

PREPARED FOR:

MARK LAMER
Instructor, Civil and Environmental Engineering
Bldg. 69, RM 122M
NORTHERN ARIZONA UNIVERSITY
Email: Mark.Lamer@nau.edu

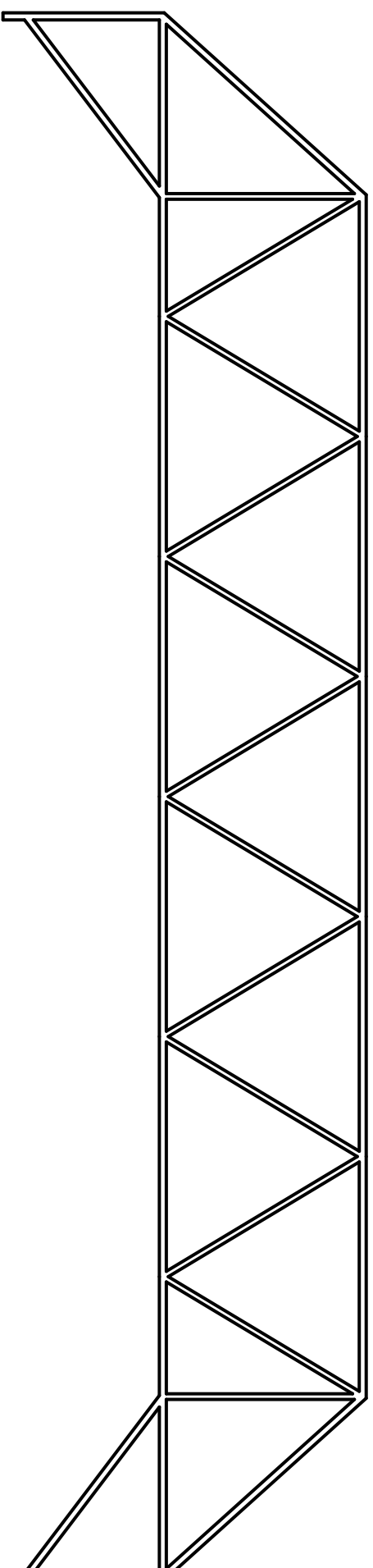
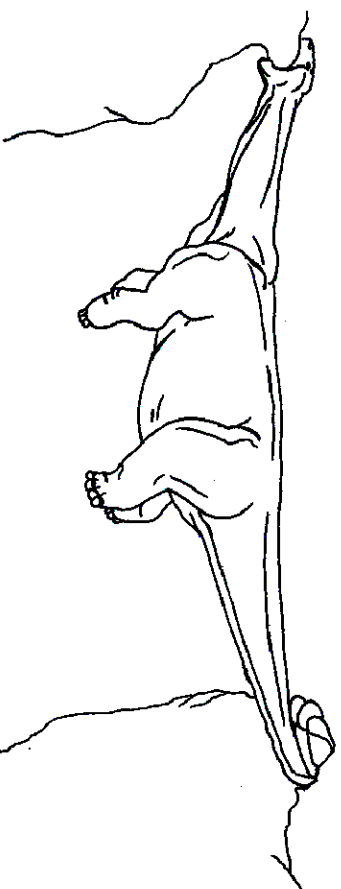
2015 NAU ASCE STEEL BRIDGE

SENIOR DESIGN PROJECT TRUSSANASAUROUS REX

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PREPARED BY:

NOEL CRUZ
LAUREN STADELMEIER
WENDY CLARK
SARAH HIGGINS
NORTHERN ARIZONA UNIVERSITY
Email: nmc76@nau.edu
Phone: (480) 321-5296



SPECIAL THANKS TO OUR SPONSORS:



ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

THESE PLANS ARE INTELLECTUAL PROPERTY OF
THE STEEL BRIDGE TEAM (SEE "DRAWN BY:" VIA
THE NORTHERN ARIZONA UNIVERSITY OF ARIZONA
AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE))

LEGEND

WEBBED BEAM	
L-BAR	
1/2" PIPES	
3/4" PIPES	

BOLT HOLE CENTERLINE		TYP
HIDDEN LINE		GRD
SECTION CUT		MEMB
WEBBED BEAM		NO.
WELD CONNECTION		PG
SECTION CUT NO.		SQ. FT
SECTION CUT PG.		LF
MEMBER NAME		EA
CONNECTION NAME		L
NON-TYPICAL CONNECTION NAME		TH
		STC

ABBREVIATIONS

TYP	TYPICAL
GRD	GRADE
MEMB	MEMBER
NO.	MEMBER NUMBER
PG	PAGE
SQ. FT	SQUARE FEET
LF	LINEAR FEET
EA	EACH
L	LENGTH
TH	THICKNESS
STC	SUBJECT TO CHANGE

MEMBER	END	PIPE END TO END OF PLATE (IN)
GH	H	1 5/32
GH	G	1 3/4
DP	D	8 1/4
SR	S	6 27/32
BI	B	6 27/32
GE	G	1 3/4
GE	E	1 3/4
EF	E	1 3/4
EF	F	1 3/4
AF	A	4 13/32
AF	F	4 5/32
SG	S	1 13/16
SG	G	1 13/16
DG	D	2 29/32
DG	G	2 7/8

CONNECTION SCHEDULE		
CONNECTION TYPE	QUANTITY	DETAIL PAGE
A	2	9, 10
B	4	10
C	4	11
D	4	12
E	6	13
F	4	14
G	4	15
H	4	16
I	2	17
J	2	18
K	2	18
L	4	19
M	4	20
N	5	N/A
O	4	21
P	2	21
Q	4	22
R	4	22
S	4	23

PIPE MEMBER SCHEDULE			
MATERIAL	O.D.	WALL THICKNESS	NPS
1/2" PIPE	0.840"	0.109"	40S STD.
3/4" PIPE	0.113"	0.113"	40S STD.

MATERIAL SCHEDULE	
MATERIAL	QUANTITY
1/2" PIPE	203 LF
3/4" PIPE	102 LF
3/4" X 3/4" X 1/8" L-BAR	32 LF
6" X 4" X 5/16" STRUCTURAL ANGLE	7 LF
5/16" PLATE	10 SQ. FT
3/16" PLATE	9 SQ. FT
5/16" BOLT	282 EA

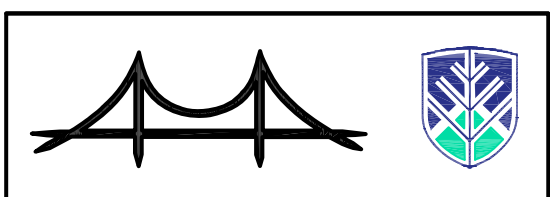
ENGINEER'S NOTES:

- Per the Material Schedule the materials listed will be used as follows:
 - 1/2" pipe will be used for the members. This material will also be used for the fabrication of the webbed beam per PG 6.
 - 3/4" pipe will be used for members
 - 3/4" x 3/4" x 1/8" L-bar will be used for members per PG 8
 - 6" x 4" x 5/16" L-Bar will be used for the fabrication of specified gussets
 - 5/16" will be used for the fabrication of gusset connections
 - 3/16" will be used for the fabrication of the webbed beam per PG 8
 - 5/16" nuts and bolts will be used for all connections. The bolt length is 1-1/2"
- All bolt holes will be 5/16" typical per plans.

Revision No.	2
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Checked By: WC, SH, LS
Date: FEBRUARY 2015
Scale: N/A

2015 NAU ASCE STEEL BRIDGE
Project Notes



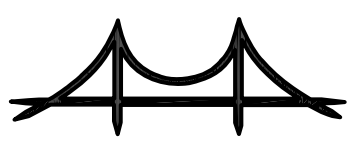
PROFILE AND CROSS BRACING

MEMBER	MATERIAL	CUT LENGTH (IN)	SLOT LENGTH (IN)		EDGE TO CENTER OF HOLE (IN)			NO. OF MEMBERS	TOTAL LENGTH (IN)
			D	O	D	O	O		
DO	3/4" PIPE	23 1/4	D	O	D	O	4	93	
			1 13/16	0	29/32	0			
QD	3/4" PIPE	19 3/16	Q	D	Q	D	4	76 3/4	
			0	1 7/8	0	29/32			
			J	Q	J	Q			
JQ	3/4" PIPE	17 23/32	1 13/16	0	29/32	0	4	70 7/8	
			J	L	J	L			
JL	3/4" PIPE	35 13/32	1 13/16	2 1/16	29/32	29/32	4	141 5/8	
			L	M	L	M			
LM	3/4" PIPE	36	2 1/16	2 1/16	29/32	29/32	6	216	
			J	C	J	C			
JC	1/2" PIPE	28 1/8	1 13/16	1 29/32	29/32	29/32	4	112 1/2	
			O	C	O	C			
OC	3/4" PIPE	31 21/32	1 13/16	1 13/16	29/32	29/32	4	126 5/8	
			A	L	A	L			
AL	1/2" PIPE	33 5/16	1 21/32	1 13/16	3/4	1 1/16	16	533	
			S	K	S	K			
SK	1/2" PIPE	32 5/16	1 21/32	1 13/16	3/4	29/32	4	129 1/4	
			TBD	TBD	TBD	TBD			
LL	3/4" X 3/4" X 1/8" L-BAR	2 1/2	TBD	TBD	TBD	TBD	10	25	
			TBD	TBD	TBD	TBD			
JK	3/4" X 3/4" X 1/8" L-BAR	4	TBD	TBD	TBD	TBD	2	8	

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2015 NAU ASCE STEEL BRIDGE Profile and Cross Bracing Member Cut Length Schedule
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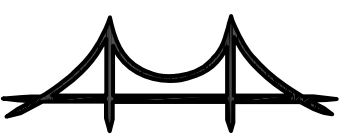


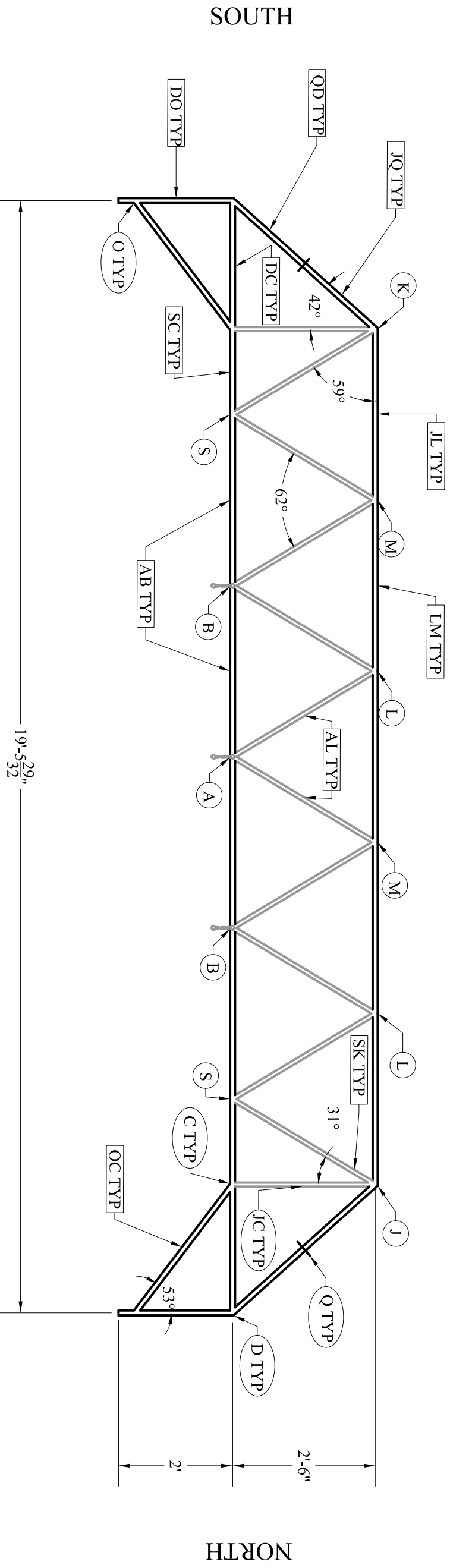
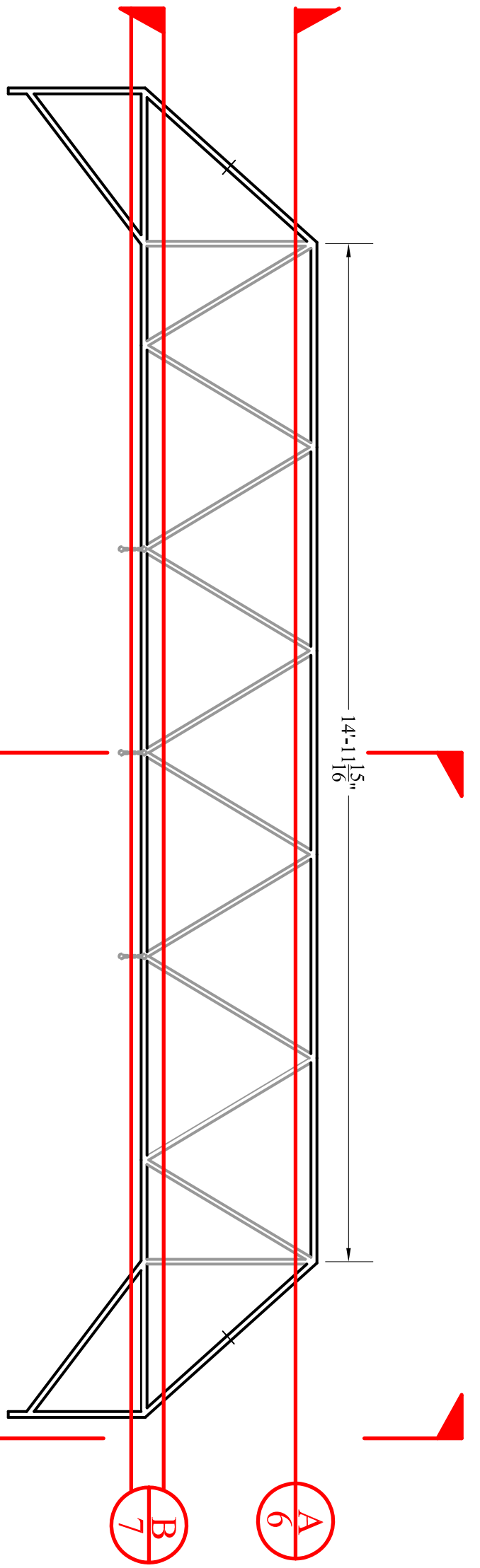
DECKING									
MEMBER	MATERIAL	CUT LENGTH (IN)	SLOT LENGTH (IN)		EDGE TO CENTER OF HOLE (IN)		NO. OF MEMBERS	TOTAL LENGTH (IN)	
			A	B	A	B			
AB	3/4" PIPE	35 19/32	A	B	A	B	8	284 3/4	
			1 21/32	1 21/32	3/4	3/4			
DC	3/4" PIPE	26 9/32	D	C	D	C	4	105 1/8	
			1 21/32	1 21/32	3/4	3/4			
SC	3/4" PIPE	17 11/16	S	C	S	C	4	70 3/4	
			1 21/32	1 21/32	3/4	3/4			
DP	1/2" PIPE	24 7/16	D	P	D	P	4	97 3/4	
			1 21/32	0	3/4	0			
BI TOP	1/2" PIPE	23 1/32	B	I	B	I	6	138 3/16	
			1 21/32	0	3/4	0			
BI Bottom	1/2" PIPE	18 9/32	B	I	B	I	6	109 11/16	
			0	0	0	0			
AF	1/2" PIPE	27 21/32	A	F	A	F	8	221 1/4	
			1 29/32	1 25/32	29/32	29/32			
EF	1/2" PIPE	36	E	F	E	F	8	288	
			0	0	0	0			
SR	1/2" PIPE	23 1/32	S	R	S	R	8	184 1/4	
			1 21/32	0	3/4	0			
SG	1/2" PIPE	15 17/32	S	G	S	G	4	62 1/8	
			1 19/32	1 15/32	3/4	3/4			
HG	1/2" PIPE	28 1/2	H	G	H	G	4	114	
			0	0	0	0			
GE	1/2" PIPE	18 1/16	G	E	G	E	4	72 1/4	
			0	0	0	0			
DG	1/2" PIPE	21 1/4	D	G	D	G	4	85	
			1 21/32	1 31/32	3/4	29/32			

