CREATIVE COMPOSITES GROUP

TECHNICAL SPECIFICATIONS

SUPERDECK® SYSTEMS

SUPERDECK LITE, SUPERDECK HIGHWAY & SUPERDECK MASS TRANSIT DECKING SYSTEMS

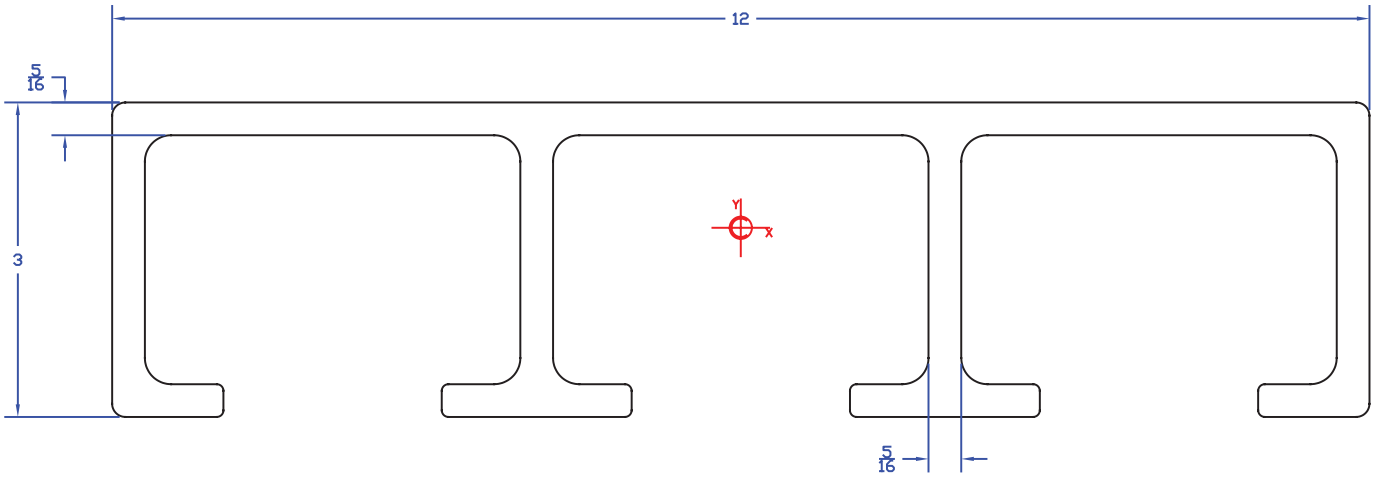
SuperDeck Lite Decking

SuperDeck Lite, a pultruded fiberglass reinforced polymer (FRP) deck profile, designed to support both uniform live loads and AASHTO H-5 wheel loads, has been developed for use on pedestrian, bicycle, and access structures.

The load tables were developed from experimental testing. The testing was used to develop ASTM D7290 characteristic full section flexural strength, characteristic in-plane shear strength, and the average full section flexural modulus of elasticity. The mechanical attributes described are the governing values necessary for both structural and serviceability computations when the loads are applied across the entire twelve-inch width of the deck profile. The corresponding full section in-plane shear strength, flexural strength, and flexural modulus of elasticity were determined based on ASTM D8069-17A full section testing conditions.

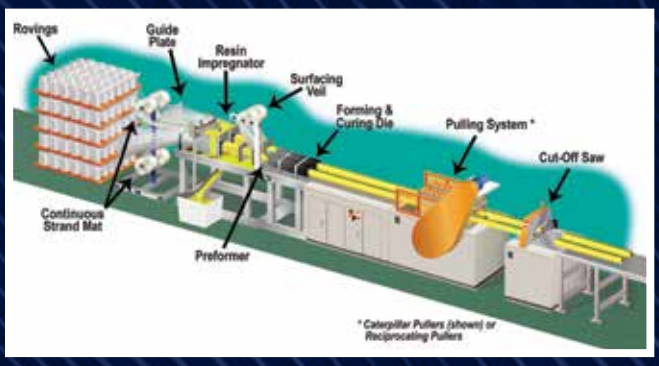
SUPERDECK LITE IS AVAILABLE IN STANDARD ISOPHTHALIC POLYESTER AND VINYL ESTER RESIN SYSTEMS:

1500 - Standard Polyester Resin (I), Non Fire Retardant, Olive Green
1525 - Standard Isophthalic Polyester Resin (IFR), Fire Retardant, Slate Gray
1625 - Standard Vinyl Ester Resin (VFR), Fire Retardant, Beige



What Is Pultrusion?

Pultrusion is an advanced continuous manufacturing process utilized to make composite profiles with uniform cross-sections. The specified fiberglass reinforcements, in the form of roving and mats are saturated with engineered resins and channeled into a customize die with high heat. The profile exits the die as a mechanically bonded solid with the desired cross-section and performance specifications.



Applications

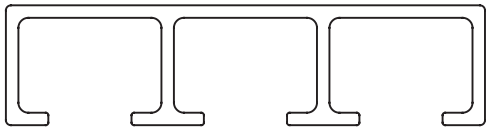
- H-5 Rated Pedestrian Bridges
- Pedestrian Decks & Walkways
- Catwalks, Mezzanines, Commercial Decks
- Sidewalks & Ramps
- Commercial Piers
- Marina Dock Decking

Features and Benefits

- ADA Compliant Traction & Dielectric Strength – Enhances Safety
- Exceptional Service Life – Lowest Lifetime Cost of Ownership
- Corrosion & Rot Resistant – Long-Life for Corrosive Applications
- Environmentally Sustainable – Doesn't Leach Toxins
- Outperforms Wood & Steel – 80% Lighter than Steel
- Fast Installation – Lightweight, Easy to Carry, Drill and Cut
- Architectural Decking – Offered in Three Natural Colors
- Manufactured in the USA – ISO 9001:2015 Compliant Facility

SuperDeck Lite Decking (Part# GR120) - Simple Supported Beam - Single Span

SuperDeck Lite Decking (Part# GR120): 12" wide x 3" high - I, IFR, VFR Series



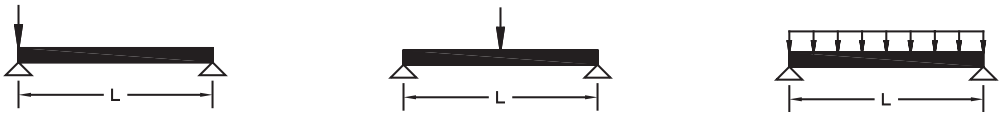
IMPERIAL

E_b = 4.50 Msi | G_b = .425 Msi | Characteristic longitudinal compressive strength (F_L^c) = 70,300 psi

I_x = 10.81 in⁴/ft | S_{Xmin} = 5.99 in³/ft | Characteristic in-plane shear strength (F_{LT}^v) = 7,380 psi

S_{Xmax} = 9.04 in³/ft

A_w = 3.75 in²/ft | Weight = 7.57 psf | Solid Top Decking



Span (in)	Allowable Concentrated Load Tables (lb/ft width of panel) L/D Ratios 240	360	500	Deflection (in) 0.25	IBC Max. Service Load	AASHTO Max. Service Load	Span (in)	Allowable Uniform Load Tables (lb/ft²) L/D Ratios 240	360	500	Deflection (in) 0.25	IBC Max. Service Load	AASHTO Max. Service Load
12	****	****	****	****	6150	4613	12	****	****	****	****	12300	9225
18	****	****	****	****	6150	4613	18	****	****	8073	****	8200	6150
24	****	****	4956	****	6150	4613	24	****	5971	4299	****	6150	4613
30	****	5122	3688	****	6150	4613	30	****	3479	2505	****	4920	3690
36	5853	3902	2809	****	6150	4613	36	3265	2177	1567	****	4100	3075
42	4567	3045	2192	****	6150	4613	42	2162	1441	1038	3089	3514	2636
48	3643	2429	1749	4554	6150	4613	48	1498	999	719	1873	3075	2306
54	2964	1976	1423	3293	6150	4613	54	1078	719	517	1198	2733	2050
60	2453	1635	1177	2453	6150	4613	60	800	533	384	800	2460	1845
66	2060	1373	989	1873	6150	4613	66	609	406	292	553	2236	1677
72	1753	1169	841	1461	6150	4613	72	474	316	227	395	2050	1538
78	1508	1006	724	1160	6150	4613	78	376	250	180	289	1892	1419
84	1311	874	629	936	6150	4613	84	303	202	145	216	1757	1318
90	1149	766	552	766	6150	4613	90	247	165	119	165	1640	1230
96	1015	677	487	635	6150	4386	96	205	136	98	128	1538	1096

