

Annexure A

Table A.1 Optimized member sections and interaction ratios for the 30.0m span through type bridge

Member	Service condition under (DL+LL) case		Overload condition under 2.25x(DL+LL) case	
	Section	Interaction ratio	Section	Interaction ratio
L0U2	4-ISA150x150x10 + 2-500x10 plate	0.977	4-ISA150x150x20 + 2-500x20 plate	0.667
U2U3	4-ISA 65x65x10 4-500x10 PLATE	0.801	4-ISA 90x90x12 2-500x12 PLATE	0.586
U3U4	4-ISA 65x65x10 2-500x10 PLATE	0.715	4-ISA 90x90x12 2-500x12 PLATE	0.551
L0L1	4-ISA 65x65x10 2-500x10 PLATE	0.690	4-ISA 90x90x10 2-500x10 PLATE	0.664
L1L2	4-ISA 90x90x10 2-500x10 PLATE	0.755	4-ISA 90x90x10 2-500x10 PLATE	0.560
L2L3	4-ISA 90x90x10 2-500x10 PLATE	0.540	4-ISA 90x90x10 2-500x10 PLATE	0.543
L3L4	4-ISA 90x90x10 2-500x10 PLATE	0.654	4-ISA 90x90x10 2-500x10 PLATE	0.517
L1M1	2-ISM300 2-320x12 PLATE	0.750	2-ISM300 2-320x14 PLATE	0.768
L2M2	2-ISM200 2-220x10 PLATE	0.944	2-ISM300 2-320x14 PLATE	0.719
L2M3	2-ISM200	0.402	2-ISM200 2-220x10PLATE	0.508
L4M4	2-ISM200	0.754	2-ISM200 2-220x10PLATE	0.461
U2M2	2-ISM200 2-220x10 PLATE	0.902	2-ISM300 2-320x14 PLATE	0.639
U3M3	2-ISM200	0.676	2-ISM200 2-220x10PLATE	0.422
U4M4	2-ISM200	0.360	2-ISM200 2-220x10PLATE	0.238
M1L2	2-ISM200	0.813	2-ISM200 2-220x10PLATE	0.478
M2L3	2-ISM200	0.604	2-ISM200 2-220x10PLATE	0.527
M3L4	2-ISM200	0.735	2-ISM200 2-220x10PLATE	0.441
M2U3	2-ISM200	0.910	2-ISM200 2-220x10PLATE	0.558
M3U4	2-ISM200	0.392	2-ISM200 2-220x10PLATE	0.273
M3M4	2-ISM200	0.142	2-ISM200	0.142

Table A.2 Optimized member sections and interaction ratios for the 30.0m span deck type bridge.

Member	Service condition under (DL+LL) case		Overload condition under 2.25x(DL+LL) case	
	Section	Interaction ratio	Section	Interaction ratio
U0U1	4-ISA65x65x8 + 2-500x8 plate	0.388	4-ISA90x90x8 + 2-500x10 plate	0.345
U1U2	4-ISA65x65x8 + 2-500x8 plate	0.557	4-ISA90x90x8 + 2-500x10 plate	0.451
U2U3	4-ISA65x65x10 + 2-500x10 plate	0.749	4-ISA90x90x8 + 2-500x10 plate	0.793
U3U4	4-ISA65x65x10 + 2-500x10 plate	0.780	4-ISA90x90x8 + 2-500x10 plate	0.811
L0L1	4-ISA65x65x8 + 2-500x8 plate	0.337	4-ISA65x65x8 + 2-500x10 plate	0.386
L1L2	4-ISA65x65x8 + 2-500x8 plate	0.468	4-ISA65x65x8 + 2-500x10 plate	0.547
L2L3	4-ISA65x65x8 + 2-500x8 plate	0.600	4-ISA65x65x8 + 2-500x10 plate	0.628
L3L4	4-ISA 90x90x10 2-500x10 PLATE	0.728	4-ISA65x65x8 + 2-500x10 plate	0.755
L0M0	2-ISM300 2-320x14 PLATE	0.556	2-ISM300 2-320x16 PLATE	0.479
L1M1	2-ISM200	0.546	2-ISM200 2-220x10 PLATE	0.319
L2M2	2-ISM200	0.691	2-ISM200 2-220x10 PLATE	0.402
L3M3	2-ISM200	0.571	2-ISM200 2-220x10PLATE	0.340
L4M4	2-ISM200	0.302	2-ISM200	0.289
U0M0	2-ISM300 2-320x14 PLATE	0.531	2-ISM300 2-320x16 PLATE	0.548
U1M1	2-ISM200	0.794	2-ISM200 2-220x10 PLATE	0.661
U2M2	2-ISM200	0.622	2-ISM200 2-220x10 PLATE	0.427
U3M3	2-ISM200	0.628	2-ISM200 2-220x10PLATE	0.560
U4M4	2-ISM200	0.590	2-ISM200	0.596
U0M1	2-ISM200	0.634	2-ISM200	0.549
M0L1	2-ISM200	0.762	2-ISM200 2-220x10PLATE	0.658
M1L2	2-ISM200	0.628	2-ISM200	0.501
M2L3	2-ISM200	0.591	2-ISM200	0.579
M3L4	2-ISM200	0.303	2-ISM200	0.285
L0M1	2-ISM250 2-270x10PLATE	0.489	2-ISM200 2-220x10PLATE	0.558

M0U1	2-ISM200 2-220x10PLATE	0.599	2-ISM300 2-320x16 PLATE	0.365
M1U2	2-ISM250 2-270x10 PLATE	0.980	2-ISM300 2-320x16 PLATE	0.667
M2U3	2-ISM200	0.897	2-ISM200 2-220x10PLATE	0.645
M3U4	2-ISM200	0.700	2-ISM200	0.667
M3M4	2-ISM200	0.142	2-ISM200	0.245

Table A.3 Optimized member sections and interaction ratios for the 30.0m span semi deck type bridge.

