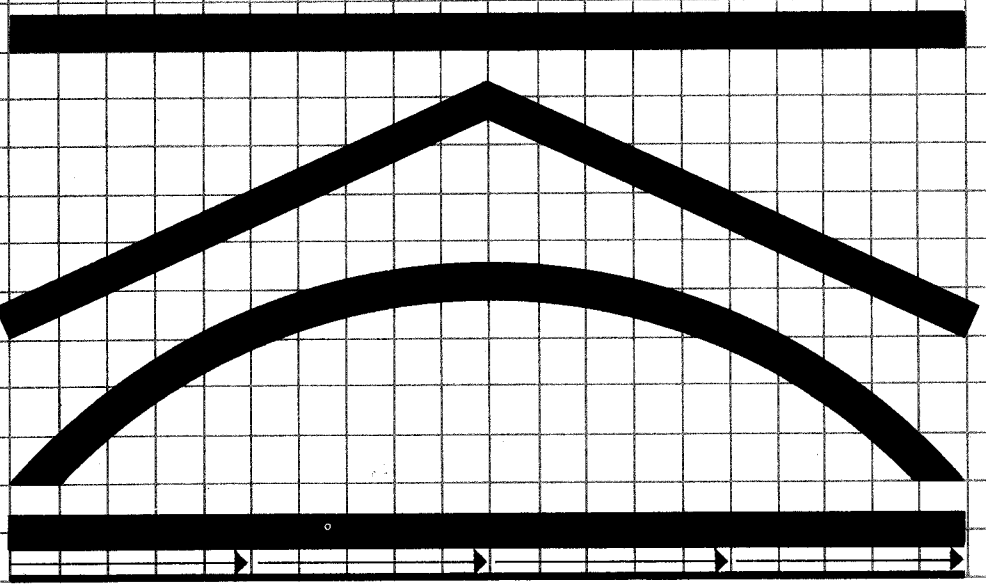

Roof systems: Technical data guide

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Robertson

Robertson Roofs

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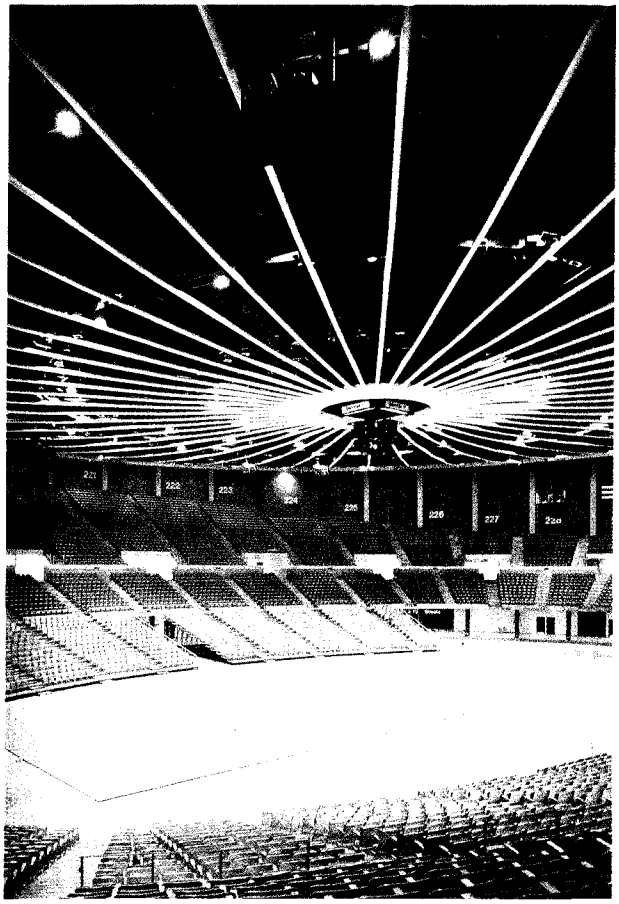

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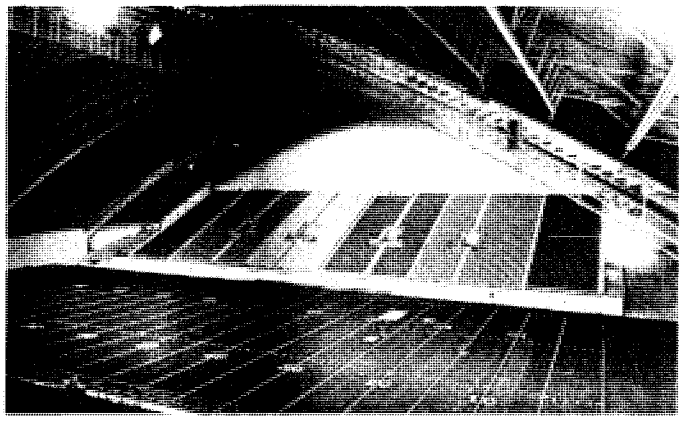

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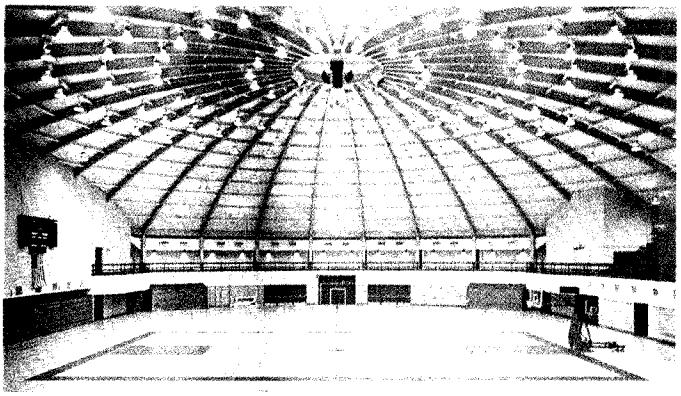

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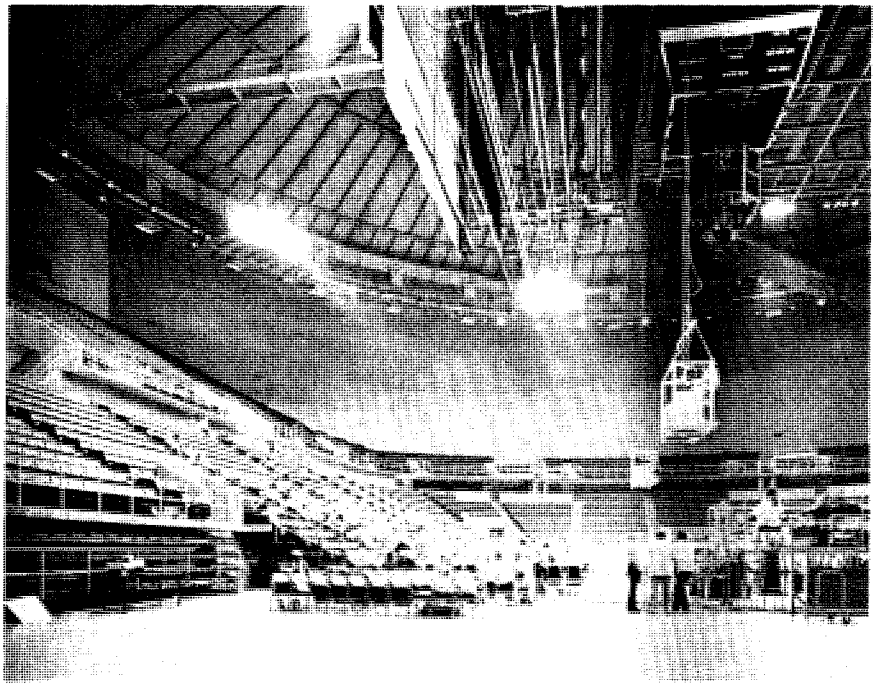

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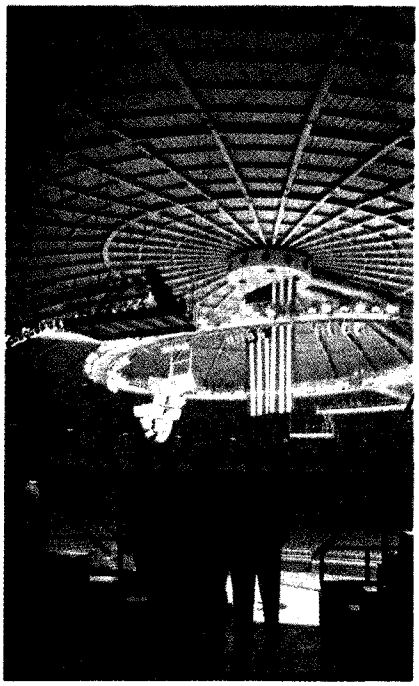

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Robertson Roofs

EDUCATIONAL INSTITUTIONS

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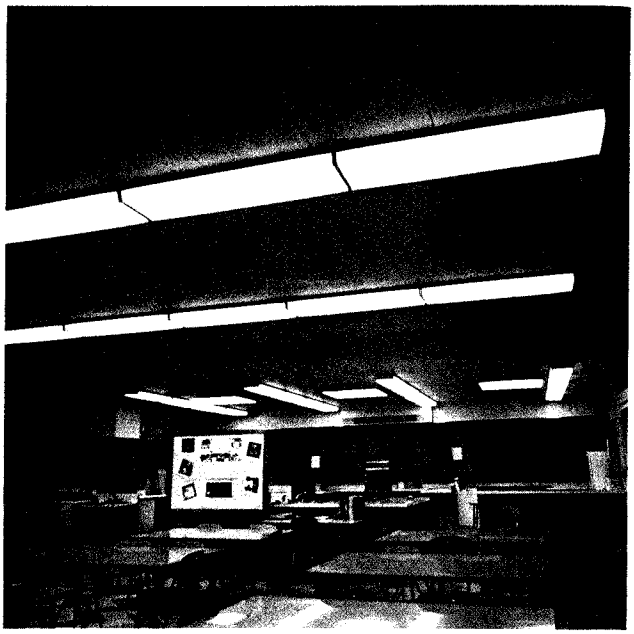

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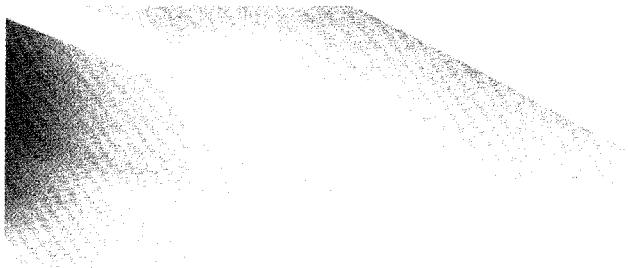

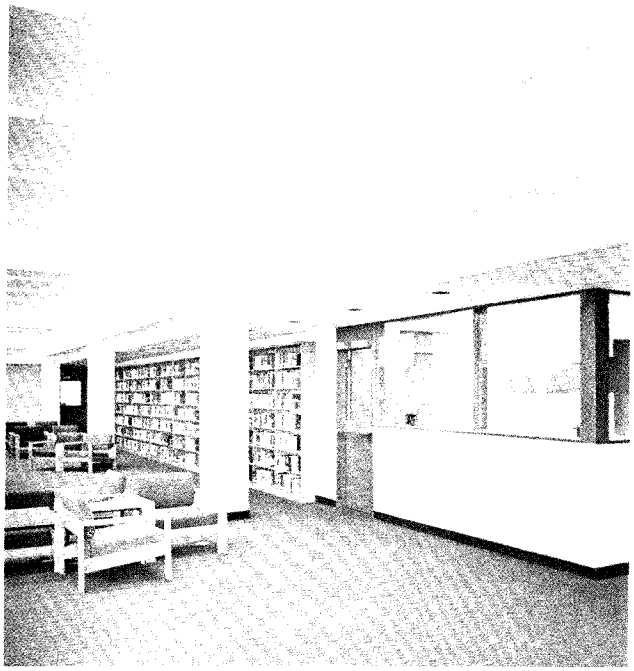

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CORRECTIONAL INSTITUTIONS

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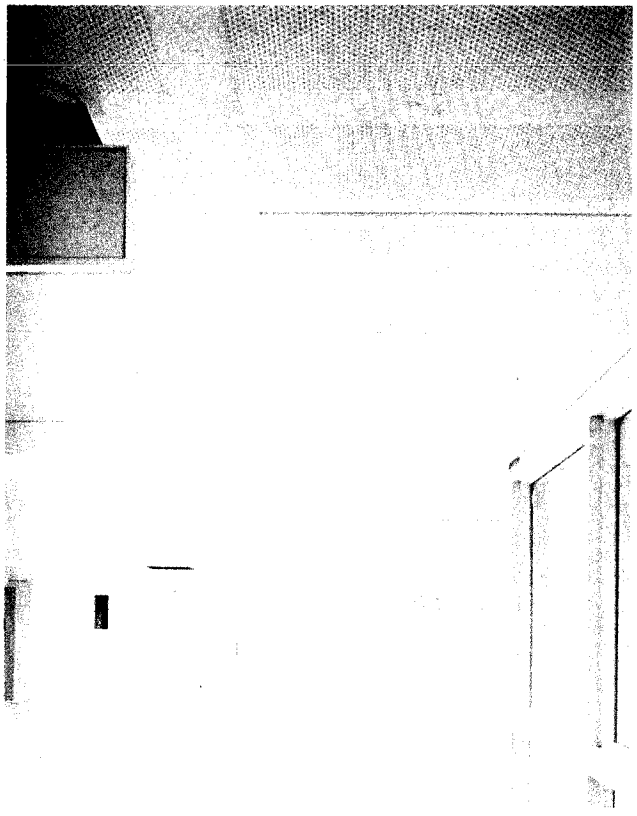

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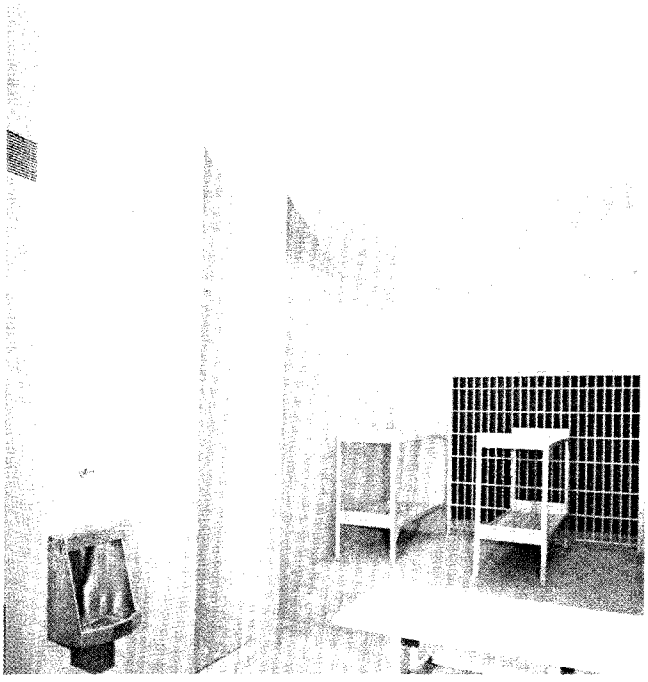

