

**NATIONAL RAILROAD PASSENGER CORPORATION**  
**ELECTRIFIED TERRITORY**  
**SPECIFICATION**  
**FOR**  
**WIRE, CONDUIT AND CABLE OCCUPATIONS**

National Railroad Passenger Corporation



**Contact:**

**Effective Date: October 1, 2014**

For more information regarding this document, please contact:

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Philadelphia, PA 19104

### Revision Record

<b>Revision Number</b>	<b>Date</b>	<b>Description</b>	<b>By</b>	<b>Checked</b>
0	10/15	Specification replaces March 1997 version		

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**1. SCOPE**

- A. These specifications apply to the design of electric transmission wires, cables, and conduits (power communications) which are to be located over, under, across or upon Railroad property and facilities and tracks owned by others over which the Railroad operates its equipment.

**2. APPLICATION FOR OCCUPANCY**

- A. Individuals, corporations, municipalities, (known as the owner) desiring occupancy of Railroad property by such wire, cable, or conduit occupations must agree, upon approval of the construction drawings by the office of the Chief Engineer of the Railroad, to execute an appropriate occupational agreement and pay any required fees and/or rentals outlined therein.

- B. Application for an occupancy shall be by letter addressed to:

Commercial Development  
National Railroad Passenger Corporation  
30<sup>th</sup> and Market Streets, 5<sup>th</sup> Floor South  
Philadelphia, PA 19104

- 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.
- C. 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. No entry upon Railroad 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 be permitted without a proper entry permit (Form CR-17) prepared by the office of the Chief Engineer of the Railroad 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 the actual construction which cannot begin until a formal agreement is finally executed by the Railroad Company and permission is received by the owner from the designated inspection agency of the

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Railroad to proceed.

- B. Plans for proposed wire, cable, or conduit occupations shall be submitted to and meet the approval of the Chief Engineer of the Railroad prior to start of construction. These plans are to be prepared in sizes as small as possible and are to be folded to an 8 ½ inch by 1 inch size (folded dimensions) with a 1 ½ inch margin on the left-hand side and a 1 inch margin on the 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 the Railroad.

- C. Plans shall be drawn to scale and show the following: (See Plates I, II, IIA, III, IV and V, hereto attached)
1. Plan review of crossing or occupation in relation to all Railroad facilities (See Plate I)
  2. Location of wire, cable, or conduit (in feet) from nearest Railroad Mile Post, centerline of a Railroad bridge (giving bridge number), or center line of an existing or former passenger station. In all cases, the name of the County in which the proposed facilities are 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.
  3. Profile of ground on center line of pole or tower line, showing clearances between top of rail and bottom of sag, as well as clearance from bottom wire or cable to top wire or cable of the Railroad's static, transmission, signal, trolley feeder and communications lines, catenary, and third rail, when present. If none of these facilities are in existence at the point of crossing, the plan should so indicate. Actual under-clearances are to be shown (See Plate V for the minimum required clearances in non-electrified territory).
  4. Show all known property lines. If wires, cables or conduits are within public highway limits, such limits should be clearly indicated with dimensions from center line.
  5. The plan must be specific, as to:
    - a. Base diameter, height, class and bury of poles. Poles shall be

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set no closer than 18'-0" from face of pole to center line 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. Number of, location, 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 designs must be accompanied by engineering computations and data.

#### **4. CONSTRUCTION REQUIREMENTS**

- A. Power and communication lines shall be constructed in accordance with Amtrak's Electrification Standards and "Safety Rules for the Installation and Maintenance of Electric Supply and Communications Lines, National Electrical Safety Code Handbook", (current issue). Casing pipes to contain power or communication wires or cables having an outside diameter of over four (4) inches shall be constructed in accordance with the current issue of Amtrak's "Requirements and Specifications for Pipeline Occupancy", USA, ENG 1604, dated November 1987.
- B. Aerial crossings consisting of communication lines and power lines below 115,000 volts are not permitted to cross the Railroad in electrified territory. Power lines below 115,000 volts and communication lines shall cross the Railroad through underground means.

