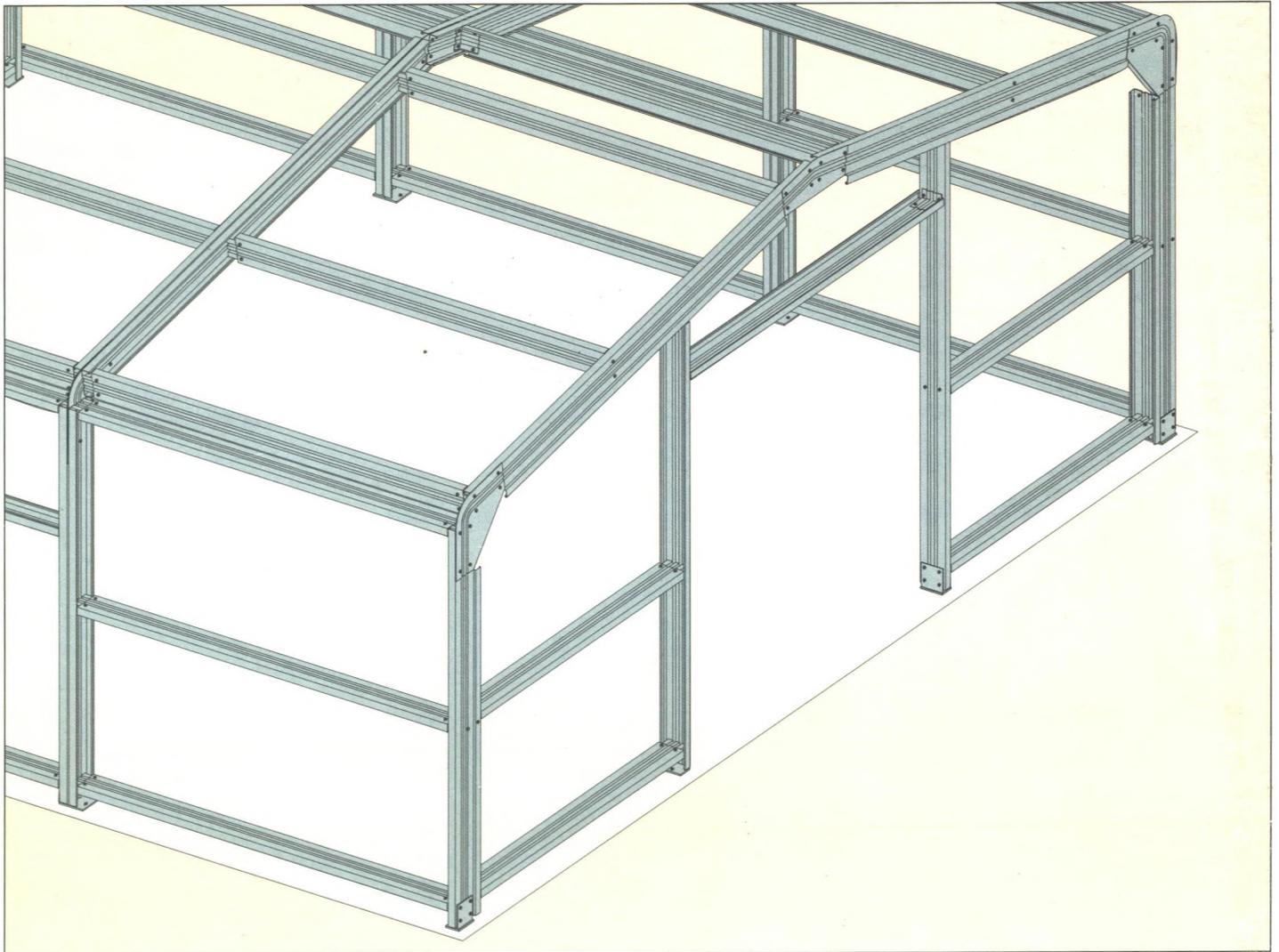


C/SfB (4) Nh2
April 1997

SWAGEBEAM BUILDINGS



Designed to suit your needs



Ayrshire Metal Products are Britain's leading manufacturer of cold rolled steel profiles.

The award winning Swagebeam Building System is a revolutionary concept in frame design, which offers Architects, Builders and Developers the opportunity to create attractive, versatile and cost effective structures.

