

**APPENDIX A: CALCULATIONS**



Date:	2/24/2025
Site Name:	Village of Albion Water Department (VAWD-Tower)
Project Engineer:	DVA
Project No:	38633.NSN.MSA.V118280.0
Customer:	North Shore Networks
Carrier:	North Shore Networks

Building Code:	2018	
TIA Standard:	H	
Mount Type:	Platform	
Mount Existing?	Proposed	
Mount Centerline:	148	ft
Superstructure Height:	150	ft
Structure Type:	Tower	

Site Information		
Exposure Category:	0	
Risk Category:	II	
Ground Elevation:	262.4	ft
Ultimate Wind Speed:	109	mph
Design Wind Speed:	109	mph
Ice Thickness:	2.00	in
Ice Wind Speed:	40.0	mph
Escalated Ice Thickness:	2.32	in
Topographic Method:	2	
Topographic Category:	1	

Factors	
Gh:	1.000
K <sub>zmin</sub> :	1.030
K <sub>z</sub> :	1.534
K <sub>d</sub> :	0.950
K <sub>st</sub> :	1.000
K <sub>e</sub> :	0.991
K <sub>a</sub> :	0.900
I <sub>ice</sub> :	1.000

Run Seismic?	Yes
Site Soil:	D (Default)
Short-Period Accel. (S <sub>s</sub> ):	0.166
1-Second Accel. (S <sub>1</sub> ):	0.047
Short-Period Design (SDS):	0.177
1-Second Design (SD1):	0.076
Short-Period Coeff. (F <sub>s</sub> ):	1.600
1-Second Coeff. (F <sub>v</sub> ):	2.400
C <sub>s</sub>	0.089
C <sub>s min</sub>	0.030
Amplification Factor (a <sub>p</sub> ):	1.000
Response Mod. (R <sub>b</sub> ):	2.500
Overstrength (O <sub>o</sub> ):	1.000

q <sub>z</sub> :	43.91	psf
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Service Wind:	30	mph
L <sub>m</sub> (man live load) =	500	lb
L <sub>v</sub> (man live load) =	250	lb

