DocuSign Envelope ID: 3ABFDAF7-9184-4E70-9E6E-787C7352EA9E

NCDOT METAL POLE STANDARDS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
DN12132102	Sig.SP 1

STANDARD NOTES FOR METAL STRAIN POLES

GENERAL

1. THESE NOTES PROVIDE INFORMATION AND REQUIREMENTS FOR THE DESIGN, FABRICATION, AND INSTALLATION OF STANDARD METAL STRAIN POLES. THEY ARE TO BE USED BY DESIGN ENGINEERS, CONTRACTORS, AND POLE MANUFACTURERS IN THE SELECTION, FABRICATION, AND INSTALLATION OF METAL TRAFFIC SIGNAL SUPPORTS IN NORTH CAROLINA. THE NOTES ARE CATEGORIZED FOR EASE OF USE, AND ARE NUMBERED CHRONOLOGICALLY. NOTES THAT ARE SPECIFIC TO A PARTICULAR SITUATION, DESIGN DETAIL OR REQUIREMENT ARE SHOWN ON THE APPLICABLE PAGE TO CLARIFY INTENT AND UNDERSTANDING.
2. THE FOLLOWING STANDARD DESIGNS ARE BASED ON LIGHT AND HEAVY LOADING CASES. NO VARIATIONS, SUBSTITUTION OR RE-DESIGN OF THE SPECIFIED POLES AND FOUNDATIONS WILL BE PERMITTED UNLESS IT IS APPROVED BY THE ITS AND SIGNALS UNIT.
3. THESE METAL POLE STANDARDS MAKE REFERENCE TO THE NCDOT "ROADWAY STANDARD DRAWINGS" DATED JANUARY 2012 HEREINAFTER REFERRED TO AS THE STANDARD DRAWINGS AND TO THE NCDOT "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012 HEREINAFTER REFERRED TO AS THE STANDARD SPECIFICATIONS. IF THERE IS A DISCREPANCY BETWEEN THE STANDARD DRAWINGS/SPECIFICATIONS AND THESE STANDARDS, THEN THESE DRAWINGS AND PROJECT SPECIAL SPECIFICATIONS SHALL GOVERN.
4. POLE CASES PREAPPROVED ON THE ITS & SIGNALS QUALIFIED PRODUCTS LIST (QPL) WILL NOT REQUIRE MANUFACTURER'S CALCULATIONS. HOWEVER, CERTIFICATION OF COMPLIANCE WITH THE MANUFACTURER'S PREAPPROVED SHOP DRAWING ON FILE WITH THE DEPARTMENT SHALL BE FURNISHED TO THE ENGINEER. IF POLE CASES ARE NOT ON THE QPL, OR VARIATIONS TO A CASE STANDARD HAS BEEN APPROVED, MANUFACTURER'S SHOP DRAWINGS SHALL BE REQUIRED.

DESIGN CRITERIA

1. THE METAL POLE DESIGN SHALL CONFORM TO THE "2013 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS" AND LATEST APPROVED INTERIM SPECIFICATIONS. DESIGN WIND PRESSURES AND APPLICATIONS ARE IN ACCORDANCE WITH SECTION 3.8 AND 3.9 OF THE 2013 AASHTO SPECIFICATIONS.
2. 2 PLY POLES ARE NOT ACCEPTABLE. EXCEPTIONS TO THIS DESIGN PARAMETER WILL BE DUE TO THE USE OF DECORATIVE POLES.
3. THESE STRAIN POLE STANDARDS ALLOW FOR SIGNAL HEADS TO BE PLACED ANYWHERE ALONG THE SPANWIRE. THE MOST CRITICAL LOCATIONS ARE SHOWN IN THE TYPICAL INTERSECTION LOADING CASES SHOWN ON DRAWING SP8-SP12 (LOAD CASE AND DESIGN DETAILS SHEET) OF THESE STANDARDS. FOR DESIGN PURPOSES, USE 4% SAG FOR THE SPANWIRE. ROADWAY DESIGN CLEARANCE RANGE FROM BOTTOM OF SIGNAL HEADS TO PAVEMENT IS 17 FEET.
4. PROVISIONS SHALL BE MADE FOR DRAINAGE OF WATER FROM INSIDE THE METAL POLE.

POLE MATERIALS

1. PROVIDE MATERIALS FOR STEEL METAL POLES THAT COMPLY WITH SECTION 1072 AND 1098 OF THE STANDARD SPECIFICATIONS AND PER THE LATEST PROJECT SPECIAL PROVISIONS.

   POLE MONOTUBE SHALL:
   - GALVANIZE ALL ITEMS OF THE SIGNAL SUPPORT STRUCTURE PER AASHTO M111.
   - USE ASTM A595 MATERIAL (55 KSI) OR EQUIVALENT AS APPROVED BY THE ENGINEER.
   - HAVE A LINEAR TAPER OF 0.14 IN/FT.
2. BASE PLATE SHALL:
   - CONFORM TO ASTM A572 GR 50 OR EQUIVALENT.
   - MECHANICALLY GALVANIZED IN ACCORDANCE WITH AASHTO M111.
3. ANCHOR BOLTS, NUTS, AND WASHER MATERIAL:
   - ANCHOR BOLTS - USE AASHTO M 314 GRADE 55 MATERIAL OR APPROVED EQUIVALENT.
   - NUTS - USE AASHTO M291 GRADE 2H, DH, OR DH3 MATERIAL OR APPROVED EQUIVALENT.
   - WASHERS - USE AASHTO M293 MATERIAL OR EQUIVALENT.
4. ALL ANCHOR BOLTS, NUTS, WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M232 OR M298.

