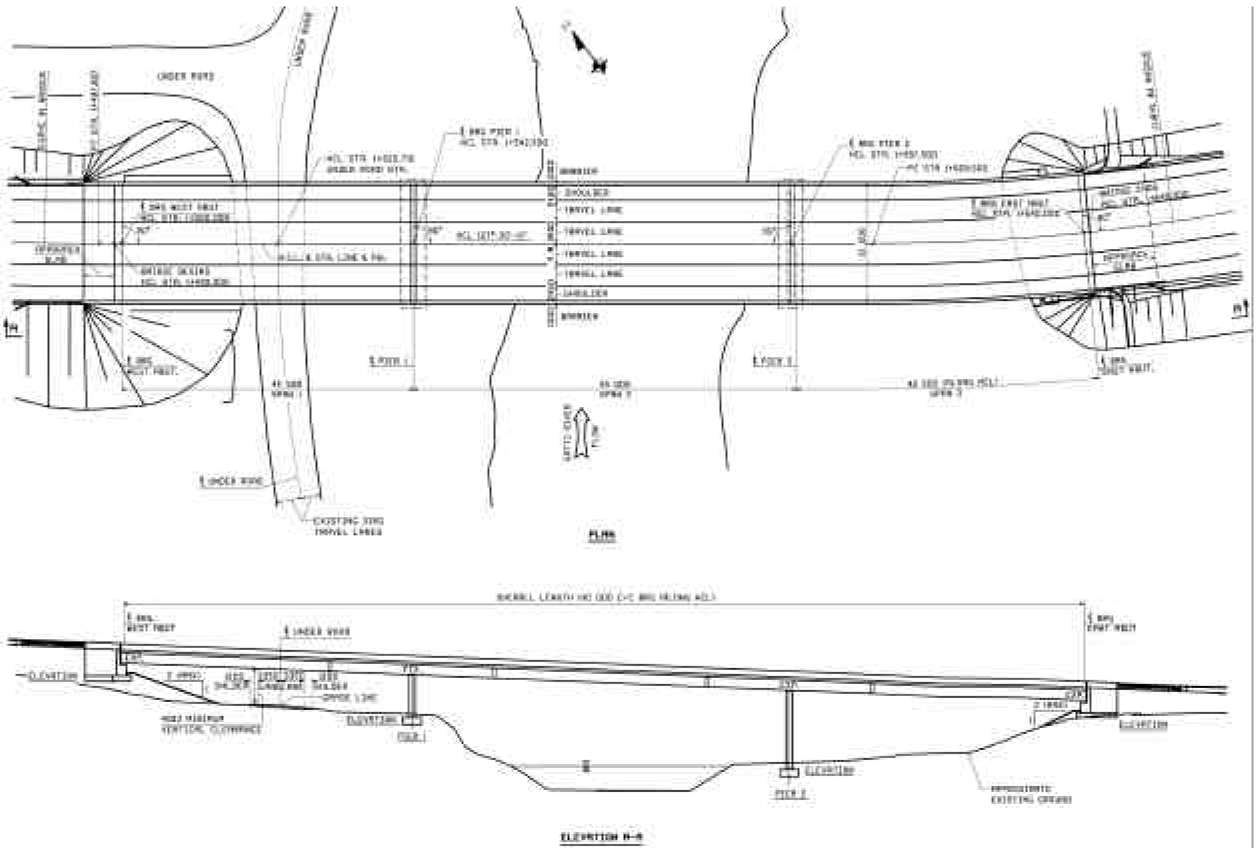
AASHTO/NSBA Steel Bridge Collaboration
G 1.2 - 2003



Design Drawing Presentation Guidelines

AASHTO/NSBA Steel Bridge Collaboration

Preface

This document is a standard developed by the AASHTO/NSBA Steel Bridge Collaboration. The primary goal of the Collaboration is to achieve steel bridge design and construction of the highest quality and value through standardization of the design, fabrication, and erection processes. Each standard represents the consensus of a diverse group of professionals

It is intended that Owners adopt and implement Collaboration standards in their entirety to facilitate the achievement of standardization. It is understood, however, that local statutes or preferences may prevent full adoption of the document. In such cases Owners should adopt these documents with the exceptions they feel are necessary.

Disclaimer

The information presented in this publication has been prepared in accordance with recognized engineering principles and is for general information only. While it is believed to be accurate, this information should not be used or relied upon for any specific application without competent professional examination and verification of its accuracy, suitability, and applicability by a licensed professional engineer, designer, or architect.

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AASHTO / NSBA Steel Bridge Collaboration

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Table of Contents

Introduction

This guide is to advise the designer on items that are the minimum required in order to detail and fabricate a structure. The following information is not to be used for designing a structure but as a guideline to establish a standard presentation of this information. Specific details and specifications are shown only as examples and it is not intended to establish them as standards.

Each section relates to a sheet in the design drawings. This sheet will follow the documentation of each section. Refer to these sheets for further clarification as you review the text.

Designers should be aware of their responsibility in making every effort to ensure that design drawings provide all of the information required by contractors and their agents to fabricate steel structures. Designers should likewise be aware of the economic impact of erroneous, missing, or conflicting information in design drawings. This guide is a collaborative effort by Owners, Fabricators, FHWA, Erectors, Detailers, and Designers to promote the need for clear concise contract documents.

The guide recognizes that other information is needed by the contractor to build a steel structure, i.e. slab reinforcement, concrete placement sequencing, etc, and this information should always be present in design drawings as well.

Standard Abbreviations

CVN Material	Charpy V-Notch tested material in accordance with ASTM A709.
FCM Material	Charpy V-Notch tested material that meets the requirements of the appropriate fracture control plan.
FCW	Fracture Critical Weld. Weld that must be specially qualified in accordance with the fracture control plan.
F.S.	Field Splice
HCL	Horizontal Control Line
PGL	Profile Grade Line
PVT	Point of Vertical Tangency

Section 1
Overall Design Plan Presentation

The Overall organization of a set of contract plans should follow a logical progression of the construction of the structure. The recommended organization of the contract plans for a structure is as follows.

- Title Sheet
- Index
- Typical Highway Sections
- Estimate of Quantities
- Legend, List of Abbreviations
- Structure Plans

The bridge plan details and information typically appear in the following order. Depending on the magnitude of the project, common items (e.g. all pier 1 details) may appear on a single sheet or require multiple sheets.

- General Plan and Elevation
- General Sections and Roadway Profile
- Estimate of Quantities and Notes
- Boring Location and General Subsurface Profile
- Excavation and Embankment Details
- Abutment 1 Plan & Elevation
- Abutment Details
- Pier 1 Plan & Elevation
- Pier Details (Subsequent up-station piers shall be numbered sequentially and shall follow the same sheet order as the first pier)
- Abutment 2 Plan & Elevation
- Superstructure

The superstructure sheets should appear in the following order. Items that relate to the steel portion of the superstructure are expanded upon in the subsequent sections of this document.

- Framing Plan
- Girder Elevation and Sections
- Standard Sections
- Camber & haunch dimensions; moment, shear & reaction tables.
- Miscellaneous Steel Details
- Superstructure cross section & plan, including reinforcement placement.
- Bearing Drawing
- Abutment Section (Joint Section)
- Joint Drawing (if required)
- Approach Slab (if required)
- Railing Layout (if required)

Section 2
General Plan

(DWG. No. GEN-1, Page 5)

The plan and elevation views are usually shown on the General Plan sheet. Typical Transverse Section (see Section 3.2) may be shown on the General Plan sheet if the space allowed.

