

SE/SH SERIES STICKS**TECHNICAL DATA
SHEET No. 301**

SE Series Sticks shall be as manufactured or furnished by Republic Doors and Frames, McKenzie, Tennessee 38201. (SH profile also available)

Republic pre-engineered steel frame components called "sticks" provide unlimited flexibility for opening systems. Stick components are used to fabricate even the most complex entrance fronts, partitions and window wall designs. The variety of jamb depths and sizes permit greater design freedom. Because stick assemblies are normally welded, they offer strength without seams showing between vertical and horizontal members.

These openings can be designed for any job requirement, fabricated from factory components, and assembled and welded by factory trained Republic Distributors. Because sticks can be shipped as components and fabricated locally, shipping costs, job delays and design limitations are greatly reduced.

Frame assemblies shall be made of standard stick components, fabricated from prime quality 16, 14 or 12 gage, cold-rolled or galvanized steel. Where sticks are used at door openings in the frame assemblies, they shall be prepared for all hardware specified. Frame assemblies shall be fabricated from three basic components: Open sections (perimeter members), Mullion sections (intermediate members) and Sill sections (bottom members).

Mullion sections shall have identical jamb depths, face dimensions and stops as open sections. Mullion sections are only available in 16 and 14 gages.

Sill sections shall be flush with both faces of adjacent vertical members. The individual sticks shall be cut to length and notched to ensure square joints and corners. All joints and corners of the frame assembly shall be welded and ground smooth at the face of the sections.

All stick components and frame assemblies shall be phosphatized and receive one coat of force-cured rust inhibiting prime paint. Steel channel glazing beads shall be provided with the assemblies for all areas in which glass is to be installed.

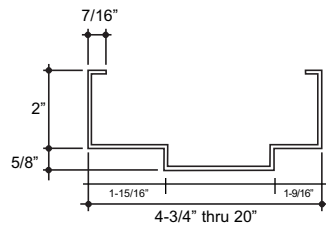
Frame assemblies may be shipped to jobsite completely welded. Field joints shall be permitted only when the size of the total assembly exceeds shipping limitations. When frame assemblies are subjected to windloads, vertical members shall be free of field splices.

Sticks are manufactured in 10'3" maximum lengths. Other lengths are available. Consult factory.

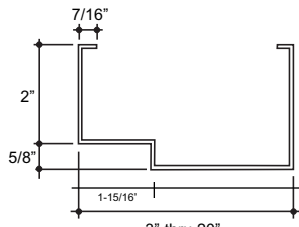
Other profiles are available upon request.

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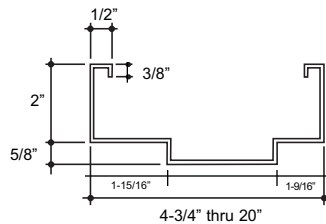
JAMBS (Open Sections)



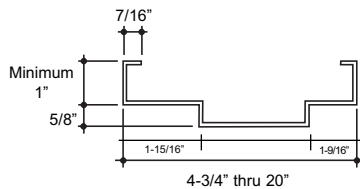
**Blank Jamb
(Standard)**



**Blank Jamb
Single Rabbet
(Standard)**

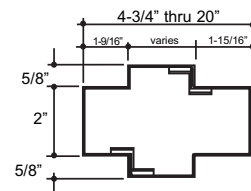


**Blank Jamb
Drywall Return
(Standard)**

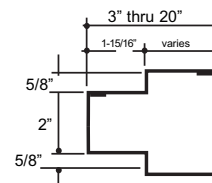


**Blank Jamb
Non Standard Face**

MULLIONS (Closed Sections)



