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5.1 Factors Governing Bridge Costs

Bridge costs are tabulated based on the bids received for all bridges let to contract. While these costs indicate some trends, they do not reflect all the factors that affect the final bridge cost. Each bridge has its own conditions which affect the cost at the time a contract is let. Some factors governing bridge costs are:

1. Location - rural or urban, or remote regions
2. Type of crossing
3. Type of superstructure
4. Skew of bridge
5. Bridge on horizontal curve
6. Type of foundation
7. Type and height of piers
8. Depth and velocity of water
9. Type of abutment
10. Ease of falsework erection
11. Need for special equipment
12. Need for maintaining traffic during construction
13. Limit on construction time
14. Complex forming costs and design details
15. Span arrangements, beam spacing, etc.

Figure 5.2-1 shows the economic span lengths of various type structures based on average conditions. Refer to Chapter 17 for discussion on selecting the type of superstructure.

Annual unit bridge costs are included in this chapter. The area of bridge is from back to back of abutments and out to out of the concrete superstructure. Costs are based only on the bridges let to contract during the period. In using these cost reports exercise care when a small number of bridges are reported as these costs may not be representative.

In these reports prestressed girder costs are grouped together because there is a small cost difference between girder sizes. Refer to unit costs. Concrete slab costs are also grouped together for this reason.



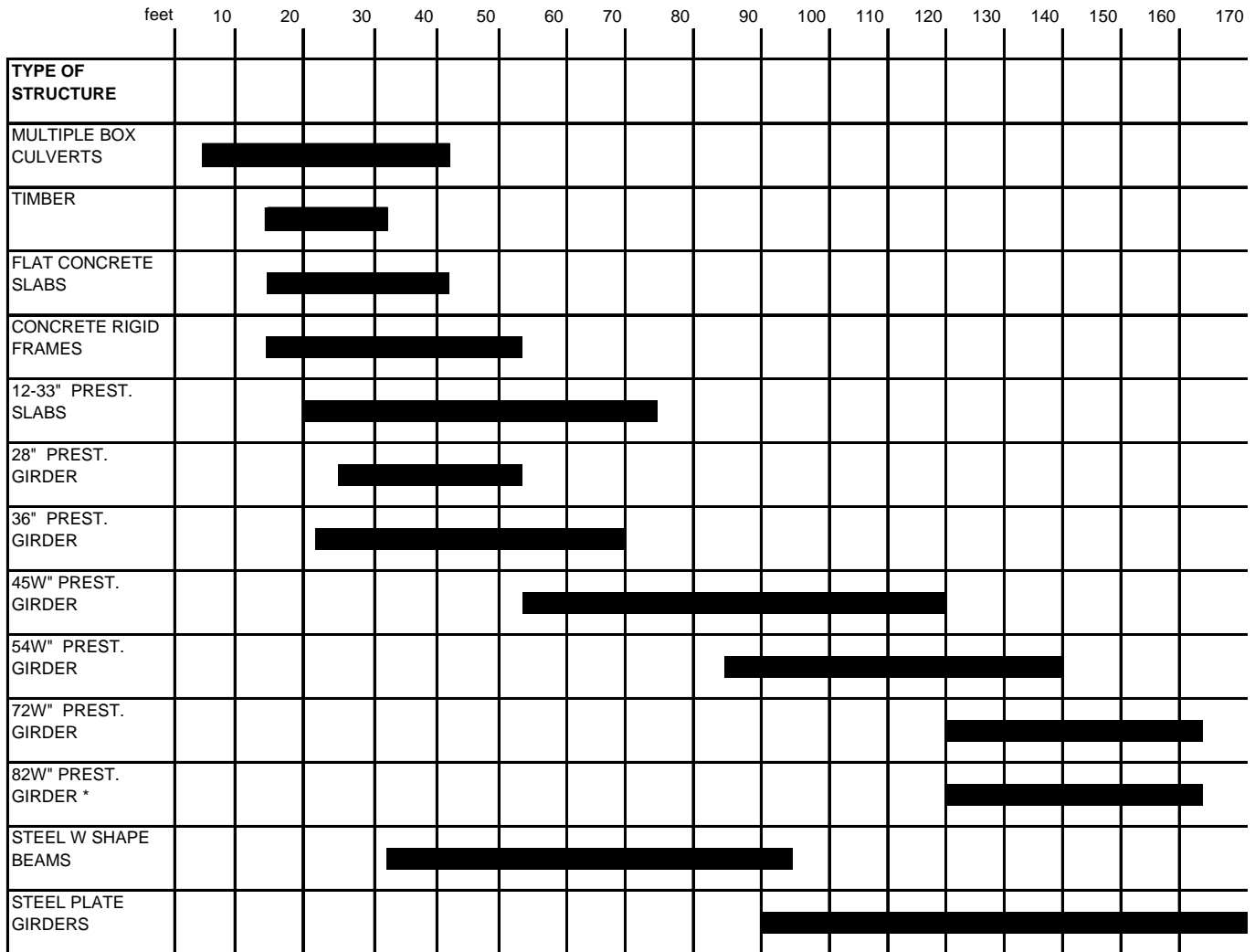
No costs are shown for rolled steel sections as these structures are not built very often. They have been replaced with prestressed girders which are usually more economical. The cost of plate girders is used to estimate rolled section costs.