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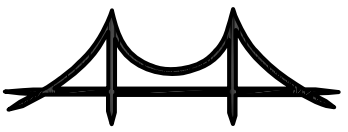
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Checked By: WC, SH, LS
Date: FEBRUARY 2015
Scale: N/A

2015 NAU ASCE STEEL BRIDGE
Decking Member Cut
Length Schedule





- Note:
- East face of bridge shown
 - Dimensions not cut length



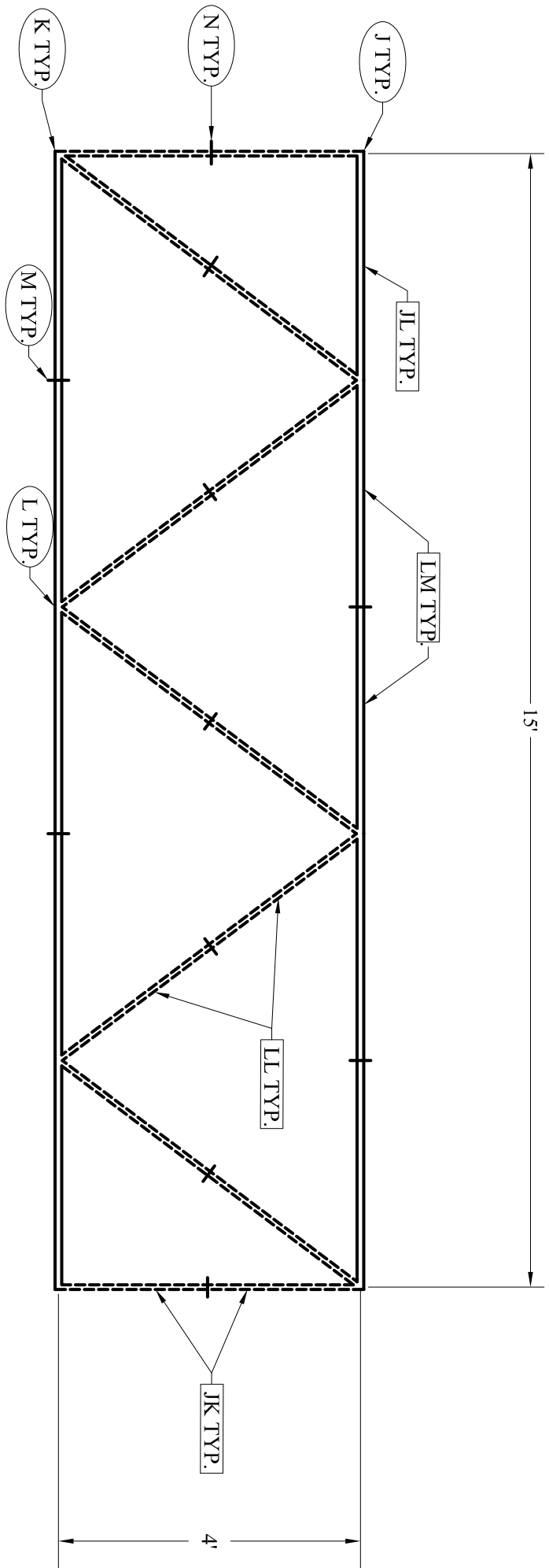
2015 NAU ASCE STEEL BRIDGE

Profile

Drawn By: LS
 Checked By: SH, NC, WC
 Date: FEBRUARY 2015
 Scale: 1":2'

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SOUTH



WEST

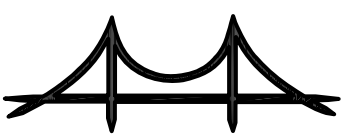
NORTH

EAST



Section A-A

- Note:
- Dimensions not cut length



2015 NAU ASCE STEEL BRIDGE

Top Cross Bracing

Drawn By: LS

Checked By: WC, NC, SH

Date: FEBRUARY 2015

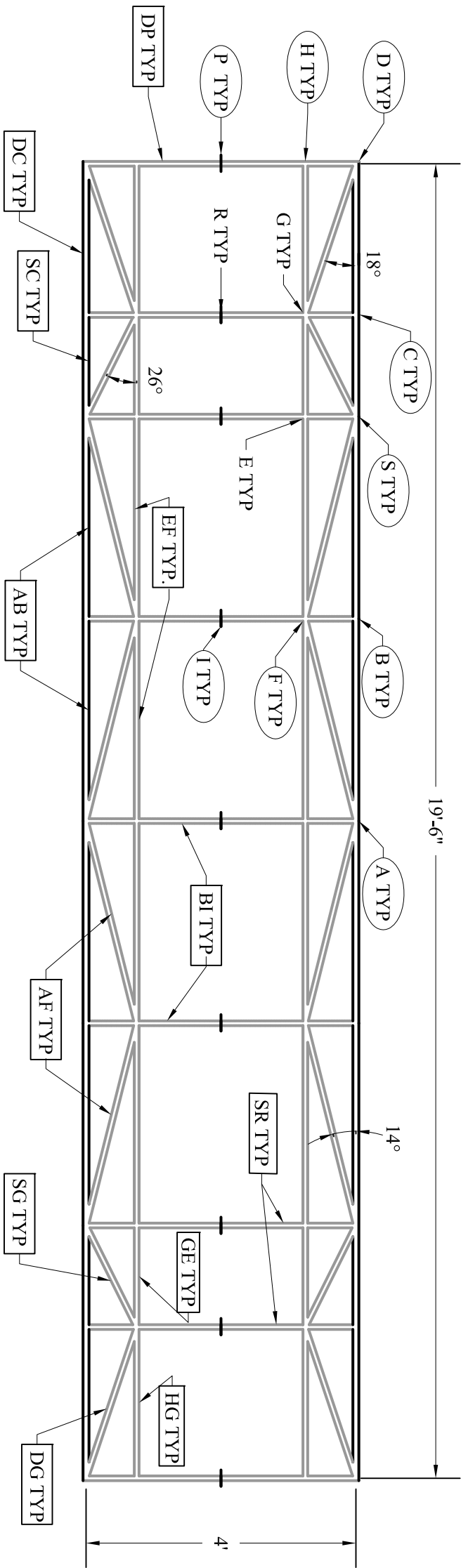
Scale: 1":2'

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SOUTH



WEST

EAST

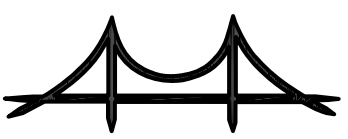
NORTH



Section B-B

Note:

- Dimensions not cut length



2015 NAU ASCE STEEL BRIDGE

Decking and Cross Bracing

Drawn By: LS

Checked By: SH, WC, NC

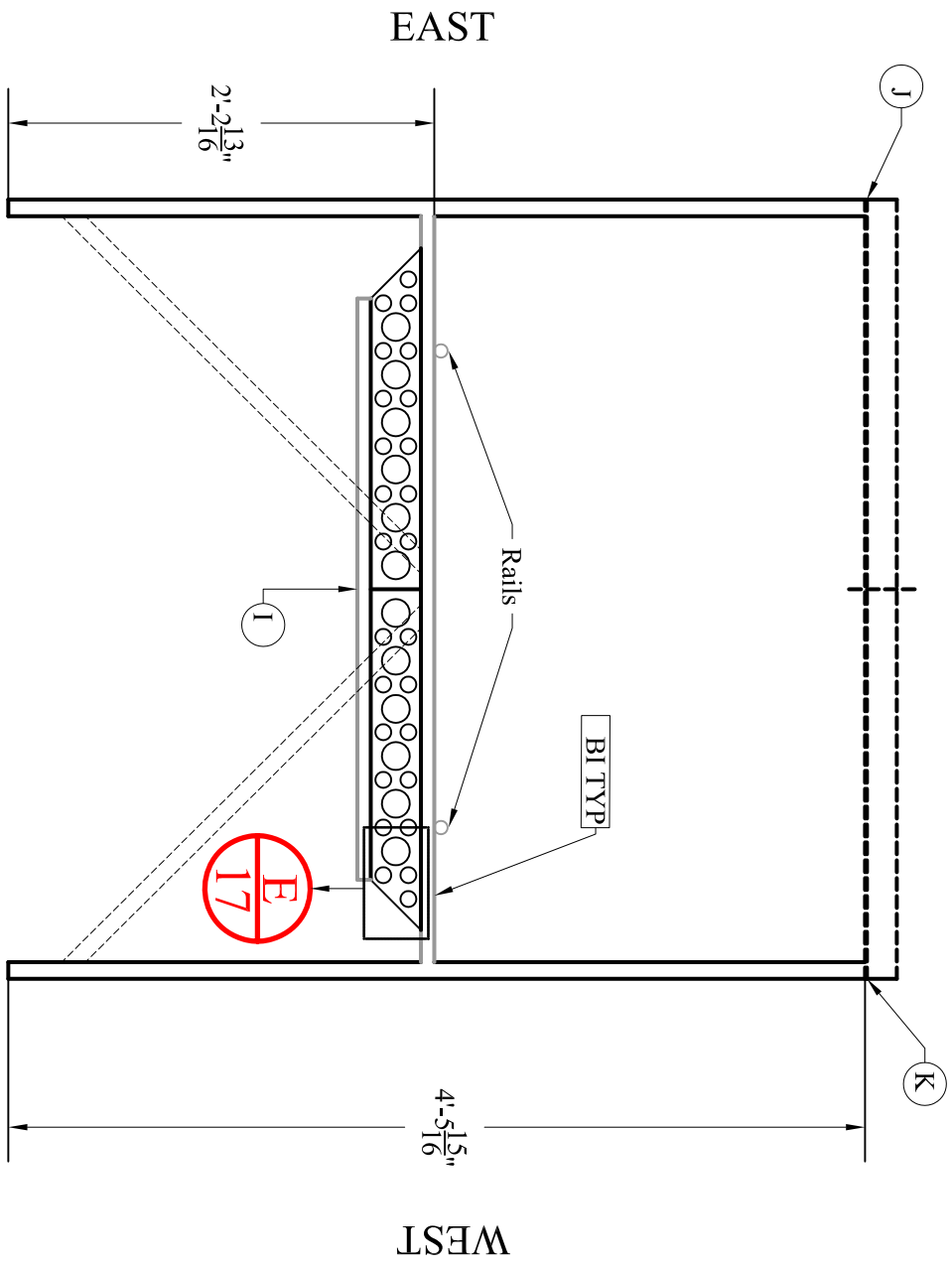
Date: FEBRUARY 2015

Scale: 1":2'

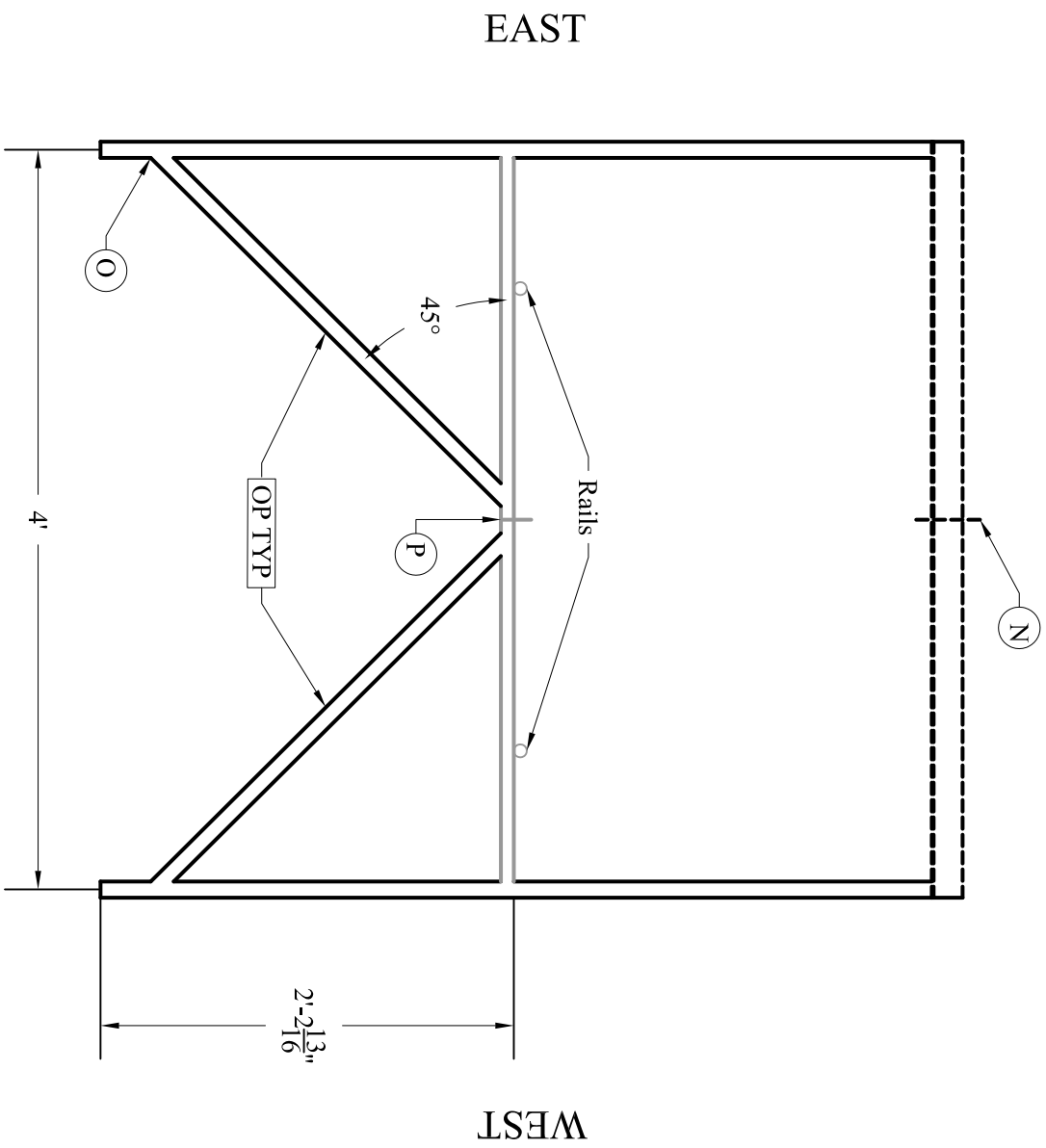
Revision No.