#### **5. LONGITUDINAL OCCUPATIONS**

- A. Wires and cables running longitudinally along Railroad right of way shall be constructed as close to Railroad property lines as possible. For electrical power wires and cables with voltages of 34,500 or over and communication cables containing over 1800 pairs, 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:
  - 1. Voltage of circuit(s) or number of pairs.
  - 2. Phase of electrical circuit(s).
  - 3. Number of electrical circuits.
  - 4. Size (AWG or CM) and material of wires or cables.

5. Length of spans clearly indicated on drawing.

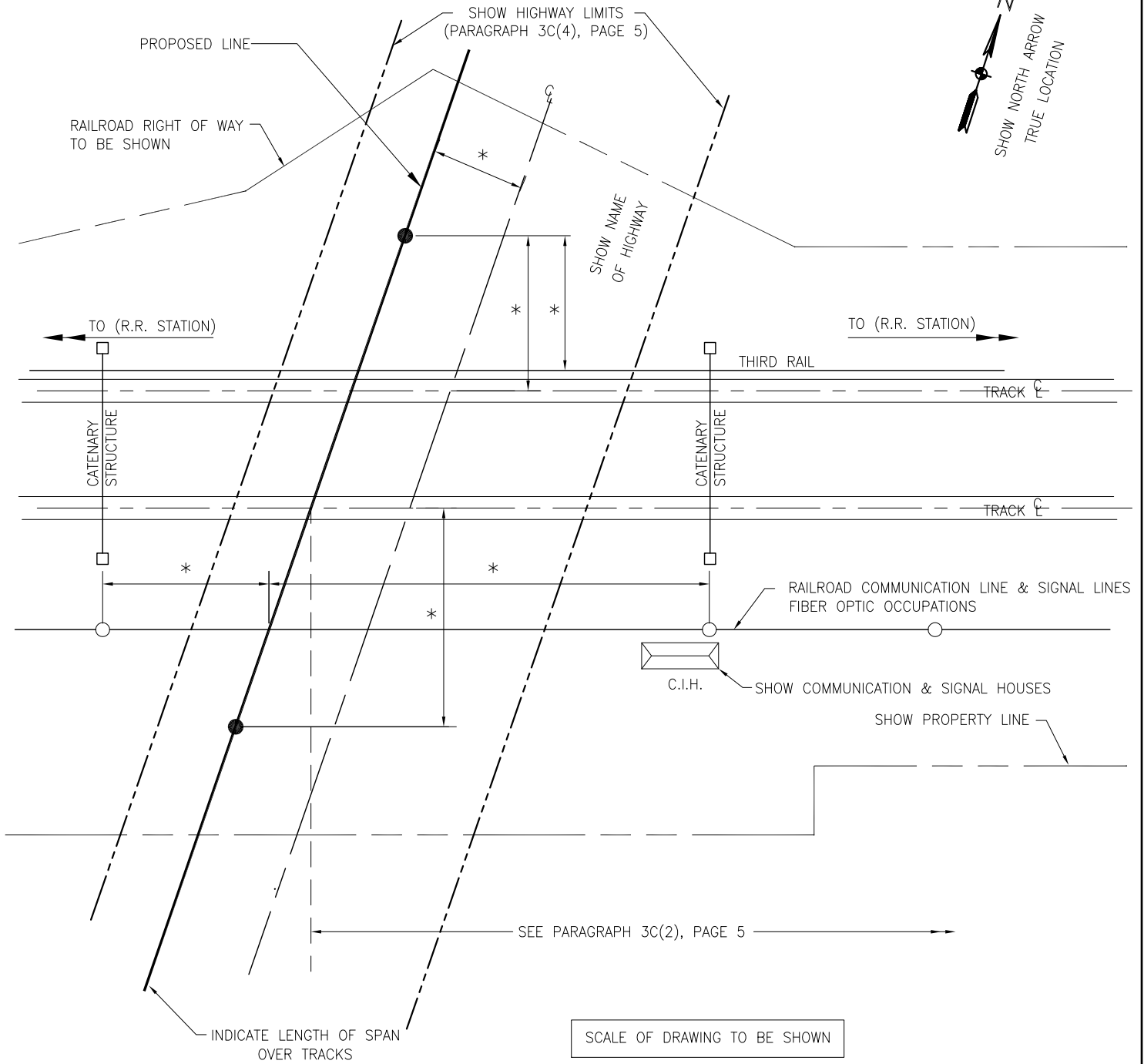
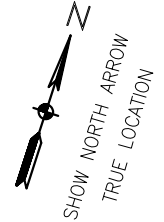
Any facilities overhanging Railroad property must have approval of the Railroad and appropriate rental charges will be applied.