For structures over a railroad, use the costs of grade separation structures. Costs vary considerably for railroad structures over a highway due to different railroad specifications.

Note: Current costs are given in English units.



5.2 Economic Span Lengths



*Currently there is a moratorium on the use of 82W" prestressed girders in Wisconsin

Figure 5.2-1
Economic Span Lengths



5.3 Contract Unit Bid Prices

Item No.	Bid Item	Unit	Cost
206.6000.S	Temporary Shoring	SF	23.00
210.0100	Structure Backfill	CY	14.50
311.0115	Breaker Run	CY	21.00
502.0100	Concrete Masonry, Bridges	CY	406.00
502.1100	Concrete Masonry, Seal	CY	201.00
502.2000	Compression Joint Sealer Preformed Elastomeric	LF	86.50
502.3100	Expansion Device (L.S.)	LF	139.50
	Expansion Device Modular (L.S.)	LF	834.00
502.6500	Protective Coating Clear	GAL	45.00
503.0128	Prestressed Girders, I-Type, 28-Inch	LF	141.00
503.0136	Prestressed Girders, I-Type, 36-Inch	LF	139.00
503.0145	Prestressed Girders, I-Type, 45-Inch	LF	156.50
503.0154	Prestressed Girders, I-Type, 54-Inch	LF	144.50
503.0155	Prestressed Girders, I-Type, 54W-Inch	LF	180.00
503.0170	Prestressed Girders, I-Type, 70-Inch	LF	93.50
503.0172	Prestressed Girders, I-Type, 72W-Inch	LF	199.00
503.0182	Prestressed Girders, I-Type, 82W-Inch	LF	288.00
504.0100	Concrete Masonry, Culverts	CY	414.00
504.0500	Concrete Masonry, Retaining Walls	CY	411.50
505.0405	Bar Steel Reinforcement HS Bridges	LB	0.92
506.2605	Bar Steel Reinforcement HS Culverts	LB	0.86
506.2610	Bar Steel Reinforcement HS Retaining Walls	LB	0.96
506.3005	Bar Steel Reinforcement HS Coated, Bridges	LB	1.00
506.3010	Bar Steel Reinforcement HS Coated, Culverts	LB	--
506.3015	Bar Steel Reinforcement HS Coated, Retaining Walls	LB	--
506.0105	Structural Carbon Steel	LB	2.00
506.0605	Structural Steel HS	LB	2.50
506.2605	Bearing Pads Elastomeric Non-Laminated	EACH	186.00
506.2610	Bearing Pads Elastomeric Laminated	EACH	1,279.00
506.3005	Welded Shear Stud Connectors, 7/8" x 4"	EACH	2.50
506.3010	Welded Shear Stud Connectors, 7/8" x 5"	EACH	4.00
506.3015	Welded Shear Stud Connectors, 7/8" x 6"	EACH	3.50
506.3020	Welded Shear Stud Connectors, 7/8" x 7"	EACH	3.00
506.3025	Welded Shear Stud Connectors, 7/8" x 8"	EACH	3.00
506.4000	Steel Diaphragms	EACH	723.50
506.5000	Bearing Assemblies Fixed	EACH	2,046.50
506.6000	Bearing Assemblies Expansion	EACH	1,714.50
507.0200	Treated Lumber and Timber	MBM	3,803.50
510.2005	Preboring Cast-in-Place Concrete Piling	LF	12.00
510.3021	Cast-in-Place Concrete Piling 10 3/4" x 0.219-Inch	LF	32.50
510.3023	Cast-in-Place Concrete Piling 12 3/4" x 0.219-Inch	LF	36.50
510.3030	Cast-in-Place Concrete Piling 10 3/4" x 0.25-Inch	LF	32.00
510.3033	Cast-in-Place Concrete Piling 12 3/4" x 0.25-Inch	LF	37.50
510.3040	Cast-in-Place Concrete Piling 10 3/4" x 0.365-Inch	LF	--
510.3043	Cast-in-Place Concrete Piling 12 3/4" x 0.375-Inch	LF	50.00
510.3044	Cast-in-Place Concrete Piling 14" x 0.375-Inch	LF	63.00
511.2105	Steel Piling HP 10-Inch x 42-Pound	LF	37.50



