosion Resistance Of The Equipment Is Not The Responsibility Of Stainless Fabrication, Inc.

3. Suitable Pressure- and/or Vacuum Relief Valve(s) Must Be Installed By Customer For Vessel and/or Heat Transfer Surface Operation.

4. Production To Provide Protection For All Nozzles & Fittings Prior To Shipment. Vessel Must Be Adequately Vented.

5. Weld Seams In Vessel Head & Shell Shall Be Located Where Possible To Avoid Nozzles, Access Openings, & Reinf. Pads.

6. All Reinforcement Pads Must Be Provided With (1) 1/8" Dia. Weephole, Located At Lowest Point When Vessel Is In Its Normal Operating Position. If No Lag Weld Pad Is Required, Drill (1) 3/16" Dia. Weephole In Lowest Point Of Pipe Leg.

7. Dye Penetrant Test All Product Containment Welds.

8. Tolerances Per SFI Standard Dimensional And Fabrication Tolerance Specification QC-800.

9. The Data Plate Shall Include The Customer Purchase Order Number and Tank Tag Number If Listed On This Drawing.

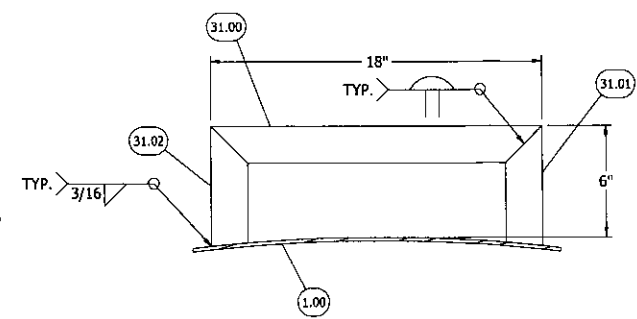
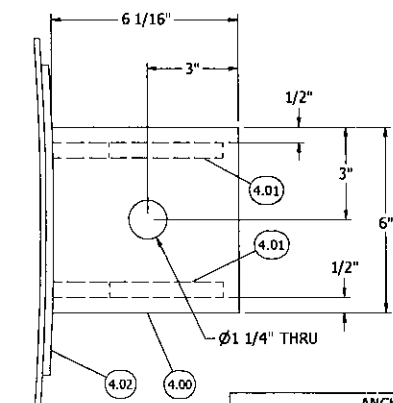
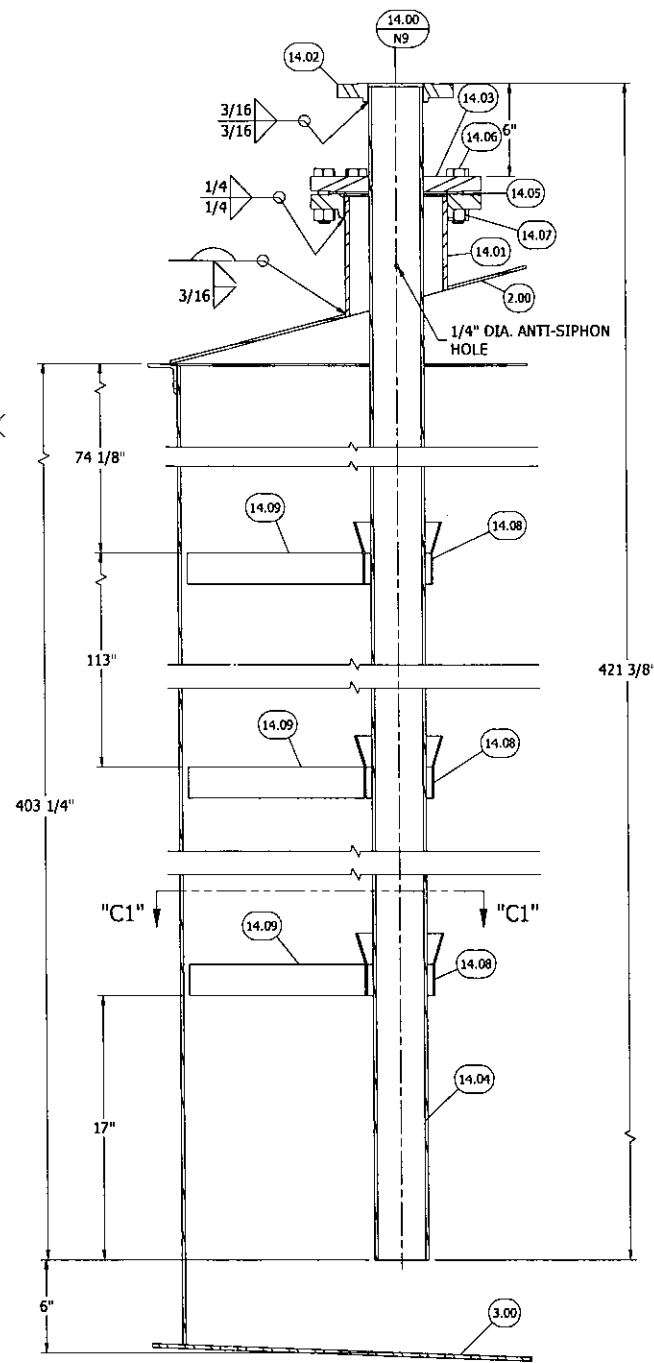
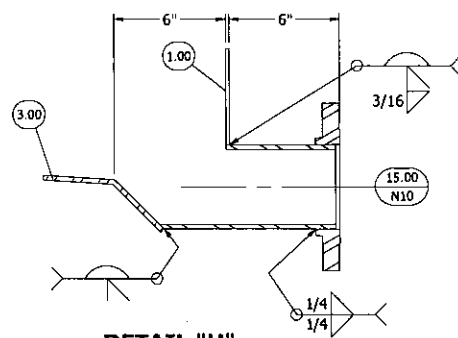
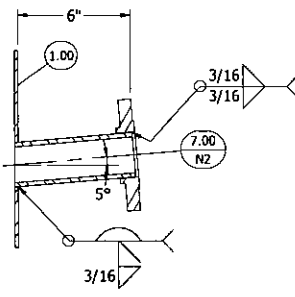
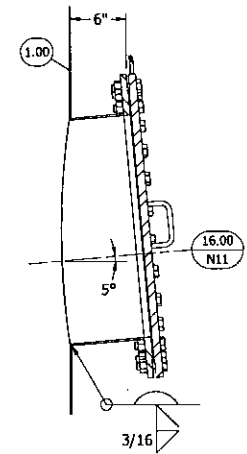
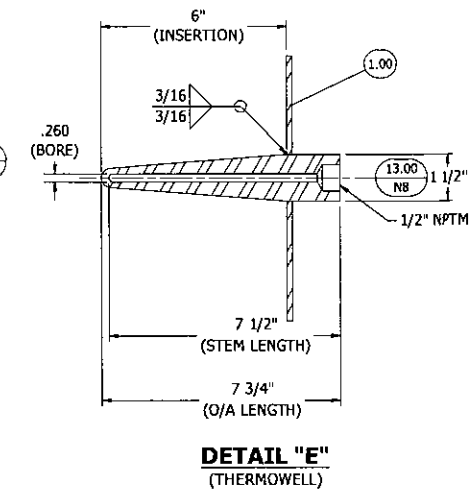
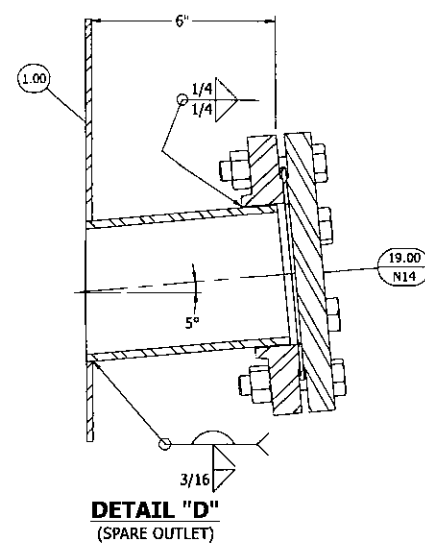
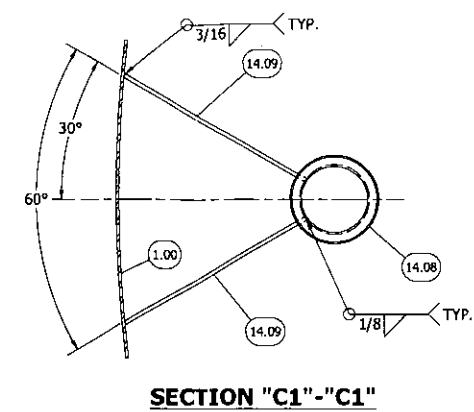
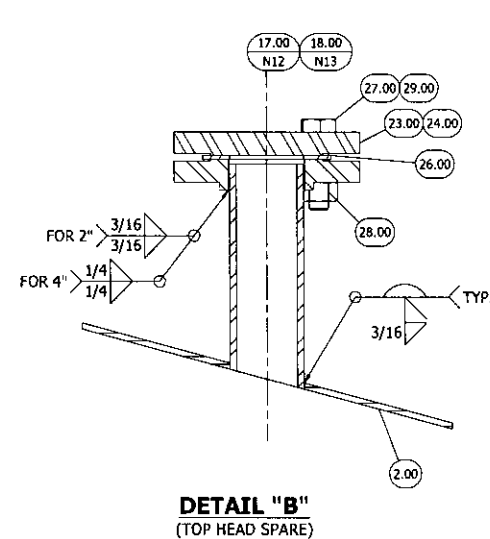
10. Unless Otherwise Specified, The Shop Is To Locate Lifting Lugs On Tank Such That Lugs Are At 3 O'clock And 9 O'clock As It Ships. Spreader Beams Required.

