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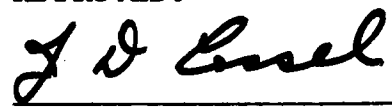
SPECIFICATIONS
FOR
WIRE, CONDUIT AND CABLE OCCUPATIONS
OF
CONSOLIDATED RAIL CORPORATION
PROPERTY

RECOMMENDED:



System Engineer
Design - Structures

APPROVED:



Chief Engineer -
Design & Construction

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1. SCOPE

A. This specification applies to the design of electric wires and cables (power or communication) which are to be located over, under, across or upon property owned by Consolidated Rail Corporation (Conrail). The specification also applies to facilities and tracks owned by others over which Conrail operates its equipment.

2. APPLICATION FOR OCCUPANCY

A. Applications will be accepted from the owner or his designated representative (hereinafter called applicant).

B. Individuals, corporations, municipalities (known as the owner) desiring occupancy of Conrail property by such wire or cable occupations must agree, upon approval of the construction details by the Office of the Chief Engineer-Design & Construction of Conrail, to:

- (1) Execute an appropriate occupational agreement
- (2) Pay any required fees and/or rentals outlined in the agreement.
- (3) Meet all Conrail insurance requirements.

C. Application for an occupancy shall be by letter addressed to the Chief Engineer-Design and Construction, Consolidated Rail Corporation, Room 1200, 15 North 32nd Street, Philadelphia, PA 19104-2849, giving the following:

- (1) Name of individual, corporation or municipality desiring the occupancy.
- (2) Complete mailing address of applicant.
- (3) Name and title of person who will sign the agreement.
- (4) The State in which the applicant is incorporated.

D. All applications shall be accompanied with eight (8) copies of all construction plans and three (3) copies of specifications and computations concerning the proposed occupancy.

3. APPROVAL OF PLANS

A. Entry upon Conrail property for the purpose of conducting surveys, field inspections, obtaining soil information, or any other purpose associated with the design and engineering of the proposed occupancy, will not be permitted without a proper Entry Permit prepared by the Chief Engineer- Design & Construction of Conrail or his designated representative and executed by the applicant. It is to be clearly understood that the issuance of such a permit does not constitute authority to proceed with any actual construction. Construction cannot begin until the owner is in receipt of a fully executed agreement and permission is received from the designated inspection agency of Conrail with authorization to proceed.

B. Plans for proposed wire line or cable occupations shall be submitted to and meet the approval of the Chief Engineer- Design & Construction of Conrail prior to start of construction. Plans are to be prepared in sizes as small as possible and are to be folded to an 8½-inch by 11-inch size (folded dimensions) with a 1½-inch margin on the left-hand side and a 1-inch margin on top so that they can be secured in a file at the upper left-hand corner and still be unfolded to full size without being removed from the file.

Also, after folding, the title block and other identification of the plans shall be visible without the necessity of unfolding at the lower right-hand corner. Each plan shall bear an individually identifying number and an original date, together with subsequent revision dates, clearly identified on the plan so as to be readily apparent as to just what revisions were made and when.

All plans are to be individually folded and where more than one plan is involved, they shall be assembled into complete sets before submission to Conrail.

C. Plans shall be drawn to scale and show the following:
(See Plates I thru V, hereto attached).

- (1) Plan view of crossing or occupation in relation to all Conrail facilities. (Plate I).
- (2) Location of wire or cable (in feet) from nearest Mile Post, centerline of a Conrail bridge (giving Bridge Number), or centerline of an existing or former passenger station. In all cases, the name of the County in which the proposed facilities are to be located must be shown. In States where Townships, Ranges and Sections are used, give distance in feet to the nearest Section Line and identify the Section number, Township and Range.

