

\*\*\*\*\*  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
NASA-16126 (September 1999)  
NASA - KSC  
Superseding NASA-16126  
(September 1994)  
\*\*\*\*\*

SECTION TABLE OF CONTENTS

DIVISION 16 - ELECTRICAL

SECTION 16126

WIRING SYSTEMS (COMMUNICATIONS)

09/99

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 GENERAL REQUIREMENTS
- 1.3 SUBMITTALS

PART 2 PRODUCTS

- 2.1 INNER DUCT
- 2.2 DUCT SEALS
- 2.3 CABLE RACK HOOKS
- 2.4 CABLE TIES

PART 3 EXECUTION

- 3.1 DUCTS AND INNER DUCT
- 3.2 INSTALLATION
- 3.3 CABLE RACK HOOKS
- 3.4 CABLE SUPPORT
- 3.5 CABLE TIES

-- End of Section Table of Contents --

\*\*\*\*\*  
NASA-16126 (September 1999)  
NATIONAL AERONAUTICS NASA - KSC  
AND SPACE ADMINISTRATION Superseding NASA-16126  
(September 1994)  
\*\*\*\*\*

SECTION 16126

WIRING SYSTEMS (COMMUNICATIONS)  
09/99

\*\*\*\*\*  
NOTE: Delete, revise, or add to the text in this section to cover project requirements. Notes are for designer information and will not appear in the final project specification.

This section covers basic wiring materials and methods applicable to most types of electrical construction for small jobs.

\*\*\*\*\*

PART 1 GENERAL

1.1 REFERENCES

\*\*\*\*\*  
NOTE: The following references should not be manually edited except to add new references. References not used in the text will automatically be deleted from this section of the project specification.

\*\*\*\*\*

The publications listed below form a part of this section to the extent referenced:

U.S. AIR FORCE TECHNICAL ORDERS (TO)

TO 31W3-10-12 (1986) AF Communications Service Standard  
Installation Practices, Outside Plant  
Cable Placement

1.2 GENERAL REQUIREMENTS

\*\*\*\*\*  
NOTE: If section 16003 "General Electrical Provisions," is not included in the project specification, applicable requirements therefrom should be inserted and the following paragraph deleted.

\*\*\*\*\*

Section 16003, "General Electrical Provisions," applies to work specified in this section.

### 1.3 SUBMITTALS

\*\*\*\*\*  
NOTE: Review submittal description (SD) definitions in Section 01330, "Submittals," and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control. Include a columnar list of appropriate products and tests beneath each submittal description.  
\*\*\*\*\*

The following shall be submitted in accordance with Section 01330, "Submittals," in sufficient detail to show full compliance with the specification:

#### SD-03 Product Data

Manufacturer's catalog data shall be submitted for the following items:

Inner Duct  
Duct Seals  
Cable Rack Hooks  
Cable Ties

## PART 2 PRODUCTS

### 2.1 INNER DUCT

Inner duct shall be [Sterling Engineered Products, Inc., Part No. PE5007] [\_\_\_\_\_] or equal, and installed in continuous lengths.

Inner duct shall be four channels of polyethylene with a nominal 1 inch 25 millimeter size.

### 2.2 DUCT SEALS

Duct seal shall be [Insta-Foam] [\_\_\_\_\_] or equal. Fire stop sealant shall be silicon foam [Insta Fire Seal] [\_\_\_\_\_] or equal. Both are manufactured by [Insta-Foam Products, Inc., Joliet, Illinois, 60435] [\_\_\_\_\_] or approved equal.

### 2.3 CABLE RACK HOOKS

Contractor shall provide the necessary cable rack hooks compatible with the existing cable racks to support the cable and its associated splice cases in manholes, vaults, and terminal rooms. These cable hooks shall be hot-dipped galvanized, cut from channel steel with rounded top surface 1-1/2 inches 38 millimeter wide, [A.B. Chance Co. No. 1133] [\_\_\_\_\_] or approved equal.

### 2.4 CABLE TIES

Cable ties shall be PVC material made by [Ty-Rap] [\_\_\_\_\_] or equal.

## PART 3 EXECUTION

### 3.1 DUCTS AND INNER DUCT

The assigned 4 inch 100 millimeter existing duct or conduits shall be rodded, cleaned, and tested for alignment in a manner equivalent to that specified in TO 31W3-10-12 before pulling in the inner duct. Contractor shall have a second winch line connected to the trailing end of any duct cleaning/aligning device to facilitate removal in the event such device becomes stuck. Under no circumstances will the Contractor be allowed to abandon a stuck cleaning/aligning device in a vacant duct.

When immovable objects are encountered in the duct run, items such as duct scoops, pickup, jar hammers and wire brushes shall be used with chains and cleaners to clear duct in accordance with TO 31W3-10-12. Mechanical rodding equipment with proper sized cutting tools and water pressure equipment shall be used as necessary to clean and align the defective or blocked orangeburg or other duct.

Inner duct shall be pulled through existing duct-manholes system in continuous sections. Exact required inner duct lengths shall be field-measured by the Contractor. Inner duct shall be continuous with no splices, joints, couplings, or connections of any type. Inner duct shall be sealed with polyurethane foam, or approved equal and placed between the inner duct and duct. In those inner duct in which cables are placed, this material shall also be placed between the cable and the inner duct. Only one cable shall be installed in a given inner duct. Existing and new unoccupied inner duct shall be trimmed leaving 12 inches 300 millimeter exposed in manholes and floor vaults and sealed with urethane foam.

### 3.2 INSTALLATION

The assigned 4-inch 100 millimeter duct shall be rodded, cleaned, and tested for alignment in accordance with TO 31W3-10-12, before installing the inner duct. Mechanical equipment with winch lines shall be used at both ends of the section to be rodded which will work the line back and forth through the duct. The 4-inch 100 millimeter existing concrete reinforced duct system at KSC does not contain pulling lines and may contain orangeburg material. Some sections may require mechanical rodding equipment with cutting tools and water pressure equipment to clean and align the duct.

### 3.3 CABLE RACK HOOKS

Cable rack hooks shall be used to support and secure the cable. Where the specified method of support is not indicated, adequate support and fasteners shall be used to secure the cable in a stable position.

Contractor shall provide two cable rack hooks per manhole as a minimum.

### 3.4 CABLE SUPPORT

Where the specific method of support is not indicated, adequate support and fasteners shall be used to secure the cable in a stable position.

### 3.5 CABLE TIES

Cable Ties: Contractor shall provide the necessary length and width cable ties to properly secure and support the cable, splice cases and associated items.

-- End of Section --