11. Vessel Is Designed Per API-650; No Marking

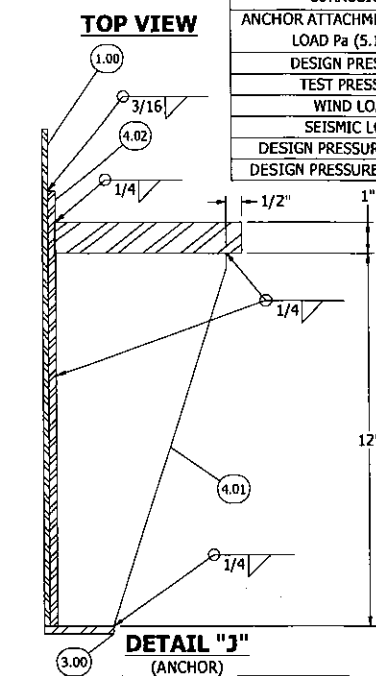
12. All Removable Dip Tubes Shall Have Their Item Number And Associated Nozzle Number Permanently Inscribed On The Tank Exterior Non-Wetted Surface.

M.T.R.'S REQUIRED
(ALL PARTS & WELD WIRE)

SPECIFICATIONS		VESSEL	HEAT TRANSFER SURFACE	DRAWN	DANIEL STAUFFER	DATE	8/25/2020
ASME Code, Sec. VIII, div. 1.		NOTE 11		CHECKER	SCOTT WALLACE	DATE	8/31/2020
Inspection & Stamped		NOTE 11		ENGINEER	JEFF BRUNSON	DATE	9/1/2020
Max. Design Temp. °F		225		TITLE ETHANOL STORAGE TANK T-110 SHEET 1 OF 5			
Max. Design Pressure, PSIG		1					
Corrosion Allowance, Inch		0					
Specific Gravity		1.0					
Hydrostatic Test, PSIG		NOTE 7					
Vacuum Design, PSIG		.145					
Radiograph		NONE					
HEAT TRANSFER SURFACE N/A				QUANTITY	(1) ONE	EST. EMPTY WEIGHT	17562 lbmass
MATERIAL FINISH				CUSTOMER EPIC SYSTEMS GROUP LLC			
INTERIOR 2B/MILL		EXTERIOR 2B/MILL		ADDRESS 4142 MERAMEC BOTTOM ROAD ST. LOUIS, MO 63129			
WELD FINISH				SHIP TO ST. LOUIS, MO 63129			
INTERIOR BF		EXTERIOR BF		CUSTOMER ORDER NO. 55341			
PAINT NONE				This Drawing Is The Property Of Stainless Fabrication, Inc. Do Not Print, Photograph, Copy, Or Use For Any Purpose Other Than That For Which It Is Specifically Furnished			
CHECKED BY							
ENGINEERED BY							
APPROVED 		RESERVED		Stainless Fabrication, Incorporated 4455 W. Kearney Springfield, MO 65803 (417) 865-5696 			
				DRAWING NO. 13585-1-M1 REV E			



ANCHOR BOLT LOADING		
UPLIFT LOAD CASE (1" DIAMETER MIN BOLT, 36 KSI YIELD, ADD FOR CORROSION)	TENSION (LBF) (PER BOLT)	SHEAR (LBF) (PER BOLT)
ANCHOR ATTACHMENT DESING LOAD Pa (5.12.12)	16973	0
DESIGN PRESSURE	6617	0
TEST PRESSURE	6617	0
WIND LOAD	2423	0
SEISMIC LOAD	4551	0
DESIGN PRESSURE + WIND	5856	0
DESIGN PRESSURE + SEISMIC	5658	0

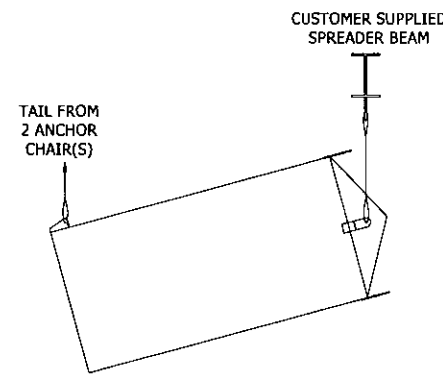


DETAIL "F"
(MANWAY)

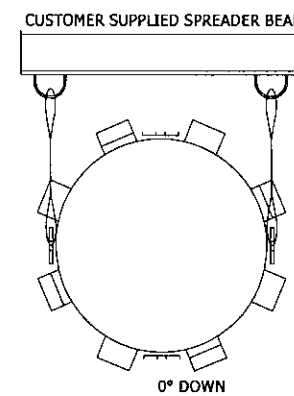
DETAIL "G"
(SIDEWALL CONNECTION)

DETAIL "H"
(OUTLET)

DETAIL "K"
(PIPE SUPPORT)



LIFTING ELEVATION
(SPREADER BEAM WITH TAILING LUGS)