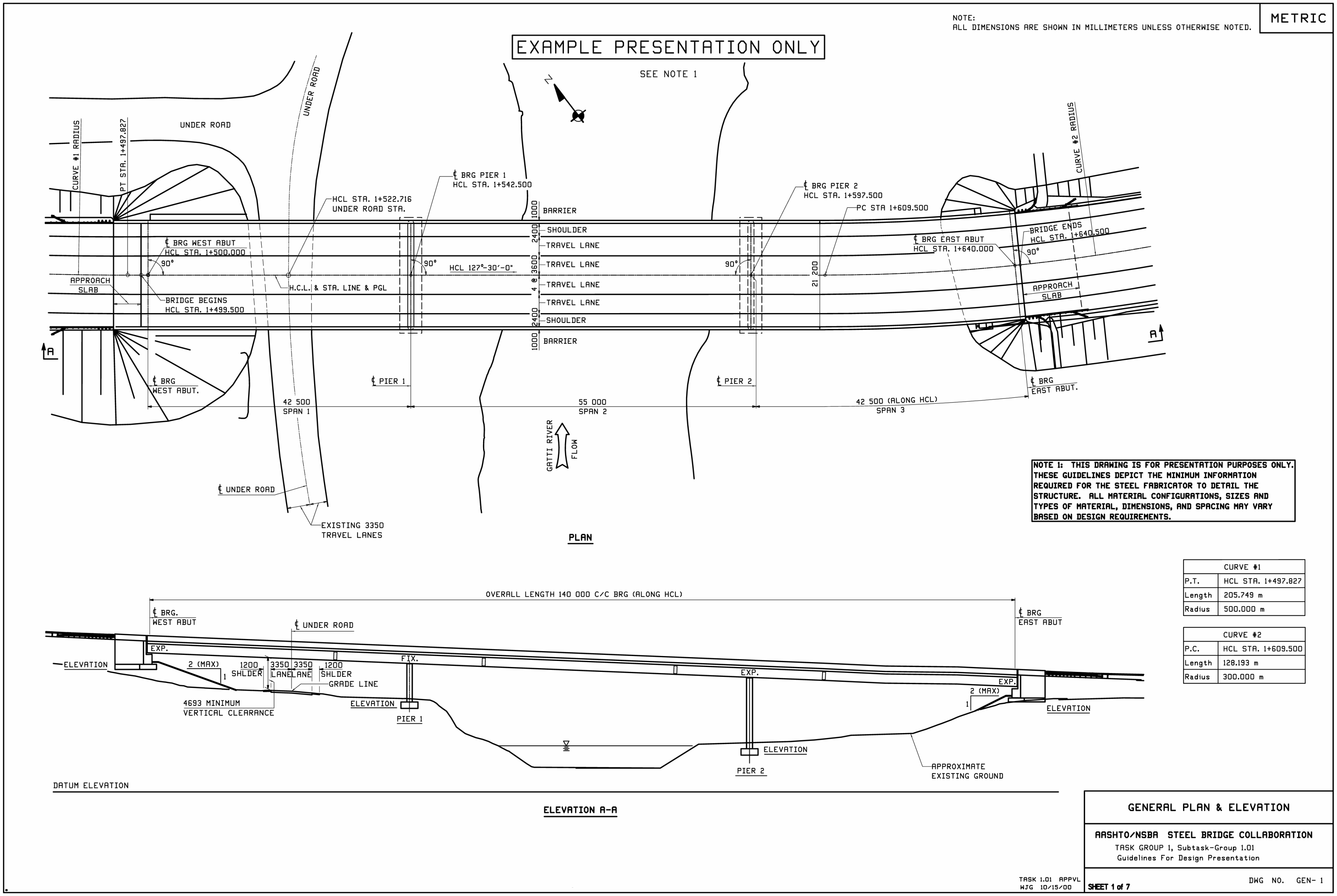
2.1 Plan

The following information shall be clearly illustrated:

a) Station line and station increasing from left to right.
b) Labels of spans and supports from left to right.
c) Horizontal/geometric control line (HCL) with all defining points (i.e. PT, PC, PCC), azimuths and radii as applicable.
d) Stations for the intersection of the centerlines of pier and centerlines of bearings and the HCL.
e) Centerlines of piers of bearings
f) Skew angle of substructure elements (between the normal or radial to centerline of structure and centerline of the pier or abutment).
g) Overall length and width of the structure, travel lane, median and shoulder widths.
h) North arrow
i) Deck Drain and manholes
j) Length of each span

2.2 Elevation

a) Datum line with elevation and stations.
b) Original ground line at the bridge centerline, or as noted.
c) Overall length of bridge along HCL or station line.
d) Minimum vertical clearances.
e) Type of bearing condition at each support (fixed or expansion).


NOTE:
ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED.
METRIC
EXAMPLE PRESENTATION ONLY
SEE NOTE 1
N
UNDER ROAD
UNDER ROAD
CURVE #1 RADIUS
PT STA. 1+497.827
HCL STA. 1+522.716
UNDER ROAD STA.
℄ BRG PIER 1
HCL STA. 1+542.500
1000
BARRIER
2400
SHOULDER
TRAVEL LANE
4 @ 3600
TRAVEL LANE
TRAVEL LANE
TRAVEL LANE
2400
SHOULDER
1000
BARRIER
℄ BRG PIER 2
HCL STA. 1+597.500
PC STA 1+609.500
CURVE #2 RADIUS
℄ BRG WEST ABUT
HCL STA. 1+500.000
90°
APPROACH SLAB
H.C.L. & STA. LINE & PGL
HCL 127°-30'-0"
90°
90°
21 200
℄ BRG EAST ABUT
HCL STA. 1+640.000
BRIDGE ENDS
HCL STA. 1+640.500
90°
APPROACH SLAB
BRIDGE BEGINS
HCL STA. 1+499.500
A
A
℄ BRG WEST ABUT.
℄ PIER 1
℄ PIER 2
℄ BRG EAST ABUT.
42 500
SPAN 1
55 000
SPAN 2
42 500 (ALONG HCL)
SPAN 3
GATTI RIVER
FLOW
NOTE 1: THIS DRAWING IS FOR PRESENTATION PURPOSES ONLY. THESE GUIDELINES DEPICT THE MINIMUM INFORMATION REQUIRED FOR THE STEEL FABRICATOR TO DETAIL THE STRUCTURE. ALL MATERIAL CONFIGURATIONS, SIZES AND TYPES OF MATERIAL, DIMENSIONS, AND SPACING MAY VARY BASED ON DESIGN REQUIREMENTS.
℄ UNDER ROAD
EXISTING 3350
TRAVEL LANES
PLAN
CURVE #1
P.T. HCL STA. 1+497.827
Length 205.749 m
Radius 500.000 m
CURVE #2
P.C. HCL STA. 1+609.500
Length 128.193 m
Radius 300.000 m
OVERALL LENGTH 140 000 C/C BRG (ALONG HCL)
℄ BRG.
WEST ABUT
℄ UNDER ROAD
℄ BRG
EAST ABUT
EXP.
FIX.
EXP.
EXP.
ELEVATION
2 (MAX)
1
1200 SHLDER
3350 LANE
3350 LANE
1200 SHLDER
GRADE LINE
4693 MINIMUM
VERTICAL CLEARANCE
ELEVATION
PIER 1
2 (MAX)
1
ELEVATION
ELEVATION
PIER 2
APPROXIMATE
EXISTING GROUND
DATUM ELEVATION
ELEVATION A-A
GENERAL PLAN & ELEVATION
AASHTO/NSBA STEEL BRIDGE COLLABORATION
TASK GROUP 1, Subtask-Group 1.01
Guidelines For Design Presentation
TASK 1.01 APPVL
WJG 10/15/00
SHEET 1 of 7
DWG NO. GEN- 1

Section 3
Sections & Profile Information

(DWG. No. GEN-2, Page 7)

The bridge profile, cross slope and typical transverse section (cross section) are typically shown on the Profile Information sheet.

