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PRACTICAL JOINT POLE CONSTRUCTION

BY J. E. MACDONALD

The object of this paper is to set forth the Los Angeles method of joint pole construction, which five years of practise has proven to be a workable scheme.

Independent operation, accompanied by very rapid development and expansion, had permitted pole conditions to become extremely objectionable to the public as well as to the corporations responsible for them. This reached a critical stage in 1906, when agitation for underground subways for all public utilities marked the beginning of the present cooperative policy. Distribution by the underground method, except in the business district, is impracticable, for the reason that the populated districts demanding service are scattered over a very wide range of territory, there being entire absence of congestion anywhere.

The problem of joint pole construction was taken up for solution by the principal companies and the result was a general agreement covering the different phases of the work as seemed best fitted for local conditions. These conditions were favorable for the consummation of the project. The old construction stood out boldly as an object lesson in dangerous and unsightly congestion. The undeveloped but rapidly growing districts offered a field for trying the proposition under favorable conditions without any complications. There were some problems in the older districts which were not so readily solved, chief of these being difficulty of eliminating the capital charges against the existing overhead system of each operating company. It is evident that if any poles are removed before the expiration of their natural life, or if wires are transferred which are providing adequate service, then a certain portion of the original invest-

ment must be absorbed in some manner in reconstructing on joint poles. This factor was given proper consideration in the preliminary investigations made in arriving at a satisfactory working agreement. A policy was adopted making the participation in such joint construction entirely optional with each company. However, when any poles are set, it is always with a view to providing space for all parties operating in such location. Even with this liberal policy, there have been but few cases where all companies have not found it to their advantage and profit to immediately join in such construction. Notwithstanding this condition, there has been no unequal division of the financial responsibilities, neither has there been any reason to suspect that the joint work has helped the financing of one project at the expense of another.

The working agreement, which was executed by nine companies operating in common territory, assigned the executive powers to a committee, acting without compensation. This committee is comprised of one representative from each member company, all representatives having similar authority regardless of the pole plant owned by the company represented. A secretary, appointed by the committee, is actively in charge of the details of the combination work. An officer is maintained independently of the affiliated companies, the expense being prorated uniformly against these member companies. The committee meets monthly for the discussion of combination work, and the consideration of mutual problems. The secretary is advised of all contemplated construction and reconstruction, and plans are made accordingly to provide for the service of all companies operating in the section, where proposed construction or reconstruction is to be undertaken.

The agreement makes certain fundamental stipulations; it defines the general purpose and intention of the agreement; it places certain necessary restrictions on joint work, defining the limits of good practice; it specifies the method of operating under the agreement; the term of agreement and responsibility of each company is predetermined as far as practicable; it limits the manner of occupying and space to be occupied by each party; it fixes valuations and charges, and prescribes regulations governing special expenses and maintenance.

In addition to the foregoing fundamentals, certain general regulations, which should not be considered as arbitrary rulings, have been adopted.

1. *Combined Use of Existing Poles.* In the combination use of existing poles, the combining parties use the highest or most satisfactory poles in the location where it is desired to make combination. The owner of same is permitted to bill the combining parties for a proportional interest at the rate which has been fixed for the valuation of such poles.

2. *Reconstruction by Owning Parties.* When it is desired to reconstruct a pole line in location where none of the existing poles are suitable for combination use, one of the parties operating in this location sets new poles of standard size and length sufficient for the combination use of all parties operating in this section and for any other party which may desire to obtain space on poles. The constructing or owning party then sells a proportional interest to each party making the combination at the rate which has been fixed for the valuation of such poles. Each party transfers its wires and removes its poles at its own expense.

3. *Reconstruction by New Coming Party.* When the party is occupying a favorable location on any street or highway, and a second party desires to build a pole line in the same location, if the construction of the first party is entirely satisfactory and adequate for present and future needs, that party is not obligated to assume any expense in connection with the joint occupation of the new pole line built by the second party. The latter builds pole line suitable for combination use of both parties, and grants and assigns an interest in same to the first party without charge, except that the first party transfers its wires, cross arms and fixtures at its own expense from old poles to new poles. This party removes its poles at its own expense and they remain its individual property. In special cases, however, the second party may be required to pay the entire expense incident to such transfer of wires and removal of poles, and this is determined by the committee, only those participating in the decision who are directly interested in the combination.