APPROVAL OF PLANS - CONTINUED

- (3) Profile of ground on centerline of pole or tower line, showing clearances between top of high rail and bottom of sag, as well as clearances from bottom wire or cable to top wire or cable of Conrail's transmission, signal and communication lines, catenary, and third rail when present. If Conrail facilities listed above do not exist at the point of crossing, the plan should so state. Actual vertical clearance shall be shown. (See Plate V for the required overhead clearance.)
- (4) Show all known property lines and Conrail right-of-way lines. If wires, cables or conduits are within public highway limits, such limits shall be clearly indicated with dimensions shown from centerline of road to centerline of proposed poles. (Plate I)
- (5) The plan must be specific, as to:
 - a. Base diameter, height, class and bury of poles. Poles shall be set as close to Conrail's right-of-way line as possible and in no instance closer than 18'-0" from face of pole to centerline of nearest track. When necessary, however, each location will be analyzed to consider speed, traffic, etc.
 - b. Number of size and material of power wires, as well as number of pairs in communication cables.
 - c. Nominal voltage of line.
 - d. Location, number of, size of, material of anchors and all guying for poles and arms.

NOTES: Double cross-arms are required on poles adjacent to track. Any tower or steel pole foundation design must be accompanied by engineering computations and data stamped by a registered professional engineer.

Any tower or steel pole to be installed on Conrail property must meet or exceed the industry standards regarding design and usage.

4. CONSTRUCTION REQUIREMENTS

A. Overhead power and communication lines shall be 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 as outlined in paragraph C (3), Page 3 herein.

B. All underground installations carrying power or communication wires and cables shall be constructed and properly marked with signs, in accordance with "Specifications for Pipeline Occupancy of Consolidated Rail Corporation Property", Conrail Specification CE-8, current edition.

C. Under special conditions, Conrail will give consideration to occupations on its structures, subject to the approval of the Chief Engineer-Design & Construction, and Conrail's policy governing such matters.

5. LONGITUDINAL OCCUPATIONS

A. Feasibility proposals will be accepted for review. Applicant should furnish a letter requesting study along with a plan view showing the extent of the proposed occupation. This feasibility plan may be in the form of a local, county, USGS Map, or drawing, showing the railroad, streets, and highways and other information outlined in item [3C(2)] to clearly identify the location of the project.

B. Arrangements will then be made to furnish the applicant with the appropriate Conrail valuation maps and a right of entry permit. There will be a 'nominal charge' for the necessary valuation maps which depict the railroad right-of-way lines and other facilities. These are the best records we have and may be used for the feasibility proposal. However, Conrail does not warrant the accuracy of these maps and all pertinent information to the occupancy must be verified prior to final submission.

C. Upon receipt of these documents, the applicant must execute the right of entry permit in order to access Conrail property. Such access would allow for verification that the proposed pole locations are feasible and do not interfere with any Conrail facilities. At such a time, the applicant should stake out a few 'key' points along the occupation such as, crossings, alignment, radical changes in alignment, etc.

LONGITUDINAL OCCUPATIONS - CONTINUED

D. Once this temporary stake out is completed, the applicant must submit to Conrail three (3) sets of preliminary plans showing the location of all proposed poles and other information as stated below. Arrangements will then be made for a site investigation by Conrail personnel. The proposed occupation will be field checked to insure compliance with and conformance to this specification. At that time; comments, recommendations, changes to, or approval of, all locations will be made.

E. Wires and cables running longitudinally along Conrail's right-of-way shall be constructed as close to property lines as possible. The following information must be submitted in addition to the detail of the pole top configuration as called for on Plate IV of these specifications:

- a. Voltage of circuit(s) or number of pairs.
- b. Phase of electrical circuit(s).
- c. Number of electrical circuits.
- d. Size (AWG or CM) and material of wires or cables.
- e. Length of spans clearly indicated on drawing.
- f. Any intended future wires or cables

F. Any facilities overhanging Conrail property must have approval of the Chief Engineer-Design and Construction; must confirm to the above specifications and are subject to the appropriate rental charges.

