

FORM NCR 101

SPECIFICATIONS

FOR

WIRE, CONDUIT AND CABLE OCCUPATIONS

OF

NORTH CAROLINA RAILROAD COMPANY

PROPERTY

**Revised
JANUARY 2009**

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Specifications For Wire, Conduit and Cable Occupancy Of North Carolina Railroad Company Property

1.0 GENERAL

1.1 Scope

- A. This specification shall apply to the design and construction of wire, conduits and cables which are to be located over, under, across and along North Carolina Railroad Company (NCRP) property and facilities. This specification shall also apply to tracks owned by others (sidings, industry tracks, etc.) which are connected to NCRP and used by the Operating Railroad.
- B. It is to be clearly understood that NCRP owns its right-of-way for the primary purpose of railroad operations. All occupancies shall therefore be designed and constructed so that operations and facilities are not interfered with, interrupted or endangered. In addition, the proposed facility shall be located to minimize encumbrance to the right-of-way so that railroad will have unrestricted use of its property for current and future operations.

1.2 Definitions

- A. NCRP - North Carolina Railroad Company
- B. Operating Railroad - A railroad company designated by NCRP to operate trains on its property. Currently, Norfolk Southern Corporation (NS), and in some places CSX Transportation (CSXT).
- C. Engineering Representative - Person or persons designated by NCRP to review and approve plans for pipeline occupancies of its property. Currently HNTB North Carolina, P.C.
- D. Owner (Applicant) - Individual, corporation or municipality desiring occupancy of NCRP property.
- E. Professional Engineer - Engineer licensed in North Carolina.
- F. Casing Pipe - Pipe through which the carrier pipe is installed.
- G. Sidings or industry tracks - Tracks located off NCRP's right-of-way, serving an industry.

1.3 Application For Occupancy

- A. Individuals, corporations or municipalities desiring occupancy of NCRP property by wire, conduit and cable occupations must agree, upon approval of the engineering and construction details by the Engineering Representative, to execute an appropriate NCRP occupational agreement and pay any required fees and/or rentals specified therein. Applications will be accepted from the Owner or his designated representative, herein after referred to as the Applicant.
- B. The application for an occupancy shall be by application addressed to the Engineering Representative, HNTB North Carolina, P.C., 121 West Trade Street, Suite 2050, Charlotte, North Carolina 28202, attn. Manager, NCRP Pipes and Wires Occupancy Agreement Process. Provide information requested on the application forms, including the following:
 - 1. Full name of Owner.
 - 2. Complete mailing address of the applicant.

3. Name and title of person who will sign the agreement.
 4. Name of representative or contact person who will handle the request.
 5. The State in which the applicant is incorporated.
- C. All applications shall only be made on the forms provided by the North Carolina Railroad. Contact the Engineering Representative at the above address for instructions, forms and further information. Application forms, instructions and specifications may also be obtained on the NCRR website (www.ncrr.com).
- D. All applications for the proposed occupancy shall be submitted in 3 copies. Applications shall be accompanied with six (6) copies of all design and construction plans and three (3) copies of all specifications and engineering computations. On extensive projects, only those plans involving work on, or affecting, NCRR property and operations, shall be submitted. Included shall be a plan showing the extent of the total project upon which that portion of the work affecting NCRR is clearly defined.
- E. All of the above plans, specifications and computations must be prepared by and bear the seal of a Professional Engineer.

1.4 Right Of Entry

- A. No entry upon NCRR property for the purpose of conducting surveys, field inspections, obtaining soils information or any other purposes associated with the design and construction for the proposed occupancy, will be permitted without a proper entry permit prepared by the Engineering Representative. The applicant must pay the associated fees, if any, and execute the entry permit. An entry permit must also be obtained from the Operating Railroad.
- B. It is to be clearly understood that the issuance of an entry permit does not constitute authority to proceed with any construction. Construction can not begin until a formal agreement is executed by NCRR and the Owner receives permission from the Engineering Representative and the Operating Railroad to proceed with the work.

1.5 Site Inspection

- A. For longitudinal occupancy of NCRR property a site inspection along the proposed wire, cable or conduit route may be required before final design plans are prepared. When a site inspection is required, the applicant and/or his engineer must meet with the Engineering Representative to view the entire length of the proposed occupancy.
- B. Prior to the site inspection the applicant must submit the following information:
1. A plan view of the proposed route showing all tracks, both NCRR right-of-way lines and all other facilities located on the right-of-way. The distance from the proposed wire, cable or conduit to both the adjacent track and the right-of-way lines must be shown.
 2. A complete application form.
 3. Typical cross sections along the proposed route.
- C. Site inspections for wire, cable or conduit crossings are not required unless, in the opinion of the Engineering Representative, the size and location of the facility warrant an inspection.

