KIRBY BUILDING SYSTEMS — BETTER SOLUTIONS. BETTER BUILDINGS.	**Job No.** K19U0654_R2 (2)	**Designer**	AH (2)
	Customer ALPHA RIDGE - ORGANICS	**Checker**	mk 2-28-20
	Address 2350 MARRIOTTSVILLE, RD	**Seal Engr.**	
	COLUMBIA, MD 21046	**Revision #**	(1) (2)

S T R U C T U R A L D E S I G N C A L C U L A T I O N S

JOB NO. K19U0654_R2 ***NEW PRODUCT***

Manufacturer:	Builder:
KIRBY BUILDING SYSTEMS	MTD ERECTORS, INC.
124 KIRBY DR.	PO BOX 47
PORTLAND, TN 37148	THURMONT, MD 21788

RECEIVED
MAR 13 2020
LICENSES & PERMITS DIVISION

Building Description:
Span(ft): 40 Length(ft): 81 Roof Slope(rise/12): -2.0:12
Back Eave Height(ft): 23.34 Front Eave Height(ft): 16.68
Bay Spacing(ft): 1 at 20.5
2 at 20
1 at 20.5

REMOVE 30PSF FROM DRAWINGS

Governing Load Code: IBC 18

Design Load Information: Designed as an Enclosed Structure
Occupancy/Risk Category: I - Low
Dead Load: 2.500 PSF Collateral Load: 3 PSF
Live Load: 40.00 PSF Trib. reduction: No Frame Live Load: 40 / ~~30~~ PSF
Ground Snow: 30 PSF Is: 0.80 Roof Snow: 30 PSF Min. Snow: 30.0000 PSF
Rain on Snow Surcharge: 0.0000 PSF Rain with Snow(if req'd): 0.0000 PSF
Exposure Factor: 1.0000 Thermal Factor: 1.20 Sloped Factor: 1.0000
Wind Load: Ultimate Wind Speed: 105 MPH Exposure: C Iw: 1.00 Kzt: 1.0
Nominal Wind Speed: 89 MPH
Seismic: Ss: 0.16 Sl: 0.05 Sds: 0.17 Sd1: 0.08 Ie: 1.00
Seismic Design Category: B Site Class: D Seismic Use Group:
Analysis Procedure: Equivalent Lateral Force Procedure
Lateral Direction - Base Shear: 2.30 KIPS
Rigid Frames - R: 3 Cs: 0.057
Left Endwall - R: 3 Cs: 0.057
Right Endwall - R: 3 Cs: 0.057
Longitudinal Direction - Base Shear: 1.47 KIPS
Front Sidewall - R: 3 Cs: 0.057
Back Sidewall - R: Cs:

Bolt tightening requirements: SNUG TIGHT

Additional Notes: Professional Certification: I Harold W. Gregory, hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 20695, Expiration Date: 1/6/2021.

This building is designed as an Enclosed Structure. All exterior components (doors, windows, etc.) shall be designed to withstand the wind loadings specified for the design of components and cladding in the above referenced code.

Kirby designs in accordance with the design provisions of the AISC16 specification for the design, fabrication, and erection of the structural steel building, the NAUS16 specification for the design of cold-formed steel structural members, the 2006 MBMA Low-Rise Building Systems Manual, and the AISC SteelDesign Guide #3 -- Serviceability Design Considerations for Low-Rise Buildings.

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This design extends only for the loads specified on Kirby's purchase order as applied to the structural components of the building designed and fabricated by Kirby and erected in accordance with Kirby's instructions.

Note: Kirby's Engineer is not acting as the Engineer of Record for this construction project and is not responsible for the observation or inspection of the building system during or after erection.

Revision: ⚠1 revised design for new building code, live load, and length (pages 1, 4 - 14, 21)

AH 12/19/2019
mk 12-19-19

⚠2 new run for eave height change per CO #2 (pages 1, 4 - 14)

AH 2/28/2020
mk 2-28-20

Standard Load Nomenclature:

Note: Not all load conditions are applicable to all buildings.

DL - DEAD LOAD	WL1 - WIND LEFT W/ INT. PRESS.
LL - LIVE LOAD	WR1 - WIND RIGHT W/ INT. PRESS.
CL - COLLATERAL LOAD	WL2 - WIND LEFT W/ INT. SUCT.
SL - SNOW LOAD	WR2 - WIND RIGHT W/ INT. SUCT.
DRIFT - SNOW DRIFT	LW1/LNWIND1 = LONG. WIND W/ INT. PRESS.
SLIDE - SLIDING SNOW	LW2/LNWIND2 = LONG. WIND W/ INT. SUCT.
FxPAT_LLx - PATTERN LIVE	LWIND1_L2E - LONG. WIND W/ INT. PRESS. + ZONE 2E
FxPAT_SLx - PATTERN SNOW	LWIND1_R2E - LONG. WIND W/ INT. PRESS. + ZONE 2E
FxUNB_SL_L - UNBALANCED SNOW LEFT	LWIND2_L3E - LONG. WIND W/ INT. SUCT. + ZONE 3E
FxUNB_SL_R - UNBALANCED SNOW RIGHT	LWIND2_R3E - LONG. WIND W/ INT. SUCT. + ZONE 3E
FxCRANEA1 - MAX LEFT W/ THRUST RIGHT	WINDP/WP - WIND PRESS. W/ INT SUCT. ENDWALL & SC
FxCRANEA2 - MAX LEFT W/ THRUST LEFT	WINDS/WS - WIND SUCT. W/ INT PRESS. ENDWALL & SC
FxCRANEA3 - MAX RIGHT W/ THRUST RIGHT	SEISMIC LEFT - SEISMIC LEFT
FxCRANEA4 - MAX RIGHT W/ THRUST LEFT	SEISMIC RIGHT - SEISMIC RIGHT

