Joe Frogge
Digitally signed by Joe Frogge
DN: CN=Joe Frogge, OU=Development, OU=LS Users, DC=COLS, DC=LOC
Date: 2022.06.03 13:17:38-05'00'

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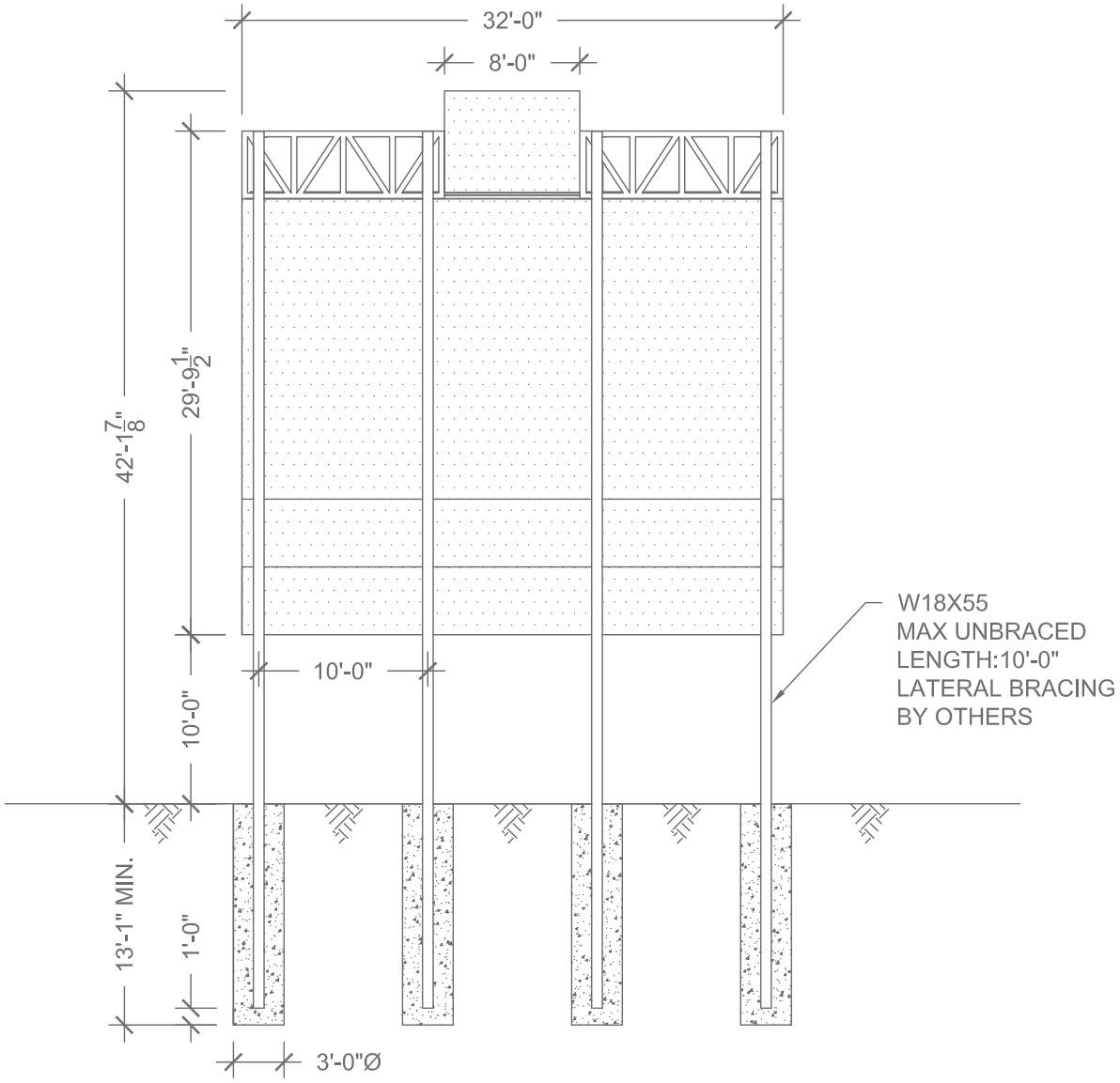
As Noted on Plans Review

Development Services Department
Lee's Summit, Missouri
06/03/2022

SULLAWAY ENGINEERING
11545 W. BERNARDO COURT
SUITE 201, SAN DIEGO, CA 92127
PROJECTMANAGER@SULLAWAYENG.COM
PHONE: 1-858-312-5150 FAX: 1-858-777-3534

PROJECT:	LEE'S SUMMIT WEST HIGH SCHOOL - 2600 SW WARD ROAD, LEE'S SUMMIT, MO	DATE:	4/26/2022
PROJECT #:	34805	ENGINEER:	AV
CLIENT:	NEVCO	LAST REVISED:	



1 - FRONT ELEVATION

GENERAL NOTES

1. DESIGN CODE: IBC 2018
2. DESIGN LOADS: ASCE 7-16
3. WIND VELOCITY: 110 MPH EXPOSURE C
4. CONCRETE 2500 PSI MIN.
5. WIDE FLANGE STEEL ASTM A992, Fy = 50 KSI MIN.
6. PROVIDE 3" CONCRETE COVER MIN. ON ALL STEEL EMBEDDED IN CONCRETE WHEN CAST AGAINST SOIL
7. PROVIDE PROTECTION AGAINST DISSIMILAR METALS USING ANTI-CORROSIVE PAINT OR NEOPRENE GASKETS.
8. LATERAL SOIL BEARING PER IBC CLASS 4 (150 PSF/FT)
9. ALL DIMENSIONS TO BE VERIFIED PRIOR TO FABRICATION.