1.6 Information Required for Submission

1.6.1 Plans and Computations

- A. Plans for proposed pipeline occupancies shall be submitted to the NCRR Engineering Representative and approved by the Engineering Representative prior to NCRR issuing an Occupancy Agreement and the start of construction.
- B. Plans are to be prepared in sizes that may be folded, individually, by the applicant to an 8 ½inch by 11 inch size, as shown on Plate V, prior to submission. Where more than one plan is involved, the folded plans shall be assembled into complete sets by the applicant before submission. Failure of the applicant to comply with these requirements may be sufficient cause for rejection of the application.
- C. Plans shall be drawn to scale and shall include the following information as a minimum.
(See Plates I to V)
 - 1. Plan view of crossing or occupation in relation to all NCRR facilities. (Plate 1).
 - 2. Location of wire, cable or conduit (in feet) from nearest Mile Post or centerline of a railroad bridge (giving Bridge Number). If the above is not available, provide distance to the nearest highway grade crossing of the railroad. The AAR/DOT number of the grade crossing should be indicated on the plans. The number is on a metal tag located on the cross buck or flasher post in the format 123 456B.(See Plate II). In all cases, the name of the City and County in which the proposed facilities are to be located must be shown.
 - 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 railroad's transmission, signal and communication lines. If railroad facilities listed above do not exist at the point of crossing, the plan should so state. Actual vertical clearance shall be shown. (See Plate VI for the required overhead clearance.)
 - 4. Show all known property lines and NCRR 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 NCRR right-of-way line as possible with every effort being made to locate poles off NCRR right of way 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 and crossing angle (degrees) between centerline of main track and wire line.
 - d. Location, number of, size of, material of anchors and all guying for poles and arms.
 - 6. The following shall be specified for underground crossings:
 - a. Size and character of conduit.
 - b. Depth below base of rail.
 - c. Number of ducts.
 - d. Depth on right of way.
 - 7. All underground crossings shall also meet the requirements of Form NCR 102 Specifications for Pipeline Occupancy.

- E. Once the application has been approved by the Engineering Representative, no variance from the approved plans, specifications, method of installation, construction, etc., will be considered or permitted without the payment to NCRR of additional fees for the re-processing of the application.
- F. All plans and computations associated with the work under the agreement shall be prepared by, and bear the seal of, a Professional Engineer. If not so imprinted, the application will be given no further consideration. This requirement also applies to all data submitted by the Owner's contractor. Contractor's plans and computations that are not stamped will be returned and construction will not be permitted to proceed.

1.6.2 Specifications

- A. Project specifications for all work on and affecting the railroad right-of-way, shall be included with the submission. All pertinent requirements of this document shall be included.

1.7 Notification to Proceed with Construction

- A. After approval of the engineering plans and specifications and execution of the Occupancy Agreement, the Owner will be notified of the appropriate NCRR Operating Railroad office that must be contacted prior to start of construction. The Operating Railroad will provide inspection of the project and coordinate all other construction aspects of the project that relate to railroad operations (flagging, track work, protection of signal cables, etc.).
- B. The Operating Railroad must be notified a minimum of fourteen (14) working days prior to desired start of construction.

1.8 Longitudinal Occupancies

- A. Where practicable, occupancies shall be located to cross tracks at approximately right angles only and not parallel tracks within NCRR right of way. Longitudinal occupancies shall only be constructed within NCRR right of way where there is no other practicable alternative.
- B. If a request is made for longitudinal occupancies of NCRR right of way, the following must accompany the application and standard related project drawings:
 - 1. An overall plan view of the proposed route, showing all tracks and NCRR right of way lines. The distance from the proposed occupancy to the adjacent track and to the right of way lines must be shown.
 - 2. A written project outline that includes the general scope of the project, as well as justification for the longitudinal request and an explanation why there are no other practicable alternative routes.
- C. Wire, conduit and cable lines laid longitudinally on NCRR's right of way shall be located as far as possible from tracks and any other important structures and as close to the NCRR right of way line as possible as it is understood that NCRR maintains its right of way for the primary purpose of operating a railroad. All occupancies shall therefore be designated and constructed so that railroad operations and facilities are not interfered with, interrupted or endangered. In addition, the proposed facility shall be located to minimize encumbrance to the right of way so that the railroad will have unrestricted use of its property for current and future operations.
- D. Feasibility proposals for longitudinal occupancies may 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 to clearly identify the location of the project.

- E. Arrangements will then be made to furnish the applicant with the appropriate NCRR maps and a right of entry permit. There will be a 'nominal charge' for the necessary 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, NCRR does not warrant the accuracy of these maps or other information furnished by NCRR and its Engineering Representative and all pertinent information to the occupancy must be verified prior to final submission.
- F. Upon receipt of these documents, the applicant must execute the right of entry permit in order to access NCRR property. Such access would allow for verification that the proposed pole locations are feasible and do not interfere with any NCRR 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. An executed right-of-entry agreement must also be obtained from the Operating Railroad prior to any entry onto NCRR property.
- G. Once this temporary stake out is completed, the applicant must submit to NCRR three (3) sets of preliminary plans showing the location of all proposed poles and other information as stated below. Three copies of completed NCRR application forms must also be submitted. Arrangements will then be made for a site investigation by NCRR 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.
- H. Wires and cables running longitudinally along NCRR right-of-way shall be constructed as close to property lines as possible. The following information must be submitted in addition to the information called for on Plates III and 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.
 - 6. Any intended future wires or cables.
 - 7. A written project outline that includes the general scope of the project, as well as justification for the longitudinal request (an explanation why there are no other practicable alternative routes).
- I. Any facilities overhanging NCRR property must have approval of the NCRR Engineering Representative and the Operating Railroad, must conform to the above specifications and are subject to the appropriate rental charges.

