REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF CONSTRUCTION
DEPARTMENT OF BRIDGE

DETAILED DESIGN STUDY ON THE BAGO RIVER BRIDGE CONSTRUCTION PROJECT

FINAL REPORT ATTACHMENTS

VOLUME II DESIGN REPORT
Part V Flyover Bridge

DECEMBER 2017

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

NIPPON KOEI CO., LTD.
ORIENTAL CONSULTANTS GLOBAL CO., LTD.
METROPOLITAN EXPRESSWAY COMPANY LIMITED.
CHODAI CO., LTD.
NIPPON ENGINEERING CONSULTANTS CO., LTD.

EI
CR(3)
17-136

REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF CONSTRUCTION
DEPARTMENT OF BRIDGE

DETAILED DESIGN STUDY ON THE BAGO RIVER BRIDGE CONSTRUCTION PROJECT

FINAL REPORT ATTACHMENTS

VOLUME II DESIGN REPORT
Part V Flyover Bridge

DECEMBER 2017

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

NIPPON KOEI CO., LTD.
ORIENTAL CONSULTANTS GLOBAL CO., LTD.
METROPOLITAN EXPRESSWAY COMPANY LIMITED.
CHODAI CO., LTD.
NIPPON ENGINEERING CONSULTANTS CO., LTD.

INDEX

01-PC BRIDGE

01-1-PC-I GIRDER BRIDGE

(AF1-PF2)

Table of Contents

1.1 DESIGN CONDITION

ROAD GRADE	:	Equivalent to CLASS 4-1
BRIDGE TYPE	:	2 span continuous PC-I girder bridge with composite deck (PC plate and RC deck)
BRIDGE LENGTH	:	L = 60.000 m
SPAN LENGTH	:	L = 28.801 + 28.851 m (ON CL)
WIDTH OF THE ROAD	:	TOTAL 12.750 m L = 0.500 + 5.500 + 0.750 + 5.500 + 0.500 m
HORIZONTAL ALIGNMENT	:	A=150 ～ R=420 ～ A=150
LONGITUDINAL SLOPE	:	3.00 % ↙
SECTION SLOPE	:	LEFT : 3.45 % ～ 4.00 % ～ 3.34 % ↘ RIGHT : 3.45 % ～ 4.00 % ～ 3.34 % ↘
ANGLE OF SKEW	:	90°00'00"
PAVEMENT	:	ASPHALT PAVEMENT t= 80 mm
SLAB	:	REINFORCED CONCRETE t= 170 mm
PLATE	:	PRESTRESS CONCRETE PLATE t= 100 mm
LIVE ROAD	:	AASHTO HL=93
DESIGN STANDARD	:	AASHTO LRFD BRIDGE DESIGN 2014(LIVE ROAD) Specifications for highway bridges(Japan Road Association) 1 Common matters,3 Concrete bridges,5 seismic design (April 2012)

1.2 MATERIALS STRENGTH

1) CONCRETE

(N/mm^2)

			MAIN GIRDER	CROSS BEAM	RC SLAB	PC PLATE	COUPLING CONCRETE
DESIGN STANDARD STRENGTH OF CONCRETE			40.00	30.00	30.00	40.00	30.0
BENDING COMPRESSIVESTRESS	IMMEDIATELY AFTER PRESTRESSING		19.00	14.00	----	19.00	----
	OTHERS		14.00	11.00	10.00	15.00	10.00
BENDING TENSILE STRESS	IMMEDIATELY AFTER PRESTRESSING		-1.50	-1.20	----	-1.50	----
	DEAD LOAD		0.0	0.0	----	----	----
	DESIGN LOAD		-1.50	-1.20	----	0.0	----
	TEMPERATURE CHANGE		-2.00	----	----	----	----
MEAN SHEAR STRESS CONCRETE CAN CARRY			0.55	0.45	----	----	----
MAXIMUM MEAN CONCRETE SHEAR STRESS			5.30	4.00	----	----	----
ALLOWABLE DIAGONEL TENSILE STRESS (Case where shear forse or torsional moment)		DEAD LOAD	-1.00	-0.80	----	----	----
		LIVE LOAD	-2.00	-1.70	----	----	----
ALLOWABLE DIAGONEL TENSILE STRESS (Case where both shear forse and torsional moment)		DEAD LOAD	-1.30	-1.10	----	----	----
		LIVE LOAD	-2.50	-2.20	----	----	----

2) PC STRAND

(N/mm^2)

		MAIN GIRDER	CROSS BEAM	PC PLATE
PRESTRESSING STEEL TYPE		SWPR7BL 7S15.2mm	SWPR7BL 4S15.2mm	SWPR7AL 1S9.3mm
TENSILE STRENGTH		1850	1850	1700
YIELD POINT		1600	1600	1450
ALLOWABLE TENSILE STRESS	DURING PRESTRESSING	1440	1440	1305
	IMMEDIATELY AFTER PRESTRESSING	1295	1295	1190
	AT COMPOSITION OF SLAB	1110	----	----
	DESIGN LOAD	1110	1110	1020

3) REINFORCING STEEL

(N/mm^2)

		MAIN GIRDER	CROSS BEAM	RC SLAB	COUPLING CONCRETE
STEEL TYPE		SD345	SD345	SD345	SD345
YIELD POINT		345	345	345	345
ALLOWABLE TENSILE STRESS	DEAD LOAD	----	----	100	100
	DESIGN LOAD	180	200	140	160
	COLLISION LOAD	----	----	300	----
	WIND LOAD	----	----	175	----

1.3 DESIGN CONSTANT

1) CONCRETE

			MAIN GIRDER	CAST IN PLACE	PC PLATE
YOUNG'S MODULUS	DESIGN LOAD	(N/mm2)	3.10×10^4	2.80×10^4	3.10×10^4
	IMMEDIATELY AFTER PRESTRESSING	(N/mm2)	2.92×10^4	2.58×10^4	2.92×10^4
CREEP COEFFICIENT	NUMBER OF DAYS FOR DECK CONSTRUCTION		90	----	----
	NUMBER OF CONSTRUCTION DAYS FOR BRIDGE SURFACE		120	----	----
	DESIGN LOAD		2.60	2.60	3.00
	DURING DECK CONSTRUCTION		1.70	----	----
	BRIDGE SURFACE		1.65	----	----
DRYING SHRINKAGE OF CONCRETE	DURING DECK CONSTRUCTION		4.0×10^{-5}	----	----
	DESIGN LOAD		20.0×10^{-5}	20.0×10^{-5}	20.0×10^{-5}
UNIT WEIGHT		(kN/mm^3)	24.5	24.5	24.5

2) PC STRAND(MAIN GIRDER)

		1	2
YOUNG'S MODULUS	N/mm^2	2.00×10^5	2.00×10^5
SLIP	mm	4.0	4.0
RELAXATION	%	2.5	2.5
FRICTION COEFFICIENT	1/m	0.004	0.004
	1/rad	0.300	0.300
AREA	mm^2	970.900	970.900
UNIT WEIGHT	kg/m	7.707	7.707
DIAMETER OF SHEATH	mm	60.0	60.0
DECREASE RATIO BY ANCHOR	%	0.0	0.0

3) PC STRAND(CROSS BEAM)

YOUNG'S MODULUS	N/mm^2	2.00×10^5
SLIP	mm	4.0
RELAXATION	%	2.5
FRICTION COEFFICIENT	1/m	0.004
AREA	mm^2	554.800
UNIT WEIGHT	kg/m	4.404
DIAMETER OF SHEATH	mm	45.0
DECREASE RATIO BY ANCHOR	%	0.0

4) PC STRAND(PC PLATE)

			BETWEEN MAIN GIRDERS
YOUNG'S MODULUS		N/mm^2	2.00×10^5
RELAXATION	BEFORE PRESTRESSING	%	1.5
	AFTER PRESTRESSING	%	1.5
	EXTRA COEFFICIENT OF HIGH TEMPERATURE	%	1.0
AREA		mm^2	51.610
UNIT WEIGHT		kg/m	0.405

1. 5 Dimension

1) Dimension of Main Girder

Girder Height : 1900.00 ～ 1900.00 mm

【Change of Web Width (mm)】

Span	End of Girder (Left Side)			End of Girder (Right Side)		
	Ending Point of Changing Web Width	Starting Point of Changing Web Width	Web Width	Ending Point of Changing Web Width	Starting Point of Changing Web Width	Web Width
1	1000.0	4000.0	700.0	4000.0	1000.0	700.0
2	1000.0	4000.0	700.0	4000.0	1000.0	700.0

2) Dimension of Cross Beam

【Interval of Cross Beam on Left Girder (m)】

Span	Number of Intermediate Cross Beams	CB1～CB2	CB2～CB3
1	1	15.088	15.088
2	1	15.106	15.106

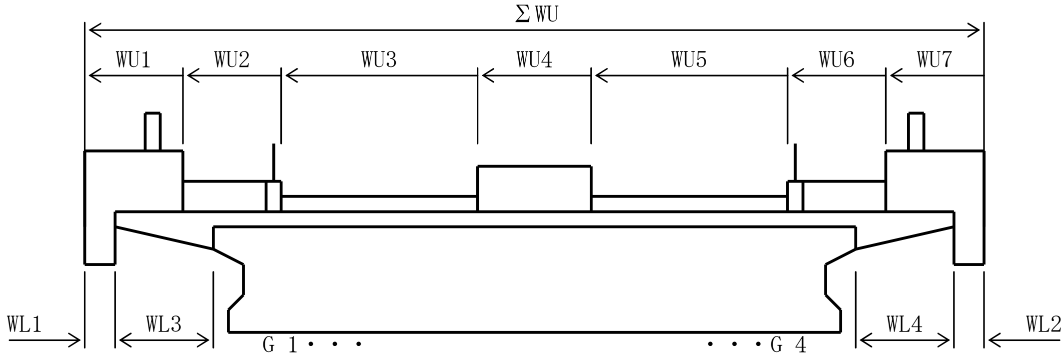
【Interval of Cross Beam on Right Girder (m)】

Span	Number of Intermediate Cross Beams	CB1～CB2	CB2～CB3
1	1	14.715	14.715
2	1	14.747	14.747

【Dimension of Cross Beam (m)】

Span	Cross Beam Width	Cross Beam Width (Left Side)	Cross Beam Width (Right Side)
1	0.300	0.900	0.950
2	0.300	0.950	0.900

【Cross Section 】



【m】

	ΣWU	WU1	WU2	WU3	WU4	WU5	WU6	WU7
1	12.750	0.500	0.000	5.500	0.750	5.500	0.000	0.500
2	12.750	0.500	0.000	5.500	0.750	5.500	0.000	0.500
3	12.750	0.500	0.000	5.500	0.750	5.500	0.000	0.500

	ΣWU	WL1	WL2	WL3	WL4
1	3.502	0.000	0.000	0.339	0.604
2	3.502	0.000	0.000	0.340	0.604
3	3.502	0.000	0.000	0.338	0.606

2. 1 Load Intensity

1) Load Intensity

(1) Bridge Surface Loads

< 1 >

Load Type		Load Intensity	Load Location	
			Left End of Girder Side	Right End of Girder Side
Selfweight of Kerb	Left	8.900 kN/m	0.180 m	0.180 m
	Right	8.650 kN/m	0.180 m	0.180 m
Selfweight of Concrete Barrier	Left	0.600 kN/m	0.125 m	0.125 m
	Right	0.600 kN/m	0.125 m	0.125 m
Selfweight of Sidewalk	Left	0.000 kN/m^2		
	Right	0.000 kN/m^2		
Selfweight of Handrail	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Kerb	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Pavement	Left	2.170 kN/m^2		
	Right	2.240 kN/m^2		
Selfweight of Median		8.590 kN/m^2		
Selfweight of Additional Object	1	0.110 kN/m	0.075 m	0.075 m
	2	0.110 kN/m	12.675 m	12.675 m

< 2 >

Load Type		Load Intensity	Load Location	
			Left End of Girder Side	Right End of Girder Side
Selfweight of Kerb	Left	8.790 kN/m	0.180 m	0.180 m
	Right	8.960 kN/m	0.180 m	0.180 m
Selfweight of Concrete Barrier	Left	0.600 kN/m	0.125 m	0.125 m
	Right	0.600 kN/m	0.125 m	0.125 m
Selfweight of Sidewalk	Left	0.000 kN/m^2		
	Right	0.000 kN/m^2		
Selfweight of Handrail	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Kerb	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Pavement	Left	2.150 kN/m^2		
	Right	2.630 kN/m^2		
Selfweight of Median		8.710 kN/m^2		
Selfweight of Additional Object	1	0.110 kN/m	0.075 m	0.075 m
	2	0.110 kN/m	12.675 m	12.675 m

Condition of Load

Calculation of Bridge Surface Loads

(AF1-PF1)

① Unit Weight

PC・RC Concrete	$\gamma 1 =$	24.5 kN/m^3
Concrete	$\gamma 2 =$	23.0 kN/m^3
Asphalt Pavement	$\gamma 3 =$	22.5 kN/m^3

② Bridge Surface Loads

・ Pavement on Left Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

t' = 1/2 × (0.107 ＋ 0.084) = 0.096 m

(Thickness of Leveling Concrete)

tc = 0.096 － 0.080 = 0.016 m

(Load Intensity)

q = 0.080 × 22.5 ＋ 0.016 × 23.0 = 2.17 kN/m^2

・ Pavement on Right Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

t' = 1/2 × (0.110 ＋ 0.087) = 0.099 m

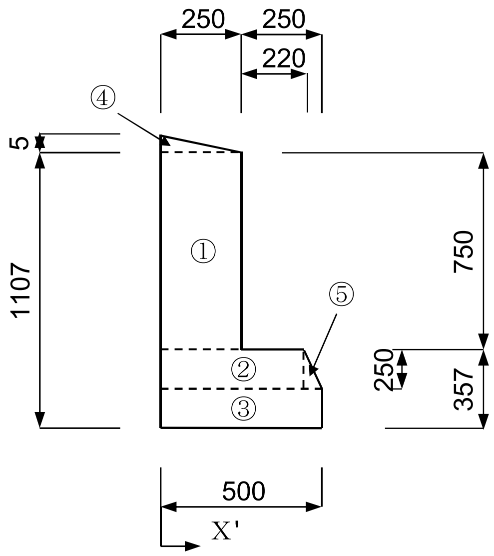
(Thickness of Leveling Concrete)

tc = 0.099 － 0.080 = 0.019 m

(Load Intensity)

q = 0.080 × 22.5 ＋ 0.019 × 23.0 = 2.24 kN/m^2

・Concrete Barrier (Left Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.107	0.500	0.0535	0.250	0.01338
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3629		0.0663

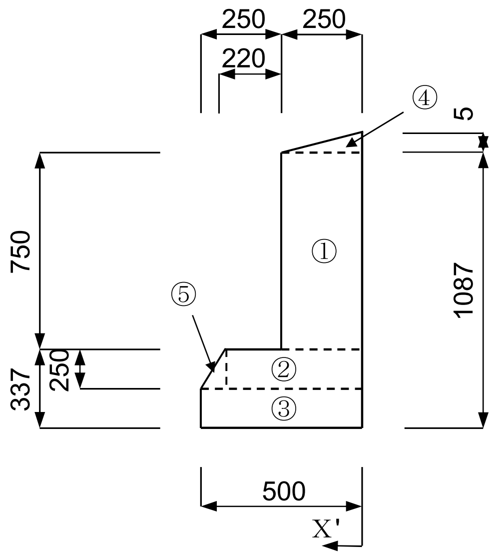
Load Location

X' = 0.0663 / 0.3629 = 0.180 m

Load Intensity

P = 0.3629 × 24.5 = 8.90 kN/m

・Concrete Barrier (Right Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.087	0.500	0.0435	0.250	0.01088
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3529		0.0638

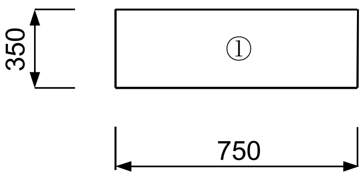
Load Location

X' = 0.0638 / 0.3529 = 0.180 m

Load Intensity

P = 0.3529 × 24.5 = 8.65 kN/m

・Median



a) Load Intensity and Load Location

		H	B	A
①	□	0.3500	0.7500	0.2625
				0.2625

Load Location

X' = On CL

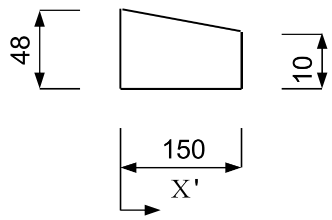
Load Intensity

P = 0.2625 × 24.5 = 6.44 kN/m

W = 6.4400 / 0.750 = 8.59 kN/m^2

・Left Drain Duct

※Loaded as Selfweight of Additional Object 1



Load Location

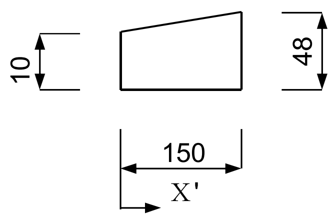
X' = 75mm inside beginning of Left Kerb

Load Intensity

P = 1/2 × (0.048 + 0.010) × 0.150 × 24.5 = 0.11 kN/m

・Right Drain Duct

※Loaded as Selfweight of Additional Object 2



Load Location

X' = 75mm inside beginning of Right Kerb

Load Intensity

P = 1/2 × (0.010 + 0.048) × 0.150 × 24.5 = 0.11 kN/m

・Handrail

※Loaded as Concrete Barrier

Load Location

X' = 125mm inside beginning of Right and Left Kerb

Load Intensity

P = 0.60 = 0.60 kN/m

Condition of Load

Calculation of Bridge Surface Loads

(PF1-PF2)

① Unit Weight

PC・RC Concrete	$\gamma 1 =$	24.5 kN/m^3
Concrete	$\gamma 2 =$	23.0 kN/m^3
Asphalt Pavement	$\gamma 3 =$	22.5 kN/m^3

② Bridge Surface Loads

・ Pavement on Left Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

t' = 1/2 × (0.098 ＋ 0.091) = 0.095 m

(Thickness of Leveling Concrete)

tc = 0.095 － 0.080 = 0.015 m

(Load Intensity)

q = 0.080 × 22.5 ＋ 0.015 × 23.0 = 2.15 kN/m^2

・ Pavement on Right Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

t' = 1/2 × (0.119 ＋ 0.112) = 0.116 m

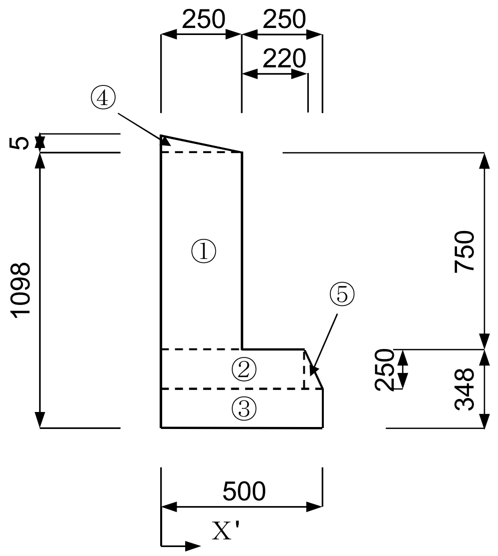
(Thickness of Leveling Concrete)

tc = 0.116 － 0.080 = 0.036 m

(Load Intensity)

q = 0.080 × 22.5 ＋ 0.036 × 23.0 = 2.63 kN/m^2

・Concrete Barrier (Left Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.098	0.500	0.0490	0.250	0.01225
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3584		0.0652

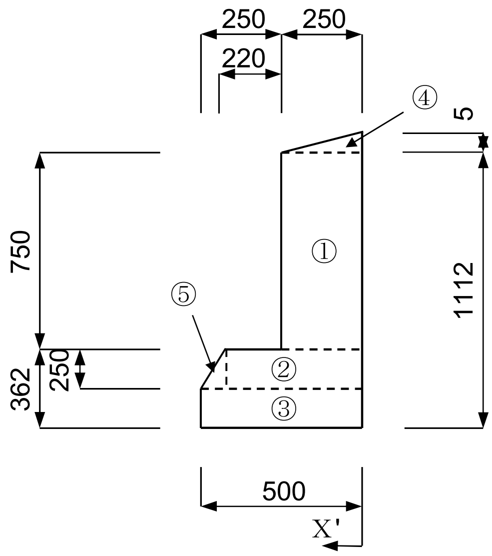
Load Location

X’ = 0.0652 / 0.3584 = 0.180 m

Load Intensity

P = 0.3584 × 24.5 = 8.79 kN/m

・Concrete Barrier (Right Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.112	0.500	0.0560	0.250	0.01400
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3654		0.0669

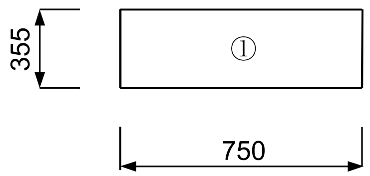
Load Location

X' = 0.0669 / 0.3654 = 0.180 m

Load Intensity

P = 0.3654 × 24.5 = 8.96 kN/m

・Median



a) Load Intensity and Load Location

		H	B	A
①	□	0.3550	0.7500	0.2663
				0.2663

Load Location

X' = On CL

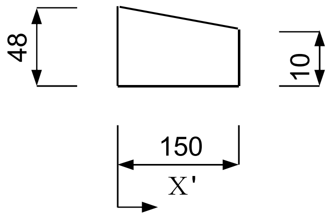
Load Intensity

P = 0.2663 × 24.5 = 6.53 kN/m

W = 6.5300 / 0.750 = 8.71 kN/m^2

・Left Drain Duct

※Loaded as Selfweight of Additional Object 1



Load Location

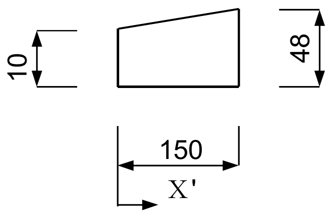
X' = 75mm inside beginning of Left Kerb

Load Intensity

P = 1/2 × (0.048 + 0.010) × 0.150 × 24.5 = 0.11 kN/m

・Right Drain Duct

※Loaded as Selfweight of Additional Object 2



Load Location

X' = 75mm inside beginning of Right Kerb

Load Intensity

P = 1/2 × (0.010 + 0.048) × 0.150 × 24.5 = 0.11 kN/m

・Handrail

※Loaded as Concrete Barrier

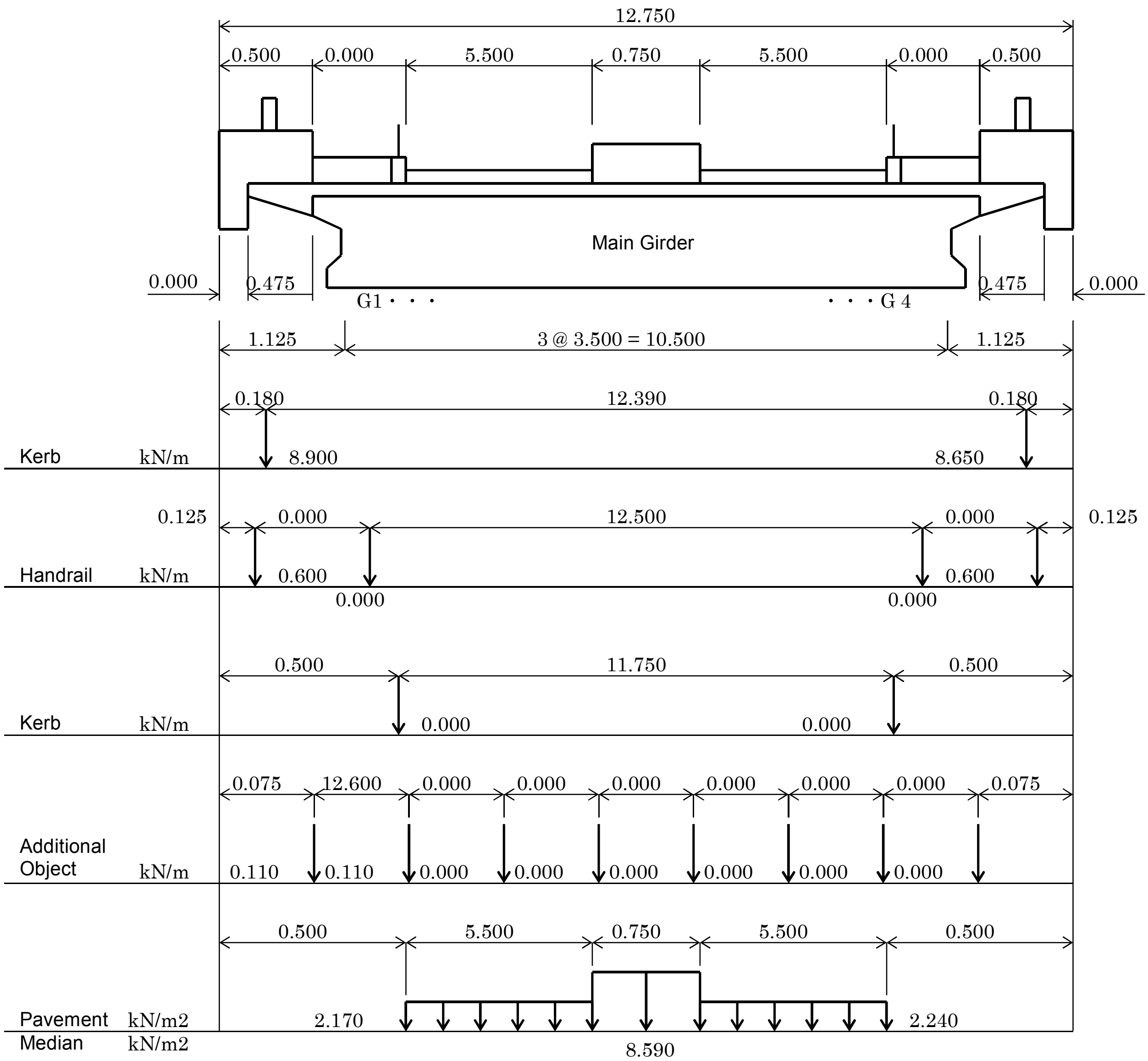
Load Location

X' = 125mm inside beginning of Right and Left Kerb

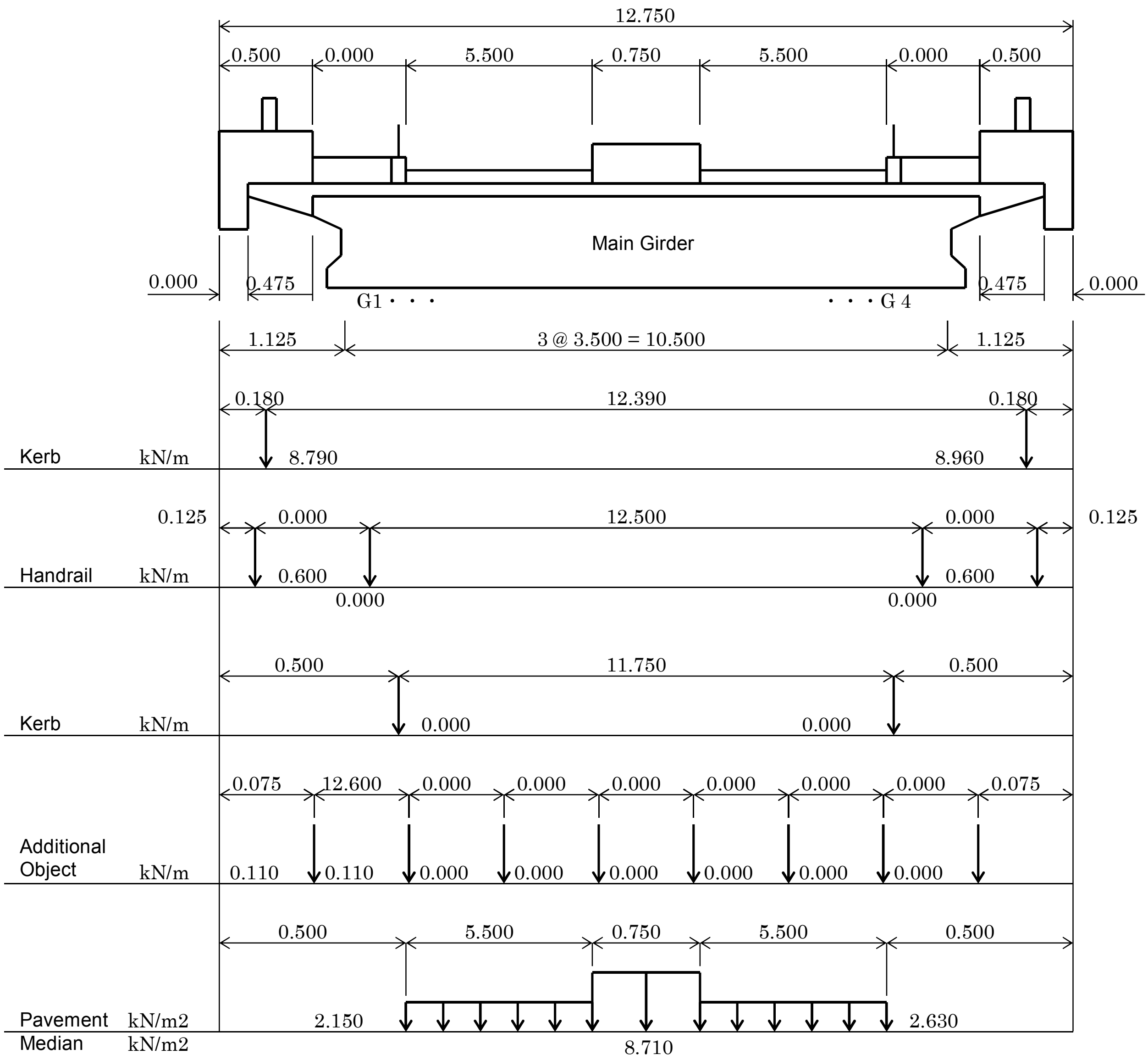
Load Intensity

P = 0.60 = 0.60 kN/m

Load Intensity（Bridge Surface Loads_AF1-PF1）

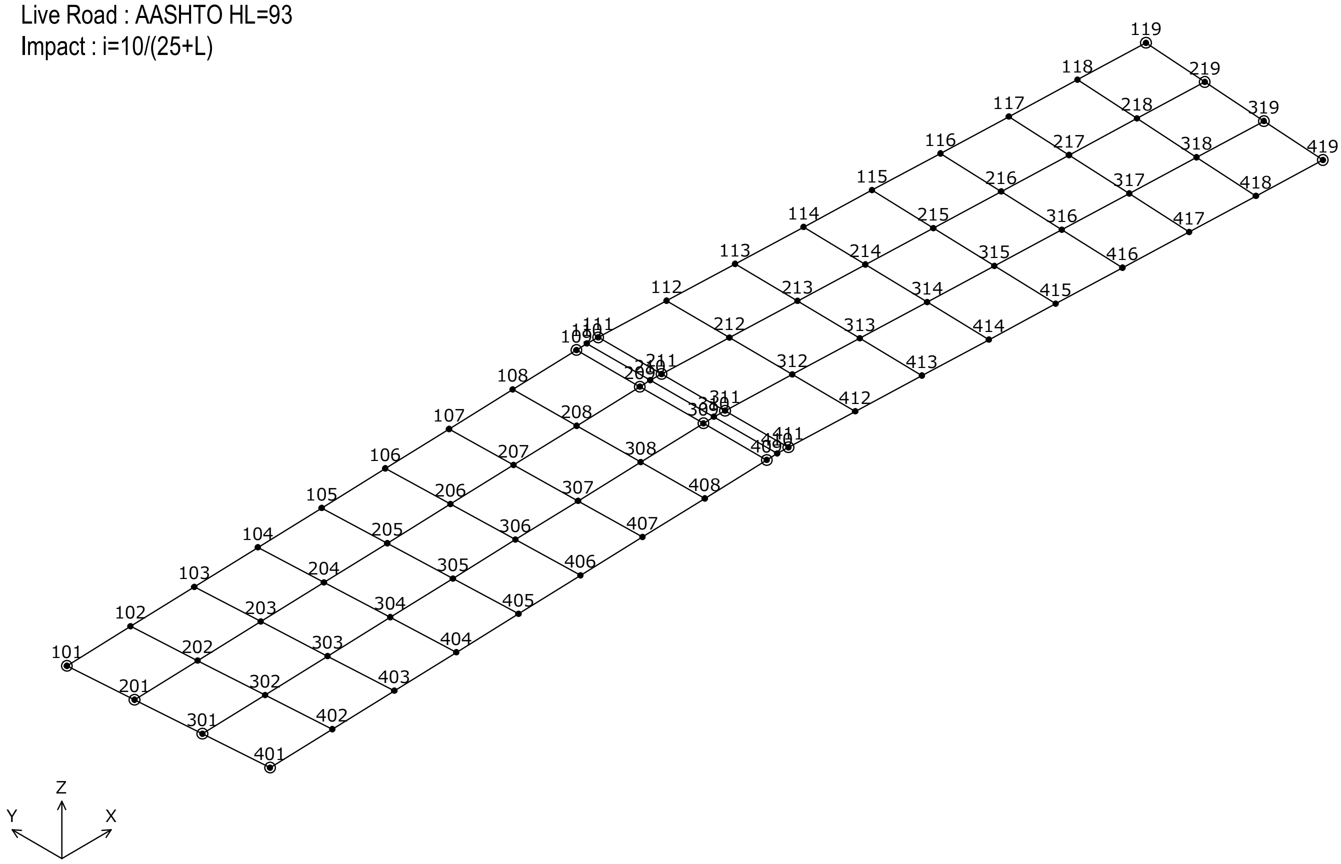


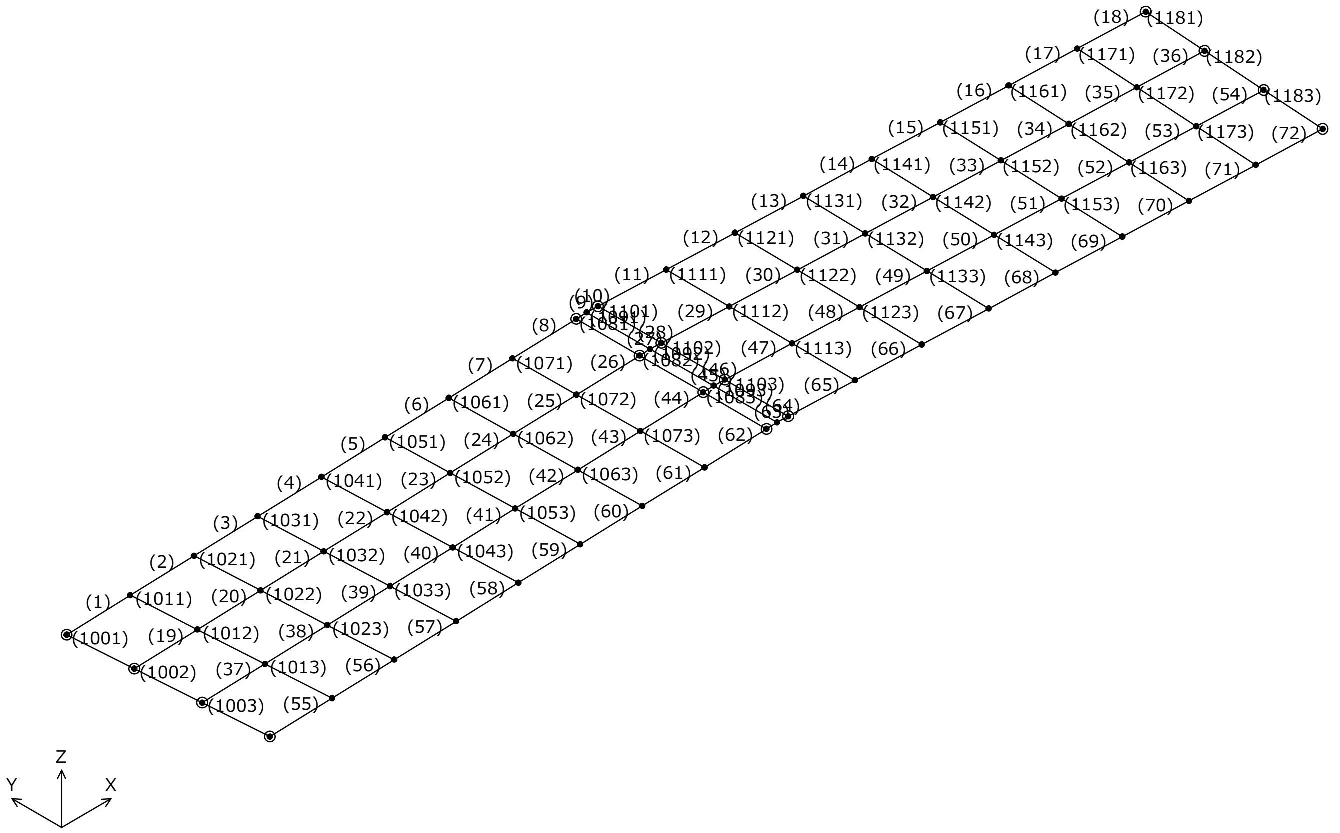
Load Intensity（Bridge Surface Loads_PF1-PF2）



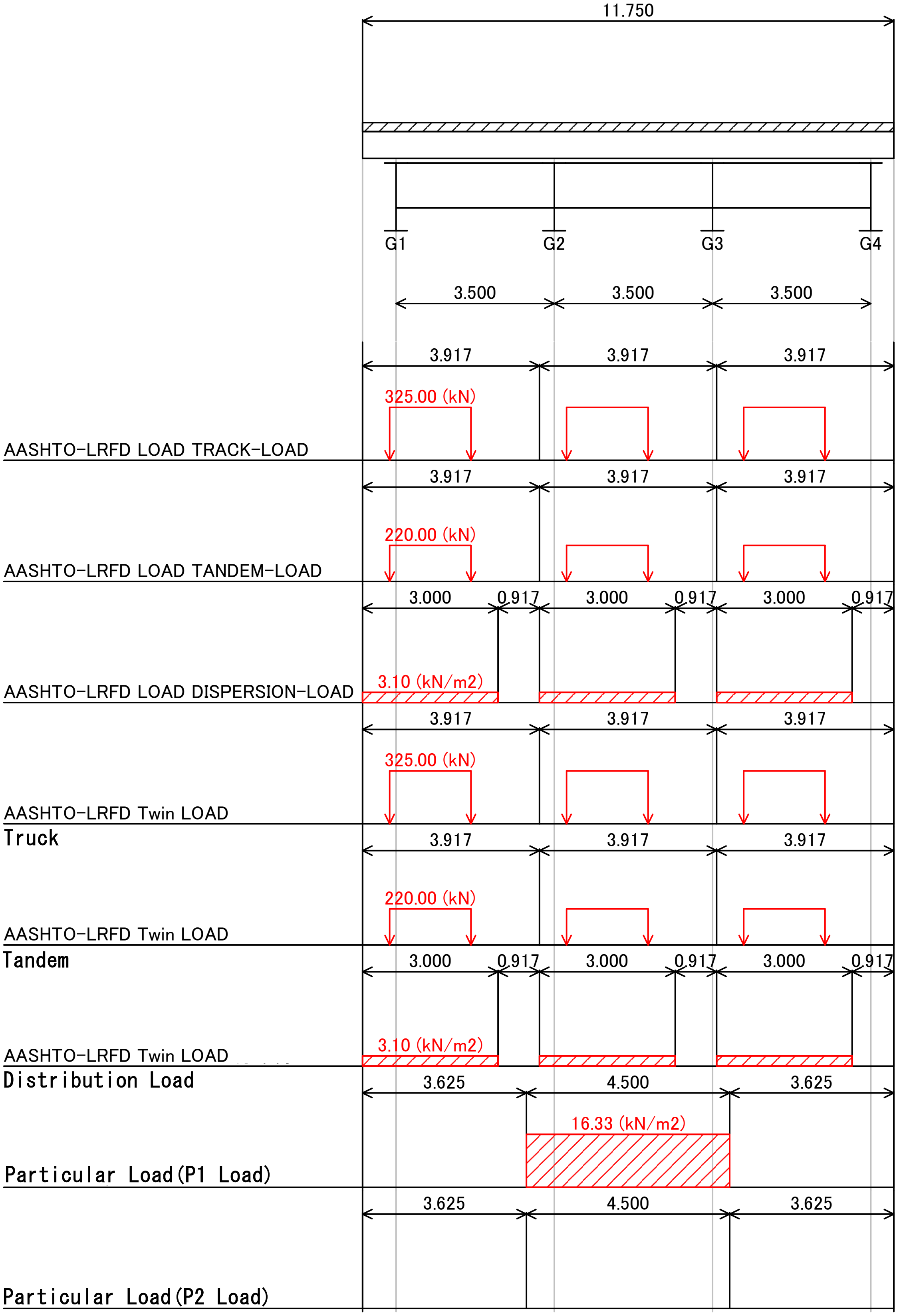
(2) Live Road

Live Road : AASHTO HL=93
Impact : i=10/(25+L)





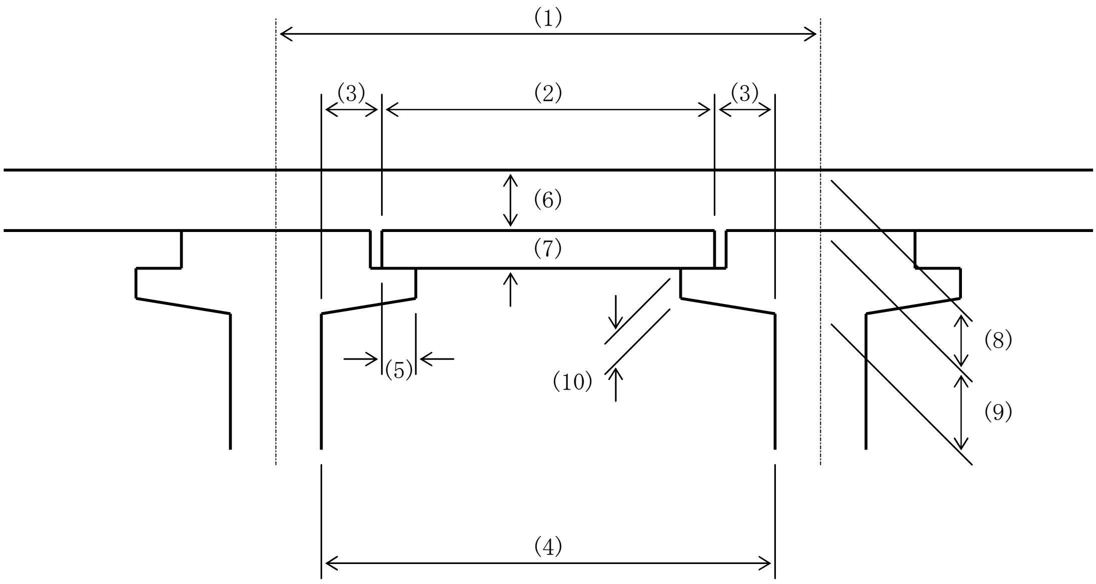
(m)


11.750
G1
G2
G3
G4
3.500
3.500
3.500
3.917
3.917
3.917
325.00 (kN)
AASHTO-LRFD LOAD TRACK-LOAD
3.917
3.917
3.917
220.00 (kN)
AASHTO-LRFD LOAD TANDEM-LOAD
3.000
0.917
3.000
0.917
3.000
0.917
3.10 (kN/m2)
AASHTO-LRFD LOAD DISPERSION-LOAD
3.917
3.917
3.917
325.00 (kN)
AASHTO-LRFD Twin LOAD
Truck
3.917
3.917
3.917
220.00 (kN)
AASHTO-LRFD Twin LOAD
Tandem
3.000
0.917
3.000
0.917
3.000
0.917
3.10 (kN/m2)
AASHTO-LRFD Twin LOAD
Distribution Load
3.625
4.500
3.625
16.33 (kN/m2)
Particular Load(P1 Load)
3.625
4.500
3.625
Particular Load(P2 Load)

3 Design of Deck Slab

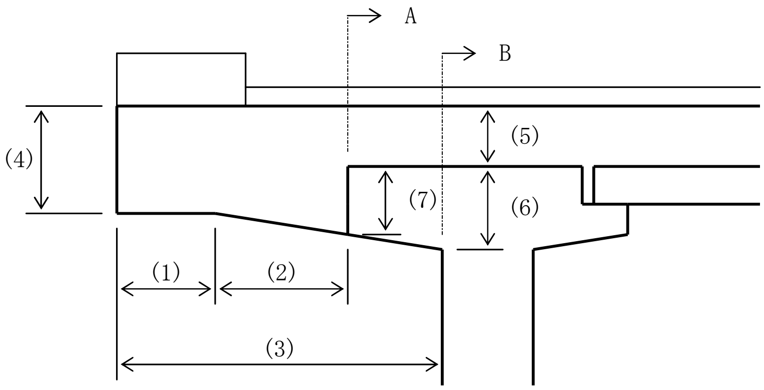
3.1 Dimension

1) Deck Slab between Girders



		1st Span		2nd Span	
		End of Girder	Center of Girder	Center of Girder	End of Girder
(1)	m	3.500	3.500	3.500	3.500
(2)	m	2.380	2.380	2.380	2.380
(3)	m	0.210	0.450	0.450	0.210
(4)	m	2.800	3.280	3.280	2.800
(5)	m	0.090	0.090	0.090	0.090
Span Length of PC Plate	m	2.260	2.260	2.260	2.260
(6)	mm	170.0	170.0	170.0	170.0
(7)	mm	100.0	100.0	100.0	100.0
(6)+(7)	mm	270.0	270.0	270.0	270.0
(8)	mm	170.0	170.0	170.0	170.0
(9)	mm	255.6	300.0	300.0	255.6
(10)	mm	100.0	100.0	100.0	100.0

2) Deck Slab outside of Girders



			1st Span		2nd Span	
			End of Girder	Center of Girder	Center of Girder	End of Girder
Left Side	(1)	m	0.000	0.000	0.000	0.000
	(2)	m	0.607	0.607	0.607	0.607
	(3)	m	0.907	1.147	1.147	0.907
	(4)	mm	250.0	250.0	250.0	250.0
	(5)	mm	170.0	170.0	170.0	170.0
	(6)	mm	255.6	300.0	300.0	255.6
	(7)	mm	200.0	200.0	200.0	200.0
Right Side	(1)	m	0.000	0.000	0.000	0.000
	(2)	m	0.607	0.607	0.607	0.607
	(3)	m	0.907	1.147	1.147	0.907
	(4)	mm	250.0	250.0	250.0	250.0
	(5)	mm	170.0	170.0	170.0	170.0
	(6)	mm	255.6	300.0	300.0	255.6
	(7)	mm	200.0	200.0	200.0	200.0

3) Calculation of Prestressing of PC Plate

		Unit	
Name of PC Strand			1S9.3
Material of PC Strand			SWPR7AL
Area of PC Strand		mm^2/no.	51.61
Number of PC Strand		No.	15
Creep Coefficient			3.00
Drying Shrinkage of Concrete		$\times 10^{-5}$	25.00
Relaxation	Before Prestressing	%	1.50
	Extra Coefficient of High Temperature	%	1.00
	After Prestressing	%	1.50
Prestressing Stress σpi		N/mm^2	1225.00
Allowable Value		N/mm^2	1305.00

<Design of Deck: Summary for Calculation Results of Stress>

1st Span, Left End of Girder Side

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5 ～19.0	9.17	○
	Bottom of PC Plate	N/mm^2		8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0 ～15.0	10.579	○
	Bottom of PC Plate	N/mm^2		3.686	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	3.479	○
	Bottom of RC Deck	N/mm^2		-0.799	○
	Top of PC Plate	N/mm^2	0 ～15.0	8.354	○
	Bottom of PC Plate	N/mm^2		1.356	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	921.338	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.555	○	140	73.604	○
Edge of PC Plate	Positive Moment	10	3.843	○	140	59.714	○
	Negative Moment	10	3.743	○	140	78.38	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	8.659	○	140	100.221	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	0.56	○
Tensile Stress of Reinforcement Bar	140	27.98	○

<Design of Deck: Summary for Calculation Results of Stress>

1st Span， Left End of Girder Side

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	8.23	○
	D+L	10	0.314	○	140	8.23	○
	D+L+CO	15	2.151	○	300	56.373	○
	D+L+W	12.5	0.459	○	175	12.028	○
	D+W	12.5	0.604	○	175	15.827	○
Supporting for Deck	D	------	------	--	100	13.197	○
	D+L	10	3.525	○	140	101.529	○
	D+L+CO	15	4.977	○	300	143.358	○
	D+L+W	12.5	3.641	○	175	104.871	○
	D+W	12.5	0.69	○	175	19.881	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	8.07	○
	D+L	10	0.308	○	140	8.07	○
	D+L+CO	15	2.145	○	300	56.213	○
	D+L+W	12.5	0.453	○	175	11.868	○
	D+W	12.5	0.598	○	175	15.667	○
Supporting for Deck	D	------	------	--	100	12.972	○
	D+L	10	3.517	○	140	101.304	○
	D+L+CO	15	4.969	○	300	143.133	○
	D+L+W	12.5	3.633	○	175	104.646	○
	D+W	12.5	0.682	○	175	19.656	○

Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	1.857	○	140	67.16	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	1.857	○	140	67.16	○

<Design of Deck: Summary for Calculation Results of Stress>

1st Span, Center of Span

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5 ～19.0	9.17	○
	Bottom of PC Plate	N/mm^2		8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0 ～15.0	10.584	○
	Bottom of PC Plate	N/mm^2		3.691	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	4.153	○
	Bottom of RC Deck	N/mm^2		-0.954	○
	Top of PC Plate	N/mm^2	0 ～15.0	8.187	○
	Bottom of PC Plate	N/mm^2		0.649	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	921.936	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.523	○	140	77.599	○
Edge of PC Plate	Positive Moment	10	6.597	○	140	102.499	○
	Negative Moment	10	3.225	○	140	67.529	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	9.958	○	140	115.254	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	1.002	○
Tensile Stress of Reinforcement Bar	140	55.499	○

<Design of Deck: Summary for Calculation Results of Stress>

1st Span,　Center of Span

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	8.228	○
	D+L	10	0.314	○	140	8.228	○
	D+L+CO	15	2.151	○	300	56.371	○
	D+L+W	12.5	0.459	○	175	12.027	○
	D+W	12.5	0.604	○	175	15.825	○
Supporting for Deck	D	------	------	--	100	16.718	○
	D+L	10	2.463	○	140	75.749	○
	D+L+CO	15	3.698	○	300	113.734	○
	D+L+W	12.5	2.563	○	175	78.813	○
	D+W	12.5	0.743	○	175	22.845	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	8.07	○
	D+L	10	0.308	○	140	8.07	○
	D+L+CO	15	2.145	○	300	56.213	○
	D+L+W	12.5	0.453	○	175	11.868	○
	D+W	12.5	0.598	○	175	15.667	○
Supporting for Deck	D	------	------	--	100	16.863	○
	D+L	10	2.468	○	140	75.895	○
	D+L+CO	15	3.703	○	300	113.879	○
	D+L+W	12.5	2.567	○	175	78.958	○
	D+W	12.5	0.748	○	175	22.991	○

Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	2.293	○	140	82.905	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	2.293	○	140	82.905	○

<Design of Deck: Summary for Calculation Results of Stress>

2nd Span， Center of Span

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5 ～19.0	9.17	○
	Bottom of PC Plate	N/mm^2		8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0 ～15.0	10.586	○
	Bottom of PC Plate	N/mm^2		3.694	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	4.187	○
	Bottom of RC Deck	N/mm^2		-0.962	○
	Top of PC Plate	N/mm^2	0 ～15.0	8.181	○
	Bottom of PC Plate	N/mm^2		0.617	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	922.32	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.539	○	140	78.077	○
Edge of PC Plate	Positive Moment	10	6.65	○	140	103.329	○
	Negative Moment	10	3.245	○	140	67.945	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	9.958	○	140	115.254	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	1.002	○
Tensile Stress of Reinforcement Bar	140	55.499	○

<Design of Deck: Summary for Calculation Results of Stress>

2nd Span， Center of Span

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	8.157	○
	D+L	10	0.311	○	140	8.157	○
	D+L+CO	15	2.148	○	300	56.3	○
	D+L+W	12.5	0.456	○	175	11.956	○
	D+W	12.5	0.601	○	175	15.755	○
Supporting for Deck	D	------	------	--	100	16.596	○
	D+L	10	2.459	○	140	75.627	○
	D+L+CO	15	3.694	○	300	113.611	○
	D+L+W	12.5	2.559	○	175	78.69	○
	D+W	12.5	0.739	○	175	22.723	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	8.272	○
	D+L	10	0.316	○	140	8.272	○
	D+L+CO	15	2.153	○	300	56.415	○
	D+L+W	12.5	0.461	○	175	12.071	○
	D+W	12.5	0.606	○	175	15.87	○
Supporting for Deck	D	------	------	--	100	17.298	○
	D+L	10	2.482	○	140	76.329	○
	D+L+CO	15	3.717	○	300	114.314	○
	D+L+W	12.5	2.582	○	175	79.393	○
	D+W	12.5	0.762	○	175	23.425	○

Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	2.293	○	140	82.905	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	2.293	○	140	82.905	○

<Design of Deck: Summary for Calculation Results of Stress>

2nd Span, Right End of Girder Side

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5 ~19.0	9.17	○
	Bottom of PC Plate	N/mm^2		8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0 ~15.0	10.581	○
	Bottom of PC Plate	N/mm^2		3.688	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	3.503	○
	Bottom of RC Deck	N/mm^2		-0.805	○
	Top of PC Plate	N/mm^2	0 ~15.0	8.35	○
	Bottom of PC Plate	N/mm^2		1.332	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	921.618	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.569	○	140	73.994	○
Edge of PC Plate	Positive Moment	10	3.87	○	140	60.135	○
	Negative Moment	10	3.763	○	140	78.796	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	8.659	○	140	100.221	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	0.56	○
Tensile Stress of Reinforcement Bar	140	27.98	○

<Design of Deck: Summary for Calculation Results of Stress>

2nd Span, Right End of Girder Side

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	8.159	○
	D+L	10	0.311	○	140	8.159	○
	D+L+CO	15	2.148	○	300	56.302	○
	D+L+W	12.5	0.456	○	175	11.958	○
	D+W	12.5	0.601	○	175	15.756	○
Supporting for Deck	D	------	------	--	100	13.093	○
	D+L	10	3.521	○	140	101.424	○
	D+L+CO	15	4.974	○	300	143.254	○
	D+L+W	12.5	3.637	○	175	104.766	○
	D+W	12.5	0.687	○	175	19.777	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	8.272	○
	D+L	10	0.316	○	140	8.272	○
	D+L+CO	15	2.153	○	300	56.415	○
	D+L+W	12.5	0.461	○	175	12.071	○
	D+W	12.5	0.606	○	175	15.87	○
Supporting for Deck	D	------	------	--	100	13.302	○
	D+L	10	3.529	○	140	101.633	○
	D+L+CO	15	4.981	○	300	143.463	○
	D+L+W	12.5	3.645	○	175	104.975	○
	D+W	12.5	0.694	○	175	19.986	○

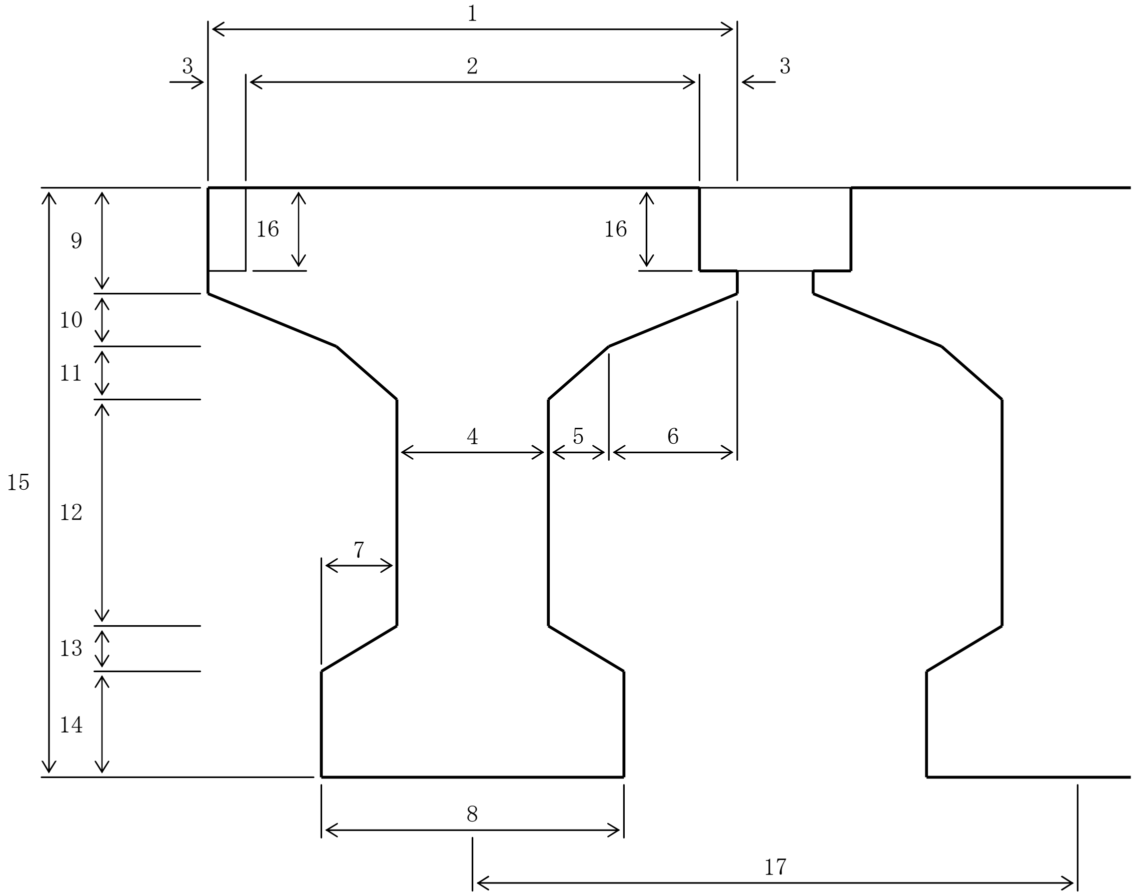
Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	1.857	○	140	67.16	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	1.857	○	140	67.16	○

4 Design of Main Girder

4.1 Dimension and PC Strand Arrangement

1) Dimension



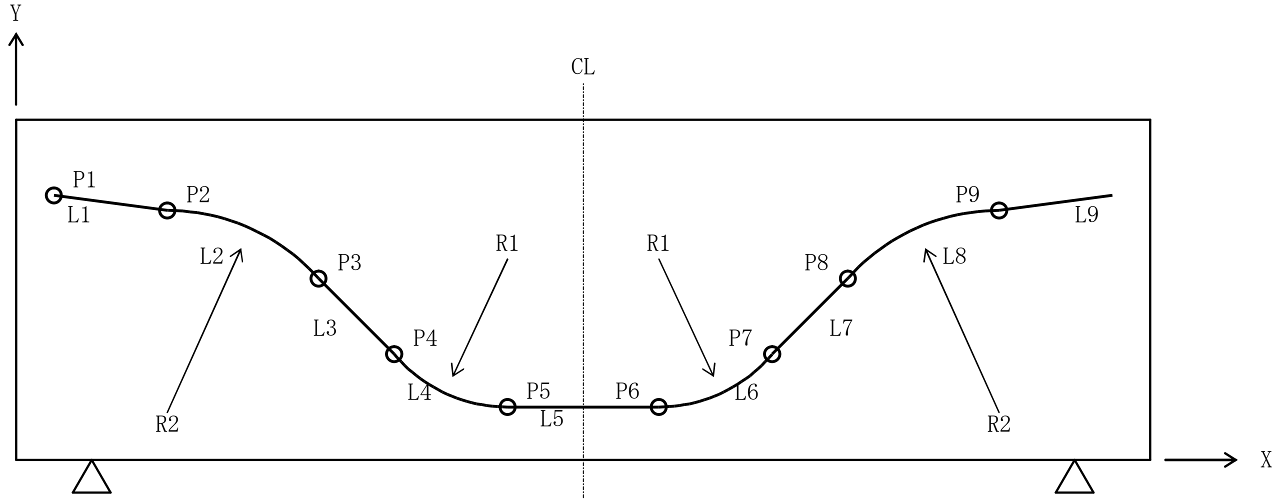
(Unit: mm)

	1st Span			2nd Span		
	End of Girder (Left)	Center Span	End of Girder (Right)	End of Girder (Left)	Center Span	End of Girder (Right)
1	1300.0	1300.0	1300.0	1300.0	1300.0	1300.0
2	1060.0	1060.0	1060.0	1060.0	1060.0	1060.0
3	120.0	120.0	120.0	120.0	120.0	120.0
4	700.0	220.0	700.0	700.0	220.0	700.0
5	0.0	0.0	0.0	0.0	0.0	0.0
6	300.0	540.0	300.0	300.0	540.0	300.0
7	0.0	240.0	0.0	0.0	240.0	0.0
8	700.0	700.0	700.0	700.0	700.0	700.0
9	200.0	200.0	200.0	200.0	200.0	200.0
10	55.6	100.0	55.6	55.6	100.0	55.6
11	0.0	0.0	0.0	0.0	0.0	0.0
12	1444.4	1150.0	1444.4	1444.4	1150.0	1444.4
13	0.0	250.0	0.0	0.0	250.0	0.0
14	200.0	200.0	200.0	200.0	200.0	200.0
15	1900.0	1900.0	1900.0	1900.0	1900.0	1900.0
16	100.0	100.0	100.0	100.0	100.0	100.0
17	3500.0	3500.0	3500.0	3500.0	3500.0	3500.0

2) PC Strand Arrangement

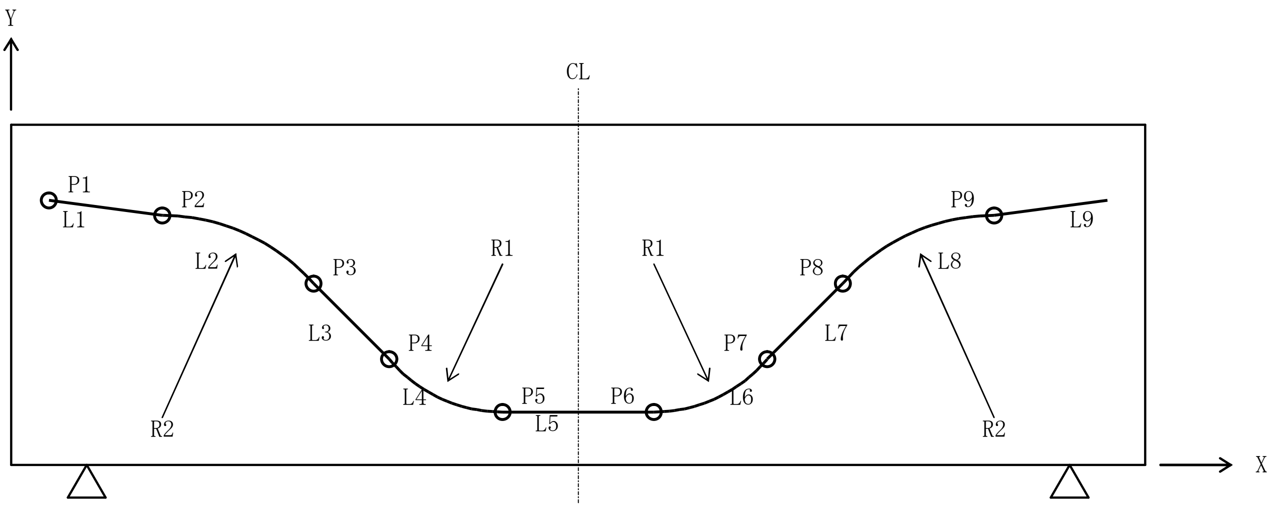
<1st Span>

PC Strand No.			1	2	3	4	5
Number of PC Strand			1	1	1	1	1
Coordinate (mm)	P1	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
	P2	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
	P3	X	200.0	200.0	200.0	200.0	200.0
		Y	1650.0	1300.0	950.0	600.0	250.0
	P4	X	13119.0	10730.4	8341.8	4706.9	1710.7
		Y	406.0	286.0	166.0	166.0	144.4
	P5	X	14077.5	11688.9	9300.2	5665.3	2408.3
		Y	360.0	240.0	120.0	120.0	120.0
	P6	X	16197.8	18071.0	19944.2	22794.8	25616.5
		Y	360.0	240.0	120.0	120.0	120.0
	P7	X	17416.5	19289.7	21162.9	24013.4	26575.0
		Y	434.5	314.5	194.5	194.5	166.0
	P8	X	26708.6	26708.6	26708.6	26708.6	26968.8
		Y	1575.5	1225.5	875.5	525.5	204.0
	P9	X	27927.3	27927.3	27927.3	27927.3	27927.3
		Y	1650.0	1300.0	950.0	600.0	250.0
	P1	X	29727.3	29727.3	29727.3	29727.3	29727.3
		Y	1650.0	1300.0	950.0	600.0	250.0
Angle	α	(L)	5°30'0"	5°30'0"	5°30'0"	5°30'0"	4°0'0"
		(R)	0°0'0"	0°0'0"	0°0'0"	0°0'0"	0°0'0"
Radius (m)	R2	(L)	----------	----------	----------	----------	----------
	R1	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(R)	10.000	10.000	10.000	10.000	10.000
	R2	(R)	10.000	10.000	10.000	10.000	10.000
Angle	β	(L)	----------	----------	----------	----------	----------
		(R)	7°0'0"	7°0'0"	7°0'0"	7°0'0"	5°30'0"
Length of PC Strand (m)	L1		----------	----------	----------	----------	----------
	L2		----------	----------	----------	----------	----------
	L3		12.979	10.579	8.179	4.528	1.514
	L4		0.960	0.960	0.960	0.960	0.698
	L5		2.120	6.382	10.644	17.129	23.208
	L6		1.222	1.222	1.222	1.222	0.960
	L7		9.362	7.475	5.587	2.715	0.396
	L8		1.222	1.222	1.222	1.222	0.960
	L9		1.800	1.800	1.800	1.800	1.800
	Total		29.664	29.639	29.614	29.576	29.536



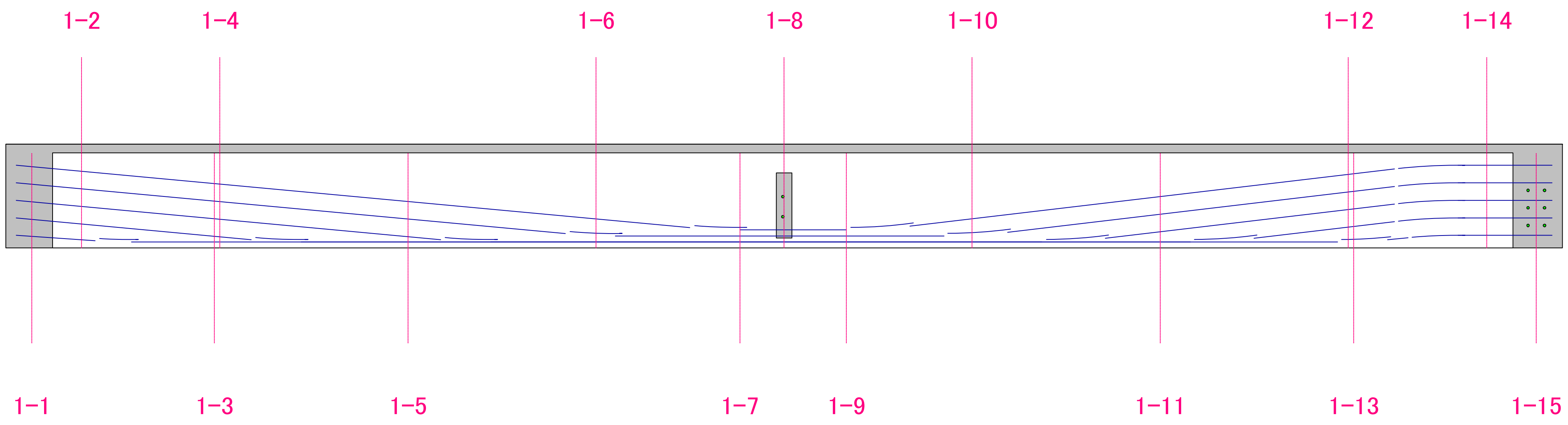
<2nd Span>

PC Strand No.			1	2	3	4	5
Number of PC Strand			1	1	1	1	1
Coordinate (mm)	P1	X	200.0	200.0	200.0	200.0	200.0
		Y	1650.0	1300.0	950.0	600.0	250.0
	P2	X	2000.0	2000.0	2000.0	2000.0	2000.0
		Y	1650.0	1300.0	950.0	600.0	250.0
	P3	X	3218.7	3218.7	3218.7	3218.7	2958.5
		Y	1575.5	1225.5	875.5	525.5	204.0
	P4	X	12510.8	10637.6	8764.4	5913.8	3352.3
		Y	434.5	314.5	194.5	194.5	166.0
	P5	X	13729.5	11856.3	9983.1	7132.5	4310.8
		Y	360.0	240.0	120.0	120.0	120.0
	P6	X	15895.2	18283.9	20672.5	24307.4	27564.4
		Y	360.0	240.0	120.0	120.0	120.0
	P7	X	16853.7	19242.3	21630.9	25265.8	28262.0
		Y	406.0	286.0	166.0	166.0	144.4
	P8	X	29772.7	29772.7	29772.7	29772.7	29772.7
		Y	1650.0	1300.0	950.0	600.0	250.0
	P9	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
	P1	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
Angle	α	(L)	0°0'0"	0°0'0"	0°0'0"	0°0'0"	0°0'0"
		(R)	5°30'0"	5°30'0"	5°30'0"	5°30'0"	4°0'0"
Radius (m)	R2	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(R)	10.000	10.000	10.000	10.000	10.000
	R2	(R)	----------	----------	----------	----------	----------
Angle	β	(L)	7°0'0"	7°0'0"	7°0'0"	7°0'0"	5°30'0"
		(R)	----------	----------	----------	----------	----------
Length of PC Strand (m)	L1		1.800	1.800	1.800	1.800	1.800
	L2		1.222	1.222	1.222	1.222	0.960
	L3		9.362	7.475	5.587	2.715	0.396
	L4		1.222	1.222	1.222	1.222	0.960
	L5		2.166	6.428	10.689	17.175	23.254
	L6		0.960	0.960	0.960	0.960	0.698
	L7		12.979	10.579	8.179	4.528	1.514
	L8		----------	----------	----------	----------	----------
	L9		----------	----------	----------	----------	----------
	Total		29.710	29.685	29.660	29.621	29.582



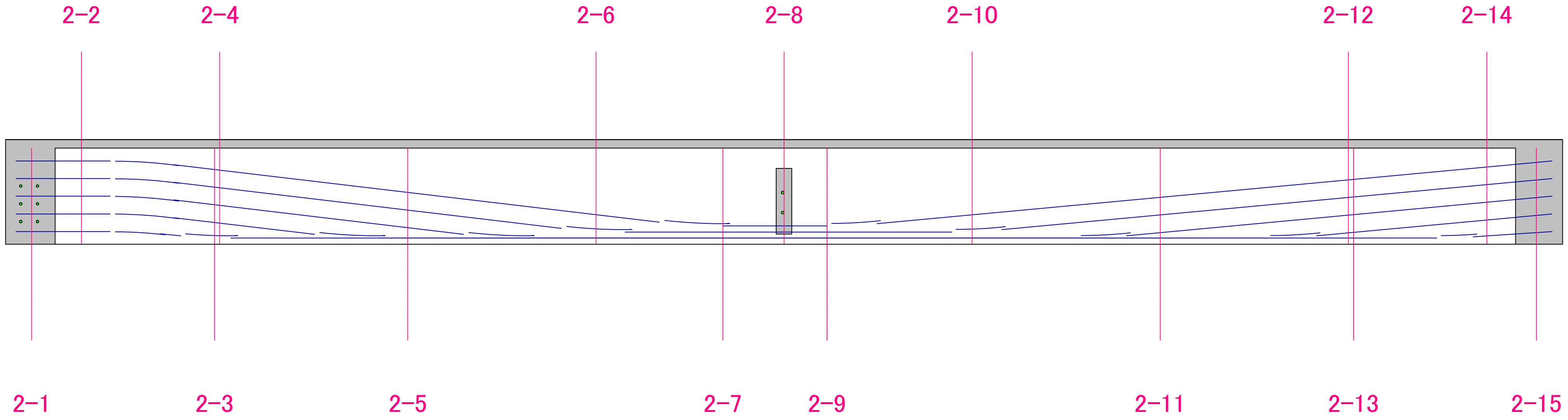
4.4 Summary for Calculation Results of Stress

1) AF1-PF2



	Unit	Allowable Value		Cross Section Number		
Calculation for Bending Moment				[1- 7] Bent up Point(Left)	[1- 8] Center of Span	[1- 9] Bent up Point(Right)
Bending Stress of Concrete						
Immediately After Prestressing	N/mm^2	-1.5～19.00	Top of Main Girder	0.76	0.80	0.78
			Bottom of Main Girder	15.09	14.99	14.94
During Deck Construction	〃	-1.5～14.00	Top of Main Girder	6.30	6.36	6.28
			Bottom of Main Girder	7.08	6.96	6.98
Dead Load	〃	≦10.00	Top of Deck	2.97	3.04	3.03
		0～14.00	Top of Main Girder	5.44	5.51	5.49
			Bottom of Main Girder	2.67	2.45	2.39
Design Load	〃	≦10.00	Top of Deck max	4.50	4.54	4.48
			Top of Deck min	2.61	2.65	2.61
		-1.5～14.00	Top of Main Girder(max)	6.70	6.75	6.68
			Bottom of Main Girder(max)	-0.89	-1.05	-0.99
			Top of Main Girder(min)	5.14	5.19	5.14
			Bottom of Main Girder(min)	3.51	3.35	3.37
Stress of PC Strand	N/mm^2	Pmax≦1110		1048	1045	1036
Ultimate Load	-----	F≧1.0		1.16	1.16	1.18
Calculation for Shear Force				[1- 2] Near a Support of girder(Left)	[1- 3] Change point of Web Width(Left)	[1-14] Near a Support of girder(Right)
Shear Stress of Design Load	kN			0.55	1.29	0.97
Compressive Strength to Failure	-----	F≧1.0		3.92	1.83	3.19
Diagonal Tensile Stress — Dead Load	N/mm^2	≧ -1		-0.04	-0.12	-0.22
Diagonal Tensile Stress — Design Load	〃	≧ -2		-0.16	-0.49	-0.39

2) PF1-PF2



	Unit	Allowable Value		Cross Section Number		
Calculation for Bending Moment				[2- 7] Bent up Point(Left)	[2- 8] Center of Span	[2- 9] Bent up Point(Right)
Bending Stress of Concrete						
Immediately After Prestressing	N/mm^2	-1.5～19.00	Top of Main Girder	0.79	0.82	0.78
			Bottom of Main Girder	14.92	14.97	15.07
During Deck Construction	〃	-1.5～14.00	Top of Main Girder	6.31	6.39	6.33
			Bottom of Main Girder	6.95	6.92	7.05
Dead Load	〃	≦10.00	Top of Deck	3.07	3.08	3.01
		0～14.00	Top of Main Girder	5.53	5.55	5.47
			Bottom of Main Girder	2.30	2.36	2.58
Design Load	〃	≦10.00	Top of Deck max	4.52	4.58	4.54
			Top of Deck min	2.65	2.69	2.64
		-1.5～14.00	Top of Main Girder(max)	6.72	6.79	6.74
			Bottom of Main Girder(max)	-1.08	-1.14	-0.98
			Top of Main Girder(min)	5.18	5.23	5.18
			Bottom of Main Girder(min)	3.28	3.26	3.43
Stress of PC Strand	N/mm^2	Pmax≦1110		1037	1047	1050
Ultimate Load	-----	F≧1.0		1.17	1.15	1.16
Calculation for Shear Force				[2- 2] Near a Support of girder(Left)	[2-13] Change point of Web Width(Right)	[2-14] Near a Support of girder(Right)
Shear Stress of Design Load	kN			0.97	1.28	0.55
Compressive Strength to Failure	-----	F≧1.0		3.20	1.84	3.91
Diagonal Tensile Stress — Dead Load	N/mm^2	≧ -1		-0.22	-0.12	-0.04
Diagonal Tensile Stress — Design Load	〃	≧ -2		-0.40	-0.49	-0.16

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder			------	0.500		1.450		4.000	
Immediately After Prestressing	Top of Main Girder		-1.5	2.971	○	2.771	○	3.781	○
	Bottom of Main Girder		～19.00	5.077	○	6.016	○	11.160	○
During Deck Construction	Top of Main Girder		-1.5	2.819	○	3.207	○	5.823	○
	Bottom of Main Girder		～14.00	4.817	○	5.018	○	7.575	○
Dead Load	Top of Deck		≦10.00	0.275	○	0.548	○	1.388	○
	Top of Main Girder		0	2.120	○	2.482	○	4.321	○
	Bottom of Main Girder		～14.00	4.786	○	4.694	○	5.873	○
Design Load1	Top of Deck	Max	≦10.00	0.275	○	0.821	○	2.276	○
		Min		0.274	○	0.523	○	1.292	○
	Top of Main Girder	Max	-1.5	2.120	○	2.719	○	5.053	○
		Min		2.120	○	2.461	○	4.243	○
	Bottom of Main Girder	Max	～14.00	4.786	○	4.190	○	3.779	○
		Min		4.786	○	4.740	○	6.097	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	0.793	○	1.346	○	2.780	○
		Min		0.793	○	1.048	○	1.796	○
	Top of Main Girder	Max	-2	1.264	○	1.866	○	4.159	○
		Min		1.263	○	1.607	○	3.349	○
	Bottom of Main Girder	Max	～16.10	5.260	○	4.627	○	3.994	○
		Min		5.260	○	5.178	○	6.312	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	0.793	○	1.346	○	2.780	○
		Min		0.793	○	1.048	○	1.796	○
	Top of Main Girder	Max	-2	1.264	○	1.866	○	4.159	○
		Min		1.263	○	1.607	○	3.349	○
	Bottom of Main Girder	Max	～16.10	5.260	○	4.627	○	3.994	○
		Min		5.260	○	5.178	○	6.312	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	0.275	○	0.821	○	2.276	○
		Min		0.274	○	0.523	○	1.292	○
	Top of Main Girder	Max	-1.5	2.120	○	2.719	○	5.053	○
		Min		2.120	○	2.461	○	4.243	○
	Bottom of Main Girder	Max	～14.00	4.786	○	4.190	○	3.779	○
		Min		4.786	○	4.740	○	6.097	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	0.793	○	1.346	○	2.780	○
		Min		0.793	○	1.048	○	1.796	○
	Top of Main Girder	Max	-2	1.264	○	1.866	○	4.159	○
		Min		1.263	○	1.607	○	3.349	○
	Bottom of Main Girder	Max	～16.10	5.260	○	4.627	○	3.994	○
		Min		5.260	○	5.178	○	6.312	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	0.793	○	1.346	○	2.780	○
		Min		0.793	○	1.048	○	1.796	○
	Top of Main Girder	Max	-2	1.264	○	1.866	○	4.159	○
		Min		1.263	○	1.607	○	3.349	○
	Bottom of Main Girder	Max	～16.10	5.260	○	4.627	○	3.994	○
		Min		5.260	○	5.178	○	6.312	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder			------	4.116		7.732		11.348	
Immediately After Prestressing	Top of Main Girder		-1.5	3.725	○	2.197	○	0.993	○
	Bottom of Main Girder		～19.00	11.238	○	13.449	○	15.059	○
During Deck Construction	Top of Main Girder		-1.5	5.836	○	6.136	○	6.108	○
	Bottom of Main Girder		～14.00	7.565	○	7.454	○	7.551	○
Dead Load	Top of Deck		≦10.00	1.413	○	2.118	○	2.623	○
	Top of Main Girder		0	4.343	○	4.887	○	5.143	○
	Bottom of Main Girder		～14.00	5.819	○	4.516	○	3.640	○
Design Load1	Top of Deck	Max	≦10.00	2.325	○	3.515	○	4.172	○
		Min		1.315	○	1.923	○	2.332	○
	Top of Main Girder	Max	-1.5	5.093	○	6.038	○	6.421	○
		Min		4.262	○	4.726	○	4.903	○
	Bottom of Main Girder	Max	～14.00	3.672	○	1.246	○	0.030	○
		Min		6.051	○	4.973	○	4.318	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	2.830	○	4.097	○	4.829	○
		Min		1.820	○	2.504	○	2.988	○
	Top of Main Girder	Max	-2	4.201	○	5.209	○	5.653	○
		Min		3.370	○	3.897	○	4.136	○
	Bottom of Main Girder	Max	～16.10	3.882	○	1.279	○	-0.110	○
		Min		6.260	○	5.006	○	4.178	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	2.830	○	4.097	○	4.829	○
		Min		1.820	○	2.504	○	2.988	○
	Top of Main Girder	Max	-2	4.201	○	5.209	○	5.653	○
		Min		3.370	○	3.897	○	4.136	○
	Bottom of Main Girder	Max	～16.10	3.882	○	1.279	○	-0.110	○
		Min		6.260	○	5.006	○	4.178	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.325	○	3.515	○	4.172	○
		Min		1.315	○	1.923	○	2.332	○
	Top of Main Girder	Max	-1.5	5.093	○	6.038	○	6.421	○
		Min		4.262	○	4.726	○	4.903	○
	Bottom of Main Girder	Max	～14.00	3.672	○	1.246	○	0.030	○
		Min		6.051	○	4.973	○	4.318	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	2.830	○	4.097	○	4.829	○
		Min		1.820	○	2.504	○	2.988	○
	Top of Main Girder	Max	-2	4.201	○	5.209	○	5.653	○
		Min		3.370	○	3.897	○	4.136	○
	Bottom of Main Girder	Max	～16.10	3.882	○	1.279	○	-0.110	○
		Min		6.260	○	5.006	○	4.178	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	2.830	○	4.097	○	4.829	○
		Min		1.820	○	2.504	○	2.988	○
	Top of Main Girder	Max	-2	4.201	○	5.209	○	5.653	○
		Min		3.370	○	3.897	○	4.136	○
	Bottom of Main Girder	Max	～16.10	3.882	○	1.279	○	-0.110	○
		Min		6.260	○	5.006	○	4.178	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder			------	14.078		14.964		16.198	
Immediately After Prestressing	Top of Main Girder		-1.5	0.764	○	0.799	○	0.778	○
	Bottom of Main Girder		～19.00	15.089	○	14.989	○	14.935	○
During Deck Construction	Top of Main Girder		-1.5	6.298	○	6.359	○	6.280	○
	Bottom of Main Girder		～14.00	7.084	○	6.960	○	6.980	○
Dead Load	Top of Deck		≦10.00	2.970	○	3.036	○	3.034	○
	Top of Main Girder		0	5.436	○	5.512	○	5.486	○
	Bottom of Main Girder		～14.00	2.665	○	2.446	○	2.387	○
Design Load1	Top of Deck	Max	≦10.00	4.498	○	4.537	○	4.484	○
		Min		2.605	○	2.648	○	2.614	○
	Top of Main Girder	Max	-1.5	6.697	○	6.750	○	6.683	○
		Min		5.135	○	5.191	○	5.139	○
	Bottom of Main Girder	Max	～14.00	-0.891	○	-1.048	○	-0.988	○
		Min		3.513	○	3.350	○	3.366	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	5.211	○	5.269	○	5.242	○
		Min		3.318	○	3.379	○	3.371	○
	Top of Main Girder	Max	-2	5.976	○	6.045	○	5.999	○
		Min		4.415	○	4.486	○	4.455	○
	Bottom of Main Girder	Max	～16.10	-1.163	○	-1.362	○	-1.363	○
		Min		3.242	○	3.035	○	2.991	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	5.211	○	5.269	○	5.242	○
		Min		3.318	○	3.379	○	3.371	○
	Top of Main Girder	Max	-2	5.976	○	6.045	○	5.999	○
		Min		4.415	○	4.486	○	4.455	○
	Bottom of Main Girder	Max	～16.10	-1.163	○	-1.362	○	-1.363	○
		Min		3.242	○	3.035	○	2.991	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	4.498	○	4.537	○	4.484	○
		Min		2.605	○	2.648	○	2.614	○
	Top of Main Girder	Max	-1.5	6.697	○	6.750	○	6.683	○
		Min		5.135	○	5.191	○	5.139	○
	Bottom of Main Girder	Max	～14.00	-0.891	○	-1.048	○	-0.988	○
		Min		3.513	○	3.350	○	3.366	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	5.211	○	5.269	○	5.242	○
		Min		3.318	○	3.379	○	3.371	○
	Top of Main Girder	Max	-2	5.976	○	6.045	○	5.999	○
		Min		4.415	○	4.486	○	4.455	○
	Bottom of Main Girder	Max	～16.10	-1.163	○	-1.362	○	-1.363	○
		Min		3.242	○	3.035	○	2.991	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	5.211	○	5.269	○	5.242	○
		Min		3.318	○	3.379	○	3.371	○
	Top of Main Girder	Max	-2	5.976	○	6.045	○	5.999	○
		Min		4.415	○	4.486	○	4.455	○
	Bottom of Main Girder	Max	～16.10	-1.163	○	-1.362	○	-1.363	○
		Min		3.242	○	3.035	○	2.991	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder			------	18.579		22.195		25.811	
Immediately After Prestressing	Top of Main Girder		-1.5	1.113	○	2.974	○	5.668	○
	Bottom of Main Girder		～19.00	14.439	○	12.169	○	8.601	○
During Deck Construction	Top of Main Girder		-1.5	6.209	○	6.840	○	7.640	○
	Bottom of Main Girder		～14.00	7.004	○	6.336	○	5.182	○
Dead Load	Top of Deck		≦10.00	2.930	○	2.812	○	2.595	○
	Top of Main Girder		0	5.438	○	5.779	○	6.108	○
	Bottom of Main Girder		～14.00	2.455	○	2.210	○	1.840	○
Design Load1	Top of Deck	Max	≦10.00	4.228	○	3.718	○	2.962	○
		Min		2.445	○	2.207	○	1.781	○
	Top of Main Girder	Max	-1.5	6.508	○	6.525	○	6.410	○
		Min		5.038	○	5.280	○	5.439	○
	Bottom of Main Girder	Max	～14.00	-0.569	○	0.088	○	0.972	○
		Min		3.585	○	3.630	○	3.765	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	5.036	○	4.605	○	3.930	○
		Min		3.253	○	3.094	○	2.749	○
	Top of Main Girder	Max	-2	5.866	○	5.947	○	5.898	○
		Min		4.396	○	4.703	○	4.927	○
	Bottom of Main Girder	Max	～16.10	-1.063	○	-0.596	○	0.088	○
		Min		3.091	○	2.946	○	2.881	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	5.036	○	4.605	○	3.930	○
		Min		3.253	○	3.094	○	2.749	○
	Top of Main Girder	Max	-2	5.866	○	5.947	○	5.898	○
		Min		4.396	○	4.703	○	4.927	○
	Bottom of Main Girder	Max	～16.10	-1.063	○	-0.596	○	0.088	○
		Min		3.091	○	2.946	○	2.881	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	4.228	○	3.718	○	2.962	○
		Min		2.445	○	2.207	○	1.781	○
	Top of Main Girder	Max	-1.5	6.508	○	6.525	○	6.410	○
		Min		5.038	○	5.280	○	5.439	○
	Bottom of Main Girder	Max	～14.00	-0.569	○	0.088	○	0.972	○
		Min		3.585	○	3.630	○	3.765	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	5.036	○	4.605	○	3.930	○
		Min		3.253	○	3.094	○	2.749	○
	Top of Main Girder	Max	-2	5.866	○	5.947	○	5.898	○
		Min		4.396	○	4.703	○	4.927	○
	Bottom of Main Girder	Max	～16.10	-1.063	○	-0.596	○	0.088	○
		Min		3.091	○	2.946	○	2.881	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	5.036	○	4.605	○	3.930	○
		Min		3.253	○	3.094	○	2.749	○
	Top of Main Girder	Max	-2	5.866	○	5.947	○	5.898	○
		Min		4.396	○	4.703	○	4.927	○
	Bottom of Main Girder	Max	～16.10	-1.063	○	-0.596	○	0.088	○
		Min		3.091	○	2.946	○	2.881	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span,　Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder			------	25.927		28.477		29.427	
Immediately After Prestressing	Top of Main Girder		-1.5	5.758	○	3.827	○	3.065	○
	Bottom of Main Girder		～19.00	8.471	○	4.286	○	4.504	○
During Deck Construction	Top of Main Girder		-1.5	7.659	○	4.187	○	2.884	○
	Bottom of Main Girder		～14.00	5.142	○	3.410	○	4.298	○
Dead Load	Top of Deck		≦10.00	2.585	○	1.795	○	1.390	○
	Top of Main Girder		0	6.112	○	3.988	○	3.093	○
	Bottom of Main Girder		～14.00	1.830	○	1.426	○	2.352	○
Design Load1	Top of Deck	Max	≦10.00	2.937	○	1.877	○	1.397	○
		Min		1.754	○	0.471	○	-0.181	○
	Top of Main Girder	Max	-1.5	6.402	○	4.059	○	3.099	○
		Min		5.429	○	2.844	○	1.725	○
	Bottom of Main Girder	Max	～14.00	0.995	○	1.275	○	2.340	○
		Min		3.795	○	3.867	○	5.141	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	3.907	○	2.963	○	2.509	○
		Min		2.724	○	1.557	○	0.930	○
	Top of Main Girder	Max	-2	5.892	○	3.691	○	2.758	○
		Min		4.919	○	2.475	○	1.385	○
	Bottom of Main Girder	Max	～16.10	0.105	○	0.677	○	1.761	○
		Min		2.905	○	3.270	○	4.563	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	3.907	○	2.963	○	2.509	○
		Min		2.724	○	1.557	○	0.930	○
	Top of Main Girder	Max	-2	5.892	○	3.691	○	2.758	○
		Min		4.919	○	2.475	○	1.385	○
	Bottom of Main Girder	Max	～16.10	0.105	○	0.677	○	1.761	○
		Min		2.905	○	3.270	○	4.563	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.937	○	1.877	○	1.397	○
		Min		1.754	○	0.471	○	-0.181	○
	Top of Main Girder	Max	-1.5	6.402	○	4.059	○	3.099	○
		Min		5.429	○	2.844	○	1.725	○
	Bottom of Main Girder	Max	～14.00	0.995	○	1.275	○	2.340	○
		Min		3.795	○	3.867	○	5.141	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	3.907	○	2.963	○	2.509	○
		Min		2.724	○	1.557	○	0.930	○
	Top of Main Girder	Max	-2	5.892	○	3.691	○	2.758	○
		Min		4.919	○	2.475	○	1.385	○
	Bottom of Main Girder	Max	～16.10	0.105	○	0.677	○	1.761	○
		Min		2.905	○	3.270	○	4.563	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	3.907	○	2.963	○	2.509	○
		Min		2.724	○	1.557	○	0.930	○
	Top of Main Girder	Max	-2	5.892	○	3.691	○	2.758	○
		Min		4.919	○	2.475	○	1.385	○
	Bottom of Main Girder	Max	～16.10	0.105	○	0.677	○	1.761	○
		Min		2.905	○	3.270	○	4.563	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 2

Cross Section NumberNo.	Unit	Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder			0.500		1.450		4.000	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1163	○	1166	○	1173	○
Effective Prestressing Force (*1)	N/mm^2	1110	1103	○	1104	○	1090	○
Effective Prestressing Force (*2)	N/mm^2	1110	1031	○	1029	○	992	○
max	N/mm^2	1110	1031	○	1031	○	1009	○
Ultimate Load	------	1.00	999.9	○	5.66	○	2.01	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder			4.116		7.732		11.348	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1174	○	1193	○	1196	○
Effective Prestressing Force (*1)	N/mm^2	1110	1090	○	1097	○	1092	○
Effective Prestressing Force (*2)	N/mm^2	1110	992	○	1005	○	1003	○
max	N/mm^2	1110	1009	○	1044	○	1058	○
Ultimate Load	------	1.00	1.96	○	1.36	○	1.21	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder			14.078		14.964		16.198	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1176	○	1172	○	1166	○
Effective Prestressing Force (*1)	N/mm^2	1110	1071	○	1068	○	1062	○
Effective Prestressing Force (*2)	N/mm^2	1110	988	○	985	○	978	○
max	N/mm^2	1110	1048	○	1045	○	1036	○
Ultimate Load	------	1.00	1.16	○	1.16	○	1.18	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder			18.579		22.195		25.811	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1162	○	1171	○	1158	○
Effective Prestressing Force (*1)	N/mm^2	1110	1061	○	1082	○	1082	○
Effective Prestressing Force (*2)	N/mm^2	1110	972	○	987	○	982	○
max	N/mm^2	1110	1021	○	1013	○	986	○
Ultimate Load	------	1.00	1.25	○	1.42	○	2.00	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder			25.927		28.477		29.427	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1157	○	1103	○	1099	○
Effective Prestressing Force (*1)	N/mm^2	1110	1081	○	1045	○	1043	○
Effective Prestressing Force (*2)	N/mm^2	1110	981	○	969	○	969	○
max	N/mm^2	1110	984	○	967	○	966	○
Ultimate Load	------	1.00	2.03	○	4.15	○	2.41	○

*1:During DeckConstruction *2:Design Load

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder				------	0.500		1.450		4.000	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.55	○	1.29	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.03	○	-0.11	○
Diagonal Tensile Stress Dead Load	Neutral Axis before Composition		N/mm^2	-1.00	------	--	-0.04	○	-0.10	○
Diagonal Tensile Stress Dead Load	Neutral Axis after Composition		N/mm^2	-1.00	------	--	-0.04	○	-0.12	○
Diagonal Tensile Stress Dead Load	Base of Lower Flange		N/mm^2	-1.00	------	--	0.00	○	-0.06	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.14	○	-0.46	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Min	N/mm^2	-2.00	------	--	-0.03	○	-0.09	○
Diagonal Tensile Stress Design Load	Neutral Axis before Composition	Max	N/mm^2	-2.00	------	--	-0.14	○	-0.47	○
Diagonal Tensile Stress Design Load	Neutral Axis before Composition	Min	N/mm^2	-2.00	------	--	-0.03	○	-0.09	○
Diagonal Tensile Stress Design Load	Neutral Axis after Composition	Max	N/mm^2	-2.00	------	--	-0.16	○	-0.49	○
Diagonal Tensile Stress Design Load	Neutral Axis after Composition	Min	N/mm^2	-2.00	------	--	-0.04	○	-0.10	○
Diagonal Tensile Stress Design Load	Base of Lower Flange	Max	N/mm^2	-2.00	------	--	-0.02	○	-0.33	○
Diagonal Tensile Stress Design Load	Base of Lower Flange	Min	N/mm^2	-2.00	------	--	0.00	○	-0.05	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	24.04	--
Spacing of Diagonal Tension Re-bar	D16		cm	------	------	--	31.62	--	37.68	--
Spacing of Diagonal Tension Re-bar	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	9.22	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	------	--	3.92	○	1.83	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	------	--	1.00	○
Strength against Diagonal Densile Failure(Sus/Shu)	D16		------	1.00	------	--	------	--	1.00	○
Strength against Diagonal Densile Failure(Sus/Shu)	D19		------	1.00	------	--	------	--	1.15	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.55	○	1.29	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.03	○	-0.11	○
Diagonal Tensile Stress Dead Load	Neutral Axis before Composition		N/mm^2	-1.30	------	--	-0.04	○	-0.10	○
Diagonal Tensile Stress Dead Load	Neutral Axis after Composition		N/mm^2	-1.30	------	--	-0.04	○	-0.12	○
Diagonal Tensile Stress Dead Load	Base of Lower Flange		N/mm^2	-1.30	------	--	0.00	○	-0.06	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.14	○	-0.46	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Min	N/mm^2	-2.50	------	--	-0.03	○	-0.09	○
Diagonal Tensile Stress Design Load	Neutral Axis before Composition	Max	N/mm^2	-2.50	------	--	-0.14	○	-0.47	○
Diagonal Tensile Stress Design Load	Neutral Axis before Composition	Min	N/mm^2	-2.50	------	--	-0.03	○	-0.09	○
Diagonal Tensile Stress Design Load	Neutral Axis after Composition	Max	N/mm^2	-2.50	------	--	-0.16	○	-0.49	○
Diagonal Tensile Stress Design Load	Neutral Axis after Composition	Min	N/mm^2	-2.50	------	--	-0.04	○	-0.10	○
Diagonal Tensile Stress Design Load	Base of Lower Flange	Max	N/mm^2	-2.50	------	--	-0.02	○	-0.33	○
Diagonal Tensile Stress Design Load	Base of Lower Flange	Min	N/mm^2	-2.50	------	--	0.00	○	-0.05	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	24.04	--
Spacing of Diagonal Tension Re-bar	D16		cm	------	------	--	31.62	--	37.68	--
Spacing of Diagonal Tension Re-bar	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder				------	4.116		7.732		11.348	
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	1.26	Δ	0.90	Δ	0.73	Δ
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	-0.11	○	-0.05	○	-0.04	○
	Neutral Axis before Composition				-0.10	○	-0.04	○	-0.04	○
	Neutral Axis after Composition				-0.11	○	-0.05	○	-0.04	○
	Base of Lower Flange				-0.06	○	-0.03	○	-0.03	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	-0.45	○	-0.22	○	-0.14	○
		Min			-0.09	○	-0.01	○	0.00	○
	Neutral Axis before Composition	Max			-0.46	○	-0.27	○	-0.20	○
		Min			-0.08	○	-0.01	○	0.00	○
	Neutral Axis after Composition	Max			-0.48	○	-0.25	○	-0.17	○
		Min			-0.09	○	-0.02	○	0.00	○
	Base of Lower Flange	Max			-0.33	○	-0.26	○	-0.25	○
		Min			-0.05	○	-0.01	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	24.48	--	40.00	--	40.00	--
	D16		cm	------	38.37	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	9.06	--	5.26	--	2.33	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.85	○	2.46	○	3.52	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.00	○	1.018	○	1.32	○
	D16				1.00	○	1.222	○	1.63	○
	D19				1.16	○	1.471	○	2.00	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	1.26	Δ	0.90	Δ	0.73	Δ
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	-0.11	○	-0.05	○	-0.04	○
	Neutral Axis before Composition				-0.10	○	-0.04	○	-0.04	○
	Neutral Axis after Composition				-0.11	○	-0.05	○	-0.04	○
	Base of Lower Flange				-0.06	○	-0.03	○	-0.03	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	-0.45	○	-0.22	○	-0.14	○
		Min			-0.09	○	-0.01	○	0.00	○
	Neutral Axis before Composition	Max			-0.46	○	-0.27	○	-0.20	○
		Min			-0.08	○	-0.01	○	0.00	○
	Neutral Axis after Composition	Max			-0.48	○	-0.25	○	-0.17	○
		Min			-0.09	○	-0.02	○	0.00	○
	Base of Lower Flange	Max			-0.33	○	-0.26	○	-0.25	○
		Min			-0.05	○	-0.01	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	24.48	--	40.00	--	40.00	--
	D16		cm	------	38.37	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder				------	14.078		14.964		16.198	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.66	△	0.54	○	0.58	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.03	○	-0.02	○	-0.01	○
	Neutral Axis before Composition				-0.04	○	-0.02	○	-0.01	○
	Neutral Axis after Composition				-0.04	○	-0.02	○	-0.01	○
	Base of Lower Flange				-0.03	○	-0.02	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.12	○	-0.08	○	-0.02	○
		Min			-0.01	○	-0.03	○	-0.10	○
	Neutral Axis before Composition	Max			-0.16	○	-0.12	○	-0.02	○
		Min			0.00	○	-0.02	○	-0.11	○
	Neutral Axis after Composition	Max			-0.14	○	-0.09	○	-0.03	○
		Min			-0.01	○	-0.03	○	-0.11	○
	Base of Lower Flange	Max			-0.19	○	-0.23	○	-0.03	○
		Min			0.00	○	-0.02	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.34	--	0.61	--	1.98	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	5.13	○	4.44	○	3.76	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.784	○	------	--	1.40	○
	D16				2.259	○	------	--	1.74	○
	D19				2.839	○	------	--	2.17	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.66	△	0.54	○	0.58	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.03	○	-0.02	○	-0.01	○
	Neutral Axis before Composition				-0.04	○	-0.02	○	-0.01	○
	Neutral Axis after Composition				-0.04	○	-0.02	○	-0.01	○
	Base of Lower Flange				-0.03	○	-0.02	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.12	○	-0.08	○	-0.02	○
		Min			-0.01	○	-0.03	○	-0.10	○
	Neutral Axis before Composition	Max			-0.16	○	-0.12	○	-0.02	○
		Min			0.00	○	-0.02	○	-0.11	○
	Neutral Axis after Composition	Max			-0.14	○	-0.09	○	-0.03	○
		Min			-0.01	○	-0.03	○	-0.11	○
	Base of Lower Flange	Max			-0.19	○	-0.23	○	-0.03	○
		Min			0.00	○	-0.02	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder				------		18.579		22.195		25.811
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.53	○	0.62	△	0.86	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.02	○	-0.01	○	0.00	○
		Min			-0.09	○	-0.12	○	-0.22	○
	Neutral Axis before Composition	Max			-0.03	○	-0.01	○	0.00	○
		Min			-0.08	○	-0.11	○	-0.21	○
	Neutral Axis after Composition	Max			-0.02	○	-0.01	○	0.00	○
		Min			-0.09	○	-0.12	○	-0.23	○
	Base of Lower Flange	Max			-0.03	○	-0.02	○	0.00	○
		Min			-0.06	○	-0.08	○	-0.14	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	39.85	--	24.16	--
	D16		cm	------	40.00	--	40.00	--	37.86	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	2.90	--	5.56	--	9.18	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	2.95	○	2.21	○	1.77	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	1	○	1.00	○
	D16				------	--	1.177	○	1.00	○
	D19				------	--	1.394	○	1.14	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.53	○	0.62	△	0.86	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.02	○	-0.01	○	0.00	○
		Min			-0.09	○	-0.12	○	-0.22	○
	Neutral Axis before Composition	Max			-0.03	○	-0.01	○	0.00	○
		Min			-0.08	○	-0.11	○	-0.21	○
	Neutral Axis after Composition	Max			-0.02	○	-0.01	○	0.00	○
		Min			-0.09	○	-0.12	○	-0.23	○
	Base of Lower Flange	Max			-0.03	○	-0.02	○	0.00	○
		Min			-0.06	○	-0.08	○	-0.14	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	39.85	--	24.16	--
	D16		cm	------	40.00	--	40.00	--	37.86	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder				------	25.927		28.477		29.427	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.85	△	0.97	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	-0.08	○	------	--
	Neutral Axis before Composition				0.00	○	-0.22	○	------	--
	Neutral Axis after Composition				0.00	○	-0.17	○	------	--
	Base of Lower Flange				0.00	○	-0.07	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	-0.07	○	------	--
		Min			-0.21	○	-0.26	○	------	--
	Neutral Axis before Composition	Max			0.00	○	-0.20	○	------	--
		Min			-0.21	○	-0.39	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.16	○	------	--
		Min			-0.22	○	-0.39	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.07	○	------	--
		Min			-0.14	○	-0.07	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	24.03	--	20.18	--	------	--
	D16		cm	------	37.67	--	31.63	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	9.22	--	9.43	--	------	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.76	○	3.19	○	------	--
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1	○	1.023	○	------	--
	D16				1	○	1.023	○	------	--
	D19				1.141	○	1.073	○	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.85	△	0.97	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	-0.08	○	------	--
	Neutral Axis before Composition				0.00	○	-0.22	○	------	--
	Neutral Axis after Composition				0.00	○	-0.17	○	------	--
	Base of Lower Flange				0.00	○	-0.07	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	-0.07	○	------	--
		Min			-0.21	○	-0.26	○	------	--
	Neutral Axis before Composition	Max			0.00	○	-0.20	○	------	--
		Min			-0.21	○	-0.39	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.16	○	------	--
		Min			-0.22	○	-0.39	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.07	○	------	--
		Min			-0.14	○	-0.07	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	24.03	--	20.18	--	------	--
	D16		cm	------	37.67	--	31.63	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder				------	0.500		1.450		4.000	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.47	○	1.16	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.03	○	-0.11	○
	Neutral Axis before Composition				------	--	-0.04	○	-0.10	○
	Neutral Axis after Composition				------	--	-0.04	○	-0.11	○
	Base of Lower Flange				------	--	0.00	○	-0.06	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.11	○	-0.39	○
		Min			------	--	-0.04	○	-0.12	○
	Neutral Axis before Composition	Max			------	--	-0.11	○	-0.40	○
		Min			------	--	-0.04	○	-0.11	○
	Neutral Axis after Composition	Max			------	--	-0.12	○	-0.42	○
		Min			------	--	-0.05	○	-0.12	○
	Base of Lower Flange	Max			------	--	-0.01	○	-0.27	○
		Min			------	--	-0.01	○	-0.06	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	27.84	--
	D16		cm	------	------	--	31.62	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	7.96	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.47	○	1.16	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.03	○	-0.11	○
	Neutral Axis before Composition				------	--	-0.04	○	-0.10	○
	Neutral Axis after Composition				------	--	-0.04	○	-0.11	○
	Base of Lower Flange				------	--	0.00	○	-0.06	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.11	○	-0.39	○
		Min			------	--	-0.04	○	-0.12	○
	Neutral Axis before Composition	Max			------	--	-0.11	○	-0.40	○
		Min			------	--	-0.04	○	-0.11	○
	Neutral Axis after Composition	Max			------	--	-0.12	○	-0.42	○
		Min			------	--	-0.05	○	-0.12	○
	Base of Lower Flange	Max			------	--	-0.01	○	-0.27	○
		Min			------	--	-0.01	○	-0.06	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	27.84	--
	D16		cm	------	------	--	31.62	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	------	--	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	--	------	-	999.999	○
	D16				------	--	------	-	999.999	○
	D19				------	--	------	-	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder				------	4.147		7.794		11.441	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.14	△	0.89	△	0.55	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.10	○	-0.03	○	-0.02	○
	Neutral Axis before Composition				-0.09	○	-0.03	○	-0.02	○
	Neutral Axis after Composition				-0.10	○	-0.03	○	-0.02	○
	Base of Lower Flange				-0.05	○	-0.02	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.38	○	-0.22	○	-0.08	○
		Min			-0.11	○	-0.03	○	-0.02	○
	Neutral Axis before Composition	Max			-0.38	○	-0.27	○	-0.12	○
		Min			-0.10	○	-0.03	○	-0.02	○
	Neutral Axis after Composition	Max			-0.40	○	-0.25	○	-0.10	○
		Min			-0.11	○	-0.03	○	-0.02	○
	Base of Lower Flange	Max			-0.26	○	-0.29	○	-0.25	○
		Min			-0.06	○	-0.02	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	29.05	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	7.63	--	5.14	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.14	△	0.89	△	0.55	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.10	○	-0.03	○	-0.02	○
	Neutral Axis before Composition				-0.09	○	-0.03	○	-0.02	○
	Neutral Axis after Composition				-0.10	○	-0.03	○	-0.02	○
	Base of Lower Flange				-0.05	○	-0.02	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.38	○	-0.22	○	-0.08	○
		Min			-0.11	○	-0.03	○	-0.02	○
	Neutral Axis before Composition	Max			-0.38	○	-0.27	○	-0.12	○
		Min			-0.10	○	-0.03	○	-0.02	○
	Neutral Axis after Composition	Max			-0.40	○	-0.25	○	-0.10	○
		Min			-0.11	○	-0.03	○	-0.02	○
	Base of Lower Flange	Max			-0.26	○	-0.29	○	-0.25	○
		Min			-0.06	○	-0.02	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	29.05	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	-
	D16				999.999	○	999.999	○	------	-
	D19				999.999	○	999.999	○	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder				------	14.078		15.088		16.446	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.20	○	0.04	○	0.36	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.01	○	0.00	○	0.00	○
	Neutral Axis before Composition				-0.01	○	0.00	○	0.00	○
	Neutral Axis after Composition				-0.01	○	0.00	○	0.00	○
	Base of Lower Flange				-0.01	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.01	○	0.00	○	0.00	○
		Min			-0.01	○	0.00	○	-0.03	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.01	○	0.00	○	-0.06	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.01	○	0.00	○	-0.04	○
	Base of Lower Flange	Max			-0.01	○	-0.01	○	0.00	○
		Min			-0.02	○	0.00	○	-0.31	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.20	○	0.04	○	0.36	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.01	○	0.00	○	0.00	○
	Neutral Axis before Composition				-0.01	○	0.00	○	0.00	○
	Neutral Axis after Composition				-0.01	○	0.00	○	0.00	○
	Base of Lower Flange				-0.01	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.01	○	0.00	○	0.00	○
		Min			-0.01	○	0.00	○	-0.03	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.01	○	0.00	○	-0.06	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.01	○	0.00	○	-0.04	○
	Base of Lower Flange	Max			-0.01	○	-0.01	○	0.00	○
		Min			-0.02	○	0.00	○	-0.31	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	------	-	------	-
	D16				------	-	------	-	------	-
	D19				------	-	------	-	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder				------	18.735		22.381		26.028	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.53	○	0.66	△	0.89	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	-0.01	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	0.00	○	0.00	○
		Min			-0.08	○	-0.13	○	-0.23	○
	Neutral Axis before Composition	Max			0.00	○	0.00	○	0.00	○
		Min			-0.11	○	-0.15	○	-0.25	○
	Neutral Axis after Composition	Max			0.00	○	0.00	○	0.00	○
		Min			-0.09	○	-0.14	○	-0.25	○
	Base of Lower Flange	Max			0.00	○	0.00	○	0.00	○
		Min			-0.24	○	-0.17	○	-0.20	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	36.21	--	24.27	--
	D16		cm	------	40.00	--	40.00	--	38.05	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	2.97	--	6.12	--	9.13	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.53	○	0.66	△	0.89	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	-0.01	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	0.00	○	0.00	○
		Min			-0.08	○	-0.13	○	-0.23	○
	Neutral Axis before Composition	Max			0.00	○	0.00	○	0.00	○
		Min			-0.11	○	-0.15	○	-0.25	○
	Neutral Axis after Composition	Max			0.00	○	0.00	○	0.00	○
		Min			-0.09	○	-0.14	○	-0.25	○
	Base of Lower Flange	Max			0.00	○	0.00	○	0.00	○
		Min			-0.24	○	-0.17	○	-0.20	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	36.21	--	24.27	--
	D16		cm	------	40.00	--	40.00	--	38.05	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	999.999	○	999.999	○
	D16				------	-	999.999	○	999.999	○
	D19				------	-	999.999	○	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder				------	26.176		28.725		29.675	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.89	△	0.98	△	------	--
Diagonal Tensile	Base of Upper Flange		N/mm^2	-1.00	0.00	○	-0.09	○	------	--
Stress	Neutral Axis before Composition				0.00	○	-0.22	○	------	--
Dead Load	Neutral Axis after Composition				0.00	○	-0.19	○	------	--
	Base of Lower Flange				0.00	○	-0.06	○	------	--
Diagonal Tensile	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	-0.10	○	------	--
Stress		Min			-0.23	○	-0.28	○	------	--
Design Load	Neutral Axis before Composition	Max			0.00	○	-0.21	○	------	--
		Min			-0.25	○	-0.40	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.19	○	------	--
		Min			-0.25	○	-0.40	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.05	○	------	--
		Min			-0.20	○	-0.07	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	23.99	--	20.18	--	------	--
	D16		cm	------	37.60	--	31.63	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	9.24	--	9.52	--	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.89	△	0.98	△	------	--
Diagonal Tensile	Base of Upper Flange		N/mm^2	-1.30	0.00	○	-0.09	○	------	--
Stress	Neutral Axis before Composition				0.00	○	-0.22	○	------	--
Dead Load	Neutral Axis after Composition				0.00	○	-0.19	○	------	--
	Base of Lower Flange				0.00	○	-0.06	○	------	--
Diagonal Tensile	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	-0.10	○	------	--
Stress		Min			-0.23	○	-0.28	○	------	--
Design Load	Neutral Axis before Composition	Max			0.00	○	-0.21	○	------	--
		Min			-0.25	○	-0.40	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.19	○	------	--
		Min			-0.25	○	-0.40	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.05	○	------	--
		Min			-0.20	○	-0.07	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	23.99	--	20.18	--	------	--
	D16		cm	------	37.60	--	31.63	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	------	--
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	--
	D16				999.999	○	999.999	○	------	--
	D19				999.999	○	999.999	○	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder			------	0.500		1.450		4.000	
Immediately After Prestressing	Top of Main Girder		-1.5	3.066	○	3.829	○	5.762	○
	Bottom of Main Girder		～19.00	4.503	○	4.284	○	8.466	○
During Deck Construction	Top of Main Girder		-1.5	2.885	○	4.190	○	7.667	○
	Bottom of Main Girder		～14.00	4.297	○	3.407	○	5.132	○
Dead Load	Top of Deck		≦10.00	1.387	○	1.795	○	2.593	○
	Top of Main Girder		0	3.090	○	3.989	○	6.123	○
	Bottom of Main Girder		～14.00	2.358	○	1.425	○	1.806	○
Design Load1	Top of Deck	Max	≦10.00	1.393	○	1.876	○	2.946	○
		Min		-0.185	○	0.471	○	1.764	○
	Top of Main Girder	Max		3.096	○	4.060	○	6.412	○
		Min	-1.5	1.722	○	2.844	○	5.441	○
	Bottom of Main Girder	Max	～14.00	2.346	○	1.274	○	0.972	○
		Min		5.148	○	3.867	○	3.770	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	2.505	○	2.963	○	3.916	○
		Min		0.926	○	1.557	○	2.734	○
	Top of Main Girder	Max		2.755	○	3.692	○	5.902	○
		Min	-2	1.381	○	2.476	○	4.931	○
	Bottom of Main Girder	Max	～16.10	1.767	○	0.676	○	0.082	○
		Min		4.570	○	3.269	○	2.879	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	2.505	○	2.963	○	3.916	○
		Min		0.926	○	1.557	○	2.734	○
	Top of Main Girder	Max		2.755	○	3.692	○	5.902	○
		Min	-2	1.381	○	2.476	○	4.931	○
	Bottom of Main Girder	Max	～16.10	1.767	○	0.676	○	0.082	○
		Min		4.570	○	3.269	○	2.879	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	1.393	○	1.876	○	2.946	○
		Min		-0.185	○	0.471	○	1.764	○
	Top of Main Girder	Max		3.096	○	4.060	○	6.412	○
		Min	-1.5	1.722	○	2.844	○	5.441	○
	Bottom of Main Girder	Max	～14.00	2.346	○	1.274	○	0.972	○
		Min		5.148	○	3.867	○	3.770	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	2.505	○	2.963	○	3.916	○
		Min		0.926	○	1.557	○	2.734	○
	Top of Main Girder	Max		2.755	○	3.692	○	5.902	○
		Min	-2	1.381	○	2.476	○	4.931	○
	Bottom of Main Girder	Max	～16.10	1.767	○	0.676	○	0.082	○
		Min		4.570	○	3.269	○	2.879	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	2.505	○	2.963	○	3.916	○
		Min		0.926	○	1.557	○	2.734	○
	Top of Main Girder	Max		2.755	○	3.692	○	5.902	○
		Min	-2	1.381	○	2.476	○	4.931	○
	Bottom of Main Girder	Max	～16.10	1.767	○	0.676	○	0.082	○
		Min		4.570	○	3.269	○	2.879	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder			------	4.122		7.743		11.365	
Immediately After Prestressing	Top of Main Girder		-1.5	5.667	○	2.974	○	1.120	○
	Bottom of Main Girder		～19.00	8.603	○	12.168	○	14.427	○
During Deck Construction	Top of Main Girder		-1.5	7.647	○	6.854	○	6.232	○
	Bottom of Main Girder		～14.00	5.174	○	6.320	○	6.974	○
Dead Load	Top of Deck		≦10.00	2.605	○	2.834	○	2.961	○
	Top of Main Girder		0	6.119	○	5.801	○	5.470	○
	Bottom of Main Girder		～14.00	1.816	○	2.160	○	2.382	○
Design Load1	Top of Deck	Max	≦10.00	2.972	○	3.740	○	4.260	○
		Min		1.792	○	2.230	○	2.478	○
	Top of Main Girder	Max		6.421	○	6.548	○	6.542	○
		Min	-1.5	5.452	○	5.304	○	5.071	○
	Bottom of Main Girder	Max	～14.00	0.946	○	0.035	○	-0.646	○
		Min		3.737	○	3.576	○	3.508	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	3.940	○	4.627	○	5.068	○
		Min		2.760	○	3.117	○	3.286	○
	Top of Main Girder	Max		5.909	○	5.970	○	5.900	○
		Min	-2	4.939	○	4.726	○	4.429	○
	Bottom of Main Girder	Max	～16.10	0.063	○	-0.649	○	-1.140	○
		Min		2.853	○	2.892	○	3.014	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	3.940	○	4.627	○	5.068	○
		Min		2.760	○	3.117	○	3.286	○
	Top of Main Girder	Max		5.909	○	5.970	○	5.900	○
		Min	-2	4.939	○	4.726	○	4.429	○
	Bottom of Main Girder	Max	～16.10	0.063	○	-0.649	○	-1.140	○
		Min		2.853	○	2.892	○	3.014	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.972	○	3.740	○	4.260	○
		Min		1.792	○	2.230	○	2.478	○
	Top of Main Girder	Max		6.421	○	6.548	○	6.542	○
		Min	-1.5	5.452	○	5.304	○	5.071	○
	Bottom of Main Girder	Max	～14.00	0.946	○	0.035	○	-0.646	○
		Min		3.737	○	3.576	○	3.508	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	3.940	○	4.627	○	5.068	○
		Min		2.760	○	3.117	○	3.286	○
	Top of Main Girder	Max		5.909	○	5.970	○	5.900	○
		Min	-2	4.939	○	4.726	○	4.429	○
	Bottom of Main Girder	Max	～16.10	0.063	○	-0.649	○	-1.140	○
		Min		2.853	○	2.892	○	3.014	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	3.940	○	4.627	○	5.068	○
		Min		2.760	○	3.117	○	3.286	○
	Top of Main Girder	Max		5.909	○	5.970	○	5.900	○
		Min	-2	4.939	○	4.726	○	4.429	○
	Bottom of Main Girder	Max	～16.10	0.063	○	-0.649	○	-1.140	○
		Min		2.853	○	2.892	○	3.014	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span，Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder			------	13.730		14.987		15.895	
Immediately After Prestressing	Top of Main Girder		-1.5	0.792	○	0.815	○	0.778	○
	Bottom of Main Girder		～19.00	14.915	○	14.968	○	15.072	○
During Deck Construction	Top of Main Girder		-1.5	6.308	○	6.391	○	6.326	○
	Bottom of Main Girder		～14.00	6.945	○	6.922	○	7.050	○
Dead Load	Top of Deck		≦10.00	3.071	○	3.075	○	3.006	○
	Top of Main Girder		0	5.525	○	5.553	○	5.474	○
	Bottom of Main Girder		～14.00	2.301	○	2.356	○	2.583	○
Design Load1	Top of Deck	Max	≦10.00	4.521	○	4.577	○	4.536	○
		Min		2.651	○	2.687	○	2.643	○
	Top of Main Girder	Max	-1.5	6.722	○	6.793	○	6.736	○
		Min		5.178	○	5.234	○	5.175	○
	Bottom of Main Girder	Max	～14.00	-1.075	○	-1.141	○	-0.978	○
		Min		3.278	○	3.257	○	3.427	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	5.279	○	5.309	○	5.249	○
		Min		3.409	○	3.419	○	3.356	○
	Top of Main Girder	Max	-2	6.038	○	6.088	○	6.016	○
		Min		4.495	○	4.529	○	4.454	○
	Bottom of Main Girder	Max	～16.10	-1.451	○	-1.456	○	-1.249	○
		Min		2.902	○	2.943	○	3.157	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	5.279	○	5.309	○	5.249	○
		Min		3.409	○	3.419	○	3.356	○
	Top of Main Girder	Max	-2	6.038	○	6.088	○	6.016	○
		Min		4.495	○	4.529	○	4.454	○
	Bottom of Main Girder	Max	～16.10	-1.451	○	-1.456	○	-1.249	○
		Min		2.902	○	2.943	○	3.157	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	4.521	○	4.577	○	4.536	○
		Min		2.651	○	2.687	○	2.643	○
	Top of Main Girder	Max	-1.5	6.722	○	6.793	○	6.736	○
		Min		5.178	○	5.234	○	5.175	○
	Bottom of Main Girder	Max	～14.00	-1.075	○	-1.141	○	-0.978	○
		Min		3.278	○	3.257	○	3.427	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	5.279	○	5.309	○	5.249	○
		Min		3.409	○	3.419	○	3.356	○
	Top of Main Girder	Max	-2	6.038	○	6.088	○	6.016	○
		Min		4.495	○	4.529	○	4.454	○
	Bottom of Main Girder	Max	～16.10	-1.451	○	-1.456	○	-1.249	○
		Min		2.902	○	2.943	○	3.157	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	5.279	○	5.309	○	5.249	○
		Min		3.409	○	3.419	○	3.356	○
	Top of Main Girder	Max	-2	6.038	○	6.088	○	6.016	○
		Min		4.495	○	4.529	○	4.454	○
	Bottom of Main Girder	Max	～16.10	-1.451	○	-1.456	○	-1.249	○
		Min		2.902	○	2.943	○	3.157	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder			------	18.608		22.230		25.851	
Immediately After Prestressing	Top of Main Girder		-1.5	1.002	○	2.200	○	3.726	○
	Bottom of Main Girder		～19.00	15.046	○	13.447	○	11.237	○
During Deck Construction	Top of Main Girder		-1.5	6.132	○	6.151	○	5.844	○
	Bottom of Main Girder		～14.00	7.522	○	7.437	○	7.555	○
Dead Load	Top of Deck		≦10.00	2.655	○	2.142	○	1.426	○
	Top of Main Girder		0	5.176	○	4.911	○	4.357	○
	Bottom of Main Girder		～14.00	3.564	○	4.461	○	5.787	○
Design Load1	Top of Deck	Max	≦10.00	4.207	○	3.541	○	2.339	○
		Min		2.365	○	1.947	○	1.328	○
	Top of Main Girder	Max	-1.5	6.456	○	6.064	○	5.108	○
		Min		4.937	○	4.751	○	4.276	○
	Bottom of Main Girder	Max	～14.00	-0.051	○	1.186	○	3.637	○
		Min		4.240	○	4.916	○	6.018	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	4.863	○	4.122	○	2.845	○
		Min		3.022	○	2.529	○	1.834	○
	Top of Main Girder	Max	-2	5.689	○	5.235	○	4.216	○
		Min		4.170	○	3.922	○	3.384	○
	Bottom of Main Girder	Max	～16.10	-0.191	○	1.219	○	3.847	○
		Min		4.100	○	4.950	○	6.228	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	4.863	○	4.122	○	2.845	○
		Min		3.022	○	2.529	○	1.834	○
	Top of Main Girder	Max	-2	5.689	○	5.235	○	4.216	○
		Min		4.170	○	3.922	○	3.384	○
	Bottom of Main Girder	Max	～16.10	-0.191	○	1.219	○	3.847	○
		Min		4.100	○	4.950	○	6.228	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	4.207	○	3.541	○	2.339	○
		Min		2.365	○	1.947	○	1.328	○
	Top of Main Girder	Max	-1.5	6.456	○	6.064	○	5.108	○
		Min		4.937	○	4.751	○	4.276	○
	Bottom of Main Girder	Max	～14.00	-0.051	○	1.186	○	3.637	○
		Min		4.240	○	4.916	○	6.018	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	4.863	○	4.122	○	2.845	○
		Min		3.022	○	2.529	○	1.834	○
	Top of Main Girder	Max	-2	5.689	○	5.235	○	4.216	○
		Min		4.170	○	3.922	○	3.384	○
	Bottom of Main Girder	Max	～16.10	-0.191	○	1.219	○	3.847	○
		Min		4.100	○	4.950	○	6.228	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	4.863	○	4.122	○	2.845	○
		Min		3.022	○	2.529	○	1.834	○
	Top of Main Girder	Max	-2	5.689	○	5.235	○	4.216	○
		Min		4.170	○	3.922	○	3.384	○
	Bottom of Main Girder	Max	～16.10	-0.191	○	1.219	○	3.847	○
		Min		4.100	○	4.950	○	6.228	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder			------	25.973		28.523		29.473	
Immediately After Prestressing	Top of Main Girder		-1.5	3.785	○	2.772	○	2.971	○
	Bottom of Main Girder		～19.00	11.156	○	6.015	○	5.077	○
During Deck Construction	Top of Main Girder		-1.5	5.831	○	3.209	○	2.819	○
	Bottom of Main Girder		～14.00	7.566	○	5.016	○	4.817	○
Dead Load	Top of Deck		≦10.00	1.399	○	0.551	○	0.275	○
	Top of Main Girder		0	4.334	○	2.486	○	2.120	○
	Bottom of Main Girder		～14.00	5.844	○	4.687	○	4.786	○
Design Load1	Top of Deck	Max	≦10.00	2.288	○	0.825	○	0.275	○
		Min		1.304	○	0.526	○	0.274	○
	Top of Main Girder	Max	-1.5	5.065	○	2.723	○	2.120	○
		Min		4.256	○	2.464	○	2.120	○
	Bottom of Main Girder	Max	～14.00	3.749	○	4.184	○	4.786	○
		Min		6.067	○	4.734	○	4.786	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	2.791	○	1.350	○	0.793	○
		Min		1.807	○	1.051	○	0.793	○
	Top of Main Girder	Max	-2	4.172	○	1.869	○	1.263	○
		Min		3.362	○	1.611	○	1.263	○
	Bottom of Main Girder	Max	～16.10	3.965	○	4.621	○	5.260	○
		Min		6.283	○	5.171	○	5.260	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	2.791	○	1.350	○	0.793	○
		Min		1.807	○	1.051	○	0.793	○
	Top of Main Girder	Max	-2	4.172	○	1.869	○	1.263	○
		Min		3.362	○	1.611	○	1.263	○
	Bottom of Main Girder	Max	～16.10	3.965	○	4.621	○	5.260	○
		Min		6.283	○	5.171	○	5.260	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.288	○	0.825	○	0.275	○
		Min		1.304	○	0.526	○	0.274	○
	Top of Main Girder	Max	-1.5	5.065	○	2.723	○	2.120	○
		Min		4.256	○	2.464	○	2.120	○
	Bottom of Main Girder	Max	～14.00	3.749	○	4.184	○	4.786	○
		Min		6.067	○	4.734	○	4.786	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	2.791	○	1.350	○	0.793	○
		Min		1.807	○	1.051	○	0.793	○
	Top of Main Girder	Max	-2	4.172	○	1.869	○	1.263	○
		Min		3.362	○	1.611	○	1.263	○
	Bottom of Main Girder	Max	～16.10	3.965	○	4.621	○	5.260	○
		Min		6.283	○	5.171	○	5.260	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	2.791	○	1.350	○	0.793	○
		Min		1.807	○	1.051	○	0.793	○
	Top of Main Girder	Max	-2	4.172	○	1.869	○	1.263	○
		Min		3.362	○	1.611	○	1.263	○
	Bottom of Main Girder	Max	～16.10	3.965	○	4.621	○	5.260	○
		Min		6.283	○	5.171	○	5.260	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span,　Main Girder Number: G 2

Cross Section NumberNo.	Unit	Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder			0.500		1.450		4.000	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1099	○	1103	○	1157	○
Effective Prestressing Force (*1)	N/mm^2	1110	1043	○	1045	○	1081	○
Effective Prestressing Force (*2)	N/mm^2	1110	969	○	969	○	981	○
max	N/mm^2	1110	966	○	967	○	984	○
Ultimate Load	------	1.00	2.41	○	4.15	○	2.03	○

*1:During DeckConstruction　*2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder			4.122		7.743		11.365	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1158	○	1171	○	1162	○
Effective Prestressing Force (*1)	N/mm^2	1110	1082	○	1082	○	1061	○
Effective Prestressing Force (*2)	N/mm^2	1110	983	○	988	○	972	○
max	N/mm^2	1110	986	○	1014	○	1022	○
Ultimate Load	------	1.00	1.99	○	1.42	○	1.24	○

*1:During DeckConstruction　*2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder			13.730		14.987		15.895	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1166	○	1172	○	1176	○
Effective Prestressing Force (*1)	N/mm^2	1110	1062	○	1068	○	1071	○
Effective Prestressing Force (*2)	N/mm^2	1110	979	○	986	○	989	○
max	N/mm^2	1110	1037	○	1047	○	1050	○
Ultimate Load	------	1.00	1.17	○	1.15	○	1.16	○

*1:During DeckConstruction　*2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder			18.608		22.230		25.851	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1196	○	1193	○	1174	○
Effective Prestressing Force (*1)	N/mm^2	1110	1092	○	1097	○	1090	○
Effective Prestressing Force (*2)	N/mm^2	1110	1003	○	1005	○	993	○
max	N/mm^2	1110	1059	○	1045	○	1010	○
Ultimate Load	------	1.00	1.21	○	1.36	○	1.95	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder			25.973		28.523		29.473	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1173	○	1166	○	1163	○
Effective Prestressing Force (*1)	N/mm^2	1110	1090	○	1104	○	1103	○
Effective Prestressing Force (*2)	N/mm^2	1110	992	○	1029	○	1031	○
max	N/mm^2	1110	1009	○	1031	○	1031	○
Ultimate Load	------	1.00	2.00	○	5.64	○	999.90	○

*1:During DeckConstruction *2:Design Load

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder				------		0.500		1.450		4.000
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.88	△	0.84	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.08	○	0.00	○
	Neutral Axis before Composition				------	--	-0.22	○	0.00	○
	Neutral Axis after Composition				------	--	-0.18	○	0.00	○
	Base of Lower Flange				------	--	-0.07	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.22	○	-0.20	○
		Min			------	--	-0.08	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.44	○	-0.24	○
		Min			------	--	-0.18	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.39	○	-0.22	○
		Min			------	--	-0.16	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.14	○	-0.24	○
		Min			------	--	-0.04	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	23.46	--
	D16		cm	------	------	--	31.63	--	36.77	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	7.66	--	9.45	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	------	--	3.49	○	1.76	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	1.12	○	1.00	○
	D16				------	--	1.12	○	1.00	○
	D19				------	--	1.176	○	1.13	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.88	△	0.84	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.08	○	0.00	○
	Neutral Axis before Composition				------	--	-0.22	○	0.00	○
	Neutral Axis after Composition				------	--	-0.18	○	0.00	○
	Base of Lower Flange				------	--	-0.07	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.22	○	-0.20	○
		Min			------	--	-0.08	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.44	○	-0.24	○
		Min			------	--	-0.18	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.39	○	-0.22	○
		Min			------	--	-0.16	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.14	○	-0.24	○
		Min			------	--	-0.04	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	23.46	--
	D16		cm	------	------	--	31.63	--	36.77	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder				------	4.092		7.684		11.275	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.84	△	0.60	△	0.48	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.20	○	-0.10	○	-0.07	○
		Min			0.00	○	-0.01	○	-0.03	○
	Neutral Axis before Composition	Max			-0.24	○	-0.13	○	-0.09	○
		Min			0.00	○	-0.01	○	-0.03	○
	Neutral Axis after Composition	Max			-0.22	○	-0.12	○	-0.08	○
		Min			0.00	○	-0.01	○	-0.03	○
	Base of Lower Flange	Max			-0.24	○	-0.16	○	-0.14	○
		Min			0.00	○	-0.01	○	-0.02	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	23.55	--	36.15	--	40.00	--
	D16		cm	------	36.91	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	9.41	--	6.13	--	3.40	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.77	○	2.24	○	3.06	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.00	○	1	○	------	--
	D16				1.00	○	1.147	○	------	--
	D19				1.14	○	1.367	○	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.84	△	0.60	△	0.48	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.20	○	-0.10	○	-0.07	○
		Min			0.00	○	-0.01	○	-0.03	○
	Neutral Axis before Composition	Max			-0.24	○	-0.13	○	-0.09	○
		Min			0.00	○	-0.01	○	-0.03	○
	Neutral Axis after Composition	Max			-0.22	○	-0.12	○	-0.08	○
		Min			0.00	○	-0.01	○	-0.03	○
	Base of Lower Flange	Max			-0.24	○	-0.16	○	-0.14	○
		Min			0.00	○	-0.01	○	-0.02	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	23.55	--	36.15	--	40.00	--
	D16		cm	------	36.91	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder				------		13.730		14.867		15.656
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	0.52	○	0.47	○	0.62	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	-0.01	○	0.00	○	-0.03	○
	Neutral Axis before Composition				-0.01	○	0.00	○	-0.03	○
	Neutral Axis after Composition				-0.01	○	0.00	○	-0.03	○
	Base of Lower Flange				-0.01	○	0.00	○	-0.03	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	-0.07	○	-0.03	○	-0.01	○
		Min			-0.03	○	-0.07	○	-0.11	○
	Neutral Axis before Composition	Max			-0.11	○	-0.05	○	-0.01	○
		Min			-0.02	○	-0.07	○	-0.12	○
	Neutral Axis after Composition	Max			-0.09	○	-0.04	○	-0.01	○
		Min			-0.03	○	-0.07	○	-0.12	○
	Base of Lower Flange	Max			-0.20	○	-0.10	○	-0.01	○
		Min			-0.02	○	-0.05	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	2.41	--	0.80	--	0.00	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	4.05	○	5.02	○	5.49	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	------	--	1.92	○
	D16				------	--	------	--	2.43	○
	D19				------	--	------	--	3.05	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	0.52	○	0.47	○	0.62	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	-0.01	○	0.00	○	-0.03	○
	Neutral Axis before Composition				-0.01	○	0.00	○	-0.03	○
	Neutral Axis after Composition				-0.01	○	0.00	○	-0.03	○
	Base of Lower Flange				-0.01	○	0.00	○	-0.03	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	-0.07	○	-0.03	○	-0.01	○
		Min			-0.03	○	-0.07	○	-0.11	○
	Neutral Axis before Composition	Max			-0.11	○	-0.05	○	-0.01	○
		Min			-0.02	○	-0.07	○	-0.12	○
	Neutral Axis after Composition	Max			-0.09	○	-0.04	○	-0.01	○
		Min			-0.03	○	-0.07	○	-0.12	○
	Base of Lower Flange	Max			-0.20	○	-0.10	○	-0.01	○
		Min			-0.02	○	-0.05	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder				------	18.459		22.050		25.642	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.70	△	0.89	△	1.26	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.03	○	-0.05	○	-0.11	○
	Neutral Axis before Composition				-0.03	○	-0.05	○	-0.10	○
	Neutral Axis after Composition				-0.03	○	-0.05	○	-0.11	○
	Base of Lower Flange				-0.02	○	-0.03	○	-0.06	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	-0.01	○	-0.09	○
		Min			-0.15	○	-0.24	○	-0.48	○
	Neutral Axis before Composition	Max			0.00	○	-0.02	○	-0.09	○
		Min			-0.14	○	-0.22	○	-0.41	○
	Neutral Axis after Composition	Max			0.00	○	-0.02	○	-0.09	○
		Min			-0.15	○	-0.25	○	-0.48	○
	Base of Lower Flange	Max			0.00	○	-0.02	○	-0.06	○
		Min			-0.09	○	-0.13	○	-0.24	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	25.21	--
	D16		cm	------	40.00	--	40.00	--	39.51	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.95	--	4.14	--	8.79	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	3.62	○	2.49	○	1.86	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.462	○	1.092	○	1.00	○
	D16				1.778	○	1.298	○	1.00	○
	D19				2.165	○	1.55	○	1.18	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.70	△	0.89	△	1.26	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.03	○	-0.05	○	-0.11	○
	Neutral Axis before Composition				-0.03	○	-0.05	○	-0.10	○
	Neutral Axis after Composition				-0.03	○	-0.05	○	-0.11	○
	Base of Lower Flange				-0.02	○	-0.03	○	-0.06	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	-0.01	○	-0.09	○
		Min			-0.15	○	-0.24	○	-0.48	○
	Neutral Axis before Composition	Max			0.00	○	-0.02	○	-0.09	○
		Min			-0.14	○	-0.22	○	-0.41	○
	Neutral Axis after Composition	Max			0.00	○	-0.02	○	-0.09	○
		Min			-0.15	○	-0.25	○	-0.48	○
	Base of Lower Flange	Max			0.00	○	-0.02	○	-0.06	○
		Min			-0.09	○	-0.13	○	-0.24	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	25.21	--
	D16		cm	------	40.00	--	40.00	--	39.51	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder				------		25.734		28.284		29.234
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	1.28	Δ	0.55	Δ	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	-0.12	○	-0.03	○	------	--
	Neutral Axis before Composition				-0.11	○	-0.04	○	------	--
	Neutral Axis after Composition				-0.12	○	-0.04	○	------	--
	Base of Lower Flange				-0.06	○	-0.01	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	-0.09	○	-0.03	○	------	--
		Min			-0.49	○	-0.15	○	------	--
	Neutral Axis before Composition	Max			-0.10	○	-0.04	○	------	--
		Min			-0.42	○	-0.14	○	------	--
	Neutral Axis after Composition	Max			-0.10	○	-0.04	○	------	--
		Min			-0.49	○	-0.16	○	------	--
	Base of Lower Flange	Max			-0.07	○	-0.01	○	------	--
		Min			-0.25	○	-0.02	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	24.70	--	20.18	--	------	--
	D16		cm	------	38.71	--	31.62	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm²	------	8.98	--	0.00	--	------	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.84	○	3.91	○	------	--
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1	○	1.423	○	------	--
	D16				1	○	1.423	○	------	--
	D19				1.166	○	1.481	○	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	1.28	Δ	0.55	Δ	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	-0.12	○	-0.03	○	------	--
	Neutral Axis before Composition				-0.11	○	-0.04	○	------	--
	Neutral Axis after Composition				-0.12	○	-0.04	○	------	--
	Base of Lower Flange				-0.06	○	-0.01	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	-0.09	○	-0.03	○	------	--
		Min			-0.49	○	-0.15	○	------	--
	Neutral Axis before Composition	Max			-0.10	○	-0.04	○	------	--
		Min			-0.42	○	-0.14	○	------	--
	Neutral Axis after Composition	Max			-0.10	○	-0.04	○	------	--
		Min			-0.49	○	-0.16	○	------	--
	Base of Lower Flange	Max			-0.07	○	-0.01	○	------	--
		Min			-0.25	○	-0.02	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	24.70	--	20.18	--	------	--
	D16		cm	------	38.71	--	31.62	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.00	--	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder				------	0.500		1.450		4.000	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.96	△	0.84	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.09	○	0.00	○
	Neutral Axis before Composition				------	--	-0.22	○	0.00	○
	Neutral Axis after Composition				------	--	-0.18	○	0.00	○
	Base of Lower Flange				------	--	-0.06	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.26	○	-0.21	○
		Min			------	--	-0.10	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.39	○	-0.22	○
		Min			------	--	-0.21	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.39	○	-0.22	○
		Min			------	--	-0.19	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.07	○	-0.17	○
		Min			------	--	-0.05	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	25.61	--
	D16		cm	------	------	--	31.63	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	8.92	--	8.65	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.96	△	0.84	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.09	○	0.00	○
	Neutral Axis before Composition				------	--	-0.22	○	0.00	○
	Neutral Axis after Composition				------	--	-0.18	○	0.00	○
	Base of Lower Flange				------	--	-0.06	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.26	○	-0.21	○
		Min			------	--	-0.10	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.39	○	-0.22	○
		Min			------	--	-0.21	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.39	○	-0.22	○
		Min			------	--	-0.19	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.07	○	-0.17	○
		Min			------	--	-0.05	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	25.61	--
	D16		cm	------	------	--	31.63	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	------	--	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	--	999.999	○	999.999	○
	D16				------	--	999.999	○	999.999	○
	D19				------	--	999.999	○	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder				------	4.152		7.803		11.455	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.84	△	0.62	△	0.48	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.21	○	-0.11	○	-0.06	○
		Min			-0.01	○	0.00	○	0.00	○
	Neutral Axis before Composition	Max			-0.22	○	-0.13	○	-0.09	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition	Max			-0.23	○	-0.13	○	-0.08	○
		Min			0.00	○	0.00	○	0.00	○
	Base of Lower Flange	Max			-0.18	○	-0.15	○	-0.24	○
		Min			0.00	○	0.00	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	25.81	--	39.27	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	8.59	--	5.65	--	2.43	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.84	△	0.62	△	0.48	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.21	○	-0.11	○	-0.06	○
		Min			-0.01	○	0.00	○	0.00	○
	Neutral Axis before Composition	Max			-0.22	○	-0.13	○	-0.09	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition	Max			-0.23	○	-0.13	○	-0.08	○
		Min			0.00	○	0.00	○	0.00	○
	Base of Lower Flange	Max			-0.18	○	-0.15	○	-0.24	○
		Min			0.00	○	0.00	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	25.81	--	39.27	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	-
	D16				999.999	○	999.999	○	------	-
	D19				999.999	○	999.999	○	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder				------	13.730		15.106		16.134	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.31	○	0.18	○	0.22	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	-0.01	○	-0.01	○
	Neutral Axis before Composition				0.00	○	-0.01	○	-0.01	○
	Neutral Axis after Composition				0.00	○	-0.01	○	-0.01	○
	Base of Lower Flange				0.00	○	-0.01	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.03	○	0.00	○	-0.01	○
		Min			0.00	○	-0.01	○	-0.01	○
	Neutral Axis before Composition	Max			-0.03	○	0.00	○	-0.01	○
		Min			0.00	○	-0.01	○	-0.02	○
	Neutral Axis after Composition	Max			-0.03	○	0.00	○	-0.01	○
		Min			0.00	○	-0.01	○	-0.02	○
	Base of Lower Flange	Max			-0.03	○	0.00	○	-0.01	○
		Min			0.00	○	-0.01	○	-0.18	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.31	○	0.18	○	0.22	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	-0.01	○	-0.01	○
	Neutral Axis before Composition				0.00	○	-0.01	○	-0.01	○
	Neutral Axis after Composition				0.00	○	-0.01	○	-0.01	○
	Base of Lower Flange				0.00	○	-0.01	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.03	○	0.00	○	-0.01	○
		Min			0.00	○	-0.01	○	-0.01	○
	Neutral Axis before Composition	Max			-0.03	○	0.00	○	-0.01	○
		Min			0.00	○	-0.01	○	-0.02	○
	Neutral Axis after Composition	Max			-0.03	○	0.00	○	-0.01	○
		Min			0.00	○	-0.01	○	-0.02	○
	Base of Lower Flange	Max			-0.03	○	0.00	○	-0.01	○
		Min			0.00	○	-0.01	○	-0.18	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	------	-	------	-
	D16				------	-	------	-	------	-
	D19				------	-	------	-	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder				------	18.758		22.409		26.060	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.56	△	0.87	△	1.20	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.02	○	-0.03	○	-0.10	○
	Neutral Axis before Composition				-0.02	○	-0.03	○	-0.09	○
	Neutral Axis after Composition				-0.02	○	-0.03	○	-0.10	○
	Base of Lower Flange				-0.01	○	-0.02	○	-0.05	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.02	○	-0.03	○	-0.10	○
		Min			-0.08	○	-0.21	○	-0.42	○
	Neutral Axis before Composition	Max			-0.02	○	-0.03	○	-0.09	○
		Min			-0.13	○	-0.26	○	-0.42	○
	Neutral Axis after Composition	Max			-0.02	○	-0.03	○	-0.10	○
		Min			-0.10	○	-0.24	○	-0.45	○
	Base of Lower Flange	Max			-0.01	○	-0.02	○	-0.05	○
		Min			-0.24	○	-0.27	○	-0.30	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	26.06	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.09	--	4.91	--	8.51	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.56	△	0.87	△	1.20	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.02	○	-0.03	○	-0.10	○
	Neutral Axis before Composition				-0.02	○	-0.03	○	-0.09	○
	Neutral Axis after Composition				-0.02	○	-0.03	○	-0.10	○
	Base of Lower Flange				-0.01	○	-0.02	○	-0.05	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.02	○	-0.03	○	-0.10	○
		Min			-0.08	○	-0.21	○	-0.42	○
	Neutral Axis before Composition	Max			-0.02	○	-0.03	○	-0.09	○
		Min			-0.13	○	-0.26	○	-0.42	○
	Neutral Axis after Composition	Max			-0.02	○	-0.03	○	-0.10	○
		Min			-0.10	○	-0.24	○	-0.45	○
	Base of Lower Flange	Max			-0.01	○	-0.02	○	-0.05	○
		Min			-0.24	○	-0.27	○	-0.30	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	26.06	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	999.999	○
	D16				999.999	○	999.999	○	999.999	○
	D19				999.999	○	999.999	○	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder				------		26.212		28.762		29.712
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.23	△	0.50	○	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.11	○	-0.03	○	------	--
	Neutral Axis before Composition				-0.10	○	-0.04	○	------	--
	Neutral Axis after Composition				-0.11	○	-0.04	○	------	--
	Base of Lower Flange				-0.06	○	0.00	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.11	○	-0.04	○	------	--
		Min			-0.44	○	-0.12	○	------	--
	Neutral Axis before Composition	Max			-0.10	○	-0.04	○	------	--
		Min			-0.44	○	-0.12	○	------	--
	Neutral Axis after Composition	Max			-0.11	○	-0.04	○	------	--
		Min			-0.46	○	-0.14	○	------	--
	Base of Lower Flange	Max			-0.06	○	-0.01	○	------	--
		Min			-0.30	○	-0.02	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	25.48	--	20.18	--	------	--
	D16		cm	------	39.95	--	31.62	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	8.70	--	0.00	--	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.23	△	0.50	○	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.11	○	-0.03	○	------	--
	Neutral Axis before Composition				-0.10	○	-0.04	○	------	--
	Neutral Axis after Composition				-0.11	○	-0.04	○	------	--
	Base of Lower Flange				-0.06	○	0.00	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.11	○	-0.04	○	------	--
		Min			-0.44	○	-0.12	○	------	--
	Neutral Axis before Composition	Max			-0.10	○	-0.04	○	------	--
		Min			-0.44	○	-0.12	○	------	--
	Neutral Axis after Composition	Max			-0.11	○	-0.04	○	------	--
		Min			-0.46	○	-0.14	○	------	--
	Base of Lower Flange	Max			-0.06	○	-0.01	○	------	--
		Min			-0.30	○	-0.02	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	25.48	--	20.18	--	------	--
	D16		cm	------	39.95	--	31.62	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	------	--
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	------	-	------	--
	D16				999.999	○	------	-	------	--
	D19				999.999	○	------	-	------	--

5 Design of Intermediate Cross Beam

(1) Parameters

<1st Span>

		Unit	Bending Moment (Maximum)	Bending Moment (Minimum)
CB 2				
Length between End of Girders	Lb	cm	328.0	328.0
Web Width	Bw	cm	22.0	22.0
Width of Cross Beam	Bc	cm	30.0	30.0
Thickness of Deck	Hs	cm	17.0	17.0
Height of Cross Beam (before Composition of Deck)	Hb	cm	130.0	130.0
Height of Cross Beam (after Composition of Deck)	Ha	cm	187.0	187.0
Interval of Cross Beam	Lt	cm	1404.0	1404.0

<2nd Span>

		Unit	Bending Moment (Maximum)	Bending Moment (Minimum)
CB 2				
Length between End of Girders	Lb	cm	328.0	328.0
Web Width	Bw	cm	22.0	22.0
Width of Cross Beam	Bc	cm	30.0	30.0
Thickness of Deck	Hs	cm	17.0	17.0
Height of Cross Beam (before Composition of Deck)	Hb	cm	130.0	130.0
Height of Cross Beam (after Composition of Deck)	Ha	cm	187.0	187.0
Interval of Cross Beam	Lt	cm	1406.7	1406.7

(2) Calculation of Prestressing

1) Arrangement of PC Strand

(1) Parameter of PC Strand

	Unit	Parameters
Name of PC Strand		4S15.2, SWPR7BL
Area of PC Strand	mm^2/no.	554.80
Amount of Set	mm	4.0
Reduction Rate of Anchor	%	0.000
Friction Coefficient	1/m	0.0040
Creep Coefficient		2.60
Drying Shrinkage	$\times 10^{-5}$	20.00
Relaxation	%	2.5
Prestressing Stress	N/mm^2	1250.000
(Considering Friction Coefficient)	N/mm^2	1250.000
Allowable Value	N/mm^2	1440.000

(2) Arrangement of PC Strand

<1st Span>

Item		Unit	Maximum Bending Moment	Minimum Bending Moment
CB 2				
How to Prestressing			From One Side	
Length of PC Strand		m	10.720	10.720
1st	Position	mm	400	400
	Number	No.	1	1
2nd	Position	Mm	800	800
	Number	No.	1	1

<2nd Span>

Item		Unit	Maximum Bending Moment	Minimum Bending Moment
CB 2				
How to Prestressing			From One Side	
Length of PC Strand		m	10.720	10.720
1st	Position	mm	400	400
	Number	No.	1	1
2nd	Position	mm	800	800
	Number	No.	1	1

<Design of Cross Beam : Summary for Calculation Results of Stress>

1st Span : Cross Beam (CB2)

Item		Unit	Allowable Value	Mmax		Mmin	
Bending Stress of Concrete Dead Load	Top of Deck	N/mm^2	≦10.0	-0.36	○	-0.39	○
	Bottom of Deck			-0.24	○	-0.26	○
	Top of Cross Beam	N/mm^2	0	2.28	○	2.29	○
	Bottom of Cross Beam		～11.0	4.55	○	4.62	○
Bending Stress of Concrete Dead Load	Top of Deck	N/mm^2	≦10.0	0.52	○	-0.91	○
	Bottom of Deck			0.35	○	-0.61	○
	Top of Cross Beam	N/mm^2	0	2.18	○	2.34	○
	Bottom of Cross Beam		～11.0	2.21	○	6.01	○
Ultimate Load		------	1	1.79	○	1.64	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1440	1250	○	1250	○
	Immediately After Prestressing	N/mm^2	1295	1175	○	1175	○
	Effective Prestressing Force	N/mm^2	1110	1024	○	1024	○

2nd Span : Cross Beam (CB2)

Item		Unit	Allowable Value	Mmax		Mmin	
Bending Stress of Concrete Dead Load	Top of Deck	N/mm^2	≦10.0	-0.36	○	-0.39	○
	Bottom of Deck			-0.24	○	-0.26	○
	Top of Cross Beam	N/mm^2	0	2.28	○	2.29	○
	Bottom of Cross Beam		～11.0	4.53	○	4.63	○
Bending Stress of Concrete Dead Load	Top of Deck	N/mm^2	≦10.0	0.53	○	-0.92	○
	Bottom of Deck			0.35	○	-0.61	○
	Top of Cross Beam	N/mm^2	0	2.18	○	2.35	○
	Bottom of Cross Beam		～11.0	2.19	○	6.01	○
Ultimate Load		------	1	1.79	○	1.64	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1440	1250	○	1250	○
	Immediately After Prestressing	N/mm^2	1295	1175	○	1175	○
	Effective Prestressing Force	N/mm^2	1110	1024	○	1024	○

<Design of Cross Beam : Summary for Calculation Results of Stress>

1st Span : Cross Beam (CB2)

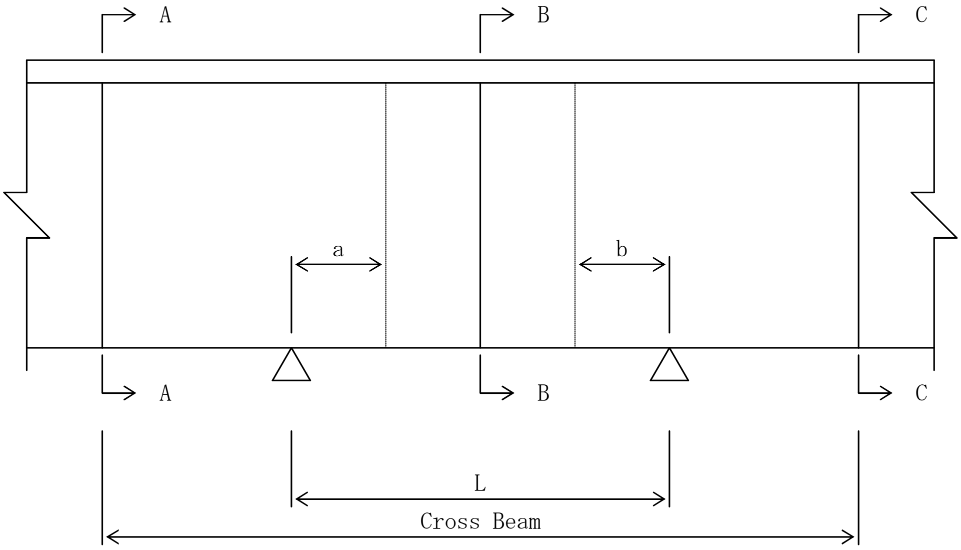
Item		Unit	Allowable Value	Smax		Smin		Tmax		Tmin	
Shear Force											
Shear Stress	Design Load	N/mm^2	0.45	0.69	△	0.48	△	0.12	○	0.17	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	-0.02	○	-0.02	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	-0.17	○	-0.18	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Suc/Shu	-	1.00	2.71	○	3.89	○	12.52	○	9.86	○
Strength against Diagonal Densile Failure	D13	-	1.00	1.00	○	1.49	○	------	--	------	--
Sus/Shu	D16	-	1.00	1.00	○	1.84	○	------	--	------	--
Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.00	○	0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	0.00	○	0.00	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	0.00	○	0.00	○	0.00	○	0.00	○
Shear Force + Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.69	△	0.48	△	0.12	○	0.17	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-1.10	-0.02	○	-0.02	○	0.00	○	0.00	○
	Design Load	N/mm^2	-2.20	-0.17	○	-0.18	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Muc/Mtu	-	1.00	999.999	○	999.999	○	1000.00	○	999.999	○
Strength against Diagonal Densile Failure	D13	-	1.00	999.999	○	999.999	○	------	--	------	--
Mus/Mtu	D16	-	1.00	999.999	○	999.999	○	------	--	------	--
Amount of Diagonal Tension Re-bar		cm^2	----	10.28	--	6.00	--	6.00	--	6.00	--
Axial Reinforcement Bar Volume		cm^2	----	5.57	--	1.01	--	0.00	--	0.00	--

2nd Span : Cross Beam (CB2)

Item		Unit	Allowable Value	Smax		Smin		Tmax		Tmin	
Shear Force											
Shear Stress	Design Load	N/mm^2	0.45	0.68	△	0.48	△	0.18	○	0.11	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	-0.02	○	-0.02	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	-0.17	○	-0.18	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Suc/Shu	-	1.00	2.72	○	3.89	○	9.71	○	12.65	○
Strength against Diagonal Densile Failure	D13	-	1.00	1.00	○	1.49	○	------	--	------	--
Sus/Shu	D16	-	1.00	1.00	○	1.84	○	------	--	------	--
Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.00	○	0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	0.00	○	0.00	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	0.00	○	0.00	○	0.00	○	0.00	○
Shear Force + Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.68	△	0.48	△	0.18	○	0.11	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-1.10	-0.02	○	-0.02	○	0.00	○	0.00	○
	Design Load	N/mm^2	-2.20	-0.17	○	-0.18	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Muc/Mtu	-	1.00	999.999	○	999.999	○	1000.00	○	999.999	○
Strength against Diagonal Densile Failure	D13	-	1.00	999.999	○	999.999	○	------	--	------	--
Mus/Mtu	D16	-	1.00	999.999	○	999.999	○	------	--	------	--
Amount of Diagonal Tension Re-bar		cm^2	----	10.23	--	6.00	--	6.00	--	6.00	--
Axial Reinforcement Bar Volume		cm^2	----	5.54	--	1.02	--	0.00	--	0.00	--

6 Design of Coupling Concrete

Dimension



Unit: m

L	1.200
a	0.500
b	0.500

<Connection of Cross beam : Summary for Calculation Results of Stress>

1st Span～2nd Span,　Main Girder Number: G1(Negative Moment) G4(Positive Moment)

Item			Unit	Allowable Value	Negative Moment						Positive Moment	
					A-A		B-B		C-C		B-B	
Re-bar Volume	1st Layer	Diameter	mm	------	D19	--	D19	--	D19	--	D22	--
		Number	Number	------	16	--	16	--	16	--	12	--
	2nd Layer	Diameter	mm	------	D19	--	D19	--	D19	--	D22	--
		Number	Number	------	16	--	16	--	16	--	12	--
Bending Stress (Dead Load)												
Bending Tensile Stress of Reinforcement Bar			N/mm^2	100	-80.12	○	-73.90	○	-80.15	○	95.77	○
Bending Stress (Design Load)												
Bending Stress of Concrete			N/mm^2	10	1.53	○	1.53	○	1.53	○	2.18	○
Bending Tensile Stress of Reinforcement Bar			N/mm^2	160	41.37	○	41.37	○	41.37	○	109.04	○
Bending Stress (Temperature Load)												
Bending Stress of Concrete			N/mm^2	11.5	1.90	○	1.53	○	1.90	○	2.99	○
Bending Tensile Stress of Reinforcement Bar			N/mm^2	184	51.19	○	41.37	○	51.23	○	149.80	○
Ultimate Load			------	1.00	1.37	○	1.55	○	1.37	○	2.85	○

7 Calculation of Reaction Force

7.1 Reaction Force for Each Girder

<1st Span, Left> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	348.939	342.005	339.517	341.351
Cast-in-place Concrete	D2	312.629	430.185	427.634	304.118
Weight of Bridge Surface	D3	155.436	133.624	130.103	144.839
Subtotal: DT1=D1+D2+D3		817.004	905.814	897.254	790.308
Live Load	Max	316.170	303.730	304.430	320.980
LT	Min	-65.180	-29.940	-28.870	-67.760
Subtotal: DT2	Max	1133.174	1209.544	1201.684	1111.288
=DT1+LT+SW	Min	751.824	875.874	868.384	722.548
Creep CR		97.215	94.869	97.067	111.118
Drying Shrinkage SH		-8.204	-9.254	-9.329	-9.079
Temperature Range		21.331	24.060	24.255	23.605
Dead Load: DT1+CR+SH		906.015	991.429	984.992	892.347
Total: DT2+CR	Max	1243.516	1319.219	1313.677	1236.932
+SH+T+SD	Min	862.166	985.549	980.377	848.192

<1st Span, Right> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	348.946	342.012	339.524	341.358
Cast-in-place Concrete	D2	326.736	454.033	451.482	318.701
Weight of Bridge Surface	D3	236.817	212.143	210.857	241.897
Subtotal: DT1=D1+D2+D3		912.499	1008.188	1001.863	901.956
Live Load	Max	537.160	473.330	463.700	514.040
LT	Min	-245.000	-162.940	-146.050	-213.350
Subtotal: DT2	Max	1449.659	1481.518	1465.563	1415.996
=DT1+LT+SW	Min	667.499	845.248	855.813	688.606
Creep CR		-97.486	-95.530	-97.821	-111.957
Drying Shrinkage SH		8.207	9.244	9.317	9.055
Temperature Range		-21.336	-24.034	-24.223	-23.543
Dead Load: DT1+CR+SH		823.220	921.902	913.359	799.054
Total: DT2+CR	Max	1339.044	1371.198	1352.836	1289.551
+SH+T+SD	Min	556.884	734.928	743.086	562.161

<2nd Span, Left> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	349.317	342.467	340.071	342.007
Cast-in-place Concrete	D2	326.677	454.507	452.050	319.589
Weight of Bridge Surface	D3	230.039	221.809	238.534	286.238
Subtotal: DT1=D1+D2+D3		906.033	1018.783	1030.655	947.834
Live Load	Max	537.660	473.690	465.120	515.530
LT	Min	-245.110	-162.290	-145.720	-212.450
Subtotal: DT2	Max	1443.693	1492.473	1495.775	1463.364
=DT1+LT+SW	Min	660.923	856.493	884.935	735.384
Creep CR		-96.812	-94.032	-96.097	-109.996
Drying Shrinkage SH		8.192	9.250	9.324	9.084
Temperature Range		-21.299	-24.049	-24.241	-23.617
Dead Load: DT1+CR+SH		817.413	934.001	943.882	846.922
Total: DT2+CR	Max	1333.774	1383.642	1384.761	1338.835
+SH+T+SD	Min	551.004	747.662	773.921	610.855

<2nd Span, Right> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	349.309	342.460	340.064	342.000
Cast-in-place Concrete	D2	312.667	430.659	428.202	304.941
Weight of Bridge Surface	D3	151.890	138.205	143.023	166.011
Subtotal: DT1=D1+D2+D3		813.866	911.324	911.289	812.952
Live Load	Max	315.870	303.700	304.890	321.560
LT	Min	-65.220	-29.790	-28.730	-67.180
Subtotal: DT2	Max	1129.736	1215.024	1216.179	1134.512
=DT1+LT+SW	Min	748.646	881.534	882.559	745.772
Creep CR		97.083	94.693	96.851	110.834
Drying Shrinkage SH		-8.194	-9.240	-9.312	-9.060
Temperature Range		21.304	24.023	24.210	23.555
Dead Load: DT1+CR+SH		902.755	996.777	998.828	914.726
Total: DT2+CR	Max	1239.929	1324.500	1327.928	1259.841
+SH+T+SD	Min	858.839	991.010	994.308	871.101

7.2 Reaction Force for Pier and Abutment

Unit: kN

		1	2	3
Weight of Girder	D1	1371.812	2745.702	1373.833
Cast-in-place Concrete	D2	1474.566	3103.775	1476.469
Weight of Bridge Surface	D3	564.002	1878.334	599.129
Subtotal: DT1=D1+D2+D3		3410.380	7727.811	3449.431
Live Load	Max	1021.120	1963.620	1021.720
LT	Min	-103.030	0.000	-102.430
Subtotal: DT2	Max	4431.500	9691.431	4471.151
=DT1+LT+SW	Min	3307.350	7727.811	3347.001
Creep CR		400.269	-799.731	399.461
Drying Shrinkage SH		-35.866	71.673	-35.806
Temperature Range		93.251	-186.342	93.092
Dead Load: DT1+CR+SH		3774.783	6999.753	3813.086
Total: DT2+CR	Max	4889.154	8777.031	4927.898
+SH+T+SD	Min	3765.004	6813.411	3803.748

7.3 Horizontal Force

Horizontal Force(PF1、PF2fix)

(kN)

	PF1	PF2
Prestressing	-266	344
Drying Shrinkage	-275	356
Temperature(+)	251	-331
Temperature(-)	-251	331
Dead Load	-540	700
Temperature+15℃	-290	370
Temperature-15℃	-791	1031
Temperature+40℃	128	-181
Temperature-40℃	-1208	1582

8 Design of Cross Beam at End of Girder

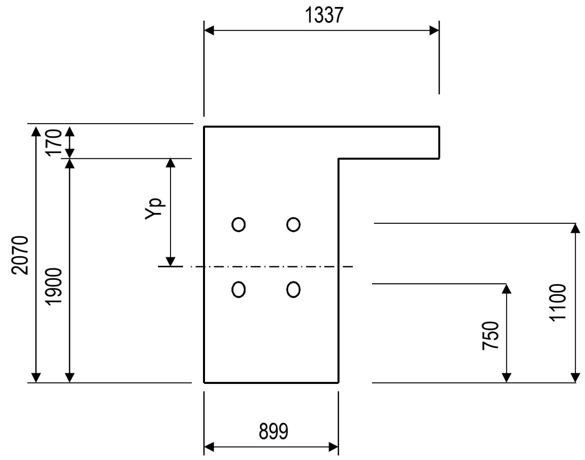
8.1 For Bending Moment

1) Calcution of Bending Moment

(kN・m)

		Bending Moment	
		max	min
Dead Load	(Md)	-84.24	-84.24
Live Load	(ML)	320.31	-159.80
Total	(M)	236.07	-244.04

2)Dimension



3)Calculation of Prestressing

Type of PC strand 4S15.2 SWPR19L

Area of PC strand 554.8 mm^2

Number of PC strand 4

(N/mm^2)

	Tensile Stress of PC strand	
	Allowable Value	Result
During Prestressing	1440	1250
Immediately after Prestressing	1295	1151
Under Effestive Prestressing Force	1110	1056

4)Combined Flexural Stress

(N/mm^2)

		Bending Moment(Max)		Bending Moment(Min)	
		Top	Bottom	Top	Bottom
Dead Load		-0.12	0.12	-0.12	0.12
Live Load		0.44	-0.47	-0.22	0.23
Prestressing		1.26	1.48	1.26	1.48
Total	Dead Load	1.14	1.60	1.14	1.60
	Live Load	1.58	1.13	0.92	1.83
Allowable Value		$0.00 \leqq \sigma \leqq 12.0$			

01-2-PC-I GIRDER BRIDGE

(PF5-PF7)

Table of Contents

1.1 DESIGN CONDITION

ROAD GRADE	:	Equivalent to CLASS 4-1
BRIDGE TYPE	:	2 span continuous PC-I girder bridge with composite deck (PC plate and RC deck)
BRIDGE LENGTH	:	L = 60.000 m
SPAN LENGTH	:	L = 28.851 + 28.852 m (ON CL)
WIDTH OF THE ROAD	:	TOTAL 12.750 m L = 0.500 + 5.500 + 0.750 + 5.500 + 0.500 m
HORIZONTAL ALIGNMENT	:	R=320 ～ A=130
LONGITUDINAL SLOPE	:	0.50 % ↙ ～ 0.20 % ↘
SECTION SLOPE	:	LEFT : 6.00 % ～ 3.86 % ↙ RIGHT : 6.00 % ～ 3.79 % ↙
ANGLE OF SKEW	:	PF5,PF6 : 90°00'00" PF7 : 92°29'51"
PAVEMENT	:	ASPHALT PAVEMENT t= 80 mm
SLAB	:	REINFORCED CONCRETE t= 170 mm
PLATE	:	PRESTRESS CONCRETE PLATE t= 100 mm
LIVE ROAD	:	AASHTO HL=93
DESIGN STANDARD	:	AASHTO LRFD BRIDGE DESIGN 2014(LIVE ROAD) Specifications for highway bridges(Japan Road Association) 1 Common matters,3 Concrete bridges,5 seismic design (April 2012)

1.2 MATERIALS STRENGTH

1) CONCRETE

(N/mm^2)

			MAIN GIRDER	CROSS BEAM	RC SLAB	PC PLATE	COUPLING CONCRETE
DESIGN STANDARD STRENGTH OF CONCRETE			40.00	30.00	30.00	40.00	30.0
BENDING COMPRESSIVESTRESS	IMMEDIATELY AFTER PRESTRESSING		19.00	14.00	----	19.00	----
	OTHERS		14.00	11.00	10.00	15.00	10.00
BENDING TENSILE STRESS	IMMEDIATELY AFTER PRESTRESSING		-1.50	-1.20	----	-1.50	----
	DEAD LOAD		0.0	0.0	----	----	----
	DESIGN LOAD		-1.50	-1.20	----	0.0	----
	TEMPERATURE CHANGE		-2.00	----	----	----	----
MEAN SHEAR STRESS CONCRETE CAN CARRY			0.55	0.45	----	----	----
MAXIMUM MEAN CONCRETE SHEAR STRESS			5.30	4.00	----	----	----
ALLOWABLE DIAGONEL TENSILE STRESS (Case where shear forse or torsional moment)		DEAD LOAD	-1.00	-0.80	----	----	----
		LIVE LOAD	-2.00	-1.70	----	----	----
ALLOWABLE DIAGONEL TENSILE STRESS (Case where both shear forse and torsional moment)		DEAD LOAD	-1.30	-1.10	----	----	----
		LIVE LOAD	-2.50	-2.20	----	----	----

2) PC STRAND

(N/mm^2)

		MAIN GIRDER	CROSS BEAM	PC PLATE
PRESTRESSING STEEL TYPE		SWPR7BL 7S15.2mm	SWPR7BL 4S15.2mm	SWPR7AL 1S9.3mm
TENSILE STRENGTH		1850	1850	1700
YIELD POINT		1600	1600	1450
ALLOWABLE TENSILE STRESS	DURING PRESTRESSING	1440	1440	1305
	IMMEDIATELY AFTER PRESTRESSING	1295	1295	1190
	AT COMPOSITION OF SLAB	1110	----	----
	DESIGN LOAD	1110	1110	1020

3) REINFORCING STEEL

(N/mm^2)

		MAIN GIRDER	CROSS BEAM	RC SLAB	COUPLING CONCRETE
STEEL TYPE		SD345	SD345	SD345	SD345
YIELD POINT		345	345	345	345
ALLOWABLE TENSILE STRESS	DEAD LOAD	----	----	100	100
	DESIGN LOAD	180	200	140	160
	COLLISION LOAD	----	----	300	----
	WIND LOAD	----	----	175	----

1.3 DESIGN CONSTANT

1) CONCRETE

			MAIN GIRDER	CAST IN PLACE	PC PLATE
YOUNG'S MODULUS	DESIGN LOAD	(N/mm2)	3.10×10^4	2.80×10^4	3.10×10^4
	IMMEDIATELY AFTER PRESTRESSING	(N/mm2)	2.92×10^4	2.58×10^4	2.92×10^4
CREEP COEFFICIENT	NUMBER OF DAYS FOR DECK CONSTRUCTION		90	----	----
	NUMBER OF CONSTRUCTION DAYS FOR BRIDGE SURFACE		120	----	----
	DESIGN LOAD		2.60	2.60	3.00
	DURING DECK CONSTRUCTION		1.70	----	----
	BRIDGE SURFACE		1.65	----	----
DRYING SHRINKAGE OF CONCRETE	DURING DECK CONSTRUCTION		4.0×10^{-5}	----	----
	DESIGN LOAD		20.0×10^{-5}	20.0×10^{-5}	20.0×10^{-5}
UNIT WEIGHT		(kN/mm^3)	24.5	24.5	24.5

2) PC STRAND(MAIN GIRDER)

		1	2
YOUNG'S MODULUS	N/mm^2	2.00×10^5	2.00×10^5
SLIP	mm	4.0	4.0
RELAXATION	%	2.5	2.5
FRICTION COEFFICIENT	1/m	0.004	0.004
	1/rad	0.300	0.300
AREA	mm^2	970.900	970.900
UNIT WEIGHT	kg/m	7.707	7.707
DIAMETER OF SHEATH	mm	60.0	60.0
DECREASE RATIO BY ANCHOR	%	0.0	0.0

3) PC STRAND(CROSS BEAM)

YOUNG'S MODULUS	N/mm^2	2.00×10^5
SLIP	mm	4.0
RELAXATION	%	2.5
FRICTION COEFFICIENT	1/m	0.004
AREA	mm^2	554.800
UNIT WEIGHT	kg/m	4.404
DIAMETER OF SHEATH	mm	45.0
DECREASE RATIO BY ANCHOR	%	0.0

4) PC STRAND(PC PLATE)

			BETWEEN MAIN GIRDERS
YOUNG'S MODULUS		N/mm^2	2.00×10^5
RELAXATION	BEFORE PRESTRESSING	%	1.5
	AFTER PRESTRESSING	%	1.5
	EXTRA COEFFICIENT OF HIGH TEMPERATURE	%	1.0
AREA		mm^2	51.610
UNIT WEIGHT		kg/m	0.405

1. 5 Dimension

1) Dimension of Main Girder

Girder Height : 1900.00 ～ 1900.00 mm

【Change of Web Width (mm)】

Span	End of Girder (Left Side)			End of Girder (Right Side)		
	Ending Point of Changing Web Width	Starting Point of Changing Web Width	Web Width	Ending Point of Changing Web Width	Starting Point of Changing Web Width	Web Width
1	1000.0	4000.0	700.0	4000.0	1000.0	700.0
2	1000.0	4000.0	700.0	4000.0	1000.0	700.0

2) Dimension of Cross Beam

【Interval of Cross Beam on Left Girder (m)】

Span	Number of Intermediate Cross Beams	CB1～CB2	CB2～CB3
1	1	14.682	14.682
2	1	14.587	14.587

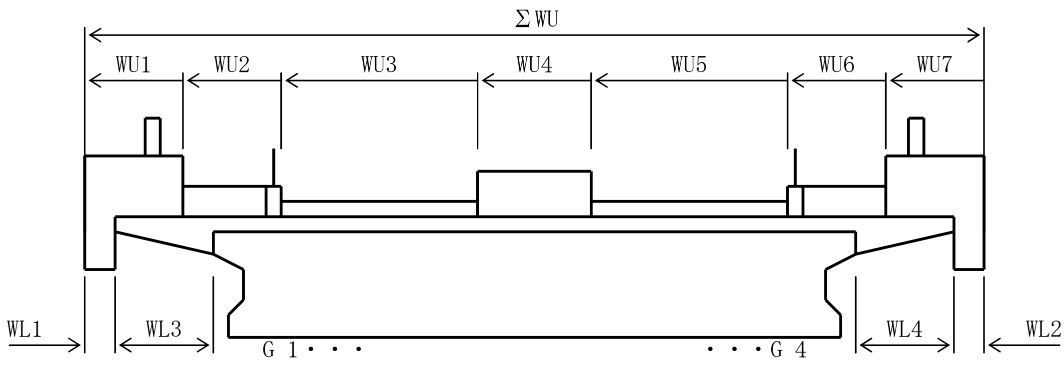
【Interval of Cross Beam on Right Girder (m)】

Span	Number of Intermediate Cross Beams	CB1～CB2	CB2～CB3
1	1	15.174	15.174
2	1	15.277	15.277

【Dimension of Cross Beam (m)】

Span	Cross Beam Width	Cross Beam Width (Left Side)	Cross Beam Width (Right Side)
1	0.300	0.900	0.950
2	0.300	0.950	0.900

【Cross Section 】



【m】

	ΣWU	WU1	WU2	WU3	WU4	WU5	WU6	WU7
1	12.750	0.500	0.000	5.500	0.750	5.500	0.000	0.500
2	12.750	0.500	0.000	5.500	0.750	5.500	0.000	0.500
3	12.763	0.500	0.000	5.506	0.751	5.505	0.000	0.500

	ΣWU	WL1	WL2	WL3	WL4
1	3.508	0.000	0.000	0.623	0.314
2	3.508	0.000	0.000	0.648	0.289
3	3.517	0.000	0.000	0.617	0.302

2. 1 Load Intensity

1) Load Intensity

(1) Bridge Surface Loads

< 1 >

Load Type		Load Intensity	Load Location	
			Left End of Girder Side	Right End of Girder Side
Selfweight of Kerb	Left	8.590 kN/m	0.180 m	0.180 m
	Right	9.750 kN/m	0.190 m	0.180 m
Selfweight of Concrete Barrier	Left	0.600 kN/m	0.125 m	0.125 m
	Right	0.600 kN/m	0.125 m	0.125 m
Selfweight of Sidewalk	Left	0.000 kN/m²		
	Right	0.000 kN/m²		
Selfweight of Handrail	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Kerb	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Pavement	Left	2.610 kN/m²		
	Right	3.300 kN/m²		
Selfweight of Median		9.320 kN/m²		
Selfweight of Additional Object	1	0.110 kN/m	0.075 m	0.075 m
	2	0.110 kN/m	12.675 m	12.675 m

< 2 >

Load Type		Load Intensity	Load Location	
			Left End of Girder Side	Right End of Girder Side
Selfweight of Kerb	Left	9.140 kN/m	0.180 m	0.180 m
	Right	9.570 kN/m	0.180 m	0.190 m
Selfweight of Concrete Barrier	Left	0.600 kN/m	0.125 m	0.125 m
	Right	0.600 kN/m	0.125 m	0.125 m
Selfweight of Sidewalk	Left	0.000 kN/m²		
	Right	0.000 kN/m²		
Selfweight of Handrail	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Kerb	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Pavement	Left	3.000 kN/m²		
	Right	3.000 kN/m²		
Selfweight of Median		9.680 kN/m²		
Selfweight of Additional Object	1	0.110 kN/m	0.075 m	0.075 m
	2	0.110 kN/m	12.675 m	12.675 m

Condition of Load

Calculation of Bridge Surface Loads

(PF5-PF6)

① Unit Weight

PC・RC Concrete	$\gamma 1 =$	24.5 kN/m^3
Concrete	$\gamma 2 =$	23.0 kN/m^3
Asphalt Pavement	$\gamma 3 =$	22.5 kN/m^3

② Bridge Surface Loads

・ Pavement on Left Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

$t' = 1/2 \times (0.082 + 0.148) = 0.115$ m

(Thickness of Leveling Concrete)

$tc = 0.115 - 0.080 = 0.035$ m

(Load Intensity)

$q = 0.080 \times 22.5 + 0.035 \times 23.0 = 2.61\ kN/m^2$

・ Pavement on Right Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

$t' = 1/2 \times (0.112 + 0.177) = 0.145$ m

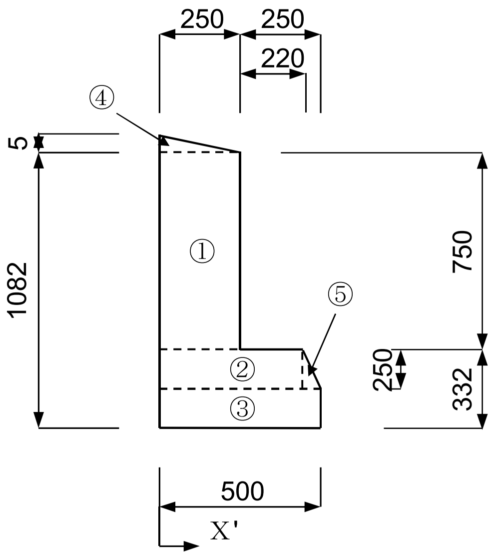
(Thickness of Leveling Concrete)

$tc = 0.145 - 0.080 = 0.065$ m

(Load Intensity)

$q = 0.080 \times 22.5 + 0.065 \times 23.0 = 3.30\ kN/m^2$

・Concrete Barrier (Left Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.082	0.500	0.0410	0.250	0.01025
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3504		0.0632

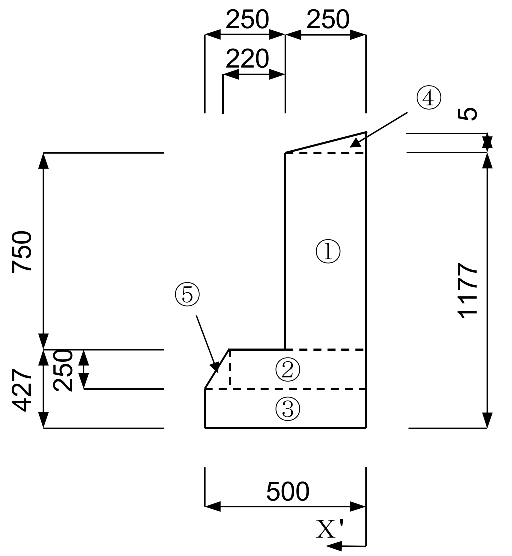
Load Location

X' = 0.0632 / 0.3504 = 0.180 m

Load Intensity

P = 0.3504 × 24.5 = 8.59 kN/m

・Concrete Barrier (Right Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.177	0.500	0.0885	0.250	0.02213
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3979		0.0750

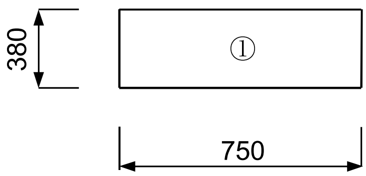
Load Location

X' = 0.0750 / 0.3979 = 0.190 m

Load Intensity

P = 0.3979 × 24.5 = 9.75 kN/m

・Median



a) Load Intensity and Load Location

		H	B	A
①	□	0.3800	0.7500	0.2850
				0.2850

Load Location

X' = On CL

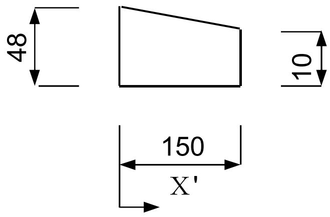
Load Intensity

P = 0.2850 × 24.5 = 6.99 kN/m

W = 6.9900 / 0.750 = 9.32 kN/m^2

・Left Drain Duct

※Loaded as Selfweight of Additional Object 1



Load Location

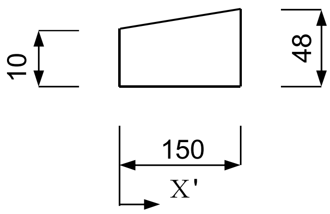
X' = 75mm inside beginning of Left Kerb

Load Intensity

P = 1/2 × (0.048 ＋ 0.010) × 0.150 × 24.5 = 0.11 kN/m

・Right Drain Duct

※Loaded as Selfweight of Additional Object 2



Load Location

X' = 75mm inside beginning of Right Kerb

Load Intensity

P = 1/2 × (0.010 ＋ 0.048) × 0.150 × 24.5 = 0.11 kN/m

・Handrail

※Loaded as Concrete Barrier

Load Location

X' = 125mm inside beginning of Right and Left Kerb

Load Intensity

P = 0.60 = 0.60 kN/m

Condition of Load

Calculation of Bridge Surface Loads

(PF6-PF7)

① Unit Weight

PC・RC Concrete	γ1＝	24.5 kN/m^3
Concrete	γ2＝	23.0 kN/m^3
Asphalt Pavement	γ3＝	22.5 kN/m^3

② Bridge Surface Loads

・ Pavement on Left Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

t' = 1/2 × (0.127 ＋ 0.163) = 0.145 m

(Thickness of Leveling Concrete)

tc = 0.145 − 0.080 = 0.065 m

(Load Intensity)

q = 0.080 × 22.5 ＋ 0.065 × 23.0 = 3.30 kN/m^2

・ Pavement on Right Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

t' = 1/2 × (0.127 ＋ 0.162) = 0.145 m

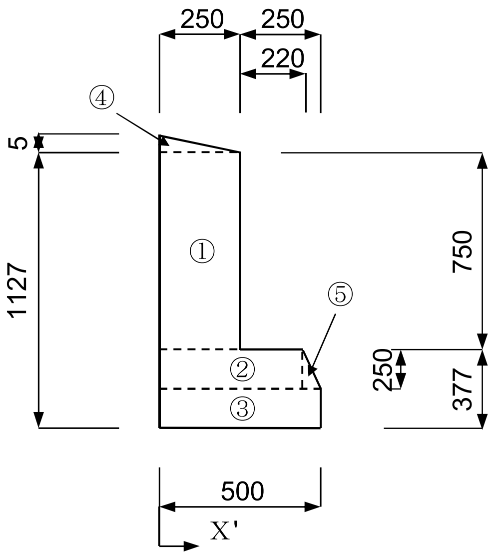
(Thickness of Leveling Concrete)

tc = 0.145 − 0.080 = 0.065 m

(Load Intensity)

q = 0.080 × 22.5 ＋ 0.065 × 23.0 = 3.30 kN/m^2

・Concrete Barrier (Left Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.127	0.500	0.0635	0.250	0.01588
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3729		0.0688

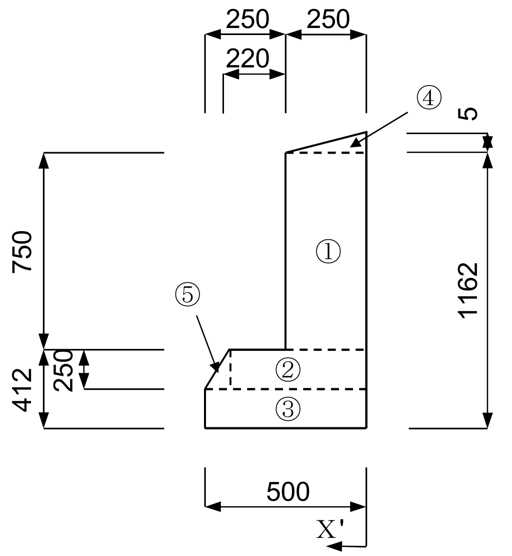
Load Location

X' = 0.0688 / 0.3729 = 0.180 m

Load Intensity

P = 0.3729 × 24.5 = 9.14 kN/m

・Concrete Barrier (Right Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.162	0.500	0.0810	0.250	0.02025
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3904		0.0732

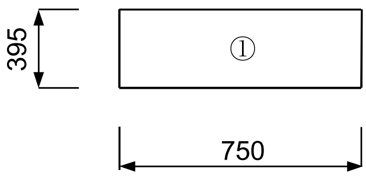
Load Location

X’ = 0.0732 / 0.3904 = 0.190 m

Load Intensity

P = 0.3904 × 24.5 = 9.57 kN/m

・Median



a) Load Intensity and Load Location

		H	B	A
①	□	0.3950	0.7500	0.2963
				0.2963

Load Location

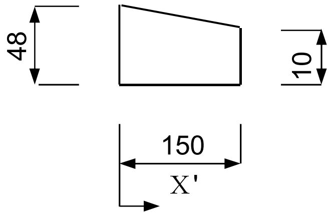
X' = On CL

Load Intensity

P = 0.2963 × 24.5 = 7.26 kN/m

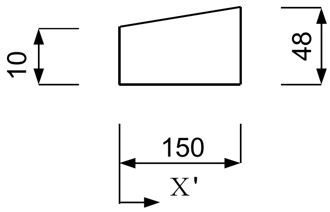
W = 7.2600 / 0.750 = 9.68 kN/m^2

・Left Drain Duct
※Loaded as Selfweight of Additional Object 1



Load Location
X’ = 75mm inside beginning of Left Kerb
Load Intensity
P = 1/2 × (0.048 ＋ 0.010) × 0.150 × 24.5 = 0.11 kN/m

・Right Drain Duct
※Loaded as Selfweight of Additional Object 2

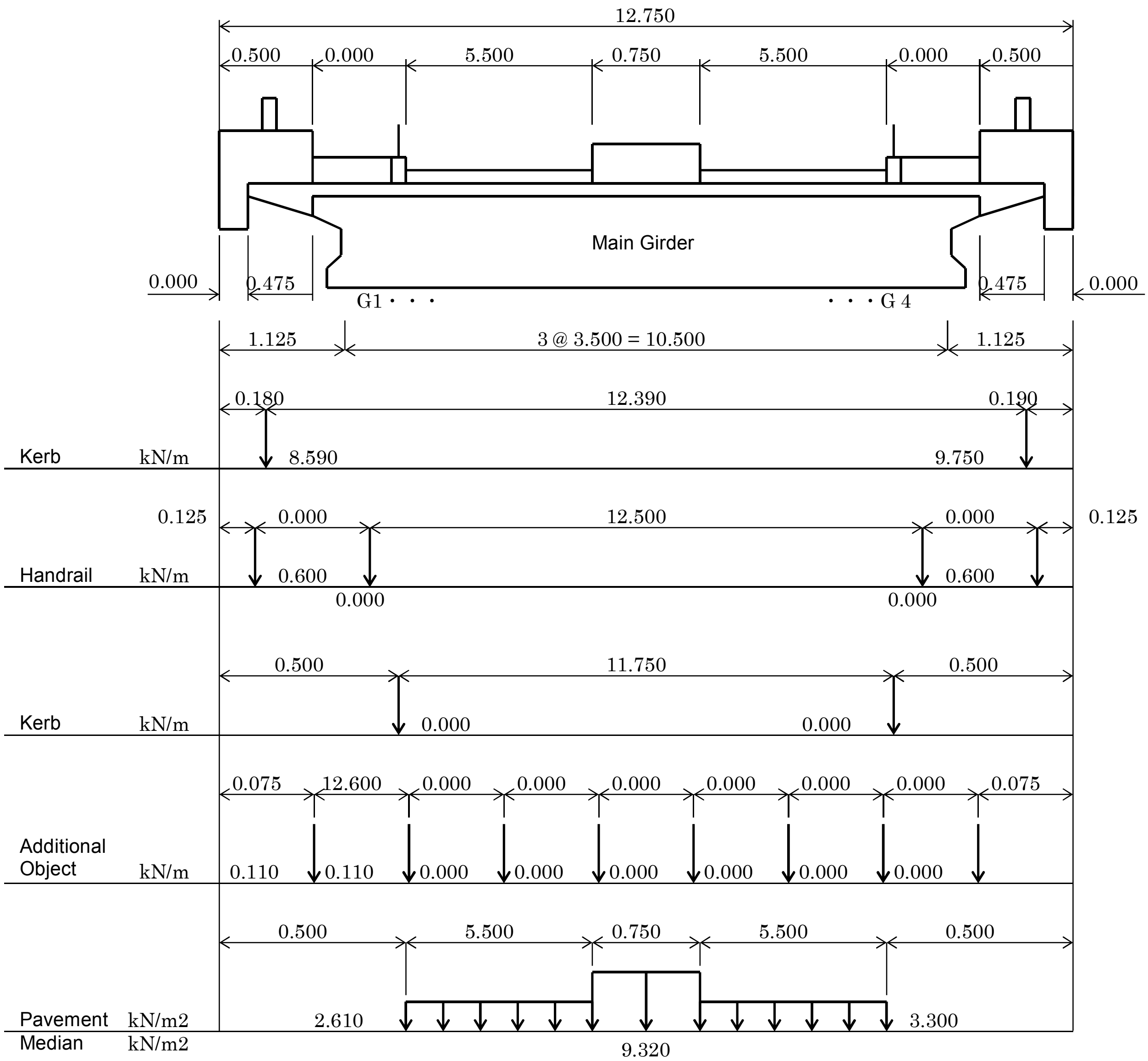


Load Location
X’ = 75mm inside beginning of Right Kerb
Load Intensity
P = 1/2 × (0.010 ＋ 0.048) × 0.150 × 24.5 = 0.11 kN/m

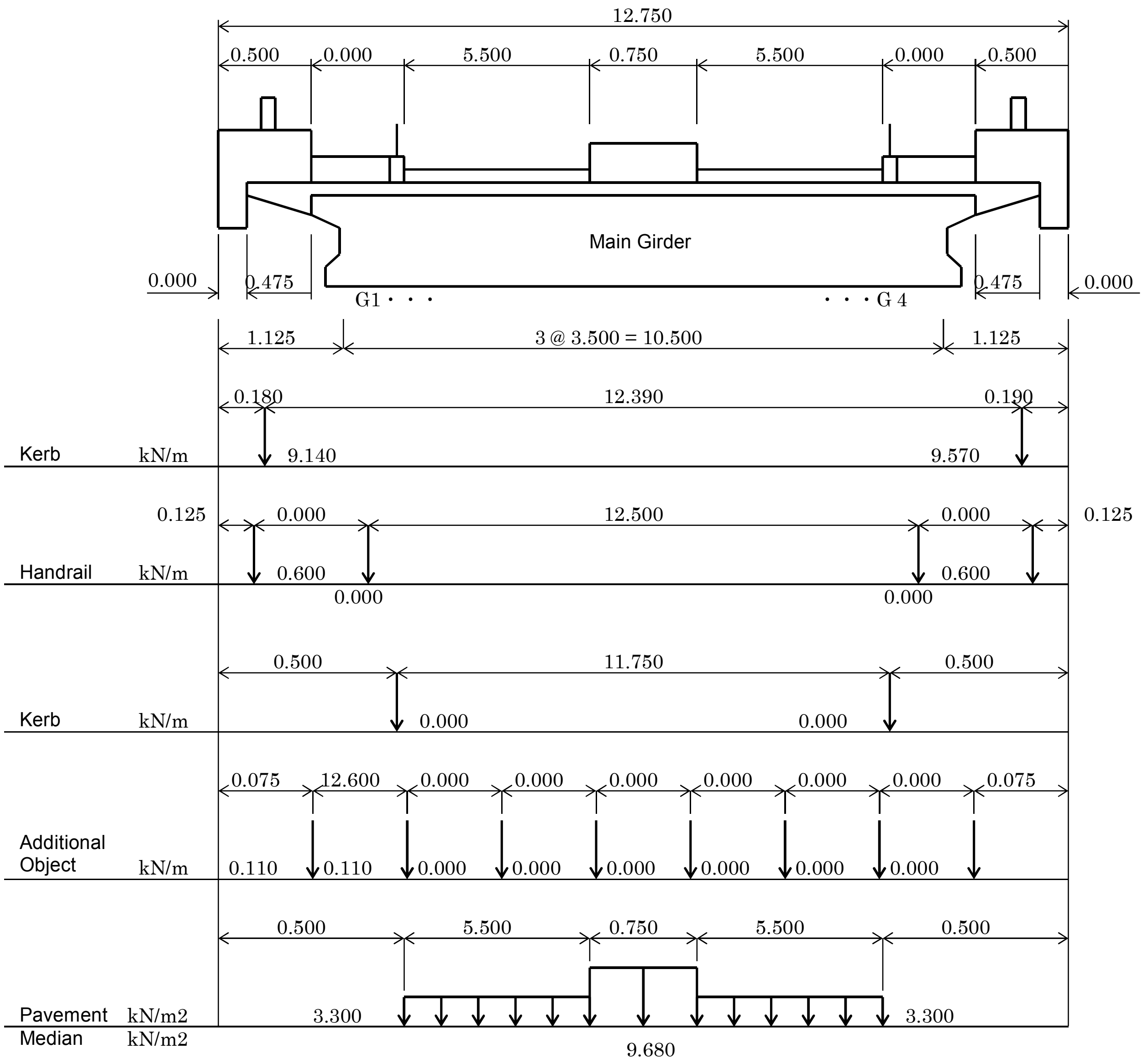
・Handrail
※Loaded as Concrete Barrier

Load Location
X’ = 125mm inside beginning of Right and Left Kerb
Load Intensity
P = 0.60 = 0.60 kN/m

Load Intensity（Bridge Surface Loads_PF5-PF6）

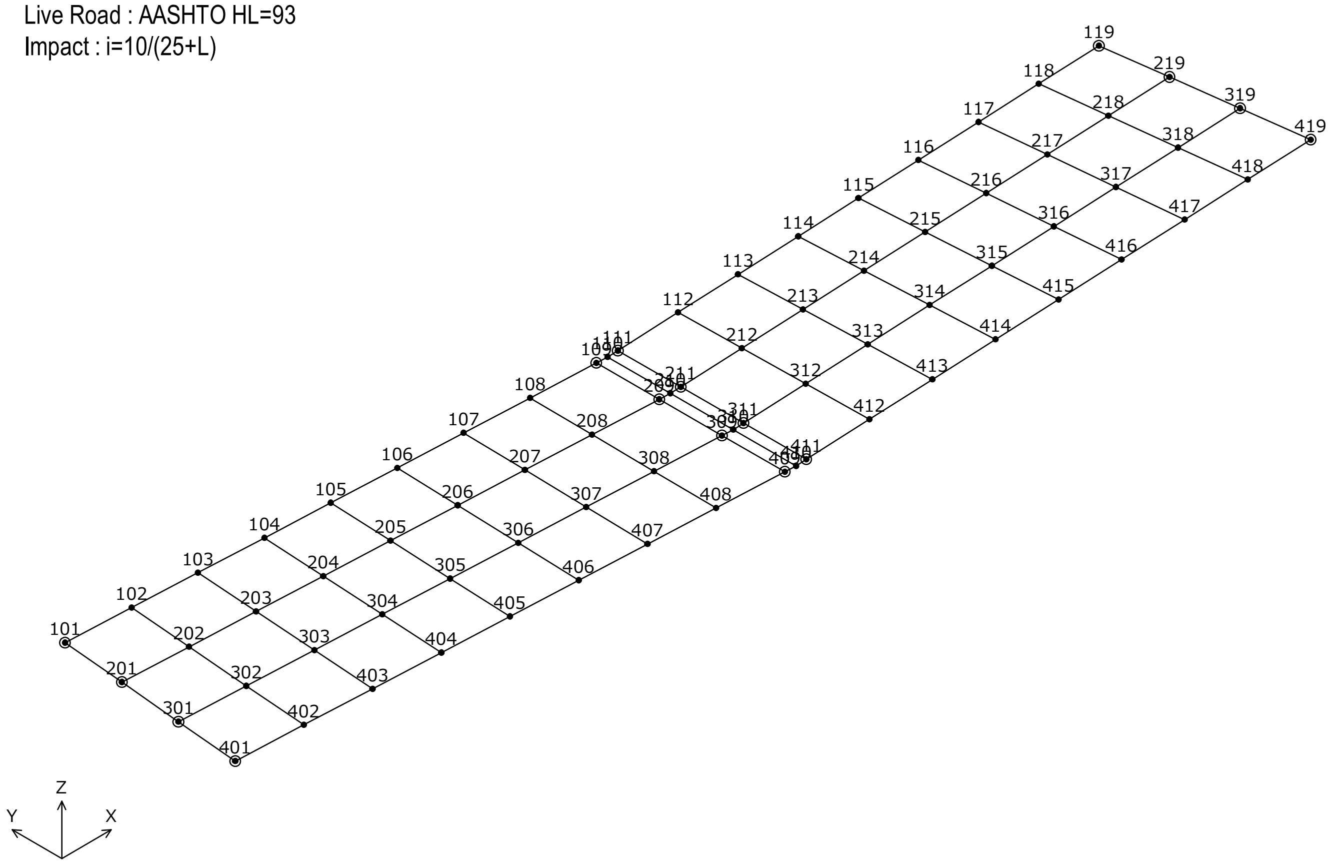


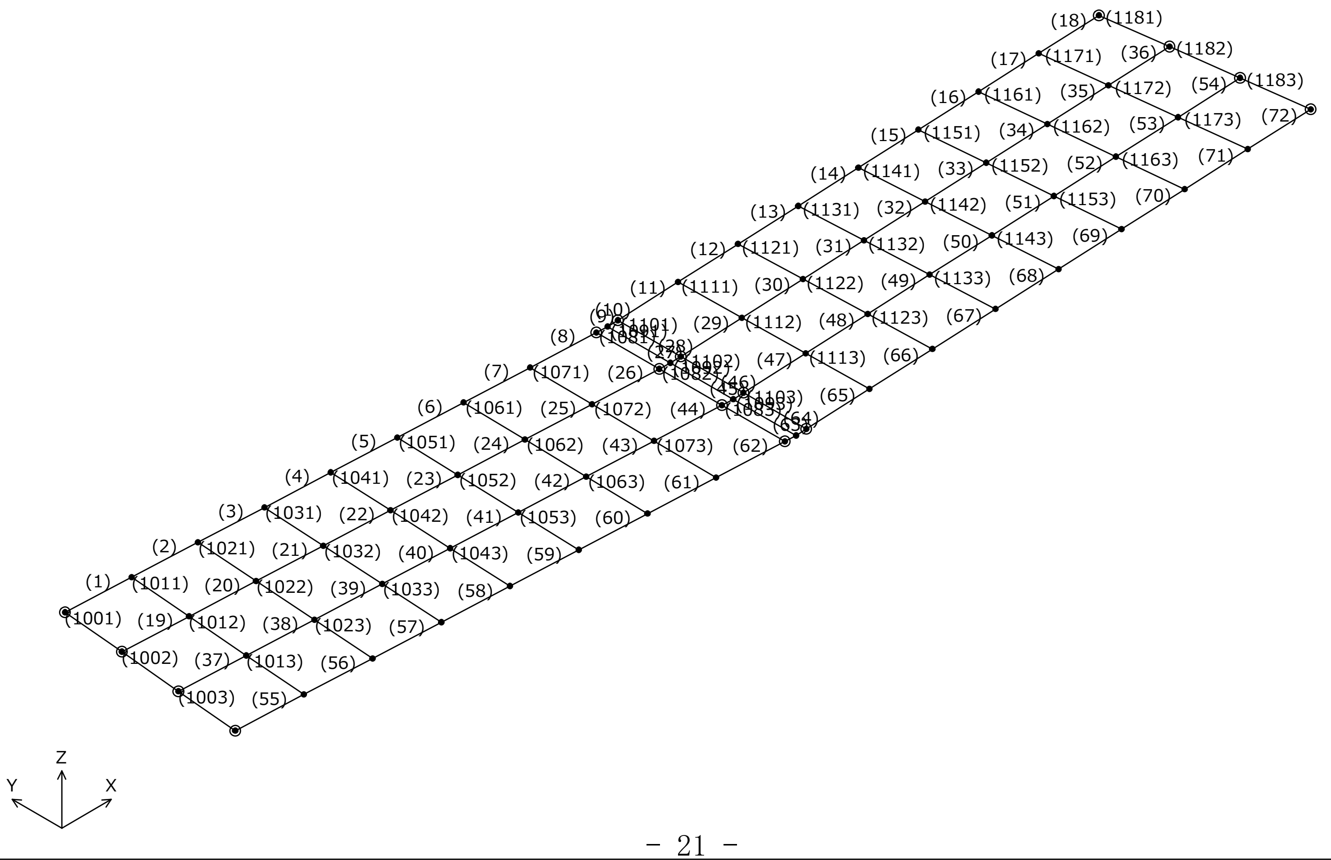
Load Intensity（Bridge Surface Loads_PF6-PF7）



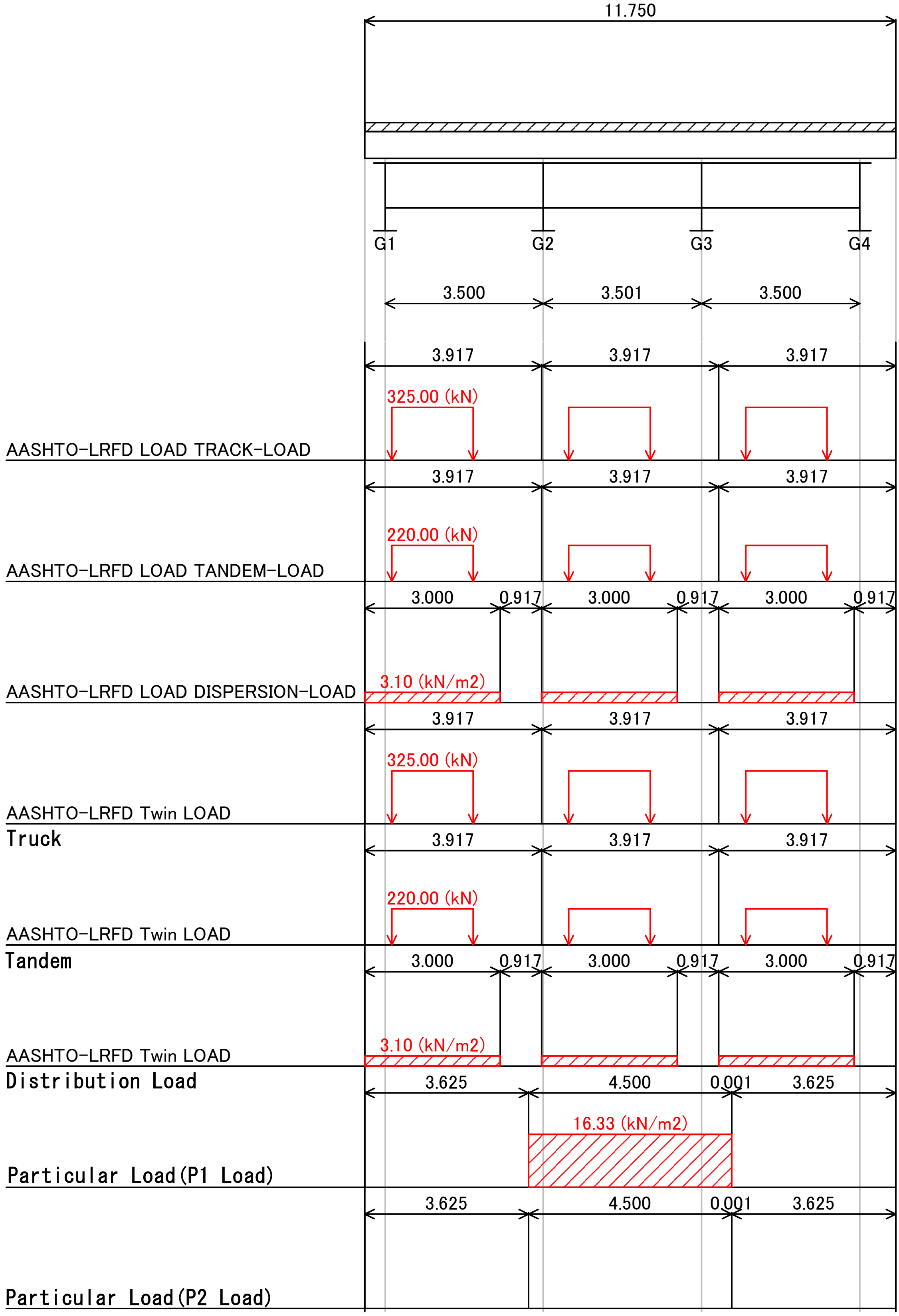
(2) Live Road

Live Road : AASHTO HL=93
Impact : i=10/(25+L)





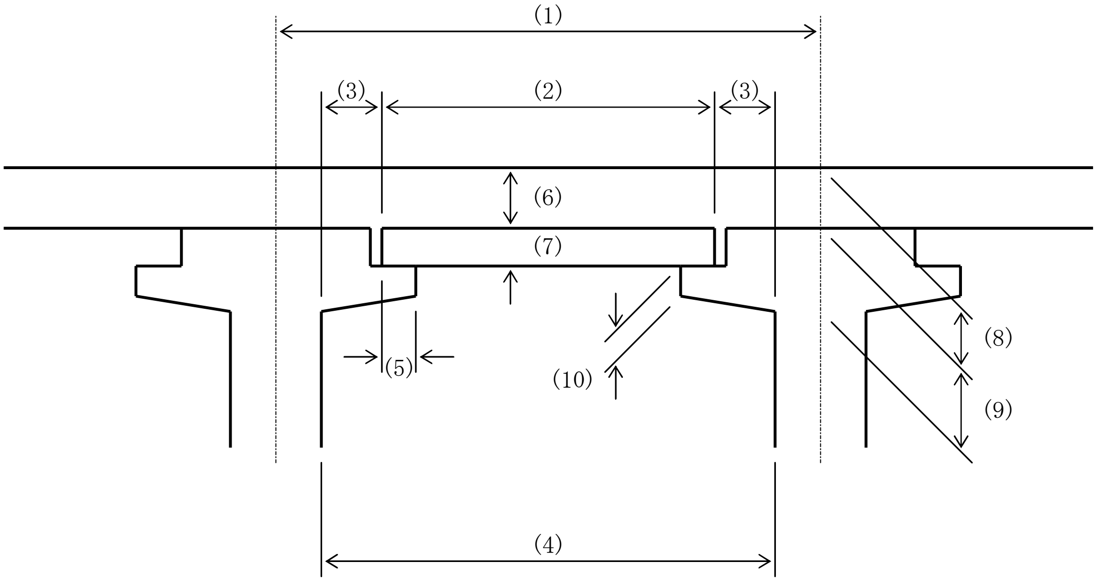
(m)


11.750
G1
G2
G3
G4
3.500
3.501
3.500
3.917
3.917
3.917
325.00 (kN)
AASHTO-LRFD LOAD TRACK-LOAD
3.917
3.917
3.917
220.00 (kN)
AASHTO-LRFD LOAD TANDEM-LOAD
3.000
0.917
3.000
0.917
3.000
0.917
3.10 (kN/m2)
AASHTO-LRFD LOAD DISPERSION-LOAD
3.917
3.917
3.917
325.00 (kN)
AASHTO-LRFD Twin LOAD
Truck
3.917
3.917
3.917
220.00 (kN)
AASHTO-LRFD Twin LOAD
Tandem
3.000
0.917
3.000
0.917
3.000
0.917
3.10 (kN/m2)
AASHTO-LRFD Twin LOAD
Distribution Load
3.625
4.500
0.001
3.625
16.33 (kN/m2)
Particular Load(P1 Load)
3.625
4.500
0.001
3.625
Particular Load(P2 Load)

3 Design of Deck Slab

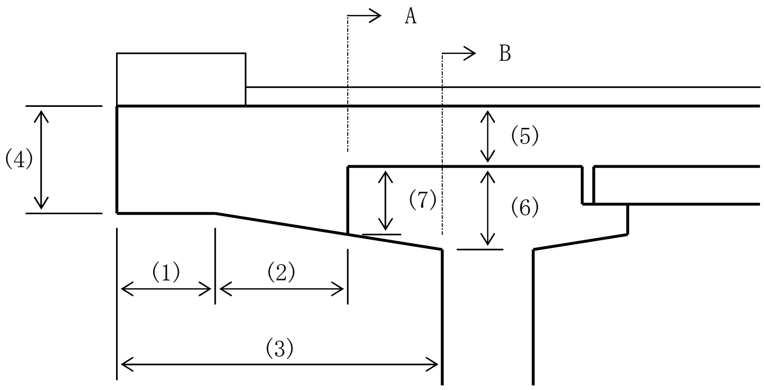
3.1 Dimension

1) Deck Slab between Girders



		1st Span		2nd Span	
		End of Girder	Center of Girder	Center of Girder	End of Girder
(1)	m	3.500	3.500	3.500	3.500
(2)	m	2.380	2.380	2.380	2.380
(3)	m	0.210	0.450	0.450	0.210
(4)	m	2.800	3.280	3.280	2.800
(5)	m	0.090	0.090	0.090	0.090
Span Length of PC Plate	m	2.260	2.260	2.260	2.260
(6)	mm	170.0	170.0	170.0	170.0
(7)	mm	100.0	100.0	100.0	100.0
(6)+(7)	mm	270.0	270.0	270.0	270.0
(8)	mm	170.0	170.0	170.0	170.0
(9)	mm	255.6	300.0	300.0	255.6
(10)	mm	100.0	100.0	100.0	100.0

2) Deck Slab outside of Girders



			1st Span		2nd Span	
			End of Girder	Center of Girder	Center of Girder	End of Girder
Left Side	(1)	m	0.000	0.000	0.000	0.000
	(2)	m	0.648	0.648	0.648	0.648
	(3)	m	0.948	1.188	1.188	0.948
	(4)	mm	250.0	250.0	250.0	250.0
	(5)	mm	170.0	170.0	170.0	170.0
	(6)	mm	255.6	300.0	300.0	255.6
	(7)	mm	200.0	200.0	200.0	200.0
Right Side	(1)	m	0.000	0.000	0.000	0.000
	(2)	m	0.647	0.647	0.647	0.647
	(3)	m	0.947	1.187	1.187	0.947
	(4)	mm	250.0	250.0	250.0	250.0
	(5)	mm	170.0	170.0	170.0	170.0
	(6)	mm	255.6	300.0	300.0	255.6
	(7)	mm	200.0	200.0	200.0	200.0

3) Calculation of Prestressing of PC Plate

		Unit	
Name of PC Strand			1S9.3
Material of PC Strand			SWPR7AL
Area of PC Strand		mm^2/no.	51.61
Number of PC Strand		No.	15
Creep Coefficient			3.00
Drying Shrinkage of Concrete		$\times 10^{-5}$	25.00
Relaxation	Before Prestressing	%	1.50
	Extra Coefficient of High Temperature	%	1.00
	After Prestressing	%	1.50
Prestressing Stress σpi		N/mm^2	1225.00
Allowable Value		N/mm^2	1305.00

<Design of Deck: Summary for Calculation Results of Stress>

1st Span, Left End of Girder Side

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5	9.17	○
	Bottom of PC Plate	N/mm^2	～19.0	8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0	10.585	○
	Bottom of PC Plate	N/mm^2	～15.0	3.692	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	3.545	○
	Bottom of RC Deck	N/mm^2		-0.814	○
	Top of PC Plate	N/mm^2	0	8.343	○
	Bottom of PC Plate	N/mm^2	～15.0	1.292	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	922.098	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.592	○	140	74.665	○
Edge of PC Plate	Positive Moment	10	3.917	○	140	60.859	○
	Negative Moment	10	3.797	○	140	79.511	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	8.659	○	140	100.221	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	0.56	○
Tensile Stress of Reinforcement Bar	140	27.98	○

<Design of Deck: Summary for Calculation Results of Stress>

1st Span， Left End of Girder Side

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	8.904	○
	D+L	10	0.34	○	140	8.904	○
	D+L+CO	15	2.177	○	300	57.047	○
	D+L+W	12.5	0.485	○	175	12.702	○
	D+W	12.5	0.63	○	175	16.501	○
Supporting for Deck	D	------	------	--	100	13.854	○
	D+L	10	3.942	○	140	113.551	○
	D+L+CO	15	5.395	○	300	155.381	○
	D+L+W	12.5	4.058	○	175	116.893	○
	D+W	12.5	0.713	○	175	20.538	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	9.709	○
	D+L	10	0.37	○	140	9.709	○
	D+L+CO	15	2.208	○	300	57.852	○
	D+L+W	12.5	0.515	○	175	13.507	○
	D+W	12.5	0.66	○	175	17.306	○
Supporting for Deck	D	------	------	--	100	15.057	○
	D+L	10	3.975	○	140	114.505	○
	D+L+CO	15	5.428	○	300	156.334	○
	D+L+W	12.5	4.092	○	175	117.847	○
	D+W	12.5	0.755	○	175	21.741	○

Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	1.932	○	140	69.85	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	1.93	○	140	69.784	○

<Design of Deck: Summary for Calculation Results of Stress>

1st Span, Center of Span

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5 ～19.0	9.17	○
	Bottom of PC Plate	N/mm^2		8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0 ～15.0	10.591	○
	Bottom of PC Plate	N/mm^2		3.699	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	4.245	○
	Bottom of RC Deck	N/mm^2		-0.975	○
	Top of PC Plate	N/mm^2	0 ～15.0	8.171	○
	Bottom of PC Plate	N/mm^2		0.561	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	922.979	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.565	○	140	78.898	○
Edge of PC Plate	Positive Moment	10	6.742	○	140	104.756	○
	Negative Moment	10	3.279	○	140	68.659	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	9.958	○	140	115.254	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	1.002	○
Tensile Stress of Reinforcement Bar	140	55.499	○

<Design of Deck: Summary for Calculation Results of Stress>

1st Span， Center of Span

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	8.893	○
	D+L	10	0.339	○	140	8.893	○
	D+L+CO	15	2.176	○	300	57.036	○
	D+L+W	12.5	0.484	○	175	12.692	○
	D+W	12.5	0.629	○	175	16.49	○
Supporting for Deck	D	------	------	--	100	17.242	○
	D+L	10	2.541	○	140	78.134	○
	D+L+CO	15	3.776	○	300	116.118	○
	D+L+W	12.5	2.64	○	175	81.197	○
	D+W	12.5	0.76	○	175	23.37	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	9.709	○
	D+L	10	0.37	○	140	9.709	○
	D+L+CO	15	2.208	○	300	57.852	○
	D+L+W	12.5	0.515	○	175	13.507	○
	D+W	12.5	0.66	○	175	17.306	○
Supporting for Deck	D	------	------	--	100	19.295	○
	D+L	10	2.606	○	140	80.143	○
	D+L+CO	15	3.841	○	300	118.128	○
	D+L+W	12.5	2.706	○	175	83.207	○
	D+W	12.5	0.827	○	175	25.422	○

Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	2.367	○	140	85.595	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	2.365	○	140	85.53	○

<Design of Deck: Summary for Calculation Results of Stress>

2nd Span, Center of Span

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5	9.17	○
	Bottom of PC Plate	N/mm^2	～19.0	8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0	10.591	○
	Bottom of PC Plate	N/mm^2	～15.0	3.699	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	4.245	○
	Bottom of RC Deck	N/mm^2		-0.975	○
	Top of PC Plate	N/mm^2	0	8.171	○
	Bottom of PC Plate	N/mm^2	～15.0	0.561	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	922.979	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.565	○	140	78.898	○
Edge of PC Plate	Positive Moment	10	6.742	○	140	104.756	○
	Negative Moment	10	3.279	○	140	68.659	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	9.958	○	140	115.254	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	1.002	○
Tensile Stress of Reinforcement Bar	140	55.499	○

<Design of Deck: Summary for Calculation Results of Stress>

2nd Span,　Center of Span

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	9.289	○
	D+L	10	0.354	○	140	9.289	○
	D+L+CO	15	2.192	○	300	57.432	○
	D+L+W	12.5	0.499	○	175	13.088	○
	D+W	12.5	0.644	○	175	16.886	○
Supporting for Deck	D	------	------	--	100	17.912	○
	D+L	10	2.562	○	140	78.804	○
	D+L+CO	15	3.798	○	300	116.788	○
	D+L+W	12.5	2.662	○	175	81.867	○
	D+W	12.5	0.782	○	175	24.04	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	9.582	○
	D+L	10	0.366	○	140	9.582	○
	D+L+CO	15	2.203	○	300	57.725	○
	D+L+W	12.5	0.511	○	175	13.381	○
	D+W	12.5	0.656	○	175	17.179	○
Supporting for Deck	D	------	------	--	100	19.088	○
	D+L	10	2.599	○	140	79.937	○
	D+L+CO	15	3.834	○	300	117.921	○
	D+L+W	12.5	2.699	○	175	83.001	○
	D+W	12.5	0.82	○	175	25.216	○

Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	2.367	○	140	85.595	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	2.365	○	140	85.53	○

<Design of Deck: Summary for Calculation Results of Stress>

2nd Span， Right End of Girder Side

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5	9.17	○
	Bottom of PC Plate	N/mm^2	～19.0	8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0	10.585	○
	Bottom of PC Plate	N/mm^2	～15.0	3.692	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	3.545	○
	Bottom of RC Deck	N/mm^2		-0.814	○
	Top of PC Plate	N/mm^2	0	8.343	○
	Bottom of PC Plate	N/mm^2	～15.0	1.292	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	922.098	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.592	○	140	74.665	○
Edge of PC Plate	Positive Moment	10	3.917	○	140	60.859	○
	Negative Moment	10	3.797	○	140	79.511	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	8.659	○	140	100.221	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	0.56	○
Tensile Stress of Reinforcement Bar	140	27.98	○

<Design of Deck: Summary for Calculation Results of Stress>

2nd Span, Right End of Girder Side

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	9.302	○
	D+L	10	0.355	○	140	9.302	○
	D+L+CO	15	2.192	○	300	57.445	○
	D+L+W	12.5	0.5	○	175	13.101	○
	D+W	12.5	0.645	○	175	16.9	○
Supporting for Deck	D	------	------	--	100	14.482	○
	D+L	10	3.964	○	140	114.179	○
	D+L+CO	15	5.416	○	300	156.009	○
	D+L+W	12.5	4.08	○	175	117.521	○
	D+W	12.5	0.735	○	175	21.166	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	9.582	○
	D+L	10	0.366	○	140	9.582	○
	D+L+CO	15	2.203	○	300	57.725	○
	D+L+W	12.5	0.511	○	175	13.381	○
	D+W	12.5	0.656	○	175	17.179	○
Supporting for Deck	D	------	------	--	100	14.88	○
	D+L	10	3.969	○	140	114.329	○
	D+L+CO	15	5.422	○	300	156.158	○
	D+L+W	12.5	4.085	○	175	117.671	○
	D+W	12.5	0.749	○	175	21.564	○

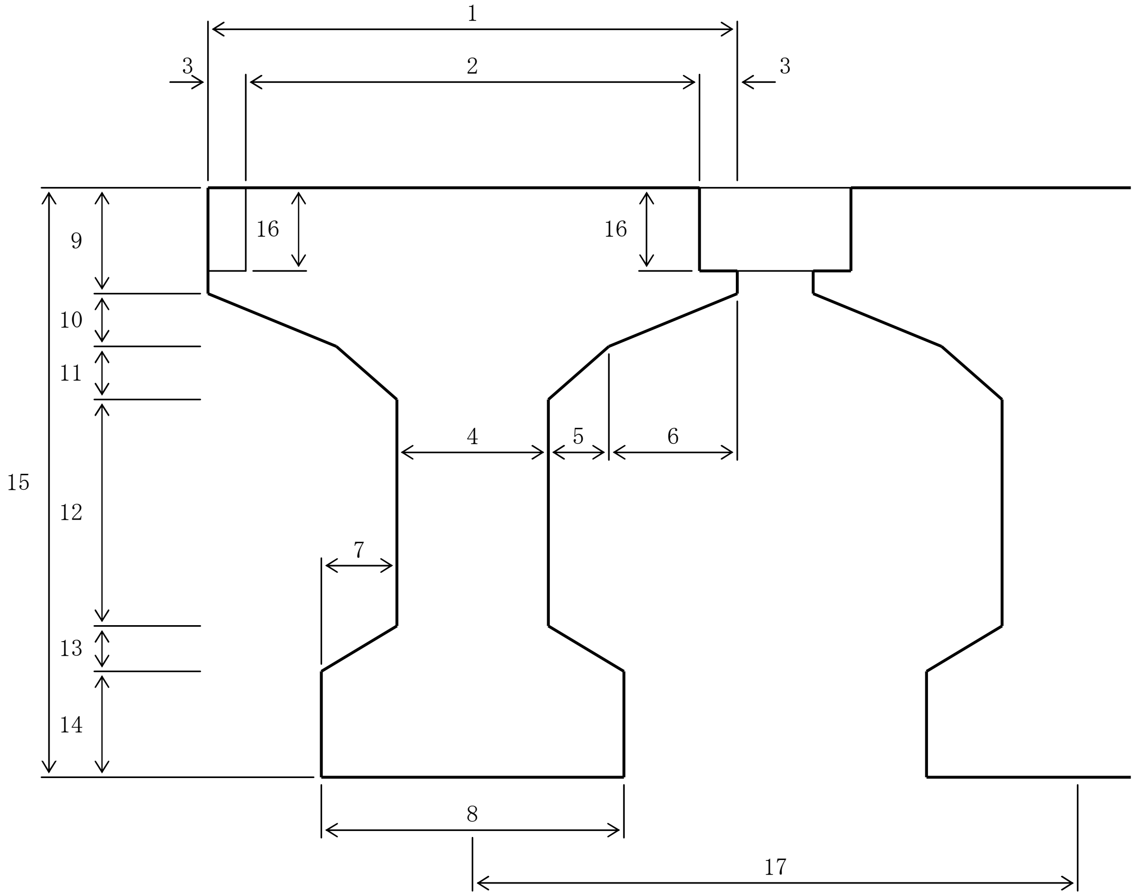
Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	1.932	○	140	69.85	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	1.93	○	140	69.784	○

4 Design of Main Girder

4.1 Dimension and PC Strand Arrangement

1) Dimension



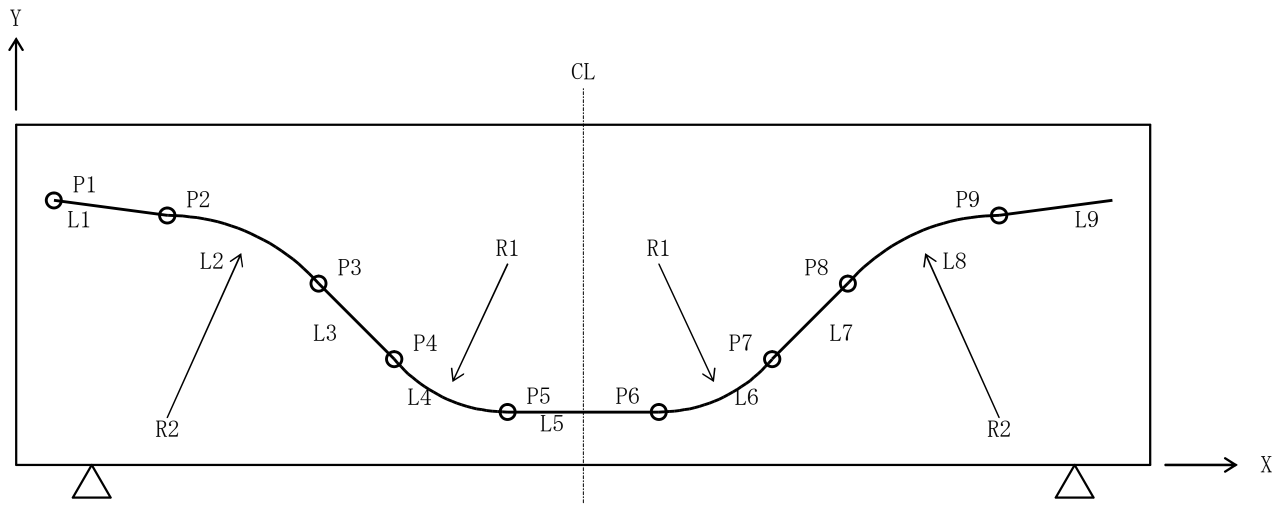
(Unit: mm)

	1st Span			2nd Span		
	End of Girder (Left)	Center Span	End of Girder (Left)	Center Span	End of Girder (Left)	Center Span
1	1300.0	1300.0	1300.0	1300.0	1300.0	1300.0
2	1060.0	1060.0	1060.0	1060.0	1060.0	1060.0
3	120.0	120.0	120.0	120.0	120.0	120.0
4	700.0	220.0	700.0	700.0	220.0	700.0
5	0.0	0.0	0.0	0.0	0.0	0.0
6	300.0	540.0	300.0	300.0	540.0	300.0
7	0.0	240.0	0.0	0.0	240.0	0.0
8	700.0	700.0	700.0	700.0	700.0	700.0
9	200.0	200.0	200.0	200.0	200.0	200.0
10	55.6	100.0	55.6	55.6	100.0	55.6
11	0.0	0.0	0.0	0.0	0.0	0.0
12	1444.4	1150.0	1444.4	1444.4	1150.0	1444.4
13	0.0	250.0	0.0	0.0	250.0	0.0
14	200.0	200.0	200.0	200.0	200.0	200.0
15	1900.0	1900.0	1900.0	1900.0	1900.0	1900.0
16	100.0	100.0	100.0	100.0	100.0	100.0
17	3500.0	3500.0	3500.0	3500.2	3500.2	3500.2

2) PC Strand Arrangement

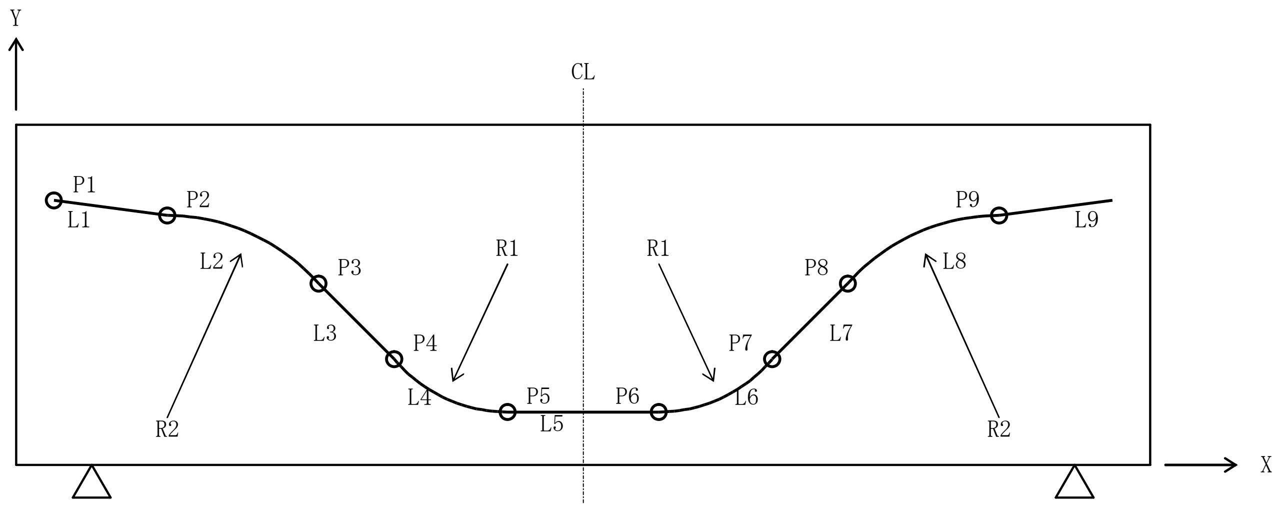
<1st Span>

PC Strand No.			1	2	3	4	5
Number of PC Strand			1	1	1	1	1
Coordinate (mm)	P1	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
	P2	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
	P3	X	200.0	200.0	200.0	200.0	200.0
		Y	1650.0	1300.0	950.0	600.0	250.0
	P4	X	13119.0	10730.4	8341.8	4706.9	1710.7
		Y	406.0	286.0	166.0	166.0	144.4
	P5	X	14077.5	11688.9	9300.2	5665.3	2408.3
		Y	360.0	240.0	120.0	120.0	120.0
	P6	X	16290.4	18163.6	20036.8	22887.4	25709.1
		Y	360.0	240.0	120.0	120.0	120.0
	P7	X	17509.1	19382.3	21255.5	24106.1	26667.6
		Y	434.5	314.5	194.5	194.5	166.0
	P8	X	26801.2	26801.2	26801.2	26801.2	27061.4
		Y	1575.5	1225.5	875.5	525.5	204.0
	P9	X	28019.9	28019.9	28019.9	28019.9	28019.9
		Y	1650.0	1300.0	950.0	600.0	250.0
	P10	X	29819.9	29819.9	29819.9	29819.9	29819.9
		Y	1650.0	1300.0	950.0	600.0	250.0
Angle	α	(L)	5°30'0"	5°30'0"	5°30'0"	5°30'0"	4°0'0"
		(R)	0°0'0"	0°0'0"	0°0'0"	0°0'0"	0°0'0"
Radius (m)	R2	(L)	----------	----------	----------	----------	----------
	R1	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(R)	10.000	10.000	10.000	10.000	10.000
	R2	(R)	10.000	10.000	10.000	10.000	10.000
Angle	β	(L)	----------	----------	----------	----------	----------
		(R)	7°0'0"	7°0'0"	7°0'0"	7°0'0"	5°30'0"
Length of PC Strand (m)	L1		----------	----------	----------	----------	----------
	L2		----------	----------	----------	----------	----------
	L3		12.979	10.579	8.179	4.528	1.514
	L4		0.960	0.960	0.960	0.960	0.698
	L5		2.213	6.475	10.737	17.222	23.301
	L6		1.222	1.222	1.222	1.222	0.960
	L7		9.362	7.475	5.587	2.715	0.396
	L8		1.222	1.222	1.222	1.222	0.960
	L9		1.800	1.800	1.800	1.800	1.800
	Total		29.757	29.732	29.707	29.669	29.629



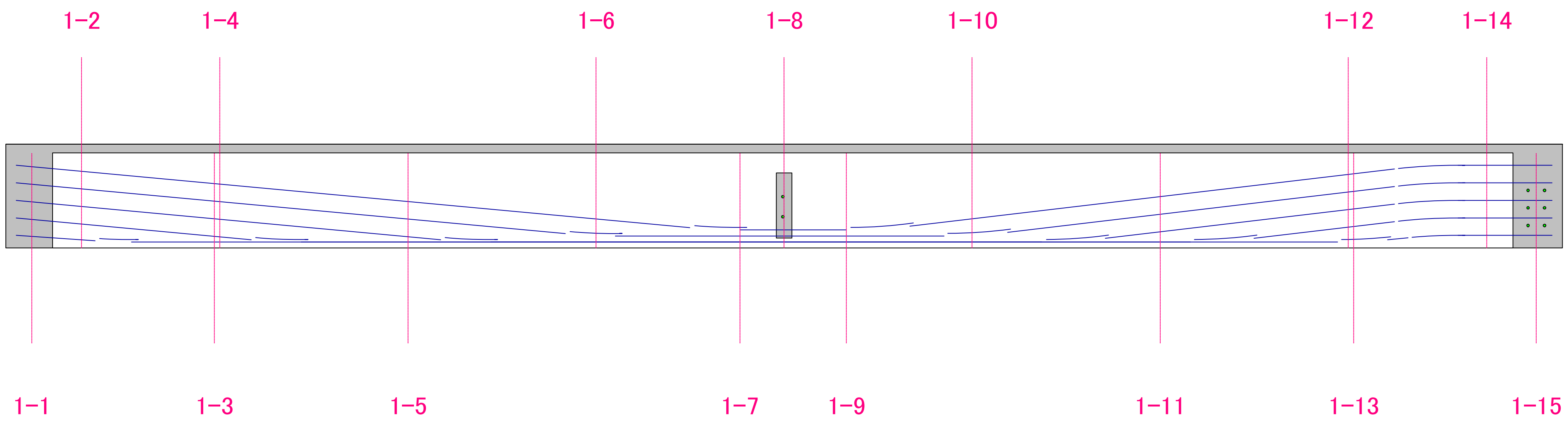
<2nd Span>

PC Strand No.			1	2	3	4	5
Number of PC Strand			1	1	1	1	1
Coordinate (mm)	P1	X	200.0	200.0	200.0	200.0	200.0
		Y	1650.0	1300.0	950.0	600.0	250.0
	P2	X	2000.0	2000.0	2000.0	2000.0	2000.0
		Y	1650.0	1300.0	950.0	600.0	250.0
	P3	X	3218.7	3218.7	3218.7	3218.7	2958.5
		Y	1575.5	1225.5	875.5	525.5	204.0
	P4	X	12510.8	10637.6	8764.4	5913.8	3352.3
		Y	434.5	314.5	194.5	194.5	166.0
	P5	X	13729.5	11856.3	9983.1	7132.5	4310.8
		Y	360.0	240.0	120.0	120.0	120.0
	P6	X	16016.0	18404.6	20793.3	24428.1	27685.2
		Y	360.0	240.0	120.0	120.0	120.0
	P7	X	16974.4	19363.1	21751.7	25386.6	28382.7
		Y	406.0	286.0	166.0	166.0	144.4
	P8	X	29893.5	29893.5	29893.5	29893.5	29893.5
		Y	1650.0	1300.0	950.0	600.0	250.0
	P9	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
	P1	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
Angle	α	(L)	0°0'0"	0°0'0"	0°0'0"	0°0'0"	0°0'0"
		(R)	5°30'0"	5°30'0"	5°30'0"	5°30'0"	4°0'0"
Radius (m)	R2	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(R)	10.000	10.000	10.000	10.000	10.000
	R2	(R)	----------	----------	----------	----------	----------
Angle	β	(L)	7°0'0"	7°0'0"	7°0'0"	7°0'0"	5°30'0"
		(R)	----------	----------	----------	----------	----------
Length of PC Strand (m)	L1		1.800	1.800	1.800	1.800	1.800
	L2		1.222	1.222	1.222	1.222	0.960
	L3		9.362	7.475	5.587	2.715	0.396
	L4		1.222	1.222	1.222	1.222	0.960
	L5		2.287	6.548	10.810	17.296	23.374
	L6		0.960	0.960	0.960	0.960	0.698
	L7		12.979	10.579	8.179	4.528	1.514
	L8		----------	----------	----------	----------	----------
	L9		----------	----------	----------	----------	----------
	Total		29.831	29.805	29.780	29.742	29.702



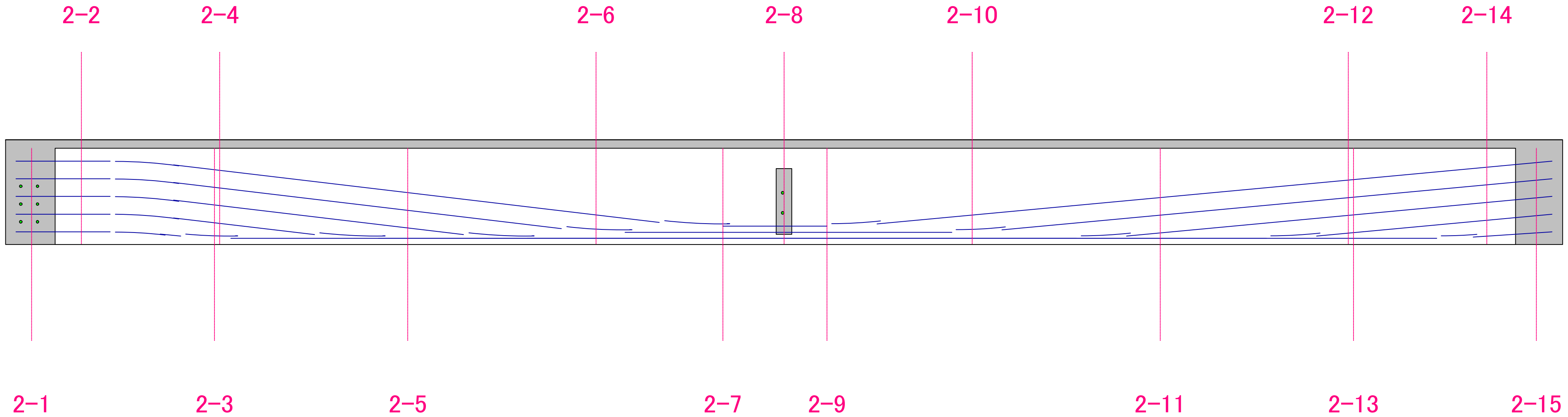
4.4 Summary for Calculation Results of Stress

1) PF5-PF6



	Unit	Allowable Value		Cross Section Number		
Calculation for Bending Moment				[1- 7] Bent up Point(Left)	[1- 8] Center of Span	[1- 9] Bent up Point(Right)
Bending Stress of Concrete						
Immediately After Prestressing	N/mm^2	-1.5～19.00	Top of Main Girder	0.79	0.83	0.81
			Bottom of Main Girder	15.05	14.95	14.89
During Deck Construction	〃	-1.5～14.00	Top of Main Girder	6.35	6.42	6.34
			Bottom of Main Girder	7.02	6.88	6.91
Dead Load	〃	≦10.00	Top of Deck	2.82	2.86	2.81
		0～14.00	Top of Main Girder	5.32	5.38	5.31
			Bottom of Main Girder	3.05	2.88	2.93
Design Load	〃	≦10.00	Top of Deck max	4.37	4.38	4.27
			Top of Deck min	2.45	2.47	2.39
		-1.5～14.00	Top of Main Girder(max)	6.60	6.63	6.52
			Bottom of Main Girder(max)	-0.55	-0.65	-0.48
			Top of Main Girder(min)	5.02	5.06	4.96
			Bottom of Main Girder(min)	3.90	3.80	3.92
Stress of PC Strand	N/mm^2	Pmax≦1110		1054	1051	1041
Ultimate Load	-----	F≧1.0		1.16	1.16	1.19
Calculation for Shear Force				[1- 2] Near a Support of girder(Left)	[1- 3] Change point of Web Width(Left)	[1-14] Near a Support of girder(Right)
Shear Stress of Design Load	kN			0.55	1.28	1.05
Compressive Strength to Failure	-----	F≧1.0		3.85	1.81	3.01
Diagonal Tensile Stress — Dead Load	N/mm^2	≧ -1		-0.04	-0.11	-0.24
Diagonal Tensile Stress — Design Load	〃	≧ -2		-0.17	-0.49	-0.44

2) PF6-PF7



	Unit	Allowable Value		Cross Section Number		
Calculation for Bending Moment				[2- 7] Bent up Point(Left)	[2- 8] Center of Span	[2- 9] Bent up Point(Right)
Bending Stress of Concrete						
Immediately After Prestressing	N/mm^2	-1.5～19.00	Top of Main Girder	0.83	0.86	0.82
			Bottom of Main Girder	14.86	14.91	15.03
During Deck Construction	〃	-1.5～14.00	Top of Main Girder	6.38	6.47	6.40
			Bottom of Main Girder	6.85	6.82	6.96
Dead Load	〃	≦10.00	Top of Deck	2.88	2.94	2.89
		0～14.00	Top of Main Girder	5.39	5.46	5.40
			Bottom of Main Girder	2.76	2.71	2.88
Design Load	〃	≦10.00	Top of Deck max	4.35	4.46	4.44
			Top of Deck min	2.46	2.55	2.53
		-1.5～14.00	Top of Main Girder(max)	6.60	6.71	6.68
			Bottom of Main Girder(max)	-0.65	-0.83	-0.73
			Top of Main Girder(min)	5.04	5.14	5.10
			Bottom of Main Girder(min)	3.75	3.62	3.73
Stress of PC Strand	N/mm^2	Pmax≦1110		1043	1053	1057
Ultimate Load	-----	F≧1.0		1.18	1.15	1.15
Calculation for Shear Force				[2- 2] Near a Support of girder(Left)	[2-13] Change point of Web Width(Right)	[2-14] Near a Support of girder(Right)
Shear Stress of Design Load	kN			1.06	1.30	0.56
Compressive Strength to Failure	-----	F≧1.0		2.98	1.80	3.82
Diagonal Tensile Stress — Dead Load	N/mm^2	≧ -1		-0.24	-0.12	-0.04
Diagonal Tensile Stress — Design Load	〃	≧ -2		-0.45	-0.50	-0.17

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 3

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder			------	0.500		1.450		4.000	
Immediately After Prestressing	Top of Main Girder		-1.5	2.971	○	2.773	○	3.788	○
	Bottom of Main Girder		～19.00	5.077	○	6.014	○	11.151	○
During Deck Construction	Top of Main Girder		-1.5	2.819	○	3.211	○	5.838	○
	Bottom of Main Girder		～14.00	4.817	○	5.014	○	7.557	○
Dead Load	Top of Deck		≦10.00	0.275	○	0.554	○	1.399	○
	Top of Main Girder		0	2.120	○	2.490	○	4.339	○
	Bottom of Main Girder		～14.00	4.786	○	4.681	○	5.852	○
Design Load1	Top of Deck	Max	≦10.00	0.275	○	0.829	○	2.291	○
		Min		0.275	○	0.529	○	1.304	○
	Top of Main	Max		2.120	○	2.727	○	5.073	○
	Girder	Min	-1.5	2.120	○	2.468	○	4.260	○
	Bottom of	Max	～14.00	4.786	○	4.177	○	3.751	○
	Main Girder	Min		4.786	○	4.728	○	6.078	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	0.793	○	1.354	○	2.794	○
		Min		0.793	○	1.054	○	1.806	○
	Top of Main	Max		1.263	○	1.874	○	4.179	○
	Girder	Min	-2	1.263	○	1.615	○	3.366	○
	Bottom of	Max	～16.10	5.260	○	4.614	○	3.967	○
	Main Girder	Min		5.260	○	5.165	○	6.294	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	0.793	○	1.354	○	2.794	○
		Min		0.793	○	1.054	○	1.806	○
	Top of Main	Max		1.263	○	1.874	○	4.179	○
	Girder	Min	-2	1.263	○	1.615	○	3.366	○
	Bottom of	Max	～16.10	5.260	○	4.614	○	3.967	○
	Main Girder	Min		5.260	○	5.165	○	6.294	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	0.275	○	0.829	○	2.291	○
		Min		0.275	○	0.529	○	1.304	○
	Top of Main	Max		2.120	○	2.727	○	5.073	○
	Girder	Min	-1.5	2.120	○	2.468	○	4.260	○
	Bottom of	Max	～14.00	4.786	○	4.177	○	3.751	○
	Main Girder	Min		4.786	○	4.728	○	6.078	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	0.793	○	1.354	○	2.794	○
		Min		0.793	○	1.054	○	1.806	○
	Top of Main	Max		1.263	○	1.874	○	4.179	○
	Girder	Min	-2	1.263	○	1.615	○	3.366	○
	Bottom of	Max	～16.10	5.260	○	4.614	○	3.967	○
	Main Girder	Min		5.260	○	5.165	○	6.294	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	0.793	○	1.354	○	2.794	○
		Min		0.793	○	1.054	○	1.806	○
	Top of Main	Max		1.263	○	1.874	○	4.179	○
	Girder	Min	-2	1.263	○	1.615	○	3.366	○
	Bottom of	Max	～16.10	5.260	○	4.614	○	3.967	○
	Main Girder	Min		5.260	○	5.165	○	6.294	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 3

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder			------	4.127		7.755		11.382	
Immediately After Prestressing	Top of Main Girder		-1.5	3.726	○	2.202	○	1.011	○
	Bottom of Main Girder		～19.00	11.236	○	13.445	○	15.034	○
During Deck Construction	Top of Main Girder		-1.5	5.853	○	6.166	○	6.156	○
	Bottom of Main Girder		～14.00	7.545	○	7.420	○	7.492	○
Dead Load	Top of Deck		≦10.00	1.427	○	2.106	○	2.548	○
	Top of Main Girder		0	4.362	○	4.884	○	5.089	○
	Bottom of Main Girder		～14.00	5.795	○	4.572	○	3.850	○
Design Load1	Top of Deck	Max	≦10.00	2.344	○	3.514	○	4.113	○
		Min		1.328	○	1.909	○	2.254	○
	Top of Main Girder	Max	-1.5	5.116	○	6.045	○	6.379	○
		Min		4.280	○	4.722	○	4.846	○
	Bottom of Main Girder	Max	～14.00	3.635	○	1.276	○	0.203	○
		Min		6.028	○	5.033	○	4.534	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	2.850	○	4.096	○	4.769	○
		Min		1.834	○	2.490	○	2.910	○
	Top of Main Girder	Max	-2	4.225	○	5.216	○	5.612	○
		Min		3.389	○	3.893	○	4.079	○
	Bottom of Main Girder	Max	～16.10	3.845	○	1.309	○	0.063	○
		Min		6.238	○	5.067	○	4.394	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	2.850	○	4.096	○	4.769	○
		Min		1.834	○	2.490	○	2.910	○
	Top of Main Girder	Max	-2	4.225	○	5.216	○	5.612	○
		Min		3.389	○	3.893	○	4.079	○
	Bottom of Main Girder	Max	～16.10	3.845	○	1.309	○	0.063	○
		Min		6.238	○	5.067	○	4.394	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.344	○	3.514	○	4.113	○
		Min		1.328	○	1.909	○	2.254	○
	Top of Main Girder	Max	-1.5	5.116	○	6.045	○	6.379	○
		Min		4.280	○	4.722	○	4.846	○
	Bottom of Main Girder	Max	～14.00	3.635	○	1.276	○	0.203	○
		Min		6.028	○	5.033	○	4.534	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	2.850	○	4.096	○	4.769	○
		Min		1.834	○	2.490	○	2.910	○
	Top of Main Girder	Max	-2	4.225	○	5.216	○	5.612	○
		Min		3.389	○	3.893	○	4.079	○
	Bottom of Main Girder	Max	～16.10	3.845	○	1.309	○	0.063	○
		Min		6.238	○	5.067	○	4.394	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	2.850	○	4.096	○	4.769	○
		Min		1.834	○	2.490	○	2.910	○
	Top of Main Girder	Max	-2	4.225	○	5.216	○	5.612	○
		Min		3.389	○	3.893	○	4.079	○
	Bottom of Main Girder	Max	～16.10	3.845	○	1.309	○	0.063	○
		Min		6.238	○	5.067	○	4.394	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 3

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder			------	14.078		15.010		16.290	
Immediately After Prestressing	Top of Main Girder		-1.5	0.792	○	0.831	○	0.807	○
	Bottom of Main Girder		～19.00	15.054	○	14.947	○	14.894	○
During Deck Construction	Top of Main Girder		-1.5	6.354	○	6.422	○	6.336	○
	Bottom of Main Girder		～14.00	7.017	○	6.884	○	6.909	○
Dead Load	Top of Deck		≦10.00	2.820	○	2.861	○	2.811	○
	Top of Main Girder		0	5.323	○	5.380	○	5.314	○
	Bottom of Main Girder		～14.00	3.048	○	2.882	○	2.927	○
Design Load1	Top of Deck	Max	≦10.00	4.365	○	4.377	○	4.274	○
		Min		2.453	○	2.468	○	2.385	○
	Top of Main Girder	Max	-1.5	6.598	○	6.632	○	6.521	○
		Min		5.020	○	5.057	○	4.963	○
	Bottom of Main Girder	Max	～14.00	-0.547	○	-0.648	○	-0.478	○
		Min		3.903	○	3.795	○	3.918	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	5.077	○	5.109	○	5.032	○
		Min		3.165	○	3.200	○	3.144	○
	Top of Main Girder	Max	-2	5.877	○	5.927	○	5.838	○
		Min		4.299	○	4.352	○	4.280	○
	Bottom of Main Girder	Max	～16.10	-0.817	○	-0.962	○	-0.855	○
		Min		3.633	○	3.481	○	3.541	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	5.077	○	5.109	○	5.032	○
		Min		3.165	○	3.200	○	3.144	○
	Top of Main Girder	Max	-2	5.877	○	5.927	○	5.838	○
		Min		4.299	○	4.352	○	4.280	○
	Bottom of Main Girder	Max	～16.10	-0.817	○	-0.962	○	-0.855	○
		Min		3.633	○	3.481	○	3.541	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	4.365	○	4.377	○	4.274	○
		Min		2.453	○	2.468	○	2.385	○
	Top of Main Girder	Max	-1.5	6.598	○	6.632	○	6.521	○
		Min		5.020	○	5.057	○	4.963	○
	Bottom of Main Girder	Max	～14.00	-0.547	○	-0.648	○	-0.478	○
		Min		3.903	○	3.795	○	3.918	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	5.077	○	5.109	○	5.032	○
		Min		3.165	○	3.200	○	3.144	○
	Top of Main Girder	Max	-2	5.877	○	5.927	○	5.838	○
		Min		4.299	○	4.352	○	4.280	○
	Bottom of Main Girder	Max	～16.10	-0.817	○	-0.962	○	-0.855	○
		Min		3.633	○	3.481	○	3.541	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	5.077	○	5.109	○	5.032	○
		Min		3.165	○	3.200	○	3.144	○
	Top of Main Girder	Max	-2	5.877	○	5.927	○	5.838	○
		Min		4.299	○	4.352	○	4.280	○
	Bottom of Main Girder	Max	～16.10	-0.817	○	-0.962	○	-0.855	○
		Min		3.633	○	3.481	○	3.541	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span，Main Girder Number: G 3

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder			------	18.637		22.265		25.892	
Immediately After Prestressing	Top of Main Girder		-1.5	1.127	○	2.974	○	5.666	○
	Bottom of Main Girder		～19.00	14.415	○	12.169	○	8.605	○
During Deck Construction	Top of Main Girder		-1.5	6.254	○	6.866	○	7.653	○
	Bottom of Main Girder		～14.00	6.945	○	6.306	○	5.168	○
Dead Load	Top of Deck		≦10.00	2.609	○	2.305	○	1.862	○
	Top of Main Girder		0	5.184	○	5.370	○	5.506	○
	Bottom of Main Girder		～14.00	3.213	○	3.391	○	3.557	○
Design Load1	Top of Deck	Max	≦10.00	3.919	○	3.217	○	2.231	○
		Min		2.119	○	1.692	○	1.041	○
	Top of Main Girder	Max		6.265	○	6.121	○	5.809	○
		Min	-1.5	4.779	○	4.865	○	4.832	○
	Bottom of Main Girder	Max	～14.00	0.159	○	1.255	○	2.685	○
		Min		4.355	○	4.827	○	5.498	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	4.727	○	4.104	○	3.198	○
		Min		2.927	○	2.580	○	2.009	○
	Top of Main Girder	Max		5.623	○	5.544	○	5.297	○
		Min	-2	4.137	○	4.288	○	4.319	○
	Bottom of Main Girder	Max	～16.10	-0.334	○	0.571	○	1.801	○
		Min		3.862	○	4.143	○	4.614	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	4.727	○	4.104	○	3.198	○
		Min		2.927	○	2.580	○	2.009	○
	Top of Main Girder	Max		5.623	○	5.544	○	5.297	○
		Min	-2	4.137	○	4.288	○	4.319	○
	Bottom of Main Girder	Max	～16.10	-0.334	○	0.571	○	1.801	○
		Min		3.862	○	4.143	○	4.614	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	3.919	○	3.217	○	2.231	○
		Min		2.119	○	1.692	○	1.041	○
	Top of Main Girder	Max		6.265	○	6.121	○	5.809	○
		Min	-1.5	4.779	○	4.865	○	4.832	○
	Bottom of Main Girder	Max	～14.00	0.159	○	1.255	○	2.685	○
		Min		4.355	○	4.827	○	5.498	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	4.727	○	4.104	○	3.198	○
		Min		2.927	○	2.580	○	2.009	○
	Top of Main Girder	Max		5.623	○	5.544	○	5.297	○
		Min	-2	4.137	○	4.288	○	4.319	○
	Bottom of Main Girder	Max	～16.10	-0.334	○	0.571	○	1.801	○
		Min		3.862	○	4.143	○	4.614	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	4.727	○	4.104	○	3.198	○
		Min		2.927	○	2.580	○	2.009	○
	Top of Main Girder	Max		5.623	○	5.544	○	5.297	○
		Min	-2	4.137	○	4.288	○	4.319	○
	Bottom of Main Girder	Max	～16.10	-0.334	○	0.571	○	1.801	○
		Min		3.862	○	4.143	○	4.614	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 3

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder			------	26.020		28.569		29.519	
Immediately After Prestressing	Top of Main Girder		-1.5	5.765	○	3.829	○	3.065	○
	Bottom of Main Girder		～19.00	8.463	○	4.284	○	4.504	○
During Deck Construction	Top of Main Girder		-1.5	7.673	○	4.191	○	2.884	○
	Bottom of Main Girder		～14.00	5.125	○	3.406	○	4.299	○
Dead Load	Top of Deck		≦10.00	1.842	○	0.894	○	0.431	○
	Top of Main Girder		0	5.503	○	3.207	○	2.254	○
	Bottom of Main Girder		～14.00	3.567	○	3.080	○	4.048	○
Design Load1	Top of Deck	Max	≦10.00	2.195	○	0.976	○	0.438	○
		Min		1.003	○	-0.444	○	-1.157	○
	Top of Main Girder	Max	-1.5	5.793	○	3.278	○	2.260	○
		Min		4.813	○	2.050	○	0.872	○
	Bottom of Main Girder	Max	～14.00	2.732	○	2.929	○	4.036	○
		Min		5.553	○	5.547	○	6.867	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	3.165	○	2.062	○	1.550	○
		Min		1.973	○	0.643	○	-0.045	○
	Top of Main Girder	Max	-2	5.283	○	2.910	○	1.920	○
		Min		4.303	○	1.682	○	0.532	○
	Bottom of Main Girder	Max	～16.10	1.841	○	2.331	○	3.458	○
		Min		4.662	○	4.949	○	6.289	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	3.165	○	2.062	○	1.550	○
		Min		1.973	○	0.643	○	-0.045	○
	Top of Main Girder	Max	-2	5.283	○	2.910	○	1.920	○
		Min		4.303	○	1.682	○	0.532	○
	Bottom of Main Girder	Max	～16.10	1.841	○	2.331	○	3.458	○
		Min		4.662	○	4.949	○	6.289	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.195	○	0.976	○	0.438	○
		Min		1.003	○	-0.444	○	-1.157	○
	Top of Main Girder	Max	-1.5	5.793	○	3.278	○	2.260	○
		Min		4.813	○	2.050	○	0.872	○
	Bottom of Main Girder	Max	～14.00	2.732	○	2.929	○	4.036	○
		Min		5.553	○	5.547	○	6.867	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	3.165	○	2.062	○	1.550	○
		Min		1.973	○	0.643	○	-0.045	○
	Top of Main Girder	Max	-2	5.283	○	2.910	○	1.920	○
		Min		4.303	○	1.682	○	0.532	○
	Bottom of Main Girder	Max	～16.10	1.841	○	2.331	○	3.458	○
		Min		4.662	○	4.949	○	6.289	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	3.165	○	2.062	○	1.550	○
		Min		1.973	○	0.643	○	-0.045	○
	Top of Main Girder	Max	-2	5.283	○	2.910	○	1.920	○
		Min		4.303	○	1.682	○	0.532	○
	Bottom of Main Girder	Max	～16.10	1.841	○	2.331	○	3.458	○
		Min		4.662	○	4.949	○	6.289	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 3

Cross Section NumberNo.	Unit	Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder			0.500		1.450		4.000	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1163	○	1166	○	1173	○
Effective Prestressing Force (*1)	N/mm^2	1110	1103	○	1104	○	1090	○
Effective Prestressing Force (*2)	N/mm^2	1110	1031	○	1029	○	993	○
max	N/mm^2	1110	1031	○	1031	○	1011	○
Ultimate Load	------	1	1000	○	6	○	2	○

*1:During DeckConstruction　*2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder			4.127		7.755		11.382	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1174	○	1193	○	1196	○
Effective Prestressing Force (*1)	N/mm^2	1110	1090	○	1097	○	1091	○
Effective Prestressing Force (*2)	N/mm^2	1110	994	○	1008	○	1006	○
max	N/mm^2	1110	1012	○	1048	○	1064	○
Ultimate Load	------	1	2	○	1	○	1	○

*1:During DeckConstruction　*2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder			14.078		15.010		16.290	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1176	○	1172	○	1166	○
Effective Prestressing Force (*1)	N/mm^2	1110	1071	○	1068	○	1062	○
Effective Prestressing Force (*2)	N/mm^2	1110	991	○	988	○	981	○
max	N/mm^2	1110	1054	○	1051	○	1041	○
Ultimate Load	------	1	1	○	1	○	1	○

*1:During DeckConstruction　*2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder			18.637		22.265		25.892	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1162	○	1171	○	1159	○
Effective Prestressing Force (*1)	N/mm^2	1110	1060	○	1082	○	1082	○
Effective Prestressing Force (*2)	N/mm^2	1110	973	○	988	○	981	○
max	N/mm^2	1110	1024	○	1013	○	984	○
Ultimate Load	------	1	1	○	2	○	2	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder			26.020		28.569		29.519	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1157	○	1103	○	1099	○
Effective Prestressing Force (*1)	N/mm^2	1110	1081	○	1045	○	1043	○
Effective Prestressing Force (*2)	N/mm^2	1110	980	○	968	○	967	○
max	N/mm^2	1110	982	○	965	○	963	○
Ultimate Load	------	1	2	○	3	○	2	○

