SOUTH FLORIDA RAIL CORRIDOR DESIGN & CONSTRUCTION STANDARDS - WIRELINES

Scope

A. These Standards shall apply to the design of electric wires and cables (power or communication) which are to be located over, under, across, or upon property owned by the Florida Department of Transportation (FDOT) for the South Florida Rail Corridor (SFRC).

B. It is to be clearly understood that FDOT owns its SFRC right-of-way for the primary purpose of operating a railroad. All occupancies shall therefore be designed and constructed so that rail operations and facilities are not interfered with, interrupted, or endangered. In addition, the proposed facility shall be located to minimize encumbrances to the right-of-way so that the railroad will have unrestricted use of its property for current and future operations.

Definitions

Owner/Applicant	Individual, Corporation, Municipality, or other public or private entity desiring occupancy of SFRC property.
Siding or Industry Tracks	Tracks located off the SFRC right-of-way serving an industry
SFRC	South Florida Rail Corridor
SFRTA	South Florida Regional Transportation Authority

Application for Occupancy

A. Owner (Applicant) desiring occupancy of SFRC property by wireline occupation must agree to approval by SFRTA of all engineering and construction details and execution of an appropriate FDOT Utility Permit.

B. The SFRTA Application for Facility/Utility Installations and information may be secured from the SFRTA website at www.sfrta.fl.gov .

C. All requirements for securing FDOT Utility Permits and FDOT General Use Permits for construction are outlined on the SFRTA website.

Site Inspections

A. For longitudinal occupancy of SFRC property, a site inspection along the proposed wireline route may be required before final design plans are prepared. When a site inspection is required, the Applicant and/or the engineer must meet with an SFRTA representative to view the entire length of the proposed occupancy; the Applicant will be informed of the need for a meeting during the application process.

B. Prior to the site inspection, the Applicant must submit the following information:

   i. A plan view of the proposed route showing all tracks, the SFRC right-of-way lines, and all other facilities located on the right-of-way. The distance from the proposed wireline to the adjacent track and to the right-of-way must be shown.
   ii. A complete application form.
   iii. Typical cross sections along the proposed route.

C. Site inspections for wireline crossings are not required unless, in the opinion of SFRTA, the size and location of the facility warrant an inspection.

Design and Construction Requirements

A. Overhead power and communication lines shall be designed and constructed in accordance with the National Electrical Safety Code (current edition), Part 2, " Safety Rules for the Installation and Maintenance of Overhead Electric Supply and Communication Lines", except where more conservative requirements are noted within this document.

B. All underground installations carrying power or communication wires and cables shall be constructed and properly marked with signs, in accordance with latest "SFRC Design and Construction Standards – Pipelines".

C. Safety Requirements

   i. All operations shall be conducted so as not to interfere with, interrupt, or endanger the operations of the trains or damage, destroy, or endanger the integrity of railroad facilities. All work on or near SFRC property shall be conducted in accordance with SFRC safety rules and regulations. Specifically all applicant employees and agents, while on SFRC property, shall be required to wear an orange hard hat, safety glasses with side shield, 6" lace up boots with a distinct

heel, shirts with sleeves, and long pants. Additional personal protective equipment may be required for certain operations including abrasive cutting, use of torches, use of chainsaws, etc. The contractor and its employees shall comply with the SFRC safety rules at all times while occupying SFRC's property. Operations will be subject to SFRTA and FDOT inspection at any and all times.

ii. All cranes, lifts, or other equipment that will be operated in the vicinity of the railroad's electrification and power transmission facilities shall be electrically grounded as directed by SFRC.

iii. Whenever equipment or personnel are working closer than 25 feet from the centerline of an adjacent track, that track shall be considered as being obstructed. In so far as possible, all operations shall be conducted no less than this distance. All operations shall be conducted only with the permission of, and as directed by, a duly qualified SFRTA employee or contractor present at the site of the work. All costs related to railroad protection and flagging will be passed on to the applicant.

iv. Crossing of tracks at grade by equipment and personnel is prohibited except by prior arrangements with, and as directed by, the SFRTA.

Above Ground and Aerial Wirelines

A. The poles or towers supporting the crossing span should be located outside the SFRC right-of-way. If locating the poles or towers outside the right-of-way is not possible, the side (outside edge) clearance of poles and towers from the nearest track rail shall be not less than 25 feet.

B. Crossing poles and towers shall be located as far as practicable from inflammable structures. The space around the poles and towers shall be kept free from underbrush, grass, and other flammable material.

C. Wires and cables running longitudinally along the SFRC right-of-way shall be constructed as close to the right-of-way line as possible, except in cases where doing so will interfere with railroad operations, surface drainage, or soil stability.

D. The minimum distance above top-of-rail for lines carrying voltage is shown in Table 1. Guy wires and suspension cable systems shall be located no closer than 25 feet above the top-of-rail.

Table 1

MINIMUM REQUIREMENTS FOR UNDERCLEARANCE OF WIRES OF VARIOUS VOLTAGES

NOMINAL L-L VOLTAGE	OVERHEAD CLEARANCE	MINIMUM BETWEEN WIRES
0 – 750	27’ – 0”	4’ – 0”
To 15,000	28’ – 0”	6’ – 0”
To 50,000	30’ – 0”	6’ – 0”
69,000	30’ – 8”	6’ – 8”
115,000	32’ – 2”	8 – 2”
138,000	33” – 0”	9’ – 0”
345,000	39’ – 10”	15’ – 10”
500,000	45’ – 0”	21’ – 0”
745,000	53” – 2”	29’ – 2”
765,000	53’ – 10”	29’ – 10”

NOTE: Calculation for overhead clearance is 30 inches plus 0.4 inch for every 1,000 volts over 50,000 volts.

