1175 Independence

150' X 24/28.16' CB-2 (50'-50'-50')
SIDEWALL COLUMN BASE = 12"

STRUCTURAL DESIGN LOADS

The structural design loads used in designing the building as furnished by Varco-Pruden and as shown on this set of drawings are given below. Capacity for loads greater than these or for load combinations other than those shown is specifically neither implied nor intended.

I. Basic Loads - VP Load Label = N-2520

A. Live Load = 25 psf (L)
B. Wind Load = 20 psf (W)
C. Dead Load = 5 psf* (D)
D. Crane Loads (C)

1. Capacity = _____ tons, M/L = _____ Kips, M/S = _____ feet
2. Capacity = _____ tons, M/L = _____ Kips, M/S = _____ feet
3. Capacity = _____ tons, M/L = _____ Kips, M/S = _____ feet

M/L = maximum wheel load, M/S = minimum wheel spacing

E. Other
1.
2.
3.

*This is the additional dead load above that imposed by the dead weight of the material furnished by Varco-Pruden. It will normally be zero unless specified by the buyer.

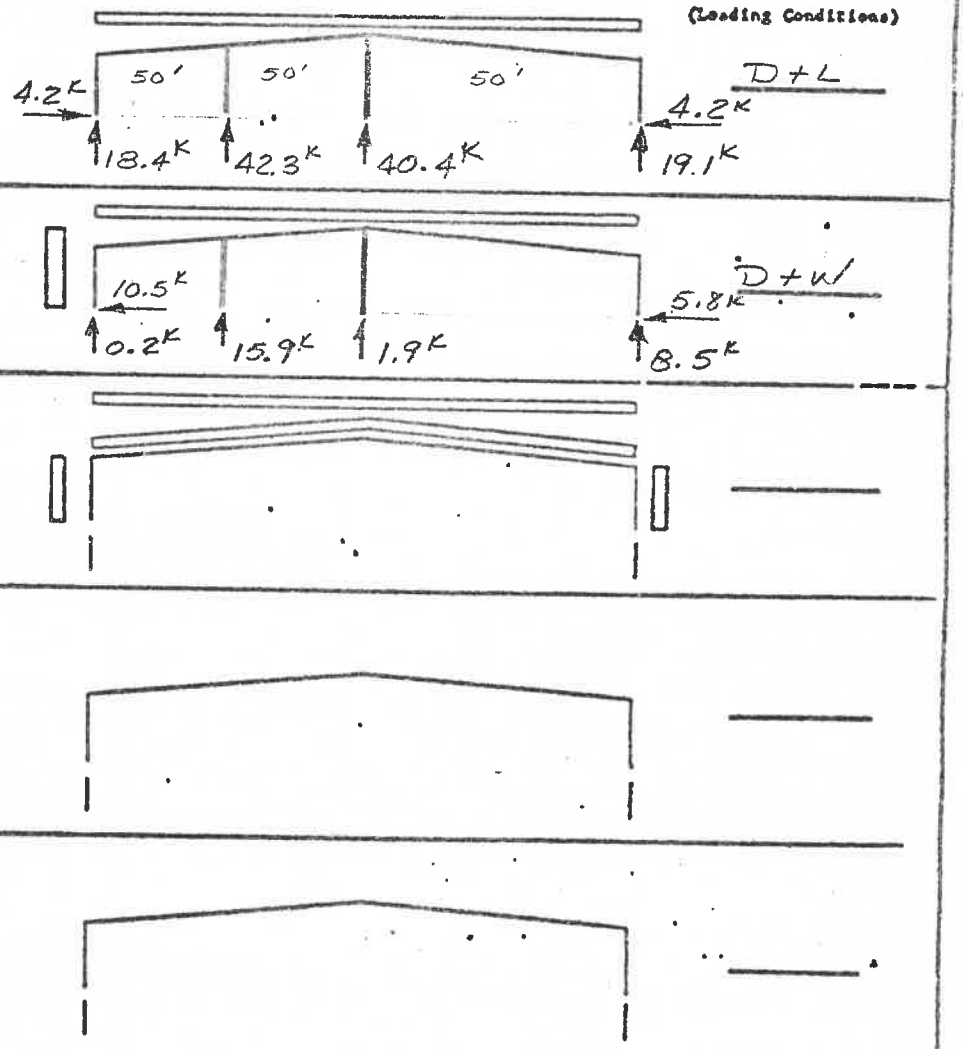
II. Load Application Combinations

A. The following load combinations have been designed for:

1. DEAD + LIVE
2. DEAD + WIND
3.
4.

a) The Dead Load (D) consists of the sum of the dead load of our framing plus the additional Dead Load indicated above, section I, item C.

