KIRBY BUILDING SYSTEMS	Job No.	K19U0659A	Designer	AH
BETTER SOLUTIONS. BETTER BUILDINGS.	Customer	ALPHA RIDGE - STORAGE SHED	Checker	AH 10/15/2019
	Address	2350 MARRIOTTSVILLE RD	Seal Engr.	WG / 10-16-19
		COLUMBIA, MD 21046	Revision #	1

STRUCTURAL DESIGN CALCULATIONS

JOB NO. K19U0659A ***NEW PRODUCT***

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

RECEIVED
MAR 13 2020
LICENSES & PERMITS DIVISION

Building Description: 1
Span(ft): 50 Length(ft): 99.99 Roof Slope(rise/12): 4.0:12
Back Eave Height(ft): 18 Front Eave Height(ft): 18
Bay Spacing(ft): 3 at 25, 1 at 24.99 1

Governing Load Code: IBC 18 1

Fix on cover page

Design Load Information: Designed as an Enclosed Structure
Occupancy/Risk Category: II - Normal
Dead Load: 2.500 PSF Collateral Load: 3 PSF
Live Load: 1 40.00 PSF Trib. reduction: No Frame Live Load: 1 40 PSF
Ground Snow: 30 PSF Is: 1.00 Roof Snow: 23.63 PSF Min. Snow: 30.00 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: 0.9400
Wind Load: Ultimate Wind Speed: 115 MPH Exposure: C Iw: 1.00 Kzt: 1.0
Nominal Wind Speed: 89 MPH
Seismic: Ss: 0.16 S1: 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: 2.34 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: 2.26 KIPS
Front Sidewall - R: 3 Cs: 0.057
Back Sidewall - R: 3 Cs: 0.057

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 AISC10 specification for the design, fabrication, and erection of the structural steel building, the NAUS12 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 - 11)

AH 12/19/2019 CK: WG / 12-19-19

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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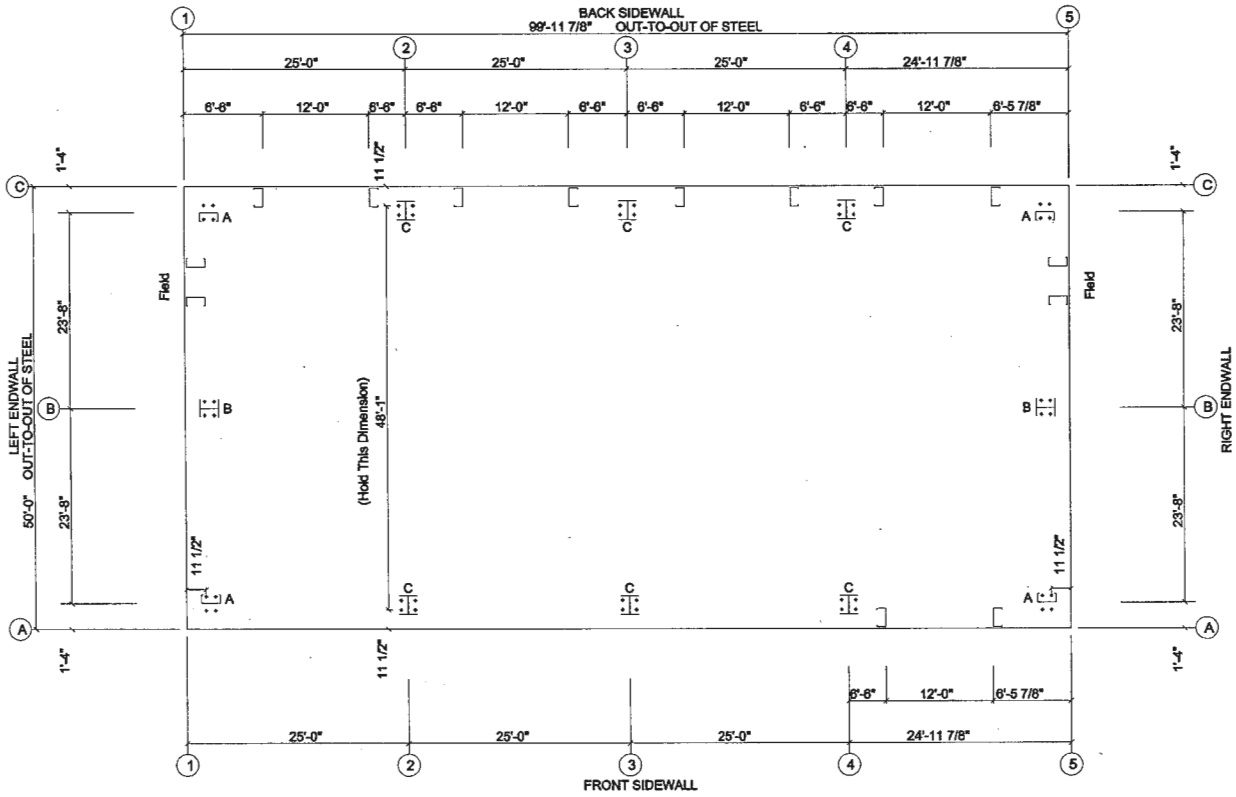
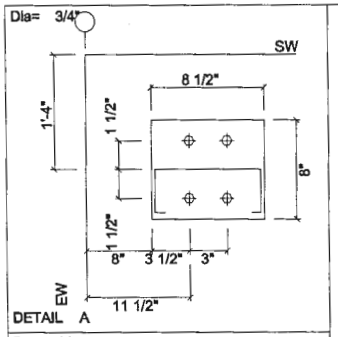


