

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH**

DOCKET NO. EC-23, Sub 50

**BLUE RIDGE ELECTRIC MEMBERSHIP
CORPORATION,**

Complainant,

v.

**CHARTER COMMUNICATIONS
PROPERTIES LLC,**

Respondent.

**REBUTTAL TESTIMONY
OF
WILFRED ARNETT**

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1 **REBUTTAL TESTIMONY**
2 **OF**
3 **WILFRED ARNETT**
4

5 **Q. PLEASE STATE YOUR NAME.**

6 A. My name is Wilfred (“Wil”) Arnett.

7 **Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY IN THIS**
8 **PROCEEDING?**

9 A. Yes. I submitted pre-filed direct testimony in this matter on October
10 16, 2017, in support of Blue Ridge Electric Membership Corporation (“Blue
11 Ridge”).

12 **Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?**

13 A. I would like to respond to portions of the testimony submitted by
14 Charter Communications Properties, LLC (“Charter”) in this matter. In
15 particular, , I want to respond to statements made by Patricia Kravtin and
16 Michael Mullins, who submitted testimony on behalf of Charter on October
17 30, 2017.

18

19 **I. THE KEY ECONOMIC AND PUBLIC POLICY PRINCIPLES OF**
20 **EFFECTIVE POLE RATE REGULATION**

21 **Q. ARE BLUE RIDGE’S POLES “ESSENTIAL FACILITIES” FOR**
22 **CHARTER AND CABLE COMPANIES?**

23 A. Cable operators have often referred to utility and incumbent local
24 exchange carrier (“ILEC”) poles as “essential facilities.” Nonetheless, after
25 considering the existing physical conditions and how many utilities own

1 poles, even in the same areas, one cannot help but question if poles on a rural
2 electric cooperative's system are in fact "essential facilities." Instead,
3 attaching to a cooperative's poles is one of many options a cable company has
4 in providing its services. The option to attach to a cooperative's poles actually
5 presents an opportunity for cable companies, like Charter, to gain the benefits
6 that come from sharing the costs of a commonly used asset.

7 Comparing Charter's assertions to the actions of ILECS, shows that
8 rural cooperative's utility poles are not "essential facilities" for
9 communications attachers. ILECS serve the same areas (and customers) as
10 Charter and provide substantially similar services. Yet, in contrast to Charter,
11 ILECs have chosen to own their own poles, enter joint use contracts (as
12 opposed to pole attachment agreements), and in the many instances, have
13 chosen to bury their facilities – even in places where power companies have
14 existing pole networks that the ILECS could use to attach their facilities.

15 I have attached several pictures showing places where Charter has
16 attached to Blue Ridge poles, but the ILEC (in this case, AT&T) has chosen to
17 bury its distribution facilities along the same route. (See WA Exhibit Nos.
18 25.1 through 25.3.) In fact, AT&T, and other former Bell System Companies
19 such as Verizon, have demonstrated a preference for decades for buried
20 distribution facilities, over aerial construction, for economy, safety and
21 reliability issues. In fact, buried distribution plant is first choice for AT&T.
22 (See WA Exhibit No. 22, AT&T's 1994 Outside Plant Engineering Handbook
23 related to Buried Plant). Telephone companies make plant investments based

1 on the total cost, or “present worth of expenditures” over the service life of the
2 asset, while cable companies appear more likely to make their investment
3 decisions based on the “installed first cost” of plant. As an example, one of
4 the ILEC’s serving the Blue Ridge EMC area has recently begun a program to
5 convert existing overhead plant to underground/buried facilities. Blue Ridge’s
6 recently completed inventory reflected a significant decrease in the number of
7 Skyline attachments to Blue Ridge poles (a decrease of 1,446 poles) since the
8 previous inventory in 2010.

9 The fact that Blue Ridge has an average of 2.35 attachers on its poles
10 further disproves Charter’s claim that Blue Ridge’s poles are “essential
11 facilities.” Charter’s entire service territory also receives service from ILECs.
12 If Blue Ridge’s poles were truly “essential facilities,” and communications
13 attachers had to attach in order to provide their services, the average number
14 of attaching entities would be three at a minimum, because the Blue Ridge,
15 the ILEC, and Charter would all have to connect to the pole. However, the
16 2015-2016 inventory identified 7,889 Blue Ridge poles where Charter is the
17 only attacher. If Blue Ridge poles are truly “essential facilities,” and the
18 telephone companies serve the same areas as Charter, one would expect the
19 ILECs to also have attachments Blue Ridge’s poles. This shows that other
20 communications companies also have an alternative instead of attaching to
21 Blue Ridge’s poles.

22 ILECs also have chosen to install their own poles in areas where
23 Charter is the only attacher on Blue Ridge poles. Indeed, at the end of 2016,

1 AT&T owned 235,763 poles in North Carolina. (See WA Exhibit No. 26,
2 AT&T NC 2016 Armis Report 4301.) In those areas where both the Blue
3 Ridge and an ILEC own poles, the ILECs' poles are also available for Charter
4 to make its attachments. This means that Charter has a choice whether to seek
5 an attachment to the ILECs poles or Blue Ridge's poles, which means that
6 Blue Ridge's poles are not essential facilities.

7 Further, I know of no North Carolina regulation, or law, that prohibits
8 Charter from owning and sharing use of joint poles with other utilities such as
9 Blue Ridge. If, in fact, the ownership of joint use poles provides other
10 benefits to the owner, as Ms. Kravtin claims, why shouldn't Charter be a pole
11 owner, and the power company a licensee?

12 **Q. HOW DO YOU RESPOND TO MS. KRAVTIN'S AND MR. MULLINS'**
13 **REPEATED ASSERTIONS THAT CHARTER ONLY USES**
14 **"SURPLUS SPACE" ON BLUE RIDGE'S POLES?**

15 A. I found no documentation in Ms. Kravtin's and Mr. Mullins' testimony
16 to support of their repeated claims that Charter only uses "surplus space" on
17 Blue Ridge's poles, even though Ms. Kravtin made that claim at least eleven
18 times in her testimony. The records, instead confirm that their claim there is
19 "surplus space" on Blue Ridge's poles is incorrect. In fact, Blue Ridge does
20 not have a policy to design and install poles with surplus space. Blue Ridge
21 instead designs its poles, which typically have a service life of 30 years, to
22 support Blue Ridge's existing and future facilities over the life of the asset.
23 What Ms. Kravtin and Mr. Mullins refers to as "surplus space" is instead

1 space planned for future use. When a utility invests in a 30-year asset,
2 engineering practice, and economics, dictates that the asset should be
3 sufficient to provide for the utilities' present needs as well as the facilities it
4 may need to add in the future to serve its customers.

5 **Q. IS THERE EVIDENCE THAT FURTHER SHOWS THERE IS NO**
6 **SURPLUS POLE SPACE ON BLUE RIDGE'S POLES?**

7 A. Yes, there is. First all, Blue Ridge's average pole height has already
8 been established to be less than the industry presumed average of 37.5 feet.
9 We determined from Blue Ridge's continuing property records at yearend
10 2016 that the average distribution pole is 36.87 feet in height. We also
11 determined that the average span length on the Blue Ridge system is 257.01
12 feet. Longer spans require a higher point of attachment to meet NESC, and
13 NC DOT, ground clearances at mid span. Shorter average poles further limit
14 the space available on the pole for communications attachments.

15 Mr. Booth, in his October 16 direct testimony , provides an example of
16 Blue Ridge's typical distribution design. (See Booth, Direct Testimony, p. 15,
17 Figure 1). Blue Ridge legacy distribution specifications requires 8.5 feet for
18 distribution facilities in its typical configuration (9.5 feet in the new/current
19 specification). The average height of distribution pole on Blue Ridge's
20 system is 36.87 feet. The depth of placement for both 35 feet and 40 feet
21 poles is 6 feet under RUS specifications. Subtracting 6 feet from the average
22 pole leaves 30.87 feet above ground and available to support facilities. Blue
23 Ridge's legacy design requires 8.5 feet for distribution facilities (9.5 feet

1 currently), on a typical pole over its service life, as stated above. Subtracting
2 8.5 feet from the above ground portion of an average Blue Ridge pole (30.87
3 feet) leaves 22.37' of pole below Blue Ridge distribution facilities, in the
4 legacy configuration, and 21.37 feet under the new specification. If a
5 communications attachment is placed on the pole, the NESC requires 3.33 feet
6 (40 inches) separation between supply facilities and communications
7 facilities. By subtracting the NESC required Communications Workers'
8 Safety Space (3.33 feet), we determine that the highest possible point of
9 attachment for communications is 19.04 feet (legacy Blue Ridge
10 specifications). As shown in WA Exhibit No. 13.3, I previously determined
11 Charter's calculated sag to be 5.76 feet (using CommScope's Spanmaster
12 program - on a typical ¼ inch (6.6 mm) strand; on Blue Ridge's typical span
13 of 257.01 feet; under NESC Medium loading). The NESC also requires 15.5
14 feet minimum ground clearance for communications attachments on the
15 overwhelming majority of Blue Ridge's system. Subtracting the calculated
16 sag for Charter's facilities (5.76 feet) from the highest possible point of
17 attachment (19.04 feet) for communications, leaves 13.28 feet of calculated
18 ground clearance under ice loading. This exercise demonstrates that Charter
19 cannot attach its facilities to an average Blue Ridge pole and meet NESC
20 ground clearance requirements with ice loading without encroaching into Blue
21 Ridge's designed space. Said another way, there is no "surplus space" on
22 Blue Ridge's average poles for communications facilities. Another example
23 of this calculation, using Pole Foreman's Sag Line calculations is also

1 provided as WA Exhibit No. 27. The Pole Foreman analysis also yields a
2 midspan ground line clearance of 13.2 feet for Charter's facilities under the
3 same conditions.

4 **Q. MS. KRAVTIN ALSO REFERS TO THE "ECONOMIC PRINCIPLES**
5 **OF COST CAUSATION AND SUBSIDY AVOIDANCE UNDERLYING**
6 **COST BASED RATES." DO YOU HAVE ANY COMMENTS**
7 **RELATED TO COST AVOIDANCE THROUGH JOINT USE?**

8 A. Joint use of poles originated in the early 1900s because there were two
9 entities (communications and power) constructing outside plant facilities on
10 separate pole lines to serve the same customers. Safety was the initial concern
11 of the parties because there were concerned about structural and inductive
12 interference between facilities installed on two separate pole lines. Joint use
13 of poles was studied almost 100 years ago by the National Electric Light
14 Association, predecessor of the Edison Electric Institute, and the Bell System
15 and determined to be a feasible alternative to construction of individual pole
16 lines. Three joint use practices were developed and published in the 1920s.
17 "Principles and Practices for the Inductive Coordination of Supply and Signal
18 Systems", December 9, 1922; "Principles and Practices for the Joint Use of
19 Wood Poles of Supply and Communications Companies," February 15, 1926;
20 and, "Allocation of Costs between Supply and Communications Companies"
21 published October 15, 1926. The third publication addressed the economics
22 of joint use construction and established agreement between the parties as to

1 cost sharing for joint use. All three publications were reissued in their entirety
2 in July 1945, and are provided here as WA Exhibit No. 28.

3 With respect to the economics of joint use, the parties recognized that
4 the true costs of joint use are not related to the rental rate, but rather the costs
5 of ownership and maintenance of joint use poles. The representatives of the
6 two industries agreed that the appropriate allocation of cost was a 50-50
7 ownership ratio. (See WA Exhibit No. 28, p. 42, "Ownership of Poles under a
8 Space Rental Agreement"). The parties/industries agreed to an equal sharing
9 of the costs of owning and operating pole plant for their mutual benefit, and
10 by extension, to the benefit of the rate base.

11 EEI and the Bell System subsequently issued, in October 1951, a joint
12 practice entitled "Joint Use of Poles in Rural Areas." A copy is attached as
13 WA Exhibit No. 29. The report referred back to the prior 1926 practice and
14 concluded that, as to joint use in rural areas, "*Joint Use Agreements should*
15 *preferably be of a type under which each of the parties shares equitably in the*
16 *cost of joint poles.*"

17 What Ms. Kravtin has proposed is not a sharing of the economics of
18 joint use, nor is it a formula under which Charter would pay for the cost of the
19 poles or portions of the poles it uses. Instead, she offers only a token rental
20 payment, equivalent to 7.41% of the costs of ownership, even though her
21 client, Charter, is one of only 2.35 attachers on the pole, on average. Charter,
22 now provides all the same enhanced services, at similar rates as local
23 telephone company. With respect to cost avoidance, her proposal would

1 create a cost avoidance of 92.6% of the costs associated with the ownership of
2 poles.

3
4 **II. THE TVA RATE FORMULA**

5 **Q. MS. KRAVTIN ASSERTS THAT “THE OUTLIER TVA APPROACH**
6 **IS HIGHLY FLAWED AND WAS DEVELOPED EXPRESSLY TO**
7 **SERVE THE LIMITED INTERESTS OF ITS POLE OWNING**
8 **CUSTOMERS IN CHARGING THE HIGHEST POSSIBLE POLE**
9 **ATTACHMENT RATES.” DO YOU AGREE WITH HER**
10 **STATEMENT?**

11 A. Absolutely not. TVA fully explained its goals and rationale in the
12 2016 resolution adopted by the TVA Board of Directors. (Exhibit WA-3).
13 Specifically, TVA stated that its goal was “to insure that electric systems are
14 being appropriately compensated for use of the electric system assets.” As the
15 TVA observed, “[f]ailure to do so has a direct impact on the retail rates
16 charged by LPCs because electric rate payers will be forced to subsidize the
17 business activities of those entities attaching to the assets of LPCs [that is,
18 their poles] for non-electric purposes.’ The other published statements in
19 support of the adopted resolution speak for themselves—it is clear TVA’s
20 intent was to protect electric rate payers from subsidizing communications
21 attachers.

22 If the intent of the TVA Board of Directors was to generate the
23 “highest possible” pole attachment rates, as Ms. Kravtin alleges, there are

1 other formulas and methods it could have adopted that generate higher rates
2 than that ultimately approved by the TVA. For instance, The APPA rental
3 model described in my Direct Testimony, and WA Exhibit No. 15, using Blue
4 Ridge financials, and a “gross calculation” as provided for in the model,
5 produces a higher rental rate than the TVA formula. See rental calculations
6 for Blue Ridge using that model at WA Exhibit No.s 30.1, 30.2 and 30.3 for
7 2014, 2015 and 2016.

8 The TVA formula, however, only requires a cable attacher to share
9 28.44% of the annual costs of a pole when there are three attachers and all the
10 assumptions are used. And in the case of Blue Ridge, where there is only an
11 average of 2.35 attachers per pole, Charter would only be required to share
12 41.25% of the annual costs of the pole when actual data is used. (See Exhibit
13 WA-2.) This is appropriate and what one would typically expect in designing
14 formula to fairly share the costs of the pole: When there are three attachers, a
15 cable attacher pays less than a third of the pole costs, and when there are only
16 2.35 average attachers, the cable attacher pays approximately two-fifths of the
17 pole cost. The TVA Method is also much more closely aligned with the
18 industry practices on cost sharing and the original REA philosophy regarding
19 joint use of poles.

20 TVA acted in the best of interests of electric ratepayers, and
21 consequently developed a rental methodology that fairly allocates the costs of
22 ownership and maintenance of poles between the owner and the users.

1 **Q. MS. KRAVTIN ALSO STATES THAT THE TVA METHOD IS AN**
2 **“UNECONOMIC, UNTESTED, UNPREDICTABLE, AND**
3 **UNREASONABLE RATE METHOD.” HOW DO YOU RESPOND TO**
4 **HER ASSERTIONS?**

5 A. I disagree with all those assertions. As I explain in my direct
6 testimony, the TVA rate formula fairly allocates pole costs among electric
7 utilities and cable attachers based on a true understanding of how they use
8 space on the pole in the real world. Ms. Kravtin has no experience with pole
9 plant. Instead, she insists the Commission should adopt the FCC rate because
10 she believes it will help achieve a public policy objective she endorses—the
11 subsidization of broadband internet—and obviously would result in an
12 economic benefit to her client.

13 The results under the TVA method are just as “predictable” as under
14 the FCC cable rate. Under both methodologies, annual pole attachment rates
15 will only change as cost inputs change. Those inputs are the same under both
16 formulas. Moreover, the only basis Ms. Kravtin appears to have for asserting
17 that the TVA rate is “unreasonable” is her disagreement with its space
18 allocation formula, particularly its requirement that cable attachers bear an
19 equal share of the costs of the support space, which benefits all attachers
20 equally, and that they pay for the costs of the forty-inch Communications
21 Worker Safety Zone, which would not be required if there were no
22 communications attachers on the pole.

1 Likewise, Ms. Kravtin's assertion that the TVA rate is "untested" is
2 simply incorrect. The TVA formula resulted from a review by a federal
3 agency with responsibility for regulating more than 160 non-profit electric
4 cooperatives and municipally-owned utilities in seven states. Its analysis is
5 thus directly relevant here, and far more appropriate than a rate formula
6 adopted by the Federal Communications Commission to regulate the pole
7 attachment rates charged by for-profit, investor-owned utilities (IOUs).

8 **Q. IS THE TVA FORMULA CONSISTENT WITH OTHER GUIDANCE**
9 **REGARDING POLE ATTACHMENT RATES CHARGED BY**
10 **ELECTRIC COOPERATIVES?**

11 A. Yes, it is. TVA stated that its underlying intent was to ensure that
12 electric cooperatives and other LPCs are appropriately compensated so their
13 members are not required to subsidize the business of communications
14 attachers. This is consistent with the earliest guidance provided by the
15 Rural Electrification Administration (REA) of the US Department of
16 Agriculture. In its early years, REA issued guidance to its member
17 cooperatives regarding acceptable joint use contract terms, including a rental
18 rate method, for telephone attachments. Telephone companies were essentially
19 the only communications companies at that time.

20 Attached as WA Exhibit No. 31 is a copy of an early REA document
21 titled "Joint Use of Facilities by REA Borrowers and Telephone Companies,"
22 secured from the National Archives. On page 2, the REA explains that, "even
23 though power system poles are already in place, and can accommodate

1 telephone facilities with little, if any, extra cost, telephone companies should
2 be required to make payments representing their fair share of the costs of the
3 poles so that the savings can accrue to the consumers of electricity as well as
4 the telephone subscribers. In other words, the power consumers should not be
5 asked to subsidize telephone subscribers.”

6 Thus, REA recognized long ago that communications attachers should
7 bear an appropriate share of the full costs of the poles they use, not just the
8 supposed “incremental” costs incurred as a result of their attachments. If not,
9 communications attachers, like Charter here, would be able to obtain the
10 benefit of fully-constructed, fully-maintained pole plants, constructed using
11 capital contributed by the cooperatives’ members, without fairly contributing
12 their costs.

13 **Q. MS. KRAVTIN FURTHER STATES THAT THE TVA FORMULA**
14 **BEARS NO RESEMBLANCE TO THE FCC CABLE RATE**
15 **FORMULA. DO YOU AGREE?**

16 A. Absolutely not. Both the FCC and the TVA formulas are based on a
17 three-component calculation. The first component is the historical bare pole
18 cost, the second factor is the total of the annual charges related to the costs of
19 ownership and maintenance of poles, and third is the space allocation for each
20 of the parties. The dispute arises only as to the third element—the allocation
21 of space (or cost responsibility) that each party includes in their rental method.
22 As I have explained before, the FCC Cable Rate requires cable attachers to
23 pay for only a small amount of the “Support Space” necessary to install the

1 pole in the ground and achieve ground clearance, even though all attachers
2 benefit equally from this space. It also allocates the forty-inch
3 Communications Worker Safety Zone, needed to provide separation between
4 communications attachments and electrical facilities, entirely to the electric
5 utility, even though this space is needed solely to protect communications
6 works and would not be required if communications attachers were not on the
7 pole.

8 Q. MS. KRAVTIN ASSERTS IT IS INAPPROPRIATE FOR THE TVA
9 FORMULA TO ALLOCATE COSTS OF THE SUPPORT SPACE ON A
10 “PER CAPITA” BASIS, BECAUSE POLE OWNERS GET THE
11 BENEFIT OF “OWNERSHIP RIGHTS” IN THE POLE, WHILE
12 COMMUNICATIONS ATTACHERS DO NOT. DO YOU BELIEVE
13 OWNERSHIP OF THE POLE IS A REASON NOT TO ALLOCATE
14 THE COSTS OF THE SUPPORT SPACE ON A “PER CAPITA”
15 BASIS?

16 A. Absolutely not. The TVA Method allocates the costs associated with
17 the various portions of the pole to the parties that occupy and benefit from that
18 space. As I have stated multiple times, all parties require, and benefit equally
19 from, the common space (the portion of the pole buried in the ground for
20 stability and the portion necessary for minimum ground clearance to comply
21 with the NESC).

22 In her testimony, Ms. Kravtin, argues that the Support Space ought to
23 be allocated in the same way that common area maintenance charges are

1 allocated in typical commercial leases—and that a tenant who leases one story
2 in a ten story building should only have to pay ten percent of the common area
3 charges. Ms. Kravtin’s example, however, does not reflect how poles are
4 actually used in real life. All pole owners must have the Support Space to
5 establish ground clearance, and they use that space even if there are no other
6 attachers on the pole. Thus, if Charter constructed its own poles, it would
7 need the full Support Space—not just a percentage of it. A better example
8 therefore would be a building where no tenant will rent space unless it is at
9 least ten stories off the ground and where each tenant insists that the first ten
10 stories remain vacant. Accordingly, Ms. Kravtin’s building example simply
11 does not reflect reality.

12 Moreover, Charter uses the Support Space on a regular basis to attach
13 risers, communications boxes, and amplifiers, and its employees and
14 contractors use the Support Space as climbing space to install and maintain
15 Charter’s facilities. Ms. Kravtin’s insistence that Charter only uses one foot
16 of space, or possibly even less, fails to account for these uses of the Support
17 Space.

18 As to Ms. Kravtin’s comments about the advantages being a pole
19 “owner”: Ownership also comes with responsibility. The pole owner is also
20 responsible for the maintenance, taxes, rights of way maintenance, insurance,
21 record keeping, and eventual replacement at the end of a pole’s service life.
22 While a pole has a definite service life, the pole location is (essentially) there
23 in perpetuity. This means the responsibilities of the pole owner never go

1 away. For instance, even if Charter pays to install a taller pole, Blue Ridge
2 incurs the ensuing maintenance costs, and is fully responsible for replacing the
3 pole at the end of its service life, even though the pole is taller and more
4 expensive than Blue Ridge would need for its own its own purposes.

5 If pole ownership was such a great thing, I am certain that Charter
6 would construct and own a large number of poles, but obviously it has not
7 chosen to do so.

8 **III. APPLICATION OF THE TVA RATE FORMULA TO BLUE RIDGE**

9 **A. USE OF ACTUAL FIGURES –POLE ATTACHMENT RATES**

10 **Q. WHY DID YOU USE ACTUAL FIGURES IN CALCULATING A POLE**
11 **ATTACHMENT RATE FOR CHARTER’S ATTACHMENTS TO**
12 **BLUE RIDGE’S POLES INSTEAD USING THE ASSUMPTIONS IN**
13 **THE TVA FORMULA?**

14 **A.** TVA adopted its formula for use by 160+ LPCs across the seven-state
15 area served by TVA. The level of detail those LPCs keep in their records
16 varies, and many do not have sufficient data to determine the average number
17 of attachers, average pole height, or whether the LPC’s average span between
18 poles requires more or less support space. Blue Ridge has sufficient data to
19 obtain this information, and so it is appropriate to use real figures to generate
20 a rate that more accurately reflects Blue Ridge’s actual pole plant as opposed
21 to relying on assumptions.

22 Indeed, the TVA Board recognized that it is appropriate to use actual
23 figures regarding a power company’s poles where they are available when it

1 adopted the TVA formula. (See Exhibit WA-3, at p. 4 (approving use of
2 actual data for average pole height and appurtenance factors)). Ms. Kravtin
3 has also testified in prior cases before the Commission involving Charter's
4 affiliate, Time Warner Cable Southeast, LLC, that it is appropriate to use
5 actual data for space allocation figures where it is available and that the FCC
6 Cable Rate approves of doing so. (See WA Exhibit No. 32 ("As with any
7 presumptive value in the formula, to the extent there is actual (or statistically
8 significant) utility or attacher specific data to support use of alternative space
9 presumptions those can be used in lieu FCC's established space presumptions
10")).

11 **Q. YOU TESTIFIED BEFORE THE COMMISSION ON BEHALF OF**
12 **SEVERAL COOPERATIVES IN A CASE AGAINST CHARTER'S**
13 **AFFILIATE, TIME WARNER CABLE SOUTHEAST, LLC. WHY DID**
14 **YOU NOT USE ACTUAL AVERAGE POLE HEIGHT,**
15 **APPURTENANCE FACTOR, OR SUPPORT SPACE FIGURES IN**
16 **THAT CASE?**

17 A. The cooperatives in those cases did not have sufficient data to
18 determine actual figures for their system. For instance, instead of listing how
19 many poles of each height and class were in their system, only one of those
20 cooperatives had data in its CPRs with specific pole height data. The others
21 merely listed the number of poles by categories of poles, such as poles that
22 were "35 feet and under," which is a common practice. Blue Ridge, however,
23 breaks down all of its poles by height in its continuing property records. It

1 also has sufficient data to determine actual figures for each of the assumptions
2 I have rebutted in calculating a pole attachment rate under the TVA formula—
3 average number of attachers, average pole height, appurtenance factor, and
4 required Support Space.

5 **Q. WHICH PRESUMPTIONS IN THE TVA FORMULA HAVE YOU**
6 **REBUTTED WITH ACTUAL FIGURES?**

7 A. First, I have used the actual average of attachers on the poles in Blue
8 Ridge's system that have communications attachers—2.35 attachers—rather
9 than the assuming there are three attachers. I have also used (1) the actual
10 average distribution pole height of 36.83', 36.85' and 36.87' for 2014, 2015
11 and 2016 respectively, (2) a "bare pole" or, appurtenance factor, of 87.0%,
12 87.29% and 87.41% for 2014, 2015, and 2016, respectively; (3) an "occupied"
13 space allocation of 1.11' for Charter in all 3 periods; and (4) an allocation of a
14 greater support space, 27.3', 27.28' and 27.26' for 2014, 2015, and 2016,
15 which is required to maintain ground clearance given the longer than average
16 span length between poles on Blue Ridge's system.

17 **B. SPACE ALLOCATION USING ACTUAL FIGURES**

18 **Q. WHAT HAPPENS TO THE SPACE ALLOCATION PERCENTAGE**
19 **UNDER THE TVA FORMULA WHEN THESE ACTUAL FIGURES**
20 **ARE USED?**

21 A. As I said before, by default, the TVA formula allocates 28.4% of the
22 annual pole costs to a cable attacher when there are three attachers on a pole
23 (an electric utility, a telephone company, and a cable attacher). However,

1 because there are only 2.35 average attachers on the poles in Blue Ridge's
2 system that have communications attachments. Thus, there are fewer
3 attachers to share the costs of the pole. When the actual number of attachers
4 is used along with the other figures described above, Charter's actual space
5 allocation percentage increases to 41.25% for FY 2014, 41.21% for FY 2015,
6 and 41.16% for FY 2016. (See WA Exhibit No.s 2.1 – 2.3).

7 **Q. DO YOU BELIEVE THE SPACE ALLOCATION FACTOR THAT**
8 **RESULTS FROM USE OF ACTUAL FIGURES IS FAIR?**

9 A. Yes. When there are three attachers and all the assumptions are used,
10 the TVA formula allocates less than a third of the costs of the pole—28.4%—
11 to a cable company. That figure is fair and about what you would expect
12 when there are three attachers. In Blue Ridge's case, the result is
13 approximately 41.2%, or just around two-fifths, which is about what you
14 would expect when there are only 2.35 attachers.

15 **C. BLUE RIDGE'S POLE COSTS**

16 **Q. WHAT WERE BLUE RIDGE'S AVERAGE ANNUAL DISTRIBUTION**
17 **POLE COSTS FOR 2014, 2015, AND 2016?**

18 A. Based on the figures shown in WA Exhibit Nos. 2.1 – 2.3, Blue
19 Ridge's average annual pole costs for *distribution* poles (including
20 maintenance and other carrying charges), were // BEGIN CONFIDENTIAL //

21 [REDACTED]

22 [REDACTED] // END CONFIDENTIAL

1 **Q. DO THESE FIGURES REFLECT THE FULL COSTS OF THE POLES**
2 **TO WHICH CHARTER HAS ATTACHED?**

3 A. While these figures reflect the annual costs of the *distribution* poles to
4 which Charter has attached (as shown in Blue Ridge’s accounting records kept
5 in accordance with Rural Utilities Service (“RUS”) standards and generally
6 accepted accounting principles) they do not reflect the actual full cost of the
7 poles to which Charter has attached for at least two reasons: (1) These figures
8 only reflect the annual costs of Blue Ridge’s *distribution poles*. However, as I
9 stated in my direct testimony, the 2015-16 pole attachment inventory shows
10 that Charter is attached to at least 442 *transmission* poles on Blue Ridge’s
11 system, which cost many times more than distribution poles. (2) Because of
12 the accounting methods used to retire poles from Blue Ridge’s books as they
13 are removed or replaced, Blue Ridge’s financial records understate the true
14 costs of even the distribution poles in Account 364 (poles, towers and
15 fixtures), even though they have been booked properly in accordance with
16 generally accepted accounting standards.

17 **Q. ARE THE COSTS OF TRANSMISSION POLES TO WHICH**
18 **CHARTER HAS ATTACHED INCLUDED IN THE TVA RATE**
19 **FORMULA?**

20 A. No. The rates I calculated under the TVA formula in my direct
21 testimony only take into account the cost of *distribution* poles, not
22 transmission poles. RUS requires its borrowers, such as Blue Ridge, to keep
23 their books in accordance with uniform system of accounts. Account 364,

1 which is used to calculate pole costs under both the TVA and the FCC
2 formula, only includes the cost of distribution poles. Transmission poles are
3 booked in a separate account (Account 355).

4 **Q. IS THERE A SIGNIFICANT DIFFERENCE IN THE COSTS OF**
5 **TRANSMISSION AND DISTRIBUTION POLES?**

6 A. Absolutely. As I explained in my direct testimony, in 2016, Blue
7 Ridge's average installed cost of a transmission pole was // BEGIN

8 CONFIDENTIAL // [REDACTED]
9 [REDACTED] // END

10 CONFIDENTIAL //

11 **Q DO ANY OF BLUE RIDGE'S OTHER AGREEMENTS WITH**
12 **ATTACHERS INCLUDE A SEPARATE TRANSMISSION RATE?**

13 Yes. Blue Ridge's 2002 agreement with SkyBest includes an \$83.50
14 per pole rate for attachments to Blue Ridge's transmission poles. (See WA
15 Exhibit No. 34, Article 8). I also know of IOUs that charge separate rates for
16 attachments to transmission poles. For instance, I know that

17 **Q. DOES THE RUS ACCOUNTING METHOD RESULT IN THE VALUE**
18 **OF BLUE RIDGE'S DISTRIBUTION POLES BEING UNDERSTED?**

19 A. As I said above, Blue Ridge's financial records, which are audited
20 annually and filed with RUS on Form 7, correctly reflect the costs of Blue
21 Ridge's poles as they were booked in Blue Ridge's accounting records using
22 the accounting process originally developed and approved by the Rural
23 Electrification Administration (REA). However, the REA method of retiring

1 poles from the plant significantly understates the asset base related to Account
2 364, (Poles, Towers & Fixtures), and other distribution accounts as well.

3 **Q. COULD YOU PLEASE EXPLAIN WHY YOU BELIEVE BLUE**
4 **RIDGE'S AVERAGE NET POLE COST IS UNDERSTATED?**

5 A. The original method developed by REA for retiring poles from a
6 cooperative's books when they were removed or replaced involved "average"
7 unit values. This system was developed in the 1930s, an era when the
8 cooperatives had limited accounting personnel and when plant costs were
9 stable and there was little inflation. REA and the cooperatives selected this
10 accounting system because it required minimal record keeping to maintain.
11 Under this system, each time the cooperative adds a pole to its books, the
12 pole's cost is added to all the others in the account. However, when a pole is
13 retired from the account, it is retired at the then-current average of the value
14 of all poles in the system—even though the actual value of the pole being
15 retired, which was installed many years ago, is likely much less than the
16 average. The result is that, over time, the value of a cooperative's pole
17 account ends up being understated.

18 **Q. DO THE INVESTOR-OWNED UTILITIES AND ILECS USE THIS**
19 **METHOD OF RETIREMENT ACCOUNTING?**

20 A. No, both IOUs and ILECs use "vintage retirement" accounting. I
21 know this because of my experience representing IOUs and also through 30
22 years of service at BellSouth Telecommunications, Inc. Under a "vintage"
23 system, when a pole is retired and taken off the books, it is "retired" at the

1 same cost at which it was installed. If a pole was installed 20 years ago for
2 \$100, that same amount will be removed from the account (364 for IOUs or
3 2411 for ILECs) when the pole is retired. In comparison, under an “average”
4 retirement system, a pole installed twenty years ago by a cooperative for \$100
5 would be retired at a current average value of \$300 in this example. IOUs
6 utilize vintage accounting processes for obvious reasons.

7 **Q. WHAT DOES THE USE OF AVERAGE RETIREMENT MEAN FOR**
8 **THE VALUE OF A COOPERATIVES’ POLE PLANT?**

9 A. As the installed cost of plant rises, an “average retirement cost” system
10 materially understates the value of a cooperative’s pole plant. Typically, older
11 poles are retired first, and when an older pole is removed at an inflated
12 retirement value, the remaining balance for the account is eroded. RUS has
13 stated that where RUS borrowers have performed system wide inventories to
14 establish “vintage retirement record systems, the existing recorded plant
15 values have ranged from 50% to 65% of the original cost.” (See WA Exhibit
16 No. 35, 1998 Correspondence between R Nichols, CPA, Auditor for Georgia
17 Electric Membership Corporation, and RUS Program Accounting and
18 Regulatory Analysis).

19 **Q. AND WHAT IS THE IMPORTANCE OF THIS ACCOUNTING**
20 **METHOD IN THIS PROCEEDING?**

21 A. Under all cost-based formulas—including both the FCC Cable Rate
22 and the TVA formula—the first input into the formula is the “average net bare
23 pole cost.” Blue Ridge has historically used the REA/RUS “average”

1 accounting method for tracking pole costs in their continuing property
2 records. Therefore, I am confident that Blue Ridge's pole costs are
3 significantly understated. Blue Ridge is currently considering whether to
4 commission an accounting study to determine the impact of this accounting
5 method to determine what action should be taken.

6 **IV. THE FCC CABLE RATE IS INSUFFICIENT TO COMPENSATE**
7 **BLUE RIDGE AND IS AN OUTLIER AMONG ACCEPTED RATE**
8 **METHODOLOGIES**

9
10 **Q. RETURNING TO MS. KRAVTIN'S TESTIMONY, SHE ASSERTS**
11 **THE TVA RATE FORMULA IS AN "OUTLIER." IS THAT**
12 **CORRECT?**

13 A. No. The FCC Cable Rate is actually the outlier.

14 In my direct testimony, I described a number of accepted rate
15 formulas used by pole owners or approved by different jurisdictions around
16 the country. These include (1) the American Public Power Association rate
17 (the "APPA Rate"), which is based on rates adopted in court proceedings in
18 Seattle, Washington; (2) the "Telecom Plus Rate" considered by the United
19 States House of Representatives (3) the rate methodology adopted by the
20 Arkansas Public Service Commission (the "Arkansas Rate"). (See Direct
21 Testimony of Wil Arnett, pp. 25-35).

22 Exhibit WA-24 includes diagrams comparing the space allocation
23 percentages under each of these formulas to the percentage allocated under the
24 TVA and Cable rate. As this exhibit shows, assuming there are three
25 attachers, the space allocation percentages under these formulas range from

1 18.9% in the case of the Arkansas Rate to 27% in the case of the APPA rate.
2 This places the FCC Cable Rate, which allocates only 7.4% of the costs of the
3 pole to the cable attacher, on the extreme low end of the range.

4 I have also prepared calculations showing the annual pole attachment
5 rates that would result under each of these formulas, which are set forth in
6 WA Exhibit No. 33. Once again, the comparison shows that the FCC Cable
7 Rate is the significant outlier. These formulas produce pole attachment rates
8 using 2016 data that range from \$17.05 dollars per pole in the case of the
9 Arkansas Rate to \$28.54 in the case of the APPA Rate—which is even higher
10 than under the TVA rate formula. In contrast, the FCC Cable Rate would
11 result in a rate of \$5.33 per attachment using the formula’s assumptions (see
12 WA-Exhibit No. 2.5), and a rate of \$8.31 when using actual data.

13 Thus, if anything, the FCC Cable Rate, and its exceptionally low,
14 subsidized rate, represents the “outlier” approach.

15 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

16 **A.** Yes.