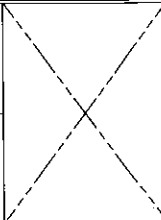


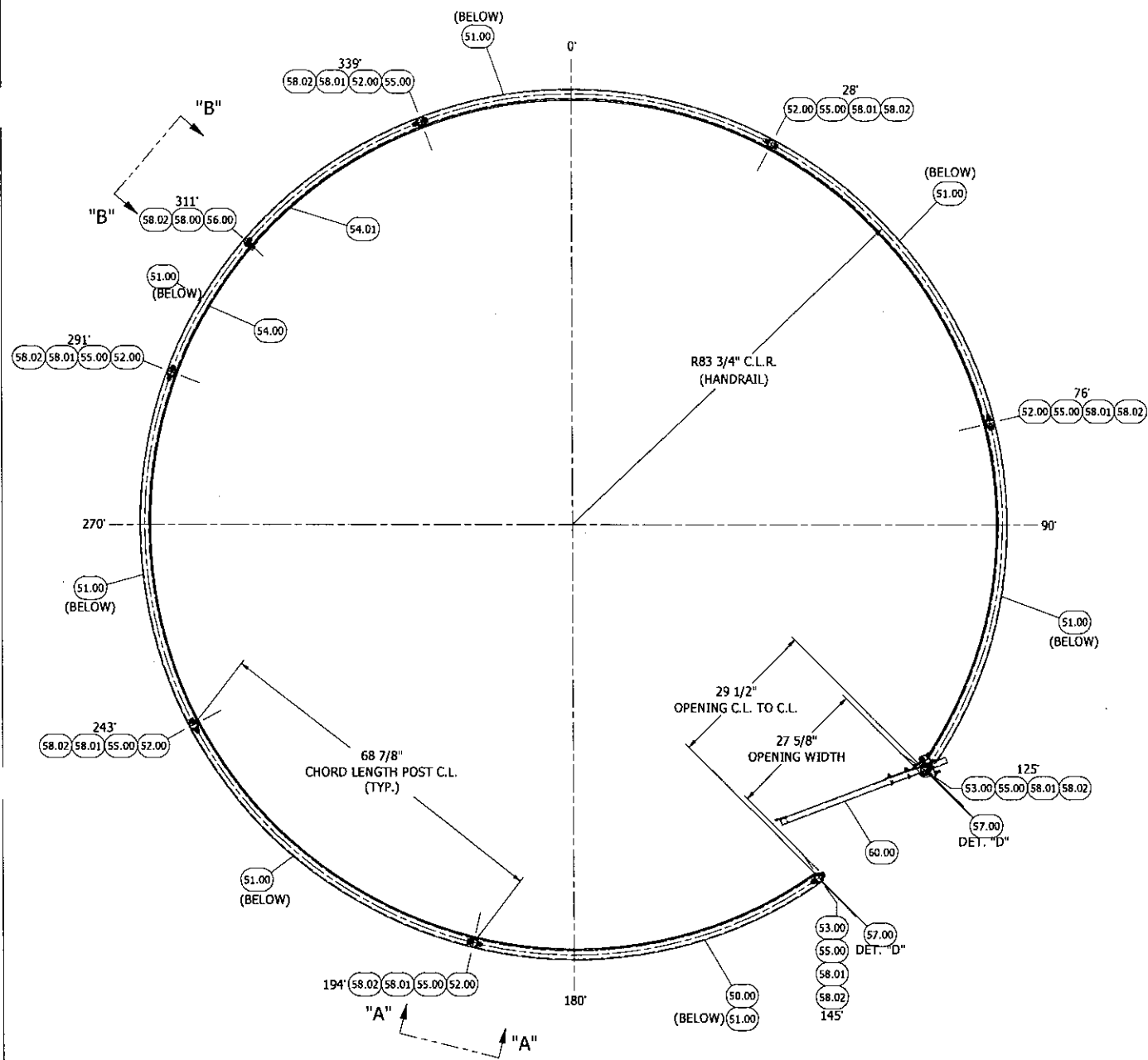
LIFTING END VIEW
(SPREADER BEAM USING TWO LUGS)

DETAIL "C"

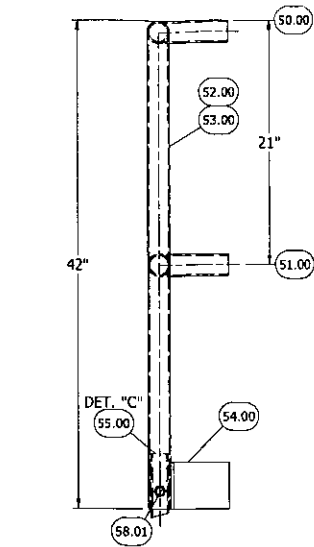
(BIP)	CERTIFIED AS-BUILT
D	421 3/8" DIMENSION IN DET. "C" WAS 322 1/8". ITEM 14.08 & 14.09 WERE SPACED 76" APART, ITEM 14.04 WAS 144 1/4" OFF THE BOTTOM HEAD IN DET. "C".
C	REVISED FOR CONSISTENCY
B	ADDED 6" WELDMENT TO DETAIL "A".
A	ADDED NEW SHEET; RELEASED FOR FABRICATION.
REV	DESCRIPTION

	J3		SM	1/22/2021
	CD	SW	JB	1/4/2021
	DS	SW	JB	10/29/2020
	DS	JK	JB	10/27/2020
	DS	SW	JB	9/28/2020
	DESIGNER	CHECKED BY	ENGINEER	DATE