Table 1. Equipment Specifications and Wind Pressure

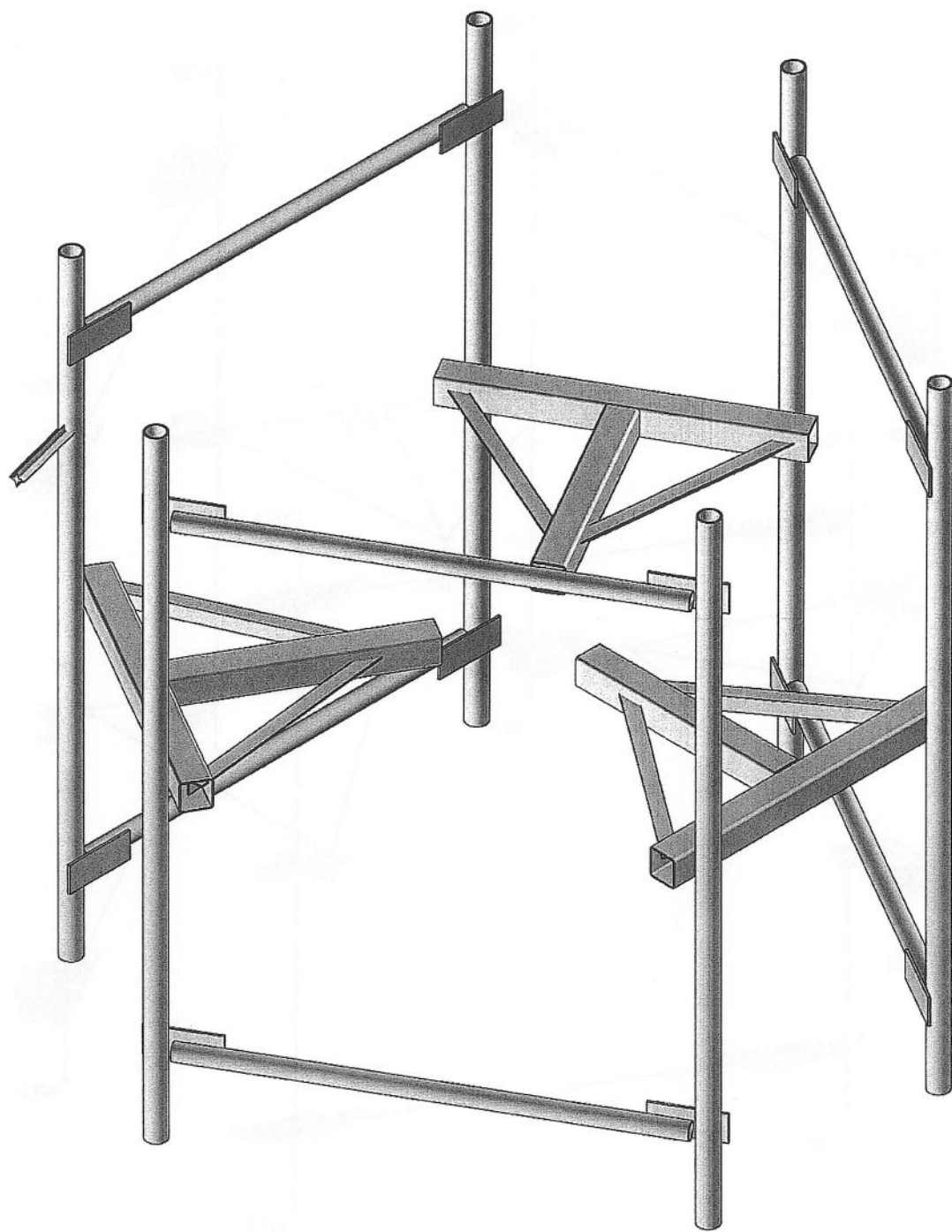
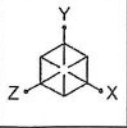
Manufacturer	Model	Elevation	Pipe Label	Weight (lb)	Height (in)	Width (in)	Depth (in)	EPA <sub>z</sub>	EPA <sub>1</sub>	EPA <sub>10/100</sub>	EPA <sub>10/1000</sub>	q <sub>z</sub>	q <sub>z min</sub>	q <sub>z max</sub>
Tarana Wireless	G1 Antenna	150.0	8, 20, 14, 13	42.0	16.4	21.2	4.6	2.71	0.65	4.25	1.61	44.0	5.9	3.3
Aviat	WTM 4800	150.0	27	17.5	11.5	10.5	4.0	0.95	0.39	1.93	1.14	44.0	5.9	3.3
Aviat	MWE-MT518M49VHAVA	150.0	27	17.6	25.8	25.8	11.8	4.58	1.32	6.38	2.17	44.0	5.9	3.3
Raycap	RCKDC-5737-PF-48	150.0		20.0	20.3	18.9	7.0	3.02	1.2	4.63	2.39	44.0	5.9	3.3

Table 2. Equipment Wind and Seismic Loads

Manufacturer	Model	Wind Load (F <sub>w</sub> ), lb		Wind Load Ice Case (F <sub>w</sub> ), lb		Wind Load Service Case		Seismic Load, lb
		0 deg	90 deg	0 deg	90 deg	0 deg	90 deg	
Tarana Wireless	G1 Antenna	107.42	25.88	22.67	8.58	95.24	6.14	1.98
Aviat	WTM 4800	37.78	15.39	10.29	6.06	37.71	2.86	1.17
Aviat	MWE-MT518M49VHAVA	181.29	52.32	34.01	11.59	191.35	13.73	3.96
Raycap	RCKDC-5737-PF-48	118.70	47.55	24.68	12.73	110.13	9.07	3.80

Table 3.1. Hot Rolled Member Capacities

Member Name	Member Shape	Wind load (plf)	Wind Load Ice (plf)	Weight Ice (plf)	Bending Check	Shear Check	Total Capacity	Controlling Capacity
Arms	HSS4X4X3	29.27	3.94	2.09	23%	11%	23%	23%
Rails	HSS4X4X3	29.27	3.94	2.09	10%	7%	10%	
Angles	L3X2X3	14.64	1.97	1.61	21%	1%	21%	
Mount Pipes	PIPE 2.5	12.62	1.70	1.82	21%	8%	21%	
Horizontal	PIPE 2.0	10.43	1.40	1.70	16%	4%	16%	
Plates	PL3.94x0.3125	28.83	3.88	2.08	9%	16%	16%	