*1:During DeckConstruction *2:Design Load

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder				------	0.500		1.450		4.000	
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	------	--	0.55	△	1.28	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	------	--	-0.03	○	-0.11	○
	Neutral Axis before Composition				------	--	-0.04	○	-0.10	○
	Neutral Axis after Composition				------	--	-0.04	○	-0.11	○
	Base of Lower Flange				------	--	-0.01	○	-0.06	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	------	--	-0.14	○	-0.46	○
		Min			------	--	-0.03	○	-0.09	○
	Neutral Axis before Composition	Max			------	--	-0.15	○	-0.47	○
		Min			------	--	-0.03	○	-0.09	○
	Neutral Axis after Composition	Max			------	--	-0.17	○	-0.49	○
		Min			------	--	-0.04	○	-0.09	○
	Base of Lower Flange	Max			------	--	-0.02	○	-0.33	○
		Min			------	--	0.00	○	-0.05	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	23.25	--
	D16		cm	------	------	--	31.62	--	36.45	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	------	--	0.19	--	9.53	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	------	--	3.85	○	1.81	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	1.402	○	1.00	○
	D16				------	--	1.402	○	1.00	○
	D19				------	--	1.459	○	1.14	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	------	--	0.55	△	1.28	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	------	--	-0.03	○	-0.11	○
	Neutral Axis before Composition				------	--	-0.04	○	-0.10	○
	Neutral Axis after Composition				------	--	-0.04	○	-0.11	○
	Base of Lower Flange				------	--	-0.01	○	-0.06	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	------	--	-0.14	○	-0.46	○
		Min			------	--	-0.03	○	-0.09	○
	Neutral Axis before Composition	Max			------	--	-0.15	○	-0.47	○
		Min			------	--	-0.03	○	-0.09	○
	Neutral Axis after Composition	Max			------	--	-0.17	○	-0.49	○
		Min			------	--	-0.04	○	-0.09	○
	Base of Lower Flange	Max			------	--	-0.02	○	-0.33	○
		Min			------	--	0.00	○	-0.05	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	23.25	--
	D16		cm	------	------	--	31.62	--	36.45	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	------	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder				------	4.127		7.755		11.382	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.26	△	0.87	△	0.68	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.10	○	-0.04	○	-0.02	○
	Neutral Axis before Composition				-0.10	○	-0.04	○	-0.03	○
	Neutral Axis after Composition				-0.11	○	-0.04	○	-0.03	○
	Base of Lower Flange				-0.06	○	-0.02	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.44	○	-0.21	○	-0.12	○
		Min			-0.08	○	-0.01	○	0.00	○
	Neutral Axis before Composition	Max			-0.46	○	-0.25	○	-0.17	○
		Min			-0.08	○	-0.01	○	0.00	○
	Neutral Axis after Composition	Max			-0.47	○	-0.23	○	-0.15	○
		Min			-0.09	○	-0.01	○	0.00	○
	Base of Lower Flange	Max			-0.33	○	-0.24	○	-0.21	○
		Min			-0.05	○	-0.01	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	23.76	--	40.00	--	40.00	--
	D16		cm	------	37.24	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	9.33	--	5.14	--	2.03	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.84	○	2.48	○	3.64	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.00	○	1.026	○	1.36	○
	D16				1.00	○	1.231	○	1.68	○
	D19				1.15	○	1.482	○	2.07	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.26	△	0.87	△	0.68	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.10	○	-0.04	○	-0.02	○
	Neutral Axis before Composition				-0.10	○	-0.04	○	-0.03	○
	Neutral Axis after Composition				-0.11	○	-0.04	○	-0.03	○
	Base of Lower Flange				-0.06	○	-0.02	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.44	○	-0.21	○	-0.12	○
		Min			-0.08	○	-0.01	○	0.00	○
	Neutral Axis before Composition	Max			-0.46	○	-0.25	○	-0.17	○
		Min			-0.08	○	-0.01	○	0.00	○
	Neutral Axis after Composition	Max			-0.47	○	-0.23	○	-0.15	○
		Min			-0.09	○	-0.01	○	0.00	○
	Base of Lower Flange	Max			-0.33	○	-0.24	○	-0.21	○
		Min			-0.05	○	-0.01	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	23.76	--	40.00	--	40.00	--
	D16		cm	------	37.24	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder				------	14.078		15.010		16.290	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.59	△	0.45	○	0.69	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.02	○	-0.01	○	-0.02	○
	Neutral Axis before Composition				-0.02	○	-0.01	○	-0.03	○
	Neutral Axis after Composition				-0.02	○	-0.01	○	-0.03	○
	Base of Lower Flange				-0.02	○	-0.01	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.09	○	-0.05	○	-0.01	○
		Min			-0.02	○	-0.04	○	-0.14	○
	Neutral Axis before Composition	Max			-0.12	○	-0.08	○	-0.01	○
		Min			-0.01	○	-0.04	○	-0.14	○
	Neutral Axis after Composition	Max			-0.11	○	-0.07	○	-0.01	○
		Min			-0.02	○	-0.05	○	-0.15	○
	Base of Lower Flange	Max			-0.13	○	-0.14	○	-0.01	○
		Min			-0.01	○	-0.03	○	-0.10	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	1.28	--	2.82	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	5.00	○	4.08	○	3.44	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.742	○	------	--	1.28	○
	D16				2.205	○	------	--	1.60	○
	D19				2.77	○	------	--	1.98	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.59	△	0.45	○	0.69	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.02	○	-0.01	○	-0.02	○
	Neutral Axis before Composition				-0.02	○	-0.01	○	-0.03	○
	Neutral Axis after Composition				-0.02	○	-0.01	○	-0.03	○
	Base of Lower Flange				-0.02	○	-0.01	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.09	○	-0.05	○	-0.01	○
		Min			-0.02	○	-0.04	○	-0.14	○
	Neutral Axis before Composition	Max			-0.12	○	-0.08	○	-0.01	○
		Min			-0.01	○	-0.04	○	-0.14	○
	Neutral Axis after Composition	Max			-0.11	○	-0.07	○	-0.01	○
		Min			-0.02	○	-0.05	○	-0.15	○
	Base of Lower Flange	Max			-0.13	○	-0.14	○	-0.01	○
		Min			-0.01	○	-0.03	○	-0.10	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder				------	18.637		22.265		25.892	
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	0.65	△	0.76	△	1.04	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	-0.01	○	-0.01	○	-0.03	○
	Neutral Axis before Composition				-0.01	○	-0.01	○	-0.02	○
	Neutral Axis after Composition				-0.01	○	-0.01	○	-0.03	○
	Base of Lower Flange				-0.01	○	-0.01	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	-0.01	○	0.00	○	-0.01	○
		Min			-0.13	○	-0.19	○	-0.32	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	-0.01	○
		Min			-0.12	○	-0.16	○	-0.28	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	-0.01	○
		Min			-0.14	○	-0.19	○	-0.32	○
	Base of Lower Flange	Max			-0.01	○	0.00	○	-0.01	○
		Min			-0.08	○	-0.10	○	-0.17	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	33.24	--	20.87	--
	D16		cm	------	40.00	--	40.00	--	32.71	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	3.83	--	6.67	--	10.62	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	2.75	○	2.08	○	1.66	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.13	○	1	○	1.00	○
	D16				1.368	○	1.107	○	1.00	○
	D19				1.659	○	1.312	○	1.08	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	0.65	△	0.76	△	1.04	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	-0.01	○	-0.01	○	-0.03	○
	Neutral Axis before Composition				-0.01	○	-0.01	○	-0.02	○
	Neutral Axis after Composition				-0.01	○	-0.01	○	-0.03	○
	Base of Lower Flange				-0.01	○	-0.01	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	-0.01	○	0.00	○	-0.01	○
		Min			-0.13	○	-0.19	○	-0.32	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	-0.01	○
		Min			-0.12	○	-0.16	○	-0.28	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	-0.01	○
		Min			-0.14	○	-0.19	○	-0.32	○
	Base of Lower Flange	Max			-0.01	○	0.00	○	-0.01	○
		Min			-0.08	○	-0.10	○	-0.17	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	33.24	--	20.87	--
	D16		cm	------	40.00	--	40.00	--	32.71	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder				------	26.020		28.569		29.519	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.03	△	1.05	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.02	○	-0.12	○	------	--
	Neutral Axis before Composition				-0.02	○	-0.24	○	------	--
	Neutral Axis after Composition				-0.03	○	-0.22	○	------	--
	Base of Lower Flange				-0.02	○	-0.05	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.01	○	-0.11	○	------	--
		Min			-0.32	○	-0.35	○	------	--
	Neutral Axis before Composition	Max			-0.01	○	-0.22	○	------	--
		Min			-0.28	○	-0.41	○	------	--
	Neutral Axis after Composition	Max			-0.01	○	-0.20	○	------	--
		Min			-0.32	○	-0.44	○	------	--
	Base of Lower Flange	Max			-0.01	○	-0.04	○	------	--
		Min			-0.16	○	-0.06	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	20.76	--	18.26	--	------	--
	D16		cm	------	32.54	--	28.63	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	10.68	--	11.11	--	------	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.65	○	3.01	○	------	--
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1	○	1	○	------	--
	D16				1	○	1	○	------	--
	D19				1.075	○	1.012	○	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.03	△	1.05	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.02	○	-0.12	○	------	--
	Neutral Axis before Composition				-0.02	○	-0.24	○	------	--
	Neutral Axis after Composition				-0.03	○	-0.22	○	------	--
	Base of Lower Flange				-0.02	○	-0.05	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.01	○	-0.11	○	------	--
		Min			-0.32	○	-0.35	○	------	--
	Neutral Axis before Composition	Max			-0.01	○	-0.22	○	------	--
		Min			-0.28	○	-0.41	○	------	--
	Neutral Axis after Composition	Max			-0.01	○	-0.20	○	------	--
		Min			-0.32	○	-0.44	○	------	--
	Base of Lower Flange	Max			-0.01	○	-0.04	○	------	--
		Min			-0.16	○	-0.06	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	20.76	--	18.26	--	------	--
	D16		cm	------	32.54	--	28.63	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder				------	0.500		1.450		4.000	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.47	○	1.11	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.03	○	-0.08	○
	Neutral Axis before Composition				------	--	-0.03	○	-0.07	○
	Neutral Axis after Composition				------	--	-0.03	○	-0.08	○
	Base of Lower Flange				------	--	0.00	○	-0.04	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.11	○	-0.39	○
		Min			------	--	-0.03	○	-0.08	○
	Neutral Axis before Composition	Max			------	--	-0.11	○	-0.36	○
		Min			------	--	-0.03	○	-0.06	○
	Neutral Axis after Composition	Max			------	--	-0.12	○	-0.40	○
		Min			------	--	-0.03	○	-0.07	○
	Base of Lower Flange	Max			------	--	-0.01	○	-0.23	○
		Min			------	--	0.00	○	-0.03	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	30.08	--
	D16		cm	------	------	--	31.62	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	7.37	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.47	○	1.11	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.03	○	-0.08	○
	Neutral Axis before Composition				------	--	-0.03	○	-0.07	○
	Neutral Axis after Composition				------	--	-0.03	○	-0.08	○
	Base of Lower Flange				------	--	0.00	○	-0.04	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.11	○	-0.39	○
		Min			------	--	-0.03	○	-0.08	○
	Neutral Axis before Composition	Max			------	--	-0.11	○	-0.36	○
		Min			------	--	-0.03	○	-0.06	○
	Neutral Axis after Composition	Max			------	--	-0.12	○	-0.40	○
		Min			------	--	-0.03	○	-0.07	○
	Base of Lower Flange	Max			------	--	-0.01	○	-0.23	○
		Min			------	--	0.00	○	-0.03	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	30.08	--
	D16		cm	------	------	--	31.62	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	------	--	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	--	------	-	999.999	○
	D16				------	--	------	-	999.999	○
	D19				------	--	------	-	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span,　Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder				------	4.045		7.591		11.136	
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	1.11	△	0.69	△	0.45	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	-0.08	○	-0.02	○	0.00	○
	Neutral Axis before Composition				-0.06	○	-0.02	○	0.00	○
	Neutral Axis after Composition				-0.08	○	-0.02	○	0.00	○
	Base of Lower Flange				-0.04	○	-0.01	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	-0.38	○	-0.15	○	-0.06	○
		Min			-0.07	○	-0.02	○	0.00	○
	Neutral Axis before Composition	Max			-0.36	○	-0.15	○	-0.07	○
		Min			-0.06	○	-0.02	○	0.00	○
	Neutral Axis after Composition	Max			-0.40	○	-0.16	○	-0.07	○
		Min			-0.07	○	-0.02	○	0.00	○
	Base of Lower Flange	Max			-0.23	○	-0.12	○	-0.07	○
		Min			-0.03	○	-0.01	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	30.40	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	7.29	--	2.63	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	1.11	△	0.69	△	0.45	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	-0.08	○	-0.02	○	0.00	○
	Neutral Axis before Composition				-0.06	○	-0.02	○	0.00	○
	Neutral Axis after Composition				-0.08	○	-0.02	○	0.00	○
	Base of Lower Flange				-0.04	○	-0.01	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	-0.38	○	-0.15	○	-0.06	○
		Min			-0.07	○	-0.02	○	0.00	○
	Neutral Axis before Composition	Max			-0.36	○	-0.15	○	-0.07	○
		Min			-0.06	○	-0.02	○	0.00	○
	Neutral Axis after Composition	Max			-0.40	○	-0.16	○	-0.07	○
		Min			-0.07	○	-0.02	○	0.00	○
	Base of Lower Flange	Max			-0.23	○	-0.12	○	-0.07	○
		Min			-0.03	○	-0.01	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	30.40	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	-
	D16				999.999	○	999.999	○	------	-
	D19				999.999	○	999.999	○	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span,　Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder				------		14.078		14.681		15.634
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.12	○	0.03	○	0.27	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.02	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.03	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.02	○
	Base of Lower Flange	Max			0.00	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.04	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.12	○	0.03	○	0.27	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.02	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.03	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.02	○
	Base of Lower Flange	Max			0.00	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.04	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	------	-	------	-
	D16				------	-	------	-	------	-
	D19				------	-	------	-	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder				------	18.227		21.772		25.317	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.37	○	0.48	○	0.82	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				-0.01	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.01	○	0.00	○	0.00	○
		Min			-0.05	○	-0.08	○	-0.22	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.05	○	-0.07	○	-0.21	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.05	○	-0.08	○	-0.23	○
	Base of Lower Flange	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.05	○	-0.06	○	-0.14	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	26.18	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	1.25	--	3.78	--	8.47	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.37	○	0.48	○	0.82	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				-0.01	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.01	○	0.00	○	0.00	○
		Min			-0.05	○	-0.08	○	-0.22	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.05	○	-0.07	○	-0.21	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.05	○	-0.08	○	-0.23	○
	Base of Lower Flange	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.05	○	-0.06	○	-0.14	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	26.18	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	------	-	999.999	○
	D16				------	-	------	-	999.999	○
	D19				------	-	------	-	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder				------		25.363		27.913		28.863
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.79	△	0.95	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	-0.10	○	------	--
	Neutral Axis before Composition				0.00	○	-0.20	○	------	--
	Neutral Axis after Composition				0.00	○	-0.18	○	------	--
	Base of Lower Flange				0.00	○	-0.05	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	-0.09	○	------	--
		Min			-0.21	○	-0.28	○	------	--
	Neutral Axis before Composition	Max			0.00	○	-0.18	○	------	--
		Min			-0.19	○	-0.37	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.16	○	------	--
		Min			-0.21	○	-0.38	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.04	○	------	--
		Min			-0.13	○	-0.06	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	27.03	--	20.18	--	------	--
	D16		cm	------	40.00	--	31.63	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	8.20	--	8.69	--	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.79	△	0.95	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	-0.10	○	------	--
	Neutral Axis before Composition				0.00	○	-0.20	○	------	--
	Neutral Axis after Composition				0.00	○	-0.18	○	------	--
	Base of Lower Flange				0.00	○	-0.05	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	-0.09	○	------	--
		Min			-0.21	○	-0.28	○	------	--
	Neutral Axis before Composition	Max			0.00	○	-0.18	○	------	--
		Min			-0.19	○	-0.37	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.16	○	------	--
		Min			-0.21	○	-0.38	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.04	○	------	--
		Min			-0.13	○	-0.06	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	27.03	--	20.18	--	------	--
	D16		cm	------	40.00	--	31.63	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	------	--
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	--
	D16				999.999	○	999.999	○	------	--
	D19				999.999	○	999.999	○	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 3

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder			------	0.501		1.451		4.000	
Immediately After Prestressing	Top of Main Girder		-1.5	3.066	○	3.831	○	5.771	○
	Bottom of Main Girder		～19.00	4.503	○	4.282	○	8.455	○
During Deck Construction	Top of Main Girder		-1.5	2.886	○	4.195	○	7.686	○
	Bottom of Main Girder		～14.00	4.297	○	3.402	○	5.109	○
Dead Load	Top of Deck		≦10.00	0.424	○	0.894	○	1.861	○
	Top of Main Girder		0	2.248	○	3.209	○	5.525	○
	Bottom of Main Girder		～14.00	4.061	○	3.078	○	3.516	○
Design Load1	Top of Deck	Max	≦10.00	0.431	○	0.976	○	2.213	○
		Min		-1.165	○	-0.445	○	1.022	○
	Top of Main Girder	Max	-1.5	2.254	○	3.279	○	5.814	○
		Min		0.865	○	2.051	○	4.835	○
	Bottom of Main Girder	Max	～14.00	4.048	○	2.928	○	2.684	○
		Min		6.881	○	5.547	○	5.503	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	1.543	○	2.062	○	3.184	○
		Min		-0.053	○	0.642	○	1.992	○
	Top of Main Girder	Max	-2	1.914	○	2.911	○	5.304	○
		Min		0.525	○	1.683	○	4.325	○
	Bottom of Main Girder	Max	～16.10	3.470	○	2.329	○	1.793	○
		Min		6.303	○	4.949	○	4.611	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	1.543	○	2.062	○	3.184	○
		Min		-0.053	○	0.642	○	1.992	○
	Top of Main Girder	Max	-2	1.914	○	2.911	○	5.304	○
		Min		0.525	○	1.683	○	4.325	○
	Bottom of Main Girder	Max	～16.10	3.470	○	2.329	○	1.793	○
		Min		6.303	○	4.949	○	4.611	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	0.431	○	0.976	○	2.213	○
		Min		-1.165	○	-0.445	○	1.022	○
	Top of Main Girder	Max	-1.5	2.254	○	3.279	○	5.814	○
		Min		0.865	○	2.051	○	4.835	○
	Bottom of Main Girder	Max	～14.00	4.048	○	2.928	○	2.684	○
		Min		6.881	○	5.547	○	5.503	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	1.543	○	2.062	○	3.184	○
		Min		-0.053	○	0.642	○	1.992	○
	Top of Main Girder	Max	-2	1.914	○	2.911	○	5.304	○
		Min		0.525	○	1.683	○	4.325	○
	Bottom of Main Girder	Max	～16.10	3.470	○	2.329	○	1.793	○
		Min		6.303	○	4.949	○	4.611	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	1.543	○	2.062	○	3.184	○
		Min		-0.053	○	0.642	○	1.992	○
	Top of Main Girder	Max	-2	1.914	○	2.911	○	5.304	○
		Min		0.525	○	1.683	○	4.325	○
	Bottom of Main Girder	Max	～16.10	3.470	○	2.329	○	1.793	○
		Min		6.303	○	4.949	○	4.611	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 3

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder			------	4.137		7.774		11.410	
Immediately After Prestressing	Top of Main Girder		-1.5	5.666	○	2.975	○	1.139	○
	Bottom of Main Girder		～19.00	8.607	○	12.169	○	14.395	○
During Deck Construction	Top of Main Girder		-1.5	7.665	○	6.888	○	6.291	○
	Bottom of Main Girder		～14.00	5.155	○	6.280	○	6.896	○
Dead Load	Top of Deck		≦10.00	1.884	○	2.351	○	2.674	○
	Top of Main Girder		0	5.529	○	5.415	○	5.247	○
	Bottom of Main Girder		～14.00	3.503	○	3.285	○	3.065	○
Design Load1	Top of Deck	Max	≦10.00	2.252	○	3.263	○	3.986	○
		Min		1.064	○	1.741	○	2.186	○
	Top of Main Girder	Max		5.832	○	6.167	○	6.330	○
		Min	-1.5	4.856	○	4.913	○	4.845	○
	Bottom of Main Girder	Max	～14.00	2.631	○	1.148	○	0.007	○
		Min		5.441	○	4.714	○	4.201	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	3.220	○	4.150	○	4.794	○
		Min		2.032	○	2.629	○	2.994	○
	Top of Main Girder	Max		5.320	○	5.589	○	5.688	○
		Min	-2	4.344	○	4.336	○	4.203	○
	Bottom of Main Girder	Max	～16.10	1.747	○	0.463	○	-0.487	○
		Min		4.557	○	4.030	○	3.708	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	3.220	○	4.150	○	4.794	○
		Min		2.032	○	2.629	○	2.994	○
	Top of Main Girder	Max		5.320	○	5.589	○	5.688	○
		Min	-2	4.344	○	4.336	○	4.203	○
	Bottom of Main Girder	Max	～16.10	1.747	○	0.463	○	-0.487	○
		Min		4.557	○	4.030	○	3.708	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.252	○	3.263	○	3.986	○
		Min		1.064	○	1.741	○	2.186	○
	Top of Main Girder	Max		5.832	○	6.167	○	6.330	○
		Min	-1.5	4.856	○	4.913	○	4.845	○
	Bottom of Main Girder	Max	～14.00	2.631	○	1.148	○	0.007	○
		Min		5.441	○	4.714	○	4.201	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	3.220	○	4.150	○	4.794	○
		Min		2.032	○	2.629	○	2.994	○
	Top of Main Girder	Max		5.320	○	5.589	○	5.688	○
		Min	-2	4.344	○	4.336	○	4.203	○
	Bottom of Main Girder	Max	～16.10	1.747	○	0.463	○	-0.487	○
		Min		4.557	○	4.030	○	3.708	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	3.220	○	4.150	○	4.794	○
		Min		2.032	○	2.629	○	2.994	○
	Top of Main Girder	Max		5.320	○	5.589	○	5.688	○
		Min	-2	4.344	○	4.336	○	4.203	○
	Bottom of Main Girder	Max	～16.10	1.747	○	0.463	○	-0.487	○
		Min		4.557	○	4.030	○	3.708	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 3

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder			------	13.730		15.047		16.016	
Immediately After Prestressing	Top of Main Girder		-1.5	0.831	○	0.856	○	0.815	○
	Bottom of Main Girder		～19.00	14.860	○	14.914	○	15.026	○
During Deck Construction	Top of Main Girder		-1.5	6.382	○	6.473	○	6.401	○
	Bottom of Main Girder		～14.00	6.851	○	6.822	○	6.963	○
Dead Load	Top of Deck		≦10.00	2.883	○	2.938	○	2.894	○
	Top of Main Girder		0	5.387	○	5.459	○	5.397	○
	Bottom of Main Girder		～14.00	2.761	○	2.707	○	2.884	○
Design Load1	Top of Deck	Max	≦10.00	4.349	○	4.459	○	4.444	○
		Min		2.459	○	2.547	○	2.529	○
	Top of Main Girder	Max		6.596	○	6.714	○	6.676	○
		Min	-1.5	5.036	○	5.136	○	5.096	○
	Bottom of Main Girder	Max	～14.00	-0.649	○	-0.834	○	-0.725	○
		Min		3.750	○	3.617	○	3.733	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	5.108	○	5.191	○	5.156	○
		Min		3.218	○	3.279	○	3.241	○
	Top of Main Girder	Max		5.914	○	6.009	○	5.954	○
		Min	-2	4.354	○	4.431	○	4.374	○
	Bottom of Main Girder	Max	～16.10	-1.028	○	-1.149	○	-0.993	○
		Min		3.372	○	3.302	○	3.465	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	5.108	○	5.191	○	5.156	○
		Min		3.218	○	3.279	○	3.241	○
	Top of Main Girder	Max		5.914	○	6.009	○	5.954	○
		Min	-2	4.354	○	4.431	○	4.374	○
	Bottom of Main Girder	Max	～16.10	-1.028	○	-1.149	○	-0.993	○
		Min		3.372	○	3.302	○	3.465	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	4.349	○	4.459	○	4.444	○
		Min		2.459	○	2.547	○	2.529	○
	Top of Main Girder	Max		6.596	○	6.714	○	6.676	○
		Min	-1.5	5.036	○	5.136	○	5.096	○
	Bottom of Main Girder	Max	～14.00	-0.649	○	-0.834	○	-0.725	○
		Min		3.750	○	3.617	○	3.733	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	5.108	○	5.191	○	5.156	○
		Min		3.218	○	3.279	○	3.241	○
	Top of Main Girder	Max		5.914	○	6.009	○	5.954	○
		Min	-2	4.354	○	4.431	○	4.374	○
	Bottom of Main Girder	Max	～16.10	-1.028	○	-1.149	○	-0.993	○
		Min		3.372	○	3.302	○	3.465	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	5.108	○	5.191	○	5.156	○
		Min		3.218	○	3.279	○	3.241	○
	Top of Main Girder	Max		5.914	○	6.009	○	5.954	○
		Min	-2	4.354	○	4.431	○	4.374	○
	Bottom of Main Girder	Max	～16.10	-1.028	○	-1.149	○	-0.993	○
		Min		3.372	○	3.302	○	3.465	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span，Main Girder Number: G 3

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder			------		18.684		22.320		25.957
Immediately After Prestressing	Top of Main Girder		-1.5	1.025	○	2.206	○	3.728	○
	Bottom of Main Girder		～19.00	15.013	○	13.441	○	11.235	○
During Deck Construction	Top of Main Girder		-1.5	6.196	○	6.191	○	5.866	○
	Bottom of Main Girder		～14.00	7.442	○	7.391	○	7.530	○
Dead Load	Top of Deck		≦10.00	2.616	○	2.157	○	1.456	○
	Top of Main Girder		0	5.155	○	4.934	○	4.391	○
	Bottom of Main Girder		～14.00	3.696	○	4.456	○	5.726	○
Design Load1	Top of Deck	Max	≦10.00	4.184	○	3.569	○	2.376	○
		Min		2.323	○	1.961	○	1.357	○
	Top of Main Girder	Max		6.449	○	6.098	○	5.148	○
		Min	-1.5	4.914	○	4.772	○	4.310	○
	Bottom of Main Girder	Max	～14.00	0.042	○	1.152	○	3.559	○
		Min		4.378	○	4.915	○	5.959	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	4.840	○	4.150	○	2.882	○
		Min		2.979	○	2.542	○	1.863	○
	Top of Main Girder	Max		5.682	○	5.268	○	4.256	○
		Min	-2	4.147	○	3.943	○	3.418	○
	Bottom of Main Girder	Max	～16.10	-0.098	○	1.185	○	3.768	○
		Min		4.238	○	4.949	○	6.168	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	4.840	○	4.150	○	2.882	○
		Min		2.979	○	2.542	○	1.863	○
	Top of Main Girder	Max		5.682	○	5.268	○	4.256	○
		Min	-2	4.147	○	3.943	○	3.418	○
	Bottom of Main Girder	Max	～16.10	-0.098	○	1.185	○	3.768	○
		Min		4.238	○	4.949	○	6.168	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	4.184	○	3.569	○	2.376	○
		Min		2.323	○	1.961	○	1.357	○
	Top of Main Girder	Max		6.449	○	6.098	○	5.148	○
		Min	-1.5	4.914	○	4.772	○	4.310	○
	Bottom of Main Girder	Max	～14.00	0.042	○	1.152	○	3.559	○
		Min		4.378	○	4.915	○	5.959	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	4.840	○	4.150	○	2.882	○
		Min		2.979	○	2.542	○	1.863	○
	Top of Main Girder	Max		5.682	○	5.268	○	4.256	○
		Min	-2	4.147	○	3.943	○	3.418	○
	Bottom of Main Girder	Max	～16.10	-0.098	○	1.185	○	3.768	○
		Min		4.238	○	4.949	○	6.168	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	4.840	○	4.150	○	2.882	○
		Min		2.979	○	2.542	○	1.863	○
	Top of Main Girder	Max		5.682	○	5.268	○	4.256	○
		Min	-2	4.147	○	3.943	○	3.418	○
	Bottom of Main Girder	Max	～16.10	-0.098	○	1.185	○	3.768	○
		Min		4.238	○	4.949	○	6.168	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 3

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder			------	26.094		28.644		29.594	
Immediately After Prestressing	Top of Main Girder		-1.5	3.794	○	2.774	○	2.971	○
	Bottom of Main Girder		～19.00	11.144	○	6.013	○	5.077	○
During Deck Construction	Top of Main Girder		-1.5	5.850	○	3.213	○	2.819	○
	Bottom of Main Girder		～14.00	7.543	○	5.011	○	4.817	○
Dead Load	Top of Deck		≦10.00	1.425	○	0.562	○	0.274	○
	Top of Main Girder		0	4.365	○	2.497	○	2.120	○
	Bottom of Main Girder		～14.00	5.789	○	4.667	○	4.786	○
Design Load1	Top of Deck	Max	≦10.00	2.319	○	0.836	○	0.275	○
		Min		1.330	○	0.536	○	0.274	○
	Top of Main Girder	Max	-1.5	5.100	○	2.735	○	2.120	○
		Min		4.287	○	2.476	○	2.120	○
	Bottom of Main Girder	Max	～14.00	3.685	○	4.161	○	4.786	○
		Min		6.014	○	4.713	○	4.786	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	2.821	○	1.361	○	0.793	○
		Min		1.833	○	1.061	○	0.793	○
	Top of Main Girder	Max	-2	4.206	○	1.882	○	1.263	○
		Min		3.393	○	1.622	○	1.263	○
	Bottom of Main Girder	Max	～16.10	3.901	○	4.599	○	5.260	○
		Min		6.230	○	5.151	○	5.260	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	2.821	○	1.361	○	0.793	○
		Min		1.833	○	1.061	○	0.793	○
	Top of Main Girder	Max	-2	4.206	○	1.882	○	1.263	○
		Min		3.393	○	1.622	○	1.263	○
	Bottom of Main Girder	Max	～16.10	3.901	○	4.599	○	5.260	○
		Min		6.230	○	5.151	○	5.260	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.319	○	0.836	○	0.275	○
		Min		1.330	○	0.536	○	0.274	○
	Top of Main Girder	Max	-1.5	5.100	○	2.735	○	2.120	○
		Min		4.287	○	2.476	○	2.120	○
	Bottom of Main Girder	Max	～14.00	3.685	○	4.161	○	4.786	○
		Min		6.014	○	4.713	○	4.786	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	2.821	○	1.361	○	0.793	○
		Min		1.833	○	1.061	○	0.793	○
	Top of Main Girder	Max	-2	4.206	○	1.882	○	1.263	○
		Min		3.393	○	1.622	○	1.263	○
	Bottom of Main Girder	Max	～16.10	3.901	○	4.599	○	5.260	○
		Min		6.230	○	5.151	○	5.260	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	2.821	○	1.361	○	0.793	○
		Min		1.833	○	1.061	○	0.793	○
	Top of Main Girder	Max	-2	4.206	○	1.882	○	1.263	○
		Min		3.393	○	1.622	○	1.263	○
	Bottom of Main Girder	Max	～16.10	3.901	○	4.599	○	5.260	○
		Min		6.230	○	5.151	○	5.260	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span,　Main Girder Number: G 3

Cross Section NumberNo.	Unit	Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder			0.501		1.451		4.000	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1099	○	1103	○	1157	○
Effective Prestressing Force (*1)	N/mm^2	1110	1043	○	1045	○	1081	○
Effective Prestressing Force (*2)	N/mm^2	1110	967	○	968	○	980	○
max	N/mm^2	1110	963	○	965	○	982	○
Ultimate Load	------	1	2	○	3	○	2	○

*1:During DeckConstruction　*2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder			4.137		7.774		11.410	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1159	○	1171	○	1161	○
Effective Prestressing Force (*1)	N/mm^2	1110	1082	○	1082	○	1060	○
Effective Prestressing Force (*2)	N/mm^2	1110	981	○	988	○	975	○
max	N/mm^2	1110	984	○	1015	○	1026	○
Ultimate Load	------	1	2	○	1	○	1	○

*1:During DeckConstruction　*2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder			13.730		15.047		16.016	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1166	○	1172	○	1176	○
Effective Prestressing Force (*1)	N/mm^2	1110	1062	○	1068	○	1071	○
Effective Prestressing Force (*2)	N/mm^2	1110	982	○	990	○	993	○
max	N/mm^2	1110	1043	○	1053	○	1057	○
Ultimate Load	------	1	1	○	1	○	1	○

*1:During DeckConstruction　*2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder			18.684		22.320		25.957	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1196	○	1193	○	1174	○
Effective Prestressing Force (*1)	N/mm^2	1110	1091	○	1098	○	1090	○
Effective Prestressing Force (*2)	N/mm^2	1110	1007	○	1009	○	994	○
max	N/mm^2	1110	1066	○	1050	○	1012	○
Ultimate Load	------	1	1	○	1	○	2	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder			26.094		28.644		29.594	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1173	○	1166	○	1163	○
Effective Prestressing Force (*1)	N/mm^2	1110	1090	○	1104	○	1103	○
Effective Prestressing Force (*2)	N/mm^2	1110	994	○	1029	○	1031	○
max	N/mm^2	1110	1011	○	1031	○	1031	○
Ultimate Load	------	1	2	○	6	○	1000	○

*1:During DeckConstruction *2:Design Load

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder				------		0.501		1.451		4.000
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	1.06	△	1.05	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.13	○	-0.03	○
	Neutral Axis before Composition				------	--	-0.24	○	-0.03	○
	Neutral Axis after Composition				------	--	-0.22	○	-0.03	○
	Base of Lower Flange				------	--	-0.05	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.35	○	-0.33	○
		Min			------	--	-0.12	○	-0.01	○
	Neutral Axis before Composition	Max			------	--	-0.43	○	-0.29	○
		Min			------	--	-0.23	○	-0.01	○
	Neutral Axis after Composition	Max			------	--	-0.45	○	-0.33	○
		Min			------	--	-0.21	○	-0.01	○
	Base of Lower Flange	Max			------	--	-0.06	○	-0.18	○
		Min			------	--	-0.05	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	17.89	--	20.45	--
	D16		cm	------	------	--	28.05	--	32.05	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	11.34	--	10.84	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	------	--	2.98	○	1.64	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	1	○	1.00	○
	D16				------	--	1	○	1.00	○
	D19				------	--	1.004	○	1.07	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	1.06	△	1.05	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.13	○	-0.03	○
	Neutral Axis before Composition				------	--	-0.24	○	-0.03	○
	Neutral Axis after Composition				------	--	-0.22	○	-0.03	○
	Base of Lower Flange				------	--	-0.05	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.35	○	-0.33	○
		Min			------	--	-0.12	○	-0.01	○
	Neutral Axis before Composition	Max			------	--	-0.43	○	-0.29	○
		Min			------	--	-0.23	○	-0.01	○
	Neutral Axis after Composition	Max			------	--	-0.45	○	-0.33	○
		Min			------	--	-0.21	○	-0.01	○
	Base of Lower Flange	Max			------	--	-0.06	○	-0.18	○
		Min			------	--	-0.05	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	17.89	--	20.45	--
	D16		cm	------	------	--	28.05	--	32.05	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder				------	4.137		7.774		11.410	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.06	△	0.78	△	0.67	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.03	○	-0.01	○	-0.01	○
	Neutral Axis before Composition				-0.03	○	-0.01	○	-0.01	○
	Neutral Axis after Composition				-0.03	○	-0.01	○	-0.01	○
	Base of Lower Flange				-0.02	○	-0.01	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.33	○	-0.19	○	-0.14	○
		Min			-0.01	○	0.00	○	-0.01	○
	Neutral Axis before Composition	Max			-0.29	○	-0.16	○	-0.13	○
		Min			-0.01	○	0.00	○	-0.01	○
	Neutral Axis after Composition	Max			-0.34	○	-0.19	○	-0.15	○
		Min			-0.01	○	0.00	○	-0.01	○
	Base of Lower Flange	Max			-0.18	○	-0.11	○	-0.09	○
		Min			-0.01	○	0.00	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	20.57	--	32.61	--	40.00	--
	D16		cm	------	32.24	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	10.78	--	6.80	--	3.96	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.65	○	2.06	○	2.73	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.00	○	1	○	1.12	○
	D16				1.00	○	1.1	○	1.36	○
	D19				1.07	○	1.303	○	1.65	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.06	△	0.78	△	0.67	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.03	○	-0.01	○	-0.01	○
	Neutral Axis before Composition				-0.03	○	-0.01	○	-0.01	○
	Neutral Axis after Composition				-0.03	○	-0.01	○	-0.01	○
	Base of Lower Flange				-0.02	○	-0.01	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.33	○	-0.19	○	-0.14	○
		Min			-0.01	○	0.00	○	-0.01	○
	Neutral Axis before Composition	Max			-0.29	○	-0.16	○	-0.13	○
		Min			-0.01	○	0.00	○	-0.01	○
	Neutral Axis after Composition	Max			-0.34	○	-0.19	○	-0.15	○
		Min			-0.01	○	0.00	○	-0.01	○
	Base of Lower Flange	Max			-0.18	○	-0.11	○	-0.09	○
		Min			-0.01	○	0.00	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	20.57	--	32.61	--	40.00	--
	D16		cm	------	32.24	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder				------		13.730		15.047		16.016
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	0.70	△	0.50	○	0.60	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	-0.02	○	-0.01	○	-0.02	○
	Neutral Axis before Composition				-0.03	○	-0.01	○	-0.03	○
	Neutral Axis after Composition				-0.03	○	-0.01	○	-0.02	○
	Base of Lower Flange				-0.02	○	-0.01	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	-0.14	○	-0.07	○	-0.01	○
		Min			-0.01	○	-0.04	○	-0.09	○
	Neutral Axis before Composition	Max			-0.15	○	-0.07	○	-0.01	○
		Min			-0.01	○	-0.06	○	-0.13	○
	Neutral Axis after Composition	Max			-0.15	○	-0.08	○	-0.01	○
		Min			-0.01	○	-0.05	○	-0.11	○
	Base of Lower Flange	Max			-0.10	○	-0.05	○	-0.01	○
		Min			-0.01	○	-0.11	○	-0.14	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	2.86	--	0.93	--	0.00	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	3.43	○	4.26	○	5.08	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.271	○	------	--	1.88	○
	D16				1.588	○	------	--	2.35	○
	D19				1.976	○	------	--	2.92	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	0.70	△	0.50	○	0.60	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	-0.02	○	-0.01	○	-0.02	○
	Neutral Axis before Composition				-0.03	○	-0.01	○	-0.03	○
	Neutral Axis after Composition				-0.03	○	-0.01	○	-0.02	○
	Base of Lower Flange				-0.02	○	-0.01	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	-0.14	○	-0.07	○	-0.01	○
		Min			-0.01	○	-0.04	○	-0.09	○
	Neutral Axis before Composition	Max			-0.15	○	-0.07	○	-0.01	○
		Min			-0.01	○	-0.06	○	-0.13	○
	Neutral Axis after Composition	Max			-0.15	○	-0.08	○	-0.01	○
		Min			-0.01	○	-0.05	○	-0.11	○
	Base of Lower Flange	Max			-0.10	○	-0.05	○	-0.01	○
		Min			-0.01	○	-0.11	○	-0.14	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder				------		18.684		22.320		25.957
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.70	△	0.88	△	1.28	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.03	○	-0.04	○	-0.11	○
	Neutral Axis before Composition				-0.03	○	-0.04	○	-0.10	○
	Neutral Axis after Composition				-0.03	○	-0.04	○	-0.11	○
	Base of Lower Flange				-0.02	○	-0.03	○	-0.06	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	-0.01	○	-0.09	○
		Min			-0.13	○	-0.21	○	-0.46	○
	Neutral Axis before Composition	Max			0.00	○	-0.01	○	-0.08	○
		Min			-0.18	○	-0.26	○	-0.46	○
	Neutral Axis after Composition	Max			0.00	○	-0.01	○	-0.09	○
		Min			-0.15	○	-0.24	○	-0.49	○
	Base of Lower Flange	Max			0.00	○	-0.01	○	-0.05	○
		Min			-0.23	○	-0.25	○	-0.32	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	23.56	--
	D16		cm	------	40.00	--	40.00	--	36.92	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	2.15	--	5.26	--	9.41	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	3.62	○	2.47	○	1.82	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.343	○	1.018	○	1.00	○
	D16				1.661	○	1.222	○	1.00	○
	D19				2.05	○	1.471	○	1.14	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.70	△	0.88	△	1.28	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.03	○	-0.04	○	-0.11	○
	Neutral Axis before Composition				-0.03	○	-0.04	○	-0.10	○
	Neutral Axis after Composition				-0.03	○	-0.04	○	-0.11	○
	Base of Lower Flange				-0.02	○	-0.03	○	-0.06	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	-0.01	○	-0.09	○
		Min			-0.13	○	-0.21	○	-0.46	○
	Neutral Axis before Composition	Max			0.00	○	-0.01	○	-0.08	○
		Min			-0.18	○	-0.26	○	-0.46	○
	Neutral Axis after Composition	Max			0.00	○	-0.01	○	-0.09	○
		Min			-0.15	○	-0.24	○	-0.49	○
	Base of Lower Flange	Max			0.00	○	-0.01	○	-0.05	○
		Min			-0.23	○	-0.25	○	-0.32	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	23.56	--
	D16		cm	------	40.00	--	40.00	--	36.92	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder				------	26.094		28.644		29.594	
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	1.30	△	0.56	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	-0.12	○	-0.03	○	------	--
	Neutral Axis before Composition				-0.11	○	-0.04	○	------	--
	Neutral Axis after Composition				-0.12	○	-0.04	○	------	--
	Base of Lower Flange				-0.07	○	-0.01	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	-0.10	○	-0.03	○	------	--
		Min			-0.48	○	-0.15	○	------	--
	Neutral Axis before Composition	Max			-0.09	○	-0.04	○	------	--
		Min			-0.48	○	-0.15	○	------	--
	Neutral Axis after Composition	Max			-0.10	○	-0.04	○	------	--
		Min			-0.50	○	-0.17	○	------	--
	Base of Lower Flange	Max			-0.05	○	-0.01	○	------	--
		Min			-0.33	○	-0.02	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	23.04	--	20.18	--	------	--
	D16		cm	------	36.12	--	31.62	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm²	------	9.62	--	0.40	--	------	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.80	○	3.82	○	------	--
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1	○	1.391	○	------	--
	D16				1	○	1.391	○	------	--
	D19				1.133	○	1.448	○	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	1.30	△	0.56	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	-0.12	○	-0.03	○	------	--
	Neutral Axis before Composition				-0.11	○	-0.04	○	------	--
	Neutral Axis after Composition				-0.12	○	-0.04	○	------	--
	Base of Lower Flange				-0.07	○	-0.01	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	-0.10	○	-0.03	○	------	--
		Min			-0.48	○	-0.15	○	------	--
	Neutral Axis before Composition	Max			-0.09	○	-0.04	○	------	--
		Min			-0.48	○	-0.15	○	------	--
	Neutral Axis after Composition	Max			-0.10	○	-0.04	○	------	--
		Min			-0.50	○	-0.17	○	------	--
	Base of Lower Flange	Max			-0.05	○	-0.01	○	------	--
		Min			-0.33	○	-0.02	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	23.04	--	20.18	--	------	--
	D16		cm	------	36.12	--	31.62	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.00	--	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder				------	0.501		1.451		4.000	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.95	△	0.78	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.11	○	-0.01	○
	Neutral Axis before Composition				------	--	-0.22	○	0.00	○
	Neutral Axis after Composition				------	--	-0.19	○	0.00	○
	Base of Lower Flange				------	--	-0.05	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.28	○	-0.20	○
		Min			------	--	-0.11	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.37	○	-0.18	○
		Min			------	--	-0.20	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.38	○	-0.20	○
		Min			------	--	-0.18	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.06	○	-0.13	○
		Min			------	--	-0.04	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	27.55	--
	D16		cm	------	------	--	31.63	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	8.71	--	8.05	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.95	△	0.78	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.11	○	-0.01	○
	Neutral Axis before Composition				------	--	-0.22	○	0.00	○
	Neutral Axis after Composition				------	--	-0.19	○	0.00	○
	Base of Lower Flange				------	--	-0.05	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.28	○	-0.20	○
		Min			------	--	-0.11	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.37	○	-0.18	○
		Min			------	--	-0.20	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.38	○	-0.20	○
		Min			------	--	-0.18	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.06	○	-0.13	○
		Min			------	--	-0.04	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	27.55	--
	D16		cm	------	------	--	31.63	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	------	--	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	--	999.999	○	999.999	○
	D16				------	--	999.999	○	999.999	○
	D19				------	--	999.999	○	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder				------	4.022		7.544		11.065	
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	0.78	∆	0.58	∆	0.35	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	-0.01	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	-0.01	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	-0.20	○	-0.11	○	-0.04	○
		Min			0.00	○	0.00	○	-0.01	○
	Neutral Axis before Composition	Max			-0.19	○	-0.11	○	-0.05	○
		Min			0.00	○	0.00	○	-0.01	○
	Neutral Axis after Composition	Max			-0.20	○	-0.12	○	-0.05	○
		Min			0.00	○	0.00	○	-0.01	○
	Base of Lower Flange	Max			-0.13	○	-0.10	○	-0.06	○
		Min			0.00	○	0.00	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	27.59	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	8.03	--	4.99	--	1.27	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	0.78	∆	0.58	∆	0.35	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	-0.01	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	-0.01	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	-0.20	○	-0.11	○	-0.04	○
		Min			0.00	○	0.00	○	-0.01	○
	Neutral Axis before Composition	Max			-0.19	○	-0.11	○	-0.05	○
		Min			0.00	○	0.00	○	-0.01	○
	Neutral Axis after Composition	Max			-0.20	○	-0.12	○	-0.05	○
		Min			0.00	○	0.00	○	-0.01	○
	Base of Lower Flange	Max			-0.13	○	-0.10	○	-0.06	○
		Min			0.00	○	0.00	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	27.59	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	-
	D16				999.999	○	999.999	○	------	-
	D19				999.999	○	999.999	○	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder				------		13.730		14.587		15.096
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.24	○	0.13	○	0.11	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	-0.01	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	-0.01	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.02	○	0.00	○	0.00	○
		Min			0.00	○	-0.01	○	0.00	○
	Neutral Axis before Composition	Max			-0.02	○	0.00	○	0.00	○
		Min			0.00	○	-0.01	○	-0.01	○
	Neutral Axis after Composition	Max			-0.02	○	0.00	○	0.00	○
		Min			0.00	○	-0.01	○	0.00	○
	Base of Lower Flange	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.24	○	0.13	○	0.11	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	-0.01	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	-0.01	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.02	○	0.00	○	0.00	○
		Min			0.00	○	-0.01	○	0.00	○
	Neutral Axis before Composition	Max			-0.02	○	0.00	○	0.00	○
		Min			0.00	○	-0.01	○	-0.01	○
	Neutral Axis after Composition	Max			-0.02	○	0.00	○	0.00	○
		Min			0.00	○	-0.01	○	0.00	○
	Base of Lower Flange	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	------	-	------	-
	D16				------	-	------	-	------	-
	D19				------	-	------	-	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder				------		18.109		21.630		25.152
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.42	○	0.80	△	1.14	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	-0.03	○	-0.09	○
	Neutral Axis before Composition				0.00	○	-0.02	○	-0.08	○
	Neutral Axis after Composition				0.00	○	-0.02	○	-0.09	○
	Base of Lower Flange				0.00	○	-0.01	○	-0.04	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	-0.02	○	-0.09	○
		Min			-0.05	○	-0.20	○	-0.41	○
	Neutral Axis before Composition	Max			0.00	○	-0.02	○	-0.07	○
		Min			-0.07	○	-0.21	○	-0.38	○
	Neutral Axis after Composition	Max			0.00	○	-0.02	○	-0.09	○
		Min			-0.06	○	-0.22	○	-0.42	○
	Base of Lower Flange	Max			0.00	○	-0.01	○	-0.04	○
		Min			-0.08	○	-0.18	○	-0.25	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	28.91	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	4.04	--	7.67	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.42	○	0.80	△	1.14	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	-0.03	○	-0.09	○
	Neutral Axis before Composition				0.00	○	-0.02	○	-0.08	○
	Neutral Axis after Composition				0.00	○	-0.02	○	-0.09	○
	Base of Lower Flange				0.00	○	-0.01	○	-0.04	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	-0.02	○	-0.09	○
		Min			-0.05	○	-0.20	○	-0.41	○
	Neutral Axis before Composition	Max			0.00	○	-0.02	○	-0.07	○
		Min			-0.07	○	-0.21	○	-0.38	○
	Neutral Axis after Composition	Max			0.00	○	-0.02	○	-0.09	○
		Min			-0.06	○	-0.22	○	-0.42	○
	Base of Lower Flange	Max			0.00	○	-0.01	○	-0.04	○
		Min			-0.08	○	-0.18	○	-0.25	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	28.91	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	999.999	○	999.999	○
	D16				------	-	999.999	○	999.999	○
	D19				------	-	999.999	○	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder				------		25.174		27.724		28.674
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.14	△	0.48	○	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.10	○	-0.04	○	------	--
	Neutral Axis before Composition				-0.08	○	-0.03	○	------	--
	Neutral Axis after Composition				-0.09	○	-0.04	○	------	--
	Base of Lower Flange				-0.04	○	0.00	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.09	○	-0.04	○	------	--
		Min			-0.41	○	-0.12	○	------	--
	Neutral Axis before Composition	Max			-0.07	○	-0.03	○	------	--
		Min			-0.38	○	-0.11	○	------	--
	Neutral Axis after Composition	Max			-0.09	○	-0.04	○	------	--
		Min			-0.42	○	-0.13	○	------	--
	Base of Lower Flange	Max			-0.04	○	0.00	○	------	--
		Min			-0.25	○	-0.01	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	28.67	--	20.18	--	------	--
	D16		cm	------	40.00	--	31.62	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	7.73	--	0.00	--	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.14	△	0.48	○	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.10	○	-0.04	○	------	--
	Neutral Axis before Composition				-0.08	○	-0.03	○	------	--
	Neutral Axis after Composition				-0.09	○	-0.04	○	------	--
	Base of Lower Flange				-0.04	○	0.00	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.09	○	-0.04	○	------	--
		Min			-0.41	○	-0.12	○	------	--
	Neutral Axis before Composition	Max			-0.07	○	-0.03	○	------	--
		Min			-0.38	○	-0.11	○	------	--
	Neutral Axis after Composition	Max			-0.09	○	-0.04	○	------	--
		Min			-0.42	○	-0.13	○	------	--
	Base of Lower Flange	Max			-0.04	○	0.00	○	------	--
		Min			-0.25	○	-0.01	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	28.67	--	20.18	--	------	--
	D16		cm	------	40.00	--	31.62	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	------	--
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	------	-	------	--
	D16				999.999	○	------	-	------	--
	D19				999.999	○	------	-	------	--

5 Design of Intermediate Cross Beam

(1) Parameters

<1st Span>

		Unit	Bending Moment (Maximum)	Bending Moment (Minimum)
CB 2				
Length between End of Girders	Lb	cm	328.0	328.0
Web Width	Bw	cm	22.0	22.0
Width of Cross Beam	Bc	cm	30.0	30.0
Thickness of Deck	Hs	cm	17.0	17.0
Height of Cross Beam (before Composition of Deck)	Hb	cm	130.0	130.0
Height of Cross Beam (after Composition of Deck)	Ha	cm	187.0	187.0
Interval of Cross Beam	Lt	cm	1421.0	1421.0

<2nd Span>

		Unit	Bending Moment (Maximum)	Bending Moment (Minimum)
CB 2				
Length between End of Girders	Lb	cm	328.0	328.0
Web Width	Bw	cm	22.0	22.0
Width of Cross Beam	Bc	cm	30.0	30.0
Thickness of Deck	Hs	cm	17.0	17.0
Height of Cross Beam (before Composition of Deck)	Hb	cm	130.0	130.0
Height of Cross Beam (after Composition of Deck)	Ha	cm	187.0	187.0
Interval of Cross Beam	Lt	cm	1424.7	1424.7

(2) Calculation of Prestressing

1) Arrangement of PC Strand

(1) Parameter of PC Strand

	Unit	Parameters
Name of PC Strand		4S15.2， SWPR7BL
Area of PC Strand	mm^2/no.	554.80
Amount of Set	mm	4.0
Reduction Rate of Anchor	%	0.000
Friction Coefficient	1/m	0.0040
Creep Coefficient		2.60
Drying Shrinkage	$\times 10^{-5}$	20.00
Relaxation	%	2.5
Prestressing Stress	N/mm^2	1250.000
(Considering Friction Coefficient)	N/mm^2	1250.000
Allowable Value	N/mm^2	1440.000

(2) Arrangement of PC Strand

<1st Span>

Item		Unit	Maximum Bending Moment	Minimum Bending Moment
CB 2				
How to Prestressing			From One Side	
Length of PC Strand		m	10.720	10.720
1st	Position	mm	400	400
	Number	No.	1	1
2nd	Position	mm	800	800
	Number	No.	1	1

<2nd Span>

Item		Unit	Maximum Bending Moment	Minimum Bending Moment
CB 2				
How to Prestressing			From One Side	
Length of PC Strand		m	10.723	10.723
1st	Position	mm	400	400
	Number	No.	1	1
2nd	Position	mm	800	800
	Number	No.	1	1

<Design of Cross Beam : Summary for Calculation Results of Stress>

1st Span : Cross Beam (CB2)

Item			Unit	Allowable Value	Mmax		Mmin	
Bending Stress of Concrete Dead Load		Top of Deck	N/mm^2	≦10.0	-0.38	○	-0.40	○
		Bottom of Deck			-0.25	○	-0.27	○
		Top of Cross Beam	N/mm^2	0	2.28	○	2.29	○
		Bottom of Cross Beam		～11.0	4.58	○	4.64	○
Bending Stress of Concrete Dead Load		Top of Deck	N/mm^2	≦10.0	0.45	○	-0.85	○
		Bottom of Deck			0.30	○	-0.57	○
		Top of Cross Beam	N/mm^2	0	2.19	○	2.34	○
		Bottom of Cross Beam		～11.0	2.40	○	5.83	○
Ultimate Load			------	1	1.96	○	1.68	○
Stress of PC Strand	Stress of PC Strand during Prestressing		N/mm^2	1440	1250	○	1250	○
	Immediately After Prestressing		N/mm^2	1295	1175	○	1175	○
	Effective Prestressing Force		N/mm^2	1110	1024	○	1024	○

2nd Span : Cross Beam (CB2)

Item			Unit	Allowable Value	Mmax		Mmin	
Bending Stress of Concrete Dead Load		Top of Deck	N/mm^2	≦10.0	-0.36	○	-0.40	○
		Bottom of Deck			-0.24	○	-0.27	○
		Top of Cross Beam	N/mm^2	0	2.28	○	2.29	○
		Bottom of Cross Beam		～11.0	4.54	○	4.64	○
Bending Stress of Concrete Dead Load		Top of Deck	N/mm^2	≦10.0	0.47	○	-0.85	○
		Bottom of Deck			0.31	○	-0.57	○
		Top of Cross Beam	N/mm^2	0	2.19	○	2.34	○
		Bottom of Cross Beam		～11.0	2.34	○	5.84	○
Ultimate Load			------	1	1.93	○	1.68	○
Stress of PC Strand	Stress of PC Strand during Prestressing		N/mm^2	1440	1250	○	1250	○
	Immediately After Prestressing		N/mm^2	1295	1175	○	1175	○
	Effective Prestressing Force		N/mm^2	1110	1024	○	1024	○

<Design of Cross Beam : Summary for Calculation Results of Stress>

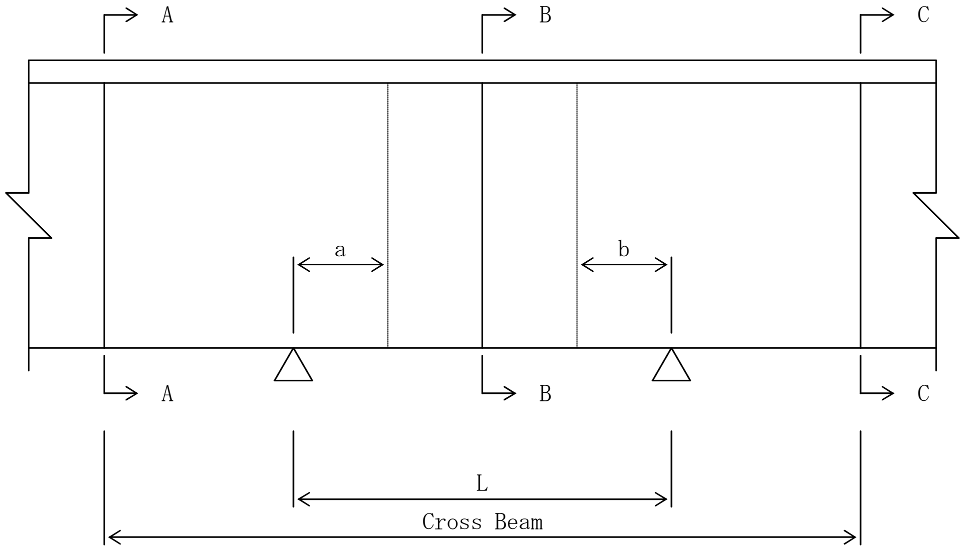
1st Span : Cross Beam (CB2)

Item		Unit	Allowable Value	Smax		Smin		Tmax		Tmin	
Shear Force											
Shear Stress	Design Load	N/mm^2	0.45	0.68	△	0.46	△	0.17	○	0.12	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	-0.02	○	-0.02	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	-0.17	○	-0.16	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Suc/Shu	-	1.00	2.81	○	4.14	○	9.76	○	12.76	○
Strength against Diagonal Densile Failure	D13	-	1.00	1.00	○	1.59	○	------	--	------	--
Sus/Shu	D16	-	1.00	1.01	○	1.96	○	------	--	------	--
Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.00	○	0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	0.00	○	0.00	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	0.00	○	0.00	○	0.00	○	0.00	○
Shear Force + Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.68	△	0.46	△	0.17	○	0.12	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-1.10	-0.02	○	-0.02	○	0.00	○	0.00	○
	Design Load	N/mm^2	-2.20	-0.17	○	-0.16	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Muc/Mtu	-	1.00	999.999	○	999.999	○	1000.00	○	999.999	○
Strength against Diagonal Densile Failure	D13	-	1.00	999.999	○	999.999	○	------	--	------	--
Mus/Mtu	D16	-	1.00	999.999	○	999.999	○	------	--	------	--
Amount of Diagonal Tension Re-bar		cm^2	----	9.74	--	6.00	--	6.00	--	6.00	--
Axial Reinforcement Bar Volume		cm^2	----	5.27	--	0.52	--	0.00	--	0.00	--

2nd Span : Cross Beam (CB2)

Item		Unit	Allowable Value	Smax		Smin		Tmax		Tmin	
Shear Force											
Shear Stress	Design Load	N/mm^2	0.45	0.68	△	0.45	○	0.11	○	0.18	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	-0.02	○	-0.02	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	-0.17	○	-0.16	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Suc/Shu	-	1.00	2.81	○	4.17	○	12.79	○	9.61	○
Strength against Diagonal Densile Failure	D13	-	1.00	1.00	○	------	--	------	--	------	--
Sus/Shu	D16	-	1.00	1.01	○	------	--	------	--	------	--
Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.00	○	0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	0.00	○	0.00	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	0.00	○	0.00	○	0.00	○	0.00	○
Shear Force + Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.68	△	0.45	○	0.11	○	0.18	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-1.10	-0.02	○	-0.02	○	0.00	○	0.00	○
	Design Load	N/mm^2	-2.20	-0.17	○	-0.16	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Muc/Mtu	-	1.00	999.999	○	999.999	○	1000.00	○	999.999	○
Strength against Diagonal Densile Failure	D13	-	1.00	999.999	○	------	--	------	--	------	--
Mus/Mtu	D16	-	1.00	999.999	○	------	--	------	--	------	--
Amount of Diagonal Tension Re-bar		cm^2	----	9.75	--	6.00	--	6.00	--	6.00	--
Axial Reinforcement Bar Volume		cm^2	----	5.28	--	0.46	--	0.00	--	0.00	--

6 Design of Coupling Concrete
Dimension



Unit: m

L	1.200
a	0.500
b	0.500

<Connection of Cross beam : Summary for Calculation Results of Stress>

1st Span～2nd Span,　Main Girder Number: G4(Negative Moment) G1(Positive Moment)

Item			Unit	Allowable Value	Negative Moment						Positive Moment	
					A-A		B-B		C-C		B-B	
Re-bar Volume	1st Layer	Diameter	mm	------	D19	--	D19	--	D19	--	D22	--
		Number	Number	------	16	--	16	--	16	--	12	--
	2nd Layer	Diameter	mm	------	D19	--	D19	--	D19	--	D22	--
		Number	Number	------	16	--	16	--	16	--	12	--
Bending Stress (Dead Load)												
Bending Tensile Stress of Reinforcement Bar			N/mm^2	100	-4.19	○	5.36	○	-3.89	○	49.42	○
Bending Stress (Design Load)												
Bending Stress of Concrete			N/mm^2	10	4.54	○	4.54	○	4.54	○	1.27	○
Bending Tensile Stress of Reinforcement Bar			N/mm^2	160	122.32	○	122.32	○	122.32	○	63.44	○
Bending Stress (Temperature Load)												
Bending Stress of Concrete			N/mm^2	11.5	4.79	○	4.54	○	4.82	○	2.09	○
Bending Tensile Stress of Reinforcement Bar			N/mm^2	184	129.05	○	122.32	○	129.94	○	104.79	○
Ultimate Load			------	1	1.04	○	1.12	○	1.03	○	4.36	○

7 Calculation of Reaction Force

7.1 Reaction Force for Each Girder

<1st Span, Left> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	340.656	339.639	342.933	350.701
Cast-in-place Concrete	D2	303.224	427.759	431.134	314.097
Weight of Bridge Surface	D3	150.985	150.499	168.009	202.782
Subtotal: DT1=D1+D2+D3		794.865	917.897	942.076	867.580
Live Load	Max	321.730	304.940	303.710	315.600
LT	Min	-67.510	-28.650	-30.040	-65.520
Subtotal: DT2	Max	1116.595	1222.837	1245.786	1183.180
=DT1+LT+SW	Min	727.355	889.247	912.036	802.060
Creep CR		87.227	70.930	67.833	68.782
Drying Shrinkage SH		-9.234	-9.324	-9.226	-7.986
Temperature Range		24.010	24.243	23.988	20.763
Dead Load: DT1+CR+SH		872.858	979.503	1000.683	928.376
Total: DT2+CR	Max	1218.598	1308.686	1328.381	1264.739
+SH+T+SD	Min	829.358	975.096	994.631	883.619

<1st Span, Right> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	340.669	339.651	342.946	350.713
Cast-in-place Concrete	D2	317.836	451.621	454.995	328.195
Weight of Bridge Surface	D3	257.523	245.574	265.559	301.974
Subtotal: DT1=D1+D2+D3		916.028	1036.846	1063.500	980.882
Live Load	Max	512.760	463.910	476.950	540.140
LT	Min	-205.700	-143.670	-167.200	-254.440
Subtotal: DT2	Max	1428.788	1500.756	1540.450	1521.022
=DT1+LT+SW	Min	710.328	893.176	896.300	726.442
Creep CR		-85.640	-70.030	-69.046	-71.669
Drying Shrinkage SH		9.297	9.336	9.210	7.998
Temperature Range		-24.171	-24.273	-23.945	-20.791
Dead Load: DT1+CR+SH		839.685	976.152	1003.664	917.211
Total: DT2+CR	Max	1328.274	1415.789	1456.669	1436.560
+SH+T+SD	Min	609.814	808.209	812.519	641.980

<2nd Span, Left> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	338.733	339.068	343.687	352.806
Cast-in-place Concrete	D2	316.991	451.047	455.775	329.021
Weight of Bridge Surface	D3	325.889	291.881	286.897	300.415
Subtotal: DT1=D1+D2+D3		981.613	1081.996	1086.359	982.242
Live Load	Max	511.490	463.600	477.980	542.050
LT	Min	-207.200	-143.510	-166.640	-252.740
Subtotal: DT2	Max	1493.103	1545.596	1564.339	1524.292
=DT1+LT+SW	Min	774.413	938.486	919.719	729.502
Creep CR		-89.468	-72.012	-66.399	-65.299
Drying Shrinkage SH		9.232	9.331	9.220	7.919
Temperature Range		-24.005	-24.261	-23.972	-20.589
Dead Load: DT1+CR+SH		901.377	1019.315	1029.180	924.862
Total: DT2+CR	Max	1388.862	1458.654	1483.188	1446.323
+SH+T+SD	Min	670.172	851.544	838.568	651.533

<2nd Span, Right> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	338.720	339.056	343.675	352.794
Cast-in-place Concrete	D2	301.984	427.186	431.914	314.522
Weight of Bridge Surface	D3	185.699	172.859	177.701	199.949
Subtotal: DT1=D1+D2+D3		826.403	939.101	953.290	867.265
Live Load	Max	321.350	304.220	302.570	314.500
LT	Min	-64.830	-28.840	-29.760	-64.870
Subtotal: DT2	Max	1147.753	1243.321	1255.860	1181.765
=DT1+LT+SW	Min	761.573	910.261	923.530	802.395
Creep CR		87.881	71.112	67.612	68.187
Drying Shrinkage SH		-9.294	-9.343	-9.204	-7.930
Temperature Range		24.165	24.291	23.929	20.618
Dead Load: DT1+CR+SH		904.990	1000.870	1011.698	927.522
Total: DT2+CR	Max	1250.505	1329.381	1338.197	1262.640
+SH+T+SD	Min	864.325	996.321	1005.867	883.270

7.2 Reaction Force for Pier and Abutment

Unit: kN

		1	2	3
Weight of Girder	D1	1373.929	2748.273	1374.245
Cast-in-place Concrete	D2	1476.214	3105.481	1475.606
Weight of Bridge Surface	D3	672.275	2275.712	736.208
Subtotal: DT1=D1+D2+D3		3522.418	8129.466	3586.059
Live Load	Max	1021.890	1965.700	1019.460
LT	Min	-102.880	0.000	-102.630
Subtotal: DT2	Max	4544.308	10095.166	4605.519
=DT1+LT+SW	Min	3419.538	8129.466	3483.429
Creep CR		294.772	-589.563	294.792
Drying Shrinkage SH		-35.770	71.543	-35.771
Temperature Range		93.004	-186.007	93.003
Dead Load: DT1+CR+SH		3781.420	7611.446	3845.080
Total: DT2+CR	Max	4896.314	9391.139	4957.543
+SH+T+SD	Min	3771.544	7425.439	3835.453

7.3 Horizontal Force

Horizontal Force(PF5、PF6fix)

(kN)

	PF5	PF6
Prestressing	-192	121
Drying Shrinkage	-199	125
Temperature(+)	201	-128
Temperature(-)	-201	128
Dead Load	-391	246
Temperature+15℃	-190	119
Temperature-15℃	-592	374
Temperature+40℃	145	-94
Temperature-40℃	-928	586

8 Design of Cross Beam at End of Girder

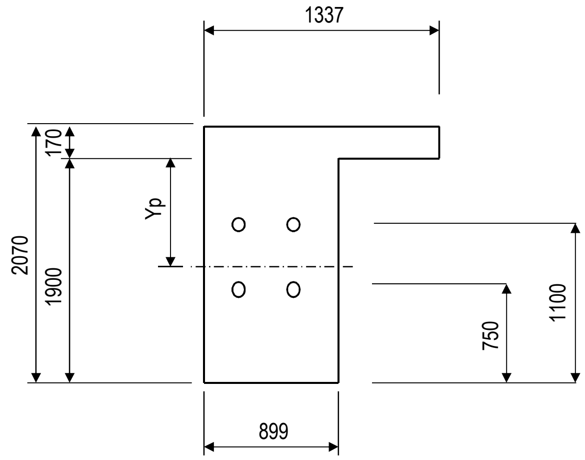
8.1 For Bending Moment

1) Calcution of Bending Moment

(kN・m)

		Bending Moment	
		max	min
Dead Load	(Md)	-81.62	-78.85
Live Load	(ML)	320.89	-160.86
Total	(M)	239.27	-239.71

2)Dimension



3)Calculation of Prestressing

Type of PC strand 4S15.2 SWPR19L

Area of PC strand 554.8 mm^2

Number of PC strand 4

(N/mm^2)

	Tensile Stress of PC strand	
	Allowable Value	Result
During Prestressing	1440	1250
Immediately after Prestressing	1295	1151
Under Effestive Prestressing Force	1110	1056

4)Combined Flexural Stress

(N/mm^2)

		Bending Moment(Max)		Bending Moment(Min)	
		Top	Bottom	Top	Bottom
Dead Load		-0.11	0.12	-0.11	0.12
Live Load		0.44	-0.47	-0.22	0.24
Prestressing		1.26	1.48	1.26	1.48
Total	Dead Load	1.15	1.60	1.15	1.60
	Live Load	1.59	1.13	0.93	1.84
Allowable Value		$0.00 \leqq \sigma \leqq 12.0$			

01-3-PC-I GIRDER BRIDGE

(PF7-PF11)

Table of Contents

1.1 DESIGN CONDITION

ROAD GRADE	:	Equivalent to CLASS 4-1
BRIDGE TYPE	:	4 span continuous PC-I girder bridge with composite deck (PC plate and RC deck)
BRIDGE LENGTH	:	L = 120.000 m
SPAN LENGTH	:	L = 28.798 + 28.800 + 28.800 + 28.800 m
WIDTH OF THE ROAD	:	TOTAL 12.750 m L = 0.500 + 5.500 + 0.750 + 5.500 + 0.500 m
HORIZONTAL ALIGNMENT	:	A=130 ～ R=∞
LONGITUDINAL SLOPE	:	0.72 % ↘
SECTION SLOPE	:	LEFT : 3.83 % ～ 2.00 % ↙ RIGHT : 3.77 % ↙ ～ 2.00 % ↘
ANGLE OF SKEW	:	PF7 : 92°29'51" PF8 : 90°07'09" PF9,PF10,PF11 : 90°00'00"
PAVEMENT	:	ASPHALT PAVEMENT t= 80 mm
SLAB	:	REINFORCED CONCRETE t= 170 mm
PLATE	:	PRESTRESS CONCRETE PLATE t= 100 mm
LIVE ROAD	:	AASHTO HL=93
DESIGN STANDARD	:	AASHTO LRFD BRIDGE DESIGN 2014(LIVE ROAD) Specifications for highway bridges(Japan Road Association) 1 Common matters,3 Concrete bridges,5 seismic design (April 2012)

1.2 MATERIALS STRENGTH

1) CONCRETE

(N/mm^2)

			MAIN GIRDER	CROSS BEAM	RC SLAB	PC PLATE	COUPLING CONCRETE
DESIGN STANDARD STRENGTH OF CONCRETE			40.00	30.00	30.00	40.00	30.0
BENDING COMPRESSIVESTRESS	IMMEDIATELY AFTER PRESTRESSING		19.00	14.00	----	19.00	----
	OTHERS		14.00	11.00	10.00	15.00	10.00
BENDING TENSILE STRESS	IMMEDIATELY AFTER PRESTRESSING		-1.50	-1.20	----	-1.50	----
	DEAD LOAD		0.0	0.0	----	----	----
	DESIGN LOAD		-1.50	-1.20	----	0.0	----
	TEMPERATURE CHANGE		-2.00	----	----	----	----
MEAN SHEAR STRESS CONCRETE CAN CARRY			0.55	0.45	----	----	----
MAXIMUM MEAN CONCRETE SHEAR STRESS			5.30	4.00	----	----	----
ALLOWABLE DIAGONEL TENSILE STRESS (Case where shear forse or torsional moment)		DEAD LOAD	-1.00	-0.80	----	----	----
		LIVE LOAD	-2.00	-1.70	----	----	----
ALLOWABLE DIAGONEL TENSILE STRESS (Case where both shear forse and torsional moment)		DEAD LOAD	-1.30	-1.10	----	----	----
		LIVE LOAD	-2.50	-2.20	----	----	----

2) PC STRAND

(N/mm^2)

		MAIN GIRDER	CROSS BEAM	PC PLATE
PRESTRESSING STEEL TYPE		SWPR7BL 7S15.2mm	SWPR7BL 4S15.2mm	SWPR7AL 1S9.3mm
TENSILE STRENGTH		1850	1850	1700
YIELD POINT		1600	1600	1450
ALLOWABLE TENSILE STRESS	DURING PRESTRESSING	1440	1440	1305
	IMMEDIATELY AFTER PRESTRESSING	1295	1295	1190
	AT COMPOSITION OF SLAB	1110	----	----
	DESIGN LOAD	1110	1110	1020

3) REINFORCING STEEL

(N/mm^2)

		MAIN GIRDER	CROSS BEAM	RC SLAB	COUPLING CONCRETE
STEEL TYPE		SD345	SD345	SD345	SD345
YIELD POINT		345	345	345	345
ALLOWABLE TENSILE STRESS	DEAD LOAD	----	----	100	100
	DESIGN LOAD	180	200	140	160
	COLLISION LOAD	----	----	300	----
	WIND LOAD	----	----	175	----

1.3 DESIGN CONSTANT

1) CONCRETE

			MAIN GIRDER	CAST IN PLACE	PC PLATE
YOUNG'S MODULUS	DESIGN LOAD	(N/mm2)	3.10×10^4	2.80×10^4	3.10×10^4
	IMMEDIATELY AFTER PRESTRESSING	(N/mm2)	2.92×10^4	2.58×10^4	2.92×10^4
CREEP COEFFICIENT	NUMBER OF DAYS FOR DECK CONSTRUCTION		90	----	----
	NUMBER OF CONSTRUCTION DAYS FOR BRIDGE SURFACE		120	----	----
	DESIGN LOAD		2.60	2.60	3.00
	DURING DECK CONSTRUCTION		1.70	----	----
	BRIDGE SURFACE		1.65	----	----
DRYING SHRINKAGE OF CONCRETE	DURING DECK CONSTRUCTION		4.0×10^{-5}	----	----
	DESIGN LOAD		20.0×10^{-5}	20.0×10^{-5}	20.0×10^{-5}
UNIT WEIGHT		(kN/mm^3)	24.5	24.5	24.5

2) PC STRAND(MAIN GIRDER)

		1	2
YOUNG'S MODULUS	N/mm^2	2.00×10^5	2.00×10^5
SLIP	mm	4.0	4.0
RELAXATION	%	2.5	2.5
FRICTION COEFFICIENT	1/m	0.004	0.004
	1/rad	0.300	0.300
AREA	mm^2	970.900	970.900
UNIT WEIGHT	kg/m	7.707	7.707
DIAMETER OF SHEATH	mm	60.0	60.0
DECREASE RATIO BY ANCHOR	%	0.0	0.0

3) PC STRAND(CROSS BEAM)

YOUNG'S MODULUS	N/mm^2	2.00×10^5
SLIP	mm	4.0
RELAXATION	%	2.5
FRICTION COEFFICIENT	1/m	0.004
AREA	mm^2	554.800
UNIT WEIGHT	kg/m	4.404
DIAMETER OF SHEATH	mm	45.0
DECREASE RATIO BY ANCHOR	%	0.0

4) PC STRAND(PC PLATE)

			BETWEEN MAIN GIRDERS
YOUNG'S MODULUS		N/mm^2	2.00×10^5
RELAXATION	BEFORE PRESTRESSING	%	1.5
	AFTER PRESTRESSING	%	1.5
	EXTRA COEFFICIENT OF HIGH TEMPERATURE	%	1.0
AREA		mm^2	51.610
UNIT WEIGHT		kg/m	0.405

1. 5 Dimension

1) Dimension of Main Girder

Girder Height : 2000.00 ～ 2000.00 mm

【Change of Web Width (mm)】

Span	End of Girder (Left Side)			End of Girder (Right Side)		
	Ending Point of Changing Web Width	Starting Point of Changing Web Width	Web Width	Ending Point of Changing Web Width	Starting Point of Changing Web Width	Web Width
1	1000.0	4000.0	700.0	4000.0	1000.0	700.0
2	1000.0	4000.0	700.0	4000.0	1000.0	700.0
3	1000.0	4000.0	700.0	4000.0	1000.0	700.0
4	1000.0	4000.0	700.0	4000.0	1000.0	700.0

2) Dimension of Cross Beam

【Interval of Cross Beam on Left Girder (m)】

Span	Number of Intermediate Cross Beams	CB1～CB2	CB2～CB3
1	1	14.899	14.899
2	1	14.900	14.900
3	1	14.900	14.900
4	1	14.900	14.900

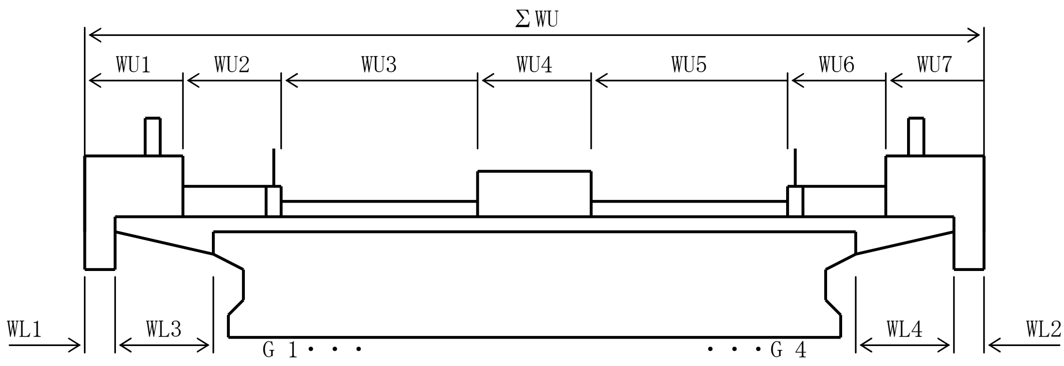
【Interval of Cross Beam on Right Girder (m)】

Span	Number of Intermediate Cross Beams	CB1～CB2	CB2～CB3
1	1	14.899	14.899
2	1	14.900	14.900
3	1	14.900	14.900
4	1	14.900	14.900

【Dimension of Cross Beam (m)】

Span	Cross Beam Width	Cross Beam Width (Left Side)	Cross Beam Width (Right Side)
1	0.300	0.900	1.000
2	0.300	1.000	1.000
3	0.300	1.000	1.000
4	0.300	1.000	0.900

【Cross Section 】



【m】

	ΣWU	WU1	WU2	WU3	WU4	WU5	WU6	WU7
1	12.762	0.500	0.000	5.505	0.751	5.505	0.000	0.500
2	12.750	0.500	0.000	5.500	0.750	5.500	0.000	0.500
3	12.750	0.500	0.000	5.500	0.750	5.500	0.000	0.500
4	12.750	0.500	0.000	5.500	0.750	5.500	0.000	0.500
5	12.750	0.500	0.000	5.500	0.750	5.500	0.000	0.500

	ΣWU	WL1	WL2	WL3	WL4
1	3.500	0.000	0.000	0.487	0.475
2	3.500	0.000	0.000	0.479	0.471
3	3.500	0.000	0.000	0.475	0.475
3	3.500	0.000	0.000	0.475	0.475
3	3.500	0.000	0.000	0.475	0.475

2. 1 Load Intensity

1) Load Intensity

(1) Bridge Surface Loads

< 1 >

Load Type		Load Intensity		Load Location	
				Left End of Girder Side	Right End of Girder Side
Selfweight of Kerb	Left	9.020	kN/m	0.180 m	0.180 m
	Right	11.630	kN/m	0.200 m	0.200 m
Selfweight of Concrete Barrier	Left	0.600	kN/m	0.125 m	0.125 m
	Right	0.600	kN/m	0.125 m	0.125 m
Selfweight of Sidewalk	Left	0.000	kN/m^2		
	Right	0.000	kN/m^2		
Selfweight of Handrail	Left	0.000	kN/m	m	m
	Right	0.000	kN/m	m	m
Selfweight of Kerb	Left	0.000	kN/m	m	m
	Right	0.000	kN/m	m	m
Selfweight of Pavement	Left	4.150	kN/m^2		
	Right	6.610	kN/m^2		
Selfweight of Median		12.190	kN/m^2		
Selfweight of Additional Object	1	0.110	kN/m	0.075 m	0.075 m
	2	0.110	kN/m	12.686 m	12.675 m

< 2 >

Load Type		Load Intensity		Load Location	
				Left End of Girder Side	Right End of Girder Side
Selfweight of Kerb	Left	8.570	kN/m	0.180 m	0.180 m
	Right	8.690	kN/m	0.180 m	0.180 m
Selfweight of Concrete Barrier	Left	0.600	kN/m	0.125 m	0.125 m
	Right	0.600	kN/m	0.125 m	0.125 m
Selfweight of Sidewalk	Left	0.000	kN/m^2		
	Right	0.000	kN/m^2		
Selfweight of Handrail	Left	0.000	kN/m	m	m
	Right	0.000	kN/m	m	m
Selfweight of Kerb	Left	0.000	kN/m	m	m
	Right	0.000	kN/m	m	m
Selfweight of Pavement	Left	3.070	kN/m^2		
	Right	3.180	kN/m^2		
Selfweight of Median		10.790	kN/m^2		
Selfweight of Additional Object	1	0.110	kN/m	0.075 m	0.075 m
	2	0.110	kN/m	12.675 m	12.675 m

< 3 >

Load Type		Load Intensity	Load Location	
			Left End of Girder Side	Right End of Girder Side
Selfweight of Kerb	Left	8.570 kN/m	0.180 m	0.180 m
	Right	8.570 kN/m	0.180 m	0.180 m
Selfweight of Concrete Barrier	Left	0.600 kN/m	0.125 m	0.125 m
	Right	0.600 kN/m	0.125 m	0.125 m
Selfweight of Sidewalk	Left	0.000 kN/m^2		
	Right	0.000 kN/m^2		
Selfweight of Handrail	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Kerb	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Pavement	Left	3.070 kN/m^2		
	Right	3.070 kN/m^2		
Selfweight of Median		10.790 kN/m^2		
Selfweight of Additional Object	1	0.110 kN/m	0.075 m	0.075 m
	2	0.110 kN/m	12.675 m	12.675 m

< 4 >

Load Type		Load Intensity	Load Location	
			Left End of Girder Side	Right End of Girder Side
Selfweight of Kerb	Left	8.570 kN/m	0.180 m	0.180 m
	Right	8.570 kN/m	0.180 m	0.180 m
Selfweight of Concrete Barrier	Left	0.600 kN/m	0.125 m	0.125 m
	Right	0.600 kN/m	0.125 m	0.125 m
Selfweight of Sidewalk	Left	0.000 kN/m^2		
	Right	0.000 kN/m^2		
Selfweight of Handrail	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Kerb	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Pavement	Left	3.070 kN/m^2		
	Right	3.070 kN/m^2		
Selfweight of Median		10.790 kN/m^2		
Selfweight of Additional Object	1	0.110 kN/m	0.075 m	0.075 m
	2	0.110 kN/m	12.675 m	12.675 m

Condition of Load

Calculation of Bridge Surface Loads

(PF7-PF8)

① Unit Weight

PC・RC Concrete	γ1＝	24.5 kN/m^3
Concrete	γ2＝	23.0 kN/m^3
Asphalt Pavement	γ3＝	22.5 kN/m^3

② Bridge Surface Loads

・ Pavement on Left Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

t' = 1/2 × (0.117 ＋ 0.247) = 0.182 m

(Thickness of Leveling Concrete)

tc = 0.182 － 0.080 = 0.102 m

(Load Intensity)

q = 0.080 × 22.5 ＋ 0.102 × 23.0 = 4.15 kN/m^2

・ Pavement on Right Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

t' = 1/2 × (0.247 ＋ 0.330) = 0.289 m

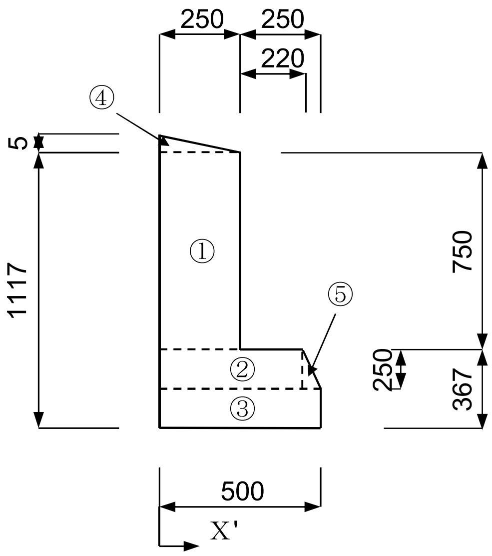
(Thickness of Leveling Concrete)

tc = 0.289 － 0.080 = 0.209 m

(Load Intensity)

q = 0.080 × 22.5 ＋ 0.209 × 23.0 = 6.61 kN/m^2

・Concrete Barrier (Left Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.117	0.500	0.0585	0.250	0.01463
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3679		0.0675

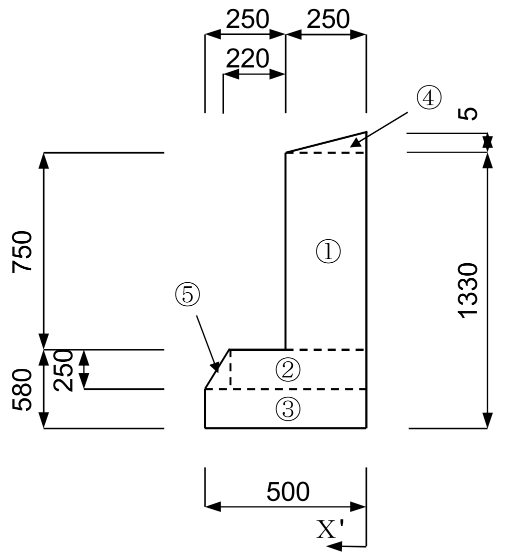
Load Location

X' = 0.0675 / 0.3679 = 0.180 m

Load Intensity

P = 0.3679 × 24.5 = 9.02 kN/m

・Concrete Barrier (Right Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.330	0.500	0.1650	0.250	0.04125
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.4744		0.0942

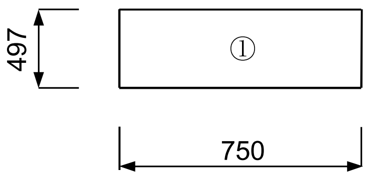
Load Location

X' = 0.0942 / 0.4744 = 0.200 m

Load Intensity

P = 0.4744 × 24.5 = 11.63 kN/m

・Median



a) Load Intensity and Load Location

		H	B	A
①	□	0.4970	0.7500	0.3728
				0.3728

Load Location

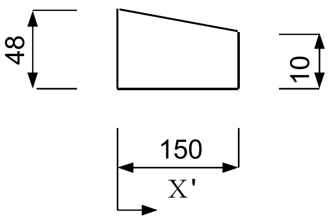
X' = On CL

Load Intensity

P = 0.3728 × 24.5 = 9.14 kN/m

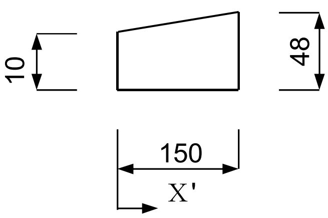
W = 9.1400 / 0.750 = 12.19 kN/m^2

・Left Drain Duct
※Loaded as Selfweight of Additional Object 1



Load Location
X' = 75mm inside beginning of Left Kerb
Load Intensity
P = 1/2 × (0.048 ＋ 0.010) × 0.150 × 24.5 = 0.11 kN/m

・Right Drain Duct
※Loaded as Selfweight of Additional Object 2



Load Location
X' = 75mm inside beginning of Right Kerb
Load Intensity
P = 1/2 × (0.010 ＋ 0.048) × 0.150 × 24.5 = 0.11 kN/m

・Handrail
※Loaded as Concrete Barrier

Load Location
X' = 125mm inside beginning of Right and Left Kerb
Load Intensity
P = 0.60 = 0.60 kN/m

Condition of Load

Calculation of Bridge Surface Loads

(PF8-PF9)

① Unit Weight

PC・RC Concrete	$\gamma 1 =$	24.5 kN/m^3
Concrete	$\gamma 2 =$	23.0 kN/m^3
Asphalt Pavement	$\gamma 3 =$	22.5 kN/m^3

② Bridge Surface Loads

・ Pavement on Left Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

t' = 1/2 × (0.080 ＋ 0.190) = 0.135 m

(Thickness of Leveling Concrete)

tc = 0.135 － 0.080 = 0.055 m

(Load Intensity)

q = 0.080 × 22.5 ＋ 0.055 × 23.0 = 3.07 kN/m^2

・ Pavement on Right Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

t' = 1/2 × (0.190 ＋ 0.090) = 0.140 m

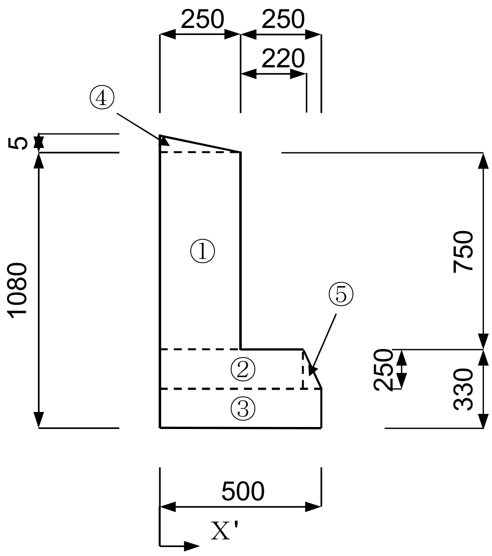
(Thickness of Leveling Concrete)

tc = 0.140 － 0.080 = 0.060 m

(Load Intensity)

q = 0.080 × 22.5 ＋ 0.060 × 23.0 = 3.18 kN/m^2

・Concrete Barrier (Left Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.080	0.500	0.0400	0.250	0.01000
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3494		0.0629

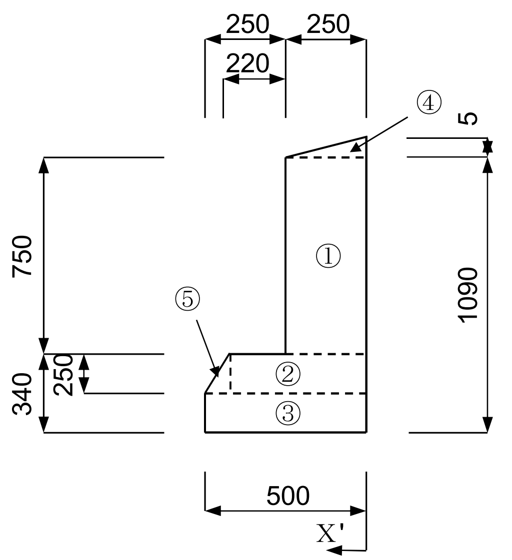
Load Location

X' = 0.0629 / 0.3494 = 0.180 m

Load Intensity

P = 0.3494 × 24.5 = 8.57 kN/m

・Concrete Barrier (Right Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.090	0.500	0.0450	0.250	0.01125
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3544		0.0642

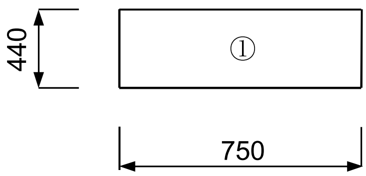
Load Location

X' = 0.0642 / 0.3544 = 0.180 m

Load Intensity

P = 0.3544 × 24.5 = 8.69 kN/m

・Median



a) Load Intensity and Load Location

		H	B	A
①	□	0.4400	0.7500	0.3300
				0.3300

Load Location

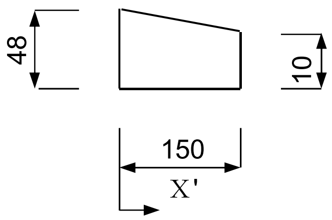
X' = On CL

Load Intensity

P = 0.3300 × 24.5 = 8.09 kN/m

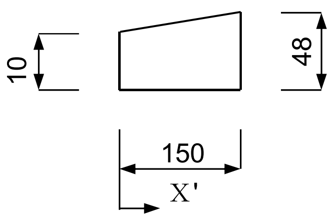
W = 8.0900 / 0.750 = 10.79 kN/m^2

・Left Drain Duct
※Loaded as Selfweight of Additional Object 1



Load Location
X' = 75mm inside beginning of Left Kerb
Load Intensity
P = 1/2 × (0.048 + 0.010) × 0.150 × 24.5 = 0.11 kN/m

・Right Drain Duct
※Loaded as Selfweight of Additional Object 2



Load Location
X' = 75mm inside beginning of Right Kerb
Load Intensity
P = 1/2 × (0.010 + 0.048) × 0.150 × 24.5 = 0.11 kN/m

・Handrail
※Loaded as Concrete Barrier

Load Location
X' = 125mm inside beginning of Right and Left Kerb
Load Intensity
P = 0.60 = 0.60 kN/m

Condition of Load

Calculation of Bridge Surface Loads

(PF9-PF11)

① Unit Weight

PC・RC Concrete	γ1＝	24.5 kN/m^3
Concrete	γ2＝	23.0 kN/m^3
Asphalt Pavement	γ3＝	22.5 kN/m^3

② Bridge Surface Loads

・ Pavement on Left Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

t' = 1/2 × (0.080 ＋ 0.190) = 0.135 m

(Thickness of Leveling Concrete)

tc = 0.135 － 0.080 = 0.055 m

(Load Intensity)

q = 0.080 × 22.5 ＋ 0.055 × 23.0 = 3.07 kN/m^2

・ Pavement on Right Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

t' = 1/2 × (0.190 ＋ 0.080) = 0.135 m

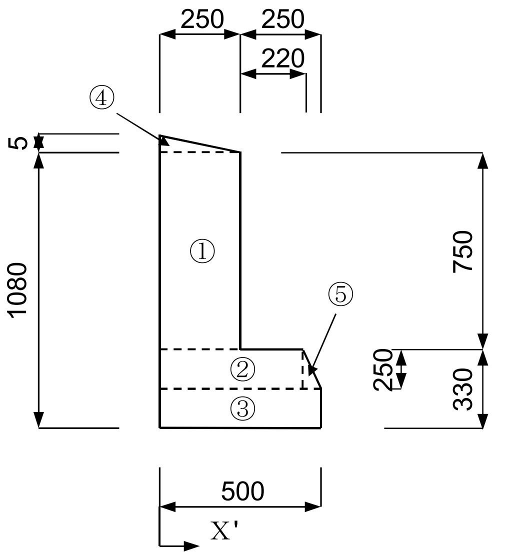
(Thickness of Leveling Concrete)

tc = 0.135 － 0.080 = 0.055 m

(Load Intensity)

q = 0.080 × 22.5 ＋ 0.055 × 23.0 = 3.07 kN/m^2

・Concrete Barrier (Left Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.080	0.500	0.0400	0.250	0.01000
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3494		0.0629

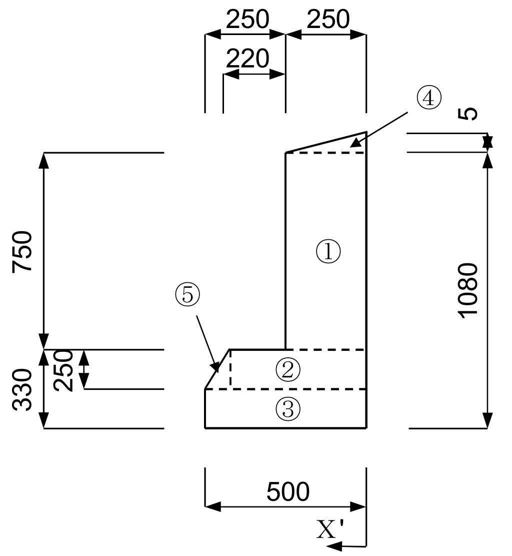
Load Location

X' = 0.0629 / 0.3494 = 0.180 m

Load Intensity

P = 0.3494 × 24.5 = 8.57 kN/m

・Concrete Barrier (Right Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.080	0.500	0.0400	0.250	0.01000
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3494		0.0629

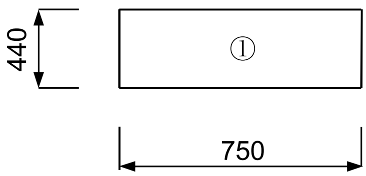
Load Location

X' = 0.0629 / 0.3494 = 0.180 m

Load Intensity

P = 0.3494 × 24.5 = 8.57 kN/m

・Median



a) Load Intensity and Load Location

		H	B	A
①	□	0.4400	0.7500	0.3300
				0.3300

Load Location

X' = On CL

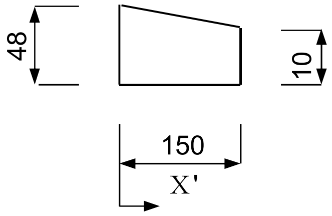
Load Intensity

P = 0.3300 × 24.5 = 8.09 kN/m

W = 8.0900 / 0.750 = 10.79 kN/m^2

・Left Drain Duct

※Loaded as Selfweight of Additional Object 1



Load Location

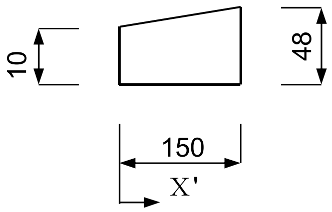
X' = 75mm inside beginning of Left Kerb

Load Intensity

P = 1/2 × (0.048 + 0.010) × 0.150 × 24.5 = 0.11 kN/m

・Right Drain Duct

※Loaded as Selfweight of Additional Object 2



Load Location

X' = 75mm inside beginning of Right Kerb

Load Intensity

P = 1/2 × (0.010 + 0.048) × 0.150 × 24.5 = 0.11 kN/m

・Handrail

※Loaded as Concrete Barrier

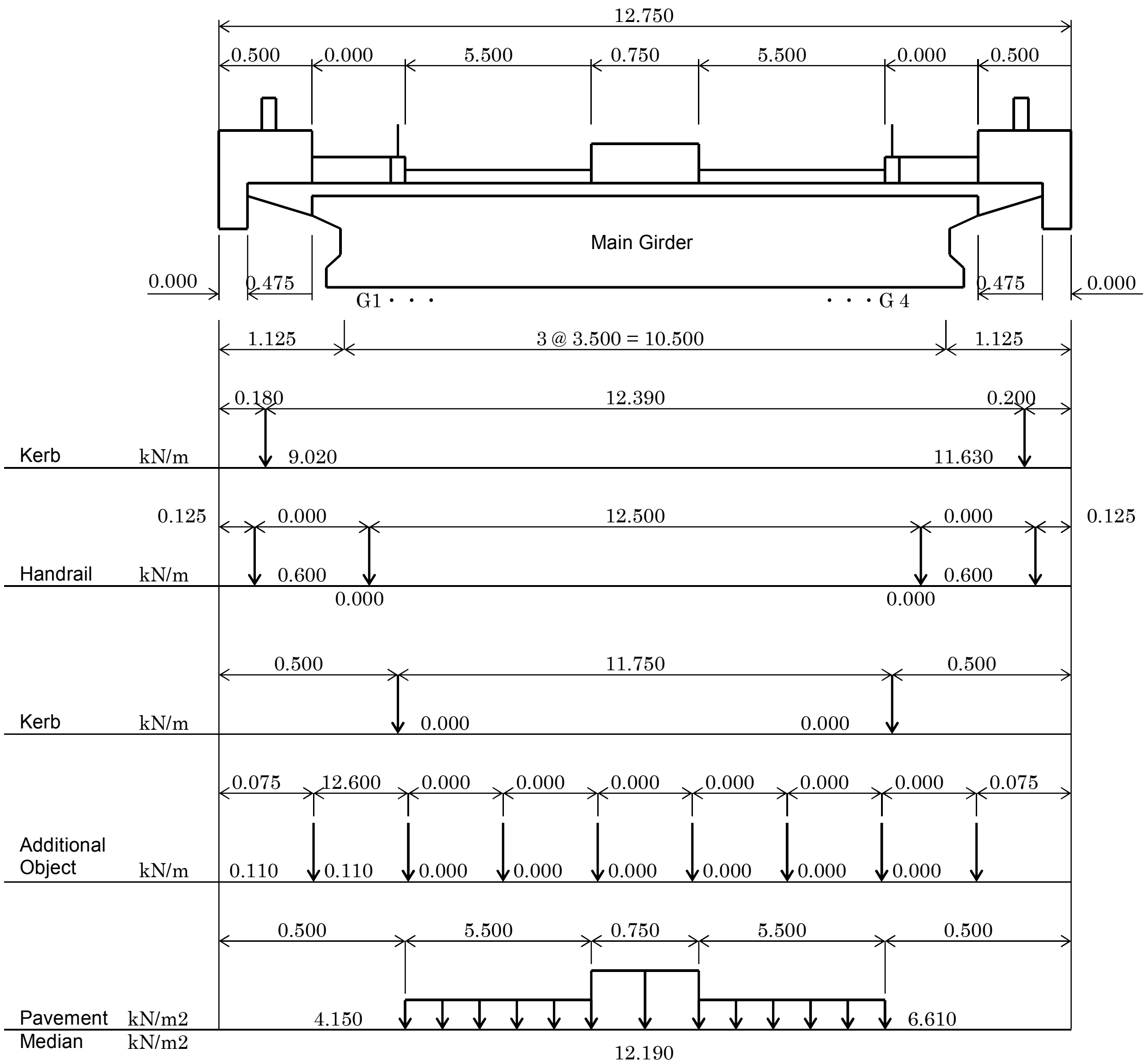
Load Location

X' = 125mm inside beginning of Right and Left Kerb

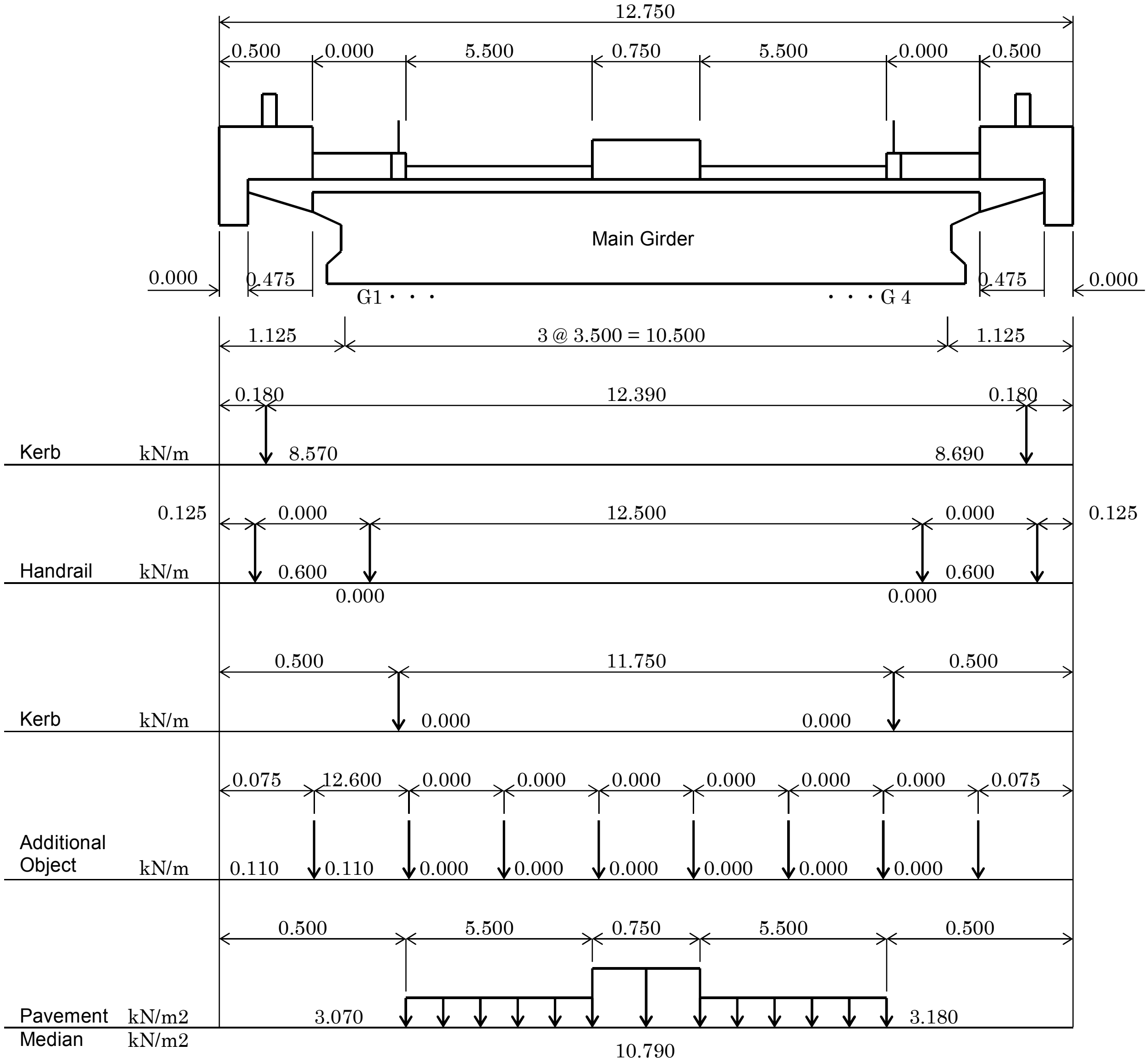
Load Intensity

P = 0.60 = 0.60 kN/m

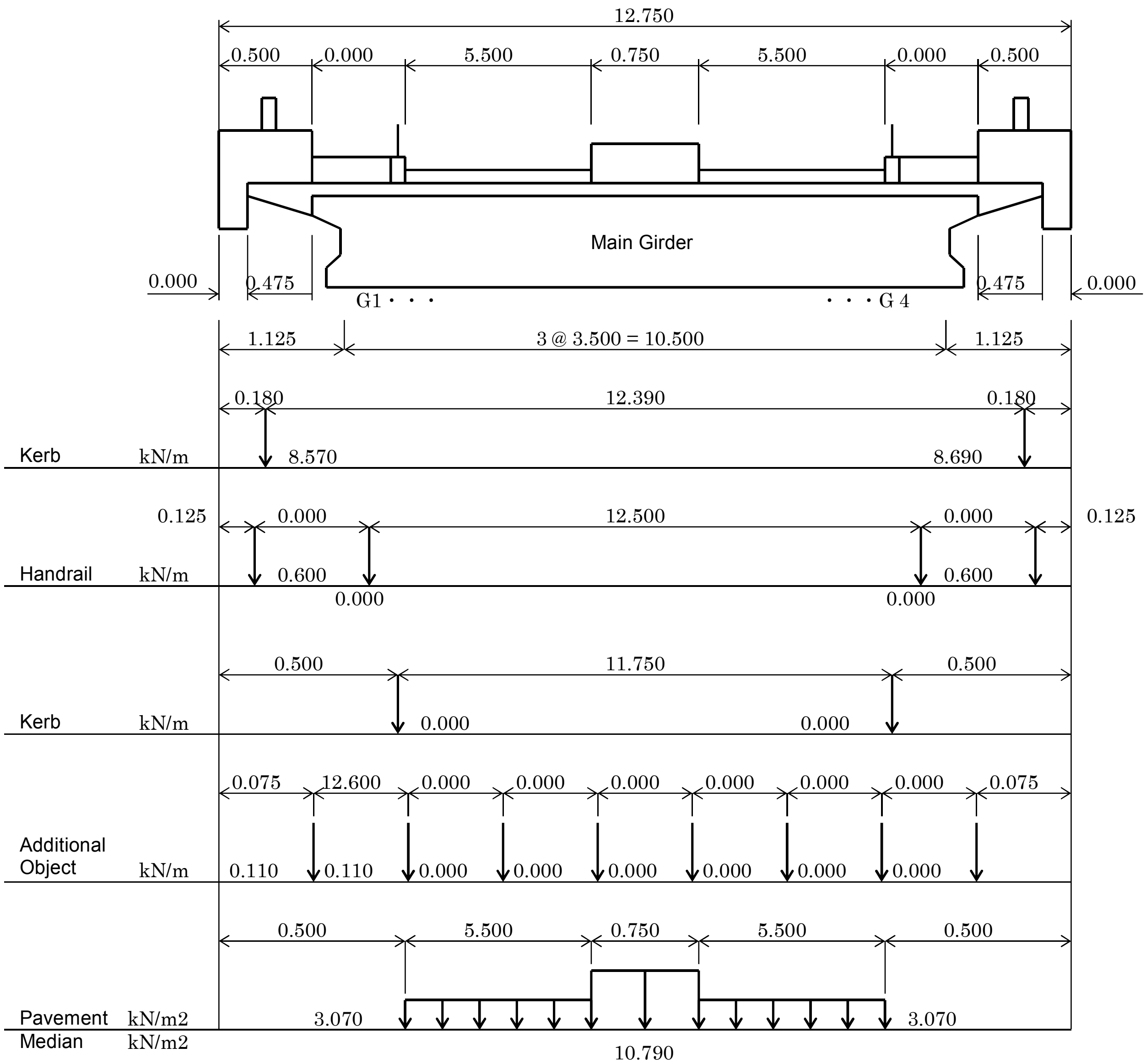
Load Intensity（Bridge Surface Loads_PF7-PF8）



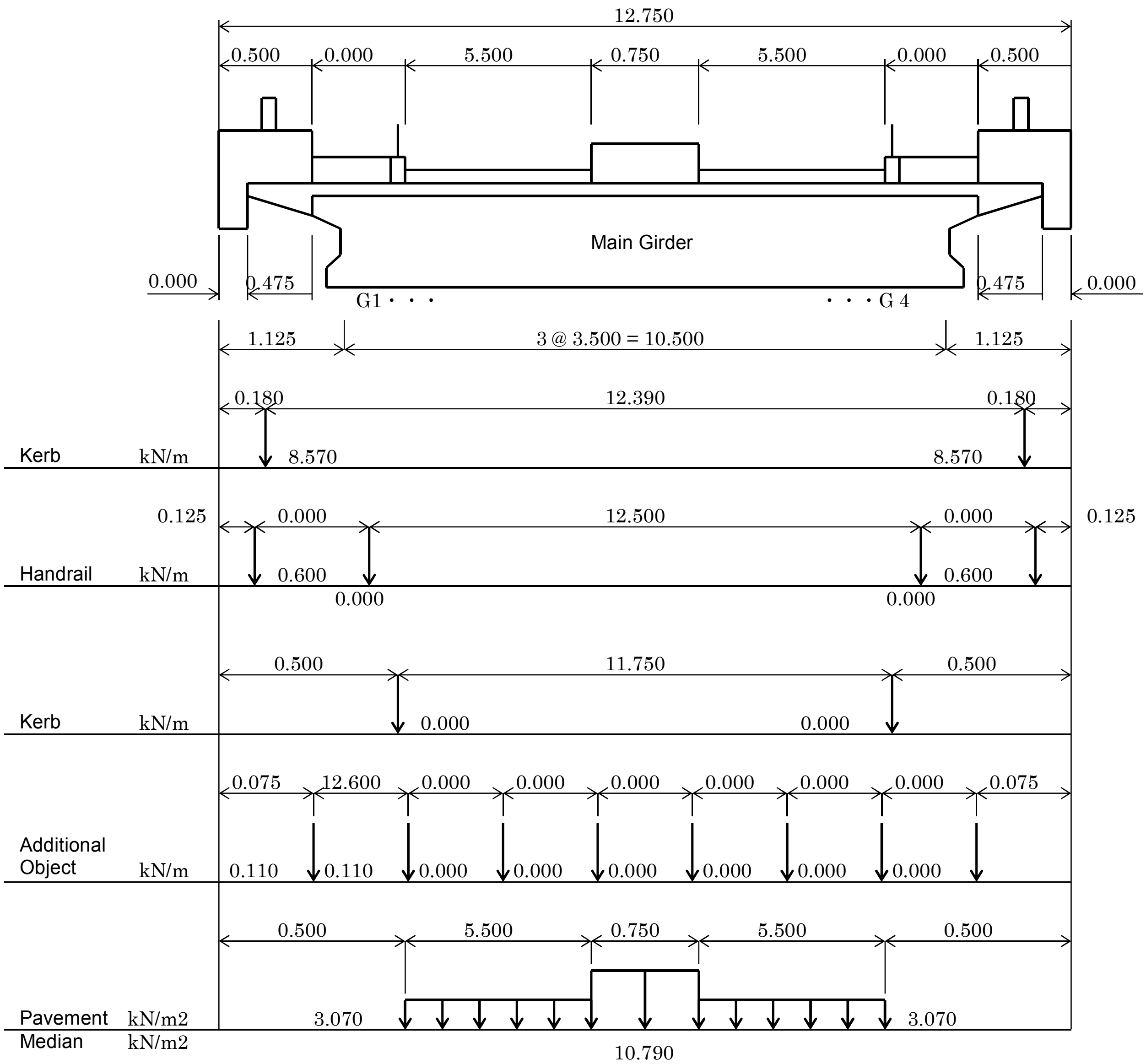
Load Intensity（Bridge Surface Loads_PF8-PF9）



Load Intensity（Bridge Surface Loads_PF9-PF10）

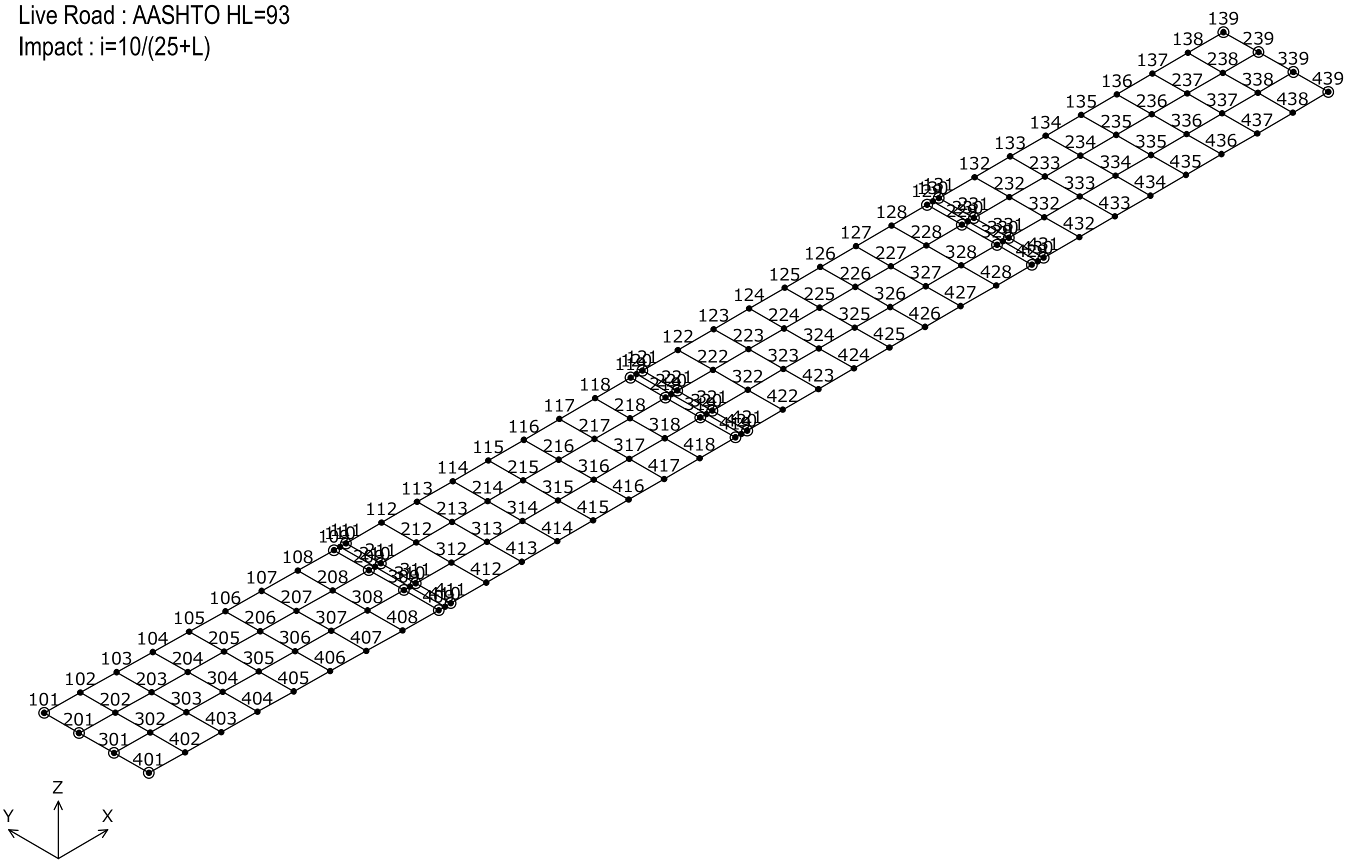


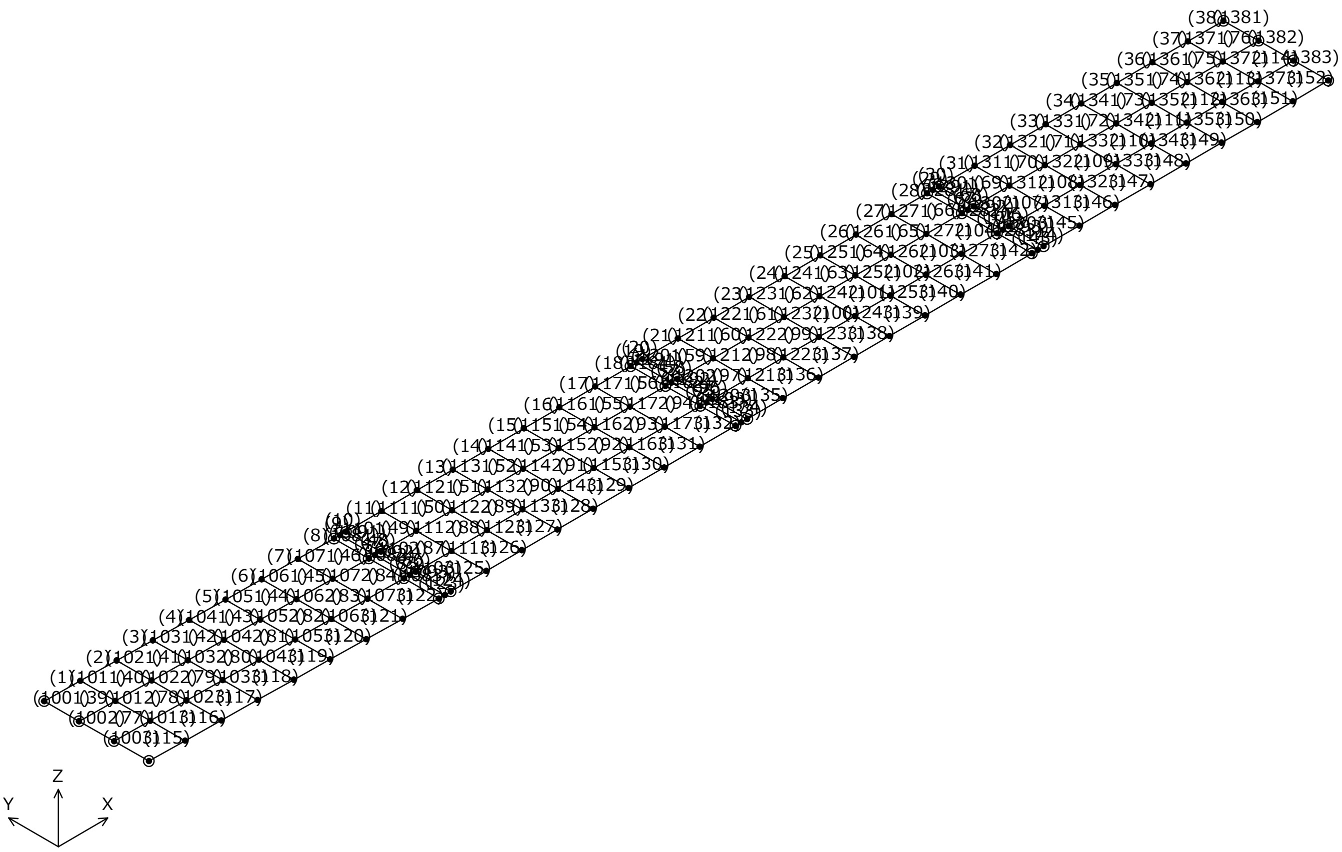
Load Intensity（Bridge Surface Loads_PF10-PF11）



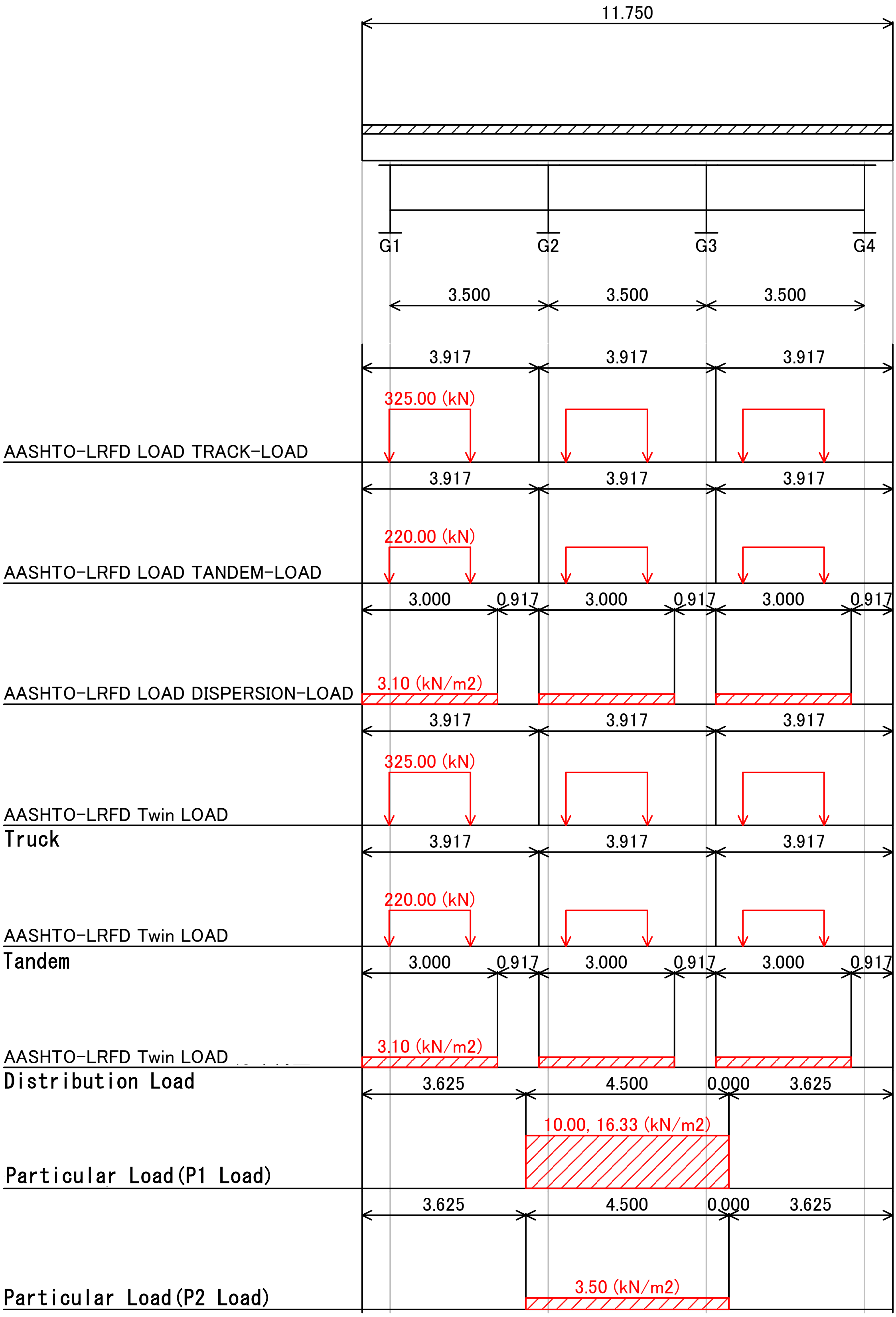
(2) Live Road

Live Road : AASHTO HL=93
Impact : i=10/(25+L)





(m)

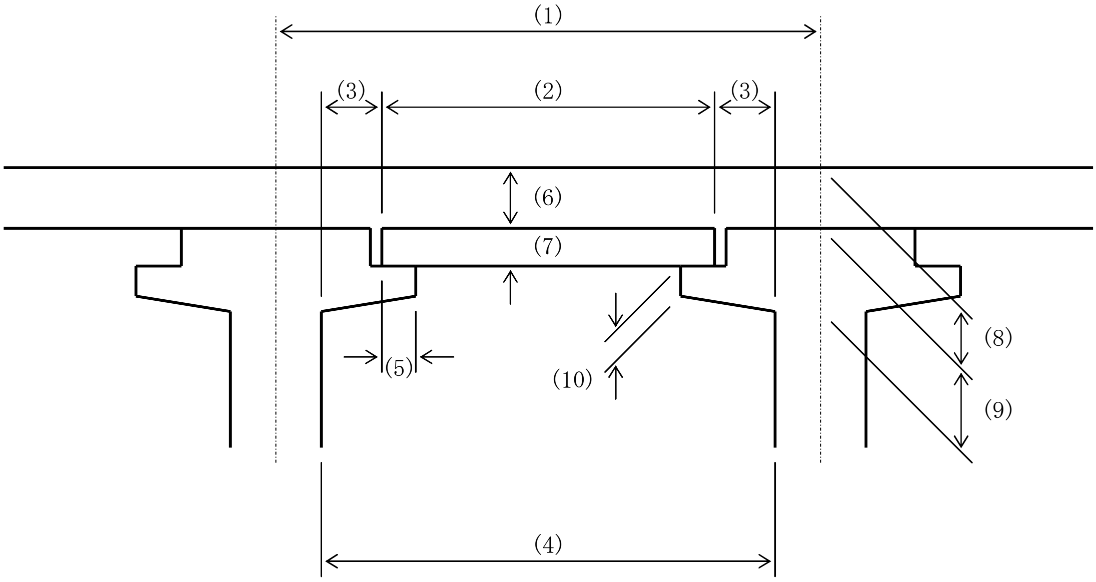


11.750
G1
G2
G3
G4
3.500
3.500
3.500
3.917
3.917
3.917
325.00 (kN)
AASHTO-LRFD LOAD TRACK-LOAD
220.00 (kN)
AASHTO-LRFD LOAD TANDEM-LOAD
3.000
0.917
3.10 (kN/m2)
AASHTO-LRFD LOAD DISPERSION-LOAD
AASHTO-LRFD Twin LOAD
Truck
AASHTO-LRFD Twin LOAD
Tandem
AASHTO-LRFD Twin LOAD
Distribution Load
3.625
4.500
0.000
10.00, 16.33 (kN/m2)
Particular Load(P1 Load)
3.50 (kN/m2)
Particular Load(P2 Load)

3 Design of Deck Slab

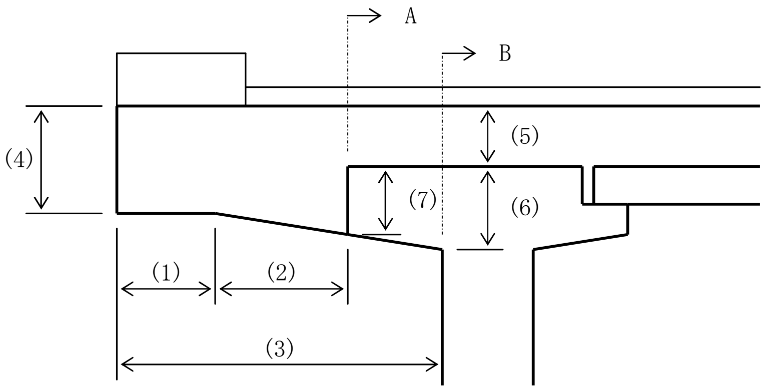
3.1 Dimension

1) Deck Slab between Girders



		1st Span		4th Span
		End of Girder	Center of Girder	Center of Girder
(1)	m	3.500	3.500	3.500
(2)	m	2.380	2.380	2.380
(3)	m	0.210	0.450	0.450
(4)	m	2.800	3.280	3.280
(5)	m	0.090	0.090	0.090
Span Length of PC Plate	m	2.260	2.260	2.260
(6)	mm	170.0	170.0	170.0
(7)	mm	100.0	100.0	100.0
(6)+(7)	mm	270.0	270.0	270.0
(8)	mm	170.0	170.0	170.0
(9)	mm	255.6	300.0	300.0
(10)	mm	100.0	100.0	100.0

2) Deck Slab outside of Girders



			1st Span		4th Span
			End of Girder	Center of Girder	Center of Girder
Left Side	(1)	m	0.000	0.000	0.000
	(2)	m	0.484	0.484	0.475
	(3)	m	0.784	1.024	1.015
	(4)	mm	250.0	250.0	250.0
	(5)	mm	170.0	170.0	170.0
	(6)	mm	255.6	300.0	300.0
	(7)	mm	200.0	200.0	200.0
Right Side	(1)	m	0.000	0.000	0.000
	(2)	m	0.626	0.626	0.475
	(3)	m	0.926	1.166	1.015
	(4)	mm	250.0	250.0	250.0
	(5)	mm	170.0	170.0	170.0
	(6)	mm	255.6	300.0	300.0
	(7)	mm	200.0	200.0	200.0

3) Calculation of Prestressing of PC Plate

		Unit	
Name of PC Strand			1S9.3
Material of PC Strand			SWPR7AL
Area of PC Strand		mm^2/no.	51.61
Number of PC Strand		No.	15
Creep Coefficient			3.00
Drying Shrinkage of Concrete		$\times 10^{-5}$	25.00
Relaxation	Before Prestressing	%	1.50
	Extra Coefficient of High Temperature	%	1.00
	After Prestressing	%	1.50
Prestressing Stress σpi		N/mm^2	1225.00
Allowable Value		N/mm^2	1305.00

<Design of Deck: Summary for Calculation Results of Stress>

1st Span, Left End of Girder Side

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5 ～19.0	9.17	○
	Bottom of PC Plate	N/mm^2		8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0 ～15.0	10.602	○
	Bottom of PC Plate	N/mm^2		3.711	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	3.753	○
	Bottom of RC Deck	N/mm^2		-0.862	○
	Top of PC Plate	N/mm^2	0 ～15.0	8.307	○
	Bottom of PC Plate	N/mm^2		1.092	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	924.471	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.707	○	140	77.98	○
Edge of PC Plate	Positive Moment	10	4.147	○	140	64.431	○
	Negative Moment	10	3.966	○	140	83.041	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	8.659	○	140	100.221	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	0.56	○
Tensile Stress of Reinforcement Bar	140	27.98	○

<Design of Deck: Summary for Calculation Results of Stress>

1st Span， Left End of Girder Side

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	5.77	○
	D+L	10	0.22	○	140	5.77	○
	D+L+CO	15	2.057	○	300	53.913	○
	D+L+W	12.5	0.365	○	175	9.569	○
	D+W	12.5	0.51	○	175	13.367	○
Supporting for Deck	D	------	------	--	100	10.797	○
	D+L	10	1.4	○	140	40.323	○
	D+L+CO	15	2.852	○	300	82.152	○
	D+L+W	12.5	1.516	○	175	43.665	○
	D+W	12.5	0.607	○	175	17.481	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	10.172	○
	D+L	10	0.388	○	140	10.172	○
	D+L+CO	15	2.225	○	300	58.315	○
	D+L+W	12.5	0.533	○	175	13.971	○
	D+W	12.5	0.678	○	175	17.769	○
Supporting for Deck	D	------	------	--	100	16.433	○
	D+L	10	3.831	○	140	110.346	○
	D+L+CO	15	5.283	○	300	152.176	○
	D+L+W	12.5	3.947	○	175	113.688	○
	D+W	12.5	0.803	○	175	23.117	○

Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	1.634	○	140	59.09	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	1.892	○	140	68.406	○

<Design of Deck: Summary for Calculation Results of Stress>

1st Span,　Center of Span

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5 ～19.0	9.17	○
	Bottom of PC Plate	N/mm^2		8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0 ～15.0	10.615	○
	Bottom of PC Plate	N/mm^2		3.726	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	4.53	○
	Bottom of RC Deck	N/mm^2		-1.041	○
	Top of PC Plate	N/mm^2	0 ～15.0	8.122	○
	Bottom of PC Plate	N/mm^2		0.286	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	926.235	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.697	○	140	82.954	○
Edge of PC Plate	Positive Moment	10	7.196	○	140	111.805	○
	Negative Moment	10	3.447	○	140	72.189	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	9.958	○	140	115.254	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	1.002	○
Tensile Stress of Reinforcement Bar	140	55.499	○

<Design of Deck: Summary for Calculation Results of Stress>

1st Span,　Center of Span

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	5.77	○
	D+L	10	0.22	○	140	5.77	○
	D+L+CO	15	2.057	○	300	53.913	○
	D+L+W	12.5	0.365	○	175	9.569	○
	D+W	12.5	0.51	○	175	13.367	○
Supporting for Deck	D	------	------	--	100	14.428	○
	D+L	10	2.143	○	140	65.917	○
	D+L+CO	15	3.379	○	300	103.902	○
	D+L+W	12.5	2.243	○	175	68.981	○
	D+W	12.5	0.668	○	175	20.556	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	10.159	○
	D+L	10	0.388	○	140	10.159	○
	D+L+CO	15	2.225	○	300	58.302	○
	D+L+W	12.5	0.533	○	175	13.958	○
	D+W	12.5	0.678	○	175	17.756	○
Supporting for Deck	D	------	------	--	100	20.153	○
	D+L	10	2.604	○	140	80.077	○
	D+L+CO	15	3.839	○	300	118.061	○
	D+L+W	12.5	2.703	○	175	83.141	○
	D+W	12.5	0.855	○	175	26.28	○

Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	2.07	○	140	74.836	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	2.327	○	140	84.152	○

<Design of Deck: Summary for Calculation Results of Stress>

4th Span, Center of Span

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5 ～19.0	9.17	○
	Bottom of PC Plate	N/mm^2		8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0 ～15.0	10.59	○
	Bottom of PC Plate	N/mm^2		3.697	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	4.225	○
	Bottom of RC Deck	N/mm^2		-0.97	○
	Top of PC Plate	N/mm^2	0 ～15.0	8.174	○
	Bottom of PC Plate	N/mm^2		0.58	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	922.752	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.556	○	140	78.616	○
Edge of PC Plate	Positive Moment	10	6.711	○	140	104.266	○
	Negative Moment	10	3.267	○	140	68.414	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	9.958	○	140	115.254	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	1.002	○
Tensile Stress of Reinforcement Bar	140	55.499	○

<Design of Deck: Summary for Calculation Results of Stress>

4th Span,　Center of Span

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	5.392	○
	D+L	10	0.206	○	140	5.392	○
	D+L+CO	15	2.043	○	300	53.535	○
	D+L+W	12.5	0.351	○	175	9.191	○
	D+W	12.5	0.496	○	175	12.99	○
Supporting for Deck	D	------	------	--	100	13.776	○
	D+L	10	2.099	○	140	64.554	○
	D+L+CO	15	3.334	○	300	102.538	○
	D+L+W	12.5	2.199	○	175	67.618	○
	D+W	12.5	0.647	○	175	19.904	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	5.392	○
	D+L	10	0.206	○	140	5.392	○
	D+L+CO	15	2.043	○	300	53.535	○
	D+L+W	12.5	0.351	○	175	9.191	○
	D+W	12.5	0.496	○	175	12.99	○
Supporting for Deck	D	------	------	--	100	13.776	○
	D+L	10	2.099	○	140	64.554	○
	D+L+CO	15	3.334	○	300	102.538	○
	D+L+W	12.5	2.199	○	175	67.618	○
	D+W	12.5	0.647	○	175	19.904	○

Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	2.053	○	140	74.245	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	2.053	○	140	74.245	○

<Design of Deck: Summary for Calculation Results of Stress>

4th Span, Right End of Girder Side

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5	9.17	○
	Bottom of PC Plate	N/mm^2	～19.0	8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0	10.584	○
	Bottom of PC Plate	N/mm^2	～15.0	3.691	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	3.531	○
	Bottom of RC Deck	N/mm^2		-0.811	○
	Top of PC Plate	N/mm^2	0	8.345	○
	Bottom of PC Plate	N/mm^2	～15.0	1.306	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	921.933	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.584	○	140	74.435	○
Edge of PC Plate	Positive Moment	10	3.901	○	140	60.61	○
	Negative Moment	10	3.785	○	140	79.265	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	8.659	○	140	100.221	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	0.56	○
Tensile Stress of Reinforcement Bar	140	27.98	○

<Design of Deck: Summary for Calculation Results of Stress>

4th Span, Right End of Girder Side

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	5.392	○
	D+L	10	0.206	○	140	5.392	○
	D+L+CO	15	2.043	○	300	53.535	○
	D+L+W	12.5	0.351	○	175	9.191	○
	D+W	12.5	0.496	○	175	12.99	○
Supporting for Deck	D	------	------	--	100	10.212	○
	D+L	10	1.14	○	140	32.822	○
	D+L+CO	15	2.592	○	300	74.651	○
	D+L+W	12.5	1.256	○	175	36.164	○
	D+W	12.5	0.587	○	175	16.896	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	5.392	○
	D+L	10	0.206	○	140	5.392	○
	D+L+CO	15	2.043	○	300	53.535	○
	D+L+W	12.5	0.351	○	175	9.191	○
	D+W	12.5	0.496	○	175	12.99	○
Supporting for Deck	D	------	------	--	100	10.212	○
	D+L	10	1.14	○	140	32.822	○
	D+L+CO	15	2.592	○	300	74.651	○
	D+L+W	12.5	1.256	○	175	36.164	○
	D+W	12.5	0.587	○	175	16.896	○

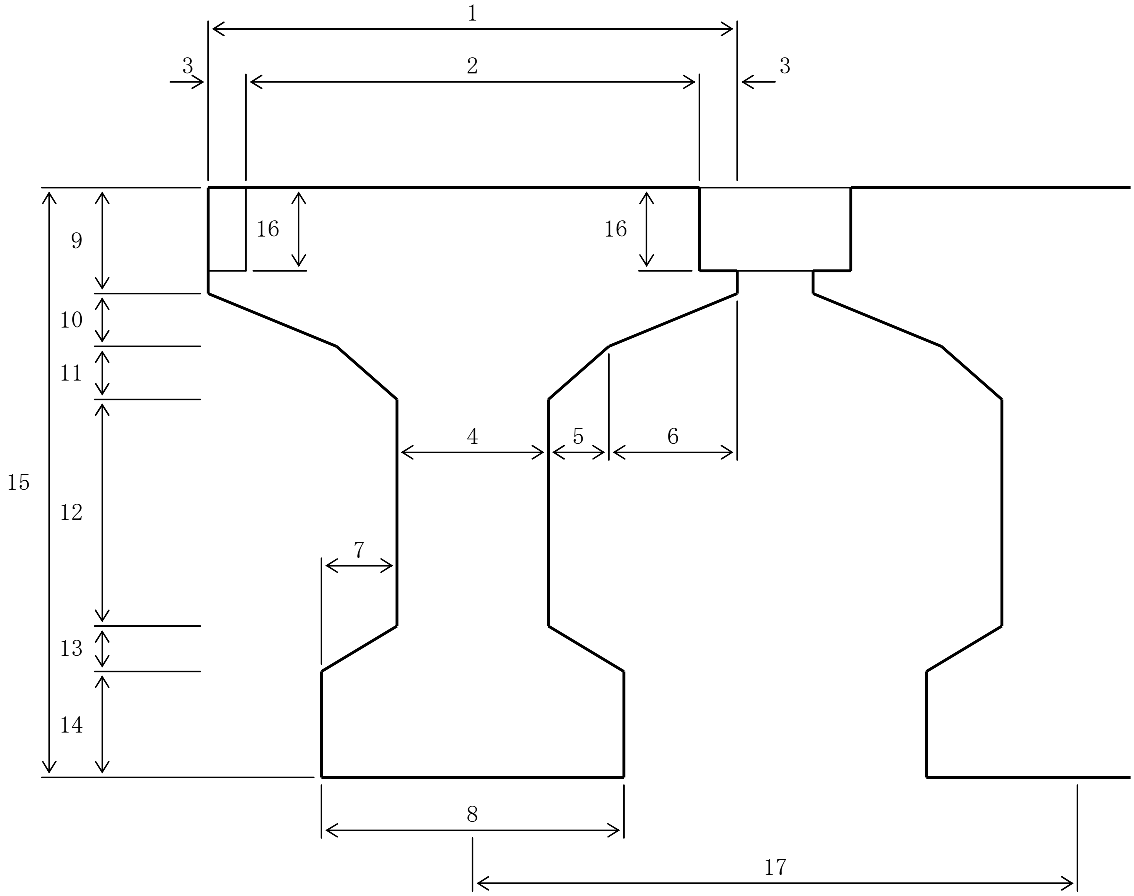
Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	1.618	○	140	58.5	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	1.618	○	140	58.5	○

4 Design of Main Girder

4.1 Dimension and PC Strand Arrangement

1) Dimension



(Unit: mm)

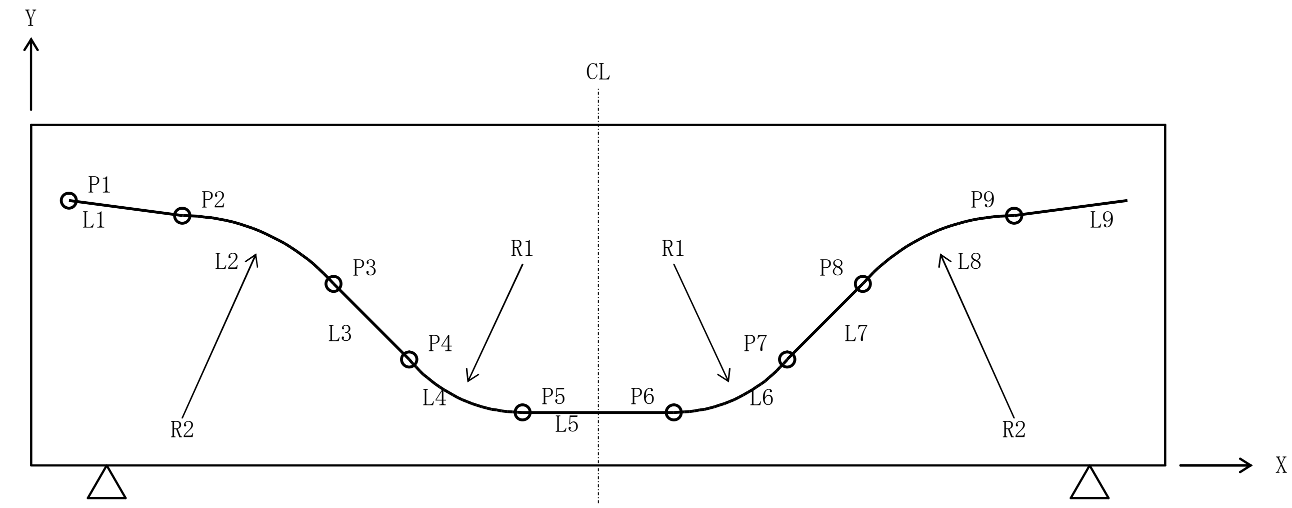
	1st Span			2nd Span		
	End of Girder (Left)	Center Span	End of Girder (Right)	End of Girder (Left)	Center Span	End of Girder (Right)
1	1300.0	1300.0	1300.0	1300.0	1300.0	1300.0
2	1180.0	1180.0	1180.0	1060.0	1060.0	1060.0
3	120.0	120.0	120.0	120.0	120.0	120.0
4	700.0	220.0	700.0	700.0	220.0	700.0
5	0.0	0.0	0.0	0.0	0.0	0.0
6	300.0	540.0	300.0	300.0	540.0	300.0
7	0.0	240.0	0.0	0.0	240.0	0.0
8	700.0	700.0	700.0	700.0	700.0	700.0
9	200.0	200.0	200.0	200.0	200.0	200.0
10	55.6	100.0	55.6	55.6	100.0	55.6
11	0.0	0.0	0.0	0.0	0.0	0.0
12	1494.4	1200.0	1494.4	1494.4	1200.0	1494.4
13	0.0	250.0	0.0	0.0	250.0	0.0
14	250.0	250.0	250.0	250.0	250.0	250.0
15	2000.0	2000.0	2000.0	2000.0	2000.0	2000.0
16	100.0	100.0	100.0	100.0	100.0	100.0
17	3499.4	3499.4	3499.4	3500.0	3500.0	3500.0

	3rd Span			4th Span		
	End of Girder (Left)	Center Span	End of Girder (Right)	End of Girder (Left)	Center Span	End of Girder (Right)
1	1300.0	1300.0	1300.0	1300.0	1300.0	1300.0
2	1060.0	1060.0	1060.0	1060.0	1060.0	1060.0
3	120.0	120.0	120.0	120.0	120.0	120.0
4	700.0	220.0	700.0	700.0	220.0	700.0
5	0.0	0.0	0.0	0.0	0.0	0.0
6	300.0	540.0	300.0	300.0	540.0	300.0
7	0.0	240.0	0.0	0.0	240.0	0.0
8	700.0	700.0	700.0	700.0	700.0	700.0
9	200.0	200.0	200.0	200.0	200.0	200.0
10	55.6	100.0	55.6	55.6	100.0	55.6
11	0.0	0.0	0.0	0.0	0.0	0.0
12	1494.4	1200.0	1494.4	1494.4	1200.0	1494.4
13	0.0	250.0	0.0	0.0	250.0	0.0
14	250.0	250.0	250.0	250.0	250.0	250.0
15	2000.0	2000.0	2000.0	2000.0	2000.0	2000.0
16	100.0	100.0	100.0	100.0	100.0	100.0
17	3500.0	3500.0	3500.0	3500.0	3500.0	3500.0

2) PC Strand Arrangement

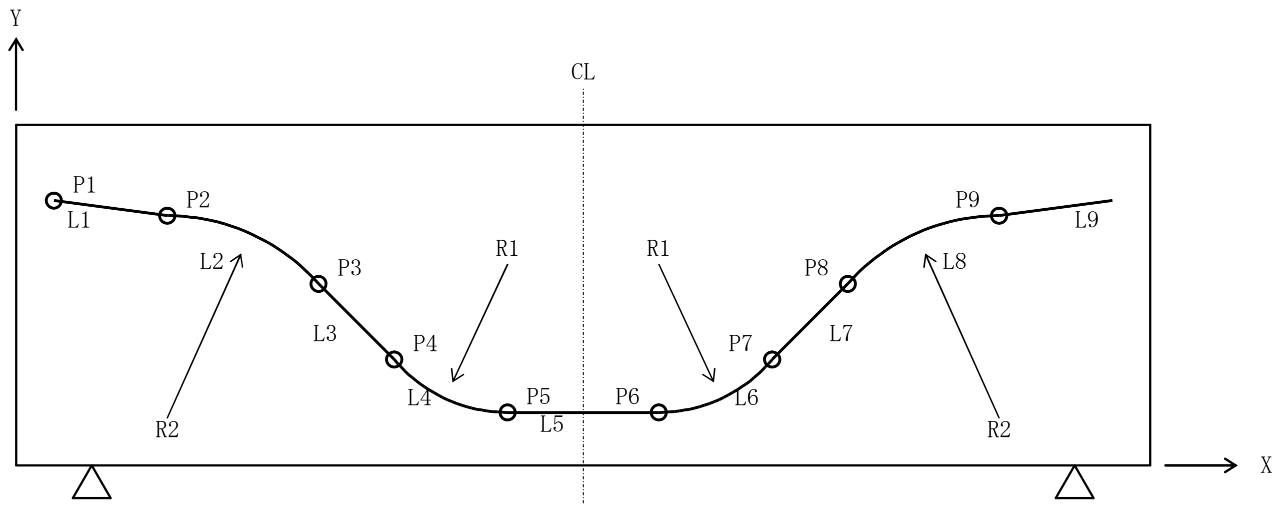
<1st Span>

PC Strand No.			1	2	3	4	5
Number of PC Strand			1	1	1	1	1
Coordinate (mm)	P1	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
	P2	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
	P3	X	200.0	200.0	200.0	200.0	200.0
		Y	1750.0	1400.0	1050.0	700.0	350.0
	P4	X	12903.8	10715.5	8527.2	5197.1	2730.7
		Y	414.8	294.8	174.8	174.8	150.8
	P5	X	13949.0	11760.7	9572.4	6242.4	3515.3
		Y	360.0	240.0	120.0	120.0	120.0
	P6	X	15928.8	17675.8	19422.8	22081.4	24448.5
		Y	360.0	240.0	120.0	120.0	120.0
	P7	X	17234.1	18981.1	20728.1	23386.6	25406.9
		Y	445.6	325.6	205.6	205.6	166.0
	P8	X	26492.5	26492.5	26492.5	26492.5	26839.3
		Y	1664.4	1314.4	964.4	614.4	304.0
	P9	X	27797.8	27797.8	27797.8	27797.8	27797.8
		Y	1750.0	1400.0	1050.0	700.0	350.0
	P1	X	29597.8	29597.8	29597.8	29597.8	29597.8
		Y	1750.0	1400.0	1050.0	700.0	350.0
Angle	α	(L)	6°0'0"	6°0'0"	6°0'0"	6°0'0"	4°30'0"
		(R)	0°0'0"	0°0'0"	0°0'0"	0°0'0"	0°0'0"
Radius (m)	R2	(L)	----------	----------	----------	----------	----------
	R1	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(R)	10.000	10.000	10.000	10.000	10.000
	R2	(R)	10.000	10.000	10.000	10.000	10.000
Angle	β	(L)	----------	----------	----------	----------	----------
		(R)	7°30'0"	7°30'0"	7°30'0"	7°30'0"	5°30'0"
Length of PC Strand (m)	L1		----------	----------	----------	----------	----------
	L2		----------	----------	----------	----------	----------
	L3		12.774	10.573	8.373	5.025	2.539
	L4		1.047	1.047	1.047	1.047	0.785
	L5		1.980	5.915	9.850	15.839	20.933
	L6		1.309	1.309	1.309	1.309	0.960
	L7		9.338	7.576	5.814	3.133	1.439
	L8		1.309	1.309	1.309	1.309	0.960
	L9		1.800	1.800	1.800	1.800	1.800
	Total		29.557	29.530	29.503	29.461	29.416



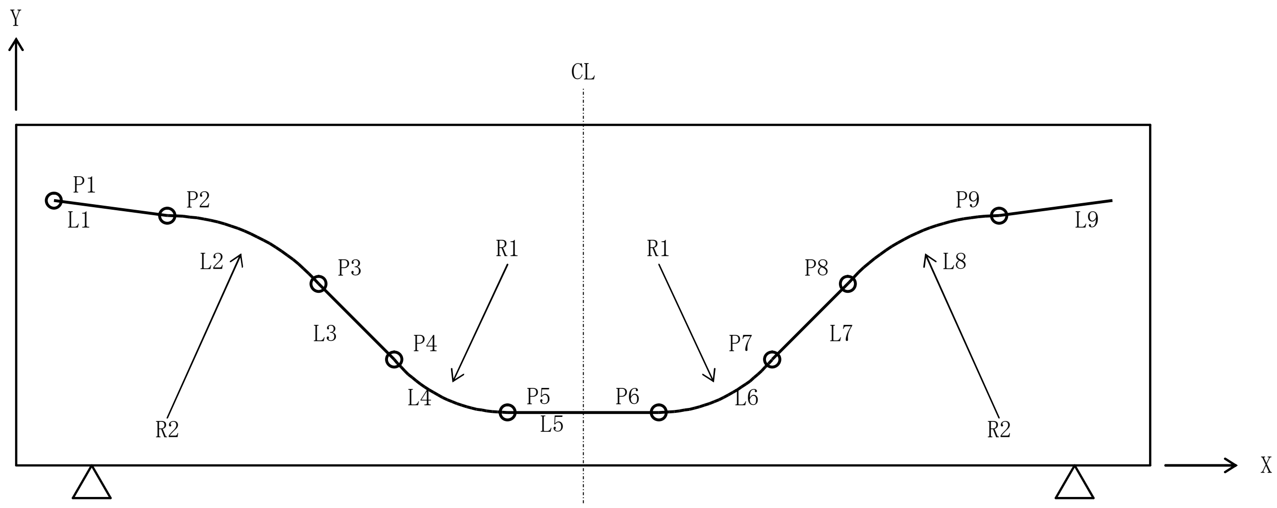
<2nd Span>

PC Strand No.			1	2	3	4	5
Number of PC Strand			1	1	1	1	1
Coordinate (mm)	P1	X	200.0	200.0	200.0	200.0	200.0
		Y	1750.0	1400.0	1050.0	700.0	350.0
	P2	X	2000.0	2000.0	2000.0	2000.0	2000.0
		Y	1750.0	1400.0	1050.0	700.0	350.0
	P3	X	3305.3	3305.3	3305.3	3305.3	2958.5
		Y	1664.4	1314.4	964.4	614.4	304.0
	P4	X	12563.7	10816.7	9069.7	6411.1	4390.9
		Y	445.6	325.6	205.6	205.6	166.0
	P5	X	13869.0	12121.9	10374.9	7716.4	5349.3
		Y	360.0	240.0	120.0	120.0	120.0
	P6	X	15931.0	17678.0	19425.1	22083.6	24450.7
		Y	360.0	240.0	120.0	120.0	120.0
	P7	X	17236.3	18983.3	20730.3	23388.8	25409.1
		Y	445.6	325.6	205.6	205.6	166.0
	P8	X	26494.7	26494.7	26494.7	26494.7	26841.5
		Y	1664.4	1314.4	964.4	614.4	304.0
	P9	X	27800.0	27800.0	27800.0	27800.0	27800.0
		Y	1750.0	1400.0	1050.0	700.0	350.0
	P1	X	29600.0	29600.0	29600.0	29600.0	29600.0
		Y	1750.0	1400.0	1050.0	700.0	350.0
Angle	α	(L)	0°0'0"	0°0'0"	0°0'0"	0°0'0"	0°0'0"
		(R)	0°0'0"	0°0'0"	0°0'0"	0°0'0"	0°0'0"
Radius (m)	R2	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(R)	10.000	10.000	10.000	10.000	10.000
	R2	(R)	10.000	10.000	10.000	10.000	10.000
Angle	β	(L)	7°30'0"	7°30'0"	7°30'0"	7°30'0"	5°30'0"
		(R)	7°30'0"	7°30'0"	7°30'0"	7°30'0"	5°30'0"
Length of PC Strand (m)	L1		1.800	1.800	1.800	1.800	1.800
	L2		1.309	1.309	1.309	1.309	0.960
	L3		9.338	7.576	5.814	3.133	1.439
	L4		1.309	1.309	1.309	1.309	0.960
	L5		2.062	5.556	9.050	14.367	19.101
	L6		1.309	1.309	1.309	1.309	0.960
	L7		9.338	7.576	5.814	3.133	1.439
	L8		1.309	1.309	1.309	1.309	0.960
	L9		1.800	1.800	1.800	1.800	1.800
	Total		29.575	29.545	29.514	29.469	29.419



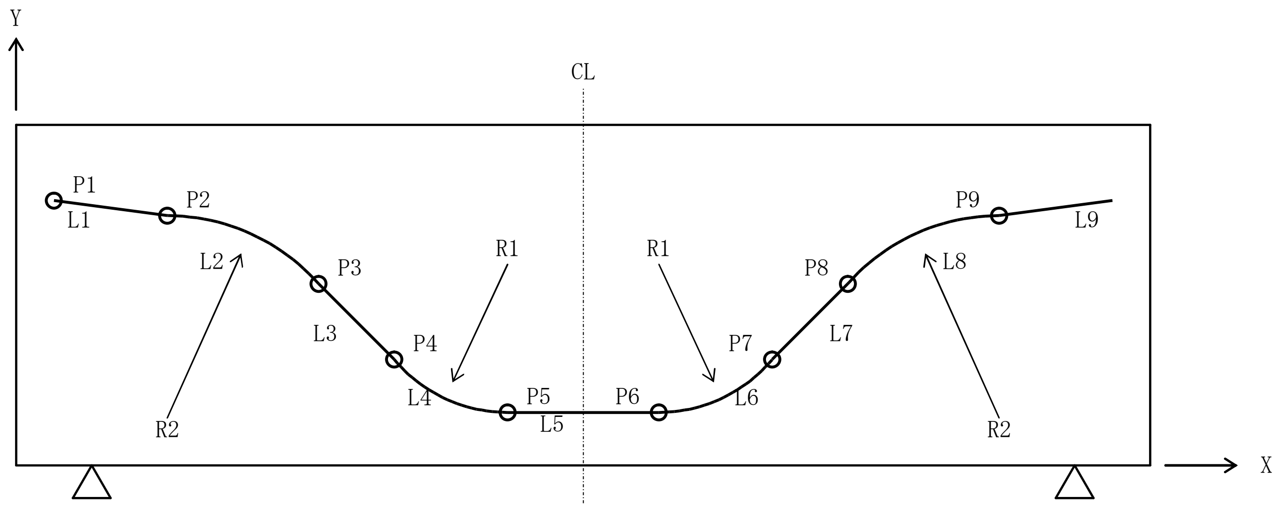
<3rd Span>

PC Strand No.			1	2	3	4	5
Number of PC Strand			1	1	1	1	1
Coordinate (mm)	P1	X	200.0	200.0	200.0	200.0	200.0
		Y	1750.0	1400.0	1050.0	700.0	350.0
	P2	X	2000.0	2000.0	2000.0	2000.0	2000.0
		Y	1750.0	1400.0	1050.0	700.0	350.0
	P3	X	3305.3	3305.3	3305.3	3305.3	2958.5
		Y	1664.4	1314.4	964.4	614.4	304.0
	P4	X	12563.7	10816.7	9069.7	6411.1	4390.9
		Y	445.6	325.6	205.6	205.6	166.0
	P5	X	13869.0	12121.9	10374.9	7716.4	5349.3
		Y	360.0	240.0	120.0	120.0	120.0
	P6	X	15931.0	17678.1	19425.1	22083.6	24450.7
		Y	360.0	240.0	120.0	120.0	120.0
	P7	X	17236.3	18983.3	20730.3	23388.9	25409.1
		Y	445.6	325.6	205.6	205.6	166.0
	P8	X	26494.7	26494.7	26494.7	26494.7	26841.5
		Y	1664.4	1314.4	964.4	614.4	304.0
	P9	X	27800.0	27800.0	27800.0	27800.0	27800.0
		Y	1750.0	1400.0	1050.0	700.0	350.0
	P10	X	29600.0	29600.0	29600.0	29600.0	29600.0
		Y	1750.0	1400.0	1050.0	700.0	350.0
Angle	α	(L)	0°0'0"	0°0'0"	0°0'0"	0°0'0"	0°0'0"
		(R)	0°0'0"	0°0'0"	0°0'0"	0°0'0"	0°0'0"
Radius (m)	R2	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(R)	10.000	10.000	10.000	10.000	10.000
	R2	(R)	10.000	10.000	10.000	10.000	10.000
Angle	β	(L)	7°30'0"	7°30'0"	7°30'0"	7°30'0"	5°30'0"
		(R)	7°30'0"	7°30'0"	7°30'0"	7°30'0"	5°30'0"
Length of PC Strand (m)	L1		1.800	1.800	1.800	1.800	1.800
	L2		1.309	1.309	1.309	1.309	0.960
	L3		9.338	7.576	5.814	3.133	1.439
	L4		1.309	1.309	1.309	1.309	0.960
	L5		2.062	5.556	9.050	14.367	19.101
	L6		1.309	1.309	1.309	1.309	0.960
	L7		9.338	7.576	5.814	3.133	1.439
	L8		1.309	1.309	1.309	1.309	0.960
	L9		1.800	1.800	1.800	1.800	1.800
	Total		29.575	29.545	29.514	29.469	29.419



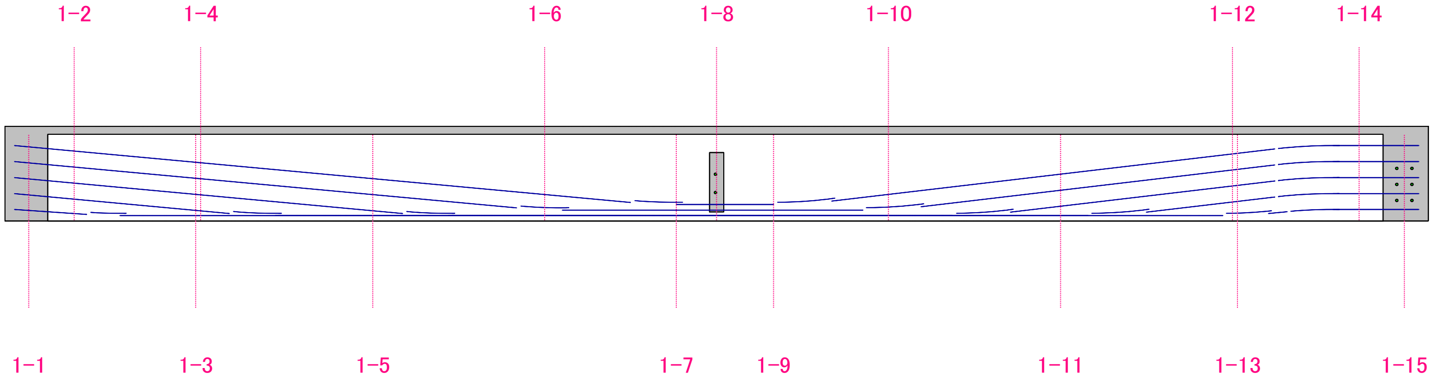
<4th Span>

PC Strand No.			1	2	3	4	5
Number of PC Strand			1	1	1	1	1
Coordinate (mm)	P1	X	200.0	200.0	200.0	200.0	200.0
		Y	1750.0	1400.0	1050.0	700.0	350.0
	P2	X	2000.0	2000.0	2000.0	2000.0	2000.0
		Y	1750.0	1400.0	1050.0	700.0	350.0
	P3	X	3305.3	3305.3	3305.3	3305.3	2958.5
		Y	1664.4	1314.4	964.4	614.4	304.0
	P4	X	12563.7	10816.7	9069.7	6411.1	4390.9
		Y	445.6	325.6	205.6	205.6	166.0
	P5	X	13869.0	12121.9	10374.9	7716.4	5349.3
		Y	360.0	240.0	120.0	120.0	120.0
	P6	X	15851.0	18039.3	20227.6	23557.6	26284.7
		Y	360.0	240.0	120.0	120.0	120.0
	P7	X	16896.2	19084.5	21272.9	24602.9	27069.3
		Y	414.8	294.8	174.8	174.8	150.8
	P8	X	29600.0	29600.0	29600.0	29600.0	29600.0
		Y	1750.0	1400.0	1050.0	700.0	350.0
	P9	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
	P1	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
Angle	α	(L)	0°0'0"	0°0'0"	0°0'0"	0°0'0"	0°0'0"
		(R)	6°0'0"	6°0'0"	6°0'0"	6°0'0"	4°30'0"
Radius (m)	R2	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(R)	10.000	10.000	10.000	10.000	10.000
	R2	(R)	----------	----------	----------	----------	----------
Angle	β	(L)	7°30'0"	7°30'0"	7°30'0"	7°30'0"	5°30'0"
		(R)	----------	----------	----------	----------	----------
Length of PC Strand (m)	L1		1.800	1.800	1.800	1.800	1.800
	L2		1.309	1.309	1.309	1.309	0.960
	L3		9.338	7.576	5.814	3.133	1.439
	L4		1.309	1.309	1.309	1.309	0.960
	L5		1.982	5.917	9.853	15.841	20.935
	L6		1.047	1.047	1.047	1.047	0.785
	L7		12.774	10.573	8.373	5.025	2.539
	L8		----------	----------	----------	----------	----------
	L9		----------	----------	----------	----------	----------
	Total		29.559	29.532	29.505	29.464	29.418



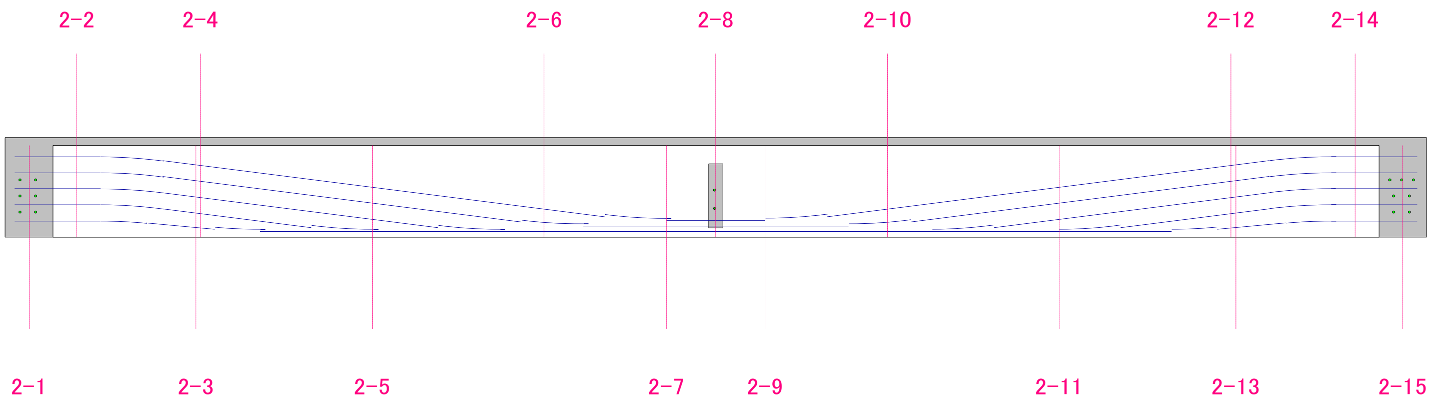
4.4 Summary for Calculation Results of Stress

1) PF7-PF8



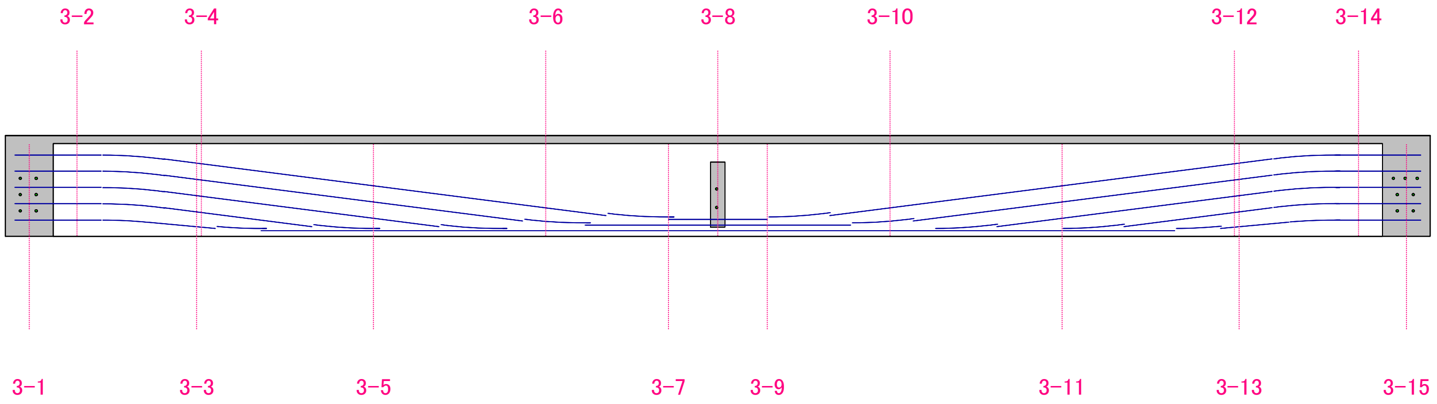
	Unit	Allowable Value		Cross Section Number		
Calculation for Bending Moment				[1- 7] Bent up Point(Left)	[1- 8] Center of Span	[1- 9] Bent up Point(Right)
Bending Stress of Concrete						
Immediately After Prestressing	N/mm^2	-1.5～19.00	Top of Main Girder	0.64	0.68	0.67
			Bottom of Main Girder	13.98	13.88	13.83
During Deck Construction	〃	-1.5～14.00	Top of Main Girder	4.71	4.77	4.73
			Bottom of Main Girder	7.97	7.86	7.85
Dead Load	〃	≦10.00	Top of Deck	3.21	3.21	3.19
		0～14.00	Top of Main Girder	5.17	5.19	5.16
			Bottom of Main Girder	2.52	2.44	2.44
Design Load	〃	≦10.00	Top of Deck max	4.96	4.94	4.86
			Top of Deck min	2.72	2.69	2.65
		-1.5～14.00	Top of Main Girder(max)	6.66	6.67	6.59
			Bottom of Main Girder(max)	-1.22	-1.27	-1.15
			Top of Main Girder(min)	4.75	4.75	4.71
			Bottom of Main Girder(min)	3.58	3.56	3.58
Stress of PC Strand	N/mm^2	Pmax≦1110		1063	1058	1051
Ultimate Load	-----	F≧1.0		1.10	1.11	1.13
Calculation for Shear Force				[1- 2] Near a Support of girder(Left)	[1- 3] Change point of Web Width(Left)	[1-14] Near a Support of girder(Right)
Shear Stress of Design Load	kN			0.59	1.34	1.15
Compressive Strength to Failure	-----	F≧1.0		3.58	1.72	2.74
Diagonal Tensile Stress — Dead Load	N/mm^2	≧ -1		-0.07	-0.17	-0.32
Diagonal Tensile Stress — Design Load	〃	≧ -2		-0.20	-0.56	-0.55

2) PF8-PF9



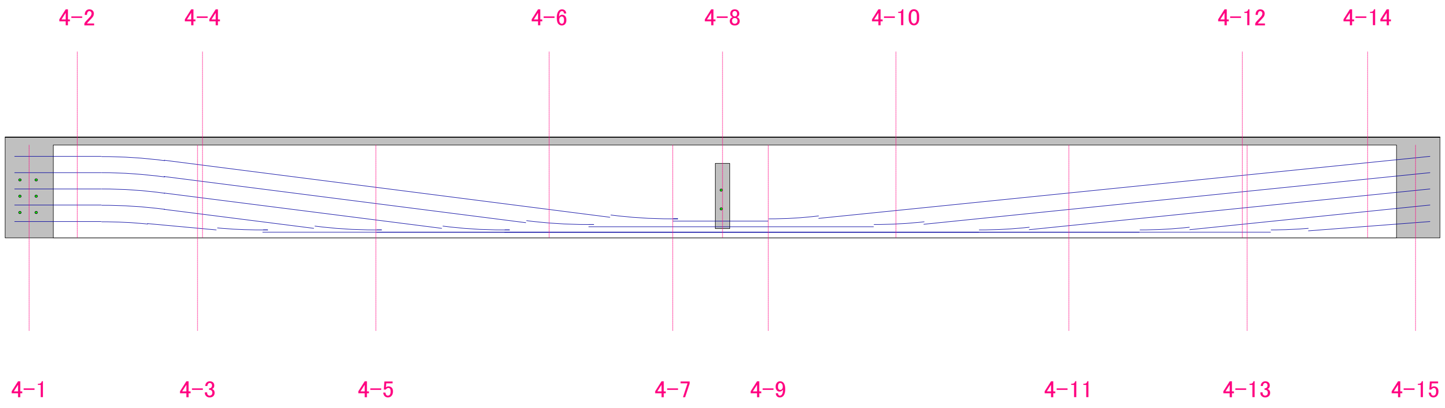
	Unit	Allowable Value		Cross Section Number		
Calculation for Bending Moment				[2- 7] Bent up Point(Left)	[2- 8] Center of Span	[2- 9] Bent up Point(Right)
Bending Stress of Concrete						
Immediately After Prestressing	N/mm^2	-1.5～19.00	Top of Main Girder	0.79	0.83	0.79
			Bottom of Main Girder	13.20	13.09	13.20
During Deck Construction	〃	-1.5～14.00	Top of Main Girder	5.85	5.93	5.85
			Bottom of Main Girder	6.24	6.10	6.24
Dead Load	〃	≦10.00	Top of Deck	2.45	2.49	2.46
		0～14.00	Top of Main Girder	4.87	4.93	4.88
			Bottom of Main Girder	2.98	2.83	2.96
Design Load	〃	≦10.00	Top of Deck max	3.58	3.63	3.60
			Top of Deck min	2.10	2.16	2.13
		-1.5～14.00	Top of Main Girder(max)	5.83	5.89	5.84
			Bottom of Main Girder(max)	0.46	0.30	0.43
			Top of Main Girder(min)	4.57	4.64	4.59
			Bottom of Main Girder(min)	3.76	3.58	3.71
Stress of PC Strand	N/mm^2	Pmax≦1110		992	991	994
Ultimate Load	-----	F≧1.0		1.35	1.34	1.34
Calculation for Shear Force				[2- 2] Near a Support of girder(Left)	[2-13] Change point of Web Width(Right)	[2-14] Near a Support of girder(Right)
Shear Stress of Design Load	kN			1.02	0.72	0.91
Compressive Strength to Failure	-----	F≧1.0		3.18	1.91	3.62
Diagonal Tensile Stress — Dead Load	N/mm^2	≧ -1		-0.23	0.00	-0.22
Diagonal Tensile Stress — Design Load	〃	≧ -2		-0.43	-0.17	-0.45

3) PF9-PF10



	Unit	Allowable Value		Cross Section Number		
Calculation for Bending Moment				[3- 7] Bent up Point(Left)	[3- 8] Center of Span	[3- 9] Bent up Point(Right)
Bending Stress of Concrete						
Immediately After Prestressing	N/mm^2	-1.5～19.00	Top of Main Girder	0.79	0.83	0.79
			Bottom of Main Girder	13.20	13.09	13.20
During Deck Construction	〃	-1.5～14.00	Top of Main Girder	5.85	5.93	5.85
			Bottom of Main Girder	6.24	6.10	6.24
Dead Load	〃	≦10.00	Top of Deck	2.56	2.60	2.56
		0～14.00	Top of Main Girder	4.96	5.01	4.96
			Bottom of Main Girder	2.77	2.62	2.76
Design Load	〃	≦10.00	Top of Deck max	3.70	3.74	3.70
			Top of Deck min	2.22	2.25	2.20
		-1.5～14.00	Top of Main Girder(max)	5.92	5.98	5.92
			Bottom of Main Girder(max)	0.24	0.09	0.24
			Top of Main Girder(min)	4.67	4.72	4.65
			Bottom of Main Girder(min)	3.54	3.40	3.57
Stress of PC Strand	N/mm^2	Pmax≦1110		997	994	996
Ultimate Load	-----	F≧1.0		1.32	1.31	1.33
Calculation for Shear Force				[3- 2] Near a Support of girder(Left)	[3-13] Change point of Web Width(Right)	[3-14] Near a Support of girder(Right)
Shear Stress of Design Load	kN			0.92	0.73	1.00
Compressive Strength to Failure	-----	F≧1.0		3.58	1.87	3.25
Diagonal Tensile Stress Dead Load	N/mm^2	≧ -1		-0.23	0.00	-0.23
Design Load	〃	≧ -2		-0.46	-0.18	-0.42

4) PF10-PF11



	Unit	Allowable Value		Cross Section Number		
Calculation for Bending Moment				[4- 7] Bent up Point(Left)	[4- 8] Center of Span	[4- 9] Bent up Point(Right)
Bending Stress of Concrete						
Immediately After Prestressing	N/mm^2	-1.5～19.00	Top of Main Girder	0.64	0.65	0.62
			Bottom of Main Girder	13.89	13.94	14.04
During Deck Construction	〃	-1.5～14.00	Top of Main Girder	5.71	5.76	5.69
			Bottom of Main Girder	6.88	6.88	7.00
Dead Load	〃	≦10.00	Top of Deck	2.52	2.54	2.50
		0～14.00	Top of Main Girder	4.86	4.90	4.84
			Bottom of Main Girder	3.39	3.39	3.54
Design Load	〃	≦10.00	Top of Deck max	3.86	3.92	3.91
			Top of Deck min	2.22	2.26	2.24
		-1.5～14.00	Top of Main Girder(max)	6.00	6.07	6.03
			Bottom of Main Girder(max)	0.40	0.32	0.41
			Top of Main Girder(min)	4.61	4.66	4.62
			Bottom of Main Girder(min)	4.06	4.02	4.12
Stress of PC Strand	N/mm^2	Pmax≦1110		1039	1046	1049
Ultimate Load	-----	F≧1.0		1.26	1.24	1.24
Calculation for Shear Force				[4- 2] Near a Support of girder(Left)	[4-13] Change point of Web Width(Right)	[4-14] Near a Support of girder(Right)
Shear Stress of Design Load	kN			1.00	1.12	0.49
Compressive Strength to Failure	-----	F≧1.0		3.16	1.92	4.02
Diagonal Tensile Stress — Dead Load	N/mm^2	≧ -1		-0.23	-0.08	-0.03
Diagonal Tensile Stress — Design Load	〃	≧ -2		-0.42	-0.39	-0.14

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 4

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder			------	0.500		1.500		4.000	
Immediately After Prestressing	Top of Main Girder		-1.5	3.248	○	3.050	○	3.865	○
	Bottom of Main Girder		～19.00	4.312	○	5.267	○	9.954	○
During Deck Construction	Top of Main Girder		-1.5	3.086	○	3.347	○	5.317	○
	Bottom of Main Girder		～14.00	4.097	○	4.463	○	7.253	○
Dead Load	Top of Deck		≦10.00	0.377	○	0.799	○	1.873	○
	Top of Main Girder		0	2.324	○	2.786	○	4.598	○
	Bottom of Main Girder		～14.00	4.147	○	3.876	○	4.544	○
Design Load1	Top of Deck	Max	≦10.00	0.377	○	1.063	○	2.713	○
		Min		0.377	○	0.765	○	1.751	○
	Top of Main Girder	Max	-1.5	2.324	○	3.019	○	5.312	○
		Min		2.324	○	2.756	○	4.494	○
	Bottom of Main Girder	Max	～14.00	4.147	○	3.408	○	2.720	○
		Min		4.147	○	3.935	○	4.809	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	0.947	○	1.635	○	3.250	○
		Min		0.947	○	1.338	○	2.288	○
	Top of Main Girder	Max	-2	1.512	○	2.206	○	4.448	○
		Min		1.512	○	1.943	○	3.630	○
	Bottom of Main Girder	Max	～16.10	4.588	○	3.815	○	2.937	○
		Min		4.588	○	4.342	○	5.025	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	0.947	○	1.635	○	3.250	○
		Min		0.947	○	1.338	○	2.288	○
	Top of Main Girder	Max	-2	1.512	○	2.206	○	4.448	○
		Min		1.512	○	1.943	○	3.630	○
	Bottom of Main Girder	Max	～16.10	4.588	○	3.815	○	2.937	○
		Min		4.588	○	4.342	○	5.025	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	0.377	○	1.063	○	2.713	○
		Min		0.377	○	0.765	○	1.751	○
	Top of Main Girder	Max	-1.5	2.324	○	3.019	○	5.312	○
		Min		2.324	○	2.756	○	4.494	○
	Bottom of Main Girder	Max	～14.00	4.147	○	3.408	○	2.720	○
		Min		4.147	○	3.935	○	4.809	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	0.947	○	1.635	○	3.250	○
		Min		0.947	○	1.338	○	2.288	○
	Top of Main Girder	Max	-2	1.512	○	2.206	○	4.448	○
		Min		1.512	○	1.943	○	3.630	○
	Bottom of Main Girder	Max	～16.10	4.588	○	3.815	○	2.937	○
		Min		4.588	○	4.342	○	5.025	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	0.947	○	1.635	○	3.250	○
		Min		0.947	○	1.338	○	2.288	○
	Top of Main Girder	Max	-2	1.512	○	2.206	○	4.448	○
		Min		1.512	○	1.943	○	3.630	○
	Bottom of Main Girder	Max	～16.10	4.588	○	3.815	○	2.937	○
		Min		4.588	○	4.342	○	5.025	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 4

Bending Stress of Concrete (N/mm²)									
Cross Section Number			Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder			------	4.100		7.699		11.299	
Immediately After Prestressing	Top of Main Girder		-1.5	3.815	○	2.134	○	0.858	○
	Bottom of Main Girder		～19.00	10.020	○	12.356	○	13.984	○
During Deck Construction	Top of Main Girder		-1.5	5.313	○	5.015	○	4.633	○
	Bottom of Main Girder		～14.00	7.263	○	7.844	○	8.317	○
Dead Load	Top of Deck		≦10.00	1.903	○	2.728	○	3.124	○
	Top of Main Girder		0	4.618	○	5.059	○	5.109	○
	Bottom of Main Girder		～14.00	4.494	○	3.348	○	2.907	○
Design Load1	Top of Deck	Max	≦10.00	2.762	○	4.121	○	4.794	○
		Min		1.777	○	2.474	○	2.739	○
	Top of Main Girder	Max	-1.5	5.349	○	6.246	○	6.533	○
		Min		4.511	○	4.843	○	4.781	○
	Bottom of Main Girder	Max	～14.00	2.629	○	0.346	○	-0.674	○
		Min		4.766	○	3.894	○	3.731	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	3.301	○	4.724	○	5.460	○
		Min		2.316	○	3.077	○	3.405	○
	Top of Main Girder	Max	-2	4.486	○	5.438	○	5.779	○
		Min		3.648	○	4.036	○	4.028	○
	Bottom of Main Girder	Max	～16.10	2.842	○	0.422	○	-0.732	○
		Min		4.979	○	3.971	○	3.673	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	3.301	○	4.724	○	5.460	○
		Min		2.316	○	3.077	○	3.405	○
	Top of Main Girder	Max	-2	4.486	○	5.438	○	5.779	○
		Min		3.648	○	4.036	○	4.028	○
	Bottom of Main Girder	Max	～16.10	2.842	○	0.422	○	-0.732	○
		Min		4.979	○	3.971	○	3.673	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.762	○	4.121	○	4.794	○
		Min		1.777	○	2.474	○	2.739	○
	Top of Main Girder	Max	-1.5	5.349	○	6.246	○	6.533	○
		Min		4.511	○	4.843	○	4.781	○
	Bottom of Main Girder	Max	～14.00	2.629	○	0.346	○	-0.674	○
		Min		4.766	○	3.894	○	3.731	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	3.301	○	4.724	○	5.460	○
		Min		2.316	○	3.077	○	3.405	○
	Top of Main Girder	Max	-2	4.486	○	5.438	○	5.779	○
		Min		3.648	○	4.036	○	4.028	○
	Bottom of Main Girder	Max	～16.10	2.842	○	0.422	○	-0.732	○
		Min		4.979	○	3.971	○	3.673	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	3.301	○	4.724	○	5.460	○
		Min		2.316	○	3.077	○	3.405	○
	Top of Main Girder	Max	-2	4.486	○	5.438	○	5.779	○
		Min		3.648	○	4.036	○	4.028	○
	Bottom of Main Girder	Max	～16.10	2.842	○	0.422	○	-0.732	○
		Min		4.979	○	3.971	○	3.673	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 4

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder			------	13.949		14.899		15.929	
Immediately After Prestressing	Top of Main Girder		-1.5	0.644	○	0.681	○	0.670	○
	Bottom of Main Girder		～19.00	13.981	○	13.880	○	13.833	○
During Deck Construction	Top of Main Girder		-1.5	4.712	○	4.768	○	4.729	○
	Bottom of Main Girder		～14.00	7.973	○	7.858	○	7.847	○
Dead Load	Top of Deck		≦10.00	3.209	○	3.210	○	3.186	○
	Top of Main Girder		0	5.171	○	5.194	○	5.162	○
	Bottom of Main Girder		～14.00	2.520	○	2.444	○	2.442	○
Design Load1	Top of Deck	Max	≦10.00	4.959	○	4.944	○	4.863	○
		Min		2.717	○	2.690	○	2.654	○
	Top of Main Girder	Max	-1.5	6.662	○	6.673	○	6.592	○
		Min		4.751	○	4.751	○	4.709	○
	Bottom of Main Girder	Max	～14.00	-1.224	○	-1.267	○	-1.146	○
		Min		3.575	○	3.556	○	3.580	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	5.672	○	5.674	○	5.612	○
		Min		3.430	○	3.420	○	3.403	○
	Top of Main Girder	Max	-2	5.949	○	5.974	○	5.909	○
		Min		4.037	○	4.052	○	4.026	○
	Bottom of Main Girder	Max	～16.10	-1.381	○	-1.460	○	-1.378	○
		Min		3.418	○	3.363	○	3.348	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	5.672	○	5.674	○	5.612	○
		Min		3.430	○	3.420	○	3.403	○
	Top of Main Girder	Max	-2	5.949	○	5.974	○	5.909	○
		Min		4.037	○	4.052	○	4.026	○
	Bottom of Main Girder	Max	～16.10	-1.381	○	-1.460	○	-1.378	○
		Min		3.418	○	3.363	○	3.348	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	4.959	○	4.944	○	4.863	○
		Min		2.717	○	2.690	○	2.654	○
	Top of Main Girder	Max	-1.5	6.662	○	6.673	○	6.592	○
		Min		4.751	○	4.751	○	4.709	○
	Bottom of Main Girder	Max	～14.00	-1.224	○	-1.267	○	-1.146	○
		Min		3.575	○	3.556	○	3.580	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	5.672	○	5.674	○	5.612	○
		Min		3.430	○	3.420	○	3.403	○
	Top of Main Girder	Max	-2	5.949	○	5.974	○	5.909	○
		Min		4.037	○	4.052	○	4.026	○
	Bottom of Main Girder	Max	～16.10	-1.381	○	-1.460	○	-1.378	○
		Min		3.418	○	3.363	○	3.348	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	5.672	○	5.674	○	5.612	○
		Min		3.430	○	3.420	○	3.403	○
	Top of Main Girder	Max	-2	5.949	○	5.974	○	5.909	○
		Min		4.037	○	4.052	○	4.026	○
	Bottom of Main Girder	Max	～16.10	-1.381	○	-1.460	○	-1.378	○
		Min		3.418	○	3.363	○	3.348	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span,　Main Girder Number: G 4

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder			------	18.499		22.098		25.698	
Immediately After Prestressing	Top of Main Girder		-1.5	1.075	○	3.020	○	5.940	○
	Bottom of Main Girder		～19.00	13.276	○	10.968	○	7.177	○
During Deck Construction	Top of Main Girder		-1.5	4.822	○	5.825	○	7.300	○
	Bottom of Main Girder		～14.00	7.695	○	6.623	○	4.660	○
Dead Load	Top of Deck		≦10.00	3.066	○	2.686	○	1.993	○
	Top of Main Girder		0	5.153	○	5.402	○	5.565	○
	Bottom of Main Girder		～14.00	2.504	○	2.658	○	2.942	○
Design Load1	Top of Deck	Max	≦10.00	4.487	○	3.604	○	2.396	○
		Min		2.533	○	2.125	○	1.222	○
	Top of Main Girder	Max		6.364	○	6.184	○	5.908	○
		Min	-1.5	4.699	○	4.925	○	4.910	○
	Bottom of Main Girder	Max	～14.00	-0.539	○	0.682	○	2.066	○
		Min		3.645	○	3.866	○	4.617	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	5.282	○	4.466	○	3.327	○
		Min		3.328	○	2.988	○	2.153	○
	Top of Main Girder	Max		5.721	○	5.598	○	5.379	○
		Min	-2	4.055	○	4.339	○	4.382	○
	Bottom of Main Girder	Max	～16.10	-0.871	○	0.203	○	1.432	○
		Min		3.313	○	3.386	○	3.982	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	5.282	○	4.466	○	3.327	○
		Min		3.328	○	2.988	○	2.153	○
	Top of Main Girder	Max		5.721	○	5.598	○	5.379	○
		Min	-2	4.055	○	4.339	○	4.382	○
	Bottom of Main Girder	Max	～16.10	-0.871	○	0.203	○	1.432	○
		Min		3.313	○	3.386	○	3.982	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	4.487	○	3.604	○	2.396	○
		Min		2.533	○	2.125	○	1.222	○
	Top of Main Girder	Max		6.364	○	6.184	○	5.908	○
		Min	-1.5	4.699	○	4.925	○	4.910	○
	Bottom of Main Girder	Max	～14.00	-0.539	○	0.682	○	2.066	○
		Min		3.645	○	3.866	○	4.617	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	5.282	○	4.466	○	3.327	○
		Min		3.328	○	2.988	○	2.153	○
	Top of Main Girder	Max		5.721	○	5.598	○	5.379	○
		Min	-2	4.055	○	4.339	○	4.382	○
	Bottom of Main Girder	Max	～16.10	-0.871	○	0.203	○	1.432	○
		Min		3.313	○	3.386	○	3.982	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	5.282	○	4.466	○	3.327	○
		Min		3.328	○	2.988	○	2.153	○
	Top of Main Girder	Max		5.721	○	5.598	○	5.379	○
		Min	-2	4.055	○	4.339	○	4.382	○
	Bottom of Main Girder	Max	～16.10	-0.871	○	0.203	○	1.432	○
		Min		3.313	○	3.386	○	3.982	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 4

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder			------	25.798		28.298		29.298	
Immediately After Prestressing	Top of Main Girder		-1.5	6.032	○	4.111	○	3.323	○
	Bottom of Main Girder		～19.00	7.060	○	3.536	○	3.775	○
During Deck Construction	Top of Main Girder		-1.5	7.346	○	4.345	○	3.149	○
	Bottom of Main Girder		～14.00	4.600	○	2.833	○	3.594	○
Dead Load	Top of Deck		≦10.00	1.969	○	0.656	○	-0.003	○
	Top of Main Girder		0	5.567	○	3.087	○	1.980	○
	Bottom of Main Girder		～14.00	2.959	○	3.148	○	4.354	○
Design Load1	Top of Deck	Max	≦10.00	2.363	○	0.909	○	0.244	○
		Min		1.184	○	-0.615	○	-1.536	○
	Top of Main Girder	Max	-1.5	5.902	○	3.311	○	2.199	○
		Min		4.899	○	1.967	○	0.621	○
	Bottom of Main Girder	Max	～14.00	2.103	○	2.700	○	3.933	○
		Min		4.666	○	5.393	○	6.965	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	3.296	○	1.955	○	1.317	○
		Min		2.116	○	0.432	○	-0.463	○
	Top of Main Girder	Max	-2	5.375	○	2.917	○	1.833	○
		Min		4.372	○	1.573	○	0.254	○
	Bottom of Main Girder	Max	～16.10	1.464	○	2.274	○	3.522	○
		Min		4.027	○	4.967	○	6.554	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	3.296	○	1.955	○	1.317	○
		Min		2.116	○	0.432	○	-0.463	○
	Top of Main Girder	Max	-2	5.375	○	2.917	○	1.833	○
		Min		4.372	○	1.573	○	0.254	○
	Bottom of Main Girder	Max	～16.10	1.464	○	2.274	○	3.522	○
		Min		4.027	○	4.967	○	6.554	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.363	○	0.909	○	0.244	○
		Min		1.184	○	-0.615	○	-1.536	○
	Top of Main Girder	Max	-1.5	5.902	○	3.311	○	2.199	○
		Min		4.899	○	1.967	○	0.621	○
	Bottom of Main Girder	Max	～14.00	2.103	○	2.700	○	3.933	○
		Min		4.666	○	5.393	○	6.965	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	3.296	○	1.955	○	1.317	○
		Min		2.116	○	0.432	○	-0.463	○
	Top of Main Girder	Max	-2	5.375	○	2.917	○	1.833	○
		Min		4.372	○	1.573	○	0.254	○
	Bottom of Main Girder	Max	～16.10	1.464	○	2.274	○	3.522	○
		Min		4.027	○	4.967	○	6.554	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	3.296	○	1.955	○	1.317	○
		Min		2.116	○	0.432	○	-0.463	○
	Top of Main Girder	Max	-2	5.375	○	2.917	○	1.833	○
		Min		4.372	○	1.573	○	0.254	○
	Bottom of Main Girder	Max	～16.10	1.464	○	2.274	○	3.522	○
		Min		4.027	○	4.967	○	6.554	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 4

Cross Section NumberNo.	Unit	Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder			0.500		1.500		4.000	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1164	○	1168	○	1177	○
Effective Prestressing Force (*1)	N/mm^2	1110	1106	○	1107	○	1097	○
Effective Prestressing Force (*2)	N/mm^2	1110	1037	○	1036	○	1010	○
max	N/mm^2	1110	1037	○	1038	○	1027	○
Ultimate Load	------	1.00	999.90	○	4.68	○	1.79	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder			4.100		7.699		11.299	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1177	○	1197	○	1199	○
Effective Prestressing Force (*1)	N/mm^2	1110	1097	○	1106	○	1098	○
Effective Prestressing Force (*2)	N/mm^2	1110	1010	○	1026	○	1020	○
max	N/mm^2	1110	1028	○	1067	○	1079	○
Ultimate Load	------	1.00	1.75	○	1.24	○	1.12	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder			13.949		14.899		15.929	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1176	○	1172	○	1167	○
Effective Prestressing Force (*1)	N/mm^2	1110	1075	○	1071	○	1067	○
Effective Prestressing Force (*2)	N/mm^2	1110	1000	○	996	○	990	○
max	N/mm^2	1110	1063	○	1058	○	1051	○
Ultimate Load	------	1.00	1.10	○	1.11	○	1.13	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder			18.499		22.098		25.698	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1164	○	1174	○	1157	○
Effective Prestressing Force (*1)	N/mm^2	1110	1067	○	1089	○	1084	○
Effective Prestressing Force (*2)	N/mm^2	1110	987	○	1002	○	989	○
max	N/mm^2	1110	1037	○	1028	○	991	○
Ultimate Load	------	1.00	1.20	○	1.43	○	2.35	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder			25.798		28.298		29.298	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1156	○	1104	○	1099	○
Effective Prestressing Force (*1)	N/mm^2	1110	1084	○	1047	○	1044	○
Effective Prestressing Force (*2)	N/mm^2	1110	989	○	971	○	971	○
max	N/mm^2	1110	990	○	969	○	967	○
Ultimate Load	------	1.00	2.41	○	2.49	○	1.55	○

*1:During DeckConstruction *2:Design Load

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 4(Shear Force Max)

Cross Section Number				Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder				------		0.500		1.500		4.000
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.59	△	1.34	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.06	○	-0.16	○
	Neutral Axis before Composition				------	--	-0.06	○	-0.15	○
	Neutral Axis after Composition				------	--	-0.07	○	-0.17	○
	Base of Lower Flange				------	--	-0.01	○	-0.10	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.16	○	-0.51	○
		Min			------	--	-0.05	○	-0.13	○
	Neutral Axis before Composition	Max			------	--	-0.18	○	-0.55	○
		Min			------	--	-0.05	○	-0.12	○
	Neutral Axis after Composition	Max			------	--	-0.20	○	-0.56	○
		Min			------	--	-0.06	○	-0.14	○
	Base of Lower Flange	Max			------	--	-0.03	○	-0.44	○
		Min			------	--	-0.01	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	20.37	--
	D16		cm	------	------	--	32.03	--	31.93	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	1.98	--	11.42	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	------	--	3.58	○	1.72	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	1.313	○	1.00	○
	D16				------	--	1.313	○	1.00	○
	D19				------	--	1.371	○	1.07	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.59	△	1.34	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.06	○	-0.16	○
	Neutral Axis before Composition				------	--	-0.06	○	-0.15	○
	Neutral Axis after Composition				------	--	-0.07	○	-0.17	○
	Base of Lower Flange				------	--	-0.01	○	-0.10	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.16	○	-0.51	○
		Min			------	--	-0.05	○	-0.13	○
	Neutral Axis before Composition	Max			------	--	-0.18	○	-0.55	○
		Min			------	--	-0.05	○	-0.12	○
	Neutral Axis after Composition	Max			------	--	-0.20	○	-0.56	○
		Min			------	--	-0.06	○	-0.14	○
	Base of Lower Flange	Max			------	--	-0.03	○	-0.44	○
		Min			------	--	-0.01	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	20.37	--
	D16		cm	------	------	--	32.03	--	31.93	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 4(Shear Force Max)

Cross Section Number				Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder				------	4.100		7.699		11.299	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.31	△	0.84	△	0.54	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.15	○	-0.04	○	-0.01	○
	Neutral Axis before Composition				-0.14	○	-0.04	○	-0.01	○
	Neutral Axis after Composition				-0.16	○	-0.04	○	-0.01	○
	Base of Lower Flange				-0.10	○	-0.03	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.49	○	-0.20	○	-0.08	○
		Min			-0.13	○	-0.01	○	-0.01	○
	Neutral Axis before Composition	Max			-0.53	○	-0.26	○	-0.12	○
		Min			-0.12	○	-0.01	○	-0.01	○
	Neutral Axis after Composition	Max			-0.54	○	-0.24	○	-0.10	○
		Min			-0.13	○	-0.01	○	-0.01	○
	Base of Lower Flange	Max			-0.43	○	-0.30	○	-0.20	○
		Min			-0.08	○	-0.01	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	20.73	--	40.00	--	40.00	--
	D16		cm	------	32.49	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	11.23	--	5.48	--	1.40	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.74	○	2.47	○	3.91	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.00	○	1.021	○	------	--
	D16				1.00	○	1.223	○	------	--
	D19				1.08	○	1.471	○	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.31	△	0.84	△	0.54	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.15	○	-0.04	○	-0.01	○
	Neutral Axis before Composition				-0.14	○	-0.04	○	-0.01	○
	Neutral Axis after Composition				-0.16	○	-0.04	○	-0.01	○
	Base of Lower Flange				-0.10	○	-0.03	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.49	○	-0.20	○	-0.08	○
		Min			-0.13	○	-0.01	○	-0.01	○
	Neutral Axis before Composition	Max			-0.53	○	-0.26	○	-0.12	○
		Min			-0.12	○	-0.01	○	-0.01	○
	Neutral Axis after Composition	Max			-0.54	○	-0.24	○	-0.10	○
		Min			-0.13	○	-0.01	○	-0.01	○
	Base of Lower Flange	Max			-0.43	○	-0.30	○	-0.20	○
		Min			-0.08	○	-0.01	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	20.73	--	40.00	--	40.00	--
	D16		cm	------	32.49	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 4(Shear Force Max)

Cross Section Number				Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder				------	13.949		14.899		15.929	
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	0.39	○	0.47	○	0.57	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	0.00	○	0.00	○	-0.01	○
	Neutral Axis before Composition				0.00	○	0.00	○	-0.01	○
	Neutral Axis after Composition				0.00	○	0.00	○	-0.01	○
	Base of Lower Flange				0.00	○	0.00	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	-0.04	○	-0.01	○	-0.01	○
		Min			-0.03	○	-0.07	○	-0.10	○
	Neutral Axis before Composition	Max			-0.07	○	-0.02	○	-0.01	○
		Min			-0.03	○	-0.07	○	-0.11	○
	Neutral Axis after Composition	Max			-0.05	○	-0.02	○	-0.01	○
		Min			-0.03	○	-0.08	○	-0.11	○
	Base of Lower Flange	Max			-0.16	○	-0.06	○	-0.03	○
		Min			-0.02	○	-0.05	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.80	--	1.88	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	5.55	○	4.35	○	3.84	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	------	--	1.42	○
	D16				------	--	------	--	1.78	○
	D19				------	--	------	--	2.21	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	0.39	○	0.47	○	0.57	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	0.00	○	0.00	○	-0.01	○
	Neutral Axis before Composition				0.00	○	0.00	○	-0.01	○
	Neutral Axis after Composition				0.00	○	0.00	○	-0.01	○
	Base of Lower Flange				0.00	○	0.00	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	-0.04	○	-0.01	○	-0.01	○
		Min			-0.03	○	-0.07	○	-0.10	○
	Neutral Axis before Composition	Max			-0.07	○	-0.02	○	-0.01	○
		Min			-0.03	○	-0.07	○	-0.11	○
	Neutral Axis after Composition	Max			-0.05	○	-0.02	○	-0.01	○
		Min			-0.03	○	-0.08	○	-0.11	○
	Base of Lower Flange	Max			-0.16	○	-0.06	○	-0.03	○
		Min			-0.02	○	-0.05	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 4(Shear Force Max)

Cross Section Number				Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder				------	18.499		22.098		25.698	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.58	△	0.85	△	1.04	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	-0.03	○	-0.04	○
	Neutral Axis before Composition				0.00	○	-0.02	○	-0.03	○
	Neutral Axis after Composition				0.00	○	-0.02	○	-0.04	○
	Base of Lower Flange				0.00	○	-0.02	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.01	○	0.00	○	-0.02	○
		Min			-0.12	○	-0.24	○	-0.35	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	-0.01	○
		Min			-0.10	○	-0.21	○	-0.30	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	-0.02	○
		Min			-0.12	○	-0.24	○	-0.35	○
	Base of Lower Flange	Max			-0.02	○	0.00	○	-0.01	○
		Min			-0.07	○	-0.15	○	-0.20	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	30.80	--	19.67	--
	D16		cm	------	40.00	--	40.00	--	30.83	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	3.57	--	7.55	--	11.83	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	2.77	○	2.01	○	1.59	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.162	○	1	○	1.00	○
	D16				1.399	○	1.076	○	1.00	○
	D19				1.688	○	1.273	○	1.05	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.58	△	0.85	△	1.04	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	-0.03	○	-0.04	○
	Neutral Axis before Composition				0.00	○	-0.02	○	-0.03	○
	Neutral Axis after Composition				0.00	○	-0.02	○	-0.04	○
	Base of Lower Flange				0.00	○	-0.02	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.01	○	0.00	○	-0.02	○
		Min			-0.12	○	-0.24	○	-0.35	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	-0.01	○
		Min			-0.10	○	-0.21	○	-0.30	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	-0.02	○
		Min			-0.12	○	-0.24	○	-0.35	○
	Base of Lower Flange	Max			-0.02	○	0.00	○	-0.01	○
		Min			-0.07	○	-0.15	○	-0.20	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	30.80	--	19.67	--
	D16		cm	------	40.00	--	40.00	--	30.83	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 4(Shear Force Max)

Cross Section Number				Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder				------	25.798		28.298		29.298	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.06	△	1.15	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.05	○	-0.20	○	------	--
	Neutral Axis before Composition				-0.04	○	-0.32	○	------	--
	Neutral Axis after Composition				-0.05	○	-0.31	○	------	--
	Base of Lower Flange				-0.03	○	-0.08	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.02	○	-0.17	○	------	--
		Min			-0.37	○	-0.45	○	------	--
	Neutral Axis before Composition	Max			-0.02	○	-0.30	○	------	--
		Min			-0.31	○	-0.50	○	------	--
	Neutral Axis after Composition	Max			-0.02	○	-0.28	○	------	--
		Min			-0.36	○	-0.55	○	------	--
	Base of Lower Flange	Max			-0.01	○	-0.08	○	------	--
		Min			-0.20	○	-0.09	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	19.29	--	14.74	--	------	--
	D16		cm	------	30.24	--	23.10	--	------	--
	D19		cm	------	40.00	--	33.32	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	12.06	--	14.51	--	------	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.58	○	2.74	○	------	--
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1	○	1	○	------	--
	D16				1	○	1	○	------	--
	D19				1.039	○	1	○	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.06	△	1.15	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.05	○	-0.20	○	------	--
	Neutral Axis before Composition				-0.04	○	-0.32	○	------	--
	Neutral Axis after Composition				-0.05	○	-0.31	○	------	--
	Base of Lower Flange				-0.03	○	-0.08	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.02	○	-0.17	○	------	--
		Min			-0.37	○	-0.45	○	------	--
	Neutral Axis before Composition	Max			-0.02	○	-0.30	○	------	--
		Min			-0.31	○	-0.50	○	------	--
	Neutral Axis after Composition	Max			-0.02	○	-0.28	○	------	--
		Min			-0.36	○	-0.55	○	------	--
	Base of Lower Flange	Max			-0.01	○	-0.08	○	------	--
		Min			-0.20	○	-0.09	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	19.29	--	14.74	--	------	--
	D16		cm	------	30.24	--	23.10	--	------	--
	D19		cm	------	40.00	--	33.32	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span,　Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder				------	0.500		1.500		4.000	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.44	○	1.03	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.03	○	-0.07	○
	Neutral Axis before Composition				------	--	-0.03	○	-0.06	○
	Neutral Axis after Composition				------	--	-0.03	○	-0.07	○
	Base of Lower Flange				------	--	0.00	○	-0.04	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.10	○	-0.33	○
		Min			------	--	-0.03	○	-0.07	○
	Neutral Axis before Composition	Max			------	--	-0.10	○	-0.32	○
		Min			------	--	-0.03	○	-0.06	○
	Neutral Axis after Composition	Max			------	--	-0.11	○	-0.35	○
		Min			------	--	-0.03	○	-0.07	○
	Base of Lower Flange	Max			------	--	-0.02	○	-0.23	○
		Min			------	--	-0.01	○	-0.04	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	31.61	--
	D16		cm	------	------	--	32.03	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	7.36	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.44	○	1.03	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.03	○	-0.07	○
	Neutral Axis before Composition				------	--	-0.03	○	-0.06	○
	Neutral Axis after Composition				------	--	-0.03	○	-0.07	○
	Base of Lower Flange				------	--	0.00	○	-0.04	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.10	○	-0.33	○
		Min			------	--	-0.03	○	-0.07	○
	Neutral Axis before Composition	Max			------	--	-0.10	○	-0.32	○
		Min			------	--	-0.03	○	-0.06	○
	Neutral Axis after Composition	Max			------	--	-0.11	○	-0.35	○
		Min			------	--	-0.03	○	-0.07	○
	Base of Lower Flange	Max			------	--	-0.02	○	-0.23	○
		Min			------	--	-0.01	○	-0.04	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	31.61	--
	D16		cm	------	------	--	32.03	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	------	--	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	--	------	-	999.999	○
	D16				------	--	------	-	999.999	○
	D19				------	--	------	-	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span,　Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder				------	4.100		7.699		11.299	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.01	Δ	0.69	Δ	0.40	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.07	○	-0.01	○	0.00	○
	Neutral Axis before Composition				-0.06	○	-0.01	○	0.00	○
	Neutral Axis after Composition				-0.07	○	-0.01	○	0.00	○
	Base of Lower Flange				-0.04	○	-0.01	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.32	○	-0.15	○	-0.05	○
		Min			-0.07	○	-0.01	○	0.00	○
	Neutral Axis before Composition	Max			-0.31	○	-0.16	○	-0.06	○
		Min			-0.06	○	-0.01	○	0.00	○
	Neutral Axis after Composition	Max			-0.34	○	-0.16	○	-0.06	○
		Min			-0.07	○	-0.01	○	0.00	○
	Base of Lower Flange	Max			-0.23	○	-0.15	○	-0.07	○
		Min			-0.03	○	-0.01	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	32.18	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	7.23	--	3.49	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.01	Δ	0.69	Δ	0.40	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.07	○	-0.01	○	0.00	○
	Neutral Axis before Composition				-0.06	○	-0.01	○	0.00	○
	Neutral Axis after Composition				-0.07	○	-0.01	○	0.00	○
	Base of Lower Flange				-0.04	○	-0.01	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.32	○	-0.15	○	-0.05	○
		Min			-0.07	○	-0.01	○	0.00	○
	Neutral Axis before Composition	Max			-0.31	○	-0.16	○	-0.06	○
		Min			-0.06	○	-0.01	○	0.00	○
	Neutral Axis after Composition	Max			-0.34	○	-0.16	○	-0.06	○
		Min			-0.07	○	-0.01	○	0.00	○
	Base of Lower Flange	Max			-0.23	○	-0.15	○	-0.07	○
		Min			-0.03	○	-0.01	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	32.18	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	-
	D16				999.999	○	999.999	○	------	-
	D19				999.999	○	999.999	○	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span,　Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder				------		13.949		14.899		15.929
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.16	○	0.05	○	0.33	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.03	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.05	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.04	○
	Base of Lower Flange	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.16	○	0.05	○	0.33	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.03	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.05	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.04	○
	Base of Lower Flange	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	------	-	------	-
	D16				------	-	------	-	------	-
	D19				------	-	------	-	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder				------	18.499		22.098		25.698	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.43	○	0.47	○	0.68	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	0.00	○	0.00	○
		Min			-0.06	○	-0.08	○	-0.16	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.07	○	-0.07	○	-0.14	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.07	○	-0.08	○	-0.16	○
	Base of Lower Flange	Max			0.00	○	0.00	○	0.00	○
		Min			-0.09	○	-0.06	○	-0.10	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	29.72	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	1.96	--	3.59	--	7.83	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.43	○	0.47	○	0.68	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	0.00	○	0.00	○
		Min			-0.06	○	-0.08	○	-0.16	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.07	○	-0.07	○	-0.14	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.07	○	-0.08	○	-0.16	○
	Base of Lower Flange	Max			0.00	○	0.00	○	0.00	○
		Min			-0.09	○	-0.06	○	-0.10	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	29.72	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	------	-	999.999	○
	D16				------	-	------	-	999.999	○
	D19				------	-	------	-	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder				------	25.798		28.298		29.298	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.70	△	0.98	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	-0.11	○	------	--
	Neutral Axis before Composition				0.00	○	-0.23	○	------	--
	Neutral Axis after Composition				0.00	○	-0.21	○	------	--
	Base of Lower Flange				0.00	○	-0.06	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	-0.12	○	------	--
		Min			-0.17	○	-0.30	○	------	--
	Neutral Axis before Composition	Max			0.00	○	-0.21	○	------	--
		Min			-0.15	○	-0.40	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.20	○	------	--
		Min			-0.17	○	-0.41	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.05	○	------	--
		Min			-0.11	○	-0.08	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	29.00	--	20.44	--	------	--
	D16		cm	------	40.00	--	32.03	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	8.02	--	9.67	--	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.70	△	0.98	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	-0.11	○	------	--
	Neutral Axis before Composition				0.00	○	-0.23	○	------	--
	Neutral Axis after Composition				0.00	○	-0.21	○	------	--
	Base of Lower Flange				0.00	○	-0.06	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	-0.12	○	------	--
		Min			-0.17	○	-0.30	○	------	--
	Neutral Axis before Composition	Max			0.00	○	-0.21	○	------	--
		Min			-0.15	○	-0.40	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.20	○	------	--
		Min			-0.17	○	-0.41	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.05	○	------	--
		Min			-0.11	○	-0.08	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	29.00	--	20.44	--	------	--
	D16		cm	------	40.00	--	32.03	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	------	--
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	--
	D16				999.999	○	999.999	○	------	--
	D19				999.999	○	999.999	○	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder			------	0.500		1.500		4.000	
Immediately After Prestressing	Top of Main Girder		-1.5	3.413	○	4.219	○	6.224	○
	Bottom of Main Girder		～19.00	3.729	○	3.488	○	7.018	○
During Deck Construction	Top of Main Girder		-1.5	3.229	○	4.549	○	7.931	○
	Bottom of Main Girder		～14.00	3.554	○	2.677	○	4.132	○
Dead Load	Top of Deck		≦10.00	0.346	○	0.809	○	1.696	○
	Top of Main Girder		0	2.334	○	3.300	○	5.518	○
	Bottom of Main Girder		～14.00	3.745	○	2.804	○	3.301	○
Design Load1	Top of Deck	Max	≦10.00	0.489	○	0.995	○	2.063	○
		Min		-1.000	○	-0.329	○	0.951	○
	Top of Main Girder	Max	-1.5	2.460	○	3.463	○	5.828	○
		Min		1.144	○	2.301	○	4.891	○
	Bottom of Main Girder	Max	～14.00	3.494	○	2.465	○	2.470	○
		Min		6.106	○	4.876	○	4.985	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	1.519	○	2.010	○	2.995	○
		Min		0.029	○	0.686	○	1.883	○
	Top of Main Girder	Max	-2	2.051	○	3.036	○	5.293	○
		Min		0.735	○	1.874	○	4.355	○
	Bottom of Main Girder	Max	～16.10	3.098	○	2.030	○	1.737	○
		Min		5.710	○	4.441	○	4.252	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	1.519	○	2.010	○	2.995	○
		Min		0.029	○	0.686	○	1.883	○
	Top of Main Girder	Max	-2	2.051	○	3.036	○	5.293	○
		Min		0.735	○	1.874	○	4.355	○
	Bottom of Main Girder	Max	～16.10	3.098	○	2.030	○	1.737	○
		Min		5.710	○	4.441	○	4.252	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	0.489	○	0.995	○	2.063	○
		Min		-1.000	○	-0.329	○	0.951	○
	Top of Main Girder	Max	-1.5	2.460	○	3.463	○	5.828	○
		Min		1.144	○	2.301	○	4.891	○
	Bottom of Main Girder	Max	～14.00	3.494	○	2.465	○	2.470	○
		Min		6.106	○	4.876	○	4.985	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	1.519	○	2.010	○	2.995	○
		Min		0.029	○	0.686	○	1.883	○
	Top of Main Girder	Max	-2	2.051	○	3.036	○	5.293	○
		Min		0.735	○	1.874	○	4.355	○
	Bottom of Main Girder	Max	～16.10	3.098	○	2.030	○	1.737	○
		Min		5.710	○	4.441	○	4.252	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	1.519	○	2.010	○	2.995	○
		Min		0.029	○	0.686	○	1.883	○
	Top of Main Girder	Max	-2	2.051	○	3.036	○	5.293	○
		Min		0.735	○	1.874	○	4.355	○
	Bottom of Main Girder	Max	～16.10	3.098	○	2.030	○	1.737	○
		Min		5.710	○	4.441	○	4.252	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span，Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder			------	4.100		7.700		11.300	
Immediately After Prestressing	Top of Main Girder		-1.5	6.127	○	3.091	○	1.096	○
	Bottom of Main Girder		～19.00	7.137	○	10.982	○	13.173	○
During Deck Construction	Top of Main Girder		-1.5	7.892	○	6.616	○	5.764	○
	Bottom of Main Girder		～14.00	4.183	○	5.888	○	6.659	○
Dead Load	Top of Deck		≦10.00	1.706	○	2.018	○	2.250	○
	Top of Main Girder		0	5.507	○	5.062	○	4.739	○
	Bottom of Main Girder		～14.00	3.310	○	3.687	○	3.602	○
Design Load1	Top of Deck	Max	≦10.00	2.083	○	2.832	○	3.321	○
		Min		0.974	○	1.472	○	1.822	○
	Top of Main Girder	Max	-1.5	5.824	○	5.750	○	5.645	○
		Min		4.889	○	4.601	○	4.377	○
	Bottom of Main Girder	Max	～14.00	2.458	○	1.864	○	1.216	○
		Min		4.966	○	4.910	○	4.554	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	3.014	○	3.742	○	4.209	○
		Min		1.905	○	2.382	○	2.710	○
	Top of Main Girder	Max	-2	5.289	○	5.197	○	5.074	○
		Min		4.353	○	4.048	○	3.806	○
	Bottom of Main Girder	Max	～16.10	1.727	○	1.192	○	0.599	○
		Min		4.235	○	4.238	○	3.936	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	3.014	○	3.742	○	4.209	○
		Min		1.905	○	2.382	○	2.710	○
	Top of Main Girder	Max	-2	5.289	○	5.197	○	5.074	○
		Min		4.353	○	4.048	○	3.806	○
	Bottom of Main Girder	Max	～16.10	1.727	○	1.192	○	0.599	○
		Min		4.235	○	4.238	○	3.936	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.083	○	2.832	○	3.321	○
		Min		0.974	○	1.472	○	1.822	○
	Top of Main Girder	Max	-1.5	5.824	○	5.750	○	5.645	○
		Min		4.889	○	4.601	○	4.377	○
	Bottom of Main Girder	Max	～14.00	2.458	○	1.864	○	1.216	○
		Min		4.966	○	4.910	○	4.554	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	3.014	○	3.742	○	4.209	○
		Min		1.905	○	2.382	○	2.710	○
	Top of Main Girder	Max	-2	5.289	○	5.197	○	5.074	○
		Min		4.353	○	4.048	○	3.806	○
	Bottom of Main Girder	Max	～16.10	1.727	○	1.192	○	0.599	○
		Min		4.235	○	4.238	○	3.936	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	3.014	○	3.742	○	4.209	○
		Min		1.905	○	2.382	○	2.710	○
	Top of Main Girder	Max	-2	5.289	○	5.197	○	5.074	○
		Min		4.353	○	4.048	○	3.806	○
	Bottom of Main Girder	Max	～16.10	1.727	○	1.192	○	0.599	○
		Min		4.235	○	4.238	○	3.936	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder			------	13.869		14.900		15.931	
Immediately After Prestressing	Top of Main Girder		-1.5	0.789	○	0.833	○	0.790	○
	Bottom of Main Girder		～19.00	13.199	○	13.089	○	13.198	○
During Deck Construction	Top of Main Girder		-1.5	5.847	○	5.926	○	5.849	○
	Bottom of Main Girder		～14.00	6.244	○	6.102	○	6.241	○
Dead Load	Top of Deck		≦10.00	2.449	○	2.491	○	2.463	○
	Top of Main Girder		0	4.868	○	4.928	○	4.879	○
	Bottom of Main Girder		～14.00	2.980	○	2.830	○	2.960	○
Design Load1	Top of Deck	Max	≦10.00	3.583	○	3.630	○	3.600	○
		Min		2.096	○	2.155	○	2.127	○
	Top of Main Girder	Max	-1.5	5.828	○	5.892	○	5.840	○
		Min		4.570	○	4.644	○	4.594	○
	Bottom of Main Girder	Max	～14.00	0.459	○	0.298	○	0.434	○
		Min		3.763	○	3.578	○	3.707	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	4.457	○	4.498	○	4.463	○
		Min		2.970	○	3.023	○	2.990	○
	Top of Main Girder	Max	-2	5.245	○	5.305	○	5.248	○
		Min		3.987	○	4.057	○	4.003	○
	Bottom of Main Girder	Max	～16.10	-0.126	○	-0.275	○	-0.128	○
		Min		3.179	○	3.004	○	3.145	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	4.457	○	4.498	○	4.463	○
		Min		2.970	○	3.023	○	2.990	○
	Top of Main Girder	Max	-2	5.245	○	5.305	○	5.248	○
		Min		3.987	○	4.057	○	4.003	○
	Bottom of Main Girder	Max	～16.10	-0.126	○	-0.275	○	-0.128	○
		Min		3.179	○	3.004	○	3.145	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	3.583	○	3.630	○	3.600	○
		Min		2.096	○	2.155	○	2.127	○
	Top of Main Girder	Max	-1.5	5.828	○	5.892	○	5.840	○
		Min		4.570	○	4.644	○	4.594	○
	Bottom of Main Girder	Max	～14.00	0.459	○	0.298	○	0.434	○
		Min		3.763	○	3.578	○	3.707	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	4.457	○	4.498	○	4.463	○
		Min		2.970	○	3.023	○	2.990	○
	Top of Main Girder	Max	-2	5.245	○	5.305	○	5.248	○
		Min		3.987	○	4.057	○	4.003	○
	Bottom of Main Girder	Max	～16.10	-0.126	○	-0.275	○	-0.128	○
		Min		3.179	○	3.004	○	3.145	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	4.457	○	4.498	○	4.463	○
		Min		2.970	○	3.023	○	2.990	○
	Top of Main Girder	Max	-2	5.245	○	5.305	○	5.248	○
		Min		3.987	○	4.057	○	4.003	○
	Bottom of Main Girder	Max	～16.10	-0.126	○	-0.275	○	-0.128	○
		Min		3.179	○	3.004	○	3.145	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder			------	18.500		22.100		25.700	
Immediately After Prestressing	Top of Main Girder		-1.5	1.101	○	3.100	○	6.141	○
	Bottom of Main Girder		～19.00	13.167	○	10.971	○	7.121	○
During Deck Construction	Top of Main Girder		-1.5	5.773	○	6.635	○	7.921	○
	Bottom of Main Girder		～14.00	6.648	○	5.866	○	4.150	○
Dead Load	Top of Deck		≦10.00	2.300	○	2.120	○	1.860	○
	Top of Main Girder		0	4.778	○	5.154	○	5.662	○
	Bottom of Main Girder		～14.00	3.526	○	3.507	○	2.983	○
Design Load1	Top of Deck	Max	≦10.00	3.379	○	2.952	○	2.296	○
		Min		1.927	○	1.660	○	1.228	○
	Top of Main Girder	Max		5.691	○	5.858	○	6.030	○
		Min	-1.5	4.462	○	4.766	○	5.130	○
	Bottom of Main Girder	Max	～14.00	1.124	○	1.643	○	1.998	○
		Min		4.357	○	4.535	○	4.411	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	4.230	○	3.787	○	3.114	○
		Min		2.778	○	2.496	○	2.047	○
	Top of Main Girder	Max		5.089	○	5.242	○	5.399	○
		Min	-2	3.860	○	4.150	○	4.499	○
	Bottom of Main Girder	Max	～16.10	0.589	○	1.137	○	1.521	○
		Min		3.821	○	4.030	○	3.934	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	4.230	○	3.787	○	3.114	○
		Min		2.778	○	2.496	○	2.047	○
	Top of Main Girder	Max		5.089	○	5.242	○	5.399	○
		Min	-2	3.860	○	4.150	○	4.499	○
	Bottom of Main Girder	Max	～16.10	0.589	○	1.137	○	1.521	○
		Min		3.821	○	4.030	○	3.934	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	3.379	○	2.952	○	2.296	○
		Min		1.927	○	1.660	○	1.228	○
	Top of Main Girder	Max		5.691	○	5.858	○	6.030	○
		Min	-1.5	4.462	○	4.766	○	5.130	○
	Bottom of Main Girder	Max	～14.00	1.124	○	1.643	○	1.998	○
		Min		4.357	○	4.535	○	4.411	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	4.230	○	3.787	○	3.114	○
		Min		2.778	○	2.496	○	2.047	○
	Top of Main Girder	Max		5.089	○	5.242	○	5.399	○
		Min	-2	3.860	○	4.150	○	4.499	○
	Bottom of Main Girder	Max	～16.10	0.589	○	1.137	○	1.521	○
		Min		3.821	○	4.030	○	3.934	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	4.230	○	3.787	○	3.114	○
		Min		2.778	○	2.496	○	2.047	○
	Top of Main Girder	Max		5.089	○	5.242	○	5.399	○
		Min	-2	3.860	○	4.150	○	4.499	○
	Bottom of Main Girder	Max	～16.10	0.589	○	1.137	○	1.521	○
		Min		3.821	○	4.030	○	3.934	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder			------	25.800		28.300		29.300	
Immediately After Prestressing	Top of Main Girder		-1.5	6.238	○	4.234	○	3.428	○
	Bottom of Main Girder		～19.00	7.001	○	3.471	○	3.711	○
During Deck Construction	Top of Main Girder		-1.5	7.960	○	4.580	○	3.261	○
	Bottom of Main Girder		～14.00	4.099	○	2.642	○	3.518	○
Dead Load	Top of Deck		≦10.00	1.851	○	0.996	○	0.545	○
	Top of Main Girder		0	5.676	○	3.483	○	2.528	○
	Bottom of Main Girder		～14.00	2.970	○	2.458	○	3.390	○
Design Load1	Top of Deck	Max	≦10.00	2.279	○	1.274	○	0.794	○
		Min		1.207	○	-0.048	○	-0.715	○
	Top of Main Girder	Max	-1.5	6.036	○	3.728	○	2.748	○
		Min		5.133	○	2.567	○	1.416	○
	Bottom of Main Girder	Max	～14.00	2.003	○	1.950	○	2.953	○
		Min		4.426	○	4.359	○	5.598	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	3.097	○	2.153	○	1.678	○
		Min		2.026	○	0.831	○	0.170	○
	Top of Main Girder	Max	-2	5.406	○	3.181	○	2.211	○
		Min		4.502	○	2.021	○	0.879	○
	Bottom of Main Girder	Max	～16.10	1.527	○	1.764	○	2.811	○
		Min		3.949	○	4.173	○	5.456	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	3.097	○	2.153	○	1.678	○
		Min		2.026	○	0.831	○	0.170	○
	Top of Main Girder	Max	-2	5.406	○	3.181	○	2.211	○
		Min		4.502	○	2.021	○	0.879	○
	Bottom of Main Girder	Max	～16.10	1.527	○	1.764	○	2.811	○
		Min		3.949	○	4.173	○	5.456	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.279	○	1.274	○	0.794	○
		Min		1.207	○	-0.048	○	-0.715	○
	Top of Main Girder	Max	-1.5	6.036	○	3.728	○	2.748	○
		Min		5.133	○	2.567	○	1.416	○
	Bottom of Main Girder	Max	～14.00	2.003	○	1.950	○	2.953	○
		Min		4.426	○	4.359	○	5.598	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	3.097	○	2.153	○	1.678	○
		Min		2.026	○	0.831	○	0.170	○
	Top of Main Girder	Max	-2	5.406	○	3.181	○	2.211	○
		Min		4.502	○	2.021	○	0.879	○
	Bottom of Main Girder	Max	～16.10	1.527	○	1.764	○	2.811	○
		Min		3.949	○	4.173	○	5.456	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	3.097	○	2.153	○	1.678	○
		Min		2.026	○	0.831	○	0.170	○
	Top of Main Girder	Max	-2	5.406	○	3.181	○	2.211	○
		Min		4.502	○	2.021	○	0.879	○
	Bottom of Main Girder	Max	～16.10	1.527	○	1.764	○	2.811	○
		Min		3.949	○	4.173	○	5.456	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 2

Cross Section NumberNo.	Unit	Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder			0.500		1.500		4.000	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1099	○	1103	○	1156	○
Effective Prestressing Force (*1)	N/mm^2	1110	1044	○	1046	○	1083	○
Effective Prestressing Force (*2)	N/mm^2	1110	972	○	972	○	987	○
max	N/mm^2	1110	970	○	970	○	988	○
Ultimate Load	------	1.00	1.90	○	3.01	○	2.57	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder			4.100		7.700		11.300	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1157	○	1174	○	1154	○
Effective Prestressing Force (*1)	N/mm^2	1110	1083	○	1089	○	1058	○
Effective Prestressing Force (*2)	N/mm^2	1110	987	○	995	○	968	○
max	N/mm^2	1110	988	○	1015	○	1007	○
Ultimate Load	------	1.00	2.52	○	1.64	○	1.43	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder			13.869		14.900		15.931	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1126	○	1121	○	1126	○
Effective Prestressing Force (*1)	N/mm^2	1110	1029	○	1025	○	1029	○
Effective Prestressing Force (*2)	N/mm^2	1110	946	○	944	○	947	○
max	N/mm^2	1110	992	○	991	○	994	○
Ultimate Load	------	1.00	1.35	○	1.34	○	1.34	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder			18.500		22.100		25.700	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1154	○	1174	○	1157	○
Effective Prestressing Force (*1)	N/mm^2	1110	1058	○	1089	○	1083	○
Effective Prestressing Force (*2)	N/mm^2	1110	970	○	1000	○	991	○
max	N/mm^2	1110	1011	○	1023	○	996	○
Ultimate Load	------	1.00	1.40	○	1.56	○	2.16	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder			25.800		28.300		29.300	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1156	○	1103	○	1099	○
Effective Prestressing Force (*1)	N/mm^2	1110	1083	○	1046	○	1044	○
Effective Prestressing Force (*2)	N/mm^2	1110	991	○	974	○	974	○
max	N/mm^2	1110	995	○	974	○	973	○
Ultimate Load	------	1.00	2.19	○	3.96	○	2.26	○

*1:During DeckConstruction *2:Design Load

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder				------	0.500		1.500		4.000	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	1.02	△	0.79	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.12	○	0.00	○
	Neutral Axis before Composition				------	--	-0.23	○	0.00	○
	Neutral Axis after Composition				------	--	-0.21	○	0.00	○
	Base of Lower Flange				------	--	-0.06	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.32	○	-0.21	○
		Min			------	--	-0.10	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.41	○	-0.16	○
		Min			------	--	-0.22	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.43	○	-0.20	○
		Min			------	--	-0.19	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.08	○	-0.10	○
		Min			------	--	-0.06	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	28.66	--
	D16		cm	------	------	--	32.03	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	9.85	--	8.12	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	------	--	3.18	○	1.84	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	1.021	○	1.00	○
	D16				------	--	1.021	○	1.04	○
	D19				------	--	1.077	○	1.21	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	1.02	△	0.79	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.12	○	0.00	○
	Neutral Axis before Composition				------	--	-0.23	○	0.00	○
	Neutral Axis after Composition				------	--	-0.21	○	0.00	○
	Base of Lower Flange				------	--	-0.06	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.32	○	-0.21	○
		Min			------	--	-0.10	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.41	○	-0.16	○
		Min			------	--	-0.22	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.43	○	-0.20	○
		Min			------	--	-0.19	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.08	○	-0.10	○
		Min			------	--	-0.06	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	28.66	--
	D16		cm	------	------	--	32.03	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder				------	4.100		7.700		11.300	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.77	△	0.67	△	0.54	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	-0.01	○	-0.01	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	-0.01	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.20	○	-0.16	○	-0.10	○
		Min			0.00	○	0.00	○	-0.01	○
	Neutral Axis before Composition	Max			-0.16	○	-0.12	○	-0.08	○
		Min			0.00	○	0.00	○	-0.02	○
	Neutral Axis after Composition	Max			-0.19	○	-0.15	○	-0.10	○
		Min			0.00	○	0.00	○	-0.01	○
	Base of Lower Flange	Max			-0.10	○	-0.08	○	-0.05	○
		Min			0.00	○	0.00	○	-0.02	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	29.35	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	7.93	--	4.91	--	1.94	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.85	○	2.31	○	3.15	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.00	○	1.051	○	------	--
	D16				1.05	○	1.237	○	------	--
	D19				1.22	○	1.463	○	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.77	△	0.67	△	0.54	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	-0.01	○	-0.01	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	-0.01	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.20	○	-0.16	○	-0.10	○
		Min			0.00	○	0.00	○	-0.01	○
	Neutral Axis before Composition	Max			-0.16	○	-0.12	○	-0.08	○
		Min			0.00	○	0.00	○	-0.02	○
	Neutral Axis after Composition	Max			-0.19	○	-0.15	○	-0.10	○
		Min			0.00	○	0.00	○	-0.01	○
	Base of Lower Flange	Max			-0.10	○	-0.08	○	-0.05	○
		Min			0.00	○	0.00	○	-0.02	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	29.35	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder				------	13.869		14.900		15.931	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.62	Δ	0.46	○	0.55	Δ
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.02	○	-0.01	○	-0.01	○
	Neutral Axis before Composition				-0.03	○	-0.01	○	-0.01	○
	Neutral Axis after Composition				-0.02	○	-0.01	○	-0.01	○
	Base of Lower Flange				-0.02	○	-0.01	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.12	○	-0.07	○	-0.02	○
		Min			-0.01	○	-0.03	○	-0.08	○
	Neutral Axis before Composition	Max			-0.12	○	-0.07	○	-0.01	○
		Min			-0.01	○	-0.04	○	-0.12	○
	Neutral Axis after Composition	Max			-0.13	○	-0.08	○	-0.02	○
		Min			-0.01	○	-0.04	○	-0.10	○
	Base of Lower Flange	Max			-0.09	○	-0.05	○	-0.01	○
		Min			-0.01	○	-0.04	○	-0.14	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	1.04	--	0.00	--	0.88	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	4.22	○	5.15	○	4.82	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.565	○	------	--	1.67	○
	D16				1.956	○	------	--	2.11	○
	D19				2.434	○	------	--	2.66	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.62	Δ	0.46	○	0.55	Δ
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.02	○	-0.01	○	-0.01	○
	Neutral Axis before Composition				-0.03	○	-0.01	○	-0.01	○
	Neutral Axis after Composition				-0.02	○	-0.01	○	-0.01	○
	Base of Lower Flange				-0.02	○	-0.01	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.12	○	-0.07	○	-0.02	○
		Min			-0.01	○	-0.03	○	-0.08	○
	Neutral Axis before Composition	Max			-0.12	○	-0.07	○	-0.01	○
		Min			-0.01	○	-0.04	○	-0.12	○
	Neutral Axis after Composition	Max			-0.13	○	-0.08	○	-0.02	○
		Min			-0.01	○	-0.04	○	-0.10	○
	Base of Lower Flange	Max			-0.09	○	-0.05	○	-0.01	○
		Min			-0.01	○	-0.04	○	-0.14	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder				------	18.500		22.100		25.700	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.47	○	0.61	△	0.70	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.02	○	0.00	○	0.00	○
		Min			-0.07	○	-0.11	○	-0.15	○
	Neutral Axis before Composition	Max			-0.02	○	-0.01	○	-0.01	○
		Min			-0.08	○	-0.12	○	-0.15	○
	Neutral Axis after Composition	Max			-0.03	○	-0.01	○	0.00	○
		Min			-0.08	○	-0.13	○	-0.16	○
	Base of Lower Flange	Max			-0.02	○	-0.01	○	-0.01	○
		Min			-0.08	○	-0.11	○	-0.13	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	32.70	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	1.61	--	4.52	--	7.12	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	3.45	○	2.44	○	1.93	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	1.077	○	1.00	○
	D16				------	--	1.272	○	1.09	○
	D19				------	--	1.512	○	1.26	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.47	○	0.61	△	0.70	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.02	○	0.00	○	0.00	○
		Min			-0.07	○	-0.11	○	-0.15	○
	Neutral Axis before Composition	Max			-0.02	○	-0.01	○	-0.01	○
		Min			-0.08	○	-0.12	○	-0.15	○
	Neutral Axis after Composition	Max			-0.03	○	-0.01	○	0.00	○
		Min			-0.08	○	-0.13	○	-0.16	○
	Base of Lower Flange	Max			-0.02	○	-0.01	○	-0.01	○
		Min			-0.08	○	-0.11	○	-0.13	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	32.70	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder				------		25.800		28.300		29.300
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.72	△	0.91	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	-0.10	○	------	--
	Neutral Axis before Composition				0.00	○	-0.22	○	------	--
	Neutral Axis after Composition				0.00	○	-0.19	○	------	--
	Base of Lower Flange				0.00	○	-0.06	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	-0.10	○	------	--
		Min			-0.16	○	-0.24	○	------	--
	Neutral Axis before Composition	Max			0.00	○	-0.19	○	------	--
		Min			-0.16	○	-0.45	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.18	○	------	--
		Min			-0.17	○	-0.41	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.04	○	------	--
		Min			-0.14	○	-0.14	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	31.90	--	20.44	--	------	--
	D16		cm	------	40.00	--	32.03	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	7.29	--	6.93	--	------	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.91	○	3.62	○	------	--
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1	○	1.16	○	------	--
	D16				1.079	○	1.16	○	------	--
	D19				1.253	○	1.224	○	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.72	△	0.91	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	-0.10	○	------	--
	Neutral Axis before Composition				0.00	○	-0.22	○	------	--
	Neutral Axis after Composition				0.00	○	-0.19	○	------	--
	Base of Lower Flange				0.00	○	-0.06	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	-0.10	○	------	--
		Min			-0.16	○	-0.24	○	------	--
	Neutral Axis before Composition	Max			0.00	○	-0.19	○	------	--
		Min			-0.16	○	-0.45	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.18	○	------	--
		Min			-0.17	○	-0.41	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.04	○	------	--
		Min			-0.14	○	-0.14	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	31.90	--	20.44	--	------	--
	D16		cm	------	40.00	--	32.03	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span,　Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder				------		0.500		1.500		4.000
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.95	△	0.64	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.11	○	0.00	○
	Neutral Axis before Composition				------	--	-0.22	○	0.00	○
	Neutral Axis after Composition				------	--	-0.20	○	0.00	○
	Base of Lower Flange				------	--	-0.06	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.27	○	-0.14	○
		Min			------	--	-0.12	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.38	○	-0.12	○
		Min			------	--	-0.21	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.39	○	-0.14	○
		Min			------	--	-0.20	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.08	○	-0.09	○
		Min			------	--	-0.05	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	35.61	--
	D16		cm	------	------	--	32.03	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	7.95	--	6.54	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.95	△	0.64	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.11	○	0.00	○
	Neutral Axis before Composition				------	--	-0.22	○	0.00	○
	Neutral Axis after Composition				------	--	-0.20	○	0.00	○
	Base of Lower Flange				------	--	-0.06	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.27	○	-0.14	○
		Min			------	--	-0.12	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.38	○	-0.12	○
		Min			------	--	-0.21	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.39	○	-0.14	○
		Min			------	--	-0.20	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.08	○	-0.09	○
		Min			------	--	-0.05	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	35.61	--
	D16		cm	------	------	--	32.03	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	------	--	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	--	999.999	○	999.999	○
	D16				------	--	999.999	○	999.999	○
	D19				------	--	999.999	○	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder				------	4.100		7.700		11.300	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.62	△	0.58	△	0.35	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.14	○	-0.11	○	-0.04	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition	Max			-0.12	○	-0.11	○	-0.05	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition	Max			-0.14	○	-0.12	○	-0.05	○
		Min			0.00	○	0.00	○	0.00	○
	Base of Lower Flange	Max			-0.09	○	-0.10	○	-0.05	○
		Min			0.00	○	0.00	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	36.65	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	6.35	--	4.14	--	0.07	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.62	△	0.58	△	0.35	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.14	○	-0.11	○	-0.04	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition	Max			-0.12	○	-0.11	○	-0.05	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition	Max			-0.14	○	-0.12	○	-0.05	○
		Min			0.00	○	0.00	○	0.00	○
	Base of Lower Flange	Max			-0.09	○	-0.10	○	-0.05	○
		Min			0.00	○	0.00	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	36.65	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	-
	D16				999.999	○	999.999	○	------	-
	D19				999.999	○	999.999	○	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder				------	13.869		14.900		15.931	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.24	○	0.06	○	0.27	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	-0.01	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.02	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.02	○
	Neutral Axis before Composition	Max			-0.02	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.03	○
	Neutral Axis after Composition	Max			-0.02	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.03	○
	Base of Lower Flange	Max			-0.02	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.06	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.24	○	0.06	○	0.27	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	-0.01	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.02	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.02	○
	Neutral Axis before Composition	Max			-0.02	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.03	○
	Neutral Axis after Composition	Max			-0.02	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.03	○
	Base of Lower Flange	Max			-0.02	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.06	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	------	-	------	-
	D16				------	-	------	-	------	-
	D19				------	-	------	-	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder				------		18.500		22.100		25.700
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.39	○	0.60	△	0.65	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	0.00	○	0.00	○
		Min			-0.05	○	-0.12	○	-0.15	○
	Neutral Axis before Composition	Max			0.00	○	0.00	○	0.00	○
		Min			-0.06	○	-0.12	○	-0.13	○
	Neutral Axis after Composition	Max			0.00	○	0.00	○	0.00	○
		Min			-0.06	○	-0.13	○	-0.15	○
	Base of Lower Flange	Max			0.00	○	0.00	○	0.00	○
		Min			-0.06	○	-0.10	○	-0.09	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	39.01	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	3.82	--	5.97	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.39	○	0.60	△	0.65	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	0.00	○	0.00	○
		Min			-0.05	○	-0.12	○	-0.15	○
	Neutral Axis before Composition	Max			0.00	○	0.00	○	0.00	○
		Min			-0.06	○	-0.12	○	-0.13	○
	Neutral Axis after Composition	Max			0.00	○	0.00	○	0.00	○
		Min			-0.06	○	-0.13	○	-0.15	○
	Base of Lower Flange	Max			0.00	○	0.00	○	0.00	○
		Min			-0.06	○	-0.10	○	-0.09	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	39.01	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	999.999	○	999.999	○
	D16				------	-	999.999	○	999.999	○
	D19				------	-	999.999	○	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder				------	25.800		28.300		29.300	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.66	∆	0.96	∆	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	-0.11	○	------	--
	Neutral Axis before Composition				0.00	○	-0.22	○	------	--
	Neutral Axis after Composition				0.00	○	-0.21	○	------	--
	Base of Lower Flange				0.00	○	-0.06	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	-0.12	○	------	--
		Min			-0.15	○	-0.28	○	------	--
	Neutral Axis before Composition	Max			0.00	○	-0.22	○	------	--
		Min			-0.13	○	-0.39	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.21	○	------	--
		Min			-0.15	○	-0.40	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.05	○	------	--
		Min			-0.10	○	-0.08	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	37.83	--	20.44	--	------	--
	D16		cm	------	40.00	--	32.03	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	6.15	--	7.58	--	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.66	∆	0.96	∆	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	-0.11	○	------	--
	Neutral Axis before Composition				0.00	○	-0.22	○	------	--
	Neutral Axis after Composition				0.00	○	-0.21	○	------	--
	Base of Lower Flange				0.00	○	-0.06	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	-0.12	○	------	--
		Min			-0.15	○	-0.28	○	------	--
	Neutral Axis before Composition	Max			0.00	○	-0.22	○	------	--
		Min			-0.13	○	-0.39	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.21	○	------	--
		Min			-0.15	○	-0.40	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.05	○	------	--
		Min			-0.10	○	-0.08	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	37.83	--	20.44	--	------	--
	D16		cm	------	40.00	--	32.03	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	------	--
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	--
	D16				999.999	○	999.999	○	------	--
	D19				999.999	○	999.999	○	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 3

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[3- 1]		[3- 2]		[3- 3]	
Interval from beginning of Girder			------	0.500		1.500		4.000	
Immediately After Prestressing	Top of Main Girder		-1.5	3.428	○	4.234	○	6.238	○
	Bottom of Main Girder		～19.00	3.711	○	3.471	○	7.001	○
During Deck Construction	Top of Main Girder		-1.5	3.261	○	4.580	○	7.960	○
	Bottom of Main Girder		～14.00	3.518	○	2.642	○	4.099	○
Dead Load	Top of Deck		≦10.00	0.565	○	1.022	○	1.893	○
	Top of Main Girder		0	2.546	○	3.507	○	5.713	○
	Bottom of Main Girder		～14.00	3.355	○	2.410	○	2.878	○
Design Load1	Top of Deck	Max	≦10.00	0.822	○	1.306	○	2.322	○
		Min		-0.694	○	-0.022	○	1.249	○
	Top of Main Girder	Max	-1.5	2.773	○	3.756	○	6.074	○
		Min		1.435	○	2.591	○	5.170	○
	Bottom of Main Girder	Max	～14.00	2.905	○	1.893	○	1.908	○
		Min		5.562	○	4.311	○	4.334	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	1.706	○	2.185	○	3.140	○
		Min		0.191	○	0.857	○	2.068	○
	Top of Main Girder	Max	-2	2.236	○	3.210	○	5.444	○
		Min		0.897	○	2.044	○	4.539	○
	Bottom of Main Girder	Max	～16.10	2.763	○	1.707	○	1.431	○
		Min		5.420	○	4.125	○	3.858	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	1.706	○	2.185	○	3.140	○
		Min		0.191	○	0.857	○	2.068	○
	Top of Main Girder	Max	-2	2.236	○	3.210	○	5.444	○
		Min		0.897	○	2.044	○	4.539	○
	Bottom of Main Girder	Max	～16.10	2.763	○	1.707	○	1.431	○
		Min		5.420	○	4.125	○	3.858	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	0.822	○	1.306	○	2.322	○
		Min		-0.694	○	-0.022	○	1.249	○
	Top of Main Girder	Max	-1.5	2.773	○	3.756	○	6.074	○
		Min		1.435	○	2.591	○	5.170	○
	Bottom of Main Girder	Max	～14.00	2.905	○	1.893	○	1.908	○
		Min		5.562	○	4.311	○	4.334	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	1.706	○	2.185	○	3.140	○
		Min		0.191	○	0.857	○	2.068	○
	Top of Main Girder	Max	-2	2.236	○	3.210	○	5.444	○
		Min		0.897	○	2.044	○	4.539	○
	Bottom of Main Girder	Max	～16.10	2.763	○	1.707	○	1.431	○
		Min		5.420	○	4.125	○	3.858	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	1.706	○	2.185	○	3.140	○
		Min		0.191	○	0.857	○	2.068	○
	Top of Main Girder	Max	-2	2.236	○	3.210	○	5.444	○
		Min		0.897	○	2.044	○	4.539	○
	Bottom of Main Girder	Max	～16.10	2.763	○	1.707	○	1.431	○
		Min		5.420	○	4.125	○	3.858	○

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 3

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[3- 4]		[3- 5]		[3- 6]	
Interval from beginning of Girder			------	4.100		7.700		11.300	
Immediately After Prestressing	Top of Main Girder		-1.5	6.141	○	3.100	○	1.101	○
	Bottom of Main Girder		～19.00	7.121	○	10.971	○	13.167	○
During Deck Construction	Top of Main Girder		-1.5	7.921	○	6.635	○	5.773	○
	Bottom of Main Girder		～14.00	4.150	○	5.866	○	6.648	○
Dead Load	Top of Deck		≦10.00	1.902	○	2.183	○	2.385	○
	Top of Main Girder		0	5.700	○	5.208	○	4.846	○
	Bottom of Main Girder		～14.00	2.890	○	3.376	○	3.360	○
Design Load1	Top of Deck	Max	≦10.00	2.340	○	3.016	○	3.465	○
		Min		1.271	○	1.724	○	2.011	○
	Top of Main Girder	Max	-1.5	6.068	○	5.911	○	5.759	○
		Min		5.167	○	4.820	○	4.529	○
	Bottom of Main Girder	Max	～14.00	1.902	○	1.511	○	0.957	○
		Min		4.319	○	4.405	○	4.193	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	3.158	○	3.851	○	4.315	○
		Min		2.090	○	2.559	○	2.862	○
	Top of Main Girder	Max	-2	5.438	○	5.295	○	5.157	○
		Min		4.536	○	4.204	○	3.927	○
	Bottom of Main Girder	Max	～16.10	1.425	○	1.005	○	0.422	○
		Min		3.841	○	3.899	○	3.657	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	3.158	○	3.851	○	4.315	○
		Min		2.090	○	2.559	○	2.862	○
	Top of Main Girder	Max	-2	5.438	○	5.295	○	5.157	○
		Min		4.536	○	4.204	○	3.927	○
	Bottom of Main Girder	Max	～16.10	1.425	○	1.005	○	0.422	○
		Min		3.841	○	3.899	○	3.657	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.340	○	3.016	○	3.465	○
		Min		1.271	○	1.724	○	2.011	○
	Top of Main Girder	Max	-1.5	6.068	○	5.911	○	5.759	○
		Min		5.167	○	4.820	○	4.529	○
	Bottom of Main Girder	Max	～14.00	1.902	○	1.511	○	0.957	○
		Min		4.319	○	4.405	○	4.193	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	3.158	○	3.851	○	4.315	○
		Min		2.090	○	2.559	○	2.862	○
	Top of Main Girder	Max	-2	5.438	○	5.295	○	5.157	○
		Min		4.536	○	4.204	○	3.927	○
	Bottom of Main Girder	Max	～16.10	1.425	○	1.005	○	0.422	○
		Min		3.841	○	3.899	○	3.657	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	3.158	○	3.851	○	4.315	○
		Min		2.090	○	2.559	○	2.862	○
	Top of Main Girder	Max	-2	5.438	○	5.295	○	5.157	○
		Min		4.536	○	4.204	○	3.927	○
	Bottom of Main Girder	Max	～16.10	1.425	○	1.005	○	0.422	○
		Min		3.841	○	3.899	○	3.657	○

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 3

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[3- 7]		[3- 8]		[3- 9]	
Interval from beginning of Girder			------	13.869		14.900		15.931	
Immediately After Prestressing	Top of Main Girder		-1.5	0.790	○	0.833	○	0.789	○
	Bottom of Main Girder		～19.00	13.198	○	13.089	○	13.199	○
During Deck Construction	Top of Main Girder		-1.5	5.849	○	5.926	○	5.847	○
	Bottom of Main Girder		～14.00	6.241	○	6.102	○	6.244	○
Dead Load	Top of Deck		≦10.00	2.563	○	2.598	○	2.562	○
	Top of Main Girder		0	4.957	○	5.012	○	4.957	○
	Bottom of Main Girder		～14.00	2.766	○	2.624	○	2.763	○
Design Load1	Top of Deck	Max	≦10.00	3.700	○	3.737	○	3.696	○
		Min		2.218	○	2.249	○	2.197	○
	Top of Main Girder	Max	-1.5	5.919	○	5.976	○	5.917	○
		Min		4.665	○	4.717	○	4.648	○
	Bottom of Main Girder	Max	～14.00	0.239	○	0.092	○	0.241	○
		Min		3.535	○	3.399	○	3.573	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	4.563	○	4.605	○	4.570	○
		Min		3.081	○	3.117	○	3.071	○
	Top of Main Girder	Max	-2	5.328	○	5.389	○	5.334	○
		Min		4.073	○	4.130	○	4.065	○
	Bottom of Main Girder	Max	～16.10	-0.322	○	-0.481	○	-0.344	○
		Min		2.973	○	2.826	○	2.988	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	4.563	○	4.605	○	4.570	○
		Min		3.081	○	3.117	○	3.071	○
	Top of Main Girder	Max	-2	5.328	○	5.389	○	5.334	○
		Min		4.073	○	4.130	○	4.065	○
	Bottom of Main Girder	Max	～16.10	-0.322	○	-0.481	○	-0.344	○
		Min		2.973	○	2.826	○	2.988	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	3.700	○	3.737	○	3.696	○
		Min		2.218	○	2.249	○	2.197	○
	Top of Main Girder	Max	-1.5	5.919	○	5.976	○	5.917	○
		Min		4.665	○	4.717	○	4.648	○
	Bottom of Main Girder	Max	～14.00	0.239	○	0.092	○	0.241	○
		Min		3.535	○	3.399	○	3.573	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	4.563	○	4.605	○	4.570	○
		Min		3.081	○	3.117	○	3.071	○
	Top of Main Girder	Max	-2	5.328	○	5.389	○	5.334	○
		Min		4.073	○	4.130	○	4.065	○
	Bottom of Main Girder	Max	～16.10	-0.322	○	-0.481	○	-0.344	○
		Min		2.973	○	2.826	○	2.988	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	4.563	○	4.605	○	4.570	○
		Min		3.081	○	3.117	○	3.071	○
	Top of Main Girder	Max	-2	5.328	○	5.389	○	5.334	○
		Min		4.073	○	4.130	○	4.065	○
	Bottom of Main Girder	Max	～16.10	-0.322	○	-0.481	○	-0.344	○
		Min		2.973	○	2.826	○	2.988	○

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span, Main Girder Number: G 3

Bending Stress of Concrete (N/mm²)									
Cross Section Number			Allowable Value	[3-10]		[3-11]		[3-12]	
Interval from beginning of Girder			------	18.500		22.100		25.700	
Immediately After Prestressing	Top of Main Girder		-1.5	1.096	○	3.091	○	6.127	○
	Bottom of Main Girder		～19.00	13.173	○	10.982	○	7.137	○
During Deck Construction	Top of Main Girder		-1.5	5.764	○	6.616	○	7.892	○
	Bottom of Main Girder		～14.00	6.659	○	5.888	○	4.184	○
Dead Load	Top of Deck		≦10.00	2.378	○	2.170	○	1.882	○
	Top of Main Girder		0	4.841	○	5.190	○	5.660	○
	Bottom of Main Girder		～14.00	3.350	○	3.375	○	2.926	○
Design Load1	Top of Deck	Max	≦10.00	3.450	○	2.984	○	2.258	○
		Min		1.941	○	1.615	○	1.139	○
	Top of Main Girder	Max	-1.5	5.748	○	5.877	○	5.978	○
		Min		4.472	○	4.721	○	5.033	○
	Bottom of Main Girder	Max	～14.00	0.965	○	1.552	○	2.075	○
		Min		4.323	○	4.617	○	4.607	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	4.337	○	3.893	○	3.190	○
		Min		2.829	○	2.525	○	2.070	○
	Top of Main Girder	Max	-2	5.177	○	5.324	○	5.442	○
		Min		3.901	○	4.168	○	4.498	○
	Bottom of Main Girder	Max	～16.10	0.348	○	0.880	○	1.343	○
		Min		3.705	○	3.945	○	3.875	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	4.337	○	3.893	○	3.190	○
		Min		2.829	○	2.525	○	2.070	○
	Top of Main Girder	Max	-2	5.177	○	5.324	○	5.442	○
		Min		3.901	○	4.168	○	4.498	○
	Bottom of Main Girder	Max	～16.10	0.348	○	0.880	○	1.343	○
		Min		3.705	○	3.945	○	3.875	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	3.450	○	2.984	○	2.258	○
		Min		1.941	○	1.615	○	1.139	○
	Top of Main Girder	Max	-1.5	5.748	○	5.877	○	5.978	○
		Min		4.472	○	4.721	○	5.033	○
	Bottom of Main Girder	Max	～14.00	0.965	○	1.552	○	2.075	○
		Min		4.323	○	4.617	○	4.607	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	4.337	○	3.893	○	3.190	○
		Min		2.829	○	2.525	○	2.070	○
	Top of Main Girder	Max	-2	5.177	○	5.324	○	5.442	○
		Min		3.901	○	4.168	○	4.498	○
	Bottom of Main Girder	Max	～16.10	0.348	○	0.880	○	1.343	○
		Min		3.705	○	3.945	○	3.875	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	4.337	○	3.893	○	3.190	○
		Min		2.829	○	2.525	○	2.070	○
	Top of Main Girder	Max	-2	5.177	○	5.324	○	5.442	○
		Min		3.901	○	4.168	○	4.498	○
	Bottom of Main Girder	Max	～16.10	0.348	○	0.880	○	1.343	○
		Min		3.705	○	3.945	○	3.875	○

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 3

Bending Stress of Concrete (N/mm²)									
Cross Section Number			Allowable Value	[3-13]		[3-14]		[3-15]	
Interval from beginning of Girder			------	25.800		28.300		29.300	
Immediately After Prestressing	Top of Main Girder		-1.5	6.224	○	4.219	○	3.413	○
	Bottom of Main Girder		～19.00	7.018	○	3.488	○	3.729	○
During Deck Construction	Top of Main Girder		-1.5	7.931	○	4.549	○	3.229	○
	Bottom of Main Girder		～14.00	4.132	○	2.677	○	3.554	○
Dead Load	Top of Deck		≦10.00	1.872	○	0.997	○	0.538	○
	Top of Main Girder		0	5.673	○	3.467	○	2.505	○
	Bottom of Main Girder		～14.00	2.916	○	2.464	○	3.411	○
Design Load1	Top of Deck	Max	≦10.00	2.239	○	1.183	○	0.681	○
		Min		1.117	○	-0.150	○	-0.817	○
	Top of Main Girder	Max	-1.5	5.982	○	3.630	○	2.632	○
		Min		5.036	○	2.460	○	1.308	○
	Bottom of Main Girder	Max	～14.00	2.085	○	2.126	○	3.160	○
		Min		4.624	○	4.554	○	5.787	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	3.171	○	2.198	○	1.711	○
		Min		2.049	○	0.865	○	0.212	○
	Top of Main Girder	Max	-2	5.447	○	3.204	○	2.222	○
		Min		4.501	○	2.034	○	0.899	○
	Bottom of Main Girder	Max	～16.10	1.352	○	1.691	○	2.764	○
		Min		3.891	○	4.119	○	5.391	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	3.171	○	2.198	○	1.711	○
		Min		2.049	○	0.865	○	0.212	○
	Top of Main Girder	Max	-2	5.447	○	3.204	○	2.222	○
		Min		4.501	○	2.034	○	0.899	○
	Bottom of Main Girder	Max	～16.10	1.352	○	1.691	○	2.764	○
		Min		3.891	○	4.119	○	5.391	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.239	○	1.183	○	0.681	○
		Min		1.117	○	-0.150	○	-0.817	○
	Top of Main Girder	Max	-1.5	5.982	○	3.630	○	2.632	○
		Min		5.036	○	2.460	○	1.308	○
	Bottom of Main Girder	Max	～14.00	2.085	○	2.126	○	3.160	○
		Min		4.624	○	4.554	○	5.787	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	3.171	○	2.198	○	1.711	○
		Min		2.049	○	0.865	○	0.212	○
	Top of Main Girder	Max	-2	5.447	○	3.204	○	2.222	○
		Min		4.501	○	2.034	○	0.899	○
	Bottom of Main Girder	Max	～16.10	1.352	○	1.691	○	2.764	○
		Min		3.891	○	4.119	○	5.391	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	3.171	○	2.198	○	1.711	○
		Min		2.049	○	0.865	○	0.212	○
	Top of Main Girder	Max	-2	5.447	○	3.204	○	2.222	○
		Min		4.501	○	2.034	○	0.899	○
	Bottom of Main Girder	Max	～16.10	1.352	○	1.691	○	2.764	○
		Min		3.891	○	4.119	○	5.391	○

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 3

Cross Section NumberNo.	Unit	Allowable Value	[3- 1]		[3- 2]		[3- 3]	
Interval from beginning of Girder			0.500		1.500		4.000	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1099	○	1103	○	1156	○
Effective Prestressing Force (*1)	N/mm^2	1110	1044	○	1046	○	1083	○
Effective Prestressing Force (*2)	N/mm^2	1110	974	○	974	○	991	○
max	N/mm^2	1110	974	○	974	○	995	○
Ultimate Load	------	1.00	2.28	○	4.02	○	2.15	○

*1:During DeckConstruction　*2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[3- 4]		[3- 5]		[3- 6]	
Interval from beginning of Girder			4.100		7.700		11.300	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1157	○	1174	○	1154	○
Effective Prestressing Force (*1)	N/mm^2	1110	1083	○	1089	○	1058	○
Effective Prestressing Force (*2)	N/mm^2	1110	992	○	1000	○	972	○
max	N/mm^2	1110	996	○	1024	○	1014	○
Ultimate Load	------	1.00	2.12	○	1.54	○	1.38	○

*1:During DeckConstruction　*2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[3- 7]		[3- 8]		[3- 9]	
Interval from beginning of Girder			13.869		14.900		15.931	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1126	○	1121	○	1126	○
Effective Prestressing Force (*1)	N/mm^2	1110	1029	○	1025	○	1029	○
Effective Prestressing Force (*2)	N/mm^2	1110	948	○	946	○	948	○
max	N/mm^2	1110	997	○	994	○	996	○
Ultimate Load	------	1.00	1.32	○	1.31	○	1.33	○

*1:During DeckConstruction　*2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[3-10]		[3-11]		[3-12]	
Interval from beginning of Girder			18.500		22.100		25.700	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1154	○	1174	○	1157	○
Effective Prestressing Force (*1)	N/mm^2	1110	1058	○	1089	○	1083	○
Effective Prestressing Force (*2)	N/mm^2	1110	970	○	997	○	989	○
max	N/mm^2	1110	1010	○	1019	○	991	○
Ultimate Load	------	1.00	1.39	○	1.58	○	2.32	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[3-13]		[3-14]		[3-15]	
Interval from beginning of Girder			25.800		28.300		29.300	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1156	○	1103	○	1099	○
Effective Prestressing Force (*1)	N/mm^2	1110	1083	○	1046	○	1044	○
Effective Prestressing Force (*2)	N/mm^2	1110	988	○	973	○	973	○
max	N/mm^2	1110	990	○	971	○	971	○
Ultimate Load	------	1.00	2.36	○	3.32	○	2.03	○