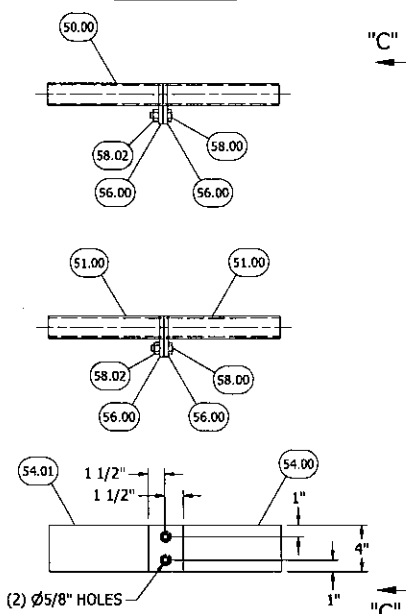
DRAWN	DANIEL STAUFFER	DATE	8/25/2020
CHECKED	SCOTT WALLACE	DATE	8/31/2020
DESIGN WORK APPROVED	JEFF BRUNSON	DATE	9/1/2020
DETAILS			
SHEET 3 OF 5			
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Stainless Fabrication, Incorporated 4455 W. Kearney Springfield, MO 65803 (417) 865-5696			
CHECKED BY			
ENGINEERED BY			
THIS DRAWING IS THE PROPERTY OF STAINLESS FABRICATION, INC. IT IS TO BE USED FOR THE PROJECT AND LOCATION SPECIFICALLY IDENTIFIED HEREON. IT IS NOT TO BE REPRODUCED, COPIED, OR USED FOR ANY OTHER PROJECT OR LOCATION WITHOUT THE WRITTEN PERMISSION OF STAINLESS FABRICATION, INC. ANY VIOLATION OF THIS NOTICE WILL BE PROSECUTED TO THE FULL EXTENT OF THE LAW.			
DRAWING NO. 13585-1-D3			
			REVISION



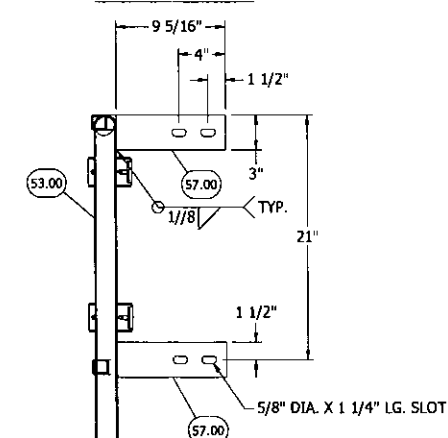
PLAN VIEW



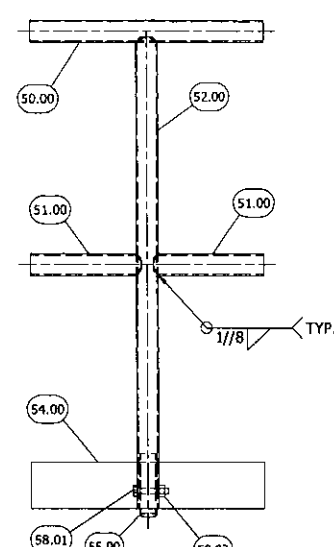
ELEVATION



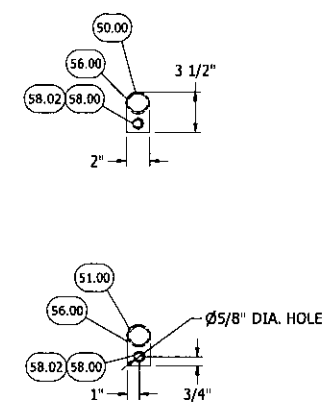
VIEW "B"-"B"



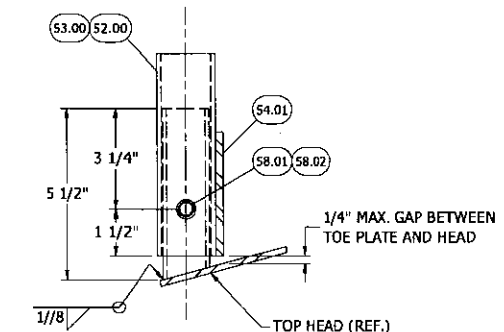
DETAIL "D"
(LADDER CLIP)



VIEW "A"-"A"



VIEW "C"-"C"



