Multi- Column Ground Sign Post Design

SUBJECT Design Standard Index 11200
PROJECT # SIGN-4_STA. 304+71.00
DESIGNED BY ___AB___ DATE _____
CHECKED BY _____NRH_____ DATE _____

GENERAL INFORMATION:

References:

1. AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 1st Edition. [LRFD LTS-1]
2. FDOT Structures Manual Volume 3
3.FDOT Design Standards for Construction and Maintenance on the State Highway System, Index 11200.

Reference:K:\SAR_Roadway\TAM_Lena Road\12345615201\Calculations\MathCAD_multipost_Lena Road\Lena Road_Sign-4\LRFD Equation Module.xmc

DESIGN REQUIREMENTS:

Main Panel Dimensions

$L_{panel} := 6 \cdot ft$ $D_{panel} := 3.0 \cdot ft$

Top Panel Dimensions and Location

$L_{top.panel} := 0 \cdot ft$ $D_{top.panel} := 0 \cdot ft$

TopJustification := Left / Center / Right

Bottom Panel Dimensions and Location

$L_{bot.panel} := \mathbf{0} \cdot ft$ $D_{bot.panel} := \mathbf{0} \cdot ft$

BottomJustification := Left / Center / Right

Ground Slope and Sign Height

$Run_{Rise} := 4.0 \cdot \frac{ft}{ft}$ *ground slope*

$H_{clear.min.sign} := 8.3 \cdot ft$ *Clearance from the ground to the bottom of the sign*

LRFD Extreme Event I Wind Speed

$V_{wind} := \mathbf{110} \cdot mph$ *FDOT Structures Manual, Vol. 3 For Ground Signs, Use 110 mph for the entire state*

Roadside Design Guide 4.3.2:

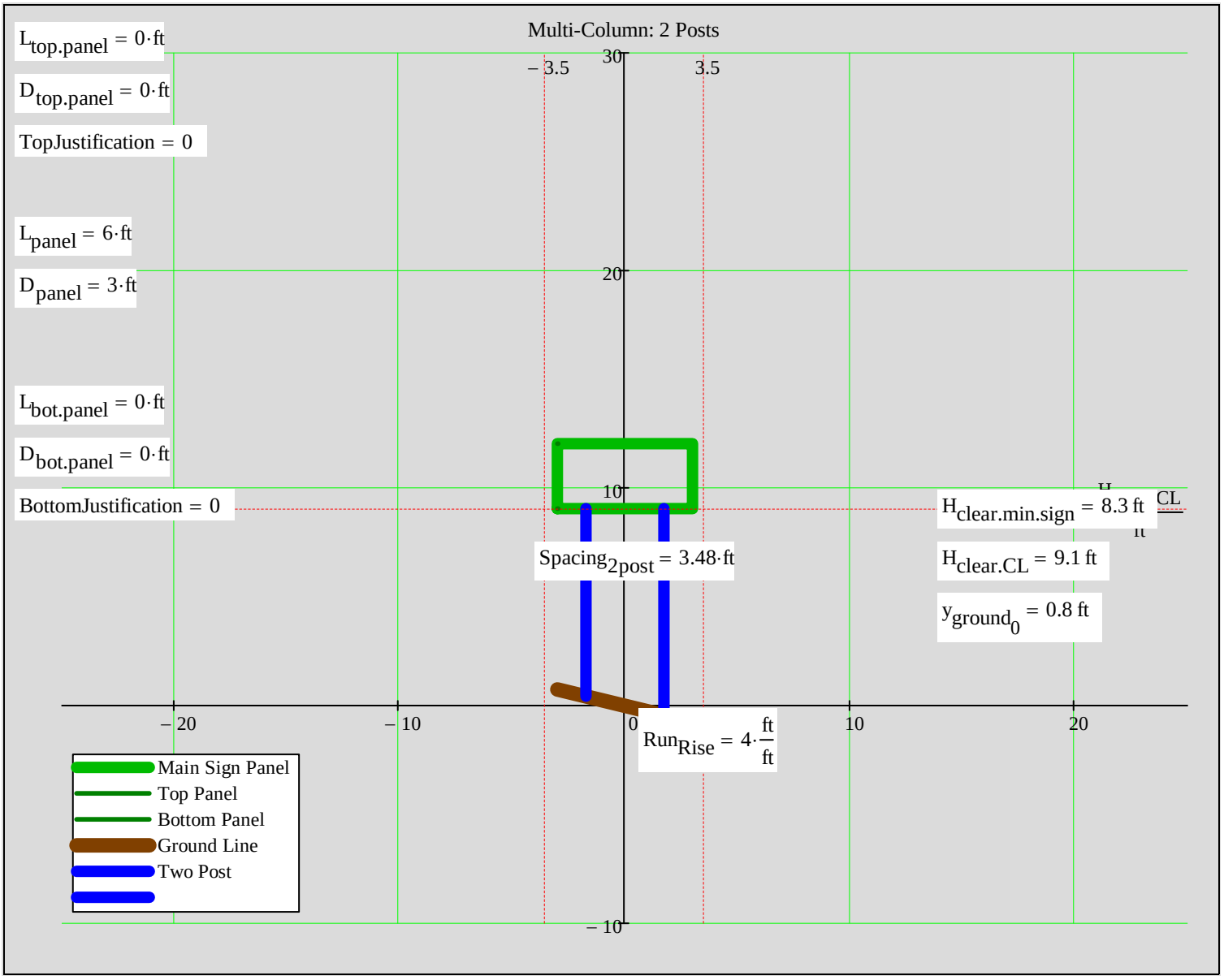
- *The hinge should be at least 7 ft, above the ground so that no portion of the sign or upper section of the support is likely to penetrate the windshield of an impacting vehicle.*
- *No supplementary signs should be attached below the hinges if such placement is likely to interfere with the breakaway action of the support post or if the supplemental sign is likely to strike the windshield of an impacting vehicle.*