3.1 Profile

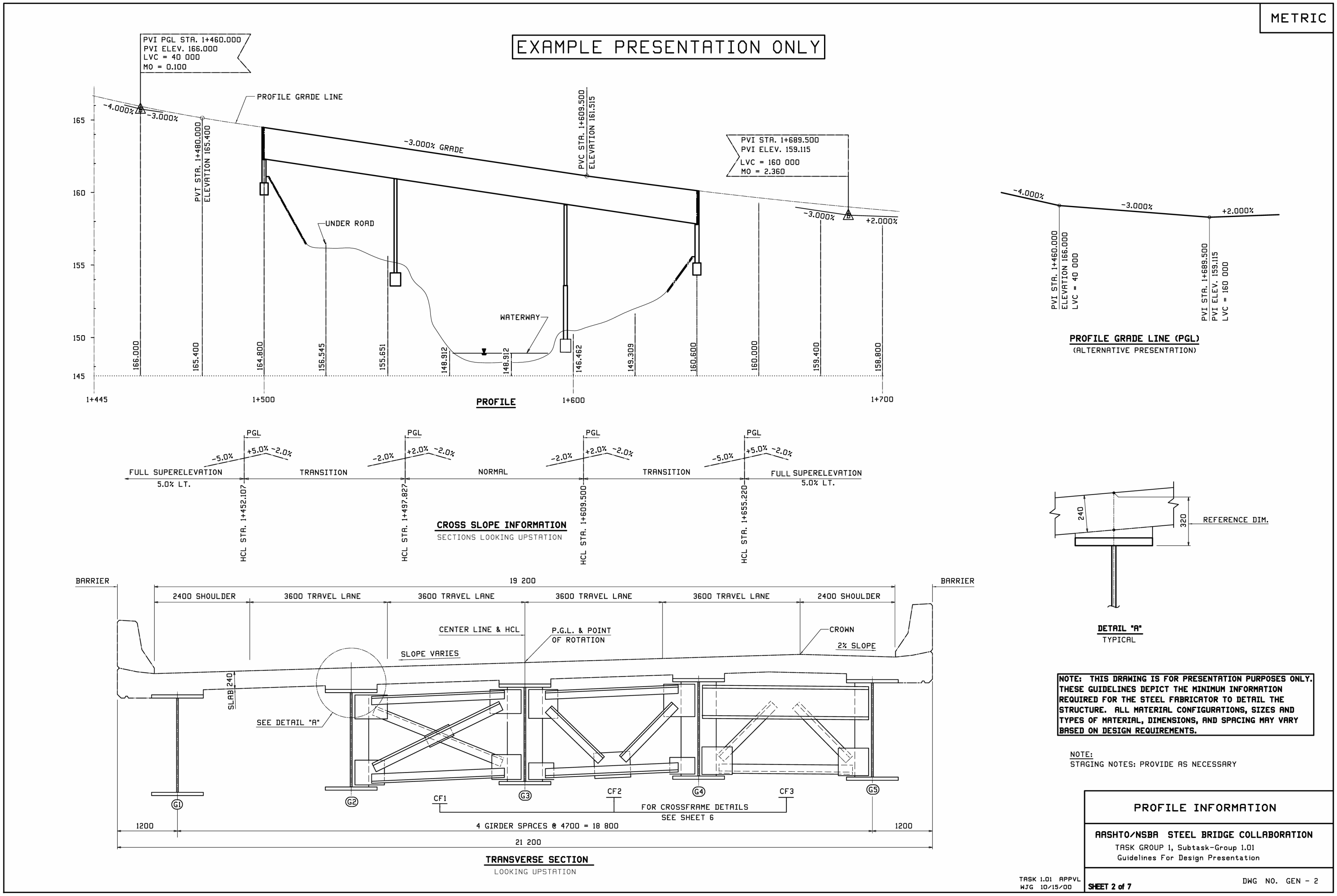
Line diagram is common for profile grade. The following information shall be clearly illustrated:

a) Grades, pertinent elevations and stations
b) Vertical curve data such as the PVI stations and elevations, length vertical curve (LVC), and grades if applicable.

3.2 Typical Transverse Section

The following information shall be illustrated:

c) Widths of traveled lanes, sidewalks, shoulders and medians on the bridge.
d) Profile grade line (PGL) on the transverse section and its offset from the HCL.
e) Location of the HCL relative to the girder line spacing.
f) Cross-slope with transitions and stationing of the transition limits.
g) Girder spacing
h) Label girders as shown in Section 4.
i) Transverse section looking upstation.
j) Depth of slab normal to grade and slab thickness depth of haunch to the top of web.
k) Dimension from roadway surface to top of web (see detail a).
l) When stage construction is required show appropriate details for individual staging.


METRIC
EXAMPLE PRESENTATION ONLY
PVI PGL STA. 1+460.000
PVI ELEV. 166.000
LVC = 40 000
MO = 0.100
PROFILE GRADE LINE
-4.000%
-3.000%
-3.000% GRADE
PVT STA. 1+480.000
ELEVATION 165.400
PVC STA. 1+609.500
ELEVATION 161.515
PVI STA. 1+689.500
PVI ELEV. 159.115
LVC = 160 000
MO = 2.360
+2.000%
UNDER ROAD
WATERWAY
166.000
165.400
164.800
156.545
155.651
148.912
148.912
146.462
149.309
160.600
160.000
159.400
158.800
1+445
1+500
1+600
1+700
PROFILE
PROFILE GRADE LINE (PGL)
(ALTERNATIVE PRESENTATION)
PVI STA. 1+460.000
ELEVATION 166.000
LVC = 40 000
PVI STA. 1+689.500
PVI ELEV. 159.115
LVC = 160 000
PGL
FULL SUPERELEVATION
5.0% LT.
TRANSITION
NORMAL
HCL STA. 1+452.107
HCL STA. 1+497.827
HCL STA. 1+609.500
HCL STA. 1+655.220
CROSS SLOPE INFORMATION
SECTIONS LOOKING UPSTATION
REFERENCE DIM.
DETAIL "A"
TYPICAL
BARRIER
19 200
2400 SHOULDER
3600 TRAVEL LANE
CENTER LINE & HCL
P.G.L. & POINT OF ROTATION
CROWN
2% SLOPE
SLOPE VARIES
SLAB 240
SEE DETAIL "A"
CF1
CF2
CF3
FOR CROSSFRAME DETAILS
SEE SHEET 6
1200
4 GIRDER SPACES @ 4700 = 18 800
21 200
TRANSVERSE SECTION
LOOKING UPSTATION
NOTE: THIS DRAWING IS FOR PRESENTATION PURPOSES ONLY. THESE GUIDELINES DEPICT THE MINIMUM INFORMATION REQUIRED FOR THE STEEL FABRICATOR TO DETAIL THE STRUCTURE. ALL MATERIAL CONFIGURATIONS, SIZES AND TYPES OF MATERIAL, DIMENSIONS, AND SPACING MAY VARY BASED ON DESIGN REQUIREMENTS.
NOTE:
STAGING NOTES: PROVIDE AS NECESSARY
PROFILE INFORMATION
AASHTO/NSBA STEEL BRIDGE COLLABORATION
TASK GROUP 1, Subtask-Group 1.01
Guidelines For Design Presentation
TASK 1.01 APPVL
WJG 10/15/00
SHEET 2 of 7
DWG NO. GEN - 2

Section 4
Framing Plan & Girder Elevations

(DWG. No. GIRDER-3, Page 9)

4.1 Framing Plan

The following information shall be clearly illustrated:

a) Stations increasing from left to right, numbers of the spans and field splices from left to right and the length of each span along the HCL.
b) HCL offset relative to the nearest girder. If the girders are not parallel and/or the girders are curved but the piers are not radial, provide the dimensions from the HCL to the nearest girder at each bearing as well as the girder spacing along the bearing line.
c) Stations at the intersection of the HCL with the centerline of each substructure element.
d) Skew angle of the centerline of bearings to the HCL.
e) Location of the field splices from the bearings.
f) Location and types of crossframe.
g) The spacing for the intermediate crossframes along either an outside girder line or the HCL so that the remaining information can be calculated by the detailer. Furnish a note stating the maximum distance the crossframe spacing can be adjusted in order to clear shop splices or field splice plates.
h) Locations of the intermediate stiffeners from centerline of bearing or from the crossframes.
i) Labels of the girder lines
j) Type of bearings at each support
k) North Arrow