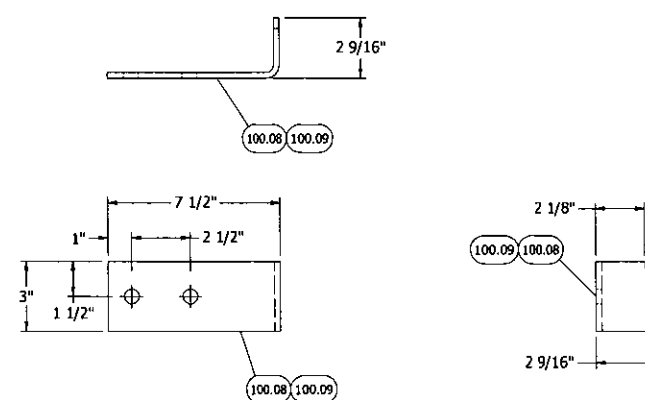
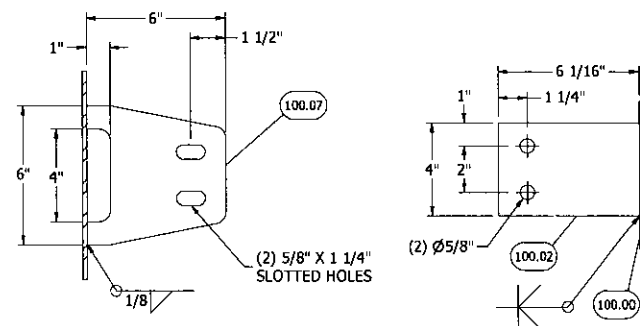
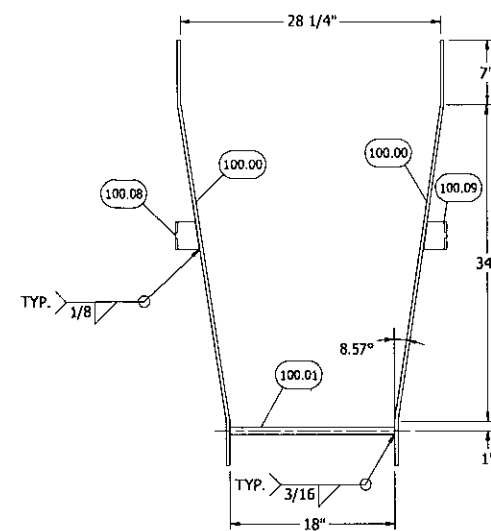
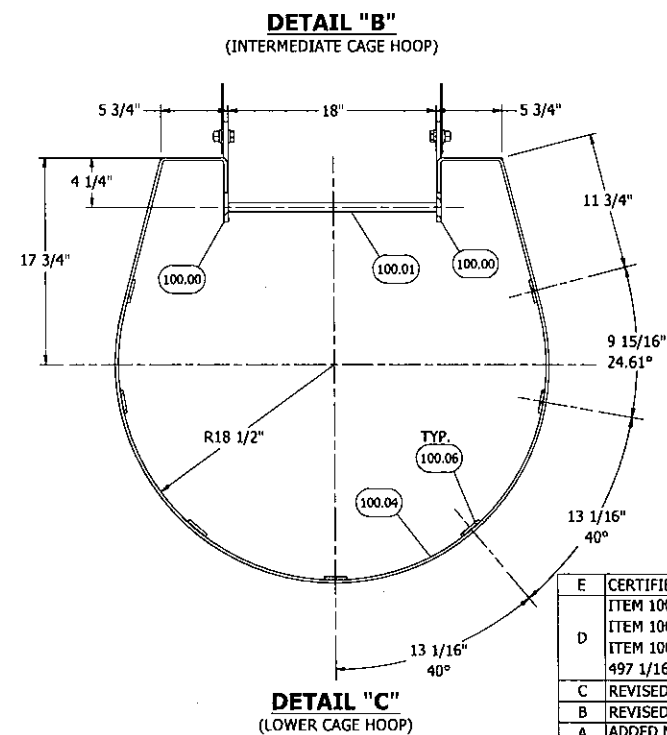
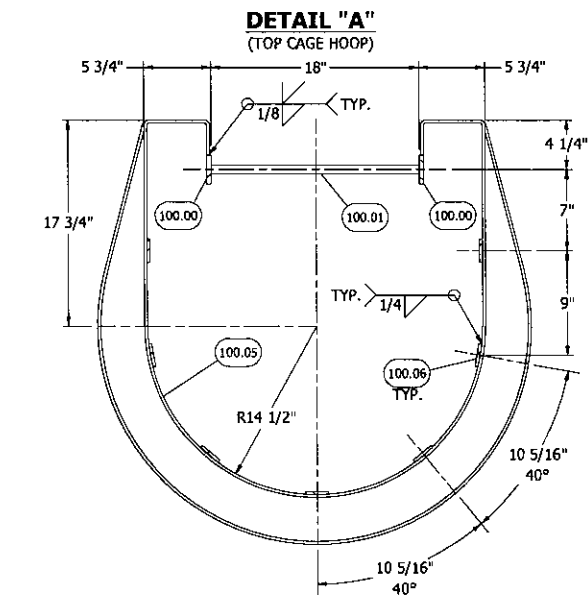
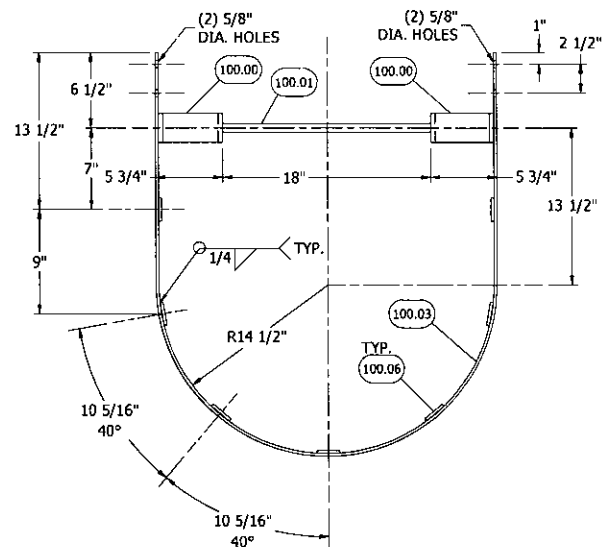
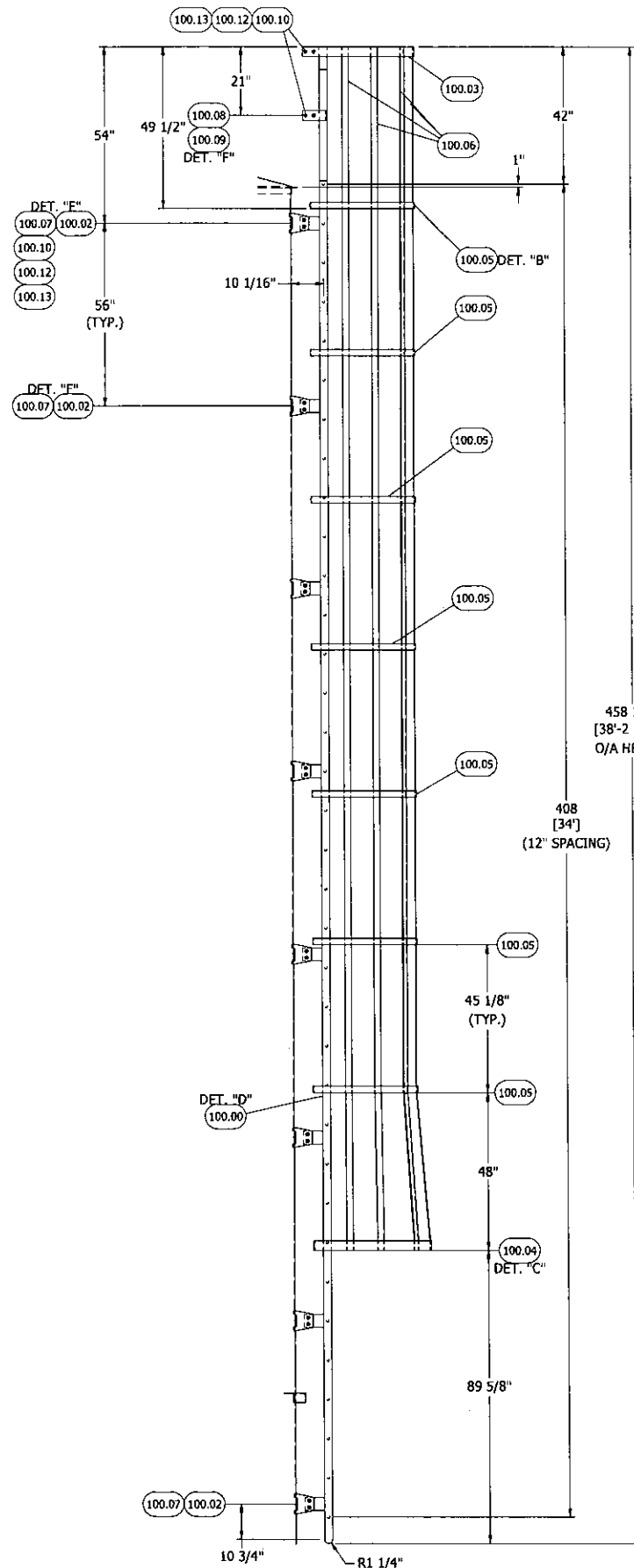
DETAIL "C"
(POST STUB)