STATE OF MISSOURI
MICHAEL F. SULLAWAY
NUMBER PE-2010022411
PROFESSIONAL ENGINEER

4-26-2022

SULLAWAY ENGINEERING
11545 W. Bernardo Court, San Diego, CA 92127
projectmanager@sullawayeng.com
Phone: 858-312-5150 Fax: 858-777-3534

PROJECT: LEE'S SUMMIT WEST HIGH SCHOOL DATE: 4/26/22
PROJ. NO.: 34805 ENGINEER: AV
CLIENT: NEVCO

V5.5 units; pounds, feet unless noted otherwise

Applied Wind Loads; from ASCE 7-16

$F=q_z*G*C_f*A_f$ with $q_z = 0.00256K_zK_{zt}K_dV^2$ (29.3.2 & 29.4)

C_f= 1.679 (Fig. 29.3-1) 1.00 0 max. height= 41.79

K_{zt}= 1.0 (26.8.2) (=1.0 unless unusual landscape) s= 25.79

K_z= from table 28.3-1 Exposure= c

K_d= 0.85 for signs (table 26.6-1)

V= 110 mph

G= 0.85 (26.9) weight= 3.123 kips

s/h= 0.617 M_{DL}= 0.00 k-ft

B/s= 1.24

Pole Loads	structure component	height at section c.g.	K_z	q_z	pressure q_z*G*C_f	A_f	shear	Wind Moment M_W
	1	5.0	0.850	22.4	31.95	6.4	204	1018
	2	12.5	0.850	22.4	31.95	50.0	1597	19967
	3	17.5	0.876	23.1	32.92	50.0	1646	28809
	4	22.5	0.921	24.2	34.61	50.0	1730	38934
	5	27.5	0.961	25.3	36.11	50.0	1806	49654
	6	32.5	0.996	26.2	37.42	50.0	1871	60807
	7	35.396	1.012	26.7	38.05	7.9	301	10667
	8	37.792	1.027	27.04	38.59	40.0	1544	58339
	9	39.896	1.040	27.38	39.09	0.8	33	1297
	10	40.896	1.045	27.51	39.28	7.2	282	11514
					sums:	312.3	11013	281.01

(M_w) k-ft arm= 25.5

P_u= 3.75 kip M= 281.01 k-ft $M=\sqrt{M_{DL}^2+M_w^2}$

$M_u=\sqrt{1.2M_{DL}^2+1.0M_W^2}$ = 281.01 k-ft

Pole Design section; W flange

$M_u \le \phi M_n$ with $M_n = f_yZ$ f_y= 50 ksi ϕ= 0.9

H	M_u(k-ft)	Z req'd. (in)	USE
at grade	281.0	74.94	W18X55 W-FLANGE, ΦMn= 362.96 k-ft
			(See page #3 for w-flange capacity)

Footing Design footprint: round

ω= 1.3 IBC 1605.3.2 IBC Table 1806.2, sections 1806.3.4, 1807.3.2 S=(1.3x2x)

P= 8.59 kip S1 = S x d / 3 A = 2.34 x P / (S1 x b) S= 400

S1= 1600 d =0.5xA (1+ (1+4.36x h/A) ^.5) IBC 1807.3.2.1

A= 4.19

footing: **3' - 0" dia.** **13' - 1" deep**

SULLAWAY ENGINEERING
10815 Rancho Bernardo RD., SD, CA 92127
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PROJECT: LEE'S SUMMIT WEST HIGH SCHOOL
PROJ. NO.: 34805
CLIENT: NEVCO

DATE: 4/26/2022
ENGINEER: AV

building code; IBC 2018

units; pounds, feet unless noted otherwise

Check W18X55 for flexure (AISC 14 F2)

	Mu =	3372 k-in	(See Page #2)	Fy =	50 ksi
Yielding				Zx =	112 in^3
	Mn = Mp = Fy Z =	5600 k-in	(eq'n. F2-1)	Lb =	120 in
				Lp =	70.79 in
LTB:				Lr =	210.5 in
	Mn = Cb[Mp-(Mp-0.7FySx)((Lb-Lp)/(Lr-Lp))] =	4839.4 k-in	(eq'n. F2-2)	E =	29000 ksi
				r_y =	1.67 in
	$Fcr = Cb\ \pi^2E/(Lb/rts)^2\ (1+0.078Jc/Sxho(Lb/rts)^2)^{1/2}$ =	89.566 ksi	(eq'n. F2-4)	S_x =	98.3 in^3
				J =	1.66 in^4
	ϕMn =	4355.5 k-in	OK	h_o =	17.5 in
				c =	1
				r_{ts} =	1.999
	Pu/2Pc + (Mu/Mc) =	0.7774	(eq'n. H1-1)	ϕ =	0.9

OK

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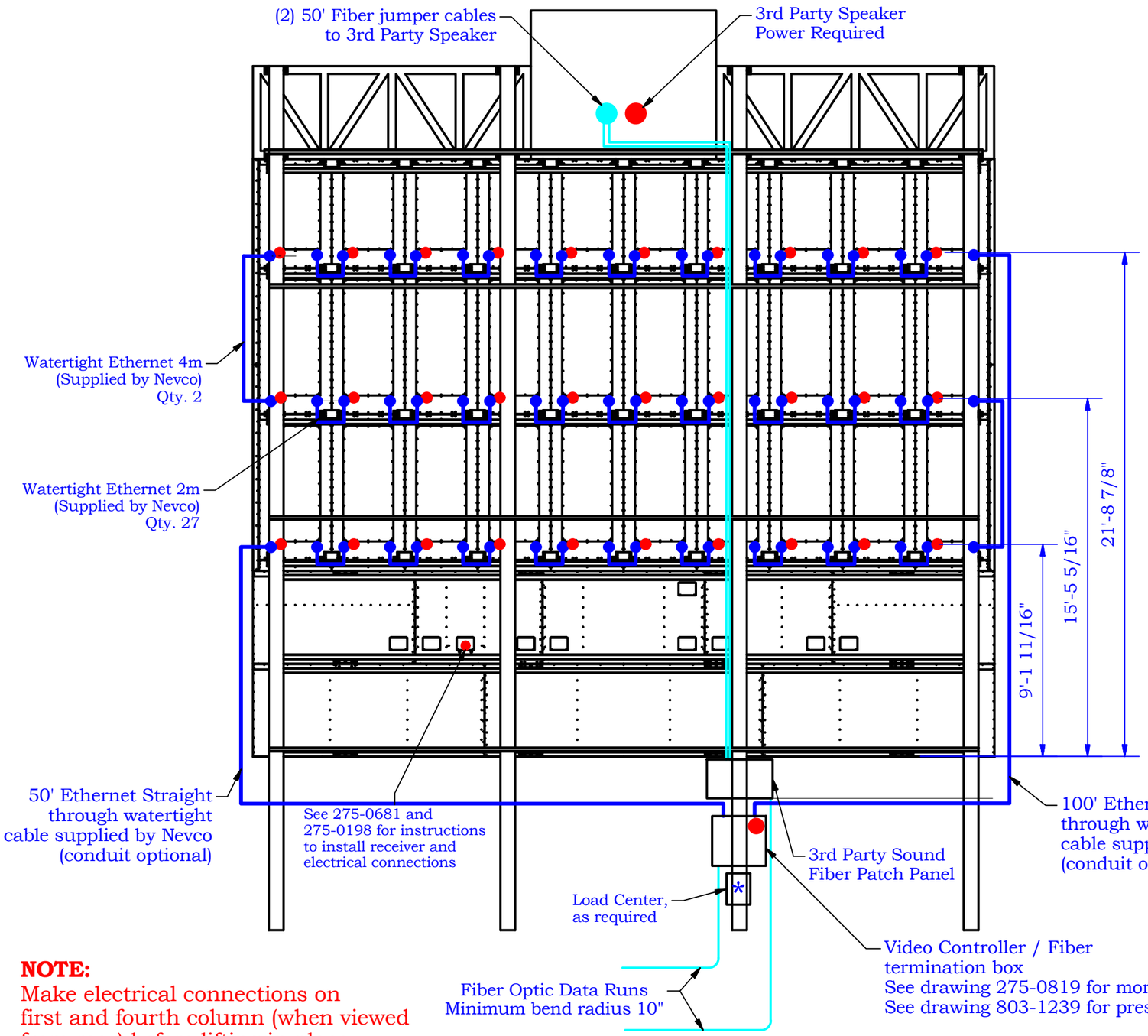
Rear View