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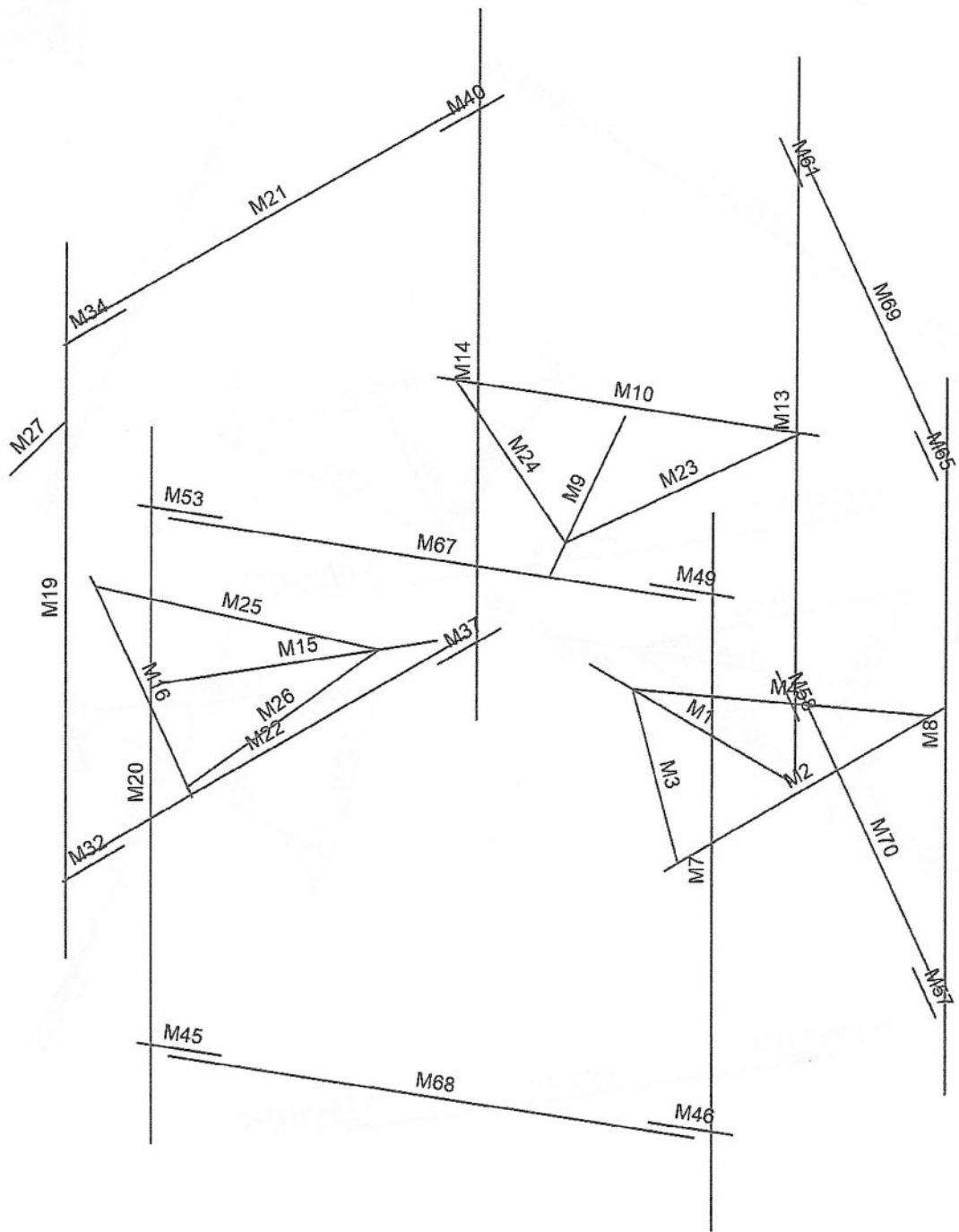
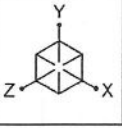
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T-Arm Platforms Model