METRIC

E_b = 31.03 GPa | G_b = 2.93 GPa | Characteristic longitudinal compressive strength (F_L^c) = 484.7 MPa

I_x = 1.48E+7 mm⁴/m | S_{Xmin} = 3.22E+5 mm³/m | Characteristic in-plane shear strength (F_{LT}^v) = 50.9 MPa

S_{Xmax} = 4.86E+5 mm³/m

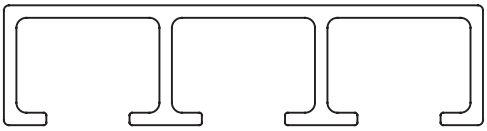
A_w = 7.94E-3 mm²/m | Weight = 0.362 kN/m² | Solid Top Decking

Span (m)	Allowable Concentrated Load Tables (kN/m width of panel) L/D Ratios 240	360	500	Deflection (mm) 6	IBC Max. Service Load	AASHTO Max. Service Load	Span (m)	Allowable Uniform Load Tables (kN/m²) L/D Ratios 240	360	500	Deflection (mm) 6	IBC Max. Service Load	AASHTO Max. Service Load
0.25	****	****	****	****	89.8	67.3	0.25	****	****	****	****	718.0	538.5
0.50	****	****	****	****	89.8	67.3	0.50	****	****	320.5	****	359.0	269.3
0.75	****	76.4	55.0	****	89.8	67.3	0.75	****	173.3	124.8	****	239.3	179.5
1.00	74.1	49.4	35.6	****	89.8	67.3	1.00	123.3	82.2	59.2	177.5	179.5	134.6
1.25	50.9	33.9	24.4	58.7	89.8	67.3	1.25	66.9	44.6	32.1	77.1	143.6	107.7
1.50	36.8	24.6	17.7	35.4	89.8	67.3	1.50	40.1	26.7	19.2	38.5	119.7	89.8
1.75	27.8	18.5	13.3	22.8	89.8	67.3	1.75	25.8	17.2	12.4	21.2	102.6	76.9
2.00	21.6	14.4	10.4	15.6	89.8	67.3	2.00	17.5	11.7	8.4	12.6	89.8	67.3
2.25	17.3	11.5	8.3	11.1	89.8	67.3	2.25	12.4	8.3	6.0	7.9	79.8	59.8
2.50	14.1	9.4	6.8	8.1	89.8	62.4	2.50	9.1	6.1	4.4	5.2	71.8	49.9
2.75	11.7	7.8	5.6	6.2	89.8	56.7	2.75	6.9	4.6	3.3	3.6	65.3	41.3
3.00	9.9	6.6	4.8	4.8	83.2	52.0	3.00	5.3	3.5	2.6	2.6	55.5	34.7

Maximum allowable load is determined by a 2.5 safety factor in flexure and a 3.0 safety factor in shear for IBC.
Maximum allowable load is determined by a 4.0 safety factor in flexure and a 4.0 safety factor in shear for AASHTO.
Shear is calculated with the point load located over the support.

SuperDeck Lite Decking (Part# GR120) - Simple Supported Beam - Continuous Span

SuperDeck Lite Decking (Part# GR120): 12" wide x 3" high - I, IFR, VFR Series



IMPERIAL

E_b = 4.50 Msi	G_b = .425 Msi	Characteristic longitudinal compressive strength (F_L^c) = 70,300 psi
I_x = 10.81 in⁴/ft	S_{Xmin} = 5.99 in³/ft	Characteristic in-plane shear strength (F_{LT}^v) = 7,380 psi
	S_{Xmax} = 9.04 in³/ft	
A_w = 3.75 in²/ft	Weight = 7.57 psf	Solid Top Decking

	Allowable Concentrated Load Tables (lb/ft width of panel)							Allowable Uniform Load Tables (lb/ft²)						
	L/D Ratios			Deflection (in)	IBC Max. Service Load	AASHTO Max. Service Load		L/D Ratios			Deflection (in)	IBC Max. Service Load	AASHTO Max. Service Load
Span (in)	240	360	500	0.25			Span (in)	240	360	500	0.25		
12	****	****	****	****	6150	4613	12	****	****	****	****	10250	7688
18	****	****	****	****	6150	4613	18	****	****	****	****	6833	5125
24	****	****	5980	****	6150	4613	24	****	****	****	****	5125	3844
30	****	****	4604	****	6150	4613	30	****	****	3882	****	4100	3075
36	****	4992	3594	****	6150	4613	36	****	****	2542	****	3417	2563
42	5946	3964	2854	****	6150	4613	42	****	2415	1739	****	2929	2196
48	4804	3203	2306	6005	6150	4613	48	****	1714	1234	****	2563	1922
54	3946	2630	1894	4384	6150	4613	54	1882	1255	903	2091	2278	1708
60	3289	2193	1579	3289	6150	4613	60	1415	943	679	1415	2050	1538
66	2778	1852	1333	2525	6150	4613	66	1088	725	522	989	1864	1398
72	2374	1582	1139	1978	6150	4613	72	853	569	410	711	1708	1281
78	2050	1366	984	1577	6150	4613	78	681	454	327	524	1577	1183
84	1786	1191	857	1276	6150	4613	84	552	368	265	394	1464	1098
90	1570	1046	753	1046	6150	4613	90	453	302	217	302	1367	1025
96	1390	926	667	868	6150	4613	96	376	251	180	235	1281	961

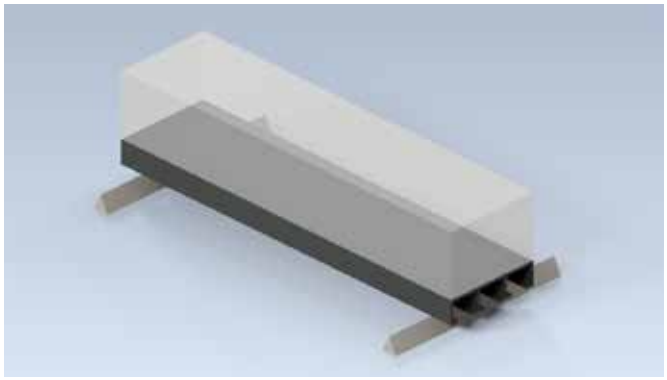
METRIC

E_b = 31.03 GPa	G_b = 2.93 GPa	Characteristic longitudinal compressive strength (F_L^c) = 484.7 MPa
I_x = 1.48E+7 mm⁴/m	S_{Xmin} = 3.22E+5 mm³/m	Characteristic in-plane shear strength (F_{LT}^v) = 50.9 MPa
	S_{Xmax} = 4.86E+5 mm³/m	
A_w = 7.94E-3 mm²/m	Weight = 0.362 kN/m²	Solid Top Decking

	Allowable Concentrated Load Tables (kN/m width of panel)							Allowable Uniform Load Tables (kN/m²)						
	L/D Ratios			Deflection (mm)	IBC Max. Service Load	AASHTO Max. Service Load		L/D Ratios			Deflection (mm)	IBC Max. Service Load	AASHTO Max. Service Load
Span (m)	240	360	500	6			Span (m)	240	360	500	6		
0.25	****	****	****	****	89.8	67.3	0.25	****	****	****	****	598.3	448.8
0.50	****	****	****	****	89.8	67.3	0.50	****	****	****	****	299.2	224.4
0.75	****	****	****	****	89.8	67.3	0.75	****	****	192.6	****	199.4	149.6
1.00	****	****	63.9	****	89.8	67.3	1.00	****	135.9	97.8	****	149.6	112.2
1.25	89.7	67.3	44.9	77.2	89.8	67.3	1.25	115.3	76.9	55.3	****	119.7	89.8
1.50	65.8	49.3	32.9	47.2	89.8	67.3	1.50	70.7	47.2	34.0	67.7	99.7	74.8
1.75	50.0	37.5	25.0	30.8	89.8	67.3	1.75	46.2	30.8	22.2	37.9	85.5	64.1
2.00	39.2	29.4	19.6	21.1	89.8	67.3	2.00	31.7	21.2	15.2	22.8	74.8	56.1
2.25	31.5	23.6	15.7	15.1	89.8	67.3	2.25	22.7	15.1	10.9	14.5	66.5	49.9
2.50	25.8	19.3	12.9	11.1	89.8	67.3	2.50	16.7	11.2	8.0	9.6	59.8	44.9
2.75	21.5	16.1	10.7	8.4	89.8	67.3	2.75	12.7	8.5	6.1	6.6	54.4	40.8
3.00	18.2	13.6	9.1	6.5	89.8	64.0	3.00	9.9	6.6	4.7	4.7	49.9	37.4