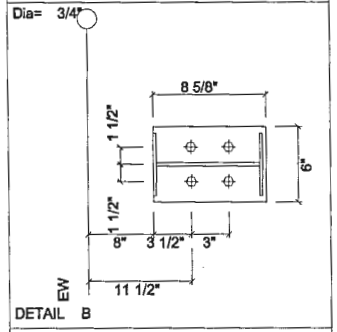
ANCHOR BOLT PLAN

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

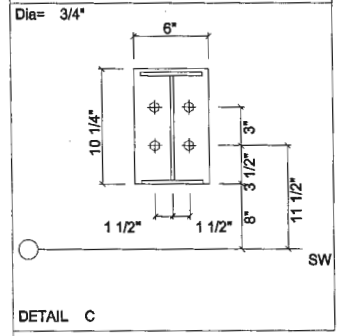
MBS RUN: K19U0659_R1



DETAIL A



DETAIL B



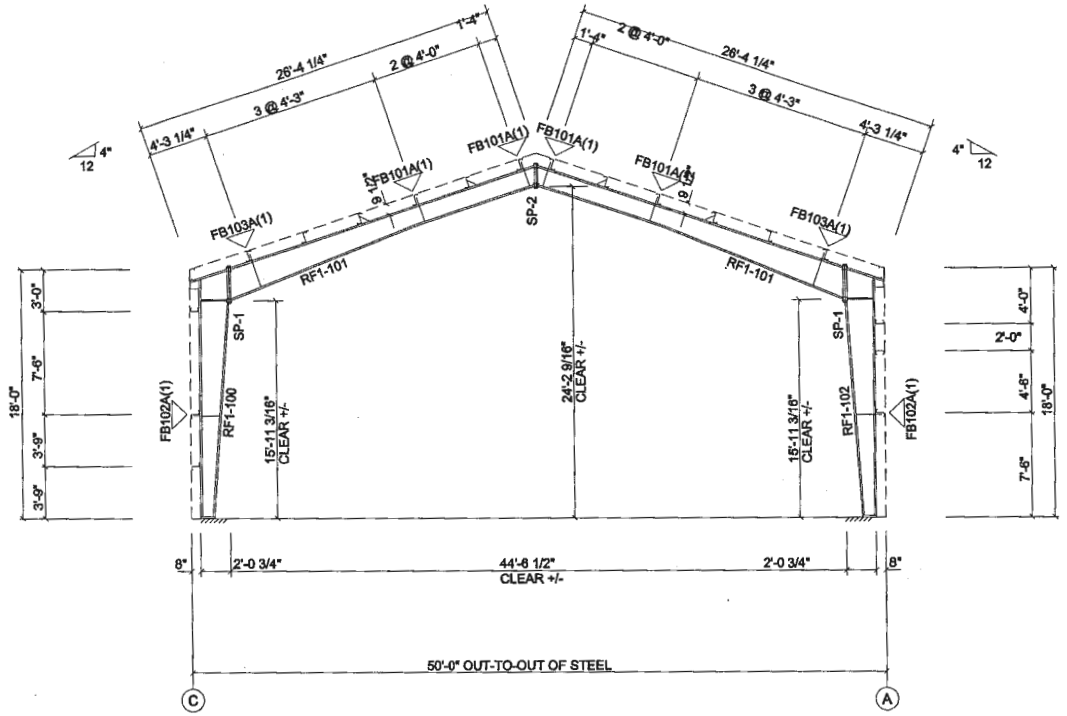
DETAIL C

MBS RUN: K19U0659_R1

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"	5/8"	2'-8 3/4"
SP-2	4	4	0	A325	3/4"	3"	6"	3/8"	1'-10"

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

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	562	9.0/24.0	0.220	216.0	6 x 1/4" x 207.9 6 x 5/16" x 33.6	6 x 1/2" x 187.7
RF1-101	563	24.0/14.0 14.0/14.0	0.188 0.135	168.5 120.0	6 x 1/4" x 280.4	6 x 3/8" x 168.8 6 x 3/16" x 115.2
RF1-102	574	24.0/ 9.0	0.220	216.0	6 x 5/16" x 33.6 6 x 1/4" x 207.9	6 x 1/2" x 187.7



