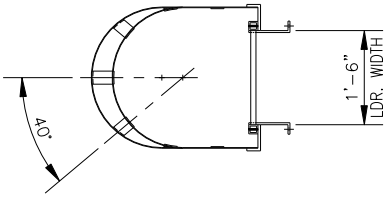
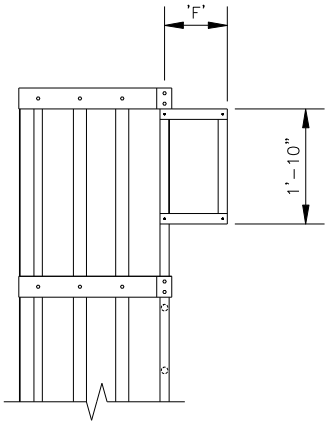
FRP LADDER TYPE	UNITS	'A'	'B'	'C'	'D'	'E'	STANDOFF CLIP TYPE NO.	RAIL EXTENSION TYPE NO.	BASE CLIPS
SAMPLE – TYPE F3	2	25'–6"	0'–6"	2'–0	1'–0	1'–0	S2	R1	Y

SEE SHEET 3 OF 3 FOR STAND–OFF CLIP AND WALK–THRU OPTIONS.

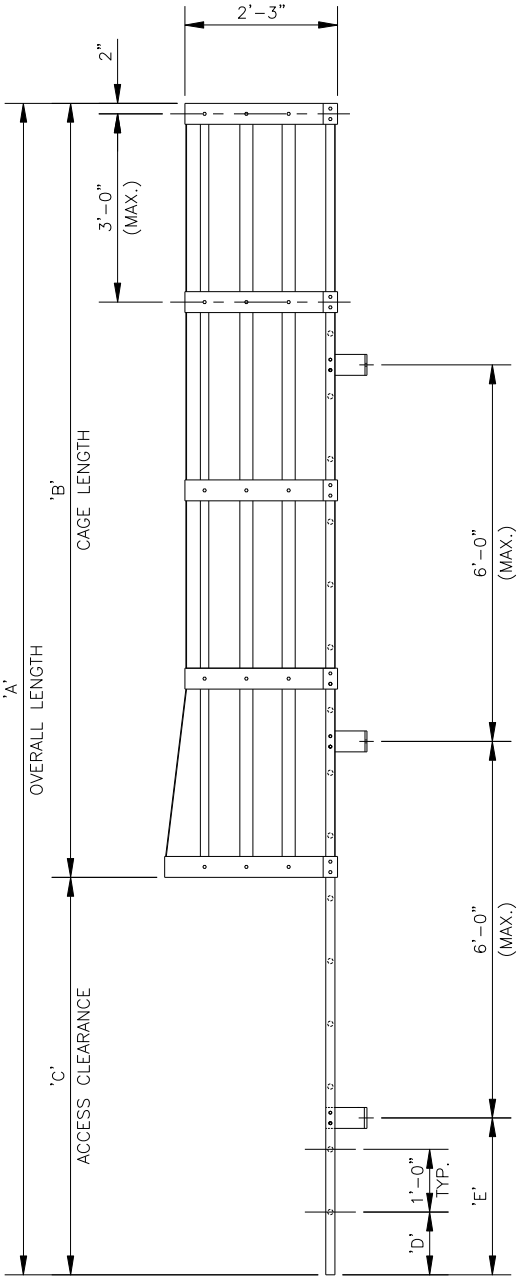


FRP CAGED LADDER MATERIALS

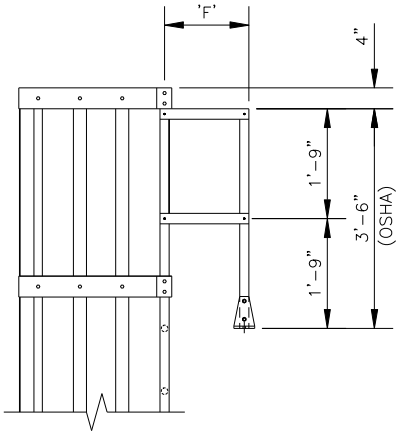
- LADDER SIDE RAIL = 1 3/4" X 1 3/4" X 1/4" SQUARE TUBE.
- LADDER RUNG = 1 1/4" DIAMETER FLUTED RUNG.
- SAFETY CAGE HORIZONTAL HOOP = 4" X 1/8" FLAT BAR.
- SAFETY CAGE VERTICAL BAR = 2 1/2" X 3/16" FLAT BAR.
- SAFETY CAGE CLIP = 5" X 2 3/4" X 1/2" X 0'–4" LONG ANGLE.
- SAFETY CAGE HARDWARE = 316 STAINLESS STEEL, 3/8" DIAMETER BOLTS, NUTS, AND WASHERS.
- LADDER STANDOFF CLIP = 7 7/8" X 2 3/16" X 0'–4" LONG ANGLE.
- LADDER BASE CLIP = 3" X 3" X 3/8" X 0'–1 3/4" LONG FRP ANGLE.
- LADDER HARDWARE = 316 STAINLESS STEEL, 3/8" DIAMETER BOLTS, NUTS, AND WASHERS.