EXHIBIT WA-24

**WA Exhibit No. 14
Pole Attachment
Rental Formula Comparisons**

PUBLIC

POLE SPACE	RENTAL FORMULAE				
	TVA	APPA	ARKANSAS	FCC CABLE	Telecom Plus - US HR
POLE HEIGHT	37.5'	37.5'	37.5'	37.5'	37.5'
POWER	7.17' Allocated	Part of 10.17' of "Assignable" (Usable) Space	8.17' Allocated	Not Specified - Part of 13.5' of "Usable" Space	Not Specified - Part of 13.5' of "Usable" Space
COMMUNICATIONS WORKER SAFETY SPACE	Allocated Equally to 2 Communications Entities	3.33' Allocated to "Common Space"	Included in the "Un-Usable" Space	Included in the "Usable" Space	Included in the "Usable" Space
COMMUNICATIONS SPACE	Allocated to Communications Attachers	Allocated to Communications Attachers	Allocated to Communications Attachers	Allocated to Communications Attachers - Part of 13.5' of "Usable" Space	Allocated to Communications Attachers - Part of 13.5' of "Usable" Space
CATV	1' Allocated	1' Allocated	1' Allocated	1' Allocated	1' Allocated
TELCO	2' Allocated	1' Allocated	1' Allocated	N/A	1' Allocated
SUPPORT SPACE	Shared Equally By All Attachers (Including Owner)	Included in "Common" Space	Included as Part of the "Un-usable" Space	Known as "Un-usable" Space	Known as "Un-usable" Space
MINIMUM ATTACHMENT HEIGHT TO GROUND LINE	18'	18'	27.33' Which includes the Safety Space. 1/3 Allocated Fully to Owner and 2/3 Allocated Equally to All Attachers Including Owner	18'	18'
IN GROUND FOR STABILITY	6'	6'		6'	6'
PRESUMED NUMBER OF ATTACHERS (INCLUDING OWNER)	3	3	3	N/A	3
CALCULATION	$1 + \frac{3.33}{2} + \frac{24}{3}$ 37.5	$1 + \frac{27.33}{3}$ 37.5	$1 + \frac{2}{3} \times \frac{27.33}{3}$ 37.5	$\frac{1}{13.5}$	$1 + \frac{24}{3}$ 37.5
% OF ANNUAL CHARGE ALLOCATED TO CATV	28.44%	26.96%	18.86%	7.41%*	24.00%
				* 1' Divided by 13.5' of "Usable" Space	

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TVA

SPACE ALLOCATION ILLUSTRATION

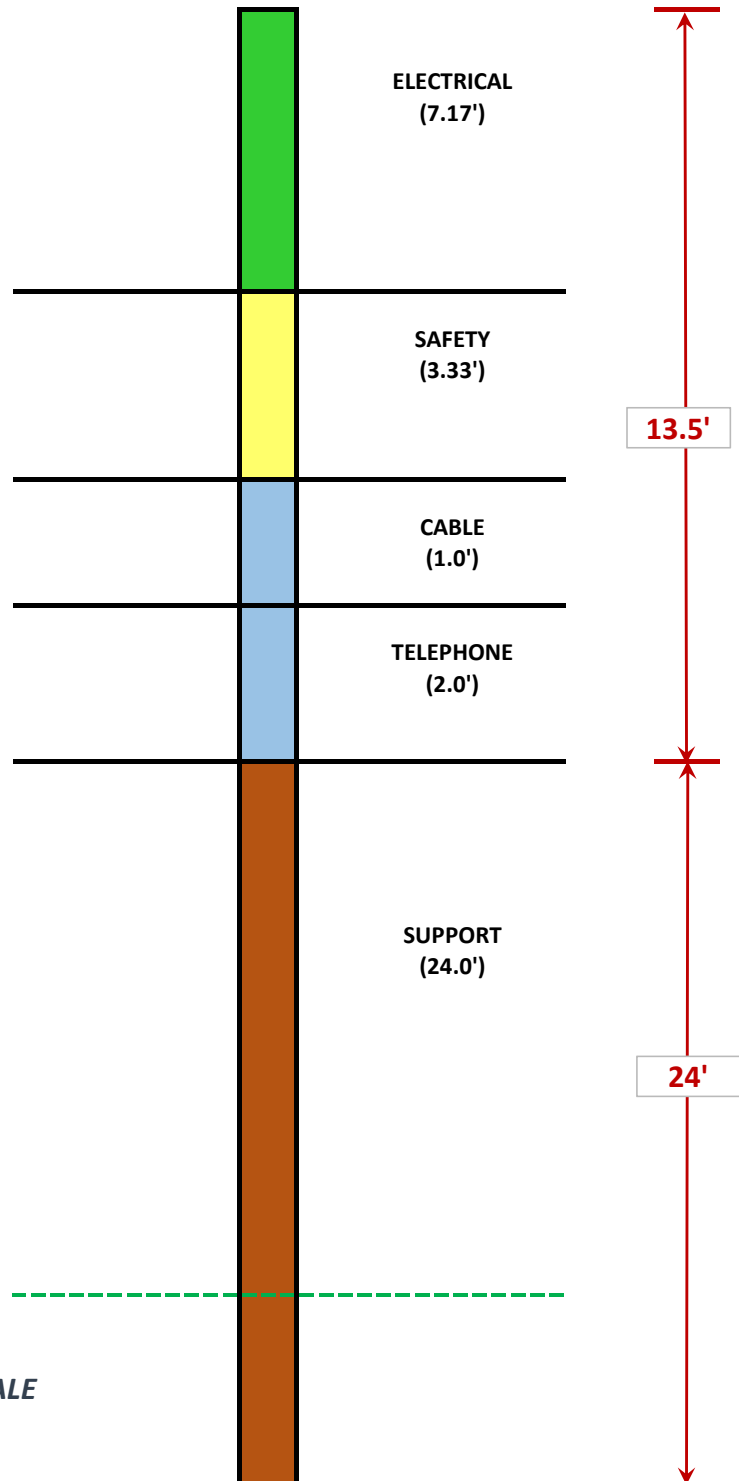
Allocates usable space

Equal sharing of safety space
among all users attaching for
communication purposes

Equal sharing of support space
among all users including
electrical

Space allocation is 28.44% based
on assumed 37.5 foot pole with 3
average users

Results in a fair allocation of costs
among pole owner and pole users



NOT TO SCALE

DELAWARE FORMULA

SPACE ALLOCATION ILLUSTRATION

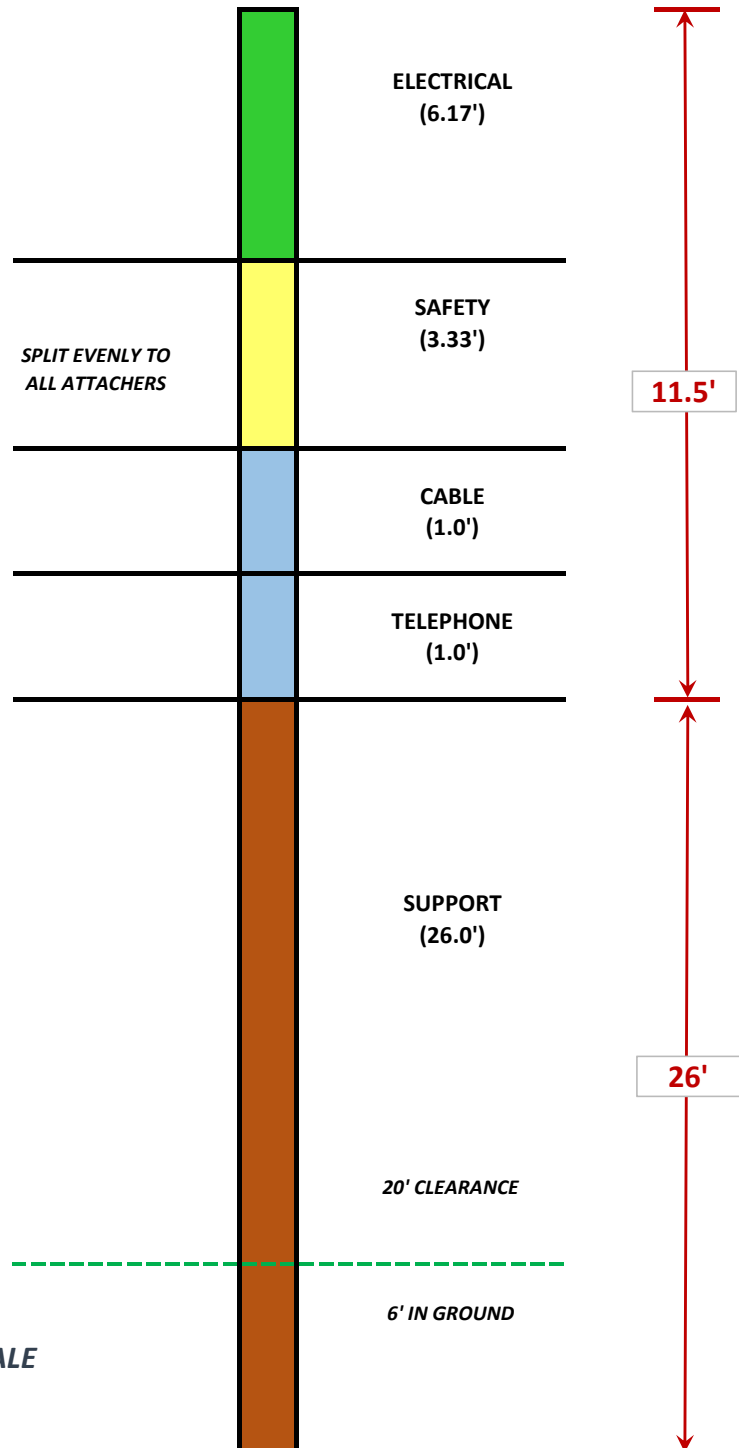
Allocates usable space

Equal sharing of safety space
among all users attaching for
communication purposes

Equal sharing of support space
among all users including
electrical

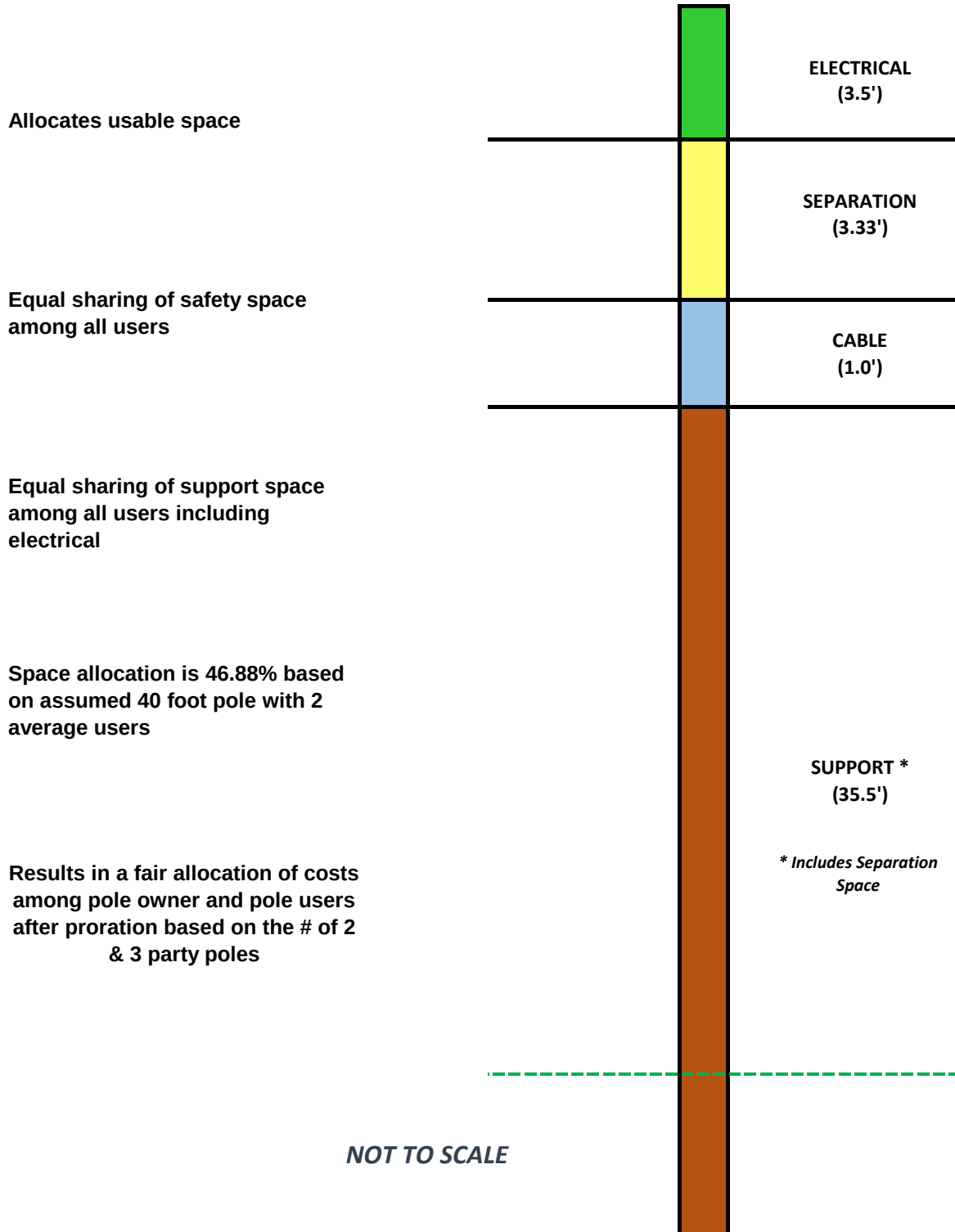
Space allocation is 28.74% based
on assumed 37.5 foot pole with 3
average users

Results in a fair allocation of costs
among pole owner and pole users



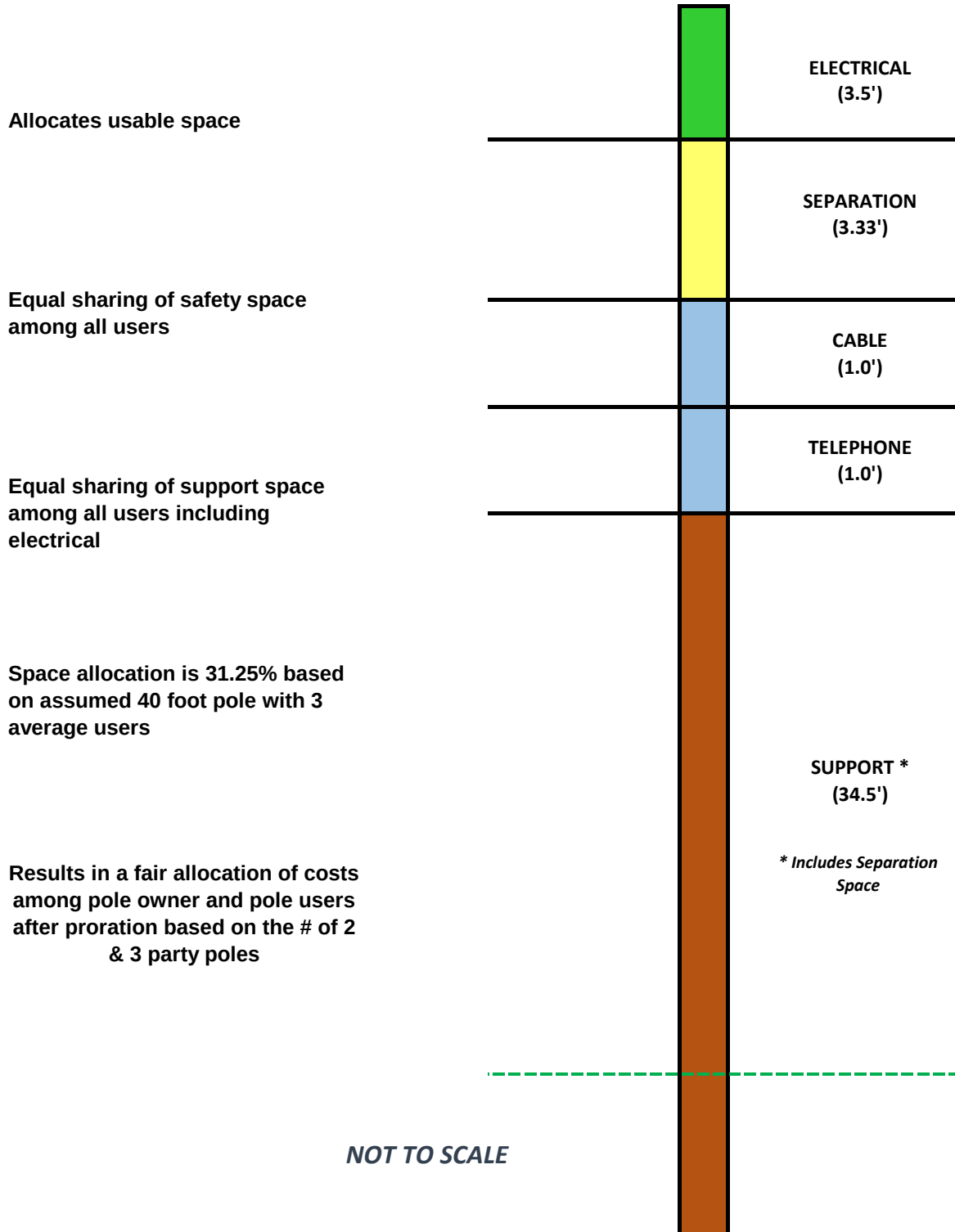
INDIANA 40' POLE - 2 Party Pole

SPACE ALLOCATION ILLUSTRATION



INDIANA 40' POLE - 3 Party Pole

SPACE ALLOCATION ILLUSTRATION



CITY OF SEATTLE

SPACE ALLOCATION ILLUSTRATION

STANDARD 47' POLE

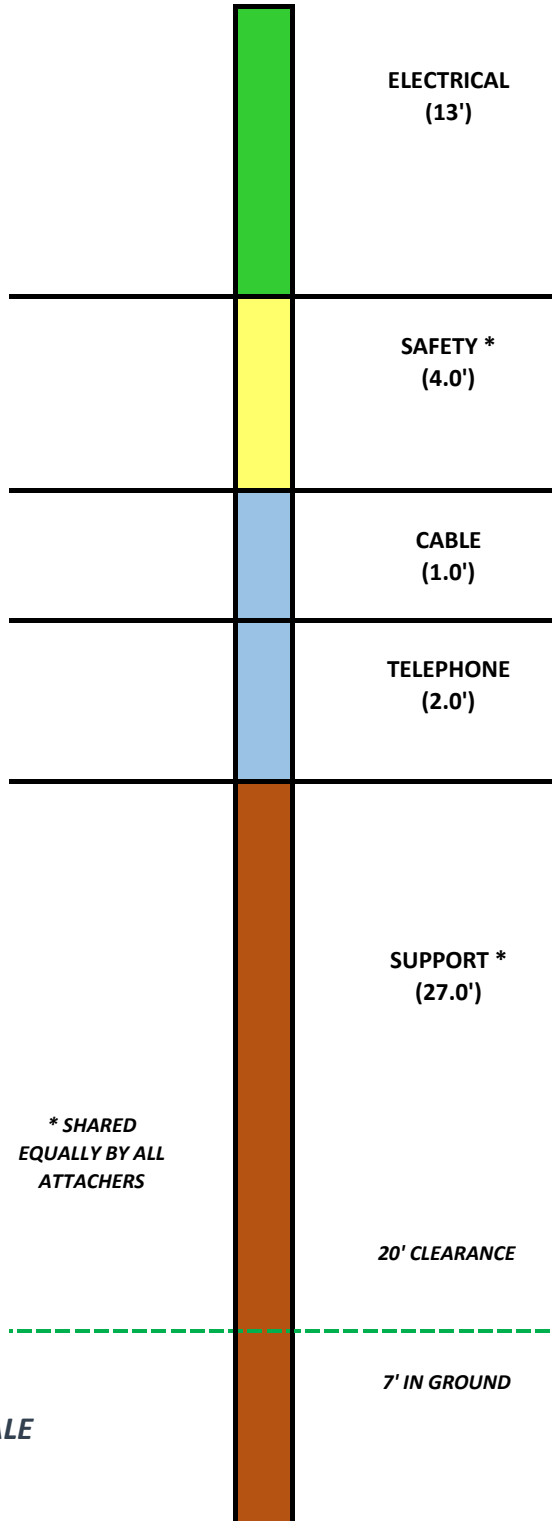
Allocates, direct a/k/a usable space

Equal sharing of safety space among all users attaching

Equal sharing of support space among all users including electrical

Space allocation is 24.11% based on assumed 47 foot pole with 3 average users & CATV using 1' of space

Results in a fair allocation of costs among pole owner and pole users



NOT TO SCALE

APPA CABLE RATE

SPACE ALLOCATION ILLUSTRATION

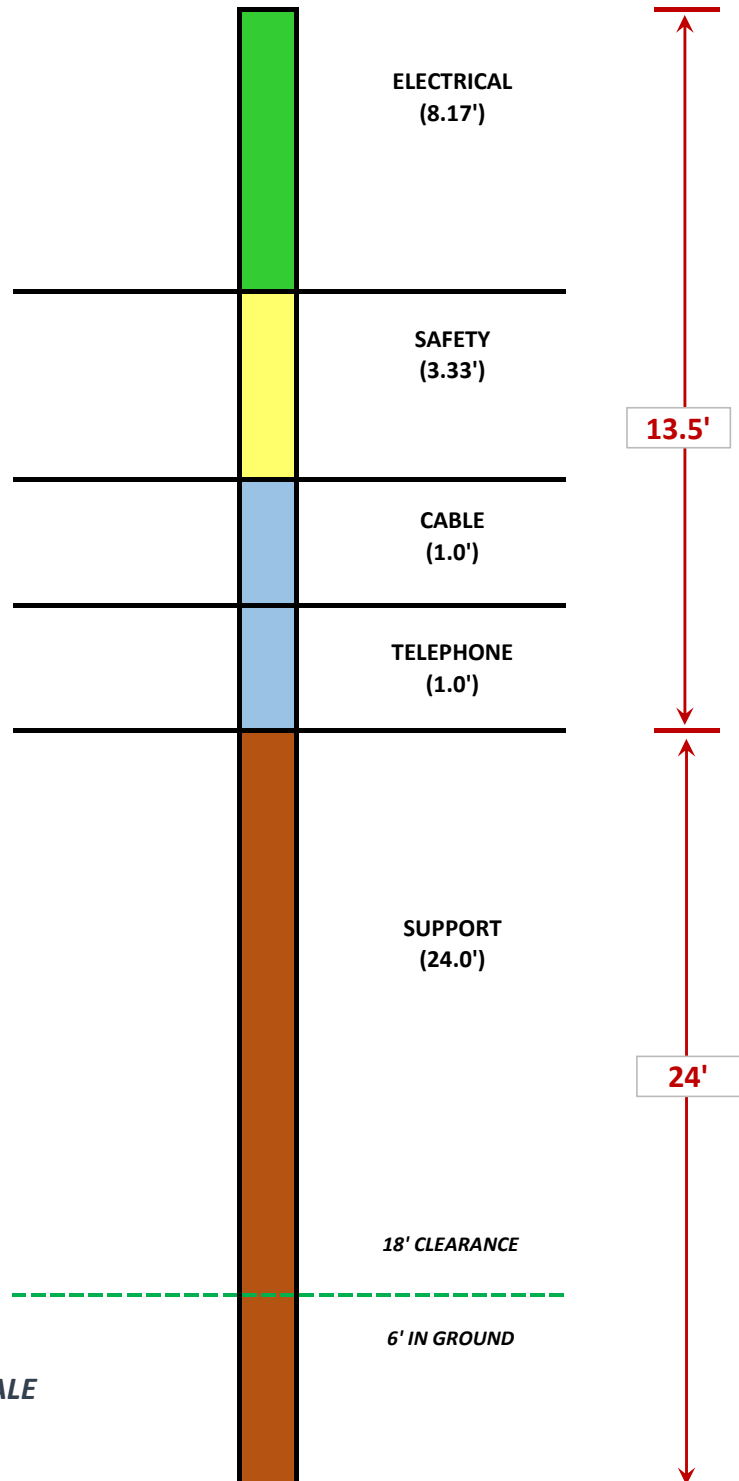
Allocates usable space only

Equal sharing of safety space
among all users attaching for
communication purposes

Equal sharing of support space
among all users including
electrical

Space allocation is 26.96% based
on assumed 37.5 foot pole with 3
average users

Results in a fair allocation of costs
among pole owner and pole users



NOT TO SCALE

ARKANSAS FORMULA

SPACE ALLOCATION ILLUSTRATION

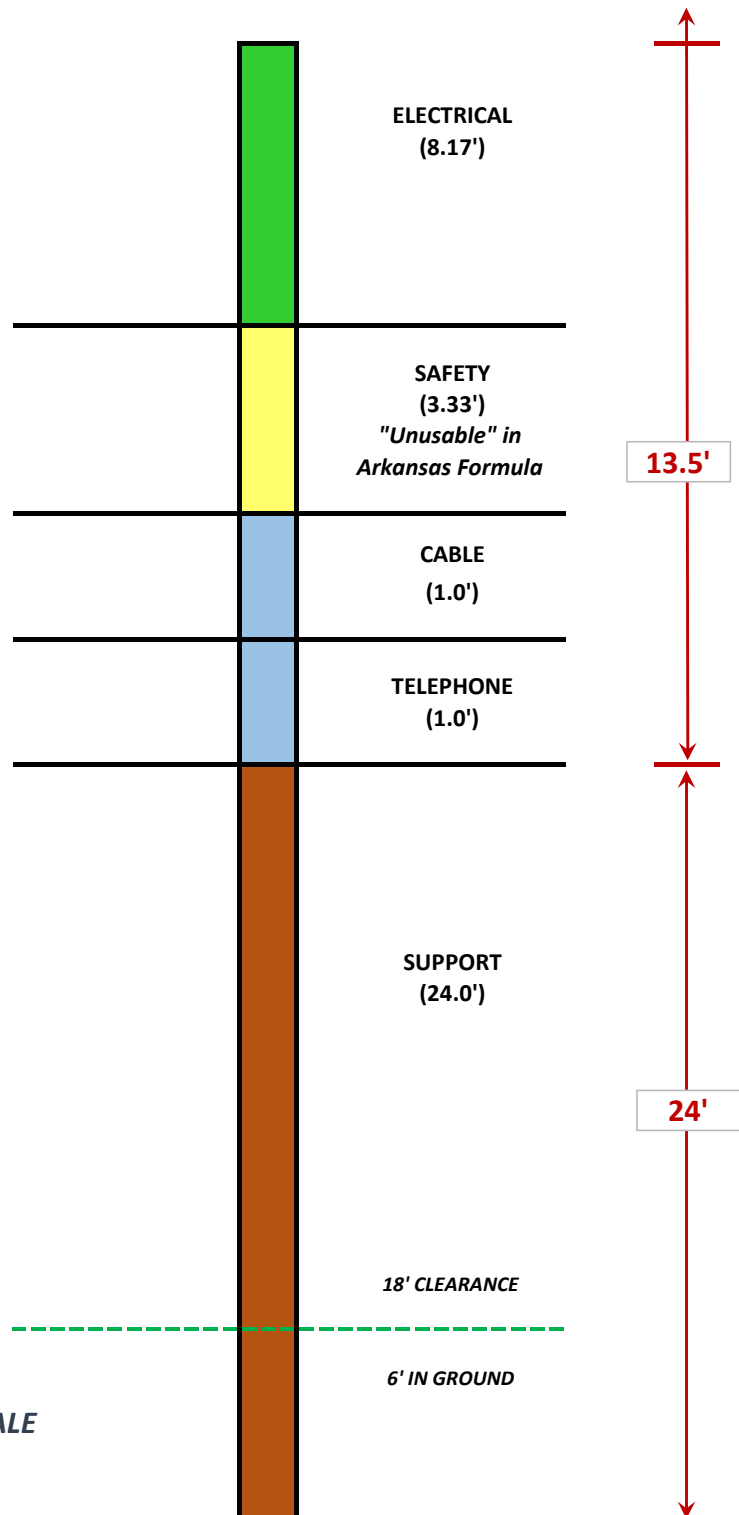
Allocates usable space

Safety space is included in the "Unusable" space.

Pole owner allocated 1/3 of unusable space. Equal sharing of 2/3 support space among all users including electrical

Space allocation is 18.86% based on assumed 37.5 foot pole with 3 average users, including the Owner

Results in a fair allocation of costs among pole owner and pole users



NOT TO SCALE

FCC CABLE RATE

SPACE ALLOCATION ILLUSTRATION

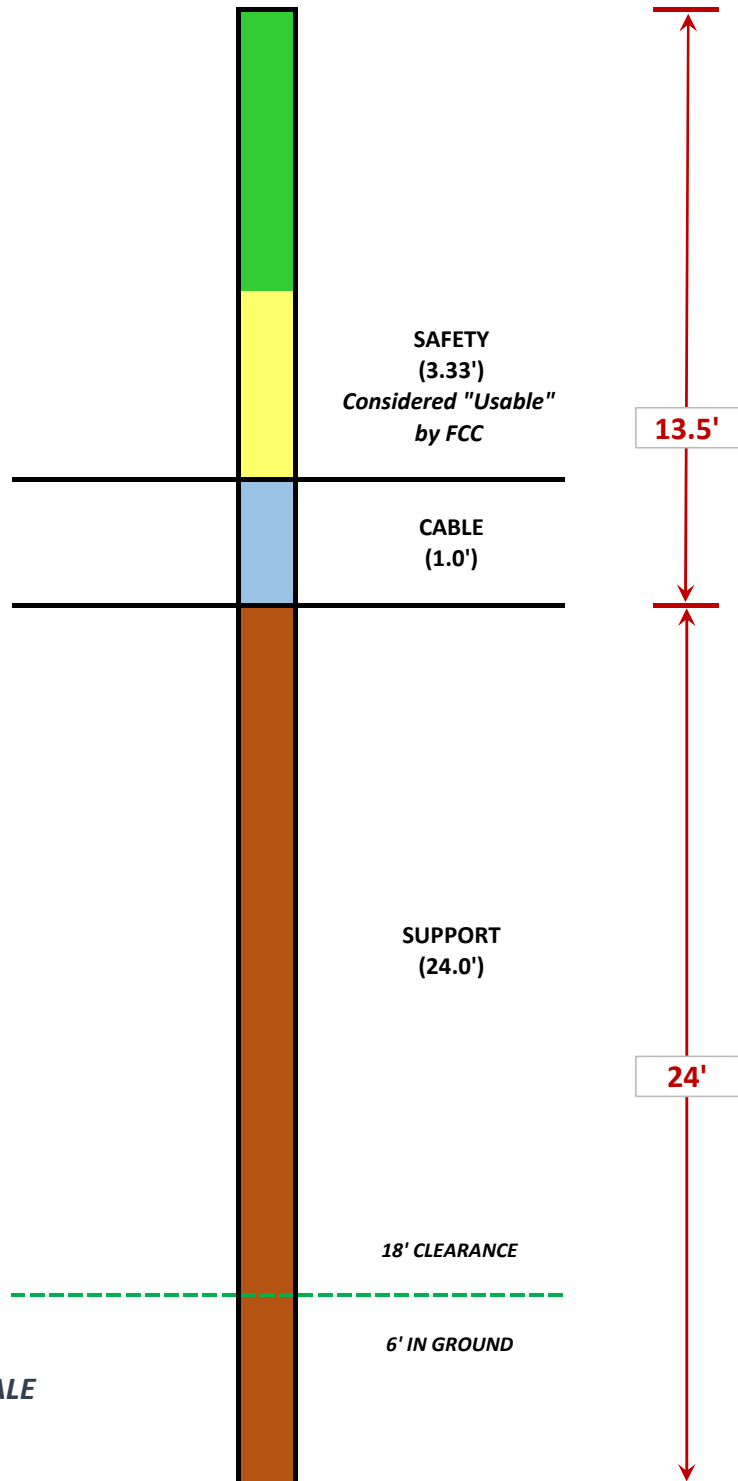
Allocates usable space only

Safety space is included in the "Unusable" space.

No sharing of support space among users

Space allocation is 7.41% based on one foot of space out of 13.5' of usable space

Results in unfair allocation of costs





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EXHIBIT WA-25.1

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EXHIBIT WA-25.2

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EXHIBIT WA-25.3

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EXHIBIT WA-26

Pole and Conduit Rental Calculation Information		
(Dollars in thousands & Operational Data in whole numbers)		
COMPANY: AT&T / BELLSOUTH CORPORATION		
STUDY AREA: NORTH CAROLINA		
PERIOD: From: Jan 2016 To: Dec 2016		
COSA: SBNC		
SUBMISSION: 1		
Page 1 of 1		
Row	Row Title (a)	Amount (b)
Financial Information (\$000)		
100	Telecommunications Plant-in-Service	8,009,850
101	Gross Investment - Poles	108,196
102	Gross Investment - Conduit	244,189
200	Accumulated Depreciation - Total Plant-in-Service	6,494,987
201	Accumulated Depreciation - Poles	105,230
202	Accumulated Depreciation - Conduit	118,800
301	Depreciation Rate - Poles	5.70
302	Depreciation Rate - Conduit	1.90
401	Net Current Deferred Operating Income Taxes - Poles	-
402	Net Current Deferred Operating Income Taxes - Conduit	-
403	Net Current Deferred Operating Income Taxes - Total	-
404	Net Non-Current Deferred Operating Income Taxes - Poles	2,343
405	Net Non-Current Deferred Operating Income Taxes - Conduit	5,288
406	Net Non-Current Deferred Operating Income Taxes - Total	173,460
501.1	Pole Maintenance Expense	2,449
501.2	Pole Rental Expense	15,030
501	Pole Expense	17,479
502.1	Conduit Maintenance Expense	1,109
502.2	Conduit Rental Expense	36
502	Conduit Expense	1,145
503	General & Administrative Expense	39,194
504	Operating Taxes	96,185
Operational Data (Whole numbers)		
601	Equivalent Number of Poles	235,763
602	Conduit System Trench Kilometers	2,732
603	Conduit System Duct Kilometers	15,842
700	Additional Rental Calculation Information	N/A

EXHIBIT WA-27

File:

Span Length (ft): 257

Circuit 1

Primary Conductor: 4 ACSR (7/1)

Neutral Conductor: 4 ACSR (7/1)

Cable - 1 Sag (in): 69

Sag (in): 40 @ 167° F

Sag (in): 35 @ 32° F

Ruling Span (ft): 250

Ruling Span (ft): 250

ANS PL - Length (ft): 40

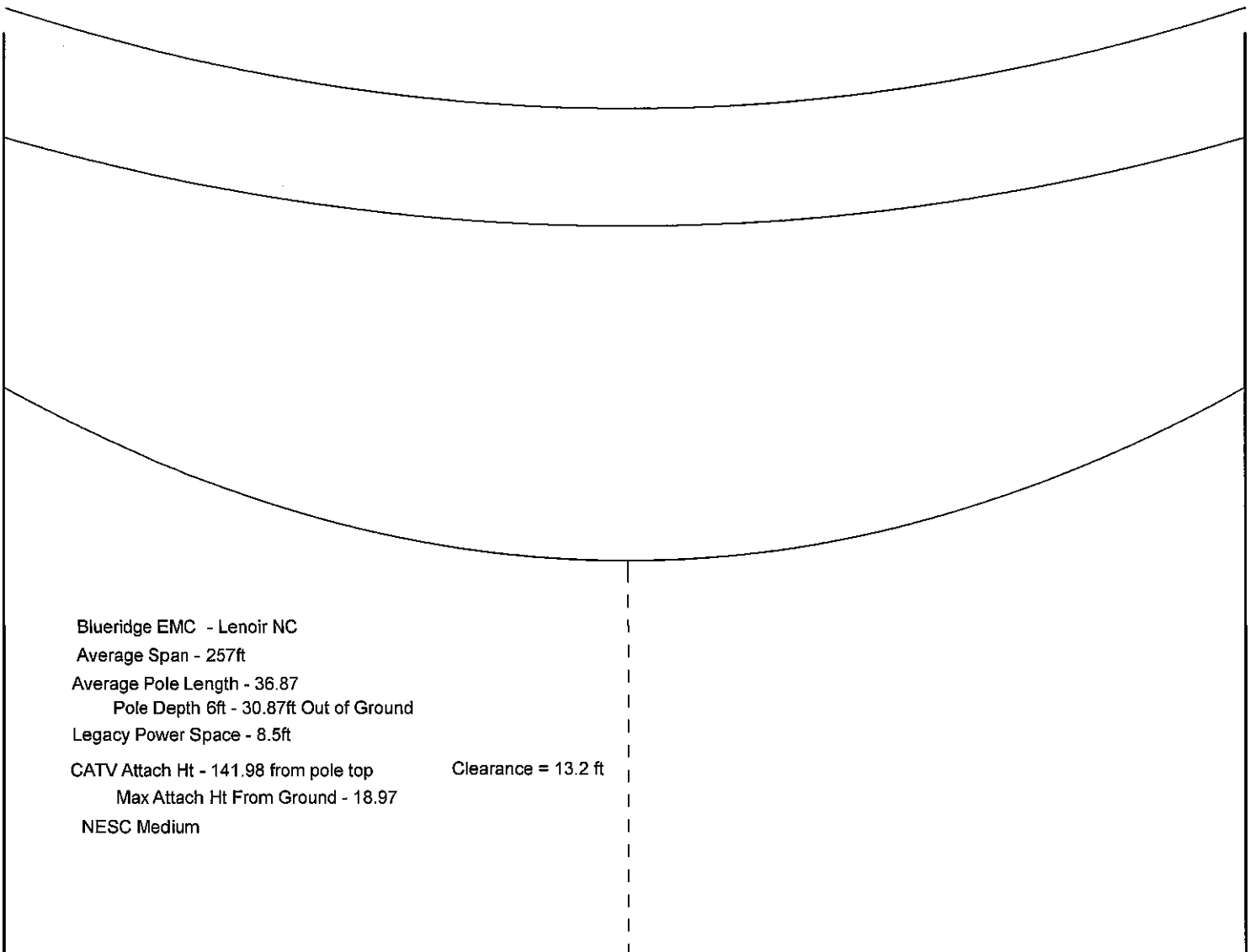
Setting Depth (Ft): 9.2

Elevation (ft): 0

ADJ PL - Length (ft): 40

Setting Depth (Ft): 9.2

Elevation (ft): 0



Blueridge EMC - Lenoir NC

Average Span - 257ft

Average Pole Length - 36.87

Pole Depth 6ft - 30.87ft Out of Ground

Legacy Power Space - 8.5ft

CATV Attach Ht - 141.98 from pole top

Clearance = 13.2 ft

Max Attach Ht From Ground - 18.97

NESC Medium

EXHIBIT WA-28

Reports of
Joint General Committee
of
Edison Electric Institute
and
Bell Telephone System
on
Physical Relations Between Electrical Supply
and Communication Systems

REISSUED
JULY, 1945

Additional copies of this report may be obtained by Power Companies from the Edison Electric Institute (Publication No. M5) and by Associated Bell Companies from the Department of Operation and Engineering of the American Telephone and Telegraph Company.