*1:During DeckConstruction *2:Design Load

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[3- 1]		[3- 2]		[3- 3]	
Interval from beginning of Girder				------	0.500		1.500		4.000	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.92	△	0.75	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.10	○	0.00	○
	Neutral Axis before Composition				------	--	-0.23	○	0.00	○
	Neutral Axis after Composition				------	--	-0.20	○	0.00	○
	Base of Lower Flange				------	--	-0.07	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.25	○	-0.17	○
		Min			------	--	-0.11	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.46	○	-0.18	○
		Min			------	--	-0.19	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.42	○	-0.18	○
		Min			------	--	-0.18	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.14	○	-0.15	○
		Min			------	--	-0.04	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	30.70	--
	D16		cm	------	------	--	32.03	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	7.22	--	7.58	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	------	--	3.58	○	1.89	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	1.148	○	1.00	○
	D16				------	--	1.148	○	1.07	○
	D19				------	--	1.211	○	1.24	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.92	△	0.75	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.10	○	0.00	○
	Neutral Axis before Composition				------	--	-0.23	○	0.00	○
	Neutral Axis after Composition				------	--	-0.20	○	0.00	○
	Base of Lower Flange				------	--	-0.07	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.25	○	-0.17	○
		Min			------	--	-0.11	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.46	○	-0.18	○
		Min			------	--	-0.19	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.42	○	-0.18	○
		Min			------	--	-0.18	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.14	○	-0.15	○
		Min			------	--	-0.04	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	30.70	--
	D16		cm	------	------	--	32.03	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[3- 4]		[3- 5]		[3- 6]	
Interval from beginning of Girder				------	4.100		7.700		11.300	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.73	△	0.65	△	0.51	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.17	○	-0.13	○	-0.08	○
		Min			0.00	○	0.00	○	-0.02	○
	Neutral Axis before Composition	Max			-0.17	○	-0.14	○	-0.09	○
		Min			0.00	○	0.00	○	-0.02	○
	Neutral Axis after Composition	Max			-0.18	○	-0.14	○	-0.09	○
		Min			0.00	○	0.00	○	-0.02	○
	Base of Lower Flange	Max			-0.14	○	-0.13	○	-0.09	○
		Min			0.00	○	0.00	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	31.44	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	7.40	--	4.86	--	1.83	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.91	○	2.40	○	3.35	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.00	○	1.056	○	------	--
	D16				1.07	○	1.248	○	------	--
	D19				1.25	○	1.483	○	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.73	△	0.65	△	0.51	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.17	○	-0.13	○	-0.08	○
		Min			0.00	○	0.00	○	-0.02	○
	Neutral Axis before Composition	Max			-0.17	○	-0.14	○	-0.09	○
		Min			0.00	○	0.00	○	-0.02	○
	Neutral Axis after Composition	Max			-0.18	○	-0.14	○	-0.09	○
		Min			0.00	○	0.00	○	-0.02	○
	Base of Lower Flange	Max			-0.14	○	-0.13	○	-0.09	○
		Min			0.00	○	0.00	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	31.44	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[3- 7]		[3- 8]		[3- 9]	
Interval from beginning of Girder				------	13.869		14.900		15.931	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.59	△	0.44	○	0.58	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.01	○	0.00	○	-0.01	○
	Neutral Axis before Composition				-0.02	○	0.00	○	-0.02	○
	Neutral Axis after Composition				-0.02	○	0.00	○	-0.02	○
	Base of Lower Flange				-0.02	○	0.00	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.10	○	-0.06	○	-0.02	○
		Min			-0.01	○	-0.04	○	-0.10	○
	Neutral Axis before Composition	Max			-0.13	○	-0.08	○	-0.01	○
		Min			-0.01	○	-0.04	○	-0.11	○
	Neutral Axis after Composition	Max			-0.12	○	-0.07	○	-0.02	○
		Min			-0.01	○	-0.04	○	-0.11	○
	Base of Lower Flange	Max			-0.13	○	-0.09	○	-0.01	○
		Min			-0.01	○	-0.03	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.85	--	0.00	--	0.67	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	4.60	○	5.03	○	4.42	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.64	○	------	--	1.64	○
	D16				2.066	○	------	--	2.05	○
	D19				2.586	○	------	--	2.55	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.59	△	0.44	○	0.58	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.01	○	0.00	○	-0.01	○
	Neutral Axis before Composition				-0.02	○	0.00	○	-0.02	○
	Neutral Axis after Composition				-0.02	○	0.00	○	-0.02	○
	Base of Lower Flange				-0.02	○	0.00	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.10	○	-0.06	○	-0.02	○
		Min			-0.01	○	-0.04	○	-0.10	○
	Neutral Axis before Composition	Max			-0.13	○	-0.08	○	-0.01	○
		Min			-0.01	○	-0.04	○	-0.11	○
	Neutral Axis after Composition	Max			-0.12	○	-0.07	○	-0.02	○
		Min			-0.01	○	-0.04	○	-0.11	○
	Base of Lower Flange	Max			-0.13	○	-0.09	○	-0.01	○
		Min			-0.01	○	-0.03	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[3-10]		[3-11]		[3-12]	
Interval from beginning of Girder				------		18.500		22.100		25.700
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.49	○	0.63	△	0.71	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.02	○	0.00	○	0.00	○
		Min			-0.08	○	-0.13	○	-0.17	○
	Neutral Axis before Composition	Max			-0.03	○	-0.01	○	0.00	○
		Min			-0.07	○	-0.11	○	-0.14	○
	Neutral Axis after Composition	Max			-0.02	○	0.00	○	0.00	○
		Min			-0.09	○	-0.13	○	-0.17	○
	Base of Lower Flange	Max			-0.03	○	-0.01	○	-0.01	○
		Min			-0.05	○	-0.07	○	-0.09	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	31.20	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	1.53	--	4.49	--	7.46	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	3.26	○	2.37	○	1.89	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	1.076	○	1.00	○
	D16				------	--	1.266	○	1.07	○
	D19				------	--	1.497	○	1.24	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.49	○	0.63	△	0.71	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.02	○	0.00	○	0.00	○
		Min			-0.08	○	-0.13	○	-0.17	○
	Neutral Axis before Composition	Max			-0.03	○	-0.01	○	0.00	○
		Min			-0.07	○	-0.11	○	-0.14	○
	Neutral Axis after Composition	Max			-0.02	○	0.00	○	0.00	○
		Min			-0.09	○	-0.13	○	-0.17	○
	Base of Lower Flange	Max			-0.03	○	-0.01	○	-0.01	○
		Min			-0.05	○	-0.07	○	-0.09	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	31.20	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[3-13]		[3-14]		[3-15]	
Interval from beginning of Girder				------		25.800		28.300		29.300
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.73	△	1.00	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	-0.10	○	------	--
	Neutral Axis before Composition				0.00	○	-0.23	○	------	--
	Neutral Axis after Composition				0.00	○	-0.20	○	------	--
	Base of Lower Flange				0.00	○	-0.07	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	-0.09	○	------	--
		Min			-0.18	○	-0.30	○	------	--
	Neutral Axis before Composition	Max			0.00	○	-0.21	○	------	--
		Min			-0.15	○	-0.40	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.18	○	------	--
		Min			-0.17	○	-0.42	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.07	○	------	--
		Min			-0.09	○	-0.08	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	30.42	--	20.44	--	------	--
	D16		cm	------	40.00	--	32.03	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	7.65	--	9.29	--	------	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.87	○	3.25	○	------	--
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1	○	1.041	○	------	--
	D16				1.062	○	1.041	○	------	--
	D19				1.233	○	1.099	○	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.73	△	1.00	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	-0.10	○	------	--
	Neutral Axis before Composition				0.00	○	-0.23	○	------	--
	Neutral Axis after Composition				0.00	○	-0.20	○	------	--
	Base of Lower Flange				0.00	○	-0.07	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	-0.09	○	------	--
		Min			-0.18	○	-0.30	○	------	--
	Neutral Axis before Composition	Max			0.00	○	-0.21	○	------	--
		Min			-0.15	○	-0.40	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.18	○	------	--
		Min			-0.17	○	-0.42	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.07	○	------	--
		Min			-0.09	○	-0.08	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	30.42	--	20.44	--	------	--
	D16		cm	------	40.00	--	32.03	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[3- 1]		[3- 2]		[3- 3]	
Interval from beginning of Girder				------	0.500		1.500		4.000	
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	------	--	0.96	△	0.66	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	------	--	-0.11	○	0.00	○
	Neutral Axis before Composition				------	--	-0.23	○	0.00	○
	Neutral Axis after Composition				------	--	-0.21	○	0.00	○
	Base of Lower Flange				------	--	-0.06	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	------	--	-0.28	○	-0.15	○
		Min			------	--	-0.12	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.39	○	-0.13	○
		Min			------	--	-0.22	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.40	○	-0.15	○
		Min			------	--	-0.21	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.08	○	-0.10	○
		Min			------	--	-0.05	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	37.98	--
	D16		cm	------	------	--	32.03	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	------	--	7.58	--	6.13	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	------	--	0.96	△	0.66	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	------	--	-0.11	○	0.00	○
	Neutral Axis before Composition				------	--	-0.23	○	0.00	○
	Neutral Axis after Composition				------	--	-0.21	○	0.00	○
	Base of Lower Flange				------	--	-0.06	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	------	--	-0.28	○	-0.15	○
		Min			------	--	-0.12	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.39	○	-0.13	○
		Min			------	--	-0.22	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.40	○	-0.15	○
		Min			------	--	-0.21	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.08	○	-0.10	○
		Min			------	--	-0.05	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	37.98	--
	D16		cm	------	------	--	32.03	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	------	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	------	--	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	--	999.999	○	999.999	○
	D16				------	--	999.999	○	999.999	○
	D19				------	--	999.999	○	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[3- 4]		[3- 5]		[3- 6]	
Interval from beginning of Girder				------		4.100		7.700		11.300
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.64	△	0.60	△	0.39	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.15	○	-0.12	○	-0.05	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition	Max			-0.13	○	-0.12	○	-0.06	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition	Max			-0.14	○	-0.13	○	-0.06	○
		Min			0.00	○	0.00	○	0.00	○
	Base of Lower Flange	Max			-0.09	○	-0.10	○	-0.06	○
		Min			0.00	○	0.00	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	39.18	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	5.94	--	3.80	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.64	△	0.60	△	0.39	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.15	○	-0.12	○	-0.05	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition	Max			-0.13	○	-0.12	○	-0.06	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition	Max			-0.14	○	-0.13	○	-0.06	○
		Min			0.00	○	0.00	○	0.00	○
	Base of Lower Flange	Max			-0.09	○	-0.10	○	-0.06	○
		Min			0.00	○	0.00	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	39.18	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	-
	D16				999.999	○	999.999	○	------	-
	D19				999.999	○	999.999	○	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[3- 7]		[3- 8]		[3- 9]	
Interval from beginning of Girder				------	13.869		14.900		15.931	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.27	○	0.04	○	0.23	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				-0.01	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.02	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.01	○
	Neutral Axis before Composition	Max			-0.03	○	0.00	○	0.00	○
		Min			-0.01	○	0.00	○	-0.03	○
	Neutral Axis after Composition	Max			-0.03	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.02	○
	Base of Lower Flange	Max			-0.02	○	0.00	○	0.00	○
		Min			-0.01	○	0.00	○	-0.04	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.27	○	0.04	○	0.23	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				-0.01	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.02	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.01	○
	Neutral Axis before Composition	Max			-0.03	○	0.00	○	0.00	○
		Min			-0.01	○	0.00	○	-0.03	○
	Neutral Axis after Composition	Max			-0.03	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.02	○
	Base of Lower Flange	Max			-0.02	○	0.00	○	0.00	○
		Min			-0.01	○	0.00	○	-0.04	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	------	-	------	-
	D16				------	-	------	-	------	-
	D19				------	-	------	-	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[3-10]		[3-11]		[3-12]	
Interval from beginning of Girder				------	18.500		22.100		25.700	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.35	○	0.57	△	0.61	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	0.00	○	0.00	○
		Min			-0.04	○	-0.11	○	-0.13	○
	Neutral Axis before Composition	Max			0.00	○	0.00	○	0.00	○
		Min			-0.04	○	-0.11	○	-0.12	○
	Neutral Axis after Composition	Max			0.00	○	0.00	○	0.00	○
		Min			-0.05	○	-0.11	○	-0.13	○
	Base of Lower Flange	Max			0.00	○	0.00	○	0.00	○
		Min			-0.05	○	-0.09	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	37.30	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.01	--	4.05	--	6.24	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.35	○	0.57	△	0.61	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	0.00	○	0.00	○
		Min			-0.04	○	-0.11	○	-0.13	○
	Neutral Axis before Composition	Max			0.00	○	0.00	○	0.00	○
		Min			-0.04	○	-0.11	○	-0.12	○
	Neutral Axis after Composition	Max			0.00	○	0.00	○	0.00	○
		Min			-0.05	○	-0.11	○	-0.13	○
	Base of Lower Flange	Max			0.00	○	0.00	○	0.00	○
		Min			-0.05	○	-0.09	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	37.30	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	999.999	○	999.999	○
	D16				------	-	999.999	○	999.999	○
	D19				------	-	999.999	○	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

3rd Span,　Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[3-13]		[3-14]		[3-15]	
Interval from beginning of Girder				------	25.800		28.300		29.300	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.63	△	0.95	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	-0.11	○	------	--
	Neutral Axis before Composition				0.00	○	-0.22	○	------	--
	Neutral Axis after Composition				0.00	○	-0.20	○	------	--
	Base of Lower Flange				0.00	○	-0.06	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	-0.11	○	------	--
		Min			-0.14	○	-0.27	○	------	--
	Neutral Axis before Composition	Max			0.00	○	-0.21	○	------	--
		Min			-0.12	○	-0.38	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.20	○	------	--
		Min			-0.14	○	-0.39	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.05	○	------	--
		Min			-0.09	○	-0.08	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	36.21	--	20.44	--	------	--
	D16		cm	------	40.00	--	32.03	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	6.43	--	7.86	--	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.63	△	0.95	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	-0.11	○	------	--
	Neutral Axis before Composition				0.00	○	-0.22	○	------	--
	Neutral Axis after Composition				0.00	○	-0.20	○	------	--
	Base of Lower Flange				0.00	○	-0.06	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	-0.11	○	------	--
		Min			-0.14	○	-0.27	○	------	--
	Neutral Axis before Composition	Max			0.00	○	-0.21	○	------	--
		Min			-0.12	○	-0.38	○	------	--
	Neutral Axis after Composition	Max			0.00	○	-0.20	○	------	--
		Min			-0.14	○	-0.39	○	------	--
	Base of Lower Flange	Max			0.00	○	-0.05	○	------	--
		Min			-0.09	○	-0.08	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	36.21	--	20.44	--	------	--
	D16		cm	------	40.00	--	32.03	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	------	--
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	--
	D16				999.999	○	999.999	○	------	--
	D19				999.999	○	999.999	○	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm²)									
Cross Section Number			Allowable Value	[4- 1]		[4- 2]		[4- 3]	
Interval from beginning of Girder			------	0.500		1.500		4.000	
Immediately After Prestressing	Top of Main Girder		-1.5	3.410	○	4.216	○	6.220	○
	Bottom of Main Girder		～19.00	3.732	○	3.491	○	7.022	○
During Deck Construction	Top of Main Girder		-1.5	3.224	○	4.543	○	7.923	○
	Bottom of Main Girder		～14.00	3.561	○	2.684	○	4.141	○
Dead Load	Top of Deck		≦10.00	0.564	○	1.020	○	1.888	○
	Top of Main Girder		0	2.525	○	3.485	○	5.685	○
	Bottom of Main Girder		～14.00	3.368	○	2.425	○	2.887	○
Design Load1	Top of Deck	Max	≦10.00	0.674	○	1.180	○	2.250	○
		Min		-0.817	○	-0.128	○	1.183	○
	Top of Main Girder	Max	-1.5	2.622	○	3.625	○	5.990	○
		Min		1.306	○	2.477	○	5.090	○
	Bottom of Main Girder	Max	～14.00	3.175	○	2.134	○	2.069	○
		Min		5.790	○	4.517	○	4.482	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	1.722	○	2.201	○	3.155	○
		Min		0.231	○	0.893	○	2.088	○
	Top of Main Girder	Max	-2	2.230	○	3.204	○	5.432	○
		Min		0.913	○	2.056	○	4.533	○
	Bottom of Main Girder	Max	～16.10	2.747	○	1.688	○	1.396	○
		Min		5.361	○	4.071	○	3.809	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	1.722	○	2.201	○	3.155	○
		Min		0.231	○	0.893	○	2.088	○
	Top of Main Girder	Max	-2	2.230	○	3.204	○	5.432	○
		Min		0.913	○	2.056	○	4.533	○
	Bottom of Main Girder	Max	～16.10	2.747	○	1.688	○	1.396	○
		Min		5.361	○	4.071	○	3.809	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	0.674	○	1.180	○	2.250	○
		Min		-0.817	○	-0.128	○	1.183	○
	Top of Main Girder	Max	-1.5	2.622	○	3.625	○	5.990	○
		Min		1.306	○	2.477	○	5.090	○
	Bottom of Main Girder	Max	～14.00	3.175	○	2.134	○	2.069	○
		Min		5.790	○	4.517	○	4.482	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	1.722	○	2.201	○	3.155	○
		Min		0.231	○	0.893	○	2.088	○
	Top of Main Girder	Max	-2	2.230	○	3.204	○	5.432	○
		Min		0.913	○	2.056	○	4.533	○
	Bottom of Main Girder	Max	～16.10	2.747	○	1.688	○	1.396	○
		Min		5.361	○	4.071	○	3.809	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	1.722	○	2.201	○	3.155	○
		Min		0.231	○	0.893	○	2.088	○
	Top of Main Girder	Max	-2	2.230	○	3.204	○	5.432	○
		Min		0.913	○	2.056	○	4.533	○
	Bottom of Main Girder	Max	～16.10	2.747	○	1.688	○	1.396	○
		Min		5.361	○	4.071	○	3.809	○

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span， Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[4- 4]		[4- 5]		[4- 6]	
Interval from beginning of Girder			------	4.100		7.700		11.300	
Immediately After Prestressing	Top of Main Girder		-1.5	6.124	○	3.087	○	1.065	○
	Bottom of Main Girder		～19.00	7.141	○	10.987	○	13.330	○
During Deck Construction	Top of Main Girder		-1.5	7.885	○	6.608	○	5.731	○
	Bottom of Main Girder		～14.00	4.193	○	5.897	○	6.806	○
Dead Load	Top of Deck		≦10.00	1.897	○	2.174	○	2.365	○
	Top of Main Girder		0	5.672	○	5.189	○	4.809	○
	Bottom of Main Girder		～14.00	2.899	○	3.395	○	3.546	○
Design Load1	Top of Deck	Max	≦10.00	2.269	○	3.021	○	3.565	○
		Min		1.206	○	1.712	○	2.009	○
	Top of Main Girder	Max		5.986	○	5.905	○	5.824	○
		Min	-1.5	5.089	○	4.799	○	4.508	○
	Bottom of Main Girder	Max	～14.00	2.058	○	1.499	○	0.874	○
		Min		4.463	○	4.430	○	4.339	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	3.173	○	3.856	○	4.333	○
		Min		2.109	○	2.548	○	2.776	○
	Top of Main Girder	Max		5.427	○	5.289	○	5.152	○
		Min	-2	4.530	○	4.183	○	3.835	○
	Bottom of Main Girder	Max	～16.10	1.389	○	0.994	○	0.524	○
		Min		3.794	○	3.924	○	3.989	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	3.173	○	3.856	○	4.333	○
		Min		2.109	○	2.548	○	2.776	○
	Top of Main Girder	Max		5.427	○	5.289	○	5.152	○
		Min	-2	4.530	○	4.183	○	3.835	○
	Bottom of Main Girder	Max	～16.10	1.389	○	0.994	○	0.524	○
		Min		3.794	○	3.924	○	3.989	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.269	○	3.021	○	3.565	○
		Min		1.206	○	1.712	○	2.009	○
	Top of Main Girder	Max		5.986	○	5.905	○	5.824	○
		Min	-1.5	5.089	○	4.799	○	4.508	○
	Bottom of Main Girder	Max	～14.00	2.058	○	1.499	○	0.874	○
		Min		4.463	○	4.430	○	4.339	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	3.173	○	3.856	○	4.333	○
		Min		2.109	○	2.548	○	2.776	○
	Top of Main Girder	Max		5.427	○	5.289	○	5.152	○
		Min	-2	4.530	○	4.183	○	3.835	○
	Bottom of Main Girder	Max	～16.10	1.389	○	0.994	○	0.524	○
		Min		3.794	○	3.924	○	3.989	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	3.173	○	3.856	○	4.333	○
		Min		2.109	○	2.548	○	2.776	○
	Top of Main Girder	Max		5.427	○	5.289	○	5.152	○
		Min	-2	4.530	○	4.183	○	3.835	○
	Bottom of Main Girder	Max	～16.10	1.389	○	0.994	○	0.524	○
		Min		3.794	○	3.924	○	3.989	○

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span， Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[4- 7]		[4- 8]		[4- 9]	
Interval from beginning of Girder			------	13.869		14.900		15.851	
Immediately After Prestressing	Top of Main Girder		-1.5	0.643	○	0.654	○	0.616	○
	Bottom of Main Girder		～19.00	13.894	○	13.942	○	14.043	○
During Deck Construction	Top of Main Girder		-1.5	5.710	○	5.760	○	5.693	○
	Bottom of Main Girder		～14.00	6.875	○	6.875	○	7.001	○
Dead Load	Top of Deck		≦10.00	2.516	○	2.539	○	2.502	○
	Top of Main Girder		0	4.860	○	4.895	○	4.840	○
	Bottom of Main Girder		～14.00	3.394	○	3.391	○	3.541	○
Design Load1	Top of Deck	Max	≦10.00	3.862	○	3.923	○	3.912	○
		Min		2.215	○	2.259	○	2.242	○
	Top of Main Girder	Max		5.999	○	6.066	○	6.033	○
		Min	-1.5	4.605	○	4.658	○	4.620	○
	Bottom of Main Girder	Max	～14.00	0.402	○	0.316	○	0.408	○
		Min		4.064	○	4.015	○	4.120	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	4.583	○	4.625	○	4.596	○
		Min		2.935	○	2.961	○	2.927	○
	Top of Main Girder	Max		5.287	○	5.338	○	5.290	○
		Min	-2	3.893	○	3.930	○	3.877	○
	Bottom of Main Girder	Max	～16.10	0.157	○	0.112	○	0.243	○
		Min		3.819	○	3.811	○	3.955	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	4.583	○	4.625	○	4.596	○
		Min		2.935	○	2.961	○	2.927	○
	Top of Main Girder	Max		5.287	○	5.338	○	5.290	○
		Min	-2	3.893	○	3.930	○	3.877	○
	Bottom of Main Girder	Max	～16.10	0.157	○	0.112	○	0.243	○
		Min		3.819	○	3.811	○	3.955	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	3.862	○	3.923	○	3.912	○
		Min		2.215	○	2.259	○	2.242	○
	Top of Main Girder	Max		5.999	○	6.066	○	6.033	○
		Min	-1.5	4.605	○	4.658	○	4.620	○
	Bottom of Main Girder	Max	～14.00	0.402	○	0.316	○	0.408	○
		Min		4.064	○	4.015	○	4.120	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	4.583	○	4.625	○	4.596	○
		Min		2.935	○	2.961	○	2.927	○
	Top of Main Girder	Max		5.287	○	5.338	○	5.290	○
		Min	-2	3.893	○	3.930	○	3.877	○
	Bottom of Main Girder	Max	～16.10	0.157	○	0.112	○	0.243	○
		Min		3.819	○	3.811	○	3.955	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	4.583	○	4.625	○	4.596	○
		Min		2.935	○	2.961	○	2.927	○
	Top of Main Girder	Max		5.287	○	5.338	○	5.290	○
		Min	-2	3.893	○	3.930	○	3.877	○
	Bottom of Main Girder	Max	～16.10	0.157	○	0.112	○	0.243	○
		Min		3.819	○	3.811	○	3.955	○

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[4-10]		[4-11]		[4-12]	
Interval from beginning of Girder			------	18.500		22.100		25.700	
Immediately After Prestressing	Top of Main Girder		-1.5	0.841	○	2.171	○	3.928	○
	Bottom of Main Girder		～19.00	14.039	○	12.384	○	10.007	○
During Deck Construction	Top of Main Girder		-1.5	5.532	○	5.766	○	5.832	○
	Bottom of Main Girder		～14.00	7.435	○	7.135	○	6.821	○
Dead Load	Top of Deck		≦10.00	2.278	○	1.930	○	1.385	○
	Top of Main Girder		0	4.649	○	4.599	○	4.332	○
	Bottom of Main Girder		～14.00	4.224	○	4.660	○	5.381	○
Design Load1	Top of Deck	Max	≦10.00	3.705	○	3.222	○	2.230	○
		Min		2.074	○	1.797	○	1.320	○
	Top of Main Girder	Max	-1.5	5.856	○	5.691	○	5.045	○
		Min		4.476	○	4.487	○	4.277	○
	Bottom of Main Girder	Max	～14.00	1.047	○	1.772	○	3.480	○
		Min		4.678	○	4.958	○	5.528	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	4.343	○	3.796	○	2.739	○
		Min		2.711	○	2.370	○	1.829	○
	Top of Main Girder	Max	-2	5.074	○	4.854	○	4.153	○
		Min		3.693	○	3.650	○	3.385	○
	Bottom of Main Girder	Max	～16.10	0.986	○	1.853	○	3.705	○
		Min		4.618	○	5.039	○	5.753	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	4.343	○	3.796	○	2.739	○
		Min		2.711	○	2.370	○	1.829	○
	Top of Main Girder	Max	-2	5.074	○	4.854	○	4.153	○
		Min		3.693	○	3.650	○	3.385	○
	Bottom of Main Girder	Max	～16.10	0.986	○	1.853	○	3.705	○
		Min		4.618	○	5.039	○	5.753	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	3.705	○	3.222	○	2.230	○
		Min		2.074	○	1.797	○	1.320	○
	Top of Main Girder	Max	-1.5	5.856	○	5.691	○	5.045	○
		Min		4.476	○	4.487	○	4.277	○
	Bottom of Main Girder	Max	～14.00	1.047	○	1.772	○	3.480	○
		Min		4.678	○	4.958	○	5.528	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	4.343	○	3.796	○	2.739	○
		Min		2.711	○	2.370	○	1.829	○
	Top of Main Girder	Max	-2	5.074	○	4.854	○	4.153	○
		Min		3.693	○	3.650	○	3.385	○
	Bottom of Main Girder	Max	～16.10	0.986	○	1.853	○	3.705	○
		Min		4.618	○	5.039	○	5.753	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	4.343	○	3.796	○	2.739	○
		Min		2.711	○	2.370	○	1.829	○
	Top of Main Girder	Max	-2	5.074	○	4.854	○	4.153	○
		Min		3.693	○	3.650	○	3.385	○
	Bottom of Main Girder	Max	～16.10	0.986	○	1.853	○	3.705	○
		Min		4.618	○	5.039	○	5.753	○

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span， Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[4-13]		[4-14]		[4-15]	
Interval from beginning of Girder			------	25.800		28.300		29.300	
Immediately After Prestressing	Top of Main Girder		-1.5	3.980	○	3.128	○	3.333	○
	Bottom of Main Girder		～19.00	9.940	○	5.235	○	4.271	○
During Deck Construction	Top of Main Girder		-1.5	5.829	○	3.525	○	3.167	○
	Bottom of Main Girder		～14.00	6.820	○	4.320	○	4.057	○
Dead Load	Top of Deck		≦10.00	1.367	○	0.636	○	0.373	○
	Top of Main Girder		0	4.319	○	2.703	○	2.359	○
	Bottom of Main Girder		～14.00	5.413	○	4.105	○	4.136	○
Design Load1	Top of Deck	Max	≦10.00	2.194	○	0.905	○	0.373	○
		Min		1.304	○	0.619	○	0.373	○
	Top of Main Girder	Max		5.017	○	2.939	○	2.359	○
		Min	-1.5	4.266	○	2.688	○	2.359	○
	Bottom of Main Girder	Max	～14.00	3.552	○	3.617	○	4.136	○
		Min		5.556	○	4.137	○	4.136	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	2.700	○	1.446	○	0.912	○
		Min		1.810	○	1.160	○	0.912	○
	Top of Main Girder	Max		4.124	○	2.097	○	1.517	○
		Min	-2	3.373	○	1.846	○	1.517	○
	Bottom of Main Girder	Max	～16.10	3.782	○	4.045	○	4.599	○
		Min		5.785	○	4.565	○	4.599	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	2.700	○	1.446	○	0.912	○
		Min		1.810	○	1.160	○	0.912	○
	Top of Main Girder	Max		4.124	○	2.097	○	1.517	○
		Min	-2	3.373	○	1.846	○	1.517	○
	Bottom of Main Girder	Max	～16.10	3.782	○	4.045	○	4.599	○
		Min		5.785	○	4.565	○	4.599	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.194	○	0.905	○	0.373	○
		Min		1.304	○	0.619	○	0.373	○
	Top of Main Girder	Max		5.017	○	2.939	○	2.359	○
		Min	-1.5	4.266	○	2.688	○	2.359	○
	Bottom of Main Girder	Max	～14.00	3.552	○	3.617	○	4.136	○
		Min		5.556	○	4.137	○	4.136	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	2.700	○	1.446	○	0.912	○
		Min		1.810	○	1.160	○	0.912	○
	Top of Main Girder	Max		4.124	○	2.097	○	1.517	○
		Min	-2	3.373	○	1.846	○	1.517	○
	Bottom of Main Girder	Max	～16.10	3.782	○	4.045	○	4.599	○
		Min		5.785	○	4.565	○	4.599	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	2.700	○	1.446	○	0.912	○
		Min		1.810	○	1.160	○	0.912	○
	Top of Main Girder	Max		4.124	○	2.097	○	1.517	○
		Min	-2	3.373	○	1.846	○	1.517	○
	Bottom of Main Girder	Max	～16.10	3.782	○	4.045	○	4.599	○
		Min		5.785	○	4.565	○	4.599	○

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span, Main Girder Number: G 2

Cross Section NumberNo.	Unit	Allowable Value	[4- 1]		[4- 2]		[4- 3]	
Interval from beginning of Girder			0.500		1.500		4.000	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1099	○	1103	○	1156	○
Effective Prestressing Force (*1)	N/mm^2	1110	1044	○	1046	○	1083	○
Effective Prestressing Force (*2)	N/mm^2	1110	973	○	973	○	989	○
max	N/mm^2	1110	971	○	971	○	991	○
Ultimate Load	------	1.00	2.00	○	3.35	○	2.33	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[4- 4]		[4- 5]		[4- 6]	
Interval from beginning of Girder			4.100		7.700		11.300	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1157	○	1174	○	1164	○
Effective Prestressing Force (*1)	N/mm^2	1110	1083	○	1089	○	1067	○
Effective Prestressing Force (*2)	N/mm^2	1110	989	○	999	○	981	○
max	N/mm^2	1110	992	○	1023	○	1026	○
Ultimate Load	------	1.00	2.29	○	1.55	○	1.34	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[4- 7]		[4- 8]		[4- 9]	
Interval from beginning of Girder			13.869		14.900		15.851	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1167	○	1172	○	1176	○
Effective Prestressing Force (*1)	N/mm^2	1110	1066	○	1071	○	1075	○
Effective Prestressing Force (*2)	N/mm^2	1110	985	○	990	○	993	○
max	N/mm^2	1110	1039	○	1046	○	1049	○
Ultimate Load	------	1.00	1.26	○	1.24	○	1.24	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[4-10]		[4-11]		[4-12]	
Interval from beginning of Girder			18.500		22.100		25.700	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1199	○	1197	○	1177	○
Effective Prestressing Force (*1)	N/mm^2	1110	1097	○	1106	○	1097	○
Effective Prestressing Force (*2)	N/mm^2	1110	1011	○	1017	○	1005	○
max	N/mm^2	1110	1062	○	1052	○	1020	○
Ultimate Load	------	1.00	1.28	○	1.42	○	2.00	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[4-13]		[4-14]		[4-15]	
Interval from beginning of Girder			25.800		28.300		29.300	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1320	○	1320	○	1320	○
Immediately After Prestressing	N/mm^2	1295	1177	○	1168	○	1164	○
Effective Prestressing Force (*1)	N/mm^2	1110	1097	○	1107	○	1106	○
Effective Prestressing Force (*2)	N/mm^2	1110	1005	○	1035	○	1036	○
max	N/mm^2	1110	1019	○	1037	○	1036	○
Ultimate Load	------	1.00	2.03	○	5.33	○	999.90	○

*1:During DeckConstruction *2:Design Load

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span， Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[4- 1]		[4- 2]		[4- 3]	
Interval from beginning of Girder				------		0.500		1.500		4.000
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	1.00	△	0.74	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.10	○	0.00	○
	Neutral Axis before Composition				------	--	-0.23	○	0.00	○
	Neutral Axis after Composition				------	--	-0.20	○	0.00	○
	Base of Lower Flange				------	--	-0.07	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.30	○	-0.18	○
		Min			------	--	-0.09	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.40	○	-0.15	○
		Min			------	--	-0.22	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.42	○	-0.18	○
		Min			------	--	-0.19	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.08	○	-0.10	○
		Min			------	--	-0.07	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	27.15	--
	D16		cm	------	------	--	32.03	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	10.03	--	8.57	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	------	--	3.16	○	1.80	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	1.015	○	1.00	○
	D16				------	--	1.015	○	1.02	○
	D19				------	--	1.071	○	1.19	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	1.00	△	0.74	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.10	○	0.00	○
	Neutral Axis before Composition				------	--	-0.23	○	0.00	○
	Neutral Axis after Composition				------	--	-0.20	○	0.00	○
	Base of Lower Flange				------	--	-0.07	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.30	○	-0.18	○
		Min			------	--	-0.09	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.40	○	-0.15	○
		Min			------	--	-0.22	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.42	○	-0.18	○
		Min			------	--	-0.19	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.08	○	-0.10	○
		Min			------	--	-0.07	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	27.15	--
	D16		cm	------	------	--	32.03	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span, Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[4- 4]		[4- 5]		[4- 6]	
Interval from beginning of Girder				------		4.100		7.700		11.300
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.72	∆	0.64	∆	0.50	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.17	○	-0.14	○	-0.09	○
		Min			0.00	○	0.00	○	-0.02	○
	Neutral Axis before Composition	Max			-0.15	○	-0.12	○	-0.07	○
		Min			0.00	○	-0.01	○	-0.02	○
	Neutral Axis after Composition	Max			-0.17	○	-0.14	○	-0.09	○
		Min			0.00	○	0.00	○	-0.02	○
	Base of Lower Flange	Max			-0.10	○	-0.08	○	-0.05	○
		Min			-0.01	○	-0.01	○	-0.03	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	27.74	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	8.39	--	5.55	--	2.46	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.82	○	2.23	○	3.02	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.00	○	1.015	○	------	--
	D16				1.03	○	1.193	○	------	--
	D19				1.20	○	1.411	○	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.72	∆	0.64	∆	0.50	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.17	○	-0.14	○	-0.09	○
		Min			0.00	○	0.00	○	-0.02	○
	Neutral Axis before Composition	Max			-0.15	○	-0.12	○	-0.07	○
		Min			0.00	○	-0.01	○	-0.02	○
	Neutral Axis after Composition	Max			-0.17	○	-0.14	○	-0.09	○
		Min			0.00	○	0.00	○	-0.02	○
	Base of Lower Flange	Max			-0.10	○	-0.08	○	-0.05	○
		Min			-0.01	○	-0.01	○	-0.03	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	27.74	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span, Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[4- 7]		[4- 8]		[4- 9]	
Interval from beginning of Girder				------	13.869		14.900		15.851	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.59	△	0.44	○	0.54	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.01	○	0.00	○	-0.02	○
	Neutral Axis before Composition				-0.02	○	0.00	○	-0.02	○
	Neutral Axis after Composition				-0.02	○	0.00	○	-0.02	○
	Base of Lower Flange				-0.01	○	0.00	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.11	○	-0.06	○	-0.02	○
		Min			-0.01	○	-0.04	○	-0.08	○
	Neutral Axis before Composition	Max			-0.11	○	-0.06	○	-0.01	○
		Min			-0.01	○	-0.05	○	-0.10	○
	Neutral Axis after Composition	Max			-0.12	○	-0.07	○	-0.01	○
		Min			-0.02	○	-0.05	○	-0.10	○
	Base of Lower Flange	Max			-0.08	○	-0.04	○	-0.01	○
		Min			-0.01	○	-0.06	○	-0.10	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	1.68	--	0.19	--	0.00	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	3.93	○	4.70	○	5.44	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.456	○	------	--	------	--
	D16				1.819	○	------	--	------	--
	D19				2.263	○	------	--	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.59	△	0.44	○	0.54	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.01	○	0.00	○	-0.02	○
	Neutral Axis before Composition				-0.02	○	0.00	○	-0.02	○
	Neutral Axis after Composition				-0.02	○	0.00	○	-0.02	○
	Base of Lower Flange				-0.01	○	0.00	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.11	○	-0.06	○	-0.02	○
		Min			-0.01	○	-0.04	○	-0.08	○
	Neutral Axis before Composition	Max			-0.11	○	-0.06	○	-0.01	○
		Min			-0.01	○	-0.05	○	-0.10	○
	Neutral Axis after Composition	Max			-0.12	○	-0.07	○	-0.01	○
		Min			-0.02	○	-0.05	○	-0.10	○
	Base of Lower Flange	Max			-0.08	○	-0.04	○	-0.01	○
		Min			-0.01	○	-0.06	○	-0.10	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span, Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[4-10]		[4-11]		[4-12]	
Interval from beginning of Girder				------	18.500		22.100		25.700	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.57	△	0.75	△	1.10	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.01	○	-0.02	○	-0.07	○
	Neutral Axis before Composition				-0.01	○	-0.02	○	-0.07	○
	Neutral Axis after Composition				-0.02	○	-0.02	○	-0.07	○
	Base of Lower Flange				-0.01	○	-0.01	○	-0.04	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	0.00	○	-0.06	○
		Min			-0.09	○	-0.16	○	-0.35	○
	Neutral Axis before Composition	Max			0.00	○	0.00	○	-0.05	○
		Min			-0.12	○	-0.19	○	-0.36	○
	Neutral Axis after Composition	Max			0.00	○	0.00	○	-0.06	○
		Min			-0.11	○	-0.18	○	-0.38	○
	Base of Lower Flange	Max			0.00	○	0.00	○	-0.03	○
		Min			-0.12	○	-0.17	○	-0.26	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	28.47	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	1.05	--	4.14	--	8.17	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	3.92	○	2.64	○	1.94	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.494	○	1.111	○	1.00	○
	D16				1.835	○	1.328	○	1.04	○
	D19				2.253	○	1.593	○	1.23	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.57	△	0.75	△	1.10	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.01	○	-0.02	○	-0.07	○
	Neutral Axis before Composition				-0.01	○	-0.02	○	-0.07	○
	Neutral Axis after Composition				-0.02	○	-0.02	○	-0.07	○
	Base of Lower Flange				-0.01	○	-0.01	○	-0.04	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	0.00	○	-0.06	○
		Min			-0.09	○	-0.16	○	-0.35	○
	Neutral Axis before Composition	Max			0.00	○	0.00	○	-0.05	○
		Min			-0.12	○	-0.19	○	-0.36	○
	Neutral Axis after Composition	Max			0.00	○	0.00	○	-0.06	○
		Min			-0.11	○	-0.18	○	-0.38	○
	Base of Lower Flange	Max			0.00	○	0.00	○	-0.03	○
		Min			-0.12	○	-0.17	○	-0.26	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	28.47	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span, Main Girder Number: G 3(Shear Force Max)

Cross Section Number				Allowable Value	[4-13]		[4-14]		[4-15]	
Interval from beginning of Girder				------	25.800		28.300		29.300	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.12	△	0.49	○	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.07	○	-0.02	○	------	--
	Neutral Axis before Composition				-0.07	○	-0.03	○	------	--
	Neutral Axis after Composition				-0.08	○	-0.03	○	------	--
	Base of Lower Flange				-0.04	○	-0.01	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.06	○	-0.02	○	------	--
		Min			-0.37	○	-0.11	○	------	--
	Neutral Axis before Composition	Max			-0.06	○	-0.02	○	------	--
		Min			-0.37	○	-0.12	○	------	--
	Neutral Axis after Composition	Max			-0.06	○	-0.03	○	------	--
		Min			-0.39	○	-0.14	○	------	--
	Base of Lower Flange	Max			-0.04	○	0.00	○	------	--
		Min			-0.27	○	-0.02	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	27.93	--	20.44	--	------	--
	D16		cm	------	40.00	--	32.03	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	8.33	--	0.00	--	------	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.92	○	4.02	○	------	--
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1	○	------	--	------	--
	D16				1.037	○	------	--	------	--
	D19				1.223	○	------	--	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.12	△	0.49	○	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.07	○	-0.02	○	------	--
	Neutral Axis before Composition				-0.07	○	-0.03	○	------	--
	Neutral Axis after Composition				-0.08	○	-0.03	○	------	--
	Base of Lower Flange				-0.04	○	-0.01	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.06	○	-0.02	○	------	--
		Min			-0.37	○	-0.11	○	------	--
	Neutral Axis before Composition	Max			-0.06	○	-0.02	○	------	--
		Min			-0.37	○	-0.12	○	------	--
	Neutral Axis after Composition	Max			-0.06	○	-0.03	○	------	--
		Min			-0.39	○	-0.14	○	------	--
	Base of Lower Flange	Max			-0.04	○	0.00	○	------	--
		Min			-0.27	○	-0.02	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	27.93	--	20.44	--	------	--
	D16		cm	------	40.00	--	32.03	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[4- 1]		[4- 2]		[4- 3]	
Interval from beginning of Girder				------		0.500		1.500		4.000
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.97	△	0.69	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.11	○	0.00	○
	Neutral Axis before Composition				------	--	-0.22	○	0.00	○
	Neutral Axis after Composition				------	--	-0.20	○	0.00	○
	Base of Lower Flange				------	--	-0.06	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.29	○	-0.17	○
		Min			------	--	-0.11	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.39	○	-0.14	○
		Min			------	--	-0.21	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.40	○	-0.16	○
		Min			------	--	-0.19	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.08	○	-0.10	○
		Min			------	--	-0.05	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	29.51	--
	D16		cm	------	------	--	32.03	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	9.31	--	7.88	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.97	△	0.69	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.11	○	0.00	○
	Neutral Axis before Composition				------	--	-0.22	○	0.00	○
	Neutral Axis after Composition				------	--	-0.20	○	0.00	○
	Base of Lower Flange				------	--	-0.06	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.29	○	-0.17	○
		Min			------	--	-0.11	○	0.00	○
	Neutral Axis before Composition	Max			------	--	-0.39	○	-0.14	○
		Min			------	--	-0.21	○	0.00	○
	Neutral Axis after Composition	Max			------	--	-0.40	○	-0.16	○
		Min			------	--	-0.19	○	0.00	○
	Base of Lower Flange	Max			------	--	-0.08	○	-0.10	○
		Min			------	--	-0.05	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.44	--	29.51	--
	D16		cm	------	------	--	32.03	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	------	--	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	--	999.999	○	999.999	○
	D16				------	--	999.999	○	999.999	○
	D19				------	--	999.999	○	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[4- 4]		[4- 5]		[4- 6]	
Interval from beginning of Girder				------	4.100		7.700		11.300	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.67	△	0.63	△	0.37	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.16	○	-0.13	○	-0.05	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition	Max			-0.14	○	-0.13	○	-0.05	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition	Max			-0.16	○	-0.14	○	-0.05	○
		Min			0.00	○	0.00	○	0.00	○
	Base of Lower Flange	Max			-0.10	○	-0.11	○	-0.07	○
		Min			0.00	○	0.00	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	30.23	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	7.70	--	5.55	--	1.29	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.67	△	0.63	△	0.37	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.16	○	-0.13	○	-0.05	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition	Max			-0.14	○	-0.13	○	-0.05	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition	Max			-0.16	○	-0.14	○	-0.05	○
		Min			0.00	○	0.00	○	0.00	○
	Base of Lower Flange	Max			-0.10	○	-0.11	○	-0.07	○
		Min			0.00	○	0.00	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	30.23	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	-
	D16				999.999	○	999.999	○	------	-
	D19				999.999	○	999.999	○	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span,　Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[4- 7]		[4- 8]		[4- 9]	
Interval from beginning of Girder				------		13.869		14.900		15.851
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.32	○	0.12	○	0.11	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.03	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition	Max			-0.04	○	-0.01	○	0.00	○
		Min			0.00	○	0.00	○	-0.01	○
	Neutral Axis after Composition	Max			-0.04	○	-0.01	○	0.00	○
		Min			0.00	○	0.00	○	0.00	○
	Base of Lower Flange	Max			-0.03	○	-0.01	○	0.00	○
		Min			0.00	○	0.00	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.32	○	0.12	○	0.11	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.03	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition	Max			-0.04	○	-0.01	○	0.00	○
		Min			0.00	○	0.00	○	-0.01	○
	Neutral Axis after Composition	Max			-0.04	○	-0.01	○	0.00	○
		Min			0.00	○	0.00	○	0.00	○
	Base of Lower Flange	Max			-0.03	○	-0.01	○	0.00	○
		Min			0.00	○	0.00	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	------	-	------	-
	D16				------	-	------	-	------	-
	D19				------	-	------	-	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[4-10]		[4-11]		[4-12]	
Interval from beginning of Girder				------	18.500		22.100		25.700	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.36	○	0.77	△	0.90	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	-0.01	○	-0.06	○
	Neutral Axis before Composition				0.00	○	-0.01	○	-0.05	○
	Neutral Axis after Composition				0.00	○	-0.01	○	-0.06	○
	Base of Lower Flange				0.00	○	-0.01	○	-0.03	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	0.00	○	-0.01	○	-0.07	○
		Min			-0.04	○	-0.18	○	-0.26	○
	Neutral Axis before Composition	Max			0.00	○	-0.01	○	-0.06	○
		Min			-0.05	○	-0.21	○	-0.24	○
	Neutral Axis after Composition	Max			0.00	○	-0.01	○	-0.07	○
		Min			-0.05	○	-0.20	○	-0.27	○
	Base of Lower Flange	Max			0.00	○	-0.01	○	-0.04	○
		Min			-0.07	○	-0.20	○	-0.17	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	4.49	--	5.80	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.36	○	0.77	△	0.90	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	-0.01	○	-0.06	○
	Neutral Axis before Composition				0.00	○	-0.01	○	-0.05	○
	Neutral Axis after Composition				0.00	○	-0.01	○	-0.06	○
	Base of Lower Flange				0.00	○	-0.01	○	-0.03	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	0.00	○	-0.01	○	-0.07	○
		Min			-0.04	○	-0.18	○	-0.26	○
	Neutral Axis before Composition	Max			0.00	○	-0.01	○	-0.06	○
		Min			-0.05	○	-0.21	○	-0.24	○
	Neutral Axis after Composition	Max			0.00	○	-0.01	○	-0.07	○
		Min			-0.05	○	-0.20	○	-0.27	○
	Base of Lower Flange	Max			0.00	○	-0.01	○	-0.04	○
		Min			-0.07	○	-0.20	○	-0.17	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	999.999	○	999.999	○
	D16				------	-	999.999	○	999.999	○
	D19				------	-	999.999	○	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

4th Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[4-13]		[4-14]		[4-15]	
Interval from beginning of Girder				------	25.800		28.300		29.300	
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	1.02	△	0.43	○	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	-0.07	○	-0.02	○	------	--
	Neutral Axis before Composition				-0.06	○	-0.02	○	------	--
	Neutral Axis after Composition				-0.07	○	-0.03	○	------	--
	Base of Lower Flange				-0.04	○	0.00	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	-0.07	○	-0.03	○	------	--
		Min			-0.32	○	-0.09	○	------	--
	Neutral Axis before Composition	Max			-0.06	○	-0.03	○	------	--
		Min			-0.32	○	-0.10	○	------	--
	Neutral Axis after Composition	Max			-0.07	○	-0.03	○	------	--
		Min			-0.34	○	-0.11	○	------	--
	Base of Lower Flange	Max			-0.04	○	0.00	○	------	--
		Min			-0.23	○	-0.02	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	32.14	--	20.44	--	------	--
	D16		cm	------	40.00	--	32.03	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm²	------	7.24	--	0.00	--	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	1.02	△	0.43	○	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	-0.07	○	-0.02	○	------	--
	Neutral Axis before Composition				-0.06	○	-0.02	○	------	--
	Neutral Axis after Composition				-0.07	○	-0.03	○	------	--
	Base of Lower Flange				-0.04	○	0.00	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	-0.07	○	-0.03	○	------	--
		Min			-0.32	○	-0.09	○	------	--
	Neutral Axis before Composition	Max			-0.06	○	-0.03	○	------	--
		Min			-0.32	○	-0.10	○	------	--
	Neutral Axis after Composition	Max			-0.07	○	-0.03	○	------	--
		Min			-0.34	○	-0.11	○	------	--
	Base of Lower Flange	Max			-0.04	○	0.00	○	------	--
		Min			-0.23	○	-0.02	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	32.14	--	20.44	--	------	--
	D16		cm	------	40.00	--	32.03	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.00	--	------	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	------	--
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	------	-	------	--
	D16				999.999	○	------	-	------	--
	D19				999.999	○	------	-	------	--

5 Design of Intermediate Cross Beam

(1) Parameters

<1st Span>

		Unit	Bending Moment (Maximum)	Bending Moment (Minimum)
CB 2				
Length between End of Girders	Lb	cm	327.9	327.9
Web Width	Bw	cm	22.0	22.0
Width of Cross Beam	Bc	cm	30.0	30.0
Thickness of Deck	Hs	cm	17.0	17.0
Height of Cross Beam (before Composition of Deck)	Hb	cm	135.0	135.0
Height of Cross Beam (after Composition of Deck)	Ha	cm	192.0	192.0
Interval of Cross Beam	Lt	cm	1409.9	1409.9

<2nd Span>

		Unit	Bending Moment (Maximum)	Bending Moment (Minimum)
CB 2				
Length between End of Girders	Lb	cm	328.0	328.0
Web Width	Bw	cm	22.0	22.0
Width of Cross Beam	Bc	cm	30.0	30.0
Thickness of Deck	Hs	cm	17.0	17.0
Height of Cross Beam (before Composition of Deck)	Hb	cm	135.0	135.0
Height of Cross Beam (after Composition of Deck)	Ha	cm	192.0	192.0
Interval of Cross Beam	Lt	cm	1410.0	1410.0

<3rd Span>

		Unit	Bending Moment (Maximum)	Bending Moment (Minimum)
CB 2				
Length between End of Girders	Lb	cm	328.0	328.0
Web Width	Bw	cm	22.0	22.0
Width of Cross Beam	Bc	cm	30.0	30.0
Thickness of Deck	Hs	cm	17.0	17.0
Height of Cross Beam (before Composition of Deck)	Hb	cm	135.0	135.0
Height of Cross Beam (after Composition of Deck)	Ha	cm	192.0	192.0
Interval of Cross Beam	Lt	cm	1410.0	1410.0

<4th Span>

		Unit	Bending Moment (Maximum)	Bending Moment (Minimum)
CB 2				
Length between End of Girders	Lb	cm	328.0	328.0
Web Width	Bw	cm	22.0	22.0
Width of Cross Beam	Bc	cm	30.0	30.0
Thickness of Deck	Hs	cm	17.0	17.0
Height of Cross Beam (before Composition of Deck)	Hb	cm	135.0	135.0
Height of Cross Beam (after Composition of Deck)	Ha	cm	192.0	192.0
Interval of Cross Beam	Lt	cm	1410.0	1410.0

(2) Calculation of Prestressing

1) Arrangement of PC Strand

(1) Parameter of PC Strand

	Unit	Parameters
Name of PC Strand		4S15.2， SWPR7BL
Area of PC Strand	mm^2/no.	554.80
Amount of Set	mm	4.0
Reduction Rate of Anchor	%	0.000
Friction Coefficient	1/m	0.0040
Creep Coefficient		2.60
Drying Shrinkage	$\times 10^{-5}$	20.00
Relaxation	%	2.5
Prestressing Stress	N/mm^2	1250.000
(Considering Friction Coefficient)	N/mm^2	1250.000
Allowable Value	N/mm^2	1440.000

(2) Arrangement of PC Strand

<1st Span>

Item		Unit	Maximum Bending Moment	Minimum Bending Moment
CB 2				
How to Prestressing			From One Side	
Length of PC Strand		m	10.720	10.720
1st	Position	mm	400	400
	Number	No.	1	1
2nd	Position	mm	800	800
	Number	No.	1	1

<2nd Span>

Item		Unit	Maximum Bending Moment	Minimum Bending Moment
CB 2				
How to Prestressing			From One Side	
Length of PC Strand		m	10.720	10.720
1st	Position	mm	400	400
	Number	No.	1	1
2nd	Position	mm	800	800
	Number	No.	1	1

<3rd Span>

Item		Unit	Maximum Bending Moment	Minimum Bending Moment
CB 2				
How to Prestressing			From One Side	
Length of PC Strand		m	10.720	10.720
1st	Position	mm	400	400
	Number	No.	1	1
2nd	Position	mm	800	800
	Number	No.	1	1

<4th Span>

Item		Unit	Maximum Bending Moment	Minimum Bending Moment
CB 2				
How to Prestressing			From One Side	
Length of PC Strand		m	10.720	10.720
1st	Position	mm	400	400
	Number	No.	1	1
2nd	Position	mm	800	800
	Number	No.	1	1

<Design of Cross Beam : Summary for Calculation Results of Stress>

1st Span : Cross Beam (CB2)

Item		Unit	Allowable Value	Mmax		Mmin	
Bending Stress of Concrete Dead Load	Top of Deck	N/mm^2	≦10.0	-0.34	○	-0.34	○
	Bottom of Deck			-0.23	○	-0.23	○
	Top of Cross Beam	N/mm^2	0 ～11.0	1.90	○	1.90	○
	Bottom of Cross Beam			4.65	○	4.65	○
Bending Stress of Concrete Dead Load	Top of Deck	N/mm^2	≦10.0	0.52	○	-0.84	○
	Bottom of Deck			0.35	○	-0.57	○
	Top of Cross Beam	N/mm^2	-1.2 ～11.0	1.84	○	1.94	○
	Bottom of Cross Beam			2.41	○	5.95	○
Ultimate Load		------	1	1.84	○	1.62	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1440	1250	○	1250	○
	Immediately After Prestressing	N/mm^2	1295	1175	○	1175	○
	Effective Prestressing Force	N/mm^2	1110	1026	○	1026	○

2nd Span : Cross Beam (CB2)

Item		Unit	Allowable Value	Mmax		Mmin	
Bending Stress of Concrete Dead Load	Top of Deck	N/mm^2	≦10.0	-0.25	○	-0.25	○
	Bottom of Deck			-0.17	○	-0.17	○
	Top of Cross Beam	N/mm^2	0 ～11.0	1.89	○	1.89	○
	Bottom of Cross Beam			4.41	○	4.41	○
Bending Stress of Concrete Dead Load	Top of Deck	N/mm^2	≦10.0	0.54	○	-0.81	○
	Bottom of Deck			0.37	○	-0.55	○
	Top of Cross Beam	N/mm^2	-1.2 ～11.0	1.84	○	1.93	○
	Bottom of Cross Beam			2.34	○	5.85	○
Ultimate Load		------	1	1.92	○	1.59	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1440	1250	○	1250	○
	Immediately After Prestressing	N/mm^2	1295	1175	○	1175	○
	Effective Prestressing Force	N/mm^2	1110	1026	○	1026	○

3rd Span : Cross Beam (CB2)

Item			Unit	Allowable Value	Mmax		Mmin	
Bending Stress of Concrete Dead Load		Top of Deck	N/mm^2	≦10.0	-0.26	○	-0.26	○
		Bottom of Deck			-0.17	○	-0.17	○
		Top of Cross Beam	N/mm^2	0 ～11.0	1.89	○	1.89	○
		Bottom of Cross Beam			4.41	○	4.41	○
Bending Stress of Concrete Dead Load		Top of Deck	N/mm^2	≦10.0	0.54	○	-0.81	○
		Bottom of Deck			0.37	○	-0.55	○
		Top of Cross Beam	N/mm^2	-1.2 ～11.0	1.84	○	1.93	○
		Bottom of Cross Beam			2.35	○	5.85	○
Ultimate Load			------	1	1.92	○	1.59	○
Stress of PC Strand	Stress of PC Strand during Prestressing		N/mm^2	1440	1250	○	1250	○
	Immediately After Prestressing		N/mm^2	1295	1175	○	1175	○
	Effective Prestressing Force		N/mm^2	1110	1026	○	1026	○

4th Span : Cross Beam (CB2)

Item			Unit	Allowable Value	Mmax		Mmin	
Bending Stress of Concrete Dead Load		Top of Deck	N/mm^2	≦10.0	-0.30	○	-0.30	○
		Bottom of Deck			-0.20	○	-0.20	○
		Top of Cross Beam	N/mm^2	0 ～11.0	1.90	○	1.90	○
		Bottom of Cross Beam			4.53	○	4.53	○
Bending Stress of Concrete Dead Load		Top of Deck	N/mm^2	≦10.0	0.53	○	-0.85	○
		Bottom of Deck			0.36	○	-0.58	○
		Top of Cross Beam	N/mm^2	-1.2 ～11.0	1.84	○	1.94	○
		Bottom of Cross Beam			2.35	○	5.98	○
Ultimate Load			------	1	1.86	○	1.56	○
Stress of PC Strand	Stress of PC Strand during Prestressing		N/mm^2	1440	1250	○	1250	○
	Immediately After Prestressing		N/mm^2	1295	1175	○	1175	○
	Effective Prestressing Force		N/mm^2	1110	1026	○	1026	○

<Design of Cross Beam : Summary for Calculation Results of Stress>

1st Span : Cross Beam (CB2)

Item		Unit	Allowable Value	Smax		Smin		Tmax		Tmin	
Shear Force											
Shear Stress	Design Load	N/mm^2	0.45	0.63	△	0.43	○	0.14	○	0.14	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	-0.02	○	-0.02	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	-0.18	○	-0.17	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Suc/Shu	-	1.00	2.97	○	4.42	○	11.02	○	12.34	○
Strength against Diagonal Densile Failure	D13	-	1.00	1.00	○	------	--	------	--	------	--
Sus/Shu	D16	-	1.00	1.07	○	------	--	------	--	------	--
Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.00	○	0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	0.00	○	0.00	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	0.00	○	0.00	○	0.00	○	0.00	○
Shear Force + Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.63	△	0.43	○	0.14	○	0.14	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-1.10	-0.02	○	-0.02	○	0.00	○	0.00	○
	Design Load	N/mm^2	-2.20	-0.18	○	-0.17	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Muc/Mtu	-	1.00	999.999	○	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure	D13	-	1.00	999.999	○	------	--	------	--	------	--
Mus/Mtu	D16	-	1.00	999.999	○	------	--	------	--	------	--
Amount of Diagonal Tension Re-bar		cm^2	----	8.99	--	6.00	--	6.00	--	6.00	--
Axial Reinforcement Bar Volume		cm^2	----	5.07	--	0.04	--	0.00	--	0.00	--

2nd Span : Cross Beam (CB2)

Item		Unit	Allowable Value	Smax		Smin		Tmax		Tmin	
Shear Force											
Shear Stress	Design Load	N/mm^2	0.45	0.56	△	0.39	○	0.16	○	0.16	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	-0.01	○	-0.01	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	-0.14	○	-0.14	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Suc/Shu	-	1.00	3.22	○	4.64	○	10.13	○	10.10	○
Strength against Diagonal Densile Failure	D13	-	1.00	1.00	○	------	--	------	--	------	--
Sus/Shu	D16	-	1.00	1.16	○	------	--	------	--	------	--
Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.00	○	0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	0.00	○	0.00	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	0.00	○	0.00	○	0.00	○	0.00	○
Shear Force + Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.56	△	0.39	○	0.16	○	0.16	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-1.10	-0.01	○	-0.01	○	0.00	○	0.00	○
	Design Load	N/mm^2	-2.20	-0.14	○	-0.14	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Muc/Mtu	-	1.00	999.999	○	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure	D13	-	1.00	999.999	○	------	--	------	--	------	--
Mus/Mtu	D16	-	1.00	999.999	○	------	--	------	--	------	--
Amount of Diagonal Tension Re-bar		cm^2	----	7.92	--	6.00	--	6.00	--	6.00	--
Axial Reinforcement Bar Volume		cm^2	----	4.46	--	0.00	--	0.00	--	0.00	--

3rd Span : Cross Beam (CB2)

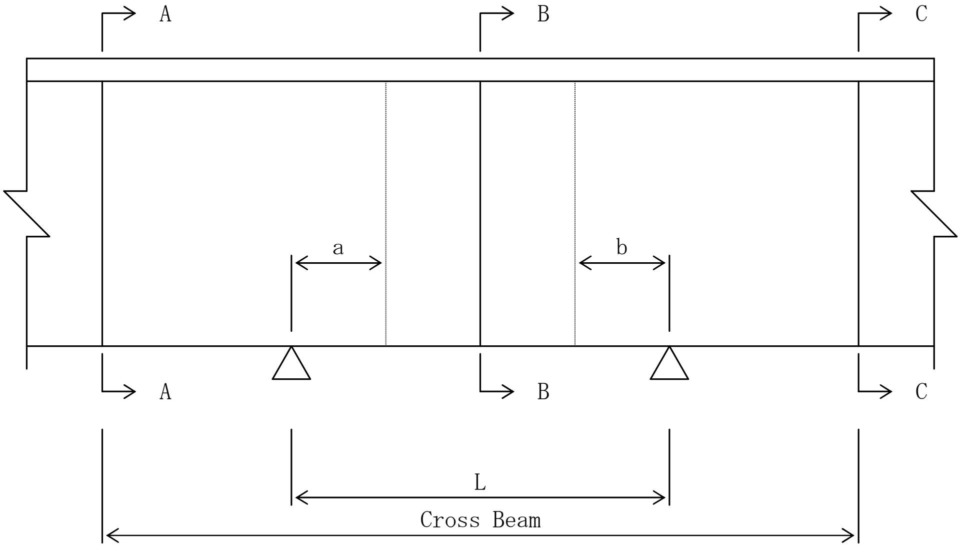
Item		Unit	Allowable Value	Smax		Smin		Tmax		Tmin	
Shear Force											
Shear Stress	Design Load	N/mm^2	0.45	0.56	△	0.39	○	0.16	○	0.16	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	-0.01	○	-0.01	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	-0.14	○	-0.14	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Suc/Shu	-	1.00	3.22	○	4.64	○	10.12	○	10.11	○
Strength against Diagonal Densile Failure	D13	-	1.00	1.00	○	------	--	------	--	------	--
Sus/Shu	D16	-	1.00	1.16	○	------	--	------	--	------	--
Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.00	○	0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	0.00	○	0.00	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	0.00	○	0.00	○	0.00	○	0.00	○
Shear Force + Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.56	△	0.39	○	0.16	○	0.16	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-1.10	-0.01	○	-0.01	○	0.00	○	0.00	○
	Design Load	N/mm^2	-2.20	-0.14	○	-0.14	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Muc/Mtu	-	1.00	999.999	○	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure	D13	-	1.00	999.999	○	------	--	------	--	------	--
Mus/Mtu	D16	-	1.00	999.999	○	------	--	------	--	------	--
Amount of Diagonal Tension Re-bar		cm^2	----	7.92	--	6.00	--	6.00	--	6.00	--
Axial Reinforcement Bar Volume		cm^2	----	4.46	--	0.00	--	0.00	--	0.00	--

<Design of Cross Beam : Summary for Calculation Results of Stress>

4th Span : Cross Beam (CB2)

Item		Unit	Allowable Value	Smax		Smin		Tmax		Tmin	
Shear Force											
Shear Stress	Design Load	N/mm^2	0.45	0.59	△	0.41	○	0.14	○	0.14	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	-0.01	○	-0.01	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	-0.16	○	-0.16	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Suc/Shu	-	1.00	3.12	○	4.49	○	11.67	○	11.67	○
Strength against Diagonal Densile Failure	D13	-	1.00	1.00	○	------	--	------	--	------	--
Sus/Shu	D16	-	1.00	1.13	○	------	--	------	--	------	--
Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.00	○	0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	0.00	○	0.00	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	0.00	○	0.00	○	0.00	○	0.00	○
Shear Force + Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.59	△	0.41	○	0.14	○	0.14	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-1.10	-0.01	○	-0.01	○	0.00	○	0.00	○
	Design Load	N/mm^2	-2.20	-0.16	○	-0.16	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Muc/Mtu	-	1.00	999.999	○	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure	D13	-	1.00	999.999	○	------	--	------	--	------	--
Mus/Mtu	D16	-	1.00	999.999	○	------	--	------	--	------	--
Amount of Diagonal Tension Re-bar		cm^2	----	8.32	--	6.00	--	6.00	--	6.00	--
Axial Reinforcement Bar Volume		cm^2	----	4.69	--	0.00	--	0.00	--	0.00	--

6 Design of Coupling Concrete
Dimension



Unit: m

	1 to 2 Span	2 to 3 Span	3 to 4 Span
L	1.200	1.200	1.200
a	0.500	0.500	0.500
b	0.500	0.500	0.500

<Connection of Cross beam : Summary for Calculation Results of Stress>

1st Span～2nd Span， Main Girder Number: G4(Negative Moment) G1(Positive Moment)

Item			Unit	Allowable Value	Negative Moment						Positive Moment	
					A-A		B-B		C-C		B-B	
Re-bar Volume	1st Layer	Diameter	mm	------	D19	--	D19	--	D19	--	D22	--
		Number	Number	------	16	--	16	--	16	--	9	--
	2nd Layer	Diameter	mm	------	D19	--	D19	--	D19	--	D22	--
		Number	Number	------	16	--	16	--	16	--	9	--
Bending Stress (Dead Load)												
Bending Tensile Stress of Reinforcement Bar			N/mm^2	100	16.04	○	27.95	○	17.01	○	18.83	○
Bending Stress (Design Load)												
Bending Stress of Concrete			N/mm^2	10	4.91	○	4.91	○	4.91	○	0.77	○
Bending Tensile Stress of Reinforcement Bar			N/mm^2	160	136.49	○	136.49	○	136.49	○	46.27	○
Bending Stress (Temperature Load)												
Bending Stress of Concrete			N/mm^2	11.5	4.95	○	4.91	○	4.77	○	1.51	○
Bending Tensile Stress of Reinforcement Bar			N/mm^2	184	137.58	○	136.49	○	132.64	○	91.24	○
Ultimate Load			------	1.00	1.07	○	1.13	○	1.11	○	3.94	○

2nd Span～3rd Span， Main Girder Number: G1(Negative Moment) G4(Positive Moment)

Item			Unit	Allowable Value	Negative Moment						Positive Moment	
					A-A		B-B		C-C		B-B	
Re-bar Volume	1st Layer	Diameter	mm	------	D19	--	D19	--	D19	--	D22	--
		Number	Number	------	16	--	16	--	16	--	9	--
	2nd Layer	Diameter	mm	------	D19	--	D19	--	D19	--	D22	--
		Number	Number	------	16	--	16	--	16	--	9	--
Bending Stress (Dead Load)												
Bending Tensile Stress of Reinforcement Bar			N/mm^2	100	-14.27	○	-6.18	○	-14.15	○	19.37	○
Bending Stress (Design Load)												
Bending Stress of Concrete			N/mm^2	10	3.34	○	3.34	○	3.34	○	0.94	○
Bending Tensile Stress of Reinforcement Bar			N/mm^2	160	92.72	○	92.72	○	92.72	○	57.00	○
Bending Stress (Temperature Load)												
Bending Stress of Concrete			N/mm^2	11.5	3.21	○	3.34	○	3.21	○	1.46	○
Bending Tensile Stress of Reinforcement Bar			N/mm^2	184	89.07	○	92.72	○	89.17	○	88.06	○
Ultimate Load			------	1.00	1.46	○	1.47	○	1.46	○	3.12	○

3rd Span～4th Span， Main Girder Number: G4(Negative Moment) G1(Positive Moment)

Item			Unit	Allowable Value	Negative Moment						Positive Moment	
					A-A		B-B		C-C		B-B	
Re-bar Volume	1st Layer	Diameter	mm	------	D19	--	D19	--	D19	--	D22	--
		Number	Number	------	16	--	16	--	16	--	9	--
	2nd Layer	Diameter	mm	------	D19	--	D19	--	D19	--	D22	--
		Number	Number	------	16	--	16	--	16	--	9	--
Bending Stress (Dead Load)												
Bending Tensile Stress of Reinforcement Bar			N/mm^2	100	-22.37	○	-15.73	○	-24.27	○	22.64	○
Bending Stress (Design Load)												
Bending Stress of Concrete			N/mm^2	10	3.30	○	3.30	○	3.30	○	0.82	○
Bending Tensile Stress of Reinforcement Bar			N/mm^2	160	91.73	○	91.73	○	91.73	○	49.82	○
Bending Stress (Temperature Load)												
Bending Stress of Concrete			N/mm^2	11.5	3.26	○	3.30	○	3.41	○	1.57	○
Bending Tensile Stress of Reinforcement Bar			N/mm^2	184	90.70	○	91.73	○	94.72	○	94.74	○
Ultimate Load			------	1.00	1.34	○	1.37	○	1.28	○	3.80	○

7 Calculation of Reaction Force

7.1 Reaction Force for Each Girder

<1st Span, Left> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	356.378	351.998	351.998	356.378
Cast-in-place Concrete	D2	303.009	435.973	435.973	321.709
Weight of Bridge Surface	D3	209.509	243.663	293.432	357.502
Subtotal: DT1=D1+D2+D3		868.896	1031.634	1081.403	1035.589
Live Load	Max	316.710	301.980	306.100	339.690
LT	Min	-67.890	-24.800	-24.820	-58.730
Subtotal: DT2	Max	1189.412	1337.580	1391.568	1379.391
=DT1+LT+SW	Min	804.812	1010.800	1060.648	980.971
Creep CR		68.754	59.640	59.640	66.262
Drying Shrinkage SH		-8.047	-8.618	-8.618	-8.033
Temperature Range		20.923	22.406	22.406	20.884
Dead Load: DT1+CR+SH		929.603	1082.656	1132.425	1093.818
Total: DT2+CR	Max	1271.042	1411.008	1464.996	1458.504
+SH+T+SD	Min	886.442	1084.228	1134.076	1060.084

<1st Span, Right> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	356.380	352.000	351.999	356.380
Cast-in-place Concrete	D2	321.952	467.424	467.424	338.837
Weight of Bridge Surface	D3	367.913	428.485	515.701	621.186
Subtotal: DT1=D1+D2+D3		1046.245	1247.909	1335.124	1316.403
Live Load	Max	462.970	426.770	435.000	495.040
LT	Min	-160.300	-90.220	-91.330	-148.220
Subtotal: DT2	Max	1516.242	1681.951	1777.531	1818.885
=DT1+LT+SW	Min	892.972	1164.961	1251.201	1175.625
Creep CR		-147.685	-125.002	-125.002	-136.973
Drying Shrinkage SH		15.361	16.215	16.215	15.406
Temperature Range		-39.940	-42.159	-42.159	-40.053
Dead Load: DT1+CR+SH		913.921	1139.122	1226.337	1194.836
Total: DT2+CR	Max	1343.978	1531.005	1626.585	1657.265
+SH+T+SD	Min	720.708	1014.015	1100.255	1014.005

<2nd Span, Left> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	356.402	352.021	352.021	356.402
Cast-in-place Concrete	D2	330.543	467.535	467.535	330.205
Weight of Bridge Surface	D3	208.731	172.455	156.446	161.447
Subtotal: DT1=D1+D2+D3		895.676	992.011	976.002	848.054
Live Load	Max	431.000	377.090	375.870	422.790
LT	Min	-174.680	-115.970	-121.660	-189.230
Subtotal: DT2	Max	1331.395	1373.798	1356.476	1275.216
=DT1+LT+SW	Min	725.715	880.738	858.946	663.196
Creep CR		55.740	45.717	45.717	50.249
Drying Shrinkage SH		-5.026	-5.145	-5.145	-5.100
Temperature Range		13.068	13.377	13.377	13.259
Dead Load: DT1+CR+SH		946.390	1032.583	1016.574	893.203
Total: DT2+CR	Max	1395.177	1427.747	1410.425	1333.624
+SH+T+SD	Min	789.497	934.687	912.895	721.604

<2nd Span, Right> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	356.402	352.021	352.022	356.402
Cast-in-place Concrete	D2	330.422	467.536	467.537	330.326
Weight of Bridge Surface	D3	216.080	178.635	164.071	171.691
Subtotal: DT1=D1+D2+D3		902.904	998.192	983.630	858.419
Live Load	Max	427.850	377.550	377.660	425.980
LT	Min	-164.200	-102.960	-105.710	-169.040
Subtotal: DT2	Max	1335.726	1380.767	1366.271	1289.241
=DT1+LT+SW	Min	743.676	900.257	882.901	694.221
Creep CR		24.471	19.657	19.657	19.209
Drying Shrinkage SH		-2.280	-2.452	-2.452	-2.286
Temperature Range		5.930	6.375	6.375	5.941
Dead Load: DT1+CR+SH		925.095	1015.397	1000.835	875.342
Total: DT2+CR	Max	1363.847	1404.347	1389.851	1312.105
+SH+T+SD	Min	771.797	923.837	906.481	717.085

<3rd Span, Left> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	356.402	352.021	352.021	356.402
Cast-in-place Concrete	D2	330.374	467.536	467.536	330.374
Weight of Bridge Surface	D3	226.325	210.799	217.120	245.773
Subtotal: DT1=D1+D2+D3		913.101	1030.356	1036.677	932.549
Live Load	Max	427.380	377.710	377.870	428.030
LT	Min	-167.570	-105.150	-105.070	-167.320
Subtotal: DT2	Max	1345.362	1413.060	1419.558	1365.511
=DT1+LT+SW	Min	750.412	930.200	936.618	770.161
Creep CR		20.840	19.625	19.625	22.767
Drying Shrinkage SH		-2.285	-2.454	-2.454	-2.267
Temperature Range		5.941	6.380	6.380	5.896
Dead Load: DT1+CR+SH		931.656	1047.527	1053.848	953.049
Total: DT2+CR	Max	1369.858	1436.611	1443.109	1391.907
+SH+T+SD	Min	774.908	953.751	960.169	796.557

<3rd Span, Right> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	356.402	352.021	352.021	356.402
Cast-in-place Concrete	D2	330.374	467.536	467.536	330.374
Weight of Bridge Surface	D3	210.216	191.754	195.501	221.394
Subtotal: DT1=D1+D2+D3		896.992	1011.311	1015.058	908.170
Live Load	Max	428.030	376.380	376.630	428.340
LT	Min	-184.440	-119.540	-119.650	-184.200
Subtotal: DT2	Max	1329.551	1392.334	1396.341	1341.071
=DT1+LT+SW	Min	717.081	896.414	900.061	728.531
Creep CR		52.290	45.705	45.705	53.560
Drying Shrinkage SH		-5.052	-5.148	-5.148	-5.048
Temperature Range		13.136	13.386	13.386	13.125
Dead Load: DT1+CR+SH		944.230	1051.868	1055.615	956.682
Total: DT2+CR	Max	1389.925	1446.277	1450.284	1402.708
+SH+T+SD	Min	777.455	950.357	954.004	790.168

<4th Span, Left> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	356.402	352.021	352.022	356.402
Cast-in-place Concrete	D2	330.374	467.536	467.536	330.374
Weight of Bridge Surface	D3	322.246	300.492	298.837	317.325
Subtotal: DT1=D1+D2+D3		1009.022	1120.049	1118.395	1004.101
Live Load	Max	490.230	430.920	430.810	490.240
LT	Min	-161.260	-90.700	-90.680	-161.470
Subtotal: DT2	Max	1506.496	1558.312	1556.544	1501.571
=DT1+LT+SW	Min	855.006	1036.692	1035.054	849.861
Creep CR		-141.953	-124.967	-124.967	-142.512
Drying Shrinkage SH		15.367	16.219	16.219	15.365
Temperature Range		-39.953	-42.170	-42.170	-39.949
Dead Load: DT1+CR+SH		882.436	1011.301	1009.647	876.954
Total: DT2+CR	Max	1339.957	1407.394	1405.626	1334.475
+SH+T+SD	Min	688.467	885.774	884.136	682.765

<4th Span, Right> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	356.402	352.021	352.021	356.402
Cast-in-place Concrete	D2	312.133	436.082	436.082	312.133
Weight of Bridge Surface	D3	185.180	171.520	171.214	184.263
Subtotal: DT1=D1+D2+D3		853.715	959.623	959.317	852.798
Live Load	Max	336.330	303.790	303.130	336.350
LT	Min	-67.140	-24.800	-24.820	-67.180
Subtotal: DT2	Max	1194.004	1267.430	1266.463	1193.104
=DT1+LT+SW	Min	790.534	938.840	938.513	789.574
Creep CR		67.542	59.626	59.626	67.438
Drying Shrinkage SH		-8.037	-8.618	-8.618	-8.037
Temperature Range		20.895	22.406	22.406	20.896
Dead Load: DT1+CR+SH		913.220	1010.631	1010.325	912.199
Total: DT2+CR	Max	1274.404	1340.844	1339.877	1273.401
+SH+T+SD	Min	870.934	1012.254	1011.927	869.871

7.2 Reaction Force for Pier and Abutment

Unit: kN

		1	2	3	4	5
Weight of Girder	D1	1416.752	2833.605	2833.693	2833.693	1416.846
Cast-in-place Concrete	D2	1496.664	3191.455	3191.641	3191.640	1496.430
Weight of Bridge Surface	D3	1104.106	2632.364	1630.494	2057.765	712.177
Subtotal: DT1=D1+D2+D3		4017.522	8657.424	7655.828	8083.098	3625.453
Live Load	Max	1025.800	1897.050	1795.390	1897.100	1025.730
LT	Min	-86.430	-179.840	-275.590	-194.920	-86.410
Subtotal: DT2	Max	5059.271	10602.014	9490.856	10027.740	4667.131
=DT1+LT+SW	Min	3947.041	8525.124	7419.876	7935.720	3554.991
Creep CR		254.296	-337.239	165.851	-337.139	254.232
Drying Shrinkage SH		-33.316	42.781	-18.930	42.774	-33.310
Temperature Range		86.619	-111.230	49.218	-111.209	86.603
Dead Load: DT1+CR+SH		4238.502	8362.966	7802.749	7788.733	3846.375
Total: DT2+CR	Max	5366.870	10196.326	9686.995	9622.166	4974.656
+SH+T+SD	Min	4254.640	8119.436	7616.015	7530.146	3862.516

7.3 Horizontal Force

Horizontal Force(PF8、PF9、PF10fix)

(kN)

	PF8	PF9	PF10
Prestressing	-378	-12	388
Drying Shrinkage	-404	-12	415
Temperature(+)	421	13	-434
Temperature(-)	-421	-13	434
Dead Load	-781	-24	803
Temperature+15℃	-360	-11	369
Temperature-15℃	-1203	-37	1236
Temperature+40℃	342	10	-354
Temperature-40℃	-1905	-58	1959

8 Design of Cross Beam at End of Girder

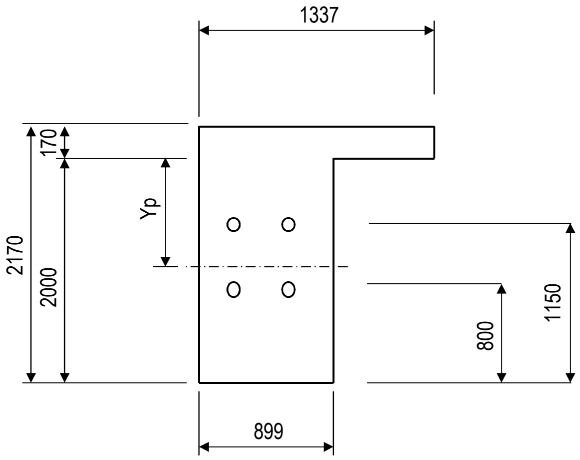
8.1 For Bending Moment

1) Calcution of Bending Moment

(kN・m)

		Bending Moment	
		max	min
Dead Load	(Md)	-68.58	-68.58
Live Load	(ML)	330.29	-211.85
Total	(M)	261.71	-280.43

2)Dimension



3)Calculation of Prestressing

Type of PC strand 4S15.2 SWPR19L

Area of PC strand 554.8 mm^2

Number of PC strand 4

(N/mm^2)

	Tensile Stress of PC strand	
	Allowable Value	Result
During Prestressing	1440	1250
Immediately after Prestressing	1295	1151
Under Effestive Prestressing Force	1110	1058

4)Combined Flexural Stress

(N/mm^2)

		Bending Moment(Max)		Bending Moment(Min)	
		Top	Bottom	Top	Bottom
Dead Load		-0.09	0.09	-0.09	0.09
Live Load		0.41	-0.44	-0.26	0.28
Prestressing		1.21	1.40	1.21	1.40
Total	Dead Load	1.12	1.49	1.12	1.49
	Live Load	1.53	1.05	0.86	1.77
Allowable Value		$0.00 \leqq \sigma \leqq 12.0$			

01-4-PC-I GIRDER BRIDGE

(PF14-AF2)

Table of Contents

Page

1.1 DESIGN CONDITION

ROAD GRADE	:	Equivalent to CLASS 4-1
BRIDGE TYPE	:	2 span continuous PC-I girder bridge with composite deck (PC plate and RC deck)
BRIDGE LENGTH	:	L = 60.000 m
SPAN LENGTH	:	L = 28.850 + 28.800 m
WIDTH OF THE ROAD	:	TOTAL 12.750 m L = 0.500 + 5.500 + 0.750 + 5.500 + 0.500 m
HORIZONTAL ALIGNMENT	:	R=∞
LONGITUDINAL SLOPE	:	3.00 % ↘
SECTION SLOPE	:	2.00 % ↙ ↘
ANGLE OF SKEW	:	90°00'00"
PAVEMENT	:	ASPHALT PAVEMENT t= 80 mm
SLAB	:	REINFORCED CONCRETE t= 170 mm
PLATE	:	PRESTRESS CONCRETE PLATE t= 100 mm
LIVE ROAD	:	AASHTO HL=93
DESIGN STANDARD	:	AASHTO LRFD BRIDGE DESIGN 2014(LIVE ROAD) Specifications for highway bridges(Japan Road Association) 1 Common matters,3 Concrete bridges,5 seismic design (April 2012)

1.2 MATERIALS STRENGTH

1) CONCRETE

(N/mm^2)

			MAIN GIRDER	CROSS BEAM	RC SLAB	PC PLATE	COUPLING CONCRETE
DESIGN STANDARD STRENGTH OF CONCRETE			40.00	30.00	30.00	40.00	30.0
BENDING COMPRESSIVESTRESS	IMMEDIATELY AFTER PRESTRESSING		19.00	14.00	----	19.00	----
	OTHERS		14.00	11.00	10.00	15.00	10.00
BENDING TENSILE STRESS	IMMEDIATELY AFTER PRESTRESSING		-1.50	-1.20	----	-1.50	----
	DEAD LOAD		0.0	0.0	----	----	----
	DESIGN LOAD		-1.50	-1.20	----	0.0	----
	TEMPERATURE CHANGE		-2.00	----	----	----	----
MEAN SHEAR STRESS CONCRETE CAN CARRY			0.55	0.45	----	----	----
MAXIMUM MEAN CONCRETE SHEAR STRESS			5.30	4.00	----	----	----
ALLOWABLE DIAGONEL TENSILE STRESS (Case where shear forse or torsional moment)		DEAD LOAD	-1.00	-0.80	----	----	----
		LIVE LOAD	-2.00	-1.70	----	----	----
ALLOWABLE DIAGONEL TENSILE STRESS (Case where both shear forse and torsional moment)		DEAD LOAD	-1.30	-1.10	----	----	----
		LIVE LOAD	-2.50	-2.20	----	----	----

2) PC STRAND

(N/mm^2)

		MAIN GIRDER	CROSS BEAM	PC PLATE
PRESTRESSING STEEL TYPE		SWPR7BL 7S15.2mm	SWPR7BL 4S15.2mm	SWPR7AL 1S9.3mm
TENSILE STRENGTH		1850	1850	1700
YIELD POINT		1600	1600	1450
ALLOWABLE TENSILE STRESS	DURING PRESTRESSING	1440	1440	1305
	IMMEDIATELY AFTER PRESTRESSING	1295	1295	1190
	AT COMPOSITION OF SLAB	1110	----	----
	DESIGN LOAD	1110	1110	1020

3) REINFORCING STEEL

(N/mm^2)

		MAIN GIRDER	CROSS BEAM	RC SLAB	COUPLING CONCRETE
STEEL TYPE		SD345	SD345	SD345	SD345
YIELD POINT		345	345	345	345
ALLOWABLE TENSILE STRESS	DEAD LOAD	----	----	100	100
	DESIGN LOAD	180	200	140	160
	COLLISION LOAD	----	----	300	----
	WIND LOAD	----	----	175	----

1.3 DESIGN CONSTANT

1) CONCRETE

			MAIN GIRDER	CAST IN PLACE	PC PLATE
YOUNG'S MODULUS	DESIGN LOAD	(N/mm2)	3.10×10^4	2.80×10^4	3.10×10^4
	IMMEDIATELY AFTER PRESTRESSING	(N/mm2)	2.92×10^4	2.58×10^4	2.92×10^4
CREEP COEFFICIENT	NUMBER OF DAYS FOR DECK CONSTRUCTION		90	----	----
	NUMBER OF CONSTRUCTION DAYS FOR BRIDGE SURFACE		120	----	----
	DESIGN LOAD		2.60	2.60	3.00
	DURING DECK CONSTRUCTION		1.70	----	----
	BRIDGE SURFACE		1.65	----	----
DRYING SHRINKAGE OF CONCRETE	DURING DECK CONSTRUCTION		4.0×10^{-5}	----	----
	DESIGN LOAD		20.0×10^{-5}	20.0×10^{-5}	20.0×10^{-5}
UNIT WEIGHT		(kN/mm^3)	24.5	24.5	24.5

2) PC STRAND(MAIN GIRDER)

		1	2
YOUNG'S MODULUS	N/mm^2	2.00×10^5	2.00×10^5
SLIP	mm	4.0	4.0
RELAXATION	%	2.5	2.5
FRICTION COEFFICIENT	1/m	0.004	0.004
	1/rad	0.300	0.300
AREA	mm^2	970.900	970.900
UNIT WEIGHT	kg/m	7.707	7.707
DIAMETER OF SHEATH	mm	60.0	60.0
DECREASE RATIO BY ANCHOR	%	0.0	0.0

3) PC STRAND(CROSS BEAM)

YOUNG'S MODULUS	N/mm^2	2.00×10^5
SLIP	mm	4.0
RELAXATION	%	2.5
FRICTION COEFFICIENT	1/m	0.004
AREA	mm^2	554.800
UNIT WEIGHT	kg/m	4.404
DIAMETER OF SHEATH	mm	45.0
DECREASE RATIO BY ANCHOR	%	0.0

4) PC STRAND(PC PLATE)

			BETWEEN MAIN GIRDERS
YOUNG'S MODULUS		N/mm^2	2.00×10^5
RELAXATION	BEFORE PRESTRESSING	%	1.5
	AFTER PRESTRESSING	%	1.5
	EXTRA COEFFICIENT OF HIGH TEMPERATURE	%	1.0
AREA		mm^2	51.610
UNIT WEIGHT		kg/m	0.405

1. 5 Dimension

1) Dimension of Main Girder

Girder Height : 1900.00 ～ 1900.00 mm

【Change of Web Width (mm)】

Span	End of Girder (Left Side)			End of Girder (Right Side)		
	Ending Point of Changing Web Width	Starting Point of Changing Web Width	Web Width	Ending Point of Changing Web Width	Starting Point of Changing Web Width	Web Width
1	1000.0	4000.0	700.0	4000.0	1000.0	700.0
2	1000.0	4000.0	700.0	4000.0	1000.0	700.0

2) Dimension of Cross Beam

【Interval of Cross Beam on Left Girder (m)】

Span	Number of Intermediate Cross Beams	CB1～CB2	CB2～CB3
1	1	14.925	14.925
2	1	14.900	14.900

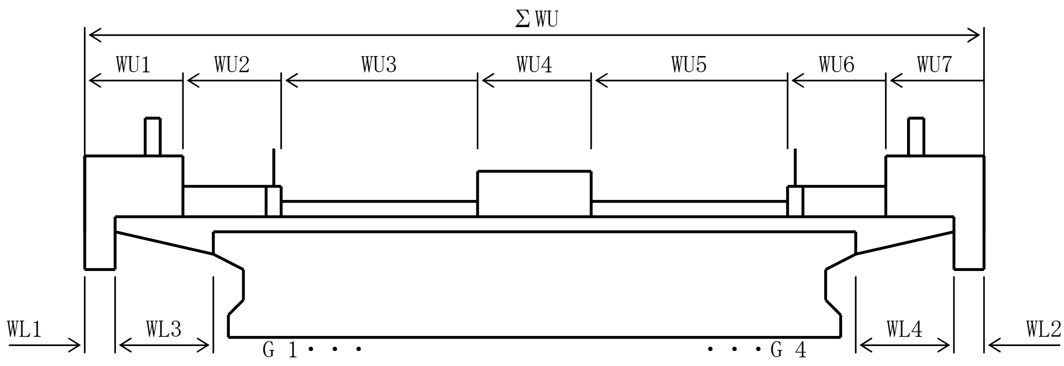
【Interval of Cross Beam on Right Girder (m)】

Span	Number of Intermediate Cross Beams	CB1～CB2	CB2～CB3
1	1	14.925	14.925
2	1	14.900	14.900

【Dimension of Cross Beam (m)】

Span	Cross Beam Width	Cross Beam Width (Left Side)	Cross Beam Width (Right Side)
1	0.300	0.900	0.950
2	0.300	0.950	0.900

【Cross Section 】



【m】

	ΣWU	WU1	WU2	WU3	WU4	WU5	WU6	WU7
1	12.750	0.500	0.000	5.500	0.750	5.500	0.000	0.500
2	12.750	0.500	0.000	5.500	0.750	5.500	0.000	0.500
3	12.750	0.500	0.000	5.500	0.750	5.500	0.000	0.500

	ΣWU	WL1	WL2	WL3	WL4
1	3.500	0.000	0.000	0.475	0.475
2	3.500	0.000	0.000	0.475	0.475
3	3.500	0.000	0.000	0.475	0.475

2. 1 Load Intensity

1) Load Intensity

(1) Bridge Surface Loads

< 1 >

Load Type		Load Intensity	Load Location	
			Left End of Girder Side	Right End of Girder Side
Selfweight of Kerb	Left	8.570 kN/m	0.180 m	0.180 m
	Right	8.570 kN/m	0.180 m	0.180 m
Selfweight of Concrete Barrier	Left	0.600 kN/m	0.125 m	0.125 m
	Right	0.600 kN/m	0.125 m	0.125 m
Selfweight of Sidewalk	Left	0.000 kN/m²		
	Right	0.000 kN/m²		
Selfweight of Handrail	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Kerb	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Pavement	Left	3.070 kN/m²		
	Right	3.070 kN/m²		
Selfweight of Median		10.790 kN/m²		
Selfweight of Additional Object	1	0.110 kN/m	0.075 m	0.075 m
	2	0.110 kN/m	12.675 m	12.675 m

< 2 >

Load Type		Load Intensity	Load Location	
			Left End of Girder Side	Right End of Girder Side
Selfweight of Kerb	Left	8.570 kN/m	0.180 m	0.180 m
	Right	8.570 kN/m	0.180 m	0.180 m
Selfweight of Concrete Barrier	Left	0.600 kN/m	0.125 m	0.125 m
	Right	0.600 kN/m	0.125 m	0.125 m
Selfweight of Sidewalk	Left	0.000 kN/m²		
	Right	0.000 kN/m²		
Selfweight of Handrail	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Kerb	Left	0.000 kN/m	m	m
	Right	0.000 kN/m	m	m
Selfweight of Pavement	Left	3.070 kN/m²		
	Right	3.070 kN/m²		
Selfweight of Median		10.790 kN/m²		
Selfweight of Additional Object	1	0.110 kN/m	0.075 m	0.075 m
	2	0.110 kN/m	12.675 m	12.675 m

Condition of Load

Calculation of Bridge Surface Loads

(PF14-AF2)

① Unit Weight

PC・RC Concrete	γ1＝	24.5 kN/m^3
Concrete	γ2＝	23.0 kN/m^3
Asphalt Pavement	γ3＝	22.5 kN/m^3

② Bridge Surface Loads

・ Pavement on Left Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

t' = 1/2 × (0.080 ＋ 0.190) = 0.135 m

(Thickness of Leveling Concrete)

tc = 0.135 － 0.080 = 0.055 m

(Load Intensity)

q = 0.080 × 22.5 ＋ 0.055 × 23.0 = 3.07 kN/m^2

・ Pavement on Right Lane (Asphalt Pavement t = 80 mm)

(Mean Thickness)

t' = 1/2 × (0.190 ＋ 0.080) = 0.135 m

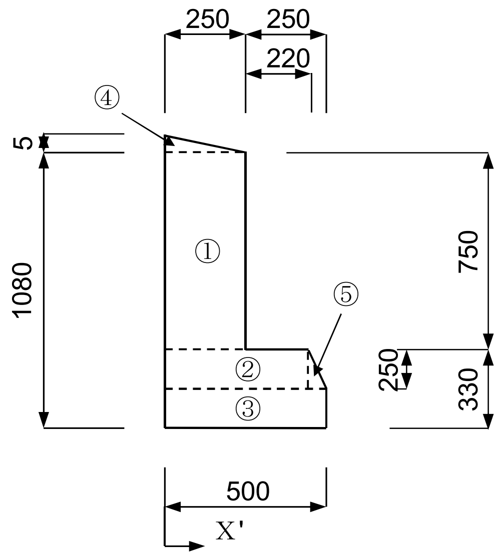
(Thickness of Leveling Concrete)

tc = 0.135 － 0.080 = 0.055 m

(Load Intensity)

q = 0.080 × 22.5 ＋ 0.055 × 23.0 = 3.07 kN/m^2

・Concrete Barrier (Left Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.080	0.500	0.0400	0.250	0.01000
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3494		0.0629

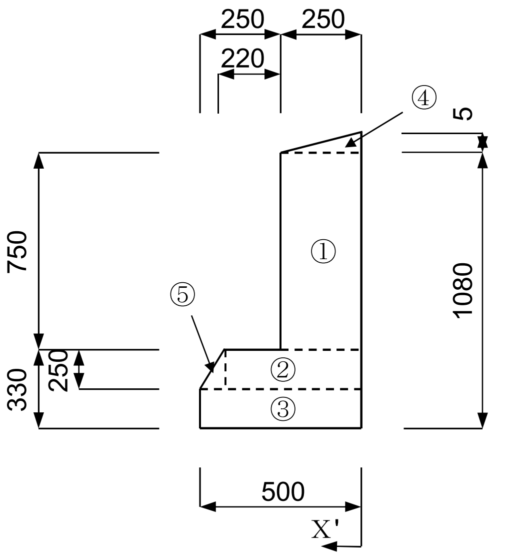
Load Location

X’ = 0.0629 / 0.3494 = 0.180 m

Load Intensity

P = 0.3494 × 24.5 = 8.57 kN/m

・Concrete Barrier (Right Side)



a) Load Intensity and Load Location

		H	B	A	X	A×X
①	□	0.750	0.250	0.1875	0.125	0.02344
②	□	0.250	0.470	0.1175	0.235	0.02761
③	□	0.080	0.500	0.0400	0.250	0.01000
④	△	0.005	0.250	0.0006	0.083	0.00005
⑤	△	0.250	0.030	0.0038	0.480	0.00180
				0.3494		0.0629

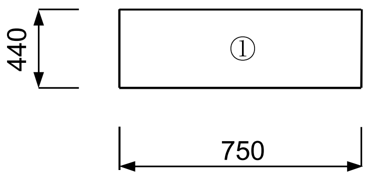
Load Location

X’ = 0.0629 / 0.3494 = 0.180 m

Load Intensity

P = 0.3494 × 24.5 = 8.57 kN/m

・Median



a) Load Intensity and Load Location

		H	B	A
①	□	0.4400	0.7500	0.3300
				0.3300

Load Location

X' = On CL

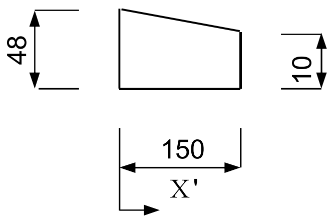
Load Intensity

P = 0.3300 × 24.5 = 8.09 kN/m

W = 8.0900 / 0.750 = 10.79 kN/m^2

・Left Drain Duct

※Loaded as Selfweight of Additional Object 1



Load Location

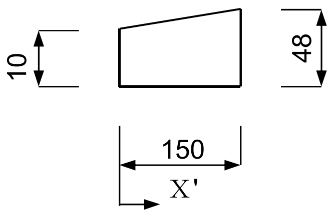
X' = 75mm inside beginning of Left Kerb

Load Intensity

P = 1/2 × (0.048 ＋ 0.010) × 0.150 × 24.5 = 0.11 kN/m

・Right Drain Duct

※Loaded as Selfweight of Additional Object 2



Load Location

X' = 75mm inside beginning of Right Kerb

Load Intensity

P = 1/2 × (0.010 ＋ 0.048) × 0.150 × 24.5 = 0.11 kN/m

・Handrail

※Loaded as Concrete Barrier

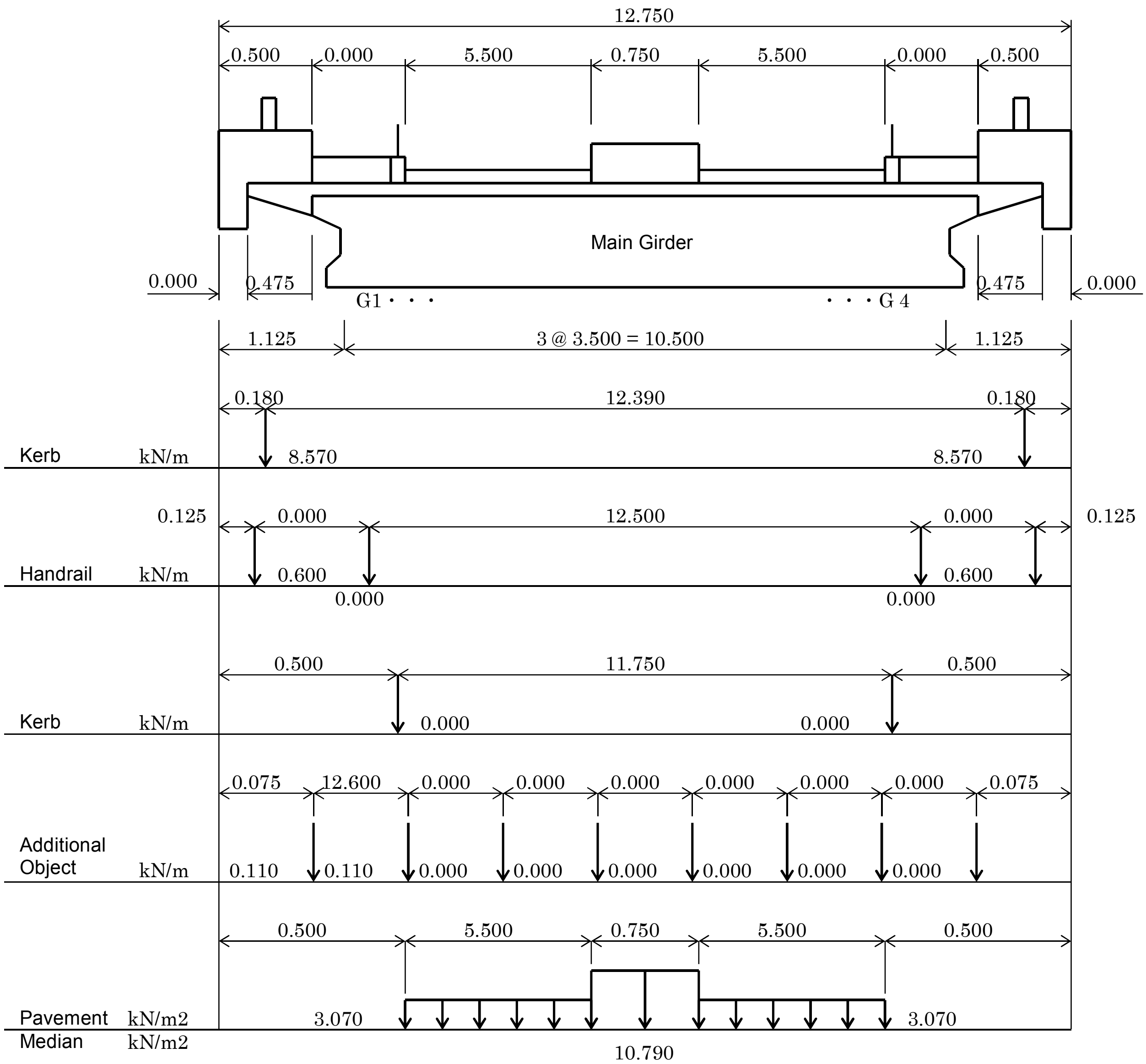
Load Location

X' = 125mm inside beginning of Right and Left Kerb

Load Intensity

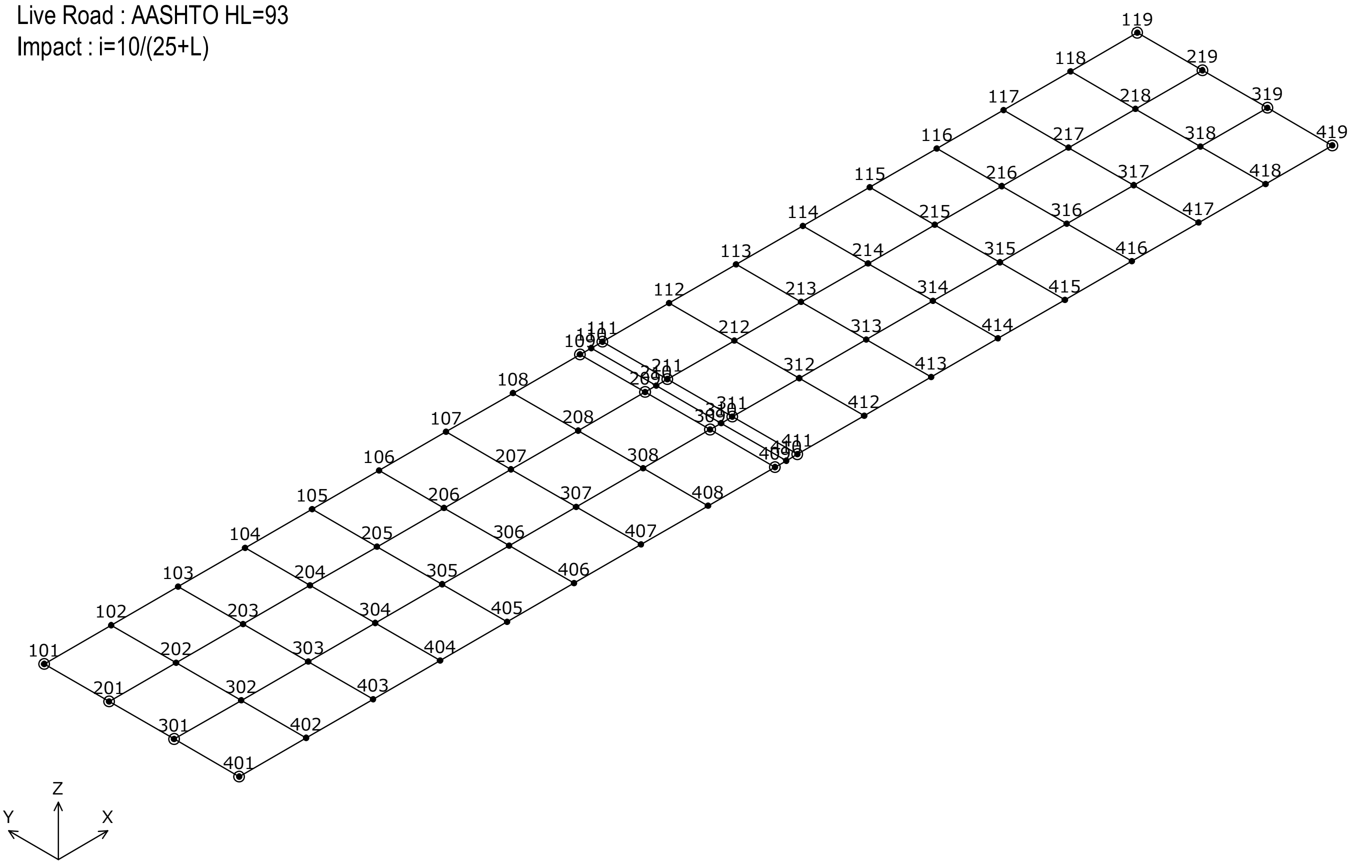
P = 0.60 = 0.60 kN/m

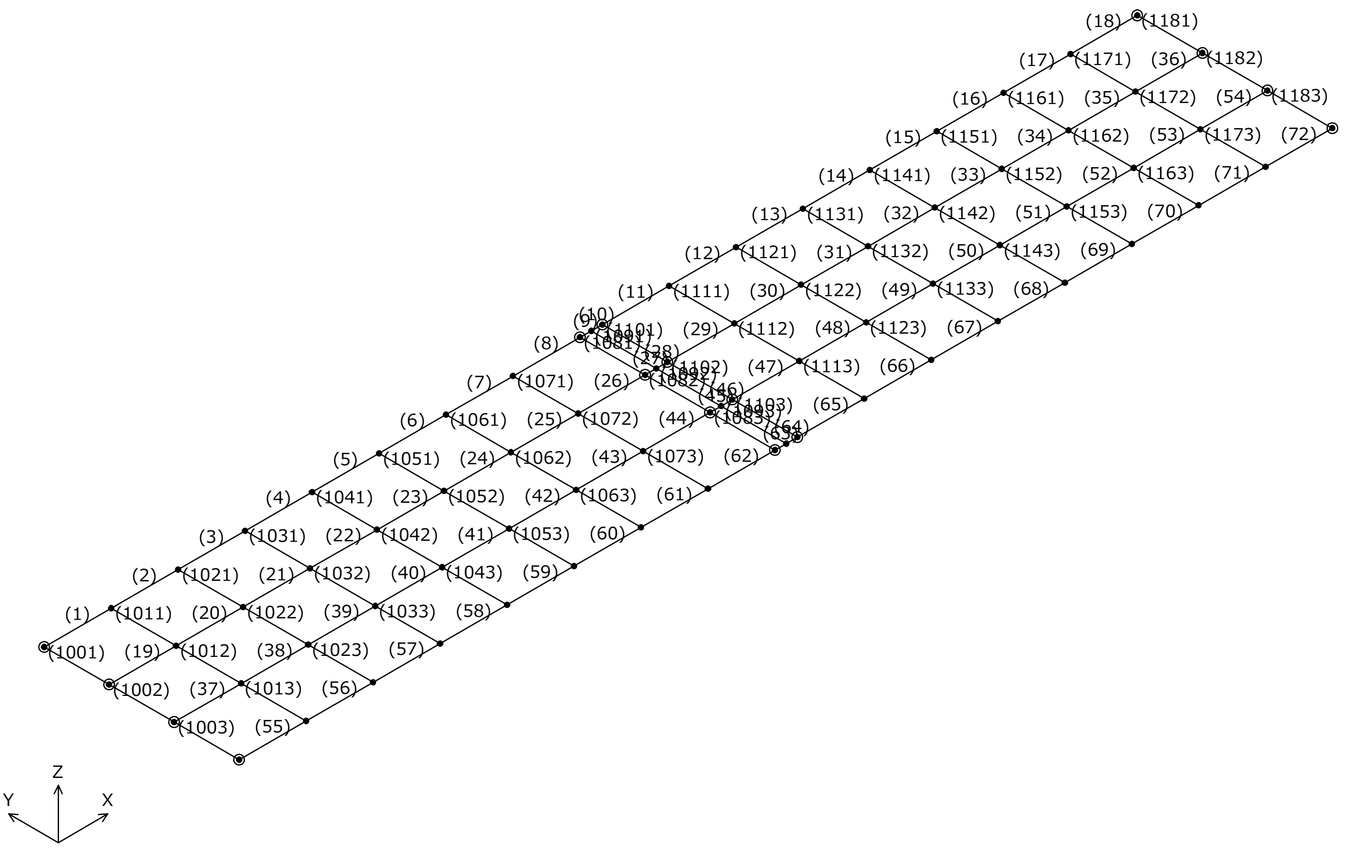
Load Intensity（Bridge Surface Loads）



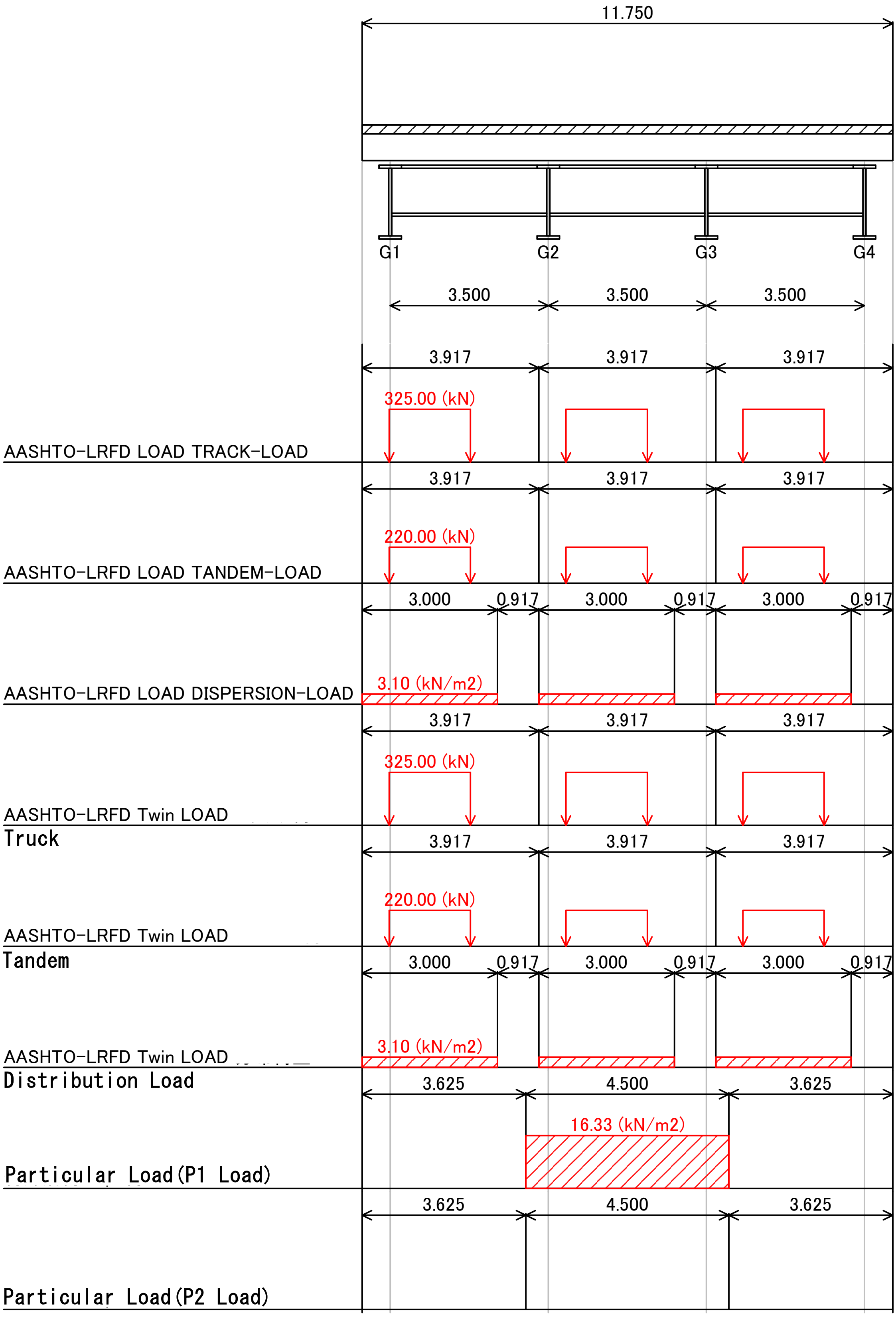
(2) Live Road

Live Road : AASHTO HL=93
Impact : i=10/(25+L)





< C1 > (m)

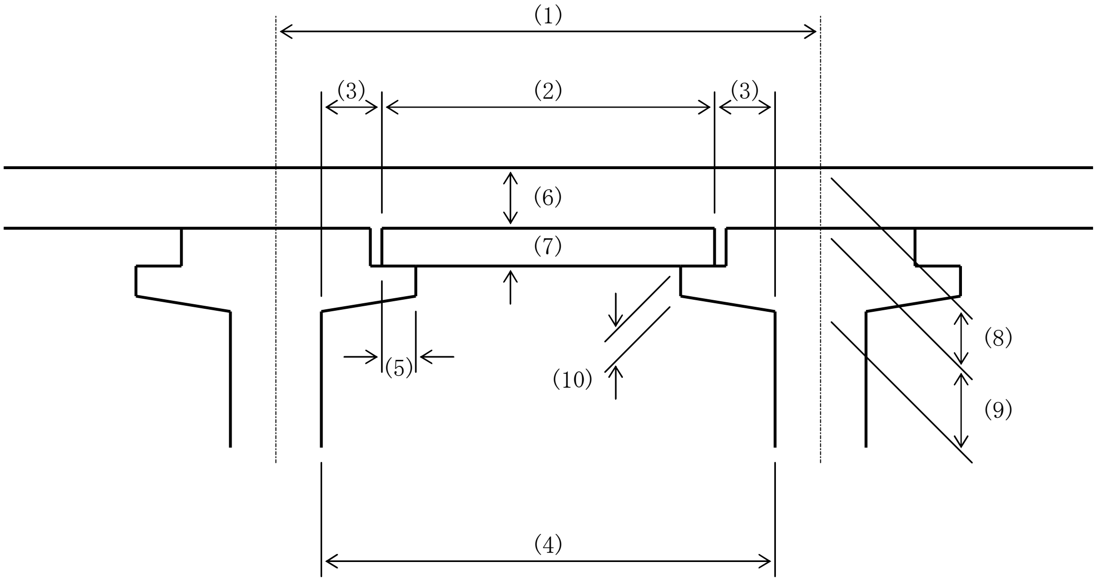


11.750
G1
G2
G3
G4
3.500
3.500
3.500
3.917
3.917
3.917
325.00 (kN)
AASHTO-LRFD LOAD TRACK-LOAD
3.917
3.917
3.917
220.00 (kN)
AASHTO-LRFD LOAD TANDEM-LOAD
3.000
0.917
3.000
0.917
3.000
0.917
3.10 (kN/m2)
AASHTO-LRFD LOAD DISPERSION-LOAD
3.917
3.917
3.917
325.00 (kN)
AASHTO-LRFD Twin LOAD
Truck
3.917
3.917
3.917
220.00 (kN)
AASHTO-LRFD Twin LOAD
Tandem
3.000
0.917
3.000
0.917
3.000
0.917
3.10 (kN/m2)
AASHTO-LRFD Twin LOAD
Distribution Load
3.625
4.500
3.625
16.33 (kN/m2)
Particular Load(P1 Load)
3.625
4.500
3.625
Particular Load(P2 Load)

3 Design of Deck Slab

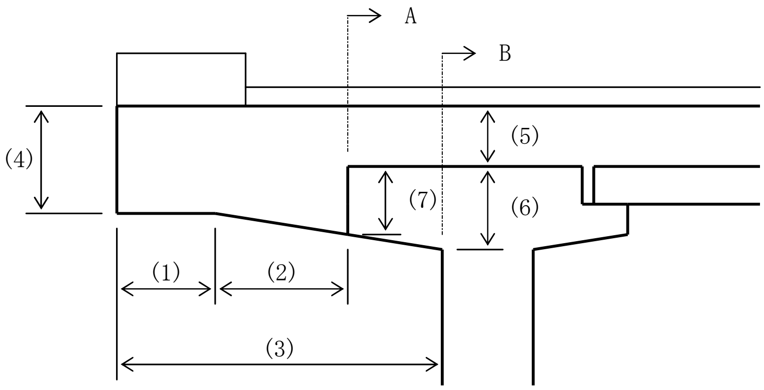
3.1 Dimension

1) Deck Slab between Girders



		1st Span	
		End of Girder	Center of Girder
(1)	m	3.500	3.500
(2)	m	2.380	2.380
(3)	m	0.210	0.450
(4)	m	2.800	3.280
(5)	m	0.090	0.090
Span Length of PC Plate	m	2.260	2.260
(6)	mm	170.0	170.0
(7)	mm	100.0	100.0
(6)+(7)	mm	270.0	270.0
(8)	mm	170.0	170.0
(9)	mm	255.6	300.0
(10)	mm	100.0	100.0

2) Deck Slab outside of Girders



			1st Span	
			End of Girder	End of Girder
Left Side	(1)	m	0.000	0.000
	(2)	m	0.475	0.475
	(3)	m	0.775	1.015
	(4)	mm	250.0	250.0
	(5)	mm	170.0	170.0
	(6)	mm	255.6	300.0
	(7)	mm	200.0	200.0
Right Side	(1)	m	0.000	0.000
	(2)	m	0.475	0.475
	(3)	m	0.775	1.015
	(4)	mm	250.0	250.0
	(5)	mm	170.0	170.0
	(6)	mm	255.6	300.0
	(7)	mm	200.0	200.0

3) Calculation of Prestressing of PC Plate

		Unit	
Name of PC Strand			1S9.3
Material of PC Strand			SWPR7AL
Area of PC Strand		mm^2/no.	51.61
Number of PC Strand		No.	15
Creep Coefficient			3.00
Drying Shrinkage of Concrete		$\times 10^{-5}$	25.00
Relaxation	Before Prestressing	%	1.50
	Extra Coefficient of High Temperature	%	1.00
	After Prestressing	%	1.50
Prestressing Stress σpi		N/mm^2	1225.00
Allowable Value		N/mm^2	1305.00

<Design of Deck: Summary for Calculation Results of Stress>

1st Span， Left End of Girder Side

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5 ～19.0	9.17	○
	Bottom of PC Plate	N/mm^2		8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0 ～15.0	10.584	○
	Bottom of PC Plate	N/mm^2		3.691	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	3.531	○
	Bottom of RC Deck	N/mm^2		-0.811	○
	Top of PC Plate	N/mm^2	0 ～15.0	8.345	○
	Bottom of PC Plate	N/mm^2		1.306	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	921.933	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.584	○	140	74.435	○
Edge of PC Plate	Positive Moment	10	3.901	○	140	60.61	○
	Negative Moment	10	3.785	○	140	79.265	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	8.659	○	140	100.221	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	0.56	○
Tensile Stress of Reinforcement Bar	140	27.98	○

<Design of Deck: Summary for Calculation Results of Stress>

1st Span,　Left End of Girder Side

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	5.392	○
	D+L	10	0.206	○	140	5.392	○
	D+L+CO	15	2.043	○	300	53.535	○
	D+L+W	12.5	0.351	○	175	9.191	○
	D+W	12.5	0.496	○	175	12.99	○
Supporting for Deck	D	------	------	--	100	10.212	○
	D+L	10	1.14	○	140	32.822	○
	D+L+CO	15	2.592	○	300	74.651	○
	D+L+W	12.5	1.256	○	175	36.164	○
	D+W	12.5	0.587	○	175	16.896	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	5.392	○
	D+L	10	0.206	○	140	5.392	○
	D+L+CO	15	2.043	○	300	53.535	○
	D+L+W	12.5	0.351	○	175	9.191	○
	D+W	12.5	0.496	○	175	12.99	○
Supporting for Deck	D	------	------	--	100	10.212	○
	D+L	10	1.14	○	140	32.822	○
	D+L+CO	15	2.592	○	300	74.651	○
	D+L+W	12.5	1.256	○	175	36.164	○
	D+W	12.5	0.587	○	175	16.896	○

Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	1.618	○	140	58.5	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	1.618	○	140	58.5	○

<Design of Deck: Summary for Calculation Results of Stress>

1st Span,　Center of Span

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5 ～19.0	9.17	○
	Bottom of PC Plate	N/mm^2		8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0 ～15.0	10.59	○
	Bottom of PC Plate	N/mm^2		3.697	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	4.225	○
	Bottom of RC Deck	N/mm^2		-0.97	○
	Top of PC Plate	N/mm^2	0 ～15.0	8.174	○
	Bottom of PC Plate	N/mm^2		0.58	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	922.752	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.556	○	140	78.616	○
Edge of PC Plate	Positive Moment	10	6.711	○	140	104.266	○
	Negative Moment	10	3.267	○	140	68.414	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	9.958	○	140	115.254	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	1.002	○
Tensile Stress of Reinforcement Bar	140	55.499	○

<Design of Deck: Summary for Calculation Results of Stress>

1st Span,　Center of Span

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	5.392	○
	D+L	10	0.206	○	140	5.392	○
	D+L+CO	15	2.043	○	300	53.535	○
	D+L+W	12.5	0.351	○	175	9.191	○
	D+W	12.5	0.496	○	175	12.99	○
Supporting for Deck	D	------	------	--	100	13.776	○
	D+L	10	2.099	○	140	64.554	○
	D+L+CO	15	3.334	○	300	102.538	○
	D+L+W	12.5	2.199	○	175	67.618	○
	D+W	12.5	0.647	○	175	19.904	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	5.392	○
	D+L	10	0.206	○	140	5.392	○
	D+L+CO	15	2.043	○	300	53.535	○
	D+L+W	12.5	0.351	○	175	9.191	○
	D+W	12.5	0.496	○	175	12.99	○
Supporting for Deck	D	------	------	--	100	13.776	○
	D+L	10	2.099	○	140	64.554	○
	D+L+CO	15	3.334	○	300	102.538	○
	D+L+W	12.5	2.199	○	175	67.618	○
	D+W	12.5	0.647	○	175	19.904	○

Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	2.053	○	140	74.245	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	2.053	○	140	74.245	○

<Design of Deck: Summary for Calculation Results of Stress>

2nd Span， Center of Span

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5 ～19.0	9.17	○
	Bottom of PC Plate	N/mm^2		8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0 ～15.0	10.59	○
	Bottom of PC Plate	N/mm^2		3.697	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	4.225	○
	Bottom of RC Deck	N/mm^2		-0.97	○
	Top of PC Plate	N/mm^2	0 ～15.0	8.174	○
	Bottom of PC Plate	N/mm^2		0.58	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	922.752	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.556	○	140	78.616	○
Edge of PC Plate	Positive Moment	10	6.711	○	140	104.266	○
	Negative Moment	10	3.267	○	140	68.414	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	9.958	○	140	115.254	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	1.002	○
Tensile Stress of Reinforcement Bar	140	55.499	○

<Design of Deck: Summary for Calculation Results of Stress>

2nd Span， Center of Span

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	5.392	○
	D+L	10	0.206	○	140	5.392	○
	D+L+CO	15	2.043	○	300	53.535	○
	D+L+W	12.5	0.351	○	175	9.191	○
	D+W	12.5	0.496	○	175	12.99	○
Supporting for Deck	D	------	------	--	100	14.115	○
	D+L	10	2.11	○	140	64.892	○
	D+L+CO	15	3.345	○	300	102.877	○
	D+L+W	12.5	2.21	○	175	67.956	○
	D+W	12.5	0.658	○	175	20.242	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	5.392	○
	D+L	10	0.206	○	140	5.392	○
	D+L+CO	15	2.043	○	300	53.535	○
	D+L+W	12.5	0.351	○	175	9.191	○
	D+W	12.5	0.496	○	175	12.99	○
Supporting for Deck	D	------	------	--	100	14.115	○
	D+L	10	2.11	○	140	64.892	○
	D+L+CO	15	3.345	○	300	102.877	○
	D+L+W	12.5	2.21	○	175	67.956	○
	D+W	12.5	0.658	○	175	20.242	○

Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	2.053	○	140	74.245	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	2.053	○	140	74.245	○

<Design of Deck: Summary for Calculation Results of Stress>

2nd Span, Right End of Girder Side

Deck Slab between Main Girders in Transverse Direction (PC Plate・Composite Deck Slab)

Item		Unit	Allowable Value	Result	
Immediately After Prestressing	Top of PC Plate	N/mm^2	-1.5 ～19.0	9.17	○
	Bottom of PC Plate	N/mm^2		8.343	○
	Max×0.6	N/mm^2	8.343	5.502	○
Bending stress of PC plate	Top of PC Plate	N/mm^2	0 ～15.0	10.584	○
	Bottom of PC Plate	N/mm^2		3.691	○
Bending stress of Composite Deck Slab	Top of RC Deck	N/mm^2	11	3.531	○
	Bottom of RC Deck	N/mm^2		-0.811	○
	Top of PC Plate	N/mm^2	0 ～15.0	8.345	○
	Bottom of PC Plate	N/mm^2		1.306	○
Stress of PC Strand	Stress of PC Strand during Prestressing	N/mm^2	1305	1225	○
	Immediately After Prestressing	N/mm^2	1190	1131.097	○
	Effective Prestressing Force	N/mm^2	1020	921.933	○
Axial stess of PC plate		N/mm^2	10	8.756	○

Deck Slab between Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Supporting for Deck		10	2.584	○	140	74.435	○
Edge of PC Plate	Positive Moment	10	3.901	○	140	60.61	○
	Negative Moment	10	3.785	○	140	79.265	○

Deck Slab between Main Girders in Longitudinal Direction (RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Center of RC Deck	10	8.659	○	140	100.221	○

Upper Flange (During Deck Construction)

Item (N/mm2)	Allowable Value	Result	
Mean Shear Stress	0.55	0.12	○
Bending Stress of Concrete	10	0.56	○
Tensile Stress of Reinforcement Bar	140	27.98	○

<Design of Deck: Summary for Calculation Results of Stress>

2nd Span, Right End of Girder Side

Deck Slab outside of Main Girder in Transverse Direction (RC Deck)

Item (N/mm2)		Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
		Allowable Value	Result		Allowable Value	Result	
Deck Slab outside of Main Girder (Left Side)							
Edge of Upper Flange	D	------	------	--	100	5.392	○
	D+L	10	0.206	○	140	5.392	○
	D+L+CO	15	2.043	○	300	53.535	○
	D+L+W	12.5	0.351	○	175	9.191	○
	D+W	12.5	0.496	○	175	12.99	○
Supporting for Deck	D	------	------	--	100	10.212	○
	D+L	10	1.14	○	140	32.822	○
	D+L+CO	15	2.592	○	300	74.651	○
	D+L+W	12.5	1.256	○	175	36.164	○
	D+W	12.5	0.587	○	175	16.896	○
Deck Slab outside of Main Girder (Right Side)							
Edge of Upper Flange	D	------	------	--	100	5.392	○
	D+L	10	0.206	○	140	5.392	○
	D+L+CO	15	2.043	○	300	53.535	○
	D+L+W	12.5	0.351	○	175	9.191	○
	D+W	12.5	0.496	○	175	12.99	○
Supporting for Deck	D	------	------	--	100	10.212	○
	D+L	10	1.14	○	140	32.822	○
	D+L+CO	15	2.592	○	300	74.651	○
	D+L+W	12.5	1.256	○	175	36.164	○
	D+W	12.5	0.587	○	175	16.896	○

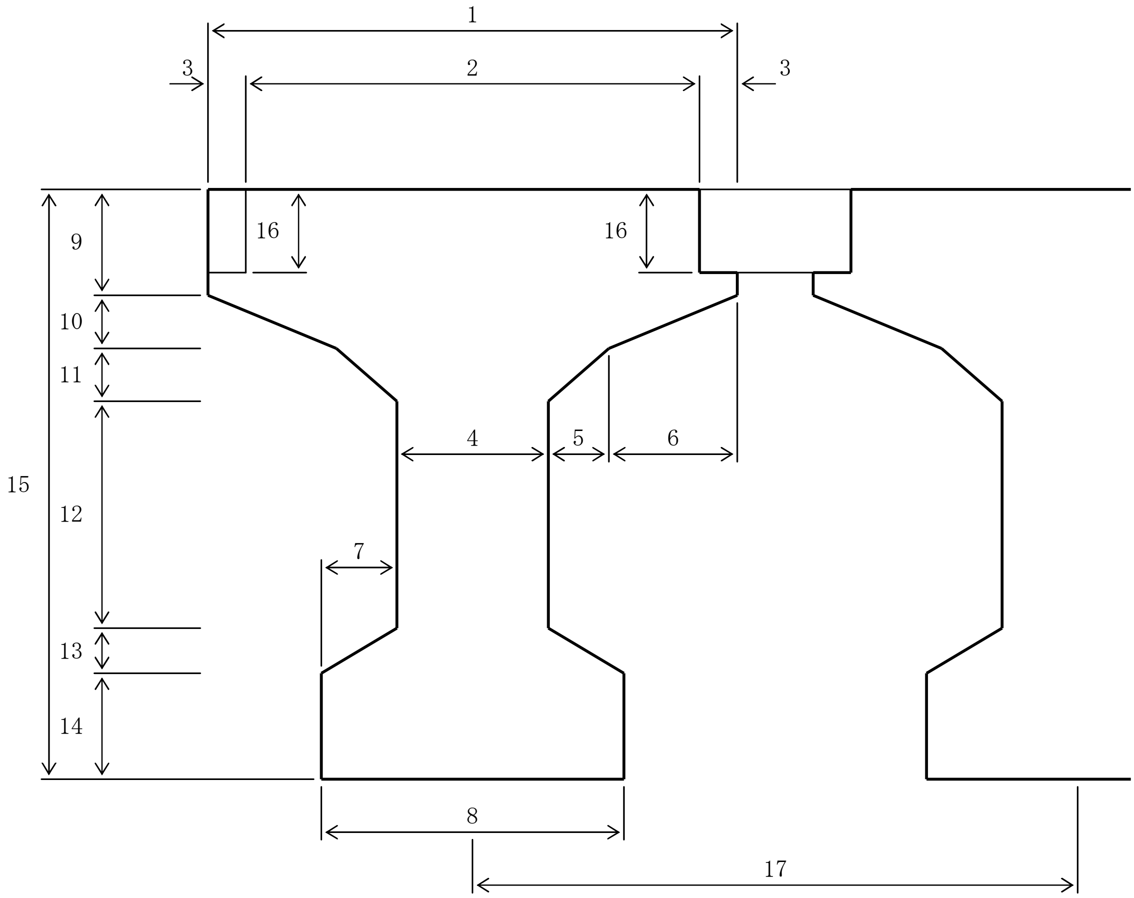
Deck Slab outside of Main Girder in Longitudinal Direction(RC Deck)

Item (N/mm2)	Bending Stress of Concrete			Tensile Stress of Reinforcement Bar		
	Allowable Value	Result		Allowable Value	Result	
Edge of Upper Flange (Left Side)	10	0	○	140	0	○
Supporting for Deck (Left Side)	10	1.618	○	140	58.5	○
Edge of Upper Flange (Right Side)	10	0	○	140	0	○
Supporting for Deck (Right Side)	10	1.618	○	140	58.5	○

4 Design of Main Girder

4.1 Dimension and PC Strand Arrangement

1) Dimension



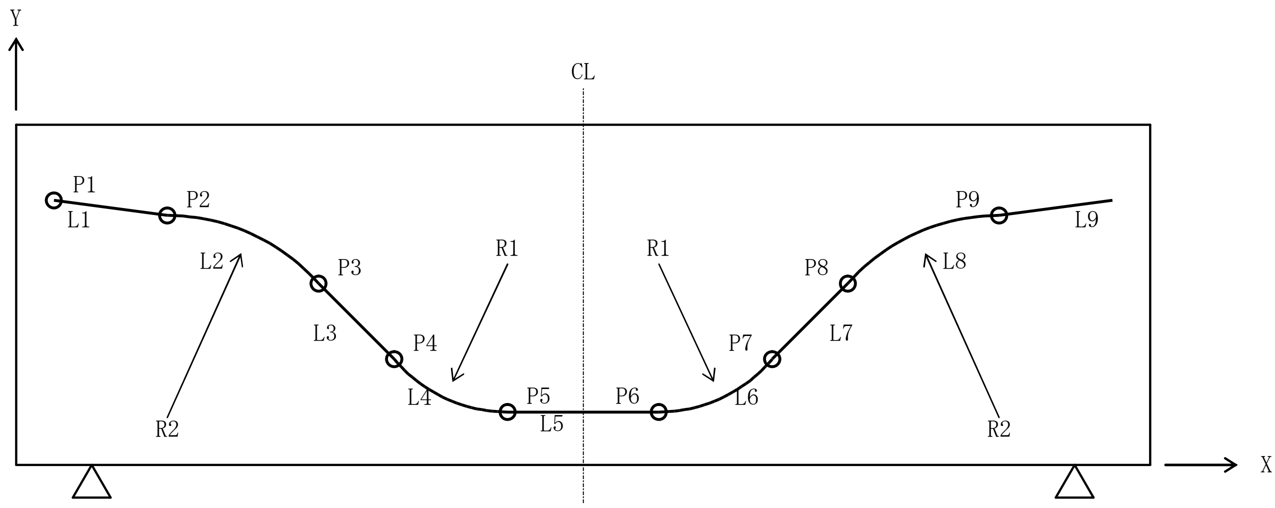
(Unit: mm)

	1st Span			2nd Span		
	End of Girder (Left)	Center Span	End of Girder (Right)	End of Girder (Left)	Center Span	End of Girder (Right)
1	1300.0	1300.0	1300.0	1300.0	1300.0	1300.0
2	1060.0	1060.0	1060.0	1060.0	1060.0	1060.0
3	120.0	120.0	120.0	120.0	120.0	120.0
4	700.0	220.0	700.0	700.0	220.0	700.0
5	0.0	0.0	0.0	0.0	0.0	0.0
6	300.0	540.0	300.0	300.0	540.0	300.0
7	0.0	240.0	0.0	0.0	240.0	0.0
8	700.0	700.0	700.0	700.0	700.0	700.0
9	200.0	200.0	200.0	200.0	200.0	200.0
10	55.6	100.0	55.6	55.6	100.0	55.6
11	0.0	0.0	0.0	0.0	0.0	0.0
12	1444.4	1150.0	1444.4	1444.4	1150.0	1444.4
13	0.0	250.0	0.0	0.0	250.0	0.0
14	200.0	200.0	200.0	200.0	200.0	200.0
15	1900.0	1900.0	1900.0	1900.0	1900.0	1900.0
16	100.0	100.0	100.0	100.0	100.0	100.0
17	3500.0	3500.0	3500.0	3500.0	3500.0	3500.0

2) PC Strand Arrangement

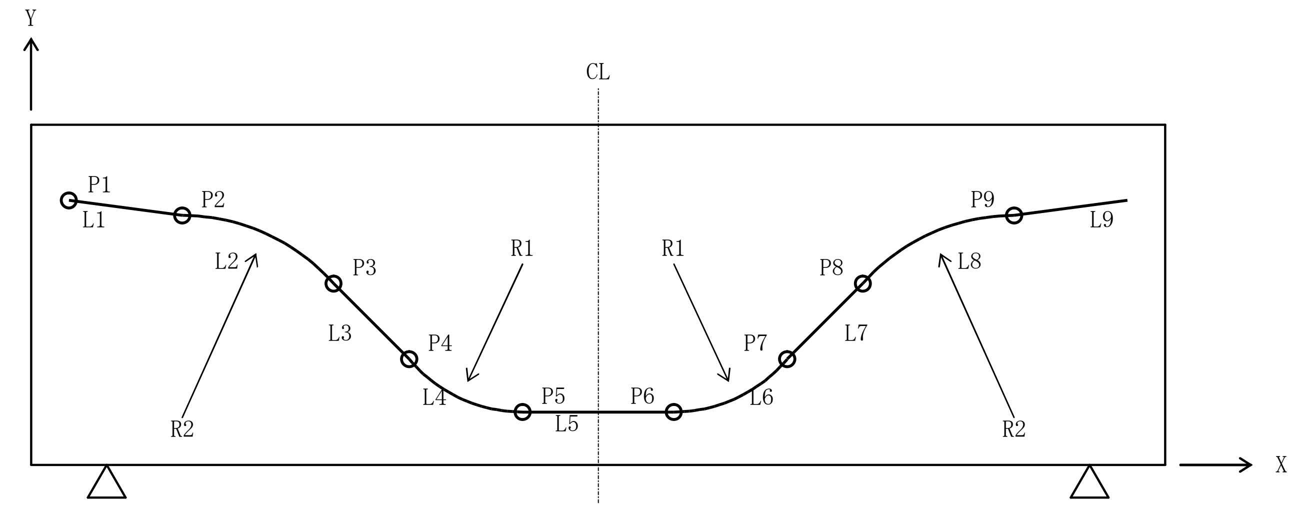
<1st Span>

PC Strand No.			1	2	3	4	5
Number of PC Strand			1	1	1	1	1
Coordinate (mm)	P1	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
	P2	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
	P3	X	200.0	200.0	200.0	200.0	200.0
		Y	1650.0	1300.0	950.0	600.0	250.0
	P4	X	13119.0	10730.4	8341.8	4706.9	1710.7
		Y	406.0	286.0	166.0	166.0	144.4
	P5	X	14077.5	11688.9	9300.2	5665.3	2408.3
		Y	360.0	240.0	120.0	120.0	120.0
	P6	X	16120.5	17993.7	19866.9	22717.5	25539.2
		Y	360.0	240.0	120.0	120.0	120.0
	P7	X	17339.2	19212.4	21085.6	23936.2	26497.7
		Y	434.5	314.5	194.5	194.5	166.0
	P8	X	26631.3	26631.3	26631.3	26631.3	26891.5
		Y	1575.5	1225.5	875.5	525.5	204.0
	P9	X	27850.0	27850.0	27850.0	27850.0	27850.0
		Y	1650.0	1300.0	950.0	600.0	250.0
	P1	X	29650.0	29650.0	29650.0	29650.0	29650.0
		Y	1650.0	1300.0	950.0	600.0	250.0
Angle	α	(L)	5°30'0"	5°30'0"	5°30'0"	5°30'0"	4°0'0"
		(R)	0°0'0"	0°0'0"	0°0'0"	0°0'0"	0°0'0"
Radius (m)	R2	(L)	----------	----------	----------	----------	----------
	R1	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(R)	10.000	10.000	10.000	10.000	10.000
	R2	(R)	10.000	10.000	10.000	10.000	10.000
Angle	β	(L)	----------	----------	----------	----------	----------
		(R)	7°0'0"	7°0'0"	7°0'0"	7°0'0"	5°30'0"
Length of PC Strand (m)	L1		----------	----------	----------	----------	----------
	L2		----------	----------	----------	----------	----------
	L3		12.979	10.579	8.179	4.528	1.514
	L4		0.960	0.960	0.960	0.960	0.698
	L5		2.043	6.305	10.567	17.052	23.131
	L6		1.222	1.222	1.222	1.222	0.960
	L7		9.362	7.475	5.587	2.715	0.396
	L8		1.222	1.222	1.222	1.222	0.960
	L9		1.800	1.800	1.800	1.800	1.800
	Total		29.587	29.562	29.537	29.499	29.459



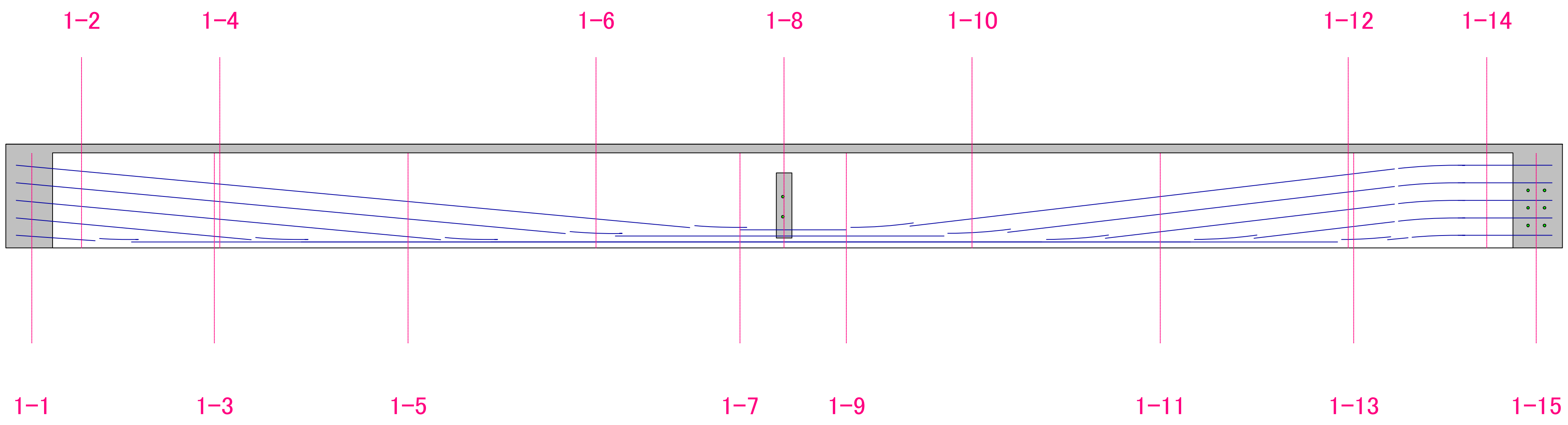
<2nd Span>

PC Strand No.			1	2	3	4	5
Number of PC Strand			1	1	1	1	1
Coordinate (mm)	P1	X	200.0	200.0	200.0	200.0	200.0
		Y	1650.0	1300.0	950.0	600.0	250.0
	P2	X	2000.0	2000.0	2000.0	2000.0	2000.0
		Y	1650.0	1300.0	950.0	600.0	250.0
	P3	X	3218.7	3218.7	3218.7	3218.7	2958.5
		Y	1575.5	1225.5	875.5	525.5	204.0
	P4	X	12510.8	10637.6	8764.4	5913.8	3352.3
		Y	434.5	314.5	194.5	194.5	166.0
	P5	X	13729.5	11856.3	9983.1	7132.5	4310.8
		Y	360.0	240.0	120.0	120.0	120.0
	P6	X	15722.5	18111.1	20499.8	24134.7	27391.7
		Y	360.0	240.0	120.0	120.0	120.0
	P7	X	16681.0	19069.6	21458.2	25093.1	28089.3
		Y	406.0	286.0	166.0	166.0	144.4
	P8	X	29600.0	29600.0	29600.0	29600.0	29600.0
		Y	1650.0	1300.0	950.0	600.0	250.0
	P9	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
	P1ˆ	X	----------	----------	----------	----------	----------
		Y	----------	----------	----------	----------	----------
Angle	α	(L)	0°0'0"	0°0'0"	0°0'0"	0°0'0"	0°0'0"
		(R)	5°30'0"	5°30'0"	5°30'0"	5°30'0"	4°0'0"
Radius (m)	R2	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(L)	10.000	10.000	10.000	10.000	10.000
	R1	(R)	10.000	10.000	10.000	10.000	10.000
	R2	(R)	----------	----------	----------	----------	----------
Angle	β	(L)	7°0'0"	7°0'0"	7°0'0"	7°0'0"	5°30'0"
		(R)	----------	----------	----------	----------	----------
Length of PC Strand (m)	L1		1.800	1.800	1.800	1.800	1.800
	L2		1.222	1.222	1.222	1.222	0.960
	L3		9.362	7.475	5.587	2.715	0.396
	L4		1.222	1.222	1.222	1.222	0.960
	L5		1.993	6.255	10.517	17.002	23.081
	L6		0.960	0.960	0.960	0.960	0.698
	L7		12.979	10.579	8.179	4.528	1.514
	L8		----------	----------	----------	----------	----------
	L9		----------	----------	----------	----------	----------
	Total		29.537	29.512	29.487	29.449	29.409



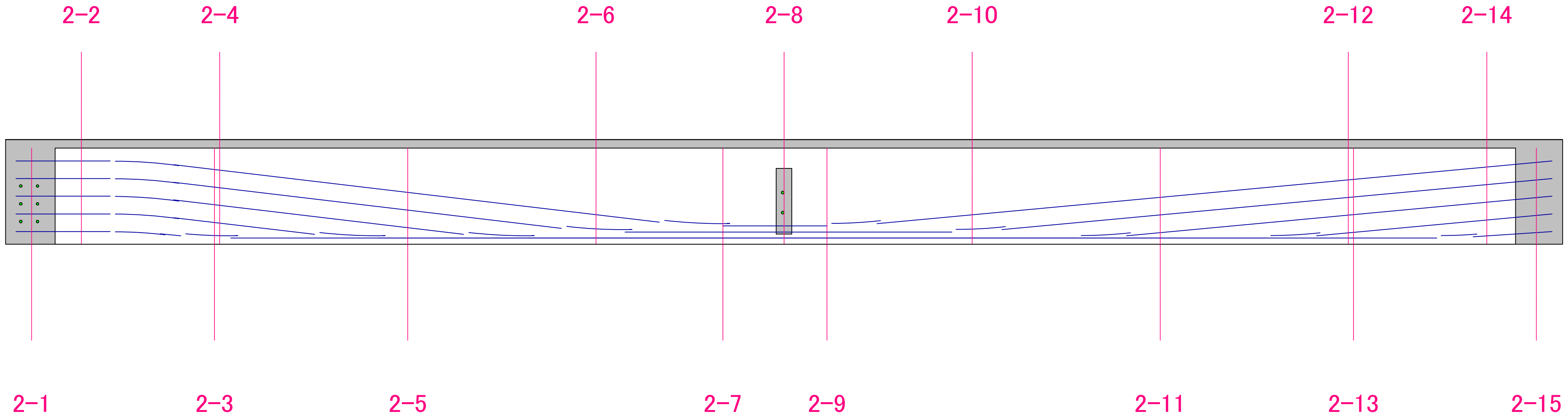
4.4 Summary for Calculation Results of Stress

1) PF14-PF15



	Unit	Allowable Value		Cross Section Number		
Calculation for Bending Moment				[1- 7] Bent up Point(Left)	[1- 8] Center of Span	[1- 9] Bent up Point(Right)
Bending Stress of Concrete						
Immediately After Prestressing	N/mm^2	-1.5～19.00	Top of Main Girder	0.80	0.84	0.82
			Bottom of Main Girder	14.80	14.70	14.65
During Deck Construction	〃	-1.5～14.00	Top of Main Girder	6.31	6.36	6.29
			Bottom of Main Girder	6.85	6.74	6.76
Dead Load	〃	≦10.00	Top of Deck	2.75	2.78	2.75
		0～14.00	Top of Main Girder	5.25	5.29	5.24
			Bottom of Main Girder	3.03	2.89	2.91
Design Load	〃	≦10.00	Top of Deck max	4.25	4.26	4.17
			Top of Deck min	2.39	2.40	2.34
		-1.5～14.00	Top of Main Girder(max)	6.48	6.51	6.42
			Bottom of Main Girder(max)	-0.46	-0.54	-0.41
			Top of Main Girder(min)	4.95	4.98	4.90
			Bottom of Main Girder(min)	3.86	3.77	3.86
Stress of PC Strand	N/mm^2	Pmax≦1110		1037	1034	1025
Ultimate Load	-----	F≧1.0		1.19	1.19	1.21
Calculation for Shear Force				[1- 2] Near a Support of girder(Left)	[1- 3] Change point of Web Width(Left)	[1-14] Near a Support of girder(Right)
Shear Stress of Design Load	kN			0.55	1.28	1.04
Compressive Strength to Failure	-----	F≧1.0		3.88	1.83	3.04
Diagonal Tensile Stress — Dead Load	N/mm^2	≧ -1		-0.04	-0.12	-0.24
Diagonal Tensile Stress — Design Load	〃	≧ -2		-0.17	-0.49	-0.44

2) PF15-AF2



		Unit	Allowable Value		Cross Section Number		
Calculation for Bending Moment					[2- 7] Bent up Point(Left)	[2- 8] Center of Span	[2- 9] Bent up Point(Right)
Bending Stress of Concrete							
Immediately After Prestressing		N/mm^2	-1.5～19.00	Top of Main Girder	0.80	0.82	0.79
				Bottom of Main Girder	14.68	14.73	14.82
During Deck Construction		〃	-1.5～14.00	Top of Main Girder	6.26	6.33	6.28
				Bottom of Main Girder	6.80	6.78	6.89
Dead Load		〃	≦10.00	Top of Deck	2.74	2.77	2.74
			0～14.00	Top of Main Girder	5.22	5.27	5.23
				Bottom of Main Girder	2.94	2.93	3.06
Design Load		〃	≦10.00	Top of Deck max	4.16	4.24	4.23
				Top of Deck min	2.33	2.39	2.38
			-1.5～14.00	Top of Main Girder(max)	6.40	6.48	6.46
				Bottom of Main Girder(max)	-0.37	-0.49	-0.42
				Top of Main Girder(min)	4.88	4.96	4.93
				Bottom of Main Girder(min)	3.90	3.82	3.90
Stress of PC Strand		N/mm^2	Pmax≦1110		1025	1033	1037
Ultimate Load		-----	F≧1.0		1.22	1.19	1.19
Calculation for Shear Force					[2- 2] Near a Support of girder(Left)	[2-13] Change point of Web Width(Right)	[2-14] Near a Support of girder(Right)
Shear Stress of Design Load		kN			1.03	1.27	0.55
Compressive Strength to Failure		-----	F≧1.0		3.05	1.83	3.88
Diagonal Tensile Stress	Dead Load	N/mm^2	≧ -1		-0.24	-0.11	-0.04
	Design Load	〃	≧ -2		-0.44	-0.49	-0.17

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder			------	0.500		1.450		4.000	
Immediately After Prestressing	Top of Main Girder		-1.5	2.923	○	2.734	○	3.749	○
	Bottom of Main Girder		～19.00	4.995	○	5.910	○	10.946	○
During Deck Construction	Top of Main Girder		-1.5	2.773	○	3.170	○	5.786	○
	Bottom of Main Girder		～14.00	4.738	○	4.919	○	7.383	○
Dead Load	Top of Deck		≦10.00	0.268	○	0.548	○	1.386	○
	Top of Main Girder		0	2.087	○	2.460	○	4.298	○
	Bottom of Main Girder		～14.00	4.704	○	4.588	○	5.706	○
Design Load1	Top of Deck	Max	≦10.00	0.268	○	0.820	○	2.269	○
		Min		0.268	○	0.523	○	1.293	○
	Top of Main Girder	Max		2.087	○	2.695	○	5.024	○
		Min	-1.5	2.087	○	2.438	○	4.221	○
	Bottom of Main Girder	Max	～14.00	4.704	○	4.087	○	3.626	○
		Min		4.704	○	4.634	○	5.926	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	0.787	○	1.345	○	2.772	○
		Min		0.787	○	1.048	○	1.796	○
	Top of Main Girder	Max		1.231	○	1.842	○	4.131	○
		Min	-2	1.231	○	1.585	○	3.327	○
	Bottom of Main Girder	Max	～16.10	5.179	○	4.524	○	3.841	○
		Min		5.179	○	5.071	○	6.141	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	0.787	○	1.345	○	2.772	○
		Min		0.787	○	1.048	○	1.796	○
	Top of Main Girder	Max		1.231	○	1.842	○	4.131	○
		Min	-2	1.231	○	1.585	○	3.327	○
	Bottom of Main Girder	Max	～16.10	5.179	○	4.524	○	3.841	○
		Min		5.179	○	5.071	○	6.141	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	0.268	○	0.820	○	2.269	○
		Min		0.268	○	0.523	○	1.293	○
	Top of Main Girder	Max		2.087	○	2.695	○	5.024	○
		Min	-1.5	2.087	○	2.438	○	4.221	○
	Bottom of Main Girder	Max	～14.00	4.704	○	4.087	○	3.626	○
		Min		4.704	○	4.634	○	5.926	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	0.787	○	1.345	○	2.772	○
		Min		0.787	○	1.048	○	1.796	○
	Top of Main Girder	Max		1.231	○	1.842	○	4.131	○
		Min	-2	1.231	○	1.585	○	3.327	○
	Bottom of Main Girder	Max	～16.10	5.179	○	4.524	○	3.841	○
		Min		5.179	○	5.071	○	6.141	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	0.787	○	1.345	○	2.772	○
		Min		0.787	○	1.048	○	1.796	○
	Top of Main Girder	Max		1.231	○	1.842	○	4.131	○
		Min	-2	1.231	○	1.585	○	3.327	○
	Bottom of Main Girder	Max	～16.10	5.179	○	4.524	○	3.841	○
		Min		5.179	○	5.071	○	6.141	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder			------	4.106		7.713		11.319	
Immediately After Prestressing	Top of Main Girder		-1.5	3.698	○	2.217	○	1.035	○
	Bottom of Main Girder		～19.00	11.015	○	13.164	○	14.759	○
During Deck Construction	Top of Main Girder		-1.5	5.799	○	6.133	○	6.119	○
	Bottom of Main Girder		～14.00	7.372	○	7.219	○	7.313	○
Dead Load	Top of Deck		≦10.00	1.409	○	2.077	○	2.499	○
	Top of Main Girder		0	4.318	○	4.843	○	5.032	○
	Bottom of Main Girder		～14.00	5.658	○	4.445	○	3.781	○
Design Load1	Top of Deck	Max	≦10.00	2.313	○	3.456	○	4.020	○
		Min		1.313	○	1.886	○	2.214	○
	Top of Main Girder	Max		5.061	○	5.979	○	6.287	○
		Min	-1.5	4.238	○	4.685	○	4.797	○
	Bottom of Main Girder	Max	～14.00	3.530	○	1.217	○	0.235	○
		Min		5.885	○	4.892	○	4.444	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	2.818	○	4.038	○	4.676	○
		Min		1.819	○	2.467	○	2.870	○
	Top of Main Girder	Max		4.169	○	5.150	○	5.520	○
		Min	-2	3.347	○	3.856	○	4.030	○
	Bottom of Main Girder	Max	～16.10	3.740	○	1.250	○	0.095	○
		Min		6.094	○	4.926	○	4.304	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	2.818	○	4.038	○	4.676	○
		Min		1.819	○	2.467	○	2.870	○
	Top of Main Girder	Max		4.169	○	5.150	○	5.520	○
		Min	-2	3.347	○	3.856	○	4.030	○
	Bottom of Main Girder	Max	～16.10	3.740	○	1.250	○	0.095	○
		Min		6.094	○	4.926	○	4.304	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.313	○	3.456	○	4.020	○
		Min		1.313	○	1.886	○	2.214	○
	Top of Main Girder	Max		5.061	○	5.979	○	6.287	○
		Min	-1.5	4.238	○	4.685	○	4.797	○
	Bottom of Main Girder	Max	～14.00	3.530	○	1.217	○	0.235	○
		Min		5.885	○	4.892	○	4.444	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	2.818	○	4.038	○	4.676	○
		Min		1.819	○	2.467	○	2.870	○
	Top of Main Girder	Max		4.169	○	5.150	○	5.520	○
		Min	-2	3.347	○	3.856	○	4.030	○
	Bottom of Main Girder	Max	～16.10	3.740	○	1.250	○	0.095	○
		Min		6.094	○	4.926	○	4.304	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	2.818	○	4.038	○	4.676	○
		Min		1.819	○	2.467	○	2.870	○
	Top of Main Girder	Max		4.169	○	5.150	○	5.520	○
		Min	-2	3.347	○	3.856	○	4.030	○
	Bottom of Main Girder	Max	～16.10	3.740	○	1.250	○	0.095	○
		Min		6.094	○	4.926	○	4.304	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span,　Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder			------	14.078		14.925		16.121	
Immediately After Prestressing	Top of Main Girder		-1.5	0.803	○	0.836	○	0.816	○
	Bottom of Main Girder		～19.00	14.798	○	14.704	○	14.653	○
During Deck Construction	Top of Main Girder		-1.5	6.307	○	6.363	○	6.289	○
	Bottom of Main Girder		～14.00	6.853	○	6.738	○	6.756	○
Dead Load	Top of Deck		≦10.00	2.750	○	2.783	○	2.747	○
	Top of Main Girder		0	5.245	○	5.292	○	5.241	○
	Bottom of Main Girder		～14.00	3.028	○	2.888	○	2.908	○
Design Load1	Top of Deck	Max	≦10.00	4.248	○	4.255	○	4.172	○
		Min		2.392	○	2.402	○	2.337	○
	Top of Main Girder	Max	-1.5	6.481	○	6.507	○	6.416	○
		Min		4.950	○	4.979	○	4.902	○
	Bottom of Main Girder	Max	～14.00	-0.458	○	-0.539	○	-0.408	○
		Min		3.861	○	3.773	○	3.863	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	4.961	○	4.987	○	4.928	○
		Min		3.105	○	3.134	○	3.093	○
	Top of Main Girder	Max	-2	5.761	○	5.802	○	5.732	○
		Min		4.230	○	4.274	○	4.218	○
	Bottom of Main Girder	Max	～16.10	-0.731	○	-0.854	○	-0.780	○
		Min		3.588	○	3.458	○	3.490	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	4.961	○	4.987	○	4.928	○
		Min		3.105	○	3.134	○	3.093	○
	Top of Main Girder	Max	-2	5.761	○	5.802	○	5.732	○
		Min		4.230	○	4.274	○	4.218	○
	Bottom of Main Girder	Max	～16.10	-0.731	○	-0.854	○	-0.780	○
		Min		3.588	○	3.458	○	3.490	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	4.248	○	4.255	○	4.172	○
		Min		2.392	○	2.402	○	2.337	○
	Top of Main Girder	Max	-1.5	6.481	○	6.507	○	6.416	○
		Min		4.950	○	4.979	○	4.902	○
	Bottom of Main Girder	Max	～14.00	-0.458	○	-0.539	○	-0.408	○
		Min		3.861	○	3.773	○	3.863	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	4.961	○	4.987	○	4.928	○
		Min		3.105	○	3.134	○	3.093	○
	Top of Main Girder	Max	-2	5.761	○	5.802	○	5.732	○
		Min		4.230	○	4.274	○	4.218	○
	Bottom of Main Girder	Max	～16.10	-0.731	○	-0.854	○	-0.780	○
		Min		3.588	○	3.458	○	3.490	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	4.961	○	4.987	○	4.928	○
		Min		3.105	○	3.134	○	3.093	○
	Top of Main Girder	Max	-2	5.761	○	5.802	○	5.732	○
		Min		4.230	○	4.274	○	4.218	○
	Bottom of Main Girder	Max	～16.10	-0.731	○	-0.854	○	-0.780	○
		Min		3.588	○	3.458	○	3.490	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 2

Bending Stress of Concrete (N/mm²)									
Cross Section Number			Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder			------	18.531		22.138		25.744	
Immediately After Prestressing	Top of Main Girder		-1.5	1.154	○	2.985	○	5.612	○
	Bottom of Main Girder		～19.00	14.154	○	11.902	○	8.414	○
During Deck Construction	Top of Main Girder		-1.5	6.220	○	6.830	○	7.576	○
	Bottom of Main Girder		～14.00	6.778	○	6.115	○	5.021	○
Dead Load	Top of Deck		≦10.00	2.571	○	2.299	○	1.875	○
	Top of Main Girder		0	5.137	○	5.345	○	5.478	○
	Bottom of Main Girder		～14.00	3.135	○	3.227	○	3.363	○
Design Load1	Top of Deck	Max	≦10.00	3.847	○	3.195	○	2.241	○
		Min		2.098	○	1.708	○	1.076	○
	Top of Main Girder	Max	-1.5	6.189	○	6.084	○	5.779	○
		Min		4.747	○	4.858	○	4.821	○
	Bottom of Main Girder	Max	～14.00	0.163	○	1.127	○	2.497	○
		Min		4.239	○	4.614	○	5.253	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	4.655	○	4.082	○	3.209	○
		Min		2.906	○	2.595	○	2.043	○
	Top of Main Girder	Max	-2	5.547	○	5.506	○	5.266	○
		Min		4.105	○	4.281	○	4.309	○
	Bottom of Main Girder	Max	～16.10	-0.331	○	0.443	○	1.614	○
		Min		3.745	○	3.930	○	4.370	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	4.655	○	4.082	○	3.209	○
		Min		2.906	○	2.595	○	2.043	○
	Top of Main Girder	Max	-2	5.547	○	5.506	○	5.266	○
		Min		4.105	○	4.281	○	4.309	○
	Bottom of Main Girder	Max	～16.10	-0.331	○	0.443	○	1.614	○
		Min		3.745	○	3.930	○	4.370	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	3.847	○	3.195	○	2.241	○
		Min		2.098	○	1.708	○	1.076	○
	Top of Main Girder	Max	-1.5	6.189	○	6.084	○	5.779	○
		Min		4.747	○	4.858	○	4.821	○
	Bottom of Main Girder	Max	～14.00	0.163	○	1.127	○	2.497	○
		Min		4.239	○	4.614	○	5.253	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	4.655	○	4.082	○	3.209	○
		Min		2.906	○	2.595	○	2.043	○
	Top of Main Girder	Max	-2	5.547	○	5.506	○	5.266	○
		Min		4.105	○	4.281	○	4.309	○
	Bottom of Main Girder	Max	～16.10	-0.331	○	0.443	○	1.614	○
		Min		3.745	○	3.930	○	4.370	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	4.655	○	4.082	○	3.209	○
		Min		2.906	○	2.595	○	2.043	○
	Top of Main Girder	Max	-2	5.547	○	5.506	○	5.266	○
		Min		4.105	○	4.281	○	4.309	○
	Bottom of Main Girder	Max	～16.10	-0.331	○	0.443	○	1.614	○
		Min		3.745	○	3.930	○	4.370	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder			------	25.850		28.400		29.350	
Immediately After Prestressing	Top of Main Girder		-1.5	5.693	○	3.772	○	3.015	○
	Bottom of Main Girder		～19.00	8.298	○	4.206	○	4.430	○
During Deck Construction	Top of Main Girder		-1.5	7.591	○	4.133	○	2.837	○
	Bottom of Main Girder		～14.00	4.987	○	3.336	○	4.227	○
Dead Load	Top of Deck		≦10.00	1.859	○	0.927	○	0.470	○
	Top of Main Girder		0	5.475	○	3.204	○	2.261	○
	Bottom of Main Girder		～14.00	3.371	○	2.930	○	3.894	○
Design Load1	Top of Deck	Max	≦10.00	2.212	○	1.010	○	0.478	○
		Min		1.045	○	-0.372	○	-1.072	○
	Top of Main Girder	Max	-1.5	5.765	○	3.276	○	2.268	○
		Min		4.805	○	2.081	○	0.919	○
	Bottom of Main Girder	Max	～14.00	2.536	○	2.777	○	3.880	○
		Min		5.298	○	5.325	○	6.631	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	3.182	○	2.096	○	1.590	○
		Min		2.014	○	0.714	○	0.040	○
	Top of Main Girder	Max	-2	5.254	○	2.908	○	1.928	○
		Min		4.295	○	1.713	○	0.579	○
	Bottom of Main Girder	Max	～16.10	1.647	○	2.179	○	3.302	○
		Min		4.409	○	4.728	○	6.053	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	3.182	○	2.096	○	1.590	○
		Min		2.014	○	0.714	○	0.040	○
	Top of Main Girder	Max	-2	5.254	○	2.908	○	1.928	○
		Min		4.295	○	1.713	○	0.579	○
	Bottom of Main Girder	Max	～16.10	1.647	○	2.179	○	3.302	○
		Min		4.409	○	4.728	○	6.053	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.212	○	1.010	○	0.478	○
		Min		1.045	○	-0.372	○	-1.072	○
	Top of Main Girder	Max	-1.5	5.765	○	3.276	○	2.268	○
		Min		4.805	○	2.081	○	0.919	○
	Bottom of Main Girder	Max	～14.00	2.536	○	2.777	○	3.880	○
		Min		5.298	○	5.325	○	6.631	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	3.182	○	2.096	○	1.590	○
		Min		2.014	○	0.714	○	0.040	○
	Top of Main Girder	Max	-2	5.254	○	2.908	○	1.928	○
		Min		4.295	○	1.713	○	0.579	○
	Bottom of Main Girder	Max	～16.10	1.647	○	2.179	○	3.302	○
		Min		4.409	○	4.728	○	6.053	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	3.182	○	2.096	○	1.590	○
		Min		2.014	○	0.714	○	0.040	○
	Top of Main Girder	Max	-2	5.254	○	2.908	○	1.928	○
		Min		4.295	○	1.713	○	0.579	○
	Bottom of Main Girder	Max	～16.10	1.647	○	2.179	○	3.302	○
		Min		4.409	○	4.728	○	6.053	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 2

Cross Section NumberNo.	Unit	Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder			0.500		1.450		4.000	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1300	○	1300	○	1300	○
Immediately After Prestressing	N/mm^2	1295	1144	○	1148	○	1154	○
Effective Prestressing Force (*1)	N/mm^2	1110	1085	○	1086	○	1072	○
Effective Prestressing Force (*2)	N/mm^2	1110	1014	○	1012	○	977	○
max	N/mm^2	1110	1014	○	1014	○	994	○
Ultimate Load	------	1.00	999.9	○	5.59	○	1.99	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder			4.106		7.713		11.319	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1300	○	1300	○	1300	○
Immediately After Prestressing	N/mm^2	1295	1155	○	1173	○	1178	○
Effective Prestressing Force (*1)	N/mm^2	1110	1072	○	1080	○	1075	○
Effective Prestressing Force (*2)	N/mm^2	1110	977	○	991	○	991	○
max	N/mm^2	1110	995	○	1031	○	1047	○
Ultimate Load	------	1.00	2.0	○	1.36	○	1.22	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder			14.078		14.925		16.121	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1300	○	1300	○	1300	○
Immediately After Prestressing	N/mm^2	1295	1159	○	1155	○	1149	○
Effective Prestressing Force (*1)	N/mm^2	1110	1055	○	1052	○	1047	○
Effective Prestressing Force (*2)	N/mm^2	1110	976	○	973	○	966	○
max	N/mm^2	1110	1037	○	1034	○	1025	○
Ultimate Load	------	1.00	1.2	○	1.19	○	1.21	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder			18.531		22.138		25.744	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1300	○	1300	○	1300	○
Immediately After Prestressing	N/mm^2	1295	1145	○	1152	○	1139	○
Effective Prestressing Force (*1)	N/mm^2	1110	1046	○	1065	○	1064	○
Effective Prestressing Force (*2)	N/mm^2	1110	960	○	972	○	965	○
max	N/mm^2	1110	1009	○	998	○	968	○
Ultimate Load	------	1.00	1.3	○	1.52	○	2.40	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder			25.850		28.400		29.350	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1300	○	1300	○	1300	○
Immediately After Prestressing	N/mm^2	1295	1138	○	1085	○	1081	○
Effective Prestressing Force (*1)	N/mm^2	1110	1063	○	1028	○	1025	○
Effective Prestressing Force (*2)	N/mm^2	1110	964	○	952	○	951	○
max	N/mm^2	1110	966	○	949	○	947	○
Ultimate Load	------	1.00	2.5	○	2.95	○	1.88	○

*1:During DeckConstruction *2:Design Load

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder				------		0.500		1.450		4.000
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.55	Δ	1.28	Δ
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.03	○	-0.11	○
	Neutral Axis before Composition				------	--	-0.04	○	-0.11	○
	Neutral Axis after Composition				------	--	-0.04	○	-0.12	○
	Base of Lower Flange				------	--	-0.01	○	-0.06	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.14	○	-0.46	○
		Min			------	--	-0.03	○	-0.09	○
	Neutral Axis before Composition	Max			------	--	-0.15	○	-0.48	○
		Min			------	--	-0.04	○	-0.09	○
	Neutral Axis after Composition	Max			------	--	-0.17	○	-0.49	○
		Min			------	--	-0.04	○	-0.09	○
	Base of Lower Flange	Max			------	--	-0.02	○	-0.34	○
		Min			------	--	-0.01	○	-0.05	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	23.53	--
	D16		cm	------	------	--	31.62	--	36.88	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.10	--	9.42	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	------	--	3.88	○	1.83	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	1.408	○	1.00	○
	D16				------	--	1.408	○	1.00	○
	D19				------	--	1.466	○	1.15	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.55	Δ	1.28	Δ
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.03	○	-0.11	○
	Neutral Axis before Composition				------	--	-0.04	○	-0.11	○
	Neutral Axis after Composition				------	--	-0.04	○	-0.12	○
	Base of Lower Flange				------	--	-0.01	○	-0.06	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.14	○	-0.46	○
		Min			------	--	-0.03	○	-0.09	○
	Neutral Axis before Composition	Max			------	--	-0.15	○	-0.48	○
		Min			------	--	-0.04	○	-0.09	○
	Neutral Axis after Composition	Max			------	--	-0.17	○	-0.49	○
		Min			------	--	-0.04	○	-0.09	○
	Base of Lower Flange	Max			------	--	-0.02	○	-0.34	○
		Min			------	--	-0.01	○	-0.05	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	23.53	--
	D16		cm	------	------	--	31.62	--	36.88	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span,　Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder				------	4.106		7.713		11.319	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.26	△	0.86	△	0.65	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.10	○	-0.04	○	-0.02	○
	Neutral Axis before Composition				-0.10	○	-0.04	○	-0.02	○
	Neutral Axis after Composition				-0.11	○	-0.04	○	-0.02	○
	Base of Lower Flange				-0.06	○	-0.02	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.45	○	-0.21	○	-0.11	○
		Min			-0.09	○	-0.01	○	0.00	○
	Neutral Axis before Composition	Max			-0.46	○	-0.25	○	-0.15	○
		Min			-0.08	○	-0.01	○	0.00	○
	Neutral Axis after Composition	Max			-0.48	○	-0.23	○	-0.13	○
		Min			-0.09	○	-0.01	○	0.00	○
	Base of Lower Flange	Max			-0.33	○	-0.24	○	-0.19	○
		Min			-0.05	○	-0.01	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	23.96	--	40.00	--	40.00	--
	D16		cm	------	37.56	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	9.25	--	4.98	--	1.69	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.85	○	2.52	○	3.75	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.00	○	1.037	○	1.40	○
	D16				1.00	○	1.245	○	1.73	○
	D19				1.15	○	1.499	○	2.13	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.26	△	0.86	△	0.65	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.10	○	-0.04	○	-0.02	○
	Neutral Axis before Composition				-0.10	○	-0.04	○	-0.02	○
	Neutral Axis after Composition				-0.11	○	-0.04	○	-0.02	○
	Base of Lower Flange				-0.06	○	-0.02	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.45	○	-0.21	○	-0.11	○
		Min			-0.09	○	-0.01	○	0.00	○
	Neutral Axis before Composition	Max			-0.46	○	-0.25	○	-0.15	○
		Min			-0.08	○	-0.01	○	0.00	○
	Neutral Axis after Composition	Max			-0.48	○	-0.23	○	-0.13	○
		Min			-0.09	○	-0.01	○	0.00	○
	Base of Lower Flange	Max			-0.33	○	-0.24	○	-0.19	○
		Min			-0.05	○	-0.01	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	23.96	--	40.00	--	40.00	--
	D16		cm	------	37.56	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder				------	14.078		14.925		16.121	
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	0.55	○	0.42	○	0.64	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	-0.02	○	-0.01	○	-0.02	○
	Neutral Axis before Composition				-0.02	○	-0.01	○	-0.02	○
	Neutral Axis after Composition				-0.02	○	-0.01	○	-0.02	○
	Base of Lower Flange				-0.01	○	0.00	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	-0.08	○	-0.05	○	-0.01	○
		Min			-0.02	○	-0.04	○	-0.12	○
	Neutral Axis before Composition	Max			-0.11	○	-0.07	○	-0.01	○
		Min			-0.01	○	-0.04	○	-0.12	○
	Neutral Axis after Composition	Max			-0.10	○	-0.06	○	-0.01	○
		Min			-0.02	○	-0.05	○	-0.13	○
	Base of Lower Flange	Max			-0.12	○	-0.12	○	-0.01	○
		Min			-0.01	○	-0.03	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.96	--	2.28	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	5.05	○	4.24	○	3.64	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	------	--	1.35	○
	D16				------	--	------	--	1.69	○
	D19				------	--	------	--	2.10	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	0.55	○	0.42	○	0.64	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	-0.02	○	-0.01	○	-0.02	○
	Neutral Axis before Composition				-0.02	○	-0.01	○	-0.02	○
	Neutral Axis after Composition				-0.02	○	-0.01	○	-0.02	○
	Base of Lower Flange				-0.01	○	0.00	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	-0.08	○	-0.05	○	-0.01	○
		Min			-0.02	○	-0.04	○	-0.12	○
	Neutral Axis before Composition	Max			-0.11	○	-0.07	○	-0.01	○
		Min			-0.01	○	-0.04	○	-0.12	○
	Neutral Axis after Composition	Max			-0.10	○	-0.06	○	-0.01	○
		Min			-0.02	○	-0.05	○	-0.13	○
	Base of Lower Flange	Max			-0.12	○	-0.12	○	-0.01	○
		Min			-0.01	○	-0.03	○	-0.08	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder				------	18.531		22.138		25.744	
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	0.61	△	0.75	△	1.02	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	-0.01	○	-0.01	○	-0.03	○
	Neutral Axis before Composition				-0.01	○	-0.01	○	-0.02	○
	Neutral Axis after Composition				-0.01	○	-0.01	○	-0.03	○
	Base of Lower Flange				-0.01	○	0.00	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	-0.01	○	0.00	○	-0.01	○
		Min			-0.12	○	-0.18	○	-0.32	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	-0.01	○
		Min			-0.11	○	-0.15	○	-0.28	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	-0.01	○
		Min			-0.12	○	-0.18	○	-0.32	○
	Base of Lower Flange	Max			-0.01	○	0.00	○	-0.01	○
		Min			-0.07	○	-0.09	○	-0.17	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	34.61	--	21.33	--
	D16		cm	------	40.00	--	40.00	--	33.44	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	3.37	--	6.41	--	10.39	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	2.84	○	2.11	○	1.68	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.169	○	1	○	1.00	○
	D16				1.415	○	1.124	○	1.00	○
	D19				1.715	○	1.332	○	1.09	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	0.61	△	0.75	△	1.02	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	-0.01	○	-0.01	○	-0.03	○
	Neutral Axis before Composition				-0.01	○	-0.01	○	-0.02	○
	Neutral Axis after Composition				-0.01	○	-0.01	○	-0.03	○
	Base of Lower Flange				-0.01	○	0.00	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	-0.01	○	0.00	○	-0.01	○
		Min			-0.12	○	-0.18	○	-0.32	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	-0.01	○
		Min			-0.11	○	-0.15	○	-0.28	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	-0.01	○
		Min			-0.12	○	-0.18	○	-0.32	○
	Base of Lower Flange	Max			-0.01	○	0.00	○	-0.01	○
		Min			-0.07	○	-0.09	○	-0.17	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	34.61	--	21.33	--
	D16		cm	------	40.00	--	40.00	--	33.44	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder				------		25.850		28.400		29.350
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.02	△	1.04	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.02	○	-0.12	○	------	--
	Neutral Axis before Composition				-0.02	○	-0.24	○	------	--
	Neutral Axis after Composition				-0.02	○	-0.21	○	------	--
	Base of Lower Flange				-0.02	○	-0.05	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.01	○	-0.11	○	------	--
		Min			-0.32	○	-0.34	○	------	--
	Neutral Axis before Composition	Max			-0.01	○	-0.22	○	------	--
		Min			-0.27	○	-0.41	○	------	--
	Neutral Axis after Composition	Max			-0.01	○	-0.20	○	------	--
		Min			-0.32	○	-0.44	○	------	--
	Base of Lower Flange	Max			-0.01	○	-0.05	○	------	--
		Min			-0.17	○	-0.06	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	21.23	--	18.85	--	------	--
	D16		cm	------	33.27	--	29.55	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	10.44	--	10.76	--	------	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.67	○	3.04	○	------	--
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1	○	1	○	------	--
	D16				1	○	1	○	------	--
	D19				1.085	○	1.024	○	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.02	△	1.04	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.02	○	-0.12	○	------	--
	Neutral Axis before Composition				-0.02	○	-0.24	○	------	--
	Neutral Axis after Composition				-0.02	○	-0.21	○	------	--
	Base of Lower Flange				-0.02	○	-0.05	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.01	○	-0.11	○	------	--
		Min			-0.32	○	-0.34	○	------	--
	Neutral Axis before Composition	Max			-0.01	○	-0.22	○	------	--
		Min			-0.27	○	-0.41	○	------	--
	Neutral Axis after Composition	Max			-0.01	○	-0.20	○	------	--
		Min			-0.32	○	-0.44	○	------	--
	Base of Lower Flange	Max			-0.01	○	-0.05	○	------	--
		Min			-0.17	○	-0.06	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	21.23	--	18.85	--	------	--
	D16		cm	------	33.27	--	29.55	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1- 1]		[1- 2]		[1- 3]	
Interval from beginning of Girder				------	0.500		1.450		4.000	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.49	○	1.19	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.03	○	-0.10	○
	Neutral Axis before Composition				------	--	-0.04	○	-0.09	○
	Neutral Axis after Composition				------	--	-0.04	○	-0.10	○
	Base of Lower Flange				------	--	0.00	○	-0.05	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.12	○	-0.42	○
		Min			------	--	-0.04	○	-0.10	○
	Neutral Axis before Composition	Max			------	--	-0.12	○	-0.42	○
		Min			------	--	-0.04	○	-0.09	○
	Neutral Axis after Composition	Max			------	--	-0.14	○	-0.45	○
		Min			------	--	-0.04	○	-0.10	○
	Base of Lower Flange	Max			------	--	-0.02	○	-0.28	○
		Min			------	--	-0.01	○	-0.05	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	26.45	--
	D16		cm	------	------	--	31.62	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	8.38	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	0.49	○	1.19	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.03	○	-0.10	○
	Neutral Axis before Composition				------	--	-0.04	○	-0.09	○
	Neutral Axis after Composition				------	--	-0.04	○	-0.10	○
	Base of Lower Flange				------	--	0.00	○	-0.05	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.12	○	-0.42	○
		Min			------	--	-0.04	○	-0.10	○
	Neutral Axis before Composition	Max			------	--	-0.12	○	-0.42	○
		Min			------	--	-0.04	○	-0.09	○
	Neutral Axis after Composition	Max			------	--	-0.14	○	-0.45	○
		Min			------	--	-0.04	○	-0.10	○
	Base of Lower Flange	Max			------	--	-0.02	○	-0.28	○
		Min			------	--	-0.01	○	-0.05	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.18	--	26.45	--
	D16		cm	------	------	--	31.62	--	40.00	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	------	--	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	--	------	-	999.999	○
	D16				------	--	------	-	999.999	○
	D19				------	--	------	-	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1- 4]		[1- 5]		[1- 6]	
Interval from beginning of Girder				------	4.106		7.713		11.319	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.17	△	0.82	△	0.48	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.10	○	-0.02	○	-0.01	○
	Neutral Axis before Composition				-0.09	○	-0.02	○	-0.01	○
	Neutral Axis after Composition				-0.10	○	-0.03	○	-0.01	○
	Base of Lower Flange				-0.05	○	-0.01	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.41	○	-0.20	○	-0.06	○
		Min			-0.10	○	-0.02	○	-0.01	○
	Neutral Axis before Composition	Max			-0.41	○	-0.23	○	-0.09	○
		Min			-0.08	○	-0.02	○	-0.01	○
	Neutral Axis after Composition	Max			-0.43	○	-0.22	○	-0.08	○
		Min			-0.10	○	-0.02	○	-0.01	○
	Base of Lower Flange	Max			-0.28	○	-0.23	○	-0.15	○
		Min			-0.05	○	-0.01	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	26.87	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	8.25	--	4.48	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.17	△	0.82	△	0.48	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.10	○	-0.02	○	-0.01	○
	Neutral Axis before Composition				-0.09	○	-0.02	○	-0.01	○
	Neutral Axis after Composition				-0.10	○	-0.03	○	-0.01	○
	Base of Lower Flange				-0.05	○	-0.01	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.41	○	-0.20	○	-0.06	○
		Min			-0.10	○	-0.02	○	-0.01	○
	Neutral Axis before Composition	Max			-0.41	○	-0.23	○	-0.09	○
		Min			-0.08	○	-0.02	○	-0.01	○
	Neutral Axis after Composition	Max			-0.43	○	-0.22	○	-0.08	○
		Min			-0.10	○	-0.02	○	-0.01	○
	Base of Lower Flange	Max			-0.28	○	-0.23	○	-0.15	○
		Min			-0.05	○	-0.01	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	26.87	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	-
	D16				999.999	○	999.999	○	------	-
	D19				999.999	○	999.999	○	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span, Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1- 7]		[1- 8]		[1- 9]	
Interval from beginning of Girder				------	14.078		14.925		16.121	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.14	○	0.06	○	0.38	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.04	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.07	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.05	○
	Base of Lower Flange	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.01	○	0.00	○	-0.19	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.14	○	0.06	○	0.38	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.04	○
	Neutral Axis before Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.07	○
	Neutral Axis after Composition	Max			-0.01	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.05	○
	Base of Lower Flange	Max			-0.01	○	0.00	○	0.00	○
		Min			-0.01	○	0.00	○	-0.19	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	------	-	------	-
	D16				------	-	------	-	------	-
	D19				------	-	------	-	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1-10]		[1-11]		[1-12]	
Interval from beginning of Girder				------	18.531		22.138		25.744	
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	0.55	○	0.73	△	0.97	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	0.00	○	0.00	○	-0.02	○
	Neutral Axis before Composition				0.00	○	0.00	○	-0.01	○
	Neutral Axis after Composition				0.00	○	0.00	○	-0.02	○
	Base of Lower Flange				0.00	○	0.00	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	0.00	○	0.00	○	-0.01	○
		Min			-0.09	○	-0.17	○	-0.30	○
	Neutral Axis before Composition	Max			0.00	○	0.00	○	-0.01	○
		Min			-0.12	○	-0.18	○	-0.28	○
	Neutral Axis after Composition	Max			0.00	○	0.00	○	-0.01	○
		Min			-0.11	○	-0.18	○	-0.31	○
	Base of Lower Flange	Max			0.00	○	0.00	○	-0.01	○
		Min			-0.17	○	-0.16	○	-0.19	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	33.99	--	22.70	--
	D16		cm	------	40.00	--	40.00	--	35.58	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	3.04	--	6.52	--	9.77	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	0.55	○	0.73	△	0.97	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	0.00	○	0.00	○	-0.02	○
	Neutral Axis before Composition				0.00	○	0.00	○	-0.01	○
	Neutral Axis after Composition				0.00	○	0.00	○	-0.02	○
	Base of Lower Flange				0.00	○	0.00	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	0.00	○	0.00	○	-0.01	○
		Min			-0.09	○	-0.17	○	-0.30	○
	Neutral Axis before Composition	Max			0.00	○	0.00	○	-0.01	○
		Min			-0.12	○	-0.18	○	-0.28	○
	Neutral Axis after Composition	Max			0.00	○	0.00	○	-0.01	○
		Min			-0.11	○	-0.18	○	-0.31	○
	Base of Lower Flange	Max			0.00	○	0.00	○	-0.01	○
		Min			-0.17	○	-0.16	○	-0.19	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	33.99	--	22.70	--
	D16		cm	------	40.00	--	40.00	--	35.58	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	999.999	○	999.999	○
	D16				------	-	999.999	○	999.999	○
	D19				------	-	999.999	○	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

1st Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[1-13]		[1-14]		[1-15]	
Interval from beginning of Girder				------	25.850		28.400		29.350	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.97	△	1.01	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.02	○	-0.12	○	------	--
	Neutral Axis before Composition				-0.01	○	-0.23	○	------	--
	Neutral Axis after Composition				-0.02	○	-0.21	○	------	--
	Base of Lower Flange				-0.01	○	-0.05	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.01	○	-0.13	○	------	--
		Min			-0.29	○	-0.34	○	------	--
	Neutral Axis before Composition	Max			-0.01	○	-0.21	○	------	--
		Min			-0.28	○	-0.40	○	------	--
	Neutral Axis after Composition	Max			-0.01	○	-0.20	○	------	--
		Min			-0.30	○	-0.43	○	------	--
	Base of Lower Flange	Max			-0.01	○	-0.04	○	------	--
		Min			-0.19	○	-0.06	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	22.57	--	19.95	--	------	--
	D16		cm	------	35.37	--	31.28	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	9.82	--	10.17	--	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.97	△	1.01	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.02	○	-0.12	○	------	--
	Neutral Axis before Composition				-0.01	○	-0.23	○	------	--
	Neutral Axis after Composition				-0.02	○	-0.21	○	------	--
	Base of Lower Flange				-0.01	○	-0.05	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.01	○	-0.13	○	------	--
		Min			-0.29	○	-0.34	○	------	--
	Neutral Axis before Composition	Max			-0.01	○	-0.21	○	------	--
		Min			-0.28	○	-0.40	○	------	--
	Neutral Axis after Composition	Max			-0.01	○	-0.20	○	------	--
		Min			-0.30	○	-0.43	○	------	--
	Base of Lower Flange	Max			-0.01	○	-0.04	○	------	--
		Min			-0.19	○	-0.06	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	22.57	--	19.95	--	------	--
	D16		cm	------	35.37	--	31.28	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	------	--
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	--
	D16				999.999	○	999.999	○	------	--
	D19				999.999	○	999.999	○	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder			------	0.500		1.450		4.000	
Immediately After Prestressing	Top of Main Girder		-1.5	3.014	○	3.771	○	5.689	○
	Bottom of Main Girder		～19.00	4.430	○	4.208	○	8.303	○
During Deck Construction	Top of Main Girder		-1.5	2.836	○	4.131	○	7.583	○
	Bottom of Main Girder		～14.00	4.229	○	3.339	○	4.998	○
Dead Load	Top of Deck		≦10.00	0.471	○	0.927	○	1.857	○
	Top of Main Girder		0	2.262	○	3.203	○	5.470	○
	Bottom of Main Girder		～14.00	3.892	○	2.930	○	3.380	○
Design Load1	Top of Deck	Max	≦10.00	0.479	○	1.010	○	2.211	○
		Min		-1.070	○	-0.371	○	1.043	○
	Top of Main	Max		2.269	○	3.275	○	5.760	○
	Girder	Min	-1.5	0.920	○	2.081	○	4.800	○
	Bottom of	Max	～14.00	3.878	○	2.777	○	2.543	○
	Main Girder	Min		6.628	○	5.325	○	5.307	○
Design Load2	Top of Deck	Max	≦11.50	1.591	○	2.096	○	3.180	○
Temperature Rise		Min		0.042	○	0.715	○	2.012	○
	Top of Main	Max		1.928	○	2.907	○	5.250	○
	Girder	Min	-2	0.580	○	1.712	○	4.290	○
	Bottom of	Max	～16.10	3.300	○	2.179	○	1.654	○
	Main Girder	Min		6.050	○	4.727	○	4.418	○
Design Load3	Top of Deck	Max	≦11.50	1.591	○	2.096	○	3.180	○
Temperature Drop		Min		0.042	○	0.715	○	2.012	○
	Top of Main	Max		1.928	○	2.907	○	5.250	○
	Girder	Min	-2	0.580	○	1.712	○	4.290	○
	Bottom of	Max	～16.10	3.300	○	2.179	○	1.654	○
	Main Girder	Min		6.050	○	4.727	○	4.418	○
Design Load4	Top of Deck	Max	≦10.00	0.479	○	1.010	○	2.211	○
Support sinking		Min		-1.070	○	-0.371	○	1.043	○
	Top of Main	Max		2.269	○	3.275	○	5.760	○
	Girder	Min	-1.5	0.920	○	2.081	○	4.800	○
	Bottom of	Max	～14.00	3.878	○	2.777	○	2.543	○
	Main Girder	Min		6.628	○	5.325	○	5.307	○
Design Load5	Top of Deck	Max	≦11.50	1.591	○	2.096	○	3.180	○
Temperature Rise		Min		0.042	○	0.715	○	2.012	○
Support sinking	Top of Main	Max		1.928	○	2.907	○	5.250	○
	Girder	Min	-2	0.580	○	1.712	○	4.290	○
	Bottom of	Max	～16.10	3.300	○	2.179	○	1.654	○
	Main Girder	Min		6.050	○	4.727	○	4.418	○
Design Load6	Top of Deck	Max	≦11.50	1.591	○	2.096	○	3.180	○
Temperature Drop		Min		0.042	○	0.715	○	2.012	○
Support sinking	Top of Main	Max		1.928	○	2.907	○	5.250	○
	Girder	Min	-2	0.580	○	1.712	○	4.290	○
	Bottom of	Max	～16.10	3.300	○	2.179	○	1.654	○
	Main Girder	Min		6.050	○	4.727	○	4.418	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder			------		4.100		7.700		11.300
Immediately After Prestressing	Top of Main Girder		-1.5	5.612	○	2.984	○	1.146	○
	Bottom of Main Girder		～19.00	8.413	○	11.902	○	14.168	○
During Deck Construction	Top of Main Girder		-1.5	7.568	○	6.815	○	6.195	○
	Bottom of Main Girder		～14.00	5.030	○	6.133	○	6.811	○
Dead Load	Top of Deck		≦10.00	1.872	○	2.293	○	2.561	○
	Top of Main Girder		0	5.472	○	5.335	○	5.121	○
	Bottom of Main Girder		～14.00	3.372	○	3.246	○	3.167	○
Design Load1	Top of Deck	Max	≦10.00	2.238	○	3.187	○	3.835	○
		Min		1.072	○	1.699	○	2.086	○
	Top of Main Girder	Max		5.773	○	6.072	○	6.171	○
		Min	-1.5	4.814	○	4.846	○	4.729	○
	Bottom of Main Girder	Max	～14.00	2.507	○	1.148	○	0.199	○
		Min		5.265	○	4.638	○	4.275	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	3.205	○	4.075	○	4.643	○
		Min		2.039	○	2.586	○	2.894	○
	Top of Main Girder	Max		5.260	○	5.495	○	5.529	○
		Min	-2	4.302	○	4.268	○	4.087	○
	Bottom of Main Girder	Max	～16.10	1.624	○	0.464	○	-0.294	○
		Min		4.382	○	3.954	○	3.781	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	3.205	○	4.075	○	4.643	○
		Min		2.039	○	2.586	○	2.894	○
	Top of Main Girder	Max		5.260	○	5.495	○	5.529	○
		Min	-2	4.302	○	4.268	○	4.087	○
	Bottom of Main Girder	Max	～16.10	1.624	○	0.464	○	-0.294	○
		Min		4.382	○	3.954	○	3.781	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.238	○	3.187	○	3.835	○
		Min		1.072	○	1.699	○	2.086	○
	Top of Main Girder	Max		5.773	○	6.072	○	6.171	○
		Min	-1.5	4.814	○	4.846	○	4.729	○
	Bottom of Main Girder	Max	～14.00	2.507	○	1.148	○	0.199	○
		Min		5.265	○	4.638	○	4.275	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	3.205	○	4.075	○	4.643	○
		Min		2.039	○	2.586	○	2.894	○
	Top of Main Girder	Max		5.260	○	5.495	○	5.529	○
		Min	-2	4.302	○	4.268	○	4.087	○
	Bottom of Main Girder	Max	～16.10	1.624	○	0.464	○	-0.294	○
		Min		4.382	○	3.954	○	3.781	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	3.205	○	4.075	○	4.643	○
		Min		2.039	○	2.586	○	2.894	○
	Top of Main Girder	Max		5.260	○	5.495	○	5.529	○
		Min	-2	4.302	○	4.268	○	4.087	○
	Bottom of Main Girder	Max	～16.10	1.624	○	0.464	○	-0.294	○
		Min		4.382	○	3.954	○	3.781	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder			------	13.730		14.900		15.723	
Immediately After Prestressing	Top of Main Girder		-1.5	0.800	○	0.819	○	0.788	○
	Bottom of Main Girder		～19.00	14.675	○	14.727	○	14.817	○
During Deck Construction	Top of Main Girder		-1.5	6.258	○	6.329	○	6.275	○
	Bottom of Main Girder		～14.00	6.795	○	6.779	○	6.889	○
Dead Load	Top of Deck		≦10.00	2.736	○	2.770	○	2.739	○
	Top of Main Girder		0	5.221	○	5.270	○	5.225	○
	Bottom of Main Girder		～14.00	2.944	○	2.926	○	3.061	○
Design Load1	Top of Deck	Max	≦10.00	4.159	○	4.240	○	4.233	○
		Min		2.325	○	2.388	○	2.379	○
	Top of Main Girder	Max	-1.5	6.395	○	6.482	○	6.458	○
		Min		4.881	○	4.955	○	4.928	○
	Bottom of Main Girder	Max	～14.00	-0.368	○	-0.494	○	-0.417	○
		Min		3.901	○	3.815	○	3.899	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	4.915	○	4.971	○	4.947	○
		Min		3.081	○	3.120	○	3.093	○
	Top of Main Girder	Max	-2	5.710	○	5.777	○	5.738	○
		Min		4.196	○	4.250	○	4.208	○
	Bottom of Main Girder	Max	～16.10	-0.739	○	-0.808	○	-0.691	○
		Min		3.530	○	3.501	○	3.625	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	4.915	○	4.971	○	4.947	○
		Min		3.081	○	3.120	○	3.093	○
	Top of Main Girder	Max	-2	5.710	○	5.777	○	5.738	○
		Min		4.196	○	4.250	○	4.208	○
	Bottom of Main Girder	Max	～16.10	-0.739	○	-0.808	○	-0.691	○
		Min		3.530	○	3.501	○	3.625	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	4.159	○	4.240	○	4.233	○
		Min		2.325	○	2.388	○	2.379	○
	Top of Main Girder	Max	-1.5	6.395	○	6.482	○	6.458	○
		Min		4.881	○	4.955	○	4.928	○
	Bottom of Main Girder	Max	～14.00	-0.368	○	-0.494	○	-0.417	○
		Min		3.901	○	3.815	○	3.899	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	4.915	○	4.971	○	4.947	○
		Min		3.081	○	3.120	○	3.093	○
	Top of Main Girder	Max	-2	5.710	○	5.777	○	5.738	○
		Min		4.196	○	4.250	○	4.208	○
	Bottom of Main Girder	Max	～16.10	-0.739	○	-0.808	○	-0.691	○
		Min		3.530	○	3.501	○	3.625	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	4.915	○	4.971	○	4.947	○
		Min		3.081	○	3.120	○	3.093	○
	Top of Main Girder	Max	-2	5.710	○	5.777	○	5.738	○
		Min		4.196	○	4.250	○	4.208	○
	Bottom of Main Girder	Max	～16.10	-0.739	○	-0.808	○	-0.691	○
		Min		3.530	○	3.501	○	3.625	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm²)									
Cross Section Number			Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder			------	18.500		22.100		25.700	
Immediately After Prestressing	Top of Main Girder		-1.5	1.026	○	2.214	○	3.697	○
	Bottom of Main Girder		～19.00	14.773	○	13.167	○	11.016	○
During Deck Construction	Top of Main Girder		-1.5	6.093	○	6.116	○	5.790	○
	Bottom of Main Girder		～14.00	7.345	○	7.238	○	7.383	○
Dead Load	Top of Deck		≦10.00	2.488	○	2.069	○	1.405	○
	Top of Main Girder		0	5.014	○	4.831	○	4.311	○
	Bottom of Main Girder		～14.00	3.813	○	4.467	○	5.671	○
Design Load1	Top of Deck	Max	≦10.00	4.006	○	3.446	○	2.307	○
		Min		2.202	○	1.878	○	1.309	○
	Top of Main Girder	Max	-1.5	6.267	○	5.965	○	5.052	○
		Min		4.779	○	4.673	○	4.231	○
	Bottom of Main Girder	Max	～14.00	0.275	○	1.245	○	3.548	○
		Min		4.479	○	4.915	○	5.898	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	4.663	○	4.027	○	2.812	○
		Min		2.859	○	2.459	○	1.814	○
	Top of Main Girder	Max	-2	5.499	○	5.136	○	4.160	○
		Min		4.011	○	3.844	○	3.339	○
	Bottom of Main Girder	Max	～16.10	0.135	○	1.278	○	3.758	○
		Min		4.339	○	4.949	○	6.108	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	4.663	○	4.027	○	2.812	○
		Min		2.859	○	2.459	○	1.814	○
	Top of Main Girder	Max	-2	5.499	○	5.136	○	4.160	○
		Min		4.011	○	3.844	○	3.339	○
	Bottom of Main Girder	Max	～16.10	0.135	○	1.278	○	3.758	○
		Min		4.339	○	4.949	○	6.108	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	4.006	○	3.446	○	2.307	○
		Min		2.202	○	1.878	○	1.309	○
	Top of Main Girder	Max	-1.5	6.267	○	5.965	○	5.052	○
		Min		4.779	○	4.673	○	4.231	○
	Bottom of Main Girder	Max	～14.00	0.275	○	1.245	○	3.548	○
		Min		4.479	○	4.915	○	5.898	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	4.663	○	4.027	○	2.812	○
		Min		2.859	○	2.459	○	1.814	○
	Top of Main Girder	Max	-2	5.499	○	5.136	○	4.160	○
		Min		4.011	○	3.844	○	3.339	○
	Bottom of Main Girder	Max	～16.10	0.135	○	1.278	○	3.758	○
		Min		4.339	○	4.949	○	6.108	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	4.663	○	4.027	○	2.812	○
		Min		2.859	○	2.459	○	1.814	○
	Top of Main Girder	Max	-2	5.499	○	5.136	○	4.160	○
		Min		4.011	○	3.844	○	3.339	○
	Bottom of Main Girder	Max	～16.10	0.135	○	1.278	○	3.758	○
		Min		4.339	○	4.949	○	6.108	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 2

Bending Stress of Concrete (N/mm^2)									
Cross Section Number			Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder			------	25.800		28.350		29.300	
Immediately After Prestressing	Top of Main Girder		-1.5	3.745	○	2.733	○	2.923	○
	Bottom of Main Girder		～19.00	10.951	○	5.911	○	4.995	○
During Deck Construction	Top of Main Girder		-1.5	5.778	○	3.168	○	2.773	○
	Bottom of Main Girder		～14.00	7.393	○	4.921	○	4.738	○
Dead Load	Top of Deck		≦10.00	1.384	○	0.547	○	0.268	○
	Top of Main Girder		0	4.292	○	2.458	○	2.087	○
	Bottom of Main Girder		～14.00	5.716	○	4.590	○	4.704	○
Design Load1	Top of Deck	Max	≦10.00	2.266	○	0.819	○	0.268	○
		Min		1.290	○	0.522	○	0.268	○
	Top of Main Girder	Max	-1.5	5.018	○	2.694	○	2.087	○
		Min		4.215	○	2.437	○	2.087	○
	Bottom of Main Girder	Max	～14.00	3.638	○	4.089	○	4.704	○
		Min		5.937	○	4.636	○	4.704	○
Design Load2 Temperature Rise	Top of Deck	Max	≦11.50	2.769	○	1.344	○	0.787	○
		Min		1.793	○	1.047	○	0.787	○
	Top of Main Girder	Max	-2	4.124	○	1.841	○	1.231	○
		Min		3.321	○	1.584	○	1.231	○
	Bottom of Main Girder	Max	～16.10	3.852	○	4.526	○	5.179	○
		Min		6.152	○	5.073	○	5.179	○
Design Load3 Temperature Drop	Top of Deck	Max	≦11.50	2.769	○	1.344	○	0.787	○
		Min		1.793	○	1.047	○	0.787	○
	Top of Main Girder	Max	-2	4.124	○	1.841	○	1.231	○
		Min		3.321	○	1.584	○	1.231	○
	Bottom of Main Girder	Max	～16.10	3.852	○	4.526	○	5.179	○
		Min		6.152	○	5.073	○	5.179	○
Design Load4 Support sinking	Top of Deck	Max	≦10.00	2.266	○	0.819	○	0.268	○
		Min		1.290	○	0.522	○	0.268	○
	Top of Main Girder	Max	-1.5	5.018	○	2.694	○	2.087	○
		Min		4.215	○	2.437	○	2.087	○
	Bottom of Main Girder	Max	～14.00	3.638	○	4.089	○	4.704	○
		Min		5.937	○	4.636	○	4.704	○
Design Load5 Temperature Rise Support sinking	Top of Deck	Max	≦11.50	2.769	○	1.344	○	0.787	○
		Min		1.793	○	1.047	○	0.787	○
	Top of Main Girder	Max	-2	4.124	○	1.841	○	1.231	○
		Min		3.321	○	1.584	○	1.231	○
	Bottom of Main Girder	Max	～16.10	3.852	○	4.526	○	5.179	○
		Min		6.152	○	5.073	○	5.179	○
Design Load6 Temperature Drop Support sinking	Top of Deck	Max	≦11.50	2.769	○	1.344	○	0.787	○
		Min		1.793	○	1.047	○	0.787	○
	Top of Main Girder	Max	-2	4.124	○	1.841	○	1.231	○
		Min		3.321	○	1.584	○	1.231	○
	Bottom of Main Girder	Max	～16.10	3.852	○	4.526	○	5.179	○
		Min		6.152	○	5.073	○	5.179	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 2

Cross Section NumberNo.	Unit	Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder			0.500		1.450		4.000	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1300	○	1300	○	1300	○
Immediately After Prestressing	N/mm^2	1295	1081	○	1085	○	1138	○
Effective Prestressing Force (*1)	N/mm^2	1110	1025	○	1028	○	1063	○
Effective Prestressing Force (*2)	N/mm^2	1110	951	○	952	○	964	○
max	N/mm^2	1110	947	○	949	○	966	○
Ultimate Load	------	1.00	1.88	○	2.95	○	2.46	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder			4.100		7.700		11.300	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1300	○	1300	○	1300	○
Immediately After Prestressing	N/mm^2	1295	1139	○	1152	○	1145	○
Effective Prestressing Force (*1)	N/mm^2	1110	1064	○	1065	○	1046	○
Effective Prestressing Force (*2)	N/mm^2	1110	965	○	972	○	960	○
max	N/mm^2	1110	968	○	998	○	1009	○
Ultimate Load	------	1.00	2.41	○	1.53	○	1.30	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder			13.730		14.900		15.723	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1300	○	1300	○	1300	○
Immediately After Prestressing	N/mm^2	1295	1149	○	1155	○	1159	○
Effective Prestressing Force (*1)	N/mm^2	1110	1047	○	1052	○	1055	○
Effective Prestressing Force (*2)	N/mm^2	1110	966	○	972	○	975	○
max	N/mm^2	1110	1025	○	1033	○	1037	○
Ultimate Load	------	1.00	1.22	○	1.19	○	1.19	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder			18.500		22.100		25.700	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1300	○	1300	○	1300	○
Immediately After Prestressing	N/mm^2	1295	1178	○	1173	○	1155	○
Effective Prestressing Force (*1)	N/mm^2	1110	1075	○	1080	○	1072	○
Effective Prestressing Force (*2)	N/mm^2	1110	991	○	991	○	977	○
max	N/mm^2	1110	1047	○	1031	○	995	○
Ultimate Load	------	1.00	1.23	○	1.37	○	1.96	○

*1:During DeckConstruction *2:Design Load

Cross Section NumberNo.	Unit	Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder			25.800		28.350		29.300	
Stress of PC Strand								
Stress of PC Strand during Prestressing	N/mm^2	1440	1300	○	1300	○	1300	○
Immediately After Prestressing	N/mm^2	1295	1154	○	1148	○	1144	○
Effective Prestressing Force (*1)	N/mm^2	1110	1072	○	1086	○	1085	○
Effective Prestressing Force (*2)	N/mm^2	1110	977	○	1012	○	1014	○
max	N/mm^2	1110	994	○	1014	○	1014	○
Ultimate Load	------	1.00	1.99	○	5.60	○	999.90	○

*1:During DeckConstruction *2:Design Load

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder				------	0.500		1.450		4.000	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	1.03	△	1.01	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.12	○	-0.02	○
	Neutral Axis before Composition				------	--	-0.24	○	-0.02	○
	Neutral Axis after Composition				------	--	-0.21	○	-0.02	○
	Base of Lower Flange				------	--	-0.05	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.33	○	-0.31	○
		Min			------	--	-0.11	○	-0.01	○
	Neutral Axis before Composition	Max			------	--	-0.42	○	-0.28	○
		Min			------	--	-0.22	○	-0.01	○
	Neutral Axis after Composition	Max			------	--	-0.44	○	-0.32	○
		Min			------	--	-0.20	○	-0.01	○
	Base of Lower Flange	Max			------	--	-0.06	○	-0.17	○
		Min			------	--	-0.05	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	18.92	--	21.30	--
	D16		cm	------	------	--	29.66	--	33.39	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	10.72	--	10.41	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	------	--	3.05	○	1.68	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	------	--	1	○	1.00	○
	D16				------	--	1	○	1.00	○
	D19				------	--	1.026	○	1.09	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	1.03	△	1.01	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.12	○	-0.02	○
	Neutral Axis before Composition				------	--	-0.24	○	-0.02	○
	Neutral Axis after Composition				------	--	-0.21	○	-0.02	○
	Base of Lower Flange				------	--	-0.05	○	-0.02	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.33	○	-0.31	○
		Min			------	--	-0.11	○	-0.01	○
	Neutral Axis before Composition	Max			------	--	-0.42	○	-0.28	○
		Min			------	--	-0.22	○	-0.01	○
	Neutral Axis after Composition	Max			------	--	-0.44	○	-0.32	○
		Min			------	--	-0.20	○	-0.01	○
	Base of Lower Flange	Max			------	--	-0.06	○	-0.17	○
		Min			------	--	-0.05	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	18.92	--	21.30	--
	D16		cm	------	------	--	29.66	--	33.39	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder				------	4.100		7.700		11.300	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.02	△	0.74	△	0.60	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.02	○	-0.01	○	-0.01	○
	Neutral Axis before Composition				-0.02	○	-0.01	○	-0.01	○
	Neutral Axis after Composition				-0.03	○	-0.01	○	-0.01	○
	Base of Lower Flange				-0.02	○	0.00	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.31	○	-0.18	○	-0.12	○
		Min			-0.01	○	0.00	○	-0.01	○
	Neutral Axis before Composition	Max			-0.28	○	-0.15	○	-0.11	○
		Min			-0.01	○	0.00	○	-0.01	○
	Neutral Axis after Composition	Max			-0.32	○	-0.18	○	-0.12	○
		Min			-0.01	○	0.00	○	-0.01	○
	Base of Lower Flange	Max			-0.17	○	-0.10	○	-0.07	○
		Min			-0.01	○	0.00	○	-0.02	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	21.41	--	34.72	--	40.00	--
	D16		cm	------	33.56	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	10.36	--	6.39	--	3.34	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.68	○	2.12	○	2.85	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.00	○	1	○	1.17	○
	D16				1.00	○	1.125	○	1.42	○
	D19				1.09	○	1.333	○	1.72	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.02	△	0.74	△	0.60	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.02	○	-0.01	○	-0.01	○
	Neutral Axis before Composition				-0.02	○	-0.01	○	-0.01	○
	Neutral Axis after Composition				-0.03	○	-0.01	○	-0.01	○
	Base of Lower Flange				-0.02	○	0.00	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.31	○	-0.18	○	-0.12	○
		Min			-0.01	○	0.00	○	-0.01	○
	Neutral Axis before Composition	Max			-0.28	○	-0.15	○	-0.11	○
		Min			-0.01	○	0.00	○	-0.01	○
	Neutral Axis after Composition	Max			-0.32	○	-0.18	○	-0.12	○
		Min			-0.01	○	0.00	○	-0.01	○
	Base of Lower Flange	Max			-0.17	○	-0.10	○	-0.07	○
		Min			-0.01	○	0.00	○	-0.02	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	21.41	--	34.72	--	40.00	--
	D16		cm	------	33.56	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder				------	13.730		14.900		15.723	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.64	△	0.46	○	0.54	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.02	○	0.00	○	-0.02	○
	Neutral Axis before Composition				-0.02	○	0.00	○	-0.02	○
	Neutral Axis after Composition				-0.02	○	0.00	○	-0.02	○
	Base of Lower Flange				-0.02	○	0.00	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.12	○	-0.06	○	-0.02	○
		Min			-0.01	○	-0.05	○	-0.08	○
	Neutral Axis before Composition	Max			-0.12	○	-0.06	○	-0.01	○
		Min			-0.01	○	-0.06	○	-0.11	○
	Neutral Axis after Composition	Max			-0.13	○	-0.07	○	-0.02	○
		Min			-0.01	○	-0.05	○	-0.09	○
	Base of Lower Flange	Max			-0.08	○	-0.05	○	-0.01	○
		Min			-0.01	○	-0.10	○	-0.11	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	2.25	--	0.57	--	0.00	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	3.65	○	4.46	○	5.02	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.354	○	------	--	------	--
	D16				1.691	○	------	--	------	--
	D19				2.104	○	------	--	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.64	△	0.46	○	0.54	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.02	○	0.00	○	-0.02	○
	Neutral Axis before Composition				-0.02	○	0.00	○	-0.02	○
	Neutral Axis after Composition				-0.02	○	0.00	○	-0.02	○
	Base of Lower Flange				-0.02	○	0.00	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.12	○	-0.06	○	-0.02	○
		Min			-0.01	○	-0.05	○	-0.08	○
	Neutral Axis before Composition	Max			-0.12	○	-0.06	○	-0.01	○
		Min			-0.01	○	-0.06	○	-0.11	○
	Neutral Axis after Composition	Max			-0.13	○	-0.07	○	-0.02	○
		Min			-0.01	○	-0.05	○	-0.09	○
	Base of Lower Flange	Max			-0.08	○	-0.05	○	-0.01	○
		Min			-0.01	○	-0.10	○	-0.11	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder				------		18.500		22.100		25.700
Shear Force										
Shear Stress	Design Load		N/mm²	0.55	0.64	△	0.86	△	1.25	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.00	-0.02	○	-0.04	○	-0.10	○
	Neutral Axis before Composition				-0.02	○	-0.04	○	-0.10	○
	Neutral Axis after Composition				-0.02	○	-0.04	○	-0.11	○
	Base of Lower Flange				-0.02	○	-0.02	○	-0.06	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.00	0.00	○	-0.01	○	-0.08	○
		Min			-0.11	○	-0.20	○	-0.45	○
	Neutral Axis before Composition	Max			0.00	○	-0.01	○	-0.08	○
		Min			-0.15	○	-0.25	○	-0.45	○
	Neutral Axis after Composition	Max			0.00	○	-0.01	○	-0.09	○
		Min			-0.13	○	-0.23	○	-0.48	○
	Base of Lower Flange	Max			0.00	○	-0.01	○	-0.05	○
		Min			-0.18	○	-0.24	○	-0.31	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	24.45	--
	D16		cm	------	40.00	--	40.00	--	38.32	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	1.58	--	4.97	--	9.07	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	3.79	○	2.52	○	1.85	○
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1.418	○	1.038	○	1.00	○
	D16				1.749	○	1.247	○	1.00	○
	D19				2.155	○	1.501	○	1.16	○
Shear Force + Torsion										
Shear Stress	Design Load		N/mm²	0.55	0.64	△	0.86	△	1.25	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm²	-1.30	-0.02	○	-0.04	○	-0.10	○
	Neutral Axis before Composition				-0.02	○	-0.04	○	-0.10	○
	Neutral Axis after Composition				-0.02	○	-0.04	○	-0.11	○
	Base of Lower Flange				-0.02	○	-0.02	○	-0.06	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm²	-2.50	0.00	○	-0.01	○	-0.08	○
		Min			-0.11	○	-0.20	○	-0.45	○
	Neutral Axis before Composition	Max			0.00	○	-0.01	○	-0.08	○
		Min			-0.15	○	-0.25	○	-0.45	○
	Neutral Axis after Composition	Max			0.00	○	-0.01	○	-0.09	○
		Min			-0.13	○	-0.23	○	-0.48	○
	Base of Lower Flange	Max			0.00	○	-0.01	○	-0.05	○
		Min			-0.18	○	-0.24	○	-0.31	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	24.45	--
	D16		cm	------	40.00	--	40.00	--	38.32	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm²	------	0.00	--	0.00	--	0.00	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span, Main Girder Number: G 2(Shear Force Max)

Cross Section Number				Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder				------		25.800		28.350		29.300
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.27	△	0.55	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.11	○	-0.03	○	------	--
	Neutral Axis before Composition				-0.10	○	-0.04	○	------	--
	Neutral Axis after Composition				-0.11	○	-0.04	○	------	--
	Base of Lower Flange				-0.06	○	-0.01	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.09	○	-0.03	○	------	--
		Min			-0.46	○	-0.14	○	------	--
	Neutral Axis before Composition	Max			-0.09	○	-0.04	○	------	--
		Min			-0.47	○	-0.15	○	------	--
	Neutral Axis after Composition	Max			-0.09	○	-0.04	○	------	--
		Min			-0.49	○	-0.17	○	------	--
	Base of Lower Flange	Max			-0.05	○	0.00	○	------	--
		Min			-0.32	○	-0.02	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	24.04	--	20.18	--	------	--
	D16		cm	------	37.69	--	31.62	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	9.22	--	0.06	--	------	--
Compressive Strength to Failure (Suc/Shu)			------	1.00	1.83	○	3.88	○	------	--
Strength against Diagonal Densile Failure(Sus/Shu)	D13		------	1.00	1	○	1.41	○	------	--
	D16				1	○	1.41	○	------	--
	D19				1.155	○	1.468	○	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.27	△	0.55	△	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.11	○	-0.03	○	------	--
	Neutral Axis before Composition				-0.10	○	-0.04	○	------	--
	Neutral Axis after Composition				-0.11	○	-0.04	○	------	--
	Base of Lower Flange				-0.06	○	-0.01	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.09	○	-0.03	○	------	--
		Min			-0.46	○	-0.14	○	------	--
	Neutral Axis before Composition	Max			-0.09	○	-0.04	○	------	--
		Min			-0.47	○	-0.15	○	------	--
	Neutral Axis after Composition	Max			-0.09	○	-0.04	○	------	--
		Min			-0.49	○	-0.17	○	------	--
	Base of Lower Flange	Max			-0.05	○	0.00	○	------	--
		Min			-0.32	○	-0.02	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	24.04	--	20.18	--	------	--
	D16		cm	------	37.69	--	31.62	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span，Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2- 1]		[2- 2]		[2- 3]	
Interval from beginning of Girder				------		0.500		1.450		4.000
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	------	--	1.01	△	0.96	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	------	--	-0.12	○	-0.02	○
	Neutral Axis before Composition				------	--	-0.23	○	-0.01	○
	Neutral Axis after Composition				------	--	-0.21	○	-0.02	○
	Base of Lower Flange				------	--	-0.05	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	------	--	-0.33	○	-0.29	○
		Min			------	--	-0.13	○	-0.01	○
	Neutral Axis before Composition	Max			------	--	-0.40	○	-0.27	○
		Min			------	--	-0.21	○	-0.01	○
	Neutral Axis after Composition	Max			------	--	-0.43	○	-0.30	○
		Min			------	--	-0.20	○	-0.01	○
	Base of Lower Flange	Max			------	--	-0.06	○	-0.18	○
		Min			------	--	-0.04	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.04	--	22.67	--
	D16		cm	------	------	--	31.42	--	35.53	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	10.12	--	9.78	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	------	--	1.01	△	0.96	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	------	--	-0.12	○	-0.02	○
	Neutral Axis before Composition				------	--	-0.23	○	-0.01	○
	Neutral Axis after Composition				------	--	-0.21	○	-0.02	○
	Base of Lower Flange				------	--	-0.05	○	-0.01	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	------	--	-0.33	○	-0.29	○
		Min			------	--	-0.13	○	-0.01	○
	Neutral Axis before Composition	Max			------	--	-0.40	○	-0.27	○
		Min			------	--	-0.21	○	-0.01	○
	Neutral Axis after Composition	Max			------	--	-0.43	○	-0.30	○
		Min			------	--	-0.20	○	-0.01	○
	Base of Lower Flange	Max			------	--	-0.06	○	-0.18	○
		Min			------	--	-0.04	○	-0.01	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	------	--	20.04	--	22.67	--
	D16		cm	------	------	--	31.42	--	35.53	--
	D19		cm	------	------	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	------	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	------	--	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	--	999.999	○	999.999	○
	D16				------	--	999.999	○	999.999	○
	D19				------	--	999.999	○	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2- 4]		[2- 5]		[2- 6]	
Interval from beginning of Girder				------	4.100		7.700		11.300	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.97	△	0.73	△	0.54	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.02	○	0.00	○	0.00	○
	Neutral Axis before Composition				-0.01	○	0.00	○	0.00	○
	Neutral Axis after Composition				-0.02	○	0.00	○	0.00	○
	Base of Lower Flange				-0.01	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.29	○	-0.17	○	-0.09	○
		Min			-0.01	○	0.00	○	0.00	○
	Neutral Axis before Composition	Max			-0.28	○	-0.18	○	-0.12	○
		Min			-0.01	○	0.00	○	0.00	○
	Neutral Axis after Composition	Max			-0.30	○	-0.18	○	-0.10	○
		Min			-0.01	○	0.00	○	0.00	○
	Base of Lower Flange	Max			-0.19	○	-0.16	○	-0.17	○
		Min			-0.01	○	0.00	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	22.80	--	34.14	--	40.00	--
	D16		cm	------	35.73	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	9.72	--	6.49	--	2.99	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.97	△	0.73	△	0.54	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.02	○	0.00	○	0.00	○
	Neutral Axis before Composition				-0.01	○	0.00	○	0.00	○
	Neutral Axis after Composition				-0.02	○	0.00	○	0.00	○
	Base of Lower Flange				-0.01	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.29	○	-0.17	○	-0.09	○
		Min			-0.01	○	0.00	○	0.00	○
	Neutral Axis before Composition	Max			-0.28	○	-0.18	○	-0.12	○
		Min			-0.01	○	0.00	○	0.00	○
	Neutral Axis after Composition	Max			-0.30	○	-0.18	○	-0.10	○
		Min			-0.01	○	0.00	○	0.00	○
	Base of Lower Flange	Max			-0.19	○	-0.16	○	-0.17	○
		Min			-0.01	○	0.00	○	0.00	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	22.80	--	34.14	--	40.00	--
	D16		cm	------	35.73	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	999.999	○	------	-
	D16				999.999	○	999.999	○	------	-
	D19				999.999	○	999.999	○	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2- 7]		[2- 8]		[2- 9]	
Interval from beginning of Girder				------		13.730		14.900		15.723
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.38	○	0.10	○	0.14	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.04	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition	Max			-0.05	○	-0.01	○	0.00	○
		Min			0.00	○	0.00	○	-0.01	○
	Neutral Axis after Composition	Max			-0.05	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.01	○
	Base of Lower Flange	Max			-0.04	○	-0.01	○	0.00	○
		Min			0.00	○	0.00	○	-0.04	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.38	○	0.10	○	0.14	○
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition				0.00	○	0.00	○	0.00	○
	Neutral Axis after Composition				0.00	○	0.00	○	0.00	○
	Base of Lower Flange				0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.04	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	0.00	○
	Neutral Axis before Composition	Max			-0.05	○	-0.01	○	0.00	○
		Min			0.00	○	0.00	○	-0.01	○
	Neutral Axis after Composition	Max			-0.05	○	0.00	○	0.00	○
		Min			0.00	○	0.00	○	-0.01	○
	Base of Lower Flange	Max			-0.04	○	-0.01	○	0.00	○
		Min			0.00	○	0.00	○	-0.04	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	40.00	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	------	-	------	-
	D16				------	-	------	-	------	-
	D19				------	-	------	-	------	-

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span， Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2-10]		[2-11]		[2-12]	
Interval from beginning of Girder				------	18.500		22.100		25.700	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	0.48	○	0.82	△	1.17	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.01	○	-0.02	○	-0.10	○
	Neutral Axis before Composition				-0.01	○	-0.02	○	-0.08	○
	Neutral Axis after Composition				-0.01	○	-0.03	○	-0.10	○
	Base of Lower Flange				0.00	○	-0.01	○	-0.05	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.01	○	-0.02	○	-0.09	○
		Min			-0.06	○	-0.20	○	-0.41	○
	Neutral Axis before Composition	Max			-0.01	○	-0.02	○	-0.08	○
		Min			-0.09	○	-0.23	○	-0.41	○
	Neutral Axis after Composition	Max			-0.01	○	-0.02	○	-0.10	○
		Min			-0.08	○	-0.22	○	-0.43	○
	Base of Lower Flange	Max			0.00	○	-0.01	○	-0.05	○
		Min			-0.14	○	-0.22	○	-0.28	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	26.98	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	4.46	--	8.22	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	0.48	○	0.82	△	1.17	△
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.01	○	-0.02	○	-0.10	○
	Neutral Axis before Composition				-0.01	○	-0.02	○	-0.08	○
	Neutral Axis after Composition				-0.01	○	-0.03	○	-0.10	○
	Base of Lower Flange				0.00	○	-0.01	○	-0.05	○
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.01	○	-0.02	○	-0.09	○
		Min			-0.06	○	-0.20	○	-0.41	○
	Neutral Axis before Composition	Max			-0.01	○	-0.02	○	-0.08	○
		Min			-0.09	○	-0.23	○	-0.41	○
	Neutral Axis after Composition	Max			-0.01	○	-0.02	○	-0.10	○
		Min			-0.08	○	-0.22	○	-0.43	○
	Base of Lower Flange	Max			0.00	○	-0.01	○	-0.05	○
		Min			-0.14	○	-0.22	○	-0.28	○
Spacing of Diagonal Tension Re-bar	D13		cm	------	40.00	--	40.00	--	26.98	--
	D16		cm	------	40.00	--	40.00	--	40.00	--
	D19		cm	------	40.00	--	40.00	--	40.00	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	0.00	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	------	-	999.999	○	999.999	○
	D16				------	-	999.999	○	999.999	○
	D19				------	-	999.999	○	999.999	○

<Design of Main Girder: Summary for Calculation Results of Stress>

2nd Span,　Main Girder Number: G 1(Torsion Max)

Cross Section Number				Allowable Value	[2-13]		[2-14]		[2-15]	
Interval from beginning of Girder				------	25.800		28.350		29.300	
Shear Force										
Shear Stress	Design Load		N/mm^2	0.55	1.18	△	0.49	○	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.00	-0.10	○	-0.03	○	------	--
	Neutral Axis before Composition				-0.09	○	-0.04	○	------	--
	Neutral Axis after Composition				-0.10	○	-0.04	○	------	--
	Base of Lower Flange				-0.05	○	0.00	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.00	-0.10	○	-0.04	○	------	--
		Min			-0.42	○	-0.12	○	------	--
	Neutral Axis before Composition	Max			-0.09	○	-0.04	○	------	--
		Min			-0.42	○	-0.12	○	------	--
	Neutral Axis after Composition	Max			-0.10	○	-0.04	○	------	--
		Min			-0.44	○	-0.14	○	------	--
	Base of Lower Flange	Max			-0.05	○	0.00	○	------	--
		Min			-0.28	○	-0.02	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	26.59	--	20.18	--	------	--
	D16		cm	------	40.00	--	31.62	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	8.34	--	0.00	--	------	--
Shear Force + Torsion										
Shear Stress	Design Load		N/mm^2	0.55	1.18	△	0.49	○	------	--
Diagonal Tensile Stress Dead Load	Base of Upper Flange		N/mm^2	-1.30	-0.10	○	-0.03	○	------	--
	Neutral Axis before Composition				-0.09	○	-0.04	○	------	--
	Neutral Axis after Composition				-0.10	○	-0.04	○	------	--
	Base of Lower Flange				-0.05	○	0.00	○	------	--
Diagonal Tensile Stress Design Load	Base of Upper Flange	Max	N/mm^2	-2.50	-0.10	○	-0.04	○	------	--
		Min			-0.42	○	-0.12	○	------	--
	Neutral Axis before Composition	Max			-0.09	○	-0.04	○	------	--
		Min			-0.42	○	-0.12	○	------	--
	Neutral Axis after Composition	Max			-0.10	○	-0.04	○	------	--
		Min			-0.44	○	-0.14	○	------	--
	Base of Lower Flange	Max			-0.05	○	0.00	○	------	--
		Min			-0.28	○	-0.02	○	------	--
Spacing of Diagonal Tension Re-bar	D13		cm	------	26.59	--	20.18	--	------	--
	D16		cm	------	40.00	--	31.62	--	------	--
	D19		cm	------	40.00	--	40.00	--	------	--
Axial Reinforcement Bar Volume			cm^2	------	0.00	--	0.00	--	------	--
Compressive Strength to Failure (Muc/Mtu)			------	1.00	999.999	○	999.999	○	------	--
Strength against Diagonal Densile Failure(Mus/Mtu)	D13		------	1.00	999.999	○	------	-	------	--
	D16				999.999	○	------	-	------	--
	D19				999.999	○	------	-	------	--

5 Design of Intermediate Cross Beam

(1) Parameters

<1st Span>

		Unit	Bending Moment (Maximum)	Bending Moment (Minimum)
CB 2				
Length between End of Girders	Lb	cm	328.0	328.0
Web Width	Bw	cm	22.0	22.0
Width of Cross Beam	Bc	cm	30.0	30.0
Thickness of Deck	Hs	cm	17.0	17.0
Height of Cross Beam (before Composition of Deck)	Hb	cm	134.4	134.4
Height of Cross Beam (after Composition of Deck)	Ha	cm	187.0	187.0
Interval of Cross Beam	Lt	cm	1412.5	1412.5

<2nd Span>

		Unit	Bending Moment (Maximum)	Bending Moment (Minimum)
CB 2				
Length between End of Girders	Lb	cm	328.0	328.0
Web Width	Bw	cm	22.0	22.0
Width of Cross Beam	Bc	cm	30.0	30.0
Thickness of Deck	Hs	cm	17.0	17.0
Height of Cross Beam (before Composition of Deck)	Hb	cm	134.4	134.4
Height of Cross Beam (after Composition of Deck)	Ha	cm	187.0	187.0
Interval of Cross Beam	Lt	cm	1410.0	1410.0

(2) Calculation of Prestressing

1) Arrangement of PC Strand

(1) Parameter of PC Strand

	Unit	Parameters
Name of PC Strand		4S15.2, SWPR7BL
Area of PC Strand	mm^2/no.	554.80
Amount of Set	mm	4.0
Reduction Rate of Anchor	%	0.000
Friction Coefficient	1/m	0.0040
Creep Coefficient		2.60
Drying Shrinkage	$\times 10^{-5}$	20.00
Relaxation	%	2.5
Prestressing Stress	N/mm^2	1250.000
(Considering Friction Coefficient)	N/mm^2	1250.000
Allowable Value	N/mm^2	1440.000

(2) Arrangement of PC Strand

<1st Span>

Item		Unit	Maximum Bending Moment	Minimum Bending Moment
CB 2				
How to Prestressing			From One Side	
Length of PC Strand		m	10.720	10.720
1st	Position	mm	400	400
	Number	No.	1	1
2nd	Position	mm	800	800
	Number	No.	1	1

<2nd Span>

Item		Unit	Maximum Bending Moment	Minimum Bending Moment
CB 2				
How to Prestressing			From One Side	
Length of PC Strand		m	10.720	10.720
1st	Position	mm	400	400
	Number	No.	1	1
2nd	Position	mm	800	800
	Number	No.	1	1

<Design of Cross Beam : Summary for Calculation Results of Stress>

1st Span : Cross Beam (CB2)

Item			Unit	Allowable Value	Mmax		Mmin	
Bending Stress of Concrete Dead Load		Top of Deck	N/mm^2	≦10.0	-0.32	○	-0.32	○
		Bottom of Deck			-0.21	○	-0.21	○
		Top of Cross Beam	N/mm^2	0 ~11.0	1.92	○	1.92	○
		Bottom of Cross Beam			4.57	○	4.57	○
Bending Stress of Concrete Dead Load		Top of Deck	N/mm^2	≦10.0	0.55	○	-0.89	○
		Bottom of Deck			0.36	○	-0.60	○
		Top of Cross Beam	N/mm^2	0 ~11.0	1.90	○	1.94	○
		Bottom of Cross Beam			2.29	○	6.10	○
Ultimate Load			------	1	1.80	○	1.57	○
Stress of PC Strand	Stress of PC Strand during Prestressing		N/mm^2	1440	1250	○	1250	○
	Immediately After Prestressing		N/mm^2	1295	1175	○	1175	○
	Effective Prestressing Force		N/mm^2	1110	1026	○	1026	○

2nd Span : Cross Beam (CB2)

Item			Unit	Allowable Value	Mmax		Mmin	
Bending Stress of Concrete Dead Load		Top of Deck	N/mm^2	≦10.0	-0.32	○	-0.32	○
		Bottom of Deck			-0.21	○	-0.21	○
		Top of Cross Beam	N/mm^2	0 ~11.0	1.92	○	1.92	○
		Bottom of Cross Beam			4.57	○	4.57	○
Bending Stress of Concrete Dead Load		Top of Deck	N/mm^2	≦10.0	0.55	○	-0.89	○
		Bottom of Deck			0.36	○	-0.60	○
		Top of Cross Beam	N/mm^2	0 ~11.0	1.90	○	1.94	○
		Bottom of Cross Beam			2.29	○	6.10	○
Ultimate Load			------	1	1.80	○	1.57	○
Stress of PC Strand	Stress of PC Strand during Prestressing		N/mm^2	1440	1250	○	1250	○
	Immediately After Prestressing		N/mm^2	1295	1175	○	1175	○
	Effective Prestressing Force		N/mm^2	1110	1026	○	1026	○

<Design of Cross Beam : Summary for Calculation Results of Stress>

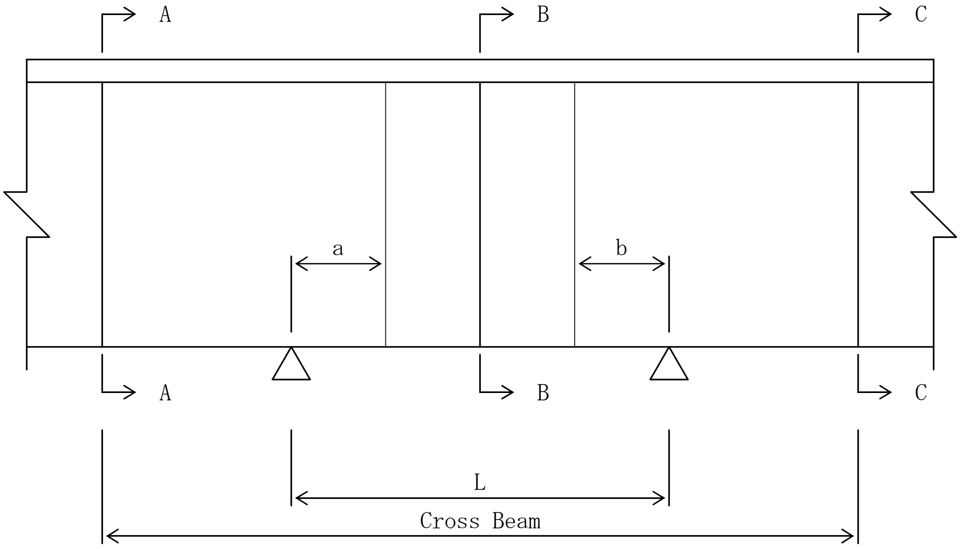
1st Span : Cross Beam (CB2)

Item		Unit	Allowable Value	Smax		Smin		Tmax		Tmin	
Shear Force											
Shear Stress	Design Load	N/mm^2	0.45	0.65	△	0.45	○	0.15	○	0.15	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	-0.01	○	-0.01	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	-0.18	○	-0.18	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Suc/Shu	-	1.00	2.82	○	4.12	○	11.04	○	11.04	○
Strength against Diagonal Densile Failure	D13	-	1.00	1.00	○	------	--	------	--	------	--
Sus/Shu	D16	-	1.00	1.02	○	------	--	------	--	------	--
Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.00	○	0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	0.00	○	0.00	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	0.00	○	0.00	○	0.00	○	0.00	○
Shear Force + Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.65	△	0.45	○	0.15	○	0.15	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-1.10	-0.01	○	-0.01	○	0.00	○	0.00	○
	Design Load	N/mm^2	-2.20	-0.18	○	-0.18	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Muc/Mtu	-	1.00	999.999	○	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure	D13	-	1.00	999.999	○	------	--	------	--	------	--
Mus/Mtu	D16	-	1.00	999.999	○	------	--	------	--	------	--
Amount of Diagonal Tension Re-bar		cm^2	----	9.67	--	6.00	--	6.00	--	6.00	--
Axial Reinforcement Bar Volume		cm^2	----	5.23	--	0.57	--	0.00	--	0.00	--

2nd Span : Cross Beam (CB2)

Item		Unit	Allowable Value	Smax		Smin		Tmax		Tmin	
Shear Force											
Shear Stress	Design Load	N/mm^2	0.45	0.65	△	0.45	○	0.15	○	0.15	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	-0.01	○	-0.01	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	-0.18	○	-0.18	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Suc/Shu	-	1.00	2.83	○	4.12	○	11.05	○	11.05	○
Strength against Diagonal Densile Failure	D13	-	1.00	1.00	○	------	--	------	--	------	--
Sus/Shu	D16	-	1.00	1.02	○	------	--	------	--	------	--
Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.00	○	0.00	○	0.00	○	0.00	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-0.80	0.00	○	0.00	○	0.00	○	0.00	○
	Design Load	N/mm^2	-1.70	0.00	○	0.00	○	0.00	○	0.00	○
Shear Force + Torsion											
Shear Stress	Design Load	N/mm^2	0.45	0.65	△	0.45	○	0.15	○	0.15	○
Diagonal Tensile Stress	Dead Load	N/mm^2	-1.10	-0.01	○	-0.01	○	0.00	○	0.00	○
	Design Load	N/mm^2	-2.20	-0.18	○	-0.18	○	-0.01	○	-0.01	○
Compressive Strength to Failure	Muc/Mtu	-	1.00	999.999	○	999.999	○	999.999	○	999.999	○
Strength against Diagonal Densile Failure	D13	-	1.00	999.999	○	------	--	------	--	------	--
Mus/Mtu	D16	-	1.00	999.999	○	------	--	------	--	------	--
Amount of Diagonal Tension Re-bar		cm^2	----	9.65	--	6.00	--	6.00	--	6.00	--
Axial Reinforcement Bar Volume		cm^2	----	5.23	--	0.56	--	0.00	--	0.00	--

6 Design of Coupling Concrete
Dimension



Unit: m

L	1.200
a	0.500
b	0.500

<Connection of Cross beam : Summary for Calculation Results of Stress>

1st Span～2nd Span, Main Girder Number: G1(Negative Moment) G1(Positive Moment)

Item			Unit	Allowable Value	Negative Moment						Positive Moment	
					A-A		B-B		C-C		B-B	
Re-bar Volume	1st Layer	Diameter	mm	------	D19	--	D19	--	D19	--	D22	--
		Number	Number	------	16	--	16	--	16	--	9	--
	2nd Layer	Diameter	mm	------	D19	--	D19	--	D19	--	D22	--
		Number	Number	------	16	--	16	--	16	--	9	--
Bending Stress (Dead Load)												
Bending Tensile Stress of Reinforcement Bar			N/mm^2	100	-28.25	○	-21.30	○	-28.34	○	27.25	○
Bending Stress (Design Load)												
Bending Stress of Concrete			N/mm^2	10	3.53	○	3.53	○	3.53	○	0.74	○
Bending Tensile Stress of Reinforcement Bar			N/mm^2	160	95.18	○	95.18	○	95.18	○	43.54	○
Bending Stress (Temperature Load)												
Bending Stress of Concrete			N/mm^2	11.5	3.65	○	3.53	○	3.64	○	1.62	○
Bending Tensile Stress of Reinforcement Bar			N/mm^2	184	98.28	○	95.18	○	98.02	○	95.51	○
Ultimate Load			------	1.00	1.19	○	1.25	○	1.19	○	5.38	○

7 Calculation of Reaction Force

7.1 Reaction Force for Each Girder

<1st Span, Left> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	345.622	341.234	341.234	345.622
Cast-in-place Concrete	D2	308.946	429.394	429.394	308.946
Weight of Bridge Surface	D3	180.602	165.524	165.524	180.602
Subtotal: DT1=D1+D2+D3		835.170	936.152	936.152	835.170
Live Load	Max	334.690	304.160	304.160	334.690
LT	Min	-71.370	-29.480	-29.480	-71.370
Subtotal: DT2	Max	1169.860	1240.312	1240.312	1169.860
=DT1+LT+SW	Min	763.800	906.672	906.672	763.800
Creep CR		75.471	66.591	66.591	75.471
Drying Shrinkage SH		-8.642	-9.277	-9.277	-8.642
Temperature Range		22.468	24.119	24.119	22.468
Dead Load: DT1+CR+SH		901.999	993.466	993.466	901.999
Total: DT2+CR	Max	1259.157	1321.745	1321.745	1259.157
+SH+T+SD	Min	853.097	988.105	988.105	853.097

<1st Span, Right> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	345.622	341.234	341.234	345.622
Cast-in-place Concrete	D2	331.750	453.224	453.224	331.750
Weight of Bridge Surface	D3	291.605	268.360	268.360	291.605
Subtotal: DT1=D1+D2+D3		968.977	1062.818	1062.818	968.977
Live Load	Max	541.200	468.490	468.490	541.200
LT	Min	-239.170	-154.070	-154.070	-239.170
Subtotal: DT2	Max	1510.177	1531.308	1531.308	1510.177
=DT1+LT+SW	Min	729.807	908.748	908.748	729.807
Creep CR		-74.779	-65.787	-65.787	-74.779
Drying Shrinkage SH		8.651	9.287	9.287	8.651
Temperature Range		-22.494	-24.147	-24.147	-22.494
Dead Load: DT1+CR+SH		902.849	1006.318	1006.318	902.849
Total: DT2+CR	Max	1421.555	1450.661	1450.661	1421.555
+SH+T+SD	Min	641.185	828.101	828.101	641.185

<2nd Span, Left> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	345.113	340.733	340.733	345.113
Cast-in-place Concrete	D2	331.336	452.710	452.710	331.336
Weight of Bridge Surface	D3	290.004	266.808	266.808	290.004
Subtotal: DT1=D1+D2+D3		966.453	1060.251	1060.251	966.453
Live Load	Max	540.230	467.580	467.580	540.230
LT	Min	-239.580	-154.560	-154.560	-239.580
Subtotal: DT2	Max	1506.683	1527.831	1527.831	1506.683
=DT1+LT+SW	Min	726.873	905.691	905.691	726.873
Creep CR		-76.323	-67.544	-67.544	-76.323
Drying Shrinkage SH		8.646	9.282	9.282	8.646
Temperature Range		-22.480	-24.132	-24.132	-22.480
Dead Load: DT1+CR+SH		898.776	1001.989	1001.989	898.776
Total: DT2+CR	Max	1416.526	1445.437	1445.437	1416.526
+SH+T+SD	Min	636.716	823.297	823.297	636.716

<2nd Span, Right> Unit: kN

		G 1	G 2	G 3	G 4
Weight of Girder	D1	345.113	340.733	340.733	345.113
Cast-in-place Concrete	D2	308.532	428.880	428.880	308.532
Weight of Bridge Surface	D3	180.155	165.086	165.086	180.155
Subtotal: DT1=D1+D2+D3		833.800	934.699	934.699	833.800
Live Load	Max	334.530	303.990	303.990	334.530
LT	Min	-71.540	-29.650	-29.650	-71.540
Subtotal: DT2	Max	1168.330	1238.689	1238.689	1168.330
=DT1+LT+SW	Min	762.260	905.049	905.049	762.260
Creep CR		75.631	66.740	66.740	75.631
Drying Shrinkage SH		-8.656	-9.292	-9.292	-8.656
Temperature Range		22.506	24.160	24.160	22.506
Dead Load: DT1+CR+SH		900.775	992.147	992.147	900.775
Total: DT2+CR	Max	1257.811	1320.297	1320.297	1257.811
+SH+T+SD	Min	851.741	986.657	986.657	851.741

7.2 Reaction Force for Pier and Abutment

Unit: kN

		1	2	3
Weight of Girder	D1	1373.712	2745.404	1371.692
Cast-in-place Concrete	D2	1476.680	3138.040	1474.824
Weight of Bridge Surface	D3	692.252	2233.554	690.482
Subtotal: DT1=D1+D2+D3		3542.644	8116.998	3536.998
Live Load	Max	1021.360	1962.760	1020.780
LT	Min	-100.970	0.000	-101.570
Subtotal: DT2	Max	4564.004	10079.758	4557.778
=DT1+LT+SW	Min	3441.674	8116.998	3435.428
Creep CR		284.124	-568.866	284.742
Drying Shrinkage SH		-35.838	71.732	-35.896
Temperature Range		93.174	-186.506	93.332
Dead Load: DT1+CR+SH		3790.930	7619.864	3785.844
Total: DT2+CR	Max	4905.464	9396.118	4899.956
+SH+T+SD	Min	3783.134	7433.358	3777.606

7.3 Horizontal Force

Horizontal Force(PF14、PF15fix)

(kN)

	PF14	PF15
Prestressing	-324	249
Drying Shrinkage	-335	258
Temperature(+)	259	-185
Temperature(-)	-259	185
Dead Load	-659	507
Temperature+15℃	-400	321
Temperature-15℃	-918	692
Temperature+40℃	32	13
Temperature-40℃	-1350	1000

8 Design of Cross Beam at End of Girder

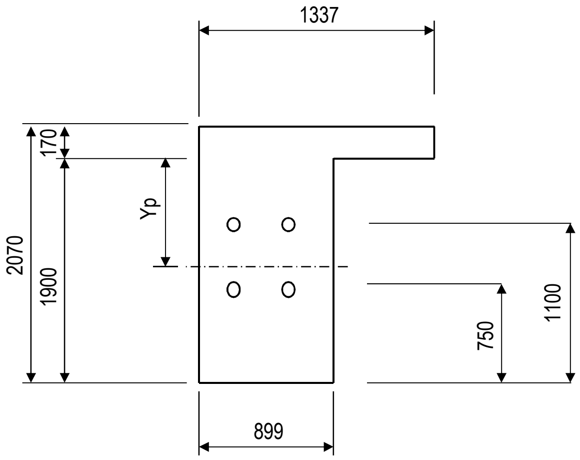
8.1 For Bending Moment

1) Calcution of Bending Moment

(kN・m)

		Bending Moment	
		max	min
Dead Load	(Md)	-67.84	-67.84
Live Load	(ML)	319.35	-204.76
Total	(M)	251.51	-272.60

2)Dimension



3)Calculation of Prestressing

Type of PC strand 4S15.2 SWPR19L

Area of PC strand 554.8 mm^2

Number of PC strand 4

(N/mm^2)

	Tensile Stress of PC strand	
	Allowable Value	Result
During Prestressing	1440	1250
Immediately after Prestressing	1295	1151
Under Effestive Prestressing Force	1110	1056

4)Combined Flexural Stress

(N/mm^2)

		Bending Moment(Max)		Bending Moment(Min)	
		Top	Bottom	Top	Bottom
Dead Load		-0.09	0.10	-0.09	0.10
Live Load		0.44	-0.47	-0.28	0.30
Prestressing		1.26	1.48	1.26	1.48
Total	Dead Load	1.17	1.58	1.17	1.58
	Live Load	1.61	1.11	0.89	1.88
Allowable Value		$0.00 \leqq \sigma \leqq 12.0$			

02-STEEL BRIDGE

02-1-STEEL BOX GIRDER BRIDGE

Contents

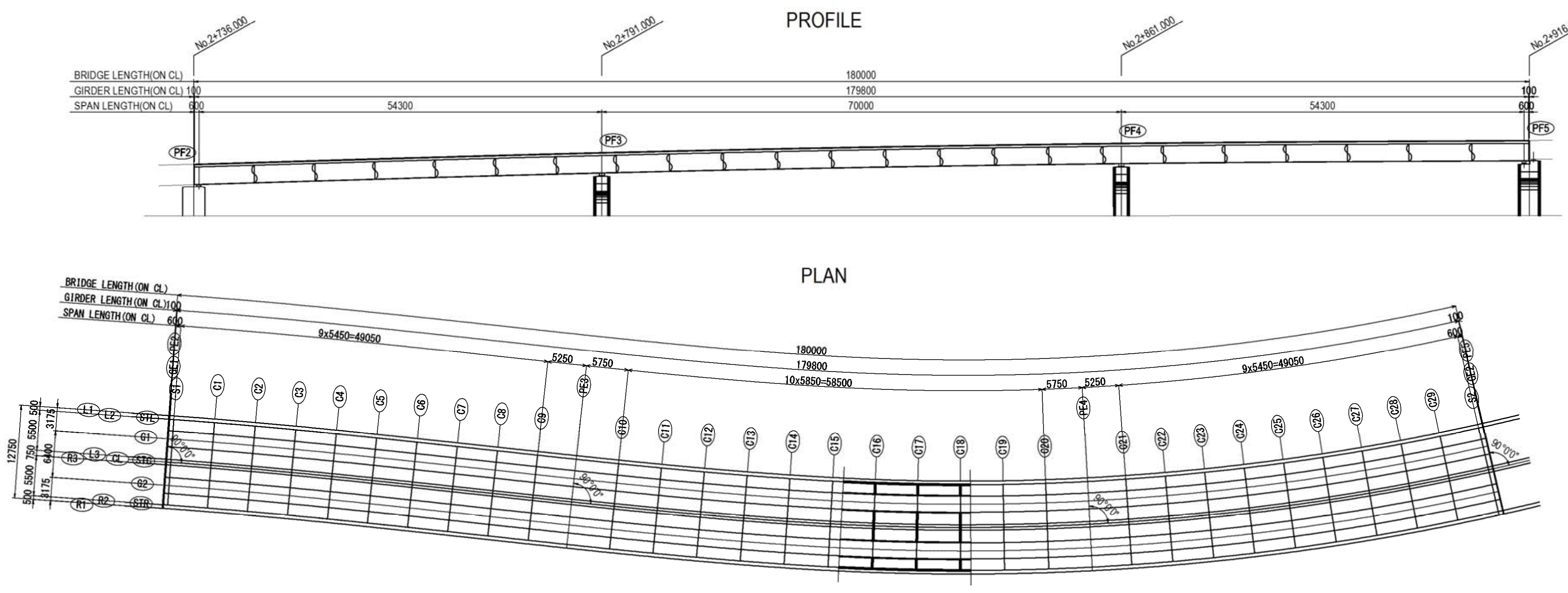
§1. Design condition

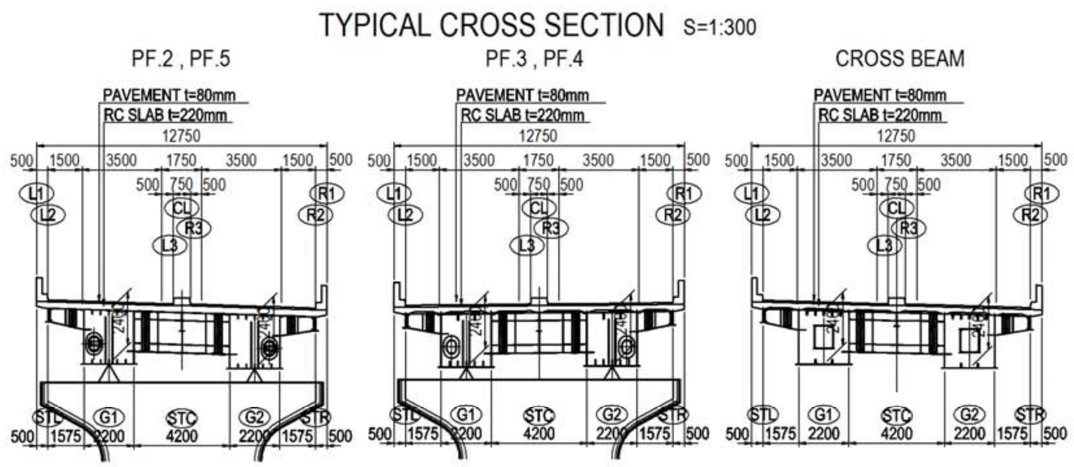
1-1 Design condition

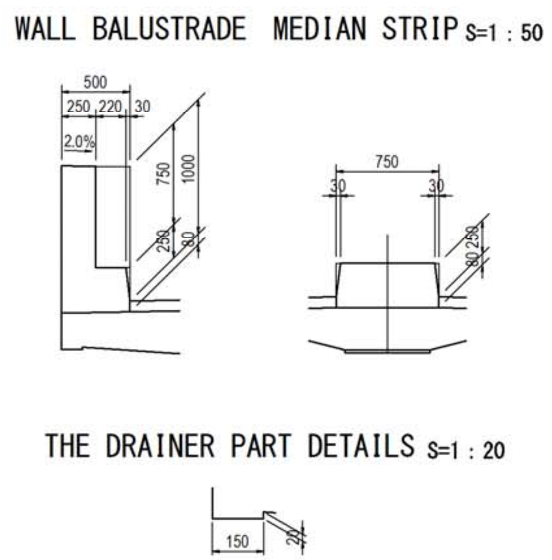
ROAD GRADE	Equivalent to CLASS 4-1
BRIDGE TYPE	3 span continuous steel box girder
BRIDGE LENGTH	L = 180.000 m
SPAN LENGTH	L = 54.300 + 70.000 + 54.300m
WIDTH OF THE ROAD	TOTAL : 12.750 m 0.500+5.500+0.750+5.500+0.500m
PLANE CONFIGURATION	A=150.0～R=-420.0～A=150.0～R=∞～A=130.0～R=320.0
LONGITUDINARL SLOPE	↙ 3.000 % (VCL=130) ↙ 0.500 % (VCL=60)
SECTION SLOPE	4.000 % ↙ 2.000 % ↙ ↘ 6.000 % ↘
ANGLE OF SKEW	90° 00′ 00″
PAVEMENT	ASPHALT PAVEMENT t= 80 mm
SLAB	REINFORCED CONCRETE t= 220 mm
LIVE ROAD	AASHTO HL=93
DESIGN STANDARD	AASHTO LRFD BRIDGE DESIGN 2014(LIVE ROAD) Specifications for highway bridges (Japan Road Association) Ⅰ Common matters, Ⅱ Steel bridges, Ⅴ Seismic design (April 2012)

1-2 General view of superstructre

GENERAL VIEW OF SUPERSTRUCTURE(PF2-PF5) S=1:600







DESIGN CONDITION

ROAD GRADE	Equivalent to class4-1
BRIDGE TYPE	3 span continuous steel box girder
BRIDGE LENGTH	L = 180.000 m
SPAN LENGTH	L = 54.300 + 70.000 + 54.300 m
WIDTH OF THE ROAD	TOTAL : 12.750 m L = 0.500 + 5.500 + 0.750 + 5.500 +0.500 m
PLANE CONFIGURATION	A=150.0〜R=∞〜A=130.0〜R=320.0
LONGITUDINAL SLOPE	3.000%(VCL=130) 0.500%(VCL=60)
SECTIN SLOPE	4.000% 2.000% 6.000%
ANGLE OF SKEW	90°00'00"
PAVEMENT	ASPHALT PAVEMENT t = 80 mm
SLAB	REINFORCED CONCRETE t = 220 mm
LIVE ROAD	AASHTO HL-93
DESIGN STANDARD	AASHTO LRFD BRIDGE DESIGN 2014(LIVE ROAD) Specifications for highway bridges(Japan Road Association) .Common matters,.Steel bridges,.Seismic design(April 2012)

PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO.,LTD. NIPPON ENGINEERING CONSULTANTS CO.,LTD.

	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
PREPARED BY	Y.SUZUKI			GENERAL VIEW OF SUPERSTRUCTURE(PF2-PF5)	3
CHECKED BY	T. HAYAKAWA				DWG No.
APPROVED BY	Y. SANO				P3-FO-

§2.Design of Slab

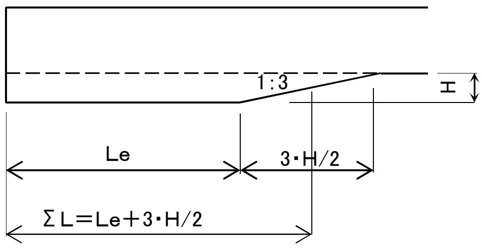
2-1 Design Condition

ASPHALT PAVEMENT	ASPHALT PAVEMENT		t ＝80mm
RC SLAB		RC SLAB	t ＝220mm
LIVE LOAD		LIVE LOAD	AASHTO Truck or JSHB T-load
$ADTT_{SL}$	2000 or more per day		k1＝1.25
Allowable Stress	Concrete	Design Strength	σck＝24N/mm2
		Allowable Stress	σca＝8.0N/mm2
	Reinforcement bar	Material	SD345
		Allowable Stress	σsa＝140N/mm2
Note: Approximately 20N/mm2 of allowance should be considered in the case without considering			

・The span of slab is determined by the maximum value.
・The length of thickness increasing of slab at the end of girder "Le" is as follows, according to JSHB II 9.2.1
・ Window Load : 44.7 m/s
・Collision force to the concrete barrier : 43kN

Ｌe＝1/2・ L　　　　L ：The span length of slab in the perpendicular direction to bridge axis

Section	Le(mm)
S1	1100
S2	1100



The bending moment of the design with two types of live loads is calculated as follows

1) AASHTO LIVE LOAD　　M=1.2*(α1-α2)*L*P / SW*(1+i)=　　23.5 kNm

α1= 0.204
α1= -0.02831
SW= 1815
P= 72.5
i= 0.33
L: SPAN 2.10 m

2) JSHB T-Load　　M=(0.12*L+0.07)*P*K*0.8 + ΔM =　　30.6 kNm

P= 100
K= 1.000

	AASHTO	JSHB
Maxmam Positive Live Load Moment	23.5 kNm	30.6 kNm
Maxmam Negative Live Load Moment	-25.0 kNm	-35.3 kNm

Since the RC slab is directly affected by the load of the wheel, it is better to design with JSHB's live load (large

2-2 Summary of Calculation Result for Deck Slab

	Deck Slab outside of Bracket			
	Longitudinal Bar		Stirrup	
Bending Moment(kN・m)	-12.92		0.00	
Deck Thickness(mm)	270		283.4	
Diameter of Upper Rebar (mm)	D19		D16	
Pitch of Upper Rebar (mm)	ctc150		ctc250	
Diameter of Lower Rebar (mm)	D19		D16	
Pitch of Lower Rebar (mm)	ctc300		ctc125	
Concrete Cover Thickness(mm)	40.0		57.5	
Amount of Rebar As (cm^2)	19.10		15.89	
Amount of Rebar As' (cm^2)	9.55		7.94	
Stress of Concrete (N/mm^2)	σ c ＝	1.30 ＜ 8.0	σc＝	0.00 ＜ 8.0
Stress of Rebar (N/mm^2)	σ s ＝	33.8 ＜ 140	σs＝	0.0 ＜ 140

	Deck Slab on Bracket (at Centre Span)			
	Longitudinal Bar		Stirrup	
Bending Moment(kN・m)	22.50		15.80	
Deck Thickness(mm)	220		220	
Diameter of Upper Rebar (mm)	D19		D16	
Pitch of Upper Rebar (mm)	ctc300		ctc250	
Diameter of Lower Rebar (mm)	D19		D16	
Pitch of Lower Rebar (mm)	ctc150		ctc125	
Concrete Cover Thickness(mm)	40.0		57.5	
Amount of Rebar As (cm^2)	19.10		15.89	
Amount of Rebar As' (cm^2)	9.55		7.94	
Stress of Concrete (N/mm^2)	σc＝	3.44 ＜ 8.0	σc＝	3.28 ＜ 8.0
Stress of Rebar (N/mm^2)	σs＝	76.8 ＜ 140	σs＝	71.6 ＜ 140

	Deck Slab on Bracket (at End of Bracket)		
	Longitudinal Bar		Stirrup
Bending Moment(kN・m)	-37.12		－
Deck Thickness(mm)	300		－
Diameter of Upper Rebar (mm)	D19		－
Pitch of Upper Rebar (mm)	ctc150		－
Diameter of Lower Rebar (mm)	D19		－
Pitch of Lower Rebar (mm)	ctc300		－
Concrete Cover Thickness(mm)	40.0		－
Amount of Rebar As (cm^2)	19.10		－
Amount of Rebar As' (cm^2)	0.00		－
Stress of Concrete (N/mm^2)	σc＝	3.37 ＜ 8.0	－
Stress of Rebar (N/mm^2)	σs＝	85.3 ＜ 140	－

	Deck Slab between Main Girder and Stringer (at Centre Span)			
	Longitudinal Bar		Stirrup	
Bending Moment(kN・m)	32.81		26.12	
Deck Thickness(mm)	220		220	
Diameter of Upper Rebar (mm)	D19		D16	
Pitch of Upper Rebar (mm)	ctc300		ctc250	
Diameter of Lower Rebar (mm)	D19		D16	
Pitch of Lower Rebar (mm)	ctc150		ctc125	
Concrete Cover Thickness(mm)	40.0		57.5	
Amount of Rebar As (cm^2)	19.10		15.89	
Amount of Rebar As' (cm^2)	9.55		7.94	
Stress of Concrete (N/mm^2)	σｃ＝	5.02 ＜ 8.0	σc＝	5.43 ＜ 8.0
Stress of Rebar (N/mm^2)	σｓ＝	111.9 ＜ 140	σs＝	118.4 ＜ 140

	Deck Slab between Main Girder and Stringer (at Stringer)		
	Longitudinal Bar		Stirrup
Bending Moment(kN・m)	-36.69		―
Deck Thickness(mm)	300		―
Diameter of Upper Rebar (mm)	D19		―
Pitch of Upper Rebar (mm)	ctc150		―
Diameter of Lower Rebar (mm)	D19		―
Pitch of Lower Rebar (mm)	ctc300		―
Concrete Cover Thickness(mm)	40.0		―
Amount of Rebar As (cm^2)	19.10		―
Amount of Rebar As' (cm^2)	0.00		―
Stress of Concrete (N/mm^2)	σc＝	3.32 ＜ 8.0	―
Stress of Rebar (N/mm^2)	σs＝	84.1 ＜ 140	―

	Deck Slab on Main Girder (at Centre Span)			
	Longitudinal Bar		Stirrup	
Bending Moment(kN・m)	30.20		20.80	
Deck Thickness(mm)	220		220	
Diameter of Upper Rebar (mm)	D19		D16	
Pitch of Upper Rebar (mm)	ctc300		ctc250	
Diameter of Lower Rebar (mm)	D19		D16	
Pitch of Lower Rebar (mm)	ctc150		ctc125	
Concrete Cover Thickness(mm)	40.0		57.5	
Amount of Rebar As (cm^2)	19.10		15.89	
Amount of Rebar As' (cm^2)	9.55		7.94	
Stress of Concrete (N/mm^2)	σc＝	4.62 ＜ 8.0	σc＝	4.32 ＜ 8.0
Stress of Rebar (N/mm^2)	σs＝	103.0 ＜ 140	σs＝	94.3 ＜ 140

	Deck Slab on Main Girder (at End of Girder)		
	Longitudinal Bar		Stirrup
Bending Moment(kN・m)	-30.20		―
Deck Thickness(mm)	300		―
Diameter of Upper Rebar (mm)	D19		―
Pitch of Upper Rebar (mm)	ctc150		―
Diameter of Lower Rebar (mm)	D19		―
Pitch of Lower Rebar (mm)	ctc300		―
Concrete Cover Thickness(mm)	40.0		―
Amount of Rebar As (cm^2)	19.10		―
Amount of Rebar As' (cm^2)	0.00		―
Stress of Concrete (N/mm^2)	σc＝	2.74 ＜ 8.0	―
Stress of Rebar (N/mm^2)	σs＝	69.4 ＜ 140	―

§3. Structure analysis

3-1 Analytical Method

1. The structural analysis is conducted by arbitrary lattice theory (a displacement method) with an electrical
   The software used is "APOLLO Analyzer " commercialized by Yokogawa Techno-information Service In
2. The structure is plane grid composed of main girders and cross beams.
3. Vertical loads (dead load and live load) is considered in the analysis.
4. The coordinates of the structure are automatically transformed from the plane coordinates
   calculated by linear analysis.

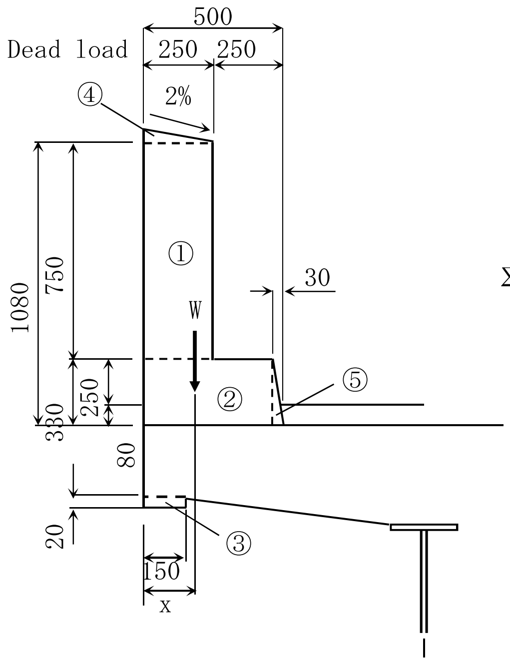
3-2 Load intensity

(1) Dead load

Pavement	22.5 x 0.080		=	1.800	kN/m2
Slab	0.220 x 24.5		=	5.390	kN/m2
Haunch		(G1)	=	1.920	kN/m
		(G2)	=	1.920	kN/m
		(STL)	=	0.510	kN/m
		(STC)	=	0.900	kN/m
		(STR)	=	0.510	kN/m
Steel weight		(G1)	=	20.020	kN/m
		(G2)	=	20.020	kN/m
Embedded Form		(G1)	=	0.340	kN/m
		(G2)	=	0.340	kN/m
Railing	From outside 0.185 m		=	8.630	kN/m
Median			=	6.070	kN/m
Point load Total	10.17 + 47.00	(G1)	=	57.170	kN
	10.17 + 47.00	(G2)	=	57.170	kN

(3) details ofload intensity

1) Concrete Barrier



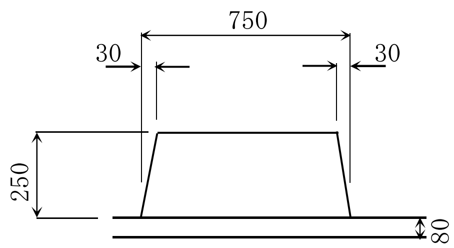
	Area	Unit W.	Load I.	Center G.	--
	A		W	X	W・X
	m2	kN/m3	kN/m	m	--
①	0.188	24.5	4.606	0.125	0.576
②	0.155	24.5	3.798	0.250	0.950
③	0.003	24.5	0.074	0.075	0.006
④	0.001	24.5	0.025	0.083	0.002
⑤	0.005	24.5	0.123	0.480	0.059
Σ			8.626		1.593

W = 8.63 kN/m

x = 1.593 / 8.626 = 0.185 m From outside

0.5 − 0.185 = 0.315 From inside

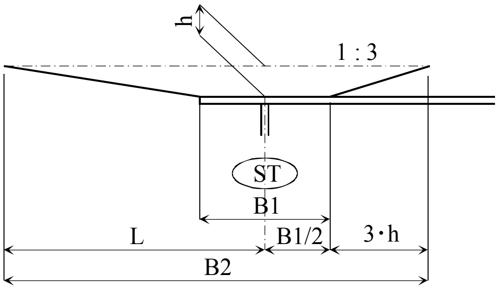
2) Center divider



W = 0.750 x 0.330 x 24.5 = 6.07 kN/m

3) Haunch

【Stringer；STL STR】

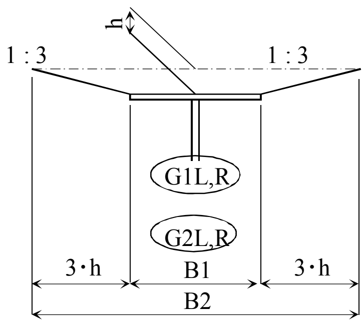


W = 1/2 x (B1 + B2) x h x 24.5 kN/m

Load Point	Section	L (mm)	B1 (mm)	B2 (mm)	h (mm)	W (kN/m)
STL,STR	S1～S2	350	220	610	50	0.510

Note: L is the value of the overhang length less 150mm of the drainage duct.

【Main Girder；G1L,G1R,G2L,G2R,STC】

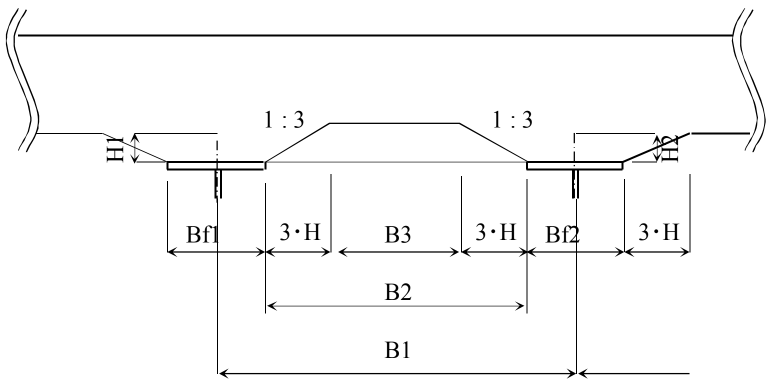


W = 1/2 x (B1 + B2) x h x 24.5 kN/m

Load Point	Applied Section	B1 (mm)	B2 (mm)	h (mm)	W (kN/m)
G1L	S1～S2	250	730	80	0.960
G1R	S1～S2	250	730	80	0.960
G2L	S1～S2	250	730	80	0.960
G2R	S1～S2	250	730	80	0.960
STC	S1～S2	220	700	80	0.900

G1=	0.960	+	0.960	=	1.92	(kN)
G2=	0.960	+	0.960	=	1.92	(kN)
STL=	0.510			=	0.51	(kN)
STR=	0.510			=	0.51	(kN)
STC=	0.900			=	0.90	(kN)

4) Embedded Form



W = 1/2 x (B2 + B3) x 0.2 kN/m2

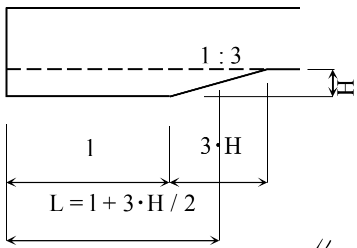
	Bf1 (mm)	Bf2 (mm)	H1 (mm)	H2 (mm)	B1 (mm)	B2 (mm)	B3 (mm)	(B2+B3)/2 (mm)	W' (kN/m2)	W (kN/m)
G1L ～ G1R	250	250	80	80	2200	1950	1470	1710	0.2	0.34
G2L ～ G2R	250	250	80	80	2200	1950	1470	1710	0.2	0.34

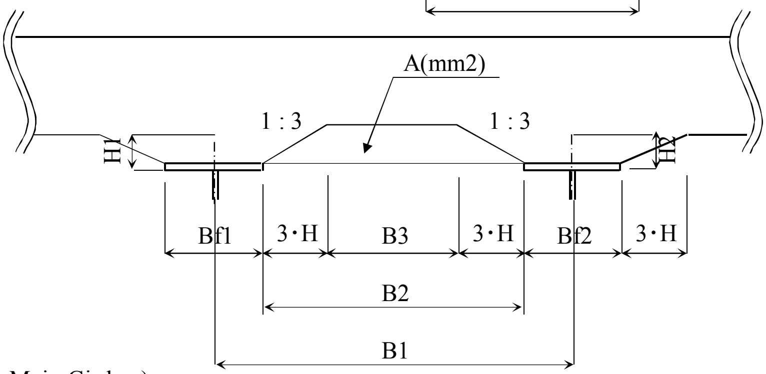
G1= 0.34 (kN/m)
G2= 0.34 (kN/m)

5) Thickness Increasing of Slab

The slab between main girders are increased at the end of girder, with in the half of deck span length from the en
It is considered as the consentrated load applied on the main girder at the end.