4. *New Pole Lines in Undeveloped Territory.* Any party desiring to construct a new pole line in location where heretofore no pole line has existed, notifies the other members, through the committee, of the proposed construction, and upon request provides space on such poles for the use of all parties who express their intention of combining in their use. The constructing party is then permitted to bill each of the combining parties for a proportional interest at the rate which has been fixed for the valuation of such poles.

5. *Renewing Poles Naturally Decayed.* All poles which have been in use as long as the committee determines that they are safe or satisfactory, or as long as the parties owning shares in same desire to use them, are replaced by new poles. The work of constructing such new pole line is undertaken by one of the parties, as determined by the committee, and this party is permitted to bill the other parties in the same manner as specified heretofore.

6. *Disposition of Joint Property Removed from Service.* Joint poles removed from service may be removed at joint expense to a place designated by the committee, where they may be sold at auction, due notice having been given to each party prior to date of sale. The proceeds of the sale are divided between the owners in proportion to the number of shares owned by each. More frequently it is desirable that such poles should be sold or disposed of before being removed, the purchaser removing same at his own expense. This may be done by mutual agreement or by an exact division of the property in proportion to the shares owned by each party.

7. *Use of Old Poles.* In the combination use of poles, those which have previously been in service elsewhere may be used, and provided that such poles are in other respects equal to new poles, are valued at the same rate as for new poles of the same height except for that portion which has been in the ground, which is considered of no value.

8. *Records.* A record map is prepared for all combinations. Poles are numbered to correspond with house numbers of adjacent property. These maps are supplements to the general agreement and furnish a complete record, specifying the number and size of poles, date when set, valuation, and such other data as may be desirable in each case. These supplements must be approved by all parties interested before any authorization for billing is permitted. A complete file of all combination work is maintained for each company by the committee.

9. *Specifications.* A specification is understood to imply only first class construction, and as a rule, deals with maximum and minimum quantities. Assuming, therefore, that each party is maintaining its lines in the highest state of efficiency, a joint specification is simply a summation of all specifications together with such modifications as are necessary to mutually protect the property of combining parties. This subject is so extensive that it cannot well be covered in a paper of this scope.



FIG. 1

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FIG. 2

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FIG. 3

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FIG. 4

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The author would refer those seeking enlightenment along this line to the specification adopted by the New York Telephone Company and the Public Service Corporation. This offers an excellent standard of construction, which is worthy of adoption. Local conditions will not demand any radical changes therefrom.

PROGRESS IN LOS ANGELES AND VICINITY

During five years of operation combinations have been recorded on 21,270 poles. By count of poles occupied by two or more parties it has been determined that the number which have been eliminated exceeds 30,000. The length of the average pole in combination use has been found to be 43.04 ft. (13.12 m.)

Figs. 1 and 2 show the condition at Sixteenth and Georgia Streets before and after reconstruction on joint poles. Sixteenth Street was widened 7.5 ft. (2.3 m.) on each side, and reconstruction was carried on by the utility companies simultaneously with the improvement of the street by the municipality.

Fig. 3 illustrates in all its crudities the results of independent operation, three lighting companies and two telephone companies maintaining individual leads on this property line. In the block shown herewith, which is 505 ft. (154 m.) long, there were ten 30 ft. (9.1 m.), nine 35 ft. (10.6 m.) and five 40 ft. (12.2 m.) poles, representing an investment in labor and material for poles alone of \$285.25. The five 40 ft. (12.2 m.) poles, at an investment of \$70.00, would have provided better clearances for all companies. Proper construction would demand 50 ft. (15.2 m.) poles in order to comply with a correct specification.

Fig. 4 represents a distributing lead on property line showing the advantage of joint construction where rights of way are not easily obtained. This is a standard form of construction where easements are usually provided in all new subdivisions for the installation of such construction.

Fig. 5 represents one of a number of square miles (1 sq. mile = 2.59 sq. km.) of territory which has been built up during the period that the companies have been operating under the joint agreement. In 1906 this section was traversed by a transmission line and a portion of single track electric railway, on private right of way, which was operated at infrequent intervals for freight traffic only. Other improvements of any kind were lacking. It is now built up with magnificent homes, representing the very best class of residence patronage for the public service corporations. Practically all the lots front east and

west, and poles have been placed on north and south property lines for distribution, while the trunk leads have been placed on main streets running east and west, upon which the electric railways have also been constructed. There are 685 combination poles shown on this plot. To accomplish the same distribution by individual construction would have required 1,903 poles, that is, provided independent construction would have been tolerated.