REPORTS OF
JOINT GENERAL COMMITTEE
of
EDISON ELECTRIC INSTITUTE
and
BELL TELEPHONE SYSTEM

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Principles and Practices for Inductive Coordination.....	7
Allocation of Costs for Inductive Coordination.....	31
Principles and Practices for Joint Use of Wood Poles.....	35

OF

EDISON ELECTRIC INSTITUTE
AND BELL TELEPHONE SYSTEM

New York, July 9, 1945.

MEMBER COMPANIES OF E.E.I.
ASSOCIATED COMPANIES OF BELL SYSTEM:

For a number of years the following reports of the Joint General Committee of the N.E.L.A. and Bell Telephone System have formed a satisfactory basis for the coordination of the electrical facilities of electric supply companies and communication facilities of the Bell System.

Principles and Practices for the Inductive Coordination of Supply and Signal Systems—December 9, 1922.

Principles and Practices for the Joint Use of Wood Poles of Supply and Communication Companies—Feb. 15, 1926.

Allocation of Costs Between Supply and Communication Companies—October 15, 1926.

The supply of copies of the original issue of these reports has been exhausted and accordingly they have been reprinted. In this reissue the three reports have been included under a single cover. A few editorial changes have been made which involve no change in substance.

H. B. Bryans

W. H. Sammis

E. C. Stone

Edison Electric Institute Representatives

M. R. Sullivan

K. S. McHugh

Bell System Representatives

JOINT GENERAL COMMITTEE

PUBLIC

The Principles and Practices which are now being reissued under a single cover have, during the past two decades, contributed greatly to the successful operations of the power and telephone industries, and because they have promoted cooperation between these industries, they have benefited the general public. It seems appropriate in connection with this reissue to review the development of these Principles and Practices however, for brevity, omitting mention of all but the original organization.

Previous to 1921, structural and inductive interference problems were giving rise to increasing numbers of controversies between Bell Telephone Companies and Power Companies throughout the country. Early in 1921, therefore, a group of power and telephone men met to discuss the possibilities of a basis for an engineering solution of the problems concerned. Mr. Owen D. Young presided at that meeting and there was formed the Joint General Committee of the National Electric Light Association and Bell Telephone System with the following membership:

Messrs. O. D. Young, *Chairman*,
General Electric Company,
R. H. BALLARD
Southern California Edison Company,
M. R. BUMP,
H. L. Doherty & Company,
H. M. BYLESBY, Represented by R. F. Pack,
H. M. Bylesby & Company,
J. J. CARY,
American Telephone and Telegraph Company,
BANCROFT GHERARDI,
American Telephone and Telegraph Company,
E. K. HALL,
American Telephone and Telegraph Company,
L. H. KINNARD,
The Bell Telephone Company of Pennsylvania,
MARTIN J. INSULL,
Middle West Utilities Company,
ROBERT LINDSAY,
Cleveland Electric Illuminating Company,
BEN S. READ,
The Mountain States Telephone and Telegraph Company,
PAUL SPENCER,
United Gas Improvement Company,
GUY E. TAIRP,
Westinghouse Electric & Manufacturing Company,
M. H. AYLESWORTH, *Secretary*,
National Electric Light Association,

Messrs. Bump, Pack and Gherardi were designated as an Engi-

neering Subcommittee representing both interests with instructions to classify the types of situations in which engineering or technical conflicts were arising. They selected a committee of engineers whose instructions were to proceed with a classification of the types of problems concerned under two divisions (a) those for which a standard had been accepted by both parties and (b) those for which there were no existing standards. Their further instructions were to approach the various problems in the broadest possible spirit of cooperation, with the double objectives of the removal of causes of friction and the early development of mutually satisfactory practices. This committee of engineers consisted of Messrs. H. P. Charlesworth, S. P. Grace, H. S. Osborne and H. S. Warren, representing the Bell Telephone System and Messrs. W. J. Canada, A. E. Silver and F. H. Lane, representing the NELA. Mr. H. L. Wills later succeeded Mr. Canada.

The Engineering Subcommittee in its first report found that the National Electrical Safety Code provided an acceptable guide to practice for problems involving crossings, conflicting construction and jointly occupied poles, and recommended, as to parallel construction, general principles pointing the way to the satisfactory solution of specific cases. After further work the subcommittee prepared the more comprehensive reports which are generally known as the Principles and Practices, and which with minor editorial changes are reproduced in this booklet.

Early in its work the Engineering Subcommittee found that there was need for mutually acceptable technical data to aid in the solution of both electrical and structural coordination problems. Accordingly, the Joint Subcommittee on Development and Research was organized in 1923. Its factual reports have greatly facilitated the solution of coordination problems by the power and telephone companies and have enabled them to arrive at sound engineering answers to the new problems which have accompanied advances in the power and communication arts.

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Scope.

These principles and practices are intended to apply to all new installations, extensions and reconstructions and to the maintenance, operation and changes of all communication and supply systems where inductive coordination may be required now or later to prevent interference with the rendering or providing of supply or communication service.

PRINCIPLES

Duty of Coordination.

(a) In order to meet the reasonable service needs of the public, all supply and communication circuits with their associated apparatus should be located, constructed, operated and maintained in conformity with general coordinated methods which maintain due regard to the prevention of interference with the rendering of either service. These methods should include limiting the inductive influence of the supply circuits or the inductive susceptibility of the communication circuits or the inductive coupling between circuits or a combination of these, in the most convenient and economical manner.

(b) Where general coordinated methods will be insufficient, such specific coordinated methods suited to the situation should be applied to the systems of either or both kinds as will most conveniently and economically prevent interference, the methods to be based on the knowledge of the art.

Cooperation.

In order that full benefit may be derived from these principles and in order to facilitate their proper application, all utilities between whose facilities inductive coordination may now or later be necessary, should adequately cooperate along the following lines:

(a) Each utility should give to other utilities in the same general territory advance notice of any construction or change in construction or in operating conditions of its

Inductive Coordination

facilities concerned, or likely to be concerned, in situations of proximity.

(b) If it appears to any utility concerned that further consideration is necessary, the utilities should confer and co-operate to secure inductive coordination in accordance with the principles set forth herein.

(c) To assist in promoting conformity with these principles, an arrangement should be set up between all utilities whose facilities occupy the same general territory, providing for the interchange of pertinent data and information including that relative to proposed and existing construction and changes in operating conditions concerned or likely to be concerned in situations of proximity.

Choice Between Specific Methods.

When specific coordinated methods are necessary and there is a choice between specific methods, those which provide the best engineering solution should be adopted.

(a) The specific methods selected should be such as to meet the service requirements of both systems in the most convenient and economical manner without regard to whether they apply to supply systems or communication systems or both.

(b) In determining what specific methods are most convenient and economical in any situation for preventing interference, all factors for all facilities concerned should be taken into consideration including present factors and those which can be reasonably foreseen.

(c) In determining whether specific methods, where necessary, shall be wholly by separation or partly by methods based on less separation, the choice should be such as to secure the greatest present and future economy and convenience in the rendering of both services.

Inductive Coordination for Existing Construction.

(a) Utilities operating supply or communication circuits should exercise due diligence in applying coordinated methods, as occasion may rise, in accordance with these principles, to existing construction.

(b) When supply or communication circuits are generally reconstructed, or when associated apparatus is rearranged or added, or when any change is made in the arrangement or characteristics of circuits, the new or changed parts should be brought into conformity with these principles.

Coordinated Locations for Lines.

Utilization of the highways is essential to the economical and efficient extension, operation and maintenance of supply and communication facilities. To avoid unduly increasing the number or difficulty of situations of inductive or other exposure incident to the use of the same highway by two different kinds of facilities, all lines should, in general, be located as follows:

(a) GENERAL LOCATION.

(1) Where the conditions and character of the circuits permit, joint use of poles by communication and supply circuits is generally preferable to separate lines when justified by considerations of safety, economy and convenience, and presuming satisfactory agreement between the parties concerned as to terms and conditions.

(2) Where communication circuits and supply circuits on the same highway are not to occupy joint poles or where either kind of circuit is alone on a highway, all communication circuits should be placed on one side of the highway and all supply circuits should be placed on the other side, so that, as far as practicable, one side of any section of a highway will be available as the communication side and one side as the supply side.

(3) Unnecessary crossings from side to side of the highway should be avoided.

(b) DETAILED LOCATION.

(1) Local Communication Lines.

Where to be located on the same highway with local supply lines, joint use is generally preferable to separate lines, except sometimes in rural districts and except where the character of circuits involved makes separate lines on opposite sides of the highway more desirable.

Inductive Coordination

Where to be located on the same highway with transmission lines, separate lines on opposite sides of the highway are generally preferable unless a large number of service wire crossings would be involved, in which case, joint use or other arrangements may be preferable.

(2) Toll or Through Communication Lines.

Where to be located on the same highway with local supply lines or lower voltage transmission supply lines, separate lines on opposite sides of the highway are generally preferable, unless a large number of service wire crossings would be involved, in which case, joint use or other arrangements may be preferable.

Where proposed for location on the same highway or to follow the same general direction with higher voltage transmission supply lines, cooperative consideration should determine whether such locations should be used, and if so, what specific coordinated methods are necessary. Where to be located on the same highway with higher voltage transmission supply lines, separate lines on opposite sides of the highway are preferable.

(3) Local Supply Lines.

Where to be located on the same highway with local communication lines, joint use is generally preferable to separate lines except sometimes in rural districts and except where the character of circuits involved makes separate lines on opposite sides of the highway more desirable.

Where to be located on the same highway with toll or through communication lines, separate lines on opposite sides of the highway are generally preferable, unless a large number of service wire crossings would be involved, in which case, joint use or other arrangements may be preferable.

(4) Transmission Supply Lines.

Where to be located on the same highway with local communication lines or shorter toll or shorter trunk communication lines, separate lines on opposite sides of the highway are generally preferable unless a large number of

service wire crossings would be involved, in which case, joint use or other arrangements may be preferable.

Where proposed for location on the same highway or to follow the same general direction with longer toll or through communication lines, cooperative consideration should determine whether such locations should be used and if so, what specific coordinated methods are necessary. Where to be located on the same highway with longer toll or through communication lines, separate lines on opposite sides of the highway are preferable.

(5) Avoidance of Overbuilding.

Overbuilding of one line by another should be avoided, where practicable. Where necessary for the two kinds of lines to occupy the same side of a highway, joint use is generally preferable to overbuilding.

(c) OTHER RIGHTS OF WAY.

The foregoing principles, although specifically mentioning highways, should also, when applicable, govern situations involving private rights of way near to each other or to highways.

Deferred General Coordination.

While communication or supply lines when alone should conform to general coordinated methods, such lines, pending the incoming or development of the other kinds of lines, may, if deemed economically advantageous, occupy locations or use types of facilities, construction and operating methods other than those conforming to general coordinated methods. However, the location and character of such facilities should be altered when and as necessary to conform to these methods upon the incoming or development of another kind of facility conforming to general coordinated methods.

Special Location and Types.

When coordination of supply and communication lines of particular types cannot be technically and economically established under the methods of coordination covered by these principles, special cooperative consideration should be given to determining what location and type of construction should be established for each line of such type.

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PRACTICES

INTRODUCTORY.

These recommended practices supplement, and are intended to be in accord with, the principles given in the foregoing. They are based on experience, and their application, in connection with the principles on "Coordinated Location of Lines" will effectively promote the inductive coordination of supply and communication systems.

In the development of these detailed practices, it has been found advisable to proceed step by step along two well defined subdivisions, namely, practices based on qualitative considerations, and those based on quantitative values. The practices given herewith cover qualitative considerations and form a basis for the later adoption of definite quantitative values where they may properly apply. It is recognized that in the growth and development of the respective utilities and as the development of the art progresses, other satisfactory methods will doubtless be devised. The fact that particular methods are specified herein does not preclude the use of other mutually satisfactory methods, nor their incorporation in these practices as they may be agreed upon.

In order that the above considerations may be carried out it is intended that the joint work on practices will be continued and that additional material will be issued from time to time as it becomes available. In the preparation of these practices, certain factors were encountered which, due to lack of complete information, could not be as fully covered at this time as their importance in inductive coordination merits. Among these factors are included certain features of the protection of communication systems, the selectivity of communication apparatus, the transposing of supply circuits outside of inductive exposures and the question of single versus multiple grounding in supply systems.

In order that the full intent of the principles may be carried out, the practices hereinafter specified as "General Coordinated Methods" should be applied to all communication and supply systems, except as deviations may be made under the principle of "Deferred Coordination." In cases of inductive exposure, where these general coordinated methods are insufficient, such of the practices hereinafter specified as "Specific Coordinated

Methods" should, in addition, be applied as will provide the best engineering solution.

MUTUALLY APPLICABLE PRACTICES

Notice and Cooperation.

Utilities between whose facilities inductive coordination is, or later may become, necessary should each give to the other advance notice of any construction or changes in construction or operation of their respective facilities. The utilities should cooperate in determining and carrying out those methods which provide the best engineering solution in each case, and to this end there should be complete interchange of information.

Limitation of Influence and Susceptiveness.

In designing, specifying or otherwise determining the location, construction and arrangement of supply or communication circuits or the quality, arrangement and suitability of materials or apparatus to be used in, or associated with, communication or supply circuits and in operating and maintaining lines and apparatus, all factors which would contribute to inductive influence or inductive susceptiveness during either normal or abnormal conditions should be limited in so far as is necessary and practicable.

Changes in Systems or Methods.

In changing systems or methods of operation, precaution should be taken to avoid increasing, and an effort made to decrease, if practicable, the influence or susceptiveness. Any abnormal condition which increases these factors should be promptly remedied. If the service requirements prevent a prompt remedy of such condition, effort should be made to reduce these effects by such other methods as are available.

Operating Instructions.

Communication companies should adopt operating instructions, specifically outlining the procedure for notification of supply companies when inductive disturbances arise on toll circuits that appear to be incidental to abnormal power influence and supply companies should adopt operating rules which outline the desirable procedure for their operators during times when a supply circuit is abnormally unbalanced.

Inductive Coordination

Records.

A record should be kept by the communication companies of disturbances on communication circuits, and the supply companies should keep a record of accidental or transient conditions on supply circuits, so that a study of such disturbances which appear to be due to accidental or transient conditions will be facilitated.

Mechanical Construction.

The mechanical design and construction of communication and supply systems should conform to good modern practice.

Maintenance.

Efforts should be made to anticipate and forestall failure of lines or equipment. Defective equipment should not be continued in service and repairs or renewals should be promptly made.

Tree Trimming.

Trees should be trimmed as necessary, due consideration being given clearances to meet weather conditions. Due diligence should be exercised in obtaining permission to trim trees when such permission is needed and such trimming should be done in accordance with good modern practice.

Insulation.

Insulators and insulating material used on communication and supply circuits should be designed, constructed and maintained so as to provide adequate mechanical and electrical strength.

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PRACTICES APPLICABLE TO COMMUNICATION SYSTEMS

GENERAL COORDINATED METHODS

The following practices should be applied to all communication systems, except as deviations may be made under the principle of deferred coordination.

Power Level and Sensitivity.

The power level and sensitivity of communication circuits should be, so far as is practicable, designed and maintained at the standard recommended for the class of service involved.

Protection.

Protective devices should be such that they will not interrupt the communication circuits by operating at unnecessarily low voltages or currents.

Protective devices should be, so far as practicable, so designed, constructed and installed as not to unbalance the communication circuits.

The same type of heat coil or fuse should be used in all wires of a circuit.

Reasonable care should be used in the maintenance of all protective apparatus to avoid conditions which will unbalance or interrupt the communication circuits.

Inspections.

Adequate field inspection and routine tests of lines and apparatus should be made with a view to maintaining the electrical balance and efficiency of the circuits.

Discontinuities.

Discontinuities should be limited to the number required by the conditions.

Lines.

In order to minimize line unbalances, the resistance, inductance, capacitance and leakage conductance of one side of a circuit, in each section thereof, should be equal respectively to the corresponding quantities in the other side of the same section of the circuit in so far as is necessary and practicable.

Some of the methods and means which should be followed for the purpose of minimizing unbalance in lines are as follows:

Transpositions.

The capacitances to earth of the two sides of a telephone circuit should be suitably balanced by transpositions. Before a communication line is placed in service, a check should be made to insure that the transpositions are properly installed and correctly located.

Excessive Spacing.

Excessive spacing of conductors should be avoided. This does not mean that the spacing should be less than that required by considerations of safety, service and the future requirements of the circuits.

PUBLIC

Phantom Circuit Apparatus.

Balancing resistance or other compensating apparatus should be inserted in the through side of a phantom group at the point where the other side circuit is terminated.

If one circuit of a phantom group is equipped with composite sets or composite ringers, the other side should be similarly equipped and the sets or ringers used on the two sides of the phantom group at any given point should have closely the same impedance characteristics.

Series Apparatus.

Where series apparatus, such as series condensers of a composite set is applied to toll circuits, those parts inserted in each side of a circuit should have closely the same electrical characteristics.

Coils.

Loading coils should be so designed, constructed and installed as to insert closely equal impedance in each wire of a circuit. Loading coils should be located as nearly as practicable at neutral or balanced points of the transposition system. In the design, construction, installation and maintenance of loading coils, efforts should be made to secure permanency of characteristics.

The coils employed for phantoming, compositing, simplexing or sectionalizing communication circuits should be as closely balanced as practicable. If in any case unbalanced coils are necessary, they should be isolated by properly balanced repeating coils.

The windings of retardation coils connected to the two sides of the same metallic circuit should have closely equal self-impedances. The coils of the different circuits should be equipped with suitable cases or so installed as to have negligible mutual impedances.

Condensers.

The condensers employed in composite sets, signaling devices, etc., should have adequate balance of admittance to ground.

Ringin~~g~~ and Signaling Equipment

The unbalance introduced by ringin~~g~~ or signaling equipment should be limited, in so far as is necessary and practicable.

Inductive Coordination

Central Office Circuits.

Central office circuits are to be so designed, installed and maintained that any connection between toll circuits and subscribers' circuits may be made through repeating coils.

Attention should be given to the control of unbalance in cords and central office wiring.

Effort should be made to prevent the introduction of unbalance by contact resistance.

Ground Connections.

Ground connections, if employed on equipment connected to toll circuits, should be in the balanced or neutral position of the circuit.

SPECIFIC COORDINATED METHODS

The specific practices outlined here are to be used in addition to the general practices to supplement the latter in so far as may be necessary and practicable in cases where communication and supply lines are involved, or are about to be involved, in inductive exposures.

All of these practices are not required to be applied in any one specific case, but in each instance that practice or those practices in combination should be selected which will under the conditions afford the best engineering solution.

Power Level and Sensitivity.

Consideration should be given to maintaining in the communication circuits as high a power level and such a degree of sensitivity as is consistent with good economics.

Selective and Other Special Devices.

Consideration should be given to the use of such devices as neutralizing transformers, sectionalizing transformers, filters, resonant shunts or drainage coils in any case where they may offer benefit and the service requirements of the circuit will permit.

Rerouting Service.

If abnormal conditions should temporarily prevent the use of a certain line and the effect of the abnormal conditions can be

PUBLIC

avoided only by temporarily rerouting the supply or communication service over a route not involved in the inductive exposure, consideration should be given to the adoption of this expedient. Where the rerouting of either service is impracticable, the choice as to which service is to be temporarily suspended should be governed by the relative importance to the public of the respective services affected.

Records.

Routine measurements of insulation, conductor resistance, balance and induction should be made on toll circuits involved in inductive exposures and records kept of the readings.

A record should be kept of abnormal conditions in toll circuits involved in inductive exposures where a study of such conditions is advisable. Such records should as fully as practicable include time, duration, circuit designation, location, probable cause and effect of the abnormal condition and how the circuits were cleared.

All the above records or a convenient summary thereof should be available for the purpose of analyzing causes and effects of disturbances.

LINES.

Configuration.

Where service requirements permit a choice of configuration of a communication circuit or a group of communication circuits consideration should be given to the selection of a configuration such as to limit susceptibility.

Cable.

Consideration should be given to the use of cable within an inductive exposure.

Where communication circuits are carried in aerial cable, consideration should be given to the use of properly arranged and installed grounds on cable sheaths or other methods of shielding.

Coordinated Transpositions.

Consideration should be given to the use of transpositions in supply or communication circuits, or both, within inductive exposures, for the purpose of limiting the coupling. Such transpositions should be installed at suitable intervals, the location to be

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such as the local conditions demand. Where transpositions are installed in both supply and communication circuits within inductive exposures, they should be properly coordinated.

North Care should be taken in the installation of transpositions that, so far as practicable, the transpositions are located nearest the theoretically correct point. In determining the most economical scheme of transpositions effort should be made to utilize as many as practicable of any existing transpositions. Where the transpositions required within an inductive exposure impair the general transposition scheme of communication or supply circuits outside the limits of inductive exposure, the necessary readjustment of transpositions should be made in the section or sections of line adjacent to inductive exposure. Uniformity of separation generally assists in the attainment of coordination. If discontinuities are of sufficient magnitude to substantially affect the coupling, sections between such points should be treated independently.

APPARATUS.

Party Line Ringers.

Consideration should be given to the use of high impedance substation party line ringers or their equivalent.

Central Office Equipment.

Consideration should be given to equipping toll circuits which may be switched to other toll circuits with repeating coils. In those cases where the design of a central office is such that there is a possibility that toll circuits may be switched directly to local circuits, consideration should be given to the use of repeating coils if their omission would contribute to interference.

Where series apparatus is applied to local communication circuits, consideration should be given to so arranging it that equal impedances are inserted in each side of the circuit where necessary and practicable.

Ground Connections.

Ground connections if employed on equipment connected to local communication circuits should so far as is practicable be at neutral or balanced points.

PRACTICES APPLICABLE TO SUPPLY SYSTEMS

GENERAL COORDINATED METHODS

The following practices should be applied to all supply systems except as deviations may be made under the principle of deferred coordination.

PUBLIC

Residual Voltages and Currents.

Residual voltages and currents should be limited as far as is necessary and practicable.

Unsymmetrical loads between phases should be avoided in so far as is practicable where they would give rise to residual currents or voltages.

Note: Circuit conditions may cause a residual voltage to appear on a three-phase system. If the neutral of the system is grounded at one point, residual current may flow and the residual voltage may be increased or decreased. In this case, the residual current may consist in part of current through the total direct admittance of the system to ground due to voltages impressed between the three conductors and ground. It may also consist in part of unbalanced charging current to ground due to voltages impressed upon unbalanced direct admittances of the three conductors to ground. The former will not be affected by transpositions while the latter may be reduced or eliminated by equalization of the conductor admittances to ground.

If the system is operated without a neutral ground, the residual voltage would be reduced by equalizing the admittances of the conductors to earth.

If the phases are not symmetrically loaded and two or more neutrals of the same electrically connected system are grounded, residual currents will flow. However, substantial residual currents due to unsymmetrical loads will not flow if the system has a single or no neutral ground.

Single phase taps from 3-phase circuits have inherently a residual voltage; such taps, if long, tend to appreciably unbalance the 3-phase circuit to which they are connected.

If the neutral of a system is grounded at two or more points, the residual voltage or the residual current may be increased or decreased. Whether the total influence of the system is increased or decreased will depend upon local conditions.

Discontinuities.

Discontinuities should be limited to the number required by the conditions.

Switching.

In all switching operations care should be taken to limit, so far as is practicable, the production of transient disturbance leading to excessive momentary influence.

Care should be taken to avoid repeatedly energizing at normal voltage a transmission supply circuit in order to locate a fault. It is sometimes practicable to locate such faults by means of lower voltage testing methods.

Maintenance.

In the maintenance of supply circuits, attention should be given to the prevention of mechanical or electrical failures which would lead to residual voltages or residual currents of substantial magnitude. When supply circuits become unbalanced, due to any

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cause, every reasonable effort should be made to remedy the unbalanced condition promptly.

Contact Resistance.

Cart should be taken to avoid contact resistance which would affect influence.

LINES.

In order to reasonably limit the residual current and voltages arising from line unbalances, the resistance, inductance, capacitance and leakage conductance of the several conductors in each section of a circuit should, so far as is necessary and practicable, be equal respectively to the corresponding quantities in any other conductor of the same section of the circuit.

Some of the methods and means for limiting unbalance in lines are described below.

Configuration.

Where there is a choice between two or more types of configuration, consideration should be given to use where practicable of such configuration of a supply circuit or a group of supply circuits as provides the superior balance.

Excessive Spacing.

Excessive spacing of conductors should be avoided. This does not mean that the spacing should be less than required by considerations of safety, service, and the future requirement of the circuits.

Transpositions.

Capacitances to earth of the conductors of transmission supply circuits should be suitably balanced by transpositions so far as is necessary and practicable.

Branch Circuits.

Where branches employing less than the total number of phase wires are to be used, they should be so planned as not to give rise to excessive residual voltages or currents on the three-phase system.

Series Lighting Circuits.

In the construction or rearrangement of series street lighting circuits, unbalances which materially contribute to inductive influence should be avoided.

PUBLIC

Three-Phase, Four-Wire Systems.

If three-phase, four-wire grounded neutral supply circuits are used, the neutral wire should be continuous except in case of a three-phase branch which is either operated non-grounded or is grounded only at symmetrical load points.

Ground Return Circuits.

Ground return circuits or ground return branches of multi-wire supply circuits should not be employed. This does not apply to track return circuits.

APPARATUS.

Note: It is recognized as commercially impossible to build rotating machinery entirely free from harmonics. It is further recognized that some distortion of wave form—and consequent introduction of harmonics—is inherent with power transformers which must employ iron in their magnetic circuits. However, in both these cases the introduction of harmonics can, to a considerable extent, be controlled within the limits of commercial design and practice. So, the above provisions are intended to secure the attention which this matter deserves because of its basic importance and its reaction on the necessity for other methods.

Rotating Machinery.

Synchronous machines should be specified and selected so as to have a wave form in which the harmonic components are limited so far as necessary and practicable.

Induction motors and generators should be selected which cause the least practicable amount of harmonic voltages and currents on the system to which they are connected.

Transformers.

In order that the wave form of voltage and current may be affected as little as practicable by transformers, such apparatus should not be designed so as to operate at excessive magnetic densities. In the installation, connection, and operation of transformers, care should be taken to avoid excessive over-voltages or excessive magnetizing currents.

When star connected transformers or autotransformers are employed with a grounded neutral on the side connected to a line circuit, low impedance closely coupled tertiary windings or delta-connected secondary windings, or other suitable means for adequately limiting the triple harmonic components of residual current or voltages should be employed.

Where open delta transformer banks are used, they should be distributed symmetrically among the phases in so far as necessary and practicable.

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Care should be taken that the individual units in each grounded neutral bank of transformers connected to a transmission supply circuit are substantially alike as to electrical characteristics and that they are similarly connected.

Switches.

Each switch controlling the supply of energy to transmission supply circuits should have all poles arranged for gang operation. So far as is practicable, these switches should be automatic for short circuits between phases and from phase to ground.

Protective Apparatus.

Protective apparatus should be such that it will not unnecessarily add to transient disturbance, and should so far as practicable forestall or limit such transient disturbances.

Routine inspection of lightning arresters should be provided, and the periodic charging, where such is required, should conform to good practice.

Arresters should be maintained in good condition. Arresters which have been temporarily withdrawn from service should not be replaced in service until they are in proper operating condition.

Where lightning arresters requiring periodic charging are employed on a supply system involved in an inductive exposure, they should be equipped with auxiliary resistances and contacts.

Routine inspection or tests should be made to determine whether or not adjustments in all protective apparatus are properly maintained.

Abnormal Conditions.

Reasonable means should be provided to prevent the continuation in operation of faulty apparatus or lines for such periods or under such conditions as lead to excessive influence.

Reliable indicating or recording devices should be installed at the source of transmission supply circuits to show abnormal operating conditions.

Series Lighting Circuits.

Consideration should be given to the use of types of equipment in series street lighting circuits which, so far as practicable, have a minimum distorting effect on the voltage and current wave

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shape of the lighting circuit, both during times of normal operation and times of lamp outages.

Ground Connections.

Ground connections, if employed on apparatus connected to transmission supply circuits, should be made in the balanced or neutral position in the circuit. This precludes the use of grounded open star transformer connections.

SPECIFIC COORDINATED METHODS

The specific practices outlined herein are to be used in addition to the general practices to supplement the latter so far as may be necessary and practicable in cases where communication and supply lines are involved, or are about to be involved, in inductive exposures.

All of these practices are not required to be applied in any one specific case, but in each instance that practice or those practices in combination should be selected which will under the conditions afford the best engineering solution.

LINES.

Configuration.

Where physical and economic conditions permit a choice of configuration of supply circuits within inductive exposures the configuration should be selected so as to limit the influence.

Branch Circuits.

Consideration should be given to the isolation of branch circuits consisting of less than the total number of wires of the main circuit, resulting in substantial balance, by means of transformers when such main or branch circuits are involved in inductive exposures.

Consideration should be given to the isolation of loops of series lighting circuits.

Coordinated Transpositions.

Consideration should be given to the use of transpositions in supply or communication circuits, or both, within inductive exposures, for the purpose of limiting the coupling. Such transpositions should be installed at suitable intervals, the location to

be such as the local conditions demand. Where transpositions are installed in both supply and communication circuits within inductive exposures, they should be properly coordinated.

Note: Care should be taken in the installation of transpositions that where practicable the transpositions are located nearest the theoretically correct point. In general, transpositions may be omitted at the junction points of successive sections which are suitably balanced. In determining the most economical scheme of transpositions effort should be made to utilize as many as practicable of any existing transpositions. Where the transpositions required within an inductive exposure impair the general transposition scheme of communication or supply circuits outside the limits of inductive exposure, the necessary readjustment of transpositions should be made in the section or sections of line adjacent to inductive exposure. Uniformity of separation generally assists in the attainment of coordination. If discontinuities are of sufficient magnitude to substantially affect the coupling, sections between such points should be treated independently.

Rerouting Service.

If abnormal conditions should temporarily prevent the use of a certain line and the effect of the abnormal conditions can be avoided only by temporarily rerouting the supply or communication service over circuits not involved in the inductive exposure, consideration should be given to the adoption of this expedient. Where the rerouting of either service is impracticable the choice as to which service is to be temporarily suspended should be governed by the relative importance to the public of the respective services affected.

APPARATUS.

Wave Shape.

Where a ground connection used on the armature winding of an alternating current generator or motor electrically connected to supply circuits results in triple harmonics on circuits involved in inductive exposures, means should be employed to reduce the triple harmonics as far as may be necessary and practicable.

Rectifiers, arc furnaces and other apparatus which distort the voltage or current wave form of a supply circuit involved in an inductive exposure, should be equipped when and as necessary and practicable with suitable auxiliary apparatus to prevent such distortion.

Where the service conditions permit, consideration should be given to special means and devices for reducing the amplitude of harmonics on systems involved in inductive exposures.

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Reasonable efforts should be made to promptly replace out-lamps on circuits equipped with individual transformers or bridged reactance coils.

Transformers.

Consideration should be given to the use of closed delta connection on main transformer supply banks or large distribution banks where necessary and practicable in preference to open delta.

Lightning Arresters.

Where, notwithstanding compliance with the paragraph regarding equipment of the arresters, interference arises at time of charging lightning arresters, charging should be done at such times as will result in minimum interference to both services.

Switches.

Consideration should be given to the installation of at least one oil-break switch, or its approved equivalent, to control the supply circuit involved in an inductive exposure.

Current Limiting Devices.

Consideration should be given to the use, so far as necessary and practicable, of current limiting devices in either the line wires or the neutral of transmission supply circuits.

Ground Connections.

Ground connections if employed on apparatus connected to local supply circuits should, so far as practicable, be made at the neutral or balanced point of the circuit.

Records.

A record should be kept of all abnormal conditions on transmission supply circuits involved in inductive exposures, where a study of such conditions is advisable. Such records should, as fully as practicable, include time and duration, circuit designation, location, probable causes and effect of abnormal conditions and how cleared.

All of the above records, or a convenient summary thereof, should be available for the purpose of analyzing cause and effect of disturbances.

DEFINITIONS

For the purpose of these principles and practices, the following terms are used with meanings as given in these definitions:

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Inductive Coordination.

The location, design, construction, operation and maintenance of supply and communication systems in conformity with harmoniously adjusted methods which will prevent inductive interference.

General Coordinated Methods.

Those methods reasonably available for general application to supply or communication systems, which contribute to inductive coordination without specific consideration to the requirements for individual inductive exposures.

Specific Coordinated Methods.

Those additional methods applicable to specific situations where general coordinated methods are inadequate.

Inductive Interference.

An effect arising from the characteristics and inductive relations of supply and communication systems of such character and magnitude as would prevent the communication circuits from rendering service satisfactorily and economically if methods of inductive coordination were not applied.

Inductive Exposure.

A situation of proximity between supply and communication circuits under such conditions that inductive interference must be considered.

Inductive Susceptiveness.

Those characteristics of a communication circuit with its associated apparatus which determine, so far as such characteristics can determine, the extent to which it is capable of being adversely affected in giving service, by a given inductive field.

Inductive Influence.

Those characteristics of a supply circuit with its associated apparatus that determine the character and intensity of the inductive field which it produces.

Inductive Coupling.

The interrelation of neighboring supply and communication circuits by electric or magnetic induction or both.

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Configuration.

The geometrical arrangement of the conductors of a circuit including the size of the wires and their relative positions with respect to other conductors and the earth.

Electrically Connected.

Connected by means of a conducting path or through a condenser as distinguished from connection merely through electromagnetic induction.

Transposition.

An interchange of position of conductors of a circuit between successive lengths.

Coordinated Transpositions.

Transpositions which are installed in either supply or communication circuits or in both for the purpose of reducing inductive coupling and which are located effectively with respect to the discontinuities in both the supply and communication circuits.

Discontinuity.

A point at which there is an abrupt change in the physical relations of supply and communication circuits or in electrical constants of either circuit which would materially affect the coupling.

Transpositions are not rated as discontinuities, although technically included in the definition, because of their application to coordination.

Residual Voltage.

The residual voltage of a supply circuit is the vector sum of the voltages to ground of the several wires. In a three-phase system it is in effect a single phase voltage equal to one-third of the residual voltage, impressed between the wires in multiple and the ground.

Residual Current.

The residual current of a supply circuit is the vector sum of the currents in the several wires and is equivalent to a single phase current having the wires in multiple as one side and the ground as the other.

Power Level.

The level of the electrical power flowing in a communication circuit. At any point the power level depends on the conditions of input and of losses between the point of input and the designated point.

In telephone practice the power level of a circuit is usually referred to the power level in a given circuit assuming that the acoustic input into the circuit under consideration is of a given amount and the same as the input into the reference circuit.

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Sensitivity.

The sensitivity of a telephone circuit or a part thereof is the ratio of the electrical or the acoustic output to the electrical input.

Selectivity.

That property of apparatus or a circuit which permits the transmission or conversion of currents of different frequencies in differing degrees.