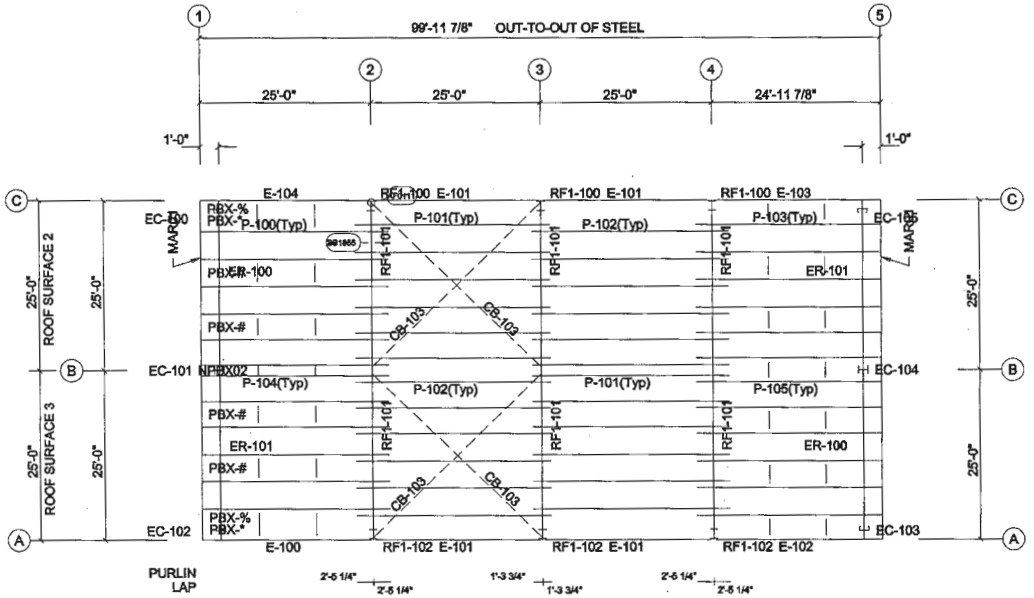
RIGID FRAME ELEVATION: FRAME LINE 2 3 4

SKIP / FULL HAUNCH STIFFENER WELDS

K19U0659_R1 / RFDES - 1

MBS RUN: K19U0659_R1

MEMBER TABLE ROOF PLAN		
QUAN	MARK	PART
6	P-100	95Z075
12	P-101	95Z075
12	P-102	95Z075
6	P-103	95Z075
6	P-104	95Z075
6	P-105	95Z075
1	E-100	95LE3075
4	E-101	95LE3075
1	E-102	95LE3075
1	E-103	95LE3075
1	E-104	95LE3075
4	CB-103	CB08
4	NPBX02	NPBX0206
16	PBX-#	PBX-#
8	PBX-%	PBX-%
8	PBX-*	PBX-*



ROOF FRAMING PLAN

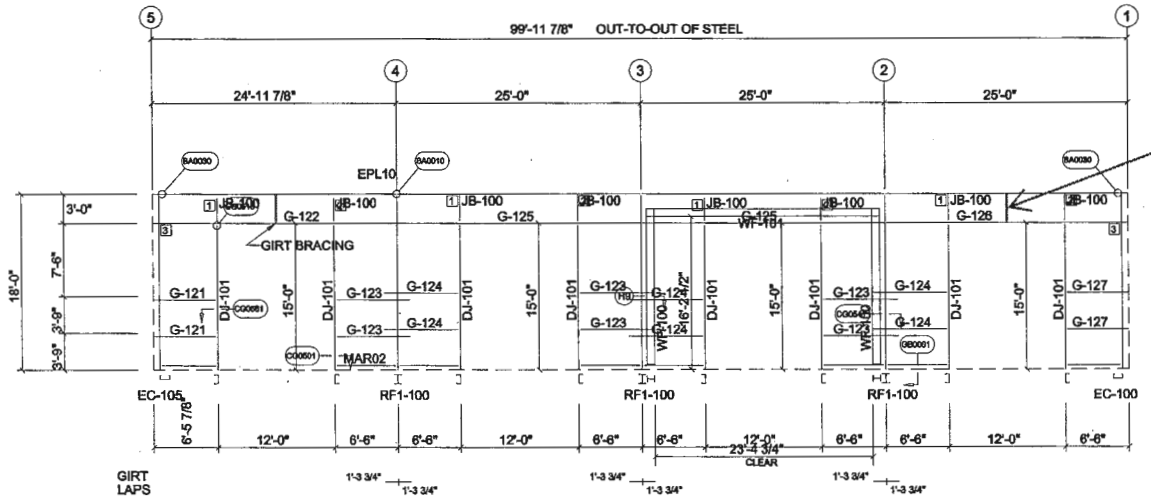
ANTI-ROLL GUSSETS AT 3RD AND 5TH PURLIN ROW FROM EAVE

MBS RUN: K19U0659_R1

BOLT TABLE FRAME LINE C				
LOCATION	QUAN	TYPE	DIA	LENGTH
WF-100 - WF-101	8	A325	3/4"	3"
WF-100 - RF1-100	10	A325	1/2"	2"

MEMBER TABLE FRAME LINE C		
QUAN	MARK	PART
2	WF-100	09W2206B
1	WF-101	09W1308B
8	DJ-101	8C060
2	G-121	8Z060
1	G-122	8C089
6	G-123	8Z060
6	G-124	8Z060
2	G-125	8C089
1	G-126	8C089
2	G-127	8Z060
8	JB-100	8C060