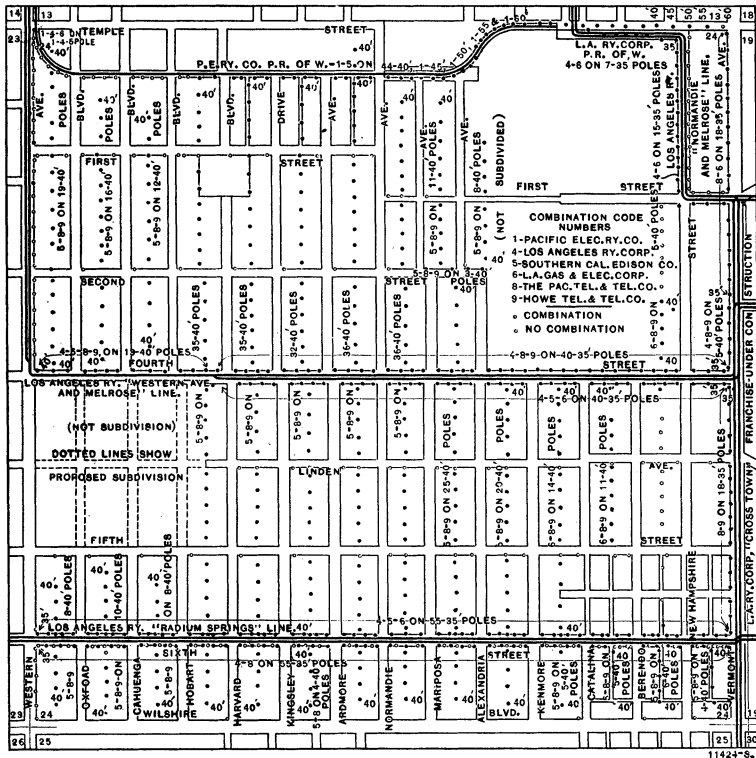


FIG. 5

In the square mile (2.59 sq.km.) there are 193 individually owned poles, which are used almost exclusively for street lighting or railway work. A few of these may ultimately become combination poles. On the south side of Sixth Street will be noted the only duplication in the entire territory. This construction was completed prior to the acceptance of the agreement by the telephone companies, and represents a superfluous pole invest-