SK-1  
Feb 24, 2025 at 12:47 PM  
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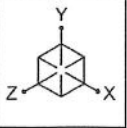


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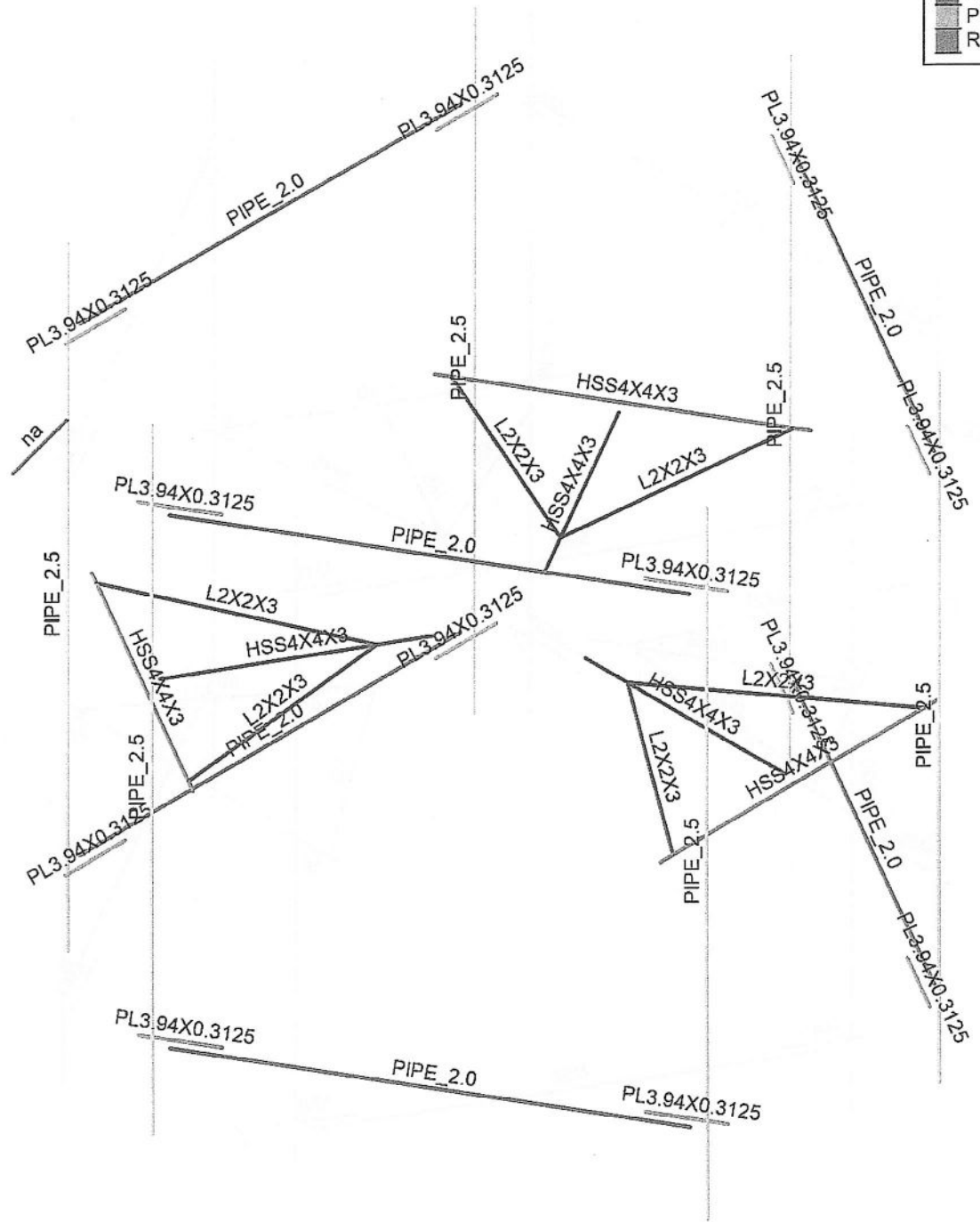
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Member Labels

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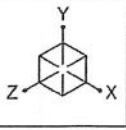