CONNECTION PLATES FRAME LINE C		
ID	QUAN	MARK/PART
1	4	e100
2	4	e101
3	2	GCC51



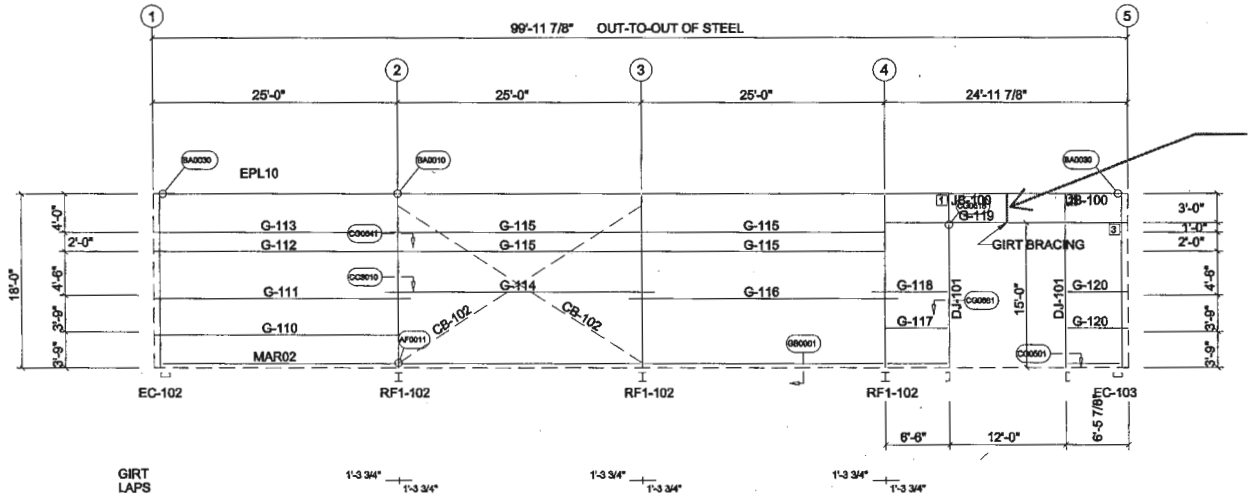
BACK SIDEWALL FRAMING: FRAME LINE C

REPLACE GIRT BRACE LINES IN END BAYS WITH BRACE CHANNELS CENTERED OVER OVERHEAD DOOR

MBS RUN: K19U0659_R1

MEMBER TABLE FRAME LINE A		
QUAN	MARK	PART
2	DJ-101	8C060
1	G-110	8Z089
1	G-111	8Z089
1	G-112	8C075
1	G-113	8C067
1	G-114	8Z089
4	G-116	8C075
1	G-118	8Z067
1	G-117	8Z060
1	G-118	8Z067
1	G-119	8C099
2	G-120	8Z060
2	CB-102	BR10
2	JB-100	8C060

