DESIGN MODULE - SCBF Gusset Design

Michael Baker INTERNATIONAL

Creech DRP Phase 2

TYPICAL BRACED FRAME DESIGN INFORMATION

Frame Height:	20.00 ft	Gusset Plate Fy:	50 ksi
Floor Thickness:	0.00 in	Weld Size Brace to Gusset:	5 /16
Gusset Thickness:	0.75 in	Corner Snip:	1.00 in
Measured from Top of Slab:	No		
Beam Size Above:	W12X45		
Beam Size Below:	BasePlate		
Column Size:	W10X68		
Brace Size:	HSS8X8X5/8		
Brace Grade:	A500 Gr C		

BRACED FRAME GUSSET SUMMARY SCHEDULE

FRAME ID	GUSSET MARK	LENGTH	HEIGHT	BEAM		COLUMN	BRACE	STATUS
BF1	1	22.56 ft	27.84 ft	TOP	W12X45	W10X68	HSS8X8X5/8	PASS
	2			BTM	BasePlate			PASS
BF2	3	11.28 ft	8.66 ft	TOP	W12X45	W10X68	HSS5X5X1/2	PASS
	4			BTM	W12X45			PASS
BF3	5	11.28 ft	7.59 ft	TOP	W12X45	W10X68	HSS5X5X1/2	PASS
	6			BTM	W12X45			PASS
BF4	7	11.28 ft	9.47 ft	TOP	W12X45	W10X68	HSS5X5X1/2	PASS
	8			BTM	W12X45			PASS
BF5	9	24.58 ft	36.51 ft	TOP	W8X40	BasePlate	HSS8X8X5/8	PASS
	10			BTM	BasePlate			PASS
BF6	11	24.58 ft	7.79 ft	TOP	W8X40	BasePlate	HSS4X4X3/8	PASS
	12			BTM	W8X40			PASS
BF7	13	9.08 ft	12.17 ft	TOP	W8X40	BasePlate	HSS4X4X3/8	PASS
	14			BTM	BasePlate			PASS
BF8	15	9.08 ft	7.79 ft	TOP	W8X40	BasePlate	HSS4X4X3/8	PASS
	16			BTM	W8X40			PASS

DESIGN MODULE - SCBF Gusset Plate

Michael Baker INTERNATIONAL

Creech DRP Phase 2

Steel Gusset Plate Geometry and Modeling Information

Mark	Frame	Gusset Thickness	Angle from Horizontal	Brace Information		Length Along Beam	Length Along Column	Comment
				Brace Weld Length	Brace Width			
1	BF1	1.00 in	50.98 deg	39 in	8.00 in	37 in	46 in	
2		1.00 in	50.98 deg	39 in	8.00 in	32 in	52 in	
3	BF2	0.88 in	37.52 deg	19 in	5.00 in	29 in	18 in	
4		0.88 in	37.52 deg	19 in	5.00 in	29 in	18 in	
5	BF3	0.88 in	33.92 deg	19 in	5.00 in	32 in	17 in	
6		0.88 in	33.92 deg	19 in	5.00 in	32 in	17 in	
7	BF4	0.88 in	40.00 deg	19 in	5.00 in	27 in	19 in	
8		0.88 in	40.00 deg	19 in	5.00 in	27 in	19 in	
9	BF5	0.88 in	56.05 deg	39 in	8.00 in	38 in	47 in	
10		0.88 in	56.05 deg	39 in	8.00 in	35 in	52 in	
11	BF6	0.75 in	17.59 deg	12 in	4.00 in	49 in	8 in	
12		0.75 in	17.59 deg	12 in	4.00 in	49 in	8 in	
13	BF7	0.75 in	53.27 deg	12 in	4.00 in	17 in	14 in	
14		0.75 in	53.27 deg	12 in	4.00 in	14 in	19 in	
15	BF8	0.75 in	40.63 deg	12 in	4.00 in	22 in	11 in	
16		0.75 in	40.63 deg	12 in	4.00 in	22 in	11 in	

Steel Gusset Plate Connection Schedule

Mark	Gusset Thickness	Geometry + Welding Information					Cover Plate Info	
		W1 Size	L1 Length	W2 Size	L2 Length	W3 Size	Plate Size	Weld
1	1.00 in	5 /16	39 in	7 /16	37 in	6 /16		
2	1.00 in	5 /16	39 in	6 /16	32 in	7 /16		
3	0.88 in	5 /16	19 in	5 /16	29 in	6 /16		
4	0.88 in	5 /16	19 in	5 /16	29 in	6 /16		
5	0.88 in	5 /16	19 in	5 /16	32 in	6 /16		
6	0.88 in	5 /16	19 in	5 /16	32 in	6 /16		
7	0.88 in	5 /16	19 in	5 /16	27 in	6 /16		
8	0.88 in	5 /16	19 in	5 /16	27 in	6 /16		
9	0.88 in	5 /16	39 in	7 /16	38 in	6 /16		
10	0.88 in	5 /16	39 in	7 /16	35 in	7 /16		
11	0.75 in	5 /16	12 in	3 /16	49 in	3 /16		
12	0.75 in	5 /16	12 in	3 /16	49 in	3 /16		
13	0.75 in	5 /16	12 in	6 /16	17 in	4 /16		
14	0.75 in	5 /16	12 in	5 /16	14 in	5 /16		
15	0.75 in	5 /16	12 in	5 /16	22 in	4 /16		
16	0.75 in	5 /16	12 in	5 /16	22 in	4 /16		

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF1 Top, Gusset 1

GENERAL CRITERIA

Frame Height:	27.84 ft	Beam Size:	W12X45
Frame Length:	22.56 ft	Column Size:	W10X68
Floor Thickness:	0.00 in	Brace Size:	HSS8X8X5/8
Gusset Thickness:	1.00 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