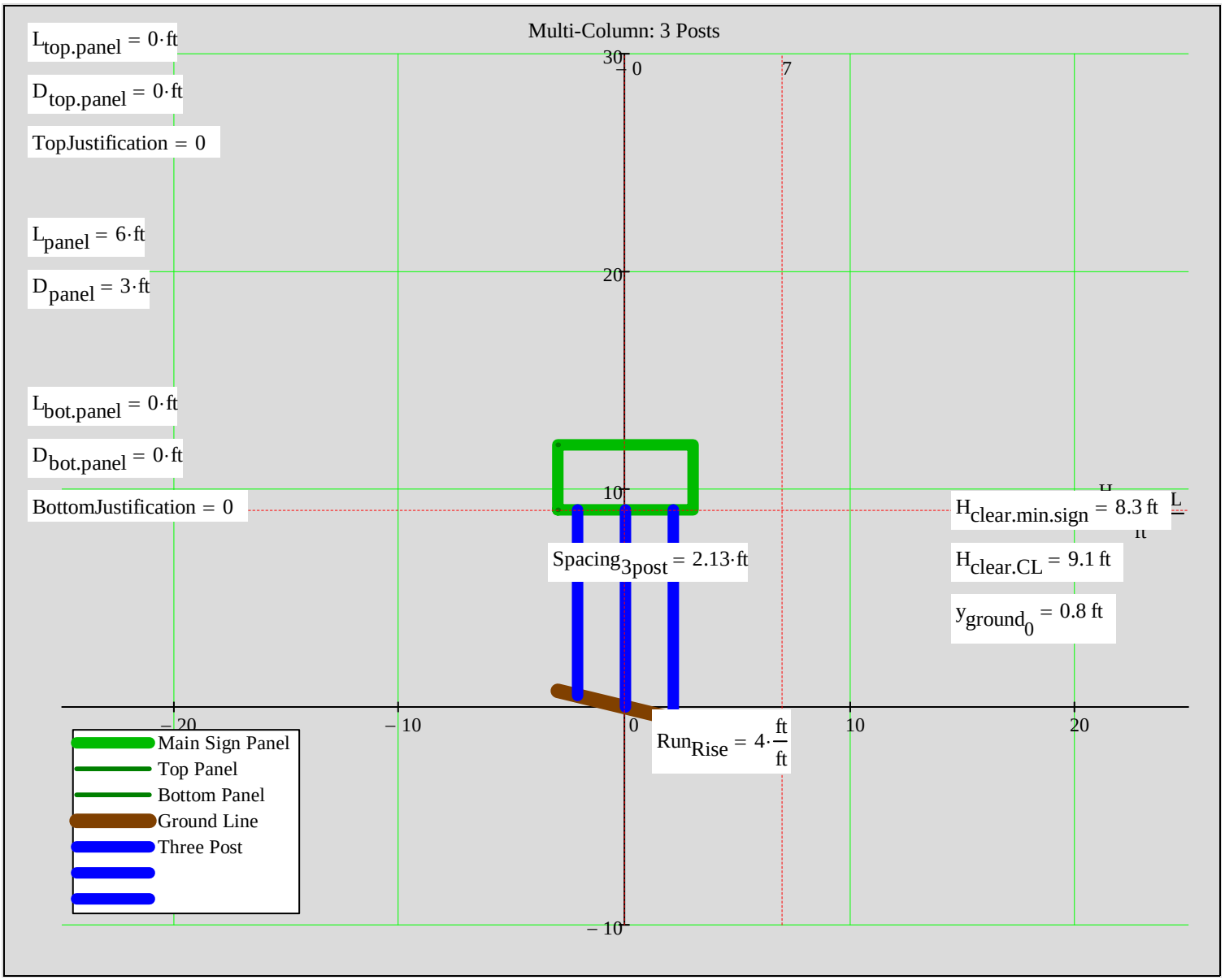
MUTCD 2A.18:

- *Directional signs on freeways and expressways shall be installed with a minimum height of 7 feet,measured vertically from the bottom of the sign to the elevation of the near edge of the pavement.*
- *Where large signs having an area exceeding 50 square feet are installed on multiple breakaway posts, the clearance from the ground to the bottom of the sign shall be at least 7 feet.*

Post and Panel Geometry

Post and Panel Geometry


Multi-Column: 2 Posts
$L_{top.panel} = 0 \cdot ft$
$D_{top.panel} = 0 \cdot ft$
TopJustification = 0
$L_{panel} = 6 \cdot ft$
$D_{panel} = 3 \cdot ft$
$L_{bot.panel} = 0 \cdot ft$
$D_{bot.panel} = 0 \cdot ft$
BottomJustification = 0
$Spacing_{2post} = 3.48 \cdot ft$
$H_{clear.min.sign} = 8.3\ ft$
$H_{clear.CL} = 9.1\ ft$
$y_{ground_0} = 0.8\ ft$
$Run_{Rise} = 4 \cdot \frac{ft}{ft}$
Main Sign Panel
Top Panel
Bottom Panel
Ground Line
Two Post
30
20
10
– 10
– 3.5
3.5
– 20
– 10
0
10
20



CheckPanelDims = "OK"

CheckTopPanelDims = "OK"

CheckBotPanelDims = "OK"

CheckMaxPanelWidth2Post = "OK"

CheckMaxClearHeight = "OK "

CheckMinClearHeight = "OK "

Post and Panel Loads

Post and Panel Loads

Post Design: Steel W-Beam

Post Material and Section Properties

$F_{y.stbeam} := 36 \cdot ksi$ $E_{steel} := 29000 \cdot ksi$

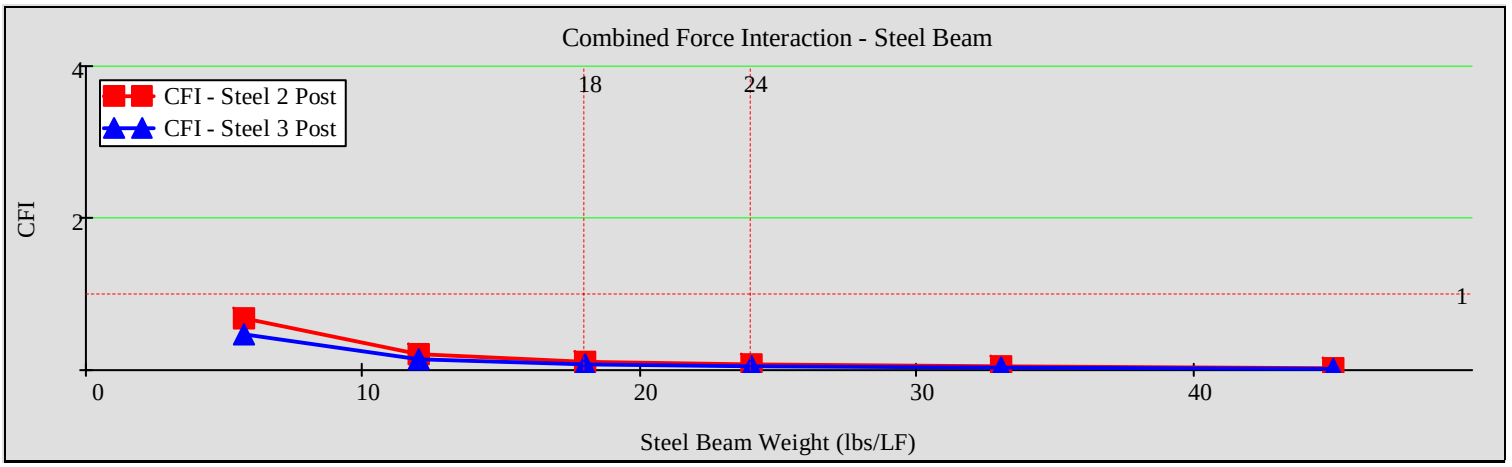
Steel I Beam Designations *S3x5.7* *W6x12* *W8x18* *W8x24* *W10x33* *W12x45*

$Prop_{stbeam} :=$

5.7	12.0	18.0	24.0	33.0	45.0	Wt per Length (lbf/ft)
2.33	4.0	5.25	6.5	7.96	8.0	Flange Width (in)
0.26	0.28	0.33	0.40	0.435	0.575	Flange Thickness (in)
3.0	6.03	8.14	7.93	9.73	12.1	d (in)
0.17	0.23	0.23	0.245	0.29	0.335	Web Thickness (in)
1.66	3.55	5.26	7.08	9.71	13.1	A (in3)
1.67	7.31	15.2	20.9	35.0	57.7	S (in3)
1.94	8.30	17.0	23.1	38.8	64.2	Z (in3)
2.5	22.1	61.9	82.7	171.0	348	I (in4)
0.447	2.99	7.97	18.3	36.6	50.0	Iy (in4)
0.0433	0.0903	0.172	0.346	0.583	1.26	J (in4)
0.838	24.7	122	259	791	1650	Cw(in6)