Swagebeam's unique design makes it the perfect choice for many applications, including industrial units, workshops, clubhouses and agricultural buildings.

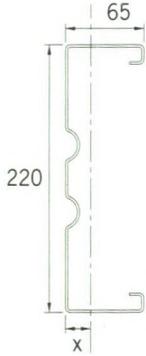
Ayrshire's comprehensive design service ensures that every building is designed to meet individual requirements. Our technical expertise is always at your service, at every stage of design and construction. For quality, consistency, economy and complete satisfaction you can rely on Ayrshire. More support, More reassurance, More flexibility.

220 System

Swagebeam as a Building System

The Swagebeam section is a 'C' section with stiffeners rolled into the web. The beams are used back-to-back as 'I' sections to form the columns and rafters of the main frames, and are connected with double eaves and ridge brackets. Single 'C' sections are used for the purlins and rails, which are fixed to the main frames with standard pressed cleats. Two systems are available using either a 220 or 300mm deep profile. The frames can be very simply secured to the top of a slab using expanding type anchor bolts. Three roof pitches are available as a standard (5,10 & 15 degrees).

Section Properties:



	Single			Back-to-Back		
	1.50	2.00	2.40	1.50	2.00	2.40
Thickness (mm)	1.50	2.00	2.40	1.50	2.00	2.40
Weight (kg/m)	4.59	6.09	7.32	9.18	12.18	14.64
Area (mm ²)	593	790	945	1186	1580	1890
I _{xx} (cm ⁴)	410.22	542.81	645.63	820.44	1085.62	1291.26
Z _{xx} (cm ³)	37.30	49.36	58.71	74.60	98.72	117.42
r _{xx} (mm)	83.17	82.89	82.66	83.17	82.89	82.66
I _{yy} (cm ⁴)	31.95	41.36	48.32	107.17	139.76	164.87
Z _{yy min} (cm ³)	6.97	9.01	10.51	16.49	21.50	25.36
r _{yy} (mm)	23.21	22.88	22.61	30.06	29.74	29.54
x (mm)	19.10	19.00	19.00	0.00	0.00	0.00
Mc (kNm)	9.30	14.12	17.96	18.60	28.24	35.92

Frame Performance

The diagram below gives an indication of 220 system frame spacing under typical loading. This is only indicative as factors such as cladding construction, wind loading and roof slope influence the design. Consultation with Ayrshire's Technical Services Department should be sought where necessary. The influencing factors have been averaged for the purpose of this diagram.

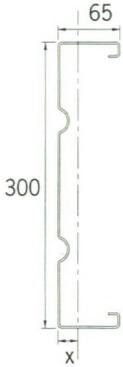
Eaves Height	Span							Frame Spacing (metres)
	5	6	7	8	9	10	11	
6	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.0
5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.0
4	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.0
3	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.0
2	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.0

The diagram is based on the following assumptions:

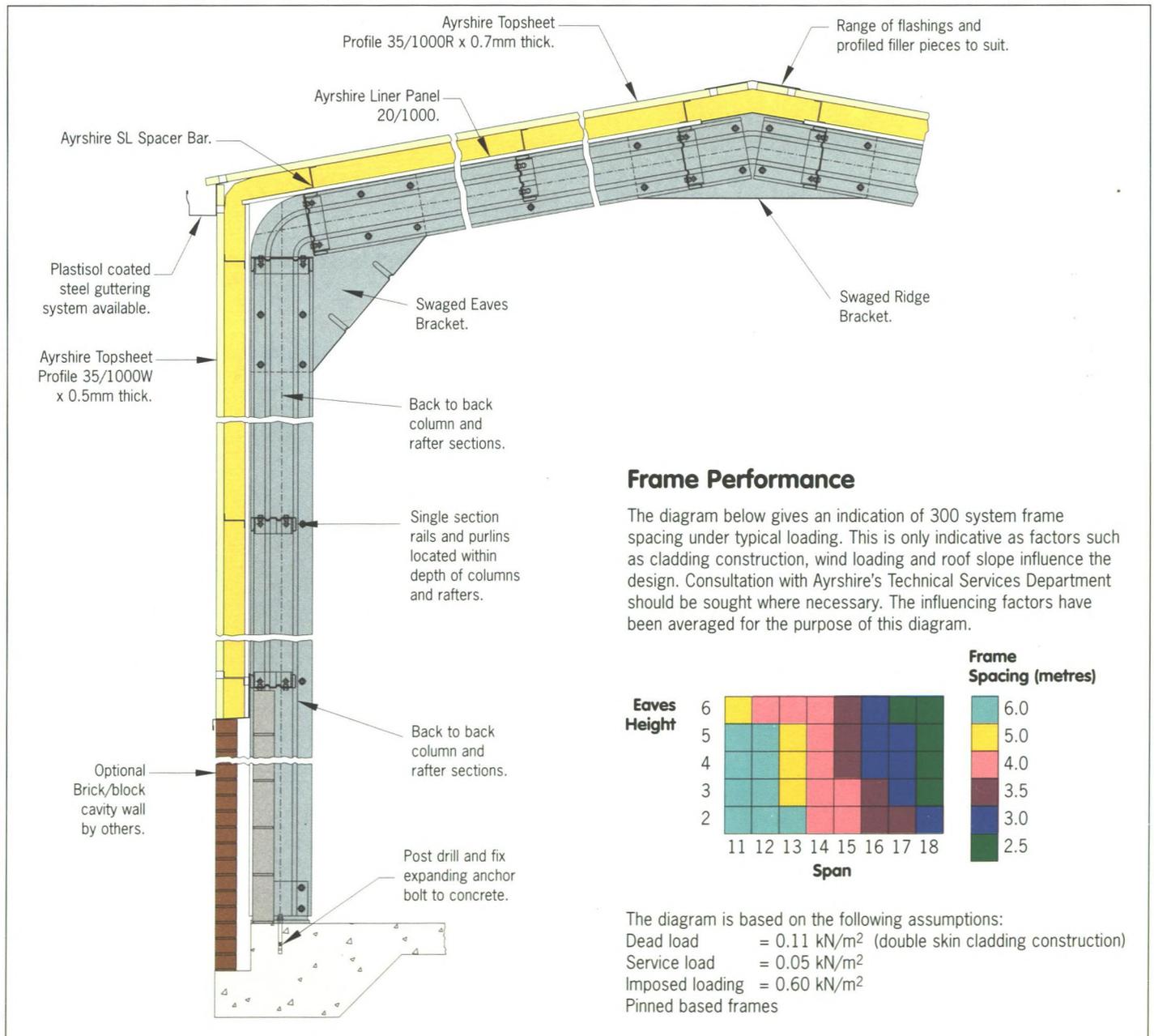
- Dead load = 0.11 kN/m² (double skin cladding construction)
- Service load = 0.05 kN/m²
- Imposed load = 0.60 kN/m²
- Pinned based frame

300 System

Section Properties:

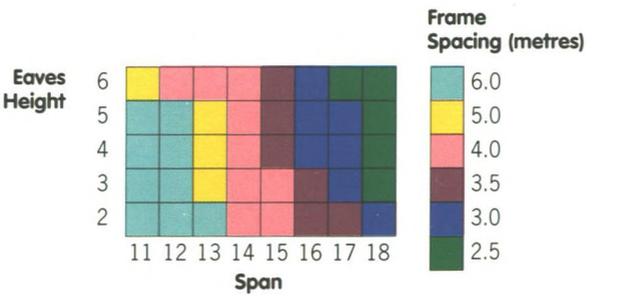


Thickness (mm)	Single				Back-to-Back			
	1.50	2.00	2.40	3.00	1.50	2.00	2.40	3.00
Weight (kg/m)	5.51	7.34	8.82	11.04	11.02	14.68	17.64	22.08
Area (mm ²)	709	946	1133	1408	1418	1892	2266	2816
Ixx (cm ⁴)	868.00	1150.79	1370.97	1691.19	1736.00	2301.58	2741.94	3382.38
Zxx (cm ³)	57.88	76.73	91.41	112.77	115.76	153.46	182.82	225.54
rxx (mm)	110.65	110.29	110.00	109.60	110.65	110.29	110.00	109.60
Iyy (cm ⁴)	35.23	45.61	53.30	63.92	107.22	140.26	164.61	199.03
Zyy min (cm ³)	7.21	9.33	10.89	13.04	16.50	21.58	25.32	30.62
ryy (mm)	22.29	21.96	21.69	21.31	27.50	27.23	26.95	26.59
x (mm)	16.10	16.10	16.10	15.90	0.00	0.00	0.00	0.00
Mc (kNm)	13.30	20.35	26.12	34.41	26.60	40.70	52.24	68.81