Member	Service condition under (DL+LL) case		Overload condition under 2.25x(DL+LL) case	
	Section	Interaction ratio	Section	Interaction ratio
U0U1	4-ISA65x65x8 + 2-500x8 plate	0.530	4-ISA90x90x8 + 2-500x10 plate	0.445
U1U2	4-ISA65x65x8 + 2-500x8 plate	0.902	4-ISA90x90x8 + 2-500x10 plate	0.799
U2U3	4-ISA65x65x8 + 2-500x8 plate	0.782	4-ISA90x90x8 + 2-500x10 plate	0.710
U3U4	4-ISA65x65x8 + 2-500x8 plate	0.914	4-ISA90x90x8 + 2-500x10 plate	0.807
MOM1	4-ISA65x65x8 + 2-500x8 plate	0.686	4-ISA65x65x8 + 2-500x10 plate	0.795
M1L2	2-ISM300 2-320x14 PLATE	1.000	2-ISM300 2-320x16 PLATE	0.835
L2L3	4-ISA65x65x8 + 2-500x8 plate	0.794	4-ISA65x65x8 + 2-500x10 plate	0.778
L3L4	4-ISA65x65x8 + 2-500x8 plate	0.826	4-ISA65x65x8 + 2-500x10 plate	0.804
L2M2	2-ISM200 2-220x10 plate	1.000	2-ISM300 2-320x16 PLATE	0.510
L3M3	2-ISM200	0.709	2-ISM200 2-220x10PLATE	0.374
L4M4	2-ISM200	0.287	2-ISM200	0.280
U0M0	2-ISM300 2-320x14 PLATE	0.853	2-ISM350 2-370x20 PLATE	0.654
U1M1	2-ISM200 2-220x10 plate	0.590	2-ISM200 2-220x10 PLATE	0.666
U2M2	2-ISM200 2-220x10 plate	0.830	2-ISM300 2-320x16 PLATE	0.584
U3M3	2-ISM200	0.667	2-ISM200 2-220x10PLATE	0.521
U4M4	2-ISM200	0.556	2-ISM200	0.559
U0M1	2-ISM250	0.745	2-ISM200	0.800
M2L3	2-ISM200	0.680	2-ISM200 2-220x10PLATE	0.419

M3L4	2-ISM200	0.308	2-ISM200	0.284
M0U1	2-ISM250 2-220x10PLATE	0.738	2-ISM300 2-320x16 PLATE	0.594
M1U2	2-ISM250 2-270x10 PLATE	0.593	2-ISM200 2-220x10 PLATE	0.406
M2U3	2-ISM200	0.861	2-ISM200 2-220x10PLATE	0.657
M3U4	2-ISM200	0.702	2-ISM200	0.666
M3M4	2-ISM200	0.142	2-ISM200	0.245

Table A.4 Optimized member sections and interaction ratios for the 30.0m under slung truss bridge.

Member	Service condition under (DL+LL) case		Overload condition under 2.25x(DL+LL) case	
	Section	Interaction ratio	Section	Interaction ratio
U0U1	4-ISA65x65x10 + 2-500x10 plate	0.878	4-ISA90x90x8 + 2-500x10 plate	0.873
U1U2	4-ISA65x65x10 + 2-500x10 plate	0.812	4-ISA90x90x8 + 2-500x10 plate	0.861
U2U3	4-ISA65x65x10 + 2-500x10 plate	0.702	4-ISA90x90x8 + 2-500x10 plate	0.778
U3U4	4-ISA65x65x10 + 2-500x10 plate	0.753	4-ISA90x90x8 + 2-500x10 plate	0.784
UOL2	4-ISA90x90x10 + 2-500x10 plate	1.000	4-ISA90x90x12 + 2-500x12 plate	0.846
L2L3	4-ISA65x65x8 + 2-500x8 plate	0.904	4-ISA65x65x8 + 2-500x10 plate	0.802
L3L4	4-ISA65x65x8 + 2-500x8 plate	0.888	4-ISA65x65x8 + 2-500x10 plate	0.842
L2M2	2-ISM200 2-220x10 plate	0.959	2-ISM300 2-320x16 PLATE	0.560
L3M3	2-ISM200 2-220x10 plate	0.485	2-ISM200 2-220x10PLATE	0.389
L4M4	2-ISM200	0.279	2-ISM200	0.282
U1M1	2-ISM200 2-220x10 plate	0.900	2-ISM300 2-320x16 PLATE	0.666
U2M2	2-ISM200 2-220x10 plate	0.882	2-ISM300 2-320x16 PLATE	0.557
U3M3	2-ISM200 2-220x10 plate	0.519	2-ISM200 2-220x10PLATE	0.510
U4M4	2-ISM200	0.520	2-ISM200	0.589
M2L3	2-ISM200	0.670	2-ISM200	0.639
M3L4	2-ISM200	0.312	2-ISM200	0.290
M1U2	2-ISM200	0.758	2-ISM300 2-320x16 PLATE	0.440

M2U3	2-ISM 200	0.860	2-ISM 200 2-220x10PLATE	0.634
M3U4	2-ISM 200	0.679	2-ISM 200	0.666
M3M4	2-ISM 200	0.142	2-ISM 200	0.245

Table A.5 Optimized member sections and interaction ratios for the 90.0m span through type bridge.

