User Guide to Standard Plans Section S – OVERHEAD SIGNS – TRUSS

Appendix C: Post Type Selection – Two Post

Introduction

Standard Plans for two post trusses include 7 post type designations (I-S through VII-S). The sign designer uses this Appendix to determine the post types and shows the post types on the project plans. There is one method available to determine post type.

The post sizing method relies on calculating a “pseudo-moment”. It is not an actual structural design moment and has no intended application outside of the post selection presented here. It is important to verify the structure meets the limitations listed in the procedure and to use the calculation method shown. Significantly unconservative designs might result if

- Using calculation methods other than those shown to arrive at the “pseudo-moment”
- Using the calculated “pseudo-moment” in other types of design calculations.
- Applying this method to a structure that falls outside of the limitations listed in the procedure.

Notation

all values are to be positive numbers

Area	=	Project area of the sign panel (based on full coverage) (feet squared)
CL	=	Center line
D	=	Depth of sign panel (inches)
H_1	=	Height from bottom of base plate to mid-height of the combined truss and sign panel for post 1.
h_1	=	height from bottom of base plate to the bottom of the truss for post 1 (feet)
H_2	=	Height from bottom of base plate to mid-height of the combined truss and sign panel for post 2.
h_2	=	height from bottom of base plate to the bottom of the truss for post 2 (feet)
S	=	Span length (feet)
O	=	Overhang (feet)
PM	=	Pseudo-Moment used to determine minimum post size (pound-foot)
$Wind_{A1}$	=	Wind “moment” calculated in Equation 3
$Wind_{AB1}$	=	Wind “moment” calculated in Equation 4
$Wind_{A2}$	=	Wind “moment” in Equation 8
$Wind_{AB2}$	=	Wind “moment” in Equation 9

Appendix C: Post Type Selection – Two Post

Two Post Truss Post Type Selection Method

Procedure is as follows.

- Determine the basic dimensions (see Figure 1)
  - Sign Panel Depth, D
  - Length of the span S (CL of post to CL of post)
  - Length of overhang if present, O (CL of post to end of truss)
  - Height, h_n, from bottom of base plate to the bottom of the truss for each post location.

- Verify the basic dimensions meet the following limitations.
  - D must be 70 inches, 80 inches, 90 inches, 100 inches, 110 inches, or 120 inches
  - S must be less than or equal to 145 feet
  - O must be less than or equal to 30 feet
  - S must be at least twice O
  - Both H_1 and H_2 must be less than 29 feet. For greater than 29 feet a special design is needed.

- Verify minimum clearance
  - Typical minimum vertical clearance to the bottom of truss is
  - 18 feet-6 inch if walkway, sign illumination, or similar is attached to the bottom of the truss
  - 18 feet if nothing will extend below the truss.
  - If the structure is on the Extra Legal Load Network, other criteria might apply.
  - Check whether clearance should be adjusted for future additional paving, overlay, or widening.

- Verify the design conforms to additional limitations
  - Details of the structure and sign panels must conform to the typical Standard Plans for two post trusses.
  - Must not include CMS or EMS or other electronic sign panels.
  - Center of sign panel must be no more than 43 feet above the surrounding terrain.
  - Extra attachments are limited to:
    - Single-sheet sign-panels strapped directly to the post. Maximum area of the sign panels is the lesser of 50 square feet or 10% of the truss length times the panel depth D. The sign must be approximately centered on the post horizontally. The sign must be below the post connection to the truss.