	Increasing Length (mm)
S1	1100
S2	1100





(Between Main Girders)
W' = A x L x 24.5 (kN)   B1,B2: Interval of main girders

S1・S2

	Bf1 (mm)	Bf2 (mm)	H1 (mm)	H2 (mm)	B1 (mm)	B2 (mm)	B3 (mm)	A (mm2)	L (mm)	W' (kN)
STL ～ G1L	220	250	50	80	1575	1340	950	74425	1198	2.19
G1L ～ G1R	250	250	80	80	2200	1950	1470	136800	1220	4.09
G1R ～ STC	250	220	80	80	2100	1865	1385	130000	1220	3.89
STC ～ G2L	220	250	80	80	2100	1865	1385	130000	1220	3.89
G2L ～ G2R	250	250	80	80	2200	1950	1470	136800	1220	4.09
G2R ～ STR	250	220	80	50	1575	1340	950	74425	1198	2.19

G1= 2.19 + 4.09 + 3.89 = 10.17 (kN)
G2= 3.89 + 4.09 + 2.19 = 10.17 (kN)

6) Load at the End of Girder

【G1: GE1-S1, GE2-S2】 L= 0.600 m

Pavement	1.800	×	0.600	×	5.500		=	5.940	kN
Deck Slab	5.390	×	0.600	×	6.375		=	20.617	kN
Haunch of Main Girder	1.920	×	0.600	×	1		=	1.152	kN
Haunch of STL	0.510	×	0.600	×	1		=	0.306	kN
Haunch of STC	0.900	×	0.600	×	0.5		=	0.270	kN
Steel Weight	19.500	×	0.600	×	1		=	11.700	kN
Concrete Barrier	8.630	×	0.600	×	1		=	5.178	kN
Median	6.070	×	0.600	×	0.5		=	1.821	kN
						Total	=	46.984	kN
								↓	
						W	=	47.0	kN/node

【G2: GE1-S1, GE2-S2】 L= 0.600 m

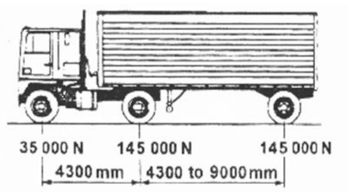
Pavement	1.800	×	0.600	×	5.500		=	5.940	kN
Deck Slab	5.390	×	0.600	×	6.375		=	20.617	kN
Haunch of Main Girder	1.920	×	0.600	×	1		=	1.152	kN
Haunch of STL	0.510	×	0.600	×	1		=	0.306	kN
Haunch of STC	0.900	×	0.600	×	0.5		=	0.270	kN
Steel Weight	19.500	×	0.600	×	1		=	11.700	kN
Concrete Barrier	8.630	×	0.600	×	1		=	5.178	kN
Median	6.070	×	0.600	×	0.5		=	1.821	kN
						Total	=	46.984	kN
								↓	
						W	=	47.0	kN/node

7) Live Load Intensity

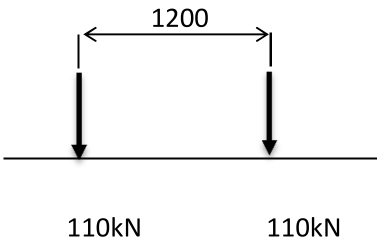
Loading Method
AASHTO HL-93 and the special vehicular load of 75t is applied.
The maximum secional force is used in the design.
Impact coefficent is considered.

1. AASHTO HL-93
① Design Vehicle Load or Design Tandem Load

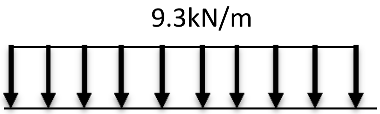
①-1 Design Truck (Hs20-44)



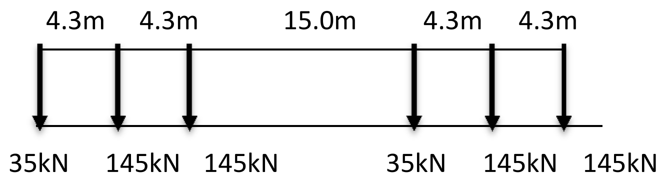
①-2 Design Tandem Load



②Design Lane Load



③Two Design Trucks for Negative Moment



Load Coefficenet with the Number of Lane

Number of Lane	Coefficnt
1	1.2
2	1
3	0.85
>3	0.65

In the Project, three lanes are adopted

Types of Combination
CASE1 (①-1 + ②)x0.85
CASE2 (①-2 + ②)x0.85
CASE3 (③x0.9 + ②x0.9)x0.85

2. Special Vehicular Load 75t(735kN)

The special vehicular load is equally distributed.

Applied Area	45.00 m2	Applied Load	735.0 /	45.0	=	16.33	kN/m2

3. Impact Coefficent

Impact coefficent is calculated as follows;

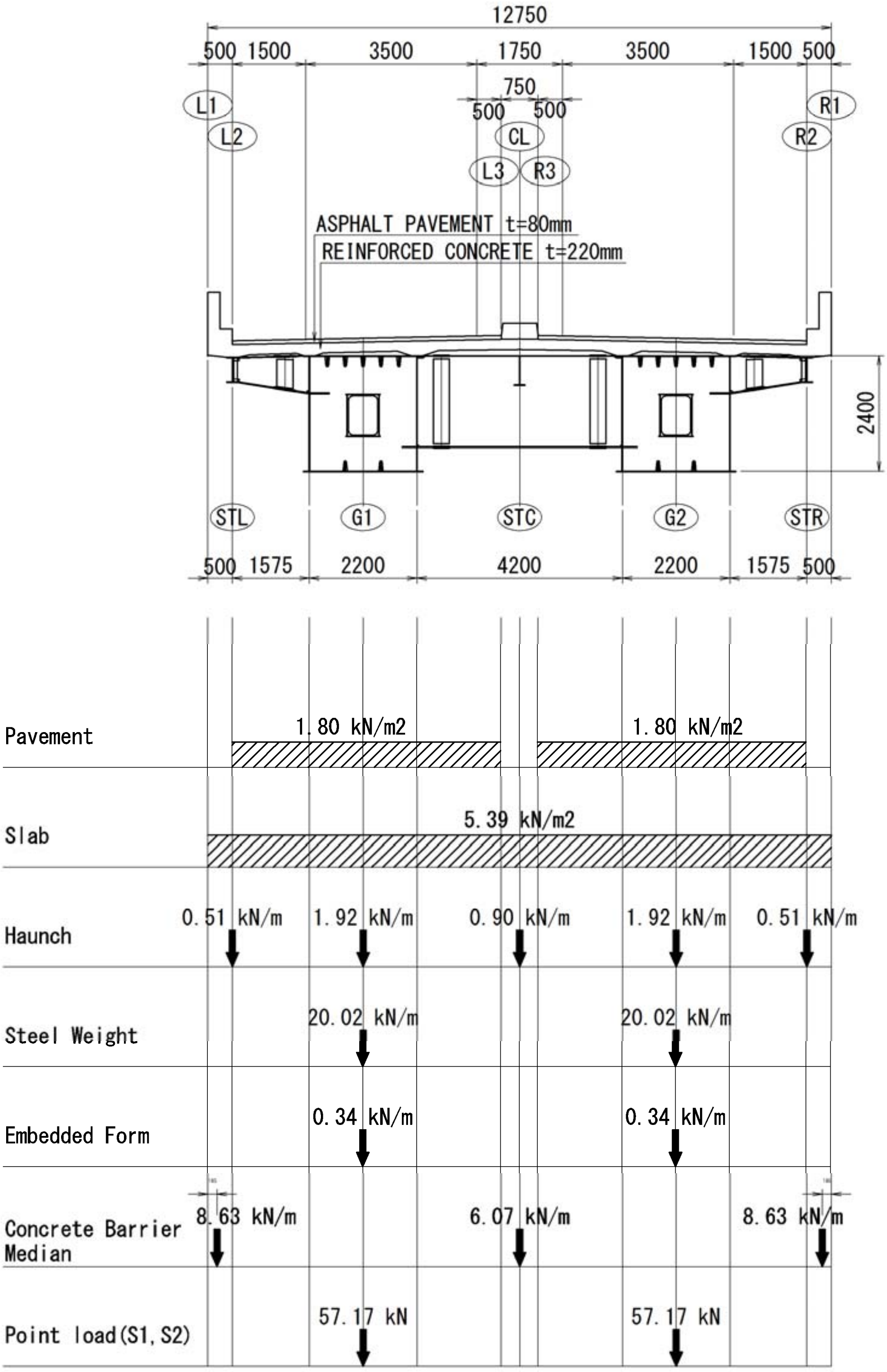
$$i = \frac{20}{50 + L}$$

	Span Length	(on CL)		Impact Coefficent
First Bearing				0.192
First Span	54.300	m	i = 20 / (50 + 54.300) =	0.192
Second Bearing				0.178
Second Span	70.000	m	i = 20 / (50 + 70.000) =	0.167
Third Bearing				0.178
Third Span	54.300	m	i = 20 / (50 + 54.300) =	0.192

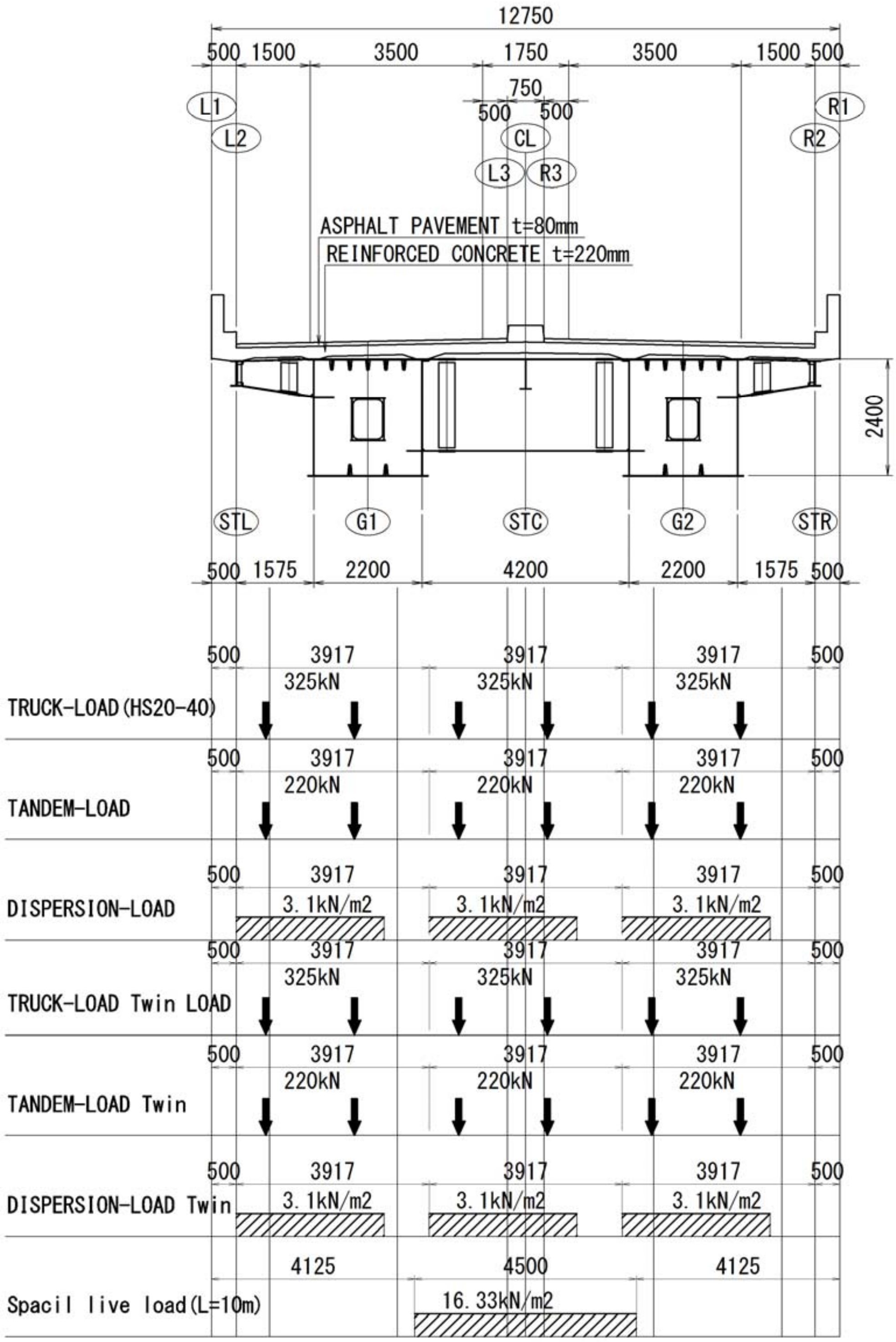
3-3 Load diagram and Load combination

(1) Load diagram

Dead load



Live load



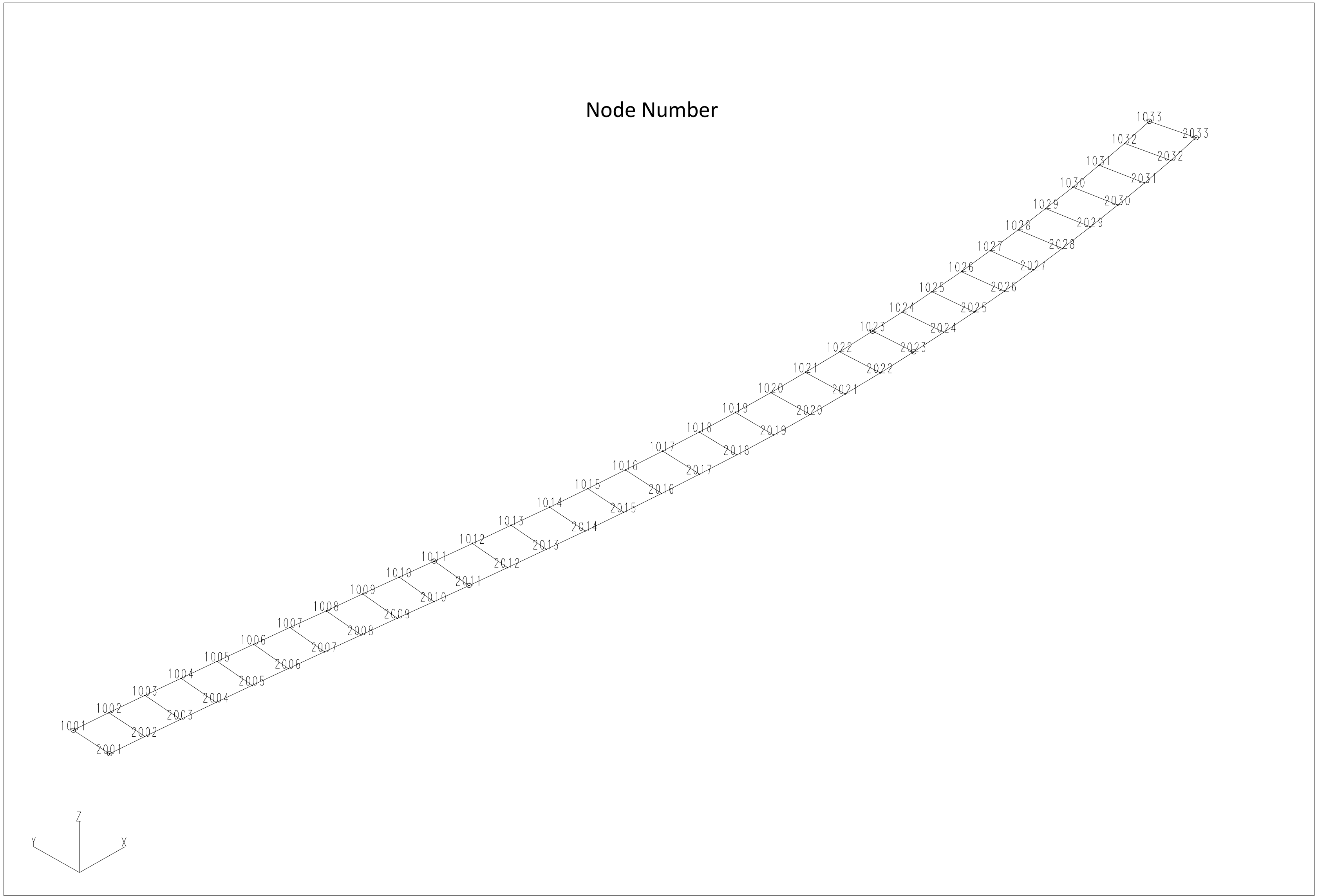
12750
500 1500 3500 1750 3500 1500 500
750
500 500
L1
L2
CL
L3 R3
R1
R2
ASPHALT PAVEMENT t=80mm
REINFORCED CONCRETE t=220mm
2400
STL G1 STC G2 STR
500 1575 2200 4200 2200 1575 500
TRUCK-LOAD(HS20-40)
500 3917 3917 3917 500
325kN 325kN 325kN
TANDEM-LOAD
500 3917 3917 3917 500
220kN 220kN 220kN
DISPERSION-LOAD
500 3917 3917 3917 500
3.1kN/m2 3.1kN/m2 3.1kN/m2
TRUCK-LOAD Twin LOAD
500 3917 3917 3917 500
325kN 325kN 325kN
TANDEM-LOAD Twin
500 3917 3917 3917 500
220kN 220kN 220kN
DISPERSION-LOAD Twin
500 3917 3917 3917 500
3.1kN/m2 3.1kN/m2 3.1kN/m2
Spacil live load(L=10m)
4125 4500 4125
16.33kN/m2

(2) Combination of Load

Case	Load	Note
11	Pavement	
12	Deck Slab	
13	Haunch	
14	Steel Weight	
15	Concrete Barrier	
16	Median	
17	Consentrated Load	
100-1	(①-1＋②)	Truck + Vehicular Load
100-2	(①-2＋②)	Tandem + Vehicular Load
111	(AASHTO two truck)x0.9	(Truck + Vehicular Load) x 2
200	Special Vehicular Load	

Case	Combination Case	Combination
300	Total of Dead Load	11+12+13+14+15+16+17;
302	Maximum Live Load	(100-1)x0.85,(100-2)x0.85,111x0.85,200
303	Dead Load + Live Load	300+302;

3-4 Skeleton Diagram



3-5 Checking of dead load

Line length				
Bridge aria	2277.137	m2	Lside	Rside
Pavement aria	1964.588	m2	977.204	987.384
L1	176.712	m		
L2	176.860	m		
G1	177.652	m		
L3	178.489	m		
CL	178.600	m		
R3	178.711	m		
G2	179.548	m		
R2	180.340	m		
R1	180.480	m		

		Load intensity		Area or Length		(A)		(B) Analysis result		(B)/(A)
Pavement		1.800	x	1964.588	=	3536.26	kN	3536.02	kN	1.00
Rcslab		5.390	x	2277.137	=	12273.77	kN	12272.95	kN	1.00
Haunch	G1	1.920	x	177.652	=	341.09	kN			
	G2	1.920	x	179.548	=	344.73	kN			
	STL	0.510	x	176.860	=	90.20	kN			
	STC	0.900	x	178.600	=	160.74	kN			
	STR	0.510	x	180.340	=	91.97	kN			
						1028.73	kN	1028.68	kN	1.00
Embedded form		0.340	x	177.652	=	60.40	kN			
		0.340	x	179.548	=	61.05	kN			
						121.45	kN	121.44	kN	1.00
Steek weight		20.020	x	177.652	=	3556.60	kN			
		20.020	x	179.548	=	3594.55	kN			
						7151.15	kN	7150.79	kN	1.00
Point load				S1 G1		57.17	kN			
				S1 G2		57.17	kN			
				S2 G1		57.17	kN			
				S2 G2		57.17	kN			
						228.68	kN	228.68	kN	1.00
concrete Barrier										
		8.630	x	176.786	=	1525.66	kN			
		8.630	x	180.410	=	1556.94	kN			
						3082.60	kN	3082.48	kN	1.00
Median		6.070	x	178.600	=	1084.10	kN	1084.05	kN	1.00
Total						28506.74	kN	28505.10	kN	1.00

Assuming steel Weight			7151.15	kN					
			46.80						
			7197.95	kN					
Real steel Weight	759816	x	9.81	/	1000	=	7453.8	kN	
weight ratio	7198.0	/	7453.8	=	97%	>	95%	OK	

3-6. Total Reaction Force

Superstructure Reaction Force (With impact)

				(S1)PF2				
		Name or Coefficient		1001	2001			
Dead load				1673.08	1505.83			
AASHTO	Truk	①-1	Max	601.66	592.45			
			Min	-95.94	-99.71			
	Tandem	①-2	Max	428.91	427.11			
			Min	-69.40	-69.71			
Lane Load	Distributed Load	②	Max	422.34	397.13			
			Min	-113.29	-120.75			
AASHTOxTWIN	Truk	③-1	Max	883.62	851.66			
			Min	-153.08	-167.58			
	Tandem	③-2	Max	428.91	427.11			
			Min	-69.40	-69.71			
Lane Load	Distributed Load	②	Max	422.34	397.13			
			Min	-113.29	-120.75			
Special Vehicular Load	Distributed Load	④	Max	394.32	378.83			
			Min	-53.54	-51.70			
Combination of Live Load	①-1+②	0.85	Max	870.40	841.14			
			Min	-177.85	-187.39			
	①-2+②	0.85	Max	723.56	700.60			
			Min	-155.29	-161.89			
	(③-1+②)x0.9	0.85	Max	999.06	955.32			
			Min	-203.77	-220.57			
	(③-2+②)x0.9	0.85	Max	651.21	630.54			
			Min	-139.76	-145.70			
	④	1.0	Max	394.32	378.83			
			Min	-53.54	-51.70			
Picked Up Live Load		PICK	Max	999.06	955.32			
			Min	-203.77	-220.57			
D + L			Max	2672.14	2461.15			
			Min	1469.31	1285.26			
Dead load total				3178.91				

				PF3				
		Name or Coefficient		1011	2011			
Dead load				5489.00	5567.61			
AASHTO	Truk	①-1	Max	643.79	645.56			
			Min	-93.77	-126.07			
	Tandem	①-2	Max	437.63	439.26			
			Min	-64.14	-86.31			
Lane Load	Distributed Load	②	Max	1185.81	1233.29			
			Min	-142.22	-172.58			
AASHTOxTWIN	Truk	③-1	Max	1170.36	1198.98			
			Min	-148.75	-196.15			
	Tandem	③-2	Max	437.63	439.26			
			Min	-64.14	-86.31			
Lane Load	Distributed Load	②	Max	1185.81	1233.29			
			Min	-142.22	-172.58			
Special Vehicular Load	Distributed Load	④	Max	442.00	436.62			
			Min	-43.63	-77.47			
Combination of Live Load	①-1+②	0.85	Max	1555.16	1597.02			
			Min	-200.59	-253.85			
	①-2+②	0.85	Max	1379.92	1421.67			
			Min	-175.41	-220.06			
	(③-1+②)x0.9	0.85	Max	1802.47	1860.69			
			Min	-222.59	-282.08			
	(③-2+②)x0.9	0.85	Max	1241.93	1279.50			
			Min	-157.87	-198.05			
	④		Max	442.00	436.62			
			Min	-43.63	-77.47			
Picked Up Live Load		PICK	Max	1802.47	1860.69			
			Min	-222.59	-282.08			
D + L			Max	7291.47	7428.30			
			Min	5266.41	5285.53			
Dead load total				11056.61				

				PF4				
		Name or Coefficient		1023	2023			
Dead load				5627.64	5485.67			
AASHTO	Truk	①-1	Max	638.28	625.20			
			Min	-117.96	-97.49			
	Tandem	①-2	Max	434.08	425.12			
			Min	-81.69	-67.36			
Lane Load	Distributed Load	②	Max	1233.17	1189.38			
			Min	-158.13	-148.82			
AASHTOxTWIN	Truk	③-1	Max	1189.05	1151.51			
			Min	-170.31	-150.18			
	Tandem	③-2	Max	434.08	425.12			
			Min	-81.69	-67.36			
Lane Load	Distributed Load	②	Max	1233.17	1189.38			
			Min	-158.13	-148.82			
Special Vehicular Load	Distributed Load	④	Max	431.99	432.48			
			Min	-72.13	-48.46			
Combination of Live Load	①-1+②	0.85	Max	1590.73	1542.39			
			Min	-234.68	-209.36			
	①-2+②	0.85	Max	1417.16	1372.33			
			Min	-203.85	-183.75			
	(③-1+②)x0.9	0.85	Max	1853.00	1790.78			
			Min	-251.26	-228.74			
	(③-2+②)x0.9	0.85	Max	1275.45	1235.09			
			Min	-183.46	-165.38			
	④		Max	431.99	432.48			
			Min	-72.13	-48.46			
Picked Up Live Load		PICK	Max	1853.00	1790.78			
			Min	-251.26	-228.74			
D + L			Max	7480.64	7276.45			
			Min	5376.38	5256.94			
Dead load total				11113.31				

				(S2)PF5				
		Name or Coefficient		1033	2033			
Dead load				1378.01	1778.24			
AASHTO	Truk	①-1	Max	582.09	611.72			
			Min	-84.49	-114.40			
	Tandem	①-2	Max	424.35	431.68			
			Min	-57.30	-84.12			
Lane Load	Distributed Load	②	Max	356.39	466.36			
			Min	-105.08	-135.53			
AASHTOxTWIN	Truk	③-1	Max	805.12	927.91			
			Min	-154.96	-174.05			
	Tandem	③-2	Max	424.35	431.68			
			Min	-57.30	-84.12			
Lane Load	Distributed Load	②	Max	356.39	466.36			
			Min	-105.08	-135.53			
Special Vehicular Load	Distributed Load	④	Max	363.69	409.11			
			Min	-30.62	-76.90			
Combination of Live Load	①-1+②	0.85	Max	797.71	916.37			
			Min	-161.13	-212.44			
	①-2+②	0.85	Max	663.63	763.33			
			Min	-138.02	-186.70			
	(③-1+②)x0.9	0.85	Max	888.56	1066.62			
			Min	-198.93	-236.83			
	(③-2+②)x0.9	0.85	Max	597.27	687.00			
			Min	-124.22	-168.03			
	④		Max	363.69	409.11			
			Min	-30.62	-76.90			
Picked Up Live Load		PICK	Max	888.56	1066.62			
			Min	-198.93	-236.83			
D + L			Max	2266.57	2844.86			
			Min	1179.08	1541.41			
Dead load total				3156.25				

Substructure Reaction Force (Without impact)

				PF2				
		Name or Coefficient		1001	2001			
Dead load				1673.08	1505.83			
AASHTO	Truk	①-1	Max	468.91	441.03			
			Min	-60.95	-59.05			
	Tandem	①-2	Max	332.36	318.33			
			Min	-41.76	-39.78			
Lane Load	Distributed Load	②	Max	382.09	306.35			
			Min	-74.33	-74.14			
AASHTOxTWIN	Truk	③-1	Max	688.12	624.50			
			Min	-103.30	-99.97			
	Tandem	③-2	Max	332.36	318.33			
			Min	-41.76	-39.78			
Lane Load	Distributed Load	②	Max	382.09	306.35			
			Min	-74.33	-74.14			
Special Vehicular Load	Distributed Load	④	Max	330.88	317.88			
			Min	-45.89	-44.32			
Combination of Live Load	①-1+②	0.85	Max	723.35	635.27			
			Min	-114.99	-113.21			
	①-2+②	0.85	Max	607.28	530.98			
			Min	-98.68	-96.83			
	(③-1+②)x0.9	0.85	Max	818.71	712.10			
			Min	-135.89	-133.19			
	(③-2+②)x0.9	0.85	Max	546.55	477.88			
			Min	-88.81	-87.15			
	④	1.0	Max	330.88	317.88			
			Min	-45.89	-44.32			
Picked Up Live Load		PICK	Max	818.71	712.10			
			Min	-135.89	-133.19			
D + L			Max	2491.79	2217.93			
			Min	1537.19	1372.64			
Dead load total				3178.91				
Live load total				1530.81				

				PF3				
		Name or Coefficient		1011	2011			
Dead load				5489.00	5567.61			
AASHTO	Truk	①-1	Max	472.54	498.64			
			Min	-48.83	-86.52			
	Tandem	①-2	Max	322.36	337.05			
			Min	-33.30	-59.29			
Lane Load	Distributed Load	②	Max	988.90	1097.83			
			Min	-48.57	-88.89			
AASHTOxTWIN	Truk	③-1	Max	898.06	947.35			
			Min	-76.65	-135.94			
	Tandem	③-2	Max	322.36	337.05			
			Min	-33.30	-59.29			
Lane Load	Distributed Load	②	Max	988.90	1097.83			
			Min	-48.57	-88.89			
Special Vehicular Load	Distributed Load	④	Max	363.99	367.54			
			Min	-36.61	-65.00			
Combination of Live Load	①-1+②	0.85	Max	1242.22	1357.00			
			Min	-82.79	-149.10			
	①-2+②	0.85	Max	1114.57	1219.65			
			Min	-69.59	-125.95			
	(③-1+②)x0.9	0.85	Max	1443.52	1564.56			
			Min	-95.79	-171.99			
	(③-2+②)x0.9	0.85	Max	1003.11	1097.68			
			Min	-62.63	-113.36			
	④	1.0	Max	363.99	367.54			
			Min	-36.61	-65.00			
Picked Up Live Load		PICK	Max	1443.53	1564.56			
			Min	-95.79	-172.00			
D + L			Max	6932.53	7132.17			
			Min	5393.21	5395.61			
Dead load total				11056.61				
Live load total				3008.09				

				PF4				
		Name or Coefficient		1023	2023			
Dead load				5627.64	5485.67			
AASHTO	Truk	①-1	Max	477.93	493.59			
			Min	-80.65	-54.03			
	Tandem	①-2	Max	323.78	335.71			
			Min	-55.20	-36.98			
Lane Load	Distributed Load	②	Max	945.47	1153.14			
			Min	-82.47	-53.75			
AASHTOxTWIN	Truk	③-1	Max	919.45	929.06			
			Min	-127.03	-84.88			
	Tandem	③-2	Max	323.78	335.71			
			Min	-55.20	-36.98			
Lane Load	Distributed Load	②	Max	945.47	1153.14			
			Min	-82.47	-53.75			
Special Vehicular Load	Distributed Load	④	Max	366.82	364.90			
			Min	-60.52	-40.67			
Combination of Live Load	①-1+②	0.85	Max	1209.89	1399.72			
			Min	-138.65	-91.61			
	①-2+②	0.85	Max	1078.86	1265.52			
			Min	-117.02	-77.12			
	(③-1+②)x0.9	0.85	Max	1426.66	1592.88			
			Min	-160.27	-106.05			
	(③-2+②)x0.9	0.85	Max	970.98	1138.97			
			Min	-105.32	-69.41			
	④	1.0	Max	366.82	364.90			
			Min	-60.52	-40.67			
Picked Up Live Load		PICK	Max	1426.67	1592.89			
			Min	-160.27	-106.05			
D + L			Max	7054.31	7078.56			
			Min	5467.37	5379.62			
Dead load total				11113.31				
Live load total				3019.56				

				PF5				
		Name or Coefficient		1033	2033			
Dead load				1378.01	1778.24			
AASHTO	Truk	①-1	Max	431.03	478.69			
			Min	-34.81	-87.79			
	Tandem	①-2	Max	316.86	333.81			
			Min	-23.69	-59.71			
Lane Load	Distributed Load	②	Max	240.12	447.73			
			Min	-42.13	-109.78			
AASHTOxTWIN	Truk	③-1	Max	571.32	739.91			
			Min	-59.06	-148.69			
	Tandem	③-2	Max	316.86	333.81			
			Min	-23.69	-59.71			
Lane Load	Distributed Load	②	Max	240.12	447.73			
			Min	-42.13	-109.78			
Special Vehicular Load	Distributed Load	④	Max	305.17	343.28			
			Min	-26.25	-65.91			
Combination of Live Load	①-1+②	0.85	Max	570.48	787.46			
			Min	-65.40	-167.93			
	①-2+②	0.85	Max	473.43	664.31			
			Min	-55.95	-144.07			
	(③-1+②)x0.9	0.85	Max	620.75	908.54			
			Min	-77.41	-197.73			
	(③-2+②)x0.9	0.85	Max	426.09	597.88			
			Min	-50.35	-129.66			
	④	1.0	Max	305.17	343.28			
			Min	-26.25	-65.91			
Picked Up Live Load		PICK	Max	620.75	908.55			
			Min	-77.41	-197.73			
D + L			Max	1998.76	2686.79			
			Min	1300.60	1580.51			
Dead load total				3156.25				
Live load total				1529.30				

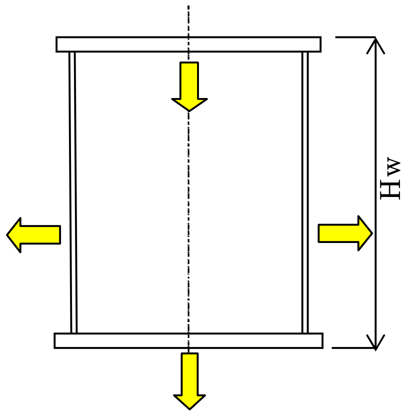
§4.Design of Main Girder

4-1 Design Method

In the design of main girder, the cross section is determined by using the soft where which downloads the cross sectional calculated in §3. and can design Steel-I Girder automatically.

(1) Method for Determination of Cross Section of Stiffener

1) The location of cross section change is same with the location of joint.
2) Maximum difference of flange thickness is half of the base material or less and 25mm or less.
3) Regarding the compressive flange, reduction of stress due to local buckling is considered for upper and lower flang
4) Regarding the tensile flange, the cross section is determined considering the influence of bolt.
   Minimum thickness is 1/80 of an interval of longitudinal rib.
5) The flange width is constant as 2450mm (125+2200+125 (in horizontal direction)).
   The cross section is changed with the thickness of flange.
6) The number of longitudinal ribs is five on the compressive flange and two on the tensile flange.
7) The height of the main girder indicates the height from the upper flange top to the upper flange upper.



8) Minimum thicknesses are shown as follows.
   The minimum difference of thickness is 2mm and the thickness is measured in increments of 1mm.
   The plate of 4.5mm, 3.2mm and 2.3mm is used for filler plates at the joint if it is less than 6mm.

＜Compressive Side＞

Material		SM400	SM490Y	SM570
Calculation Equation		b/(56・n)	b/(46・n)	b/(40・n)
Calculated Value		6.55	7.97	9.17
Minimum Thickness of Plate		7.00	8.00	10.00
Interval of Web Plate	b	2200	2200	2200
Division Number	n	6	6	6

＜Tensile Side＞

Material		SM400	SM490Y	SM570
Calculation Equation		b/(80・n)	b/(80・n)	b/(80・n)
Calculated Value		9.17	9.17	9.17
Minimum Thickness of Plate		10.00	10.00	10.00
Interval of Web Plate	b	2200	2200	2200
Division Number	n	3	3	3

＜Web Plate＞

Horizontal Stiffener is installed in one stage according to the girder height.

The thickness of web plate is decided by the minimum thickness shown in JSHB II

One Stage

Material		SM400	SM490Y	SM570
Calculation Equation		b/256	b/209	b/188
Calculated Value		9.38	11.48	12.77
Minimum Thickness of Plate		10.00	12.00	13.00
Height of Web Plate	b	2400	2400	2400

Note: Height of web plate is the total height.

(2) Design Method for Field Joint

1) The joint is designed so that the strength is 75% of the base material or more.
2) The minimum number of bolt rows on the compressive flange is two.
3) Hole deductions tress of the tensile flange is increased by 1.1 times of net cross sectional area.
4) The thickness of splice plate is determined by the stress (75% or more of the total strength)
5) The number of bolt rows and the thickness of splice plate is determined on the thinner cross section of the base material at the joint.

(3) Vertical Stiffener

1) The cross section is determined as follows according to JSHB II－11.4.4.
   a) The width of vertical stiffener is the value or more which is the total of 1/30 of web height and 50mm.
   b) The material is SM400.
   c) The thickness of vertical stiffener is 1/13 of the width or more.
   d) The interval of vertical stiffener "a" used in the equation (11.4.7) is the maximum value which satisfies the assessment equation stated in 11.4.3

(4) Horizontal Stiffener

1) The number of horizontal stiffener rows is one according to the girder height.
   The cross section is determined to satisfy the stiffness stated in JSHB II-11.4.7.

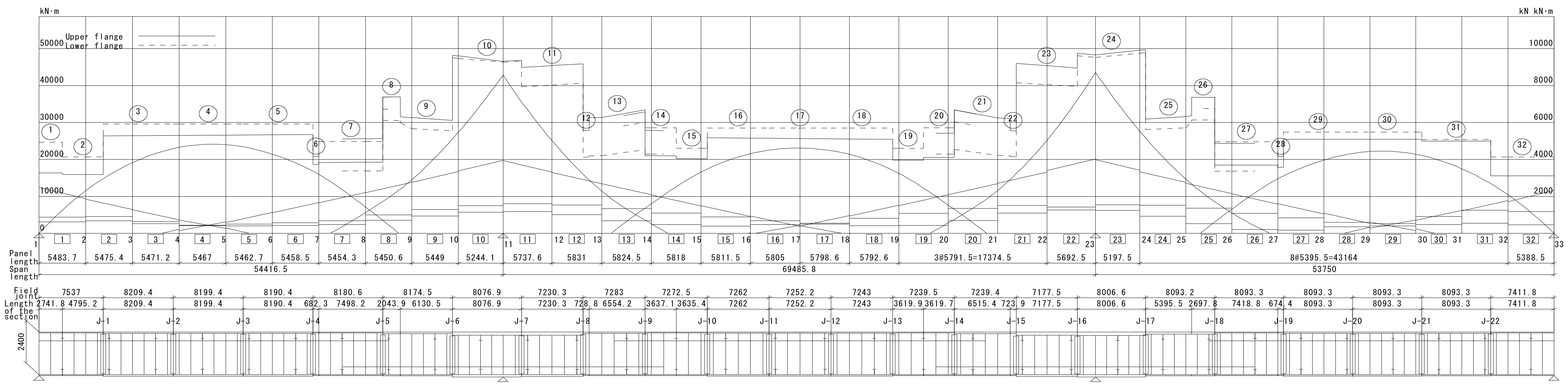
(5) Bearing Stiffener

1) The bearing stiffener is determined by the structure at the load concentrated point stated in JSHB II-11.5.

4-2 Calculation result og Main Girder

STRESS DIAGRAM(1/2) S=1:400

G-1



Unit : mm N/mm2

		1		2	3	4	5	6	7			8			9	10		11	12
Section		Sec-1		Sec-1	Sec-2	Sec-3	Sec-4	Sec-5	Sec-5			Sec-6			Sec-6	Sec-7		Sec-8	Sec-9
Uflg W=2450 T		10(3)		10(3)	14(3)	14(3)	14(3)	11(3)	11(3)			18(3)			18(3)	32(3)		32(3)	16(3)
Upper flange Vertical rib	Number	5		5	5	5	5	5	5			5			2	2		2	2
	Width	190		190	190	190	190	190	190			230			230	260		230	230
	Thickness	19(3)		19(3)	19(3)	19(3)	19(3)	19(3)	19(3)			22(3)			22(3)	25(3)		22(3)	22(3)
Left Web	Height	2426.3	2424.6	2421.7	2412.7	2409.8	2406.9	2401.4	2400.7	2392.4	2392.4	2385.4	2385.4	2383.2	2376.4	2355.9	2355.9	2353.5	2361.3
	Thickness	12(3)		12(3)	12(3)	12(3)	12(3)	12(3)	12(3)			14(3)			14(3)	16(3)		16(3)	14(3)
Right Web	Height	2353.7	2355.4	2358.3	2359.3	2362.1	2365.1	2376.6	2377.3	2385.6	2385.6	2378.6	2378.6	2380.8	2387.6	2380.1	2380.1	2382.5	2406.7
	Thickness	12(3)		12(3)	12(3)	12(3)	12(3)	12(3)	12(3)			14(3)			14(3)	16(3)		16(3)	14(3)
Lower flange Vertical rib	Number	5		2	2	2	2	2	5			5			5	5		5	5
	Width	190		190	190	190	190	190	190			230			230	260		230	230
	Thickness	19(3)		19(3)	19(3)	19(3)	19(3)	19(3)	19(3)			22(3)			22(3)	25(3)		22(3)	22(3)
Lflg W=2450 T		10(3)		10(3)	18(3)	18(3)	18(3)	10(3)	10(3)			14(3)			14(3)	26(3)		21(3)	11(3)
Upper flange	σ	0	-55	-133	-165	-173	-168	-143	-131	-29	71	-20	49	68	176	193	193	167	121
	σa	210	143	143	191	191	191	158	158	158	210	210	210	210	210	210	210	210	210
	σa-σ	210	88	10	26	17	23	15	26	129	139	190	161	142	34	17	17	43	89
Lower flange	σ	0	53	151	163	171	166	170	135	30	-73	22	-54	-75	-175	-194	-194	-189	-123
	σa	210	210	210	210	210	210	210	210	210	143	210	191	191	191	210	210	210	158
	σa-σ	210	157	59	47	39	44	40	75	180	70	188	137	116	16	16	16	21	35
Web	τ	56	50	39	20	13	19	36	37	55	55	47	47	50	63	65	65	62	59
	τa	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	Combined	0.21	0.17	0.57	0.60	0.65	0.62	0.69	0.46	0.21	0.24	0.15	0.16	0.23	0.86	1.03	1.04	0.96	0.49
Calculated points		Left	Right	J-1	J-2		J-3	J-4	Left	J-5	J-5	Left	Left	Right	J-6	Max Left	Max Right	J-7	J-8
Uflg σspl											109				198			189	137
Lflg σspl				168	177		181	195		47									

		13			14			15	16	17		18	19	20			21			22	23
Section		Sec-9			Sec-10			Sec-10	Sec-11	Sec-12		Sec-13	Sec-14	Sec-14			Sec-15			Sec-15	Sec-16
Uflg W=2450 T		16(3)			11(3)			11(3)	13(3)	13(3)		13(3)	11(3)	11(3)			17(3)			17(3)	34(3)
Upper flange Vertical rib	Number	5			5			5	5	5		5	5	5			5			2	2
	Width	230			230			230	230	230		230	230	230			230			230	230
	Thickness	22(3)			22(3)			22(3)	22(3)	22(3)		22(3)	22(3)	22(3)			22(3)			22(3)	22(3)
Left Web	Height	2360.5	2352.4	2352.4	2357.4	2357.4	2352.8	2348.3	2337.1	2332.8	2332.6	2328	2323.5	2323	2323	2323	2317	2317	2317	2317	2299.9
	Thickness	14(3)			12(3)			12(3)	12(3)	12(3)		12(3)	12(3)	12(3)			14(3)			14(3)	16(3)
Right Web	Height	2407.5	2415.6	2415.6	2420.6	2420.6	2425.2	2429.7	2436.8	2441.1	2441.4	2445.9	2454.4	2455	2455	2455	2449	2449	2449	2449	2431.9
	Thickness	14(3)			12(3)			12(3)	12(3)	12(3)		12(3)	12(3)	12(3)			14(3)			14(3)	16(3)
Lower flange Vertical rib	Number	5			5			2	2	2		2	2	5			5			5	5
	Width	230			230			230	230	230		230	230	230			230			230	230
	Thickness	22(3)			22(3)			22(3)	22(3)	22(3)		22(3)	22(3)	22(3)			22(3)			22(3)	22(3)
Lflg W=2450 T		11(3)			11(3)			11(3)	16(3)	16(3)		16(3)	11(3)	11(3)			11(3)			11(3)	21(3)
Upper flange	σ	97	-43	22	-51	27	-95	-136	-159	-163	-163	-159	-136	-94	-50	29	-40	24	98	122	170
	σa	210	206	210	158	210	158	158	182	182	182	182	158	158	158	210	210	210	210	210	210
	σa-σ	113	163	188	107	183	63	22	23	18	18	22	22	64	108	181	170	186	112	88	40
Lower flange	σ	-108	48	-25	50	-26	93	159	166	170	170	165	156	90	47	-28	45	-26	-109	-123	-190
	σa	158	210	158	210	158	210	210	210	210	210	210	210	210	210	158	210	158	158	158	210
	σa-σ	49	162	133	160	132	117	51	44	40	40	45	54	120	163	130	165	132	49	35	20
Web	τ	58	45	45	53	53	43	35	19	13	12	19	35	43	53	53	45	45	58	59	63
	τa	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	Combined	0.41	0.14	0.14	0.19	0.19	0.28	0.61	0.63	0.65	0.65	0.62	0.59	0.27	0.19	0.19	0.14	0.14	0.41	0.49	0.98
Calculated points		Left	Right	Right	J-9	J-9	Right	J-10	J-11			J-12	J-13	Left	J-14	J-14	Left	Left	Right	J-15	J-16
Uflg σspl						46										50				138	191
Lflg σspl					86			186	188			187	183		81						

Grade (1):SM400
(2):SM490
(3):SM490Y
(4):SM570

Unit : mm N/mm2

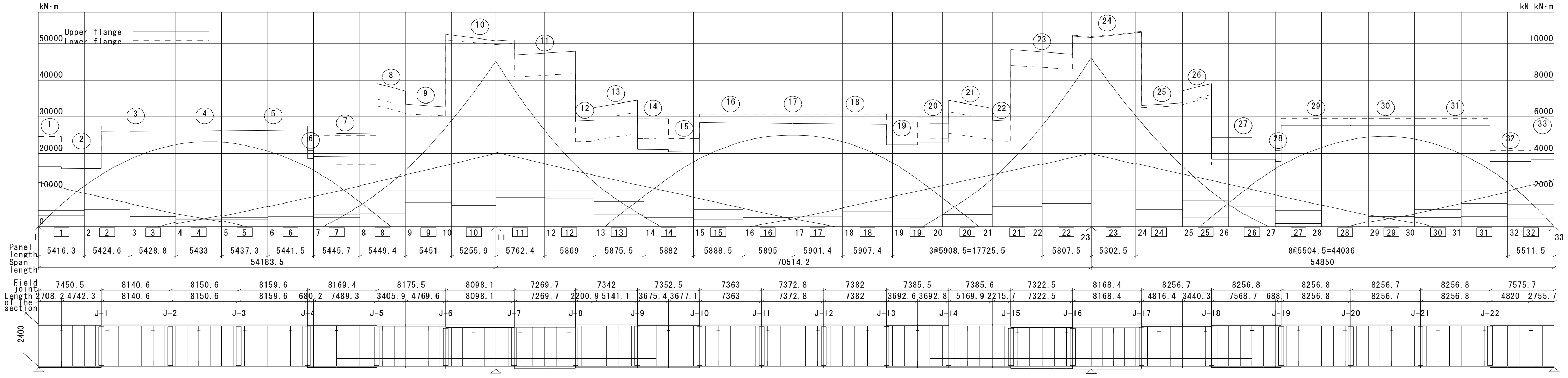
		24		25	26			27			28	29	30	31	32	
Section		Sec-17		Sec-18	Sec-18			Sec-19			Sec-19	Sec-20	Sec-21	Sec-22	Sec-23	
Uflg W=2450 T		36(3)		20(3)	20(3)			11(3)			11(3)	14(3)	14(3)	14(3)	10(3)	
Upper flange Vertical rib	Number	2		2	5			5			5	5	5	5	5	
	Width	260		230	230			190			190	190	190	190	190	
	Thickness	25(3)		22(3)	22(3)			19(3)			19(3)	19(3)	19(3)	19(3)	19(3)	
Left Web	Height	2297.9	2297.9	2314	2314	2314	2314	2323	2323	2323	2323	2320	2320	2320	2324	2324
	Thickness	16(3)		14(3)	14(3)			12(3)			12(3)	12(3)	12(3)	12(3)	12(3)	
Right Web	Height	2429.9	2429.9	2446	2446	2446	2446	2455	2455	2455	2455	2452	2452	2452	2456	2456
	Thickness	16(3)		14(3)	14(3)			12(3)			12(3)	12(3)	12(3)	12(3)	12(3)	
Lower flange Vertical rib	Number	5		5	5			5			2	2	2	2	2	
	Width	260		230	230			190			190	190	190	190	190	
	Thickness	25(3)		22(3)	22(3)			19(3)			19(3)	19(3)	19(3)	19(3)	19(3)	
Lflg W=2450 T		27(3)		14(3)	14(3)			10(3)			10(3)	16(3)	16(3)	14(3)	10(3)	
Upper flange	σ	190	190	175	76	-17	49	-26	74	-127	-138	-162	-167	-161	-124	0
	σa	210	210	210	210	210	210	158	210	158	158	191	191	191	143	210
	σa-σ	20	20	35	134	193	161	132	136	31	20	28	24	30	19	210
Lower flange	σ	-192	-192	-175	-83	19	-53	26	-73	125	158	165	170	175	137	0
	σa	210	210	191	191	210	191	210	143	210	210	210	210	210	210	210
	σa-σ	18	18	15	108	191	137	184	70	85	52	45	40	35	73	210
Web	τ	66	66	64	53	48	48	57	57	39	37	19	13	22	41	55
	τa	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	Combined	1.02	1.02	0.87	0.28	0.16	0.17	0.22	0.26	0.42	0.60	0.62	0.65	0.70	0.48	0.21
Calculated points		Max Left	Max Right	J-17	Left	Right	Right	J-18	J-18	Right	J-19	J-20		J-21	J-22	Right
Uflg σspl				196					114							
Lflg σspl								41			181	184		196	157	

Grade (1):SM400
(2):SM490
(3):SM490Y
(4):SM570

G-1

STRESS DIAGRAM(2/2)

G-2



Unit：mm N/mm2

		1		2	3	4	5	6	7		
Section		Sec-1		Sec-1	Sec-2	Sec-3	Sec-4	Sec-5	Sec-5		
Uflg W=2450 T		10(3)		10(3)	14(3)	14(3)	14(3)	11(3)	11(3)		
Upper flange Vertical rib	Number	5		5	5	5	5	5	5		
	Width	190		190	190	190	190	190	190		
	Thickness	19(3)		19(3)	19(3)	19(3)	19(3)	19(3)	19(3)		
Left Web	Height	2426.3	2424.6	2421.7	2412.7	2409.9	2406.9	2401.4	2400.7	2392.4	2392.4
	Thickness	12(3)		12(3)	12(3)	12(3)	12(3)	12(3)	12(3)		
Right Web	Height	2353.7	2355.4	2358.3	2359.3	2362.1	2365.1	2376.6	2377.3	2385.6	2385.6
	Thickness	12(3)		12(3)	12(3)	12(3)	12(3)	12(3)	12(3)		
Lower flange Vertical rib	Number	5		2	2	2	2	2	5		
	Width	190		190	190	190	190	190	190		
	Thickness	19(3)		19(3)	19(3)	19(3)	19(3)	19(3)	19(3)		
Lflg W=2450 T		10(3)		10(3)	16(3)	16(3)	16(3)	10(3)	10(3)		
Upper flange	σ	0	-52	-128	-161	-169	-164	-138	-127	-25	73
	σa	210	143	143	191	191	191	158	158	158	210
	σa-σ	210	90	15	30	22	27	20	31	132	137
Lower flange	σ	0	51	145	169	177	172	164	130	26	-76
	σa	210	210	210	210	210	210	210	210	210	143
	σa-σ	210	159	65	41	33	38	46	80	184	67
Web	τ	54	48	39	20	12	18	35	36	56	56
	τa	120	120	120	120	120	120	120	120	120	120
	Combined	0.20	0.16	0.52	0.65	0.70	0.67	0.64	0.43	0.22	0.26
Calculated points		Left	Right	J-1	J-2		J-3	J-4	Left	J-5	J-5
Uflg σspl											113
Lflg σspl				166	188		191	188		42	

		8			9	10		11	12	13			14		
Section		Sec-6			Sec-6	Sec-7		Sec-8	Sec-9	Sec-9			Sec-10		
Uflg W=2450 T		20(3)			20(3)	36(3)		34(3)	17(3)	17(3)			11(3)		
Upper flange Vertical rib	Number	5			2	2		2	2	5			5		
	Width	230			230	260		230	230	230			230		
	Thickness	22(3)			22(3)	25(3)		22(3)	22(3)	22(3)			22(3)		
Left Web	Height	2383.4	2383.4	2379.7	2374.4	2351.9	2351.9	2351.5	2360.3	2357.8	2351.4	2351.4	2357.4	2357.4	2352.8
	Thickness	14(3)			14(3)	16(3)		16(3)	14(3)	14(3)			12(3)		
Right Web	Height	2376.6	2376.6	2380.3	2385.6	2376.1	2376.1	2380.5	2405.7	2408.2	2414.6	2414.6	2420.6	2420.6	2425.2
	Thickness	14(3)			14(3)	16(3)		16(3)	14(3)	14(3)			12(3)		
Lower flange Vertical rib	Number	5			5	5		5	5	5			5		
	Width	230			230	260		230	230	230			230		
	Thickness	22(3)			22(3)	25(3)		22(3)	22(3)	22(3)			22(3)		
Lflg W=2450 T		15(3)			15(3)	29(3)		22(3)	12(3)	12(3)			12(3)		
Upper flange	σ	-17	48	87	174	187	187	168	123	78	-42	23	-52	29	-99
	σa	210	210	210	210	210	210	210	210	210	210	210	158	210	158
	σa-σ	193	162	123	36	23	23	42	87	132	168	187	106	181	59
Lower flange	σ	19	-54	-98	-178	-191	-191	-193	-124	-88	47	-26	49	-27	94
	σa	210	199	199	199	210	210	210	171	171	210	171	210	171	210
	σa-σ	191	145	100	21	19	19	17	46	83	163	145	161	144	116
Web	τ	47	47	53	64	65	67	64	61	57	47	47	55	55	46
	τa	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	Combined	0.15	0.16	0.34	0.89	1.01	1.02	1.01	0.51	0.32	0.16	0.16	0.21	0.21	0.30
Calculated points		Left	Left	Right	J-6	Max Left	Max Right	J-7	J-8	Left	Right	Right	J-9	J-9	Right
Uflg σspl					195			189	156					49	
Lflg σspl													82		

		15	16	17		18	19	20			21			22	23
Section		Sec-10	Sec-11	Sec-12		Sec-13	Sec-14	Sec-14			Sec-15			Sec-15	Sec-16
Uflg W=2450 T		11(3)	14(3)	14(3)		14(3)	12(3)	12(3)			18(3)			18(3)	36(3)
Upper flange Vertical rib	Number	5	5	5		5	5	5			5			2	2
	Width	230	230	230		230	230	230			230			230	230
	Thickness	22(3)	22(3)	22(3)		22(3)	22(3)	22(3)			22(3)			22(3)	22(3)
Left Web	Height	2348.3	2336.1	2331.6	2331.6	2327	2322.5	2322	2322	2322	2316	2316	2316	2316	2297.9
	Thickness	12(3)	12(3)	12(3)		12(3)	12(3)	12(3)			14(3)			14(3)	16(3)
Right Web	Height	2429.7	2435.8	2440.3	2440.4	2444.9	2453.4	2454	2454	2454	2448	2448	2448	2448	2429.9
	Thickness	12(3)	12(3)	12(3)		12(3)	12(3)	12(3)			14(3)			14(3)	16(3)
Lower flange Vertical rib	Number	2	2	2		2	2	5			5			5	5
	Width	230	230	230		230	230	230			230			230	230
	Thickness	22(3)	22(3)	22(3)		22(3)	22(3)	22(3)			22(3)			22(3)	22(3)
Lflg W=2450 T		12(3)	18(3)	18(3)		18(3)	12(3)	12(3)			12(3)			12(3)	24(3)
Upper flange	σ	-144	-164	-169	-169	-165	-140	-96	-48	33	-40	27	84	130	172
	σa	158	191	191	191	191	171	171	171	210	210	210	210	210	210
	σa-σ	14	26	21	21	26	30	75	122	177	170	183	126	80	38
Lower flange	σ	162	166	171	171	166	160	92	46	-31	44	-29	-93	-131	-189
	σa	210	210	210	210	210	210	210	210	171	210	171	171	171	210
	σa-σ	48	44	39	39	44	50	118	164	140	166	141	77	40	21
Web	τ	37	20	13	13	20	37	47	56	56	48	48	57	62	63
	τa	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	Combined	0.64	0.63	0.65	0.65	0.63	0.62	0.29	0.22	0.22	0.16	0.16	0.33	0.55	0.97
Calculated points		J-10	J-11			J-12	J-13	Left	J-14	J-14	Left	Left	Right	J-15	J-16
Uflg σspl										54				147	194
Lflg σspl		213	200※			187	186		77						

Grade (1):SM400
(2):SM490
(3):SM490Y
(4):SM570

The stress with "※" mark shows the stress after the main plate thickness is increased.

G-2

Unit：mm N/mm2

		24		25	26			27			28	29	30	31	32	33	
Section		Sec-17		Sec-18	Sec-18			Sec-19			Sec-19	Sec-20	Sec-21	Sec-22	Sec-23	Sec-23	
Uflg W=2450 T		39(3)		22(3)	22(3)			11(3)			11(3)	15(3)	15(3)	15(3)	11(3)	11(3)	
Upper flange Vertical rib	Number	2		2	5			5			5	5	5	5	5	5	
	Width	260		230	230			190			190	190	190	190	190	190	
	Thickness	25(3)		22(3)	22(3)			19(3)			19(3)	19(3)	19(3)	19(3)	19(3)	19(3)	
Left Web	Height	2294.9	2294.9	2312	2312	2312	2312	2323	2323	2323	2323	2319	2319	2319	2323	2323	2323
	Thickness	16(3)		14(3)	14(3)			12(3)			12(3)	12(3)	12(3)	12(3)	12(3)	12(3)	
Right Web	Height	2426.9	2426.9	2444	2444	2444	2444	2455	2455	2455	2455	2451	2451	2451	2455	2455	2455
	Thickness	16(3)		14(3)	14(3)			12(3)			12(3)	12(3)	12(3)	12(3)	12(3)	12(3)	
Lower flange Vertical rib	Number	5		5	5			5			2	2	2	2	2	5	
	Width	260		230	230			190			190	190	190	190	190	190	
	Thickness	25(3)		22(3)	22(3)			19(3)			19(3)	19(3)	19(3)	19(3)	19(3)	19(3)	
Lflg W=2450 T		31(3)		16(3)	16(3)			10(3)			10(3)	18(3)	18(3)	18(3)	10(3)	10(3)	
Upper flange	σ	188	188	180	93	-14	51	-22	82	-136	-148	-170	-177	-169	-137	-56	0
	σa	210	210	210	210	210	210	158	210	158	158	199	199	199	158	158	210
	σa-σ	22	22	30	117	196	159	135	128	22	10	28	22	30	21	102	210
Lower flange	σ	-186	-186	-179	-102	15	-56	22	-81	134	169	168	174	167	156	56	0
	σa	210	210	206	206	210	206	210	143	210	210	210	210	210	210	210	210
	σa-σ	24	24	26	104	195	150	188	62	76	41	42	36	43	54	154	210
Web	τ	66	66	66	58	51	51	60	60	43	39	21	13	22	43	54	60
	τa	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	Combined	0.98	0.98	0.92	0.39	0.18	0.19	0.25	0.30	0.48	0.70	0.64	0.68	0.64	0.62	0.20	0.25
Calculated points		Max Left	Max Right	J-17	Left	Right	Right	J-18	J-18	Right	J-19	J-20		J-21	J-22	Left	Right
Uflg σspl				200					127								
Lflg σspl								35			194	186		185	203		

Grade (1):SM400
(2):SM490
(3):SM490Y
(4):SM570

The stress with "※" mark shows the stress after the main plate thickness is increased.

G-2

4-3 Calculation Result of Field Joint for Main Girder

1) Flange

・Main plate

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress			Flg THK	Flg stress	Req Bolts	Applied Bolts	Bolts Stress	Spl THK	Spl THK	Req Area	Total Area	Group No.
							σt	σc	τ		σtn	n		ρ	1	2	Ar	As	
1	G-1	J-1(Sec-1)	UFLG	2450	10	SM490Y	---	-133	37	---	---	30.3	52	65152	9	9	155.6	0.0	*1
4	G-1	J-1(Sec-1)	LFLG	2450	10	SM490Y	168	---	32	---	168	34.2	60	63020	9	9	176.0	0.0	61
5	G-1	J-2(Sec-2)	UFLG	2450	14	SM490Y	---	-165	14	---	---	52.6	78	73028	9	9	270.3	0.0	*4
8	G-1	J-2(Sec-2)	LFLG	2450	18	SM490Y	177	---	10	---	177	66.4	83	86618	12	10	341.6	0.0	115
9	G-1	J-3(Sec-4)	UFLG	2450	14	SM490Y	---	-168	13	---	---	53.4	78	74178	9	9	274.7	0.0	*5
12	G-1	J-3(Sec-4)	LFLG	2450	18	SM490Y	181	---	10	---	181	67.8	83	88349	12	10	348.6	0.0	115
13	G-1	J-4(Sec-5)	UFLG	2450	11	SM490Y	---	-143	30	---	---	35.6	52	75552	9	9	183.2	0.0	*6
16	G-1	J-4(Sec-5)	LFLG	2450	10	SM490Y	189	---	28	---	189	38.5	60	70229	9	9	197.9	0.0	*9
17	G-1	J-5(Sec-5)	UFLG	2450	11	SM490Y	158	118	45	---	100	29.5	52	65622	9	9	129.3	0.0	*10
20	G-1	J-5(Sec-5)	LFLG	2450	10	SM490Y	158	107	48	---	43	24.3	52	55294	9	9	115.8	0.0	*11
21	G-1	J-6(Sec-6)	UFLG	2450	18	SM490Y	199	---	36	---	199	71.7	83	95260	10	12	368.8	0.0	*12
24	G-1	J-6(Sec-6)	LFLG	2450	14	SM490Y	---	-175	48	---	---	55.6	78	79906	9	9	286.2	0.0	46
25	G-1	J-7(Sec-8)	UFLG	2450	32	SM490Y	190	---	25	---	190	122.5	152	87991	19	25	630.1	0.0	*15
28	G-1	J-7(Sec-8)	LFLG	2450	21	SM490Y	---	-189	37	---	---	89.9	104	95115	14	12	462.4	0.0	42
29	G-1	J-8(Sec-9)	UFLG	2450	16	SM490Y	158	---	39	---	138	45.5	60	85752	9	12	234.2	0.0	*18
32	G-1	J-8(Sec-9)	LFLG	2450	11	SM490Y	---	-123	57	---	---	30.6	52	70151	9	9	157.4	0.0	78
33	G-1	J-9(Sec-10)	UFLG	2450	11	SM490Y	158	118	46	---	47	29.6	52	65818	9	9	104.0	0.0	75
36	G-1	J-9(Sec-10)	LFLG	2450	11	SM490Y	158	118	45	---	89	29.5	52	65675	9	9	104.0	0.0	75
37	G-1	J-10(Sec-10)	UFLG	2450	11	SM490Y	---	-136	31	---	---	34.1	52	72523	9	9	175.1	0.0	78
40	G-1	J-10(Sec-10)	LFLG	2450	11	SM490Y	188	---	27	---	188	39.6	60	72350	9	9	203.7	0.0	*24
41	G-1	J-11(Sec-11)	UFLG	2450	13	SM490Y	---	-160	15	---	---	47.1	52	98245	9	9	242.2	0.0	28

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress			Flg THK	Flg stress	Req Bolts	Applied Bolts	Bolts Stress	Spl THK	Spl THK	Req Area	Total Area	Group No.
							σt	σc	τ		σtn	n		ρ	1	2	Ar	As	
44	G-1	J-11(Sec-11)	LFLG	2450	16	SM490Y	189	---	11	---	189	60.2	83	78577	12	9	309.8	0.0	*27
45	G-1	J-12(Sec-13)	UFLG	2450	13	SM490Y	---	-160	14	---	---	47.2	52	98402	9	9	242.7	0.0	*28
48	G-1	J-12(Sec-13)	LFLG	2450	16	SM490Y	188	---	11	---	188	59.9	83	78148	12	9	308.2	0.0	27
49	G-1	J-13(Sec-14)	UFLG	2450	11	SM490Y	---	-137	31	---	---	34.1	52	72696	9	9	175.6	0.0	78
52	G-1	J-13(Sec-14)	LFLG	2450	11	SM490Y	184	---	27	---	184	38.9	60	71035	9	9	200.0	0.0	24
53	G-1	J-14(Sec-14)	UFLG	2450	11	SM490Y	158	118	47	---	52	29.6	52	65957	9	9	104.0	0.0	75
56	G-1	J-14(Sec-14)	LFLG	2450	11	SM490Y	158	118	45	---	84	29.5	52	65706	9	9	104.0	0.0	75
57	G-1	J-15(Sec-15)	UFLG	2450	17	SM490Y	158	---	38	---	139	48.6	60	91282	9	12	249.9	0.0	*35
60	G-1	J-15(Sec-15)	LFLG	2450	11	SM490Y	---	-123	57	---	---	30.7	52	70285	9	9	157.8	0.0	*38
61	G-1	J-16(Sec-16)	UFLG	2450	34	SM490Y	192	---	24	---	192	132.3	152	94954	19	25	680.6	0.0	*39
64	G-1	J-16(Sec-16)	LFLG	2450	21	SM490Y	---	-190	37	---	---	90.7	104	95922	14	12	466.5	0.0	*42
65	G-1	J-17(Sec-18)	UFLG	2450	20	SM490Y	197	---	35	---	197	81.4	106	84486	12	14	418.5	0.0	*43
68	G-1	J-17(Sec-18)	LFLG	2450	14	SM490Y	---	-176	49	---	---	55.8	78	80203	9	9	286.7	0.0	*46
69	G-1	J-18(Sec-19)	UFLG	2450	11	SM490Y	158	118	49	---	105	29.6	52	66357	9	9	129.3	0.0	*47
72	G-1	J-18(Sec-19)	LFLG	2450	10	SM490Y	158	107	51	---	37	24.3	52	55824	9	9	115.8	0.0	11
73	G-1	J-19(Sec-19)	UFLG	2450	11	SM490Y	---	-139	32	---	---	34.6	52	73735	9	9	178.0	0.0	6
76	G-1	J-19(Sec-19)	LFLG	2450	10	SM490Y	176	---	30	---	176	35.7	60	65496	9	9	183.8	0.0	*48
77	G-1	J-20(Sec-20)	UFLG	2450	14	SM490Y	---	-163	13	---	---	51.9	78	72059	9	9	266.8	0.0	4
80	G-1	J-20(Sec-20)	LFLG	2450	16	SM490Y	181	---	11	---	181	60.1	83	78314	12	9	308.9	0.0	56
81	G-1	J-21(Sec-22)	UFLG	2450	14	SM490Y	---	-162	16	---	---	51.4	78	71460	9	9	264.2	0.0	4
84	G-1	J-21(Sec-22)	LFLG	2450	14	SM490Y	192	---	15	---	192	55.4	60	100143	10	9	285.1	0.0	*51
85	G-1	J-22(Sec-23)	UFLG	2450	10	SM490Y	---	-125	39	---	---	28.3	52	61506	9	9	145.3	0.0	1
88	G-1	J-22(Sec-23)	LFLG	2450	10	SM490Y	158	---	35	---	153	31.1	60	57720	9	9	159.9	0.0	61
89	G-2	J-1(Sec-1)	UFLG	2450	10	SM490Y	---	-128	36	---	---	29.0	52	62628	9	9	149.2	0.0	1
92	G-2	J-1(Sec-1)	LFLG	2450	10	SM490Y	161	---	32	---	161	32.8	60	60530	9	9	168.8	0.0	61
93	G-2	J-2(Sec-2)	UFLG	2450	14	SM490Y	---	-162	14	---	---	51.3	78	71280	9	9	263.8	0.0	4
96	G-2	J-2(Sec-2)	LFLG	2450	16	SM490Y	185	---	11	---	185	61.2	83	79849	12	9	314.9	0.0	*56

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress			Flg THK	Flg stress	Req Bolts	Applied Bolts	Bolts Stress	Spl THK	Spl THK	Req Area	Total Area	Group No.
							σt	σc	τ		σtn	n		ρ	1	2	Ar	As	
97	G-2	J-3(Sec-4)	UFLG	2450	14	SM490Y	---	-164	13	---	---	52.1	78	72325	9	10	267.9	0.0	*57
100	G-2	J-3(Sec-4)	LFLG	2450	16	SM490Y	188	---	10	---	188	62.4	83	81369	12	9	321.0	0.0	*60
101	G-2	J-4(Sec-5)	UFLG	2450	11	SM490Y	---	-138	29	---	---	34.4	52	73055	9	9	177.0	0.0	107
104	G-2	J-4(Sec-5)	LFLG	2450	10	SM490Y	183	---	28	---	183	37.2	60	67893	9	9	191.3	0.0	*61
105	G-2	J-5(Sec-5)	UFLG	2450	11	SM490Y	158	118	46	---	104	29.5	52	65765	9	9	129.3	0.0	103
108	G-2	J-5(Sec-5)	LFLG	2450	10	SM490Y	158	107	49	---	38	24.3	52	55457	9	9	115.8	0.0	106
109	G-2	J-6(Sec-6)	UFLG	2450	20	SM490Y	196	---	34	---	196	79.0	83	104669	12	15	406.2	0.0	*64
112	G-2	J-6(Sec-6)	LFLG	2450	15	SM490Y	---	-178	46	---	---	60.6	78	86678	10	9	311.8	0.0	*67
113	G-2	J-7(Sec-8)	UFLG	2450	34	SM490Y	190	---	24	---	190	131.1	152	94101	20	24	674.3	0.0	*68
116	G-2	J-7(Sec-8)	LFLG	2450	22	SM490Y	---	-193	36	---	---	96.3	130	81374	15	13	495.2	0.0	*71
117	G-2	J-8(Sec-9)	UFLG	2450	17	SM490Y	158	---	38	---	139	48.6	60	91329	10	12	249.9	0.0	*72
120	G-2	J-8(Sec-9)	LFLG	2450	12	SM490Y	---	128	55	---	---	34.8	52	78661	9	9	179.2	0.0	86
121	G-2	J-9(Sec-10)	UFLG	2450	11	SM490Y	158	118	48	---	50	29.6	52	66202	9	9	104.0	0.0	*75
124	G-2	J-9(Sec-10)	LFLG	2450	12	SM490Y	158	128	44	---	84	34.8	52	76461	9	9	117.5	0.0	*77
125	G-2	J-10(Sec-10)	UFLG	2450	11	SM490Y	---	-144	33	---	---	36.0	52	76634	9	9	185.1	0.0	*78
128	G-2	J-10(Sec-10)	LFLG	2450	12	SM490Y	190	---	27	---	190	44.1	60	80486	9	9	226.9	0.0	*81
129	G-2	J-11(Sec-11)	UFLG	2450	14	SM490Y	---	-165	14	---	---	52.4	78	72884	9	9	269.7	0.0	46
132	G-2	J-11(Sec-11)	LFLG	2450	18	SM490Y	188	---	11	---	188	68.0	83	88608	12	10	349.5	0.0	12
133	G-2	J-12(Sec-13)	UFLG	2450	14	SM490Y	---	-166	14	---	---	52.7	78	73280	9	9	271.2	0.0	46
136	G-2	J-12(Sec-13)	LFLG	2450	18	SM490Y	188	---	10	---	188	67.9	83	88474	12	10	349.0	0.0	12
137	G-2	J-13(Sec-14)	UFLG	2450	12	SM490Y	---	-141	30	---	---	38.4	52	81614	9	9	197.7	0.0	*86
140	G-2	J-13(Sec-14)	LFLG	2450	12	SM490Y	187	---	26	---	187	43.5	60	79379	9	9	223.8	0.0	*89
141	G-2	J-14(Sec-14)	UFLG	2450	12	SM490Y	158	128	46	---	56	34.9	52	76831	9	9	117.5	0.0	77
144	G-2	J-14(Sec-14)	LFLG	2450	12	SM490Y	158	128	44	---	79	34.8	52	76590	9	9	117.5	0.0	77
145	G-2	J-15(Sec-15)	UFLG	2450	18	SM490Y	158	---	37	---	147	53.2	60	99561	10	12	273.6	0.0	*92
148	G-2	J-15(Sec-15)	LFLG	2450	12	SM490Y	---	-131	55	---	---	35.7	52	80342	9	9	183.6	0.0	86
149	G-2	J-16(Sec-16)	UFLG	2450	36	SM490Y	195	---	23	---	195	142.4	152	102044	20	24	732.3	0.0	*95

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress			Flg THK	Flg stress	Req Bolts	Applied Bolts	Bolts Stress	Spl THK	Spl THK	Req Area	Total Area	Group No.
							σt	σc	τ		σtn	n		ρ	1	2	Ar	As	
152	G-2	J-16(Sec-16)	LFLG	2450	24	SM490Y	---	-189	33	---	---	102.7	130	86578	15	13	528.1	0.0	*98
153	G-2	J-17(Sec-18)	UFLG	2450	22	SM490Y	201	---	33	---	201	91.8	106	95026	12	15	472.0	0.0	*99
156	G-2	J-17(Sec-18)	LFLG	2450	16	SM490Y	---	-180	45	---	---	65.2	78	93023	10	9	335.1	0.0	*102
157	G-2	J-18(Sec-19)	UFLG	2450	11	SM490Y	158	118	52	---	117	29.6	52	66989	9	9	129.3	0.0	*103
160	G-2	J-18(Sec-19)	LFLG	2450	10	SM490Y	158	107	54	---	32	24.3	52	56505	9	9	115.8	0.0	*106
161	G-2	J-19(Sec-19)	UFLG	2450	11	SM490Y	---	-149	34	---	---	37.2	52	79222	9	9	191.2	0.0	*107
164	G-2	J-19(Sec-19)	LFLG	2450	10	SM490Y	189	---	32	---	189	38.4	60	70354	9	9	197.4	0.0	*110
165	G-2	J-20(Sec-20)	UFLG	2450	15	SM490Y	---	-171	14	---	---	58.3	78	80951	9	10	299.7	0.0	*111
168	G-2	J-20(Sec-20)	LFLG	2450	18	SM490Y	183	---	11	---	183	68.7	83	89532	12	10	353.1	0.0	*114
169	G-2	J-21(Sec-22)	UFLG	2450	15	SM490Y	---	-170	15	---	---	57.8	78	80405	9	10	297.5	0.0	111
172	G-2	J-21(Sec-22)	LFLG	2450	18	SM490Y	182	---	12	---	182	68.2	83	88912	12	10	350.5	0.0	*115
173	G-2	J-22(Sec-23)	UFLG	2450	11	SM490Y	---	-138	38	---	---	34.3	52	73931	9	9	176.6	0.0	*116
176	G-2	J-22(Sec-23)	LFLG	2450	10	SM490Y	174	---	36	---	174	35.5	60	65495	9	9	182.3	0.0	61
										※1							※2	※2	

・L-rib

Mem No.	Girder Name	Joint Name	Member	Section dimensions			σtnr	thickness up t	Req Bolts n	Applied Bolts	Spl THK 1	Spl THK 2	Req Area Arr	Total Area Asr	Group No.
1	G-1	J-1(Sec-1)	UFLG	5-RIB	PL	190 * 19	---	---	22.3	25	16	16	114.6	184.0	*1
4	G-1	J-1(Sec-1)	LFLG	2-RIB	PL	190 * 19	0	---	10.5	12	19	19	54.1	73.6	61
5	G-1	J-2(Sec-2)	UFLG	5-RIB	PL	190 * 19	---	---	27.7	30	16	16	142.2	184.0	*4
8	G-1	J-2(Sec-2)	LFLG	2-RIB	PL	190 * 19	0	---	10.9	12	19	19	55.9	73.6	115
9	G-1	J-3(Sec-4)	UFLG	5-RIB	PL	190 * 19	---	---	28.1	35	16	16	144.6	184.0	*5
12	G-1	J-3(Sec-4)	LFLG	2-RIB	PL	190 * 19	0	---	11.1	12	19	19	57.1	73.6	115
13	G-1	J-4(Sec-5)	UFLG	5-RIB	PL	190 * 19	---	---	23.9	35	16	16	122.7	184.0	*6
16	G-1	J-4(Sec-5)	LFLG	2-RIB	PL	190 * 19	0	---	11.6	18	19	19	58.3	73.6	*9
17	G-1	J-5(Sec-5)	UFLG	5-RIB	PL	190 * 19	0	---	26.3	35	19	19	135.4	183.9	*10
20	G-1	J-5(Sec-5)	LFLG	5-RIB	PL	190 * 19	0	---	26.3	35	19	19	135.4	183.9	*11
21	G-1	J-6(Sec-6)	UFLG	2-RIB	PL	230 * 22	0	---	16.5	20	22	22	84.6	97.8	*12
24	G-1	J-6(Sec-6)	LFLG	5-RIB	PL	230 * 22	---	---	41.0	50	19	19	211.1	294.5	46
25	G-1	J-7(Sec-8)	UFLG	2-RIB	PL	230 * 22	0	---	15.6	20	22	22	80.4	97.8	*15
28	G-1	J-7(Sec-8)	LFLG	5-RIB	PL	230 * 22	---	---	44.2	50	19	19	227.4	294.5	42
29	G-1	J-8(Sec-9)	UFLG	2-RIB	PL	230 * 22	0	---	14.8	16	22	22	75.9	97.8	*18
32	G-1	J-8(Sec-9)	LFLG	5-RIB	PL	230 * 22	---	---	28.7	40	19	19	147.8	294.5	78
33	G-1	J-9(Sec-10)	UFLG	5-RIB	PL	230 * 22	0	---	36.9	40	22	22	189.8	244.4	75
36	G-1	J-9(Sec-10)	LFLG	5-RIB	PL	230 * 22	0	---	36.9	40	22	22	189.8	244.4	75
37	G-1	J-10(Sec-10)	UFLG	5-RIB	PL	230 * 22	---	---	32.0	40	19	19	164.4	294.5	78
40	G-1	J-10(Sec-10)	LFLG	2-RIB	PL	230 * 22	0	---	14.9	16	22	22	76.5	97.8	*24
41	G-1	J-11(Sec-11)	UFLG	5-RIB	PL	230 * 22	---	---	37.4	40	19	19	192.4	294.5	28
44	G-1	J-11(Sec-11)	LFLG	2-RIB	PL	230 * 22	0	---	15.6	20	22	22	80.0	97.8	*27
45	G-1	J-12(Sec-13)	UFLG	5-RIB	PL	230 * 22	---	---	37.5	40	19	19	192.8	294.5	*28
48	G-1	J-12(Sec-13)	LFLG	2-RIB	PL	230 * 22	0	---	15.5	20	22	22	79.6	97.8	27
49	G-1	J-13(Sec-14)	UFLG	5-RIB	PL	230 * 22	---	---	32.1	40	19	19	164.8	294.5	78

Mem No.	Girder Name	Joint Name	Member	Section dimensions				thickness up	Req Bolts	Applied Bolts	Spl THK	Spl THK	Req Area	Total Area	Group No.
							σtnr	t	n		1	2	Arr	Asr	
52	G-1	J-13(Sec-14)	LFLG	2-RIB	PL	230 * 22	0	---	14.8	16	22	22	75.9	97.8	24
53	G-1	J-14(Sec-14)	UFLG	5-RIB	PL	230 * 22	0	---	36.9	40	22	22	189.8	244.4	75
56	G-1	J-14(Sec-14)	LFLG	5-RIB	PL	230 * 22	0	---	36.9	40	22	22	189.8	244.4	75
57	G-1	J-15(Sec-15)	UFLG	2-RIB	PL	230 * 22	0	---	14.8	16	22	22	75.9	97.8	*35
60	G-1	J-15(Sec-15)	LFLG	5-RIB	PL	230 * 22	---	---	28.8	30	19	19	148.2	294.5	*38
61	G-1	J-16(Sec-16)	UFLG	2-RIB	PL	230 * 22	0	---	15.9	20	22	22	81.7	97.8	*39
64	G-1	J-16(Sec-16)	LFLG	5-RIB	PL	230 * 22	---	---	44.6	50	19	19	229.4	294.5	*42
65	G-1	J-17(Sec-18)	UFLG	2-RIB	PL	230 * 22	0	---	16.4	20	22	22	84.4	97.8	*43
68	G-1	J-17(Sec-18)	LFLG	5-RIB	PL	230 * 22	---	---	41.1	50	19	19	211.5	294.5	*46
69	G-1	J-18(Sec-19)	UFLG	5-RIB	PL	190 * 19	0	---	26.3	35	19	19	135.4	183.9	*47
72	G-1	J-18(Sec-19)	LFLG	5-RIB	PL	190 * 19	0	---	26.3	35	19	19	135.4	183.9	11
73	G-1	J-19(Sec-19)	UFLG	5-RIB	PL	190 * 19	---	---	23.2	35	16	16	119.2	184.0	6
76	G-1	J-19(Sec-19)	LFLG	2-RIB	PL	190 * 19	0	---	10.5	16	19	19	54.2	73.6	*48
77	G-1	J-20(Sec-20)	UFLG	5-RIB	PL	190 * 19	---	---	27.3	30	16	16	140.4	184.0	4
80	G-1	J-20(Sec-20)	LFLG	2-RIB	PL	190 * 19	0	---	11.1	12	19	19	56.9	73.6	56
81	G-1	J-21(Sec-22)	UFLG	5-RIB	PL	190 * 19	---	---	27.0	30	16	16	139.0	184.0	4
84	G-1	J-21(Sec-22)	LFLG	2-RIB	PL	190 * 19	0	---	11.7	14	19	19	60.0	73.6	*51
85	G-1	J-22(Sec-23)	UFLG	5-RIB	PL	190 * 19	---	---	20.8	25	16	16	107.1	184.0	1
88	G-1	J-22(Sec-23)	LFLG	2-RIB	PL	190 * 19	0	---	10.5	12	19	19	54.1	73.6	61
89	G-2	J-1(Sec-1)	UFLG	5-RIB	PL	190 * 19	---	---	21.4	25	16	16	109.9	184.0	1
92	G-2	J-1(Sec-1)	LFLG	2-RIB	PL	190 * 19	0	---	10.5	12	19	19	54.1	73.6	61
93	G-2	J-2(Sec-2)	UFLG	5-RIB	PL	190 * 19	---	---	27.0	30	16	16	138.8	184.0	4
96	G-2	J-2(Sec-2)	LFLG	2-RIB	PL	190 * 19	0	---	11.3	12	19	19	58.0	73.6	*56
97	G-2	J-3(Sec-4)	UFLG	5-RIB	PL	190 * 19	---	---	27.4	30	16	16	141.0	184.0	*57
100	G-2	J-3(Sec-4)	LFLG	2-RIB	PL	190 * 19	0	---	11.5	14	19	19	59.1	73.6	*60
101	G-2	J-4(Sec-5)	UFLG	5-RIB	PL	190 * 19	---	---	23.1	30	16	16	118.6	184.0	107
104	G-2	J-4(Sec-5)	LFLG	2-RIB	PL	190 * 19	0	---	11.0	12	19	19	56.4	73.6	*61

Mem No.	Girder Name	Joint Name	Member	Section dimensions				thickness up	Req Bolts	Applied Bolts	Spl THK	Spl THK	Req Area	Total Area	Group No.
							σtnr	t	n		1	2	Arr	Asr	
105	G-2	J-5(Sec-5)	UFLG	5-RIB	PL	190 * 19	0	---	26.3	30	19	19	135.4	183.9	103
108	G-2	J-5(Sec-5)	LFLG	5-RIB	PL	190 * 19	0	---	26.3	30	19	19	135.4	183.9	106
109	G-2	J-6(Sec-6)	UFLG	2-RIB	PL	230 * 22	0	---	16.3	20	22	22	83.9	97.8	*64
112	G-2	J-6(Sec-6)	LFLG	5-RIB	PL	230 * 22	---	---	41.7	50	19	19	214.6	294.5	*67
113	G-2	J-7(Sec-8)	UFLG	2-RIB	PL	230 * 22	0	---	15.7	20	22	22	81.0	97.8	*68
116	G-2	J-7(Sec-8)	LFLG	5-RIB	PL	230 * 22	---	---	45.2	50	19	19	232.4	294.5	*71
117	G-2	J-8(Sec-9)	UFLG	2-RIB	PL	230 * 22	0	---	14.8	16	22	22	75.9	97.8	*72
120	G-2	J-8(Sec-9)	LFLG	5-RIB	PL	230 * 22	---	---	30.0	40	19	19	154.2	294.5	86
121	G-2	J-9(Sec-10)	UFLG	5-RIB	PL	230 * 22	0	---	36.9	40	22	22	189.8	244.4	*75
124	G-2	J-9(Sec-10)	LFLG	5-RIB	PL	230 * 22	0	---	36.9	40	22	22	189.8	244.4	*77
125	G-2	J-10(Sec-10)	UFLG	5-RIB	PL	230 * 22	---	---	33.8	40	19	19	173.8	294.5	*78
128	G-2	J-10(Sec-10)	LFLG	2-RIB	PL	230 * 22	0	---	15.2	20	22	22	78.1	97.8	*81
129	G-2	J-11(Sec-11)	UFLG	5-RIB	PL	230 * 22	---	---	38.7	50	19	19	198.9	294.5	46
132	G-2	J-11(Sec-11)	LFLG	2-RIB	PL	230 * 22	0	---	15.6	20	22	22	80.2	97.8	12
133	G-2	J-12(Sec-13)	UFLG	5-RIB	PL	230 * 22	---	---	38.9	50	19	19	200.1	294.5	46
136	G-2	J-12(Sec-13)	LFLG	2-RIB	PL	230 * 22	0	---	15.6	20	22	22	80.1	97.8	12
137	G-2	J-13(Sec-14)	UFLG	5-RIB	PL	230 * 22	---	---	33.1	40	19	19	170.1	294.5	*86
140	G-2	J-13(Sec-14)	LFLG	2-RIB	PL	230 * 22	0	---	15.0	16	22	22	77.0	97.8	*89
141	G-2	J-14(Sec-14)	UFLG	5-RIB	PL	230 * 22	0	---	36.9	40	22	22	189.8	244.4	77
144	G-2	J-14(Sec-14)	LFLG	5-RIB	PL	230 * 22	0	---	36.9	40	22	22	189.8	244.4	77
145	G-2	J-15(Sec-15)	UFLG	2-RIB	PL	230 * 22	0	---	14.8	16	22	22	75.9	97.8	*92
148	G-2	J-15(Sec-15)	LFLG	5-RIB	PL	230 * 22	---	---	30.7	40	19	19	158.0	294.5	86
149	G-2	J-16(Sec-16)	UFLG	2-RIB	PL	230 * 22	0	---	16.1	20	22	22	83.0	97.8	*95
152	G-2	J-16(Sec-16)	LFLG	5-RIB	PL	230 * 22	---	---	44.2	50	19	19	227.2	294.5	*98
153	G-2	J-17(Sec-18)	UFLG	2-RIB	PL	230 * 22	0	---	16.8	20	22	22	86.5	97.8	*99
156	G-2	J-17(Sec-18)	LFLG	5-RIB	PL	230 * 22	---	---	42.0	50	19	19	216.3	294.5	*102
157	G-2	J-18(Sec-19)	UFLG	5-RIB	PL	190 * 19	0	---	26.3	30	19	19	135.4	183.9	*103

Mem No.	Girder Name	Joint Name	Member	Section dimensions				thickness up	Req Bolts	Applied Bolts	Spl THK	Spl THK	Req Area	Total Area	Group No.
							σtnr	t	n		1	2	Arr	Asr	
160	G-2	J-18(Sec-19)	LFLG	5-RIB	PL	190 * 19	0	---	26.3	30	19	19	135.4	183.9	*106
161	G-2	J-19(Sec-19)	UFLG	5-RIB	PL	190 * 19	---	---	24.9	30	16	16	128.1	184.0	*107
164	G-2	J-19(Sec-19)	LFLG	2-RIB	PL	190 * 19	0	---	11.3	14	19	19	58.2	73.6	*110
165	G-2	J-20(Sec-20)	UFLG	5-RIB	PL	190 * 19	---	---	28.6	35	16	16	147.2	184.0	*111
168	G-2	J-20(Sec-20)	LFLG	2-RIB	PL	190 * 19	0	---	11.2	14	19	19	57.8	73.6	*114
169	G-2	J-21(Sec-22)	UFLG	5-RIB	PL	190 * 19	---	---	28.4	35	16	16	146.1	184.0	111
172	G-2	J-21(Sec-22)	LFLG	2-RIB	PL	190 * 19	0	---	11.2	12	19	19	57.4	73.6	*115
173	G-2	J-22(Sec-23)	UFLG	5-RIB	PL	190 * 19	---	---	23.0	25	16	16	118.3	184.0	*116
176	G-2	J-22(Sec-23)	LFLG	2-RIB	PL	190 * 19	0	---	10.5	12	19	19	54.1	73.6	61
											※４	※４	※２※３	※２※３	

※Display in the case of thickness up only
If both the tensile Stress and Compressive Stress occurs, the one with the lower difference of Ar and As, will be applied,.
Omit in the case of required area includes flange section area.
All members * of Group No. means the representative member

2) Web

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress			Joint Type	Applied Bolts			Bolts Stress	Spl THK		Group No.
							σUn	σLn	τ			P	Req Bolts	ρ	l	σsp	
2	G-1	J-1(Sec-1)	LWEB	2422	12	SM490Y	-139	158	39	w(s)	72	262783	3	89018	9	118	*2
3	G-1	J-1(Sec-1)	RWEB	2358	12	SM490Y	-131	158	39	w(s)	72	262783	3	88947	9	118	*3
6	G-1	J-2(Sec-2)	LWEB	2413	12	SM490Y	-163	160	20	w(s)	72	265326	3	88806	9	122	54
7	G-1	J-2(Sec-2)	RWEB	2359	12	SM490Y	-157	160	20	w(s)	72	266105	3	89051	9	119	55
10	G-1	J-3(Sec-4)	LWEB	2407	12	SM490Y	-166	163	19	w(s)	72	271030	3	90655	9	124	58
11	G-1	J-3(Sec-4)	RWEB	2365	12	SM490Y	-161	164	19	w(s)	72	271538	3	90815	9	122	59
14	G-1	J-4(Sec-5)	LWEB	2401	12	SM490Y	-141	168	36	w(s)	72	280767	3	94667	9	126	*7
15	G-1	J-4(Sec-5)	RWEB	2377	12	SM490Y	-138	168	36	w(s)	72	281142	3	94770	9	126	*8
18	G-1	J-5(Sec-5)	LWEB	2392	12	SM490Y	153	-158	55	w(s)	72	261851	3	89967	9	118	62
19	G-1	J-5(Sec-5)	RWEB	2386	12	SM490Y	152	-158	55	w(s)	72	261851	3	89953	9	118	63
22	G-1	J-6(Sec-6)	ʻ혯	2376	14	SM490Y	171	-173	63	w(s)	96	340206	4	87788	9	153	*13
23	G-1	J-6(Sec-6)	RWEB	2388	14	SM490Y	173	-173	63	w(s)	96	343489	4	88604	9	153	*14
26	G-1	J-7(Sec-8)	LWEB	2354	16	SM490Y	158	-186	62	w(s)	120	412733	5	84821	10	166	*16
27	G-1	J-7(Sec-8)	RWEB	2382	16	SM490Y	162	-185	62	w(s)	120	411964	5	84709	10	166	*17
30	G-1	J-8(Sec-9)	LWEB	2361	14	SM490Y	149	-158	59	w(s)	96	305480	4	79039	9	140	*19
31	G-1	J-8(Sec-9)	RWEB	2407	14	SM490Y	155	-158	59	w(s)	96	311101	4	80485	9	139	*20
34	G-1	J-9(Sec-10)	LWEB	2357	12	SM490Y	-153	158	53	w(s)	72	261565	3	89604	9	118	*21
35	G-1	J-9(Sec-10)	RWEB	2421	12	SM490Y	-158	153	52	w(s)	72	254879	3	87556	9	118	76
38	G-1	J-10(Sec-10)	LWEB	2348	12	SM490Y	-126	158	35	w(s)	72	263038	3	88737	9	118	*22
39	G-1	J-10(Sec-10)	RWEB	2430	12	SM490Y	-135	158	35	w(s)	72	263038	3	88803	9	117	*23
42	G-1	J-11(Sec-11)	LWEB	2337	12	SM490Y	-145	164	19	w(s)	72	272717	3	91216	9	122	*25
43	G-1	J-11(Sec-11)	RWEB	2437	12	SM490Y	-157	163	19	w(s)	72	271162	3	90722	9	121	*26
46	G-1	J-12(Sec-13)	LWEB	2328	12	SM490Y	-143	163	19	w(s)	72	271257	3	90715	9	122	*29
47	G-1	J-12(Sec-13)	RWEB	2446	12	SM490Y	-157	162	19	w(s)	72	269503	3	90158	9	120	*30
50	G-1	J-13(Sec-14)	LWEB	2324	12	SM490Y	-123	158	35	w(s)	72	263043	3	88708	9	118	*31

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress			Joint Type	Applied Bolts			Bolts Stress	Spl THK		Group No.
							σUn	σLn	τ			P	Req Bolts	ρ	l	σsp	
51	G-1	J-13(Sec-14)	RWEB	2454	12	SM490Y	-138	158	35	w(s)	72	263043	3	88814	9	117	*32
54	G-1	J-14(Sec-14)	LWEB	2323	12	SM490Y	-149	158	53	w(s)	72	261572	3	89558	9	118	*33
55	G-1	J-14(Sec-14)	RWEB	2455	12	SM490Y	-158	149	53	w(s)	72	255768	3	87924	9	118	*34
58	G-1	J-15(Sec-15)	LWEB	2317	14	SM490Y	139	-158	59	w(s)	96	305761	4	79032	9	140	*36
59	G-1	J-15(Sec-15)	RWEB	2449	14	SM490Y	156	-158	59	w(s)	96	315395	4	81611	9	139	*37
62	G-1	J-16(Sec-16)	LWEB	2300	16	SM490Y	146	-187	63	w(s)	120	416809	5	85553	10	169	*40
63	G-1	J-16(Sec-16)	RWEB	2432	16	SM490Y	164	-186	62	w(s)	120	413915	5	85159	10	166	*41
66	G-1	J-17(Sec-18)	LWEB	2314	14	SM490Y	154	-174	64	w(s)	96	336742	4	86937	9	154	*44
67	G-1	J-17(Sec-18)	RWEB	2446	14	SM490Y	171	-172	64	w(s)	96	345014	4	89186	9	152	*45
70	G-1	J-18(Sec-19)	LWEB	2323	12	SM490Y	143	-158	57	w(s)	72	261861	3	90003	9	119	104
71	G-1	J-18(Sec-19)	RWEB	2455	12	SM490Y	158	-154	56	w(s)	72	260520	3	89859	9	118	105
74	G-1	J-19(Sec-19)	LWEB	2323	12	SM490Y	-123	158	37	w(s)	72	263033	3	88813	9	118	108
75	G-1	J-19(Sec-19)	RWEB	2455	12	SM490Y	-139	158	36	w(s)	72	263033	3	88935	9	117	109
78	G-1	J-20(Sec-20)	LWEB	2320	12	SM490Y	-144	163	19	w(s)	72	271702	3	90863	9	122	49
79	G-1	J-20(Sec-20)	RWEB	2452	12	SM490Y	-161	162	19	w(s)	72	269820	3	90267	9	120	50
82	G-1	J-21(Sec-22)	LWEB	2320	12	SM490Y	-142	173	22	w(s)	72	287805	3	96309	9	129	*49
83	G-1	J-21(Sec-22)	RWEB	2452	12	SM490Y	-159	171	22	w(s)	72	285810	3	95683	9	127	*50
86	G-1	J-22(Sec-23)	LWEB	2324	12	SM490Y	-127	158	41	w(s)	72	262790	3	88990	9	118	*52
87	G-1	J-22(Sec-23)	RWEB	2456	12	SM490Y	-143	158	40	w(s)	72	262790	3	89143	9	117	*53
90	G-2	J-1(Sec-1)	LWEB	2422	12	SM490Y	-139	158	39	w(s)	72	262783	3	88990	9	118	2
91	G-2	J-1(Sec-1)	RWEB	2358	12	SM490Y	-131	158	39	w(s)	72	262783	3	88921	9	118	3
94	G-2	J-2(Sec-2)	LWEB	2413	12	SM490Y	-159	166	20	w(s)	72	276224	3	92416	9	123	*54
95	G-2	J-2(Sec-2)	RWEB	2359	12	SM490Y	-153	166	20	w(s)	72	277041	3	92675	9	124	*55
98	G-2	J-3(Sec-4)	LWEB	2407	12	SM490Y	-162	169	18	w(s)	72	281927	3	94263	9	126	*58
99	G-2	J-3(Sec-4)	RWEB	2365	12	SM490Y	-156	170	18	w(s)	72	282458	3	94431	9	127	*59
102	G-2	J-4(Sec-5)	LWEB	2401	12	SM490Y	-136	162	35	w(s)	72	271308	3	91510	9	121	7
103	G-2	J-4(Sec-5)	RWEB	2377	12	SM490Y	-133	163	35	w(s)	72	271673	3	91610	9	122	8

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress			Joint Type	Applied Bolts			Bolts Stress	Spl THK		Group No.
							σUn	σLn	τ			P	Req Bolts	ρ	l	σsp	
106	G-2	J-5(Sec-5)	LWEB	2392	12	SM490Y	153	-158	56	w(s)	72	261851	3	90062	9	118	*62
107	G-2	J-5(Sec-5)	RWEB	2386	12	SM490Y	152	-158	56	w(s)	72	261851	3	90047	9	118	*63
110	G-2	J-6(Sec-6)	LWEB	2374	14	SM490Y	170	-176	64	w(s)	96	341205	4	88117	9	156	*65
111	G-2	J-6(Sec-6)	RWEB	2386	14	SM490Y	171	-176	64	w(s)	96	341060	4	88103	9	155	*66
114	G-2	J-7(Sec-8)	LWEB	2352	16	SM490Y	159	-190	64	w(s)	120	421773	5	86704	10	170	*69
115	G-2	J-7(Sec-8)	RWEB	2380	16	SM490Y	163	-189	64	w(s)	120	420990	5	86590	10	169	*70
118	G-2	J-8(Sec-9)	LWEB	2360	14	SM490Y	149	-158	61	w(s)	96	305462	4	79216	9	140	*73
119	G-2	J-8(Sec-9)	RWEB	2406	14	SM490Y	155	-158	61	w(s)	96	311398	4	80738	9	139	*74
122	G-2	J-9(Sec-10)	LWEB	2357	12	SM490Y	-158	157	55	w(s)	72	260407	3	89468	9	118	21
123	G-2	J-9(Sec-10)	RWEB	2421	12	SM490Y	-158	149	55	w(s)	72	253898	3	87495	9	118	*76
126	G-2	J-10(Sec-10)	LWEB	2348	12	SM490Y	-133	161	37	w(s)	72	267803	3	90429	9	120	*79
127	G-2	J-10(Sec-10)	RWEB	2430	12	SM490Y	-142	160	37	w(s)	72	266502	3	90074	9	119	*80
130	G-2	J-11(Sec-11)	LWEB	2336	12	SM490Y	-150	164	20	w(s)	72	272652	3	91224	9	122	*82
131	G-2	J-11(Sec-11)	RWEB	2436	12	SM490Y	-163	163	20	w(s)	72	271124	3	90740	9	121	*83
134	G-2	J-12(Sec-13)	LWEB	2327	12	SM490Y	-149	164	20	w(s)	72	272282	3	91076	9	122	*84
135	G-2	J-12(Sec-13)	RWEB	2445	12	SM490Y	-163	163	19	w(s)	72	270553	3	90528	9	122	*85
138	G-2	J-13(Sec-14)	LWEB	2323	12	SM490Y	-124	158	37	w(s)	72	264366	3	89262	9	119	*87
139	G-2	J-13(Sec-14)	RWEB	2453	12	SM490Y	-139	158	37	w(s)	72	262993	3	88926	9	117	*88
142	G-2	J-14(Sec-14)	LWEB	2322	12	SM490Y	-149	158	56	w(s)	72	261565	3	89858	9	118	*90
143	G-2	J-14(Sec-14)	RWEB	2454	12	SM490Y	-158	149	56	w(s)	72	255762	3	88254	9	118	*91
146	G-2	J-15(Sec-15)	LWEB	2316	14	SM490Y	139	-158	62	w(s)	96	305737	4	79213	9	140	*93
147	G-2	J-15(Sec-15)	RWEB	2448	14	SM490Y	156	-158	61	w(s)	96	315894	4	81923	9	139	*94
150	G-2	J-16(Sec-16)	LWEB	2298	16	SM490Y	148	-185	63	w(s)	120	411528	5	84519	10	167	*96
151	G-2	J-16(Sec-16)	RWEB	2430	16	SM490Y	166	-184	62	w(s)	120	408728	5	84140	10	164	*97
154	G-2	J-17(Sec-18)	LWEB	2312	14	SM490Y	157	-177	66	w(s)	96	343712	4	88790	9	158	*100
155	G-2	J-17(Sec-18)	RWEB	2444	14	SM490Y	175	-176	65	w(s)	96	353175	4	91326	9	155	*101
158	G-2	J-18(Sec-19)	LWEB	2323	12	SM490Y	143	-158	60	w(s)	72	261861	3	90368	9	119	*104

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress			Joint Type	Applied Bolts			Bolts Stress	Spl THK		Group No.
							σUn	σLn	τ			P	Req Bolts	ρ	l	σsp	
159	G-2	J-18(Sec-19)	RWEB	2455	12	SM490Y	158	-154	60	w(s)	72	260520	3	90264	9	118	*105
162	G-2	J-19(Sec-19)	LWEB	2323	12	SM490Y	-131	168	39	w(s)	72	280387	3	94702	9	126	*108
163	G-2	J-19(Sec-19)	RWEB	2455	12	SM490Y	-147	167	39	w(s)	72	278483	3	94211	9	124	*109
166	G-2	J-20(Sec-20)	LWEB	2319	12	SM490Y	-151	166	21	w(s)	72	275340	3	92129	9	124	*112
167	G-2	J-20(Sec-20)	RWEB	2451	12	SM490Y	-168	165	21	w(s)	72	273470	3	91542	9	126	*113
170	G-2	J-21(Sec-22)	LWEB	2319	12	SM490Y	-150	164	22	w(s)	72	273299	3	91501	9	123	112
171	G-2	J-21(Sec-22)	RWEB	2451	12	SM490Y	-167	163	22	w(s)	72	271443	3	90923	9	125	113
174	G-2	J-22(Sec-23)	LWEB	2323	12	SM490Y	-123	158	43	w(s)	72	263033	3	89225	9	118	*117
175	G-2	J-22(Sec-23)	RWEB	2455	12	SM490Y	-139	158	43	w(s)	72	263033	3	89389	9	118	*118

* of Group No. means the representative member

4-4 Checking of Stiffness ratio

BOX G1

PANEL	length	Assumption (Iy')	Actual value (Iy)	ratio	Assumption (J')	Actual value (J)	ratio
1	5.484	0.135410	0.134611	0.6	0.136422	0.132448	3.0
2	5.475	0.154481	0.154610	-0.1	0.154281	0.152088	1.4
3	5.471	0.169323	0.170870	-0.9	0.165472	0.163874	1.0
4	5.467	0.175984	0.170858	3.0	0.170761	0.163877	4.2
5	5.463	0.175971	0.170846	3.0	0.170762	0.163880	4.2
6	5.459	0.172011	0.165769	3.8	0.165165	0.160354	3.0
7	5.454	0.163393	0.145023	12.7	0.139712	0.135644	3.0
8	5.451	0.182898	0.177130	3.3	0.167279	0.162408	3.0
9	5.449	0.195847	0.190143	3.0	0.195712	0.186727	4.8
10	5.244	0.281101	0.272914	3.0	0.238502	0.244555	-2.5
11	5.738	0.262950	0.255291	3.0	0.239040	0.237840	0.5
12	5.831	0.222373	0.215896	3.0	0.214806	0.207325	3.6
13	5.824	0.173303	0.176318	-1.7	0.164971	0.160166	3.0
14	5.818	0.158987	0.154356	3.0	0.143226	0.139054	3.0
15	5.812	0.172537	0.167512	3.0	0.162002	0.155180	4.4
16	5.805	0.175954	0.170829	3.0	0.162197	0.157473	3.0
17	5.799	0.176005	0.170879	3.0	0.162184	0.157460	3.0
18	5.793	0.172677	0.167648	3.0	0.162361	0.155144	4.7
19	5.792	0.159166	0.154530	3.0	0.143180	0.139011	3.0
20	5.792	0.176561	0.179066	-1.4	0.166636	0.161783	3.0
21	5.792	0.227410	0.220786	3.0	0.214547	0.209141	2.6
22	5.693	0.272757	0.264813	3.0	0.238240	0.241072	-1.2
23	5.198	0.297694	0.289023	3.0	0.253950	0.250188	1.5
24	5.396	0.204118	0.198173	3.0	0.198155	0.190392	4.1
25	5.396	0.187516	0.181146	3.5	0.169437	0.164502	3.0
26	5.396	0.163682	0.145269	12.7	0.139655	0.135587	3.0
27	5.396	0.165604	0.159549	3.8	0.161777	0.157064	3.0
28	5.396	0.168604	0.163693	3.0	0.166892	0.160133	4.2
29	5.396	0.168604	0.163693	3.0	0.166892	0.160133	4.2
30	5.396	0.161513	0.156809	3.0	0.160899	0.156212	3.0
31	5.396	0.149624	0.145266	3.0	0.151343	0.146934	3.0
32	5.388	0.140934	0.134781	4.6	0.137701	0.132404	4.0

Span	length	Assumption (Iy')	Actual value (Iy)	ratio	Assumption (J')	Actual value (J)	ratio
1	54.417	0.180212	0.174865	3.1	0.170115	0.166256	2.3
2	69.486	0.195706	0.191319	2.3	0.180975	0.176564	2.5
3	53.750	0.180364	0.173320	4.1	0.170368	0.165047	3.2

BOX G2

PANEL	length	Assumption (Iy')	Actual value (Iy)	ratio	Assumption (J')	Actual value (J)	ratio
1	5.416	0.135664	0.134611	0.8	0.136422	0.132448	3.0
2	5.425	0.154481	0.149982	3.0	0.156501	0.149787	4.5
3	5.429	0.168369	0.163465	3.0	0.166962	0.160191	4.2
4	5.433	0.168358	0.163454	3.0	0.166962	0.160194	4.2
5	5.437	0.168346	0.163443	3.0	0.166963	0.160197	4.2
6	5.441	0.165340	0.159291	3.8	0.161845	0.157131	3.0
7	5.446	0.165281	0.145023	14.0	0.139712	0.135644	3.0
8	5.449	0.187180	0.183378	2.1	0.171582	0.166584	3.0
9	5.451	0.207594	0.202004	2.8	0.199308	0.193707	2.9
10	5.256	0.301152	0.295957	1.8	0.250753	0.253629	-1.1
11	5.762	0.276456	0.269728	2.5	0.238485	0.243961	-2.2
12	5.869	0.231146	0.224414	3.0	0.211410	0.212349	-0.4
13	5.876	0.176726	0.182819	-3.3	0.170899	0.165921	3.0
14	5.882	0.162950	0.158204	3.0	0.146309	0.142049	3.0
15	5.888	0.182822	0.177497	3.0	0.165962	0.161128	3.0
16	5.895	0.187094	0.181645	3.0	0.170948	0.163843	4.3
17	5.901	0.187148	0.181697	3.0	0.170930	0.163830	4.3
18	5.907	0.183337	0.177997	3.0	0.166315	0.161471	3.0
19	5.909	0.166392	0.161546	3.0	0.149392	0.145042	3.0
20	5.909	0.185559	0.186058	-0.3	0.172876	0.167841	3.0
21	5.909	0.241592	0.234555	3.0	0.224393	0.216881	3.5
22	5.808	0.295749	0.284684	3.9	0.250967	0.249900	0.4
23	5.303	0.322222	0.312837	3.0	0.257586	0.259149	-0.6
24	5.505	0.224352	0.213269	5.2	0.205612	0.199623	3.0
25	5.505	0.202950	0.189889	6.9	0.176726	0.170295	3.8
26	5.505	0.165541	0.145269	14.0	0.139655	0.135587	3.0
27	5.505	0.175874	0.168978	4.1	0.167800	0.162484	3.3
28	5.505	0.179703	0.174469	3.0	0.173411	0.166327	4.3
29	5.505	0.179703	0.174469	3.0	0.173411	0.166327	4.3
30	5.505	0.179703	0.174469	3.0	0.173411	0.166327	4.3
31	5.505	0.162735	0.157995	3.0	0.159444	0.154799	3.0
32	5.512	0.142041	0.137904	3.0	0.139655	0.135586	3.0

Span	length	Assumption (Iy')	Actual value (Iy)	ratio	Assumption (J')	Actual value (J)	ratio
1	54.183	0.181810	0.175687	3.5	0.171456	0.166681	2.9
2	70.514	0.206170	0.201503	2.3	0.186393	0.182647	2.1
3	54.850	0.193002	0.184478	4.6	0.176368	0.171324	2.9

4-5 Checking of Live Load deflection

Main girder G-1

Span No.	Span length	Actual Deflection	Allowable deflection	Actual def./Span Length	Allowable def./Span Length
	L span(mm)	δ(mm)	δa(mm)	δ／L span	δa／L span
1	54417	65.5	108.8	1/830	1/500
2	69486	95.7	139.0	1/726	1/500
3	53750	62.2	107.5	1/864	1/500

Main girder G-2

Span No.	Span length	Actual Deflection	Allowable deflection	Actual def./Span Length	Allowable def./Span Length
	L span(mm)	δ(mm)	δa(mm)	δ／L span	δa／L span
1	54183	64.5	108.4	1/840	1/500
2	70514	100.6	141.0	1/701	1/500
3	54850	67.2	109.7	1/817	1/500

4-5 Checking of Live Load deflection

Main girder G-1

Span No.	Span length	Actual Deflection	Allowable deflection	Actual def./Span Length	Allowable def./Span Length
	L span(mm)	δ(mm)	δa(mm)	δ／L span	δa／L span
1	54417	65.5	108.8	1/830	1/500
2	69486	95.7	139.0	1/726	1/500
3	53750	62.2	107.5	1/864	1/500

Main girder G-2

Span No.	Span length	Actual Deflection	Allowable deflection	Actual def./Span Length	Allowable def./Span Length
	L span(mm)	δ(mm)	δa(mm)	δ／L span	δa／L span
1	54183	64.5	108.4	1/840	1/500
2	70514	100.6	141.0	1/701	1/500
3	54850	67.2	109.7	1/817	1/500

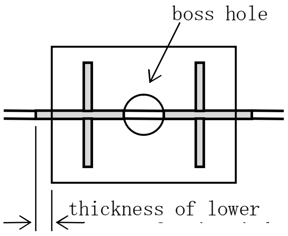
§5. Diaphragm and Stiffener

5-1 Calculation of support diaphragm

1. Checking Method

（ａ） Check of bearing stress

$\sigma b = Rv / An \leqq \sigma ba$



σb : bearing stress

Rv : reaction force for support

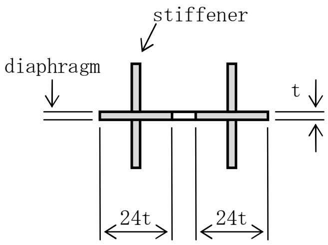
An : Effective section area of bearing

(shown in the left sketch in gray)

σba : allowable bearing stress

（ｂ） vertical stress of stiffeners

$\sigma v = Rv / Ag \leqq \sigma ca$



σv : Vertical stress

Rv : Reaction force

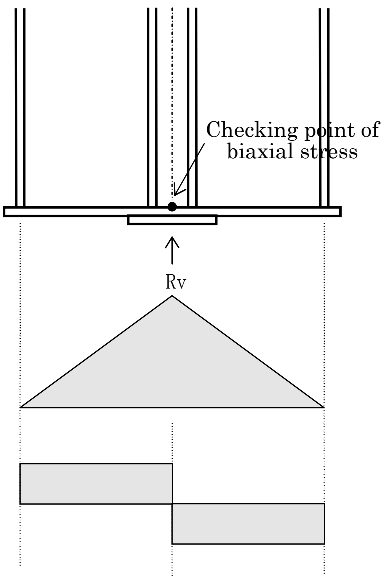
Ag : Effective area of stiffeners

（ Colored area in the figure ）

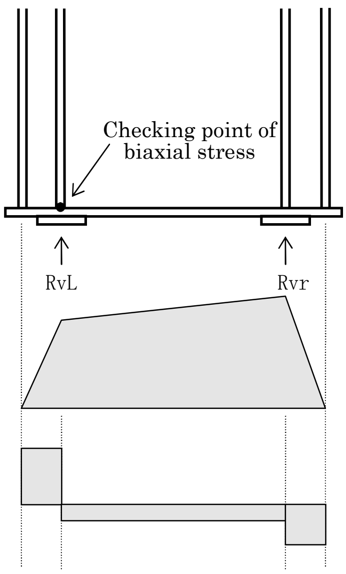
σca : allowable compressive stress

（ｃ） Check of horizontal stress of diaphragm

The diaphragm is assumed as a simple beam supported at webs, and bending and shear stresses caused by the reaction force are checked.



(In case of 1 shoe)



(In case of 2 shoes)

（d） Check of biaxial stress

Biaxial stress of the diaphragm is checked using actual stresses calculated from （b） and （c）.

$$(\sigma v / \sigma a)^2 - (\sigma v / \sigma a) * (\sigma L / \sigma a) + (\sigma L / \sigma a)^2 + (\tau / \tau a)^2 \leqq 1.2$$

σv・σL ：Actual stress calculated at （b） and （c）.

σa ：Allowable tensile stress

τa ：Allowable shear stress

（e） Calculation of fillet weld size

Between vertical stiffener and diaphragm

Required throat thickness: Areq = 2 * Rv / (n * h * τa)

Required size : Sreq = Areq / 0.707

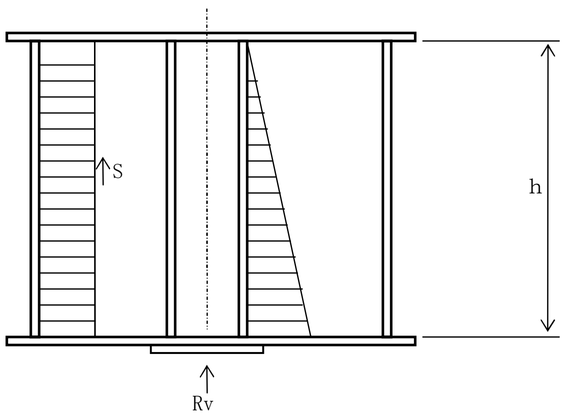
Between diaphragm and web of main girder

Required throat thickness: Areq = S / (n * h * τa)

Required size : Sreq = Areq / 0.707

Where

n : Number of welding lines



(Distribution of shear force)

2. Diaphragm on Support Position

1. Main girder: G-1　Support: S-1

Reaction force　Ra= 2700.0 kN

```
Diaphragm        TD= 12 mm     (SM490YA   )
Lflg              TL= 10 mm     (SM490YA   )
Web               TW= 12 mm     (SM490YA   )
Lower plate    1- 760 * 810 (202.0φ)
Rib            4- 160 * 16  (SM490YA   )
```

Check of bearing stress

```
(SM490YA   )Stiff          2*( 16.00+ 16.00-2*  3.50)* 1.6 =  80.00
(SM490YA   )DIA           ( 81.00- 20.20+4* 1.0)* 1.2      =  77.76
---------------------------------------------------------------------
                                                   Ab = 157.76 cm2
    σb   =R/Ab= 2700.0*10**3/ 157.76e2= 171.1 N/mm2
                                 < σba= 315.0 N/mm2
```

Check of vertical stress

```
(SM490YA   )Stiff        2*( 16.00+ 16.00)* 1.6        = 102.40
(SM490YA   )DIA           57.60* 1.2                   =  69.12
-----------------------------------------------------------------
                                                 A = 171.52 cm2

   1.7* 102.40= 174.08 cm2 > A   故に Ae= 171.52 cm2

   r=SQR(I/Ae)=SQR(   9766/ 171.52)=  7.55 cm
```

Stress

```
    L/r=239.0 / 2 /  7.55= 15.84 > 15
                                 ≦ 75

     σcag=210.0- 1.50*( 15.84-15)=208.7 N/mm2

   ∴ σca=σcag*σcal/σcao=208.7*210.0/210.0=208.7 N/mm2

   σv=R/Ae= 2700.0*10**3/ 171.52e2= 157.4 N/mm2 < σca
```

Check of horizontal stress

S1

Shear force Sa= 2700.0*1.100/2.200= 1350.0 kN
Sc= 1350.0 kN

Bending moment Ma=Mc= 2700.0*1.100*1.100/2.200= 1485.0 kN.m

Section A-A

					A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YA	) 1-FLG	PL	663*	10	66.27	-120.00	-7953	954333
(SM490YA	) 1-DIA	PL	2390*	12	286.80	——	——	1365192
(SM490YA	) 1-FLG	PL	663*	10	66.27	120.00	7953	954333
					419.35		0	3273857
								0
							I=	3273857

e =Σ(Ay)/ΣA= 0/ 419.35= 0.00 cm
Yl =119.50 + 1.0 +(0.00)=120.50 cm

σl= 1485.0*10**6*120.50e1/ 3273857e4= 54.7 N/mm2 <σa=210.0 N/mm2
τ = 1350.0*10**3/ 286.80e2= 47.1 N/mm2 <τa=120.0 N/mm2

Section C-C

					A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YA	) 1-FLG	PL	663*	10	66.27	-120.00	-7953	954333
(SM490YA	) 1-DIA	PL	1195*	12	143.40	-59.75	-8568	682596
(SM490YA	) 1-DIA	PL	1195*	12	143.40	59.75	8568	682596
(SM490YA	) 1-FLG	PL	663*	10	66.27	120.00	7953	954333
					419.35		0	3273857
								0
							I=	3273857

e =Σ(Ay)/ΣA= 0/ 419.35= 0.00 cm
Yl =119.50 + 1.0 +(-0.00)=120.50 cm

σl= 1485.0*10**6*120.50e1/ 3273857e4= 54.7 N/mm2 <σa=210.0 N/mm2
τ = 1350.0*10**3/ 286.80e2= 47.1 N/mm2 <τa=120.0 N/mm2

Check of biaxial stress

A-A (σv/σta)**2-(σv/σta)*(σl/σta)+(σl/σta)**2+(τ/τa)**2
= 0.588 < 1.2

S1

Weld size

(a) Between stiffener and diaphragm

Required size: s =SQR(2*16)= 5.66 ---> 6 mm < tmin=12 mm
a = 8* 6/1.4142=33.94 mm

τa=2*Ra/(a*hw')=2* 2700.0*10**3/{33.94*(2390- 35-300)}
= 77.4 N/mm2 < τa=120.0 N/mm2

(b) Between diaphragm and web of main girder

Size s =SQR(2*12)= 4.90 ---> 6 mm < tmin=12 mm

τ=1350.0*10**3/(2* 6*0.7071* 2354)= 67.6 N/mm2
< τa=120.0 N/mm2

2. Main girder: G-1 Support: PF3

Reaction force Ra = 7300.0 kN

Diaphragm TD= 26 mm (SM490YB)
Lflg TL= 26 mm (SM490YB)
Web TW= 16 mm (SM490YA)
Lower plate 1-1210 *1210 (352.0φ)
Rib 4- 280 * 28 (SM490YB)

Check of bearing stress

(SM490YB)Stiff	2*(28.00+ 28.00-2* 3.50)* 2.8	= 274.40	
(SM490YB)DIA	(121.00- 35.20+4* 2.6)* 2.6	= 250.12	
			Ab = 524.52 cm2

σb =R/Ab= 7300.0*10**3/ 524.52e2= 139.2 N/mm2
< σba= 315.0 N/mm2

Check of vertical stress

(SM490YB)Stiff	2*(28.00+ 28.00)* 2.8	= 313.60	
(SM490YB)Dia	92.40* 2.6	= 240.24	
			A = 553.84 cm2

1.7* 313.60= 533.12 cm2 < A 故に Ae= 533.12 cm2

r=SQR(I/Ae)=SQR(94034/ 533.12)= 13.28 cm

Stress

L/r=236.8 / 2 / 13.28= 8.91 ＜ 15

σcag=210.0 N/mm2

∴ σca=σcag*σcal/σcao=210.0*210.0/210.0=210.0 N/mm2

σv=R/Ae= 7300.0*10**3/ 533.12e2= 136.9 N/mm2 < σca

Check of horizontal stress

PF3

Shear force Sa= 7300.0*1.100/2.200= 3650.0 kN
Sc= 3650.0 kN

Bending moment Ma=Mc= 7300.0*1.100*1.100/2.200= 4015.0 kN.m

Section A-A

	Section	A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YB)	1-FLG PL 660* 32	211.20	-120.00	-25344	3041460
(SM490YB)	1-DIA PL 2368* 26	615.68	——	——	2876982
(SM490YB)	1-FLG PL 660* 26	171.60	119.70	20541	2458797
		998.48		-4803	8377239
					-23109
				I=	8354131

e =Σ(Ay)/ΣA= -4803/ 998.48= -4.81 cm
Yl =118.40 + 2.6 +(4.81)=125.81 cm

σl= 4015.0*10**6*125.81e1/ 8354131e4= 60.5 N/mm2 < σa=210.0 N/mm2
τ = 3650.0*10**3/ 615.68e2= 59.3 N/mm2 < τa=120.0 N/mm2

Section C-C

	Section	A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YB)	1-FLG PL 660* 32	211.20	-120.00	-25344	3041460
(SM490YB)	1-DIA PL 1184* 26	307.84	-59.20	-18224	1438491
(SM490YB)	1-DIA PL 1184* 26	307.84	59.20	18224	1438491
(SM490YB)	1-FLG PL 660* 26	171.60	119.70	20541	2458797
		998.48		-4803	8377239
					-23109
				I=	8354131

e =Σ(Ay)/ΣA= -4803/ 998.48= -4.81 cm
Yl =118.40 + 2.6 +(4.81)=125.81 cm

σl= 4015.0*10**6*125.81e1/ 8354131e4= 60.5 N/mm2 < σa=210.0 N/mm2
τ = 3650.0*10**3/ 615.68e2= 59.3 N/mm2 < τa=120.0 N/mm2

Check of biaxial stress

section A-A (σv/σta)**2-(σv/σta)*(σl/σta)+(σl/σta)**2+(τ/τa)**2
= 0.564 < 1.2

Weld size

(a) Between stiffener and diaphragm

Required size s =SQR(2*28)= 7.48 ---> 11 mm < tmin=26 mm
a = 8*12/1.4142=67.88 mm

τa=2*Ra/(a*hw')=2* 7300.0*10**3/{67.88*(2368- 35-350)}
= 108.7 N/mm2 < τa=120.0 N/mm2

(b) Between diaphragm and web of main girder

Welding Size s =SQR(2*26)= 7.21 ---> 10 mm < tmin=16 mm

τ=3650.0*10**3/(2*10*0.7071* 2356)= 109.6 N/mm2
< τa=120.0 N/mm2

3. Main girder: G-1　Support: PF3

Reaction force　Ra= 7500.0 kN

```
Diaphragm      TD= 26 mm    (SM490YB  )
Lflg            TL= 27 mm    (SM490YB  )
Web            TW= 16 mm    (SM490YA  )
Lower plate   1-1210 *1210 (352.0φ)
RIB               4- 280 * 28  (SM490YB  )
```

Check of bearing stress

```
(SM490YB  )Stiff       2*( 28.00+ 28.00-2*  3.50)* 2.8 = 274.40
(SM490YB  )DIA        (121.00- 35.20+4* 2.7)* 2.6      = 251.16
----------------------------------------------------------------
                                                 Ab = 525.56 cm2
```

σb　=R/Ab= 7500.0*10**3/ 525.56e2= 142.7 N/mm2
< σba= 315.0 N/mm2

Check of vertical stress

```
(SM490YB  )Stiff      2*( 28.00+ 28.00)* 2.8        = 313.60
(SM490YB  )DIA         92.40* 2.6                   = 240.24
--------------------------------------------------------------
                                               A = 553.84 cm2
```

1.7* 313.60= 533.12 cm2 < A　故に Ae= 533.12 cm2

r=SQR(I/Ae)=SQR(94034/ 533.12)= 13.28 cm

Stress

L/r=236.4 / 2 / 13.28= 8.90 < 15

σcag=210.0 N/mm2

∴ σca=σcag*σcal/σcao=210.0*210.0/210.0=210.0 N/mm2

σv=R/Ae= 7500.0*10**3/ 533.12e2= 140.7 N/mm2 < σca

Check of horizontal stress

PF4

Shear force Sa= 7500.0*1.100/2.200= 3750.0 kN
Sc= 3750.0 kN

Bending moment Ma=Mc= 7500.0*1.100*1.100/2.200= 4125.0 kN.m

Section A-A

	Section		A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YB)	1-FLG PL	660* 36	237.60	-120.00	-28512	3421697
(SM490YB)	1-DIA PL	2364* 26	614.64	——	——	2862428
(SM490YB)	1-FLG PL	660* 27	178.20	119.55	21304	2546979
			1030.44		-7208	8831103
						-50423

e =Σ(Ay)/ΣA= -7208/1030.44= -7.00 cm
Yl =118.20 + 2.7 +(7.00)=127.90 cm I= 8780680

σl= 4125.0*10**6*127.90e1/ 8780680e4= 60.1 N/mm2 <σa=210.0 N/mm2
τ = 3750.0*10**3/ 614.64e2= 61.0 N/mm2 <τa=120.0 N/mm2

Section C-C

	Section		A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YB)	1-FLG PL	660* 36	237.60	-120.00	-28512	3421697
(SM490YB)	1-DIA PL	1182* 26	307.32	-59.10	-18163	1431214
(SM490YB)	1-DIA PL	1182* 26	307.32	59.10	18163	1431214
(SM490YB)	1-FLG PL	660* 27	178.20	119.55	21304	2546979
			1030.44		-7208	8831103
						-50423

e =Σ(Ay)/ΣA= -7208/1030.44= -7.00 cm
Yl =118.20 + 2.7 +(7.00)=127.90 cm I= 8780680

σl= 4125.0*10**6*127.90e1/ 8780680e4= 60.1 N/mm2 <σa=210.0 N/mm2
τ = 3750.0*10**3/ 614.64e2= 61.0 N/mm2 <τa=120.0 N/mm2

Check of biaxial stress

Section A-A (σv/σta)**2-(σv/σta)*(σl/σta)+(σl/σta)**2+(τ/τa)**2
= 0.597 < 1.2

Weld size

(a) Between stiffener and diaphragm

Required size s =SQR(2*28)= 7.48 ---> 12 mm < tmin=26 mm
a = 8*12/1.4142=67.88 mm

τa=2*Ra/(a*hw')=2* 7500.0*10**3/{62.23*(2364- 35-350)}
= 111.7 N/mm2 > τa=120.0 N/mm2!

(b) Between diaphragm and web of main girder

Welding Size s =SQR(2*26)= 7.21 ---> 10 mm < tmin=16 mm

τ =3750.0*10**3/(2*10*0.7071* 2298)= 115.4 N/mm2
< τa=120.0 N/mm2

4. Main girder: G-1　Support: S2

Reaction force　Ra= 2300.0 kN

```
Diaphragm       TD= 12 mm     (SM490YA   )
Lflg            TL= 10 mm     (SM490YA   )
Web             TW= 12 mm     (SM490YA   )
Lower plate    1- 760 * 810 (202.0φ)
Rib             4- 160 * 16  (SM490YA   )
```

Check of bearing stress

```
(SM490YA   )Stiff         2*( 16.00+ 16.00-2*  3.50)* 1.6 =  80.00
(SM490YA   )DIA          ( 81.00- 20.20+4* 1.0)* 1.2      =  77.76
------------------------------------------------------------------
                                                  Ab = 157.76 cm2
```

σb　=R/Ab= 2300.0*10**3/ 157.76e2= 145.8 N/mm2
　　　　　　　　　　　　　＜ σba= 315.0 N/mm2

Check of vertical stress

```
(SM490YA   )Stiff        2*( 16.00+ 16.00)* 1.6        = 102.40
(SM490YA   )DIA           57.60* 1.2                   =  69.12
---------------------------------------------------------------
                                                 A = 171.52 cm2
```

1.7* 102.40= 174.08 cm2 ＞ A　故に Ae= 171.52 cm2

r=SQR(I/Ae)=SQR(　9766/ 171.52)=　7.55 cm

Stress

L/r=239.0 / 2 /　7.55= 15.84 ＞ 15
　　　　　　　　　　　　　　　≦ 75

σcag=210.0- 1.50*(15.84-15)=208.7 N/mm2

∴　σca=σcag*σcal/σcao=208.7*210.0/210.0=208.7 N/mm2

σv=R/Ae= 2300.0*10**3/ 171.52e2= 134.1 N/mm2 ＜ σca

Check of horizontal stress

S2

Shear force Sa= 2300.0*1.100/2.200= 1150.0 kN
Sc= 1150.0 kN

Bending moment Ma=Mc= 2300.0*1.100*1.100/2.200= 1265.0 kN.m

Section A-A

	Section	A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YA)	1-FLG PL 663* 10	66.27	-120.00	-7953	954333
(SM490YA)	1-DIA PL 2390* 12	286.80	―――	―――	1365192
(SM490YA)	1-FLG PL 663* 10	66.27	120.00	7953	954333
		419.35		0	3273857
					0

e =Σ(Ay)/ΣA= 0/ 419.35= 0.00 cm
Yl =119.50 + 1.0 +(0.00)=120.50 cm I= 3273857

σl= 1265.0*10**6*120.50e1/ 3273857e4= 46.6 N/mm2 <σa=210.0 N/mm2
τ = 1150.0*10**3/ 286.80e2= 40.1 N/mm2 <τa=120.0 N/mm2

Section C-C

	Section	A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YA)	1-FLG PL 663* 10	66.27	-120.00	-7953	954333
(SM490YA)	1-DIA PL 1195* 12	143.40	-59.75	-8568	682596
(SM490YA)	1-DIA PL 1195* 12	143.40	59.75	8568	682596
(SM490YA)	1-FLG PL 663* 10	66.27	120.00	7953	954333
		419.35		0	3273857
					0

e =Σ(Ay)/ΣA= 0/ 419.35= 0.00 cm
Yl =119.50 + 1.0 +(-0.00)=120.50 cm I= 3273857

σl= 1265.0*10**6*120.50e1/ 3273857e4= 46.6 N/mm2 <σa=210.0 N/mm2
τ = 1150.0*10**3/ 286.80e2= 40.1 N/mm2 <τa=120.0 N/mm2

Check of biaxial stress

Section A-A (σv/σta)**2-(σv/σta)*(σl/σta)+(σl/σta)**2+(τ/τa)**2
= 0.427 < 1.2

Weld size

(a) Between stiffener and diaphragm

Required size s =SQR(2*16)= 5.66 ---> 6 mm < tmin=12 mm
a = 8* 6/1.4142=33.94 mm

τa=2*Ra/(a*hw')=2* 2300.0*10**3/{33.94*(2390- 35-300)}
= 66.0 N/mm2 < τa=120.0 N/mm2

(b) Between diaphragm and web of main girder

Welding Size s =SQR(2*12)= 4.90 ---> 6 mm < tmin=12 mm

τ=1150.0*10**3/(2* 6*0.7071* 2324)= 58.3 N/mm2
< τa=120.0 N/mm2

5. Main girder: G-2　Support: S1

Reaction force　Ra= 2500.0 kN

```
Diaphragm        TD= 12 mm     (SM490YA   )
Lflg              TL= 10 mm     (SM490YA   )
Web               TW= 12 mm     (SM490YA   )
Lower plate       1- 760 * 810 (202.0φ)
RIB                4- 160 * 16  (SM490YA   )
```

Check of bearing stress

```
(SM490YA   )Stiff         2*( 16.00+ 16.00-2*  3.50)* 1.6 =  80.00
(SM490YA   )DIA          ( 81.00- 20.20+4* 1.0)* 1.2      =  77.76
--------------------------------------------------------------------
                                                Ab = 157.76 cm2
```

σb　=R/Ab= 2500.0*10**3/ 157.76e2= 158.5 N/mm2
　　　　　　　　　　　　　　　　< σba= 315.0 N/mm2

Check of vertical stress

```
(SM490YA   )Stiff       2*( 16.00+ 16.00)* 1.6        = 102.40
(SM490YA   )DIA          57.60* 1.2                   =  69.12
-----------------------------------------------------------------
                                              A = 171.52 cm2
```

1.7* 102.40= 174.08 cm2 > A　故に Ae= 171.52 cm2

r=SQR(I/Ae)=SQR(　9766/ 171.52)=　7.55 cm

Stress

L/r=239.0 / 2 /　7.55= 15.84 > 15
　　　　　　　　　　　　　　　≦ 75

σcag=210.0- 1.50*(15.84-15)=208.7 N/mm2

∴ σca=σcag*σcal/σcao=208.7*210.0/210.0=208.7 N/mm2

σv=R/Ae= 2500.0*10**3/ 171.52e2= 145.8 N/mm2 < σca

Check of horizontal stress

S1

Shear force Sa= 2500.0*1.100/2.200= 1250.0 kN
Sc= 1250.0 kN

Bending moment Ma=Mc= 2500.0*1.100*1.100/2.200= 1375.0 kN.m

Section A-A

	Section	A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YA)	1-FLG PL 663* 10	66.27	-120.00	-7953	954333
(SM490YA)	1-DIA PL 2390* 12	286.80	――	――	1365192
(SM490YA)	1-FLG PL 663* 10	66.27	120.00	7953	954333
		419.35		0	3273857
					0
				I=	3273857

e =Σ(Ay)/ΣA= 0/ 419.35= 0.00 cm
Yl =119.50 + 1.0 +(0.00)=120.50 cm

σl= 1375.0*10**6*120.50e1/ 3273857e4= 50.6 N/mm2 <σa=210.0 N/mm2
τ = 1250.0*10**3/ 286.80e2= 43.6 N/mm2 <τa=120.0 N/mm2

Section C-C

	Section	A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YA)	1-FLG PL 663* 10	66.27	-120.00	-7953	954333
(SM490YA)	1-DIA PL 1195* 12	143.40	-59.75	-8568	682596
(SM490YA)	1-DIA PL 1195* 12	143.40	59.75	8568	682596
(SM490YA)	1-FLG PL 663* 10	66.27	120.00	7953	954333
		419.35		0	3273857
					0
				I=	3273857

e =Σ(Ay)/ΣA= 0/ 419.35= 0.00 cm
Yl =119.50 + 1.0 +(0.00)=120.50 cm

σl= 1375.0*10**6*120.50e1/ 3273857e4= 50.6 N/mm2 <σa=210.0 N/mm2
τ = 1250.0*10**3/ 286.80e2= 43.6 N/mm2 <τa=120.0 N/mm2

Check of biaxial stress

Section A-A (σv/σta)**2-(σv/σta)*(σl/σta)+(σl/σta)**2+(τ/τa)**2
= 0.505 < 1.2

Weld size

(a) Between stiffener and diaphragm

Required size s =SQR(2*16)= 5.66 ---> 6 mm < tmin=12 mm
a = 8* 6/1.4142=33.94 mm

τa=2*Ra/(a*hw')=2* 2500.0*10**3/{33.94*(2390- 35-300)}
= 71.7 N/mm2 < τa=120.0 N/mm2

(c) Between diaphragm and web of main girder

Welding Size s =SQR(2*12)= 4.90 ---> 6 mm < tmin=12 mm

τ=1250.0*10**3/(2* 6*0.7071* 2354)= 62.6 N/mm2
< τa=120.0 N/mm2

6. Main girder: G-2   Support: PF3

Reaction force   Ra= 7450.0 kN

Diaphragm   TD= 26 mm   (SM490YB   )
Lflg   TL= 29 mm   (SM490YB   )
Web   TW= 16 mm   (SM490YA   )
Lower plate   1-1210 *1210 (352.0φ)
Rib   4- 280 * 28 (SM490YB   )

Check of bearing stress

(SM490YB)Stiff	2*(28.00+ 28.00-2* 3.50)* 2.8	=	274.40
(SM490YB)DIA	(121.00- 35.20+4* 2.9)* 2.6	=	253.24
		Ab =	527.64 cm2

σb =R/Ab= 7450.0*10**3/ 527.64e2= 141.2 N/mm2
< σba= 315.0 N/mm2

Check of vertical stress

(SM490YB)Stiff	2*(28.00+ 28.00)* 2.8	=	313.60
(SM490YB)DIA	92.40* 2.6	=	240.24
		A =	553.84 cm2

1.7* 313.60= 533.12 cm2 < A   故に Ae= 533.12 cm2

r=SQR(I/Ae)=SQR(94034/ 533.12)= 13.28 cm

Stress

L/r=236.4 / 2 / 13.28= 8.90 < 15

σcag=210.0 N/mm2

∴ σca=σcag*σcal/σcao=210.0*210.0/210.0=210.0 N/mm2

σv=R/Ae= 7450.0*10**3/ 533.12e2= 139.7 N/mm2 < σca

Check of horizontal stress

PF3

Shear force Sa= 7450.0*1.100/2.200= 3725.0 kN
Sc= 3725.0 kN

Bending moment Ma=Mc= 7450.0*1.100*1.100/2.200= 4097.5 kN.m

Section A-A

	Section	A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YB)	1-FLG PL 660* 36	237.60	-120.00	-28512	3421697
(SM490YB)	1-DIA PL 2364* 26	614.64	——	——	2862428
(SM490YB)	1-FLG PL 660* 29	191.40	119.65	22901	2740240
		1043.64		-5611	9024364
					-30167
				I=	8994198

e =Σ(Ay)/ΣA= -5611/1043.64= -5.38 cm
Yl =118.20 + 2.9 +(5.38)=126.48 cm

σl= 4097.5*10**6*126.48e1/ 8994198e4= 57.6 N/mm2 <σa=210.0 N/mm2
τ = 3725.0*10**3/ 614.64e2= 60.6 N/mm2 <τa=120.0 N/mm2

Section C-C

	Section	A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YB)	1-FLG PL 660* 36	237.60	-120.00	-28512	3421697
(SM490YB)	1-DIA PL 1182* 26	307.32	-59.10	-18163	1431214
(SM490YB)	1-DIA PL 1182* 26	307.32	59.10	18163	1431214
(SM490YB)	1-FLG PL 660* 29	191.40	119.65	22901	2740240
		1043.64		-5611	9024364
					-30167
				I=	8994198

e =Σ(Ay)/ΣA= -5611/1043.64= -5.38 cm
Yl =118.20 + 2.9 +(5.38)=126.48 cm

σl= 4097.5*10**6*126.48e1/ 8994198e4= 57.6 N/mm2 <σa=210.0 N/mm2
τ = 3725.0*10**3/ 614.64e2= 60.6 N/mm2 <τa=120.0 N/mm2

Check of biaxial stress

Section A-A (σv/σta)**2-(σv/σta)*(σl/σta)+(σl/σta)**2+(τ/τa)**2
= 0.590 < 1.2

Weld size

(a) Between stiffener and diaphragm

Required size s =SQR(2*28)= 7.48 ---> 12 mm < tmin=26 mm
a = 8*12/1.4142=67.88 mm

τa=2*Ra/(a*hw')=2* 7450.0*10**3/{67.88*(2364- 35-350)}
= 110.9 N/mm2 < τa=120.0 N/mm2

(b) Between diaphragm and web of main girder

Welding Size s =SQR(2*26)= 7.21 ---> 10 mm < tmin=16 mm

τ=3725.0*10**3/(2*10*0.7071* 2352)= 112.0 N/mm2
< τa=120.0 N/mm2

7. Main girder: G-2　Support: PF4

Reaction force　Ra= 7300.0 kN

Diaphragm	TD= 26 mm	(SM490YB)
Lflg	TL= 31 mm	(SM490YB)
Web	TW= 16 mm	(SM490YA)
Lower plate	1-1210 *1210 (352.0φ)	
RIB	4- 280 * 28	(SM490YB)

Check of bearing stress

(SM490YB)Stiff	2*(28.00+ 28.00-2* 3.50)* 2.8	=	274.40
(SM490YB)DIA	(121.00- 35.20+4* 3.1)* 2.6	=	255.32

Ab = 529.72 cm2

σb =R/Ab= 7300.0*10**3/ 529.72e2= 137.8 N/mm2
< σba= 315.0 N/mm2

Check of vertical stress

(SM490YB)Stiff	2*(28.00+ 28.00)* 2.8	=	313.60
(SM490YB)DIA	92.40* 2.6	=	240.24

A = 553.84 cm2

1.7* 313.60= 533.12 cm2 < A　故に Ae= 533.12 cm2

r=SQR(I/Ae)=SQR(94034/ 533.12)= 13.28 cm

Stress

L/r=236.1 / 2 / 13.28= 8.89 ＜ 15

σcag=210.0 N/mm2

∴ σca=σcag*σcal/σcao=210.0*210.0/210.0=210.0 N/mm2

σv=R/Ae= 7300.0*10**3/ 533.12e2= 136.9 N/mm2 < σca

Check of horizontal stress

PF4

Shear force Sa= 7300.0*1.100/2.200= 3650.0 kN
Sc= 3650.0 kN

Bending moment Ma=Mc= 7300.0*1.100*1.100/2.200= 4015.0 kN.m

Section A-A

	Section		A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YB)	1-FLG PL	660* 39	257.40	-120.00	-30888	3706886
(SM490YB)	1-DIA PL	2361* 26	613.86	——	——	2851544
(SM490YB)	1-FLG PL	660* 31	204.60	119.60	24470	2926795
			1075.86		-6418	9485225
						-38284
					I=	9446941

e =Σ(Ay)/ΣA= -6418/1075.86= -5.97 cm
Yl =118.05 + 3.1 +(5.97)=127.12 cm

σl= 4015.0*10**6*127.12e1/ 9446941e4= 54.0 N/mm2 <σa=210.0 N/mm2
τ = 3650.0*10**3/ 613.86e2= 59.5 N/mm2 <τa=120.0 N/mm2

Section C-C

	Section		A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YB)	1-FLG PL	660* 39	257.40	-120.00	-30888	3706886
(SM490YB)	1-DIA PL	1181* 26	306.93	-59.03	-18117	1425772
(SM490YB)	1-DIA PL	1181* 26	306.93	59.03	18117	1425772
(SM490YB)	1-FLG PL	660* 31	204.60	119.60	24470	2926795
			1075.86		-6418	9485225
						-38284
					I=	9446941

e =Σ(Ay)/ΣA= -6418/1075.86= -5.97 cm
Yl =118.05 + 3.1 +(5.97)=127.12 cm

σl= 4015.0*10**6*127.12e1/ 9446941e4= 54.0 N/mm2 <σa=210.0 N/mm2
τ = 3650.0*10**3/ 613.86e2= 59.5 N/mm2 <τa=120.0 N/mm2

Check of biaxial stress

Section A-A (σv/σta)**2-(σv/σta)*(σl/σta)+(σl/σta)**2+(τ/τa)**2
= 0.569 < 1.2

Weld size

(a) Between stiffener and diaphragm

Required size s =SQR(2*28)= 7.48 ---> 12 mm < tmin=26 mm
a = 8*12/1.4142=67.88 mm

τa=2*Ra/(a*hw')=2* 7300.0*10**3/{67.88*(2361- 35-350)}
= 108.8 N/mm2 < τa=120.0 N/mm2

(b) Between diaphragm and web of main girder

Welding Size =SQR(2*26)= 7.21 ---> 10 mm < tmin=16 mm

τ=3650.0*10**3/(2*10*0.7071* 2295)= 112.5 N/mm2
< τa=120.0 N/mm2

8. Main girder: G-2　Support: S2

Reaction force　Ra= 2850.0 kN

```
Diaphragm        TD= 12 mm     (SM490YA   )
Lflg             TL= 10 mm     (SM490YA   )
Web              TW= 12 mm     (SM490YA   )
Lower plate      1- 760 * 810 (202.0φ)
Rib           4- 160 * 16  (SM490YA   )
```

Check of bearing stress

```
(SM490YA   )Stiff         2*( 16.00+ 16.00-2*  3.50)* 1.6 =  80.00
(SM490YA   )DIA          ( 81.00- 20.20+4* 1.0)* 1.2      =  77.76
--------------------------------------------------------------------
                                                     Ab = 157.76 cm2
   σb   =R/Ab= 2850.0*10**3/ 157.76e2= 180.7 N/mm2
                               <  σba= 315.0 N/mm2
```

Check of vertical stress

```
(SM490YA   )Stiff          2*( 16.00+ 16.00)* 1.6         = 102.40
(SM490YA   )DIA             57.60* 1.2                    =  69.12
-------------------------------------------------------------------
                                                   A = 171.52 cm2

   1.7* 102.40= 174.08 cm2 > A   故に Ae= 171.52 cm2


   r=SQR(I/Ae)=SQR(   9766/ 171.52)=  7.55 cm

  Stress

    L/r=238.9 / 2 /  7.55= 15.83 ＞ 15
                                 ≦ 75

     σcag=210.0- 1.50*( 15.83-15)=208.8 N/mm2

   ∴  σca=σcag*σcal/σcao=208.8*210.0/210.0=208.8 N/mm2

   σv=R/Ae= 2850.0*10**3/ 171.52e2= 166.2 N/mm2 <  σca
```

Check of horizontal stress

S2

Shear force Sa= 2850.0*1.100/2.200= 1425.0 kN
Sc= 1425.0 kN

Bending moment Ma=Mc= 2850.0*1.100*1.100/2.200= 1567.5 kN.m

Section A-A

	Section	A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YA)	1-FLG PL 663* 11	72.90	-120.00	-8748	1049767
(SM490YA)	1-DIA PL 2389* 12	286.68	——	——	1363479
(SM490YA)	1-FLG PL 663* 10	66.27	119.95	7949	953538
		425.85		-799	3366784
					-1498
				I=	3365286

e =Σ(Ay)/ΣA= -799/ 425.85= -1.88 cm
Yl =119.45 + 1.0 +(1.88)=122.33 cm

σl= 1567.5*10**6*122.33e1/ 3365286e4= 57.0 N/mm2 <σa=210.0 N/mm2
τ = 1425.0*10**3/ 286.68e2= 49.7 N/mm2 <τa=120.0 N/mm2

Section C-C

	Section	A(cm2)	y(cm)	Ay(cm3)	Ay2(cm4)
(SM490YA)	1-FLG PL 663* 11	72.90	-120.00	-8748	1049767
(SM490YA)	1-DIA PL 1195* 12	143.34	-59.73	-8561	681739
(SM490YA)	1-DIA PL 1195* 12	143.34	59.73	8561	681739
(SM490YA)	1-FLG PL 663* 10	66.27	119.95	7949	953538
		425.85		-799	3366784
					-1498
				I=	3365286

e =Σ(Ay)/ΣA= -799/ 425.85= -1.88 cm
Yl =119.45 + 1.0 +(1.88)=122.33 cm

σl= 1567.5*10**6*122.33e1/ 3365286e4= 57.0 N/mm2 <σa=210.0 N/mm2
τ = 1425.0*10**3/ 286.68e2= 49.7 N/mm2 <τa=120.0 N/mm2

Check of biaxial stress

Section A-A (σv/σta)**2-(σv/σta)*(σl/σta)+(σl/σta)**2+(τ/τa)**2
= 0.657 < 1.2

Weld size

(a) Between stiffener and diaphragm

Required size s =SQR(2*16)= 5.66 ---> 6 mm < tmin=12 mm
a = 8* 6/1.4142=33.94 mm

τa=2*Ra/(a*hw')=2* 2850.0*10**3/{33.94*(2389- 35-300)}
= 81.8 N/mm2 < τa=120.0 N/mm2

(b) Between diaphragm and web of main girder

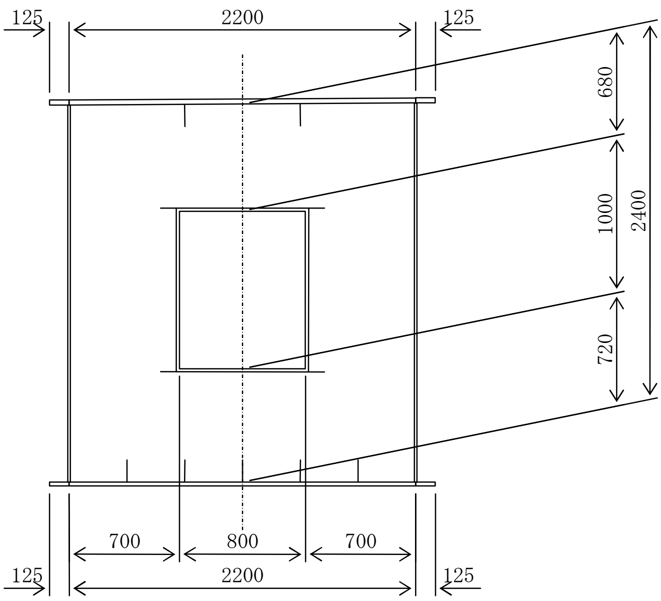
Welding Size s =SQR(2*12)= 4.90 ---> 6 mm < tmin=12 mm

τ=1425.0*10**3/(2* 6*0.7071* 2323)= 72.3 N/mm2
< τa=120.0 N/mm2

5-2 Calculation of mid diagram

1. Girder G-1

（１）Design conditions



(a) Diaphragm

Equivalent span Lu = 33.816 m

Interval of diaphragms Ld = 5.449 m

Thickness of diaphragm Td = 9 mm (SM400)

Manhole width b = 800 mm

Manhole height h = 1000 mm

(b) Section of girder

Upper flange

Web spacing Bu = 2200 mm , Tu = 32 mm , Au = 704.00 cm^2

Over edge length at left side BuL = 125 mm , TuL = 32 mm , AuL = 40.00 cm^2

Over edge length at right side BuR = 125 mm , TuR = 32 mm , AuR = 40.00 cm^2

Slope = 0.57 %

Rib section 2-PL 260* 25 A = 130.00 cm^2

Total area Fu = 914.0 cm^2

Lower flange

Web spacing BL = 2200 mm , TL = 26 mm , AL = 572.00 cm^2

Over edge length at left side BLL = 125 mm , TLL = 26 mm , ALL = 32.50 cm^2

Over edge length at right side BLR = 125 mm , TLR = 26 mm , ALR = 32.50 cm^2

Rib section 5-PL 260* 25 A = 325.00 cm^2

Total area FL = 962.0 cm^2

Web

Height Hw = 2400 mm

Thickness Tw = 16 mm

Total area Fh = 384.0 cm^2

（２）Checking diaphragm spacing

Limit spacing of diaphragms

Lu = 33.816 <= 50.000 m

Therefore, Ldreq = 6.000 m

（３）Calculation of Aperture ratio ρ

$\rho = \sqrt{\{ (b * h) / ((Bu+BL) * Hw / 2) \}}$

$= \sqrt{\{ (800 * 1000) / ((2200+2200) * 2400 / 2) \}} = 0.39 < 0.40$

Therefore, the Solid type

（４）Calculation of required stiffness of diaphragm

(a) Calculation of warping constant Idw

$e = IL / BL + ((Bu + 2 * BL) / 12) * Fh$

$= 4060216 / 220.0 + ((220.0 + 2 * 220.0) / 12) * 384.0 = 39576\ cm^3$

$f = Iu / Bu + ((2 * Bu + BL) / 12) * Fh$

$= 4096411 / 220.0 + ((2 * 220.0 + 220.0) / 12) * 384.0 = 39740\ cm^3$

$\alpha 1 = e / (e + f) * (Bu + BL) / 4 * Hw$

$= 39576 / (39576 + 39740) * (220.0 + 220.0) / 4 * 240.0 = 13173\ cm^2$

$\alpha 2 = f / (e + f) * (Bu + BL) / 4 * Hw$

$= 39740 / (39576 + 39740) * (220.0 + 220.0) / 4 * 240.0 = 13227\ cm^2$

$Idw = 1/3 \{ \alpha 1^2 * Fu * (1 + (bu1 + bu2) / Bu)^2$

$+ \alpha 2^2 * FL * (1 + (bL1 + bL2) / BL)^2$

$+ 2 * (\alpha 1^2 - \alpha 1 * \alpha 2 + \alpha 2^2) * Fh \}$

$= 1/3 \{ 13173^2 * 914.0 * (1 + (12.5 + 12.5) / 220.0)^2$

$+ 13227^2 * 962.0 * (1 + (12.5 + 12.5) / 220.0)^2$

$+ 2 * (13173^2 - 13173 * 13227 + 13227^2) * 384.0 \}$

$= 1.797*10^{11}\ cm^6 = 1.797*10^{17}\ mm^6$

Iu : Moment of inertia about vertical axis for uflg incl. ribs = 4096411 cm^4

IL : Moment of inertia about vertical axis for lflg incl. ribs = 4060216 cm^4

Fu : Total section area of upper flange (including ribs) = 914.0 cm^2

FL : Total section area of lower flange (including ribs) = 962.0 cm^2

Fh : Section area of web par piece = 384.0 cm^2

Hw : Height of web = 240.0 cm

(b)Calculation of required stiffness Kreq

$Kreq = 20 * Es * Idw / Ld^3$

$= 20 * 2.0*10^5 * 1.797*10^{17} / 5449.0^3 = 4.444*10^{12}$ N・mm

Es : Young's modulus of steel = $2.0*10^5$ N/mm^2

Idw : Warping constant

Ld : Actual interval of diaphragms

（５）Calculation of actual stiffness of diaphragms

(a) Actual stiffness

$K = 4 * Gs * A * td$

$= 4 * 7.7*10^4 * 240.0 * (220.0+220.0) * 10^3 / 2 * 0.9 = 1.464*10^{13}$ N・mm

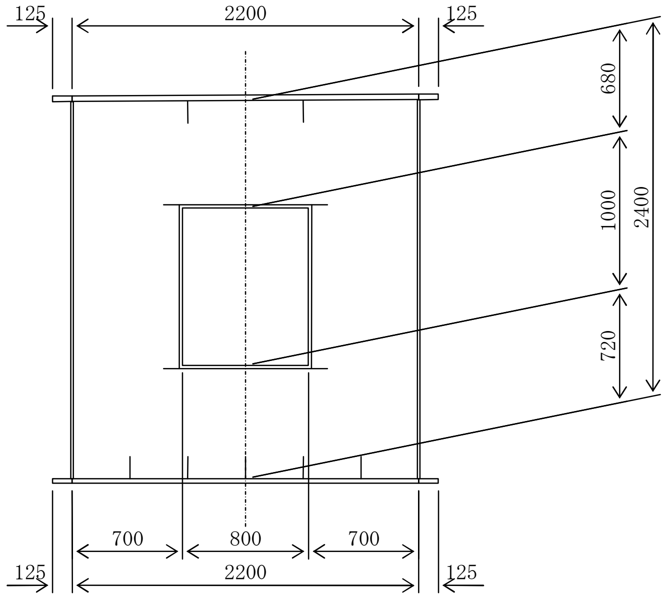
$> Kreq = 4.444*10^{12}$ N・mm

Gs : Shear modulus of elasticity of steel = $7.7*10^4$ N/mm^2

A : Main girder area

2. Girder G-2

（１）Design conditions



(a) Diaphragm

Equivalent span Lu = 33.867 m

Interval of diaphragms Ld = 5.451 m

Thickness of diaphragm Td = 9 mm (SM400)

Manhole width b = 800 mm

Manhole height h = 1000 mm

(b) Section of girder

Upper flange

Web spacing Bu = 2200 mm , Tu = 36 mm , Au = 792.00 cm^2

Over edge length at left side BuL = 125 mm , TuL = 36 mm , AuL = 45.00 cm^2

Over edge length at right side BuR = 125 mm , TuR = 36 mm , AuR = 45.00 cm^2

Slope = 0.58 %

Rib section 2-PL 260* 25 A = 130.00 cm^2

Total area Fu = 1012.0 cm^2

Lower flange

Web spacing BL = 2200 mm , TL = 29 mm , AL = 638.00 cm^2

Over edge length at left side BLL = 125 mm , TLL = 29 mm , ALL = 36.25 cm^2

Over edge length at right side BLR = 125 mm , TLR = 29 mm , ALR = 36.25 cm^2

Rib section 5-PL 260* 25 A = 325.00 cm^2

Total area FL = 1035.5 cm^2

Web

Height Hw = 2400 mm

Thickness Tw = 16 mm

Total area Fh = 384.0 cm^2

（２） Checking diaphragm spacing

Limit spacing of diaphragms

Lu = 33.867 <= 50.000 m

Therefore, Ldreq = 6.000 m

（３） Calculation of Aperture ratio ρ

$\rho = \sqrt{ (b * h) / ((Bu+BL) * Hw / 2) }$

$= \sqrt{ (800 * 1000) / ((2200+2200) * 2400 / 2) } =$ 0.39 < 0.40

Therefore, the Solid type

（４） Calculation of required stiffness of diaphragm

(a) Calculation of warping constant Idw

e = IL / BL + ((Bu + 2 * BL) / 12) * Fh

= 4427869 / 220.0 + ((220.0 + 2 * 220.0) / 12) * 384.0 = 41247 cm^3

f = Iu / Bu + ((2 * Bu + BL) / 12) * Fh

= 4586615 / 220.0 + ((2 * 220.0 + 220.0) / 12) * 384.0 = 41968 cm^3

α1 = e / (e + f) * (Bu + BL) / 4 * Hw

= 41247 / (41247 + 41968) * (220.0 + 220.0) / 4 * 240.0 = 13086 cm^2

α2 = f / (e + f) * (Bu + BL) / 4 * Hw

= 41968 / (41247 + 41968) * (220.0 + 220.0) / 4 * 240.0 = 13314 cm^2

$Idw = 1/3 \{ \alpha1^2 * Fu * (1 + (bu1 + bu2) / Bu)^2$

$+ \alpha2^2 * FL * (1 + (bL1 + bL2) / BL)^2$

$+ 2 * (\alpha1^2 - \alpha1 * \alpha2 + \alpha2^2) * Fh \}$

$= 1/3 \{ 13086^2 * 1012.0 * (1 + (12.5 + 12.5) / 220.0)^2$

$+ 13314^2 * 1035.5 * (1 + (12.5 + 12.5) / 220.0)^2$

$+ 2 * (13086^2 - 13086 * 13314 + 13314^2) * 384.0 \}$

$= 1.921*10^{11}\ cm^6 = 1.921*10^{17}\ mm^6$

Iu : Moment of inertia about vertical axis for uflg incl. ribs = 4586615 cm^4

IL : Moment of inertia about vertical axis for lflg incl. ribs = 4427869 cm^4

Fu : Total section area of upper flange (including ribs) = 1012.0 cm^2

FL : Total section area of lower flange (including ribs) = 1035.5 cm^2

Fh : Section area of web par piece = 384.0 cm^2

Hw : Height of web = 240.0 cm

(b)Calculation of required stiffness Kreq

$Kreq = 20 * Es * Idw / Ld^3$

$= 20 * 2.0*10^5 * 1.921*10^{17} / 5451.0^3 = 4.745*10^{12}$ N・mm

Es : Young's modulus of steel = $2.0*10^5$ N/mm^2

Idw : Warping constant

Ld : Actual interval of diaphragms

（５） Calculation of actual stiffness of diaphragms

(a) Actual stiffness

$K = 4 * Gs * A * td$

$= 4 * 7.7*10^4 * 240.0 * (220.0+220.0) * 10^3 / 2 * 0.9 = 1.464*10^{13}$ N・mm

$> Kreq = 4.745*10^{12}$ N・mm

Gs : Shear modulus of elasticity of steel = $7.7*10^4$ N/mm^2

A : Main girder area

5-3 Stiffener for Jack up

1. Design force for Jack up (When replacing bearing)

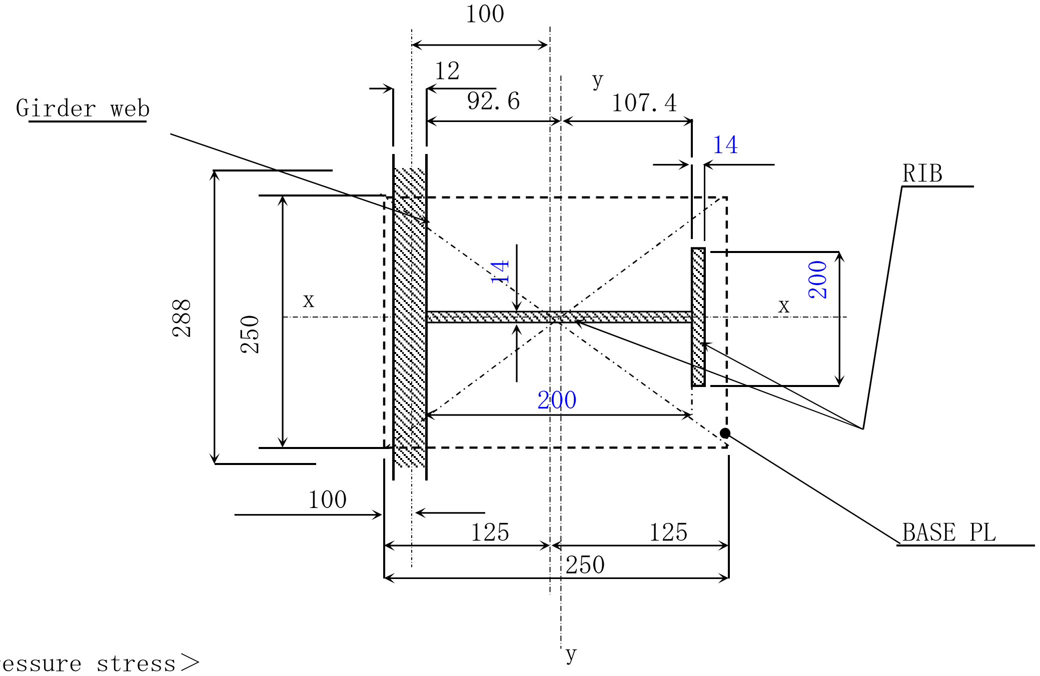
(kN)

		Rd+RL MAX	N	Non-uniformity coefficient	Force
S1	G1	2672.14	2	1.1	1500
	G2	2461.15	2	1.1	1400
PF3	G1	7291.47	4	1.1	2100
	G2	7428.30	4	1.1	2100
PF4	G1	7480.64	4	1.1	2100
	G2	7276.45	4	1.1	2100
S2	G1	2266.57	2	1.1	1300
	G2	2844.86	2	1.1	1600

2. Reinforcement rib for jack up design

(1) Suppprt (End side)

Force	R =	1600.00	(KN)
Jack		200 t	
	tw =	12	(mm)
	Hw =	2350	(mm)
Left side Effective width	ll =	144	(mm)
Right side Effective width	lr =	144	(mm)
		90	°
		SM 490 Y	



<pressure stress>

	A (cm^2)	y (cm)	Ay (cm3)	Ay2 (cm^4)
1 -Stiff PL 200 x 14 (SM 490 Y)	28.00	-10.70	-300	3210
1 -Stiff PL 200 x 14 (SM 490 Y)	28.00	---	---	933
1 -WEB PL 288 x 12 (SM 490 Y)	34.56	10.60	366	3887
ΣA =	90.56		67	8031

e= Ay / A= 0.74 cm yu = 12.14 cm

Ix= Ay2-e^2A= 7982 cm^4 yl = 10.46 cm

ΣA = 90.56 < 1.7 x 56.00 = 95.20 (cm^2)

∴ A = 90.56 (cm^2)

Rx = √ (7982 / 90.56) = 9.39 (cm)

<Rib >

width	=	200 (mm)	>	Hw / 30 + 50 =	128.3 (mm)
thickness	=	14 (mm)	>	B / 9.5 =	9.5 (mm)

<Compressive stress >

Lx= 235 x 0.8 = 188 cm

Lx/rx= 188.00 / 9.39 = 20.03 > 15

∴ σca = 202.5 (N/mm^2)

σN = 1600.00 x 10^3 / 9056 = 176.7 < 202.5 (N/mm^2)

<pressure stress>

BASEPL 250 mm

ba = 250 + 2 x 10 = 270 mm

tf= 10 mm

						A (cm^2)
1	- Stiff PL	200	x	14	(SM 490 Y)	28.00
1	- Stiff PL	200	x	14	(SM 490 Y)	28.00
1	-WEB PL	270	x	12	(SM 490 Y)	32.40
					ΣA =	88.40

σb = R / Ab

= 1600.00 x 10^3 / 8840

= 181.0 (N/mm^2) < 315 (N/mm^2)

Eccentricity moment

Me = 1600.00 x 2.37 / 1000 = 3.80 kNm

Stress

σu 3.80 x 10^6 x 12.14 x10/ 7982 x10^4 = 5.8 < σca = 202.5 N/mm2

σl 3.80 x 10^6 x 10.46 x10/ 7982 x10^4 = 5

r = √(I /A) = √(7982 / 90.56)= 9.39

l/r = 1880 / 93.9 = 20 > 15

σcag = 202.5 (N/mm2) (t ≦40)

b/t = 7.14 ≦ 10.5

σcal = 210.0 (N/mm2) (t ≦40)

∴ σca = 202.5 kN/mm2

Effect of buckling $\frac{\sigma c}{\sigma caz} + \frac{\sigma bcz}{\sigma ba0 \cdot \alpha} \leqq 1.0$

Stability $\sigma c + \frac{\sigma bcz}{\alpha} \leqq \sigma cal$

$\sigma ey = \pi^2 E/(l/r)^2 =$ 4922 N/mm2

$\alpha = 1 - \sigma c/(0.8 \sigma ey) =$ 0.96

$\therefore \frac{176.7}{202.5} + \frac{5.8}{202.5 \times (0.96)} = 0.90 \leqq 1.0$

$\therefore 176.7 + \frac{5.8}{0.96} = 182.8 \leqq \sigma cal$

Rib welding

Force	R	=	1600.00	kN
Allowable shear stre	τ a	=	120	N/mm^2
	n	=	4	

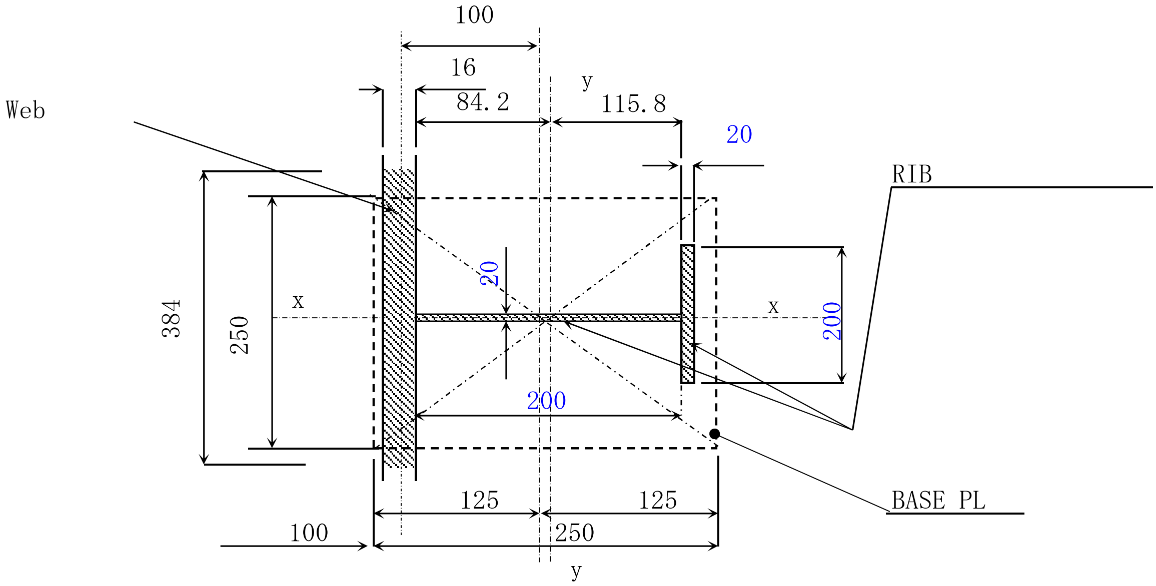
= R / (n x 0.707 x Hw x τ a) = 2.0 (mm)

= √(2 x T) = 5.3 (mm)

Weld size 6 mm

(3) Suppprt (Intermediate)

Force	R =	2100.00	(KN)
Jack		300 t	
	tw =	16	(mm)
	Hw =	2350	(mm)
Left side Effective width	ll =	192	(mm)
Right side Effective width	lr =	192	(mm)
		90	°
		SM 490 Y	



<pressure stress>

	A (cm^2)	y(cm)	Ay (cm3)	Ay2 (cm^4)
1 -Stiff PL 200 x 20 (SM 490 Y)	40.00	-11.00	-440	4853
1 -Stiff PL 200 x 20 (SM 490 Y)	40.00	---	---	1333
1 -WEB PL 384 x 16 (SM 490 Y)	61.44	10.80	664	7179
ΣA =	141.44		224	13366

e= Ay / A= 1.58 cm　　yu = 13.58 cm

Ix= Ay2-e^2A= 13013 cm^4　　yl = 10.02 cm

ΣA = 141.44 > 1.7 x 80.00 = 136.00 (cm^2)

∴ A = 136.00 (cm^2)

Rx = √ (13013 / 136.00) = 9.78 (cm)

<Rib >

width	=	200 (mm)	>	Hw / 30 + 50 =	128.3	(mm)
thickness	=	20 (mm)	>	B / 9.5 =	9.5	(mm)

＜Compressive stress ＞

Lx= 235 x 0.8 = 188 cm

Lx/rx= 188.00 / 9.78 = 19.22 ＞ 15

∴ σca = 203.7 (N/mm^2)

σN = 2100.00 x 10^3 / 13600 = 154.4 ＜ 203.7 (N/mm^2)

＜pressure stress＞

BASEPL 250 mm

ba = 250 + 2 x 31 = 312 mm

tf= 31 mm

						A (cm^2)
1	- Stiff PL	200	x	20	(SM 490 Y)	40.00
1	- Stiff PL	200	x	20	(SM 490 Y)	40.00
1	-WEB PL	312	x	16	(SM 490 Y)	49.92
					ΣA =	129.92

σb = R / Ab

= 2100.00 x 10^3 / 12992

= 161.6 (N/mm^2) ＜ 315 (N/mm^2)

Eccentricity moment

Me = 2100.00 x 10.8 / 1000 = 22.70 kNm

Stress

σu 22.70 x 10ˆ6 x 13.58 x10/ 13013 x10ˆ4 = 23.7 ＜ σca = 203.7 N/mm2

σl 22.70 x 10ˆ6 x 10.02 x10/ 13013 x10ˆ4 = 17.5

r = √(I /A) = √(13013 / 136.00)= 9.78

l/r = 1880 / 97.8 = 19.2 ＞ 15

σcag = 203.7 (N/mm2) (t ≦40)

b/t = 5.00 ≦ 10.5

σcal = 210.0 (N/mm2) (t ≦40)

∴ σca = 203.7 kN/mm2

Effect of buckling	$\dfrac{\sigma c}{\sigma caz}$	+	$\dfrac{\sigma bcz}{\sigma ba0 \cdot \alpha}$		$\leqq$ 1.0
Stability	σc	+	$\dfrac{\sigma bcz}{\alpha}$		$\leqq$ 1.0

$\sigma ey = \pi\hat{}2E/(l/r)\hat{}2$ = 5344 N/mm2

$\alpha = 1-\sigma c/(0.8\sigma ey)$ = 0.96

$$\therefore \quad \frac{154.4}{203.7} + \frac{23.7}{203.7 \times (0.96)} = 0.88 \leqq 1.0$$

$$\therefore \quad 154.4 + \frac{23.7}{0.96} = 179 \leqq \sigma cal$$

Rib welding

Force	R	=	2100.00	kN
Allowable shear stre	τa	=	120	N/mm^2
	n	=	4	

Weld size 7 mm

5-4 Calculation of Stiffener for lateral Force

(1) Lateral Force

1) Longitudinal Direction

L1		Force	Fγ (kN)	α	H(kN)
S1(PF2)	G1	1610	805.00	1.5	537
	G2		805.00	1.5	537
PF3	G1	3120	1560.00	1.5	1040
	G2		1560.00	1.5	1040
PF4	G1	2530	1265.00	1.5	843
	G2		1265.00	1.5	843
S2(PF5)	G1	1380	690.00	1.5	460
	G2		690.00	1.5	460

Rd : Reaction of Dead Load
kH : seismic intensity
α : Constant coefficient
H : Force

2)Transverse Direction

L1		force	Fγ (kN)	α	H(kN)
S1(PF2)	G1	980	490.00	1.5	327
	G2		490.00	1.5	327
PF3	G1	3490	1745.00	1.5	1163
	G2		1745.00	1.5	1163
PF4	G1	3010	1505.00	1.5	1003
	G2		1505.00	1.5	1003
S2(PF5)	G1	1160	580.00	1.5	387
	G2		580.00	1.5	387

Design Force

			H(kN)	tf (mm)	ST (mm)	SH (mm)	H (mm)	L1	L2	P	q1
S1(PF2)	G1	Longitudinal Direction	537	10	33	351	394	760	810	278.22	343
		Transverse Direction	327	10	33	351	394	760	810	158.90	209
	G2	Longitudinal Direction	537	10	35	351	396	760	810	279.63	345
		Transverse Direction	327	10	35	351	396	760	810	159.71	210
PF3	G1	Longitudinal Direction	1040	26	36	524	586	1210	1210	503.67	416
		Transverse Direction	1163	26	36	524	586	1210	1210	563.40	466
	G2	Longitudinal Direction	1040	29	40	524	593	1210	1210	509.69	421
		Transverse Direction	1163	29	40	524	593	1210	1210	570.13	471
PF4	G1	Longitudinal Direction	843	27	30	524	581	1210	1210	404.94	335
		Transverse Direction	1003	27	30	524	581	1210	1210	481.76	398
	G2	Longitudinal Direction	843	31	29	524	584	1210	1210	407.03	336
		Transverse Direction	1003	31	29	524	584	1210	1210	484.25	400
S2(PF5)	G1	Longitudinal Direction	460	10	24	351	385	760	810	233.03	288
		Transverse Direction	387	10	24	351	385	760	810	183.79	242
	G2	Longitudinal Direction	460	10	24	351	385	760	810	233.03	288
		Transverse Direction	387	10	24	351	385	760	810	183.79	242

tf :Lflange Thickness
ST :Sole PL Thickness
SH :Bearing Height
H : Total Height
L1 : Longitudinal Direction length for sole plate
L2 : Transverse Direction length for sole plate
P : Vertical force due to couple of force
q1 : distributed load

(2) Girder end side Support

1) Stiffener for Transverse Direction

a) Effective width

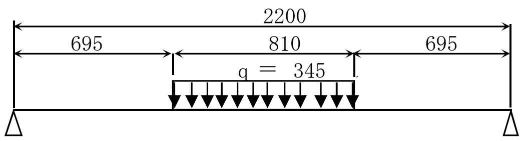
Lower Flange

b	=	760 /	2 =	380.0 mm	(soleの1/2)	
l	=	2200 mm	b/l	=	0.17	<0.3
λd/2	=	(1.1-2(b/l))b		=	286.52 mm	
∴λd	=	573.0 mm				

b) Design force

L = 2.200 m
λ = 0.810 m
q = 345.2 kN/m

M = λxq/4x(L-λ/2) = 125.5 kN·m
S = λxq/2 = 139.8 kN



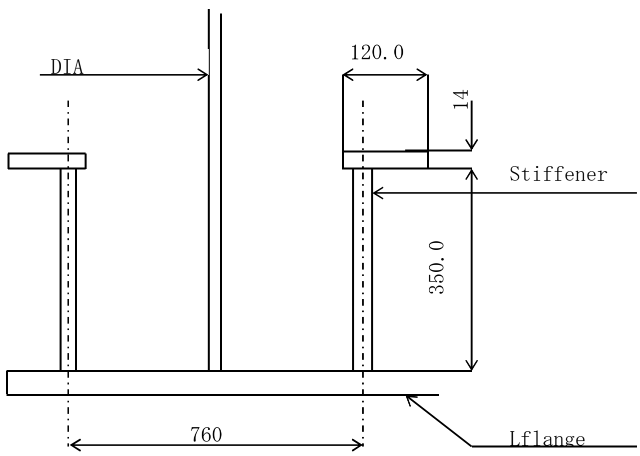
c) Checking Stress

SM490Y

	b(mm)	t(mm)	A (mm2)	y(mm)	A·y	Ay^2 or I	
1-flg	120.0	14	1680	-182	-305760	5.565E+07	SM490Y
1-WEB	350.0	10	3500	0	0	3.573E+07	SM490Y
1-Lflg	573.0	10	5730	180	1031472	1.857E+08	(SM490Y)
Σ			10910		725712	2.770E+08	
					-ΣA·δ^2	-4.827E+07	
δ=Σ(Ay)/ΣA =			66.5 mm		Ir=	2.288E+08	

Yu = 255.5 mm
Yl = 118.5 mm

σu =	M・Yu/Ir	=	140.2 N/mm2	<	σa=	210N/mm2	
σl =	M・Yl/Ir	=	65.0 N/mm2	<	σa=	210N/mm2	
τ =	S / A	=	39.9 N/mm2	<	τa=	120N/mm2	
KU =	√((σWU/σa)^2+(τ/τa)^2)	=	0.71 < 1.2				
KL =	√((σWU/σa)^2+(τ/τa)^2)	=	0.44 < 1.2				



2) Stiffener for Longitudinal Direction

a) Effective width

Lower Flange

b	=	733 /	2 =	366.5 mm		
l	=	760 mm		b/l	=	0.48 >0.3
λd/2	=	0.15 x L			=	114 mm
∴λd	=	228.0 mm				

b) Design Force

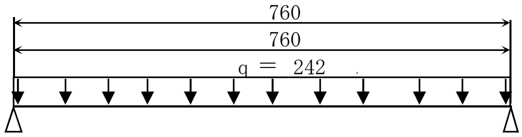
L = 0.760 m

λ = 0.760 m

q = 241.8 kN/m

M = λxq/4x(L-λ/2) = 17.5 kN·m

S = λxq/2 = 91.9 kN



c) Checking Stress

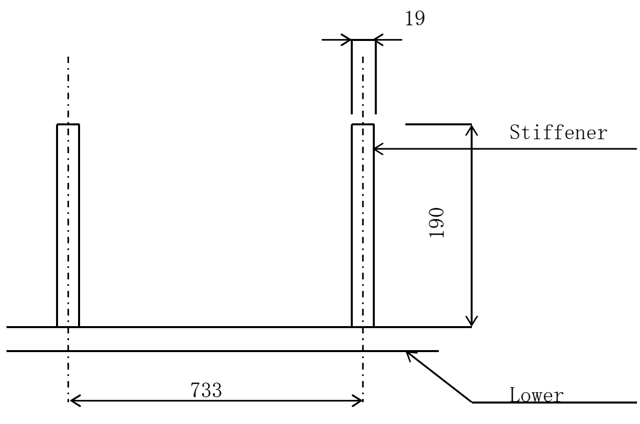
SM490Y

	b(mm)	t(mm)	A (mm2)	y(mm)	A·y	Ay^2 or I	
1-TRIB	190	19	3610	0	0	1.086E+07	SM490Y
1-Lflg	228	10	2280	100	228000	2.280E+07	(SM490Y)
Σ			5890		228000	3.366E+07	
δ=Σ(Ay)/ΣA) =			38.7 mm		-ΣA·δ^2	-8.826E+06	
					Ir=	2.483E+07	

Yu = 133.7 mm

Yl = 66.3 mm

σu =	M·Yu/Ir	=	94.0 N/mm2	<	σa= 210N/mm2
σl =	M·Yl/Ir	=	46.6 N/mm2	<	σa= 210N/mm2
τ =	S / A	=	25.5 N/mm2	<	τa= 120N/mm2



3) Welding

Stiffener for Transverse Direction

Welding Size

$$s1 = \frac{R \cdot \sqrt{2}}{2 \cdot \tau a \cdot hs}$$

$$= \frac{139814 \times \sqrt{2}}{2 \times 120 \times 350} = 2.4 \text{ mm}$$

$$s2 = \sqrt{(2t)} = \sqrt{(2 \times 10)} = 4.5 \text{ mm}$$

Size 6.00 mm

Stiffener for Longitudinal Direction

Welding Size

$$s1 = \frac{R \cdot \sqrt{2}}{2 \cdot \tau a \cdot hs}$$

$$= \frac{91895 \times \sqrt{2}}{2 \times 120 \times 190} = 2.9 \text{ mm}$$

$$s2 = \sqrt{(2t)} = \sqrt{(2 \times 19)} = 6.2 \text{ mm}$$

Size 7.00 mm

(4) Intermediate Support

1) Stiffener for Transverse Direction

a) Effective width

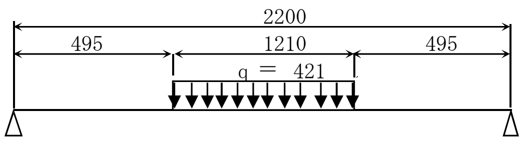
Lower Flange

b	=	1210 /	2 =	605.0 mm (soleの1/2)		
l	=	2200 mm		b/l	=	0.28 >0.3
λd/2	=	(1.1-2(b/l))b			=	326.7 mm
∴λd	=	653.4 mm				

b) Design force

L = 2.200 m
λ = 1.210 m
q = 421.2 kN/m

M = λxq/4x(L-λ/2) = 203.2 kN･m
S = λxq/2 = 254.8 kN



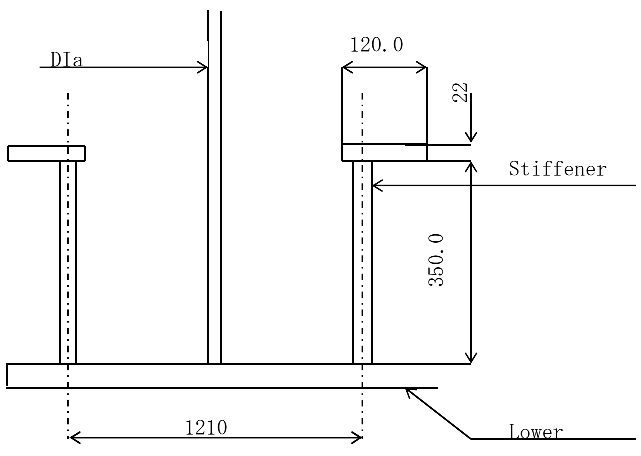
c) Checking Stress

SM490Y

	b(mm)	t(mm)	A (mm2)	y(mm)	A･y	Ay^2 or I	
1-flg	120.0	22	2640	-186	-491040	9.133E+07	SM490Y
1-WEB	350.0	10	3500	0	0	3.573E+07	SM490Y
1-Lflg	653.4	26	16988	188	3193819	6.004E+08	(SM490Y)
Σ			23128		2702779	7.275E+08	
δ＝Σ(Ay)/ΣA)	=		116.9 mm		-ΣA･δ^2	-3.158E+08	
					Ir=	4.117E+08	

Yu = 313.9 mm
Yl = 84.1 mm

σu =	M・Yu/Ir	=	155.0 N/mm2	<	σa=	210N/mm2
σl =	M・Yl/Ir	=	41.5 N/mm2	<	σa=	210N/mm2
τ =	S / A	=	72.8 N/mm2	<	τa=	120N/mm2
KU =	√((σWU/σa)^2+(τ/τa)^2)	=	0.92	< 1.2		
KL =	√((σWU/σa)^2+(τ/τa)^2)	=	0.62	< 1.2		



2) Stiffener for Longitudinal Direction

a) Effective width

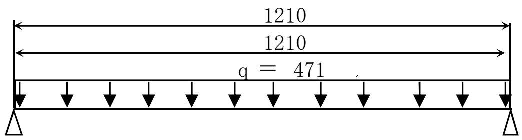
Lower Flange

b	=	1466.7 /	2 =	733.4 mm		
l	=	1210 mm		b/l	=	0.61 >0.3
λd/2	=	0.15 x L			=	181.5 mm
∴λd	=	363.0 mm				

b) Design Force

L = 1.210 m
λ = 1.210 m
q = 471.2 kN/m

M = λxq/4x(L-λ/2) = 86.2 kN·m
S = λxq/2 = 285.1 kN



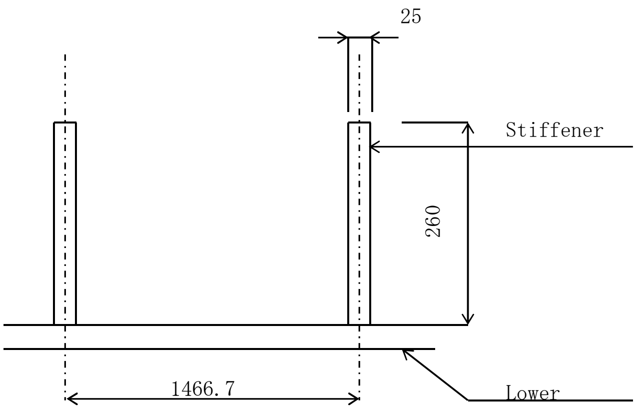
c) Checking Stress

SM490Y

	b(mm)	t(mm)	A (mm2)	y(mm)	A·y	Ay^2 or I	
1-TRIB	260	25	6500	0	0	3.662E+07	SM490Y
1-Lflg	363	26	9438	143	1349634	1.930E+08	(SM490Y)
Σ			15938		1349634	2.296E+08	
δ=Σ(Ay)/ΣA	=		84.7 mm		-ΣA·δ^2	-1.143E+08	
					Ir=	1.153E+08	

Yu = 214.7 mm
Yl = 71.3 mm

σu =	M·Yu/Ir	=	160.5 N/mm2	<	σa=	210N/mm2
σl =	M·Yl/Ir	=	53.3 N/mm2	<	σa=	210N/mm2
τ =	S / A	=	43.9 N/mm2	<	τa=	120N/mm2



3) Welding

Stiffener for Transverse Direction

Welding Size

$$s1 = \frac{R \cdot \sqrt{2}}{2 \cdot \tau a \cdot hs}$$

$$= \frac{254844 \times \sqrt{2}}{2 \times 120 \times 350} = 4.3 \text{ mm}$$

$$s2 = \sqrt{(2t)} = \sqrt{(2 \times 10)} = 4.5 \text{ mm}$$

Size 6.00 mm

Stiffener for Longitudinal Direction

Welding Size

$$s1 = \frac{R \cdot \sqrt{2}}{2 \cdot \tau a \cdot hs}$$

$$= \frac{285064 \times \sqrt{2}}{2 \times 120 \times 260} = 6.5 \text{ mm}$$

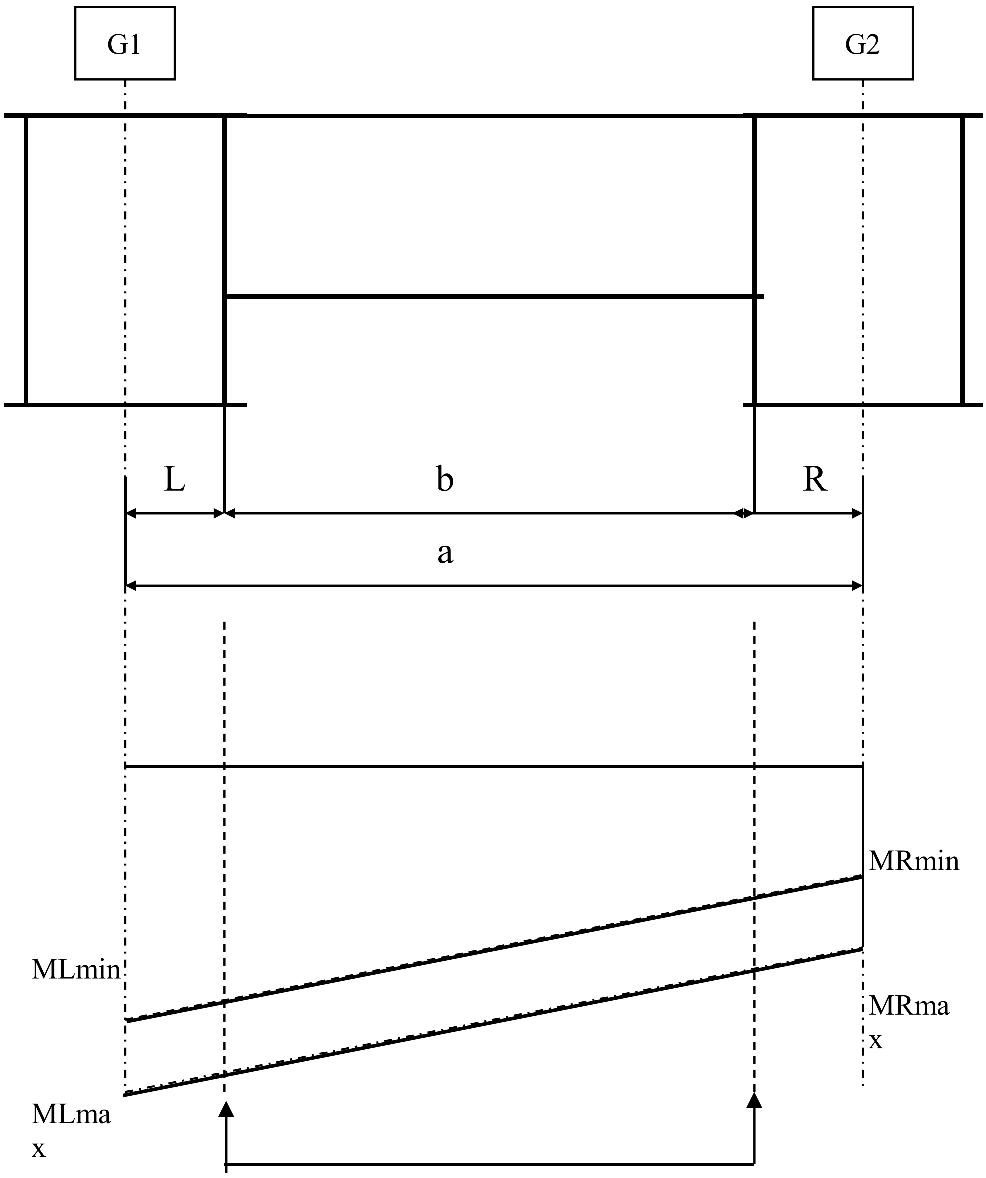
$$s2 = \sqrt{(2t)} = \sqrt{(2 \times 25)} = 7.1 \text{ mm}$$

Size 8.00 mm

§6. Design of Cross Beam

6-1 Design Method

- In the design of cross beam at the end of main girder, the greater value is used comparing with the sectional force by Floor system and the grid sectional force calculated from grid analysis.
- In the design of intermediate cross beam and cross beam at connection part, the grid sectional force calculated from grid analysis is used.
- The grid sectional force calculated from electrical calculator is the value at the centre of main girder.
  The sectional force at both ends of cross beam and a joint is therefore calculated complementing the force at web as which is linear complementarity connecting the maximum and minimum value on the right and left side.



6-2 Calculation Result of Cross Beam

		CROSS BEAM					
		S2		PF4		C21	
FORCE	MOMENT	1053.17	kNm	601.52	kNm	551.5	kNm
		-832.00	kNm	-590.83	kNm	-546.8	kNm
	SHEAR	370.30	kN	380.23	kN	171.6	kN
FLANGE	mm	320	x 16	250	x 12	250	x 12
WEB	mm	1784	x 9	1788	x 9	1788	x 9
σt	N/mm2	76.2	≦ 140.0	59.6	≦ 140.0	48.1	≦ 140.0
σc	N/mm2	-77.4	≦ 117.1	-59.6	≦ 102.7	-48.1	≦ 102.7
τ	N/mm2	24.1	≦ 80.0	23.6	≦ 80.0	23.5	≦ 80.0

§7. Design of Intside Stringer

7-1 Design Method

Design Method

- Inside Stringers are calculated including additional bending moment by Main Girder camber.
- Calculation model is Simple beam.
- In the Stringer, Dead load is given as equal distributed load on beam, Live load is given as concentrated load on the center of the span.

Load

Dead Load	Pavement
	Slab
	Haunch

Live Load

7-2 Calculation Result of Inside Stringer

		INSIDE STRINGER	
FORCE	MOMENT	369.06	kNm
		-440.31	kNm
	SHEAR	322.35	KN
FLANGE	mm	220	x 19
WEB	mm	800	x 10
σt	N/mm2	84.9	≦ 140.0
σc	N/mm2	-100.9	≦ 135.9
τ	N/mm2	40.3	≦ 80.0

§8. Design of Outside Stringer and Bracket

8-1 Design Method

Design Method

- Brackets are calculated by the direct force caused by vehicle and slab load.
- Brackets are calculated as a cantilever beam model.
- Outside Stringers are caluculated as a Simple beam model.
- In the Stringer, Dead load is given as equal distributed load on beam, Live load is given as concentrated load on the center of the span.

Load

Dead Load
- Pavement
- Slab
- Haunch
- Concrete Barrier
- Steel Weight

Live Load

8-2 Calculation Result of Outside Stringer and Bracket

		OUTSIDE STRINGER							
		LEFT SIDE - INTERMEDIATE		LEFT SIDE - GIRDER END SIDE		RIGHT SIDE - INTERMEDIATE		RIGHT SIDE - GIRDER END SIDE	
		C11		S1		C17		S2	
FORCE	MOMENT	201.63	kNm	199.37	kNm	209.18	kNm	202.11	kNm
		-187.39	kNm	-172.58	kNm	194.53	kNm	-175.03	kNm
	SHEAR	158.29	KN	154.41	KN	160.11	KN	155.06	KN
FLANGE	mm	220	x 14	220	x 14	220	x 14	220	x 14
WEB	mm	600	x 9	600	x 9	600	x 9	600	x 9
σt	N/mm2	98.1	≦ 140.0	101.5	≦ 140.0	124.4	≦ 140.0	115.7	≦ 140.0
σc	N/mm2	-91.2	≦ 134.9	-87.9	≦ 135.8	-115.6	≦ 134.6	-100.3	≦ 135.6
τ	N/mm2	29.3	≦ 80.0	28.6	≦ 80.0	29.7	≦ 80.0	28.7	≦ 80.0

		BRACKET							
		LEFT SIDE				RIGHT SIDE			
		C11		S1		C18		S2	
FORCE	MOMENT	-349.32	kNm	-287.81	kNm	-354.83	kNm	-288.74	kNm
			kNm		kNm		kNm		kNm
	SHEAR	222.97	KN	185.18	KN	226.47	KN	185.77	KN
FLANGE	mm	250	x 10	250	x 10	250	x 10	250	x 10
WEB	mm	890	x 9	890	x 9	890	x 9	890	x 9
σt	N/mm2	102.4	≦ 140.0	85.0	≦ 140.0	104.7	≦ 140.0	85.2	≦ 140.0
σc	N/mm2	-102.4	≦ 134.9	-85.0	≦ 134.9	-104.7	≦ 134.6	-85.2	≦ 134.6
τ	N/mm2	27.8	≦ 80.0	23.1	≦ 80.0	28.3	≦ 80.0	23.2	≦ 80.0

§9. Fatigue Design

9-1 Condtion for Fatigue design

1． Live Load

AASHTO Track load
T-load

Comparing the stress range when loading one AASHTO track load and the stress range of a pair of loads of 100 t, there is a possibility that those large stress ranges will affect fatigue. the larger stress of them shall be adopted for stress of fatigue design.

2． Load correction factor

line n_L＝ 2

$ADTT_{SLi}$＝ 2090

Variable stress correction factor（λT）

$\gamma_T = \gamma_{T1} \cdot \gamma_{T2}$

$\gamma T1 = \log L_{B1} + 1.50$ $(2.00 \leqq \gamma_{T1} \leqq 3.00)$

γT2

$ADTT_{SLi}$ \ L_{B2}	$L_{B1} \leqq 50m$	$50m < L_{B1}$
$ADTT_{SLi} \leqq 2000$	1.00	1.00
$2000 < ADTT_{SLi}$	1.00	1.10

	L_{B1} (m)	L_{B2} (m)	$ADTT_{SLi}$	γT1	γT2	γT
First span	54.300	54.300	0.0	3.00	1.10	3.30
Second spane	70.000	70.000	0.0	3.00	1.00	3.00
The third span	54.300	54.300	0.0	3.00	1.00	3.00

3． Impact

i f＝ 10/(50+L)

	L (m)	i f
First span	54.300	0.096
Second spane	70.000	0.083
The third span	54.300	0.096

4． Structural analysis coefficient

γa＝γa＝ 0.80 （girder）
0.50 （Cross beam）

4． Frequency correction factor

γn＝ 0.03

5． Lane traffic volume deviation coefficient

γ_L＝ 1.0（Carriage way）

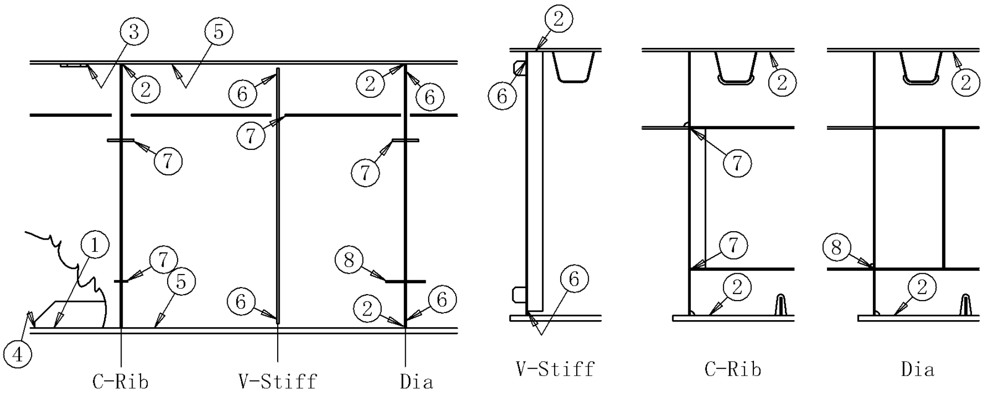
5. Comparing the stress range of 2 type Live Load

Girder		AASHTO	B-Live	(B) -(A)
Member		Stress Range(A)	Stress Range(B)	
G1	1001	2	4	2
	1002	1901	2121	221
	1003	2945	3291	346
	1004	3580	3987	407
	1005	3915	4364	450
	1006	3992	4452	460
	1007	3827	4273	447
	1008	3448	3882	434
	1009	2945	3349	404
	1010	2343	2782	440
	1011	2555	2561	6
	1012	2245	2688	443
	1013	2749	3165	416
	1014	3169	3573	404
	1015	3484	3898	414
	1016	3620	4039	419
	1017	3546	3996	449
	1018	3593	4050	457
	1019	3435	3897	462
	1020	3104	3565	462
	1021	2668	3086	418
	1022	2139	2587	448
	1023	2741	2738	-3
	1024	2395	2827	433
	1025	2928	3329	401
	1026	3371	3825	454
	1027	3681	4147	466
	1028	3790	4264	473
	1029	3689	4146	457
	1030	3357	3771	414
	1031	2753	3112	359
	1032	1784	2021	237

Girder		AASHTO	B-Live	(B) -(A)
Member		Stress Range(A)	Stress Range(B)	
G2	2001	0	4	4
	2002	2066	2074	8
	2003	3095	3207	112
	2004	3692	3865	173
	2005	4002	4215	214
	2006	4100	4314	214
	2007	3994	4191	198
	2008	3662	3893	231
	2009	3112	3483	371
	2010	2225	2998	773
	2011	1944	2965	1021
	2012	1933	2658	725
	2013	2864	3192	328
	2014	3456	3663	207
	2015	3873	4060	186
	2016	4066	4257	191
	2017	4001	4227	226
	2018	4062	4278	216
	2019	3873	4087	214
	2020	3462	3722	259
	2021	2881	3291	409
	2022	1978	2793	815
	2023	1785	2877	1093
	2024	2219	3045	826
	2025	3172	3583	411
	2026	3765	4025	260
	2027	4161	4375	214
	2028	4330	4555	225
	2029	4257	4480	222
	2030	3945	4119	174
	2031	3311	3413	101
	2032	2199	2190	-9

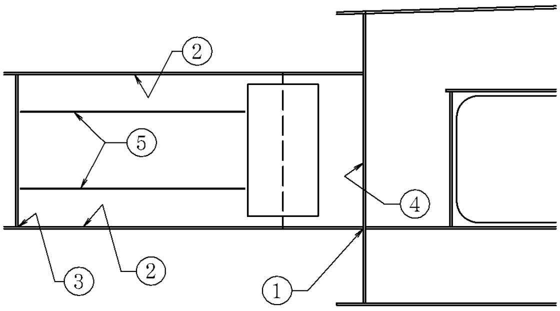
6. Checking Point and Grade

(1) GIRDER



	MAIN MEMBER	ATTACHED MEMBER	GRADE	STRESS
①	FLANGE	Longitudinal RIB	D	100
②	FLANGE	Lateral RIB DIA V-STIFF	E	80
③	FLANGE	HAND HOLE	F	65
⑤	MAINGIRDER-WEB	DECK LOWER FLANGE	D	100
⑥	MAINGIRDER-WEB	V-STIFF DIA CROSS BEAM BLACKET	E	80
⑦	MAINGIRDER-WEB	H-STIFF GUSSET PL BLACKET	G	50
⑧	MAINGIRDER-WEB	CROSS BEAM	G	50

(2) CROSS BEAM



	MEMBER	ATTACHED MEMBER	GRADE	STRESS
①	CROSS BEAM FLAN	MAIN GIRDER WEB	E	80
②	CROSS BEAM WEB	CROSS BEAM FLANGE	D	100
③	CROSS BEAM WEB	V-STIFF	E	80
④		MAIN GIRDER WEB	E	80
⑤	CROSS BEAM WEB	H-STIFF	G	50

9-2 Checking of Fatigue Stress for Main Girder

σtmax : Maximum stress (Including the effect of γa)
σtmin : Minimum stress（Including the effect of γa)
σd : Stress of Dead load (Including the effect of γa)
Δσmax : σtmax－σtmin
Ｃ0 : 2.0E+6・Δσf**ｍ
Δσf : 2.0E+6 Allowable stress
ｍ : Slope constant
ＣR : Correction coefficient for mean stress
Ｃt : Correction factor for t

Structural analysis coefficient Main Girder γa = 0.800

Maximum stress range checking Δσmax≦Δσce・ＣR・Ｃt

Stress range cycles checking Ｄ=Σi[Σj{nti/(C0・(CR・Ct)**ｍ/Δσij**ｍ)}] ≦1

1. G1

STEEL-BOX G1

node U.FLG-MAX

node number	node number	Flange	t(mm)	σtmax (N/mm2)	σtmin (N/mm2)	σd (N/mm2)	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Stress range Δσmax (N/mm2)		Stress range Δσce・CR・Ct (N/mm2) cycle D
1	1	node Right	10	0.0	0.0	0.0	F (65)	46.0	3	21.0	1.300	1.000	0.0	<	59.8
1	2	node Left	10	1.7	-17.4	-66.3	F (65)	46.0	3	21.0	1.300	1.000	19.1	<	59.8
1	2	node Right	10	1.6	-17.5	-66.3	F (65)	46.0	3	21.0	1.300	1.000	19.1	<	59.8
2	3	node Left	14	2.6	-21.3	-88.6	F (65)	46.0	3	21.0	1.300	1.000	23.8	<	59.8
2	3	node Right	14	2.6	-21.3	-88.6	F (65)	46.0	3	21.0	1.300	1.000	23.8	<	59.8
3	4	node Left	14	4.0	-24.8	-106.6	F (65)	46.0	3	21.0	1.300	1.000	28.8	<	59.8
3	4	node Right	14	4.0	-24.8	-106.6	F (65)	46.0	3	21.0	1.300	1.000	28.8	<	59.8
3	5	node Left	14	5.2	-26.2	-107.2	F (65)	46.0	3	21.0	1.300	1.000	31.4	<	59.8
3	5	node Right	14	5.2	-26.2	-107.2	F (65)	46.0	3	21.0	1.300	1.000	31.4	<	59.8
4	6	node Left	14	6.5	-25.4	-90.4	F (65)	46.0	3	21.0	1.300	1.000	31.9	<	59.8
4	6	node Right	14	6.5	-25.4	-90.4	F (65)	46.0	3	21.0	1.300	1.000	31.9	<	59.8
5	7	node Left	11	9.2	-27.1	-67.7	F (65)	46.0	3	21.0	1.300	1.000	36.3	<	59.8
5	7	node Right	11	9.0	-26.3	-65.8	F (65)	46.0	3	21.0	1.300	1.000	35.3	<	59.8
5	8	node Left	11	10.2	-21.8	-8.4	F (65)	46.0	3	21.0	1.258	1.000	31.9	<	57.9
5	8	node Right	11	10.2	-21.8	-8.4	F (65)	46.0	3	21.0	1.258	1.000	31.9	<	57.9
6	9	node Left	18	8.4	-11.8	48.9	F (65)	46.0	3	21.0	1.000	1.000	20.2	<	46.0
6	9	node Right	18	9.4	-13.1	54.6	F (65)	46.0	3	21.0	1.000	1.000	22.5	<	46.0
7	10	node Left	32	7.4	-4.8	85.6	F (65)	46.0	3	21.0	1.000	0.940	12.2	<	43.2
7	10	node Right	32	7.4	-4.8	85.6	F (65)	46.0	3	21.0	1.000	0.940	12.2	<	43.2
7	11	node Left	32	9.6	-2.0	148.0	F (65)	46.0	3	21.0	1.000	0.940	11.6	<	43.2
7	11	node Right	32	9.6	-2.0	148.0	F (65)	46.0	3	21.0	1.000	0.940	11.6	<	43.2
8	12	node Left	32	7.1	-5.4	85.2	F (65)	46.0	3	21.0	1.000	0.940	12.5	<	43.2
8	12	node Right	32	7.1	-5.4	85.2	F (65)	46.0	3	21.0	1.000	0.940	12.5	<	43.2
9	13	node Left	16	8.9	-14.6	49.0	F (65)	46.0	3	21.0	1.000	1.000	23.5	<	46.0
9	13	node Right	16	7.9	-13.0	43.6	F (65)	46.0	3	21.0	1.000	1.000	21.0	<	46.0
10	14	node Left	11	7.4	-19.6	-19.8	F (65)	46.0	3	21.0	1.300	1.000	27.0	<	59.8
10	14	node Right	11	7.4	-19.5	-19.8	F (65)	46.0	3	21.0	1.300	1.000	27.0	<	59.8
10	15	node Left	11	6.5	-24.2	-71.2	F (65)	46.0	3	21.0	1.300	1.000	30.6	<	59.8
10	15	node Right	11	6.5	-24.2	-71.2	F (65)	46.0	3	21.0	1.300	1.000	30.6	<	59.8
11	16	node Left	13	4.6	-23.9	-91.2	F (65)	46.0	3	21.0	1.300	1.000	28.6	<	59.8
11	16	node Right	13	4.6	-23.9	-91.2	F (65)	46.0	3	21.0	1.300	1.000	28.6	<	59.8
12	17	node Left	13	3.7	-24.8	-100.4	F (65)	46.0	3	21.0	1.300	1.000	28.5	<	59.8
12	17	node Right	13	3.7	-24.8	-100.4	F (65)	46.0	3	21.0	1.300	1.000	28.5	<	59.8
13	18	node Left	13	4.9	-24.2	-91.2	F (65)	46.0	3	21.0	1.300	1.000	29.0	<	59.8
13	18	node Right	13	4.9	-24.1	-91.2	F (65)	46.0	3	21.0	1.300	1.000	29.0	<	59.8
14	19	node Left	11	6.9	-24.4	-70.9	F (65)	46.0	3	21.0	1.300	1.000	31.3	<	59.8
14	19	node Right	11	6.8	-24.5	-70.8	F (65)	46.0	3	21.0	1.300	1.000	31.3	<	59.8
14	20	node Left	11	7.8	-19.8	-18.3	F (65)	46.0	3	21.0	1.300	1.000	27.6	<	59.8
14	20	node Right	11	7.8	-19.8	-18.3	F (65)	46.0	3	21.0	1.300	1.000	27.6	<	59.8
15	21	node Left	17	7.5	-12.9	45.4	F (65)	46.0	3	21.0	1.000	1.000	20.4	<	46.0
15	21	node Right	17	8.5	-14.3	50.7	F (65)	46.0	3	21.0	1.000	1.000	22.8	<	46.0
16	22	node Left	34	6.8	-5.2	86.0	F (65)	46.0	3	21.0	1.000	0.926	12.0	<	42.6
16	22	node Right	34	6.7	-5.3	86.1	F (65)	46.0	3	21.0	1.000	0.926	12.0	<	42.6
17	23	node Left	36	9.8	-2.2	143.8	F (65)	46.0	3	21.0	1.000	0.913	11.9	<	42.0
17	23	node Right	36	9.8	-2.1	143.7	F (65)	46.0	3	21.0	1.000	0.913	11.9	<	42.0
17	24	node Left	36	7.3	-4.6	82.8	F (65)	46.0	3	21.0	1.000	0.913	11.9	<	42.0

17	24 node Right	36	7.3	-4.7	83.3	F (65)	46.0	3	21.0	1.000	0.913	12.0 < 42.0
18	25 node Left	20	9.2	-13.0	55.3	F (65)	46.0	3	21.0	1.000	1.000	22.2 < 46.0
18	25 node Right	20	8.4	-11.7	50.0	F (65)	46.0	3	21.0	1.000	1.000	20.1 < 46.0
19	26 node Left	11	10.6	-22.3	-5.2	F (65)	46.0	3	21.0	1.183	1.000	33.0 < 54.4
19	26 node Right	11	10.6	-22.4	-5.2	F (65)	46.0	3	21.0	1.183	1.000	33.0 < 54.4
19	27 node Left	11	9.2	-26.6	-62.0	F (65)	46.0	3	21.0	1.300	1.000	35.8 < 59.8
19	27 node Right	11	9.5	-27.4	-64.1	F (65)	46.0	3	21.0	1.300	1.000	37.0 < 59.8
20	28 node Left	14	6.6	-25.6	-87.1	F (65)	46.0	3	21.0	1.300	1.000	32.2 < 59.8
20	28 node Right	14	6.7	-25.5	-87.2	F (65)	46.0	3	21.0	1.300	1.000	32.2 < 59.8
21	29 node Left	14	5.3	-26.1	-103.1	F (65)	46.0	3	21.0	1.300	1.000	31.4 < 59.8
21	29 node Right	14	5.3	-26.1	-103.1	F (65)	46.0	3	21.0	1.300	1.000	31.4 < 59.8
21	30 node Left	14	3.9	-24.6	-102.1	F (65)	46.0	3	21.0	1.300	1.000	28.5 < 59.8
21	30 node Right	14	3.8	-24.6	-102.0	F (65)	46.0	3	21.0	1.300	1.000	28.5 < 59.8
22	31 node Left	14	2.6	-21.3	-85.6	F (65)	46.0	3	21.0	1.300	1.000	23.8 < 59.8
22	31 node Right	14	2.6	-21.4	-85.5	F (65)	46.0	3	21.0	1.300	1.000	23.9 < 59.8
23	32 node Left	10	1.4	-17.3	-61.2	F (65)	46.0	3	21.0	1.300	1.000	18.7 < 59.8
23	32 node Right	10	1.4	-17.3	-61.2	F (65)	46.0	3	21.0	1.300	1.000	18.7 < 59.8
23	33 node Left	10	0.0	-0.1	0.0	F (65)	46.0	3	21.0	1.300	1.000	0.1 < 59.8

STEEL-BOX G1

node L.FLG-MAX

node number	node number	FLANGE	t (mm)	σtmax	σtmin (N/mm2)	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Stress range Δσmax (N/mm2)		Δσce・CR・Ct (N/mm2)	Cycle D
1	1	node Right	10	0.0	0.0	0.0	F	(65)	46.0	3	21.0	1.300	1.000	0.0	<	59.8	
1	2	node Left	10	19.8	-1.8	74.9	F	(65)	46.0	3	21.0	1.000	1.000	21.6	<	46.0	
1	2	node Right	10	19.8	-1.8	74.9	F	(65)	46.0	3	21.0	1.000	1.000	21.6	<	46.0	
2	3	node Left	18	20.8	-2.6	86.9	F	(65)	46.0	3	21.0	1.000	1.000	23.4	<	46.0	
2	3	node Right	18	20.8	-2.6	86.9	F	(65)	46.0	3	21.0	1.000	1.000	23.4	<	46.0	
3	4	node Left	18	24.5	-3.8	104.7	F	(65)	46.0	3	21.0	1.000	1.000	28.3	<	46.0	
3	4	node Right	18	24.5	-3.8	104.7	F	(65)	46.0	3	21.0	1.000	1.000	28.3	<	46.0	
3	5	node Left	18	25.8	-5.1	105.6	F	(65)	46.0	3	21.0	1.000	1.000	31.0	<	46.0	
3	5	node Right	18	25.8	-5.1	105.6	F	(65)	46.0	3	21.0	1.000	1.000	31.0	<	46.0	
4	6	node Left	18	25.1	-6.5	89.5	F	(65)	46.0	3	21.0	1.000	1.000	31.6	<	46.0	
4	6	node Right	18	25.1	-6.5	89.5	F	(65)	46.0	3	21.0	1.000	1.000	31.6	<	46.0	
5	7	node Left	10	32.2	-10.9	80.4	F	(65)	46.0	3	21.0	1.000	1.000	43.1	<	46.0	
5	7	node Right	10	27.0	-9.1	67.2	F	(65)	46.0	3	21.0	1.000	1.000	36.1	<	46.0	
5	8	node Left	10	22.3	-10.5	8.7	F	(65)	46.0	3	21.0	1.000	1.000	32.8	<	46.0	
5	8	node Right	10	22.3	-10.5	8.7	F	(65)	46.0	3	21.0	1.000	1.000	32.8	<	46.0	
6	9	node Left	14	13.0	-9.3	-54.2	F	(65)	46.0	3	21.0	1.300	1.000	22.3	<	59.8	
6	9	node Right	14	13.2	-9.4	-54.9	F	(65)	46.0	3	21.0	1.300	1.000	22.6	<	59.8	
7	10	node Left	26	4.9	-7.4	-86.7	F	(65)	46.0	3	21.0	1.300	0.990	12.3	<	59.2	
7	10	node Right	26	4.9	-7.4	-86.7	F	(65)	46.0	3	21.0	1.300	0.990	12.3	<	59.2	
7	11	node Left	26	2.0	-9.7	-148.7	F	(65)	46.0	3	21.0	1.300	0.990	11.7	<	59.2	
7	11	node Right	26	2.0	-9.7	-148.7	F	(65)	46.0	3	21.0	1.300	0.990	11.7	<	59.2	
8	12	node Left	21	6.1	-8.0	-96.3	F	(65)	46.0	3	21.0	1.300	1.000	14.1	<	59.8	
8	12	node Right	21	6.1	-8.0	-96.3	F	(65)	46.0	3	21.0	1.300	1.000	14.1	<	59.8	
9	13	node Left	11	14.9	-9.0	-49.7	F	(65)	46.0	3	21.0	1.300	1.000	23.8	<	59.8	
9	13	node Right	11	14.6	-8.8	-49.0	F	(65)	46.0	3	21.0	1.300	1.000	23.4	<	59.8	
10	14	node Left	11	19.1	-7.2	19.3	F	(65)	46.0	3	21.0	1.000	1.000	26.3	<	46.0	
10	14	node Right	11	19.0	-7.3	19.4	F	(65)	46.0	3	21.0	1.000	1.000	26.3	<	46.0	
10	15	node Left	11	28.1	-7.5	82.8	F	(65)	46.0	3	21.0	1.000	1.000	35.6	<	46.0	
10	15	node Right	11	28.2	-7.5	82.8	F	(65)	46.0	3	21.0	1.000	1.000	35.7	<	46.0	
11	16	node Left	16	24.9	-4.9	94.9	F	(65)	46.0	3	21.0	1.000	1.000	29.8	<	46.0	
11	16	node Right	16	25.0	-4.8	94.9	F	(65)	46.0	3	21.0	1.000	1.000	29.8	<	46.0	
12	17	node Left	16	25.7	-3.8	103.9	F	(65)	46.0	3	21.0	1.000	1.000	29.5	<	46.0	
12	17	node Right	16	25.7	-3.8	103.9	F	(65)	46.0	3	21.0	1.000	1.000	29.5	<	46.0	
13	18	node Left	16	24.9	-5.0	93.9	F	(65)	46.0	3	21.0	1.000	1.000	29.9	<	46.0	
13	18	node Right	16	24.9	-5.0	93.9	F	(65)	46.0	3	21.0	1.000	1.000	29.9	<	46.0	
14	19	node Left	11	27.8	-7.8	80.7	F	(65)	46.0	3	21.0	1.000	1.000	35.6	<	46.0	
14	19	node Right	11	27.8	-7.8	80.6	F	(65)	46.0	3	21.0	1.000	1.000	35.6	<	46.0	
14	20	node Left	11	18.8	-7.4	17.4	F	(65)	46.0	3	21.0	1.000	1.000	26.2	<	46.0	
14	20	node Right	11	18.8	-7.4	17.4	F	(65)	46.0	3	21.0	1.000	1.000	26.2	<	46.0	
15	21	node Left	11	14.2	-8.5	-50.4	F	(65)	46.0	3	21.0	1.300	1.000	22.7	<	59.8	
15	21	node Right	11	14.5	-8.6	-51.2	F	(65)	46.0	3	21.0	1.300	1.000	23.0	<	59.8	
16	22	node Left	21	5.8	-7.7	-96.8	F	(65)	46.0	3	21.0	1.300	1.000	13.5	<	59.8	
16	22	node Right	21	5.9	-7.6	-96.9	F	(65)	46.0	3	21.0	1.300	1.000	13.5	<	59.8	
17	23	node Left	27	2.2	-9.9	-145.6	F	(65)	46.0	3	21.0	1.300	0.981	12.1	<	58.7	
17	23	node Right	27	2.2	-9.9	-145.6	F	(65)	46.0	3	21.0	1.300	0.981	12.1	<	58.7	
17	24	node Left	27	4.7	-7.4	-84.7	F	(65)	46.0	3	21.0	1.300	0.981	12.2	<	58.7	
17	24	node Right	27	4.7	-7.5	-84.6	F	(65)	46.0	3	21.0	1.300	0.981	12.2	<	58.7	
18	25	node Left	14	13.0	-9.4	-55.6	F	(65)	46.0	3	21.0	1.300	1.000	22.3	<	59.8	
18	25	node Right	14	12.9	-9.2	-55.0	F	(65)	46.0	3	21.0	1.300	1.000	22.1	<	59.8	
19	26	node Left	10	21.9	-10.5	5.1	F	(65)	46.0	3	21.0	1.000	1.000	32.4	<	46.0	

19	26	node Right	10	21.9	-10.5	5.2 F	(65)	46.0	3	21.0	1.000	1.000	32.4 < 46.0
19	27	node Left	10	26.2	-9.0	60.8 F	(65)	46.0	3	21.0	1.000	1.000	35.1 < 46.0
19	27	node Right	10	31.2	-10.8	72.8 F	(65)	46.0	3	21.0	1.000	1.000	42.0 < 46.0
20	28	node Left	16	25.8	-6.8	88.3 F	(65)	46.0	3	21.0	1.000	1.000	32.6 < 46.0
20	28	node Right	16	25.9	-6.7	88.3 F	(65)	46.0	3	21.0	1.000	1.000	32.6 < 46.0
21	29	node Left	16	26.4	-5.4	104.4 F	(65)	46.0	3	21.0	1.000	1.000	31.8 < 46.0
21	29	node Right	16	26.4	-5.4	104.4 F	(65)	46.0	3	21.0	1.000	1.000	31.8 < 46.0
21	30	node Left	16	24.9	-4.0	103.4 F	(65)	46.0	3	21.0	1.000	1.000	28.9 < 46.0
21	30	node Right	16	25.0	-3.9	103.3 F	(65)	46.0	3	21.0	1.000	1.000	28.9 < 46.0
22	31	node Left	14	23.0	-2.8	92.4 F	(65)	46.0	3	21.0	1.000	1.000	25.8 < 46.0
22	31	node Right	14	23.0	-2.8	92.3 F	(65)	46.0	3	21.0	1.000	1.000	25.8 < 46.0
23	32	node Left	10	19.0	-1.7	67.4 F	(65)	46.0	3	21.0	1.000	1.000	20.6 < 46.0
23	32	node Right	10	19.0	-1.6	67.3 F	(65)	46.0	3	21.0	1.000	1.000	20.6 < 46.0
23	33	node Left	10	0.1	0.0	0.0 F	(65)	46.0	3	21.0	1.000	1.000	0.1 < 46.0

STEEL-BOX G1

node WEB-U-1 (Web Upper edge) WEB - 1

Stress range

node node Web Grade Δσce・Cycle

number number height tσtmaxσtmin σd (Δσf)Δσce m Δσve CR Ct Δσmax CR・Ct D

(mm) (N/mm2) (N/mm2)

1	1	node Right	2436	12	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6
1	2	node Left	2433	12	0	1.6	-17.3	-65.5	E(80)	62.0	3	29.0	1.300	1.000	18.9<	80.6
1	2	node Right	2433	12	0	1.6	-17.3	-65.5	E(80)	62.0	3	29.0	1.300	1.000	18.9<	80.6
2	3	node Left	2430	14	0	2.6	-21.0	-87.4	E(80)	62.0	3	29.0	1.300	1.000	23.5<	80.6
2	3	node Right	2430	14	0	2.6	-21.0	-87.4	E(80)	62.0	3	29.0	1.300	1.000	23.5<	80.6
3	4	node Left	2426	14	0	3.8	-24.6	-105.1	E(80)	62.0	3	29.0	1.300	1.000	28.4<	80.6
3	4	node Right	2426	14	0	3.8	-24.6	-105.1	E(80)	62.0	3	29.0	1.300	1.000	28.4<	80.6
3	5	node Left	2423	14	0	5.2	-25.8	-105.8	E(80)	62.0	3	29.0	1.300	1.000	31.0<	80.6
3	5	node Right	2423	14	0	5.2	-25.8	-105.8	E(80)	62.0	3	29.0	1.300	1.000	31.0<	80.6
4	6	node Left	2418	14	0	6.5	-25.0	-89.3	E(80)	62.0	3	29.0	1.300	1.000	31.5<	80.6
4	6	node Right	2418	14	0	6.5	-25.0	-89.3	E(80)	62.0	3	29.0	1.300	1.000	31.5<	80.6
5	7	node Left	2412	12	0	9.1	-26.8	-66.9	E(80)	62.0	3	29.0	1.300	1.000	35.9<	80.6
5	7	node Right	2412	12	0	8.9	-26.1	-65.1	E(80)	62.0	3	29.0	1.300	1.000	35.0<	80.6
5	8	node Left	2406	12	0	10.1	-21.4	-8.4	E(80)	62.0	3	29.0	1.260	1.000	31.5<	78.1
5	8	node Right	2406	12	0	10.1	-21.4	-8.4	E(80)	62.0	3	29.0	1.260	1.000	31.5<	78.1
6	9	node Left	2400	18	0	8.2	-11.5	48.1	E(80)	62.0	3	29.0	1.000	1.000	19.8<	62.0
6	9	node Right	2400	18	0	9.2	-12.9	53.7	E(80)	62.0	3	29.0	1.000	1.000	22.1<	62.0
7	10	node Left	2394	32	0	7.2	-4.6	82.4	E(80)	62.0	3	29.0	1.000	0.940	11.8<	58.3
7	10	node Right	2394	32	0	7.2	-4.6	82.4	E(80)	62.0	3	29.0	1.000	0.940	11.8<	58.3
7	11	node Left	2388	32	0	9.2	-1.8	141.1	E(80)	62.0	3	29.0	1.000	0.940	11.0<	58.3
7	11	node Right	2388	32	0	9.2	-1.8	141.1	E(80)	62.0	3	29.0	1.000	0.940	11.0<	58.3
8	12	node Left	2382	32	0	6.6	-5.0	80.1	E(80)	62.0	3	29.0	1.000	0.940	11.7<	58.3
8	12	node Right	2382	32	0	6.6	-5.0	80.1	E(80)	62.0	3	29.0	1.000	0.940	11.7<	58.3
9	13	node Left	2375	16	0	8.3	-13.9	46.4	E(80)	62.0	3	29.0	1.000	1.000	22.2<	62.0
9	13	node Right	2375	16	0	7.4	-12.2	41.1	E(80)	62.0	3	29.0	1.000	1.000	19.7<	62.0
10	14	node Left	2368	12	0	7.0	-18.4	-18.6	E(80)	62.0	3	29.0	1.300	1.000	25.4<	80.6
10	14	node Right	2368	12	0	7.0	-18.4	-18.6	E(80)	62.0	3	29.0	1.300	1.000	25.4<	80.6
10	15	node Left	2360	12	0	5.9	-22.2	-65.5	E(80)	62.0	3	29.0	1.300	1.000	28.2<	80.6
10	15	node Right	2360	12	0	5.9	-22.2	-65.5	E(80)	62.0	3	29.0	1.300	1.000	28.2<	80.6
11	16	node Left	2353	13	0	4.2	-21.9	-83.1	E(80)	62.0	3	29.0	1.300	1.000	26.1<	80.6
11	16	node Right	2353	13	0	4.2	-21.8	-83.2	E(80)	62.0	3	29.0	1.300	1.000	26.1<	80.6
12	17	node Left	2346	13	0	3.3	-22.3	-90.4	E(80)	62.0	3	29.0	1.300	1.000	25.6<	80.6
12	17	node Right	2346	13	0	3.3	-22.3	-90.4	E(80)	62.0	3	29.0	1.300	1.000	25.6<	80.6
13	18	node Left	2338	13	0	4.4	-21.4	-81.2	E(80)	62.0	3	29.0	1.300	1.000	25.8<	80.6
13	18	node Right	2338	13	0	4.3	-21.5	-81.1	E(80)	62.0	3	29.0	1.300	1.000	25.8<	80.6
14	19	node Left	2334	12	0	6.0	-21.4	-62.2	E(80)	62.0	3	29.0	1.300	1.000	27.4<	80.6
14	19	node Right	2334	12	0	6.1	-21.4	-62.2	E(80)	62.0	3	29.0	1.300	1.000	27.5<	80.6
14	20	node Left	2334	12	0	7.0	-17.6	-16.3	E(80)	62.0	3	29.0	1.300	1.000	24.6<	80.6
14	20	node Right	2334	12	0	7.0	-17.6	-16.2	E(80)	62.0	3	29.0	1.300	1.000	24.6<	80.6
15	21	node Left	2334	17	0	6.6	-11.2	39.6	E(80)	62.0	3	29.0	1.000	1.000	17.8<	62.0
15	21	node Right	2334	17	0	7.4	-12.6	44.6	E(80)	62.0	3	29.0	1.000	1.000	20.1<	62.0
16	22	node Left	2334	34	0	5.8	-4.5	73.9	E(80)	62.0	3	29.0	1.000	0.926	10.3<	57.4
16	22	node Right	2334	34	0	5.8	-4.5	73.9	E(80)	62.0	3	29.0	1.000	0.926	10.3<	57.4
17	23	node Left	2334	36	0	8.6	-1.8	124.4	E(80)	62.0	3	29.0	1.000	0.913	10.3<	56.6
17	23	node Right	2334	36	0	8.5	-1.8	124.4	E(80)	62.0	3	29.0	1.000	0.913	10.3<	56.6
17	24	node Left	2334	36	0	6.3	-4.1	72.1	E(80)	62.0	3	29.0	1.000	0.913	10.4<	56.6
17	24	node Right	2334	36	0	6.4	-4.0	72.0	E(80)	62.0	3	29.0	1.000	0.913	10.4<	56.6
18	25	node Left	2334	20	0	8.2	-11.3	48.5	E(80)	62.0	3	29.0	1.000	1.000	19.4<	62.0
18	25	node Right	2334	20	0	7.3	-10.2	43.6	E(80)	62.0	3	29.0	1.000	1.000	17.4<	62.0

19	26 node Left	2334	12	0	9.4	-19.8	-4.6	E(80)	62.0	3	29.0	1.183	1.000	29.3< 73.3
19	26 node Right	2334	12	0	9.4	-19.8	-4.7	E(80)	62.0	3	29.0	1.185	1.000	29.2< 73.4
19	27 node Left	2334	12	0	8.2	-23.5	-55.0	E(80)	62.0	3	29.0	1.300	1.000	31.7< 80.6
19	27 node Right	2334	12	0	8.3	-24.1	-56.2	E(80)	62.0	3	29.0	1.300	1.000	32.4< 80.6
20	28 node Left	2334	14	0	5.8	-22.6	-76.9	E(80)	62.0	3	29.0	1.300	1.000	28.4< 80.6
20	28 node Right	2334	14	0	5.9	-22.5	-77.0	E(80)	62.0	3	29.0	1.300	1.000	28.4< 80.6
21	29 node Left	2334	14	0	4.6	-23.0	-91.0	E(80)	62.0	3	29.0	1.300	1.000	27.7< 80.6
21	29 node Right	2334	14	0	4.6	-23.0	-91.0	E(80)	62.0	3	29.0	1.300	1.000	27.7< 80.6
21	30 node Left	2334	14	0	3.4	-21.7	-90.1	E(80)	62.0	3	29.0	1.300	1.000	25.1< 80.6
21	30 node Right	2334	14	0	3.4	-21.7	-90.1	E(80)	62.0	3	29.0	1.300	1.000	25.1< 80.6
22	31 node Left	2334	14	0	2.2	-18.7	-75.2	E(80)	62.0	3	29.0	1.300	1.000	21.0< 80.6
22	31 node Right	2334	14	0	2.3	-18.7	-75.2	E(80)	62.0	3	29.0	1.300	1.000	21.0< 80.6
23	32 node Left	2334	12	0	1.3	-15.2	-53.9	E(80)	62.0	3	29.0	1.300	1.000	16.5< 80.6
23	32 node Right	2334	12	0	1.3	-15.2	-53.9	E(80)	62.0	3	29.0	1.300	1.000	16.5< 80.6
23	33 node Left	2334	12	0	0.0	-0.1	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.1< 80.6

STEEL-BOX G1

node WEB-L-1 (Web Lower edge) WEB - 1

Stress range

node number	node number		Web height (mm)	t	σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Cycle D
1	1 node	Right	2436	12	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6
1	2 node	Left	2433	12	0	19.6	-1.8	74.0	E(80)	62.0	3	29.0	1.000	1.000	21.4<	62.0
1	2 node	Right	2433	12	0	19.6	-1.8	74.0	E(80)	62.0	3	29.0	1.000	1.000	21.4<	62.0
2	3 node	Left	2430	18	0	20.4	-2.6	85.4	E(80)	62.0	3	29.0	1.000	1.000	23.0<	62.0
2	3 node	Right	2430	18	0	20.4	-2.6	85.4	E(80)	62.0	3	29.0	1.000	1.000	23.0<	62.0
3	4 node	Left	2426	18	0	24.0	-3.8	102.9	E(80)	62.0	3	29.0	1.000	1.000	27.8<	62.0
3	4 node	Right	2426	18	0	24.0	-3.8	102.9	E(80)	62.0	3	29.0	1.000	1.000	27.8<	62.0
3	5 node	Left	2423	18	0	25.4	-5.1	103.9	E(80)	62.0	3	29.0	1.000	1.000	30.5<	62.0
3	5 node	Right	2423	18	0	25.4	-5.1	103.9	E(80)	62.0	3	29.0	1.000	1.000	30.5<	62.0
4	6 node	Left	2418	18	0	24.7	-6.3	88.0	E(80)	62.0	3	29.0	1.000	1.000	31.0<	62.0
4	6 node	Right	2418	18	0	24.7	-6.3	88.0	E(80)	62.0	3	29.0	1.000	1.000	31.0<	62.0
5	7 node	Left	2412	12	0	31.9	-10.9	79.8	E(80)	62.0	3	29.0	1.000	1.000	42.8<	62.0
5	7 node	Right	2412	12	0	26.7	-9.0	66.7	E(80)	62.0	3	29.0	1.000	1.000	35.8<	62.0
5	8 node	Left	2406	12	0	22.2	-10.4	8.6	E(80)	62.0	3	29.0	1.000	1.000	32.6<	62.0
5	8 node	Right	2406	12	0	22.2	-10.4	8.6	E(80)	62.0	3	29.0	1.000	1.000	32.6<	62.0
6	9 node	Left	2400	14	0	12.9	-9.2	-53.6	E(80)	62.0	3	29.0	1.300	1.000	22.1<	80.6
6	9 node	Right	2400	14	0	13.0	-9.3	-54.2	E(80)	62.0	3	29.0	1.300	1.000	22.2<	80.6
7	10 node	Left	2394	26	0	4.7	-7.3	-84.9	E(80)	62.0	3	29.0	1.300	0.990	12.0<	79.8
7	10 node	Right	2394	26	0	4.7	-7.3	-84.9	E(80)	62.0	3	29.0	1.300	0.990	12.0<	79.8
7	11 node	Left	2388	26	0	1.9	-9.4	-145.5	E(80)	62.0	3	29.0	1.300	0.990	11.4<	79.8
7	11 node	Right	2388	26	0	1.9	-9.4	-145.5	E(80)	62.0	3	29.0	1.300	0.990	11.4<	79.8
8	12 node	Left	2382	21	0	5.9	-7.9	-94.7	E(80)	62.0	3	29.0	1.300	1.000	13.8<	80.6
8	12 node	Right	2382	21	0	5.9	-7.9	-94.7	E(80)	62.0	3	29.0	1.300	1.000	13.8<	80.6
9	13 node	Left	2375	14	0	14.7	-8.9	-49.3	E(80)	62.0	3	29.0	1.300	1.000	23.6<	80.6
9	13 node	Right	2375	14	0	14.5	-8.8	-48.5	E(80)	62.0	3	29.0	1.300	1.000	23.3<	80.6
10	14 node	Left	2368	12	0	19.0	-7.1	19.1	E(80)	62.0	3	29.0	1.000	1.000	26.1<	62.0
10	14 node	Right	2368	12	0	18.9	-7.2	19.2	E(80)	62.0	3	29.0	1.000	1.000	26.1<	62.0
10	15 node	Left	2360	12	0	27.8	-7.4	82.1	E(80)	62.0	3	29.0	1.000	1.000	35.3<	62.0
10	15 node	Right	2360	12	0	27.8	-7.4	82.1	E(80)	62.0	3	29.0	1.000	1.000	35.3<	62.0
11	16 node	Left	2353	16	0	24.6	-4.8	93.7	E(80)	62.0	3	29.0	1.000	1.000	29.4<	62.0
11	16 node	Right	2353	16	0	24.6	-4.8	93.7	E(80)	62.0	3	29.0	1.000	1.000	29.4<	62.0
12	17 node	Left	2346	16	0	25.4	-3.8	102.5	E(80)	62.0	3	29.0	1.000	1.000	29.1<	62.0
12	17 node	Right	2346	16	0	25.4	-3.8	102.5	E(80)	62.0	3	29.0	1.000	1.000	29.1<	62.0
13	18 node	Left	2338	16	0	24.5	-5.0	92.7	E(80)	62.0	3	29.0	1.000	1.000	29.4<	62.0
13	18 node	Right	2338	16	0	24.5	-5.0	92.7	E(80)	62.0	3	29.0	1.000	1.000	29.4<	62.0
14	19 node	Left	2334	12	0	27.6	-7.8	80.0	E(80)	62.0	3	29.0	1.000	1.000	35.4<	62.0
14	19 node	Right	2334	12	0	27.6	-7.7	79.9	E(80)	62.0	3	29.0	1.000	1.000	35.3<	62.0
14	20 node	Left	2334	12	0	18.6	-7.4	17.2	E(80)	62.0	3	29.0	1.000	1.000	26.0<	62.0
14	20 node	Right	2334	12	0	18.6	-7.4	17.2	E(80)	62.0	3	29.0	1.000	1.000	26.0<	62.0
15	21 node	Left	2334	14	0	14.2	-8.3	-50.0	E(80)	62.0	3	29.0	1.300	1.000	22.5<	80.6
15	21 node	Right	2334	14	0	14.3	-8.5	-50.7	E(80)	62.0	3	29.0	1.300	1.000	22.8<	80.6
16	22 node	Left	2334	21	0	5.8	-7.5	-95.3	E(80)	62.0	3	29.0	1.300	1.000	13.3<	80.6
16	22 node	Right	2334	21	0	5.8	-7.5	-95.3	E(80)	62.0	3	29.0	1.300	1.000	13.3<	80.6
17	23 node	Left	2334	27	0	2.2	-9.7	-142.5	E(80)	62.0	3	29.0	1.300	0.981	11.8<	79.1
17	23 node	Right	2334	27	0	2.1	-9.8	-142.4	E(80)	62.0	3	29.0	1.300	0.981	11.8<	79.1
17	24 node	Left	2334	27	0	4.6	-7.3	-82.9	E(80)	62.0	3	29.0	1.300	0.981	11.9<	79.1
17	24 node	Right	2334	27	0	4.6	-7.3	-82.8	E(80)	62.0	3	29.0	1.300	0.981	11.9<	79.1
18	25 node	Left	2334	14	0	12.9	-9.2	-55.0	E(80)	62.0	3	29.0	1.300	1.000	22.1<	80.6
18	25 node	Right	2334	14	0	12.7	-9.0	-54.4	E(80)	62.0	3	29.0	1.300	1.000	21.8<	80.6
19	26 node	Left	2334	12	0	21.8	-10.3	5.0	E(80)	62.0	3	29.0	1.000	1.000	32.2<	62.0

19	26 node Right	2334	12	0	21.8	-10.3	5.1	E(80)	62.0	3	29.0	1.000	1.000	32.1< 62.0
19	27 node Left	2334	12	0	25.9	-9.0	60.3	E(80)	62.0	3	29.0	1.000	1.000	34.9< 62.0
19	27 node Right	2334	12	0	31.0	-10.7	72.2	E(80)	62.0	3	29.0	1.000	1.000	41.7< 62.0
20	28 node Left	2334	16	0	25.5	-6.6	87.1	E(80)	62.0	3	29.0	1.000	1.000	32.2< 62.0
20	28 node Right	2334	16	0	25.5	-6.7	87.2	E(80)	62.0	3	29.0	1.000	1.000	32.2< 62.0
21	29 node Left	2334	16	0	26.0	-5.3	103.1	E(80)	62.0	3	29.0	1.000	1.000	31.3< 62.0
21	29 node Right	2334	16	0	26.0	-5.3	103.1	E(80)	62.0	3	29.0	1.000	1.000	31.3< 62.0
21	30 node Left	2334	16	0	24.6	-3.9	102.0	E(80)	62.0	3	29.0	1.000	1.000	28.5< 62.0
21	30 node Right	2334	16	0	24.6	-3.9	102.0	E(80)	62.0	3	29.0	1.000	1.000	28.5< 62.0
22	31 node Left	2334	14	0	22.8	-2.7	91.3	E(80)	62.0	3	29.0	1.000	1.000	25.5< 62.0
22	31 node Right	2334	14	0	22.8	-2.7	91.3	E(80)	62.0	3	29.0	1.000	1.000	25.5< 62.0
23	32 node Left	2334	12	0	18.9	-1.6	66.8	E(80)	62.0	3	29.0	1.000	1.000	20.5< 62.0
23	32 node Right	2334	12	0	18.8	-1.6	66.8	E(80)	62.0	3	29.0	1.000	1.000	20.4< 62.0
23	33 node Left	2334	12	0	0.1	0.0	0.0	E(80)	62.0	3	29.0	1.000	1.000	0.1< 62.0

STEEL-BOX G1

node HSTIFF-1 (Web H-stiff) WEB - 1

range number	node number		Web height (mm)	t	σtmax	σtmin	σd (N/mm2)	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Stress Δσce・CR・Ct Cycle D
1	1	node Right	2436	12	487	0.0	0.0	0.0 G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6
1	2	node Left	2433	12	487	0.9	-9.9	-37.6 G(50)	32.0	3	15.0	1.300	1.000	10.8<	41.6
1	2	node Right	2433	12	487	0.9	-9.9	-37.6 G(50)	32.0	3	15.0	1.300	1.000	10.8<	41.6
2	3	node Left	2430	12	486	1.5	-12.7	-52.8 G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6
2	3	node Right	2430	12	486	1.5	-12.7	-52.8 G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6
3	4	node Left	2426	12	485	2.3	-14.8	-63.5 G(50)	32.0	3	15.0	1.300	1.000	17.2<	41.6
3	4	node Right	2426	12	485	2.3	-14.8	-63.5 G(50)	32.0	3	15.0	1.300	1.000	17.2<	41.6
3	5	node Left	2423	12	485	3.1	-15.6	-63.9 G(50)	32.0	3	15.0	1.300	1.000	18.7<	41.6
3	5	node Right	2423	12	485	3.1	-15.6	-63.9 G(50)	32.0	3	15.0	1.300	1.000	18.7<	41.6
4	6	node Left	2418	12	484	3.9	-15.1	-53.8 G(50)	32.0	3	15.0	1.300	1.000	19.0<	41.6
4	6	node Right	2418	12	484	3.9	-15.1	-53.8 G(50)	32.0	3	15.0	1.300	1.000	19.0<	41.6
5	7	node Left	2412	12	482	5.1	-15.1	-37.6 G(50)	32.0	3	15.0	1.300	1.000	20.2<	41.6
5	7	node Right	2412	12	482	5.3	-15.5	-38.7 G(50)	32.0	3	15.0	1.300	1.000	20.8<	41.6
5	8	node Left	2406	12	481	6.0	-12.7	-5.0 G(50)	32.0	3	15.0	1.260	1.000	18.7<	40.3
5	8	node Right	2406	12	481	6.0	-12.7	-5.0 G(50)	32.0	3	15.0	1.260	1.000	18.7<	40.3
6	9	node Left	2400	14	480	8.0	-5.7	-33.3 G(50)	32.0	3	15.0	1.300	1.000	13.7<	41.6
6	9	node Right	2400	14	480	7.8	-5.6	-32.6 G(50)	32.0	3	15.0	1.300	1.000	13.4<	41.6
7	10	node Left	2394	16	479	2.9	-4.4	-51.4 G(50)	32.0	3	15.0	1.300	1.000	7.2<	41.6
7	10	node Right	2394	16	479	2.9	-4.4	-51.4 G(50)	32.0	3	15.0	1.300	1.000	7.2<	41.6
7	11	node Left	2388	16	478	1.2	-5.7	-88.2 G(50)	32.0	3	15.0	1.300	1.000	6.9<	41.6
7	11	node Right	2388	16	478	1.2	-5.7	-88.2 G(50)	32.0	3	15.0	1.300	1.000	6.9<	41.6
8	12	node Left	2382	16	476	3.7	-5.0	-59.7 G(50)	32.0	3	15.0	1.300	1.000	8.7<	41.6
8	12	node Right	2382	16	476	3.7	-5.0	-59.7 G(50)	32.0	3	15.0	1.300	1.000	8.7<	41.6
9	13	node Left	2375	14	475	9.0	-5.4	-30.2 G(50)	32.0	3	15.0	1.300	1.000	14.4<	41.6
9	13	node Right	2375	14	475	9.1	-5.6	-30.6 G(50)	32.0	3	15.0	1.300	1.000	14.7<	41.6
10	14	node Left	2368	12	474	4.1	-10.9	-11.1 G(50)	32.0	3	15.0	1.300	1.000	15.1<	41.6
10	14	node Right	2368	12	474	4.1	-10.9	-11.0 G(50)	32.0	3	15.0	1.300	1.000	15.1<	41.6
10	15	node Left	2360	12	472	3.2	-12.2	-36.0 G(50)	32.0	3	15.0	1.300	1.000	15.5<	41.6
10	15	node Right	2360	12	472	3.2	-12.2	-36.0 G(50)	32.0	3	15.0	1.300	1.000	15.5<	41.6
11	16	node Left	2353	12	471	2.4	-12.6	-47.7 G(50)	32.0	3	15.0	1.300	1.000	15.0<	41.6
11	16	node Right	2353	12	471	2.4	-12.5	-47.8 G(50)	32.0	3	15.0	1.300	1.000	15.0<	41.6
12	17	node Left	2346	12	469	1.9	-12.8	-51.8 G(50)	32.0	3	15.0	1.300	1.000	14.7<	41.6
12	17	node Right	2346	12	469	1.9	-12.8	-51.8 G(50)	32.0	3	15.0	1.300	1.000	14.7<	41.6
13	18	node Left	2338	12	468	2.5	-12.3	-46.4 G(50)	32.0	3	15.0	1.300	1.000	14.8<	41.6
13	18	node Right	2338	12	468	2.5	-12.3	-46.3 G(50)	32.0	3	15.0	1.300	1.000	14.8<	41.6
14	19	node Left	2334	12	467	3.2	-11.6	-33.8 G(50)	32.0	3	15.0	1.300	1.000	14.9<	41.6
14	19	node Right	2334	12	467	3.3	-11.6	-33.8 G(50)	32.0	3	15.0	1.300	1.000	15.0<	41.6
14	20	node Left	2334	12	467	4.1	-10.4	-9.6 G(50)	32.0	3	15.0	1.300	1.000	14.4<	41.6
14	20	node Right	2334	12	467	4.1	-10.4	-9.5 G(50)	32.0	3	15.0	1.300	1.000	14.4<	41.6
15	21	node Left	2334	14	467	9.1	-5.3	-32.1 G(50)	32.0	3	15.0	1.300	1.000	14.4<	41.6
15	21	node Right	2334	14	467	8.9	-5.3	-31.6 G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6
16	22	node Left	2334	16	467	3.7	-4.8	-61.5 G(50)	32.0	3	15.0	1.300	1.000	8.6<	41.6
16	22	node Right	2334	16	467	3.7	-4.8	-61.5 G(50)	32.0	3	15.0	1.300	1.000	8.6<	41.6
17	23	node Left	2334	16	467	1.4	-6.0	-89.1 G(50)	32.0	3	15.0	1.300	1.000	7.4<	41.6
17	23	node Right	2334	16	467	1.3	-6.1	-89.0 G(50)	32.0	3	15.0	1.300	1.000	7.4<	41.6
17	24	node Left	2334	16	467	2.9	-4.6	-51.9 G(50)	32.0	3	15.0	1.300	1.000	7.5<	41.6
17	24	node Right	2334	16	467	2.9	-4.5	-51.8 G(50)	32.0	3	15.0	1.300	1.000	7.5<	41.6
18	25	node Left	2334	14	467	8.0	-5.7	-34.3 G(50)	32.0	3	15.0	1.300	1.000	13.8<	41.6
18	25	node Right	2334	14	467	8.1	-5.8	-34.8 G(50)	32.0	3	15.0	1.300	1.000	13.9<	41.6
19	26	node Left	2334	12	467	5.5	-11.5	-2.7 G(50)	32.0	3	15.0	1.183	1.000	17.0<	37.8

19	26 node Right	2334	12	467	5.5	-11.5	-2.7	G(50)	32.0	3	15.0	1.185	1.000	16.9< 37.9
19	27 node Left	2334	12	467	4.7	-13.6	-31.9	G(50)	32.0	3	15.0	1.300	1.000	18.4< 41.6
19	27 node Right	2334	12	467	4.5	-13.1	-30.5	G(50)	32.0	3	15.0	1.300	1.000	17.6< 41.6
20	28 node Left	2334	12	467	3.3	-12.9	-44.1	G(50)	32.0	3	15.0	1.300	1.000	16.3< 41.6
20	28 node Right	2334	12	467	3.4	-12.9	-44.2	G(50)	32.0	3	15.0	1.300	1.000	16.3< 41.6
21	29 node Left	2334	12	467	2.7	-13.2	-52.2	G(50)	32.0	3	15.0	1.300	1.000	15.9< 41.6
21	29 node Right	2334	12	467	2.7	-13.2	-52.2	G(50)	32.0	3	15.0	1.300	1.000	15.9< 41.6
21	30 node Left	2334	12	467	2.0	-12.4	-51.7	G(50)	32.0	3	15.0	1.300	1.000	14.4< 41.6
21	30 node Right	2334	12	467	2.0	-12.4	-51.7	G(50)	32.0	3	15.0	1.300	1.000	14.4< 41.6
22	31 node Left	2334	12	467	1.2	-10.4	-41.9	G(50)	32.0	3	15.0	1.300	1.000	11.7< 41.6
22	31 node Right	2334	12	467	1.3	-10.4	-41.9	G(50)	32.0	3	15.0	1.300	1.000	11.7< 41.6
23	32 node Left	2334	12	467	0.7	-8.4	-29.8	G(50)	32.0	3	15.0	1.300	1.000	9.1< 41.6
23	32 node Right	2334	12	467	0.7	-8.4	-29.8	G(50)	32.0	3	15.0	1.300	1.000	9.1< 41.6
23	33 node Left	2334	12	467	0.0	-0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0< 41.6

STEEL-BOX G1

node POINT-U-1 (Web Upper) WEB - 1

range node number	node number			Web height (mm)	t	Grade	σtmax	σtmin	σd (N/mm2)	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Stress range Δσce・Cycle CR・Ct	D
1	1	node	Right	2436	12	900	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	node	Left	2433	12	900	0.4	-3.6	-13.9	G(50)	32.0	3	15.0	1.300	1.000	4.0<	41.6	
1	2	node	Right	2433	12	900	0.4	-3.6	-13.9	G(50)	32.0	3	15.0	1.300	1.000	4.0<	41.6	
2	3	node	Left	2430	12	900	0.7	-5.6	-23.4	G(50)	32.0	3	15.0	1.300	1.000	6.3<	41.6	
2	3	node	Right	2430	12	900	0.7	-5.6	-23.4	G(50)	32.0	3	15.0	1.300	1.000	6.3<	41.6	
3	4	node	Left	2426	12	900	1.0	-6.5	-27.9	G(50)	32.0	3	15.0	1.300	1.000	7.6<	41.6	
3	4	node	Right	2426	12	900	1.0	-6.5	-27.9	G(50)	32.0	3	15.0	1.300	1.000	7.6<	41.6	
3	5	node	Left	2423	12	900	1.4	-6.8	-27.9	G(50)	32.0	3	15.0	1.300	1.000	8.2<	41.6	
3	5	node	Right	2423	12	900	1.4	-6.8	-27.9	G(50)	32.0	3	15.0	1.300	1.000	8.2<	41.6	
4	6	node	Left	2418	12	900	1.7	-6.5	-23.3	G(50)	32.0	3	15.0	1.300	1.000	8.2<	41.6	
4	6	node	Right	2418	12	900	1.7	-6.5	-23.3	G(50)	32.0	3	15.0	1.300	1.000	8.2<	41.6	
5	7	node	Left	2412	12	900	1.7	-4.9	-12.2	G(50)	32.0	3	15.0	1.300	1.000	6.5<	41.6	
5	7	node	Right	2412	12	900	2.2	-6.4	-15.9	G(50)	32.0	3	15.0	1.300	1.000	8.6<	41.6	
5	8	node	Left	2406	12	900	2.4	-5.1	-2.0	G(50)	32.0	3	15.0	1.262	1.000	7.5<	40.4	
5	8	node	Right	2406	12	900	2.4	-5.1	-2.0	G(50)	32.0	3	15.0	1.262	1.000	7.5<	40.4	
6	9	node	Left	2400	14	900	1.7	-2.4	10.0	G(50)	32.0	3	15.0	1.000	1.000	4.1<	32.0	
6	9	node	Right	2400	14	900	2.3	-3.2	13.2	G(50)	32.0	3	15.0	1.000	1.000	5.5<	32.0	
7	10	node	Left	2394	16	900	1.8	-1.1	19.5	G(50)	32.0	3	15.0	1.000	1.000	2.8<	32.0	
7	10	node	Right	2394	16	900	1.8	-1.1	19.5	G(50)	32.0	3	15.0	1.000	1.000	2.8<	32.0	
7	11	node	Left	2388	16	900	2.2	-0.4	33.1	G(50)	32.0	3	15.0	1.000	1.000	2.6<	32.0	
7	11	node	Right	2388	16	900	2.2	-0.4	33.1	G(50)	32.0	3	15.0	1.000	1.000	2.6<	32.0	
8	12	node	Left	2382	16	900	1.1	-0.9	14.0	G(50)	32.0	3	15.0	1.000	1.000	2.0<	32.0	
8	12	node	Right	2382	16	900	1.1	-0.9	14.0	G(50)	32.0	3	15.0	1.000	1.000	2.0<	32.0	
9	13	node	Left	2375	14	900	1.8	-3.1	10.1	G(50)	32.0	3	15.0	1.000	1.000	4.9<	32.0	
9	13	node	Right	2375	14	900	1.3	-2.1	7.1	G(50)	32.0	3	15.0	1.000	1.000	3.4<	32.0	
10	14	node	Left	2368	12	900	1.6	-4.2	-4.3	G(50)	32.0	3	15.0	1.300	1.000	5.8<	41.6	
10	14	node	Right	2368	12	900	1.6	-4.2	-4.2	G(50)	32.0	3	15.0	1.300	1.000	5.8<	41.6	
10	15	node	Left	2360	12	900	0.8	-3.1	-9.2	G(50)	32.0	3	15.0	1.300	1.000	4.0<	41.6	
10	15	node	Right	2360	12	900	0.8	-3.1	-9.2	G(50)	32.0	3	15.0	1.300	1.000	4.0<	41.6	
11	16	node	Left	2353	12	900	0.7	-4.1	-15.5	G(50)	32.0	3	15.0	1.300	1.000	4.9<	41.6	
11	16	node	Right	2353	12	900	0.8	-4.1	-15.5	G(50)	32.0	3	15.0	1.300	1.000	4.8<	41.6	
12	17	node	Left	2346	12	900	0.6	-4.0	-16.4	G(50)	32.0	3	15.0	1.300	1.000	4.6<	41.6	
12	17	node	Right	2346	12	900	0.6	-4.0	-16.4	G(50)	32.0	3	15.0	1.300	1.000	4.6<	41.6	
13	18	node	Left	2338	12	900	0.8	-3.8	-14.3	G(50)	32.0	3	15.0	1.300	1.000	4.6<	41.6	
13	18	node	Right	2338	12	900	0.7	-3.8	-14.2	G(50)	32.0	3	15.0	1.300	1.000	4.6<	41.6	
14	19	node	Left	2334	12	900	0.7	-2.5	-7.4	G(50)	32.0	3	15.0	1.300	1.000	3.2<	41.6	
14	19	node	Right	2334	12	900	0.8	-2.5	-7.4	G(50)	32.0	3	15.0	1.300	1.000	3.3<	41.6	
14	20	node	Left	2334	12	900	1.4	-3.6	-3.4	G(50)	32.0	3	15.0	1.300	1.000	5.1<	41.6	
14	20	node	Right	2334	12	900	1.4	-3.6	-3.3	G(50)	32.0	3	15.0	1.300	1.000	5.1<	41.6	
15	21	node	Left	2334	14	900	0.9	-1.4	5.0	G(50)	32.0	3	15.0	1.000	1.000	2.3<	32.0	
15	21	node	Right	2334	14	900	1.3	-2.2	7.9	G(50)	32.0	3	15.0	1.000	1.000	3.5<	32.0	
16	22	node	Left	2334	16	900	0.7	-0.5	8.7	G(50)	32.0	3	15.0	1.000	1.000	1.2<	32.0	
16	22	node	Right	2334	16	900	0.7	-0.5	8.7	G(50)	32.0	3	15.0	1.000	1.000	1.2<	32.0	
17	23	node	Left	2334	16	900	1.5	-0.2	21.5	G(50)	32.0	3	15.0	1.000	1.000	1.8<	32.0	
17	23	node	Right	2334	16	900	1.4	-0.3	21.5	G(50)	32.0	3	15.0	1.000	1.000	1.8<	32.0	
17	24	node	Left	2334	16	900	1.1	-0.7	12.3	G(50)	32.0	3	15.0	1.000	1.000	1.8<	32.0	
17	24	node	Right	2334	16	900	1.1	-0.7	12.3	G(50)	32.0	3	15.0	1.000	1.000	1.8<	32.0	
18	25	node	Left	2334	14	900	1.5	-2.0	8.6	G(50)	32.0	3	15.0	1.000	1.000	3.4<	32.0	
18	25	node	Right	2334	14	900	1.0	-1.3	5.8	G(50)	32.0	3	15.0	1.000	1.000	2.3<	32.0	
19	26	node	Left	2334	12	900	1.8	-3.8	-0.9	G(50)	32.0	3	15.0	1.183	1.000	5.6<	37.9	

19	26 node Right	2334	12	900	1.8	-3.7	-0.9	G(50)	32.0	3	15.0	1.185	1.000	5.6< 37.9
19	27 node Left	2334	12	900	1.6	-4.5	-10.5	G(50)	32.0	3	15.0	1.300	1.000	6.0< 41.6
19	27 node Right	2334	12	900	1.0	-2.9	-6.7	G(50)	32.0	3	15.0	1.300	1.000	3.8< 41.6
20	28 node Left	2334	12	900	1.0	-4.0	-13.7	G(50)	32.0	3	15.0	1.300	1.000	5.0< 41.6
20	28 node Right	2334	12	900	1.0	-4.0	-13.7	G(50)	32.0	3	15.0	1.300	1.000	5.0< 41.6
21	29 node Left	2334	12	900	0.8	-4.1	-16.2	G(50)	32.0	3	15.0	1.300	1.000	4.9< 41.6
21	29 node Right	2334	12	900	0.8	-4.1	-16.2	G(50)	32.0	3	15.0	1.300	1.000	4.9< 41.6
21	30 node Left	2334	12	900	0.6	-3.8	-16.0	G(50)	32.0	3	15.0	1.300	1.000	4.5< 41.6
21	30 node Right	2334	12	900	0.6	-3.8	-16.0	G(50)	32.0	3	15.0	1.300	1.000	4.5< 41.6
22	31 node Left	2334	12	900	0.3	-2.7	-11.0	G(50)	32.0	3	15.0	1.300	1.000	3.0< 41.6
22	31 node Right	2334	12	900	0.4	-2.7	-11.0	G(50)	32.0	3	15.0	1.300	1.000	3.1< 41.6
23	32 node Left	2334	12	900	0.2	-2.1	-7.4	G(50)	32.0	3	15.0	1.300	1.000	2.2< 41.6
23	32 node Right	2334	12	900	0.2	-2.1	-7.4	G(50)	32.0	3	15.0	1.300	1.000	2.3< 41.6
23	33 node Left	2334	12	900	0.0	-0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0< 41.6