Member	Service condition under (DL+LL) case		Overload condition under 2.25x(DL+LL) case	
	Section	Interaction ratio	Section	Interaction ratio
L0L1	4-ISA150x150x12 2-575x12 plate	0.885	4-ISA150x150x10 2-575x10 plate	1.000
L1L2	4-ISA150x150x12 2-575x12 plate	0.753	4-ISA150x150x10 2-575x10 plate	0.824
L2L3	4-ISA150x150x10 2-575x10 plate	0.566	4-ISA150x150x10 2-575x10 plate	0.586
L3L4	4-ISA150x150x10 2-575x10 plate	0.845	4-ISA150x150x12 2-575x12 plate	0.760
L4L5	4-ISA150x150x12 2-575x12 plate	0.823	4-ISA150x150x16 2-575x16 plate	0.703
L5L6	4-ISA150x150x12 2-575x12 plate	0.945	4-ISA150x150x18 2-575x18 plate	0.725
L6L7	4-ISA150x150x16 2-575x16 plate	0.840	4-ISA150x150x20 2-575x20 plate	0.756
L7L8	4-ISA150x150x16 2-575x16 plate	0.940	4-ISA200x200x18 2-575x18 plate	0.790
L8L9	4-ISA150x150x20 2-575x20 plate	0.812	4-ISA200x200x18 2-575x18 plate	0.822
L0U2	4-ISA150x150x16 2-575x16 plate	0.991	4-ISA200x200x25 2-575x25 plate	0.652
U2U3	4-ISA150x150x10 2-575x10 plate	0.951	4-ISA200x200x25 2-575x25 plate	0.896
U3U4	4-ISA150x150x12 2-575x14 plate	0.895	4-ISA200x200x18 2-575x20 plate	0.621
U4U5	4-ISA150x150x16 2-575x16 plate	0.867	4-ISA200x200x18 2-575x20 plate	0.666
U5U6	4-ISA150x150x18 2-575x18 plate	0.878	4-ISA200x200x25 2-575x25 plate	0.591
U6U7	4-ISA150x150x20 2-575x20 plate	0.898	4-ISA200x200x25 2-575x25 plate	0.658
U7U8	4-ISA200x200x20 2-575x20 plate	0.901	4-ISA200x200x25 2-575x32 plate	0.634
U8U9	4-ISA200x200x10 2-575x20 plate	0.926	4-ISA200x200x25 2-575x32 plate	0.651
M1L1	2-ISM 350	0.692	2-ISM 350 2-370x16 plate	0.441
M2L2	2-ISM 350	0.481	2-ISM 350	0.436

	2-370x16 plate		2-370x16 plate	
M3L3	2-ISM C 350	0.768	2-ISM C 350 2-370x16 plate	0.602
M4L4	2-ISM C 350	0.765	2-ISM C 350 2-370x10 plate	0.642
M5L5	2-ISM C 300	0.663	2-ISM C 350 2-370x10 plate	0.553
M6L6	2-ISM C 250	0.740	2-ISM C 250 2-270x14 plate	0.581
M7L7	2-ISM C 250	0.489	2-ISM C 250	0.424
M8L8	2-ISM C 200	0.467	2-ISM C 200	0.575
M9L9	2-ISM C 200	0.442	2-ISM C 200	0.462
M2U2	2-ISM C 350 2-370x16 plate	0.956	2-ISM C 350 2-370x16 plate	0.895
M3U3	2-ISM C 350	0.927	2-ISM C 350 2-370x16 plate	0.542
M4U4	2-ISM C 350	0.800	2-ISM C 350 2-370x10 plate	0.480
M5U5	2-ISM C 300	0.770	2-ISM C 350 2-370x10 plate	0.426
M6U6	2-ISM C 250	0.672	2-ISM C 250 2-270x14 plate	0.384
M7U7	2-ISM C 250	0.588	2-ISM C 250	0.588
M8U8	2-ISM C 200	0.452	2-ISM C 200	0.472
M9U9	2-ISM C 200	0.254	2-ISM C 200	0.269
M2U3	2-ISM C 350 2-370x10 plate	0.659	2-ISM C 350 2-370x25 plate	0.647
M3U4	2-ISM C 350	0.999	2-ISM C 350 2-370x16 plate	0.626
M4U5	2-ISM C 350	0.854	2-ISM C 350 2-370x10 plate	0.593
M5U6	2-ISM C 300	0.912	2-ISM C 300 2-320x10 plate	0.619
M6U7	2-ISM C 250	0.853	2-ISM C 250 2-270x10 plate	0.657
M7U8	2-ISM C 200	1.000	2-ISM C 250	0.643
M8U9	2-ISM C 200	0.624	2-ISM C 200	0.603
M1L2	2-ISM C 350	0.439	2-ISM C 350 2-370x16 plate	0.275
M2L3	2-ISM C 350 2-370x10 plate	0.841	2-ISM C 350 2-370x10 plate	0.785
M3L4	2-ISM C 350	1.000	2-ISM C 350	1.000
M4L5	2-ISM C 350	0.903	2-ISM C 350	0.887
M5L6	2-ISM C 300	0.868	2-ISM C 300	0.899
M6L7	2-ISM C 200	0.960	2-ISM C 200	0.992
M7L8	2-ISM C 200	0.661	2-ISM C 200	0.576
M8L9	2-ISM C 200	0.540	2-ISM C 200	0.531

Table A.6 Optimized member sections and interaction ratios for the 90.0m span deck type bridge.