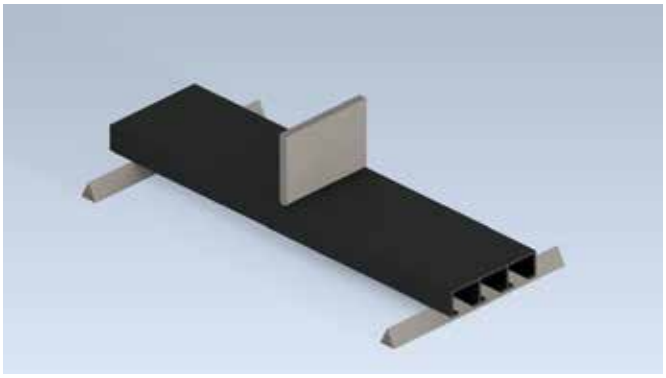
Maximum allowable load is determined by a 2.5 safety factor in flexure and a 3.0 safety factor in shear for IBC.
Maximum allowable load is determined by a 4.0 safety factor in flexure and a 4.0 safety factor in shear for AASHTO.
Shear is calculated with the point load located over the support.

Typical Load Scenario Depicted In Load Charts



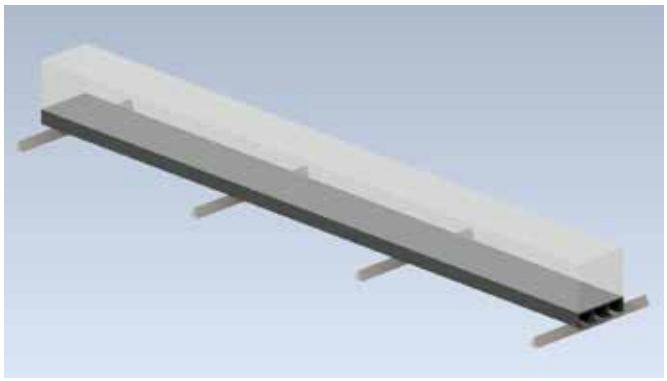
UNIFORM LOAD – SINGLE SPAN; SIMPLY SUPPORTED

Uniform Load in lbf/ft² (kN/m²)



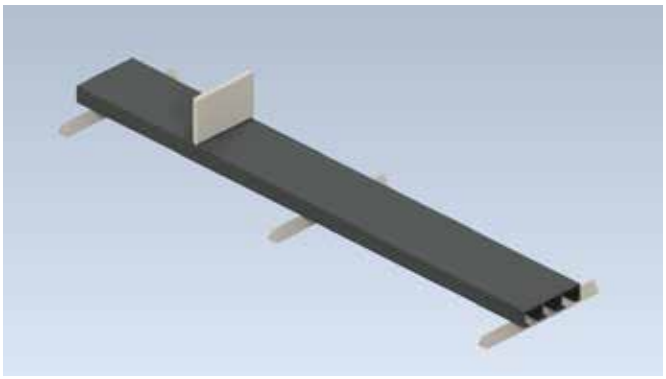
CONCENTRATED LOAD - SINGLE SPAN; SIMPLY SUPPORTED

A concentrated load in lbf/ft width of panel (kN/m)



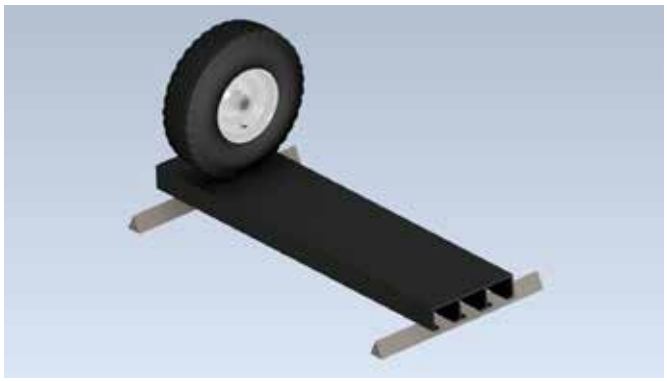
UNIFORM LOAD - CONTINUOUS SPAN

Uniform Load in lbf/ft² (kN/m²)



CONCENTRATED LOAD AT CENTER OF ONE SPAN - CONTINUOUS SPAN

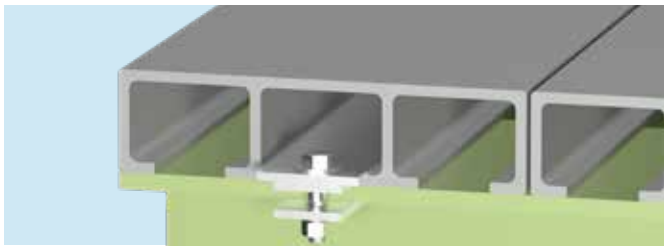
A concentrated load in lbf/ft width of panel (kN/m)



WHEEL LOAD – SINGLE SPAN – WHEEL LOAD APPLIED ADJACENT TO SUPPORT

A concentrated load in lbf based on tire footprint (kN)

Deck To Girder Connections

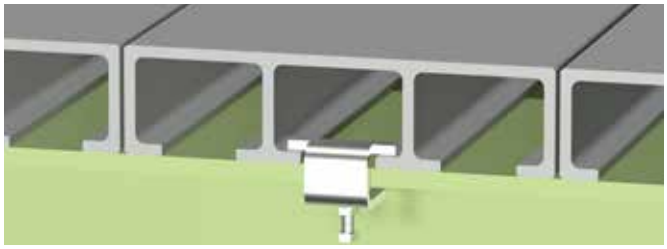


Hold Down Clamp

The hold down clamp features a steel machined plate that interlocks with the deck and clamps to the flanges of the girder. This connection would offer little to no visibility from top of deck.

Typical Hold Down Clamp Connection	
Description	**Quantity**
Top Plate	1
Bottom Plate	2
½" Bolt	2
½" Nut	2
½" Washer	4
½" Lock Washer	2

Hold-down components can be supplied in either stainless or galvanized steel; Consult factory for part numbers and connection details

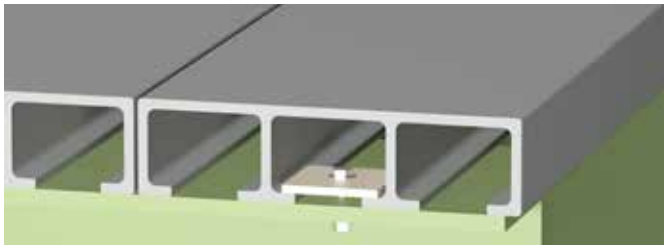


Beam Clip

The beam clip offers a quick hold down option that can be adjusted for a variance of thicknesses. This clamp also provides little to no visual effects from the top of the structure. The maximum thickness of the steel or FRP flange can be 11/16 inch.