STEEL-BOX G1

node POINT-L-1 (Web) WEB - 1

range node number	node number		Web height (mm)	t	Grade	σtmax	σtmin	σd	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Stress Δσce・CR・Ct	Cycle D
						(N/mm2)											
1	1	node Right	2436	12	500	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	node Left	2433	12	500	12.0	-1.1	45.3	G(50)	32.0	3	15.0	1.000	1.000	13.1<	32.0	
1	2	node Right	2433	12	500	12.0	-1.1	45.3	G(50)	32.0	3	15.0	1.000	1.000	13.1<	32.0	
2	3	node Left	2430	12	500	11.9	-1.5	49.8	G(50)	32.0	3	15.0	1.000	1.000	13.4<	32.0	
2	3	node Right	2430	12	500	11.9	-1.5	49.8	G(50)	32.0	3	15.0	1.000	1.000	13.4<	32.0	
3	4	node Left	2426	12	500	14.0	-2.2	60.0	G(50)	32.0	3	15.0	1.000	1.000	16.2<	32.0	
3	4	node Right	2426	12	500	14.0	-2.2	60.0	G(50)	32.0	3	15.0	1.000	1.000	16.2<	32.0	
3	5	node Left	2423	12	500	14.8	-3.0	60.6	G(50)	32.0	3	15.0	1.000	1.000	17.8<	32.0	
3	5	node Right	2423	12	500	14.8	-3.0	60.6	G(50)	32.0	3	15.0	1.000	1.000	17.8<	32.0	
4	6	node Left	2418	12	500	14.4	-3.7	51.3	G(50)	32.0	3	15.0	1.000	1.000	18.1<	32.0	
4	6	node Right	2418	12	500	14.4	-3.7	51.3	G(50)	32.0	3	15.0	1.000	1.000	18.1<	32.0	
5	7	node Left	2412	12	500	19.7	-6.7	49.4	G(50)	32.0	3	15.0	1.000	1.000	26.5<	32.0	
5	7	node Right	2412	12	500	15.8	-5.3	39.4	G(50)	32.0	3	15.0	1.000	1.000	21.1<	32.0	
5	8	node Left	2406	12	500	13.1	-6.1	5.1	G(50)	32.0	3	15.0	1.000	1.000	19.2<	32.0	
5	8	node Right	2406	12	500	13.1	-6.1	5.1	G(50)	32.0	3	15.0	1.000	1.000	19.2<	32.0	
6	9	node Left	2400	14	500	7.8	-5.6	-32.4	G(50)	32.0	3	15.0	1.300	1.000	13.4<	41.6	
6	9	node Right	2400	14	500	7.6	-5.4	-31.7	G(50)	32.0	3	15.0	1.300	1.000	13.0<	41.6	
7	10	node Left	2394	16	500	2.8	-4.3	-50.0	G(50)	32.0	3	15.0	1.300	1.000	7.0<	41.6	
7	10	node Right	2394	16	500	2.8	-4.3	-50.0	G(50)	32.0	3	15.0	1.300	1.000	7.0<	41.6	
7	11	node Left	2388	16	500	1.1	-5.5	-85.5	G(50)	32.0	3	15.0	1.300	1.000	6.7<	41.6	
7	11	node Right	2388	16	500	1.1	-5.5	-85.5	G(50)	32.0	3	15.0	1.300	1.000	6.7<	41.6	
8	12	node Left	2382	16	500	3.6	-4.9	-58.0	G(50)	32.0	3	15.0	1.300	1.000	8.5<	41.6	
8	12	node Right	2382	16	500	3.6	-4.9	-58.0	G(50)	32.0	3	15.0	1.300	1.000	8.5<	41.6	
9	13	node Left	2375	14	500	8.7	-5.3	-29.2	G(50)	32.0	3	15.0	1.300	1.000	13.9<	41.6	
9	13	node Right	2375	14	500	8.9	-5.4	-29.6	G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6	
10	14	node Left	2368	12	500	11.1	-4.1	11.1	G(50)	32.0	3	15.0	1.000	1.000	15.2<	32.0	
10	14	node Right	2368	12	500	11.0	-4.2	11.2	G(50)	32.0	3	15.0	1.000	1.000	15.2<	32.0	
10	15	node Left	2360	12	500	17.2	-4.6	50.8	G(50)	32.0	3	15.0	1.000	1.000	21.8<	32.0	
10	15	node Right	2360	12	500	17.2	-4.6	50.8	G(50)	32.0	3	15.0	1.000	1.000	21.8<	32.0	
11	16	node Left	2353	12	500	14.7	-2.9	56.1	G(50)	32.0	3	15.0	1.000	1.000	17.6<	32.0	
11	16	node Right	2353	12	500	14.8	-2.9	56.1	G(50)	32.0	3	15.0	1.000	1.000	17.6<	32.0	
12	17	node Left	2346	12	500	15.2	-2.3	61.4	G(50)	32.0	3	15.0	1.000	1.000	17.5<	32.0	
12	17	node Right	2346	12	500	15.2	-2.3	61.4	G(50)	32.0	3	15.0	1.000	1.000	17.5<	32.0	
13	18	node Left	2338	12	500	14.7	-3.0	55.5	G(50)	32.0	3	15.0	1.000	1.000	17.6<	32.0	
13	18	node Right	2338	12	500	14.6	-3.0	55.5	G(50)	32.0	3	15.0	1.000	1.000	17.6<	32.0	
14	19	node Left	2334	12	500	17.1	-4.8	49.5	G(50)	32.0	3	15.0	1.000	1.000	21.9<	32.0	
14	19	node Right	2334	12	500	17.1	-4.7	49.5	G(50)	32.0	3	15.0	1.000	1.000	21.8<	32.0	
14	20	node Left	2334	12	500	10.9	-4.3	10.0	G(50)	32.0	3	15.0	1.000	1.000	15.2<	32.0	
14	20	node Right	2334	12	500	10.9	-4.3	10.0	G(50)	32.0	3	15.0	1.000	1.000	15.2<	32.0	
15	21	node Left	2334	14	500	8.7	-5.1	-30.8	G(50)	32.0	3	15.0	1.300	1.000	13.8<	41.6	
15	21	node Right	2334	14	500	8.5	-5.1	-30.3	G(50)	32.0	3	15.0	1.300	1.000	13.6<	41.6	
16	22	node Left	2334	16	500	3.6	-4.7	-59.1	G(50)	32.0	3	15.0	1.300	1.000	8.2<	41.6	
16	22	node Right	2334	16	500	3.6	-4.7	-59.1	G(50)	32.0	3	15.0	1.300	1.000	8.2<	41.6	
17	23	node Left	2334	16	500	1.3	-5.8	-85.3	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6	
17	23	node Right	2334	16	500	1.2	-5.9	-85.2	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6	
17	24	node Left	2334	16	500	2.8	-4.4	-49.7	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6	
17	24	node Right	2334	16	500	2.8	-4.3	-49.6	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6	
18	25	node Left	2334	14	500	7.7	-5.5	-32.8	G(50)	32.0	3	15.0	1.300	1.000	13.2<	41.6	
18	25	node Right	2334	14	500	7.8	-5.5	-33.4	G(50)	32.0	3	15.0	1.300	1.000	13.4<	41.6	
19	26	node Left	2334	12	500	12.9	-6.1	2.9	G(50)	32.0	3	15.0	1.000	1.000	19.0<	32.0	

19	26 node Right	2334	12	500	12.9	-6.1	3.0	G(50)	32.0	3	15.0	1.000	1.000	19.0<	32.0
19	27 node Left	2334	12	500	15.3	-5.3	35.6	G(50)	32.0	3	15.0	1.000	1.000	20.6<	32.0
19	27 node Right	2334	12	500	19.2	-6.6	44.7	G(50)	32.0	3	15.0	1.000	1.000	25.8<	32.0
20	28 node Left	2334	12	500	15.2	-4.0	52.0	G(50)	32.0	3	15.0	1.000	1.000	19.2<	32.0
20	28 node Right	2334	12	500	15.2	-4.0	52.0	G(50)	32.0	3	15.0	1.000	1.000	19.2<	32.0
21	29 node Left	2334	12	500	15.5	-3.2	61.5	G(50)	32.0	3	15.0	1.000	1.000	18.6<	32.0
21	29 node Right	2334	12	500	15.5	-3.2	61.5	G(50)	32.0	3	15.0	1.000	1.000	18.6<	32.0
21	30 node Left	2334	12	500	14.7	-2.3	60.8	G(50)	32.0	3	15.0	1.000	1.000	17.0<	32.0
21	30 node Right	2334	12	500	14.7	-2.3	60.8	G(50)	32.0	3	15.0	1.000	1.000	17.0<	32.0
22	31 node Left	2334	12	500	13.9	-1.7	55.6	G(50)	32.0	3	15.0	1.000	1.000	15.6<	32.0
22	31 node Right	2334	12	500	13.9	-1.6	55.6	G(50)	32.0	3	15.0	1.000	1.000	15.5<	32.0
23	32 node Left	2334	12	500	11.6	-1.0	40.9	G(50)	32.0	3	15.0	1.000	1.000	12.6<	32.0
23	32 node Right	2334	12	500	11.5	-1.0	40.9	G(50)	32.0	3	15.0	1.000	1.000	12.5<	32.0
23	33 node Left	2334	12	500	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.000	1.000	0.0<	32.0

STEEL-BOX G1

node WEB-U-2 (Web Upper Edge) WEB - 2

range node number	node number		Web height (mm)	t	τ	σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)		Stress range Cycle Δσce・CR・Ct	D
1	1	node Right	2364	12	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0	<	80.6	
1	2	node Left	2367	12	0	1.5	-16.3	-61.9	E(80)	62.0	3	29.0	1.300	1.000	17.8	<	80.6	
1	2	node Right	2367	12	0	1.5	-16.4	-61.9	E(80)	62.0	3	29.0	1.300	1.000	17.9	<	80.6	
2	3	node Left	2370	14	0	2.5	-20.0	-83.4	E(80)	62.0	3	29.0	1.300	1.000	22.5	<	80.6	
2	3	node Right	2370	14	0	2.4	-20.0	-83.4	E(80)	62.0	3	29.0	1.300	1.000	22.4	<	80.6	
3	4	node Left	2374	14	0	3.7	-23.5	-100.8	E(80)	62.0	3	29.0	1.300	1.000	27.2	<	80.6	
3	4	node Right	2374	14	0	3.7	-23.5	-100.8	E(80)	62.0	3	29.0	1.300	1.000	27.2	<	80.6	
3	5	node Left	2377	14	0	5.0	-24.9	-102.0	E(80)	62.0	3	29.0	1.300	1.000	29.9	<	80.6	
3	5	node Right	2377	14	0	5.0	-24.9	-102.0	E(80)	62.0	3	29.0	1.300	1.000	29.9	<	80.6	
4	6	node Left	2382	14	0	6.2	-24.4	-86.8	E(80)	62.0	3	29.0	1.300	1.000	30.6	<	80.6	
4	6	node Right	2382	14	0	6.2	-24.4	-86.8	E(80)	62.0	3	29.0	1.300	1.000	30.6	<	80.6	
5	7	node Left	2388	12	0	8.9	-26.3	-65.5	E(80)	62.0	3	29.0	1.300	1.000	35.2	<	80.6	
5	7	node Right	2388	12	0	8.7	-25.5	-63.9	E(80)	62.0	3	29.0	1.300	1.000	34.2	<	80.6	
5	8	node Left	2394	12	0	10.0	-21.3	-8.3	E(80)	62.0	3	29.0	1.259	1.000	31.3	<	78.1	
5	8	node Right	2394	12	0	10.0	-21.3	-8.3	E(80)	62.0	3	29.0	1.259	1.000	31.3	<	78.1	
6	9	node Left	2400	18	0	8.2	-11.6	48.2	E(80)	62.0	3	29.0	1.000	1.000	19.8	<	62.0	
6	9	node Right	2400	18	0	9.2	-12.9	53.8	E(80)	62.0	3	29.0	1.000	1.000	22.1	<	62.0	
7	10	node Left	2406	32	0	7.2	-4.6	83.3	E(80)	62.0	3	29.0	1.000	0.940	11.8	<	58.3	
7	10	node Right	2406	32	0	7.2	-4.6	83.3	E(80)	62.0	3	29.0	1.000	0.940	11.8	<	58.3	
7	11	node Left	2412	32	0	9.4	-1.8	143.9	E(80)	62.0	3	29.0	1.000	0.940	11.2	<	58.3	
7	11	node Right	2412	32	0	9.4	-1.8	143.9	E(80)	62.0	3	29.0	1.000	0.940	11.2	<	58.3	
8	12	node Left	2418	32	0	6.9	-5.2	82.7	E(80)	62.0	3	29.0	1.000	0.940	12.1	<	58.3	
8	12	node Right	2418	32	0	6.9	-5.2	82.7	E(80)	62.0	3	29.0	1.000	0.940	12.1	<	58.3	
9	13	node Left	2425	16	0	8.7	-14.4	48.3	E(80)	62.0	3	29.0	1.000	1.000	23.1	<	62.0	
9	13	node Right	2425	16	0	7.8	-12.8	42.9	E(80)	62.0	3	29.0	1.000	1.000	20.6	<	62.0	
10	14	node Left	2433	12	0	7.4	-19.4	-19.6	E(80)	62.0	3	29.0	1.300	1.000	26.7	<	80.6	
10	14	node Right	2433	12	0	7.4	-19.4	-19.6	E(80)	62.0	3	29.0	1.300	1.000	26.7	<	80.6	
10	15	node Left	2440	12	0	6.3	-23.8	-70.2	E(80)	62.0	3	29.0	1.300	1.000	30.2	<	80.6	
10	15	node Right	2440	12	0	6.4	-23.8	-70.3	E(80)	62.0	3	29.0	1.300	1.000	30.2	<	80.6	
11	16	node Left	2447	13	0	4.6	-23.6	-89.8	E(80)	62.0	3	29.0	1.300	1.000	28.2	<	80.6	
11	16	node Right	2447	13	0	4.6	-23.6	-89.8	E(80)	62.0	3	29.0	1.300	1.000	28.2	<	80.6	
12	17	node Left	2454	13	0	3.6	-24.4	-98.8	E(80)	62.0	3	29.0	1.300	1.000	28.0	<	80.6	
12	17	node Right	2454	13	0	3.6	-24.4	-98.8	E(80)	62.0	3	29.0	1.300	1.000	28.0	<	80.6	
13	18	node Left	2462	13	0	4.9	-23.7	-89.8	E(80)	62.0	3	29.0	1.300	1.000	28.6	<	80.6	
13	18	node Right	2462	13	0	4.9	-23.7	-89.8	E(80)	62.0	3	29.0	1.300	1.000	28.6	<	80.6	
14	19	node Left	2466	12	0	6.7	-24.1	-69.8	E(80)	62.0	3	29.0	1.300	1.000	30.8	<	80.6	
14	19	node Right	2466	12	0	6.7	-24.1	-69.7	E(80)	62.0	3	29.0	1.300	1.000	30.8	<	80.6	
14	20	node Left	2466	12	0	7.8	-19.4	-18.1	E(80)	62.0	3	29.0	1.300	1.000	27.2	<	80.6	
14	20	node Right	2466	12	0	7.7	-19.5	-18.0	E(80)	62.0	3	29.0	1.300	1.000	27.2	<	80.6	
15	21	node Left	2466	17	0	7.4	-12.6	44.4	E(80)	62.0	3	29.0	1.000	1.000	20.0	<	62.0	
15	21	node Right	2466	17	0	8.3	-14.1	49.7	E(80)	62.0	3	29.0	1.000	1.000	22.4	<	62.0	
16	22	node Left	2466	34	0	6.5	-5.0	83.1	E(80)	62.0	3	29.0	1.000	0.926	11.5	<	57.4	
16	22	node Right	2466	34	0	6.5	-5.0	83.1	E(80)	62.0	3	29.0	1.000	0.926	11.5	<	57.4	
17	23	node Left	2466	36	0	9.4	-2.0	138.8	E(80)	62.0	3	29.0	1.000	0.913	11.4	<	56.6	
17	23	node Right	2466	36	0	9.4	-2.1	138.8	E(80)	62.0	3	29.0	1.000	0.913	11.5	<	56.6	
17	24	node Left	2466	36	0	7.1	-4.5	80.4	E(80)	62.0	3	29.0	1.000	0.913	11.6	<	56.6	
17	24	node Right	2466	36	0	7.0	-4.5	80.4	E(80)	62.0	3	29.0	1.000	0.913	11.5	<	56.6	
18	25	node Left	2466	20	0	9.0	-12.6	54.1	E(80)	62.0	3	29.0	1.000	1.000	21.7	<	62.0	
18	25	node Right	2466	20	0	8.2	-11.4	48.9	E(80)	62.0	3	29.0	1.000	1.000	19.6	<	62.0	
19	26	node Left	2466	12	0	10.5	-22.1	-5.1	E(80)	62.0	3	29.0	1.183	1.000	32.6	<	73.3	

19	26	node	Right	2466	12	0	10.5	-22.0	-5.2	E(80)	62.0	3	29.0	1.184	1.000	32.5<	73.4
19	27	node	Left	2466	12	0	9.0	-26.2	-61.1	E(80)	62.0	3	29.0	1.300	1.000	35.2<	80.6
19	27	node	Right	2466	12	0	9.4	-27.0	-63.1	E(80)	62.0	3	29.0	1.300	1.000	36.3<	80.6
20	28	node	Left	2466	14	0	6.6	-25.1	-85.7	E(80)	62.0	3	29.0	1.300	1.000	31.7<	80.6
20	28	node	Right	2466	14	0	6.6	-25.1	-85.7	E(80)	62.0	3	29.0	1.300	1.000	31.7<	80.6
21	29	node	Left	2466	14	0	5.2	-25.6	-101.4	E(80)	62.0	3	29.0	1.300	1.000	30.8<	80.6
21	29	node	Right	2466	14	0	5.2	-25.6	-101.4	E(80)	62.0	3	29.0	1.300	1.000	30.8<	80.6
21	30	node	Left	2466	14	0	3.8	-24.2	-100.3	E(80)	62.0	3	29.0	1.300	1.000	28.0<	80.6
21	30	node	Right	2466	14	0	3.8	-24.2	-100.3	E(80)	62.0	3	29.0	1.300	1.000	28.0<	80.6
22	31	node	Left	2466	14	0	2.6	-21.0	-84.1	E(80)	62.0	3	29.0	1.300	1.000	23.5<	80.6
22	31	node	Right	2466	14	0	2.5	-21.0	-84.0	E(80)	62.0	3	29.0	1.300	1.000	23.4<	80.6
23	32	node	Left	2466	12	0	1.4	-17.0	-60.4	E(80)	62.0	3	29.0	1.300	1.000	18.4<	80.6
23	32	node	Right	2466	12	0	1.4	-17.0	-60.3	E(80)	62.0	3	29.0	1.300	1.000	18.5<	80.6
23	33	node	Left	2466	12	0	0.0	-0.1	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.1<	80.6

STEEL-BOX G1

node WEB-L-2 (Web Lower edge) WEB - 2

range node number	node number			Web height (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Stress Δσce・CR・Ct Cycle D
1	1	node	Right	2364	12	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6
1	2	node	Left	2367	12	0	19.6	-1.8	74.3	E(80)	62.0	3	29.0	1.000	1.000	21.4<	62.0
1	2	node	Right	2367	12	0	19.6	-1.8	74.3	E(80)	62.0	3	29.0	1.000	1.000	21.4<	62.0
2	3	node	Left	2370	18	0	20.5	-2.5	85.6	E(80)	62.0	3	29.0	1.000	1.000	23.0<	62.0
2	3	node	Right	2370	18	0	20.5	-2.5	85.6	E(80)	62.0	3	29.0	1.000	1.000	23.0<	62.0
3	4	node	Left	2374	18	0	24.0	-3.8	103.2	E(80)	62.0	3	29.0	1.000	1.000	27.8<	62.0
3	4	node	Right	2374	18	0	24.1	-3.8	103.2	E(80)	62.0	3	29.0	1.000	1.000	27.9<	62.0
3	5	node	Left	2377	18	0	25.4	-5.1	104.1	E(80)	62.0	3	29.0	1.000	1.000	30.5<	62.0
3	5	node	Right	2377	18	0	25.4	-5.1	104.1	E(80)	62.0	3	29.0	1.000	1.000	30.5<	62.0
4	6	node	Left	2382	18	0	24.8	-6.3	88.1	E(80)	62.0	3	29.0	1.000	1.000	31.1<	62.0
4	6	node	Right	2382	18	0	24.8	-6.3	88.1	E(80)	62.0	3	29.0	1.000	1.000	31.1<	62.0
5	7	node	Left	2388	12	0	32.0	-10.8	79.8	E(80)	62.0	3	29.0	1.000	1.000	42.8<	62.0
5	7	node	Right	2388	12	0	26.8	-9.0	66.7	E(80)	62.0	3	29.0	1.000	1.000	35.8<	62.0
5	8	node	Left	2394	12	0	22.2	-10.4	8.6	E(80)	62.0	3	29.0	1.000	1.000	32.6<	62.0
5	8	node	Right	2394	12	0	22.2	-10.4	8.6	E(80)	62.0	3	29.0	1.000	1.000	32.6<	62.0
6	9	node	Left	2400	14	0	12.9	-9.1	-53.6	E(80)	62.0	3	29.0	1.300	1.000	22.0<	80.6
6	9	node	Right	2400	14	0	13.0	-9.3	-54.2	E(80)	62.0	3	29.0	1.300	1.000	22.2<	80.6
7	10	node	Left	2406	26	0	4.7	-7.4	-84.8	E(80)	62.0	3	29.0	1.300	0.990	12.1<	79.8
7	10	node	Right	2406	26	0	4.7	-7.4	-84.8	E(80)	62.0	3	29.0	1.300	0.990	12.1<	79.8
7	11	node	Left	2412	26	0	1.9	-9.4	-145.4	E(80)	62.0	3	29.0	1.300	0.990	11.4<	79.8
7	11	node	Right	2412	26	0	1.9	-9.4	-145.4	E(80)	62.0	3	29.0	1.300	0.990	11.4<	79.8
8	12	node	Left	2418	21	0	5.9	-7.9	-94.5	E(80)	62.0	3	29.0	1.300	1.000	13.8<	80.6
8	12	node	Right	2418	21	0	5.9	-7.9	-94.5	E(80)	62.0	3	29.0	1.300	1.000	13.8<	80.6
9	13	node	Left	2425	14	0	14.6	-8.9	-49.1	E(80)	62.0	3	29.0	1.300	1.000	23.5<	80.6
9	13	node	Right	2425	14	0	14.5	-8.7	-48.4	E(80)	62.0	3	29.0	1.300	1.000	23.2<	80.6
10	14	node	Left	2433	12	0	18.8	-7.2	19.1	E(80)	62.0	3	29.0	1.000	1.000	26.0<	62.0
10	14	node	Right	2433	12	0	18.8	-7.1	19.1	E(80)	62.0	3	29.0	1.000	1.000	25.9<	62.0
10	15	node	Left	2440	12	0	27.7	-7.4	81.8	E(80)	62.0	3	29.0	1.000	1.000	35.1<	62.0
10	15	node	Right	2440	12	0	27.7	-7.4	81.8	E(80)	62.0	3	29.0	1.000	1.000	35.1<	62.0
11	16	node	Left	2447	16	0	24.5	-4.7	93.2	E(80)	62.0	3	29.0	1.000	1.000	29.2<	62.0
11	16	node	Right	2447	16	0	24.5	-4.7	93.2	E(80)	62.0	3	29.0	1.000	1.000	29.2<	62.0
12	17	node	Left	2454	16	0	25.2	-3.7	101.9	E(80)	62.0	3	29.0	1.000	1.000	28.9<	62.0
12	17	node	Right	2454	16	0	25.2	-3.7	101.9	E(80)	62.0	3	29.0	1.000	1.000	28.9<	62.0
13	18	node	Left	2462	16	0	24.3	-5.0	92.1	E(80)	62.0	3	29.0	1.000	1.000	29.3<	62.0
13	18	node	Right	2462	16	0	24.3	-5.0	92.1	E(80)	62.0	3	29.0	1.000	1.000	29.3<	62.0
14	19	node	Left	2466	12	0	27.4	-7.7	79.4	E(80)	62.0	3	29.0	1.000	1.000	35.1<	62.0
14	19	node	Right	2466	12	0	27.4	-7.7	79.4	E(80)	62.0	3	29.0	1.000	1.000	35.0<	62.0
14	20	node	Left	2466	12	0	18.6	-7.3	17.1	E(80)	62.0	3	29.0	1.000	1.000	25.8<	62.0
14	20	node	Right	2466	12	0	18.5	-7.4	17.1	E(80)	62.0	3	29.0	1.000	1.000	25.8<	62.0
15	21	node	Left	2466	14	0	14.0	-8.3	-49.6	E(80)	62.0	3	29.0	1.300	1.000	22.3<	80.6
15	21	node	Right	2466	14	0	14.3	-8.4	-50.4	E(80)	62.0	3	29.0	1.300	1.000	22.7<	80.6
16	22	node	Left	2466	21	0	5.7	-7.4	-94.6	E(80)	62.0	3	29.0	1.300	1.000	13.1<	80.6
16	22	node	Right	2466	21	0	5.8	-7.4	-94.7	E(80)	62.0	3	29.0	1.300	1.000	13.2<	80.6
17	23	node	Left	2466	27	0	2.1	-9.6	-141.5	E(80)	62.0	3	29.0	1.300	0.981	11.7<	79.1
17	23	node	Right	2466	27	0	2.1	-9.6	-141.5	E(80)	62.0	3	29.0	1.300	0.981	11.7<	79.1
17	24	node	Left	2466	27	0	4.6	-7.2	-82.3	E(80)	62.0	3	29.0	1.300	0.981	11.8<	79.1
17	24	node	Right	2466	27	0	4.6	-7.2	-82.3	E(80)	62.0	3	29.0	1.300	0.981	11.8<	79.1
18	25	node	Left	2466	14	0	12.8	-9.1	-54.6	E(80)	62.0	3	29.0	1.300	1.000	21.9<	80.6
18	25	node	Right	2466	14	0	12.6	-9.0	-54.0	E(80)	62.0	3	29.0	1.300	1.000	21.7<	80.6
19	26	node	Left	2466	12	0	21.6	-10.2	5.0	E(80)	62.0	3	29.0	1.000	1.000	31.8<	62.0

19	26 node Right	2466	12	0	21.6	-10.3	5.1	E(80)	62.0	3	29.0	1.000	1.000	31.9< 62.0
19	27 node Left	2466	12	0	25.7	-8.9	59.9	E(80)	62.0	3	29.0	1.000	1.000	34.6< 62.0
19	27 node Right	2466	12	0	30.7	-10.6	71.7	E(80)	62.0	3	29.0	1.000	1.000	41.4< 62.0
20	28 node Left	2466	16	0	25.4	-6.6	86.5	E(80)	62.0	3	29.0	1.000	1.000	32.0< 62.0
20	28 node Right	2466	16	0	25.3	-6.6	86.6	E(80)	62.0	3	29.0	1.000	1.000	31.9< 62.0
21	29 node Left	2466	16	0	25.8	-5.3	102.4	E(80)	62.0	3	29.0	1.000	1.000	31.1< 62.0
21	29 node Right	2466	16	0	25.8	-5.3	102.4	E(80)	62.0	3	29.0	1.000	1.000	31.1< 62.0
21	30 node Left	2466	16	0	24.4	-3.8	101.3	E(80)	62.0	3	29.0	1.000	1.000	28.2< 62.0
21	30 node Right	2466	16	0	24.4	-3.8	101.3	E(80)	62.0	3	29.0	1.000	1.000	28.2< 62.0
22	31 node Left	2466	14	0	22.6	-2.7	90.7	E(80)	62.0	3	29.0	1.000	1.000	25.3< 62.0
22	31 node Right	2466	14	0	22.6	-2.7	90.7	E(80)	62.0	3	29.0	1.000	1.000	25.3< 62.0
23	32 node Left	2466	12	0	18.6	-1.6	66.4	E(80)	62.0	3	29.0	1.000	1.000	20.2< 62.0
23	32 node Right	2466	12	0	18.7	-1.6	66.3	E(80)	62.0	3	29.0	1.000	1.000	20.3< 62.0
23	33 node Left	2466	12	0	0.1	0.0	0.0	E(80)	62.0	3	29.0	1.000	1.000	0.1< 62.0

STEEL-BOX G1

node HSTIFF-2 (Web H-stiff) WEB - 2

node number	node number		Web height (mm)	t		σtmax	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Stress range Δσce・Cycle CR・Ct D
1	1	node Right	2364	12	473	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6
1	2	node Left	2367	12	473	0.8	-9.1	-34.7	G(50)	32.0	3	15.0	1.300	1.000	10.0<	41.6
1	2	node Right	2367	12	473	0.8	-9.2	-34.7	G(50)	32.0	3	15.0	1.300	1.000	10.0<	41.6
2	3	node Left	2370	12	474	1.5	-11.9	-49.6	G(50)	32.0	3	15.0	1.300	1.000	13.4<	41.6
2	3	node Right	2370	12	474	1.4	-11.9	-49.6	G(50)	32.0	3	15.0	1.300	1.000	13.3<	41.6
3	4	node Left	2374	12	475	2.2	-14.0	-60.0	G(50)	32.0	3	15.0	1.300	1.000	16.2<	41.6
3	4	node Right	2374	12	475	2.2	-14.0	-60.0	G(50)	32.0	3	15.0	1.300	1.000	16.2<	41.6
3	5	node Left	2377	12	475	3.0	-14.8	-60.8	G(50)	32.0	3	15.0	1.300	1.000	17.8<	41.6
3	5	node Right	2377	12	475	3.0	-14.8	-60.8	G(50)	32.0	3	15.0	1.300	1.000	17.8<	41.6
4	6	node Left	2382	12	476	3.7	-14.6	-51.8	G(50)	32.0	3	15.0	1.300	1.000	18.3<	41.6
4	6	node Right	2382	12	476	3.7	-14.6	-51.8	G(50)	32.0	3	15.0	1.300	1.000	18.3<	41.6
5	7	node Left	2388	12	478	4.9	-14.7	-36.4	G(50)	32.0	3	15.0	1.300	1.000	19.6<	41.6
5	7	node Right	2388	12	478	5.2	-15.1	-37.8	G(50)	32.0	3	15.0	1.300	1.000	20.2<	41.6
5	8	node Left	2394	12	479	5.9	-12.6	-4.9	G(50)	32.0	3	15.0	1.259	1.000	18.5<	40.3
5	8	node Right	2394	12	479	5.9	-12.6	-4.9	G(50)	32.0	3	15.0	1.259	1.000	18.5<	40.3
6	9	node Left	2400	14	480	8.0	-5.6	-33.2	G(50)	32.0	3	15.0	1.300	1.000	13.6<	41.6
6	9	node Right	2400	14	480	7.8	-5.6	-32.6	G(50)	32.0	3	15.0	1.300	1.000	13.4<	41.6
7	10	node Left	2406	16	481	2.8	-4.4	-51.2	G(50)	32.0	3	15.0	1.300	1.000	7.3<	41.6
7	10	node Right	2406	16	481	2.8	-4.4	-51.2	G(50)	32.0	3	15.0	1.300	1.000	7.3<	41.6
7	11	node Left	2412	16	482	1.2	-5.7	-87.5	G(50)	32.0	3	15.0	1.300	1.000	6.8<	41.6
7	11	node Right	2412	16	482	1.2	-5.7	-87.5	G(50)	32.0	3	15.0	1.300	1.000	6.8<	41.6
8	12	node Left	2418	16	484	3.7	-5.0	-59.1	G(50)	32.0	3	15.0	1.300	1.000	8.7<	41.6
8	12	node Right	2418	16	484	3.7	-5.0	-59.1	G(50)	32.0	3	15.0	1.300	1.000	8.7<	41.6
9	13	node Left	2425	14	485	8.8	-5.4	-29.6	G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6
9	13	node Right	2425	14	485	9.0	-5.4	-30.1	G(50)	32.0	3	15.0	1.300	1.000	14.4<	41.6
10	14	node Left	2433	12	487	4.4	-11.7	-11.9	G(50)	32.0	3	15.0	1.300	1.000	16.2<	41.6
10	14	node Right	2433	12	487	4.5	-11.7	-11.9	G(50)	32.0	3	15.0	1.300	1.000	16.2<	41.6
10	15	node Left	2440	12	488	3.6	-13.5	-39.8	G(50)	32.0	3	15.0	1.300	1.000	17.1<	41.6
10	15	node Right	2440	12	488	3.6	-13.5	-39.9	G(50)	32.0	3	15.0	1.300	1.000	17.1<	41.6
11	16	node Left	2447	12	489	2.7	-14.0	-53.2	G(50)	32.0	3	15.0	1.300	1.000	16.7<	41.6
11	16	node Right	2447	12	489	2.7	-14.0	-53.2	G(50)	32.0	3	15.0	1.300	1.000	16.7<	41.6
12	17	node Left	2454	12	491	2.1	-14.5	-58.7	G(50)	32.0	3	15.0	1.300	1.000	16.6<	41.6
12	17	node Right	2454	12	491	2.1	-14.5	-58.7	G(50)	32.0	3	15.0	1.300	1.000	16.6<	41.6
13	18	node Left	2462	12	492	2.9	-14.1	-53.4	G(50)	32.0	3	15.0	1.300	1.000	17.0<	41.6
13	18	node Right	2462	12	492	2.9	-14.1	-53.4	G(50)	32.0	3	15.0	1.300	1.000	17.0<	41.6
14	19	node Left	2466	12	493	3.8	-13.8	-40.0	G(50)	32.0	3	15.0	1.300	1.000	17.6<	41.6
14	19	node Right	2466	12	493	3.8	-13.8	-39.9	G(50)	32.0	3	15.0	1.300	1.000	17.6<	41.6
14	20	node Left	2466	12	493	4.8	-11.8	-11.1	G(50)	32.0	3	15.0	1.300	1.000	16.6<	41.6
14	20	node Right	2466	12	493	4.7	-11.9	-11.0	G(50)	32.0	3	15.0	1.300	1.000	16.6<	41.6
15	21	node Left	2466	14	493	8.7	-5.2	-30.8	G(50)	32.0	3	15.0	1.300	1.000	13.9<	41.6
15	21	node Right	2466	14	493	8.6	-5.1	-30.4	G(50)	32.0	3	15.0	1.300	1.000	13.7<	41.6
16	22	node Left	2466	16	493	3.5	-4.7	-59.1	G(50)	32.0	3	15.0	1.300	1.000	8.2<	41.6
16	22	node Right	2466	16	493	3.6	-4.7	-59.1	G(50)	32.0	3	15.0	1.300	1.000	8.3<	41.6
17	23	node Left	2466	16	493	1.3	-5.8	-85.4	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6
17	23	node Right	2466	16	493	1.2	-5.8	-85.4	G(50)	32.0	3	15.0	1.300	1.000	7.0<	41.6
17	24	node Left	2466	16	493	2.8	-4.3	-49.8	G(50)	32.0	3	15.0	1.300	1.000	7.2<	41.6
17	24	node Right	2466	16	493	2.8	-4.4	-49.8	G(50)	32.0	3	15.0	1.300	1.000	7.2<	41.6
18	25	node Left	2466	14	493	7.7	-5.5	-32.9	G(50)	32.0	3	15.0	1.300	1.000	13.2<	41.6
18	25	node Right	2466	14	493	7.8	-5.6	-33.4	G(50)	32.0	3	15.0	1.300	1.000	13.4<	41.6
19	26	node Left	2466	12	493	6.3	-13.3	-3.1	G(50)	32.0	3	15.0	1.183	1.000	19.7<	37.8

19	26 node Right	2466	12	493	6.3	-13.3	-3.1	G(50)	32.0	3	15.0	1.185	1.000	19.6< 37.9
19	27 node Left	2466	12	493	5.5	-15.8	-36.9	G(50)	32.0	3	15.0	1.300	1.000	21.2< 41.6
19	27 node Right	2466	12	493	5.4	-15.4	-36.1	G(50)	32.0	3	15.0	1.300	1.000	20.8< 41.6
20	28 node Left	2466	12	493	3.9	-15.0	-51.3	G(50)	32.0	3	15.0	1.300	1.000	18.9< 41.6
20	28 node Right	2466	12	493	3.9	-15.0	-51.2	G(50)	32.0	3	15.0	1.300	1.000	19.0< 41.6
21	29 node Left	2466	12	493	3.1	-15.3	-60.6	G(50)	32.0	3	15.0	1.300	1.000	18.4< 41.6
21	29 node Right	2466	12	493	3.1	-15.3	-60.6	G(50)	32.0	3	15.0	1.300	1.000	18.4< 41.6
21	30 node Left	2466	12	493	2.3	-14.4	-60.0	G(50)	32.0	3	15.0	1.300	1.000	16.8< 41.6
21	30 node Right	2466	12	493	2.3	-14.4	-60.0	G(50)	32.0	3	15.0	1.300	1.000	16.8< 41.6
22	31 node Left	2466	12	493	1.5	-12.3	-49.1	G(50)	32.0	3	15.0	1.300	1.000	13.8< 41.6
22	31 node Right	2466	12	493	1.4	-12.3	-49.1	G(50)	32.0	3	15.0	1.300	1.000	13.7< 41.6
23	32 node Left	2466	12	493	0.8	-9.8	-35.0	G(50)	32.0	3	15.0	1.300	1.000	10.7< 41.6
23	32 node Right	2466	12	493	0.8	-9.9	-35.0	G(50)	32.0	3	15.0	1.300	1.000	10.7< 41.6
23	33 node Left	2466	12	493	0.0	-0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0< 41.6

STEEL-BOX G1

node POINT-U-2 (Web Upper) WEB - 2

range node number	node number		Web height (mm)	t	Grade	σtmax (N/mm2)	σtmin	σd	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Stress Δσce・CR・Ct Cycle D
1	1	node Right	2364	12	900	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6
1	2	node Left	2367	12	900	0.2	-2.7	-10.1	G(50)	32.0	3	15.0	1.300	1.000	2.9<	41.6
1	2	node Right	2367	12	900	0.2	-2.7	-10.1	G(50)	32.0	3	15.0	1.300	1.000	3.0<	41.6
2	3	node Left	2370	12	900	0.6	-4.6	-19.2	G(50)	32.0	3	15.0	1.300	1.000	5.2<	41.6
2	3	node Right	2370	12	900	0.5	-4.6	-19.2	G(50)	32.0	3	15.0	1.300	1.000	5.2<	41.6
3	4	node Left	2374	12	900	0.8	-5.5	-23.5	G(50)	32.0	3	15.0	1.300	1.000	6.3<	41.6
3	4	node Right	2374	12	900	0.8	-5.5	-23.5	G(50)	32.0	3	15.0	1.300	1.000	6.3<	41.6
3	5	node Left	2377	12	900	1.2	-5.9	-24.0	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6
3	5	node Right	2377	12	900	1.2	-5.9	-24.0	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6
4	6	node Left	2382	12	900	1.5	-5.8	-20.7	G(50)	32.0	3	15.0	1.300	1.000	7.3<	41.6
4	6	node Right	2382	12	900	1.5	-5.8	-20.7	G(50)	32.0	3	15.0	1.300	1.000	7.3<	41.6
5	7	node Left	2388	12	900	1.5	-4.3	-10.7	G(50)	32.0	3	15.0	1.300	1.000	5.8<	41.6
5	7	node Right	2388	12	900	2.0	-5.8	-14.7	G(50)	32.0	3	15.0	1.300	1.000	7.8<	41.6
5	8	node Left	2394	12	900	2.3	-5.0	-1.9	G(50)	32.0	3	15.0	1.260	1.000	7.3<	40.3
5	8	node Right	2394	12	900	2.3	-5.0	-1.9	G(50)	32.0	3	15.0	1.260	1.000	7.3<	40.3
6	9	node Left	2400	14	900	1.7	-2.4	10.0	G(50)	32.0	3	15.0	1.000	1.000	4.2<	32.0
6	9	node Right	2400	14	900	2.3	-3.2	13.3	G(50)	32.0	3	15.0	1.000	1.000	5.5<	32.0
7	10	node Left	2406	16	900	1.8	-1.1	20.4	G(50)	32.0	3	15.0	1.000	1.000	2.9<	32.0
7	10	node Right	2406	16	900	1.8	-1.1	20.4	G(50)	32.0	3	15.0	1.000	1.000	2.9<	32.0
7	11	node Left	2412	16	900	2.3	-0.4	36.0	G(50)	32.0	3	15.0	1.000	1.000	2.8<	32.0
7	11	node Right	2412	16	900	2.3	-0.4	36.0	G(50)	32.0	3	15.0	1.000	1.000	2.8<	32.0
8	12	node Left	2418	16	900	1.4	-1.1	16.8	G(50)	32.0	3	15.0	1.000	1.000	2.4<	32.0
8	12	node Right	2418	16	900	1.4	-1.1	16.8	G(50)	32.0	3	15.0	1.000	1.000	2.4<	32.0
9	13	node Left	2425	14	900	2.2	-3.6	12.2	G(50)	32.0	3	15.0	1.000	1.000	5.8<	32.0
9	13	node Right	2425	14	900	1.6	-2.7	9.0	G(50)	32.0	3	15.0	1.000	1.000	4.3<	32.0
10	14	node Left	2433	12	900	2.0	-5.2	-5.3	G(50)	32.0	3	15.0	1.300	1.000	7.2<	41.6
10	14	node Right	2433	12	900	2.0	-5.2	-5.3	G(50)	32.0	3	15.0	1.300	1.000	7.2<	41.6
10	15	node Left	2440	12	900	1.2	-4.8	-14.1	G(50)	32.0	3	15.0	1.300	1.000	6.1<	41.6
10	15	node Right	2440	12	900	1.3	-4.8	-14.2	G(50)	32.0	3	15.0	1.300	1.000	6.1<	41.6
11	16	node Left	2447	12	900	1.1	-5.9	-22.5	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6
11	16	node Right	2447	12	900	1.1	-5.9	-22.5	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6
12	17	node Left	2454	12	900	0.9	-6.2	-25.2	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6
12	17	node Right	2454	12	900	0.9	-6.2	-25.2	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6
13	18	node Left	2462	12	900	1.3	-6.1	-23.3	G(50)	32.0	3	15.0	1.300	1.000	7.4<	41.6
13	18	node Right	2462	12	900	1.3	-6.1	-23.3	G(50)	32.0	3	15.0	1.300	1.000	7.4<	41.6
14	19	node Left	2466	12	900	1.5	-5.3	-15.3	G(50)	32.0	3	15.0	1.300	1.000	6.7<	41.6
14	19	node Right	2466	12	900	1.5	-5.3	-15.3	G(50)	32.0	3	15.0	1.300	1.000	6.8<	41.6
14	20	node Left	2466	12	900	2.3	-5.6	-5.3	G(50)	32.0	3	15.0	1.300	1.000	7.8<	41.6
14	20	node Right	2466	12	900	2.2	-5.7	-5.2	G(50)	32.0	3	15.0	1.300	1.000	7.8<	41.6
15	21	node Left	2466	14	900	1.7	-2.9	10.1	G(50)	32.0	3	15.0	1.000	1.000	4.6<	32.0
15	21	node Right	2466	14	900	2.2	-3.7	13.2	G(50)	32.0	3	15.0	1.000	1.000	5.9<	32.0
16	22	node Left	2466	16	900	1.4	-1.1	18.2	G(50)	32.0	3	15.0	1.000	1.000	2.5<	32.0
16	22	node Right	2466	16	900	1.4	-1.1	18.2	G(50)	32.0	3	15.0	1.000	1.000	2.5<	32.0
17	23	node Left	2466	16	900	2.5	-0.5	36.5	G(50)	32.0	3	15.0	1.000	1.000	3.0<	32.0
17	23	node Right	2466	16	900	2.5	-0.6	36.5	G(50)	32.0	3	15.0	1.000	1.000	3.1<	32.0
17	24	node Left	2466	16	900	1.9	-1.2	21.0	G(50)	32.0	3	15.0	1.000	1.000	3.0<	32.0
17	24	node Right	2466	16	900	1.8	-1.2	21.0	G(50)	32.0	3	15.0	1.000	1.000	3.0<	32.0
18	25	node Left	2466	14	900	2.4	-3.4	14.4	G(50)	32.0	3	15.0	1.000	1.000	5.8<	32.0
18	25	node Right	2466	14	900	1.9	-2.7	11.3	G(50)	32.0	3	15.0	1.000	1.000	4.5<	32.0
19	26	node Left	2466	12	900	2.9	-6.1	-1.4	G(50)	32.0	3	15.0	1.182	1.000	9.1<	37.8

19	26 node Right	2466	12	900	2.9	-6.1	-1.4	G(50)	32.0	3	15.0	1.185	1.000	9.0<	37.9
19	27 node Left	2466	12	900	2.5	-7.2	-16.9	G(50)	32.0	3	15.0	1.300	1.000	9.7<	41.6
19	27 node Right	2466	12	900	2.1	-5.9	-13.9	G(50)	32.0	3	15.0	1.300	1.000	8.0<	41.6
20	28 node Left	2466	12	900	1.7	-6.7	-22.9	G(50)	32.0	3	15.0	1.300	1.000	8.4<	41.6
20	28 node Right	2466	12	900	1.7	-6.7	-22.8	G(50)	32.0	3	15.0	1.300	1.000	8.5<	41.6
21	29 node Left	2466	12	900	1.4	-6.8	-27.0	G(50)	32.0	3	15.0	1.300	1.000	8.2<	41.6
21	29 node Right	2466	12	900	1.4	-6.8	-27.0	G(50)	32.0	3	15.0	1.300	1.000	8.2<	41.6
21	30 node Left	2466	12	900	1.0	-6.4	-26.7	G(50)	32.0	3	15.0	1.300	1.000	7.5<	41.6
21	30 node Right	2466	12	900	1.0	-6.4	-26.7	G(50)	32.0	3	15.0	1.300	1.000	7.5<	41.6
22	31 node Left	2466	12	900	0.6	-5.1	-20.3	G(50)	32.0	3	15.0	1.300	1.000	5.7<	41.6
22	31 node Right	2466	12	900	0.6	-5.1	-20.2	G(50)	32.0	3	15.0	1.300	1.000	5.7<	41.6
23	32 node Left	2466	12	900	0.3	-4.0	-14.1	G(50)	32.0	3	15.0	1.300	1.000	4.3<	41.6
23	32 node Right	2466	12	900	0.3	-4.0	-14.1	G(50)	32.0	3	15.0	1.300	1.000	4.3<	41.6
23	33 node Left	2466	12	900	0.0	-0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6

STEEL-BOX G1

node POINT-L-2 (Web) WEB - 2

node number	node number		Web height (mm)	t	Grade	σtmax (N/mm2)	σtmin	σd	(Δσf)	Δσce	m	Δσve	CR	Ct	Stress range Δσmax (N/mm2)	Δσce・CR・Ct	Cycle D
1	1	node Right	2364	12	500	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	node Left	2367	12	500	12.0	-1.1	45.5	G(50)	32.0	3	15.0	1.000	1.000	13.1<	32.0	
1	2	node Right	2367	12	500	12.0	-1.1	45.5	G(50)	32.0	3	15.0	1.000	1.000	13.1<	32.0	
2	3	node Left	2370	12	500	11.9	-1.4	50.0	G(50)	32.0	3	15.0	1.000	1.000	13.4<	32.0	
2	3	node Right	2370	12	500	11.9	-1.5	50.0	G(50)	32.0	3	15.0	1.000	1.000	13.4<	32.0	
3	4	node Left	2374	12	500	14.0	-2.3	60.2	G(50)	32.0	3	15.0	1.000	1.000	16.2<	32.0	
3	4	node Right	2374	12	500	14.1	-2.3	60.2	G(50)	32.0	3	15.0	1.000	1.000	16.3<	32.0	
3	5	node Left	2377	12	500	14.8	-3.0	60.7	G(50)	32.0	3	15.0	1.000	1.000	17.8<	32.0	
3	5	node Right	2377	12	500	14.8	-3.0	60.7	G(50)	32.0	3	15.0	1.000	1.000	17.8<	32.0	
4	6	node Left	2382	12	500	14.5	-3.7	51.4	G(50)	32.0	3	15.0	1.000	1.000	18.2<	32.0	
4	6	node Right	2382	12	500	14.5	-3.7	51.4	G(50)	32.0	3	15.0	1.000	1.000	18.2<	32.0	
5	7	node Left	2388	12	500	19.8	-6.7	49.4	G(50)	32.0	3	15.0	1.000	1.000	26.5<	32.0	
5	7	node Right	2388	12	500	15.8	-5.3	39.4	G(50)	32.0	3	15.0	1.000	1.000	21.2<	32.0	
5	8	node Left	2394	12	500	13.1	-6.1	5.1	G(50)	32.0	3	15.0	1.000	1.000	19.2<	32.0	
5	8	node Right	2394	12	500	13.1	-6.1	5.1	G(50)	32.0	3	15.0	1.000	1.000	19.2<	32.0	
6	9	node Left	2400	14	500	7.8	-5.5	-32.4	G(50)	32.0	3	15.0	1.300	1.000	13.3<	41.6	
6	9	node Right	2400	14	500	7.6	-5.4	-31.7	G(50)	32.0	3	15.0	1.300	1.000	13.0<	41.6	
7	10	node Left	2406	16	500	2.8	-4.3	-49.9	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6	
7	10	node Right	2406	16	500	2.8	-4.3	-49.9	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6	
7	11	node Left	2412	16	500	1.1	-5.5	-85.4	G(50)	32.0	3	15.0	1.300	1.000	6.7<	41.6	
7	11	node Right	2412	16	500	1.1	-5.5	-85.4	G(50)	32.0	3	15.0	1.300	1.000	6.7<	41.6	
8	12	node Left	2418	16	500	3.6	-4.9	-57.9	G(50)	32.0	3	15.0	1.300	1.000	8.5<	41.6	
8	12	node Right	2418	16	500	3.6	-4.9	-57.9	G(50)	32.0	3	15.0	1.300	1.000	8.5<	41.6	
9	13	node Left	2425	14	500	8.7	-5.3	-29.0	G(50)	32.0	3	15.0	1.300	1.000	13.9<	41.6	
9	13	node Right	2425	14	500	8.9	-5.3	-29.6	G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6	
10	14	node Left	2433	12	500	11.0	-4.2	11.1	G(50)	32.0	3	15.0	1.000	1.000	15.2<	32.0	
10	14	node Right	2433	12	500	11.0	-4.1	11.1	G(50)	32.0	3	15.0	1.000	1.000	15.1<	32.0	
10	15	node Left	2440	12	500	17.1	-4.6	50.6	G(50)	32.0	3	15.0	1.000	1.000	21.7<	32.0	
10	15	node Right	2440	12	500	17.1	-4.6	50.6	G(50)	32.0	3	15.0	1.000	1.000	21.7<	32.0	
11	16	node Left	2447	12	500	14.7	-2.8	55.8	G(50)	32.0	3	15.0	1.000	1.000	17.5<	32.0	
11	16	node Right	2447	12	500	14.7	-2.8	55.8	G(50)	32.0	3	15.0	1.000	1.000	17.5<	32.0	
12	17	node Left	2454	12	500	15.1	-2.2	61.0	G(50)	32.0	3	15.0	1.000	1.000	17.3<	32.0	
12	17	node Right	2454	12	500	15.1	-2.2	61.0	G(50)	32.0	3	15.0	1.000	1.000	17.3<	32.0	
13	18	node Left	2462	12	500	14.6	-3.0	55.2	G(50)	32.0	3	15.0	1.000	1.000	17.5<	32.0	
13	18	node Right	2462	12	500	14.6	-3.0	55.2	G(50)	32.0	3	15.0	1.000	1.000	17.5<	32.0	
14	19	node Left	2466	12	500	17.0	-4.8	49.1	G(50)	32.0	3	15.0	1.000	1.000	21.8<	32.0	
14	19	node Right	2466	12	500	16.9	-4.8	49.2	G(50)	32.0	3	15.0	1.000	1.000	21.7<	32.0	
14	20	node Left	2466	12	500	10.9	-4.2	10.0	G(50)	32.0	3	15.0	1.000	1.000	15.1<	32.0	
14	20	node Right	2466	12	500	10.8	-4.3	10.0	G(50)	32.0	3	15.0	1.000	1.000	15.1<	32.0	
15	21	node Left	2466	14	500	8.6	-5.1	-30.5	G(50)	32.0	3	15.0	1.300	1.000	13.7<	41.6	
15	21	node Right	2466	14	500	8.6	-5.0	-30.1	G(50)	32.0	3	15.0	1.300	1.000	13.6<	41.6	
16	22	node Left	2466	16	500	3.5	-4.6	-58.6	G(50)	32.0	3	15.0	1.300	1.000	8.1<	41.6	
16	22	node Right	2466	16	500	3.6	-4.6	-58.6	G(50)	32.0	3	15.0	1.300	1.000	8.2<	41.6	
17	23	node Left	2466	16	500	1.3	-5.7	-84.7	G(50)	32.0	3	15.0	1.300	1.000	7.0<	41.6	
17	23	node Right	2466	16	500	1.2	-5.7	-84.7	G(50)	32.0	3	15.0	1.300	1.000	7.0<	41.6	
17	24	node Left	2466	16	500	2.8	-4.3	-49.3	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6	
17	24	node Right	2466	16	500	2.8	-4.3	-49.3	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6	
18	25	node Left	2466	14	500	7.6	-5.4	-32.6	G(50)	32.0	3	15.0	1.300	1.000	13.1<	41.6	
18	25	node Right	2466	14	500	7.8	-5.6	-33.1	G(50)	32.0	3	15.0	1.300	1.000	13.3<	41.6	
19	26	node Left	2466	12	500	12.7	-6.0	3.0	G(50)	32.0	3	15.0	1.000	1.000	18.8<	32.0	

19	26 node Right	2466	12	500	12.8	-6.1	3.0	G(50)	32.0	3	15.0	1.000	1.000	18.9< 32.0
19	27 node Left	2466	12	500	15.2	-5.2	35.4	G(50)	32.0	3	15.0	1.000	1.000	20.4< 32.0
19	27 node Right	2466	12	500	19.0	-6.6	44.4	G(50)	32.0	3	15.0	1.000	1.000	25.6< 32.0
20	28 node Left	2466	12	500	15.1	-4.0	51.6	G(50)	32.0	3	15.0	1.000	1.000	19.1< 32.0
20	28 node Right	2466	12	500	15.1	-4.0	51.7	G(50)	32.0	3	15.0	1.000	1.000	19.0< 32.0
21	29 node Left	2466	12	500	15.4	-3.2	61.1	G(50)	32.0	3	15.0	1.000	1.000	18.6< 32.0
21	29 node Right	2466	12	500	15.4	-3.2	61.1	G(50)	32.0	3	15.0	1.000	1.000	18.6< 32.0
21	30 node Left	2466	12	500	14.6	-2.3	60.4	G(50)	32.0	3	15.0	1.000	1.000	16.8< 32.0
21	30 node Right	2466	12	500	14.6	-2.3	60.4	G(50)	32.0	3	15.0	1.000	1.000	16.8< 32.0
22	31 node Left	2466	12	500	13.7	-1.6	55.3	G(50)	32.0	3	15.0	1.000	1.000	15.4< 32.0
22	31 node Right	2466	12	500	13.7	-1.7	55.3	G(50)	32.0	3	15.0	1.000	1.000	15.4< 32.0
23	32 node Left	2466	12	500	11.4	-1.0	40.7	G(50)	32.0	3	15.0	1.000	1.000	12.4< 32.0
23	32 node Right	2466	12	500	11.5	-1.0	40.6	G(50)	32.0	3	15.0	1.000	1.000	12.5< 32.0
23	33 node Left	2466	12	500	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.000	1.000	0.0< 32.0

1. G2

STEEL-BOX G2

node U.FLG-MAX (UpperFlange)

node number	node number	Flange	t (mm)	σtmax (N/mm2)	σtmin	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Stress range Δσmax (N/mm2)		Δσce・Cycle CR・Ct D (N/mm2)
1	1 node	Right	10	0.0	0.0	0.0	F	(65)	46.0	3	21.0	1.300	1.000	0.0	<	59.8
1	2 node	Left	10	1.6	-17.1	-63.1	F	(65)	46.0	3	21.0	1.300	1.000	18.7	<	59.8
1	2 node	Right	10	1.6	-17.1	-63.1	F	(65)	46.0	3	21.0	1.300	1.000	18.7	<	59.8
2	3 node	Left	14	2.6	-21.0	-86.3	F	(65)	46.0	3	21.0	1.300	1.000	23.6	<	59.8
2	3 node	Right	14	2.6	-21.0	-86.3	F	(65)	46.0	3	21.0	1.300	1.000	23.5	<	59.8
3	4 node	Left	14	3.8	-24.5	-103.9	F	(65)	46.0	3	21.0	1.300	1.000	28.3	<	59.8
3	4 node	Right	14	3.8	-24.5	-103.9	F	(65)	46.0	3	21.0	1.300	1.000	28.3	<	59.8
3	5 node	Left	14	5.0	-25.8	-104.4	F	(65)	46.0	3	21.0	1.300	1.000	30.8	<	59.8
3	5 node	Right	14	5.0	-25.8	-104.4	F	(65)	46.0	3	21.0	1.300	1.000	30.8	<	59.8
4	6 node	Left	14	6.3	-25.0	-88.1	F	(65)	46.0	3	21.0	1.300	1.000	31.4	<	59.8
4	6 node	Right	14	6.3	-25.0	-88.1	F	(65)	46.0	3	21.0	1.300	1.000	31.4	<	59.8
5	7 node	Left	11	9.0	-26.7	-64.6	F	(65)	46.0	3	21.0	1.300	1.000	35.7	<	59.8
5	7 node	Right	11	8.7	-25.9	-62.8	F	(65)	46.0	3	21.0	1.300	1.000	34.6	<	59.8
5	8 node	Left	11	10.2	-21.8	-5.5	F	(65)	46.0	3	21.0	1.194	1.000	32.0	<	54.9
5	8 node	Right	11	10.2	-21.8	-5.5	F	(65)	46.0	3	21.0	1.194	1.000	32.0	<	54.9
6	9 node	Left	20	8.5	-11.2	49.4	F	(65)	46.0	3	21.0	1.000	1.000	19.7	<	46.0
6	9 node	Right	20	9.4	-12.4	54.7	F	(65)	46.0	3	21.0	1.000	1.000	21.8	<	46.0
7	10 node	Left	36	7.5	-4.5	82.0	F	(65)	46.0	3	21.0	1.000	0.913	12.0	<	42.0
7	10 node	Right	36	7.5	-4.5	82.0	F	(65)	46.0	3	21.0	1.000	0.913	12.0	<	42.0
7	11 node	Left	36	10.1	-2.2	141.4	F	(65)	46.0	3	21.0	1.000	0.913	12.3	<	42.0
7	11 node	Right	36	10.1	-2.2	141.4	F	(65)	46.0	3	21.0	1.000	0.913	12.3	<	42.0
8	12 node	Left	34	6.7	-5.0	86.0	F	(65)	46.0	3	21.0	1.000	0.926	11.8	<	42.6
8	12 node	Right	34	6.7	-5.0	86.0	F	(65)	46.0	3	21.0	1.000	0.926	11.8	<	42.6
9	13 node	Left	17	8.6	-13.9	50.9	F	(65)	46.0	3	21.0	1.000	1.000	22.6	<	46.0
9	13 node	Right	17	7.8	-12.4	45.4	F	(65)	46.0	3	21.0	1.000	1.000	20.2	<	46.0
10	14 node	Left	11	7.8	-19.7	-20.0	F	(65)	46.0	3	21.0	1.300	1.000	27.4	<	59.8
10	14 node	Right	11	7.8	-19.8	-20.0	F	(65)	46.0	3	21.0	1.300	1.000	27.5	<	59.8
10	15 node	Left	11	6.9	-24.7	-75.3	F	(65)	46.0	3	21.0	1.300	1.000	31.6	<	59.8
10	15 node	Right	11	6.8	-24.7	-75.3	F	(65)	46.0	3	21.0	1.300	1.000	31.5	<	59.8
11	16 node	Left	14	4.8	-24.0	-94.1	F	(65)	46.0	3	21.0	1.300	1.000	28.8	<	59.8
11	16 node	Right	14	4.8	-24.1	-94.1	F	(65)	46.0	3	21.0	1.300	1.000	28.9	<	59.8
12	17 node	Left	14	3.8	-25.0	-104.2	F	(65)	46.0	3	21.0	1.300	1.000	28.7	<	59.8
12	17 node	Right	14	3.8	-25.0	-104.2	F	(65)	46.0	3	21.0	1.300	1.000	28.7	<	59.8
13	18 node	Left	14	5.0	-24.3	-94.8	F	(65)	46.0	3	21.0	1.300	1.000	29.3	<	59.8
13	18 node	Right	14	5.0	-24.2	-94.8	F	(65)	46.0	3	21.0	1.300	1.000	29.3	<	59.8
14	19 node	Left	12	6.9	-24.5	-73.1	F	(65)	46.0	3	21.0	1.300	1.000	31.4	<	59.8
14	19 node	Right	12	7.0	-24.5	-73.1	F	(65)	46.0	3	21.0	1.300	1.000	31.4	<	59.8
14	20 node	Left	12	8.1	-19.7	-17.2	F	(65)	46.0	3	21.0	1.300	1.000	27.8	<	59.8
14	20 node	Right	12	8.0	-19.7	-17.1	F	(65)	46.0	3	21.0	1.300	1.000	27.7	<	59.8
15	21 node	Left	18	8.3	-12.6	49.9	F	(65)	46.0	3	21.0	1.000	1.000	21.0	<	46.0
15	21 node	Right	18	9.3	-14.0	55.5	F	(65)	46.0	3	21.0	1.000	1.000	23.3	<	46.0
16	22 node	Left	36	7.3	-5.0	89.4	F	(65)	46.0	3	21.0	1.000	0.913	12.3	<	42.0
16	22 node	Right	36	7.3	-5.0	89.4	F	(65)	46.0	3	21.0	1.000	0.913	12.3	<	42.0
17	23 node	Left	39	9.7	-1.9	142.4	F	(65)	46.0	3	21.0	1.000	0.895	11.6	<	41.2
17	23 node	Right	39	9.8	-1.9	143.2	F	(65)	46.0	3	21.0	1.000	0.895	11.7	<	41.2
17	24 node	Left	39	7.6	-4.5	85.7	F	(65)	46.0	3	21.0	1.000	0.895	12.1	<	41.2

17	24 node Right	39	7.6	-4.5	85.7	F	(65)	46.0	3	21.0	1.000	0.895	12.1 < 41.2
18	25 node Left	22	9.7	-12.2	59.4	F	(65)	46.0	3	21.0	1.000	1.000	21.9 < 46.0
18	25 node Right	22	8.9	-11.2	54.0	F	(65)	46.0	3	21.0	1.000	1.000	20.1 < 46.0
19	26 node Left	11	11.5	-23.1	-2.0	F	(65)	46.0	3	21.0	1.116	1.000	34.6 < 51.3
19	26 node Right	11	11.6	-23.1	-2.1	F	(65)	46.0	3	21.0	1.117	1.000	34.7 < 51.4
19	27 node Left	11	9.8	-27.9	-66.1	F	(65)	46.0	3	21.0	1.300	1.000	37.8 < 59.8
19	27 node Right	11	10.2	-28.9	-68.3	F	(65)	46.0	3	21.0	1.300	1.000	39.0 < 59.8
20	28 node Left	15	6.9	-25.9	-90.9	F	(65)	46.0	3	21.0	1.300	1.000	32.8 < 59.8
20	28 node Right	15	6.9	-25.9	-90.9	F	(65)	46.0	3	21.0	1.300	1.000	32.8 < 59.8
21	29 node Left	15	5.6	-26.7	-108.8	F	(65)	46.0	3	21.0	1.300	1.000	32.3 < 59.8
21	29 node Right	15	5.6	-26.7	-108.8	F	(65)	46.0	3	21.0	1.300	1.000	32.3 < 59.8
21	30 node Left	15	4.2	-25.5	-108.9	F	(65)	46.0	3	21.0	1.300	1.000	29.8 < 59.8
21	30 node Right	15	4.2	-25.4	-108.9	F	(65)	46.0	3	21.0	1.300	1.000	29.7 < 59.8
22	31 node Left	15	3.0	-21.7	-91.2	F	(65)	46.0	3	21.0	1.300	1.000	24.6 < 59.8
22	31 node Right	15	2.9	-21.7	-91.1	F	(65)	46.0	3	21.0	1.300	1.000	24.6 < 59.8
23	32 node Left	11	1.8	-17.7	-68.1	F	(65)	46.0	3	21.0	1.300	1.000	19.5 < 59.8
23	32 node Right	11	1.9	-17.6	-68.1	F	(65)	46.0	3	21.0	1.300	1.000	19.5 < 59.8
23	33 node Left	11	0.0	-0.1	0.0	F	(65)	46.0	3	21.0	1.300	1.000	0.1 < 59.8

STEEL-BOX G2

node L.FLG-MAX (Lower Flange)

node number	node number	Flange	t (mm)	σtmax (N/mm2)	σtmin	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)		Stress range Δσce・CR・Ct (N/mm2) Cycle D
1	1	node Right	10	0.0	0.0	0.0	F	(65)	46.0	3	21.0	1.300	1.000	0.0	<	59.8
1	2	node Left	10	19.4	-1.8	71.3	F	(65)	46.0	3	21.0	1.000	1.000	21.2	<	46.0
1	2	node Right	10	19.3	-1.8	71.3	F	(65)	46.0	3	21.0	1.000	1.000	21.1	<	46.0
2	3	node Left	16	21.8	-2.7	89.7	F	(65)	46.0	3	21.0	1.000	1.000	24.5	<	46.0
2	3	node Right	16	21.8	-2.7	89.7	F	(65)	46.0	3	21.0	1.000	1.000	24.5	<	46.0
3	4	node Left	16	25.5	-4.0	108.5	F	(65)	46.0	3	21.0	1.000	1.000	29.5	<	46.0
3	4	node Right	16	25.5	-4.0	108.5	F	(65)	46.0	3	21.0	1.000	1.000	29.5	<	46.0
3	5	node Left	16	27.0	-5.3	109.3	F	(65)	46.0	3	21.0	1.000	1.000	32.2	<	46.0
3	5	node Right	16	27.0	-5.3	109.3	F	(65)	46.0	3	21.0	1.000	1.000	32.2	<	46.0
4	6	node Left	16	26.3	-6.6	92.6	F	(65)	46.0	3	21.0	1.000	1.000	33.0	<	46.0
4	6	node Right	16	26.3	-6.6	92.6	F	(65)	46.0	3	21.0	1.000	1.000	33.0	<	46.0
5	7	node Left	10	31.7	-10.6	76.8	F	(65)	46.0	3	21.0	1.000	1.000	42.3	<	46.0
5	7	node Right	10	26.5	-8.9	64.2	F	(65)	46.0	3	21.0	1.000	1.000	35.4	<	46.0
5	8	node Left	10	22.3	-10.6	5.7	F	(65)	46.0	3	21.0	1.000	1.000	32.9	<	46.0
5	8	node Right	10	22.3	-10.6	5.7	F	(65)	46.0	3	21.0	1.000	1.000	32.9	<	46.0
6	9	node Left	15	12.6	-9.6	-55.8	F	(65)	46.0	3	21.0	1.300	1.000	22.2	<	59.8
6	9	node Right	15	12.7	-9.8	-56.4	F	(65)	46.0	3	21.0	1.300	1.000	22.5	<	59.8
7	10	node Left	29	4.6	-7.8	-84.8	F	(65)	46.0	3	21.0	1.300	0.964	12.4	<	57.6
7	10	node Right	29	4.6	-7.8	-84.8	F	(65)	46.0	3	21.0	1.300	0.964	12.4	<	57.6
7	11	node Left	29	2.3	-10.2	-144.4	F	(65)	46.0	3	21.0	1.300	0.964	12.6	<	57.6
7	11	node Right	29	2.3	-10.2	-144.4	F	(65)	46.0	3	21.0	1.300	0.964	12.6	<	57.6
8	12	node Left	22	5.8	-7.8	-98.8	F	(65)	46.0	3	21.0	1.300	1.000	13.5	<	59.8
8	12	node Right	22	5.8	-7.8	-98.8	F	(65)	46.0	3	21.0	1.300	1.000	13.5	<	59.8
9	13	node Left	12	14.1	-8.8	-51.6	F	(65)	46.0	3	21.0	1.300	1.000	22.9	<	59.8
9	13	node Right	12	13.9	-8.6	-50.9	F	(65)	46.0	3	21.0	1.300	1.000	22.6	<	59.8
10	14	node Left	12	18.6	-7.4	19.0	F	(65)	46.0	3	21.0	1.000	1.000	26.0	<	46.0
10	14	node Right	12	18.6	-7.4	19.0	F	(65)	46.0	3	21.0	1.000	1.000	26.0	<	46.0
10	15	node Left	12	27.8	-7.7	84.6	F	(65)	46.0	3	21.0	1.000	1.000	35.4	<	46.0
10	15	node Right	12	27.8	-7.7	84.6	F	(65)	46.0	3	21.0	1.000	1.000	35.5	<	46.0
11	16	node Left	18	24.2	-4.9	95.0	F	(65)	46.0	3	21.0	1.000	1.000	29.1	<	46.0
11	16	node Right	18	24.2	-4.8	95.0	F	(65)	46.0	3	21.0	1.000	1.000	29.0	<	46.0
12	17	node Left	18	25.1	-3.8	104.6	F	(65)	46.0	3	21.0	1.000	1.000	29.0	<	46.0
12	17	node Right	18	25.1	-3.8	104.6	F	(65)	46.0	3	21.0	1.000	1.000	29.0	<	46.0
13	18	node Left	18	24.2	-5.0	94.7	F	(65)	46.0	3	21.0	1.000	1.000	29.3	<	46.0
13	18	node Right	18	24.2	-5.0	94.7	F	(65)	46.0	3	21.0	1.000	1.000	29.3	<	46.0
14	19	node Left	12	27.8	-7.8	82.7	F	(65)	46.0	3	21.0	1.000	1.000	35.6	<	46.0
14	19	node Right	12	27.7	-7.8	82.7	F	(65)	46.0	3	21.0	1.000	1.000	35.5	<	46.0
14	20	node Left	12	18.7	-7.6	16.3	F	(65)	46.0	3	21.0	1.000	1.000	26.3	<	46.0
14	20	node Right	12	18.6	-7.7	16.3	F	(65)	46.0	3	21.0	1.000	1.000	26.3	<	46.0
15	21	node Left	12	14.0	-9.2	-55.2	F	(65)	46.0	3	21.0	1.300	1.000	23.2	<	59.8
15	21	node Right	12	14.2	-9.3	-56.0	F	(65)	46.0	3	21.0	1.300	1.000	23.4	<	59.8
16	22	node Left	24	5.6	-7.9	-98.1	F	(65)	46.0	3	21.0	1.300	1.000	13.5	<	59.8
16	22	node Right	24	5.5	-7.9	-98.1	F	(65)	46.0	3	21.0	1.300	1.000	13.4	<	59.8
17	23	node Left	31	2.0	-9.6	-142.4	F	(65)	46.0	3	21.0	1.300	0.948	11.6	<	56.7
17	23	node Right	31	1.9	-9.7	-142.3	F	(65)	46.0	3	21.0	1.300	0.948	11.6	<	56.7
17	24	node Left	31	4.5	-7.5	-85.5	F	(65)	46.0	3	21.0	1.300	0.948	12.0	<	56.7
17	24	node Right	31	4.5	-7.6	-85.4	F	(65)	46.0	3	21.0	1.300	0.948	12.1	<	56.7
18	25	node Left	16	12.3	-9.7	-59.6	F	(65)	46.0	3	21.0	1.300	1.000	22.0	<	59.8
18	25	node Right	16	12.2	-9.6	-59.0	F	(65)	46.0	3	21.0	1.300	1.000	21.8	<	59.8

19	26	node Left	10	22.7	-11.4	2.0	F	(65)	46.0	3	21.0	1.000	1.000	34.1 <	46.0
19	26	node Right	10	22.8	-11.3	2.0	F	(65)	46.0	3	21.0	1.000	1.000	34.1 <	46.0
19	27	node Left	10	27.4	-9.7	64.9	F	(65)	46.0	3	21.0	1.000	1.000	37.0 <	46.0
19	27	node Right	10	32.7	-11.5	77.6	F	(65)	46.0	3	21.0	1.000	1.000	44.2 <	46.0
20	28	node Left	18	25.5	-6.7	89.2	F	(65)	46.0	3	21.0	1.000	1.000	32.2 <	46.0
20	28	node Right	18	25.5	-6.7	89.2	F	(65)	46.0	3	21.0	1.000	1.000	32.2 <	46.0
21	29	node Left	18	26.2	-5.4	106.8	F	(65)	46.0	3	21.0	1.000	1.000	31.7 <	46.0
21	29	node Right	18	26.2	-5.4	106.8	F	(65)	46.0	3	21.0	1.000	1.000	31.7 <	46.0
21	30	node Left	18	25.0	-4.2	106.9	F	(65)	46.0	3	21.0	1.000	1.000	29.2 <	46.0
21	30	node Right	18	25.0	-4.2	106.9	F	(65)	46.0	3	21.0	1.000	1.000	29.2 <	46.0
22	31	node Left	18	21.4	-2.9	89.5	F	(65)	46.0	3	21.0	1.000	1.000	24.2 <	46.0
22	31	node Right	18	21.3	-2.9	89.5	F	(65)	46.0	3	21.0	1.000	1.000	24.2 <	46.0
23	32	node Left	10	20.1	-2.2	77.4	F	(65)	46.0	3	21.0	1.000	1.000	22.2 <	46.0
23	32	node Right	10	20.1	-2.1	77.3	F	(65)	46.0	3	21.0	1.000	1.000	22.2 <	46.0
23	33	node Left	10	0.1	0.0	0.0	F	(65)	46.0	3	21.0	1.000	1.000	0.1 <	46.0

STEEL-BOX G2

node WEB-U-1 (Web Upper edge) WEB - 1

node number	node number	Web height (mm)	t	σ	tmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Stress range Δσce・Cycle CR・Ct D
1	1 node Right	2436	12	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6
1	2 node Left	2433	12	0	1.5	-17.0	-62.3	E(80)	62.0	3	29.0	1.300	1.000	18.5<	80.6
1	2 node Right	2433	12	0	1.5	-17.0	-62.3	E(80)	62.0	3	29.0	1.300	1.000	18.5<	80.6
2	3 node Left	2430	14	0	2.6	-20.6	-85.1	E(80)	62.0	3	29.0	1.300	1.000	23.2<	80.6
2	3 node Right	2430	14	0	2.6	-20.6	-85.1	E(80)	62.0	3	29.0	1.300	1.000	23.2<	80.6
3	4 node Left	2426	14	0	3.8	-24.1	-102.5	E(80)	62.0	3	29.0	1.300	1.000	27.8<	80.6
3	4 node Right	2426	14	0	3.8	-24.1	-102.5	E(80)	62.0	3	29.0	1.300	1.000	27.8<	80.6
3	5 node Left	2423	14	0	5.0	-25.4	-103.0	E(80)	62.0	3	29.0	1.300	1.000	30.3<	80.6
3	5 node Right	2423	14	0	5.0	-25.4	-103.0	E(80)	62.0	3	29.0	1.300	1.000	30.3<	80.6
4	6 node Left	2418	14	0	6.2	-24.7	-86.9	E(80)	62.0	3	29.0	1.300	1.000	31.0<	80.6
4	6 node Right	2418	14	0	6.2	-24.7	-86.9	E(80)	62.0	3	29.0	1.300	1.000	31.0<	80.6
5	7 node Left	2412	12	0	8.8	-26.4	-63.9	E(80)	62.0	3	29.0	1.300	1.000	35.2<	80.6
5	7 node Right	2412	12	0	8.6	-25.7	-62.1	E(80)	62.0	3	29.0	1.300	1.000	34.2<	80.6
5	8 node Left	2406	12	0	10.2	-21.4	-5.5	E(80)	62.0	3	29.0	1.194	1.000	31.6<	74.0
5	8 node Right	2406	12	0	10.2	-21.4	-5.5	E(80)	62.0	3	29.0	1.194	1.000	31.6<	74.0
6	9 node Left	2400	20	0	8.3	-11.0	48.5	E(80)	62.0	3	29.0	1.000	1.000	19.3<	62.0
6	9 node Right	2400	20	0	9.2	-12.2	53.8	E(80)	62.0	3	29.0	1.000	1.000	21.4<	62.0
7	10 node Left	2394	36	0	7.3	-4.3	79.1	E(80)	62.0	3	29.0	1.000	0.913	11.6<	56.6
7	10 node Right	2394	36	0	7.3	-4.3	79.1	E(80)	62.0	3	29.0	1.000	0.913	11.6<	56.6
7	11 node Left	2388	36	0	9.5	-2.2	134.4	E(80)	62.0	3	29.0	1.000	0.913	11.7<	56.6
7	11 node Right	2388	36	0	9.5	-2.2	134.4	E(80)	62.0	3	29.0	1.000	0.913	11.7<	56.6
8	12 node Left	2382	34	0	6.3	-4.7	80.8	E(80)	62.0	3	29.0	1.000	0.926	11.0<	57.4
8	12 node Right	2382	34	0	6.3	-4.7	80.8	E(80)	62.0	3	29.0	1.000	0.926	11.0<	57.4
9	13 node Left	2375	17	0	8.2	-13.2	48.2	E(80)	62.0	3	29.0	1.000	1.000	21.4<	62.0
9	13 node Right	2375	17	0	7.3	-11.8	42.9	E(80)	62.0	3	29.0	1.000	1.000	19.0<	62.0
10	14 node Left	2368	12	0	7.3	-18.6	-18.8	E(80)	62.0	3	29.0	1.300	1.000	25.8<	80.6
10	14 node Right	2368	12	0	7.3	-18.6	-18.8	E(80)	62.0	3	29.0	1.300	1.000	25.8<	80.6
10	15 node Left	2360	12	0	6.3	-22.8	-69.4	E(80)	62.0	3	29.0	1.300	1.000	29.1<	80.6
10	15 node Right	2360	12	0	6.2	-22.8	-69.4	E(80)	62.0	3	29.0	1.300	1.000	29.0<	80.6
11	16 node Left	2353	14	0	4.4	-21.9	-85.9	E(80)	62.0	3	29.0	1.300	1.000	26.3<	80.6
11	16 node Right	2353	14	0	4.4	-21.9	-85.9	E(80)	62.0	3	29.0	1.300	1.000	26.3<	80.6
12	17 node Left	2346	14	0	3.4	-22.6	-93.9	E(80)	62.0	3	29.0	1.300	1.000	26.0<	80.6
12	17 node Right	2346	14	0	3.4	-22.6	-93.9	E(80)	62.0	3	29.0	1.300	1.000	26.0<	80.6
13	18 node Left	2338	14	0	4.4	-21.7	-84.4	E(80)	62.0	3	29.0	1.300	1.000	26.1<	80.6
13	18 node Right	2338	14	0	4.4	-21.7	-84.4	E(80)	62.0	3	29.0	1.300	1.000	26.1<	80.6
14	19 node Left	2334	12	0	6.1	-21.5	-64.1	E(80)	62.0	3	29.0	1.300	1.000	27.6<	80.6
14	19 node Right	2334	12	0	6.1	-21.4	-64.1	E(80)	62.0	3	29.0	1.300	1.000	27.5<	80.6
14	20 node Left	2334	12	0	7.2	-17.4	-15.3	E(80)	62.0	3	29.0	1.300	1.000	24.6<	80.6
14	20 node Right	2334	12	0	7.1	-17.4	-15.2	E(80)	62.0	3	29.0	1.300	1.000	24.6<	80.6
15	21 node Left	2334	18	0	7.2	-11.0	43.6	E(80)	62.0	3	29.0	1.000	1.000	18.2<	62.0
15	21 node Right	2334	18	0	8.2	-12.3	48.8	E(80)	62.0	3	29.0	1.000	1.000	20.5<	62.0
16	22 node Left	2334	36	0	6.2	-4.3	76.8	E(80)	62.0	3	29.0	1.000	0.913	10.6<	56.6
16	22 node Right	2334	36	0	6.2	-4.4	76.9	E(80)	62.0	3	29.0	1.000	0.913	10.6<	56.6
17	23 node Left	2334	39	0	8.4	-1.7	123.8	E(80)	62.0	3	29.0	1.000	0.895	10.1<	55.5
17	23 node Right	2334	39	0	8.4	-1.7	123.8	E(80)	62.0	3	29.0	1.000	0.895	10.1<	55.5
17	24 node Left	2334	39	0	6.6	-3.8	74.1	E(80)	62.0	3	29.0	1.000	0.895	10.4<	55.5
17	24 node Right	2334	39	0	6.6	-3.8	74.0	E(80)	62.0	3	29.0	1.000	0.895	10.5<	55.5
18	25 node Left	2334	22	0	8.5	-10.8	52.1	E(80)	62.0	3	29.0	1.000	1.000	19.3<	62.0
18	25 node Right	2334	22	0	7.7	-9.8	47.1	E(80)	62.0	3	29.0	1.000	1.000	17.4<	62.0
19	26 node Left	2334	12	0	10.2	-20.5	-1.8	E(80)	62.0	3	29.0	1.116	1.000	30.7<	69.2

19	26 node Right	2334	12	0	10.2	-20.6	-1.8	E(80)	62.0	3	29.0	1.116	1.000	30.8<	69.2
19	27 node Left	2334	12	0	8.7	-24.7	-58.6	E(80)	62.0	3	29.0	1.300	1.000	33.4<	80.6
19	27 node Right	2334	12	0	8.9	-25.4	-59.9	E(80)	62.0	3	29.0	1.300	1.000	34.2<	80.6
20	28 node Left	2334	15	0	6.1	-23.0	-80.3	E(80)	62.0	3	29.0	1.300	1.000	29.0<	80.6
20	28 node Right	2334	15	0	6.1	-22.9	-80.4	E(80)	62.0	3	29.0	1.300	1.000	29.0<	80.6
21	29 node Left	2334	15	0	4.9	-23.7	-96.1	E(80)	62.0	3	29.0	1.300	1.000	28.6<	80.6
21	29 node Right	2334	15	0	4.9	-23.7	-96.1	E(80)	62.0	3	29.0	1.300	1.000	28.6<	80.6
21	30 node Left	2334	15	0	3.8	-22.5	-96.3	E(80)	62.0	3	29.0	1.300	1.000	26.2<	80.6
21	30 node Right	2334	15	0	3.8	-22.5	-96.3	E(80)	62.0	3	29.0	1.300	1.000	26.2<	80.6
22	31 node Left	2334	15	0	2.6	-19.2	-80.6	E(80)	62.0	3	29.0	1.300	1.000	21.8<	80.6
22	31 node Right	2334	15	0	2.6	-19.2	-80.5	E(80)	62.0	3	29.0	1.300	1.000	21.8<	80.6
23	32 node Left	2334	12	0	1.7	-15.5	-59.8	E(80)	62.0	3	29.0	1.300	1.000	17.2<	80.6
23	32 node Right	2334	12	0	1.6	-15.5	-59.7	E(80)	62.0	3	29.0	1.300	1.000	17.1<	80.6
23	33 node Left	2334	12	0	0.0	-0.1	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.1<	80.6

STEEL-BOX G2

node WEB-L-1 (Web Lower edge) WEB - 1

Stress range

node number	node number		Web height (mm)	t	τ	σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax	Δσce・CR・Ct (N/mm2)	Cycle D
1	1	node Right	2436	12	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
1	2	node Left	2433	12	0	19.1	-1.8	70.5	E(80)	62.0	3	29.0	1.000	1.000	21.0<	62.0	
1	2	node Right	2433	12	0	19.1	-1.8	70.5	E(80)	62.0	3	29.0	1.000	1.000	20.9<	62.0	
2	3	node Left	2430	16	0	21.5	-2.6	88.5	E(80)	62.0	3	29.0	1.000	1.000	24.2<	62.0	
2	3	node Right	2430	16	0	21.5	-2.6	88.5	E(80)	62.0	3	29.0	1.000	1.000	24.2<	62.0	
3	4	node Left	2426	16	0	25.2	-3.9	106.8	E(80)	62.0	3	29.0	1.000	1.000	29.1<	62.0	
3	4	node Right	2426	16	0	25.2	-3.9	106.8	E(80)	62.0	3	29.0	1.000	1.000	29.1<	62.0	
3	5	node Left	2423	16	0	26.6	-5.2	107.7	E(80)	62.0	3	29.0	1.000	1.000	31.8<	62.0	
3	5	node Right	2423	16	0	26.6	-5.2	107.7	E(80)	62.0	3	29.0	1.000	1.000	31.8<	62.0	
4	6	node Left	2418	16	0	25.9	-6.6	91.3	E(80)	62.0	3	29.0	1.000	1.000	32.5<	62.0	
4	6	node Right	2418	16	0	25.9	-6.6	91.3	E(80)	62.0	3	29.0	1.000	1.000	32.5<	62.0	
5	7	node Left	2412	12	0	31.5	-10.5	76.1	E(80)	62.0	3	29.0	1.000	1.000	42.0<	62.0	
5	7	node Right	2412	12	0	26.3	-8.8	63.7	E(80)	62.0	3	29.0	1.000	1.000	35.1<	62.0	
5	8	node Left	2406	12	0	22.1	-10.5	5.7	E(80)	62.0	3	29.0	1.000	1.000	32.6<	62.0	
5	8	node Right	2406	12	0	22.1	-10.5	5.7	E(80)	62.0	3	29.0	1.000	1.000	32.6<	62.0	
6	9	node Left	2400	15	0	12.5	-9.4	-55.2	E(80)	62.0	3	29.0	1.300	1.000	21.9<	80.6	
6	9	node Right	2400	15	0	12.6	-9.5	-55.8	E(80)	62.0	3	29.0	1.300	1.000	22.2<	80.6	
7	10	node Left	2394	29	0	4.6	-7.5	-82.9	E(80)	62.0	3	29.0	1.300	0.964	12.1<	77.7	
7	10	node Right	2394	29	0	4.6	-7.5	-82.9	E(80)	62.0	3	29.0	1.300	0.964	12.1<	77.7	
7	11	node Left	2388	29	0	2.2	-10.0	-141.0	E(80)	62.0	3	29.0	1.300	0.964	12.2<	77.7	
7	11	node Right	2388	29	0	2.2	-9.9	-141.0	E(80)	62.0	3	29.0	1.300	0.964	12.2<	77.7	
8	12	node Left	2382	22	0	5.7	-7.6	-97.1	E(80)	62.0	3	29.0	1.300	1.000	13.3<	80.6	
8	12	node Right	2382	22	0	5.7	-7.6	-97.1	E(80)	62.0	3	29.0	1.300	1.000	13.3<	80.6	
9	13	node Left	2375	14	0	14.0	-8.7	-51.1	E(80)	62.0	3	29.0	1.300	1.000	22.7<	80.6	
9	13	node Right	2375	14	0	13.8	-8.6	-50.4	E(80)	62.0	3	29.0	1.300	1.000	22.3<	80.6	
10	14	node Left	2368	12	0	18.5	-7.3	18.8	E(80)	62.0	3	29.0	1.000	1.000	25.8<	62.0	
10	14	node Right	2368	12	0	18.5	-7.3	18.8	E(80)	62.0	3	29.0	1.000	1.000	25.8<	62.0	
10	15	node Left	2360	12	0	27.5	-7.6	83.8	E(80)	62.0	3	29.0	1.000	1.000	35.1<	62.0	
10	15	node Right	2360	12	0	27.5	-7.6	83.8	E(80)	62.0	3	29.0	1.000	1.000	35.1<	62.0	
11	16	node Left	2353	18	0	23.9	-4.8	93.6	E(80)	62.0	3	29.0	1.000	1.000	28.7<	62.0	
11	16	node Right	2353	18	0	23.9	-4.7	93.6	E(80)	62.0	3	29.0	1.000	1.000	28.6<	62.0	
12	17	node Left	2346	18	0	24.7	-3.7	103.0	E(80)	62.0	3	29.0	1.000	1.000	28.4<	62.0	
12	17	node Right	2346	18	0	24.7	-3.7	103.0	E(80)	62.0	3	29.0	1.000	1.000	28.4<	62.0	
13	18	node Left	2338	18	0	23.9	-5.0	93.3	E(80)	62.0	3	29.0	1.000	1.000	28.9<	62.0	
13	18	node Right	2338	18	0	23.9	-4.9	93.2	E(80)	62.0	3	29.0	1.000	1.000	28.8<	62.0	
14	19	node Left	2334	12	0	27.5	-7.8	81.9	E(80)	62.0	3	29.0	1.000	1.000	35.3<	62.0	
14	19	node Right	2334	12	0	27.4	-7.8	81.9	E(80)	62.0	3	29.0	1.000	1.000	35.2<	62.0	
14	20	node Left	2334	12	0	18.5	-7.6	16.2	E(80)	62.0	3	29.0	1.000	1.000	26.1<	62.0	
14	20	node Right	2334	12	0	18.5	-7.5	16.1	E(80)	62.0	3	29.0	1.000	1.000	26.0<	62.0	
15	21	node Left	2334	14	0	13.8	-9.1	-54.7	E(80)	62.0	3	29.0	1.300	1.000	23.0<	80.6	
15	21	node Right	2334	14	0	14.0	-9.2	-55.4	E(80)	62.0	3	29.0	1.300	1.000	23.2<	80.6	
16	22	node Left	2334	24	0	5.4	-7.8	-96.2	E(80)	62.0	3	29.0	1.300	1.000	13.3<	80.6	
16	22	node Right	2334	24	0	5.4	-7.8	-96.3	E(80)	62.0	3	29.0	1.300	1.000	13.2<	80.6	
17	23	node Left	2334	31	0	1.8	-9.4	-138.7	E(80)	62.0	3	29.0	1.300	0.948	11.3<	76.4	
17	23	node Right	2334	31	0	1.8	-9.4	-138.7	E(80)	62.0	3	29.0	1.300	0.948	11.3<	76.4	
17	24	node Left	2334	31	0	4.3	-7.4	-83.3	E(80)	62.0	3	29.0	1.300	0.948	11.7<	76.4	
17	24	node Right	2334	31	0	4.3	-7.4	-83.3	E(80)	62.0	3	29.0	1.300	0.948	11.7<	76.4	
18	25	node Left	2334	16	0	12.2	-9.6	-58.8	E(80)	62.0	3	29.0	1.300	1.000	21.8<	80.6	
18	25	node Right	2334	16	0	12.1	-9.5	-58.2	E(80)	62.0	3	29.0	1.300	1.000	21.6<	80.6	
19	26	node Left	2334	12	0	22.6	-11.2	1.9	E(80)	62.0	3	29.0	1.000	1.000	33.8<	62.0	

19	26 node Right	2334	12	0	22.6	-11.2	2.0	E(80)	62.0	3	29.0	1.000	1.000	33.8<	62.0
19	27 node Left	2334	12	0	27.2	-9.5	64.3	E(80)	62.0	3	29.0	1.000	1.000	36.7<	62.0
19	27 node Right	2334	12	0	32.5	-11.4	77.0	E(80)	62.0	3	29.0	1.000	1.000	43.9<	62.0
20	28 node Left	2334	18	0	25.0	-6.6	87.9	E(80)	62.0	3	29.0	1.000	1.000	31.7<	62.0
20	28 node Right	2334	18	0	25.1	-6.6	87.9	E(80)	62.0	3	29.0	1.000	1.000	31.8<	62.0
21	29 node Left	2334	18	0	25.8	-5.4	105.2	E(80)	62.0	3	29.0	1.000	1.000	31.2<	62.0
21	29 node Right	2334	18	0	25.8	-5.4	105.2	E(80)	62.0	3	29.0	1.000	1.000	31.2<	62.0
21	30 node Left	2334	18	0	24.6	-4.1	105.3	E(80)	62.0	3	29.0	1.000	1.000	28.7<	62.0
21	30 node Right	2334	18	0	24.6	-4.1	105.3	E(80)	62.0	3	29.0	1.000	1.000	28.7<	62.0
22	31 node Left	2334	18	0	21.0	-2.8	88.2	E(80)	62.0	3	29.0	1.000	1.000	23.8<	62.0
22	31 node Right	2334	18	0	21.0	-2.8	88.1	E(80)	62.0	3	29.0	1.000	1.000	23.8<	62.0
23	32 node Left	2334	12	0	19.9	-2.2	76.8	E(80)	62.0	3	29.0	1.000	1.000	22.1<	62.0
23	32 node Right	2334	12	0	19.9	-2.1	76.7	E(80)	62.0	3	29.0	1.000	1.000	22.0<	62.0
23	33 node Left	2334	12	0	0.1	0.0	0.0	E(80)	62.0	3	29.0	1.000	1.000	0.1<	62.0

STEEL-BOX G2

node HSTIFF-1 (Web H-stiff) WEB - 1

range node number	node number		Web height (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Stress range Cycle CR・Ct D
1	1	node Right	2436	12	487	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6
1	2	node Left	2433	12	487	0.8	-9.7	-35.7	G(50)	32.0	3	15.0	1.300	1.000	10.6<	41.6
1	2	node Right	2433	12	487	0.9	-9.7	-35.7	G(50)	32.0	3	15.0	1.300	1.000	10.6<	41.6
2	3	node Left	2430	12	486	1.5	-12.2	-50.4	G(50)	32.0	3	15.0	1.300	1.000	13.7<	41.6
2	3	node Right	2430	12	486	1.5	-12.2	-50.4	G(50)	32.0	3	15.0	1.300	1.000	13.7<	41.6
3	4	node Left	2426	12	485	2.2	-14.2	-60.6	G(50)	32.0	3	15.0	1.300	1.000	16.4<	41.6
3	4	node Right	2426	12	485	2.2	-14.2	-60.6	G(50)	32.0	3	15.0	1.300	1.000	16.4<	41.6
3	5	node Left	2423	12	485	2.9	-15.0	-60.9	G(50)	32.0	3	15.0	1.300	1.000	17.9<	41.6
3	5	node Right	2423	12	485	2.9	-15.0	-60.9	G(50)	32.0	3	15.0	1.300	1.000	17.9<	41.6
4	6	node Left	2418	12	484	3.7	-14.6	-51.3	G(50)	32.0	3	15.0	1.300	1.000	18.3<	41.6
4	6	node Right	2418	12	484	3.7	-14.6	-51.3	G(50)	32.0	3	15.0	1.300	1.000	18.3<	41.6
5	7	node Left	2412	12	482	4.9	-14.8	-35.9	G(50)	32.0	3	15.0	1.300	1.000	19.8<	41.6
5	7	node Right	2412	12	482	5.1	-15.3	-36.9	G(50)	32.0	3	15.0	1.300	1.000	20.4<	41.6
5	8	node Left	2406	12	481	6.0	-12.7	-3.3	G(50)	32.0	3	15.0	1.194	1.000	18.8<	38.2
5	8	node Right	2406	12	481	6.0	-12.7	-3.3	G(50)	32.0	3	15.0	1.194	1.000	18.8<	38.2
6	9	node Left	2400	14	480	7.8	-5.9	-34.5	G(50)	32.0	3	15.0	1.300	1.000	13.7<	41.6
6	9	node Right	2400	14	480	7.7	-5.8	-33.9	G(50)	32.0	3	15.0	1.300	1.000	13.5<	41.6
7	10	node Left	2394	16	479	2.8	-4.6	-50.5	G(50)	32.0	3	15.0	1.300	1.000	7.3<	41.6
7	10	node Right	2394	16	479	2.8	-4.6	-50.5	G(50)	32.0	3	15.0	1.300	1.000	7.3<	41.6
7	11	node Left	2388	16	478	1.4	-6.1	-85.9	G(50)	32.0	3	15.0	1.300	1.000	7.5<	41.6
7	11	node Right	2388	16	478	1.4	-6.0	-85.9	G(50)	32.0	3	15.0	1.300	1.000	7.4<	41.6
8	12	node Left	2382	16	476	3.6	-4.8	-61.5	G(50)	32.0	3	15.0	1.300	1.000	8.4<	41.6
8	12	node Right	2382	16	476	3.6	-4.8	-61.5	G(50)	32.0	3	15.0	1.300	1.000	8.4<	41.6
9	13	node Left	2375	14	475	8.6	-5.3	-31.2	G(50)	32.0	3	15.0	1.300	1.000	13.9<	41.6
9	13	node Right	2375	14	475	8.7	-5.4	-31.7	G(50)	32.0	3	15.0	1.300	1.000	14.0<	41.6
10	14	node Left	2368	12	474	4.4	-11.2	-11.3	G(50)	32.0	3	15.0	1.300	1.000	15.5<	41.6
10	14	node Right	2368	12	474	4.4	-11.2	-11.3	G(50)	32.0	3	15.0	1.300	1.000	15.5<	41.6
10	15	node Left	2360	12	472	3.5	-12.7	-38.8	G(50)	32.0	3	15.0	1.300	1.000	16.3<	41.6
10	15	node Right	2360	12	472	3.5	-12.7	-38.8	G(50)	32.0	3	15.0	1.300	1.000	16.2<	41.6
11	16	node Left	2353	12	471	2.6	-12.8	-50.0	G(50)	32.0	3	15.0	1.300	1.000	15.3<	41.6
11	16	node Right	2353	12	471	2.6	-12.8	-50.0	G(50)	32.0	3	15.0	1.300	1.000	15.3<	41.6
12	17	node Left	2346	12	469	2.0	-13.1	-54.5	G(50)	32.0	3	15.0	1.300	1.000	15.1<	41.6
12	17	node Right	2346	12	469	2.0	-13.1	-54.5	G(50)	32.0	3	15.0	1.300	1.000	15.1<	41.6
13	18	node Left	2338	12	468	2.5	-12.6	-48.9	G(50)	32.0	3	15.0	1.300	1.000	15.1<	41.6
13	18	node Right	2338	12	468	2.5	-12.6	-48.9	G(50)	32.0	3	15.0	1.300	1.000	15.1<	41.6
14	19	node Left	2334	12	467	3.3	-11.7	-34.9	G(50)	32.0	3	15.0	1.300	1.000	15.0<	41.6
14	19	node Right	2334	12	467	3.3	-11.7	-34.9	G(50)	32.0	3	15.0	1.300	1.000	15.0<	41.6
14	20	node Left	2334	12	467	4.2	-10.3	-9.0	G(50)	32.0	3	15.0	1.300	1.000	14.5<	41.6
14	20	node Right	2334	12	467	4.2	-10.3	-8.9	G(50)	32.0	3	15.0	1.300	1.000	14.4<	41.6
15	21	node Left	2334	14	467	8.9	-5.9	-35.0	G(50)	32.0	3	15.0	1.300	1.000	14.7<	41.6
15	21	node Right	2334	14	467	8.7	-5.7	-34.6	G(50)	32.0	3	15.0	1.300	1.000	14.5<	41.6
16	22	node Left	2334	16	467	3.5	-5.0	-61.6	G(50)	32.0	3	15.0	1.300	1.000	8.5<	41.6
16	22	node Right	2334	16	467	3.5	-5.0	-61.7	G(50)	32.0	3	15.0	1.300	1.000	8.4<	41.6
17	23	node Left	2334	16	467	1.1	-5.9	-86.2	G(50)	32.0	3	15.0	1.300	1.000	7.0<	41.6
17	23	node Right	2334	16	467	1.1	-5.9	-86.2	G(50)	32.0	3	15.0	1.300	1.000	7.0<	41.6
17	24	node Left	2334	16	467	2.7	-4.6	-51.8	G(50)	32.0	3	15.0	1.300	1.000	7.3<	41.6
17	24	node Right	2334	16	467	2.7	-4.6	-51.8	G(50)	32.0	3	15.0	1.300	1.000	7.2<	41.6
18	25	node Left	2334	14	467	7.6	-6.0	-36.6	G(50)	32.0	3	15.0	1.300	1.000	13.6<	41.6
18	25	node Right	2334	14	467	7.7	-6.1	-37.1	G(50)	32.0	3	15.0	1.300	1.000	13.8<	41.6
19	26	node Left	2334	12	467	6.0	-11.9	-1.1	G(50)	32.0	3	15.0	1.116	1.000	17.8<	35.7

19	26 node Right	2334	12	467	6.0	-11.9	-1.0	G(50)	32.0	3	15.0	1.116	1.000	17.9<	35.7
19	27 node Left	2334	12	467	5.1	-14.3	-34.0	G(50)	32.0	3	15.0	1.300	1.000	19.4<	41.6
19	27 node Right	2334	12	467	4.8	-13.8	-32.5	G(50)	32.0	3	15.0	1.300	1.000	18.6<	41.6
20	28 node Left	2334	12	467	3.5	-13.4	-46.7	G(50)	32.0	3	15.0	1.300	1.000	16.9<	41.6
20	28 node Right	2334	12	467	3.5	-13.3	-46.7	G(50)	32.0	3	15.0	1.300	1.000	16.8<	41.6
21	29 node Left	2334	12	467	2.8	-13.8	-55.8	G(50)	32.0	3	15.0	1.300	1.000	16.6<	41.6
21	29 node Right	2334	12	467	2.8	-13.8	-55.8	G(50)	32.0	3	15.0	1.300	1.000	16.6<	41.6
21	30 node Left	2334	12	467	2.2	-13.1	-56.0	G(50)	32.0	3	15.0	1.300	1.000	15.2<	41.6
21	30 node Right	2334	12	467	2.2	-13.1	-56.0	G(50)	32.0	3	15.0	1.300	1.000	15.2<	41.6
22	31 node Left	2334	12	467	1.5	-11.2	-46.8	G(50)	32.0	3	15.0	1.300	1.000	12.7<	41.6
22	31 node Right	2334	12	467	1.5	-11.2	-46.8	G(50)	32.0	3	15.0	1.300	1.000	12.6<	41.6
23	32 node Left	2334	12	467	0.9	-8.4	-32.5	G(50)	32.0	3	15.0	1.300	1.000	9.3<	41.6
23	32 node Right	2334	12	467	0.9	-8.4	-32.4	G(50)	32.0	3	15.0	1.300	1.000	9.3<	41.6
23	33 node Left	2334	12	467	0.0	-0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6

STEEL-BOX G2

node POINT-U-1 (Web Upper) WEB - 1

range node number	node number	Web	height (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax	Stress range Δσce・CR・Ct D (N/mm2)
1	1 node	Right	2436	12	900	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6
1	2 node	Left	2433	12	900	0.3	-3.6	-13.2	G(50)	32.0	3	15.0	1.300	1.000	3.9<	41.6
1	2 node	Right	2433	12	900	0.3	-3.6	-13.2	G(50)	32.0	3	15.0	1.300	1.000	3.9<	41.6
2	3 node	Left	2430	12	900	0.6	-5.0	-20.8	G(50)	32.0	3	15.0	1.300	1.000	5.7<	41.6
2	3 node	Right	2430	12	900	0.6	-5.0	-20.8	G(50)	32.0	3	15.0	1.300	1.000	5.7<	41.6
3	4 node	Left	2426	12	900	0.9	-5.8	-24.9	G(50)	32.0	3	15.0	1.300	1.000	6.7<	41.6
3	4 node	Right	2426	12	900	0.9	-5.8	-24.9	G(50)	32.0	3	15.0	1.300	1.000	6.7<	41.6
3	5 node	Left	2423	12	900	1.2	-6.1	-24.7	G(50)	32.0	3	15.0	1.300	1.000	7.3<	41.6
3	5 node	Right	2423	12	900	1.2	-6.1	-24.7	G(50)	32.0	3	15.0	1.300	1.000	7.3<	41.6
4	6 node	Left	2418	12	900	1.5	-5.9	-20.6	G(50)	32.0	3	15.0	1.300	1.000	7.3<	41.6
4	6 node	Right	2418	12	900	1.5	-5.9	-20.6	G(50)	32.0	3	15.0	1.300	1.000	7.3<	41.6
5	7 node	Left	2412	12	900	1.6	-4.8	-11.7	G(50)	32.0	3	15.0	1.300	1.000	6.4<	41.6
5	7 node	Right	2412	12	900	2.1	-6.3	-15.2	G(50)	32.0	3	15.0	1.300	1.000	8.4<	41.6
5	8 node	Left	2406	12	900	2.4	-5.2	-1.3	G(50)	32.0	3	15.0	1.194	1.000	7.6<	38.2
5	8 node	Right	2406	12	900	2.4	-5.2	-1.3	G(50)	32.0	3	15.0	1.194	1.000	7.6<	38.2
6	9 node	Left	2400	14	900	1.7	-2.2	9.6	G(50)	32.0	3	15.0	1.000	1.000	3.8<	32.0
6	9 node	Right	2400	14	900	2.2	-2.9	12.7	G(50)	32.0	3	15.0	1.000	1.000	5.0<	32.0
7	10 node	Left	2394	16	900	1.7	-1.0	18.2	G(50)	32.0	3	15.0	1.000	1.000	2.7<	32.0
7	10 node	Right	2394	16	900	1.7	-1.0	18.2	G(50)	32.0	3	15.0	1.000	1.000	2.7<	32.0
7	11 node	Left	2388	16	900	2.2	-0.5	30.6	G(50)	32.0	3	15.0	1.000	1.000	2.7<	32.0
7	11 node	Right	2388	16	900	2.2	-0.5	30.6	G(50)	32.0	3	15.0	1.000	1.000	2.7<	32.0
8	12 node	Left	2382	16	900	1.1	-0.8	13.6	G(50)	32.0	3	15.0	1.000	1.000	1.8<	32.0
8	12 node	Right	2382	16	900	1.1	-0.8	13.6	G(50)	32.0	3	15.0	1.000	1.000	1.8<	32.0
9	13 node	Left	2375	14	900	1.8	-2.9	10.6	G(50)	32.0	3	15.0	1.000	1.000	4.7<	32.0
9	13 node	Right	2375	14	900	1.3	-2.1	7.5	G(50)	32.0	3	15.0	1.000	1.000	3.4<	32.0
10	14 node	Left	2368	12	900	1.7	-4.5	-4.5	G(50)	32.0	3	15.0	1.300	1.000	6.2<	41.6
10	14 node	Right	2368	12	900	1.7	-4.5	-4.5	G(50)	32.0	3	15.0	1.300	1.000	6.2<	41.6
10	15 node	Left	2360	12	900	1.0	-3.6	-11.0	G(50)	32.0	3	15.0	1.300	1.000	4.6<	41.6
10	15 node	Right	2360	12	900	1.0	-3.6	-11.0	G(50)	32.0	3	15.0	1.300	1.000	4.6<	41.6
11	16 node	Left	2353	12	900	0.9	-4.4	-17.2	G(50)	32.0	3	15.0	1.300	1.000	5.3<	41.6
11	16 node	Right	2353	12	900	0.9	-4.4	-17.2	G(50)	32.0	3	15.0	1.300	1.000	5.3<	41.6
12	17 node	Left	2346	12	900	0.7	-4.4	-18.4	G(50)	32.0	3	15.0	1.300	1.000	5.1<	41.6
12	17 node	Right	2346	12	900	0.7	-4.4	-18.4	G(50)	32.0	3	15.0	1.300	1.000	5.1<	41.6
13	18 node	Left	2338	12	900	0.8	-4.1	-16.0	G(50)	32.0	3	15.0	1.300	1.000	4.9<	41.6
13	18 node	Right	2338	12	900	0.8	-4.1	-16.0	G(50)	32.0	3	15.0	1.300	1.000	5.0<	41.6
14	19 node	Left	2334	12	900	0.7	-2.6	-7.8	G(50)	32.0	3	15.0	1.300	1.000	3.4<	41.6
14	19 node	Right	2334	12	900	0.7	-2.6	-7.8	G(50)	32.0	3	15.0	1.300	1.000	3.3<	41.6
14	20 node	Left	2334	12	900	1.5	-3.6	-3.2	G(50)	32.0	3	15.0	1.300	1.000	5.1<	41.6
14	20 node	Right	2334	12	900	1.5	-3.6	-3.1	G(50)	32.0	3	15.0	1.300	1.000	5.1<	41.6
15	21 node	Left	2334	14	900	0.9	-1.4	5.7	G(50)	32.0	3	15.0	1.000	1.000	2.4<	32.0
15	21 node	Right	2334	14	900	1.5	-2.2	8.6	G(50)	32.0	3	15.0	1.000	1.000	3.6<	32.0
16	22 node	Left	2334	16	900	0.8	-0.6	10.1	G(50)	32.0	3	15.0	1.000	1.000	1.4<	32.0
16	22 node	Right	2334	16	900	0.8	-0.6	10.1	G(50)	32.0	3	15.0	1.000	1.000	1.4<	32.0
17	23 node	Left	2334	16	900	1.5	-0.3	22.6	G(50)	32.0	3	15.0	1.000	1.000	1.8<	32.0
17	23 node	Right	2334	16	900	1.5	-0.3	22.6	G(50)	32.0	3	15.0	1.000	1.000	1.8<	32.0
17	24 node	Left	2334	16	900	1.2	-0.7	13.4	G(50)	32.0	3	15.0	1.000	1.000	1.9<	32.0
17	24 node	Right	2334	16	900	1.2	-0.7	13.3	G(50)	32.0	3	15.0	1.000	1.000	1.9<	32.0
18	25 node	Left	2334	14	900	1.5	-1.9	9.3	G(50)	32.0	3	15.0	1.000	1.000	3.5<	32.0
18	25 node	Right	2334	14	900	1.0	-1.3	6.5	G(50)	32.0	3	15.0	1.000	1.000	2.4<	32.0
19	26 node	Left	2334	12	900	2.0	-3.9	-0.4	G(50)	32.0	3	15.0	1.117	1.000	5.9<	35.7

19	26 node Right	2334	12	900	2.0	-3.9	-0.3	G(50)	32.0 3	15.0	1.115	1.000	5.9< 35.7
19	27 node Left	2334	12	900	1.7	-4.7	-11.2	G(50)	32.0 3	15.0	1.300	1.000	6.4< 41.6
19	27 node Right	2334	12	900	1.0	-3.1	-7.1	G(50)	32.0 3	15.0	1.300	1.000	4.1< 41.6
20	28 node Left	2334	12	900	1.2	-4.5	-15.4	G(50)	32.0 3	15.0	1.300	1.000	5.6< 41.6
20	28 node Right	2334	12	900	1.2	-4.4	-15.5	G(50)	32.0 3	15.0	1.300	1.000	5.5< 41.6
21	29 node Left	2334	12	900	0.9	-4.6	-18.5	G(50)	32.0 3	15.0	1.300	1.000	5.5< 41.6
21	29 node Right	2334	12	900	0.9	-4.6	-18.5	G(50)	32.0 3	15.0	1.300	1.000	5.5< 41.6
21	30 node Left	2334	12	900	0.7	-4.3	-18.6	G(50)	32.0 3	15.0	1.300	1.000	5.0< 41.6
21	30 node Right	2334	12	900	0.7	-4.3	-18.6	G(50)	32.0 3	15.0	1.300	1.000	5.0< 41.6
22	31 node Left	2334	12	900	0.5	-3.7	-15.5	G(50)	32.0 3	15.0	1.300	1.000	4.2< 41.6
22	31 node Right	2334	12	900	0.5	-3.7	-15.5	G(50)	32.0 3	15.0	1.300	1.000	4.2< 41.6
23	32 node Left	2334	12	900	0.2	-1.9	-7.1	G(50)	32.0 3	15.0	1.300	1.000	2.1< 41.6
23	32 node Right	2334	12	900	0.2	-1.9	-7.1	G(50)	32.0 3	15.0	1.300	1.000	2.0< 41.6
23	33 node Left	2334	12	900	0.0	-0.0	0.0	G(50)	32.0 3	15.0	1.300	1.000	0.0< 41.6

STEEL-BOX G2

node POINT-L-1 (Web) WEB - 1

range node number	node number		Web height (mm)	t	σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Stress Δσce・CR・Ct	Cycle D
1	1	node Right	2436	12	500	0.0	0.0	0.0 G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	node Left	2433	12	500	11.7	-1.1	43.2 G(50)	32.0	3	15.0	1.000	1.000	12.9<	32.0	
1	2	node Right	2433	12	500	11.7	-1.1	43.2 G(50)	32.0	3	15.0	1.000	1.000	12.8<	32.0	
2	3	node Left	2430	12	500	12.8	-1.6	52.8 G(50)	32.0	3	15.0	1.000	1.000	14.4<	32.0	
2	3	node Right	2430	12	500	12.8	-1.6	52.8 G(50)	32.0	3	15.0	1.000	1.000	14.4<	32.0	
3	4	node Left	2426	12	500	15.0	-2.3	63.7 G(50)	32.0	3	15.0	1.000	1.000	17.4<	32.0	
3	4	node Right	2426	12	500	15.0	-2.3	63.7 G(50)	32.0	3	15.0	1.000	1.000	17.4<	32.0	
3	5	node Left	2423	12	500	15.8	-3.1	64.2 G(50)	32.0	3	15.0	1.000	1.000	18.9<	32.0	
3	5	node Right	2423	12	500	15.8	-3.1	64.2 G(50)	32.0	3	15.0	1.000	1.000	18.9<	32.0	
4	6	node Left	2418	12	500	15.4	-3.9	54.4 G(50)	32.0	3	15.0	1.000	1.000	19.4<	32.0	
4	6	node Right	2418	12	500	15.4	-3.9	54.4 G(50)	32.0	3	15.0	1.000	1.000	19.4<	32.0	
5	7	node Left	2412	12	500	19.5	-6.5	47.1 G(50)	32.0	3	15.0	1.000	1.000	26.0<	32.0	
5	7	node Right	2412	12	500	15.5	-5.2	37.6 G(50)	32.0	3	15.0	1.000	1.000	20.7<	32.0	
5	8	node Left	2406	12	500	13.0	-6.2	3.4 G(50)	32.0	3	15.0	1.000	1.000	19.2<	32.0	
5	8	node Right	2406	12	500	13.0	-6.2	3.4 G(50)	32.0	3	15.0	1.000	1.000	19.2<	32.0	
6	9	node Left	2400	14	500	7.6	-5.7	-33.6 G(50)	32.0	3	15.0	1.300	1.000	13.3<	41.6	
6	9	node Right	2400	14	500	7.5	-5.6	-33.0 G(50)	32.0	3	15.0	1.300	1.000	13.1<	41.6	
7	10	node Left	2394	16	500	2.7	-4.4	-49.1 G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6	
7	10	node Right	2394	16	500	2.7	-4.4	-49.1 G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6	
7	11	node Left	2388	16	500	1.3	-5.9	-83.3 G(50)	32.0	3	15.0	1.300	1.000	7.2<	41.6	
7	11	node Right	2388	16	500	1.3	-5.8	-83.3 G(50)	32.0	3	15.0	1.300	1.000	7.2<	41.6	
8	12	node Left	2382	16	500	3.5	-4.7	-59.8 G(50)	32.0	3	15.0	1.300	1.000	8.2<	41.6	
8	12	node Right	2382	16	500	3.5	-4.7	-59.8 G(50)	32.0	3	15.0	1.300	1.000	8.2<	41.6	
9	13	node Left	2375	14	500	8.3	-5.2	-30.2 G(50)	32.0	3	15.0	1.300	1.000	13.4<	41.6	
9	13	node Right	2375	14	500	8.4	-5.2	-30.8 G(50)	32.0	3	15.0	1.300	1.000	13.6<	41.6	
10	14	node Left	2368	12	500	10.7	-4.2	10.9 G(50)	32.0	3	15.0	1.000	1.000	14.9<	32.0	
10	14	node Right	2368	12	500	10.7	-4.2	10.9 G(50)	32.0	3	15.0	1.000	1.000	14.9<	32.0	
10	15	node Left	2360	12	500	16.9	-4.7	51.3 G(50)	32.0	3	15.0	1.000	1.000	21.5<	32.0	
10	15	node Right	2360	12	500	16.9	-4.7	51.3 G(50)	32.0	3	15.0	1.000	1.000	21.5<	32.0	
11	16	node Left	2353	12	500	14.2	-2.8	55.5 G(50)	32.0	3	15.0	1.000	1.000	17.0<	32.0	
11	16	node Right	2353	12	500	14.2	-2.8	55.5 G(50)	32.0	3	15.0	1.000	1.000	17.0<	32.0	
12	17	node Left	2346	12	500	14.6	-2.2	61.0 G(50)	32.0	3	15.0	1.000	1.000	16.8<	32.0	
12	17	node Right	2346	12	500	14.6	-2.2	61.0 G(50)	32.0	3	15.0	1.000	1.000	16.8<	32.0	
13	18	node Left	2338	12	500	14.2	-3.0	55.3 G(50)	32.0	3	15.0	1.000	1.000	17.1<	32.0	
13	18	node Right	2338	12	500	14.2	-2.9	55.2 G(50)	32.0	3	15.0	1.000	1.000	17.1<	32.0	
14	19	node Left	2334	12	500	17.0	-4.8	50.6 G(50)	32.0	3	15.0	1.000	1.000	21.8<	32.0	
14	19	node Right	2334	12	500	17.0	-4.8	50.6 G(50)	32.0	3	15.0	1.000	1.000	21.8<	32.0	
14	20	node Left	2334	12	500	10.8	-4.4	9.5 G(50)	32.0	3	15.0	1.000	1.000	15.2<	32.0	
14	20	node Right	2334	12	500	10.8	-4.4	9.4 G(50)	32.0	3	15.0	1.000	1.000	15.2<	32.0	
15	21	node Left	2334	14	500	8.5	-5.6	-33.6 G(50)	32.0	3	15.0	1.300	1.000	14.1<	41.6	
15	21	node Right	2334	14	500	8.4	-5.5	-33.1 G(50)	32.0	3	15.0	1.300	1.000	13.8<	41.6	
16	22	node Left	2334	16	500	3.3	-4.8	-59.1 G(50)	32.0	3	15.0	1.300	1.000	8.2<	41.6	
16	22	node Right	2334	16	500	3.3	-4.8	-59.2 G(50)	32.0	3	15.0	1.300	1.000	8.1<	41.6	
17	23	node Left	2334	16	500	1.1	-5.6	-82.5 G(50)	32.0	3	15.0	1.300	1.000	6.7<	41.6	
17	23	node Right	2334	16	500	1.1	-5.6	-82.5 G(50)	32.0	3	15.0	1.300	1.000	6.7<	41.6	
17	24	node Left	2334	16	500	2.6	-4.4	-49.6 G(50)	32.0	3	15.0	1.300	1.000	6.9<	41.6	
17	24	node Right	2334	16	500	2.6	-4.4	-49.6 G(50)	32.0	3	15.0	1.300	1.000	6.9<	41.6	
18	25	node Left	2334	14	500	7.2	-5.7	-35.0 G(50)	32.0	3	15.0	1.300	1.000	13.0<	41.6	
18	25	node Right	2334	14	500	7.4	-5.8	-35.6 G(50)	32.0	3	15.0	1.300	1.000	13.2<	41.6	
19	26	node Left	2334	12	500	13.3	-6.6	1.1 G(50)	32.0	3	15.0	1.000	1.000	19.9<	32.0	

19	26 node Right	2334	12	500	13.3	-6.6	1.2	G(50)	32.0	3	15.0	1.000	1.000	19.9< 32.0
19	27 node Left	2334	12	500	16.1	-5.6	38.0	G(50)	32.0	3	15.0	1.000	1.000	21.7< 32.0
19	27 node Right	2334	12	500	20.1	-7.1	47.7	G(50)	32.0	3	15.0	1.000	1.000	27.2< 32.0
20	28 node Left	2334	12	500	14.8	-3.9	51.9	G(50)	32.0	3	15.0	1.000	1.000	18.7< 32.0
20	28 node Right	2334	12	500	14.8	-3.9	51.8	G(50)	32.0	3	15.0	1.000	1.000	18.8< 32.0
21	29 node Left	2334	12	500	15.2	-3.2	62.1	G(50)	32.0	3	15.0	1.000	1.000	18.4< 32.0
21	29 node Right	2334	12	500	15.2	-3.2	62.1	G(50)	32.0	3	15.0	1.000	1.000	18.4< 32.0
21	30 node Left	2334	12	500	14.5	-2.4	62.1	G(50)	32.0	3	15.0	1.000	1.000	16.9< 32.0
21	30 node Right	2334	12	500	14.5	-2.4	62.1	G(50)	32.0	3	15.0	1.000	1.000	16.9< 32.0
22	31 node Left	2334	12	500	12.4	-1.7	52.0	G(50)	32.0	3	15.0	1.000	1.000	14.0< 32.0
22	31 node Right	2334	12	500	12.4	-1.7	52.0	G(50)	32.0	3	15.0	1.000	1.000	14.1< 32.0
23	32 node Left	2334	12	500	12.3	-1.3	47.5	G(50)	32.0	3	15.0	1.000	1.000	13.7< 32.0
23	32 node Right	2334	12	500	12.3	-1.3	47.5	G(50)	32.0	3	15.0	1.000	1.000	13.6< 32.0
23	33 node Left	2334	12	500	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.000	1.000	0.0< 32.0

STEEL-BOX G2

node WEB-U-2 (Web Upper edge) WEB - 2

Stress range

node number	node number		Web height (mm)	t	τ	σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct Cycle D
1	1	node Right	2364	12	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6
1	2	node Left	2367	12	0	1.4	-16.0	-58.9	E(80)	62.0	3	29.0	1.300	1.000	17.4<	80.6
1	2	node Right	2367	12	0	1.4	-16.0	-58.9	E(80)	62.0	3	29.0	1.300	1.000	17.4<	80.6
2	3	node Left	2370	14	0	2.4	-19.7	-81.1	E(80)	62.0	3	29.0	1.300	1.000	22.1<	80.6
2	3	node Right	2370	14	0	2.4	-19.7	-81.1	E(80)	62.0	3	29.0	1.300	1.000	22.1<	80.6
3	4	node Left	2374	14	0	3.6	-23.1	-98.1	E(80)	62.0	3	29.0	1.300	1.000	26.7<	80.6
3	4	node Right	2374	14	0	3.6	-23.1	-98.1	E(80)	62.0	3	29.0	1.300	1.000	26.7<	80.6
3	5	node Left	2377	14	0	4.8	-24.4	-99.2	E(80)	62.0	3	29.0	1.300	1.000	29.2<	80.6
3	5	node Right	2377	14	0	4.8	-24.4	-99.2	E(80)	62.0	3	29.0	1.300	1.000	29.2<	80.6
4	6	node Left	2382	14	0	6.0	-24.0	-84.4	E(80)	62.0	3	29.0	1.300	1.000	30.0<	80.6
4	6	node Right	2382	14	0	6.0	-24.0	-84.4	E(80)	62.0	3	29.0	1.300	1.000	30.0<	80.6
5	7	node Left	2388	12	0	8.6	-25.8	-62.6	E(80)	62.0	3	29.0	1.300	1.000	34.5<	80.6
5	7	node Right	2388	12	0	8.5	-25.2	-61.0	E(80)	62.0	3	29.0	1.300	1.000	33.7<	80.6
5	8	node Left	2394	12	0	10.1	-21.3	-5.4	E(80)	62.0	3	29.0	1.193	1.000	31.4<	74.0
5	8	node Right	2394	12	0	10.1	-21.3	-5.4	E(80)	62.0	3	29.0	1.193	1.000	31.4<	74.0
6	9	node Left	2400	20	0	8.3	-11.0	48.5	E(80)	62.0	3	29.0	1.000	1.000	19.3<	62.0
6	9	node Right	2400	20	0	9.3	-12.2	53.8	E(80)	62.0	3	29.0	1.000	1.000	21.4<	62.0
7	10	node Left	2406	36	0	7.3	-4.4	80.0	E(80)	62.0	3	29.0	1.000	0.913	11.7<	56.6
7	10	node Right	2406	36	0	7.3	-4.4	80.0	E(80)	62.0	3	29.0	1.000	0.913	11.7<	56.6
7	11	node Left	2412	36	0	9.7	-2.2	137.1	E(80)	62.0	3	29.0	1.000	0.913	11.8<	56.6
7	11	node Right	2412	36	0	9.7	-2.2	137.1	E(80)	62.0	3	29.0	1.000	0.913	11.8<	56.6
8	12	node Left	2418	34	0	6.6	-4.8	83.4	E(80)	62.0	3	29.0	1.000	0.926	11.4<	57.4
8	12	node Right	2418	34	0	6.6	-4.9	83.4	E(80)	62.0	3	29.0	1.000	0.926	11.4<	57.4
9	13	node Left	2425	17	0	8.5	-13.8	50.2	E(80)	62.0	3	29.0	1.000	1.000	22.2<	62.0
9	13	node Right	2425	17	0	7.6	-12.3	44.8	E(80)	62.0	3	29.0	1.000	1.000	19.9<	62.0
10	14	node Left	2433	12	0	7.7	-19.4	-19.8	E(80)	62.0	3	29.0	1.300	1.000	27.1<	80.6
10	14	node Right	2433	12	0	7.7	-19.5	-19.8	E(80)	62.0	3	29.0	1.300	1.000	27.2<	80.6
10	15	node Left	2440	12	0	6.7	-24.4	-74.3	E(80)	62.0	3	29.0	1.300	1.000	31.1<	80.6
10	15	node Right	2440	12	0	6.7	-24.4	-74.3	E(80)	62.0	3	29.0	1.300	1.000	31.1<	80.6
11	16	node Left	2447	14	0	4.7	-23.6	-92.7	E(80)	62.0	3	29.0	1.300	1.000	28.3<	80.6
11	16	node Right	2447	14	0	4.7	-23.6	-92.7	E(80)	62.0	3	29.0	1.300	1.000	28.3<	80.6
12	17	node Left	2454	14	0	3.7	-24.6	-102.5	E(80)	62.0	3	29.0	1.300	1.000	28.3<	80.6
12	17	node Right	2454	14	0	3.7	-24.6	-102.5	E(80)	62.0	3	29.0	1.300	1.000	28.3<	80.6
13	18	node Left	2462	14	0	4.9	-23.9	-93.2	E(80)	62.0	3	29.0	1.300	1.000	28.8<	80.6
13	18	node Right	2462	14	0	4.9	-23.9	-93.2	E(80)	62.0	3	29.0	1.300	1.000	28.8<	80.6
14	19	node Left	2466	12	0	6.8	-24.2	-71.9	E(80)	62.0	3	29.0	1.300	1.000	31.0<	80.6
14	19	node Right	2466	12	0	6.8	-24.1	-71.9	E(80)	62.0	3	29.0	1.300	1.000	30.9<	80.6
14	20	node Left	2466	12	0	7.9	-19.4	-16.9	E(80)	62.0	3	29.0	1.300	1.000	27.3<	80.6
14	20	node Right	2466	12	0	7.9	-19.4	-16.9	E(80)	62.0	3	29.0	1.300	1.000	27.3<	80.6
15	21	node Left	2466	18	0	8.2	-12.3	48.8	E(80)	62.0	3	29.0	1.000	1.000	20.5<	62.0
15	21	node Right	2466	18	0	9.0	-13.8	54.4	E(80)	62.0	3	29.0	1.000	1.000	22.8<	62.0
16	22	node Left	2466	36	0	7.0	-4.9	86.2	E(80)	62.0	3	29.0	1.000	0.913	11.8<	56.6
16	22	node Right	2466	36	0	7.0	-4.9	86.2	E(80)	62.0	3	29.0	1.000	0.913	11.8<	56.6
17	23	node Left	2466	39	0	9.4	-1.9	138.0	E(80)	62.0	3	29.0	1.000	0.895	11.3<	55.5
17	23	node Right	2466	39	0	9.4	-1.9	138.0	E(80)	62.0	3	29.0	1.000	0.895	11.3<	55.5
17	24	node Left	2466	39	0	7.3	-4.3	82.6	E(80)	62.0	3	29.0	1.000	0.895	11.6<	55.5
17	24	node Right	2466	39	0	7.4	-4.2	82.5	E(80)	62.0	3	29.0	1.000	0.895	11.6<	55.5
18	25	node Left	2466	22	0	9.4	-12.0	58.0	E(80)	62.0	3	29.0	1.000	1.000	21.4<	62.0
18	25	node Right	2466	22	0	8.6	-10.9	52.7	E(80)	62.0	3	29.0	1.000	1.000	19.5<	62.0
19	26	node Left	2466	12	0	11.4	-22.8	-2.0	E(80)	62.0	3	29.0	1.116	1.000	34.2<	69.2

19	26	node Right	2466	12	0	11.4	-22.9	-2.0	E(80)	62.0	3	29.0	1.117	1.000	34.2<	69.2
19	27	node Left	2466	12	0	9.7	-27.5	-65.1	E(80)	62.0	3	29.0	1.300	1.000	37.2<	80.6
19	27	node Right	2466	12	0	9.9	-28.4	-67.2	E(80)	62.0	3	29.0	1.300	1.000	38.3<	80.6
20	28	node Left	2466	15	0	6.8	-25.5	-89.3	E(80)	62.0	3	29.0	1.300	1.000	32.3<	80.6
20	28	node Right	2466	15	0	6.7	-25.5	-89.3	E(80)	62.0	3	29.0	1.300	1.000	32.2<	80.6
21	29	node Left	2466	15	0	5.5	-26.2	-106.9	E(80)	62.0	3	29.0	1.300	1.000	31.8<	80.6
21	29	node Right	2466	15	0	5.5	-26.2	-106.9	E(80)	62.0	3	29.0	1.300	1.000	31.8<	80.6
21	30	node Left	2466	15	0	4.2	-25.0	-107.0	E(80)	62.0	3	29.0	1.300	1.000	29.2<	80.6
21	30	node Right	2466	15	0	4.2	-25.0	-107.0	E(80)	62.0	3	29.0	1.300	1.000	29.2<	80.6
22	31	node Left	2466	15	0	2.9	-21.4	-89.6	E(80)	62.0	3	29.0	1.300	1.000	24.2<	80.6
22	31	node Right	2466	15	0	2.8	-21.4	-89.5	E(80)	62.0	3	29.0	1.300	1.000	24.2<	80.6
23	32	node Left	2466	12	0	1.8	-17.4	-67.1	E(80)	62.0	3	29.0	1.300	1.000	19.2<	80.6
23	32	node Right	2466	12	0	1.8	-17.4	-67.0	E(80)	62.0	3	29.0	1.300	1.000	19.2<	80.6
23	33	node Left	2466	12	0	0.0	-0.1	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.1<	80.6

STEEL-BOX G2

node WEB-L-2 (Web Lower edge) WEB - 2

node number	node number		Web height (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Stress range Δσce・CR・Ct・D Cycle
1	1	node Right	2364	12	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6
1	2	node Left	2367	12	0	19.2	-1.8	70.7	E(80)	62.0	3	29.0	1.000	1.000	21.0<	62.0
1	2	node Right	2367	12	0	19.2	-1.8	70.7	E(80)	62.0	3	29.0	1.000	1.000	21.0<	62.0
2	3	node Left	2370	16	0	21.5	-2.6	88.8	E(80)	62.0	3	29.0	1.000	1.000	24.2<	62.0
2	3	node Right	2370	16	0	21.5	-2.6	88.8	E(80)	62.0	3	29.0	1.000	1.000	24.2<	62.0
3	4	node Left	2374	16	0	25.2	-3.9	107.1	E(80)	62.0	3	29.0	1.000	1.000	29.1<	62.0
3	4	node Right	2374	16	0	25.2	-3.9	107.1	E(80)	62.0	3	29.0	1.000	1.000	29.1<	62.0
3	5	node Left	2377	16	0	26.6	-5.2	107.9	E(80)	62.0	3	29.0	1.000	1.000	31.8<	62.0
3	5	node Right	2377	16	0	26.6	-5.2	107.9	E(80)	62.0	3	29.0	1.000	1.000	31.8<	62.0
4	6	node Left	2382	16	0	26.0	-6.6	91.4	E(80)	62.0	3	29.0	1.000	1.000	32.6<	62.0
4	6	node Right	2382	16	0	26.0	-6.6	91.4	E(80)	62.0	3	29.0	1.000	1.000	32.6<	62.0
5	7	node Left	2388	12	0	31.4	-10.6	76.2	E(80)	62.0	3	29.0	1.000	1.000	42.0<	62.0
5	7	node Right	2388	12	0	26.3	-8.8	63.7	E(80)	62.0	3	29.0	1.000	1.000	35.1<	62.0
5	8	node Left	2394	12	0	22.1	-10.6	5.7	E(80)	62.0	3	29.0	1.000	1.000	32.6<	62.0
5	8	node Right	2394	12	0	22.1	-10.6	5.7	E(80)	62.0	3	29.0	1.000	1.000	32.6<	62.0
6	9	node Left	2400	15	0	12.5	-9.4	-55.2	E(80)	62.0	3	29.0	1.300	1.000	21.9<	80.6
6	9	node Right	2400	15	0	12.6	-9.5	-55.8	E(80)	62.0	3	29.0	1.300	1.000	22.2<	80.6
7	10	node Left	2406	29	0	4.5	-7.6	-82.8	E(80)	62.0	3	29.0	1.300	0.964	12.1<	77.7
7	10	node Right	2406	29	0	4.5	-7.6	-82.8	E(80)	62.0	3	29.0	1.300	0.964	12.1<	77.7
7	11	node Left	2412	29	0	2.2	-10.0	-140.8	E(80)	62.0	3	29.0	1.300	0.964	12.2<	77.7
7	11	node Right	2412	29	0	2.2	-10.0	-140.8	E(80)	62.0	3	29.0	1.300	0.964	12.2<	77.7
8	12	node Left	2418	22	0	5.6	-7.6	-96.9	E(80)	62.0	3	29.0	1.300	1.000	13.2<	80.6
8	12	node Right	2418	22	0	5.6	-7.6	-96.9	E(80)	62.0	3	29.0	1.300	1.000	13.2<	80.6
9	13	node Left	2425	14	0	14.0	-8.6	-51.0	E(80)	62.0	3	29.0	1.300	1.000	22.6<	80.6
9	13	node Right	2425	14	0	13.8	-8.6	-50.3	E(80)	62.0	3	29.0	1.300	1.000	22.3<	80.6
10	14	node Left	2433	12	0	18.4	-7.3	18.7	E(80)	62.0	3	29.0	1.000	1.000	25.7<	62.0
10	14	node Right	2433	12	0	18.4	-7.2	18.7	E(80)	62.0	3	29.0	1.000	1.000	25.6<	62.0
10	15	node Left	2440	12	0	27.4	-7.5	83.4	E(80)	62.0	3	29.0	1.000	1.000	35.0<	62.0
10	15	node Right	2440	12	0	27.4	-7.6	83.5	E(80)	62.0	3	29.0	1.000	1.000	35.0<	62.0
11	16	node Left	2447	18	0	23.8	-4.8	93.2	E(80)	62.0	3	29.0	1.000	1.000	28.6<	62.0
11	16	node Right	2447	18	0	23.8	-4.8	93.2	E(80)	62.0	3	29.0	1.000	1.000	28.6<	62.0
12	17	node Left	2454	18	0	24.6	-3.8	102.5	E(80)	62.0	3	29.0	1.000	1.000	28.3<	62.0
12	17	node Right	2454	18	0	24.6	-3.8	102.5	E(80)	62.0	3	29.0	1.000	1.000	28.3<	62.0
13	18	node Left	2462	18	0	23.8	-4.9	92.6	E(80)	62.0	3	29.0	1.000	1.000	28.6<	62.0
13	18	node Right	2462	18	0	23.8	-4.9	92.6	E(80)	62.0	3	29.0	1.000	1.000	28.6<	62.0
14	19	node Left	2466	12	0	27.3	-7.7	81.4	E(80)	62.0	3	29.0	1.000	1.000	35.0<	62.0
14	19	node Right	2466	12	0	27.3	-7.7	81.3	E(80)	62.0	3	29.0	1.000	1.000	35.0<	62.0
14	20	node Left	2466	12	0	18.3	-7.5	16.1	E(80)	62.0	3	29.0	1.000	1.000	25.8<	62.0
14	20	node Right	2466	12	0	18.3	-7.5	16.0	E(80)	62.0	3	29.0	1.000	1.000	25.8<	62.0
15	21	node Left	2466	14	0	13.8	-9.1	-54.3	E(80)	62.0	3	29.0	1.300	1.000	22.9<	80.6
15	21	node Right	2466	14	0	13.8	-9.2	-55.0	E(80)	62.0	3	29.0	1.300	1.000	23.0<	80.6
16	22	node Left	2466	24	0	5.4	-7.8	-95.6	E(80)	62.0	3	29.0	1.300	1.000	13.2<	80.6
16	22	node Right	2466	24	0	5.4	-7.8	-95.6	E(80)	62.0	3	29.0	1.300	1.000	13.1<	80.6
17	23	node Left	2466	31	0	1.8	-9.4	-137.8	E(80)	62.0	3	29.0	1.300	0.948	11.2<	76.4
17	23	node Right	2466	31	0	1.8	-9.4	-137.8	E(80)	62.0	3	29.0	1.300	0.948	11.2<	76.4
17	24	node Left	2466	31	0	4.2	-7.4	-82.7	E(80)	62.0	3	29.0	1.300	0.948	11.6<	76.4
17	24	node Right	2466	31	0	4.3	-7.4	-82.7	E(80)	62.0	3	29.0	1.300	0.948	11.7<	76.4
18	25	node Left	2466	16	0	12.1	-9.5	-58.4	E(80)	62.0	3	29.0	1.300	1.000	21.6<	80.6
18	25	node Right	2466	16	0	11.9	-9.5	-57.8	E(80)	62.0	3	29.0	1.300	1.000	21.4<	80.6
19	26	node Left	2466	12	0	22.4	-11.1	1.9	E(80)	62.0	3	29.0	1.000	1.000	33.5<	62.0

19	26	node	Right	2466	12	0	22.4	-11.1	2.0	E(80)	62.0	3	29.0	1.000	1.000	33.5< 62.0
19	27	node	Left	2466	12	0	27.0	-9.5	63.9	E(80)	62.0	3	29.0	1.000	1.000	36.5< 62.0
19	27	node	Right	2466	12	0	32.3	-11.3	76.4	E(80)	62.0	3	29.0	1.000	1.000	43.6< 62.0
20	28	node	Left	2466	18	0	24.9	-6.6	87.3	E(80)	62.0	3	29.0	1.000	1.000	31.5< 62.0
20	28	node	Right	2466	18	0	25.0	-6.6	87.3	E(80)	62.0	3	29.0	1.000	1.000	31.5< 62.0
21	29	node	Left	2466	18	0	25.7	-5.4	104.5	E(80)	62.0	3	29.0	1.000	1.000	31.0< 62.0
21	29	node	Right	2466	18	0	25.7	-5.4	104.5	E(80)	62.0	3	29.0	1.000	1.000	31.0< 62.0
21	30	node	Left	2466	18	0	24.5	-4.1	104.6	E(80)	62.0	3	29.0	1.000	1.000	28.6< 62.0
21	30	node	Right	2466	18	0	24.5	-4.1	104.6	E(80)	62.0	3	29.0	1.000	1.000	28.6< 62.0
22	31	node	Left	2466	18	0	20.8	-2.8	87.6	E(80)	62.0	3	29.0	1.000	1.000	23.6< 62.0
22	31	node	Right	2466	18	0	20.9	-2.7	87.5	E(80)	62.0	3	29.0	1.000	1.000	23.6< 62.0
23	32	node	Left	2466	12	0	19.8	-2.2	76.3	E(80)	62.0	3	29.0	1.000	1.000	21.9< 62.0
23	32	node	Right	2466	12	0	19.8	-2.1	76.2	E(80)	62.0	3	29.0	1.000	1.000	21.8< 62.0
23	33	node	Left	2466	12	0	0.1	0.0	0.0	E(80)	62.0	3	29.0	1.000	1.000	0.1< 62.0

STEEL-BOX G2

node HSTIFF-2 (Web H-stiff) WEB - 2

Stress range node number	node number	Web	height (mm)	t	σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・Cycle CR・Ct D
1	1	node Right	2364	12	473	0.0	0.0	0.0 G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6
1	2	node Left	2367	12	473	0.8	-9.0	-33.0 G(50)	32.0	3	15.0	1.300	1.000	9.8<	41.6
1	2	node Right	2367	12	473	0.8	-9.0	-33.0 G(50)	32.0	3	15.0	1.300	1.000	9.8<	41.6
2	3	node Left	2370	12	474	1.4	-11.4	-47.1 G(50)	32.0	3	15.0	1.300	1.000	12.8<	41.6
2	3	node Right	2370	12	474	1.4	-11.4	-47.1 G(50)	32.0	3	15.0	1.300	1.000	12.8<	41.6
3	4	node Left	2374	12	475	2.1	-13.5	-57.1 G(50)	32.0	3	15.0	1.300	1.000	15.6<	41.6
3	4	node Right	2374	12	475	2.1	-13.5	-57.1 G(50)	32.0	3	15.0	1.300	1.000	15.6<	41.6
3	5	node Left	2377	12	475	2.8	-14.2	-57.8 G(50)	32.0	3	15.0	1.300	1.000	17.0<	41.6
3	5	node Right	2377	12	475	2.8	-14.2	-57.8 G(50)	32.0	3	15.0	1.300	1.000	17.0<	41.6
4	6	node Left	2382	12	476	3.5	-14.0	-49.2 G(50)	32.0	3	15.0	1.300	1.000	17.5<	41.6
4	6	node Right	2382	12	476	3.5	-14.0	-49.2 G(50)	32.0	3	15.0	1.300	1.000	17.5<	41.6
5	7	node Left	2388	12	478	4.8	-14.4	-34.8 G(50)	32.0	3	15.0	1.300	1.000	19.2<	41.6
5	7	node Right	2388	12	478	5.0	-14.9	-36.1 G(50)	32.0	3	15.0	1.300	1.000	19.9<	41.6
5	8	node Left	2394	12	479	6.0	-12.6	-3.2 G(50)	32.0	3	15.0	1.193	1.000	18.6<	38.2
5	8	node Right	2394	12	479	6.0	-12.6	-3.2 G(50)	32.0	3	15.0	1.193	1.000	18.6<	38.2
6	9	node Left	2400	14	480	7.8	-5.9	-34.5 G(50)	32.0	3	15.0	1.300	1.000	13.7<	41.6
6	9	node Right	2400	14	480	7.7	-5.8	-33.9 G(50)	32.0	3	15.0	1.300	1.000	13.4<	41.6
7	10	node Left	2406	16	481	2.7	-4.6	-50.2 G(50)	32.0	3	15.0	1.300	1.000	7.3<	41.6
7	10	node Right	2406	16	481	2.7	-4.6	-50.2 G(50)	32.0	3	15.0	1.300	1.000	7.3<	41.6
7	11	node Left	2412	16	482	1.4	-6.1	-85.2 G(50)	32.0	3	15.0	1.300	1.000	7.4<	41.6
7	11	node Right	2412	16	482	1.4	-6.1	-85.2 G(50)	32.0	3	15.0	1.300	1.000	7.4<	41.6
8	12	node Left	2418	16	484	3.5	-4.8	-60.8 G(50)	32.0	3	15.0	1.300	1.000	8.3<	41.6
8	12	node Right	2418	16	484	3.5	-4.8	-60.8 G(50)	32.0	3	15.0	1.300	1.000	8.3<	41.6
9	13	node Left	2425	14	485	8.4	-5.2	-30.8 G(50)	32.0	3	15.0	1.300	1.000	13.7<	41.6
9	13	node Right	2425	14	485	8.5	-5.3	-31.3 G(50)	32.0	3	15.0	1.300	1.000	13.9<	41.6
10	14	node Left	2433	12	487	4.7	-11.9	-12.1 G(50)	32.0	3	15.0	1.300	1.000	16.6<	41.6
10	14	node Right	2433	12	487	4.7	-11.9	-12.1 G(50)	32.0	3	15.0	1.300	1.000	16.6<	41.6
10	15	node Left	2440	12	488	3.9	-14.0	-42.8 G(50)	32.0	3	15.0	1.300	1.000	17.9<	41.6
10	15	node Right	2440	12	488	3.9	-14.0	-42.7 G(50)	32.0	3	15.0	1.300	1.000	17.9<	41.6
11	16	node Left	2447	12	489	2.8	-14.1	-55.5 G(50)	32.0	3	15.0	1.300	1.000	16.9<	41.6
11	16	node Right	2447	12	489	2.8	-14.1	-55.5 G(50)	32.0	3	15.0	1.300	1.000	16.9<	41.6
12	17	node Left	2454	12	491	2.2	-14.8	-61.5 G(50)	32.0	3	15.0	1.300	1.000	17.0<	41.6
12	17	node Right	2454	12	491	2.2	-14.8	-61.5 G(50)	32.0	3	15.0	1.300	1.000	17.0<	41.6
13	18	node Left	2462	12	492	2.9	-14.4	-56.0 G(50)	32.0	3	15.0	1.300	1.000	17.3<	41.6
13	18	node Right	2462	12	492	2.9	-14.4	-56.0 G(50)	32.0	3	15.0	1.300	1.000	17.3<	41.6
14	19	node Left	2466	12	493	3.9	-13.9	-41.2 G(50)	32.0	3	15.0	1.300	1.000	17.8<	41.6
14	19	node Right	2466	12	493	3.9	-13.8	-41.3 G(50)	32.0	3	15.0	1.300	1.000	17.7<	41.6
14	20	node Left	2466	12	493	4.8	-11.8	-10.3 G(50)	32.0	3	15.0	1.300	1.000	16.7<	41.6
14	20	node Right	2466	12	493	4.8	-11.8	-10.3 G(50)	32.0	3	15.0	1.300	1.000	16.7<	41.6
15	21	node Left	2466	14	493	8.5	-5.7	-33.7 G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6
15	21	node Right	2466	14	493	8.3	-5.6	-33.1 G(50)	32.0	3	15.0	1.300	1.000	13.9<	41.6
16	22	node Left	2466	16	493	3.4	-4.8	-59.2 G(50)	32.0	3	15.0	1.300	1.000	8.2<	41.6
16	22	node Right	2466	16	493	3.3	-4.8	-59.2 G(50)	32.0	3	15.0	1.300	1.000	8.1<	41.6
17	23	node Left	2466	16	493	1.1	-5.6	-82.6 G(50)	32.0	3	15.0	1.300	1.000	6.7<	41.6
17	23	node Right	2466	16	493	1.1	-5.6	-82.6 G(50)	32.0	3	15.0	1.300	1.000	6.7<	41.6
17	24	node Left	2466	16	493	2.5	-4.4	-49.6 G(50)	32.0	3	15.0	1.300	1.000	7.0<	41.6
17	24	node Right	2466	16	493	2.6	-4.4	-49.7 G(50)	32.0	3	15.0	1.300	1.000	7.0<	41.6
18	25	node Left	2466	14	493	7.3	-5.7	-35.1 G(50)	32.0	3	15.0	1.300	1.000	13.0<	41.6
18	25	node Right	2466	14	493	7.4	-5.9	-35.7 G(50)	32.0	3	15.0	1.300	1.000	13.2<	41.6
19	26	node Left	2466	12	493	6.9	-13.8	-1.2 G(50)	32.0	3	15.0	1.117	1.000	20.6<	35.7

19	26	node	Right	2466	12	493	6.9	-13.8	-1.2	G(50)	32.0	3	15.0	1.117	1.000	20.7<	35.7
19	27	node	Left	2466	12	493	5.8	-16.6	-39.3	G(50)	32.0	3	15.0	1.300	1.000	22.5<	41.6
19	27	node	Right	2466	12	493	5.7	-16.3	-38.5	G(50)	32.0	3	15.0	1.300	1.000	21.9<	41.6
20	28	node	Left	2466	12	493	4.1	-15.4	-54.0	G(50)	32.0	3	15.0	1.300	1.000	19.6<	41.6
20	28	node	Right	2466	12	493	4.1	-15.4	-54.0	G(50)	32.0	3	15.0	1.300	1.000	19.5<	41.6
21	29	node	Left	2466	12	493	3.3	-15.9	-64.6	G(50)	32.0	3	15.0	1.300	1.000	19.2<	41.6
21	29	node	Right	2466	12	493	3.3	-15.9	-64.6	G(50)	32.0	3	15.0	1.300	1.000	19.2<	41.6
21	30	node	Left	2466	12	493	2.5	-15.1	-64.7	G(50)	32.0	3	15.0	1.300	1.000	17.6<	41.6
21	30	node	Right	2466	12	493	2.5	-15.1	-64.7	G(50)	32.0	3	15.0	1.300	1.000	17.6<	41.6
22	31	node	Left	2466	12	493	1.7	-12.9	-54.2	G(50)	32.0	3	15.0	1.300	1.000	14.7<	41.6
22	31	node	Right	2466	12	493	1.7	-12.9	-54.1	G(50)	32.0	3	15.0	1.300	1.000	14.6<	41.6
23	32	node	Left	2466	12	493	1.0	-9.9	-38.4	G(50)	32.0	3	15.0	1.300	1.000	11.0<	41.6
23	32	node	Right	2466	12	493	1.1	-9.9	-38.4	G(50)	32.0	3	15.0	1.300	1.000	11.0<	41.6
23	33	node	Left	2466	12	493	0.0	-0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6

STEEL-BOX G2

node POINT-U-2 (Web) WEB - 2

																	Stress range
node	node			Web				Grade								Δσce・	Cycle
number	number			height (mm)	t	σtmax (N/mm2)	σtmin	σd	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	CR・Ct	D
1	1	node	Right	2364	12	900	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6
1	2	node	Left	2367	12	900	0.2	-2.6	-9.6	G(50)	32.0	3	15.0	1.300	1.000	2.8<	41.6
1	2	node	Right	2367	12	900	0.2	-2.6	-9.6	G(50)	32.0	3	15.0	1.300	1.000	2.8<	41.6
2	3	node	Left	2370	12	900	0.5	-4.0	-16.6	G(50)	32.0	3	15.0	1.300	1.000	4.5<	41.6
2	3	node	Right	2370	12	900	0.5	-4.0	-16.6	G(50)	32.0	3	15.0	1.300	1.000	4.5<	41.6
3	4	node	Left	2374	12	900	0.7	-4.8	-20.3	G(50)	32.0	3	15.0	1.300	1.000	5.5<	41.6
3	4	node	Right	2374	12	900	0.7	-4.8	-20.3	G(50)	32.0	3	15.0	1.300	1.000	5.5<	41.6
3	5	node	Left	2377	12	900	1.0	-5.1	-20.8	G(50)	32.0	3	15.0	1.300	1.000	6.1<	41.6
3	5	node	Right	2377	12	900	1.0	-5.1	-20.8	G(50)	32.0	3	15.0	1.300	1.000	6.1<	41.6
4	6	node	Left	2382	12	900	1.3	-5.1	-18.0	G(50)	32.0	3	15.0	1.300	1.000	6.4<	41.6
4	6	node	Right	2382	12	900	1.3	-5.1	-18.0	G(50)	32.0	3	15.0	1.300	1.000	6.4<	41.6
5	7	node	Left	2388	12	900	1.4	-4.3	-10.3	G(50)	32.0	3	15.0	1.300	1.000	5.7<	41.6
5	7	node	Right	2388	12	900	2.0	-5.8	-14.0	G(50)	32.0	3	15.0	1.300	1.000	7.8<	41.6
5	8	node	Left	2394	12	900	2.3	-5.0	-1.2	G(50)	32.0	3	15.0	1.193	1.000	7.3<	38.2
5	8	node	Right	2394	12	900	2.3	-5.0	-1.2	G(50)	32.0	3	15.0	1.193	1.000	7.3<	38.2
6	9	node	Left	2400	14	900	1.7	-2.2	9.6	G(50)	32.0	3	15.0	1.000	1.000	3.8<	32.0
6	9	node	Right	2400	14	900	2.2	-2.9	12.7	G(50)	32.0	3	15.0	1.000	1.000	5.1<	32.0
7	10	node	Left	2406	16	900	1.7	-1.1	19.1	G(50)	32.0	3	15.0	1.000	1.000	2.8<	32.0
7	10	node	Right	2406	16	900	1.7	-1.1	19.1	G(50)	32.0	3	15.0	1.000	1.000	2.8<	32.0
7	11	node	Left	2412	16	900	2.3	-0.5	33.4	G(50)	32.0	3	15.0	1.000	1.000	2.9<	32.0
7	11	node	Right	2412	16	900	2.3	-0.5	33.4	G(50)	32.0	3	15.0	1.000	1.000	2.9<	32.0
8	12	node	Left	2418	16	900	1.3	-0.9	16.3	G(50)	32.0	3	15.0	1.000	1.000	2.2<	32.0
8	12	node	Right	2418	16	900	1.3	-1.0	16.3	G(50)	32.0	3	15.0	1.000	1.000	2.3<	32.0
9	13	node	Left	2425	14	900	2.1	-3.5	12.6	G(50)	32.0	3	15.0	1.000	1.000	5.6<	32.0
9	13	node	Right	2425	14	900	1.6	-2.6	9.5	G(50)	32.0	3	15.0	1.000	1.000	4.2<	32.0
10	14	node	Left	2433	12	900	2.1	-5.4	-5.6	G(50)	32.0	3	15.0	1.300	1.000	7.6<	41.6
10	14	node	Right	2433	12	900	2.2	-5.5	-5.6	G(50)	32.0	3	15.0	1.300	1.000	7.7<	41.6
10	15	node	Left	2440	12	900	1.5	-5.3	-16.1	G(50)	32.0	3	15.0	1.300	1.000	6.7<	41.6
10	15	node	Right	2440	12	900	1.4	-5.3	-16.1	G(50)	32.0	3	15.0	1.300	1.000	6.7<	41.6
11	16	node	Left	2447	12	900	1.2	-6.2	-24.3	G(50)	32.0	3	15.0	1.300	1.000	7.4<	41.6
11	16	node	Right	2447	12	900	1.2	-6.2	-24.3	G(50)	32.0	3	15.0	1.300	1.000	7.4<	41.6
12	17	node	Left	2454	12	900	1.0	-6.6	-27.3	G(50)	32.0	3	15.0	1.300	1.000	7.6<	41.6
12	17	node	Right	2454	12	900	1.0	-6.6	-27.3	G(50)	32.0	3	15.0	1.300	1.000	7.6<	41.6
13	18	node	Left	2462	12	900	1.3	-6.5	-25.3	G(50)	32.0	3	15.0	1.300	1.000	7.8<	41.6
13	18	node	Right	2462	12	900	1.3	-6.5	-25.3	G(50)	32.0	3	15.0	1.300	1.000	7.8<	41.6
14	19	node	Left	2466	12	900	1.5	-5.4	-16.0	G(50)	32.0	3	15.0	1.300	1.000	6.9<	41.6
14	19	node	Right	2466	12	900	1.5	-5.3	-16.0	G(50)	32.0	3	15.0	1.300	1.000	6.9<	41.6
14	20	node	Left	2466	12	900	2.3	-5.6	-4.9	G(50)	32.0	3	15.0	1.300	1.000	7.9<	41.6
14	20	node	Right	2466	12	900	2.3	-5.6	-4.9	G(50)	32.0	3	15.0	1.300	1.000	7.9<	41.6
15	21	node	Left	2466	14	900	1.9	-2.8	11.2	G(50)	32.0	3	15.0	1.000	1.000	4.7<	32.0
15	21	node	Right	2466	14	900	2.4	-3.7	14.5	G(50)	32.0	3	15.0	1.000	1.000	6.1<	32.0
16	22	node	Left	2466	16	900	1.6	-1.1	19.8	G(50)	32.0	3	15.0	1.000	1.000	2.7<	32.0
16	22	node	Right	2466	16	900	1.6	-1.1	19.8	G(50)	32.0	3	15.0	1.000	1.000	2.7<	32.0
17	23	node	Left	2466	16	900	2.5	-0.5	37.3	G(50)	32.0	3	15.0	1.000	1.000	3.1<	32.0
17	23	node	Right	2466	16	900	2.5	-0.5	37.3	G(50)	32.0	3	15.0	1.000	1.000	3.1<	32.0
17	24	node	Left	2466	16	900	1.9	-1.2	22.3	G(50)	32.0	3	15.0	1.000	1.000	3.1<	32.0
17	24	node	Right	2466	16	900	2.0	-1.1	22.2	G(50)	32.0	3	15.0	1.000	1.000	3.1<	32.0
18	25	node	Left	2466	14	900	2.5	-3.2	15.5	G(50)	32.0	3	15.0	1.000	1.000	5.7<	32.0
18	25	node	Right	2466	14	900	2.0	-2.6	12.4	G(50)	32.0	3	15.0	1.000	1.000	4.6<	32.0
19	26	node	Left	2466	12	900	3.2	-6.3	-0.6	G(50)	32.0	3	15.0	1.117	1.000	9.5<	35.8

19	26 node Right	2466	12	900	3.2	-6.4	-0.5	G(50)	32.0	3	15.0	1.116	1.000	9.5< 35.7
19	27 node Left	2466	12	900	2.7	-7.6	-18.0	G(50)	32.0	3	15.0	1.300	1.000	10.3< 41.6
19	27 node Right	2466	12	900	2.2	-6.2	-14.8	G(50)	32.0	3	15.0	1.300	1.000	8.4< 41.6
20	28 node Left	2466	12	900	1.9	-7.1	-24.8	G(50)	32.0	3	15.0	1.300	1.000	9.0< 41.6
20	28 node Right	2466	12	900	1.9	-7.1	-24.8	G(50)	32.0	3	15.0	1.300	1.000	9.0< 41.6
21	29 node Left	2466	12	900	1.5	-7.3	-29.7	G(50)	32.0	3	15.0	1.300	1.000	8.8< 41.6
21	29 node Right	2466	12	900	1.5	-7.3	-29.7	G(50)	32.0	3	15.0	1.300	1.000	8.8< 41.6
21	30 node Left	2466	12	900	1.2	-7.0	-29.8	G(50)	32.0	3	15.0	1.300	1.000	8.1< 41.6
21	30 node Right	2466	12	900	1.2	-7.0	-29.8	G(50)	32.0	3	15.0	1.300	1.000	8.1< 41.6
22	31 node Left	2466	12	900	0.8	-6.0	-24.9	G(50)	32.0	3	15.0	1.300	1.000	6.8< 41.6
22	31 node Right	2466	12	900	0.8	-5.9	-24.9	G(50)	32.0	3	15.0	1.300	1.000	6.7< 41.6
23	32 node Left	2466	12	900	0.4	-3.8	-14.8	G(50)	32.0	3	15.0	1.300	1.000	4.2< 41.6
23	32 node Right	2466	12	900	0.4	-3.8	-14.7	G(50)	32.0	3	15.0	1.300	1.000	4.2< 41.6
23	33 node Left	2466	12	900	0.0	-0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0< 41.6

STEEL-BOX G2

node POINT-L-2 (Web) WEB - 2

Stress range

node number	node number	Web	height (mm)	t	σtmax	σtmin	σd	(Δσf) Grade	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct
1	1	node Right	2364	12	500	0.0	0.0	0.0 G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6
1	2	node Left	2367	12	500	11.8	-1.1	43.3 G(50)	32.0	3	15.0	1.000	1.000	12.8<	32.0
1	2	node Right	2367	12	500	11.8	-1.1	43.3 G(50)	32.0	3	15.0	1.000	1.000	12.8<	32.0
2	3	node Left	2370	12	500	12.8	-1.6	53.0 G(50)	32.0	3	15.0	1.000	1.000	14.4<	32.0
2	3	node Right	2370	12	500	12.8	-1.6	53.0 G(50)	32.0	3	15.0	1.000	1.000	14.4<	32.0
3	4	node Left	2374	12	500	15.0	-2.3	63.9 G(50)	32.0	3	15.0	1.000	1.000	17.4<	32.0
3	4	node Right	2374	12	500	15.0	-2.3	63.9 G(50)	32.0	3	15.0	1.000	1.000	17.4<	32.0
3	5	node Left	2377	12	500	15.8	-3.1	64.3 G(50)	32.0	3	15.0	1.000	1.000	18.9<	32.0
3	5	node Right	2377	12	500	15.8	-3.1	64.3 G(50)	32.0	3	15.0	1.000	1.000	18.9<	32.0
4	6	node Left	2382	12	500	15.5	-3.9	54.5 G(50)	32.0	3	15.0	1.000	1.000	19.4<	32.0
4	6	node Right	2382	12	500	15.5	-3.9	54.5 G(50)	32.0	3	15.0	1.000	1.000	19.4<	32.0
5	7	node Left	2388	12	500	19.4	-6.5	47.1 G(50)	32.0	3	15.0	1.000	1.000	26.0<	32.0
5	7	node Right	2388	12	500	15.5	-5.2	37.6 G(50)	32.0	3	15.0	1.000	1.000	20.7<	32.0
5	8	node Left	2394	12	500	13.0	-6.2	3.4 G(50)	32.0	3	15.0	1.000	1.000	19.3<	32.0
5	8	node Right	2394	12	500	13.0	-6.2	3.4 G(50)	32.0	3	15.0	1.000	1.000	19.3<	32.0
6	9	node Left	2400	14	500	7.6	-5.7	-33.6 G(50)	32.0	3	15.0	1.300	1.000	13.3<	41.6
6	9	node Right	2400	14	500	7.5	-5.6	-33.0 G(50)	32.0	3	15.0	1.300	1.000	13.1<	41.6
7	10	node Left	2406	16	500	2.6	-4.5	-49.0 G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6
7	10	node Right	2406	16	500	2.6	-4.5	-49.0 G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6
7	11	node Left	2412	16	500	1.3	-5.9	-83.2 G(50)	32.0	3	15.0	1.300	1.000	7.2<	41.6
7	11	node Right	2412	16	500	1.3	-5.9	-83.2 G(50)	32.0	3	15.0	1.300	1.000	7.2<	41.6
8	12	node Left	2418	16	500	3.4	-4.7	-59.6 G(50)	32.0	3	15.0	1.300	1.000	8.1<	41.6
8	12	node Right	2418	16	500	3.4	-4.7	-59.6 G(50)	32.0	3	15.0	1.300	1.000	8.1<	41.6
9	13	node Left	2425	14	500	8.3	-5.1	-30.1 G(50)	32.0	3	15.0	1.300	1.000	13.4<	41.6
9	13	node Right	2425	14	500	8.4	-5.2	-30.7 G(50)	32.0	3	15.0	1.300	1.000	13.6<	41.6
10	14	node Left	2433	12	500	10.6	-4.2	10.8 G(50)	32.0	3	15.0	1.000	1.000	14.8<	32.0
10	14	node Right	2433	12	500	10.6	-4.1	10.8 G(50)	32.0	3	15.0	1.000	1.000	14.7<	32.0
10	15	node Left	2440	12	500	16.8	-4.6	51.1 G(50)	32.0	3	15.0	1.000	1.000	21.4<	32.0
10	15	node Right	2440	12	500	16.8	-4.7	51.2 G(50)	32.0	3	15.0	1.000	1.000	21.4<	32.0
11	16	node Left	2447	12	500	14.1	-2.9	55.2 G(50)	32.0	3	15.0	1.000	1.000	16.9<	32.0
11	16	node Right	2447	12	500	14.1	-2.9	55.2 G(50)	32.0	3	15.0	1.000	1.000	16.9<	32.0
12	17	node Left	2454	12	500	14.5	-2.2	60.7 G(50)	32.0	3	15.0	1.000	1.000	16.8<	32.0
12	17	node Right	2454	12	500	14.5	-2.2	60.7 G(50)	32.0	3	15.0	1.000	1.000	16.8<	32.0
13	18	node Left	2462	12	500	14.1	-2.9	54.9 G(50)	32.0	3	15.0	1.000	1.000	17.0<	32.0
13	18	node Right	2462	12	500	14.1	-2.9	54.9 G(50)	32.0	3	15.0	1.000	1.000	17.0<	32.0
14	19	node Left	2466	12	500	16.9	-4.7	50.3 G(50)	32.0	3	15.0	1.000	1.000	21.6<	32.0
14	19	node Right	2466	12	500	16.9	-4.7	50.2 G(50)	32.0	3	15.0	1.000	1.000	21.6<	32.0
14	20	node Left	2466	12	500	10.7	-4.4	9.4 G(50)	32.0	3	15.0	1.000	1.000	15.1<	32.0
14	20	node Right	2466	12	500	10.7	-4.4	9.3 G(50)	32.0	3	15.0	1.000	1.000	15.1<	32.0
15	21	node Left	2466	14	500	8.5	-5.6	-33.4 G(50)	32.0	3	15.0	1.300	1.000	14.1<	41.6
15	21	node Right	2466	14	500	8.2	-5.5	-32.8 G(50)	32.0	3	15.0	1.300	1.000	13.7<	41.6
16	22	node Left	2466	16	500	3.3	-4.8	-58.7 G(50)	32.0	3	15.0	1.300	1.000	8.1<	41.6
16	22	node Right	2466	16	500	3.3	-4.8	-58.7 G(50)	32.0	3	15.0	1.300	1.000	8.1<	41.6
17	23	node Left	2466	16	500	1.1	-5.6	-81.9 G(50)	32.0	3	15.0	1.300	1.000	6.6<	41.6
17	23	node Right	2466	16	500	1.1	-5.6	-81.9 G(50)	32.0	3	15.0	1.300	1.000	6.6<	41.6
17	24	node Left	2466	16	500	2.5	-4.4	-49.2 G(50)	32.0	3	15.0	1.300	1.000	6.9<	41.6
17	24	node Right	2466	16	500	2.6	-4.4	-49.2 G(50)	32.0	3	15.0	1.300	1.000	7.0<	41.6
18	25	node Left	2466	14	500	7.2	-5.7	-34.8 G(50)	32.0	3	15.0	1.300	1.000	12.9<	41.6
18	25	node Right	2466	14	500	7.3	-5.8	-35.4 G(50)	32.0	3	15.0	1.300	1.000	13.1<	41.6
19	26	node Left	2466	12	500	13.2	-6.6	1.1 G(50)	32.0	3	15.0	1.000	1.000	19.8<	32.0

19	26	node	Right	2466	12	500	13.2	-6.6	1.2	G(50)	32.0	3	15.0	1.000	1.000	19.8<	32.0
19	27	node	Left	2466	12	500	15.9	-5.6	37.7	G(50)	32.0	3	15.0	1.000	1.000	21.5<	32.0
19	27	node	Right	2466	12	500	20.0	-7.0	47.3	G(50)	32.0	3	15.0	1.000	1.000	27.0<	32.0
20	28	node	Left	2466	12	500	14.7	-3.9	51.5	G(50)	32.0	3	15.0	1.000	1.000	18.6<	32.0
20	28	node	Right	2466	12	500	14.7	-3.9	51.5	G(50)	32.0	3	15.0	1.000	1.000	18.6<	32.0
21	29	node	Left	2466	12	500	15.2	-3.2	61.6	G(50)	32.0	3	15.0	1.000	1.000	18.3<	32.0
21	29	node	Right	2466	12	500	15.2	-3.2	61.6	G(50)	32.0	3	15.0	1.000	1.000	18.3<	32.0
21	30	node	Left	2466	12	500	14.4	-2.4	61.7	G(50)	32.0	3	15.0	1.000	1.000	16.8<	32.0
21	30	node	Right	2466	12	500	14.4	-2.4	61.7	G(50)	32.0	3	15.0	1.000	1.000	16.8<	32.0
22	31	node	Left	2466	12	500	12.3	-1.6	51.7	G(50)	32.0	3	15.0	1.000	1.000	13.9<	32.0
22	31	node	Right	2466	12	500	12.3	-1.6	51.6	G(50)	32.0	3	15.0	1.000	1.000	13.9<	32.0
23	32	node	Left	2466	12	500	12.2	-1.3	47.2	G(50)	32.0	3	15.0	1.000	1.000	13.6<	32.0
23	32	node	Right	2466	12	500	12.2	-1.3	47.2	G(50)	32.0	3	15.0	1.000	1.000	13.5<	32.0
23	33	node	Left	2466	12	500	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.000	1.000	0.0<	32.0

9-3 Checking of Fatigue Stress for Cross Beam

σtmax	:	Maximum stress (Including the effect of γa)
σtmin	:	Minimum stress (Including the effect of γa)
σd	:	Stress of Dead load (Including the effect of γa)
$\Delta\sigma$max	:	σtmax－σtmin
C0	:	2.0E+6・$\Delta\sigma$f**m
$\Delta\sigma$f	:	2.0E+6 Allowable stress
m	:	Slope constant
CR	:	Correction coefficient for mean stress
Ct	:	Correction factor for t

Structural analysis coefficient Cross Beam γa = 0.500

Maximum stress range checking $\Delta\sigma$max≦$\Delta\sigma$ce・CR・Ct

Stress range cycles checking D=Σi[Σj{nti/(C0・(CR・Ct)**m/$\Delta\sigma$ij**m)}] ≦1 node U.FLG-MAX (Upper Flange Max Stress)

node	Point	Flange	t (mm)	σtmax	σtmin (N/mm2)	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)		Stress range Δσce・cyale CR・Ct (N/mm2)	D
S1	1	Beam Left	16	14.6	-13.4	8.9	E (80)	62.0	3	29.0	1.000	1.000	28.0	<	62.0	
S1	1	Beam Right	16	13.4	-14.6	-8.9	E (80)	62.0	3	29.0	1.186	1.000	28.0	<	73.5	
S2	1	Beam Left	16	12.1	-15.7	-17.8	E (80)	62.0	3	29.0	1.300	1.000	27.8	<	80.6	
S2	1	Beam Right	16	15.8	-12.2	18.5	E (80)	62.0	3	29.0	1.000	1.000	28.0	<	62.0	
PF3	1	Beam Left	12	8.5	-8.4	3.9	E (80)	62.0	3	29.0	1.000	1.000	16.9	<	62.0	
PF3	1	Beam Right	12	8.3	-8.5	-4.2	E (80)	62.0	3	29.0	1.133	1.000	16.8	<	70.3	
PF4	1	Beam Left	12	8.4	-7.1	14.2	E (80)	62.0	3	29.0	1.000	1.000	15.5	<	62.0	
PF4	1	Beam Right	12	7.3	-8.1	-16.1	E (80)	62.0	3	29.0	1.300	1.000	15.4	<	80.6	
C1	1	Beam Left	12	4.0	-4.1	2.9	E (80)	62.0	3	29.0	1.000	1.000	8.1	<	62.0	
C1	1	Beam Right	12	3.8	-4.2	-2.7	E (80)	62.0	3	29.0	1.203	1.000	8.0	<	74.6	
C2	1	Beam Left	12	10.9	-10.8	-0.2	E (80)	62.0	3	29.0	1.004	1.000	21.6	<	62.2	
C2	1	Beam Right	12	11.0	-11.1	0.5	E (80)	62.0	3	29.0	1.000	1.000	22.1	<	62.0	
C3	1	Beam Left	12	12.7	-12.5	0.4	E (80)	62.0	3	29.0	1.000	1.000	25.2	<	62.0	
C3	1	Beam Right	12	12.7	-12.9	-0.1	E (80)	62.0	3	29.0	1.004	1.000	25.6	<	62.3	
C4	1	Beam Left	12	12.8	-12.2	1.6	E (80)	62.0	3	29.0	1.000	1.000	25.0	<	62.0	
C4	1	Beam Right	12	12.4	-12.9	-1.3	E (80)	62.0	3	29.0	1.030	1.000	25.4	<	63.8	
C5	1	Beam Left	12	12.1	-11.6	0.4	E (80)	62.0	3	29.0	1.000	1.000	23.7	<	62.0	
C5	1	Beam Right	12	11.7	-12.2	-0.2	E (80)	62.0	3	29.0	1.010	1.000	23.9	<	62.6	
C6	1	Beam Left	12	11.0	-10.9	-2.2	E (80)	62.0	3	29.0	1.048	1.000	21.9	<	65.0	
C6	1	Beam Right	12	11.0	-11.1	2.4	E (80)	62.0	3	29.0	1.000	1.000	22.0	<	62.0	
C7	1	Beam Left	12	10.2	-10.4	-4.7	E (80)	62.0	3	29.0	1.121	1.000	20.5	<	69.5	
C7	1	Beam Right	12	10.4	-10.2	4.8	E (80)	62.0	3	29.0	1.000	1.000	20.7	<	62.0	
C8	1	Beam Left	12	7.4	-7.4	-3.2	E (80)	62.0	3	29.0	1.110	1.000	14.9	<	68.8	
C8	1	Beam Right	12	7.5	-7.5	3.2	E (80)	62.0	3	29.0	1.000	1.000	15.0	<	62.0	
C9	1	Beam Left	12	6.7	-7.4	0.8	E (80)	62.0	3	29.0	1.000	1.000	14.1	<	62.0	
C9	1	Beam Right	12	7.4	-6.7	-0.9	E (80)	62.0	3	29.0	1.018	1.000	14.1	<	63.1	
C10	1	Beam Left	12	7.4	-6.3	2.8	E (80)	62.0	3	29.0	1.000	1.000	13.7	<	62.0	
C10	1	Beam Right	12	6.3	-7.4	-3.0	E (80)	62.0	3	29.0	1.137	1.000	13.7	<	70.5	
C11	1	Beam Left	12	8.3	-8.9	1.8	E (80)	62.0	3	29.0	1.000	1.000	17.2	<	62.0	
C11	1	Beam Right	12	8.8	-8.2	-1.6	E (80)	62.0	3	29.0	1.038	1.000	16.9	<	64.3	
C12	1	Beam Left	12	11.0	-11.4	0.8	E (80)	62.0	3	29.0	1.000	1.000	22.5	<	62.0	
C12	1	Beam Right	12	11.3	-10.9	-0.7	E (80)	62.0	3	29.0	1.010	1.000	22.2	<	62.6	
C13	1	Beam Left	12	11.3	-12.0	-1.2	E (80)	62.0	3	29.0	1.031	1.000	23.2	<	63.9	
C13	1	Beam Right	12	11.8	-11.1	1.7	E (80)	62.0	3	29.0	1.000	1.000	22.9	<	62.0	
C14	1	Beam Left	12	11.7	-12.6	-2.0	E (80)	62.0	3	29.0	1.049	1.000	24.3	<	65.0	
C14	1	Beam Right	12	12.4	-11.4	2.9	E (80)	62.0	3	29.0	1.000	1.000	23.8	<	62.0	
C15	1	Beam Left	12	12.0	-12.8	-2.5	E (80)	62.0	3	29.0	1.058	1.000	24.8	<	65.6	
C15	1	Beam Right	12	12.6	-11.6	3.4	E (80)	62.0	3	29.0	1.000	1.000	24.2	<	62.0	
C16	1	Beam Left	12	11.7	-12.6	-2.9	E (80)	62.0	3	29.0	1.067	1.000	24.3	<	66.2	
C16	1	Beam Right	12	12.4	-11.3	3.6	E (80)	62.0	3	29.0	1.000	1.000	23.7	<	62.0	
C17	1	Beam Left	12	11.2	-12.0	-2.9	E (80)	62.0	3	29.0	1.071	1.000	23.2	<	66.4	
C17	1	Beam Right	12	11.9	-10.9	3.2	E (80)	62.0	3	29.0	1.000	1.000	22.7	<	62.0	
C18	1	Beam Left	12	10.9	-11.4	-0.5	E (80)	62.0	3	29.0	1.015	1.000	22.3	<	62.9	
C18	1	Beam Right	12	11.2	-10.7	-0.0	E (80)	62.0	3	29.0	1.000	1.000	21.9	<	62.0	
C19	1	Beam Left	12	8.5	-8.5	3.0	E (80)	62.0	3	29.0	1.000	1.000	17.0	<	62.0	
C19	1	Beam Right	12	8.4	-8.3	-4.4	E (80)	62.0	3	29.0	1.135	1.000	16.7	<	70.4	
C20	1	Beam Left	12	7.0	-6.8	8.8	E (80)	62.0	3	29.0	1.000	1.000	13.8	<	62.0	
C20	1	Beam Right	12	6.5	-6.9	-10.6	E (80)	62.0	3	29.0	1.300	1.000	13.3	<	80.6	
C21	1	Beam Left	12	7.6	-6.7	11.1	E (80)	62.0	3	29.0	1.000	1.000	14.2	<	62.0	
C21	1	Beam Right	12	6.4	-7.4	-12.9	E (80)	62.0	3	29.0	1.300	1.000	13.8	<	80.6	
C22	1	Beam Left	12	7.2	-7.6	5.0	E (80)	62.0	3	29.0	1.000	1.000	14.8	<	62.0	
C22	1	Beam Right	12	7.5	-7.0	-6.4	E (80)	62.0	3	29.0	1.243	1.000	14.5	<	77.1	

C23	1	Beam	Left	12	10.2	-10.5	1.0	E	(80)	62.0	3	29.0	1.000	1.000	20.7	<	62.0
C23	1	Beam	Right	12	10.4	-9.9	-1.8	E	(80)	62.0	3	29.0	1.038	1.000	20.3	<	64.4
C24	1	Beam	Left	12	10.8	-11.3	-2.1	E	(80)	62.0	3	29.0	1.052	1.000	22.1	<	65.2
C24	1	Beam	Right	12	11.1	-10.4	2.6	E	(80)	62.0	3	29.0	1.000	1.000	21.5	<	62.0
C25	1	Beam	Left	12	11.7	-12.3	-1.5	E	(80)	62.0	3	29.0	1.036	1.000	24.0	<	64.3
C25	1	Beam	Right	12	12.1	-11.2	2.6	E	(80)	62.0	3	29.0	1.000	1.000	23.3	<	62.0
C26	1	Beam	Left	12	12.5	-13.0	-0.7	E	(80)	62.0	3	29.0	1.018	1.000	25.5	<	63.1
C26	1	Beam	Right	12	12.8	-11.9	2.3	E	(80)	62.0	3	29.0	1.000	1.000	24.7	<	62.0
C27	1	Beam	Left	12	12.5	-13.3	-1.9	E	(80)	62.0	3	29.0	1.043	1.000	25.8	<	64.7
C27	1	Beam	Right	12	13.0	-11.9	3.6	E	(80)	62.0	3	29.0	1.000	1.000	24.9	<	62.0
C28	1	Beam	Left	12	10.5	-11.7	-3.6	E	(80)	62.0	3	29.0	1.096	1.000	22.3	<	68.0
C28	1	Beam	Right	12	11.4	-9.8	5.5	E	(80)	62.0	3	29.0	1.000	1.000	21.2	<	62.0
C29	1	Beam	Left	12	4.0	-4.7	-7.2	E	(80)	62.0	3	29.0	1.300	1.000	8.7	<	80.6
C29	1	Beam	Right	12	4.9	-3.4	8.9	E	(80)	62.0	3	29.0	1.000	1.000	8.3	<	62.0

node L.FLG-MAX (Lower flange Max Stress)

node	Point	Flange	t	σtmax	σtmin	Grade σd		(Δσf)	Δσce	m	Δσve	CR	Ct	Stress range Δσmax		Δσce・cyale CR・Ct	D
S1	1	Beam Left	16	13.4	-14.6	-8.9	E	(80)	62.0	3	29.0	1.186	1.000	28.0	<	73.5	
S1	1	Beam Right	16	14.6	-13.4	8.9	E	(80)	62.0	3	29.0	1.000	1.000	28.0	<	62.0	
S2	1	Beam Left	16	15.7	-12.1	17.8	E	(80)	62.0	3	29.0	1.000	1.000	27.8	<	62.0	
S2	1	Beam Right	16	12.2	-15.8	-18.5	E	(80)	62.0	3	29.0	1.300	1.000	28.0	<	80.6	
PF3	1	Beam Left	12	8.4	-8.5	-3.9	E	(80)	62.0	3	29.0	1.120	1.000	16.9	<	69.4	
PF3	1	Beam Right	12	8.5	-8.3	4.2	E	(80)	62.0	3	29.0	1.000	1.000	16.8	<	62.0	
PF4	1	Beam Left	12	7.1	-8.4	-14.2	E	(80)	62.0	3	29.0	1.300	1.000	15.5	<	80.6	
PF4	1	Beam Right	12	8.1	-7.3	16.1	E	(80)	62.0	3	29.0	1.000	1.000	15.4	<	62.0	
C1	1	Beam Left	12	4.1	-4.0	-2.9	E	(80)	62.0	3	29.0	1.198	1.000	8.1	<	74.3	
C1	1	Beam Right	12	4.2	-3.8	2.7	E	(80)	62.0	3	29.0	1.000	1.000	8.0	<	62.0	
C2	1	Beam Left	12	10.8	-10.9	0.2	E	(80)	62.0	3	29.0	1.000	1.000	21.6	<	62.0	
C2	1	Beam Right	12	11.1	-11.0	-0.5	E	(80)	62.0	3	29.0	1.010	1.000	22.1	<	62.7	
C3	1	Beam Left	12	12.5	-12.7	-0.4	E	(80)	62.0	3	29.0	1.010	1.000	25.2	<	62.6	
C3	1	Beam Right	12	12.9	-12.7	0.1	E	(80)	62.0	3	29.0	1.000	1.000	25.6	<	62.0	
C4	1	Beam Left	12	12.2	-12.8	-1.6	E	(80)	62.0	3	29.0	1.035	1.000	25.0	<	64.2	
C4	1	Beam Right	12	12.9	-12.4	1.3	E	(80)	62.0	3	29.0	1.000	1.000	25.4	<	62.0	
C5	1	Beam Left	12	11.6	-12.1	-0.4	E	(80)	62.0	3	29.0	1.014	1.000	23.7	<	62.9	
C5	1	Beam Right	12	12.2	-11.7	0.2	E	(80)	62.0	3	29.0	1.000	1.000	23.9	<	62.0	
C6	1	Beam Left	12	10.9	-11.0	2.2	E	(80)	62.0	3	29.0	1.000	1.000	21.9	<	62.0	
C6	1	Beam Right	12	11.1	-11.0	-2.4	E	(80)	62.0	3	29.0	1.052	1.000	22.0	<	65.2	
C7	1	Beam Left	12	10.4	-10.2	4.7	E	(80)	62.0	3	29.0	1.000	1.000	20.5	<	62.0	
C7	1	Beam Right	12	10.2	-10.4	-4.8	E	(80)	62.0	3	29.0	1.124	1.000	20.7	<	69.7	
C8	1	Beam Left	12	7.4	-7.4	3.2	E	(80)	62.0	3	29.0	1.000	1.000	14.9	<	62.0	
C8	1	Beam Right	12	7.5	-7.5	-3.2	E	(80)	62.0	3	29.0	1.109	1.000	15.0	<	68.8	
C9	1	Beam Left	12	7.4	-6.7	-0.8	E	(80)	62.0	3	29.0	1.015	1.000	14.1	<	62.9	
C9	1	Beam Right	12	6.7	-7.4	0.9	E	(80)	62.0	3	29.0	1.000	1.000	14.1	<	62.0	
C10	1	Beam Left	12	6.3	-7.4	-2.8	E	(80)	62.0	3	29.0	1.128	1.000	13.7	<	69.9	
C10	1	Beam Right	12	7.4	-6.3	3.0	E	(80)	62.0	3	29.0	1.000	1.000	13.7	<	62.0	
C11	1	Beam Left	12	8.9	-8.3	-1.8	E	(80)	62.0	3	29.0	1.041	1.000	17.2	<	64.5	
C11	1	Beam Right	12	8.2	-8.8	1.6	E	(80)	62.0	3	29.0	1.000	1.000	16.9	<	62.0	
C12	1	Beam Left	12	11.4	-11.0	-0.8	E	(80)	62.0	3	29.0	1.014	1.000	22.5	<	62.9	
C12	1	Beam Right	12	10.9	-11.3	0.7	E	(80)	62.0	3	29.0	1.000	1.000	22.2	<	62.0	
C13	1	Beam Left	12	12.0	-11.3	1.2	E	(80)	62.0	3	29.0	1.000	1.000	23.2	<	62.0	
C13	1	Beam Right	12	11.1	-11.8	-1.7	E	(80)	62.0	3	29.0	1.045	1.000	22.9	<	64.8	
C14	1	Beam Left	12	12.6	-11.7	2.0	E	(80)	62.0	3	29.0	1.000	1.000	24.3	<	62.0	
C14	1	Beam Right	12	11.4	-12.4	-2.9	E	(80)	62.0	3	29.0	1.070	1.000	23.8	<	66.3	
C15	1	Beam Left	12	12.8	-12.0	2.5	E	(80)	62.0	3	29.0	1.000	1.000	24.8	<	62.0	
C15	1	Beam Right	12	11.6	-12.6	-3.4	E	(80)	62.0	3	29.0	1.081	1.000	24.2	<	67.0	
C16	1	Beam Left	12	12.6	-11.7	2.9	E	(80)	62.0	3	29.0	1.000	1.000	24.3	<	62.0	
C16	1	Beam Right	12	11.3	-12.4	-3.6	E	(80)	62.0	3	29.0	1.089	1.000	23.7	<	67.5	
C17	1	Beam Left	12	12.0	-11.2	2.9	E	(80)	62.0	3	29.0	1.000	1.000	23.2	<	62.0	
C17	1	Beam Right	12	10.9	-11.9	-3.2	E	(80)	62.0	3	29.0	1.081	1.000	22.7	<	67.0	
C18	1	Beam Left	12	11.4	-10.9	0.5	E	(80)	62.0	3	29.0	1.000	1.000	22.3	<	62.0	
C18	1	Beam Right	12	10.7	-11.2	0.0	E	(80)	62.0	3	29.0	1.005	1.000	21.9	<	62.3	
C19	1	Beam Left	12	8.5	-8.5	-3.0	E	(80)	62.0	3	29.0	1.089	1.000	17.0	<	67.5	
C19	1	Beam Right	12	8.3	-8.4	4.4	E	(80)	62.0	3	29.0	1.000	1.000	16.7	<	62.0	
C20	1	Beam Left	12	6.8	-7.0	-8.8	E	(80)	62.0	3	29.0	1.300	1.000	13.8	<	80.6	
C20	1	Beam Right	12	6.9	-6.5	10.6	E	(80)	62.0	3	29.0	1.000	1.000	13.3	<	62.0	
C21	1	Beam Left	12	6.7	-7.6	-11.1	E	(80)	62.0	3	29.0	1.300	1.000	14.2	<	80.6	
C21	1	Beam Right	12	7.4	-6.4	12.9	E	(80)	62.0	3	29.0	1.000	1.000	13.8	<	62.0	
C22	1	Beam Left	12	7.6	-7.2	-5.0	E	(80)	62.0	3	29.0	1.175	1.000	14.8	<	72.8	
C22	1	Beam Right	12	7.0	-7.5	6.4	E	(80)	62.0	3	29.0	1.000	1.000	14.5	<	62.0	

C23	1	Beam	Left	12	10.5	-10.2	-1.0	E	(80)	62.0	3	29.0	1.020	1.000	20.7	<	63.2
C23	1	Beam	Right	12	9.9	-10.4	1.8	E	(80)	62.0	3	29.0	1.000	1.000	20.3	<	62.0
C24	1	Beam	Left	12	11.3	-10.8	2.1	E	(80)	62.0	3	29.0	1.000	1.000	22.1	<	62.0
C24	1	Beam	Right	12	10.4	-11.1	-2.6	E	(80)	62.0	3	29.0	1.068	1.000	21.5	<	66.2
C25	1	Beam	Left	12	12.3	-11.7	1.5	E	(80)	62.0	3	29.0	1.000	1.000	24.0	<	62.0
C25	1	Beam	Right	12	11.2	-12.1	-2.6	E	(80)	62.0	3	29.0	1.066	1.000	23.3	<	66.1
C26	1	Beam	Left	12	13.0	-12.5	0.7	E	(80)	62.0	3	29.0	1.000	1.000	25.5	<	62.0
C26	1	Beam	Right	12	11.9	-12.8	-2.3	E	(80)	62.0	3	29.0	1.053	1.000	24.7	<	65.3
C27	1	Beam	Left	12	13.3	-12.5	1.9	E	(80)	62.0	3	29.0	1.000	1.000	25.8	<	62.0
C27	1	Beam	Right	12	11.9	-13.0	-3.6	E	(80)	62.0	3	29.0	1.085	1.000	24.9	<	67.2
C28	1	Beam	Left	12	11.7	-10.5	3.6	E	(80)	62.0	3	29.0	1.000	1.000	22.3	<	62.0
C28	1	Beam	Right	12	9.8	-11.4	-5.5	E	(80)	62.0	3	29.0	1.159	1.000	21.2	<	71.8
C29	1	Beam	Left	12	4.7	-4.0	7.2	E	(80)	62.0	3	29.0	1.000	1.000	8.7	<	62.0
C29	1	Beam	Right	12	3.4	-4.9	-8.9	E	(80)	62.0	3	29.0	1.300	1.000	8.3	<	80.6

node　WEB-U-1　(Web Upper Edge)　WEB - 1

Stress range

Point　webe　Grade　Δσce・

cyale

t　σtmax　σtmin　σd　(Δσf)　Δσce　m　Δσve　CR　Ct　Δσmax　CR・Ct　D

S1	1 beam Left	1784	16	0	14.3	-13.1	8.7	E(80)	62.0	3	29.0	1.000	1.000	27.5<	62.0	
S1	1 beam Right	1784	16	0	13.2	-14.4	-8.7	E(80)	62.0	3	29.0	1.186	1.000	27.5<	73.5	
S2	1 beam Left	1784	16	0	11.9	-15.4	-17.5	E(80)	62.0	3	29.0	1.300	1.000	27.3<	80.6	
S2	1 beam Right	1784	16	0	15.6	-12.0	18.2	E(80)	62.0	3	29.0	1.000	1.000	27.5<	62.0	
PF3	1 beam Left	1788	12	0	8.4	-8.3	3.9	E(80)	62.0	3	29.0	1.000	1.000	16.7<	62.0	
PF3	1 beam Right	1788	12	0	8.2	-8.4	-4.1	E(80)	62.0	3	29.0	1.133	1.000	16.6<	70.3	
PF4	1 beam Left	1788	12	0	8.3	-7.0	14.0	E(80)	62.0	3	29.0	1.000	1.000	15.3<	62.0	
PF4	1 beam Right	1788	12	0	7.2	-8.0	-15.9	E(80)	62.0	3	29.0	1.300	1.000	15.2<	80.6	
C1	1 beam Left	1788	12	0	3.9	-4.0	2.9	E(80)	62.0	3	29.0	1.000	1.000	7.9<	62.0	
C1	1 beam Right	1788	12	0	3.8	-4.1	-2.7	E(80)	62.0	3	29.0	1.203	1.000	7.9<	74.6	
C2	1 beam Left	1788	12	0	10.7	-10.6	-0.2	E(80)	62.0	3	29.0	1.004	1.000	21.4<	62.2	
C2	1 beam Right	1788	12	0	10.9	-10.9	0.5	E(80)	62.0	3	29.0	1.000	1.000	21.8<	62.0	
C3	1 beam Left	1788	12	0	12.6	-12.3	0.4	E(80)	62.0	3	29.0	1.000	1.000	24.9<	62.0	
C3	1 beam Right	1788	12	0	12.6	-12.8	-0.1	E(80)	62.0	3	29.0	1.004	1.000	25.3<	62.3	
C4	1 beam Left	1788	12	0	12.6	-12.1	1.5	E(80)	62.0	3	29.0	1.000	1.000	24.7<	62.0	
C4	1 beam Right	1788	12	0	12.2	-12.8	-1.3	E(80)	62.0	3	29.0	1.030	1.000	25.0<	63.8	
C5	1 beam Left	1788	12	0	12.0	-11.4	0.4	E(80)	62.0	3	29.0	1.000	1.000	23.4<	62.0	
C5	1 beam Right	1788	12	0	11.6	-12.1	-0.2	E(80)	62.0	3	29.0	1.010	1.000	23.6<	62.6	
C6	1 beam Left	1788	12	0	10.8	-10.7	-2.2	E(80)	62.0	3	29.0	1.048	1.000	21.6<	65.0	
C6	1 beam Right	1788	12	0	10.8	-10.9	2.4	E(80)	62.0	3	29.0	1.000	1.000	21.8<	62.0	
C7	1 beam Left	1788	12	0	10.0	-10.2	-4.6	E(80)	62.0	3	29.0	1.121	1.000	20.3<	69.5	
C7	1 beam Right	1788	12	0	10.3	-10.1	4.8	E(80)	62.0	3	29.0	1.000	1.000	20.4<	62.0	
C8	1 beam Left	1788	12	0	7.3	-7.3	-3.2	E(80)	62.0	3	29.0	1.110	1.000	14.7<	68.8	
C8	1 beam Right	1788	12	0	7.4	-7.4	3.2	E(80)	62.0	3	29.0	1.000	1.000	14.8<	62.0	
C9	1 beam Left	1788	12	0	6.6	-7.3	0.8	E(80)	62.0	3	29.0	1.000	1.000	13.9<	62.0	
C9	1 beam Right	1788	12	0	7.3	-6.6	-0.9	E(80)	62.0	3	29.0	1.018	1.000	13.9<	63.1	
C10	1 beam Left	1788	12	0	7.3	-6.2	2.8	E(80)	62.0	3	29.0	1.000	1.000	13.5<	62.0	
C10	1 beam Right	1788	12	0	6.2	-7.3	-3.0	E(80)	62.0	3	29.0	1.137	1.000	13.5<	70.5	
C11	1 beam Left	1788	12	0	8.2	-8.8	1.7	E(80)	62.0	3	29.0	1.000	1.000	17.0<	62.0	
C11	1 beam Right	1788	12	0	8.6	-8.1	-1.6	E(80)	62.0	3	29.0	1.038	1.000	16.7<	64.3	
C12	1 beam Left	1788	12	0	10.9	-11.3	0.8	E(80)	62.0	3	29.0	1.000	1.000	22.1<	62.0	
C12	1 beam Right	1788	12	0	11.1	-10.7	-0.7	E(80)	62.0	3	29.0	1.010	1.000	21.9<	62.6	
C13	1 beam Left	1788	12	0	11.1	-11.8	-1.2	E(80)	62.0	3	29.0	1.031	1.000	22.9<	63.9	
C13	1 beam Right	1788	12	0	11.7	-10.9	1.7	E(80)	62.0	3	29.0	1.000	1.000	22.6<	62.0	
C14	1 beam Left	1788	12	0	11.6	-12.4	-2.0	E(80)	62.0	3	29.0	1.049	1.000	24.0<	65.0	
C14	1 beam Right	1788	12	0	12.2	-11.2	2.8	E(80)	62.0	3	29.0	1.000	1.000	23.5<	62.0	
C15	1 beam Left	1788	12	0	11.8	-12.6	-2.5	E(80)	62.0	3	29.0	1.058	1.000	24.4<	65.6	
C15	1 beam Right	1788	12	0	12.5	-11.4	3.4	E(80)	62.0	3	29.0	1.000	1.000	23.9<	62.0	
C16	1 beam Left	1788	12	0	11.6	-12.4	-2.8	E(80)	62.0	3	29.0	1.067	1.000	24.0<	66.2	
C16	1 beam Right	1788	12	0	12.2	-11.2	3.6	E(80)	62.0	3	29.0	1.000	1.000	23.4<	62.0	
C17	1 beam Left	1788	12	0	11.1	-11.9	-2.9	E(80)	62.0	3	29.0	1.071	1.000	22.9<	66.4	
C17	1 beam Right	1788	12	0	11.7	-10.7	3.1	E(80)	62.0	3	29.0	1.000	1.000	22.4<	62.0	
C18	1 beam Left	1788	12	0	10.8	-11.2	-0.5	E(80)	62.0	3	29.0	1.015	1.000	22.0<	62.9	
C18	1 beam Right	1788	12	0	11.1	-10.5	-0.0	E(80)	62.0	3	29.0	1.000	1.000	21.6<	62.0	
C19	1 beam Left	1788	12	0	8.4	-8.4	3.0	E(80)	62.0	3	29.0	1.000	1.000	16.8<	62.0	
C19	1 beam Right	1788	12	0	8.3	-8.2	-4.3	E(80)	62.0	3	29.0	1.135	1.000	16.5<	70.4	
C20	1 beam Left	1788	12	0	7.0	-6.7	8.7	E(80)	62.0	3	29.0	1.000	1.000	13.6<	62.0	
C20	1 beam Right	1788	12	0	6.4	-6.8	-10.5	E(80)	62.0	3	29.0	1.300	1.000	13.2<	80.6	
C21	1 beam Left	1788	12	0	7.5	-6.6	10.9	E(80)	62.0	3	29.0	1.000	1.000	14.0<	62.0	
C21	1 beam Right	1788	12	0	6.3	-7.3	-12.7	E(80)	62.0	3	29.0	1.300	1.000	13.6<	80.6	
C22	1 beam Left	1788	12	0	7.1	-7.5	4.9	E(80)	62.0	3	29.0	1.000	1.000	14.6<	62.0	

C22	1	beam	Right	1788	12	0	7.4	-6.9	-6.3	E(80)	62.0	3	29.0	1.243	1.000	14.3< 77.1
C23	1	beam	Left	1788	12	0	10.0	-10.4	1.0	E(80)	62.0	3	29.0	1.000	1.000	20.4< 62.0
C23	1	beam	Right	1788	12	0	10.2	-9.8	-1.8	E(80)	62.0	3	29.0	1.038	1.000	20.0< 64.4
C24	1	beam	Left	1788	12	0	10.6	-11.2	-2.0	E(80)	62.0	3	29.0	1.052	1.000	21.8< 65.2
C24	1	beam	Right	1788	12	0	11.0	-10.2	2.5	E(80)	62.0	3	29.0	1.000	1.000	21.2< 62.0
C25	1	beam	Left	1788	12	0	11.5	-12.2	-1.5	E(80)	62.0	3	29.0	1.036	1.000	23.7< 64.3
C25	1	beam	Right	1788	12	0	12.0	-11.0	2.6	E(80)	62.0	3	29.0	1.000	1.000	23.0< 62.0
C26	1	beam	Left	1788	12	0	12.3	-12.8	-0.7	E(80)	62.0	3	29.0	1.018	1.000	25.1< 63.1
C26	1	beam	Right	1788	12	0	12.6	-11.8	2.2	E(80)	62.0	3	29.0	1.000	1.000	24.4< 62.0
C27	1	beam	Left	1788	12	0	12.3	-13.1	-1.9	E(80)	62.0	3	29.0	1.043	1.000	25.4< 64.7
C27	1	beam	Right	1788	12	0	12.9	-11.7	3.6	E(80)	62.0	3	29.0	1.000	1.000	24.6< 62.0
C28	1	beam	Left	1788	12	0	10.4	-11.6	-3.6	E(80)	62.0	3	29.0	1.096	1.000	22.0< 67.9
C28	1	beam	Right	1788	12	0	11.2	-9.7	5.4	E(80)	62.0	3	29.0	1.000	1.000	20.9< 62.0
C29	1	beam	Left	1788	12	0	4.0	-4.6	-7.1	E(80)	62.0	3	29.0	1.300	1.000	8.6< 80.6
C29	1	beam	Right	1788	12	0	4.9	-3.4	8.8	E(80)	62.0	3	29.0	1.000	1.000	8.2< 62.0

node WEB-L-1 (Web lower Edge) WEB - 1

Stress range Δσce・ cyale

Point webe Grade

t σtmax σtmin σd (Δσf) Δσce m Δσve CR Ct Δσmax CR・Ct D

S1	1	beam	Left	1784	16	0	13.1	-14.3	-8.7	E(80)	62.0	3	29.0	1.186	1.000	27.5<	73.5
S1	1	beam	Right	1784	16	0	14.4	-13.2	8.7	E(80)	62.0	3	29.0	1.000	1.000	27.5<	62.0
S2	1	beam	Left	1784	16	0	15.4	-11.9	17.5	E(80)	62.0	3	29.0	1.000	1.000	27.3<	62.0
S2	1	beam	Right	1784	16	0	12.0	-15.6	-18.2	E(80)	62.0	3	29.0	1.300	1.000	27.5<	80.6
PF3	1	beam	Left	1788	12	0	8.3	-8.4	-3.9	E(80)	62.0	3	29.0	1.120	1.000	16.7<	69.4
PF3	1	beam	Right	1788	12	0	8.4	-8.2	4.1	E(80)	62.0	3	29.0	1.000	1.000	16.6<	62.0
PF4	1	beam	Left	1788	12	0	7.0	-8.3	-14.0	E(80)	62.0	3	29.0	1.300	1.000	15.3<	80.6
PF4	1	beam	Right	1788	12	0	8.0	-7.2	15.9	E(80)	62.0	3	29.0	1.000	1.000	15.2<	62.0
C1	1	beam	Left	1788	12	0	4.0	-3.9	-2.9	E(80)	62.0	3	29.0	1.198	1.000	7.9<	74.3
C1	1	beam	Right	1788	12	0	4.1	-3.8	2.7	E(80)	62.0	3	29.0	1.000	1.000	7.9<	62.0
C2	1	beam	Left	1788	12	0	10.6	-10.7	0.2	E(80)	62.0	3	29.0	1.000	1.000	21.4<	62.0
C2	1	beam	Right	1788	12	0	10.9	-10.9	-0.5	E(80)	62.0	3	29.0	1.010	1.000	21.8<	62.6
C3	1	beam	Left	1788	12	0	12.3	-12.6	-0.4	E(80)	62.0	3	29.0	1.010	1.000	24.9<	62.6
C3	1	beam	Right	1788	12	0	12.8	-12.6	0.1	E(80)	62.0	3	29.0	1.000	1.000	25.3<	62.0
C4	1	beam	Left	1788	12	0	12.1	-12.6	-1.5	E(80)	62.0	3	29.0	1.035	1.000	24.7<	64.2
C4	1	beam	Right	1788	12	0	12.8	-12.2	1.3	E(80)	62.0	3	29.0	1.000	1.000	25.0<	62.0
C5	1	beam	Left	1788	12	0	11.4	-12.0	-0.4	E(80)	62.0	3	29.0	1.014	1.000	23.4<	62.9
C5	1	beam	Right	1788	12	0	12.1	-11.6	0.2	E(80)	62.0	3	29.0	1.000	1.000	23.6<	62.0
C6	1	beam	Left	1788	12	0	10.7	-10.8	2.2	E(80)	62.0	3	29.0	1.000	1.000	21.6<	62.0
C6	1	beam	Right	1788	12	0	10.9	-10.8	-2.4	E(80)	62.0	3	29.0	1.052	1.000	21.8<	65.2
C7	1	beam	Left	1788	12	0	10.2	-10.0	4.6	E(80)	62.0	3	29.0	1.000	1.000	20.3<	62.0
C7	1	beam	Right	1788	12	0	10.1	-10.3	-4.8	E(80)	62.0	3	29.0	1.124	1.000	20.4<	69.7
C8	1	beam	Left	1788	12	0	7.3	-7.3	3.2	E(80)	62.0	3	29.0	1.000	1.000	14.7<	62.0
C8	1	beam	Right	1788	12	0	7.4	-7.4	-3.2	E(80)	62.0	3	29.0	1.109	1.000	14.8<	68.8
C9	1	beam	Left	1788	12	0	7.3	-6.6	-0.8	E(80)	62.0	3	29.0	1.015	1.000	13.9<	62.9
C9	1	beam	Right	1788	12	0	6.6	-7.3	0.9	E(80)	62.0	3	29.0	1.000	1.000	13.9<	62.0
C10	1	beam	Left	1788	12	0	6.2	-7.3	-2.8	E(80)	62.0	3	29.0	1.128	1.000	13.5<	69.9
C10	1	beam	Right	1788	12	0	7.3	-6.2	3.0	E(80)	62.0	3	29.0	1.000	1.000	13.5<	62.0
C11	1	beam	Left	1788	12	0	8.8	-8.2	-1.7	E(80)	62.0	3	29.0	1.041	1.000	17.0<	64.5
C11	1	beam	Right	1788	12	0	8.1	-8.6	1.6	E(80)	62.0	3	29.0	1.000	1.000	16.7<	62.0
C12	1	beam	Left	1788	12	0	11.3	-10.9	-0.8	E(80)	62.0	3	29.0	1.014	1.000	22.1<	62.9
C12	1	beam	Right	1788	12	0	10.7	-11.1	0.7	E(80)	62.0	3	29.0	1.000	1.000	21.9<	62.0
C13	1	beam	Left	1788	12	0	11.8	-11.1	1.2	E(80)	62.0	3	29.0	1.000	1.000	22.9<	62.0
C13	1	beam	Right	1788	12	0	10.9	-11.7	-1.7	E(80)	62.0	3	29.0	1.044	1.000	22.6<	64.8
C14	1	beam	Left	1788	12	0	12.4	-11.6	2.0	E(80)	62.0	3	29.0	1.000	1.000	24.0<	62.0
C14	1	beam	Right	1788	12	0	11.2	-12.2	-2.8	E(80)	62.0	3	29.0	1.070	1.000	23.5<	66.3
C15	1	beam	Left	1788	12	0	12.6	-11.8	2.5	E(80)	62.0	3	29.0	1.000	1.000	24.4<	62.0
C15	1	beam	Right	1788	12	0	11.4	-12.5	-3.4	E(80)	62.0	3	29.0	1.081	1.000	23.9<	67.0
C16	1	beam	Left	1788	12	0	12.4	-11.6	2.8	E(80)	62.0	3	29.0	1.000	1.000	24.0<	62.0
C16	1	beam	Right	1788	12	0	11.2	-12.2	-3.6	E(80)	62.0	3	29.0	1.089	1.000	23.4<	67.5
C17	1	beam	Left	1788	12	0	11.9	-11.1	2.9	E(80)	62.0	3	29.0	1.000	1.000	22.9<	62.0
C17	1	beam	Right	1788	12	0	10.7	-11.7	-3.1	E(80)	62.0	3	29.0	1.081	1.000	22.4<	67.0
C18	1	beam	Left	1788	12	0	11.2	-10.8	0.5	E(80)	62.0	3	29.0	1.000	1.000	22.0<	62.0
C18	1	beam	Right	1788	12	0	10.5	-11.1	0.0	E(80)	62.0	3	29.0	1.005	1.000	21.6<	62.3
C19	1	beam	Left	1788	12	0	8.4	-8.4	-3.0	E(80)	62.0	3	29.0	1.089	1.000	16.8<	67.5
C19	1	beam	Right	1788	12	0	8.2	-8.3	4.3	E(80)	62.0	3	29.0	1.000	1.000	16.5<	62.0
C20	1	beam	Left	1788	12	0	6.7	-7.0	-8.7	E(80)	62.0	3	29.0	1.300	1.000	13.6<	80.6
C20	1	beam	Right	1788	12	0	6.8	-6.4	10.5	E(80)	62.0	3	29.0	1.000	1.000	13.2<	62.0
C21	1	beam	Left	1788	12	0	6.6	-7.5	-10.9	E(80)	62.0	3	29.0	1.300	1.000	14.0<	80.6
C21	1	beam	Right	1788	12	0	7.3	-6.3	12.7	E(80)	62.0	3	29.0	1.000	1.000	13.6<	62.0
C22	1	beam	Left	1788	12	0	7.5	-7.1	-4.9	E(80)	62.0	3	29.0	1.175	1.000	14.6<	72.8

C22	1	beam	Right	1788	12	0	6.9	-7.4	6.3	E(80)	62.0	3	29.0	1.000	1.000	14.3< 62.0
C23	1	beam	Left	1788	12	0	10.4	-10.0	-1.0	E(80)	62.0	3	29.0	1.020	1.000	20.4< 63.2
C23	1	beam	Right	1788	12	0	9.8	-10.2	1.8	E(80)	62.0	3	29.0	1.000	1.000	20.0< 62.0
C24	1	beam	Left	1788	12	0	11.2	-10.6	2.0	E(80)	62.0	3	29.0	1.000	1.000	21.8< 62.0
C24	1	beam	Right	1788	12	0	10.2	-11.0	-2.5	E(80)	62.0	3	29.0	1.068	1.000	21.2< 66.2
C25	1	beam	Left	1788	12	0	12.2	-11.5	1.5	E(80)	62.0	3	29.0	1.000	1.000	23.7< 62.0
C25	1	beam	Right	1788	12	0	11.0	-12.0	-2.6	E(80)	62.0	3	29.0	1.066	1.000	23.0< 66.1
C26	1	beam	Left	1788	12	0	12.8	-12.3	0.7	E(80)	62.0	3	29.0	1.000	1.000	25.1< 62.0
C26	1	beam	Right	1788	12	0	11.8	-12.6	-2.2	E(80)	62.0	3	29.0	1.053	1.000	24.4< 65.3
C27	1	beam	Left	1788	12	0	13.1	-12.3	1.9	E(80)	62.0	3	29.0	1.000	1.000	25.4< 62.0
C27	1	beam	Right	1788	12	0	11.7	-12.9	-3.6	E(80)	62.0	3	29.0	1.085	1.000	24.6< 67.2
C28	1	beam	Left	1788	12	0	11.6	-10.4	3.6	E(80)	62.0	3	29.0	1.000	1.000	22.0< 62.0
C28	1	beam	Right	1788	12	0	9.7	-11.2	-5.4	E(80)	62.0	3	29.0	1.159	1.000	20.9< 71.8
C29	1	beam	Left	1788	12	0	4.6	-4.0	7.1	E(80)	62.0	3	29.0	1.000	1.000	8.6< 62.0
C29	1	beam	Right	1788	12	0	3.4	-4.9	-8.8	E(80)	62.0	3	29.0	1.300	1.000	8.2< 80.6

§10. Design of Bridge Accessories

10-1 Design of Bearing

Design of Lubber Bearing - for Steel-I Girder Bridge

1. Design Condition

(1) Horizontal Seismic Coefficient

			Horizontal Seismic Coefficient	
			n Bridge Axis Directio	In the Direction of Perpendicular to Bridge Axis
			Level 1	Level 1
No	Area	ype of Grou	kh	kh
PF2	A2	Type III	0.30	0.30
PF3	A2	Type III	0.30	0.30
PF4	A2	Type III	0.30	0.30
PF5	A2	Type III	0.30	0.30

(2) Design Reaction Force

	Design Reaction Force						
	Maximum of Bearing		Minimum of Bearing	Dead Load		Total of Dead Load	Live Load
	Rmax1	Rmax2	Rmin	Rdmax	Rdmin	ΣRd	RL+I
No	kN	kN	kN	kN	kN	kN	kN
PF2	2672.1	2461.2	1285.3	1673.1	1505.8	3178.9	999.1
PF3	7428.3	7291.5	5266.4	5567.6	5489.0	11056.6	---
PF4	7480.6	7276.5	5376.4	5627.6	5485.7	11113.3	---
PF5	2844.9	2266.6	1179.1	1778.2	1378.0	3156.3	1066.6

(3) Regular Displacement

		Indeterminate				Total	
	Temp. Change	Dry Shrinkage/ Creep/	Dead Load	Total	Live Load	+30℃	-30℃
	ΔLt	ΔLscp	ΔLd	ΔL'	ΔLr	ΔL	ΔL
No	mm	mm	mm	mm	mm	mm	mm
PF2	±26.8	----	----	----	7.0	33.7	-19.8
PF3	±10.5	----	----	----	5.3	15.8	-5.2
PF4	±10.5	----	----	----	5.5	16.0	-5.0
PF5	±26.8	----	----	----	6.7	33.5	-20.1

※ Positive number means expanding, while negative number means shrinking.
The larger value is adopted comparing absolute value to check the allowable stress.

(4) Oblique and Rotation Angle

	Oblique Angle			Rotation Angle
	θ			Σαe
No	°	′	″	rad
PF2	90	0	0	1 / 230
PF3	90	0	0	1 / 300
PF4	90	0	0	1 / 290
PF5	90	0	0	1 / 238

(5) Allowable Value

Item		Code	Unit	Value	
Maximum Compressive Stress	Under	σmaxa	N/mm2	≦ 8.0 ≦ S1 ≦ 12.0	
Difference of Compressive Stress	Under Design Load	Δσa	N/mm2	≦ 5.0 --- S1 ≦ 8 ≦ 5+0.375(S1-8) ≦ 6.5 --- S1 ＞ 8	
Tensile Stress	Under Earthquake	σta	N/mm2	≦ 1.2 --- G6 ≦ 1.6 --- G8 ≦ 2.0 --- G10以上	
Shear Strain	Under Design Load	γsa	%	≦ 70	
	Level 1	γsea	%	≦ 150	
Safety Factor of Local Shear Strain	Under Design	fs	----	1.5	
Stress of Stiffener	Under Design Load	σsa	N/mm2	≦ 140.0	
	Under Earthquake	σsa		≦ 210.0	

2. Calculation

(1) Calculation of Vertical Force

1) Vertical Force under Earthquake

RL = Rdmax + √ RHEQ^2 + RVEQmax^2

RU = Rdmin - √ RHEQ^2 + RVEQmin^2

2) Vertical force due to horizontal force applied in the direction of perpendicular to bridge axis

$$RHEQ = \frac{H \cdot hs}{\Sigma xi^2} \cdot xi$$

hs : Vertical distance from a bearing to a center of girder
xi : Horizontal distance from a bearing to a center of girder

	Vertical Distance	Horizontal Distance	
	hs	xi	Σxi^2
No	m	m	m2
PF2	2.40	3.20	20.48
PF3	2.40	3.20	20.48
PF4	2.40	3.20	20.48
PF5	2.40	3.20	20.48

3) Vertical Force generated by Design Vertical Seismic Coefficient (kv)

RVEQmax = kv ・ Rdmax

RVEQmin = kv ・ Rdmin

	Vertical Seismic Coefficient	
	Level 1	
	In Bridge Axis Direction	In the Direction of Perpendicular to Bridge Axis
No	kv	kv
PF2	0.12	0.12
PF3	0.12	0.12
PF4	0.12	0.12
PF5	0.12	0.12

10) Result

・ Stiffness and Coefficient

No	Stiffness		Coefficient				
	Horizontal	Vertical	Shape	Secondary shape		Distortion	Local inspection
	KB	KV	S1	S2	S2	E	E
	kN/mm	kN/mm	----	Bridge Axis Direction	Perpendicular to Bridge	N/mm2	N/mm2
PF2	5.75	1177.6	6.72	5.60	6.00	302.27	299.88
PF3	18.64	2748.4	8.93	6.39	6.39	401.64	527.18
PF4	18.64	2748.4	8.93	6.39	6.39	401.64	527.18
PF5	5.76	1177.6	6.72	5.60	6.00	302.27	299.88

・ Displacement under earthquake

No	Bridge Axis Direction	Perpendicular to Bridge Axis
	Level 1	Level 2
	UB	UB
	mm	mm
PF2	76.1	----
PF3	76.2	----
PF4	62.3	----
PF5	57.9	----

・ Bearing surface area

No	Bridge Axis Direction		Perpendicular to Bridge Axis	Distortion	
	Stationary	Earthquake Level1	Earthquake Level2	Bearing load	Live load
	Acn	Ace	Ace	δo	δcl
	m2	m2	m2	mm	mm
PF2	0.4617	0.3625	0.4870	2.39	0.42
PF3	1.2135	1.1282	1.2317	2.74	----
PF4	1.2133	1.1650	1.2317	2.76	----
PF5	0.4619	0.4000	0.4870	2.55	0.45

・ Checking of Stationary load

	Compressive stress			Buckling	Strain		Local shear strain				Stiffener
	Max	Min	Max-Min	Stress	Rotation	Vertical	Vertical	Shear	Rotation	Total	stress
	σmax	σmin	Δσ	σcra	δr	δc	γc	γs	γr	γt	σs
No	N/mm2	N/mm2	N/mm2	N/mm2	mm	mm	%	%	%	%	N/mm2
PF2	5.79	2.64	3.15	15.05	1.52	1.61	110.20	27.00	29.33	166.52	96.47
PF3	6.12	4.28	1.85	22.81	1.92	2.04	88.09	8.80	35.41	132.29	91.82
PF4	6.17	4.36	1.80	22.81	1.98	2.04	88.73	8.90	36.63	134.25	92.48
PF5	6.16	2.42	3.74	15.05	1.47	1.48	117.27	26.81	28.34	172.43	102.66
Allowable Value	≦ 8.0 ≦ S1 ≦ 12.0	----	≦ 5.0 - S1≦8 5+0.375・(S1-8) ≧6.5- S1＞8	≧σmax	----	≧ δr	----	≦ 70	----	≦γu/1.5	≦140.0

・ Checking for seismic resistance level 1

	In Bridge Axis Direction											
	Displacement	Shear strain	Lateral force	Shear stress (lead)		Yield load	Equivalent elastic constant	Primary	Secondary	K1・K2 intersection point		Equivalent attenuation
					Yield							
	UB	γ	F	q	qo	Qd	KB	K1	K2	Qy	Uy	hB
No	mm	---	kN	N/mm2	N/mm2	kN	kN/mm	kN/mm	kN/mm	kN	mm	---
PF2	76.10	0.43	602.68	10.40	8.34	316.92	11.31	24.41	3.76	374.54	15.34	0.267
PF3	76.20	0.30	1164.07	8.80	7.06	640.87	21.82	44.63	6.87	757.39	16.97	0.272
PF4	62.30	0.24	951.72	7.20	5.77	523.97	21.82	44.63	6.87	619.23	13.87	0.272
PF5	57.90	0.32	523.97	9.63	7.72	293.59	12.93	25.86	3.98	346.97	13.42	0.274

	In the Direction of Perpendicular to Bridge Axis											
	Displacement	Shear strain	Lateral force	shear stress (lead)		Yeild load	Equivalent elastic stiffness	Primary	Secondary	K1・K2 intersection point		Equivalent attenuation
					yeild							
	UB	γ	F	q	qo	Qd	KB	K1	K2	Qy	Uy	hB
No	mm	---	kN	N/mm2	N/mm2	kN	kN/mm	kN/mm	kN/mm	kN	mm	---
PF2	---	---	---	---	---	---	---	---	---	---	---	---
PF3	---	---	---	---	---	---	---	---	---	---	---	---
PF4	---	---	---	---	---	---	---	---	---	---	---	---
PF5	---	---	---	---	---	---	---	---	---	---	---	---

	Bridge Axis Direction					Perpendicular to Bridge Axis					Tension
	Bearing stress	Tension stress	Buckling stress	Shear strain	sttifener stress	Bearing stress	Tension stress	Buckling stress	Shear strain	Sttifener stress	Stress
											-0.3Rd
	σce	σte	σcrae	γse	σse	σce	σte	σcrae	γse	σse	σte
No	N/mm2	N/mm2	N/mm2	%	N/mm2	N/mm2	N/mm2	N/mm2	%	N/mm2	N/mm2
PF2	4.36	----	25.08	60.88	72.64	4.28	----	26.87	----	71.30	1.03
PF3	5.45	----	38.02	42.33	81.76	5.67	----	38.02	----	85.00	1.36
PF4	5.43	----	38.02	34.61	81.50	5.72	----	38.02	----	85.84	1.37
PF5	4.49	----	25.08	46.32	74.83	4.50	----	26.87	----	75.04	1.10
Allowable value	----	≦ σta	≧ σce	≦ 150	≦ 210.0	----	≦ σta	≧ σce	≦ 150	≦ 210.0	≦ σta

(4) Summary

No	Type	Size			Rubber				Stiffener	Bearing stiffness	
		Perpendicular to Bridge Axis	Bridge Axis Direction	Thickness	Elastic modulus	Thickness	Number of layers	Total thickness	Stiffener	Horizontal	Vertical
		b'	a'	t	Ge	te	n	Σte	ts	KB	KV
No	Type	mm	mm	mm	N/mm2	mm	Layer	mm	mm	kN/mm	kN/mm
PF2	N R	770	720	219	1.00	25	5	125	4.5	5.75	1177.6
PF3	N R	1170	1170	314	1.00	30	6	180	6.0	18.64	2748.4
PF4	N R	1170	1170	314	1.00	30	6	180	6.0	18.64	2748.4
PF5	N R	770	720	219	1.00	25	5	125	4.5	5.76	1177.6

Bearing Condition for Substructure Design

$$\text{Difference} = \frac{UB-UB'}{UB} \times 100 \quad (\%)$$

	ΣKB(kN/m)	Seismic Force (kN)	Assumed displacement value (m)	Actual displacement (m)	Difference (%)
Bridge 1-Support-1	------	------	------	------	------
Bridge 1-Support-2	------	------	------	------	------
Bridge 1-Support-3	------	------	------	------	------
Bridge 2-Support-1	2.263632E+004	1609.673	0.0761	0.0711	6.501
Bridge 2-Support-2	4.364701E+004	3114.750	0.0762	0.0714	6.328
Bridge 2-Support-3	4.364701E+004	2529.781	0.0623	0.0580	6.978
Bridge 2-Support-4	2.585569E+004	1372.176	0.0579	0.0531	8.319
Bridge 3-Support-1	------	------	------	------	------
Bridge 3-Support-2	------	------	------	------	------
Bridge 3-Support-3	------	------	------	------	------
Bridge 4-Support-1	------	------	------	------	------
Bridge 4-Support-2	------	------	------	------	------
Bridge 4-Support-3	------	------	------	------	------
Bridge 4-Support-4	------	------	------	------	------
Bridge 4-Support-5	------	------	------	------	------
Bridge 5-Support-1	4.117886E+004	1066.506	0.0272	0.0259	4.952
Bridge 5-Support-2	6.550148E+004	1663.639	0.0266	0.0254	4.664
Bridge 5-Support-3	6.550148E+004	1829.754	0.0292	0.0279	4.389
Bridge 5-Support-4	4.056619E+004	1265.081	0.0328	0.0312	4.820
Bridge 6-Support-1	------	------	------	------	------
Bridge 6-Support-2	------	------	------	------	------
Bridge 6-Support-3	------	------	------	------	------

10-2 Bridge drainage

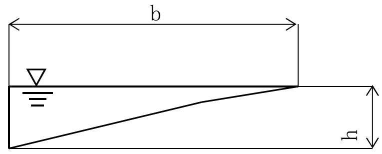
Calculation for catchpit interval

1.Design conditions

Rain intensity	I=	β x 149.0 = 149	mm/h
	β =	1.00	
Discharge coefficient	C =	0.9	
Roughness coefficient	n =	0.013	
Safety factor	k =	0.8	
Minimum interval	L=	5.000	m

1) Caliculation for catchpit interval

$$Ls=\frac{2.46x10^{-8} x A x R^{2/3} \cdot i^{1/2}}{\beta \ x \ rh \ x \ B}$$



Ls : Interval(m) (Ls≦20m)
A : flowing area (m2) A=1/2xhxb
R : Depth(m)、R = A / S
S : flowing length   S=h+√(b2+h2)
i : Longitudinal slope
β x rh : Design rain intensity
B : Road width (m)

Calculateion of Catch Pit Interval

Fly Over (Left Side)

		Length	C.L Height	Longitudinal Slope	Transverse Gradient	Flowing water Width	Depth h	Flow area A	Wetted per Imte	Hydraulic mean depth	Watershed width	Rain intensity	Fall rate	Drainage PIT Maximum Interval	PIT Interval
		(m)	(m)	(%)	(%)	(m)	(m)	A (m2)	P (m)	R(m)	(m)	I[mm/h]	γ	Ls (m)	
PC	AF1	0.0000	10.5800	-	3.44	1.000	0.0344	0.0172	1.0350	0.0166	-		-	-	
	EDR1	4.992	10.7298	3.00	4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	
	DR1	5.008	10.8800	3.00	4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	
	DR2	10.000	11.1800	3.00	4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	
	PF1(DR3)	10.000	11.4800	3.00	4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	
	DR4	10.000	11.7800	3.00	4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	
	EDR2	8.080	12.0224	3.00	4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	
	DR5	1.920	12.0800	3.00	3.89	1.000	0.0389	0.0195	1.0397	0.0187	12.750	149.000	0.90	30.7	
Steel-Box	PF2(DR6)	10.000	12.3800	3.00	3.34	1.000	0.0334	0.0167	1.0340	0.0162	12.750	149.000	0.90	23.9	
	DR7	10.000	12.6800	3.00	2.78	1.000	0.0278	0.0139	1.0282	0.0135	12.750	149.000	0.90	17.7	
	DR8	10.000	12.9800	3.00	2.22	1.000	0.0222	0.0111	1.0224	0.0109	12.750	149.000	0.90	12.2	
	EDR3	4.000	13.1000	3.00	2.00	1.000	0.0200	0.0100	1.0202	0.0098	12.750	149.000	0.90	10.3	
	DR9	6.000	13.2799	3.00	1.40	1.000	0.0140	0.0070	1.0141	0.0069	12.750	149.000	0.90	5.7	
	DR10	10.000	13.5684	2.89	0.40	1.000	0.0040	0.0020	1.0040	0.0020	12.750	149.000	0.90	0.7	5
	EDR4	4.000	13.6784	2.75	0.00	1.000	0.0000	0.0000	1.0000	0.0000	12.750	149.000	0.90	0.0	5
	DR11	6.000	13.8376	2.65	-0.60	1.000	0.0060	0.0030	1.0060	0.0030	12.750	149.000	0.90	1.3	5
	PF3	5.000	13.9650	2.55	-1.10	1.000	0.0110	0.0055	1.0111	0.0054	12.750	149.000	0.90	3.5	5
	DR12	5.000	14.0876	2.45	-1.60	1.000	0.0160	0.0080	1.0161	0.0079	12.750	149.000	0.90	6.4	6
	EDR5	4.000	14.1822	2.36	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	12.750	149.000	0.90	9.1	9
	DR13	6.000	14.3184	2.27	-2.68	1.000	0.0268	0.0134	1.0272	0.0130	12.750	149.000	0.90	14.5	14
	DR14	10.000	14.5299	2.11	-3.81	1.000	0.0381	0.0191	1.0388	0.0183	12.750	149.000	0.90	24.9	20
	DR15	10.000	14.7222	1.92	-4.95	1.000	0.0495	0.0248	1.0507	0.0236	12.750	149.000	0.90	36.5	20
	EDR6	9.298	14.8838	1.74	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	47.5	20
	DR16	0.702	14.8953	1.64	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	46.1	20
	DR17	10.000	15.0491	1.54	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	44.7	20
	DR18	10.000	15.1837	1.35	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	41.8	20
	PF4	5.000	15.2438	1.20	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	39.5	20
	DR19	5.000	15.2991	1.11	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	37.9	20
	DR20	10.000	15.3953	0.96	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	35.3	20
	DR21	10.000	15.4722	0.77	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	31.6	20
	DR22	10.000	15.5300	0.58	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	27.4	20
	DR23	10.000	15.5800	0.50	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	25.5	20
PC-2	PF5(DR24)	10.000	15.6300	0.50	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	25.5	20
	DR25	10.000	15.6800	0.50	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	25.5	20
	DR26	10.000	15.7264	0.46	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	24.5	20
	PF6(DR27)	10.000	15.7541	0.28	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	19.0	18
	DR28	10.000	15.7616	0.08	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	9.9	9
	EDR7	5.571	15.7569	-0.08	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	10.5	10
	DR29	4.429	15.7488	-0.18	-5.33	1.000	0.0533	0.0267	1.0547	0.0253	12.750	149.000	0.90	12.7	12
PC-4	PF7(DR30)	10.000	15.7158	-0.33	-3.81	1.000	0.0381	0.0191	1.0388	0.0183	12.750	149.000	0.90	9.9	9
	DR31	10.000	15.6625	-0.53	-2.30	1.000	0.0230	0.0115	1.0233	0.0112	12.750	149.000	0.90	5.5	5
	EDR8	1.977	15.6496	-0.65	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	12.750	149.000	0.90	4.8	5
	DR32	8.023	15.5926	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	12.750	149.000	0.90	5.0	5
	PF8(DR33)	10.000	15.5211	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	EDR9	8.383	15.4612	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR34	1.617	15.4496	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR35	10.000	15.3781	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	PF9(DR36)	10.000	15.3066	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR37	10.000	15.2351	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR38	10.000	15.1636	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	PF10(DR39)	10.000	15.0921	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR40	10.000	15.0206	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR41	10.000	14.9491	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
Steel-I	PF11(DR42)	10.000	14.8776	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR43	10.000	14.8061	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR44	10.000	14.7305	-0.76	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.3	10
	DR45	10.000	14.6339	-0.97	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	11.7	11
	PF12	5.000	14.5770	-1.14	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	12.7	12
	DR46	5.000	14.5144	-1.25	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	13.3	13
	DR47	10.000	14.3720	-1.42	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	14.2	14
	DR48	10.000	14.2068	-1.65	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	15.2	15
	DR49	10.000	14.0188	-1.88	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	16.3	16
	DR50	10.000	13.8079	-2.11	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	17.2	17
	PF13	7.000	13.6467	-2.30	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	18.0	18
	DR51	3.000	13.5742	-2.42	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	18.4	18
	DR52	10.000	13.3176	-2.57	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	19.0	19
	DR53	10.000	13.0382	-2.79	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	19.8	19
	DR54	10.000	12.7400	-2.98	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
PC-2	PF14	2.000	12.6800	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR55	8.000	12.4400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR56	10.000	12.1400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR57	10.000	11.8400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	PF15	2.000	11.7800	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR58	8.000	11.5400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR59	10.000	11.2400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR60	10.000	10.9400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	AF2	2.000	10.8800	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20

total 602.0000 m

Fly Over (Right Side)

		Length	C.L Height	Slope	Gradient	Width	Depth h	Flow area A	Wetted per Imte	mean depth	Watershed width	Rain intensity	Fall rate	Drainage PIT Maximum Interval	PIT Interval
		(m)	(m)	(%)	(%)	(m)	(m)	A (m2)	P (m)	R(m)	(m)	I[mm/h]	γ	Ls (m)	
	AF1	0.0000	10.5800	-	-3.44	1.000	0.0344	0.0172	1.0350	0.0166	-		-	-	
	EDR1	4.992	10.7298	3.00	-4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	20
	DR1	5.008	10.8800	3.00	-4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	20
PC-2	DR2	10.000	11.1800	3.00	-4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	20
	PF1(DR3)	10.000	11.4800	3.00	-4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	20
	DR4	10.000	11.7800	3.00	-4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	20
	EDR2	8.080	12.0224	3.00	-4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	20
	DR5	1.920	12.0800	3.00	-3.89	1.000	0.0389	0.0195	1.0397	0.0187	12.750	149.000	0.90	30.7	20
	PF2(DR6)	10.000	12.3800	3.00	-3.34	1.000	0.0334	0.0167	1.0340	0.0162	12.750	149.000	0.90	23.9	20
	DR7	10.000	12.6800	3.00	-2.78	1.000	0.0278	0.0139	1.0282	0.0135	12.750	149.000	0.90	17.7	17
	DR8	10.000	12.9800	3.00	-2.22	1.000	0.0222	0.0111	1.0224	0.0109	12.750	149.000	0.90	12.2	12
	EDR3	4.000	13.1000	3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	12.750	149.000	0.90	10.3	10
	DR9	6.000	13.2799	3.00	-1.40	1.000	0.0140	0.0070	1.0141	0.0069	12.750	149.000	0.90	5.7	5
	DR10	10.000	13.5684	2.89	-0.40	1.000	0.0040	0.0020	1.0040	0.0020	12.750	149.000	0.90	0.7	5
	EDR4	4.000	13.6784	2.75	0.00	1.000	0.0000	0.0000	1.0000	0.0000	12.750	149.000	0.90	0.0	5
	DR11	6.000	13.8376	2.65	0.60	1.000	0.0060	0.0030	1.0060	0.0030	12.750	149.000	0.90	1.3	5
	PF3	5.000	13.9650	2.55	1.10	1.000	0.0110	0.0055	1.0111	0.0054	12.750	149.000	0.90	3.5	
	DR12	5.000	14.0876	2.45	1.60	1.000	0.0160	0.0080	1.0161	0.0079	12.750	149.000	0.90	6.4	
	EDR5	4.000	14.1822	2.36	2.00	1.000	0.0200	0.0100	1.0202	0.0098	12.750	149.000	0.90	9.1	
Steel-I	DR13	6.000	14.3184	2.27	2.68	1.000	0.0268	0.0134	1.0272	0.0130	12.750	149.000	0.90	14.5	
	DR14	10.000	14.5299	2.11	3.81	1.000	0.0381	0.0191	1.0388	0.0183	12.750	149.000	0.90	24.9	
	DR15	10.000	14.7222	1.92	4.95	1.000	0.0495	0.0248	1.0507	0.0236	12.750	149.000	0.90	36.5	
	EDR6	9.298	14.8838	1.74	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	47.5	
	DR16	0.702	14.8953	1.64	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	46.1	
	DR17	10.000	15.0491	1.54	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	44.7	
	DR18	10.000	15.1837	1.35	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	41.8	
	PF4	5.000	15.2438	1.20	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	39.5	
	DR19	5.000	15.2991	1.11	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	37.9	
	DR20	10.000	15.3953	0.96	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	35.3	
	DR21	10.000	15.4722	0.77	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	31.6	
	DR22	10.000	15.5300	0.58	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	27.4	
	DR23	10.000	15.5800	0.50	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	25.5	
	PF5(DR24)	10.000	15.6300	0.50	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	25.5	
	DR25	10.000	15.6800	0.50	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	25.5	
	DR26	10.000	15.7264	0.46	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	24.5	
PC-2	PF6(DR27)	10.000	15.7541	0.28	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	19.0	
	DR28	10.000	15.7616	0.08	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	9.9	
	EDR7	5.571	15.7569	-0.08	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	10.5	
	DR29	4.429	15.7488	-0.18	5.33	1.000	0.0533	0.0267	1.0547	0.0253	12.750	149.000	0.90	12.7	
	PF7(DR30)	10.000	15.7158	-0.33	3.81	1.000	0.0381	0.0191	1.0388	0.0183	12.750	149.000	0.90	9.9	
	DR31	10.000	15.6625	-0.53	2.30	1.000	0.0230	0.0115	1.0233	0.0112	12.750	149.000	0.90	5.5	
	EDR8	1.977	15.6496	-0.65	2.00	1.000	0.0200	0.0100	1.0202	0.0098	12.750	149.000	0.90	4.8	
	DR32	8.023	15.5926	-0.71	0.78	1.000	0.0078	0.0039	1.0078	0.0039	12.750	149.000	0.90	1.0	5
	PF8(DR33)	10.000	15.5211	-0.71	-0.73	1.000	0.0073	0.0037	1.0073	0.0036	6.375	149.000	0.90	1.9	5
	EDR9	8.383	15.4612	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
PC-4	DR34	1.617	15.4496	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR35	10.000	15.3781	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	PF9(DR36)	10.000	15.3066	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR37	10.000	15.2351	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR38	10.000	15.1636	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	PF10(DR39)	10.000	15.0921	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR40	10.000	15.0206	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR41	10.000	14.9491	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	PF11(DR42)	10.000	14.8776	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR43	10.000	14.8061	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR44	10.000	14.7305	-0.76	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.3	10
	DR45	10.000	14.6339	-0.97	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	11.7	11
	PF12	5.000	14.5770	-1.14	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	12.7	12
	DR46	5.000	14.5144	-1.25	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	13.3	13
	DR47	10.000	14.3720	-1.42	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	14.2	14
Steel-I	DR48	10.000	14.2068	-1.65	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	15.2	15
	DR49	10.000	14.0188	-1.88	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	16.3	16
	DR50	10.000	13.8079	-2.11	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	17.2	17
	PF13	7.000	13.6467	-2.30	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	18.0	18
	DR51	3.000	13.5742	-2.42	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	18.4	18
	DR52	10.000	13.3176	-2.57	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	19.0	19
	DR53	10.000	13.0382	-2.79	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	19.8	19
	DR54	10.000	12.7400	-2.98	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	PF14	2.000	12.6800	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR55	8.000	12.4400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR56	10.000	12.1400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR57	10.000	11.8400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
PC-2	PF15	2.000	11.7800	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR58	8.000	11.5400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR59	10.000	11.2400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR60	10.000	10.9400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	AF2	2.000	10.8800	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20

Total 602.0000 m

10-3 Expansion joint

(1) Gap of girder and abutment

The expansion length is determined based on the displacement of the earthquake and the temperature.
Expansion joint shall be installed not to compromise the following gap of the girder and abutment, and displacement of seismic and temperature.

(2) Gap and displacement

				PCI Grider			Steel box Girder				PCI Grider			PCI Girder					Steel I Girder				PCI Girder		
	condition of support			M	F	F	E	E	E	E	F	F	M	M	F	F	F	M	E	E	E	E	F	F	M
	substructure			AF1	PF1	PF2		PF3	PF4	PF5		PF6	PF7		PF8	PF9	PF10	PF11		PF12	PF13	PF14		PF15	AF2
Gap of girder and abutment			mm	100		150				150			150					150				100			100
expansion	Creep･drying shrinkage(⊿sc2)		mm	7		0	0			0	0		-7	14				-14	0			0	0		-7
	temperature (⊿t)		mm	±12		±0	±27			±27	±0		±12	±23				±23	±19			±19	±0		±12
	displacement (⊿L)	stretching	mm	19		27				27			56					56				19			19
		reducing	mm	-5		-27				-27			-14					-28				-19			-5
	Margin (LA)		mm	10		11				11			14					17				10			10
	⊿U2		mm	34		65				65			84					101				48			34
	seismic(⊿EQ) SBR×2		mm	48		260				234			110					144				162			58
	design displacemnt(⊿Ej)		mm	48		260				234			110					144				162			58

02-2-STEEL-I GIRDER BRIDGE

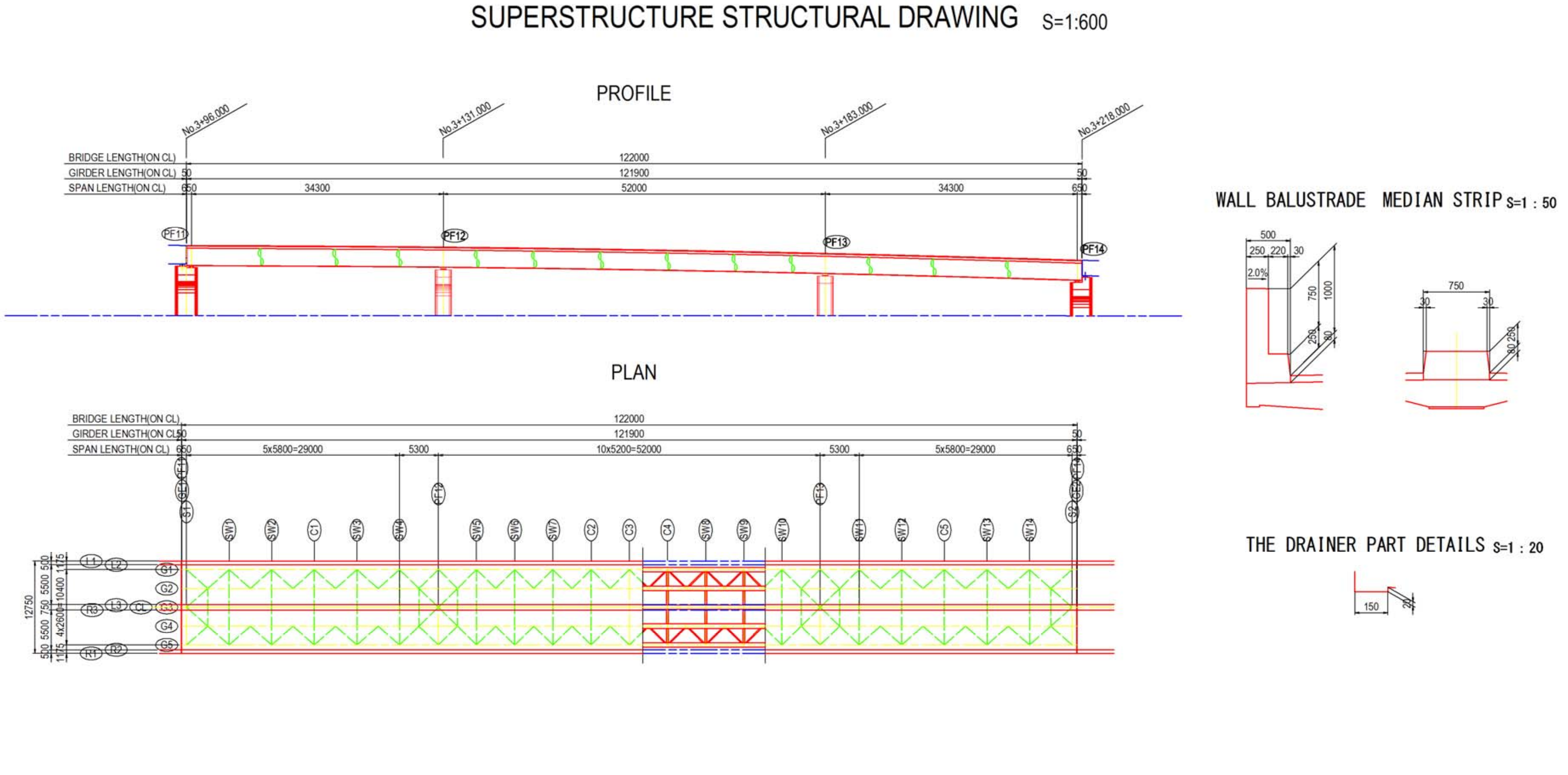
Contents

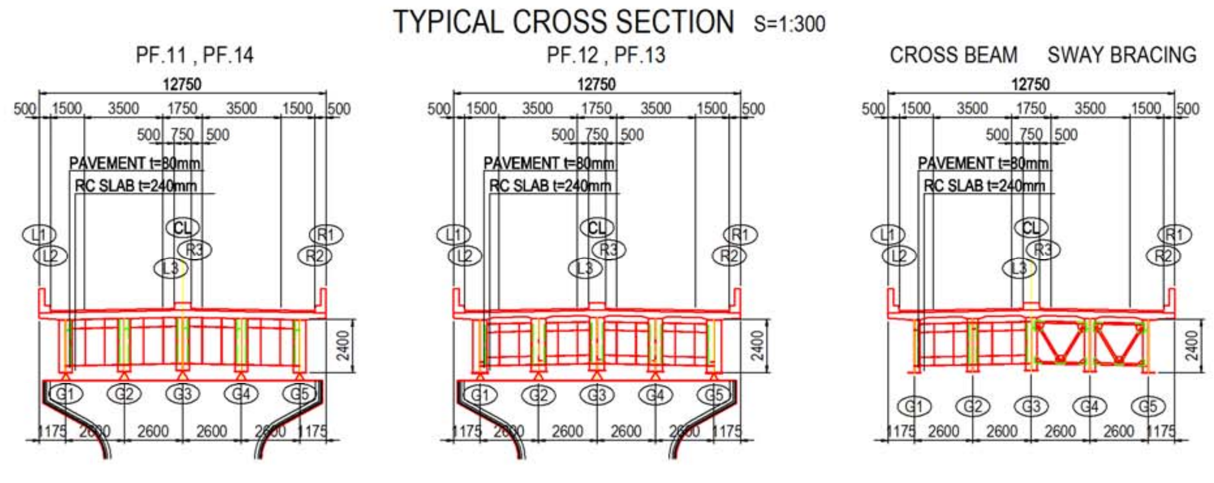
§1. Design condition

1-1 Design condition

ROAD GRADE	Equivalent to CLASS 4-1
BRIDGE TYPE	3 span continuous steel I girder
BRIDGE LENGTH	L = 122.000 m
SPAN LENGTH	L = 34.300 + 52.000 + 34.300m
WIDTH OF THE ROAD	TOTAL : 12.750 m 0.500+5.500+0.750+5.500+0.500m
Horizontal aligriment	R=∞
LONGITUDINARL SLOPE	↘ 0.715 % (VCL=100) ↘ 3.000 %
SECTION SLOPE	2.000 % ↙ ↘
ANGLE OF SKEW	90° 00′ 00″
PAVEMENT	ASPHALT PAVEMENT t= 80 mm
SLAB	REINFORCED CONCRETE t= 240 mm
LIVE ROAD	AASHTO HL=93
DESIGN STANDARD	AASHTO LRFD BRIDGE DESIGN 2014(LIVE ROAD) Specifications for highway bridges (Japan Road Association) Ⅰ Common matters, Ⅱ Steel bridges, Ⅴ Seismic design (April 2012)

1-2 General Vew of Super Structural





DESIGN CONDITION

ROAD GRADE	Equivalent to class 4-1
BRIDGE TYPE	3 span continuous steel I girder
BRIDGE LENGTH	L = 122.000 m
SPAN LENGTH	L = 34.300 + 52.000 + 34.300 m
WIDTH OF THE ROAD	TOTAL : 12.750 m L = 0.500 + 5.500 + 0.750 + 5.500 +0.500 m
PLANE CONFIGURATION	R=∞
LONGITUDINAL SLOPE	0.715% ↘ 3.000%(VCL=100) ↘
SECTIN SLOPE	2.000% ↗ ↘
ANGLE OF SKEW	90°00'00"
PAVEMENT	ASPHALT PAVEMENT t = 80 mm
SLAB	REINFORCED CONCRETE t = 240 mm
LIVE ROAD	AASHTO HL-93
DESIGN STANDARD	AASHTO LRFD BRIDGE DESIGN 2014(LIVE ROAD) Specifications for highway bridges(Japan Road Association) Common matters, Steel bridges, Seismic design(April 2012)

PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM		NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO.,LTD. NIPPON ENGINEERING CONSULTANTS CO.,LTD.	PREPARED BY	Y.SUZUKI			SUPERSTRUCTURE STRUCTURAL DRAWING	3
				CHECKED BY	T. HAYAKAWA				DWG No.
				APPROVED BY	Y. SANO				

§2. Design of Slab

2-1 Design Condition

ASPHALT PAVEMENT	ASPHALT PAVEMENT		t =80mm
RC SLAB		RC SLAB	t =240mm
LIVE LOAD		LIVE LOAD	AASHTO Truk or JSHB T-Load
$ADTT_{SL}$	2000 or more per day		k1＝1.25
Allowable Stress	Concrete	Design Strength	σck＝24N/mm2
		Allowable Stress	σca＝8.0N/mm2
	Reinforcement bar	Material	SD345
		Allowable Stress	σsa＝140N/mm2
Note: Approximately 20N/mm2 of allowance should be considered in the case without considering differential settlement			

・The thickness of haunch is constant as 80mm.

・The span of slab is determined by the maximum value.

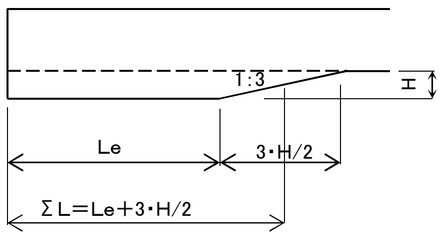
・The length of thickness of slab at the end of girder "Le" is as follows, according to JSHB II 9.2.11.

・ Window Load : 44.7 m/s

・Collision force to the concrete barrier : 43kN

Le＝1/2・ L　　　　L ：The span length of slab in the perpendicular direction to bridge a

Section	Le(mm)
S1	1300
S2	1300



The bending moment of the design with two types of live loads is calculated as follows

1) AASHTO LIVE LOAD　M=1.2*(α1-α2)*L*P / SW*(1+i)=　27.3 kNm

α1= 0.204
α1= -0.01431
SW= 2090
P= 72.5
i= 0.33
L: SPAN 2.60 m

2) JSHB T-Load　M=(0.12*L+0.07)*P*K*0.8 =　30.8 kNm

P= 100
K= 1.008

Since the RC slab is directly affected by the load of the wheel, it is better to design with JSHB's live load (larger force).

2-2 Summary of Calculation Result for Deck Slab

	Cantilever Slab Standard			
	Longitudinal Bar		Stirrup	
Bending Moment(kN・m)	-56.64		17.21	
Deck Thickness(mm)	320		285.1	
Diameter of Upper Rebar (mm)	D19		D16	
Pitch of Upper Rebar (mm)	ctc150		ctc300	
Diameter of Lower Rebar (mm)	D19		D16	
Pitch of Lower Rebar (mm)	ctc300		ctc150	
Concrete Cover Thickness(mm)	40.0		57.5	
Amount of Rebar As (cm^2)	19.10		13.24	
Amount of Rebar As' (cm^2)	9.55		6.62	
Stress of Concrete (N/mm^2)	$\sigma c =$	4.11 ＜ 8.0	$\sigma c =$	2.14 ＜ 8.0
Stress of Rebar (N/mm^2)	$\sigma s =$	120.0 ＜ 140	$\sigma s =$	64.8 ＜ 140

	Cantilever Slab Girder end		
	Longitudinal Bar		Stirrup
Bending Moment(kN・m)	-102.27		—
Deck Thickness(mm)	320		—
Diameter of Upper Rebar (mm)	D22		—
Pitch of Upper Rebar (mm)	ctc110		—
Diameter of Lower Rebar (mm)	D22		—
Pitch of Lower Rebar (mm)	ctc220		—
Concrete Cover Thickness(mm)	41.0		—
Amount of Rebar As (cm^2)	35.19		—
Amount of Rebar As' (cm^2)	17.60		—
Stress of Concrete (N/mm^2)	$\sigma c =$	5.70 ＜ 8.0	—
Stress of Rebar (N/mm^2)	$\sigma s =$	121.1 ＜ 140	—

	Centre of span (inside)			
	Longitudinal Bar		Stirrup	
Bending Moment(kN・m)	34.52		24.00	
Deck Thickness(mm)	240		240	
Diameter of Upper Rebar (mm)	D19		D16	
Pitch of Upper Rebar (mm)	ctc300		ctc300	
Diameter of Lower Rebar (mm)	D19		D16	
Pitch of Lower Rebar (mm)	ctc150		ctc150	
Concrete Cover Thickness(mm)	40.0		57.5	
Amount of Rebar As (cm^2)	19.10		13.24	
Amount of Rebar As' (cm^2)	9.55		6.62	
Stress of Concrete (N/mm^2)	$\sigma c =$	4.41 ＜ 8.0	$\sigma c =$	4.36 ＜ 8.0
Stress of Rebar (N/mm^2)	$\sigma s =$	105.0 ＜ 140	$\sigma s =$	114.0 ＜ 140

	On Main Girder (inside)		
	Longitudinal Bar		Stirrup
Bending Moment(kN・m)	-36.01		―
Deck Thickness(mm)	320		―
Diameter of Upper Rebar (mm)	D19		―
Pitch of Upper Rebar (mm)	ctc150		―
Diameter of Lower Rebar (mm)	D19		―
Pitch of Lower Rebar (mm)	ctc300		―
Concrete Cover Thickness(mm)	40.0		―
Amount of Rebar As (cm^2)	19.10		―
Amount of Rebar As' (cm^2)	0.00		―
Stress of Concrete (N/mm^2)	σc =	2.89 < 8.0	―
Stress of Rebar (N/mm^2)	σs =	46.6 < 140	―

	Centre of span (out side)			
	Longitudinal Bar		Stirrup	
Bending Moment(kN・m)	36.01		24.00	
Deck Thickness(mm)	240		240	
Diameter of Upper Rebar (mm)	D19		D16	
Pitch of Upper Rebar (mm)	ctc300		ctc300	
Diameter of Lower Rebar (mm)	D19		D16	
Pitch of Lower Rebar (mm)	ctc150		ctc150	
Concrete Cover Thickness(mm)	40.0		57.5	
Amount of Rebar As (cm^2)	19.10		13.24	
Amount of Rebar As' (cm^2)	9.55		6.62	
Stress of Concrete (N/mm^2)	σc =	4.60 < 8.0	σc =	4.36 < 8.0
Stress of Rebar (N/mm^2)	σs =	109.5 < 140	σs =	114.0 < 140

	On Main Girder (outside)		
	Longitudinal Bar		Stirrup
Bending Moment(kN・m)	-36.01		―
Deck Thickness(mm)	320		―
Diameter of Upper Rebar (mm)	D19		―
Pitch of Upper Rebar (mm)	ctc150		―
Diameter of Lower Rebar (mm)	D19		―
Pitch of Lower Rebar (mm)	ctc300		―
Concrete Cover Thickness(mm)	40.0		―
Amount of Rebar As (cm^2)	19.10		―
Amount of Rebar As' (cm^2)	0.00		―
Stress of Concrete (N/mm^2)	σc =	2.89 < 8.0	―
Stress of Rebar (N/mm^2)	σs =	76.6 < 140	―

§3. Structure analysis

3-1 Analytical Method

1. The structural analysis is conducted by arbitrary lattice theory (a displacement method) with an electrical
   The software used is "APOLLO Analyzer " commercialized by Yokogawa Techno-information Service In

2. The structure is plane grid composed of main girders and cross beams.

3. Vertical loads (dead load and live load) is considered in the analysis.

4. The coordinates of the structure are automatically transformed from the plane coordinates
   calculated by linear analysis.

3-2 Load intensity

(1) Dead load

Pavement	0.080	×	22.5 kN／m^3	=	1.800 kN/m^2
thickness of slab	(30L+110) x k1 x k2			=	240 mm

Large vehicle traffic volume 2000more than/1day・1 direction

A1-A2 L = 2.600 m

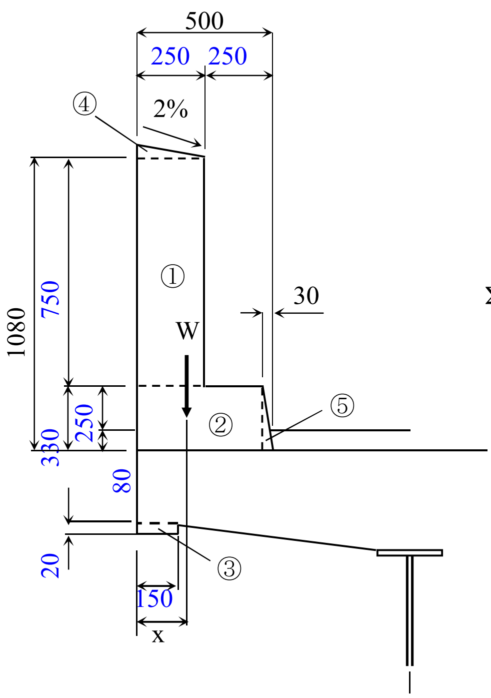
k1 = 1.25 k2 = 1.00

Slab	0.240	×	24.5 kN／m^3	=	5.880 kN/m^2
Haunch	G1,G5			=	2.250 kN/m
	G2～G4				1.630 kN/m
Steel weight				=	6.100 kN/m
Concrete barrier				=	8.630 kN/m
Median				=	6.070 kN/m

Point load A1-A2

	end part		Levelling concrete		
G1,G5	21.000	+	3.00	=	24.0 kN
G2～G4	21.000	+	5.00	=	26.0 kN

2) Concrete Barrier



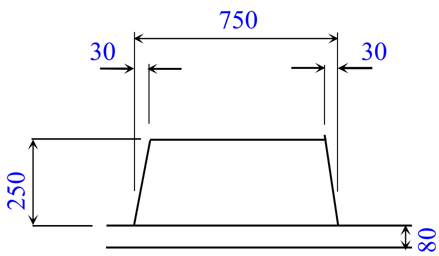
	Area	Unit Weight	Load	Center	--
	A		W	X	W・X
	m2	kN/m3	kN/m	m	--
①	0.188	24.5	4.606	0.125	0.576
②	0.155	24.5	3.798	0.250	0.950
③	0.003	24.5	0.074	0.075	0.006
④	0.001	24.5	0.025	0.083	0.002
⑤	0.005	24.5	0.123	0.480	0.059
Σ			8.626		1.593

W = 8.63 kN/m

x = 1.593 / 8.626 = 0.185 m (from the outer edge)

0.5 - 0.185 = 0.315 (from the outer edge)

3) Median

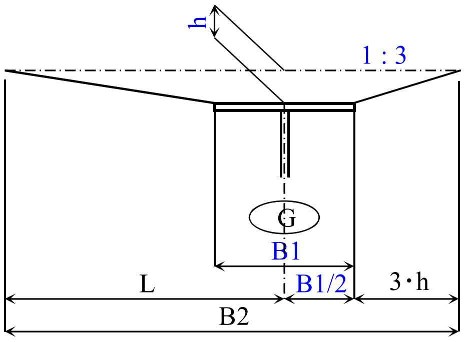


W = 0.750 x 0.330 x 24.5 = 6.07 kN/m

(3) Detail of Load

1) Haunch

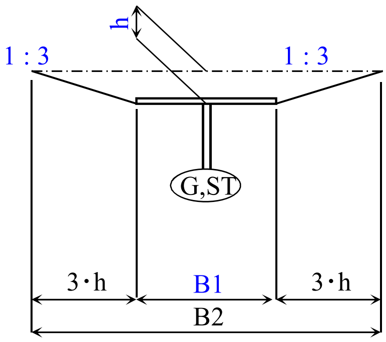
【Main Girder ; G1, G5】



W = 1/2 x (B1 + B2) x h x 24.5 kN/m

Girder	Applied Section	L (mm)	B1 (mm)	B2 (mm)	h (mm)	W (kN/m)
G1,G5	S1～S2	1175	590	1710	80	2.25

【Main Girder ; G2-G4】



W = 1/2 x (B1 + B2) x h x 24.5 kN/m

Girder	Applied Section	B1 (mm)	B2 (mm)	h (mm)	W (kN/m)
G2～G4	S1～S2	590	1070	80	1.63

4） Load at the End of Girder

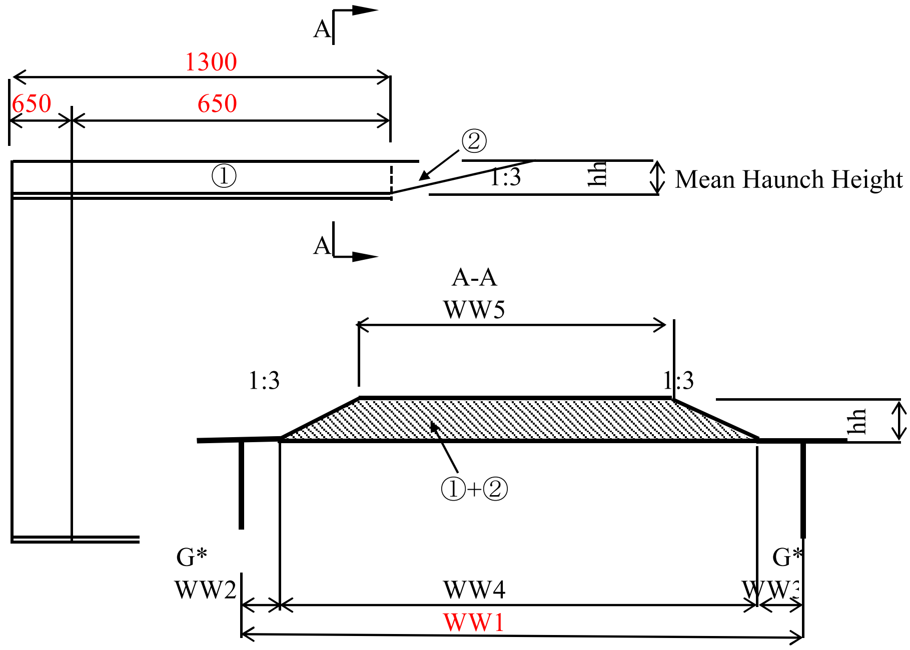
■S1,S2

L= 650 mm

Pavement	1.80 ×	11.750	×	0.650		=	13.748	kN
Deck Slab	5.88 ×	12.750	×	0.650		=	48.731	kN
Haunch of G1	2.25 ×	1	×	0.650		=	1.463	kN
Haunch of G2	1.63 ×	1	×	0.650		=	1.060	kN
Haunch of G3	1.63 ×	1	×	0.650		=	1.060	kN
Haunch of G4	1.63 ×	1	×	0.650		=	1.060	kN
Haunch of G5	2.25 ×	1	×	0.650		=	1.463	kN
Concrete Barrier	8.63 ×	2	×	0.650		=	11.219	kN
Median	6.07 ×	1	×	0.650		=	3.946	kN
Steel Weight of Main Gird	6.10 ×	5	×	0.650		=	19.825	kN
							103.575	kN
Divided by the number of girders			103.575	/	5	=	20.715	kN
						≒	21.000	kN

5) Thickness Increasing of Slab

The slab between main girders are increased at the end of girder, with in the half of deck span length from the e
It is considered as the consentrated load applied on the main girder at the end.



	Haunch Height	Mean Haunch	WW1	WW2	WW3	WW4	WW5
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
G1	80	80	2600	295	295	2010	1530
G2	80	80	2600	295	295	2010	1530
G3	80	80	2600	295	295	2010	1530
G4	80	80	2600	295	295	2010	1530
G5	80						

G1-G5 Mean Width

①	1.300	×	0.080	×	1.770	×	24.5			=	4.51	kN
②	0.240	×	0.080	×	1.770	×	24.5	/	2	=	0.42	kN
											4.93	kN

The above load is applied as the consentrated load on each bearing equally divided.

G1、G5=	4.93	/	2					=	2.50 kN
								≒	3.00 kN
G2-G4=	4.93	/	2	+	4.93	/	2	=	4.90 kN
								≒	5.00 kN

6) Live Load

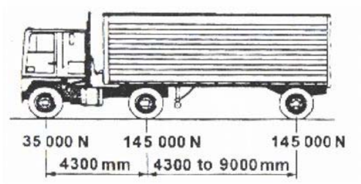
<u>Loading Method</u>

AASHTO HL-93 and the special vehicular load of 75t is applied.
The maximum secional force is used in the design.
Impact coefficent is considered.

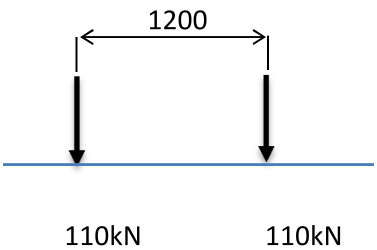
1. AASHTO HL-93

① Design Vehicle Load or Design Tandem Load

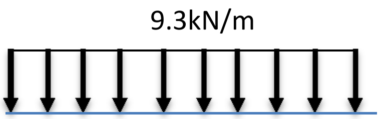
①-1 Design Truck (Hs20-44)



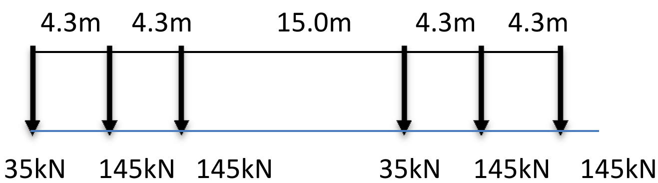
①-2 Design Tandem Load



②Design Lane Load



③Two Design Trucks for Negative Moment



Load Coefficenet with the Number of Lane

Number of Lane	Coefficnt
1	1.2
2	1
3	0.85
＞3	0.65

In the Project, three lanes are adopted

Types of Combination

CASE1 (①-1 + ②)x0.85

CASE2 (①-2 + ②)x0.85

CASE3 (③x0.9 + ②x0.9)x0.85

2. Special Vehicular Load 75t(735kN)

The special vehicular load is equally distributed.