**6. INDUCTIVE INTERFERENCE**

- A. On agreements covering occupations, provisions will be included that the applicant will conduct appropriate EMI/EMF studies and provide appropriate remedies, at his own expense, to correct any inductive interference with Railroad facilities.

INFORMATION TO BE SHOWN ON PLAN SECTION OF DRAWINGS

C.E. 4  
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NOTES:

ALL RAILROAD ELECTRIFICATION FACILITIES MUST BE SHOWN IN RELATION TO PROPOSED LINE.

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.

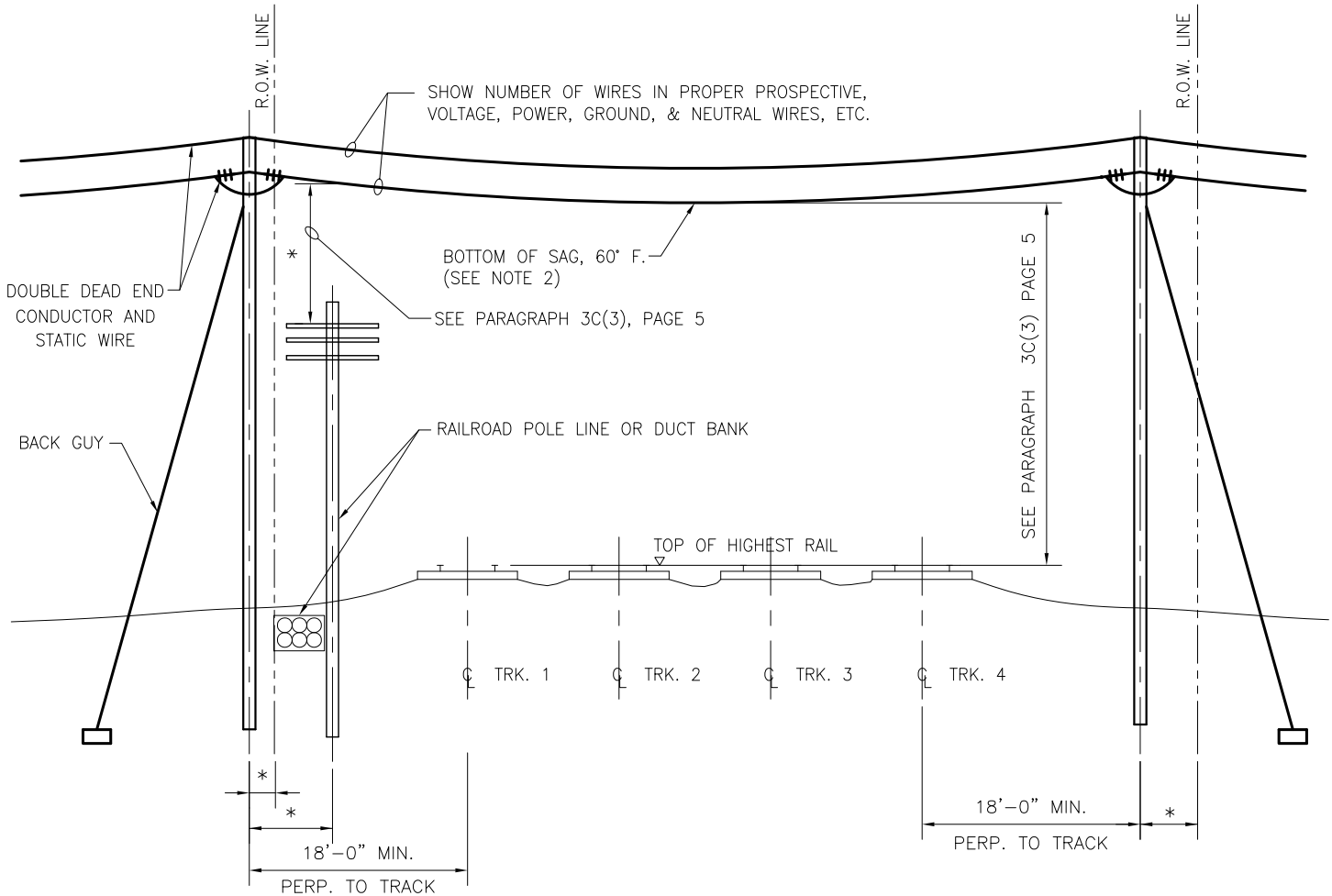
\* DIMENSIONS TO BE SUPPLIED BY OWNER



C.E. SPECIFICATIONS  
**PLATE I**  
WHEN FACILITY IS A CROSSING



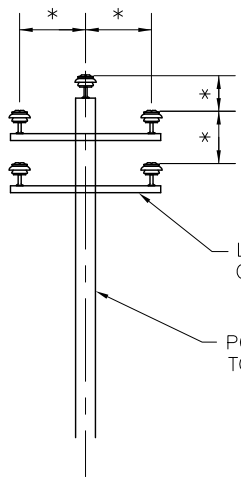
INFORMATION TO BE SHOWN ON PROFILE SECTION OF DRAWINGS



SECTION LOOKING \_\_\_\_\_ (DIRECTION)