Beam Clip Connection	
Description	**Quantity**
Heavy Duty Beam Clip	1
5/16" – 18 UNC Hex Head Bolt	1
5/16" -18 UNC Hex Nut	1

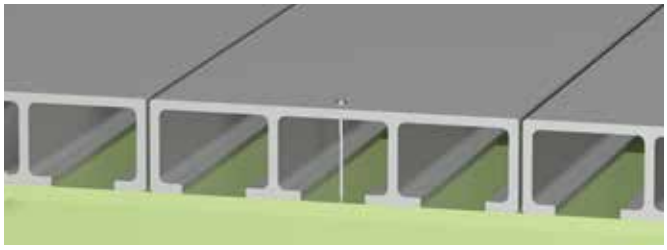
Hold-down components can be supplied in either stainless or galvanized steel; Consult factory for part numbers and connection details



Hidden Clamp Connection

This hidden clamp features an FRP flat sheet that captures the bottom flanges of the GR120. This allows for a secure hold on the plank and creates a clean connection. The flange of the support structure will need to be drilled. Although this connection is more labor intensive, it is an excellent blind connection technique for bridges with higher-than-average wind uplift loads.

Hidden Clamp Connection	
Description	**Quantity**
3" x 3" x ¼" FRP Flat Sheet	1
3/8" Hex Head Bolt	1
3/8" Washer	2
3/8" Lock Washer	1
3/8" Hex Nut	1



Flanged Screw

The *Saberdrive Construction Lag Screw*® is ideal for quick installations and top-down construction with partial visual of the hardware. When wind uplift load is minimal, this is a good choice for pedestrian bridges and board walks. The recommended screw length for the GR120 is four inches assuming a material thickness of 1/2 inch.

Specifying

1.0 SCOPE

This specification depicts the minimum mechanical physical properties, and quality standards for the Fiberglass Reinforced Polymer (FRP) GR120 AASHTO Wheel Load Deck.

2.0 APPLICABLE DOCUMENTS

The latest revisions of the following documents in effect on the date of invitation apply to the extent specified herein, except in the case of specifically dated documents, in which case those revisions shall apply:

- ASTM D3917, Standard Specification for Dimensional Tolerance of Thermosetting Glass-Reinforced Plastic Pultruded Shapes
- ASTM D4385, Standard Practice for Classifying Visual Defects in Thermosetting Reinforced Plastic Pultruded Products
- ASTM D7290, Standard Practice for Evaluating Material Property Characteristic Values for Polymeric Composites for Civil Engineering Structural Applications
- ASTM D8069-17A, Standard Test Method for Determining Flexural Modulus of Full Section Pultruded Fiber Reinforced Polymer (FRP) Composite Members with Doubly Symmetric Cross Sections Under Bending
- UL 94 (V0), Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances
- ASTM E84 Class A, Standard Test Method for Surface Burning Characteristics of Building Materials

3.0 GENERAL

Pultruded FRP Planks shall be manufactured by a manufacturer that holds an ISO 9001:2015 certificate.

The FRP Planks shall be manufactured with commercial grade E or ECR fiberglass and thermoset resins and shall meet or exceed the manufactures published properties.

The strength and stiffness ratings shall be established by full section testing to determine the apparent flexural and shear strength and the flexural modulus of elasticity.

4.0 MINIMUM MECHANICAL AND PHYSICAL PROPERTIES

Minimum Full Section Modulus of Elasticity: 4.5 Msi
Characteristic Bending Strength per ASTM D7290: 70,300 psi (Full Section)
Characteristic In-Plane Shear Strength per ASTM D7290: 7,380 psi (Full Section)
Fire ratings when applicable: UL 94 (V0) and ASTM E84 Class A.

5.0 VISUAL REQUIREMENTS

The FRP Planks shall be manufactured and inspected per the visual standard ASTM D4385.

6.0 DIMENSIONAL REQUIREMENTS

The FRP Planks shall be manufactured and dimensionally inspected per the dimensional requirements as set forth in ASTM D3917.

7.0 WEATHERING UV PROTECTION

The FRP Planks shall be encompassed with a 10 mil thick thermoplastic polyester surface veil to protect the fiberglass reinforcements from fiber blooming. Shall contain UV light absorbers.

8.0 WEARING SURFACE

The wear surface shal be a low-VOC, elastomeric polymer antiskid specially formulated for pedestrain traffic. Yielding a sealed and weather-resistant anti-slip surface that meets the requirements of the ADA. Coefficient of Friction Dry 1.3, Wet 0.9 (ADA min requirement = 0.6).

9.0 QUALITY CONTROL

Manufacturer shall inspect the FRP Planks as detailed in their ISO 9001:2015 requirements.

10.0 DECK TO GIRDER CONNECTIONS

Fastener connection to be designed by engineer with knowledge in working with fiber reinforced polymer (FRP).

H-5 Wheel Load Design & Calculations

The following design requirements and calculations are based on full section testing that Creative Composites Group (CCG) performed. Further information regarding testing or test results can be found in the "AASHTO H-5 Pultruded Fiberglass Reinforced Polymer (FRP) SuperDeck Lite Realization & Validation" white paper. Due to the deck width being 12 in. and the footprint length of 11.2 in., CCG assumed the wheel footprint load distributed evenly across the top 12 in surface of the deck. Both AASHTO H-5 wheel footprint and standard full section shear testing values meet the general load requirements. Therefore, CCG used the standard full section shear stress as a conservative design value.

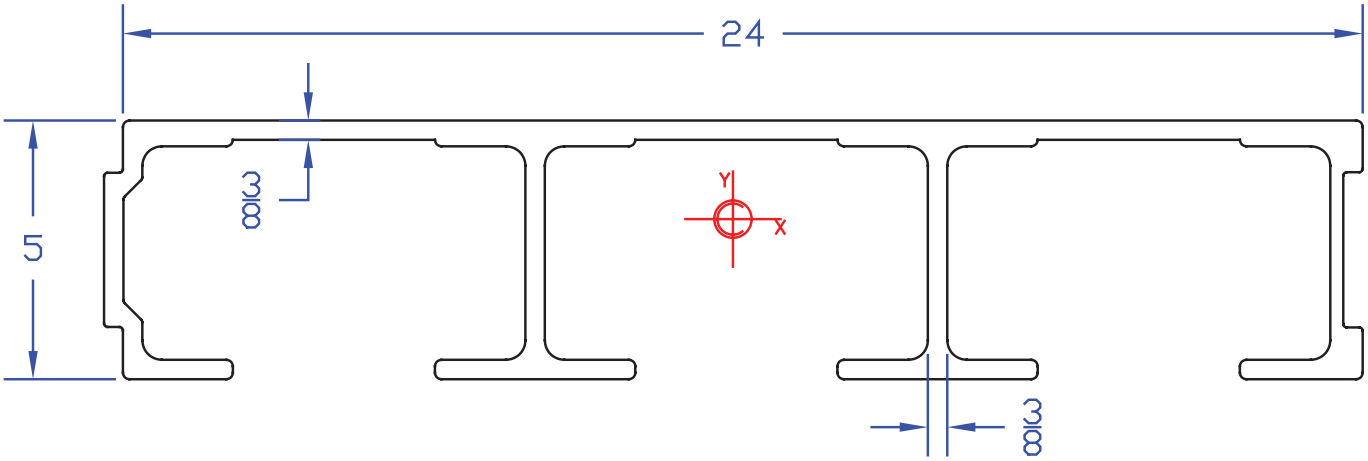
AASHTO H-5 Truck specifies a rear-wheel load of 4,000 lbf. With a safety factor of four, the minimum shear and flexural stress would need to be 5,778 psi and 32,059 psi, respectively. Assuming the worst-case load scenario, CCG publishes a characteristic shear and flexural stress of 7,380 psi and 70,300 psi, respectively which are above the minimum values.

	Max Span (in) for H-5 Wheel Load Applied at Midspan			
Code	Allowable Strength	Allowable Deflection 0.25in	Allowable Deflection L/360	Allowable Deflection L/500
IBC[A]	168	50	35	28
LRFD AASHTO[B]	120			
ASD AASHTO[C]	105			

A – 2018 International Building Code (IBC); IBC Safety Factors include 3 for shear and 2.5 for flexure
B – 2020 LRFD Bridge Design Specifications, 9th Edition; LRFD AASHTO Equivalent Allowable Safety Factors include 3.5 for shear and 3.5 for flexure (Equivalent Allowable Safety Factor = Load Factor Divided by Phi Factor)
C - 2002 AASHTO Standard Specifications for Highway Bridges 17th Edition; ASD AASHTO Safety Factors include 4 for shear and 4 for flexure

SuperDeck Mass Transit Decking

SuperDeck Mass Transit decking was developed specifically for the mass transit industry. As the infrastructure ages and mass transit platforms are repaired and replaced, concrete decks are being upgraded with lightweight, corrosion resistant pultruded decks. SuperDeck Mass Transit was designed for rapid construction with an integrated tactile and ADA compliant wearing surface. The unique connection system allows contractors to install the deck in a fraction of the time of a concrete deck. Contact us for anti-skid and wearing surface options.