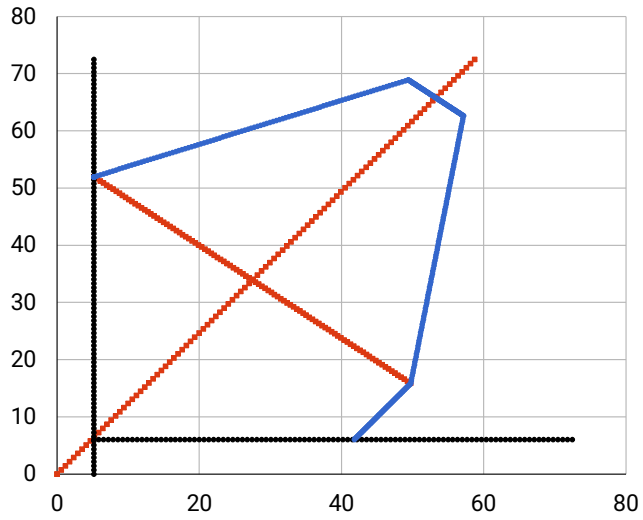
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	27.84 ft
Frame Length:	22.56 ft
Brace Length:	35.84 ft
Angle from Horz:	50.98 deg
Angle from Vert:	39.02 deg

Gusset Plate Geometry

Brace on Gusset:	39.00 in
Length along Beam:	36.61 in
Length along Column:	45.91 in



DESIGN OUTPUT

Uniform Force Method

ec:	5.20 in
eb:	6.05 in
a:	18.76 in
b:	23.51 in
r:	38.05

Max Brace Force, Pu **= 1066 kips**

Vub:	0.159 x Pu	**= 170 kips**	V= Vertical Force
Hub:	0.493 x Pu	**= 526 kips**	H= Horizontal Force
Vuc:	0.618 x Pu	**= 659 kips**	b= Beam Side
Huc:	0.137 x Pu	**= 146 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	7/16	Weld to Column Size:	6/16
Interaction for Vub:	0.155	Interaction for Vuc:	0.839
Interaction for Hub:	0.720	Interaction for Huc:	0.124
Total Interaction:	**0.875**	Total Interaction:	**0.963**

Gusset Design

Buckling Capacity:	238k OK
Yielding Capacity:	2476k OK
Block Shear Capacity:	2145k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF1 Bottom, Gusset 2

GENERAL CRITERIA

Frame Height:	27.84 ft	Beam Size:	BasePlate
Frame Length:	22.56 ft	Column Size:	W10X68
Floor Thickness:	0.00 in	Brace Size:	HSS8X8X5/8
Gusset Thickness:	1.00 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

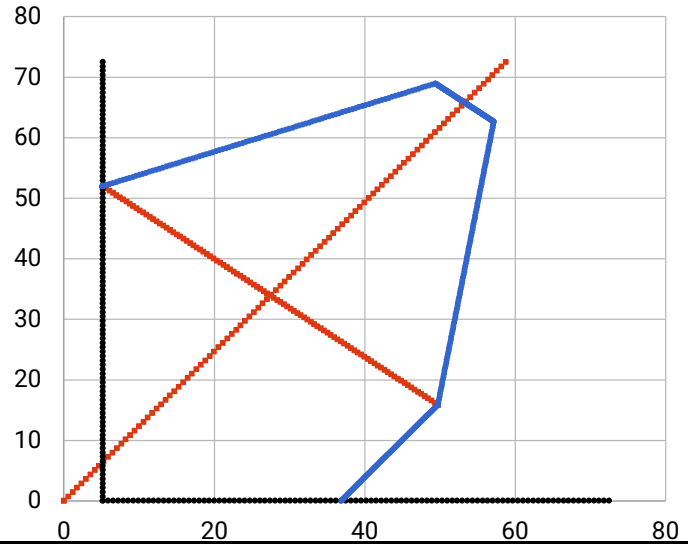
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	27.84 ft
Frame Length:	22.56 ft
Brace Length:	35.84 ft
Angle from Horz:	50.98 deg
Angle from Vert:	39.02 deg

Gusset Plate Geometry

Brace on Gusset:	39.00 in
Length along Beam:	31.70 in
Length along Column:	51.96 in



DESIGN OUTPUT

Uniform Force Method

ec:	5.20 in
eb:	0.00 in
a:	16.32 in
b:	26.55 in
r:	34.18

Max Brace Force, Pu **= 1066 kips**

Vub:	0.000 x Pu	**= 0 kips**	V= Vertical Force
Hub:	0.477 x Pu	**= 509 kips**	H= Horizontal Force
Vuc:	0.777 x Pu	**= 829 kips**	b= Beam Side
Huc:	0.152 x Pu	**= 163 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	6/16	Weld to Column Size:	7/16
Interaction for Vub:	0.000	Interaction for Vuc:	0.801
Interaction for Hub:	0.934	Interaction for Huc:	0.105
Total Interaction:	**0.934**	Total Interaction:	**0.906**

Gusset Design

Buckling Capacity:	238k OK
Yielding Capacity:	2476k OK
Block Shear Capacity:	2145k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF2 Top, Gusset 3

GENERAL CRITERIA

Frame Height:	8.66 ft	Beam Size:	W12X45
Frame Length:	11.28 ft	Column Size:	W10X68
Floor Thickness:	0.00 in	Brace Size:	HSS5X5X1/2
Gusset Thickness:	0.88 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

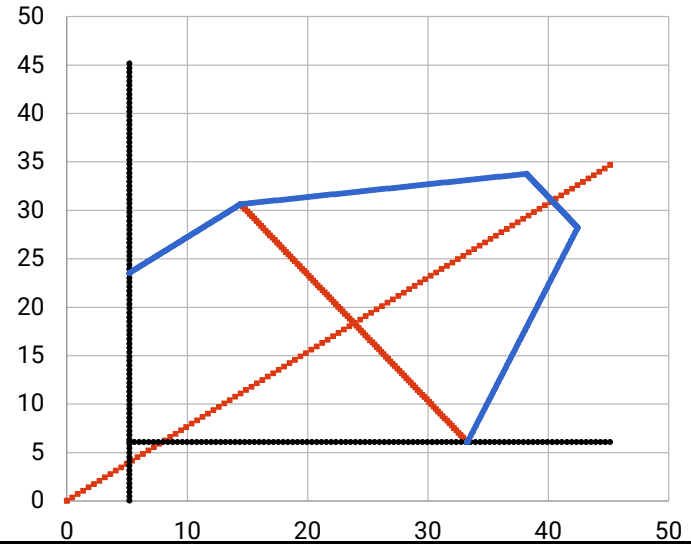
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	8.66 ft
Frame Length:	11.28 ft
Brace Length:	14.22 ft
Angle from Horz:	37.52 deg
Angle from Vert:	52.48 deg