Frame Performance

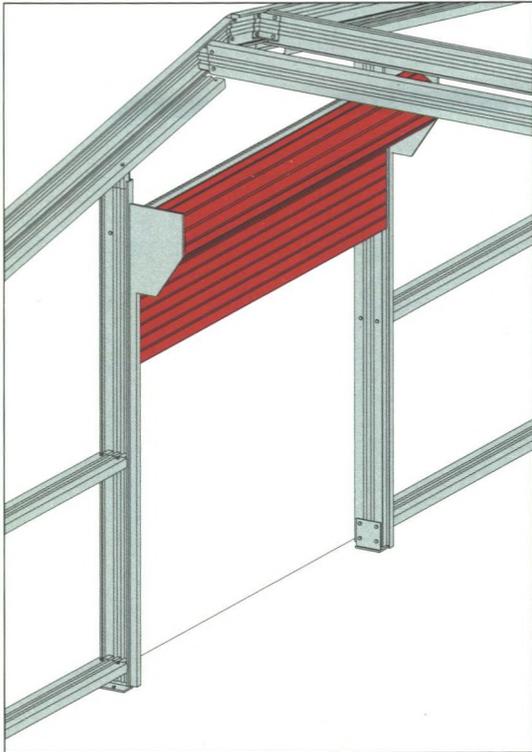
The diagram below gives an indication of 300 system frame spacing under typical loading. This is only indicative as factors such as cladding construction, wind loading and roof slope influence the design. Consultation with Ayrshire's Technical Services Department should be sought where necessary. The influencing factors have been averaged for the purpose of this diagram.



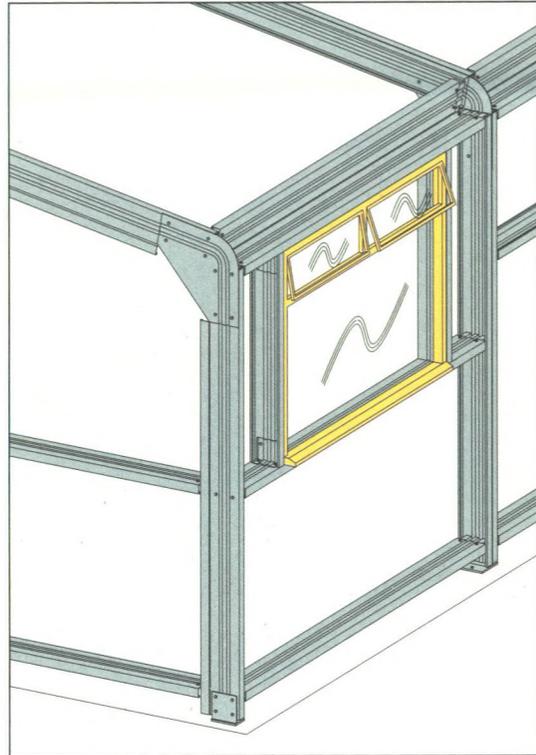
The diagram is based on the following assumptions:
 Dead load = 0.11 kN/m² (double skin cladding construction)
 Service load = 0.05 kN/m²
 Imposed loading = 0.60 kN/m²
 Pinned based frames

Door and Window Framing

Door and window openings can be easily accommodated within a Swagebeam frame by simply adding intermediate single Swagebeam posts and curtailing the side rails across the opening.