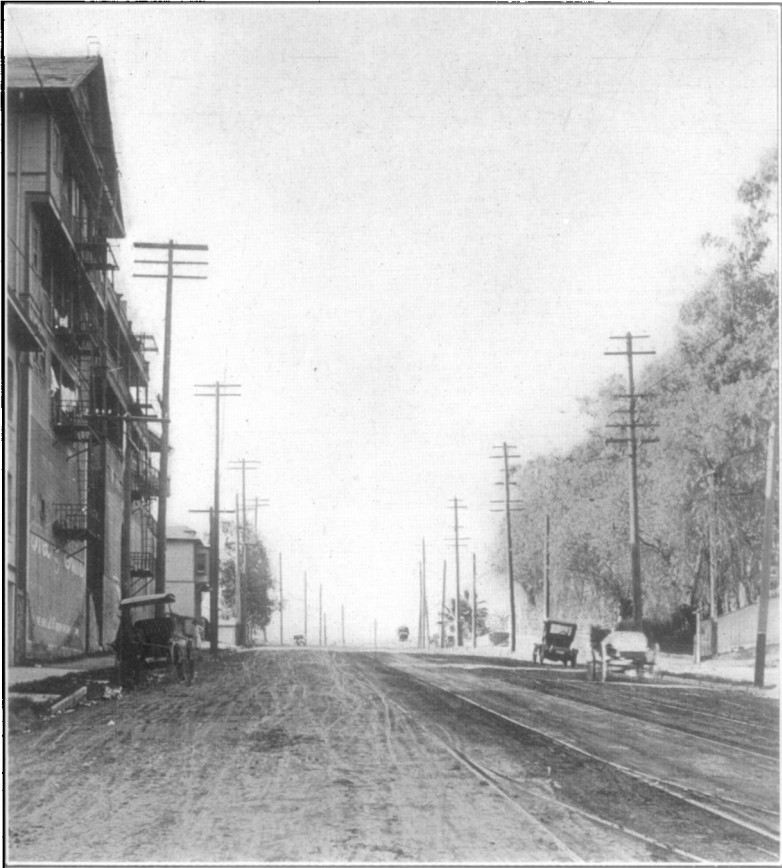


FIG. 6

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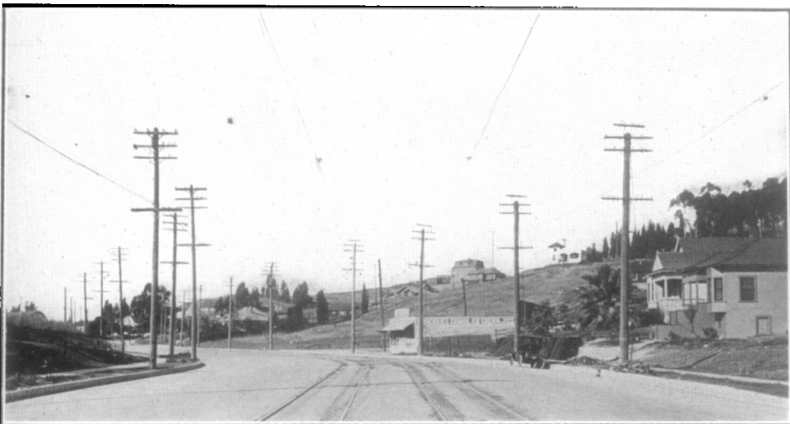


FIG. 7

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FIG. 8

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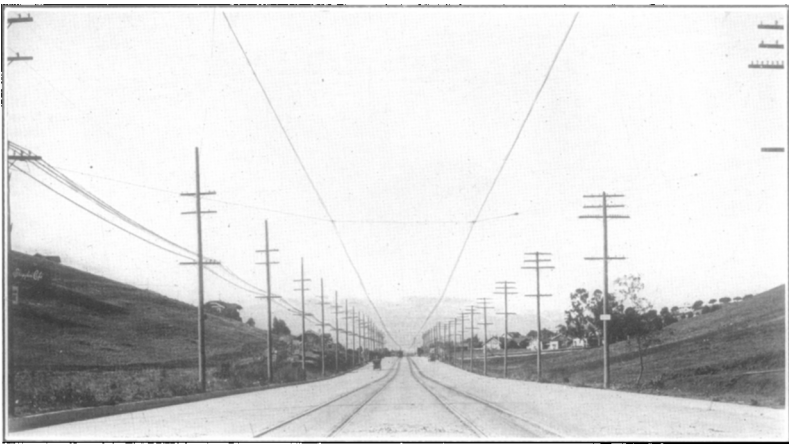


FIG. 9

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FIG. 10

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FIG. 11

[MACDONALD]



FIG. 12

[MACDONALD]



FIG. 13

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ment of approximately \$614.25. It will, therefore, be noted that failure or neglect to coöperate leads to the possibility of creating objectionable construction, which may possibly be maintained during the entire life of pole line, owing to the expense of transfer.

Figs. 6 to 13 inclusive show pole conditions on Sunset and Hollywood Boulevards, one of the principal outlets to a suburban community, and represent fairly well various types of joint construction, where conduit subways would be impracticable from a financial standpoint. These form a continuous thoroughfare, extending over seven miles (11.2 km.) in length, from the extreme limit of the present conduit district. Of this there remains a distance of less than 3,000 ft. (914 m.) which is not improved from the joint construction standpoint.

Fig. 6 shows a combination which is incomplete. The city has underway the work of widening the street and reducing the grade, and joint work is to be completed by the removal of the railway company's poles. The transmission line shown on the north side of the street is the 33,000-volt Edison line built in 1897; this portion is now being operated at 15,000 volts. Poles are in fair condition and are not unsuitable for combination use.

Fig 7 represents joint construction on a curve, where it was impossible to secure permit for anchoring on private property. Poles were trussed at joint expense. There are the municipal fire alarm, two telephone companies, a telegraph company and the railway company operating on one side of the street, and two lighting companies and the railway company on the other. The telegraph company and city are not parties to general agreement, but cooperate where lines parallel.

Fig. 8 also shows joint construction on curve; poles on outside of curve have been blocked with concrete at base and at ground line, no buying being necessary. This is a combination of one telegraph company, a telephone company and the railway company on one side of the street, and two lighting companies and the railway company on the other.