Applied Area	45.00	m2	Applied Loac	735.0	/	45.0 =	16.33	kN/m2

3. Impact Coefficent

Impact coefficent is calculated as follows;

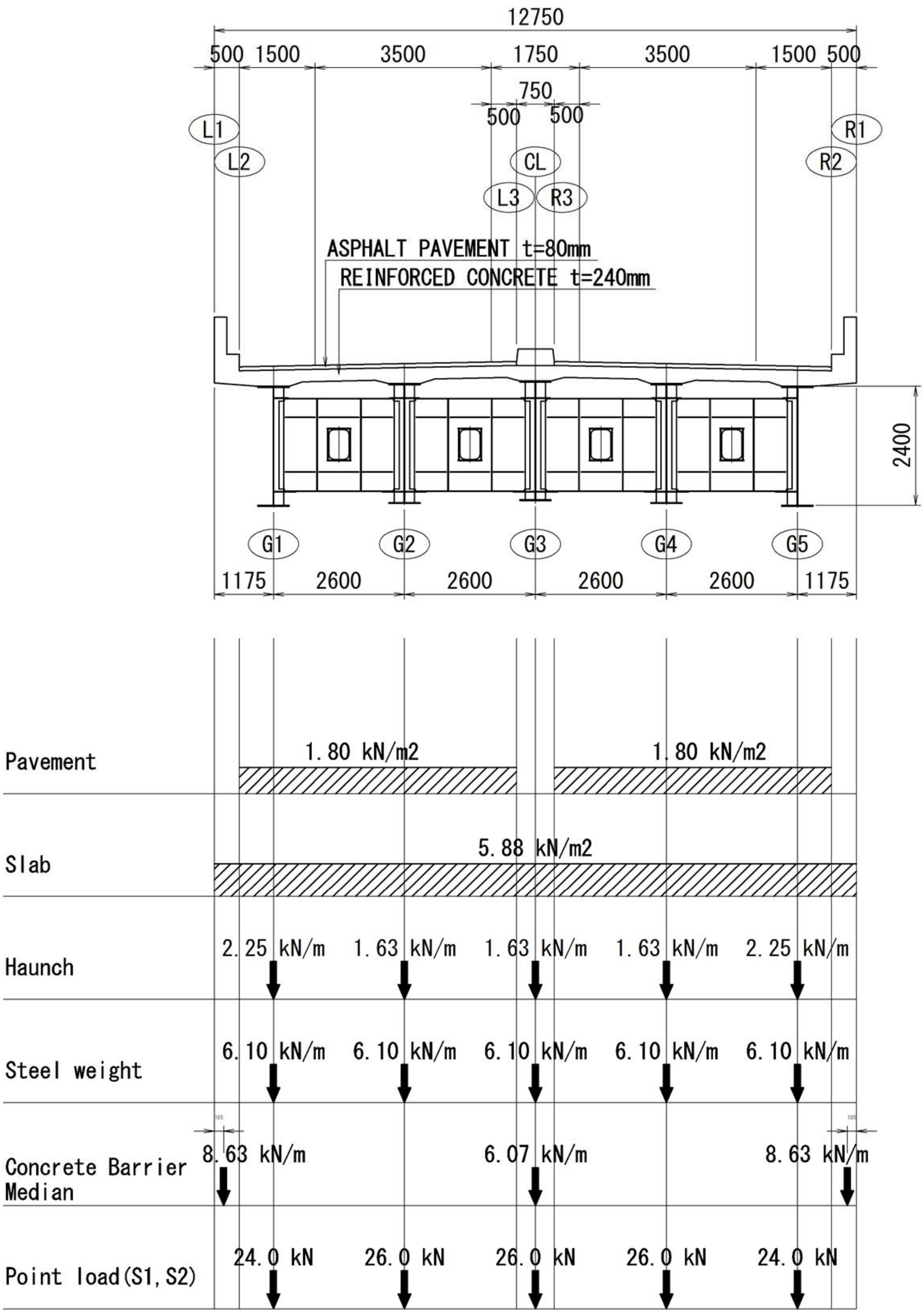
$$i = \frac{20}{50 + L}$$

	Span Length		(on CL)		Impact Coefficent
First Span	34.300	m	i	= 20 / (50 + 34.300) =	0.237
Second Bearing	43.150	m	i	= 20 / (50 + 43.150) =	0.215
Second Span	52.000	m	i	= 20 / (50 + 52.000) =	0.196
Third Bearing	43.150	m	i	= 20 / (50 + 43.150) =	0.215
Third Span	34.300	m	i	= 20 / (50 + 34.300) =	0.237

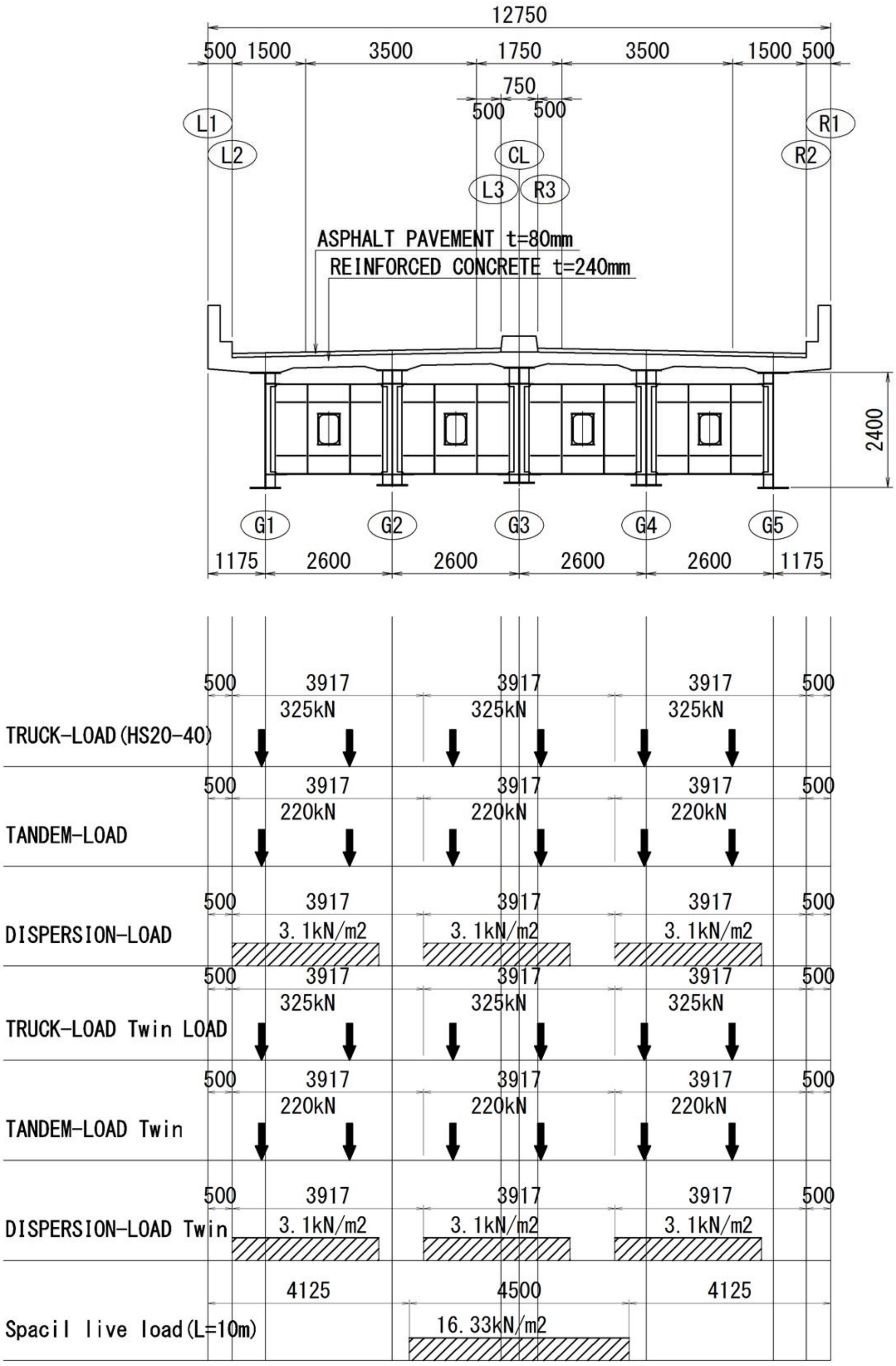
3-3 Load diagram and Load combination

(1) Load diagram

Dead load



Live load

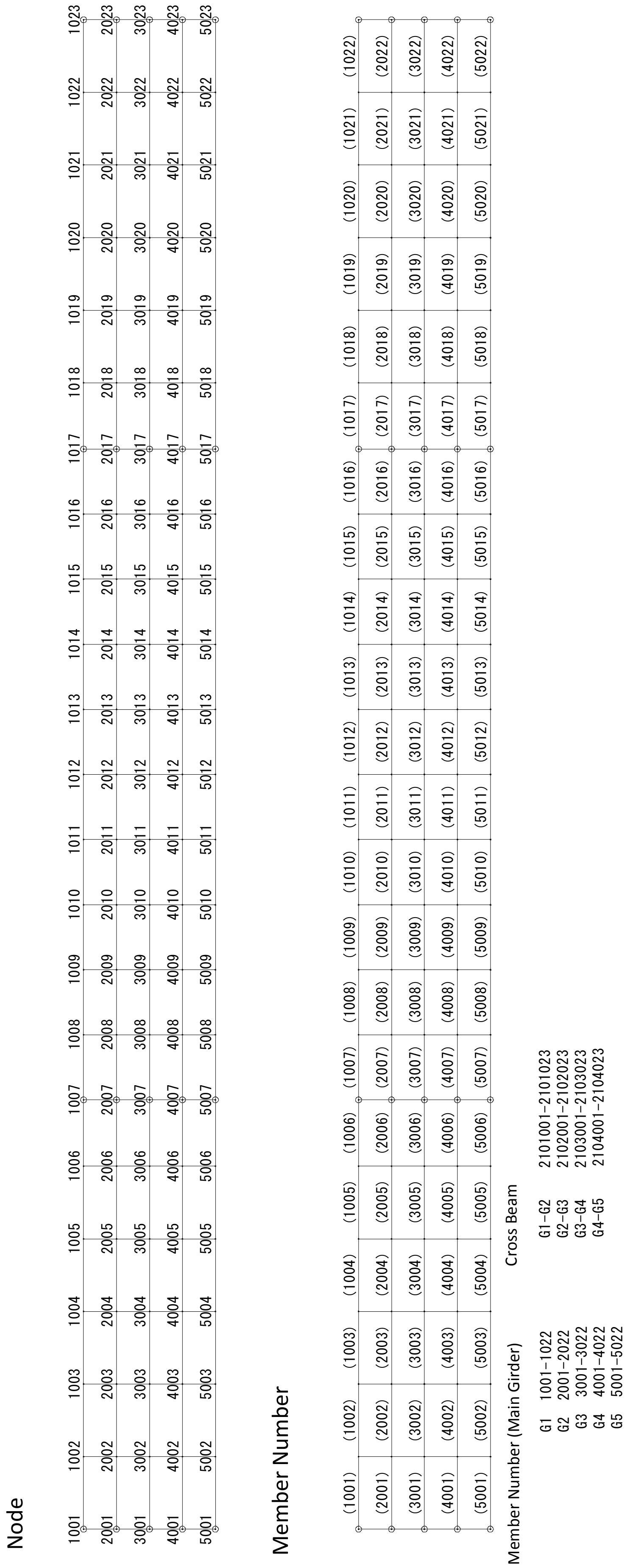

12750
500 1500 3500 1750 3500 1500 500
750
500 500
L1
L2
CL
L3 R3
R1
R2
ASPHALT PAVEMENT t=80mm
REINFORCED CONCRETE t=240mm
2400
G1 G2 G3 G4 G5
1175 2600 2600 2600 2600 1175
TRUCK-LOAD(HS20-40)
500 3917 3917 3917 500
325kN 325kN 325kN
TANDEM-LOAD
500 3917 3917 3917 500
220kN 220kN 220kN
DISPERSION-LOAD
500 3917 3917 3917 500
3.1kN/m2 3.1kN/m2 3.1kN/m2
TRUCK-LOAD Twin LOAD
500 3917 3917 3917 500
325kN 325kN 325kN
TANDEM-LOAD Twin
500 3917 3917 3917 500
220kN 220kN 220kN
DISPERSION-LOAD Twin
500 3917 3917 3917 500
3.1kN/m2 3.1kN/m2 3.1kN/m2
Spacil live load(L=10m)
4125 4500 4125
16.33kN/m2

(2) Combination of Load

Case	Load	Note
11	Pavement	
12	Deck Slab	
13	Haunch	
14	Steel Weight	
15	Concrete Barrier	
16	Median	
17	Consentrated Load	
100-1	(①-1＋②)	Truck + Vehicular Load
100-2	(①-2＋②)	Tandem + Vehicular Load
111	（AASHTO two truck)x0.9	(Truck + Vehicular Load) x 2
200	Special Vehicular Load	

Case	Combination Case	Combination
300	Total of Dead Load	11+12+13+14+15+16+17;
302	Maximum Live Load	(100-1)x0.85,(100-2)x0.85,111x0.85,200
303	Dead Load + Live Load	300+302;

3-4 Skeleton Diagram



3-5 Check of dead load and Reaction force aggregate

1. Check of dead load

Total span 120.600 m

Area Pavment 1326.600 m2

Slab 1537.650 m2

Check of dead load

Load name	Load I. (kN/m, kN/m2)	Line	A.N.L (m2, N, m)	Total (A) (kN)	Com (B) (kN)	compare (A/B)
Pavement	1.80		1326.60	2387.88	2387.88	1.00
Slab	5.88		1537.65	9041.38	9041.38	1.00
Haunch	2.25	G1	120.60	271.35		
	1.63	G2	120.60	196.58		
	1.63	G3	120.60	196.58		
	1.63	G4	120.60	196.58		
	2.25	G5	120.60	271.35		
			Subtotal	1132.43	1132.43	1.00
Steel weight	6.10	G1	120.60	735.66		
	6.10	G2	120.60	735.66		
	6.10	G3	120.60	735.66		
	6.10	G4	120.60	735.66		
	6.10	G5	120.60	735.66		
			Subtotal	3678.30	3678.30	1.00
Railing	8.63	L	120.60	1040.78		
	8.63	R	120.60	1040.78		
			Subtotal	2081.56	2081.56	1.00
Center divider	6.07	CL	120.60	732.04	732.04	1.00
Point load	24.00	S1,S2-G1	2	48.00		
	26.00	S1,S2-G2	2	52.00		
	26.00	S1,S2-G3	2	52.00		
	26.00	S1,S2-G4	2	52.00		
	24.00	S1,S2-G5	2	48.00		
			Subtotal	252.00	252.00	1.00
			Total	19305.59	19305.60	1.00

Assuming steel Weight

	M.G. (kN)	End part (kN)	Total (kN)	Unit C. (t)
A.S.W. ①	3678.30	39.65	3717.95	379.0

Real steel Weight

	The main structure (t)		Total (t)
R.S.W. ②	375.674		375.674

weight ratio = ①/②x100= 101 % < 105% OK

3-6 Total Reaction Force

Superstructure Reaction Force (With impact)

				(S1)PF11				
		Name or Coefficient		1001	2001	3001	4001	5001
Dead load				451.03	306.54	375.46	306.54	451.03
AASHTO	Truk	①-1	Max	265.96	297.31	279.26	297.31	265.96
			Min	-58.48	-34.96	-33.64	-34.96	-58.48
	Tandem	①-2	Max	197.31	225.49	213.90	225.49	197.31
			Min	-40.53	-23.97	-23.17	-23.97	-40.53
Lane Load	Distributed Load	②	Max	113.90	110.47	101.67	110.47	113.90
			Min	-43.75	-29.39	-25.82	-29.39	-43.75
AASHTOxTWIN	Truk	③-1	Max	303.97	326.13	284.65	326.13	303.97
			Min	-78.66	-52.32	-49.12	-52.32	-78.66
	Tandem	③-2	Max	197.31	225.49	213.90	225.49	197.31
			Min	-40.53	-23.97	-23.17	-23.97	-40.53
Lane Load	Distributed Load	②	Max	113.90	110.47	101.67	110.47	113.90
			Min	-43.75	-29.39	-25.82	-29.39	-43.75
Special Vehicular Load	Distributed Load	④	Max	58.73	161.08	372.45	161.08	58.73
			Min	-27.20	-24.22	-23.25	-24.22	-27.20
Combination of Live Load	①-1+②	0.85	Max	322.88	346.61	323.79	346.61	322.88
			Min	-86.90	-54.70	-50.54	-54.70	-86.90
	①-2+②	0.85	Max	264.53	285.57	268.23	285.57	264.53
			Min	-71.64	-45.36	-41.64	-45.36	-71.64
	(③-1+②)x0.9	0.85	Max	319.67	334.00	295.53	334.00	319.67
			Min	-93.64	-62.51	-57.33	-62.51	-93.64
	(③-2+②)x0.9	0.85	Max	238.08	257.01	241.41	257.01	238.08
			Min	-64.47	-40.82	-37.48	-40.82	-64.47
	④	1.0	Max	58.73	161.08	372.45	161.08	58.73
			Min	-27.20	-24.22	-23.25	-24.22	-27.20
Picked Up Live Load		PICK	Max	322.88	346.61	372.45	346.61	322.88
			Min	-93.64	-62.51	-57.33	-62.51	-93.64
D + L			Max	773.91	653.15	747.91	653.15	773.91
			Min	357.39	244.03	318.13	244.03	357.39
Dead load total				1890.60				

		Name or Coefficient		PF12				
				1007	2007	3007	4007	5007
Dead load				1824.53	1319.87	1473.41	1319.87	1824.53
AASHTO	Truk	①-1	Max	314.08	339.90	347.11	339.90	314.08
			Min	-62.21	-24.02	-22.19	-24.02	-62.21
	Tandem	①-2	Max	214.84	235.33	243.88	235.33	214.84
			Min	-43.01	-16.70	-15.37	-16.70	-43.01
Lane Load	Distributed Load	②	Max	365.81	346.57	317.75	346.57	365.81
			Min	-51.15	-17.40	-11.91	-17.40	-51.15
AASHTOxTWIN	Truk	③-1	Max	505.70	503.58	447.08	503.58	505.70
			Min	-70.42	-24.39	-22.68	-24.39	-70.42
	Tandem	③-2	Max	214.84	235.33	243.88	235.33	214.84
			Min	-43.01	-16.70	-15.37	-16.70	-43.01
Lane Load	Distributed Load	②	Max	365.81	346.57	317.75	346.57	365.81
			Min	-51.15	-17.40	-11.91	-17.40	-51.15
Special Vehicular Load	Distributed Load	④	Max	118.59	192.16	485.52	192.16	118.59
			Min	-21.47	-16.63	-15.32	-16.63	-21.47
Combination of Live Load	①-1+②	0.85	Max	577.91	583.50	565.13	583.50	577.91
			Min	-96.36	-35.21	-28.99	-35.21	-96.36
	①-2+②	0.85	Max	493.55	494.62	477.39	494.62	493.55
			Min	-80.04	-28.99	-23.19	-28.99	-80.04
	(③-1+②)x0.9	0.85	Max	666.71	650.36	585.09	650.36	666.71
			Min	-93.00	-31.97	-26.46	-31.97	-93.00
	(③-2+②)x0.9	0.85	Max	444.20	445.15	429.65	445.15	444.20
			Min	-72.03	-26.09	-20.87	-26.09	-72.03
	④	1.0	Max	118.59	192.16	485.52	192.16	118.59
			Min	-21.47	-16.63	-15.32	-16.63	-21.47
Picked Up Live Load		PICK	Max	666.71	650.36	585.09	650.36	666.71
			Min	-96.36	-35.21	-28.99	-35.21	-96.36
D + L			Max	2491.24	1970.23	2058.50	1970.23	2491.24
			Min	1728.17	1284.66	1444.43	1284.66	1728.17
Dead load total				7762.21				

				PF13				
		Name or Coefficient		1017	2017	3017	4017	5017
Dead load				1824.53	1319.87	1473.41	1319.87	1824.53
AASHTO	Truk	①-1	Max	314.08	339.90	347.11	339.90	314.08
			Min	-62.21	-24.02	-22.19	-24.02	-62.21
	Tandem	①-2	Max	214.84	235.33	243.88	235.33	214.84
			Min	-43.01	-16.70	-15.37	-16.70	-43.01
Lane Load	Distributed Load	②	Max	365.81	346.57	317.75	346.57	365.81
			Min	-51.15	-17.40	-11.91	-17.40	-51.15
AASHTOxTWIN	Truk	③-1	Max	505.70	503.58	447.08	503.58	505.70
			Min	-70.42	-24.39	-22.68	-24.39	-70.42
	Tandem	③-2	Max	214.84	235.33	243.88	235.33	214.84
			Min	-43.01	-16.70	-15.37	-16.70	-43.01
Lane Load	Distributed Load	②	Max	365.81	346.57	317.75	346.57	365.81
			Min	-51.15	-17.40	-11.91	-17.40	-51.15
Special Vehicular Load	Distributed Load	④	Max	118.59	192.16	485.52	192.16	118.59
			Min	-21.47	-16.63	-15.32	-16.63	-21.47
Combination of Live Load	①-1+②	0.85	Max	577.91	583.50	565.13	583.50	577.91
			Min	-96.36	-35.21	-28.99	-35.21	-96.36
	①-2+②	0.85	Max	493.55	494.62	477.39	494.62	493.55
			Min	-80.04	-28.99	-23.19	-28.99	-80.04
	(③-1+②)x0.9	0.85	Max	666.71	650.36	585.09	650.36	666.71
			Min	-93.00	-31.97	-26.46	-31.97	-93.00
	(③-2+②)x0.9	0.85	Max	444.20	445.15	429.65	445.15	444.20
			Min	-72.03	-26.09	-20.87	-26.09	-72.03
	④	1.0	Max	118.59	192.16	485.52	192.16	118.59
			Min	-21.47	-16.63	-15.32	-16.63	-21.47
Picked Up Live Load		PICK	Max	666.71	650.36	585.09	650.36	666.71
			Min	-96.36	-35.21	-28.99	-35.21	-96.36
D + L			Max	2491.24	1970.23	2058.50	1970.23	2491.24
			Min	1728.17	1284.66	1444.43	1284.66	1728.17
Dead load total				7762.21				

				(S2)PF14				
		Name or Coefficient		1023	2023	3023	4023	5023
Dead load				451.03	306.54	375.46	306.54	451.03
AASHTO	Truk	①-1	Max	265.96	297.31	279.26	297.31	265.96
			Min	-58.48	-34.96	-33.64	-34.96	-58.48
	Tandem	①-2	Max	197.31	225.49	213.90	225.49	197.31
			Min	-40.53	-23.97	-23.17	-23.97	-40.53
Lane Load	Distributed Load	②	Max	113.90	110.47	101.67	110.47	113.90
			Min	-43.75	-29.39	-25.82	-29.39	-43.75
AASHTOxTWIN	Truk	③-1	Max	303.97	326.13	284.65	326.13	303.97
			Min	-78.66	-52.32	-49.12	-52.32	-78.66
	Tandem	③-2	Max	197.31	225.49	213.90	225.49	197.31
			Min	-40.53	-23.97	-23.17	-23.97	-40.53
Lane Load	Distributed Load	②	Max	113.90	110.47	101.67	110.47	113.90
			Min	-43.75	-29.39	-25.82	-29.39	-43.75
Special Vehicular Load	Distributed Load	④	Max	58.73	161.08	372.45	161.08	58.73
			Min	-27.20	-24.22	-23.25	-24.22	-27.20
Combination of Live Load	①-1+②	0.85	Max	322.88	346.61	323.79	346.61	322.88
			Min	-86.90	-54.70	-50.54	-54.70	-86.90
	①-2+②	0.85	Max	264.53	285.57	268.23	285.57	264.53
			Min	-71.64	-45.36	-41.64	-45.36	-71.64
	(③-1+②)x0.9	0.85	Max	319.67	334.00	295.53	334.00	319.67
			Min	-93.64	-62.51	-57.33	-62.51	-93.64
	(③-2+②)x0.9	0.85	Max	238.08	257.01	241.41	257.01	238.08
			Min	-64.47	-40.82	-37.48	-40.82	-64.47
	④	1.0	Max	58.73	161.08	372.45	161.08	58.73
			Min	-27.20	-24.22	-23.25	-24.22	-27.20
Picked Up Live Load		PICK	Max	322.88	346.61	372.45	346.61	322.88
			Min	-93.64	-62.51	-57.33	-62.51	-93.64
D + L			Max	773.91	653.15	747.91	653.15	773.91
			Min	357.39	244.03	318.13	244.03	357.39
Dead load total				1890.60				

Substructure Reaction Force (Without impact)

				PF11				
		Name or Coefficient		1001	2001	3001	4001	5001
Dead load				451.03	306.54	375.46	306.54	451.03
AASHTO	Truk	①-1	Max	108.44	234.46	189.99	234.46	108.44
			Min	-28.50	-27.71	-27.53	-27.71	-28.50
	Tandem	①-2	Max	75.60	176.99	140.62	176.99	75.60
			Min	-19.56	-18.97	-18.93	-18.97	-19.56
Lane Load	Distributed Load	②	Max	70.43	99.82	100.46	99.82	70.43
			Min	-26.18	-25.63	-25.67	-25.63	-26.18
AASHTOxTWIN	Truk	③-1	Max	143.81	262.31	222.02	262.31	143.81
			Min	-42.19	-41.35	-40.47	-41.35	-42.19
	Tandem	③-2	Max	75.60	176.99	140.62	176.99	75.60
			Min	-19.56	-18.97	-18.93	-18.97	-19.56
Lane Load	Distributed Load	②	Max	70.43	99.82	100.46	99.82	70.43
			Min	-26.18	-25.63	-25.67	-25.63	-26.18
Special Vehicular Load	Distributed Load	④	Max	21.20	130.19	301.03	130.19	21.20
			Min	-22.55	-20.25	-18.87	-20.25	-22.55
Combination of Live Load	①-1+②	0.85	Max	152.04	284.14	246.88	284.14	152.04
			Min	-46.48	-45.34	-45.22	-45.34	-46.48
	①-2+②	0.85	Max	124.13	235.29	204.92	235.29	124.13
			Min	-38.88	-37.91	-37.91	-37.91	-38.88
	(③-1+②)x0.9	0.85	Max	163.89	277.03	246.70	277.03	163.89
			Min	-52.30	-51.24	-50.60	-51.24	-52.30
	(③-2+②)x0.9	0.85	Max	111.71	211.76	184.43	211.76	111.71
			Min	-34.99	-34.12	-34.12	-34.12	-34.99
	④	1.0	Max	21.20	130.19	301.03	130.19	21.20
			Min	-22.55	-20.25	-18.87	-20.25	-22.55
Picked Up Live Load		PICK	Max	163.89	277.03	246.69	277.03	163.89
			Min	-52.30	-51.24	-50.59	-51.24	-52.30
D + L			Max	614.92	583.57	622.15	583.57	614.92
			Min	398.73	255.30	324.87	255.30	398.73
Dead load total				1890.60				
Live load total				1128.53				

				PF12				
		name.OR. facter		1007	2007	3007	4007	5007
Dead load				1824.53	1319.87	1473.41	1319.87	1824.53
AASHTO	Truk	①-1	Max	212.90	169.09	210.62	169.09	212.90
			Min	-21.96	-18.67	-17.90	-18.67	-21.96
	Tandem	①-2	Max	145.76	115.19	141.04	115.19	145.76
			Min	-15.25	-12.96	-12.43	-12.96	-15.25
Lane Load	Distributed Load	②	Max	299.83	287.33	260.92	287.33	299.83
			Min	-14.29	-12.06	-11.51	-12.06	-14.29
AASHTOxTWIN	Truk	③-1	Max	375.04	313.29	344.84	313.29	375.04
			Min	-22.35	-18.97	-18.18	-18.97	-22.35
	Tandem	③-2	Max	145.76	115.19	141.04	115.19	145.76
			Min	-15.25	-12.96	-12.43	-12.96	-15.25
Lane Load	Distributed Load	②	Max	299.83	287.33	260.92	287.33	299.83
			Min	-14.29	-12.06	-11.51	-12.06	-14.29
Special Vehicular Load	Distributed Load	④	Max	8.36	159.41	396.78	159.41	8.36
			Min	-17.33	-13.43	-12.35	-13.43	-17.33
Combination of Live Load	①-1+②	0.85	Max	435.82	387.96	400.81	387.96	435.82
			Min	-30.81	-26.12	-25.00	-26.12	-30.81
	①-2+②	0.85	Max	378.75	342.14	341.67	342.14	378.75
			Min	-25.11	-21.27	-20.35	-21.27	-25.11
	(③-1+②)x0.9	0.85	Max	516.28	459.47	463.41	459.47	516.28
			Min	-28.03	-23.74	-22.71	-23.74	-28.03
	(③-2+②)x0.9	0.85	Max	340.88	307.93	307.50	307.93	340.88
			Min	-22.60	-19.14	-18.31	-19.14	-22.60
	④	1.0	Max	8.36	159.41	396.78	159.41	8.36
			Min	-17.33	-13.43	-12.35	-13.43	-17.33
Picked Up Live Load		PICK	Max	516.27	459.48	463.41	459.48	516.27
			Min	-30.81	-26.12	-25.00	-26.12	-30.81
D + L			Max	2340.80	1779.35	1936.82	1779.35	2340.80
			Min	1793.72	1293.75	1448.41	1293.75	1793.72
Dead load total				7762.21				
Live load total				2414.91				

				PF13				
		name.OR. facter		1017	2017	3017	4017	5017
Dead load				1824.53	1319.87	1473.41	1319.87	1824.53
AASHTO	Truk	①-1	Max	212.90	169.09	210.62	169.09	212.90
			Min	-21.96	-18.67	-17.90	-18.67	-21.96
	Tandem	①-2	Max	145.76	115.19	141.04	115.19	145.76
			Min	-15.25	-12.96	-12.43	-12.96	-15.25
Lane Load	Distributed Load	②	Max	299.83	287.33	260.92	287.33	299.83
			Min	-14.29	-12.06	-11.51	-12.06	-14.29
AASHTOxTWIN	Truk	③-1	Max	375.04	313.29	344.84	313.29	375.04
			Min	-22.35	-18.97	-18.18	-18.97	-22.35
	Tandem	③-2	Max	145.76	115.19	141.04	115.19	145.76
			Min	-15.25	-12.96	-12.43	-12.96	-15.25
Lane Load	Distributed Load	②	Max	299.83	287.33	260.92	287.33	299.83
			Min	-14.29	-12.06	-11.51	-12.06	-14.29
Special Vehicular Load	Distributed Load	④	Max	8.36	159.41	396.78	159.41	8.36
			Min	-17.33	-13.43	-12.35	-13.43	-17.33
Combination of Live Load	①-1+②	0.85	Max	435.82	387.96	400.81	387.96	435.82
			Min	-30.81	-26.12	-25.00	-26.12	-30.81
	①-2+②	0.85	Max	378.75	342.14	341.67	342.14	378.75
			Min	-25.11	-21.27	-20.35	-21.27	-25.11
	(③-1+②)x0.9	0.85	Max	516.28	459.47	463.41	459.47	516.28
			Min	-28.03	-23.74	-22.71	-23.74	-28.03
	(③-2+②)x0.9	0.85	Max	340.88	307.93	307.50	307.93	340.88
			Min	-22.60	-19.14	-18.31	-19.14	-22.60
	④	1.0	Max	8.36	159.41	396.78	159.41	8.36
			Min	-17.33	-13.43	-12.35	-13.43	-17.33
Picked Up Live Load		PICK	Max	516.27	459.48	463.41	459.48	516.27
			Min	-30.81	-26.12	-25.00	-26.12	-30.81
D + L			Max	2340.80	1779.35	1936.82	1779.35	2340.80
			Min	1793.72	1293.75	1448.41	1293.75	1793.72
Dead load total				7762.21				
Live load total				2414.91				

				PF14				
		name.OR. facter		1023	2023	3023	4023	5023
Dead load				451.03	306.54	375.46	306.54	451.03
AASHTO	Truk	①-1	Max	108.44	234.46	189.99	234.46	108.44
			Min	-28.50	-27.71	-27.53	-27.71	-28.50
	Tandem	①-2	Max	75.60	176.99	140.62	176.99	75.60
			Min	-19.56	-18.97	-18.93	-18.97	-19.56
Lane Load	Distributed Load	②	Max	70.43	99.82	100.46	99.82	70.43
			Min	-26.18	-25.63	-25.67	-25.63	-26.18
AASHTOxTWIN	Truk	③-1	Max	143.81	262.31	222.02	262.31	143.81
			Min	-42.19	-41.35	-40.47	-41.35	-42.19
	Tandem	③-2	Max	75.60	176.99	140.62	176.99	75.60
			Min	-19.56	-18.97	-18.93	-18.97	-19.56
Lane Load	Distributed Load	②	Max	70.43	99.82	100.46	99.82	70.43
			Min	-26.18	-25.63	-25.67	-25.63	-26.18
Special Vehicular Load	Distributed Load	④	Max	21.20	130.19	301.03	130.19	21.20
			Min	-22.55	-20.25	-18.87	-20.25	-22.55
Combination of Live Load	①-1+②	0.85	Max	152.04	284.14	246.88	284.14	152.04
			Min	-46.48	-45.34	-45.22	-45.34	-46.48
	①-2+②	0.85	Max	124.13	235.29	204.92	235.29	124.13
			Min	-38.88	-37.91	-37.91	-37.91	-38.88
	(③-1+②)x0.9	0.85	Max	163.89	277.03	246.70	277.03	163.89
			Min	-52.30	-51.24	-50.60	-51.24	-52.30
	(③-2+②)x0.9	0.85	Max	111.71	211.76	184.43	211.76	111.71
			Min	-34.99	-34.12	-34.12	-34.12	-34.99
	④	1.0	Max	21.20	130.19	301.03	130.19	21.20
			Min	-22.55	-20.25	-18.87	-20.25	-22.55
Picked Up Live Load		PICK	Max	163.89	277.03	246.69	277.03	163.89
			Min	-52.30	-51.24	-50.59	-51.24	-52.30
D + L			Max	614.92	583.57	622.15	583.57	614.92
			Min	398.73	255.30	324.87	255.30	398.73
Dead load total				1890.60				
Live load total				1128.53				

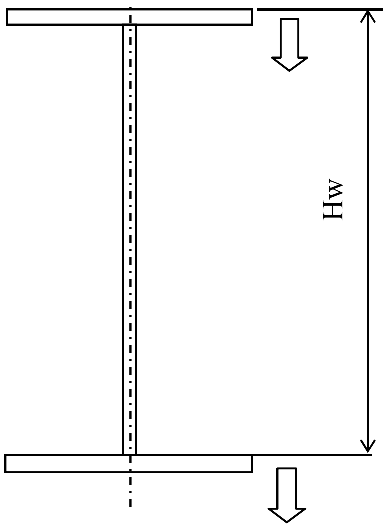
§4. Design f Main Girder

4-1 Design Method

In the design of main girder, the cross section is determined by using the soft where which downloads the cross sectional forc calculated in §3. and can design Steel-I Girder automatically.

(1) Method for Determination of Cross Section of Stiffener

1) The location of cross section change is same with the location of joint.
The longest length of material is approximately 12.0m or less due to the restriction of transportation.
2) The maximum difference of flange thickness is half of the thicker base material or less and 25mm or less.
3) Regarding the compressive flange, reduction of stress due to local buckling is considered for upper and lower flange.
4) Regarding the tensile flange, the cross section is determined considering the influence of hole of bolts
Minimum thickness is 1/16 of 1/2 of the width of the flange
5) The flange width is constant and cross section is changed with the thickness of flange.
At bearing, on the other hand, the cross section is changed with the size of bearing.
6) The height of the main girder shall be from the upper flange top to the lower flange upper.



7) Minimum thicknesses are shown as follows.
The minimum difference of flange thickness is 2mm and the thickness is measured in increments of 1mm.

＜Upper Compressive Flange＞

(mm)

Material	SM400	SM490Y	SM570
Standard	b/16	b/16	b/16
Flange Width	590	590	590
Minimum Thickness of Plate	19	19	19

＜Lower Compressive Flange＞

(mm)

Material	SM400	SM490Y	SM570
Standard	b/16	b/16	b/16
Flange Width b	590	590	590
Minimum Thickness of Plate	19	19	19

＜Web＞

(mm)

Material	SM400	SM490Y	SM570
Calculation Equation	Hw/256	Hw/209	Hw/188
Calculated Value	9.38	11.48	12.77
Minimum Thickness of Plate	10.00	12.00	13.00
Height of Web Plate Hw	2400	2400	2400

(2) Vertical Stiffener

1) The cross section is determined as follows according to JSHB II－11.4.4.

a) The width of vertical stiffener is the value or more which is the total of 1/30 of web height and 50mm.

b) The material is SM400.

c) The thickness of vertical stiffener is 1/13 of the width or more.

d) The interval of vertical stiffener "a" used in the equation (11.4.7) is the maximum value which satisfies the assessment equation stated in 11.4.3

(3) Horizontal Stiffener

1) The number of horizontal stiffener rows is one according to the girder height.
The cross section is determined to be satisfied with the stiffness stated in JSHB II-11.4.7.

(4) Bearing Stiffener

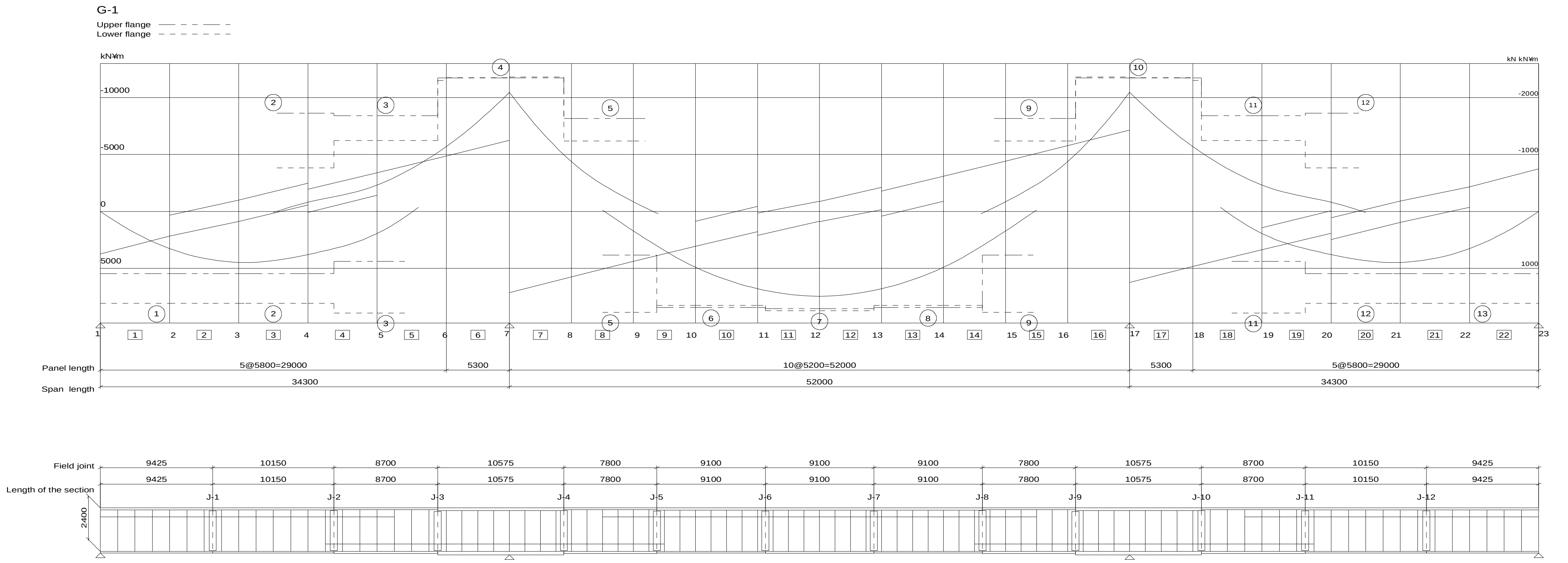
1) The bearing stiffener is determined by the structure at the load concentrated point stated in JSHB II-11.5.

(5) Design Method for Field Joint

1) For the bending stress, the design stress of field joint is the greater value comparing with the applied stress and 75% of the total strength.
2) The minimum number of bolt rows on the compressive flange is two.
3) Stress deducting a hole of the tensile flange is increased by 1.1 times of net cross sectional area.
4) Allowable force of Torshear type high strength bolt (S10T) M22 is 54 kN
5) The number of bolt rows and the thickness of splice plate is determined on the thinner cross section of the base material at joint.
6) The size of the hole of the bolt shall be φ25
7) The maximum number of bolt rows is eight while it is allowed to be 12 when unavoidable.
8) The splice plate is determined by the design stress which is 75% or more of the total strength.
9) The distance between the edge of splice plate and the edge of base material is 5mm.

4-2 Calculation of Main Girder

STRESS DIAGRAM(1/5) S=1:400



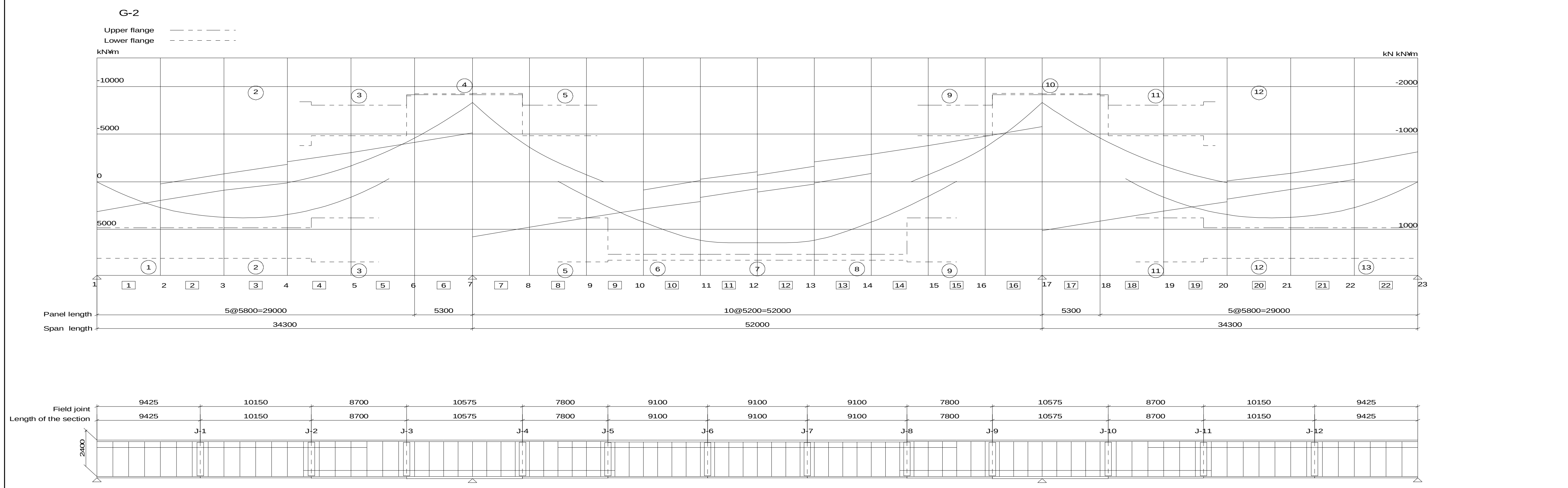
UnitFmm N/mm2

		1		2			3			4		5		6	7	8	9		10		11			12			13	
Section		Sec-2		Sec-2			Sec-3			Sec-4		Sec-5		Sec-6	Sec-7	Sec-8	Sec-9		Sec-10		Sec-11			Sec-12			Sec-13	
Upper flange	Width	590		590			590			590		590		590	590	590	590		590		590			590			590	
	Thickness	22(3)		22(3)			20(3)			31(3)		19(3)		26(3)	26(3)	26(3)	19(3)		31(3)		20(3)			22(3)			22(3)	
Web	Height	2378	2378	2378	2378	2378	2380	2380	2380	2369	2369	2381	2381	2374	2374	2374	2381	2381	2369	2369	2380	2380	2380	2378	2378	2378	2378	2378
	Thickness	12(3)		12(3)			12(3)			12(3)		12(3)		12(3)	12(3)	12(3)	12(3)		12(3)		12(3)			12(3)			12(3)	
Lower flange	Width	590		590			590			590		590		590	590	590	590		590		590			590			590	
	Thickness	19(3)		19(3)			23(3)			39(3)		23(3)		19(3)	21(3)	19(3)	23(3)		39(3)		23(3)			19(3)			19(3)	
Upper flange	ƒÐ	0	-104	-110	-80	31	-82	32	129	188	188	128	-78	-153	-162	-153	-78	128	188	188	129	-82	32	-80	31	-110	-104	0
	ƒÐa	210	133	133	133	210	110	210	210	210	210	210	99	186	186	186	99	210	210	210	210	110	210	133	210	133	133	210
	ƒÐa-ƒÐ	210	29	23	53	179	28	178	81	22	22	82	21	33	24	33	21	82	22	22	81	28	178	53	179	23	29	210
Lower flange	ƒÐ	0	111	117	85	-33	77	-30	-121	-165	-165	-118	72	177	179	177	72	-118	-165	-165	-121	77	-30	85	-33	117	111	0
	ƒÐa	210	210	210	210	99	210	146	146	185	186	146	210	210	210	210	210	146	186	185	146	210	146	210	99	210	210	210
	ƒÐa-ƒÐ	210	99	93	125	66	133	116	25	20	21	28	138	33	31	33	138	28	21	20	25	133	116	125	66	93	99	210
Web	ƒÑ	26	10	8	17	17	17	17	33	44	50	42	27	14	6	14	27	42	50	44	33	17	17	17	17	8	10	26
	ƒÑa	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	Combined	0.05	0.28	0.31	0.18	0.05	0.17	0.04	0.44	0.89	0.94	0.48	0.19	0.70	0.71	0.70	0.19	0.48	0.94	0.89	0.44	0.17	0.04	0.18	0.05	0.31	0.28	0.05
Calculated points		Left	J-1		J-2	J-2	Left	Left	J-3	Max Left	Max Right	J-4	J-5	J-6		J-7	J-8	J-9	Max Left	Max Right	J-10	Right	Right	J-11	J-11		J-12	Right
Uflg ƒÐpl						34			141			141						141			141				34			
Lflg ƒÐpl			121		93								78	177		177	87							93			121	

Grade (1):SM400
(2):SM490
(3):SM490Y
(4):SM570

Bago bridge girder part G-1

STRESS DIAGRAM(2/5) S=1:400



UnitFmm N/mm2

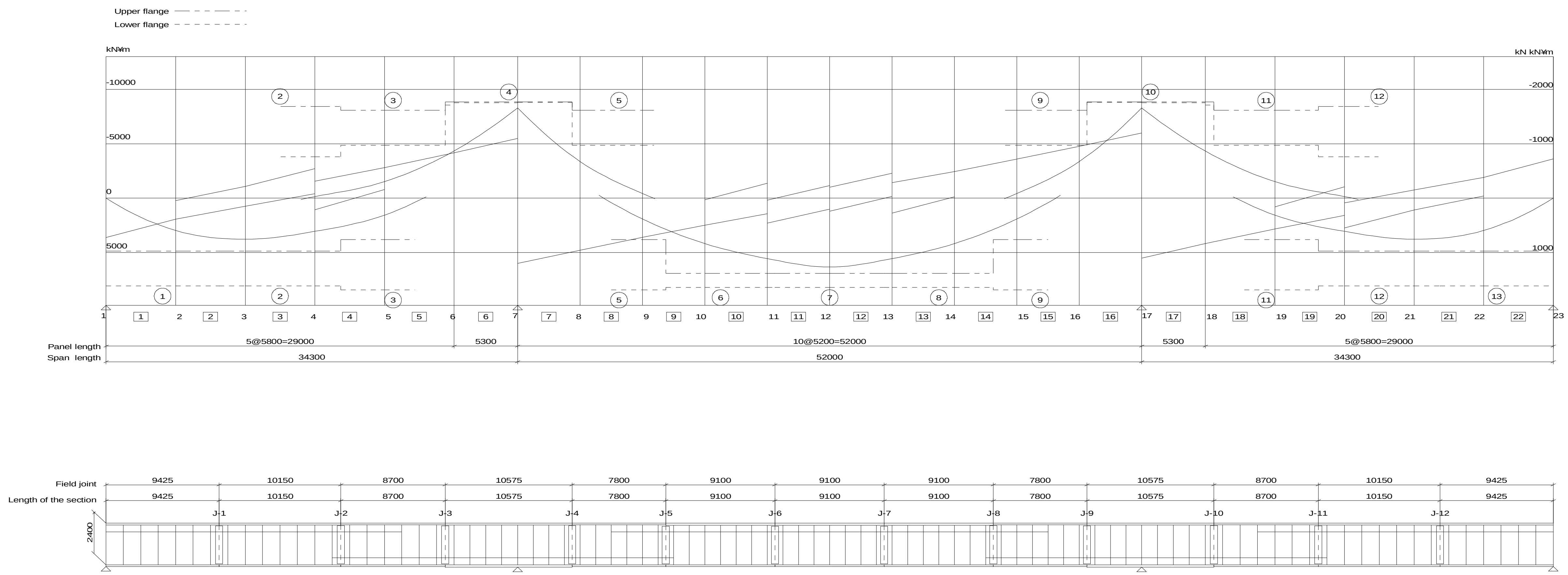
		1		2			3			4		5		6	7		8	9		10		11			12			13	
Section		Sec-1		Sec-2			Sec-3			Sec-4		Sec-5		Sec-6	Sec-7		Sec-8	Sec-9		Sec-10		Sec-11			Sec-12			Sec-13	
Upper flange	Width	590		590			590			590		590		590	590		590	590		590		590			590			590	
	Thickness	21(3)		21(3)			19(3)			22(3)		19(3)		25(3)	25(3)		25(3)	19(3)		22(3)		19(3)			21(3)			21(3)	
Web	Height	2379	2379	2379	2379	2379	2381	2381	2381	2378	2378	2381	2381	2375	2375	2375	2375	2381	2381	2378	2378	2381	2381	2381	2379	2379	2379	2379	2379
	Thickness	12(3)		12(3)			12(3)			12(3)		12(3)		12(3)	12(3)		12(3)	12(3)		12(3)		12(3)			12(3)			12(3)	
Lower flange	Width	590		590			590			590		590		590	590		590	590		590		590			590			590	
	Thickness	19(3)		19(3)			21(3)			29(3)		21(3)		19(3)	19(3)		19(3)	21(3)		29(3)		21(3)			19(3)			19(3)	
Upper flange	ƒÐ	0	-88	-95	-74	11	-77	11	108	191	191	107	-68	-141	-144	-144	-141	-68	107	191	191	108	-77	11	-74	11	-95	-88	0
	ƒÐa	210	121	121	121	210	99	210	210	210	210	210	99	172	172	172	172	99	210	210	210	210	99	210	121	210	121	121	210
	ƒÐa-ƒÐ	210	33	26	47	199	22	199	102	19	19	103	31	31	28	28	31	31	103	19	19	102	22	199	47	199	26	33	210
Lower flange	ƒÐ	0	92	99	77	-11	74	-11	-104	-167	-167	-103	66	160	164	164	160	66	-103	-167	-167	-104	74	-11	77	-11	99	92	0
	ƒÐa	210	210	210	210	99	210	121	121	185	186	121	210	210	210	210	210	210	121	186	185	121	210	121	210	99	210	210	210
	ƒÐa-ƒÐ	210	118	111	133	88	136	110	17	18	19	18	144	50	46	46	50	144	18	19	18	17	136	110	133	88	111	118	210
Web	ƒÑ	22	9	8	17	17	17	17	28	36	41	34	24	11	8	7	11	24	34	41	36	28	17	17	17	17	8	9	22
	ƒÑa	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	Combined	0.03	0.19	0.22	0.15	0.02	0.15	0.02	0.31	0.89	0.92	0.33	0.14	0.57	0.59	0.59	0.57	0.14	0.33	0.92	0.89	0.31	0.15	0.02	0.15	0.02	0.22	0.19	0.03
Calculated points		Left	J-1		J-2	J-2	Left	Left	J-3	Max Left	Max Right	J-4	J-5	J-6			J-7	J-8	J-9	Max Left	Max Right	J-10	J-11	J-11	Left	Left		J-12	Right
Uflg ƒÐpl						13			119			117							117			119		14					
Lflg ƒÐpl			100		84								72	175			175	72					81					100	

Grade (1):SM400
(2):SM490
(3):SM490Y
(4):SM570

Bago bridge girder part G-2

STRESS DIAGRAM(3/5) S=1:400

G-3



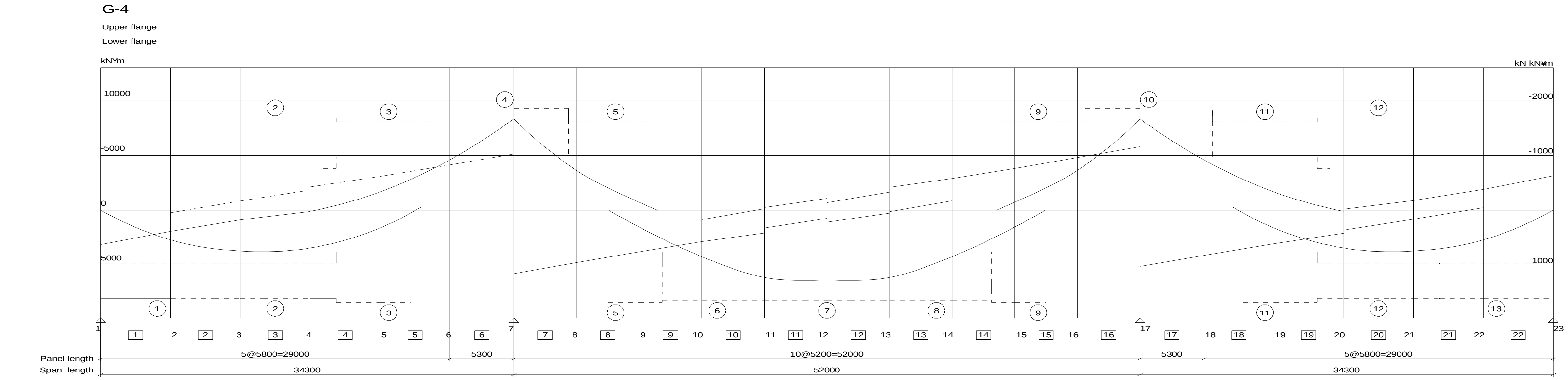
UnitFmm N/mm2

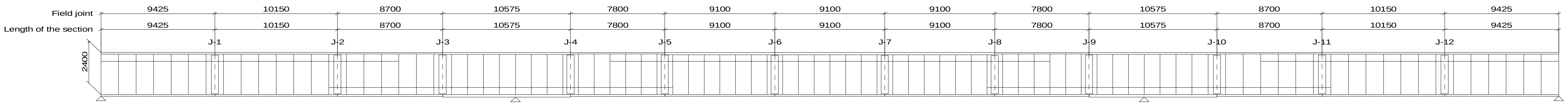
		1		2			3			4		5		6	7	8	9		10		11			12			13	
Section		Sec-1		Sec-2			Sec-3			Sec-4		Sec-5		Sec-6	Sec-7	Sec-8	Sec-9		Sec-10		Sec-11			Sec-12			Sec-13	
Upper flange	Width	590		590			590			590		590		590	590	590	590		590		590			590			590	
	Thickness	21(3)		21(3)			19(3)			21(3)		19(3)		24(3)	24(3)	24(3)	19(3)		21(3)		19(3)			21(3)			21(3)	
Web	Height	2379	2379	2379	2379	2379	2381	2381	2381	2379	2379	2381	2381	2376	2376	2376	2381	2381	2379	2379	2381	2381	2381	2379	2379	2379	2379	2379
	Thickness	12(3)		12(3)			12(3)			12(3)		12(3)		12(3)	12(3)	12(3)	12(3)		12(3)		12(3)			12(3)			12(3)	
Lower flange	Width	590		590			590			590		590		590	590	590	590		590		590			590			590	
	Thickness	19(3)		19(3)			21(3)			27(3)		21(3)		19(3)	19(3)	19(3)	21(3)		27(3)		21(3)			19(3)			19(3)	
Upper flange	ƒÐ	0	-92	-94	-65	15	-68	15	101	198	198	101	-75	-131	-146	-131	-75	101	198	198	101	-68	15	-65	15	-94	-92	0
	ƒÐa	210	121	121	121	210	99	210	210	210	210	210	99	159	159	159	99	210	210	210	210	99	210	121	210	121	121	210
	ƒÐa-ƒÐ	210	29	27	56	195	31	195	109	12	12	109	24	28	13	28	24	109	12	12	109	31	195	56	195	27	29	210
Lower flange	ƒÐ	0	96	98	68	-15	65	-15	-97	-175	-175	-97	71	146	162	146	71	-97	-175	-175	-97	65	-15	68	-15	98	96	0
	ƒÐa	210	210	210	210	99	210	121	121	185	186	121	210	210	210	210	210	121	186	185	121	210	121	210	99	210	210	210
	ƒÐa-ƒÐ	210	114	112	142	84	145	106	24	10	11	24	139	64	48	64	139	24	11	10	24	145	106	142	84	112	114	210
Web	ƒÑ	25	8	8	14	14	14	14	28	39	42	34	22	15	8	15	22	34	42	39	28	14	14	14	14	8	8	25
	ƒÑa	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	Combined	0.04	0.21	0.22	0.12	0.02	0.12	0.02	0.28	0.96	0.98	0.31	0.16	0.48	0.58	0.48	0.16	0.31	0.98	0.96	0.28	0.12	0.02	0.12	0.02	0.22	0.21	0.04
Calculated points		Left	J-1		J-2	J-2	Left	Left	J-3	Max Left	Max Right	J-4	J-5	J-6		J-7	J-8	J-9	Max Left	Max Right	J-10	J-11	J-11	Left	Left		J-12	Right
Uflg ƒÐpl						16			111			110						110			111		17					
Lflg ƒÐpl			105		75								78	160		160	78					71					105	

Grade (1):SM400
(2):SM490
(3):SM490Y
(4):SM570

Bago bridge girder part G-3

STRESS DIAGRAM(4/5) S=1:400





UnitFmm N/mm2

		1		2			3			4		5		6
Section		Sec-1		Sec-2			Sec-3			Sec-4		Sec-5		Sec-6
Upper flange	Width	590		590			590			590		590		590
	Thickness	21(3)		21(3)			19(3)			22(3)		19(3)		25(3)
Web	Height	2379	2379	2379	2379	2379	2381	2381	2381	2378	2378	2381	2381	2375
	Thickness	12(3)		12(3)			12(3)			12(3)		12(3)		12(3)
Lower flange	Width	590		590			590			590		590		590
	Thickness	19(3)		19(3)			21(3)			29(3)		21(3)		19(3)
Upper flange	ƒÐ	0	-88	-95	-74	11	-77	11	108	191	191	107	-68	-141
	ƒÐa	210	121	121	121	210	99	210	210	210	210	210	99	172
	ƒÐa-ƒÐ	210	33	26	47	199	22	199	102	19	19	103	31	31
Lower flange	ƒÐ	0	92	99	77	-11	74	-11	-104	-167	-167	-103	66	160
	ƒÐa	210	210	210	210	99	210	121	121	185	186	121	210	210
	ƒÐa-ƒÐ	210	118	111	133	88	136	110	17	18	19	18	144	50
Web	ƒÑ	22	9	8	17	17	17	17	28	36	41	34	24	11
	ƒÑa	120	120	120	120	120	120	120	120	120	120	120	120	120
	Combined	0.03	0.19	0.22	0.15	0.02	0.15	0.02	0.31	0.89	0.92	0.33	0.14	0.57
Calculated points		Left	J-1		J-2	J-2	Left	Left	J-3	Max Left	Max Right	J-4	J-5	J-6
Uflg ƒÐpl						13			132			117		
Lflg ƒÐpl			100		84								80	195

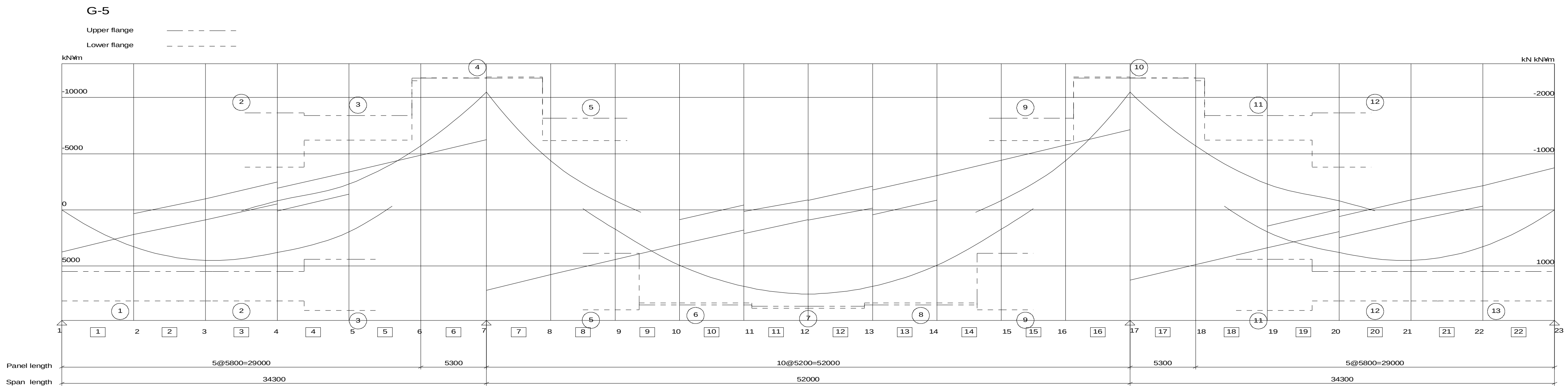
		7		8	9		10		11			12			13	
Section		Sec-7		Sec-8	Sec-9		Sec-10		Sec-11			Sec-12			Sec-13	
Upper flange	Width	590		590	590		590		590			590			590	
	Thickness	25(3)		25(3)	19(3)		22(3)		19(3)			21(3)			21(3)	
Web	Height	2375	2375	2375	2381	2381	2378	2378	2381	2381	2381	2379	2379	2379	2379	2379
	Thickness	12(3)		12(3)	12(3)		12(3)		12(3)			12(3)			12(3)	
Lower flange	Width	590		590	590		590		590			590			590	
	Thickness	19(3)		19(3)	21(3)		29(3)		21(3)			19(3)			19(3)	
Upper flange	ƒÐ	-144	-144	-141	-68	107	191	191	108	-77	11	-74	11	-95	-88	0
	ƒÐa	172	172	172	99	210	210	210	210	99	210	121	210	121	121	210
	ƒÐa-ƒÐ	28	28	31	31	103	19	19	102	22	199	47	199	26	33	210
Lower flange	ƒÐ	164	164	160	66	-103	-167	-167	-104	74	-11	77	-11	99	92	0
	ƒÐa	210	210	210	210	121	186	185	121	210	121	210	99	210	210	210
	ƒÐa-ƒÐ	46	46	50	144	18	19	18	17	136	110	133	88	111	118	210
Web	ƒÑ	8	7	11	24	34	41	36	28	17	17	17	17	8	9	22
	ƒÑa	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	Combined	0.59	0.59	0.57	0.14	0.33	0.92	0.89	0.31	0.15	0.02	0.15	0.02	0.22	0.19	0.03
Calculated points				J-7	J-8	J-9	Max Left	Max Right	J-10	J-11	J-11	Left	Left		J-12	Right
Uflg ƒÐpl						131			132		14					
Lflg ƒÐpl				195	80					81					100	

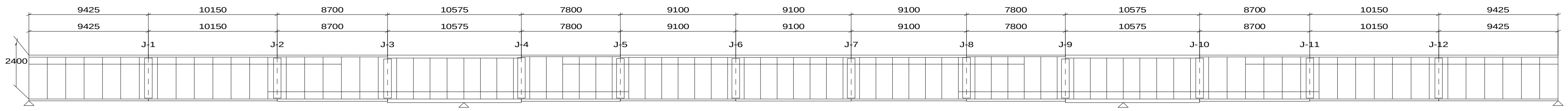
Grade (1):SM400
(2):SM490
(3):SM490Y
(4):SM570

Determinant factor
A:Tensile stress degree
B:Compressive stress degree
C:Pore resilience
D:Flange free protrusion
E:Flange thickness difference

Bago bridge girder part G-4

STRESS DIAGRAM(5/5) S=1:400





UnitFmm N/mm2

		1		2			3		
Section		Sec-1		Sec-2			Sec-3		
Upper flange	Width	590		590			590		
	Thickness	22(3)		22(3)			20(3)		
Web	Height	2378	2378	2378	2378	2378	2380	2380	2380
	Thickness	12(3)		12(3)			12(3)		
Lower flange	Width	590		590			590		
	Thickness	19(3)		19(3)			23(3)		
Upper flange	ƒÐ	0	-104	-110	-80	31	-82	32	129
	ƒÐa	210	133	133	133	210	110	210	210
	ƒÐa-ƒÐ	210	29	23	53	179	28	178	81
Lower flange	ƒÐ	0	111	117	85	-33	77	-30	-121
	ƒÐa	210	210	210	210	99	210	146	146
	ƒÐa-ƒÐ	210	99	93	125	66	133	116	25
Web	ƒÑ	26	10	8	17	17	17	17	33
	ƒÑa	120	120	120	120	120	120	120	120
	Combined	0.05	0.28	0.31	0.18	0.05	0.17	0.04	0.44
Calculated points		Left	J-1		J-2	J-2	Left	Left	J-3
Uflg ƒÐpl						34			141
Lflg ƒÐpl			121		93				

		4		5		6	7	8	9	
Section		Sec-4		Sec-5		Sec-6	Sec-7	Sec-8	Sec-9	
Upper flange	Width	590		590		590	590	590	590	
	Thickness	31(3)		19(3)		26(3)	26(3)	26(3)	19(3)	
Web	Height	2369	2369	2381	2381	2374	2374	2374	2381	2381
	Thickness	12(3)		12(3)		12(3)	12(3)	12(3)	12(3)	
Lower flange	Width	590		590		590	590	590	590	
	Thickness	39(3)		23(3)		19(3)	21(3)	19(3)	23(3)	
Upper flange	ƒÐ	188	188	128	-78	-153	-162	-153	-78	128
	ƒÐa	210	210	210	99	186	186	186	99	210
	ƒÐa-ƒÐ	22	22	82	21	33	24	33	21	82
Lower flange	ƒÐ	-165	-165	-118	72	177	179	177	72	-118
	ƒÐa	185	186	146	210	210	210	210	210	146
	ƒÐa-ƒÐ	20	21	28	138	33	31	33	138	28
Web	ƒÑ	44	50	42	27	14	6	14	27	42
	ƒÑa	120	120	120	120	120	120	120	120	120
	Combined	0.89	0.94	0.48	0.19	0.70	0.71	0.70	0.19	0.48
Calculated points		Max Left	Max Right	J-4	J-5	J-6		J-7	J-8	J-9
Uflg ƒÐpl				141						141
Lflg ƒÐpl					78	193		177	78	

		10		11			12			13	
Section		Sec-10		Sec-11			Sec-12			Sec-13	
Upper flange	Width	590		590			590			590	
	Thickness	31(3)		20(3)			22(3)			22(3)	
Web	Height	2369	2369	2380	2380	2380	2378	2378	2378	2378	2378
	Thickness	12(3)		12(3)			12(3)			12(3)	
Lower flange	Width	590		590			590			590	
	Thickness	39(3)		23(3)			19(3)			19(3)	
Upper flange	ƒÐ	188	188	129	-82	32	-80	31	-110	-104	0
	ƒÐa	210	210	210	110	210	133	210	133	133	210
	ƒÐa-ƒÐ	22	22	81	28	178	53	179	23	29	210
Lower flange	ƒÐ	-165	-165	-121	77	-30	85	-33	117	111	0
	ƒÐa	186	185	146	210	146	210	99	210	210	210
	ƒÐa-ƒÐ	21	20	25	133	116	125	66	93	99	210
Web	ƒÑ	50	44	33	17	17	17	17	8	10	26
	ƒÑa	120	120	120	120	120	120	120	120	120	120
	Combined	0.94	0.89	0.44	0.17	0.04	0.18	0.05	0.31	0.28	0.05
Calculated points		Max Left	Max Right	J-10	Right	Right	J-11	J-11		J-12	Right
Uflg ƒÐpl				141				34			
Lflg ƒÐpl							93			121	

Grade (1):SM400
(2):SM490
(3):SM490Y
(4):SM570

Bago bridge girder part G-5

4-3. Calculation Result of Field joint for Main Girder

1) Flange

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress			Flg THK	Flg stress	Req Bolts	Applied Bolts	Bolts Stress	Spl THK	Spl THK	Req Area	Total Area	Group No.
							σt	σc	τ		σtn	n		ρ	1	2	Ar	As	
1	G-1	J-1(Sec-2)	UFLG	590	22	SM490Y	---	-104	0	---	---	12.5	18	74863	12	14	101.3	142.4	*1
2	G-1	J-1(Sec-2)	LFLG	590	19	SM490Y	158	---	0	---	121	13.6	20	73316	14	12	69.8	113.7	17
4	G-1	J-2(Sec-2)	UFLG	590	22	SM490Y	158	100	0	---	34	15.7	20	84893	12	14	80.9	113.7	*3
5	G-1	J-2(Sec-2)	LFLG	590	19	SM490Y	158	74	0	---	93	13.6	20	73316	14	12	69.8	113.7	*4
7	G-1	J-3(Sec-3)	UFLG	590	20	SM490Y	158	---	0	---	141	14.3	20	77175	12	14	73.5	113.7	*5
8	G-1	J-3(Sec-3)	LFLG	590	23	SM490Y	---	-121	0	---	---	15.2	24	68607	14	12	112.8	142.4	*6
10	G-1	J-4(Sec-5)	UFLG	590	19	SM490Y	158	---	0	---	141	13.6	20	73316	12	14	69.8	113.7	17
11	G-1	J-4(Sec-5)	LFLG	590	23	SM490Y	---	-118	0	---	---	14.8	24	66711	14	12	109.7	142.4	6
13	G-1	J-5(Sec-5)	UFLG	590	19	SM490Y	---	-78	0	---	---	8.1	12	72773	10	12	88.2	120.4	*9
14	G-1	J-5(Sec-5)	LFLG	590	23	SM490Y	158	---	0	---	78	16.4	20	88751	14	12	84.5	113.7	*10
16	G-1	J-6(Sec-6)	UFLG	590	26	SM490Y	---	-153	0	---	---	21.7	30	78172	14	16	126.1	164.4	*11
17	G-1	J-6(Sec-6)	LFLG	590	19	SM490Y	177	---	0	---	177	18.3	24	82511	14	14	94.3	123.2	*12
19	G-1	J-7(Sec-8)	UFLG	590	26	SM490Y	---	-153	0	---	---	21.7	30	78172	14	16	126.1	164.4	11
20	G-1	J-7(Sec-8)	LFLG	590	19	SM490Y	177	---	0	---	177	18.3	24	82511	14	14	94.3	123.2	12
22	G-1	J-8(Sec-9)	UFLG	590	19	SM490Y	---	-78	0	---	---	8.1	12	72773	10	12	88.2	120.4	9
23	G-1	J-8(Sec-9)	LFLG	590	23	SM490Y	158	---	0	---	78	16.4	20	88751	14	12	84.5	113.7	10
25	G-1	J-9(Sec-9)	UFLG	590	19	SM490Y	158	---	0	---	141	13.6	20	73316	12	14	69.8	113.7	17
26	G-1	J-9(Sec-9)	LFLG	590	23	SM490Y	---	-118	0	---	---	14.8	24	66711	14	12	109.7	142.4	6
28	G-1	J-10(Sec-11)	UFLG	590	20	SM490Y	158	---	0	---	141	14.3	20	77175	12	14	73.5	113.7	5
29	G-1	J-10(Sec-11)	LFLG	590	23	SM490Y	---	-121	0	---	---	15.2	24	68607	14	12	112.8	142.4	6
31	G-1	J-11(Sec-12)	UFLG	590	22	SM490Y	158	100	0	---	34	15.7	20	84893	12	14	80.9	113.7	3
32	G-1	J-11(Sec-12)	LFLG	590	19	SM490Y	158	74	0	---	93	13.6	20	73316	14	12	69.8	113.7	4
34	G-1	J-12(Sec-13)	UFLG	590	22	SM490Y	---	-104	0	---	---	12.5	18	74863	12	14	101.3	142.4	1

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress σt	σc	τ	Flg THK	Flg stress σtn	Req Bolts n	Applied Bolts	Bolts Stress ρ	Spl THK 1	Spl THK 2	Req Area Ar	Total Area As	Group No.
35	G-1	J-12(Sec-13)	LFLG	590	19	SM490Y	158	---	0	---	121	13.6	20	73316	14	12	69.8	113.7	17
37	G-2	J-1(Sec-1)	UFLG	590	21	SM490Y	---	91	0	---	---	10.4	12	93699	12	12	92.9	132.0	22
38	G-2	J-1(Sec-1)	LFLG	590	19	SM490Y	158	---	0	---	100	13.6	20	73316	14	12	69.8	113.7	17
40	G-2	J-2(Sec-2)	UFLG	590	21	SM490Y	158	91	0	---	13	13.5	18	80850	10	12	92.9	120.4	*14
41	G-2	J-2(Sec-2)	LFLG	590	19	SM490Y	158	74	0	---	84	13.6	20	73316	14	12	69.8	113.7	4
43	G-2	J-3(Sec-3)	UFLG	590	19	SM490Y	158	---	0	---	119	13.6	20	73316	12	14	69.8	113.7	17
44	G-2	J-3(Sec-3)	LFLG	590	21	SM490Y	---	-104	0	---	---	11.9	18	71450	12	12	106.3	132.0	*15
46	G-2	J-4(Sec-5)	UFLG	590	19	SM490Y	158	---	0	---	117	13.6	20	73316	12	14	69.8	113.7	17
47	G-2	J-4(Sec-5)	LFLG	590	21	SM490Y	---	-103	0	---	---	11.8	18	70684	12	12	105.2	132.0	15
49	G-2	J-5(Sec-5)	UFLG	590	19	SM490Y	---	74	0	---	---	7.7	12	69362	10	12	84.1	120.4	9
50	G-2	J-5(Sec-5)	LFLG	590	21	SM490Y	158	---	0	---	72	15.0	20	81034	14	12	77.2	113.7	24
52	G-2	J-6(Sec-6)	UFLG	590	25	SM490Y	---	-141	0	---	---	19.3	24	86654	14	16	120.9	164.4	*16
53	G-2	J-6(Sec-6)	LFLG	590	19	SM490Y	175	---	0	---	175	16.6	20	89570	14	12	85.3	113.7	*17
55	G-2	J-7(Sec-8)	UFLG	590	25	SM490Y	---	-141	0	---	---	19.3	24	86654	14	16	120.9	164.4	16
56	G-2	J-7(Sec-8)	LFLG	590	19	SM490Y	175	---	0	---	175	16.6	20	89570	14	12	85.3	113.7	17
58	G-2	J-8(Sec-9)	UFLG	590	19	SM490Y	---	74	0	---	---	7.7	12	69362	10	12	84.1	120.4	9
59	G-2	J-8(Sec-9)	LFLG	590	21	SM490Y	158	---	0	---	72	15.0	20	81034	14	12	77.2	113.7	24
61	G-2	J-9(Sec-9)	UFLG	590	19	SM490Y	158	---	0	---	117	13.6	20	73316	12	14	69.8	113.7	17
62	G-2	J-9(Sec-9)	LFLG	590	21	SM490Y	---	-103	0	---	---	11.8	18	70684	12	12	105.2	132.0	15
64	G-2	J-10(Sec-11)	UFLG	590	19	SM490Y	158	---	0	---	119	13.6	20	73316	12	14	69.8	113.7	17
65	G-2	J-10(Sec-11)	LFLG	590	21	SM490Y	---	-104	0	---	---	11.9	18	71450	12	12	106.3	132.0	15
67	G-2	J-11(Sec-11)	UFLG	590	19	SM490Y	158	-77	0	---	14	12.2	18	73150	10	12	87.2	120.4	*19
68	G-2	J-11(Sec-11)	LFLG	590	21	SM490Y	158	91	0	---	81	15.0	20	81034	14	12	77.2	113.7	*20
70	G-2	J-12(Sec-13)	UFLG	590	21	SM490Y	---	91	0	---	---	10.4	12	93699	12	12	92.9	132.0	22
71	G-2	J-12(Sec-13)	LFLG	590	19	SM490Y	158	---	0	---	100	13.6	20	73316	14	12	69.8	113.7	17
73	G-3	J-1(Sec-1)	UFLG	590	21	SM490Y	---	-92	0	---	---	10.5	12	94776	12	12	94.0	132.0	*22
74	G-3	J-1(Sec-1)	LFLG	590	19	SM490Y	158	---	0	---	105	13.6	20	73316	14	12	69.8	113.7	17

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress σt	σc	τ	Flg THK	Flg stress σtn	Req Bolts n	Applied Bolts	Bolts Stress ρ	Spl THK 1	Spl THK 2	Req Area Ar	Total Area As	Group No.
76	G-3	J-2(Sec-2)	UFLG	590	21	SM490Y	158	91	0	---	16	15.0	20	81034	12	14	77.2	113.7	20
77	G-3	J-2(Sec-2)	LFLG	590	19	SM490Y	158	74	0	---	75	13.6	20	73316	14	12	69.8	113.7	4
79	G-3	J-3(Sec-3)	UFLG	590	19	SM490Y	158	---	0	---	111	13.6	20	73316	12	14	69.8	113.7	17
80	G-3	J-3(Sec-3)	LFLG	590	21	SM490Y	---	-97	0	---	---	11.1	18	66878	12	12	99.5	132.0	15
82	G-3	J-4(Sec-5)	UFLG	590	19	SM490Y	158	---	0	---	110	13.6	20	73316	12	14	69.8	113.7	17
83	G-3	J-4(Sec-5)	LFLG	590	21	SM490Y	---	-97	0	---	---	11.1	18	66478	12	12	98.9	132.0	15
85	G-3	J-5(Sec-5)	UFLG	590	19	SM490Y	---	-75	0	---	---	7.8	12	69766	10	12	84.6	120.4	9
86	G-3	J-5(Sec-5)	LFLG	590	21	SM490Y	158	---	0	---	78	15.0	20	81034	14	12	77.2	113.7	*24
88	G-3	J-6(Sec-6)	UFLG	590	24	SM490Y	---	-131	0	---	---	17.2	24	77390	14	14	116.8	154.0	*25
89	G-3	J-6(Sec-6)	LFLG	590	19	SM490Y	160	---	0	---	160	15.1	20	81697	14	12	77.8	113.7	17
91	G-3	J-7(Sec-8)	UFLG	590	24	SM490Y	---	-131	0	---	---	17.2	24	77390	14	14	116.8	154.0	25
92	G-3	J-7(Sec-8)	LFLG	590	19	SM490Y	160	---	0	---	160	15.1	20	81697	14	12	77.8	113.7	17
94	G-3	J-8(Sec-9)	UFLG	590	19	SM490Y	---	-75	0	---	---	7.8	12	69766	10	12	84.6	120.4	9
95	G-3	J-8(Sec-9)	LFLG	590	21	SM490Y	158	---	0	---	78	15.0	20	81034	14	12	77.2	113.7	24
97	G-3	J-9(Sec-9)	UFLG	590	19	SM490Y	158	---	0	---	110	13.6	20	73316	12	14	69.8	113.7	17
98	G-3	J-9(Sec-9)	LFLG	590	21	SM490Y	---	-97	0	---	---	11.1	18	66478	12	12	98.9	132.0	15
100	G-3	J-10(Sec-11)	UFLG	590	19	SM490Y	158	---	0	---	111	13.6	20	73316	12	14	69.8	113.7	17
101	G-3	J-10(Sec-11)	LFLG	590	21	SM490Y	---	-97	0	---	---	11.1	18	66878	12	12	99.5	132.0	15
103	G-3	J-11(Sec-11)	UFLG	590	19	SM490Y	158	74	0	---	17	13.6	20	73316	12	14	69.8	113.7	4
104	G-3	J-11(Sec-11)	LFLG	590	21	SM490Y	158	91	0	---	71	15.0	20	81034	14	12	77.2	113.7	20
106	G-3	J-12(Sec-13)	UFLG	590	21	SM490Y	---	-92	0	---	---	10.5	12	94776	12	12	94.0	132.0	22
107	G-3	J-12(Sec-13)	LFLG	590	19	SM490Y	158	---	0	---	105	13.6	20	73316	14	12	69.8	113.7	17
109	G-4	J-1(Sec-1)	UFLG	590	21	SM490Y	---	91	0	---	---	10.4	12	93699	12	12	92.9	132.0	22
110	G-4	J-1(Sec-1)	LFLG	590	19	SM490Y	158	---	0	---	100	13.6	20	73316	14	12	69.8	113.7	17
112	G-4	J-2(Sec-2)	UFLG	590	21	SM490Y	158	91	0	---	13	13.5	18	80850	10	12	92.9	120.4	14
113	G-4	J-2(Sec-2)	LFLG	590	19	SM490Y	158	74	0	---	84	13.6	20	73316	14	12	69.8	113.7	4
115	G-4	J-3(Sec-3)	UFLG	590	19	SM490Y	158	---	0	---	119	13.6	20	73316	12	14	69.8	113.7	17

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress			Flg THK	Flg stress	Req Bolts	Applied Bolts	Bolts Stress	Spl THK	Spl THK	Req Area	Total Area	Group No.
							σt	σc	τ		σtn	n		ρ	1	2	Ar	As	
116	G-4	J-3(Sec-3)	LFLG	590	21	SM490Y	---	-104	0	---	---	11.9	18	71450	12	12	106.3	132.0	15
118	G-4	J-4(Sec-5)	UFLG	590	19	SM490Y	158	---	0	---	117	13.6	20	73316	12	14	69.8	113.7	17
119	G-4	J-4(Sec-5)	LFLG	590	21	SM490Y	---	-103	0	---	---	11.8	18	70684	12	12	105.2	132.0	15
121	G-4	J-5(Sec-5)	UFLG	590	19	SM490Y	---	74	0	---	---	7.7	12	69362	10	12	84.1	120.4	9
122	G-4	J-5(Sec-5)	LFLG	590	21	SM490Y	158	---	0	---	72	15.0	20	81034	14	12	77.2	113.7	24
124	G-4	J-6(Sec-6)	UFLG	590	25	SM490Y	---	-141	0	---	---	19.3	24	86654	14	16	120.9	164.4	16
125	G-4	J-6(Sec-6)	LFLG	590	19	SM490Y	175	---	0	---	175	16.6	20	89570	14	12	85.3	113.7	17
127	G-4	J-7(Sec-8)	UFLG	590	25	SM490Y	---	-141	0	---	---	19.3	24	86654	14	16	120.9	164.4	16
128	G-4	J-7(Sec-8)	LFLG	590	19	SM490Y	175	---	0	---	175	16.6	20	89570	14	12	85.3	113.7	17
130	G-4	J-8(Sec-9)	UFLG	590	19	SM490Y	---	74	0	---	---	7.7	12	69362	10	12	84.1	120.4	9
131	G-4	J-8(Sec-9)	LFLG	590	21	SM490Y	158	---	0	---	72	15.0	20	81034	14	12	77.2	113.7	24
133	G-4	J-9(Sec-9)	UFLG	590	19	SM490Y	158	---	0	---	117	13.6	20	73316	12	14	69.8	113.7	17
134	G-4	J-9(Sec-9)	LFLG	590	21	SM490Y	---	-103	0	---	---	11.8	18	70684	12	12	105.2	132.0	15
136	G-4	J-10(Sec-11)	UFLG	590	19	SM490Y	158	---	0	---	119	13.6	20	73316	12	14	69.8	113.7	17
137	G-4	J-10(Sec-11)	LFLG	590	21	SM490Y	---	-104	0	---	---	11.9	18	71450	12	12	106.3	132.0	15
139	G-4	J-11(Sec-11)	UFLG	590	19	SM490Y	158	-77	0	---	14	12.2	18	73150	10	12	87.2	120.4	19
140	G-4	J-11(Sec-11)	LFLG	590	21	SM490Y	158	91	0	---	81	15.0	20	81034	14	12	77.2	113.7	20
142	G-4	J-12(Sec-13)	UFLG	590	21	SM490Y	---	91	0	---	---	10.4	12	93699	12	12	92.9	132.0	22
143	G-4	J-12(Sec-13)	LFLG	590	19	SM490Y	158	---	0	---	100	13.6	20	73316	14	12	69.8	113.7	17
145	G-5	J-1(Sec-1)	UFLG	590	22	SM490Y	---	-104	0	---	---	12.5	18	74863	12	14	101.3	142.4	1
146	G-5	J-1(Sec-1)	LFLG	590	19	SM490Y	158	---	0	---	121	13.6	20	73316	14	12	69.8	113.7	17
148	G-5	J-2(Sec-2)	UFLG	590	22	SM490Y	158	100	0	---	34	15.7	20	84893	12	14	80.9	113.7	3
149	G-5	J-2(Sec-2)	LFLG	590	19	SM490Y	158	74	0	---	93	13.6	20	73316	14	12	69.8	113.7	4
151	G-5	J-3(Sec-3)	UFLG	590	20	SM490Y	158	---	0	---	141	14.3	20	77175	12	14	73.5	113.7	5
152	G-5	J-3(Sec-3)	LFLG	590	23	SM490Y	---	-121	0	---	---	15.2	24	68607	14	12	112.8	142.4	6
154	G-5	J-4(Sec-5)	UFLG	590	19	SM490Y	158	---	0	---	141	13.6	20	73316	12	14	69.8	113.7	17
155	G-5	J-4(Sec-5)	LFLG	590	23	SM490Y	---	-118	0	---	---	14.8	24	66711	14	12	109.7	142.4	6

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress			Flg THK	Flg stress	Req Bolts	Applied Bolts	Bolts Stress	Spl THK	Spl THK	Req Area	Total Area	Group No.
							σt	σc	τ		σtn	n		ρ	1	2	Ar	As	
157	G-5	J-5(Sec-5)	UFLG	590	19	SM490Y	---	-78	0	---	---	8.1	12	72773	10	12	88.2	120.4	9
158	G-5	J-5(Sec-5)	LFLG	590	23	SM490Y	158	---	0	---	78	16.4	20	88751	14	12	84.5	113.7	10
160	G-5	J-6(Sec-6)	UFLG	590	26	SM490Y	---	-153	0	---	---	21.7	30	78172	14	16	126.1	164.4	11
161	G-5	J-6(Sec-6)	LFLG	590	19	SM490Y	177	---	0	---	177	18.3	24	82511	14	14	94.3	123.2	12
163	G-5	J-7(Sec-8)	UFLG	590	26	SM490Y	---	-153	0	---	---	21.7	30	78172	14	16	126.1	164.4	11
164	G-5	J-7(Sec-8)	LFLG	590	19	SM490Y	177	---	0	---	177	18.3	24	82511	14	14	94.3	123.2	12
166	G-5	J-8(Sec-9)	UFLG	590	19	SM490Y	---	-78	0	---	---	8.1	12	72773	10	12	88.2	120.4	9
167	G-5	J-8(Sec-9)	LFLG	590	23	SM490Y	158	---	0	---	78	16.4	20	88751	14	12	84.5	113.7	10
169	G-5	J-9(Sec-9)	UFLG	590	19	SM490Y	158	---	0	---	141	13.6	20	73316	12	14	69.8	113.7	17
170	G-5	J-9(Sec-9)	LFLG	590	23	SM490Y	---	-118	0	---	---	14.8	24	66711	14	12	109.7	142.4	6
172	G-5	J-10(Sec-11)	UFLG	590	20	SM490Y	158	---	0	---	141	14.3	20	77175	12	14	73.5	113.7	5
173	G-5	J-10(Sec-11)	LFLG	590	23	SM490Y	---	-121	0	---	---	15.2	24	68607	14	12	112.8	142.4	6
175	G-5	J-11(Sec-12)	UFLG	590	22	SM490Y	158	100	0	---	34	15.7	20	84893	12	14	80.9	113.7	3
176	G-5	J-11(Sec-12)	LFLG	590	19	SM490Y	158	74	0	---	93	13.6	20	73316	14	12	69.8	113.7	4
178	G-5	J-12(Sec-13)	UFLG	590	22	SM490Y	---	-104	0	---	---	12.5	18	74863	12	14	101.3	142.4	1
179	G-5	J-12(Sec-13)	LFLG	590	19	SM490Y	158	---	0	---	121	13.6	20	73316	14	12	69.8	113.7	17
										※1							※2	※2	

※Display in the case of thickness up only
If both the tensile Stress and Compressive Stress occurs, the one with the lower difference of Ar and As, will be applied,.
Omit in the case of required area includes flange section area
All members
* of Group No. means the representative member

2) Web

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress			Joint Type	Applied Bolts			Bolts Stress	Spl THK		Group No.
							σUn	σLn	τ			P	Req Bolts	ρ	l	σsp	
3	G-1	J-1(Sec-2)	WEB	2378	12	SM490Y	-147	158	10	w(s)	69	274485	3	91582	9	118	*2
6	G-1	J-2(Sec-2)	WEB	2378	12	SM490Y	-147	158	17	w(s)	69	274485	3	91776	9	118	2
9	G-1	J-3(Sec-3)	WEB	2380	12	SM490Y	158	-147	33	w(s)	69	274488	3	92497	9	119	*7
12	G-1	J-4(Sec-5)	WEB	2381	12	SM490Y	158	-144	42	w(s)	69	276354	3	93716	9	119	*8
15	G-1	J-5(Sec-5)	WEB	2381	12	SM490Y	-158	144	27	w(s)	69	276354	3	92811	9	119	8
18	G-1	J-6(Sec-6)	WEB	2374	12	SM490Y	-149	174	14	w(s)	69	298608	3	99697	9	131	*13
21	G-1	J-7(Sec-8)	WEB	2374	12	SM490Y	-149	174	14	w(s)	69	298608	3	99697	9	131	13
24	G-1	J-8(Sec-9)	WEB	2381	12	SM490Y	-158	144	27	w(s)	69	276354	3	92811	9	119	8
27	G-1	J-9(Sec-9)	WEB	2381	12	SM490Y	158	-144	42	w(s)	69	276354	3	93716	9	119	8
30	G-1	J-10(Sec-11)	WEB	2380	12	SM490Y	158	-147	33	w(s)	69	274488	3	92497	9	119	7
33	G-1	J-11(Sec-12)	WEB	2378	12	SM490Y	-147	158	17	w(s)	69	274485	3	91776	9	118	2
36	G-1	J-12(Sec-13)	WEB	2378	12	SM490Y	-147	158	10	w(s)	69	274485	3	91580	9	118	2
39	G-2	J-1(Sec-1)	WEB	2379	12	SM490Y	-150	158	9	w(s)	69	274292	3	91506	9	119	23
42	G-2	J-2(Sec-2)	WEB	2379	12	SM490Y	-150	158	17	w(s)	69	274292	3	91710	9	119	23
45	G-2	J-3(Sec-3)	WEB	2381	12	SM490Y	158	-150	28	w(s)	69	275956	3	92714	9	119	8
48	G-2	J-4(Sec-5)	WEB	2381	12	SM490Y	158	-150	34	w(s)	69	275956	3	93079	9	119	8
51	G-2	J-5(Sec-5)	WEB	2381	12	SM490Y	-158	150	24	w(s)	69	275956	3	92529	9	119	8
54	G-2	J-6(Sec-6)	WEB	2375	12	SM490Y	-138	158	11	w(s)	69	275018	3	91779	9	118	*18
57	G-2	J-7(Sec-8)	WEB	2375	12	SM490Y	-138	158	11	w(s)	69	275018	3	91778	9	118	18
60	G-2	J-8(Sec-9)	WEB	2381	12	SM490Y	-158	150	24	w(s)	69	275956	3	92529	9	119	8
63	G-2	J-9(Sec-9)	WEB	2381	12	SM490Y	158	-150	34	w(s)	69	275956	3	93079	9	119	8
66	G-2	J-10(Sec-11)	WEB	2381	12	SM490Y	158	-150	28	w(s)	69	275956	3	92714	9	119	8
69	G-2	J-11(Sec-11)	WEB	2381	12	SM490Y	-158	150	17	w(s)	69	272657	3	91167	9	119	*21
72	G-2	J-12(Sec-13)	WEB	2379	12	SM490Y	-150	158	9	w(s)	69	274292	3	91503	9	119	23
75	G-3	J-1(Sec-1)	WEB	2379	12	SM490Y	-150	158	8	w(s)	69	274292	3	91495	9	119	*23

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress			Joint Type	Applied Bolts			Bolts Stress	Spl THK		Group No.
							σUn	σLn	τ			P	Req Bolts	ρ	l	σsp	
78	G-3	J-2(Sec-2)	WEB	2379	12	SM490Y	-150	158	14	w(s)	69	274292	3	91620	9	119	23
81	G-3	J-3(Sec-3)	WEB	2381	12	SM490Y	158	-150	28	w(s)	69	275956	3	92713	9	119	8
84	G-3	J-4(Sec-5)	WEB	2381	12	SM490Y	158	-150	34	w(s)	69	275956	3	93087	9	119	8
87	G-3	J-5(Sec-5)	WEB	2381	12	SM490Y	-158	150	22	w(s)	69	275956	3	92444	9	119	8
90	G-3	J-6(Sec-6)	WEB	2376	12	SM490Y	-141	158	15	w(s)	69	274848	3	91823	9	118	*26
93	G-3	J-7(Sec-8)	WEB	2376	12	SM490Y	-141	158	15	w(s)	69	274848	3	91823	9	118	26
96	G-3	J-8(Sec-9)	WEB	2381	12	SM490Y	-158	150	22	w(s)	69	275956	3	92439	9	119	8
99	G-3	J-9(Sec-9)	WEB	2381	12	SM490Y	158	-150	34	w(s)	69	275956	3	93087	9	119	8
102	G-3	J-10(Sec-11)	WEB	2381	12	SM490Y	158	-150	28	w(s)	69	275956	3	92713	9	119	8
105	G-3	J-11(Sec-11)	WEB	2381	12	SM490Y	-158	150	14	w(s)	69	272657	3	91076	9	119	21
108	G-3	J-12(Sec-13)	WEB	2379	12	SM490Y	-150	158	8	w(s)	69	274292	3	91495	9	119	23
111	G-4	J-1(Sec-1)	WEB	2379	12	SM490Y	-150	158	9	w(s)	69	274292	3	91506	9	119	23
114	G-4	J-2(Sec-2)	WEB	2379	12	SM490Y	-150	158	17	w(s)	69	274292	3	91710	9	119	23
117	G-4	J-3(Sec-3)	WEB	2381	12	SM490Y	158	-150	28	w(s)	69	275956	3	92714	9	119	8
120	G-4	J-4(Sec-5)	WEB	2381	12	SM490Y	158	-150	34	w(s)	69	275956	3	93079	9	119	8
123	G-4	J-5(Sec-5)	WEB	2381	12	SM490Y	-158	150	24	w(s)	69	275956	3	92529	9	119	8
126	G-4	J-6(Sec-6)	WEB	2375	12	SM490Y	-138	158	11	w(s)	69	275018	3	91779	9	118	18
129	G-4	J-7(Sec-8)	WEB	2375	12	SM490Y	-138	158	11	w(s)	69	275018	3	91778	9	118	18
132	G-4	J-8(Sec-9)	WEB	2381	12	SM490Y	-158	150	24	w(s)	69	275956	3	92529	9	119	8
135	G-4	J-9(Sec-9)	WEB	2381	12	SM490Y	158	-150	34	w(s)	69	275956	3	93079	9	119	8
138	G-4	J-10(Sec-11)	WEB	2381	12	SM490Y	158	-150	28	w(s)	69	275956	3	92714	9	119	8
141	G-4	J-11(Sec-11)	WEB	2381	12	SM490Y	-158	150	17	w(s)	69	272657	3	91167	9	119	21
144	G-4	J-12(Sec-13)	WEB	2379	12	SM490Y	-150	158	9	w(s)	69	274292	3	91503	9	119	23
147	G-5	J-1(Sec-1)	WEB	2378	12	SM490Y	-147	158	10	w(s)	69	274485	3	91582	9	118	2
150	G-5	J-2(Sec-2)	WEB	2378	12	SM490Y	-147	158	17	w(s)	69	274485	3	91776	9	118	2
153	G-5	J-3(Sec-3)	WEB	2380	12	SM490Y	158	-147	33	w(s)	69	274488	3	92497	9	119	7
156	G-5	J-4(Sec-5)	WEB	2381	12	SM490Y	158	-144	42	w(s)	69	276354	3	93716	9	119	8

Mem No.	Girder Name	Joint Name	Member	Width	THK	Grade	Stress			Joint Type	Applied Bolts			Bolts Stress	Spl THK		Group No.
							σUn	σLn	τ			P	Req Bolts	ρ	l	σsp	
159	G-5	J-5(Sec-5)	WEB	2381	12	SM490Y	-158	144	27	w(s)	69	276354	3	92811	9	119	8
162	G-5	J-6(Sec-6)	WEB	2374	12	SM490Y	-149	174	14	w(s)	69	298608	3	99697	9	131	13
165	G-5	J-7(Sec-8)	WEB	2374	12	SM490Y	-149	174	14	w(s)	69	298608	3	99697	9	131	13
168	G-5	J-8(Sec-9)	WEB	2381	12	SM490Y	-158	144	27	w(s)	69	276354	3	92811	9	119	8
171	G-5	J-9(Sec-9)	WEB	2381	12	SM490Y	158	-144	42	w(s)	69	276354	3	93716	9	119	8
174	G-5	J-10(Sec-11)	WEB	2380	12	SM490Y	158	-147	33	w(s)	69	274488	3	92497	9	119	7
177	G-5	J-11(Sec-12)	WEB	2378	12	SM490Y	-147	158	17	w(s)	69	274485	3	91776	9	118	2
180	G-5	J-12(Sec-13)	WEB	2378	12	SM490Y	-147	158	10	w(s)	69	274485	3	91580	9	118	2

* of Group No. means the representative member

4-4 Calculation of Bearing Stiffeners

1. Main girder G-1

Main girder G-1, Support S-1

```
Reaction Force Ra=  800.0 kN
Upper Flange         590
Lower Flange         590 * 19
WEB               2378 * 12  (SM490YA   )
Sole Plate          510 * 510 (101.0φ)
STIFFENER        2- 280 * 22  (SM400A    )
STIFF             2378.0/30+50 =  129.3 <  280.0
```

Check of bearing stress(S1)

```
(SM400A    )STIFF        2*( 24.90-  4.45+ 1.9)* 2.2      =  98.34
(SM490YA   )WEB        ( 28.80- 10.10+2* 1.9)* 1.2      =  27.00
-----------------------------------------------------------------
                                                   Ab = 125.34 cm2
σb=R/Ab= 800.00*10^3/ 125.34*10^2=  63.8 N/mm2
                          <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(S1)

```
(SM400A    )STIFF       2* 24.90* 2.2                  = 109.56
(SM490YA   )WEB        28.80* 1.2                    =  34.56
-----------------------------------------------------------------
                                                 A = 144.12 cm2

 1.7* 109.56= 186.25 cm2 > A     therefore      Ae= 144.12 cm2

                          I=  24323 cm4

 r=SQR(I/Ae)=SQR(  24323/ 144.12)= 12.99 cm

allowable stress

  L/r=237.8 / 2 / 12.99=  9.15 < 18

   σcag=140.0 N/mm2

∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

σv=R/Ae= 800.00*10^3/ 144.12*10^2=  55.5 N/mm2 <  σca
```

Welding between stiffener and web plate(S1)

```
fillet weld s =SQR(2*22)= 6.63 --->  8 mm < tmin=12 mm
throat thickness       a = 4* 8/1.4142=22.63 mm

 τ  =2*Ra/(a*hw')=2* 800.0*10^3/(22.63*2378)
                =  29.7 N/mm2 <  τa= 80.0 N/mm2
```

Main girder G-1, Support S-2

Reaction Force Ra= 800.0 kN
Upper Flange 590
Lower Flange 590 * 19
WEB 2378 * 12 (SM490YA)
Sole Plate 510 * 510 (101.0φ)
STIFFENER 2- 280 * 22 (SM400A)
STIFF 2378.0/30+50 = 129.3 < 280.0

Check of bearing stress(S2)

(SM400A)	STIFF	2*(24.90- 4.45+ 1.9)* 2.2	= 98.34
(SM490YA)	WEB	(28.80- 10.10+2* 1.9)* 1.2	= 27.00
			Ab = 125.34 cm2

σb=R/Ab= 800.00*10^3/ 125.34*10^2= 63.8 N/mm2
< σba= 210.0 N/mm2

Check of stress in vertical direction(S2)

(SM400A)	STIFF	2* 24.90* 2.2	= 109.56
(SM490YA)	WEB	28.80* 1.2	= 34.56
			A = 144.12 cm2

1.7* 109.56= 186.25 cm2 > A therefore Ae= 144.12 cm2

I= 24323 cm4

r=SQR(I/Ae)=SQR(24323/ 144.12)= 12.99 cm

allowable stress

L/r=237.8 / 2 / 12.99= 9.15 < 18

σcag=140.0 N/mm2

∴ σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

σv=R/Ae= 800.00*10^3/ 144.12*10^2= 55.5 N/mm2 < σca

Welding between stiffener and web plate(S2)

fillet weld s =SQR(2*22)= 6.63 ---> 8 mm < tmin=12 mm
throat thickness a = 4* 8/1.4142=22.63 mm

τ =2*Ra/(a*hw')=2* 800.0*10^3/(22.63*2378)
= 29.7 N/mm2 < τa= 80.0 N/mm2

Main girder G-1, Support PF12

```
Reaction Force  Ra= 2500.0 kN
Upper Flange          590
Lower Flange          590 * 39
WEB             2369 * 12  (SM490YA   )
Sole Plate        710 * 710 (202.0φ)
STIFFENER    2- 320 * 26  (SM400A    )
STIFF           2369.0/30+50 =  129.0 <  320.0
```

Check of bearing stress(PF12)

```
(SM400A    )STIFF        2*( 32.00-  9.50+ 3.9)* 2.6      = 137.28
(SM490YA   )WEB       ( 28.80- 20.20+2* 3.9)* 1.2       =  19.68
-------------------------------------------------------------------
                                                 Ab = 156.96 cm2
  σb=R/Ab=2500.00*10^3/ 156.96*10^2= 159.3 N/mm2
                          <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(PF12)

```
(SM400A    )STIFF       2* 32.00* 2.6                  = 166.40
(SM490YA   )WEB        28.80* 1.2                   =  34.56
-------------------------------------------------------------------
                                                 A = 200.96 cm2

   1.7* 166.40= 282.88 cm2 > A    therefore     Ae= 200.96 cm2

                                             I=  60057 cm4

   r=SQR(I/Ae)=SQR(  60057/ 200.96)= 17.29 cm
```

allowable stress

```
    L/r=236.9 / 2 / 17.29=  6.85 < 18

     σcag=140.0 N/mm2

  ∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

  σv=R/Ae=2500.00*10^3/ 200.96*10^2= 124.4 N/mm2 <  σca
```

Welding between stiffener and web plate(PF12)

```
fillet weld s =SQR(2*26)= 7.21 ---> 10 mm < tmin=12 mm
throat thickness       a = 4*10/1.4142=28.28 mm

 τ  =2*Ra/(a*hw')=2*2500.0*10^3/(28.28*2369)
                 =  74.6 N/mm2 <  τa= 80.0 N/mm2
```

Main girder G-1, Support PF13

```
Reaction Force  Ra= 2500.0 kN
Upper Flange         590
Lower Flange         590 * 39
WEB               2369 * 12  (SM490YA   )
Sole Plate         710 * 710 (202.0φ)
STIFFENER      2- 320 * 26  (SM400A    )
STIFF             2369.0/30+50 =  129.0 <  320.0
```

Check of bearing stress(PF13)

```
(SM400A    )STIFF        2*( 32.00-  9.50+ 3.9)* 2.6     = 137.28
(SM490YA   )WEB        ( 28.80- 20.20+2* 3.9)* 1.2      =  19.68
--------------------------------------------------------------------
                                                   Ab = 156.96 cm2
   σb=R/Ab=2500.00*10^3/ 156.96*10^2= 159.3 N/mm2
                             <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(PF13)

```
(SM400A    )STIFF       2* 32.00* 2.6                 = 166.40
(SM490YA   )WEB        28.80* 1.2                  =  34.56
--------------------------------------------------------------------
                                                A = 200.96 cm2

    1.7* 166.40= 282.88 cm2 > A    therefore     Ae= 200.96 cm2

                                              I=  60057 cm4

    r=SQR(I/Ae)=SQR(  60057/ 200.96)= 17.29 cm

  allowable stress

     L/r=236.9 / 2 / 17.29=  6.85 < 18

       σcag=140.0 N/mm2

  ∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

   σv=R/Ae=2500.00*10^3/ 200.96*10^2= 124.4 N/mm2 <  σca
```

Welding between stiffener and web plate(PF13)

```
fillet weld s =SQR(2*26)= 7.21 ---> 10 mm < tmin=12 mm
throat thickness       a = 4*10/1.4142=28.28 mm

τ  =2*Ra/(a*hw')=2*2500.0*10^3/(28.28*2369)
               =  74.6 N/mm2 <  τa= 80.0 N/mm2
```

2. Main girder G-2

Main girder G-2, Support S-1

```
Reaction Force  Ra=  700.0 kN
Upper Flange         590
Lower Flange         590 * 19
WEB            2379 * 12  (SM490YA   )
Sole Plate       510 * 510 (101.0φ)
STIFFENER    2- 280 * 22  (SM400A    )
STIFF          2379.0/30+50 =  129.3 <  280.0
```

Check of bearing stress(S1)

```
(SM400A    )STIFF        2*( 24.90-  4.45+ 1.9)* 2.2      =  98.34
(SM490YA   )WEB       ( 28.80- 10.10+2* 1.9)* 1.2      =  27.00
--------------------------------------------------------------------
                                                  Ab = 125.34 cm2
   σb=R/Ab= 700.00*10^3/ 125.34*10^2=  55.8 N/mm2
                               <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(S1)

```
(SM400A    )STIFF       2* 24.90* 2.2                  = 109.56
(SM490YA   )WEB        28.80* 1.2                    =  34.56
--------------------------------------------------------------------
                                                A = 144.12 cm2

    1.7* 109.56= 186.25 cm2 > A    therefore     Ae= 144.12 cm2

                                                I=  24323 cm4

    r=SQR(I/Ae)=SQR(  24323/ 144.12)= 12.99 cm
```

allowable stress

```
     L/r=237.9 / 2 / 12.99=  9.16 < 18

      σcag=140.0 N/mm2

   ∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

   σv=R/Ae= 700.00*10^3/ 144.12*10^2=  48.6 N/mm2 <  σca
```

Welding between stiffener and web plate(S1)

```
fillet weld s =SQR(2*22)= 6.63 --->  8 mm < tmin=12 mm
throat thickness       a = 4* 8/1.4142=22.63 mm

τ  =2*Ra/(a*hw')=2* 700.0*10^3/(22.63*2379)
               =  26.0 N/mm2 <  τa= 80.0 N/mm2
```

Main girder G-2, Support S2

Reaction Force Ra= 700.0 kN
Upper Flange 590
Lower Flange 590 * 19
WEB 2379 * 12 (SM490YA)
Sole Plate 510 * 510 (101.0φ)
STIFFENER 2- 280 * 22 (SM400A)
STIFF 2379.0/30+50 = 129.3 < 280.0

Check of bearing stress(S2)

(SM400A)STIFF	2*(24.90- 4.45+ 1.9)* 2.2	=	98.34
(SM490YA)WEB	(28.80- 10.10+2* 1.9)* 1.2	=	27.00

Ab = 125.34 cm2

σb=R/Ab= 700.00*10^3/ 125.34*10^2= 55.8 N/mm2
< σba= 210.0 N/mm2

Check of stress in vertical direction(S2)

(SM400A)STIFF	2* 24.90* 2.2	=	109.56
(SM490YA)WEB	28.80* 1.2	=	34.56

A = 144.12 cm2

1.7* 109.56= 186.25 cm2 > A therefore Ae= 144.12 cm2

I= 24323 cm4

r=SQR(I/Ae)=SQR(24323/ 144.12)= 12.99 cm

allowable stress

L/r=237.9 / 2 / 12.99= 9.16 < 18

σcag=140.0 N/mm2

∴ σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

σv=R/Ae= 700.00*10^3/ 144.12*10^2= 48.6 N/mm2 < σca

Welding between stiffener and web plate(S2)

fillet weld s =SQR(2*22)= 6.63 ---> 8 mm < tmin=12 mm
throat thickness a = 4* 8/1.4142=22.63 mm

τ =2*Ra/(a*hw')=2* 700.0*10^3/(22.63*2379)
= 26.0 N/mm2 < τa= 80.0 N/mm2

Main girder G-2, Support PF12

```
Reaction Force  Ra= 2000.0 kN
Upper Flange         590
Lower Flange         590 * 29
WEB             2378 * 12  (SM490YA   )
Sole Plate        710 * 710 (202.0φ)
STIFFENER    2- 320 * 26  (SM400A    )
STIFF           2378.0/30+50 =  129.3 <  320.0
```

Check of bearing stress(PF12)

```
(SM400A    )STIFF        2*( 32.00-  9.50+ 2.9)* 2.6      = 132.08
(SM490YA   )WEB       ( 28.80- 20.20+2* 2.9)* 1.2       =  17.28
-----------------------------------------------------------------
                                                  Ab = 149.36 cm2
```

$\sigma b=R/Ab=2000.00*10^3/ 149.36*10^2= 133.9$ N/mm2
$< \sigma ba= 210.0$ N/mm2

Check of stress in vertical direction(PF12)

```
(SM400A    )STIFF       2* 32.00* 2.6                  = 166.40
(SM490YA   )WEB        28.80* 1.2                    =  34.56
-----------------------------------------------------------------
                                                  A = 200.96 cm2
```

1.7* 166.40= 282.88 cm2 > A therefore Ae= 200.96 cm2

I= 60057 cm4

r=SQR(I/Ae)=SQR(60057/ 200.96)= 17.29 cm

allowable stress

L/r=237.8 / 2 / 17.29= 6.88 < 18

$\sigma cag=140.0$ N/mm2

$\therefore \sigma ca=\sigma cag*\sigma cal/\sigma cao=140.0*140.0/140.0=140.0$ N/mm2

$\sigma v=R/Ae=2000.00*10^3/ 200.96*10^2= 99.5$ N/mm2 $< \sigma ca$

Welding between stiffener and web plate(PF12)

fillet weld s =SQR(2*26)= 7.21 ---> 8 mm < tmin=12 mm
throat thickness a = 4* 8/1.4142=22.63 mm

τ =2*Ra/(a*hw')=2*2000.0*10^3/(22.63*2378)
= 74.3 N/mm2 < τa= 80.0 N/mm2

Main girder G-2, Support PF13

Reaction Force Ra= 2000.0 kN
Upper Flange 590
Lower Flange 590 * 29
WEB 2378 * 12 (SM490YA)
Sole Plate 710 * 710 (202.0φ)
STIFFENER 2- 320 * 26 (SM400A)
STIFF 2378.0/30+50 = 129.3 < 320.0

Check of bearing stress(PF13)

(SM400A)	STIFF	2*(32.00- 9.50+ 2.9)* 2.6	= 132.08
(SM490YA)	WEB	(28.80- 20.20+2* 2.9)* 1.2	= 17.28
			Ab = 149.36 cm2

σb=R/Ab=2000.00*10^3/ 149.36*10^2= 133.9 N/mm2
< σba= 210.0 N/mm2

Check of stress in vertical direction(PF13)

(SM400A)	STIFF	2* 32.00* 2.6	= 166.40
(SM490YA)	WEB	28.80* 1.2	= 34.56
			A = 200.96 cm2

1.7* 166.40= 282.88 cm2 > A therefore Ae= 200.96 cm2

I= 60057 cm4

r=SQR(I/Ae)=SQR(60057/ 200.96)= 17.29 cm

allowable stress

L/r=237.8 / 2 / 17.29= 6.88 < 18

σcag=140.0 N/mm2

∴ σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

σv=R/Ae=2000.00*10^3/ 200.96*10^2= 99.5 N/mm2 < σca

Welding between stiffener and web plate(PF13)

fillet weld s =SQR(2*26)= 7.21 ---> 8 mm < tmin=12 mm
throat thickness a = 4* 8/1.4142=22.63 mm

τ =2*Ra/(a*hw')=2*2000.0*10^3/(22.63*2378)
= 74.3 N/mm2 < τa= 80.0 N/mm2

3. Main girder G-3

Main girder G-3, Support S1

```
Reaction Force  Ra=  750.0 kN
Upper Flange         590
Lower Flange         590 * 19
WEB            2379 * 12  (SM490YA   )
Sole Plate       510 * 510 (101.0φ)
STIFFENER    2- 280 * 22  (SM400A    )
STIFF          2379.0/30+50 =  129.3 <  280.0
```

Check of bearing stress(S1)

```
(SM400A    )STIFF        2*( 24.90-  4.45+ 1.9)* 2.2      =  98.34
(SM490YA   )WEB       ( 28.80- 10.10+2* 1.9)* 1.2      =  27.00
--------------------------------------------------------------------
                                                 Ab = 125.34 cm2
   σb=R/Ab= 750.00*10^3/ 125.34*10^2=  59.8 N/mm2
                              <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(S1)

```
(SM400A    )STIFF       2* 24.90* 2.2                  = 109.56
(SM490YA   )WEB        28.80* 1.2                    =  34.56
--------------------------------------------------------------------
                                               A = 144.12 cm2

   1.7* 109.56= 186.25 cm2 > A    therefore     Ae= 144.12 cm2

                                             I=  24323 cm4

   r=SQR(I/Ae)=SQR(  24323/ 144.12)= 12.99 cm

  allowable stress

    L/r=237.9 / 2 / 12.99=  9.16 < 18

     σcag=140.0 N/mm2

  ∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

   σv=R/Ae= 750.00*10^3/ 144.12*10^2=  52.0 N/mm2 <  σca
```

Welding between stiffener and web plate(S1)

```
fillet weld s =SQR(2*22)= 6.63 --->  8 mm < tmin=12 mm
throat thickness       a = 4* 8/1.4142=22.63 mm

τ  =2*Ra/(a*hw')=2* 750.0*10^3/(22.63*2379)
               =  27.9 N/mm2 <  τa= 80.0 N/mm2
```

Main girder G-3, Support S2

```
Reaction Force  Ra=  750.0 kN
Upper Flange         590
Lower Flange         590 * 19
WEB             2379 * 12  (SM490YA   )
Sole Plate        510 * 510 (101.0φ)
STIFFENER    2- 280 * 22  (SM400A    )
STIFF           2379.0/30+50 =  129.3 <  280.0
```

Check of bearing stress(S2)

```
(SM400A    )STIFF        2*( 24.90-  4.45+ 1.9)* 2.2      =  98.34
(SM490YA   )WEB       ( 28.80- 10.10+2* 1.9)* 1.2      =  27.00
-------------------------------------------------------------------
                                                      Ab = 125.34 cm2
  σb=R/Ab= 750.00*10^3/ 125.34*10^2=  59.8 N/mm2
                          <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(S2)

```
(SM400A    )STIFF       2* 24.90* 2.2                  = 109.56
(SM490YA   )WEB        28.80* 1.2                   =  34.56
-------------------------------------------------------------------
                                                    A = 144.12 cm2

   1.7* 109.56= 186.25 cm2 > A    therefore     Ae= 144.12 cm2

                                                I=  24323 cm4

   r=SQR(I/Ae)=SQR(  24323/ 144.12)= 12.99 cm

 allowable stress

    L/r=237.9 / 2 / 12.99=  9.16 < 18

     σcag=140.0 N/mm2

  ∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

  σv=R/Ae= 750.00*10^3/ 144.12*10^2=  52.0 N/mm2 <  σca
```

Welding between stiffener and web plate(S2)

```
fillet weld s =SQR(2*22)= 6.63 --->  8 mm < tmin=12 mm
throat thickness       a = 4* 8/1.4142=22.63 mm

τ  =2*Ra/(a*hw')=2* 750.0*10^3/(22.63*2379)
              =  27.9 N/mm2 <  τa= 80.0 N/mm2
```

Main girder G-3, Support PF12

Reaction Force Ra= 2100.0 kN
Upper Flange 590
Lower Flange 590 * 27
WEB 2379 * 12 (SM490YA)
Sole Plate 710 * 710 (202.0φ)
STIFFENER 2- 320 * 26 (SM400A)
STIFF 2379.0/30+50 = 129.3 < 320.0

Check of bearing stress(PF12)

(SM400A)STIFF 2*(32.00- 9.50+ 2.7)* 2.6 = 131.04
(SM490YA)WEB (28.80- 20.20+2* 2.7)* 1.2 = 16.80

Ab = 147.84 cm2

σb=R/Ab=2100.00*10^3/ 147.84*10^2= 142.0 N/mm2
< σba= 210.0 N/mm2

Check of stress in vertical direction(PF12)

(SM400A)STIFF 2* 32.00* 2.6 = 166.40
(SM490YA)WEB 28.80* 1.2 = 34.56

A = 200.96 cm2

1.7* 166.40= 282.88 cm2 > A therefore Ae= 200.96 cm2

I= 60057 cm4

r=SQR(I/Ae)=SQR(60057/ 200.96)= 17.29 cm

allowable stress

L/r=237.9 / 2 / 17.29= 6.88 < 18

σcag=140.0 N/mm2

∴ σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

σv=R/Ae=2100.00*10^3/ 200.96*10^2= 104.5 N/mm2 < σca

Welding between stiffener and web plate(PF12)

fillet weld s =SQR(2*26)= 7.21 ---> 8 mm < tmin=12 mm
throat thickness a = 4* 8/1.4142=22.63 mm

τ =2*Ra/(a*hw')=2*2100.0*10^3/(22.63*2379)
= 78.0 N/mm2 < τa= 80.0 N/mm2

Main girder G-3, Support PF13

```
Reaction Force  Ra= 2100.0 kN
Upper Flange         590
Lower Flange         590 * 27
WEB              2379 * 12  (SM490YA   )
Sole Plate         710 * 710 (202.0φ)
STIFFENER    2- 320 * 26  (SM400A    )
STIFF            2379.0/30+50 =  129.3 <  320.0
```

Check of bearing stress(PF13)

```
(SM400A    )STIFF        2*( 32.00-  9.50+ 2.7)* 2.6      = 131.04
(SM490YA   )WEB       ( 28.80- 20.20+2* 2.7)* 1.2       =  16.80
---------------------------------------------------------------------
                                                    Ab = 147.84 cm2
  σb=R/Ab=2100.00*10^3/ 147.84*10^2= 142.0 N/mm2
                              <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(PF13)

```
(SM400A    )STIFF       2* 32.00* 2.6                  = 166.40
(SM490YA   )WEB        28.80* 1.2                    =  34.56
---------------------------------------------------------------------
                                                  A = 200.96 cm2

   1.7* 166.40= 282.88 cm2 > A    therefore     Ae= 200.96 cm2

                                              I=  60057 cm4

   r=SQR(I/Ae)=SQR(  60057/ 200.96)= 17.29 cm

 allowable stress

    L/r=237.9 / 2 / 17.29=  6.88 < 18

     σcag=140.0 N/mm2

  ∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

  σv=R/Ae=2100.00*10^3/ 200.96*10^2= 104.5 N/mm2 <  σca
```

Welding between stiffener and web plate(PF13)

```
fillet weld s =SQR(2*26)= 7.21 --->  8 mm < tmin=12 mm
throat thickness       a = 4* 8/1.4142=22.63 mm

τ  =2*Ra/(a*hw')=2*2100.0*10^3/(22.63*2379)
              =  78.0 N/mm2 <  τa= 80.0 N/mm2
```

4. Main girder G-4

Main girder G-4, Support S1

```
Reaction Force  Ra=  700.0 kN
Upper Flange         590
Lower Flange         590 * 19
WEB            2379 * 12  (SM490YA   )
Sole Plate       510 * 510 (101.0φ)
STIFFENER    2- 280 * 22  (SM400A    )
STIFF          2379.0/30+50 =  129.3 <  280.0
```

Check of bearing stress(S1)

```
(SM400A    )STIFF        2*( 24.90-  4.45+ 1.9)* 2.2      =  98.34
(SM490YA   )WEB       ( 28.80- 10.10+2* 1.9)* 1.2      =  27.00
---------------------------------------------------------------------
                                                       Ab = 125.34 cm2
    σb=R/Ab= 700.00*10^3/ 125.34*10^2=  55.8 N/mm2
                             <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(S1)

```
(SM400A    )STIFF       2* 24.90* 2.2                 = 109.56
(SM490YA   )WEB        28.80* 1.2                   =  34.56
---------------------------------------------------------------------
                                                    A = 144.12 cm2

     1.7* 109.56= 186.25 cm2 > A    therefore     Ae= 144.12 cm2

                                                 I=  24323 cm4

     r=SQR(I/Ae)=SQR(  24323/ 144.12)= 12.99 cm

   allowable stress

      L/r=237.9 / 2 / 12.99=  9.16 < 18

        σcag=140.0 N/mm2

    ∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

    σv=R/Ae= 700.00*10^3/ 144.12*10^2=  48.6 N/mm2 <  σca
```

Welding between stiffener and web plate(S1)

```
    fillet weld s =SQR(2*22)= 6.63 --->  8 mm < tmin=12 mm
    throat thickness       a = 4* 8/1.4142=22.63 mm

    τ  =2*Ra/(a*hw')=2* 700.0*10^3/(22.63*2379)
                    =  26.0 N/mm2 <  τa= 80.0 N/mm2
```

Main girder G-4, Support S2

```
Reaction Force  Ra=  700.0 kN
Upper Flange         590
Lower Flange         590 * 19
WEB            2379 * 12  (SM490YA   )
Sole Plate       510 * 510 (101.0φ)
STIFFENER    2- 280 * 22  (SM400A    )
STIFF          2379.0/30+50 =  129.3 <  280.0
```

Check of bearing stress(S2)

```
(SM400A    )STIFF        2*( 24.90-  4.45+ 1.9)* 2.2     =  98.34
(SM490YA   )WEB       ( 28.80- 10.10+2* 1.9)* 1.2      =  27.00
----------------------------------------------------------------------
                                                   Ab = 125.34 cm2
  σb=R/Ab= 700.00*10^3/ 125.34*10^2=  55.8 N/mm2
                          <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(S2)

```
(SM400A    )STIFF       2* 24.90* 2.2                 = 109.56
(SM490YA   )WEB        28.80* 1.2                   =  34.56
----------------------------------------------------------------------
                                                  A = 144.12 cm2

   1.7* 109.56= 186.25 cm2 > A    therefore     Ae= 144.12 cm2

                                              I=  24323 cm4

   r=SQR(I/Ae)=SQR(  24323/ 144.12)= 12.99 cm

  allowable stress

    L/r=237.9 / 2 / 12.99=  9.16 < 18

      σcag=140.0 N/mm2

  ∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

  σv=R/Ae= 700.00*10^3/ 144.12*10^2=  48.6 N/mm2 <  σca
```

Welding between stiffener and web plate(S2)

```
fillet weld s =SQR(2*22)= 6.63 --->  8 mm < tmin=12 mm
throat thickness       a = 4* 8/1.4142=22.63 mm

τ  =2*Ra/(a*hw')=2* 700.0*10^3/(22.63*2379)
               =  26.0 N/mm2 <  τa= 80.0 N/mm2
```

Main girder G-4, Support PF12

```
Reaction Force  Ra= 2000.0 kN
Upper Flange         590
Lower Flange         590 * 29
WEB              2378 * 12  (SM490YA   )
Sole Plate        710 * 710 (202.0φ)
STIFFENER    2- 320 * 26  (SM400A    )
STIFF            2378.0/30+50 =  129.3 <  320.0
```

Check of bearing stress(PF12)

```
(SM400A    )STIFF        2*( 32.00-  9.50+ 2.9)* 2.6      = 132.08
(SM490YA   )WEB       ( 28.80- 20.20+2* 2.9)* 1.2       =  17.28
-----------------------------------------------------------------
                                                  Ab = 149.36 cm2
   σb=R/Ab=2000.00*10^3/ 149.36*10^2= 133.9 N/mm2
                            <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(PF12)

```
(SM400A    )STIFF       2* 32.00* 2.6                  = 166.40
(SM490YA   )WEB        28.80* 1.2                    =  34.56
-----------------------------------------------------------------
                                                A = 200.96 cm2

    1.7* 166.40= 282.88 cm2 > A    therefore     Ae= 200.96 cm2

                                             I=  60057 cm4

    r=SQR(I/Ae)=SQR(  60057/ 200.96)= 17.29 cm

  allowable stress

     L/r=237.8 / 2 / 17.29=  6.88 < 18

      σcag=140.0 N/mm2

   ∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

   σv=R/Ae=2000.00*10^3/ 200.96*10^2=  99.5 N/mm2 <  σca
```

Welding between stiffener and web plate(PF12)

```
fillet weld s =SQR(2*26)= 7.21 --->  8 mm < tmin=12 mm
throat thickness       a = 4* 8/1.4142=22.63 mm

τ  =2*Ra/(a*hw')=2*2000.0*10^3/(22.63*2378)
              =  74.3 N/mm2 <  τa= 80.0 N/mm2
```

Main girder G-4, Support PF13

```
Reaction Force  Ra= 2000.0 kN
Upper Flange         590
Lower Flange         590 * 29
WEB             2378 * 12  (SM490YA   )
Sole Plate        710 * 710 (202.0φ)
STIFFENER    2- 320 * 26  (SM400A    )
STIFF           2378.0/30+50 =  129.3 <  320.0
```

Check of bearing stress(PF13)

```
(SM400A    )STIFF        2*( 32.00-  9.50+ 2.9)* 2.6     = 132.08
(SM490YA   )WEB       ( 28.80- 20.20+2* 2.9)* 1.2      =  17.28
-----------------------------------------------------------------
                                                  Ab = 149.36 cm2
   σb=R/Ab=2000.00*10^3/ 149.36*10^2= 133.9 N/mm2
                              <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(PF13)

```
(SM400A    )STIFF       2* 32.00* 2.6                 = 166.40
(SM490YA   )WEB        28.80* 1.2                   =  34.56
-----------------------------------------------------------------
                                                A = 200.96 cm2

    1.7* 166.40= 282.88 cm2 > A    therefore     Ae= 200.96 cm2

                                               I=  60057 cm4

    r=SQR(I/Ae)=SQR(  60057/ 200.96)= 17.29 cm

  allowable stress

     L/r=237.8 / 2 / 17.29=  6.88 < 18

      σcag=140.0 N/mm2

   ∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

   σv=R/Ae=2000.00*10^3/ 200.96*10^2=  99.5 N/mm2 <  σca
```

Welding between stiffener and web plate(PF13)

```
fillet weld s =SQR(2*26)= 7.21 --->  8 mm < tmin=12 mm
throat thickness       a = 4* 8/1.4142=22.63 mm

τ  =2*Ra/(a*hw')=2*2000.0*10^3/(22.63*2378)
               =  74.3 N/mm2 <  τa= 80.0 N/mm2
```

5. Main girder G-5

Main girder G-5, Support S1

```
Reaction Force  Ra=  800.0 kN
Upper Flange         590
Lower Flange         590 * 19
WEB            2378 * 12  (SM490YA   )
Sole Plate       510 * 510 (101.0φ)
STIFFENER    2- 280 * 22  (SM400A    )
STIFF          2378.0/30+50 =  129.3 <  280.0
```

Check of bearing stress(S1)

```
(SM400A    )STIFF        2*( 24.90-  4.45+ 1.9)* 2.2      =  98.34
(SM490YA   )WEB       ( 28.80- 10.10+2* 1.9)* 1.2      =  27.00
-------------------------------------------------------------------
                                                  Ab = 125.34 cm2
   σb=R/Ab= 800.00*10^3/ 125.34*10^2=  63.8 N/mm2
                               <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(S1)

```
(SM400A    )STIFF       2* 24.90* 2.2                 = 109.56
(SM490YA   )WEB        28.80* 1.2                   =  34.56
-------------------------------------------------------------------
                                                A = 144.12 cm2

     1.7* 109.56= 186.25 cm2 > A     therefore      Ae= 144.12 cm2

                                                I=  24323 cm4

     r=SQR(I/Ae)=SQR(  24323/ 144.12)= 12.99 cm

   allowable stress

      L/r=237.8 / 2 / 12.99=  9.15 < 18

        σcag=140.0 N/mm2

    ∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

    σv=R/Ae= 800.00*10^3/ 144.12*10^2=  55.5 N/mm2 <  σca
```

Welding between stiffener and web plate(S1)

```
fillet weld s =SQR(2*22)= 6.63 --->  8 mm < tmin=12 mm
throat thickness       a = 4* 8/1.4142=22.63 mm

τ  =2*Ra/(a*hw')=2* 800.0*10^3/(22.63*2378)
                =  29.7 N/mm2 <  τa= 80.0 N/mm2
```

Main girder G-5, Support S2

```
Reaction Force  Ra=  800.0 kN
Upper Flange         590
Lower Flange         590 * 19
WEB            2378 * 12  (SM490YA   )
Sole Plate       510 * 510 (101.0φ)
STIFFENER    2- 280 * 22  (SM400A    )
STIFF          2378.0/30+50 =  129.3 <  280.0
```

Check of bearing stress(S2)

```
(SM400A    )STIFF        2*( 24.90-  4.45+ 1.9)* 2.2      =  98.34
(SM490YA   )WEB       ( 28.80- 10.10+2* 1.9)* 1.2      =  27.00
-------------------------------------------------------------------
                                                   Ab = 125.34 cm2
  σb=R/Ab= 800.00*10^3/ 125.34*10^2=  63.8 N/mm2
                             <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(S2)

```
(SM400A    )STIFF       2* 24.90* 2.2                  = 109.56
(SM490YA   )WEB        28.80* 1.2                    =  34.56
-------------------------------------------------------------------
                                                 A = 144.12 cm2

   1.7* 109.56= 186.25 cm2 > A    therefore     Ae= 144.12 cm2

                                             I=  24323 cm4

   r=SQR(I/Ae)=SQR(  24323/ 144.12)= 12.99 cm

 allowable stress

    L/r=237.8 / 2 / 12.99=  9.15 < 18

      σcag=140.0 N/mm2

  ∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

  σv=R/Ae= 800.00*10^3/ 144.12*10^2=  55.5 N/mm2 <  σca
```

Welding between stiffener and web plate(S2)

```
fillet weld s =SQR(2*22)= 6.63 --->  8 mm < tmin=12 mm
throat thickness       a = 4* 8/1.4142=22.63 mm

τ  =2*Ra/(a*hw')=2* 800.0*10^3/(22.63*2378)
                =  29.7 N/mm2 <  τa= 80.0 N/mm2
```

Main girder G-5, Support PF12

```
Reaction Force  Ra= 2500.0 kN
Upper Flange         590
Lower Flange         590 * 39
WEB            2369 * 12  (SM490YA   )
Sole Plate       710 * 710 (202.0φ)
STIFFENER    2- 320 * 26  (SM400A    )
STIFF          2369.0/30+50 =  129.0 <  320.0
```

Check of bearing stress(PF12)

```
(SM400A    )STIFF        2*( 32.00-  9.50+ 3.9)* 2.6      = 137.28
(SM490YA   )WEB       ( 28.80- 20.20+2* 3.9)* 1.2      =  19.68
--------------------------------------------------------------------
                                                  Ab = 156.96 cm2
σb=R/Ab=2500.00*10^3/ 156.96*10^2= 159.3 N/mm2
                          <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(PF12)

```
(SM400A    )STIFF       2* 32.00* 2.6                  = 166.40
(SM490YA   )WEB        28.80* 1.2                    =  34.56
--------------------------------------------------------------------
                                                A = 200.96 cm2

1.7* 166.40= 282.88 cm2 > A    therefore     Ae= 200.96 cm2

                                             I=  60057 cm4

r=SQR(I/Ae)=SQR(  60057/ 200.96)= 17.29 cm
```

allowable stress

```
L/r=236.9 / 2 / 17.29=  6.85 < 18

σcag=140.0 N/mm2

∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

σv=R/Ae=2500.00*10^3/ 200.96*10^2= 124.4 N/mm2 <  σca
```

Welding between stiffener and web plate(PF12)

```
fillet weld s =SQR(2*26)= 7.21 ---> 10 mm < tmin=12 mm
throat thickness       a = 4*10/1.4142=28.28 mm

τ  =2*Ra/(a*hw')=2*2500.0*10^3/(28.28*2369)
               =  74.6 N/mm2 <  τa= 80.0 N/mm2
```

Main girder G-5, Support PF13

```
Reaction Force  Ra= 2500.0 kN
Upper Flange         590
Lower Flange         590 * 39
WEB             2369 * 12  (SM490YA   )
Sole Plate        710 * 710 (202.0φ)
STIFFENER    2- 320 * 26  (SM400A    )
STIFF           2369.0/30+50 =  129.0 <  320.0
```

Check of bearing stress(PF13)

```
(SM400A    )STIFF        2*( 32.00-  9.50+ 3.9)* 2.6      = 137.28
(SM490YA   )WEB       ( 28.80- 20.20+2* 3.9)* 1.2       =  19.68
--------------------------------------------------------------------
                                                   Ab = 156.96 cm2
  σb=R/Ab=2500.00*10^3/ 156.96*10^2= 159.3 N/mm2
                          <  σba= 210.0 N/mm2
```

Check of stress in vertical direction(PF13)

```
(SM400A    )STIFF       2* 32.00* 2.6                  = 166.40
(SM490YA   )WEB        28.80* 1.2                   =  34.56
--------------------------------------------------------------------
                                                 A = 200.96 cm2

   1.7* 166.40= 282.88 cm2 > A    therefore     Ae= 200.96 cm2

                                              I=  60057 cm4

   r=SQR(I/Ae)=SQR(  60057/ 200.96)= 17.29 cm

 allowable stress

    L/r=236.9 / 2 / 17.29=  6.85 < 18

     σcag=140.0 N/mm2

  ∴  σca=σcag*σcal/σcao=140.0*140.0/140.0=140.0 N/mm2

  σv=R/Ae=2500.00*10^3/ 200.96*10^2= 124.4 N/mm2 <  σca
```

Welding between stiffener and web plate(PF13)

```
fillet weld s =SQR(2*26)= 7.21 ---> 10 mm < tmin=12 mm
throat thickness       a = 4*10/1.4142=28.28 mm

τ  =2*Ra/(a*hw')=2*2500.0*10^3/(28.28*2369)
               =  74.6 N/mm2 <  τa= 80.0 N/mm2
```

4-5 Calculation of Stiffener for Lateral Force

1. Design force

The stiffener is calculated by the horizontal force during earthquake.

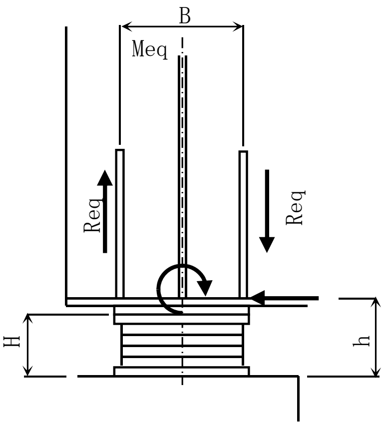
1) Horizontal force

Piers	Girder	Node No.	Force	Force Each Girder
S1(PF11)	G1	101	1070	214
	G2	201		214
	G3	301		214
	G4	401		214
	G5	501		214
PF12	G1	107	1670	334
	G2	207		334
	G3	307		334
	G4	407		334
	G5	507		334
PF13	G1	117	1830	366
	G2	217		366
	G3	317		366
	G4	417		366
	G5	517		366
S2(PF14)	G1	123	1270	254
	G2	223		254
	G3	323		254
	G4	423		254
	G5	523		254

2. Caluculation for Bearing sttifener

(1) Calculate P14 (P11 has the same sttifener)

1) Conditions



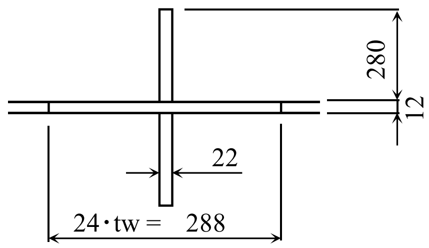
Force	:	Heq	=	254	(kN)
Bearing Height	:	H	=	230	(mm)
Sole P L	:	ts	=	24	(mm)
Lower Flange	:	tf	=	19	(mm)
Point of action	:	h	=	273	(mm)
Space	:	B	=	510	(mm)
Rib Height	:	L	=	250	(mm)

Meq = 254.0 x 0.273 = 69.3 (kN.m)
Req = 69.3 / 0.510 / 1.5 = 90.6 (kN)

2) Shape of rib

							A (cm^2)	y (cm)	Ay^2 (cm^4)	Io (cm^4)
1	- PL.	288	x	12	(SM490Y)		34.6	---	---	4
2	- PL.	280	x	22	(SM400)		123.2	14.60	26261	8049
						A =	157.8	< 1.7 x	123.2 =	209.4 (cm^2)

Ae = 157.8 (cm^2)
I = 34314 (cm^4)
r = 14.75 (cm)
L = 25.00 (cm)
L / r = 1.69



3) Allowable Stress

B = 280 (mm) ≧ L / 30 + 50 = 58.3 (mm)
t = 22 (mm) ≧ B / 12.8 = 21.9 (mm)
σcag = = 140 (N/mm^2)

4) Checking of Compressive Stress

L / r = 1.69 ≦ 18
σca = 140 (N/mm^2)
σc = 90.60 x 10^3 / 15780 = 5.7 ≦ 140 (N/mm^2)

5) Wellding of Stiffener and Web

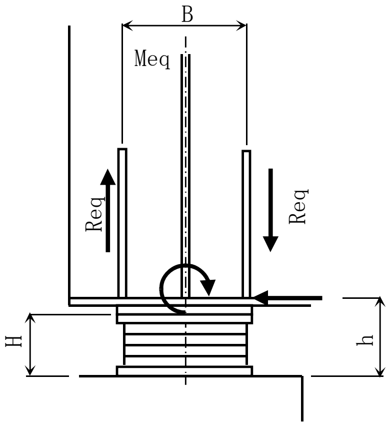
WeldingSaize : S = √(2 x 22) = 6.6 (mm) → 7 (mm) < tmin = 12
Effective Throat : a = 4 x 7.0 /√2 = 19.8 (mm)

τ = 1 x R / (a x Hw)
= 1 x 90.60 x 10^3 / (19.8 x(250 - 50))
= 22.9 (N/mm^2) < τa = 80 (N/mm2)

(2) Calculate P13 (P12 has the same sttifener)

1) Conditions

Force	:	Heq	=	366	(kN)	
Bearing Height	:	H	=	248	(mm)	
Sole P L	:	ts	=	27	(mm)	
Lower Flange	:	tf	=	39	(mm)	Maximum
Point of action	:	h	=	314	(mm)	
Space	:	B	=	710	(mm)	
Rib Height	:	L	=	250	(mm)	



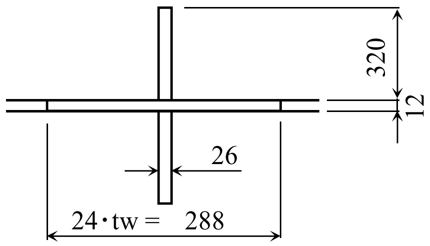
Meq = 366.0 x 0.314 = 114.9 (kN.m)
Req = 114.9 / 0.710 / 1.5 = 107.9 (kN)

2) Shape

						A (cm^2)	y (cm)	Ay^2 (cm^4)	Io (cm^4)
1	- PL.	288	x	12	(SM490Y)	34.6	---	---	4
2	- PL.	320	x	26	(SM400)	166.4	16.60	45853	14199

A = 201.0 < 1.7 x 166.4 = 282.9 (cm^2)

Ae = 201.0 (cm^2)
I = 60056 (cm^4)
r = 17.29 (cm)
L = 25.00 (cm)
L / r = 1.45



3) Allowable Stress

B = 320 (mm) ≧ L / 30 + 50 = 58.3 (mm)
t = 26 (mm) ≧ B / 12.8 = 25 (mm)
σcag = = 140 (N/mm^2)

4) Checking of Compressive Stress

L / r = 1.45 ≦ 18
σca = 140 (N/mm^2)
σc = 107.90 x 10^3 / 20100 = 5.4 ≦ 140 (N/mm^2)

5) Wellding of Stiffener and Web

WeldingSaize : S = √ (2 x 26) = 7.2 (mm) → 8 (mm) < tmin = 12
Effective Throat : a = 4 x 8.0 /√2 = 22.6 (mm)

τ = 1 x R / (a x Hw)
= 1 x 107.90 x 10^3 / (22.6 x 250)
= 19.1 (N/mm^2) < τa = 80 (N/mm2)

4-6 Stiffener for Jack up

1. Design force for Jack up (When replacing bearing)

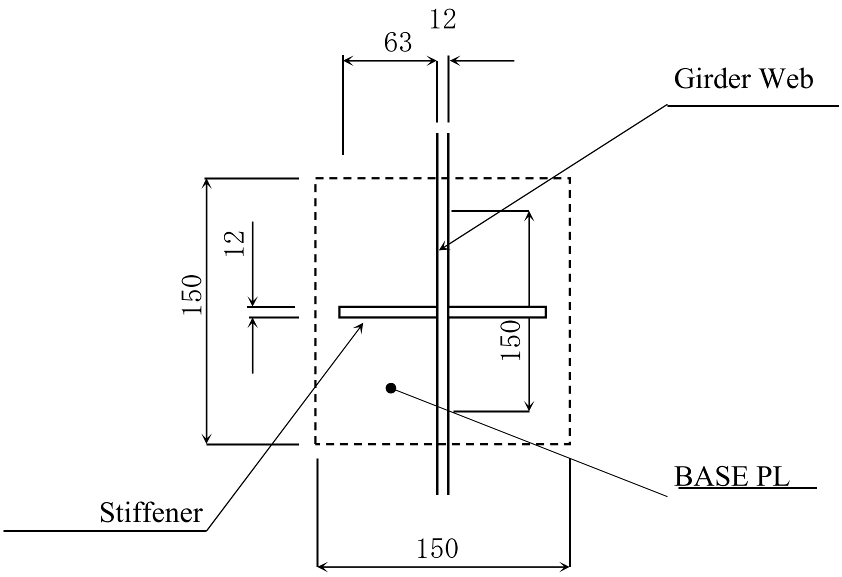
(kN)

		Rd+RL MAX	N	uniformity coefficient	Force
S1	G1	773.91	1	1.1	900
	G2	653.15	1	1.1	800
	G3	747.91	1	1.1	900
	G4	653.15	1	1.1	800
	G5	773.91	1	1.1	900
PF12	G1	2491.24	2	1.1	1400
	G2	1970.23	2	1.1	1100
	G3	2058.50	2	1.1	1200
	G4	1970.23	2	1.1	1100
	G2	2491.24	2	1.1	1400
PF13	G1	2491.24	2	1.1	1400
	G2	1970.23	2	1.1	1100
	G3	2058.50	2	1.1	1200
	G4	1970.23	2	1.1	1100
	G2	2491.24	2	1.1	1400
S2	G1	773.91	1	1.1	900
	G2	653.15	1	1.1	800
	G3	747.91	1	1.1	900
	G4	653.15	1	1.1	800
	G5	773.91	1	1.1	900

2. Reinforcement rib for jack up design

(1) Suppprt (End side)

Force	Rjk =	900.0	kN		
Jack	:	100	t		
	n =	1			
PL width		150	×	150	
Rib		130	×	12	（ SM490 Y)
Welding Height		2378	mm		
Web thickness	tw =	12	mm	（ SM490 Y）	



＜pressure stress＞

Rib	（ SM490 Y)	2	×	6.3	×	1.2		=	15.12 cm2
Web	（ SM490 Y)	1	×	15.0	×	1.2		=	18.00 cm2
							Ab	=	33.12 cm2

σb = R / Ab = 900.0 × 10^3 / 33.12 × 10^2

= 271.7 N/mm2 ＜ σba = 315 N/mm2

＜Compressive stress ＞

							A(cm2)	y(cm)	A・y(cm3)	A・y^2(cm4)
Rib	（ SM490 Y)	1	×	13.0	×	1.2	15.60	-7.10	-110.76	1006
Web	（ SM490 Y)	1	×	28.8	×	1.2	34.56	--	--	4
Stiff	（ SM490 Y)	1	×	13.0	×	1.2	15.60	7.10	110.76	1006
						∑A=	65.76		0.00	2016
										0
									I =	2016 cm4

1.7 × 31.20 = 53.04 cm2 ＜ A 故に Ae = 53.04 cm2

e = 0.0 cm , , r = 6.17 cm

L/r = 1/2 x 237.8 / 6.17 = 19.28

・Stress

$\sigma c = R / Ae = 900.0 \times 10^3 / (53.04 \times 10^2) = 169.7$ N/mm2

$< \sigma ca = 190.0$ N/mm2

Allowable Stress

$L/r = 19.28 > 15$ $\sigma cag = 203.6$ (N/mm2) $(t \leqq 40)$

Allowable Stress for Local buckring

$b/t = 130 / 12 = 10.8 > 10.5$

$\therefore \sigma cag = 196.0$ N/mm2

$\therefore \sigma ca = \sigma cag \times \sigma cal / \sigma cao = 190.0$ N/mm2

<Welding check>

・Stiffener - Web

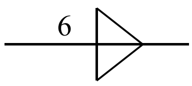
$areq = (2 \times R) / (n \times L \times \tau a)$

$= (2 \times 900.0 \times 10^3) / (4 \times 2378 \times 120) = 1.6$ mm

Welding Size

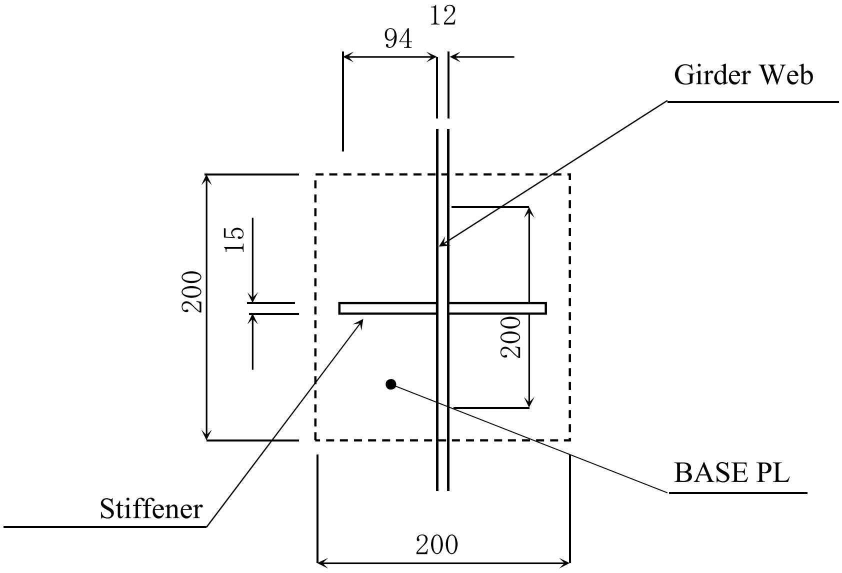
$S = 1.6 \times \sqrt{2} \times 1 / 2 = 1.1$ mm

$\sqrt{(2t)} = 4.9 \leqq 6$ mm $< \min(ts,tw) = 12$ mm



(2) Intermediate fulcrum

Force	Rjk =	1400.0	kN		
Jack	:	200	t		
	n =	2			
PL width		200	×	200	
Rib		150	×	15	(SM490 Y)
Welding Height		2369	mm		
Web thickness	tw =	12	mm	(SM490 Y)	



<pressure stress>

Rib	(SM490 Y)	2	× 9.4	× 1.5		=	28.20	cm2
Web	(SM490 Y)	1	× 20.0	× 1.2		=	24.00	cm2
					Ab	=	52.20	cm2

σb = R / Ab = 1400.0 × 10^3 / 52.20 × 10^2

= 268.2 N/mm2 < σba = 315 N/mm2

<Compressive stress >

					A(cm2)	y(cm)	A・y(cm3)	A・y^2(cm4)
Rib	(SM490 Y)	1	× 15.0	× 1.5	22.50	-8.10	-182.25	1898
Web	(SM490 Y)	1	× 28.8	× 1.2	34.56	--	--	4
Stiff	(SM490 Y)	1	× 15.0	× 1.5	22.50	8.10	182.25	1898
				∑A=	79.56		0.00	3800
								0
							I =	3800 cm4

1.7 × 45.00 = 76.50 cm2 < A 故に Ae = 76.50 cm2

e = 0.0 cm , , r = 7.05 cm

L/r = 1/2 x 236.9 / 7.05 = 16.81

・Stress

σc = R / Ae = 1400.0 × 10^3 / (76.50 × 10^2) = 183.0 N/mm2

< σca = 207.3 N/mm2

Allowable Stress

L/r = 16.8 ＞ 15 σcag = 207.3 (N/mm2) （ｔ≦40）

Allowable Stress for Local buckring

b/t = 150 / 15 = 10.0 ≦ 10.5

∴ σcag= 210.0 N/mm2

∴ σca= σcag x σcal / σcao = 210.0 N/mm2

<Welding check>

・Stiffener - Web

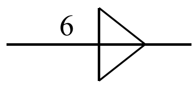
areq = (2 × R) / (n × L × τa)

= (2 × 1400.0×10^3) / (4 × 2369 × 120) = 2.5 mm

Welding Size

S = 2.5 × √2× 1 / 2 = 1.7 mm

√(2t)= 5.5 ≦ 6 mm ＜ min(ts,tw)= 12 mm



4-7 Checking of Stiffness ratio

(1) G1

PANEL	length	Assumption (Iy')	Actual value (Iy)	ratio
1	5.800	0.048274	0.048154	0.2
2	5.800	0.048274	0.048154	0.2
3	5.800	0.048274	0.048154	0.2
4	5.800	0.049417	0.049294	0.3
5	5.800	0.055000	0.052795	4.2
6	5.300	0.072144	0.072513	-0.5
7	5.200	0.069247	0.069586	-0.5
8	5.200	0.049216	0.049093	0.2
9	5.200	0.051508	0.050325	2.4
10	5.200	0.055000	0.051064	7.7
11	5.200	0.055000	0.052766	4.2
12	5.200	0.055000	0.052766	4.2
13	5.200	0.055000	0.051064	7.7
14	5.200	0.051508	0.050325	2.4
15	5.200	0.049216	0.049093	0.2
16	5.200	0.069247	0.069586	-0.5
17	5.300	0.072144	0.072513	-0.5
18	5.800	0.055000	0.052795	4.2
19	5.800	0.049417	0.049294	0.3
20	5.800	0.048274	0.048154	0.2
21	5.800	0.048274	0.048154	0.2
22	5.800	0.048274	0.048154	0.2

Span	length	Assumption (Iy')	Actual value (Iy)	ratio
1	34.300	0.053293	0.052895	0.8
2	52.000	0.055994	0.054567	2.6
3	34.300	0.053293	0.052895	0.8

(2) G2

PANEL	length	Assumption (Iy')	Actual value (Iy)	ratio
1	5.800	0.047501	0.047382	0.3
2	5.800	0.047501	0.047382	0.3
3	5.800	0.047501	0.047382	0.3
4	5.800	0.047558	0.047439	0.3
5	5.800	0.048722	0.048600	0.3
6	5.300	0.057870	0.056492	2.4
7	5.200	0.056893	0.055364	2.8
8	5.200	0.047592	0.047473	0.3
9	5.200	0.051417	0.049278	4.3
10	5.200	0.052414	0.050362	4.1
11	5.200	0.050488	0.050362	0.3
12	5.200	0.050488	0.050362	0.3
13	5.200	0.052414	0.050362	4.1
14	5.200	0.051417	0.049278	4.3
15	5.200	0.047592	0.047473	0.3
16	5.200	0.056893	0.055364	2.8
17	5.300	0.057870	0.056492	2.4
18	5.800	0.048722	0.048600	0.3
19	5.800	0.047558	0.047439	0.3
20	5.800	0.047501	0.047382	0.3
21	5.800	0.047501	0.047382	0.3
22	5.800	0.047501	0.047382	0.3

Span	length	Assumption (Iy')	Actual value (Iy)	ratio
1	34.300	0.049319	0.049005	0.6
2	52.000	0.051761	0.050568	2.4
3	34.300	0.049319	0.049005	0.6

(3) G3

PANEL	length	Assumption (Iy')	Actual value (Iy)	ratio
1	5.800	0.047382	0.047382	0.0
2	5.800	0.047382	0.047382	0.0
3	5.800	0.047382	0.047382	0.0
4	5.800	0.047439	0.047439	0.0
5	5.800	0.048388	0.048293	0.2
6	5.300	0.054796	0.054035	1.4
7	5.200	0.053881	0.053215	1.3
8	5.200	0.047473	0.047473	0.0
9	5.200	0.048829	0.048829	0.0
10	5.200	0.049643	0.049643	0.0
11	5.200	0.049643	0.049643	0.0
12	5.200	0.049643	0.049643	0.0
13	5.200	0.049643	0.049643	0.0
14	5.200	0.048829	0.048829	0.0
15	5.200	0.047473	0.047473	0.0
16	5.200	0.053881	0.053215	1.3
17	5.300	0.054796	0.054035	1.4
18	5.800	0.048388	0.048293	0.2
19	5.800	0.047439	0.047439	0.0
20	5.800	0.047382	0.047382	0.0
21	5.800	0.047382	0.047382	0.0
22	5.800	0.047382	0.047382	0.0

Span	length	Assumption (Iy')	Actual value (Iy)	ratio
1	34.300	0.048707	0.048574	0.3
2	52.000	0.049894	0.049761	0.3
3	34.300	0.048707	0.048574	0.3

(4) G4

PANEL	length	Assumption (Iy')	Actual value (Iy)	ratio
1	5.800	0.047501	0.047382	0.3
2	5.800	0.047501	0.047382	0.3
3	5.800	0.047501	0.047382	0.3
4	5.800	0.047558	0.047439	0.3
5	5.800	0.048722	0.048600	0.3
6	5.300	0.057870	0.056492	2.4
7	5.200	0.056893	0.055364	2.8
8	5.200	0.047592	0.047473	0.3
9	5.200	0.051417	0.049278	4.3
10	5.200	0.052414	0.050362	4.1
11	5.200	0.050488	0.050362	0.3
12	5.200	0.050488	0.050362	0.3
13	5.200	0.052414	0.050362	4.1
14	5.200	0.051417	0.049278	4.3
15	5.200	0.047592	0.047473	0.3
16	5.200	0.056893	0.055364	2.8
17	5.300	0.057870	0.056492	2.4
18	5.800	0.048722	0.048600	0.3
19	5.800	0.047558	0.047439	0.3
20	5.800	0.047501	0.047382	0.3
21	5.800	0.047501	0.047382	0.3
22	5.800	0.047501	0.047382	0.3

Span	length	Assumption (Iy')	Actual value (Iy)	ratio
1	34.300	0.049319	0.049005	0.6
2	52.000	0.051761	0.050568	2.4
3	34.300	0.049319	0.049005	0.6

(5) G5

PANEL	length	Assumption (Iy')	Actual value (Iy)	ratio
1	5.800	0.048274	0.048154	0.2
2	5.800	0.048274	0.048154	0.2
3	5.800	0.048274	0.048154	0.2
4	5.800	0.049417	0.049294	0.3
5	5.800	0.055000	0.052795	4.2
6	5.300	0.072144	0.072513	-0.5
7	5.200	0.069247	0.069586	-0.5
8	5.200	0.049216	0.049093	0.2
9	5.200	0.051508	0.050325	2.4
10	5.200	0.055000	0.051064	7.7
11	5.200	0.055000	0.052766	4.2
12	5.200	0.055000	0.052766	4.2
13	5.200	0.055000	0.051064	7.7
14	5.200	0.051508	0.050325	2.4
15	5.200	0.049216	0.049093	0.2
16	5.200	0.069247	0.069586	-0.5
17	5.300	0.072144	0.072513	-0.5
18	5.800	0.055000	0.052795	4.2
19	5.800	0.049417	0.049294	0.3
20	5.800	0.048274	0.048154	0.2
21	5.800	0.048274	0.048154	0.2
22	5.800	0.048274	0.048154	0.2

Span	length	Assumption (Iy')	Actual value (Iy)	ratio
1	34.300	0.053293	0.052895	0.8
2	52.000	0.055994	0.054567	2.6
3	34.300	0.053293	0.052895	0.8

4-8 Checking of Live Load deflection

Main girder G1

Span No.	Span length	Actual Deflection	Allowable deflection	Actual def./Span Length	Allowable def./Span Length
	L span(mm)	δ(mm)	δa(mm)	δ／L span	δa／L span
1	34300	23.0	58.8	1/1491	1/583
2	52000	54.6	104.0	1/953	1/500
3	34300	23.0	58.8	1/1491	1/583

Main girder G2

Span No.	Span length	Actual Deflection	Allowable deflection	Actual def./Span Length	Allowable def./Span Length
	L span(mm)	δ(mm)	δa(mm)	δ／L span	δa／L span
1	34300	18.2	58.8	1/1885	1/583
2	52000	45.6	104.0	1/1141	1/500
3	34300	18.2	58.8	1/1885	1/583

Main girder G3

Span No.	Span length	Actual Deflection	Allowable deflection	Actual def./Span Length	Allowable def./Span Length
	L span(mm)	δ(mm)	δa(mm)	δ／L span	δa／L span
1	34300	17.9	58.8	1/1919	1/583
2	52000	43.2	104.0	1/1204	1/500
3	34300	17.9	58.8	1/1919	1/583

Main girder G4

Span No.	Span length	Actual Deflection	Allowable deflection	Actual def./Span Length	Allowable def./Span Length
	L span(mm)	δ(mm)	δa(mm)	δ／L span	δa／L span
1	34300	18.2	58.8	1/1885	1/583
2	52000	45.6	104.0	1/1141	1/500
3	34300	18.2	58.8	1/1885	1/583

Main girder G5

Span No.	Span length	Actual Deflection	Allowable deflection	Actual def./Span Length	Allowable def./Span Length
	L span(mm)	δ(mm)	δa(mm)	δ／L span	δa／L span
1	34300	23.0	58.8	1/1491	1/583
2	52000	54.6	104.0	1/953	1/500
3	34300	23.0	58.8	1/1491	1/583

§5 Design of Cross Beam

5-1 Design Method

Design Method

- In the design of the cross beam, the section is determined by the load due to the wind load and the seismic load.
- The end crossbeam is calculated by the direct force caused by vehicle and slab load.
- Cross beam is calculated as a simple beam model.

Load Condition

1) Wind Load

Without Live Load	qw	=	16.000	(kN/m)
With Live Load	qw'	=	8.000	(kN/m)

2) Seismic Load

Dead Load	∑Rd	=	19305.60	(kN)
Span length	∑L	=	120.600	(m)
Seismic intensity	Kh	=	0.30	

$$qe1 = \sum Rd \;/\; \Sigma L \;\times\; Kh$$
$$= 19305.60 \;/\; 120.600 \;\times\; 0.30$$
$$= 48.024 \;\text{(kN/m)}$$

5-2 Calculation Result of Cross Beam

		CROSS BEAM					
		S1		PF12		C2	
FORCE	MOMENT	184.1	kNm	0.0	kNm	739.7	kNm
	Axial Force	0.0	kNm	392.26	kNm	-717.9	kNm
	SHEAR	362.5	kN	0.0	kN	194.8	kN
FLANGE	mm	250	x 10	250	x 10	250	x 10
WEB	mm	2080	x 9	1880	x 9	1880	x 9
MATERIALl		SM400		SM400		SM400	
σx	N/mm2	-6.0	≦ 90.6	17.9	≦ 93.0	-	-
σx + σc	N/mm2	-15.83	≦ 118.4	17.9	≦ 140.0	-74	≦ 119.0
τ	N/mm2	19.36	≦ 80.0	0	≦ 80.0	12	≦ 80.0

§6. Design of Sway Bracing

6-1 Design Method

Design Method

- In the design of the cross beam, the section is determined by the load due to the wind load and the seismic load.
- Limiting slenderness ratio is 150

Load Condition

1) Intensity of Wind Load

The intensity of wind load is calculated in §2. Design of Slab

Without Live Load	qw	=	16.000	(kN/m)
With Live Load	qw'	=	8.000	(kN/m)

2) Intensity of Seismic Load

Reaction Force of Dead Load	ΣRd	=	19305.60	(kN)	(by the analytical result)
Average Span Length	ΣL	=	120.600	(m)	
Design Horizontal Seismic Coefficient	Kh	=	0.30		

$$qe1 = \Sigma Rd / \Sigma L \times Kh$$
$$= 19305.60 / 120.600 \times 0.30$$
$$= 48.02 \ (kN/m)$$

6-2 Calculation Result of Sway Bracing

		SWAY BRACING			
		UPPER & LOWER CORD		DIAGONAL MEMBER	
SHAPE		L-90x90x10x10		L-90x90x10x10	
MATERIALl		SS400		SS400	
SLENDERNESS RATIO		149	＜ 150.0	129	＜ 150.0
AXIAL FORCE	kN	23.2	kN	40.1	kN
σc	N/mm2	-13.7	≦ 41.0	-23.6	≦ 51.0
σt	N/mm2	17.9	≦ 140.0	30.8	≦ 140.0

§7. Design of Lower Lateral Bracing

7-1 Design Method

・In the design of the cross beam, the section is determined by the load due to the wind load and the seismic

・Sectional forces are shared between the deck and lateral, lateral forces are equally shared on the left and right.

・Limiting slenderness ratio is 150

1. Load

1) Intensity of Wind Load

Without Live Load	qw	=	16.00	(kN/m)	1/4 of the force is supported	4.00	(kN/m)
With Live Load	qw'	=	8.000	(kN/m)	1/4 of the force is supported	2.00	(kN/m)

2) Intensity of Seismic Load

Reaction Force of Dead Load	ΣRd	=	19305.6	(kN)	(by the analytical result)
Average Span Length	ΣL	=	120.600	(m)	
Design Horizontal Seismic Coefficient	Kh	=	0.30		

qe1 = ΣRd / ΣL x Kh

= 19305.60 / 120.600 x 0.30

= 48.024 (kN/m) 1/4 of the force is supported **12.01** (kN/m)

7-2 Calculation Result of Lateral Sway Bracing

*** Lateral sway bracing ***

```
       1             2             3             4
S1           SW1           SW2           C1           SW3
I*===========*I*===========*I*===========*I*===========*I
I *         * I *         * I *         * I *         * I
I  *1     2*  I  *3     4*  I  *5     6*  I  *7     8*  I
I   *     *   I   *     *   I   *     *   I   *     *   I
I    *   *    I    *   *    I    *   *    I    *   *    I
I     * *     I     * *     I     * *     I     * *     I
I=====*=======I=====*=======I=====*=======I=====*=======I
```

Member			1	3	5	7
Section	B W	mm	CT-118*178	CT-118*178	CT-118*178	BT-200,150
	P T	mm	10* 8	10* 8	10* 8	*16,*16
	Q M		SS400	SS400	SS400	SM400A
	Length	cm	389.5	389.5	389.5	389.5
Slenderness	Weak axis		109.1	109.1	109.1	89.0
	outersurface		109.1	109.1	109.1	77.9
	Slenderness		150	150	150	150
Actual stress		kN	101.423	37.979	37.663	107.207
Compression	Actual	N/mm2	39.1	14.6	14.5	19.1
	Allowable	N/mm2	39.3	39.3	39.3	52.5
Tension	Actual	N/mm2	61.6	23.1	22.9	29.8
	Allowable	N/mm2	140.0	140.0	140.0	140.0
bolt	Required b	N	1.88	0.70	0.70	1.99
	Use bolt	N	2	2	2	2

Member			2	4	6	8
Section	B W	mm	CT-118*178	CT-118*178	CT-118*178	BT-200,150
	P T	mm	10* 8	10* 8	10* 8	*16,*16
	Q M		SS400	SS400	SS400	SM400A
	Length	cm	389.5	389.5	389.5	389.5
Slenderness	Weak axis		109.1	109.1	109.1	89.0
	outersurface		109.1	109.1	109.1	77.9
	Slenderness		150	150	150	150
Actual stress		kN	101.423	37.979	37.663	107.207
Compression	Actual	N/mm2	39.1	14.6	14.5	19.1
	Allowable	N/mm2	39.3	39.3	39.3	52.5
Tension	Actual	N/mm2	61.6	23.1	22.9	29.8
	Allowable	N/mm2	140.0	140.0	140.0	140.0
bolt	Required b	N	1.88	0.70	0.70	1.99
	Use bolt	N	2	2	2	2

*** Lateral sway bracing ***

```
              5              6              7              8
         SW3          SW4           PF12           SW5          SW6
          I*===========*I*===========*I*===========*I*===========*I
          I *         * I *         * I *         * I *         * I
          I  *9    10*  I  *11   12*  I  *13   14*  I  *15   16*  I
          I   *     *   I   *     *   I   *     *   I   *     *   I
          I    *   *    I    *   *    I    *   *    I    *   *    I
          I     * *     I     * *     I     * *     I     * *     I
          I======*======I======*======I======*======I======*======I
```

Member			9	11	13	15
Section	B W	mm	BT-200,150	BT-200,150	BT-200,150	BT-200,150
	P T	mm	*16,*16	*16,*16	*16,*16	*16,*16
	Q M		SM400A	SM400A	SM400A	SM400A
	Length	cm	389.5	371.2	367.7	367.7
Slenderness	Weak axis		89.0	84.9	84.0	84.0
	outersurface		77.9	74.2	73.5	73.5
	Slenderness		150	150	150	150
Actual stress		kN	176.750	231.902	264.873	206.012
Compression	Actual	N/mm2	31.6	41.4	47.3	36.8
	Allowable	N/mm2	52.5	53.9	54.2	54.2
Tension	Actual	N/mm2	49.1	64.4	73.6	57.2
	Allowable	N/mm2	140.0	140.0	140.0	140.0
bolt	Required b	N	3.27	4.29	4.91	3.82
	Use bolt	N	4	6	6	4
Member			10	12	14	16
Section	B W	mm	BT-200,150	BT-200,150	BT-200,150	BT-200,150
	P T	mm	*16,*16	*16,*16	*16,*16	*16,*16
	Q M		SM400A	SM400A	SM400A	SM400A
	Length	cm	389.5	371.2	367.7	367.7
Slenderness	Weak axis		89.0	84.9	84.0	84.0
	outersurface		77.9	74.2	73.5	73.5
	Slenderness		150	150	150	150
Actual stress		kN	176.750	231.902	264.873	206.012
Compression	Actual	N/mm2	31.6	41.4	47.3	36.8
	Allowable	N/mm2	52.5	53.9	54.2	54.2
Tension	Actual	N/mm2	49.1	64.4	73.6	57.2
	Allowable	N/mm2	140.0	140.0	140.0	140.0
bolt	Required b	N	3.27	4.29	4.91	3.82
	Use bolt	N	4	6	6	4

*** Lateral sway bracing   ***

```
                9            10             11            12
      SW6           SW7            C2            C3            C4
        I*===========*I*===========*I*===========*I*===========*I
        I *         * I *         * I *         * I *         * I
        I  *17   18*  I  *19   20*  I  *21   22*  I  *23   24*  I
        I   *     *   I   *     *   I   *     *   I   *     *   I
        I    *   *    I    *   *    I    *   *    I    *   *    I
        I     * *     I     * *     I     * *     I     * *     I
        I=====*=======I=====*=======I=====*=======I=====*=======I
```

Member			17	19	21	23
Section	B W	mm	BT-200,150	CT-118*178	CT-118*178	CT-118*178
	P T	mm	*16,*16	10* 8	10* 8	10* 8
	Q M		SM400A	SS400	SS400	SS400
	Length	cm	367.7	367.7	367.7	367.7
Slenderness	Weak axis		84.0	103.0	103.0	103.0
	outersurface		73.5	103.0	103.0	103.0
	Slenderness		150	150	150	150
Actual stress		kN	147.152	88.291	36.799	36.799
Compression	Actual	N/mm2	26.3	34.0	14.2	14.2
	Allowable	N/mm2	54.2	41.8	41.8	41.8
Tension	Actual	N/mm2	40.9	53.6	22.3	22.3
	Allowable	N/mm2	140.0	140.0	140.0	140.0
bolt	Required b	N	2.73	1.64	0.68	0.68
	Use bolt	N	4	2	2	2
Member			18	20	22	24
Section	B W	mm	BT-200,150	CT-118*178	CT-118*178	CT-118*178
	P T	mm	*16,*16	10* 8	10* 8	10* 8
	Q M		SM400A	SS400	SS400	SS400
	Length	cm	367.7	367.7	367.7	367.7
Slenderness	Weak axis		84.0	103.0	103.0	103.0
	outersurface		73.5	103.0	103.0	103.0
	Slenderness		150	150	150	150
Actual stress		kN	147.152	88.291	36.799	36.799
Compression	Actual	N/mm2	26.3	34.0	14.2	14.2
	Allowable	N/mm2	54.2	41.8	41.8	41.8
Tension	Actual	N/mm2	40.9	53.6	22.3	22.3
	Allowable	N/mm2	140.0	140.0	140.0	140.0
bolt	Required b	N	2.73	1.64	0.68	0.68
	Use bolt	N	4	2	2	2

*** Lateral sway bracing ***

```
       13             14             15             16
C4            SW8            SW9            SW10           PF13
I*===========*I*===========*I*===========*I*===========*I
I *         * I *         * I *         * I *         * I
I  *25   26*  I  *27   28*  I  *29   30*  I  *31   32*  I
I   *     *   I   *     *   I   *     *   I   *     *   I
I    *   *    I    *   *    I    *   *    I    *   *    I
I     * *     I     * *     I     * *     I     * *     I
I======*======I======*======I======*======I======*======I
```

Member			25	27	29	31
Section	B W	mm	CT-118*178	BT-200,150	BT-200,150	BT-200,150
	P T	mm	10* 8	*16,*16	*16,*16	*16,*16
	Q M		SS400	SM400A	SM400A	SM400A
	Length	cm	367.7	367.7	367.7	367.7
Slenderness	Weak axis		103.0	84.0	84.0	84.0
	outersurface		103.0	73.5	73.5	73.5
	Slenderness		150	150	150	150
Actual stress		kN	88.291	147.152	206.012	264.873
Compression	Actual	N/mm2	34.0	26.3	36.8	47.3
	Allowable	N/mm2	41.8	54.2	54.2	54.2
Tension	Actual	N/mm2	53.6	40.9	57.2	73.6
	Allowable	N/mm2	140.0	140.0	140.0	140.0
bolt	Required b	N	1.64	2.73	3.82	4.91
	Use bolt	N	2	4	4	6

Member			26	28	30	32
Section	B W	mm	CT-118*178	BT-200,150	BT-200,150	BT-200,150
	P T	mm	10* 8	*16,*16	*16,*16	*16,*16
	Q M		SS400	SM400A	SM400A	SM400A
	Length	cm	367.7	367.7	367.7	367.7
Slenderness	Weak axis		103.0	84.0	84.0	84.0
	outersurface		103.0	73.5	73.5	73.5
	Slenderness		150	150	150	150
Actual stress		kN	88.291	147.152	206.012	264.873
Compression	Actual	N/mm2	34.0	26.3	36.8	47.3
	Allowable	N/mm2	41.8	54.2	54.2	54.2
Tension	Actual	N/mm2	53.6	40.9	57.2	73.6
	Allowable	N/mm2	140.0	140.0	140.0	140.0
bolt	Required b	N	1.64	2.73	3.82	4.91
	Use bolt	N	2	4	4	6

*** Lateral sway bracing ***

```
          17              18              19              20
     PF13            SW11            SW12            C5              SW13
      I*===========*I*===========*I*===========*I*===========*I
      I *         * I *         * I *         * I *         * I
      I  *33   34*  I  *35   36*  I  *37   38*  I  *39   40*  I
      I   *     *   I   *     *   I   *     *   I   *     *   I
      I    *   *    I    *   *    I    *   *    I    *   *    I
      I     * *     I     * *     I     * *     I     * *     I
      I=====*=======I=====*=======I=====*=======I=====*=======I
```

Member			33	35	37	39
Section	B W	mm	BT-200,150	BT-200,150	BT-200,150	CT-118*178
	P T	mm	*16,*16	*16,*16	*16,*16	10* 8
	Q M		SM400A	SM400A	SM400A	SS400
	Length	cm	371.2	389.5	389.5	389.5
Slenderness	Weak axis		84.9	89.0	89.0	109.1
	outersurface		74.2	77.9	77.9	109.1
	Slenderness		150	150	150	150
Actual stress		kN	231.902	176.750	107.207	37.663
Compression	Actual	N/mm2	41.4	31.6	19.1	14.5
	Allowable	N/mm2	53.9	52.5	52.5	39.3
Tension	Actual	N/mm2	64.4	49.1	29.8	22.9
	Allowable	N/mm2	140.0	140.0	140.0	140.0
bolt	Required b	N	4.29	3.27	1.99	0.70
	Use bolt	N	6	4	2	2
Member			34	36	38	40
Section	B W	mm	BT-200,150	BT-200,150	BT-200,150	CT-118*178
	P T	mm	*16,*16	*16,*16	*16,*16	10* 8
	Q M		SM400A	SM400A	SM400A	SS400
	Length	cm	371.2	389.5	389.5	389.5
Slenderness	Weak axis		84.9	89.0	89.0	109.1
	outersurface		74.2	77.9	77.9	109.1
	Slenderness		150	150	150	150
Actual stress		kN	231.902	176.750	107.207	37.663
Compression	Actual	N/mm2	41.4	31.6	19.1	14.5
	Allowable	N/mm2	53.9	52.5	52.5	39.3
Tension	Actual	N/mm2	64.4	49.1	29.8	22.9
	Allowable	N/mm2	140.0	140.0	140.0	140.0
bolt	Required b	N	4.29	3.27	1.99	0.70
	Use bolt	N	6	4	2	2

*** Lateral sway bracing ***

```
          21             22
       SW13          SW14           S2
        I*===========*I*===========*I
        I *         * I *         * I
        I  *41   42*  I  *43   44*  I
        I   *     *   I   *     *   I
        I    *   *    I    *   *    I
        I     * *     I     * *     I
        I======*======I======*======I
```

Member			41	43
Section	B W	mm	CT-118*178	CT-118*178
	P T	mm	10* 8	10* 8
	Q M		SS400	SS400
	Length	cm	389.5	389.5
Slenderness	Weak axis		109.1	109.1
	outersurface		109.1	109.1
	Slenderness		150	150
Actual stress		kN	37.979	101.423
Compression	Actual	N/mm2	14.6	39.1
	Allowable	N/mm2	39.3	39.3
Tension	Actual	N/mm2	23.1	61.6
	Allowable	N/mm2	140.0	140.0
bolt	Required b	N	0.70	1.88
	Use bolt	N	2	2

Member			42	44
Section	B W	mm	CT-118*178	CT-118*178
	P T	mm	10* 8	10* 8
	Q M		SS400	SS400
	Length	cm	389.5	389.5
Slenderness	Weak axis		109.1	109.1
	outersurface		109.1	109.1
	Slenderness		150	150
Actual stress		kN	37.979	101.423
Compression	Actual	N/mm2	14.6	39.1
	Allowable	N/mm2	39.3	39.3
Tension	Actual	N/mm2	23.1	61.6
	Allowable	N/mm2	140.0	140.0
bolt	Required b	N	0.70	1.88
	Use bolt	N	2	2

§8. Fatigue Design

8-1 Condtion for Fatigue design

1． Live Load

AASHTO Track load
T-load

Comparing the stress range when loading one AASHTO track load and the stress range of a pair of loads of 100 t, there is a possibility that those large stress ranges will affect fatigue. the larger stress of them shall be adopted for stress of fatigue design.

2． Load correction factor

line n_L = 2

$ADTT_{SLi}$ = 2090

Variable stress correction factor（λT）

$\gamma_T = \gamma_{T1} \cdot \gamma_{T2}$

$\gamma T1 = \log L_{B1} + 1.50$ （$2.00 \leqq \gamma_{T1} \leqq 3.00$）

γT2

$ADTT_{SLi}$ \ L_{B2}	$L_{B1} \leqq 50m$	$50m < L_{B1}$
$ADTT_{SLi} \leqq 2000$	1.00	1.00
$2000 < ADTT_{SLi}$	1.00	1.10

	L_{B1} (m)	L_{B2} (m)	$ADTT_{SLi}$	γT1	γT2	γT
First span	34.300	34.300	2090.0	3.00	1.00	3.00
Second spane	52.000	52.000	2090.0	3.00	1.10	3.30
The third span	34.300	34.300	0.0	3.00	1.10	3.30

3． Impact

i f= 10/(50+L)

	L (m)	i f
First span	34.300	0.119
Second spane	52.000	0.098
The third span	34.300	0.119

4． Structural analysis coefficient

γa= 0.80 （girder）
γa= 0.50 （Cross beam）

4． Frequency correction factor

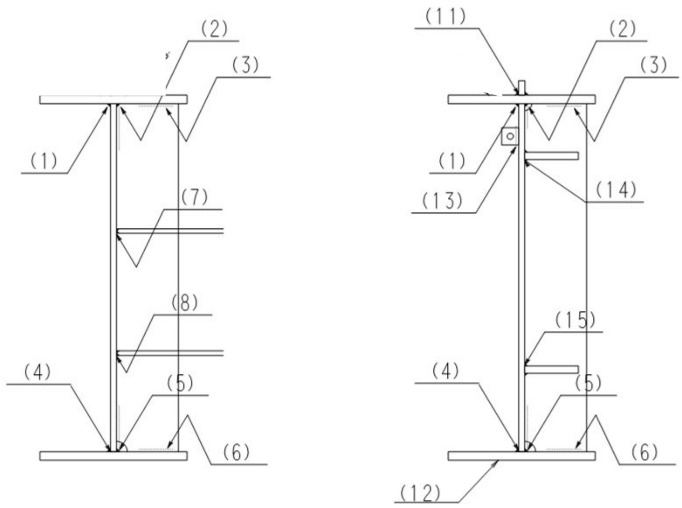
γn= 0.03

5. Comparing the stress range of 2 type Live Load

Girder		AASHTO	B-Live	(B) -(A)
Member		Stress Range(A)	Stress Range(B)	
G1	1001	0	0	0
	1002	763	1001	238
	1003	1442	1803	361
	1004	1912	2285	373
	1005	1545	1912	367
	1006	1162	1517	356
	1007	1303	1483	180
	1008	674	992	319
	1009	977	1355	378
	1010	1444	1825	381
	1011	1859	2242	383
	1012	1816	2219	404
	1013	1859	2242	383
	1014	1444	1825	381
	1015	977	1355	378
	1016	674	992	319
	1017	1303	1483	180
	1018	1162	1517	356
	1019	1545	1912	367
	1020	1912	2285	373
	1021	1442	1803	361
	1022	763	1001	238
G2	2001	0	0	0
	2002	1262	1559	297
	2003	1552	1964	411
	2004	1257	1639	383
	2005	1610	2004	394
	2006	1394	1711	318
	2007	1079	1131	53
	2008	1030	1386	357
	2009	1445	1816	371
	2010	1455	1824	369
	2011	1296	1601	305
	2012	1319	1645	326
	2013	1296	1601	305
	2014	1455	1824	369
	2015	1445	1816	371
	2016	1030	1386	357
	2017	1079	1131	53
	2018	1394	1711	318
	2019	1610	2004	394
	2020	1257	1639	383
	2021	1552	1964	411
	2022	1262	1559	297

6. Checking Point and Grade

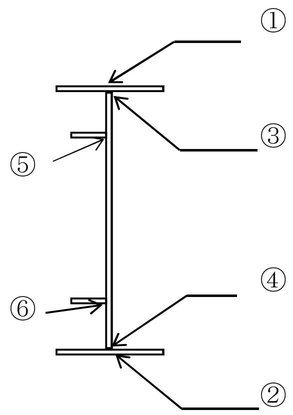
(1) GIRDER



	Checking position	Grade		Position	
(1)	Main Girder Web -Main Girder Flange	D	(100)	Upper Flange	※
(2)	V-Stiffener - Main Girder Web	E	(80)	Web Upper Edge	Checking
(3)	V-Stiffener - Main Girder Upper Flange	E	(80)		
(4)	Main Girder web - Main Girder Lower Flange	D	(100)	Lower Flange	Checking
(5)	V-Stiffener - Main Girder Web	E	(80)	Web Lower Edge	Checking
(6)	V-Stiffener - Main Girder Lower Flange	E	(80)		
(7)	Cross Beam Upper Flange - Main Girder Web	G	(50)	Gasset	Checking
(8)	Cross Beam Lower Flange - Main Girder Web	G	(50)	Gasset	Checking
(11)	Erection Piece - Main Girder Upper Flange	F	(65)	Upper Flange	Checking
(14)	Main Girder Web - H-Stiffener (Upper)	G	(50)	H-Stiffener	Checking
(15)	Main Girder Web - H-Stiffener (Lower)	G	(50)	H-Stiffener	Checking

※Upper Flange(1) shall be checked "F" grade, because (1) and (11) is in the same position.

(2) CROSS BEAM



Position	Grade		Checking Position
① ②	D	(100)	Cross Beam Flange - Web
③ ④	E	(80)	Cross Beam Flange - Web Cross Beam Flange - Main Girdee Web
⑤ ⑥	G	(50)	Cross BeamWeb - H-Stiffener

8-2 Checking of Fatigue Stress for Main Girder

$\sigma tmax$: Maximum stress (Including the effect of γa)
$\sigma tmin$: Minimum stress（Including the effect of γa)
σd : Stress of Dead load (Including the effect of γa)
$\Delta\sigma max$: $\sigma tmax - \sigma tmin$
Ｃ0 : 2.0E+6・$\Delta\sigma f$**ｍ
$\Delta\sigma f$: 2.0E+6 Allowable stress
ｍ : Slope constant
ＣR : Correction coefficient for mean stress
Ｃt : Correction factor for t

Structural analysis coefficient Main Girder γa = 0.800

Maximum stress range checking $\Delta\sigma max \leqq \Delta\sigma ce$・ＣR・Ｃt

Stress range cycles checking Ｄ=Σi[Σj{nti/(C0・(CR・Ct)**ｍ/Δσij**ｍ)}] ≦1

Steel I Girder G1

node U.FLG-MAX (UpperFlangeStress MAx)

node			Flange t (mm)	σtmax	σtmin (N/mm2)	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)		Δσce・CR・Ct (N/mm2)	Stress Cycle D
1	1	nodeRight	22	0.0	0.0	0.0	F	(65)	46.0	3	21.0	1.300	1.000	0.0	<	59.8	
1	2	nodeLeft	22	4.9	-19.4	-43.5	F	(65)	46.0	3	21.0	1.300	1.000	24.3	<	59.8	
1	2	nodeRight	22	4.9	-19.4	-43.5	F	(65)	46.0	3	21.0	1.300	1.000	24.3	<	59.8	
2	3	nodeLeft	22	9.9	-33.9	-54.2	F	(65)	46.0	3	21.0	1.300	1.000	43.8	<	59.8	
2	3	nodeRight	22	9.9	-33.9	-54.2	F	(65)	46.0	3	21.0	1.300	1.000	43.8	<	59.8	
2	4	nodeLeft	22	14.8	-40.7	-32.1	F	(65)	46.0	3	21.0	1.300	1.000	55.5	<	59.8	
2	4	nodeRight	22	14.8	-40.7	-32.1	F	(65)	46.0	3	21.0	1.300	1.000	55.5	<	59.8	
3	5	nodeLeft	20	20.6	-27.2	9.7	F	(65)	46.0	3	21.0	1.000	1.000	47.8	>	46.0	0.46 < 1
3	5	nodeRight	20	20.6	-27.2	9.7	F	(65)	46.0	3	21.0	1.000	1.000	47.8	>	46.0	0.46 < 1
4	6	nodeLeft	31	18.6	-8.5	61.7	F	(65)	46.0	3	21.0	1.000	0.948	27.2	<	43.6	
4	6	nodeRight	31	18.6	-8.5	61.7	F	(65)	46.0	3	21.0	1.000	0.948	27.2	<	43.6	
4	7	nodeLeft	31	22.1	-4.4	132.9	F	(65)	46.0	3	21.0	1.000	0.948	26.5	<	43.6	
4	7	nodeRight	31	22.1	-4.4	132.9	F	(65)	46.0	3	21.0	1.000	0.948	26.5	<	43.6	
5	8	nodeLeft	19	16.8	-8.7	76.2	F	(65)	46.0	3	21.0	1.000	1.000	25.5	<	46.0	
5	8	nodeRight	19	16.8	-8.7	76.2	F	(65)	46.0	3	21.0	1.000	1.000	25.5	<	46.0	
5	9	nodeLeft	19	14.2	-20.6	-10.6	F	(65)	46.0	3	21.0	1.223	1.000	34.8	<	56.3	
5	9	nodeRight	19	14.2	-20.6	-10.6	F	(65)	46.0	3	21.0	1.223	1.000	34.8	<	56.3	
6	10	nodeLeft	26	10.0	-30.1	-59.4	F	(65)	46.0	3	21.0	1.300	0.990	40.1	<	59.2	
6	10	nodeRight	26	10.0	-30.1	-59.4	F	(65)	46.0	3	21.0	1.300	0.990	40.1	<	59.2	
6	11	nodeLeft	26	8.2	-41.0	-86.0	F	(65)	46.0	3	21.0	1.300	0.990	49.3	<	59.2	
6	11	nodeRight	26	8.2	-41.0	-86.0	F	(65)	46.0	3	21.0	1.300	0.990	49.3	<	59.2	
7	12	nodeLeft	26	5.7	-42.4	-95.5	F	(65)	46.0	3	21.0	1.300	0.990	48.1	<	59.2	
7	12	nodeRight	26	5.7	-42.4	-95.5	F	(65)	46.0	3	21.0	1.300	0.990	48.1	<	59.2	
8	13	nodeLeft	26	8.2	-41.0	-86.0	F	(65)	46.0	3	21.0	1.300	0.990	49.3	<	59.2	
8	13	nodeRight	26	8.2	-41.0	-86.0	F	(65)	46.0	3	21.0	1.300	0.990	49.3	<	59.2	
8	14	nodeLeft	26	10.0	-30.1	-59.4	F	(65)	46.0	3	21.0	1.300	0.990	40.1	<	59.2	
8	14	nodeRight	26	10.0	-30.1	-59.4	F	(65)	46.0	3	21.0	1.300	0.990	40.1	<	59.2	
9	15	nodeLeft	19	14.2	-20.6	-10.6	F	(65)	46.0	3	21.0	1.223	1.000	34.8	<	56.3	
9	15	nodeRight	19	14.2	-20.6	-10.6	F	(65)	46.0	3	21.0	1.223	1.000	34.8	<	56.3	
9	16	nodeLeft	19	16.8	-8.7	76.2	F	(65)	46.0	3	21.0	1.000	1.000	25.5	<	46.0	
9	16	nodeRight	19	16.8	-8.7	76.2	F	(65)	46.0	3	21.0	1.000	1.000	25.5	<	46.0	
10	17	nodeLeft	31	22.1	-4.4	132.9	F	(65)	46.0	3	21.0	1.000	0.948	26.5	<	43.6	
10	17	nodeRight	31	22.1	-4.4	132.9	F	(65)	46.0	3	21.0	1.000	0.948	26.5	<	43.6	
10	18	nodeLeft	31	18.6	-8.5	61.7	F	(65)	46.0	3	21.0	1.000	0.948	27.2	<	43.6	
10	18	nodeRight	31	18.6	-8.5	61.7	F	(65)	46.0	3	21.0	1.000	0.948	27.2	<	43.6	
11	19	nodeLeft	20	20.6	-27.2	9.7	F	(65)	46.0	3	21.0	1.000	1.000	47.8	>	46.0	0.46 < 1
11	19	nodeRight	20	20.6	-27.2	9.7	F	(65)	46.0	3	21.0	1.000	1.000	47.8	>	46.0	0.46 < 1
12	20	nodeLeft	22	14.8	-40.7	-32.1	F	(65)	46.0	3	21.0	1.300	1.000	55.5	<	59.8	
12	20	nodeRight	22	14.8	-40.7	-32.1	F	(65)	46.0	3	21.0	1.300	1.000	55.5	<	59.8	
12	21	nodeLeft	22	9.9	-33.9	-54.2	F	(65)	46.0	3	21.0	1.300	1.000	43.8	<	59.8	
12	21	nodeRight	22	9.9	-33.9	-54.2	F	(65)	46.0	3	21.0	1.300	1.000	43.8	<	59.8	
13	22	nodeLeft	22	4.9	-19.4	-43.5	F	(65)	46.0	3	21.0	1.300	1.000	24.3	<	59.8	
13	22	nodeRight	22	4.9	-19.4	-43.5	F	(65)	46.0	3	21.0	1.300	1.000	24.3	<	59.8	
13	23	nodeLeft	22	0.0	0.0	0.0	F	(65)	46.0	3	21.0	1.300	1.000	0.0	<	59.8	

Steel I Girder G1

node　L.FLG-MAX (LowerFlangeStress MAx)

Sec	node		Flange t (mm)	σtmax	σtmin (N/mm2)	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)		Δσce・CR・Ct (N/mm2)	Stress Cycle D
1	1	nodeRight	19	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
1	2	nodeLeft	19	20.7	-5.3	46.4	D	(100)	84.0	3	39.0	1.000	1.000	26.0	<	84.0	
1	2	nodeRight	19	20.7	-5.3	46.4	D	(100)	84.0	3	39.0	1.000	1.000	26.0	<	84.0	
2	3	nodeLeft	19	36.2	-10.5	57.8	D	(100)	84.0	3	39.0	1.000	1.000	46.8	<	84.0	
2	3	nodeRight	19	36.2	-10.5	57.8	D	(100)	84.0	3	39.0	1.000	1.000	46.8	<	84.0	
2	4	nodeLeft	19	43.4	-15.8	34.2	D	(100)	84.0	3	39.0	1.000	1.000	59.3	<	84.0	
2	4	nodeRight	19	43.4	-15.8	34.2	D	(100)	84.0	3	39.0	1.000	1.000	59.3	<	84.0	
3	5	nodeLeft	23	25.5	-19.4	-9.1	D	(100)	84.0	3	39.0	1.066	1.000	44.9	<	89.6	
3	5	nodeRight	23	25.5	-19.4	-9.1	D	(100)	84.0	3	39.0	1.066	1.000	44.9	<	89.6	
4	6	nodeLeft	39	7.5	-16.4	-54.2	D	(100)	84.0	3	39.0	1.300	0.895	23.9	<	97.7	
4	6	nodeRight	39	7.5	-16.4	-54.2	D	(100)	84.0	3	39.0	1.300	0.895	23.9	<	97.7	
4	7	nodeLeft	39	3.9	-19.5	-116.8	D	(100)	84.0	3	39.0	1.300	0.895	23.3	<	97.7	
4	7	nodeRight	39	3.9	-19.5	-116.8	D	(100)	84.0	3	39.0	1.300	0.895	23.3	<	97.7	
5	8	nodeLeft	23	8.0	-15.4	-70.0	D	(100)	84.0	3	39.0	1.300	1.000	23.4	<	109.2	
5	8	nodeRight	23	8.0	-15.4	-70.0	D	(100)	84.0	3	39.0	1.300	1.000	23.4	<	109.2	
5	9	nodeLeft	23	18.9	-13.1	9.8	D	(100)	84.0	3	39.0	1.000	1.000	32.0	<	84.0	
5	9	nodeRight	23	18.9	-13.1	9.8	D	(100)	84.0	3	39.0	1.000	1.000	32.0	<	84.0	
6	10	nodeLeft	19	34.7	-11.6	68.7	D	(100)	84.0	3	39.0	1.000	1.000	46.3	<	84.0	
6	10	nodeRight	19	34.7	-11.6	68.7	D	(100)	84.0	3	39.0	1.000	1.000	46.3	<	84.0	
6	11	nodeLeft	19	47.4	-9.5	99.3	D	(100)	84.0	3	39.0	1.000	1.000	56.9	<	84.0	
6	11	nodeRight	19	47.4	-9.5	99.3	D	(100)	84.0	3	39.0	1.000	1.000	56.9	<	84.0	
7	12	nodeLeft	21	46.9	-6.3	105.6	D	(100)	84.0	3	39.0	1.000	1.000	53.2	<	84.0	
7	12	nodeRight	21	46.9	-6.3	105.6	D	(100)	84.0	3	39.0	1.000	1.000	53.2	<	84.0	
8	13	nodeLeft	19	47.4	-9.5	99.3	D	(100)	84.0	3	39.0	1.000	1.000	56.9	<	84.0	
8	13	nodeRight	19	47.4	-9.5	99.3	D	(100)	84.0	3	39.0	1.000	1.000	56.9	<	84.0	
8	14	nodeLeft	19	34.7	-11.6	68.7	D	(100)	84.0	3	39.0	1.000	1.000	46.3	<	84.0	
8	14	nodeRight	19	34.7	-11.6	68.7	D	(100)	84.0	3	39.0	1.000	1.000	46.3	<	84.0	
9	15	nodeLeft	23	18.9	-13.1	9.8	D	(100)	84.0	3	39.0	1.000	1.000	32.0	<	84.0	
9	15	nodeRight	23	18.9	-13.1	9.8	D	(100)	84.0	3	39.0	1.000	1.000	32.0	<	84.0	
9	16	nodeLeft	23	8.0	-15.4	-70.0	D	(100)	84.0	3	39.0	1.300	1.000	23.4	<	109.2	
9	16	nodeRight	23	8.0	-15.4	-70.0	D	(100)	84.0	3	39.0	1.300	1.000	23.4	<	109.2	
10	17	nodeLeft	39	3.9	-19.5	-116.8	D	(100)	84.0	3	39.0	1.300	0.895	23.3	<	97.7	
10	17	nodeRight	39	3.9	-19.5	-116.8	D	(100)	84.0	3	39.0	1.300	0.895	23.3	<	97.7	
10	18	nodeLeft	39	7.5	-16.4	-54.2	D	(100)	84.0	3	39.0	1.300	0.895	23.9	<	97.7	
10	18	nodeRight	39	7.5	-16.4	-54.2	D	(100)	84.0	3	39.0	1.300	0.895	23.9	<	97.7	
11	19	nodeLeft	23	25.5	-19.4	-9.1	D	(100)	84.0	3	39.0	1.066	1.000	44.9	<	89.6	
11	19	nodeRight	23	25.5	-19.4	-9.1	D	(100)	84.0	3	39.0	1.066	1.000	44.9	<	89.6	
12	20	nodeLeft	19	43.4	-15.8	34.2	D	(100)	84.0	3	39.0	1.000	1.000	59.3	<	84.0	
12	20	nodeRight	19	43.4	-15.8	34.2	D	(100)	84.0	3	39.0	1.000	1.000	59.3	<	84.0	
12	21	nodeLeft	19	36.2	-10.5	57.8	D	(100)	84.0	3	39.0	1.000	1.000	46.8	<	84.0	
12	21	nodeRight	19	36.2	-10.5	57.8	D	(100)	84.0	3	39.0	1.000	1.000	46.8	<	84.0	
13	22	nodeLeft	19	20.7	-5.3	46.4	D	(100)	84.0	3	39.0	1.000	1.000	26.0	<	84.0	
13	22	nodeRight	19	20.7	-5.3	46.4	D	(100)	84.0	3	39.0	1.000	1.000	26.0	<	84.0	
13	23	nodeLeft	19	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	

Steel I Girder G1

node WEB-U-1 (WebUpper edge) WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	22	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
1	2	nodeLeft	2400	22	0	4.8	-19.0	-42.7	E(80)	62.0	3	29.0	1.300	1.000	23.9<	80.6	
1	2	nodeRight	2400	22	0	4.8	-19.0	-42.7	E(80)	62.0	3	29.0	1.300	1.000	23.9<	80.6	
2	3	nodeLeft	2400	22	0	9.7	-33.3	-53.2	E(80)	62.0	3	29.0	1.300	1.000	43.0<	80.6	
2	3	nodeRight	2400	22	0	9.7	-33.3	-53.2	E(80)	62.0	3	29.0	1.300	1.000	43.0<	80.6	
2	4	nodeLeft	2400	22	0	14.6	-39.9	-31.5	E(80)	62.0	3	29.0	1.300	1.000	54.5<	80.6	
2	4	nodeRight	2400	22	0	14.6	-39.9	-31.5	E(80)	62.0	3	29.0	1.300	1.000	54.5<	80.6	
3	5	nodeLeft	2400	20	0	20.3	-26.7	9.6	E(80)	62.0	3	29.0	1.000	1.000	47.0<	62.0	
3	5	nodeRight	2400	20	0	20.3	-26.7	9.6	E(80)	62.0	3	29.0	1.000	1.000	47.0<	62.0	
4	6	nodeLeft	2400	31	0	18.2	-8.3	60.2	E(80)	62.0	3	29.0	1.000	0.948	26.5<	58.8	
4	6	nodeRight	2400	31	0	18.2	-8.3	60.2	E(80)	62.0	3	29.0	1.000	0.948	26.5<	58.8	
4	7	nodeLeft	2400	31	0	21.6	-4.3	129.7	E(80)	62.0	3	29.0	1.000	0.948	25.9<	58.8	
4	7	nodeRight	2400	31	0	21.6	-4.3	129.7	E(80)	62.0	3	29.0	1.000	0.948	25.9<	58.8	
5	8	nodeLeft	2400	19	0	16.5	-8.6	75.1	E(80)	62.0	3	29.0	1.000	1.000	25.1<	62.0	
5	8	nodeRight	2400	19	0	16.5	-8.6	75.1	E(80)	62.0	3	29.0	1.000	1.000	25.1<	62.0	
5	9	nodeLeft	2400	19	0	14.0	-20.3	-10.5	E(80)	62.0	3	29.0	1.223	1.000	34.3<	75.8	
5	9	nodeRight	2400	19	0	14.0	-20.3	-10.5	E(80)	62.0	3	29.0	1.223	1.000	34.3<	75.8	
6	10	nodeLeft	2400	26	0	9.8	-29.4	-58.0	E(80)	62.0	3	29.0	1.300	0.990	39.2<	79.8	
6	10	nodeRight	2400	26	0	9.8	-29.4	-58.0	E(80)	62.0	3	29.0	1.300	0.990	39.2<	79.8	
6	11	nodeLeft	2400	26	0	8.0	-40.1	-84.0	E(80)	62.0	3	29.0	1.300	0.990	48.1<	79.8	
6	11	nodeRight	2400	26	0	8.0	-40.1	-84.0	E(80)	62.0	3	29.0	1.300	0.990	48.1<	79.8	
7	12	nodeLeft	2400	26	0	5.6	-41.5	-93.3	E(80)	62.0	3	29.0	1.300	0.990	47.0<	79.8	
7	12	nodeRight	2400	26	0	5.6	-41.5	-93.3	E(80)	62.0	3	29.0	1.300	0.990	47.0<	79.8	
8	13	nodeLeft	2400	26	0	8.0	-40.1	-84.0	E(80)	62.0	3	29.0	1.300	0.990	48.1<	79.8	
8	13	nodeRight	2400	26	0	8.0	-40.1	-84.0	E(80)	62.0	3	29.0	1.300	0.990	48.1<	79.8	
8	14	nodeLeft	2400	26	0	9.8	-29.4	-58.0	E(80)	62.0	3	29.0	1.300	0.990	39.2<	79.8	
8	14	nodeRight	2400	26	0	9.8	-29.4	-58.0	E(80)	62.0	3	29.0	1.300	0.990	39.2<	79.8	
9	15	nodeLeft	2400	19	0	14.0	-20.3	-10.5	E(80)	62.0	3	29.0	1.223	1.000	34.3<	75.8	
9	15	nodeRight	2400	19	0	14.0	-20.3	-10.5	E(80)	62.0	3	29.0	1.223	1.000	34.3<	75.8	
9	16	nodeLeft	2400	19	0	16.5	-8.6	75.1	E(80)	62.0	3	29.0	1.000	1.000	25.1<	62.0	
9	16	nodeRight	2400	19	0	16.5	-8.6	75.1	E(80)	62.0	3	29.0	1.000	1.000	25.1<	62.0	
10	17	nodeLeft	2400	31	0	21.6	-4.3	129.7	E(80)	62.0	3	29.0	1.000	0.948	25.9<	58.8	
10	17	nodeRight	2400	31	0	21.6	-4.3	129.7	E(80)	62.0	3	29.0	1.000	0.948	25.9<	58.8	
10	18	nodeLeft	2400	31	0	18.2	-8.3	60.2	E(80)	62.0	3	29.0	1.000	0.948	26.5<	58.8	
10	18	nodeRight	2400	31	0	18.2	-8.3	60.2	E(80)	62.0	3	29.0	1.000	0.948	26.5<	58.8	
11	19	nodeLeft	2400	20	0	20.3	-26.7	9.6	E(80)	62.0	3	29.0	1.000	1.000	47.0<	62.0	
11	19	nodeRight	2400	20	0	20.3	-26.7	9.6	E(80)	62.0	3	29.0	1.000	1.000	47.0<	62.0	
12	20	nodeLeft	2400	22	0	14.6	-39.9	-31.5	E(80)	62.0	3	29.0	1.300	1.000	54.5<	80.6	
12	20	nodeRight	2400	22	0	14.6	-39.9	-31.5	E(80)	62.0	3	29.0	1.300	1.000	54.5<	80.6	
12	21	nodeLeft	2400	22	0	9.7	-33.3	-53.2	E(80)	62.0	3	29.0	1.300	1.000	43.0<	80.6	
12	21	nodeRight	2400	22	0	9.7	-33.3	-53.2	E(80)	62.0	3	29.0	1.300	1.000	43.0<	80.6	
13	22	nodeLeft	2400	22	0	4.8	-19.0	-42.7	E(80)	62.0	3	29.0	1.300	1.000	23.9<	80.6	
13	22	nodeRight	2400	22	0	4.8	-19.0	-42.7	E(80)	62.0	3	29.0	1.300	1.000	23.9<	80.6	
13	23	nodeLeft	2400	22	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	

Steel I Girder G1

node　WEB-L-1　(WebLower edge)　WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	19	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
1	2	nodeLeft	2400	19	0	20.4	-5.2	45.7	E(80)	62.0	3	29.0	1.000	1.000	25.6<	62.0	
1	2	nodeRight	2400	19	0	20.4	-5.2	45.7	E(80)	62.0	3	29.0	1.000	1.000	25.6<	62.0	
2	3	nodeLeft	2400	19	0	35.7	-10.4	56.9	E(80)	62.0	3	29.0	1.000	1.000	46.0<	62.0	
2	3	nodeRight	2400	19	0	35.7	-10.4	56.9	E(80)	62.0	3	29.0	1.000	1.000	46.0<	62.0	
2	4	nodeLeft	2400	19	0	42.8	-15.6	33.7	E(80)	62.0	3	29.0	1.000	1.000	58.4<	62.0	
2	4	nodeRight	2400	19	0	42.8	-15.6	33.7	E(80)	62.0	3	29.0	1.000	1.000	58.4<	62.0	
3	5	nodeLeft	2400	23	0	25.0	-19.0	-8.9	E(80)	62.0	3	29.0	1.066	1.000	44.0<	66.1	
3	5	nodeRight	2400	23	0	25.0	-19.0	-8.9	E(80)	62.0	3	29.0	1.066	1.000	44.0<	66.1	
4	6	nodeLeft	2400	39	0	7.3	-15.8	-52.4	E(80)	62.0	3	29.0	1.300	0.895	23.1<	72.1	
4	6	nodeRight	2400	39	0	7.3	-15.8	-52.4	E(80)	62.0	3	29.0	1.300	0.895	23.1<	72.1	
4	7	nodeLeft	2400	39	0	3.7	-18.8	-112.8	E(80)	62.0	3	29.0	1.300	0.895	22.5<	72.1	
4	7	nodeRight	2400	39	0	3.7	-18.8	-112.8	E(80)	62.0	3	29.0	1.300	0.895	22.5<	72.1	
5	8	nodeLeft	2400	23	0	7.9	-15.1	-68.6	E(80)	62.0	3	29.0	1.300	1.000	23.0<	80.6	
5	8	nodeRight	2400	23	0	7.9	-15.1	-68.6	E(80)	62.0	3	29.0	1.300	1.000	23.0<	80.6	
5	9	nodeLeft	2400	23	0	18.5	-12.8	9.6	E(80)	62.0	3	29.0	1.000	1.000	31.3<	62.0	
5	9	nodeRight	2400	23	0	18.5	-12.8	9.6	E(80)	62.0	3	29.0	1.000	1.000	31.3<	62.0	
6	10	nodeLeft	2400	19	0	34.2	-11.4	67.7	E(80)	62.0	3	29.0	1.000	1.000	45.7<	62.0	
6	10	nodeRight	2400	19	0	34.2	-11.4	67.7	E(80)	62.0	3	29.0	1.000	1.000	45.7<	62.0	
6	11	nodeLeft	2400	19	0	46.7	-9.4	97.9	E(80)	62.0	3	29.0	1.000	1.000	56.1<	62.0	
6	11	nodeRight	2400	19	0	46.7	-9.4	97.9	E(80)	62.0	3	29.0	1.000	1.000	56.1<	62.0	
7	12	nodeLeft	2400	21	0	46.2	-6.2	103.9	E(80)	62.0	3	29.0	1.000	1.000	52.4<	62.0	
7	12	nodeRight	2400	21	0	46.2	-6.2	103.9	E(80)	62.0	3	29.0	1.000	1.000	52.4<	62.0	
8	13	nodeLeft	2400	19	0	46.7	-9.4	97.9	E(80)	62.0	3	29.0	1.000	1.000	56.1<	62.0	
8	13	nodeRight	2400	19	0	46.7	-9.4	97.9	E(80)	62.0	3	29.0	1.000	1.000	56.1<	62.0	
8	14	nodeLeft	2400	19	0	34.2	-11.4	67.7	E(80)	62.0	3	29.0	1.000	1.000	45.7<	62.0	
8	14	nodeRight	2400	19	0	34.2	-11.4	67.7	E(80)	62.0	3	29.0	1.000	1.000	45.7<	62.0	
9	15	nodeLeft	2400	23	0	18.5	-12.8	9.6	E(80)	62.0	3	29.0	1.000	1.000	31.3<	62.0	
9	15	nodeRight	2400	23	0	18.5	-12.8	9.6	E(80)	62.0	3	29.0	1.000	1.000	31.3<	62.0	
9	16	nodeLeft	2400	23	0	7.9	-15.1	-68.6	E(80)	62.0	3	29.0	1.300	1.000	23.0<	80.6	
9	16	nodeRight	2400	23	0	7.9	-15.1	-68.6	E(80)	62.0	3	29.0	1.300	1.000	23.0<	80.6	
10	17	nodeLeft	2400	39	0	3.7	-18.8	-112.8	E(80)	62.0	3	29.0	1.300	0.895	22.5<	72.1	
10	17	nodeRight	2400	39	0	3.7	-18.8	-112.8	E(80)	62.0	3	29.0	1.300	0.895	22.5<	72.1	
10	18	nodeLeft	2400	39	0	7.3	-15.8	-52.4	E(80)	62.0	3	29.0	1.300	0.895	23.1<	72.1	
10	18	nodeRight	2400	39	0	7.3	-15.8	-52.4	E(80)	62.0	3	29.0	1.300	0.895	23.1<	72.1	
11	19	nodeLeft	2400	23	0	25.0	-19.0	-8.9	E(80)	62.0	3	29.0	1.066	1.000	44.0<	66.1	
11	19	nodeRight	2400	23	0	25.0	-19.0	-8.9	E(80)	62.0	3	29.0	1.066	1.000	44.0<	66.1	
12	20	nodeLeft	2400	19	0	42.8	-15.6	33.7	E(80)	62.0	3	29.0	1.000	1.000	58.4<	62.0	
12	20	nodeRight	2400	19	0	42.8	-15.6	33.7	E(80)	62.0	3	29.0	1.000	1.000	58.4<	62.0	
12	21	nodeLeft	2400	19	0	35.7	-10.4	56.9	E(80)	62.0	3	29.0	1.000	1.000	46.0<	62.0	
12	21	nodeRight	2400	19	0	35.7	-10.4	56.9	E(80)	62.0	3	29.0	1.000	1.000	46.0<	62.0	
13	22	nodeLeft	2400	19	0	20.4	-5.2	45.7	E(80)	62.0	3	29.0	1.000	1.000	25.6<	62.0	
13	22	nodeRight	2400	19	0	20.4	-5.2	45.7	E(80)	62.0	3	29.0	1.000	1.000	25.6<	62.0	
13	23	nodeLeft	2400	19	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	

Steel I Girder G1

node HSTIFF-1 (WebH-Stiffener) WEB - 1

Sec	node		Web h	t		σtmax	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax	Δσce・CR・Ct	Stress Cycle D
			(mm)			(N/mm2)									(N/mm2)		
1	1	nodeRight	2400	12	480	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	nodeLeft	2400	12	480	2.8	-11.1	-25.0	G(50)	32.0	3	15.0	1.300	1.000	14.0<	41.6	
1	2	nodeRight	2400	12	480	2.8	-11.1	-25.0	G(50)	32.0	3	15.0	1.300	1.000	14.0<	41.6	
2	3	nodeLeft	2400	12	480	5.7	-19.5	-31.1	G(50)	32.0	3	15.0	1.300	1.000	25.2<	41.6	
2	3	nodeRight	2400	12	480	5.7	-19.5	-31.1	G(50)	32.0	3	15.0	1.300	1.000	25.2<	41.6	
2	4	nodeLeft	2400	12	480	8.5	-23.4	-18.5	G(50)	32.0	3	15.0	1.300	1.000	31.9<	41.6	
2	4	nodeRight	2400	12	480	8.5	-23.4	-18.5	G(50)	32.0	3	15.0	1.300	1.000	31.9<	41.6	
3	5	nodeLeft	2400	12	480	12.4	-16.4	5.9	G(50)	32.0	3	15.0	1.000	1.000	28.8<	32.0	
3	5	nodeRight	2400	12	480	12.4	-16.4	5.9	G(50)	32.0	3	15.0	1.000	1.000	28.8<	32.0	
4	6	nodeLeft	2400	12	480	4.1	-9.0	-29.9	G(50)	32.0	3	15.0	1.300	1.000	13.1<	41.6	
4	6	nodeRight	2400	12	480	4.1	-9.0	-29.9	G(50)	32.0	3	15.0	1.300	1.000	13.1<	41.6	
4	7	nodeLeft	2400	12	480	2.1	-10.7	-64.3	G(50)	32.0	3	15.0	1.300	1.000	12.8<	41.6	
4	7	nodeRight	2400	12	480	2.1	-10.7	-64.3	G(50)	32.0	3	15.0	1.300	1.000	12.8<	41.6	
5	8	nodeLeft	2400	12	480	4.6	-8.8	-39.9	G(50)	32.0	3	15.0	1.300	1.000	13.4<	41.6	
5	8	nodeRight	2400	12	480	4.6	-8.8	-39.9	G(50)	32.0	3	15.0	1.300	1.000	13.4<	41.6	
5	9	nodeLeft	2400	12	480	8.7	-12.5	-6.5	G(50)	32.0	3	15.0	1.223	1.000	21.2<	39.1	
5	9	nodeRight	2400	12	480	8.7	-12.5	-6.5	G(50)	32.0	3	15.0	1.223	1.000	21.2<	39.1	
6	10	nodeLeft	2400	12	480	5.6	-16.6	-32.9	G(50)	32.0	3	15.0	1.300	1.000	22.2<	41.6	
6	10	nodeRight	2400	12	480	5.6	-16.6	-32.9	G(50)	32.0	3	15.0	1.300	1.000	22.2<	41.6	
6	11	nodeLeft	2400	12	480	4.6	-22.7	-47.6	G(50)	32.0	3	15.0	1.300	1.000	27.3<	41.6	
6	11	nodeRight	2400	12	480	4.6	-22.7	-47.6	G(50)	32.0	3	15.0	1.300	1.000	27.3<	41.6	
7	12	nodeLeft	2400	12	480	3.2	-24.0	-53.9	G(50)	32.0	3	15.0	1.300	1.000	27.2<	41.6	
7	12	nodeRight	2400	12	480	3.2	-24.0	-53.9	G(50)	32.0	3	15.0	1.300	1.000	27.2<	41.6	
8	13	nodeLeft	2400	12	480	4.6	-22.7	-47.6	G(50)	32.0	3	15.0	1.300	1.000	27.3<	41.6	
8	13	nodeRight	2400	12	480	4.6	-22.7	-47.6	G(50)	32.0	3	15.0	1.300	1.000	27.3<	41.6	
8	14	nodeLeft	2400	12	480	5.6	-16.6	-32.9	G(50)	32.0	3	15.0	1.300	1.000	22.2<	41.6	
8	14	nodeRight	2400	12	480	5.6	-16.6	-32.9	G(50)	32.0	3	15.0	1.300	1.000	22.2<	41.6	
9	15	nodeLeft	2400	12	480	8.7	-12.5	-6.5	G(50)	32.0	3	15.0	1.223	1.000	21.2<	39.1	
9	15	nodeRight	2400	12	480	8.7	-12.5	-6.5	G(50)	32.0	3	15.0	1.223	1.000	21.2<	39.1	
9	16	nodeLeft	2400	12	480	4.6	-8.8	-39.9	G(50)	32.0	3	15.0	1.300	1.000	13.4<	41.6	
9	16	nodeRight	2400	12	480	4.6	-8.8	-39.9	G(50)	32.0	3	15.0	1.300	1.000	13.4<	41.6	
10	17	nodeLeft	2400	12	480	2.1	-10.7	-64.3	G(50)	32.0	3	15.0	1.300	1.000	12.8<	41.6	
10	17	nodeRight	2400	12	480	2.1	-10.7	-64.3	G(50)	32.0	3	15.0	1.300	1.000	12.8<	41.6	
10	18	nodeLeft	2400	12	480	4.1	-9.0	-29.9	G(50)	32.0	3	15.0	1.300	1.000	13.1<	41.6	
10	18	nodeRight	2400	12	480	4.1	-9.0	-29.9	G(50)	32.0	3	15.0	1.300	1.000	13.1<	41.6	
11	19	nodeLeft	2400	12	480	12.4	-16.4	5.9	G(50)	32.0	3	15.0	1.000	1.000	28.8<	32.0	
11	19	nodeRight	2400	12	480	12.4	-16.4	5.9	G(50)	32.0	3	15.0	1.000	1.000	28.8<	32.0	
12	20	nodeLeft	2400	12	480	8.5	-23.4	-18.5	G(50)	32.0	3	15.0	1.300	1.000	31.9<	41.6	
12	20	nodeRight	2400	12	480	8.5	-23.4	-18.5	G(50)	32.0	3	15.0	1.300	1.000	31.9<	41.6	
12	21	nodeLeft	2400	12	480	5.7	-19.5	-31.1	G(50)	32.0	3	15.0	1.300	1.000	25.2<	41.6	
12	21	nodeRight	2400	12	480	5.7	-19.5	-31.1	G(50)	32.0	3	15.0	1.300	1.000	25.2<	41.6	
13	22	nodeLeft	2400	12	480	2.8	-11.1	-25.0	G(50)	32.0	3	15.0	1.300	1.000	14.0<	41.6	
13	22	nodeRight	2400	12	480	2.8	-11.1	-25.0	G(50)	32.0	3	15.0	1.300	1.000	14.0<	41.6	
13	23	nodeLeft	2400	12	480	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

Steel I Girder G1

node　POINT-U-1　(WebUpper　　　)　WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)		Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	12	300	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0	<	41.6	
1	2	nodeLeft	2400	12	300	3.6	-14.1	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.7	<	41.6	
1	2	nodeRight	2400	12	300	3.6	-14.1	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.7	<	41.6	
2	3	nodeLeft	2400	12	300	7.2	-24.7	-39.4	G(50)	32.0	3	15.0	1.300	1.000	31.9	<	41.6	
2	3	nodeRight	2400	12	300	7.2	-24.7	-39.4	G(50)	32.0	3	15.0	1.300	1.000	31.9	<	41.6	
2	4	nodeLeft	2400	12	300	10.8	-29.6	-23.3	G(50)	32.0	3	15.0	1.300	1.000	40.4	<	41.6	
2	4	nodeRight	2400	12	300	10.8	-29.6	-23.3	G(50)	32.0	3	15.0	1.300	1.000	40.4	<	41.6	
3	5	nodeLeft	2400	12	300	15.4	-20.3	7.3	G(50)	32.0	3	15.0	1.000	1.000	35.7	>	32.0	0.41<1
3	5	nodeRight	2400	12	300	15.4	-20.3	7.3	G(50)	32.0	3	15.0	1.000	1.000	35.7	>	32.0	0.41<1
4	6	nodeLeft	2400	12	300	13.9	-6.4	46.2	G(50)	32.0	3	15.0	1.000	1.000	20.3	<	32.0	
4	6	nodeRight	2400	12	300	13.9	-6.4	46.2	G(50)	32.0	3	15.0	1.000	1.000	20.3	<	32.0	
4	7	nodeLeft	2400	12	300	16.6	-3.3	99.4	G(50)	32.0	3	15.0	1.000	1.000	19.9	<	32.0	
4	7	nodeRight	2400	12	300	16.6	-3.3	99.4	G(50)	32.0	3	15.0	1.000	1.000	19.9	<	32.0	
5	8	nodeLeft	2400	12	300	12.6	-6.5	57.1	G(50)	32.0	3	15.0	1.000	1.000	19.1	<	32.0	
5	8	nodeRight	2400	12	300	12.6	-6.5	57.1	G(50)	32.0	3	15.0	1.000	1.000	19.1	<	32.0	
5	9	nodeLeft	2400	12	300	10.7	-15.4	-8.0	G(50)	32.0	3	15.0	1.223	1.000	26.1	<	39.1	
5	9	nodeRight	2400	12	300	10.7	-15.4	-8.0	G(50)	32.0	3	15.0	1.223	1.000	26.1	<	39.1	
6	10	nodeLeft	2400	12	300	7.2	-21.4	-42.3	G(50)	32.0	3	15.0	1.300	1.000	28.6	<	41.6	
6	10	nodeRight	2400	12	300	7.2	-21.4	-42.3	G(50)	32.0	3	15.0	1.300	1.000	28.6	<	41.6	
6	11	nodeLeft	2400	12	300	5.9	-29.2	-61.2	G(50)	32.0	3	15.0	1.300	1.000	35.1	<	41.6	
6	11	nodeRight	2400	12	300	5.9	-29.2	-61.2	G(50)	32.0	3	15.0	1.300	1.000	35.1	<	41.6	
7	12	nodeLeft	2400	12	300	4.1	-30.5	-68.7	G(50)	32.0	3	15.0	1.300	1.000	34.6	<	41.6	
7	12	nodeRight	2400	12	300	4.1	-30.5	-68.7	G(50)	32.0	3	15.0	1.300	1.000	34.6	<	41.6	
8	13	nodeLeft	2400	12	300	5.9	-29.2	-61.2	G(50)	32.0	3	15.0	1.300	1.000	35.1	<	41.6	
8	13	nodeRight	2400	12	300	5.9	-29.2	-61.2	G(50)	32.0	3	15.0	1.300	1.000	35.1	<	41.6	
8	14	nodeLeft	2400	12	300	7.2	-21.4	-42.3	G(50)	32.0	3	15.0	1.300	1.000	28.6	<	41.6	
8	14	nodeRight	2400	12	300	7.2	-21.4	-42.3	G(50)	32.0	3	15.0	1.300	1.000	28.6	<	41.6	
9	15	nodeLeft	2400	12	300	10.7	-15.4	-8.0	G(50)	32.0	3	15.0	1.223	1.000	26.1	<	39.1	
9	15	nodeRight	2400	12	300	10.7	-15.4	-8.0	G(50)	32.0	3	15.0	1.223	1.000	26.1	<	39.1	
9	16	nodeLeft	2400	12	300	12.6	-6.5	57.1	G(50)	32.0	3	15.0	1.000	1.000	19.1	<	32.0	
9	16	nodeRight	2400	12	300	12.6	-6.5	57.1	G(50)	32.0	3	15.0	1.000	1.000	19.1	<	32.0	
10	17	nodeLeft	2400	12	300	16.6	-3.3	99.4	G(50)	32.0	3	15.0	1.000	1.000	19.9	<	32.0	
10	17	nodeRight	2400	12	300	16.6	-3.3	99.4	G(50)	32.0	3	15.0	1.000	1.000	19.9	<	32.0	
10	18	nodeLeft	2400	12	300	13.9	-6.4	46.2	G(50)	32.0	3	15.0	1.000	1.000	20.3	<	32.0	
10	18	nodeRight	2400	12	300	13.9	-6.4	46.2	G(50)	32.0	3	15.0	1.000	1.000	20.3	<	32.0	
11	19	nodeLeft	2400	12	300	15.4	-20.3	7.3	G(50)	32.0	3	15.0	1.000	1.000	35.7	>	32.0	0.41<1
11	19	nodeRight	2400	12	300	15.4	-20.3	7.3	G(50)	32.0	3	15.0	1.000	1.000	35.7	>	32.0	0.41<1
12	20	nodeLeft	2400	12	300	10.8	-29.6	-23.3	G(50)	32.0	3	15.0	1.300	1.000	40.4	<	41.6	
12	20	nodeRight	2400	12	300	10.8	-29.6	-23.3	G(50)	32.0	3	15.0	1.300	1.000	40.4	<	41.6	
12	21	nodeLeft	2400	12	300	7.2	-24.7	-39.4	G(50)	32.0	3	15.0	1.300	1.000	31.9	<	41.6	
12	21	nodeRight	2400	12	300	7.2	-24.7	-39.4	G(50)	32.0	3	15.0	1.300	1.000	31.9	<	41.6	
13	22	nodeLeft	2400	12	300	3.6	-14.1	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.7	<	41.6	
13	22	nodeRight	2400	12	300	3.6	-14.1	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.7	<	41.6	
13	23	nodeLeft	2400	12	300	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0	<	41.6	

Steel I Girder G1

node POINT-L-1 (WebLower) WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσce・Δσmax (N/mm2)	CR・Ct	Stress Cycle D
1	1	nodeRight	2400	12	400	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	nodeLeft	2400	12	400	13.8	-3.5	31.0	G(50)	32.0	3	15.0	1.000	1.000	17.3<	32.0	
1	2	nodeRight	2400	12	400	13.8	-3.5	31.0	G(50)	32.0	3	15.0	1.000	1.000	17.3<	32.0	
2	3	nodeLeft	2400	12	400	24.2	-7.0	38.6	G(50)	32.0	3	15.0	1.000	1.000	31.2<	32.0	
2	3	nodeRight	2400	12	400	24.2	-7.0	38.6	G(50)	32.0	3	15.0	1.000	1.000	31.2<	32.0	
2	4	nodeLeft	2400	12	400	29.0	-10.6	22.9	G(50)	32.0	3	15.0	1.000	1.000	39.5>	32.0	0.57<1
2	4	nodeRight	2400	12	400	29.0	-10.6	22.9	G(50)	32.0	3	15.0	1.000	1.000	39.5>	32.0	0.57<1
3	5	nodeLeft	2400	12	400	16.4	-12.4	-5.9	G(50)	32.0	3	15.0	1.066	1.000	28.8<	34.1	
3	5	nodeRight	2400	12	400	16.4	-12.4	-5.9	G(50)	32.0	3	15.0	1.066	1.000	28.8<	34.1	
4	6	nodeLeft	2400	12	400	4.7	-10.1	-33.6	G(50)	32.0	3	15.0	1.300	1.000	14.8<	41.6	
4	6	nodeRight	2400	12	400	4.7	-10.1	-33.6	G(50)	32.0	3	15.0	1.300	1.000	14.8<	41.6	
4	7	nodeLeft	2400	12	400	2.4	-12.1	-72.4	G(50)	32.0	3	15.0	1.300	1.000	14.5<	41.6	
4	7	nodeRight	2400	12	400	2.4	-12.1	-72.4	G(50)	32.0	3	15.0	1.300	1.000	14.5<	41.6	
5	8	nodeLeft	2400	12	400	5.1	-9.8	-44.7	G(50)	32.0	3	15.0	1.300	1.000	15.0<	41.6	
5	8	nodeRight	2400	12	400	5.1	-9.8	-44.7	G(50)	32.0	3	15.0	1.300	1.000	15.0<	41.6	
5	9	nodeLeft	2400	12	400	12.0	-8.3	6.2	G(50)	32.0	3	15.0	1.000	1.000	20.4<	32.0	
5	9	nodeRight	2400	12	400	12.0	-8.3	6.2	G(50)	32.0	3	15.0	1.000	1.000	20.4<	32.0	
6	10	nodeLeft	2400	12	400	23.6	-7.9	46.7	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
6	10	nodeRight	2400	12	400	23.6	-7.9	46.7	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
6	11	nodeLeft	2400	12	400	32.3	-6.5	67.6	G(50)	32.0	3	15.0	1.000	1.000	38.7>	32.0	0.53<1
6	11	nodeRight	2400	12	400	32.3	-6.5	67.6	G(50)	32.0	3	15.0	1.000	1.000	38.7>	32.0	0.53<1
7	12	nodeLeft	2400	12	400	31.6	-4.2	71.0	G(50)	32.0	3	15.0	1.000	1.000	35.8>	32.0	0.42<1
7	12	nodeRight	2400	12	400	31.6	-4.2	71.0	G(50)	32.0	3	15.0	1.000	1.000	35.8>	32.0	0.42<1
8	13	nodeLeft	2400	12	400	32.3	-6.5	67.6	G(50)	32.0	3	15.0	1.000	1.000	38.7>	32.0	0.53<1
8	13	nodeRight	2400	12	400	32.3	-6.5	67.6	G(50)	32.0	3	15.0	1.000	1.000	38.7>	32.0	0.53<1
8	14	nodeLeft	2400	12	400	23.6	-7.9	46.7	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
8	14	nodeRight	2400	12	400	23.6	-7.9	46.7	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
9	15	nodeLeft	2400	12	400	12.0	-8.3	6.2	G(50)	32.0	3	15.0	1.000	1.000	20.4<	32.0	
9	15	nodeRight	2400	12	400	12.0	-8.3	6.2	G(50)	32.0	3	15.0	1.000	1.000	20.4<	32.0	
9	16	nodeLeft	2400	12	400	5.1	-9.8	-44.7	G(50)	32.0	3	15.0	1.300	1.000	15.0<	41.6	
9	16	nodeRight	2400	12	400	5.1	-9.8	-44.7	G(50)	32.0	3	15.0	1.300	1.000	15.0<	41.6	
10	17	nodeLeft	2400	12	400	2.4	-12.1	-72.4	G(50)	32.0	3	15.0	1.300	1.000	14.5<	41.6	
10	17	nodeRight	2400	12	400	2.4	-12.1	-72.4	G(50)	32.0	3	15.0	1.300	1.000	14.5<	41.6	
10	18	nodeLeft	2400	12	400	4.7	-10.1	-33.6	G(50)	32.0	3	15.0	1.300	1.000	14.8<	41.6	
10	18	nodeRight	2400	12	400	4.7	-10.1	-33.6	G(50)	32.0	3	15.0	1.300	1.000	14.8<	41.6	
11	19	nodeLeft	2400	12	400	16.4	-12.4	-5.9	G(50)	32.0	3	15.0	1.066	1.000	28.8<	34.1	
11	19	nodeRight	2400	12	400	16.4	-12.4	-5.9	G(50)	32.0	3	15.0	1.066	1.000	28.8<	34.1	
12	20	nodeLeft	2400	12	400	29.0	-10.6	22.9	G(50)	32.0	3	15.0	1.000	1.000	39.5>	32.0	0.57<1
12	20	nodeRight	2400	12	400	29.0	-10.6	22.9	G(50)	32.0	3	15.0	1.000	1.000	39.5>	32.0	0.57<1
12	21	nodeLeft	2400	12	400	24.2	-7.0	38.6	G(50)	32.0	3	15.0	1.000	1.000	31.2<	32.0	
12	21	nodeRight	2400	12	400	24.2	-7.0	38.6	G(50)	32.0	3	15.0	1.000	1.000	31.2<	32.0	
13	22	nodeLeft	2400	12	400	13.8	-3.5	31.0	G(50)	32.0	3	15.0	1.000	1.000	17.3<	32.0	
13	22	nodeRight	2400	12	400	13.8	-3.5	31.0	G(50)	32.0	3	15.0	1.000	1.000	17.3<	32.0	
13	23	nodeLeft	2400	12	400	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

2. G2

Steel I Girder G2

node　U.FLG-MAX (UpperFlangeStress MAx)

Sec	node		Flange t (mm)	σtmax	σtmin (N/mm2)	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)		Δσce・CR・Ct (N/mm2)	Stress Cycle D
1	1	nodeRight	21	0.0	0.0	0.0	F	(65)	46.0	3	21.0	1.300	1.000	0.0	<	59.8	
1	2	nodeLeft	21	3.5	-35.4	-31.4	F	(65)	46.0	3	21.0	1.300	1.000	38.9	<	59.8	
1	2	nodeRight	21	3.5	-35.4	-31.4	F	(65)	46.0	3	21.0	1.300	1.000	38.9	<	59.8	
2	3	nodeLeft	21	7.0	-42.0	-43.8	F	(65)	46.0	3	21.0	1.300	1.000	49.0	<	59.8	
2	3	nodeRight	21	7.0	-42.0	-43.8	F	(65)	46.0	3	21.0	1.300	1.000	49.0	<	59.8	
2	4	nodeLeft	21	10.5	-30.4	-37.2	F	(65)	46.0	3	21.0	1.300	1.000	40.9	<	59.8	
2	4	nodeRight	21	10.5	-30.4	-37.2	F	(65)	46.0	3	21.0	1.300	1.000	40.9	<	59.8	
3	5	nodeLeft	19	14.9	-37.4	7.7	F	(65)	46.0	3	21.0	1.032	1.000	52.2	>	47.5	0.54 < 1
3	5	nodeRight	19	14.9	-37.4	7.7	F	(65)	46.0	3	21.0	1.032	1.000	52.2	>	47.5	0.54 < 1
4	6	nodeLeft	22	16.1	-20.0	65.3	F	(65)	46.0	3	21.0	1.000	1.000	36.1	<	46.0	
4	6	nodeRight	22	16.1	-20.0	65.3	F	(65)	46.0	3	21.0	1.000	1.000	36.1	<	46.0	
4	7	nodeLeft	22	22.5	-3.5	134.0	F	(65)	46.0	3	21.0	1.000	1.000	26.0	<	46.0	
4	7	nodeRight	22	22.5	-3.5	134.0	F	(65)	46.0	3	21.0	1.000	1.000	26.0	<	46.0	
5	8	nodeLeft	19	12.8	-18.9	65.2	F	(65)	46.0	3	21.0	1.000	1.000	31.7	<	46.0	
5	8	nodeRight	19	12.8	-18.9	65.2	F	(65)	46.0	3	21.0	1.000	1.000	31.7	<	46.0	
5	9	nodeLeft	19	11.2	-36.1	-5.9	F	(65)	46.0	3	21.0	1.217	1.000	47.3	<	56.0	
5	9	nodeRight	19	11.2	-36.1	-5.9	F	(65)	46.0	3	21.0	1.217	1.000	47.3	<	56.0	
6	10	nodeLeft	25	7.1	-33.9	-52.6	F	(65)	46.0	3	21.0	1.300	1.000	41.1	<	59.8	
6	10	nodeRight	25	7.1	-33.9	-52.6	F	(65)	46.0	3	21.0	1.300	1.000	41.1	<	59.8	
6	11	nodeLeft	25	5.6	-30.5	-86.5	F	(65)	46.0	3	21.0	1.300	1.000	36.1	<	59.8	
6	11	nodeRight	25	5.6	-30.5	-86.5	F	(65)	46.0	3	21.0	1.300	1.000	36.1	<	59.8	
7	12	nodeLeft	25	3.9	-33.1	-91.2	F	(65)	46.0	3	21.0	1.300	1.000	37.0	<	59.8	
7	12	nodeRight	25	3.9	-33.1	-91.2	F	(65)	46.0	3	21.0	1.300	1.000	37.0	<	59.8	
8	13	nodeLeft	25	5.6	-30.5	-86.5	F	(65)	46.0	3	21.0	1.300	1.000	36.1	<	59.8	
8	13	nodeRight	25	5.6	-30.5	-86.5	F	(65)	46.0	3	21.0	1.300	1.000	36.1	<	59.8	
8	14	nodeLeft	25	7.1	-33.9	-52.6	F	(65)	46.0	3	21.0	1.300	1.000	41.1	<	59.8	
8	14	nodeRight	25	7.1	-33.9	-52.6	F	(65)	46.0	3	21.0	1.300	1.000	41.1	<	59.8	
9	15	nodeLeft	19	11.2	-36.1	-5.9	F	(65)	46.0	3	21.0	1.217	1.000	47.3	<	56.0	
9	15	nodeRight	19	11.2	-36.1	-5.9	F	(65)	46.0	3	21.0	1.217	1.000	47.3	<	56.0	
9	16	nodeLeft	19	12.8	-18.9	65.2	F	(65)	46.0	3	21.0	1.000	1.000	31.7	<	46.0	
9	16	nodeRight	19	12.8	-18.9	65.2	F	(65)	46.0	3	21.0	1.000	1.000	31.7	<	46.0	
10	17	nodeLeft	22	22.5	-3.5	134.0	F	(65)	46.0	3	21.0	1.000	1.000	26.0	<	46.0	
10	17	nodeRight	22	22.5	-3.5	134.0	F	(65)	46.0	3	21.0	1.000	1.000	26.0	<	46.0	
10	18	nodeLeft	22	16.1	-20.0	65.3	F	(65)	46.0	3	21.0	1.000	1.000	36.1	<	46.0	
10	18	nodeRight	22	16.1	-20.0	65.3	F	(65)	46.0	3	21.0	1.000	1.000	36.1	<	46.0	
11	19	nodeLeft	19	14.9	-37.4	7.7	F	(65)	46.0	3	21.0	1.032	1.000	52.2	>	47.5	0.54 < 1
11	19	nodeRight	19	14.9	-37.4	7.7	F	(65)	46.0	3	21.0	1.032	1.000	52.2	>	47.5	0.54 < 1
12	20	nodeLeft	21	10.5	-30.4	-37.2	F	(65)	46.0	3	21.0	1.300	1.000	40.9	<	59.8	
12	20	nodeRight	21	10.5	-30.4	-37.2	F	(65)	46.0	3	21.0	1.300	1.000	40.9	<	59.8	
12	21	nodeLeft	21	7.0	-42.0	-43.8	F	(65)	46.0	3	21.0	1.300	1.000	49.0	<	59.8	
12	21	nodeRight	21	7.0	-42.0	-43.8	F	(65)	46.0	3	21.0	1.300	1.000	49.0	<	59.8	
13	22	nodeLeft	21	3.5	-35.4	-31.4	F	(65)	46.0	3	21.0	1.300	1.000	38.9	<	59.8	
13	22	nodeRight	21	3.5	-35.4	-31.4	F	(65)	46.0	3	21.0	1.300	1.000	38.9	<	59.8	
13	23	nodeLeft	21	0.0	0.0	0.0	F	(65)	46.0	3	21.0	1.300	1.000	0.0	<	59.8	

Steel I Girder G2

node L.FLG-MAX (LowerFlangeStress MAx)

Sec	node		Flange t (mm)	σtmax	σtmin (N/mm2)	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct (N/mm2)	Stress Cycle D
1	1	nodeRight	19	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
1	2	nodeLeft	19	37.0	-3.7	32.8	D	(100)	84.0	3	39.0	1.000	1.000	40.7	< 84.0	
1	2	nodeRight	19	37.0	-3.7	32.8	D	(100)	84.0	3	39.0	1.000	1.000	40.7	< 84.0	
2	3	nodeLeft	19	43.9	-7.3	45.8	D	(100)	84.0	3	39.0	1.000	1.000	51.2	< 84.0	
2	3	nodeRight	19	43.9	-7.3	45.8	D	(100)	84.0	3	39.0	1.000	1.000	51.2	< 84.0	
2	4	nodeLeft	19	31.8	-11.0	38.9	D	(100)	84.0	3	39.0	1.000	1.000	42.8	< 84.0	
2	4	nodeRight	19	31.8	-11.0	38.9	D	(100)	84.0	3	39.0	1.000	1.000	42.8	< 84.0	
3	5	nodeLeft	21	35.8	-14.2	-7.4	D	(100)	84.0	3	39.0	1.000	1.000	50.0	< 84.0	
3	5	nodeRight	21	35.8	-14.2	-7.4	D	(100)	84.0	3	39.0	1.000	1.000	50.0	< 84.0	
4	6	nodeLeft	29	17.5	-14.1	-57.0	D	(100)	84.0	3	39.0	1.300	0.964	31.5	<105.2	
4	6	nodeRight	29	17.5	-14.1	-57.0	D	(100)	84.0	3	39.0	1.300	0.964	31.5	<105.2	
4	7	nodeLeft	29	3.1	-19.6	-117.0	D	(100)	84.0	3	39.0	1.300	0.964	22.7	<105.2	
4	7	nodeRight	29	3.1	-19.6	-117.0	D	(100)	84.0	3	39.0	1.300	0.964	22.7	<105.2	
5	8	nodeLeft	21	18.1	-12.3	-62.4	D	(100)	84.0	3	39.0	1.300	1.000	30.4	<109.2	
5	8	nodeRight	21	18.1	-12.3	-62.4	D	(100)	84.0	3	39.0	1.300	1.000	30.4	<109.2	
5	9	nodeLeft	21	34.5	-10.8	5.6	D	(100)	84.0	3	39.0	1.000	1.000	45.3	< 84.0	
5	9	nodeRight	21	34.5	-10.8	5.6	D	(100)	84.0	3	39.0	1.000	1.000	45.3	< 84.0	
6	10	nodeLeft	19	38.5	-8.1	59.7	D	(100)	84.0	3	39.0	1.000	1.000	46.5	< 84.0	
6	10	nodeRight	19	38.5	-8.1	59.7	D	(100)	84.0	3	39.0	1.000	1.000	46.5	< 84.0	
6	11	nodeLeft	19	34.6	-6.3	98.0	D	(100)	84.0	3	39.0	1.000	1.000	40.9	< 84.0	
6	11	nodeRight	19	34.6	-6.3	98.0	D	(100)	84.0	3	39.0	1.000	1.000	40.9	< 84.0	
7	12	nodeLeft	19	37.5	-4.4	103.4	D	(100)	84.0	3	39.0	1.000	1.000	42.0	< 84.0	
7	12	nodeRight	19	37.5	-4.4	103.4	D	(100)	84.0	3	39.0	1.000	1.000	42.0	< 84.0	
8	13	nodeLeft	19	34.6	-6.3	98.0	D	(100)	84.0	3	39.0	1.000	1.000	40.9	< 84.0	
8	13	nodeRight	19	34.6	-6.3	98.0	D	(100)	84.0	3	39.0	1.000	1.000	40.9	< 84.0	
8	14	nodeLeft	19	38.5	-8.1	59.7	D	(100)	84.0	3	39.0	1.000	1.000	46.5	< 84.0	
8	14	nodeRight	19	38.5	-8.1	59.7	D	(100)	84.0	3	39.0	1.000	1.000	46.5	< 84.0	
9	15	nodeLeft	21	34.5	-10.8	5.6	D	(100)	84.0	3	39.0	1.000	1.000	45.3	< 84.0	
9	15	nodeRight	21	34.5	-10.8	5.6	D	(100)	84.0	3	39.0	1.000	1.000	45.3	< 84.0	
9	16	nodeLeft	21	18.1	-12.3	-62.4	D	(100)	84.0	3	39.0	1.300	1.000	30.4	<109.2	
9	16	nodeRight	21	18.1	-12.3	-62.4	D	(100)	84.0	3	39.0	1.300	1.000	30.4	<109.2	
10	17	nodeLeft	29	3.1	-19.6	-117.0	D	(100)	84.0	3	39.0	1.300	0.964	22.7	<105.2	
10	17	nodeRight	29	3.1	-19.6	-117.0	D	(100)	84.0	3	39.0	1.300	0.964	22.7	<105.2	
10	18	nodeLeft	29	17.5	-14.1	-57.0	D	(100)	84.0	3	39.0	1.300	0.964	31.5	<105.2	
10	18	nodeRight	29	17.5	-14.1	-57.0	D	(100)	84.0	3	39.0	1.300	0.964	31.5	<105.2	
11	19	nodeLeft	21	35.8	-14.2	-7.4	D	(100)	84.0	3	39.0	1.000	1.000	50.0	< 84.0	
11	19	nodeRight	21	35.8	-14.2	-7.4	D	(100)	84.0	3	39.0	1.000	1.000	50.0	< 84.0	
12	20	nodeLeft	19	31.8	-11.0	38.9	D	(100)	84.0	3	39.0	1.000	1.000	42.8	< 84.0	
12	20	nodeRight	19	31.8	-11.0	38.9	D	(100)	84.0	3	39.0	1.000	1.000	42.8	< 84.0	
12	21	nodeLeft	19	43.9	-7.3	45.8	D	(100)	84.0	3	39.0	1.000	1.000	51.2	< 84.0	
12	21	nodeRight	19	43.9	-7.3	45.8	D	(100)	84.0	3	39.0	1.000	1.000	51.2	< 84.0	
13	22	nodeLeft	19	37.0	-3.7	32.8	D	(100)	84.0	3	39.0	1.000	1.000	40.7	< 84.0	
13	22	nodeRight	19	37.0	-3.7	32.8	D	(100)	84.0	3	39.0	1.000	1.000	40.7	< 84.0	
13	23	nodeLeft	19	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	

Steel I Girder G2

node WEB-U-1 (WebUpper edge) WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	21	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
1	2	nodeLeft	2400	21	0	3.4	-34.8	-30.9	E(80)	62.0	3	29.0	1.300	1.000	38.2<	80.6	
1	2	nodeRight	2400	21	0	3.4	-34.8	-30.9	E(80)	62.0	3	29.0	1.300	1.000	38.2<	80.6	
2	3	nodeLeft	2400	21	0	6.9	-41.3	-43.1	E(80)	62.0	3	29.0	1.300	1.000	48.2<	80.6	
2	3	nodeRight	2400	21	0	6.9	-41.3	-43.1	E(80)	62.0	3	29.0	1.300	1.000	48.2<	80.6	
2	4	nodeLeft	2400	21	0	10.4	-29.9	-36.6	E(80)	62.0	3	29.0	1.300	1.000	40.2<	80.6	
2	4	nodeRight	2400	21	0	10.4	-29.9	-36.6	E(80)	62.0	3	29.0	1.300	1.000	40.2<	80.6	
3	5	nodeLeft	2400	19	0	14.6	-36.8	7.6	E(80)	62.0	3	29.0	1.032	1.000	51.4<	64.0	
3	5	nodeRight	2400	19	0	14.6	-36.8	7.6	E(80)	62.0	3	29.0	1.032	1.000	51.4<	64.0	
4	6	nodeLeft	2400	22	0	15.8	-19.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	35.5<	62.0	
4	6	nodeRight	2400	22	0	15.8	-19.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	35.5<	62.0	
4	7	nodeLeft	2400	22	0	22.1	-3.4	131.7	E(80)	62.0	3	29.0	1.000	1.000	25.5<	62.0	
4	7	nodeRight	2400	22	0	22.1	-3.4	131.7	E(80)	62.0	3	29.0	1.000	1.000	25.5<	62.0	
5	8	nodeLeft	2400	19	0	12.6	-18.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	31.2<	62.0	
5	8	nodeRight	2400	19	0	12.6	-18.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	31.2<	62.0	
5	9	nodeLeft	2400	19	0	11.1	-35.5	-5.8	E(80)	62.0	3	29.0	1.217	1.000	46.6<	75.5	
5	9	nodeRight	2400	19	0	11.1	-35.5	-5.8	E(80)	62.0	3	29.0	1.217	1.000	46.6<	75.5	
6	10	nodeLeft	2400	25	0	7.0	-33.2	-51.5	E(80)	62.0	3	29.0	1.300	1.000	40.2<	80.6	
6	10	nodeRight	2400	25	0	7.0	-33.2	-51.5	E(80)	62.0	3	29.0	1.300	1.000	40.2<	80.6	
6	11	nodeLeft	2400	25	0	5.4	-29.8	-84.5	E(80)	62.0	3	29.0	1.300	1.000	35.3<	80.6	
6	11	nodeRight	2400	25	0	5.4	-29.8	-84.5	E(80)	62.0	3	29.0	1.300	1.000	35.3<	80.6	
7	12	nodeLeft	2400	25	0	3.8	-32.4	-89.2	E(80)	62.0	3	29.0	1.300	1.000	36.2<	80.6	
7	12	nodeRight	2400	25	0	3.8	-32.4	-89.2	E(80)	62.0	3	29.0	1.300	1.000	36.2<	80.6	
8	13	nodeLeft	2400	25	0	5.4	-29.8	-84.5	E(80)	62.0	3	29.0	1.300	1.000	35.3<	80.6	
8	13	nodeRight	2400	25	0	5.4	-29.8	-84.5	E(80)	62.0	3	29.0	1.300	1.000	35.3<	80.6	
8	14	nodeLeft	2400	25	0	7.0	-33.2	-51.5	E(80)	62.0	3	29.0	1.300	1.000	40.2<	80.6	
8	14	nodeRight	2400	25	0	7.0	-33.2	-51.5	E(80)	62.0	3	29.0	1.300	1.000	40.2<	80.6	
9	15	nodeLeft	2400	19	0	11.1	-35.5	-5.8	E(80)	62.0	3	29.0	1.217	1.000	46.6<	75.5	
9	15	nodeRight	2400	19	0	11.1	-35.5	-5.8	E(80)	62.0	3	29.0	1.217	1.000	46.6<	75.5	
9	16	nodeLeft	2400	19	0	12.6	-18.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	31.2<	62.0	
9	16	nodeRight	2400	19	0	12.6	-18.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	31.2<	62.0	
10	17	nodeLeft	2400	22	0	22.1	-3.4	131.7	E(80)	62.0	3	29.0	1.000	1.000	25.5<	62.0	
10	17	nodeRight	2400	22	0	22.1	-3.4	131.7	E(80)	62.0	3	29.0	1.000	1.000	25.5<	62.0	
10	18	nodeLeft	2400	22	0	15.8	-19.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	35.5<	62.0	
10	18	nodeRight	2400	22	0	15.8	-19.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	35.5<	62.0	
11	19	nodeLeft	2400	19	0	14.6	-36.8	7.6	E(80)	62.0	3	29.0	1.032	1.000	51.4<	64.0	
11	19	nodeRight	2400	19	0	14.6	-36.8	7.6	E(80)	62.0	3	29.0	1.032	1.000	51.4<	64.0	
12	20	nodeLeft	2400	21	0	10.4	-29.9	-36.6	E(80)	62.0	3	29.0	1.300	1.000	40.2<	80.6	
12	20	nodeRight	2400	21	0	10.4	-29.9	-36.6	E(80)	62.0	3	29.0	1.300	1.000	40.2<	80.6	
12	21	nodeLeft	2400	21	0	6.9	-41.3	-43.1	E(80)	62.0	3	29.0	1.300	1.000	48.2<	80.6	
12	21	nodeRight	2400	21	0	6.9	-41.3	-43.1	E(80)	62.0	3	29.0	1.300	1.000	48.2<	80.6	
13	22	nodeLeft	2400	21	0	3.4	-34.8	-30.9	E(80)	62.0	3	29.0	1.300	1.000	38.2<	80.6	
13	22	nodeRight	2400	21	0	3.4	-34.8	-30.9	E(80)	62.0	3	29.0	1.300	1.000	38.2<	80.6	
13	23	nodeLeft	2400	21	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	

Steel I Girder G2

node WEB-L-1 (WebLower edge) WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)		Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	19	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0	<	80.6	
1	2	nodeLeft	2400	19	0	36.4	-3.6	32.3	E(80)	62.0	3	29.0	1.000	1.000	40.0	<	62.0	
1	2	nodeRight	2400	19	0	36.4	-3.6	32.3	E(80)	62.0	3	29.0	1.000	1.000	40.0	<	62.0	
2	3	nodeLeft	2400	19	0	43.2	-7.2	45.1	E(80)	62.0	3	29.0	1.000	1.000	50.4	<	62.0	
2	3	nodeRight	2400	19	0	43.2	-7.2	45.1	E(80)	62.0	3	29.0	1.000	1.000	50.4	<	62.0	
2	4	nodeLeft	2400	19	0	31.3	-10.8	38.3	E(80)	62.0	3	29.0	1.000	1.000	42.1	<	62.0	
2	4	nodeRight	2400	19	0	31.3	-10.8	38.3	E(80)	62.0	3	29.0	1.000	1.000	42.1	<	62.0	
3	5	nodeLeft	2400	21	0	35.1	-14.0	-7.2	E(80)	62.0	3	29.0	1.000	1.000	49.1	<	62.0	
3	5	nodeRight	2400	21	0	35.1	-14.0	-7.2	E(80)	62.0	3	29.0	1.000	1.000	49.1	<	62.0	
4	6	nodeLeft	2400	29	0	17.0	-13.7	-55.5	E(80)	62.0	3	29.0	1.300	0.964	30.7	<	77.7	
4	6	nodeRight	2400	29	0	17.0	-13.7	-55.5	E(80)	62.0	3	29.0	1.300	0.964	30.7	<	77.7	
4	7	nodeLeft	2400	29	0	3.0	-19.1	-114.0	E(80)	62.0	3	29.0	1.300	0.964	22.1	<	77.7	
4	7	nodeRight	2400	29	0	3.0	-19.1	-114.0	E(80)	62.0	3	29.0	1.300	0.964	22.1	<	77.7	
5	8	nodeLeft	2400	21	0	17.7	-12.1	-61.3	E(80)	62.0	3	29.0	1.300	1.000	29.8	<	80.6	
5	8	nodeRight	2400	21	0	17.7	-12.1	-61.3	E(80)	62.0	3	29.0	1.300	1.000	29.8	<	80.6	
5	9	nodeLeft	2400	21	0	33.9	-10.6	5.5	E(80)	62.0	3	29.0	1.000	1.000	44.5	<	62.0	
5	9	nodeRight	2400	21	0	33.9	-10.6	5.5	E(80)	62.0	3	29.0	1.000	1.000	44.5	<	62.0	
6	10	nodeLeft	2400	19	0	37.9	-7.9	58.8	E(80)	62.0	3	29.0	1.000	1.000	45.8	<	62.0	
6	10	nodeRight	2400	19	0	37.9	-7.9	58.8	E(80)	62.0	3	29.0	1.000	1.000	45.8	<	62.0	
6	11	nodeLeft	2400	19	0	34.1	-6.2	96.5	E(80)	62.0	3	29.0	1.000	1.000	40.3	<	62.0	
6	11	nodeRight	2400	19	0	34.1	-6.2	96.5	E(80)	62.0	3	29.0	1.000	1.000	40.3	<	62.0	
7	12	nodeLeft	2400	19	0	37.0	-4.4	101.9	E(80)	62.0	3	29.0	1.000	1.000	41.4	<	62.0	
7	12	nodeRight	2400	19	0	37.0	-4.4	101.9	E(80)	62.0	3	29.0	1.000	1.000	41.4	<	62.0	
8	13	nodeLeft	2400	19	0	34.1	-6.2	96.5	E(80)	62.0	3	29.0	1.000	1.000	40.3	<	62.0	
8	13	nodeRight	2400	19	0	34.1	-6.2	96.5	E(80)	62.0	3	29.0	1.000	1.000	40.3	<	62.0	
8	14	nodeLeft	2400	19	0	37.9	-7.9	58.8	E(80)	62.0	3	29.0	1.000	1.000	45.8	<	62.0	
8	14	nodeRight	2400	19	0	37.9	-7.9	58.8	E(80)	62.0	3	29.0	1.000	1.000	45.8	<	62.0	
9	15	nodeLeft	2400	21	0	33.9	-10.6	5.5	E(80)	62.0	3	29.0	1.000	1.000	44.5	<	62.0	
9	15	nodeRight	2400	21	0	33.9	-10.6	5.5	E(80)	62.0	3	29.0	1.000	1.000	44.5	<	62.0	
9	16	nodeLeft	2400	21	0	17.7	-12.1	-61.3	E(80)	62.0	3	29.0	1.300	1.000	29.8	<	80.6	
9	16	nodeRight	2400	21	0	17.7	-12.1	-61.3	E(80)	62.0	3	29.0	1.300	1.000	29.8	<	80.6	
10	17	nodeLeft	2400	29	0	3.0	-19.1	-114.0	E(80)	62.0	3	29.0	1.300	0.964	22.1	<	77.7	
10	17	nodeRight	2400	29	0	3.0	-19.1	-114.0	E(80)	62.0	3	29.0	1.300	0.964	22.1	<	77.7	
10	18	nodeLeft	2400	29	0	17.0	-13.7	-55.5	E(80)	62.0	3	29.0	1.300	0.964	30.7	<	77.7	
10	18	nodeRight	2400	29	0	17.0	-13.7	-55.5	E(80)	62.0	3	29.0	1.300	0.964	30.7	<	77.7	
11	19	nodeLeft	2400	21	0	35.1	-14.0	-7.2	E(80)	62.0	3	29.0	1.000	1.000	49.1	<	62.0	
11	19	nodeRight	2400	21	0	35.1	-14.0	-7.2	E(80)	62.0	3	29.0	1.000	1.000	49.1	<	62.0	
12	20	nodeLeft	2400	19	0	31.3	-10.8	38.3	E(80)	62.0	3	29.0	1.000	1.000	42.1	<	62.0	
12	20	nodeRight	2400	19	0	31.3	-10.8	38.3	E(80)	62.0	3	29.0	1.000	1.000	42.1	<	62.0	
12	21	nodeLeft	2400	19	0	43.2	-7.2	45.1	E(80)	62.0	3	29.0	1.000	1.000	50.4	<	62.0	
12	21	nodeRight	2400	19	0	43.2	-7.2	45.1	E(80)	62.0	3	29.0	1.000	1.000	50.4	<	62.0	
13	22	nodeLeft	2400	19	0	36.4	-3.6	32.3	E(80)	62.0	3	29.0	1.000	1.000	40.0	<	62.0	
13	22	nodeRight	2400	19	0	36.4	-3.6	32.3	E(80)	62.0	3	29.0	1.000	1.000	40.0	<	62.0	
13	23	nodeLeft	2400	19	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0	<	80.6	

Steel I Girder G2

node　HSTIFF-1　(WebH-Stiffener　)　WEB - 1

Sec	node		Web h	t		σtmax	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax	Δσce・CR・Ct	Stress Cycle D
			(mm)			(N/mm2)									(N/mm2)		
1	1	nodeRight	2400	12	480	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	nodeLeft	2400	12	480	2.0	-20.5	-18.2	G(50)	32.0	3	15.0	1.300	1.000	22.6<	41.6	
1	2	nodeRight	2400	12	480	2.0	-20.5	-18.2	G(50)	32.0	3	15.0	1.300	1.000	22.6<	41.6	
2	3	nodeLeft	2400	12	480	4.1	-24.4	-25.4	G(50)	32.0	3	15.0	1.300	1.000	28.4<	41.6	
2	3	nodeRight	2400	12	480	4.1	-24.4	-25.4	G(50)	32.0	3	15.0	1.300	1.000	28.4<	41.6	
2	4	nodeLeft	2400	12	480	6.1	-17.6	-21.6	G(50)	32.0	3	15.0	1.300	1.000	23.7<	41.6	
2	4	nodeRight	2400	12	480	6.1	-17.6	-21.6	G(50)	32.0	3	15.0	1.300	1.000	23.7<	41.6	
3	5	nodeLeft	2400	12	480	8.9	-22.4	4.6	G(50)	32.0	3	15.0	1.032	1.000	31.3<	33.0	
3	5	nodeRight	2400	12	480	8.9	-22.4	4.6	G(50)	32.0	3	15.0	1.032	1.000	31.3<	33.0	
4	6	nodeLeft	2400	12	480	9.7	-7.8	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.5<	41.6	
4	6	nodeRight	2400	12	480	9.7	-7.8	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.5<	41.6	
4	7	nodeLeft	2400	12	480	1.7	-10.9	-64.9	G(50)	32.0	3	15.0	1.300	1.000	12.6<	41.6	
4	7	nodeRight	2400	12	480	1.7	-10.9	-64.9	G(50)	32.0	3	15.0	1.300	1.000	12.6<	41.6	
5	8	nodeLeft	2400	12	480	10.5	-7.1	-36.2	G(50)	32.0	3	15.0	1.300	1.000	17.6<	41.6	
5	8	nodeRight	2400	12	480	10.5	-7.1	-36.2	G(50)	32.0	3	15.0	1.300	1.000	17.6<	41.6	
5	9	nodeLeft	2400	12	480	6.7	-21.6	-3.5	G(50)	32.0	3	15.0	1.217	1.000	28.4<	38.9	
5	9	nodeRight	2400	12	480	6.7	-21.6	-3.5	G(50)	32.0	3	15.0	1.217	1.000	28.4<	38.9	
6	10	nodeLeft	2400	12	480	4.0	-19.0	-29.4	G(50)	32.0	3	15.0	1.300	1.000	23.0<	41.6	
6	10	nodeRight	2400	12	480	4.0	-19.0	-29.4	G(50)	32.0	3	15.0	1.300	1.000	23.0<	41.6	
6	11	nodeLeft	2400	12	480	3.1	-17.1	-48.3	G(50)	32.0	3	15.0	1.300	1.000	20.2<	41.6	
6	11	nodeRight	2400	12	480	3.1	-17.1	-48.3	G(50)	32.0	3	15.0	1.300	1.000	20.2<	41.6	
7	12	nodeLeft	2400	12	480	2.2	-18.5	-51.0	G(50)	32.0	3	15.0	1.300	1.000	20.7<	41.6	
7	12	nodeRight	2400	12	480	2.2	-18.5	-51.0	G(50)	32.0	3	15.0	1.300	1.000	20.7<	41.6	
8	13	nodeLeft	2400	12	480	3.1	-17.1	-48.3	G(50)	32.0	3	15.0	1.300	1.000	20.2<	41.6	
8	13	nodeRight	2400	12	480	3.1	-17.1	-48.3	G(50)	32.0	3	15.0	1.300	1.000	20.2<	41.6	
8	14	nodeLeft	2400	12	480	4.0	-19.0	-29.4	G(50)	32.0	3	15.0	1.300	1.000	23.0<	41.6	
8	14	nodeRight	2400	12	480	4.0	-19.0	-29.4	G(50)	32.0	3	15.0	1.300	1.000	23.0<	41.6	
9	15	nodeLeft	2400	12	480	6.7	-21.6	-3.5	G(50)	32.0	3	15.0	1.217	1.000	28.4<	38.9	
9	15	nodeRight	2400	12	480	6.7	-21.6	-3.5	G(50)	32.0	3	15.0	1.217	1.000	28.4<	38.9	
9	16	nodeLeft	2400	12	480	10.5	-7.1	-36.2	G(50)	32.0	3	15.0	1.300	1.000	17.6<	41.6	
9	16	nodeRight	2400	12	480	10.5	-7.1	-36.2	G(50)	32.0	3	15.0	1.300	1.000	17.6<	41.6	
10	17	nodeLeft	2400	12	480	1.7	-10.9	-64.9	G(50)	32.0	3	15.0	1.300	1.000	12.6<	41.6	
10	17	nodeRight	2400	12	480	1.7	-10.9	-64.9	G(50)	32.0	3	15.0	1.300	1.000	12.6<	41.6	
10	18	nodeLeft	2400	12	480	9.7	-7.8	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.5<	41.6	
10	18	nodeRight	2400	12	480	9.7	-7.8	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.5<	41.6	
11	19	nodeLeft	2400	12	480	8.9	-22.4	4.6	G(50)	32.0	3	15.0	1.032	1.000	31.3<	33.0	
11	19	nodeRight	2400	12	480	8.9	-22.4	4.6	G(50)	32.0	3	15.0	1.032	1.000	31.3<	33.0	
12	20	nodeLeft	2400	12	480	6.1	-17.6	-21.6	G(50)	32.0	3	15.0	1.300	1.000	23.7<	41.6	
12	20	nodeRight	2400	12	480	6.1	-17.6	-21.6	G(50)	32.0	3	15.0	1.300	1.000	23.7<	41.6	
12	21	nodeLeft	2400	12	480	4.1	-24.4	-25.4	G(50)	32.0	3	15.0	1.300	1.000	28.4<	41.6	
12	21	nodeRight	2400	12	480	4.1	-24.4	-25.4	G(50)	32.0	3	15.0	1.300	1.000	28.4<	41.6	
13	22	nodeLeft	2400	12	480	2.0	-20.5	-18.2	G(50)	32.0	3	15.0	1.300	1.000	22.6<	41.6	
13	22	nodeRight	2400	12	480	2.0	-20.5	-18.2	G(50)	32.0	3	15.0	1.300	1.000	22.6<	41.6	
13	23	nodeLeft	2400	12	480	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