CONNECTION PLATES FRAME LINE A		
ID	QUAN	MARK/PART
1	1	e100
2	1	e101
3	1	GCC51



FRONT SIDEWALL FRAMING: FRAME LINE A

REPLACE GIRT BRACE LINE WITH BRACE CHANNEL CENTERED OVER OVERHEAD DOOR

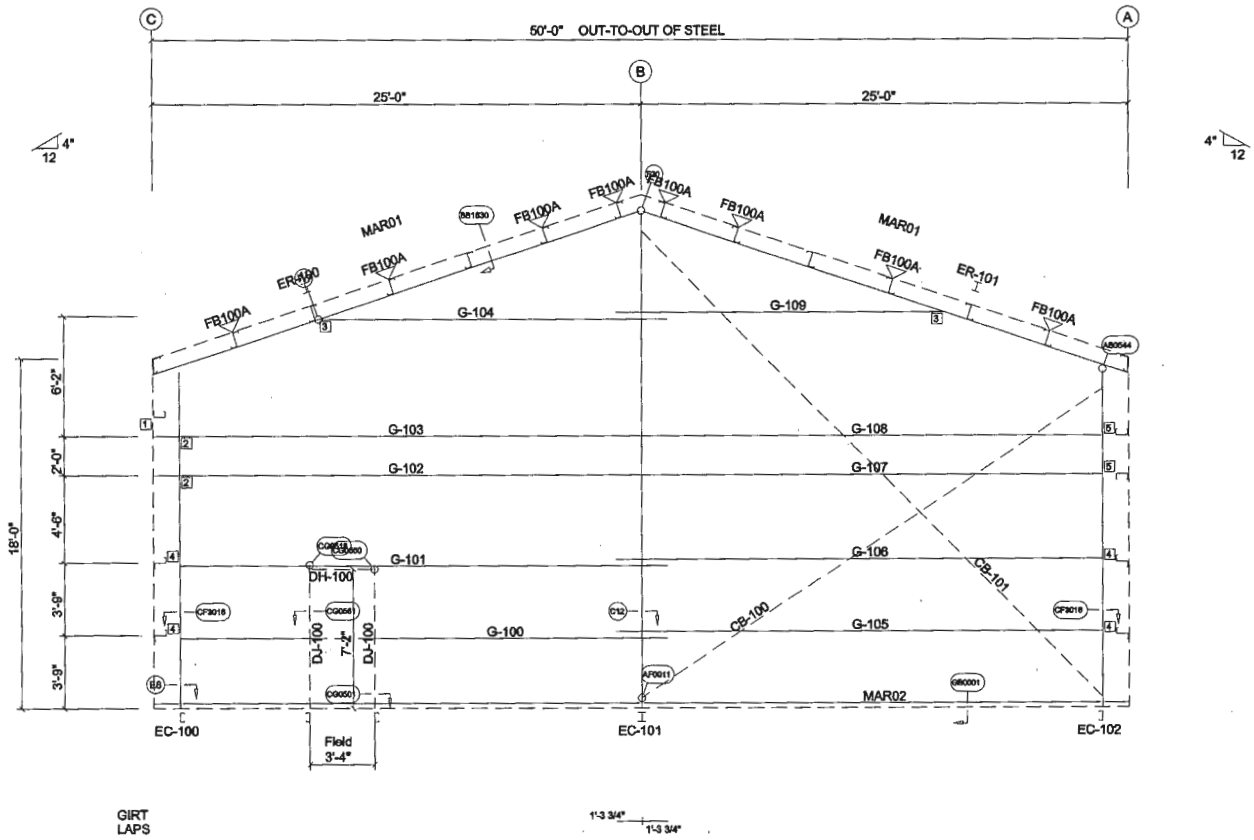
MBS RUN: K19U0659_R1

BOLT TABLE FRAME LINE 1				
LOCATION	QUAN	TYPE	DIA	LENGTH
ER 100/ER 101	8	A325	3/4"	3"
Columns/Raf	4	A325	1/2"	2"

FLANGE BRACE TABLE FRAME LINE 1			
ID	QUAN	MARK	LENGTH
1	8	FB100A	3'-6 9/16"

MEMBER TABLE FRAME LINE 1		
QUAN	MARK	PART
1	EC-100	84C089
1	EC-101	W8x18
1	EC-102	84C089
1	ER-100	W8x24
1	ER-101	W8x24
2	DJ-100	8C060
1	DH-100	8C060
1	G-100	8Z060
1	G-101	8Z099
1	G-102	8C075
1	G-103	8C089
1	G-104	8Z060
1	G-105	8Z060
1	G-106	8Z099
1	G-107	8C075
1	G-108	8C089
1	G-109	8Z060
1	CB-100	BR10
1	CB-101	BR10

