

**ENGLERT™**

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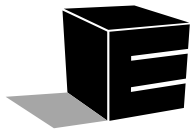
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# **CONSTRUCTION DETAILS HANDBOOK**

*For*

*METAL ROOFING SYSTEMS  
FASCIA, MANSARDS, & SOFFITS  
WALL PANELS/SIDING*



# ENGLERT™

## INTRODUCTION

The details contained in the following pages are merely suggestions/guidelines as to how our products can be installed. While we believe all information presented is accurate, it is not intended to cover all instances, building requirements, designs or codes. The details may require adaptations, changes, or revisions for each project since conditions vary from one project to another and may be unique for each application.

The details shown are widely used methods of construction; however, it must be noted that weathertightness is the function of the installer. The installer can virtually assure weathertightness through the use of these details, good materials and workmanship, the use of the right type of sealant, and sealing and caulking all joints adequately.

It is the responsibility of the designer/roofing contractor/installer to ensure that the enclosed details are adapted to meet particular building requirements and to assure adequate weathertightness. Englert shall be held harmless from any and all claims arising from a lack of weathertightness as a result of using these suggested drawings. The designer/installer must be aware of and allow for expansion/contraction of roof panels when designing and/or installing panels and flashing.

In like manner, ensuring adequacy of anchoring framing materials to walls, structures, subgirts and cees/zees, shall be determined by the designer/installer and Englert shall be held harmless against all claims resulting from any inadequacy. The installer should familiarize himself with all erection instructions before starting work.

Before beginning erection of panels, the installer shall examine the substrate to ensure that all supporting members are straight, level, plumb and true in accordance with minimum tolerances. Report any variations and potential problems to the architect. Do not start work until unsatisfactory conditions have been corrected.

Special precautions must be taken when storing and handling bare and painted metal products. Please contact Englert for proper instructions and recommendations to prevent unnecessary and serious damage to material.

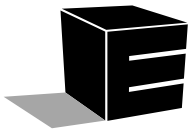
The roofing/fascia system shall be installed plumb, straight and true to adjacent work. Seams shall be equidistant from corners, hips, mullions, columns, etc., in accordance with design concept as shown on the drawings. Horizontal panel end laps are not acceptable. Metal Z closures shall be embedded in sealant. Roof clips, when required, shall allow for thermal movement and shall be installed at each panel joint. Longitudinal spacing of roof clips shall be as specified for design loads. No perforations shall be made in roofing/fascia by fasteners, except as shown on the drawings. To guide thermal expansion in one direction, the panel must be pinned to the substrate below, preferably at the top of the panel, behind the Z trim closures.

Installation procedures which are not indicated shall be in accordance with SMACNA and NRCA details. Flashing and trim shall be installed true and in proper alignment, with any exposed fasteners equally spaced for the best appearance.

Sealant for joints and flashing endlaps shall be non-drying, non-toxic, non-shrinking, and shall have a serviceable temperature of 50 to 212 degrees F. Sealant shall be field applied on dry, clean surfaces. To ensure weathertightness, the sealant shall be installed where indicated without skips or voids. Sealants shall be furnished by others.

The installer may utilize details provided and procedures recommended for installation of materials. Some field cutting and fitting of panels and flashing is expected of the installer and field corrections of materials is a part of normal erection work. Workmanship shall be the best industry standards and installation shall be preformed by experienced craftsmen. Oil canning in the flat areas of the pans is common to the industry and shall not be cause for product refusal, or rejection.

SMACNA (Sheet Metal and Air Conditioning Contractors National Association) architectural sheet metal manual specifications and NRCA (National Roofing Contractors Association) guidelines, shall govern for material and workmanship not shown.



## UL-580 TEST PROCEDURE

### Windload Testing of Light Gauge Roofing Basis and Characteristics of Test

History has shown that wind-uplift is the single most destructive force in nature that compromises the long-term dependability of metal roofing products. It is due to the high risk of application that a need for standardized testing and evaluation of the products be undertaken. This, so that a standard of performance and durability can be specified with confidence by Architects and Engineers in the design of safe dependable structures.