Actual Full-Load Power Consumption (120-240VAC, 50/60Hz)				
Description	@120V	@208VAC	@240VA	Quantity
Custom Scoreboard	5.0	2.9	2.5	1
16mm Video Module 6.30'x3.14'	6.7	3.8	3.3	20
16mm Video Module 4.72'x3.14'	5.0	2.9	2.5	10
3rd Party Sound System	N/A	12	N/A	1
Fiber Converters	0.1	N/A	N/A	2
MPC Receiver	0.2	N/A	N/A	1
Total + 30% Margin	277.2A	159.9 A	138.6A	

Use high inrush current circuit breakers for video display.
* National Electrical Code requires a disconnect switch within sight of sign or lockable within the building. If a subpanel is fed via a breaker from a main panel inside the building, ensure a lockable panel is installed.

Important. Read before Installation.
This display is intended to be installed in accordance with the requirements of Article 600 of the National Electrical Code and/or other applicable local codes. This includes proper grounding and bonding of the sign. All personnel who work with electrical connections must be educated in the safe procedures for installing and repairing electrical connections before they are given the responsibility of performing such tasks.

Controller Configuration V3SS
PortA: Signal In top right cabinet when viewed from rear

Port B: Signal Out bottom left cabinet when viewed from rear

NOTE:
Make electrical connections on first and fourth column (when viewed from rear) before lifting in place

Power Location
Signal Location

* Load center, power wire, conduit and fittings are supplied by installer.

Lee's Summit
West High School
Lee's Summit, MO
Custom Video

Nevco, Inc.
Greenville, Illinois 62246

Last ECO

Drawing No. Quote 43549 Elec

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Sheet 1 of 2

Panel Schedule						
	208 VAC-3Phase					
Description	ØA	ØB	ØC	breaker	trip	Loads
16mm Tall Modules	1.608			2-pole	20A	2 Tall
16mm Tall Modules		1.608				2 Tall
16mm Tall Modules			1.608	2-pole	20A	2 Tall
16mm Tall Modules	1.608					2 Tall
16mm Tall Modules		1.608		2-pole	20A	2 Tall
16mm Tall Modules			1.608			2 Tall
16mm Tall Modules	1.608			2-pole	20A	2 Tall
16mm Tall Modules		1.608				2 Tall
16mm Tall Modules			1.608	2-pole	20A	2 Tall
16mm Tall Modules	1.608					2 Tall
16mm Short Modules		1.8		2-pole	20A	3 Short
16mm Short Modules			1.2			2 Short
16mm Short Modules	1.8			2-pole	20A	3 Short
16mm Short Modules		1.2				2 Short
Sound System			1.248	2-pole	20A	Sound
Sound System	1.248					System
Scoreboard		1.04		1-pole	20A	120VAC
Fiber Adaptors			0.048	1-pole	20 A	120VAC
Total	9.48	8.864	7.32			
max KVA		9.48				
Max phase Line Current with 30% margin		102.50				

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West High School
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Custom Video

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Drawing No. Quote 43549 Elec

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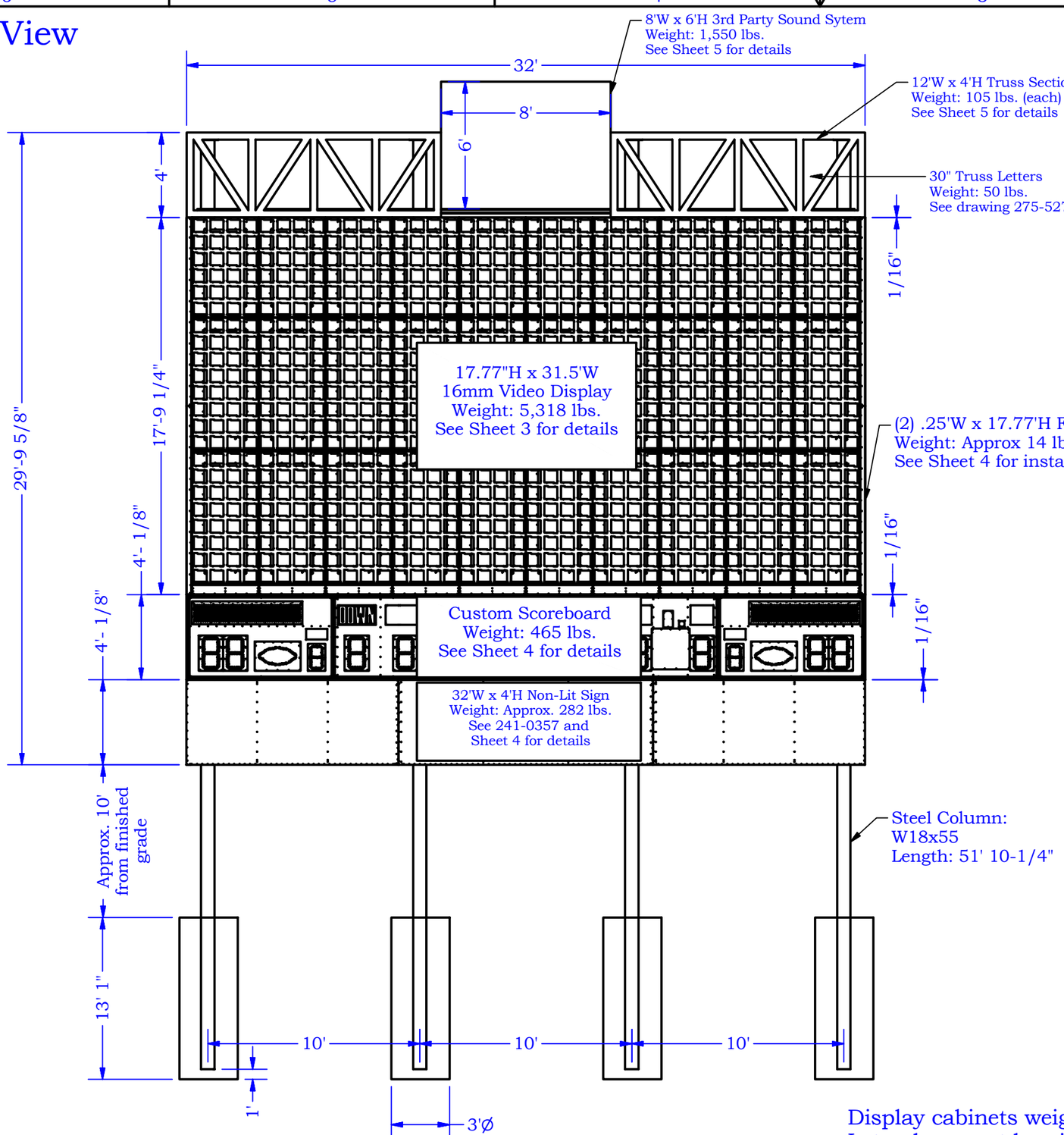
Sheet 2 of 2