Gusset Plate Geometry

Brace on Gusset:	19.00 in
Length along Beam:	28.10 in
Length along Column:	17.46 in



DESIGN OUTPUT

Uniform Force Method

ec:	5.20 in
eb:	6.05 in
a:	14.64 in
b:	9.18 in
r:	25.01

Max Brace Force, Pu **= 512 kips**

Vub:	0.242 x Pu	**= 124 kips**	V= Vertical Force
Hub:	0.585 x Pu	**= 300 kips**	H= Horizontal Force
Vuc:	0.367 x Pu	**= 189 kips**	b= Beam Side
Huc:	0.208 x Pu	**= 107 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	5/16	Weld to Column Size:	6/16
Interaction for Vub:	0.203	Interaction for Vuc:	0.616
Interaction for Hub:	0.736	Interaction for Huc:	0.233
Total Interaction:	**0.939**	Total Interaction:	**0.849**

Gusset Design

Buckling Capacity:	303k OK
Yielding Capacity:	1139k OK
Block Shear Capacity:	961k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF2 Bottom, Gusset 4

GENERAL CRITERIA

Frame Height:	8.66 ft	Beam Size:	W12X45
Frame Length:	11.28 ft	Column Size:	W10X68
Floor Thickness:	0.00 in	Brace Size:	HSS5X5X1/2
Gusset Thickness:	0.88 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

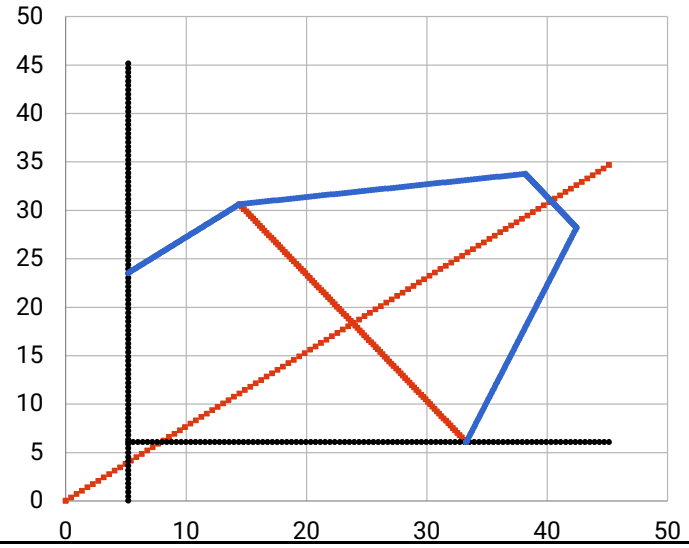
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	8.66 ft
Frame Length:	11.28 ft
Brace Length:	14.22 ft
Angle from Horz:	37.52 deg
Angle from Vert:	52.48 deg

Gusset Plate Geometry

Brace on Gusset:	19.00 in
Length along Beam:	28.10 in
Length along Column:	17.46 in



DESIGN OUTPUT

Uniform Force Method

ec:	5.20 in
eb:	6.05 in
a:	14.64 in
b:	9.18 in
r:	25.01

Max Brace Force, Pu **= 512 kips**

Vub:	0.242 x Pu	**= 124 kips**	V= Vertical Force
Hub:	0.585 x Pu	**= 300 kips**	H= Horizontal Force
Vuc:	0.367 x Pu	**= 189 kips**	b= Beam Side
Huc:	0.208 x Pu	**= 107 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	5/16	Weld to Column Size:	6/16
Interaction for Vub:	0.203	Interaction for Vuc:	0.616
Interaction for Hub:	0.736	Interaction for Huc:	0.233
Total Interaction:	**0.939**	Total Interaction:	**0.849**

Gusset Design

Buckling Capacity:	303k OK
Yielding Capacity:	1139k OK
Block Shear Capacity:	961k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF3 Top, Gusset 5

GENERAL CRITERIA

Frame Height:	7.59 ft	Beam Size:	W12X45
Frame Length:	11.28 ft	Column Size:	W10X68
Floor Thickness:	0.00 in	Brace Size:	HSS5X5X1/2
Gusset Thickness:	0.88 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

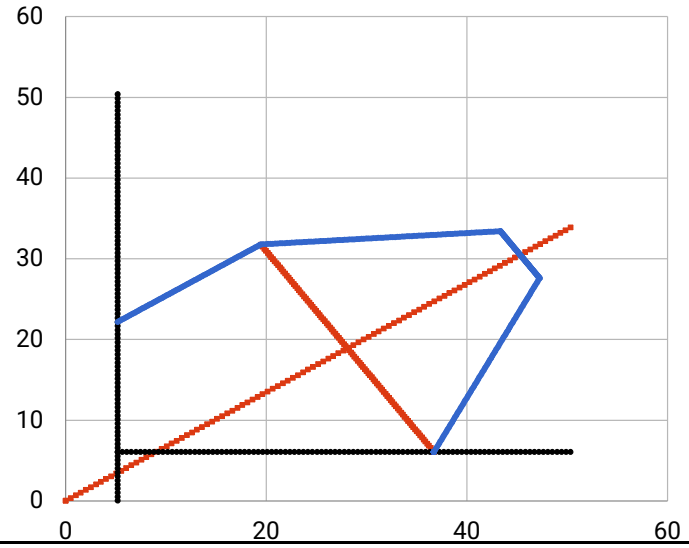
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	7.59 ft
Frame Length:	11.28 ft
Brace Length:	13.60 ft
Angle from Horz:	33.92 deg
Angle from Vert:	56.08 deg

Gusset Plate Geometry

Brace on Gusset:	19.00 in
Length along Beam:	31.54 in
Length along Column:	16.10 in



DESIGN OUTPUT

Uniform Force Method

ec:	5.20 in
eb:	6.05 in
a:	16.42 in
b:	8.49 in
r:	26.05

Max Brace Force, Pu **= 512 kips**

Vub:	0.232 x Pu	**= 119 kips**	V= Vertical Force
Hub:	0.630 x Pu	**= 323 kips**	H= Horizontal Force
Vuc:	0.326 x Pu	**= 167 kips**	b= Beam Side
Huc:	0.200 x Pu	**= 103 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	5/16	Weld to Column Size:	6/16
Interaction for Vub:	0.174	Interaction for Vuc:	0.589
Interaction for Hub:	0.707	Interaction for Huc:	0.242
Total Interaction:	**0.880**	Total Interaction:	**0.831**