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INDUCTIVE COORDINATION
ALLOCATION OF COSTS
BETWEEN
SUPPLY AND COMMUNICATION COMPANIES

The Reports of the Joint General Committee on Principles and Practices for Inductive Coordination have established the broad basis for the solution of inductive coordination problems from a physical standpoint based on the present state of the art. From the start, however, it has been recognized that the question of allocation of costs enters into the problem in an important way and in this connection the letter transmitting the first report contained the following statement:

"Your Committee, as soon as standards of construction and operation are adopted, will consider whether principles can be established to aid in the fair allocation of costs of co-ordinative measures. In the meantime, your Committee believes that with the cooperative spirit which now is evident a mutually equitable adjustment can and should be made in each specific case. It is understood that any adjustments made will not be considered as precedents by either party to the prejudice of future understandings."

It is understood that, generally speaking, the respective utilities have been handling the allocation of costs in specific cases along the above recommended lines. However, in some cases difficulty has been encountered in endeavoring to reach an equitable adjustment; in fact, negotiations regarding the allocation of costs have in some cases unduly influenced the technical work on the specific situations involved and have tended to retard or prevent agreement on the best engineering solution.

This question has received careful consideration for some time and as a result certain suggestions have been made which will be helpful to the supply utilities and communication utilities as a guide in arriving at an equitable apportionment of the costs of

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methods of inductive coordination in situations where the two utilities have not already arrived at a mutually satisfactory plan for handling the allocation of costs.

In arriving at conclusions on this matter of allocation of costs, the following were carefully considered. The solution to the problem of inductive coordination should, of course, be based on the service needs of both parties and on the overall cost rather than on any consideration of in what plant the changes shall be made or how the costs are to be allocated. This is in accordance with the section on "Choice Between Specific Methods" contained in the Principles and Practices for the Inductive Coordination of Supply and Communication Systems and it is obvious that the approach to the problem should be such as to offer every incentive to obtaining the best engineering solution. It was the consideration of these facts that suggested the method herein outlined for the allocation of costs.

As has been stated in previous reports, each party should be the judge of its own service requirements but as covered in the Principles and Practices above referred to, each party also has a duty of coordination as shown by the following quotation:

"In order to meet the reasonable service needs of the public, all supply and communication circuits with their associated apparatus should be located, constructed, operated and maintained in conformity with general coordinated methods which maintain due regard to the prevention of interference with the rendering of either service. These methods should include limiting the inductive influence of the supply circuits or the inductive susceptibility of the communication circuits or the inductive coupling between circuits or a combination of these, in the most convenient and economical manner."

In other words, there are certain things indicated in connection with the classes of circuits covered in the Principles and Practices above referred to which each utility should do in its system in a general way which will promote inductive coordination.

These measures, however, cannot take account of the problems which arise in specific cases, and this was also recognized in the principles on Duty of Coordination already referred to as follows:

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"Where general coordinated methods will be insufficient, such specific coordinated methods suited to the situation should be applied to the systems of either or both kinds as will most conveniently and economically prevent interference, the methods to be based on the knowledge of the art."

These specific methods cannot be embodied in the general design of either plant because their nature and the necessity of their application are contingent upon the conditions of the specific situations which may arise and which generally cannot be foreseen. It is the equitable apportionment of the cost of these latter items which has apparently given rise to such differences of opinion as have existed between representatives of the two industries on this subject.

Taking into account all the foregoing factors, the plan suggested for use in connection with new construction is as follows:

1. Each utility should at its own expense design, construct, operate and maintain its plant in accordance with general coordinated methods.
2. Specific methods of coordination should be paid for by such equitable apportionment of the costs as may be agreed to by the utilities affected. It may be found reasonable in some cases for each party to bear the costs of such specific methods of coordination as result in net capital additions in its own plant; care must be exercised, however, that this be not carried to a point where the best engineering solution is prejudiced. In cases where it is not clear as to what constitutes an equitable apportionment a fifty-fifty division of the costs may be found the most practicable solution.
3. All carrying charges, repair, operating or other current expenses incident to specific coordinated methods and all subsequent replacement costs arising after and due to the installation of specific coordinated methods should be borne by the utility on whose system the costs are incurred.

The above outlined plan has the advantage that it can in no way prejudice the application of the best engineering solution because it makes each party have a direct interest in reducing the

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total cost of specific coordinated methods rather than in whether or not the expense is incurred in one plant or the other or both.

In applying this suggested general plan for the allocation of costs of specific methods of coordination, it is assumed the four following conditions will be met:

1. That each system has complied with the requirements for general coordination.
2. That the best engineering solution of the specific problem has been determined.
3. That the costs to be allocated are net costs and, therefore, exclude all items of betterment.
4. That the costs are computed on a uniform and mutually acceptable basis for both direct and indirect charges.

In situations involving extensions to existing systems or the cleaning up of existing exposures it is recognized that such existing systems may not comply entirely with general coordinated methods, and that the method suggested above for new construction may require some modification to adapt it to existing situations. Such problems involve consideration of whether or not both systems should be brought into compliance with general coordinated methods or whether some other plan is the best engineering solution. This point, together with the history of the case and any contemplated plans either party may have for changes in its system, will have a bearing on what constitutes an equitable apportionment of the costs.

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PRINCIPLES AND PRACTICES
FOR THE
JOINT USE OF WOOD POLES BY SUPPLY AND
COMMUNICATION COMPANIES

INTRODUCTORY

These Principles and Practices cover the general engineering and operating features involved in the joint use of wood poles and are intended to be in conformity with the broad principles heretofore mutually agreed upon by the Joint General Committee.

The Principles set forth in a broad and general manner the basic fundamentals involved in the intercompany relationships on joint use of poles. The two groups of utilities recognize their responsibility to serve the public safely, adequately and economically. It is therefore essential that any arrangement entered into be such as to best facilitate the present and future rendering of both classes of service.

Practices are recommendations which cover in a more specific way the general ground included in the Principles and are based on an analysis of practical operating experience with joint use of poles. It is recommended that they be used as a guide in the preparation of new agreements for the joint use of poles and in the modification of existing agreements where it is desired by either party to bring such existing agreements into conformity with these Principles and Practices.

PRINCIPLES

1. *Duties.*

Each party should:

- (a) Be the judge of the quality and requirements of its own service, including the character and design of its own facilities.

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(b) Provide and maintain facilities adequate to meet the service requirements including such future modifications in these facilities as changing conditions indicate to be necessary and proper.

(c) Determine the character of its own circuits and structures to be placed or continued in joint use, and determine the character of the circuits and structures of others with which it will enter into or continue in joint use.

(d) Cooperate with the other party so that in carrying out the foregoing duties, proper consideration will be given to the mutual problems which may arise and so that the parties can jointly determine the best engineering solution in situations where the facilities of both are involved.

2. Establishing, Maintaining and Terminating Joint Use.

Joint consideration by both parties of safety, service, economy, convenience and the trend toward higher distribution voltages should determine:

(a) When joint use should be employed, taking into account present conditions and those which can be reasonably foreseen, including the possibility of reverting to separate lines.

(b) The best engineering solution for the coordinated arrangement and design of facilities in joint use.

(c) The administrative methods for entering into, carrying on and terminating joint use.

3. Local Contact.

All parties at interest in a locality should maintain close co-operation and each notify the others of any intent to build new lines or to reconstruct existing lines, as an aid to orderly planning and the utilization of joint use where advantageous.

4. Contracts.

General contracts for joint use, if entered into, should define conditions for entering into joint use, for operating in joint use, for terminating joint use and for a practical procedure for modifying facilities in joint use from time to time.

Joint Use

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In either general or specific contracts, any provisions treating of the character of circuits on poles for joint use should be so drawn as not to restrict changes in the character of the circuits of either party, except that it should be recognized that such changes may involve the modification or abandonment of joint use in specific cases.

Each specific instance of contemplated initial or modified joint use, whether embracing a single pole, a group of poles or an entire line, should be considered, as to acceptance, as a separate and distinct case, with the right of refusal by either party, and if accepted should be in writing.

Joint use now exists and gives satisfaction in many localities under one of two general plans, one a "Space Rental Plan" and the other a "Joint Ownership Plan." In addition, joint use is sometimes effected on an "Attachment" or "Contact Rental" basis, and sometimes under a "Permanent Rights" agreement, which is a modification of the "Joint Ownership Plan." The Joint Ownership Plan and the Space Rental Plan have in general proved the more simple and convenient working arrangements.

5. Costs.

The allocation of costs between the parties at interest should be prima facie, reasonable and equitable, taking into account all factors involved.

6. Legal Considerations.

Legal questions, including the sufficiency of right-of-way grants held by the parties and the protection of title or property of both parties in the case of mortgages, sales, mergers or consolidations entered into by either party should be given due consideration in the preparation of contracts.

In any terms of the contract dealing with liability for personal or property damage, care should be taken that such terms are not disadvantageous to either party.

7. Periodical Readjustment of Contracts.

Provision should be made for review and revision from time to time of those stipulations of a contract treating of conditions of a varying nature and particularly of items of expense to be apportioned between the parties, such as the cost of poles and rentals which are dependent on material and labor prices.

8. Construction and Inductive Coordination.

The construction and inductive coordination employed in joint use should be in accordance with mutually acceptable practices and in conformity with such recommendations of the Joint General Committee as are issued from time to time.

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PRACTICES

1. Territory Covered by Agreement.

Agreements should preferably cover all existing wood poles of each of the parties and any other wood poles hereafter erected or acquired by either of them within a certain described territory, except those which carry circuits of a character that the parties wish to keep out of joint use.

Note: It is recognized that there are exceptional situations where it may not be desirable to make general agreements covering a given territory, as, for example, where the major portion of the poles of one of the parties carry circuits for which joint use is not generally advantageous. Such cases may be more satisfactorily handled by agreements covering a specific line or certain specific poles.

2. Types of Joint Use Agreements.

Joint use agreement should preferably be of a type under which each of the parties shares equitably in the cost of joint poles. This may be accomplished in either of the following ways:

(a) Space rental under which form of agreement the licensee rents space on the pole of the Owner and pays a rental per pole which is based on the amount of space reserved. A much used form of this is the so called "flat rental per pole" where the division is practically equal and the rental is approximately equal to one-half the average annual charges on a pole which is stipulated as the standard of reference.

(b) Joint ownership, under which form of agreement each of the parties owns a half interest in each joint pole and pays one-half the cost in place of the pole which is stipulated as the standard of reference.

Note: A permanent rights agreement is a modification of the joint ownership agreement which has been used occasionally under which each of the parties retains sole ownership of certain of the poles and the other party purchases a permanent right of occupancy. The other arrangements are the same as in a joint ownership agreement.

Joint Use

Rentals based on individual contacts or attachments are not generally recommended for joint pole agreements, as such a basis involves the expense and obligations arising from periodical inventories of the attachments. It is also difficult to establish rental rates for the many kinds of individual attachments which will continue to be equitable and mutually satisfactory. Furthermore, this basis does not have the advantage of providing a suitable space for the present and future requirements of each party. However, such a basis may sometimes be found satisfactory for an individual agreement where only a small number of poles is involved.

3. Conditions Relating to Joint Use of Poles.

It is recognized that there are very substantial advantages to both utilities in the employment of jointly occupied poles where the conditions and character of circuits permit. The conditions determining the necessity or desirability of joint use depends upon the service requirements to be met by both parties including considerations of safety and economy. Each party is the judge of what the character of its circuits should be to meet its service requirements and as to whether or not these service requirements can be properly met by the joint use of poles.

(a) It is recommended that joint use should be entered into in preference to separate pole lines on the same street or highway where the combination of circuits is such as to make further cooperative study of the problem unnecessary and in other cases where a cooperative study shows that joint use is economical and is the best engineering solution.

(b) Each party should retain the right to remain out of joint use with such of its pole lines as are necessary for its own sole use or in other cases where in its judgment the proper rendering of its service now or in the future requires separate lines.

(c) It is recognized that joint use is advisable but that it is necessary that when employed it should meet the service requirements of both parties and that any statement made as to conditions under which joint use is desirable is likely to change as time goes on and as service conditions and the state of the art change.

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(d) Based upon the present state of the art, the Supply Utilities and the Communication Utilities have stated as to their respective circuits (See appendices 1 and 2) the present limitations within which each group recommends that joint use be entered into.

(e) In any case where it is necessary that the two kinds of lines occupy the same side of the highway joint use is generally preferable to overbuilding.

(f) It is recognized that situations will sometimes arise in rural districts where greater economy can be obtained with separate lines than with a joint line and without sacrificing safety or service. It is also recognized that a utility will find in some cases that it is necessary to construct a line which is to carry such number and weight of attachments that joint use would not be economical or desirable. In such cases it is not intended to recommend joint use of poles in preference to other arrangements which would be more advantageous.

4. Cooperation to Establish Joint Use.

(a) When any party to a joint use agreement is about to erect a new pole line or to extend or reconstruct an existing pole line within the territory covered by the agreement, notice in advance should be given to the other party to the agreement, such notice showing the proposed location and character of the new poles. The parties should then cooperate to determine whether or not joint use of the poles should be established.

(b) When any party to a joint use agreement desires to occupy space on any existing poles of the other party within the territory covered by the agreement, notice should be given the owner of said poles and the parties should then cooperate to determine whether or not joint use of poles should be established.

5. Avoidance of Conflicting Lines.

Where joint use of poles is not to be established or where in accordance with Section 6 of these Practices joint use is to be terminated, the parties should make every reasonable effort to avoid the establishment of conflicting lines.

Joint Use

6. Procedure When Character of Circuits Is Changed.

When either party desires to change the character of its circuits on jointly used poles it shall so notify the other party and the parties shall cooperate to determine whether or not joint use of the poles involved shall be continued. If it is not agreed to continue joint use of the said poles, the parties shall then cooperate to determine the most practical and economical method of effectively providing for separate lines. The party whose circuits are to be moved shall promptly carry out the necessary work and the parties shall cooperate to determine the equitable apportionment of the net expense involved in such relocation. In the event of a disagreement as to what constitutes an equitable apportionment of such expense the following arrangements are recommended:

(a) In the case of a space rental agreement, the licensee shall bear the said net expense.

(b) In the case of a joint ownership agreement the said net expense shall be divided equally between the parties.

Unless otherwise agreed by the parties, ownership of any new line constructed under the foregoing provision in a new location shall rest in the party for whose use it is constructed. The net cost of establishing service in the new location should be exclusive of any increased cost due to the substitution for the existing facilities of other facilities of a substantially new or improved type or of increased capacity, but should include the new pole line, the cost of removing attachments from the old poles to the new location and the cost of placing the attachments on the poles in the new location.

7. Ownership of Poles Under a Space Rental Agreement.

In any case where the parties to a space rental agreement shall conclude arrangements for the joint use of any new poles to be erected, the ownership of such new poles should be determined by mutual agreement. In case of failure to agree, the party then owning the smaller number of joint poles under the agreement should erect the poles and be the owner thereof.

Note: It has been found to be of advantage under this form of agreement to have each party own approximately one-half the total number of jointly used poles, as this tends to equalize the investment of the two parties. Furthermore, this has the advantage of reducing the intercompany billing and the exchange of money between the parties. This division of ownership should preferably be accomplished by each party owning certain continuous lines rather than having the ownership of the poles in a given line divided.

Joint Use

8. Joint Fundamental Plan.

An effective way of handling the proper development of joint pole lines in a given territory is through the full application of the principles on cooperation including advance notice, advance planning and the interchange of information. Experience has shown that this can be accomplished through a joint fundamental plan of the present and future developments of the overhead systems of the respective parties. Through such joint planning it will be generally found possible to avoid any difficult situations in locating the lines and the application of these Principles and Practices to both the present and future developments can be carried out in the most effective and economical manner.

9. Specifications for Joint Pole Construction.

It is intended that complete specifications covering recommended practices for joint use of poles under various conditions will be prepared as soon as practicable. Until such time as these specifications are issued, it is recommended that the National Electrical Safety Code be used as a guide to practice.

Existing joint pole construction should be brought into conformity with the recommended practices in an orderly and systematic manner. This may be accomplished by a provision in the agreement that a certain percentage of the existing construction be brought into conformity with the recommended practices each year.

10. Inductive Coordination for Circuits on Jointly Used Poles.

The "Principles and Practices for the Inductive Coordination of Supply and Communication Systems" as issued from time to time by the Joint General Committee should be followed.

Joint Use

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APPENDIX 1

Supply Utilities Statement.

In the present state of the art and subject to the limitations of the Principles and Practices of which this is an appendix, the Supply Utilities are willing to enter into joint use of poles generally, irrespective of the character of the Communication Utilities circuits with the clear understanding that these Principles and Practices do not limit such changes to higher voltages as may be desirable in the future as the most advantageous means of serving their customers but provide for such changes in location or construction as may be necessary to meet the changed conditions.

EXHIBIT WA-29

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JOINT USE OF POLES IN RURAL AREAS

A Report of the Joint Subcommittee on Joint Use of Poles for Rural Power and Telephone Circuits Edison Electric Institute and Bell Telephone System

Summary

This is a final report of the Joint Subcommittee on Joint Use of Poles for Rural Power and Telephone Circuits. The first report consisted of a preliminary issue of Part 5 "Special Considerations for Long Span Joint Use" of the Joint Pole Practices. This report reviews the factors concerned in the relative economies of joint construction vs. separate power and telephone line construction in sparsely settled rural areas and makes recommendations concerning further joint work on rural joint use matters.

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October 1951

Copies of this report may be obtained by Power Companies from the Edison Electric Institute, 420 Lexington Avenue, New York 17, N. Y. (Publication 51-19) and by Associated Bell Companies from the Department of Operation and Engineering of the American Telephone and Telegraph Company, 195 Broadway, New York 7, N. Y.

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EDISON ELECTRIC INSTITUTEBELL TELEPHONE SYSTEMJOINT COMMITTEE ON PLANT COORDINATION

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W F Nimmo H K Sels
H E Kent, Secretary

H S Osborne, Chairman
A B Clark J J Pilliod
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JOINT SUBCOMMITTEE ON JOINT USE OF POLES FOR
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E K Karcher
F W Nimmer
H E Kent, Secretary

H R Huntley, Chairman
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V G Teders
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JOINT USE OF POLES IN RURAL AREAS

Under date of October 29, 1945, the Joint Committee on Plant Coordination issued a report covering the construction and maintenance of jointly used pole lines carrying supply and communication circuits which was designated as "Joint Pole Practices." These Practices are divided into four parts intended for application under the various conditions which obtain generally in urban and suburban areas. Because of limited experience it was not practicable to include in the Joint Pole Practices requirements covering long span joint use such as obtains in rural areas. Provisions were, therefore, made for a Part 5 which could be added later to cover the clearance and other requirements involved in such joint use.

Early in 1946, the Subcommittee on Joint Use of Poles for Rural Power and Telephone Circuits was formed and instructed to study the factors involved in the joint use of poles for rural power and telephone circuits including the guidance of trial installations with the objective of developing:

- (a) Suitable specifications for the construction of long span joint use.
- (b) The economies of rural joint use as compared with separate lines.
- (c) Sound and equitable principles and practices for guidance in negotiating administrative and contractual relations.

These instructions also included application of available methods of inductive coordination and electrical protection on the power and telephone circuits.

Specifications

Under date of April 10, 1946, the Subcommittee on Joint Use of Poles for Rural Power and Telephone Circuits submitted tentative specifications for long span joint construction. These specifications were prepared in the form of Part 5 of the Joint Pole Practices and were intended to be used in combination with such of the other requirements of the Joint Pole Practices as apply.

In line with the recommendations of the Subcommittee, the Joint Committee on Plant Coordination issued Part 5 for field trial on May 6, 1946, and copies were sent to Member Companies of the Edison Electric Institute and Associated Companies of the Bell Telephone System.

Basic Considerations

In its studies of long span joint use, the Subcommittee has found it convenient to group the factors concerned under three headings, namely, Structural Coordination, Electrical Protection and Inductive Coordination.

Structural Coordination

The important factors involving Structural Coordination in long span joint use are:

1. Separations between power and telephone wires at the pole and in the span.
2. Clearances of power and telephone wires above highways and above ground along highways and over ways generally.
3. Pole sizes to provide required strengths and wire clearances.

Minimum requirements covering these factors are contained in Part 2 of the 5th (Current) Edition of the National Electrical Safety Code. Joint use has been employed in urban and suburban areas for many years, and patterns of joint use have been developed which have proven generally satisfactory in such areas. With the development of relatively small, high strength power wires, the construction of power lines in span lengths 2 to 5 times longer than those normally used in urban areas, became practicable. Also, the development of improved high strength telephone wires made practicable the construction of correspondingly long span open wire telephone lines. Joint use with such wires in long spans was not contemplated in Part 2 of the Current Edition of the National Electrical Safety Code and the need of guides, particularly concerning separations between power and telephone wires at the pole and in the span, was indicated. Part 5 of the Joint Pole Practices referred to above, was intended for this purpose.

Electrical Protection

Previous to 1930 a large percentage of power distribution circuits involved in joint use ranged between 2300 and 4800 volts and adequate practices for such joint use had been developed based on experience. However, the situation was less clear where higher distribution voltages were involved, and the Joint Subcommittee on Development and Research consequently undertook a study of the problem, the results of which were given in Provisional Report 19, entitled "Joint Use of Poles - Telephone Circuits and 6.6 and 13.2 Kv Power Circuits - Safety Features." Out of these studies there developed the following basic concepts which facilitated the extension of joint use with power circuits in higher voltage categories.

1. Protection of telephone plant in joint use requires coordination of protective devices in both the power and telephone circuits.
2. Such coordination consists in essence of provision for positive deenergization of the power circuit in case of fault to ground, and limitation of the voltages on the telephone plant in case of accidental contact to the range of safe operating characteristics of telephone protective equipment. On open wire telephone circuits this involves the use of auxiliary protectors associated with telephone line wires which will (a) limit the voltage at the telephone station to the protective equipment operating range and (b) provide for impedance to ground low enough and with current carrying capacity high enough to assure the operation of power protective equipment in the event of accidental contact. On telephone cable and associated drop wire, the effective grounding of the telephone cable sheath -- in some cases bonding the sheath to the multi-grounded neutral of the power system -- provides suitable limitation of impressed voltage.

The auxiliary protector used on open wire telephone circuits where exposed to contact with higher voltage conductors, has been standardized and is known as the 99A protector. It consists of three carbon cylinders, each about 5/8 inch in diameter, and 1/2 inch long, inclosed in a mounting suitable for attachment to a pole or telephone crossarm. The carbon cylinders are spaced to give approximately 3000-volt gaps. Two of the cylinders are connected to the wires of the telephone circuit concerned and the third is grounded, where practicable to a grounding wire which is also connected to the multi-grounded neutral of the power system.

These methods of protection, developed primarily for application to joint use in urban and suburban areas, are equally applicable to joint use in rural areas where higher voltage multi-grounded neutral distribution circuits are employed. In rural areas, however, where telephone circuits may be involved in considerable lengths of joint use, the matter of electric or magnetic induced voltages on telephone wires may be of importance. To take care of this problem, there has been developed a drainage protector for use on open wire telephone circuits. This device is in two forms, one consisting of a resistor in series with a capacitor and the other of a reactor in series with a capacitor, the combination tuned to 60 cycles. Since these drainage devices are connected between each wire of a telephone circuit and ground, it is important that their bridging impedance be high so as not to cause high telephone transmission losses and low as regards impedance to ground, so as to limit induced voltages to ground. The device with resistors is known as the 104A telephone protector and the one with reactors is

known as the 108A telephone protector. The 104A is designed for electric induction only; the 108A, while designed primarily for electric induction, is also effective for magnetic induction if the impedance of the line to which it is connected is relatively high.

In urban and suburban areas, joint use largely involves telephone cables and relatively short extensions of open wire. Where these open wire extensions are joint with higher voltages, 99A protectors are usually employed but drainage protectors are seldom required. In rural areas, where open wire telephone circuits are usually relatively long, both types of protectors are indicated where higher voltage power circuits are involved. Where the power circuit operates at less than 3000 volts to ground, 99A protectors are not applicable but drainage protectors may be indicated.

Inductive Coordination

The principal problem of inductive coordination in rural joint use involves "noise induction" in open wire telephone circuits. Studies in this connection indicate the importance of the following:

1. That the power circuits concerned have reasonably low values of harmonics.
2. That the telephone circuits be well balanced as regards impedance to ground and that they be adequately transposed throughout the extent of joint use and other parallel construction.

Well balanced telephone equipment both at telephone central offices and at telephone stations are indicated where rural power and telephone circuits operate in the same territory in joint use or in parallel construction. A system of telephone circuit transpositions, known as the R System, has been developed which is applicable to open wire telephone circuits in either paralleling construction or joint use and has been found to be effective when employed in combination with well balanced equipment at the central office and at subscriber stations as referred to above. With this system of telephone transpositions, each telephone circuit is transposed at alternate poles if long span construction is used; with short span construction transpositions are made at about the same linear intervals, rather than at alternate poles. Where two or more circuits are involved, the transposition locations are staggered to minimize telephone cross-talk induction. An important feature of the system is the use of a tandem-type transposition bracket.

Trial Installations

During 1946, a number of trial installations of long span higher

voltage rural joint use were constructed. Data on five of these installations, three in the light and medium loading districts and two in the heavy loading district, were made the subject of a paper on Joint Use of Pole Lines for Rural Services presented at the 1947 Winter meeting of the American Institute of Electrical Engineers by Messrs J W Campbell of the American Telephone and Telegraph Company, L W Hill of the Carolina Telephone and Telegraph Company, L M Moore of the Rural Electrification Administration and H J Scholz of the Commonwealth and Southern Corporation. (Transactions of the American Institute of Electrical Engineers, Vol. 66, pp 519-524, 1947.) This paper described the means employed in the five installations for the coordination of construction, electrical protection and induction and gave the results of noise measurements on the telephone circuits in each instance. This paper indicated that the trials made up to that time had demonstrated the feasibility of higher voltage long span joint use in rural areas.

In many locations throughout the country, particularly surrounding larger cities, joint use has extended into rural areas with the same pattern of construction and the same power system voltage as employed in the urban areas. In more thinly populated rural areas, long span higher voltage joint use has been constructed in many instances. It is estimated that at present there are of the order of 2,000,000 poles jointly used in rural areas in the United States and that about 300,000 of these involve joint use of the long span higher voltage type.

Economies of Rural Joint Use as Compared with Separate Lines

In its studies of the relative economies of rural joint lines as compared with separate lines, the Subcommittee has confined its considerations primarily to situations such as obtain in thinly settled rural areas where higher voltage power circuits, long spans and long open wire telephone circuits are indicated. In considering the costs of joint lines as compared with separate lines in such situations, certain elements of cost are involved which are not present in the same degree in urban types of joint use. The procedure has, therefore, been to investigate the cost of separate rural power and telephone lines including in each case the cost of poles in place, the cost of rights-of-way, initial clearing, recurrent trimming, and added costs such as are involved where the lines cross each other. On joint lines there have been included the costs of poles in place, rights-of-way, initial clearing, recurrent trimming and additional electrical protection. For situations in which joint use is established on existing rural power lines there has also been included in the joint line costs, the added cost to the Telephone Company of stringing wire under energized power wires and the added cost of rearrangement of power facilities, added poles and pole replacements. Thus the effort has been to compare the over-all costs of separate rural power and telephone pole lines with the over-all costs of joint pole lines in the same territory.

These cost items vary considerably depending on the circumstances which obtain in different territories. For example, initial clearing and recurrent

trimming costs may be high in some localities and low in others. The cost of poles in place vary considerably in different parts of the country. In general, however, the factors which cause these variations apply to the lines built separately by the Power and Telephone Companies and to joint lines.

In addition to the factors reviewed above and to which dollar values can be assigned, there are also certain other items, important in the consideration of joint versus separate lines, but to which it is not practicable to assign dollar values.

In its studies of relative economies the Subcommittee has been guided by the following factors.

1. So far as the inductive influence of the power system and the inductive susceptiveness of the telephone system are concerned, these would equate to the same problem in joint use as in parallel construction on the opposite side of the highway. Therefore, joint use as of itself would not add to the cost of inductive coordination in joint construction.
2. As regards electrical protection, since the protective devices usually employed on the rural power system provide for de-energization at times of ground faults, and since the protective devices designed for use on telephone circuits result in ground impedances such as are usually employed by power companies in this connection, no additional expense on the power system pertinent to joint use would be involved. On the telephone system there would be involved the expense of a greater number of 99A protectors and drainage protectors than would be required for separate lines.
3. In constructing lines in rural areas there are usually involved rights-of-way, initial clearing and subsequent trimming costs. These costs would be applicable to separate lines and to joint lines.
4. In establishing new separate rural power and telephone lines, crossings of the two lines are involved at intervals, as for example at cross roads, service drops, etc. A certain amount of expense would be involved to provide the required strengths, clearances and electrical protection at many of these crossings. Such expense, assumed paid by the second comer, would be chargeable to the cost of separate lines.

5. The joint lines has been assumed to be a line suitable for both services without regard to height or class of poles, i.e., no normal joint pole.
6. In establishing joint use on existing lines, some rearrangement of existing facilities, replacement of poles, and provision of additional poles may be required. Such expense would be chargeable to the cost of the joint line.
7. The stringing of telephone wires under energized power conductors requires particular care to prevent contacts between the telephone wires and energized power wires which add to the cost of stringing telephone wires. In building new joint use lines, the work could be so planned as to avoid this added expense in connection with the telephone wires to be installed initially.
8. Since the number of poles per mile used by power and telephone companies on their normal separate line construction may differ, and since many of the cost items mentioned in the preceding can best be compared on a unit length of line basis, it is convenient to make cost comparisons on the basis of annual charges per mile. This permits the direct inclusion in the comparison of the annual cost of recurrent trimming where this item is of importance.
9. There is likely to be more costly damage and greater delay in clearing trouble due to storms when power and telephone wires are attached to the same poles. However, it was not practicable to arrive at a suitable valuation of this item.

With these factors considered, the studies of the Subcommittee have led to the conclusion that, in general, joint use in sparsely settled rural areas may offer opportunities for dollar economies. These opportunities for dollar economies are, of course, greatest where new joint lines are constructed. Where existing power lines are to be rearranged for joint use opportunities for dollar economies will be considerably reduced. Where existing rural telephone lines or existing rural power and telephone lines are involved, joint use, in general, offers no dollar economies but in some instances, may be the best engineering solution to specific problems.

Joint Use Arrangements in Rural Areas

The EEI-Bell System "Principles and Practices for the Joint Use of Wood Poles by Supply and Communication Companies" as issued by the Joint

General Committee in 1926 and reissued without change in 1945, has formed the basis for a large percentage of the more than 300 joint use agreements now in effect between power and telephone companies in the United States. These agreements have established general patterns as to form which are adaptable to the conditions obtaining primarily in urban and suburban areas. As affecting thinly settled rural areas, a sufficient number of agreements have not so far been executed to establish a general pattern for such specific joint use. However, it is believed that the first sentence of Item 2 of the EEI-Bell System Practices referred to above should form a reasonable basis for joint use arrangements in rural areas. This sentence is as follows: "Joint Use Agreement should preferably be of a type under which each of the parties shares equitably in the cost of joint poles."

Recommendations

In completing its assignments, the Subcommittee makes the following recommendations:

1. That this report be issued to the power and telephone companies as a Subcommittee Report.
2. That consideration be given to combining trial Part 5 covering long span joint construction, with the Joint Pole Practices and that in this connection, consideration also be given to such of the recommendations contained in Provisional Report No. 32 of the Joint Subcommittee on Development and Research entitled "Factors Which Influence Pole Height in the Rural Joint Use of Poles" as are mutually acceptable.
3. That work be continued through appropriate channels with the objective of promoting safety and economy in joint use.