There exists four (4) basic possibilities of loading as briefly described below:

1. A typical unshielded roof line will potentially receive the full impact of a wind resistance, allowing pressure to develop on that surface. (Positive loading.)
2. The sloped nature of a roof-line causes the development of up-lift zones across the roof at various points. This uplift, that is created, is similar to that found in an airplane wing situation - a condition that is undesirable in a roofing application. (Negative loading.)
3. Wind forces on the roof line periodically causing outside air pressure to drop (Negative loading), will be amplified by a constant inside air pressure (Positive loading). Thus a combination of positive and negative loading can be expected to work on the structures roof line simultaneously.
4. The general nature of a building, specifically poorly sealed sheeting, leaky doors and windows, open windows or large open areas, lend the structure to a fourth potentially destructive scenario - wind gust. Sudden wind gusts can, within a very short time span (even seconds), over pressure a structure from the interior, at the same time creating an up-lift zone on the exterior. Thus we experience dynamic loading of the structure.

UL Laboratories has designed a test procedure referred to as the UL-580 testing method. The test simulates the four possibilities of loading as described above. The test has also been broken down into three (3) progressive classifications - for those products requiring a lesser degree of loading.

UL-30 Class

UL-60 Class

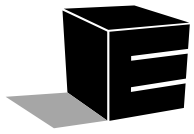
UL-90 Class

The test involves a 10' x 10' assembly of manufacturers roofing product installed over a specific purlin size, gauge, and spacing. The assembly is mounted in a specially designed chamber.

Each phase of the "Progressive" test lasts for 80 minutes. The product receiving the last highest rating before failure.

During the test, a UL Technician constantly observes the mock-up, looking for structural distress at side joints, connections, and broad flats. In order to pass a phase of the UL-580 test, there must be no joint displacement, clip distress, or buckling activity anywhere in the system.

The result of a successful test is the listing of the last phase passed (specifically UL-30, 60, or 90) in the UL Building Materials Directory. This directory is a key reference for Architects, Designers, and Insurance Companies. Products listed in the UL Directory carry a connotation of quality, high performance, and low risk.

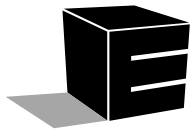


Each phase or classification run requires 80 minutes of time. This is a progressive type of test which means that to qualify for a phase (2), the specimen must successfully pass the previous phase of testing, etc.

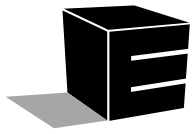
The following chart outlines the times and pressures within a given UL classification phase:

		The Addition of These Pressures Yields The Total Pressure.		
CLASS	TIME, MINUTES	NEG. PRESSURE PSF	POS. PRESSURE PSF	TOTAL PRESSURE PSF
30	5	16.15	0	16.15
	5	16.15	13.85	30.00
	60**	8.07-27.69	13.85	21.92-41.54
	5	24.23	0	24.23
	5	24.23	20.77	45.00
60	5	32.31	0	32.31
	5	32.31	27.69	60.00
	60**	16.15-55.38	27.69	44.84-83.07
	5	40.38	0	75.00
	5	40.38	34.62	40.38
90	5	48.46	0	48.46
	5	48.46	41.54	90.00
	60**	24.23-48.46	41.54	65.77-90.02
	5	56.54	0	56.54
	5	56.54	48.46	105.00

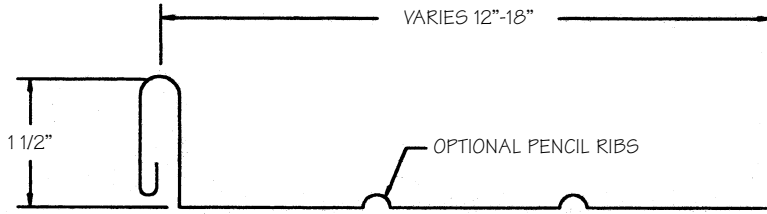
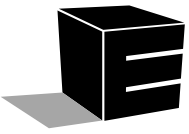
\*\* The 60 minute portion of the test is the dynamic cycling where the negative component of the total pressure is varied quickly from a minimum to a maximum with the positive component held constant.



