

Advantage: *Extremely lightweight bridge*



G-Rail crane profiles combine with Slant-Truss bolt-on reinforcements to create one of the lightest lifting systems in the world. *When you have to move a load quickly, the importance of a lightweight bridge becomes obvious!*

The Slant Truss (patented) is an all-aluminum bolt-on system that instantly increases the stiffness of the G-Rail by several times. When spans approach 25', 30' or even 35', the weight of the bridge increases exponentially, making many traditional cranes ergonomically impossible --there is simply too much weight to pull back and forth quickly. The extremely lightweight G-Rail, reinforced with the Slant Truss, makes long spans much more feasible.

Advantage: *Low running friction*



The key to smooth, friction-free running is in the end trucks.

G-Rail end trucks are rigid, as opposed to articulating, that is, bridge cannot skew with respect to the runways. This means that the whole bridge moves along evenly, with less "pendulum effect".

Our end trucks are machined from aluminum, not welded, making them very accurate and square-fitting, which eliminates the possibility of binding. Notice the size of the guide wheels at either end, which reduces friction further.

In some cases headroom is very limited. In the crane pictured, "strongbacks" have been used instead of trusses on the runways.

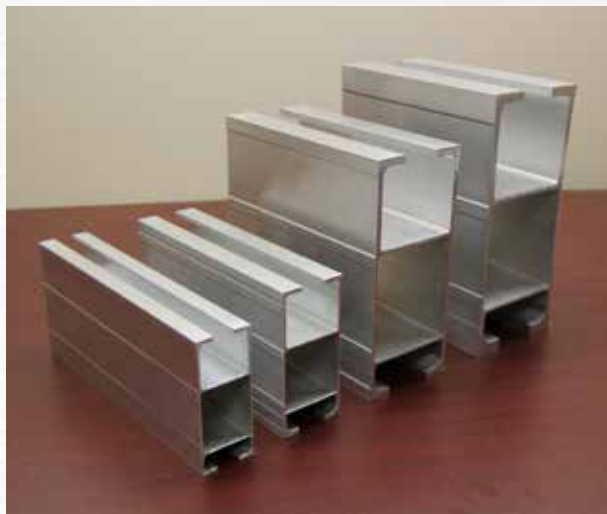


C2000 with low-profile "strongbacks" on runways and Slant Truss on bridge



End truck with optional tractor drive for heavier loads

G-Rail Track Profiles:



C100 Aluminum Profile

Nominal 100kg capacity, 130mm x 55mm

C250 Aluminum Profile

Nominal 250kg capacity, 150mm x 70mm

C1000 Aluminum Profile

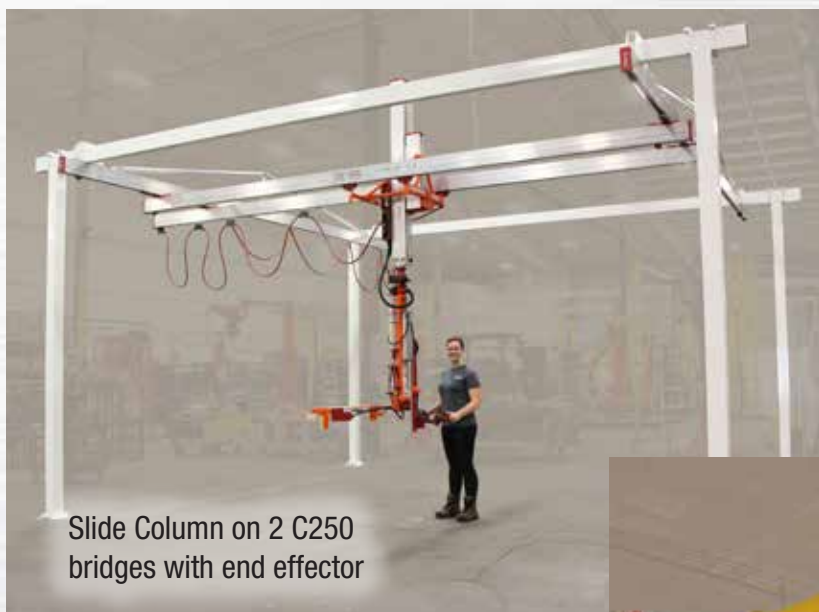
Nominal 1000kg capacity, 250mm x 110mm

C2000 Aluminum Profile

Nominal 2000kg capacity, 295mm x 130mm

These rail shapes feature an extremely high moment-of-inertia (stiffness) to weight ratio. They also have an unusually high torsional stiffness compared to most traditional rail profiles. Notice how high the profile is relative to its width -- maximizing the stiffness-to-weight ratio.