Member	Service condition under (DL+LL) case		Overload condition under 2.25x(DL+LL) case	
	Section	Interaction ratio	Section	Interaction ratio
L0L1	4-ISA150x150x10 2-575x10 plate	0.389	4-ISA150x150x10 2-575x10 plate	0.399
L1L2	4-ISA150x150x10 2-575x10 plate	0.599	4-ISA150x150x10 2-575x10 plate	0.616
L2L3	4-ISA150x150x10 2-575x10 plate	0.739	4-ISA150x150x10 2-575x10 plate	0.763
L3L4	4-ISA150x150x12 2-575x12 plate	0.954	4-ISA150x150x12 2-575x12 plate	0.954
L4L5	4-ISA150x150x16 2-575x16 plate	0.918	4-ISA150x150x16 2-575x16 plate	0.935
L5L6	4-ISA150x150x18 2-575x18 plate	0.923	4-ISA150x150x18 2-575x18 plate	0.971
L6L7	4-ISA150x150x20 2-575x20 plate	0.955	4-ISA150x150x20 2-575x20 plate	0.947
L7L8	4-ISA200x200x18 2-575x18 plate	0.959	4-ISA200x200x18 2-575x18 plate	0.977
L8L9	4-ISA200x200x18 2-575x18 plate	0.983	4-ISA200x200x18 2-575x18 plate	1.000
U0U1	4-ISA150x150x10 2-575x10 plate	0.279	4-ISA150x150x10 2-575x10 plate	0.263
U1U2	4-ISA150x150x10 2-575x10 plate	0.452	4-ISA150x150x10 2-575x10 plate	0.420
U2U3	4-ISA150x150x10 2-575x10 plate	0.874	4-ISA150x150x10 2-575x10 plate	0.898
U3U4	4-ISA150x150x12 2-575x14 plate	0.923	4-ISA150x150x12 2-575x14 plate	0.932
U4U5	4-ISA150x150x16 2-575x16 plate	0.903	4-ISA150x150x16 2-575x16 plate	0.919
U5U6	4-ISA150x150x18 2-575x18 plate	0.911	4-ISA150x150x18 2-575x18 plate	0.934
U6U7	4-ISA150x150x20 2-575x20 plate	0.943	4-ISA150x150x20 2-575x20 plate	0.944
U7U8	4-ISA200x200x18 2-575x18 plate	0.934	4-ISA200x200x18 2-575x18 plate	0.949
U8U9	4-ISA200x200x18 2-575x18 plate	0.982	4-ISA200x200x18 2-575x18 plate	1.000
M0L0	2-ISM 350 2-370x10 plate	0.859	2-ISM 350 2-370x25 plate	0.581
M1L1	2-ISM 350	0.447	2-ISM 350 2-370x20 plate	0.382
M2L2	2-ISM 350 2-370x16 plate	0.475	2-ISM 350 2-370x14 plate	0.424

M3L3	2-ISMIC 350	0.837	2-ISMIC 350 2-370x16 plate	0.546
M4L4	2-ISMIC 350	0.808	2-ISMIC 350 2-370x10 plate	0.567
M5L5	2-ISMIC 350	0.667	2-ISMIC 350 2-370x10 plate	0.477
M6L6	2-ISMIC 200	1.000	2-ISMIC 250 2-270x14 plate	0.512
M7L7	2-ISMIC 250	0.862	2-ISMIC 250	0.542
M8L8	2-ISMIC 200	0.513	2-ISMIC 200	0.502
M9L9	2-ISMIC 200	0.442	2-ISMIC 200	0.295
M0U0	2-ISMIC 350 2-370x10 plate	0.462	2-ISMIC 350 2-370x25 plate	0.318
M1U1	2-ISMIC 350	0.504	2-ISMIC 350 2-370x20 plate	0.308
M2U2	2-ISMIC 350 2-370x16 plate	0.717	2-ISMIC 350 2-370x14 plate	0.590
M3U3	2-ISMIC 350	0.762	2-ISMIC 350 2-370x16 plate	0.372
M4U4	2-ISMIC 350	0.694	2-ISMIC 350 2-370x10 plate	0.395
M5U5	2-ISMIC 350	0.520	2-ISMIC 350 2-370x10 plate	0.311
M6U6	2-ISMIC 200	0.632	2-ISMIC 250 2-270x14 plate	0.263
M7U7	2-ISMIC 250	0.425	2-ISMIC 250	0.303
M8U8	2-ISMIC 200	0.468	2-ISMIC 200	0.454
M9U9	2-ISMIC 200	0.403	2-ISMIC 200	0.396
L0M1	4-ISA150x150x10 2-575x10 plate	0.684	4-ISA150x150x10 2-575x10 plate	0.451
M0U1	2-ISMIC 300	0.692	2-ISMIC 350 2-370x8 plate	0.518
M1U2	4-ISA150x150x10 2-575x10 plate	0.817	4-ISA150x150x16 2-575x16 plate	0.564
M2U3	2-ISMIC 350 2-370x10 plate	0.879	2-ISMIC 350 2-370x25 plate	0.593
M3U4	2-ISMIC 350	1.000	2-ISMIC 350 2-370x16 plate	0.585
M4U5	2-ISMIC 350	0.870	2-ISMIC 350 2-370x10 plate	0.569
M5U6	2-ISMIC 300	0.921	2-ISMIC 300 2-320x10 plate	0.612
M6U7	2-ISMIC 250	0.865	2-ISMIC 250 2-270x10 plate	0.624
M7U8	2-ISMIC 250	0.610	2-ISMIC 250	0.604
M8U9	2-ISMIC 200	0.745	2-ISMIC 200	0.667
U0M1	2-ISMIC 300	0.671	2-ISMIC 350	0.486
M0L1	2-ISMIC 300	0.743	2-ISMIC 350	0.655

M1L2	2-ISM 350	0.727	2-ISM 350	0.692
M2L3	2-ISM 350 2-370x10 plate	0.659	2-ISM 350 2-370x10 plate	0.648
M3L4	2-ISM 350	0.870	2-ISM 350	0.897
M4L5	2-ISM 350	0.722	2-ISM 350	0.737
M5L6	2-ISM 300	0.714	2-ISM 300	0.696
M6L7	2-ISM 250	0.646	2-ISM 250	0.648
M7L8	2-ISM 250	0.445	2-ISM 250	0.445
M8L9	2-ISM 200	0.382	2-ISM 200	0.382

Table A.7 Optimized member sections and interaction ratios for the 90.0m span semi deck type bridge.