SCALE: H \_\_\_\_\_

SCALE: V \_\_\_\_\_



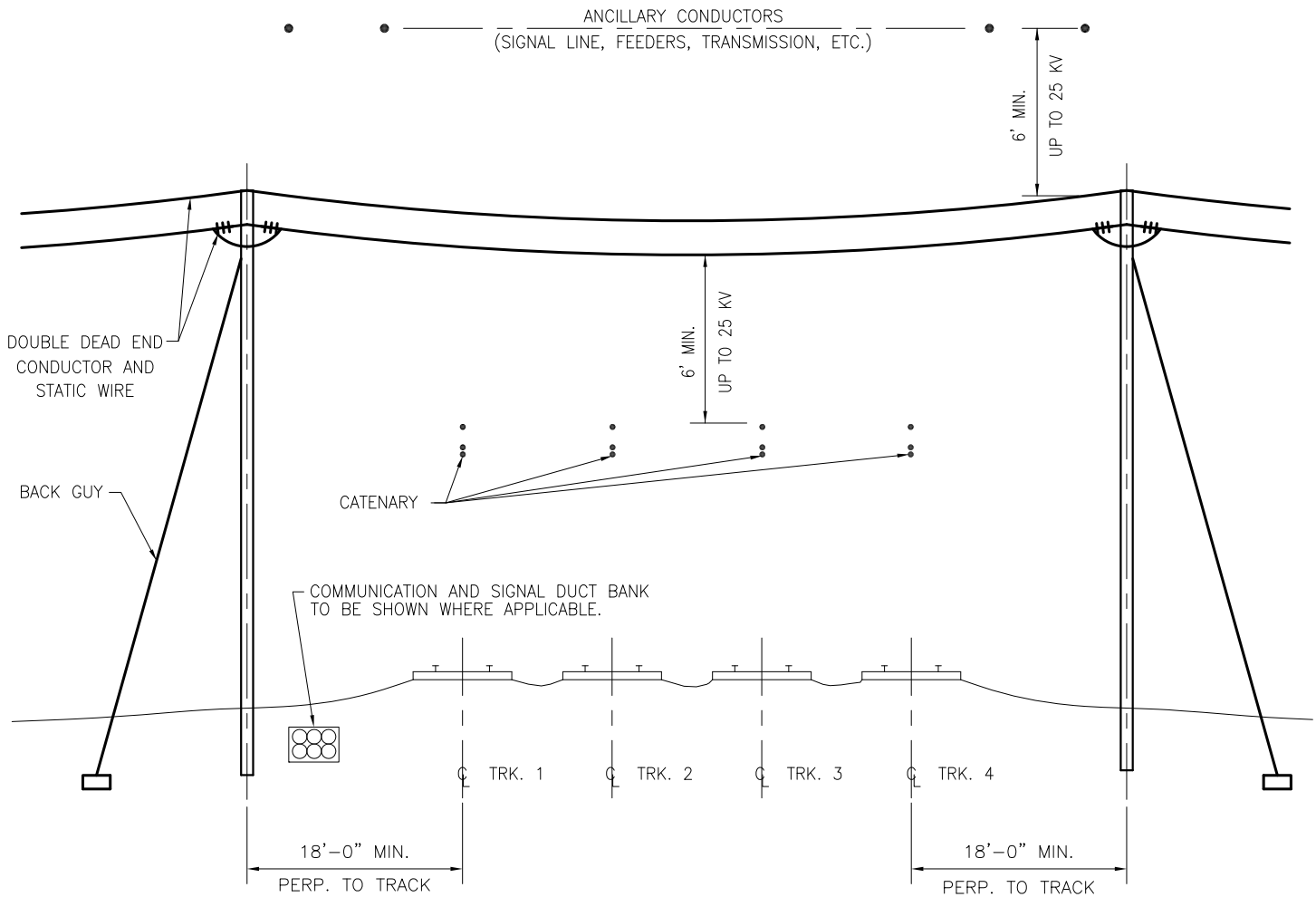
NOTES:

1. ALL TRANSMISSION, STATIC, CATENARY, FEEDERS, COMMUNICATION LINES AND THIRD RAIL SHOULD BE INDICATED AND THE PROPER CLEARANCES SHOWN. (SEE PLATE IIA)
2. SHOW MAXIMUM SAG INCREASE OF POWER WIRES OVER TRACKS IF THE SPAN EXCEEDS 175 FEET IN LENGTH. (SEE PLATE IIB FOR CALC.)
3. DOUBLE DEAD END ALL CROSSING WIRES ON BOTH SIDES OF THE RAILROAD AND PROVIDE BACK GUYS AWAY FROM THE RAILROAD.

\* DIMENSIONS TO BE SUPPLIED BY OWNER

INFORMATION TO BE SHOWN ON PROFILE SECTION OF DRAWINGS

C.E. 4  
10/1/14



TYPICAL ARRANGEMENT OF RAILROAD CONDUCTORS

WIRE CLEARANCES FOR VOLTAGES ABOVE 25 KV	
VOLTAGE	MINIMUM VERTICAL CLEARANCE (TOP OF CONDUCTOR TO BOTTOM OF SAG)
115,000	11'-6"
138,000	12'-0"
230,000	15'-0"
345,000	19'-0"
500,000	24'-0"
745,000	32'-6"
765,000	33'-0"

NOTES:

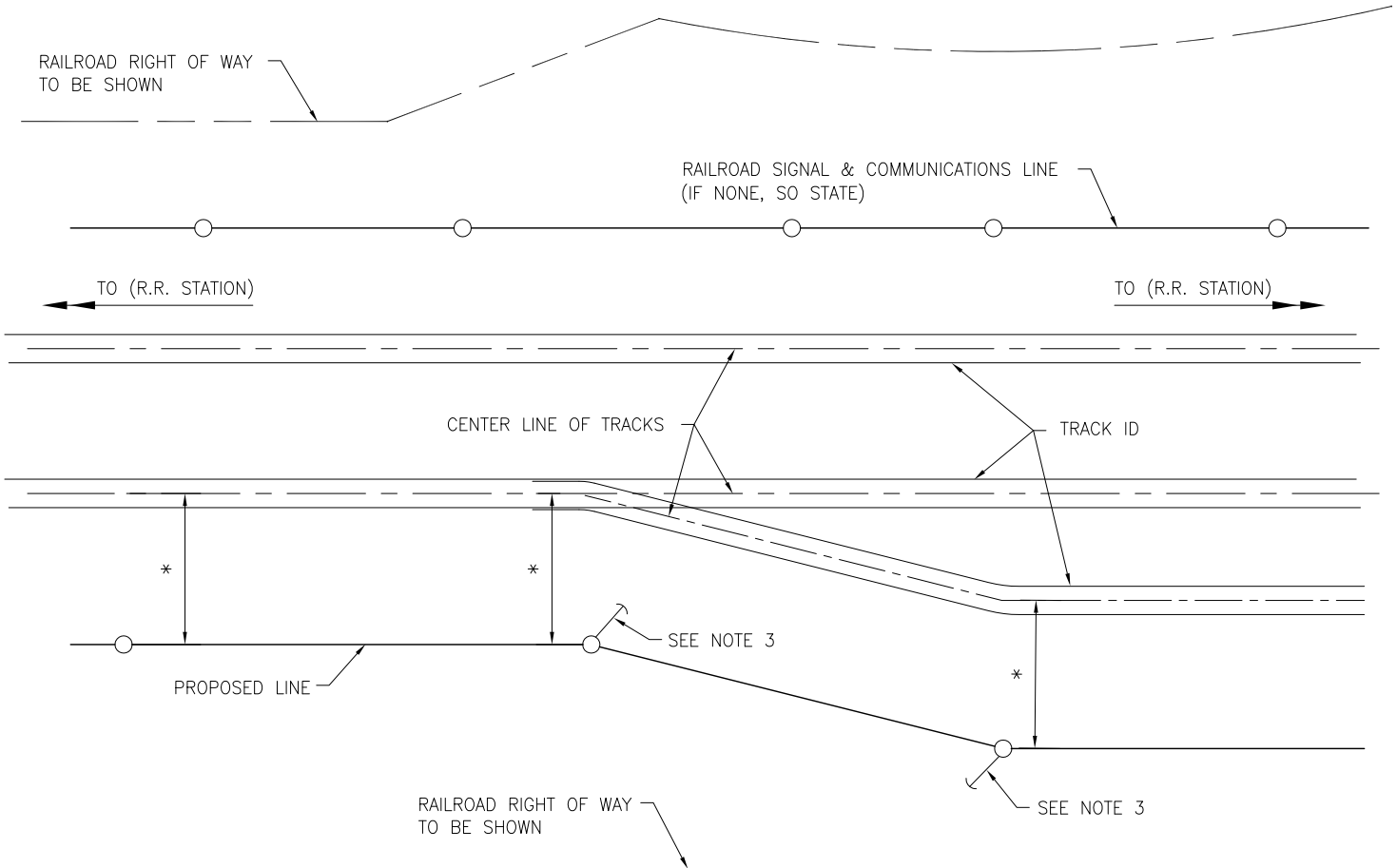
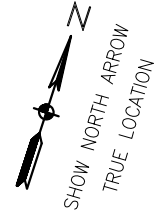
1. MINIMUM CLEARANCE IS CALCULATED AT WORST CASE WIRE SAG. (RESULT OF MAXIMUM OPERATING TEMPERATURE, ICE LOADING, ETC.)
2. THE ABOVE DIAGRAM SHOWS A TYPICAL HIGH VOLTAGE UTILITY CROSSING ON THE NEW YORK TO WASHINGTON CORRIDOR. ALL UTILITY CROSSINGS ON THE NORTHEAST ELECTRIFICATION PROJECT WILL BE ABOVE THE HIGHEST RAILROAD CONDUCTOR.
3. STEEL POLES OR TOWERS THAT CAN SUPPORT BROKEN CONDUCTOR LOADS MAY NOT NEED TO BE GUYED PENDING APPROVAL FROM AMTRAK. WOODEN STRUCTURES ARE NOT PERMITTED.