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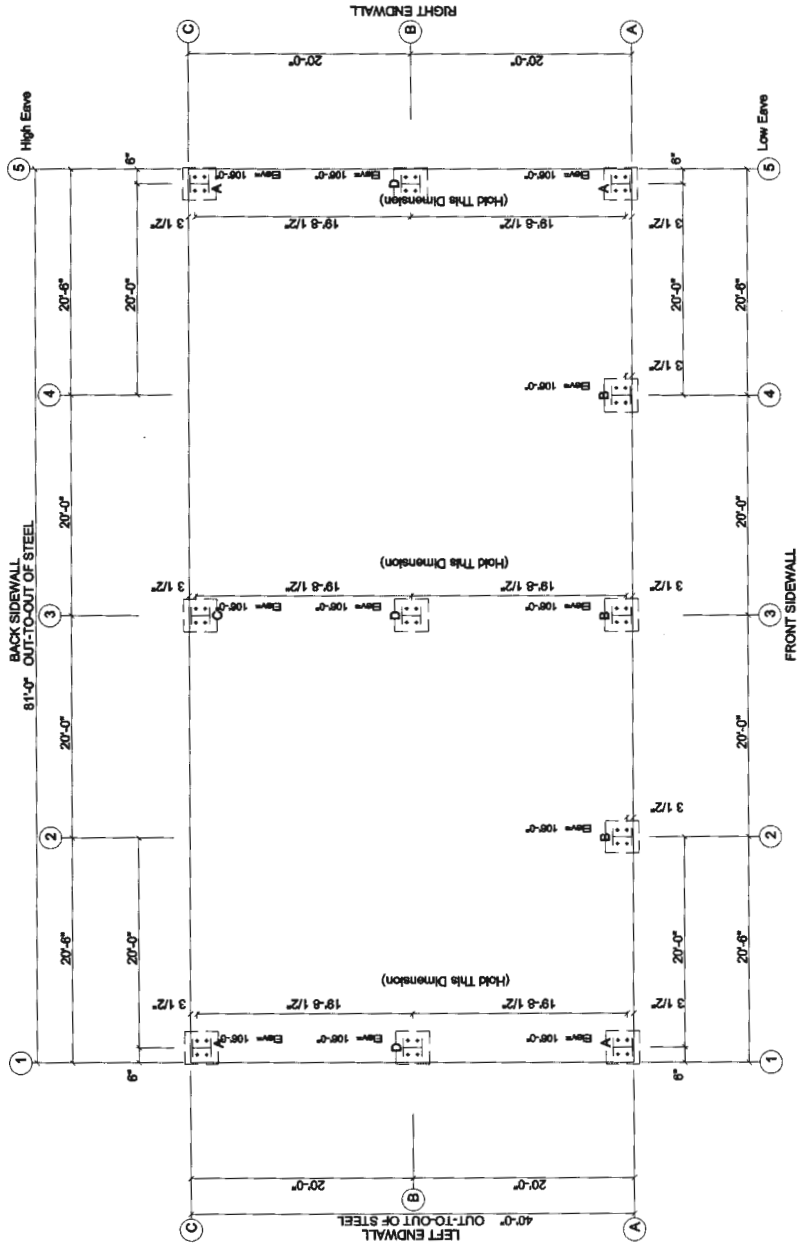
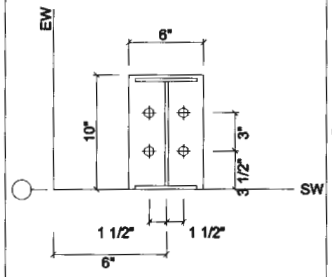
MBS RUN: K19U0654_R2



ANCHOR BOLT PLAN

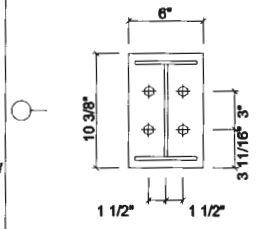
NOTE: All Base Plates @ 100'-0" (U.N.)

