



STEEL BRIDGE FINAL PROPOSAL

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CENE 476

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Project Introduction

Purpose:

- 1:10 Scale Model of bridge to be designed and constructed

Background:

- Across the Skunk River in Peterson Park, Iowa

Client:

- Mark Lamer



Figure1, Skunk River [1]

Task 1: Background Research

1.1 - Research Steel Properties and Types

1.2 - Research Connection Types

1.3 - Research Bridge Types

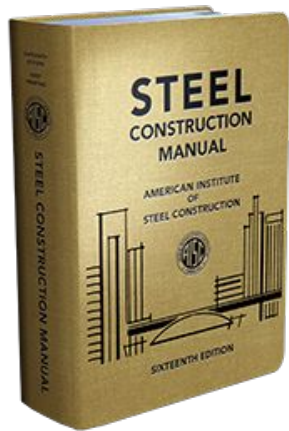


Figure 2, AISC Gold Book [2]

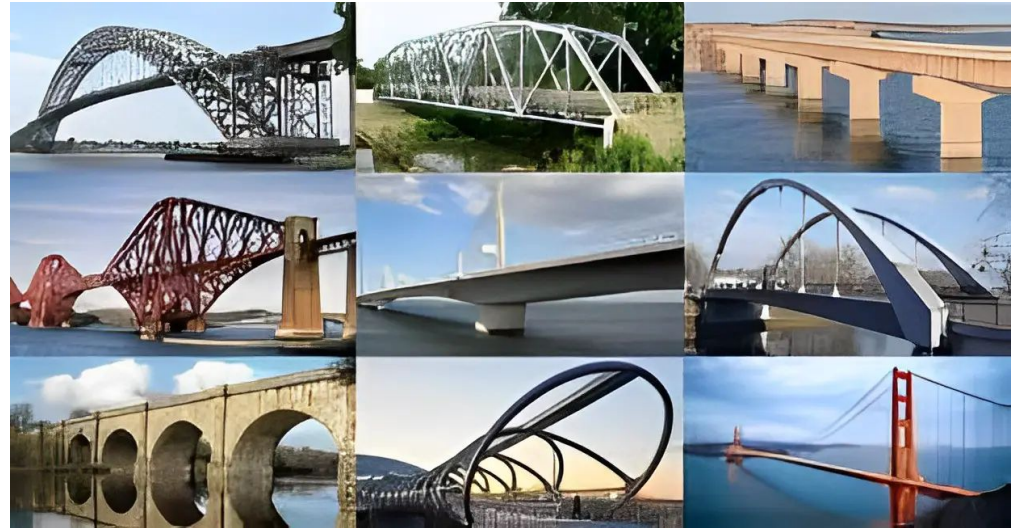


Figure 3, Types of Bridges [3]

Task 2: Design

2.1 - Create Preliminary Sketches

2.2 - Create RISA 3D Models

2.3 - Select Final Design (Decision Matrix)