EXHIBIT WA-30.1

WA Exhibit No. 30.1 - APPA Rental Rate Calculation
Blue Ridge EMC
FY 2014 Data

Line #	Description	Amount	Definition
Attacher Responsibility Percentage			
1	Space occupied	1.11	Per audit
2	Unusable Space	30.63	Calculation-Includes Safety Space
3	Unusable Space Factor	35.39%	Line 2 / Line 6 / Line 7
4	Usable Space	6.2	(Pole Height - Unusable)
5	Usable Space Factor	3.01%	(Line 1 / Line 4) x (Line 4 / Line 6)
6	Pole Height	36.83	Calculated with CPR Detail
7	Number of Attachers	2.35	Calculated using GIS data
8	Attacher responsibility percentage	38.40%	Line 3 plus Line 5
Gross Cost of a Bare Pole			
9	Gross pole investment (Acct. 364)	49,295,043	
10	Appurtenance factor	87.00%	
11	Gross pole investment allocable to attachments	42,886,688	Line 9 x Line 10
12	Total number of poles	107,751	
13	Gross cost of a bare pole	\$398.02	Line 11/Line 12
Gross Carrying Charge			
14	Total general and administrative	10,164,119	
15	Total electric plant in service	425,883,764	
16	Administrative carrying charge	2.39%	Line 14 / Line 15
17	Maintenance expense for overhead lines	7,674,619	
18	Pole investment in Accts. 364, 365, & 369	158,218,973	
19	Maintenance carrying charge	4.85%	Line 17 / Line 18
20	Depreciation rate for gross pole Investment	3.60%	
21	Depreciation carrying charge	3.60%	Line 20
22	Taxes (Accts. 408.1 + 409.1 + 410.1 + 411.4 - 411.1)	2,160,782	
23	Total utility plant in service	425,883,764	
24	Taxes carrying charge	0.51%	Line 22 / Line 23
25	Applicable rate of return (default)	11.25%	Presumption
26	Gross Pole Investment	\$ 49,295,043.19	Line 9
27	Net Pole Investment	\$ 32,539,753.16	
28	Return carrying charge	7.43%	(Line 25 x Line 26) / Line 27
29	Total carrying charges	18.77%	Line 16 + Line 19 + Line 21 + Line 24 + Line 28
RATE			
30	Attacher responsibility percentage	38.40%	Line 8
31	Gross cost of a bare pole	\$398.02	Line 13
32	Total carrying charges	18.77%	Line 29
33	Pole attachment rental rate	28.69	Line 30 x Line 31 x Line 32

EXHIBIT WA-30.2

WA Exhibit No. 30.2 - APPA Rental Rate Calculation
Blue Ridge EMC
FY 2015 Data

Line #	Description	Amount	Definition
Attacher Responsibility Percentage			
1	Space occupied	1.11	Per audit
2	Unusable Space	30.61	Calculation-Includes Safety Space
3	Unusable Space Factor	35.35%	Line 2 / Line 6 / Line 7
4	Usable Space	6.24	(Pole Height - Unusable)
5	Usable Space Factor	3.01%	(Line 1 / Line 4) x (Line 4 / Line 6)
6	Pole Height	36.85	Calculated with CPR Detail
7	Number of Attachers	2.35	Calculated using GIS data
8	Attacher responsibility percentage	38.36%	Line 3 plus Line 5
Gross Cost of a Bare Pole			
9	Gross pole investment (Acct. 364)	50,390,546	
10	Appurtenance factor	87.29%	
11	Gross pole investment allocable to attachments	43,984,989	Line 9 x Line 10
12	Total number of poles	108,086	
13	Gross cost of a bare pole	\$406.94	Line 11/Line 12
Gross Carrying Charge			
14	Total general and administrative	9,870,339	
15	Total electric plant in service	440,866,858	
16	Administrative carrying charge	2.24%	Line 14 / Line 15
17	Maintenance expense for overhead lines	7,951,569	
18	Pole investment in Accts. 364, 365, & 369	164,546,374	
19	Maintenance carrying charge	4.83%	Line 17 / Line 18
20	Depreciation rate for gross pole Investment	3.60%	
21	Depreciation carrying charge	3.60%	Line 20
22	Taxes (Accts. 408.1 + 409.1 + 410.1 + 411.4 - 411.1)	1,477,001	
23	Total utility plant in service	440,866,858	
24	Taxes carrying charge	0.34%	Line 22 / Line 23
25	Applicable rate of return (default)	11.25%	Presumption
26	Gross Pole Investment	\$ 50,390,545.70	Line 9
27	Net Pole Investment	\$ 32,466,328.65	
28	Return carrying charge	7.25%	(Line 25 x Line 26) / Line 27
29	Total carrying charges	18.25%	Line 16 + Line 19 + Line 21 + Line 24 + Line 28
RATE			
30	Attacher responsibility percentage	38.36%	Line 8
31	Gross cost of a bare pole	\$406.94	Line 13
32	Total carrying charges	18.25%	Line 29
33	Pole attachment rental rate	28.50	Line 30 x Line 31 x Line 32

EXHIBIT WA-30.3

WA Exhibit No. 30.3 - APPA Rental Rate Calculation
Blue Ridge EMC
FY 2016 Data

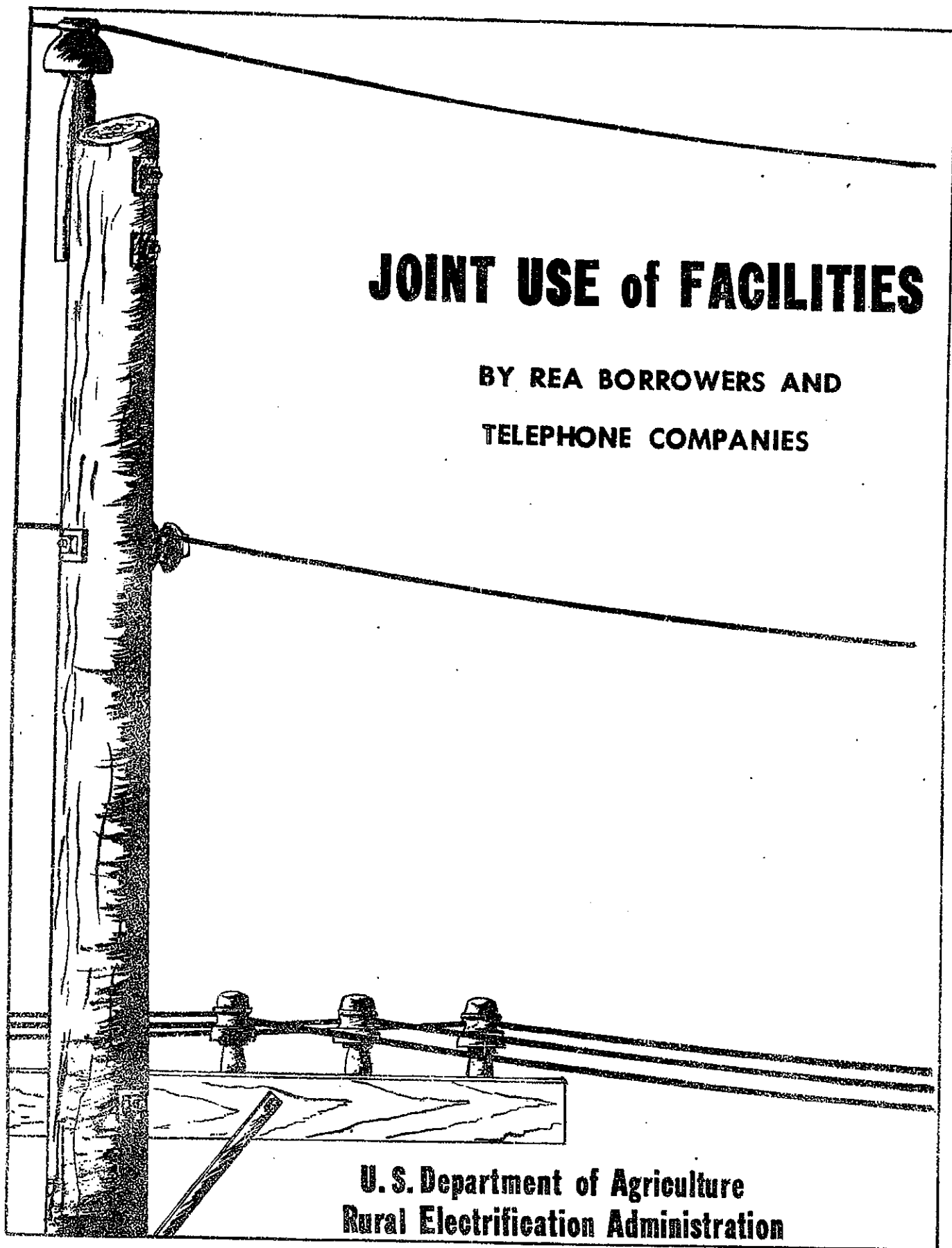
Line #	Description	Amount	Definition
Attacher Responsibility Percentage			
1	Space occupied	1.11	Per audit
2	Unusable Space	30.59	Calculation-Includes Safety Space
3	Unusable Space Factor	35.31%	Line 2 / Line 6 / Line 7
4	Usable Space	6.28	(Pole Height - Unusable)
5	Usable Space Factor	3.01%	(Line 1 / Line 4) x (Line 4 / Line 6)
6	Pole Height	36.87	Calculated with CPR Detail
7	Number of Attachers	2.35	Calculated using GIS data
8	Attacher responsibility percentage	38.32%	Line 3 plus Line 5
Gross Cost of a Bare Pole			
9	Gross pole investment (Acct. 364)	51,209,182	
10	Appurtenance factor	87.41%	
11	Gross pole investment allocable to attachments	44,762,968	Line 9 x Line 10
12	Total number of poles	108,330	
13	Gross cost of a bare pole	\$413.21	Line 11/Line 12
Gross Carrying Charge			
14	Total general and administrative	9,666,925	
15	Total electric plant in service	454,916,323	
16	Administrative carrying charge	2.12%	Line 14 / Line 15
17	Maintenance expense for overhead lines	8,486,535	
18	Pole investment in Accts. 364, 365, & 369	168,093,587	
19	Maintenance carrying charge	5.05%	Line 17 / Line 18
20	Depreciation rate for gross pole Investment	3.60%	
21	Depreciation carrying charge	3.60%	Line 20
22	Taxes (Accts. 408.1 + 409.1 + 410.1 + 411.4 - 411.1)	1,698,970	
23	Total utility plant in service	454,916,323	
24	Taxes carrying charge	0.37%	Line 22 / Line 23
25	Applicable rate of return (default)	11.00%	Presumption
26	Gross Pole Investment	\$ 51,209,181.87	Line 9
27	Net Pole Investment	\$ 32,011,587.29	
28	Return carrying charge	6.88%	(Line 25 x Line 26) / Line 27
29	Total carrying charges	18.02%	Line 16 + Line 19 + Line 21 + Line 24 + Line 28
RATE			
30	Attacher responsibility percentage	38.32%	Line 8
31	Gross cost of a bare pole	\$413.21	Line 13
32	Total carrying charges	18.02%	Line 29
33	Pole attachment rental rate	28.54	Line 30 x Line 31 x Line 32

EXHIBIT WA-31

JOINT USE of FACILITIES

BY REA BORROWERS AND
TELEPHONE COMPANIES

U. S. Department of Agriculture
Rural Electrification Administration



CONSIDERATIONS INVOLVED IN JOINT USE OF FACILITIES
BY REA BORROWERS AND TELEPHONE COMPANIES

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CONSIDERATIONS INVOLVED IN JOINT USE OF FACILITIES
BY REA BORROWERS AND TELEPHONE COMPANIES

Introduction

Joint use of facilities by power and telephone systems has been found to be feasible in rural areas with the development of high strength telephone wires that can match rural power line spans and the development of generally accepted construction standards and safety devices to minimize any possible hazards. The power line carrier telephone system, wherein the power wires act as guides for carrier radio waves, is another recent development having application in rural areas.

Joint use raises for REA borrowers questions of policy with respect to (1) protecting and advancing the interests of their members in connection with telephone rates and area coverage, (2) uniform relations with local telephone companies in their areas that may include mutuals, independents and members of the Bell Telephone System, and (3) development of engineering, construction and operating practices in cooperation with the local telephone companies that will make joint use an asset to all. Joint use raises for REA questions with respect to use of loan funds and protection of the Government's interests in borrowers' systems as they may be affected by joint use arrangements.

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The joint use contract forms, copies of which were distributed to all borrowers with the Administrator's memorandum of July 3, 1947, were designed to include desirable legal, business and technical factors to provide adequate protection for REA borrowers and to establish a practical working framework for relations between REA borrowers and their local telephone companies when they wish to engage in joint use of facilities.

I. Objective of Joint Use of Facilities

The primary objective of joint use of facilities is to achieve savings in cost by eliminating one pole line. Elimination of structural conflicts as well as local regulations may also require or make joint use desirable.

The costs as well as the savings of joint use construction should be shared equitably by the power and telephone suppliers. Where the savings are appreciable, it can well mean that both services can be extended into areas where construction might not otherwise be economically feasible. Therefore, even though power system poles are already in place and can accommodate telephone facilities with little, if any, extra cost, telephone companies should be required to make payments representing their fair share of the costs of the poles so that savings can accrue to the consumers of electricity as well as to the telephone subscribers. In other words, the power consumers should not be asked to subsidize telephone subscribers.

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II. REA Financing as Related to Joint Use Facilities

As a general rule, an REA borrower should not invest REA loan funds in joint use facilities in a given area to a greater extent than would have been required to provide facilities capable of rendering electric service alone in the same given area. This will raise no serious problem since the pole sizes in common use by REA borrowers are capable of accommodating certain telephone facilities and the contracts provide that the telephone companies shall pay any additional capital outlays required as well as rentals for the benefits they secure from the use of REA borrowers' poles and wires. Moreover, since telephone companies may also set and own joint use poles, an REA borrower should actually have a lesser investment in pole plant than would be required for separate line construction considering an area as a whole.

III. Telephone Company Qualifications

The sample forms of contracts and the recommended payments contained therein are predicated on the assumption that the telephone supplier is fully competent to carry its part of responsibility and that the REA borrower will not be put to any additional expense by reason of the telephone supplier's lack of knowledge or competence. Therefore, REA borrowers, before entering joint use agreements, should satisfy themselves that:

- A. the telephone company concerned is a financially responsible organization which is fully capable of bearing its proper share of the costs and responsibilities for any possible hazards.

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- B. the telephone company has available a qualified engineering and construction force to assure that its facilities on joint use lines will be installed in accordance with accepted construction standards and safety practices.
- C. the telephone company has a maintenance and operations force capable, where necessary, of maintaining its own facilities when installed jointly with power lines.

IV. Insurance

The contract forms have no clauses concerning insurance coverage on the assumption that each party will carry its usual insurance and that in the event of any claims, liability will be assessed according to the legal responsibility that is determined.

REA borrowers should satisfy themselves that the local telephone companies with which they share joint use facilities either

- A. provide adequate reserves for insurance, or
- B. carry adequate insurance policies.

The Bell Telephone System, for example, is self insured and sets aside reserves against losses. However, smaller telephone companies should be required to have liability insurance coverage comparable to that carried by REA borrowers.

V. Safety

It cannot be too strongly emphasized that proper precautions should be taken in joint use construction to minimize possible hazards to both telephone and power linemen as well as to consumers. Adequate standards of safety can be established by observation of the proper construction, maintenance and safety practices and installation of power and telephone protective devices. The telephone companies should be held completely responsible for installation and operation of their own facilities (except as otherwise provided for carrier telephone facilities) and borrowers who find it necessary to advise their local telephone companies on proper construction and safety practices would be best advised themselves not to engage in joint use construction with such companies in view of the risks and costs involved.

All wires and appurtenances on joint use poles should be treated as hot when performing line work.

VI. Description of Contracts

A. Power Line Carrier Facilities, REA Form DS-209.

The highlights of this form of contract are

1. The telephone company is given the right to transmit communications over the power lines at frequencies in the 150-500 KC band, but there is to be no interference with the use of frequencies by the REA borrower outside that band.

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2. The telephone company is given the right to have attached to the power lines and poles such equipment as is necessary to provide for carrier telephone service. All such equipment is furnished or paid for by and remains the property of the telephone company but for safety reasons most installation and maintenance of equipment installed on power system facilities is to be performed by the REA borrower in behalf of the telephone company.
3. The telephone company will reimburse the REA borrower for all expenses incurred to accommodate the telephone facilities and will pay an annual fee for each pole on which telephone equipment is installed. To simplify billing, unit telephone equipment assemblies have been established and uniform telephone company payments for installation, removal and maintenance work performed by the REA borrower in connection with such units have been suggested in Exhibit B. These payments make allowance for average labor, material, transportation and overhead costs. If experience discloses that they vary too greatly from actual costs in any particular area, either party may request a revision annually.

The annual charge of \$1.00 for each pole of the REA borrower upon which the telephone company has attachments amounts to a leasing fee. The fee of

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\$1.00 is purely nominal in view of the fact that there is no experience with the actual operation of carrier telephone systems on which there could be based an exact determination of any cost savings of this method of providing telephone service that might be shared between the telephone company and REA borrower.

Power consumption payments are based on estimates of the average power losses caused by the various types of telephone company equipment connected to or inserted in the power lines. The maintenance visit payment has been established to cover any work done by the Cooperative on any specific request from the Telephone Company. It is anticipated that maintenance jobs generally will involve single locations and that the work can be done in a single visit. The largest part of the cost of the maintenance visit is in travel time and motor vehicle expense, whether the trip involves replacement of a capacitor fuse or complete replacement of an isolating choke assembly.

4. If work is to be performed by the REA borrower on behalf of the telephone company that is not covered by the unit assemblies and costs set forth in

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Exhibit B, additional reimbursement should be agreed upon. This would include, for example, replacement of poles or the initial installation of poles of greater height or class to accommodate the telephone company.

5. The contract term is 5 years and thereafter until terminated by 1 year's notice by either party.
6. All construction must be in accordance with the National Electrical Safety Code. The specifications and schematics of Exhibit A are illustrative only. A separate document entitled "CONSIDERATIONS OF MUTUAL INTEREST TO REA BORROWERS AND TELEPHONE COMPANIES IN INSTALLING AND MAINTAINING EQUIPMENT USED FOR CARRIER TELEPHONE SERVICE" is attached, dated July 9, 1947. This document provides installation drawings and engineering information that can be readily changed when justified without necessitating changes in the basic contract.

B. General Agreement for Joint Use of Wood Poles, REA Form DS-210.

This form of contract is intended to be used in areas where widespread joint use of facilities is contemplated to achieve savings in pole plant costs. This form of

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contract provides that:

1. Each party may own joint use poles and license the other to make attachments thereto.
2. Each party reserves the right to exclude any of its facilities from joint use.
3. Each party is responsible for the installation and maintenance of its own facilities on the joint poles. The owner is to maintain its poles.
4. The owner will install a normal joint pole, as defined, which is suggested as a 35-foot, class 6 pole for new construction. If a pole of greater height and class than normal is required, the additional investment in excess of the cost of a normal pole is paid by the party requiring it. A shorter or lighter pole than normal may be installed by mutual agreement when suitable for specific locations.

NOTE: Class 6 is the suggested strength for a normal pole on the assumption that the normal pole will carry the usual single-phase power circuit plus four (4) telephone wires.

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5. Where existing poles must be replaced to make them suitable for joint use, the owner will set new normal poles and assume the cost of transferring its own facilities to the new poles. The licensee will pay the owner the value in place of the replaced poles, plus the cost of removal less salvage, as provided in Article VIII and Appendix A of the contract. If poles more costly than normal poles are required to meet the licensee's needs, the licensee will also pay the excess costs. In addition, where an existing pole must be replaced to accommodate the licensee's service drop, the licensee will also pay the owner the difference between the cost of the new pole and a new pole of the same size as the replaced pole. Appendix A of the contract establishes tables of costs to permit ready calculation of payments due.
6. When poles must be erected between existing poles to make a line suitable for joint use, they will be erected at the sole expense of the licensee but will be the property of the owner. Each party will install its own attachments to such poles.
7. The licensee will pay a standard annual rental fee per pole to the owner for the privilege of occupying joint poles. Poles used for the sole

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purpose of providing clearance between the facilities of the two parties, such as secondaries and services, are not considered as joint poles and are not subject to rental fees. To simplify agreement on whether a pole provides clearance or support, the following interpretation is suggested. Where individual services of either party (secondaries for the REA borrower and service wires for the telephone company) are involved, single pole crossover attachments shall be treated as clearance attachments under the provisions of Article VIII without regard to any support which may be supplied by the crossing pole. The term "service wires" for the telephone company means a service to a single subscriber which may consist of either insulated or open wire conductors.

The fees suggested in Appendix B of the contract are designed to reflect and share the savings in cost realized by joint use of poles. The fees are based on average costs per mile of separate and joint pole lines in various sections of the country and make allowance for costs to the owner and licensee of modifying existing line to allow joint use, as well as making allowance for extra costs to the licensee of making arrangements to occupy joint poles.

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The rental fees payable by REA borrowers to telephone companies are higher than those they receive because rural telephone systems ordinarily employ smaller poles than power lines and incur a larger increase in cost than power systems in supplying poles suitable for rural joint use. The rental fees may be adjusted by mutual agreement at any time after 5 years from the signing of the contract and at subsequent intervals of not less than 5 years.

8. The first page of Appendix B is self-explanatory in its description of the basic principles followed in arriving at the rental payments suggested in Appendix B. While the telephone cost figures employed were those appropriate to Bell System Companies, the same principles can be used for determining equitable rental payments for joint use with any telephone company.

The following example of rental calculations will illustrate the method utilized in arriving at the suggested payments in Appendix B:

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Sample Calculations of Telephone Company Rental Payment to REA Borrower

Separate rural telephone pole line (Note 1)	\$350 per mile
Separate rural power pole line (Note 1)	<u>\$450 per mile</u>
Sum of separate pole line costs	\$800 per mile
Power System owned pole line suitable for joint use	\$540 per mile
Added Telephone Company costs on joint line (Note 2)	\$100 per mile
Added Power System costs on joint line (Note 3)	<u>\$ 10 per mile</u>
Total	\$650 per mile
Total Savings to both organizations \$800 - \$650	\$150 per mile
Telephone Company's share of savings based on respective cost of separate lines: $\frac{350}{800}$ or 44% (Note 4)	\$ 66 per mile
Assumed annual charge (Note 5)	10%

Tel. Rent per mile	Equals	Annual charge saved by Tel. Co. through not having to build a separate line	Less	Telephone Com- pany's share	of	Total savings in annual charges
Tel. Rent per mile	Equals	10% of (\$350-100)	Less	44%	of	10% of \$150
Tel. Rent per mile	Equals	\$25.00	Less	\$6.60	Equals	\$18.40

At 14 poles per mile, the rental payment is $\frac{\$18.40}{14}$ Equals approximately \$1.30 per pole.

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Note 1: Per mile costs are those of bare poles in place, including right-of-way, clearing, engineering and overhead in addition to direct installation labor and material costs. Such costs will be mutually agreed upon when joint use contract is executed.

Note 2: Includes such factors as:

- (1) Allowance for Telephone Company's share of costs for additional poles (if required) for Telephone Company's benefit
- (2) Allowance for additional cost of stringing telephone wire under energized power circuits
- (3) Additional protection features (99A and 104A protectors) on telephone circuits
- (4) Allowance for engineering and survey costs.

Note 3: Includes only item (2) of Note 7.

Note 4: An average value of 45% was used in the agreement form.

Note 5: No specific annual charge is fixed in the agreement. In the negotiations with the Bell System, a range of annual charges was considered as well as the appropriateness of a differential between the annual charges that apply to telephone company and REA borrower operations. However, the use of 10% results in rentals approximately equivalent to those in the agreed upon table in Appendix B of the contract form.

Note 6: Includes only item (3) of Note 2

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Note 7: Includes such factors as:

- (1) Allowance for additional cost of placing facilities over telephone wires
- (2) Attachments on additional poles
- (3) Allowance for engineering and survey costs.

Note 8: An average value of 55% was used in the agreement form.

9. The contract term is 25 years and thereafter until terminated by 3 years' notice by either party.

C. Application -- Permit for Joint Use of Poles, REA Form DS-211.

This form of contract was developed for use where widespread joint use of poles is not contemplated. It will find use in such cases as the elimination of structural difficulties that may arise at crossing points or when common occupancy of a few poles on one side of a highway is necessary. It is also a convenient means of recording those poles that are in joint use. This form of contract provides that:

1. The licensee shall reimburse the owner for any work necessary to make poles suitable for joint occupancy.
2. A nominal fee of \$1.00 per pole is established as the annual rental. No differential in rental fees payable

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by telephone companies and REA borrowers is warranted here since the owner is reimbursed at the outset for any extra costs.

3. No rental fee is payable for clearance attachments of service drops of either party.
4. The owner may revoke the attachment permit on 60 days' notice and the licensee may terminate the permit on 30 days' notice.

VII. Procedure for Executing Contracts

The contract forms for Power Line Carrier Facilities, Form DS-209, and for Joint Use of Wood Poles, Form DS-210, provide for approval by the Administrator of REA. In accordance with the usual procedures, three copies of a contract signed by the parties thereto should be forwarded to the Engineering Division of REA. Two approved copies will be returned to the borrower, one for the borrower's files and one for the telephone company. If an officer other than the President or Vice-President of a telephone company signs the contract, evidence of the officer's authorization to sign on behalf of the company should be attached unless otherwise filed with REA.

The form of Application-Permit for Joint Use of Specific Poles, Form DS-211, does not call for submission to REA for approval and will be subject only to review in the field by the Engineering Division.

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Under the contracts for Power Line Carrier Facilities, Form DS-209, and for Joint Use of Wood Poles, Form DS-210, a specific request and authorization must be made each time it is desired to make attachments to poles and wires. The REA borrower and telephone company should establish procedures complementary to the contracts for establishing working relationships.

VIII. Construction Standards

Any type of joint use of poles should conform to the requirements of the National Electrical Safety Code except as the requirements of local authority may be more stringent.

1. For power line carrier installations, installation drawings and other engineering information are supplied in the attached document dated July 9, 1947, and entitled "Considerations of Mutual Interest to REA Borrowers and Telephone Companies in Installing and Maintaining Equipment Used for Carrier Telephone Service."
2. For joint use of poles, suggested standards based on the National Electrical Safety Code are contained in E.E.I. Publication No. M12, "Joint Pole Practices for Supply and Communication Circuits" and Part 5 thereof entitled "Special Considerations for Long Span Joint

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Use." These are available from Bell System companies and from the Edison Electric Institute, 420 Lexington Avenue, New York 17, N. Y., at a price of \$1.25.

IX. Billing and Accounting

Exhibit B of the agreement form for Power Line Carrier Facilities, REA Form DS-209, and Appendix A of the agreement form for Joint Use of Wood Poles, REA Form DS-210, are designed to simplify and expedite the billing procedures for amounts that may be due the owner from the licensee for work done to make facilities suitable for joint use. Any cost figures or values that are left blank in the sample forms should be supplied from locally applicable data. Thus, the billing for work to be done in modifying existing lines can be predetermined and differences of opinion with respect to the charges in individual cases can be minimized. On the average, billings should approximate actual costs even though individual cases may show wide differences.

The internal accounting of REA borrowers need not be complicated by the billing procedures established under the joint use contracts and should be undertaken in the usual manner to reflect actual costs as closely as is warranted.

A. Accounting for Changes in Plant

All changes in size or location of poles owned by REA cooperatives should be handled

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for accounting purposes in accordance with the Manual of Work Order Procedure and Related Instructions. Thus, if a pole is removed and replaced, a retirement and construction work order should be prepared and cost recorded in the appropriate work in progress account in the usual manner. Amounts to be received from the telephone companies in accordance with the terms of the contracts are to be based on the costs as agreed upon in the contracts and will not, therefore, be the same costs as reflected on construction and retirement work orders. Any payments received from the telephone companies in connection with plant changes should be credited to Account 144, Retirement Work in Progress. If the amount received is more than sufficient to cover any balance in this account because of such charges, the difference should be debited to Account 144 and credited to Account 265.1/393, Donations in Aid of Construction.

B. Accounting for Revenues and Expenses

1. Telephone Company Rental Payments.

Revenues to be received from the telephone company for pole rentals should be credited

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to Account 610, Rent from Electric Property and charged to Account 125.2, Other Accounts Receivable. The contract provisions dealing with rental payments require that a complete record be kept of all poles of either party which are in joint use; that any rentals to be billed shall be on a yearly basis according to the number of joint poles in use on the day preceding the specified billing date. The rent per pole will be in accordance with the contract appendices. Payments by borrowers for taxes and assessments on their own property should normally be charged to appropriate tax expense.

2. Installation and Maintenance Work for Telephone Companies.

All revenues and expenses involved in installation, repair or maintenance of the telephone company's attachments to poles, or for other work done for the telephone company on a reimbursable basis as provided for in the contracts, should be included in appropriate separate subaccounts of 520.1 and 520.2. Charges to telephone companies for maintenance service should be debited to Account 125.2, Other Accounts Receivable, when the credit to Account 520.1 is recorded.

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3. Energy Sales.

Amounts to be received from the telephone company for electric energy consumed in connection with carrier service should be credited to Account 608, Other Electric Service, and charged to Account 125.2, Other Accounts Receivable.

4. Payments to Telephone Companies.

Payments to a telephone company for rental of its poles or for its plant changes necessitated because of the joint use agreement are to be charged to the appropriate rent expense account, namely, 776, Rents. Payments to telephone companies for tree trimming and other normal operating or maintenance work done by them for a borrower should be charged to appropriate expense accounts.

C. Capital Credits

Any revenues received as pole rentals or for electric energy losses in connection with carrier service should not be included in the base for patronage capital distribution.

UNITED STATES DEPARTMENT OF AGRICULTURE
RURAL ELECTRIFICATION ADMINISTRATION
WASHINGTON 25, D. C.

September 1, 1950

To : All REA Borrowers
From : George W. Haggard, Deputy Administrator
Subject: Joint Use of Borrowers' Wood Poles by Telephone Systems
Requirement of REA Approval
Use of REA Form DS-211

Under date of July 3, 1947, there were transmitted to all REA borrowers sample forms of contracts covering joint-use arrangements with telephone companies. At the same time, a bulletin entitled "Joint Use of Facilities by REA Borrowers and Telephone Companies" was circulated. This bulletin describes the contract forms and their use and purpose in detail. On December 22, 1949, there was transmitted to all REA borrowers a memorandum relating to the joint-use arrangements and suggesting forms of amendments of the joint-use contracts to effectuate area coverage telephone service.

Forms DS-209 and DS-210, as amended to include area-coverage provisions, are the contract forms to be employed for joint-use arrangements which are entered into for the purpose of permitting use by telephone companies of REA-financed facilities to furnish subscriber telephone service. These forms require REA approval before they become effective. This requirement is imposed pursuant to the provisions of REA security documents in which borrowers agree not to enter into contracts for the use by others of any of their property without REA approval.

There have come to REA's attention numerous instances where joint-use contacts have been made by telephone companies for subscriber telephone service without proper authorization and approval. In some cases, such contacts have been made without authorization by the borrower; in others, upon oral authorization, or by written permission but not by contract on Form DS-209 or Form DS-210, or pursuant to contract on Form DS-209 or Form DS-210 but without REA approval, or by permit on Form DS-211. All such contacts made for subscriber telephone service must be considered unauthorized except where made pursuant to a properly executed and approved contract or a contract entered into by the predecessor owner of systems or facilities acquired by an REA borrower.

There appears to be some misunderstanding of the use and purpose of Form DS-211. Some borrowers have used this form to permit pole contacts on their systems by telephone companies for subscriber telephone service. Form DS-211 is not intended and should not be used for this purpose. As stated in the bulletin on "Joint Use of Facilities by REA Borrowers and

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2--All REA Borrowers

Telephone Companies" (p. 16) it is intended for use in such cases "as the elimination of structural difficulties that may arise at crossing points or when common occupancy of a few poles on one side of a highway is necessary." This permit form prescribes only a nominal rental fee since it contemplates reimbursement of the owner of the poles for costs involved in rearrangements, etc., required for the joint use.

A survey is now being conducted by the REA Engineering Division to determine the extent to which joint use is practiced and to appraise its usefulness and effectiveness. Reports already received show cases of unauthorized attachment, including many in which Form DS-211 was improperly employed instead of Form DS-210 which requires REA approval. This practice should be discontinued forthwith as it has resulted in the assumption by REA-financed systems, in some instances, of costs which would have been borne by the telephone system if the proper contract form had been used.

Borrowers which have improperly used Form DS-211 for joint use for subscriber telephone service, or where facilities have been contacted without authorization, should wherever possible negotiate a joint-use agreement on the appropriate form, Form DS-210, with the area-coverage amendment, submit it to REA for approval, and arrange for reimbursement by the telephone company involved of any expenditures incurred by the REA borrower in connection with joint use which would have been charged to the telephone company if the proper form of contract had been employed at the outset. It should be noted that the permits granted under Form DS-211 are revocable at any time upon 60 days' notice by the owner of the facilities.

It is recognized that joint-use arrangements properly entered into can effect economies which can be equitably shared and can contribute toward the conservation of materials and manpower which are so urgently needed today. However, the disadvantages and burdens which are entailed by improper joint-use agreements which do not provide for the equitable sharing of benefits and which do not assure telephone service to the widest practicable number of rural users, far outweigh the advantages. For this reason strict adherence to the principles which have been established for such arrangements is indicated.

The cooperation of all REA borrowers is solicited for the field engineers who are now conducting joint-use field surveys.

George W. Haggard

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UNITED STATES DEPARTMENT OF AGRICULTURE
RURAL ELECTRIFICATION ADMINISTRATION
WASHINGTON 25, D. C.

May 14, 1951

To: REA Borrowers
From: George W. Haggard, Acting Administrator
Subject: Joint Use of Wood Poles by Power and Telephone Systems: Area Coverage

a. General

By memorandum dated December 22, 1949, REA imposed as a condition of its approval of joint-use contracts the inclusion of amendments designed to assure the availability of adequate telephone service to the widest practicable number of users of such service. This memorandum is issued to clarify several points as to the area-coverage requirement in connection with joint use of wood poles. It also furnishes an alternative form of amendment to Form DS-210 which may be used instead of the amendment appearing in the December 22, 1949 memorandum.

b. Borrower's Responsibility Regarding Joint Use

It is initially the borrower's responsibility, as owner of the electric system, to determine whether or not it desires to enter into a joint-use agreement. In making the decision, due consideration should be given to the following important factors:

1. Is joint use generally in the best interests of all of the member-owners of the electric system?
2. Do the economic benefits at least equal or exceed the additional costs incurred under the joint-use agreement?
3. Will the agreement actually result in an appreciable increase in telephone service in the area, without avoidable discrimination against some member-owners?
4. Will the economic benefits and increased telephone service justify the additional safety hazards to electric system personnel involved in maintenance and operation of jointly used facilities?
5. Will the economic and telephone service benefits justify the additional physical burden on the electrical facilities and the hazards of sleet and ice which may be multiplied by the addition of telephone circuits?

Once a decision is made by an electrical borrower to enter into a joint-use agreement, it must be submitted to REA for approval before becoming effective.

2-REA Borrowers

c. Situations Where the Area-Coverage Amendments Are Not Required

Area-coverage amendments need not be incorporated in agreements which have already been approved by REA or in agreements for joint use in special situations not involving telephone service to additional subscribers. Examples of such special situations are as follows:

1. Joint use on facilities specially constructed for service to telephone installations, such as to radio relay towers, repeater stations, etc.
2. Joint use required because of necessity for relocating a power or telephone line, or both, due to highway widening or relocation.
3. Joint use required by structural conflicts or where common occupancy of more than a few poles on one side of a highway is involved. (Form DS-211 is to be used where occupancy of only a few poles is involved.)

Joint use in such cases as these may be covered by a special form of agreement which will contain the terms agreed upon or by an appropriate adaptation of one of the present joint-use forms. In any case, the agreement should be restricted to the specific joint use and to the specific electric facilities involved, the location of which should be shown on a map or sketch attached to the agreement as an exhibit. Where appropriate, the existing situation should be shown as well as the changes covered by the agreement, including the type of telephone facilities to be installed. For this purpose, a detail map of the portion of the electric system involved may be used. Joint-use agreements covering these special situations shall be submitted to REA for approval.

d. Situations Where the Area-Coverage Amendments Are Required

The area-coverage amendments set forth in our December 22, 1949 memorandum or in paragraph "e" of this memorandum are required in all cases where the joint-use agreement:

1. Was not approved by REA prior to October 28, 1949, the effective date of Public Law 423, amending the Rural Electrification Act of 1936; and
2. Involves the furnishing of local telephone service to additional subscribers.

Borrowers wishing to assure themselves of a systematic program of area-coverage telephone service throughout the common service area should continue to insist on the area-coverage amendment and procedures established in the December 22, 1949 memorandum as a condition to joint use of their wood poles by a telephone company. A copy of the December 1949 amendment to the DS-210 agreement is attached hereto.

3-REA Borrowers

Borrowers wishing to permit the use of their poles by a telephone company on a project-by-project basis may use the DS-210 form of agreement with the amendment of Articles IV and V described in paragraph "e" hereof.

e. Alternative Form of Area-Coverage Amendment Which May be Used in Place of December 1949 Amendments

Where the parties do not wish to use the December 1949 amendment and procedure, and where borrowers are willing to permit the use of their wood poles by a telephone company on a project-by-project basis, the form of amendment of Articles IV and V of the DS-210 agreement attached to this memorandum may be used.

The procedure established herein for initiating joint use in the area to be included in a particular telephone company project involves two distinct steps for each such project. First, the telephone company submits a map showing generally the territorial limits of the proposed project together with a written request conforming to Appendix C (attached hereto) for permission to use the borrower's poles. These must be submitted to REA for approval, accompanied by the borrower's recommendation. The second step is the submission by the telephone company to the borrower, upon completion of the project canvass and the engineering work, of detailed construction plans and drawings together with a map showing the final territorial limits of the project.

Where the final map, submitted to the borrower as part of the second step, varies substantially from the map submitted as part of the first step, the telephone company's request (conforming to Appendix C) should be resubmitted to REA for approval, accompanied by the borrower's recommendation. In such cases, the reason for the change in the project limits should be stated.

While no specific type of map is required to be submitted by the telephone company in connection with its request on the Appendix C form, the area covered by the request and its relationship to the borrower's entire service area should be clearly shown. The borrower's system map may be used for this purpose. The map should show the entire common service area of the parties, i.e., the telephone company's service area to the extent it is included within the borrower's service area, and the specific portion of the common service area covered by the telephone company's request.

Where these forms and procedures are employed, the borrower shall, in each instance when submitting the telephone company's request on the Appendix C form, or any revision thereof, together with the map or maps, to REA for approval, include a statement which:

1. Sets forth the circumstances under which a portion only of the borrower's service area was selected for the joint-use program.
2. Establishes that the proposed joint use is consistent with and will not bar development of area-coverage telephone service in adjoining areas.

4-REA Borrowers

3. Where the joint-use proposal represents the first step in a program which will ultimately be extended throughout the borrower's service area, presents all available information on the entire program.
4. Recommends approval by REA of the telephone company request.

All documents and information, both of the telephone company and of the borrower, should be submitted in triplicate.

f. Procedure for Executed Joint-Use Agreements Not Approved by REA

A number of executed agreements covering joint use of wood poles (Form DS-210) which were under consideration by REA on October 28, 1949, or which were received after that date without the area-coverage amendment, were returned to borrowers without REA approval with a recommendation that the amendment be added and the agreements resubmitted to REA for approval.

Borrowers still holding such agreements may, at their options

1. Insist on the December 1949 area-coverage amendment and submit the agreements when the amendment is executed.
2. Resubmit the agreements with the May 1951 amendment executed, either with or without requests of the telephone company for permission to undertake joint use on a particular project.
3. Where joint use on wood poles has already been accomplished under an unapproved joint-use agreement, or without an agreement but in contemplation of the execution and approval of an agreement, the borrower should attempt to work out with the telephone company an area-coverage telephone service program covering the areas in which joint use has been accomplished. The May 1951 amendment and procedure may be used for this purpose. Until the joint-use agreement, as amended, and the telephone company's request for permission to use borrowers' wood poles, are approved by REA, no additional joint use should be permitted. In all cases where joint use was undertaken without approved contracts, borrowers should collect all rentals due and unpaid since the pole contacts were initially made.

It is of the utmost importance in all cases (i) that all pole contacts be recorded; (ii) that additional pole contacts, if any may be made, be permitted only upon compliance with the requirements of Articles IV and V that written application be made and written permission be given; and (iii) that REA approval be obtained where required.

Borrowers having special joint-use problems which do not appear to be covered by this memorandum should present a full statement thereof, together with their recommendation, to the Engineering Division.

Attachments

George W. Haggard

Amendment to
REA Form DS-210
(12-49)

JOINT USE OF FACILITIES
RURAL ELECTRIC POWER SYSTEMS
TELEPHONE SYSTEMS

AMENDMENT TO FORM OF GENERAL AGREEMENT FOR JOINT USE OF POLES

The Cooperative and the Telephone Company agree that the following amendments shall be a part of the Agreement between the parties dated _____, 19____:

1. Add a new subsection, lettered "(c)," to Article I, reading as follows:

"(c) It is the intention of the parties that adequate telephone service shall be made available to the widest practicable number of rural users in the above territory. Exhibits 1 and 2, attached hereto and made part hereof, state the present programs of the Telephone Company and of the Cooperative, respectively, for extending telephone and electric service in the above territory during the first five years of this agreement, and show the general location and number of persons to be served and the estimated dates when they will be served. If required to carry out the foregoing intention of the parties, additional five-year programs for extending telephone and electric service in the above territory shall be furnished by each party to the other at least ninety (90) days prior to the expiration of the programs then in effect under the provisions of this section, and shall be identified as supplements to Exhibits 1 and 2."

2. Add a new subsection, lettered "(c)," to Article XIII, reading as follows:

"(c) Failure of either party for a period of _____ months to comply substantially with its current program for extending telephone or electric service, as set forth in Exhibits 1 and 2, or supplements thereto, shall, at the election of the other party, and after due notice thereof in writing, constitute a default under Section (a) of this Article."

Executed on the _____ day of _____, 19____.

