

**DEFLCAMB0699**  
**FRTLUMBR0699**

## **Miscellaneous**

**Commentary - Deflection and Camber**  
**Fire Retardant Treated Lumber**

## COMMENTARY: DEFLECTION AND CAMBER

CAMBER IS TYPICALLY BUILT INTO TRUSSES TO COMPENSATE FOR THE VERTICAL DEFLECTION THAT RESULTS FROM THE APPLICATION OF LOADS. PROVIDING CAMBER HAS THE FOLLOWING ADVANTAGES:

L = SPAN OF TRUSS  
D = DEPTH OF TRUSS AT DEFLECTION POINT

- ? HELPS TO ENSURE LEVEL CEILINGS AND FLOORS AFTER DEAD LOADS ARE APPLIED.
- ? FACILITATES DRAINAGE TO AVOID PONDING ON FLAT OR LOW SLOPE ROOFS.
- ? COMPENSATES FOR DIFFERENT DEFLECTION CHARACTERISTICS BETWEEN ADJACENT TRUSSES.
- ? IMPROVES APPEARANCE OF GARAGE DOOR HEADERS AND OTHER LONG SPANS THAT CAN APPEAR TO "SAG."
- ? AVOIDS "DIPS" IN ROOF RIDGELINES AT THE TRANSITION FROM THE GABLE TO ADJACENT CLEAR SPAN TRUSSES.

### RECOMMENDED DEFLECTION LIMITS

TRUSS TYPE	L/D	DEFLECTION LIMITS	
		LIVE LOAD	TOTAL LOAD
PITCHED ROOF TRUSSES	24	L/240 (VERTICAL)	L/180 (VERTICAL)
FLOOR OF ROOM-IN-ATTIC TRUSSES	24	L/360 (VERTICAL)	L/240 (VERTICAL)
FLAT OR SHALLOW PITCHED ROOF TRUSSES	24	L/360 (VERTICAL)	L/240 (VERTICAL)
RESIDENTIAL FLOOR TRUSSES	24	L/360 (VERTICAL)	L/240 (VERTICAL)
COMMERCIAL FLOOR TRUSSES	20	L/480 (VERTICAL)	L/240 (VERTICAL)
SCISSORS TRUSSES	24	0.75" (HORIZONTAL)	1.25" (HORIZONTAL)

CAMBER MAY BE OMITTED IN RESIDENTIAL CONSTRUCTION TO PREVENT GAPS BETWEEN CEILINGS AND INTERIOR NON-LOADING BEARING WALLS.

### RECOMMENDED CAMBER

PITCHED TRUSSES	1.00 x DEFLECTION FROM ACTUAL DEAD LOAD
SLOPING PARALLEL CHORD TRUSSES	1.5 x VERTICAL DEFLECTION FROM ACTUAL DEAD LOAD
FLOOR TRUSSES	(0.25 x DEFLECTION FROM LIVE LOAD) + ACTUAL DEAD LOAD
FLAT ROOF TRUSSES	(0.25 x DEFLECTION FROM LIVE LOAD) + (1.5 x DESIGN DEAD LOAD DEFLECTION)

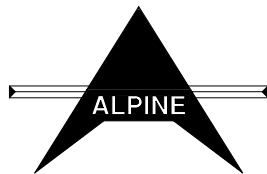
THE AMOUNT OF CAMBER IS DEPENDENT ON THE TRUSS TYPE, SPAN, LOADING, APPLICATION, ETCETERAS.

INCREASED LIMITS FOR DEFLECTION AND SLENDERNESS RATIO (L/D) MAY BE REQUIRED TO HELP CONTROL VIBRATION.

THE FOLLOWING TABLES ARE PROVIDED AS GUIDELINES FOR LIMITING DEFLECTION AND ESTIMATING CAMBER. CONDITIONS OR CODES MAY EXIST THAT REQUIRE EXCEEDING THESE RECOMMENDATIONS, OR PAST EXPERIENCE MAY WARRANT USING MORE STRINGENT LIMITATIONS.

NOTE: THE ACTUAL DEAD LOAD MAY BE CONSIDERABLY LESS THAN THE DESIGN DEAD LOAD.