Member	Service condition under (DL+LL) case		Overload condition under 2.25x(DL+LL) case	
	Section	Interaction ratio	Section	Interaction ratio
M0M1	4-ISA150x150x10 2-575x10 plate	0.864	4-ISA150x150x10 2-575x10 plate	1.000
M1L2	4-ISA150x150x16 2-575x16 plate	0.978	4-ISA150x150x16 2-575x16 plate	0.989
L2L3	4-ISA150x150x10 2-575x10 plate	1.000	4-ISA150x150x10 2-575x10 plate	1.000
L3L4	4-ISA150x150x12 2-575x12 plate	0.947	4-ISA150x150x12 2-575x12 plate	0.936
L4L5	4-ISA150x150x16 2-575x16 plate	0.900	4-ISA150x150x16 2-575x16 plate	0.941
L5L6	4-ISA150x150x18 2-575x18 plate	0.945	4-ISA150x150x18 2-575x18 plate	0.975
L6L7	4-ISA150x150x20 2-575x20 plate	0.946	4-ISA150x150x20 2-575x20 plate	0.952
L7L8	4-ISA200x200x18 2-575x18 plate	0.975	4-ISA200x200x18 2-575x18 plate	0.981
L8L9	4-ISA200x200x18 2-575x18 plate	1.000	4-ISA200x200x18 2-575x18 plate	1.000
U0U1	4-ISA150x150x10 2-575x10 plate	0.557	4-ISA150x150x10 2-575x10 plate	0.576
U1U2	4-ISA150x150x10 2-575x10 plate	0.924	4-ISA150x150x10 2-575x10 plate	0.943
U2U3	4-ISA150x150x10 2-575x10 plate	0.902	4-ISA150x150x10 2-575x10 plate	0.923
U3U4	4-ISA150x150x12 2-575x14 plate	0.921	4-ISA150x150x12 2-575x14 plate	0.924
U4U5	4-ISA150x150x16 2-575x16 plate	0.908	4-ISA150x150x16 2-575x16 plate	0.923
U5U6	4-ISA150x150x18 2-575x18 plate	0.913	4-ISA150x150x18 2-575x18 plate	0.937
U6U7	4-ISA150x150x20	0.943	4-ISA150x150x20	0.948

	2-575x20 plate		2-575x20 plate	
U7U8	4-ISA200x200x18 2-575x18 plate	0.946	4-ISA200x200x18 2-575x18 plate	0.954
U8U9	4-ISA200x200x18 2-575x18 plate	0.996	4-ISA200x200x18 2-575x18 plate	1.000
M2L2	2-ISMIC 350 2-370x14 plate	0.930	2-ISMIC 350 2-370x14 plate	0.902
M3L3	2-ISMIC 350	1.000	2-ISMIC 350 2-370x16 plate	0.645
M4L4	2-ISMIC 350	0.838	2-ISMIC 350 2-370x10 plate	0.545
M5L5	2-ISMIC 300	0.774	2-ISMIC 350 2-370x10 plate	0.483
M6L6	2-ISMIC 250	0.834	2-ISMIC 250 2-270x14 plate	0.514
M7L7	2-ISMIC 200	0.876	2-ISMIC 250	0.544
M8L8	2-ISMIC 200	0.554	2-ISMIC 200	0.504
M9L9	2-ISMIC 200	0.296	2-ISMIC 200	0.295
M0U0	2-ISMIC 350 2-370x10 plate	1.000	4-ISA150x150x20 2-575x20 plate	0.408
M1U1	2-ISMIC 250 2-270x20 plate	0.563	2-ISMIC 250 2-370x20 plate	0.743
M2U2	2-ISMIC 350 2-370x14 plate	0.362	2-ISMIC 350 2-370x14 plate	0.328
M3U3	2-ISMIC 350	0.609	2-ISMIC 350 2-370x16 plate	0.385
M4U4	2-ISMIC 350	0.629	2-ISMIC 350 2-370x10 plate	0.415
M5U5	2-ISMIC 300	0.578	2-ISMIC 350 2-370x10 plate	0.311
M6U6	2-ISMIC 250	0.490	2-ISMIC 250 2-270x14 plate	0.265
M7U7	2-ISMIC 200	0.452	2-ISMIC 250	0.305
M8U8	2-ISMIC 200	0.450	2-ISMIC 200	0.455
M9U9	2-ISMIC 200	0.405	2-ISMIC 200	0.397
M0U1	2-ISMIC 350 2-370x10 plate	0.872	2-ISMIC 350 2-370x25 plate	0.667
M1U2	2-ISMIC 200	0.364	2-ISMIC 350 2-370x25 plate	0.185
M2U3	2-ISMIC 350 2-370x10 plate	0.824	2-ISMIC 350 2-370x25 plate	0.547
M3U4	2-ISMIC 300 2-320x10 plate	0.885	2-ISMIC 350 2-370x16 plate	0.593
M4U5	2-ISMIC 300 2-320x10 plate	0.754	2-ISMIC 350 2-370x10 plate	0.570
M5U6	2-ISMIC 300	0.930	2-ISMIC 300 2-320x10 plate	0.615
M6U7	2-ISMIC 250	0.865	2-ISMIC 250 2-270x10 plate	0.627

M7U8	2-ISM 200	0.984	2-ISM 250	0.604
M8U9	2-ISM 200	0.762	2-ISM 200	0.606
U0M1	2-ISM 350 2-370x10 plate	0.895	2-ISM 350	0.667
M2L3	2-ISM 350 2-370x10 plate	0.730	2-ISM 350 2-370x10 plate	0.717
M3L4	2-ISM 300	1.000	2-ISM 350	0.881
M4L5	2-ISM 300	0.889	2-ISM 350	0.742
M5L6	2-ISM 300	0.712	2-ISM 300	0.699
M6L7	2-ISM 200	0.877	2-ISM 350	0.651
M7L8	2-ISM 200	0.594	2-ISM 250	0.447
M8L9	2-ISM 200	0.390	2-ISM 250	0.383

Table A.8 Optimized member sections and interaction ratios for the 90.0m under slung truss bridge.