511.2110	Steel Piling HP 12-Inch x 53-Pound	LF	45.50
511.2120	Steel Piling HP 14-Inch x 73-Pound	LF	47.50
511.3000	Pile Points	EACH	99.00
511.6000	Preboring Steel Piling	LF	77.00
512.1000	Temporary Steel Sheet Piling	SF	12.00
513.4050	Tubular Railing Type F (2 Rail)	LF	109.50
513.4052 or 3	Tubular Railing Type F (4 or 5 Rail)	LF	148.50
513.4055	Tubular Railing Type H	LF	82.50
513.4060	Tubular Railing Type M	LF	244.00
513.7005	Steel Railing Type C1	LF	161.50
513.7010	Steel Railing Type C2	LF	105.00
513.7015	Steel Railing Type C3	LF	297.50
513.7020	Steel Railing Type C4	LF	--
513.7025	Steel Railing Type C5	LF	151.00
513.7030	Steel Railing Type C6	LF	176.00
513.7050	Steel Railing Type W	LF	116.00
514.0445	Floor Drains Type GC	EACH	1,453.50
514.2625	Downspouts 6-Inch	EACH	--
516.0500	Rubberized Membrane Waterproofing	SY	32.00
516.0600.S	Sheet Membrane Waterproofing	SY	--
604.0400	Slope Paving Concrete	SY	40.50
604.0500	Slope Paving Crushed Aggregate	SY	15.00
604.0600	Slope Paving Select Crushed Material	SY	--
606.0200	Medium Riprap	CY	62.50
606.0300	Heavy Riprap	CY	39.00
606.0700	Grouted Heavy Riprap	CY	68.00
612.0106	Pipe Underdrain 6-Inch	LF	8.00
612.0206	Pipe Underdrain Unperforated 6-Inch	LF	9.00
612.0406	Pipe Underdrain Wrapped 6-Inch	LF	6.00
616.0205	Chain Link Fence 5-Foot	LF	45.00
645.0105	Geotextile Fabric Type C	SY	3.00
645.0111	Geotextile Fabric Type DF (Schedule A)	SY	2.50
645.0120	Geotextile Fabric Type HR	SY	3.00
652.0125	Conduit Rigid Metallic 2-Inch	LF	18.50
652.0135	Conduit Rigid Metallic 3-Inch	LF	30.00
652.0225	Conduit Rigid Non-Metallic 2-Inch	LF	5.00
652.0235	Conduit Rigid non-Metallic 3-Inch	LF	6.00
SPV.0105	Parapet Concrete Type 'TX' (Texas Rail)	LF	100.00
SPV.0165	Concrete Staining	SF	1.50
SPV.0165	Concrete Staining Multi-Color	SF	3.00
SPV.0165	Anti-Graffiti Coating	SF	1.50
SPV.0165	Architectural Surface Treatment	SF	9.00

