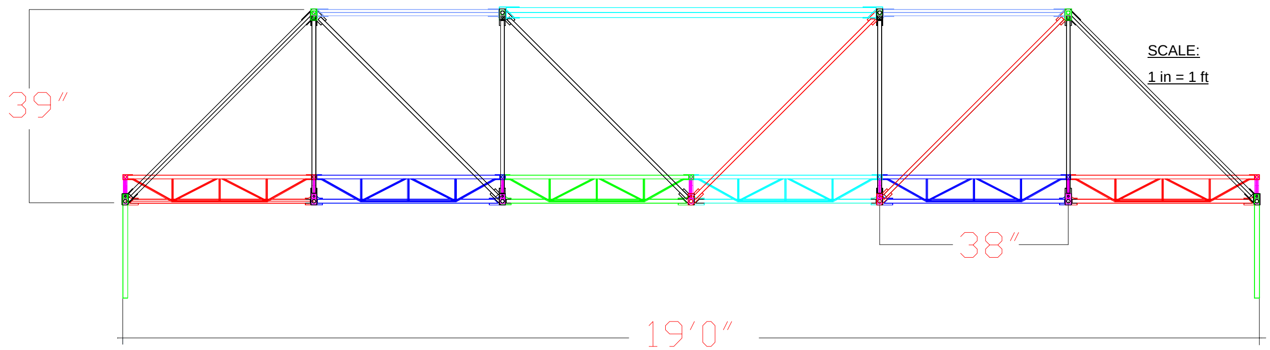
ILLINOIS INSTITUTE OF TECHNOLOGY

2007 AISC/ ASCE STEEL BRIDGE COMPETITION

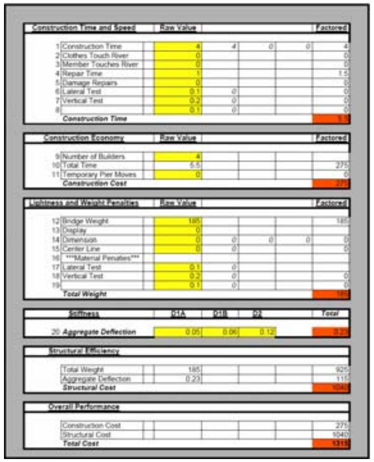
IIT

Bridge Configuration:

We selected this bridge configuration because we decided that it would be the most economical choice as based on the design loads, the weight of the bridge, the building time and the ease of building. To make this our final selection we used a scoring sheet which was based on the given requirements by AISC. We also took into consideration the site the bridge would be built in and how construction would affect our cost. To make the bridge more economical we made sure to use steel sections that are widely available in the current market. This reduces material cost and therefore the overall cost of the bridge.



Score Sheet:



#	Construction Time and Speed	Raw Value				Factored
1	Construction Time	4	4	0	0	4
2	Clothes Touch River	0				0
3	Member Touches River	0				0
4	Repair Time	1				1.5
5	Damage Repairs	0				0
6	Lateral Test	0.1	0			0
7	Vertical Test	0.2	0			0
8		0.1	0			0
	Construction Time					[illegible]

#	Construction Economy	Raw Value				Factored
9	Number of Builders	4				
10	Total Time	5.5				275
11	Temporary Pier Moves	0				0
	Construction Cost					275

#	Lightness and Weight Penalties	Raw Value				Factored
12	Bridge Weight	185				185
13	Display	0				
14	Dimension	0	0	0	0	0
15	Center Line	0	0			0
16	***Material Penalties***					
17	Lateral Test	0.1	0			
18	Vertical Test	0.2	0			0
19		0.1	0			0
	Total Weight					[illegible]

#	Stiffness	D1A	D1B	D2		Total
20	Aggregate Deflection	0.05	0.06	0.12		[illegible]

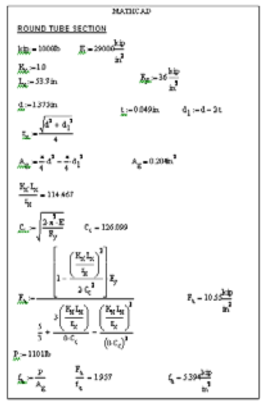
Structural Efficiency					Factored
Total Weight	185				925
Aggregate Deflection	0.23				115
Structural Cost					[illegible]

Overall Performance					
Construction Cost					275
Structural Cost					1040
Total Cost					[illegible]