1.9 Crossings in the Vicinity of Railroad Bridges and Other Structures

- A. Wires, conduits and cables shall be located, as far as practicable, to cross tracks at approximately right angles to the track (but preferably not less than 45 degrees) and shall not be placed within a culvert, under railway bridges nor closer than 50 feet to any portion of any railway bridge, building or other important structure, except in special cases and then by special design as approved by the Railroad.

1.10 Overhead Bridge Structures for Wires and Cables

- A. New overhead structures shall not be constructed on NCRR's right of way unless underground installation is not possible and/or the Applicant can show that no practicable alternative is available.
- B. When forwarding requests of this nature, utilize the Application for Wire, Conduit and Cables to the fullest extent possible. Along with the standard project drawings, complete structural plans and design computations for the structure and foundations, sealed by a Professional Engineer, are also required.
- C. The minimum vertical clearance from the top of rail to the closest portion of the structure is 23 feet. The minimum horizontal clearance is 20 feet from the centerline of track on tangents and 21 feet on curves.

2.0 CONSTRUCTION REQUIREMENTS

2.1 General

- 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 where more conservative requirements are noted herein.
- B. Under special conditions, NCRR will give consideration to occupations on its structures, subject to approval of the NCRR Engineering Representative, the Operating Railroad, and NCRR's policy governing such matters.
- C. Wirelines shall be located, where practicable, to cross tracks at approximately right angles to the track but preferably not less than at a 45 degree angle to the centerline of track.
- D. All operations shall be conducted so as not to interfere with, interrupt, or endanger the operation of trains; nor damage, destroy or endanger the integrity of railroad facilities. All work on or near NCRR property shall be conducted in accordance with the safety rules and regulations of the Operating Railroads.

2.2 Above Ground and Aerial Wirelines

- A. The poles, or towers, supporting the crossing span shall, preferably, be outside NCRR right of way. If locating the poles or towers outside the right of way is not possible, the side clearance of poles and towers from the nearest track rail shall be not less than 25 feet.
- B. Wires and cables running longitudinally along NCRR's right of way shall be constructed as close to the right of way lines as possible, except in cases where doing so will interfere with Railroad operations, surface drainage, or soil stability.
- C. The poles, or towers, supporting the crossing span and the adjoining span on each side shall, preferably, be in a straight line.

- D. 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 inflammable material.
- E. For the protection of the aerial wire crossing and railroad pile driver operation, it is preferable that aerial wire crossings 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 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 Crossing Company. When required by NCRR, the Crossing Company shall place on all crossing structures located on the property of NCRR, warning signs of approved design.
- G. All parts of the supporting structures of the crossing span shall be examined annually by the owner and all defective parts shall be promptly restored to a safe condition.
- H. The minimum horizontal and vertical clearances of wires to the railroad are as indicated on Plate VI of these Specifications. Guy wires and suspension cable systems may be located no closer than 25 feet above top of rail.
- I. Double cross-arms are required on poles adjacent to track. Any tower or steel pole foundation design must be accompanied by engineering computations and date stamped by a registered professional engineer. Any tower or steel pole to be installed on NCRR right of way must meet or exceed industry standards regarding design and usage.
- J. All work shall be done without interfering with the Operating Railroad's signal systems and cables.

2.3 Underground Crossings

- A. 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 NCRR Property", Specification NCR 102, current edition.
- B. In addition to the requirements of these specifications, the underground crossing is to conform to the requirements of the National Electrical Safety Code, as published by the National Standards Institute, Inc. the current edition of same being controlling. The crossing is also to conform to the requirements of any local or state laws or regulations of any local code enforcing authority that may be in effect at the time of the installation.
- C. The cable or duct system of proposed underground crossings shall be laid as straight and direct as possible between the points where the underground line enters and leaves the NCRR right of way.
- D. Where possible, manholes, pull boxes and terminals in the underground crossings should be located off NCRR right of way.
- E. The tops of ducts and cable systems structures of underground cable crossings shall be located at a depth of not less than 66 inches below base of rail and not less than 48 inches below ground level for the entire width of the right of way.

- F. Cable marker signs must be installed 15 feet from the centerline of nearest track on both sides at points of right of way entry and exit. Signs must indicate cable owner, depth buried and voltage.
- G. Underground crossings of power supply cables with maximum voltage of 750 volts and communication cables of low voltage may be installed by pushing a galvanized steel pipe under the tracks at a depth specified above to serve as a conduit. Such pipe shall extend at least 20 feet beyond the outside rail on each end of the crossing. (This distance may be increased at the discretion of the Railroad where there is a potential for the construction of future tracks at the crossing location.) The pipe shall be buried at least 66 inches below the base of rail and 48 inches below natural ground at all other points on NCRR property. Measurements to the ends of the conduits shall be to the outside rail and made at right angles to the track. Additional lengths will be required for crossings in fill sections, at locations where there is the potential for the construction of additional future tracks, at crossing angles of less than ninety degrees (90°) and for multi-track crossings. Generally, on fills, two feet beyond the toe of the slope or three feet beyond the ditch should be sufficient. All ducts and/or encasements beneath the tracks must be capable of withstanding Cooper E-80 loading and conform to AREMA Guidelines. Any conduits and/or encasements larger than four inches will be governed entirely by those specifications which normally cover pipelines – “Specifications for Pipeline Occupancy of NCRR Property”, Specification NCR 102 current edition. Jacking or boring installation is preferred, and no water is to be used in the installation of the encasement. Plastic casing pipe is not permitted on NCRR right of way.
- H. Underground crossings of power supply cables operating above 750 volts will be installed at depths specified above and in addition, between the points where the underground crossing enters and leaves NCRR property, the cable is to be enclosed in galvanized steel pipe or approved concrete encased duct for mechanical protection of the cable. No cable of this potential which is unprotected will be permitted on NCRR right of way.