The order of Steel Beams need to be in ascending order of the Section Strength

Steel Beam Post Design



$WtPerFt_{stbeam} = \begin{pmatrix} 5.7 \\ 12 \\ 18 \\ 24 \\ 33 \\ 45 \end{pmatrix} \cdot \frac{lbf}{ft}$ $CFI_{2Post.stbeam} = \begin{pmatrix} 0.68 \\ 0.21 \\ 0.11 \\ 0.07 \\ 0.05 \\ 0.03 \end{pmatrix}$

Smallest 2 Post Steel Beam that Satisfies Strength Requirements

SteelBeam2Post = "W 3 X 5.7"

CheckMaxPanelWidth2Post = "OK"

CheckCFI2PostStBeam = "OK"

CheckBreakaway2PostStBeam = "OK"

$$WtPerFt_{stbeam} = \begin{pmatrix} 5.7 \\ 12 \\ 18 \\ 24 \\ 33 \\ 45 \end{pmatrix} \cdot \frac{lbf}{ft} \qquad CFI_{3Post.stbeam} = \begin{pmatrix} 0.47 \\ 0.15 \\ 0.08 \\ 0.05 \\ 0.04 \\ 0.02 \end{pmatrix}$$

Smallest 3 Post Steel Beam that Satisfies Strength Requirements

SteelBeam3Post = "W 3 X 5.7"

CheckCFI3PostStBeam = "OK"

CheckBreakaway3PostStBeam = "NG, Spacing < 3.5 ft"

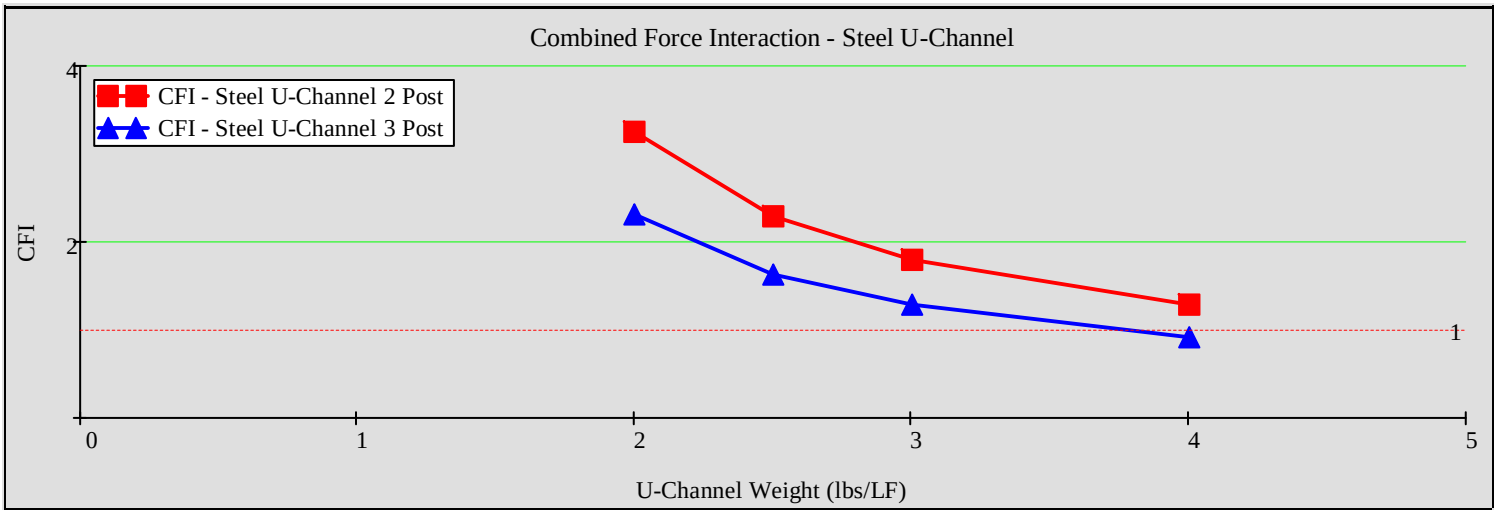
Post Design: Steel U-Channel

$F_{y.steel.uchan} := 60 \cdot ksi$

$$Prop_{uchan} := \begin{pmatrix} 2 & 2.5 & 3 & 4 \\ 3.125 & 3.125 & 3.5 & 3.5 \\ 1.25 & 1.25 & 1.625 & 1.671 \\ 0.11 & 0.13 & 0.14 & 0.19 \\ 0.59 & 0.74 & 0.92 & 1.24 \\ 0.23 & 0.31 & 0.43 & 0.56 \\ 0.26 & 0.35 & 0.48 & 0.62 \\ 0.18 & 0.24 & 0.40 & 0.50 \end{pmatrix} \begin{pmatrix} \text{Wt per Length (lbf/ft)} \\ \text{Overall Width (in)} \\ \text{Flange Width (in)} \\ \text{Flange Thickness (in)} \\ \text{A (in3)} \\ \text{S (in3)} \\ \text{Z (in3)} \\ \text{Iy (in4)} \end{pmatrix}$$

The order of Steel U-Channels need to be in ascending order of the Section Strength

Steel U-Channel Post Design



$$WtPerFt_{uchan} = \begin{pmatrix} 2 \\ 2.5 \\ 3 \\ 4 \end{pmatrix} \cdot \frac{lbf}{ft} \qquad CFI_{2Post.uchan} = \begin{pmatrix} 3.25 \\ 2.29 \\ 1.80 \\ 1.28 \end{pmatrix}$$

Smallest 2 Post U-Channel that Satisfies Strength Requirements

SteelUChannel2Post = "N/A"

CheckMaxPanelWidth2Post = "OK"

CheckCFI2PostUchan = "NG"

CheckBreakaway2PostUchan = "OK"

$$WtPerFt_{uchan} = \begin{pmatrix} 2 \\ 2.5 \\ 3 \\ 4 \end{pmatrix} \cdot \frac{lbf}{ft} \qquad CFI_{3Post.uchan} = \begin{pmatrix} 2.31 \\ 1.63 \\ 1.28 \\ 0.92 \end{pmatrix}$$

Smallest 3 Post U-Channel that Satisfies Strength Requirements

SteelUChannel3Post = "4 lb/ft"

CheckCFI3PostUchan = "OK"

CheckBreakaway3PostUchan = "U-Channel too large for 3 posts in a 7 ft path"

Post Design: Aluminum Beam (6061-T6 Alloy)