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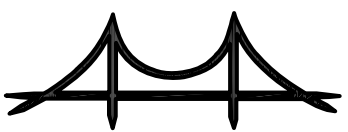


Section C-C



Section D-D

- Note:
- Dimensions not cut length



2015 NAU ASCE STEEL BRIDGE

Section Views C and D

Drawn By: LS

Checked By: SH, NC, WC

Date: FEBRUARY 2015

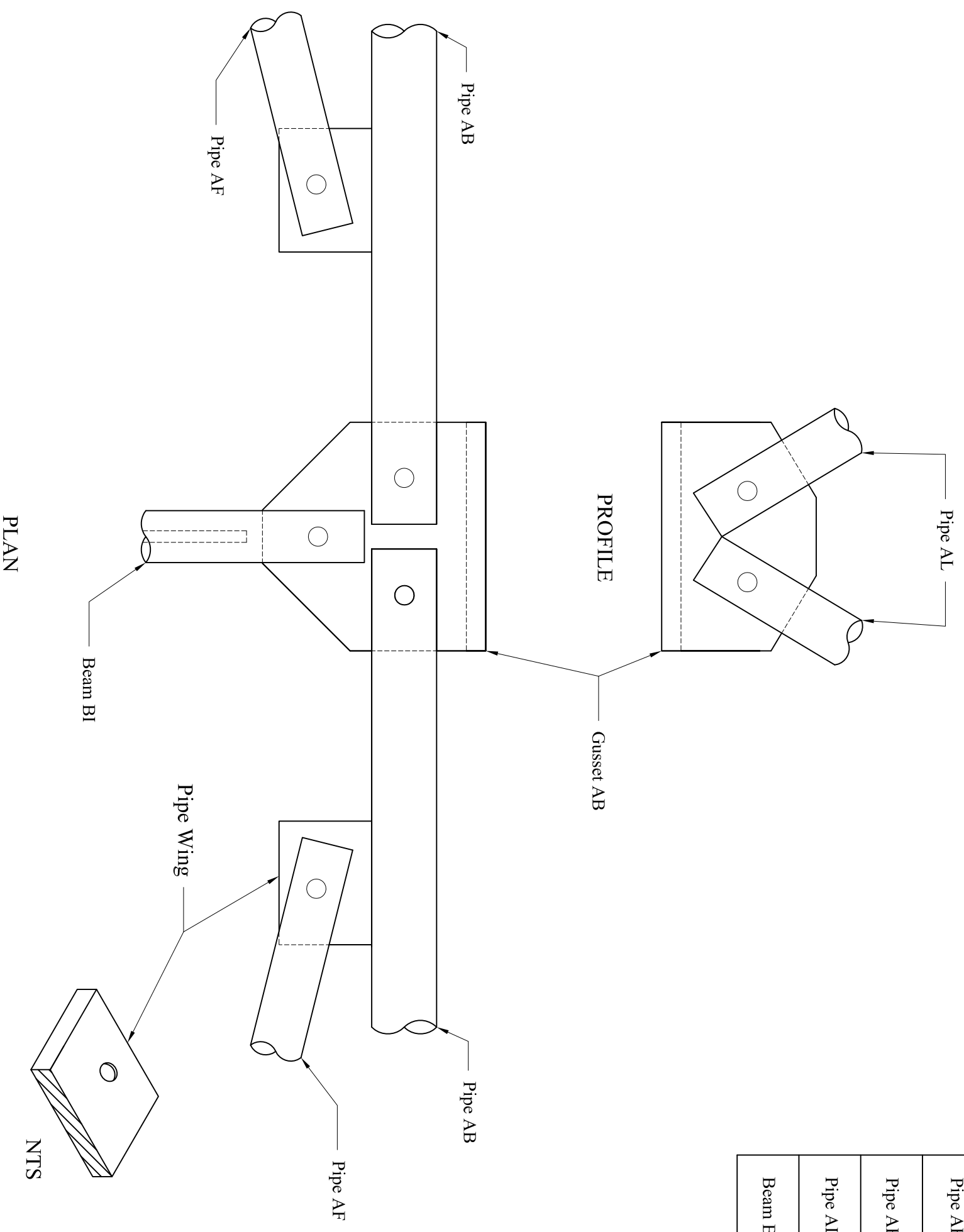
Scale: 1":2'

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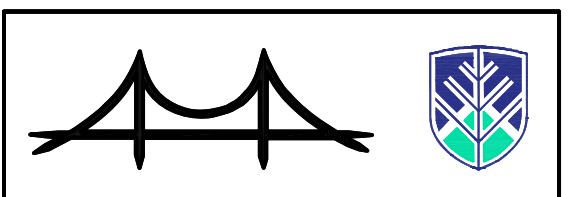
Component	Cut	Qty
Gusset AB	See Pg. 10	1
Pipe AB	See Pg. 4	2
Pipe AF	See Pg. 4	2
Pipe AL	See Pg. 3	2
Beam BI	See Pg. 4	1



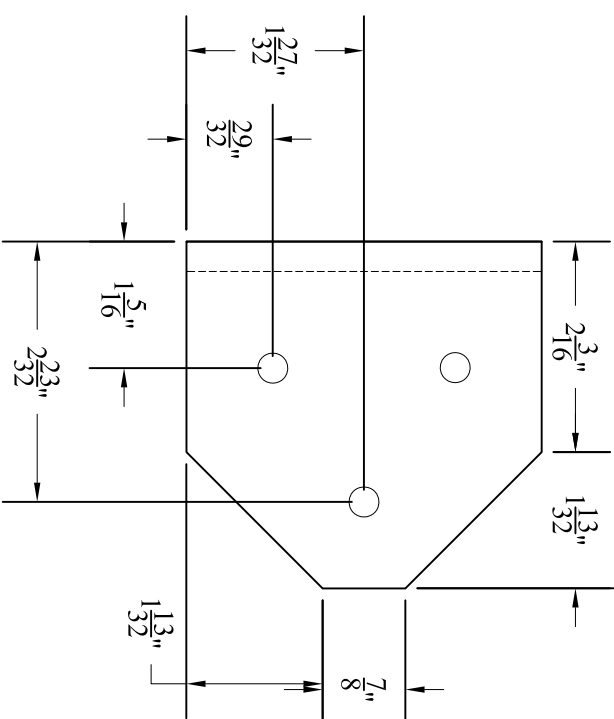
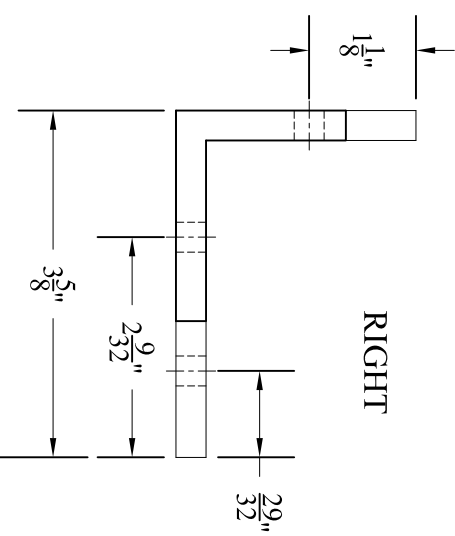
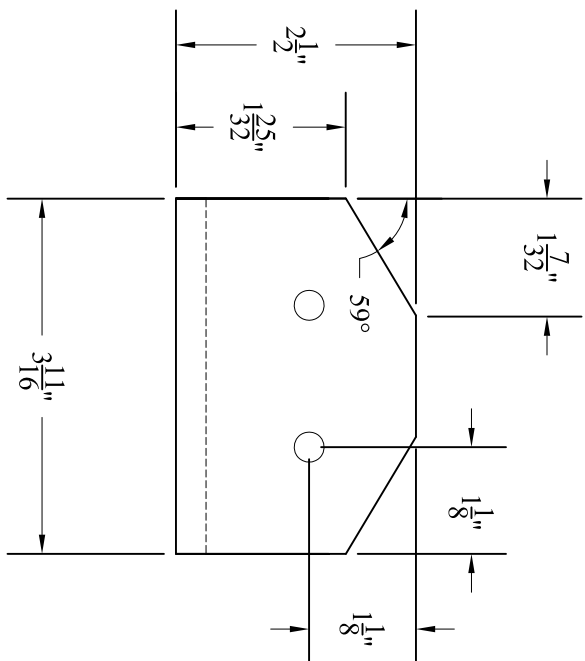
Revision No.	2
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Drawn By: WC
Checked By: NC, SH, LS
Date: FEBRUARY 2015
Scale: 1" : 2"

2015 NAU ASCE STEEL BRIDGE
Connection Details - A



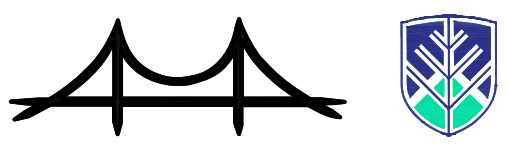
Material	Cut	Qty
6x4x $\frac{5}{16}$ Structural Angle	$\frac{311}{16}$ "	10



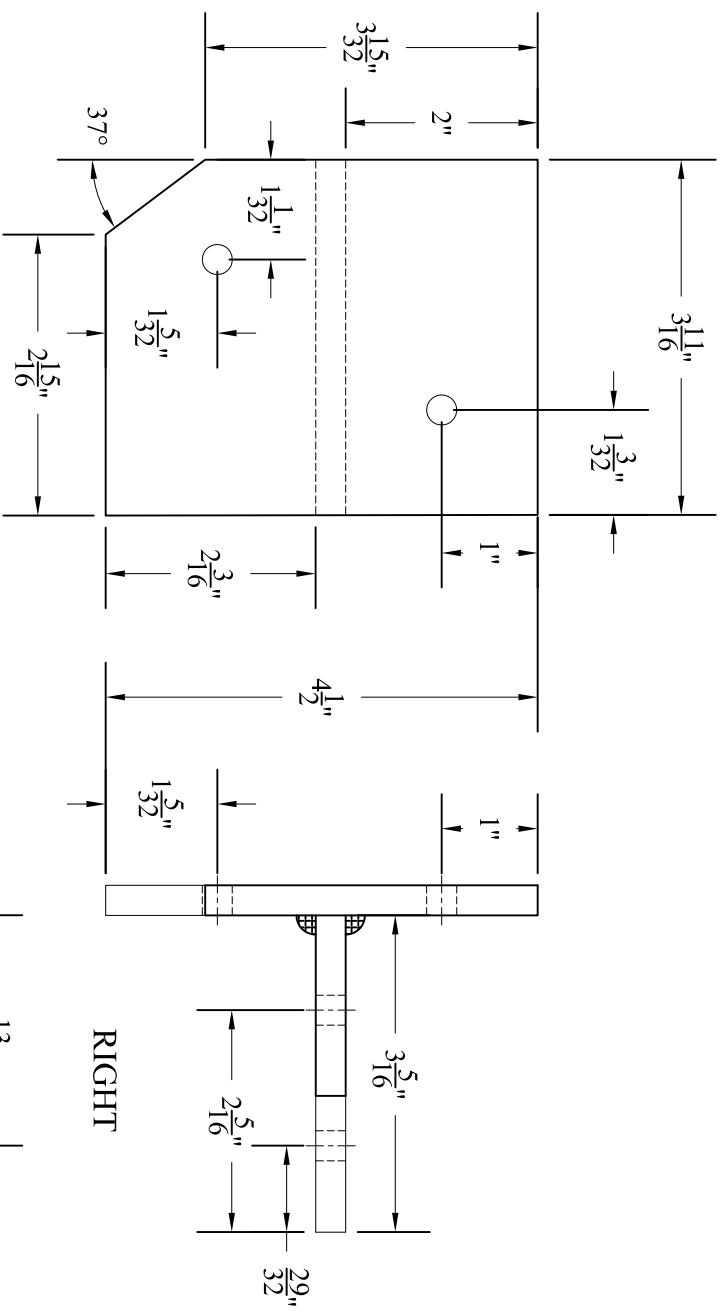
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Drawn By: WC
Checked By: NC, SH, LS
Date: FEBRUARY 2015
Scale: 1" : 2"

2015 NAU ASCE STEEL BRIDGE
Gusset AB



Material	Cut	Qty
$\frac{5}{16}$ Plate	$3\frac{11}{16}$ " x $4\frac{1}{2}$ "	4
$\frac{5}{16}$ Plate	$3\frac{11}{16}$ " x $3\frac{5}{16}$ "	4

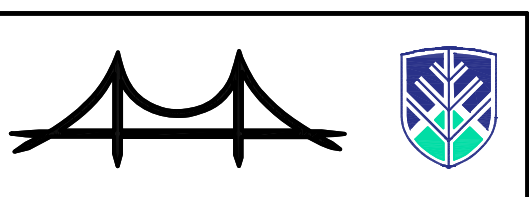


- Note:
- Four gussets will be needed - two with the tab on the left and two with the tab on the right

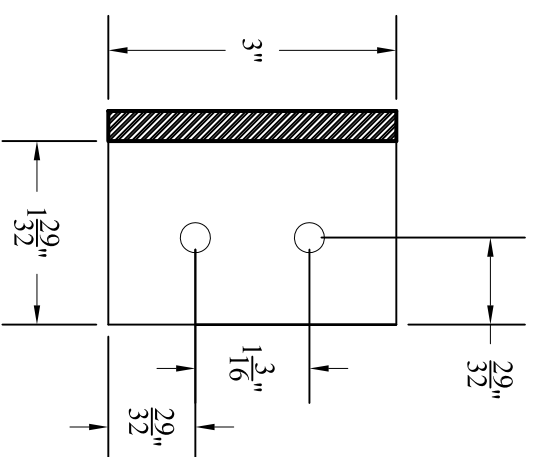
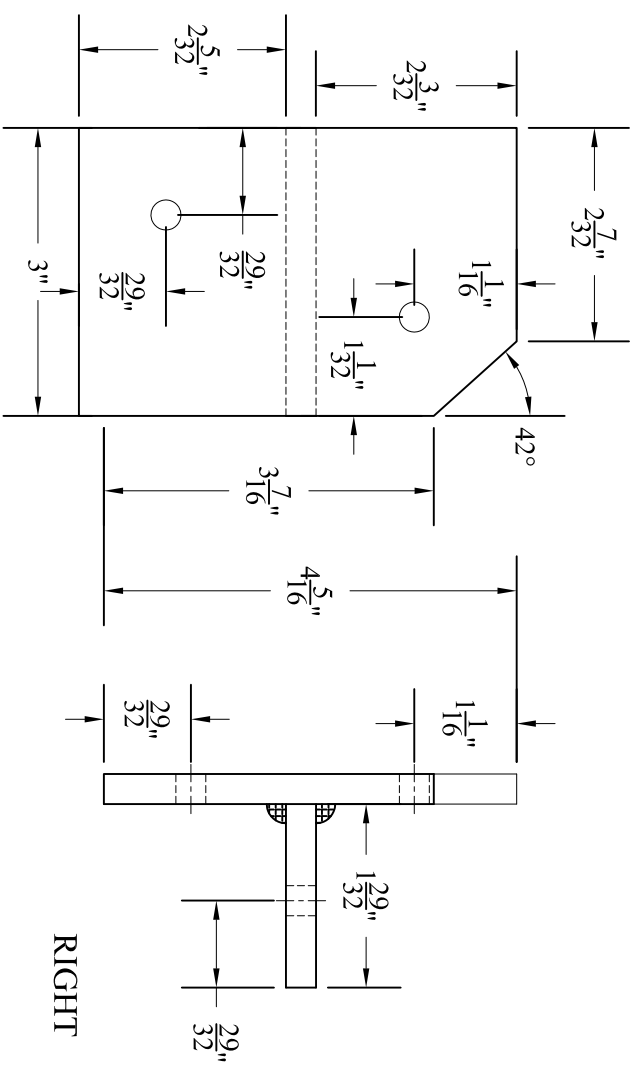
Revision No.	2
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Drawn By: WC
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Date: FEBRUARY 2015
Scale: 1" : 2"

