METAL POLE No. 1 & 2	PROJECT REFERENCE NO.	SHEET NO.
	33879.2.91	ITS-15

Design Loading for Metal Pole #1 with Folding Mast Arm

Elevation View

Design Loading for Metal Pole #2 with Folding Mast Arm

Elevation View

SPECIAL NOTES

1. The contractor is responsible for determining the mast arm attachment height (H1). Ensure that the mast arm attachment height will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval.
2. ALPRs and Infrared Illuminators are shown on top of the mast arm for illustration purposes. If the contractor elects to install these devices under the mast arm then, the 20 Ft. roadway clearance applies to the lowest device.

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	SIZE	WEIGHT
	TRANSPONDER READER	6.5″ W x 4.5″ L x 4.0″ D	7 LBS
	LICENSE PLATE READER CAMERA	13.0″ W x 6.0″ L x 5.5″ D	6 LBS
	INFRARED ILLUMINATOR	3.0″ W x 3.0″ L x 3.0″ D	5 LBS

POLE RADIAL ORIENTATION

8 BOLT BASE PLATE DETAIL

See Note 5

BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

NOTES

Design Reference Material

1. Design the metal pole structure and foundation in accordance with:
   - The 6th Edition, 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2018 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the ITS and Signals project special provisions.
   - The 2018 NCDOT Roadway Standard Drawings.
   - The project plans and special provisions.
   - The NCDOT "Metal Pole Standards" located at the following NCDOT website: https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

Design Requirements

2. Design the metal pole structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads".
3. Design all metal pole supports using stress ratios that do not exceed 0.9.
4. The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded or any other load condition.
5. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
6. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Attachments to the mast arm are rigid mounted and vertically centered on the arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is .75 feet above the ground elevation.
7. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus ½ of the total height of the mast arm attachment assembly plus 1 foot.
8. If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the ITS & Signals Structural Engineer for assistance at (919) 814-5000.
9. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the attached equipment over the roadway.
10. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NCDOT Wind Zone 4 (90 mph)

Prepared in the Offices of:
Transportation Mobility and Safety Division
Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

METAL POLE WITH MAST ARM

DIVISION 11 SURRY CO. MT. AIRY

PLAN DATE: DECEMBER 2019 REVIEWED BY:

PREPARED BY: A. J. SKUCE

SCALE: NOT TO SCALE

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGAN

DocuSigned by: Kevin Durigan 12/11/2019
SIGNATURE DATE