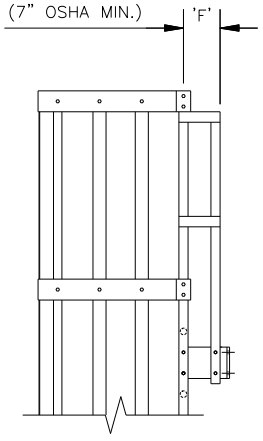
FRP CAGED LADDER – TYPE C4



STANDARD FRP CAGED LADDER – TYPE C1



FRP CAGED LADDER – TYPE C2



FRP CAGED LADDER – TYPE C3

STRUCTURAL FIBERGLASS, INCORPORATED

BUSINESS ROUTE 220 NORTH, POST OFFICE BOX 615, BEDFORD, PA 15522

TITLE: SPECIFICATION WORKSHEET FRP CAGED LADDERS

DWG. NO. WS–1000

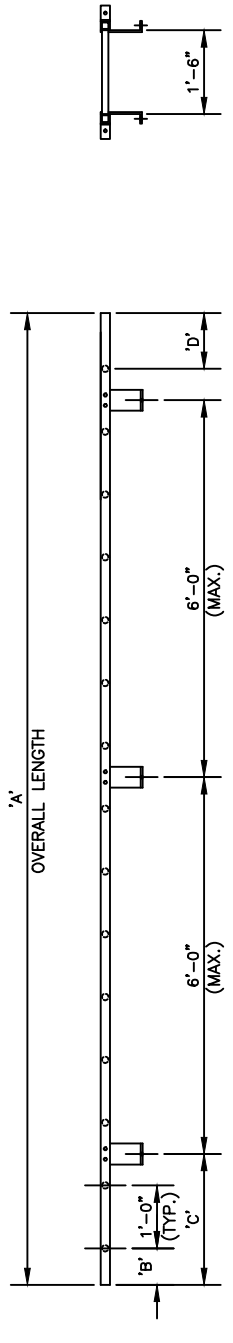
SHT. NO. 1 OF 3

FRP LADDER TYPE	UNITS	'A'	'B'	'C'	'D'	STANDOFF CLIP TYPE NO.	RAIL EXTENSION TYPE NO.	BASE CLIPS
SAMPLE – TYPE F3	2	25'–6"	0'–6"	2'–0	1'–0	S2	R1	Y

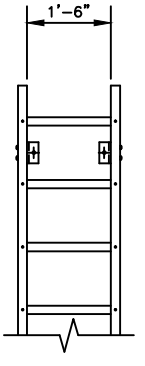
SEE SHEET 3 OF 3 FOR STAND–OFF CLIP AND WALK–THRU OPTIONS.

FRP LADDER MATERIALS

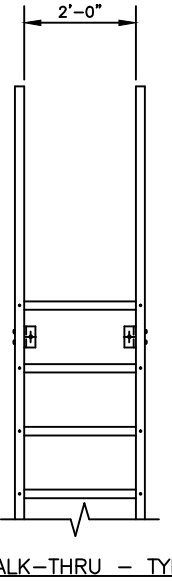
- LADDER SIDE RAIL = 1 3/4" X 1 3/4" X 1/4" SQUARE TUBE.
- LADDER RUNG = 1 1/4" DIAMETER FLUTED RUNG.
- LADDER STANDOFF CLIP = 7 7/8" X 2 3/16" X 0'–4" LONG ANGLE.
- LADDER BASE CLIP = 3" X 3" X 3/8" X 0'–1 3/4" LONG FRP ANGLE.
- LADDER HARDWARE = 316 STAINLESS STEEL, 3/8" DIAMETER BOLTS, NUTS, AND WASHERS.