Table 5.3-1
2008 Contract Unit Bid Price New Structures



Item No.	Bid Item	Unit	Cost
455.0105	Asphaltic Material	TON	451.00
460.1100	HMA Pavement Type	TON	23.50
502.5002	Masonry Anchors, Type L, No. 4 Bars	EACH	11.00
502.5005	Masonry Anchors, Type L, No. 5 Bars	EACH	11.50
502.5010	Masonry Anchors, Type L, No. 6 Bars	EACH	14.00
502.5015	Masonry Anchors, Type L, No. 7 Bars	EACH	24.00
502.5020	Masonry Anchors, Type L, No. 8 Bars	EACH	25.00
502.5025	Masonry Anchors, Type L, No. 9 Bars	EACH	38.00
502.6102	Masonry Anchors, Type S, ½-Inch	EACH	11.00
502.6105	Masonry Anchors, Type S, 5/8-Inch	EACH	16.00
502.6110	Masonry Anchors Type S, ¾-Inch	EACH	15.00
502.6120	Masonry Anchors Type S, 1-Inch	EACH	12.00
505.0904	Bar Couplers, No. 4	EACH	17.00
505.0905	Bar Couplers, No. 5	EACH	15.50
505.0906	Bar Couplers, No. 6	EACH	30.50
505.0907	Bar Couplers, No. 7	SY	14.50
505.0908	Bar Couplers, No. 8	SY	20.00
505.0909	Bar Couplers, No. 9	SY	12.00
509.0301	Preparation, Decks	LF	78.50
509.0500	Cleaning, Decks	SF	12.50
509.1000	Joint Repair	SY	656.00
509.1200	Curb Repair	CY	48.00
509.1500	Concrete Surface Repair	SF	88.50
509.2000	Full Depth Repair	SF	306.50
509.2500	Concrete Masonry, Overlay, Decks	CY	434.00
	Structure Repainting (Sand Blasting)	SF	9.00
	Structure Repainting (Power Tooling)	SF	4.50

Table 5.3-2
2008 Contract Unit Bid Price Rehab Structures



5.4 Bid Letting Cost Data

This section includes past information on bid letting costs per structure type. Values are presented by structure type and include: number of structures, total area, total cost, superstructure cost per square foot and total cost per square foot.

5.4.1 2004 Year End Structure Costs

Structure Type	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Super. Only Cost Per Square Foot	Cost per Square Foot
Prestressed Concrete Girders	40	427,288	28,260,949	43.54	66.14
Reinf. Conc. Slabs (All But A5)	55	133,415	9,226,375	34.13	69.16
Reinf. Conc. Slabs (A5 Abuts	45	80,963	6,386,110	36.93	87.71
Prestressed Box Girders	5	8,453	731,673	51.14	86.56
Steel Plate Girder	2	97,218	9,923,598	77.56	101.86
Arch Structure	2	8,332	866,649	0	104.01

Table 5.4-1
Stream Crossing Structures

Structure Type	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Super. Only Cost Per Square Foot	Cost per Square Foot
Prestressed Concrete Girders	72	701,487	46,153,750	42.99	65.79
Rigid Frame	1	14,661	2,018,224	0	137.66
Steel Plate Girders	2	51,668	3,405,347	54.32	74.70