Member	Service condition under (DL+LL) case		Overload condition under 2.25x(DL+LL) case	
	Section	Interaction ratio	Section	Interaction ratio
U0L2	4-ISA150x150x16 2-575x16 plate	0.884	4-ISA150x150x16 2-575x16 plate	0.898
L2L3	4-ISA150x150x10 2-575x10 plate	1.000	4-ISA150x150x10 2-575x10 plate	1.000
L3L4	4-ISA150x150x12 2-575x12 plate	0.933	4-ISA150x150x12 2-575x12 plate	0.940
L4L5	4-ISA150x150x16 2-575x16 plate	0.905	4-ISA150x150x16 2-575x16 plate	0.936
L5L6	4-ISA150x150x18 2-575x18 plate	0.937	4-ISA150x150x18 2-575x18 plate	0.970
L6L7	4-ISA150x150x20 2-575x20 plate	0.929	4-ISA150x150x20 2-575x20 plate	0.948
L7L8	4-ISA200x200x18 2-575x18 plate	0.973	4-ISA200x200x18 2-575x18 plate	0.978
L8L9	4-ISA200x200x18 2-575x18 plate	0.999	4-ISA200x200x18 2-575x18 plate	1.000
U0U1	4-ISA150x150x10 2-575x10 plate	0.982	4-ISA150x150x10 2-575x10 plate	0.972
U1U2	4-ISA150x150x10 2-575x10 plate	0.970	4-ISA150x150x10 2-575x10 plate	0.973
U2U3	4-ISA150x150x10 2-575x10 plate	0.887	4-ISA150x150x10 2-575x10 plate	0.893
U3U4	4-ISA150x150x12 2-575x14 plate	0.915	4-ISA150x150x12 2-575x14 plate	0.918
U4U5	4-ISA150x150x16 2-575x16 plate	0.913	4-ISA150x150x16 2-575x16 plate	0.924
U5U6	4-ISA150x150x18 2-575x18 plate	0.915	4-ISA150x150x18 2-575x18 plate	0.934
U6U7	4-ISA150x150x20	0.936	4-ISA150x150x20	0.951

	2-575x20 plate		2-575x20 plate	
U7U8	4-ISA200x200x18 2-575x18 plate	0.947	4-ISA200x200x18 2-575x18 plate	0.956
U8U9	4-ISA200x200x18 2-575x18 plate	0.999	4-ISA200x200x18 2-575x18 plate	1.000
M2L2	2-ISM 350 2-370x14 plate	1.000	2-ISM 350 2-370x14 plate	0.950
M3L3	2-ISM 350	0.976	2-ISM 350 2-370x16 plate	0.637
M4L4	2-ISM 350	0.776	2-ISM 350 2-370x10 plate	0.546
M5L5	2-ISM 250	1.000	2-ISM 350 2-370x10 plate	0.483
M6L6	2-ISM 250	0.750	2-ISM 250 2-270x14 plate	0.515
M7L7	2-ISM 200	0.847	2-ISM 250	0.544
M8L8	2-ISM 200	0.557	2-ISM 200	0.503
M9L9	2-ISM 200	0.296	2-ISM 200	0.296
M1U1	2-ISM 350	0.568	2-ISM 250 2-370x20 plate	0.392
M2U2	2-ISM 350 2-370x14 plate	0.403	2-ISM 350 2-370x14 plate	0.339
M3U3	2-ISM 350	0.746	2-ISM 350 2-370x16 plate	0.384
M4U4	2-ISM 350	0.696	2-ISM 350 2-370x10 plate	0.411
M5U5	2-ISM 250	0.581	2-ISM 350 2-370x10 plate	0.309
M6U6	2-ISM 250	0.490	2-ISM 250 2-270x14 plate	0.264
M7U7	2-ISM 200	0.428	2-ISM 250	0.303
M8U8	2-ISM 200	0.449	2-ISM 200	0.458
M9U9	2-ISM 200	0.406	2-ISM 200	0.397
M1U2	2-ISM 350	0.338	2-ISM 350 2-370x25 plate	0.246
M2U3	2-ISM 350 2-370x10 plate	0.778	2-ISM 350 2-370x25 plate	0.554
M3U4	2-ISM 350	1.000	2-ISM 350 2-370x16 plate	0.593
M4U5	2-ISM 350	0.862	2-ISM 350 2-370x10 plate	0.571
M5U6	2-ISM 300 2-320x10 plate	0.642	2-ISM 300 2-320x10 plate	0.615
M6U7	2-ISM 250	0.893	2-ISM 250 2-270x10 plate	0.629
M7U8	2-ISM 200	0.963	2-ISM 250	0.605
M8U9	2-ISM 200	0.759	2-ISM 200	0.745
M2L3	2-ISM 350	1.000	2-ISM 350	0.712

			2-370x10 plate	
M3L4	2-ISM 350	0.845	2-ISM 350	0.884
M4L5	2-ISM 350	0.735	2-ISM 350	0.743
M5L6	2-ISM 300	0.738	2-ISM 300	0.702
M6L7	2-ISM 250	0.657	2-ISM 350	0.653
M7L8	2-ISM 200	0.591	2-ISM 250	0.446
M8L9	2-ISM 200	0.388	2-ISM 250	0.382

Design results for mild steel (E 250) bridge

Table A.9 Optimized member sections and interaction ratios for the 90.0m span semi deck type bridge using mild steel (E 250).

Member	Service condition under (DL+LL) case		Overload condition under 2.25x(DL+LL) case	
	Section	Interaction ratio	Section	Interaction ratio
M0M1	4-ISA150x150x10 2-500x10 plate	0.864	4-ISA150x150x10 2-500x10 plate	1.000
M1L2	4-ISA150x150x16 2-500x16 plate	0.978	4-ISA150x150x16 2-500x16 plate	0.989
L2L3	4-ISA150x150x10 2-500x10 plate	1.000	4-ISA150x150x10 2-500x10 plate	1.000
L3L4	4-ISA150x150x12 2-500x12 plate	0.947	4-ISA150x150x12 2-500x12 plate	0.936
L4L5	4-ISA150x150x16 2-500x16 plate	0.900	4-ISA150x150x16 2-500x16 plate	0.941
L5L6	4-ISA150x150x18 2-500x18 plate	0.945	4-ISA150x150x18 2-500x18 plate	0.975
L6L7	4-ISA150x150x20 2-500x20 plate	0.946	4-ISA150x150x20 2-500x20 plate	0.952
L7L8	4-ISA200x200x18 2-500x18 plate	0.975	4-ISA200x200x18 2-500x18 plate	0.981
L8L9	4-ISA200x200x18 2-500x18 plate	1.000	4-ISA200x200x18 2-500x18 plate	1.000
U0U1	4-ISA150x150x10 2-500x10 plate	0.557	4-ISA150x150x10 2-500x10 plate	0.576
U1U2	4-ISA150x150x10 2-500x10 plate	0.924	4-ISA150x150x10 2-500x10 plate	0.943
U2U3	4-ISA150x150x10 2-500x10 plate	0.902	4-ISA150x150x10 2-500x10 plate	0.923
U3U4	4-ISA150x150x12 2-500x14 plate	0.921	4-ISA150x150x12 2-500x14 plate	0.924
U4U5	4-ISA150x150x16 2-500x16 plate	0.908	4-ISA150x150x16 2-500x16 plate	0.923
U5U6	4-ISA150x150x18 2-500x18 plate	0.913	4-ISA150x150x18 2-500x18 plate	0.937