CONNECTION PLATES FRAME LINE 1		
ID	QUAN	MARK/PART
1	1	GCC51
2	2	d102
3	2	d100
4	4	GCC22
5	2	r101



LEFT ENDWALL FRAMING: FRAME LINE 1

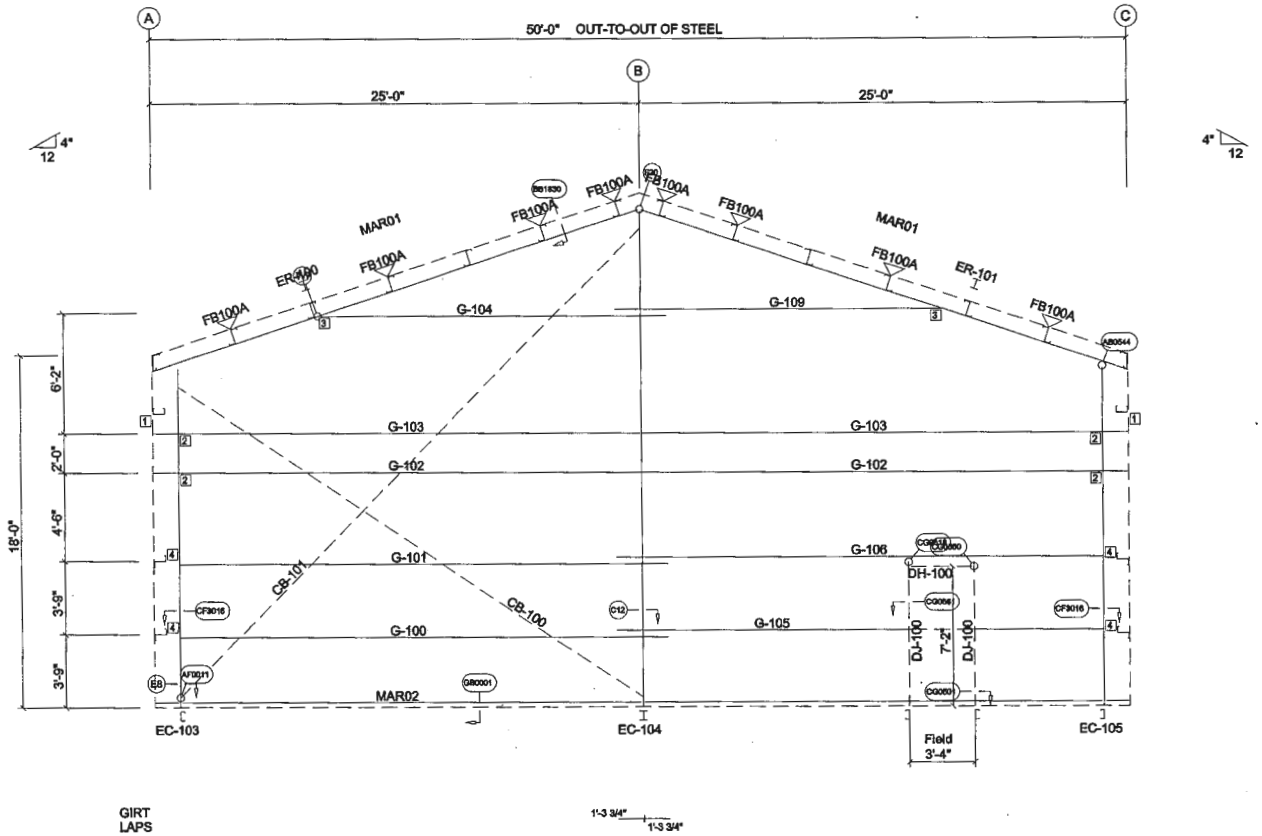
MBS RUN: K19U0659_R1

BOLT TABLE FRAME LINE 5				
LOCATION	QUAN	TYPE	DIA	LENGTH
ER 100/ER 101	8	A325	3/4"	3"
Columns/Raf	4	A325	1/2"	2"

FLANGE BRACE TABLE FRAME LINE 5			
▽ID	QUAN	MARK	LENGTH
1	8	FB100A	3'-6 9/16"