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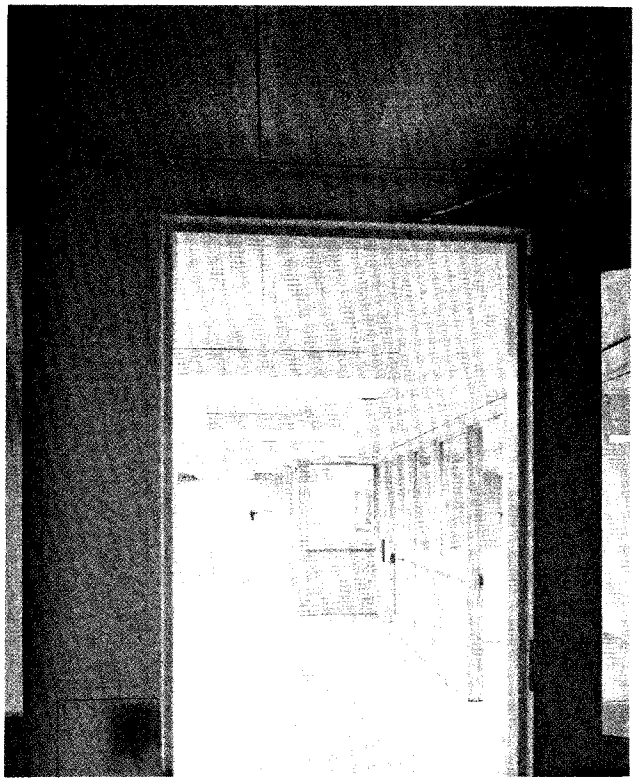

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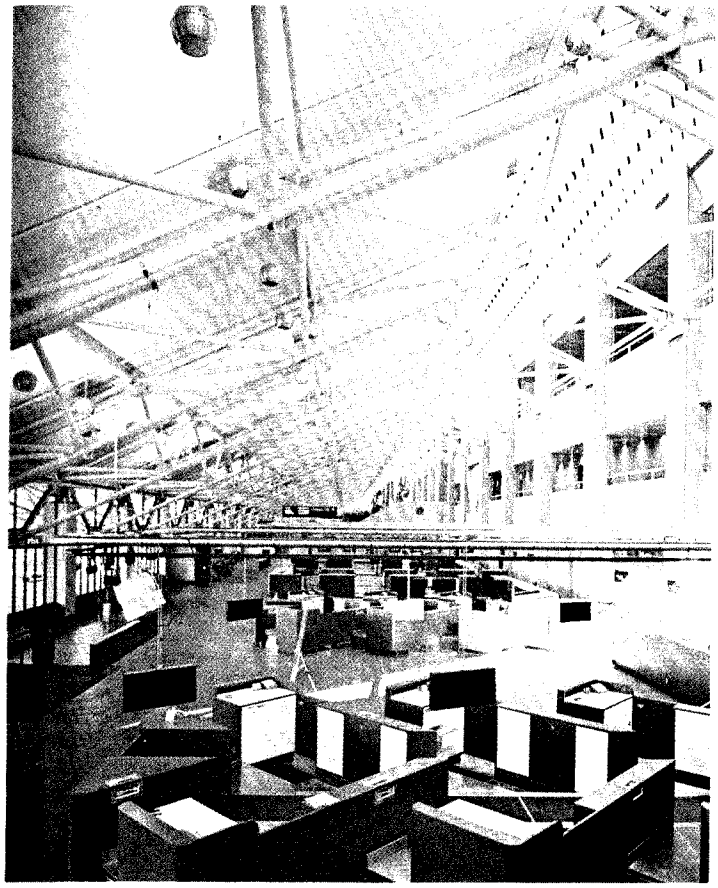
Robertson Roofs

POWER PLANTS AND SPECIAL PURPOSE



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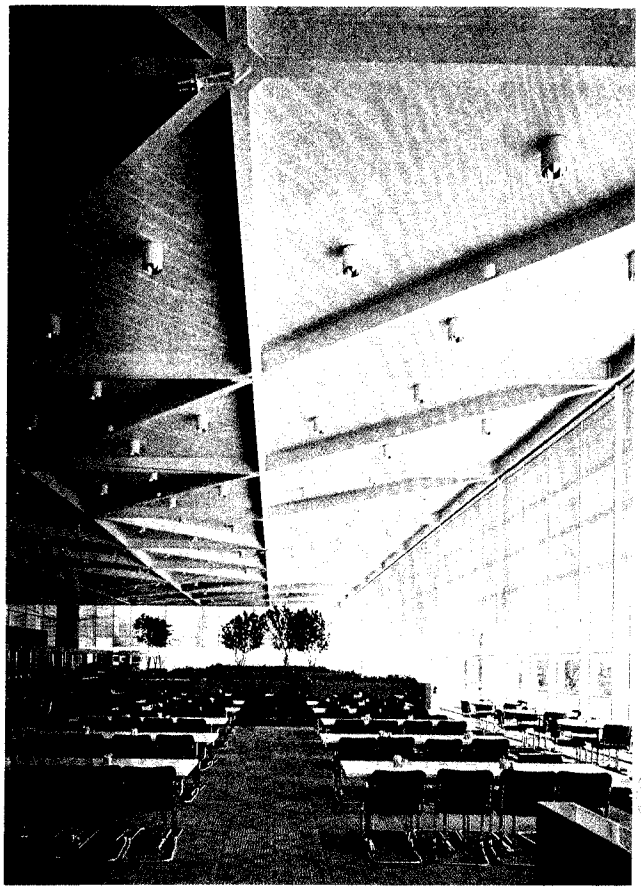

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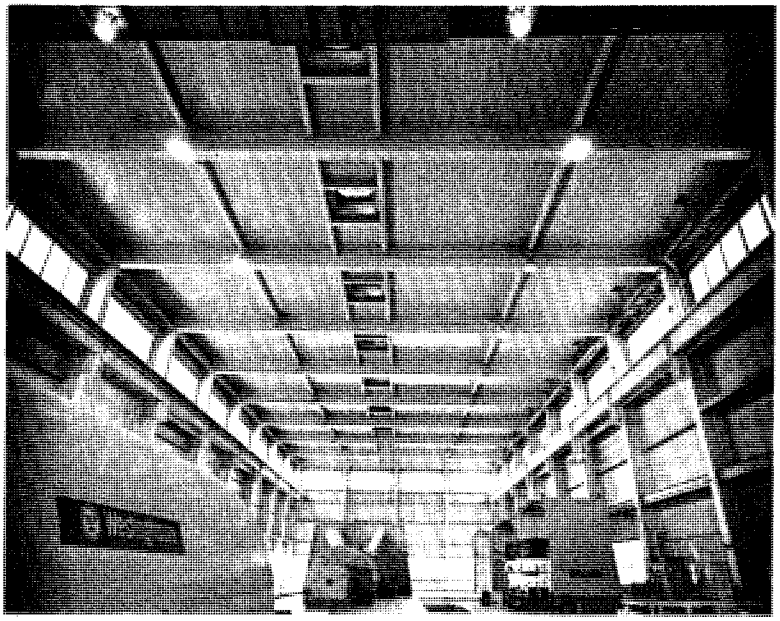

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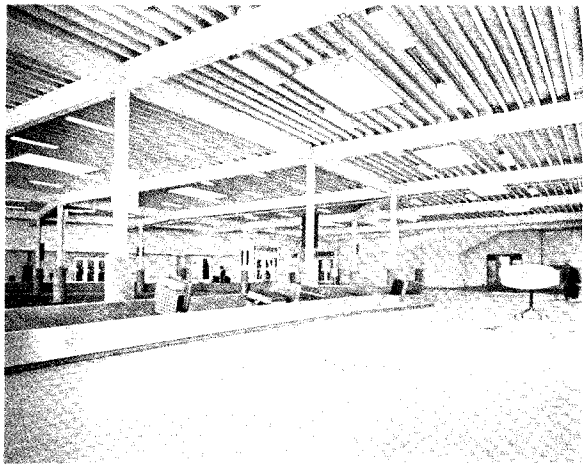

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Robertson Roofs

ENGINEERING DATA - STRUCTURAL

SELECTING A ROBERTSON ROOF DECK SECTION

Designing a Robertson roof deck follows the procedure for any structural section. It is necessary to consider such items as the type of structure, type and degree of loading, span provisions, end bearing, and ceiling conditions, as well as humidity levels in the building.

The following data will enable the designer to select a steel roof deck. Most of the computation work normally required has been reduced to tabular form to simplify the selection of the appropriate deck unit.

1 — LOAD AND SPAN

A deck section must satisfy two basic requirements:
(a) Strength — indicated by Section Modulus "S".
(b) Deflection Resistance — indicated by Moment of Inertia "I".

The individual job and use of the deck will determine the dead and live load values. These are to be specified by the architect or designer and it is beneficial to have the values appear on the contract drawings. In addition, the architect will specify the type ceiling which will dictate the deflection criteria, normally 1/360 of the span for plastered ceilings and 1/240 of the span for unplastered ceilings. (Check local or state codes for accepted practice.)

2 — REACTION VALUES

End and intermediate reaction values are given in the Deck Section Property Table and are for 12" widths, the same as section property values. These values have been determined using web strength formulae promulgated by the American Iron and Steel Institute and are in full accordance with their accepted specification.

3 — LATERAL DIAPHRAGM DESIGN

Pertains to seismic, wind and bomb shock loadings. For further information see your local Robertson representative.

4 — LATERAL BRACING

Pertains to the stiffening of the compression flange of a beam. This should not be confused with Lateral Diaphragm Design.

5 — HUMIDITY

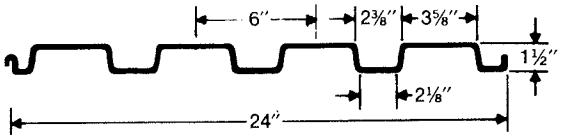
Higher-than-normal interior relative humidity can require special consideration for the design and application of the steel deck. Contact your local Robertson representative with specific conditions.

DESIGN CONSIDERATIONS FOR SECTION PROPERTY AND LOAD-SPAN TABLES

1. All section properties have been determined by use of American Iron and Steel Institute's Specifications for Design of Light Gage Cold-Formed Steel Structural Members.
2. All properties are based on a 12" width of deck, although the units may be wider.
3. Recommended end bearing is 3 inches for roofs.
4. Allowable loads (all spans loaded) shown in tables have been rounded down to the nearest whole number. This number includes a provision of 7 psf for built-up roofing materials, plus the actual weight of the specific deck unit. None of the loads shown will produce a stress greater than 20,000 psi, or exceed end or intermediate bearing values as shown in the section property tables, or a deflection due to live load greater than:
   a. Spans up to and including 20' center to center limited by a maximum deflection of L/240.
   b. Spans over 21' center to center limited by a maximum deflection of 1".
   c. Spans over 30' to be limited by the criteria of a maximum deflection of L/360.
5. End and intermediate reaction values vary with the length of bearing. For bearing lengths less than those shown in the catalog, consult AISC specifications or your local Robertson representative.
6. A moment coefficient of 1/10 has been used for 3 or more spans and 1/8 for two spans and simple spans.
7. A deflection coefficient of 2.65/384 has been used for 3 spans, and 2.08/384 for 2 spans and 5/384 for simple spans.
8. For cellular decks utilized in the inverted (flat-plate-up) position contact your Robertson representative.
9. Damage to the steel deck profile during the construction phase can significantly reduce its load carrying capacity. Deck erectors should exercise appropriate care to insure that any damaged deck is suitably strengthened or replaced. This is especially critical for decking placed on simple spans, since premature buckling caused by damaged deck can create a danger to workmen. For deck jobs where minor damage would be detrimental to underside appearance in the finished structure, suitably heavier deck gauges should be considered.
10. Roofs subject to water ponding and other similar phenomena (such as torrential rains) may need to be checked for load capacity. Because of the many factors involved, this responsibility rests with the structural designer.

Robertson Roofs

SECTION 3



PROPERTIES

DECK DESIGNATION	SECTION AND GAUGE	ACTUAL WT./SQ. FOOT POUNDS	OVER-ALL DEPTH in.	MOM. OF INERTIA in.⁴	SECTION MODULUS + MOMENT in.³	SECTION MODULUS – MOMENT in.³	ALLOWABLE END * REACTION lbs./ft.	ALLOWABLE INTER-* MEDIATE REACTION lbs./ft.
SECTION 3	3-22	1.8	1.530	0.18	0.20	0.22	589	1687
	3-20	2.2	1.536	0.23	0.27	0.27	950	2303
	3-18	2.9	1.548	0.34	0.40	0.38	1841	3719
	3-16	3.5	1.560	0.44	0.51	0.48	2972	5407
	3-14	4.4	1.575	0.56	0.63	0.59	4697	7863
	3-12	5.9	1.605	0.76	0.88	0.88	9231	13996

*End Bearing = 3" Intermediate Bearing = 4"

LOAD-SPAN TABLES

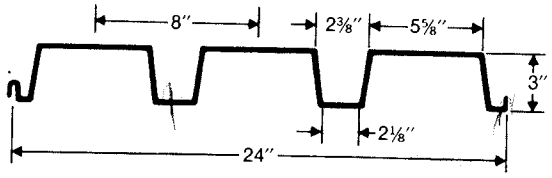
ALLOWABLE UNIFORM TOTAL LOADS IN POUNDS PER SQUARE FOOT

DECK SECTION	GAUGE	RIB DEPTH	TYPE OF SPAN	PURLIN SPACING IN FEET												
SECTION 3 MAX. LENGTH 40'-0"	22	1½"		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0				
			SIMPLE	103	79	63										
			DOUBLE	116	96	81	69	59	51	45	40	36				
			TRIPLE	146	120	101	86	73	61	52	45	39				
	20	1½"		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0				
			SIMPLE	78	64	53										
			DOUBLE	99	86	74	64	56	50	44	40	36				
			TRIPLE	126	107	92	76	64	55	48	42	37				
	18	1½"		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0
			SIMPLE	112	90	74	62	53	45	40	35	31				
			DOUBLE	140	119	103	90	79	70	62	56	50	45	41	38	35
			TRIPLE	175	149	129	108	91	77	67	58	51	46	41	37	34
	16	1½"		6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	
			SIMPLE	115	94	79	67	57	50	44	39	35	32			
			DOUBLE	151	130	113	100	88	79	70	64	58	52	48	44	
			TRIPLE	189	163	140	117	99	85	74	65	57	51	46	42	

Note: For Factory Mutual Insured roofs, refer to FM 1-28 Bulletin for relevant design criteria.
Refer to page seven for additional design/erection considerations and limitations.