2.4 - Design Connections

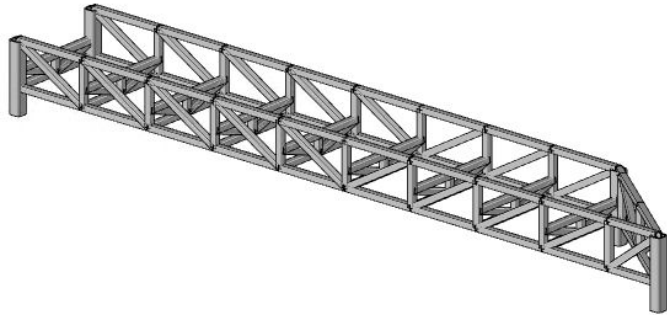


Figure 5, RISA 3D Bridge Model Example 2

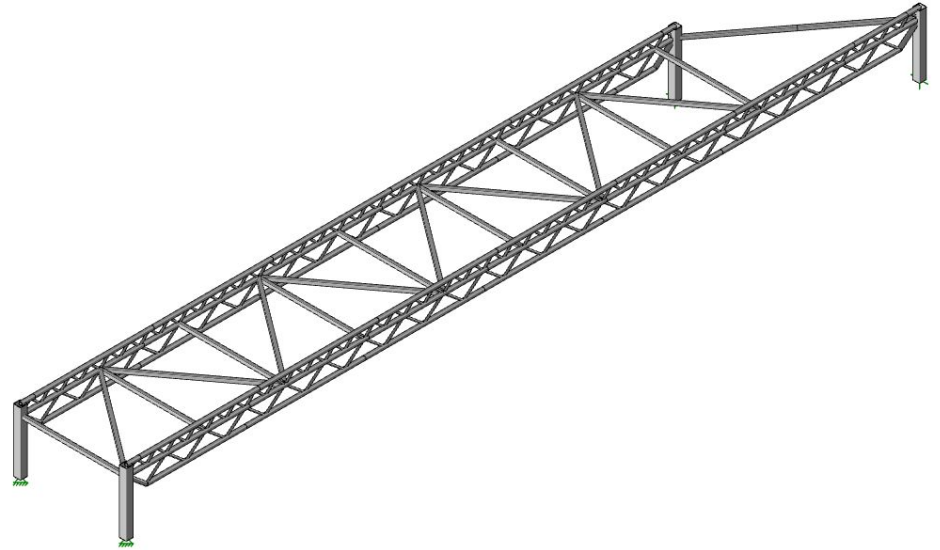


Figure 4, RISA 3D Bridge Model Example 1

Task 3: Develop Shop Drawings

3.1 - Create Title Block and Cover Sheet

3.2 - Draw Required Views

3.3 - Draw Connection Details

3.4 - Develop General Structural Notes

3.5 - Create Materials Schedule

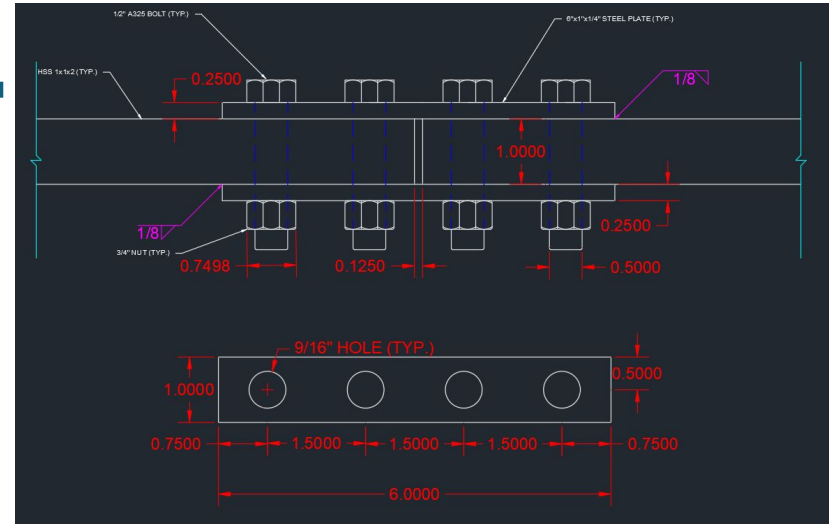


Figure 7, Bridge Profile View Example

Task 4: Sub-Consultant Coordination and Fabrication

4.1 - Coordinate with Page Steel

4.2 - Coordinate with Copper State Nut and Bolt

4.3 - Coordinate with Flagstaff High School

4.4 - Complete Additional Team Fabrication



Figure 8, Steel [4]

Task 5: Competition Preparation

5.1 - Practice Bridge Assembly

5.2 - Create Poster

Task 6: Competition

6.1 - Participate in Display Day

6.2 - Participate in Build Competition



Figure 9, Competition [5]