Applications

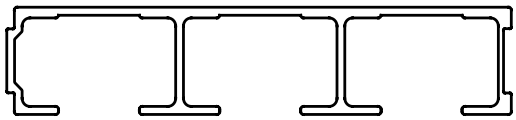
- Mass Transit Platforms
- Decking for Walkways & Platforms
- Marina Dock Decking
- Pedestrian Bridge Decks
- Commercial Piers

Features and Benefits

- Corrosion Resistant
- Non-Conductive
- Lightweight
- Maintenance Free
- Environmentally Safe
- High Strength
- Structurally Stable
- Electromagnetic Transparency
- Easy Standard Installation Methods
- Panels Easily removed
- Elimination of Expensive Labor & Equipment

SuperDeck Mass Transit Decking (Part# GR250) - Simple Supported Beam - Single Span

SuperDeck Mass Transit Decking (Part# GR250): 24" wide x 5" high - I, IFR, VFR Series



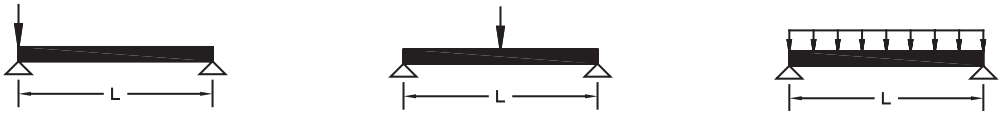
IMPERIAL

E_b = 3.50 Msi | G_b = 0.50 Msi | Characteristic longitudinal compressive strength (F_L) = 30,000 psi

I_X = 41.2 in⁴/ft | S_{Xmin} = 13.3 in³/ft | Characteristic in-plane shear strength (F_{LT}^v) = 10,000 psi

S_{Xmax} = 21.64 in³/ft

A_W = 3.9 in²/ft | Weight = 9.4 psf



	Allowable Concentrated Load Tables (lb/ft width of panel)							Allowable Uniform Load Tables (lb/ft²)					
	L/D Ratios			Deflection (in)	IBC Max. Service Load	AASHTO Max. Service Load		L/D Ratios			Deflection (in)	IBC Max. Service Load	AASHTO Max. Service Load
Span (in)	240	360	500	0.25			Span (in)	240	360	500	0.25		
12	****	****	****	****	8667	6500	12	****	****	****	****	17333	13000
18	****	****	****	****	8667	6500	18	****	****	****	****	11556	8667
24	****	****	****	****	8667	6500	24	****	****	8612	****	8667	6500
30	****	****	7745	****	8667	6500	30	****	****	5503	****	6933	5200
36	****	****	6340	****	8667	6500	36	****	5112	3681	****	5778	4333
42	****	7252	5221	****	8667	6500	42	****	3553	2558	****	4952	3714
48	****	6025	4338	****	8667	6500	48	3828	2552	1837	****	4333	3250
54	7583	5055	3640	8425	8667	6500	54	2828	1885	1357	3142	3852	2889
60	6427	4285	3085	6427	8667	6500	60	2141	1428	1028	2141	3467	2600
66	5500	3667	2640	5000	8667	6045	66	1656	1104	795	1506	3152	2198
72	4750	3167	2280	3958	8667	5542	72	1305	870	626	1087	2889	1847
78	4137	2758	1986	3182	8185	5115	78	1045	697	502	804	2518	1574
84	3631	2420	1743	2593	7600	4750	84	849	566	407	606	2171	1357
90	3209	2139	1540	2139	7093	4433	90	698	466	335	466	1892	1182
112	2147	1431	1031	1150	5700	3563	112	373	249	179	200	1221	763

METRIC

E_b = 24.1 GPa | G_b = 3.4 GPa | Characteristic longitudinal compressive strength (F_L) = 207 MPa

I_X = 5.6E+7 mm⁴/m | S_{Xmin} = 7.15E+5 mm³/m | Characteristic in-plane shear strength (F_{LT}^v) = 69 MPa

S_{Xmax} = 1.16E+6 mm³/m

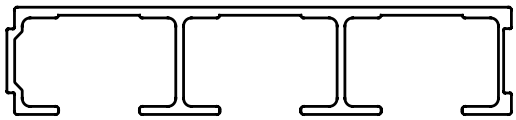
A_W = 8.26E+3 mm²/m | Weight = 0.45 kN/m²

	Allowable Concentrated Load Tables (kN/m width of panel)							Allowable Uniform Load Tables (kN/m²)					
	L/D Ratios			Deflection (mm)	IBC Max. Service Load	AASHTO Max. Service Load		L/D Ratios			Deflection (mm)	IBC Max. Service Load	AASHTO Max. Service Load
Span (m)	240	360	500	6			Span (m)	240	360	500	6		
0.25	****	****	****	****	126.5	94.9	0.25	****	****	****	****	1011.8	758.9
0.50	****	****	****	****	126.5	94.9	0.50	****	****	****	****	505.9	379.4
0.75	****	****	114.8	****	126.5	94.9	0.75	****	****	272.5	****	337.3	253.0
1.00	****	115.1	82.9	****	126.5	94.9	1.00	****	198.7	143.0	****	253.0	189.7
1.25	****	84.8	61.0	****	126.5	94.9	1.25	172.0	114.7	82.6	198.2	202.4	151.8
1.50	96.2	64.1	46.2	92.4	126.5	94.9	1.50	107.0	71.3	51.3	102.7	168.6	126.5
1.75	74.7	49.8	35.9	61.5	126.5	84.5	1.75	70.5	47.0	33.8	58.0	144.5	96.6
2.00	59.4	39.6	28.5	42.8	118.3	74.0	2.00	48.7	32.5	23.4	35.1	118.3	74.0
2.25	48.2	32.1	23.1	30.8	105.2	65.7	2.25	35.0	23.3	16.8	22.4	93.5	58.4
2.50	39.8	26.5	19.1	22.9	94.7	59.2	2.50	25.9	17.3	12.4	14.9	75.7	47.3
2.75	33.4	22.3	16.0	17.5	86.1	53.8	2.75	19.7	13.1	9.5	10.3	62.6	39.1
3.00	28.4	18.9	13.6	13.6	78.9	49.3	3.00	15.3	10.2	7.3	7.3	52.6	32.9

Maximum allowable load is determined by a 2.5 safety factor in flexure and a 3.0 safety factor in shear for IBC.
Maximum allowable load is determined by a 4.0 safety factor in flexure and a 4.0 safety factor in shear for AASHTO.
Shear is calculated with the point load located over the support.

