Index 641-010 Concrete Poles

Design Criteria

AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals (LRFDLTS-1); ***Structures Manual (SM)***, Volume 3, FDOT Modifications to LRFDLTS-1; ***Structures Manual (SM)***Introduction, I.6 References; ***FDOT Design Manual (FDM)***

Design Assumptions and Limitations

See ***FDM 261*** and ***Structures Manual (SM)***,Volume 3 for additional design criteria.

The following computer-based design program is available for use on the **Structures Design Office Website:**

- *University of Florida Bridge Software Institute ATLAS Program v7 or higher*.

For Pole Types P-III through P-VIII, design poles within the following limits:

- 30 ft. ≤ Length (L) ≤ 65 ft.
- Pole Height (H) ≤ 50 ft.

Foundations may be designed assuming a 3'-6" diameter (See ***Specification 641***). The minimum foundation depths for Concrete Poles are as follows:

- Pole Types P-III through P-V 7 feet
- Pole Types P-VI 8 feet
- Pole Types P-VII through PVIII 9 feet

Foundations are designed using the following soil criteria:

Classification: Cohesionless (Fine Sand)

Friction Angle: 30 Degrees

Unit Weight: 50 lbs/cubic foot (assumed submerged)

For Pole Types P-II and P-III, nominal moment capacity may be estimated as:

$$M_n(\text{estimate}) = A_{ps} \cdot f_{pu} \cdot d_p \cdot \left[1 - 0.59 \left(\frac{A_{ps}}{b \cdot d_p} \right) \cdot \left(\frac{f_{pu}}{f_c} \right) \right]$$

Note: Refer to ***LRFD Bridge Design Specifications*** for definition of variables.

Determine maximum loads to be placed on poles, and select the required pole type meeting the requirements of **Table 641-1** (shown on the next page).

Plan Content Requirements

Complete the "*Strain Pole Schedule*" provided with the FDOT CAD Bar Menu, Linked Data Manager, and include in the Roadway Plans.

Signalization Plans:

See the ***FDM 941***. Include poles in "*Tabulation of Quantities"*.

Table 641-1

Factored Flexural Resistance $M_r = Ø\ M_n$* at Finished Grade

H (feet)	Type of Strain Pole				
	P-IV (kip-ft)	P-V (kip-ft)	P-VI (kip-ft)	P-VII (kip-ft)	P-VIII (kip-ft)
20	84	150	184	263	350
22	88	155	190	271	359
24	92	161	195	279	368
26	96	166	201	286	378
28	100	172	207	294	387
30	104	178	212	301	397
32	109	183	218	309	406
34	113	189	224	316	415
36	117	195	229	324	425
38	121	200	235	332	434
40	125	206	241	339	443
42	130	212	246	347	453
44	134	217	252	354	462
46	138	223	257	362	471
48	142	228	263	369	481
50	146	234	269	377	490

* $M_r \geq Mu$

Payment

Item number	Item Description	Unit Measure
641-2-AB	Prestressed Concrete Poles	EA

See the ***BOE*** and ***Specification 641*** for additional information on payment, pay item use and compensation.