		V	P <sub>v</sub>	.60 P <sub>v</sub>	.70 P <sub>v</sub>
CLASS	GROSS UPLIFT, PSF	WIND VELOCITY, MPH	VELOCITY PRESSURE, PSF	POSITIVE PRESSURE, PSF	NEGATIVE PRESSURE, PSF
30	30	95	23.08	13.85	16.15
	45	116	34.61	20.77	24.23
60	60	134	46.15	27.69	32.31
	75	150	57.69	34.62	40.38
90	90	164	69.23	41.54	48.46
	105	178	80.77	48.46	56.54

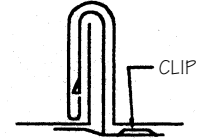


CD-001-003	Product Profiles & Application
CD-003A, B	Product Span Tables (Basic)
CD-004-006	Applications
CD-008	Roof Layout
P-011	Ridge - Standard
P-013	Ridge - Vented
P-020	Valley - Standard
P-023	Valley - Hooked
P-030	Gutter
P-033	Roofing w/Exp. Joint
P-040	Gable
P-050	Eave
P-060	Peak - Standard
P-061	Peak - No Return
P-070, 071 & 074	Pitch Break / Head Wall
P-072	Ridge - Vented
P-080	Roof Penetration - Pipe Boot
P-081	Roof Penetration - Pipe Boot w/ Metal Skirt
P-110, 111 & 112	Sidewall Details
P-131 & 132	Curb Details

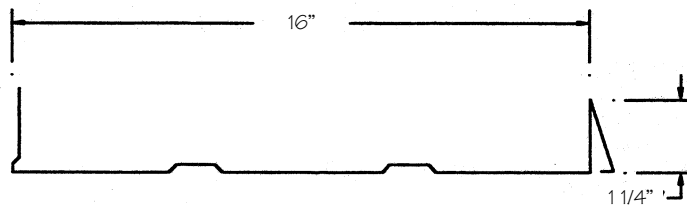


**SERIES 1000**

Profile



Interlock

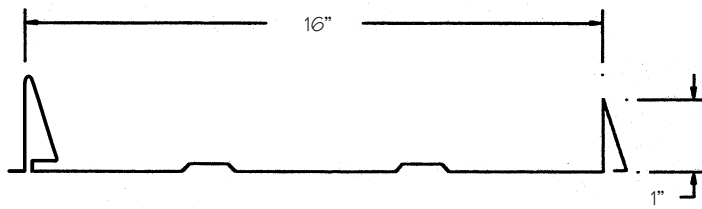


**SERIES 1100**

Profile



Interlock

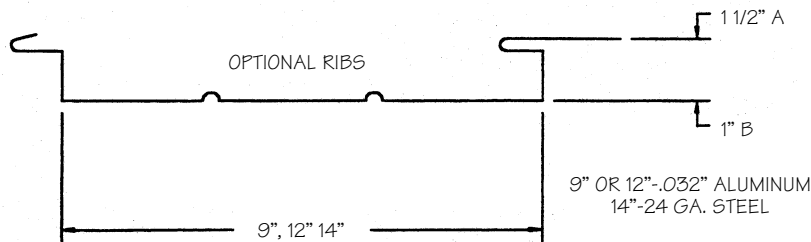


**SERIES 1101 (NAIL FIN)**

Profile



Interlock



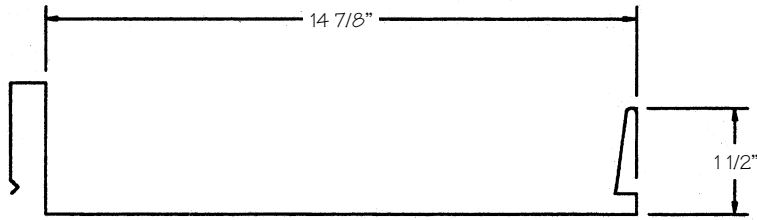
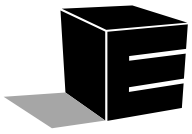
**SERIES 4000 A/B**

Profile

AVAILABLE IN  
SMOOTH STEEL  
OR ALUMINUM OR  
PERFORATED  
ALUMINUM

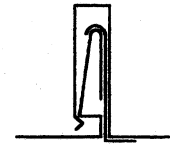


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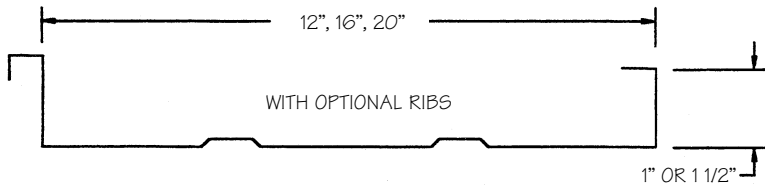