Robertson Roofs

SECTION 21



PROPERTIES

DECK DESIGNATION	SECTION AND GAUGE	ACTUAL WT./SQ. FOOT POUNDS	OVER-ALL DEPTH in.	MOM. OF INERTIA in.⁴	SECTION MODULUS + MOMENT in.³	SECTION MODULUS – MOMENT in.³	ALLOWABLE END * REACTION lbs./ft.	ALLOWABLE INTER-* MEDIATE REACTION lbs./ft.
SECTION 21	21-22	2.1	3.030	0.67	0.39	0.47	403	1190
	21-20	2.6	3.036	0.85	0.50	0.58	663	1648
	21-18	3.5	3.048	1.26	0.76	0.79	1316	2706
	21-16	4.2	3.060	1.70	0.98	0.99	2154	3972
	21-14	5.2	3.075	2.26	1.26	1.23	3441	5820
	21-12	6.9	3.105	3.38	1.82	1.70	6841	10448

*End Bearing = 3″ Intermediate Bearing = 4″

LOAD-SPAN TABLES

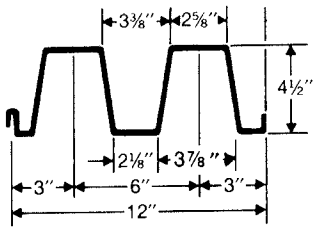
ALLOWABLE UNIFORM TOTAL LOADS IN POUNDS PER SQUARE FOOT

DECK SECTION	GAUGE	RIB DEPTH	TYPE OF SPAN	PURLIN SPACING IN FEET										
SECTION 21 MAX. LENGTH 40′-0″	22	3″	SIMPLE	8.0	9.0	10.0	11.0	12.0						
			DOUBLE	81										
			TRIPLE	97	77	62	51							
				122	96	78	64	54						
	20	3″	SIMPLE	8.0	9.0	10.0	11.0	12.0	13.0					
			DOUBLE	104	82	65								
			TRIPLE	120	95	77	63	53	45					
				151	119	96	79	67	57					
	18	3″	SIMPLE	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0		
			DOUBLE	92	72	58	48	40	34					
			TRIPLE	105	87	73	62	53	46	41	36	32		
				131	108	91	77							
	16	3″	SIMPLE	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0
			DOUBLE	122	95	75	62	51	44	38	33			
			TRIPLE	132	109	91	78	67	58	51	45	40	36	33
				165	136	114	97							

Note: For Factory Mutual Insured roofs, refer to FM 1-28 Bulletin for relevant design criteria.
Refer to page seven for additional design/erection considerations and limitations.

Robertson Roofs

SECTION 12



PROPERTIES

DECK DESIGNATION	SECTION AND GAUGE	ACTUAL WT./SQ. FOOT POUNDS	OVER-ALL DEPTH in.	MOM. OF INERTIA in.⁴	SECTION MODULUS + MOMENT in.³	SECTION MODULUS – MOMENT in.³	ALLOWABLE END * REACTION lbs./ft.	ALLOWABLE INTER-* MEDIATE REACTION lbs./ft.
SECTION 12	12-20	3.6	4.536	2.93	1.13	1.06	772	2281
	12-18	4.9	4.548	4.08	1.61	1.53	1577	3763
	12-16	5.9	4.560	5.19	2.11	2.04	2622	5518
	12-14	7.3	4.575	6.18	2.69	2.57	4239	8054
	12-12	10.0	4.605	8.59	3.43	3.60	8541	14338

*End Bearing = 3" Intermediate Bearing = 5"

LOAD-SPAN TABLES

ALLOWABLE UNIFORM TOTAL LOADS IN POUNDS PER SQUARE FOOT

DECK SECTION	GAUGE	RIB DEPTH	TYPE OF SPAN	PURLIN SPACING IN FEET										
				10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0
SECTION 12 MAX. LENGTH 40'-0"	20	4½"	SIMPLE	150	124	104	88	76	66	57	49	43	38	34
			DOUBLE	140	117	98	83	72	62	55	48	43	39	35
			TRIPLE	176	145	122	104							
				12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0
	18	4½"	SIMPLE	149	127	109	91	77	66	57	50	45	39	34
			DOUBLE	142	121	104	90	79	70	63	56	51		
			TRIPLE	177	151									
				13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0
	16	4½"	SIMPLE	166	136	113	96	82	71	62	55	47	41	37
			DOUBLE	160	138	120	106	94	83	75	67			
			TRIPLE	200										

Refer to page seven for additional design/erection considerations and limitations.

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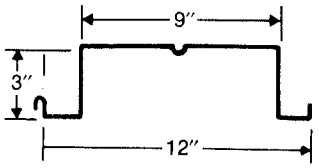
SECTION 5-3.0



PROPERTIES

DECK DESIGNATION	SECTION AND GAUGE	ACTUAL WT./SQ. FOOT POUNDS	OVER-ALL DEPTH in.	MOM. OF INERTIA in.⁴	SECTION MODULUS + MOMENT in.³	SECTION MODULUS – MOMENT in.³	ALLOWABLE END * REACTION lbs./ft.	ALLOWABLE INTER-* MEDIATE REACTION lbs./ft.
SECTION 5-3.0	5-3.0-20	2.7	3.036	0.85	0.49	0.59	449	1289
	5-3.0-18	3.6	3.048	1.30	0.73	0.79	892	2085
	5-3.0-16	4.5	3.060	1.75	0.95	0.98	1459	3023
	5-3.0-14	5.4	3.075	2.26	1.20	1.22	2344	4402

*End Bearing = 3″ Intermediate Bearing = 5″

LOAD-SPAN TABLES

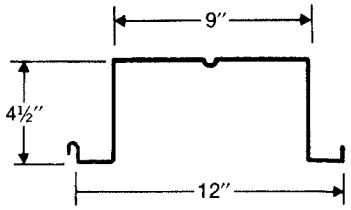
ALLOWABLE UNIFORM TOTAL LOADS IN POUNDS PER SQUARE FOOT

DECK SECTION	GAUGE	RIB DEPTH	TYPE OF SPAN	PURLIN SPACING IN FEET										
SECTION 5-3.0 MAX. LENGTH 40′-0″	20	3″		8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0			
			SIMPLE	101	80	64	51	41	35					
			DOUBLE	123	97	78	65	54	46	40	34			
			TRIPLE	153	121	98	81	68	57					
	18	3″		8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0
			SIMPLE	153	120	95	74	59	49	41	35	31		
			DOUBLE	164	129	105	87	72	62	53	46	41	36	32
			TRIPLE	205	162	131	108	91	77					
	16	3″		10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0
			SIMPLE	126	97	77	63	53	45	39	34			
			DOUBLE	130	107	90	77	66	58	51	45	40	36	32
			TRIPLE	163	134	113	96							

Refer to page seven for additional design/erection considerations and limitations.

Robertson Roofs

SECTION 5-4.5



PROPERTIES

DECK DESIGNATION	SECTION AND GAUGE	ACTUAL WT./SQ. FOOT POUNDS	OVER-ALL DEPTH in.	MOM. OF INERTIA in.⁴	SECTION MODULUS + MOMENT in.³	SECTION MODULUS – MOMENT in.³	ALLOWABLE END * REACTION lbs./ft.	ALLOWABLE INTER-MEDIATE * REACTION lbs./ft.
SECTION 5-4.5	5-4.5-20	3.1	4.536	2.20	0.85	1.03	408	1367
	5-4.5-18	4.1	4.548	3.25	1.27	1.37	833	2227
	5-4.5-16	5.1	4.560	4.38	1.64	1.71	1384	3232
	5-4.5-14	6.5	4.575	5.68	2.08	2.12	2237	4669

*End Bearing = 3″ Intermediate Bearing = 6″

LOAD-SPAN TABLES

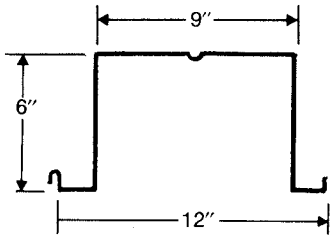
ALLOWABLE UNIFORM TOTAL LOADS IN POUNDS PER SQUARE FOOT

DECK SECTION	GAUGE	RIB DEPTH	TYPE OF SPAN	PURLIN SPACING IN FEET											
SECTION 5-4.5 MAX. LENGTH 40′-0″	20	4½″		10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	
			SIMPLE	82	74	68	63	52	42	35					
			DOUBLE	109	99	91	81	70	61	53	47	42	38	34	
			TRIPLE	124	113	103	95								
	18	4½″		10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0
			SIMPLE	166	139	118	100	86	74	63	54	47	42	37	33
			DOUBLE	178	150	126	100	93	81	71	63	56	50	45	
			TRIPLE	202	184	158	135								
	16	4½″		12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	
			SIMPLE	151	129	111	96	82	70	61	53	48	41	36	
			DOUBLE	158	134	116	101	88	78	70	63	56			
			TRIPLE	197	168										

Refer to page seven for additional design/erection considerations and limitations.

Robertson Roofs

SECTION 5-6.0



PROPERTIES

DECK DESIGNATION	SECTION AND GAUGE	ACTUAL WT./SQ. FOOT POUNDS	OVER-ALL DEPTH in.	MOM. OF INERTIA in.⁴	SECTION MODULUS + MOMENT in.³	SECTION MODULUS – MOMENT in.³	ALLOWABLE END * REACTION lbs./ft.	ALLOWABLE INTER- * MEDIATE REACTION lbs./ft.
SECTION 5-6.0	5-6.0-18	4.6	6.048	6.30	1.88	2.04	775	2117
	5-6.0-16	5.7	6.060	8.47	2.43	2.54	1310	3108
	5-6.0-14	7.2	6.075	10.99	3.09	3.16	2144	4528

* End Bearing = 3″ Intermediate Bearing = 6″

LOAD-SPAN TABLES

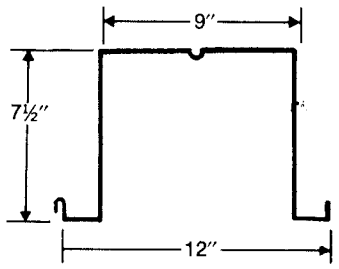
ALLOWABLE UNIFORM TOTAL LOADS IN POUNDS PER SQUARE FOOT

DECK SECTION	GAUGE	RIB DEPTH	TYPE OF SPAN	PURLIN SPACING IN FEET									
SECTION 5-6.0 MAX. LENGTH 40′-0″	18	6″		16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0
			SIMPLE	97	86	77	69	62	54	46	41	36	32
			DOUBLE	106	94	83	75	67					
	16	6″		16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0
			SIMPLE	126	111	99	89	80	69	60	52	46	41
			DOUBLE	132	117	104	93	84					

Refer to page seven for additional design/erection considerations and limitations.

Robertson Roofs

SECTION 5-7.5



PROPERTIES

DECK DESIGNATION	SECTION AND GAUGE	ACTUAL WT./SQ. FOOT POUNDS	OVER-ALL DEPTH in.	MOM. OF INERTIA in.⁴	SECTION MODULUS + MOMENT in.³	SECTION MODULUS – MOMENT in.³	ALLOWABLE END * REACTION lbs./ft.	ALLOWABLE INTER- * MEDIATE REACTION lbs./ft.
SECTION 5-7.5	5-7.5-18	5.1	7.548	10.59	2.56	2.79	716	2332
	5-7.5-16	6.4	7.560	14.21	3.31	3.48	1236	3428
	5-7.5-14	7.9	7.575	18.44	4.22	4.33	2051	4981
	5-7.5-13	9.4	7.590	22.36	5.11	5.19	3059	6757
	5-7.5-12	10.9	7.605	26.35	6.03	6.03	4246	8729

* End Bearing = 3″ Intermediate Bearing = 7½″

LOAD-SPAN TABLES

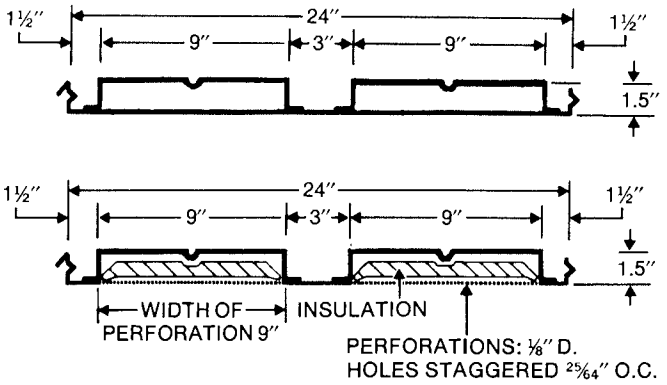
ALLOWABLE UNIFORM TOTAL LOADS IN POUNDS PER SQUARE FOOT

DECK SECTION	GAUGE	RIB DEPTH	TYPE OF SPAN	PURLIN SPACING IN FEET											
SECTION 5-7.5 MAX. LENGTH 40′-0″	18	7½″	SIMPLE	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0		
			DOUBLE	89	84	79	75	72	68	65	61	53	47		
				117	110	104	98	92							
	16	7½″	SIMPLE	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0	31.0
			DOUBLE	110	100	91	80	69	61	54	48	43	39	36	33
				115											

Refer to page seven for additional design/erection considerations and limitations.