SuperDeck Mass Transit Decking (Part# GR250) - Simple Supported Beam - Continuous Span

SuperDeck Mass Transit Decking (Part# GR250): 24" wide x 5" high - I, IFR, VFR Series



IMPERIAL

E_b = 3.50 Msi | G_b = 0.50 Msi | Characteristic longitudinal compressive strength (F_L) = 30,000 psi

I_X = 41.2 in⁴/ft | S_{Xmin} = 13.3 in³/ft | Characteristic in-plane shear strength (F_{LT}^v) = 10,000 psi

S_{Xmax} = 21.64 in³/ft

A_W = 3.9 in²/ft | Weight = 9.4 psf

	Allowable Concentrated Load Tables (lb/ft width of panel)						Allowable Uniform Load Tables (lb/ft²)					
	L/D Ratios			Deflection (in)	IBC Max. Service Load	AASHTO Max. Service Load	L/D Ratios			Deflection (in)	IBC Max. Service Load	AASHTO Max. Service Load
Span (in)	240	360	500	0.25			240	360	500	0.25		
12	****	****	****	****	8667	6500	****	****	****	****	14444	32500
18	****	****	****	****	8667	6500	****	****	****	****	9630	21667
24	****	****	****	****	8667	6500	****	****	****	****	7222	16250
30	****	****	****	****	8667	6500	****	****	****	****	5778	13000
36	****	****	7604	****	8667	6500	****	****	****	****	4815	9236
42	****	****	6416	****	8667	6500	****	****	3848	****	4127	6786
48	****	7551	5437	****	8667	6500	****	****	2868	****	3611	5195
54	****	6437	4635	****	8667	6500	****	3031	2183	****	3210	4105
60	8289	5526	3979	8289	8667	6500	****	2350	1692	****	2889	3325
66	7168	4778	3440	6516	8667	6500	****	1853	1334	2527	2626	2748
72	6243	4162	2996	5202	8667	6500	2225	1483	1068	1854	2407	2309
78	5475	3650	2628	4211	8667	6297	1805	1203	866	1388	2222	1967
84	4833	3222	2320	3452	8667	5847	1482	988	711	1058	2063	1696
90	4292	2861	2060	2861	8667	5457	1230	820	590	820	1926	1478
96	3834	2556	1840	2396	8186	5116	1031	687	495	644	1806	1299

METRIC

E_b = 24.1 GPa | G_b = 3.4 GPa | Characteristic longitudinal compressive strength (F_L) = 207 MPa

I_X = 5.6E+7 mm⁴/m | S_{Xmin} = 7.15E+5 mm³/m | Characteristic in-plane shear strength (F_{LT}^v) = 69 MPa

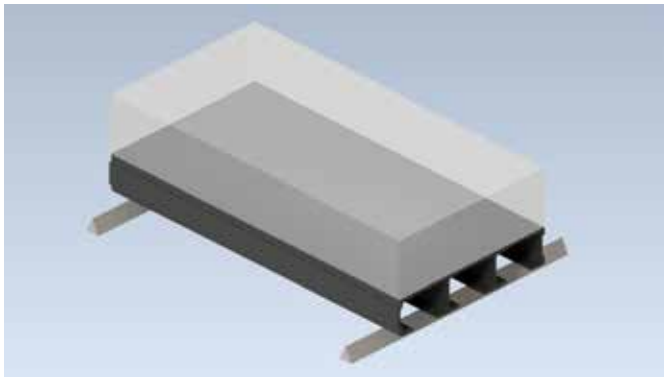
S_{Xmax} = 1.16E+6 mm³/m

A_W = 8.26E+3 mm²/m | Weight = 0.45 kN/m²

	Allowable Concentrated Load Tables (kN/m width of panel)						Allowable Uniform Load Tables (kN/m²)					
	L/D Ratios			Deflection (mm)	IBC Max. Service Load	AASHTO Max. Service Load	L/D Ratios			Deflection (mm)	IBC Max. Service Load	AASHTO Max. Service Load
Span (m)	240	360	500	6			240	360	500	6		
0.25	****	****	****	****	126.5	94.9	****	****	****	****	843.2	632.4
0.50	****	****	****	****	126.5	94.9	****	****	****	****	421.6	316.2
0.75	****	****	****	****	126.5	94.9	****	****	****	****	281.1	210.8
1.00	****	****	100.8	****	126.5	94.9	****	****	****	****	210.8	158.1
1.25	****	106.6	76.8	****	126.5	94.9	****	****	129.7	****	168.6	126.5
1.50	123.8	82.6	59.4	118.9	126.5	94.9	****	117.0	84.2	****	140.5	105.4
1.75	97.8	65.2	46.9	80.4	126.5	94.9	119.3	79.5	57.3	98.2	120.5	90.3
2.00	78.6	52.4	37.8	56.6	126.5	91.0	84.3	56.2	40.5	60.7	105.4	79.0
2.25	64.4	42.9	30.9	41.2	126.5	80.9	61.5	41.0	29.5	39.3	93.7	70.3
2.50	53.5	35.7	25.7	30.8	116.5	72.8	46.1	30.7	22.1	26.6	84.3	59.2
2.75	45.1	30.1	21.7	23.6	105.9	66.2	35.4	23.6	17.0	18.5	76.7	48.9
3.00	38.5	25.7	18.5	18.5	97.1	60.7	27.7	18.5	13.3	13.3	65.7	41.1

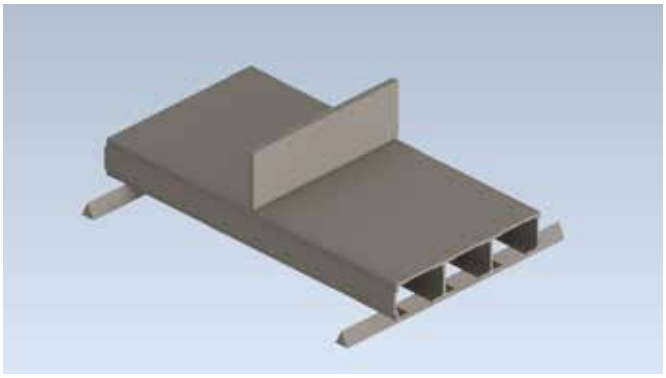
Maximum allowable load is determined by a 2.5 safety factor in flexure and a 3.0 safety factor in shear for IBC.
Maximum allowable load is determined by a 4.0 safety factor in flexure and a 4.0 safety factor in shear for AASHTO.
Shear is calculated with the point load located over the support.

Typical Load Scenario Depicted In Load Charts



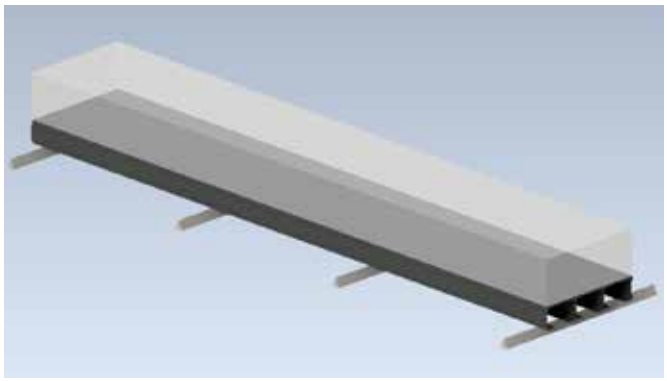
UNIFORM LOAD – SINGLE SPAN; SIMPLY SUPPORTED

Uniform Load in lbf/ft² (kN/m²)



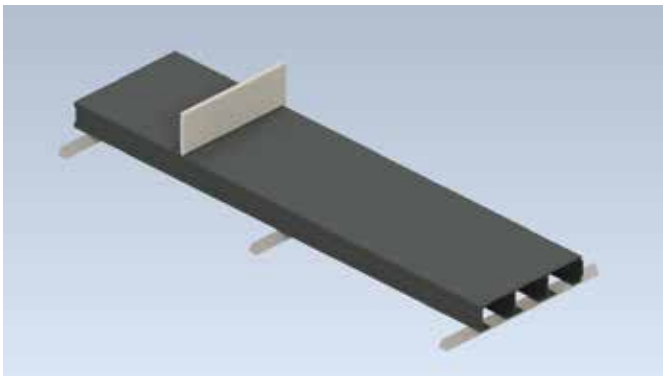
CONCENTRATED LOAD - SINGLE SPAN; SIMPLY SUPPORTED

A concentrated load in lbf/ft width of panel (kN/m)



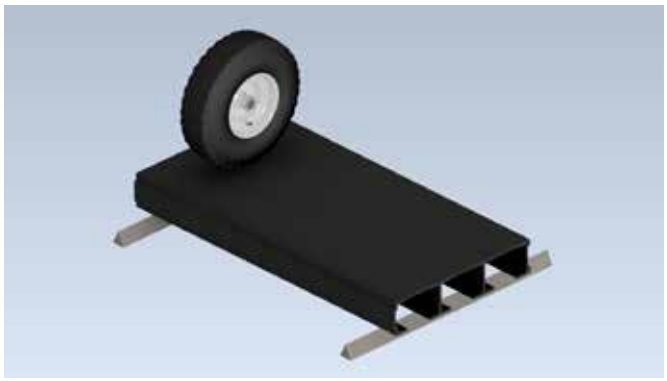
UNIFORM LOAD - CONTINUOUS SPAN

Uniform Load in lbf/ft² (kN/m²)