2.4 Inductive Interference

- A. 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° 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 NCRR’s or the Operating Railroad’s facilities.

2.5 Inspection

- A. The construction shall be subject to the inspection of NCRR and shall comply with the requirements of these specifications. Defective material shall be rejected and replaced with acceptable material.
- B. Crossings that are not installed in conformance with the plans and specifications submitted with the Application are subject to modification or removal, as determined by NCRR and/or the Operating Railroad, at the Applicant’s expense.

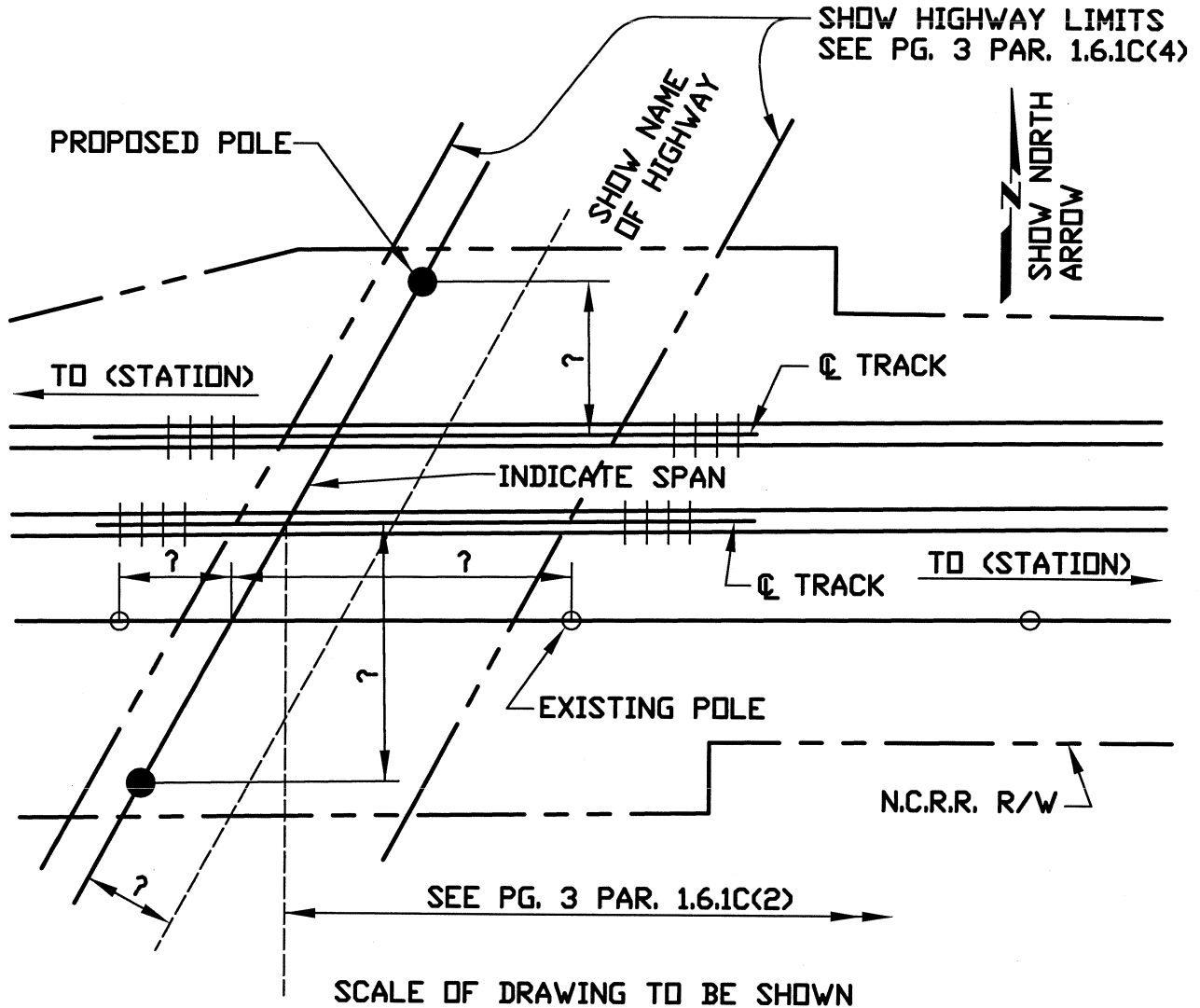
2.6 Maintenance

- A. The crossing shall be maintained in safe condition. The poles, cross arms, insulators, guys, wires, and other parts and materials used in the structure of the crossing shall be periodically inspected, and all defects shall be promptly repaired by the owner of the line. The guys and anchors shall be maintained so that the guys are kept taut and serve the purpose for which they are intended. The line wires shall

be kept to the proper sag. Underbrush, grass, or other inflammable material shall be kept removed by the crossing owner, from the poles for a sufficient distance to reduce the fire hazard to the minimum.