Gusset Design

Buckling Capacity:	303k OK
Yielding Capacity:	1139k OK
Block Shear Capacity:	961k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF3 Bottom, Gusset 6

GENERAL CRITERIA

Frame Height:	7.59 ft	Beam Size:	W12X45
Frame Length:	11.28 ft	Column Size:	W10X68
Floor Thickness:	0.00 in	Brace Size:	HSS5X5X1/2
Gusset Thickness:	0.88 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

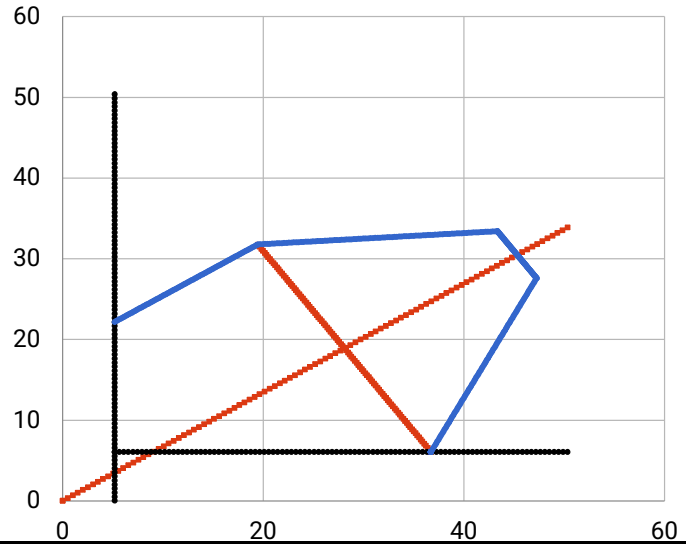
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	7.59 ft
Frame Length:	11.28 ft
Brace Length:	13.60 ft
Angle from Horz:	33.92 deg
Angle from Vert:	56.08 deg

Gusset Plate Geometry

Brace on Gusset:	19.00 in
Length along Beam:	31.54 in
Length along Column:	16.10 in



DESIGN OUTPUT

Uniform Force Method

ec:	5.20 in
eb:	6.05 in
a:	16.42 in
b:	8.49 in
r:	26.05

Max Brace Force, Pu **= 512 kips**

Vub:	0.232 x Pu	**= 119 kips**	V= Vertical Force
Hub:	0.630 x Pu	**= 323 kips**	H= Horizontal Force
Vuc:	0.326 x Pu	**= 167 kips**	b= Beam Side
Huc:	0.200 x Pu	**= 103 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	5/16	Weld to Column Size:	6/16
Interaction for Vub:	0.174	Interaction for Vuc:	0.589
Interaction for Hub:	0.707	Interaction for Huc:	0.242
Total Interaction:	**0.880**	Total Interaction:	**0.831**

Gusset Design

Buckling Capacity:	303k OK
Yielding Capacity:	1139k OK
Block Shear Capacity:	961k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF4 Top, Gusset 7

GENERAL CRITERIA

Frame Height:	9.47 ft	Beam Size:	W12X45
Frame Length:	11.28 ft	Column Size:	W10X68
Floor Thickness:	0.00 in	Brace Size:	HSS5X5X1/2
Gusset Thickness:	0.88 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

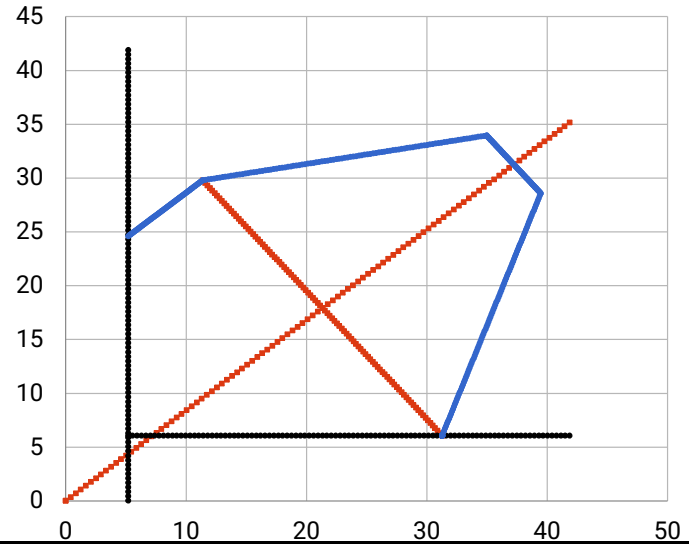
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	9.47 ft
Frame Length:	11.28 ft
Brace Length:	14.73 ft
Angle from Horz:	40.00 deg
Angle from Vert:	50.00 deg

Gusset Plate Geometry

Brace on Gusset:	19.00 in
Length along Beam:	26.09 in
Length along Column:	18.52 in



DESIGN OUTPUT

Uniform Force Method

ec:	5.20 in
eb:	6.05 in
a:	13.60 in
b:	9.73 in
r:	24.54

Max Brace Force, Pu **= 512 kips**

Vub:	0.247 x Pu	**= 127 kips**	V= Vertical Force
Hub:	0.554 x Pu	**= 284 kips**	H= Horizontal Force
Vuc:	0.396 x Pu	**= 203 kips**	b= Beam Side
Huc:	0.212 x Pu	**= 109 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	5/16	Weld to Column Size:	6/16
Interaction for Vub:	0.224	Interaction for Vuc:	0.625
Interaction for Hub:	0.750	Interaction for Huc:	0.224
Total Interaction:	**0.974**	Total Interaction:	**0.848**

Gusset Design

Buckling Capacity:	303k OK
Yielding Capacity:	1139k OK
Block Shear Capacity:	961k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF4 Bottom, Gusset 8

GENERAL CRITERIA

Frame Height:	9.47 ft	Beam Size:	W12X45
Frame Length:	11.28 ft	Column Size:	W10X68
Floor Thickness:	0.00 in	Brace Size:	HSS5X5X1/2
Gusset Thickness:	0.88 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