Advantage: Completely free-standing support frame



Slide Column on 2 C250 bridges with end effector

The support frame for the G-Rail crane is one of the strongest on the market.

Competitors state that unless movement of the support frame can be tolerated, attachment to part of the building structure may be necessary.

G-Rail cranes can be completely self-supporting, due to some of the largest columns in the industry. For example, C250 cranes have 5" x 5" columns, where competitors can be 3" x 3" and 4" x 4".

Also, G-Rail cranes are stiffened by recruiting the runway itself to rigidize the top of the frame. In effect, the runways become part of the frame! In particular, the saddle clamp, unique in the industry, connects the header absolutely rigidly to the runway.

Notice that the headers are made of tube -- not I-beam or channel-- adding to the stiffness in the direction of the runways.

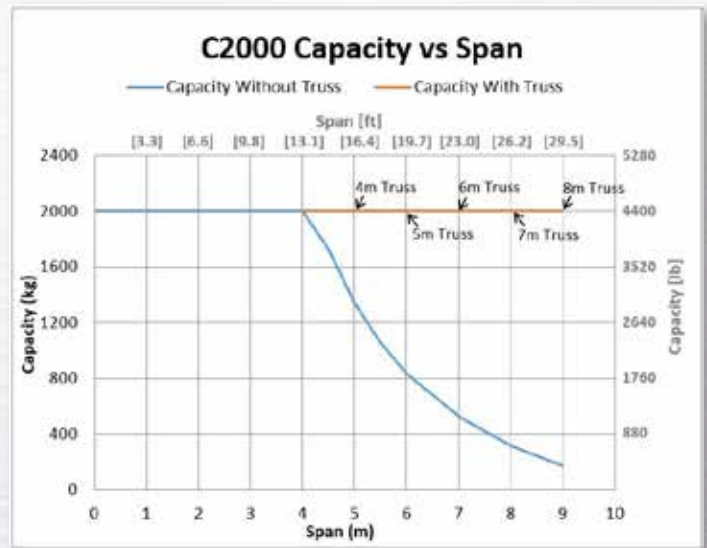
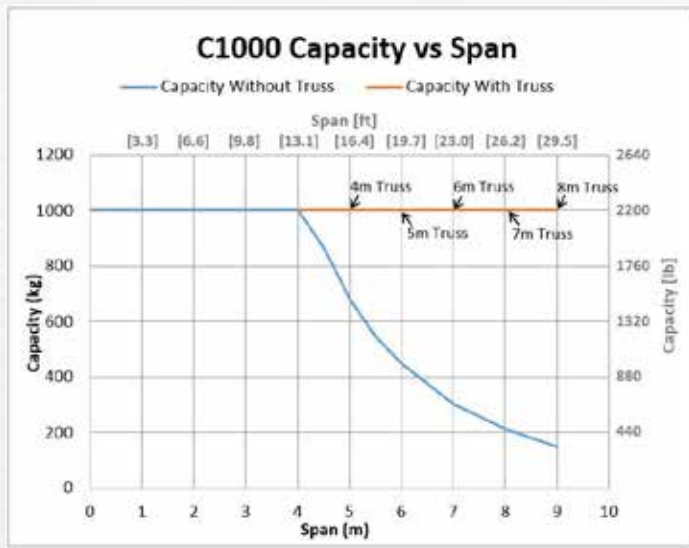
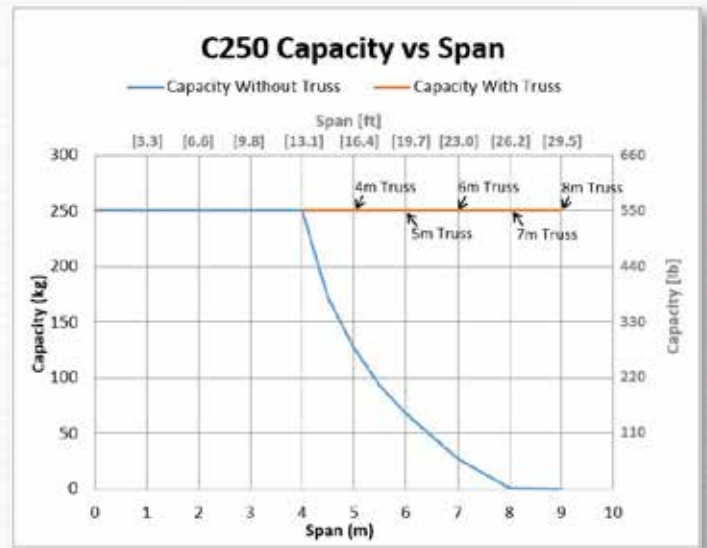
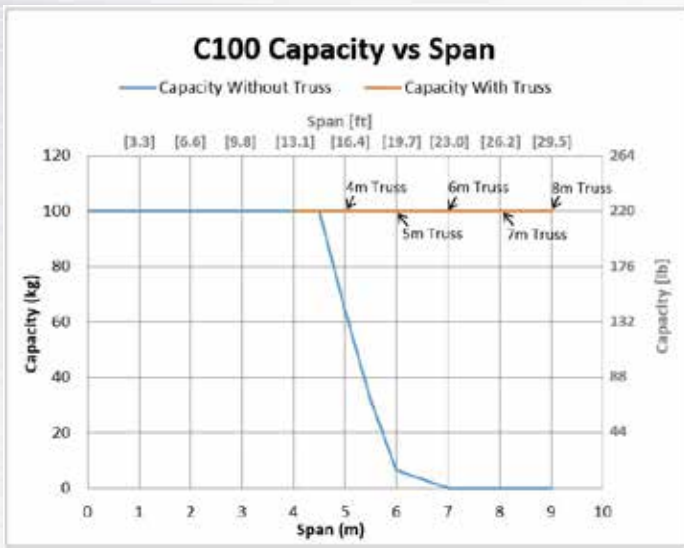