PLATE I

INFORMATION TO BE SHOWN ON PLAN 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.

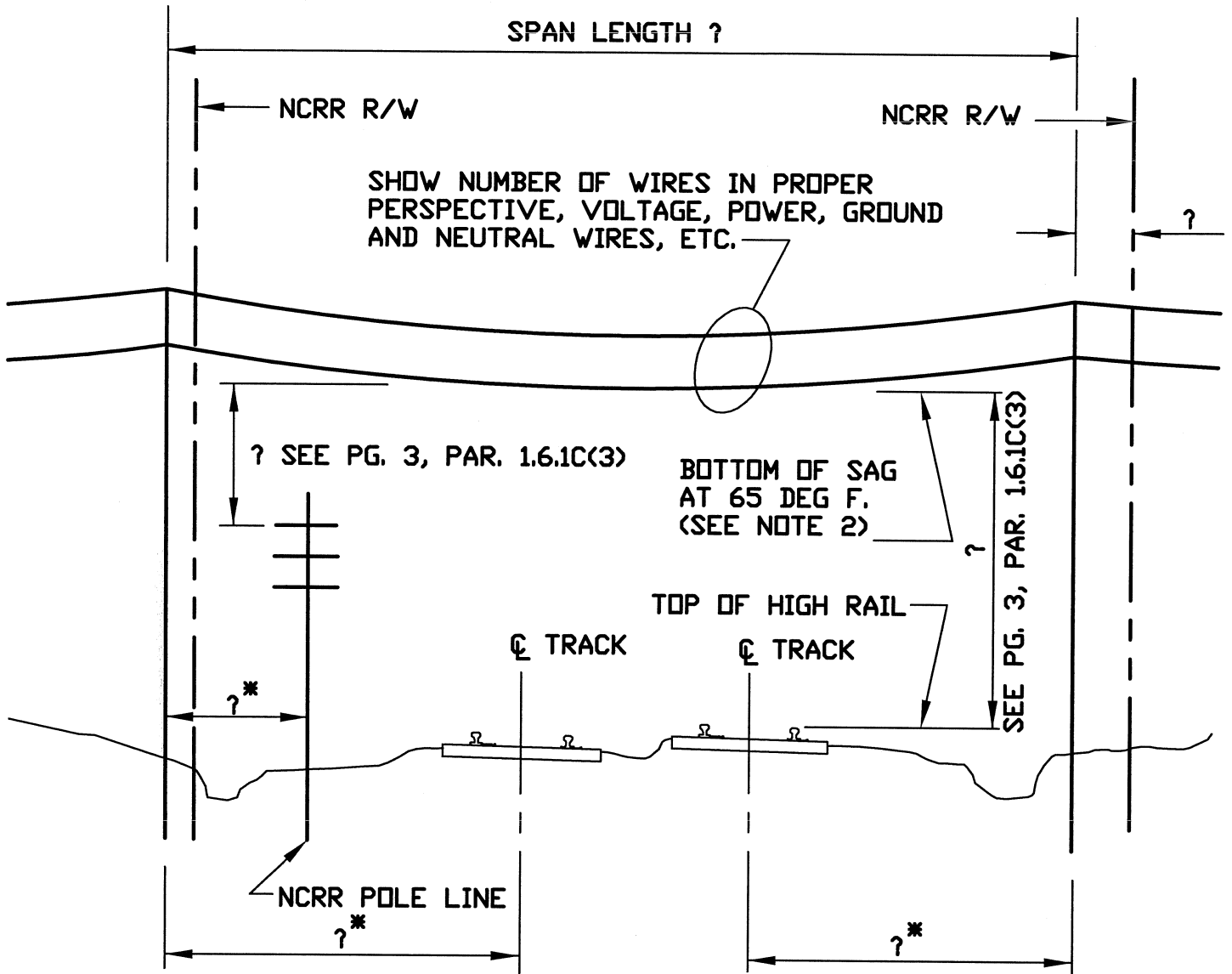
IF THE PROPOSED LINE IS NOT WHOLLY (OR PARTIALLY) WITHIN HIGHWAY LIMITS, THE SAME INFORMATION IS REQUIRED AS SHOWN ON THIS PLATE.

LOCATE N.C.R.R. 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 II

INFORMATION TO BE SHOWN ON CROSS SECTION OF DRAWINGS
WHEN FACILITY IS A CROSSING



SECTION LOOKING _____ (DIRECTION)

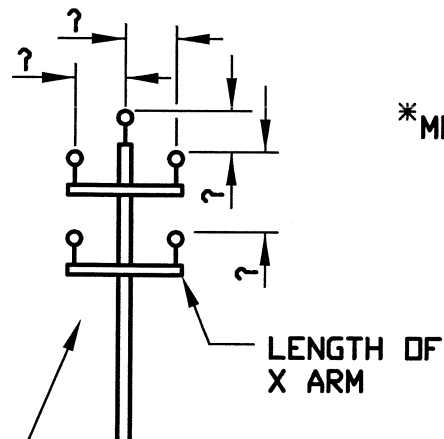
SCALE: H _____

V _____

* MEASURED AT RIGHT ANGLES TO TRACK

NOTE 1: ALL TRANSMISSION, SIGNAL, AND COMMUNICATION LINES SHOULD BE INDICATED AND PROPER CLEARANCES SHOWN.