DEFINITIONS:

NOMINAL L-L VOLTAGE - Means Line-to-Line Voltage

OVERHEAD CLEARANCE – The measured distance (in feet) from the top of the highest rail to the bottom of the sag of the bottom wire.

NOTE 1: The minimum clearance between the top wire of any pole line and proposed overhead guy wires shall not be less than 4 feet.

NOTE 2: The minimum clearance from crossing gate tips, cantilever structures, signal masts, signal and other bridges, etc., shall conform to the National Electrical Safety Code, Section 23, Rule 234, but in no case shall the overhead clearance shown in the above table be reduced.

E. For the protection of the wire crossing and railroad pile driver operations, it is preferable that the wire crossing should be located 1,000 feet or more from any railroad bridge, trestle, or large culvert. Where necessary to locate the crossing less than 1,000 feet from such bridge, trestle, or large culvert, the vertical clearance of the wire shall be not less than 50 feet above top of the rail.

F. The poles or structures supporting the crossing span shall be plainly marked with the name, initials, or trademark and the pole numbers, if used, of the Owner. When required by SFRTA, the Owner shall place on all crossing structures located on the property of SFRC, warning signs of approved design.

G. Double cross-arms are required on poles adjacent to the track. Any tower or steel pole foundation design must be accompanied by engineering computations prepared by and signed and sealed by a Professional Engineer licensed to practice in the State of Florida. Any tower or steel pole to be installed on SFRC property must meet or exceed the industry standards regarding design and usage.

H. All work done will be without interfering with SFRC's signal and communications systems and cables.

I. Inductive Interference

   i. An inductive interference coordination study is required for all proposed electrical power longitudinal occupations. This study may also be required for any crossing other than 90 degrees with the track(s).

   ii. All permits covering crossings and longitudinal occupations will include provisions that the owner provides appropriate remedies, at his own expense, to correct any inductive interference with SFRC facilities.

Underground Wirelines

A. General Location of Underground Crossings

   i. The cable or duct system of proposed underground crossings shall be laid as straight and direct as possible between the points where the ground line enters and leaves the SFRC right-of-way.

   ii. Manholes, pull boxes, and terminals in the underground crossings shall be located off the SFRC right-of-way where possible.

B. Construction of Underground Crossings

i. The tops of ducts and cable system structures of underground cable crossings shall be located at a depth of not less than 48 inches below the base of rail and not less than 36 inches below the bottoms of ditches or 48 inches below base of rail for both crossings and/or parallel encroachments, with the lowest depth governing.

ii. Underground crossings of power supply cables with maximum voltage of 750 volts may be installed by pushing a galvanized steel pipe under the tracks at a depth specified above to serve as a conduit, provided such pipe extends at least 15 feet beyond the outside rail on each end of the crossing and the cable is buried at least 48 inches below the base of the rail and 36 inches below the ditch bottoms at all other points on the SFRC right-of-way. Measurements to the end of the conduits shall be to the outside of the rail and made at right angles to the track. Additional lengths shall be required for crossings in fill sections, those at angles of less than ninety degrees and for multi-track crossings. On fill sections, two feet beyond the toe of the slopes or three feet beyond the ditch should be sufficient. All ducts and/or encasements beneath the tracks shall be capable of withstanding Cooper E-80 loading and conform to SFRTA Standards and the current AREMA Manual for Railway Engineering. Any conduits and/or encasements larger than four inches will be governed entirely by the SFRC Pipeline Standards. Jacking or boring installation is preferred, and no water or slurry is to be used in the installation of the encasement.

iii. Underground crossings of communication cables of low voltage shall conform to "ii" above, except that encasement may, at the discretion of SFRTA, be restricted to ten feet beyond the outside rail of spur or sidetracks measured at right angles to the track. As in "ii" above, additional lengths will be required for crossing in fill sections. This applies to crossing paved street sections.

iv. Underground crossings of power supply cables operating above 750 volts will be installed at depths specified above. Between the points where the underground crossing enters and leaves SFRC right-of-way, the cable is to be enclosed in galvanized steel pipe or approved concrete encased duct for mechanical protection of the cable. No unprotected cable on SFRC right-of-way will be permitted.

v. Owners of the cables shall designate the location of such cables by placing and maintaining signs or markers clearly visible on each side of the track, preferably at or near the SFRC right-of-way to aid in the prevention of damage to the cable

as a result of use of the SFRC property. Signs are not required when crossing is located in a public street right-of-way.

vi. The underground crossing is to conform to the requirements of the latest edition of the National Electrical Safety Code as published by the National Standards Institute, Inc. The crossing is also to conform to the requirements of any federal, state, or local laws or regulations of any local code enforcing authority that may be in effect at the time of the installation.

Notification to Proceed with Construction

A. Construction may proceed only after approval of the Application and supporting documentation by SFRTA and issuance of an FDOT Utility Permit.