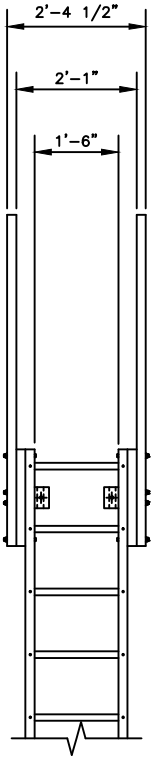
STANDARD FRP LADDER – TYPE F1



NO WALK–THRU – TYPE F1



24" WALK–THRU – TYPE F2



25" WALK–THRU – TYPE F3

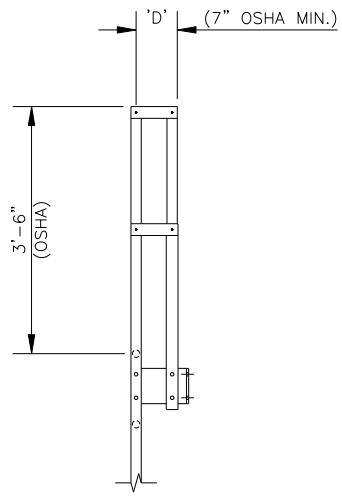
STRUCTURAL FIBERGLASS, INCORPORATED

BUSINESS ROUTE 220 NORTH, POST OFFICE BOX 615, BEDFORD, PA 15522

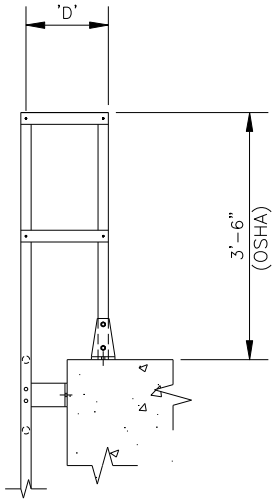
TITLE: SPECIFICATION WORKSHEET FRP FIXED LADDER

DWG. NO.: WS–1000

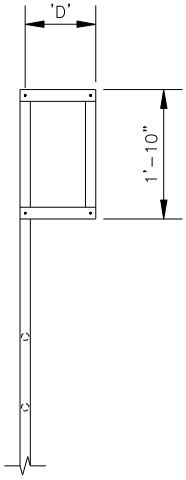
SHT. NO.: 2 OF 3



FRP LADDER – TYPE R1

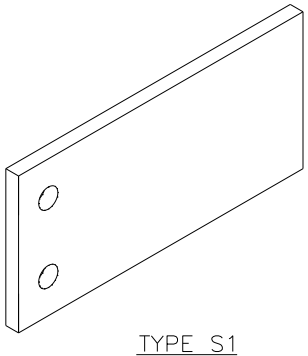


FRP LADDER – TYPE R2

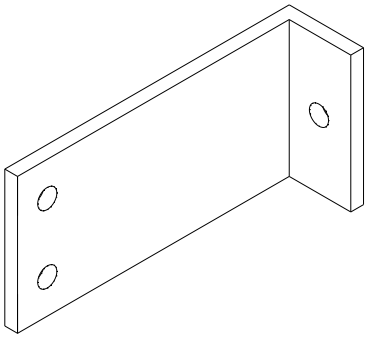


FRP LADDER – TYPE R3

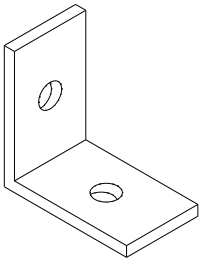
FRP LADDER RAIL EXTENSION OPTIONS



TYPE S1
8" X 4" X 3/8" FRP PLATE



TYPE S2
7 7/8" X 2 3/16" X 3/8"
X 0'-4" LONG FRP ANGLE



STANDARD BASE CLIP
3" X 3" X 3/8" X 0'-1 3/4" FRP ANGLE

STRUCTURAL FIBERGLASS, INCORPORATED

BUSINESS ROUTE 220 NORTH, POST OFFICE BOX 615, BEDFORD, PA 15522

TITLE: SPECIFICATION WORKSHEET
STANDARD STAND-OFF CLIPS

DWG. NO. WS-1000

SHT. NO. 3 OF 3

Section Properties: Section1_FLUTED TUBE - FM.dxf

Section Information:

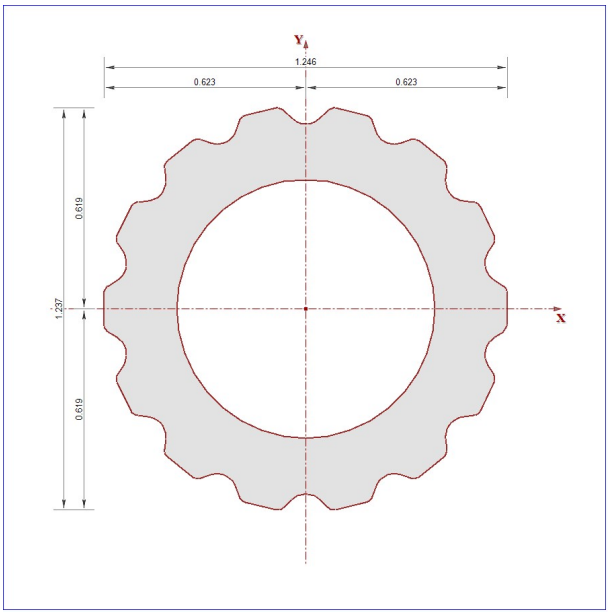
Material Type	=	General
Shape Type	=	Arbitrary
Number of Shapes	=	1