Robertson Roofs

DC-1.5
ADC-1.5



PROPERTIES

SECTION AND GAUGE	DC-ACTUAL WT./SQ. FOOT POUNDS[1]	OVER-ALL DEPTH in.	DC DECK MOM. OF INERTIA in.⁴	DC DECK SECTION MODULUS +MOMENT in.³	DC DECK SECTION MODULUS −MOMENT in.³	ADC DECK MOM. OF INERTIA in.⁴	ADC DECK SECTION MODULUS +MOMENT in.³	ADC DECK SECTION MODULUS −MOMENT in.³	ALLOWABLE END* REACTION lbs./ft.	ALLOWABLE INTER-* MEDIATE REACTION lbs./ft.
1.5-20/18	4.0	1.584	0.36	0.26	0.48	0.34	0.25	0.44	490	1188
1.5-18/18	4.6	1.596	0.52	0.43	0.53	0.50	0.42	0.49	950	1919
1.5-18/16	5.1	1.608	0.56	0.43	0.64	0.54	0.43	0.60	950	1919
1.5-16/18	5.2	1.608	0.67	0.63	0.58	0.65	0.62	0.53	1533	2790
1.5-16/16	5.8	1.620	0.73	0.64	0.72	0.70	0.63	0.65	1533	2790
1.5-16/14	6.4	1.635	0.79	0.65	0.81	0.76	0.65	0.79	1533	2790
1.5-14/16	6.5	1.635	0.91	0.89	0.78	0.87	0.88	0.71	2423	4057
1.5-14/14	7.2	1.649	0.99	0.91	0.97	0.95	0.90	0.85	2423	4057
1.5-13/16	7.3	1.650	1.06	1.13	.084	1.01	1.12	0.77	3505	5541

[1]ADC weights are approximately 4% less.

*End Bearing = 3" Intermediate Bearing = 4"

LOAD-SPAN TABLES

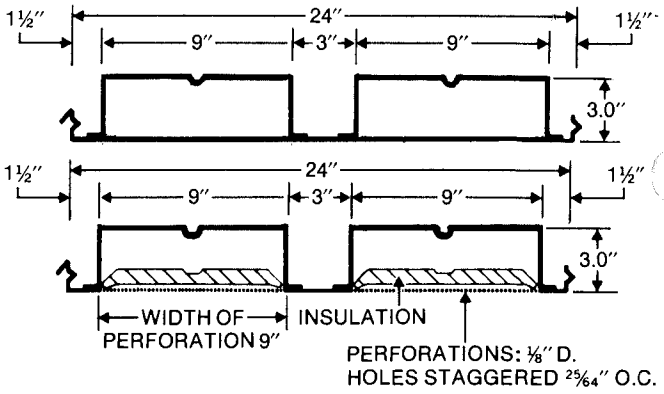
ALLOWABLE UNIFORM TOTAL LOADS IN POUNDS PER SQUARE FOOT

GAUGE	RIB DEPTH	TYPE OF SPAN	DC-1.5 PURLIN SPACING IN FEET							ADC-1.5 PURLIN SPACING IN FEET								
			7.0	7.5	8.0	8.5	9.0	9.5	10.0	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0
20/18	1½"	SIMPLE	69	60	53	47	42	37	34	69	60	52	46	41	37	33		
		DOUBLE	130	114	100	88	78	70	63	119	104	91	81	72	64	58	52	48
		TRIPLE	140	116	97	83	72	62	55	122	99	92	79	68	58	52	47	42
			7.0	7.5	8.0	8.5	9.0	9.5	10.0	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0
18/18	1½"	SIMPLE	110	92	78	66	58	51	45	106	88	75	64	56	49	44	39	35
		DOUBLE	145	126	111	98	87	78	71	132	115	101	89	80	71	64	58	53
		TRIPLE	180	157	137	116	99	86	75	165	144	126	112	96	83	73	64	57
			8.0	8.5	9.0	9.5	10.0	10.5	11.0	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0
18/16	1½"	SIMPLE	83	71	62	54	48	43	39	80	69	60	53	47	42	38	35	
		DOUBLE	133	118	105	94	85	77	70	124	110	98	88	79	72	65	60	55
		TRIPLE	147	124	107	92	81	71	64	142	120	103	89	78	69	62	55	50
			8.5	9.0	9.5	10.0	10.5	11.0	11.5	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5
16/18	1½"	SIMPLE	84	72	63	56	50	45	41	80	69	61	54	48	43	39	36	33
		DOUBLE	107	95	86	77	70	64	58	98	87	78	71	64	58	53	49	45
		TRIPLE	134	119	107	95	84	75	67	123	109	98	89	80	72	64	58	52
			9.0	9.5	10.0	10.5	11.0	11.5	12.0	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
16/16	1½"	SIMPLE	78	68	60	54	48	44	40	75	66	58	52	47	42	39	36	33
		DOUBLE	118	106	96	87	79	72	66	106	95	86	78	71	65	59	55	51
		TRIPLE	137	118	103	91	81	72	65	131	114	99	87	77	69	62	57	52

For spans not shown on charts, please consut your Robertson sales representative.
Refer to page seven for additional design/erection considerations and limitations.

Robertson Roofs

DC-3.0
ADC-3.0



PROPERTIES

SECTION AND GAUGE	DC-ACTUAL WT./SQ. FOOT POUNDS[1]	OVER-ALL DEPTH in.	DC DECK MOM. OF INERTIA in.⁴	DC DECK SECTION MODULUS +MOMENT in.³	DC DECK SECTION MODULUS −MOMENT in.³	ADC DECK MOM. OF INERTIA in.⁴	ADC DECK SECTION MODULUS +MOMENT in.³	ADC DECK SECTION MODULUS −MOMENT in.³	ALLOWABLE END* REACTION lbs./ft.	ALLOWABLE INTER-* MEDIATE REACTION lbs./ft.
3.0-20/18	4.4	3.084	1.56	0.60	1.04	1.50	0.59	0.99	449	1289
3.0-18/18	5.1	3.096	2.22	0.97	1.35	2.14	0.96	1.11	892	2085
3.0-18/16	5.7	3.108	2.38	0.99	1.39	2.30	0.98	1.35	892	2085
3.0-16/18	5.8	3.108	2.85	1.42	1.33	2.74	1.40	1.24	1459	3023
3.0-16/16	6.4	3.120	3.09	1.44	1.62	2.96	1.43	1.47	1459	3023
3.0-16/14	7.1	3.135	3.33	1.46	1.76	3.20	1.45	1.72	1459	3023
3.0-14/16	7.3	3.135	3.80	1.98	1.77	3.64	1.96	1.62	2344	4402
3.0-14/14	8.0	3.149	4.13	2.01	2.15	3.96	2.00	1.94	2344	4402
3.0-13/16	8.2	3.150	4.41	2.50	1.92	4.22	2.48	1.77	3393	5946

[1]ADC weights are approximately 4% less.

*End Bearing = 3" Intermediate Bearing = 5"

LOAD-SPAN TABLES

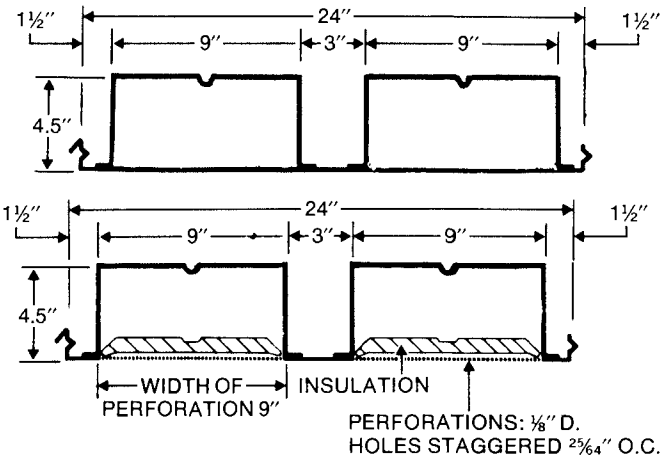
ALLOWABLE UNIFORM TOTAL LOADS IN POUNDS PER SQUARE FOOT

GAUGE	RIB DEPTH	TYPE OF SPAN	DC-3.0 PURLIN SPACING IN FEET							ADC-3.0 PURLIN SPACING IN FEET							
			8.0	9.0	10.0	11.0	12.0	13.0	14.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
20/18	3"	SIMPLE	112	98	79	65	55	47	40	112	97	79	65	54	46	40	35
		DOUBLE	129	114	103	98	86	79	73	129	114	103	98	86	79	73	68
		TRIPLE	146	130	117	106	97	90		146	130	117	106	97	90		
			9.0	10.0	11.0	12.0	13.0	14.0	15.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
18/18	3"	SIMPLE	159	129	106	89	76	65	55	158	127	105	89	75	62	53	46
		DOUBLE	185	166	148	124	106	91	79	182	147	122	103	87	75	66	58
		TRIPLE	210	189	172	156	124			210	189	152	128	109			
			9.0	10.0	11.0	12.0	13.0	14.0	15.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
18/16	3"	SIMPLE	162	131	108	90	77	67	58	160	130	107	90	77	66	56	49
		DOUBLE	185	166	148	128	109	94	82	185	166	148	124	106	90	80	70
		TRIPLE	210	189	172	158	133			210	189	172	156	129			
			11.0	12.0	13.0	14.0	15.0	16.0	17.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0
16/18	3"	SIMPLE	153	121	97	80	68	58	50	147	116	94	77	65	56	49	43
		DOUBLE	146	123	105	90	78	69	61	136	114	97	84	73	64	47	50
		TRIPLE	183	154	131					170	143	121					
			11.0	12.0	13.0	14.0	15.0	16.0	17.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0
16/16	3"	SIMPLE	158	130	105	87	73	62	54	157	125	101	83	70	60	52	46
		DOUBLE	178	150	127	110	96	84	74	162	136	116	100	87	76	68	60
		TRIPLE	223	187	159					203	170	145					

For spans not shown on charts, please consult your Robertson sales representative.
Refer to page seven for additional design/erection considerations and limitations.

Robertson Roofs

DC-4.5
ADC-4.5



PROPERTIES

SECTION AND GAUGE	DC-ACTUAL WT./SQ. FOOT POUNDS[1]	OVER-ALL DEPTH in.	DC DECK MOM. OF INERTIA in.⁴	DC DECK SECTION MODULUS +MOMENT in.³	DC DECK SECTION MODULUS −MOMENT in.³	ADC DECK MOM. OF INERTIA in.⁴	ADC DECK SECTION MODULUS +MOMENT in.³	ADC DECK SECTION MODULUS −MOMENT in.³	ALLOWABLE END* REACTION lbs./ft.	ALLOWABLE INTER-* MEDIATE REACTION lbs./ft.
4.5-20/18	4.6	4.584	3.80	1.03	1.66	3.67	1.02	1.62	408	1367
4.5-18/18	5.4	4.596	5.32	1.62	1.97	5.12	1.61	1.83	833	2227
4.5-18/16	5.9	4.608	5.71	1.65	2.23	5.50	1.63	2.19	833	2227
4.5-16/18	6.5	4.608	6.77	2.32	2.19	6.50	2.30	2.05	1384	3232
4.5-16/16	6.8	4.620	7.31	2.37	2.63	7.03	2.34	2.41	1384	3232
4.5-16/14	7.4	4.635	7.88	2.41	2.82	7.58	2.39	2.76	1384	3232
4.5-14/16	8.1	4.635	8.97	3.22	2.90	8.60	3.18	2.68	2237	4669
4.5-14/14	8.4	4.649	9.71	3.28	3.45	9.31	3.24	3.15	2237	4669
4.5-13/16	9.2	4.650	10.39	4.04	3.16	9.96	4.00	2.95	3282	6324

[1]ADC weights are approximately 4% less.

*End Bearing = 3" Intermediate Bearing = 6"

LOAD-SPAN TABLES

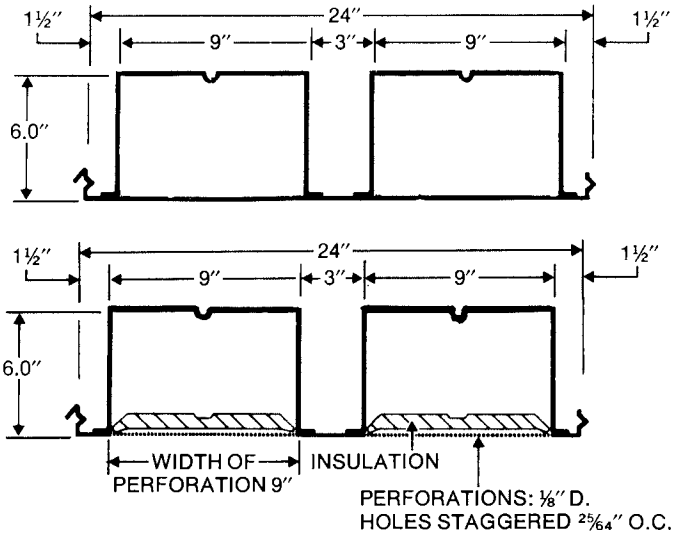
ALLOWABLE UNIFORM TOTAL LOADS IN POUNDS PER SQUARE FOOT

GAUGE	RIB DEPTH	TYPE OF SPAN	DC-4.5 PURLIN SPACING IN FEET							ADC-4.5 PURLIN SPACING IN FEET						
			12.0	13.0	14.0	15.0	16.0	17.0	18.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0
20/18	4½"	SIMPLE	68	63	58	54	51	47	42	68	63	58	54	51	46	41
		DOUBLE	91	84	78	73	68	64	61	91	84	78	73	68	64	61
		TRIPLE	103	95						103	95					
			12.0	13.0	14.0	15.0	16.0	17.0	18.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0
18/18	4½"	SIMPLE	150	127	110	96	84	74	66	148	126	109	95	83	74	66
		DOUBLE	148	137	127	116	102	90	81	148	137	124	108	95	84	75
		TRIPLE	168	156						168	156					
			12.0	13.0	14.0	15.0	16.0	17.0	18.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0
18/16	4½"	SIMPLE	152	130	112	97	85	76	67	151	128	111	96	85	75	67
		DOUBLE	148	137	127	119	111	102	91	148	137	127	119	111	101	90
		TRIPLE	168	156						168	156					
			14.0	15.0	16.0	17.0	18.0	19.0	20.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0
16/18	4½"	SIMPLE	158	137	120	103	89	78	69	156	136	117	100	86	75	66
		DOUBLE	149	129	114	101	90	80	73	139	121	106	94	84	75	68
			15.0	16.0	17.0	18.0	19.0	20.0	21.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0
16/16	4½"	SIMPLE	140	123	109	96	83	73	63	138	122	107	92	80	71	61
		DOUBLE	155	130	121	108	97	87		142	125	111	99	89	80	

For spans not shown on charts, please consult your Robertson sales representative.
Refer to page seven for additional design/erection considerations and limitations.