(Seal)

By _____

ATTEST:

(Seal)

By _____

ATTEST:

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Amendment to
REA Form DS-210
(5-51)

JOINT USE OF FACILITIES
RURAL ELECTRIC POWER SYSTEMS
TELEPHONE SYSTEMS

AMENDMENT TO FORM OF GENERAL AGREEMENT FOR JOINT USE OF WOOD POLES

The Cooperative and the Telephone Company agree that the following amendments shall be a part of the Agreement between the parties dated _____, 19 ____:

1. Amend Article IV to read as follows:

ARTICLE IV

ESTABLISHING JOINT USE OF EXISTING POLES

(a) Before the Telephone Company shall make use of the poles of the Cooperative under this Agreement, it shall request permission therefor in writing on the form attached hereto and identified as Appendix C, and shall comply with the procedure set forth in said Appendix C. During any period in which the Cooperative is a borrower from the Rural Electrification Administration, the Cooperative shall, before granting its permission for such use, submit the Telephone Company's request, and any revisions thereof, to the Administrator of the Rural Electrification Administration for written approval, together with the Cooperative's recommendation. The right of the Telephone Company as licensee to use such poles in accordance with the terms of its request and of this Agreement shall be conditioned upon such approval by the Administrator of the Rural Electrification Administration.

(b) Whenever either party desires to reserve space for its attachments on any pole owned by the other party, either as initial space or additional space on such pole, it shall make written application therefor, specifying the location of the poles in question, the amount of space desired on each pole, and the number and character of the circuits to be placed thereon. If, in the judgment of the owner, the poles are necessary for its own sole use, or joint use under the circumstances is undesirable, the owner shall have the right to reject the application. In any event, within a reasonable period after the receipt of such application the owner shall notify the applicant in writing whether the application is approved or rejected. Rights of the Telephone Company as licensee hereunder shall be conditioned upon compliance by the parties with the provisions of Section (a) of this Article. Upon receipt of notice from the owner that the application has been approved, and after the completion of any transferring or rearranging which is required to permit the attaching of the applicant's circuits on such poles, including any necessary pole replacements, the applicant shall have the right as licensee hereunder to use such space in accordance with the terms of the application and of this Agreement.

(c) Whenever any jointly used pole or any pole about to be so used under the provisions of this Agreement is insufficient in height or strength for

the existing attachments and for the proposed additional attachments thereon, the owner shall promptly replace such pole with a new pole of the necessary height and strength and shall make such other changes in the existing pole line in which such pole is included as the conditions may then require.

(d) Each party shall place, transfer and rearrange its own attachments, place guys to sustain any unbalanced loads caused by its attachments, and perform any tree trimming or cutting incidental thereto. Each party shall at all times execute such work promptly and in such manner as not to interfere with the service of the other party.

(e) The cost of establishing the joint use of existing poles, including the making of any necessary pole replacements, shall be borne by the parties hereto in the manner provided in Article VIII--Division of Costs.

2. Amend Article V to read as follows:

ARTICLE V

ESTABLISHING JOINT USE OF NEW POLES

(a) Whenever either party hereto requires new pole facilities for an additional pole line, an extension of an existing pole line, or in connection with the reconstruction of an existing pole line, it shall promptly notify the other party to that effect in writing (verbal notice subsequently confirmed in writing may be given in cases of emergency), stating the proposed location and character of the new poles and the character of circuits it intends to use thereon and indicating whether or not such pole facilities will be, in the estimation of the party proposing to construct the new pole facilities, susceptible of joint use. Within a reasonable period after the receipt of such notice, the other party shall reply in writing, stating whether it does, or does not, desire space on the said poles and, if it does desire space thereon, the character of the circuits it desires to use and the amount of space it wishes to reserve. If such other party requests space on the proposed new poles and if the character and number of its circuits and attachments are such that the party proposing to construct the new pole facilities does not consider joint use undesirable, then it shall erect poles suitable for such joint use, subject, however, to the provisions of Section (b) of this Article, and subject further to the condition that requests by the Telephone Company for space on proposed new poles of the Cooperative under this Agreement shall be made in writing on the form attached hereto and identified as Appendix C, and shall comply with the procedure set forth in said Appendix C. During any period in which the Cooperative is a borrower from the Rural Electrification Administration, the Cooperative shall, before granting its permission for such use, submit the Telephone Company's request, and any revisions thereof, to the Administrator of the Rural Electrification Administration for written approval, together with the Cooperative's recommendation. The right of the Telephone Company as licensee to use such poles in accordance with the terms of its request and of this Agreement shall be conditioned upon such approval by the Administrator of the Rural Electrification Administration. The applicant for space on the poles shall be promptly notified in writing of the action taken on the application.

(b) In any case where the parties hereto shall conclude arrangements for the joint use of any new poles to be erected, and the party proposing to

construct the new pole facilities already owns more than its proportionate share of joint poles, the parties shall take into consideration the desirability of having the new pole facilities owned by the party owning less than its proportionate share of joint poles so as to work towards such a division of ownership of the joint poles that neither party shall be obligated to pay to the other any rentals because of their respective use of joint poles owned by the other.

(c) Each party shall place its own attachments on the new joint poles and place guys to sustain any unbalanced loads caused by its attachments. The owner shall, however, provide the initial clearing of the right-of-way, and tree trimming, which shall at least meet the requirements of the other party. Each party shall execute its work promptly and in such manner as not to interfere with the service of the other party.

(d) The cost of establishing the joint use of new poles including costs incurred in the retirement of existing poles shall be borne by the parties hereto in the manner provided in Article VIII--Division of Costs.

Executed on the _____ day of _____, 19 ____.

(Seal)

By _____

ATTEST:

(Seal)

By _____

ATTEST:

APPENDIX C

(Name of Telephone Company) _____
(Location)

Request No. _____

(Date)

To _____
(Name of Cooperative) _____
(Location)

This is to request your permission for this Company to use jointly certain of your poles under the terms and conditions of the General Agreement for Joint Use of Wood Poles which has been executed by your Cooperative and this Company.

The poles for which this permission is requested are located generally within the limits of the extension-of-service project in the territory indicated by the attached map, which also bears the above date and Request Number.

If permission to use these poles is given by you, this Company intends to canvass fully the territory generally within the project limits and if construction of the project by use of your poles for our attachments is begun, will furnish telephone service to all establishments therein desiring service, subject to its tariff rates and regulations. Our present plan is to start the work involved in this project about _____ and complete the work about _____.
(Month-Year) (Month-Year)

If permission to use these poles is given by you, this Company proposes to prepare and furnish to you detailed construction plans and drawings to indicate specifically your poles that we wish to use jointly, in accordance with the procedure provided in Article IV or V of the Agreement, as the case may be, together with a map showing the final project limits as determined after engineering is complete. If the final project limits vary substantially from the project limits shown on the map attached hereto, it is understood that this Company will request your further permission to use poles within the territory indicated on the final map.

If the joint use proposed is agreeable to your Cooperative please signify your approval on the second copy of this request in the space provided and return that copy to this Company.

(Name and Title of Telephone Company
Employee making this request)

To _____
 (Name of Telephone Company) (Location)

This is to advise you that your Request No. _____, to use jointly certain poles of this Cooperative to furnish telephone service to rural users, as stated therein, is agreeable to this Cooperative and has been approved by the Administrator of the Rural Electrification Administration as indicated below. You may proceed with such joint use of poles on the terms and conditions of the General Agreement for Joint Use of Wood Poles now in effect between us, and under the conditions outlined in your request.

 (Name of Cooperative) (Date)

 (Name and Title of Cooperative Representative)

REA PROJECT _____

On the basis of the information submitted by the Telephone Company and the Cooperative, the granting of the above request by the Cooperative is hereby approved.

 For Claude R. Wickard, Administrator
 Rural Electrification Administration

DATED _____

UNITED STATES DEPARTMENT OF AGRICULTURE
RURAL ELECTRIFICATION ADMINISTRATION
WASHINGTON 25, D. C.

May 14, 1951

To: REA Borrowers

From: George W. Haggard, Acting Administrator

Subject: Joint Use of Wood Poles by Power and Telephone Systems:
Construction Practices

Article III of Form DS-210 establishes specifications for joint use of wood poles which provide adequate clearance and strength requirements for safety purposes. Recent consideration of these provisions indicates the need for clarifying the strength requirements.

The specifications referred to in Article III establish a margin of strength for assumed transverse storm loadings of 2 and require replacement of poles when a margin of strength of $1\frac{1}{3}$ is reached. However, it appears that the specifications are capable of being, and have been interpreted to permit the addition of wires so long as the margin of strength is not reduced below $1\frac{1}{3}$, the point at which pole replacement is required.

REA believes that, in general, the margin of strength to withstand assumed storm loading of its borrowers' poles should not be reduced below 2 through the attachment of additional wire circuits, whether the circuits added are electric or telephone circuits. This margin is determined in terms of the transverse load on the pole under assumed storm conditions related to the ultimate fiber stress of the kind of wood pole involved. Methods of calculating this margin are discussed in the National Electrical Safety Code. For the purpose of determination of this margin on an existing pole line of an REA borrower, the poles should be considered as having the same strength as when new.

The design of REA borrowers' pole lines in accordance with REA standards normally results in a factor of strength in the poles in excess of the minimum requirements of the National Electrical Safety Code to withstand the assumed storm loadings. Any additional wires attached to existing poles will increase the load on the pole and consequently decrease the margin of strength above that required to withstand assumed storm loadings. This is true, of course, whether the circuits added are secondaries, additional phase wires or telephone circuits. This was recognized throughout the discussions and considerations which resulted in REA approval of joint use of borrowers' wood poles.

Since the second paragraph of Article III contemplates agreements to construction practices supplementing the requirements of the National Electrical Safety Code, to be accepted in writing by both parties to the Form DS-210 contract, it is recommended that existing contracts be supplemented in writing by adoption of the "Agreement to Construction Practices Supplementing the

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Provisions of Article III of General Agreement for Joint Use of Wood Poles", attached hereto. It should be noted that this supplement relates only to the establishment of joint use of wood poles in the future under joint-use agreements which have already been executed. However, where joint use has been accomplished in anticipation of, but prior to, the execution or approval of a DS-210 contract, this supplement may be used in submitting such contracts for REA approval in place of the amendment to Article III.

Joint-use contracts on Form DS-210 executed in the future should incorporate the "Amendment to Article III of General Agreement for Joint Use of Wood Poles" attached hereto.

Attachments

George W Haggard

Supplement to
REA Form DS-210
(5-51)

JOINT USE OF FACILITIES
RURAL ELECTRIC POWER SYSTEMS
TELEPHONE SYSTEMS

AGREEMENT TO CONSTRUCTION PRACTICES SUPPLEMENTING THE PROVISIONS OF

ARTICLE III OF GENERAL AGREEMENT FOR JOINT USE OF WOOD POLES

The parties to the General Agreement for Joint Use of Wood Poles, executed on _____, hereby agree, pursuant to Article III thereof, that the following construction practice shall govern the establishment of joint use of wood poles in the future, and shall be applicable both to poles installed new for joint use and poles installed initially for electric circuits alone:

The total transverse and vertical loads for all conductors attached to a pole jointly used under this agreement shall not, under the assumed storm loadings of the National Electrical Safety Code for the area in which the pole is located, exceed fifty (50) percent of the ultimate fiber stress of the supporting pole. In case of existing pole lines, the strength of the pole shall be assumed to be the same as when new.

Executed on the _____ day of _____ 19 ____.

By _____

By _____

Amendment to
REA Form DS-210
(5-51)

JOINT USE OF FACILITIES
RURAL ELECTRIC POWER SYSTEMS
TELEPHONE SYSTEMS

AMENDMENT TO ARTICLE III OF GENERAL AGREEMENT FOR JOINT USE OF
WOOD POLES

The Cooperative and the Telephone Company agree that the following amendment shall be a part of the Agreement between the parties dated _____, 19__:

Insert the following paragraph between the first and second paragraphs of Article III:

"In establishing joint use of wood poles whether installed new for joint use or installed initially for electric circuits alone, the total transverse and vertical loads for all conductors attached to a pole covered by this agreement shall not, under the assumed storm loadings of the National Electrical Safety Code for the area in which the pole is located, exceed fifty (50) percent of the ultimate fiber stress of the supporting pole. In the case of existing pole lines, the strength of the pole shall be assumed to be the same as when new."

Executed on the _____ day of _____ 19 ____.

(Seal)

ATTEST:

By _____

(Seal)

ATTEST:

By _____

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UNITED STATES DEPARTMENT OF AGRICULTURE
RURAL ELECTRIFICATION ADMINISTRATION
WASHINGTON 25, D. C.

May 14, 1951

To: REA Borrowers

From: George W. Haggard, Acting Administrator

Subject: Joint Use of Wood Poles by Power and Telephone Systems:
Determination of Rentals.

Several inquiries have been received as to whether the provisions of Article XI(d) for establishing and adjusting pole rentals permit variations from the table of rentals appearing in Appendix B attached to Form DS-210. Paragraph 8 on page 12 of the REA document entitled "Joint Use of Facilities by REA Borrowers and Telephone Companies" specifically states as follows:

"While the telephone cost figures employed (in arriving at the rental payments suggested in Appendix B) were those appropriate to Bell System Companies, the same principles can be used for determining equitable rental payments for joint use with any telephone company."

On pages 13 to 16 of this document appear sample calculations of telephone and cooperative rental payments.

While it is desirable that rental rates be kept uniform on a particular cooperative system, where it appears that the basic factors entering into determination of the rental rate vary from those which were used in establishing the table of rental payments appearing in Appendix B, which reflect telephone cost figures appropriate to Bell System Companies, the borrower and the telephone company seeking joint use are at liberty to make their own calculations using both electric and telephone cost figures appropriate to the particular systems involved. In making any variations from the table of rental payments appearing in Appendix B, borrowers are cautioned in making their calculations of rental payments to give effect to the principle of reflecting and sharing the savings in cost realized by joint use of poles. In submitting to REA for approval Form DS-210 contracts which provide rentals other than those appearing in the table in Appendix B, borrowers should supply the detailed calculations which produced the agreed rentals. In all cases, borrowers are urged to give careful consideration to the various factors involved in joint use of facilities as set forth in the above-mentioned document.

George W Haggard

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JOINT USE OF FACILITIES
RURAL ELECTRIC POWER SYSTEMS
TELEPHONE SYSTEMS

35-

FORM OF GENERAL AGREEMENT FOR
JOINT USE OF WOOD POLES

FORM OF APPLICATION PERMIT FOR
JOINT USE OF SPECIFIC POLES

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FORM OF APPLICATION PERMIT FOR JOINT USE OF SPECIFIC POLES, REA Form DS-211

PREAMBLE

_____, a corporation organized
under the laws of the State of _____,
(hereinafter called the "Cooperative"), and
_____, a corporation organized un-
der the laws of the State of _____,
(hereinafter called the "Telephone Company"),
desiring to cooperate in the joint use of
their respective poles, erected or to be
erected within the areas in which both par-
ties render service in the State(s) of _____,
whenever and wherever such
use shall, in the estimation of both parties,
be compatible with their respective needs, do
hereby, in consideration of the premises and
the mutual covenants herein contained, covenant
and agree for themselves and their respective
successors and assigns as follows:

ARTICLE I

SCOPE OF AGREEMENT

(a) This Agreement shall be in effect
in the areas in which both of the parties render
service in the State(s) of _____, and shall
cover all wood poles of the parties now existing
or hereafter erected in the above territory when
said poles are brought under this Agreement in
accordance with the procedure hereinafter pro-
vided.

PREAMBLE

The Preamble describes the
parties to the Agreement and de-
signates the State in which each
of the parties is organized. Mor-
over, for the sake of emphasis,
the territorial limitations of the
Agreement are set out in the Pre-
amble even though Article I of the
Agreement also describes it.

ARTICLE I

Article I is designed to
set out at the inception of the
contract the territorial limita-
tion of the Agreement. It should
describe the States in which the
Cooperative already has distri-
bution facilities or where it in-
tends to have distribution facili-
ties. It is intended that the
Agreement will apply to the entire
territory served in common by the
Cooperative and the Telephone Com-
pany.

of its facilities from joint use.

ARTICLE II

EXPLANATION OF TERMS

For the purpose of this agreement, the following terms shall have the following meanings:

1. A JOINT POLE is a pole jointly used by both parties.
2. A NORMAL JOINT POLE is a pole which is just tall enough to provide normal spaces, as normal space is hereinafter defined, for the respective parties and just strong enough to meet the requirements of the specifications mentioned in Article III for the attachments ordinarily placed by the parties in their respective normal spaces. Such pole for the purpose of this agreement shall be a _____ foot class _____ wood pole as classified by the pole classification tables of the American Standards Association.

3. SPACE is the linear portion of a joint pole parallel to its axis reserved for the exclusive use of one of the parties (subject only to the exceptions provided for by the specifications mentioned in Article III which in certain instances permit the making of cer-

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should have the right to exclude from joint use any of its own facilities where joint use seems undesirable.

ARTICLE II

Article II defines some of the words which are most commonly used in the agreement and which would seem to call for definitions in order to prevent any possible misunderstanding. Obviously, technical words are used throughout the agreement and there might be some question as to why all such words were not defined. The answer is that it must be taken for granted that some words have a general meaning and are clear to all parties so that an attempt to define them would be totally unnecessary.

Naturally, the type of pole that will be used to support the joint use will vary according to the locality and the exigencies of the situation. However, generally speaking, the normal joint pole will be a 35-foot class 6 pole.

It is believed that the definition of "space" is self-explanatory.

The specifications mentioned in this definition are the specifications of the National Electrical Safety Code or the requirements of public authorities.

tain attachments by one party in the space reserved for the other party).

4. NORMAL SPACE is the following described space:

- a. For the Cooperative the uppermost _____ feet, measured from top of pole.
- b. For the Telephone Company a space of _____ feet, at a sufficient distance below the space of the Cooperative to provide at all times the minimum clearance required by the specifications mentioned in Article III and at a sufficient height above ground to provide the proper vertical clearance above ground or track rails for the lowest horizontally run line wires or cables attached in such space.

The foregoing definition of "a normal joint pole" is not intended to preclude the use of joint poles shorter or of less strength than the normal joint pole in locations where such poles will meet the requirements of the parties hereto.

The above assignment of space is not intended to preclude the use of vertical runs or the mounting of such equipment

Presuming that a 35-foot class 6 pole is used, the normal space that a cooperative would occupy would be the uppermost 4 feet, whereas, the telephone company would occupy a space of 2 feet below the space of the cooperative. The distance between the space of the cooperative and the space of the telephone company would be determined by clearance requirements depending upon the voltage of the power line, span length, type of conductors, and the loading district. In actual cases this distance may be anything from the Code minimum of 40 inches to 6 or 8 feet or even more, depending on factors mentioned in the preceding sentence.

The next to last paragraph of this Article is designed to permit a certain elasticity in the choice of poles and to pave a way for an agreement between the parties as to the use of poles shorter than the ones defined as normal joint poles. For example, on longer span lines 35-foot poles may be necessary to provide proper clearance above ground because of the greater sag in the conductors; on shorter span lines 30-foot poles would, in many cases, be adequate; also if poles are located

poles on the lower portions of the pole when mutually agreeable.

primarily along private property on the rear of residential lots, it may be possible to use 30 or even 25-foot poles to advantage.

ARTICLE III

SPECIFICATIONS

Except as otherwise provided in Section (e) of Article VII, referring to construction temporarily exempt from the application of the specifications mentioned herein, the joint use of the poles covered by this Agreement shall at all times be in conformity with accepted modern methods such as those suggested in Edison Electric Institute Publication No. M12 and shall at all times conform to the requirements of the National Electrical Safety Code, Fifth Edition, and subsequent revisions thereof, except where the lawful requirements of public authorities may be more stringent, in which case the latter will govern.

Modifications of, additions to, or construction practices supplementing wholly or in part the requirements of the National Electrical Safety Code, shall, when accepted in writing by both parties hereto through their agents authorized to approve such changes, likewise govern the joint use of poles.

ARTICLE III

The construction and operation of the system should at all times be governed by the National Electrical Safety Code. In some cases, however, public rules and regulations make it necessary to go beyond the requirements of the Code. In this event, of course, the parties have no choice except to comply with the more strict rules and regulations. If the Code is more strict than the requirements of public laws, the Code should govern. In other words, it is always the more stringent requirement that applies.

The last paragraph in the Article was inserted to pave the way for agreements between the parties looking towards the adoption of practices necessitated by peculiar conditions which necessitate modifying and supplementing requirements of the Code.

ARTICLE IV

ESTABLISHING JOINT USE OF EXISTING POLES

(a) Whenever either party desires to reserve space for its attachments on any pole owned by the other party, either as initial space or additional space on such pole, it shall make written application therefor, specifying the location of the poles in question, the amount of space desired on each pole, and the number and character of the circuits to be placed thereon. If, in the judgement of the owner, the poles are necessary for its own sole use, or joint use under the circumstances is undesirable, the owner shall have the right to reject the application. In any event, within 10 days after the receipt of such application the owner shall notify the applicant in writing whether the application is approved or rejected. Upon receipt of notice from the owner that the application has been approved, and after the completion of any transferring or rearranging which is required to permit the attaching of the applicant's circuits on such poles, including any necessary pole replacements, the applicant shall have the right as licensee hereunder to use such space in accordance with the terms of the application and of this agreement.

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ARTICLE IV

(a) In order to promote the keeping of accurate records, the contract provides that a written application to enter into joint use shall be made. Inasmuch as the parties are at liberty to refuse to use certain poles jointly, the party to which the application is addressed, that is the owner of the poles, has the right to reject the application and to refuse to enter into the joint use of the poles identified in such application. In order that the applicant may be assured of a definite answer, to enable it to make other plans in the event the application is rejected it is provided that the application must be considered and the applicant notified in writing within ten (10) days after its receipt. If the application is approved, the owner is obligated to rearrange its circuits in such a manner as to permit the joint use.

Whenever any jointly used pole or any pole about to be so used under the provision of this agreement is insufficient in height or strength for the existing attachments and for the proposed additional attachments thereon, the owner shall promptly replace such pole with a new pole of the necessary height and strength and shall make such other changes in the existing pole line in which such pole is included as the conditions may then require.

(c) Each party shall place, transfer and rearrange its own attachments, place guys to sustain any unbalanced loads caused by its attachments, and perform any tree trimming or cutting incidental thereto. Each party shall at all times execute such work promptly and in such manner as not to interfere with the service of the other party.

(d) The cost of establishing the joint use of existing poles, including the making of any necessary pole replacements, shall be borne by the parties hereto in the manner provided in Article VIII - Division of Costs.

(b) One of the first things that has to be done in order to permit joint use is to make certain that the poles which will support the joint use are adequate in height and strength. For that reason it is provided that the owner shall promptly replace any existing poles which do not have such adequate height or strength. The amount, if any, to be paid the owner for installing a new pole is covered in Article VIII.

(c) Inasmuch as the cooperative is best qualified to attach the electric circuits to the poles and the telephone company is best qualified to attach the telephone circuits, it is contemplated that each party will do the necessary rearranging and attaching of its circuits.

(d) This section is inserted for the purpose of making clear that Article IV does not relate to the apportionment of costs, but is concerned merely with the methods to be followed in establishing joint use of existing poles.

ARTICLE V

ARTICLE V

ESTABLISHING JOINT USE OF NEW POLES

(a) Whenever either party hereto requires new pole facilities for an additional

(a) Article IV presupposed that the poles that were contemplated for joint use were existing poles

pole line, an extension of an existing pole line, or in connection with the reconstruction of an existing pole line, it shall promptly notify the other party to that effect in writing (verbal notice subsequently confirmed in writing may be given in cases of emergency), stating the proposed location and character of the new poles and the character of circuits it intends to use thereon and indicating whether or not such pole facilities will be, in the estimation of the party proposing to construct the new pole facilities, susceptible of joint use. Within 10 days after the receipt of such notice, the other party shall reply in writing, stating whether it does, or does not, desire space on the said poles and, if it does desire space thereon, the character of the circuits it desires to use and the amount of space it wishes to reserve. If such other party requests space on the proposed new poles and if the character and number of its circuits and attachments are such that the party proposing to construct the new pole facilities does not consider joint use undesirable, then it shall erect poles suitable for such joint use, subject, however, to the provisions of Section (b)

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forming a part of an existing line. Article V goes on to provide that whenever either party is considering the construction of new pole facilities (including new poles to replace existing ones), the question whether such new facilities should be made susceptible of joint use should be considered. Obviously, this has manifest advantages for if poles are to be jointly used by both parties, it is certainly to their best interest that they be erected with the joint use in view. Otherwise, it might be necessary to reconstruct an entire line after it had once been built, in order to permit the joint use of poles. As neither party is under an obligation to undertake joint use in any particular instance, the party constructing the new facilities may consider that the poles are not susceptible of joint use and so inform the other party. Such information should be supplied in all cases, for it might be that, in a particular instance, there would be a compelling reason for undertaking joint use which if brought to the attention of the party contemplating the construction of the lines, would make it change its opinion. If the poles are susceptible of joint use, the party proposing to construct the new facilities should notify the other party in sufficient time to

The applicant for space

on the poles shall be promptly notified in writing of the action taken on the application.

(b) In any case where the parties hereto shall conclude arrangements for the joint use of any new poles to be erected, and the party proposing to construct the new pole facilities already owns more than its proportionate share of joint poles, the parties shall take into consideration the desirability of having the new pole facilities owned by the party owning less than its proportionate share of joint poles so as to work towards such a division of ownership of the joint poles that neither party shall be obligated to pay to the other any rentals because of their respective use of joint poles owned by the other.

(c) Each party shall place its own attachments on the new joint poles and place guys to sustain any unbalanced loads caused by its attachments. The owner shall, however, provide the initial clearing of the right-of-way, and tree trimming, which shall at least meet the requirements of the other party. Each party shall execute its work promptly and in such manner as not to interfere with the service of the other party.

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permit such other party to consider the desirability of joint use. In order that the party proposing to construct or reconstruct the line may not be delayed, the agreement provides that the prospective licensee reply within ten (10) days after receiving notice of the proposed new construction whether it does or does not desire to use the new pole.

(b) This section is intended to lay the foundation for an agreement. However, it does not impose an obligation on either party. In view of the possibility that a cooperative might not be in a position to construct a new line at any given time, as such construction necessarily depends upon the availability of funds and prior approval by REA, it would be inadvisable to obligate either of the parties in this respect.

(c) This provision is the same as section (c) of Article IV. Except that as to new joint poles the initial right-of-way clearing and tree trimming is to be done by the owner. Thereafter it is to be done by the party requiring it.

(d) The cost of establishing the joint use of new poles including costs incurred in the retirement of existing poles shall be borne by the parties hereto in the manner provided in Article VIII - Division of Costs.

ARTICLE VI

RIGHT OF WAY FOR LICENSEE'S ATTACHMENTS

While the owner and licensee will co-operate as far as may be practicable in obtaining rights-of-way for both parties on joint poles, the owner does not warrant or assure to the licensee any right-of-way privileges or easements on, over or across streets, alleys and public thoroughfares, and private or publicly owned property, and if the licensee shall at any time be prevented from placing or maintaining its attachments on the owner's poles, no liability on account thereof shall attach to the owner of the poles.

ARTICLE VII

MAINTENANCE OF POLES AND ATTACHMENTS

(a) The owner shall maintain its joint poles in a safe and serviceable condition and in

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(d) This provision was inserted for the same reason as section (d) of Article IV was inserted -- namely, to make it clear that this Article provided a method for establishing joint use and did not deal with allocation of costs.

ARTICLE VI

Considering that the cooperative is often granted easements by private land owners without charge, for the sole reason that the cooperative is a non-profit undertaking, the cooperative would not be in a position to license or assign the use of the right of way obtained by it to a utility, such as the telephone company, as that might constitute a breach of faith on its part. Hence, the cooperative, if it permits the telephone company to use its poles cannot guarantee the adequacy or legal sufficiency of the right of way.

Notwithstanding the foregoing cooperation between the telephone company and the cooperative in solving mutual right-of-way problems is not only desirable but imperative. However, methods by which this cooperation can be achieved will differ so much from place to place and time to time as to make it impossible to set them out in an agreement of this nature

ARTICLE VII

(a) It seems clear that the owner of the poles should have the duty of maintaining such poles in a serviceable condition and section (a) so provides.

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the specifications mentioned in Article III and shall replace, reinforce or repair such of these poles as become defective.

(b) When replacing a jointly used pole carrying terminals of aerial cable, underground connection, or transformer equipment, the new pole shall be set in the same hole which the replaced pole occupied unless special conditions make it necessary or mutually desirable to set it in a different location.

(c) Whenever it is necessary to replace or relocate a jointly used pole, the owner shall, before making such replacement or relocation, give notice thereof in writing (except in case of emergency, when verbal notice will be given and subsequently confirmed in writing) to the licensee, specifying in such notice the time of such proposed replacement or relocation and the licensee shall at the time so specified transfer its attachments to the new or relocated joint pole.

(d) Except as otherwise provided in Section (e) of this Article, each party shall at all times maintain all of its attachments,

(b) Where a pole that has to be replaced carries terminals of aerial cable, underground connection or transformer equipment it may be necessary to make alterations in the facilities if the pole is moved to another location, which would not have been necessary had the pole not been relocated. Therefore, it is provided that if a pole carrying terminals of aerial cables, underground connection or transformer equipment is replaced, the new pole generally should be set in the same hole.

(c) As has been heretofore pointed out, the cooperative is best qualified to install, rearrange or transfer its own attachments and the telephone company to do likewise with its facilities. For that reason it is provided that when a pole is to be replaced or relocated, the licensee is to be notified so as to have an opportunity to perform the work required in transferring its attachments to the new or relocated pole.

(d) The reason for the inclusion of this provision is evident and therefore no comment is necessary.

and perform any necessary tree trimming or cutting incidental thereto, in accordance with the specifications mentioned in Article III and shall keep them in safe condition and in thorough repair. Nothing in the foregoing shall preclude the parties hereto from making any mutually agreeable arrangement for jointly contracting for or otherwise providing for maintenance trimming.

(e) Any existing joint use construction of the parties hereto which does not conform to the specifications mentioned in Article III shall be brought into conformity therewith as soon as practicable.

When such existing construction shall have been brought into conformity with said specification, it shall at all times thereafter be maintained as provided in Sections (a) and (d) of this Article.

(f) The cost of maintaining poles and attachments and of bringing existing joint use construction into conformity with said specifications shall be borne by the parties hereto in the manner provided in Article VIII - Division of Costs.

ARTICLE VIII

DIVISION OF COSTS

(a) The cost of erecting new joint poles coming under this agreement, to construct

(e) Sometimes, in connection with the acquisition of facilities it is found that the lines acquired have not been maintained and operated in accordance with the strict specifications mentioned in Article III. Naturally any dangerous condition should be remedied at once. It is often impossible, however, to remedy all of the deficiencies and to bring the construction up to Code standards immediately. Nevertheless it is clear that as soon as it is practicable the lines should be rehabilitated to meet the applicable specifications.

(f) This section is inserted to show that this Article deals with methods of maintenance rather than with the apportionment of costs.

ARTICLE VIII

(a) Subsection 1. No comment is needed as it is clear that the owner should pay for the

to make extensions to existing pole lines, or to replace existing poles, shall be borne by the parties as follows:

construction of a normal joint pole.

1. A normal joint pole, or joint pole smaller than the normal, shall be erected at the sole expense of the owner.

2. A pole larger than the normal, the extra height or strength of which is due wholly to the owner's requirements, including requirements as to keeping the owner's wires clear of trees, shall be erected at the sole expense of the owner.

Subsection 2. It is likewise clear that the owner should pay the entire cost of a pole, the extra height or strength of which is due wholly to its own requirements.

3. In the case of a pole larger than the normal, the extra height or strength of which is due wholly to the licensee's requirements, including requirements as to keeping the licensee's wires clear of trees, the licensee shall pay to the owner a sum equal to the difference between the cost in place of such pole and the cost in place of a normal joint pole, the rest of the cost of erecting such pole to be borne by the owner, except in so far as otherwise provided in Section (c) of this Article.

Subsection 3. If the extra height or strength of a pole is owing entirely to the licensee's requirements, it is only equitable that the licensee shall pay the owner the extra cost of installing such a pole. It should be noted that the differences calculated between the cost in place of a pole and the cost in place of a normal joint pole takes into consideration the labor costs involved in installation. For example, if it becomes necessary to use a 45-foot class 6 pole which costs \$20 in place, whereas a normal joint pole costs \$15, the licensee would pay the owner \$5.

From a comparison of section 3 of section (a) with section (c), it will be seen that subsection 3 contemplate the erection of a new pole necessary by the needs of the owner and licensee jointly. Section (c), as will be seen later, deals with the replacement of existing poles to serve the convenience of the licensee.

4. In the case of a pole larger than the normal, the extra height or strength which is due to the requirements of both parties or the requirements of public authorities or of property owners, (other than requirements with regard to keeping the wires of one party only clear of trees,) the difference between the cost in place of such pole and the cost in place of a normal joint pole shall be shared in the ratio of fifty five percent by the Cooperative and forty five percent by the Telephone Company, the rest of the cost of erecting such pole to be borne by the owner.

5. A pole erected between existing poles to provide sufficient clearance and furnish adequate strength to support the circuits of both the owner and licensee, which it would have been unnecessary to erect if joint use had not been undertaken, shall be erected at the sole expense of the licensee.

Subsection 4. It is equitable that where the extra height or strength of the pole is due to the requirements of both parties or of third parties, both parties should share the extra cost involved.

Subsection 5. To provide for the support of the facilities of the licensee, it may become necessary to install so-called "intermediate" poles. If such poles would not have been necessary for the operation of the owner's facilities there is no reason why the licensee should not pay the entire cost of installing such poles. This subsection provides for such a contingency.

(b) Any payments for poles made by the licensee under any foregoing provisions of this Article shall not entitle the licensee to the ownership of any part of said poles for which it has contributed in whole or in part.

(b) This provision makes it clear that the payments made by the licensee will not entitle it to the ownership of any pole.

(c) Where an existing jointly used pole or a non-joint pole is prematurely replaced by a new one solely for the benefit of the licensee, the cost of the new pole shall be divided as specified in Section (a) of this Article and the licensee shall also pay its owner the value in place of the replaced pole, plus the cost of removal less the salvage value of such pole. The replaced pole shall be removed and retained by its owner.

(c) It may sometimes happen that one party will apply for the joint use of poles already in the ground which are perfectly serviceable from the owner's standpoint, and that such joint use will necessitate the replacement of such poles with poles of greater height and strength. In such cases if the pole in place still was in good condition and its replacement would not have been necessary, the owner should not be called upon to bear the entire cost of removal and installation. Hence, this section provides a formula whereby the cost can be equitably apportioned. How this formula works can best be shown by way of illustration. Let us suppose that the owner has installed a normal joint pole with a life expectancy of 20 years. Let us further suppose that, in order to meet the licensee's needs, it will be necessary to install a 45-foot class 6 pole, the same type of pole as was considered in the comment on subsection (a) 3. Let us further suppose that the salvage value of the existing pole is \$5 and that the value in place of the existing pole is \$10 (the reason that \$10 is assigned as its

be in place rather than \$15 mentioned in the comment on subsection (a) 3, is that we are presuming that the pole has depreciated in value). Let us further suppose that the cost of removal is \$5. With these figures in mind, the amounts due by the licensee to the owner would be calculated as follows: \$5 (the excess cost of a new pole as specified in section (a) plus \$10, plus \$5, minus \$5. This means that the licensee would pay the owner \$15.

(d) Each party shall place, maintain, rearrange, transfer and remove its own attachments at its own expense except as otherwise expressly provided.

(d) This language is included to make certain that there shall be no misunderstanding that the installation and maintenance of the attachments is a duty incumbent upon each party.

(e) The expense of maintaining joint poles shall be borne by the owner thereof except that the cost of replacing poles shall be borne by the parties hereto in the manner provided in Sections (a) and (c) of this Article.

(e) It is desirable to make it clear that the owner must carry the burden of maintaining the poles.

(f) Where service drops of one party crossing over or under lines of the other party are attached to the other party's poles, either directly or by means of a pole top extension fixture, the cost shall be borne as follows:

(f) Subdivisions 1 and 2 In some cases it is advisable, in order to maintain proper clearances, for a service drop of one party to be attached to the pole of another party. In a sense that is a form of joint use, and therefore, the provisions of this agreement should when not inconsistent, apply. Naturally, if in order to make such attachments possible, the owner of a pole has to replace it, the cost of making such replacement should be shared by the licensee.

(1) Pole top extension fixtures shall be provided and installed at the sole expense of the party using them.

(2) Where an existing pole is replaced with a taller one to provide the necessary clearance the party owning the service drop

pay to the party owning the pole a sum equal to the difference in cost in place between the new pole and a new pole of the same size as the replaced pole, together with a sum representing the value in place of the replaced pole plus the cost of removal less the salvage value of such pole, the owner of the pole to remove and retain such pole.