CONCENTRATED LOAD AT CENTER OF ONE SPAN - CONTINUOUS SPAN

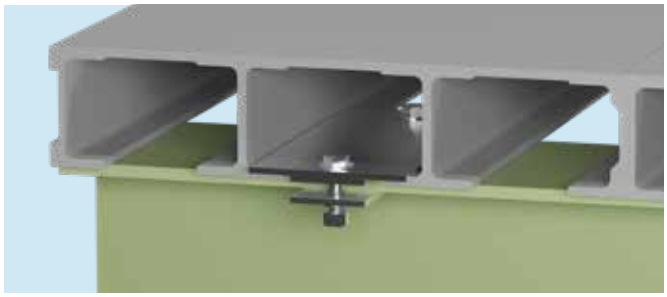
A concentrated load in lbf/ft width of panel (kN/m)



WHEEL LOAD – SINGLE SPAN – WHEEL LOAD APPLIED ADJACENT TO SUPPORT

A concentrated load in lbf based on tire footprint (kN)

Deck To Girder Connections

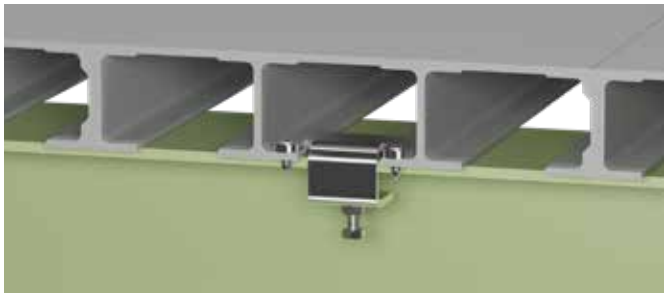


Hold Down Clamp

The hold down clamp features a steel machined plate that interlocks with the deck and clamps to the flange of the girder on both sides of the beam. This clamp would offer little to no visibility upon assembly.

Hold Down Clamp Connection	
Description	**Quantity**
Top Plate	1
Bottom Plate	2
5/8″ Bolt	2
5/8″ Nut	2
5/8″ Washer	4
5/8″ Lock Washer	2

Hold-down components can be supplied in either stainless or galvanized steel; Consult factory for part numbers and connection details



Beam Clip

The beam clip offers a quick hold down option that can be adjusted for a variance of thicknesses. This clamp also provides little to no visual effects from the top of the structure. The maximum thickness of the steel or FRP flange can be 1 3/4 inch.

Beam Clip Connection	
Description	**Quantity**
Heavy Duty Beam Clip	1
5/8″ Hex Head Bolt	1
5/8″ Hex Nut	1
¼″ Hex Head Bolt	2
¼″ Washer	4
¼″ Lock Washer	2
¼″ Hex Nut	2

Hold-down components can be supplied in either stainless or galvanized steel; Consult factory for part numbers and connection details

Hidden Clamp Connection

This hidden clamp features a steel plate that captures the bottom flanges of the GR250. This allows for a secure hold on the plank and creates a clean connection. The flange of the support structure will need to be drilled. Although this connection is more labor intensive, it is an excellent blind connection technique for bridges with higher-than-average wind uplift loads.

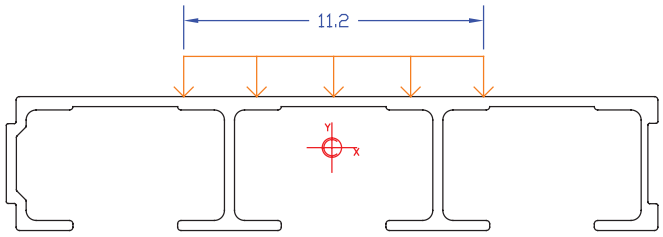
Hidden Clamp Connection	
Description	**Quantity**
6.5″ x 6.5″ x ¼″ Steel Plate	1
5/8″ Hex Head Bolt	1
5/8″ Washer	2
5/8″ Lock Washer	1
5/8″ Hex Nut	1

H-5 Wheel Load Analysis & Design Considerations

Flexural properties for design strength and serviceability calculations are extrapolated from testing of GR120, at the component level, which was performed previously at (CCG). Additional information regarding the testing procedure and test results can be scrutinized in the GR120 white paper data base. Wheel load simulation testing on the GR120 demonstrated that the top flange distributed the wheel load to the outside webs increasing the total effective web area. The web load distribution factor was determined by dividing the total number of webs by the number of webs influenced by the wheel load. The web ratio was defined for the purpose of calculating the load distribution factor on the shear area (webs) in GR250 panel.

The load distribution on the top flange varies for each SuperDeck profile. Because the wheel footprint is 11.2 inches, most of CCG's decks are assumed to evenly distribute the load across each of the webs. However, the GR250 deck is 24 inches wide and the test results depicted in the image to the right indicates that the webs directly under the wheel resist the majority of the applied wheel load. It is assumed that GR250 would have the same failure mechanism in the webs under shear loading (wheel load). Hence, the web ratio calculation is needed to define effective web (shear) area for a conservative design approach. This effective shear area is basically a reduction of the total shear area based on the number of webs influenced by the wheel load.

The GR250 deck has a total of four webs and three unsupported lengths. The wheel load covers a maximum of two webs and one unsupported length as seen in the image to the right. To determine the maximum reactions for each beam calculation, an arbitrary wheel load (distributed load) was distributed across the entire width. This ratio then is multiplied by the total web area, hence a reduced shear area.



	Max Span (in) for H-5 Wheel Load Applied at Midspan			
Code	Allowable Strength	Allowable Deflection 0.25in	Allowable Deflection L/360	Allowable Deflection L/500
IBC[A]	315	90	91	75
LRFD AASHTO[B]	225			
ASD AASHTO[C]	199			

A – 2018 International Building Code (IBC); IBC Safety Factors include 3 for shear and 2.5 for flexure
B – 2020 LRFD Bridge Design Specifications, 9th Edition; LRFD AASHTO Equivalent Allowable Safety Factors include 3.5 for shear and 3.5 for flexure (Equivalent Allowable Safety Factor = Load Factor Divided by Phi Factor)
C - 2002 AASHTO Standard Specifications for Highway Bridges 17th Edition; ASD AASHTO Safety Factors include 4 for shear and 4 for flexure

SuperDeck Highway Decking

SuperDeck Highway Decking was designed to replace deteriorating wood, concrete and steel bridges. The SuperDeck Highway performs to HS25-44 load standards and is intended for highway traffic. The corrosion resistant deck is 1/5th the weight of traditional concrete deck. It is factory manufactured and shipped to the job site per the engineer's specification. The deck installs very fast and can be connected to steel or concrete girders with shear studs. Contact us for anti-skid and wearing surface options.

Applications

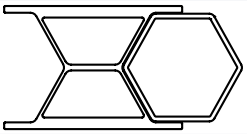
- Decking for Walkways & Platforms
- Marina Dock Decking
- Cooling Tower Decking
- Pedestrian Bridge Decks
- Vehicular Bridges
- Commercial Piers

Features and Benefits

- Corrosion Resistant
- Non-Conductive
- Lightweight
- Maintenance Free
- Environmentally Safe
- High Strength
- Structurally Stable
- Electromagnetic Transparency
- Easy Standard Installation Methods
- Panels Easily Removed
- Elimination of Expensive Labor & Equipment

SuperDeck Highway Decking (Part# CP045/CP046) - Simple Supported Beam - Single Span

SuperDeck Highway Decking (Part# CP045/CP046): 8" wide - I, IFR, VFR Series



IMPERIAL

E_b = 3.50 Msi | G_b = 0.50 Msi | Characteristic longitudinal compressive strength (F_L) = 35,000 psi

I_x = 263 in⁴/ft | S_{Xmin} = 65.7 in³/ft | Characteristic in-plane shear strength (F_{LT}^{v}) = 9,000 psi