**SERIES 1200**

Profile

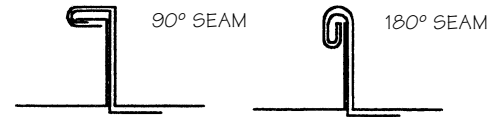


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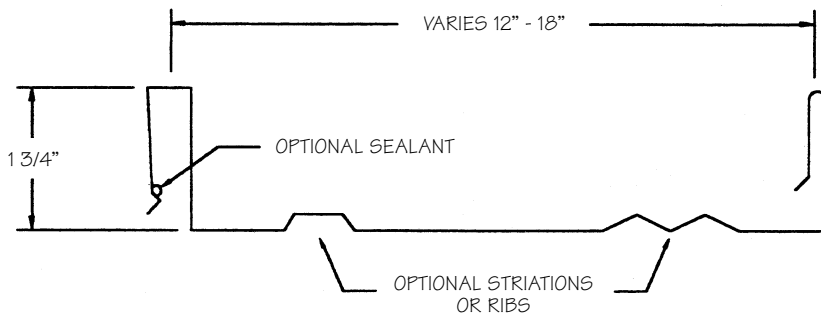


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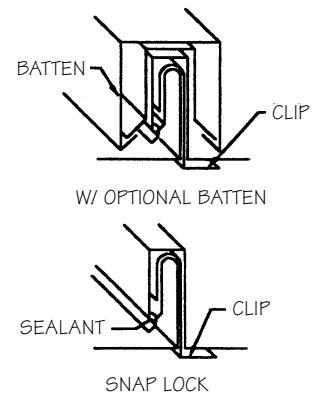
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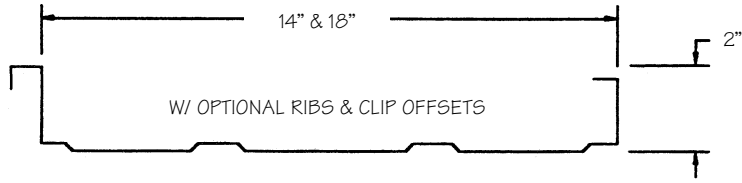
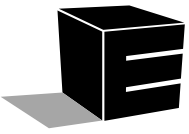


**SERIES 2000 & SERIES 2000B (W/ BATTEN CAP)** Profile

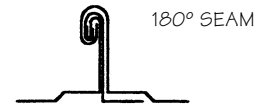


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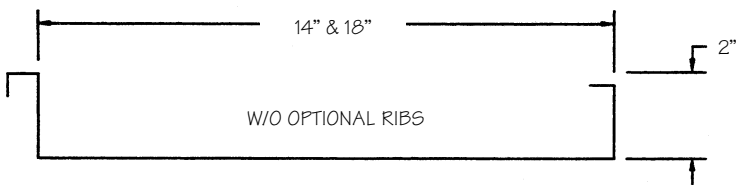




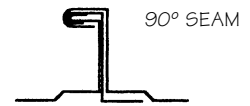
Profile



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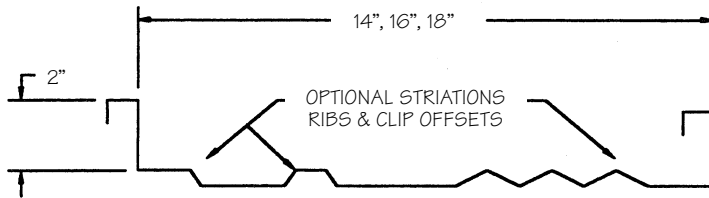


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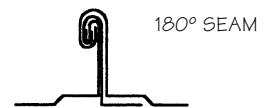


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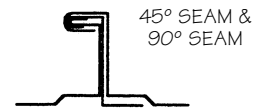
## SERIES 2400



Profile

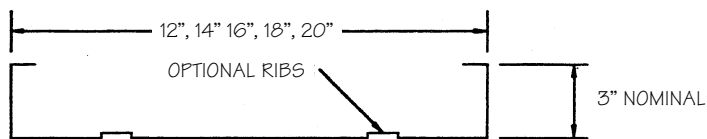


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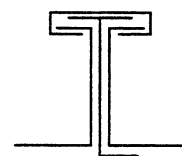


Interlock

## SERIES 2500

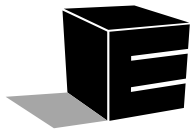


Profile



Interlock

## "T" SEAM SERIES 3000



### SERIES 2500 PROFILE | ALLOWABLE UNIFORM (POSITIVE) LIVE LOAD (PSF)

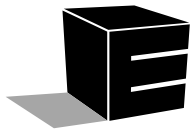
PANEL WIDTHS	PANEL GAUGE	5'	6'	7'
16 in.	24 GA. STEEL	73	52	37
16 in.	22 GA. STEEL	95	68	49

Check with manufacturer for engineering on other panel widths. Span table based on 3 or more spans.