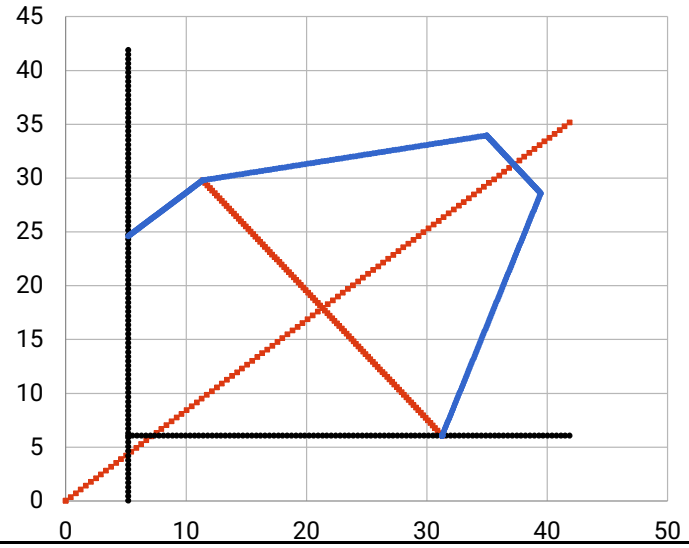
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	9.47 ft
Frame Length:	11.28 ft
Brace Length:	14.73 ft
Angle from Horz:	40.00 deg
Angle from Vert:	50.00 deg

Gusset Plate Geometry

Brace on Gusset:	19.00 in
Length along Beam:	26.09 in
Length along Column:	18.52 in



DESIGN OUTPUT

Uniform Force Method

ec:	5.20 in
eb:	6.05 in
a:	13.60 in
b:	9.73 in
r:	24.54

Max Brace Force, Pu **= 512 kips**

Vub:	0.247 x Pu	**= 127 kips**	V= Vertical Force
Hub:	0.554 x Pu	**= 284 kips**	H= Horizontal Force
Vuc:	0.396 x Pu	**= 203 kips**	b= Beam Side
Huc:	0.212 x Pu	**= 109 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	5/16	Weld to Column Size:	6/16
Interaction for Vub:	0.224	Interaction for Vuc:	0.625
Interaction for Hub:	0.750	Interaction for Huc:	0.224
Total Interaction:	**0.974**	Total Interaction:	**0.848**

Gusset Design

Buckling Capacity:	303k OK
Yielding Capacity:	1139k OK
Block Shear Capacity:	961k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF5 Top, Gusset 9

GENERAL CRITERIA

Frame Height:	36.51 ft	Beam Size:	W8X40
Frame Length:	24.58 ft	Column Size:	BasePlate
Floor Thickness:	0.00 in	Brace Size:	HSS8X8X5/8
Gusset Thickness:	0.88 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

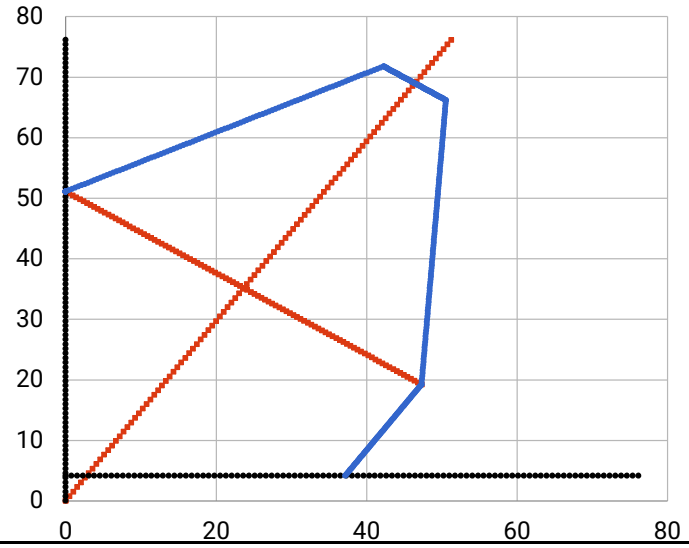
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	36.51 ft
Frame Length:	24.58 ft
Brace Length:	44.02 ft
Angle from Horz:	56.05 deg
Angle from Vert:	33.95 deg

Gusset Plate Geometry

Brace on Gusset:	39.00 in
Length along Beam:	37.17 in
Length along Column:	46.95 in



DESIGN OUTPUT

Uniform Force Method

ec:	0.00 in
eb:	4.13 in
a:	18.99 in
b:	24.08 in
r:	34.00

Max Brace Force, Pu = **1066 kips**

Vub:	0.121 x Pu	**= 130 kips**	V= Vertical Force
Hub:	0.558 x Pu	**= 596 kips**	H= Horizontal Force
Vuc:	0.708 x Pu	**= 755 kips**	b= Beam Side
Huc:	0.000 x Pu	**= 0 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	7/16	Weld to Column Size:	6/16
Interaction for Vub:	0.117	Interaction for Vuc:	0.939
Interaction for Hub:	0.805	Interaction for Huc:	0.000
Total Interaction:	**0.922**	Total Interaction:	**0.939**

Gusset Design

Buckling Capacity:	159k OK
Yielding Capacity:	2167k OK
Block Shear Capacity:	1877k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF5 Bottom, Gusset 10

GENERAL CRITERIA

Frame Height:	36.51 ft	Beam Size:	BasePlate
Frame Length:	24.58 ft	Column Size:	BasePlate
Floor Thickness:	0.00 in	Brace Size:	HSS8X8X5/8
Gusset Thickness:	0.88 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

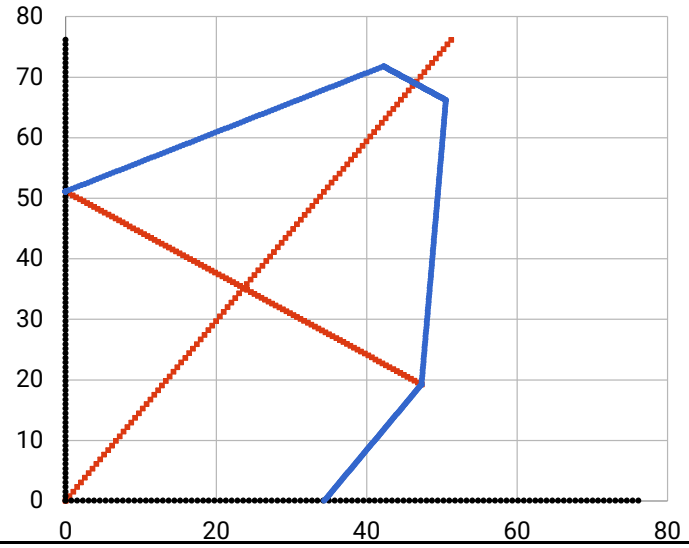
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	36.51 ft
Frame Length:	24.58 ft
Brace Length:	44.02 ft
Angle from Horz:	56.05 deg
Angle from Vert:	33.95 deg