C1000 crane with balancer and custom hook

G-Rail™ Crane Capacity

G-Rail™	Max. Cap.	Max. Span without Truss	Max Span with Truss
C100	100kg	4m / 13'	9m / 30'
C250	250kg	4m / 13'	9m / 30'
C1000	1000kg	4m / 13'	9m / 30'
C2000	2000kg	4m / 13'	9m / 30'

The maximum capacity of the rail already takes into account its self-weight and the weight of one trolley and one hoist. That is, the capacity refers to the weight hung below the hoist hook.

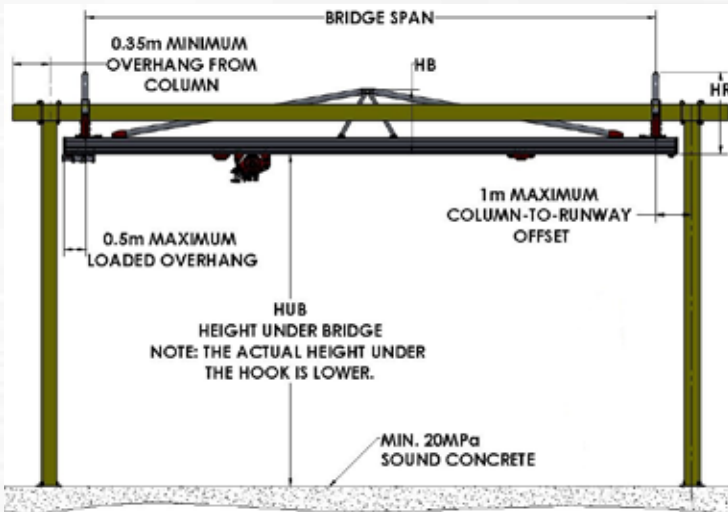


Need a non-standard crane? We can probably engineer it for your situation.