U6U7	4-ISA150x150x20 2-500x20 plate	0.943	4-ISA150x150x20 2-500x20 plate	0.948
U7U8	4-ISA200x200x18 2-500x18 plate	0.946	4-ISA200x200x18 2-500x18 plate	0.954
U8U9	4-ISA200x200x18 2-500x18 plate	0.996	4-ISA200x200x18 2-500x18 plate	1.000
M2L2	2-ISMIC 350 2-370x14 plate	0.930	2-ISMIC 350 2-370x14 plate	0.902
M3L3	2-ISMIC 350	1.000	2-ISMIC 350 2-370x16 plate	0.645
M4L4	2-ISMIC 350	0.838	2-ISMIC 350 2-370x10 plate	0.545
M5L5	2-ISMIC 300	0.774	2-ISMIC 350 2-370x10 plate	0.483
M6L6	2-ISMIC 250	0.834	2-ISMIC 250 2-270x14 plate	0.514
M7L7	2-ISMIC 200	0.876	2-ISMIC 250	0.544
M8L8	2-ISMIC 200	0.554	2-ISMIC 200	0.504
M9L9	2-ISMIC 200	0.296	2-ISMIC 200	0.295
M0U0	2-ISMIC 350 2-370x10 plate	1.000	4-ISA150x150x20 2-575x20 plate	0.408
M1U1	2-ISMIC 250 2-270x20 plate	0.563	2-ISMIC 250 2-370x20 plate	0.743
M2U2	2-ISMIC 350 2-370x14 plate	0.362	2-ISMIC 350 2-370x14 plate	0.328
M3U3	2-ISMIC 350	0.609	2-ISMIC 350 2-370x16 plate	0.385
M4U4	2-ISMIC 350	0.629	2-ISMIC 350 2-370x10 plate	0.415
M5U5	2-ISMIC 300	0.578	2-ISMIC 350 2-370x10 plate	0.311
M6U6	2-ISMIC 250	0.490	2-ISMIC 250 2-270x14 plate	0.265
M7U7	2-ISMIC 200	0.452	2-ISMIC 250	0.305
M8U8	2-ISMIC 200	0.450	2-ISMIC 200	0.455
M9U9	2-ISMIC 200	0.405	2-ISMIC 200	0.397
M0U1	2-ISMIC 350 2-370x10 plate	0.872	2-ISMIC 350 2-370x25 plate	0.667
M1U2	2-ISMIC 200	0.364	2-ISMIC 350 2-370x25 plate	0.185
M2U3	2-ISMIC 350 2-370x10 plate	0.824	2-ISMIC 350 2-370x25 plate	0.547
M3U4	2-ISMIC 300 2-320x10 plate	0.885	2-ISMIC 350 2-370x16 plate	0.593
M4U5	2-ISMIC 300 2-320x10 plate	0.754	2-ISMIC 350 2-370x10 plate	0.570
M5U6	2-ISMIC 300	0.930	2-ISMIC 300 2-320x10 plate	0.615
M6U7	2-ISMIC 250	0.865	2-ISMIC 250	0.627

			2-270x10 plate	
M7U8	2-ISM 200	0.984	2-ISM 250	0.604
M8U9	2-ISM 200	0.762	2-ISM 200	0.606
U0M1	2-ISM 350 2-370x10 plate	0.895	2-ISM 350	0.667
M2L3	2-ISM 350 2-370x10 plate	0.730	2-ISM 350 2-370x10 plate	0.717
M3L4	2-ISM 300	1.000	2-ISM 350	0.881
M4L5	2-ISM 300	0.889	2-ISM 350	0.742
M5L6	2-ISM 300	0.712	2-ISM 300	0.699
M6L7	2-ISM 200	0.877	2-ISM 350	0.651
M7L8	2-ISM 200	0.594	2-ISM 250	0.447
M8L9	2-ISM 200	0.390	2-ISM 250	0.383

Design results for HTS (E 410) bridge

Table A.10 Optimized member sections and interaction ratios for the 90.0m span semi deck type bridge using HTS steel (E 410).

Member	Service condition under (DL+LL) case		Overload condition under 2.25x(DL+LL) case	
	Section	Interaction ratio	Section	Interaction ratio
M0M1	4-ISA100x100x8 2-500x10 plate	0.618	4-ISA100x100x8 2-500x10 plate	0.577
M1L2	4-ISA100x100x8 2-500x10 plate	0.915	4-ISA100x100x8 2-500x10 plate	0.884
L2L3	4-ISA100x100x8 2-500x10 plate	0.728	4-ISA100x100x8 2-500x10 plate	0.703
L3L4	4-ISA100x100x8 2-500x10 plate	0.795	4-ISA100x100x8 2-500x10 plate	0.814
L4L5	4-ISA150x150x10 2-500x10 plate	0.819	4-ISA150x150x10 2-500x10 plate	0.845
L5L6	4-ISA150x150x10 2-500x10 plate	0.953	4-ISA150x150x10 2-500x10 plate	0.975
L6L7	4-ISA150x150x12 2-500x12 plate	0.883	4-ISA150x150x12 2-500x12 plate	0.890
L7L8	4-ISA150x150x12 2-500x12 plate	0.930	4-ISA150x150x12 2-500x12 plate	0.946
L8L9	4-ISA150x150x12 2-500x12 plate	0.963	4-ISA150x150x12 2-500x12 plate	0.979
U0U1	4-ISA100x100x8 2-500x10 plate	0.458	4-ISA100x100x8 2-500x10 plate	0.442
U1U2	4-ISA100x100x8 2-500x10 plate	0.843	4-ISA100x100x8 2-500x10 plate	0.887
U2U3	4-ISA100x100x8 2-500x10 plate	0.972	4-ISA100x100x8 2-500x10 plate	0.945