Table 5.4-2
Grade Separation Structures



Box Culverts	No. of Culverts	Cost per Lin. Ft.
Single Cell	8	840.68
Twin Cell	10	1,190.99
Triple Cell	2	1,598.99

Table 5.4-3
Box Culverts

Railroad Bridge	Cost per Sq. Ft.
B-55-181 (1 Tracks)	405.50

Table 5.4-4
Railroad Bridge

Retaining Walls	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Cost per Square Foot
MSE Walls	26	147,869	5,682,475	38.43
Modular Walls	0	0	0	0
Concrete Walls	12	27,789	1,881,180	67.70
Panel Walls	32	251,343	31,168,806	124.01

Table 5.4-5
Retaining Walls



5.4.2 2005 Year End Structure Costs

Structure Type	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Super. Only Cost Per Square Foot	Cost per Square Foot
Prestressed Concrete Girders	36	427,627	27,984,030	39.51	65.44
Reinf. Conc. Slabs (All But A5)	48	152,215	10,707,339	38.59	70.34
Reinf. Conc. Slabs (A5 Abuts	36	54,583	5,112,320	44.51	93.66
Prestressed Box Girders	2	3,582	471,911	78.88	131.75
Steel Plate Girder	1	18,119	2,439,964	104.88	134.66
Arch Structure	2	17,062	3,297,909	0	193.29
Post-Tensioned Slab	1	16,643	1,512,908	35.95	89.29

Table 5.4-6
Stream Crossing Structures

Structure Type	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Super. Only Cost Per Square Foot	Cost per Square Foot
Prestressed Concrete Girders	23	318,918	22,709,977	61.49	71.21
Steel Plate Girders	2	27,585	3,689,778	107.10	133.76

Table 5.4-7
Grade Separation Structures

Box Culverts	No. of Culverts	Cost per Lin. Ft.
Single Cell	16	1,326.71
Twin Cell	11	880.03
Triple Cell	0	0
Aluminum	1	3,043.00

Table 5.4-8
Box Culverts



Railroad Bridge	Cost per Sq. Ft.
None this Year	

Table 5.4-9
Railroad Bridge

Retaining Walls	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Cost per Square Foot
MSE Walls	13	30,189	74,958	24.68
Modular Walls	0	0	0	0
Concrete Walls	9	20,445	3,125,863	152.89
Panel Walls	5	43,069	2,762,167	64.13

Table 5.4-10
Retaining Walls

5.4.3 2006 Year End Structure Costs

Structure Type	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Super Only Cost Per Square Foot	Cost per Square Foot
Prestressed Concrete Girders	24	453,000	35,249,963	51.45	77.81
Reinforced Concrete Slabs (All But A5)	39	63,984	5,211,526	47.76	81.50
Reinf. Conc. Slab (A5 Abuts)	37	66,675	5,174,920	40.95	77.61
Prestressed Box Girders	4	12,761	1,804,149	62.28	141.38

Table 5.4-11
Stream Crossing Structures



Structure Type	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Super. Only Cost Per Square Foot	Cost per Square Foot
Prestressed Concrete Girders	24	167,899	13,544,510	60.12	80.67
Steel Plate Girders	2	28,782	6,572,494	142.68	228.35
Reinf. Conc. Slabs (All But A5)	6	20,316	1,732,386	43.02	85.27
Reinf. Conc. Slabs (A5 Abuts)	4	5,979	605,133	44.08	101.21

Table 5.4-12
Grade Separation Structures

Box Culverts	No. of Culverts	Cost per Lin. Ft.
Single Cell	9	885.72
Twin Cell	6	1,805.23
Triple Cell	0	0
Aluminum	0	0

Table 5.4-13
Box Culverts

Bascule Bridge	Cost per Sq. Ft.
B-15-23	388.85

Table 5.4-14
Bascule Bridge



Retaining Walls	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Cost per Square Foot
MSE Walls	7	6,102	343,147	56.25
Modular Walls	0	0	0	0
Concrete Walls	7	15,848	1,059,081	66.83
Panel Walls	16	25,907	2,908,492	112.07