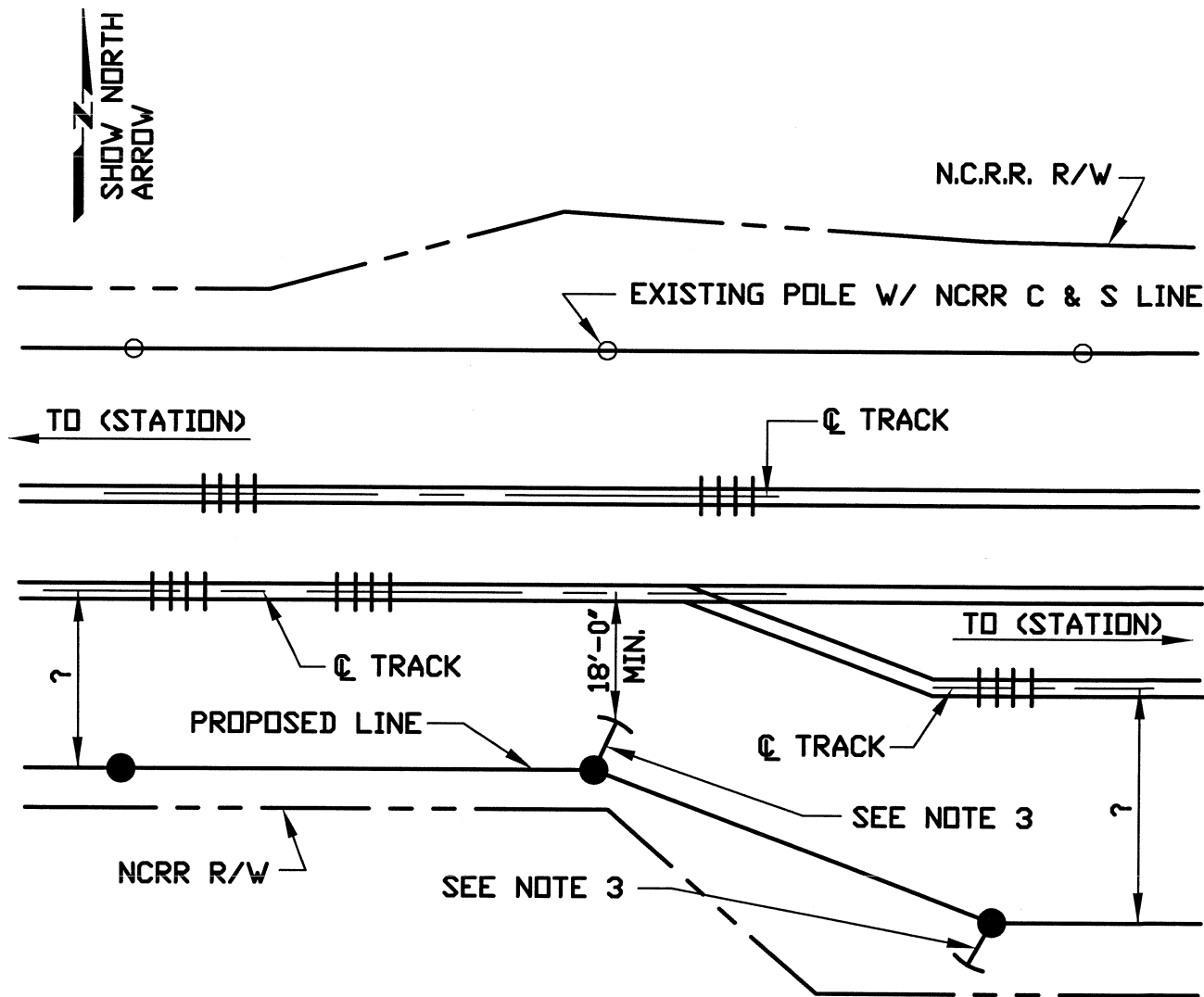
NOTE 2: SHOW MAXIMUM SAG INCREASE OF POWER WIRES OVER TRACKS IF SPAN EXCEEDS 175 FEET IN LENGTH.