U3U4	4-ISA100x100x12 2-500x12 plate	0.940	4-ISA100x100x12 2-500x12 plate	0.939
U4U5	4-ISA150x150x12 2-500x12 plate	0.938	4-ISA150x150x12 2-500x12 plate	0.948
U5U6	4-ISA150x150x16 2-500x12 plate	0.923	4-ISA150x150x16 2-500x12 plate	0.922
U6U7	4-ISA150x150x16 2-500x14 plate	0.971	4-ISA150x150x16 2-500x14 plate	0.970
U7U8	4-ISA150x150x16 2-500x16 plate	0.957	4-ISA150x150x16 2-500x16 plate	0.962
U8U9	4-ISA150x150x16 2-500x16 plate	1.000	4-ISA150x150x16 2-500x16 plate	1.000
M2L2	4-ISA65x65x5 2-420x8 plate	1.000	4-ISA100x100x10 2-420x10 plate	0.673
M3L3	4-ISA65x65x5 2-420x8 plate	0.776	4-ISA65x65x10 2-420x10 plate	0.558
M4L4	4-ISA65x65x5 2-420x8 plate	0.603	4-ISA65x65x8 2-420x10 plate	0.470
M5L5	4-ISA65x65x5 2-320x8 plate	0.669	4-ISA65x65x5 2-420x8 plate	0.504
M6L6	4-ISA65x65x5 2-320x8 plate	0.576	4-ISA65x65x5 2-420x8 plate	0.422
M7L7	4-ISA65x65x5 2-320x8 plate	0.433	4-ISA65x65x5 2-320x8 plate	0.415
M8L8	4-ISA65x65x5 2-320x8 plate	0.336	4-ISA65x65x5 2-320x8 plate	0.337
M9L9	4-ISA65x65x5 2-320x8 plate	0.201	4-ISA65x65x5 2-320x8 plate	0.202
M0U0	4-ISA150x150x10 2-500x10 plate	0.540	4-ISA150x150x10 2-500x10 plate	0.521
M1U1	4-ISA100x100x10 2-500x10 plate	0.649	4-ISA100x100x10 2-500x10 plate	0.622
M2U2	4-ISA65x65x5 2-420x8 plate	0.375	4-ISA100x100x10 2-420x10 plate	0.266
M3U3	4-ISA65x65x5 2-420x8 plate	0.665	4-ISA65x65x10 2-420x10 plate	0.450
M4U4	4-ISA65x65x5 2-420x8 plate	0.601	4-ISA65x65x8 2-420x10 plate	0.444
M5U5	4-ISA65x65x5 2-320x8 plate	0.508	4-ISA65x65x5 2-420x8 plate	0.445
M6U6	4-ISA65x65x5 2-320x8 plate	0.416	4-ISA65x65x5 2-420x8 plate	0.365
M7U7	4-ISA65x65x5 2-320x8 plate	0.393	4-ISA65x65x5 2-320x8 plate	0.382
M8U8	4-ISA65x65x5 2-320x8 plate	0.526	4-ISA65x65x5 2-320x8 plate	0.524
M9U9	4-ISA65x65x5 2-320x8 plate	0.372	4-ISA65x65x5 2-320x8 plate	0.372
M0U1	4-ISA100x100x12	0.848	4-ISA150x150x10	0.667

	2-500x10 plate		2-500x10 plate	
M1U2	4-ISA65x65x10 2-420x10 plate	0.553	4-ISA65x65x10 2-420x10 plate	0.518
M2U3	4-ISA65x65x5 2-420x8 plate	1.000	4-ISA65x65x10 2-420x12 plate	0.624
M3U4	4-ISA65x65x5 2-420x8 plate	0.933	4-ISA65x65x10 2-420x10 plate	0.655
M4U5	4-ISA65x65x5 2-420x8 plate	0.790	4-ISA65x65x8 2-420x10 plate	0.583
M5U6	4-ISA65x65x8 2-320x10 plate	0.921	4-ISA65x65x8 2-420x10 plate	0.512
M6U7	4-ISA65x65x8 2-320x10 plate	0.707	4-ISA65x65x5 2-420x8 plate	0.533
M7U8	4-ISA65x65x8 2-320x10 plate	0.523	4-ISA65x65x5 2-320x8 plate	0.515
M8U9	4-ISA65x65x8 2-320x10 plate	0.456	4-ISA65x65x5 2-320x8 plate	0.457
U0M1	4-ISA65x65x8 2-320x10 plate	0.871	4-ISA65x65x5 2-420x8 plate	0.732
M2L3	4-ISA65x65x5 2-420x8 plate	0.753	4-ISA65x65x5 2-420x8 plate	0.738
M3L4	4-ISA65x65x5 2-420x8 plate	0.615	4-ISA65x65x5 2-420x8 plate	0.627
M4L5	4-ISA65x65x5 2-420x8 plate	0.551	4-ISA65x65x5 2-420x8 plate	0.537
M5L6	4-ISA65x65x5 2-320x8 plate	0.528	4-ISA65x65x5 2-420x8 plate	0.440
M6L7	4-ISA65x65x5 2-320x8 plate	0.417	4-ISA65x65x5 2-420x8 plate	0.349
M7L8	4-ISA65x65x5 2-320x8 plate	0.292	4-ISA65x65x5 2-320x8 plate	0.292
M8L9	4-ISA65x65x5 2-320x8 plate	0.210	4-ISA65x65x5 2-320x8 plate	0.210