(g) When, in order to improve an existing condition considered undesirable by both parties, existing poles of one of the parties are abandoned in favor of combining lines on poles of the other party, the then value in place of the abandoned poles plus the cost of removal less the salvage value of such poles shall be shared in the ratio of fifty five percent by the Cooperative and forty five percent by the Telephone Company.

(h) Payments made by either party to the other under the provisions of this Article shall be based on the table of values listed in Appendix A.

ARTICLE IX

PROCEDURE WHEN CHARACTER OF CIRCUITS IS CHANGED

When either party desires to change the character of its circuits on jointly used poles, such party shall give _____ days' notice to the other party of such contemplated change and in the event that the party agrees in writing to joint use with

ARTICLE IX

It sometimes happens that the owner of the line or the licensee desires to change the character of the circuits. There are so many types of situations that might arise that it is impossible to try to provide for procedures by which each of the situations

such changed circuits, then the joint use of such poles shall be continued with such changes in construction as may be required to meet the terms of the specifications mentioned in Article III for the character of circuits involved and such other changes as may be agreed upon. The parties shall cooperate to determine the equitable apportionment of the net expense of such changes. In the event, however, that the other party fails within _____ days from receipt of such notice to agree in writing to such change in character of circuits, then both parties shall cooperate in accordance with the following plan:

1. The parties hereto shall determine the most practical and economical method of effectively providing for separate lines, either overhead or underground, and the party whose circuits are to be moved shall promptly carry out the necessary work.

2. The net cost of re-establishing such circuits in the new location as are necessary to furnish the same business facilities that existed in the joint use section at the time such change was decided upon, shall be borne by the licensee; provided, however, that the owner shall bear an

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should be met in an agreement of this type. Therefore, about the most that can be done is to stipulate that the parties shall cooperate in an effort to determine the equitable apportionment of the expense incident to the changes.

In some cases it may be utterly impossible to continue the joint use in view of the proposed change of character of the circuits. When this is the case, of course, it will be necessary to construct separate lines. Inasmuch as the licensee's rights are subordinate to those of the owner, cost of re-establishing the circuits in a new location should in most instances be assumed by the licensee. However, there may be cases where the assumption of the entire cost by the licensee will work a hardship upon it. For example let us suppose that the owner allowed the licensee, at considerable cost, to install circuits on a given line, and then, within two months' time the owner decides to change the character of its circuits so as to make it impossible to maintain the joint use. In such a case the licensee, in addition to being faced with the cost of constructing new lines and relocating its facilities on them, might lose completely the investment it made in undertaking joint use, such as the payments it made to the owner pursuant to Article VII. Hence, it is only just that in such cases the owner should assume an equitable portion of the expense. In view of the varying circumstances that are likely to be met, it is manifestly impossible to provide any formula whereby the amount could be calculated. Therefore, all that

able share of such cost wherever the change was occasioned by the necessities of the owner and the licensee would suffer a hardship in having to assume the entire burden of the cost of reestablishing the circuits.

can be done is to provide that the owner shall bear an equitable share and trust to the good will of the parties to effect a solution.

Unless otherwise agreed by the parties, ownership of any new line or underground facilities constructed under the foregoing provisions in a new location shall vest in the party for whose use it is constructed.

ARTICLE X

ABANDONMENT OF JOINTLY USED POLES

(a) If the owner desires at any time to abandon any jointly used pole, it shall give the licensee notice in writing to that effect at least _____ days prior to the date on which it intends to abandon such pole. If at the expiration of said period the owner shall have no attachments on such pole but the licensee shall not have removed all of the attachments therefrom, such pole shall thereupon become the property of the licensee, and the licensee shall save harmless the former owner of such pole from all obligation, liability, damages, cost, expenses or charges incurred thereafter, and not arising out of anything theretofore occurring, because of, or arising out of, the presence or condition of such

ARTICLE X

(a) The time may come when the owner of a section of joint use line may wish to abandon the operation of its circuits on that line. However, to take the poles down might work a hardship on the licensee as it may need the poles for the operation of its own circuits. For that reason, Article X has been drafted so as to permit the licensee to acquire the poles upon their abandonment by the Owner.

pole or of any attachments thereon; and shall pay the owner the then value in place of the pole to the licensee but in no case an amount less than the net salvage value of the pole to the owner as provided in Appendix A attached hereto. The former owner shall further evidence transfer of title to the pole by means of a bill of sale. Credit shall be allowed for any payments which the licensee may have made under the provisions of Article VIII - Division of Costs, when the pole was originally set.

(b) The licensee may at any time abandon the use of a joint pole by giving due notice thereof in writing to the owner and by removing therefrom any and all attachments it may have thereon. The licensee shall in such case pay to the owner the full rental for said pole for the then current year.

(b) Conversely, the licensee may wish at some time to abandon the use of a joint pole for its circuits. However, inasmuch as the owner will still retain possession of the line, the owner will not be prejudiced by such abandonment so long as the owner is appropriately advised.

ARTICLE XI

RENTALS

(a) On or about ____ of each year the parties acting in cooperation shall, subject to the provisions of Section (b) of this Article, tabulate the total number of joint poles in use as of the preceding day, and the number of poles on which either party as licensee removed all of its attachments during the twelve preceding

ARTICLE XI

(a) It would be manifestly desirable to have the telephone company and the Cooperative each own a proportionate number of joint poles so that the payment of rental would be unnecessary and the use of one set of poles would balance the use of the other. However, it will probably be impossible to achieve such a proportionate distribution

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tabulation shall indicate the number of poles which each party owns on which rentals are to be paid by the other party.

(b) For the purpose of such tabulation, any pole used by the licensee for the sole purpose of attaching wires or cables thereto, either directly or by means of a pole top extension fixture, in order to provide clearance between the facilities of the two parties as distinguished from providing support for such wires or cables, shall not be considered as a joint pole.

(c) If there is provision under a separate agreement between the Telephone Company and the Cooperative for facilities associated with power line carrier systems, the rental provisions of the agreement of which this article forms a part shall apply for poles on which both types of facilities are present, and no other rentals shall apply. The rental provisions of this agreement shall not apply however, where only those facilities directly associated with power line carrier systems are involved.

(d) The rentals per pole due from either party as licensee to the other party as owner shall be based on the equitable sharing of the economies of joint use as provided for in Appendix B. Subject

and for that reason a tabulation should be made to determine which of the two parties owns more than its proportionate share of poles used jointly. Theoretically, it might be desirable to make such tabulation as of January 1 so as to make the rentals coincide with the calendar year. However, the spring season is the season in which the greatest bulk of the changes is made and for that reason, July 1 is, from the practical standpoint, the more desirable date to adopt for the making of a tabulation.

(d) The amount of rental that should be paid for each pole will necessarily vary according to circumstances. In most cases a rental per pole will probably be equitable.

to the provisions of Article XII, \$ ____ per annum shall be paid by the Cooperative for each jointly used pole owned by the Telephone Company and \$ ____ per annum shall be paid by the Telephone Company for each jointly used pole owned by the Cooperative. The smaller total sum shall be deducted from the larger and the Cooperative or the Telephone Company, as the case may be, shall pay to the other the difference between such amounts.. The rental herein provided for shall be paid within 10 days after the bill has been submitted.

ARTICLE XII

PERIODICAL ADJUSTMENT OF RENTALS

(a) At any time after 5 years from the date of this agreement and at intervals of not less than 5 years thereafter, the rentals applicable under this agreement shall be subject to joint review and adjustment as provided for under Section (b) of this Article upon the written request of either party. In case of adjustment of rentals as herein provided, the new rentals agreed upon shall apply starting with the annual bill next rendered and continuing until again adjusted.

ARTICLE XII

At some future time, it may become advisable to reconsider the rentals paid and to arrange for a change in the amount of rentals. Article XII is meant to pave the way for such reconsideration and to bring any changed rentals automatically within the terms of the contract.

All adjustments of rentals shall be in accord with the provisions of Appendix B, and any changes shall take into account the cost factors originally involved in all joint use existing at that time under this agreement.

ARTICLE XIII

DEFAULTS

(a) If either party shall default in any of its obligations under this agreement and such default continues thirty (30) days after due notice thereof in writing by the other party, the party not in default may suspend the rights of the party in default in so far as concerns the granting of future joint use and if such default shall continue for a period of _____ days after such suspension, the party not in default may forthwith terminate this agreement as far as concerns the future granting of joint use.

(b) If either party shall make default in the performance of any work it is obligated to do under this agreement at its sole expense, the other party may elect to do such work, and the party in default shall reimburse the other party for the cost thereof. Failure on the part of the defaulting party to make such payment within _____ days upon presentation of bills therefor, shall, at the election of the other party, constitute a default under Section (a) of this Article.

ARTICLE XII

(a) It is to be supposed that neither party will ever default in its obligations under the contract. As there is a possibility of such defaults occurring, however, the contingency should be provided for in the agreement. Therefore, section (a) of Article XIII has been drafted to protect the party who has lived up to its obligations by allowing it to suspend and eventually terminate the agreement in so far as the granting of future joint use is concerned.

(b) One of the particular defaults that might occur is one resulting from failure of one of the parties to perform any work which it is obligated to perform at its own expense. Rather than invoking the remedies provided for by the preceding section, which might work a hardship on the defaulting party not commensurate with the breach of its

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obligations, section (a) provides that one of the parties may perform the work itself and then bill the defaulting party. Naturally, the party in default should be extremely careful in exercising this privilege and should exercise it only as the last resource for the telephone company may not be qualified to perform work on the electric line the cooperative may not be qualified to perform work on the telephone line.

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ARTICLE XIV

EXISTING RIGHTS OF OTHER PARTIES

(a) If either of the parties hereto has, prior to the execution of this agreement, conferred upon others, not parties to this agreement, by contract or otherwise, rights or privileges to use any poles covered by this agreement, nothing herein contained shall be construed as affecting such rights or privileges, and either party hereto shall have the right, by contract or otherwise, to continue and extend such existing rights or privileges, it being expressly understood, however, that for the purpose of this agreement, the attachments of any such outside party, except those of a municipality or other public authority, shall be treated as attachments belonging to the grantor, and the rights, obligations, and liabilities hereunder of

ARTICLE XIV

(a) At the time agreement is entered into one of the parties may have already obligated itself to permit the use of the joint poles by some third party, and may be necessary or desirable to extend or continue that permission even after the date of the agreement. In order to protect the other party to the agreement section (a) provides the facilities of the third party shall be considered as those of the party having granted the privilege.

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aspect to such attachments shall be the same as if it were the actual owner thereof.

(b) Where municipal regulations require either party to allow the use of its poles for fire alarm, police, or other like signal systems, such use shall be permitted under the terms of this Article, provided attachments of such parties are placed and maintained in accordance with the specifications mentioned in Article III.

(b) The purpose of this section is so clear as not to need any comment.

ARTICLE XV

ASSIGNMENT OF RIGHTS

Except as otherwise provided in this agreement, neither party hereto shall assign or otherwise dispose of this agreement or any of its rights or interests hereunder, or in any of the jointly used poles, or the attachments or rights of way covered by this agreement, to any firm, corporation or individual, without the written consent of the other party except to the United States of America or any agency thereof; provided, however, that nothing herein contained shall prevent or limit the right of either party to mortgage any or all of its property, rights, privileges, and franchises, or lease or transfer any of them to another corporation organized for the purpose of conducting a business of the same general character as that of such party, or to enter into any merger or consolidation; and, in case of the foreclosure of such mortgage; or in case of such lease, transfer,

ARTICLE XV

The preparation of the paragraph in regard to the assignment of rights is necessarily difficult in a situation such as this. An absolute prohibition against the assignment of the rights conferred by the contract without the written consent of the other party might work a considerable hardship on the party who is desirous of making such an assignment as it might limit the disposition of its properties. However, it is equally true that allowing a party to assign its rights under the contract to a third party without the consent of the other party to the contract might work a considerable hardship on the latter inasmuch as it might be faced with the prospect of attempting to maintain joint use with an

merger, or consolidation, its rights and obligations hereunder shall pass to, and be acquired and assumed by, the purchaser on foreclosure, the transferee, lessee, assignee, merging or consolidating company, as the case may be; and provided, further, that subject to all of the terms and conditions of this agreement, either party may permit any corporation conducting a business of the same general character as that of such party, and owned, operated, leased and controlled by it, or associated or affiliated with it in interest, or connecting with it, the use of all or any part of the space reserved hereunder on any pole covered by this agreement for the attachments used by such party in the conduct of its said business; and for the purpose of this agreement, all such attachments maintained on any such pole by the permission as aforesaid of either party hereto shall be considered as the attachments of the party granting such permission, and the rights, obligations and liabilities of such party under this agreement, with respect to such attachments, shall be the same as if it were the actual owner thereof.

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irresponsible organization with whom it would not have entered into a contract originally. Hence, this Article has been drafted with the thought of attempting to permit the assignment under certain circumstances, that is where the organization assuming the rights assigned will be a responsible organization conducting a business the same general character as that of its predecessor.

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ARTICLE XVI

WAIVER OF TERMS OR CONDITIONS

The failure of either party to enforce or insist upon compliance with any of the terms or conditions of this agreement shall not constitute a general waiver or relinquishment of any such terms or conditions, but the same shall be and remain at all times in full force and effect.

ARTICLE XVII

PAYMENT OF TAXES

Each party shall pay all taxes and assessments lawfully levied on its own property upon said jointly used poles, and the taxes and the assessments which are levied on said joint poles shall be paid by the owner thereof, but any tax, fee, or charge levied on owner's poles solely because of their use by the licensee shall be paid by the licensee.

ARTICLE XVIII

BILLS AND PAYMENT FOR WORK

Upon the completion of work performed hereunder by either party, the expense of which is to be borne wholly or in part by the other party, the party performing the work shall present to the other party within _____ days after the completion of such work an itemized statement of

ARTICLE XVI

This Article XVI is inserted to make certain that if one of the parties, in the interest of harmony and in view of the particular situation, waives a condition in the agreement, such waiver will not be considered as a general waiver applicable to all similar situations in the future.

ARTICLE XVII

The purpose of this Article is so obvious as not to need any comments.

ARTICLE XVIII

This Article is inserted to insure business relationships in the payment of reimbursable items. The number of days that should be inserted in the blanks will vary according to circumstances. Probably the insertion of the number 10 in the blanks would provide a suitable time.

the costs and such other party shall within _____ days after such statement is presented pay to the party doing the work such other party's proportion of the cost of said work.

ARTICLE XIX

SERVICE OF NOTICES

Whenever in this agreement notice is provided to be given by either party hereto to the other, such notice shall be in writing and given by letter mailed, or by personal delivery, to the Cooperative at its office at _____, or to the Telephone Company at its office at _____, as the case may be, or to such other address as either party may from time to time designate in writing for that purpose.

ARTICLE XX

TERM OF AGREEMENT

Subject to the provisions of Article XIII, Defaults, herein, this Agreement shall remain in effect until terminated at the end of 25 years from the date hereof or thereafter upon the giving of written notice to the other party not less than three years prior to the date of termination.

ARTICLE XIX

This Article is inserted to make certain that there will not be any dispute as to the proper place for the service of notice.

ARTICLE XX

The Agreement made to run for 25 and as long thereafter as the parties may agree. The type of arrangement contemplated in the contract is that involves long range planning and investment and therefore does not lend itself to a short term.

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ARTICLE XXI

EXISTING CONTRACTS

All existing agreements between the parties hereto for the joint use of poles are by mutual consent hereby abrogated and superseded by this Agreement.

Nothing in the foregoing shall preclude the parties to this agreement from preparing such supplemental operating routines or working practices as they mutually agree to be necessary or desirable to effectively administer the provisions of this agreement.

ARTICLE XXII

APPROVAL OF ADMINISTRATOR

This Agreement, and any amendment thereof, shall be effective subject to the condition that, during any period in which the Cooperative is a borrower from the Rural Electrification Administration, the agreement and any amendment thereof shall have the approval in writing of the Administrator of the Rural Electrification Administration.

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ARTICLE XXI

This Agreement is intended to cover the entire arrangement between the parties. Therefore, this Article provides that any existing agreements between the parties with respect to the joint use of poles are ended and this Agreement takes their place.

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In witness whereof, the parties hereto,
have caused these presents to be executed in tripli-
cate, and their corporate seals to be affixed thereto
by their respective officers thereunto duly uauthorized,
on the _____ day of _____, 19 .

By _____

(Seal)

Attest:

By _____

(Seal)

Attest:

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APPENDIX A

This Appendix contains tables of pole values to be used in dividing costs as provided under Article VIII. It also outlines the steps for adjusting such values to determine any payments that the licensee must make to the owner to defray costs of premature replacement of poles to accommodate the licensee.

A. Tabulation of New Pole Costs.

The following tabulation shall list mutually agreed upon average costs in place of new poles of all kinds of timber, including only such cost items as are repetitive when poles are replaced.

Table 1

Height \ Class	1	2	3	4	5	6	7	8	9	10
20'										
22'										
25'										
30'										
35'										
40'										
45'										
50'										
55'										
60'										

Age Factors for Modifying Values of Poles.

1. The following table of age factors shall be used in adjusting pole costs in Table 1 to arrive at current values in place of existing poles coming under the provisions of this agreement.

Table 2

Age of Pole	0-3 years	4-9 years	10-15 years	16-21 years	22-27 years	over 27 years
Factor	1.0	.8	.6	.4	.2	0

C. Cost Level Factor.

1. The values obtained from B are to be modified further by the following factors to allow for periodic variation in pole cost levels.

Table 3

For poles set prior to Jan. 1, 1937	.5
For poles set between Jan. 1, 1937 and Jan. 1, 1945.	.7
For poles set between Jan. 1, 1945 and	1.0
For poles set between and	

2. It is intended that additional factors will be added to cover future long term changes in costs.

D. Salvage Value of Poles.

1. A figure of 70% of current material costs shall be used for computing salvage values of poles which have been installed not exceeding 10 years. Average values for all kinds of timber shall be used. The follow-

Table 4

Height \ Class	1	2	3	4	5	6	7	8	9	10
20'										
22'										
25'										
30'										
35'										
40'										
45'										
50'										
55'										
60'										

2. For poles installed longer than 10 years it shall be assumed that the salvage value is equal to the cost of removal.

Note: This is based on assumption that owner should bear an increasing portion of cost of removal as poles age.

1. The following table sets forth mutually agreed upon total costs of removing poles.

Table 5

Height	Cost of Removal
25' or less	
30'	
35'	
40'	
45'	
50'	
55'	

Note:
Annual variations
in costs of removal
neglected.

F. Anchors.

1. The cost in place of all anchors regardless of size, type or number of thimbles shall be deemed to be ____ for use in applying the provisions of this agreement.

This appendix describes the basic principles and guides which have been used under this agreement in setting the rents specified in Article XI and which are to be used in making periodical adjustments of rentals as provided for in Article XII.

Under these principles the rentals are intended, in so far as it is practicable, to result in a sharing of the economies realized by the joint use of pole plant in proportion to the relative costs of separate pole line construction.

The procedures outlined herein take into account the following objectives:

1. An equitable division of savings regardless of the number of jointly used poles owned by each party.
2. Rental rates applicable universally in the area covered by the agreement regardless of whether the pole lines involved are initially constructed with joint use in view or are existing lines modified for joint use.
3. Appropriate allowance in the rental rates for additional costs incurred by each party in supplying 'normal joint poles', as defined in the agreement, and the costs of other items required in the joint use of poles which would not be incurred in separate line construction.
4. Rentals based on the costs of "typical miles" of separate lines, of newly constructed joint lines and of existing lines modified to make them suitable for joint use. The 'per mile' value of rentals are then reduced to 'per pole' values for purposes of simplifying tabulations and to provide for the joint use of scattered poles.

The rentals are the dollar values resulting from the licensee paying to the owner as annual rental, an amount representing the annual charge on a separate line for the licensee less the sum of (a) the annual charges on the additional costs incurred by the licensee in establishing joint use and (b) the licensee's share of

savings. This share is the ratio of the licensee's typical separate

line costs to the sum of the typical separate line costs of each of the parties.

The annual rent payable can also be stated as follows:

Licensee's annual rent	Equals	Annual charges saved by licensee through not having to build a separate line	Less	Licensee's appropriate percentage	Of	Total savings in annual charges realized through joint use
------------------------------	--------	--	------	---	----	---

The cost in place of a line of poles is made up of a number of factors including such items as right-of-way solicitation, clearing, staking, direct labor and material costs of bare poles in place and pro rata shares of construction supervision and overhead. These costs, for a specific area, may differ considerably from corresponding costs in other parts of the country. These variations in pole line costs will, however, affect both power and telephone lines to about the same degree.

The parties to this contract will mutually agree on the average cost of a typical mile of 35 foot, class 6 poles in place in their common area. Below are tabulated appropriate rentals over a range of typical mile costs. From this tabulation the parties shall use the rental payments associated with the value nearest to the agreed upon average cost.

RENTAL PAYMENTS

Where the mutually agreed upon average cost per mile of 35 foot class 6 poles in place approximates	The telephone company's annual rental payment per pole to the cooperative will be	The cooperative's annual rental pay- ment per pole to the telephone company will be
\$350*	\$1.00	\$1.70
\$410	1.10	1.80
\$470	1.20	1.90
\$530	1.30	2.00
\$590	1.40	2.10
\$650	1.50	2.20
\$710	1.60	2.30
\$770**	1.70	2.40

* Rentals associated with this amount are minimum and applicable for all lower costs.
 **If average costs are substantially higher than this value, appropriate rentals should be determined by agreement.

Form of
Application---Permit
For Joint Use of Poles.

No.....

To.....

hereinafter referred to as the
Licensor; the applicant hereunder
being hereinafter referred to as
the Licensee.

The following application is made for the use of your pole plant located as follows:

<u>No. of Poles</u>	<u>Pole Numbers</u>	<u>Type of Attachments</u>	<u>Annual Rental</u>
-------------------------	-------------------------	--------------------------------	--------------------------

Pole locations and work to be performed are shown on the above diagram.

Licensee's initial payment, if any\$_____

The joint occupancy herein provided for and the work to be done hereunder shall be subject to the terms and conditions on the reverse side hereof, which shall constitute a specified agreement in connection herewith and shall supersede, except as to matters not covered herein, any provisions in other contracts, if any, heretofore entered into between the parties hereto or their predecessor companies.

Recommended by:_____ Application made _____ 19 __, By _____

Approved by:_____

THE ABOVE APPLICATION IS ACCEPTED AND
THE PERMIT REQUESTED IS HEREBY GRANTED

By _____
Title _____

_____ 19 __, By _____

Approved by:_____

By _____

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1. **CONSIDERATION.** In consideration of the right to attach and maintain at its sole expense, attachments on the poles of the Licensor, the Licensee promises and agrees to pay the initial payment, if any, shown on the face hereof, within 30 days of its receipt of the Licensor's bill therefor; and likewise promises and agrees to pay the Licensor annually upon the 31st day of December the yearly rental(s) specified on the face of this agreement.

These rentals shall be based on the following:

- a. For attachments of facilities owned by the Telephone Company to poles owned by the Cooperative. 1.00 per pole
 - b. For attachments of facilities owned by the Cooperative to poles owned by the Telephone Company. 1.00 per pole
- (There will be no charge for clearance attachments of service drops of either party.)

Yearly payments hereunder shall be made on December 31st of each year in which this permit is exercised; rental charges being based upon the Licensee's occupation of the Licensor's pole as of July 1st in said calendar year.

All payments for rental under this agreement shall be based upon a minimum period of one year except that should the Licensor revoke this permit before the expiration of any calendar year, then and not otherwise, the Licensor shall reduce the yearly rental by an amount proportionate to the interval from the last day of the month in which attachments were discontinued to the end of the said year.

2. **SPECIFICATIONS.** Attachments shall at all times be in conformity with accepted modern methods such as those suggested in Edison Electric Institute Publication No. M12 and shall at all times conform to the requirements of the National Electrical Safety Code, Fifth Edition and subsequent revisions thereof, except where the lawful requirements of public authorities may be more stringent, in which case the latter will govern.

3. **LICENSEE'S RIGHT TO TERMINATE.** This agreement may be terminated by the Licensee upon thirty days' notice to the Licensor. All obligations of the Licensee, hereunder, shall continue until its attachments are completely removed.

4. **LICENSOR'S RIGHT TO REVOKE.** The Licensor may revoke this permit at any time upon written notice, and the Licensee shall remove its wires and other attachments from said pole(s) within sixty days from the date of said notice.

5. **LICENSOR'S RIGHT TO ABANDON.** The Licensor may abandon any said pole at any time upon written notice to the Licensee. The Licensee shall, within sixty days after such notice, either purchase the pole from the Licensor or remove its attachments therefrom, and the failure of the Licensee to remove its attachments within said sixty days shall be deemed an election to purchase the pole at a price equal to its then value in place.

6. **DEFAULT.** If the Licensee shall make default in any of its obligations under this contract, and such default continues for thirty days after written notice thereof from the Licensor, all rights of the Licensee hereunder, including its right to occupy said poles, shall be suspended until such default has been remedied.

7. **ASSIGNMENT.** Licensee shall not assign, transfer or sub-let any of the privileges described in this agreement without the written consent of the Licensor.

8. **LICENSOR'S RESPONSIBILITY.** The Licensor shall not be liable to the Licensee for any interruption to, nor interference with the operations of the wires of the Licensee on said poles caused by the operations of the Licensor; nor shall the Licensor be responsible for any loss or damage caused by objection to the stringing of said wires, by any corporation or person owning property on which, or abutting upon which, said pole line or fixtures thereon, or any part thereof, is located, or because of interference with said pole line, wires or fixtures thereon by any third person, or because of the objections or interference of any public authorities. It is expressly agreed that the Licensor is not obligated to secure or guarantee any right-of-way or franchise for the Licensee, and no use, however extended, of the Licensor's poles under this agreement shall be taken as creating or vesting in the Licensee any right, title or interest to said poles, or any right, title and interest in any franchise right or easement which the Licensor may possess.

REA Form DS-210
(8-47)

GENERAL AGREEMENT
FOR
JOINT USE OF WOOD POLES

BETWEEN

.....
.....

AND

.....
.....

Date

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REA Form DS-210
(8-47)

GENERAL AGREEMENT FOR JOINT USE OF WOOD POLES

PREAMBLE

....., a corporation organized under the laws of the State of, (hereinafter called the "Cooperative"), and

....., a corporation organized under the laws of the State of, (hereinafter called the "Telephone Company"), desiring to cooperate in the joint use of their respective poles, erected or to be erected within the areas in which both parties render service in the State(s) of, whenever and wherever such use shall, in the estimation of both parties, be compatible with their respective needs, do hereby, in consideration of the premises and the mutual covenants herein contained, covenant and agree for themselves and their respective successors and assigns as follows:

ARTICLE I

SCOPE OF AGREEMENT

- (a) This Agreement shall be in effect in the areas in which both of the parties render service in the State(s) of, and shall cover all wood poles of the parties now existing or hereafter erected in the above territory when said poles are brought under this Agreement in accordance with the procedure hereinafter provided.
- (b) Each party reserves the right to exclude any of its facilities from joint use.

ARTICLE II

EXPLANATION OF TERMS

For the purpose of this Agreement, the following terms shall have the following meanings:

1. A JOINT POLE is a pole jointly used by both parties.
2. A NORMAL JOINT POLE is a pole which is just tall enough to provide normal spaces, as normal space is hereinafter defined, for the respective parties and just strong enough to meet the requirements of the specifications mentioned in Article III for the attachments ordinarily placed by the parties in their respective normal spaces. Such pole for the purpose of this Agreement shall be a foot class wood pole as classified by the pole classification tables of the American Standards Association.
3. SPACE is the linear portion of a joint pole parallel to its axis reserved for the exclusive use of one of the parties (subject only to the exceptions provided for by the specifications mentioned in Article III which in certain instances permit the making of certain attachments by one party in the space reserved for the other party).
4. NORMAL SPACE is the following described space:
 - a. For the Cooperative the uppermost feet, measured from top of pole.
 - b. For the Telephone Company a space of feet, at a sufficient distance below the space of the Cooperative to provide at all times the minimum clearance required by the specifications mentioned in Article III and at a sufficient height above ground to provide the proper vertical clearance above ground or track rails for the lowest horizontally run line wires or cables attached in such space.

The foregoing definition of "a normal joint pole" is not intended to preclude the use of joint poles shorter or of less strength than the normal joint pole in locations where such poles will meet the requirements of the parties hereto.

The above assignment of space is not intended to preclude the use of vertical runs or the mounting of such equipment as terminals or meters on the lower portions of the pole when mutually agreeable.

ARTICLE III

SPECIFICATIONS

Except as otherwise provided in Section (e) of Article VII, referring to construction temporarily exempt from the application of the specifications mentioned herein, the joint use of the poles covered by this Agreement shall at all times be in conformity with accepted modern methods such as those suggested in Edison Electric Institute Publication No. M12 and shall at all times conform to the requirements of the National Electrical Safety Code, Fifth Edition, and subsequent revisions thereof, except where the lawful requirements of public authorities may be more stringent, in which case the latter will govern.

Modifications of, additions to, or construction practices supplementing wholly or in part the requirements of the National Electrical Safety Code, shall, when accepted in writing by both parties hereto through their agents authorized to approve such changes, likewise govern the joint use of poles.

ARTICLE IV

ESTABLISHING JOINT USE OF EXISTING POLES

(a) Whenever either party desires to reserve space for its attachments on any pole owned by the other party, either as initial space or additional space on such pole, it shall make written application therefor, specifying the location of the poles in question, the amount of space desired on each pole, and the number and character of the circuits to be placed thereon. If, in the judgment of the owner, the poles are necessary for its own sole use, or joint use under the circumstances is undesirable, the owner shall have the right to reject the application. In any event, within 10 days after the receipt of such application the owner shall notify the applicant in writing whether the application is approved or rejected. Upon receipt of notice from the owner that the application has been approved, and after the completion of any transferring or rearranging which is required to permit the attaching of the applicant's circuits on such poles, including any necessary pole replacements, the applicant shall have the right as licensee hereunder to use such space in accordance with the terms of the application and of this Agreement.

(b) Whenever any jointly used pole or any pole about to be so used under the provision of this Agreement is insufficient in height or strength for the existing attachments and for the proposed additional attachments thereon, the owner shall promptly replace such pole with a new pole of the necessary height and strength and shall make such other changes in the existing pole line in which such pole is included as the conditions may then require.

(c) Each party shall place, transfer and rearrange its own attachments, place guys to sustain any unbalanced loads caused by its attachments, and perform any tree trimming or cutting incidental thereto. Each party shall at all times execute such work promptly and in such manner as not to interfere with the service of the other party.

(d) The cost of establishing the joint use of existing poles, including the making of any necessary pole replacements, shall be borne by the parties hereto in the manner provided in Article VIII—Division of Costs.

ARTICLE V

ESTABLISHING JOINT USE OF NEW POLES

(a) Whenever either party hereto requires new pole facilities for an additional pole line, an extension of an existing pole line, or in connection with the reconstruction of an existing pole line, it shall promptly notify the other party to that effect in writing (verbal notice subsequently confirmed in writing may be given in cases of emergency), stating the proposed location and character of the new poles and the character of circuits it intends to use thereon and indicating whether or not such pole facilities will be, in the estimation of the party proposing to construct the new pole facilities, susceptible of joint use. Within 10 days after the receipt of such notice, the other party shall reply in writing, stating whether it does, or does not, desire space on the said poles and, if it does desire space thereon, the character of the circuits it desires to

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use and the amount of space it wishes to reserve. If such other party requests space on the proposed new poles and if the character and number of its circuits and attachments are such that the party proposing to construct the new pole facilities does not consider joint use undesirable, then it shall erect poles suitable for such joint use, subject, however, to the provisions of Section (b) of this Article. The applicant for space on the poles shall be promptly notified in writing of the action taken on the application.

(b) In any case where the parties hereto shall conclude arrangements for the joint use of any new poles to be erected, and the party proposing to construct the new pole facilities already owns more than its proportionate share of joint poles, the parties shall take into consideration the desirability of having the new pole facilities owned by the party owning less than its proportionate share of joint poles so as to work towards such a division of ownership of the joint poles that neither party shall be obligated to pay to the other any rentals because of their respective use of joint poles owned by the other.

(c) Each party shall place its own attachments on the new joint poles and place guys to sustain any unbalanced loads caused by its attachments. The owner shall, however, provide the initial clearing of the right-of-way, and tree trimming, which shall at least meet the requirements of the other party. Each party shall execute its work promptly and in such manner as not to interfere with the service of the other party.

(d) The cost of establishing the joint use of new poles including costs incurred in the retirement of existing poles shall be borne by the parties hereto in the manner provided in Article VIII—Division of Costs.

ARTICLE VI

RIGHT OF WAY FOR LICENSEE'S ATTACHMENTS

While the owner and licensee will cooperate as far as may be practicable in obtaining rights-of-way for both parties on joint poles, the owner does not warrant or assure to the licensee any right-of-way privileges or easements on, over or across streets, alleys and public thoroughfares, and private or publicly owned property, and if the licensee shall at any time be prevented from placing or maintaining its attachments on the owner's poles, no liability on account thereof shall attach to the owner of the poles.

ARTICLE VII

MAINTENANCE OF POLES AND ATTACHMENTS

(a) The owner shall maintain its joint poles in a safe and serviceable condition and in accordance with the specifications mentioned in Article III and shall replace, reinforce or repair such of these poles as become defective.

(b) When replacing a jointly used pole carrying terminals of aerial cable, underground connection, or transformer equipment, the new pole shall be set in the same hole which the replaced pole occupied unless special conditions make it necessary or mutually desirable to set it in a different location.

(c) Whenever it is necessary to replace or relocate a jointly used pole, the owner shall, before making such replacement or relocation, give notice thereof in writing (except in case of emergency, when verbal notice will be given and subsequently confirmed in writing) to the licensee, specifying in such notice the time of such proposed replacement or relocation and the licensee shall at the time so specified transfer its attachments to the new or relocated joint pole.

(d) Except as otherwise provided in Section (e) of this Article, each party shall at all times maintain all of its attachments, and perform any necessary tree trimming or cutting incidental thereto, in accordance with the specifications mentioned in Article III and shall keep them in safe condition and in thorough repair. Nothing in the foregoing shall preclude the parties hereto from making any mutually agreeable arrangement for jointly contracting for or otherwise providing for maintenance trimming.

(e) Any existing joint use construction of the parties hereto which does not conform to the specifications mentioned in Article III shall be brought into conformity therewith as soon as practicable.

When such existing construction shall have been brought into conformity with said specification, it shall at all times thereafter be maintained as provided in Sections (a) and (d) of this Article.

(f) The cost of maintaining poles and attachments and of bringing existing joint use construction into conformity with said specifications shall be borne by the parties hereto in the manner provided in Article VIII—Division of Costs.

ARTICLE VIII

DIVISION OF COSTS

(a) The cost of erecting new joint poles coming under this Agreement, to construct new pole lines, to make extensions to existing pole lines, or to replace existing poles, shall be borne by the parties as follows:

1. A normal joint pole, or joint pole smaller than the normal, shall be erected at the sole expense of the owner.

2. A pole larger than the normal, the extra height or strength of which is due wholly to the owner's requirements, including requirements as to keeping the owner's wires clear of trees, shall be erected at the sole expense of the owner.

3. In the case of a pole larger than the normal, the extra height or strength of which is due wholly to the licensee's requirements, including requirements as to keeping the licensee's wires clear of trees, the licensee shall pay to the owner a sum equal to the difference between the cost in place of such pole and the cost in place of a normal joint pole, the rest of the cost of erecting such pole to be borne by the owner, except in so far as otherwise provided in Section (c) of this Article.

4. In the case of a pole larger than the normal, the extra height or strength which is due to the requirements of both parties or the requirements of public authorities or of property owners, (other than requirements with regard to keeping the wires of one party only clear of trees), the difference between the cost in place of such pole and the cost in place of a normal joint pole shall be shared in the ratio of fifty five percent by the Cooperative and forty five percent by the Telephone Company, the rest of the cost of erecting such pole to be borne by the owner.

5. A pole erected between existing poles to provide sufficient clearance and furnish adequate strength to support the circuits of both the owner and licensee, which it would have been unnecessary to erect if joint use had not been undertaken, shall be erected at the sole expense of the licensee.

(b) Any payments for poles made by the licensee under any foregoing provisions of this Article shall not entitle the licensee to the ownership of any part of said poles for which it has contributed in whole or in part.

(c) Where an existing jointly used pole or a non-joint pole is prematurely replaced by a new one solely for the benefit of the licensee, the cost of the new pole shall be divided as specified in Section (a) of this Article and the licensee shall also pay its owner the value in place of the replaced pole, plus the cost of removal less the salvage value of such pole. The replaced pole shall be removed and retained by its owner.

(d) Each party shall place, maintain, rearrange, transfer and remove its own attachments at its own expense except as otherwise expressly provided.

(e) The expense of maintaining joint poles shall be borne by the owner thereof except that the cost of replacing poles shall be borne by the parties hereto in the manner provided in Sections (a) and (c) of this Article.