Robertson Roofs

DC-6.0
ADC-6.0



PROPERTIES

SECTION AND GAUGE	DC-ACTUAL WT./SQ. FOOT POUNDS[1]	OVER-ALL DEPTH in.	DC DECK MOM. OF INERTIA in.⁴	DC DECK SECTION MODULUS +MOMENT in.³	DC DECK SECTION MODULUS −MOMENT in.³	ADC DECK MOM. OF INERTIA in.⁴	ADC DECK SECTION MODULUS +MOMENT in.³	ADC DECK SECTION MODULUS −MOMENT in.³	ALLOWABLE END* REACTION lbs./ft.	ALLOWABLE INTER-* MEDIATE REACTION lbs./ft.
6.0-18/18	6.0	6.096	10.00	2.37	2.81	9.63	2.34	2.63	775	2117
6.0-18/16	6.4	6.108	10.74	2.41	3.15	10.35	2.39	3.09	775	2117
6.0-16/18	7.1	6.108	12.65	3.34	3.15	12.16	3.30	2.97	1310	3108
6.0-16/16	7.3	6.120	13.64	3.41	3.73	13.11	3.37	3.45	1310	3108
6.0-16/14	8.0	6.135	14.70	3.48	3.98	14.13	3.44	3.89	1310	3108
6.0-14/16	8.9	6.135	16.67	4.58	4.15	16.01	4.53	3.87	2144	4528
6.0-14/14	9.1	6.149	18.01	4.68	4.86	17.29	4.63	4.49	2144	4528
6.0-13/16	10.0	6.150	19.30	5.72	4.56	18.53	5.65	4.28	3170	6168

[1]ADC weights are approximately 4% less.

*End Bearing = 3" Intermediate Bearing = 6"

LOAD-SPAN TABLES

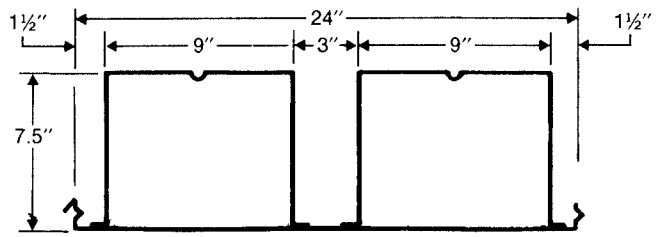
ALLOWABLE UNIFORM TOTAL LOADS IN POUNDS PER SQUARE FOOT

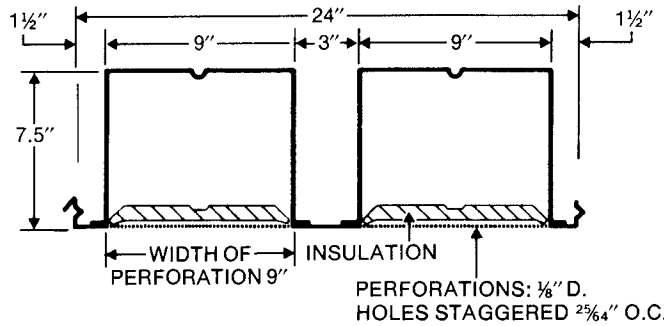
GAUGE	RIB DEPTH	TYPE OF SPAN	DC-6.0 PURLIN SPACING IN FEET								ADC-6.0 PURLIN SPACING IN FEET							
			15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0
18/18	6"	SIMPLE	103	97	91	86	80	77	71	65	103	97	91	86	81	77	70	64
		DOUBLE	112	106	99	94	89	84			112	106	99	94	89	84		
			15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0
18/16	6"	SIMPLE	103	97	91	86	81	77	71	66	103	97	91	86	81	77	71	65
		DOUBLE	112	106	99	94	89	84			112	106	99	94	89	84		
			19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
16/18	6"	SIMPLE	123	111	99	84	73	64	56	50	121	110	95	81	70	61	54	48
		DOUBLE	111	105							109	98						
			19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
16/16	6"	SIMPLE	125	113	103	90	78	68	60	53	124	112	101	87	75	66	58	51
		DOUBLE	111	105							111	105						

For spans not shown on charts, please consult your Robertson sales representative.
Refer to page seven for additional design/erection considerations and limitations.

Robertson Roofs

DC-7.5
ADC-7.5





PROPERTIES

SECTION AND GAUGE	DC-ACTUAL WT./SQ. FOOT POUNDS[1]	OVER-ALL DEPTH in.	DC DECK MOM. OF INERTIA in.⁴	DC DECK SECTION MODULUS +MOMENT in.³	DC DECK SECTION MODULUS −MOMENT in.³	ADC DECK MOM. OF INERTIA in.⁴	ADC DECK SECTION MODULUS +MOMENT in.³	ADC DECK SECTION MODULUS −MOMENT in.³	ALLOWABLE END* REACTION lbs./ft.	ALLOWABLE INTER-*MEDIATE REACTION lbs./ft.
7.5-18/18	6.6	7.595	16.44	3.20	3.73	15.83	3.16	3.50	716	2332
7.5-18/16	6.9	7.608	17.66	3.27	4.14	17.01	3.23	4.06	716	2332
7.5-16/18	7.7	7.608	20.68	4.46	4.21	19.90	4.40	3.99	1236	3428
7.5-16/16	8.0	7.620	22.28	4.56	4.92	21.42	4.50	4.57	1236	3428
7.5-16/14	9.2	7.635	23.99	4.66	5.23	23.08	4.61	5.12	1236	3428
7.5-14/16	9.6	7.635	27.15	6.07	5.52	26.11	6.00	5.17	2051	4981
7.5-14/14	10.0	7.649	29.29	6.21	6.38	28.14	6.14	5.94	2051	4981
7.5-13/16	11.0	7.650	31.44	7.55	6.11	30.25	7.45	5.76	3059	6757

[1]ADC weights are approximately 4% less.

*End Bearing = 3" Intermediate Bearing = 7½"

LOAD-SPAN TABLES

ALLOWABLE UNIFORM TOTAL LOADS IN POUNDS PER SQUARE FOOT

GAUGE	RIB DEPTH	TYPE OF SPAN	DC-7.5 PURLIN SPACING IN FEET								ADC-7.5 PURLIN SPACING IN FEET							
			15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0
18/18	7½"	SIMPLE	95	89	84	79	75	71	68	65	95	89	84	79	75	71	68	65
		DOUBLE	124	116	110	103	98	93			124	116	110	103	98	93		
18/16	7½"	SIMPLE	95	89	84	79	75	71	68	65	95	89	84	79	75	71	68	65
		DOUBLE	124	116	110	103	98	93			124	116	110	103	98	93		
16/18	7½"	SIMPLE	112	107	96	84	74	65	58	53	112	107	93	81	71	63	56	51
16/16	7½"	SIMPLE	112	107	103	88	78	69	62	56	112	107	99	86	76	67	60	54

For spans not shown on charts, please consult your Robertson sales representative.
Refer to page seven for additional design/erection considerations and limitations.

Robertson Roofs

CANTILEVER GUIDE & SELECTION TABLE

FORMULA FOR DETERMINING REQUIRED SECTION PROPERTIES FOR CANTILEVER SELECTION

1. Anchor span governs when $L < 0.414A$

   Req'd. $S = 0.000075 \frac{W_T}{A^2}(A+L)^2(A-L)^2$

   Req'd. $I = 0.00000305\, W_L A\,(5A^2-12L^2)$

   Note—Formula for req'd. I based on simplifying assumption that Δmax occurs at A/2

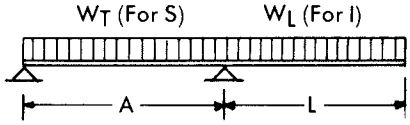
2. Cantilever governs when $L > 0.414A$

   Req'd. $S = 0.0003\, W_T L^2$

   Req'd. $I = 0.0000244\, W_L\,(4L^2A-A^3+3L^3)$

   W_T = total load in psf
   W_L = live load in psf
   A = anchor span in feet
   L = cantilever overhang in feet

In deriving the above formula, $f_b = 20000$ psi and E = 29,500,000 psi maximum deflection: for cantilever Δmax = L/120 and for anchor span, Δmax = A/240.



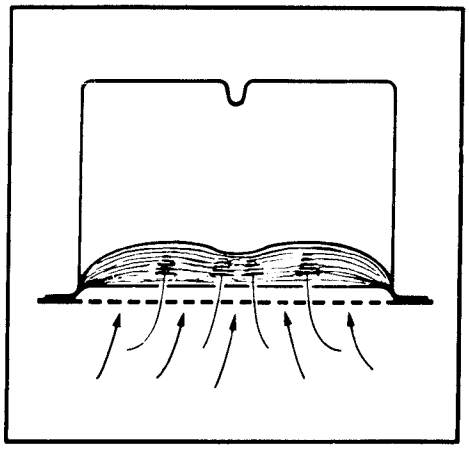
Total Load 45 psf
Live Load 30 psf
Deflection L/120 (or A/240)
L = 0.866 x A

L (ft.)	REQUIRED S (in.³)	REQUIRED I (in.⁴)	SELECTION TABLE • REQUIRED SECTION		
5	0.34	0.55	21-18 3-14	5-3.0-20	DC-3.0-20/18 DC-1.5-18/16
6	0.49	0.95	21-18 12-20	5-3.0-18	DC-3.0-20/18
7	0.66	1.50	12-20 21-16	5-4.5-20	DC-3.0-18/18
8	0.86	2.24	12-20 21-14	5-4.5-18	DC-3.0-18/16
9	1.09	3.19	12-18 21-12	5-4.5-18	DC-4.5-18/18 DC-3.0-16/14
10	1.35	4.38	12-16	5-4.5-16	DC-4.5-18/18 DC-3.0-13/16
11	1.63	5.83	12-14	5-6.0-18	DC-4.5-16/18
12	1.94	7.56	12-12	5-6.0-16	DC-6.0-18/18 DC-4.5-16/14 DC-4.5-14/16
13	2.28	9.62		5-7.5-18 5-6.0-14	DC-6.0-18/18 DC-4.5-14/14
14	2.65	12.01		5-7.5-16	DC-6.0-16/18
15	3.04	14.77		5-7.5-14	DC-7.5-18/18 DC-6.0-14/16

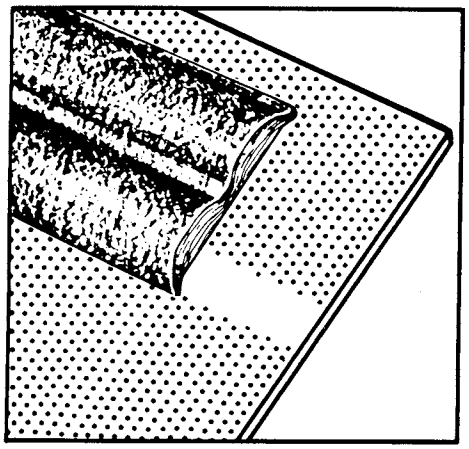
• For the listed sections, web crippling and weld strength are not critical for wind uplift forces less than 30 psf.

Robertson Roofs

ENGINEERING DATA - ACOUSTICAL



After it penetrates the perforated metal surface, sound energy is absorbed by the glass fiber pad and the air space above. The use of "metal pan" acoustical ceilings is well known and is recognized as one of the more effective acoustic ceiling methods. The arch shape of the sound absorbing element insures its support above the perforations to permit the sound energy to penetrate the pad. This self-supporting shape holds the pad above the holes to prevent clogging during subsequent field painting operations.



Long Span Acoustical ADC units combine a perforated plate, which also becomes the finished ceiling, with an internal sound absorbing element. The plate is perforated with paths of ⅛" diameter holes, providing approximately 10% open area. A specially formed arched pad of extra fine glass fibers is provided as the sound absorbing medium. It is field installed above the perforated plate. The high degree of acoustical correction is readily seen in the adjoining table which summarized NRC values.

Sound absorption

	FREQUENCIES						
DECK	125	250	500	1000	2000	4000	NRC
	COEFFICIENTS						
ADC-1.5	.24	.45	.65	.93	.75	.52	.70
ADC-3.0	.62	.61	.82	.83	.66	.60	.75
ADC-4.5	.37	.79	.98	.81	.70	.50	.80
ADC-6.0	.63	.94	.93	.74	.70	.48	.85
ADC-7.5	.67	1.09	.87	.67	.70	.47	.85

All of the above data, with exception of ADC-60, is from actual tests conducted at recognized acoustical laboratories following the provisions of ASTM C423-66 and using a number 4 mounting. All tests were conducted using the standard perforation pattern for ADC and standard thermally molded arched glass fiber insulation pads. Should values in excess of those shown be required, changes in the depth and density of the insulation can be made. Values for ADC-60 have been interpolated.

Sound transmission

The transmission of sound from one room to another can readily occur when partitions stop at the underside of a ceiling. Sound waves can enter the plenum and be transmitted to adjoining areas unless properly blocked.

In a suspended acoustical ceiling, it is generally costly and difficult to effect a sound barrier in the plenum above partitions. However, this is readily handled within the confines of the cells of Long Span units.

Directly over non-load-bearing partitions, sound barriers of formed glass fiber are inserted in the deck cells. Above load bearing partitions, specially formed glass fiber cells closures are inserted in the deck ends. Sound transmission from room to room is reduced to a level equal to or less than that of the walls.

Robertson Roofs

ENGINEERING DATA - AIR DIFFUSION

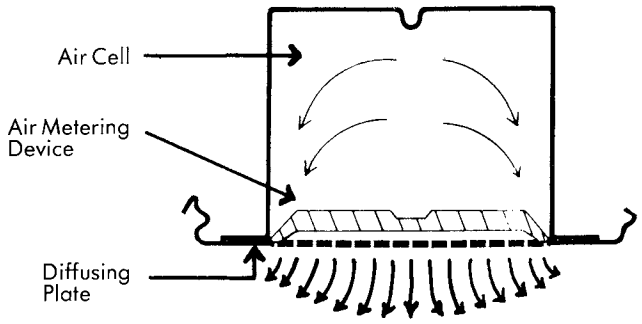
ADC Deck provides concealed delivery of conditioned air

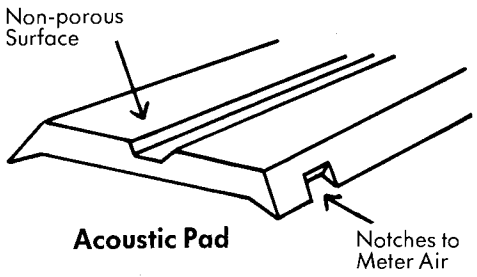
One additional function that can be obtained from the cellular floor or roof section is the transfer and diffusion of conditioned air into an interior space. The large cross section of the deck affords a generous "air duct," and the perforations provide the diffusing medium. The result is an air delivery method that eliminates branch duct work, and exposed grilles and provides for a uniform delivery of air across the entire width of the room. No hot or cold spots — no uncomfortable or drafty location. Utilizing the structural decking also reduces site assembly and connections and makes the "system" truly functional in nature.

