

Wisconsin Public Service Joint Use Manual		
Section:	Joint CATV	
Requirements for Make Ready Engineering Firms		505
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“Make Ready” refers to the modification of poles or lines or the installation of guys, anchors and other equipment to accommodate new or additional/modified communication company facilities. A pole “change-out” is the replacement of a pole to accommodate additional users or increased loads of existing users. Below is a list of requirements that must be completed prior to allowing any CATV (cable television) or CLEC (competitive local exchange carrier) to attach to Wisconsin Public Service (WPS)-owned poles. For purposes of this document, the terms CATV and CLEC do not include ILEC (incumbent local exchange) carriers. Please contact the local Field Application Engineer and/or WPS Joint Use department for any requests for exceptions or on-site meetings to discuss specific project details.

Definitions

- **Attacher** – Any cable television (CATV), competitive local exchange carrier (CLEC), telecommunications company (TELCOM) or other entity attaching utility communication facilities to poles.
- **Make Ready Engineering Firms** – Engineering firms hired by attachers to design communication company attachments, take measurements, and conduct code compliance analysis (both pole strength analysis and clearances)
- **ILEC** – Incumbent local exchange carrier – usually the original telephone company in a geographic region that usually has pole ownership and joint use of such poles.
- **WPS** – Wisconsin Public Service. Electric distribution company that owns poles referred to in this document.
- **WPS Joint Use Department** – Department that is responsible for any Make Ready request and other joint use work within WPS. Any WPS reference in this document refers to this department.

Requirements

1. The attacher and/or engineering firm needs to submit a data request to WPS Joint Use Department. This request will include a map of the proposed route, indicating the poles to which the attacher desires to attach. On-site meetings are available at the request of the attacher to discuss possible routes. This meeting may be billable to the attacher.
2. Upon receipt of the request, WPS will provide the attacher with records indicating pole size, conductor type, attached equipment, pole owner, and **approximate** span lengths.
3. The attacher shall verify with a field check pole size, pole number, conductor types, attached equipment, third-party attachments, and span lengths. Individual span lengths shall be measured, not estimated. Any discrepancies shall be reported to WPS.
4. Qualified communication workers (as defined in the NESC) shall only verify attachment heights with an insulated measuring stick up to the neutral or secondary conductor. Unqualified workers are not allowed to perform these measurements. WPS will provide construction standards with approximate attachment heights for various primary construction methods. The use of a sonar measuring device should be used to verify the attachment heights are accurate.
5. All Make Ready projects shall meet all applicable codes in the currently adopted version of the National Electric Safety Code (NESC), including clearances and pole strength.
6. For clearance calculations, use the sag information provided in the WPS Standards sag tables. If any discrepancies between the actual field-measured sag and the sag tables are found, notify the local Field Application Engineer.
7. The attacher should obtain all relevant third-party attachment information such as cable size, weight and tensions. If any adjustment to third party attachments is required, the third party information must be obtained to verify that their attachments will remain in code compliance after the adjustment.

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8. Digital photographs must be included for all poles involved in the Make Ready request. The photos must clearly show the pole, all attached facilities, and any nearby structures that may need to be taken into account for clearance purposes.
9. The attacher must perform structural analysis for each pole that is affected by the attachments. This includes such things as poles adjacent to span taps or head guys. The pole strength analysis must be done using the Osmose O-Calc pole strength program. Attachment 1 covers WPS-specific requirements for pole strength analysis and design criteria. WPS will provide O-Calc default equipment data to the attacher.
10. The attacher must perform a clearance analysis for each span that is affected by the attachments. The clearance analysis must be done using an approved clearance software program that includes a profile view. Attachment 2 covers WPS-specific requirements for clearance calculations.
11. A copy (both paper and electronic) of the engineering shall be submitted to WPS Joint Use Department. The paper copies must include the profile view of all spans, a Make Ready Summary Sheet and O-Calc structural reports. The electronic copy must include the paper documents in electronic form and electronic copies of the color pictures. A notarized PE certification on the profile and structural analysis is also required before the Make Ready engineering will be approved.
12. No "grandfathering" to previous code editions will be allowed for any new Make Ready projects. All facilities must be modeled using the currently adopted NESC revision.
13. For any poles that are not owned by WPS, the engineering shall be given to the appropriate pole owner (usually an ILEC) for Make Ready review and approval. Please copy WPS on the engineering for these poles as well.
14. All existing code violations for all attachers on a pole or in a span must be identified in the Make Ready engineering.
15. The facility owner or the Make Ready engineering firm shall perform a final inspection of the new communication facilities once the construction has been completed. This inspection is to ensure that the new facilities were installed in accordance with the Make Ready engineering specifications.
16. Any violation of the above guidelines may force WPS disallow future Make Ready projects until the issues have been corrected. Additionally, WPS may not accept Make Ready engineering from firms that do not follow these requirements.
17. All existing attachments & sags shall be defined in paperwork submitted to WPS for every pole. Along with any recommendations to remedy violations.