Basic Properties:

Total Width	=	1.246	in
Total Height	=	1.237	in
Centroid, Xo	=	0.625	in
Centroid, Yo	=	0.619	in
X-Bar (Right)	=	0.623	in
X-Bar (Left)	=	0.623	in
Y-Bar (Top)	=	0.619	in
Y-Bar (Bot)	=	0.619	in
Max Thick	=	1.246	in

Equivalent Properties:

Area, Ax	=	0.653	in^2
Inertia, Ixx	=	0.086	in^4
Inertia, Iyy	=	0.086	in^4
Inertia, Ixy	=	0.000	in^4
Sx (Top)	=	0.139	in^3
Sx (Bot)	=	0.139	in^3
Sy (Left)	=	0.138	in^3
Sy (Right)	=	0.138	in^3
rx	=	0.363	in
ry	=	0.363	in
Plastic Zx	=	0.212	in^3
Plastic Zy	=	0.212	in^3
Torsional J	=	0.156	in^4
As-xx Def	=	1.000	
As-yy Def	=	1.000	
As-xx Stress	=	1.000	
As-yy Stress	=	1.000	



Section Diagram

TYPICAL COUPON PROPERTIES

Below are test results for typical coupon properties of Bedford Reinforced Plastics' structural fiberglass profiles (Standard, Fire Retardant, & Vinylester shapes). Properties are derived per the ASTM test method shown. Synthetic surfacing veil and ultraviolet inhibitors are standard.

		ENGLISH		METRIC	
MECHANICAL PROPERTIES	**ASTM**	**Units**	**Value**	**Units**	**Value**
Tensile Stress, LW	D-638	psi	30,000	*MPa*	*206.8*
Tensile Stress, CW	D-638	psi	7,000	*MPa*	*48.2*
Tensile Modulus, LW	D-638	10^6 psi	2.5	*GPa*	*17.2*
Tensile Modulus, CW	D-638	10^6 psi	.8	*GPa*	*5.5*
Compressive Stress, LW	D-695	psi	30,000	*MPa*	*206.8*
Compressive Stress, CW	D-695	psi	15,000	*MPa*	*103.4*
Compressive Modulus, LW	D-695	10^6 psi	2.5	*GPa*	*17.2*
Compressive Modulus,CW	D-695	10^6 psi	1.0	GPa	6.9
Flexural Stress, LW	D-790	psi	30,000	*MPa*	*206.8*
Flexural Stress, CW	D-790	psi	10,000	*MPa*	*68.9*
Flexural Modulus, LW	D-790	10^6 psi	1.8	*GPa*	*12.4*
Flexural Modulus, CW	D-790	10^6 psi	.8	*GPa*	*5.5*
Modulus of Elasticity, E	Full Section	10^6 psi	2.8	*GPa*	*19.3*
Shear Modulus	——	10^6 psi	0.450	*GPa*	*3.1*
Short Beam Shear	D-2344	psi	4,500	*MPa*	*31.0*
Punch Shear	D-732	psi	10,000	*MPa*	*68.9*
Notched Izod Impact, LW	D-256	ft.-lbs./in.	25	*J/mm*	*1.33*
Notched Izod Impact, CW	D-256	ft.-lbs./in.	4	*J/mm*	*.21*

PHYSICAL PROPERTIES	**ASTM**	**Units**	**Value**	**Units**	**Value**
Barcol Hardness	D-2583	—-	45	—-	*45*
24 Hour Water Absorbtion	D-570	% max.	0.45	*% max.*	*0.45*
Density	D-792	lbs./in.^{3}	.062-.070	*g/cc*	*1.72-1.94*
Coefficient of Thermal Expansion, LW	D-696	10^{-6} in./in./°F	7	*10^{-6} cm./cm./°C*	*12*

ELECTRICAL PROPERTIES	**ASTM**	**Units**	**Value**	**Units**	**Value**
Arc Resistance, LW	D-495	seconds	120	*seconds*	*120*
Dielectric Strength, LW	D-149	kv./in.	35	*kv./mm*	*1.37*
Dielectric Strength, PF	D-149	volts/mil.	200	*volts/mil.*	*200*
Dielectric Constant, PF	D-150	@60hz	5	*@60hz*	*5*

Fire Retardant Polyester and Fire Retardant Vinylester Structural Profiles:

FLAMMABILITY PROPERTIES	**ASTM**	**Units**	**Value**
Tunnel Test	E-84	Flame Spread	25 max.
Flammability	D-635	——	Nonburning
UL	94	VO	
NBS Smoke Chamber	E-662	Smoke Density 600-700	

LW = Lengthwise CW = Crosswise PF = Perpendicular to Laminate Face