C.E. SPECIFICATIONS  
**PLATE IIA**  
CROSSINGS - ELECTRIFIED RAILROAD

INFORMATION TO BE SHOWN ON PLAN SECTION OF DRAWINGS

C.E. 4  
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SCALE OF DRAWING TO BE SHOWN

NOTE:

- (1) EACH END OF THE LINE MUST SHOW MEASUREMENTS AS CALLED FOR IN PARAGRAPH 3C(2), PAGE 5
- (2) IF POWER LINE CROSSES ANY TRACK, THEN THE INFORMATION SHOWN ON PLATE I IS ALSO REQUIRED.
- (3) WHERE ANCHOR GUYS ARE REQUIRED, SEE PARAGRAPH 3C(3), PAGE 5.
- (4) THE DISTANCE BETWEEN EACH POLE IS TO BE SHOWN.
- (5) ASSIGNED POLE NUMBERS TO BE SHOWN AT EACH POLE.

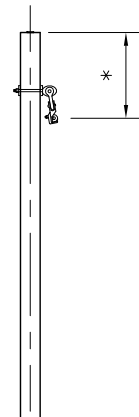
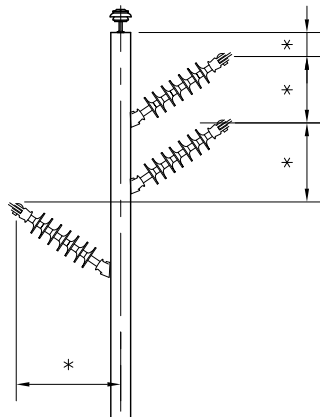
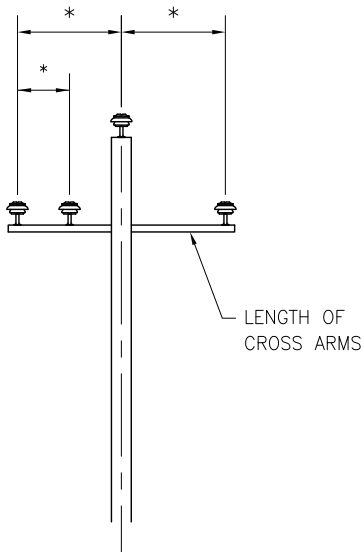
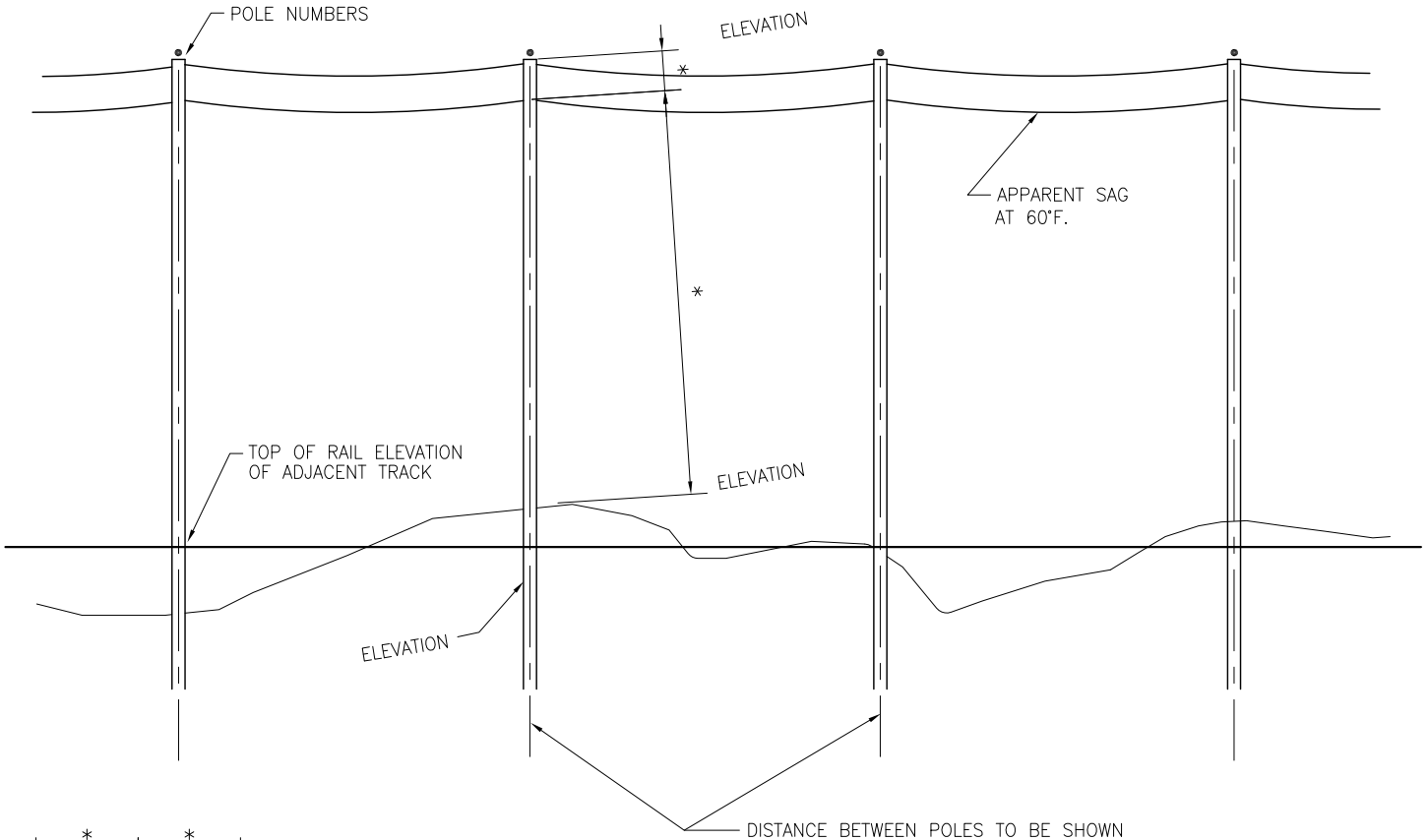
\* DIMENSIONS TO BE SUPPLIED BY OWNER



C.E. SPECIFICATIONS  
**PLATE III**  
LONGITUDINAL OCCUPATIONS

INFORMATION TO BE SHOWN ON PROFILE SECTION OF DRAWINGS

C.E. 4  
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POLE TOP CONFIGURATION TO BE SHOWN SIMILAR TO SAMPLES ABOVE

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

\* DIMENSIONS TO BE SUPPLIED BY OWNER

NON – ELECTRIFIED TERRITORY

VOLTAGE	OVERHEAD CLEARANCE (TOP OF RAIL TO BOTTOM OF SAG)
0-750	27'-0"
751-15,000	28'-0"
15,001-50,000	30'-0"
69,000	30'-8"
115,000	32'-2"
138,000	33'-0"
345,000	39'-10"
500,000	45'-0"
745,000	53'-2"
765,000	53'-10"

CALCULATION IS 30'-0" + 0.4" PER 1,000 VOLTS OVER 50,000 VOLTS



C.E. SPECIFICATIONS  
**PLATE V**  
CROSSINGS – NON-ELECTRIFIED RAILROAD