

FIBER REINFORCED POLYMER RAFT DESIGN FORCE TABLE

LRFD LOAD COMBINATION AND DESIGN FORCE ENVELOPES	RAFT 1											RAFT 2										RAFT 3								
	0.0 L	0.1 L	0.2 L	0.3 L	0.4 L	0.5 L	0.6 L	0.7 L	0.8 L	0.9 L	1.0 L	0.0 L	0.1 L	0.2 L	0.3 L	0.4 L	0.5 L	0.6 L	0.7 L	0.8 L	0.9 L	1.0 L	0.0 L	0.1 L	0.2 L	0.3 L	0.4 L	0.5 L		
SERVICE I	VERTICAL BENDING MOMENT, MAXIMUM (KIP*FT)	0	-92	-132	-137	-119	-83	-41	10	63	115	163	170	208	242	276	307	335	360	382	410	428	444	448	455	461	458	460	461	
	VERTICAL BENDING MOMENT, MINIMUM (KIP*FT)	0	-280	-521	-721	-882	-1010	-1103	-1169	-1207	-1225	-1221	-1219	-1204	-1175	-1138	-1093	-1042	-988	-946	-911	-877	-845	-837	-812	-791	-775	-766	-763	
	HORIZONTAL BENDING MOMENT, REVERSIBLE (KIP*FT)	5	39	71	102	132	160	187	212	237	260	281	287	307	326	343	359	373	386	398	409	418	425	428	434	438	442	444	444	
	VERTICAL SHEAR, REVERSIBLE (KIP)	61.7	57.3	51.8	46.5	40.7	36.0	31.8	28.2	25.2	23.0	25.1	24.8	25.4	26.5	27.5	28.1	28.7	29.2	29.7	30.0	30.2	30.3	29.5	29.2	29.1	28.8	28.4	27.9	
	HORIZONTAL SHEAR, REVERSIBLE (KIP)	6.9	6.7	6.5	6.2	6.0	5.7	5.5	5.2	5.0	4.8	4.6	4.4	4.3	4.1	3.9	3.7	3.5	3.3	3.1	2.9	2.8	2.6	2.5	2.4	2.2	2.1	1.9	1.8	
	TORSION, REVERSIBLE (KIP*FT)	63	170	216	275	316	355	391	426	458	488	516	532	545	569	590	610	628	644	658	670	681	691	696	699	704	708	710	710	
STRENGTH II	VERTICAL BENDING MOMENT, MAXIMUM (KIP*FT)	0	-74	-87	-64	-18	45	110	181	253	324	389	399	448	490	528	559	586	610	630	659	675	689	692	696	699	691	692	692	
	VERTICAL BENDING MOMENT, MINIMUM (KIP*FT)	0	-367	-683	-946	-1157	-1327	-1449	-1537	-1588	-1612	-1609	-1606	-1587	-1550	-1503	-1443	-1377	-1307	-1251	-1207	-1162	-1121	-1111	-1078	-1050	-1030	-1018	-1014	
	HORIZONTAL BENDING MOMENT, REVERSIBLE (KIP*FT)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VERTICAL SHEAR, REVERSIBLE (KIP)	80.8	74.3	66.0	58.3	49.9	43.3	37.7	33.0	29.1	30.9	33.6	33.2	33.8	35.4	36.6	37.4	38.3	38.9	39.5	39.7	39.7	39.5	38.8	37.8	37.3	36.8	36.1	35.4	
	HORIZONTAL SHEAR, REVERSIBLE (KIP)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TORSION, REVERSIBLE (KIP*FT)	227	283	336	406	452	496	537	575	611	645	663	680	708	734	757	779	798	815	830	842	853	859	863	869	873	876	876	874	
STRENGTH III	VERTICAL BENDING MOMENT, MAXIMUM (KIP*FT)	0	-101	-181	-241	-285	-314	-330	-337	-334	-325	-311	-306	-288	-267	-245	-222	-199	-177	-155	-136	-118	-103	-99	-86	-76	-69	-64	-63	
	VERTICAL BENDING MOMENT, MINIMUM (KIP*FT)	0	-142	-257	-347	-415	-463	-495	-513	-519	-515	-502	-498	-479	-456	-430	-402	-374	-346	-318	-293	-269	-249	-243	-226	-212	-202	-196	-194	
	HORIZONTAL BENDING MOMENT, REVERSIBLE (KIP*FT)	12	92	169	242	313	380	444	505	563	617	668	683	730	774	815	852	887	918	946	971	992	1011	1016	1030	1041	1049	1054	1056	
	VERTICAL SHEAR, REVERSIBLE (KIP)	31.5	28.4	22.9	18.0	13.6	9.7	6.4	3.5	1.1	2.5	4.0	4.6	5.1	5.8	6.2	6.4	6.4	6.2	5.9	5.4	4.9	4.3	3.9	3.6	2.8	2.0	1.2	0.4	
	HORIZONTAL SHEAR, REVERSIBLE (KIP)	16.4	16.0	15.4	14.8	14.2	13.6	13.0	12.4	11.9	11.4	10.8	10.5	10.2	9.7	9.2	8.7	8.3	7.8	7.4	7.0	6.5	6.2	5.9	5.7	5.3	4.9	4.6	4.3	
	TORSION, REVERSIBLE (KIP*FT)	4	11	18	24	30	36	41	46	51	55	58	60	64	67	70	73	75	78	80	82	83	84	85	86	86	87	87	87	
STRENGTH V	VERTICAL BENDING MOMENT, MAXIMUM (KIP*FT)	0	-74	-87	-64	-18	45	110	181	253	324	389	399	448	490	528	559	586	610	630	659	675	689	692	696	699	691	692	692	
	VERTICAL BENDING MOMENT, MINIMUM (KIP*FT)	0	-367	-683	-946	-1157	-1327	-1449	-1537	-1588	-1612	-1609	-1606	-1587	-1550	-1503	-1443	-1377	-1307	-1251	-1207	-1162	-1121	-1111	-1078	-1050	-1030	-1018	-1014	
	HORIZONTAL BENDING MOMENT, REVERSIBLE (KIP*FT)	6	45	83	120	154	187	219	249	277	304	329	337	360	382	402	420	437	453	466	479	489	498	501	508	513	517	520	521	
	VERTICAL SHEAR, REVERSIBLE (KIP)	80.8	74.3	66.0	58.3	49.9	43.3	37.7	33.0	29.1	30.9	33.6	33.2	33.8	35.4	36.6	37.4	38.3	38.9	39.5	39.7	39.7	39.5	38.8	37.8	37.3	36.8	36.1	35.4	
	HORIZONTAL SHEAR, REVERSIBLE (KIP)	8.1	7.9	7.6	7.3	7.0	6.7	6.4	6.1	5.9	5.6	5.3	5.2	5.0	4.8	4.5	4.3	4.1	3.9	3.6	3.4	3.2	3.0	2.9	2.8	2.6	2.4	2.3	2.1	
	TORSION, REVERSIBLE (KIP*FT)	230	292	350	424	476	524	569	612	651	688	708	727	758	786	812	836	857	875	892	906	918	924	929	936	941	943	944	942	
EXTREME EVENT II	VERTICAL BENDING MOMENT (KIP*FT)	0	-261	-471	-636	-761	-850	-909	-941	-952	-944	-921	-913	-879	-837	-789	-739	-686	-634	-584	-537	-494	-457	-446	-414	-389	-370	-359	-355	
	VERTICAL SHEAR (KIP)	57.8	52.2	42.0	33.0	24.9	17.9	11.7	6.5	2.1	4.6	7.3	8.4	9.3	10.6	11.4	11.7	11.7	11.4	10.8	9.9	8.9	7.8	7.2	6.5	5.2	3.7	2.3	0.8	