Fig. 9 represents a typical straight line combination. Vacant position has been left on top of one line of poles for future installation of transmission line for the railway company. Otherwise, the combination is the same as shown in Fig. 8, except that the view is in the opposite direction.

Figs. 10 and 11 are views taken from the same point looking

in opposite directions, one representing a completed combination, and the other a proposition which will be undertaken upon the improvement of the street by the municipality. The railway company owns private right of way in the center of street and has heretofore maintained center pole construction, this being removed in connection with the combination work.

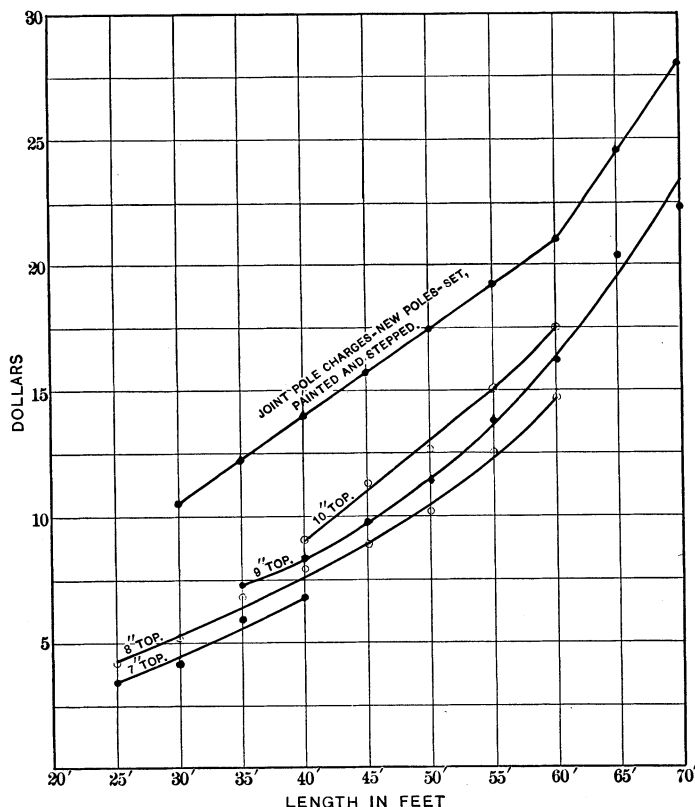


FIG. 14.—JOINT POLE CHARGES AND MARKET PRICES OF ROUND CEDAR POLES

(Los Angeles, March 1, 1912)

Figs. 12 and 13 illustrate a combination between a railway company and one telephone company, on one side of the street. On the other side is shown the conventional construction of one lighting company and of the railway company.

Fig. 14 is a series of curves showing the present market prices of poles at tidewater points, from which points distribution is