Steel I Girder G2

node　POINT-U-1　(WebUpper　　　)　WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	12	300	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	nodeLeft	2400	12	300	2.6	-25.9	-23.0	G(50)	32.0	3	15.0	1.300	1.000	28.5<	41.6	
1	2	nodeRight	2400	12	300	2.6	-25.9	-23.0	G(50)	32.0	3	15.0	1.300	1.000	28.5<	41.6	
2	3	nodeLeft	2400	12	300	5.1	-30.7	-32.0	G(50)	32.0	3	15.0	1.300	1.000	35.8<	41.6	
2	3	nodeRight	2400	12	300	5.1	-30.7	-32.0	G(50)	32.0	3	15.0	1.300	1.000	35.8<	41.6	
2	4	nodeLeft	2400	12	300	7.7	-22.2	-27.2	G(50)	32.0	3	15.0	1.300	1.000	29.9<	41.6	
2	4	nodeRight	2400	12	300	7.7	-22.2	-27.2	G(50)	32.0	3	15.0	1.300	1.000	29.9<	41.6	
3	5	nodeLeft	2400	12	300	11.1	-27.8	5.7	G(50)	32.0	3	15.0	1.032	1.000	38.9>	33.0	0.49<1
3	5	nodeRight	2400	12	300	11.1	-27.8	5.7	G(50)	32.0	3	15.0	1.032	1.000	38.9>	33.0	0.49<1
4	6	nodeLeft	2400	12	300	12.1	-15.1	49.2	G(50)	32.0	3	15.0	1.000	1.000	27.2<	32.0	
4	6	nodeRight	2400	12	300	12.1	-15.1	49.2	G(50)	32.0	3	15.0	1.000	1.000	27.2<	32.0	
4	7	nodeLeft	2400	12	300	16.9	-2.6	101.0	G(50)	32.0	3	15.0	1.000	1.000	19.6<	32.0	
4	7	nodeRight	2400	12	300	16.9	-2.6	101.0	G(50)	32.0	3	15.0	1.000	1.000	19.6<	32.0	
5	8	nodeLeft	2400	12	300	9.6	-14.0	48.5	G(50)	32.0	3	15.0	1.000	1.000	23.6<	32.0	
5	8	nodeRight	2400	12	300	9.6	-14.0	48.5	G(50)	32.0	3	15.0	1.000	1.000	23.6<	32.0	
5	9	nodeLeft	2400	12	300	8.4	-26.8	-4.4	G(50)	32.0	3	15.0	1.217	1.000	35.2<	38.9	
5	9	nodeRight	2400	12	300	8.4	-26.8	-4.4	G(50)	32.0	3	15.0	1.217	1.000	35.2<	38.9	
6	10	nodeLeft	2400	12	300	5.1	-24.3	-37.7	G(50)	32.0	3	15.0	1.300	1.000	29.4<	41.6	
6	10	nodeRight	2400	12	300	5.1	-24.3	-37.7	G(50)	32.0	3	15.0	1.300	1.000	29.4<	41.6	
6	11	nodeLeft	2400	12	300	4.0	-21.8	-61.9	G(50)	32.0	3	15.0	1.300	1.000	25.8<	41.6	
6	11	nodeRight	2400	12	300	4.0	-21.8	-61.9	G(50)	32.0	3	15.0	1.300	1.000	25.8<	41.6	
7	12	nodeLeft	2400	12	300	2.8	-23.7	-65.3	G(50)	32.0	3	15.0	1.300	1.000	26.5<	41.6	
7	12	nodeRight	2400	12	300	2.8	-23.7	-65.3	G(50)	32.0	3	15.0	1.300	1.000	26.5<	41.6	
8	13	nodeLeft	2400	12	300	4.0	-21.8	-61.9	G(50)	32.0	3	15.0	1.300	1.000	25.8<	41.6	
8	13	nodeRight	2400	12	300	4.0	-21.8	-61.9	G(50)	32.0	3	15.0	1.300	1.000	25.8<	41.6	
8	14	nodeLeft	2400	12	300	5.1	-24.3	-37.7	G(50)	32.0	3	15.0	1.300	1.000	29.4<	41.6	
8	14	nodeRight	2400	12	300	5.1	-24.3	-37.7	G(50)	32.0	3	15.0	1.300	1.000	29.4<	41.6	
9	15	nodeLeft	2400	12	300	8.4	-26.8	-4.4	G(50)	32.0	3	15.0	1.217	1.000	35.2<	38.9	
9	15	nodeRight	2400	12	300	8.4	-26.8	-4.4	G(50)	32.0	3	15.0	1.217	1.000	35.2<	38.9	
9	16	nodeLeft	2400	12	300	9.6	-14.0	48.5	G(50)	32.0	3	15.0	1.000	1.000	23.6<	32.0	
9	16	nodeRight	2400	12	300	9.6	-14.0	48.5	G(50)	32.0	3	15.0	1.000	1.000	23.6<	32.0	
10	17	nodeLeft	2400	12	300	16.9	-2.6	101.0	G(50)	32.0	3	15.0	1.000	1.000	19.6<	32.0	
10	17	nodeRight	2400	12	300	16.9	-2.6	101.0	G(50)	32.0	3	15.0	1.000	1.000	19.6<	32.0	
10	18	nodeLeft	2400	12	300	12.1	-15.1	49.2	G(50)	32.0	3	15.0	1.000	1.000	27.2<	32.0	
10	18	nodeRight	2400	12	300	12.1	-15.1	49.2	G(50)	32.0	3	15.0	1.000	1.000	27.2<	32.0	
11	19	nodeLeft	2400	12	300	11.1	-27.8	5.7	G(50)	32.0	3	15.0	1.032	1.000	38.9>	33.0	0.49<1
11	19	nodeRight	2400	12	300	11.1	-27.8	5.7	G(50)	32.0	3	15.0	1.032	1.000	38.9>	33.0	0.49<1
12	20	nodeLeft	2400	12	300	7.7	-22.2	-27.2	G(50)	32.0	3	15.0	1.300	1.000	29.9<	41.6	
12	20	nodeRight	2400	12	300	7.7	-22.2	-27.2	G(50)	32.0	3	15.0	1.300	1.000	29.9<	41.6	
12	21	nodeLeft	2400	12	300	5.1	-30.7	-32.0	G(50)	32.0	3	15.0	1.300	1.000	35.8<	41.6	
12	21	nodeRight	2400	12	300	5.1	-30.7	-32.0	G(50)	32.0	3	15.0	1.300	1.000	35.8<	41.6	
13	22	nodeLeft	2400	12	300	2.6	-25.9	-23.0	G(50)	32.0	3	15.0	1.300	1.000	28.5<	41.6	
13	22	nodeRight	2400	12	300	2.6	-25.9	-23.0	G(50)	32.0	3	15.0	1.300	1.000	28.5<	41.6	
13	23	nodeLeft	2400	12	300	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

Steel I Girder G2

node POINT-L-1 (WebLower) WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	12	400	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	nodeLeft	2400	12	400	24.6	-2.4	21.8	G(50)	32.0	3	15.0	1.000	1.000	27.0<	32.0	
1	2	nodeRight	2400	12	400	24.6	-2.4	21.8	G(50)	32.0	3	15.0	1.000	1.000	27.0<	32.0	
2	3	nodeLeft	2400	12	400	29.1	-4.9	30.4	G(50)	32.0	3	15.0	1.000	1.000	34.0>	32.0	0.36<1
2	3	nodeRight	2400	12	400	29.1	-4.9	30.4	G(50)	32.0	3	15.0	1.000	1.000	34.0>	32.0	0.36<1
2	4	nodeLeft	2400	12	400	21.1	-7.3	25.8	G(50)	32.0	3	15.0	1.000	1.000	28.4<	32.0	
2	4	nodeRight	2400	12	400	21.1	-7.3	25.8	G(50)	32.0	3	15.0	1.000	1.000	28.4<	32.0	
3	5	nodeLeft	2400	12	400	23.1	-9.2	-4.8	G(50)	32.0	3	15.0	1.000	1.000	32.3>	32.0	0.31<1
3	5	nodeRight	2400	12	400	23.1	-9.2	-4.8	G(50)	32.0	3	15.0	1.000	1.000	32.3>	32.0	0.31<1
4	6	nodeLeft	2400	12	400	10.9	-8.8	-35.6	G(50)	32.0	3	15.0	1.300	1.000	19.7<	41.6	
4	6	nodeRight	2400	12	400	10.9	-8.8	-35.6	G(50)	32.0	3	15.0	1.300	1.000	19.7<	41.6	
4	7	nodeLeft	2400	12	400	1.9	-12.2	-73.1	G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6	
4	7	nodeRight	2400	12	400	1.9	-12.2	-73.1	G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6	
5	8	nodeLeft	2400	12	400	11.7	-8.0	-40.4	G(50)	32.0	3	15.0	1.300	1.000	19.6<	41.6	
5	8	nodeRight	2400	12	400	11.7	-8.0	-40.4	G(50)	32.0	3	15.0	1.300	1.000	19.6<	41.6	
5	9	nodeLeft	2400	12	400	22.4	-7.0	3.6	G(50)	32.0	3	15.0	1.000	1.000	29.3<	32.0	
5	9	nodeRight	2400	12	400	22.4	-7.0	3.6	G(50)	32.0	3	15.0	1.000	1.000	29.3<	32.0	
6	10	nodeLeft	2400	12	400	26.1	-5.5	40.4	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
6	10	nodeRight	2400	12	400	26.1	-5.5	40.4	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
6	11	nodeLeft	2400	12	400	23.4	-4.3	66.4	G(50)	32.0	3	15.0	1.000	1.000	27.7<	32.0	
6	11	nodeRight	2400	12	400	23.4	-4.3	66.4	G(50)	32.0	3	15.0	1.000	1.000	27.7<	32.0	
7	12	nodeLeft	2400	12	400	25.4	-3.0	70.0	G(50)	32.0	3	15.0	1.000	1.000	28.4<	32.0	
7	12	nodeRight	2400	12	400	25.4	-3.0	70.0	G(50)	32.0	3	15.0	1.000	1.000	28.4<	32.0	
8	13	nodeLeft	2400	12	400	23.4	-4.3	66.4	G(50)	32.0	3	15.0	1.000	1.000	27.7<	32.0	
8	13	nodeRight	2400	12	400	23.4	-4.3	66.4	G(50)	32.0	3	15.0	1.000	1.000	27.7<	32.0	
8	14	nodeLeft	2400	12	400	26.1	-5.5	40.4	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
8	14	nodeRight	2400	12	400	26.1	-5.5	40.4	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
9	15	nodeLeft	2400	12	400	22.4	-7.0	3.6	G(50)	32.0	3	15.0	1.000	1.000	29.3<	32.0	
9	15	nodeRight	2400	12	400	22.4	-7.0	3.6	G(50)	32.0	3	15.0	1.000	1.000	29.3<	32.0	
9	16	nodeLeft	2400	12	400	11.7	-8.0	-40.4	G(50)	32.0	3	15.0	1.300	1.000	19.6<	41.6	
9	16	nodeRight	2400	12	400	11.7	-8.0	-40.4	G(50)	32.0	3	15.0	1.300	1.000	19.6<	41.6	
10	17	nodeLeft	2400	12	400	1.9	-12.2	-73.1	G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6	
10	17	nodeRight	2400	12	400	1.9	-12.2	-73.1	G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6	
10	18	nodeLeft	2400	12	400	10.9	-8.8	-35.6	G(50)	32.0	3	15.0	1.300	1.000	19.7<	41.6	
10	18	nodeRight	2400	12	400	10.9	-8.8	-35.6	G(50)	32.0	3	15.0	1.300	1.000	19.7<	41.6	
11	19	nodeLeft	2400	12	400	23.1	-9.2	-4.8	G(50)	32.0	3	15.0	1.000	1.000	32.3>	32.0	0.31<1
11	19	nodeRight	2400	12	400	23.1	-9.2	-4.8	G(50)	32.0	3	15.0	1.000	1.000	32.3>	32.0	0.31<1
12	20	nodeLeft	2400	12	400	21.1	-7.3	25.8	G(50)	32.0	3	15.0	1.000	1.000	28.4<	32.0	
12	20	nodeRight	2400	12	400	21.1	-7.3	25.8	G(50)	32.0	3	15.0	1.000	1.000	28.4<	32.0	
12	21	nodeLeft	2400	12	400	29.1	-4.9	30.4	G(50)	32.0	3	15.0	1.000	1.000	34.0>	32.0	0.36<1
12	21	nodeRight	2400	12	400	29.1	-4.9	30.4	G(50)	32.0	3	15.0	1.000	1.000	34.0>	32.0	0.36<1
13	22	nodeLeft	2400	12	400	24.6	-2.4	21.8	G(50)	32.0	3	15.0	1.000	1.000	27.0<	32.0	
13	22	nodeRight	2400	12	400	24.6	-2.4	21.8	G(50)	32.0	3	15.0	1.000	1.000	27.0<	32.0	
13	23	nodeLeft	2400	12	400	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

3. G3

node　U.FLG-MAX (UpperFlangeStress MAx)

Sec	node		Flange t (mm)	σtmax	σtmin (N/mm2)	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)		Stress Δσce・CR・Ct (N/mm2)	Cycle D
1	1	nodeRight	21	0.0	0.0	0.0	F (65)	46.0	3	21.0	1.300	1.000	0.0	<	59.8	
1	2	nodeLeft	21	2.2	-6.6	-37.0	F (65)	46.0	3	21.0	1.300	1.000	8.8	<	59.8	
1	2	nodeRight	21	2.2	-6.6	-37.0	F (65)	46.0	3	21.0	1.300	1.000	8.8	<	59.8	
2	3	nodeLeft	21	4.5	-13.2	-46.7	F (65)	46.0	3	21.0	1.300	1.000	17.6	<	59.8	
2	3	nodeRight	21	4.5	-13.2	-46.7	F (65)	46.0	3	21.0	1.300	1.000	17.6	<	59.8	
2	4	nodeLeft	21	6.7	-18.8	-29.1	F (65)	46.0	3	21.0	1.300	1.000	25.6	<	59.8	
2	4	nodeRight	21	6.7	-18.8	-29.1	F (65)	46.0	3	21.0	1.300	1.000	25.6	<	59.8	
3	5	nodeLeft	19	8.8	-10.2	5.5	F (65)	46.0	3	21.0	1.000	1.000	19.0	<	46.0	
3	5	nodeRight	19	8.8	-10.2	5.5	F (65)	46.0	3	21.0	1.000	1.000	19.0	<	46.0	
4	6	nodeLeft	21	9.9	-2.9	63.7	F (65)	46.0	3	21.0	1.000	1.000	12.8	<	46.0	
4	6	nodeRight	21	9.9	-2.9	63.7	F (65)	46.0	3	21.0	1.000	1.000	12.8	<	46.0	
4	7	nodeLeft	21	11.5	-2.2	140.2	F (65)	46.0	3	21.0	1.000	1.000	13.7	<	46.0	
4	7	nodeRight	21	11.5	-2.2	140.2	F (65)	46.0	3	21.0	1.000	1.000	13.7	<	46.0	
5	8	nodeLeft	19	7.1	-2.0	58.9	F (65)	46.0	3	21.0	1.000	1.000	9.2	<	46.0	
5	8	nodeRight	19	7.1	-2.0	58.9	F (65)	46.0	3	21.0	1.000	1.000	9.2	<	46.0	
5	9	nodeLeft	19	6.0	-6.7	-12.8	F (65)	46.0	3	21.0	1.300	1.000	12.7	<	59.8	
5	9	nodeRight	19	6.0	-6.7	-12.8	F (65)	46.0	3	21.0	1.300	1.000	12.7	<	59.8	
6	10	nodeLeft	24	4.4	-12.5	-54.5	F (65)	46.0	3	21.0	1.300	1.000	16.9	<	59.8	
6	10	nodeRight	24	4.4	-12.5	-54.5	F (65)	46.0	3	21.0	1.300	1.000	16.9	<	59.8	
6	11	nodeLeft	24	4.0	-18.4	-77.4	F (65)	46.0	3	21.0	1.300	1.000	22.4	<	59.8	
6	11	nodeRight	24	4.0	-18.4	-77.4	F (65)	46.0	3	21.0	1.300	1.000	22.4	<	59.8	
7	12	nodeLeft	24	2.5	-19.3	-94.1	F (65)	46.0	3	21.0	1.300	1.000	21.8	<	59.8	
7	12	nodeRight	24	2.5	-19.3	-94.1	F (65)	46.0	3	21.0	1.300	1.000	21.8	<	59.8	
8	13	nodeLeft	24	4.0	-18.4	-77.4	F (65)	46.0	3	21.0	1.300	1.000	22.4	<	59.8	
8	13	nodeRight	24	4.0	-18.4	-77.4	F (65)	46.0	3	21.0	1.300	1.000	22.4	<	59.8	
8	14	nodeLeft	24	4.4	-12.5	-54.5	F (65)	46.0	3	21.0	1.300	1.000	16.9	<	59.8	
8	14	nodeRight	24	4.4	-12.5	-54.5	F (65)	46.0	3	21.0	1.300	1.000	16.9	<	59.8	
9	15	nodeLeft	19	6.0	-6.7	-12.8	F (65)	46.0	3	21.0	1.300	1.000	12.7	<	59.8	
9	15	nodeRight	19	6.0	-6.7	-12.8	F (65)	46.0	3	21.0	1.300	1.000	12.7	<	59.8	
9	16	nodeLeft	19	7.1	-2.0	58.9	F (65)	46.0	3	21.0	1.000	1.000	9.2	<	46.0	
9	16	nodeRight	19	7.1	-2.0	58.9	F (65)	46.0	3	21.0	1.000	1.000	9.2	<	46.0	
10	17	nodeLeft	21	11.5	-2.2	140.2	F (65)	46.0	3	21.0	1.000	1.000	13.7	<	46.0	
10	17	nodeRight	21	11.5	-2.2	140.2	F (65)	46.0	3	21.0	1.000	1.000	13.7	<	46.0	
10	18	nodeLeft	21	9.9	-2.9	63.7	F (65)	46.0	3	21.0	1.000	1.000	12.8	<	46.0	
10	18	nodeRight	21	9.9	-2.9	63.7	F (65)	46.0	3	21.0	1.000	1.000	12.8	<	46.0	
11	19	nodeLeft	19	8.8	-10.2	5.5	F (65)	46.0	3	21.0	1.000	1.000	19.0	<	46.0	
11	19	nodeRight	19	8.8	-10.2	5.5	F (65)	46.0	3	21.0	1.000	1.000	19.0	<	46.0	
12	20	nodeLeft	21	6.7	-18.8	-29.1	F (65)	46.0	3	21.0	1.300	1.000	25.6	<	59.8	
12	20	nodeRight	21	6.7	-18.8	-29.1	F (65)	46.0	3	21.0	1.300	1.000	25.6	<	59.8	
12	21	nodeLeft	21	4.5	-13.2	-46.7	F (65)	46.0	3	21.0	1.300	1.000	17.6	<	59.8	
12	21	nodeRight	21	4.5	-13.2	-46.7	F (65)	46.0	3	21.0	1.300	1.000	17.6	<	59.8	
13	22	nodeLeft	21	2.2	-6.6	-37.0	F (65)	46.0	3	21.0	1.300	1.000	8.8	<	59.8	
13	22	nodeRight	21	2.2	-6.6	-37.0	F (65)	46.0	3	21.0	1.300	1.000	8.8	<	59.8	
13	23	nodeLeft	21	0.0	0.0	0.0	F (65)	46.0	3	21.0	1.300	1.000	0.0	<	59.8	

Steel I Girder G3

node L.FLG-MAX (LowerFlangeStress MAx)

Sec	node		Flange t (mm)	σtmax	σtmin (N/mm2)	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)		Δσce・CR・Ct (N/mm2)	Stress Cycle D
1	1	nodeRight	19	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
1	2	nodeLeft	19	6.9	-2.3	38.6	D	(100)	84.0	3	39.0	1.000	1.000	9.2	<	84.0	
1	2	nodeRight	19	6.9	-2.3	38.6	D	(100)	84.0	3	39.0	1.000	1.000	9.2	<	84.0	
2	3	nodeLeft	19	13.7	-4.7	48.8	D	(100)	84.0	3	39.0	1.000	1.000	18.4	<	84.0	
2	3	nodeRight	19	13.7	-4.7	48.8	D	(100)	84.0	3	39.0	1.000	1.000	18.4	<	84.0	
2	4	nodeLeft	19	19.7	-7.0	30.3	D	(100)	84.0	3	39.0	1.000	1.000	26.7	<	84.0	
2	4	nodeRight	19	19.7	-7.0	30.3	D	(100)	84.0	3	39.0	1.000	1.000	26.7	<	84.0	
3	5	nodeLeft	21	9.8	-8.5	-5.2	D	(100)	84.0	3	39.0	1.132	1.000	18.2	<	95.1	
3	5	nodeRight	21	9.8	-8.5	-5.2	D	(100)	84.0	3	39.0	1.132	1.000	18.2	<	95.1	
4	6	nodeLeft	27	2.6	-8.8	-56.5	D	(100)	84.0	3	39.0	1.300	0.981	11.3	<	107.1	
4	6	nodeRight	27	2.6	-8.8	-56.5	D	(100)	84.0	3	39.0	1.300	0.981	11.3	<	107.1	
4	7	nodeLeft	27	2.0	-10.2	-124.3	D	(100)	84.0	3	39.0	1.300	0.981	12.2	<	107.1	
4	7	nodeRight	27	2.0	-10.2	-124.3	D	(100)	84.0	3	39.0	1.300	0.981	12.2	<	107.1	
5	8	nodeLeft	21	1.9	-6.8	-56.4	D	(100)	84.0	3	39.0	1.300	1.000	8.8	<	109.2	
5	8	nodeRight	21	1.9	-6.8	-56.4	D	(100)	84.0	3	39.0	1.300	1.000	8.8	<	109.2	
5	9	nodeLeft	21	6.4	-5.8	12.2	D	(100)	84.0	3	39.0	1.000	1.000	12.2	<	84.0	
5	9	nodeRight	21	6.4	-5.8	12.2	D	(100)	84.0	3	39.0	1.000	1.000	12.2	<	84.0	
6	10	nodeLeft	19	13.9	-4.8	60.5	D	(100)	84.0	3	39.0	1.000	1.000	18.8	<	84.0	
6	10	nodeRight	19	13.9	-4.8	60.5	D	(100)	84.0	3	39.0	1.000	1.000	18.8	<	84.0	
6	11	nodeLeft	19	20.5	-4.4	86.0	D	(100)	84.0	3	39.0	1.000	1.000	24.9	<	84.0	
6	11	nodeRight	19	20.5	-4.4	86.0	D	(100)	84.0	3	39.0	1.000	1.000	24.9	<	84.0	
7	12	nodeLeft	19	21.4	-2.8	104.5	D	(100)	84.0	3	39.0	1.000	1.000	24.2	<	84.0	
7	12	nodeRight	19	21.4	-2.8	104.5	D	(100)	84.0	3	39.0	1.000	1.000	24.2	<	84.0	
8	13	nodeLeft	19	20.5	-4.4	86.0	D	(100)	84.0	3	39.0	1.000	1.000	24.9	<	84.0	
8	13	nodeRight	19	20.5	-4.4	86.0	D	(100)	84.0	3	39.0	1.000	1.000	24.9	<	84.0	
8	14	nodeLeft	19	13.9	-4.8	60.5	D	(100)	84.0	3	39.0	1.000	1.000	18.8	<	84.0	
8	14	nodeRight	19	13.9	-4.8	60.5	D	(100)	84.0	3	39.0	1.000	1.000	18.8	<	84.0	
9	15	nodeLeft	21	6.4	-5.8	12.2	D	(100)	84.0	3	39.0	1.000	1.000	12.2	<	84.0	
9	15	nodeRight	21	6.4	-5.8	12.2	D	(100)	84.0	3	39.0	1.000	1.000	12.2	<	84.0	
9	16	nodeLeft	21	1.9	-6.8	-56.4	D	(100)	84.0	3	39.0	1.300	1.000	8.8	<	109.2	
9	16	nodeRight	21	1.9	-6.8	-56.4	D	(100)	84.0	3	39.0	1.300	1.000	8.8	<	109.2	
10	17	nodeLeft	27	2.0	-10.2	-124.3	D	(100)	84.0	3	39.0	1.300	0.981	12.2	<	107.1	
10	17	nodeRight	27	2.0	-10.2	-124.3	D	(100)	84.0	3	39.0	1.300	0.981	12.2	<	107.1	
10	18	nodeLeft	27	2.6	-8.8	-56.5	D	(100)	84.0	3	39.0	1.300	0.981	11.3	<	107.1	
10	18	nodeRight	27	2.6	-8.8	-56.5	D	(100)	84.0	3	39.0	1.300	0.981	11.3	<	107.1	
11	19	nodeLeft	21	9.8	-8.5	-5.2	D	(100)	84.0	3	39.0	1.132	1.000	18.2	<	95.1	
11	19	nodeRight	21	9.8	-8.5	-5.2	D	(100)	84.0	3	39.0	1.132	1.000	18.2	<	95.1	
12	20	nodeLeft	19	19.7	-7.0	30.3	D	(100)	84.0	3	39.0	1.000	1.000	26.7	<	84.0	
12	20	nodeRight	19	19.7	-7.0	30.3	D	(100)	84.0	3	39.0	1.000	1.000	26.7	<	84.0	
12	21	nodeLeft	19	13.7	-4.7	48.8	D	(100)	84.0	3	39.0	1.000	1.000	18.4	<	84.0	
12	21	nodeRight	19	13.7	-4.7	48.8	D	(100)	84.0	3	39.0	1.000	1.000	18.4	<	84.0	
13	22	nodeLeft	19	6.9	-2.3	38.6	D	(100)	84.0	3	39.0	1.000	1.000	9.2	<	84.0	
13	22	nodeRight	19	6.9	-2.3	38.6	D	(100)	84.0	3	39.0	1.000	1.000	9.2	<	84.0	
13	23	nodeLeft	19	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	

Steel I Girder G3

node WEB-U-1 (WebUpper edge) WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	21	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
1	2	nodeLeft	2400	21	0	2.2	-6.5	-36.3	E(80)	62.0	3	29.0	1.300	1.000	8.7<	80.6	
1	2	nodeRight	2400	21	0	2.2	-6.5	-36.3	E(80)	62.0	3	29.0	1.300	1.000	8.7<	80.6	
2	3	nodeLeft	2400	21	0	4.4	-12.9	-45.9	E(80)	62.0	3	29.0	1.300	1.000	17.3<	80.6	
2	3	nodeRight	2400	21	0	4.4	-12.9	-45.9	E(80)	62.0	3	29.0	1.300	1.000	17.3<	80.6	
2	4	nodeLeft	2400	21	0	6.6	-18.5	-28.5	E(80)	62.0	3	29.0	1.300	1.000	25.1<	80.6	
2	4	nodeRight	2400	21	0	6.6	-18.5	-28.5	E(80)	62.0	3	29.0	1.300	1.000	25.1<	80.6	
3	5	nodeLeft	2400	19	0	8.7	-10.0	5.4	E(80)	62.0	3	29.0	1.000	1.000	18.7<	62.0	
3	5	nodeRight	2400	19	0	8.7	-10.0	5.4	E(80)	62.0	3	29.0	1.000	1.000	18.7<	62.0	
4	6	nodeLeft	2400	21	0	9.7	-2.8	62.7	E(80)	62.0	3	29.0	1.000	1.000	12.6<	62.0	
4	6	nodeRight	2400	21	0	9.7	-2.8	62.7	E(80)	62.0	3	29.0	1.000	1.000	12.6<	62.0	
4	7	nodeLeft	2400	21	0	11.3	-2.2	137.9	E(80)	62.0	3	29.0	1.000	1.000	13.5<	62.0	
4	7	nodeRight	2400	21	0	11.3	-2.2	137.9	E(80)	62.0	3	29.0	1.000	1.000	13.5<	62.0	
5	8	nodeLeft	2400	19	0	7.0	-2.0	58.0	E(80)	62.0	3	29.0	1.000	1.000	9.0<	62.0	
5	8	nodeRight	2400	19	0	7.0	-2.0	58.0	E(80)	62.0	3	29.0	1.000	1.000	9.0<	62.0	
5	9	nodeLeft	2400	19	0	5.9	-6.6	-12.6	E(80)	62.0	3	29.0	1.300	1.000	12.6<	80.6	
5	9	nodeRight	2400	19	0	5.9	-6.6	-12.6	E(80)	62.0	3	29.0	1.300	1.000	12.6<	80.6	
6	10	nodeLeft	2400	24	0	4.3	-12.3	-53.3	E(80)	62.0	3	29.0	1.300	1.000	16.5<	80.6	
6	10	nodeRight	2400	24	0	4.3	-12.3	-53.3	E(80)	62.0	3	29.0	1.300	1.000	16.5<	80.6	
6	11	nodeLeft	2400	24	0	3.9	-18.0	-75.7	E(80)	62.0	3	29.0	1.300	1.000	22.0<	80.6	
6	11	nodeRight	2400	24	0	3.9	-18.0	-75.7	E(80)	62.0	3	29.0	1.300	1.000	22.0<	80.6	
7	12	nodeLeft	2400	24	0	2.4	-18.9	-92.1	E(80)	62.0	3	29.0	1.300	1.000	21.3<	80.6	
7	12	nodeRight	2400	24	0	2.4	-18.9	-92.1	E(80)	62.0	3	29.0	1.300	1.000	21.3<	80.6	
8	13	nodeLeft	2400	24	0	3.9	-18.0	-75.7	E(80)	62.0	3	29.0	1.300	1.000	22.0<	80.6	
8	13	nodeRight	2400	24	0	3.9	-18.0	-75.7	E(80)	62.0	3	29.0	1.300	1.000	22.0<	80.6	
8	14	nodeLeft	2400	24	0	4.3	-12.3	-53.3	E(80)	62.0	3	29.0	1.300	1.000	16.5<	80.6	
8	14	nodeRight	2400	24	0	4.3	-12.3	-53.3	E(80)	62.0	3	29.0	1.300	1.000	16.5<	80.6	
9	15	nodeLeft	2400	19	0	5.9	-6.6	-12.6	E(80)	62.0	3	29.0	1.300	1.000	12.6<	80.6	
9	15	nodeRight	2400	19	0	5.9	-6.6	-12.6	E(80)	62.0	3	29.0	1.300	1.000	12.6<	80.6	
9	16	nodeLeft	2400	19	0	7.0	-2.0	58.0	E(80)	62.0	3	29.0	1.000	1.000	9.0<	62.0	
9	16	nodeRight	2400	19	0	7.0	-2.0	58.0	E(80)	62.0	3	29.0	1.000	1.000	9.0<	62.0	
10	17	nodeLeft	2400	21	0	11.3	-2.2	137.9	E(80)	62.0	3	29.0	1.000	1.000	13.5<	62.0	
10	17	nodeRight	2400	21	0	11.3	-2.2	137.9	E(80)	62.0	3	29.0	1.000	1.000	13.5<	62.0	
10	18	nodeLeft	2400	21	0	9.7	-2.8	62.7	E(80)	62.0	3	29.0	1.000	1.000	12.6<	62.0	
10	18	nodeRight	2400	21	0	9.7	-2.8	62.7	E(80)	62.0	3	29.0	1.000	1.000	12.6<	62.0	
11	19	nodeLeft	2400	19	0	8.7	-10.0	5.4	E(80)	62.0	3	29.0	1.000	1.000	18.7<	62.0	
11	19	nodeRight	2400	19	0	8.7	-10.0	5.4	E(80)	62.0	3	29.0	1.000	1.000	18.7<	62.0	
12	20	nodeLeft	2400	21	0	6.6	-18.5	-28.5	E(80)	62.0	3	29.0	1.300	1.000	25.1<	80.6	
12	20	nodeRight	2400	21	0	6.6	-18.5	-28.5	E(80)	62.0	3	29.0	1.300	1.000	25.1<	80.6	
12	21	nodeLeft	2400	21	0	4.4	-12.9	-45.9	E(80)	62.0	3	29.0	1.300	1.000	17.3<	80.6	
12	21	nodeRight	2400	21	0	4.4	-12.9	-45.9	E(80)	62.0	3	29.0	1.300	1.000	17.3<	80.6	
13	22	nodeLeft	2400	21	0	2.2	-6.5	-36.3	E(80)	62.0	3	29.0	1.300	1.000	8.7<	80.6	
13	22	nodeRight	2400	21	0	2.2	-6.5	-36.3	E(80)	62.0	3	29.0	1.300	1.000	8.7<	80.6	
13	23	nodeLeft	2400	21	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	

Steel I Girder G3

node　WEB-L-1　(WebLower edge)　WEB - 1

Sec	node		Web h	t		σtmax	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax	Δσce・CR・Ct	Stress Cycle D
			(mm)			(N/mm2)									(N/mm2)		
1	1	nodeRight	2400	19	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
1	2	nodeLeft	2400	19	0	6.8	-2.3	38.0	E(80)	62.0	3	29.0	1.000	1.000	9.1<	62.0	
1	2	nodeRight	2400	19	0	6.8	-2.3	38.0	E(80)	62.0	3	29.0	1.000	1.000	9.1<	62.0	
2	3	nodeLeft	2400	19	0	13.5	-4.6	48.0	E(80)	62.0	3	29.0	1.000	1.000	18.2<	62.0	
2	3	nodeRight	2400	19	0	13.5	-4.6	48.0	E(80)	62.0	3	29.0	1.000	1.000	18.2<	62.0	
2	4	nodeLeft	2400	19	0	19.4	-6.9	29.9	E(80)	62.0	3	29.0	1.000	1.000	26.3<	62.0	
2	4	nodeRight	2400	19	0	19.4	-6.9	29.9	E(80)	62.0	3	29.0	1.000	1.000	26.3<	62.0	
3	5	nodeLeft	2400	21	0	9.6	-8.3	-5.2	E(80)	62.0	3	29.0	1.132	1.000	17.9<	70.2	
3	5	nodeRight	2400	21	0	9.6	-8.3	-5.2	E(80)	62.0	3	29.0	1.132	1.000	17.9<	70.2	
4	6	nodeLeft	2400	27	0	2.5	-8.6	-55.2	E(80)	62.0	3	29.0	1.300	0.981	11.1<	79.1	
4	6	nodeRight	2400	27	0	2.5	-8.6	-55.2	E(80)	62.0	3	29.0	1.300	0.981	11.1<	79.1	
4	7	nodeLeft	2400	27	0	1.9	-10.0	-121.4	E(80)	62.0	3	29.0	1.300	0.981	11.9<	79.1	
4	7	nodeRight	2400	27	0	1.9	-10.0	-121.4	E(80)	62.0	3	29.0	1.300	0.981	11.9<	79.1	
5	8	nodeLeft	2400	21	0	1.9	-6.7	-55.4	E(80)	62.0	3	29.0	1.300	1.000	8.6<	80.6	
5	8	nodeRight	2400	21	0	1.9	-6.7	-55.4	E(80)	62.0	3	29.0	1.300	1.000	8.6<	80.6	
5	9	nodeLeft	2400	21	0	6.3	-5.7	12.0	E(80)	62.0	3	29.0	1.000	1.000	12.0<	62.0	
5	9	nodeRight	2400	21	0	6.3	-5.7	12.0	E(80)	62.0	3	29.0	1.000	1.000	12.0<	62.0	
6	10	nodeLeft	2400	19	0	13.7	-4.8	59.6	E(80)	62.0	3	29.0	1.000	1.000	18.5<	62.0	
6	10	nodeRight	2400	19	0	13.7	-4.8	59.6	E(80)	62.0	3	29.0	1.000	1.000	18.5<	62.0	
6	11	nodeLeft	2400	19	0	20.2	-4.4	84.7	E(80)	62.0	3	29.0	1.000	1.000	24.6<	62.0	
6	11	nodeRight	2400	19	0	20.2	-4.4	84.7	E(80)	62.0	3	29.0	1.000	1.000	24.6<	62.0	
7	12	nodeLeft	2400	19	0	21.1	-2.7	103.0	E(80)	62.0	3	29.0	1.000	1.000	23.8<	62.0	
7	12	nodeRight	2400	19	0	21.1	-2.7	103.0	E(80)	62.0	3	29.0	1.000	1.000	23.8<	62.0	
8	13	nodeLeft	2400	19	0	20.2	-4.4	84.7	E(80)	62.0	3	29.0	1.000	1.000	24.6<	62.0	
8	13	nodeRight	2400	19	0	20.2	-4.4	84.7	E(80)	62.0	3	29.0	1.000	1.000	24.6<	62.0	
8	14	nodeLeft	2400	19	0	13.7	-4.8	59.6	E(80)	62.0	3	29.0	1.000	1.000	18.5<	62.0	
8	14	nodeRight	2400	19	0	13.7	-4.8	59.6	E(80)	62.0	3	29.0	1.000	1.000	18.5<	62.0	
9	15	nodeLeft	2400	21	0	6.3	-5.7	12.0	E(80)	62.0	3	29.0	1.000	1.000	12.0<	62.0	
9	15	nodeRight	2400	21	0	6.3	-5.7	12.0	E(80)	62.0	3	29.0	1.000	1.000	12.0<	62.0	
9	16	nodeLeft	2400	21	0	1.9	-6.7	-55.4	E(80)	62.0	3	29.0	1.300	1.000	8.6<	80.6	
9	16	nodeRight	2400	21	0	1.9	-6.7	-55.4	E(80)	62.0	3	29.0	1.300	1.000	8.6<	80.6	
10	17	nodeLeft	2400	27	0	1.9	-10.0	-121.4	E(80)	62.0	3	29.0	1.300	0.981	11.9<	79.1	
10	17	nodeRight	2400	27	0	1.9	-10.0	-121.4	E(80)	62.0	3	29.0	1.300	0.981	11.9<	79.1	
10	18	nodeLeft	2400	27	0	2.5	-8.6	-55.2	E(80)	62.0	3	29.0	1.300	0.981	11.1<	79.1	
10	18	nodeRight	2400	27	0	2.5	-8.6	-55.2	E(80)	62.0	3	29.0	1.300	0.981	11.1<	79.1	
11	19	nodeLeft	2400	21	0	9.6	-8.3	-5.2	E(80)	62.0	3	29.0	1.132	1.000	17.9<	70.2	
11	19	nodeRight	2400	21	0	9.6	-8.3	-5.2	E(80)	62.0	3	29.0	1.132	1.000	17.9<	70.2	
12	20	nodeLeft	2400	19	0	19.4	-6.9	29.9	E(80)	62.0	3	29.0	1.000	1.000	26.3<	62.0	
12	20	nodeRight	2400	19	0	19.4	-6.9	29.9	E(80)	62.0	3	29.0	1.000	1.000	26.3<	62.0	
12	21	nodeLeft	2400	19	0	13.5	-4.6	48.0	E(80)	62.0	3	29.0	1.000	1.000	18.2<	62.0	
12	21	nodeRight	2400	19	0	13.5	-4.6	48.0	E(80)	62.0	3	29.0	1.000	1.000	18.2<	62.0	
13	22	nodeLeft	2400	19	0	6.8	-2.3	38.0	E(80)	62.0	3	29.0	1.000	1.000	9.1<	62.0	
13	22	nodeRight	2400	19	0	6.8	-2.3	38.0	E(80)	62.0	3	29.0	1.000	1.000	9.1<	62.0	
13	23	nodeLeft	2400	19	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	

Steel I Girder G3

node HSTIFF-1 (WebH-Stiffener) WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Stress Δσce・CR・Ct	Cycle D
1	1	nodeRight	2400	12	480	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	nodeLeft	2400	12	480	1.3	-3.8	-21.5	G(50)	32.0	3	15.0	1.300	1.000	5.1<	41.6	
1	2	nodeRight	2400	12	480	1.3	-3.8	-21.5	G(50)	32.0	3	15.0	1.300	1.000	5.1<	41.6	
2	3	nodeLeft	2400	12	480	2.6	-7.6	-27.1	G(50)	32.0	3	15.0	1.300	1.000	10.2<	41.6	
2	3	nodeRight	2400	12	480	2.6	-7.6	-27.1	G(50)	32.0	3	15.0	1.300	1.000	10.2<	41.6	
2	4	nodeLeft	2400	12	480	3.9	-10.9	-16.9	G(50)	32.0	3	15.0	1.300	1.000	14.8<	41.6	
2	4	nodeRight	2400	12	480	3.9	-10.9	-16.9	G(50)	32.0	3	15.0	1.300	1.000	14.8<	41.6	
3	5	nodeLeft	2400	12	480	5.3	-6.1	3.3	G(50)	32.0	3	15.0	1.000	1.000	11.4<	32.0	
3	5	nodeRight	2400	12	480	5.3	-6.1	3.3	G(50)	32.0	3	15.0	1.000	1.000	11.4<	32.0	
4	6	nodeLeft	2400	12	480	1.4	-4.9	-31.6	G(50)	32.0	3	15.0	1.300	1.000	6.3<	41.6	
4	6	nodeRight	2400	12	480	1.4	-4.9	-31.6	G(50)	32.0	3	15.0	1.300	1.000	6.3<	41.6	
4	7	nodeLeft	2400	12	480	1.1	-5.7	-69.5	G(50)	32.0	3	15.0	1.300	1.000	6.8<	41.6	
4	7	nodeRight	2400	12	480	1.1	-5.7	-69.5	G(50)	32.0	3	15.0	1.300	1.000	6.8<	41.6	
5	8	nodeLeft	2400	12	480	1.1	-4.0	-32.7	G(50)	32.0	3	15.0	1.300	1.000	5.1<	41.6	
5	8	nodeRight	2400	12	480	1.1	-4.0	-32.7	G(50)	32.0	3	15.0	1.300	1.000	5.1<	41.6	
5	9	nodeLeft	2400	12	480	3.6	-4.0	-7.7	G(50)	32.0	3	15.0	1.300	1.000	7.6<	41.6	
5	9	nodeRight	2400	12	480	3.6	-4.0	-7.7	G(50)	32.0	3	15.0	1.300	1.000	7.6<	41.6	
6	10	nodeLeft	2400	12	480	2.5	-7.1	-30.7	G(50)	32.0	3	15.0	1.300	1.000	9.5<	41.6	
6	10	nodeRight	2400	12	480	2.5	-7.1	-30.7	G(50)	32.0	3	15.0	1.300	1.000	9.5<	41.6	
6	11	nodeLeft	2400	12	480	2.2	-10.4	-43.7	G(50)	32.0	3	15.0	1.300	1.000	12.7<	41.6	
6	11	nodeRight	2400	12	480	2.2	-10.4	-43.7	G(50)	32.0	3	15.0	1.300	1.000	12.7<	41.6	
7	12	nodeLeft	2400	12	480	1.4	-10.9	-53.1	G(50)	32.0	3	15.0	1.300	1.000	12.3<	41.6	
7	12	nodeRight	2400	12	480	1.4	-10.9	-53.1	G(50)	32.0	3	15.0	1.300	1.000	12.3<	41.6	
8	13	nodeLeft	2400	12	480	2.2	-10.4	-43.7	G(50)	32.0	3	15.0	1.300	1.000	12.7<	41.6	
8	13	nodeRight	2400	12	480	2.2	-10.4	-43.7	G(50)	32.0	3	15.0	1.300	1.000	12.7<	41.6	
8	14	nodeLeft	2400	12	480	2.5	-7.1	-30.7	G(50)	32.0	3	15.0	1.300	1.000	9.5<	41.6	
8	14	nodeRight	2400	12	480	2.5	-7.1	-30.7	G(50)	32.0	3	15.0	1.300	1.000	9.5<	41.6	
9	15	nodeLeft	2400	12	480	3.6	-4.0	-7.7	G(50)	32.0	3	15.0	1.300	1.000	7.6<	41.6	
9	15	nodeRight	2400	12	480	3.6	-4.0	-7.7	G(50)	32.0	3	15.0	1.300	1.000	7.6<	41.6	
9	16	nodeLeft	2400	12	480	1.1	-4.0	-32.7	G(50)	32.0	3	15.0	1.300	1.000	5.1<	41.6	
9	16	nodeRight	2400	12	480	1.1	-4.0	-32.7	G(50)	32.0	3	15.0	1.300	1.000	5.1<	41.6	
10	17	nodeLeft	2400	12	480	1.1	-5.7	-69.5	G(50)	32.0	3	15.0	1.300	1.000	6.8<	41.6	
10	17	nodeRight	2400	12	480	1.1	-5.7	-69.5	G(50)	32.0	3	15.0	1.300	1.000	6.8<	41.6	
10	18	nodeLeft	2400	12	480	1.4	-4.9	-31.6	G(50)	32.0	3	15.0	1.300	1.000	6.3<	41.6	
10	18	nodeRight	2400	12	480	1.4	-4.9	-31.6	G(50)	32.0	3	15.0	1.300	1.000	6.3<	41.6	
11	19	nodeLeft	2400	12	480	5.3	-6.1	3.3	G(50)	32.0	3	15.0	1.000	1.000	11.4<	32.0	
11	19	nodeRight	2400	12	480	5.3	-6.1	3.3	G(50)	32.0	3	15.0	1.000	1.000	11.4<	32.0	
12	20	nodeLeft	2400	12	480	3.9	-10.9	-16.9	G(50)	32.0	3	15.0	1.300	1.000	14.8<	41.6	
12	20	nodeRight	2400	12	480	3.9	-10.9	-16.9	G(50)	32.0	3	15.0	1.300	1.000	14.8<	41.6	
12	21	nodeLeft	2400	12	480	2.6	-7.6	-27.1	G(50)	32.0	3	15.0	1.300	1.000	10.2<	41.6	
12	21	nodeRight	2400	12	480	2.6	-7.6	-27.1	G(50)	32.0	3	15.0	1.300	1.000	10.2<	41.6	
13	22	nodeLeft	2400	12	480	1.3	-3.8	-21.5	G(50)	32.0	3	15.0	1.300	1.000	5.1<	41.6	
13	22	nodeRight	2400	12	480	1.3	-3.8	-21.5	G(50)	32.0	3	15.0	1.300	1.000	5.1<	41.6	
13	23	nodeLeft	2400	12	480	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

Steel I Girder G3

node POINT-U-1 (WebUpper) WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	12	300	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	nodeLeft	2400	12	300	1.6	-4.8	-27.0	G(50)	32.0	3	15.0	1.300	1.000	6.4<	41.6	
1	2	nodeRight	2400	12	300	1.6	-4.8	-27.0	G(50)	32.0	3	15.0	1.300	1.000	6.4<	41.6	
2	3	nodeLeft	2400	12	300	3.3	-9.6	-34.1	G(50)	32.0	3	15.0	1.300	1.000	12.9<	41.6	
2	3	nodeRight	2400	12	300	3.3	-9.6	-34.1	G(50)	32.0	3	15.0	1.300	1.000	12.9<	41.6	
2	4	nodeLeft	2400	12	300	4.9	-13.8	-21.2	G(50)	32.0	3	15.0	1.300	1.000	18.7<	41.6	
2	4	nodeRight	2400	12	300	4.9	-13.8	-21.2	G(50)	32.0	3	15.0	1.300	1.000	18.7<	41.6	
3	5	nodeLeft	2400	12	300	6.6	-7.6	4.1	G(50)	32.0	3	15.0	1.000	1.000	14.2<	32.0	
3	5	nodeRight	2400	12	300	6.6	-7.6	4.1	G(50)	32.0	3	15.0	1.000	1.000	14.2<	32.0	
4	6	nodeLeft	2400	12	300	7.4	-2.2	48.0	G(50)	32.0	3	15.0	1.000	1.000	9.6<	32.0	
4	6	nodeRight	2400	12	300	7.4	-2.2	48.0	G(50)	32.0	3	15.0	1.000	1.000	9.6<	32.0	
4	7	nodeLeft	2400	12	300	8.7	-1.7	105.5	G(50)	32.0	3	15.0	1.000	1.000	10.3<	32.0	
4	7	nodeRight	2400	12	300	8.7	-1.7	105.5	G(50)	32.0	3	15.0	1.000	1.000	10.3<	32.0	
5	8	nodeLeft	2400	12	300	5.3	-1.5	43.8	G(50)	32.0	3	15.0	1.000	1.000	6.8<	32.0	
5	8	nodeRight	2400	12	300	5.3	-1.5	43.8	G(50)	32.0	3	15.0	1.000	1.000	6.8<	32.0	
5	9	nodeLeft	2400	12	300	4.5	-5.0	-9.5	G(50)	32.0	3	15.0	1.300	1.000	9.5<	41.6	
5	9	nodeRight	2400	12	300	4.5	-5.0	-9.5	G(50)	32.0	3	15.0	1.300	1.000	9.5<	41.6	
6	10	nodeLeft	2400	12	300	3.1	-9.0	-39.2	G(50)	32.0	3	15.0	1.300	1.000	12.2<	41.6	
6	10	nodeRight	2400	12	300	3.1	-9.0	-39.2	G(50)	32.0	3	15.0	1.300	1.000	12.2<	41.6	
6	11	nodeLeft	2400	12	300	2.9	-13.3	-55.7	G(50)	32.0	3	15.0	1.300	1.000	16.1<	41.6	
6	11	nodeRight	2400	12	300	2.9	-13.3	-55.7	G(50)	32.0	3	15.0	1.300	1.000	16.1<	41.6	
7	12	nodeLeft	2400	12	300	1.8	-13.9	-67.7	G(50)	32.0	3	15.0	1.300	1.000	15.7<	41.6	
7	12	nodeRight	2400	12	300	1.8	-13.9	-67.7	G(50)	32.0	3	15.0	1.300	1.000	15.7<	41.6	
8	13	nodeLeft	2400	12	300	2.9	-13.3	-55.7	G(50)	32.0	3	15.0	1.300	1.000	16.1<	41.6	
8	13	nodeRight	2400	12	300	2.9	-13.3	-55.7	G(50)	32.0	3	15.0	1.300	1.000	16.1<	41.6	
8	14	nodeLeft	2400	12	300	3.1	-9.0	-39.2	G(50)	32.0	3	15.0	1.300	1.000	12.2<	41.6	
8	14	nodeRight	2400	12	300	3.1	-9.0	-39.2	G(50)	32.0	3	15.0	1.300	1.000	12.2<	41.6	
9	15	nodeLeft	2400	12	300	4.5	-5.0	-9.5	G(50)	32.0	3	15.0	1.300	1.000	9.5<	41.6	
9	15	nodeRight	2400	12	300	4.5	-5.0	-9.5	G(50)	32.0	3	15.0	1.300	1.000	9.5<	41.6	
9	16	nodeLeft	2400	12	300	5.3	-1.5	43.8	G(50)	32.0	3	15.0	1.000	1.000	6.8<	32.0	
9	16	nodeRight	2400	12	300	5.3	-1.5	43.8	G(50)	32.0	3	15.0	1.000	1.000	6.8<	32.0	
10	17	nodeLeft	2400	12	300	8.7	-1.7	105.5	G(50)	32.0	3	15.0	1.000	1.000	10.3<	32.0	
10	17	nodeRight	2400	12	300	8.7	-1.7	105.5	G(50)	32.0	3	15.0	1.000	1.000	10.3<	32.0	
10	18	nodeLeft	2400	12	300	7.4	-2.2	48.0	G(50)	32.0	3	15.0	1.000	1.000	9.6<	32.0	
10	18	nodeRight	2400	12	300	7.4	-2.2	48.0	G(50)	32.0	3	15.0	1.000	1.000	9.6<	32.0	
11	19	nodeLeft	2400	12	300	6.6	-7.6	4.1	G(50)	32.0	3	15.0	1.000	1.000	14.2<	32.0	
11	19	nodeRight	2400	12	300	6.6	-7.6	4.1	G(50)	32.0	3	15.0	1.000	1.000	14.2<	32.0	
12	20	nodeLeft	2400	12	300	4.9	-13.8	-21.2	G(50)	32.0	3	15.0	1.300	1.000	18.7<	41.6	
12	20	nodeRight	2400	12	300	4.9	-13.8	-21.2	G(50)	32.0	3	15.0	1.300	1.000	18.7<	41.6	
12	21	nodeLeft	2400	12	300	3.3	-9.6	-34.1	G(50)	32.0	3	15.0	1.300	1.000	12.9<	41.6	
12	21	nodeRight	2400	12	300	3.3	-9.6	-34.1	G(50)	32.0	3	15.0	1.300	1.000	12.9<	41.6	
13	22	nodeLeft	2400	12	300	1.6	-4.8	-27.0	G(50)	32.0	3	15.0	1.300	1.000	6.4<	41.6	
13	22	nodeRight	2400	12	300	1.6	-4.8	-27.0	G(50)	32.0	3	15.0	1.300	1.000	6.4<	41.6	
13	23	nodeLeft	2400	12	300	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

Steel I Girder G3

node　POINT-L-1　(WebLower　　　)　WEB - 1

Sec	node		Web h (mm)	t	Grade	σtmax (N/mm2)	σtmin	σd	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Stress Cycle Δσce・CR・Ct	D
1	1	nodeRight	2400	12	400	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	nodeLeft	2400	12	400	4.6	-1.6	25.7	G(50)	32.0	3	15.0	1.000	1.000	6.1<	32.0	
1	2	nodeRight	2400	12	400	4.6	-1.6	25.7	G(50)	32.0	3	15.0	1.000	1.000	6.1<	32.0	
2	3	nodeLeft	2400	12	400	9.1	-3.1	32.4	G(50)	32.0	3	15.0	1.000	1.000	12.2<	32.0	
2	3	nodeRight	2400	12	400	9.1	-3.1	32.4	G(50)	32.0	3	15.0	1.000	1.000	12.2<	32.0	
2	4	nodeLeft	2400	12	400	13.1	-4.7	20.1	G(50)	32.0	3	15.0	1.000	1.000	17.7<	32.0	
2	4	nodeRight	2400	12	400	13.1	-4.7	20.1	G(50)	32.0	3	15.0	1.000	1.000	17.7<	32.0	
3	5	nodeLeft	2400	12	400	6.3	-5.5	-3.4	G(50)	32.0	3	15.0	1.132	1.000	11.8<	36.2	
3	5	nodeRight	2400	12	400	6.3	-5.5	-3.4	G(50)	32.0	3	15.0	1.132	1.000	11.8<	36.2	
4	6	nodeLeft	2400	12	400	1.6	-5.5	-35.6	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6	
4	6	nodeRight	2400	12	400	1.6	-5.5	-35.6	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6	
4	7	nodeLeft	2400	12	400	1.2	-6.4	-78.2	G(50)	32.0	3	15.0	1.300	1.000	7.7<	41.6	
4	7	nodeRight	2400	12	400	1.2	-6.4	-78.2	G(50)	32.0	3	15.0	1.300	1.000	7.7<	41.6	
5	8	nodeLeft	2400	12	400	1.3	-4.4	-36.5	G(50)	32.0	3	15.0	1.300	1.000	5.7<	41.6	
5	8	nodeRight	2400	12	400	1.3	-4.4	-36.5	G(50)	32.0	3	15.0	1.300	1.000	5.7<	41.6	
5	9	nodeLeft	2400	12	400	4.2	-3.7	7.9	G(50)	32.0	3	15.0	1.000	1.000	7.9<	32.0	
5	9	nodeRight	2400	12	400	4.2	-3.7	7.9	G(50)	32.0	3	15.0	1.000	1.000	7.9<	32.0	
6	10	nodeLeft	2400	12	400	9.4	-3.3	40.8	G(50)	32.0	3	15.0	1.000	1.000	12.7<	32.0	
6	10	nodeRight	2400	12	400	9.4	-3.3	40.8	G(50)	32.0	3	15.0	1.000	1.000	12.7<	32.0	
6	11	nodeLeft	2400	12	400	13.8	-3.0	58.0	G(50)	32.0	3	15.0	1.000	1.000	16.8<	32.0	
6	11	nodeRight	2400	12	400	13.8	-3.0	58.0	G(50)	32.0	3	15.0	1.000	1.000	16.8<	32.0	
7	12	nodeLeft	2400	12	400	14.5	-1.9	70.5	G(50)	32.0	3	15.0	1.000	1.000	16.3<	32.0	
7	12	nodeRight	2400	12	400	14.5	-1.9	70.5	G(50)	32.0	3	15.0	1.000	1.000	16.3<	32.0	
8	13	nodeLeft	2400	12	400	13.8	-3.0	58.0	G(50)	32.0	3	15.0	1.000	1.000	16.8<	32.0	
8	13	nodeRight	2400	12	400	13.8	-3.0	58.0	G(50)	32.0	3	15.0	1.000	1.000	16.8<	32.0	
8	14	nodeLeft	2400	12	400	9.4	-3.3	40.8	G(50)	32.0	3	15.0	1.000	1.000	12.7<	32.0	
8	14	nodeRight	2400	12	400	9.4	-3.3	40.8	G(50)	32.0	3	15.0	1.000	1.000	12.7<	32.0	
9	15	nodeLeft	2400	12	400	4.2	-3.7	7.9	G(50)	32.0	3	15.0	1.000	1.000	7.9<	32.0	
9	15	nodeRight	2400	12	400	4.2	-3.7	7.9	G(50)	32.0	3	15.0	1.000	1.000	7.9<	32.0	
9	16	nodeLeft	2400	12	400	1.3	-4.4	-36.5	G(50)	32.0	3	15.0	1.300	1.000	5.7<	41.6	
9	16	nodeRight	2400	12	400	1.3	-4.4	-36.5	G(50)	32.0	3	15.0	1.300	1.000	5.7<	41.6	
10	17	nodeLeft	2400	12	400	1.2	-6.4	-78.2	G(50)	32.0	3	15.0	1.300	1.000	7.7<	41.6	
10	17	nodeRight	2400	12	400	1.2	-6.4	-78.2	G(50)	32.0	3	15.0	1.300	1.000	7.7<	41.6	
10	18	nodeLeft	2400	12	400	1.6	-5.5	-35.6	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6	
10	18	nodeRight	2400	12	400	1.6	-5.5	-35.6	G(50)	32.0	3	15.0	1.300	1.000	7.1<	41.6	
11	19	nodeLeft	2400	12	400	6.3	-5.5	-3.4	G(50)	32.0	3	15.0	1.132	1.000	11.8<	36.2	
11	19	nodeRight	2400	12	400	6.3	-5.5	-3.4	G(50)	32.0	3	15.0	1.132	1.000	11.8<	36.2	
12	20	nodeLeft	2400	12	400	13.1	-4.7	20.1	G(50)	32.0	3	15.0	1.000	1.000	17.7<	32.0	
12	20	nodeRight	2400	12	400	13.1	-4.7	20.1	G(50)	32.0	3	15.0	1.000	1.000	17.7<	32.0	
12	21	nodeLeft	2400	12	400	9.1	-3.1	32.4	G(50)	32.0	3	15.0	1.000	1.000	12.2<	32.0	
12	21	nodeRight	2400	12	400	9.1	-3.1	32.4	G(50)	32.0	3	15.0	1.000	1.000	12.2<	32.0	
13	22	nodeLeft	2400	12	400	4.6	-1.6	25.7	G(50)	32.0	3	15.0	1.000	1.000	6.1<	32.0	
13	22	nodeRight	2400	12	400	4.6	-1.6	25.7	G(50)	32.0	3	15.0	1.000	1.000	6.1<	32.0	
13	23	nodeLeft	2400	12	400	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

4. G4

Steel I Girder G4

node U.FLG-MAX (UpperFlangeStress MAx)

Sec	node		Flange t (mm)	σtmax (N/mm2)	σtmin	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)		Δσce・CR・Ct (N/mm2)	Stress Cycle D
1	1	nodeRight	21	0.0	0.0	0.0	F	(65)	46.0	3	21.0	1.300	1.000	0.0	<	59.8	
1	2	nodeLeft	21	3.5	-35.4	-31.4	F	(65)	46.0	3	21.0	1.300	1.000	38.9	<	59.8	
1	2	nodeRight	21	3.5	-35.4	-31.4	F	(65)	46.0	3	21.0	1.300	1.000	38.9	<	59.8	
2	3	nodeLeft	21	7.0	-42.0	-43.8	F	(65)	46.0	3	21.0	1.300	1.000	49.0	<	59.8	
2	3	nodeRight	21	7.0	-42.0	-43.8	F	(65)	46.0	3	21.0	1.300	1.000	49.0	<	59.8	
2	4	nodeLeft	21	10.5	-30.4	-37.2	F	(65)	46.0	3	21.0	1.300	1.000	40.9	<	59.8	
2	4	nodeRight	21	10.5	-30.4	-37.2	F	(65)	46.0	3	21.0	1.300	1.000	40.9	<	59.8	
3	5	nodeLeft	19	14.9	-37.4	7.7	F	(65)	46.0	3	21.0	1.032	1.000	52.2	>	47.5	0.54 < 1
3	5	nodeRight	19	14.9	-37.4	7.7	F	(65)	46.0	3	21.0	1.032	1.000	52.2	>	47.5	0.54 < 1
4	6	nodeLeft	22	16.1	-20.0	65.3	F	(65)	46.0	3	21.0	1.000	1.000	36.1	<	46.0	
4	6	nodeRight	22	16.1	-20.0	65.3	F	(65)	46.0	3	21.0	1.000	1.000	36.1	<	46.0	
4	7	nodeLeft	22	22.5	-3.5	134.0	F	(65)	46.0	3	21.0	1.000	1.000	26.0	<	46.0	
4	7	nodeRight	22	22.5	-3.5	134.0	F	(65)	46.0	3	21.0	1.000	1.000	26.0	<	46.0	
5	8	nodeLeft	19	12.8	-18.9	65.2	F	(65)	46.0	3	21.0	1.000	1.000	31.7	<	46.0	
5	8	nodeRight	19	12.8	-18.9	65.2	F	(65)	46.0	3	21.0	1.000	1.000	31.7	<	46.0	
5	9	nodeLeft	19	11.2	-36.1	-5.9	F	(65)	46.0	3	21.0	1.217	1.000	47.3	<	56.0	
5	9	nodeRight	19	11.2	-36.1	-5.9	F	(65)	46.0	3	21.0	1.217	1.000	47.3	<	56.0	
6	10	nodeLeft	25	7.1	-33.9	-52.6	F	(65)	46.0	3	21.0	1.300	1.000	41.1	<	59.8	
6	10	nodeRight	25	7.1	-33.9	-52.6	F	(65)	46.0	3	21.0	1.300	1.000	41.1	<	59.8	
6	11	nodeLeft	25	5.6	-30.5	-86.5	F	(65)	46.0	3	21.0	1.300	1.000	36.1	<	59.8	
6	11	nodeRight	25	5.6	-30.5	-86.5	F	(65)	46.0	3	21.0	1.300	1.000	36.1	<	59.8	
7	12	nodeLeft	25	3.9	-33.1	-91.2	F	(65)	46.0	3	21.0	1.300	1.000	37.0	<	59.8	
7	12	nodeRight	25	3.9	-33.1	-91.2	F	(65)	46.0	3	21.0	1.300	1.000	37.0	<	59.8	
8	13	nodeLeft	25	5.6	-30.5	-86.5	F	(65)	46.0	3	21.0	1.300	1.000	36.1	<	59.8	
8	13	nodeRight	25	5.6	-30.5	-86.5	F	(65)	46.0	3	21.0	1.300	1.000	36.1	<	59.8	
8	14	nodeLeft	25	7.1	-33.9	-52.6	F	(65)	46.0	3	21.0	1.300	1.000	41.1	<	59.8	
8	14	nodeRight	25	7.1	-33.9	-52.6	F	(65)	46.0	3	21.0	1.300	1.000	41.1	<	59.8	
9	15	nodeLeft	19	11.2	-36.1	-5.9	F	(65)	46.0	3	21.0	1.217	1.000	47.3	<	56.0	
9	15	nodeRight	19	11.2	-36.1	-5.9	F	(65)	46.0	3	21.0	1.217	1.000	47.3	<	56.0	
9	16	nodeLeft	19	12.8	-18.9	65.2	F	(65)	46.0	3	21.0	1.000	1.000	31.7	<	46.0	
9	16	nodeRight	19	12.8	-18.9	65.2	F	(65)	46.0	3	21.0	1.000	1.000	31.7	<	46.0	
10	17	nodeLeft	22	22.5	-3.5	134.0	F	(65)	46.0	3	21.0	1.000	1.000	26.0	<	46.0	
10	17	nodeRight	22	22.5	-3.5	134.0	F	(65)	46.0	3	21.0	1.000	1.000	26.0	<	46.0	
10	18	nodeLeft	22	16.1	-20.0	65.3	F	(65)	46.0	3	21.0	1.000	1.000	36.1	<	46.0	
10	18	nodeRight	22	16.1	-20.0	65.3	F	(65)	46.0	3	21.0	1.000	1.000	36.1	<	46.0	
11	19	nodeLeft	19	14.9	-37.4	7.7	F	(65)	46.0	3	21.0	1.032	1.000	52.2	>	47.5	0.54 < 1
11	19	nodeRight	19	14.9	-37.4	7.7	F	(65)	46.0	3	21.0	1.032	1.000	52.2	>	47.5	0.54 < 1
12	20	nodeLeft	21	10.5	-30.4	-37.2	F	(65)	46.0	3	21.0	1.300	1.000	40.9	<	59.8	
12	20	nodeRight	21	10.5	-30.4	-37.2	F	(65)	46.0	3	21.0	1.300	1.000	40.9	<	59.8	
12	21	nodeLeft	21	7.0	-42.0	-43.8	F	(65)	46.0	3	21.0	1.300	1.000	49.0	<	59.8	
12	21	nodeRight	21	7.0	-42.0	-43.8	F	(65)	46.0	3	21.0	1.300	1.000	49.0	<	59.8	
13	22	nodeLeft	21	3.5	-35.4	-31.4	F	(65)	46.0	3	21.0	1.300	1.000	38.9	<	59.8	
13	22	nodeRight	21	3.5	-35.4	-31.4	F	(65)	46.0	3	21.0	1.300	1.000	38.9	<	59.8	
13	23	nodeLeft	21	0.0	0.0	0.0	F	(65)	46.0	3	21.0	1.300	1.000	0.0	<	59.8	

Steel I Girder G4

node　L.FLG-MAX (LowerFlangeStress MAx)

Sec	node		Flange t	σtmax	σtmin	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax	Δσce・CR・Ct	Stress Cycle D
			(mm)		(N/mm2)									(N/mm2)	(N/mm2)	
1	1	nodeRight	19	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
1	2	nodeLeft	19	37.0	-3.7	32.8	D	(100)	84.0	3	39.0	1.000	1.000	40.7	< 84.0	
1	2	nodeRight	19	37.0	-3.7	32.8	D	(100)	84.0	3	39.0	1.000	1.000	40.7	< 84.0	
2	3	nodeLeft	19	43.9	-7.3	45.8	D	(100)	84.0	3	39.0	1.000	1.000	51.2	< 84.0	
2	3	nodeRight	19	43.9	-7.3	45.8	D	(100)	84.0	3	39.0	1.000	1.000	51.2	< 84.0	
2	4	nodeLeft	19	31.8	-11.0	38.9	D	(100)	84.0	3	39.0	1.000	1.000	42.8	< 84.0	
2	4	nodeRight	19	31.8	-11.0	38.9	D	(100)	84.0	3	39.0	1.000	1.000	42.8	< 84.0	
3	5	nodeLeft	21	35.8	-14.2	-7.4	D	(100)	84.0	3	39.0	1.000	1.000	50.0	< 84.0	
3	5	nodeRight	21	35.8	-14.2	-7.4	D	(100)	84.0	3	39.0	1.000	1.000	50.0	< 84.0	
4	6	nodeLeft	29	17.5	-14.1	-57.0	D	(100)	84.0	3	39.0	1.300	0.964	31.5	<105.2	
4	6	nodeRight	29	17.5	-14.1	-57.0	D	(100)	84.0	3	39.0	1.300	0.964	31.5	<105.2	
4	7	nodeLeft	29	3.1	-19.6	-117.0	D	(100)	84.0	3	39.0	1.300	0.964	22.7	<105.2	
4	7	nodeRight	29	3.1	-19.6	-117.0	D	(100)	84.0	3	39.0	1.300	0.964	22.7	<105.2	
5	8	nodeLeft	21	18.1	-12.3	-62.4	D	(100)	84.0	3	39.0	1.300	1.000	30.4	<109.2	
5	8	nodeRight	21	18.1	-12.3	-62.4	D	(100)	84.0	3	39.0	1.300	1.000	30.4	<109.2	
5	9	nodeLeft	21	34.5	-10.8	5.6	D	(100)	84.0	3	39.0	1.000	1.000	45.3	< 84.0	
5	9	nodeRight	21	34.5	-10.8	5.6	D	(100)	84.0	3	39.0	1.000	1.000	45.3	< 84.0	
6	10	nodeLeft	19	38.5	-8.1	59.7	D	(100)	84.0	3	39.0	1.000	1.000	46.5	< 84.0	
6	10	nodeRight	19	38.5	-8.1	59.7	D	(100)	84.0	3	39.0	1.000	1.000	46.5	< 84.0	
6	11	nodeLeft	19	34.6	-6.3	98.0	D	(100)	84.0	3	39.0	1.000	1.000	40.9	< 84.0	
6	11	nodeRight	19	34.6	-6.3	98.0	D	(100)	84.0	3	39.0	1.000	1.000	40.9	< 84.0	
7	12	nodeLeft	19	37.5	-4.4	103.4	D	(100)	84.0	3	39.0	1.000	1.000	42.0	< 84.0	
7	12	nodeRight	19	37.5	-4.4	103.4	D	(100)	84.0	3	39.0	1.000	1.000	42.0	< 84.0	
8	13	nodeLeft	19	34.6	-6.3	98.0	D	(100)	84.0	3	39.0	1.000	1.000	40.9	< 84.0	
8	13	nodeRight	19	34.6	-6.3	98.0	D	(100)	84.0	3	39.0	1.000	1.000	40.9	< 84.0	
8	14	nodeLeft	19	38.5	-8.1	59.7	D	(100)	84.0	3	39.0	1.000	1.000	46.5	< 84.0	
8	14	nodeRight	19	38.5	-8.1	59.7	D	(100)	84.0	3	39.0	1.000	1.000	46.5	< 84.0	
9	15	nodeLeft	21	34.5	-10.8	5.6	D	(100)	84.0	3	39.0	1.000	1.000	45.3	< 84.0	
9	15	nodeRight	21	34.5	-10.8	5.6	D	(100)	84.0	3	39.0	1.000	1.000	45.3	< 84.0	
9	16	nodeLeft	21	18.1	-12.3	-62.4	D	(100)	84.0	3	39.0	1.300	1.000	30.4	<109.2	
9	16	nodeRight	21	18.1	-12.3	-62.4	D	(100)	84.0	3	39.0	1.300	1.000	30.4	<109.2	
10	17	nodeLeft	29	3.1	-19.6	-117.0	D	(100)	84.0	3	39.0	1.300	0.964	22.7	<105.2	
10	17	nodeRight	29	3.1	-19.6	-117.0	D	(100)	84.0	3	39.0	1.300	0.964	22.7	<105.2	
10	18	nodeLeft	29	17.5	-14.1	-57.0	D	(100)	84.0	3	39.0	1.300	0.964	31.5	<105.2	
10	18	nodeRight	29	17.5	-14.1	-57.0	D	(100)	84.0	3	39.0	1.300	0.964	31.5	<105.2	
11	19	nodeLeft	21	35.8	-14.2	-7.4	D	(100)	84.0	3	39.0	1.000	1.000	50.0	< 84.0	
11	19	nodeRight	21	35.8	-14.2	-7.4	D	(100)	84.0	3	39.0	1.000	1.000	50.0	< 84.0	
12	20	nodeLeft	19	31.8	-11.0	38.9	D	(100)	84.0	3	39.0	1.000	1.000	42.8	< 84.0	
12	20	nodeRight	19	31.8	-11.0	38.9	D	(100)	84.0	3	39.0	1.000	1.000	42.8	< 84.0	
12	21	nodeLeft	19	43.9	-7.3	45.8	D	(100)	84.0	3	39.0	1.000	1.000	51.2	< 84.0	
12	21	nodeRight	19	43.9	-7.3	45.8	D	(100)	84.0	3	39.0	1.000	1.000	51.2	< 84.0	
13	22	nodeLeft	19	37.0	-3.7	32.8	D	(100)	84.0	3	39.0	1.000	1.000	40.7	< 84.0	
13	22	nodeRight	19	37.0	-3.7	32.8	D	(100)	84.0	3	39.0	1.000	1.000	40.7	< 84.0	
13	23	nodeLeft	19	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	

Steel I Girder G4

node WEB-U-1 (WebUpper edge) WEB - 1

Sec	node		Web h (mm)	Web t (mm)		σtmax (N/mm2)	σtmin (N/mm2)	σd (N/mm2)	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax < Δσce・CR・Ct (N/mm2)	Stress Cycle D
1	1	nodeRight	2400	21	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0< 80.6	
1	2	nodeLeft	2400	21	0	3.4	-34.8	-30.9	E(80)	62.0	3	29.0	1.300	1.000	38.2< 80.6	
1	2	nodeRight	2400	21	0	3.4	-34.8	-30.9	E(80)	62.0	3	29.0	1.300	1.000	38.2< 80.6	
2	3	nodeLeft	2400	21	0	6.9	-41.3	-43.1	E(80)	62.0	3	29.0	1.300	1.000	48.2< 80.6	
2	3	nodeRight	2400	21	0	6.9	-41.3	-43.1	E(80)	62.0	3	29.0	1.300	1.000	48.2< 80.6	
2	4	nodeLeft	2400	21	0	10.4	-29.9	-36.6	E(80)	62.0	3	29.0	1.300	1.000	40.2< 80.6	
2	4	nodeRight	2400	21	0	10.4	-29.9	-36.6	E(80)	62.0	3	29.0	1.300	1.000	40.2< 80.6	
3	5	nodeLeft	2400	19	0	14.6	-36.8	7.6	E(80)	62.0	3	29.0	1.032	1.000	51.4< 64.0	
3	5	nodeRight	2400	19	0	14.6	-36.8	7.6	E(80)	62.0	3	29.0	1.032	1.000	51.4< 64.0	
4	6	nodeLeft	2400	22	0	15.8	-19.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	35.5< 62.0	
4	6	nodeRight	2400	22	0	15.8	-19.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	35.5< 62.0	
4	7	nodeLeft	2400	22	0	22.1	-3.4	131.7	E(80)	62.0	3	29.0	1.000	1.000	25.5< 62.0	
4	7	nodeRight	2400	22	0	22.1	-3.4	131.7	E(80)	62.0	3	29.0	1.000	1.000	25.5< 62.0	
5	8	nodeLeft	2400	19	0	12.6	-18.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	31.2< 62.0	
5	8	nodeRight	2400	19	0	12.6	-18.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	31.2< 62.0	
5	9	nodeLeft	2400	19	0	11.1	-35.5	-5.8	E(80)	62.0	3	29.0	1.217	1.000	46.6< 75.5	
5	9	nodeRight	2400	19	0	11.1	-35.5	-5.8	E(80)	62.0	3	29.0	1.217	1.000	46.6< 75.5	
6	10	nodeLeft	2400	25	0	7.0	-33.2	-51.5	E(80)	62.0	3	29.0	1.300	1.000	40.2< 80.6	
6	10	nodeRight	2400	25	0	7.0	-33.2	-51.5	E(80)	62.0	3	29.0	1.300	1.000	40.2< 80.6	
6	11	nodeLeft	2400	25	0	5.4	-29.8	-84.5	E(80)	62.0	3	29.0	1.300	1.000	35.3< 80.6	
6	11	nodeRight	2400	25	0	5.4	-29.8	-84.5	E(80)	62.0	3	29.0	1.300	1.000	35.3< 80.6	
7	12	nodeLeft	2400	25	0	3.8	-32.4	-89.2	E(80)	62.0	3	29.0	1.300	1.000	36.2< 80.6	
7	12	nodeRight	2400	25	0	3.8	-32.4	-89.2	E(80)	62.0	3	29.0	1.300	1.000	36.2< 80.6	
8	13	nodeLeft	2400	25	0	5.4	-29.8	-84.5	E(80)	62.0	3	29.0	1.300	1.000	35.3< 80.6	
8	13	nodeRight	2400	25	0	5.4	-29.8	-84.5	E(80)	62.0	3	29.0	1.300	1.000	35.3< 80.6	
8	14	nodeLeft	2400	25	0	7.0	-33.2	-51.5	E(80)	62.0	3	29.0	1.300	1.000	40.2< 80.6	
8	14	nodeRight	2400	25	0	7.0	-33.2	-51.5	E(80)	62.0	3	29.0	1.300	1.000	40.2< 80.6	
9	15	nodeLeft	2400	19	0	11.1	-35.5	-5.8	E(80)	62.0	3	29.0	1.217	1.000	46.6< 75.5	
9	15	nodeRight	2400	19	0	11.1	-35.5	-5.8	E(80)	62.0	3	29.0	1.217	1.000	46.6< 75.5	
9	16	nodeLeft	2400	19	0	12.6	-18.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	31.2< 62.0	
9	16	nodeRight	2400	19	0	12.6	-18.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	31.2< 62.0	
10	17	nodeLeft	2400	22	0	22.1	-3.4	131.7	E(80)	62.0	3	29.0	1.000	1.000	25.5< 62.0	
10	17	nodeRight	2400	22	0	22.1	-3.4	131.7	E(80)	62.0	3	29.0	1.000	1.000	25.5< 62.0	
10	18	nodeLeft	2400	22	0	15.8	-19.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	35.5< 62.0	
10	18	nodeRight	2400	22	0	15.8	-19.6	64.2	E(80)	62.0	3	29.0	1.000	1.000	35.5< 62.0	
11	19	nodeLeft	2400	19	0	14.6	-36.8	7.6	E(80)	62.0	3	29.0	1.032	1.000	51.4< 64.0	
11	19	nodeRight	2400	19	0	14.6	-36.8	7.6	E(80)	62.0	3	29.0	1.032	1.000	51.4< 64.0	
12	20	nodeLeft	2400	21	0	10.4	-29.9	-36.6	E(80)	62.0	3	29.0	1.300	1.000	40.2< 80.6	
12	20	nodeRight	2400	21	0	10.4	-29.9	-36.6	E(80)	62.0	3	29.0	1.300	1.000	40.2< 80.6	
12	21	nodeLeft	2400	21	0	6.9	-41.3	-43.1	E(80)	62.0	3	29.0	1.300	1.000	48.2< 80.6	
12	21	nodeRight	2400	21	0	6.9	-41.3	-43.1	E(80)	62.0	3	29.0	1.300	1.000	48.2< 80.6	
13	22	nodeLeft	2400	21	0	3.4	-34.8	-30.9	E(80)	62.0	3	29.0	1.300	1.000	38.2< 80.6	
13	22	nodeRight	2400	21	0	3.4	-34.8	-30.9	E(80)	62.0	3	29.0	1.300	1.000	38.2< 80.6	
13	23	nodeLeft	2400	21	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0< 80.6	

Steel I Girder G4

node　WEB-L-1　(WebLower edge)　WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	19	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
1	2	nodeLeft	2400	19	0	36.4	-3.6	32.3	E(80)	62.0	3	29.0	1.000	1.000	40.0<	62.0	
1	2	nodeRight	2400	19	0	36.4	-3.6	32.3	E(80)	62.0	3	29.0	1.000	1.000	40.0<	62.0	
2	3	nodeLeft	2400	19	0	43.2	-7.2	45.1	E(80)	62.0	3	29.0	1.000	1.000	50.4<	62.0	
2	3	nodeRight	2400	19	0	43.2	-7.2	45.1	E(80)	62.0	3	29.0	1.000	1.000	50.4<	62.0	
2	4	nodeLeft	2400	19	0	31.3	-10.8	38.3	E(80)	62.0	3	29.0	1.000	1.000	42.1<	62.0	
2	4	nodeRight	2400	19	0	31.3	-10.8	38.3	E(80)	62.0	3	29.0	1.000	1.000	42.1<	62.0	
3	5	nodeLeft	2400	21	0	35.1	-14.0	-7.2	E(80)	62.0	3	29.0	1.000	1.000	49.1<	62.0	
3	5	nodeRight	2400	21	0	35.1	-14.0	-7.2	E(80)	62.0	3	29.0	1.000	1.000	49.1<	62.0	
4	6	nodeLeft	2400	29	0	17.0	-13.7	-55.5	E(80)	62.0	3	29.0	1.300	0.964	30.7<	77.7	
4	6	nodeRight	2400	29	0	17.0	-13.7	-55.5	E(80)	62.0	3	29.0	1.300	0.964	30.7<	77.7	
4	7	nodeLeft	2400	29	0	3.0	-19.1	-114.0	E(80)	62.0	3	29.0	1.300	0.964	22.1<	77.7	
4	7	nodeRight	2400	29	0	3.0	-19.1	-114.0	E(80)	62.0	3	29.0	1.300	0.964	22.1<	77.7	
5	8	nodeLeft	2400	21	0	17.7	-12.1	-61.3	E(80)	62.0	3	29.0	1.300	1.000	29.8<	80.6	
5	8	nodeRight	2400	21	0	17.7	-12.1	-61.3	E(80)	62.0	3	29.0	1.300	1.000	29.8<	80.6	
5	9	nodeLeft	2400	21	0	33.9	-10.6	5.5	E(80)	62.0	3	29.0	1.000	1.000	44.5<	62.0	
5	9	nodeRight	2400	21	0	33.9	-10.6	5.5	E(80)	62.0	3	29.0	1.000	1.000	44.5<	62.0	
6	10	nodeLeft	2400	19	0	37.9	-7.9	58.8	E(80)	62.0	3	29.0	1.000	1.000	45.8<	62.0	
6	10	nodeRight	2400	19	0	37.9	-7.9	58.8	E(80)	62.0	3	29.0	1.000	1.000	45.8<	62.0	
6	11	nodeLeft	2400	19	0	34.1	-6.2	96.5	E(80)	62.0	3	29.0	1.000	1.000	40.3<	62.0	
6	11	nodeRight	2400	19	0	34.1	-6.2	96.5	E(80)	62.0	3	29.0	1.000	1.000	40.3<	62.0	
7	12	nodeLeft	2400	19	0	37.0	-4.4	101.9	E(80)	62.0	3	29.0	1.000	1.000	41.4<	62.0	
7	12	nodeRight	2400	19	0	37.0	-4.4	101.9	E(80)	62.0	3	29.0	1.000	1.000	41.4<	62.0	
8	13	nodeLeft	2400	19	0	34.1	-6.2	96.5	E(80)	62.0	3	29.0	1.000	1.000	40.3<	62.0	
8	13	nodeRight	2400	19	0	34.1	-6.2	96.5	E(80)	62.0	3	29.0	1.000	1.000	40.3<	62.0	
8	14	nodeLeft	2400	19	0	37.9	-7.9	58.8	E(80)	62.0	3	29.0	1.000	1.000	45.8<	62.0	
8	14	nodeRight	2400	19	0	37.9	-7.9	58.8	E(80)	62.0	3	29.0	1.000	1.000	45.8<	62.0	
9	15	nodeLeft	2400	21	0	33.9	-10.6	5.5	E(80)	62.0	3	29.0	1.000	1.000	44.5<	62.0	
9	15	nodeRight	2400	21	0	33.9	-10.6	5.5	E(80)	62.0	3	29.0	1.000	1.000	44.5<	62.0	
9	16	nodeLeft	2400	21	0	17.7	-12.1	-61.3	E(80)	62.0	3	29.0	1.300	1.000	29.8<	80.6	
9	16	nodeRight	2400	21	0	17.7	-12.1	-61.3	E(80)	62.0	3	29.0	1.300	1.000	29.8<	80.6	
10	17	nodeLeft	2400	29	0	3.0	-19.1	-114.0	E(80)	62.0	3	29.0	1.300	0.964	22.1<	77.7	
10	17	nodeRight	2400	29	0	3.0	-19.1	-114.0	E(80)	62.0	3	29.0	1.300	0.964	22.1<	77.7	
10	18	nodeLeft	2400	29	0	17.0	-13.7	-55.5	E(80)	62.0	3	29.0	1.300	0.964	30.7<	77.7	
10	18	nodeRight	2400	29	0	17.0	-13.7	-55.5	E(80)	62.0	3	29.0	1.300	0.964	30.7<	77.7	
11	19	nodeLeft	2400	21	0	35.1	-14.0	-7.2	E(80)	62.0	3	29.0	1.000	1.000	49.1<	62.0	
11	19	nodeRight	2400	21	0	35.1	-14.0	-7.2	E(80)	62.0	3	29.0	1.000	1.000	49.1<	62.0	
12	20	nodeLeft	2400	19	0	31.3	-10.8	38.3	E(80)	62.0	3	29.0	1.000	1.000	42.1<	62.0	
12	20	nodeRight	2400	19	0	31.3	-10.8	38.3	E(80)	62.0	3	29.0	1.000	1.000	42.1<	62.0	
12	21	nodeLeft	2400	19	0	43.2	-7.2	45.1	E(80)	62.0	3	29.0	1.000	1.000	50.4<	62.0	
12	21	nodeRight	2400	19	0	43.2	-7.2	45.1	E(80)	62.0	3	29.0	1.000	1.000	50.4<	62.0	
13	22	nodeLeft	2400	19	0	36.4	-3.6	32.3	E(80)	62.0	3	29.0	1.000	1.000	40.0<	62.0	
13	22	nodeRight	2400	19	0	36.4	-3.6	32.3	E(80)	62.0	3	29.0	1.000	1.000	40.0<	62.0	
13	23	nodeLeft	2400	19	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	

Steel I Girder G4

node HSTIFF-1 (WebH-Stiffener) WEB - 1

Sec	node		Web h	t		σtmax	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax	Δσce・CR・Ct	Stress Cycle D
			(mm)			(N/mm2)									(N/mm2)		
1	1	nodeRight	2400	12	480	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	nodeLeft	2400	12	480	2.0	-20.5	-18.2	G(50)	32.0	3	15.0	1.300	1.000	22.6<	41.6	
1	2	nodeRight	2400	12	480	2.0	-20.5	-18.2	G(50)	32.0	3	15.0	1.300	1.000	22.6<	41.6	
2	3	nodeLeft	2400	12	480	4.1	-24.4	-25.4	G(50)	32.0	3	15.0	1.300	1.000	28.4<	41.6	
2	3	nodeRight	2400	12	480	4.1	-24.4	-25.4	G(50)	32.0	3	15.0	1.300	1.000	28.4<	41.6	
2	4	nodeLeft	2400	12	480	6.1	-17.6	-21.6	G(50)	32.0	3	15.0	1.300	1.000	23.7<	41.6	
2	4	nodeRight	2400	12	480	6.1	-17.6	-21.6	G(50)	32.0	3	15.0	1.300	1.000	23.7<	41.6	
3	5	nodeLeft	2400	12	480	8.9	-22.4	4.6	G(50)	32.0	3	15.0	1.032	1.000	31.3<	33.0	
3	5	nodeRight	2400	12	480	8.9	-22.4	4.6	G(50)	32.0	3	15.0	1.032	1.000	31.3<	33.0	
4	6	nodeLeft	2400	12	480	9.7	-7.8	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.5<	41.6	
4	6	nodeRight	2400	12	480	9.7	-7.8	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.5<	41.6	
4	7	nodeLeft	2400	12	480	1.7	-10.9	-64.9	G(50)	32.0	3	15.0	1.300	1.000	12.6<	41.6	
4	7	nodeRight	2400	12	480	1.7	-10.9	-64.9	G(50)	32.0	3	15.0	1.300	1.000	12.6<	41.6	
5	8	nodeLeft	2400	12	480	10.5	-7.1	-36.2	G(50)	32.0	3	15.0	1.300	1.000	17.6<	41.6	
5	8	nodeRight	2400	12	480	10.5	-7.1	-36.2	G(50)	32.0	3	15.0	1.300	1.000	17.6<	41.6	
5	9	nodeLeft	2400	12	480	6.7	-21.6	-3.5	G(50)	32.0	3	15.0	1.217	1.000	28.4<	38.9	
5	9	nodeRight	2400	12	480	6.7	-21.6	-3.5	G(50)	32.0	3	15.0	1.217	1.000	28.4<	38.9	
6	10	nodeLeft	2400	12	480	4.0	-19.0	-29.4	G(50)	32.0	3	15.0	1.300	1.000	23.0<	41.6	
6	10	nodeRight	2400	12	480	4.0	-19.0	-29.4	G(50)	32.0	3	15.0	1.300	1.000	23.0<	41.6	
6	11	nodeLeft	2400	12	480	3.1	-17.1	-48.3	G(50)	32.0	3	15.0	1.300	1.000	20.2<	41.6	
6	11	nodeRight	2400	12	480	3.1	-17.1	-48.3	G(50)	32.0	3	15.0	1.300	1.000	20.2<	41.6	
7	12	nodeLeft	2400	12	480	2.2	-18.5	-51.0	G(50)	32.0	3	15.0	1.300	1.000	20.7<	41.6	
7	12	nodeRight	2400	12	480	2.2	-18.5	-51.0	G(50)	32.0	3	15.0	1.300	1.000	20.7<	41.6	
8	13	nodeLeft	2400	12	480	3.1	-17.1	-48.3	G(50)	32.0	3	15.0	1.300	1.000	20.2<	41.6	
8	13	nodeRight	2400	12	480	3.1	-17.1	-48.3	G(50)	32.0	3	15.0	1.300	1.000	20.2<	41.6	
8	14	nodeLeft	2400	12	480	4.0	-19.0	-29.4	G(50)	32.0	3	15.0	1.300	1.000	23.0<	41.6	
8	14	nodeRight	2400	12	480	4.0	-19.0	-29.4	G(50)	32.0	3	15.0	1.300	1.000	23.0<	41.6	
9	15	nodeLeft	2400	12	480	6.7	-21.6	-3.5	G(50)	32.0	3	15.0	1.217	1.000	28.4<	38.9	
9	15	nodeRight	2400	12	480	6.7	-21.6	-3.5	G(50)	32.0	3	15.0	1.217	1.000	28.4<	38.9	
9	16	nodeLeft	2400	12	480	10.5	-7.1	-36.2	G(50)	32.0	3	15.0	1.300	1.000	17.6<	41.6	
9	16	nodeRight	2400	12	480	10.5	-7.1	-36.2	G(50)	32.0	3	15.0	1.300	1.000	17.6<	41.6	
10	17	nodeLeft	2400	12	480	1.7	-10.9	-64.9	G(50)	32.0	3	15.0	1.300	1.000	12.6<	41.6	
10	17	nodeRight	2400	12	480	1.7	-10.9	-64.9	G(50)	32.0	3	15.0	1.300	1.000	12.6<	41.6	
10	18	nodeLeft	2400	12	480	9.7	-7.8	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.5<	41.6	
10	18	nodeRight	2400	12	480	9.7	-7.8	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.5<	41.6	
11	19	nodeLeft	2400	12	480	8.9	-22.4	4.6	G(50)	32.0	3	15.0	1.032	1.000	31.3<	33.0	
11	19	nodeRight	2400	12	480	8.9	-22.4	4.6	G(50)	32.0	3	15.0	1.032	1.000	31.3<	33.0	
12	20	nodeLeft	2400	12	480	6.1	-17.6	-21.6	G(50)	32.0	3	15.0	1.300	1.000	23.7<	41.6	
12	20	nodeRight	2400	12	480	6.1	-17.6	-21.6	G(50)	32.0	3	15.0	1.300	1.000	23.7<	41.6	
12	21	nodeLeft	2400	12	480	4.1	-24.4	-25.4	G(50)	32.0	3	15.0	1.300	1.000	28.4<	41.6	
12	21	nodeRight	2400	12	480	4.1	-24.4	-25.4	G(50)	32.0	3	15.0	1.300	1.000	28.4<	41.6	
13	22	nodeLeft	2400	12	480	2.0	-20.5	-18.2	G(50)	32.0	3	15.0	1.300	1.000	22.6<	41.6	
13	22	nodeRight	2400	12	480	2.0	-20.5	-18.2	G(50)	32.0	3	15.0	1.300	1.000	22.6<	41.6	
13	23	nodeLeft	2400	12	480	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

Steel I Girder G4

node POINT-U-1 (WebUpper) WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	12	300	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	nodeLeft	2400	12	300	2.6	-25.9	-23.0	G(50)	32.0	3	15.0	1.300	1.000	28.5<	41.6	
1	2	nodeRight	2400	12	300	2.6	-25.9	-23.0	G(50)	32.0	3	15.0	1.300	1.000	28.5<	41.6	
2	3	nodeLeft	2400	12	300	5.1	-30.7	-32.0	G(50)	32.0	3	15.0	1.300	1.000	35.8<	41.6	
2	3	nodeRight	2400	12	300	5.1	-30.7	-32.0	G(50)	32.0	3	15.0	1.300	1.000	35.8<	41.6	
2	4	nodeLeft	2400	12	300	7.7	-22.2	-27.2	G(50)	32.0	3	15.0	1.300	1.000	29.9<	41.6	
2	4	nodeRight	2400	12	300	7.7	-22.2	-27.2	G(50)	32.0	3	15.0	1.300	1.000	29.9<	41.6	
3	5	nodeLeft	2400	12	300	11.1	-27.8	5.7	G(50)	32.0	3	15.0	1.032	1.000	38.9>	33.0	0.49<1
3	5	nodeRight	2400	12	300	11.1	-27.8	5.7	G(50)	32.0	3	15.0	1.032	1.000	38.9>	33.0	0.49<1
4	6	nodeLeft	2400	12	300	12.1	-15.1	49.2	G(50)	32.0	3	15.0	1.000	1.000	27.2<	32.0	
4	6	nodeRight	2400	12	300	12.1	-15.1	49.2	G(50)	32.0	3	15.0	1.000	1.000	27.2<	32.0	
4	7	nodeLeft	2400	12	300	16.9	-2.6	101.0	G(50)	32.0	3	15.0	1.000	1.000	19.6<	32.0	
4	7	nodeRight	2400	12	300	16.9	-2.6	101.0	G(50)	32.0	3	15.0	1.000	1.000	19.6<	32.0	
5	8	nodeLeft	2400	12	300	9.6	-14.0	48.5	G(50)	32.0	3	15.0	1.000	1.000	23.6<	32.0	
5	8	nodeRight	2400	12	300	9.6	-14.0	48.5	G(50)	32.0	3	15.0	1.000	1.000	23.6<	32.0	
5	9	nodeLeft	2400	12	300	8.4	-26.8	-4.4	G(50)	32.0	3	15.0	1.217	1.000	35.2<	38.9	
5	9	nodeRight	2400	12	300	8.4	-26.8	-4.4	G(50)	32.0	3	15.0	1.217	1.000	35.2<	38.9	
6	10	nodeLeft	2400	12	300	5.1	-24.3	-37.7	G(50)	32.0	3	15.0	1.300	1.000	29.4<	41.6	
6	10	nodeRight	2400	12	300	5.1	-24.3	-37.7	G(50)	32.0	3	15.0	1.300	1.000	29.4<	41.6	
6	11	nodeLeft	2400	12	300	4.0	-21.8	-61.9	G(50)	32.0	3	15.0	1.300	1.000	25.8<	41.6	
6	11	nodeRight	2400	12	300	4.0	-21.8	-61.9	G(50)	32.0	3	15.0	1.300	1.000	25.8<	41.6	
7	12	nodeLeft	2400	12	300	2.8	-23.7	-65.3	G(50)	32.0	3	15.0	1.300	1.000	26.5<	41.6	
7	12	nodeRight	2400	12	300	2.8	-23.7	-65.3	G(50)	32.0	3	15.0	1.300	1.000	26.5<	41.6	
8	13	nodeLeft	2400	12	300	4.0	-21.8	-61.9	G(50)	32.0	3	15.0	1.300	1.000	25.8<	41.6	
8	13	nodeRight	2400	12	300	4.0	-21.8	-61.9	G(50)	32.0	3	15.0	1.300	1.000	25.8<	41.6	
8	14	nodeLeft	2400	12	300	5.1	-24.3	-37.7	G(50)	32.0	3	15.0	1.300	1.000	29.4<	41.6	
8	14	nodeRight	2400	12	300	5.1	-24.3	-37.7	G(50)	32.0	3	15.0	1.300	1.000	29.4<	41.6	
9	15	nodeLeft	2400	12	300	8.4	-26.8	-4.4	G(50)	32.0	3	15.0	1.217	1.000	35.2<	38.9	
9	15	nodeRight	2400	12	300	8.4	-26.8	-4.4	G(50)	32.0	3	15.0	1.217	1.000	35.2<	38.9	
9	16	nodeLeft	2400	12	300	9.6	-14.0	48.5	G(50)	32.0	3	15.0	1.000	1.000	23.6<	32.0	
9	16	nodeRight	2400	12	300	9.6	-14.0	48.5	G(50)	32.0	3	15.0	1.000	1.000	23.6<	32.0	
10	17	nodeLeft	2400	12	300	16.9	-2.6	101.0	G(50)	32.0	3	15.0	1.000	1.000	19.6<	32.0	
10	17	nodeRight	2400	12	300	16.9	-2.6	101.0	G(50)	32.0	3	15.0	1.000	1.000	19.6<	32.0	
10	18	nodeLeft	2400	12	300	12.1	-15.1	49.2	G(50)	32.0	3	15.0	1.000	1.000	27.2<	32.0	
10	18	nodeRight	2400	12	300	12.1	-15.1	49.2	G(50)	32.0	3	15.0	1.000	1.000	27.2<	32.0	
11	19	nodeLeft	2400	12	300	11.1	-27.8	5.7	G(50)	32.0	3	15.0	1.032	1.000	38.9>	33.0	0.49<1
11	19	nodeRight	2400	12	300	11.1	-27.8	5.7	G(50)	32.0	3	15.0	1.032	1.000	38.9>	33.0	0.49<1
12	20	nodeLeft	2400	12	300	7.7	-22.2	-27.2	G(50)	32.0	3	15.0	1.300	1.000	29.9<	41.6	
12	20	nodeRight	2400	12	300	7.7	-22.2	-27.2	G(50)	32.0	3	15.0	1.300	1.000	29.9<	41.6	
12	21	nodeLeft	2400	12	300	5.1	-30.7	-32.0	G(50)	32.0	3	15.0	1.300	1.000	35.8<	41.6	
12	21	nodeRight	2400	12	300	5.1	-30.7	-32.0	G(50)	32.0	3	15.0	1.300	1.000	35.8<	41.6	
13	22	nodeLeft	2400	12	300	2.6	-25.9	-23.0	G(50)	32.0	3	15.0	1.300	1.000	28.5<	41.6	
13	22	nodeRight	2400	12	300	2.6	-25.9	-23.0	G(50)	32.0	3	15.0	1.300	1.000	28.5<	41.6	
13	23	nodeLeft	2400	12	300	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

Steel I Girder G4

node POINT-L-1 (WebLower) WEB - 1

Sec	node		Web h (mm)	t	Grade	σtmax (N/mm2)	σtmin	σd	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	12	400	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	nodeLeft	2400	12	400	24.6	-2.4	21.8	G(50)	32.0	3	15.0	1.000	1.000	27.0<	32.0	
1	2	nodeRight	2400	12	400	24.6	-2.4	21.8	G(50)	32.0	3	15.0	1.000	1.000	27.0<	32.0	
2	3	nodeLeft	2400	12	400	29.1	-4.9	30.4	G(50)	32.0	3	15.0	1.000	1.000	34.0>	32.0	0.36<1
2	3	nodeRight	2400	12	400	29.1	-4.9	30.4	G(50)	32.0	3	15.0	1.000	1.000	34.0>	32.0	0.36<1
2	4	nodeLeft	2400	12	400	21.1	-7.3	25.8	G(50)	32.0	3	15.0	1.000	1.000	28.4<	32.0	
2	4	nodeRight	2400	12	400	21.1	-7.3	25.8	G(50)	32.0	3	15.0	1.000	1.000	28.4<	32.0	
3	5	nodeLeft	2400	12	400	23.1	-9.2	-4.8	G(50)	32.0	3	15.0	1.000	1.000	32.3>	32.0	0.31<1
3	5	nodeRight	2400	12	400	23.1	-9.2	-4.8	G(50)	32.0	3	15.0	1.000	1.000	32.3>	32.0	0.31<1
4	6	nodeLeft	2400	12	400	10.9	-8.8	-35.6	G(50)	32.0	3	15.0	1.300	1.000	19.7<	41.6	
4	6	nodeRight	2400	12	400	10.9	-8.8	-35.6	G(50)	32.0	3	15.0	1.300	1.000	19.7<	41.6	
4	7	nodeLeft	2400	12	400	1.9	-12.2	-73.1	G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6	
4	7	nodeRight	2400	12	400	1.9	-12.2	-73.1	G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6	
5	8	nodeLeft	2400	12	400	11.7	-8.0	-40.4	G(50)	32.0	3	15.0	1.300	1.000	19.6<	41.6	
5	8	nodeRight	2400	12	400	11.7	-8.0	-40.4	G(50)	32.0	3	15.0	1.300	1.000	19.6<	41.6	
5	9	nodeLeft	2400	12	400	22.4	-7.0	3.6	G(50)	32.0	3	15.0	1.000	1.000	29.3<	32.0	
5	9	nodeRight	2400	12	400	22.4	-7.0	3.6	G(50)	32.0	3	15.0	1.000	1.000	29.3<	32.0	
6	10	nodeLeft	2400	12	400	26.1	-5.5	40.4	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
6	10	nodeRight	2400	12	400	26.1	-5.5	40.4	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
6	11	nodeLeft	2400	12	400	23.4	-4.3	66.4	G(50)	32.0	3	15.0	1.000	1.000	27.7<	32.0	
6	11	nodeRight	2400	12	400	23.4	-4.3	66.4	G(50)	32.0	3	15.0	1.000	1.000	27.7<	32.0	
7	12	nodeLeft	2400	12	400	25.4	-3.0	70.0	G(50)	32.0	3	15.0	1.000	1.000	28.4<	32.0	
7	12	nodeRight	2400	12	400	25.4	-3.0	70.0	G(50)	32.0	3	15.0	1.000	1.000	28.4<	32.0	
8	13	nodeLeft	2400	12	400	23.4	-4.3	66.4	G(50)	32.0	3	15.0	1.000	1.000	27.7<	32.0	
8	13	nodeRight	2400	12	400	23.4	-4.3	66.4	G(50)	32.0	3	15.0	1.000	1.000	27.7<	32.0	
8	14	nodeLeft	2400	12	400	26.1	-5.5	40.4	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
8	14	nodeRight	2400	12	400	26.1	-5.5	40.4	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
9	15	nodeLeft	2400	12	400	22.4	-7.0	3.6	G(50)	32.0	3	15.0	1.000	1.000	29.3<	32.0	
9	15	nodeRight	2400	12	400	22.4	-7.0	3.6	G(50)	32.0	3	15.0	1.000	1.000	29.3<	32.0	
9	16	nodeLeft	2400	12	400	11.7	-8.0	-40.4	G(50)	32.0	3	15.0	1.300	1.000	19.6<	41.6	
9	16	nodeRight	2400	12	400	11.7	-8.0	-40.4	G(50)	32.0	3	15.0	1.300	1.000	19.6<	41.6	
10	17	nodeLeft	2400	12	400	1.9	-12.2	-73.1	G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6	
10	17	nodeRight	2400	12	400	1.9	-12.2	-73.1	G(50)	32.0	3	15.0	1.300	1.000	14.2<	41.6	
10	18	nodeLeft	2400	12	400	10.9	-8.8	-35.6	G(50)	32.0	3	15.0	1.300	1.000	19.7<	41.6	
10	18	nodeRight	2400	12	400	10.9	-8.8	-35.6	G(50)	32.0	3	15.0	1.300	1.000	19.7<	41.6	
11	19	nodeLeft	2400	12	400	23.1	-9.2	-4.8	G(50)	32.0	3	15.0	1.000	1.000	32.3>	32.0	0.31<1
11	19	nodeRight	2400	12	400	23.1	-9.2	-4.8	G(50)	32.0	3	15.0	1.000	1.000	32.3>	32.0	0.31<1
12	20	nodeLeft	2400	12	400	21.1	-7.3	25.8	G(50)	32.0	3	15.0	1.000	1.000	28.4<	32.0	
12	20	nodeRight	2400	12	400	21.1	-7.3	25.8	G(50)	32.0	3	15.0	1.000	1.000	28.4<	32.0	
12	21	nodeLeft	2400	12	400	29.1	-4.9	30.4	G(50)	32.0	3	15.0	1.000	1.000	34.0>	32.0	0.36<1
12	21	nodeRight	2400	12	400	29.1	-4.9	30.4	G(50)	32.0	3	15.0	1.000	1.000	34.0>	32.0	0.36<1
13	22	nodeLeft	2400	12	400	24.6	-2.4	21.8	G(50)	32.0	3	15.0	1.000	1.000	27.0<	32.0	
13	22	nodeRight	2400	12	400	24.6	-2.4	21.8	G(50)	32.0	3	15.0	1.000	1.000	27.0<	32.0	
13	23	nodeLeft	2400	12	400	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

5. G5

node　U.FLG-MAX (UpperFlangeStress MAx)

Sec	node		Flange t (mm)	σtmax	σtmin (N/mm2)	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)		Δσce・CR・Ct (N/mm2)	Stress Cycle D
1	1	nodeRight	22	0.0	0.0	0.0	F	(65)	46.0	3	21.0	1.300	1.000	0.0	<	59.8	
1	2	nodeLeft	22	4.9	-19.4	-43.5	F	(65)	46.0	3	21.0	1.300	1.000	24.3	<	59.8	
1	2	nodeRight	22	4.9	-19.4	-43.5	F	(65)	46.0	3	21.0	1.300	1.000	24.3	<	59.8	
2	3	nodeLeft	22	9.9	-33.9	-54.2	F	(65)	46.0	3	21.0	1.300	1.000	43.8	<	59.8	
2	3	nodeRight	22	9.9	-33.9	-54.2	F	(65)	46.0	3	21.0	1.300	1.000	43.8	<	59.8	
2	4	nodeLeft	22	14.8	-40.7	-32.1	F	(65)	46.0	3	21.0	1.300	1.000	55.5	<	59.8	
2	4	nodeRight	22	14.8	-40.7	-32.1	F	(65)	46.0	3	21.0	1.300	1.000	55.5	<	59.8	
3	5	nodeLeft	20	20.6	-27.2	9.7	F	(65)	46.0	3	21.0	1.000	1.000	47.8	>	46.0	0.46 < 1
3	5	nodeRight	20	20.6	-27.2	9.7	F	(65)	46.0	3	21.0	1.000	1.000	47.8	>	46.0	0.46 < 1
4	6	nodeLeft	31	18.6	-8.5	61.7	F	(65)	46.0	3	21.0	1.000	0.948	27.2	<	43.6	
4	6	nodeRight	31	18.6	-8.5	61.7	F	(65)	46.0	3	21.0	1.000	0.948	27.2	<	43.6	
4	7	nodeLeft	31	22.1	-4.4	132.9	F	(65)	46.0	3	21.0	1.000	0.948	26.5	<	43.6	
4	7	nodeRight	31	22.1	-4.4	132.9	F	(65)	46.0	3	21.0	1.000	0.948	26.5	<	43.6	
5	8	nodeLeft	19	16.8	-8.7	76.2	F	(65)	46.0	3	21.0	1.000	1.000	25.5	<	46.0	
5	8	nodeRight	19	16.8	-8.7	76.2	F	(65)	46.0	3	21.0	1.000	1.000	25.5	<	46.0	
5	9	nodeLeft	19	14.2	-20.6	-10.6	F	(65)	46.0	3	21.0	1.223	1.000	34.8	<	56.3	
5	9	nodeRight	19	14.2	-20.6	-10.6	F	(65)	46.0	3	21.0	1.223	1.000	34.8	<	56.3	
6	10	nodeLeft	26	10.0	-30.1	-59.4	F	(65)	46.0	3	21.0	1.300	0.990	40.1	<	59.2	
6	10	nodeRight	26	10.0	-30.1	-59.4	F	(65)	46.0	3	21.0	1.300	0.990	40.1	<	59.2	
6	11	nodeLeft	26	8.2	-41.0	-86.0	F	(65)	46.0	3	21.0	1.300	0.990	49.3	<	59.2	
6	11	nodeRight	26	8.2	-41.0	-86.0	F	(65)	46.0	3	21.0	1.300	0.990	49.3	<	59.2	
7	12	nodeLeft	26	5.7	-42.4	-95.5	F	(65)	46.0	3	21.0	1.300	0.990	48.1	<	59.2	
7	12	nodeRight	26	5.7	-42.4	-95.5	F	(65)	46.0	3	21.0	1.300	0.990	48.1	<	59.2	
8	13	nodeLeft	26	8.2	-41.0	-86.0	F	(65)	46.0	3	21.0	1.300	0.990	49.3	<	59.2	
8	13	nodeRight	26	8.2	-41.0	-86.0	F	(65)	46.0	3	21.0	1.300	0.990	49.3	<	59.2	
8	14	nodeLeft	26	10.0	-30.1	-59.4	F	(65)	46.0	3	21.0	1.300	0.990	40.1	<	59.2	
8	14	nodeRight	26	10.0	-30.1	-59.4	F	(65)	46.0	3	21.0	1.300	0.990	40.1	<	59.2	
9	15	nodeLeft	19	14.2	-20.6	-10.6	F	(65)	46.0	3	21.0	1.223	1.000	34.8	<	56.3	
9	15	nodeRight	19	14.2	-20.6	-10.6	F	(65)	46.0	3	21.0	1.223	1.000	34.8	<	56.3	
9	16	nodeLeft	19	16.8	-8.7	76.2	F	(65)	46.0	3	21.0	1.000	1.000	25.5	<	46.0	
9	16	nodeRight	19	16.8	-8.7	76.2	F	(65)	46.0	3	21.0	1.000	1.000	25.5	<	46.0	
10	17	nodeLeft	31	22.1	-4.4	132.9	F	(65)	46.0	3	21.0	1.000	0.948	26.5	<	43.6	
10	17	nodeRight	31	22.1	-4.4	132.9	F	(65)	46.0	3	21.0	1.000	0.948	26.5	<	43.6	
10	18	nodeLeft	31	18.6	-8.5	61.7	F	(65)	46.0	3	21.0	1.000	0.948	27.2	<	43.6	
10	18	nodeRight	31	18.6	-8.5	61.7	F	(65)	46.0	3	21.0	1.000	0.948	27.2	<	43.6	
11	19	nodeLeft	20	20.6	-27.2	9.7	F	(65)	46.0	3	21.0	1.000	1.000	47.8	>	46.0	0.46 < 1
11	19	nodeRight	20	20.6	-27.2	9.7	F	(65)	46.0	3	21.0	1.000	1.000	47.8	>	46.0	0.46 < 1
12	20	nodeLeft	22	14.8	-40.7	-32.1	F	(65)	46.0	3	21.0	1.300	1.000	55.5	<	59.8	
12	20	nodeRight	22	14.8	-40.7	-32.1	F	(65)	46.0	3	21.0	1.300	1.000	55.5	<	59.8	
12	21	nodeLeft	22	9.9	-33.9	-54.2	F	(65)	46.0	3	21.0	1.300	1.000	43.8	<	59.8	
12	21	nodeRight	22	9.9	-33.9	-54.2	F	(65)	46.0	3	21.0	1.300	1.000	43.8	<	59.8	
13	22	nodeLeft	22	4.9	-19.4	-43.5	F	(65)	46.0	3	21.0	1.300	1.000	24.3	<	59.8	
13	22	nodeRight	22	4.9	-19.4	-43.5	F	(65)	46.0	3	21.0	1.300	1.000	24.3	<	59.8	
13	23	nodeLeft	22	0.0	0.0	0.0	F	(65)	46.0	3	21.0	1.300	1.000	0.0	<	59.8	

Steel I Girder G5

node　L.FLG-MAX (LowerFlangeStress MAx)

Sec	node		Flange t (mm)	σtmax	σtmin (N/mm2)	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct (N/mm2)	Stress Cycle D
1	1	nodeRight	19	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
1	2	nodeLeft	19	20.7	-5.3	46.4	D	(100)	84.0	3	39.0	1.000	1.000	26.0	< 84.0	
1	2	nodeRight	19	20.7	-5.3	46.4	D	(100)	84.0	3	39.0	1.000	1.000	26.0	< 84.0	
2	3	nodeLeft	19	36.2	-10.5	57.8	D	(100)	84.0	3	39.0	1.000	1.000	46.8	< 84.0	
2	3	nodeRight	19	36.2	-10.5	57.8	D	(100)	84.0	3	39.0	1.000	1.000	46.8	< 84.0	
2	4	nodeLeft	19	43.4	-15.8	34.2	D	(100)	84.0	3	39.0	1.000	1.000	59.3	< 84.0	
2	4	nodeRight	19	43.4	-15.8	34.2	D	(100)	84.0	3	39.0	1.000	1.000	59.3	< 84.0	
3	5	nodeLeft	23	25.5	-19.4	-9.1	D	(100)	84.0	3	39.0	1.066	1.000	44.9	< 89.6	
3	5	nodeRight	23	25.5	-19.4	-9.1	D	(100)	84.0	3	39.0	1.066	1.000	44.9	< 89.6	
4	6	nodeLeft	39	7.5	-16.4	-54.2	D	(100)	84.0	3	39.0	1.300	0.895	23.9	< 97.7	
4	6	nodeRight	39	7.5	-16.4	-54.2	D	(100)	84.0	3	39.0	1.300	0.895	23.9	< 97.7	
4	7	nodeLeft	39	3.9	-19.5	-116.8	D	(100)	84.0	3	39.0	1.300	0.895	23.3	< 97.7	
4	7	nodeRight	39	3.9	-19.5	-116.8	D	(100)	84.0	3	39.0	1.300	0.895	23.3	< 97.7	
5	8	nodeLeft	23	8.0	-15.4	-70.0	D	(100)	84.0	3	39.0	1.300	1.000	23.4	<109.2	
5	8	nodeRight	23	8.0	-15.4	-70.0	D	(100)	84.0	3	39.0	1.300	1.000	23.4	<109.2	
5	9	nodeLeft	23	18.9	-13.1	9.8	D	(100)	84.0	3	39.0	1.000	1.000	32.0	< 84.0	
5	9	nodeRight	23	18.9	-13.1	9.8	D	(100)	84.0	3	39.0	1.000	1.000	32.0	< 84.0	
6	10	nodeLeft	19	34.7	-11.6	68.7	D	(100)	84.0	3	39.0	1.000	1.000	46.3	< 84.0	
6	10	nodeRight	19	34.7	-11.6	68.7	D	(100)	84.0	3	39.0	1.000	1.000	46.3	< 84.0	
6	11	nodeLeft	19	47.4	-9.5	99.3	D	(100)	84.0	3	39.0	1.000	1.000	56.9	< 84.0	
6	11	nodeRight	19	47.4	-9.5	99.3	D	(100)	84.0	3	39.0	1.000	1.000	56.9	< 84.0	
7	12	nodeLeft	21	46.9	-6.3	105.6	D	(100)	84.0	3	39.0	1.000	1.000	53.2	< 84.0	
7	12	nodeRight	21	46.9	-6.3	105.6	D	(100)	84.0	3	39.0	1.000	1.000	53.2	< 84.0	
8	13	nodeLeft	19	47.4	-9.5	99.3	D	(100)	84.0	3	39.0	1.000	1.000	56.9	< 84.0	
8	13	nodeRight	19	47.4	-9.5	99.3	D	(100)	84.0	3	39.0	1.000	1.000	56.9	< 84.0	
8	14	nodeLeft	19	34.7	-11.6	68.7	D	(100)	84.0	3	39.0	1.000	1.000	46.3	< 84.0	
8	14	nodeRight	19	34.7	-11.6	68.7	D	(100)	84.0	3	39.0	1.000	1.000	46.3	< 84.0	
9	15	nodeLeft	23	18.9	-13.1	9.8	D	(100)	84.0	3	39.0	1.000	1.000	32.0	< 84.0	
9	15	nodeRight	23	18.9	-13.1	9.8	D	(100)	84.0	3	39.0	1.000	1.000	32.0	< 84.0	
9	16	nodeLeft	23	8.0	-15.4	-70.0	D	(100)	84.0	3	39.0	1.300	1.000	23.4	<109.2	
9	16	nodeRight	23	8.0	-15.4	-70.0	D	(100)	84.0	3	39.0	1.300	1.000	23.4	<109.2	
10	17	nodeLeft	39	3.9	-19.5	-116.8	D	(100)	84.0	3	39.0	1.300	0.895	23.3	< 97.7	
10	17	nodeRight	39	3.9	-19.5	-116.8	D	(100)	84.0	3	39.0	1.300	0.895	23.3	< 97.7	
10	18	nodeLeft	39	7.5	-16.4	-54.2	D	(100)	84.0	3	39.0	1.300	0.895	23.9	< 97.7	
10	18	nodeRight	39	7.5	-16.4	-54.2	D	(100)	84.0	3	39.0	1.300	0.895	23.9	< 97.7	
11	19	nodeLeft	23	25.5	-19.4	-9.1	D	(100)	84.0	3	39.0	1.066	1.000	44.9	< 89.6	
11	19	nodeRight	23	25.5	-19.4	-9.1	D	(100)	84.0	3	39.0	1.066	1.000	44.9	< 89.6	
12	20	nodeLeft	19	43.4	-15.8	34.2	D	(100)	84.0	3	39.0	1.000	1.000	59.3	< 84.0	
12	20	nodeRight	19	43.4	-15.8	34.2	D	(100)	84.0	3	39.0	1.000	1.000	59.3	< 84.0	
12	21	nodeLeft	19	36.2	-10.5	57.8	D	(100)	84.0	3	39.0	1.000	1.000	46.8	< 84.0	
12	21	nodeRight	19	36.2	-10.5	57.8	D	(100)	84.0	3	39.0	1.000	1.000	46.8	< 84.0	
13	22	nodeLeft	19	20.7	-5.3	46.4	D	(100)	84.0	3	39.0	1.000	1.000	26.0	< 84.0	
13	22	nodeRight	19	20.7	-5.3	46.4	D	(100)	84.0	3	39.0	1.000	1.000	26.0	< 84.0	
13	23	nodeLeft	19	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	

Steel I Girder G5

node WEB-U-1 (WebUpper edge) WEB - 1

Sec	node		Web h	Web t		σtmax	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax		Stress Cycle Δσce・CR・Ct	D
			(mm)			(N/mm2)									(N/mm2)			
1	1	nodeRight	2400	22	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0	<	80.6	
1	2	nodeLeft	2400	22	0	4.8	-19.0	-42.7	E(80)	62.0	3	29.0	1.300	1.000	23.9	<	80.6	
1	2	nodeRight	2400	22	0	4.8	-19.0	-42.7	E(80)	62.0	3	29.0	1.300	1.000	23.9	<	80.6	
2	3	nodeLeft	2400	22	0	9.7	-33.3	-53.2	E(80)	62.0	3	29.0	1.300	1.000	43.0	<	80.6	
2	3	nodeRight	2400	22	0	9.7	-33.3	-53.2	E(80)	62.0	3	29.0	1.300	1.000	43.0	<	80.6	
2	4	nodeLeft	2400	22	0	14.6	-39.9	-31.5	E(80)	62.0	3	29.0	1.300	1.000	54.5	<	80.6	
2	4	nodeRight	2400	22	0	14.6	-39.9	-31.5	E(80)	62.0	3	29.0	1.300	1.000	54.5	<	80.6	
3	5	nodeLeft	2400	20	0	20.3	-26.7	9.6	E(80)	62.0	3	29.0	1.000	1.000	47.0	<	62.0	
3	5	nodeRight	2400	20	0	20.3	-26.7	9.6	E(80)	62.0	3	29.0	1.000	1.000	47.0	<	62.0	
4	6	nodeLeft	2400	31	0	18.2	-8.3	60.2	E(80)	62.0	3	29.0	1.000	0.948	26.5	<	58.8	
4	6	nodeRight	2400	31	0	18.2	-8.3	60.2	E(80)	62.0	3	29.0	1.000	0.948	26.5	<	58.8	
4	7	nodeLeft	2400	31	0	21.6	-4.3	129.7	E(80)	62.0	3	29.0	1.000	0.948	25.9	<	58.8	
4	7	nodeRight	2400	31	0	21.6	-4.3	129.7	E(80)	62.0	3	29.0	1.000	0.948	25.9	<	58.8	
5	8	nodeLeft	2400	19	0	16.5	-8.6	75.1	E(80)	62.0	3	29.0	1.000	1.000	25.1	<	62.0	
5	8	nodeRight	2400	19	0	16.5	-8.6	75.1	E(80)	62.0	3	29.0	1.000	1.000	25.1	<	62.0	
5	9	nodeLeft	2400	19	0	14.0	-20.3	-10.5	E(80)	62.0	3	29.0	1.223	1.000	34.3	<	75.8	
5	9	nodeRight	2400	19	0	14.0	-20.3	-10.5	E(80)	62.0	3	29.0	1.223	1.000	34.3	<	75.8	
6	10	nodeLeft	2400	26	0	9.8	-29.4	-58.0	E(80)	62.0	3	29.0	1.300	0.990	39.2	<	79.8	
6	10	nodeRight	2400	26	0	9.8	-29.4	-58.0	E(80)	62.0	3	29.0	1.300	0.990	39.2	<	79.8	
6	11	nodeLeft	2400	26	0	8.0	-40.1	-84.0	E(80)	62.0	3	29.0	1.300	0.990	48.1	<	79.8	
6	11	nodeRight	2400	26	0	8.0	-40.1	-84.0	E(80)	62.0	3	29.0	1.300	0.990	48.1	<	79.8	
7	12	nodeLeft	2400	26	0	5.6	-41.5	-93.3	E(80)	62.0	3	29.0	1.300	0.990	47.0	<	79.8	
7	12	nodeRight	2400	26	0	5.6	-41.5	-93.3	E(80)	62.0	3	29.0	1.300	0.990	47.0	<	79.8	
8	13	nodeLeft	2400	26	0	8.0	-40.1	-84.0	E(80)	62.0	3	29.0	1.300	0.990	48.1	<	79.8	
8	13	nodeRight	2400	26	0	8.0	-40.1	-84.0	E(80)	62.0	3	29.0	1.300	0.990	48.1	<	79.8	
8	14	nodeLeft	2400	26	0	9.8	-29.4	-58.0	E(80)	62.0	3	29.0	1.300	0.990	39.2	<	79.8	
8	14	nodeRight	2400	26	0	9.8	-29.4	-58.0	E(80)	62.0	3	29.0	1.300	0.990	39.2	<	79.8	
9	15	nodeLeft	2400	19	0	14.0	-20.3	-10.5	E(80)	62.0	3	29.0	1.223	1.000	34.3	<	75.8	
9	15	nodeRight	2400	19	0	14.0	-20.3	-10.5	E(80)	62.0	3	29.0	1.223	1.000	34.3	<	75.8	
9	16	nodeLeft	2400	19	0	16.5	-8.6	75.1	E(80)	62.0	3	29.0	1.000	1.000	25.1	<	62.0	
9	16	nodeRight	2400	19	0	16.5	-8.6	75.1	E(80)	62.0	3	29.0	1.000	1.000	25.1	<	62.0	
10	17	nodeLeft	2400	31	0	21.6	-4.3	129.7	E(80)	62.0	3	29.0	1.000	0.948	25.9	<	58.8	
10	17	nodeRight	2400	31	0	21.6	-4.3	129.7	E(80)	62.0	3	29.0	1.000	0.948	25.9	<	58.8	
10	18	nodeLeft	2400	31	0	18.2	-8.3	60.2	E(80)	62.0	3	29.0	1.000	0.948	26.5	<	58.8	
10	18	nodeRight	2400	31	0	18.2	-8.3	60.2	E(80)	62.0	3	29.0	1.000	0.948	26.5	<	58.8	
11	19	nodeLeft	2400	20	0	20.3	-26.7	9.6	E(80)	62.0	3	29.0	1.000	1.000	47.0	<	62.0	
11	19	nodeRight	2400	20	0	20.3	-26.7	9.6	E(80)	62.0	3	29.0	1.000	1.000	47.0	<	62.0	
12	20	nodeLeft	2400	22	0	14.6	-39.9	-31.5	E(80)	62.0	3	29.0	1.300	1.000	54.5	<	80.6	
12	20	nodeRight	2400	22	0	14.6	-39.9	-31.5	E(80)	62.0	3	29.0	1.300	1.000	54.5	<	80.6	
12	21	nodeLeft	2400	22	0	9.7	-33.3	-53.2	E(80)	62.0	3	29.0	1.300	1.000	43.0	<	80.6	
12	21	nodeRight	2400	22	0	9.7	-33.3	-53.2	E(80)	62.0	3	29.0	1.300	1.000	43.0	<	80.6	
13	22	nodeLeft	2400	22	0	4.8	-19.0	-42.7	E(80)	62.0	3	29.0	1.300	1.000	23.9	<	80.6	
13	22	nodeRight	2400	22	0	4.8	-19.0	-42.7	E(80)	62.0	3	29.0	1.300	1.000	23.9	<	80.6	
13	23	nodeLeft	2400	22	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0	<	80.6	

Steel I Girder G5

node WEB-L-1 (WebLower edge) WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	19	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
1	2	nodeLeft	2400	19	0	20.4	-5.2	45.7	E(80)	62.0	3	29.0	1.000	1.000	25.6<	62.0	
1	2	nodeRight	2400	19	0	20.4	-5.2	45.7	E(80)	62.0	3	29.0	1.000	1.000	25.6<	62.0	
2	3	nodeLeft	2400	19	0	35.7	-10.4	56.9	E(80)	62.0	3	29.0	1.000	1.000	46.0<	62.0	
2	3	nodeRight	2400	19	0	35.7	-10.4	56.9	E(80)	62.0	3	29.0	1.000	1.000	46.0<	62.0	
2	4	nodeLeft	2400	19	0	42.8	-15.6	33.7	E(80)	62.0	3	29.0	1.000	1.000	58.4<	62.0	
2	4	nodeRight	2400	19	0	42.8	-15.6	33.7	E(80)	62.0	3	29.0	1.000	1.000	58.4<	62.0	
3	5	nodeLeft	2400	23	0	25.0	-19.0	-8.9	E(80)	62.0	3	29.0	1.066	1.000	44.0<	66.1	
3	5	nodeRight	2400	23	0	25.0	-19.0	-8.9	E(80)	62.0	3	29.0	1.066	1.000	44.0<	66.1	
4	6	nodeLeft	2400	39	0	7.3	-15.8	-52.4	E(80)	62.0	3	29.0	1.300	0.895	23.1<	72.1	
4	6	nodeRight	2400	39	0	7.3	-15.8	-52.4	E(80)	62.0	3	29.0	1.300	0.895	23.1<	72.1	
4	7	nodeLeft	2400	39	0	3.7	-18.8	-112.8	E(80)	62.0	3	29.0	1.300	0.895	22.5<	72.1	
4	7	nodeRight	2400	39	0	3.7	-18.8	-112.8	E(80)	62.0	3	29.0	1.300	0.895	22.5<	72.1	
5	8	nodeLeft	2400	23	0	7.9	-15.1	-68.6	E(80)	62.0	3	29.0	1.300	1.000	23.0<	80.6	
5	8	nodeRight	2400	23	0	7.9	-15.1	-68.6	E(80)	62.0	3	29.0	1.300	1.000	23.0<	80.6	
5	9	nodeLeft	2400	23	0	18.5	-12.8	9.6	E(80)	62.0	3	29.0	1.000	1.000	31.3<	62.0	
5	9	nodeRight	2400	23	0	18.5	-12.8	9.6	E(80)	62.0	3	29.0	1.000	1.000	31.3<	62.0	
6	10	nodeLeft	2400	19	0	34.2	-11.4	67.7	E(80)	62.0	3	29.0	1.000	1.000	45.7<	62.0	
6	10	nodeRight	2400	19	0	34.2	-11.4	67.7	E(80)	62.0	3	29.0	1.000	1.000	45.7<	62.0	
6	11	nodeLeft	2400	19	0	46.7	-9.4	97.9	E(80)	62.0	3	29.0	1.000	1.000	56.1<	62.0	
6	11	nodeRight	2400	19	0	46.7	-9.4	97.9	E(80)	62.0	3	29.0	1.000	1.000	56.1<	62.0	
7	12	nodeLeft	2400	21	0	46.2	-6.2	103.9	E(80)	62.0	3	29.0	1.000	1.000	52.4<	62.0	
7	12	nodeRight	2400	21	0	46.2	-6.2	103.9	E(80)	62.0	3	29.0	1.000	1.000	52.4<	62.0	
8	13	nodeLeft	2400	19	0	46.7	-9.4	97.9	E(80)	62.0	3	29.0	1.000	1.000	56.1<	62.0	
8	13	nodeRight	2400	19	0	46.7	-9.4	97.9	E(80)	62.0	3	29.0	1.000	1.000	56.1<	62.0	
8	14	nodeLeft	2400	19	0	34.2	-11.4	67.7	E(80)	62.0	3	29.0	1.000	1.000	45.7<	62.0	
8	14	nodeRight	2400	19	0	34.2	-11.4	67.7	E(80)	62.0	3	29.0	1.000	1.000	45.7<	62.0	
9	15	nodeLeft	2400	23	0	18.5	-12.8	9.6	E(80)	62.0	3	29.0	1.000	1.000	31.3<	62.0	
9	15	nodeRight	2400	23	0	18.5	-12.8	9.6	E(80)	62.0	3	29.0	1.000	1.000	31.3<	62.0	
9	16	nodeLeft	2400	23	0	7.9	-15.1	-68.6	E(80)	62.0	3	29.0	1.300	1.000	23.0<	80.6	
9	16	nodeRight	2400	23	0	7.9	-15.1	-68.6	E(80)	62.0	3	29.0	1.300	1.000	23.0<	80.6	
10	17	nodeLeft	2400	39	0	3.7	-18.8	-112.8	E(80)	62.0	3	29.0	1.300	0.895	22.5<	72.1	
10	17	nodeRight	2400	39	0	3.7	-18.8	-112.8	E(80)	62.0	3	29.0	1.300	0.895	22.5<	72.1	
10	18	nodeLeft	2400	39	0	7.3	-15.8	-52.4	E(80)	62.0	3	29.0	1.300	0.895	23.1<	72.1	
10	18	nodeRight	2400	39	0	7.3	-15.8	-52.4	E(80)	62.0	3	29.0	1.300	0.895	23.1<	72.1	
11	19	nodeLeft	2400	23	0	25.0	-19.0	-8.9	E(80)	62.0	3	29.0	1.066	1.000	44.0<	66.1	
11	19	nodeRight	2400	23	0	25.0	-19.0	-8.9	E(80)	62.0	3	29.0	1.066	1.000	44.0<	66.1	
12	20	nodeLeft	2400	19	0	42.8	-15.6	33.7	E(80)	62.0	3	29.0	1.000	1.000	58.4<	62.0	
12	20	nodeRight	2400	19	0	42.8	-15.6	33.7	E(80)	62.0	3	29.0	1.000	1.000	58.4<	62.0	
12	21	nodeLeft	2400	19	0	35.7	-10.4	56.9	E(80)	62.0	3	29.0	1.000	1.000	46.0<	62.0	
12	21	nodeRight	2400	19	0	35.7	-10.4	56.9	E(80)	62.0	3	29.0	1.000	1.000	46.0<	62.0	
13	22	nodeLeft	2400	19	0	20.4	-5.2	45.7	E(80)	62.0	3	29.0	1.000	1.000	25.6<	62.0	
13	22	nodeRight	2400	19	0	20.4	-5.2	45.7	E(80)	62.0	3	29.0	1.000	1.000	25.6<	62.0	
13	23	nodeLeft	2400	19	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	

Steel I Girder G5

node HSTIFF-1 (WebH-Stiffener) WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)		Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	12	480	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0	<	41.6	
1	2	nodeLeft	2400	12	480	2.8	-11.1	-25.0	G(50)	32.0	3	15.0	1.300	1.000	14.0	<	41.6	
1	2	nodeRight	2400	12	480	2.8	-11.1	-25.0	G(50)	32.0	3	15.0	1.300	1.000	14.0	<	41.6	
2	3	nodeLeft	2400	12	480	5.7	-19.5	-31.1	G(50)	32.0	3	15.0	1.300	1.000	25.2	<	41.6	
2	3	nodeRight	2400	12	480	5.7	-19.5	-31.1	G(50)	32.0	3	15.0	1.300	1.000	25.2	<	41.6	
2	4	nodeLeft	2400	12	480	8.5	-23.4	-18.5	G(50)	32.0	3	15.0	1.300	1.000	31.9	<	41.6	
2	4	nodeRight	2400	12	480	8.5	-23.4	-18.5	G(50)	32.0	3	15.0	1.300	1.000	31.9	<	41.6	
3	5	nodeLeft	2400	12	480	12.4	-16.4	5.9	G(50)	32.0	3	15.0	1.000	1.000	28.8	<	32.0	
3	5	nodeRight	2400	12	480	12.4	-16.4	5.9	G(50)	32.0	3	15.0	1.000	1.000	28.8	<	32.0	
4	6	nodeLeft	2400	12	480	4.1	-9.0	-29.9	G(50)	32.0	3	15.0	1.300	1.000	13.1	<	41.6	
4	6	nodeRight	2400	12	480	4.1	-9.0	-29.9	G(50)	32.0	3	15.0	1.300	1.000	13.1	<	41.6	
4	7	nodeLeft	2400	12	480	2.1	-10.7	-64.3	G(50)	32.0	3	15.0	1.300	1.000	12.8	<	41.6	
4	7	nodeRight	2400	12	480	2.1	-10.7	-64.3	G(50)	32.0	3	15.0	1.300	1.000	12.8	<	41.6	
5	8	nodeLeft	2400	12	480	4.6	-8.8	-39.9	G(50)	32.0	3	15.0	1.300	1.000	13.4	<	41.6	
5	8	nodeRight	2400	12	480	4.6	-8.8	-39.9	G(50)	32.0	3	15.0	1.300	1.000	13.4	<	41.6	
5	9	nodeLeft	2400	12	480	8.7	-12.5	-6.5	G(50)	32.0	3	15.0	1.223	1.000	21.2	<	39.1	
5	9	nodeRight	2400	12	480	8.7	-12.5	-6.5	G(50)	32.0	3	15.0	1.223	1.000	21.2	<	39.1	
6	10	nodeLeft	2400	12	480	5.6	-16.6	-32.9	G(50)	32.0	3	15.0	1.300	1.000	22.2	<	41.6	
6	10	nodeRight	2400	12	480	5.6	-16.6	-32.9	G(50)	32.0	3	15.0	1.300	1.000	22.2	<	41.6	
6	11	nodeLeft	2400	12	480	4.6	-22.7	-47.6	G(50)	32.0	3	15.0	1.300	1.000	27.3	<	41.6	
6	11	nodeRight	2400	12	480	4.6	-22.7	-47.6	G(50)	32.0	3	15.0	1.300	1.000	27.3	<	41.6	
7	12	nodeLeft	2400	12	480	3.2	-24.0	-53.9	G(50)	32.0	3	15.0	1.300	1.000	27.2	<	41.6	
7	12	nodeRight	2400	12	480	3.2	-24.0	-53.9	G(50)	32.0	3	15.0	1.300	1.000	27.2	<	41.6	
8	13	nodeLeft	2400	12	480	4.6	-22.7	-47.6	G(50)	32.0	3	15.0	1.300	1.000	27.3	<	41.6	
8	13	nodeRight	2400	12	480	4.6	-22.7	-47.6	G(50)	32.0	3	15.0	1.300	1.000	27.3	<	41.6	
8	14	nodeLeft	2400	12	480	5.6	-16.6	-32.9	G(50)	32.0	3	15.0	1.300	1.000	22.2	<	41.6	
8	14	nodeRight	2400	12	480	5.6	-16.6	-32.9	G(50)	32.0	3	15.0	1.300	1.000	22.2	<	41.6	
9	15	nodeLeft	2400	12	480	8.7	-12.5	-6.5	G(50)	32.0	3	15.0	1.223	1.000	21.2	<	39.1	
9	15	nodeRight	2400	12	480	8.7	-12.5	-6.5	G(50)	32.0	3	15.0	1.223	1.000	21.2	<	39.1	
9	16	nodeLeft	2400	12	480	4.6	-8.8	-39.9	G(50)	32.0	3	15.0	1.300	1.000	13.4	<	41.6	
9	16	nodeRight	2400	12	480	4.6	-8.8	-39.9	G(50)	32.0	3	15.0	1.300	1.000	13.4	<	41.6	
10	17	nodeLeft	2400	12	480	2.1	-10.7	-64.3	G(50)	32.0	3	15.0	1.300	1.000	12.8	<	41.6	
10	17	nodeRight	2400	12	480	2.1	-10.7	-64.3	G(50)	32.0	3	15.0	1.300	1.000	12.8	<	41.6	
10	18	nodeLeft	2400	12	480	4.1	-9.0	-29.9	G(50)	32.0	3	15.0	1.300	1.000	13.1	<	41.6	
10	18	nodeRight	2400	12	480	4.1	-9.0	-29.9	G(50)	32.0	3	15.0	1.300	1.000	13.1	<	41.6	
11	19	nodeLeft	2400	12	480	12.4	-16.4	5.9	G(50)	32.0	3	15.0	1.000	1.000	28.8	<	32.0	
11	19	nodeRight	2400	12	480	12.4	-16.4	5.9	G(50)	32.0	3	15.0	1.000	1.000	28.8	<	32.0	
12	20	nodeLeft	2400	12	480	8.5	-23.4	-18.5	G(50)	32.0	3	15.0	1.300	1.000	31.9	<	41.6	
12	20	nodeRight	2400	12	480	8.5	-23.4	-18.5	G(50)	32.0	3	15.0	1.300	1.000	31.9	<	41.6	
12	21	nodeLeft	2400	12	480	5.7	-19.5	-31.1	G(50)	32.0	3	15.0	1.300	1.000	25.2	<	41.6	
12	21	nodeRight	2400	12	480	5.7	-19.5	-31.1	G(50)	32.0	3	15.0	1.300	1.000	25.2	<	41.6	
13	22	nodeLeft	2400	12	480	2.8	-11.1	-25.0	G(50)	32.0	3	15.0	1.300	1.000	14.0	<	41.6	
13	22	nodeRight	2400	12	480	2.8	-11.1	-25.0	G(50)	32.0	3	15.0	1.300	1.000	14.0	<	41.6	
13	23	nodeLeft	2400	12	480	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0	<	41.6	

Steel I Girder G5

node POINT-U-1 (WebUpper) WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	12	300	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	nodeLeft	2400	12	300	3.6	-14.1	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.7<	41.6	
1	2	nodeRight	2400	12	300	3.6	-14.1	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.7<	41.6	
2	3	nodeLeft	2400	12	300	7.2	-24.7	-39.4	G(50)	32.0	3	15.0	1.300	1.000	31.9<	41.6	
2	3	nodeRight	2400	12	300	7.2	-24.7	-39.4	G(50)	32.0	3	15.0	1.300	1.000	31.9<	41.6	
2	4	nodeLeft	2400	12	300	10.8	-29.6	-23.3	G(50)	32.0	3	15.0	1.300	1.000	40.4<	41.6	
2	4	nodeRight	2400	12	300	10.8	-29.6	-23.3	G(50)	32.0	3	15.0	1.300	1.000	40.4<	41.6	
3	5	nodeLeft	2400	12	300	15.4	-20.3	7.3	G(50)	32.0	3	15.0	1.000	1.000	35.7>	32.0	0.41<1
3	5	nodeRight	2400	12	300	15.4	-20.3	7.3	G(50)	32.0	3	15.0	1.000	1.000	35.7>	32.0	0.41<1
4	6	nodeLeft	2400	12	300	13.9	-6.4	46.2	G(50)	32.0	3	15.0	1.000	1.000	20.3<	32.0	
4	6	nodeRight	2400	12	300	13.9	-6.4	46.2	G(50)	32.0	3	15.0	1.000	1.000	20.3<	32.0	
4	7	nodeLeft	2400	12	300	16.6	-3.3	99.4	G(50)	32.0	3	15.0	1.000	1.000	19.9<	32.0	
4	7	nodeRight	2400	12	300	16.6	-3.3	99.4	G(50)	32.0	3	15.0	1.000	1.000	19.9<	32.0	
5	8	nodeLeft	2400	12	300	12.6	-6.5	57.1	G(50)	32.0	3	15.0	1.000	1.000	19.1<	32.0	
5	8	nodeRight	2400	12	300	12.6	-6.5	57.1	G(50)	32.0	3	15.0	1.000	1.000	19.1<	32.0	
5	9	nodeLeft	2400	12	300	10.7	-15.4	-8.0	G(50)	32.0	3	15.0	1.223	1.000	26.1<	39.1	
5	9	nodeRight	2400	12	300	10.7	-15.4	-8.0	G(50)	32.0	3	15.0	1.223	1.000	26.1<	39.1	
6	10	nodeLeft	2400	12	300	7.2	-21.4	-42.3	G(50)	32.0	3	15.0	1.300	1.000	28.6<	41.6	
6	10	nodeRight	2400	12	300	7.2	-21.4	-42.3	G(50)	32.0	3	15.0	1.300	1.000	28.6<	41.6	
6	11	nodeLeft	2400	12	300	5.9	-29.2	-61.2	G(50)	32.0	3	15.0	1.300	1.000	35.1<	41.6	
6	11	nodeRight	2400	12	300	5.9	-29.2	-61.2	G(50)	32.0	3	15.0	1.300	1.000	35.1<	41.6	
7	12	nodeLeft	2400	12	300	4.1	-30.5	-68.7	G(50)	32.0	3	15.0	1.300	1.000	34.6<	41.6	
7	12	nodeRight	2400	12	300	4.1	-30.5	-68.7	G(50)	32.0	3	15.0	1.300	1.000	34.6<	41.6	
8	13	nodeLeft	2400	12	300	5.9	-29.2	-61.2	G(50)	32.0	3	15.0	1.300	1.000	35.1<	41.6	
8	13	nodeRight	2400	12	300	5.9	-29.2	-61.2	G(50)	32.0	3	15.0	1.300	1.000	35.1<	41.6	
8	14	nodeLeft	2400	12	300	7.2	-21.4	-42.3	G(50)	32.0	3	15.0	1.300	1.000	28.6<	41.6	
8	14	nodeRight	2400	12	300	7.2	-21.4	-42.3	G(50)	32.0	3	15.0	1.300	1.000	28.6<	41.6	
9	15	nodeLeft	2400	12	300	10.7	-15.4	-8.0	G(50)	32.0	3	15.0	1.223	1.000	26.1<	39.1	
9	15	nodeRight	2400	12	300	10.7	-15.4	-8.0	G(50)	32.0	3	15.0	1.223	1.000	26.1<	39.1	
9	16	nodeLeft	2400	12	300	12.6	-6.5	57.1	G(50)	32.0	3	15.0	1.000	1.000	19.1<	32.0	
9	16	nodeRight	2400	12	300	12.6	-6.5	57.1	G(50)	32.0	3	15.0	1.000	1.000	19.1<	32.0	
10	17	nodeLeft	2400	12	300	16.6	-3.3	99.4	G(50)	32.0	3	15.0	1.000	1.000	19.9<	32.0	
10	17	nodeRight	2400	12	300	16.6	-3.3	99.4	G(50)	32.0	3	15.0	1.000	1.000	19.9<	32.0	
10	18	nodeLeft	2400	12	300	13.9	-6.4	46.2	G(50)	32.0	3	15.0	1.000	1.000	20.3<	32.0	
10	18	nodeRight	2400	12	300	13.9	-6.4	46.2	G(50)	32.0	3	15.0	1.000	1.000	20.3<	32.0	
11	19	nodeLeft	2400	12	300	15.4	-20.3	7.3	G(50)	32.0	3	15.0	1.000	1.000	35.7>	32.0	0.41<1
11	19	nodeRight	2400	12	300	15.4	-20.3	7.3	G(50)	32.0	3	15.0	1.000	1.000	35.7>	32.0	0.41<1
12	20	nodeLeft	2400	12	300	10.8	-29.6	-23.3	G(50)	32.0	3	15.0	1.300	1.000	40.4<	41.6	
12	20	nodeRight	2400	12	300	10.8	-29.6	-23.3	G(50)	32.0	3	15.0	1.300	1.000	40.4<	41.6	
12	21	nodeLeft	2400	12	300	7.2	-24.7	-39.4	G(50)	32.0	3	15.0	1.300	1.000	31.9<	41.6	
12	21	nodeRight	2400	12	300	7.2	-24.7	-39.4	G(50)	32.0	3	15.0	1.300	1.000	31.9<	41.6	
13	22	nodeLeft	2400	12	300	3.6	-14.1	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.7<	41.6	
13	22	nodeRight	2400	12	300	3.6	-14.1	-31.6	G(50)	32.0	3	15.0	1.300	1.000	17.7<	41.6	
13	23	nodeLeft	2400	12	300	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

Steel I Girder G5

node POINT-L-1 (WebLower) WEB - 1

Sec	node		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
1	1	nodeRight	2400	12	400	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
1	2	nodeLeft	2400	12	400	13.8	-3.5	31.0	G(50)	32.0	3	15.0	1.000	1.000	17.3<	32.0	
1	2	nodeRight	2400	12	400	13.8	-3.5	31.0	G(50)	32.0	3	15.0	1.000	1.000	17.3<	32.0	
2	3	nodeLeft	2400	12	400	24.2	-7.0	38.6	G(50)	32.0	3	15.0	1.000	1.000	31.2<	32.0	
2	3	nodeRight	2400	12	400	24.2	-7.0	38.6	G(50)	32.0	3	15.0	1.000	1.000	31.2<	32.0	
2	4	nodeLeft	2400	12	400	29.0	-10.6	22.9	G(50)	32.0	3	15.0	1.000	1.000	39.5>	32.0	0.57<1
2	4	nodeRight	2400	12	400	29.0	-10.6	22.9	G(50)	32.0	3	15.0	1.000	1.000	39.5>	32.0	0.57<1
3	5	nodeLeft	2400	12	400	16.4	-12.4	-5.9	G(50)	32.0	3	15.0	1.066	1.000	28.8<	34.1	
3	5	nodeRight	2400	12	400	16.4	-12.4	-5.9	G(50)	32.0	3	15.0	1.066	1.000	28.8<	34.1	
4	6	nodeLeft	2400	12	400	4.7	-10.1	-33.6	G(50)	32.0	3	15.0	1.300	1.000	14.8<	41.6	
4	6	nodeRight	2400	12	400	4.7	-10.1	-33.6	G(50)	32.0	3	15.0	1.300	1.000	14.8<	41.6	
4	7	nodeLeft	2400	12	400	2.4	-12.1	-72.4	G(50)	32.0	3	15.0	1.300	1.000	14.5<	41.6	
4	7	nodeRight	2400	12	400	2.4	-12.1	-72.4	G(50)	32.0	3	15.0	1.300	1.000	14.5<	41.6	
5	8	nodeLeft	2400	12	400	5.1	-9.8	-44.7	G(50)	32.0	3	15.0	1.300	1.000	15.0<	41.6	
5	8	nodeRight	2400	12	400	5.1	-9.8	-44.7	G(50)	32.0	3	15.0	1.300	1.000	15.0<	41.6	
5	9	nodeLeft	2400	12	400	12.0	-8.3	6.2	G(50)	32.0	3	15.0	1.000	1.000	20.4<	32.0	
5	9	nodeRight	2400	12	400	12.0	-8.3	6.2	G(50)	32.0	3	15.0	1.000	1.000	20.4<	32.0	
6	10	nodeLeft	2400	12	400	23.6	-7.9	46.7	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
6	10	nodeRight	2400	12	400	23.6	-7.9	46.7	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
6	11	nodeLeft	2400	12	400	32.3	-6.5	67.6	G(50)	32.0	3	15.0	1.000	1.000	38.7>	32.0	0.53<1
6	11	nodeRight	2400	12	400	32.3	-6.5	67.6	G(50)	32.0	3	15.0	1.000	1.000	38.7>	32.0	0.53<1
7	12	nodeLeft	2400	12	400	31.6	-4.2	71.0	G(50)	32.0	3	15.0	1.000	1.000	35.8>	32.0	0.42<1
7	12	nodeRight	2400	12	400	31.6	-4.2	71.0	G(50)	32.0	3	15.0	1.000	1.000	35.8>	32.0	0.42<1
8	13	nodeLeft	2400	12	400	32.3	-6.5	67.6	G(50)	32.0	3	15.0	1.000	1.000	38.7>	32.0	0.53<1
8	13	nodeRight	2400	12	400	32.3	-6.5	67.6	G(50)	32.0	3	15.0	1.000	1.000	38.7>	32.0	0.53<1
8	14	nodeLeft	2400	12	400	23.6	-7.9	46.7	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
8	14	nodeRight	2400	12	400	23.6	-7.9	46.7	G(50)	32.0	3	15.0	1.000	1.000	31.5<	32.0	
9	15	nodeLeft	2400	12	400	12.0	-8.3	6.2	G(50)	32.0	3	15.0	1.000	1.000	20.4<	32.0	
9	15	nodeRight	2400	12	400	12.0	-8.3	6.2	G(50)	32.0	3	15.0	1.000	1.000	20.4<	32.0	
9	16	nodeLeft	2400	12	400	5.1	-9.8	-44.7	G(50)	32.0	3	15.0	1.300	1.000	15.0<	41.6	
9	16	nodeRight	2400	12	400	5.1	-9.8	-44.7	G(50)	32.0	3	15.0	1.300	1.000	15.0<	41.6	
10	17	nodeLeft	2400	12	400	2.4	-12.1	-72.4	G(50)	32.0	3	15.0	1.300	1.000	14.5<	41.6	
10	17	nodeRight	2400	12	400	2.4	-12.1	-72.4	G(50)	32.0	3	15.0	1.300	1.000	14.5<	41.6	
10	18	nodeLeft	2400	12	400	4.7	-10.1	-33.6	G(50)	32.0	3	15.0	1.300	1.000	14.8<	41.6	
10	18	nodeRight	2400	12	400	4.7	-10.1	-33.6	G(50)	32.0	3	15.0	1.300	1.000	14.8<	41.6	
11	19	nodeLeft	2400	12	400	16.4	-12.4	-5.9	G(50)	32.0	3	15.0	1.066	1.000	28.8<	34.1	
11	19	nodeRight	2400	12	400	16.4	-12.4	-5.9	G(50)	32.0	3	15.0	1.066	1.000	28.8<	34.1	
12	20	nodeLeft	2400	12	400	29.0	-10.6	22.9	G(50)	32.0	3	15.0	1.000	1.000	39.5>	32.0	0.57<1
12	20	nodeRight	2400	12	400	29.0	-10.6	22.9	G(50)	32.0	3	15.0	1.000	1.000	39.5>	32.0	0.57<1
12	21	nodeLeft	2400	12	400	24.2	-7.0	38.6	G(50)	32.0	3	15.0	1.000	1.000	31.2<	32.0	
12	21	nodeRight	2400	12	400	24.2	-7.0	38.6	G(50)	32.0	3	15.0	1.000	1.000	31.2<	32.0	
13	22	nodeLeft	2400	12	400	13.8	-3.5	31.0	G(50)	32.0	3	15.0	1.000	1.000	17.3<	32.0	
13	22	nodeRight	2400	12	400	13.8	-3.5	31.0	G(50)	32.0	3	15.0	1.000	1.000	17.3<	32.0	
13	23	nodeLeft	2400	12	400	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

8-2 Checking of Fatigue Stress for Cross Beam

σtmax : Maximum stress (Including the effect of γa)
σtmin : Minimum stress (Including the effect of γa)
σd : Stress of Dead load (Including the effect of γa)
Δσmax : σtmax－σtmin
C0 : 2.0E+6・Δσf**m
Δσf : 2.0E+6 Allowable stress
m : Slope constant
CR : Correction coefficient for mean stress
Ct : Correction factor for t

Structural analysis coefficient Cross Beam γa = 0.500

Maximum stress range checking Δσmax≦Δσce・CR・Ct

Stress range cycles checking D=Σi[Σj{nti/(C0・(CR・Ct)**m/Δσij**m)}] ≦1

Node U.FLG-MAX (UpperFlange Stress MAx)

Node	Panel		Flange t (mm)	σtmax	σtmin (N/mm2)	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)		Δσce・CR・Ct (N/mm2)	Stress Cycle D
C1	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
C1	1	BeamRight	10	3.9	-14.5	24.7	D	(100)	84.0	3	39.0	1.000	1.000	18.3	<	84.0	
C1	2	BeamLeft	10	3.9	-14.5	24.7	D	(100)	84.0	3	39.0	1.000	1.000	18.3	<	84.0	
C1	2	BeamRight	10	1.0	-0.6	15.1	D	(100)	84.0	3	39.0	1.000	1.000	1.5	<	84.0	
C1	3	BeamLeft	10	1.0	-0.6	15.1	D	(100)	84.0	3	39.0	1.000	1.000	1.5	<	84.0	
C1	3	BeamRight	10	3.9	-14.5	24.7	D	(100)	84.0	3	39.0	1.000	1.000	18.3	<	84.0	
C1	4	BeamLeft	10	3.9	-14.5	24.7	D	(100)	84.0	3	39.0	1.000	1.000	18.3	<	84.0	
C1	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
C2	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
C2	1	BeamRight	10	4.1	-15.6	18.6	D	(100)	84.0	3	39.0	1.000	1.000	19.7	<	84.0	
C2	2	BeamLeft	10	4.1	-15.6	18.6	D	(100)	84.0	3	39.0	1.000	1.000	19.7	<	84.0	
C2	2	BeamRight	10	2.3	-1.2	3.2	D	(100)	84.0	3	39.0	1.000	1.000	3.5	<	84.0	
C2	3	BeamLeft	10	2.3	-1.2	3.2	D	(100)	84.0	3	39.0	1.000	1.000	3.5	<	84.0	
C2	3	BeamRight	10	4.1	-15.6	18.6	D	(100)	84.0	3	39.0	1.000	1.000	19.7	<	84.0	
C2	4	BeamLeft	10	4.1	-15.6	18.6	D	(100)	84.0	3	39.0	1.000	1.000	19.7	<	84.0	
C2	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
C3	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
C3	1	BeamRight	10	3.1	-9.1	4.9	D	(100)	84.0	3	39.0	1.000	1.000	12.2	<	84.0	
C3	2	BeamLeft	10	3.1	-9.1	4.9	D	(100)	84.0	3	39.0	1.000	1.000	12.2	<	84.0	
C3	2	BeamRight	10	1.7	-2.7	19.3	D	(100)	84.0	3	39.0	1.000	1.000	4.3	<	84.0	
C3	3	BeamLeft	10	1.7	-2.7	19.3	D	(100)	84.0	3	39.0	1.000	1.000	4.3	<	84.0	
C3	3	BeamRight	10	3.1	-9.1	4.9	D	(100)	84.0	3	39.0	1.000	1.000	12.2	<	84.0	
C3	4	BeamLeft	10	3.1	-9.1	4.9	D	(100)	84.0	3	39.0	1.000	1.000	12.2	<	84.0	
C3	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
C4	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
C4	1	BeamRight	10	4.1	-15.6	18.6	D	(100)	84.0	3	39.0	1.000	1.000	19.7	<	84.0	
C4	2	BeamLeft	10	4.1	-15.6	18.6	D	(100)	84.0	3	39.0	1.000	1.000	19.7	<	84.0	
C4	2	BeamRight	10	2.3	-1.2	3.2	D	(100)	84.0	3	39.0	1.000	1.000	3.5	<	84.0	
C4	3	BeamLeft	10	2.3	-1.2	3.2	D	(100)	84.0	3	39.0	1.000	1.000	3.5	<	84.0	
C4	3	BeamRight	10	4.1	-15.6	18.6	D	(100)	84.0	3	39.0	1.000	1.000	19.7	<	84.0	
C4	4	BeamLeft	10	4.1	-15.6	18.6	D	(100)	84.0	3	39.0	1.000	1.000	19.7	<	84.0	
C4	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
C5	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
C5	1	BeamRight	10	3.9	-14.5	24.7	D	(100)	84.0	3	39.0	1.000	1.000	18.3	<	84.0	
C5	2	BeamLeft	10	3.9	-14.5	24.7	D	(100)	84.0	3	39.0	1.000	1.000	18.3	<	84.0	
C5	2	BeamRight	10	1.0	-0.6	15.1	D	(100)	84.0	3	39.0	1.000	1.000	1.5	<	84.0	
C5	3	BeamLeft	10	1.0	-0.6	15.1	D	(100)	84.0	3	39.0	1.000	1.000	1.5	<	84.0	
C5	3	BeamRight	10	3.9	-14.5	24.7	D	(100)	84.0	3	39.0	1.000	1.000	18.3	<	84.0	
C5	4	BeamLeft	10	3.9	-14.5	24.7	D	(100)	84.0	3	39.0	1.000	1.000	18.3	<	84.0	
C5	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
PF12	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
PF12	1	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
PF12	2	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
PF12	2	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
PF12	3	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
PF12	3	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
PF12	4	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
PF12	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	
PF13	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<	109.2	

Node U.FLG-MAX (UpperFlange Stress MAx)

Panel			Flange				Grade								Δσce・	Stress Cycle
			t (mm)	σtmax	σtmin (N/mm2)	σd		(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	CR・Ct (N/mm2)	D
PF13	1	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF13	2	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF13	2	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF13	3	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF13	3	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF13	4	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF13	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	1	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	2	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	2	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	3	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	3	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	4	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	1	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	2	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	2	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	3	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	3	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	4	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	

Node L.FLG-MAX (LowerFlange Stress MAx)

Panel			Flange t (mm)	σtmax	σtmin (N/mm2)	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct (N/mm2)	Stress Cycle D
C1	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
C1	1	BeamRight	10	14.5	-3.9	-24.7	D	(100)	84.0	3	39.0	1.300	1.000	18.3	<109.2	
C1	2	BeamLeft	10	14.5	-3.9	-24.7	D	(100)	84.0	3	39.0	1.300	1.000	18.3	<109.2	
C1	2	BeamRight	10	0.6	-1.0	-15.1	D	(100)	84.0	3	39.0	1.300	1.000	1.5	<109.2	
C1	3	BeamLeft	10	0.6	-1.0	-15.1	D	(100)	84.0	3	39.0	1.300	1.000	1.5	<109.2	
C1	3	BeamRight	10	14.5	-3.9	-24.7	D	(100)	84.0	3	39.0	1.300	1.000	18.3	<109.2	
C1	4	BeamLeft	10	14.5	-3.9	-24.7	D	(100)	84.0	3	39.0	1.300	1.000	18.3	<109.2	
C1	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
C2	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
C2	1	BeamRight	10	15.6	-4.1	-18.6	D	(100)	84.0	3	39.0	1.300	1.000	19.7	<109.2	
C2	2	BeamLeft	10	15.6	-4.1	-18.6	D	(100)	84.0	3	39.0	1.300	1.000	19.7	<109.2	
C2	2	BeamRight	10	1.2	-2.3	-3.2	D	(100)	84.0	3	39.0	1.300	1.000	3.5	<109.2	
C2	3	BeamLeft	10	1.2	-2.3	-3.2	D	(100)	84.0	3	39.0	1.300	1.000	3.5	<109.2	
C2	3	BeamRight	10	15.6	-4.1	-18.6	D	(100)	84.0	3	39.0	1.300	1.000	19.7	<109.2	
C2	4	BeamLeft	10	15.6	-4.1	-18.6	D	(100)	84.0	3	39.0	1.300	1.000	19.7	<109.2	
C2	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
C3	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
C3	1	BeamRight	10	9.1	-3.1	-4.9	D	(100)	84.0	3	39.0	1.079	1.000	12.2	< 90.6	
C3	2	BeamLeft	10	9.1	-3.1	-4.9	D	(100)	84.0	3	39.0	1.079	1.000	12.2	< 90.6	
C3	2	BeamRight	10	2.7	-1.7	-19.3	D	(100)	84.0	3	39.0	1.300	1.000	4.3	<109.2	
C3	3	BeamLeft	10	2.7	-1.7	-19.3	D	(100)	84.0	3	39.0	1.300	1.000	4.3	<109.2	
C3	3	BeamRight	10	9.1	-3.1	-4.9	D	(100)	84.0	3	39.0	1.079	1.000	12.2	< 90.6	
C3	4	BeamLeft	10	9.1	-3.1	-4.9	D	(100)	84.0	3	39.0	1.079	1.000	12.2	< 90.6	
C3	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
C4	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
C4	1	BeamRight	10	15.6	-4.1	-18.6	D	(100)	84.0	3	39.0	1.300	1.000	19.7	<109.2	
C4	2	BeamLeft	10	15.6	-4.1	-18.6	D	(100)	84.0	3	39.0	1.300	1.000	19.7	<109.2	
C4	2	BeamRight	10	1.2	-2.3	-3.2	D	(100)	84.0	3	39.0	1.300	1.000	3.5	<109.2	
C4	3	BeamLeft	10	1.2	-2.3	-3.2	D	(100)	84.0	3	39.0	1.300	1.000	3.5	<109.2	
C4	3	BeamRight	10	15.6	-4.1	-18.6	D	(100)	84.0	3	39.0	1.300	1.000	19.7	<109.2	
C4	4	BeamLeft	10	15.6	-4.1	-18.6	D	(100)	84.0	3	39.0	1.300	1.000	19.7	<109.2	
C4	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
C5	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
C5	1	BeamRight	10	14.5	-3.9	-24.7	D	(100)	84.0	3	39.0	1.300	1.000	18.3	<109.2	
C5	2	BeamLeft	10	14.5	-3.9	-24.7	D	(100)	84.0	3	39.0	1.300	1.000	18.3	<109.2	
C5	2	BeamRight	10	0.6	-1.0	-15.1	D	(100)	84.0	3	39.0	1.300	1.000	1.5	<109.2	
C5	3	BeamLeft	10	0.6	-1.0	-15.1	D	(100)	84.0	3	39.0	1.300	1.000	1.5	<109.2	
C5	3	BeamRight	10	14.5	-3.9	-24.7	D	(100)	84.0	3	39.0	1.300	1.000	18.3	<109.2	
C5	4	BeamLeft	10	14.5	-3.9	-24.7	D	(100)	84.0	3	39.0	1.300	1.000	18.3	<109.2	
C5	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF12	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF12	1	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF12	2	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF12	2	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF12	3	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF12	3	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF12	4	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF12	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF13	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF13	1	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	

Node　　L.FLG-MAX (LowerFlange Stress MAx)

Panel			Flange t (mm)	σtmax (N/mm2)	σtmin (N/mm2)	σd	Grade	(Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct (N/mm2)	Stress Cycle D
PF13	2	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF13	2	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF13	3	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF13	3	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF13	4	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
PF13	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	1	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	2	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	2	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	3	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	3	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	4	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S1	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	1	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	1	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	2	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	2	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	3	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	3	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	4	BeamLeft	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	
S2	4	BeamRight	10	0.0	0.0	0.0	D	(100)	84.0	3	39.0	1.300	1.000	0.0	<109.2	

Node WEB-U-1 (WebUpperEdge) WEB - 1

	Panel		Web h	t		σtmax	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax	Δσce・CR・Ct	Stress Cycle D
			(mm)			(N/mm2)									(N/mm2)		
C1	1	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C1	1	BeamRight	1880	10	0	3.8	-14.3	24.4	E(80)	62.0	3	29.0	1.000	1.000	18.1<	62.0	
C1	2	BeamLeft	1880	10	0	3.8	-14.3	24.4	E(80)	62.0	3	29.0	1.000	1.000	18.1<	62.0	
C1	2	BeamRight	1880	10	0	1.0	-0.5	14.9	E(80)	62.0	3	29.0	1.000	1.000	1.5<	62.0	
C1	3	BeamLeft	1880	10	0	1.0	-0.5	14.9	E(80)	62.0	3	29.0	1.000	1.000	1.5<	62.0	
C1	3	BeamRight	1880	10	0	3.8	-14.3	24.4	E(80)	62.0	3	29.0	1.000	1.000	18.1<	62.0	
C1	4	BeamLeft	1880	10	0	3.8	-14.3	24.4	E(80)	62.0	3	29.0	1.000	1.000	18.1<	62.0	
C1	4	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C2	1	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C2	1	BeamRight	1880	10	0	4.0	-15.5	18.4	E(80)	62.0	3	29.0	1.000	1.000	19.5<	62.0	
C2	2	BeamLeft	1880	10	0	4.0	-15.5	18.4	E(80)	62.0	3	29.0	1.000	1.000	19.5<	62.0	
C2	2	BeamRight	1880	10	0	2.3	-1.2	3.2	E(80)	62.0	3	29.0	1.000	1.000	3.5<	62.0	
C2	3	BeamLeft	1880	10	0	2.3	-1.2	3.2	E(80)	62.0	3	29.0	1.000	1.000	3.5<	62.0	
C2	3	BeamRight	1880	10	0	4.0	-15.5	18.4	E(80)	62.0	3	29.0	1.000	1.000	19.5<	62.0	
C2	4	BeamLeft	1880	10	0	4.0	-15.5	18.4	E(80)	62.0	3	29.0	1.000	1.000	19.5<	62.0	
C2	4	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C3	1	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C3	1	BeamRight	1880	10	0	3.0	-9.0	4.9	E(80)	62.0	3	29.0	1.000	1.000	12.0<	62.0	
C3	2	BeamLeft	1880	10	0	3.0	-9.0	4.9	E(80)	62.0	3	29.0	1.000	1.000	12.0<	62.0	
C3	2	BeamRight	1880	10	0	1.6	-2.6	19.1	E(80)	62.0	3	29.0	1.000	1.000	4.3<	62.0	
C3	3	BeamLeft	1880	10	0	1.6	-2.6	19.1	E(80)	62.0	3	29.0	1.000	1.000	4.3<	62.0	
C3	3	BeamRight	1880	10	0	3.0	-9.0	4.9	E(80)	62.0	3	29.0	1.000	1.000	12.0<	62.0	
C3	4	BeamLeft	1880	10	0	3.0	-9.0	4.9	E(80)	62.0	3	29.0	1.000	1.000	12.0<	62.0	
C3	4	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C4	1	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C4	1	BeamRight	1880	10	0	4.0	-15.5	18.4	E(80)	62.0	3	29.0	1.000	1.000	19.5<	62.0	
C4	2	BeamLeft	1880	10	0	4.0	-15.5	18.4	E(80)	62.0	3	29.0	1.000	1.000	19.5<	62.0	
C4	2	BeamRight	1880	10	0	2.3	-1.2	3.2	E(80)	62.0	3	29.0	1.000	1.000	3.5<	62.0	
C4	3	BeamLeft	1880	10	0	2.3	-1.2	3.2	E(80)	62.0	3	29.0	1.000	1.000	3.5<	62.0	
C4	3	BeamRight	1880	10	0	4.0	-15.5	18.4	E(80)	62.0	3	29.0	1.000	1.000	19.5<	62.0	
C4	4	BeamLeft	1880	10	0	4.0	-15.5	18.4	E(80)	62.0	3	29.0	1.000	1.000	19.5<	62.0	
C4	4	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C5	1	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C5	1	BeamRight	1880	10	0	3.8	-14.3	24.4	E(80)	62.0	3	29.0	1.000	1.000	18.1<	62.0	
C5	2	BeamLeft	1880	10	0	3.8	-14.3	24.4	E(80)	62.0	3	29.0	1.000	1.000	18.1<	62.0	
C5	2	BeamRight	1880	10	0	1.0	-0.5	14.9	E(80)	62.0	3	29.0	1.000	1.000	1.5<	62.0	
C5	3	BeamLeft	1880	10	0	1.0	-0.5	14.9	E(80)	62.0	3	29.0	1.000	1.000	1.5<	62.0	
C5	3	BeamRight	1880	10	0	3.8	-14.3	24.4	E(80)	62.0	3	29.0	1.000	1.000	18.1<	62.0	
C5	4	BeamLeft	1880	10	0	3.8	-14.3	24.4	E(80)	62.0	3	29.0	1.000	1.000	18.1<	62.0	
C5	4	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	1	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	1	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	2	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	2	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	3	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	3	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	4	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	4	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF13	1	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF13	1	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF13	2	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	

Node WEB-U-1 (WebUpperEdge) WEB - 1

Panel		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
PF13	2 BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF13	3 BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF13	3 BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF13	4 BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF13	4 BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	1 BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	1 BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	2 BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	2 BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	3 BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	3 BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	4 BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	4 BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	1 BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	1 BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	2 BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	2 BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	3 BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	3 BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	4 BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	4 BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	

Node WEB-L-1 (WebLowerEdge) WEB - 1

Node	Panel		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
C1	1	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C1	1	BeamRight	1880	10	0	14.3	-3.8	-24.4	E(80)	62.0	3	29.0	1.300	1.000	18.1<	80.6	
C1	2	BeamLeft	1880	10	0	14.3	-3.8	-24.4	E(80)	62.0	3	29.0	1.300	1.000	18.1<	80.6	
C1	2	BeamRight	1880	10	0	0.5	-1.0	-14.9	E(80)	62.0	3	29.0	1.300	1.000	1.5<	80.6	
C1	3	BeamLeft	1880	10	0	0.5	-1.0	-14.9	E(80)	62.0	3	29.0	1.300	1.000	1.5<	80.6	
C1	3	BeamRight	1880	10	0	14.3	-3.8	-24.4	E(80)	62.0	3	29.0	1.300	1.000	18.1<	80.6	
C1	4	BeamLeft	1880	10	0	14.3	-3.8	-24.4	E(80)	62.0	3	29.0	1.300	1.000	18.1<	80.6	
C1	4	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C2	1	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C2	1	BeamRight	1880	10	0	15.5	-4.0	-18.4	E(80)	62.0	3	29.0	1.300	1.000	19.5<	80.6	
C2	2	BeamLeft	1880	10	0	15.5	-4.0	-18.4	E(80)	62.0	3	29.0	1.300	1.000	19.5<	80.6	
C2	2	BeamRight	1880	10	0	1.2	-2.3	-3.2	E(80)	62.0	3	29.0	1.300	1.000	3.5<	80.6	
C2	3	BeamLeft	1880	10	0	1.2	-2.3	-3.2	E(80)	62.0	3	29.0	1.300	1.000	3.5<	80.6	
C2	3	BeamRight	1880	10	0	15.5	-4.0	-18.4	E(80)	62.0	3	29.0	1.300	1.000	19.5<	80.6	
C2	4	BeamLeft	1880	10	0	15.5	-4.0	-18.4	E(80)	62.0	3	29.0	1.300	1.000	19.5<	80.6	
C2	4	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C3	1	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C3	1	BeamRight	1880	10	0	9.0	-3.0	-4.9	E(80)	62.0	3	29.0	1.079	1.000	12.0<	66.9	
C3	2	BeamLeft	1880	10	0	9.0	-3.0	-4.9	E(80)	62.0	3	29.0	1.079	1.000	12.0<	66.9	
C3	2	BeamRight	1880	10	0	2.6	-1.6	-19.1	E(80)	62.0	3	29.0	1.300	1.000	4.3<	80.6	
C3	3	BeamLeft	1880	10	0	2.6	-1.6	-19.1	E(80)	62.0	3	29.0	1.300	1.000	4.3<	80.6	
C3	3	BeamRight	1880	10	0	9.0	-3.0	-4.9	E(80)	62.0	3	29.0	1.079	1.000	12.0<	66.9	
C3	4	BeamLeft	1880	10	0	9.0	-3.0	-4.9	E(80)	62.0	3	29.0	1.079	1.000	12.0<	66.9	
C3	4	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C4	1	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C4	1	BeamRight	1880	10	0	15.5	-4.0	-18.4	E(80)	62.0	3	29.0	1.300	1.000	19.5<	80.6	
C4	2	BeamLeft	1880	10	0	15.5	-4.0	-18.4	E(80)	62.0	3	29.0	1.300	1.000	19.5<	80.6	
C4	2	BeamRight	1880	10	0	1.2	-2.3	-3.2	E(80)	62.0	3	29.0	1.300	1.000	3.5<	80.6	
C4	3	BeamLeft	1880	10	0	1.2	-2.3	-3.2	E(80)	62.0	3	29.0	1.300	1.000	3.5<	80.6	
C4	3	BeamRight	1880	10	0	15.5	-4.0	-18.4	E(80)	62.0	3	29.0	1.300	1.000	19.5<	80.6	
C4	4	BeamLeft	1880	10	0	15.5	-4.0	-18.4	E(80)	62.0	3	29.0	1.300	1.000	19.5<	80.6	
C4	4	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C5	1	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
C5	1	BeamRight	1880	10	0	14.3	-3.8	-24.4	E(80)	62.0	3	29.0	1.300	1.000	18.1<	80.6	
C5	2	BeamLeft	1880	10	0	14.3	-3.8	-24.4	E(80)	62.0	3	29.0	1.300	1.000	18.1<	80.6	
C5	2	BeamRight	1880	10	0	0.5	-1.0	-14.9	E(80)	62.0	3	29.0	1.300	1.000	1.5<	80.6	
C5	3	BeamLeft	1880	10	0	0.5	-1.0	-14.9	E(80)	62.0	3	29.0	1.300	1.000	1.5<	80.6	
C5	3	BeamRight	1880	10	0	14.3	-3.8	-24.4	E(80)	62.0	3	29.0	1.300	1.000	18.1<	80.6	
C5	4	BeamLeft	1880	10	0	14.3	-3.8	-24.4	E(80)	62.0	3	29.0	1.300	1.000	18.1<	80.6	
C5	4	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	1	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	1	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	2	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	2	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	3	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	3	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	4	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF12	4	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF13	1	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF13	1	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF13	2	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	

Node WEB-L-1 (WebLowerEdge) WEB - 1

Panel			Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
PF13	2	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF13	3	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF13	3	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF13	4	BeamLeft	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
PF13	4	BeamRight	1880	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	1	BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	1	BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	2	BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	2	BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	3	BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	3	BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	4	BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S1	4	BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	1	BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	1	BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	2	BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	2	BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	3	BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	3	BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	4	BeamLeft	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	
S2	4	BeamRight	2080	10	0	0.0	0.0	0.0	E(80)	62.0	3	29.0	1.300	1.000	0.0<	80.6	

Node HSTIFF-1 (WebH-Stiffener) WEB - 1

Node	Panel		Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
C1	1	BeamLeft	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
C1	1	BeamRight	1880	9	376	8.6	-2.3	-14.7	G(50)	32.0	3	15.0	1.300	1.000	10.9<	41.6	
C1	2	BeamLeft	1880	9	376	8.6	-2.3	-14.7	G(50)	32.0	3	15.0	1.300	1.000	10.9<	41.6	
C1	2	BeamRight	1880	9	376	0.3	-0.6	-9.0	G(50)	32.0	3	15.0	1.300	1.000	0.9<	41.6	
C1	3	BeamLeft	1880	9	376	0.3	-0.6	-9.0	G(50)	32.0	3	15.0	1.300	1.000	0.9<	41.6	
C1	3	BeamRight	1880	9	376	8.6	-2.3	-14.7	G(50)	32.0	3	15.0	1.300	1.000	10.9<	41.6	
C1	4	BeamLeft	1880	9	376	8.6	-2.3	-14.7	G(50)	32.0	3	15.0	1.300	1.000	10.9<	41.6	
C1	4	BeamRight	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
C2	1	BeamLeft	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
C2	1	BeamRight	1880	9	376	9.3	-2.4	-11.1	G(50)	32.0	3	15.0	1.300	1.000	11.7<	41.6	
C2	2	BeamLeft	1880	9	376	9.3	-2.4	-11.1	G(50)	32.0	3	15.0	1.300	1.000	11.7<	41.6	
C2	2	BeamRight	1880	9	376	0.7	-1.4	-1.9	G(50)	32.0	3	15.0	1.300	1.000	2.1<	41.6	
C2	3	BeamLeft	1880	9	376	0.7	-1.4	-1.9	G(50)	32.0	3	15.0	1.300	1.000	2.1<	41.6	
C2	3	BeamRight	1880	9	376	9.3	-2.4	-11.1	G(50)	32.0	3	15.0	1.300	1.000	11.7<	41.6	
C2	4	BeamLeft	1880	9	376	9.3	-2.4	-11.1	G(50)	32.0	3	15.0	1.300	1.000	11.7<	41.6	
C2	4	BeamRight	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
C3	1	BeamLeft	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
C3	1	BeamRight	1880	9	376	5.4	-1.8	-2.9	G(50)	32.0	3	15.0	1.079	1.000	7.2<	34.5	
C3	2	BeamLeft	1880	9	376	5.4	-1.8	-2.9	G(50)	32.0	3	15.0	1.079	1.000	7.2<	34.5	
C3	2	BeamRight	1880	9	376	1.6	-1.0	-11.4	G(50)	32.0	3	15.0	1.300	1.000	2.6<	41.6	
C3	3	BeamLeft	1880	9	376	1.6	-1.0	-11.4	G(50)	32.0	3	15.0	1.300	1.000	2.6<	41.6	
C3	3	BeamRight	1880	9	376	5.4	-1.8	-2.9	G(50)	32.0	3	15.0	1.079	1.000	7.2<	34.5	
C3	4	BeamLeft	1880	9	376	5.4	-1.8	-2.9	G(50)	32.0	3	15.0	1.079	1.000	7.2<	34.5	
C3	4	BeamRight	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
C4	1	BeamLeft	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
C4	1	BeamRight	1880	9	376	9.3	-2.4	-11.1	G(50)	32.0	3	15.0	1.300	1.000	11.7<	41.6	
C4	2	BeamLeft	1880	9	376	9.3	-2.4	-11.1	G(50)	32.0	3	15.0	1.300	1.000	11.7<	41.6	
C4	2	BeamRight	1880	9	376	0.7	-1.4	-1.9	G(50)	32.0	3	15.0	1.300	1.000	2.1<	41.6	
C4	3	BeamLeft	1880	9	376	0.7	-1.4	-1.9	G(50)	32.0	3	15.0	1.300	1.000	2.1<	41.6	
C4	3	BeamRight	1880	9	376	9.3	-2.4	-11.1	G(50)	32.0	3	15.0	1.300	1.000	11.7<	41.6	
C4	4	BeamLeft	1880	9	376	9.3	-2.4	-11.1	G(50)	32.0	3	15.0	1.300	1.000	11.7<	41.6	
C4	4	BeamRight	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
C5	1	BeamLeft	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
C5	1	BeamRight	1880	9	376	8.6	-2.3	-14.7	G(50)	32.0	3	15.0	1.300	1.000	10.9<	41.6	
C5	2	BeamLeft	1880	9	376	8.6	-2.3	-14.7	G(50)	32.0	3	15.0	1.300	1.000	10.9<	41.6	
C5	2	BeamRight	1880	9	376	0.3	-0.6	-9.0	G(50)	32.0	3	15.0	1.300	1.000	0.9<	41.6	
C5	3	BeamLeft	1880	9	376	0.3	-0.6	-9.0	G(50)	32.0	3	15.0	1.300	1.000	0.9<	41.6	
C5	3	BeamRight	1880	9	376	8.6	-2.3	-14.7	G(50)	32.0	3	15.0	1.300	1.000	10.9<	41.6	
C5	4	BeamLeft	1880	9	376	8.6	-2.3	-14.7	G(50)	32.0	3	15.0	1.300	1.000	10.9<	41.6	
C5	4	BeamRight	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF12	1	BeamLeft	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF12	1	BeamRight	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF12	2	BeamLeft	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF12	2	BeamRight	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF12	3	BeamLeft	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF12	3	BeamRight	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF12	4	BeamLeft	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF12	4	BeamRight	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF13	1	BeamLeft	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF13	1	BeamRight	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF13	2	BeamLeft	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

Beam

Node HSTIFF-1 (WebH-Stiffener) WEB - 1

Panel			Web h (mm)	t		σtmax (N/mm2)	σtmin	σd	Grade (Δσf)	Δσce	m	Δσve	CR	Ct	Δσmax (N/mm2)	Δσce・CR・Ct	Stress Cycle D
PF13	2	BeamRight	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF13	3	BeamLeft	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF13	3	BeamRight	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF13	4	BeamLeft	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
PF13	4	BeamRight	1880	9	376	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S1	1	BeamLeft	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S1	1	BeamRight	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S1	2	BeamLeft	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S1	2	BeamRight	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S1	3	BeamLeft	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S1	3	BeamRight	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S1	4	BeamLeft	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S1	4	BeamRight	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S2	1	BeamLeft	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S2	1	BeamRight	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S2	2	BeamLeft	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S2	2	BeamRight	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S2	3	BeamLeft	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S2	3	BeamRight	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S2	4	BeamLeft	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	
S2	4	BeamRight	2080	9	416	0.0	0.0	0.0	G(50)	32.0	3	15.0	1.300	1.000	0.0<	41.6	

§9. Design of Bridge Accessories

9-1 Design of Bearing

Design of Lubber Bearing - for Steel-I Girder Bridge

1. Design Condition

(1) Horizontal Seismic Coefficient

No	Area	Type of Ground	Horizontal Seismic Coefficient	
			In Bridge Axis Direction	In the Direction of Perpendicular to Bridge Axis
			Level 1	Level 1
			kh	kh
PF11	A2	Type III	0.30	0.30
PF12	A2	Type III	0.30	0.30
PF13	A2	Type III	0.30	0.30
PF14	A2	Type III	0.30	0.30

(2) Design Reaction Force

No	Design Reaction Force						
	Maximum of Bearing		Minimum of Bearing	Dead Load		Total of Dead Load	Live Load
	Rmax1	Rmax2	Rmin	Rdmax	Rdmin	ΣRd	RL+I
	kN	kN	kN	kN	kN	kN	kN
PF11	773.9	653.2	244.0	451.0	306.5	1890.6	372.5
PF12	2491.2	1970.2	1284.7	1824.5	1319.9	7762.2	---
PF13	2491.2	1970.2	1284.7	1824.5	1319.9	7762.2	---
PF14	773.9	653.2	244.0	451.0	306.5	1890.6	372.5

(3) Regular Displacement

No	Temp. Change	Indeterminate			Live Load	Total	
		Dry Shrinkage /	Dead Load	Total		+30℃	-30℃
	ΔLt	ΔLscp	ΔLd	ΔL'	ΔLr	ΔL	ΔL
	mm	mm	mm	mm	mm	mm	mm
PF11	±18.1	----	----	----	3.6	21.6	-14.5
PF12	±7.8	----	----	----	4.0	11.8	-3.8
PF13	±7.8	----	----	----	4.0	11.8	-3.8
PF14	±18.1	----	----	----	3.6	21.6	-14.5

※ Positive number means expanding, while negative number means shrinking.
The larger value is adopted comparing absolute value to check the allowable stress.

(4) Oblique and Rotation Angle

No	Oblique Angle			Rotation Angle
	θ			Σαe
	°	′	″	rad
PF11	90	0	0	1 / 450
PF12	90	0	0	1 / 400
PF13	90	0	0	1 / 400
PF14	90	0	0	1 / 450

(5) Allowable Value

Item		Code	Unit	Value
Maximum Compressive Stress	Under Design Load	σmaxa	N/mm2	≦ 8.0 ≦ S1 ≦ 12.0
Difference of Compressive Stress	Under Design Load	Δσa	N/mm2	≦ 5.0 --- S1 ≦ 8 ≦ 5+0.375(S1-8) ≦ 6.5 --- S1 ＞ 8
Tensile Stress	Under Earthquake	σta	N/mm2	≦ 1.2 --- G6 ≦ 1.6 --- G8 ≦ 2.0 --- G10以上
Shear Strain	Under Design Load	γsa	%	≦ 70
	Level 1	γsea	%	≦ 150
	Level 2	γsea	%	≦ 250
Safety Factor of Local Shear Strain	Under Design Load	fs	----	1.5
Stress of Stiffener	Under Design Load	σsa	N/mm2	≦ 140.0
	Under Earthquake	σsa		≦ 210.0

2. Calculation

(1) Calculation of Vertical Force

1) Vertical Force under Earthquake

RL = Rdmax + √ RHEQ^2 + RVEQmax^2

RU = Rdmin - √ RHEQ^2 + RVEQmin^2

2) Vertical force due to horizontal force applied in the direction of perpendicular to bridge axis

$$RHEQ = \frac{H \cdot hs}{\Sigma xi^2} \cdot xi$$

hs : Vertical distance from a bearing to a center of girder
xi : Horizontal distance from a bearing to a center of girder

	Vertical Distance	Horizontal Distance	
	hs	xi	Σxi^2
No	m	m	m2
PF11	2.40	5.20	67.60
PF12	2.40	5.20	67.60
PF13	2.40	5.20	67.60
PF14	2.40	5.20	67.60

3) Vertical Force generated by Design Vertical Seismic Coefficient (kv)

RVEQmax = kv ・ Rdmax

RVEQmin = kv ・ Rdmin

	Vertical Seismic Coefficient	
	Level 1	
	n Bridge Axis Directio	In the Direction of Perpendicular to Bridge Axis
No	kv	kv
PF11	0.12	0.12
PF12	0.12	0.12
PF13	0.12	0.12
PF14	0.12	0.12

10) Result

・ Stiffness and Coefficient

No	Stiffness		Coefficient				
	Horizontal	Vertical	Shape	Secondary shape		Distortion	Local inspection
	KB	KV	S1	S2	S2	E	E
	kN/mm	kN/mm	----	Bridge Axis Direction	Perpendicular to Bridge Axis	N/mm2	N/mm2
PF11	3.78	892.4	6.64	7.03	7.03	298.73	292.98
PF12	9.11	1409.4	6.94	7.39	7.39	312.37	320.05
PF13	9.11	1409.4	6.94	7.39	7.39	312.37	320.05
PF14	3.78	892.4	6.64	7.03	7.03	298.73	292.98

・ Displacement under earthquake

No	Bridge Axis Direction	Perpendicular to Bridge Axis
	Level 1	Level 1
	UB	UB
	mm	mm
PF11	27.2	----
PF12	26.6	----
PF13	29.2	----
PF14	32.8	----

・ Bearing surface area

No	Bridge Axis Direction		Perpendicular to Bridge Axis	Distortion	
		Earthquake	Earthquake		
	Stationary	Level 1	Level 1	Bearing load	Live load
	Acn	Ace	Ace	δo	δcl
	m2	m2	m2	mm	mm
PF11	0.1814	0.1790	0.1912	0.91	0.21
PF12	0.3894	0.3798	0.3971	1.80	----
PF13	0.3894	0.3781	0.3971	1.80	----
PF14	0.1814	0.1764	0.1912	0.91	0.21

・ Checking of Stationary load

	Compressive stress			Buckling stress	Strain		Local shear strain				Stiffener stress
	Max	Min	Max-Min		Rotation	Vertical	Vertical	Shear	Rotation	Total	
	σmax	σmin	Δσ	σcra	δr	δc	γc	γs	γr	γt	σs
No	N/mm2	N/mm2	N/mm2	N/mm2	mm	mm	%	%	%	%	N/mm2
PF11	4.27	1.28	2.99	18.67	0.50	0.56	82.15	33.82	19.59	135.55	63.98
PF12	6.40	3.24	3.16	20.51	0.81	1.08	117.95	13.41	24.09	155.45	93.84
PF13	6.40	3.24	3.16	20.51	0.81	1.08	117.95	13.41	24.09	155.45	93.84
PF14	4.27	1.28	2.99	18.67	0.50	0.56	82.15	33.82	19.59	135.55	63.98
Allowable value	≦ 8.0 ≦ S1 ≦ 12.0	----	≦ 5.0 - S1≦8 5+0.375・(S1-8) ≧6.5- S1＞8	≧σmax	----	≧ δr	----	≦ 70	----	≦γu/1.5	≦140.0

・ Checking for seismic resistance level 1

	Bridge Axis Direction											
	Displacement	Shear strain	Lateral force	Shear stress		Yield load	Equivalent elastic stiffness	Primary	Secondary	K1・K2 intersection point		Equivalent attenuation
					Yield							
	UB	γ	F	q	qo	Qd	KB	K1	K2	Qy	Uy	hB
No	mm	---	kN	N/mm2	N/mm2	kN	kN/mm	kN/mm	kN/mm	kN	mm	---
PF11	27.20	0.30	156.81	8.84	7.09	80.15	8.24	18.32	2.82	94.72	5.17	0.264
PF12	26.60	0.21	243.93	6.28	5.04	128.25	13.10	28.27	4.35	151.57	5.36	0.267
PF13	29.20	0.23	267.77	6.90	5.53	140.79	13.10	28.27	4.35	166.39	5.89	0.267
PF14	32.80	0.36	186.15	10.40	8.34	94.29	8.11	18.20	2.80	111.43	6.12	0.262

	Perpendicular to Bridge Axis											
	Displacement	Shear strain	Lateral force	Shear stress		Yield load	Equivalent elastic stiffness	Primary	Secondary	K1・K2 intersection point		Equivalent attenuation
					Yield							
	UB	γ	F	q	qo	Qd	KB	K1	K2	Qy	Uy	hB
No	mm	---	kN	N/mm2	N/mm2	kN	kN/mm	kN/mm	kN/mm	kN	mm	---
PF11	---	---	---	---	---	---	---	---	---	---	---	---
PF12	---	---	---	---	---	---	---	---	---	---	---	---
PF13	---	---	---	---	---	---	---	---	---	---	---	---
PF14	---	---	---	---	---	---	---	---	---	---	---	---

	Bridge Axis Direction					Perpendicular to Bridge Axis					Tension
	Bearing stress	Tension stress	Buckling stress	Shear stress	Stiffener stress	Bearing stress	Tension stress	Buckling stress	Shear strain	Stiffener stress	Stress -0.3Rd
	σce	σte	σcrae	γse	σse	σce	σte	σcrae	γse	σse	σte
No	N/mm2	N/mm2	N/mm2	%	N/mm2	N/mm2	N/mm2	N/mm2	%	N/mm2	N/mm2
PF11	2.82	----	31.12	42.50	42.34	2.98	----	31.12	----	44.63	0.71
PF12	5.38	----	34.18	30.23	78.92	5.81	----	34.18	----	85.22	1.38
PF13	5.40	----	34.18	33.18	79.27	5.81	----	34.18	----	85.22	1.38
PF14	2.86	----	31.12	51.25	42.95	2.98	----	31.12	----	44.63	0.71
Allowable value	----	≦ σta	≧ σce	≦ 150	≦ 210.0	----	≦ σta	≧ σce	≦ 150	≦ 210.0	≦ σta

(4) Summary

		Size			Rubber				Stiffener	Bearing stiffness	
		Perpendicular to Bridge Axis	Bridge Axis Direction	Thickness	Elastic modulus	Thickness	Number of layers	Total thickness		Horizontal	Vertical
		b'	a'	t	Ge	te	n	Σte	ts	KB	KV
No	Type	mm	mm	mm	N/mm2	mm	Layer	mm	mm	kN/mm	kN/mm
PF11	N R	470	470	134	1.00	16	4	64	3.2	3.78	892.4
PF12	N R	670	670	170	1.00	22	4	88	4.5	9.11	1409.4
PF13	N R	670	670	170	1.00	22	4	88	4.5	9.11	1409.4
PF14	N R	470	470	134	1.00	16	4	64	3.2	3.78	892.4

Bearing Condition for Substructure Design

$$\text{Difference} = \frac{UB-UB'}{UB} \times 100 \ (\%)$$

	ΣKB (kN/m)	Seismic Force (kN)	Assumed displacement value (m)	Actual displacement (m)	Difference (%)
Bridge 1-Support-1	------	------	------	------	------
Bridge 1-Support-2	------	------	------	------	------
Bridge 1-Support-3	------	------	------	------	------
Bridge 2-Support-1	2.263632E+004	1609.673	0.0761	0.0711	6.501
Bridge 2-Support-2	4.364701E+004	3114.750	0.0762	0.0714	6.328
Bridge 2-Support-3	4.364701E+004	2529.781	0.0623	0.0580	6.978
Bridge 2-Support-4	2.585569E+004	1372.176	0.0579	0.0531	8.319
Bridge 3-Support-1	------	------	------	------	------
Bridge 3-Support-2	------	------	------	------	------
Bridge 3-Support-3	------	------	------	------	------
Bridge 4-Support-1	------	------	------	------	------
Bridge 4-Support-2	------	------	------	------	------
Bridge 4-Support-3	------	------	------	------	------
Bridge 4-Support-4	------	------	------	------	------
Bridge 4-Support-5	------	------	------	------	------
Bridge 5-Support-1	4.117886E+004	1066.506	0.0272	0.0259	4.952
Bridge 5-Support-2	6.550148E+004	1663.639	0.0266	0.0254	4.664
Bridge 5-Support-3	6.550148E+004	1829.754	0.0292	0.0279	4.389
Bridge 5-Support-4	4.056619E+004	1265.081	0.0328	0.0312	4.820
Bridge 6-Support-1	------	------	------	------	------
Bridge 6-Support-2	------	------	------	------	------
Bridge 6-Support-3	------	------	------	------	------

9-2 Bridge drainage

Calculation for catchpit interval

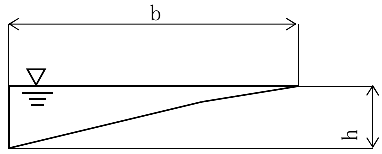
1. Design conditions

Rain intensity	I=	βx 149.0 = 149 mm/h
	β=	1.00
Discharge coefficient	C =	0.9
Roughness coefficient	n =	0.013
Safety factor	k =	0.8
Minimum interval	L=	5.000 m

1) Caliculation for catchpit interval

$$Ls=\frac{2.46x10^{-8}xAxR^{2/3}\cdot i^{1/2}}{\beta\ x\ rh\ x\ B}$$

Ls : Interval(m) (Ls≦20m)
A : flowing area (m2) A=1/2xhxb
R : Depth(m)、R = A / S
S : flowing length S=h+√(b2+h2)
i : Longitudinal slope
β x rh : Design rain intensity
B : Road width (m)



Calculateion of Catch Pit Interval

Fly Over (Left Side)

		Length	C.L Height	Longitudinal Slope	Transverse Gradient	Flowing water Width	Depth h	Flow area A	Wetted per Imte	Hydraulic mean depth	Watershed width	Rain intensity	Fall rate	Drainage PIT Maximum Interval	PIT Interval
		(m)	(m)	(%)	(%)	(m)	(m)	A (m2)	P (m)	R(m)	(m)	I[mm/h]	γ	Ls (m)	
PC	AF1	0.0000	10.5800	-	3.44	1.000	0.0344	0.0172	1.0350	0.0166	-		-	-	
	EDR1	4.992	10.7298	3.00	4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	
	DR1	5.008	10.8800	3.00	4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	
	DR2	10.000	11.1800	3.00	4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	
	PF1(DR3)	10.000	11.4800	3.00	4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	
	DR4	10.000	11.7800	3.00	4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	
	EDR2	8.080	12.0224	3.00	4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	
	DR5	1.920	12.0800	3.00	3.89	1.000	0.0389	0.0195	1.0397	0.0187	12.750	149.000	0.90	30.7	
Steel-Box	PF2(DR6)	10.000	12.3800	3.00	3.34	1.000	0.0334	0.0167	1.0340	0.0162	12.750	149.000	0.90	23.9	
	DR7	10.000	12.6800	3.00	2.78	1.000	0.0278	0.0139	1.0282	0.0135	12.750	149.000	0.90	17.7	
	DR8	10.000	12.9800	3.00	2.22	1.000	0.0222	0.0111	1.0224	0.0109	12.750	149.000	0.90	12.2	
	EDR3	4.000	13.1000	3.00	2.00	1.000	0.0200	0.0100	1.0202	0.0098	12.750	149.000	0.90	10.3	
	DR9	6.000	13.2799	3.00	1.40	1.000	0.0140	0.0070	1.0141	0.0069	12.750	149.000	0.90	5.7	
	DR10	10.000	13.5684	2.89	0.40	1.000	0.0040	0.0020	1.0040	0.0020	12.750	149.000	0.90	0.7	5
	EDR4	4.000	13.6784	2.75	0.00	1.000	0.0000	0.0000	1.0000	0.0000	12.750	149.000	0.90	0.0	5
	DR11	6.000	13.8376	2.65	-0.60	1.000	0.0060	0.0030	1.0060	0.0030	12.750	149.000	0.90	1.3	5
	PF3	5.000	13.9650	2.55	-1.10	1.000	0.0110	0.0055	1.0111	0.0054	12.750	149.000	0.90	3.5	5
	DR12	5.000	14.0876	2.45	-1.60	1.000	0.0160	0.0080	1.0161	0.0079	12.750	149.000	0.90	6.4	6
	EDR5	4.000	14.1822	2.36	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	12.750	149.000	0.90	9.1	9
	DR13	6.000	14.3184	2.27	-2.68	1.000	0.0268	0.0134	1.0272	0.0130	12.750	149.000	0.90	14.5	14
	DR14	10.000	14.5299	2.11	-3.81	1.000	0.0381	0.0191	1.0388	0.0183	12.750	149.000	0.90	24.9	20
	DR15	10.000	14.7222	1.92	-4.95	1.000	0.0495	0.0248	1.0507	0.0236	12.750	149.000	0.90	36.5	20
	EDR6	9.298	14.8838	1.74	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	47.5	20
	DR16	0.702	14.8953	1.64	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	46.1	20
	DR17	10.000	15.0491	1.54	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	44.7	20
	DR18	10.000	15.1837	1.35	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	41.8	20
	PF4	5.000	15.2438	1.20	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	39.5	20
	DR19	5.000	15.2991	1.11	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	37.9	20
	DR20	10.000	15.3953	0.96	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	35.3	20
	DR21	10.000	15.4722	0.77	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	31.6	20
	DR22	10.000	15.5300	0.58	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	27.4	20
	DR23	10.000	15.5800	0.50	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	25.5	20
PC-2	PF5(DR24)	10.000	15.6300	0.50	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	25.5	20
	DR25	10.000	15.6800	0.50	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	25.5	20
	DR26	10.000	15.7264	0.46	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	24.5	20
	PF6(DR27)	10.000	15.7541	0.28	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	19.0	18
	DR28	10.000	15.7616	0.08	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	9.9	9
	EDR7	5.571	15.7569	-0.08	-6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	10.5	10
	DR29	4.429	15.7488	-0.18	-5.33	1.000	0.0533	0.0267	1.0547	0.0253	12.750	149.000	0.90	12.7	12
PC-4	PF7(DR30)	10.000	15.7158	-0.33	-3.81	1.000	0.0381	0.0191	1.0388	0.0183	12.750	149.000	0.90	9.9	9
	DR31	10.000	15.6625	-0.53	-2.30	1.000	0.0230	0.0115	1.0233	0.0112	12.750	149.000	0.90	5.5	5
	EDR8	1.977	15.6496	-0.65	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	12.750	149.000	0.90	4.8	5
	DR32	8.023	15.5926	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	12.750	149.000	0.90	5.0	5
	PF8(DR33)	10.000	15.5211	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	EDR9	8.383	15.4612	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR34	1.617	15.4496	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR35	10.000	15.3781	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	PF9(DR36)	10.000	15.3066	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR37	10.000	15.2351	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR38	10.000	15.1636	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	PF10(DR39)	10.000	15.0921	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR40	10.000	15.0206	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR41	10.000	14.9491	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
Steel-I	PF11(DR42)	10.000	14.8776	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR43	10.000	14.8061	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR44	10.000	14.7305	-0.76	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.3	10
	DR45	10.000	14.6339	-0.97	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	11.7	11
	PF12	5.000	14.5770	-1.14	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	12.7	12
	DR46	5.000	14.5144	-1.25	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	13.3	13
	DR47	10.000	14.3720	-1.42	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	14.2	14
	DR48	10.000	14.2068	-1.65	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	15.2	15
	DR49	10.000	14.0188	-1.88	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	16.3	16
	DR50	10.000	13.8079	-2.11	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	17.2	17
	PF13	7.000	13.6467	-2.30	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	18.0	18
	DR51	3.000	13.5742	-2.42	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	18.4	18
	DR52	10.000	13.3176	-2.57	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	19.0	19
	DR53	10.000	13.0382	-2.79	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	19.8	19
	DR54	10.000	12.7400	-2.98	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
PC-2	PF14	2.000	12.6800	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR55	8.000	12.4400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR56	10.000	12.1400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR57	10.000	11.8400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	PF15	2.000	11.7800	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR58	8.000	11.5400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR59	10.000	11.2400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR60	10.000	10.9400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	AF2	2.000	10.8800	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20

total 602.0000 m

Fly Over (Right Side)

		Length	C.L Height	Slope	Gradient	Width	Depth h	Flow area A	Wetted per Imte	mean depth	Watershed width	Rain intensity	Fall rate	Drainage PIT Maximum Interval	PIT Interval
		(m)	(m)	(%)	(%)	(m)	(m)	A (m2)	P (m)	R(m)	(m)	I[mm/h]	γ	Ls (m)	
	AF1	0.0000	10.5800	-	-3.44	1.000	0.0344	0.0172	1.0350	0.0166	-		-	-	
	EDR1	4.992	10.7298	3.00	-4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	20
	DR1	5.008	10.8800	3.00	-4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	20
PC-2	DR2	10.000	11.1800	3.00	-4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	20
	PF1(DR3)	10.000	11.4800	3.00	-4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	20
	DR4	10.000	11.7800	3.00	-4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	20
	EDR2	8.080	12.0224	3.00	-4.00	1.000	0.0400	0.0200	1.0408	0.0192	12.750	149.000	0.90	32.2	20
	DR5	1.920	12.0800	3.00	-3.89	1.000	0.0389	0.0195	1.0397	0.0187	12.750	149.000	0.90	30.7	20
	PF2(DR6)	10.000	12.3800	3.00	-3.34	1.000	0.0334	0.0167	1.0340	0.0162	12.750	149.000	0.90	23.9	20
	DR7	10.000	12.6800	3.00	-2.78	1.000	0.0278	0.0139	1.0282	0.0135	12.750	149.000	0.90	17.7	17
	DR8	10.000	12.9800	3.00	-2.22	1.000	0.0222	0.0111	1.0224	0.0109	12.750	149.000	0.90	12.2	12
	EDR3	4.000	13.1000	3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	12.750	149.000	0.90	10.3	10
	DR9	6.000	13.2799	3.00	-1.40	1.000	0.0140	0.0070	1.0141	0.0069	12.750	149.000	0.90	5.7	5
	DR10	10.000	13.5684	2.89	-0.40	1.000	0.0040	0.0020	1.0040	0.0020	12.750	149.000	0.90	0.7	5
	EDR4	4.000	13.6784	2.75	0.00	1.000	0.0000	0.0000	1.0000	0.0000	12.750	149.000	0.90	0.0	5
	DR11	6.000	13.8376	2.65	0.60	1.000	0.0060	0.0030	1.0060	0.0030	12.750	149.000	0.90	1.3	5
	PF3	5.000	13.9650	2.55	1.10	1.000	0.0110	0.0055	1.0111	0.0054	12.750	149.000	0.90	3.5	
	DR12	5.000	14.0876	2.45	1.60	1.000	0.0160	0.0080	1.0161	0.0079	12.750	149.000	0.90	6.4	
	EDR5	4.000	14.1822	2.36	2.00	1.000	0.0200	0.0100	1.0202	0.0098	12.750	149.000	0.90	9.1	
Steel-I	DR13	6.000	14.3184	2.27	2.68	1.000	0.0268	0.0134	1.0272	0.0130	12.750	149.000	0.90	14.5	
	DR14	10.000	14.5299	2.11	3.81	1.000	0.0381	0.0191	1.0388	0.0183	12.750	149.000	0.90	24.9	
	DR15	10.000	14.7222	1.92	4.95	1.000	0.0495	0.0248	1.0507	0.0236	12.750	149.000	0.90	36.5	
	EDR6	9.298	14.8838	1.74	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	47.5	
	DR16	0.702	14.8953	1.64	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	46.1	
	DR17	10.000	15.0491	1.54	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	44.7	
	DR18	10.000	15.1837	1.35	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	41.8	
	PF4	5.000	15.2438	1.20	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	39.5	
	DR19	5.000	15.2991	1.11	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	37.9	
	DR20	10.000	15.3953	0.96	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	35.3	
	DR21	10.000	15.4722	0.77	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	31.6	
	DR22	10.000	15.5300	0.58	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	27.4	
	DR23	10.000	15.5800	0.50	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	25.5	
	PF5(DR24)	10.000	15.6300	0.50	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	25.5	
	DR25	10.000	15.6800	0.50	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	25.5	
	DR26	10.000	15.7264	0.46	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	24.5	
PC-2	PF6(DR27)	10.000	15.7541	0.28	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	19.0	
	DR28	10.000	15.7616	0.08	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	9.9	
	EDR7	5.571	15.7569	-0.08	6.00	1.000	0.0600	0.0300	1.0618	0.0283	12.750	149.000	0.90	10.5	
	DR29	4.429	15.7488	-0.18	5.33	1.000	0.0533	0.0267	1.0547	0.0253	12.750	149.000	0.90	12.7	
	PF7(DR30)	10.000	15.7158	-0.33	3.81	1.000	0.0381	0.0191	1.0388	0.0183	12.750	149.000	0.90	9.9	
	DR31	10.000	15.6625	-0.53	2.30	1.000	0.0230	0.0115	1.0233	0.0112	12.750	149.000	0.90	5.5	
	EDR8	1.977	15.6496	-0.65	2.00	1.000	0.0200	0.0100	1.0202	0.0098	12.750	149.000	0.90	4.8	
	DR32	8.023	15.5926	-0.71	0.78	1.000	0.0078	0.0039	1.0078	0.0039	12.750	149.000	0.90	1.0	5
	PF8(DR33)	10.000	15.5211	-0.71	-0.73	1.000	0.0073	0.0037	1.0073	0.0036	6.375	149.000	0.90	1.9	5
	EDR9	8.383	15.4612	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
PC-4	DR34	1.617	15.4496	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR35	10.000	15.3781	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	PF9(DR36)	10.000	15.3066	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR37	10.000	15.2351	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR38	10.000	15.1636	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	PF10(DR39)	10.000	15.0921	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR40	10.000	15.0206	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR41	10.000	14.9491	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	PF11(DR42)	10.000	14.8776	-0.72	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR43	10.000	14.8061	-0.71	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.0	10
	DR44	10.000	14.7305	-0.76	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	10.3	10
	DR45	10.000	14.6339	-0.97	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	11.7	11
	PF12	5.000	14.5770	-1.14	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	12.7	12
	DR46	5.000	14.5144	-1.25	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	13.3	13
	DR47	10.000	14.3720	-1.42	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	14.2	14
Steel-I	DR48	10.000	14.2068	-1.65	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	15.2	15
	DR49	10.000	14.0188	-1.88	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	16.3	16
	DR50	10.000	13.8079	-2.11	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	17.2	17
	PF13	7.000	13.6467	-2.30	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	18.0	18
	DR51	3.000	13.5742	-2.42	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	18.4	18
	DR52	10.000	13.3176	-2.57	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	19.0	19
	DR53	10.000	13.0382	-2.79	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	19.8	19
	DR54	10.000	12.7400	-2.98	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	PF14	2.000	12.6800	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR55	8.000	12.4400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR56	10.000	12.1400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR57	10.000	11.8400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
PC-2	PF15	2.000	11.7800	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR58	8.000	11.5400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR59	10.000	11.2400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	DR60	10.000	10.9400	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20
	AF2	2.000	10.8800	-3.00	-2.00	1.000	0.0200	0.0100	1.0202	0.0098	6.375	149.000	0.90	20.5	20

Total 602.0000 m

9-3 Expansion joint

(1) Gap of girder and abutment

The expansion length is determined based on the displacement of the earthquake and the temperature.
Expansion joint shall be installed not to compromise the following gap of the girder and abutment, and displacement of seismic and temperature.

(2) Gap and displacement

				PCI Grider			Steel box Girder				PCI Grider			PCI Girder					Steel I Girder				PCI Girder		
	condition of support			M	F	F	E	E	E	E	F	F	M	M	F	F	F	M	E	E	E	E	F	F	M
	substructure			AF1	PF1	PF2		PF3	PF4	PF5		PF6	PF7		PF8	PF9	PF10	PF11		PF12	PF13	PF14		PF15	AF2
Gap of girder and abutment			mm	100		150				150			150					150				100			100
expansion	Creep･drying shrinkage(⊿sc2)		mm	7		0	0			0	0		-7	14				-14	0			0	0		-7
	temperature (⊿t)		mm	±12		±0	±27			±27	±0		±12	±23				±23	±19			±19	±0		±12
	displacement (⊿L)	stretching	mm	19		27				27			56					56				19			19
		reducing	mm	-5		-27				-27			-14					-28				-19			-5
	Margin (LA)		mm	10		11				11			14					17				10			10
	⊿U2		mm	34		65				65			84					101				48			34
	seismic(⊿EQ) SBR×2		mm	48		260				234			110					144				162			58
	design displacemnt(⊿Ej)		mm	48		260				234			110					144				162			58

03-SUBSTRUCTURE AND FOUNDATION

Contents

§1.Design condition

1. Basic condition

1). Bridge length : 602.000 (m)

2). Span length : 30.00 + 30.00 + 55.00 + 70.00 + 55.00
+ 30.00 + 30.00 + 30.00 + 30.00 + 30.00 + 30.00
+ 35.00 + 52.00 + 35.00 + 30.00 + 30.00 (m)

3). Angle of skew : 92 ° 29 ' 51 " (cross CL) PF7
: 90 ° 7 ' 9 " (cross CL) PF8
: 90 ° 0 ' 0 " (cross CL) Other

4). Width of the road : B= 12.750m

5). Bridge type : 2 span continuous PC- I girder bridge with composite deck(PC plate and RC deck)
3 span continuous steel box girder bridge
2 span continuous PC- I girder bridge with composite deck(PC plate and RC deck)
4 span continuous PC- I girder bridge with composite deck(PC plate and RC deck)
3 span continuous steel I girder bridge
2 span continuous PC- I girder bridge with composite deck(PC plate and RC deck)

6). Substructure type : inverted T-shaped abutment, T-shaped pier

7). Foundation type : Cast-in-place pile φ1500

8). Live load : AASHTO HL=93

9). Design condition for substructure
(1) Unit weight
Reinforced concrete : γc = 24.5 kN/m^3
relaid soil(front side) : γd = 18.0 kN/m^3
water : γw = 10.0 kN/m^3
(2) Load of ground surface : q = 11.6 kN/m^2

(3) Earth pressure method
dead+ live :Coulomb's earth pressure theory
seismic:Revise monobe and okabe's earth pressure theory
Backfill : γ = 19.0 kN/m^3 φ = 30°
(4) Materials

	Substructure
Body	σck=24N/mm²
Pile cap	σck=24N/mm²
Cast-in-place pile	σck=24N/mm²(SD345)

10). Earthquake-resistant condition
Ground type : Type Ⅲ
Design horizontal seismic coefficient : kh=0.30

11). Design standard
Specifications for highway bridges (Japan Road Association)
1 Common matters,4 substructure,5 seismic design(April 2012)

12). Allowable stress

(1) Allowable stress

a) Allowable stress of concrete

For rainforced concrete structure, the alloable compressive stress of concrete shall be the value in next Table.

Table Allowable compressive stress(N/mm2)
and allowable shear stress(N/mm2) for reinforced concrete structure

Stress type \ Design standard strength of concrete σck		21	24	27	30
Compressive stress	Bending compressive stress	7.0	8.0	9.0	10.0
	Axial compressive stress	5.5	6.5	7.5	8.5
Shear stress	Concrete (τa1)	0.22	0.23	0.24	0.25
	Concrete+Reinforcement (τa2)	1.6	1.7	1.8	1.9
	Punching shear stress (τa3)	0.85	0.90	0.95	1.00

The allowable bond stress of concrete shall be the values in next Table
for reinforcement of 51 mm in diameter or less.

Table Allowable bond stress(N/mm2)

Stress type \ Design standard strength of concrete σck	21	24	27	30
Deformed bar	1.4	1.6	1.7	1.8

b) Allowable stress of reinforcement

The allowable stress of reinforcement for reinforced concrete shall be the values in next Table
for reinforcement of 51 mm in diameter or less.

Table allowable stress(N/mm2) of reinforcement

Stress and member type \ reinforcement type			SD345	SD390	SD490
Tensile stress	1) Principal loads other than live load and impact (For example:beams)		100	100	100
	Reference value of allowable stress to be used when collision load or the effects of earthquakes are not considered in the combination of loads	2) General members	180	180	180
		3) Members in water or less	160	160	160
	Reference value of allowable stress to be used when collision load or the effects of earthquakes are considered in the combination loads	4) Axial reinforcement	200	230	290
		5) other less	200	200	200
	6) Reference value of allowable stress to be used when calculating the lap joint length or bond length of reinforcement		200	230	290
7) Compressive stress			200	230	290

(2) Increase coefficient of allowable stress

Allowable stress used in the design of substructure shall be the value multiplied by an increase coefficient given in the next Table according to the combination of loads.

Table Increase Coefficient of Allowable Stress

	combination of loads	Increase coefficient
1）	Principal loads（P）＋Special loads corresponding to "Principal load"（PP）	1.00
2）	Principal loads（P）＋Special loads corresponding to "Principal load"（PP）+Effects of temperature changes(T)	1.15
3）	Principal loads（P）＋Special loads corresponding to "Principal load"（PP）+Wind load(W)	1.25
4）	Principal loads（P）＋Special loads corresponding to "Principal load"（PP）+Effects of temperature changes(T)+Wind load(W)	1.35
5）	Principal loads（P）＋Special loads corresponding to "Principal load"（PP）+Braking load(BK)	1.25
6）	Principal loads（P）＋Special loads corresponding to "Principal load"（PP）+Collision load(CO)	1.50
7）	Principal loads other than live load and inpact+Effects of eathquakes(EQ)	1.50

Load for design of substructure

[kN]

Load category			AF1	PF1	PF2		PF3	PF4	PF5		PF6	PF7	
			M	F	F	E	E	E	E	F	F	M	M
Vertical load		① Dead load	3800	7000	3900	3200	11100	11200	3200	3800	7700	3900	4300
		② Live load	1100	2000	1100	1600	3100	3100	1600	1100	2000	1100	1100
Horizontal load	Bridge-axial direction	③ Drying shrinkage load	0	600	700	0	0	0	0	400	300	0	0
		④ Tempareture load	0	800	1100	0	0	0	0	600	400	0	0
		⑤ seismic load	600	3200	1300	1700	3200	2600	1400	2600	2100	600	700
					3000				4000			1300	
	Bridge-axial-orthogonal direction	④ Wind load	0	300	300		600	600	300		300	200	
		⑤ seismic load	0	2000	2300		3500	3100	2100		3000	1600	

[kN]

Load category			PF8	PF9	PF10	PF11		PF12	PF13	PF14		PF15	AF2
			F	F	F	M	E	E	E	E	F	F	M
Vertical load		① Dead load	8400	7900	7800	3900	1900	7800	7800	1900	3800	7700	3800
		② Live load	1900	1800	1900	1100	1200	2500	2500	1200	1100	2000	1100
Horizontal load	Bridge-axial direction	③ Drying shrinkage load	800	100	900	0	0	0	0	0	700	600	0
		④ Tempareture load	1300	100	1300	0	0	0	0	0	1000	700	0
		⑤ seismic load	3200	2800	3800	600	1100	1700	1900	1300	1200	3500	600
						1700				2500			
	Bridge-axial-orthogonal direction	④ Wind load	300	300	300	300		400	400	300		300	0
		⑤ seismic load	2900	2600	3000	1500		2200	2300	1700		2800	0

Load for design of beams

with impact [kN]

Load category			AF1		PF1L		PF1R		PF2L		PF2R		PF3		PF4		PF5L		PF5R		PF6L		PF6R		PF7L		PF7R	
			G1	G4	G1	G4	G1	G4	G1	G4	G1	G2	G1	G2	G1	G2	G1	G2	G1	G4	G1	G4	G1	G4	G1	G4	G1	G4
Virtical load	Dead load		910	900	830	800	820	850	910	920	1680	1510	5490	5570	5630	5490	1380	1780	880	930	840	920	910	930	910	930	930	1100
		Design value	910	900	830	800	820	850	910	920	840	760	2750	2790	2820	2750	690	890	880	930	840	920	910	930	910	930	930	1100
	Live load		320	330	540	520	540	520	320	330	1000	960	1810	1870	1860	1800	890	1070	330	320	520	550	520	550	330	320	320	340
		Design value	320	330	540	520	540	520	320	330	500	480	910	940	930	900	450	540	330	320	520	550	520	550	330	320	320	340
Horizontal load	Drying shrinkage load	③/Σn	0	0	75	75	75	75	175	175	0	0	0	0	0	0	0	0	100	100	38	38	38	38	0	0	0	0
		Design value	0	0	80	80	80	80	180	180	0	0	0	0	0	0	0	0	100	100	40	40	40	40	0	0	0	0
	Seismic load	③+⑤/Σn	150	150	475	475	475	475	500	500	425	425	800	800	650	650	350	350	750	750	300	300	300	300	150	150	175	175
		Design value	150	150	480	480	480	480	500	500	430	430	800	800	650	650	350	350	750	750	300	300	300	300	150	150	180	180

[kN]

Load category			PF8L		PF8R		PF9L		PF9R		PF10L		PF10R		PF11L		PF11R		PF12		PF13		PF14L		PF14R		PF15L		PF15R		AF2	
			G1	G4	G1	G4	G1	G4	G1	G4	G1	G4	G1	G4	G1	G4	G1	G5	G1	G5	G1	G5	G1	G5	G1	G4	G1	G4	G1	G4	G1	G4
Virtical load	Dead load		920	1200	950	900	930	880	940	960	950	960	890	880	920	920	460	460	1830	1830	1830	1830	460	460	910	910	910	910	900	900	910	910
		Design value	920	1200	950	900	930	880	940	960	950	960	890	880	920	920	460	460	1830	1830	1830	1830	460	460	910	910	910	910	900	900	910	910
	Live load		470	500	440	430	430	430	430	430	430	430	500	500	340	340	330	330	670	670	670	670	330	330	340	340	550	550	550	550	340	340
		Design value	470	500	440	430	430	430	430	430	430	430	500	500	340	340	330	330	670	670	670	670	330	330	340	340	550	550	550	550	340	340
Horizontal load	Drying shrinkage load	③/Σn	100	100	100	100	13	13	13	13	113	113	113	113	0	0	0	0	0	0	0	0	0	0	175	175	75	75	75	75	0	0
		Design value	100	100	100	100	20	20	20	20	120	120	120	120	0	0	0	0	0	0	0	0	0	0	200	200	80	80	80	80	0	0
	Seismic load	③+⑤/Σn	500	500	500	500	363	363	363	363	588	588	588	588	150	150	220	220	340	340	380	380	260	260	475	475	513	513	513	513	150	150
		Design value	500	500	500	500	370	370	370	370	590	590	590	590	150	150	220	220	340	340	380	380	260	260	480	480	520	520	520	520	150	150

Load for design of brigde seat

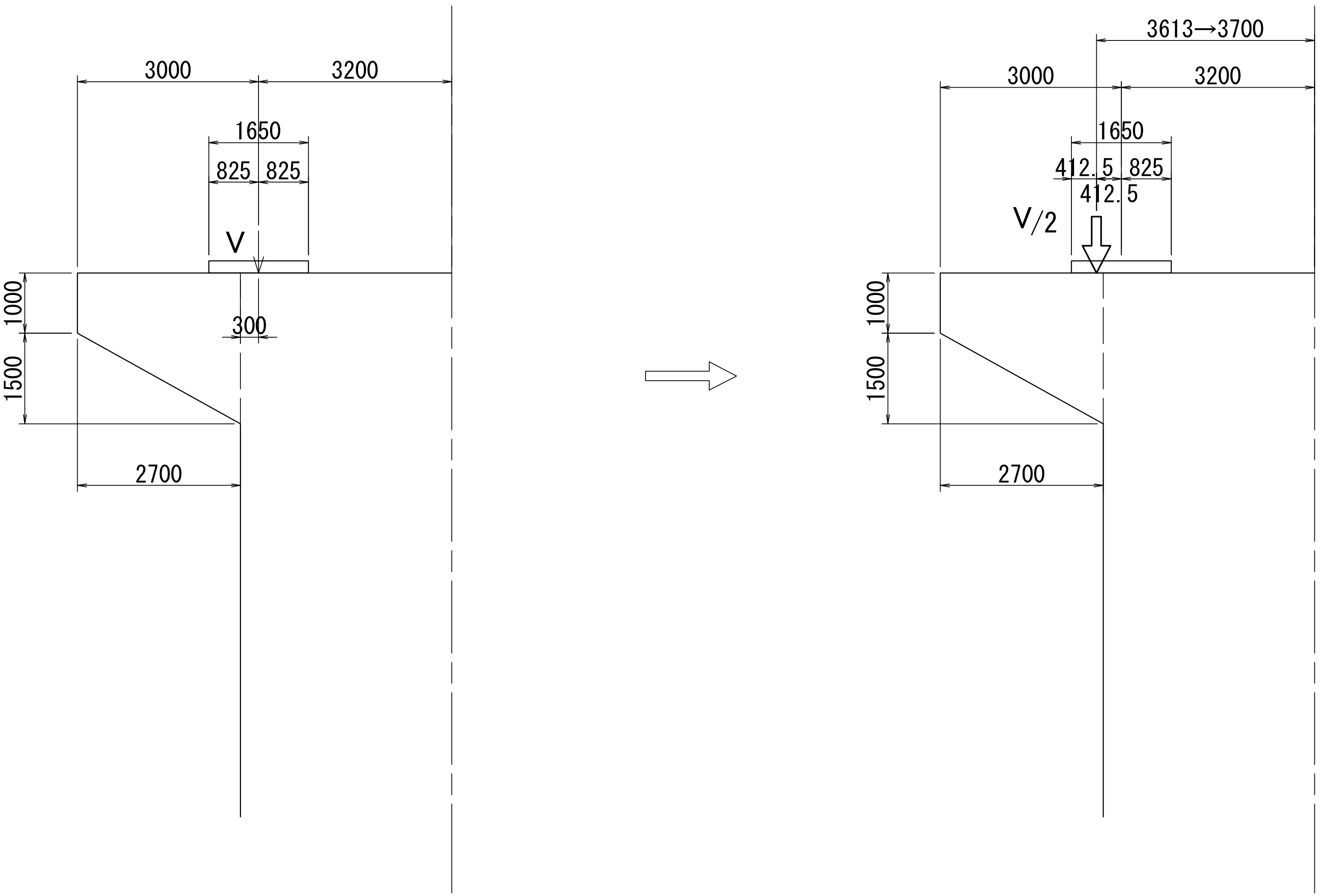
[kN]

Load category			AF1	PF1	PF2L	PF2R	PF3	PF4	PF5L	PF5R	PF6	PF7L	PF7R
Virtical load	Minimam dead load	Design value	0	0	0	1510	5490	5490	1380	0	0	0	0
Horizontal load	Seismic load	③+⑤/Σn	285	1267	333	850	1600	1300	700	500	800	293	323
		Design value	290	1270	340	850	1600	1300	700	500	800	300	330

[kN]

Load category			PF8	PF9	PF10	PF11L	PF11R	PF12	PF13	PF14L	PF14R	PF15	AF2
Virtical load	Minimam dead load	Design value	0	0	0	0	460	1830	1830	460	0	0	0
Horizontal load	Seismic load	③+⑤/Σn	1333	967	1567	293	220	340	380	260	317	1367	285
		Design value	1340	970	1570	300	220	340	380	260	320	1370	290

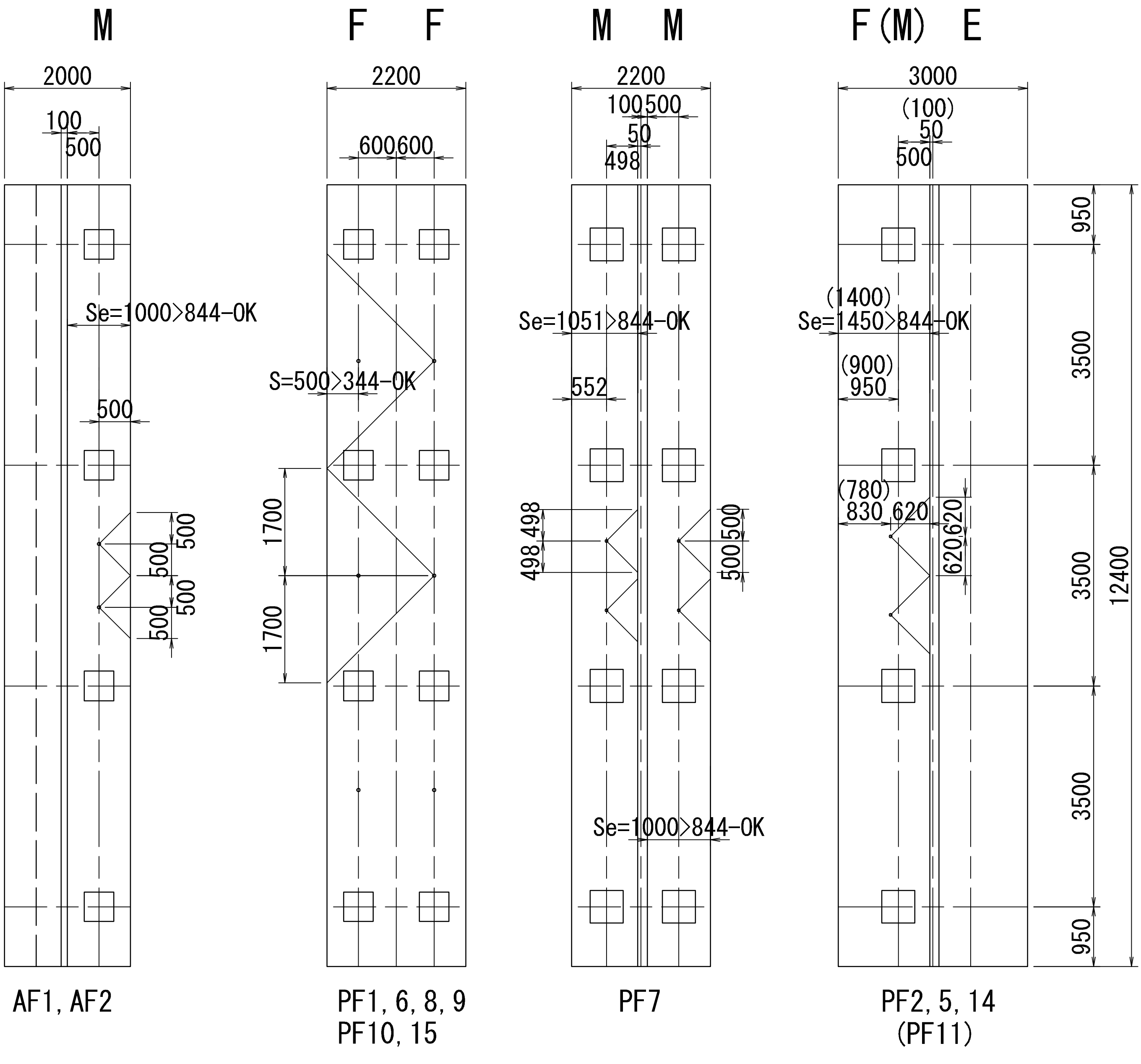
Steel Box girder
Beam design model



Concrete I girder

S=0.2+0.005l
=0.2+0.005×28.8
=0.344m

Se=0.7+0.005l
=0.7+0.005×28.8
=0.844m



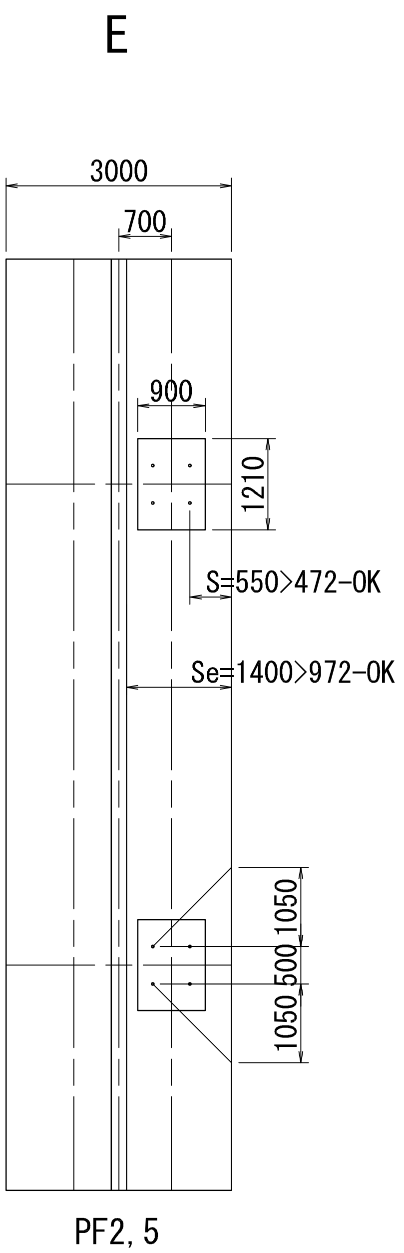
Steel Box girder

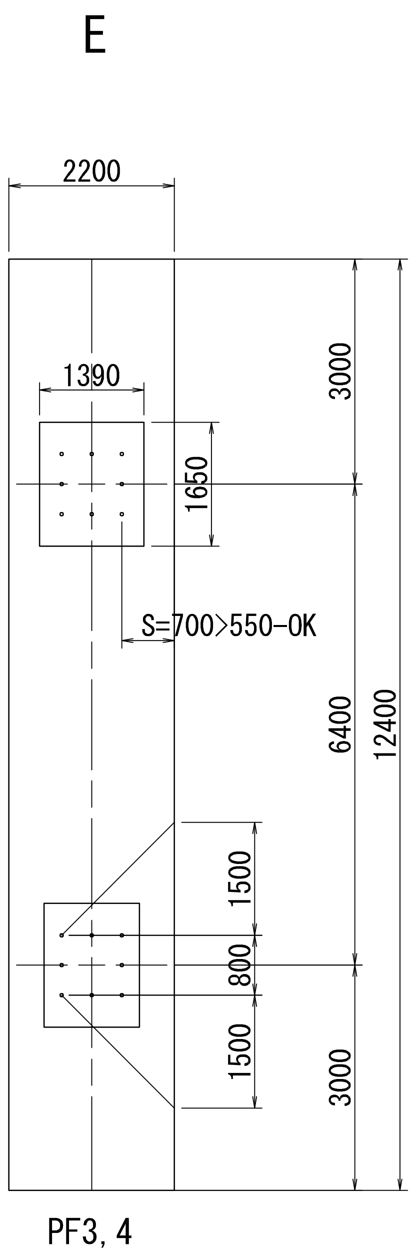
S=0.2+0.005l
=0.2+0.005×54.3
=0.472m

Se=0.7+0.005l
=0.7+0.005×54.3
=0.972m

S=0.2+0.005l
=0.2+0.005×70.0
=0.550m

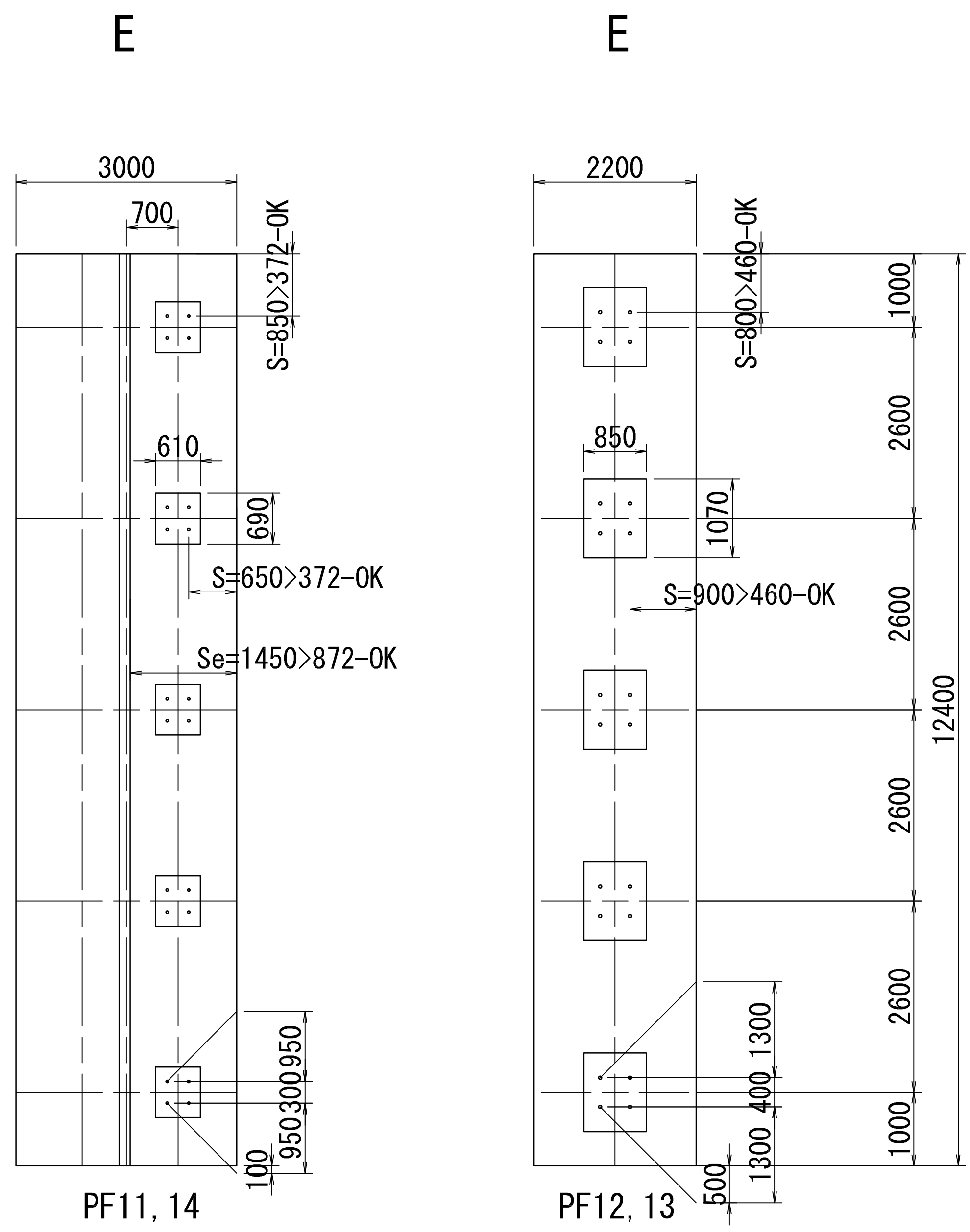
Se=0.7+0.005l
=0.7+0.005×70.0
=1.050m





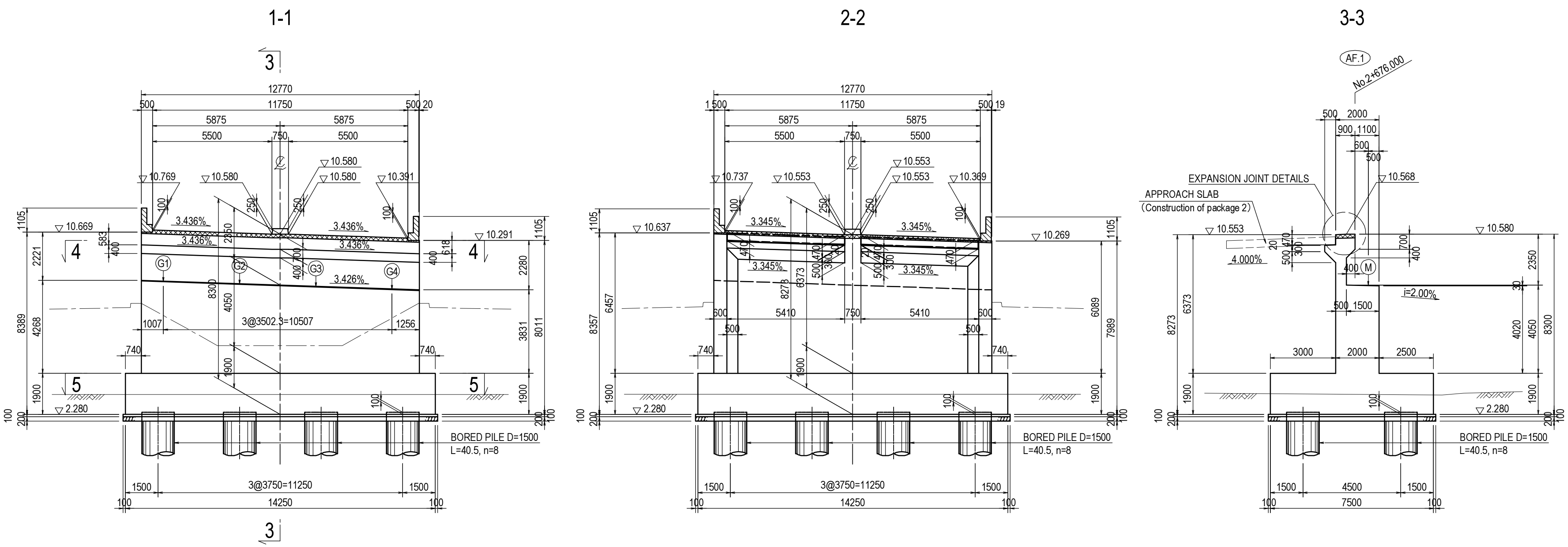
Steel Plate girder

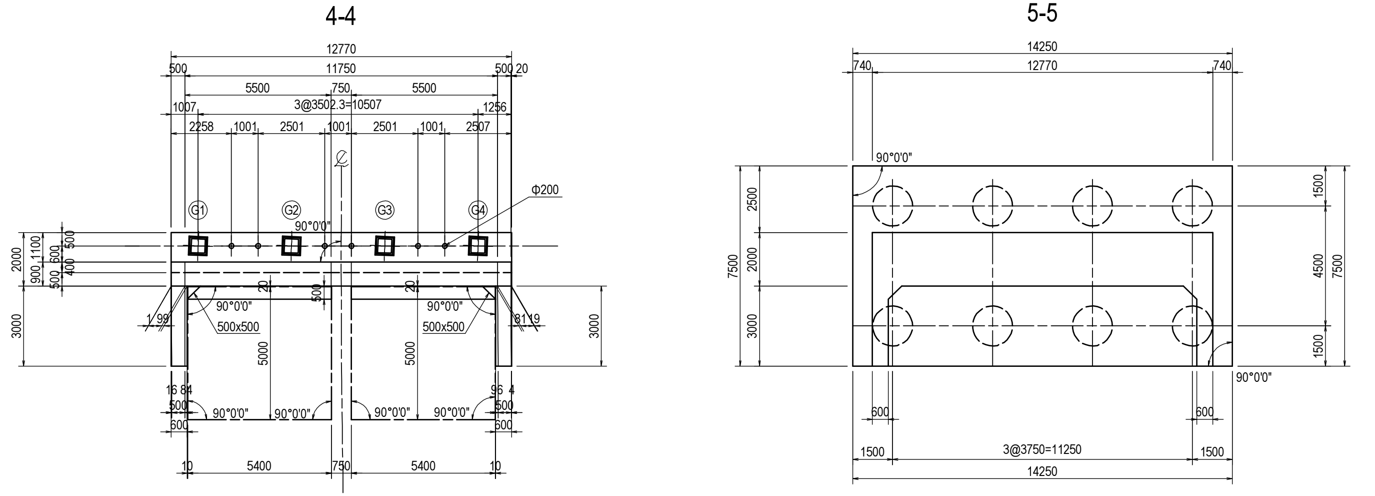
S=0.2+0.005l =0.2+0.005×34.3 =0.372m	S=0.2+0.005l =0.2+0.005×52.0 =0.460m
Se=0.7+0.005l =0.7+0.005×34.3 =0.872m	Se=0.7+0.005l =0.7+0.005×52.0 =0.960m



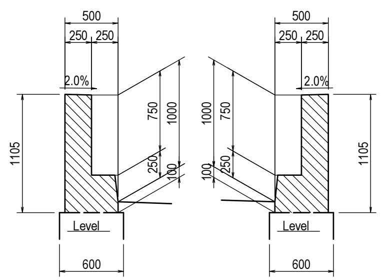
GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (1)

CROSS SECTION S=1:200

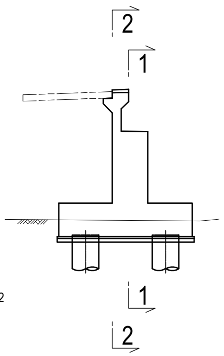




CONCRETE RAILING DETAILS S=1:50



KEY PLAN



NOTE :

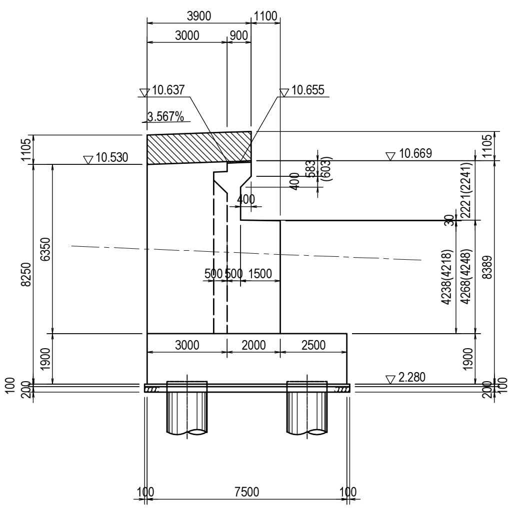
1. The construction of approach slab is included in Package 2
2. The work of backfill is included in Package 2

PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM		NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO.,LTD. NIPPON ENGINEERING CONSULTANTS CO.,LTD.	PREPARED BY	Y. SUZUKI	Y.S	15 Jun. 2017	GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (1)	3
				CHECKED BY	T. HAYAKAWA	早川 知邦			DWG No.
				APPROVED BY	Y. SANO	佐野 裕一			P3-FO-2002

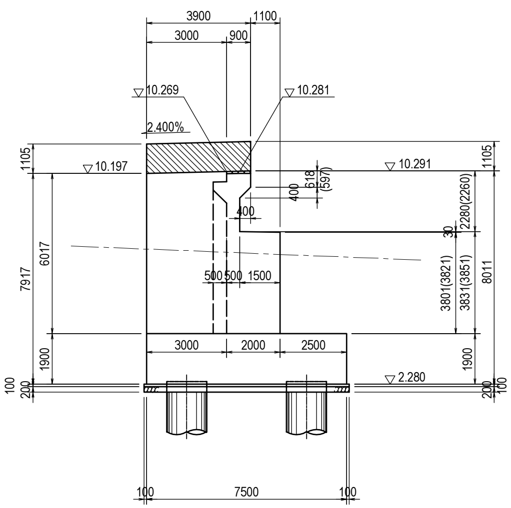
GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (2)

CROSS SECTION S=1:200

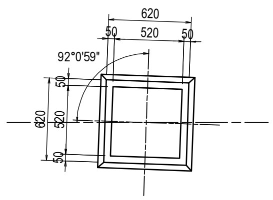
6-6



7-7

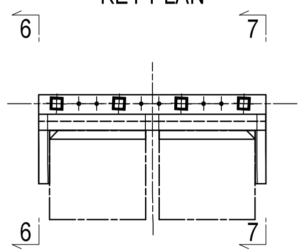


BEARING DETAILS S=1:40



	G1	G2	G3	G4
BEARING MORTAR(mm)	49	49	49	49
LOWER UPPER END HEIGHT	▽ 8.394	▽ 8.274	▽ 8.155	▽ 8.034

KEY PLAN

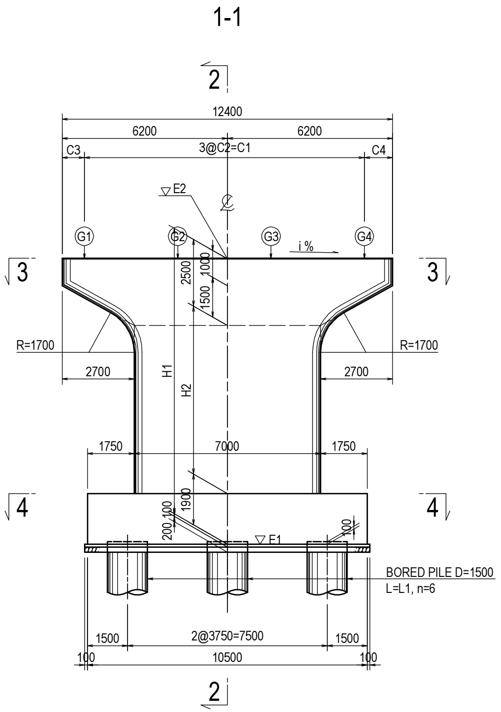


PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM		NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO.,LTD. NIPPON ENGINEERING CONSULTANTS CO.,LTD.	PREPARED BY	Y. SUZUKI	Y.S	15 Jun. 2017	GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (2)	3
				CHECKED BY	T. HAYAKAWA				DWG No.
				APPROVED BY	Y. SANO				P3-FO-2003

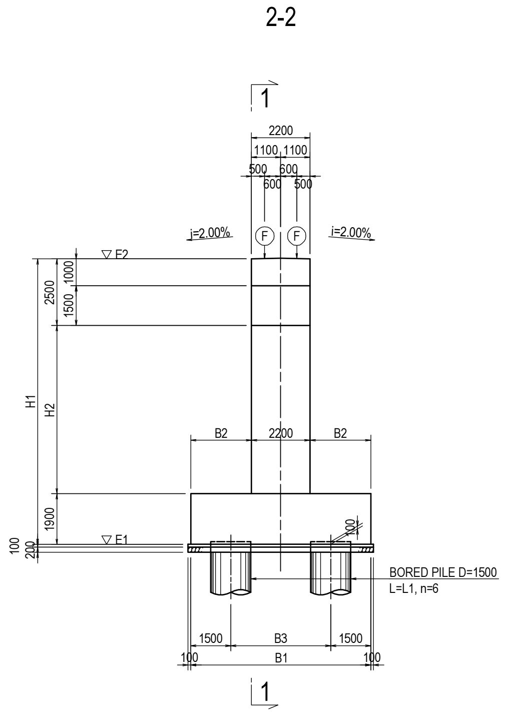
GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (3)

CROSS SECTION S=1:200

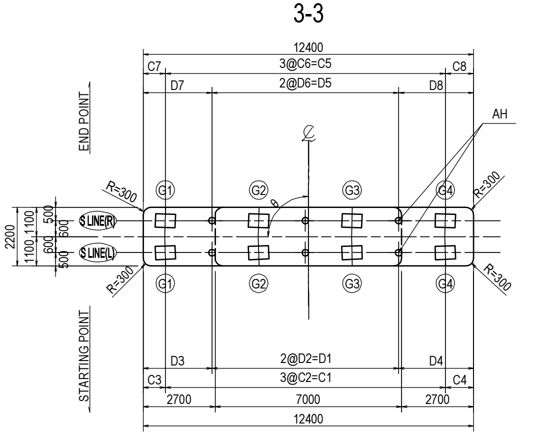
1-1



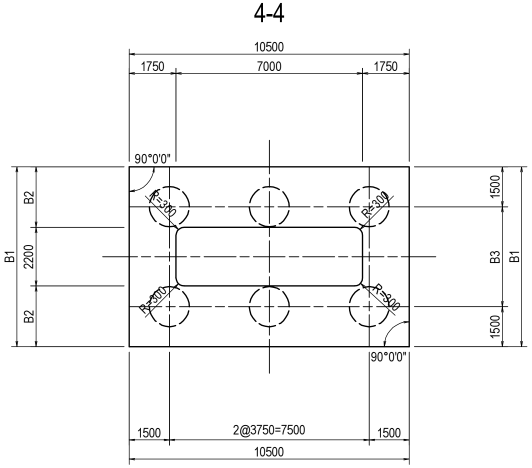
2-2



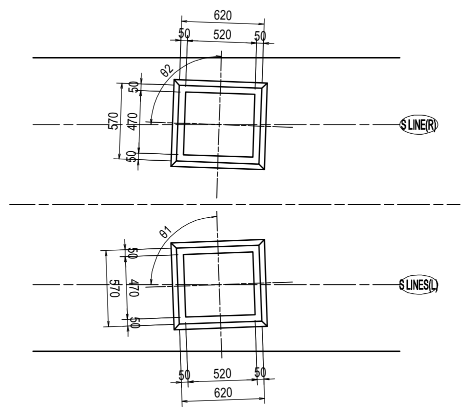
3-3



4-4



BEARING DETAILS S=1:40



No.	AXIS	STATION No.	i(%)	E1(m)	E2(m)	θ(°)	H1(mm)	H2(mm)	B1(mm)	B2(mm)	B3(mm)	L1(m)
1	PF.1	2+706.000	3.636 ↘	2.187	9.087	90°00'00"	6900	2500	8500	3150	5500	41.5
2	PF.6	2+946.000	4.795 ↙	1.437	13.337	90°00'00"	11900	7500	6750	2275	3750	33.5
3	PF.8	3+ 6.000	LEVEL	1.184	12.984	90°07'09"	11800	7400	7500	2650	4500	37.0
4	PF.9	3+ 36.000	LEVEL	1.370	12.770	90°00'00"	11400	7000	6750	2275	3750	35.5
5	PF.10	3+ 66.000	LEVEL	1.555	12.555	90°00'00"	11000	6600	7500	2650	4500	32.5
6	PF.15	3+248.000	LEVEL	1.530	9.330	90°00'00"	7800	3400	7500	2650	4500	34.0

No.	AXIS	C1(mm)	C2(mm)	C3(mm)	C4(mm)	C5(mm)	C6(mm)	C7(mm)	C8(mm)	θ1(°)	θ2(°)	AH
1	PF.1	10507	3502.3	832	1061	10507	3502.3	832	1061	87°57'20"	92°01'20"	Φ250
2	PF.6	10512	3504	1096	792	10512	3504	1096	792	92°41'09"	87°22'15"	Φ250
3	PF.8	10500	3500	945	955	10500	3500	956	944	91°03'14"	90°00'00"	Φ250
4	PF.9	10500	3500	950	950	10500	3500	950	950	90°00'00"	90°00'00"	Φ250
5	PF.10	10500	3500	950	950	10500	3500	950	950	90°00'00"	90°00'00"	Φ250
6	PF.15	10500	3500	950	950	10500	3500	950	950	90°00'00"	90°00'00"	Φ250

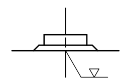
No.	AXIS	D1(mm)	D2(mm)	D3(mm)	D4(mm)	D5(mm)	D6(mm)	D7(mm)	D8(mm)
1	PF.1	7004.6	3502.3	2583	2812	7004.6	3502.3	2583	2812
2	PF.6	7008	3504	2848	2544	7008	3504	2848	2544
3	PF.8	7000	3500	2695	2705	7000	3500	2706	2694
4	PF.9	7000	3500	2700	2700	7000	3500	2700	2700
5	PF.10	7000	3500	2700	2700	7000	3500	2700	2700
6	PF.15	7000	3500	2700	2700	7000	3500	2700	2700

BEARING MORTAR(mm)

No.	AXIS	S LINE (L)				S LINE (R)			
		G1	G2	G3	G4	G1	G2	G3	G4
1	PF.1	50	50	50	50	55	55	55	55
2	PF.6	55	56	58	58	56	58	59	60
3	PF.8	47	47	47	47	40	40	40	41
4	PF.9	48	48	48	48	40	40	40	40
5	PF.10	49	49	49	49	40	40	40	40
6	PF.15	46	46	46	46	40	40	40	40

LOWER UPPER END HEIGHT

No.	AXIS	S LINE (L)				S LINE (R)			
		G1	G2	G3	G4	G1	G2	G3	G4
1	PF.1	▽ 9.292	▽ 9.165	▽ 9.037	▽ 8.910	▽ 9.292	▽ 9.165	▽ 9.037	▽ 8.910
2	PF.6	▽ 13.102	▽ 13.270	▽ 13.438	▽ 13.606	▽ 13.102	▽ 13.270	▽ 13.438	▽ 13.606
3	PF.8	▽ 12.994	▽ 12.994	▽ 12.994	▽ 12.994	▽ 12.994	▽ 12.994	▽ 12.994	▽ 12.994
4	PF.9	▽ 12.780	▽ 12.780	▽ 12.780	▽ 12.780	▽ 12.780	▽ 12.780	▽ 12.780	▽ 12.780
5	PF.10	▽ 12.565	▽ 12.565	▽ 12.565	▽ 12.565	▽ 12.565	▽ 12.565	▽ 12.565	▽ 12.565
6	PF.15	▽ 9.340	▽ 9.340	▽ 9.340	▽ 9.340	▽ 9.340	▽ 9.340	▽ 9.340	▽ 9.340



PROJECT NAME
DETAILED DESIGN ON
BAGO RIVER BRIDGE
CONSTRUCTION PROJECT

FINANCED BY
JAPAN INTERNATIONAL
COOPERATION AGENCY

COUNTERPART
REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF CONSTRUCTION
DEPARTMENT OF BRIDGE

JICA STUDY TEAM
NIPPON KOEI CO., LTD.
ORIENTAL CONSULTANTS GLOBAL CO., LTD.
METROPOLITAN EXPRESSWAY COMPANY LIMITED
CHODAI CO.,LTD.
NIPPON ENGINEERING CONSULTANTS CO.,LTD.

	NAME	SIGNATURE	DATE
PREPARED BY	Y. SUZUKI	Y.S	15 Jun. 2017
CHECKED BY	T. HAYAKAWA	早川 知邦	
APPROVED BY	Y. SANO	佐野 [illegible]	

DRAWING TITLE: GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (3)

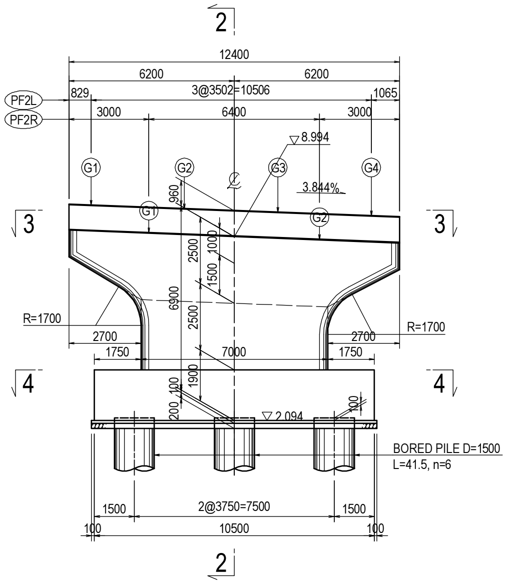
PACKAGE: 3

DWG No.: P3-FO-

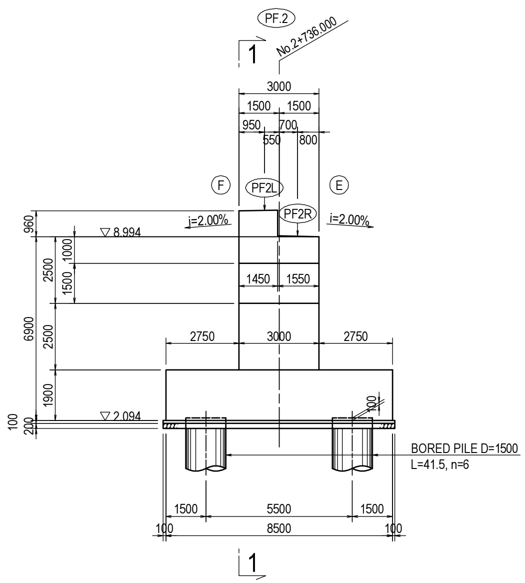
GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (4)

CROSS SECTION S=1:200

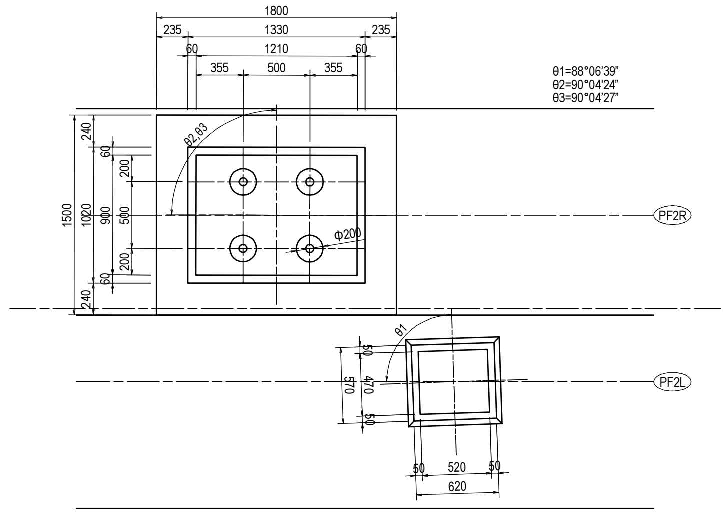
1-1



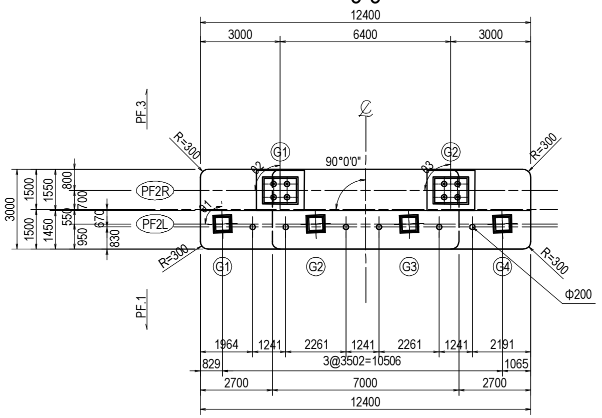
2-2



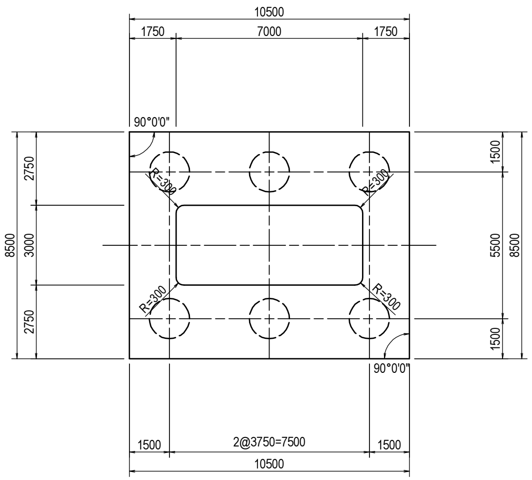
BEARING DETAILS S=1:40



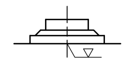
3-3



4-4



	PF2L				PF2R	
	G1	G2	G3	G4	G1	G2
BEARING MORTAR(mm)	54	54	54	54	32	30
BASE HEIGHT(mm)	-	-	-	-	150	210
LOWER UPPER END HEIGHT	▽ 10.179	▽ 10.045	▽ 9.910	▽ 9.776	▽ 9.133	▽ 8.887



PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO.,LTD. NIPPON ENGINEERING CONSULTANTS CO.,LTD.