2015 NAU ASCE STEEL BRIDGE
Gusset C



Material	Cut	Qty
$\frac{5}{16}$ Plate	$4\frac{5}{16}$ " x 3"	4
$\frac{5}{16}$ Plate	$4\frac{3}{4}$ " x $2\frac{3}{4}$ "	4

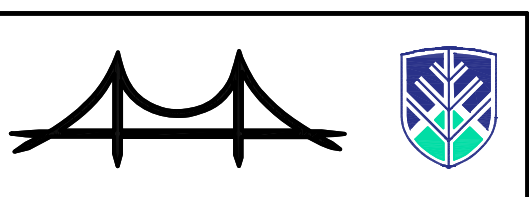


- Note:
- Four gussets will be needed - one for each corner - they should be oriented appropriately

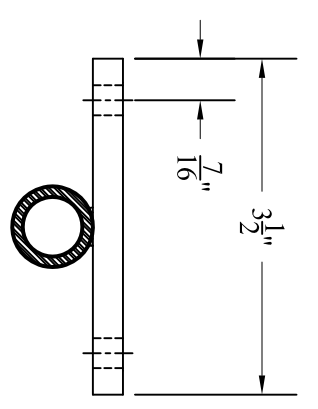
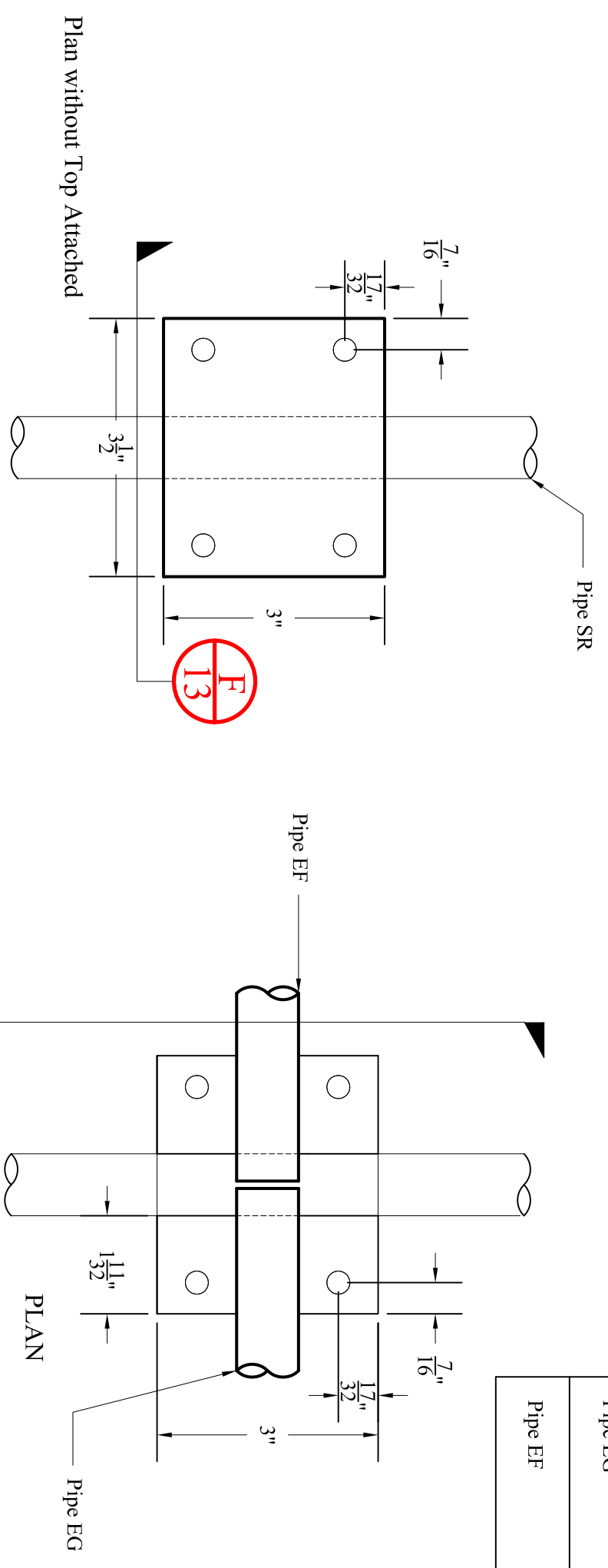
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Drawn By: WC
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Date: FEBRUARY 2015
Scale: 1" : 2"

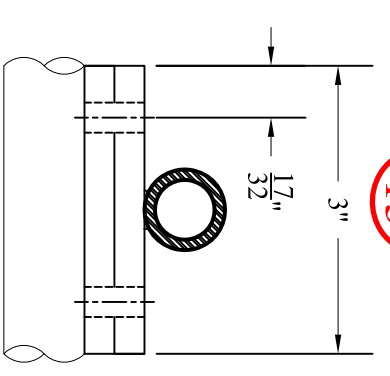
2015 NAU ASCE STEEL BRIDGE
Gusset D



Material	Cut	Qty
Pipe SR	See Pg. 4	1
Pipe EG	See Pg. 4	1
Pipe EF	See Pg. 4	1



Section F
F
13

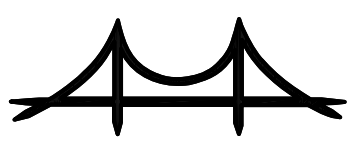


Section G
G
13

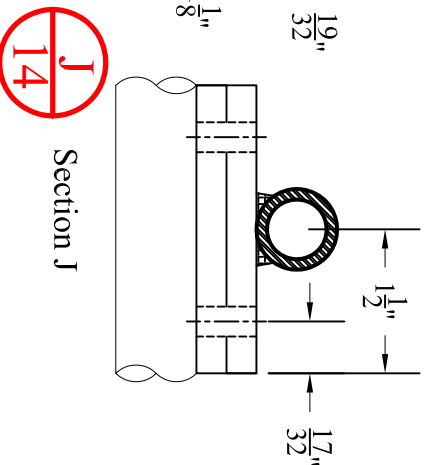
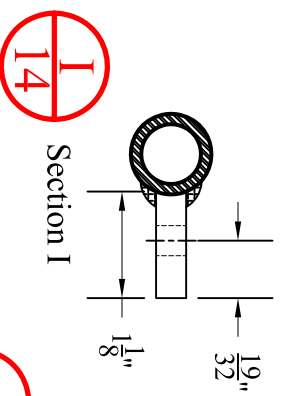
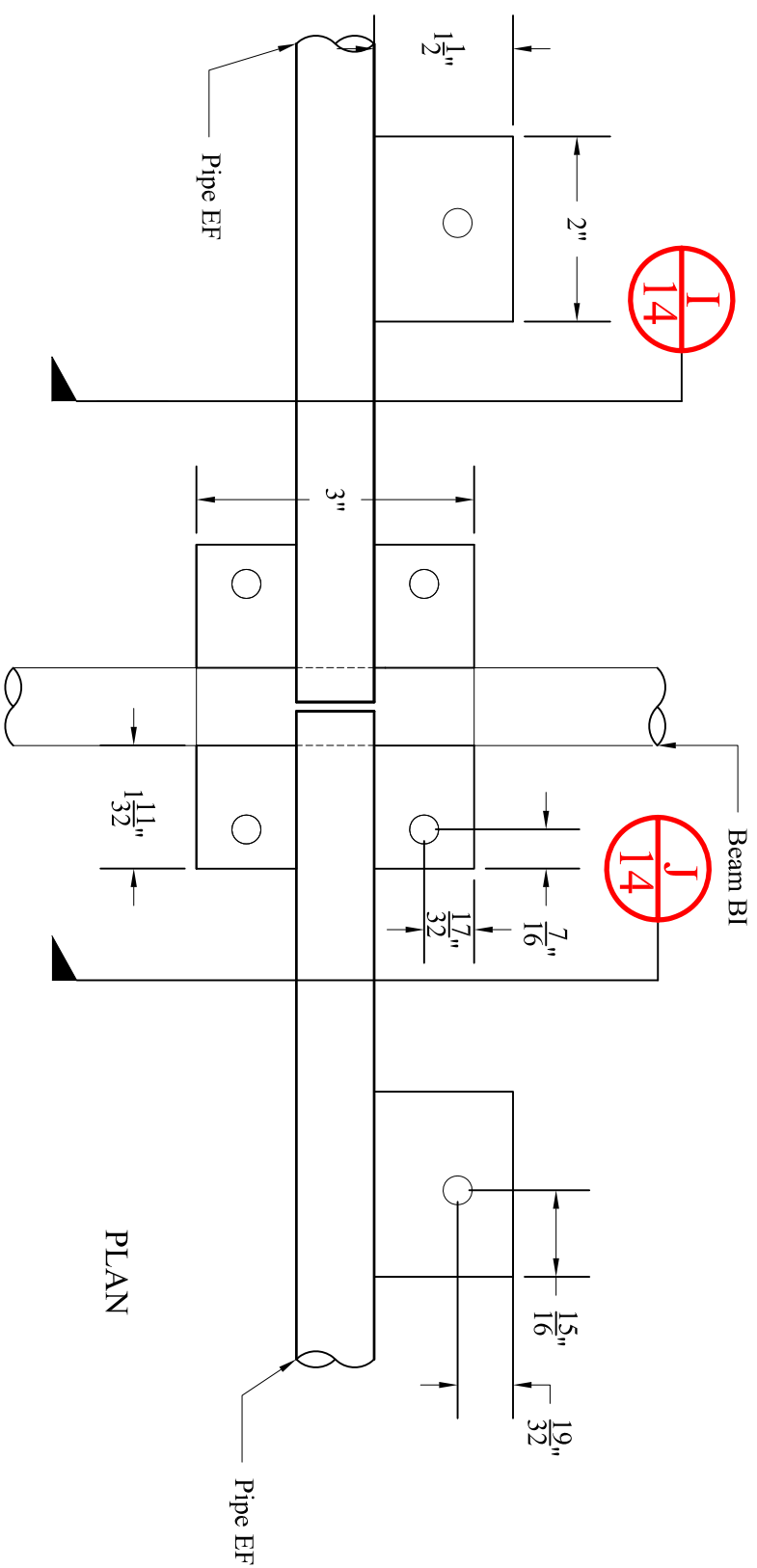
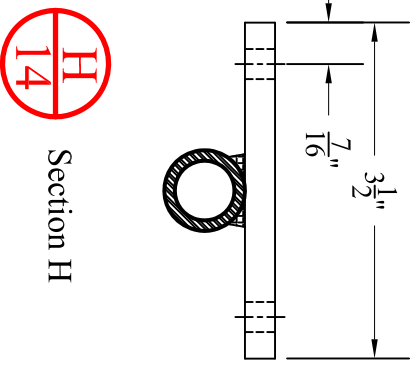
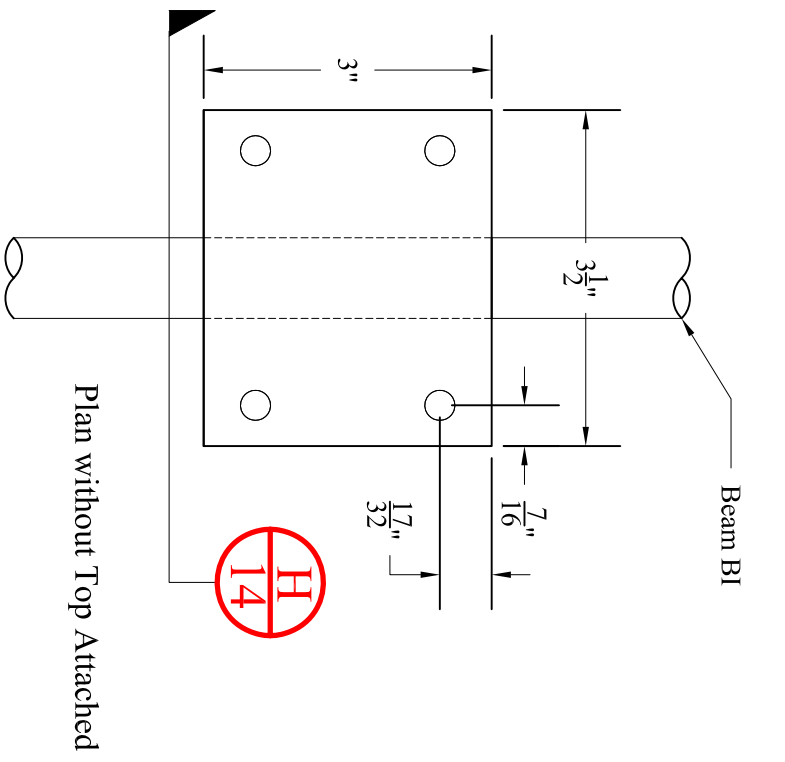
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 Scale: 1" : 2"

2015 NAU ASCE STEEL BRIDGE
 Connection Details - E



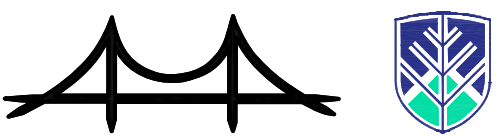
Material	Cut	Qty
Beam BI	See Pg. 4	1
Pipe EF	See Pg. 4	2