NOTES:

- DESIGN LOADS IN THE TABLE ABOVE ARE GLOBAL FORCES ACTING ON THE RAFTS. THESE DESIGN FORCES SHALL BE INVESTIGATED SIMULTANEOUSLY WITH LOCALIZED FORCE EFFECTS NOTED IN THESE PLANS, AS APPROPRIATE.
- EXTREME EVENT II LOAD COMBINATION SHALL BE INVESTIGATED WITH TRANSVERSE ICE PRESSURES NOTED ON SHEET 35.
- SERVICE AND STRENGTH FORCE EFFECTS NOTED IN THE TABLE ACCOUNT FOR VEHICULAR LIVE LOAD, PEDESTRIAN LOAD, WIND LOAD, AND DEAD AND LIVE LOAD APPROACH RAMP REACTIONS. EXTREME EVENT FORCE EFFECTS NOTED IN THE TABLE ACCOUNT FOR SNOW AND DEAD LOAD APPROACH RAMP REACTIONS.
- POSITIVE VERTICAL BENDING MOMENT VALUES CAUSE LONGITUDINAL TENSION STRESSES IN THE BOTTOM OF THE FRP RAFTS. NEGATIVE VERTICAL BENDING MOMENT VALUES CAUSE LONGITUDINAL TENSION STRESSES IN THE TOP OF THE FRP RAFTS.

PROJECT NAME: BROOKFIELD
PROJECT NUMBER: BRF FLBR(2)

TYL INTERNATIONAL

FILE NAME: z12e134bdr-frpdlagr.dgn PLOT DATE: 12/3/2013
PROJECT LEADER: J. OLUND DRAWN BY: S. MORGAN
DESIGNED BY: J. OLUND CHECKED BY: C. TAYLOR
FRP RAFT LOADING DIAGRAMS 3 SHEET 37 OF 70