Attachment 1 - Pole Strength and Design Requirements

All attachments must, at a minimum, meet the currently adopted NESC and PSC 114. Any WPS design standard that is greater than the minimum requirements must also be met.

1. All utility anchors shall be assumed to be an 8" single helix unless if verified differently by WPS.
2. All guy and anchor lead length and splay angles must be measured in the field. Estimates are not acceptable.
3. All line angles must be measured in the field.

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4. All WPS steel guy wire types installed prior to 2002 must be modeled as 3/8" High Strength (HS). All WPS guy wire types installed 2002 and later must be modeled as 3/8" Extra High Strength (EHS). Older copperweld guys shall be modeled at the strength dictated by its diameter.

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5. Soil types shall be modeled as type 5 unless the pole is known to be in a different class of soil (such as loose sand or rock). Approval from the local WPS Field Application Engineer must be granted to change soil class.
6. All power conductor tensions shall be based on the WPS maximum guying tensions for the conductor type and span type (short, medium, or long). Any changes to this methodology must be approved by the local WPS Field Application Engineer.
7. Tensions shall be the same throughout the entire length of a cable (i.e., tensions cannot change span to span without appropriate guys and anchors). For suggested Make Ready repairs, pulling slack out of one span or changing tension in one span is not allowable for this reason.
8. All electric service drops must be modeled with a maximum guying tension of 400 lbs. WPS may reduce this tension during the Make Ready review based on actual tension of the service.
9. If a pole has more than five communication service drops, all communication drops must be modeled with a maximum guying tension of 50 lbs.
10. Attaching to WPS anchors shall not be allowed under any circumstances unless there is written approval from the WPS local Field Application Engineer.
11. All communication messengers shall be bonded to the pole ground where required by the NESC. Any pole ground under the U-guard must be bonded by WPS field personnel. The communication company must specifically request that this bonding be done by WPS at the time of installation.
12. Slack spans are not allowed without approval from the local WPS Field Application Engineer.
13. There shall be a minimum of 6" between holes drilled in poles. Any suggested attachment height changes need to take this into account.
14. The engineering shall be done to NESC grade C construction standards, except for situations where a pole line crosses or runs parallel to railroad, limited-access highways, navigable waterways or other location required to be engineered at NESC Grade B construction. WPS may require grade B construction on certain structures outside of NESC requirements.
15. For poles where there is a head guy (span guy), poles on both sides must be engineered. In order to do this, model the pole causing the tension on the head guy. Run the analysis and take the resulting tension and enter that tension for the second pole.
16. Fiber stress height reduction factor does not need to be used for poles that extend less than 50 feet above ground.
17. When modeling poles in O-Calc, be sure to select the correct structure type on the "Admin" tab. There are four options: TANGENT, ANGLE, DEADEND, and JUNCTION. There are different strength and load factors applied based on the structure type, so it is imperative that the correct structure type is selected.
18. In O-Calc, the correct wood pole species must be selected. The pole species can usually be found on the pole brand, typically placed 3-6 feet above the ground line.

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Attachment 2 - Clearance Specifications

1. Model and verify that the new facilities will meet the currently adopted NESC clearance requirements, including, but not limited to:
 - a. Building and structure clearances.
 - b. Traffic signals, railroad signals, billboards, and private streetlight clearances.
 - c. Clearances between facilities on the pole, both mid-span and at the pole (typically other communication facilities and the power facilities).
 - d. Clearances on utilities not attached to the pole, but crossing underneath or nearby.
 - e. Ground clearances, including any service drops.

(NOTE: all clearances need to be determined for worst-case scenario.)
2. Use of the NESC “inaccessible rule” is not permitted (i.e., no 9½-foot communication ground clearances accepted).
3. Terrain elevation changes and snow accumulation must be taken into account when determining ground clearances.
4. Some states, DOTs, counties, municipalities, river crossings, and railroads have additional vertical ground clearance requirements for crossings. These requirements must be incorporated into the engineering analysis.
5. Mid-span clearances from the secondary or neutral shall be taken into account when determining the location at the pole. All new attachments must have at least 30” of separation under worst case at mid-span (12” neutral clearances will not be accepted unless approved by the WPS local Field Application Engineer). The secondary must be modeled at worst-case sag conditions. Usually, worst-case sag conditions are power conductors at 194 degrees or at 32 degrees with a half-inch of ice.
6. Often, suggestions for fixing problems found in the Make Ready process are not able to be used because they create other code violations. For example, a suggested fix to lower telephone in order to obtain mid-span clearance for a CATV line may cause their telephone’s service drops not to meet ground clearance. All facilities attached to a pole must be engineered to comply with the NESC.
7. Clearances must be maintained throughout the entire span. Typically, the middle of the span and the attachments at the pole are examined for code violations.
8. Streetlight mounting heights shall not be changed without permission from WPS and/or the party paying for the streetlight. Adjusting the mounting height of a streetlight may cause inadequate lighting for the roadway. IESNA RP-8 can be used as a reference for the basis of roadway lighting.