POLE FABRICATION

1. ALL OTHER STEEL HARDWARE MATERIAL REQUIRED BUT NOT SPECIFIED ABOVE SHALL COMPLY WITH SECTIONS 1072 AND 1098 OF THE STANDARD SPECIFICATIONS.
2. POLE ASSEMBLIES SHALL BE PERMANENTLY TAGGED OR ENGRAVED WITH THE FOLLOWING:
   - POLE MANUFACTURERS NAME
   - MANUFACTURE DATE
   - POLE CASE NUMBER
   - THICKNESS AND GRADE OF STEEL
3. FOR MANUFACTURING THE METAL POLE THE FOLLOWING CRITERIA MUST BE ADHERED TO:
   - THE METAL POLES SHALL NOT BE SPLICED WITHIN 5 FEET FROM BASE NOR WITHIN 2 FEET FROM ANY CONNECTION.
   - ONLY ONE SPLICE PER UPRIGHT WILL BE PERMITTED.
   - THE QUALITY CONTROL AND WORKMANSHIP OF THE SPLICE WELDS ARE THE SOLE RESPONSIBILITY OF THE POLE MANUFACTURER.
   - CIRCUMFERENTIAL WELDING OF THE POLES IS NOT ALLOWED.
4. ALL WELDS SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF THE AWS D1.1 STRUCTURAL WELDING CODE-STEEL.
5. PROVIDE 2- 3" FACTORY DRILLED HOLES THROUGH THE POLE WALL FOR WIRE ENTRANCE ACCESS TO THE TERMINAL STRIP INSIDE THE TERMINAL COMPARTMENT. THE HOLES SHALL BE IN THE CENTER OF THE TERMINAL COMPARTMENT (0 DEGREES ON THE POLES RADIAL INDEX) LOCATED AT 26" AND 36" FROM THE BASE OF THE POLE. SEE DRAWING Sig.SP4 (POLE FABRICATION DETAILS) OF THESE METAL POLE STANDARDS FOR GRAPHIC DETAILS.
6. THE METAL POLE SHALL BE FABRICATED WITH 3-2" THREADED HALF COUPLINGS AND 1-1" THREADED HALF COUPLING INSTALLED 9" FROM THE TOP OF THE POLE TO RECEIVE THE WEATHERHEADS FOR SIGNAL WIRE ENTRANCES TO THE POLE. THE HALF COUPLINGS SHALL BE WELDED AT NO LESS THAN A 45 DEGREE ANGLE FROM HORIZONTAL TO PROPERLY INSTALL THE WEATHERHEADS. THE 1" HALF COUPLING FOR ELECTRICAL SERVICE ENTRANCE SHALL BE LOCATED AT 0 DEGREES ON THE POLES RADIAL INDEX. ALL OTHER 2" HALF COUPLINGS SHALL BE LOCATED AT 90 DEGREE INCREMENTS. PROVIDE WEATHER TIGHT BUSHING CAPS FOR ALL HALF COUPLINGS. REFER TO DRAWING Sig.SP4 (POLE FABRICATION DETAILS) OF THESE METAL POLE STANDARDS FOR GRAPHIC DETAILS.
7. PROVIDE A FACTORY STANDARD "C" HOOK FOR CABLE SUPPORT WELDED INSIDE THE TOP OF THE POLE AT 225 DEGREES ON THE POLES RADIAL INDEX. REFER TO DRAWING M3 (POLE FABRICATION DETAILS) OF THESE METAL POLE STANDARDS FOR DETAILS.
8. FOR ALL OTHER NON-STRUCTURAL DETAILS AND REQUIREMENTS, REFER TO APPLICABLE SECTIONS OF THESE STANDARDS, THE TRAFFIC SIGNAL PLANS AND SPECIFICATIONS.
9. AT THE TIME OF SHIPMENT FROM THE FACTORY, ENSURE THE POLE IS PACKAGED SO THAT WATER CAN NOT GET INSIDE THE POLE.
10. SHIP ALL POLE ACCESSORIES FOR EACH POLE IN A SEPARATE WATERTIGHT CONTAINER WITH A LABEL THAT IDENTIFIES THE SPECIFIC POLE AND DESCRIBES THE CONTENTS.

https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS and Signals Unit
750 N.Greenfield Pkwy.
Garner,NC 27529

Designed in conformance with the latest 2015 Interim to the 6th Edition 2013
AASHTO
Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals

INDEX OF PLANS

DRAWING No.	DESCRIPTION
Sig.SP 1–2	Standard Strain Pole Notes
Sig. SP 3–7	Statewide Wind Zones
Sig.SP 8	ZONE 1 140 MPH
Sig.SP 9	ZONE 2 130 MPH
Sig.SP 10	ZONE 3 110 MPH
Sig.SP 11	ZONE 4 90 MPH
Sig.SP 12	ZONE 5 120 MPH

NCDOT CONTACTS:
MOBILITY AND SAFETY DIVISION – ITS AND SIGNALS UNIT

G. A. FULLER, P.E. – STATE ITS AND SIGNALS ENGINEER
G. G. MURR, JR., P.E. – STATE SIGNALS ENGINEER
D.C. SARKAR, P.E. – ITS AND SIGNALS SENIOR STRUCTURAL ENGINEER
C.F. ANDREWS – ITS AND SIGNALS JOURNEY STRUCTURAL ENGINEER

SEAL

DocuSigned by:
Debesh C Sarkar 8/2/2016
SIGNATURE DATE
442E2E2E147E4C4...