MEMBER TABLE FRAME LINE 5		
QUAN	MARK	PART
1	EC-103	84C089
1	EC-104	W8x18
1	EC-105	84C089
1	ER-100	W8x24
1	ER-101	W8x24
2	DJ-100	8C060
1	DH-100	8C060
1	G-100	8Z060
1	G-101	8Z099
2	G-102	8C075
2	G-103	8C089
1	G-104	8Z060
1	G-105	8Z060
1	G-106	8Z099
1	G-109	8Z060
1	CB-100	BR10
1	CB-101	BR10

CONNECTION PLATES FRAME LINE 5		
□ID	QUAN	MARK/PART
1	2	GCC51
2	4	d102
3	2	d100
4	4	GCC22



RIGHT ENDWALL FRAMING: FRAME LINE 5

MBS RUN: K19U0659_R1

KIRBY BUILDING SYSTEMS
A NUCOR Company

Standing Seam Panel Uplift Check

Job Number:	K19U0659
Engineer:	AH
Date:	10/15/2019
Version:	4.3

Page 1

Code:	2015 IBC	Length:	100 ft	BWP:	26.4 psf	High Zone Coeff:	2.78
Panel Type:	SS360 24ga - 24"	Width:	50 ft	"A" Zone Width:	5' - 0"	Center Zone Coeff:	1.88
Panel Loc.:	Gable Rake Panel	E.H.:	18 ft	High Zone Width:	5' - 0"	Low Zone Coeff:	2.78
Enclosure:	Enclosed	Slope:	4" in 12"	Low Zone Width:	5' - 0"		
High Point is Not Considered as a Support Point				Low Point is Considered as a Support Point			

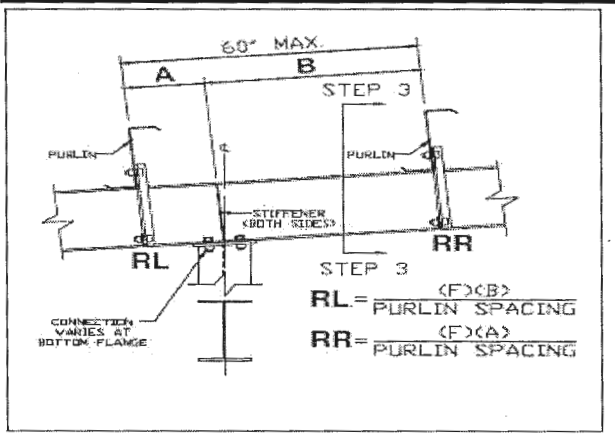
Purlin	Spacing (ft)	Location	Trib Area (ft)	Reaction (k)	Allowable Reaction (k)	Unity	Check
High Point	0.0000	0' - 0"	0.000	0.000	0.000	0.000	O.K.
1	1.3333	1' - 4"	2.417	0.209	0.457	0.458	O.K.
2	3.5000	4' - 10"	3.500	0.258	0.522	0.494	O.K.
3	3.5000	8' - 4"	4.000	0.232	0.529	0.439	O.K.
4	4.5000	12' - 10"	4.500	0.261	0.520	0.503	O.K.
5	4.5000	17' - 4"	4.500	0.261	0.520	0.503	O.K.
6	4.5000	21' - 10"	4.510	0.340	0.519	0.655	O.K.
Low Point	4.5190	26' - 4 1/4"	2.260	0.196	0.455	0.430	O.K.

KIRBY BUILDING SYSTEMS
A NUCOR Company

Endwall Column Bracing

Job Num:	K19U0659
Engineer:	AH
Date:	10/15/2019
Version:	2.2
Page:	

Column	Column Label(s)	F (Kips)	A	B	Rafter Shape	Use Detail	Clip	Bolt	Flange Brace	Purlin Gage	Figure
1	B	6.53	15	15	W8X18	K0B					see K0B



Built-Up Section	Flange Width, bf (in)	Flange Thickness, tf (in)	Web Depth, D (in)