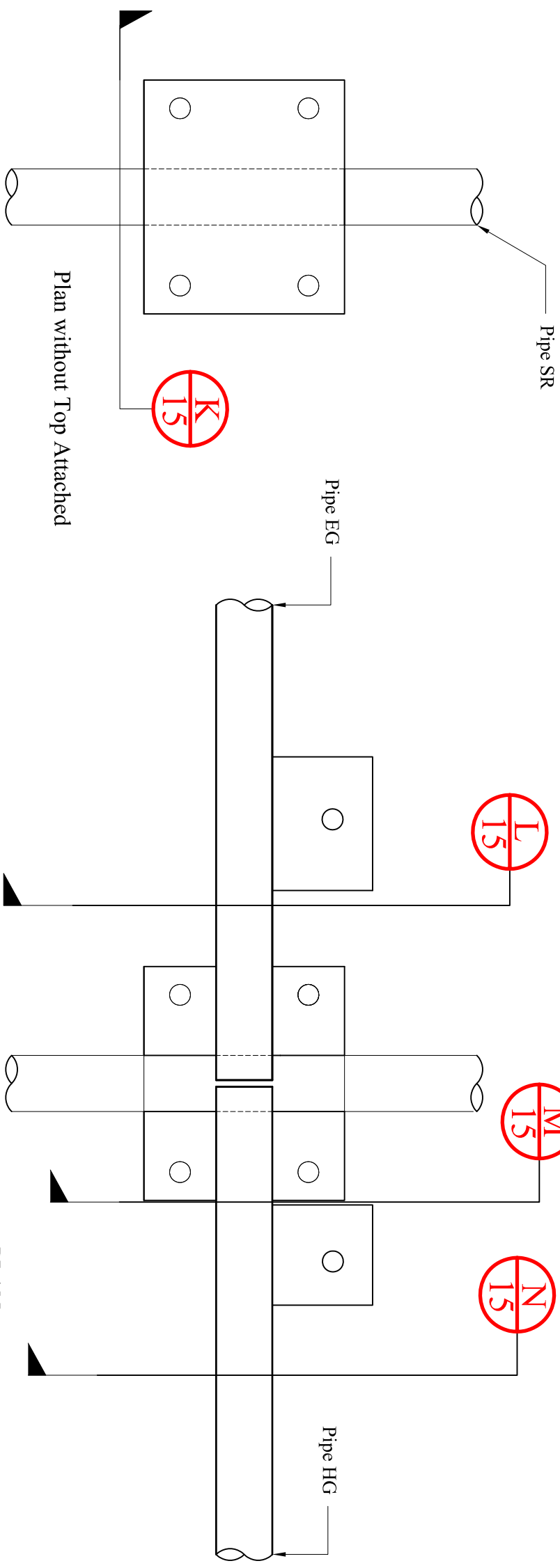
Revision No.
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Drawn By: WC
 Checked By: NC, SH, LS
 Date: FEBRUARY 2015
 Scale: 1" : 2"

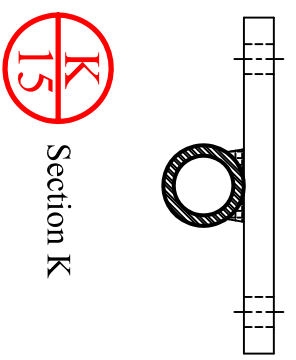
2015 NAU ASCE STEEL BRIDGE
 Connection Details - F



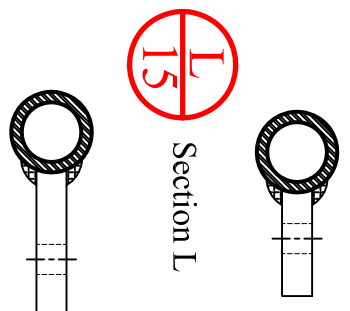
Material	Cut	Qty
Pipe SR	See Pg. 4	1
Pipe EG	See Pg. 4	1
Pipe HG	See Pg. 4	1



PLAN



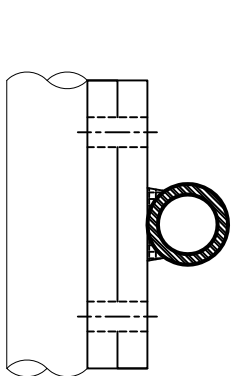
Section K
K
15



Section L
L
15



Section M
M
15

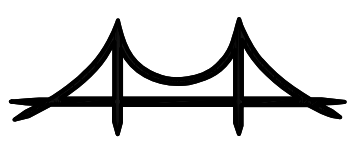


Section N
N
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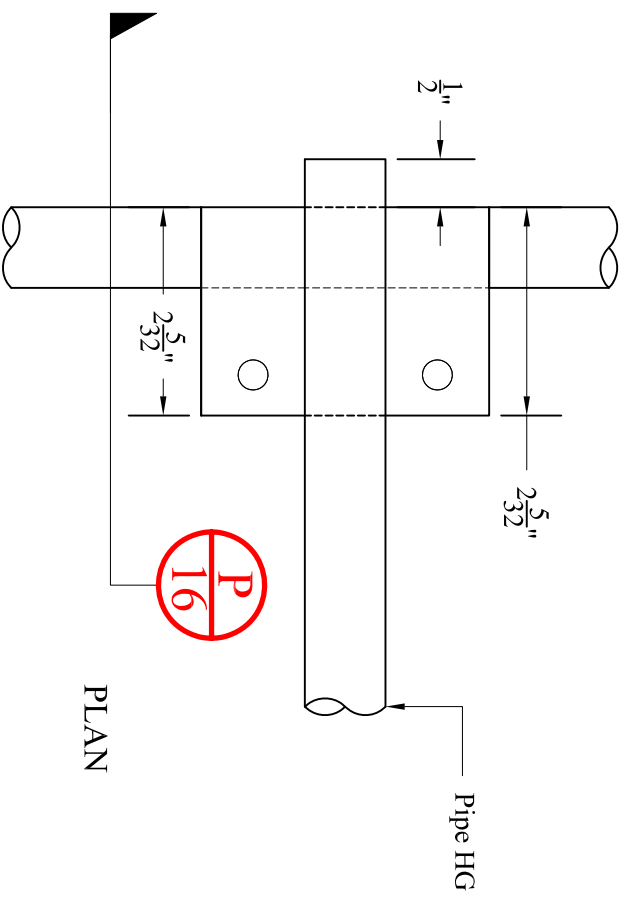
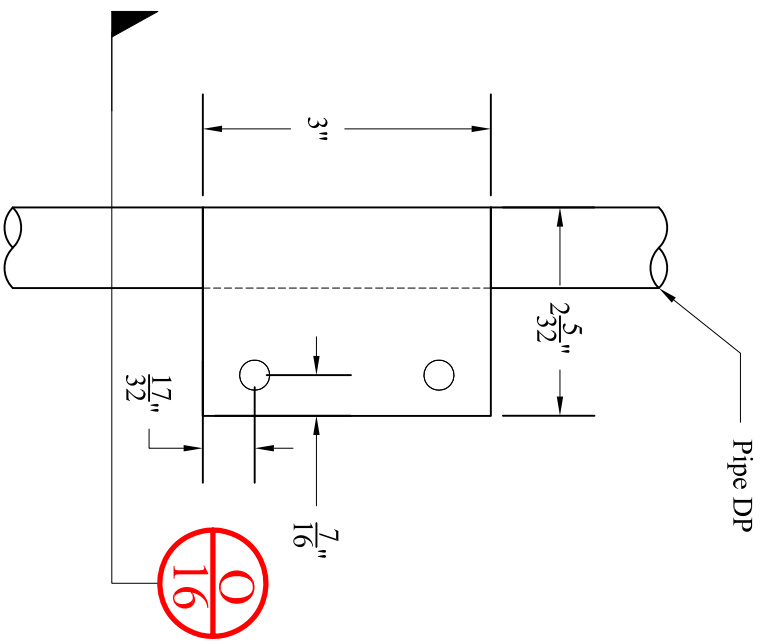
Revision No.
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Drawn By: WC
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 Scale: 1" : 2"

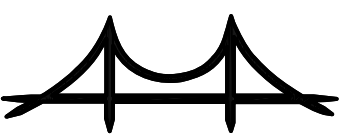
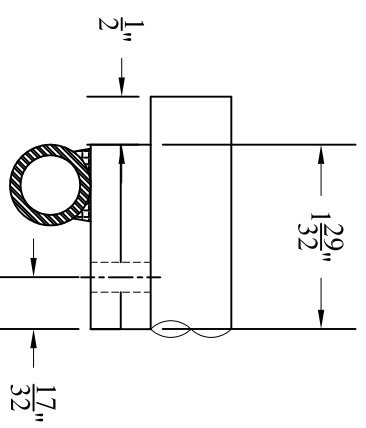
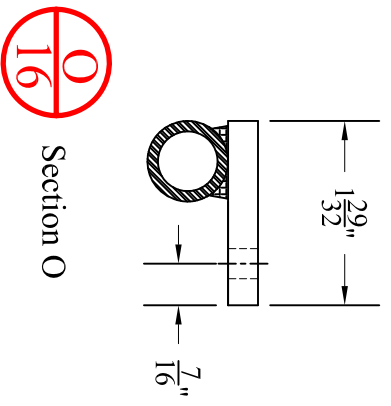
2015 NAU ASCE STEEL BRIDGE
 Connection Details - G



Component	Cut	Qty
Pipe DP	See Pg. 4	1
Pipe HG	See Pg. 4	1



Plan without Top Attached



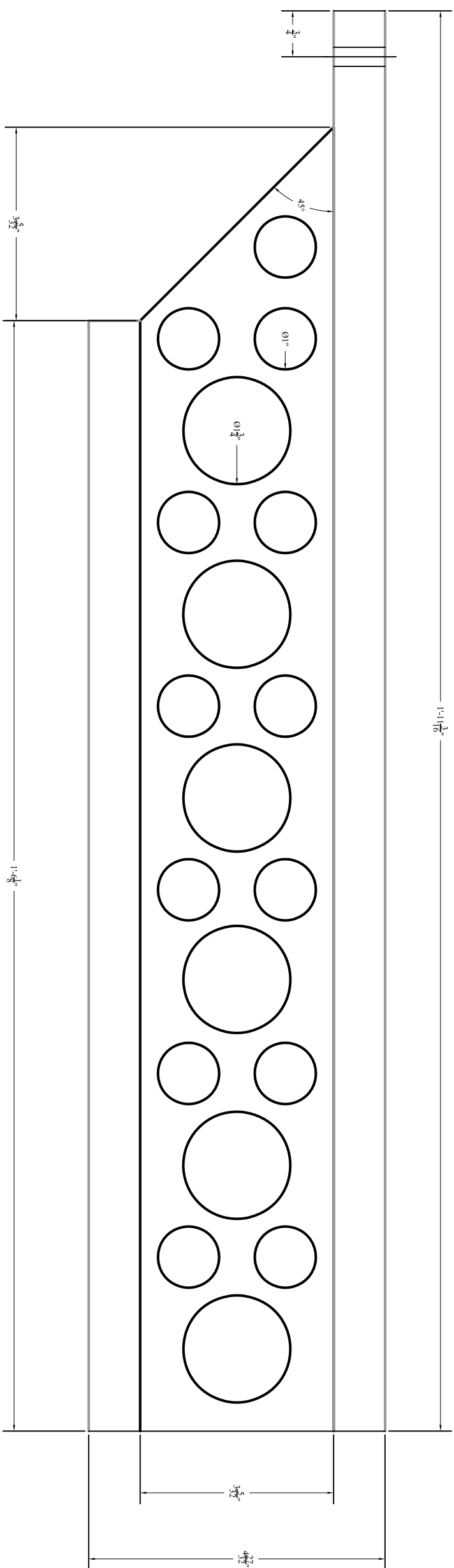
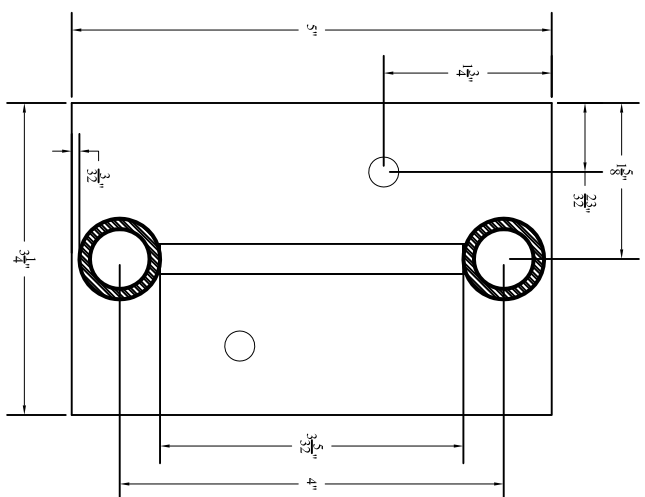
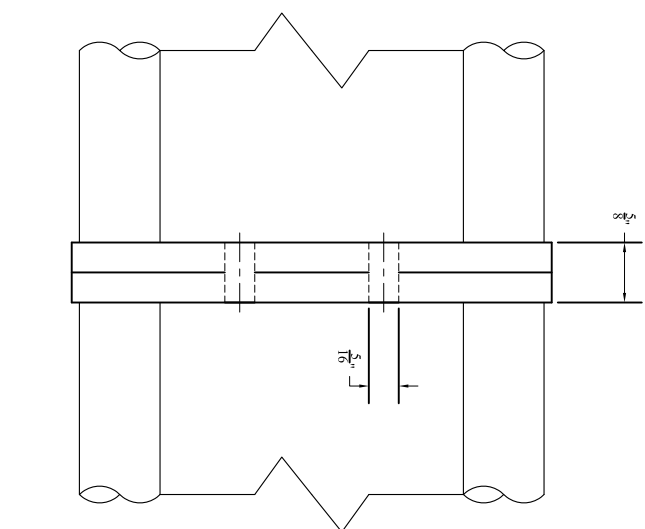
2015 NAU ASCE STEEL BRIDGE

Connection Details - H

Drawn By: WC
 Checked By: NC, SH, LS
 Date: FEBRUARY 2015
 Scale: 1" : 2"

Revision No.
 2
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Material	Cut	Qty
Beam B1	See Pg. 4	2



Revision No.