Post Material and Section Properties

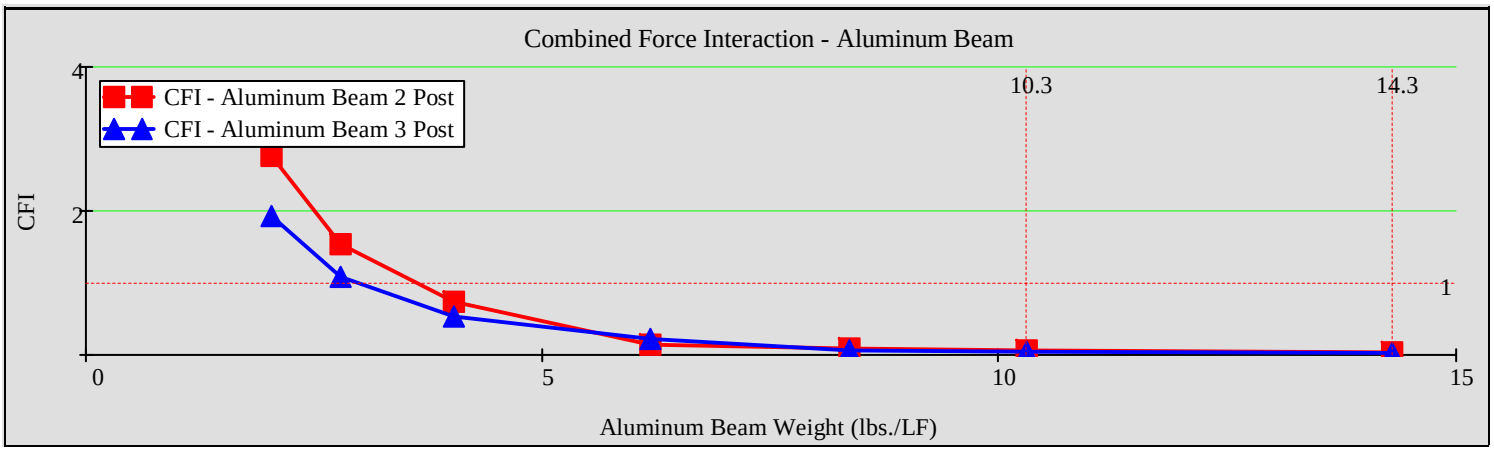
$F_{cy} := 35 \cdot ksi$ $F_{ty} := 35 \cdot ksi$ $C_t := 141$ $F_{tu} := 38 \cdot ksi$ $k_t := 1.0$ $E_{aluminum} := 10000 \cdot ksi$

Aluminum I-Beam Designations *3x2.03* *4x2.79* *6x4.03* *8x6.18* *9x8.36* *10x10.3* *12x14.3*

$$Prop_{albeam} := \begin{pmatrix} 2.03 & 2.79 & 4.03 & 6.18 & 8.36 & 10.3 & 14.3 \\ 2.5 & 3 & 4 & 5 & 5.5 & 6 & 7 \\ 0.26 & 0.29 & 0.29 & 0.35 & 0.44 & 0.5 & 0.62 \\ 3 & 4 & 6 & 8 & 9 & 10 & 12 \\ 0.15 & 0.17 & 0.19 & 0.23 & 0.27 & 0.29 & 0.31 \\ 1.73 & 2.38 & 3.43 & 5.26 & 7.11 & 8.75 & 12.1 \\ 1.81 & 3.36 & 7.33 & 14.9 & 22.7 & 31.2 & 52.9 \\ 1.25 & 1.68 & 2.53 & 3.37 & 3.79 & 4.22 & 5.11 \\ 2.71 & 6.71 & 22.0 & 59.7 & 102 & 156 & 317 \\ 0.679 & 1.31 & 3.10 & 7.30 & 12.2 & 18.0 & 35.5 \\ 0.0374 & 0.0608 & 0.0888 & 0.188 & 0.386 & 0.620 & 1.26 \end{pmatrix} \begin{pmatrix} \text{Wt per Length (lbf/ft)} \\ \text{Flange Width (in)} \\ \text{Flange Thickness (in)} \\ \text{d (in)} \\ \text{Web Thickness (in)} \\ \text{A (in3)} \\ \text{S (in3)} \\ \text{r (in)} \\ \text{I (in4)} \\ \text{Iy (in4)} \\ \text{J (in4)} \end{pmatrix}$$

The order of Aluminum Beams need to be in ascending order of the Section Modulus

Aluminum Beam Post Design



$$WtPerFt_{albeam} = \begin{pmatrix} 2.03 \\ 2.79 \\ 4.03 \\ 6.18 \\ 8.36 \\ 10.3 \\ 14.3 \end{pmatrix} \cdot \frac{lbf}{ft} \quad CFI_{2Post.albeam} = \begin{pmatrix} 2.77 \\ 1.54 \\ 0.74 \\ 0.14 \\ 0.09 \\ 0.06 \\ 0.04 \end{pmatrix}$$

Smallest 2 Post Aluminum Beam that Satisfies Strength Requirements

AlBeam2Post = "I 6 x 4.03"

CheckMaxPanelWidth2Post = "OK"

CheckCFI2PostAlBeam = "OK"

CheckBreakaway2PostAlBeam = "OK"

$$WtPerFt_{albeam} = \begin{pmatrix} 2.03 \\ 2.79 \\ 4.03 \\ 6.18 \\ 8.36 \\ 10.3 \\ 14.3 \end{pmatrix} \cdot \frac{lbf}{ft} \quad CFI_{3Post.albeam} = \begin{pmatrix} 1.93 \\ 1.08 \\ 0.53 \\ 0.22 \\ 0.07 \\ 0.05 \\ 0.03 \end{pmatrix}$$

Smallest 3 Post Aluminum Beam that Satisfies Strength Requirements

AlBeam3Post = "I 6 x 4.03"

CheckCFI3PostAlBeam = "OK"

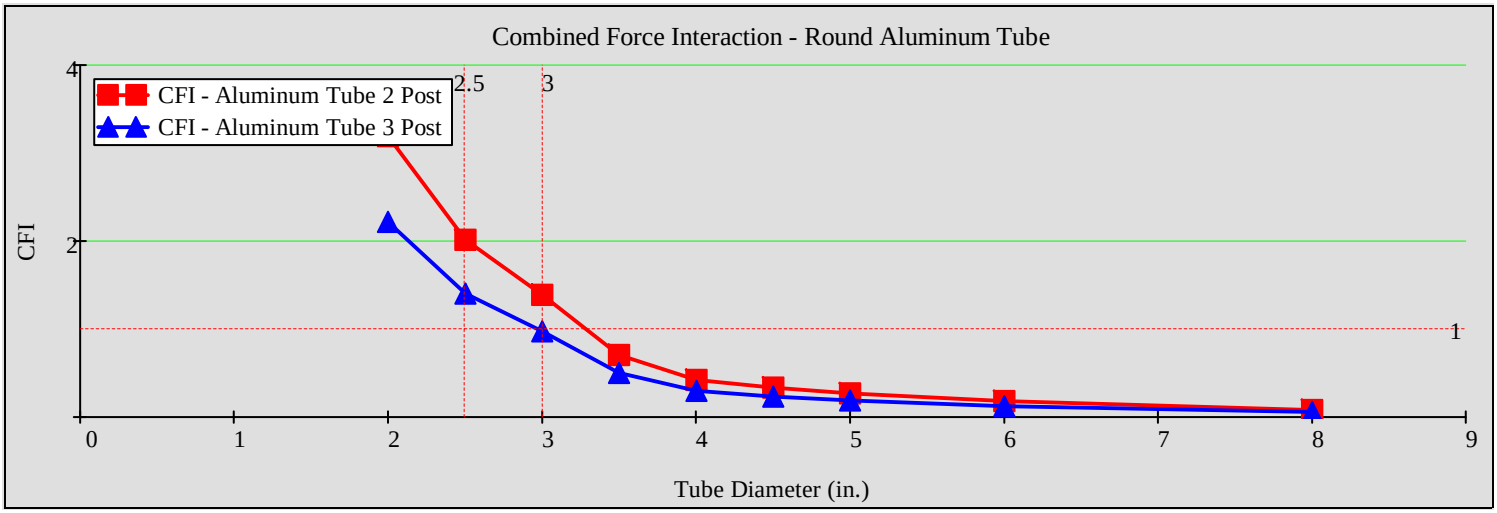
CheckBreakaway3PostAlBeam = "NG"