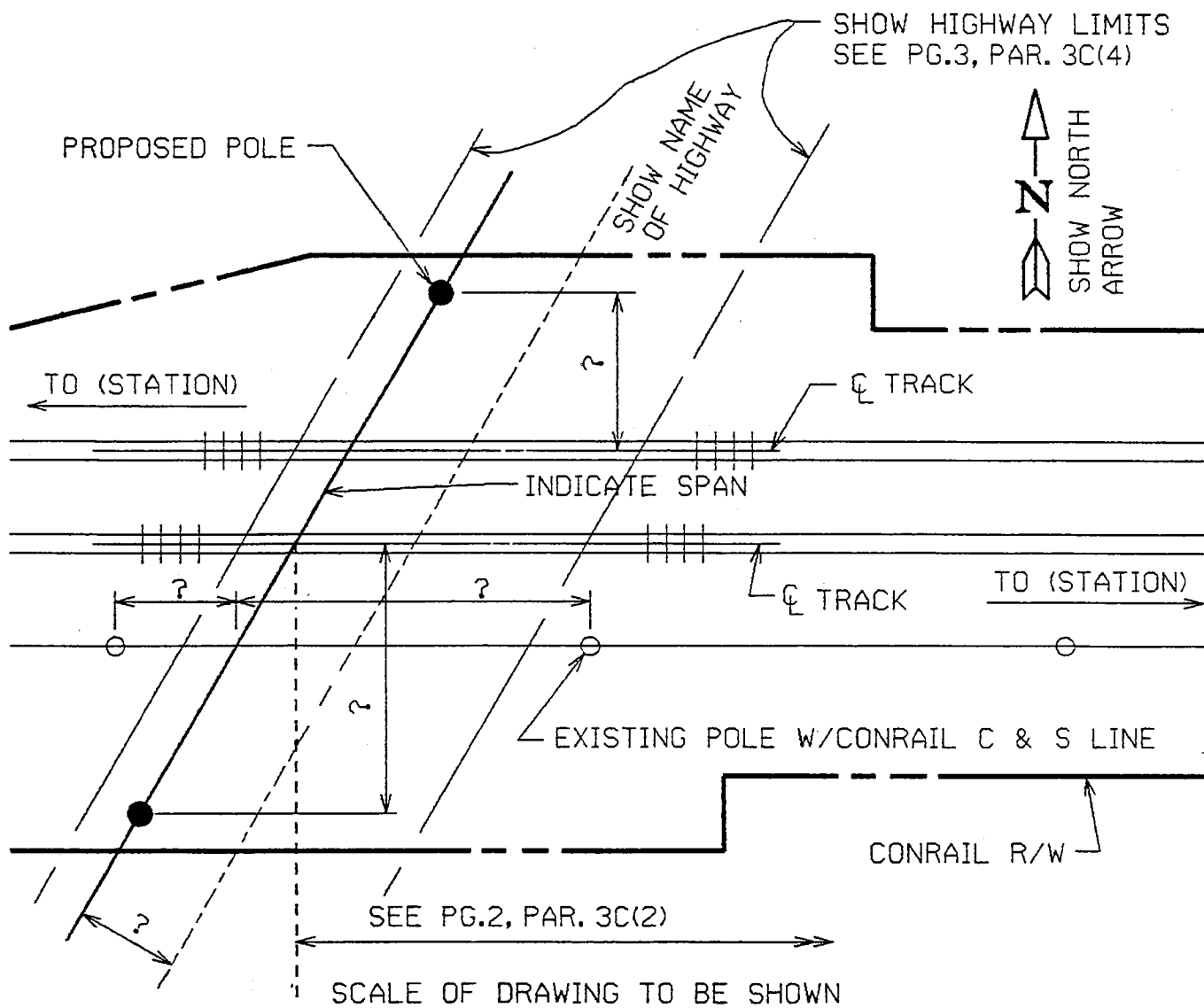
6. INDUCTIVE INTERFERENCE

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

B. All agreements covering crossings and longitudinal occupations, will include provisions that the owner provide appropriate remedies, at his own expense, to correct any inductive interference with Conrail facilities.