### SERIES 2000 PROFILE | ALLOWABLE UNIFORM (POSITIVE) LIVE LOAD (PSF)

PANEL WIDTHS	PANEL GAUGE	PANEL OF EQUAL SPANS	4'	4'-6"	5'	5'-6"	6'
12 in.	.032" ALUM.	2 3 OR MORE	31 36	25 29	20 23	16 19	14 16
	24 GA. STEEL	2 3 OR MORE	82 96	65 76	53 61	44 51	37 43
	22 GA. STEEL	2 3 OR MORE	106 124	84 98	68 79	56 66	47 55
16 in.	.032" ALUM.	2 3 OR MORE	23 27	18 21	15 17	12 14	10 12
	24 GA. STEEL	2 3 OR MORE	62 72	49 57	40 46	33 38	27 32
	22 GA. STEEL	2 3 OR MORE	80 93	63 74	51 60	42 49	35 41
18 in.	.032" ALUM.	2 3 OR MORE	20 23	16 19	13 15	11 12	9 10
	24 GA. STEEL	2 3 OR MORE	55 64	43 51	35 41	29 34	24 28
	22 GA. STEEL	2 3 OR MORE	71 83	56 65	45 53	38 44	32 37

Load values shown may be increased by 1/3 for allowable wind load. Deflections do not exceed 1/240 of span in inches.



## “T” SERIES 3000 PROFILE | ALLOWABLE UNIFORM (POSITIVE) LIVE LOAD (PSF)

PANEL WIDTHS	PANEL GAUGE	4'	5'	6'
16 in.	24 GA. STEEL	145	93	64
20 in.	24 GA. STEEL	116	74	51

Span table based on 3 or more spans. Grade D Galvalume.

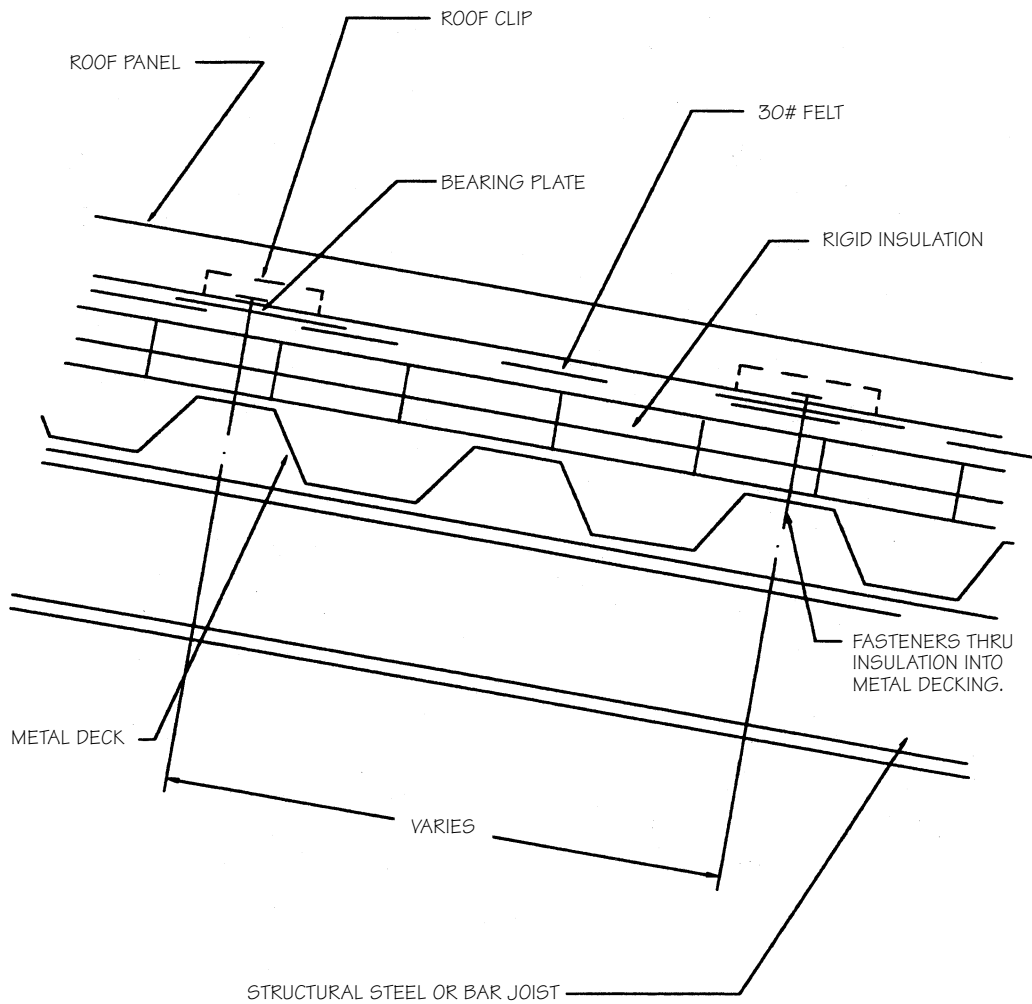
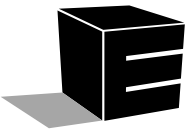
## SERIES 4000 | FLUSH WALL PANEL (1 1/2")