Post Design: Aluminum Round Tube (6061-T6 Alloy)

$$AlTube := \begin{pmatrix} 2 & 2.5 & 3 & 3.5 & 4 & 4.5 & 5 & 6 & 8 \\ 0.125 & 0.125 & 0.125 & 0.188 & 0.25 & 0.25 & 0.25 & 0.25 & 0.313 \end{pmatrix} \begin{pmatrix} \text{Outside Diameter (in)} \\ \text{Wall Thickness (in)} \end{pmatrix}$$

The order of Aluminum Round Tubes needs to be in ascending order of the Section Strength

Aluminum Round Tube Post Design



$$OD_{tube} = \begin{pmatrix} 2 \\ 2.5 \\ 3 \\ 3.5 \\ 4 \\ 4.5 \\ 5 \\ 6 \\ 8 \end{pmatrix} \cdot in \qquad CFI_{2Post.tube} = \begin{pmatrix} 3.19 \\ 2.01 \\ 1.39 \\ 0.71 \\ 0.42 \\ 0.33 \\ 0.27 \\ 0.18 \\ 0.08 \end{pmatrix}$$

Smallest 2 Post Aluminum Tube that Satisfies Strength Requirements

AlTube2Post = "OD = 3.5 in, t = 3/16 in"

CheckMaxPanelWidth2Post = "OK"

CheckCFI2PostTube = "OK"

CheckBreakaway2PostTube = "NG, posts too strong"

Note: for aluminum tube the only acceptable breakaway sizes are 3 inch OD and smaller with no more than 2 posts in a 7 foot path.

$$OD_{tube} = \begin{pmatrix} 2 \\ 2.5 \\ 3 \\ 3.5 \\ 4 \\ 4.5 \\ 5 \\ 6 \\ 8 \end{pmatrix} \cdot in \qquad CFI_{3Post.tube} = \begin{pmatrix} 2.22 \\ 1.41 \\ 0.98 \\ 0.5 \\ 0.3 \\ 0.24 \\ 0.19 \\ 0.13 \\ 0.06 \end{pmatrix}$$

Smallest 3 Post Aluminum Tube that Satisfies Strength Requirements

AlTube3Post = "OD = 3 in, t = 1/8 in"

CheckCFI3PostTube = "OK"

CheckBreakaway3PostTube = "OK"

Note: for aluminum tube the only acceptable breakaway sizes are 3 inch OD and smaller with no more than 2 posts in a 7 foot path.