Section Sets	
[Pattern]	Arms
[Pattern]	Rails
[Pattern]	Angles
[Pattern]	Mount Pipes
[Pattern]	Horizontal
[Pattern]	Plates
[Pattern]	RIGID

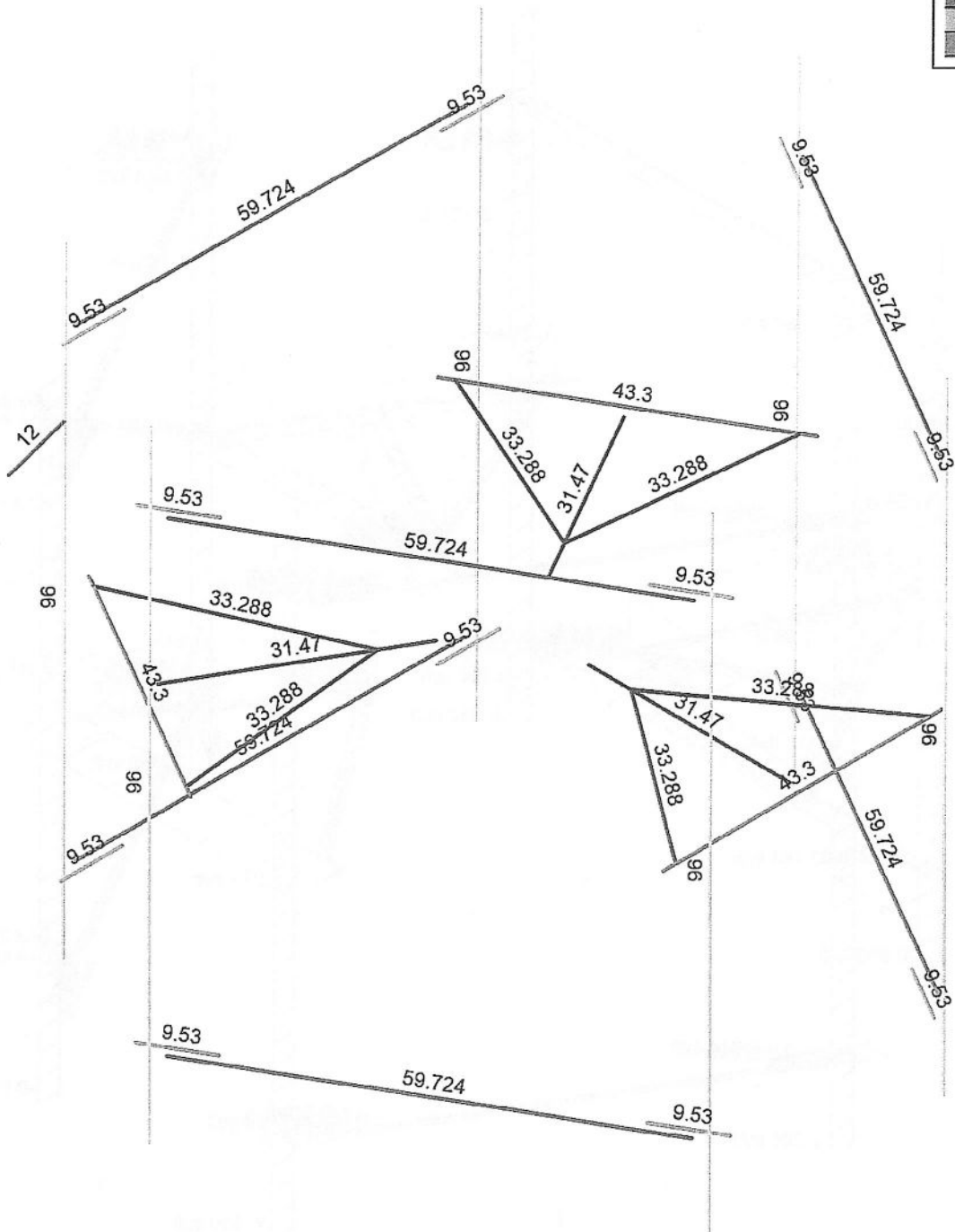


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Member Shapes			



Section Sets	
	Arms
	Rails
	Angles
	Mount Pipes
	Horizontal Plates
	Plates
	RIGID