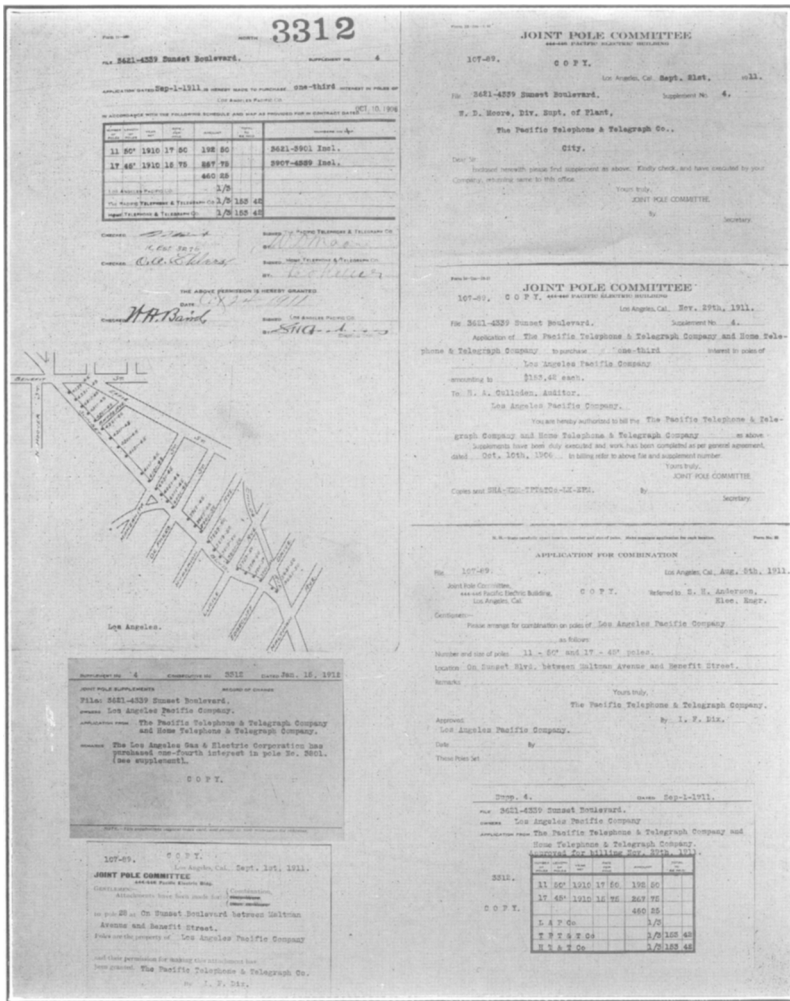


FIG. 15

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made locally. Supplementing this, is the curve showing the valuations according to the joint schedule for new poles set, painted and stepped. It will be noted that this gives a valuation of thirty-five cents per pole foot (0.3048 m.) for poles 30 to 60.ft. (9.1 to 18.3 m.) in length. Poles which have been set less than three years are assumed to be of the same value as new poles. Poles set from three to six years are assumed to be of the same value as new poles, but no value is given to that portion of the pole which is in the ground. Poles set over six years are assumed to depreciate at the rate of three and one-half cents per foot per annum, but no value is given to that portion of pole which is in the ground. During five years' operation under this schedule, it has been found that the valuations are approximately correct. The values given for 50 ft. (15.2 m.), 55 ft. (16.7 m.) and 60 ft. (18.3m.) poles are lower than they should be, but inasmuch as such poles are usually set by the party desiring the top position and the added length is often solely for this party's benefit, it has not been found that the charges prove inequitable.

Fig. 15 shows the practical application of certain forms which have been found useful in maintaining proper records of joint work.

During the five years under discussion no individual, save a newspaper reporter, has precipitated the query "does it pay?" It should not be necessary to furnish exact data on this point. The reduction in investment that is, the difference between the purchase and installation cost of over 50,000 poles independently and operated, as against 21,270 combination poles is subject to exact deduction. The difference in the maintenance and depreciation charges on them represents a quantity which may also be arrived at very closely. The saving in the maintenance and depreciation charges, at joint expense, of the combination poles for one year exceeds the cost of maintaining the office of the committee for the entire period of five years. In addition to this there are the intangible quantities, such as the saving which results from such a project as a matter of public policy; also the saving due to the entire absence of accidents on joint poles, on account of superior construction. Some of us might even figure on the conservation possibilities, taking the entire United States as a basis of action.

In conclusion it should be stated that whatever degree of success has attended the joint proposition in Los Angeles is due to

the constant and consistent policy of cooperation which actuated the engineers of the participating companies. Not a single problem has been presented for solution which has not ultimately been passed upon by unanimous vote. The defection of even one of the nine member companies, so far as participation in joint construction is concerned, could easily have introduced an element of doubt as to the success of the project.

An effort has been made in this brief paper to touch on a few of the problems which will come up for adjudication by those who endeavor to undertake similar projects in joint construction. The suggestions contained herein are the result of five years of development under practically all conditions, and it is hoped that it will be possible for others to inaugurate a system which will solve even better the problem of complete cooperation between utility corporations.

Possibly there are some operating engineers who will find it impossible to secure the cooperation of kindred or opposing interests in such a project. Public opinion is an excellent but uncertain regulator in this respect, and it is to be regretted that some corporations are glad to be publicly coerced into propositions which should have been adopted as sound business policy.

However favorable we feel toward public control, matters of equity, as between the corporations themselves, should be adjusted on an equitable basis without great legal assistance or the compelling influence of a public service commission.

There are few cities in the United States where conditions are favorable for complete underground distribution systems as a possibility of the immediate future. To attempt to accomplish even a small portion of this would be to invite possible financial difficulties. But we can and should make our overhead construction conform to certain limits of decency.