ADC Deck as an Air Ceiling is simply a pressurized plenum that diffuses cool or warm air into a space spanned by the deck assembly above. The specially notched and coated acoustic pad is the "metering device" that transfers air from the upper distributing chamber into the lower diffusing chamber. The static pressure of the mechanical system, the notch pattern and the continuous perforation pattern in the ceiling plate combine to deliver air to the space below in a most uniform fashion the entire span length. Cooling or heating loads for individual room requirements will determine the number of cells to be activated for air diffusion.

Air capacities are a direct function of the depth of the deck. Depth is usually governed by structural considerations. Adjustment of each deck gauges can also be helpful in providing an optimum of structural/air handling criteria.

Air capacities could have been calculated by standard ASHRAE formulae. However, because the air cell, metering device and perforations act in series, it was considered essential to run actual tests to check flow patterns, velocities and other aspects. Various lengths, different depths of deck, methods of air supply, location of closures and baffles were tested to arrive at the indicated design information summarized below.





AIR QUANTITY CAPACITIES

ADC DECK DEPTH	AREA OF EQUIVALENT ROUND	MAXIMUM CAPACITIES*
4.5"	5.5" (above metering pad)	100 cfm
6.0"	6.9" (above metering pad)	200 cfm
7.5"	8.0" (above metering pad)	320 cfm

Design Notes:

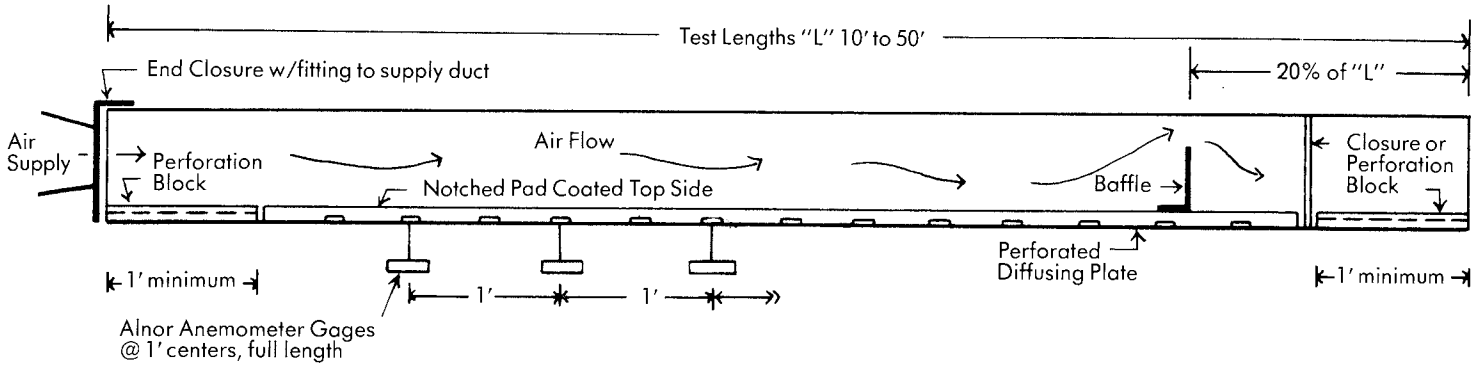
1. Flow Range — Maintain between 3 and 10 cfm/lineal foot.
2. Place perforation blocks or closures to keep air diffusion a minimum of 1' from any wall.
3. When used in ceiling/roof construction — insulate voids to each side of ADC Air Cell.
4. At the indicated capacities* there is no detectable sound level of inlet air or diffused air.

Robertson Roofs

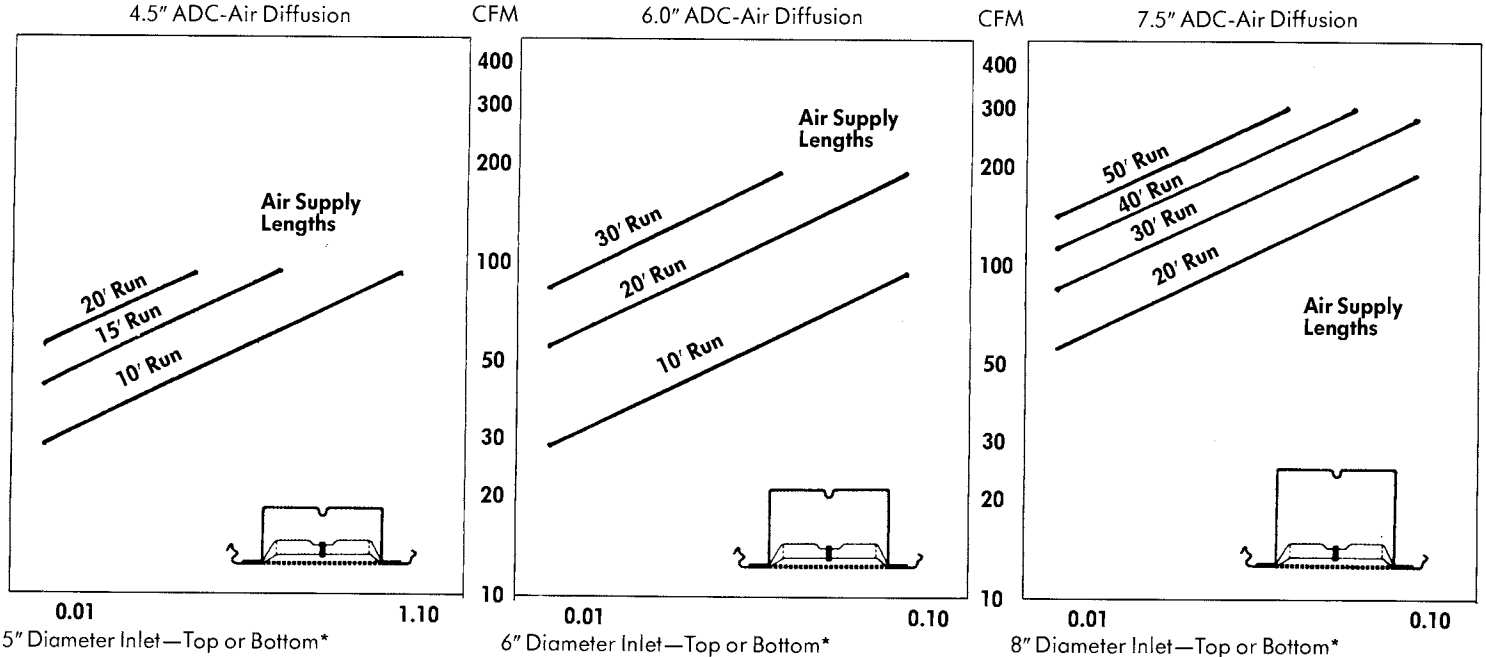
ENGINEERING DATA-
AIR DISTRIBUTION

Test procedures and design value

The schematic drawing below shows the basic test assembly. Alnor Thermal Anemometers spaced 1' along the air cells were the instrumentation. Velocity readings and variations were taken as a direct measure of volume delivery. The total volume variation at 3 cfm per lineal foot, measured +1.5% to −2% along the length. At 10 cfm per lineal foot, volume variation measured +9.0% to −6.0% along the length. The most efficient location of the baffle detail was found to be constant for all lengths of air cell, at a position equal to 20% of the total length mesured from the end opposite the delivery.



Friction loss charts—Required inlet static pressure, inches water.



5" Diameter Inlet—Top or Bottom*

6" Diameter Inlet—Top or Bottom*

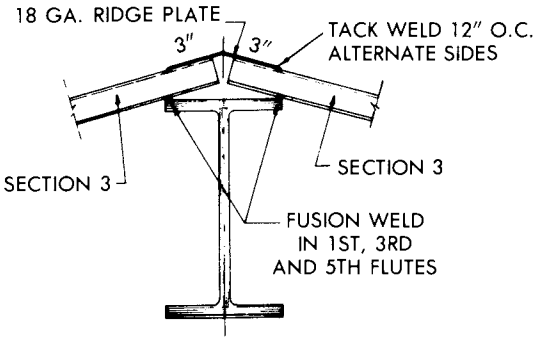
8" Diameter Inlet—Top or Bottom*

*Static pressure required for air supply through an end inlet is less than for a top or bottom inlet. Use equivalent rectangular area for size of end inlet fitting.

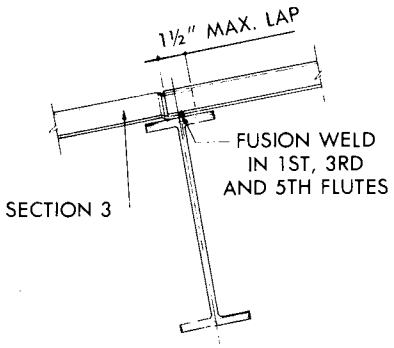
Robertson Roofs

TYPICAL DETAILS - STRUCTURAL

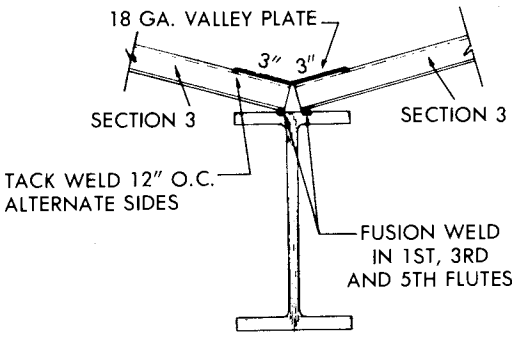
Sections 3, 21 and 12



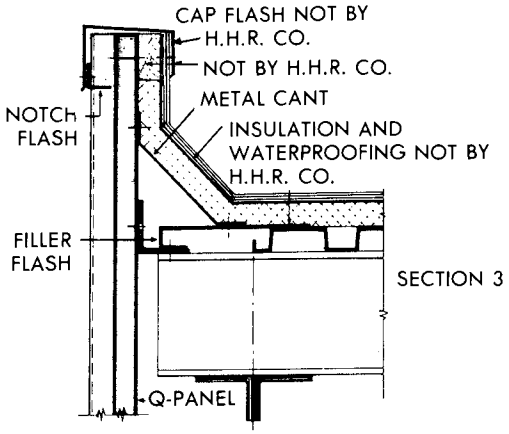
RIDGE DETAIL—ROOF



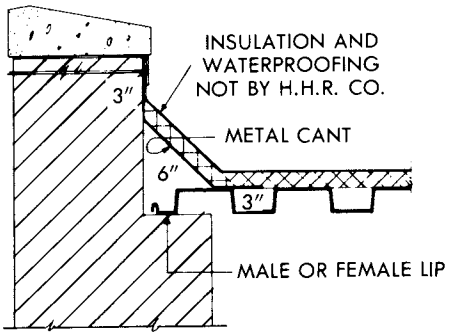
TYPICAL END JOINT DETAIL SHOWING LAP OVER ROOF PURLIN



VALLEY DETAIL—ROOF



ROOF CELLS PARALLEL TO PARAPET WALL (Q-PANEL)

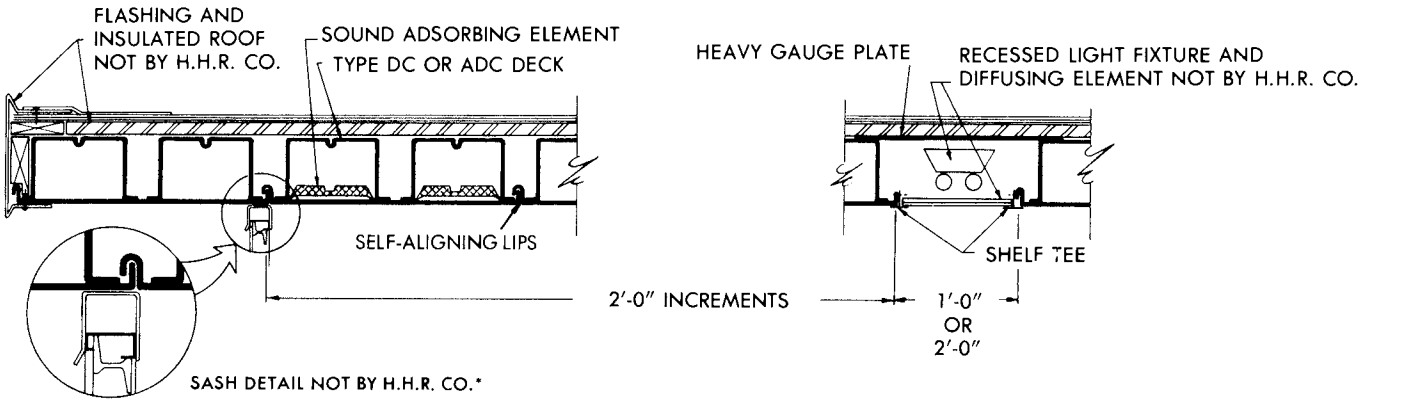


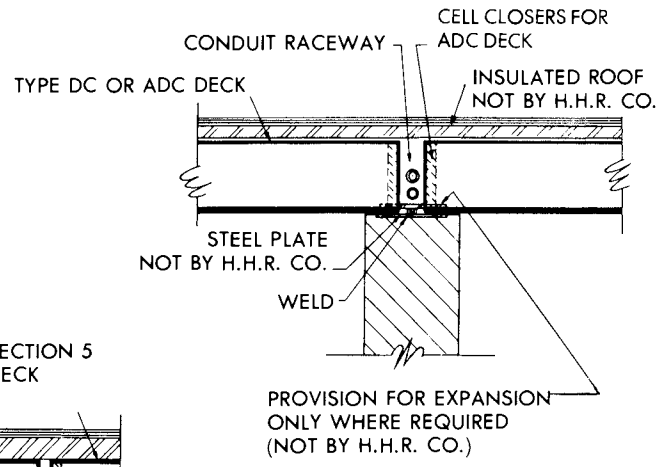
ROOF CELLS PARALLEL TO PARAPET WALL (MASONRY)