Crane Dimensions

$$\text{Overall Height} = \text{HUB} + (\text{HB or HR})$$

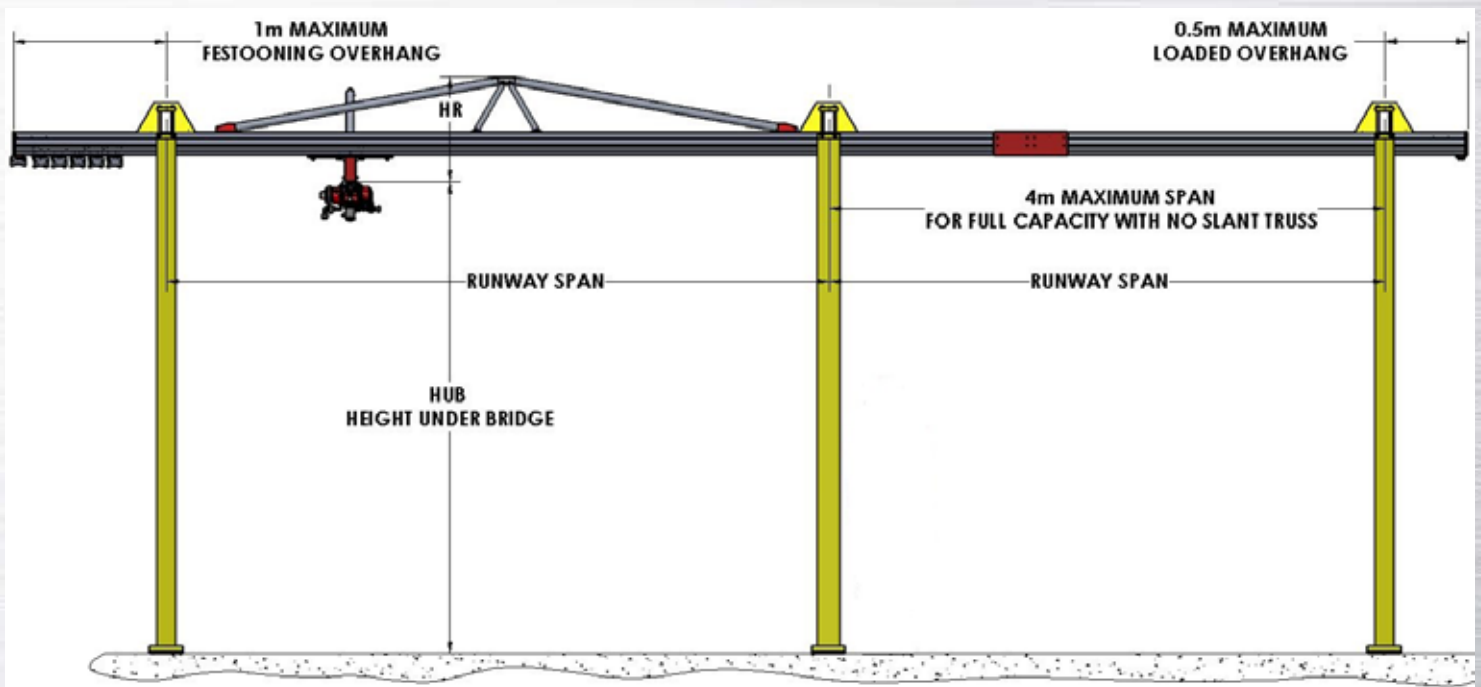
1 Meter \approx 3.28 Feet



		HB mm[in]					
		BRIDGE SPAN					
G-Rail™		4m[13.1']	5m[16.4']	6m[19.7']	7m[23.0']	8m[26.3']	9m[29.5']
C100		435[17.2]	800[31.5]	890[35.1]	975[38.4]	1065[42.0]	1155[45.5]
C250		530[20.9]	845[33.3]	935[36.9]	1020[40.2]	1110[43.8]	1195[47.1]
C1000		795[31.3]	1015[40.0]	1105[43.6]	1190[46.9]	1280[50.4]	1370[54.0]
C2000		946[37.3]	1125[44.3]	1210[47.7]	1300[51.2]	1385[54.6]	1475[58.1]