PLATE I

INFORMATION TO BE SHOWN ON PLAN VIEW OF DRAWINGS
WHEN FACILITY IS A CROSSING



NOTES:

IF THE PROPOSED LINE IS TO SERVE A NEW DEVELOPMENT, A MAP SHOWING THE AREA IN RELATION TO ESTABLISHED AREAS AND ROADS IS TO BE SENT WITH THE REQUEST.

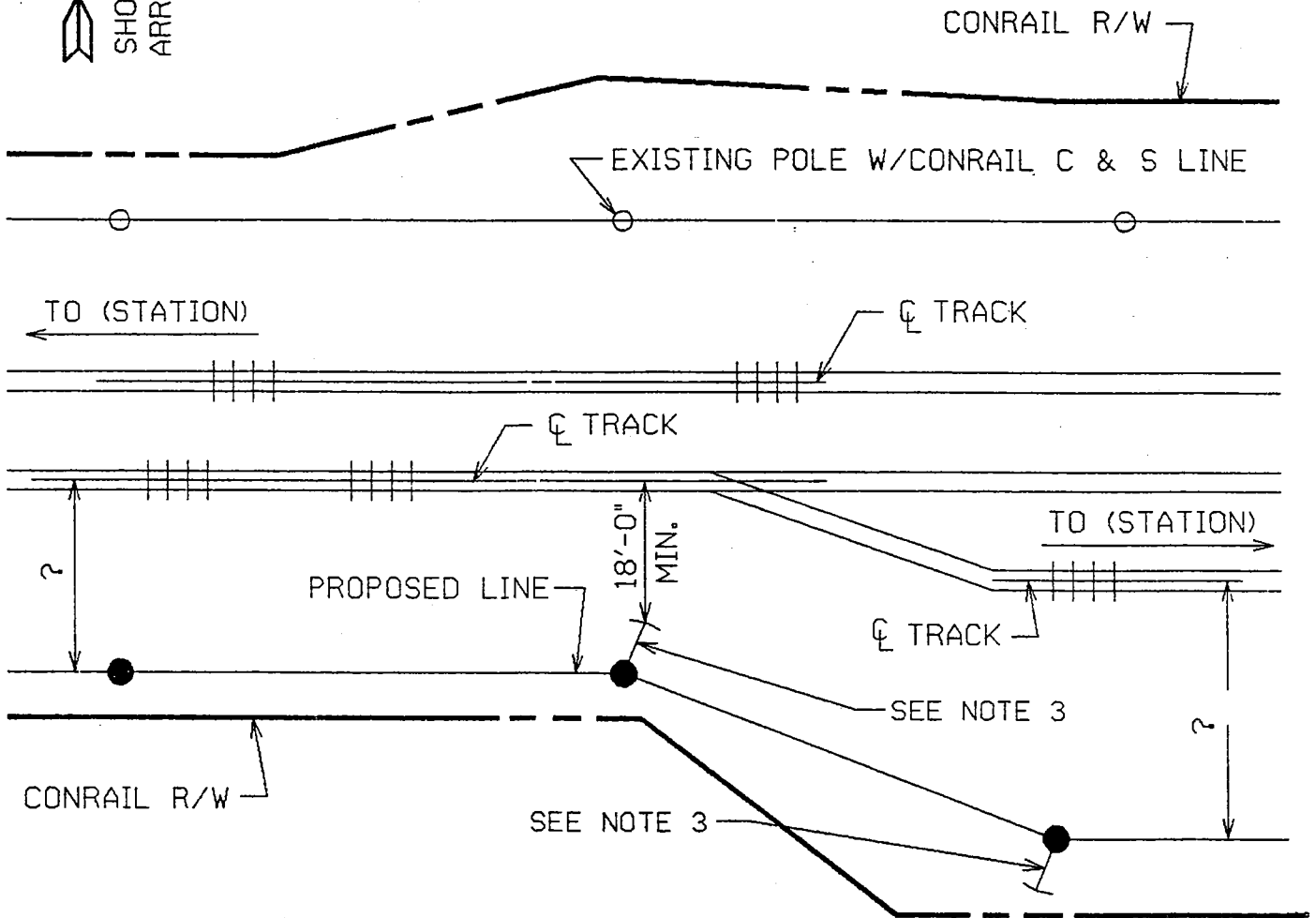
IF THE PROPOSED LINE IS NOT WHOLLY (OR PARTIALLY) WITHIN HIGHWAY LIMITS, THE SAME INFORMATION IS REQUIRED AS SHOWN ON THIS PLATE.