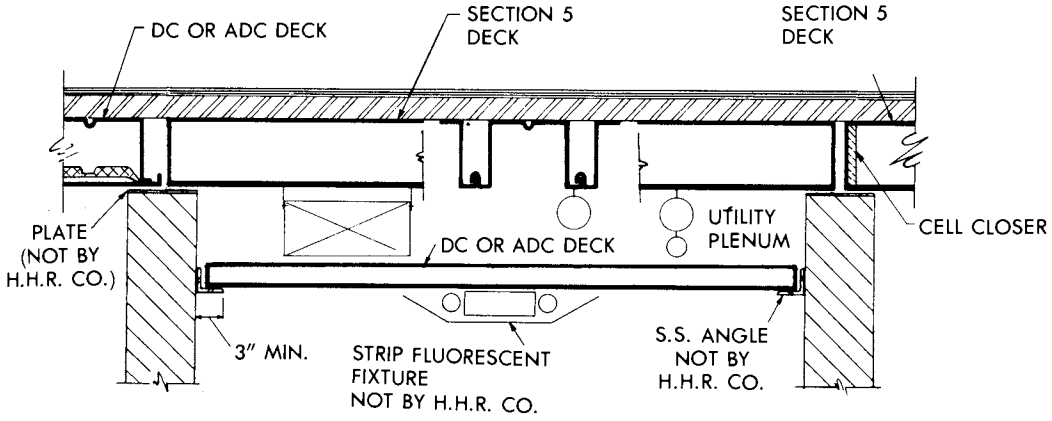
Robertson Roofs

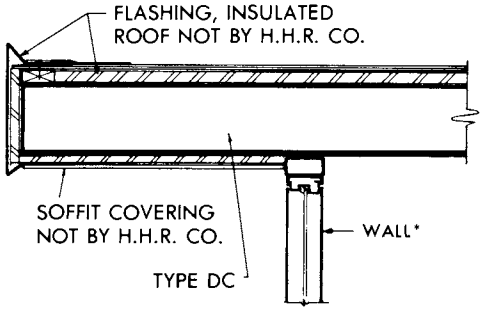
TYPICAL DETAILS - STRUCTURAL

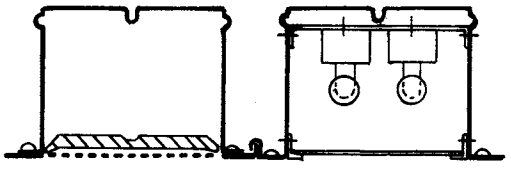
DC/ADC DECK









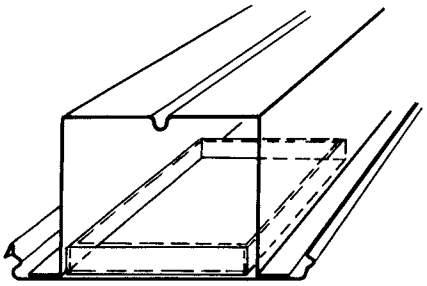


Robertson single unit (#5) is inserted in deck construction where simple installation of recessed lighting is desired.

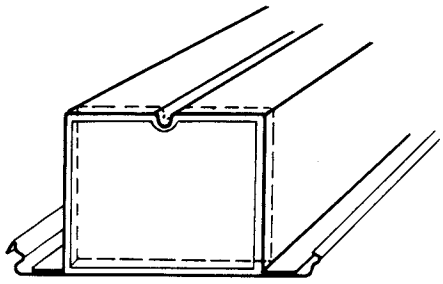
***Designer should consider deck deflection & its influence on this detail.**

TYPICAL DETAILS - STRUCTURAL

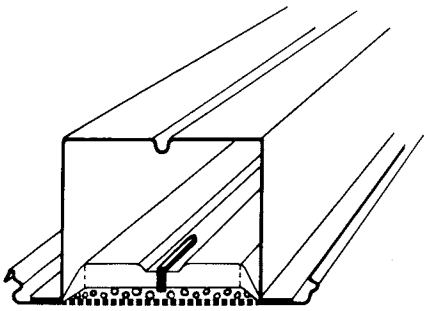
ADC AIR CEILING

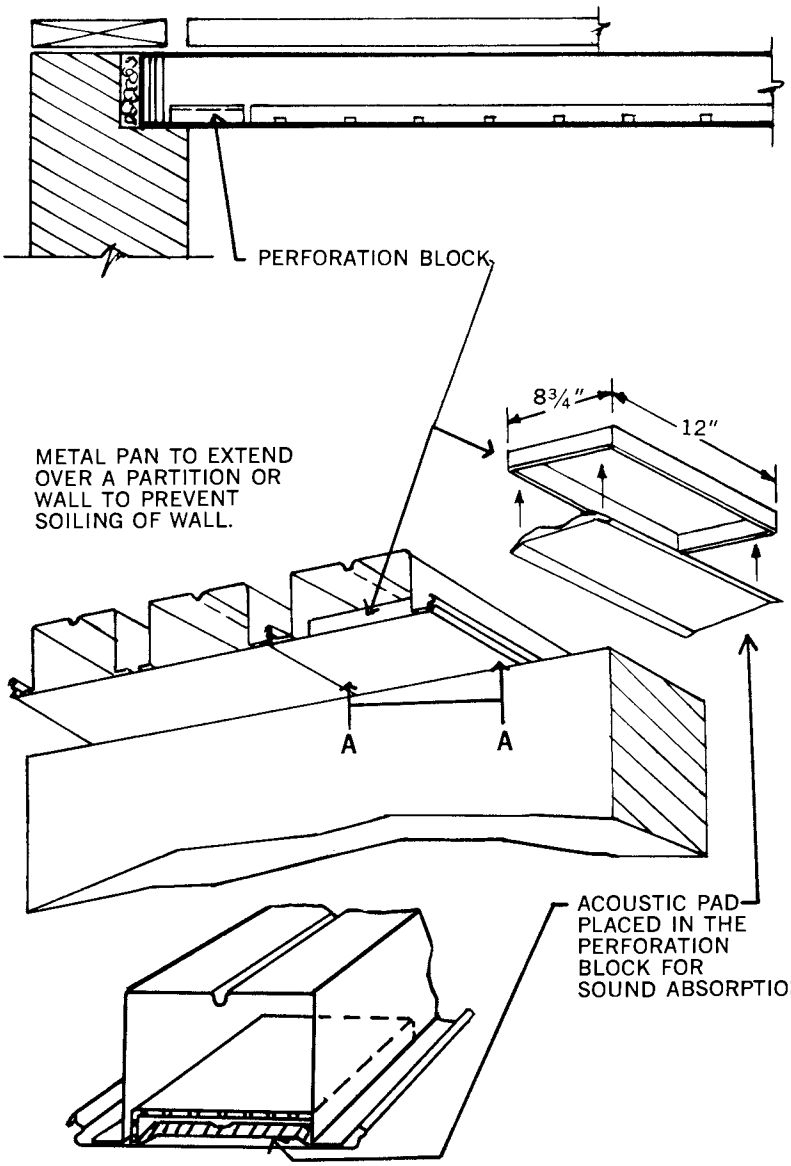


PERFORATION-BLOCK



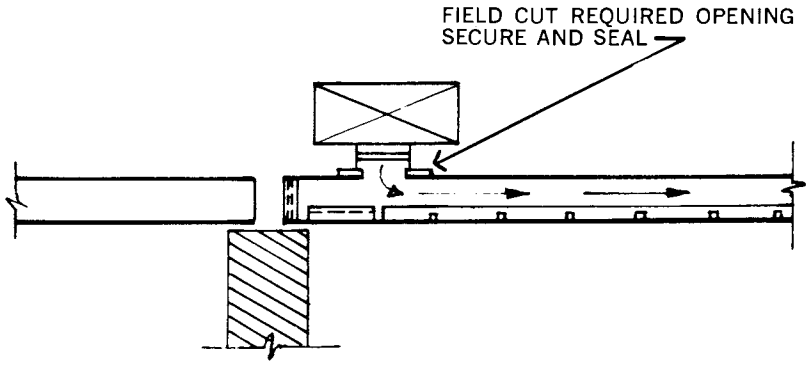
END CLOSURE





SECTION A-A

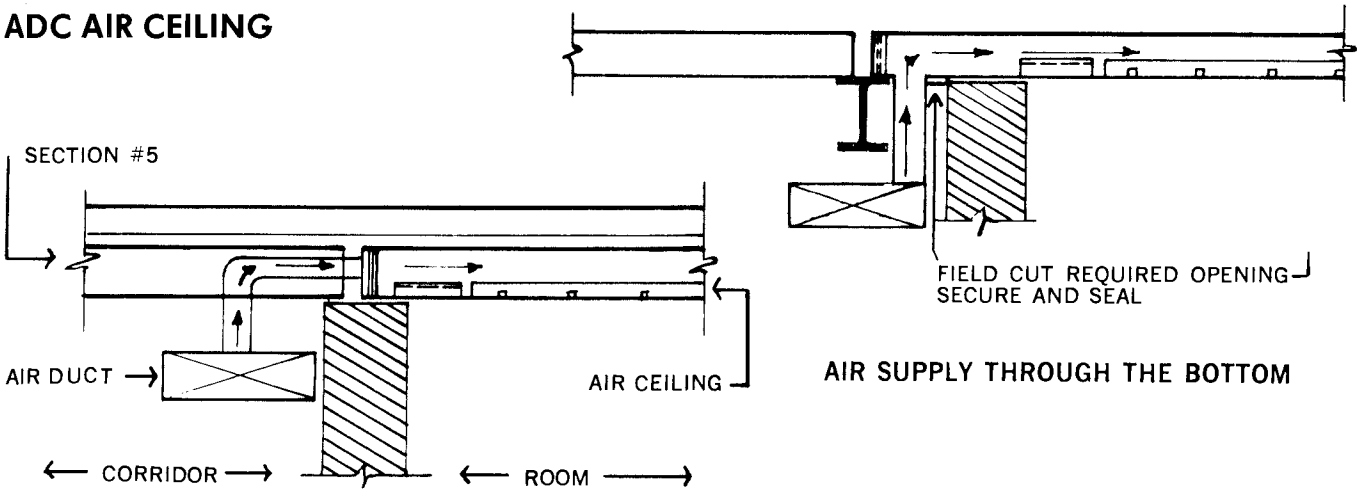
PAD AND PERFORATION-BLOCK



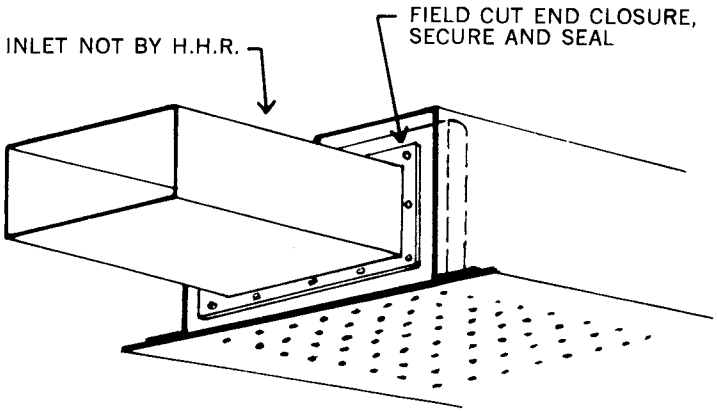
AIR SUPPLY THROUGH THE TOP

TYPICAL DETAILS - STRUCTURAL

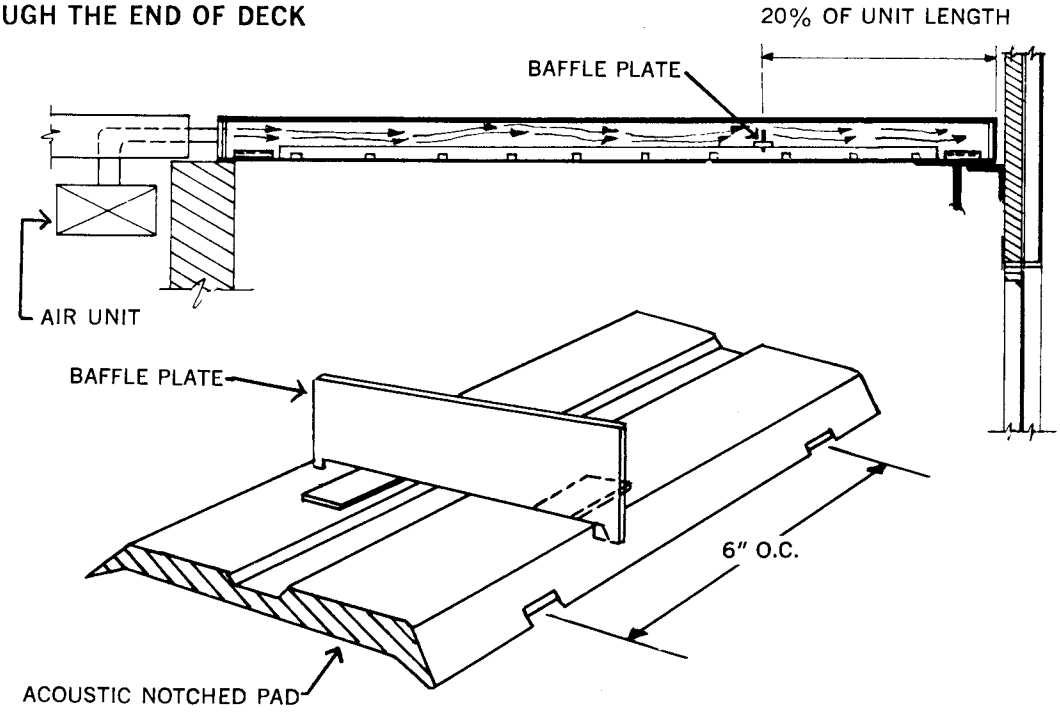
ADC AIR CEILING



AIR SUPPLY THROTUGH THE BOTTOM



AIR SUPPLY THROUGH THE END OF DECK



BAFFLE PLATE

Robertson Roofs

SPECIFICATIONS

UCI SECTION 05310
METAL ROOF DECK
ROBERTSON SECTIONS 3, 21 and 12

PART 1—GENERAL

1.01 DESCRIPTION:

Provide all structural metal roof decking and sheet metal accessories specified in this section.