Foundation Design

Soil Properties, Shaft Properties and Phi Factor for Overturning

SoilType := **1** *(0 for clay, 1 for sand)*

γ_{soil} := **105**·pcf

ϕ_{soil} := **30**·deg *(for sand)*

c_{soil} := **1.0**·ksf *(for clay)*

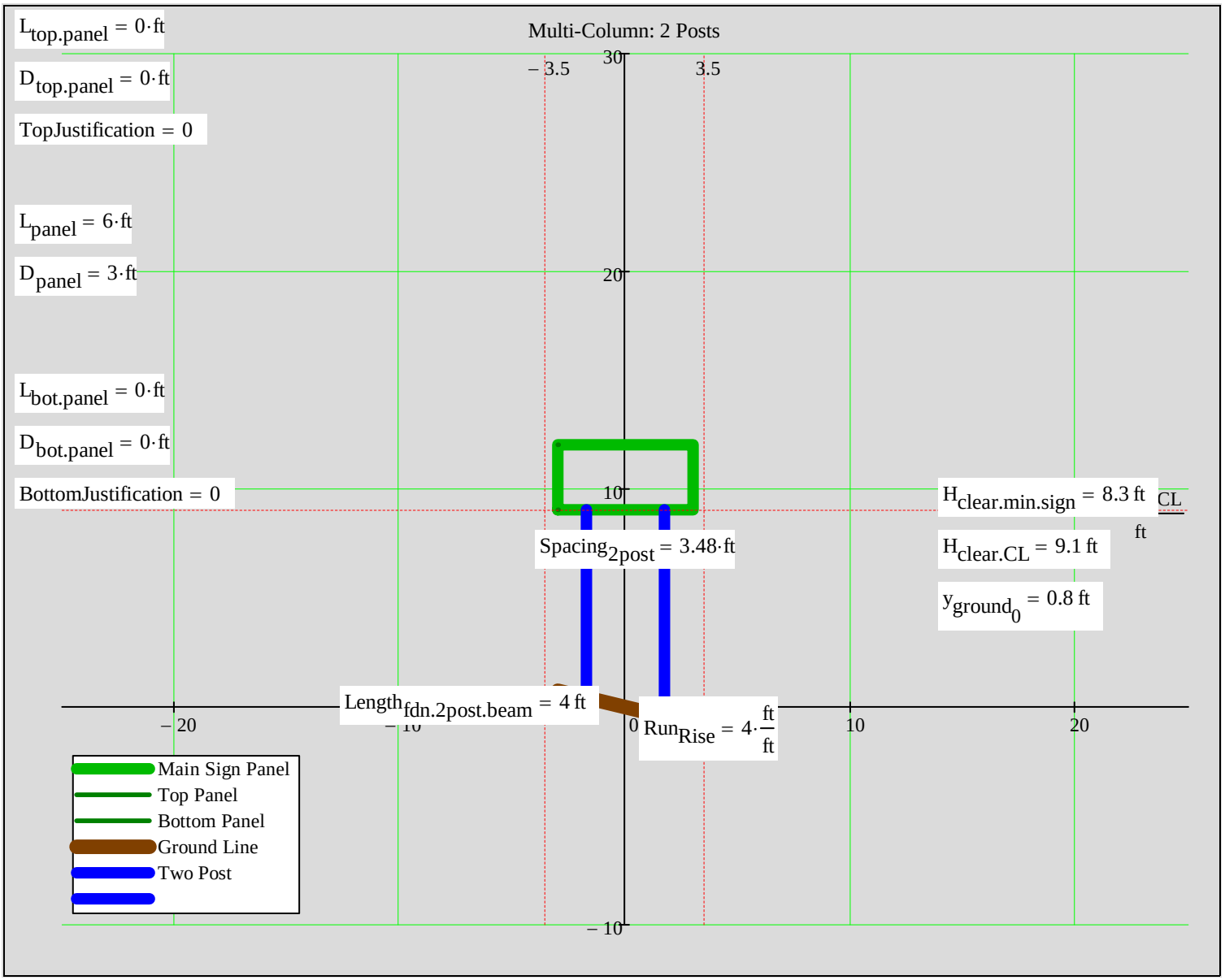
Dia_{fdn} := **2.0**·ft

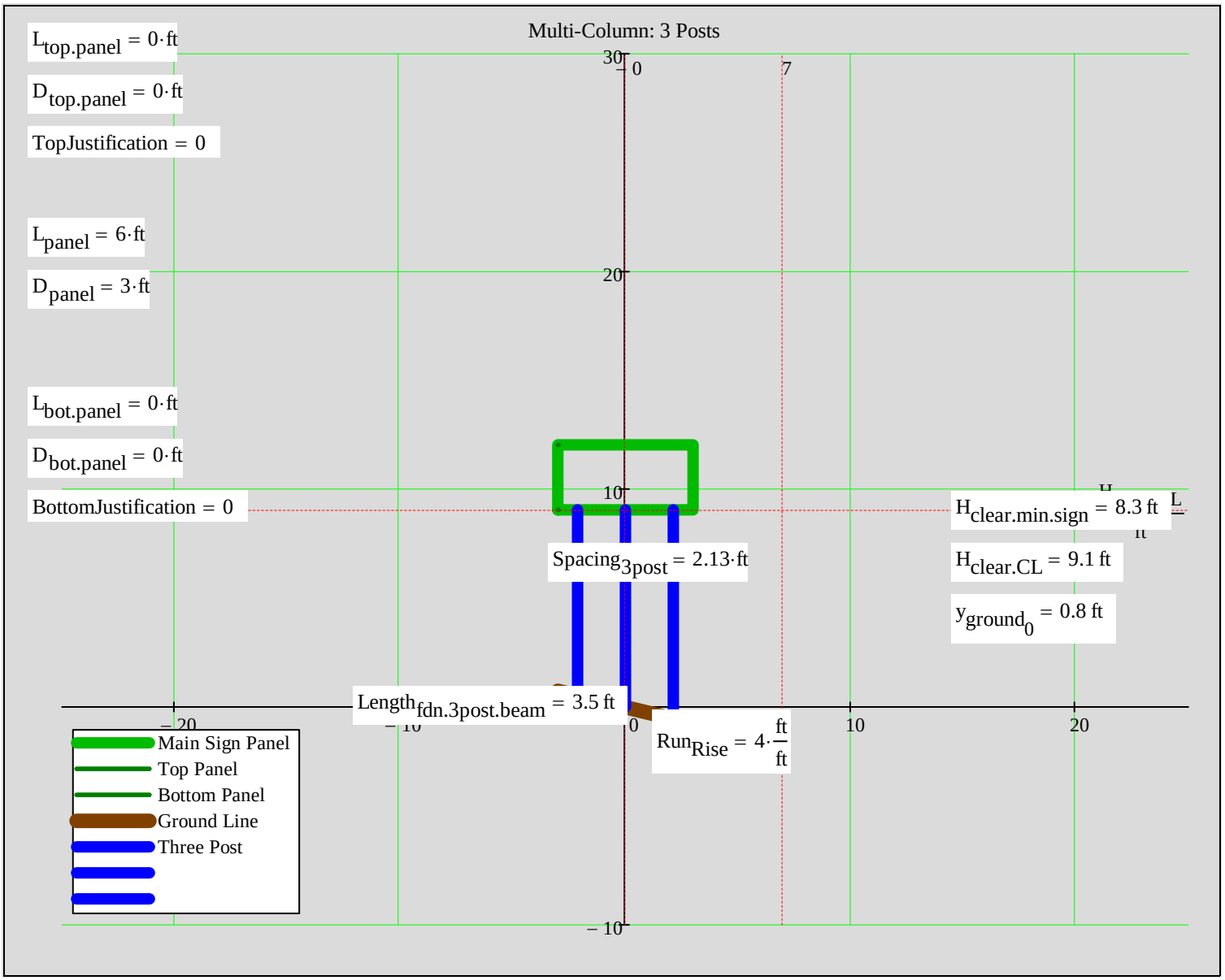
Offset := **0.5**·ft

ϕ_{ot} := 0.6

Foundation Design for Round Piles for Steel & Aluminum Beams and Direct Burial U-Channel and Aluminum Tubes

DESIGN SUMMARY:





Panel and Supplemental Panel Checks

CheckTopPanelDims = "OK"

CheckPanelDims = "OK"

CheckBotPanelDims = "OK"

CheckMaxPanelWidth2Post = "OK"

CheckMaxClearHeight = "OK "

CheckMinClearHeight = "OK "

Design Wind Speed and Number of Wind Beams

$V_{wind} = 110 \cdot mph$ #WindBeams = 2 Check#WindBeams = "OK"

Steel W-Beam Post Option $F_{y.stbeam} = 36 \cdot ksi$

CheckCFI2PostStBeam = "OK"

SteelBeam2Post = "W 3 X 5.7"

CheckBreakaway2PostStBeam = "OK"

CheckCFI3PostStBeam = "OK"

SteelBeam3Post = "W 3 X 5.7"

CheckBreakaway3PostStBeam = "NG, Spacing < 3.5 ft"

$L_{post.avg} = 11.92 \cdot ft$ *Estimated Average Post Length:*
2 Post
3 Post

Aluminum I-Beam Post Option (6061-T6 Alloy)

CheckCFI2PostAlBeam = "OK" = "I 6 x 4.03"

AlBeam2Post = "I 6 x 4.03"

CheckBreakaway2PostAlBeam = "OK"

CheckCFI3PostAlBeam = "OK"

AlBeam3Post = "I 6 x 4.03"

CheckBreakaway3PostAlBeam = "NG"

$L_{post.avg} = 11.92 \cdot ft$ *Estimated Average Post Length*

Round Pile Foundation Design for Steel and Aluminum Beams

SoilType = 1 *(0 for clay, 1 for sand)* $\gamma_{soil} = 105 \cdot pcf$ $\phi_{soil} = 30 \cdot deg$ $c_{soil} = 1 \cdot ksf$

$Dia_{fdn} = 2 \cdot ft$ Offset = $0.5 \cdot ft$

Shaft Length for Two Post Configuration $Length_{fdn.2post.beam} = 4 \cdot ft$

Shaft Length for Three Post Configuration $Length_{fdn.3post.beam} = 3.5 \cdot ft$

Steel U-Channel Post Option $F_{y.steel.uchan} = 60 \cdot ksi$

CheckCFI2PostUchan = "NG"

SteelUChannel2Post = "N/A"

CheckBreakaway2PostUchan = "OK"

CheckCFI3PostUchan = "OK"

SteelUChannel3Post = "4 lb/ft"

CheckBreakaway3PostUchan = "U-Channel too large for 3 posts in a 7 ft [illegible]"

$L_{uchannel.avg} = 15.05 \cdot ft$ *Est. Average Post Length:*
2 Post
3 Post

Aluminum Tube Post Option (6061-T6 Alloy)

CheckCFI2PostTube = "OK"

AlTube2Post = "OD = 3.5 in, t = 3/16 in"

CheckBreakaway2PostTube = "NG, posts too strong"

CheckCFI3PostTube = "OK"

AlTube3Post = "OD = 3 in, t = 1/8 in"

CheckBreakaway3PostTube = "OK"

$L_{post.avg} = 11.92 \cdot ft$ *Estimated Average Post Length*

RELOCATE
1 AS 700-1-50
STA 299+11 LT.

REMOVE
1 AS 700-1-60
STA 302+16 LT.

SIGN-1
60" X 18"
1 AS 700-1-11
STA 301+61 LT.

SIGN 2
72" X 18"
700-1-11 1 AS
STA 302+42

SIGN-4
60" X 30"
700-1-12 1 AS
STA 304+71

R3-8 LT/TR
30" X 30"
700-1-11 1 AS
STA 304+65 RT.