LOCATE CONRAIL'S C & S FACILITIES AT CROSSING, IE, CANTILEVERS, FLASHERS, GATES AND SHOW CLEARANCES FROM EACH FACILITY.

POLES SHALL BE LOCATED AS CLOSE TO THE RIGHT-OF-WAY LINE AS POSSIBLE.

PLATE III

INFORMATION TO BE SHOWN ON PLAN VIEW OF DRAWINGS
WHEN FACILITY IS A LONGITUDINAL OCCUPATION



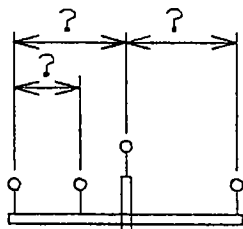
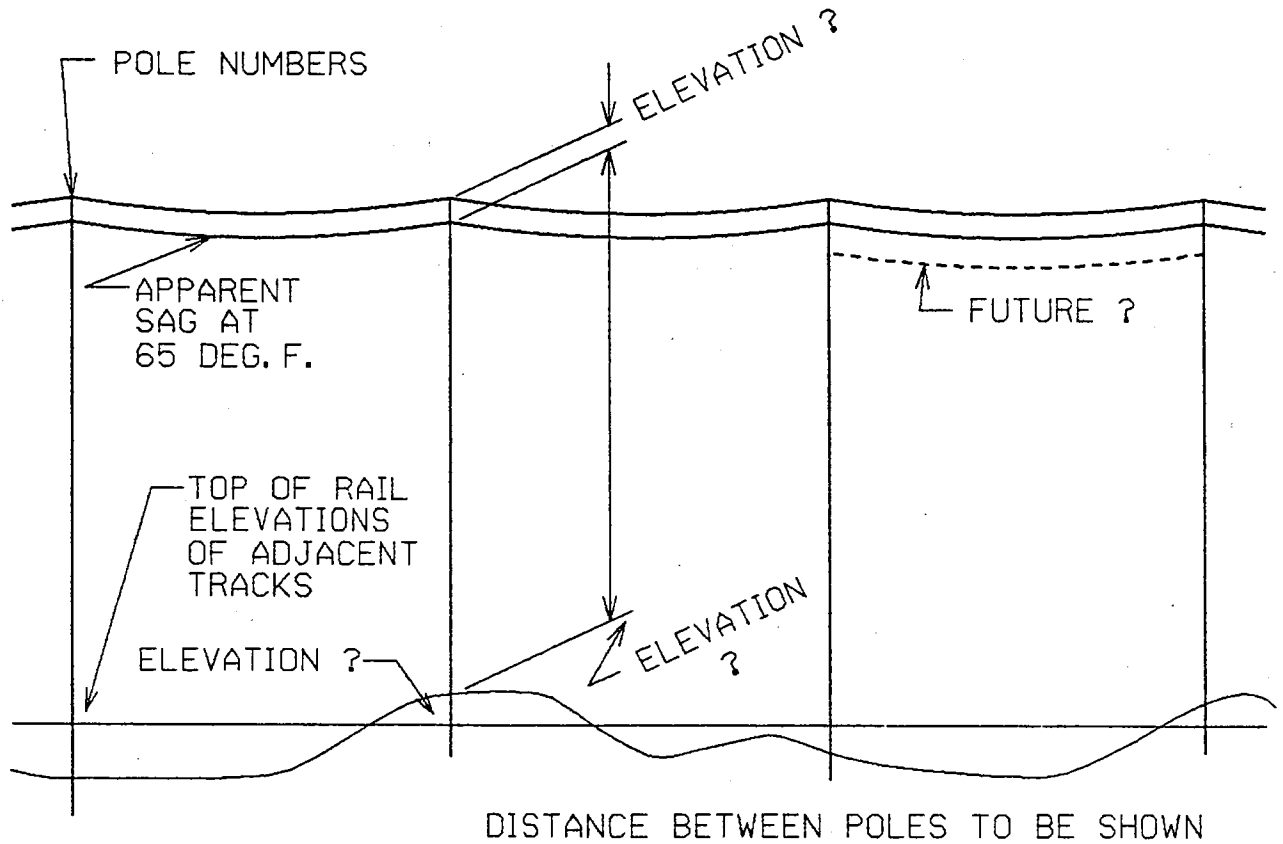
SCALE OF DRAWING TO BE SHOWN