SAP2000 ANALYSIS

TABLE: Element Joint Forces - Frames

Frame	Joint	F1	F2	F3	M1	M3
Text	Text	Kip	Kip	Kip	Kip-in	Kip-in
4	1	0.686	-0.004522	0.688	0.155	-0.123
4	4	-0.6	0.005116	-0.598	0.039	-0.049
4	1	0.6	-0.005116	0.602	0.14	-0.135
4	4	-0.686	0.004522	-0.684	0.032	-0.059
12	4	1.408	0.002091	0.001304	-0.011	0.055
12	6	-1.184	-0.001734	0.001304	0.016	0.026
12	4	1.184	0.001734	0.001304	-0.016	0.046
12	6	-1.408	-0.002091	0.001304	0.011	0.017
13	6	1.738	0.0001141	0.003236	0.00001786	0.0002725
13	10	-1.233	0.00002603	0.003236	0.001916	0.011
13	6	1.233	-0.00002603	0.003236	-0.001916	-0.01
13	10	-1.738	-0.0001141	0.003236	-0.00001786	-0.0002725
14	10	1.408	-0.001907	0.001304	0.016	-0.017
14	11	-1.186	0.002258	0.001304	-0.011	-0.052



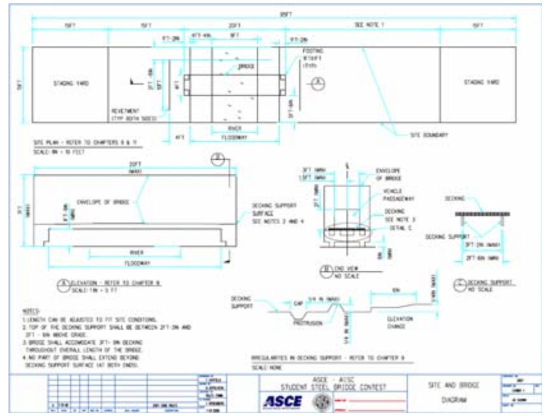


TABLE: Base Reactions

OutputCase	CaseType	StepType	GlobalFZ	GlobalMX	GlobalMY	XCentroidFX	YCentroidFX	XCentroidFY	YCentroidFY	XCentroidFZ	YCentroidFZ
Text	Text	Text	Kip	Kip-in	Kip-in	in	in	in	in	in	in
ENVELOPE	Combination	Max	2.808	59.636	-301.547	-1.111E+14	24.12	30.535	2.984E+14	128.026	21.237
ENVELOPE	Combination	Min	2.7	56.702	-354.899	-1.302E+14	-4.077E+7	-3.754E+7	2.409E+13	111.68	21

Team Member	Major	Year
Gbadebo Atewologun	CE	Junior
Christina Barret	CS	Junior
John Brilla	ARCH	Junior
David Fahs	CE	Senior
Patrick Fong	ARCH	Junior
Bernard Froehlich	CE	Senior
Emiliano Giana	CE	Senior
Naomi Heler	CE	Senior
Daniel Hernandez	CE	Senior
Ei Sheng Hong	CE	Senior
Thomas Huang	ARCH	Junior
Mohamad Khudeira	CE	Junior
Yong-Wan Kim	CE	Junior
Linda Lee	ARCH	Senior
Man Leung	CE	Junior
Heather Mahoney	CE	Senior
Jinit Patel	CE	Senior
Robert Pershey	POL.SCI	Senior
Sotiel Polena	CE	Senior
Fuzel Shethwala	ARCH	Junior
Lucas Shorette	CE	Senior
Milena Stopic	ARCH	Junior
Melissa B. Swiderski	CE	Senior
Chintan B. Thakkar	ME	Senior
Lee Welsh	CE	Senior

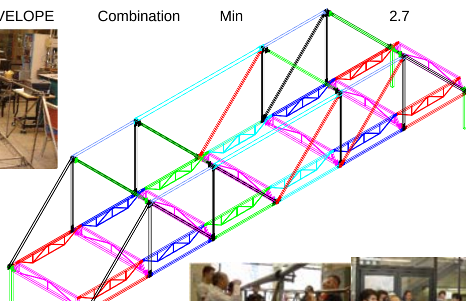
History

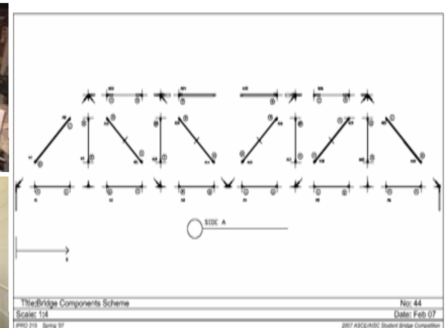
The Student Steel Bridge Competition is sponsored by the American Institute of Steel Construction (AISC) and the American Society of Civil Engineers (ASCE).