PANEL GAUGE	PANEL WIDTHS	NUMBER OF EQUAL SPANS	WIND LOAD (PSF)							
			20	25	30	35	40	45	50	55
24 GA. STEEL	14"	1	6-5	5-11	5-7	5-4	5-1	4-11	4-9	4-7
		3	8-1	7-6	7-1	6-9	6-2	6-2	6-0	5-9
22 GA. STEEL	14"	1	6-11	6-6	6-1	5-9	5-6	5-4	5-1	4-11
		3	8-9	8-2	7-8	7-3	6-11	6-8	6-5	6-3
24 GA. STEEL	12"	1	6-9	6-3	5-11	5-7	5-4	5-2	5-0	4-10
		3	8-6	7-11	7-5	7-1	6-9	6-6	6-3	6-1
22 GA. STEEL	12"	1	7-4	6-9	6-5	6-1	5-10	5-7	5-4	5-3
		3	9-3	8-7	8-1	7-8	7-4	7-1	6-9	6-7

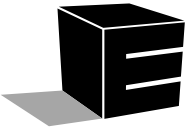
## SERIES 2400 | 2" HIGH PROFILE

PANEL WIDTHS	SPAN IN FEET	4'	5'	6'
14 in.	LOAD (PN)	132	85	59
18 in.	LOAD (PN)	104	67	46

Span table based on 3 or more spans. Check with manufacturer on load tables for other gauges.