ITEM	QTY	PART #	DESCRIPTION	MATERIAL
50.00	1		TOP RAIL, 1 1/2" SCH. 40S PIPE X 498 9/16" LG. (ROLL TO 83 3/4" C.L.R.) (MITERED ENDS)	A500-Gr. B
51.00	7		MID RAIL, 1 1/2" SCH. 40S PIPE X 69 15/16" LG. (ROLL TO 83 3/4" C.L.R.) (COPE ENDS)	A500-Gr. B
52.00	6		POST, 1 1/2" SCH. 40S PIPE X 40 9/16" LG. (COPE ONE END)	A500-Gr. B
53.00	2		END POST, 1 1/2" SCH. 40S PIPE X 42" LG. (MITER ONE END)	A500-Gr. B
54.00	1		TOE PLATE, 1/4" X 4" F.B. X 241" LG. (ROLL TO 82 9/16" L.S.R.)	A500-Gr. B
54.01	1		TOE PLATE, 1/4" X 4" F.B. X 253" LG. (ROLL TO 82 9/16" L.S.R.)	A500-Gr. B
55.00	8		POST STUB, 1 1/2" X 0.120 WALL TUBE X 5 1/2" LG.	SA249-304/304L
56.00	4		HANDRAIL SPLICE CLIP, 3/8" X 2" X 3 1/2" LG. W/ 5/8" DIA. HOLE	SA36
57.00	4		LADDER CLIP, 1/4" X 3" X 9 5/16" LG. W/ (2) 5/8" X 1 1/4" LG. SLOTS	SA36
58.00	4	FS-24-05015010	BOLT, 1/2"-13UNC HEAVY HEX X 1 1/2" LG.	GALV. A325
58.01	8	FS-24-05027510	BOLT, 1/2"-13UNC HEAVY HEX X 2 3/4" LG.	GALV. A325
58.02	12	FS-24-05000030	NUT, 1/2"-13UNC HEAVY HEX	GALV. A563
59.00	1		SAFETY YELLOW PAINT (1 GAL)	
60.00	1	LSG-27-PCY	SAFETY GATE KIT, SELF CLOSING FOR 29 1/2" OPENING WIDTH, LSG-27-PCY, W/ MOUNTING HARDWARE (PN. 500979)	