(Loading Conditions)



092871

Design Loads and Reactions
VARCO-PRUDEN INC.
RDK

LOAD = N-2520 + 3 PSF

PURLINS = 4'-6" O/C

4.5' × 30 PSF = 135.0 PLF

CONTINUOUS PURLIN LOAD CHART

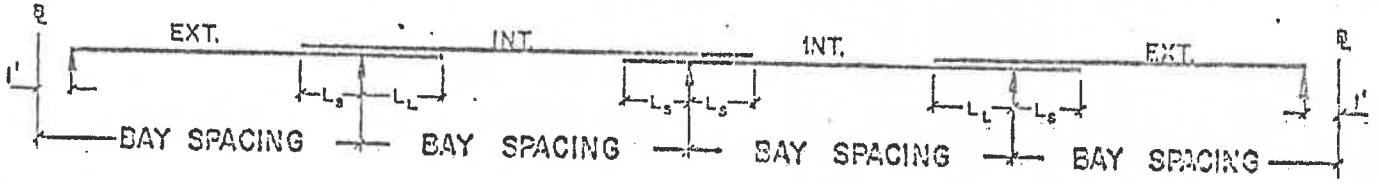
TOTAL ALLOWABLE LOAD in lbs/ft

L_s = Short Lap

L_L = Long Lap

$F_b = 0.6(F_y) = 0.6(50) = 30$ ksi

4 - SPAN



BAY SPACING

8.5" Z PURLIN EXT GA	INT GA	L_s = 1'-0" L_L = 3'-0" 14'	16'	17'	18'	19'	20'	L_s = 2'-0" L_L = 3'-6" 21'	22'	23'	24'	25'	L_s = 2'-6" L_L = 4'-0" 26'	27'	28'	29'	30'
16	16	457	331	281	242	210	185	189	168	149	134	121	120	110	101	93	85
15	16	511	377	320	276	240	211	213	192	171	153	138	135	125	115	106	97
14	16	546	417	363	321	271	238	239	216	194	174	156	152	140	129	120	110
13	16	511	467	414	369	330	290	268	244	224	202	178	174	160	142	128	116
12	16	673	515	443	381	331	291	296	269	232	203	179	181	161	143	129	116
13	15	642	491	435	378	329	289	281	256	235	211	190	182	169	156	144	130
12	15	706	540	478	427	376	330	310	283	259	229	202	201	181	162	145	131
11	15	750	582	502	432	375	329	338	305	263	230	203	206	182	163	146	132
12	14	741	566	501	443	386	339	324	296	271	248	223	210	195	181	162	147
11	14	750*	583*	519*	465*	419*	371	353	322	295	258	227	229	204	182	164	148
11	13	752*	584*	520*	467*	421*	381*	380	346	316	283	255	246	227	210	195	177

* Denotes systems controlled by connection

Allowable load per foot is the total allowable (dead + live) and is based on an analysis of the system considering the increased stiffness over the support and the connection capacities at the supports with the allowable bending stress set at 30 ksi for all systems.

No. Roof Framing
Page 4 of 14
Date 12/1/73
Prepared by
Reviewed by

27

SIMPLE SPAN 8.5 Z LIGHT GAGE BEAMS

TOTAL ALLOWABLE LOAD PER FOOT (W #/')

SPAN (L')	8.5 Z 16			8.5 Z 15			8.5 Z 14			8.5 Z 13			8.5 Z 12			8.5 Z 11		
	F_b=30	F_b=40	Δ	F_b=30	F_b=40	Δ	F_b=30	F_b=40	Δ	F_b=30	F_b=40	Δ	F_b=30	F_b=40	Δ	F_b=30	F_b=40	Δ
10	422	562	791	477	637	889	538	717	1001	650	866	1208	762	1015	1415	874	165	1623
11	348	465	594	395	526	668	444	592	752	537	716	907	629	839	1063	722	963	1220
12	293	390	459	331	442	514	373	498	579	451	601	699	529	705	819	606	809	939
13	249	332	360	282	377	405	318	424	455	384	512	550	450	601	644	517	689	739
14	215	287	288	243	325	324	274	365	364	331	442	440	388	518	515	445	594	591
15	187	250	234	212	283	263	239	318	296	288	385	358	338	451	419	388	517	481
16	164	219	193	186	248	217	210	280	244	253	338	295	297	396	345	341	455	395
17	146	194	161	165	220	181	186	248	203	224	299	245	263	351	288	302	403	330
18	130	173	135	147	196	152	166	221	171	200	267	207	235	313	242	269	359	278
19	116	155	115	132	176	129	149	198	145	180	240	176	211	281	206	242	322	236
20	105	140	98	119	159	111	134	179	125	162	216	151	190	253	176	218	291	202
21	95	127	85	108	144	96	121	162	108	147	196	130	172	230	152	198	264	175
22	87	116	74	99	131	83	111	148	94	134	179	113	157	209	132	180	240	152
23	79	106	65	90	120	73	101	135	82	122	163	99	144	192	116	165	220	133
24	73	97	57	82	110	64	93	124	72	112	150	87	132	176	102	151	202	117
25	67	90	50	76	101	56	86	114	64	104	138	77	121	162	90	139	186	103
26	62	83	45	70	94	50	79	106	56	96	128	68	112	150	80	129	172	92
27	57	77	40	65	87	45	73	98	50	89	118	61	104	139	71	119	159	82
28	53	71	36	60	81	40	68	91	45	82	110	55	97	129	64	111	148	73
29	50	66	32	56	75	36	63	85	41	77	103	49	90	120	58	103	138	66
30	46	62	29	53	70	32	59	79	37	72	96	44	84	112	52	97	129	60
	S_x = 2.11			S_x = 2.39			S_x = 2.69			S_x = 3.23			S_x = 3.81			S_x = 4.37		