2

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Drawn By: WC

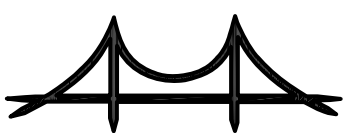
Checked By: LS, NC, WC

Date: FEBRUARY 2015

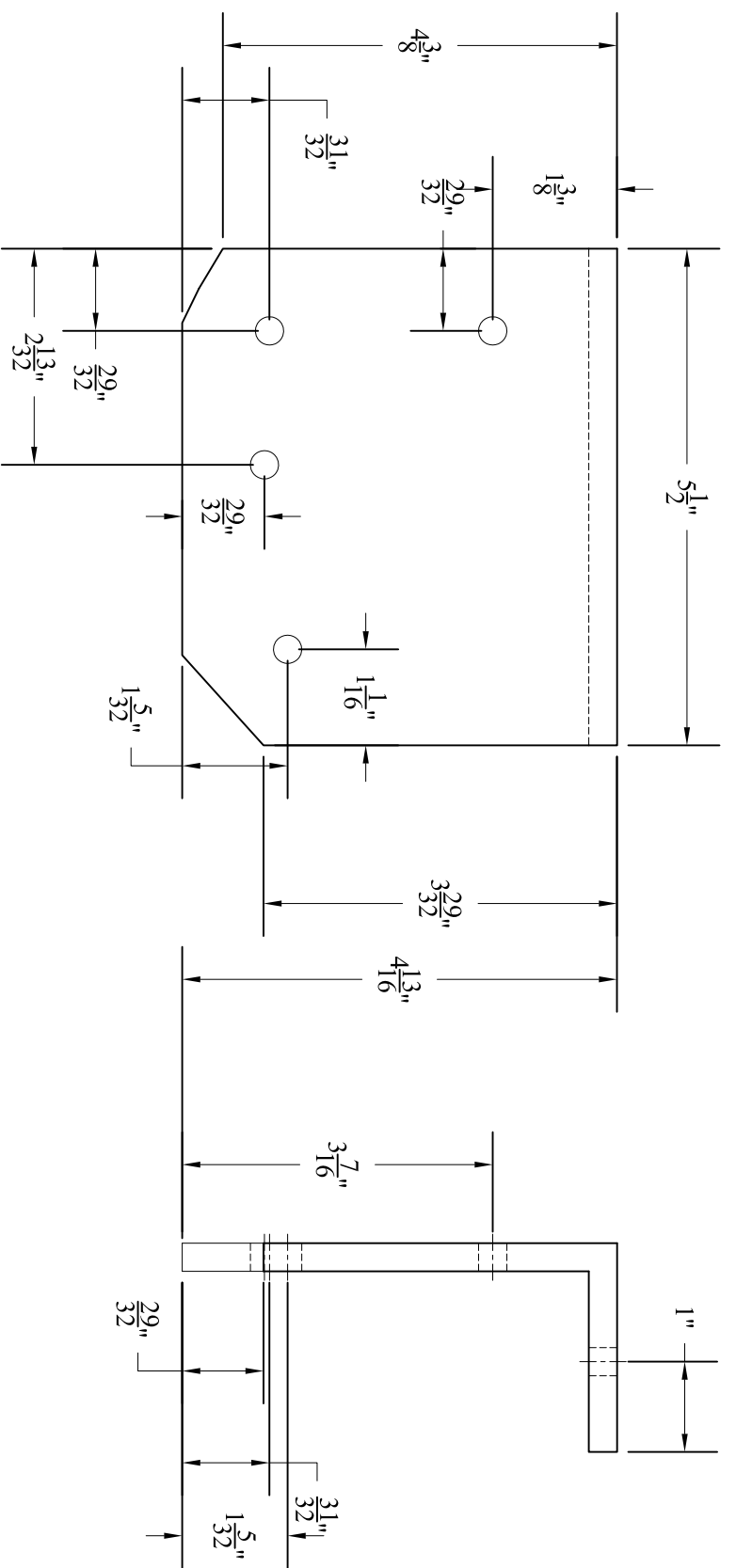
Scale: 1:2

2015 NAU ASCE STEEL BRIDGE

Connection Details - I

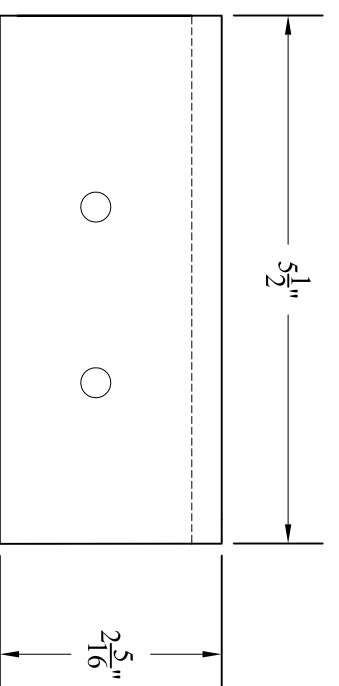


Material	Cut	Qty
6x4x $\frac{5}{16}$ Structural Angle	5 $\frac{1}{2}$ "	2



FRONT

RIGHT



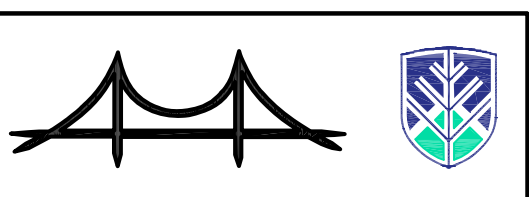
TOP

- Note:
- This plate must be oriented for opposite corners
 - The top holes for the L-cross bars will be fitted at the end of fabrication. One hole will be necessary for K and two holes will be necessary for J

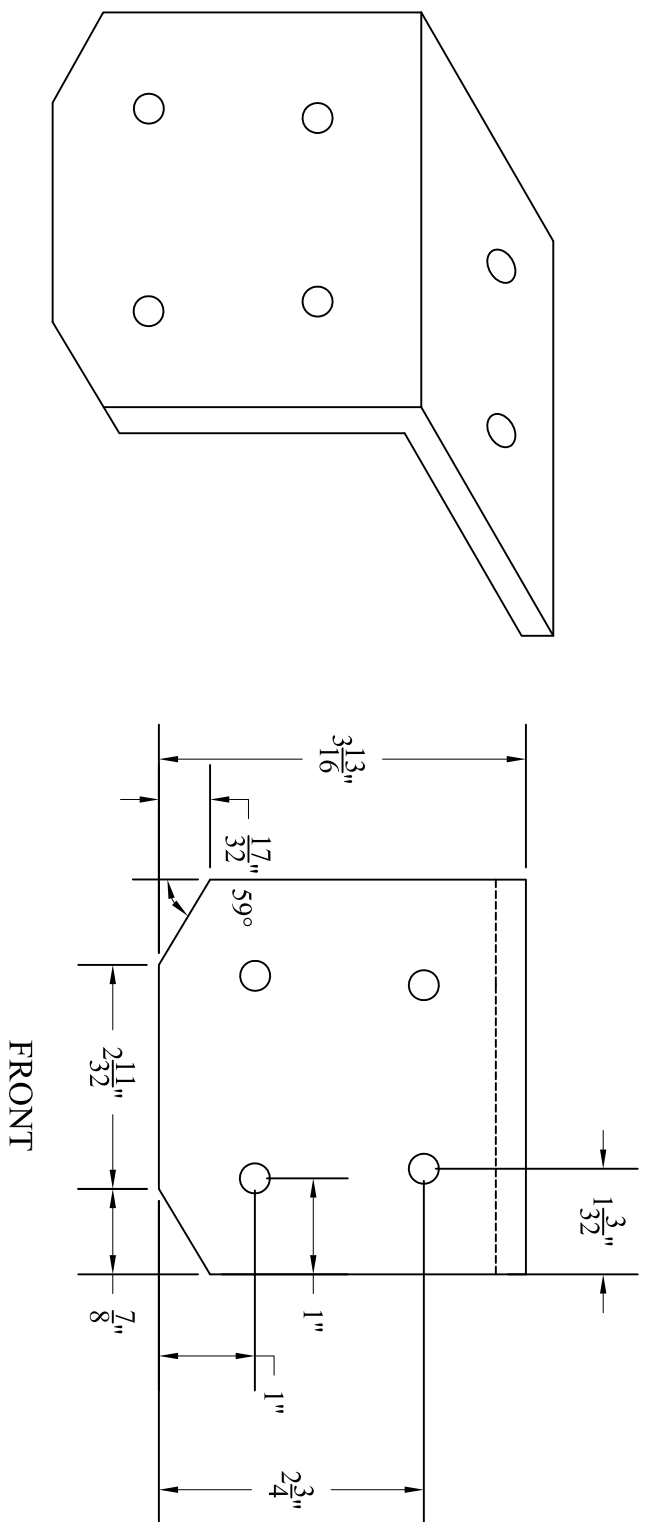
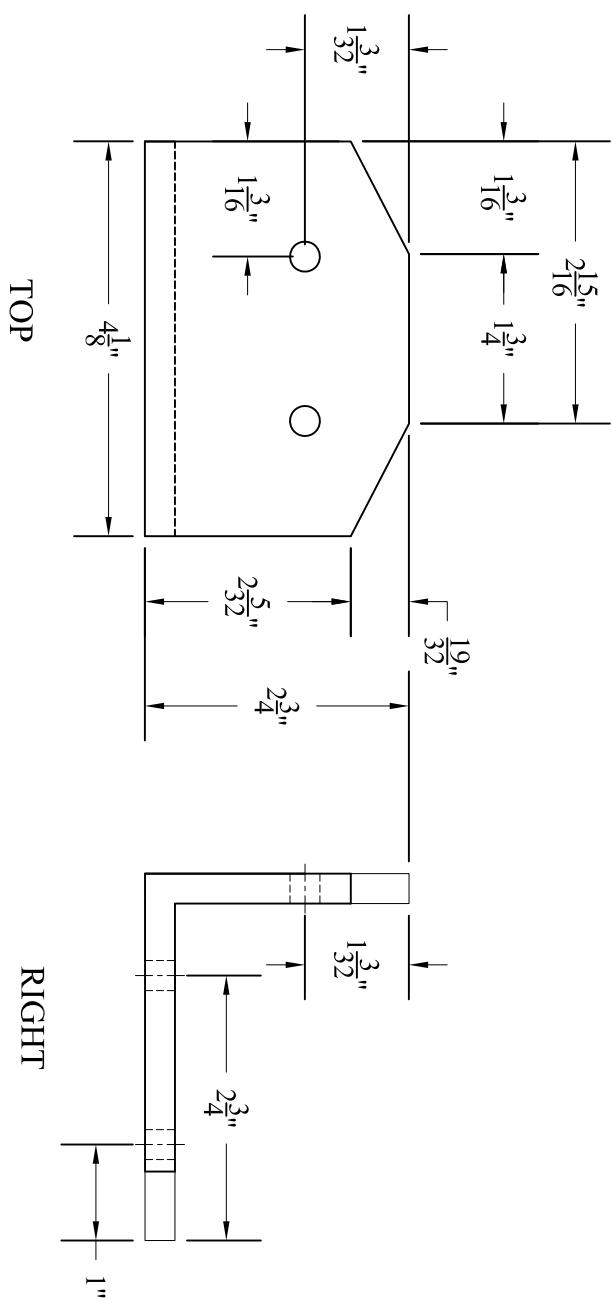
Revision No.	2
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Drawn By: WC
 Checked By: NC, SH, LS
 Date: FEBRUARY 2015
 Scale: 1" : 2"

2015 NAU ASCE STEEL BRIDGE
 Gusset JK



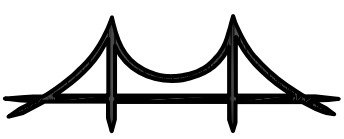
Material	Cut	Qty
6x4x $\frac{1}{2}$ Structural Angle	4 $\frac{1}{8}$ "	4



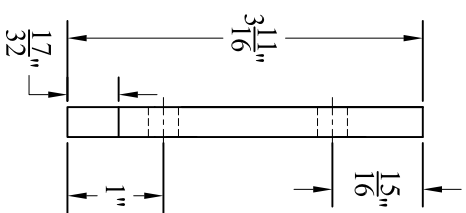
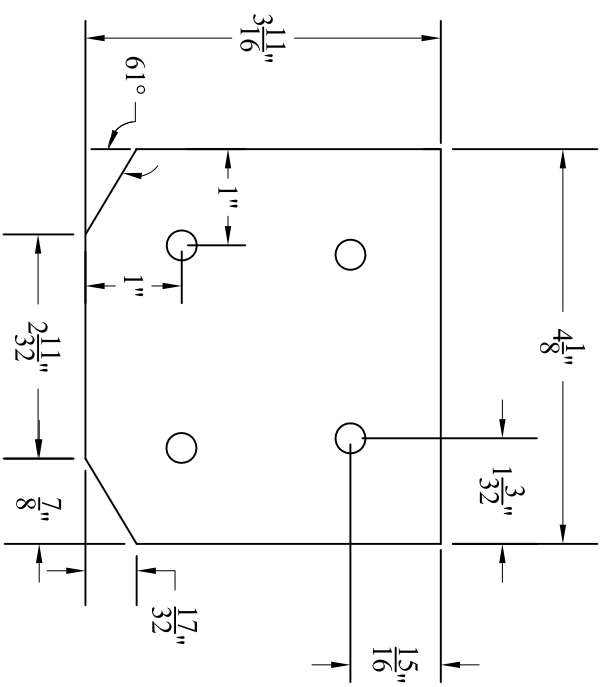
Revision No.
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Drawn By: WC
Checked By: NC, SH, LS
Date: FEBRUARY 2015
Scale: 1" : 2"

2015 NAU ASCE STEEL BRIDGE
Gusset L



Material	Cut	Qty
$\frac{5}{16}$ Plate	$3\frac{11}{16}$ " x $4\frac{1}{8}$ "	4

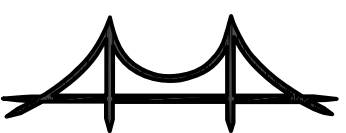


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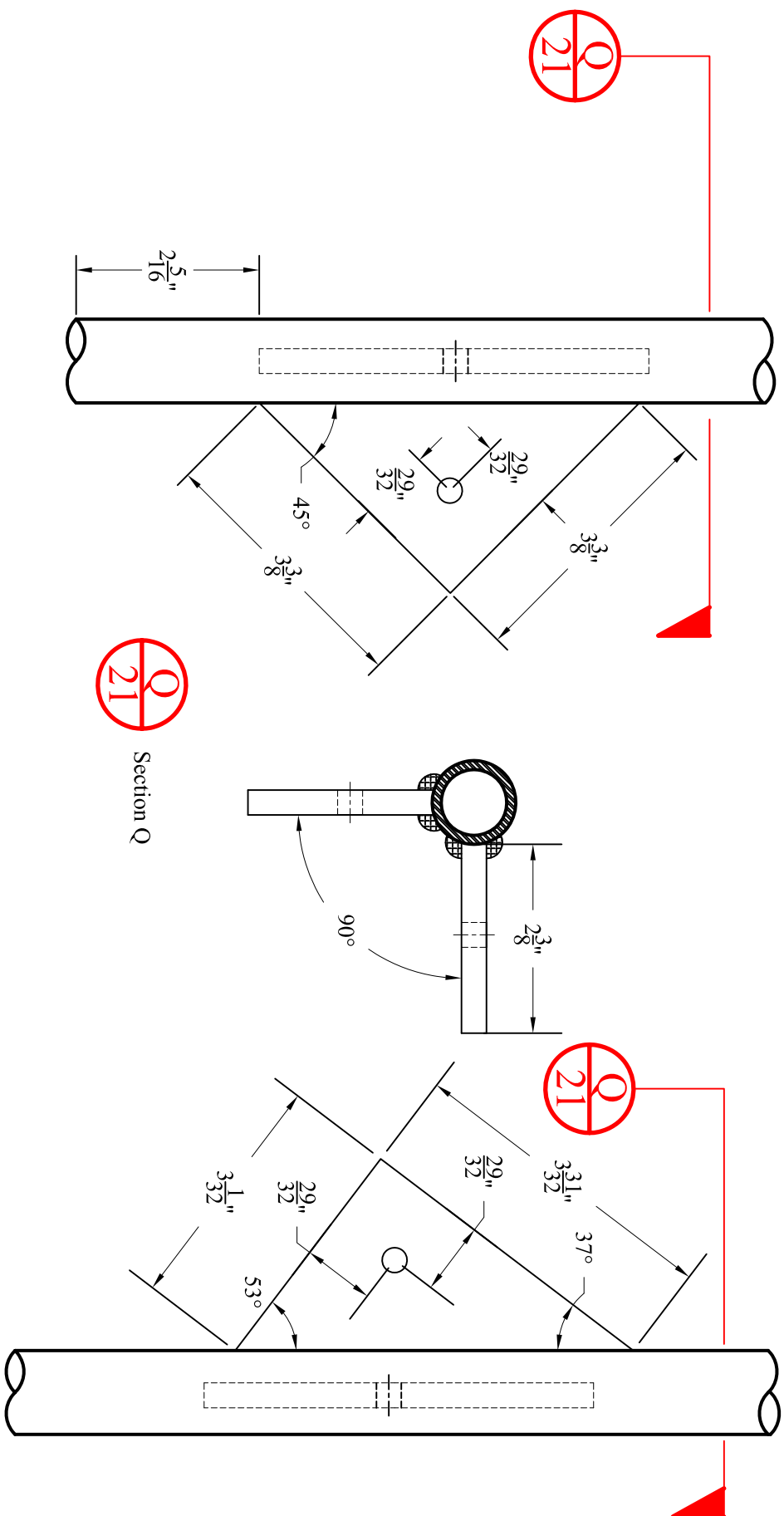
Drawn By: WC
Checked By: NC, SH, LS
Date: FEBRUARY 2015
Scale: 1" : 2"