REV	DESCRIPTION	DESIGNER	CHECKED BY	ENGINEER	DATE
E	CERTIFIED AS-BUILT	J3	SW	SM	1/22/2021
D	REVISED FOR CONSISTENCY	CD	SW	JB	1/4/2021
C	REVISED FOR CONSISTENCY	DS	SW	JB	10/29/2020
B	REVISED FOR CONSISTENCY	DS	JK	JB	10/27/2020
A	ADDED NEW SHEET; RELEASED FOR FABRICATION.	DS	SW	JB	9/28/2020

MATERIAL FINISH
EXTERIOR SB
WELD FINISH
EXTERIOR SB
PAINT
SAFETY YELLOW

DRAWN	DANIEL STAUFFER	DATE	8/25/2020
CHECKED	SCOTT WALLACE	DATE	8/31/2020
DESIGNER	JEFF BRUNSON	DATE	9/1/2020
HANDRAIL			
SHEET 4 OF 5			
QUANTITY (1) ONE			
Stainless Fabrication, Incorporated			
4455 W. Kearney			
Springfield, MO 65803			
(417) 865-5696			
CHECKED BY			
ENGINEERED BY			
DRAWING NO.	13585-1-L4		
REVISION			



REV	DESCRIPTION	DESIGNER	CHECKED BY	ENGINEER	DATE
E	CERTIFIED AS-BUILT	J3		SM	1/22/2021
D	ITEM 100.00 WAS 497 7/16" LG., ITEM 100.01 WAS QTY. (38), ITEM 100.02 WAS QTY. (18), ITEM 100.05 WAS QTY. (8), ITEM 100.06 WAS 413 3/4" LG., ITEM 100.07 WAS QTY. (18), ITEM 100.10 & 100.13 WERE QTY. (44), ITEM 100.12 WAS QTY. (88), LADDER O.A.H. WAS 497 1/16".	CD	SW	JB	1/4/2021
C	REVISED FOR CONSISTENCY	DS	SW	JB	10/29/2020
B	REVISED FOR CONSISTENCY	DS	JK	JB	10/27/2020
A	ADDED NEW SHEET; RELEASED FOR FABRICATION.	DS	SW	JB	9/28/2020

ITEM	QTY	PART #	DESCRIPTION	MATERIAL
100.00	2		STRINGER, 3/8" X 2 1/2" F.B. X 458 7/16" LG.	SA36
100.01	35		RUNG, 3/4" DIA. R.B. X 17 7/8" LG.	SA36
100.02	16		CONNECTION CLIP, 3/8" THK. X 4" X 6 1/16"	SA36
100.03	1		TOP CAGE HOOP, 1/4" X 3" F.B. X 85 15/16" LG. (FORM AS REQUIRED)	SA36
100.04	1		BOTTOM CAGE HOOP, 1/4" X 3" WD. F.B. X 110 3/4" LG.	SA36
100.05	7		INTERMEDIATE CAGE HOOP, 1/4" X 2" WD. F.B. X 96 11/16" LG.	SA36
100.06	7		VERTICAL CAGE BAR, 1/4" X 2" F.B. X 368 5/8" LG.	SA36
100.07	16		TANK STUB, 7 GA. X 6" X 6" W/ (2) 5/8" X 1 1/4" LG. SLOTTED HOLES	304/304L
100.08	1		LADDER CLIP, 1/4" THK. X 3" X 11 7/16" W/ (2) 5/8" DIA. HOLES	SA36
100.09	1		LADDER CLIP, 1/4" THK. X 3" X 11 7/16" W/ (2) 5/8" DIA. HOLES	SA36
100.10	40	FS-24-05015010	BOLT, 1/2"-13UNC HEAVY HEX X 1 1/2" LG.	GALV. A325
100.11	1		SAFETY YELLOW PAINT	
100.12	80	FS-24-05000065	WASHER, 1/2" FLAT	GALV. F436
100.13	40	FS-24-05000030	NUT, 1/2"-13UNC HEAVY HEX	GALV. A563
100.14	1		FALL ARREST SYSTEM (SAF-T CLIMB)	

MATERIAL FINISH	
EXTERIOR	SB
WELD FINISH	
EXTERIOR	SB
PAINT	
SAFETY YELLOW	
DRAWING NO.	
13585-1-L5	
E	
REVISION	

DRAWN	DANIEL STAUFFER	DATE	8/25/2020
CHECKED	SCOTT WALLACE	DATE	8/31/2020
DES. ENGR. APPROVED	JEFF BRUNSON	DATE	9/1/2020
LADDER			
SHEET 5 OF 5			
QUANTITY (1) ONE			
Stainless Fabrication, Incorporated			
4455 W. Kearney			
Springfield, MO 65803			
(417) 865-5696			