		HR mm[in]					
		RUNWAY SPAN					
G-Rail™		4m[13.1']	5m[16.4']	6m[19.7']	7m[23.0']	8m[26.3']	9m[29.5']
C100		435[17.2]	670[26.4]	760[30.0]	850[33.5]	935[36.9]	1025[40.4]
C250		530[20.9]	715[28.2]	805[31.7]	890[35.1]	980[38.6]	1065[42.0]
C1000		795[31.3]	960[37.8]	1050[41.4]	1135[44.7]	1225[48.3]	1315[51.8]
C2000		946[37.3]	1060[41.8]	1150[45.3]	1240[48.9]	1325[52.2]	1415[55.8]

Sample Front View of Single Bridge System



Sample Side View of a Single Bridge system

Standard HUB
2.50m / 98.4"
3.25m / 128"
4.00m / 157.5"
4.75m / 187"

Example: For estimating the overall height for a standard 4.0m HUB, C250 G-Rail™ crane that has a 7.0 m bridge span and 6.0 m runway span.

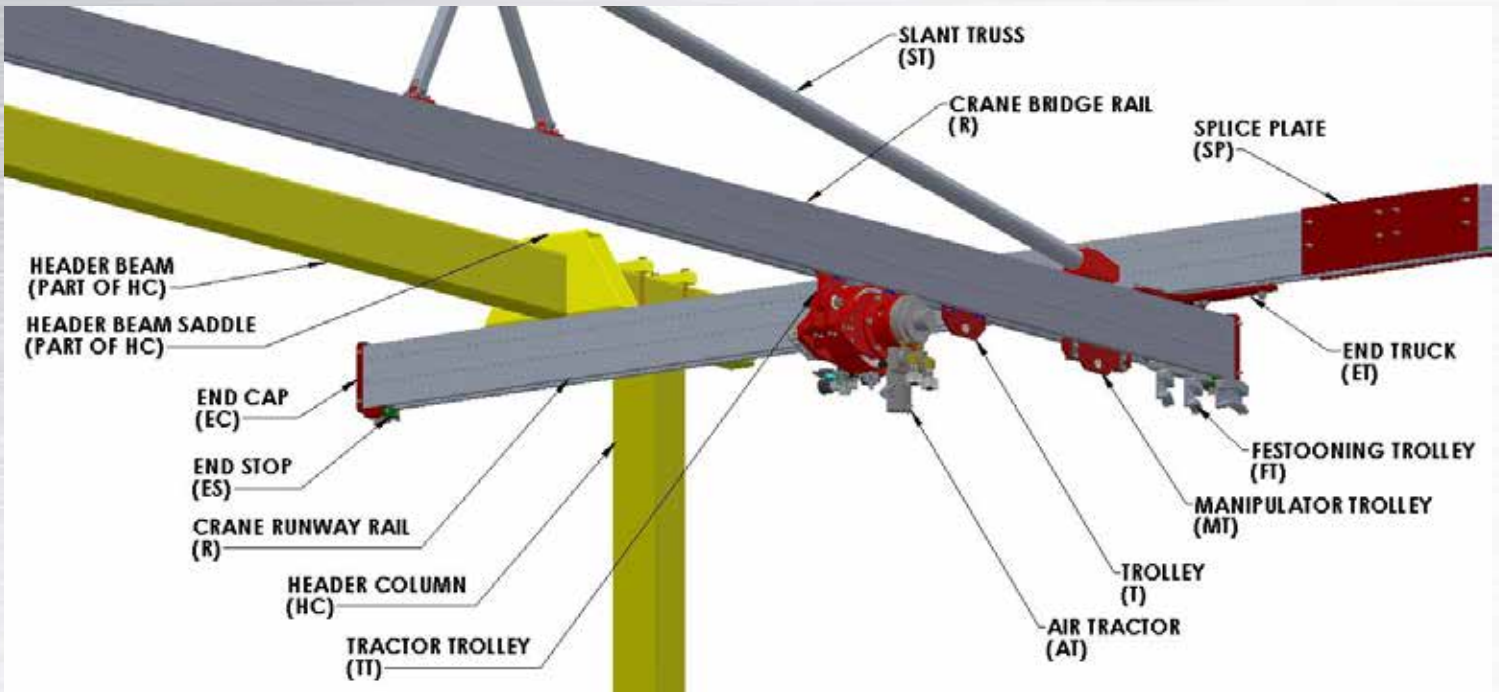
For C250 rail, 7.0m Bridge span, "HB" is 1020mm

For C250 rail, 6.0m Runway span, "HR" is 805mm

$$\text{Overall Height} = 4000\text{mm} + 1020\text{mm} = 5020\text{mm or } 5.02\text{m}$$

Maximum loaded rail overhangs can be increased in many cases, but only after approval from the engineers at GEI or GLS. Maximum span of 9m can also be increased in some cases, with engineering approval.