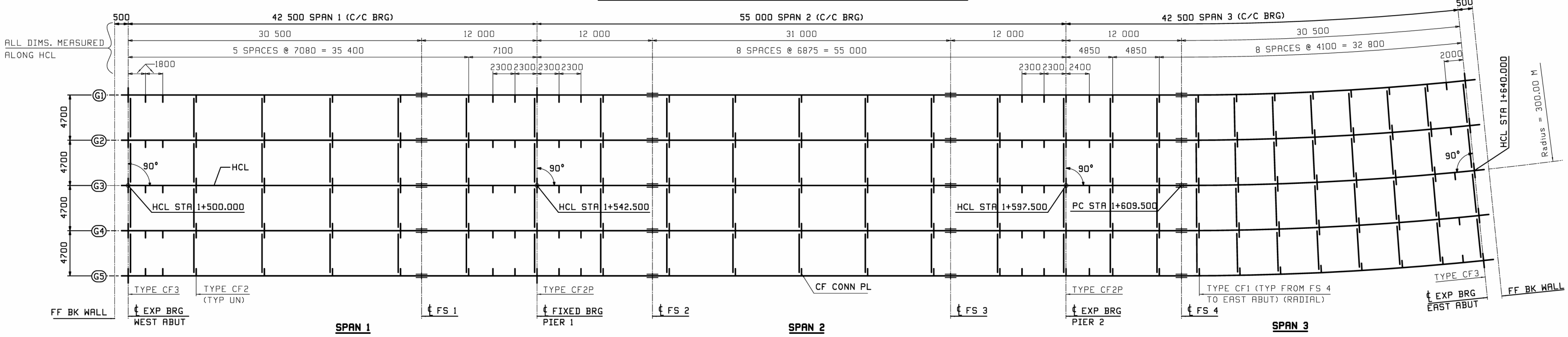
4.2 Girder Elevation

The following information shall be clearly illustrated:

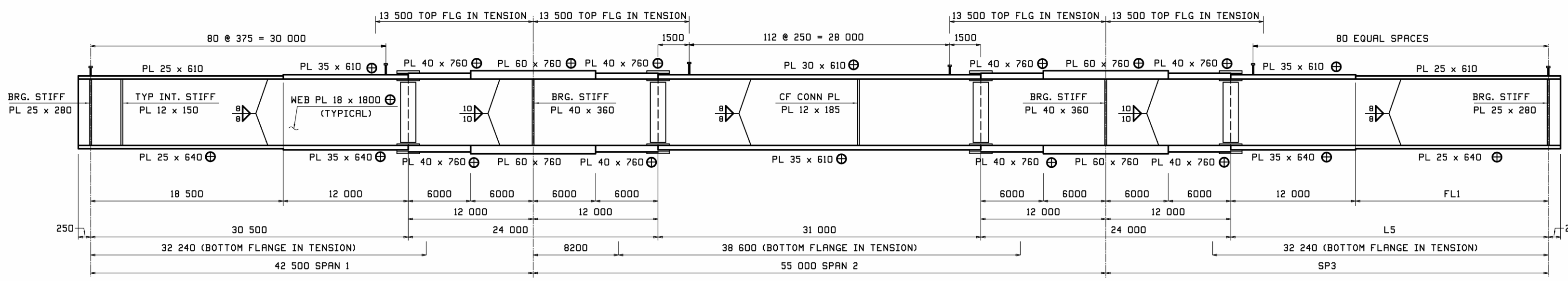
a) Span numbers and their lengths.
b) Dimensions of the field splice locations from the bearings.
c) Distance from centerline of bearing to the end of girder.
d) Thickness and depth of web; thickness, width and length of flange plates.. (The length of flange plates from the centerline of bearings and not from the end of the girder.)
e) Sizes and locations of fillet welds for flange to web connections.
f) The thickness and width of the bearing and intermediate stiffeners.
g) Notations for main members. (All others will be considered secondary.)
h) Dimension tension zones from the centerline of bearings
i) CVN and FCM requirements should be identified.
j) Notes on the final position of the bearing and intermediate stiffeners and interior crossframes.
k) The shear stud spacing.
l) Unique NDT requirements (not in AWS or Standards Specifications) should be noted.

EXAMPLE PRESENTATION ONLY

METRIC



FRAMING PLAN



TYPICAL GIRDER ELEVATION

LINE	RADIUS	SP3	L5	FL1
G1	290 600	41 544	29 544	17 544
G2	295 300	42 022	30 022	18 022
G3	300 000	42 500	30 500	18 500
G4	304 700	42 978	30 978	18 978
G5	309 400	43 456	31 456	19 456

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NOTES:

1 - ALL MATERIAL SHALL BE M345M-345W.
2 - CHARPY V-NOTCH TOUGHNESS TEST SHALL BE PERFORMED ON ALL MAIN LOAD CARRYING MEMBERS SUBJECT TO TENSILE STRESS INDICATED BY ⊕ .
3 - FOR WELDING DETAILS AND WELDING SPECIFICATIONS SEE "TYPICAL GIRDER DETAILS" ON DESIGN DWG 5.
4 - ALL DIMENSIONS SHOWN ARE HORIZONTAL.
5 - ALL BEARING STIFFENERS SHALL BE VERTICAL (IF GRADE EXCEEDS 3%) AFTER DEAD LOAD IS APPLIED. ALL INTERMEDIATE STIFFENERS, INTERIOR CROSS FRAMES, AND FIELD SPLICES CAN BE NORMAL TO GRADE.
6 - ALL DIMENSIONS AND PLATE SIZES ARE IN MILLIMETERS.
7 - ALL BEARING STIFFENERS ARE ON EACH SIDE OF THE WEB. INTERMEDIATE STIFFENERS ARE ON THE INSIDE FACE OF FASCIA GIRDERS AND ON ONE SIDE OF INTERIOR GIRDERS.
8 - CROSSFRAME SPACING AND/OR FIELD SPLICE LOCATIONS MAY BE ADJUSTED UP TO 300 MILLIMETERS TO ACCOMMODATE FIELD SPLICE PLATES.
9 - SEE DWG. 7 FOR CROSSFRAME.
10 - GIRDERS G1, G2, G3, G4 & G5 ARE TO BE CONSIDERED MAIN MEMBERS

FRAMING PLAN & GIRDER ELEVATION

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TASK GROUP 1, Subtask-Group 1.01
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TASK 1.01 APPVL WJG 10/15/00

DWG NO. GIRDER - 3

SHEET 3 of 7

Section 5
Standard Details

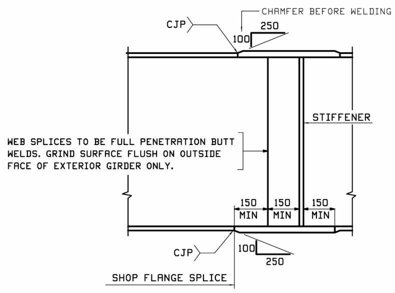
(DWG. No. STDDET, Page 11)

The shop fabrication clearances, weld termination details, shear connectors, stiffeners and crossframe connection plates are usually shown in the Standard Details sheets. The following information shall be clearly illustrated if applicable:

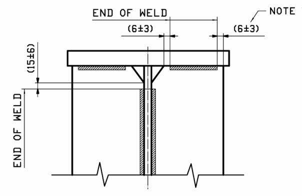
a) Shop clearances for locating web and flange splices in relation to stiffeners/crossframe connection plates and each other.
b) A welded transition in flange thickness and/or width if varies from AWS norm. (Welded flange width transitions are discouraged.)
c) A weld termination detail for connecting the stiffeners/crossframe connection plates to the web and flanges.
d) Transverse shear stud spacing, size of studs and method(s) of application.
e) The location of welds, the size of stiffeners and connection plates and clip details. Only show the weld information if AWS D1.5 does not govern.
f) Necessary requirements such as "finish to bear", applicable welding code and any special provisions that modify the code; any material to be CVN or FCM and welding that is to be FCW use "finish to bear" in lieu of "mill to bear" or "grind to bear" to allow fabricator choice.
g) Give option to tight fit or gap the interior stiffener at the tension flange.