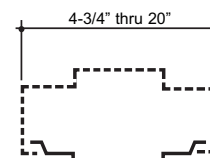
**Blank Mullion
(Standard)**



**Blank Mullion
Single Rabbet
(Standard)**



**Blank Jamb
Filler No Stop**



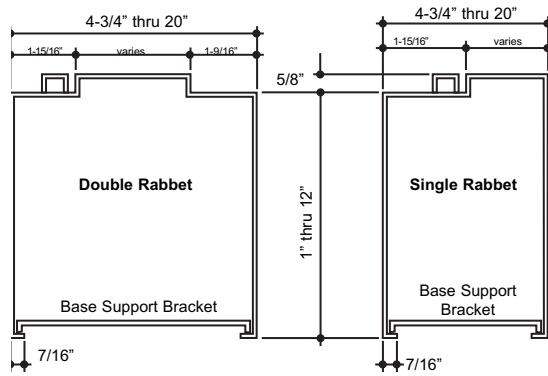
**Blank Jamb
Filler with Stop**

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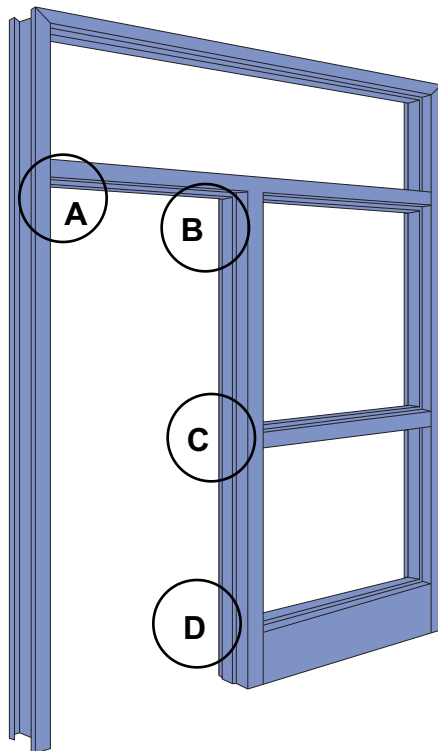
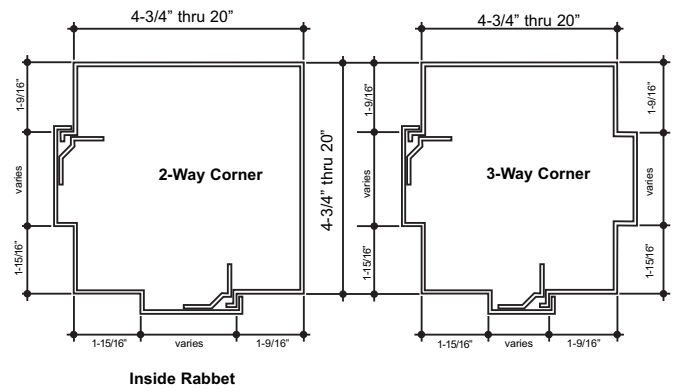
STICKS - BASES, CORNER POST AND FIELD SPLICE CONNECTIONS

TECHNICAL DATA SHEET No. 303

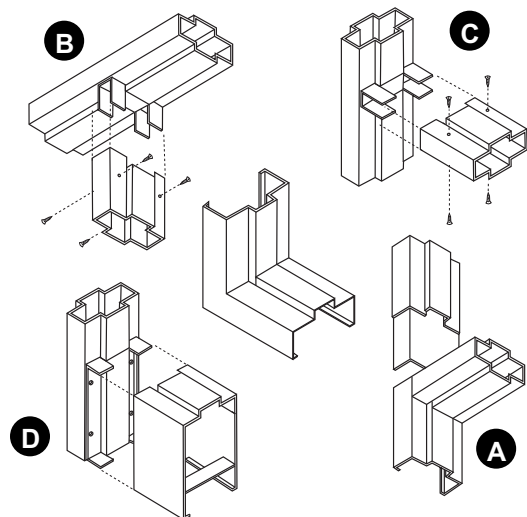
Bases (Sill Section)



Corner Posts



Section Details of Optional Field Splice connections



Revised 9/14

STRUCTURAL PROPERTIES AND LOAD CARRYING CAPACITIES FOR SE SERIES STICKS



TECHNICAL DATA SHEET No. 304

The information contained herein has been prepared to permit architects, engineers and other qualified persons to design and select the proper Republic stick components for use in fabricated frame assemblies when subjected to structural or wind loads.

Physical properties and wind load tables were calculated by a registered engineer and are based on the "Specifications for the Design of Cold-Formed Steel Structural Members", 1969 Edition, published by the American Iron & Steel Institute.

Table I lists the physical properties of open sections. These sections are usually used as perimeter components in any frame assembly and are not critical components of that assembly because perimeter components must be securely anchored to building walls.

Table II lists the physical properties of the closed sections. These sections are usually used as the intermediate horizontal and vertical components and are usually found to be the critical sections in any frame assembly. The critical component in any frame assembly is usually the component having the longest unsupported length or supporting the largest frame area in wind loading.

The most frequently encountered problem is that of designing an intermediate component to resist wind load only. For this reason, Table III is included. This table allows the designer to calculate the wind load on the component in pounds per linear foot and then select the proper section directly from the table.

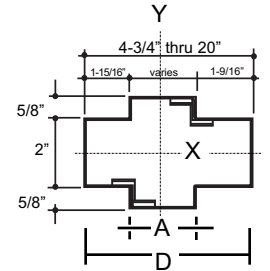
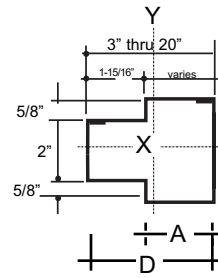
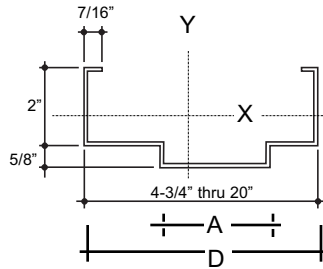
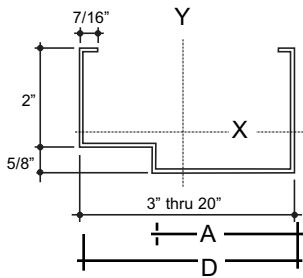
A design example is included for reference.