EXIST. SIGN TO REMAIN

MATCH LINE – STA. 12+66.00 (SEE SHEET S-20)

MATCH LINE – STA. 101+42.00 (SEE SHEET S-20)

MATCH LINE – STA. 299+00.00

MATCH LINE – STA. 306+00.00

GILLIS DRIVE

LENA ROAD

BROWER ROAD

MUSGRAVE RANCH ROAD

Lena Rd

Brower Rd

Musgrave Ranch Rd

SR 64 NEXT SIGNAL

STOP

DEAD END

YIELD

24" WHITE

12" WHITE @ 14' C/C

6" YELLOW

6" WHITE

6" WHITE W/R RPM'S @ 20'

CONST. EASEMENT

PROP. R/W

EXIST R/W

6" SKIP WHITE (10'/30') W/R RPM'S @ 40'

12" WHITE @ 12' C/C (TYP.)

24" WHITE (TYP.)

18" WHITE @ 20' (TYP.)

8" WHITE W/R RPM'S @ 20' (TYP.)

12" SKIP WHITE (2'/2') (TYP.)

6" SKIP WHITE (2'/4') (TYP.)

DIRECTIONAL ARROW PER FDOT STD INDEX 711-001 (TYP.)

PAVT. MESSAGE PER FDOT STD INDEX 711-001 (TYP.)

CONST. LENA ROAD

0 10 50
Feet

W4-2L
36" X 36"
1 AS 700-1-11
STA 301+28 LT.

R3-8 LT/TR
30" X 30"
1 AS 700-1-11
STA 300+18 RT.

SIGN 3
66" X 30"
1 AS 700-1-12
STA 302+25 RT.

SIGN-1
60" X 18"
700-1-11 1 AS
STA 303+09

R6-4a
48" X 24"
700-1-11 4 AS
STA 302+11 RT.
STA 302+31 LT.
STA 302+50 RT.
STA 302+63 LT.

R1-2
30" X 30"
700-1-11 8 AS
STA 301+60 RT.
STA 301+70 RT.
STA 302+03 LT.
STA 302+31 RT.
STA 302+37 LT.
STA 302+74 RT.
STA 303+00 LT.
STA 303+11 LT.

W11-2 / W16-7PL
36" X 36" / 24" X 12"
700-1-11 4 AS
STA 302+01 RT.
STA 302+13 LT.
STA 302+50 RT.
STA 302+63 LT.

W11-2 / W16-7PL
36" X 36" / 24" X 12"
654-2-21 4 AS
STA 301+27 RT.
STA 301+27 LT.
STA 303+43 RT.
STA 303+46 LT.

W11-2 / W16-7PR
36" X 36" / 24" X 12"
630-2-12 200 LF
635-2-11 4 EA
654-2-21 4 AS
STA 301+39 LT.
STA 301+49 LT.
STA 303+22 RT.
STA 303+31 RT.

LEGEND

(X) PROPOSED SIGN (EACH NUMBER CORRESPONDS TO SIGN CONFIGURATION)

No.	REVISIONS	DATE	BY

Kimley»Horn

201 NORTH FRANKLIN STREET, SUITE 1400, TAMPA, FL 33602
PHONE: (813) 635-5514
WWW.KIMLEY-HORN.COM

KHA PROJECT 148400100
DATE JULY 2023
SCALE AS SHOWN
DESIGNED BY
DRAWN BY
CHECKED BY

MANATEE COUNTY FL
LENA ROAD

LICENSED PROFESSIONAL
NICOLE R. HECK, P.E.
FL LICENSE NUMBER 84306
DATE:

SIGNING AND PAVEMENT MARKING PLAN SHEET (13)

SHEET NUMBER
S-18

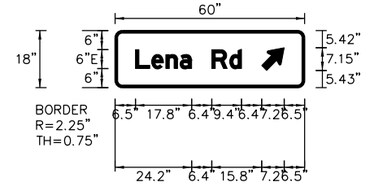
THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

josh.quinn 7/26/2023 2:41:21 PM Default K:\SAR_Roadway\TAM_Lena Road\12345615201\signing\PLANSP13.dgn

SIGN NAME	SIGN 1	QTY	2	SIGN NUMBER	STATION(S)
PANEL		BORDER			301+61
WIDTH	5'-0"	WIDTH	0.75"		303+09
HEIGHT	1'-6"	RADII	2.25"		
LEGEND	White	COLOR	White		
COLOR	Green				

SYMBOL(S)	ANGLE	X	Y	WID	HT
AR_Type D	315	46.4	5.4	6	9

SIGN NUMBER	NUMBER OF POSTS	CLEARANCE Edge Of Land	COLUMN SIZE		AVERAGE LENGTH



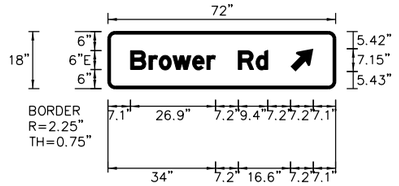
NO. OF LIGHT FIXTURES | FIXTURE SPACING | PHOTOMETRIC CURVE | WATT | VOLTAGE

COPY	L	e	n	a	R	d		L														
SPACE	6.5	11.6	16.1	20.6	30.6	36.3		33.5														
COPY																						
SPACE																						
COPY																						
SPACE																						
COPY																						
SPACE																						
COPY																						
SPACE																						
COPY																						
SPACE																						

SIGN NAME	SIGN 2	QTY	1	SIGN NUMBER	STATION(S)
PANEL		BORDER			302+42
WIDTH	6'-0"	WIDTH	0.75"		
HEIGHT	1'-6"	RADII	2.25"		
LEGEND	White	COLOR	White		
COLOR	Green				

SYMBOL(S)	ANGLE	X	Y	WID	HT
AR_Type D	315	57.8	5.4	6	9

SIGN NUMBER	NUMBER OF POSTS	CLEARANCE Edge Of Land	COLUMN SIZE		AVERAGE LENGTH



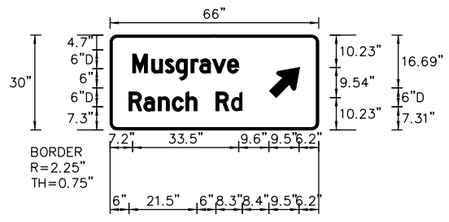
NO. OF LIGHT FIXTURES | FIXTURE SPACING | PHOTOMETRIC CURVE | WATT | VOLTAGE

COPY	B	r	o	w	e	r	R	d		L												
SPACE	7.1	12.9	16.2	20.5	26.7	31.2	41.2	46.8		43.4												
COPY																						
SPACE																						
COPY																						
SPACE																						
COPY																						
SPACE																						
COPY																						
SPACE																						
COPY																						
SPACE																						

SIGN NAME	SIGN 3	QTY	1	SIGN NUMBER	STATION(S)
PANEL		BORDER			302+25
WIDTH	5'-6"	WIDTH	0.75"		
HEIGHT	2'-6"	RADII	2.25"		
LEGEND	White	COLOR	White		
COLOR	Green				