METRIC

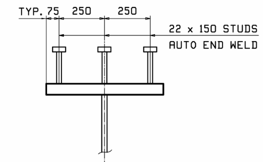
EXAMPLE PRESENTATION ONLY



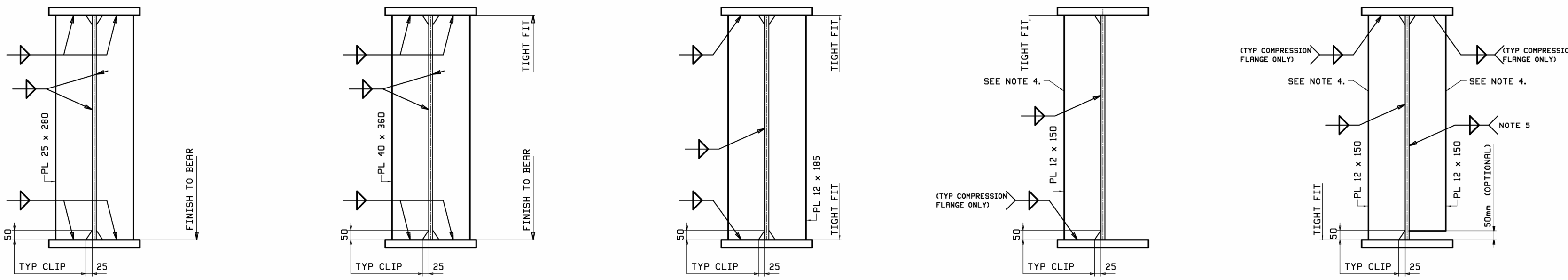
SHOP SPLICE CLEARANCES



WELD TERMINATION DETAIL



SHEAR CONNECTOR DETAIL



ABUT BRG. STIFFENER DETAIL
(HOLES NOT SHOWN)

PIER BRG. STIFFENER DETAIL
(HOLES NOT SHOWN)

CROSSFRAME CONNECTION PLATE DETAIL
(HOLES NOT SHOWN)

INT. STIFFENER DETAIL

INT. STIFFENER DETAIL

NOTES:

1 - WELDING , WELDER QUALIFICATIONS, PREQUALIFICATION OF WELD DETAILS AND INSPECTION OF WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE OR SPECIAL PROVISIONS

2 - THE USE OF ANY WELDING PROCESS WILL BE SATISFACTORY ONLY AFTER THE WELDING PROCEDURE SPECIFICATION HAS BEEN SUBMITTED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.

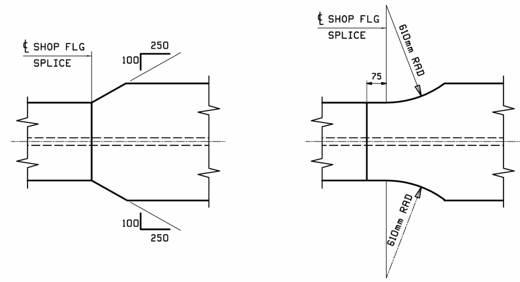
3 - NON-DESTRUCTIVE TESTING SHALL BE DONE IN ACCORDANCE WITH AWS D1.5 OR AS MODIFIED BY THE SPECIAL PROVISIONS.

4 - INTERMEDIATE STIFFENERS ARE NOT REQUIRED ON FASCIA SIDE OF EXTERIOR GIRDERS.

5 - NO WELDING OF INTERMEDIATE STIFFENERS TO TENSION FLANGES. PLATES SHALL BE "TIGHT FIT".

6 - ALL FILLET WELDS SHALL BE 6 mm MINIMUM UNLESS NOTED.

7 - ON BEARING STIFFENERS WITH FULL PENETRACTION WELDS, THESE WELDS MAY WRAP AROUND CORNERS



FLANGE WIDTH TRANSITION (AVOID)

FLANGE WIDTHS SHOULD BE KEPT THE SAME WITHIN ANY ONE GIRDER SECTION FOR ECONOMY IN ORDERING AND FABRICATION

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TASK 1.01 APPVL
WJG 10/15/00

STIFFENER & MISCELLANEOUS DETAILS

AASHTO/NSBA STEEL BRIDGE COLLABORATION
TASK GROUP 1, Subtask-Group 1.01
Guidelines For Design Presentation

SHEET 4 of 7 | DWG NO. STDDET - 4

Section 6
Camber Diagram

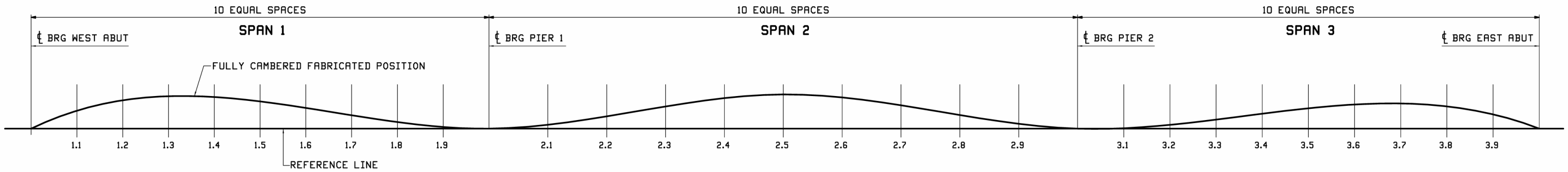
(DWG. No. CAM-5, Page 13)

The following information shall be clearly illustrated:

a) Distribute camber ordinates between bearings. Space ordinates between 1500 mm (5 ft) and 6000 mm (20 ft) apart, depending on span length and variations in camber curve. When practical, 10 equal spaces are preferred.
b) Geometric, dead load, superimposed dead load and resulting total camber ordinate value.
c) Labels of span numbers and bearings in same order they appear on the plans. (For example if the plans start from left to right with Span 1, Span 2 …etc. then the camber diagram should start with Span 1, Span 2 …etc.)
d) The camber information in the table format presented in the same format as the plans. (If the plan starts with Girder 1 at the top then the table should start with the ordinates for Girder 1. Make the table sequential. For example Girder 2 not Girder 5 should follow Girder 1.)
e) The total dead load deflection to the nearest millimeter.