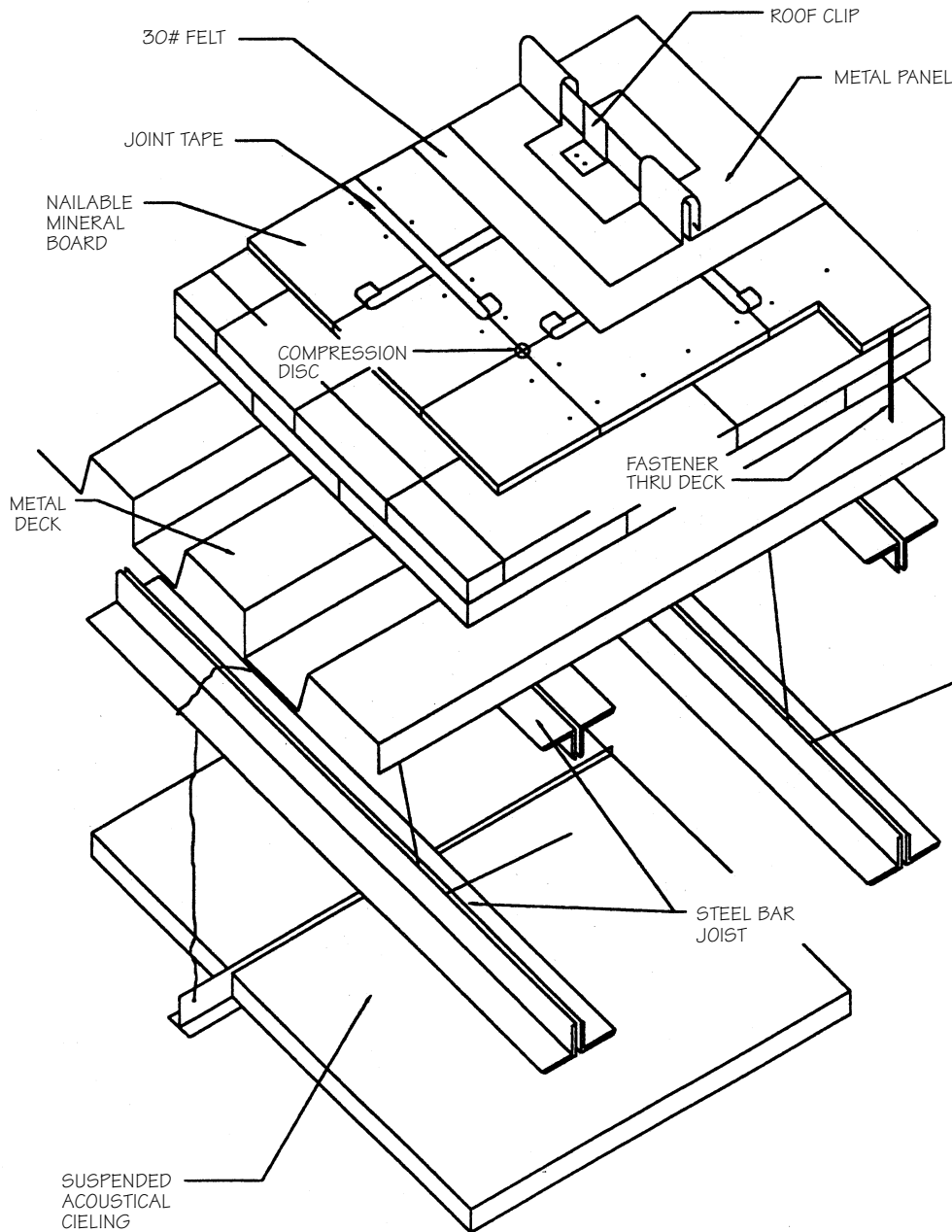
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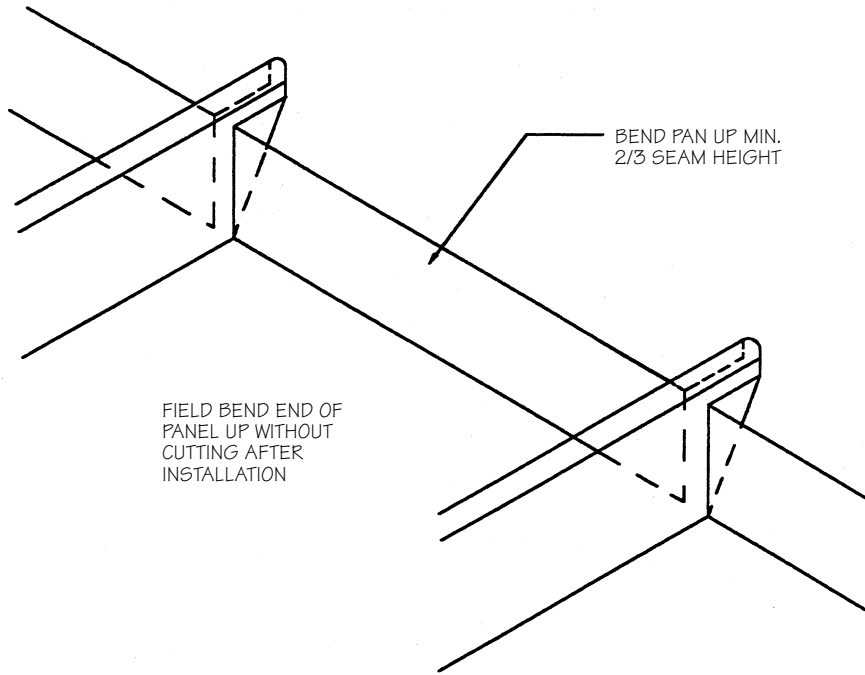
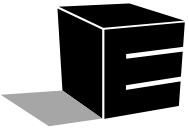


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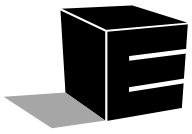
**APPLICATION**