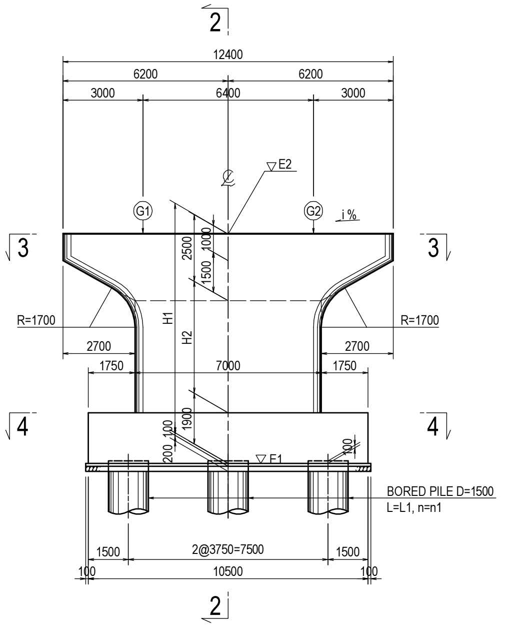
	NAME	SIGNATURE	DATE
PREPARED BY	Y. SUZUKI	T.S	15 Jun. 2017
CHECKED BY	T. HAYAKAWA	早川 知邦	
APPROVED BY	Y. SANO	佐野 祐一	

DRAWING TITLE	PACKAGE
GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (4)	3
	DWG No. P3-FO-

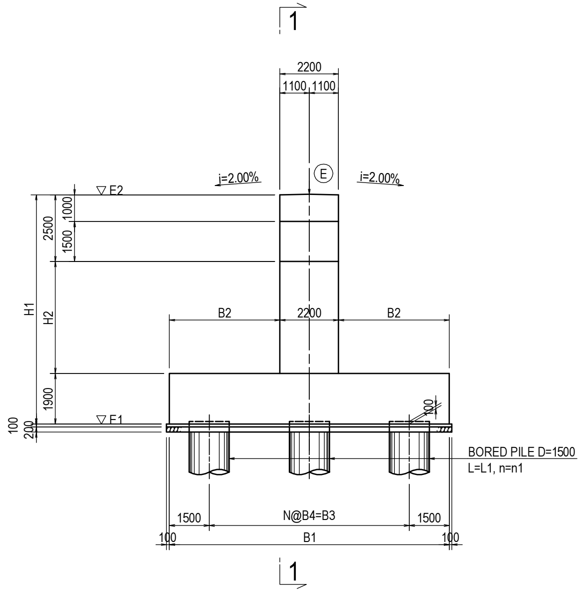
GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (5)

CROSS SECTION S=1:200

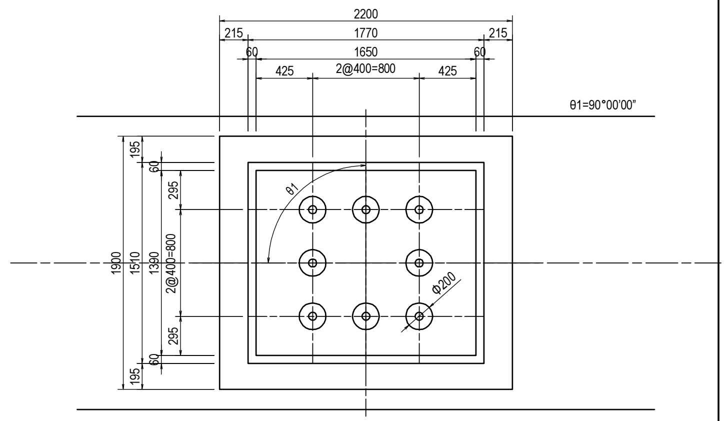
1-1



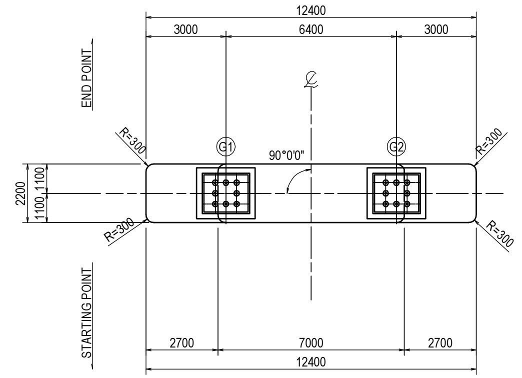
2-2



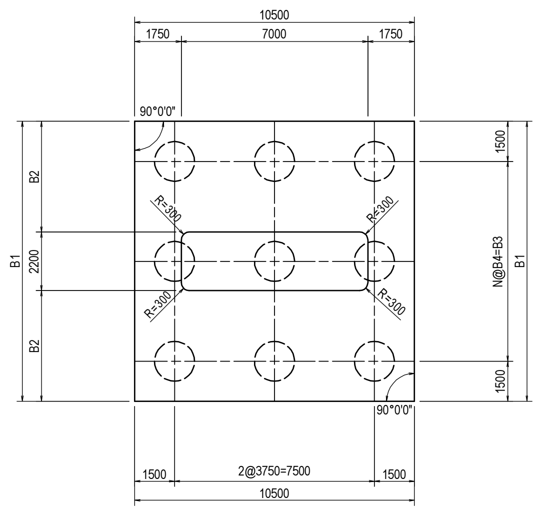
BEARING DETAILS S=1:40



3-3



4-4



No.	AXIS	STATION No.	i(%)	E1(m)	E2(m)	H1(mm)	H2(mm)
1	PF.3	2+791.000	0.844	2.092	10.392	8300	3900
2	PF.4	2+861.000	5.234	1.879	11.679	9800	5400

No.	AXIS	B1(mm)	B2(mm)	B3(mm)	B4(mm)	N	L1(m)	n1
1	PF.3	10500	4150	7500	3750	2	38.0	9
2	PF.4	6750	2275	3750	-	-	40.5	6

BEARING MORTAR(mm)

No.	AXIS	G1	G2
1	PF.3	31	32
2	PF.4	31	31

BASE HEIGHT(mm)

No.	AXIS	G1	G2
1	PF.3	150	150
2	PF.4	150	150

LOWER UPPER END HEIGHT

No.	AXIS	G1	G2
1	PF.3	▽ 10.387	▽ 10.441
2	PF.4	▽ 11.533	▽ 11.868

PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.

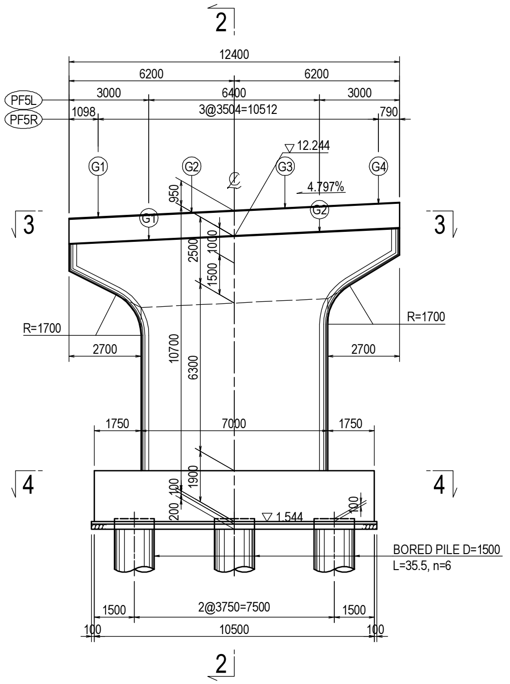
	NAME	SIGNATURE	DATE
PREPARED BY	Y. SUZUKI	Y.S	15 Jun. 2017
CHECKED BY	T. HAYAKAWA	早川 知邦	
APPROVED BY	Y. SANO	佐野 祐一	

DRAWING TITLE	PACKAGE
GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (5)	3
	DWG No. P3-FO-2006

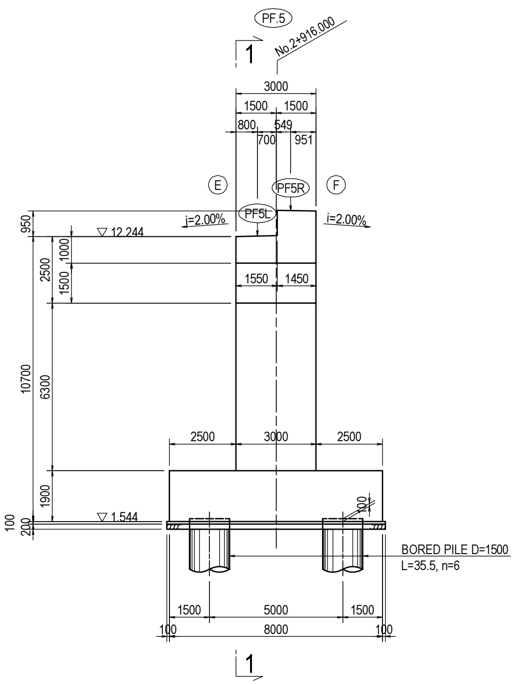
GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (6)

CROSS SECTION S=1:200

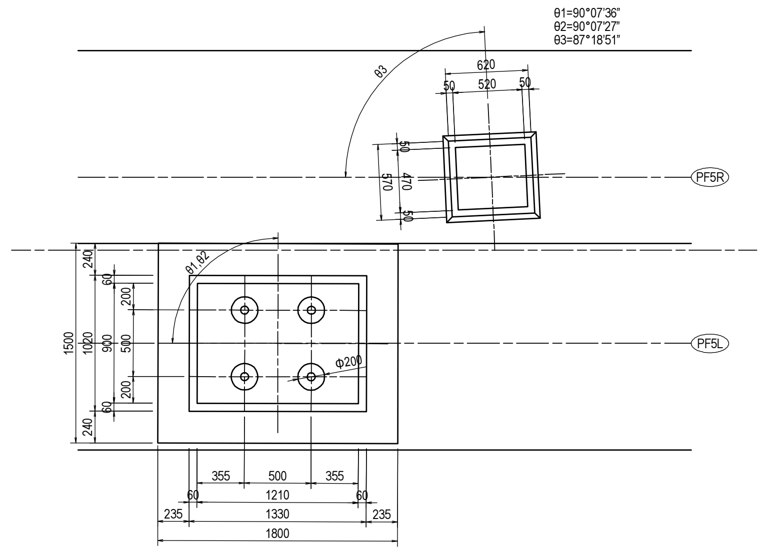
1-1



2-2

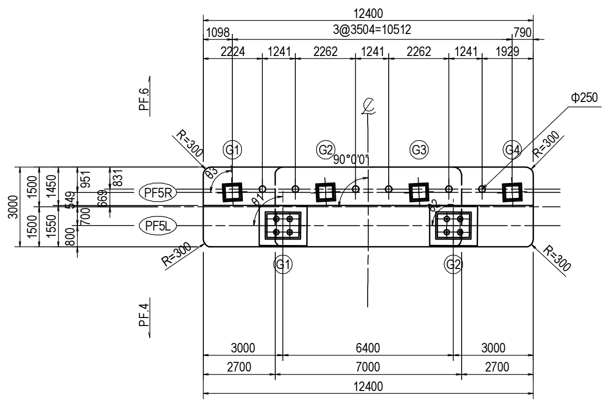


BEARING DETAILS S=1:40

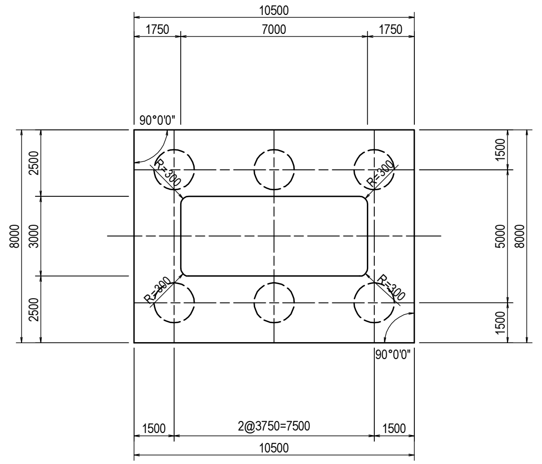


	PF5L		PF5R			
	G1	G2	G1	G2	G3	G4
BEARING MORTAR(mm)	31	33	60	60	60	60
BASE HEIGHT(mm)	150	180	-	-	-	-
LOWER UPPER END HEIGHT	▽ 12.106	▽ 12.413	▽ 12.968	▽ 13.136	▽ 13.304	▽ 13.472

3-3



4-4

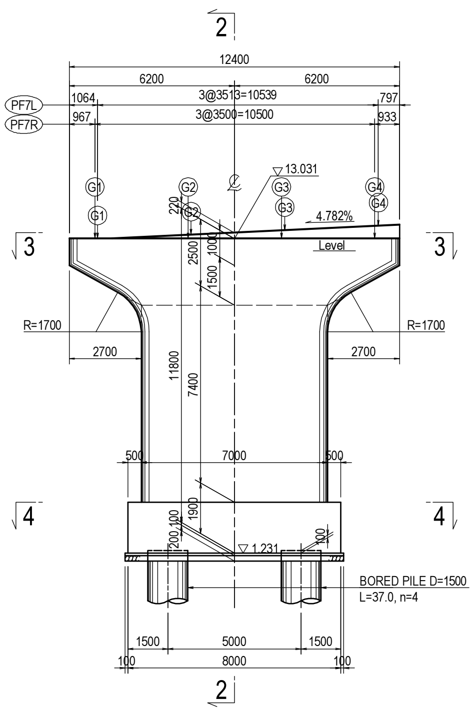


PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM		NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO.,LTD. NIPPON ENGINEERING CONSULTANTS CO.,LTD.	PREPARED BY	Y. SUZUKI		15 Jun. 2017	GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (6)	3
				CHECKED BY	T. HAYAKAWA				DWG No.
				APPROVED BY	Y. SANO				P3-FO-

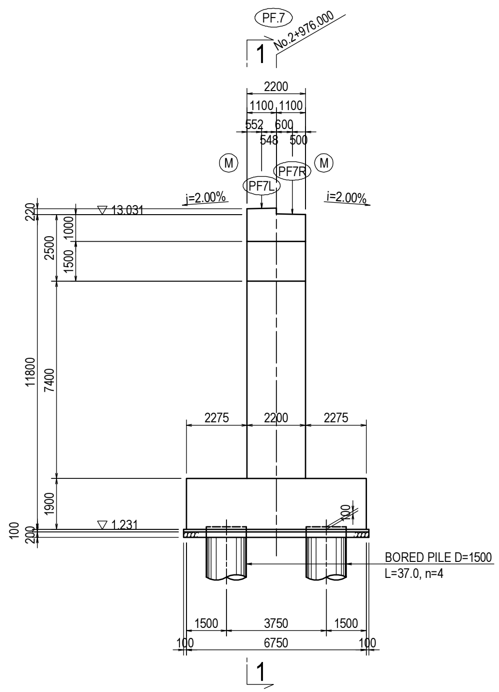
GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (7)

CROSS SECTION S=1:200

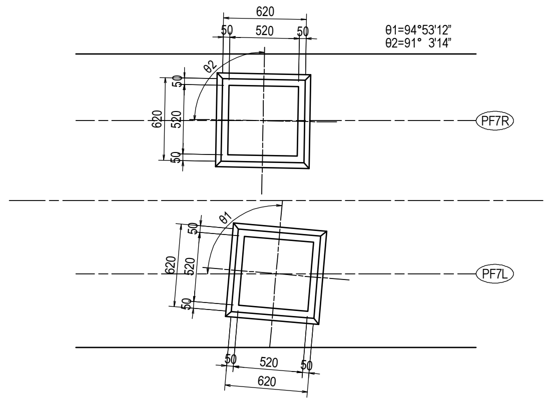
1-1



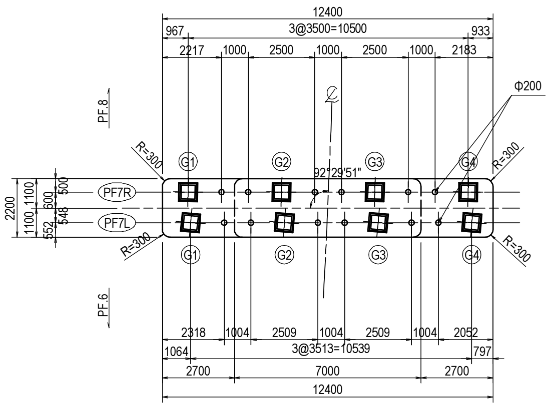
2-2



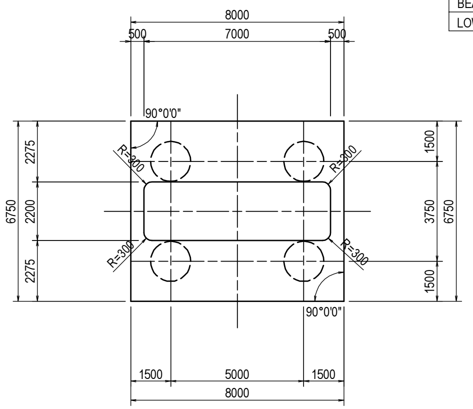
BEARING DETAILS S=1:40



3-3



4-4



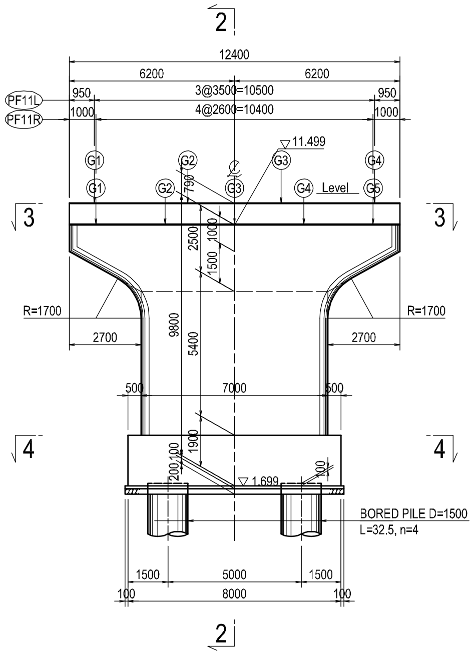
	PF7L				PF7R			
	G1	G2	G3	G4	G1	G2	G3	G4
BEARING MORTAR(mm)	34	60	60	60	41	41	40	41
LOWER UPPER END HEIGHT	▽ 13.042	▽ 13.184	▽ 13.352	▽ 13.520	▽ 13.041	▽ 13.041	▽ 13.041	▽ 13.041

PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM		NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO.,LTD. NIPPON ENGINEERING CONSULTANTS CO.,LTD.	PREPARED BY	Y. SUZUKI	Y.S	15 Jun. 2017	GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (7)	3
				CHECKED BY	T. HAYAKAWA	早川 和邦			DWG No.
				APPROVED BY	Y. SANO	佐野 裕一			P3-FO-

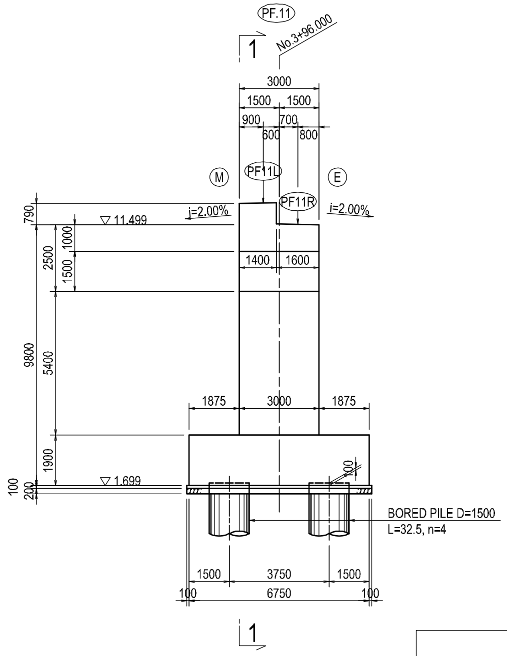
GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (8)

CROSS SECTION S=1:200

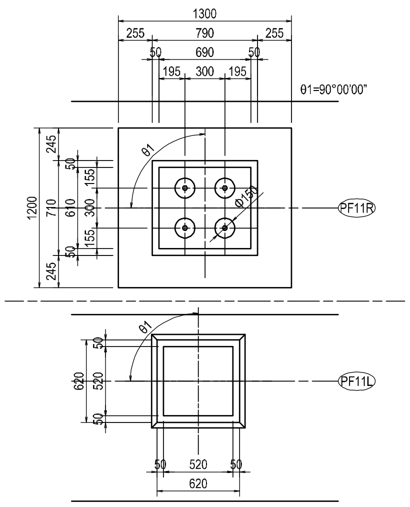
1-1



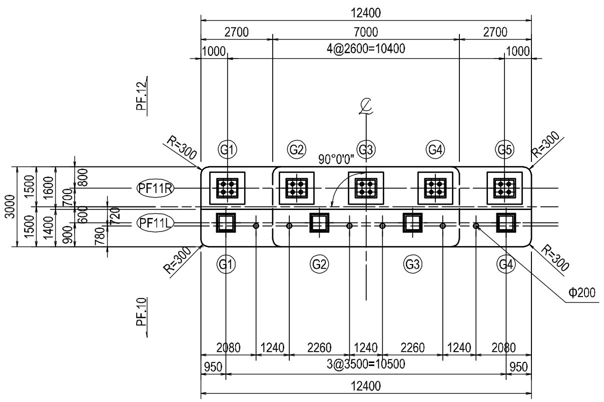
2-2



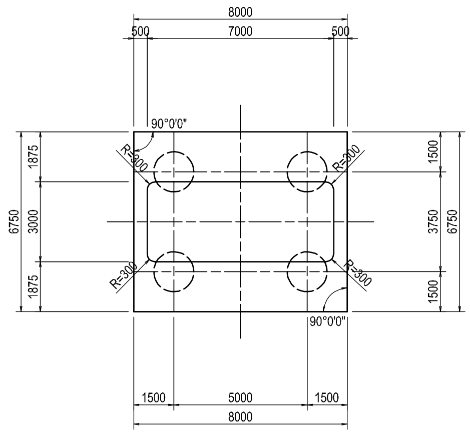
BEARING DETAILS S=1:40

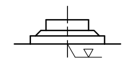


3-3



4-4



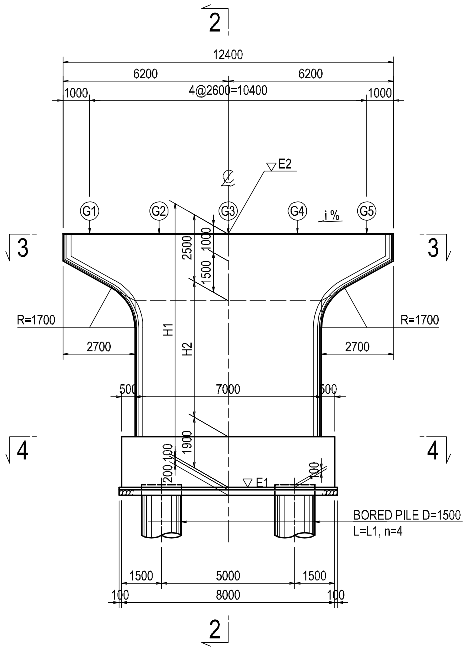
	PF11L				PF11R					
	G1	G2	G3	G4	G1	G2	G3	G4	G5	
BEARING MORTAR(mm)	42	42	42	42	30	32	37	32	30	
BASE HEIGHT(mm)	-	-	-	-	150	200	240	200	150	
LOWER UPPER END HEIGHT	▽ 12.307	▽ 12.307	▽ 12.307	▽ 12.307	▽ 11.515	▽ 11.515	▽ 11.515	▽ 11.515	▽ 11.515	

PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM		NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO.,LTD. NIPPON ENGINEERING CONSULTANTS CO.,LTD.	PREPARED BY	Y. SUZUKI	Y.S	15 Jun. 2017	GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (8)	3
				CHECKED BY	T. HAYAKAWA	早川 知邦			DWG No.
				APPROVED BY	Y. SANO	佐野 裕一			P3-FO-

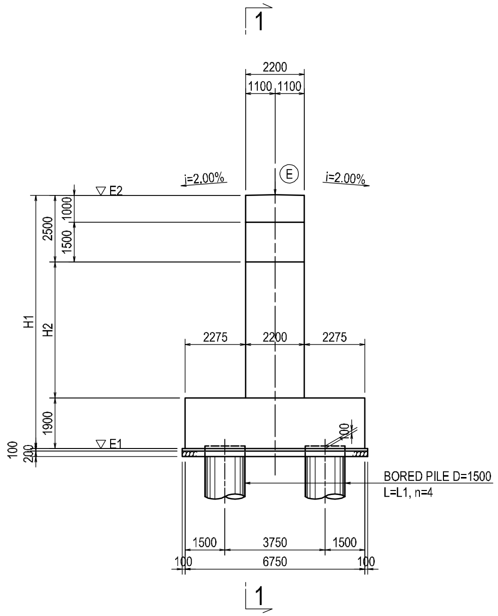
GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (9)

CROSS SECTION S=1:200

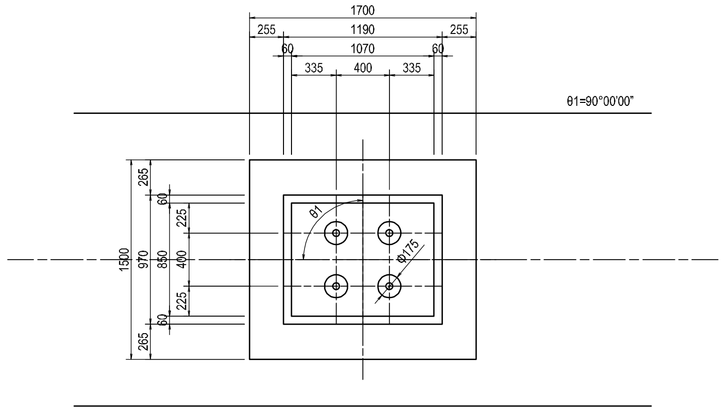
1-1



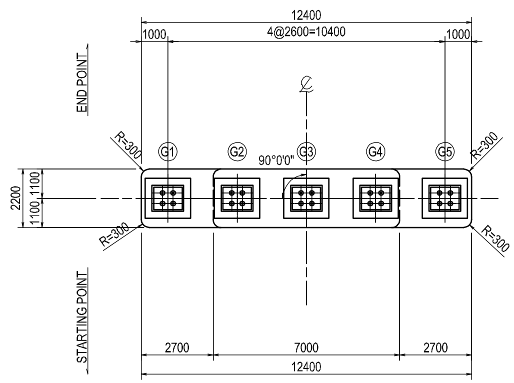
2-2



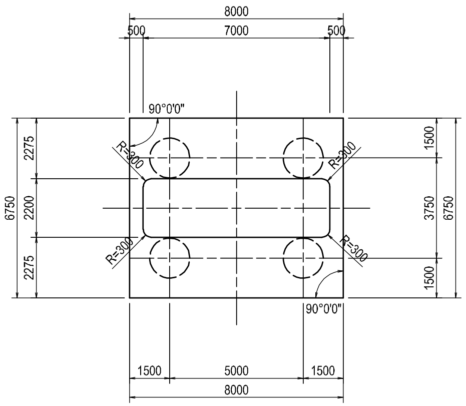
BEARING DETAILS S=1:40



3-3



4-4



No.	AXIS	STATION No.	i(%)	E1(m)	E2(m)	H1(mm)	H2(mm)	L1(m)
1	PF.12	3+131.000	LEVEL	1.907	11.107	9200	4800	33.0
2	PF.13	3+183.000	LEVEL	1.873	10.173	8300	3900	32.5

BEARING MORTAR(mm)

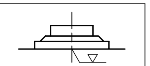
No.	AXIS	G1	G2	G3	G4	G5
1	PF.12	30	32	39	32	30
2	PF.13	30	32	39	32	30

BASE HEIGHT(mm)

No.	AXIS	G1	G2	G3	G4	G5
1	PF.12	150	210	250	210	150
2	PF.13	150	210	250	210	150

LOWER UPPER END HEIGHT

No.	AXIS	G1	G2	G3	G4	G5
1	PF.12	▽ 11.129	▽ 11.129	▽ 11.129	▽ 11.129	▽ 11.129
2	PF.13	▽ 10.195	▽ 10.195	▽ 10.195	▽ 10.195	▽ 10.195

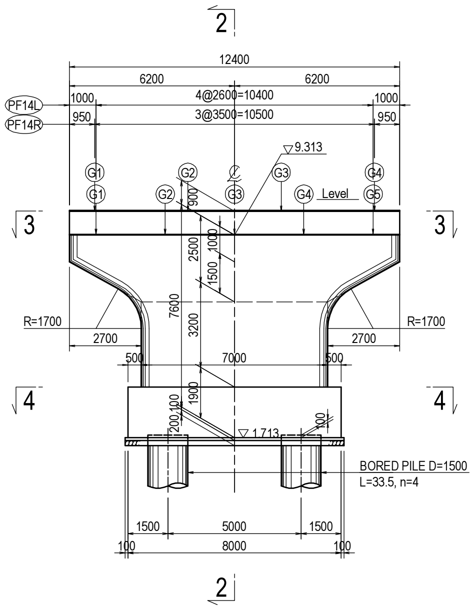


PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM		NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO.,LTD. NIPPON ENGINEERING CONSULTANTS CO.,LTD.	PREPARED BY	Y. SUZUKI	Y.S	15 Jun. 2017	GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (9)	3
				CHECKED BY	T. HAYAKAWA	早川 知邦			DWG No.
				APPROVED BY	Y. SANO	佐野 祐一			P3-FO-

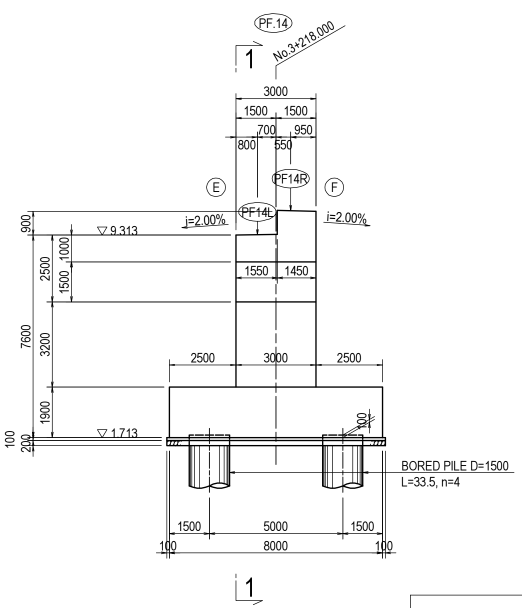
GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (10)

CROSS SECTION S=1:200

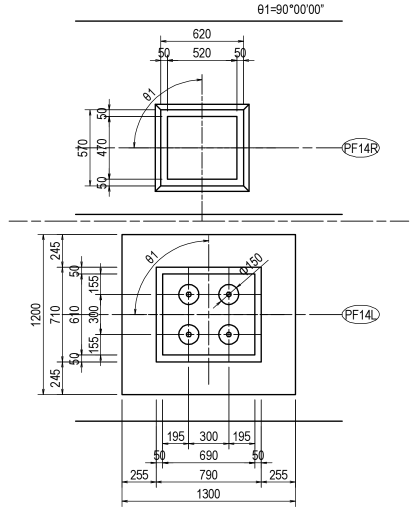
1-1



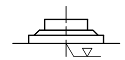
2-2



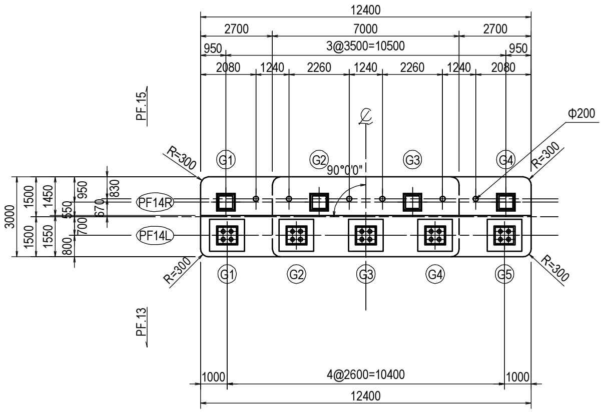
BEARING DETAILS S=1:40



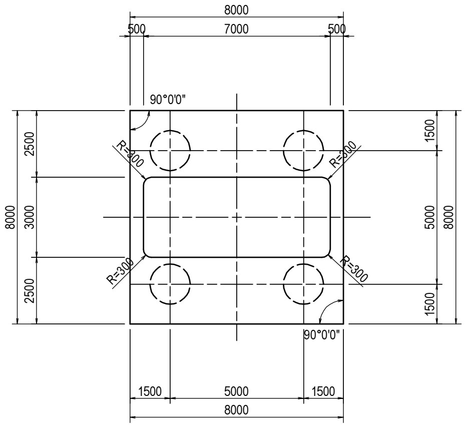
	PF14L					PF14R				
	G1	G2	G3	G4	G5	G1	G2	G3	G4	
BEARING MORTAR(mm)	39	31	35	31	39	49	49	49	49	
BASE HEIGHT(mm)	150	210	250	210	150	-	-	-	-	
LOWER UPPER END HEIGHT	▽ 9.329	▽ 9.329	▽ 9.329	▽ 9.329	▽ 9.329	▽ 10.232	▽ 10.232	▽ 10.232	▽ 10.232	



3-3



4-4



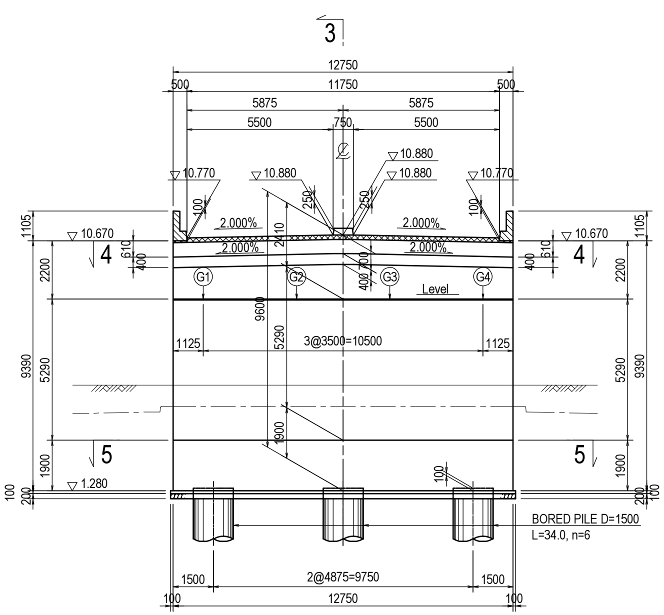
PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO.,LTD. NIPPON ENGINEERING CONSULTANTS CO.,LTD.

	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
PREPARED BY	Y. SUZUKI	Y.S	15 Jun. 2017	GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (10)	3
CHECKED BY	T. HAYAKAWA	[signature]			DWG No.
APPROVED BY	Y. SANO	[signature]			P3-FO-

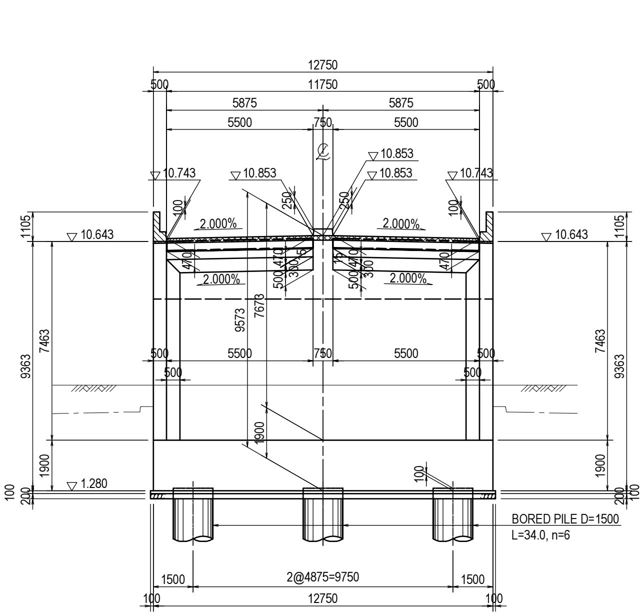
GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (11)

CROSS SECTION S=1:200

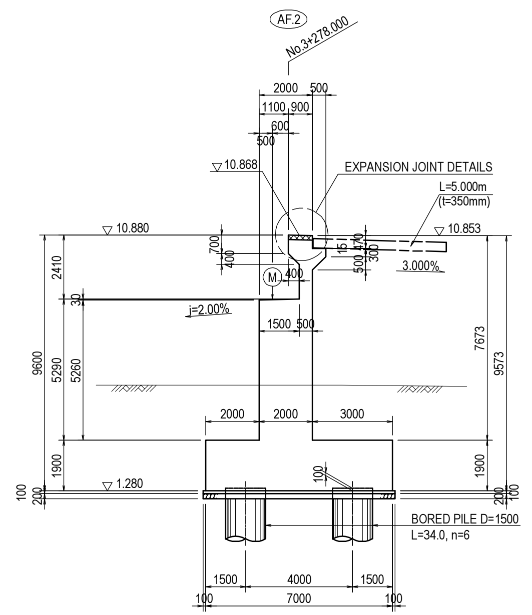
1-1



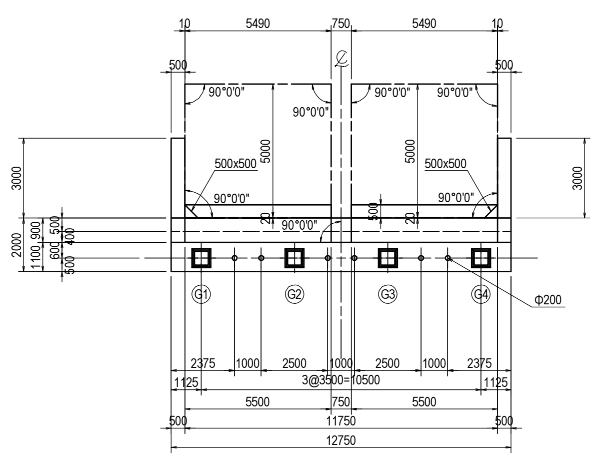
2-2



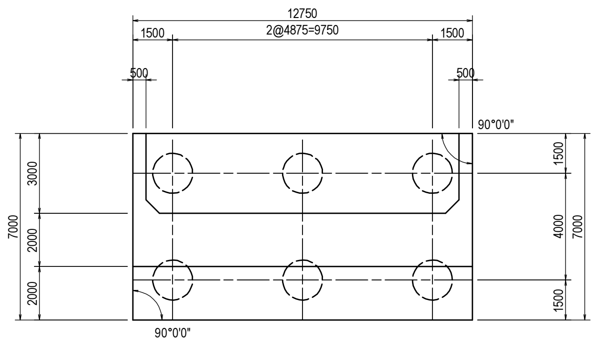
3-3



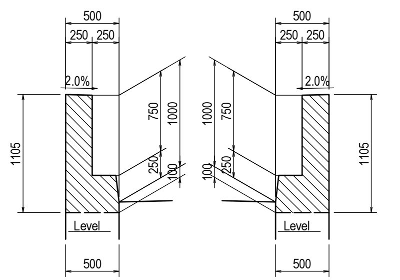
4-4



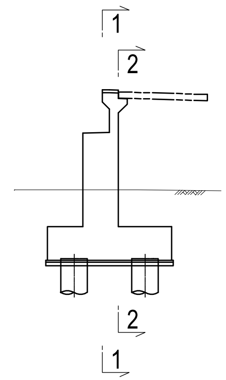
5-5



CONCRETE RAILING DETAILS S=1:50



KEY PLAN

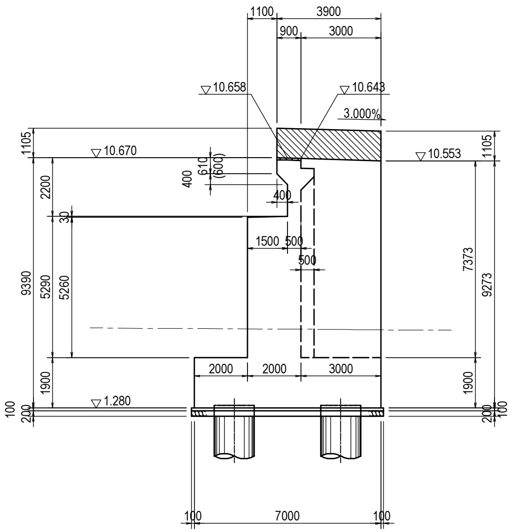


PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM		NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO.,LTD. NIPPON ENGINEERING CONSULTANTS CO.,LTD.	PREPARED BY	Y. SUZUKI	Y.S	15 Jun. 2017	GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (11)	3
				CHECKED BY	T. HAYAKAWA	早川 和邦			DWG No.
				APPROVED BY	Y. SANO	佐野 祐一			P3-FO-2012

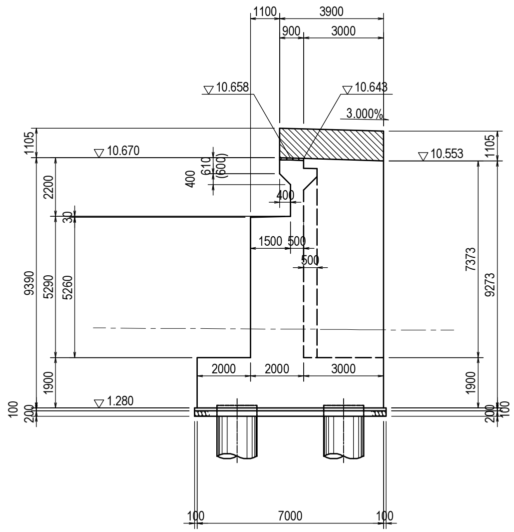
GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (12)

CROSS SECTION S=1:200

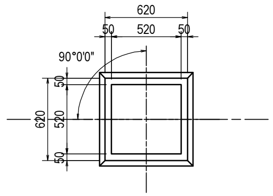
6-6



7-7

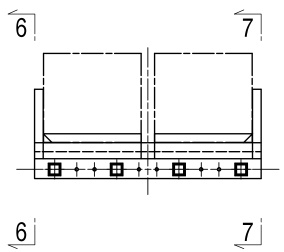


BEARING DETAILS S=1:40



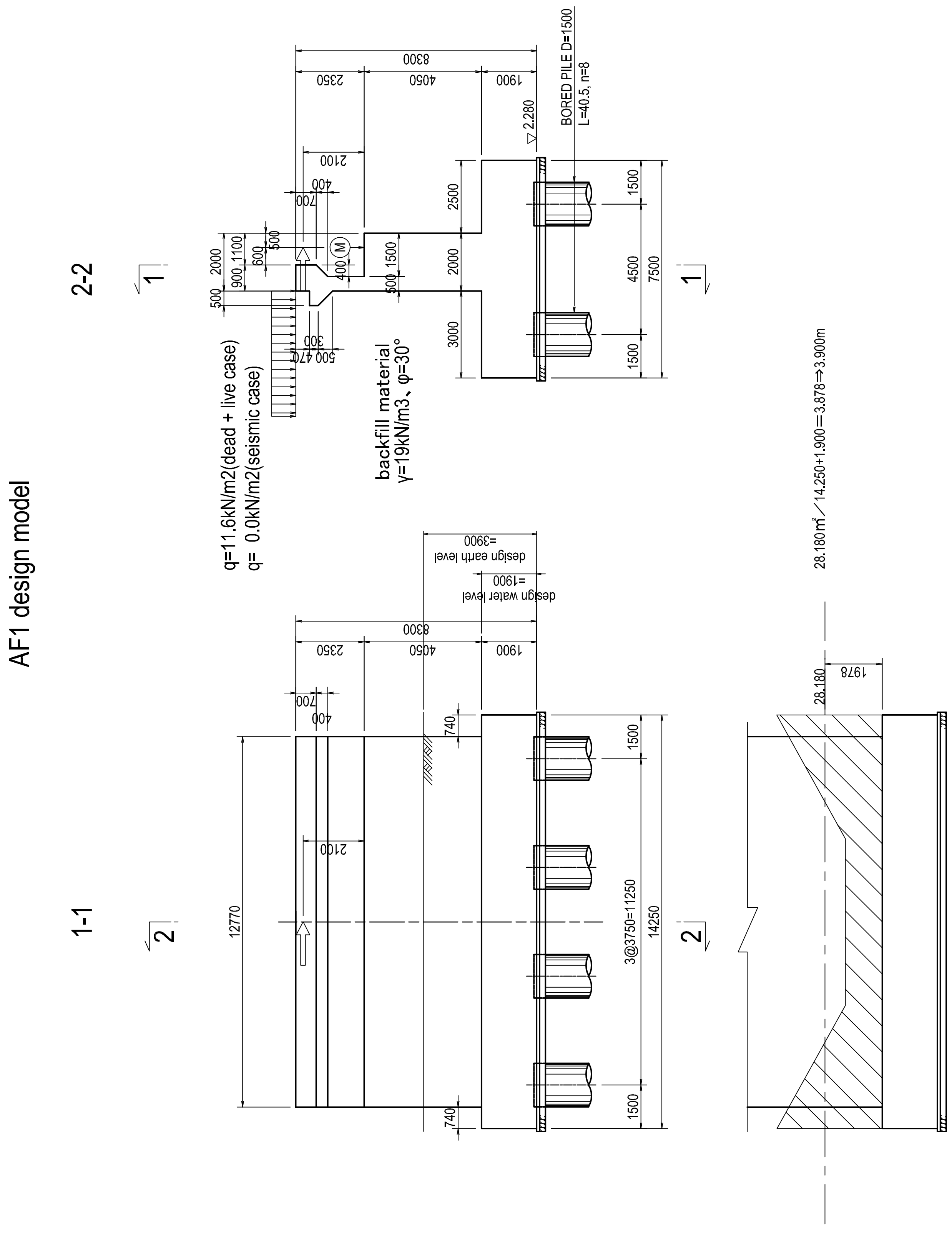
	G1	G2	G3	G4
BEARING MORTAR(mm)	46	46	46	46
LOWER UPPER END HEIGHT	▽ 8.450	▽ 8.450	▽ 8.450	▽ 8.450

KEY PLAN

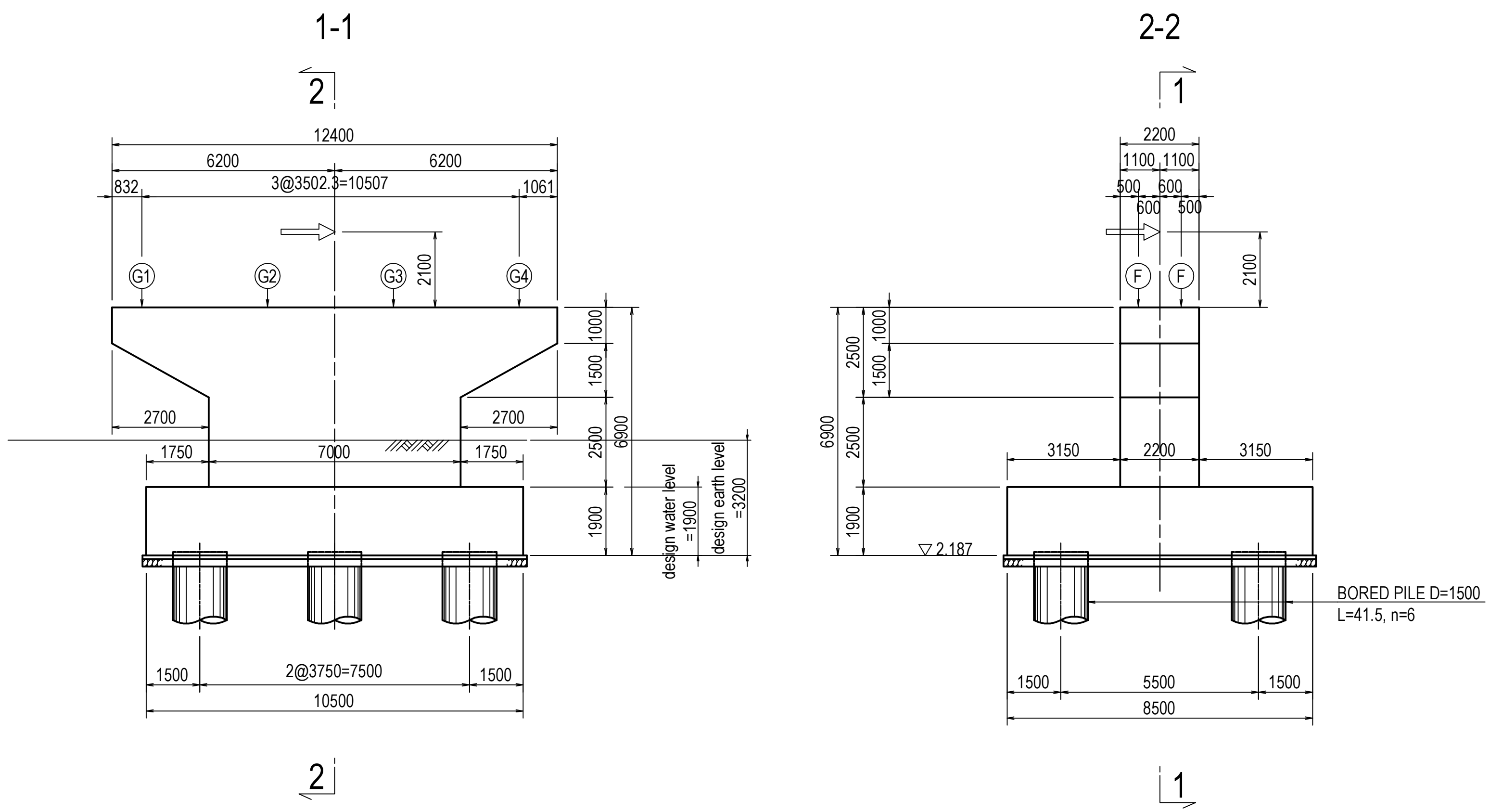


PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM		NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO.,LTD. NIPPON ENGINEERING CONSULTANTS CO.,LTD.	PREPARED BY	Y. SUZUKI	Y.S	15 Jun. 2017	GENERAL VIEW OF SUBSTRUCTURE AND FOUNDATION (12)	3
				CHECKED BY	T. HAYAKAWA	早川 知邦			DWG No.
				APPROVED BY	Y. SANO	佐野 裕一			P3-FO-2013

§3.Design models

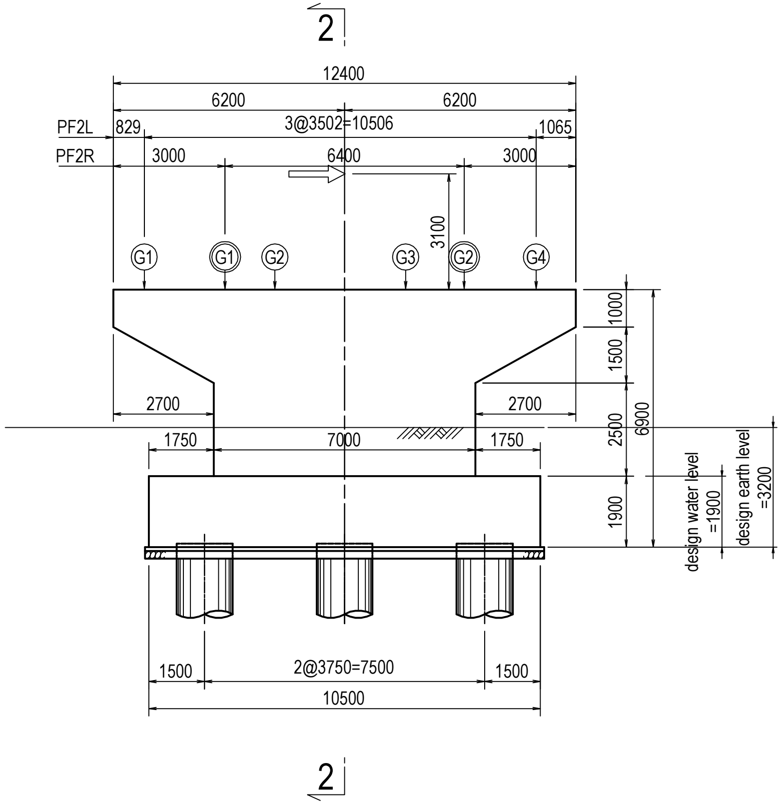


PF1 design model

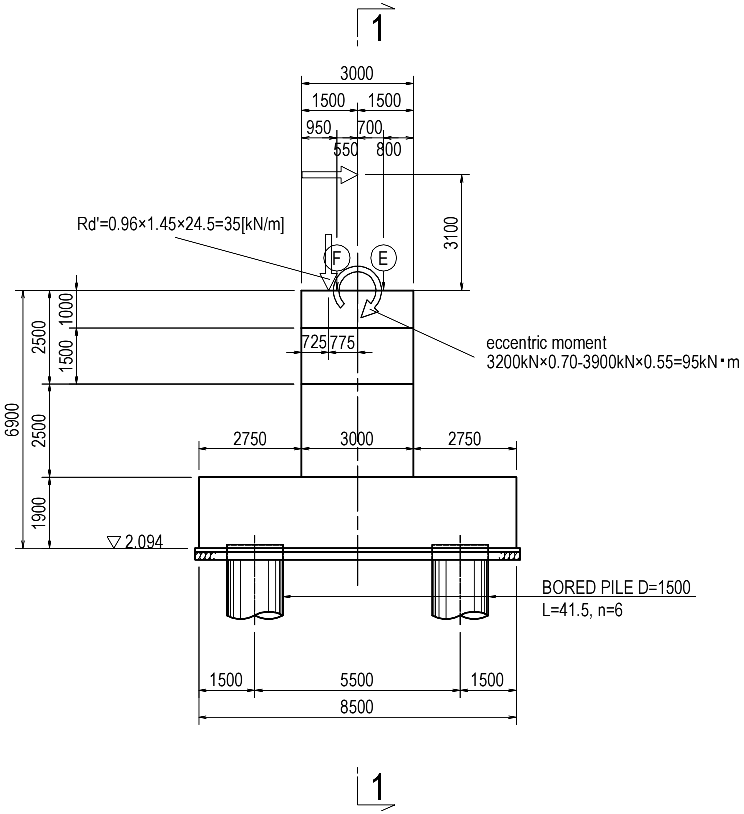


PF2 design model

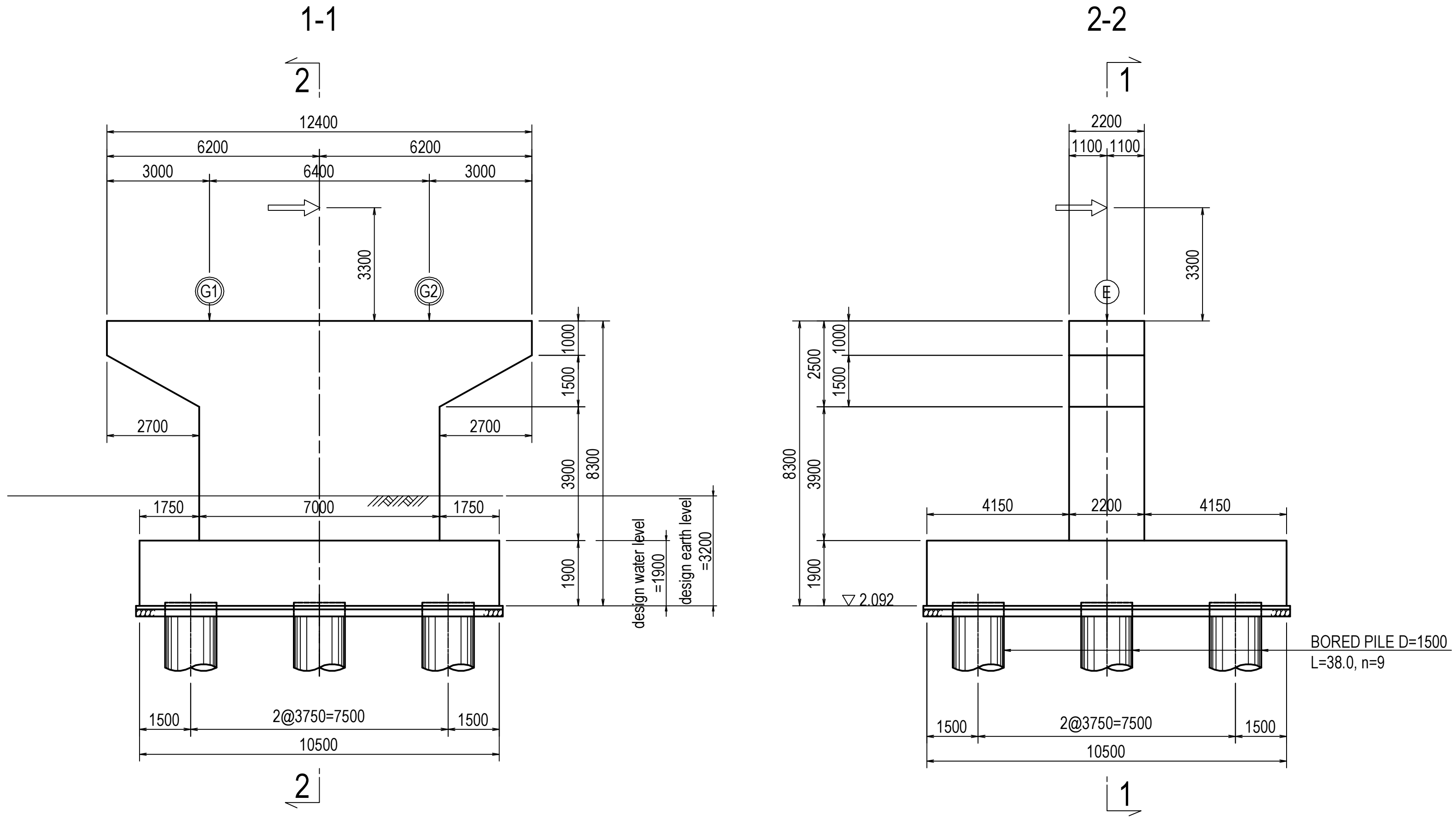
1-1



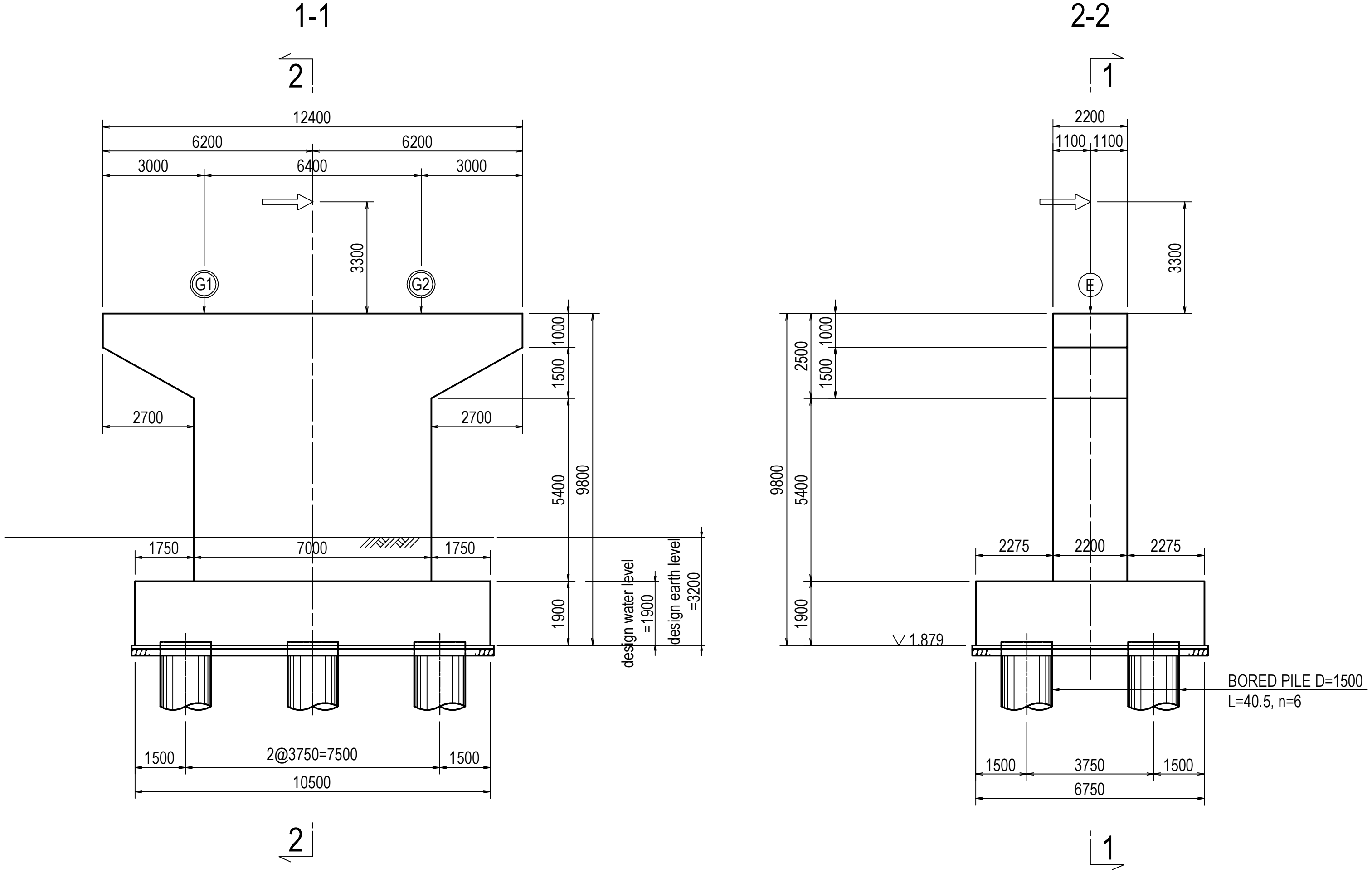
2-2



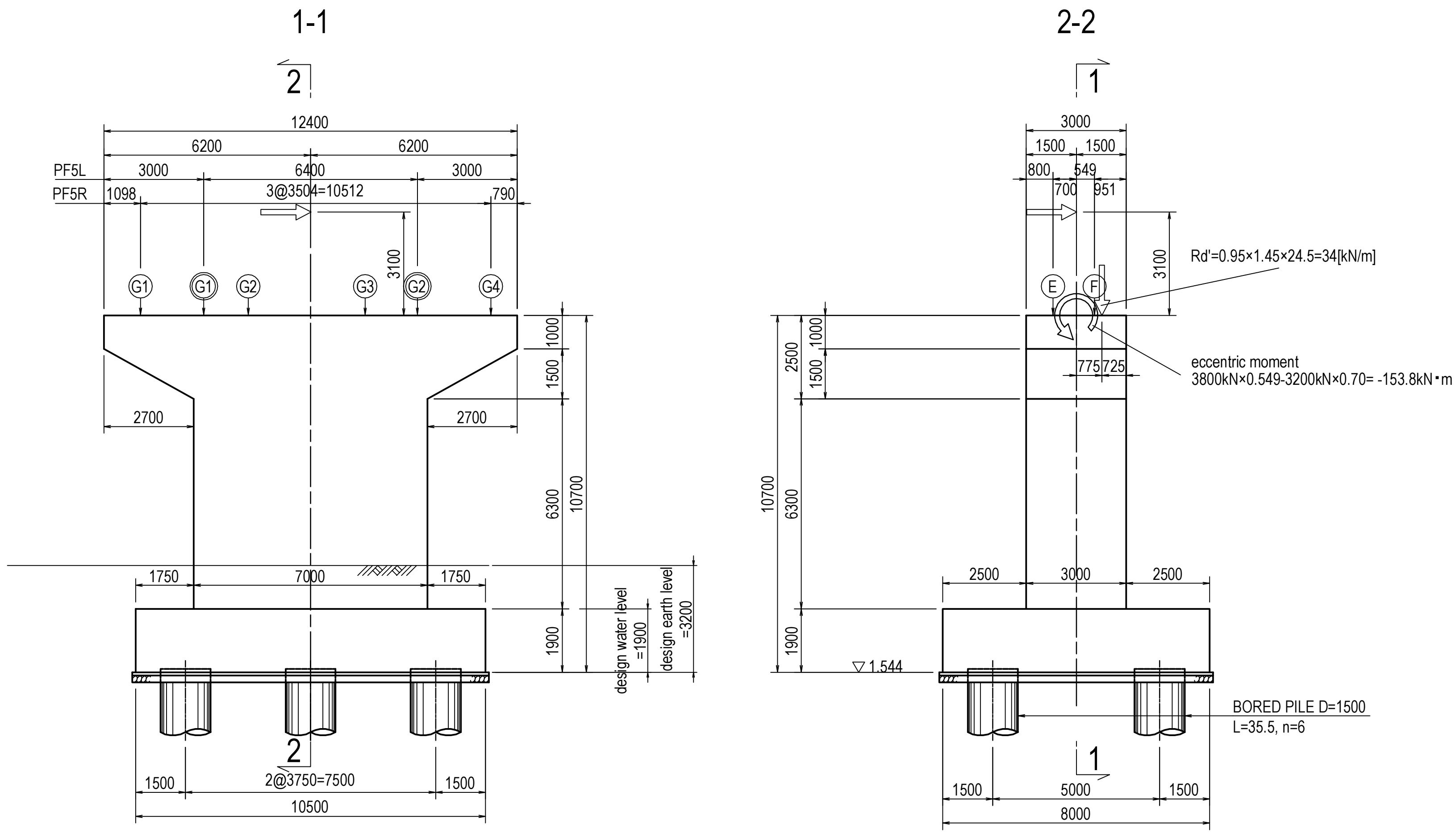
PF3 design model



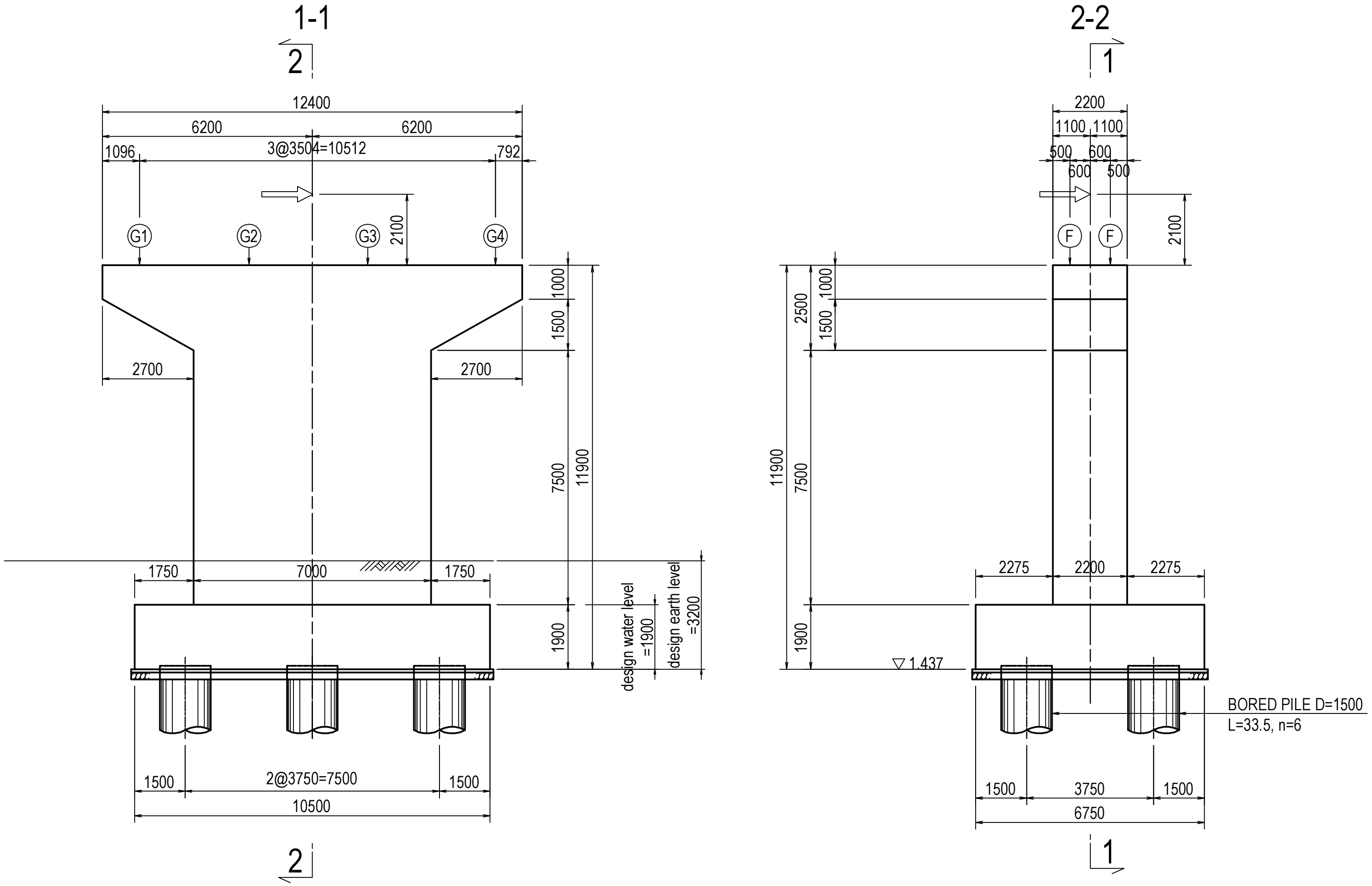
PF4 design model



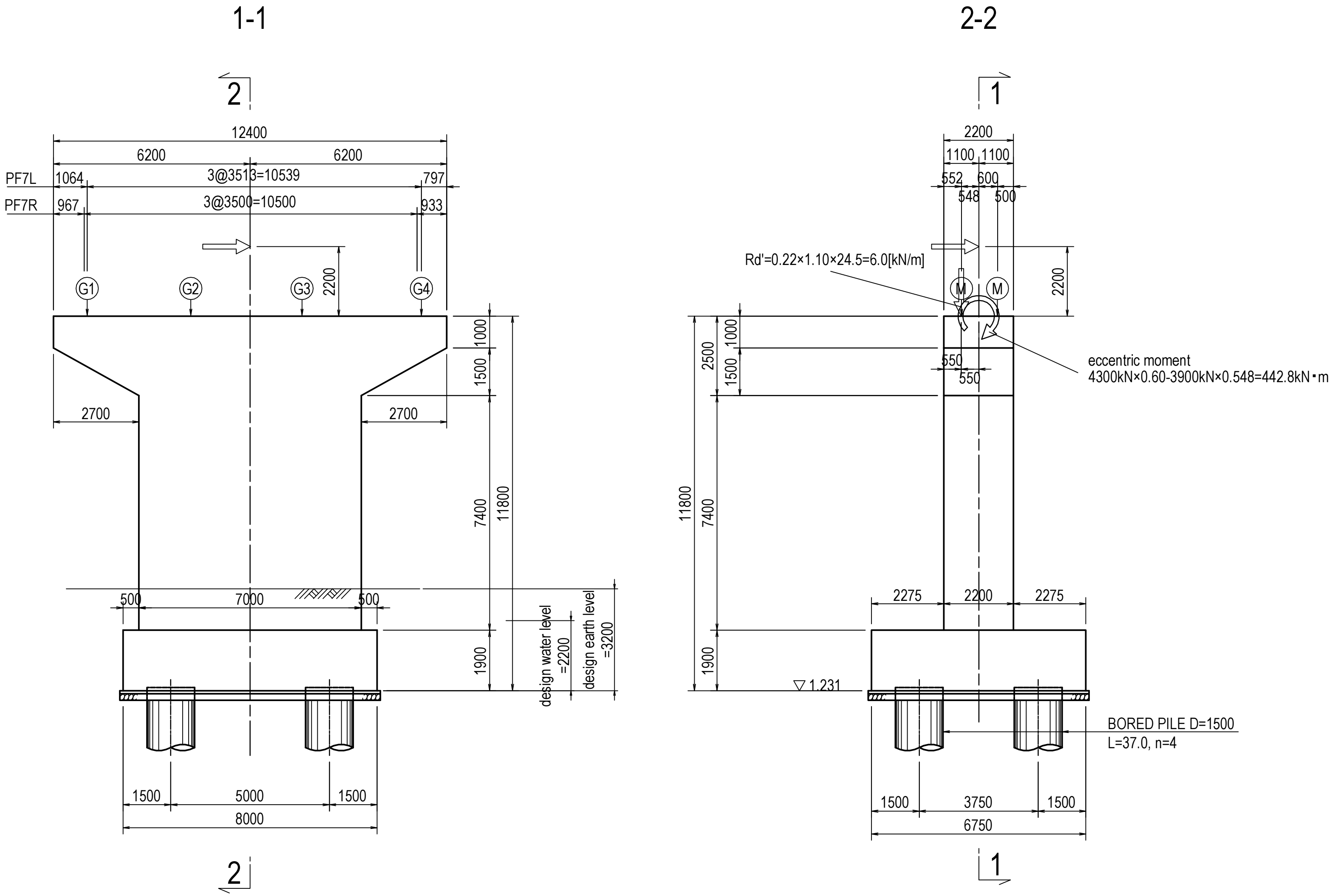
PF5 design model



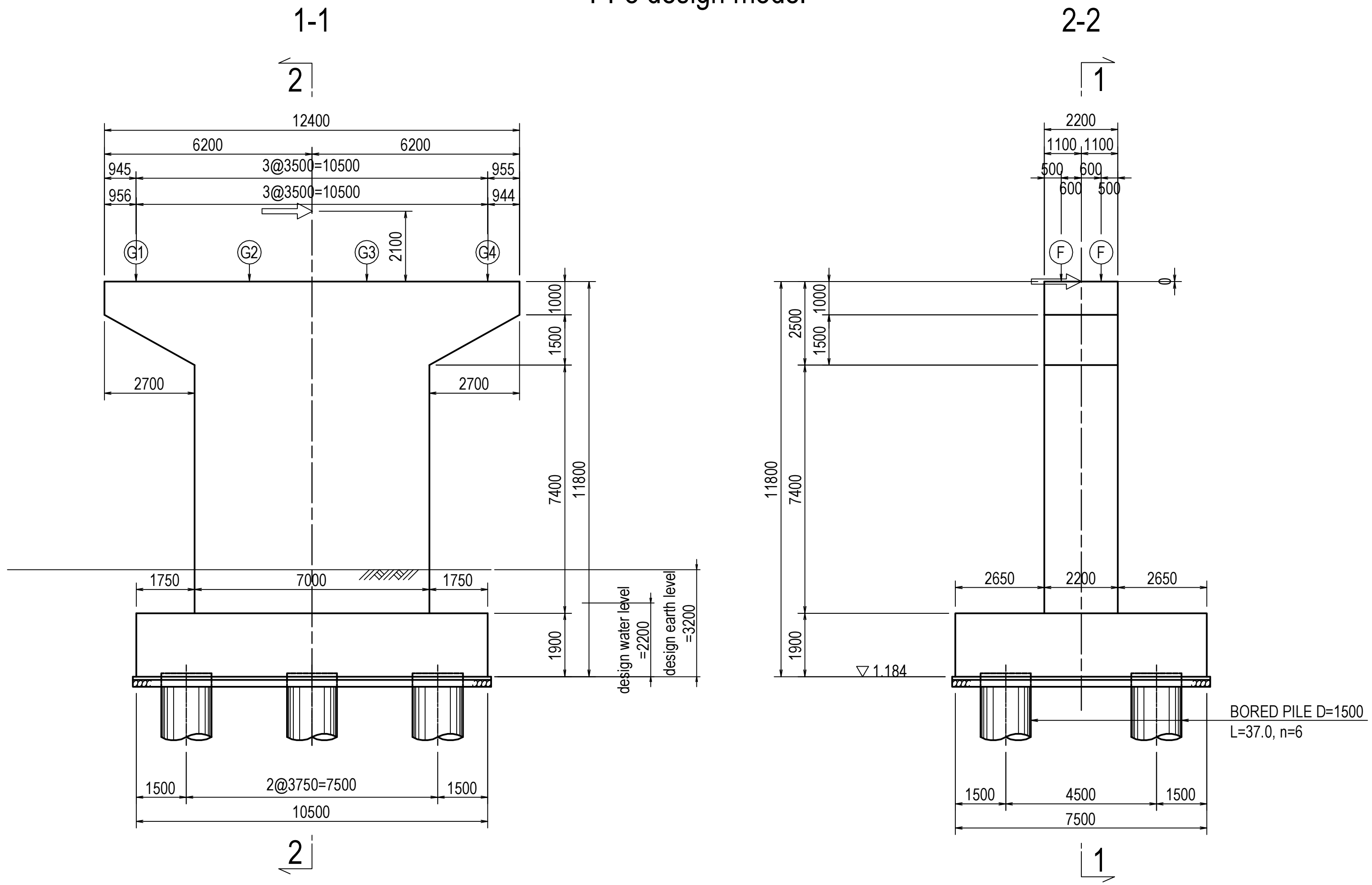
PF6 design model



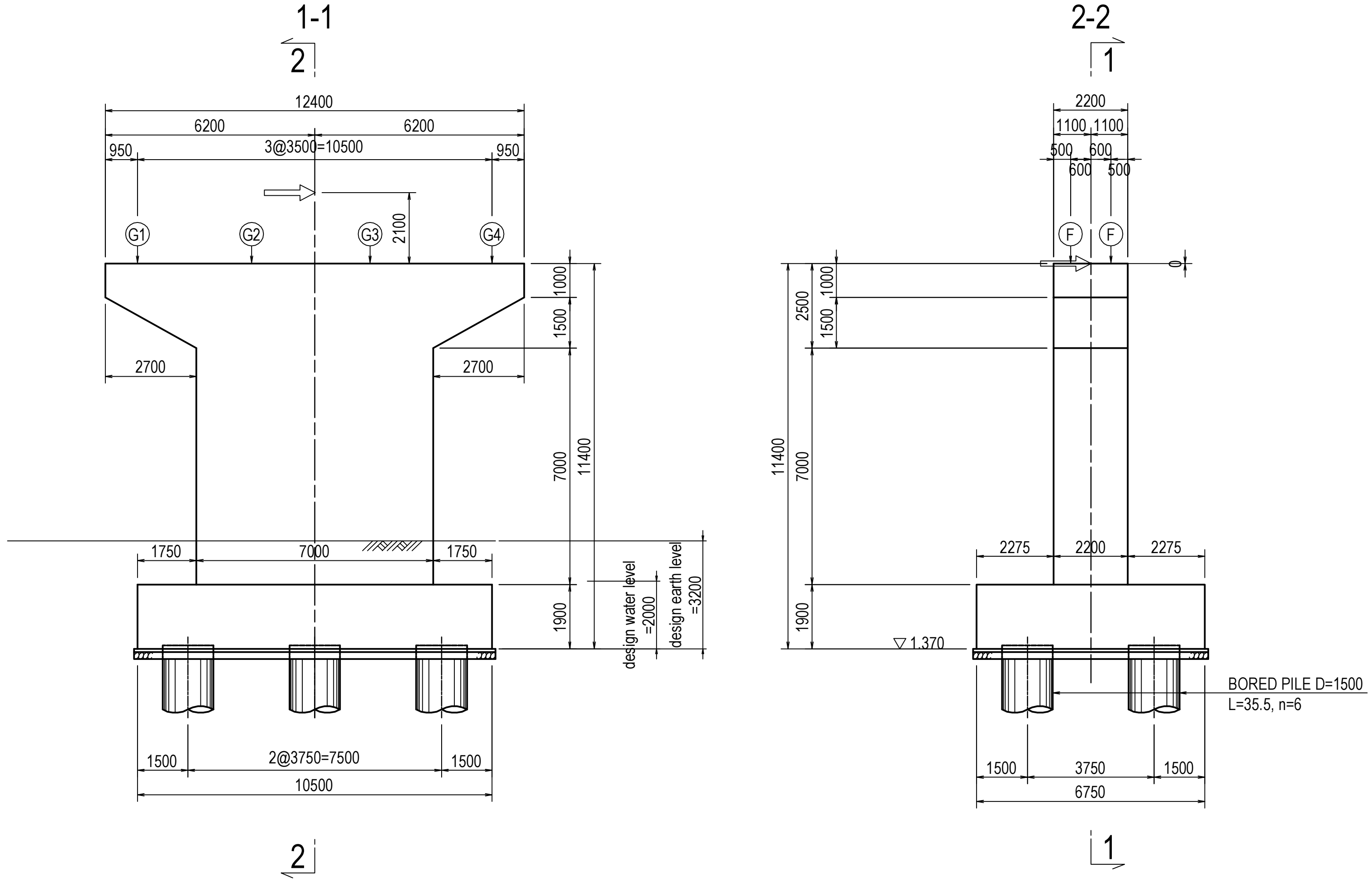
PF7 design model



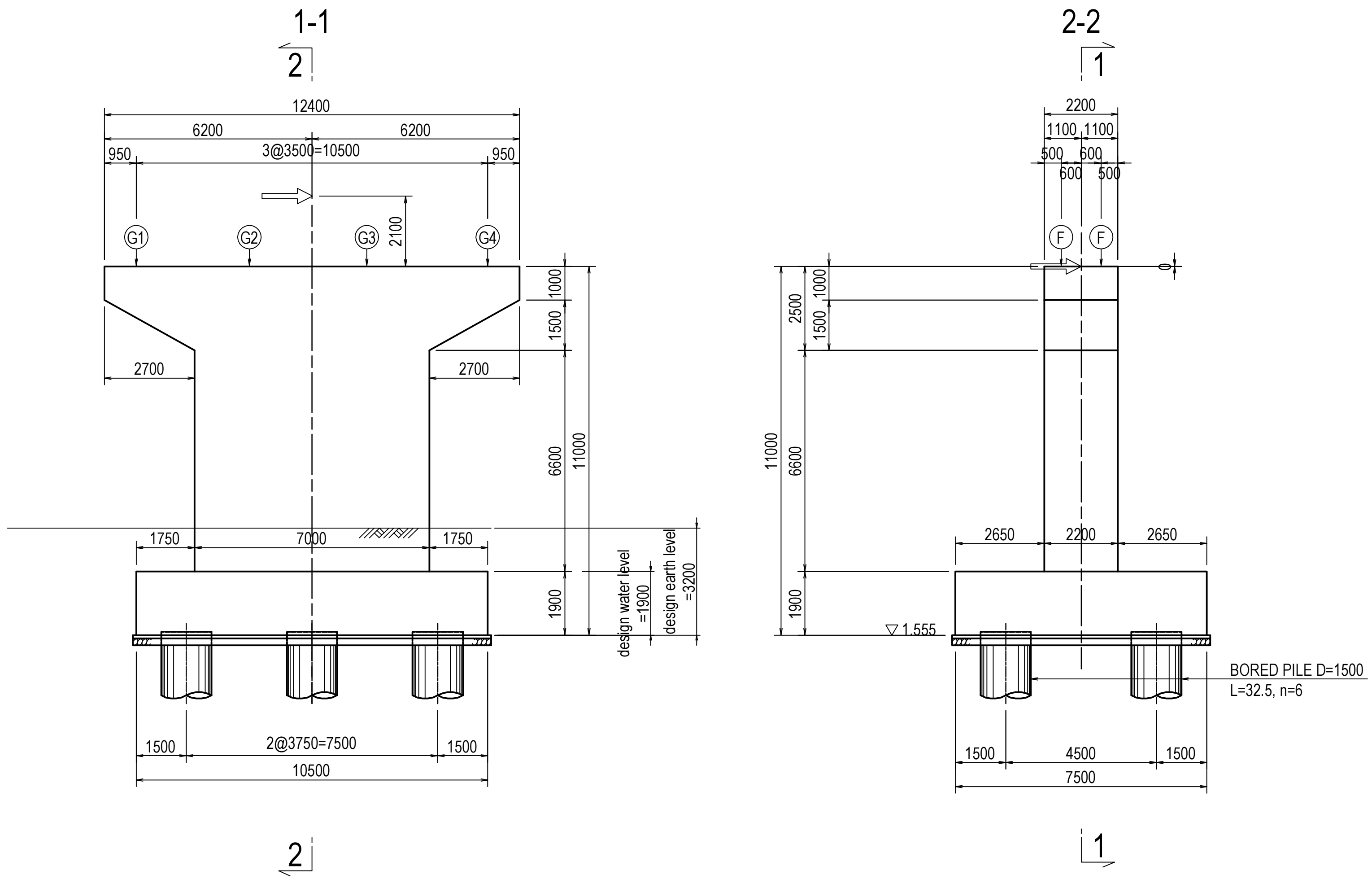
PF8 design model



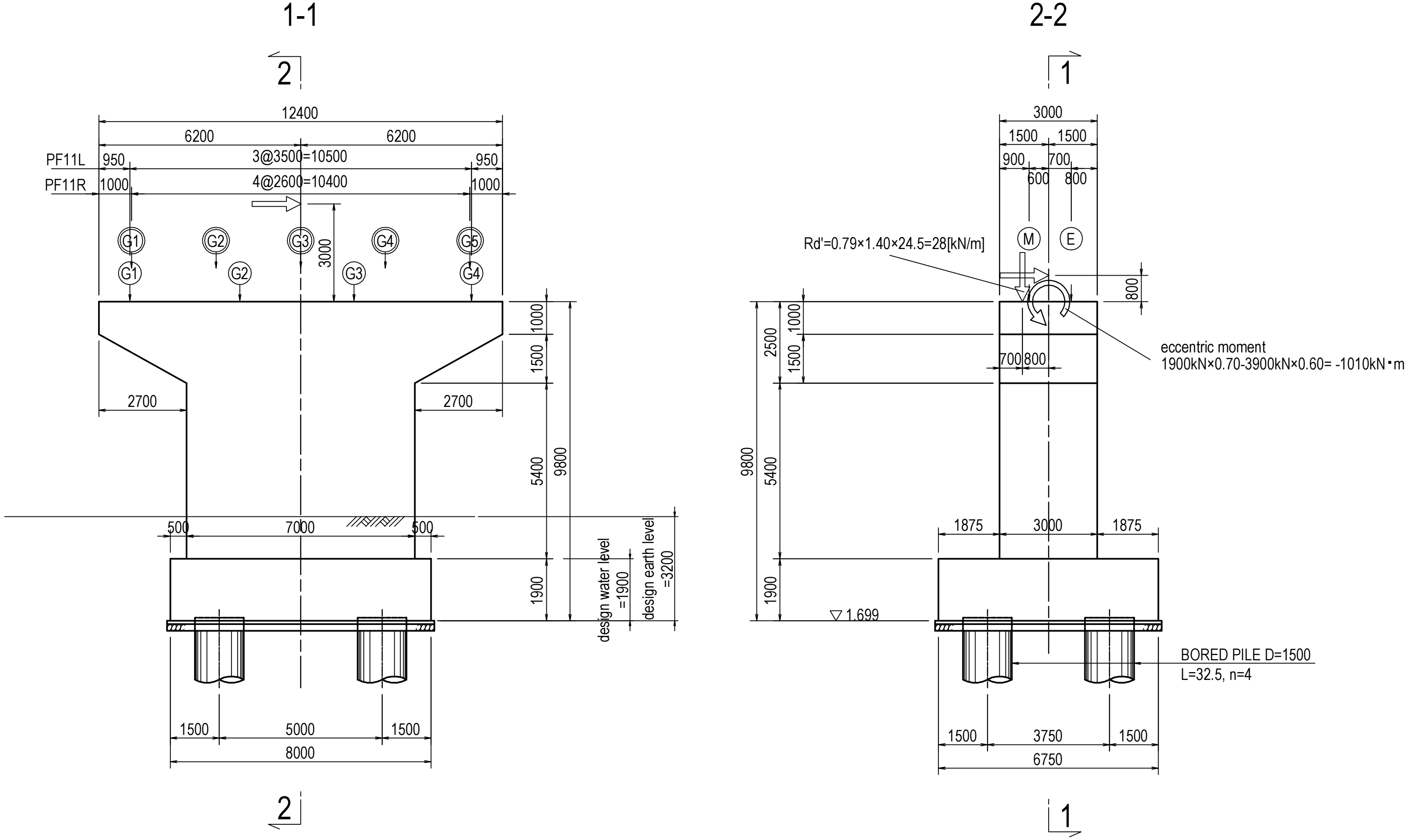
PF9 design model



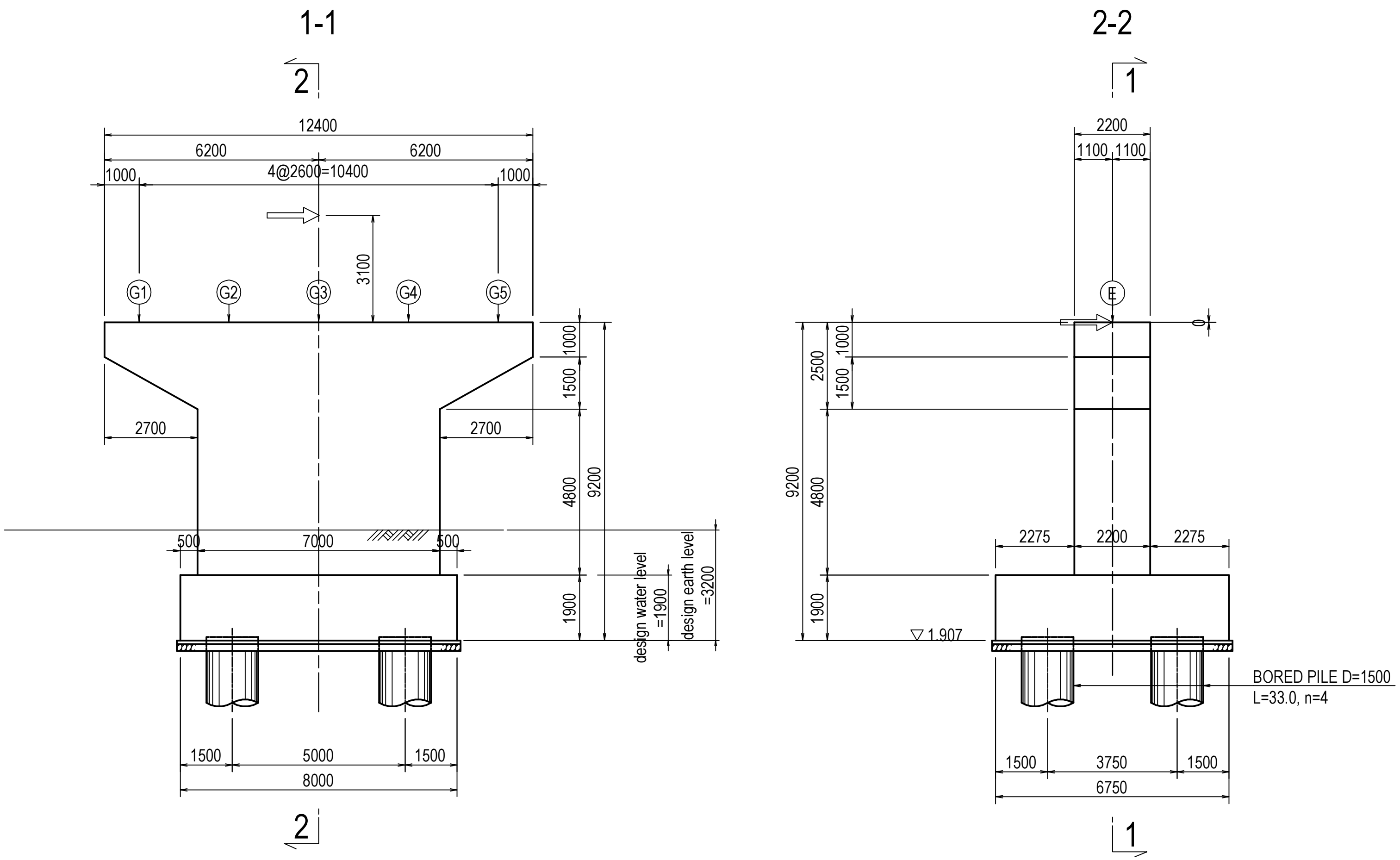
PF10 design model



PF11 design model

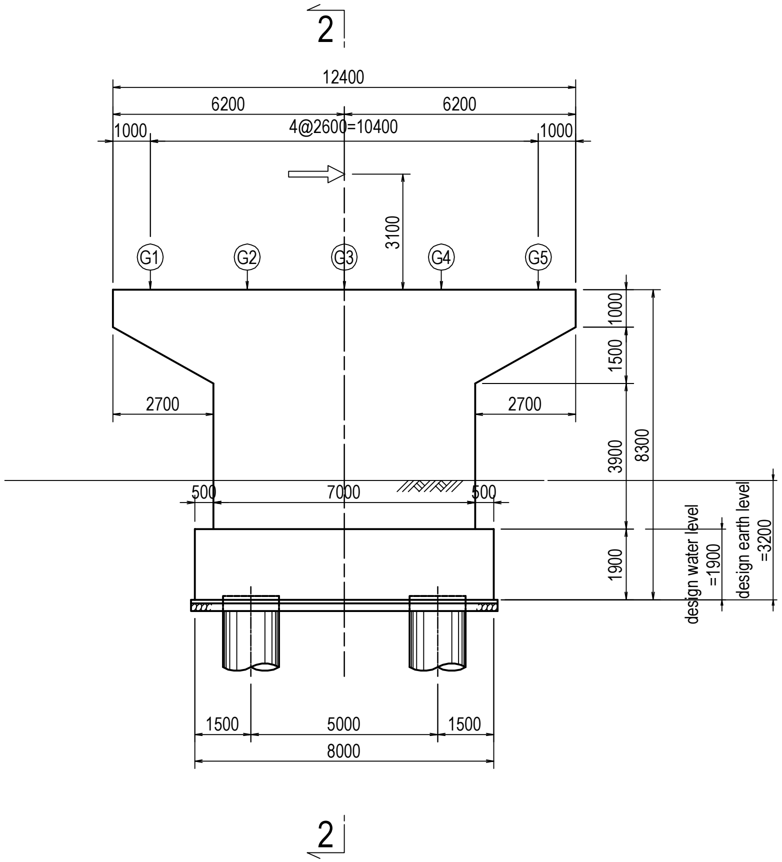


PF12 design model

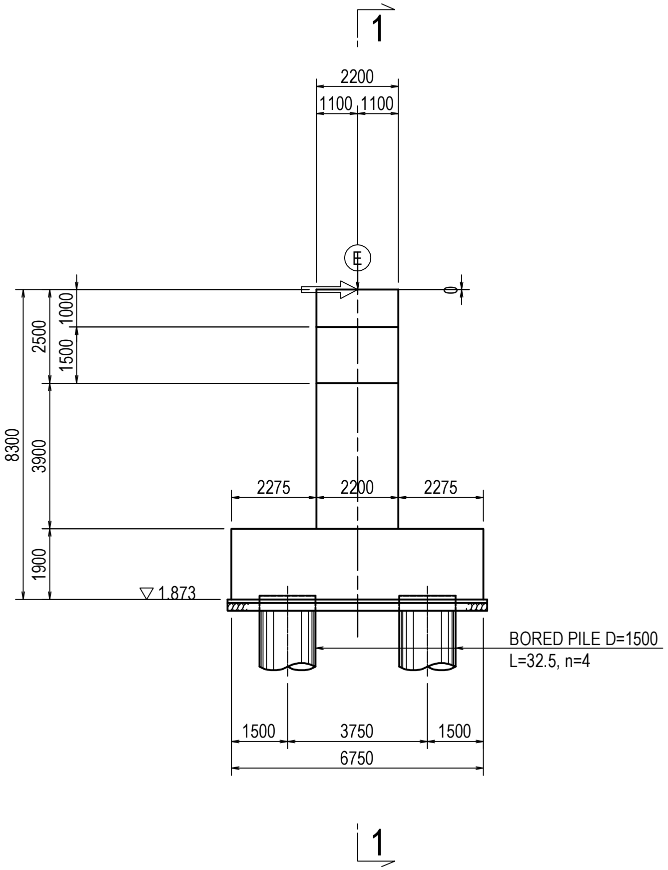


PF13 design model

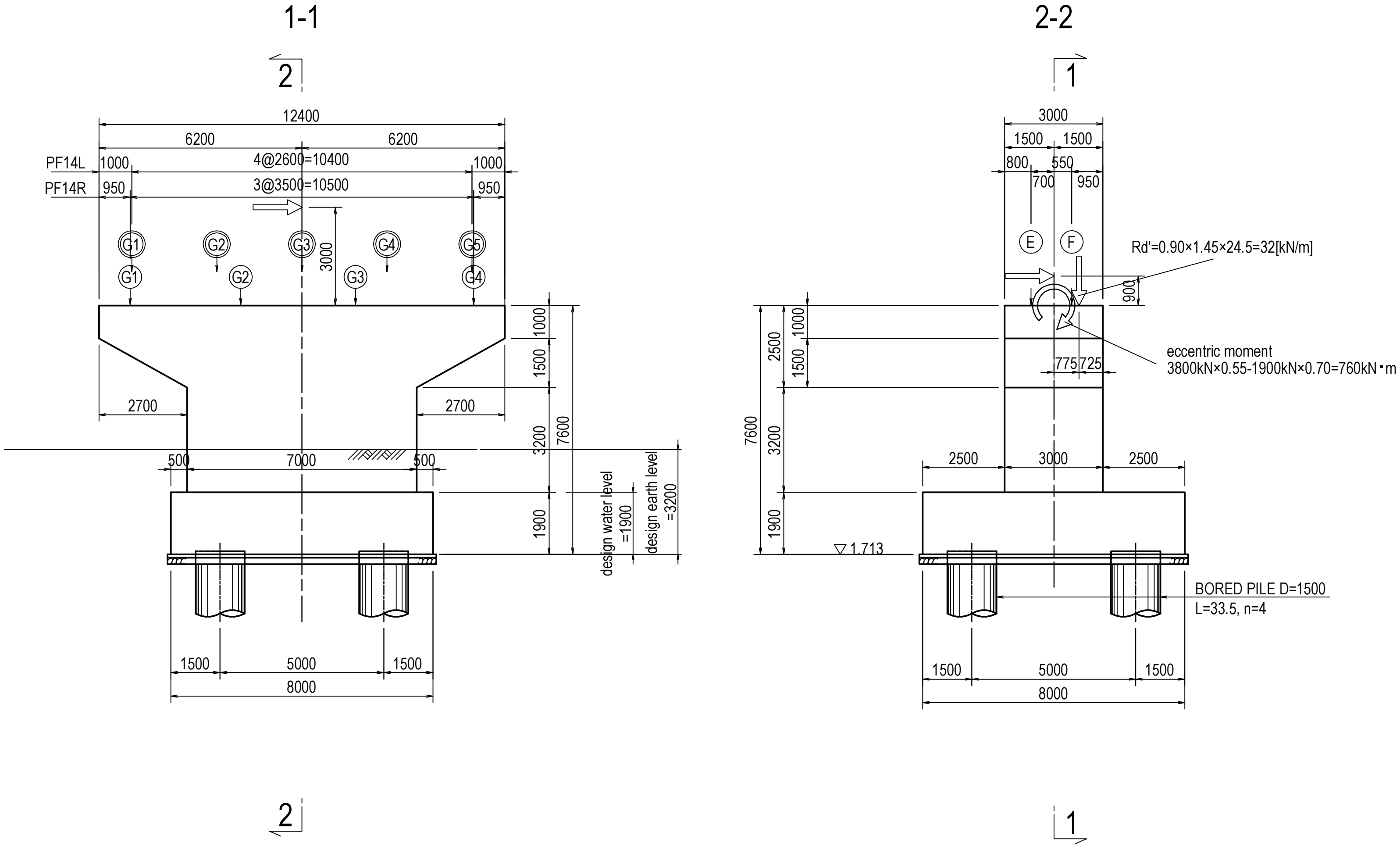
1-1



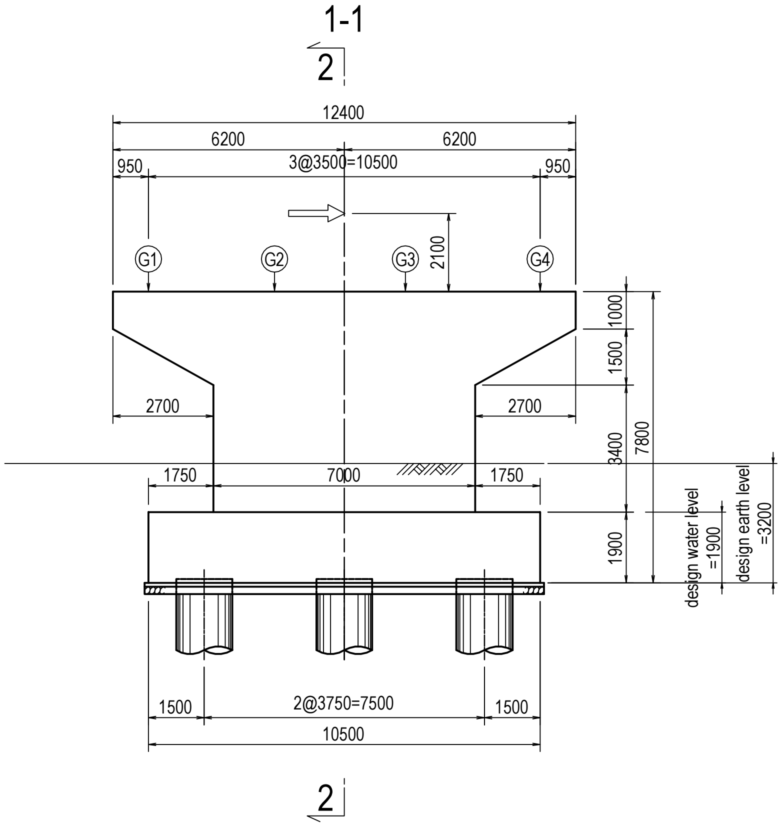
2-2

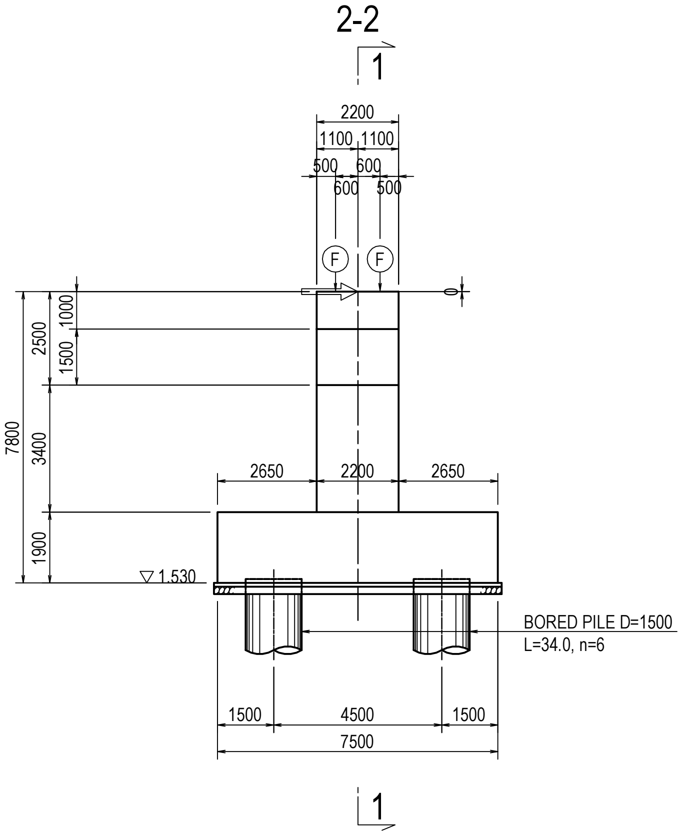


PF14 design model



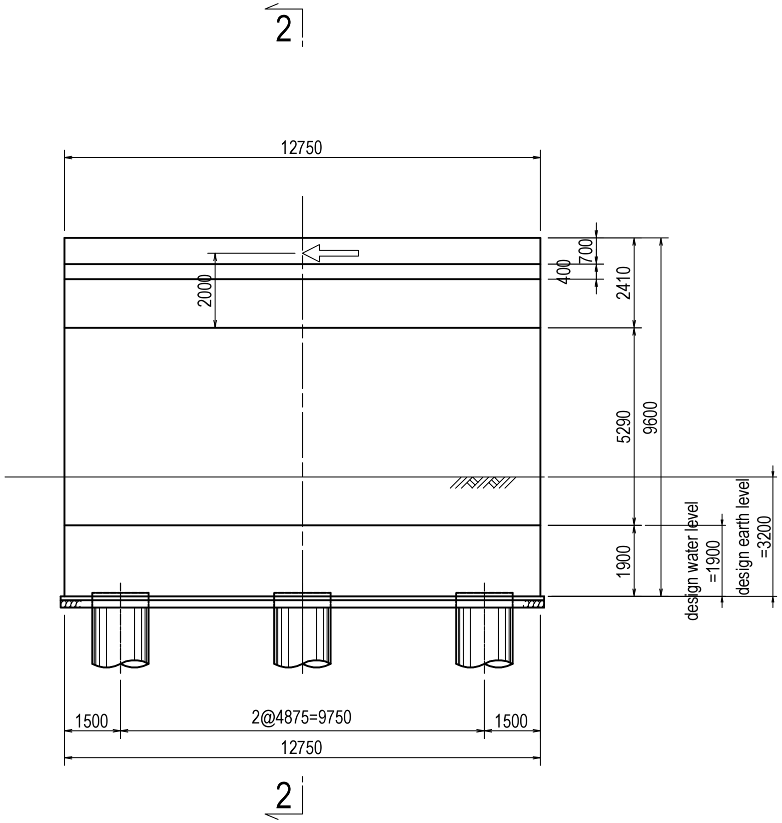
PF15 design model



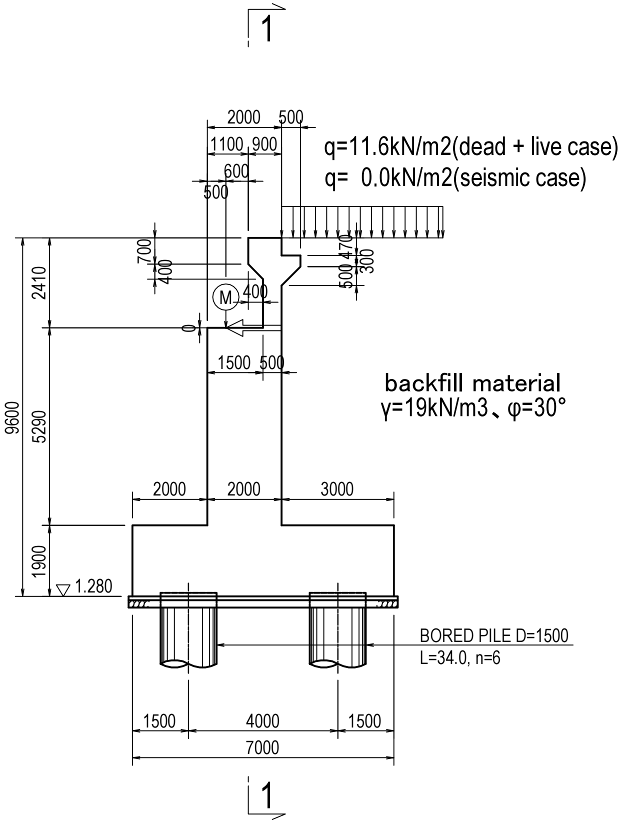


AF2 design model

1-1



2-2



§ 4.Geotechnical parameters

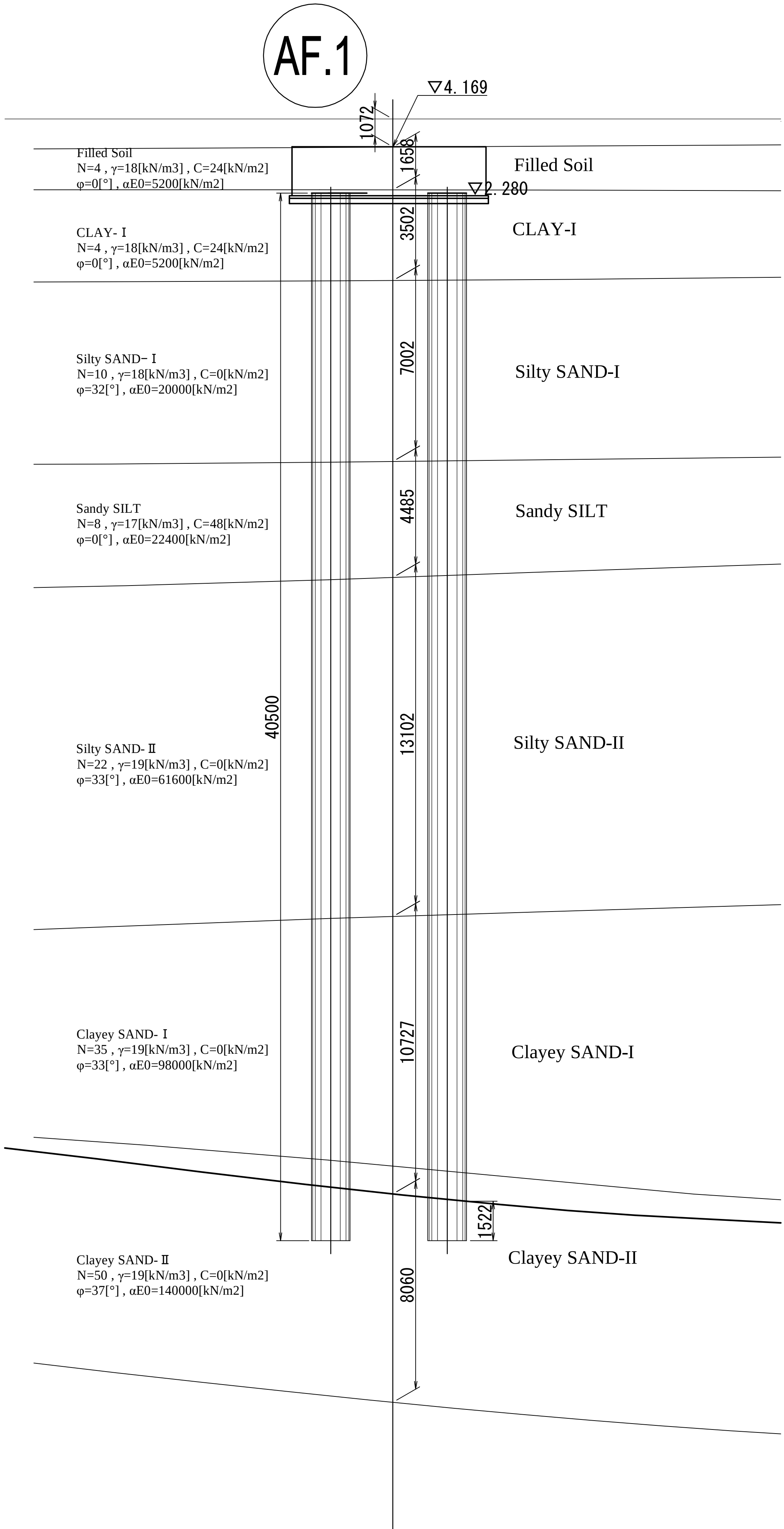
Regarding the information for the determination of geotechnical parameters, the Final Report of the Supplemental survey for Bago River Bridge was used. The parameters were established based on the soil conditions encountered during soil exploration and testing. Table 4- 1 shows the geotechnical design parameters.

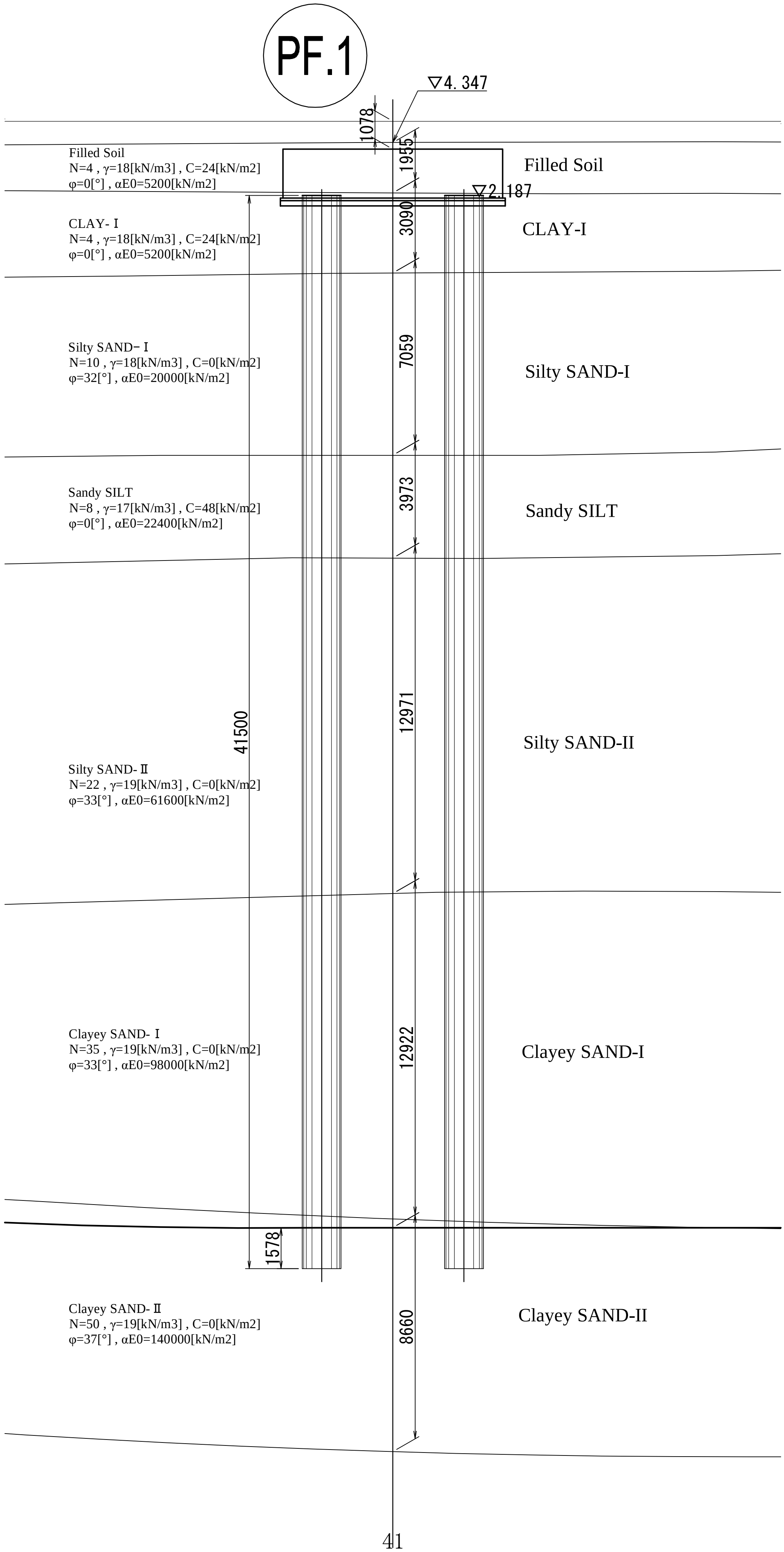
Table 4- 1 Geotechnical Design Parameters for Flyover Design

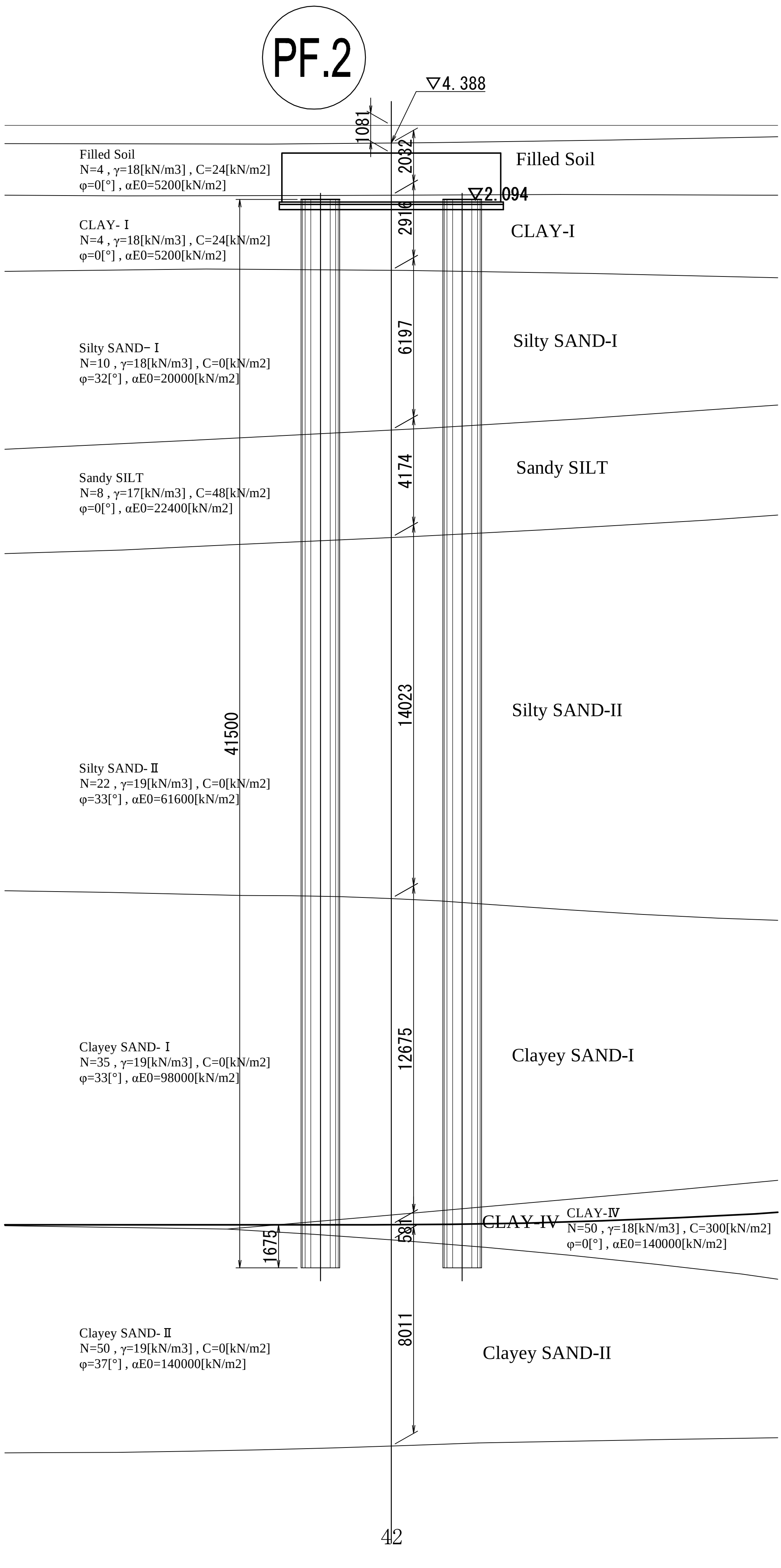
Layer	N Average *1	Unit Weight "γ" (kN/m3)	Cohesion "c" (kN/m2)	Friction Angle "φ" *5 (°)	Modulus of Deformation "E" (kN/m2)
FILLED SOIL	4	18 *3	24 *4	0	1300 *6
CLAY-I	4	18 *2	24 *1	0	1300 *6
SILTY SAND-I	10	18 *2	0 *4	32	5000 *8
SANDY SILT	8	17 *3	48 *4	0	5600 *7
SILTY SAND-II	22	19 *3	0 *4	33	15400 *7
CLAY-II	21	18 *3	126 *4	0	14700 *7
CLAYEY SAND-I	35	19 *3	0 *4	33	24500 *7
CLAY-III	35	18 *3	210 *4	0	24500 *7
CLAYEY SAND-II	50	19 *3	0 *4	37	35000 *7
CLAY-IV	50	18 *3	300 *4	0	35000 *7

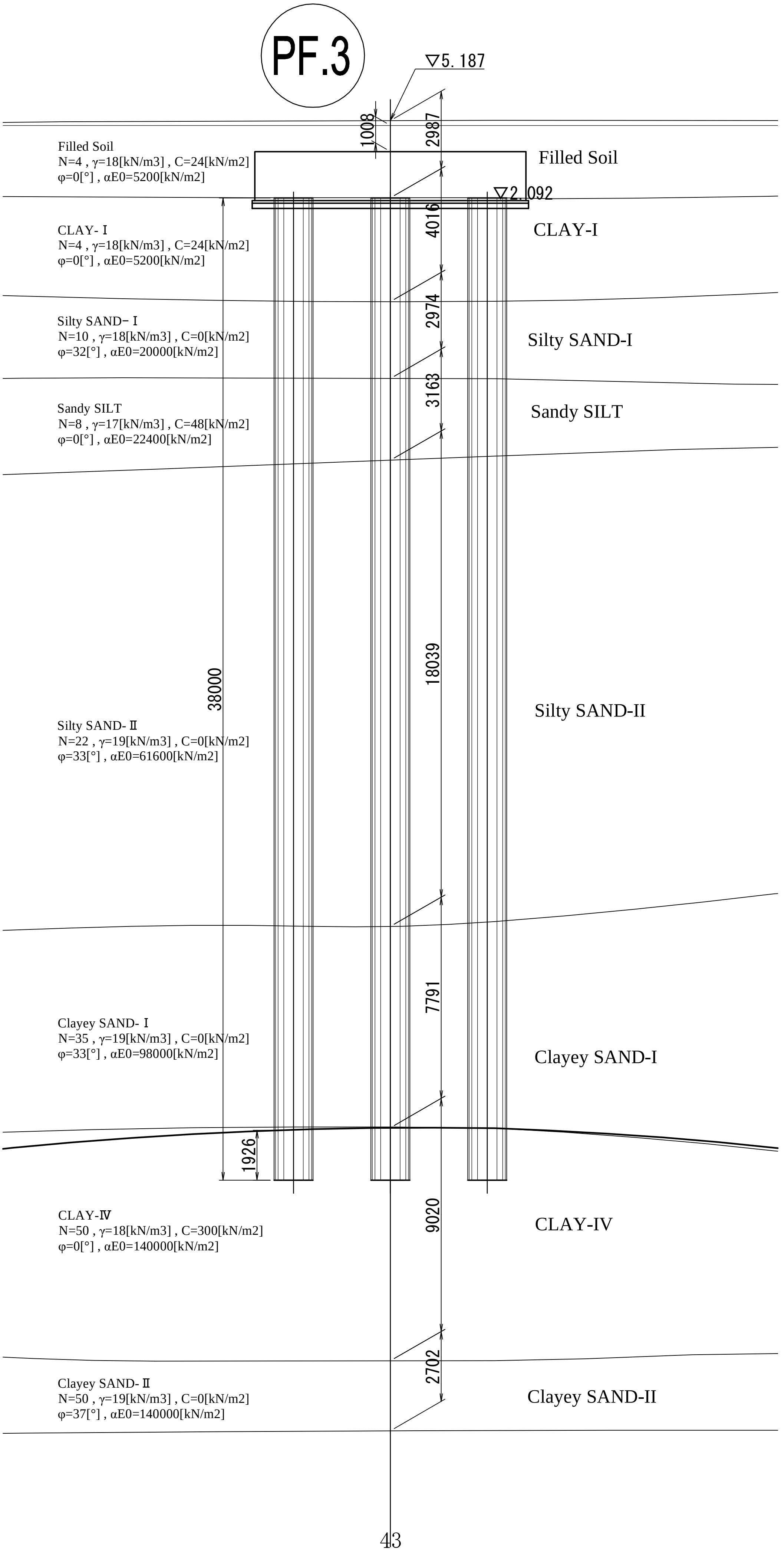
Source: JICA Study Team

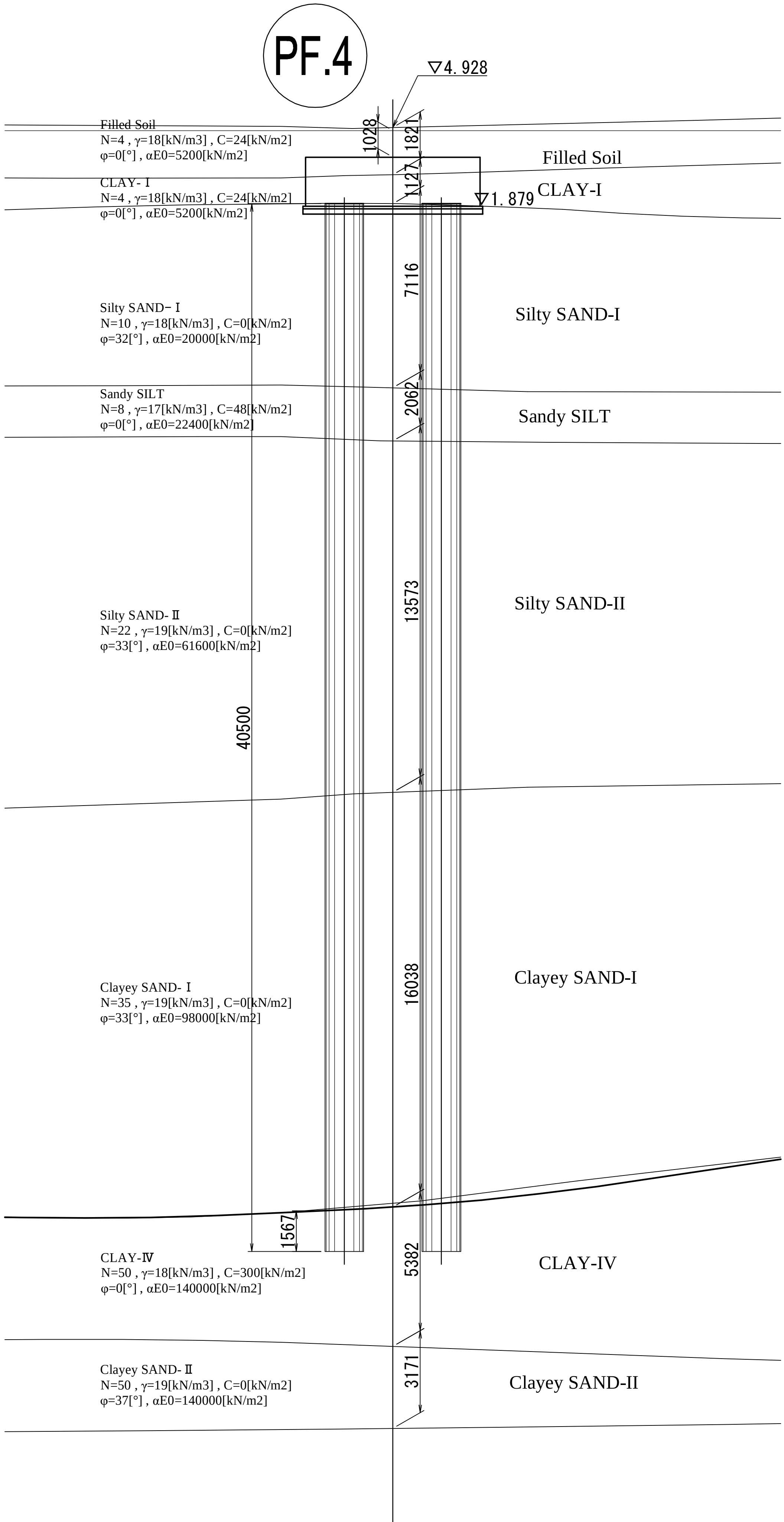
*1 Maximum N value is 50
*2 Average values obtained by each tests
*3 Referenced by Japanese Standard (NEXCO)
*4 Calculated by C=6N (referenced by Japanese Standard (NEXCO)). The value of sandy soil is 0.
*5 Calculated with N value using effective overburden pressure
*6 Test value obtained by unconfined compression test
*7 E=700N according to the worth value obtained by borehole lateral load test
*8 E=500N according to the worth value obtained by borehole lateral load test

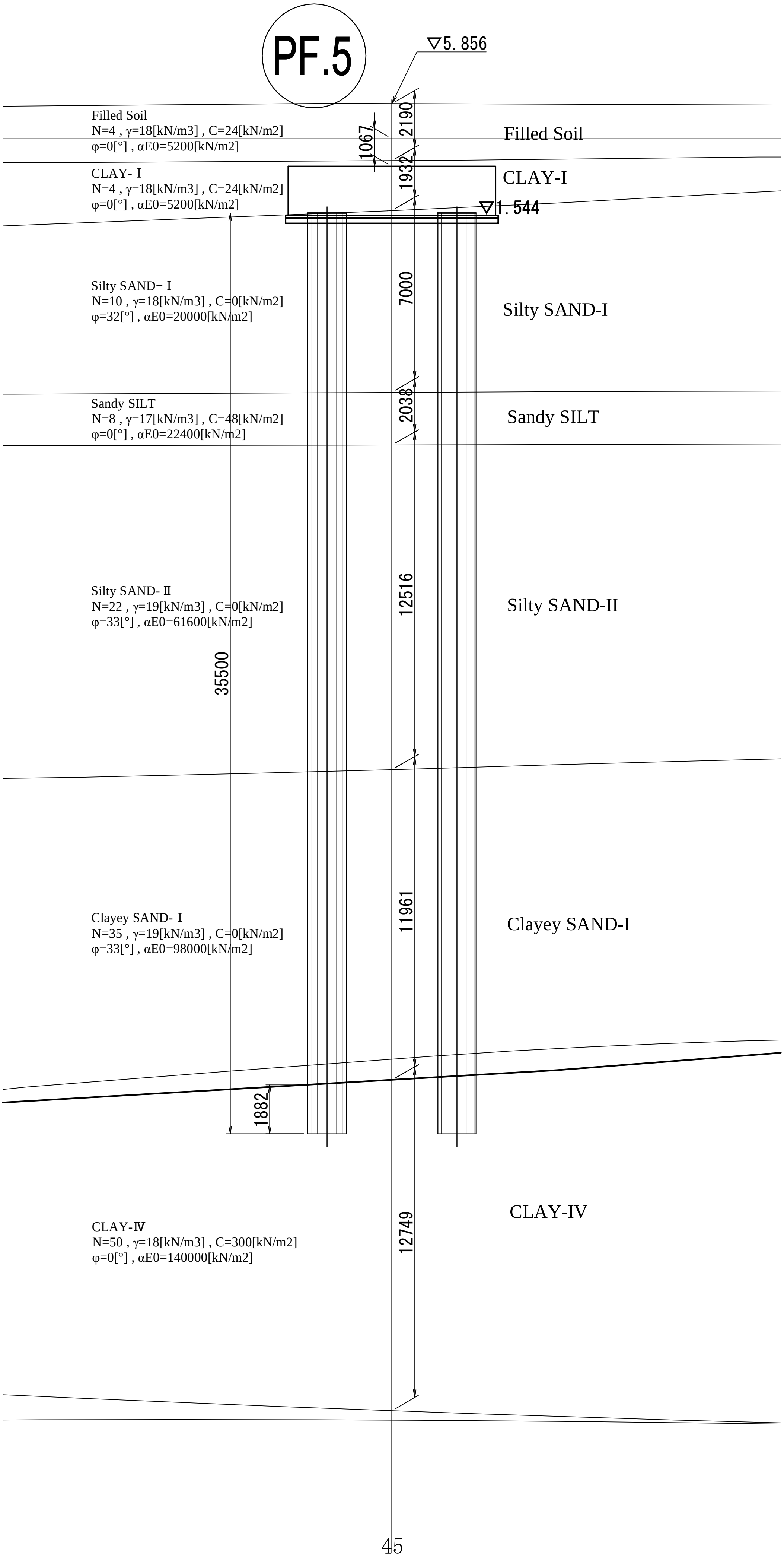

AF.1
▽4. 169
1072
1658
▽2. 280
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Filled Soil
CLAY- Ⅰ
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
3502
CLAY-I
Silty SAND− Ⅰ
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
7002
Silty SAND-I
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
4485
Sandy SILT
40500
Silty SAND- Ⅱ
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
13102
Silty SAND-II
Clayey SAND- Ⅰ
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
10727
Clayey SAND-I
1522
Clayey SAND- Ⅱ
N=50 , γ=19[kN/m3] , C=0[kN/m2]
φ=37[°] , αE0=140000[kN/m2]
8060
Clayey SAND-II


PF.1
▽4. 347
1078
1955
▽2. 187
3090
7059
3973
12971
12922
8660
41500
1578
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY- Ⅰ
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Silty SAND- Ⅰ
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Silty SAND- Ⅱ
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
Clayey SAND- Ⅰ
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
Clayey SAND- Ⅱ
N=50 , γ=19[kN/m3] , C=0[kN/m2]
φ=37[°] , αE0=140000[kN/m2]
Filled Soil
CLAY-I
Silty SAND-I
Sandy SILT
Silty SAND-II
Clayey SAND-I
Clayey SAND-II

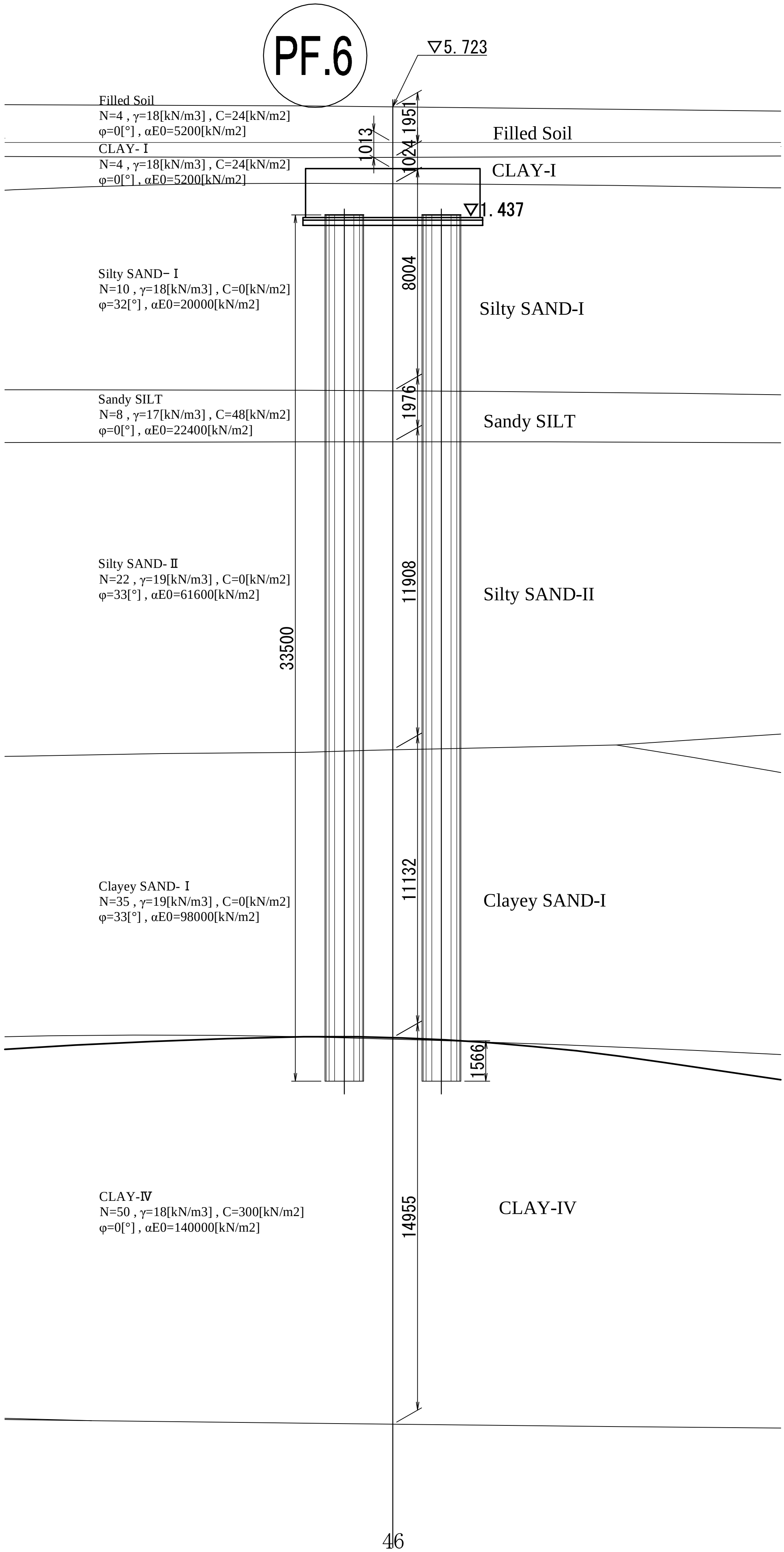

PF.2
▽4.388
▽2.094
1081
2032
2916
6197
4174
14023
12675
581
8011
41500
1675
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Filled Soil
CLAY-Ⅰ
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY-I
Silty SAND−Ⅰ
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
Silty SAND-I
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Sandy SILT
Silty SAND-Ⅱ
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
Silty SAND-II
Clayey SAND-Ⅰ
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
Clayey SAND-I
CLAY-IV
CLAY-Ⅳ
N=50 , γ=18[kN/m3] , C=300[kN/m2]
φ=0[°] , αE0=140000[kN/m2]
Clayey SAND-Ⅱ
N=50 , γ=19[kN/m3] , C=0[kN/m2]
φ=37[°] , αE0=140000[kN/m2]
Clayey SAND-II

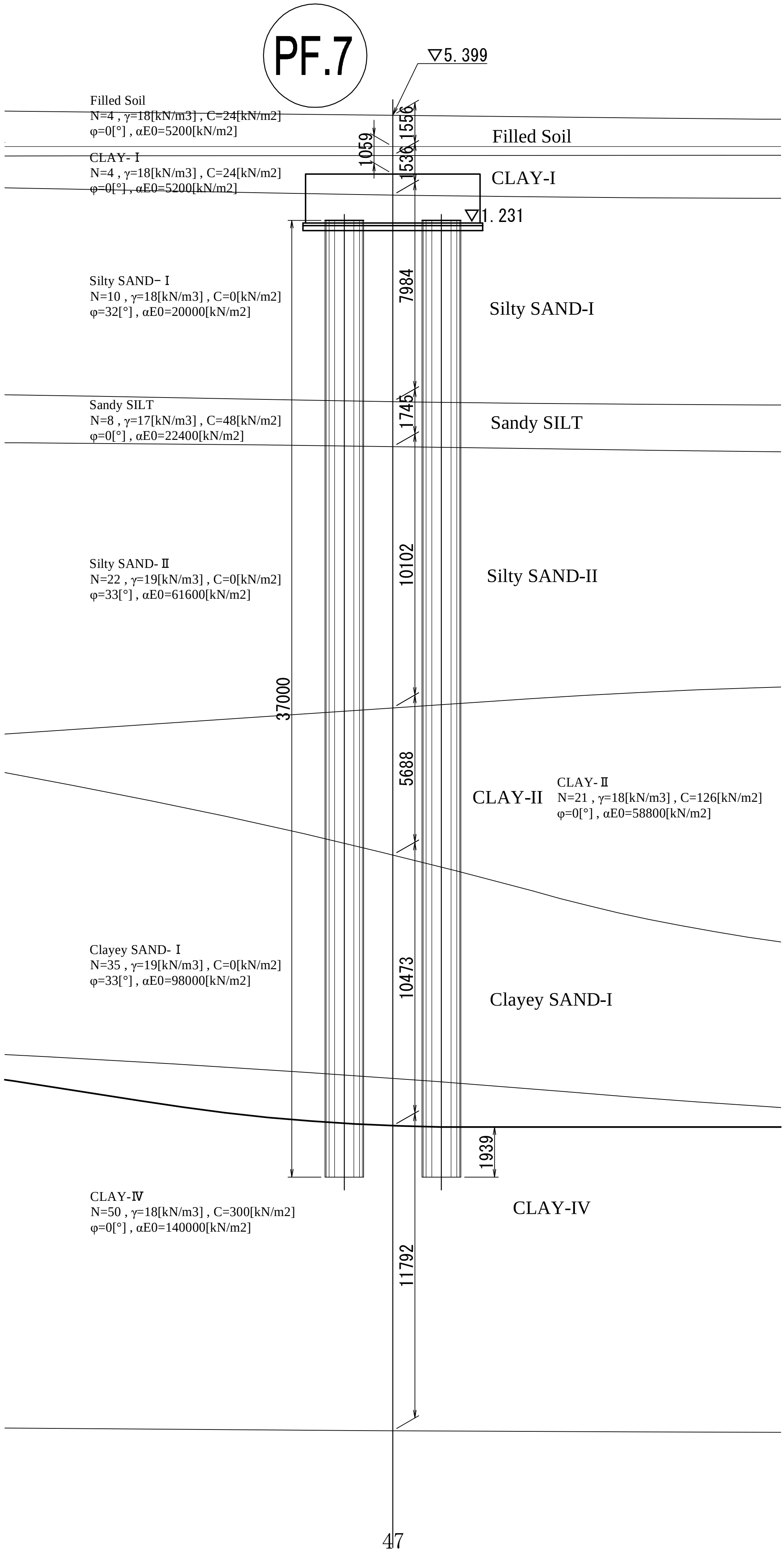

PF.3
▽5. 187
1008
2987
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Filled Soil
▽2. 092
4016
CLAY- Ⅰ
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY-I
2974
Silty SAND− Ⅰ
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
Silty SAND-I
3163
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Sandy SILT
38000
18039
Silty SAND- Ⅱ
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
Silty SAND-II
7791
Clayey SAND- Ⅰ
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
Clayey SAND-I
1926
9020
CLAY-Ⅳ
N=50 , γ=18[kN/m3] , C=300[kN/m2]
φ=0[°] , αE0=140000[kN/m2]
CLAY-IV
2702
Clayey SAND- Ⅱ
N=50 , γ=19[kN/m3] , C=0[kN/m2]
φ=37[°] , αE0=140000[kN/m2]
Clayey SAND-II

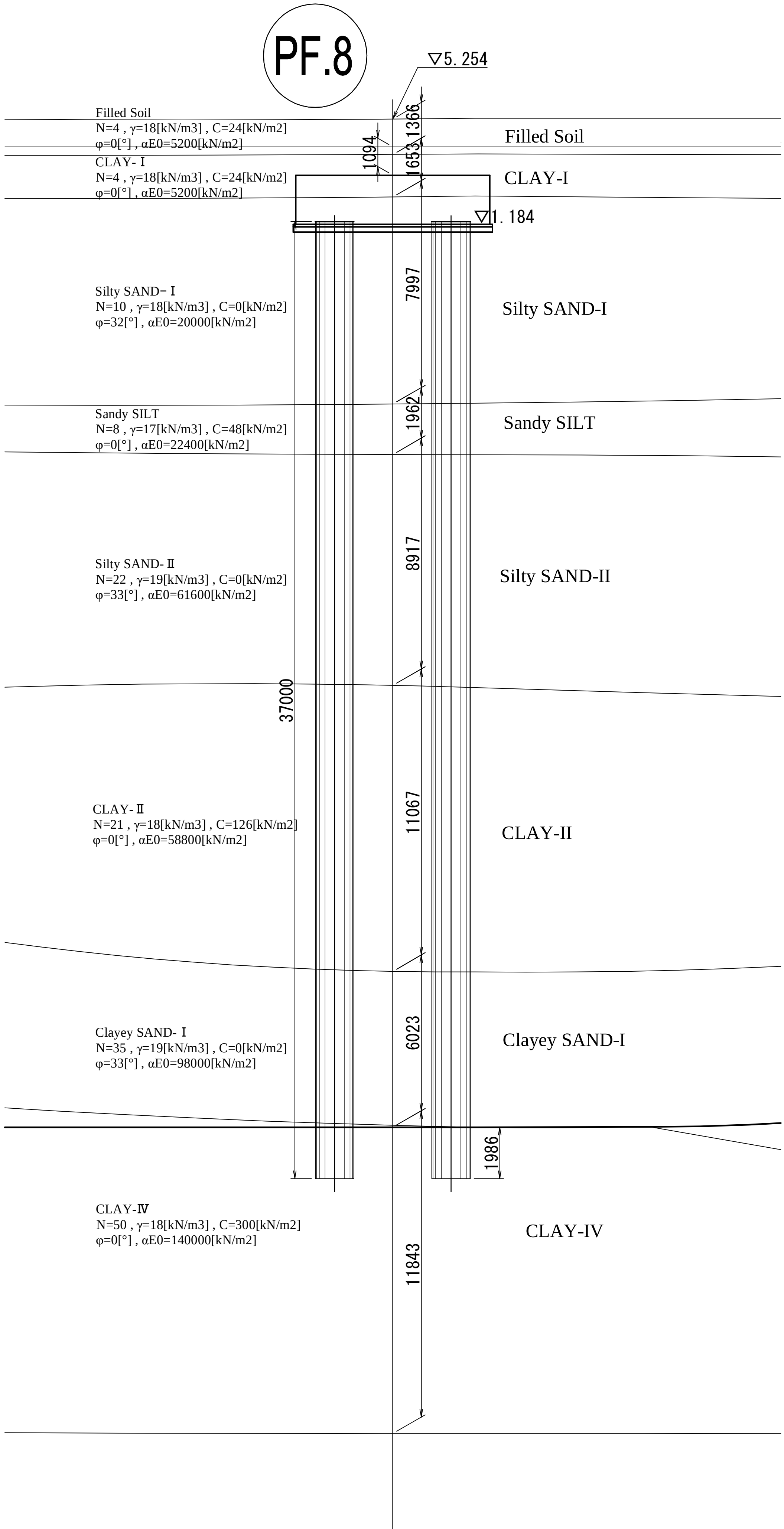

PF.4
▽4.928
▽1.879
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY- I
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Silty SAND- I
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Silty SAND- II
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
Clayey SAND- I
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
CLAY-IV
N=50 , γ=18[kN/m3] , C=300[kN/m2]
φ=0[°] , αE0=140000[kN/m2]
Clayey SAND- II
N=50 , γ=19[kN/m3] , C=0[kN/m2]
φ=37[°] , αE0=140000[kN/m2]
1028
1821
1127
7116
2062
13573
16038
5382
3171
40500
1567
Filled Soil
CLAY-I
Silty SAND-I
Sandy SILT
Silty SAND-II
Clayey SAND-I
CLAY-IV
Clayey SAND-II

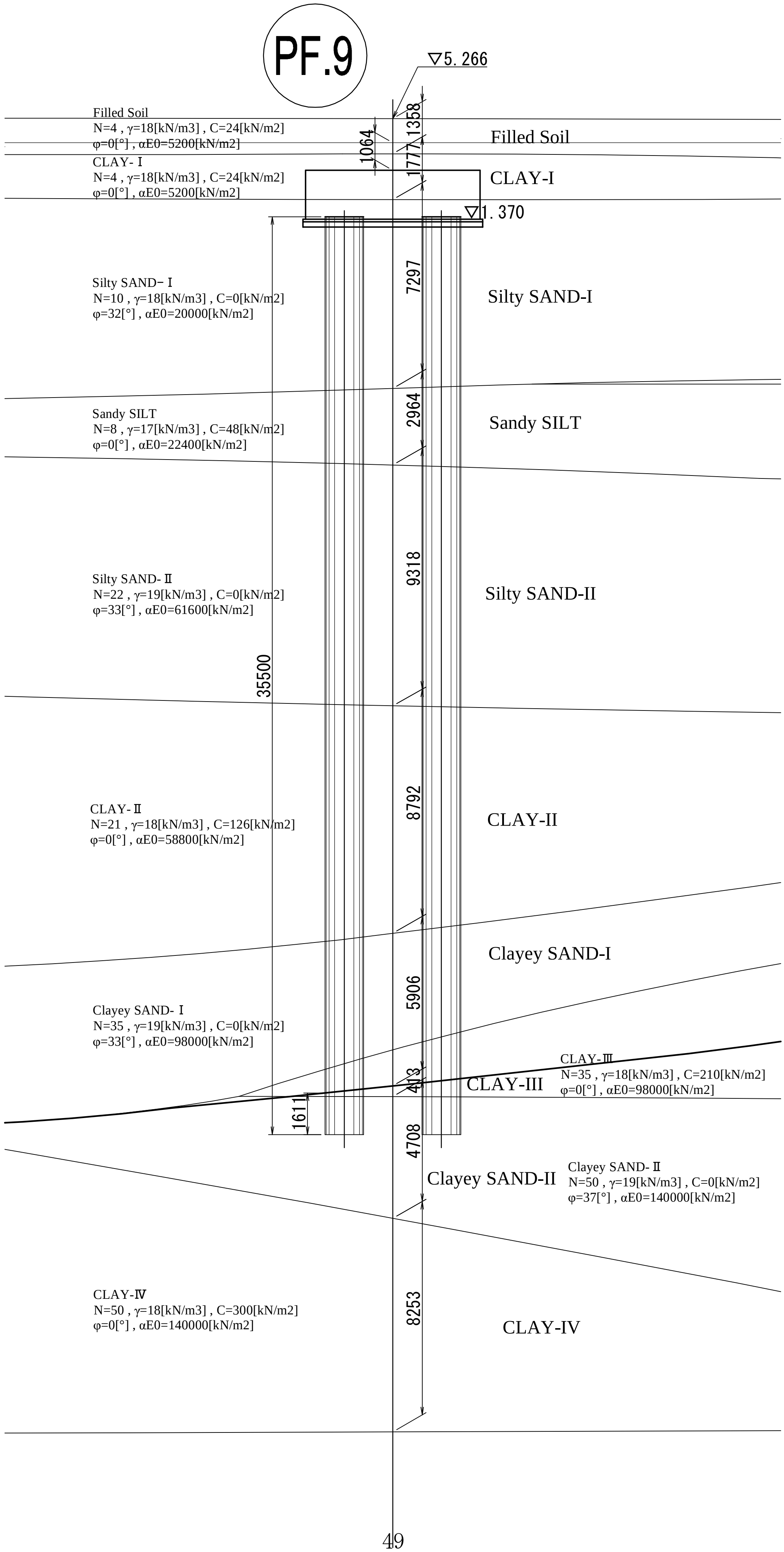


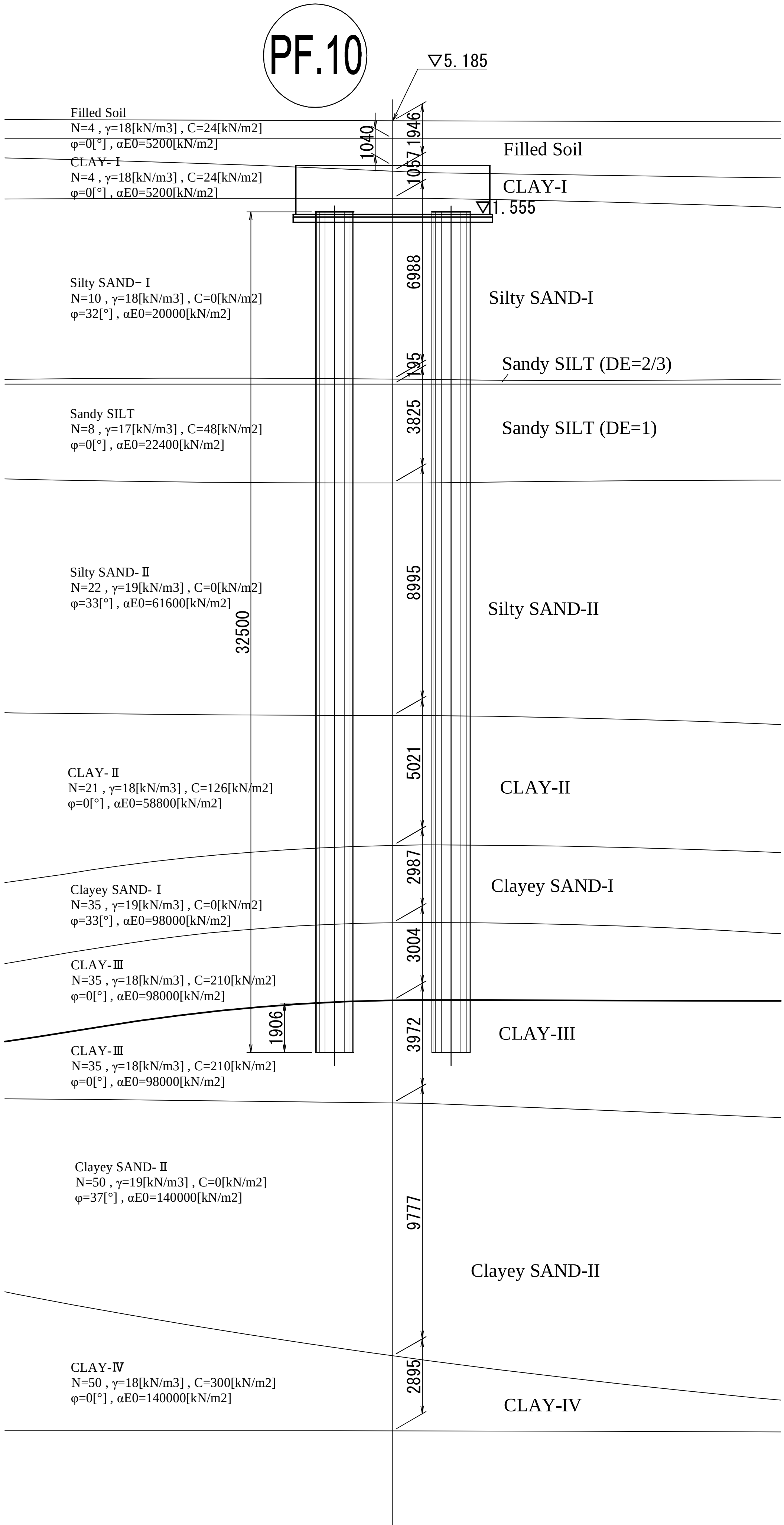
PF.5
▽5.856
▽1.544
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY-Ⅰ
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Silty SAND-Ⅰ
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Silty SAND-Ⅱ
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
Clayey SAND-Ⅰ
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
CLAY-Ⅳ
N=50 , γ=18[kN/m3] , C=300[kN/m2]
φ=0[°] , αE0=140000[kN/m2]
2190
1067
1932
7000
2038
12516
35500
11961
1882
12749
Filled Soil
CLAY-I
Silty SAND-I
Sandy SILT
Silty SAND-II
Clayey SAND-I
CLAY-IV


PF.6
▽5. 723
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY- Ⅰ
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
1013
1024
1951
Filled Soil
CLAY-I
▽1. 437
Silty SAND− Ⅰ
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
8004
Silty SAND-I
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
1976
Sandy SILT
Silty SAND- Ⅱ
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
11908
Silty SAND-II
33500
Clayey SAND- Ⅰ
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
11132
Clayey SAND-I
1566
CLAY-Ⅳ
N=50 , γ=18[kN/m3] , C=300[kN/m2]
φ=0[°] , αE0=140000[kN/m2]
14955
CLAY-IV

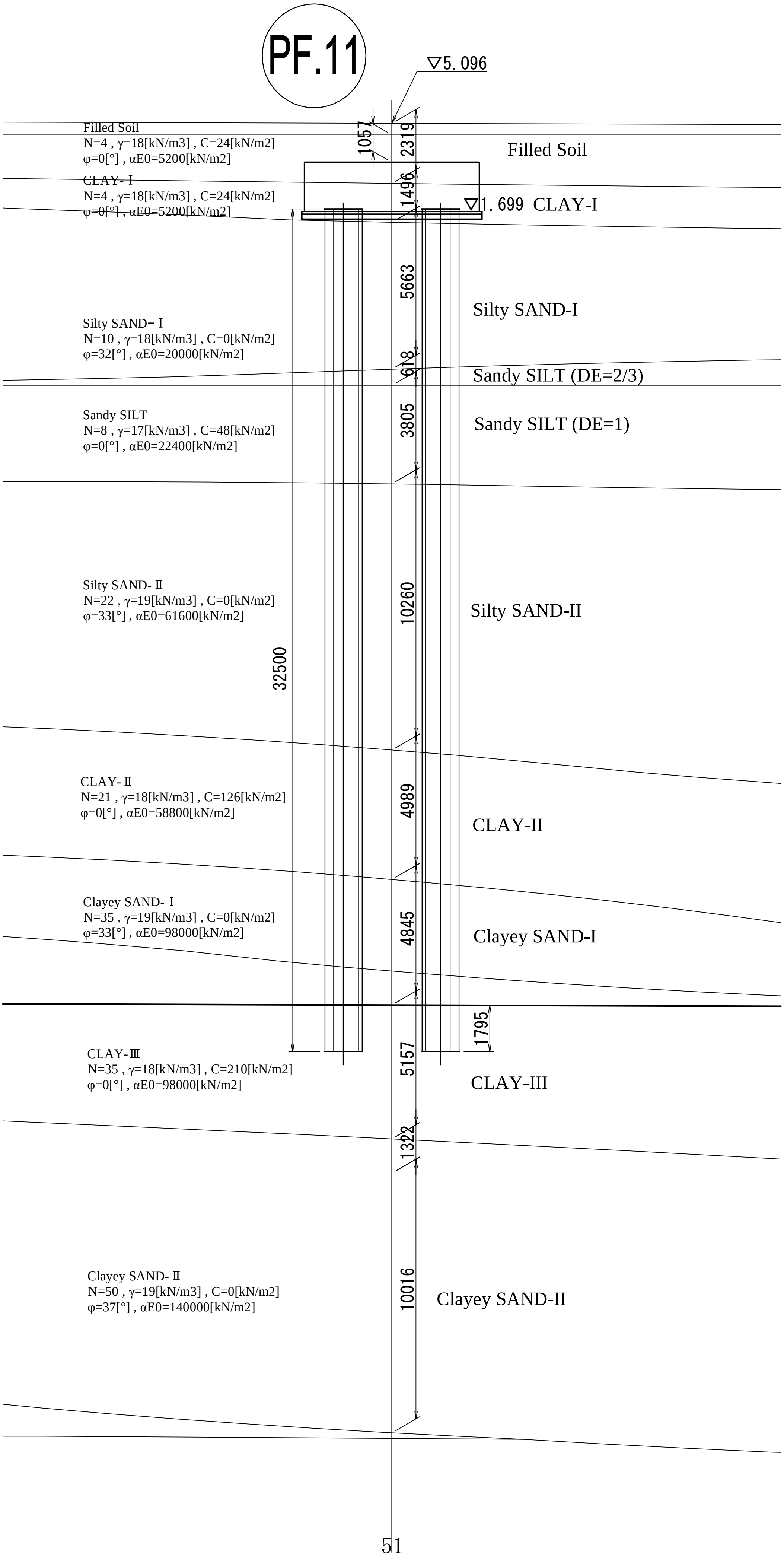

PF.7
▽5. 399
▽1. 231
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY- Ⅰ
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Silty SAND- Ⅰ
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Silty SAND- Ⅱ
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
CLAY- Ⅱ
N=21 , γ=18[kN/m3] , C=126[kN/m2]
φ=0[°] , αE0=58800[kN/m2]
Clayey SAND- Ⅰ
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
CLAY-Ⅳ
N=50 , γ=18[kN/m3] , C=300[kN/m2]
φ=0[°] , αE0=140000[kN/m2]
Filled Soil
CLAY-I
Silty SAND-I
Sandy SILT
Silty SAND-II
CLAY-II
Clayey SAND-I
CLAY-IV
1059
1556
1536
7984
1745
10102
5688
10473
1939
11792
37000

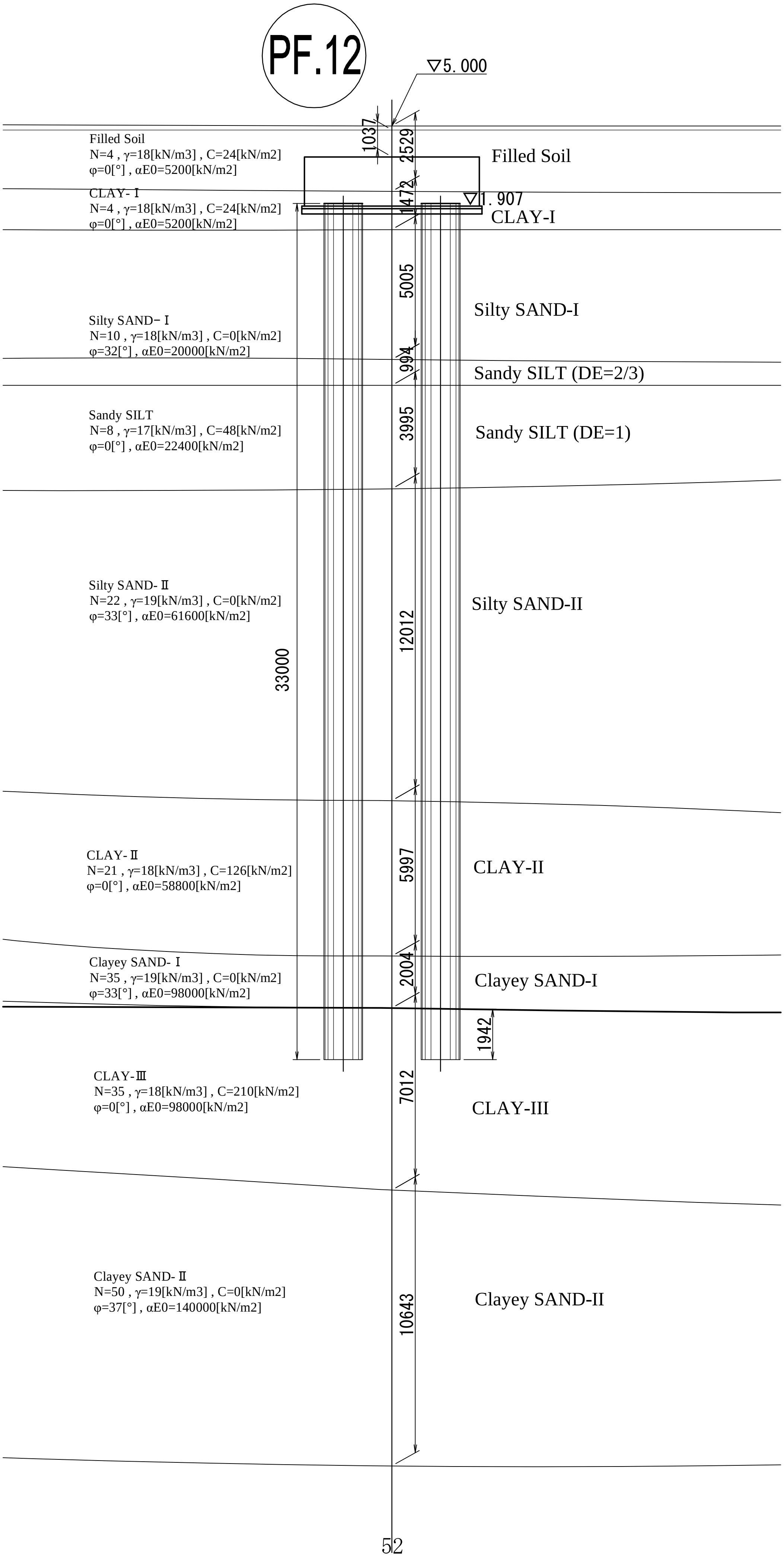

PF.8
▽5. 254
▽1. 184
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY- Ⅰ
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Silty SAND− Ⅰ
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Silty SAND- Ⅱ
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
CLAY- Ⅱ
N=21 , γ=18[kN/m3] , C=126[kN/m2]
φ=0[°] , αE0=58800[kN/m2]
Clayey SAND- Ⅰ
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
CLAY-Ⅳ
N=50 , γ=18[kN/m3] , C=300[kN/m2]
φ=0[°] , αE0=140000[kN/m2]
1366
1094
1653
7997
1962
8917
11067
6023
1986
11843
37000
Filled Soil
CLAY-I
Silty SAND-I
Sandy SILT
Silty SAND-II
CLAY-II
Clayey SAND-I
CLAY-IV

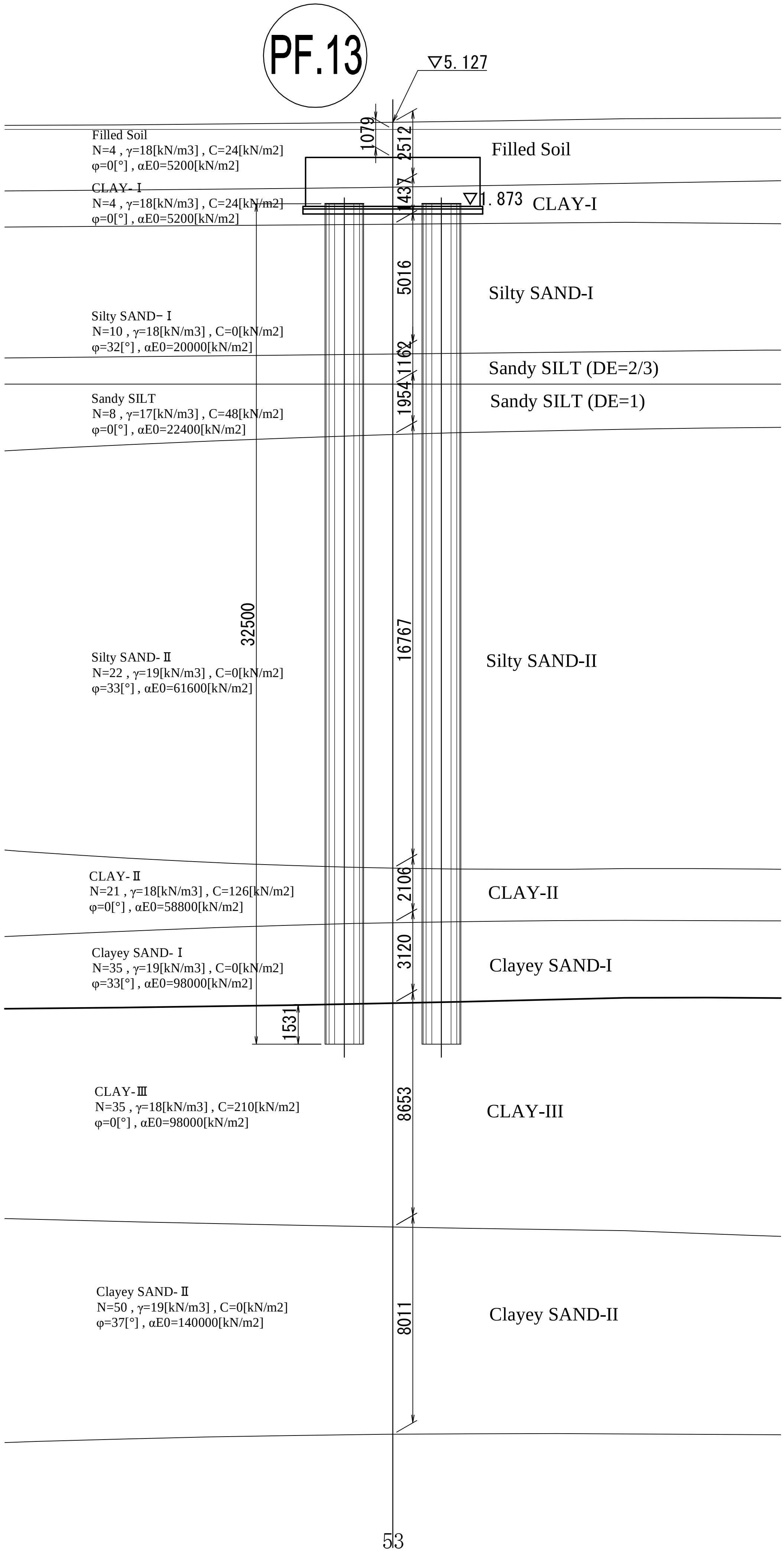

PF.9
▽5.266
▽1.370
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY- Ⅰ
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Silty SAND- Ⅰ
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Silty SAND- Ⅱ
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
CLAY- Ⅱ
N=21 , γ=18[kN/m3] , C=126[kN/m2]
φ=0[°] , αE0=58800[kN/m2]
Clayey SAND- Ⅰ
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
CLAY-Ⅲ
N=35 , γ=18[kN/m3] , C=210[kN/m2]
φ=0[°] , αE0=98000[kN/m2]
Clayey SAND- Ⅱ
N=50 , γ=19[kN/m3] , C=0[kN/m2]
φ=37[°] , αE0=140000[kN/m2]
CLAY-Ⅳ
N=50 , γ=18[kN/m3] , C=300[kN/m2]
φ=0[°] , αE0=140000[kN/m2]
Filled Soil
CLAY-I
Silty SAND-I
Sandy SILT
Silty SAND-II
CLAY-II
Clayey SAND-I
CLAY-III
Clayey SAND-II
CLAY-IV
1064
1358
1777
7297
2964
9318
8792
5906
413
4708
8253
35500
1611

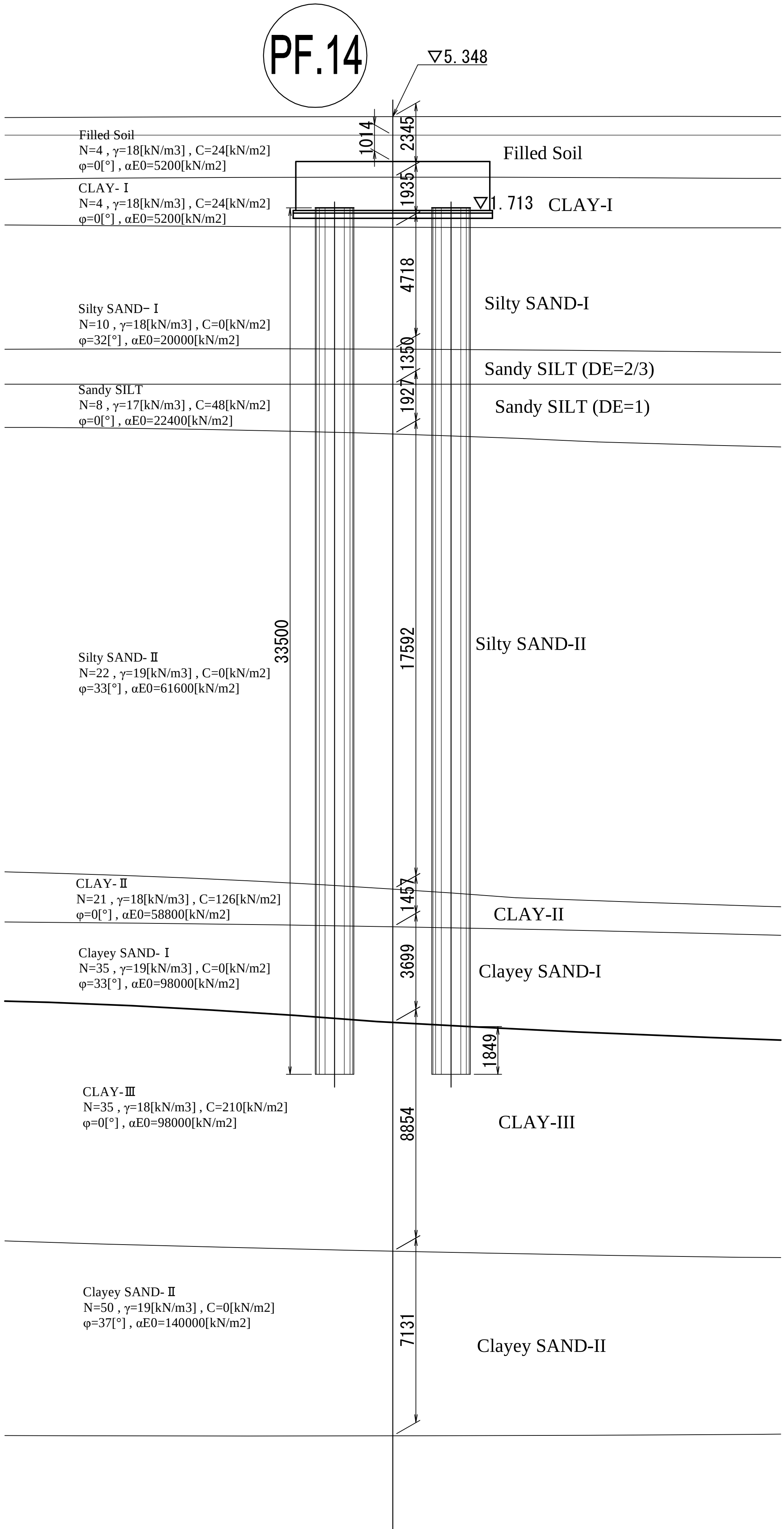


PF.10
▽5. 185
▽1. 555
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY- Ⅰ
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Silty SAND- Ⅰ
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Silty SAND- Ⅱ
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
CLAY- Ⅱ
N=21 , γ=18[kN/m3] , C=126[kN/m2]
φ=0[°] , αE0=58800[kN/m2]
Clayey SAND- Ⅰ
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
CLAY-Ⅲ
N=35 , γ=18[kN/m3] , C=210[kN/m2]
φ=0[°] , αE0=98000[kN/m2]
CLAY-Ⅲ
N=35 , γ=18[kN/m3] , C=210[kN/m2]
φ=0[°] , αE0=98000[kN/m2]
Clayey SAND- Ⅱ
N=50 , γ=19[kN/m3] , C=0[kN/m2]
φ=37[°] , αE0=140000[kN/m2]
CLAY-Ⅳ
N=50 , γ=18[kN/m3] , C=300[kN/m2]
φ=0[°] , αE0=140000[kN/m2]
1040
1946
1057
6988
195
3825
8995
32500
5021
2987
3004
1906
3972
9777
2895
Filled Soil
CLAY-I
Silty SAND-I
Sandy SILT (DE=2/3)
Sandy SILT (DE=1)
Silty SAND-II
CLAY-II
Clayey SAND-I
CLAY-III
Clayey SAND-II
CLAY-IV

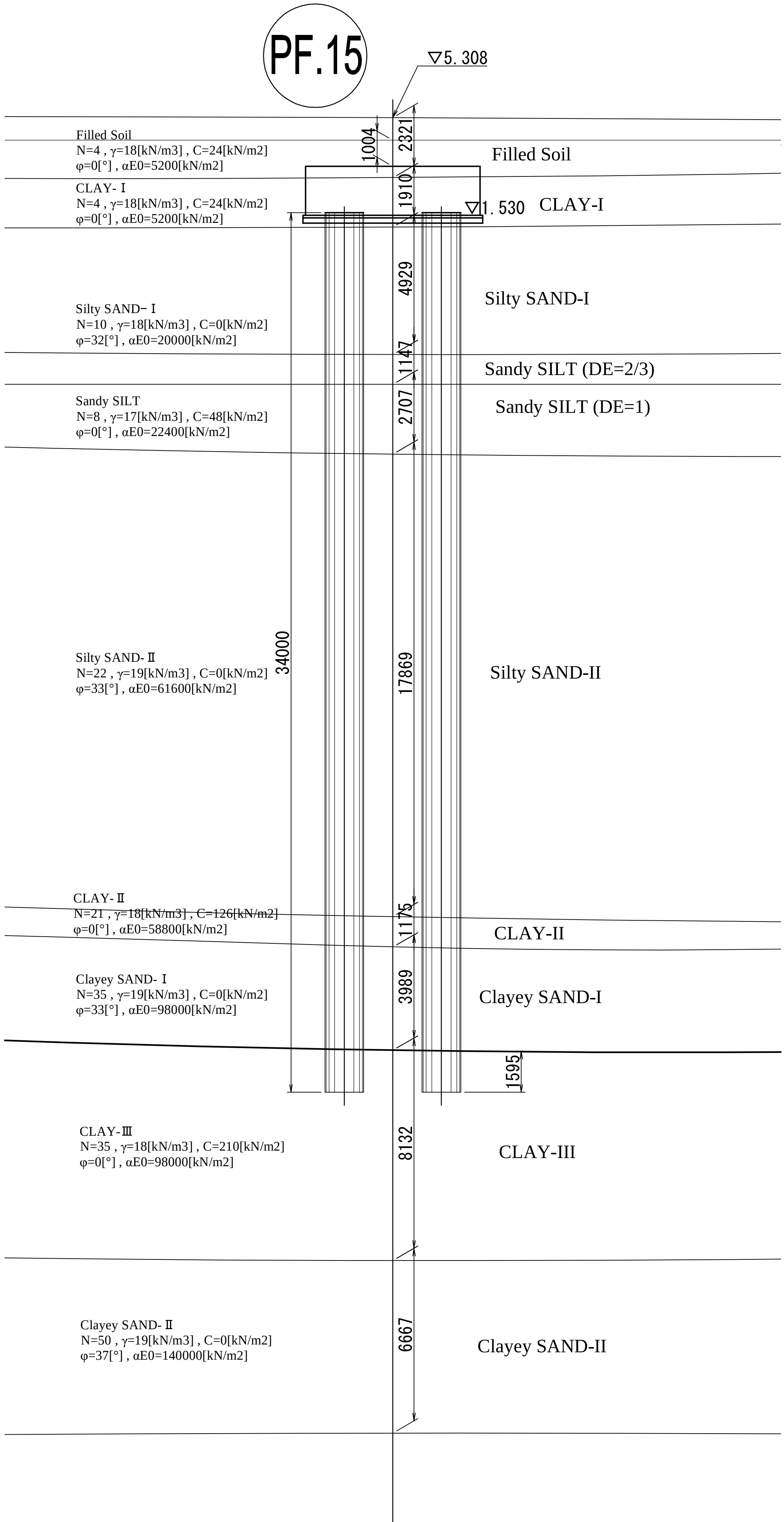

PF.11
▽5.096
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY- I
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
1057
2319
1496
Filled Soil
▽1.699 CLAY-I
5663
Silty SAND-I
Silty SAND- I
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
618
Sandy SILT (DE=2/3)
3805
Sandy SILT (DE=1)
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Silty SAND- II
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
10260
Silty SAND-II
32500
CLAY- II
N=21 , γ=18[kN/m3] , C=126[kN/m2]
φ=0[°] , αE0=58800[kN/m2]
4989
CLAY-II
Clayey SAND- I
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
4845
Clayey SAND-I
1795
CLAY- III
N=35 , γ=18[kN/m3] , C=210[kN/m2]
φ=0[°] , αE0=98000[kN/m2]
5157
CLAY-III
1322
Clayey SAND- II
N=50 , γ=19[kN/m3] , C=0[kN/m2]
φ=37[°] , αE0=140000[kN/m2]
10016
Clayey SAND-II

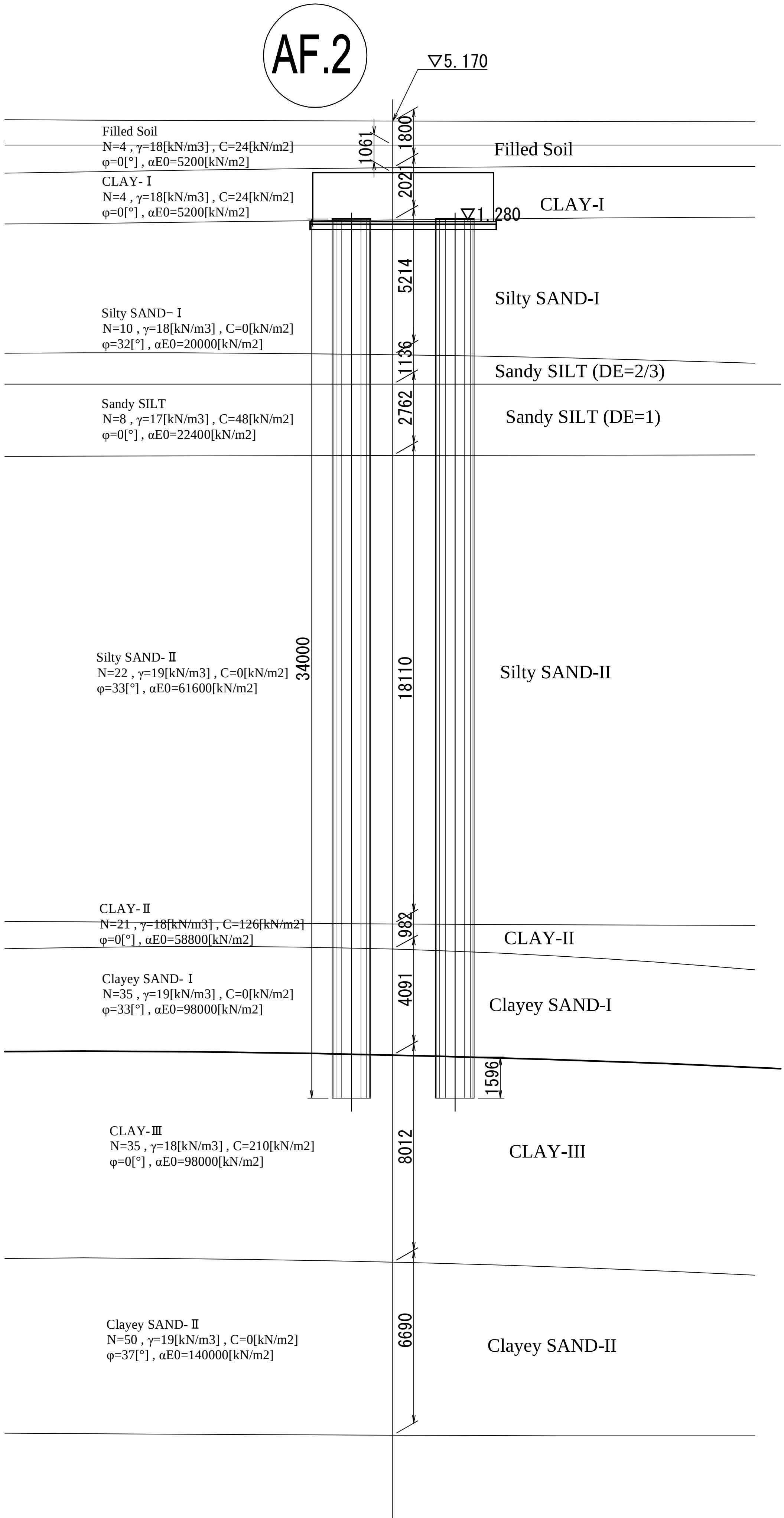

PF.12
▽5.000
▽1.907
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY-Ⅰ
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Silty SAND-Ⅰ
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Silty SAND-Ⅱ
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
CLAY-Ⅱ
N=21 , γ=18[kN/m3] , C=126[kN/m2]
φ=0[°] , αE0=58800[kN/m2]
Clayey SAND-Ⅰ
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
CLAY-Ⅲ
N=35 , γ=18[kN/m3] , C=210[kN/m2]
φ=0[°] , αE0=98000[kN/m2]
Clayey SAND-Ⅱ
N=50 , γ=19[kN/m3] , C=0[kN/m2]
φ=37[°] , αE0=140000[kN/m2]
1037
2529
1472
5005
994
3995
12012
33000
5997
2004
1942
7012
10643
Filled Soil
CLAY-I
Silty SAND-I
Sandy SILT (DE=2/3)
Sandy SILT (DE=1)
Silty SAND-II
CLAY-II
Clayey SAND-I
CLAY-III
Clayey SAND-II


PF.13
▽5. 127
▽1. 873
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY- Ⅰ
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Silty SAND− Ⅰ
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Silty SAND- Ⅱ
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
CLAY- Ⅱ
N=21 , γ=18[kN/m3] , C=126[kN/m2]
φ=0[°] , αE0=58800[kN/m2]
Clayey SAND- Ⅰ
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
CLAY-Ⅲ
N=35 , γ=18[kN/m3] , C=210[kN/m2]
φ=0[°] , αE0=98000[kN/m2]
Clayey SAND- Ⅱ
N=50 , γ=19[kN/m3] , C=0[kN/m2]
φ=37[°] , αE0=140000[kN/m2]
1079
2512
437
5016
1162
1954
32500
16767
2106
3120
1531
8653
8011
Filled Soil
CLAY-I
Silty SAND-I
Sandy SILT (DE=2/3)
Sandy SILT (DE=1)
Silty SAND-II
CLAY-II
Clayey SAND-I
CLAY-III
Clayey SAND-II



PF.14
▽5.348
1014
2345
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Filled Soil
1935
▽1.713
CLAY-I
CLAY-Ⅰ
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
4718
Silty SAND-I
Silty SAND−Ⅰ
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
1350
Sandy SILT (DE=2/3)
1927
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Sandy SILT (DE=1)
33500
17592
Silty SAND-II
Silty SAND-Ⅱ
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
CLAY-Ⅱ
N=21 , γ=18[kN/m3] , C=126[kN/m2]
φ=0[°] , αE0=58800[kN/m2]
1457
CLAY-II
Clayey SAND-Ⅰ
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
3699
Clayey SAND-I
1849
CLAY-Ⅲ
N=35 , γ=18[kN/m3] , C=210[kN/m2]
φ=0[°] , αE0=98000[kN/m2]
8854
CLAY-III
Clayey SAND-Ⅱ
N=50 , γ=19[kN/m3] , C=0[kN/m2]
φ=37[°] , αE0=140000[kN/m2]
7131
Clayey SAND-II


PF.15
▽5. 308
▽1. 530
1004
2321
1910
4929
1147
2707
34000
17869
1175
3989
1595
8132
6667
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY- Ⅰ
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Silty SAND− Ⅰ
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Silty SAND- Ⅱ
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
CLAY- Ⅱ
N=21 , γ=18[kN/m3] , C=126[kN/m2]
φ=0[°] , αE0=58800[kN/m2]
Clayey SAND- Ⅰ
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
CLAY-Ⅲ
N=35 , γ=18[kN/m3] , C=210[kN/m2]
φ=0[°] , αE0=98000[kN/m2]
Clayey SAND- Ⅱ
N=50 , γ=19[kN/m3] , C=0[kN/m2]
φ=37[°] , αE0=140000[kN/m2]
Filled Soil
CLAY-I
Silty SAND-I
Sandy SILT (DE=2/3)
Sandy SILT (DE=1)
Silty SAND-II
CLAY-II
Clayey SAND-I
CLAY-III
Clayey SAND-II


AF.2
▽5.170
Filled Soil
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
CLAY- I
N=4 , γ=18[kN/m3] , C=24[kN/m2]
φ=0[°] , αE0=5200[kN/m2]
Silty SAND− I
N=10 , γ=18[kN/m3] , C=0[kN/m2]
φ=32[°] , αE0=20000[kN/m2]
Sandy SILT
N=8 , γ=17[kN/m3] , C=48[kN/m2]
φ=0[°] , αE0=22400[kN/m2]
Silty SAND- II
N=22 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=61600[kN/m2]
CLAY- II
N=21 , γ=18[kN/m3] , C=126[kN/m2]
φ=0[°] , αE0=58800[kN/m2]
Clayey SAND- I
N=35 , γ=19[kN/m3] , C=0[kN/m2]
φ=33[°] , αE0=98000[kN/m2]
CLAY- III
N=35 , γ=18[kN/m3] , C=210[kN/m2]
φ=0[°] , αE0=98000[kN/m2]
Clayey SAND- II
N=50 , γ=19[kN/m3] , C=0[kN/m2]
φ=37[°] , αE0=140000[kN/m2]
1061
1800
2021
▽1.280
5214
1136
2762
34000
18110
982
4091
1596
8012
6690
Filled Soil
CLAY-I
Silty SAND-I
Sandy SILT (DE=2/3)
Sandy SILT (DE=1)
Silty SAND-II
CLAY-II
Clayey SAND-I
CLAY-III
Clayey SAND-II

§5. Calculation result

						AF1		AF2	
Parapet wall	Checking side					Front side	Back side	Front side	Back side
Parapet wall	Section	Dimensior	Sectional width	b	(cm)	100.0	100.0	100.0	100.0
Parapet wall	Section	Dimensior	Sectional height	h	(cm)	50.0	50.0	50.0	50.0
Parapet wall	Section	Dimensior	Effective height	d	(cm)	35.0	35.0	35.0	35.0
Parapet wall	Section	Reinforceme	Primary reinforcement	As	(cm^2)	D22－250ctc×1 15.484	D22－250ctc×1 15.484	D22－250ctc×1 15.484	D22－250ctc×1 15.484
Parapet wall	Section	Reinforceme	Stirrup	Aw0	(cm^2)				
Parapet wall	Allowable stress method	Sectional force	Load case			dead+live	seismic	dead+live	seismic
Parapet wall	Allowable stress method	Sectional force	Bending moment	M	(kN・m)	68.163	59.357	68.163	62.427
Parapet wall	Allowable stress method	Sectional force	Shearing force	S	(kN)		50.387		51.962
Parapet wall	Allowable stress method	Checking	Conpression stress	σc	(N/mm^2)	4.074≦8.000	3.548≦12.000	4.074≦8.000	3.732≦12.000
Parapet wall	Allowable stress method	Checking	Tensile stress	σs	(N/mm^2)	139.952≦160.000	121.872≦300.000	139.952≦160.000	128.176≦300.000
Parapet wall	Allowable stress method	Checking	Shearing stress	τm	(N/mm^2)		0.144≦0.548		0.148≦0.548
Parapet wall	Allowable stress method	Checking	Stirrup requirement	Aw	(cm^2)				
Parapet wall	Allowable stress method	Checking	Minimum reinforcement			Mu≧Mc	Mu≧Mc	Mu≧Mc	Mu≧Mc
Vertical wall	Section	Dimensior	Sectional width	b	(cm)	100.0		100.0	
Vertical wall	Section	Dimensior	Sectional height	h	(cm)	200.0		200.0	
Vertical wall	Section	Dimensior	Effective height	d	(cm)	185.0		185.0	
Vertical wall	Section	Reinforcement – Primary reinforceme	Tension side	As	(cm^2)	D22－250ctc×1 15.484		D25－250ctc×1 20.268	
Vertical wall	Section	Reinforcement – Primary reinforceme	Compression side	As	(cm^2)	D16－250ctc×1 7.944		D25－250ctc×1 20.268	
Vertical wall	Section	Reinforcement	Intermediate hoop	Aw0	(cm^2)			D16-1.00-600ctc 1.986	
Vertical wall	Allowable stress method	Sectional force	Load case			seismic		seismic	
Vertical wall	Allowable stress method	Sectional force	Bending moment	M	(kN・m)	1012.407		1382.954	
Vertical wall	Allowable stress method	Sectional force	Axial force	N	(kN)	540.367		602.329	
Vertical wall	Allowable stress method	Sectional force	Shearing force	S	(kN)	314.072		419.523	
Vertical wall	Allowable stress method	Checking items	Conpression stress	σc	(N/mm^2)	3.991≦12.000		4.853≦12.000	
Vertical wall	Allowable stress method	Checking items	Tensile stress	σs	(N/mm^2)	206.524≦300.000		249.619≦300.000	
Vertical wall	Allowable stress method	Checking items	Shearing stress	τm	(N/mm^2)	0.170≦0.204		0.227＞0.220	
Vertical wall	Allowable stress method	Checking items	Stirrup requirement	Aw	(cm^2)			0.165≦1.986	
Vertical wall	Allowable stress method	Checking items – Minimum re.	Bending member			Mu≧Mc		Mu≧Mc	
Vertical wall	Allowable stress method	Checking items – Minimum re.	Axial member	ΣAs≧0.008A1	(cm^2)	23.428≧21.820		40.536≧27.069	

						AF1		AF2	
Pile cap	Checking direction					Front side of pile cap	Back side of pile cap	Front side of pile cap	Back side of pile cap
	Section	Dimensior	Sectional width	b	(cm)	100.0	100.0	100.0	100.0
			Sectional height	h	(cm)	190.0	190.0	190.0	190.0
			Effective height	d	(cm)	165.0	175.0	165.0	175.0
		Reinforceme	Primary reinforcement	As	(cm^2)	D32－250ctc×1 31.768	D25－250ctc×1 20.268	D25－250ctc×1 20.268	D29－250ctc×1 25.696
			Stirrup	Aw0	(cm^2)				
	Allowable stress method	Sectional force	Load case			dead+live	seismic	dead+live	seismic
			Bending moment	M	(kN・m)	688.790	772.170	405.221	1022.442
			Shearing force	S	(kN)	1196.389	-312.765		468.948
		Checking items	Conpression stress	σc	(N/mm^2)	2.554≦8.000	3.149≦12.000	1.812≦8.000	3.770≦12.000
			Tensile stress	σs	(N/mm^2)	141.473≦160.000	230.747≦300.000	128.647≦160.000	242.664≦300.000
			Shearing stress	τm	(N/mm^2)	0.725≦1.647	0.179≦0.405		0.268≦0.669
			Stirrup requirement	Aw	(cm^2)				
			Minimum reinforcement			1.7M≦Mc	Mu≧Mc	1.7M≦Mc	Mu≧Mc
Wing wall	Checking side					Left side	Right side	Left side	Right side
	Checking section					Point C		Point C	
	Section	Dimensior	Sectional width	b	(cm)	100.0		100.0	
			Sectional height	h	(cm)	60.0		50.0	
			Effective height	d	(cm)	45.0		35.0	
		Reinforcemer	Primary reinforcement	As	(cm^2)	D29－250ctc×1 25.696		D25－125ctc×1 40.536	
			Stirrup	Aw0	(cm^2)				
	Allowable stress method	Sectional force	Load case			dead+live		seismic	
			Soil pressure			Active soil pressure		Active soil pressure	
			Bending moment	M	(kN・m)	130.139		259.823	
			Shearing force	S	(kN)	95.417		187.442	
		Checking items	Conpression stress	σc	(N/mm^2)	4.297≦8.000		11.281≦12.000	
			Tensile stress	σs	(N/mm^2)	126.789≦160.000		214.676≦300.000	
			Shearing stress	τm	(N/mm^2)	0.212≦0.376		0.536≦0.720	
			Stirrup requirement	Aw	(cm^2)				
			Minimum reinforcement			Mu≧Mc		Mu≧Mc	

			AF1	AF2
Designing conditin	Pile		Cast-in-place concrete pile	Cast-in-place concrete pile
	Method		Cast-in-place	Cast-in-place
	Bearing ground		Sand	Silt
	Material	Concrete strength σck (N/mm^2)	24.00	24.00
		Reinforcement	SD345	SD345
	Diameter D (mm)		1500.0000	1500.0000
	Lemgth L (m)		40.40	33.90
	Total number N (No.)		8	6
	Support method		Bearing pile	Bearing pile
	Pile ultimate bearing power qd (kN/m^2)		3000	2100

			Item	Symbol (unit)	AF1		AF2	
Stability calculation	Direction				Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction
	Force of Pile cap	dead+live	Vertical load	N (kN)		21039.8		21428.3
			Horizontal load	H (kN)		-2467.3		-3238.3
			Bending moment	M (kN･m)		2605.8		-276.6
		seismic	Vertical load	N (kN)		19062.8		19364.8
			Horizontal load	H (kN)		-8157.0		-9641.2
			Bending moment	M (kN･m)		-18863.2		-26682.6
	dead+live		Case			dead+live(a)		dead+live(a)
			Maximum axial force	Pmax (kN/n)		2972.0≦7610.0		4206.1≦6169.0
			Minimum axial force	Pmax (kN/n)		2287.9≧0.0		2936.6≧0.0
			Horizontal displacement at ground surface δ	(mm)		5.28≦15.00		6.20≦15.00
	seismic		Case1			seismic		seismic(liquefaction)
			Case2 (1.Not-Buoyant force、2.Buoyant force)			1		1
			Maximum axial force	Pmax (kN/n)		4510.9≦11592.0		6235.9≦9331.0
			Minimum axial force	Pmax (kN/n)		254.8≧-7931.0		219.1≧-6595.0
			Horizontal displacement at ground surface δ	(mm)		13.89≦15.00		14.25≦15.00
Primary reinforcement					D32-36×1 285.9		D32-36×1 285.9	
Hoop ties					D19 - 2 150ctc		D19 - 2 150ctc	
Stress	Direction				Bridge-axial direction		Bridge-axial direction	
	Case				seismic		seismic(not-liquefaction)	
	Sectional force		Case		seismic		seismic	
			Bending moment	M (kN･m)	2881.8		2673.2	
			Axial force	N (kN)	254.8		-59.3	
			Shearing force	S (kN)	1019.6		1590.4	
	Checking items		Conpression stress	σc (N/mm^2)	10.91≦12.00		10.09≦12.00	
			Tensile stress	σt (N/mm^2)	263.79≦300.00		256.36≦300.00	
			Shearing stress	τ (N/mm^2)	0.641＞0.499		1.000＞0.489	
			Hoop ties requirement	A_w (cm^2)	5.730≧1.091		5.730≧3.909	

				PF1		PF2		PF3	
Colum	Skeleton shape			rectangle		rectangle		rectangle	
	Checking side			Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction
	Section	Dimension	Sectional width b (mm)	7000	2200	7000	3000	7000	2200
			Sectional height h (mm)	2200	7000	3000	7000	2200	7000
			Effective height d (mm)	2050	6850	2850	6850	2050	6850
		Reinforcement	Primary reinforcement As (mm^2)	D32-51×1 92127.2	D32-7×1 92127.2	D29-51×1 79657.6	D29-11×1 79657.6	D32-51×1 92127.2	D32-7×1 92127.2
			Hoop ties（including intermediate hoop）Aw0 (mm^2)	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D16-2 150ctc 397.2
	Allowable stress method		Case	seismic	seismic	seismic	seismic	seismic	seismic
		Sectional force	Bending moment M (kN･m)	29017.02	16237.02	-33640.10	22058.75	34194.20	37104.20
			Vertical load N (kN)	9395.86	9395.86	10801.08	10801.08	14024.08	14024.08
			Shearing force S (kN)	4518.76	2718.76	-4810.32	3410.32	4077.22	4377.22
		Checking	Conpression stress σc (N/mm^2)	7.82≦12.00	1.56≦12.00	5.92≦12.00	1.57≦12.00	9.26≦12.00	4.10≦12.00
			Tensile stress σt (N/mm^2)	273.19≦300.00	6.06≦300.00	235.57≦300.00	11.83≦300.00	290.94≦300.00	73.07≦300.00
			Shearing stress τ (N/mm^2)	0.315 >0.301	0.180≦0.198	0.241 >0.227	0.166≦0.175	0.284≦0.301	0.290 >0.198
			Hoop ties requirement Aw (cm^2)	55.7	0.0	55.2	0.0	0.0	116.8
			Minimum: Bending member	Mu≧Mc	1.7M≦Mc	Mu≧Mc	1.7M≦Mc	Mu≧Mc	Mu≧Mc
			Minimum: Axial member ΣAs≧0.008A'1 (mm^2)	92127.2≧6186.6	92127.2≧6186.6	79657.6≧7111.8	79657.6≧7111.8	92127.2≧9234.0	92127.2≧9234.0
			Minimum reinforcement	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu

				PF4		PF5		PF6	
Colum	Skeleton shape			rectangle		rectangle		rectangle	
	Checking side			Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction
	Section	Dimension	Sectional width b (mm)	7000	2200	7000	3000	7000	2200
			Sectional height h (mm)	2200	7000	3000	7000	2200	7000
			Effective height d (mm)	2050	6850	2815	6850	2000	6850
		Reinforcement	Primary reinforcement As (mm^2)	D32-51×1 92127.2	D32-7×1 92127.2	D32-51×1.5 141367.6	D32-11×1 141367.6	D29-51×2 140043.2	D29-7×1 140043.2
			Hoop ties（including intermediate hoop）Aw0 (mm^2)	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D16-2 150ctc 397.2
	Allowable stress method		Case	seismic	seismic	seismic	seismic	seismic	seismic
		Sectional force	Bending moment M (kN・m)	33717.38	39317.38	61262.59	33719.64	36085.67	43345.67
			Vertical load N (kN)	14690.03	14690.03	12643.78	12643.78	11982.35	11982.35
			Shearing force S (kN)	3647.01	4147.01	6093.13	3793.13	3684.71	4284.71
		Checking	Conpression stress σc (N/mm^2)	9.13≦12.00	4.38≦12.00	8.27≦12.00	2.70≦12.00	8.22≦12.00	6.69≦12.00
			Tensile stress σt (N/mm^2)	278.03≦300.00	81.01≦300.00	293.35≦300.00	47.68≦300.00	229.45≦300.00	291.89≦300.00
			Shearing stress τ (N/mm^2)	0.254≦0.301	0.275 >0.198	0.309 >0.270	0.185≦0.206	0.263≦0.357	0.284 >0.229
			Hoop ties requirement Aw (cm^2)	0.0	97.4	159.2	0.0	0.0	69.4
			Minimum: Bending member	Mu≧Mc	Mu≧Mc	Mu≧Mc	1.7M≦Mc	Mu≧Mc	Mu≧Mc
			Minimum: Axial member ΣAs≧0.008A'1 (mm^2)	92127.2≧9672.4	92127.2≧9672.4	141367.6≧8325.1	141367.6≧8325.1	140043.2≧7889.6	140043.2≧7889.6
			Minimum reinforcement	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu

		PF7		PF8		PF9	
Colum	Skeleton shape	rectangle		rectangle		rectangle	
	Checking side	Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction
Section / Dimension	Sectional width b (mm)	7000	2200	7000	2200	7000	2200
Section / Dimension	Sectional height h (mm)	2200	7000	2200	7000	2200	7000
Section / Dimension	Effective height d (mm)	2050	6850	2000	6850	2015	6850
Section / Reinforcement	Primary reinforcement As (mm^2)	D25-51×1 58777.2	D25-7×1 58777.2	D32-51×2 173135.6	D32-7×1 173135.6	D29-51×1.5 109208.0	D29-7×1 109208.0
Section / Reinforcement	Hoop ties（including intermediate hoop）Aw0 (mm^2)	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D19-2 150ctc 573.0	D19-2 150ctc 573.0	D16-2 150ctc 397.2	D16-2 150ctc 397.2
Allowable stress method	Case	seismic	seismic	seismic	seismic	seismic	seismic
Allowable stress method / Sectional force	Bending moment M (kN・m)	23270.62	26498.74	46517.77	41717.77	33967.47	36577.47
Allowable stress method / Sectional force	Vertical load N (kN)	12519.03	12519.03	12644.63	12644.63	11993.71	11993.71
Allowable stress method / Sectional force	Shearing force S (kN)	2595.71	2895.71	5273.39	4173.39	4128.11	3828.11
Allowable stress method / Checking	Conpression stress σc (N/mm^2)	7.56≦12.00	2.64≦12.00	9.51≦12.00	5.60≦12.00	8.62≦12.00	4.78≦12.00
Allowable stress method / Checking	Tensile stress σt (N/mm^2)	252.84≦300.00	23.45≦300.00	257.46≦300.00	183.86≦300.00	265.45≦300.00	138.10≦300.00
Allowable stress method / Checking	Shearing stress τ (N/mm^2)	0.181≦0.267	0.192 >0.175	0.377≦0.378	0.277 >0.245	0.293≦0.323	0.254 >0.209
Allowable stress method / Checking	Hoop ties requirement Aw (cm^2)	0.0	21.2	0.0	40.1	0.0	56.5
Allowable stress method / Checking / Minimum	Bending member	Mu≧Mc	1.7M≦Mc	Mu≧Mc	Mu≧Mc	Mu≧Mc	Mu≧Mc
Allowable stress method / Checking / Minimum	Axial member ΣAs≧0.008A'1 (mm^2)	58777.2≧8243.0	58777.2≧8243.0	173135.6≧8325.7	173135.6≧8325.7	109208.0≧7897.1	109208.0≧7897.1
Allowable stress method / Checking	Minimum reinforcement	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu

			PF10		PF11		PF12	
Colum		Skeleton shape	rectangle		rectangle		rectangle	
		Checking side	Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction
Section	Dimension	Sectional width b (mm)	7000	2200	7000	3000	7000	2200
		Sectional height h (mm)	2200	7000	3000	7000	2200	7000
		Effective height d (mm)	2000	6850	2850	6850	2050	6850
	Reinforcement	Primary reinforcement As (mm^2)	D32-51×2 173135.6	D32-7×1 173135.6	D25-27×1 38509.2	D25-11×1 38509.2	D25-27×1 34455.6	D25-7×1 34455.6
		Hoop ties（including intermediate hoop）Aw0 (mm^2)	D19-2 150ctc 573.0	D19-2 150ctc 573.0	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D16-2 150ctc 397.2
Allowable stress method		Case	seismic	seismic	seismic	seismic	seismic	seismic
	Sectional force	Bending moment M (kN･m)	48705.28	39835.28	-23169.77	23442.01	16399.54	26869.54
		Vertical load N (kN)	11742.78	11742.78	10906.33	10906.33	11063.65	11063.65
		Shearing force S (kN)	5882.84	4182.84	-3231.90	3031.90	2679.09	3179.09
	Checking	Conpression stress σc (N/mm^2)	9.90≦12.00	5.40≦12.00	5.57≦12.00	1.71≦12.00	6.60≦12.00	2.89≦12.00
		Tensile stress σt (N/mm^2)	277.81≦300.00	185.62≦300.00	258.67≦300.00	15.87≦300.00	249.48≦300.00	41.86≦300.00
		Shearing stress τ (N/mm^2)	0.420 >0.378	0.278 >0.245	0.162≦0.175	0.148 >0.135	0.187≦0.218	0.211 >0.144
		Hoop ties requirement Aw (cm^2)	169.4	40.9	0.0	20.8	0.0	85.2
		Minimum – Bending member	Mu≧Mc	Mu≧Mc	Mu≧Mc	1.7M≦Mc	Mu≧Mc	1.7M≦Mc
		Minimum – Axial member ΣAs≧0.008A'1 (mm^2)	173135.6≧7731.9	173135.6≧7731.9	38509.2≧7181.1	38509.2≧7181.1	34455.6≧7284.7	34455.6≧7284.7
		Minimum reinforcement	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu

				PF13		PF14		PF15	
Colum	Skeleton shape			rectangle		rectangle		rectangle	
	Checking side			Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction
	Section	Dimension	Sectional width b (mm)	7000	2200	7000	3000	7000	2200
			Sectional height h (mm)	2200	7000	3000	7000	2200	7000
			Effective height d (mm)	2050	6850	2850	6850	2050	6850
		Reinforcement	Primary reinforcement As (mm^2)	D25-27×1 34455.6	D25-7×1 34455.6	D32-27×1 60359.2	D32-11×1 60359.2	D32-51×1 92127.2	D32-7×1 92127.2
			Hoop ties（including intermediate hoop）Aw0 (mm^2)	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D16-2 150ctc 397.2	D16-2 150ctc 397.2
	Allowable stress method		Case	seismic	seismic	seismic	seismic	seismic	seismic
		Sectional force	Bending moment M (kN・m)	15314.20	25004.20	26367.70	18970.18	26919.74	25129.74
			Vertical load N (kN)	10724.08	10724.08	9724.03	9724.03	10435.42	10435.42
			Shearing force S (kN)	2777.22	3177.22	4407.21	2907.21	4920.63	3620.63
		Checking	Conpression stress σc (N/mm^2)	6.11≦12.00	2.61≦12.00	5.50≦12.00	1.33≦12.00	7.28≦12.00	2.60≦12.00
			Tensile stress σt (N/mm^2)	221.78≦300.00	32.79≦300.00	249.11≦300.00	8.26≦300.00	235.32≦300.00	34.20≦300.00
			Shearing stress τ (N/mm^2)	0.194≦0.218	0.211 >0.144	0.221 >0.203	0.141≦0.156	0.343 >0.301	0.240 >0.198
			Hoop ties requirement Aw (cm^2)	0.0	85.1	72.3	0.0	168.4	53.8
			Minimum – Bending member	Mu≧Mc	1.7M≦Mc	Mu≧Mc	1.7M≦Mc	Mu≧Mc	1.7M≦Mc
			Minimum – Axial member ΣAs≧0.008A'1 (mm^2)	34455.6≧7061.1	34455.6≧7061.1	60359.2≧6402.7	60359.2≧6402.7	92127.2≧6871.1	92127.2≧6871.1
			Minimum reinforcement	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu	My0≦Mu

			PF1		PF2		PF3	
Beams		Checking direction	Virtical direction	Horizontal direction	Virtical direction	Horizontal direction	Virtical direction	Horizontal direction
Section	Dimension	Sectional width b (mm)	2200 (2200)	2500 (1462)	3000 (3000)	2500 (2333)	2200 (2200)	2500 (2333)
		Sectional height h (mm)	2500 (1462)	2200 (2200)	2500 (1461)	3000 (3000)	2500 (1806)	2200 (2200)
		Effective height d (mm)	2300 (1262)	2100 (2100)	2350 (1311)	2900 (2900)	2350 (1656)	2100 (2100)
	Reinforcement	Primary reinforcement As (mm^2)	D32-14×2 22237.6	D22-13×1 5032.3	D32-17×1 13501.4	D16-14×1 2780.4	D22-15×1 5806.5	D16-14×1 2780.4
		Hoop ties（including intermediate hoop）Aw0 (mm^2)	D22-6 150ctc 2322.6	D22-2 150ctc 972.8	D22-4 200ctc 1548.4	D22-2 200ctc 972.8	D19-4 200ctc 1146.0	D19-2 200ctc 771.6
Allowable stress method	Sectional force	Case	dead	seismic	dead	seismic	dead	seismic
		Bending moment M (kN・m)	3376.90	1881.69	2400.05	1062.33	852.70	248.41
		Shearing force S (kN)	2785.21	976.56	1333.98	1049.66	109.63	868.50
	Checking	Conpression stress σc (N/mm^2)	2.13≦8.00	2.31≦12.00	1.47≦8.00	1.03≦12.00	0.89≦8.00	0.40≦12.00
		Tensile stress σt (N/mm^2)	75.69≦100.00	187.82≦300.00	81.41≦100.00	136.37≦300.00	66.18≦100.00	44.29≦300.00
		Shearing stress τ (N/mm^2)	1.000 >0.305	0.318 >0.190	0.335 >0.229	0.152 >0.145	0.023≦0.170	0.173≦0.179
		Stirrup requirement Aw (mm^2)	1464.4	107.4	406.5	11.5	0.0	0.0
		Minimum reinforcement	Mu≧Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc
	Checking for corbel	Primary reinforcement in lowest position h≦d/4(mm)	250.00≦575.00	---	150.00≦587.50	---	150.00≦587.50	---
		Effective height in loading point da≧d/2 (mm)	1262.20≧1150.00	---	1310.60≧1175.00	---	2238.90≧1175.00	---
		Reinforcement interval in side face s≦300 (mm)	150.00≦300.00	---	150.00≦300.00	---	150.00≦300.00	---
		Primary reinforcement in surface Asu≧Asureq(mm^2)	22237.60≧17273.14	---	13501.40≧12015.25	---	5806.50≧4268.83	---
		Reinforcement interval in side face Ass≧Assreq (mm^2)	10064.60≧6909.25	---	5560.80≧4806.10	---	5560.80≧1707.53	---

					PF4		PF5		PF6	
Beams	Checking direction				Virtical direction	Horizontal direction	Virtical direction	Horizontal direction	Virtical direction	Horizontal direction
	Section	Dimension	Sectional width	b (mm)	2200 (2200)	2500 (2333)	3000 (3000)	2500 (2333)	2200 (2200)	2500 (1440)
			Sectional height	h (mm)	2500 (1806)	2200 (2200)	2500 (1439)	3000 (3000)	2500 (1440)	2200 (2200)
			Effective height	d (mm)	2350 (1656)	2100 (2100)	2350 (1289)	2900 (2900)	2300 (1240)	2100 (2100)
		Reinforcement	Primary reinforcement	As (mm^2)	D22-15×1 5806.5	D16-14×1 2780.4	D32-17×1 13501.4	D16-14×1 2780.4	D32-14×2 22237.6	D22-13×1 5032.3
			Hoop ties（including intermediate hoop）	Aw0 (mm^2)	D19-4 200ctc 1146.0	D19-2 200ctc 771.6	D22-4 200ctc 1548.4	D22-2 200ctc 972.8	D22-6 150ctc 2322.6	D22-2 150ctc 972.8
	Allowable stress method	Sectional force	Case		dead	seismic	dead	seismic	dead	seismic
			Bending moment	M (kN･m)	858.70	218.41	2480.09	1660.24	3824.50	1233.21
			Shearing force	S (kN)	109.63	718.50	1347.67	779.30	3002.08	615.62
		Checking	Conpression stress	σc (N/mm^2)	0.89≦8.00	0.35≦12.00	1.52≦8.00	1.61≦12.00	2.41≦8.00	1.51≦12.00
			Tensile stress	σt (N/mm^2)	66.65≦100.00	38.94≦300.00	84.13≦100.00	213.13≦300.00	85.72≦100.00	123.09≦300.00
			Shearing stress	τ (N/mm^2)	0.023≦0.170	0.143≦0.179	0.344 >0.231	0.187 >0.142	1.097 >0.308	0.204 >0.191
			Stirrup requirement	Aw (mm^2)	0.0	0.0	435.3	49.6	1664.1	10.4
			Minimum reinforcement		1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	Mu≧Mc	1.7M≦Mc
		Checking for corbel	Primary reinforcement in lowest position	h≦d/4(mm)	150.00≦587.50	---	150.00≦587.50	---	250.00≦575.00	---
			Effective height in loading point	da≧d/2 (mm)	2238.90≧1175.00	---	1288.90≧1175.00	---	1240.00≧1150.00	---
			Reinforcement interval in side face	s≦300 (mm)	150.00≦300.00	---	150.00≦300.00	---	150.00≦300.00	---
			Primary reinforcement in surface	Asu≧Asureq(mm^2)	5806.50≧4298.86	---	13501.40≧12415.98	---	22237.60≧19562.65	---
			Reinforcement interval in side face	Ass≧Assreq (mm^2)	5560.80≧1719.55	---	5560.80≧4966.39	---	10064.60≧7825.06	---

				PF7		PF8		PF9	
Beams		Checking direction		Virtical direction	Horizontal direction	Virtical direction	Horizontal direction	Virtical direction	Horizontal direction
	Section	Dimension	Sectional width b (mm)	2200 (2200)	2500 (1518)	2200 (2200)	2500 (1531)	2200 (2200)	2500 (1528)
			Sectional height h (mm)	2500 (1518)	2200 (2200)	2500 (1531)	2200 (2200)	2500 (1528)	2200 (2200)
			Effective height d (mm)	2300 (1318)	2100 (2100)	2300 (1331)	2100 (2100)	2300 (1328)	2100 (2100)
		Reinforcement	Primary reinforcement As (mm^2)	D32-14×2 22237.6	D22-13×1 5032.3	D32-14×2 22237.6	D22-13×1 5032.3	D32-14×2 22237.6	D22-13×1 5032.3
			Hoop ties（including intermediate hoop）Aw0 (mm^2)	D22-6 150ctc 2322.6	D22-2 150ctc 972.8	D22-6 150ctc 2322.6	D22-2 150ctc 972.8	D22-6 150ctc 2322.6	D22-2 150ctc 972.8
	Allowable stress method		Case	dead	seismic	dead	seismic	dead	seismic
		Sectional force	Bending moment M (kN·m)	4030.06	698.48	3969.10	1838.91	3567.20	1383.41
			Shearing force S (kN)	2758.92	350.68	3095.13	1019.54	2794.72	759.42
		Checking	Conpression stress σc (N/mm^2)	2.54≦8.00	0.86≦12.00	2.50≦8.00	2.26≦12.00	2.25≦8.00	1.70≦12.00
			Tensile stress σt (N/mm^2)	90.32≦100.00	69.72≦300.00	88.96≦100.00	183.55≦300.00	79.95≦100.00	138.09≦300.00
			Shearing stress τ (N/mm^2)	0.922 >0.298	0.110≦0.196	1.051 >0.296	0.317 >0.195	0.953 >0.297	0.237 >0.195
			Stirrup requirement Aw (mm^2)	1316.3	0.0	1591.3	107.2	1382.9	36.2
			Minimum reinforcement	Mu≧Mc	1.7M≦Mc	Mu≧Mc	1.7M≦Mc	Mu≧Mc	1.7M≦Mc
		Checking for corbel	Primary reinforcement in lowest position h≦d/4(mm)	250.00≦575.00	---	250.00≦575.00	---	250.00≦575.00	---
			Effective height in loading point da≧d/2 (mm)	1242.80≧1150.00	---	1324.40≧1150.00	---	1327.80≧1150.00	---
			Reinforcement interval in side face s≦300 (mm)	150.00≦300.00	---	150.00≦300.00	---	150.00≦300.00	---
			Primary reinforcement in surface Asu≧Asureq(mm^2)	22237.60≧20614.11	---	22237.60≧20302.29	---	22237.60≧18246.54	---
			Reinforcement interval in side face Ass≧Assreq (mm^2)	10064.60≧8245.64	---	10064.60≧8120.92	---	10064.60≧7298.62	---

				PF10		PF11		PF12	
Beams			Checking direction	Virtical direction	Horizontal direction	Virtical direction	Horizontal direction	Virtical direction	Horizontal direction
	Section	Dimension	Sectional width b (mm)	2200 (2200)	2500 (1528)	3000 (3000)	2500 (1556)	2200 (2200)	2500 (1556)
			Sectional height h (mm)	2500 (1528)	2200 (2200)	2500 (1556)	3000 (3000)	2500 (1556)	2200 (2200)
			Effective height d (mm)	2300 (1328)	2100 (2100)	2315 (1371)	2900 (2900)	2300 (1356)	2100 (2100)
		Reinforcement	Primary reinforcement As (mm^2)	D32-14×2 22237.6	D22-13×1 5032.3	D32-15×1.5 18266.6	D19-13×1 3724.5	D32-14×2 22237.6	D19-13×1 3724.5
			Hoop ties（including intermediate hoop）Aw0 (mm^2)	D22-6 150ctc 2322.6	D22-2 150ctc 972.8	D22-4 200ctc 1548.4	D22-2 200ctc 972.8	D22-4 150ctc 1548.4	D22-2 150ctc 972.8
	Allowable stress method	Sectional force	Case	dead	seismic	dead	seismic	dead	seismic
			Bending moment M (kN·m)	3514.70	2153.41	2895.92	787.68	3405.70	666.41
			Shearing force S (kN)	2834.72	1199.42	2171.92	406.57	2568.87	360.66
		Checking	Conpression stress σc (N/mm^2)	2.21≦8.00	2.64≦12.00	1.60≦8.00	0.67≦12.00	2.15≦8.00	0.93≦12.00
			Tensile stress σt (N/mm^2)	78.77≦100.00	214.94≦300.00	75.99≦100.00	75.88≦300.00	76.33≦100.00	89.23≦300.00
			Shearing stress τ (N/mm^2)	0.966 >0.297	0.374 >0.195	0.516 >0.249	0.090≦0.147	0.857 >0.293	0.110≦0.182
			Stirrup requirement Aw (mm^2)	1411.7	156.7	1026.3	0.0	1188.3	0.0
			Minimum reinforcement	Mu≧Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	Mu≧Mc	1.7M≦Mc
		Checking for corbel	Primary reinforcement in lowest position h≦d/4(mm)	250.00≦575.00	---	250.00≦578.80	---	250.00≦575.00	---
			Effective height in loading point da≧d/2 (mm)	1327.80≧1150.00	---	1343.02≧1157.61	---	1355.60≧1150.00	---
			Reinforcement interval in side face s≦300 (mm)	150.00≦300.00	---	150.00≦300.00	---	150.00≦300.00	---
			Primary reinforcement in surface Asu≧Asureq(mm^2)	22237.60≧17978.00	---	18266.60≧14715.53	---	22237.60≧17420.45	---
			Reinforcement interval in side face Ass≧Assreq (mm^2)	10064.60≧7191.20	---	7449.00≧5886.21	---	7449.00≧6968.18	---

				PF13		PF14		PF15	
Beams			Checking direction	Virtical direction	Horizontal direction	Virtical direction	Horizontal direction	Virtical direction	Horizontal direction
	Section	Dimension	Sectional width b (mm)	2200 (2200)	2500 (1556)	3000 (3000)	2500 (1556)	2200 (2200)	2500 (1528)
			Sectional height h (mm)	2500 (1556)	2200 (2200)	2500 (1556)	3000 (3000)	2500 (1528)	2200 (2200)
			Effective height d (mm)	2300 (1356)	2100 (2100)	2315 (1371)	2900 (2900)	2300 (1328)	2100 (2100)
		Reinforcement	Primary reinforcement As (mm^2)	D32-14×2 22237.6	D19-13×1 3724.5	D32-15×1.5 18266.6	D19-13×1 3724.5	D32-14×2 22237.6	D22-13×1 5032.3
			Hoop ties（including intermediate hoop）Aw0 (mm^2)	D22-4 150ctc 1548.4	D22-2 150ctc 972.8	D22-4 200ctc 1548.4	D22-2 200ctc 972.8	D22-6 150ctc 2322.6	D22-2 150ctc 972.8
	Allowable stress method	Sectional force	Case	dead	seismic	dead	seismic	dead	seismic
			Bending moment M (kN·m)	3405.70	734.41	2893.00	1437.55	3462.20	1908.41
			Shearing force S (kN)	2568.87	400.66	2165.92	777.78	2974.72	1059.42
		Checking	Conpression stress σc (N/mm^2)	2.15≦8.00	1.03≦12.00	1.60≦8.00	1.22≦12.00	2.18≦8.00	2.34≦12.00
			Tensile stress σt (N/mm^2)	76.33≦100.00	98.34≦300.00	75.91≦100.00	138.48≦300.00	77.60≦100.00	190.49≦300.00
			Shearing stress τ (N/mm^2)	0.857 >0.293	0.123≦0.182	0.515 >0.249	0.172 >0.147	1.014 >0.297	0.330 >0.195
			Stirrup requirement Aw (mm^2)	1188.3	0.0	1020.1	29.9	1512.8	118.3
			Minimum reinforcement	Mu≧Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	Mu≧Mc	1.7M≦Mc
		Checking for corbel	Primary reinforcement in lowest position h≦d/4(mm)	250.00≦575.00	---	250.00≦578.80	---	250.00≦575.00	---
			Effective height in loading point da≧d/2 (mm)	1355.60≧1150.00	---	1343.02≧1157.61	---	1327.80≧1150.00	---
			Reinforcement interval in side face s≦300 (mm)	150.00≦300.00	---	150.00≦300.00	---	150.00≦300.00	---
			Primary reinforcement in surface Asu≧Asureq(mm^2)	22237.60≧17420.45	---	18266.60≧14700.70	---	22237.60≧17709.45	---
			Reinforcement interval in side face Ass≧Assreq (mm^2)	7449.00≧6968.18	---	7449.00≧5880.28	---	10064.60≧7083.78	---

				PF1		PF2		PF3	
Checking side				Under side	Up side	Under side	Up side	Under side	Up side
Pile cap (bridge-axial direction)	Reinforcement (mm2/m)		Primary reinforcement As (mm^2/m)	D32-125ctc×1 6399.9	D29-250ctc×1 2569.6	D29-125ctc×1 5176.6	D25-250ctc×1 2026.8	D32-125ctc×2 9780.0	D32-250ctc×1 3176.8
			Stirrup Aw0 (mm^2/m)	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0
	Allowable stress method	Dimension	Sectional width ( ) is Shearing position b (mm)	10300 (10500)	8750 (10500)	10300 (10500)	8750 (10500)	10232 (10500)	8750 (10500)
			Sectional height ( ) is Shearing position h (mm)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)
			Effective height ( ) is Shearing position d (mm)	1650 (1650)	1750 (1750)	1650 (1650)	1750 (1750)	1616 (1616)	1750 (1750)
		Sectional force	Case ( ) s Shearing check	seismic (seismic)	seismic (seismic)	dead +live (seismic)	seismic (seismic)	seismic (seismic)	seismic (seismic)
			Bending moment M (kN·m)	24065.22	-6552.70	11239.22	-5301.56	32500.48	-7518.66
			Shearing force S (kN)	15691.70	-3539.71	17226.07	-3585.90	13549.32	-2810.73
		Checking	Conpression stress σc (N/mm2)	6.60≦12.00	2.76≦12.00	3.34≦8.00	2.47≦12.00	7.96≦12.00	2.90≦12.00
			Tensile stress σt (N/mm2)	244.74≦300.00	177.74≦300.00	140.03≦160.00	181.06≦300.00	234.12≦300.00	166.07≦300.00
			Shearing stress τm (N/mm2)	0.906≦1.365	0.193≦0.590	0.994≦1.644	0.195≦0.543	0.799≦0.895	0.153≦0.387
			Stirrup requirement Aw (mm2)	0.0	0.0	0.0	0.0	0.0	0.0
			Minimum reinforcement	Mu≧Mc	Mu≧Mc	Mu≧Mc	1.7M≦Mc	Mu≧Mc	Mu≧Mc
Pile cap (bridge-axial-orthogonal direction)	Reinforcement (mm2/m)		Primary reinforcement As (mm^2/m)	D29-250ctc×1 2657.4	D19-250ctc×1 1081.4	D25-250ctc×1 1993.6	D16-250ctc×1 791.1	D29-250ctc×2 4941.5	D25-250ctc×1 1910.6
			Stirrup Aw0 (mm^2/m)	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0
	Allowable stress method	Dimension	Sectional width ( ) is Shearing position b (mm)	5560 (8500)	3974 (8500)	6354 (8500)	4770 (8500)	5460 (10500)	3978 (10500)
			Sectional height ( ) is Shearing position h (mm)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)
			Effective height ( ) is Shearing position d (mm)	1680 (1680)	1774 (1774)	1677 (1677)	1770 (1770)	1630 (1630)	1778 (1778)
		Sectional force	Case ( ) s Shearing check	seismic (dead)	seismic (seismic)	seismic (dead)	seismic (seismic)	seismic (dead)	seismic (seismic)
			Bending moment M (kN·m)	1535.38	-703.86	1912.48	-868.60	2803.65	-1359.45
			Shearing force S (kN)	-475.66	-475.66	-475.66	-475.66	-587.58	-587.58
		Checking	Conpression stress σc (N/mm2)	1.07≦12.00	0.93≦12.00	1.32≦12.00	1.10≦12.00	1.63≦12.00	1.39≦12.00
			Tensile stress σt (N/mm2)	66.16≦300.00	96.38≦300.00	95.49≦300.00	134.97≦300.00	72.57≦300.00	106.43≦300.00
			Shearing stress τm (N/mm2)	0.033≦1.077	0.032≦0.783	0.033≦0.990	0.032≦0.734	0.034≦1.363	0.031≦0.907
			Stirrup requirement Aw (mm2)	0.0	0.0	0.0	0.0	0.0	0.0
			Minimum reinforcement	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc

			Item	Symbol	Unit	PF4 Under side	PF4 Up side	PF5 Under side	PF5 Up side	PF6 Under side	PF6 Up side
Checking side						Under side	Up side	Under side	Up side	Under side	Up side
Pile cap (bridge-axial direction)	Reinforcement (mm2/m)		Primary reinforcement	As	(mm^2/m)	D32-250ctc×1 3315.6	D19-250ctc×1 1146.0	D32-125ctc×1 6399.9	D29-250ctc×1 2569.6	D32-250ctc×1 3315.6	D19-250ctc×1 1146.0
			Stirrup	Aw0	(mm^2/m)	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0
	Allowable stress method	Dimension	Sectional width ( ) is Shearing position	b	(mm)	10300 (10500)	8750 (10500)	10300 (10500)	8750 (10500)	10300 (10500)	8750 (10500)
			Sectional height ( ) is Shearing position	h	(mm)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)
			Effective height ( ) is Shearing position	d	(mm)	1650 (1650)	1750 (1750)	1650 (1650)	1750 (1750)	1650 (1650)	1750 (1750)
		Sectional force	Case ( ) s Shearing check			seismic (dead +live)	seismic (seismic)	seismic (seismic)	seismic (seismic)	seismic (dead +live)	seismic (seismic)
			Bending moment	M	(kN·m)	13112.28	-1971.48	21304.05	-8040.90	12297.83	-3255.48
			Shearing force	S	(kN)	-973.18	-973.18	22497.57	-7198.31	-973.18	-973.18
		Checking	Conpression stress	σc	(N/mm2)	4.64≦12.00	1.18≦12.00	5.84≦12.00	3.39≦12.00	4.35≦12.00	1.94≦12.00
			Tensile stress	σt	(N/mm2)	250.84≦300.00	117.47≦300.00	216.66≦300.00	218.10≦300.00	235.26≦300.00	193.97≦300.00
			Shearing stress	τm	(N/mm2)	0.056≦1.188	0.053≦1.139	1.299≦2.011	0.392≦0.675	0.056≦1.188	0.053≦1.139
			Stirrup requirement	Aw	(mm2)	0.0	0.0	0.0	0.0	0.0	0.0
			Minimum reinforcement			Mu≧Mc	1.7M≦Mc	Mu≧Mc	Mu≧Mc	Mu≧Mc	1.7M≦Mc
Pile cap (bridge-axial-orthogonal direction)	Reinforcement (mm2/m)		Primary reinforcement	As	(mm^2/m)	D19-250ctc×1 1187.3	D16-250ctc×1 750.9	D29-250ctc×1 2525.2	D19-250ctc×1 1140.2	D19-250ctc×1 1187.3	D16-250ctc×1 750.9
			Stirrup	Aw0	(mm^2/m)	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0
	Allowable stress method	Dimension	Sectional width ( ) is Shearing position	b	(mm)	5550 (6750)	3967 (6750)	6360 (8000)	4774 (8000)	5550 (6750)	3967 (6750)
			Sectional height ( ) is Shearing position	h	(mm)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)
			Effective height ( ) is Shearing position	d	(mm)	1675 (1675)	1767 (1767)	1680 (1680)	1774 (1774)	1675 (1675)	1767 (1767)
		Sectional force	Case ( ) s Shearing check			seismic (dead)	seismic (seismic)	seismic (dead)	seismic (seismic)	seismic (dead)	seismic (seismic)
			Bending moment	M	(kN·m)	2710.67	-857.94	2294.93	-904.26	2603.62	-1202.17
			Shearing force	S	(kN)	-377.73	-377.73	-447.68	-447.68	-377.73	-377.73
		Checking	Conpression stress	σc	(N/mm2)	2.69≦12.00	1.35≦12.00	1.43≦12.00	0.97≦12.00	2.58≦12.00	1.89≦12.00
			Tensile stress	σt	(N/mm2)	257.22≦300.00	169.00≦300.00	90.83≦300.00	97.87≦300.00	247.06≦300.00	236.81≦300.00
			Shearing stress	τm	(N/mm2)	0.033≦0.843	0.032≦0.731	0.033≦1.078	0.032≦0.784	0.033≦0.843	0.032≦0.731
			Stirrup requirement	Aw	(mm2)	0.0	0.0	0.0	0.0	0.0	0.0
			Minimum reinforcement			1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc

				PF7		PF8		PF9	
Checking side				Under side	Up side	Under side	Up side	Under side	Up side
Pile cap (bridge-axial direction)	Reinforcement (mm2/m)		Primary reinforcement As (mm^2/m)	D32-250ctc×1 3276.1	D19-250ctc×1 1181.8	D32-125ctc×1 6399.9	D29-250ctc×1 2569.6	D32-250ctc×1 3315.6	D19-250ctc×1 1146.0
			Stirrup Aw0 (mm^2/m)	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0
	Allowable stress method	Dimension	Sectional width ( ) is Shearing position b (mm)	8000 (8000)	8000 (8000)	10300 (10500)	8750 (10500)	10300 (10500)	8750 (10500)
			Sectional height ( ) is Shearing position h (mm)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)
			Effective height ( ) is Shearing position d (mm)	1650 (1650)	1750 (1750)	1650 (1650)	1750 (1750)	1650 (1650)	1750 (1750)
		Sectional force	Case ( ) s Shearing check	dead +live (dead +live)	seismic (seismic)	seismic (seismic)	seismic (seismic)	seismic (dead +live)	seismic (seismic)
			Bending moment M (kN·m)	5638.51	-530.96	21860.04	-6741.36	12330.26	-3279.97
			Shearing force S (kN)	-741.47	-741.47	20149.56	-5176.45	-973.18	-973.18
		Checking	Conpression stress σc (N/mm2)	2.58≦8.00	0.34≦12.00	5.99≦12.00	2.84≦12.00	4.37≦12.00	1.96≦12.00
			Tensile stress σt (N/mm2)	140.52≦160.00	33.58≦300.00	222.31≦300.00	182.85≦300.00	235.88≦300.00	195.43≦300.00
			Shearing stress τm (N/mm2)	0.056≦1.192	0.053≦1.141	1.163≦1.862	0.282≦0.782	0.056≦1.188	0.053≦1.139
			Stirrup requirement Aw (mm2)	0.0	0.0	0.0	0.0	0.0	0.0
			Minimum reinforcement	Mu≧Mc	1.7M≦Mc	Mu≧Mc	Mu≧Mc	Mu≧Mc	1.7M≦Mc
Pile cap (bridge-axial-orthogonal direction)	Reinforcement (mm2/m)		Primary reinforcement As (mm^2/m)	D19-250ctc×1 1187.3	D16-250ctc×1 750.9	D29-250ctc×1 2657.4	D19-250ctc×1 1081.4	D19-250ctc×1 1187.3	D16-250ctc×1 750.9
			Stirrup Aw0 (mm^2/m)	-ctc	-ctc	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0
	Allowable stress method	Dimension	Sectional width ( ) is Shearing position b (mm)	()	3967 ()	5560 (7500)	3974 (7500)	5550 (6750)	3967 (6750)
			Sectional height ( ) is Shearing position h (mm)	()	1900 ()	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)
			Effective height ( ) is Shearing position d (mm)	()	1767 ()	1680 (1680)	1774 (1774)	1675 (1675)	1767 (1767)
		Sectional force	Case ( ) s Shearing check	()	dead ()	seismic (dead)	seismic (seismic)	seismic (dead)	seismic (seismic)
			Bending moment M (kN·m)		-59.02	2604.81	-1139.58	2363.82	-956.62
			Shearing force S (kN)			-419.70	-419.70	-377.73	-377.73
		Checking	Conpression stress σc (N/mm2)		0.09≦8.00	1.82≦12.00	1.51≦12.00	2.35≦12.00	1.50≦12.00
			Tensile stress σt (N/mm2)		11.63≦160.00	112.24≦300.00	156.05≦300.00	224.31≦300.00	188.44≦300.00
			Shearing stress τm (N/mm2)			0.033≦1.079	0.032≦0.784	0.033≦0.843	0.032≦0.731
			Stirrup requirement Aw (mm2)			0.0	0.0	0.0	0.0
			Minimum reinforcement		1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc

				PF10		PF11		PF12	
Checking side				Under side	Up side	Under side	Up side	Under side	Up side
Pile cap (bridge-axial direction)	Reinforcement (mm2/m)		Primary reinforcement As (mm^2/m)	D32-125ctc×1 6399.9	D29-250ctc×1 2569.6	D22-250ctc×1 1596.8	D16-250ctc×1 819.2	D32-250ctc×1 3276.1	D19-250ctc×1 1181.8
			Stirrup Aw0 (mm^2/m)	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0
	Allowable stress method	Dimension	Sectional width ( ) is Shearing position b (mm)	10300 (10500)	8750 (10500)	8000 (8000)	8000 (8000)	8000 (8000)	8000 (8000)
			Sectional height ( ) is Shearing position h (mm)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)
			Effective height ( ) is Shearing position d (mm)	1650 (1650)	1750 (1750)	1650 (1650)	1750 (1750)	1650 (1650)	1750 (1750)
		Sectional force	Case ( ) s Shearing check	seismic (seismic)	seismic (seismic)	seismic (dead +live)	seismic (seismic)	dead +live (dead +live)	seismic (seismic)
			Bending moment M (kN·m)	22166.83	-8059.90	4545.11	-1115.55	5131.84	-467.78
			Shearing force S (kN)	20416.34	-6284.65	-517.63	-517.63	-741.47	-741.47
		Checking	Conpression stress σc (N/mm2)	6.08≦12.00	3.40≦12.00	2.81≦12.00	0.85≦12.00	2.35≦8.00	0.30≦12.00
			Tensile stress σt (N/mm2)	225.43≦300.00	218.62≦300.00	227.52≦300.00	101.02≦300.00	127.89≦160.00	29.58≦300.00
			Shearing stress τm (N/mm2)	1.178≦1.862	0.342≦0.782	0.039≦0.921	0.037≦0.864	0.056≦1.192	0.053≦1.141
			Stirrup requirement Aw (mm2)	0.0	0.0	0.0	0.0	0.0	0.0
			Minimum reinforcement	Mu≧Mc	Mu≧Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc	1.7M≦Mc
Pile cap (bridge-axial-orthogonal direction)	Reinforcement (mm2/m)		Primary reinforcement As (mm^2/m)	D29-250ctc×1 2657.4	D19-250ctc×1 1081.4	D16-250ctc×1 783.4	D16-250ctc×1 791.7	D19-250ctc×1 1187.3	D16-250ctc×1 750.9
			Stirrup Aw0 (mm^2/m)	-0.000ctc 0.0	-0.000ctc 0.0	-ctc	-ctc	-ctc	-ctc
	Allowable stress method	Dimension	Sectional width ( ) is Shearing position b (mm)	5560 (7500)	3974 (7500)	()	4766 ()	()	3967 ()
			Sectional height ( ) is Shearing position h (mm)	1900 (1900)	1900 (1900)	()	1900 ()	()	1900 ()
			Effective height ( ) is Shearing position d (mm)	1680 (1680)	1774 (1774)	()	1766 ()	()	1767 ()
		Sectional force	Case ( ) s Shearing check	seismic (dead)	seismic (seismic)	()	dead ()	()	dead ()
			Bending moment M (kN·m)	2447.03	-1145.02		-59.02		-59.02
			Shearing force S (kN)	-419.70	-419.70				
		Checking	Conpression stress σc (N/mm2)	1.71≦12.00	1.51≦12.00		0.08≦8.00		0.09≦8.00
			Tensile stress σt (N/mm2)	105.44≦300.00	156.79≦300.00		9.19≦160.00		11.63≦160.00
			Shearing stress τm (N/mm2)	0.033≦1.079	0.032≦0.784				
			Stirrup requirement Aw (mm2)	0.0	0.0				
			Minimum reinforcement	1.7M≦Mc	1.7M≦Mc		1.7M≦Mc		1.7M≦Mc

				PF13		PF14		PF15	
			Checking side	Under side	Up side	Under side	Up side	Under side	Up side
Pile cap (bridge-axial direction)	Reinforcement (mm2/m)		Primary reinforcement As (mm^2/m)	D32-250ctc×1 3276.1	D19-250ctc×1 1181.8	D32-125ctc×1 6254.3	D29-250ctc×1 2649.9	D29-125ctc×1 5176.6	D25-250ctc×1 2026.8
			Stirrup Aw0 (mm^2/m)	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0	-0.000ctc 0.0
	Allowable stress method	Dimension	Sectional width ( ) is Shearing position b (mm)	8000 (8000)	8000 (8000)	8000 (8000)	8000 (8000)	10300 (10500)	8750 (10500)
			Sectional height ( ) is Shearing position h (mm)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)	1900 (1900)
			Effective height ( ) is Shearing position d (mm)	1650 (1650)	1750 (1750)	1650 (1650)	1750 (1750)	1650 (1650)	1750 (1750)
		Sectional force	Case ( ) s Shearing check	dead +live (dead +live)	seismic (seismic)	dead +live (seismic)	seismic (seismic)	seismic (seismic)	seismic (seismic)
			Bending moment M (kN・m)	5000.26	-431.23	9221.99	-2122.68	21400.44	-2470.30
			Shearing force S (kN)	-741.47	-741.47	13716.63	-727.48	15134.94	-973.18
		Checking	Conpression stress σc (N/mm2)	2.29≦8.00	0.28≦12.00	3.28≦8.00	0.97≦12.00	6.36≦12.00	1.15≦12.00
			Tensile stress σt (N/mm2)	124.61≦160.00	27.27≦300.00	123.44≦160.00	61.12≦300.00	266.62≦300.00	84.37≦300.00
			Shearing stress τm (N/mm2)	0.056≦1.192	0.053≦1.141	1.039≦1.760	0.052≦1.169	0.874≦1.389	0.053≦1.324
			Stirrup requirement Aw (mm2)	0.0	0.0	0.0	0.0	0.0	0.0
			Minimum reinforcement	1.7M≦Mc	1.7M≦Mc	Mu≧Mc	1.7M≦Mc	Mu≧Mc	1.7M≦Mc
Pile cap (bridge-axial-orthogonal direction)	Reinforcement (mm2/m)		Primary reinforcement As (mm^2/m)	D19-250ctc×1 1187.3	D16-250ctc×1 750.9	D29-250ctc×1 2525.2	D19-250ctc×1 1140.2	D25-250ctc×1 2007.1	D16-250ctc×1 800.4
			Stirrup Aw0 (mm^2/m)	-ctc	-ctc	-ctc	-ctc	-0.000ctc 0.0	-0.000ctc 0.0
	Allowable stress method	Dimension	Sectional width ( ) is Shearing position b (mm)	()	3967 ()	()	4774 ()	5554 (7500)	3970 (7500)
			Sectional height ( ) is Shearing position h (mm)	()	1900 ()	()	1900 ()	1900 (1900)	1900 (1900)
			Effective height ( ) is Shearing position d (mm)	()	1767 ()	()	1774 ()	1677 (1677)	1770 (1770)
		Sectional force	Case ( ) s Shearing check	()	dead ()	()	dead ()	seismic (dead)	seismic (seismic)
			Bending moment M (kN・m)		-59.02		-69.95	1898.96	-814.84
			Shearing force S (kN)					-419.70	-419.70
		Checking	Conpression stress σc (N/mm2)		0.09≦8.00		0.08≦8.00	1.50≦12.00	1.24≦12.00
			Tensile stress σt (N/mm2)		11.63≦160.00		7.57≦160.00	107.78≦300.00	150.38≦300.00
			Shearing stress τm (N/mm2)					0.033≦0.992	0.032≦0.734
			Stirrup requirement Aw (mm2)					0.0	0.0
			Minimum reinforcement		1.7M≦Mc		1.7M≦Mc	1.7M≦Mc	1.7M≦Mc

			PF1	PF2	PF3
Designing conditin	Pile		Cast-in-place concrete pile	Cast-in-place concrete pile	Cast-in-place concrete pile
	Method		Cast-in-place	Cast-in-place	Cast-in-place
	Bearing ground		Sand	Sand	Silt
	Material	Concrete strength σck (N/mm²)	24.00	24.00	24.00
		Reinforcement	SD345	SD345	SD345
	Diameter D (mm)		1500.0000	1500.0000	1500.0000
	Lemgth L (m)		41.40	41.40	37.90
	Total number N (No.)		6	6	9
	Support method		Bearing pile	Bearing pile	Bearing pile
	Pile ultimate bearing power qd (kN/m²)		3000	3000	3000

			PF4	PF5	PF6
Designing conditin	Pile		Cast-in-place concrete pile	Cast-in-place concrete pile	Cast-in-place concrete pile
	Method		Cast-in-place	Cast-in-place	Cast-in-place
	Bearing ground		Silt	Silt	Silt
	Material	Concrete strength σck (N/mm^2)	24.00	24.00	24.00
		Reinforcement	SD345	SD345	SD345
	Diameter D (mm)		1500.0000	1500.0000	1500.0000
	Lemgth L (m)		40.40	35.40	33.40
	Total number N (No.)		6	6	6
	Support method		Bearing pile	Bearing pile	Bearing pile
	Pile ultimate bearing power qd (kN/m^2)		3000	3000	3000

			PF7	PF8	PF9
Designing conditin	Pile		Cast-in-place concrete pile	Cast-in-place concrete pile	Cast-in-place concrete pile
	Method		Cast-in-place	Cast-in-place	Cast-in-place
	Bearing ground		Silt	Silt	Sand
	Material	Concrete strength σck (N/mm^2)	24.00	24.00	24.00
		Reinforcement	SD345	SD345	SD345
	Diameter D (mm)		1500.0000	1500.0000	1500.0000
	Lemgth L (m)		36.90	36.90	35.40
	Total number N (No.)		4	6	6
	Support method		Bearing pile	Bearing pile	Bearing pile
	Pile ultimate bearing power qd (kN/m^2)		3000	3000	3000

			PF10	PF11	PF12
Designing conditin	Pile		Cast-in-place concrete pile	Cast-in-place concrete pile	Cast-in-place concrete pile
	Method		Cast-in-place	Cast-in-place	Cast-in-place
	Bearing ground		Silt	Silt	Silt
	Material	Concrete strength σck (N/mm^2)	24.00	24.00	24.00
		Reinforcement	SD345	SD345	SD345
	Diameter D (mm)		1500.0000	1500.0000	1500.0000
	Lemgth L (m)		32.40	32.40	32.90
	Total number N (No.)		6	4	4
	Support method		Bearing pile	Bearing pile	Bearing pile
	Pile ultimate bearing power qd (kN/m^2)		2100	2100	2100

			PF13	PF14	PF15
Designing conditin	Pile		Cast-in-place concrete pile	Cast-in-place concrete pile	Cast-in-place concrete pile
	Method		Cast-in-place	Cast-in-place	Cast-in-place
	Bearing ground		Silt	Silt	Silt
	Material	Concrete strength σck (N/mm^2)	24.00	24.00	24.00
		Reinforcement	SD345	SD345	SD345
	Diameter D (mm)		1500.0000	1500.0000	1500.0000
	Lemgth L (m)		32.40	33.40	33.90
	Total number N (No.)		4	4	6
	Support method		Bearing pile	Bearing pile	Bearing pile
	Pile ultimate bearing power qd (kN/m^2)		2100	2100	2100

					PF1		PF2		PF3	
Stability calculation	Direction				Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction
	Force of Pile cap	dead+live	Vertical load	N (kN)	17278.5	17278.5	19252.7	19252.7	24475.7	24475.7
			Horizontal load	H (kN)	800.0	0.0	-1100.0	0.0	0.0	0.0
			Bending moment	M (kN･m)	7200.0	0.0	-11241.4	0.0	0.0	0.0
		seismic	Vertical load	N (kN)	15278.5	15278.5	16552.7	16552.7	21375.7	21375.7
			Horizontal load	H (kN)	5665.1	3965.1	-6056.7	4656.7	5616.9	5916.9
			Bending moment	M (kN･m)	37886.7	22586.7	-43963.8	29722.4	43403.6	46883.6
	dead+live		Case		temperature	dead+live	temperature	dead+live	dead+live	dead+live
			Maximum axial force	Pmax (kN/n)	3430.6≦8048.0	2879.8≦8048.0	4032.7≦8133.0	3208.8≦8133.0	2719.5≦7238.0	2719.5≦7238.0
			Minimum axial force	Pmax (kN/n)	2328.9≧0.0	2879.8≧0.0	2384.9≧0.0	3208.8≧0.0	2719.5≧0.0	2719.5≧0.0
			Horizontal displacement at ground surface δ	(mm)	2.89≦15.00	0.00≦15.00	4.00≦15.00	0.00≦15.00	0.00≦15.00	0.00≦15.00
	seismic		Case1		seismic	seismic	seismic	seismic	seismic	seismic
			Case2 (1.Not-Buoyant force、2.Buoyant force)		1	1	1	1	1	1
			Maximum axial force	Pmax (kN/n)	5597.8≦12253.0	4679.7≦12253.0	6109.3≦12380.0	5433.9≦12380.0	4883.7≦11021.0	5063.2≦11021.0
			Minimum axial force	Pmax (kN/n)	-505.0≧-8407.0	413.2≧-8407.0	-591.7≧-8460.0	83.7≧-8460.0	-133.5≧-7338.0	-313.0≧-7338.0
			Horizontal displacement at ground surface δ	(mm)	13.48≦15.00	8.38≦15.00	14.01≦15.00	9.76≦15.00	9.56≦15.00	10.13≦15.00
Primary reinforcement					D32-36×1 285.9		D32-36×1 285.9		D32-28×1 222.4	
Hoop ties					D19 - 2 150ctc		D19 - 2 150ctc		D19 - 2 150ctc	
Stress	Direction				Bridge-axial direction		Bridge-axial direction		Bridge-axial-orthogonal direction	
	Case				seismic[water]		seismic[water]		seismic	
	Sectional force		Case		3		3		3	
			Bending moment	M (kN･m)	2652.0		2736.6		1911.3	
			Axial force	N (kN)	-787.6		-874.3		-313.0	
			Shearing force	S (kN)	960.9		1009.5		657.4	
	Checking items		Conpression stress	σc (N/mm²)	9.90≦12.00		10.20≦12.00		8.23≦12.00	
			Tensile stress	σt (N/mm²)	283.53≦300.00		295.07≦300.00		243.95≦300.00	
			Shearing stress	τ (N/mm²)	0.604＞0.489		0.635＞0.489		0.414≦0.448	
			Hoop ties requirement	Aw (cm²)	5.730≧0.882		5.730≧1.116			

			Item	Unit	PF4		PF5		PF6	
Stability calculation			Direction		Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction
Stability calculation	Force of Pile cap	dead+live	Vertical load	N (kN)	22487.4	22487.4	20728.2	20728.2	18579.7	18579.7
Stability calculation	Force of Pile cap	dead+live	Horizontal load	H (kN)	0.0	0.0	600.0	0.0	400.0	0.0
Stability calculation	Force of Pile cap	dead+live	Bending moment	M (kN·m)	0.0	0.0	8452.9	0.0	5600.0	0.0
Stability calculation	Force of Pile cap	seismic	Vertical load	N (kN)	19287.4	19287.4	18028.2	18028.2	16579.7	16579.7
Stability calculation	Force of Pile cap	seismic	Horizontal load	H (kN)	4636.8	5136.8	7266.2	4966.2	4674.5	5274.5
Stability calculation	Force of Pile cap	seismic	Bending moment	M (kN·m)	41587.0	48137.0	73953.9	42041.0	44026.9	52426.9
Stability calculation	dead+live		Case		dead+live	dead+live	temperature	dead+live	temperature	dead+live
Stability calculation	dead+live		Maximum axial force	Pmax (kN/n)	3747.9≦8807.0	3747.9≦8807.0	4013.8≦7639.0	3454.7≦7639.0	3526.0≦7227.0	3096.6≦7227.0
Stability calculation	dead+live		Minimum axial force	Pmax (kN/n)	3747.9≧0.0	3747.9≧0.0	2895.5≧0.0	3454.7≧0.0	2667.3≧0.0	3096.6≧0.0
Stability calculation	dead+live		Horizontal displacement at ground surface δ	(mm)	0.00≦15.00	0.00≦15.00	1.86≦15.00	0.00≦15.00	1.60≦15.00	0.00≦15.00
Stability calculation	seismic		Case1		seismic	seismic	seismic	seismic	seismic	seismic
Stability calculation	seismic		Case2 (1.Not-Buoyant force、2.Buoyant force)		1	1	1	1	1	1
Stability calculation	seismic		Maximum axial force	Pmax (kN/n)	6457.2≦13382.0	6699.0≦13382.0	7866.4≦11610.0	6104.1≦11610.0	6106.9≦10984.0	6484.9≦10984.0
Stability calculation	seismic		Minimum axial force	Pmax (kN/n)	-28.1≧-9003.0	-269.9≧-9003.0	-1857.0≧-7638.0	-94.7≧-7638.0	-580.3≧-7146.0	-958.3≧-7146.0
Stability calculation	seismic		Horizontal displacement at ground surface δ	(mm)	10.21≦15.00	7.89≦15.00	13.56≦15.00	7.47≦15.00	10.73≦15.00	8.39≦15.00
Primary reinforcement					D32-28×1 222.4		D32-36×1 285.9		D32-36×1 285.9	
Hoop ties					D19 - 2 150ctc		D19 - 2 150ctc		D19 - 2 150ctc	
Stress			Direction		Bridge-axial direction		Bridge-axial direction		Bridge-axial direction	
Stress			Case		seismic[water]		seismic[water]		seismic[water]	
Stress	Sectional force		Case		3		3		3	
Stress	Sectional force		Bending moment	M (kN·m)	1893.7		2140.7		2069.9	
Stress	Sectional force		Axial force	N (kN)	-252.5		-2123.0		-804.8	
Stress	Sectional force		Shearing force	S (kN)	772.8		1211.0		779.1	
Stress	Checking items		Conpression stress	σc (N/mm^2)	8.16≦12.00		7.58≦12.00		7.69≦12.00	
Stress	Checking items		Tensile stress	σt (N/mm^2)	238.69≦300.00		289.96≦300.00		229.01≦300.00	
Stress	Checking items		Shearing stress	τ (N/mm^2)	0.486＞0.448		0.762＞0.489		0.490＞0.489	
Stress	Checking items		Hoop ties requirement	A_w (cm^2)	5.730≧0.289		5.730≧2.085		5.730≧0.008	

			Item	Symbol (unit)	PF7		PF8		PF9	
	Direction				Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction
Stability calculation	Force of Pile cap	dead+live	Vertical load	N (kN)	18136.0	18136.0	19692.8	19692.8	18391.1	18391.1
			Horizontal load	H (kN)	0.0	0.0	1300.0	0.0	100.0	0.0
			Bending moment	M (kN･m)	401.9	0.0	15340.0	0.0	1140.0	0.0
		seismic	Vertical load	N (kN)	15936.0	15936.0	17792.8	17792.8	16591.1	16591.1
			Horizontal load	H (kN)	3349.8	3649.8	6373.1	5273.1	5117.9	4817.9
			Bending moment	M (kN･m)	28918.9	32717.0	57582.0	50692.0	42751.2	44791.2
	dead+live		Case		dead+live	dead+live	temperature	dead+live	dead+live	dead+live
			Maximum axial force	Pmax (kN/n)	4572.0≦8076.0	4534.0≦8076.0	4402.5≦7939.0	3282.1≦7939.0	3156.6≦7533.0	3065.2≦7533.0
			Minimum axial force	Pmax (kN/n)	4495.9≧0.0	4534.0≧0.0	2161.7≧0.0	3282.1≧0.0	2973.7≧0.0	3065.2≧0.0
			Horizontal displacement at ground surface	δ (mm)	0.09≦15.00	0.00≦15.00	4.07≦15.00	0.00≦15.00	0.36≦15.00	0.00≦15.00
	seismic		Case1		seismic	seismic	seismic	seismic	seismic	seismic
			Case2 (1.Not-Buoyant force、2.Buoyant force)		1	1	1	1	1	1
			Maximum axial force	Pmax (kN/n)	7372.0≦12276.0	7306.6≦12276.0	7083.8≦12076.0	6603.4≦12076.0	6120.8≦11459.0	5997.6≦11459.0
			Minimum axial force	Pmax (kN/n)	596.0≧-8139.0	661.4≧-8139.0	-1152.8≧-8009.0	-672.5≧-8009.0	-590.5≧-7657.0	-467.2≧-7657.0
			Horizontal displacement at ground surface	δ (mm)	10.97≦15.00	9.68≦15.00	12.27≦15.00	8.22≦15.00	11.05≦15.00	7.46≦15.00
Primary reinforcement					D32-24×1 190.6		D32-36×1 285.9		D32-32×1 254.1	
Hoop ties					D19 - 2 150ctc		D19 - 2 150ctc		D19 - 2 150ctc	
Stress	Direction				Bridge-axial direction		Bridge-axial direction		Bridge-axial direction	
	Case				seismic[water]		seismic[water]		seismic[water]	
	Sectional force		Case		3		3		3	
			Bending moment	M (kN･m)	2017.8		1998.5		2011.1	
			Axial force	N (kN)	301.9		-1438.4		-825.8	
			Shearing force	S (kN)	837.5		1062.2		853.0	
	Checking items		Conpression stress	σc (N/mm²)	9.42≦12.00		7.26≦12.00		7.98≦12.00	
			Tensile stress	σt (N/mm²)	257.85≦300.00		248.19≦300.00		250.04≦300.00	
			Shearing stress	τ (N/mm²)	0.527＞0.456		0.668＞0.489		0.537＞0.469	
			Hoop ties requirement	Aw (cm²)	5.730≧0.545		5.730≧1.369		5.730≧0.519	

					PF10		PF11		PF12	
Stability calculation	Direction				Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction
	Force of Pile cap	dead+live	Vertical load	N (kN)	18791.0	18791.0	16492.2	16492.2	16980.6	16980.6
			Horizontal load	H (kN)	1300.0	0.0	0.0	0.0	0.0	0.0
			Bending moment	M (kN・m)	14300.0	0.0	-1287.8	0.0	0.0	0.0
		seismic	Vertical load	N (kN)	16891.0	16891.0	14192.2	14192.2	14480.6	14480.6
			Horizontal load	H (kN)	6982.6	5282.6	-3986.0	3786.0	3433.2	3933.2
			Bending moment	M (kN・m)	60927.4	48827.4	-30026.8	29919.0	22206.2	33626.2
	dead+live		Case		temperature	dead+live	dead+live	dead+live	dead+live	dead+live
			Maximum axial force	Pmax (kN/n)	4183.6≦6273.0	3131.8≦6273.0	4245.8≦6115.0	4123.1≦6115.0	4245.1≦5927.0	4245.1≦5927.0
			Minimum axial force	Pmax (kN/n)	2080.1≧0.0	3131.8≧0.0	4000.3≧0.0	4123.1≧0.0	4245.1≧0.0	4245.1≧0.0
			Horizontal displacement at ground surface δ	(mm)	4.02≦15.00	0.00≦15.00	0.30≦15.00	0.00≦15.00	0.00≦15.00	0.00≦15.00
	seismic		Case1		seismic (liquefaction)	seismic (liquefaction)	seismic (liquefaction)	seismic (liquefaction)	seismic (liquefaction)	seismic (liquefaction)
			Case2 (1.Not-Buoyant force、2.Buoyant force)		1	1	1	1	1	1
			Maximum axial force	Pmax (kN/n)	7172.3≦9365.0	6313.3≦9365.0	7270.8≦9281.0	6739.1≦9281.0	6603.3≦8980.0	7234.0≦8980.0
			Minimum axial force	Pmax (kN/n)	-1542.0≧-6567.0	-683.0≧-6567.0	-174.7≧-6510.0	357.0≧-6510.0	637.0≧-6329.0	6.3≧-6329.0
			Horizontal displacement at ground surface δ	(mm)	13.43≦15.00	8.22≦15.00	13.50≦15.00	10.47≦15.00	11.95≦15.00	12.15≦15.00
Primary reinforcement					D32-36×1 285.9		D32-28×1 222.4		D32-28×1 222.4	
Hoop ties					D19 - 2 150ctc		D19 - 2 150ctc		D19 - 2 150ctc	
Stress	Direction				Bridge-axial direction		Bridge-axial direction		Bridge-axial-orthogonal direction	
	Case				seismic[water] (not-liquefaction)		seismic[water] (not-liquefaction)		seismic[water] (not-liquefaction)	
	Sectional force		Case		3		3		3	
			Bending moment	M (kN・m)	2183.1		2240.6		2069.6	
			Axial force	N (kN)	-1791.7		-432.3		-252.2	
			Shearing force	S (kN)	1163.8		996.5		983.3	
	Checking items		Conpression stress	σc (N/mm^2)	7.86≦12.00		9.64≦12.00		8.92≦12.00	
			Tensile stress	σt (N/mm^2)	280.23≦300.00		289.39≦300.00		259.63≦300.00	
			Shearing stress	τ (N/mm^2)	0.732＞0.489		0.627＞0.448		0.619＞0.448	
			Hoop ties requirement	A_w (cm^2)	5.730≧1.858		5.730≧1.365		5.730≧1.301	

					PF13		PF14		PF15	
Stability calculation	Direction				Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction	Bridge-axial direction	Bridge-axial-orthogonal direction
	Force of Pile cap	dead+live	Vertical load	N (kN)	16641.0	16641.0	16009.4	16009.4	17583.6	17583.6
			Horizontal load	H (kN)	0.0	0.0	1000.0	0.0	700.0	0.0
			Bending moment	M (kN・m)	0.0	0.0	6684.4	0.0	931.9	0.0
		seismic	Vertical load	N (kN)	14141.0	14141.0	13709.4	13709.4	15583.6	15583.6
			Horizontal load	H (kN)	3531.3	3931.3	5301.0	3801.0	6020.4	4720.4
			Bending moment	M (kN・m)	21307.3	31757.3	33282.3	25342.9	33535.5	33053.7
	dead+live	Case			dead+live	dead+live	temperature	dead+live	temperature	dead+live
		Maximum axial force		Pmax (kN/n)	4160.3≦5825.0	4160.3≦5825.0	4827.4≦6059.0	4002.4≦6059.0	3118.7≦6112.0	2930.6≦6112.0
		Minimum axial force		Pmax (kN/n)	4160.3≧0.0	4160.3≧0.0	3177.3≧0.0	4002.4≧0.0	2742.5≧0.0	2930.6≧0.0
		Horizontal displacement at ground surface		δ (mm)	0.00≦15.00	0.00≦15.00	3.97≦15.00	0.00≦15.00	1.49≦15.00	0.00≦15.00
	seismic	Case1			seismic (liquefaction)	seismic (liquefaction)	seismic (liquefaction)	seismic (liquefaction)	seismic (liquefaction)	seismic (liquefaction)
		Case2 (1.Not-Buoyant force、2.Buoyant force)			1	1	1	1	1	1
		Maximum axial force		Pmax (kN/n)	6409.9≦8808.0	6955.8≦8808.0	7275.1≦9151.0	6304.0≦9151.0	5409.9≦9245.0	5215.6≦9245.0
		Minimum axial force		Pmax (kN/n)	660.6≧-6190.0	114.7≧-6190.0	-420.3≧-6456.0	550.7≧-6456.0	-215.3≧-6537.0	-21.0≧-6537.0
		Horizontal displacement at ground surface		δ (mm)	11.56≦15.00	11.51≦15.00	14.15≦15.00	10.33≦15.00	10.72≦15.00	7.32≦15.00
Primary reinforcement					D32-28×1 222.4		D32-36×1 285.9		D32-28×1 222.4	
Hoop ties					D19 - 2 150ctc		D19 - 2 150ctc		D19 - 2 150ctc	
Stress	Direction				Bridge-axial-orthogonal direction		Bridge-axial direction		Bridge-axial direction	
	Case				seismic[water] (not-liquefaction)		seismic[water] (not-liquefaction)		seismic[water] (not-liquefaction)	
	Sectional force	Case			3		3		3	
		Bending moment		M (kN・m)	1973.5		2632.8		1903.2	
		Axial force		N (kN)	-143.7		-727.3		-467.0	
		Shearing force		S (kN)	982.8		1325.2		1003.4	
	Checking items	Conpression stress		σc (N/mm^2)	8.51≦12.00		9.83≦12.00		8.18≦12.00	
		Tensile stress		σt (N/mm^2)	242.52≦300.00		279.27≦300.00		251.06≦300.00	
		Shearing stress		τ (N/mm^2)	0.618＞0.448		0.834＞0.489		0.631＞0.448	
		Hoop ties requirement		A_w (cm^2)	5.730≧1.299		5.730≧2.634		5.730≧1.398	