(f) Where service drops of one party crossing over or under lines of the other party are attached to the other party's poles, either directly or by means of a pole top extension fixture, the cost shall be borne as follows:

(1) Pole top extension fixtures shall be provided and installed at the sole expense of the party using them.

(2) Where an existing pole is replaced with a taller one to provide the necessary clearance the party owning the service drop shall pay to the party owning the pole a sum equal to the difference in cost in place between the new pole and a new pole of the same size as the replaced pole, together with a sum representing the value in place of the replaced pole plus the cost of removal less the salvage value of such pole, the owner of the pole to remove and retain such pole.

(g) When, in order to improve an existing condition considered undesirable by both parties, existing poles of one of the parties are abandoned in favor of combining lines on poles of the other party, the then value in place of the abandoned poles plus the cost of removal less the salvage value of such poles shall be shared in the ratio of fifty five percent by the Cooperative and forty five percent by the Telephone Company.

(h) Payments made by either party to the other under the provisions of this Article shall be based on the table of values listed in Appendix A.

FS-2.0
FS-7.67

ARTICLE IX

PROCEDURE WHEN CHARACTER OF CIRCUITS IS CHANGED

When either party desires to change the character of its circuits on jointly used poles, such party shall give.....days notice to the other party of such contemplated change and in the event that the party agrees in writing to joint use with such changed circuits, then the joint use of such poles shall be continued with such changes in construction as may be required to meet the terms of the specifications mentioned in Article III for the character of circuits involved and such other changes as may be agreed upon. The parties shall cooperate to determine the equitable apportionment of the net expense of such changes. In the event, however, that the other party fails within.....days from receipt of such notice to agree in writing to such change in character of circuits, then both parties shall cooperate in accordance with the following plan:

1. The parties hereto shall determine the most practical and economical method of effectively providing for separate lines, either overhead or underground, and the party whose circuits are to be moved shall promptly carry out the necessary work.
2. The net cost of re-establishing such circuits in the new location as are necessary to furnish the same business facilities that existed in the joint use section at the time such change was decided upon, shall be borne by the licensee; provided, however, that the owner shall bear an equitable share of such cost wherever the change was occasioned by the necessities of the owner and the licensee would suffer a hardship in having to assume the entire burden of the cost of re-establishing the circuits.

Unless otherwise agreed by the parties, ownership of any new line or underground facilities constructed under the foregoing provisions in a new location shall vest in the party for whose use it is constructed.

ARTICLE X

ABANDONMENT OF JOINTLY USED POLES

(a) If the owner desires at any time to abandon any jointly used pole, it shall give the licensee notice in writing to that effect at least.....days prior to the date on which it intends to abandon such pole. If at the expiration of said period the owner shall have no attachments on such pole but the licensee shall not have removed all of the attachments therefrom, such pole shall thereupon become the property of the licensee, and the licensee shall save harmless the former owner of such pole from all obligation, liability, damages, cost, expenses or charges incurred thereafter, and not arising out of anything theretofore occurring, because of, or arising out of, the presence or condition of such pole or of any attachments thereon; and shall pay the owner the then value in place of the pole to the licensee but in no case an amount less than the net salvage value of the pole to the owner as provided in Appendix A attached hereto. The former owner shall further evidence transfer of title to the pole by means of a bill of sale. Credit shall be allowed for any payments which the licensee may have made under the provisions of Article VIII—Division of Costs, when the pole was originally set.

(b) The licensee may at any time abandon the use of a joint pole by giving due notice thereof in writing to the owner and by removing therefrom any and all attachments it may have thereon. The licensee shall in such case pay to the owner the full rental for said pole for the then current year.

ARTICLE XI

RENTALS

(a) On or about..... of each year the parties acting in cooperation shall, subject to the provisions of Section (b) of this Article, tabulate the total number of joint poles in use as of the preceding day, and the number of poles on which either party as licensee removed all of its attachments during the twelve preceding months, which tabulation shall indicate the number of poles which each party owns on which rentals are to be paid by the other party.

(b) For the purpose of such tabulation, any pole used by the licensee for the sole purpose of attaching wires or cables thereto, either directly or by means of a pole

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top extension fixture, in order to provide clearance between the facilities of the two parties as distinguished from providing support for such wires or cables, shall not be considered as a joint pole.

(c) If there is provision under a separate agreement between the Telephone Company and the Cooperative for facilities associated with power line carrier systems, the rental provisions of the Agreement of which this article forms a part shall apply for poles on which both types of facilities are present, and no other rentals shall apply. The rental provisions of this Agreement shall not apply however, where only those facilities directly associated with the power line carrier systems are involved.

(d) The rentals per pole due from either party as licensee to the other party as owner shall be based on the equitable sharing of the economies of joint use as provided for in Appendix B. Subject to the provisions of Article XII, \$.....per annum shall be paid by the Cooperative for each jointly used pole owned by the Telephone Company and \$.....per annum shall be paid by the Telephone Company for each jointly used pole owned by the Cooperative. The smaller total sum shall be deducted from the larger and the Cooperative or the Telephone Company, as the case may be, shall pay to the other the difference between such amounts. The rental herein provided for shall be paid within 10 days after the bill has been submitted.

ARTICLE XII

PERIODICAL ADJUSTMENT OF RENTALS

(a) At any time after 5 years from the date of this Agreement and at intervals of not less than 5 years thereafter, the rentals applicable under this Agreement shall be subject to joint review and adjustment as provided for under Section (b) of this Article upon the written request of either party. In case of adjustment of rentals as herein provided, the new rentals agreed upon shall apply starting with the annual bill next rendered and continuing until again adjusted.

(b) All adjustments of rental shall be in accord with the provisions of Appendix B, and any changes shall take into account the cost factors originally involved in all joint use existing at that time under this Agreement.

ARTICLE XIII

DEFAULTS

(a) If either party shall default in any of its obligations under this Agreement and such default continues thirty (30) days after due notice thereof in writing by the other party, the party not in default may suspend the rights of the party in default in so far as concerns the granting of future joint use and if such default shall continue for a period of..... days after such suspension, the party not in default may forthwith terminate this Agreement as far as concerns the future granting of joint use.

(b) If either party shall make default in the performance of any work it is obligated to do under this Agreement at its sole expense, the other party may elect to do such work, and the party in default shall reimburse the other party for the cost thereof. Failure on the part of the defaulting party to make such payment within days upon presentation of bills therefor shall, at the election of the other party, constitute a default under Section (a) of this Article.

ARTICLE XIV

EXISTING RIGHTS OF OTHER PARTIES

(a) If either of the parties hereto has, prior to the execution of this Agreement, conferred upon others, not parties to this Agreement, by contract or otherwise, rights or privileges to use any poles covered by this Agreement, nothing herein contained shall be construed as affecting such rights or privileges, and either party hereto shall have the right, by contract or otherwise, to continue and extend such existing rights or privileges, it being expressly understood, however, that for the purpose of this Agreement, the attachments of any such outside party, except those of a municipality or other public authority, shall be treated as attachments belonging to the grantor, and the rights, obligations, and liabilities hereunder of the grantor in respect to such attachments shall be the same as if it were the actual owner thereof.

(b) Where municipal regulations require either party to allow the use of its poles for fire alarm, police, or other like signal systems, such use shall be permitted under the terms of this Article, provided attachments of such parties are placed and maintained in accordance with the specifications mentioned in Article III.

ARTICLE XV

ASSIGNMENT OF RIGHTS

Except as otherwise provided in this Agreement, neither party hereto shall assign or otherwise dispose of this Agreement or any of its rights or interests hereunder, or in any of the jointly used poles, or the attachments or rights of way covered by this Agreement, to any firm, corporation or individual, without the written consent of the other party, except to the United States of America or any agency thereof; provided, however, that nothing herein contained shall prevent or limit the right of either party to mortgage any or all of its property, rights, privileges, and franchises, or lease or transfer any of them to another corporation organized for the purpose of conducting a business of the same general character as that of such party, or to enter into any merger or consolidation; and, in case of the foreclosure of such mortgage, or in case of such lease, transfer, merger, or consolidation, its rights and obligations hereunder shall pass to, and be acquired and assumed by, the purchaser on foreclosure, the transferee, lessee, assignee, merging or consolidating company, as the case may be; and provided, further, that subject to all of the terms and conditions of this Agreement, either party may permit any corporation conducting a business of the same general character as that of such party, and owned, operated, leased and controlled by it, or associated or affiliated with it in interest, or connecting with it, the use of all or any part of the space reserved hereunder on any pole covered by this Agreement for the attachments used by such party in the conduct of its said business; and for the purpose of this Agreement, all such attachments maintained on any such pole by the permission as aforesaid of either party hereto shall be considered as the attachments of the party granting such permission, and the rights, obligations and liabilities of such party under this Agreement, with respect to such attachments, shall be the same as if it were the actual owner thereof.

ARTICLE XVI

WAIVER OF TERMS OR CONDITIONS

The failure of either party to enforce or insist upon compliance with any of the terms or conditions of this Agreement shall not constitute a general waiver or relinquishment of any such terms or conditions, but the same shall be and remain at all times in full force and effect.

ARTICLE XVII

PAYMENT OF TAXES

Each party shall pay all taxes and assessments lawfully levied on its own property upon said jointly used poles, and the taxes and the assessments which are levied on said joint poles shall be paid by the owner thereof, but any tax, fee, or charge levied on owner's poles solely because of their use by the licensee shall be paid by the licensee.

ARTICLE XVIII

BILLS AND PAYMENT FOR WORK

Upon the completion of work performed hereunder by either party, the expense of which is to be borne wholly or in part by the other party, the party performing the work shall present to the other party within.....days after the completion of such work an itemized statement of the costs and such other party shall within.....days after such statement is presented pay to the party doing the work such other party's proportion of the cost of said work.

ARTICLE XIX

SERVICE OF NOTICES

Whenever in this Agreement notice is provided to be given by either party hereto to the other, such notice shall be in writing and given by letter mailed, or by personal delivery, to the Cooperative at its office at _____, or to the Telephone Company at its office at _____, as the case may be, or to such other address as either party may from time to time designate in writing for that purpose.

ARTICLE XX

TERM OF AGREEMENT

Subject to the provisions of Article XIII, Defaults, herein, this Agreement shall remain in effect until terminated at the end of 25 years from the date hereof or thereafter upon the giving of written notice to the other party not less than three years prior to the date of termination.

ARTICLE XXI

EXISTING CONTRACTS

All existing agreements between the parties hereto for the joint use of poles are by mutual consent hereby abrogated and superseded by this Agreement. Nothing in the foregoing shall preclude the parties to this Agreement from preparing such supplemental operating routines or working practices as they mutually agree to be necessary or desirable to effectively administer the provisions of this Agreement.

ARTICLE XXII

APPROVAL OF ADMINISTRATOR

This Agreement, and any amendment thereof, shall be effective subject to the condition that, during any period in which the Cooperative is a borrower from the Rural Electrification Administration, the Agreement and any amendment thereof shall have the approval in writing of the Administrator of the Rural Electrification Administration. In witness whereof, the parties hereto, have caused these presents to be executed in triplicate, and their corporate seals to be affixed thereto by their respective officers thereunto duly authorized, on the _____ day of _____, 19____.

(Seal)

By _____

Attest:

(Seal)

By _____

Attest:

APPENDIX A

This Appendix contains tables of pole values to be used in dividing costs as provided under Article VIII. It also outlines the steps for adjusting such values to determine any payments that the licensee must make to the owner to defray costs of premature replacement of poles to accommodate the licensee.

A. Tabulation of New Pole Costs.

The following tabulation shall list mutually agreed upon average costs in place of new poles of all kinds of timber, including only such cost items as are repetitive when poles are replaced.

Table 1

Height	CLASS									
	1	2	3	4	5	6	7	8	9	10
20'										
22'										
25'										
30'										
35'										
40'										
45'										
50'										
55'										
60'										

B. Age Factor for Modifying Values of Poles.

1. The following table of age factors shall be used in adjusting pole costs in Table 1 to arrive at current values in place of existing poles coming under the provisions of this Agreement.

Table 2

Age of Pole	0-3 years	4-9 years	10-15 years	16-21 years	22-27 years	over 27 years
Factor	1.0	.8	.6	.4	.2	0

C. Cost Level Factor.

1. The values obtained from B are to be modified further by the following factors to allow for periodic variation in pole cost levels.

Table 3

For poles set prior to Jan. 1, 1937		
For poles set between Jan. 1, 1937	and Jan. 1, 1945	.5
For poles set between Jan. 1, 1945	and	.7
For poles set between	and	1.0

2. It is intended that additional factors will be added to cover future long term changes in costs.

D. Salvage Value of Poles.

1. A figure of 70% of current material costs shall be used for computing salvage values of poles which have been installed not exceeding 10 years. Average values for all kinds of timber shall be used. The following table sets forth mutually agreed upon salvage values.

Table 4

Height	CLASS									
	1	2	3	4	5	6	7	8	9	10
20'										
22'										
25'										
30'										
35'										
40'										
45'										
50'										
55'										
60'										

2. For poles installed longer than 10 years it shall be assumed that the salvage value is equal to the cost of removal.

Note: This is based on assumption that owner should bear an increasing portion of cost of removal as poles age.

E. Cost of Removal.

1. The following table sets forth mutually agreed upon total costs of removing poles.

Table 5

Height	Cost of Removal
25' or less	
30'	
35'	
40'	
45'	
50'	
55'	

Note:
Annual variations
in costs of removal
neglected.

F. Anchors.

1. The cost in place of all anchors regardless of size, type or number of thimbles shall be deemed to be.....for use in applying the provisions of this Agreement.

APPENDIX B

This Appendix describes the basic principles and guides which have been used under this Agreement in setting the rents specified in Article XI and which are to be used in making periodical adjustments of rentals as provided for in Article XII.

Under these principles the rentals are intended, in so far as it is practicable, to result in a sharing of the economies realized by the joint use of pole plant in proportion to the relative costs of separate pole line construction.

The procedures outlined herein take into account the following objectives:

1. An equitable division of savings regardless of the number of jointly used poles owned by each party.
2. Rental rates applicable universally in the area covered by the Agreement regardless of whether the pole lines involved are initially constructed with joint use in view or are existing lines modified for joint use.
3. Appropriate allowance in the rental rates for additional costs incurred by each party in supplying 'normal joint poles', as defined in the Agreement, and the costs of other items required in the joint use of poles which would not be incurred in separate line construction.
4. Rentals based on the costs of "typical miles" of separate lines, of newly constructed joint lines and of existing lines modified to make them suitable for joint use. The 'per mile' values of rentals are then reduced to 'per pole' values for purposes of simplifying tabulations and to provide for the joint use of scattered poles.

The rentals are the dollar values resulting from the licensee paying to the owner, as annual rental, an amount representing the annual charge on a separate line for the licensee less the sum of (a) the annual charges on the additional costs incurred by the licensee in establishing joint use and (b) the licensee's share of the total annual savings. This share is the ratio of the Licensee's typical separate line costs to the sum of the typical separate line costs of each of the parties.

The annual rent payable can also be stated as follows:

Licensee's annual rent	Equals	Annual charges saved by licensee through not having to build a separate line	Less	Licensee's appropriate percentage	Of	Total savings in annual charges realized through joint use
---------------------------	--------	--	------	---	----	---

The cost in place of a line of poles is made up of a number of factors including such items as right-of-way solicitation, clearing, staking, direct labor and material costs of bare poles in place and pro rata shares of construction supervision and overhead. These costs, for a specific area, may differ considerably from corresponding costs in other parts of the country. These variations in pole line costs will, however, affect both power and telephone lines to about the same degree.

The parties to this contract will mutually agree on the average cost of a typical mile of 35 foot, class 6 poles in place in their common area. Below are tabulated appropriate rentals over a range of typical mile costs. From this tabulation the parties shall use the rental payments associated with the value nearest to the agreed upon average cost.

RENTAL PAYMENTS

Where the mutually
agreed upon average
cost per mile of 36
foot class 6 poles in
place approximates

The Telephone Company's annual
rental payment per pole to the
Cooperative will be

The Cooperative's
annual rental pay-
ment per pole to
the Telephone
Company will be

\$350*	\$1.00	\$1.70
410	1.10	1.80
470	1.20	1.90
530	1.30	2.00
590	1.40	2.10
650	1.50	2.20
710	1.60	2.30
770**	1.70	2.40

* Rentals associated with this amount are minimum and applicable for all lower costs.

** If average costs are substantially higher than this value, appropriate rentals should be determined by agreement.

EXHIBIT WA-32

1 the utility's pole-related costs are allocated to a given attaching entity. These
2 three components are multiplied in a simple straightforward manner.

3 Expressed as an equation, the FCC Cable Rate formula is as follows:

4 ***Cable Rate Formula =***

5 *Net Bare Pole Cost (NBP) x Carrying Charge Factor (CCF) x Space Allocation*
6 *Factor (SAF)*

7 *Where the SAF = Space Occupied by Attacher / Usable Space on Pole*

8 Using the widely accepted FCC presumptions of a 37.5-foot joint use pole, with
9 13.5 feet of usable space, 24 feet of unusable space,²¹ and 1 foot of space
10 occupied by the attacher, the cost allocation factor—applicable to the costs of the
11 entire pole—is 1/13.5 share or 7.41%.²² As with any presumptive value in the
12 formula, to the extent there is actual (or statistically significant) utility or attacher
13 specific data to support the use of alternative space presumptions those can be
14 used in lieu of the FCC's established space presumptions subject to Commission
15 oversight. So, for example, if actual data exists to support use of a 35-foot joint
16 use pole with 11 feet of usable space and 24 feet of unusable space, the space
17 allocation factor would be 1/11 share or 9.09%. The allocation of the costs of the
18 entire pole under the Cable Rate using FCC space presumptions is illustrated
19 graphically in Exhibit PDK-3 to this testimony.

20 **V. ECONOMIC RATIONALE FOR THE CABLE RATE'S**
21 **PROPORTIONAL COST ALLOCATOR**

22 **Q. The defining feature of the Cable Rate methodology is its third component,**
23 **i.e., the space allocation factor used to allocate the annual costs attributable**

²¹ This corresponds to 18 feet above ground clearance and 6 feet of below ground support.

²² See 47 C.F.R. § 1.1418.

EXHIBIT WA-33

Blue Ridge EMC
Rental Rate Formula Comparison
FY 2014, 2015, 2016

Space Allocation:

Space occupied by attacher

Safety Space

Usable Space

Usable Space Factor

Unusable space (Support)

Unusable Space Allocation Factor

Number of attaching entities

Pole height

Space Allocation % - Licensee

APSC		
2014	2015	2016
1.11	1.11	1.11
30.63	30.61	30.59
66.67%	66.67%	66.67%
2.35	2.35	2.35
36.83	36.85	36.87
26.61%	26.58%	26.55%

TVA		
2014	2015	2016
1.11	1.11	1.11
3.33	3.33	3.33
27.30	27.28	27.26
2.35	2.35	2.35
36.83	36.85	36.87
41.25%	41.21%	41.16%

APPA		
2014	2015	2016
1.11	1.11	1.11
6.20	6.24	6.28
3.01%	3.01%	3.01%
30.63	30.61	30.59
35.39%	35.35%	35.31%
2.35	2.35	2.35
36.83	36.85	36.87
38.40%	38.36%	38.32%

FCC Telecom Plus		
2014	2015	2016
1.11	1.11	1.11
27.30	27.28	27.26
1.00	1.00	1.00
2.35	2.35	2.35
36.83	36.85	36.87
34.56%	34.51%	34.47%

FCC Cable Only		
2014	2015	2016
1.11	1.11	1.11
9.53	9.57	9.61
11.65%	11.60%	11.55%

Net Cost of Bare Pole

\$262.73	\$262.19	\$258.30
----------	----------	----------

\$262.73	\$262.19	\$258.30
----------	----------	----------

\$398.02	\$406.94	\$413.21
----------	----------	----------

\$262.73	\$262.19	\$258.30
----------	----------	----------

\$262.73	\$262.19	\$258.30
----------	----------	----------

Carrying Charges:

Administrative

Maintenance

Depreciation

Taxes

Return on Investment

Total Carrying Charges

3.49%	3.33%	3.24%
6.81%	6.84%	7.30%
5.45%	5.59%	5.76%
0.74%	0.50%	0.57%
8.00%	8.00%	8.00%
24.49%	24.26%	24.87%

3.49%	3.33%	3.24%
6.80%	6.83%	6.91%
5.45%	5.59%	5.76%
0.74%	0.50%	0.57%
8.50%	8.50%	8.50%
24.99%	24.76%	24.98%

2.39%	2.24%	2.12%
4.85%	4.83%	5.05%
3.60%	3.60%	3.60%
0.51%	0.34%	0.37%
7.43%	7.25%	6.88%
18.77%	18.25%	18.02%

3.49%	3.33%	3.24%
6.81%	6.84%	7.30%
5.45%	5.59%	5.76%
0.74%	0.50%	0.57%
11.25%	11.25%	11.00%
27.74%	27.51%	27.87%

3.49%	3.33%	3.24%
6.81%	6.84%	7.30%
5.45%	5.59%	5.76%
0.74%	0.50%	0.57%
11.25%	11.25%	11.00%
27.74%	27.51%	27.87%

Rate

\$17.12	\$16.91	\$17.05
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\$27.08	\$26.75	\$26.56
---------	---------	---------

\$28.69	\$28.50	\$28.54
---------	---------	---------

\$25.19	\$24.90	\$24.81
---------	---------	---------

\$8.49	\$8.37	\$8.31
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FCC CABLE-ONLY RATE
Blue Ridge EMC
FY 2014 Data

Line #	Description	Amount	Definition
Attacher Responsibility Percentage			
1	Space occupied	1.11	Per audit
2	Total usable space	9.53	Calculation-includes Safety Space
3	Attacher responsibility percentage	11.65%	Line 1/Line 2
Net Cost of a Bare Pole			
4	Gross pole investment (Acct. 364)	49,295,043	
5	Accumulated depreciation for poles	16,755,290	
6	Accumulated deferred income taxes	0	
7	Net pole investment	32,539,753	Line 4 - Line 5 - Line 6
8	Appurtenance factor	87.00%	
9	Net pole investment allocable to attachments	28,309,585	Line 7 x Line 8
10	Total number of poles	107,751	
11	Net cost of a bare pole	\$262.73	Line 9/Line 10
Carrying Charge			
12	Total general and administrative	10,164,119	
13	Total electric plant in service	425,883,764	
14	Total electric plant accumulated depreciation	134,648,942	
15	Total electric plant accumulated deferred income taxes	0	
16	Administrative carrying charge	3.49%	Line 12/(Line 13 - Line 14 - Line 15)
17	Maintenance expense for overhead lines	7,674,619	
18	Pole investment in Accts. 364, 365, & 369	158,218,973	
19	Depreciation (poles) related to Accts. 364, 365, & 369	45,505,682	
20	Accumulated deferred income taxes for 364, 365, & 369	0	
21	Maintenance carrying charge	6.81%	Line 17/(Line 18 - Line 19 - Line 20)
22	Gross pole investment (Acct. 364)	49,295,043	
23	Net pole investment	32,539,753	Line 7
24	Depreciation rate for gross pole Investment	3.60%	
25	Depreciation carrying charge	5.45%	(Line 22/Line 23) x Line 24
26	Taxes (Accts. 408.1 + 409.1 + 410.1 + 411.4 - 411.1)	2,160,782	
27	Total utility plant in service	425,883,764	
28	Total company accumulated depreciation	134,648,942	
29	Total company accumulated deferred income taxes	0	
30	Taxes carrying charge	0.74%	Line 26/(Line 27 - Line 28 - Line 29)
31	Applicable rate of return (default)	11.25%	Presumption
32	Return carrying charge	11.25%	
33	Total carrying charges	27.74%	Line 16 + Line 21 + Line 25 + Line 30 + Line 32
RATE			
34	Attacher responsibility percentage	11.65%	Line 3
35	Net cost of a bare pole	\$262.73	Line 11
36	Total carrying charges	27.74%	Line 33
37	Pole attachment rate for cable-only	8.49	Line 34 x Line 35 x Line 36

FCC CABLE-ONLY RATE

Blue Ridge EMC

FY 2015 Data

Line #	Description	Amount	Definition
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Attacher Responsibility Percentage

1	Space occupied	1.11	Per audit
2	Total usable space	9.57	Calculation-includes Safety Space
3	Attacher responsibility percentage	11.60%	Line 1/Line 2

Net Cost of a Bare Pole

4	Gross pole investment (Acct. 364)	50,390,546	
5	Accumulated depreciation for poles	17,924,217	
6	Accumulated deferred income taxes	0	
7	Net pole investment	32,466,329	Line 4 - Line 5 - Line 6
8	Appurtenance factor	87.29%	
9	Net pole investment allocable to attachments	28,339,266	Line 7 x Line 8
10	Total number of poles	108,086	
11	Net cost of a bare pole	\$262.19	Line 9/Line 10

Carrying Charge

12	Total general and administrative	9,870,339	
13	Total electric plant in service	440,866,858	
14	Total electric plant accumulated depreciation	144,871,920	
15	Total electric plant accumulated deferred income taxes	0	
16	Administrative carrying charge	3.33%	Line 12/(Line 13 - Line 14 - Line 15)
17	Maintenance expense for overhead lines	7,951,569	
18	Pole investment in Accts. 364, 365, & 369	164,546,374	
19	Depreciation (poles) related to Accts. 364, 365, & 369	48,323,315	
20	Accumulated deferred income taxes for 364, 365, & 369	0	
21	Maintenance carrying charge	6.84%	Line 17/(Line 18 - Line 19 - Line 20)
22	Gross pole investment (Acct. 364)	50,390,546	
23	Net pole investment	32,466,329	Line 7
24	Depreciation rate for gross pole Investment	3.60%	
25	Depreciation carrying charge	5.59%	(Line 22/Line 23) x Line 24
26	Taxes (Accts. 408.1 + 409.1 + 410.1 + 411.4 - 411.1)	1,477,001	
27	Total utility plant in service	440,866,858	
28	Total company accumulated depreciation	144,871,920	
29	Total company accumulated deferred income taxes	0	
30	Taxes carrying charge	0.50%	Line 26/(Line 27 - Line 28 - Line 29)
31	Applicable rate of return (default)	11.25%	Presumption
32	Return carrying charge	11.25%	
33	Total carrying charges	27.51%	Line 16 + Line 21 + Line 25 + Line 30 + Line 32

RATE

34	Attacher responsibility percentage	11.60%	Line 3
35	Net cost of a bare pole	\$262.19	Line 11
36	Total carrying charges	27.51%	Line 33
37	Pole attachment rate for cable-only	8.37	Line 34 x Line 35 x Line 36

FCC CABLE-ONLY RATE
Blue Ridge EMC
FY 2016 Data

Line #	Description	Amount	Definition
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Attacher Responsibility Percentage

1	Space occupied	1.11	Per Audit
2	Total usable space	9.61	Calculated - Includes Safety Space
3	Attacher responsibility percentage	11.55%	Line 1/Line 2

Net Cost of a Bare Pole

4	Gross pole investment (Acct. 364)	51,209,182	
5	Accumulated depreciation for poles	19,197,595	
6	Accumulated deferred income taxes	0	
7	Net pole investment	32,011,587	Line 4 - Line 5 - Line 6
8	Appurtenance factor	87.41%	
9	Net pole investment allocable to attachments	27,981,967	Line 7 x Line 8
10	Total number of poles	108,330	
11	Net cost of a bare pole	\$258.30	Line 9/Line 10

Carrying Charge

12	Total general and administrative	9,666,925	
13	Total electric plant in service	454,916,323	
14	Total electric plant accumulated depreciation	156,430,349	
15	Total electric plant accumulated deferred income taxes	0	
16	Administrative carrying charge	3.24%	Line 12/(Line 13 - Line 14 - Line 15)
17	Maintenance expense for overhead lines	8,486,535	
18	Pole investment in Accts. 364, 365, & 369	168,093,587	
19	Depreciation (poles) related to Accts. 364, 365, & 369	51,825,495	
20	Accumulated deferred income taxes for 364, 365, & 369	0	
21	Maintenance carrying charge	7.30%	Line 17/(Line 18 - Line 19 - Line 20)
22	Gross pole investment (Acct. 364)	51,209,182	
23	Net pole investment	32,011,587	Line 7
24	Depreciation rate for gross pole Investment	3.60%	
25	Depreciation carrying charge	5.76%	(Line 22/Line 23) x Line 24
26	Taxes (Accts. 408.1 + 409.1 + 410.1 + 411.4 - 411.1)	1,698,970	
27	Total utility plant in service	454,916,323	
28	Total company accumulated depreciation	156,430,349	
29	Total company accumulated deferred income taxes	0	
30	Taxes carrying charge	0.57%	Line 26/(Line 27 - Line 28 - Line 29)
31	Applicable rate of return (default)	11.00%	Presumption
32	Return carrying charge	11.00%	
33	Total carrying charges	27.87%	Line 16 + Line 21 + Line 25 + Line 30 + Line 32

RATE

34	Attacher responsibility percentage	11.55%	Line 3
35	Net cost of a bare pole	\$258.30	Line 11
36	Total carrying charges	27.87%	Line 33
37	Pole attachment rate for cable-only	8.31	Line 34 x Line 35 x Line 36

EXHIBIT WA-34

REDACTED /

CONFIDENTIAL

EXHIBIT WA-35

McNAIR, McLEMORE, MIDDLEBROOKS & Co., LLP
CERTIFIED PUBLIC ACCOUNTANTS
A PARTNERSHIP INCLUDING A PROFESSIONAL CORPORATION

PUBLIC

RALPH S. McLEMORE, SR., C.P.A. (1963-1977)
SIDNEY B. McNAIR, C.P.A. (1954-1992)

SIDNEY E. MIDDLEBROOKS, C.P.A., P.C.
RAY C. PEARSON, C.P.A.
J. RANDOLPH NICHOLS, C.P.A.
WILLIAM H. EPPS, JR., C.P.A.
RAYMOND A. PIPPIN, JR., C.P.A.
JERRY A. WOLFE, C.P.A.
W. E. BARFIELD, JR., C.P.A.
HOWARD S. HOLLEMAN, C.P.A.
F. GAY McMICHAEL, C.P.A.
RICHARD A. WHITTEN, JR., C.P.A.
ELIZABETH WARE HARDIN, C.P.A.
CAROLINE E. GRIFFIN, C.P.A.
RONNIE K. GILBERT, C.P.A.

389 MULBERRY STREET
POST OFFICE BOX ONE
MACON, GEORGIA 31202
(912) 746-6277
FAX (912) 741-8353

1117 MORNINGSIDE DRIVE
POST OFFICE BOX 1287
PERRY, GA 31069
(912) 987-0947
FAX (912) 987-0526

July 23, 1998

Ms. Roberta D. Purcell
Assistant Administrator
Program Accounting and Regulatory Analysis
USDA-RUS, Room 4063
14th & Independence Ave., SW
Washington, D.C. 20250

Dear Ms. Purcell:

As we previously discussed, the Georgia cooperatives are negotiating a joint use agreement with BellSouth.

BellSouth has stated "Booked cost is the only acceptable cost for calculation of joint use rental" (Exhibit A). The cooperatives disagree with this position based on the following:

- Cooperatives have used average historical cost for retirements. This is the method of retirement provided for in RUS Bulletin 1767B-2, 8.4.4 (Exhibit B). This method has been consistently applied by all the cooperatives and has resulted in plant being retired at a value higher than the original cost. The effect is to understate gross plant, accumulated depreciation expense and depreciation rates.
- The Investor-Owned Utilities (IOUs) in Georgia utilize vintage retirement rather than average historical cost.
- Based on data obtained from FERC Form 1, pole costs for IOUs in Georgia range from approximately \$485 (Exhibit C) to \$525 (Exhibit D) per pole. Pole cost utilizing book values for Georgia cooperatives is approximately \$210 per pole (Exhibit E). The cooperatives and IOUs to a great degree utilize common suppliers and contractors to obtain, install and remove poles. The conclusion is the methodology for retiring plant is the primary cause of the significantly lower book costs for the cooperatives.

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July 23, 1998

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- The cooperative's do not have vintage retirement unit costs, so in order to establish the cost of poles currently in place, we utilized the following alternative costing methodology. Costing methodology was to:
 - Select 3 cooperatives (urban, suburban, rural) representing approximately 20% of the joint use poles.
 - Determine 1997 pole cost.
 - Obtain additions and retirement data for over 30 years for selected cooperatives.
 - Have an independent statistician apply the additions and retirements to the Iowa survivor curve in a program maintained by the Interstate Commerce Commission (Exhibit F).
 - Utilize the Iowa survivor curve data to determine the number of surviving poles by year installed.
 - Utilize the Handy Whitman Index for wooden utility poles (see attachment) in the South Atlantic Region to determine post cost for years prior to 1997 (Exhibit G).
- The result indicated the average pole cost for the cooperatives in the sample, exclusive of anchor and guys, was \$233 for poles 35' and under and \$412 for 40' poles (Exhibit H).

Based on the information provided, would you let me know if RUS recognizes the cost discrepancies which result from utilizing historical average costing for retirement purposes and recognizes that vintage retirement provides better cost data and your opinion as to whether our alternative approach based on data available provides better costing data than the utilization of average historical cost for retirements. In addition, would you recommend cooperatives convert from the current method to vintage retirement and if so, what data is necessary from RUS's perspective in order to convert. Please give me a call if you have any questions or need any additional information.

Respectfully,



J. Randolph Nichols

JRN/lja

Enclosures

cc: Tim Clower (Enclosures)
Will Arnett (Enclosures)
Mike Whiteside
Hugh Richardson

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United States Department of Agriculture
Rural Development

Rural Business-Cooperative Service • Rural Housing Service • Rural Utilities Service
Washington, DC 20250

AUG - 4 1998

Mr. J. Randolph Nichols
McNair, McLemore, Middlebrooks & Co., LLP
P.O. Box 1
Macon, Georgia 31202

Dear Mr. Nichols:

We have reviewed the information included in your letter dated July 23, 1998, and offer the following comments.

The Uniform System of Accounts as set forth in 7 CFR Part 1767, Accounting Requirements for RUS Electric Borrowers, establishes the requirement that all Rural Utilities Service (RUS) electric borrowers establish continuing property records (CPRs). The Uniform System of Accounts does not, however, specify a method for establishing and maintaining those records. In the 1930s, 1940s, and 1950s, when many of the RUS electric cooperatives were founded, plant costs were relatively stable from year to year and inflationary trends were nonexistent. Because the RUS systems were small with few employees, RUS developed an average-cost CPR system that required a minimal amount of recordkeeping. Each time a unit was added to plant, its cost was factored into the average cost of all units within that CPR category. When a unit was retired, it was retired at the then-current, average cost of the units within the CPR.

As indicated in your letter, RUS Bulletin 1767 B-2, Work Order Procedure (Electric), still provides for the use of the average cost method. During times of rising costs, however, the average cost method materially understates plant values. Typically, it is the older, lower cost units that are first retired on a system. When these units are retired at an inflated average cost, one that is more reflective of current-day prices, the system value is inappropriately reduced. For example, a pole originally recorded on a cooperative's books and records at \$100 may be retired at an average cost of \$300. In so doing, plant is understated by \$200 as a result of that one retirement.

It is for this reason that RUS is actively encouraging its borrowers to adopt vintage year property records. Under a vintage-year property record system, all plant items within a CPR that are placed in service in a single year are considered to be a distinct group for depreciation purposes (e.g. all poles placed in service in 1995 would represent one vintage while poles placed in service in 1996 would represent another). When a unit is retired, it is retired at the vintage's average cost thereby more accurately reflecting its actual cost.

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Nov 06 2017

Mr. J. Randolph Nichols

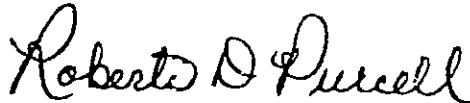
2

Studies have shown that any RUS cooperative utilizing an average-cost CPR system will have an undervalued system. Systems in areas that have experienced significant growth during the last 20 years will be materially undervalued. When RUS borrowers have performed system-wide inventories to establish vintage year property records, recorded plant values have ranged from between 50 and 65 percent of their actual original cost.

As indicated in your letter, vintage-year property values can be established utilizing the Iowa survivor curves. With the information available from a borrower's records, the number of units and dollars installed each year as well as the number and dollar balances at year's end can be determined. We can also determine the total number of units retired; however, we will not know in which year the unit retired was first placed into service (vintage year). From this information, simulated vintage-year plant records can be developed through a type of regression analysis. By taking the known additions and ending balance for each year, we can "simulate" the vintage retirements that would occur under the retirement pattern of each of the Iowa curves. Each simulated curve is then matched against actual data to determine the best curve fit.

Based upon the information provided with your letter, it appears that the Georgia cooperatives have performed a similar procedure in determining their pole values. The data presented is consistent with the data and conclusions that have been drawn from depreciation studies performed by RUS cooperatives throughout the country. If you have any questions or if we can be of any further assistance, please contact us.

Sincerely,



ROBERTA D. PURCELL
Assistant Administrator
Program Accounting and
Regulatory Analysis