Gusset Plate Geometry

Brace on Gusset:	39.00 in
Length along Beam:	34.39 in
Length along Column:	51.08 in



DESIGN OUTPUT

Uniform Force Method

ec:	0.00 in
eb:	0.00 in
a:	17.61 in
b:	26.16 in
r:	31.54

Max Brace Force, Pu **= 1066 kips**

Vub:	0.000 x Pu	**= 0 kips**	V= Vertical Force
Hub:	0.558 x Pu	**= 596 kips**	H= Horizontal Force
Vuc:	0.830 x Pu	**= 885 kips**	b= Beam Side
Huc:	0.000 x Pu	**= 0 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	7/16	Weld to Column Size:	7/16
Interaction for Vub:	0.000	Interaction for Vuc:	0.868
Interaction for Hub:	0.868	Interaction for Huc:	0.000
Total Interaction:	**0.868**	Total Interaction:	**0.868**

Gusset Design

Buckling Capacity:	159k OK
Yielding Capacity:	2167k OK
Block Shear Capacity:	1877k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF6 Top, Gusset 11

GENERAL CRITERIA

Frame Height:	7.79 ft	Beam Size:	W8X40
Frame Length:	24.58 ft	Column Size:	BasePlate
Floor Thickness:	0.00 in	Brace Size:	HSS4X4X3/8
Gusset Thickness:	0.75 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

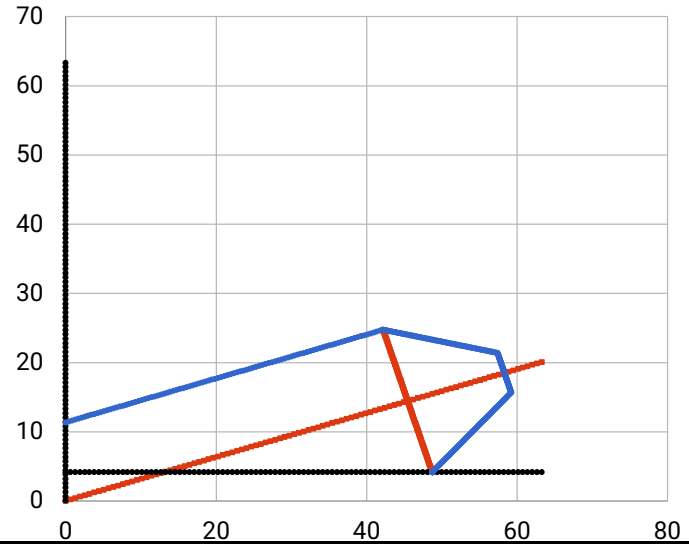
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	7.79 ft
Frame Length:	24.58 ft
Brace Length:	25.79 ft
Angle from Horz:	17.59 deg
Angle from Vert:	72.41 deg

Gusset Plate Geometry

Brace on Gusset:	12.00 in
Length along Beam:	48.74 in
Length along Column:	7.20 in



DESIGN OUTPUT

Uniform Force Method

ec:	0.00 in
eb:	4.13 in
a:	25.72 in
b:	4.03 in
r:	26.98

Max Brace Force, Pu **= 312 kips**

Vub:	0.153 x Pu	**= 48 kips**	V= Vertical Force
Hub:	0.953 x Pu	**= 298 kips**	H= Horizontal Force
Vuc:	0.149 x Pu	**= 47 kips**	b= Beam Side
Huc:	0.000 x Pu	**= 0 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	3/16	Weld to Column Size:	3/16
Interaction for Vub:	0.075	Interaction for Vuc:	0.699
Interaction for Hub:	0.694	Interaction for Huc:	0.000
Total Interaction:	**0.768**	Total Interaction:	**0.699**

Gusset Design

Buckling Capacity:	276k OK
Yielding Capacity:	670k OK
Block Shear Capacity:	551k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF6 Bottom, Gusset 12

GENERAL CRITERIA

Frame Height:	7.79 ft	Beam Size:	W8X40
Frame Length:	24.58 ft	Column Size:	BasePlate
Floor Thickness:	0.00 in	Brace Size:	HSS4X4X3/8
Gusset Thickness:	0.75 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

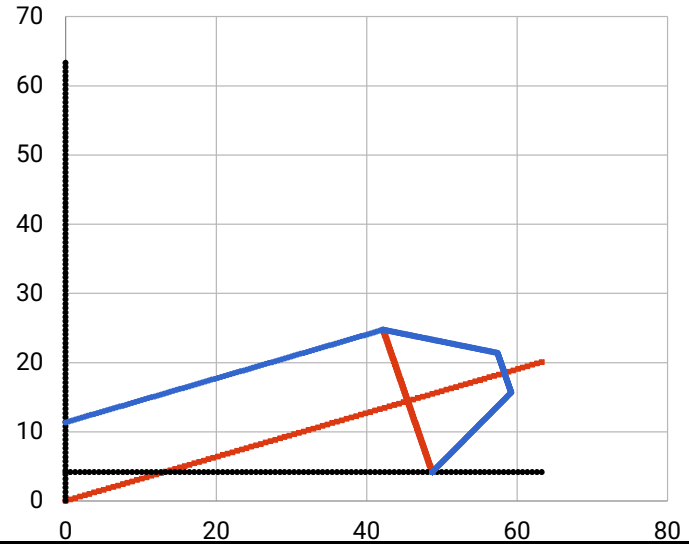
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	7.79 ft
Frame Length:	24.58 ft
Brace Length:	25.79 ft
Angle from Horz:	17.59 deg
Angle from Vert:	72.41 deg