Dia= 3/4"



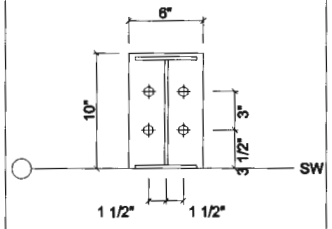
DETAIL A Base EL. 106'-0"

Dia= 3/4"



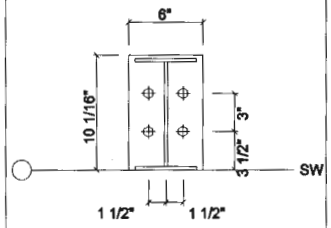
DETAIL D Base EL. 106'-0"

Dia= 3/4"



DETAIL B Base EL. 106'-0"

Dia= 3/4"



DETAIL C Base EL. 106'-0"

MBS RUN: K19U0654_R2

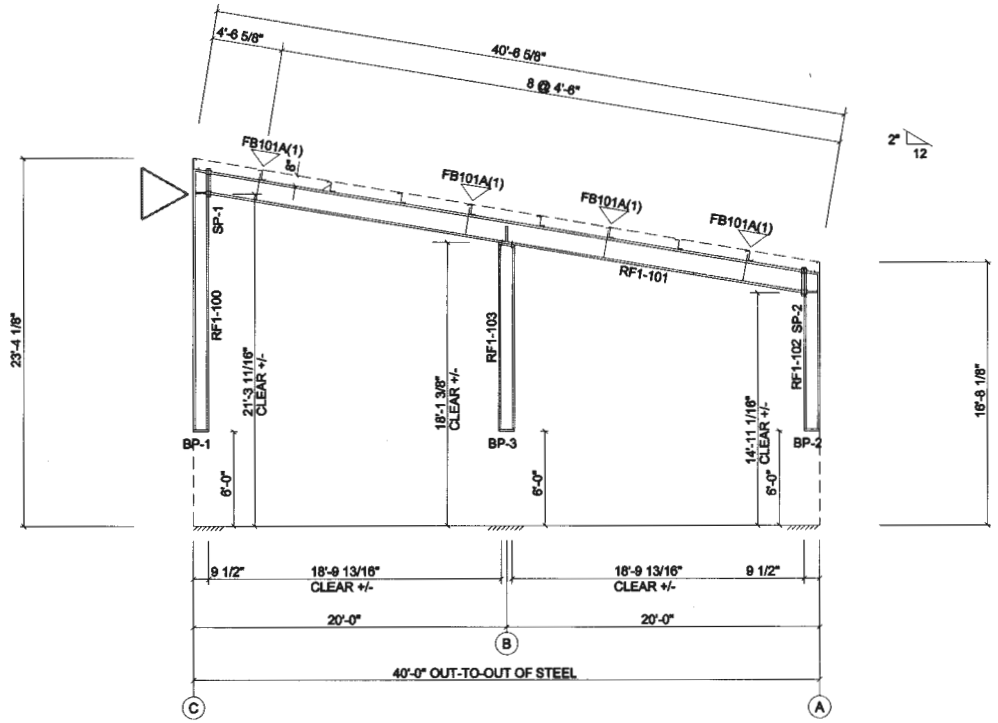
SPLICE PLATE & BOLT TABLE										CAP PLATE BOLTS				
Mark	Qty Top	Bot	Int	Type	Dia	Length	Width	Thick	Length	Mark	Qty	Type	Dia	Length
SP-1	4	4	0	A325	3/4"	3"	6"	3/8"	1'-9 7/16"	RF1-103	4	A325	5/8"	2 1/4"
SP-2	4	4	0	A325	3/4"	3"	6"	1/2"	1'-9 7/16"					

BASE PLATE TABLE			
Col Mark	Plate Size Width	Thick	Length
BP-1	6"	3/8"	1'-0"
BP-2	6"	3/8"	10"
BP-3	6"	3/8"	10 3/8"

MEMBER TABLE						
Mark	Weight	Web Depth Start/End	Web Plate Thick	Web Plate Length	Outside Flange W x Thk x Length	Inside Flange W x Thk x Length
RF1-100	304	9.0/ 9.0	0.220	199.4	6 x 1/4" x 199.4 6 x 3/16" x 9.3	6 x 1/4" x 180.0
RF1-101	601	14.0/14.0 14.0/14.0	0.135 0.135	239.0 229.4	5 x 3/16" x 466.1	5 x 1/4" x 466.1
RF1-102	193	9.0/ 9.0	0.220	121.0	6 x 3/16" x 9.3 6 x 1/4" x 119.5	6 x 1/4" x 103.2
RF1-103	164	9.0/ 9.0	0.164	145.5	6 x 3/16" x 145.5	6 x 3/16" x 144.0