NOTE:

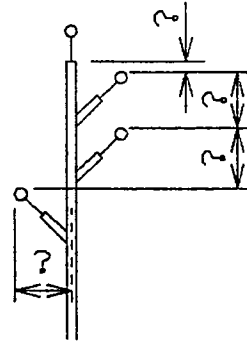
1. EACH END OF THE LINE MUST SHOW MEASUREMENTS AS CALLED FOR ON PG.2, PAR.3C(2).
2. IF POWER LINE CROSSES ANY TRACK, THEN THE INFORMATION SHOWN ON PLATE I IS ALSO REQUIRED.
3. WHERE ANCHOR GUYS ARE REQUIRED, THE MINIMUM CLEARANCE MUST BE 18'-0" FROM FACE OF ANCHOR TO CENTERLINE OF NEAREST TRACK. CROSS SECTIONS MUST BE SUBMITTED FOR ALL ANCHOR LOCATIONS.
4. THE DISTANCE BETWEEN EACH POLE IS TO BE SHOWN.
5. ASSIGNED POLE NUMBERS TO BE SHOWN AT EACH POLE.

PLATE IV

INFORMATION TO BE SHOWN ON PROFILE SECTION OF DRAWINGS
WHEN FACILITY IS A LONGITUDINAL OCCUPATION



LENGTH OF
X ARMS



POLE TOP CONFIGURATION TO BE SHOWN SIMILAR TO SAMPLES ABOVE

NOTE: IF POWER LINE CROSSES ANY TRACK, THEN INFORMATION SHOWN
ON PLATE 2 IS ALSO REQUIRED.

PLATE V

**FOR INFORMATION ONLY
MINIMUM REQUIREMENTS FOR UNDERCLEARANCE
OF WIRES OF VARIOUS VOLTAGES**

<u>NOMINAL L-L VOLTAGE</u>	<u>OVERHEAD CLEARANCE</u>	<u>MINIMUM BETWEEN WIRES</u>
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"

Calculation for overhead clearance is 30'-0" plus 0.4" per 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 high rail to the bottom of sag of the bottom wire at 65°F.

MINIMUM BETWEEN WIRES - The minimum clearance between the top wire of a Conrail pole line and the proposed bottom power wire.

NOTE 1: The minimum clearance between the top wire of any Conrail pole line and any proposed overhead guy wire shall not be less than 4'-0".

NOTE 2: The minimum clearance from crossing gate tips, C&S 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.