Front View



Lee's Summit West High School
2600 SW Ward Road
Lee's Summit, MO 64082

This project has been designed using IBC-2018, ASCE 7-16 and the Manual of Steel Construction (13th Edition) standards with a wind speed of 110 mph, Exposure C, Risk Category II. Lateral bearing soil pressure is assumed to be 150psf/f. Vertical soil pressure value is 1,500 PSF.

* Structural by Sullaway Engineering, PE-0330 takes precedence over this drawing.

Important. Read before installation.
This is not an engineered drawing. It is intended for representational purposes only. The dimensions called out on this drawing are intended to be used as a guide only, and are not intended to be suitable for all conditions. Adding signs or other components around the scoreboard beyond the scope of this drawing or increasing the display height from the ground will affect the installation requirements. Nevco recommends that you consult a professional engineer or architect familiar with the area before attempting installation. They can verify that the selected mounting beams or posts along with the brackets, screws, and other hardware items provided by others or Nevco are adequate for your local soil conditions, wind loads and other local codes. If procedures are used that are not covered in this drawing, careful analysis of the installation is urged.

General Notes:
1. Column steel to be grade A992 (50 ksi steel minimum).
2. Bracing steel to be ASTM A500 Grade B minimum
3. Minimum bolt grade: A307
4. Per IBC standards, welds to conform to AWS standard

Display cabinets weight	7,889 lbs.
Lateral support bracing weight	1,676 lbs.
Steel Columns weight	12,159 lbs.
Total Weight	21,724 lbs.

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Lee's Summit, Missouri
06/03/2022

Lee's Summit West HS,
Lee's Summit, MO
Custom Video Installation

Nevco, Inc.
Greenville, Illinois 62246

Last ECO

Drawing No. Quote 43549 MECH

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Sheet 1 of 5

Laterals and Brackets Installation

* All Dimensions to TOP of laterals and brackets

Steel Supplied by Others				
Part	Description	Size	Length	Quantity
A	Columns	W18 x 55	51' 10-1/4"	4
B	Front Speaker Lateral	HSS 2-1/2" x 2-1/2" x 1/4"	31'	1
C	Back Speaker Lateral	HSS 2-1/2" x 2-1/2" x 1/4"	30' 7-1/2"	1
D	Video Laterals	HSS 2-1/2" x 2-1/2" x 1/8"	30' 9-7/16"	4
E	Scoreboard/Sign Lateral	HSS 2-1/2" x 2-1/2" x 1/8"	30' 7-1/2"	4
F	Bracing Laterals	HSS 2" x 2" x 1/8"	30' 7-1/2"	3