FLANGE BRACES: (1) One Side; (2) Two Sides
FBxxA(1)
A - L2525105

: 3/8" full length stiffener on one side with a FULL weld on it



RIGID FRAME ELEVATION: FRAME LINE 1 5

2

SKIP / FULL HAUNCH STIFFENER WELDS

K19U0654_R2 / RFDES - 1

MBS RUN: K19U0654_R2

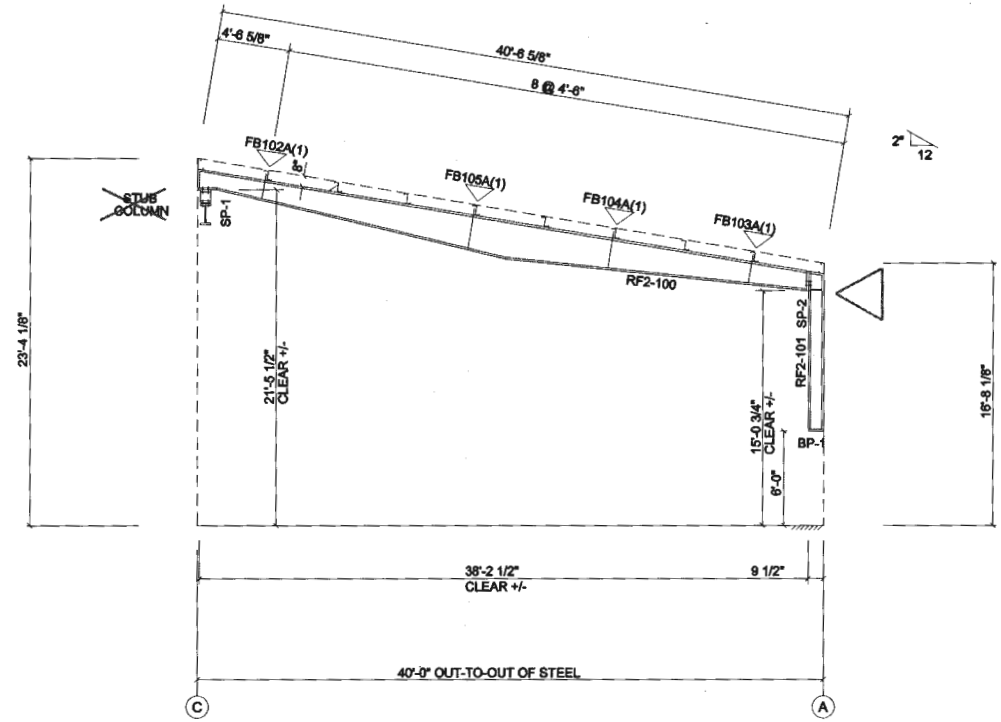
SPLICE PLATE & BOLT TABLE									
Mark	Qty Top	Bot	Int	Type	Dia	Length	Width	Thick	Length
SP-1	4	0	0	A325	3/4"	3"	6"	3/8"	1'-0"
SP-2	4	0	0	A325	3/4"	3"	6"	3/8"	1'-1 15/16"

BASE PLATE TABLE			
Col Mark	Plate Size Width	Thick	Length
BP-1	6"	3/8"	10"

MEMBER TABLE						
Mark	Weight	Web Depth Start/End	Web Plate Thick	Length	Outside Flange W x Thk x Length	Inside Flange W x Thk x Length
RF2-100	1068	13.5/11.6	0.164	13.7	6 x 3/8" x 13.7	6 x 3/8" x 229.7
		11.6/26.0	0.164	229.3	6 x 3/8" x 476.4	6 x 3/8" x 235.5
		26.0/12.0	0.164	235.1		
RF2-101	174	9.0/ 9.0	0.188	120.8	6 x 1/4" x 9.3 6 x 1/4" x 119.3	6 x 1/4" x 107.9

FLANGE BRACES: (1) One Side; (2) Two Sides
FBxxA(1)
A - L2525105

: 3/8" full length stiffener on one side with a FULL weld on it



RIGID FRAME ELEVATION: FRAME LINE 2 4

SKIP / FULL HAUNCH STIFFENER WELDS

K19U0654_R2 / RFDES - 2

MBS RUN: K19U0654_R2

SPLICE PLATE & BOLT TABLE									
Mark	Qty Top	Bot	Int	Type	Dia	Length	Width	Thick	Length
SP-1	4	4	0	A325	3/4"	3"	6"	3/8"	1'-9 3/8"