Typical Roller Shutter Door Installation



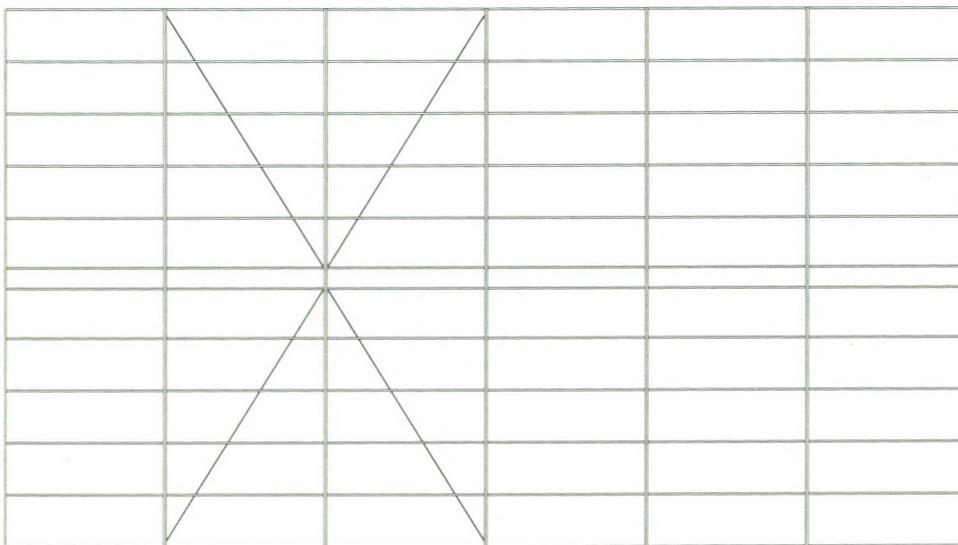
Typical Window Case Installation

Longitudinal Stability

Longitudinal stability is achieved by providing 'cross bracing' to the roof and side elevations. The diagram below gives an indication of our typical bracing arrangement.

Where profiled steel cladding is fixed directly to the structural steelwork, additional stability can be achieved through the effects of the stressed

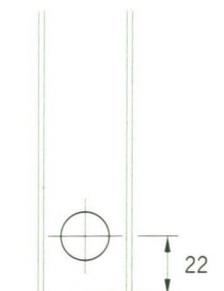
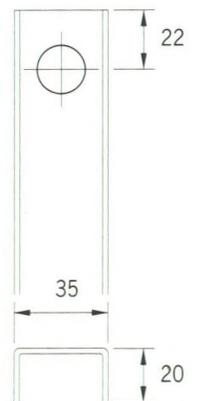
skin diaphragm action of the sheeting. Considerable in-plane stiffness occurs due to the sheeting acting as a deep plate girder, which in turn can significantly reduce frame deflections.