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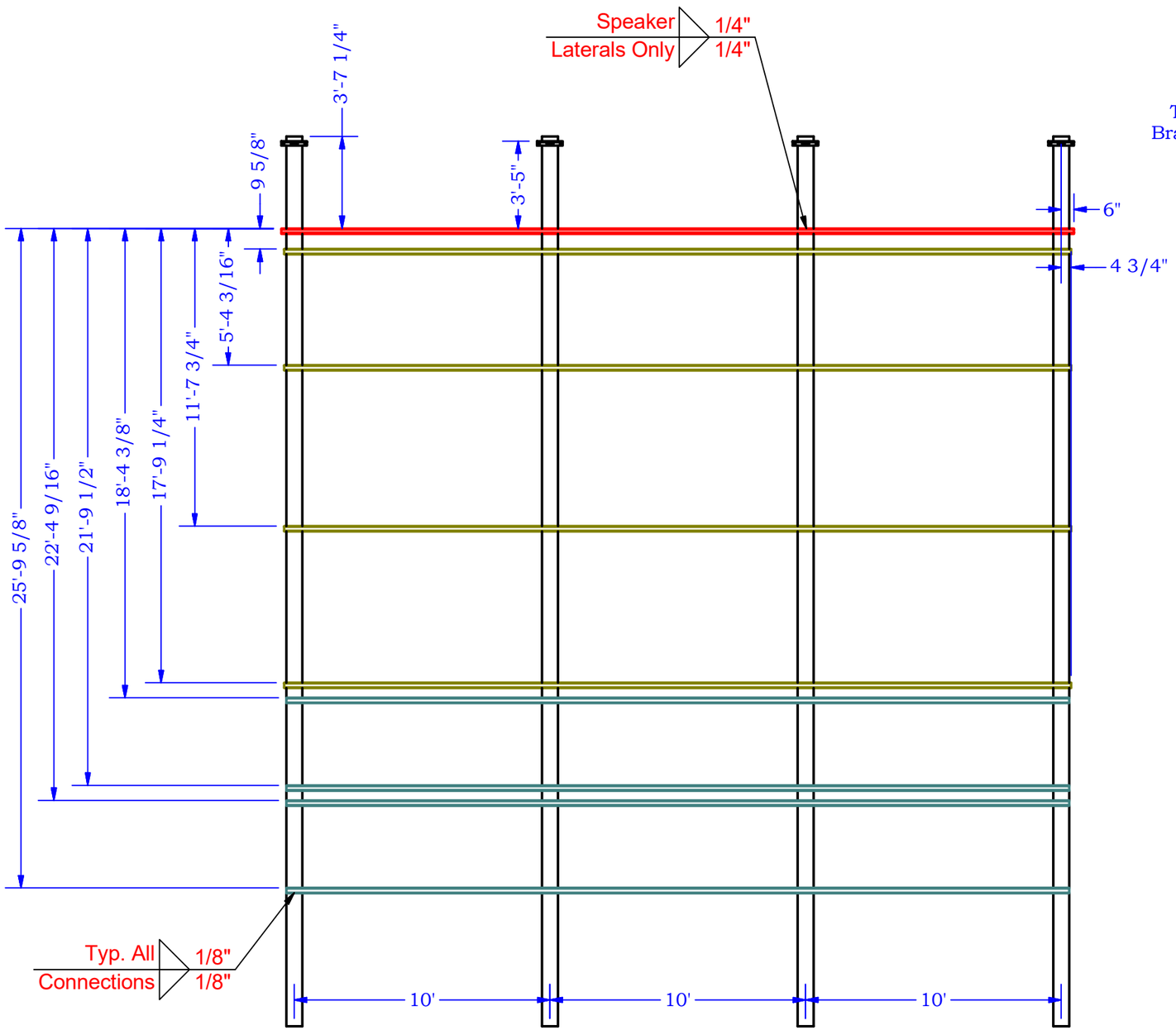
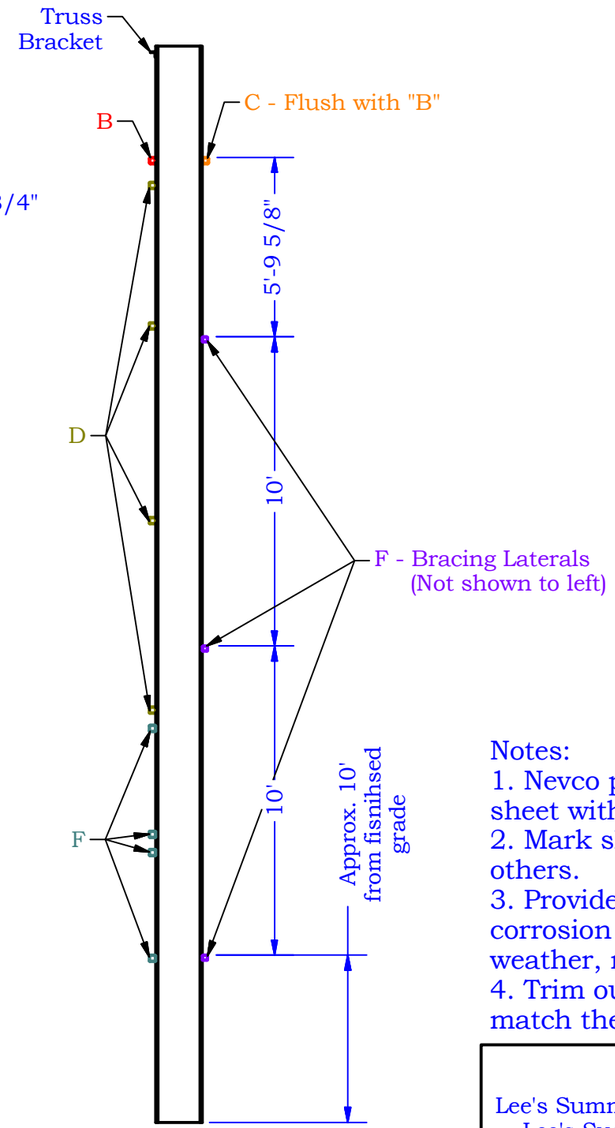
Lee's Summit, Missouri
06/03/2022



Front View



Side View

Notes:
1. Nevco provided hardware itemized on sheet with bolt/nut/screw bags.
2. Mark shortest column, then level across to others.
3. Provide a protective coating to minimize corrosion for all steel members exposed to weather, moisture, or soil.
4. Trim outer columns after installation to match the shape of the arched truss.

Lee's Summit West HS, Lee's Summit, MO Custom Video Installation	Nevco, Inc. Greenville, Illinois 62246
Last ECO	Drawing No. Quote 43549 MECH
Drawn MJM / Date 4/27/2022	Sheet 2 of 5

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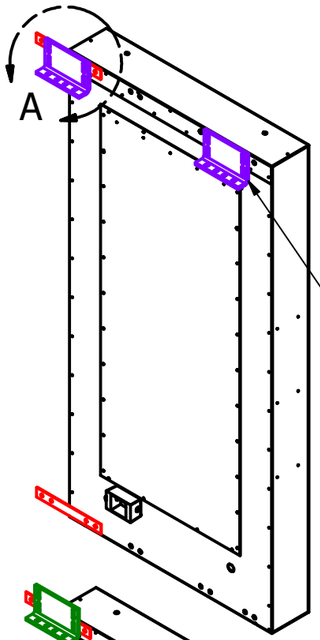
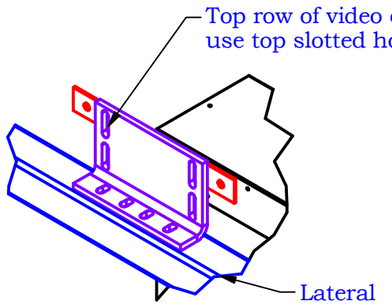
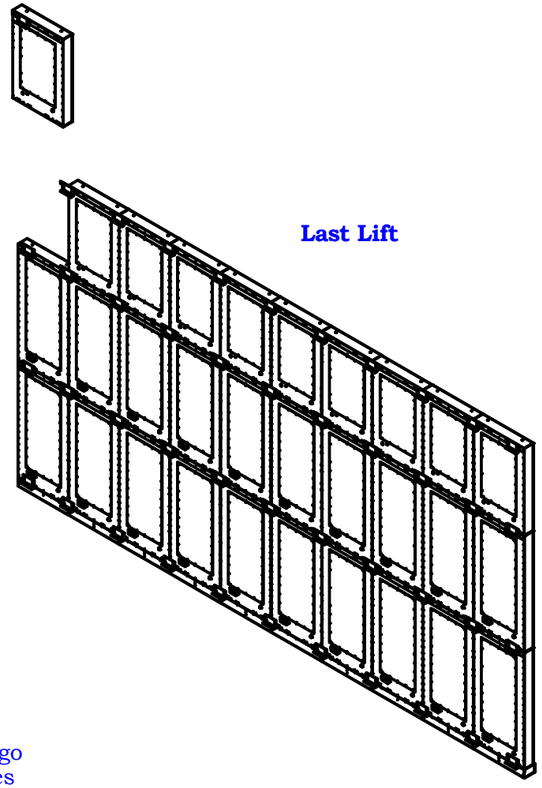
Video Display Installation