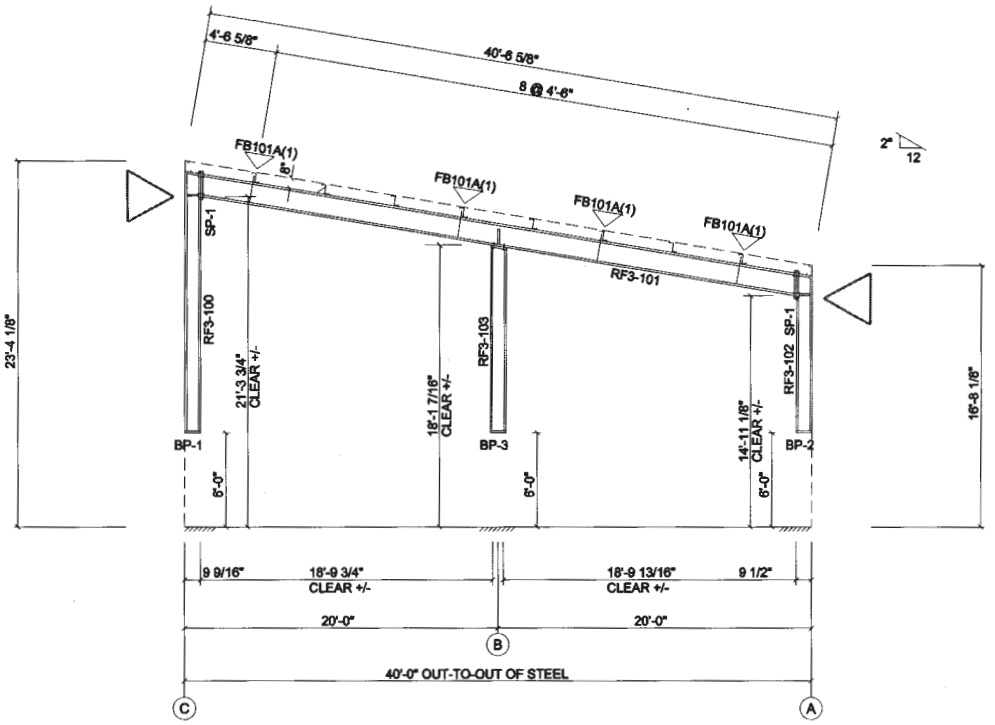
CAP PLATE BOLTS				
Mark	Qty	Type	Dia	Length
RF3-103	4	A325	5/8"	2 1/4"

BASE PLATE TABLE			
Col Mark	Plate Size Width	Thick	Length
BP-1	6"	3/8"	1'-0"
BP-2	6"	3/8"	10"
BP-3	6"	3/8"	10 3/8"

MEMBER TABLE						
Mark	Weight	Web Depth Start/End	Web Plate Thick	Web Plate Length	Outside Flange W x Thk x Length	Inside Flange W x Thk x Length
RF3-100	307	9.0/ 9.0	0.188	199.4	6 x 1/4" x 199.4 6 x 3/16" x 9.3	6 x 5/16" x 180.1
RF3-101	555	14.0/14.0 14.0/14.0	0.135 0.135	239.0 229.7	5 x 3/16" x 466.3	5 x 3/16" x 466.3
RF3-102	176	9.0/ 9.0	0.188	121.0	6 x 3/16" x 9.3 6 x 1/4" x 119.5	6 x 1/4" x 103.3
RF3-103	164	9.0/ 9.0	0.164	145.6	6 x 3/16" x 145.6	6 x 3/16" x 144.0

FLANGE BRACES: (1) One Side; (2) Two Sides
FBxxA(1)
A - L2525105

▽: 3/8" full length stiffener on one side with a FULL weld on it



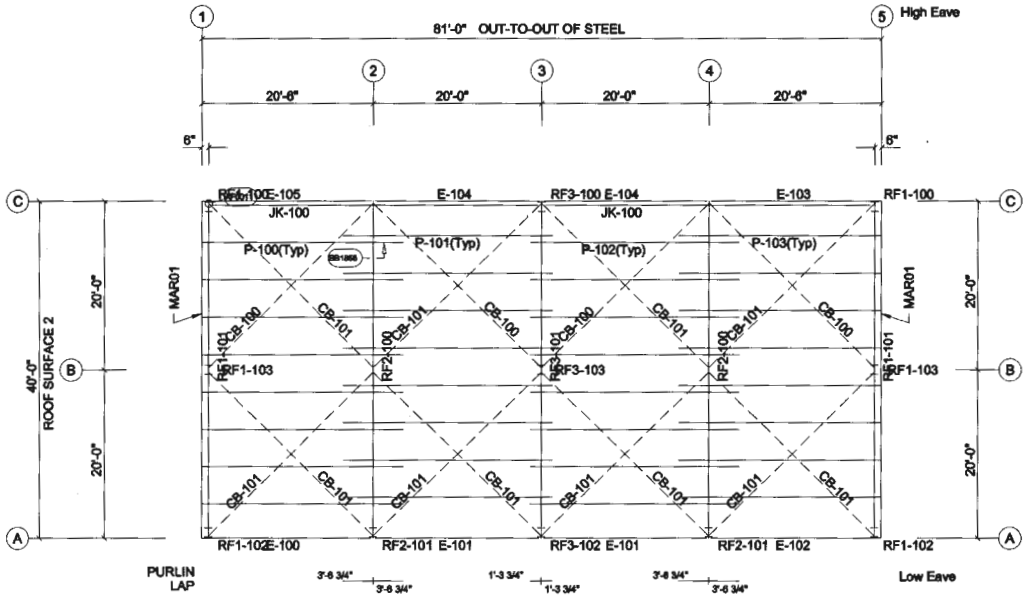
RIGID FRAME ELEVATION: FRAME LINE 3

SKIP / FULL HAUNCH STIFFENER WELDS

K19U0654_R2 / RFDES - 3

MBS RUN: K19U0654_R2

MEMBER TABLE ROOF PLAN		
QUAN	MARK	PART
2	JK-100	14W2508H
8	P-100	8Z089
8	P-101	8Z060
8	P-102	8Z060
8	P-103	8Z089
1	E-100	08LE2075
2	E-101	08LE2075
1	E-102	08LE2075
1	E-103	08HE2075
2	E-104	08HE2075
1	E-105	08HE2075
4	CB-100	BR10
12	CB-101	BR10