Safety is of primary importance. AISC and ASCE request that competitors, advisers, hosts, and judges take all necessary precautions to prevent injury.

Students design a steel bridge by themselves but may seek advise from faculty and other consultant. Students may fabricate the entire bridge themselves, however the services of a commercial fabricator may be used, provided that students develop the work orders and observe the operations. Student involvement in bridge fabrication is encouraged.

The rules are changed every year to improve the contest and assure that competitors design and build new bridges. These rules govern both Regional and National competitions.





ILLINOIS INSTITUTE OF TECHNOLOGY
IPRO 315: SPRING 2007
DESIGN OF A LARGE-SCALE BRIDGE STRUCTURE

IIT

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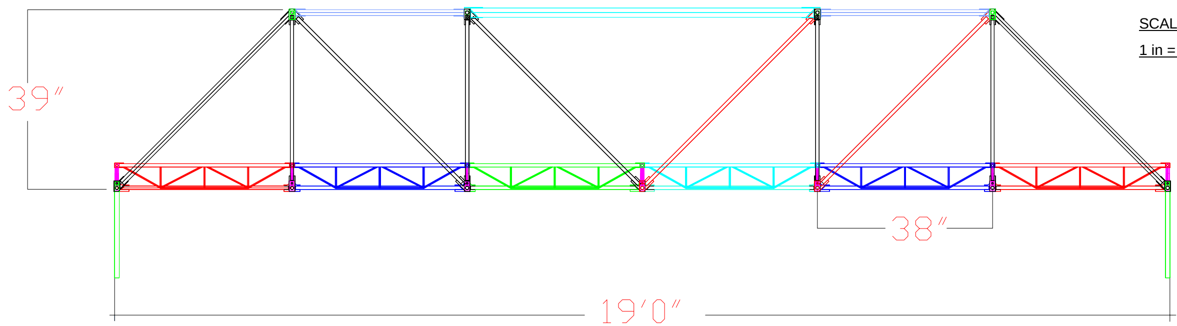
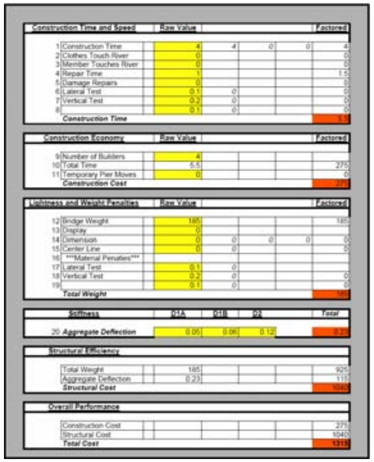


SCALE:

1 in = 1 ft

Score Sheet:



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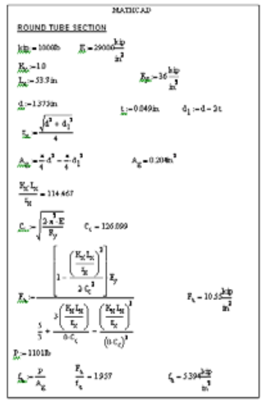

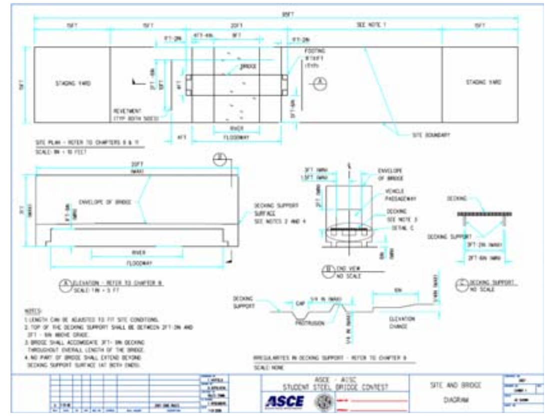

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