Gusset Plate Geometry

Brace on Gusset:	12.00 in
Length along Beam:	48.74 in
Length along Column:	7.20 in



DESIGN OUTPUT

Uniform Force Method

ec:	0.00 in
eb:	4.13 in
a:	25.72 in
b:	4.03 in
r:	26.98

Max Brace Force, Pu **= 312 kips**

Vub:	0.153 x Pu	**= 48 kips**	V= Vertical Force
Hub:	0.953 x Pu	**= 298 kips**	H= Horizontal Force
Vuc:	0.149 x Pu	**= 47 kips**	b= Beam Side
Huc:	0.000 x Pu	**= 0 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	3/16	Weld to Column Size:	3/16
Interaction for Vub:	0.075	Interaction for Vuc:	0.699
Interaction for Hub:	0.694	Interaction for Huc:	0.000
Total Interaction:	**0.768**	Total Interaction:	**0.699**

Gusset Design

Buckling Capacity:	276k OK
Yielding Capacity:	670k OK
Block Shear Capacity:	551k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF7 Top, Gusset 13

GENERAL CRITERIA

Frame Height:	12.17 ft	Beam Size:	W8X40
Frame Length:	9.08 ft	Column Size:	BasePlate
Floor Thickness:	0.00 in	Brace Size:	HSS4X4X3/8
Gusset Thickness:	0.75 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

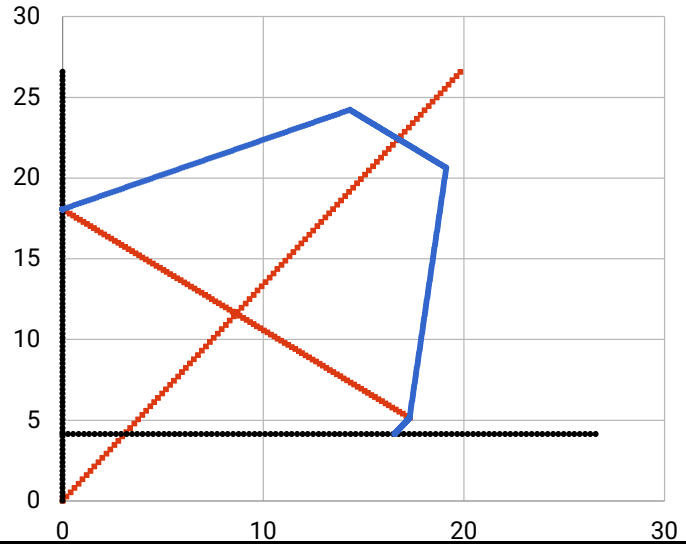
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	12.17 ft
Frame Length:	9.08 ft
Brace Length:	15.19 ft
Angle from Horz:	53.27 deg
Angle from Vert:	36.73 deg

Gusset Plate Geometry

Brace on Gusset:	12.00 in
Length along Beam:	16.55 in
Length along Column:	13.92 in



DESIGN OUTPUT

Uniform Force Method

ec:	0.00 in
eb:	4.13 in
a:	8.68 in
b:	7.51 in
r:	14.52

Max Brace Force, Pu **= 312 kips**

Vub:	0.284 x Pu	**= 89 kips**	V= Vertical Force
Hub:	0.598 x Pu	**= 187 kips**	H= Horizontal Force
Vuc:	0.517 x Pu	**= 162 kips**	b= Beam Side
Huc:	0.000 x Pu	**= 0 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	6/16	Weld to Column Size:	4/16
Interaction for Vub:	0.205	Interaction for Vuc:	0.969
Interaction for Hub:	0.645	Interaction for Huc:	0.000
Total Interaction:	**0.849**	Total Interaction:	**0.969**

Gusset Design

Buckling Capacity:	276k OK
Yielding Capacity:	670k OK
Block Shear Capacity:	551k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF7 Bottom, Gusset 14

GENERAL CRITERIA

Frame Height:	12.17 ft	Beam Size:	BasePlate
Frame Length:	9.08 ft	Column Size:	BasePlate
Floor Thickness:	0.00 in	Brace Size:	HSS4X4X3/8
Gusset Thickness:	0.75 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

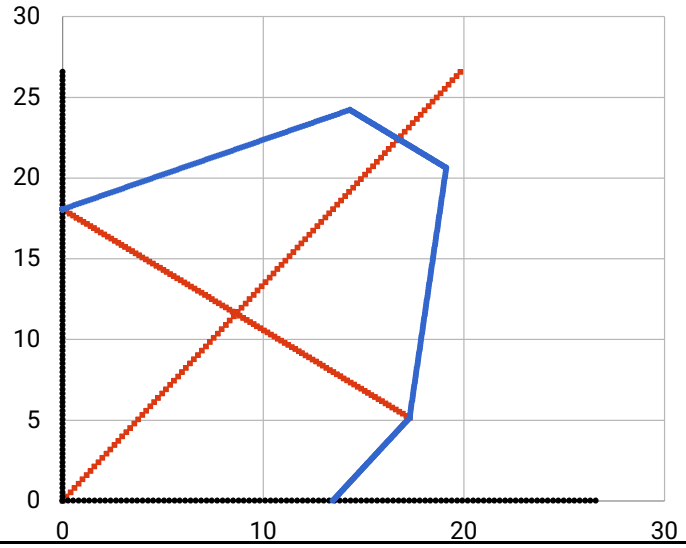
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	12.17 ft
Frame Length:	9.08 ft
Brace Length:	15.19 ft
Angle from Horz:	53.27 deg
Angle from Vert:	36.73 deg

Gusset Plate Geometry

Brace on Gusset:	12.00 in
Length along Beam:	13.47 in
Length along Column:	18.05 in



DESIGN OUTPUT

Uniform Force Method

ec:	0.00 in
eb:	0.00 in
a:	7.17 in
b:	9.61 in
r:	11.99

Max Brace Force, Pu = **312 kips**

Vub:	0.000 x Pu	**= 0 kips**	V= Vertical Force
Hub:	0.598 x Pu	**= 187 kips**	H= Horizontal Force
Vuc:	0.801 x Pu	**= 251 kips**	b= Beam Side
Huc:	0.000 x Pu	**= 0 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	5/16	Weld to Column Size:	5/16
Interaction for Vub:	0.000	Interaction for Vuc:	0.939
Interaction for Hub:	0.937	Interaction for Huc:	0.000
Total Interaction:	**0.937**	Total Interaction:	**0.939**