ROOF FRAMING PLAN

ANTI-ROLL GUSSETS NOT REQUIRED

MBS RUN: K19U0654_R2

SPLICE BOLTS				
Splice Mark	Quan	Bolt Type	Bolt Dia	Bolt Length
SP-1	2	A325	0.750	3.00
SP-2	4	A325	0.500	2.00

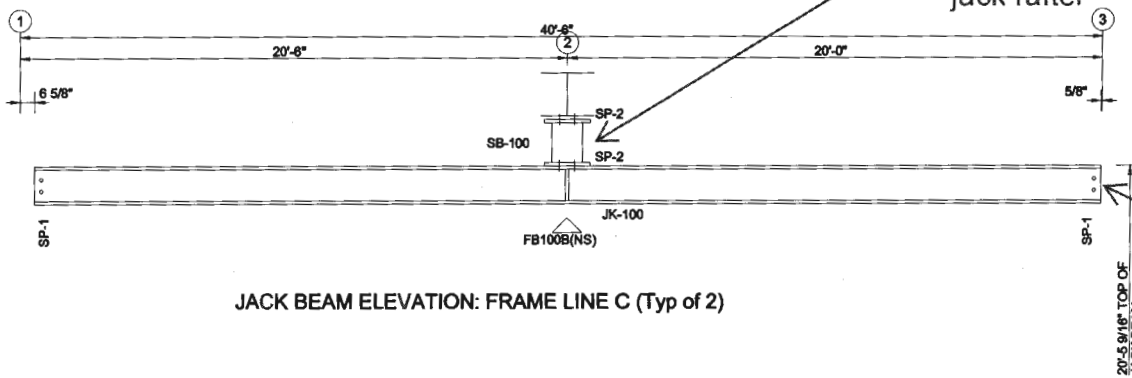
BOLT TABLE			
ID	Bolt Type	Bolt Dia	Length
1	A325	0.500	1.25

FLANGE BRACES: Both Sides(U.N.)
FBxxA(1)
A - L3X3X1/4

MEMBER SIZE TABLE	
MARK	MEMBER
JK-100	14W2508H
~~SB-100~~	~~W8x24~~

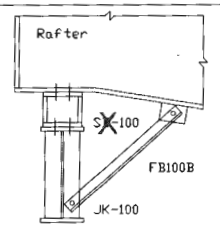
2

remove stub column, bolt rafter directly to jack rafter

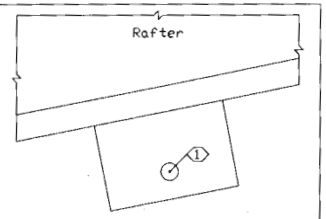


JACK BEAM ELEVATION: FRAME LINE C (Typ of 2)

jack frame connects to adjacent frames with typical 3x5x5/16" mezzanine double angle connections with (2) rows of 3/4" diameter bolts. typ.