2015 NAU ASCE STEEL BRIDGE

Gusset M

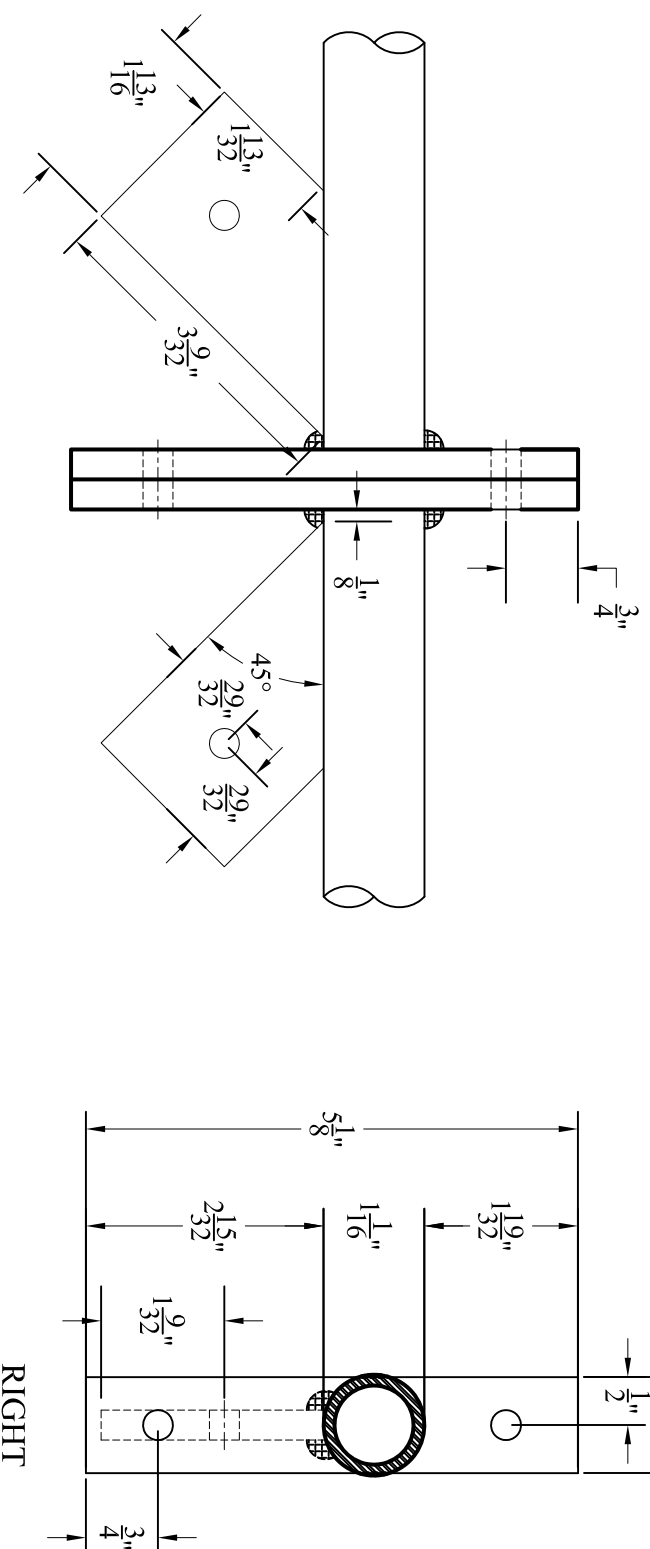


Material	Cut	Qty
$\frac{5}{16}$ " Plate	See Left	4
$\frac{1}{2}$ " Plate	See Front	4



Connection O

Material	Cut	Qty
Pipe DP	See Pg. 4	2

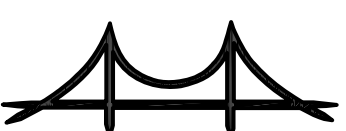


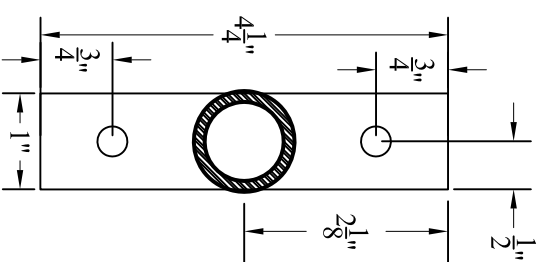
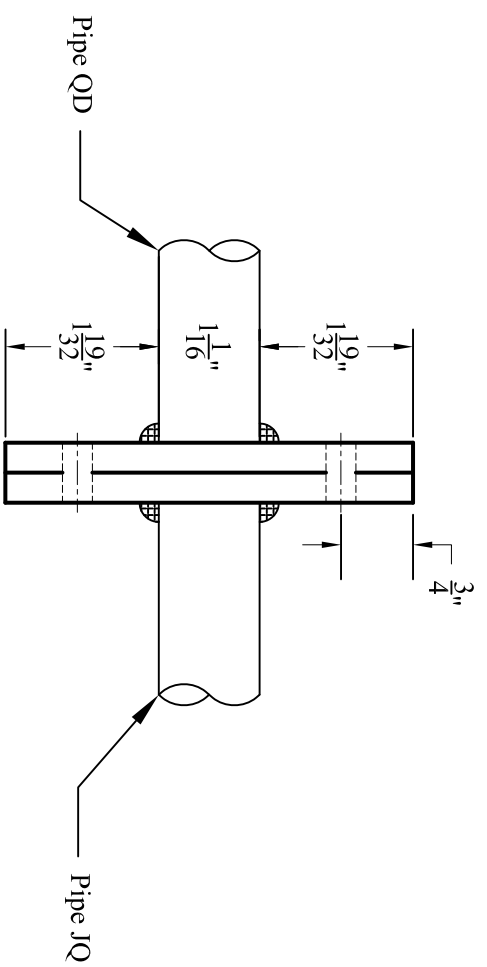
Connection P

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Drawn By: WC
 Checked By: NC, SH, LS
 Date: FEBRUARY 2015
 Scale: 1" : 2"

2015 NAU ASCE STEEL BRIDGE
 Connection Details O and P



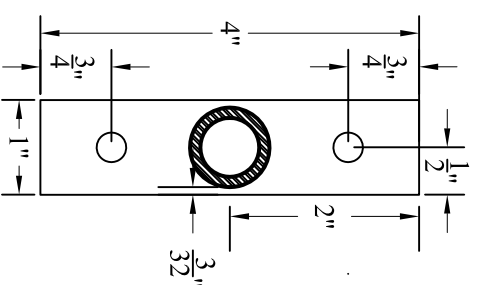
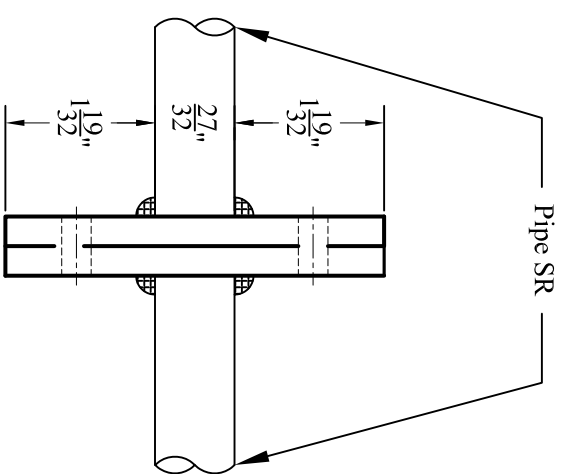


Material	Cut	Qty
Pipe QD	See Pg. 3	1
Pipe JQ	See Pg. 3	1

FRONT

RIGHT

Connection Q



Material	Cut	Qty
Pipe SR	See Pg. 4	2

FRONT

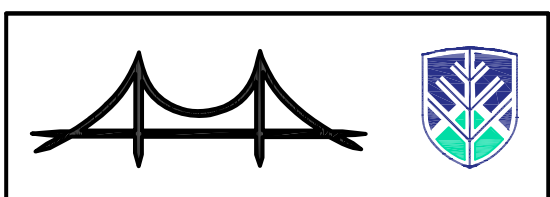
RIGHT

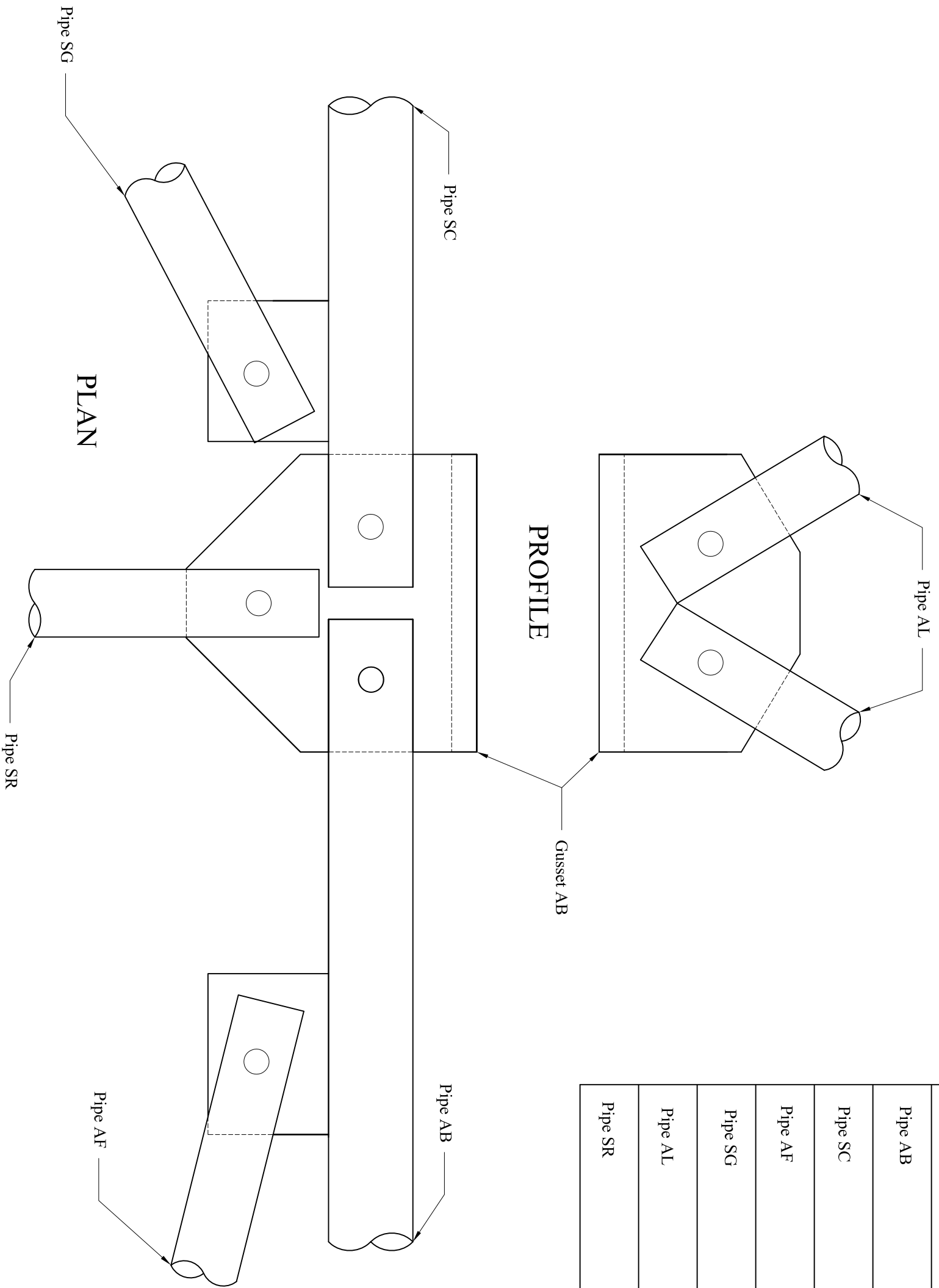
Connection R

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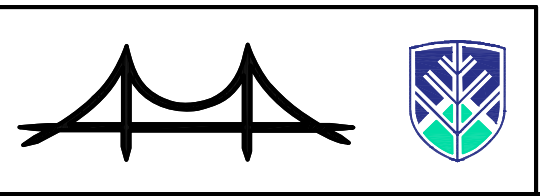
Drawn By: WC
Checked By: NC, SH, LS
Date: FEBRUARY 2015
Scale: 1" : 2"

2015 NAU ASCE STEEL BRIDGE
Connection Details - Q and R





Material	Cut	Qty
Gusset AB	See Pg. 10	1
Pipe AB	See Pg. 4	1
Pipe SC	See Pg. 4	1
Pipe AF	See Pg. 4	1
Pipe SG	See Pg. 4	1
Pipe AL	See Pg. 3	2
Pipe SR	See Pg. 4	1



2015 NAU ASCE STEEL BRIDGE
 Connection Details - S

Drawn By: WC
 Checked By: NC, SH, LS
 Date: FEBRUARY 2015
 Scale: 1" : 2"

Revision No.
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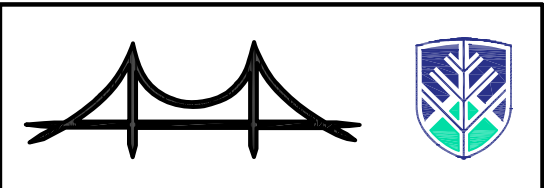
PIECE NUMBER	NUMBER TOTAL	JOINT 1	NUMBER 1	JOINT 2	NUMBER 2	JOINT 3	NUMBER 3
1	8	A	4	S	4		
2	4	C	4				
3	4	C	4				
4	4	D	4				
5	4	D	4				
6	4	D	4				
7	14	E	6	F	4	G	4
8	28	E	12	F	8	G	8
9	12	F	8	G	4		
10	4	G	4				
11	8	H	8				
12	6	I	6				
13	4	M	4				
14	4	O	4				
15	4	O	4				
16	4	P	4				
17	4	P	4				
18	8	Q	8				
19	8	R	8				
20	4	S	4				

- Note:
- See pages 24 and 25 for corresponding gusset pieces.