METRIC

EXAMPLE PRESENTATION ONLY



ALL DIMENTIONS ARE GIVEN IN MILLIMETERS

		ORDINATES	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	PIER 1
SPAN 1	LINES 1 & 5	STL. DEFL.	9	15	18	19	18	16	12	7	2	—
		CONC. DEFL.	19	32	40	42	40	34	25	14	4	—
		SUPER DL DEFL.	7	12	14	15	14	12	9	5	2	—
		TOTAL DL DEFL.	35	59	72	76	72	62	46	26	8	—
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2							
		TOTAL CAMBER	SEE	NOTES 1	& 2							
	LINE 2, 3 & 4	STL. DEFL.	10	17	21	21	21	18	13	8	3	—
		CONC. DEFL.	21	36	44	46	44	38	28	15	4	—
		SUPER DL DEFL.	8	13	15	17	15	13	10	6	2	—
		TOTAL DL DEFL.	39	66	80	84	80	69	51	29	9	—
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2							
		TOTAL CAMBER	SEE	NOTES 1	& 2							

ALL DIMENTIONS ARE GIVEN IN MILLIMETERS

		ORDINATES	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	PIER 2
SPAN 2	LINES 1 & 5	STL. DEFL.	3	10	16	21	23	21	16	10	3	—
		CONC. DEFL.	6	20	35	47	51	47	35	20	6	—
		SUPER DL DEFL.	2	7	13	17	19	17	13	7	2	—
		TOTAL DL DEFL.	11	37	64	85	93	85	64	37	11	—
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2							
		TOTAL CAMBER	SEE	NOTES 1	& 2							
	LINE 2, 3 & 4	STL. DEFL.	3	11	18	23	25	23	18	11	3	—
		CONC. DEFL.	7	22	39	52	57	52	39	22	7	—
		SUPER DL DEFL.	2	8	14	19	21	19	14	8	2	—
		TOTAL DL DEFL.	12	41	71	94	103	94	71	41	12	—
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2							
		TOTAL CAMBER	SEE	NOTES 1	& 2							

NOTE:

1. WHERE STATES AND DESIGNERS DO NOT SHOW GEOMETRIC CAMBER IN WHICH CASE THE FABRICATOR SHALL ADJUST ALL VALUES TO ACCOUNT FOR THE EFFECT OF THE GEOMETRIC CAMBER.
2. THE DESIGNER MAY SHOW ANY INFORMATION IN ADDITION TO WHAT IS PRESENTED (i.e. GEOMETRIC CURVE, ORIDINATES AT FIELD SPLICES, ETC.)

ALL DIMENTIONS ARE GIVEN IN MILLIMETERS

		ORDINATES	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9
SPAN 3	LINE 1	STL. DEFL.	2	6	11	15	17	18	17	14	8
		CONC. DEFL.	4	14	25	33	39	41	39	32	19
		SUPER DL DEFL.	1	5	9	12	14	15	14	12	7
		TOTAL DL DEFL.	7	25	45	60	70	74	70	58	24
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2						
		TOTAL CAMBER	SEE	NOTES 1	& 2						
	LINE 2	STL. DEFL.	2	7	12	16	19	20	19	16	9
		CONC. DEFL.	4	15	26	35	41	43	41	34	20
		SUPER DL DEFL.	2	5	10	13	15	16	15	12	7
		TOTAL DL DEFL.	8	27	48	64	75	79	75	62	36
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2						
		TOTAL CAMBER	SEE	NOTES 1	& 2						
	LINE 3	STL. DEFL.	3	8	13	18	21	21	21	17	10
		CONC. DEFL.	4	15	28	38	44	46	44	36	21
		SUPER DL DEFL.	2	6	10	13	15	17	15	13	8
		TOTAL DL DEFL.	9	29	51	69	80	84	80	66	39
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2						
		TOTAL CAMBER	SEE	NOTES 1	& 2						
	LINE 4	STL. DEFL.	2	8	14	18	22	22	22	18	11
		CONC. DEFL.	6	17	30	41	47	50	47	39	23
		SUPER DL DEFL.	2	6	11	15	17	18	17	14	8
		TOTAL DL DEFL.	10	31	55	74	86	90	86	71	42
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2						
		TOTAL CAMBER	SEE	NOTES 1	& 2						
	LINE 5	STL. DEFL.	3	8	13	18	21	21	21	17	8
		CONC. DEFL.	6	18	32	43	51	53	51	42	25
		SUPER DL DEFL.	2	6	12	16	18	19	18	15	9
		TOTAL DL DEFL.	11	33	59	79	92	96	92	76	45
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2						
		TOTAL CAMBER	SEE	NOTES 1	& 2						

OPTION 1

TASK 1.01 APPVL
WJG 10/15/00

NOTE: THIS DRAWING IS FOR PRESENTATION PURPOSES ONLY. THESE GUIDELINES DEPICT THE MINIMUM INFORMATION REQUIRED FOR THE STEEL FABRICATOR TO DETAIL THE STRUCTURE. ALL MATERIAL CONFIGURATIONS, SIZES AND TYPES OF MATERIAL, DIMENSIONS, AND SPACING MAY VARY BASED ON DESIGN REQUIREMENTS.

CAMBER DIAGRAMS

AASHTO/NSBA STEEL BRIDGE COLLABORATION
TASK GROUP 1, Subtask-Group 1.01
Guidelines For Design Presentation

SHEET 5 of 7

DWG NO. CAM-5 (OPT 1)

Section 7
Crossframes

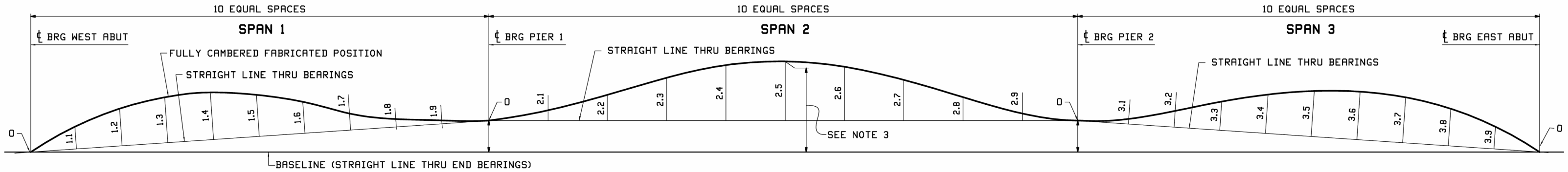
(DWG. No. DET-6, Page 15)

The following information shall be clearly illustrated:

a) The method to be used in determining the position of the girder web during erection when differential deflection occurs between adjacent girders at crossframes due to curved and/or skewed spans or staged construction.
b) The size or shape of all crossframe components and the thickness and width of the connection plates.
c) The ASTM and/or AASHTO designation of the crossframe material.
d) The minimum size and length of weld required at each connection.
e) Bolt diameters and hole sizes in English Units and the ASTM designation for the bolts.
f) Show number of bolts along with minimum edge distance.
g) The vertical clear distance for crossframe material to the flanges.
h) A fillet weld termination detail (see detail “A”).
i) Orientation of the crossframe sections (i.e. upstation or downstation).

EXAMPLE PRESENTATION ONLY

METRIC



ALL DIMENTIONS ARE GIVEN IN MILLIMETERS

		ORDINATES	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	PIER 1
SPAN 1	LINES 1 & 5	STL. DEFL.	9	15	18	19	18	16	12	7	2	—
		CONC. DEFL.	19	32	40	42	40	34	25	14	4	—
		SUPER DL DEFL.	7	12	14	15	14	12	9	5	2	—
		TOTAL DL DEFL.	35	59	72	76	72	62	46	26	8	—
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2							120
		TOTAL CAMBER	SEE	NOTES 1	& 2							120
	LINE 2, 3 & 4	STL. DEFL.	10	17	21	21	21	18	13	8	3	—
		CONC. DEFL.	21	36	44	46	44	38	28	15	4	—
		SUPER DL DEFL.	8	13	15	17	15	13	10	6	2	—
		TOTAL DL DEFL.	39	66	80	84	80	69	51	29	9	—
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2							120
		TOTAL CAMBER	SEE	NOTES 1	& 2							120

ALL DIMENTIONS ARE GIVEN IN MILLIMETERS

		ORDINATES	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	PIER 2
SPAN 2	LINES 1 & 5	STL. DEFL.	3	10	16	21	23	21	16	10	3	—
		CONC. DEFL.	6	20	35	47	51	47	35	20	6	—
		SUPER DL DEFL.	2	7	13	17	19	17	13	7	2	—
		TOTAL DL DEFL.	11	37	64	85	93	85	64	37	11	—
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2							90
		TOTAL CAMBER	SEE	NOTES 1	& 2							90
	LINE 2, 3 & 4	STL. DEFL.	3	11	18	23	25	23	18	11	3	—
		CONC. DEFL.	7	22	39	52	57	52	39	22	7	—
		SUPER DL DEFL.	2	8	14	19	21	19	14	8	2	—
		TOTAL DL DEFL.	12	41	71	94	103	94	71	41	12	—
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2							90
		TOTAL CAMBER	SEE	NOTES 1	& 2							90

