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## POLE SPECIFICATIONS

### Structural Design

The pole standards presented by Maverick Poles and Structure, LLC are designed to meet AASHTO 2002 (American Association of State Highway and Transportation Officials) design criteria.

The wind load effects have been analyzed with wind velocities ranging from 90 to 140mph. Due to varying wind effects, height correction factors and drag coefficients have been applied to the entire structure. The dead load effects have been determined by using a final deflected position analysis to account for secondary moments caused by eccentric dead loads. These combined loading effects have been used to determine the maximum allowable loading capabilities.

These maximum loading capabilities include an appropriate factor of safety which is based upon the nationally recognized AASHTO standard.

### Pole Shaft

Each pole shaft is made from a single ply steel sheet. This steel sheet is formed into a tubular shape with one or more longitudinal welds. No circumferentially welded splices are permitted. This tubular shape has a cross section, which is either multi-sided, round, or square and is either tapered or non-tapered along its length. Standard taper rates include 0.11 inches per foot for square poles and 0.14 inches per foot for round. Multi-sided cross-sections do not utilize a bend radius of less than 2" and do not have a cross-section with less than 12 sides.

The material used for the pole sections meets the requirements of ASTM A500 Grade C, ASTM A595 Grade A, or ASTM A572 Grade 65.

Poles, which exceed 53 feet in length, are designed as two piece pole assemblies. These two piece assemblies are joined together by telescoping the upper "female" section over the lower "male" section by a minimum lap distance of 1.5 times the female inside diameter. The longitudinally welded seam on the female section is welded both inside and out to insure 100% weld penetration at the telescoped area.

Pole assemblies, which exceed 50 feet in height, or are specifically being used for sports applications, are also designed with an internal cable guide and strain relief mechanism, which is typically attached at the mid-height of the pole assembly. This cable guide assembly consists of an offset bar, steel pipe sleeve with internal PVC sheathing to reduce wear, and a hand hole opposite the offset bar for access.

### Hinged Poles

All hinged poles are equipped with a shroud and an external hinge assembly to facilitate lowering the top of the pole for maintenance purposes. The shroud is made of a commercial quality carbon steel which meets the requirements of ASTM A572 Grade 50. The shroud is designed to conform to either a taper or non-tapered square pole and includes a locking device which prevents unauthorized lowering of the pole. The external hinge assembly includes a stainless steel pin.

### Base Plate

Base plates are used for either anchor base or stub base type pole assemblies. These plates are integrally welded to the bottom pole section with either a telescopic weld or a full penetration weld with a back-up bar. All bolt holes are circumferentially slotted to allow for +/- 2.5 degrees rotation for field adjustment.

The material used for these plates will conform to either ASTM A36 or ASTM A572.

### Anchor Bolts

All standard anchor bolts meet the requirements of ASTM F1554. Grade 55. The bolts have a minimum threaded length of at least 6 inches and are galvanized for a minimum of 12" on the threaded end to the requirements of A153. Each anchor bolt is supplied with two hex nuts and two flat washers. All standard anchor bolts have a hooked end on the embedded portion to assist in the development of pull out strength.

### Stub Base

The stub base consists of a steel pipe with an integrally welded flange plate, which conforms to the requirements and dimensions of the aforementioned base plate. The flange plate is mechanically fastened to the base plate with hardware, which meets the requirements of ASTM A325. These bolts include two flat washers and one heavy hex nut. All bolt holes are circumferentially slotted to allow for a +/- 2.5 degrees rotation for field adjustment. The steel pipe used for the stub base will either meet or exceed the requirements of ASTM A53 Grade B. The stub base will have a pair of wire entrances at 180 degrees apart located 24 inches below grade, dependent upon local electrical codes.

### Embedded Poles

Embedded poles will be set directly into the ground by an embedment distance which is equal to 10% of the free pole height, plus 2 feet. The embedded pole will not utilize a stub base or base plates as an anchoring means, but will rest upon a bearing plate which is integrally welded to the bottom of the pole shaft. The embedded portion of the pole, plus 6 inches will be additionally protected with a mastic coating. Two 3" x 5" openings, located 24" below grade and oriented at 180 degrees apart will be provided for wire access.

### Platforms

All service platforms or cages shall be constructed from either tubing or angle material, which meets the minimum requirements of ASTM A53 Grade B and ASTM A36 respectively. Aircraft cable is used for some of the side supports.

Top mounted platforms shall be mechanically attached to the pole with plates meeting the requirements of ASTM A36 and connecting hardware meeting the requirements of ASTM A325.

Side mounted platforms should be mechanically fastened to the pole with plates conforming to ASTM A36 and ubolts fabricated from round stock conforming to ASTM A36. The floor of the platform shall consist of expanded metal grating and should incorporate a hinged door for access to the platform. The hinged door shall be capable of closing prior to unlatching any safety climbing devices.

### Cross Arms

All cross arms shall be constructed from either tubing or angle material, which meets the minimum requirements of ASTM A53 Grade B and ASTM A36 respectively.

Top mounted cross arms shall be mechanically attached to the pole with plates meeting the requirements of ASTM A36 and connecting hardware meeting the requirements of ASTM A325.

Side mounted platforms should be mechanically fastened to the pole with plates conforming to ASTM A36 and ubolts fabricated from round stock conforming to ASTM A36.

### Hand Holes

All hand holes are peripherally reinforced with flat bar which integrally welded to the plate shaft. Each pole will have a 4" x 6.5" reinforced hand hole located 18" above finished grade. Cover plates are included with all hand holes and are attached to the pole with a back bar and screw.

### Protective Coatings

All pole shaft sections are either galvanized or powder coated or a combination of both. Stub base sections are galvanized in accordance with the requirements of ASTM A123. Each shaft assembly is completely coated both inside and out with a single dip. Double dipping will not be permitted in compliance with USGA recommended practices. Embedded portions of all pole shafts and stub bases will be additionally protected with a mastic coating which meets the performance requirements of TT-V-51F Varnish: Asphalt.

Powder coated poles are covered with a urethane polyester powder meeting the requirements of the project specifications and cured in a convection oven at 400 degrees Fahrenheit.

### Welding

All welding is performed by AWS (American Welding Society) certified welders and all welds comply with the most recent edition of the AWS Structural Welding Code.



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