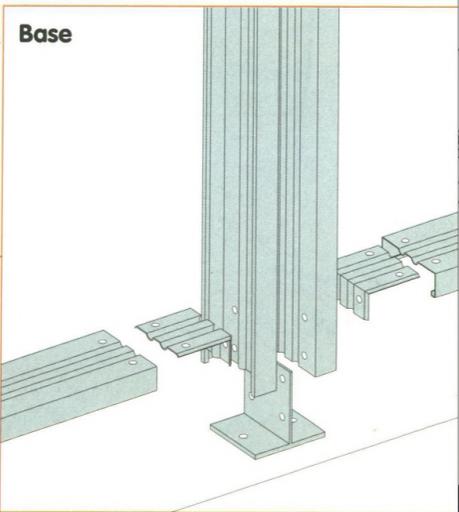
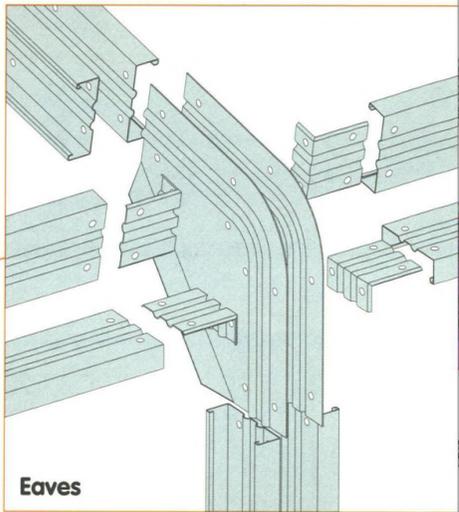
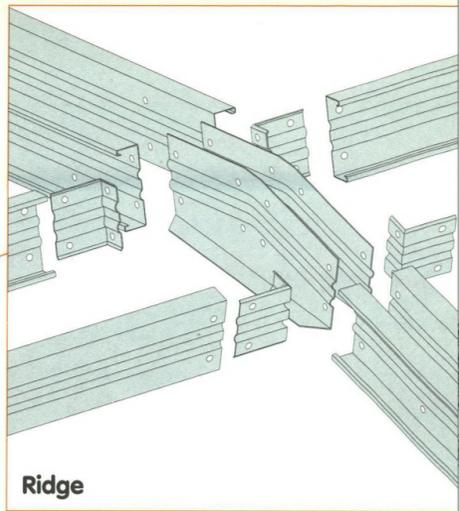
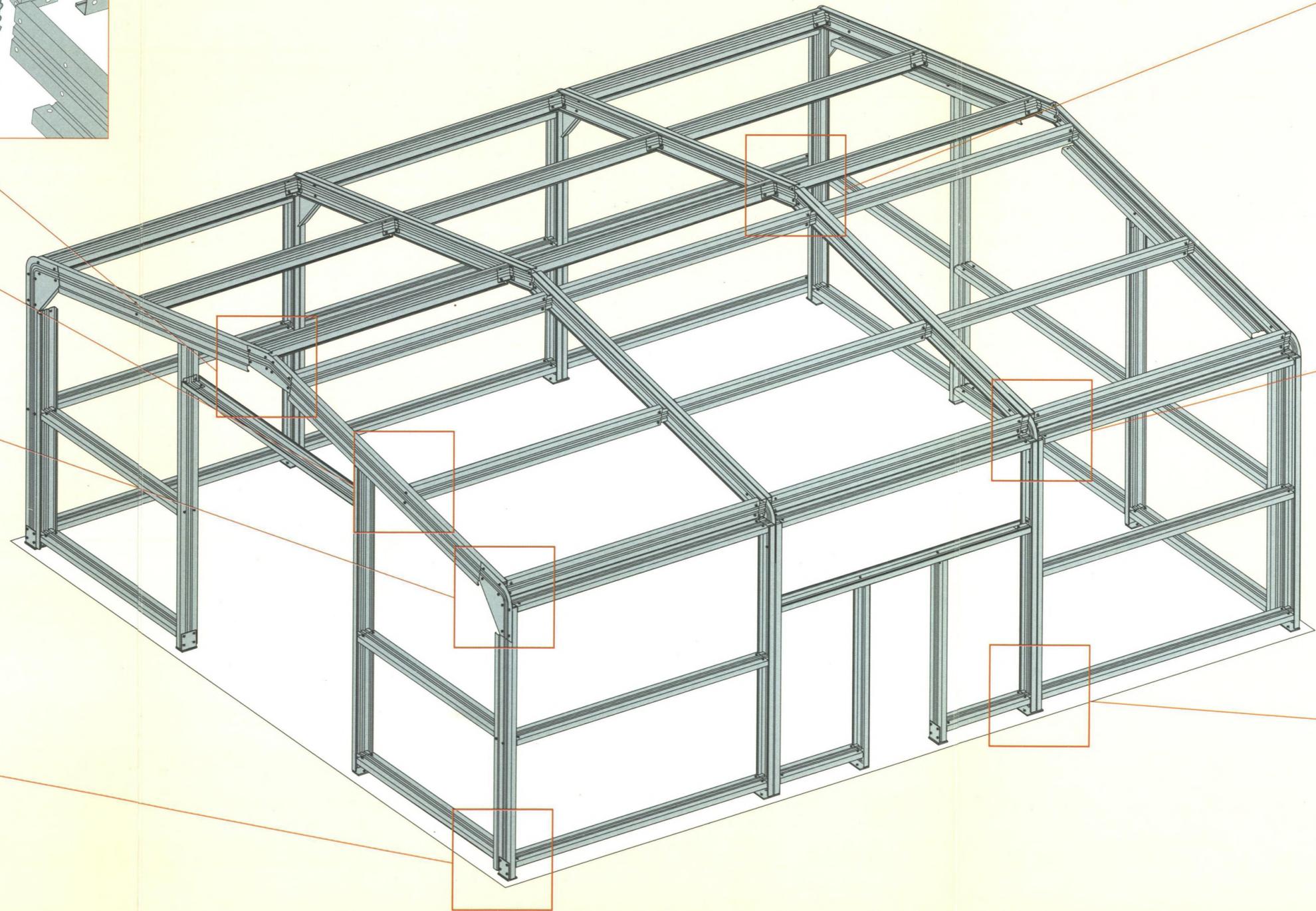