Table 5.4-15
Retaining Walls

5.4.4 2007 Year End Structure Costs

Structure Type	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Super. Only Cost Per Square Foot	Cost per Square Foot
Prestressed Concrete Girders	248	529,222	44,292,799	43.38	83.69
Reinf. Conc. Slabs (All But A5)	50	133,565	14,226,156	47.96	98.98
Reinf. Conc. Slabs (A5 Abuts)	24	40,309	4,286,494	47.85	92.14
Prestressed Box Girders	3	11,522	1,350,270	68.84	117.19

Table 5.4-16
Stream Crossing Structures

Structure Type	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Super. Only Cost Per Square Foot	Cost per Square Foot
Prestressed Concrete Girders	24	218,501	16,506,445	55.79	75.54
Steel Plate Girders	1	32,000	4,959,856	122.43	155.00
Reinf. Conc. Slabs (All But A5)	2	9,738	709,168	32.77	72.82
Reinf. Conc. Slabs (A5 Abuts)	1	1,944	226,433	47.81	116.46

Table 5.4-17
Grade Separation Structures



Box Culverts	No. of Culverts	Cost per Lin. Ft.
Single Cell	5	1,168.00
Twin Cell	9	1,000.00
Triple Cell	1	3,832.00
Precast Box	1	894.00

Table 5.4-18
Box Culverts

Pedestrian Bridge	Cost per Sq. Ft.
B-13-605	154.34
B-45-96	443.41

Table 5.4-19
Pedestrian Bridges

Retaining Walls	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Cost per Square Foot
MSE Walls	6	14,133	752,236	53.23
Modular Walls	0	0	0	0
Concrete Walls	6	21,376	1,254,180	58.67
Panel Walls	0	0	0	0

Table 5.4-20
Retaining Walls



5.4.5 2008 Year End Structure Costs

Structure Type	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Super. Only Cost per Square Foot	Cost per Square Foot
Prestressed Concrete Girders	27	354,319	37,636,697	56.00	106.00
Reinf. Conc. Slabs (All But A5)	28	29,381	3,892,609	45.00	98.50
Reinf. Conc. Slabs (A5 Abuts)	20	19,900	2,529,658	53.50	127.00
Prestressed Box Girders	1	762	106,847	109.00	140.00

Table 5.4-21
Stream Crossing Structures

Structure Type	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Super. Only Cost per Square Foot	Cost per Square Foot
Prestressed Concrete Girders	68	617,067	52,412,539	64.50	85.00
Steel Plate Girders	0	--	--	--	--
Reinf. Conc. Slabs (All But A5)	2	23,777	2,769,953	58.50	116.50
Reinf. Conc. Slabs (A5 Abuts)	0	--	--	--	--

Table 5.4-22
Grade Separation Structures



Box Culverts	No. of Culverts	Cost per Lin. Ft.
Single Cell	7	1,059.00
Twin Cell	15	1,914.00
Triple Cell	0	--
Aluminum	0	--

Table 5.4-23
Box Culverts

Pedestrian Bridges	Cost per Sq. Ft.
None this Year	--

Table 5.4-24
Pedestrian Bridges

Railroad Bridges	Cost per Sq. Ft.
None this Year	--

Table 5.4-25
Railroad Bridges

Bascule Bridge	Cost per Sq. Ft.
None this Year	--

Table 5.4-26
Bascule Bridges



Retaining Walls	No. of Bridges	Total Area (Sq. Ft.)	Total Costs	Cost per Square Foot
MSE Walls	4	14,292	520,912	36.50
Modular Walls	0	--	--	--
Concrete Walls	14	23,572	2,572,658	108.00
Panel Walls	5	11,939	782,972	65.50

Table 5.4-27
Retaining Walls



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