ALL DIMENTIONS ARE GIVEN IN MILLIMETERS

		ORDINATES	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9
SPAN 3	LINE 1	STL. DEFL.	2	6	11	15	17	18	17	14	8
		CONC. DEFL.	4	14	25	33	39	41	39	32	19
		SUPER DL DEFL.	1	5	9	12	14	15	14	12	7
		TOTAL DL DEFL.	7	25	45	60	70	74	70	58	24
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2						
		TOTAL CAMBER	SEE	NOTES 1	& 2						
	LINE 2	STL. DEFL.	2	7	12	16	19	20	19	16	9
		CONC. DEFL.	4	15	26	35	41	43	41	34	20
		SUPER DL DEFL.	2	5	10	13	15	16	15	12	7
		TOTAL DL DEFL.	8	27	48	64	75	79	75	62	36
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2						
		TOTAL CAMBER	SEE	NOTES 1	& 2						
	LINE 3	STL. DEFL.	3	8	13	18	21	21	21	17	10
		CONC. DEFL.	4	15	28	38	44	46	44	36	21
		SUPER DL DEFL.	2	6	10	13	15	17	15	13	8
		TOTAL DL DEFL.	9	29	51	69	80	84	80	66	39
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2						
		TOTAL CAMBER	SEE	NOTES 1	& 2						
	LINE 4	STL. DEFL.	2	8	14	18	22	22	22	18	11
		CONC. DEFL.	6	17	30	41	47	50	47	39	23
		SUPER DL DEFL.	2	6	11	15	17	18	17	14	8
		TOTAL DL DEFL.	10	31	55	74	86	90	86	71	42
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2						
		TOTAL CAMBER	SEE	NOTES 1	& 2						
	LINE 5	STL. DEFL.	3	8	13	18	21	21	21	17	8
		CONC. DEFL.	6	18	32	43	51	53	51	42	25
		SUPER DL DEFL.	2	6	12	16	18	19	18	15	9
		TOTAL DL DEFL.	11	33	59	79	92	96	92	76	45
		GEOMETRIC CAMBER	SEE	NOTES 1	& 2						
		TOTAL CAMBER	SEE	NOTES 1	& 2						

NOTE:

1. WHERE STATES AND DESIGNERS DO NOT SHOW GEOMETRIC CAMBER IN WHICH CASE THE FABRICATOR SHALL ADJUST ALL VALUES TO ACCOUNT FOR THE EFFECT OF THE GEOMETRIC CAMBER.
2. THE DESIGNER MAY SHOW ANY INFORMATION IN ADDITION TO WHAT IS PRESENTED (i.e. GEOMETRIC CURVE, ORDINATES AT FIELD SPLICES, ETC.)
3. GEOMETRIC CAMBER AND TOTAL CAMBER IS SHOWN RELATIVE TO A STRAIGHT LINE BETWEEN END BEARINGS.

OPTION 2

TASK 1.01 APPVL
WJG 10/15/00

NOTE: THIS DRAWING IS FOR PRESENTATION PURPOSES ONLY. THESE GUIDELINES DEPICT THE MINIMUM INFORMATION REQUIRED FOR THE STEEL FABRICATOR TO DETAIL THE STRUCTURE. ALL MATERIAL CONFIGURATIONS, SIZES AND TYPES OF MATERIAL, DIMENSIONS, AND SPACING MAY VARY BASED ON DESIGN REQUIREMENTS.

CAMBER DIAGRAMS

AASHTO/NSBA STEEL BRIDGE COLLABORATION
TASK GROUP 1, Subtask-Group 1.01
Guidelines For Design Presentation

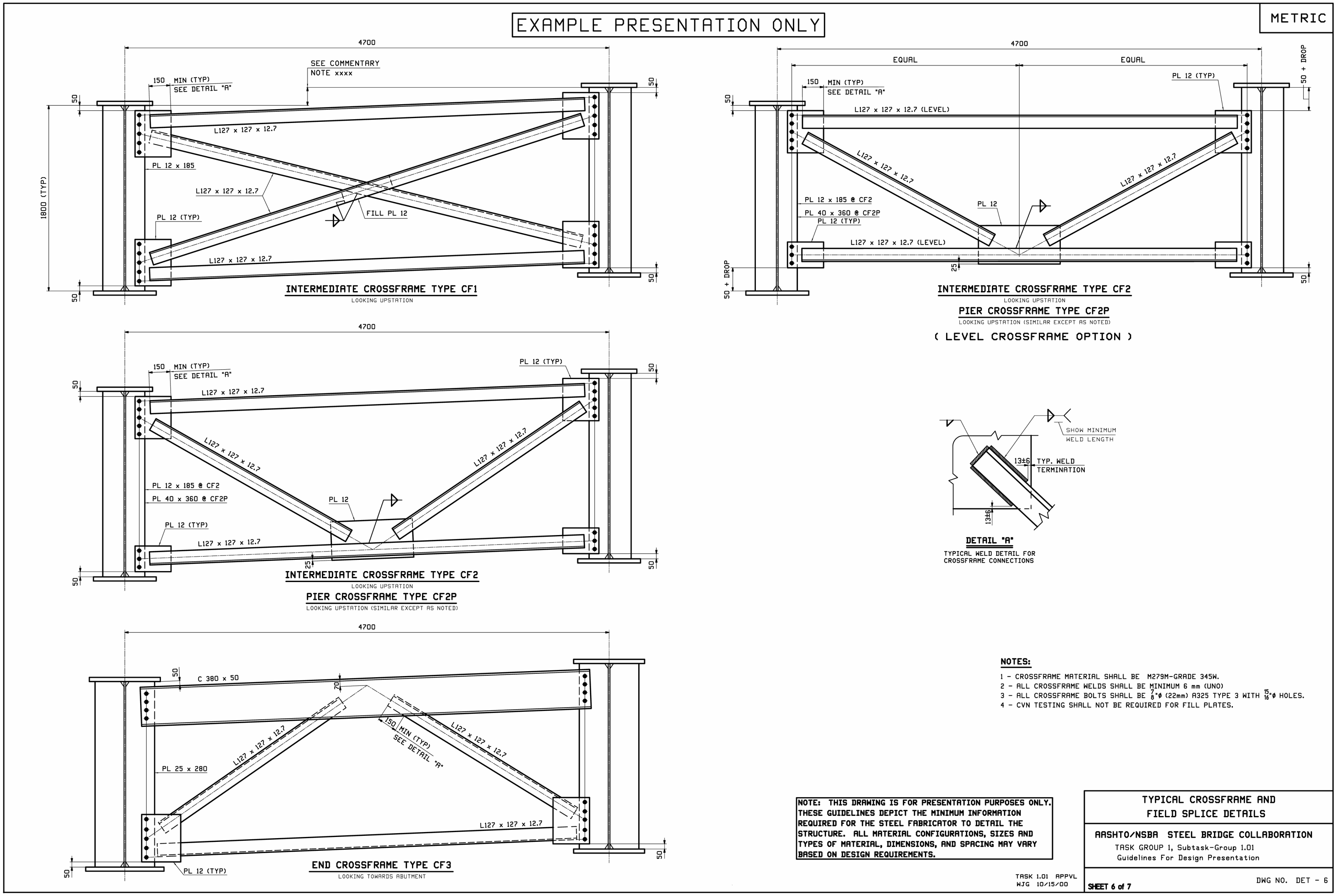
SHEET 5 of 7 DWG NO. CAM-5 (OPT 2)

Section 8
Field Splices Details

(DWG. No. DET-7, Page 17)