1.02 SHOP DRAWINGS:

The metal roof deck sub-contractor shall prepare and submit to the general contractor for approval by designer and contractor, erection/shop drawings which show the type of deck and gauge of steel being supplied, where it is to be located, necessary field fabrication, erection sequence and detail interface of deck with adjacent materials. These drawings shall also call or show all flashing which is to be supplied by the metal roof deck contractor. Drawings shall be submitted in _____ sets of prints for approval; after approval _____ sets shall be supplied for files and distribution.

PART 2—PRODUCTS

2.01 MATERIALS:

The steel deck and all flashing shall be formed from steel sheets, conforming to ASTM 446-76. The steel shall have received before being formed, a metal protective coating of zinc conforming to ASTM-A525-79 Class G-30 and to Federal Specifications QQ-S-775E.

2.02 DESIGN:

a. The American Iron and Steel Institute's latest "Specification for the Design of cold formed steel Structural Members" shall govern the design of all roof deck units. The deck units shall be provided with an interlocking side lap. [Ends of deck units shall be countersunk to provide a smooth top surface at overlapping ends (except 14 and 12 ga.).] Roof deck units shall be in lengths to span over three or more supports wherever possible.

b. Section #3 — Material shall be roll formed in sections 24" wide with custom cut lengths up to 40'. The units shall have four flutes 6" on center. The deck units shall be fabricated from (22—12 gauge, choose one) steel and be capable of supporting a live load of _____ psf, a dead load of _____ psf and maintaining a deflection of less than _____ (L/240 or L/360).

c. Section #21 — Material shall be roll formed in sections 24" wide with custom cut lengths up to 40'. The units shall have three flutes 8" on center. The deck units shall be fabricated from (22—12 gauge, choose one) steel and be capable of supporting a live load of _____ psf, a dead load of _____ psf and maintaining a deflection of less than _____ (L/240 or L/360.

d. Section #12 — Material shall be roll formed in sections 12" wide with custom cut lengths up to 40'. The units shall have two flutes 6" on center. The deck units shall be fabricated from (20 — 12 gauge, choose one) steel and be capable of supporting a live load of _____ psf, a dead load of _____ psf and maintaining a deflection of less than _____ (L/240 or L/360).

2.03 ACCESSORIES:

a. Ridge and valley plates, metal cant strips and metal sump pans, which must be attached directly to the steel decks in order to provide a finished surface for the application of insulation and roofing, shall be furnished by the deck manufacturer.

b. When decks rest on masonry walls or steel beams, over a partition or at an exterior wall, the hollow spaces between webs of the deck shall be closed with a pressed metal closure or die-cut neoprene filler where indicated on drawings. Closure or fillers shall be fastened to webs by means of sheet metal screws, welding or adhesive for neoprene fillers.

PART 3—EXECUTION

3.01 ERECTION

a. Section 3 — Roof deck sheets shall be fastened to the supporting roof steel by 3/4" diameter fusion welds as follows:
   1. At outside edges of deck area, fasten in 1st, 3rd and 5th low corrugations. Fasten parallel edge 3' on center.
   2. At joints, fasten in 1st, 3rd and 5th low corrugations.
   3. At intermediate supports, fasten in 2nd and 4th low corrugations if span is greater than 4'-0".
   4. For spans of 4'-0" or less, fasten in one low cell at each intermediate support. Use the 2nd and 4th low cells alternately.
   5. Fasten side joints by:
      a. Clinch side joints at 3'-0" centers for units 16 gauge and lighter.
      b. One inch welds at 3'-0" on centers between supports for 12 and 14 gauge units.

b. Section 21 — Roof deck sheets shall be fastened to the supporting roof steel by 3/4" diameter fusion welds as follows:
   1. At outside edges of deck area, fasten in 1st, 2nd and 4th low corrugations. Fasten parallel edge 3' on center.
   2. At joints, fasten in 1st, 2nd and 4th low corrugations.

(CONTINUED)

SPECIFICATIONS

ROBERTSON SECTIONS 3, 21 and 12

3. At intermediate supports, fasten in 1st and 3rd low corrugations.
4. Fasten side joints by:
   a. Clinch side joints at 3'-0" centers for units 16 gauge and lighter.
   b. One inch welds at 3'-0" on centers between supports for 12 and 14 gauge units.

c. Erection for Section 12 Deck-Roof deck sheets shall be fastened to the supporting roof steel by 3/4" diameter fusion welds as follows:
   1. Fasten units at each support locating one weld along side the female lip and one at the middle low corrugation.
   2. Fasten side joints by:
      a. Clinch side joints at 3'-0" maximum between centers for units 16 gauge and lighter.
      b. One inch welds at 3'-0" on centers between supports for 12 and 14 gauge units.

d. Cutting and flashing of openings other than framed openings shown on the structural drawings shall be framed, cut and flashed by others.

e. Erection will comply with manufacturer's standards and with specific requirements of the approved metal roof deck shop drawings. All accessories specified of those drawings to be supplied by deck supplier will be erected by metal roof deck erector.

f. Damage to steel deck profiles during the construction phase can significantly reduce their load carrying capacity. Deck erectors should exercise appropriate care to insure that any damaged deck is suitably strengthened or replaced.

Robertson Roofs

SPECIFICATIONS

UCI SECTION 05310
METAL ROOF DECK
ROBERTSON SECTIONS DC-ADC, AIR CEILING AND SECTION #5

PART 1—GENERAL

1.01 DESCRIPTION

Provide all structural metal roof decking and sheet metal accessories specified in this section.

1.02 SHOP DRAWINGS

The metal roof deck sub-contractor shall prepare and submit to the general contractor for approval by designer and contractor, erection/shop drawings which show the type of deck and gauge of steel being supplied, where it is to be located, necessary field fabrication, erection sequence and detail interface of deck with adjacent materials. These drawings shall also call or show all flashing which is to be supplied by the metal roof deck contractor. Drawings shall be submitted in _____ sets of prints for approval; after approval _____ sets shall be supplied for files and distribution.

PART 2—PRODUCTS

2.01 MATERIAL:

All of the deck units and associated flashing shall be fabricated from steel sheets conforming to ASTM-A446-76. The sheet shall have received a zinc coating conforming to ASTM-A525-79, Class A40.

2.02 DESIGN:

a. The American Iron and Steel Institute's latest "Specification for the design of cold formed steel structural members" shall govern the design of all roof deck units.

b. Type DC or ADC Roof Deck shall be composed of two identically formed beam sections with an integral stiffening rib rolled into the top flange af each section, and a flat plate. The flat plate shall have formed male and female self aligning side joints on opposite edges. These side joints shall be male-female type with continuous locking beads to insure positive vertical and lateral alignment of adjacent sections. The flat plate and the beam sections shall be assembled by electrical resistance spot welding to provide a structural cellular-beam unit. The flat plate for ADC Deck shall be perforated with 1/8" holes staggered 25/64" o.c. in two continuous paths 9" wide. The deck units shall be 24" in width and 1½", 3", 4½", 6" or 7½" in depth, designated as 1.5, 3.0, 4.5, 6.0 and 7.5. The following nomenclature should be used — type — depth — hat gauge/plate gauge — example: ADC-7.5 — 18/16.

c. Type "ADC Air Ceiling" deck shall be of identical construction as described for ADC deck except units shall be one single beam section mounted on a 12" width plate. Perforation pattern shall be such to permit the diffusion of air quantities as shown on mechanical drawing for specific areas. The type designation for these units shall be ADC "Air".

d. Stucco embossed steel shall be used for the flat plate sections of all DC-ADC units. This shall be accomplished in embossing rolls, prior to forming the side laps, to remove rolling stresses, camber and to insure flatness of the sheet when assembled. Samples of the embossed pattern shall be approved by the architect prior to bid date, as part of a total deck assembly.

e. After perforating and forming the side edges, the flat plate shall be degreased, steam cleaned and hot phosphate treated. The underside of the flat plate shall then receive a shop applied, oven cured prime coating compatible with standard field applied finish enamels.

f. The sound absorbing elements in ADC deck shall be self-supporting, arch shaped, pressure and thermally-molded fiberglass pads which provide an air space of ½" between the perforated steel plate and pad. Metal chair supports are nat permissible. The Noise Reduction Coefficient of the complete assembly shall be as determined by standard tests conducted by recognized acoustical laboratories.

The sound absorbing elements in the ADC Air Ceiling units shall be as described above, except shall be notched along edge supports to permit the flow of pressurized air from chamber above the pad to the perforated plate. Notch pattern shall be of such dimension to provide the air quantities specified or shown on mechanical drawings. The top side of all arched pads in the ADC Air Ceiling units shall be coated with neoprene, foil or other material to prevent air passage through the pad itself.

g. Section #5 deck element shall consist of a single flute beam section 12" in width, with an integral stiffening rib rolled into the top flange. Bottom flanges shall have formed male and female side joints on opposite edges. Depth shall be 3", 4½", 6" or 7½", designated as 3.0, 4.5, 6.0 and 7.5. The following nomenclature should be used: Section #5 (depth) (gauge). Example: Section #5, 4.5-18.

2.03 ACCESSORIES:

a. Ridge and valley plates and metal cant strips, and metal sump pans which must be attached directly to the steel decks in order to provide a finished surface for the application of insulation and roofing shall be furnished by the deck manufacturer.

b. Cell end sound barrier closures of pressure and thermally-molded fiberglass shall be furnished by manufacturer wherever air-borne sound transmission can occur over walls and through deck cells at butt joint conditions. Closures shall be formed to cell profile to insure tight fit.

Where deck units are continuous over partition walls, sound barriers of 3"-thick, dimensionally oversize, laminar fiberglass shall be furnished for installation by the erector.

c. Provide necessary sheet metal closure accessories for "ADC Air Ceiling." These accessories to be installed by the sheet metal or mechanical contractor.

d. Provide glass fiber and metal closures, baffles and perforation blocks as shown on drawings to provide for air

delivery through the ADC deck unit.

e. Recessed lighting troffers shall be located and erected as indicated on the contract drawings.

DC or ADC units adjacent to recessed lighting troffer opening shall be increased to gauges indicated on drawings to support the additional load.

Shelf tees required to support diffusers for troffer lighting shall be furnished by the deck manufacturer and installed as specified under "Carpentry" section of specifications.

PART 3—EXECUTION

3.01 ERECTION:

Erection shall be by manufacturer or his qualified erector with proven experience and competence. Inaccuracies in alignment or level of bearing plates and structural supports shall be brought to the attention of proper parties and corrected by others before placement of deck. Proper bearing shall be provided at supporting members.

Units shall be attached to steel supports with three ½" fillet welds per unit end. All welding shall be electric arc welding performed by competent welders. Side joint welding, when necessary due to heavy gauge deck or diaphragm shear requirements, should be carefully made in the upper region of the side lap to minimize damage to underside coating below the weld area. All welds upon cooling shall be given a touch-up coat of paint top side only. Self-aligning side joints shall be integrated by button punching on 3' centers.

All holes or openings shall be cut and reinforced as shown in manufacturer's layout drawings.

3.02 WORK NOT INCLUDED:

a. Painting — The touch-up of scuffs and abrasions due to transit or erection, the touch-up of charred points on the underside of the sidelap weld areas, as well as the field paint to the exposed surface of the galvanized steel deck shall be under the general painting specifications.

For those deck manufacturers who do not conform to the preparation and primer processes described by para. 2.01 Material, this contractor shall clean down the exposed flat surfaces, field prime with a suitable primer for galvanized metal and then apply the specified number of finished coats.

b. Steel Framing—All structural steel and structural steel attachments required to support the deck shall be furnished by the steel contractor. All steel framing shall be erected in conformance with tolerances set forth in AISC Standard Code of Practice.

c. Built-up Roofing—Insulation—(24" Type DC (ADC) flat plate down)—Insulation shall be rigid type roof insulation _____ thick (minimum thickness and application based on roofer's standard recommendations) to span the 3" opening.

d. Openings (not covered under Design)
Electrical—plumbing—heating—ventilating.
(1) All trades whose work involves the cutting of holes, reinforcing or drilling the deck shall furnish all work and labor necessary and at the cost of that trade whose work is affected. All such work shall be done in a neat, workman-like manner, without adversely affecting the structural value of the deck or finished appearance of exposed surfaces.
(2) At the option of the various sub-contractors whose work involves the cutting of holes, reinforcing or drilling the deck, the deck contractor shall furnish all work and labor necessary only during the time of his work at the job site, at the cost to the sub-contractor whose work is affected and at prices to be agreed upon by both parties.

e. Electrical Work—The electrical contractor shall inspect all light troffer installations to assure that the opening width and height dimensions are acceptable for fixture installation and diffuser attachment.

f. Mechanical Work—When the ADC Air Ceiling units are to be used for air conditioning the mechanical contractor shall include all necessary cutting preparation and attachment of ducts to air cells and coordinate them with the AC system.

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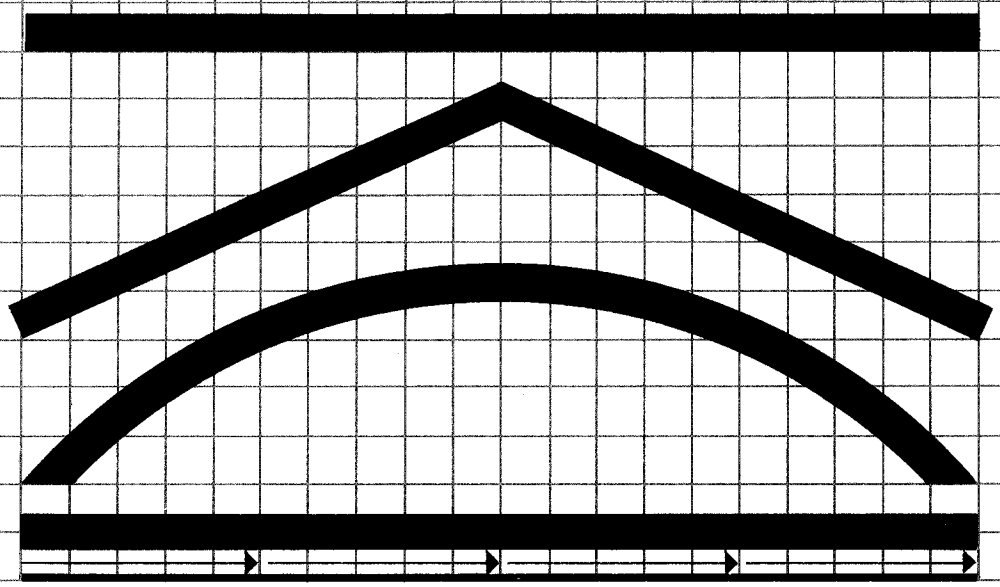

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