SYMBOL(S)	ANGLE	X	Y	WID	HT
AR_Type D	315	50.3	10.2	8	12

SIGN NUMBER	NUMBER OF POSTS	CLEARANCE Edge Of Land	COLUMN SIZE		AVERAGE LENGTH



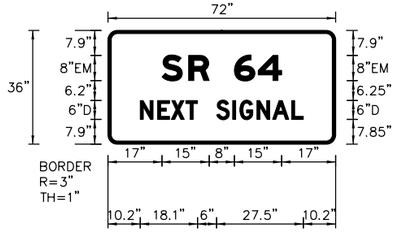
NO. OF LIGHT FIXTURES | FIXTURE SPACING | PHOTOMETRIC CURVE | WATT | VOLTAGE

COPY	M	u	s	g	r	a	v	e		L												
SPACE	7.2	13.1	17.5	20.9	25.7	28.4	32.4	37.2		33.5												
COPY	R	a	n	c	h	R	d		L													
SPACE	6	10.7	15.2	19.7	24	33.5	38.3		35.9													
COPY																						
SPACE																						
COPY																						
SPACE																						
COPY																						
SPACE																						
COPY																						
SPACE																						

SIGN NAME	SIGN 4	QTY	1	SIGN NUMBER	STATION(S)
PANEL		BORDER			304+71
WIDTH	6'-0"	WIDTH	1"		
HEIGHT	3'-0"	RADII	3"		
LEGEND	White	COLOR	White		
COLOR	Green				

SYMBOL(S)	ANGLE	X	Y	WID	HT

SIGN NUMBER	NUMBER OF POSTS	CLEARANCE Edge Of Land	COLUMN SIZE		AVERAGE LENGTH
SIGN-4	2	10.3'	W3	5.7	11.920'



NO. OF LIGHT FIXTURES | FIXTURE SPACING | PHOTOMETRIC CURVE | WATT | VOLTAGE

COPY	S	R	6	4		L																
SPACE	17	25.5	40	47.5		37.9																
COPY	N	E	X	T	S	I	G	N	A	L		L										
SPACE	10.2	15.7	20	24.6	34.3	39.4	41.7	47.1	52.1	58.1		51.6										
COPY																						
SPACE																						
COPY																						
SPACE																						
COPY																						
SPACE																						
COPY																						
SPACE																						

No.	REVISIONS	DATE	BY

Kimley»Horn

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201 NORTH FRANKLIN STREET, SUITE 1400, TAMPA, FL 33602
PHONE: (813) 635-5514
WWW.KIMLEY-HORN.COM

KHA PROJECT	148400100
DATE	JULY 2023
SCALE	AS SHOWN
DESIGNED BY	
DRAWN BY	
CHECKED BY	

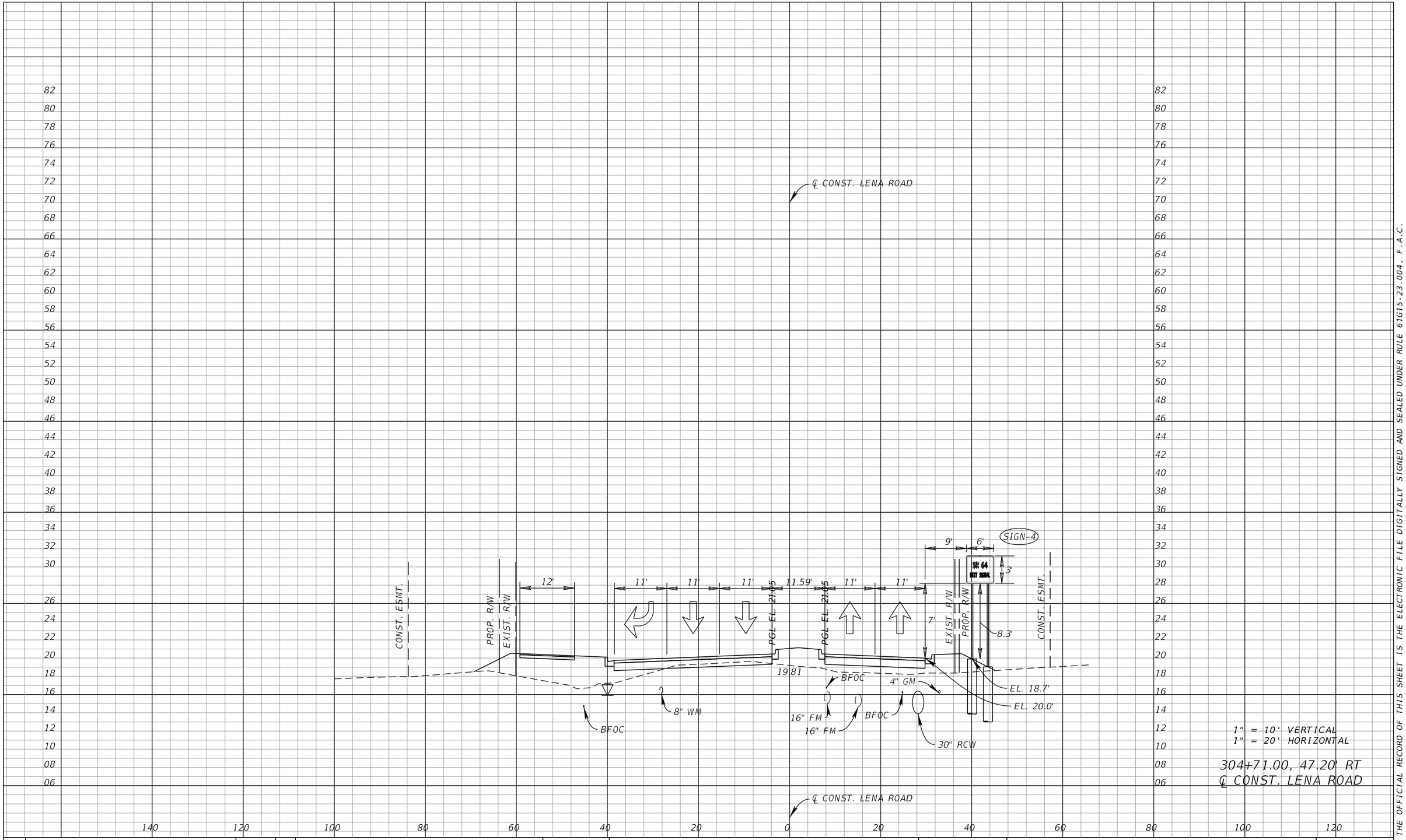
MANATEE COUNTY — LENA ROAD — FL

LICENSED PROFESSIONAL

NICOLE R. HECK, P.E.
FL LICENSE NUMBER 84306
DATE:

GUIDESIGN WORKSHEET

SHEET NUMBER S-21



1" = 10' VERTICAL
1" = 20' HORIZONTAL

304+71.00, 47.20' RT
℄ CONST. LENA ROAD

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

No.	REVISIONS	DATE	BY

Kimley»Horn
KIMLEY-HORN AND ASSOCIATES, INC.
201 NORTH FRANKLIN STREET, SUITE 1400, TAMPA, FL 33602
PHONE: (813) 620-1460
WWW.KIMLEY-HORN.COM

KHA PROJECT	6107560
DATE	JULY 2023
SCALE	AS SHOWN
DESIGNED BY	
DRAWN BY	
CHECKED BY	

Manatee County FLORIDA

MANATEE COUNTY FL

LENA ROAD

LICENSED PROFESSIONAL

NICOLE R. HECK, P.E.

FL LICENSE NUMBER 84306

DATE:

SIGNING CROSS SECTION

SHEET NUMBER S-22