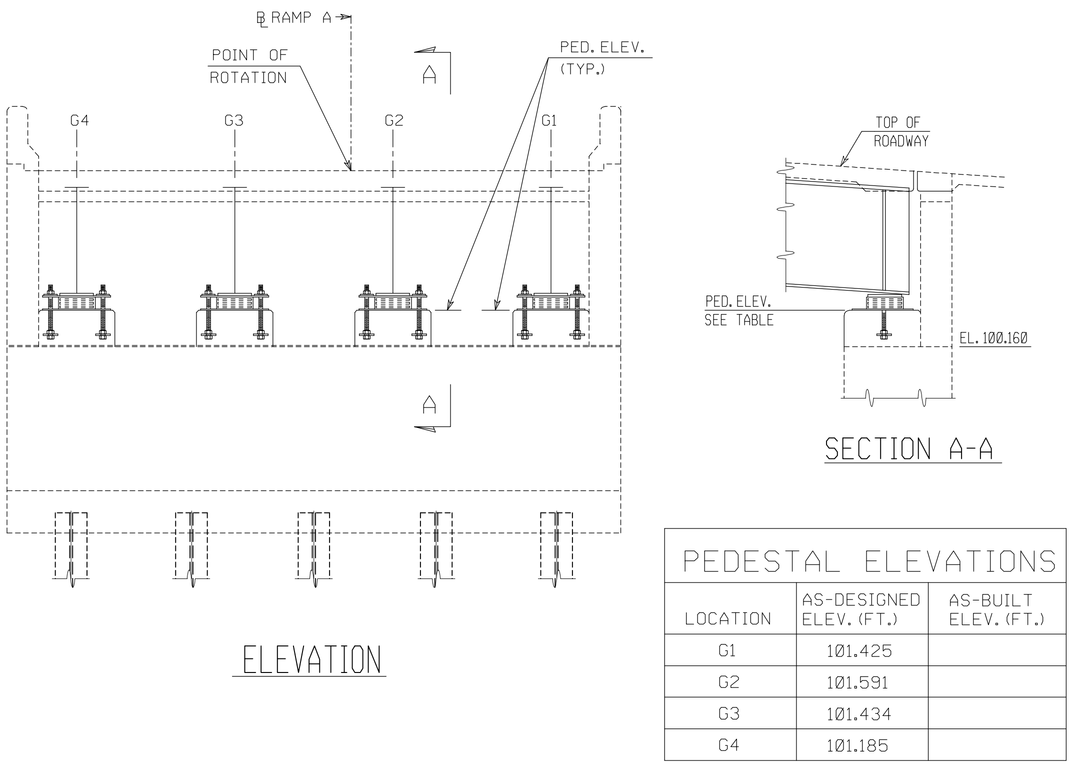
The following information shall be clearly illustrated if applicable:

a) The field splice numbers corresponding to the field splice detail.
b) Thickness, width and length of splice material.
c) The ASTM and/or AASHTO designation for the field splice material and bolts.
d) The vertical and horizontal bolt spacing and bolt and hole diameter.
e) Edge distances.


EXAMPLE PRESENTATION ONLY
METRIC
4700
SEE COMMENTARY
NOTE xxxx
150 MIN (TYP)
SEE DETAIL "A"
L127 x 127 x 12.7
PL 12 x 185
1800 (TYP)
PL 12 (TYP)
FILL PL 12
INTERMEDIATE CROSSFRAME TYPE CF1
LOOKING UPSTATION
EQUAL
PL 12 (TYP)
50 + DROP
L127 x 127 x 12.7 (LEVEL)
PL 12 x 185 @ CF2
PL 40 x 360 @ CF2P
PL 12
INTERMEDIATE CROSSFRAME TYPE CF2
LOOKING UPSTATION
PIER CROSSFRAME TYPE CF2P
LOOKING UPSTATION (SIMILAR EXCEPT AS NOTED)
(LEVEL CROSSFRAME OPTION)
SHOW MINIMUM
WELD LENGTH
13±6
TYP. WELD
TERMINATION
DETAIL "A"
TYPICAL WELD DETAIL FOR
CROSSFRAME CONNECTIONS
C 380 x 50
PL 25 x 280
END CROSSFRAME TYPE CF3
LOOKING TOWARDS ABUTMENT
NOTES:
1 - CROSSFRAME MATERIAL SHALL BE M270M-GRADE 345W.
2 - ALL CROSSFRAME WELDS SHALL BE MINIMUM 6 mm (UNO)
3 - ALL CROSSFRAME BOLTS SHALL BE 7/8"φ (22mm) A325 TYPE 3 WITH 15/16"φ HOLES.
4 - CVN TESTING SHALL NOT BE REQUIRED FOR FILL PLATES.
NOTE: THIS DRAWING IS FOR PRESENTATION PURPOSES ONLY. THESE GUIDELINES DEPICT THE MINIMUM INFORMATION REQUIRED FOR THE STEEL FABRICATOR TO DETAIL THE STRUCTURE. ALL MATERIAL CONFIGURATIONS, SIZES AND TYPES OF MATERIAL, DIMENSIONS, AND SPACING MAY VARY BASED ON DESIGN REQUIREMENTS.
TASK 1.01 APPVL
WJG 10/15/00
TYPICAL CROSSFRAME AND
FIELD SPLICE DETAILS
AASHTO/NSBA STEEL BRIDGE COLLABORATION
TASK GROUP 1, Subtask-Group 1.01
Guidelines For Design Presentation
SHEET 6 of 7
DWG NO. DET - 6

Commentary

C1.1



PEDESTAL ELEVATIONS		
LOCATION	AS-DESIGNED ELEV. (FT.)	AS-BUILT ELEV. (FT.)
G1	101.425	
G2	101.591	
G3	101.434	
G4	101.185	

Pedestal (bridge seat) elevations are essential in checking vertical geometry. By providing this information on the contract plans, vertical control at piers and abutments may be coordinated between the Designer, Fabricator, Erector and Bridge Contractor.

Related information necessary for complete detailing & vertical control of the structure at bearing points include the following:

- Girder depth (from the girder elevation)
- Bearing height (derived from the bearing drawings)

C3.2

When stage construction is required, show detailed requirements for placement of cross frames or diaphragms between stages to accommodate deflection such as temporary supports, slotted holes, field drilling of connection holes, etc.

C4.2d

- Allow extension of thicker flange in order to eliminate a shop splice. Keep flange thickness the same transversely across structure and maintain width of flange within one shipping piece.

- On certain structures crossframes may be primary members. The designer should consider the impact of this and clearly indicate special requirements (CVN, NDT, etc.). Typically crossframes considered a primary member do not require full shop assembly.
- Increase studs adjacent to splice plate to minimize studs on splice plates to avoid interference of bolts on splice plates.
- To avoid using tab plates consider relocating crossframes or slightly increase flange sizes. If tab plates are necessary, only use where required. Between the material and labor, tab plates cost approximately $150 each (2001 cost).

C5.2

Provide details for any special paint requirements on painted structures (embedded girder ends, integral abutment end, or painted end at expansion ends of weathering steel girders, etc.)

C6.2a

- While geometric camber is usually calculated by the detailer/fabricator, showing ordinates for geometric camber is a good double check.
- Total camber should be shown for estimating and bidding purposes.

C7

- Shop assembled , welded crossframes are the most economical. This is especially true if all members are placed on the same side of the gusset plate for welding. Avoid double member crossframes. Use WT in lieu of double angle and W in lieu of double channel.
- Wherever possible (i.e.: straight plate girder) show work-lines of members intersecting a hole rather than a work-point off the gusset plate.
- It is more efficient to keep crossframe connection plates identical for each type of crossframe rather than adjusting the hole spacing on the connection plate for the vertical drop between girders.

C8

Do not design field splice plates with minimum edge distances. Provide 4 to 6 millimeters more than the minimum required edge distance.