G-Rail™ Crane Components



C 250 - MT -

Load Capacity	
100	Up to 100kg
250	Up to 250kg
1000	Up to 1000kg
2000	Up to 2000kg

Crane Components	
EC	End Cap
ES	End Stop
ET	End Truck
FT	Festooning Trolley
HC	Header Column
MT	Manipulator Trolley
R	G-Rail™
SP	Splice Plate
ST	Slant Truss
T	Trolley
TT	Tractor Trolley

Applies to component HC, R, and ST only	
For component HC	
2.5	2.50m / 98.4" Height under Bridge
3.25	3.25m / 128" Height under Bridge
4	4.00m / 157.5" Height under Bridge
4.75	4.75m / 187" Height under Bridge

For Component ST	
4m	For Rail span 4-5m / 13'-16.4'
5m	For Rail span 5-6m / 16.4'-20'
6m	For Rail span 6-7m / 20'-23'
7m	For Rail span 7-8m / 23'-26'
8m	For Rail span 8-9m / 26'-30'

For Custom Header Column height, please contact Givens Engineering Inc.

For component R
Please specify the required length for G-Rail™

Trolleys (T) are meant to be used with ordinary hoists and balancers. Manipulator trolleys (MT) have large guide wheels that can withstand the side loads present with manipulators, torque arms and torque tubes.



Cantilevered C250 crane without trusses.

The slant truss...

can be added to the G-Rail or not, as the loading requires. G-Rail does not need to be reinforced if the span is 4m (13') or less.

If the loading is less than the maximum rail capacity, longer spans than 4m can be used without a truss.



G-Rail cranes are versatile....

We understand that a perfectly rectangular crane is not always possible, that there are often obstacles to be avoided.

If you have an unusual requirement, give us a call... we can probably create a solution.

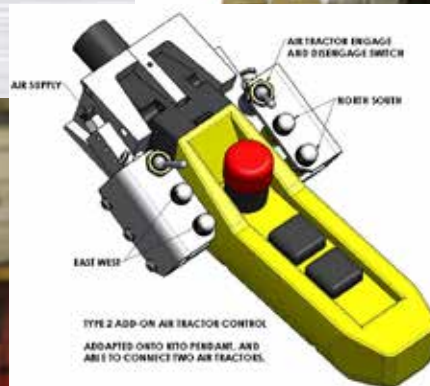
Disengageable Tractor Drive

Our AT tractor drive disengages from the rail when not in use, allowing the load to 'free-wheel'. The operator can choose to pull the load manually or engage the tractor at any time.

For heavy, continuous use, the airmotor should be supplied with a small amount of oil; for intermittent use, the tractor can be run oil-free.



Tractor controls on hoist pendant



The AT can pull loads of up to 2000kg. (4400 lb). Max speed with lighter loads: .75m/sec or 150 ft/min

Typically, one AT is used to pull the hoist trolley and one AT is used to pull the bridge.



Gripper end effector on a manipulator running on a C2000 Crane



Battery end effector on a slide column

End Effectors

We design and create specialized end effectors on a continuous basis, based on grippers, vacuum, magnets or mechanical latches. We mass-produce and stock handlebars, grippers, bearing assemblies, etc for fast turnaround.

No one is better at creating custom end effectors out of standard parts!

Givens Engineering, established in 1993, provides manipulators, cranes and custom machinery to a wide range of customers in the United States, Canada and beyond.

Almost everything we manufacture is customized and engineered to some extent.

We employ engineers (mechanical and electrical), designers, machinists, millwrights, welders, electricians and controls specialists to manufacture cranes, manipulators, grippers and end effectors entirely in-house.

Installation, startup support, maintenance and annual inspections are services that we routinely provide.

We have supplied equipment to these large organizations:

Toyota, Honda, GM, Chrysler, Magna, International Truck, Hino Truck, GE, Volvo, NASA, TRW, Dana, GKN, Siemens, Kaiser and many others.



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