Gusset Design

Buckling Capacity:	276k OK
Yielding Capacity:	670k OK
Block Shear Capacity:	551k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF8 Top, Gusset 15

GENERAL CRITERIA

Frame Height:	7.79 ft	Beam Size:	W8X40
Frame Length:	9.08 ft	Column Size:	BasePlate
Floor Thickness:	0.00 in	Brace Size:	HSS4X4X3/8
Gusset Thickness:	0.75 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

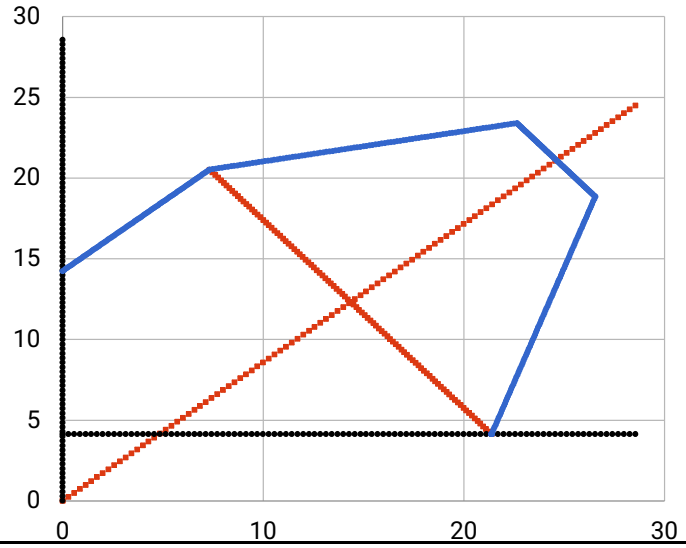
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	7.79 ft
Frame Length:	9.08 ft
Brace Length:	11.97 ft
Angle from Horz:	40.63 deg
Angle from Vert:	49.37 deg

Gusset Plate Geometry

Brace on Gusset:	12.00 in
Length along Beam:	21.39 in
Length along Column:	10.10 in



DESIGN OUTPUT

Uniform Force Method

ec:	0.00 in
eb:	4.13 in
a:	11.26 in
b:	5.53 in
r:	14.83

Max Brace Force, Pu **= 312 kips**

Vub:	0.278 x Pu	**= 87 kips**	V= Vertical Force
Hub:	0.759 x Pu	**= 237 kips**	H= Horizontal Force
Vuc:	0.373 x Pu	**= 117 kips**	b= Beam Side
Huc:	0.000 x Pu	**= 0 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	5/16	Weld to Column Size:	4/16
Interaction for Vub:	0.185	Interaction for Vuc:	0.950
Interaction for Hub:	0.756	Interaction for Huc:	0.000
Total Interaction:	**0.942**	Total Interaction:	**0.950**

Gusset Design

Buckling Capacity:	276k OK
Yielding Capacity:	670k OK
Block Shear Capacity:	551k OK

SCBF GUSSET DESIGN

Michael Baker INTERNATIONAL

BF8 Bottom, Gusset 16

GENERAL CRITERIA

Frame Height:	7.79 ft	Beam Size:	W8X40
Frame Length:	9.08 ft	Column Size:	BasePlate
Floor Thickness:	0.00 in	Brace Size:	HSS4X4X3/8
Gusset Thickness:	0.75 in	Brace Grade:	A500 Gr C
Measured from Top of Slab:	No	Gusset Plate Fy:	50 ksi
		Weld Size Brace to Gusset:	5 /16
		Corner Snip:	1.00 in

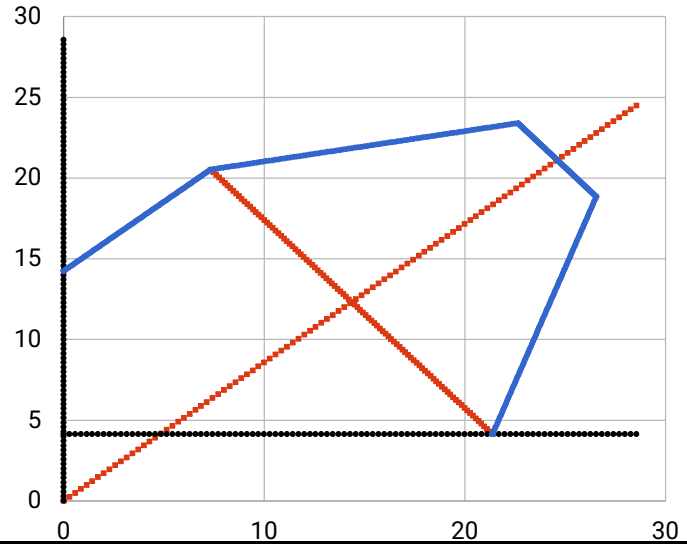
ANALYSIS AND CALCULATIONS

Frame Geometry (Work-Point to Work-Point)

Frame Height:	7.79 ft
Frame Length:	9.08 ft
Brace Length:	11.97 ft
Angle from Horz:	40.63 deg
Angle from Vert:	49.37 deg

Gusset Plate Geometry

Brace on Gusset:	12.00 in
Length along Beam:	21.39 in
Length along Column:	10.10 in



DESIGN OUTPUT

Uniform Force Method

ec:	0.00 in
eb:	4.13 in
a:	11.26 in
b:	5.53 in
r:	14.83

Max Brace Force, Pu **= 312 kips**

Vub:	0.278 x Pu	**= 87 kips**	V= Vertical Force
Hub:	0.759 x Pu	**= 237 kips**	H= Horizontal Force
Vuc:	0.373 x Pu	**= 117 kips**	b= Beam Side
Huc:	0.000 x Pu	**= 0 kips**	c= Column Side

Welding of Gusset Connection

Weld to Beam Size:	5/16	Weld to Column Size:	4/16
Interaction for Vub:	0.185	Interaction for Vuc:	0.950
Interaction for Hub:	0.756	Interaction for Huc:	0.000
Total Interaction:	**0.942**	Total Interaction:	**0.950**

Gusset Design

Buckling Capacity:	276k OK
Yielding Capacity:	670k OK
Block Shear Capacity:	551k OK