THIS DRAWING REPLACES DRAWING 579,000



**\*\*WARNING\*\*** TRUSSES REQUIRE EXTREME CARE IN FABRICATING, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO HIB-91 (HANDLING INSTALLING AND BRACING), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE, 583 D'ONDRIOD DR., SUITE 200, MADISON, WI. 53719) FOR SAFETY PRACTICES PRIOR TO PERFORMING THESE FUNCTIONS. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING. **\*\*IMPORTANT\*\*** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN; ANY FAILURE TO BUILD THE TRUSSES IN CONFORMANCE WITH TPI OR FABRICATING, HANDLING, SHIPPING, INSTALLING AND BRACING OF TRUSSES. DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPECIFICATION PUBLISHED BY THE AMERICAN FOREST AND PAPER ASSOCIATION) AND TPI. ALPINE CONNECTORS ARE MADE OF 20GA ASTM A653 GR40 GALV. STEEL EXCEPT AS NOTED. APPLY CONNECTORS TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION CONNECTORS PER DRAWINGS 160 A-Z. THE SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY PARTICULAR BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER, PER ANSI/TPI 1-1995 SECTION 2.

REF	DEFLEC/CAMBER
DATE	06/28/99
DRWG	DEFLECAMB0699
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Wood which has been pressure treated with fire-retardant chemicals shall conform to AWPAC Standard C20 and possess a flame spread rating of 25 or less when tested in accordance with one of the following test methods: ASTM E-84, UL723, or NFPA255. Manufacturer of fire-retardant chemicals shall publish strength reduction factors for treated lumber which will be applicable for their process at in-service temperatures up to 150°F. Each piece of lumber shall bear the quality mark of an accredited testing / inspection agency indicating conformance to the treating procedures of AWPAC C20. The agency shall also attest to the fact that the treating process is the same process that was used to establish the published strength reductions. Treated lumber shall be redried to a moisture content not exceeding 19%. Plants performing the treating and redrying must maintain continuing supervision of the process and be monitored by an independent third party inspection service.

Corrosion of galvanized plates in FRT lumber and untreated lumber, of the same species subjected to similar environments, shall be virtually indistinguishable at relative humidities up to 90% max. The moisture content of FRT lumber shall not exceed 28% when tested in accordance with ASTM D3201-94 at 92% relative humidity. Make certain that attic spaces are ventilated to prevent the accumulation of moisture and humidity, and to prevent temperatures in excess of 150°F. Do not allow any devices which ventilate from the interior of the structure (bathroom vents, clothes dryers, kitchen vents, etc.) to terminate in the attic or between floor spaces. Vapor barriers are recommended to prevent the migration of moisture into attic and between floor spaces.

The TRUSS MANUFACTURER shall obtain the following written CERTIFICATION STATEMENT from the lumber treater and provide a copy to the architect or building designer and Alpine Engineered Products.

"The treating and redrying procedures recommended by the manufacturer of fire-retardant formulations have been followed. The strength characteristics of this treated lumber are in compliance with values for Fire-Retardant Treated Lumber published by the manufacturer of fire-retardant formulations at in-service temperatures ranging up to 150°F. The agency applying the quality mark to the lumber has maintained supervision and inspection of the quality assurance program of the treated product to assure the strength characteristics published by the manufacturer of fire-retardant formulations. The formulations used for the treating process does not contain any chemicals that will cause degradation of the lumber at in-service temperatures up to 150°F."

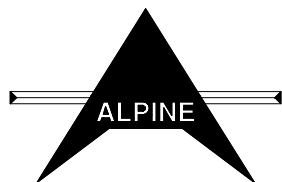
The certification shall include the name of the truss manufacturer and the project where the trusses are to be used.

The CONTRACTOR shall obtain a warranty for the fire-retardant treated lumber from the manufacturer of fire-retardant formulations. A copy of the warranty shall be furnished to the architect and building designer.

The ARCHITECT or BUILDING DESIGNER must specify and approve the suitability of the treatment of lumber for this specific project, and assure that conditions for use specified by the manufacturer of fire-retardant formulations are met on this specific structure.

Dricon™ from Hickson, PYRO-GUARD® from Hoover Treated Wood Products, and D-Blaze® from Chemical Specialties, are products which are represented by their manufacturers as meeting the above requirements. Literature on these products is available from Alpine or may be obtained directly from the manufacturer of fire-retardant formulations.

THIS DRAWING REPLACES DRAWING 140



## Specifications to be used in conjunction with Interior Type Fire-Retardant Treated Lumber Truss Designs

FURNISH A COPY OF THIS SHEET TO THE ARCHITECT, BUILDING DESIGNER, AND CONTRACTOR  
DO NOT INSTALL FIRE-RETARDANT TREATED (FRT) TRUSSES WITHOUT A LUMBER WARRANTY

Alpine Engineered Products, Inc. / P.O. Box 2225 Pompano Beach, FL 33061 / (954)781-3333

REF	Spec FRT
DATE	06/30/99
DRWG	FRTLUMBR0699
	-ENG MLH/KAR