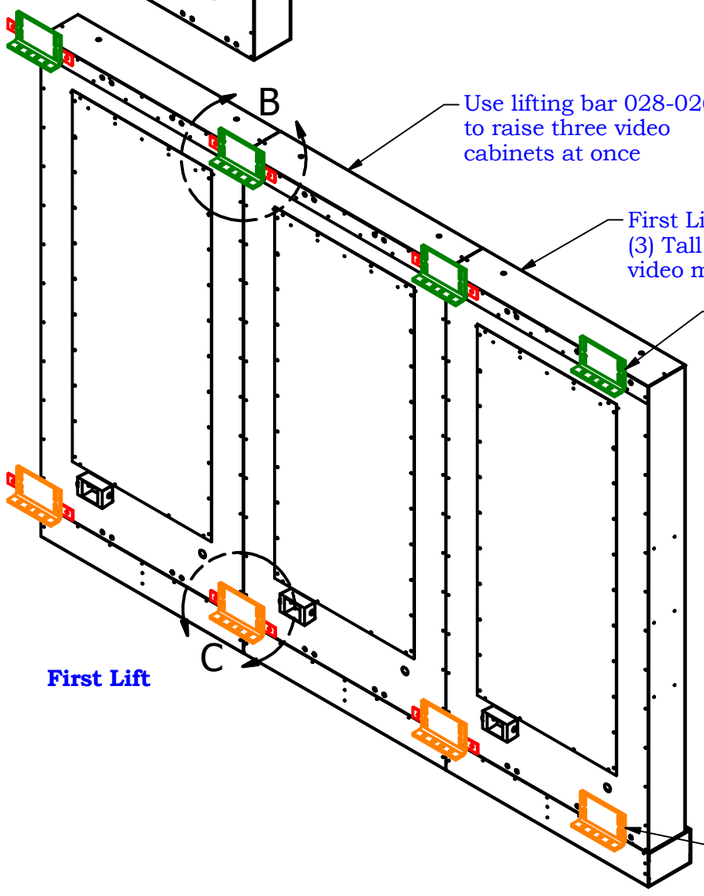


Note: Side brackets do NOT have straps



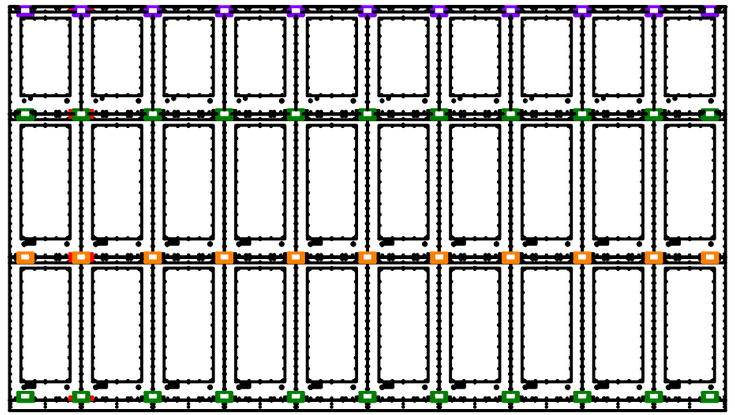
DETAIL A





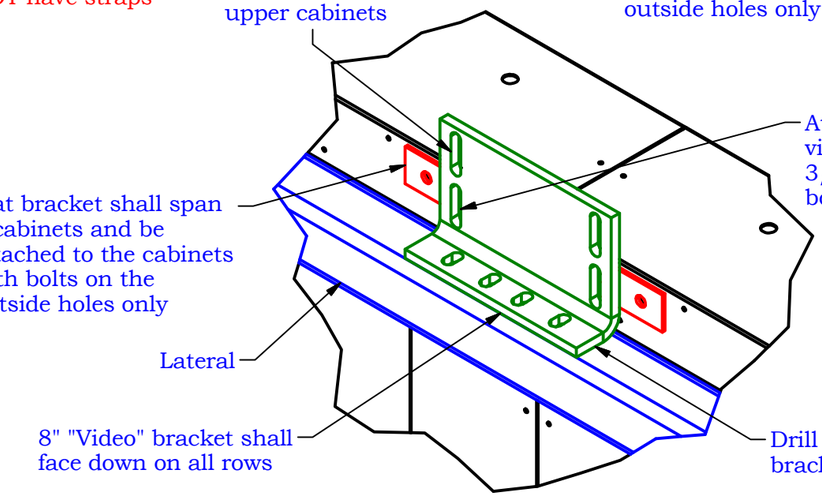
Note: The brackets on the far left and right end of the display do not require straps.

Order of video modules as seen from the rear

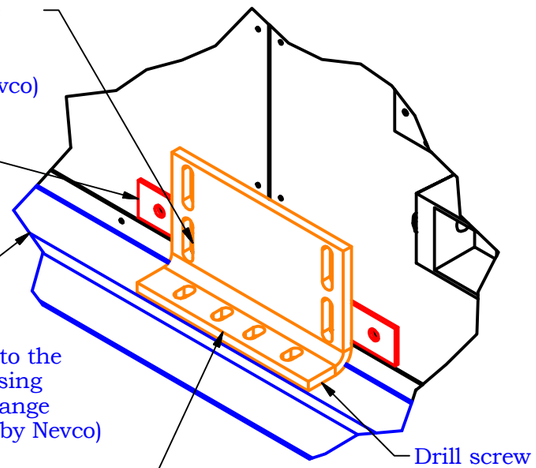


Rear View

See page 1 for front view video block orientation.