**CD-004A**





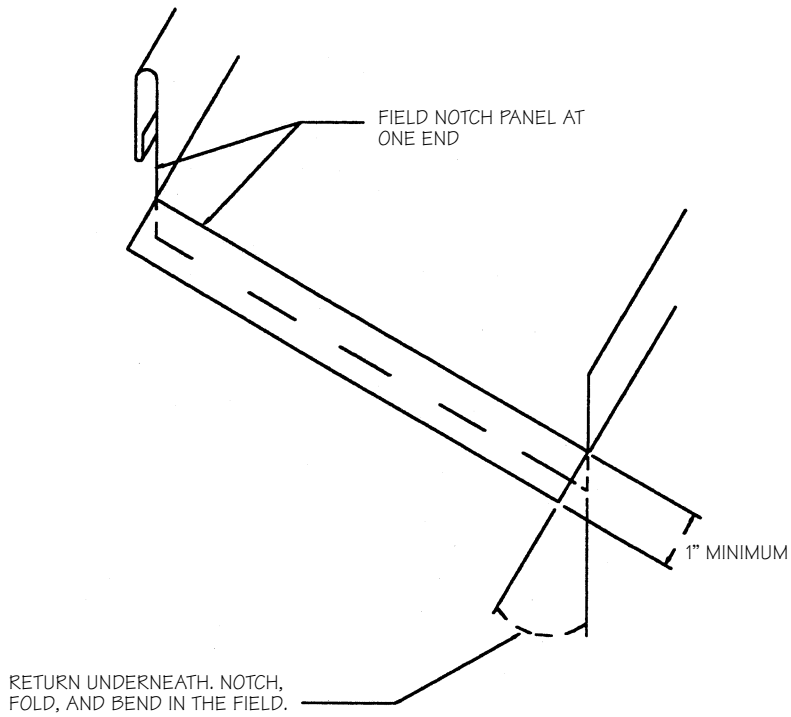
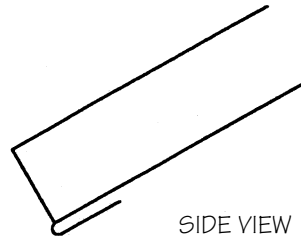
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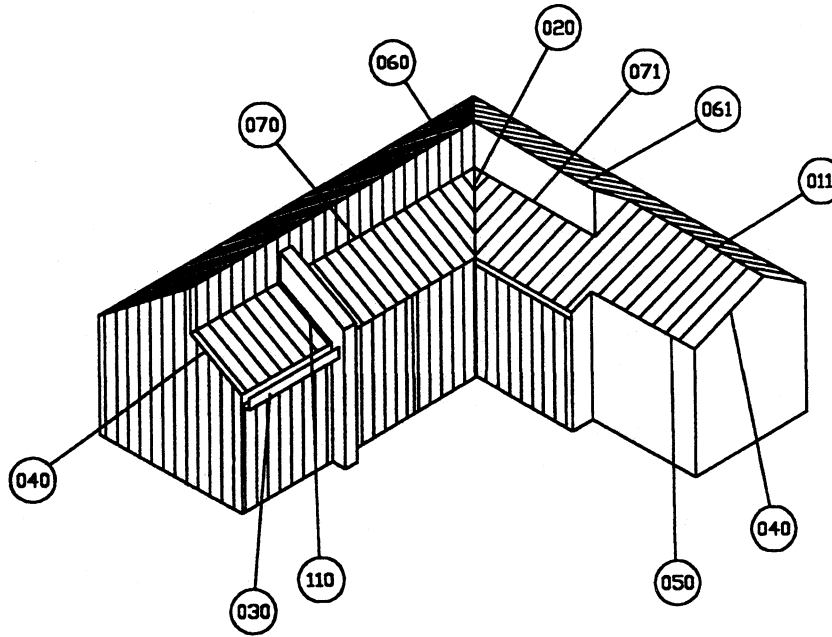
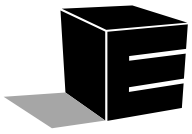
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**APPLICATION**

**CD-006**



PANEL BOTTOM RETURN (FIELD FORM)  
TYPICAL FOR ALL PANELS



## Construction Details Location

P-011	Ridge
P-020	Valley
P-030	Gutter
P-040	Rake
P-050	Eave
P-060	Peak w/ Fascia
P-061	Peak w/o Fascia
P-070	Pitch Break w/ Fascia
P-110, 111 & 112	Sidewall