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TABLE I AND II PROPERTIES - OPEN AND CLOSED SECTIONS

TECHNICAL DATA SHEET No. 304a



OPEN SECTIONS

CLOSED SECTIONS

TABLE I PROPERTIES - OPEN SECTIONS

Jamb Depth "D"	"A"	Gage	I _x In. ⁴	S _x In. ³	P _x In.	I _y In. ⁴	S _y In. ³	P _y In.	Area In. ²
3"	1-1/16"	16	0.382	0.261	0.857	0.768	0.470	1.215	0.520
		14	0.469	0.321	0.853	0.942	0.576	1.208	0.645
3-3/4"	1-13/16"	16	0.438	0.283	0.881	1.263	0.632	1.496	0.564
		14	0.532	0.343	0.872	1.553	0.776	1.490	0.699
4-3/4"	1-1/4"	16	0.496	0.301	0.891	2.181	0.877	1.868	0.625
		14	0.604	0.367	0.885	2.674	1.075	1.862	0.771
5-3/4"	2-1/4"	16	0.545	0.316	0.893	3.406	1.143	2.233	0.683
		14	0.662	0.384	0.886	4.182	1.404	2.227	0.843
6-3/4"	3-1/4"	16	0.584	0.325	0.888	4.972	1.432	2.590	0.741
		14	0.712	0.397	0.882	6.111	1.760	2.584	0.915
8-3/4"	5-1/4"	16	0.648	0.340	0.870	9.246	2.074	3.285	0.857
		14	0.789	0.415	0.863	11.376	2.552	3.277	1.059

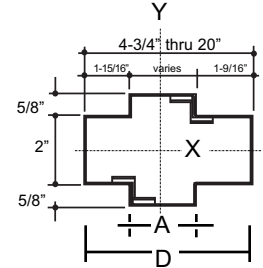
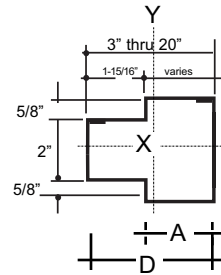
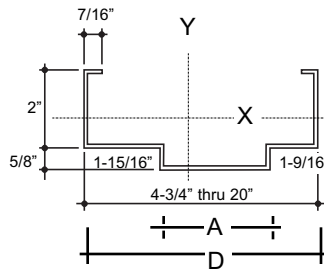
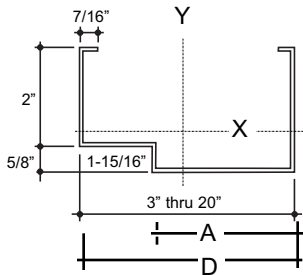
TABLE II PROPERTIES - CLOSED SECTIONS

3"	1-1/16"	16	0.815	0.501	1.073	0.876	0.515	1.112	0.708
		14	1.002	0.617	1.068	1.075	0.632	1.106	0.879
3-3/4"	1-13/16"	16	1.041	0.641	1.144	1.472	0.717	1.361	0.795
		14	1.271	0.782	1.135	1.811	0.882	1.355	0.987
4-3/4"	1-1/4"	16	1.046	0.644	1.071	2.291	0.952	1.586	0.911
		14	1.276	0.785	1.062	2.814	1.170	1.577	1.131
5-3/4"	2-1/4"	16	1.344	0.827	1.142	3.785	1.304	1.917	1.030
		14	1.640	1.009	1.135	4.650	1.602	1.910	1.275
6-3/4"	3-1/4"	16	1.640	1.009	1.196	5.791	1.703	2.248	1.146
		14	2.004	1.233	1.189	7.118	2.093	2.240	1.419
8-3/4"	5-1/4"	16	2.232	1.374	1.273	11.568	2.632	2.897	1.378
		14	2.730	1.680	1.264	14.266	3.246	2.892	1.707

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TABLE III - WIND LOADS - CLOSED SECTIONS

TECHNICAL DATA SHEET No. 304b



OPEN SECTIONS

CLOSED SECTIONS

Simply supported beam--no axial load-- wind bending about the Y-axis. Allowable uniform load on standard closed sections, in pounds per linear foot.