Task 7: Project Management

7.1 - Deliverables

7.1.1 - 30% Submittal

7.1.2 - 60% Submittal

7.1.3 - 90% Submittal

7.1.4 - Final Submittal

7.1.5 - Website

7.1.6 - Final Presentation

7.2 - Schedule Management

7.3 - Resource Management

7.4 - Meetings



Figure 10, Team Meeting [6]

Task 8: Impacts

Environmental Impacts

Social Impacts

Economic Impacts

Exclusions:

Footing Design

Geotechnical Considerations

Effects due to Weathering



Figure 11, Bridge Competition [7]

Life-Cycle Cost Analysis

Design and Construction of the Full-Size Bridge

Staffing

Table 1. Staffing Table

Tasks	SENG	ENG	EIT	DRFT	Task Totals
Task 1: Background Research	5	15	15	5	35
Task 2: Design	15	65	50	30	160
Task 3: Shop Drawings	20	40	25	55	140
Task 4: Sub-Consultant Coordination and Fabrication	20	20	20	10	70
Task 5: Competition Preparation	15	25	25	10	75
Task 6: Competition	20	20	20		60
Task 7: Project Management	40	45	30	35	150
Task 8: Project Impacts	5	5	5		15
Staff Totals	140	235	190	145	710

1.0 Staffing	Description	Quantity	Units	Unit Cost	Cost
	SENG	140	HR	\$ 200.00	\$ 28,000.00
	ENG	235	HR	\$ 150.00	\$ 35,250.00
	EIT	190	HR	\$ 90.00	\$ 17,100.00
	DRFT	145	HR	\$ 60.00	\$ 8,700.00
			SUBTOTAL		\$ 85,350.00
2.0 Supplies	Description	Quantity	Units	Unit Cost	Cost
	Steel	150	FT	\$ 10.00	\$ 1,500.00
	Nuts	100	EA	\$ 1.00	\$ 100.00
	Bolts	100	EA	\$ 1.00	\$ 100.00
	Miscellaneous	1	LS	\$ 500.00	\$ 500.00
			SUBTOTAL		\$ 2,200.00
3.0 Subcontracting	Description	Quantity	Units	Unit Cost	Cost
	Fabrication	100	HR	\$ 90.00	\$ 9,000.00
			SUBTOTAL		\$ 9,000.00
4.0 Travel	Description	Quantity	Units	Unit Cost	Cost
	Rental Van	5	Days	\$ 73.54	\$ 367.70
	Fuel	530	Miles	\$ 0.41	\$ 217.30
	Hotel	4	Nights (2 rooms)	\$ 120.00	\$ 960.00
	Meals and Incidental Expenses	4	People (4 days)	\$ 54.00	\$ 864.00
			SUBTOTAL		\$ 2,409.00
				TOTAL	\$ 102,659.00

Cost of Engineering Services

THANK YOU



Figure 13, Steel Bridge Team [8]

References:

- [1] Story County Conservation, "South Skunk River Water Trail", *storycountyiowa.gov*. [Online]. Available: <https://storycountyiowa.gov/1496/South-Skunk-River-Water-Trail>
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- [3] Godwin, "Bridges: everything about bridges, their types, and main parts", *studentlesson.com*. [Online]. Available: https://studentlesson.com/bridges-everything-about-bridges-their-types-main-part/#google_vignette
- [4] Freepik, "A pile of various sized steel beams and bars in a metal yard", *freepik.com*. [Online]. Available: https://www.freepik.com/premium-ai-image/pile-various-sized-steel-beams-bars-metal-yard_234708562.htm
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- [6] MeetingsNet, "The Most Important Thing to Do Before Your Next Team Meeting", *meetingsnet.com*. [Online]. Available: <https://www.meetingsnet.com/corporate-meetings-events/most-important-thing-do-your-next-team-meeting>
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- [8] Western Kentucky University, "WKU engineering students show strength in bridge competitions", *wku.edu*. [Online]. Available: <https://www.wku.edu/ogden/news/index.php?view=article&articleid=3017&return=archive>