Member Length (in) Displayed  
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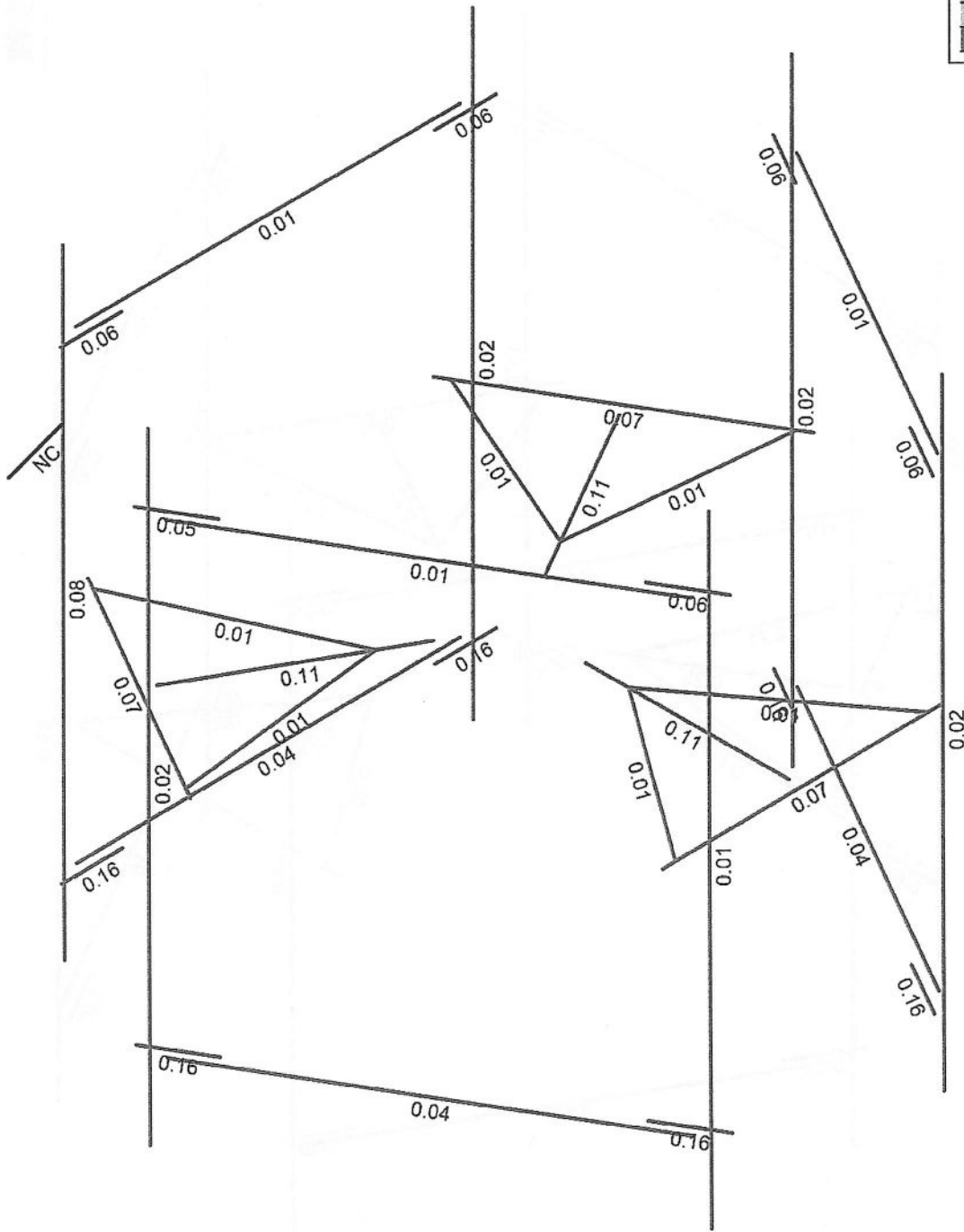
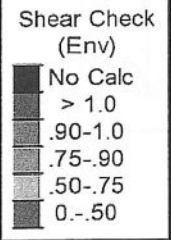
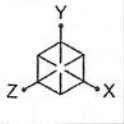
Member Lengths

SK-5  
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Member Shear Checks Displayed (Enveloped)  
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