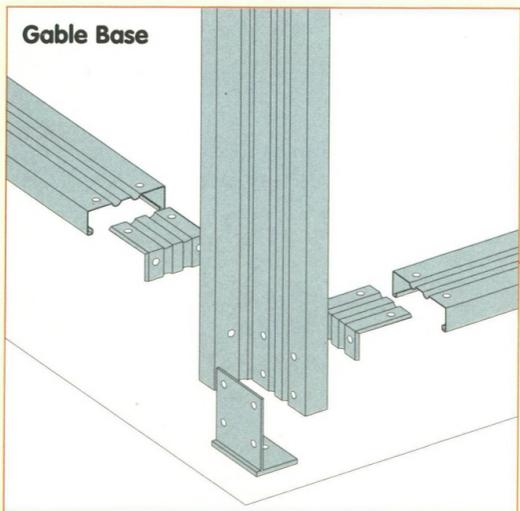
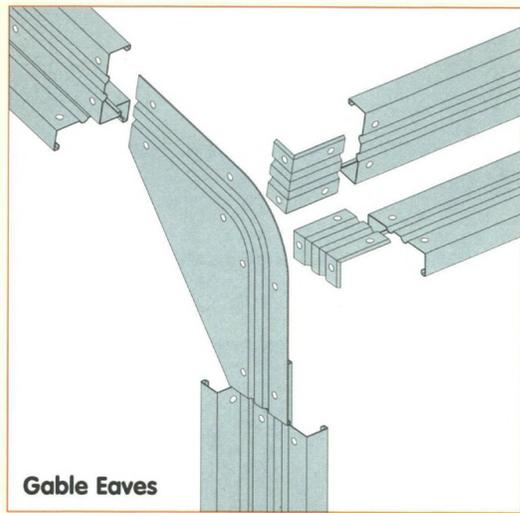
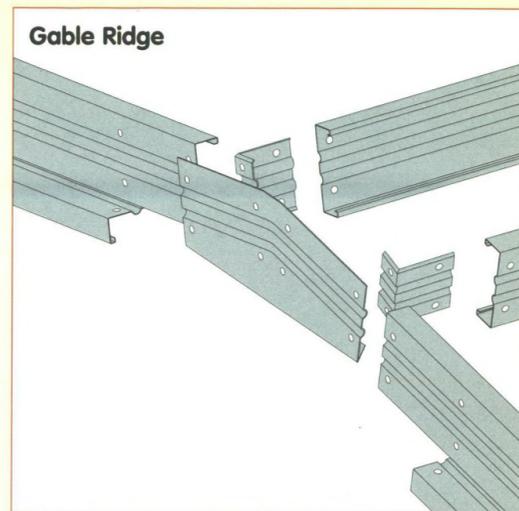
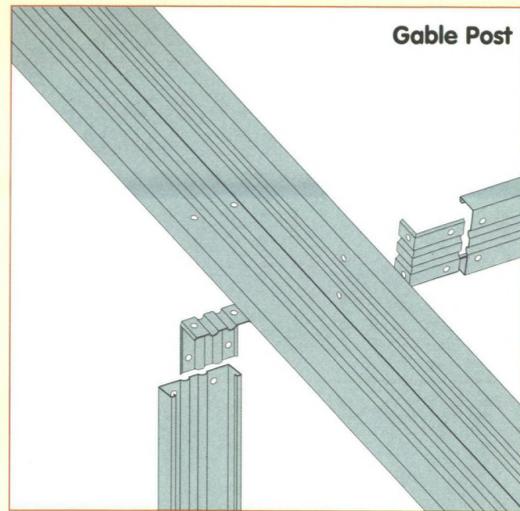
Roof Plan