POLE TOP
CONFIGURATION
TO BE SHOWN

PLATE III

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



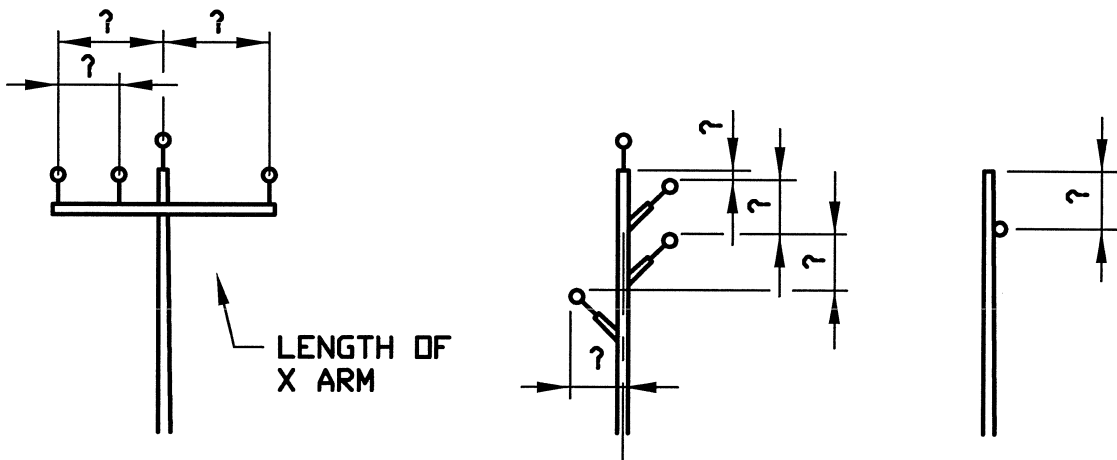
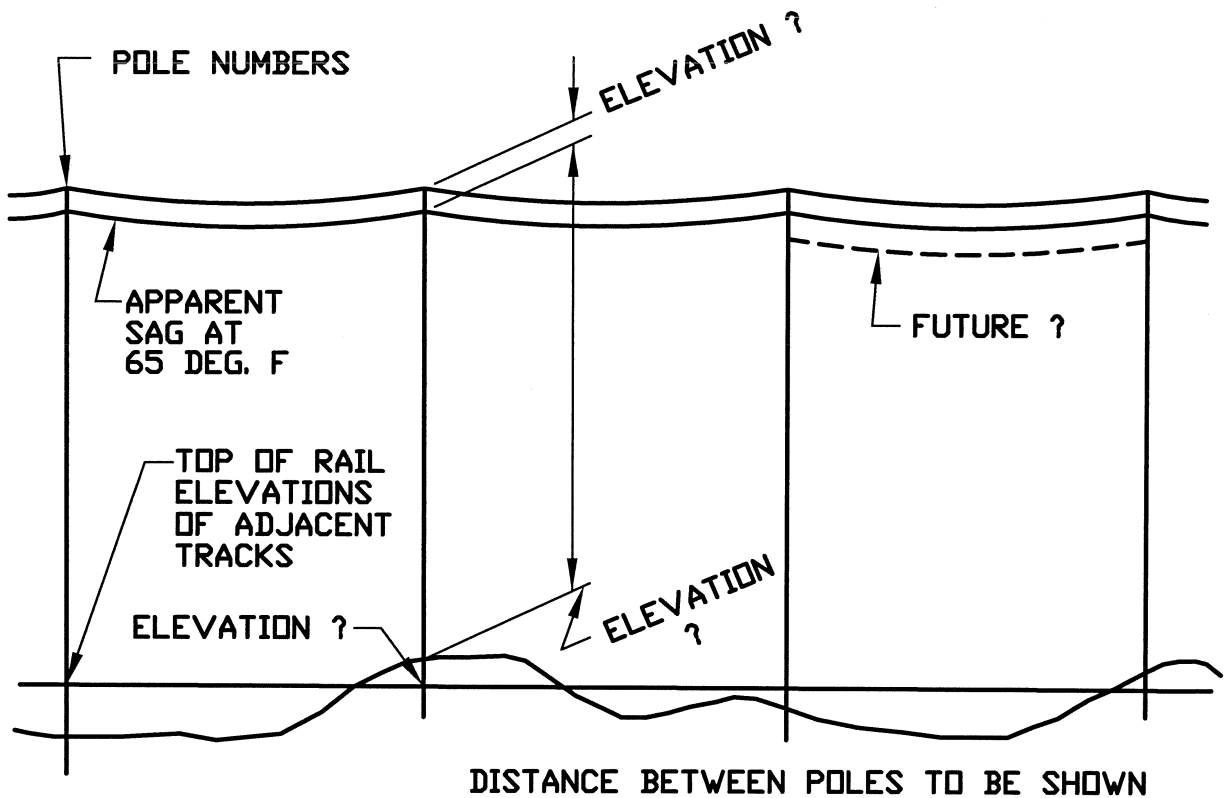
SCALE OF DRAWING TO BE SHOWN

NOTES:

1. EACH END OF THE LINE MUST SHOW MEASUREMENTS AS CALLED FOR ON PG. 3, PAR. 1.6.1C(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