S_{Xmax} = 65.7 in³/ft

A_w = 8.0 in²/ft | Weight = 23 psf

	Allowable Concentrated Load Tables (lb/ft width of panel)							Allowable Uniform Load Tables (lb/ft²)					
	L/D Ratios			Deflection (in)				L/D Ratios			Deflection (in)		
Span (in)	180	240	360	0.25	0.375	Max. Service Load	Span (in)	180	240	360	0.25	0.375	Max. Service Load
78	27783	20837	13891	16029	24043	48180	78	7293	5470	3647	4208	6311	7412
84	25029	18772	12515	13409	20113	44933	84	6061	4546	3031	3247	4870	6883
90	22621	16966	11311	11311	16966	41938	90	5084	3813	2542	2542	3813	6424
96	20512	15384	10256	9615	14422	39317	96	4300	3225	2150	2016	3023	6023
102	18659	13994	9330	8232	12348	37004	102	3666	2749	1833	1617	2426	5668
108	17028	12771	8514	7095	10643	34948	108	3147	2361	1574	1311	1967	5353
114	15588	11691	7794	6153	9230	33109	114	2720	2040	1360	1074	1611	5072
118	14720	11040	7360	5614	8421	31986	118	2477	1858	1238	945	1417	4900
126	13178	9883	6589	4706	7060	29956	126	2069	1552	1035	739	1108	4589
132	12167	9125	6083	4148	6222	28594	132	1819	1364	910	620	930	4380

METRIC

E_b = 24.1 GPa | G_b = 3.40 GPa | Characteristic longitudinal compressive strength (F_L) = 241 MPa

I_x = 3.64E-4 m⁴/m | S_{Xmin} = 3.5E-3 m³/m | Characteristic in-plane shear strength (F_{LT}^{v}) = 62 MPa

S_{Xmax} = 3.5E-3 m³/m

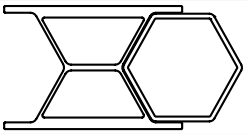
A_w = 1.7E-2 m²/m | Weight = 112 kg/m²

	Allowable Concentrated Load Tables (kN/m width of panel)							Allowable Uniform Load Tables (kN/m²)					
	L/D Ratios			Deflection (mm)				L/D Ratios			Deflection (mm)		
Span (m)	180	240	360	6	10	Max. Service Load	Span (m)	180	240	360	6	10	Max. Service Load
0.25	****	****	628.9	****	****	703.1	0.25	****	****	****	****	****	2812.5
0.50	****	****	570.7	****	****	703.1	0.50	****	****	****	****	****	1406.3
0.75	****	****	494.4	****	****	703.1	0.75	****	****	****	****	****	937.5
1.00	****	624.6	416.4	****	****	703.1	1.00	****	****	****	****	****	703.1
1.25	692.5	519.4	346.2	598.3	****	703.1	1.25	****	****	495.9	****	****	562.5
1.50	574.2	430.7	287.1	413.4	689.0	703.1	1.50	****	****	335.9	****	****	468.8
1.75	477.8	358.3	238.9	294.8	491.4	703.1	1.75	****	353.6	235.7	290.9	****	401.8
2.00	400.2	300.2	200.1	216.1	360.2	699.5	2.00	341.1	255.8	170.6	184.2	307.0	351.6
2.25	338.0	253.5	169.0	162.2	270.4	621.8	2.25	253.5	190.1	126.8	121.7	202.8	312.5
2.50	288.0	216.0	144.0	124.4	207.4	559.6	2.50	192.8	144.6	96.4	83.3	138.8	281.3
2.75	247.5	185.6	123.8	97.2	162.0	508.8	2.75	149.7	112.3	74.8	58.8	98.0	255.7
3.00	214.5	160.9	107.2	77.2	128.7	466.4	3.00	118.3	88.7	59.1	42.6	71.0	234.4

Maximum allowable load is determined by a 2.5 safety factor in both flexure and 3.0 safety factor in shear.

SuperDeck Highway Decking (Part# CP045/CP046) - Simple Supported Beam - Continuous Span

SuperDeck Highway Decking (Part# CP045/CP046): 8" wide - I, IFR, VFR Series



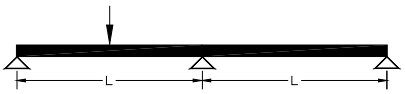
IMPERIAL

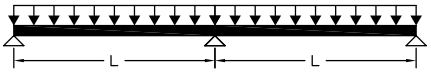
E_b = 3.50 Msi | G_b = 0.50 Msi | Characteristic longitudinal compressive strength (F_L) = 35,000 psi

I_x = 263 in⁴/ft | S_{Xmin} = 65.7 in³/ft | Characteristic in-plane shear strength (F_{LT}^{v}) = 9,000 psi

S_{Xmax} = 65.7 in³/ft

A_w = 8.0 in²/ft | Weight = 23 psf





	Allowable Concentrated Load Tables (lb/ft width of panel)					
	L/D Ratios			Deflection (in)		
Span (in)	180	240	360	0.25	0.375	Max. Service Load
78	34426	25819	17213	19861	29791	40570
84	31350	23512	15675	16794	25192	40570
90	28604	21453	14302	14302	21453	40570
96	26156	19617	13078	12261	18391	40570
102	23972	17979	11986	10576	15864	40570
108	22021	16516	11011	9176	13763	40570
114	20277	15208	10139	8004	12006	39769
118	19217	14413	9608	7328	10993	38421
126	17313	12984	8656	6183	9275	35981
132	16051	12038	8026	5472	8208	34346
138	14914	11186	7457	4863	7295	32852

	Allowable Uniform Load Tables (lb/ft²)					
	L/D Ratios			Deflection (in)		
Span (in)	180	240	360	0.25	0.375	Max. Service Load
78	****	****	5570	****	****	6177
84	****	****	4724	5061	****	5736
90	****	****	4033	4033	****	5353
96	****	****	3465	3249	4873	5019
102	****	4493	2995	****	3965	4724
108	****	3906	2604	****	3255	4461
114	****	3413	2275	1796	2694	4226
118	****	3128	2085	1590	2386	4083
126	3525	2644	1762	1259	1888	3824
132	3123	2342	1562	1065	1597	3650
138	2779	2084	1389	906	1359	3491

METRIC

E_b = 24.1 GPa | G_b = 3.40 GPa | Characteristic longitudinal compressive strength (F_L) = 241 MPa

I_x = 3.64E-4 m⁴/m | S_{Xmin} = 3.5E-3 m³/m | Characteristic in-plane shear strength (F_{LT}^{v}) = 62 MPa

S_{Xmax} = 3.5E-3 m³/m

A_w = 1.7E-2 m²/m | Weight = 112 kg/m²

	Allowable Concentrated Load Tables (kN/m width of panel)					
	L/D Ratios			Deflection (mm)		
Span (m)	180	240	360	6	10	Max. Service Load
0.25	****	****	****	****	****	592.1
0.50	****	****	591.1	****	****	592.1
0.75	****	****	530.1	****	****	592.1
1.00	****	****	463.2	****	****	592.1
1.25	****	****	398.5	****	****	592.1
1.50	****	510.6	340.4	490.2	****	592.1
1.75	580.8	435.6	290.4	358.4	****	592.1
2.00	496.6	372.4	248.3	268.2	446.9	592.1
2.25	426.5	319.9	213.2	204.7	341.2	592.1
2.50	368.4	276.3	184.2	159.1	265.2	592.1
2.75	320.2	240.1	160.1	125.7	209.6	592.1
3.00	280.0	210.0	140.0	100.8	168.0	560.2

	Allowable Uniform Load Tables (kN/m²)					
	L/D Ratios			Deflection (mm)		
Span (m)	180	240	360	6	10	Max. Service Load
0.25	****	****	****	****	***	2343.8
0.50	****	****	****	****	****	1171.9
0.75	****	****	****	****	****	781.3
1.00	****	****	****	****	****	585.9
1.25	****	****	****	****	****	468.8
1.50	****	****	****	****	****	390.6
1.75	****	****	****	****	****	334.8
2.00	****	****	261.2	282.1	****	293.0
2.25	****	****	200.3	192.3	****	260.4
2.50	****	234.5	156.3	135.1	225.1	234.4
2.75	****	185.9	123.9	97.3	162.2	213.1
3.00	****	149.4	99.6	71.7	119.5	195.3

Maximum allowable load is determined by a 2.5 safety factor in both flexure and 3.0 safety factor in shear.

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