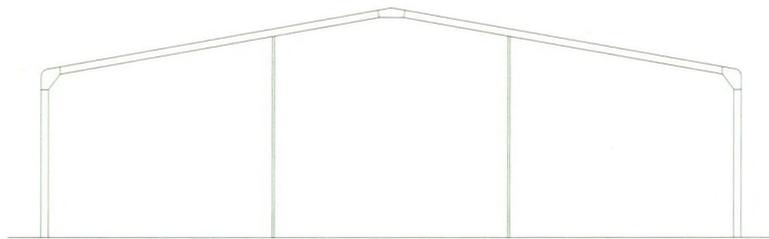
Elevation



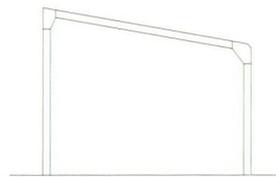
Bracing Section



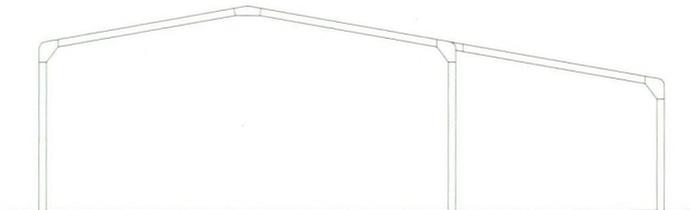
ALTERNATIVE APPLICATIONS



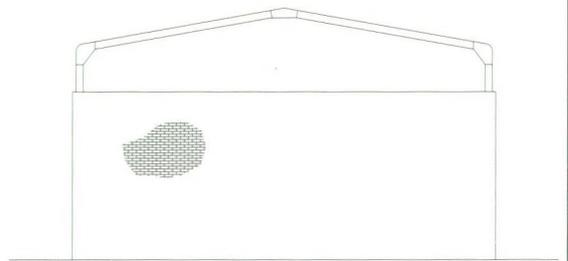
Propped Frames



Mono Pitches



Lean-to



Over-roof system

DESIGN

Steelwork- Complies with BS 5950: Part 5: 1987
Industrial Imposed Loading- Complies with BS 6399: Part 3: 1988
Wind Loading- Complies with CP3: Chapter V: Part 2: 1972
Boundary condition design is in accordance with the recommendations in the Steel Construction Institute's, "The Behaviour of Steel Portal Frames in Boundary Conditions".

Design assumptions were verified by full scale frame load tests carried out by the University of Salford, Department of Civil Engineering.

MATERIALS

Swagebeam section, brackets and cleats:
Pre-hot dipped galvanised mild steel strip to BS EN 10147,
Grade S280GD + Z275 zinc coated steel, having a guaranteed
minimum yield strength of 280 N/mm².
Baseplates:
Mild steel Grade HR4, BS 1449 and then hot dip galvanised to BS 729: 1971.

SITE STORAGE AND HANDLING

On delivery to site, handling and storage become the responsibility of the purchaser or their agent. Loading and off-loading by crane or fork-lift should be carried out with care to avoid damage to the materials. Do not off-load with chains, use soft slings only.

The materials should be stored on a firm, dry, even base protected from the weather, accidental damage, theft and moisture.

If indoor storage is not available, a temporary tarpaulin covered scaffold should be erected with sufficient space left around the materials to allow air to circulate. The materials should be laid at a slight fall, so that any moisture present can drain away. Inspection of stored materials should be made on a regular basis.



AYRSHIRE METAL PRODUCTS (Daventry) Ltd.
Royal Oak Way, Daventry, Northamptonshire NN11 5NR.
Tel: (01327) 300990 Fax: (01327) 300885

DESIGN AND ESTIMATING SERVICE

Below is a list of services and standard components that make up a Swagebeam building package:

Quotation

Free design and estimating service tailored to each individual building, thereby ensuring that we always offer the best possible price.

Calculations

Full structural calculations including foundation loads produced ready for Local Authority submission.

Drawings

Frame and cladding layout drawings, marked up and showing relevant assembly details.

Frame Supply

The manufacture and supply of all cold formed frame components, cut to length and pre-punched ready for assembly, including all necessary standard fixings. Frameworks for door and window openings can be supplied to customers requirements.

Cladding Supply

The manufacture and supply of all cold formed cladding components, cut to length ready for assembly. This includes all the necessary standard self-drilling, self tapping screw fixings.

All necessary standard flashings, GRP rooflights, sealing tape and fillers.

A plastisol coated guttering system is available to match the cladding.

Nothing in this manual represents a performance warranty with regard to durability. The building designer is responsible for assessing the suitability of the product for their intended application, taking into account local environmental conditions.

Since our policy is one of continuous product development, Ayrshire Metal Products (Daventry) Ltd. reserve the right to revise the information shown without notification.

QUALITY ASSURED
BS EN ISO 9002: 1994
Certificate No. FM 34021
Certificate No. FM 33431