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

FOLDING OF PLANS

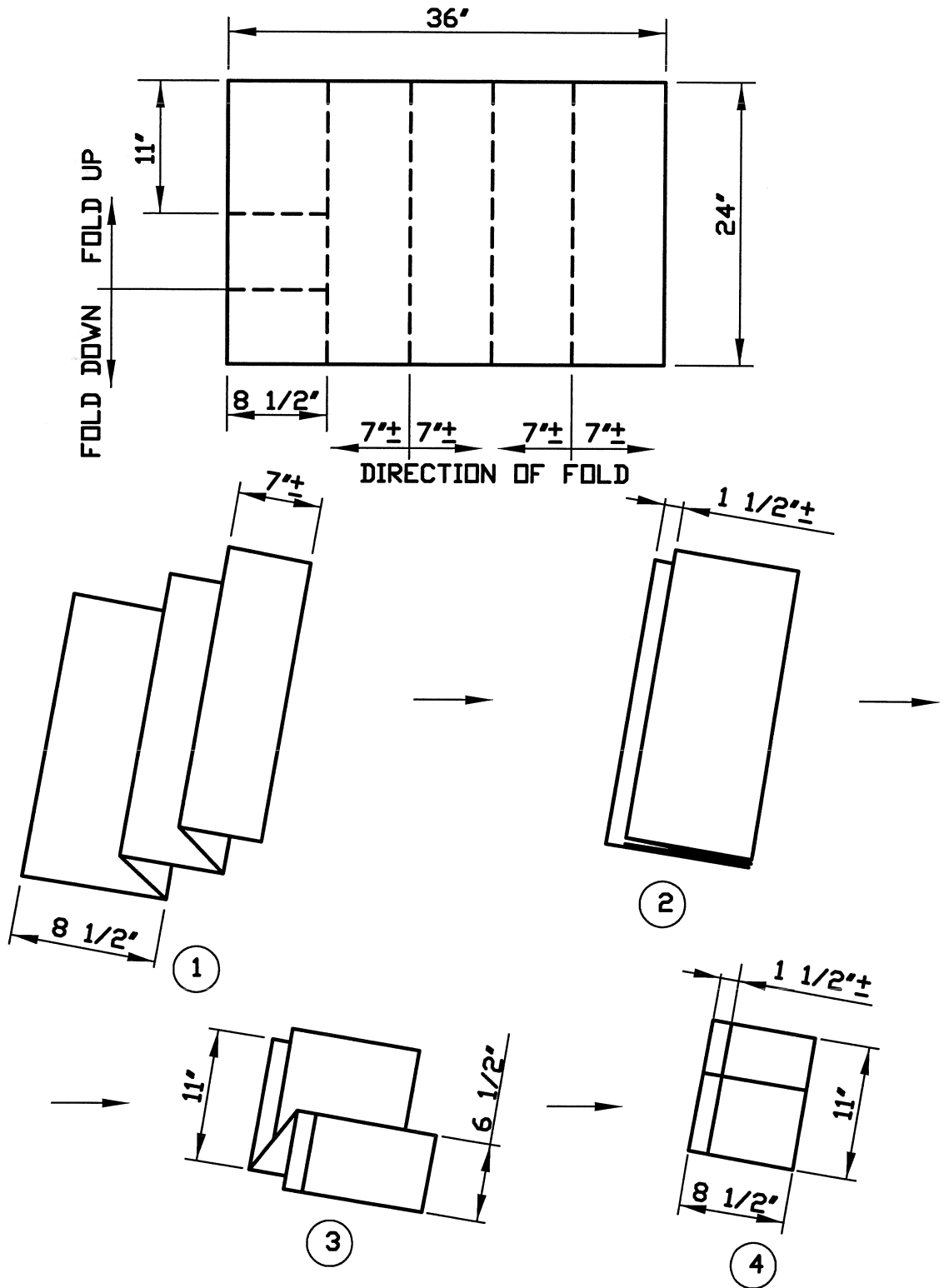


PLATE VI
FOR INFORMATION ONLY
MINIMUM REQUIREMENTS FOR UNDERCLEARANCE
OF WIRES OF VARIOUS VOLTAGES

<u>NOMINAL L-L VOLTAGE</u>	<u>OVERHEAD CLEARANCE</u>	<u>MINIMUM BETWEEN WIRES</u>
0-750	30' - 0"	4' - 0"
To - 15,000	31' - 0"	6' - 0"
To - 50,000	33' - 0"	6' - 0"

Calculation for overhead clearance is 33'-0" plus 0.5" per 1,000 volts over 50,000 volts.

Where the distance from the nearer crossing support to the point where the line crosses over the farthest rail is more than 75 feet, the overhead clearance shall be increased by 0.2th foot for each 10 feet of the excess over 75 feet. In no case need the distance from the nearest crossing support to the point where the line crosses over the farthest rail be considered in excess of one-half the total length of the crossing span.

For the protection of the wire crossing and railroad pile driver operation, 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 overhead clearance shall be not less than 50 feet above top of rail.

Calculation for minimum between wires is 6'-0" plus 0.5" per 1,000 volts over 50,000 volts.

Where the upper conductor or wire has fixed supports, and the sum of the distances from the point of intersection of the two crossing wires to the nearer supporting structure of each span exceeds 100 feet, the minimum clearance between wires shall be increased by 0.1th foot for each 10 feet in excess of 100 feet.

Conductors supported by suspension-type insulators at crossings over communication wires shall be increased by such an amount that the values specified above will be maintained in case of a broken conductor in either adjacent span, provided such conductor is supported as follows:

1. At on support by suspension-type insulators in a suspended position and at the other support by insulators not free to swing (including semi-strain-type insulator).
2. At one support by a strain insulator, and at the other support by a semi-strain-type insulator.

Where necessary for unobstructed view of signals, signs, etc., NCRR may require greater clearances than those specified herein.

The side clearance of poles, towers, and anchor guys shall be not less than 18 feet.

PLATE VI (continued)

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 60°F.

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

NOTE 1: The minimum clearance between the top wire of any NCRR 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.