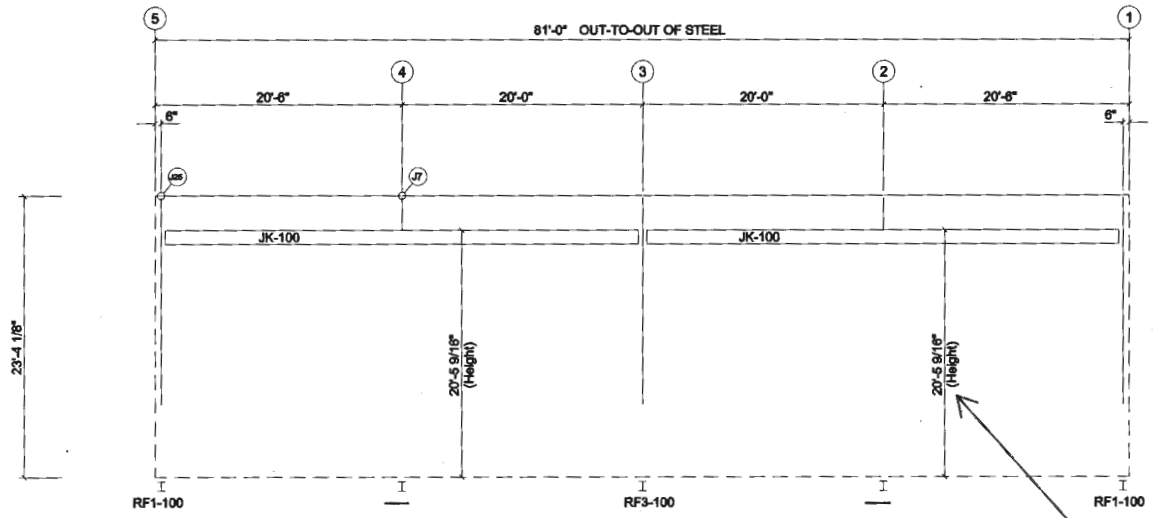
SECTION AT ②



RAFTER FLANGE BRACE CLIP

MBS RUN: K19U0654_R2

MEMBER TABLE FRAME LINE C		
QUAN	MARK	PART
2	JK-100	14W2508H



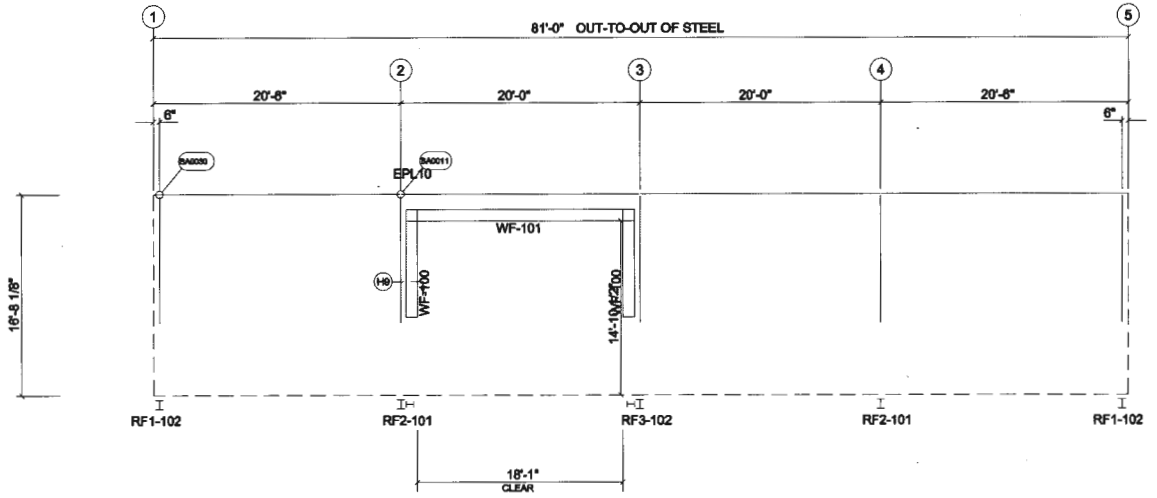
BACK SIDEWALL FRAMING: FRAME LINE C

show clearance under the rafter after raising it for the removed stub column

MBS RUN: K19U0654_R2

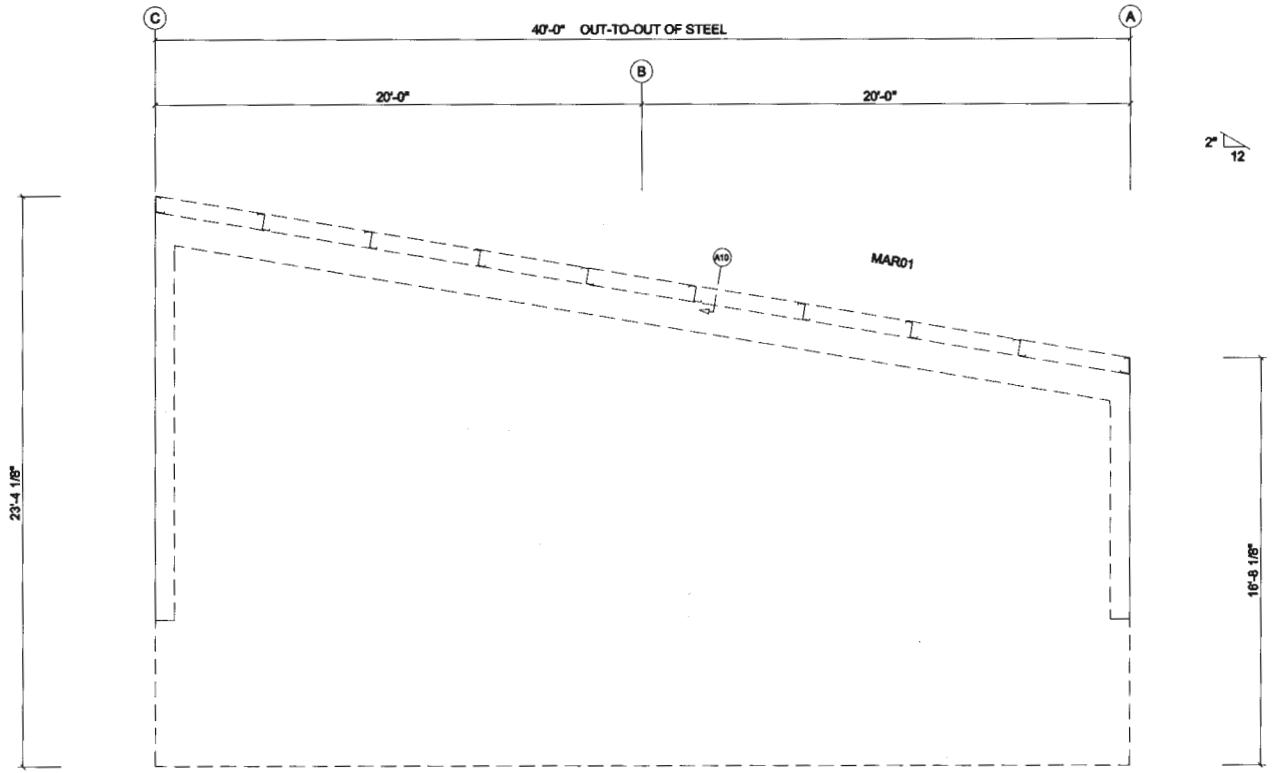
BOLT TABLE FRAME LINE A				
LOCATION	QUAN	TYPE	DIA	LENGTH
WF-100 - WF-101	8	A325	3/4"	3"
WF-100 - RF2-101	6	A325	1/2"	2"
WF-100 - RF3-102	6	A325	1/2"	2"