- Calculate $Wind_{A1}$

$$H_1 = h_1 + \frac{0.5+\frac{D}{12}}{2} \quad \text{(Equation 1)}$$

$$Area_1 = \frac{DS}{24} \quad \text{(Equation 2)}$$

$$Wind_A = H(Area_1)40.3 \quad \text{(Equation 3)}$$

- Calculate $Wind_{AB1}$

$$Wind_{AB1} = 1.05(Wind_{A1}) \quad \text{(Equation 4)}$$

- Pseudo-Moment for Post 1

$$PM_1 = Wind_{AB1} \quad \text{(Equation 5)}$$

- Use Figure 2 to determine minimum post size for Post 1
- Calculate $Wind_{A2}$

$$H_2 = h_2 + \frac{0.5+\frac{D}{12}}{2} \quad \text{(Equation 6)}$$

$$Area_2 = \frac{DS}{24} + \frac{DO}{12} \quad \text{(Equation 7)}$$

$$Wind_{A2} = H(Area_2)40.3 \quad \text{(Equation 8)}$$

- Calculate $Wind_{AB2}$

$$Wind_{AB2} = 1.05(Wind_{A2}) \quad \text{(Equation 9)}$$

- Pseudo-Moment for Post 2

$$PM_2 = Wind_{AB2} \quad \text{(Equation 10)}$$

- Use Figure 2 to determine minimum post size for Post 2

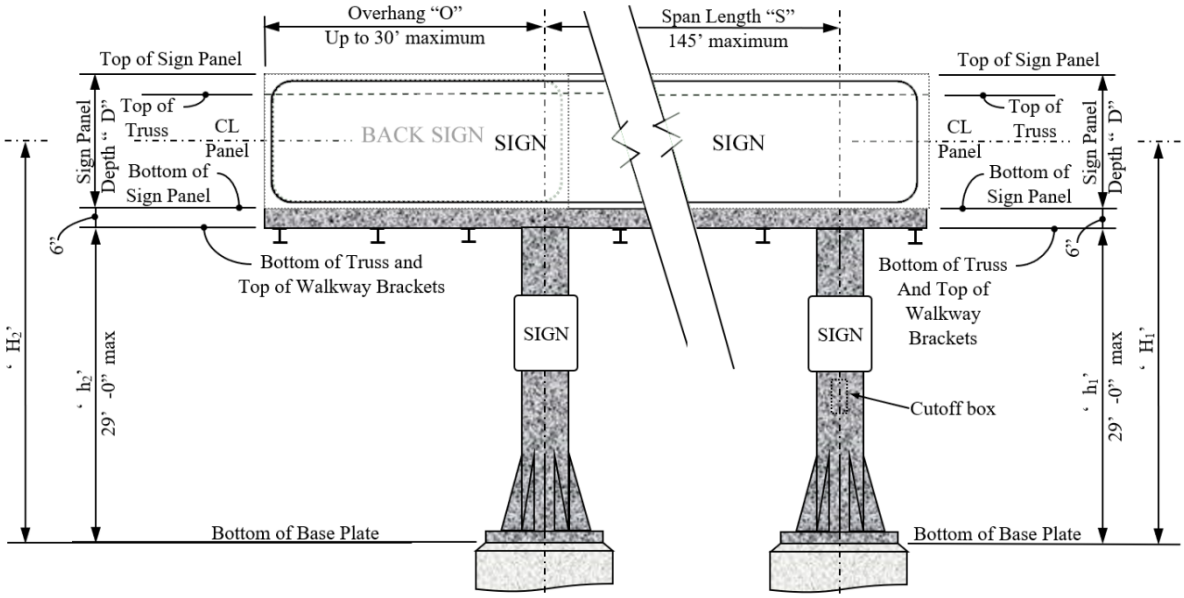

Figure 1: Explanation of dimensions

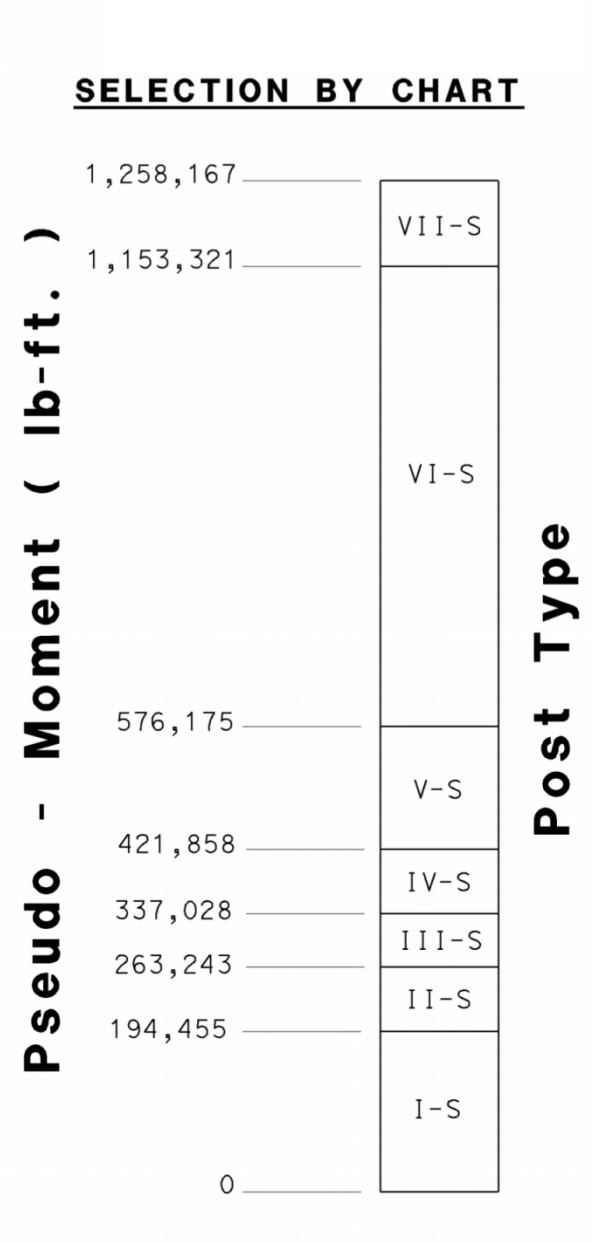

Figure 2: Post Type Selection for Two Post Truss Using Pseudo-Moment