24.0' EAVE

17'-4" AVG. SPACE = 5.84' × 20PSF = 116.8 PLF

12'-4" AVG = 5.0' × 20PSF = 100 PLF

7'-4" AVG. = 6.2' × 20PSF = 124.0 PLF

(87)

LOAD

$$M = F_b S_x = \frac{W(L)(12)}{8}$$

$$W = \frac{F_b S_x}{L^2}\left(\frac{8}{12}\right)$$

DEFLECTION

$$\Delta = L/180 = \frac{5WL^4}{384EI}$$

$$\Delta = \frac{(384)EI}{180(5)L^3}$$

GA	I (in)⁴
16	9.05
15	10.17
14	11.44
13	13.61
12	16.18
11	19.56

E = 29500 ksi

Design Aid Manual

Roof Framing

Page 3 of 14

Date 12/1/73

Prepared by

Reviewed by

Section Properties
8.5" - Light Gage Z Shapes

Section	Lip Angle	Theoretical Lip Depth	Thick (In)	Radius of Bend	Gage	Full Area $(In)^2$	Eff Sx $(In)^3$	Full Sx $(In)^3$	Full Ix $(In)^4$	Rx (In)	Full Sy $(In)^3$	Full Iy $(In)^4$	ry (In)
8.5Z16	45	0.61"	0.060	0.3125	16	0.85	2.11	2.13	9.05	3.26	0.38	1.09	1.13
8.5Z15	45	0.66"	0.067	0.3125	15	0.96	2.39	2.39	10.17	3.26	0.43	1.27	1.15
8.5Z14	45	0.71"	0.075	0.3125	14	1.08	2.69	2.69	11.44	3.26	0.50	1.48	1.17
8.5Z13	45	0.79"	0.090	0.3125	13	1.30	3.25	3.25	13.81	3.25	0.62	1.87	1.20
8.5Z12	45	0.85"	0.105	0.3125	12	1.53	3.81	3.81	16.18	3.25	0.75	2.29	1.22
8.5Z11	45	0.93"	0.12"	0.3125	11	1.76	4.37	4.37	18.56	3.25	0.88	2.75	1.25

8.5" - Light Gage C Shapes

Section	Lip Angle	Theoretical Lip Depth	Thick (In)	Radius of Bend	Gage	Full Area $(In)^2$	Eff Sx $(In)^3$	Full Sx $(In)^3$	Full Ix $(In)^4$	Rx (In)	Full Sy $(In)^4$	Full Iy $(In)^4$	ry (In)
8.5C16	90	0.54"	0.060	0.0938	16	0.85	2.03	2.11	8.95	3.25	0.33	0.62	0.86
8.5C15	90	0.58"	0.067	0.0938	15	0.95	2.34	2.36	10.02	3.25	0.38	0.71	0.86
8.5C14	90	0.62"	0.095	0.0938	14	1.07	2.64	2.64	11.24	3.25	0.43	0.80	0.87
8.5C13	90	0.70"	0.090	0.0938	13	1.29	3.18	3.18	13.52	3.24	0.53	0.99	0.88
8.5C12	90	0.71"	0.105	0.1875	12	1.48	3.61	3.61	15.33	3.22	0.59	1.10	0.86
8.5C11	90	0.77"	0.120	0.1875	11	1.70	4.12	4.12	17.51	3.21	0.69	1.28	0.87