DETAIL B

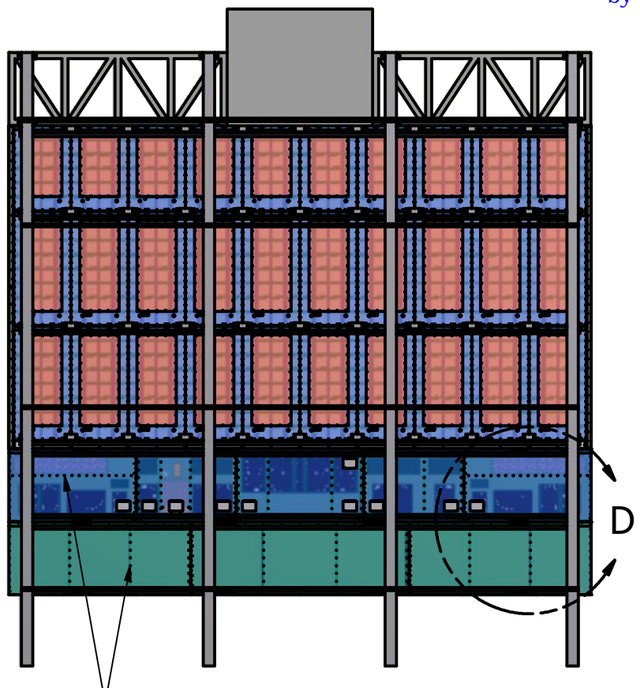


DETAIL C

Lee's Summit West HS, Lee's Summit, MO Custom Video Installation	Nevco, Inc. Greenville, Illinois 62246
Last ECO	Drawing No. Quote 43549 MECH
Drawn MJM / Date 4/27/2022	Sheet 3 of 5

Filler Panel and Scoreboard Installation

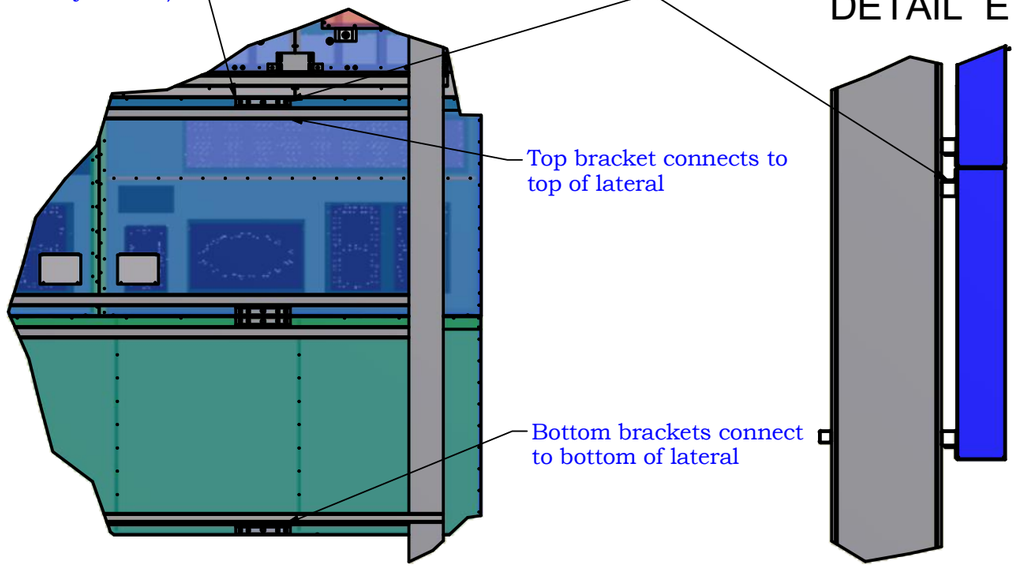
(See 241-0357 and 241-0365 for more details)



Scoreboard and sign use same connection method

Connect brackets to laterals using 3/8" bolts, washers, and nuts or by welding (Conenction by Others)

Mount 12" scoreboard brackets to back of cabinets using 3/8" serrated flange bolts (Provided by Nevco). Top brackets face down and bottom brackets face up.

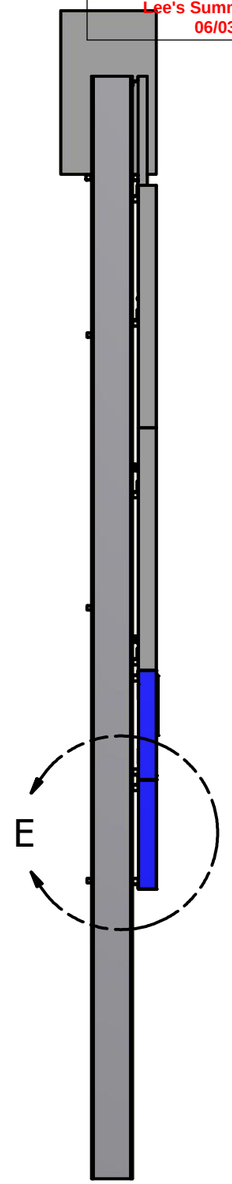


Top bracket connects to top of lateral

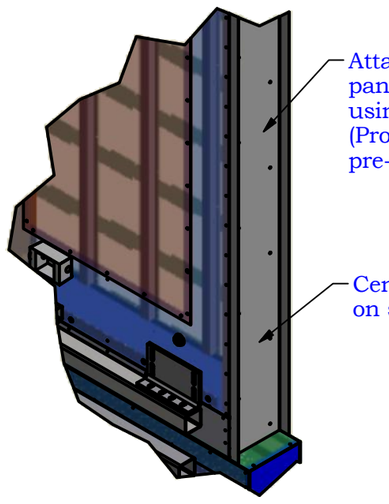
Bottom brackets connect to bottom of lateral

DETAIL D

DETAIL E

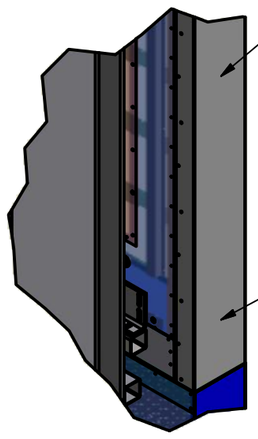


E



Attach inner channel of filler panel to side of video cabinets using sheet metal screw (Provided by Nevco) in each pre-punched location

Center inner channel on side of video block



After inner channels have been installed, slide out channel over inner channel and attach channels together using drill screws in each pre-punched hole. Outer channel to be flush with outside of scoreboard. (Provided by Nevco)

