

STRAIN POLE DESIGN CRITERIA:

THE DESIGN OF THE STRAIN POLE STRUCTURE SHOWN ON SIG-023-A IS BASED ON THE AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, FIRST EDITION (2015), WITH 2017 TO 2022 INTERIM REVISIONS.

THE DESIGN IS BASED ON THE MAXIMUM WIND AREAS AND WEIGHTS SHOWN BELOW IN THE SPAN WIRE LOADING TABLE. THE SUM OF THE WEIGHTS AND AREAS (VIEWED PERPENDICULAR TO THE SPAN) OF ALL SIGNALS, SIGNS, DEVICES AND OTHER EQUIPMENT SUPPORTED ON EACH SPAN MUST BE LESS THAN THE MAXIMUM VALUES SHOWN. THE SPAN LENGTH IS DEFINED AS THE STRAIGHT HORIZONTAL DISTANCE BETWEEN POLES.

THE STRAIN POLE STRUCTURES SHOWN ON SIG-023-A ARE ONLY INTENDED TO BE USED WITH THE FOUNDATION DESIGNS SHOWN ON SIG-DESIGN-154-A.

LOAD PARAMETERS:

WIND LOAD (EXTREME EVENT LIMIT STATE): 1700-YEAR MRI BASIC WIND SPEED
MAP, 120 MPH DESIGN WIND SPEED

WIND LOAD (SERVICE I EVENT LIMIT STATE): 10-YEAR MRI BASIC WIND SPEED
MAP, 76 MPH DESIGN WIND SPEED

HEIGHT AND EXPOSURE FACTOR (K_z): K_z IS CALCULATED USING A HEIGHT (Z) MEASURED FROM TOP OF THE DRILLED SHAFT (IT IS ASSUMED THAT THE POLE IS GROUND-MOUNTED).

DIRECTIONALITY FACTOR (K_d): 0.85

GUST EFFECT FACTOR (G): 1.14

WIND DRAG COEFFICIENT FOR WIND AREA (C_d): 1.2

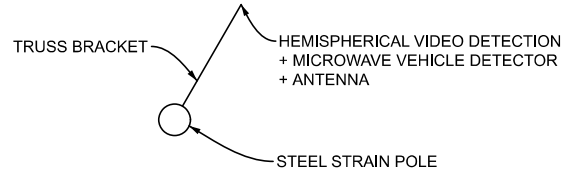
WIRE SAG: 5%

STRAIN POLE LOADING: SEE SPAN WIRE LOADING TABLE BELOW.

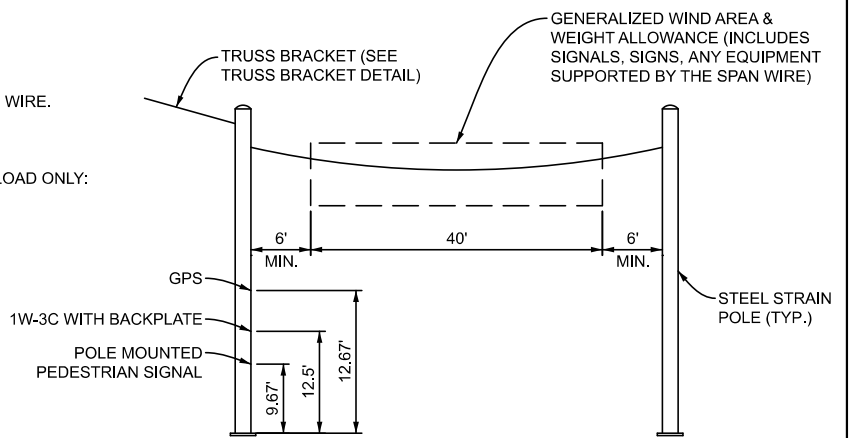
SPAN WIRE + ELECTRIC CABLES WEIGHT: 0.599 LB/FT FOR 5/16" SPAN WIRE.

SERVICABILITY PARAMETERS:

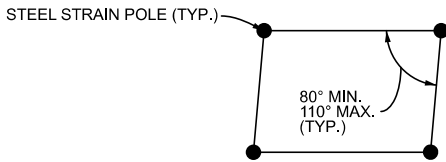
LIMIT FOR HORIZONTAL DEFLECTION AT TOP OF POLE UNDER DEAD LOAD ONLY:
2.5% OF POLE HEIGHT



1 DETAIL - TRUSS BRACKET



2 DETAIL - STRAIN POLE LOADING ELEVATION VIEW



NOTES:

1. SEE SIG-023-A FOR POLE SIZES.
2. USE THE LONGEST CONNECTED SPAN FOR DRILLED SHAFT LENGTH SELECTION.
3. ANGLE BETWEEN TWO ADJACENT SPANS MUST BE BETWEEN 80 DEGREES AND 110 DEGREES.
4. TIE-OFFS ARE NOT ALLOWED.

3 DETAIL - STRAIN POLE CONFIGURATION

FIELD DRILLED HOLE SIZE	SPAN LENGTH	WEIGHT OF GENERALIZED LOAD (LBS)**	MAX PERP. WIND AREA (SFT)**
NO FIELD DRILLED HOLE	UP TO 100 FT	171.0	27.4
	101 FT TO 120 FT	171.0	27.4
	121 FT TO 150 FT	171.0	27.4
3.5" DIAMETER	UP TO 100 FT	136.8	21.9
	101 FT TO 120 FT	136.8	21.9
	121 FT TO 150 FT	136.8	21.9
4.5" DIAMETER	UP TO 100 FT	124.0	19.9
	101 FT TO 120 FT	124.0	19.9
	121 FT TO 150 FT	124.0	19.9

**WEIGHTS AND AREAS INCLUDE ALLOWANCE FOR SIGNALS, SIGNS, AND ANYTHING ELSE CARRIED BY THE CABLES. THESE WEIGHTS AND AREAS APPLY TO TETHERED AND UNTETHERED SPANS.

EQUIPMENT	WEIGHT LBS	AREA SFT
ANTENNA	20	0.09
GPS MODULE	30	0.75
POLE MOUNTED PEDESTRIAN SIGNAL	25	1.78
1W-3C SIGNAL (WITH BACKPLATE)	43	8.67
18' STEEL TRUSS BRACKET	106	7.29
HEMISPHERICAL VIDEO DETECTION	22	2.11
MICROWAVE VEHICLE DETECTOR	4	0.97

SEE ELEVATION VIEW FOR EQUIPMENT MOUNTING LOCATIONS.

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
TRAFFIC SIGNAL STRAIN POLE - 36" DIA FOUNDATION
LOADING TABLE AND DESIGN CRITERIA

(SPECIAL DETAIL)
FHWA APPROVAL

05/17/24
PLAN DATE

SIG-022-A

SHEET
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