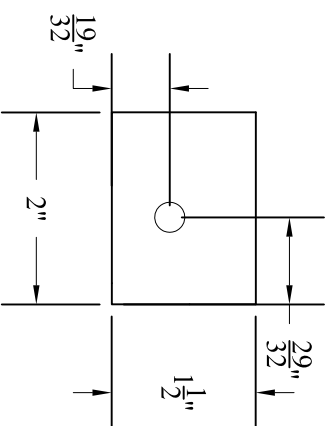
Revision No.	2
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Drawn By: WC
Checked By: NC, SH, LS
Date: FEBRUARY 2015
Scale: N/A

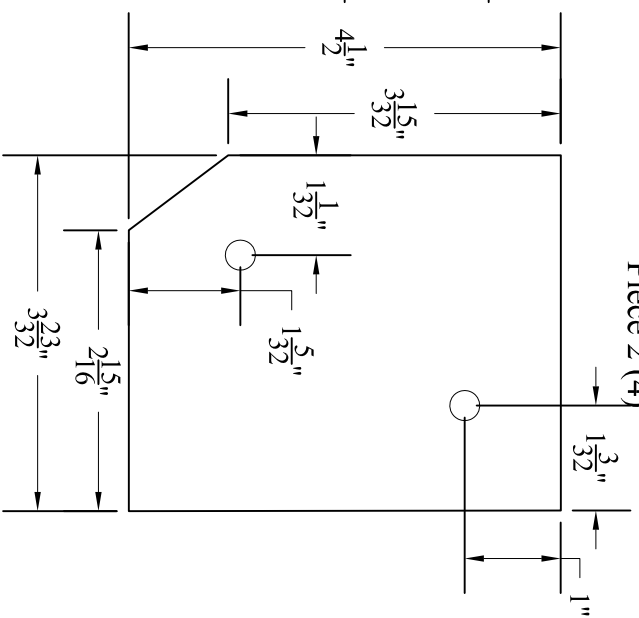
2015 NAU ASCE STEEL BRIDGE
Pieces Summary Chart



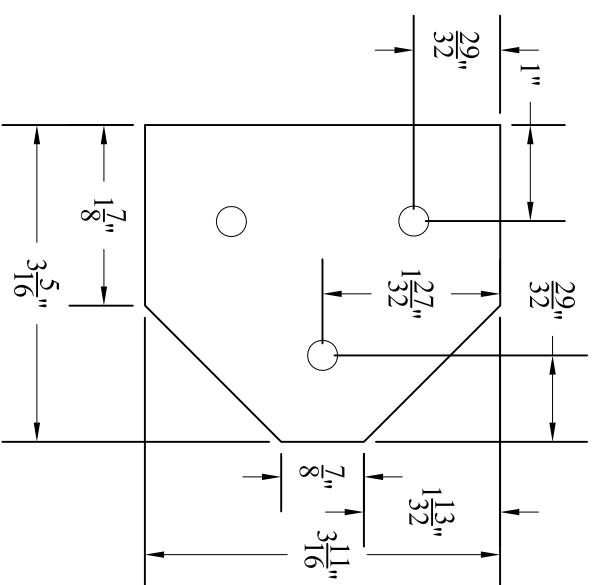
Piece 1 (8)



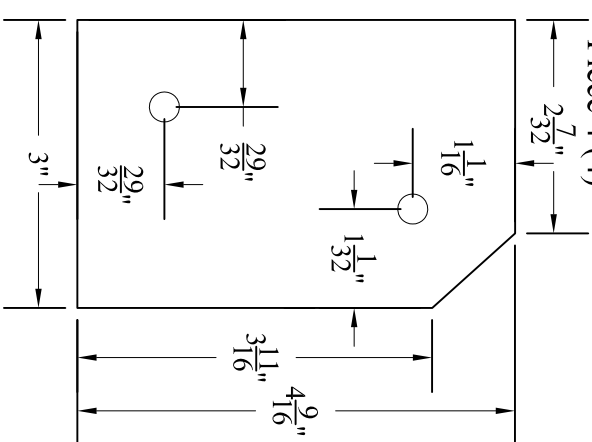
Piece 2 (4)



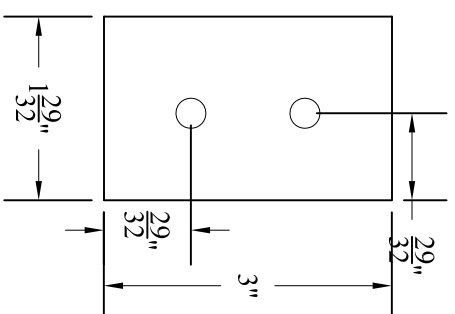
Piece 3 (4)



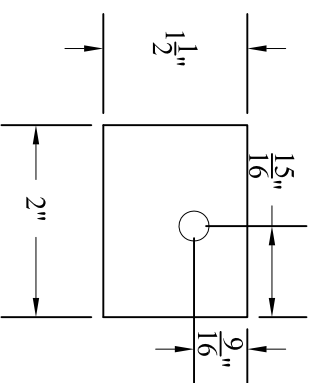
Piece 4 (4)



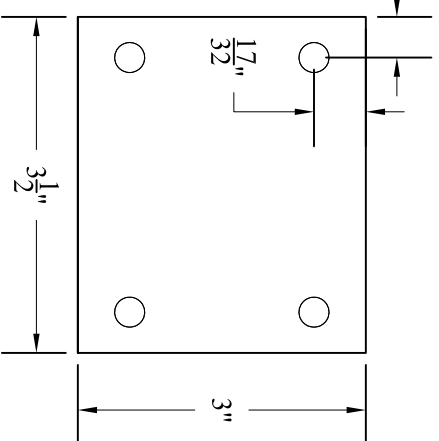
Piece 5 (4)



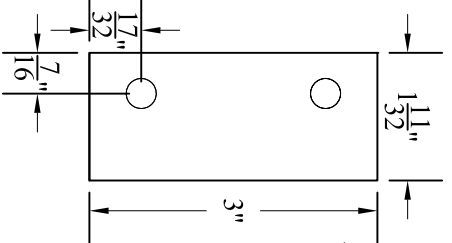
Piece 6 (4)



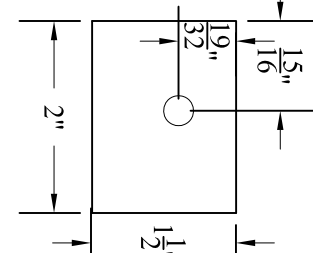
Piece 7 (14)



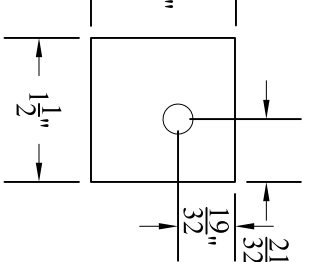
Piece 8 (28)



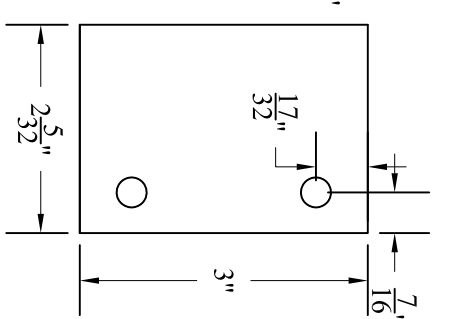
Piece 9 (12)



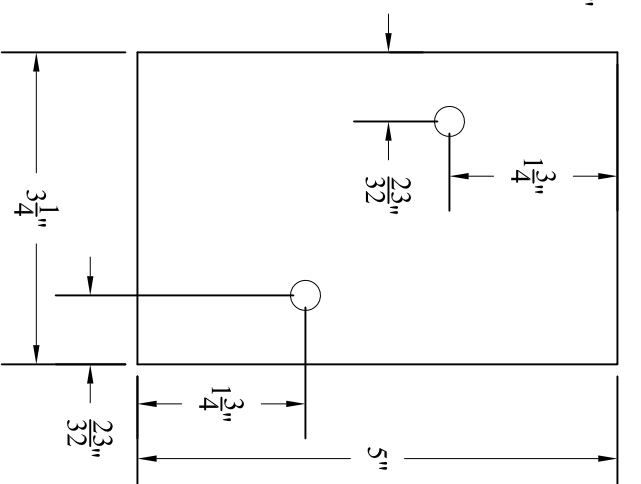
Piece 10 (4)



Piece 11 (8)



Piece 12 (6)



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Drawn By: WC

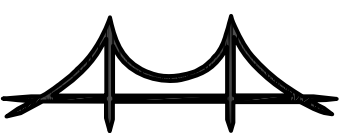
Checked By: NC, SH, LS

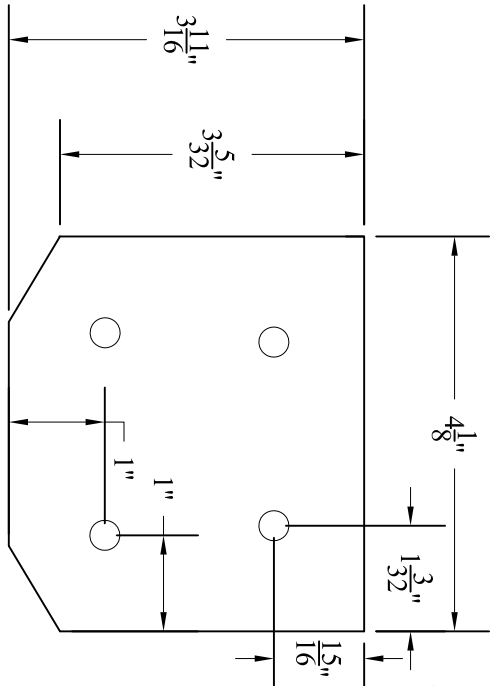
Date: FEBRUARY 2015

Scale: 1" : 2"

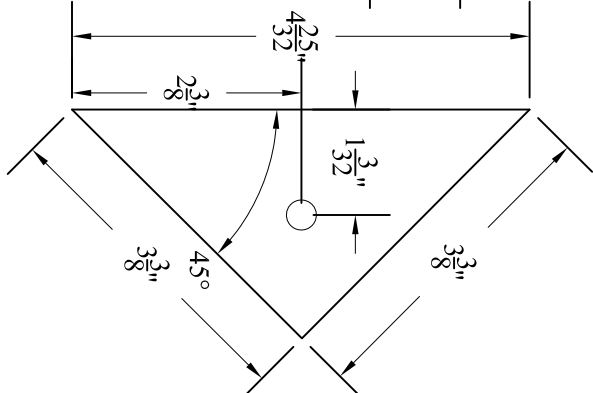
2015 NAU ASCE STEEL BRIDGE

Pieces Details - 1

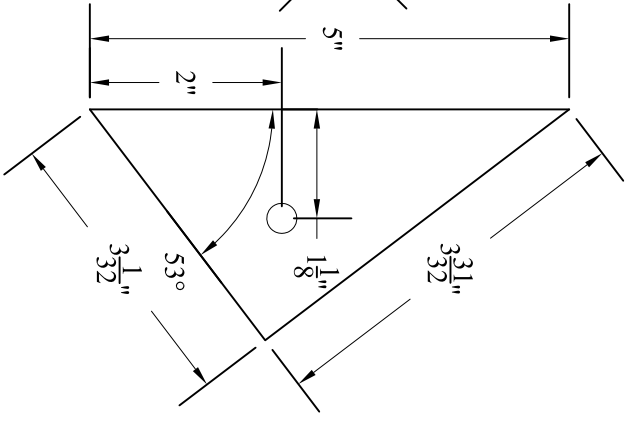




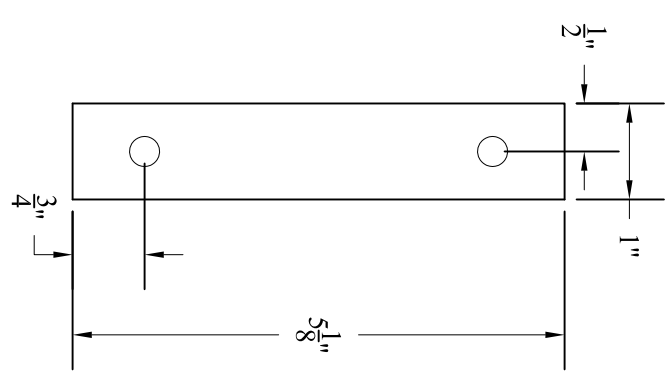
Piece 13 (4)



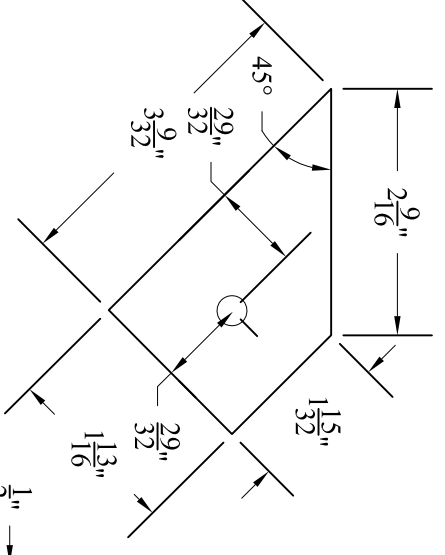
Piece 14 (4)



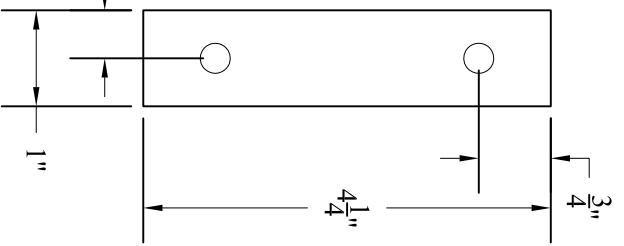
Piece 15 (4)



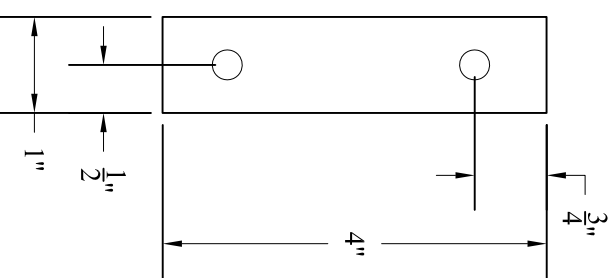
Piece 16 (4)



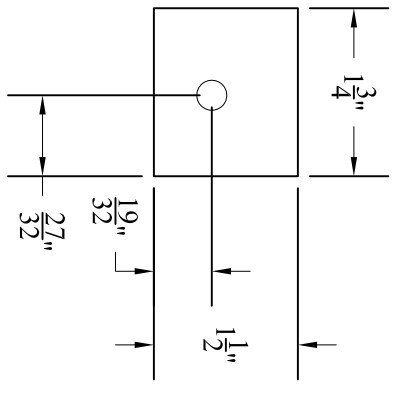
Piece 17 (4)



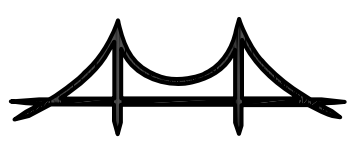
Piece 18 (8)



Piece 19 (8)



Piece 20 (4)



2015 NAU ASCE STEEL BRIDGE

Pieces Details - 2

Drawn By: WC
Checked By: NC, SH, LS
Date: FEBRUARY 2015
Scale: 1" : 2"

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