JAMB DEPTH	3"		3-3/4"		4-3/4"		5-3/4"		6-3/4"		8-3/4"		
	GAGE	16	14	16	14	16	14	16	14	16	14	16	14
LENGTH (FT.)	2	1486	2176	1910	2693	1850	2612	1850	2612	1850	2612	1850	2612
	3	991	1451	1273	1792	1233	1741	1233	1741	1233	1741	1233	1741
	4	588	722	955	1216	925	1306	925	1306	925	1306	925	1306
	5	301	369	506	623	740	967	740	1045	740	1045	740	1045
	6	174	214	293	360	456	560	617	870	617	870	617	870
	7	110	135	184	226	287	352	474	582	529	746	529	746
	8	74	91	124	153	192	236	317	390	463	597	463	653
	9	52	64	87	107	135	166	223	274	341	419	411	580
	10	38	47	63	78	99	121	162	200	248	306	370	522
	11	28	34	48	59	74	91	122	150	186	230	336	460
	12	22	27	37	46	57	70	94	116	143	177	308	355

F_v (shear) 14,670 psi - F_b (bending) 22,000 psi (increased 1/3 due to wind):

Loads above solid line are limited by maximum end reaction....loads below by deflection of 1/360 of span on inches.

Maximum concentrated loads at supports: 1850 pounds 16 gage sections, 2610 pounds 14 gage sections based on N & $h = 1.563$ " except for 3" and 3-3/4" sections where N & $h = 0.9375$ & 1.688 respectively. See AISI Specifications for Design of Cold Formed Steel Structural Members, Section 3.5 for Web Crippling of Beams.

JAMB DEPTH "D"	Reference Nomenclature	
	*OPEN SECTION	*CLOSED SECTION
3"	16-300-BJ	16-300-BM
3-3/4"	16-334-BJ	16-334-BM
4-3/4"	16-434-BJ	16-434-BM
5-3/4"	16-534-BJ	16-534-BM
6-3/4"	16-634-BJ	16-634-BM
8-3/4"	16-834-BJ	16-834-BM

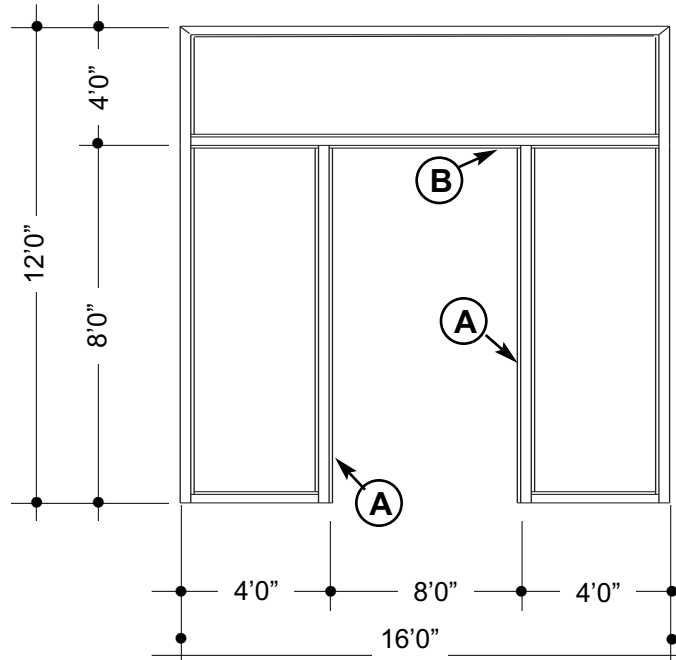
*Change prefix to 14 when 14 gage sections are required.

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DESIGN EXAMPLE

TECHNICAL DATA SHEET No. 304c

Given: 1/4" Plate Glass in all lites - 20 psf Wind Load
Find: Proper Depth of Members (A) and (B)



Solution:

Members (A) support a uniform load of $1/2 (4 + 8) \times 20 = 120$ plf on an 8'0" Span.

Using Table III:

Select a 3-3/4" depth 16 gage closed section (16-334-BM) as the most economical section to support a minimum uniform wind load of 120 plf on an 8'0" span.

Member (B) has a 16'0" span and supports a uniform wind load of $1/2 (4) \times 20 = 40$ plf Plus:

Two concentrated loads at 4'0" from each end of $4 \times 120 = 480$ pounds (From members (A))

$$*M \text{ max} = \frac{WL^2}{8} + P_A = \frac{40 \times 16 \times 16 \times 12}{8} + (480 \times 4 \times 12) = 38,400 \text{ in Lbs.}$$

$$M = fs f = \frac{8}{4} (22,000) = 29,333 \text{ psi (Increase due to wind)}$$

$$S = \frac{38,400}{29,333} = 1.309 \text{ In.}^3$$

Using Table II: Select a 6-3/4" depth 16 gage closed section (16-634-BM)
 $S_{\text{eff}} = 1.703 \times 1.309$

Thus this section will govern: Use 16 gage 6-3/4" depth sections throughout.

*Standard simple beam formula found in most engineering handbooks.

Revised 9/14