Center channels in vertical and horizontal directions

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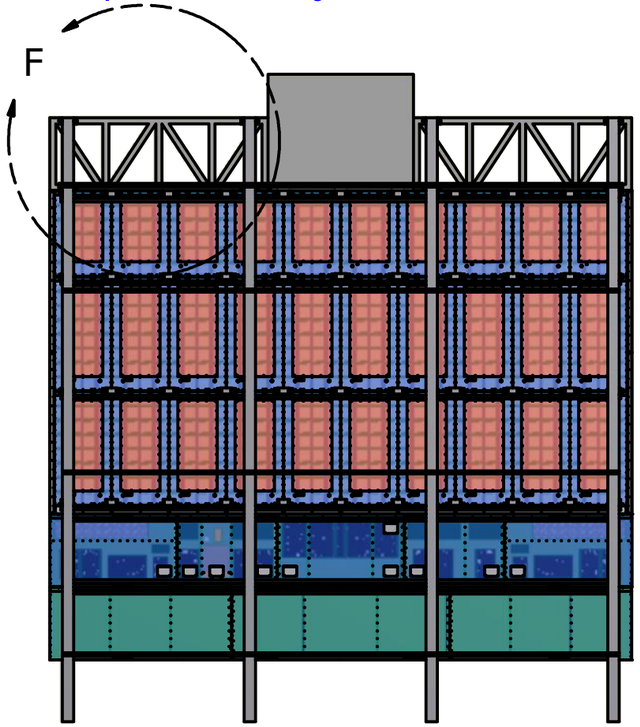
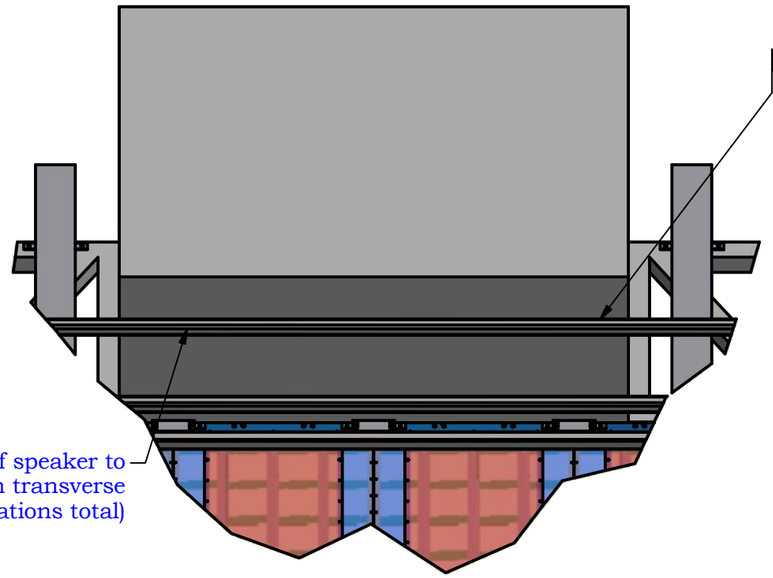
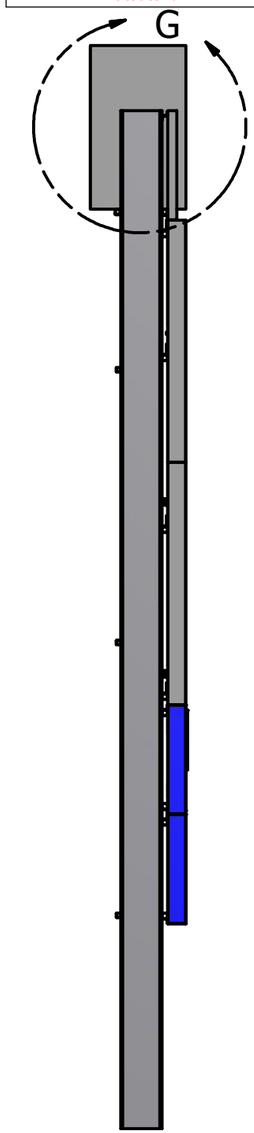
Last ECO	Drawing No. Quote 43549 MECH
Drawn MJM / Date 4/27/2022	Sheet 4 of 5

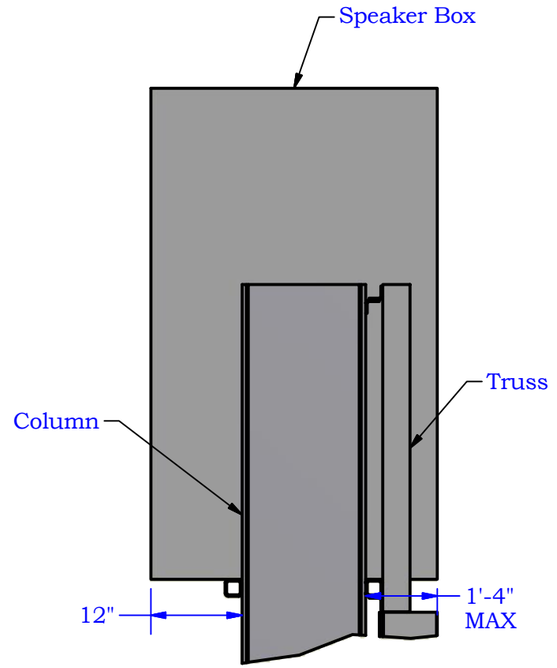
Truss/Sound System Installation



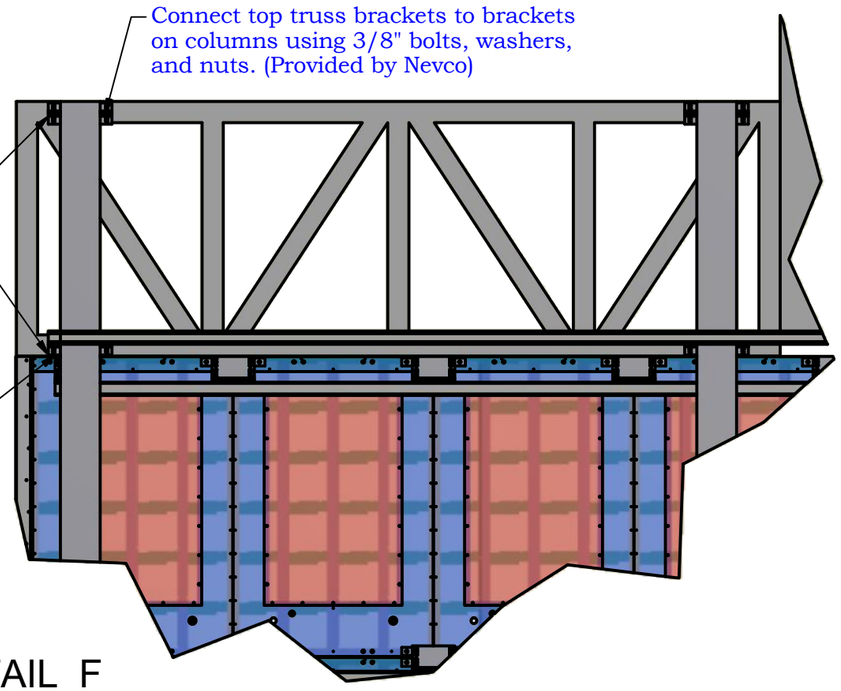


Speaker Mounting





DETAIL G



DETAIL F

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Last ECO	Drawing No. Quote 43549 MECH
Drawn MJM / Date 4/27/2022	Sheet 5 of 5