MEMBER TABLE FRAME LINE A		
QUAN	MARK	PART
2	WF-100	11W1605A
1	WF-101	11W1606B



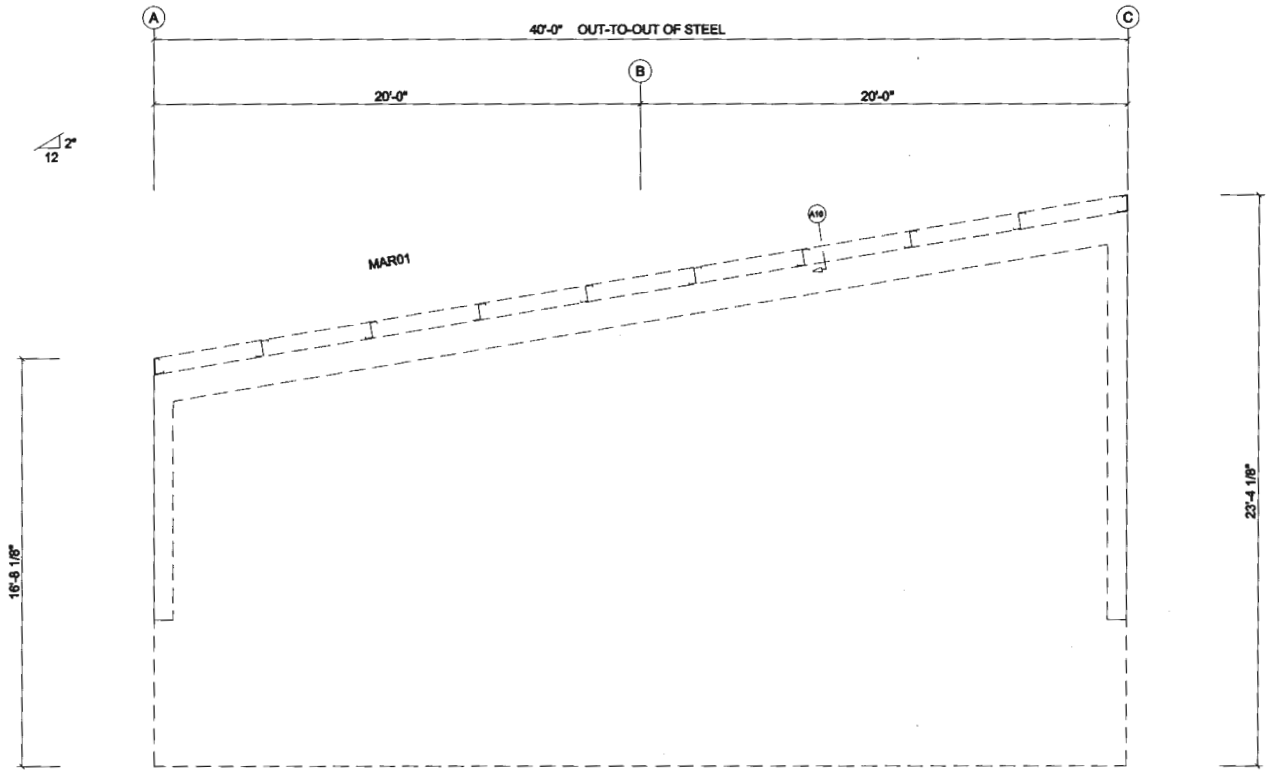
FRONT SIDEWALL FRAMING: FRAME LINE A

MBS RUN: K19U0654_R2



LEFT ENDWALL FRAMING: FRAME LINE 1

MBS RUN: K19U0654_R2



RIGHT ENDWALL FRAMING: FRAME LINE 5

MBS RUN: K19U0654_R2