EXCHANGE WIRE RECORD PREPARATION

CONTENTS PAGE

1. GENERAL

1.01 This section describes and illustrates the preparation of Exchange Wire Record forms.

1.02 It is reissued to:

(a) Include Forms E-4529 and E-4585.

(b) Describe multiple line wire and show a method of recording it.

Since this is a general revision, marginal arrows have been omitted.

1.03 The exhibits show entries made in the record for various conditions encountered in plant. Although there may be conditions that are not shown, the same general principles will apply.

1.04 The Forms E-4011 through E-4018, E-4529, and E-4585 provide a column or line for each item of pertinent information. The central section of the form is for the diagramming of wire and the entering of customer telephone numbers. Avoid, whenever possible, the placing of other items in this space. Allow enough space for entering each item in a neat, legible manner.

1.05 If local operations do not require certain information that is provided for in this practice, the use of those spaces or items may be omitted.

2. SELECTION OF FORMS

2.01 In selecting the proper form, consider the following points:

(a) The size of crossarms supporting the wires to be charted.

(b) The number of crossarms on each pole.

(c) The length of the lead.

(d) Future growth that may result in a pole line extension or the placing of additional crossarms.

(e) The type of wire used.

2.02 The 15 pole and 19 pole capacity forms will have their greatest use in urban areas. However, there are many short leads and spurs in rural developments, where these forms will be useful. (See Section 680-220-010.)

2.03 Make full use of the filing equipment. The interchange forms will permit the interchanging of two sizes of forms, e.g., a one column 50 pole capacity form may be converted into a one column 15 pole capacity or vice versa, without loss of filing space. (See Section 680-220-010.)

3. PREPARATION

3.01 The notes with each figure describe the details peculiar to that figure. However, the following paragraphs call attention to points of a general nature.

Permanent Entries

3.02 Exhibits 1 through 6 illustrate permanent entries.

Temporary Entries

3.03 In general, temporary entries are the pencil entries affected by the day-to-day posting of service order and construction activity. Use a well-sharpened drawing pencil when making these entries.

Note: Reproduction of the records is done for many reasons. Therefore, it is essential that all pencil entries be dark enough to give sharp, legible reproductions. It is also essential that pencil entries do not smear, if the records are to be neat and legible. All manufacturers do not use the same standards when grading pencil lead. Determine locally what grade lead best meets all requirements.

3.04 Exhibits 7B through 16 illustrate temporary entries.

Charting of Leads That Exceed the Capacity of Forms

3.05 ***Long Leads:*** There will be times when the length of the lead exceeds the capacity of the form. Form E-4016 accommodates one 10 pin crossarm for approximately 100 poles by using both columns. Form E-4012 accommodates one 16 pin crossarm for approximately 50 poles. Leads of greater length will require additional forms filed in consecutive order.

3.06 ***Three or More 10 Pin Crossarms:*** Leads consisting of three or more 10 pin crossarms will require additional forms filed in consecutive order.

3.07 ***Two or More 16 Pin Crossarms:*** Leads consisting of two or more 16 pin crossarms will require additional forms filed in consecutive order.

Transpositions

3.08 Enter the type of transposition in the remarks space when required. (See Exhibit 8B.)

3.09 If required by local instructions, older type transmission schemes (other than type R1 or R2) may be reflected on the record by placing "X" marks along the circuit at the points where transpositions occur.

Protection of Index Tabs

3.10 When the record has been prepared, protect the index portion of each form with two applications of Bell System lacquer. Follow the details described in Section 680-201-010.

4. MULTIPLE LINE WIRE

4.01 Multiple line wire (MLW) is the general term used for rural and urban wire. It consists of twisted pairs of annealed copper conductors which are stranded around a steel support wire. Each conductor is insulated with polyethylene covered by a polyvinyl chloride jacket. The steel support wire is covered with a polyethylene jacket. MLW is manufactured in sizes of six, twelve and sixteen pairs.

4.02 All MLW except B Rural Distribution Wire (BDW) is color coded. All conductors of BDW are black. To distinguish the Tip from the Ring conductor the ring wire in each pair has a longitudinal ridge. For color codes of MLW see Exhibit 11.

Terminating Multiple Line Wire

4.03 The conductors on MLW will generally be terminated in existing distribution cable terminals and in 116 type protectors, 104 type wire terminals, or 105A type wire terminals depending on local conditions.

4.04 The 104 type wire terminals or 116 type protectors have six pairs of binding posts which permit terminating all conductors. Pairs will generally be terminated in the same sequence at all appearances to facilitate service installations and maintenance.

4.05 The 105A type wire terminal will generally be used when only one or two pairs are to be terminated.

Exchange Wire Record

4.06 When MLW is the only wire used to extend cable it may be recorded on the Exchange Subscriber Cable Record or on Form

E-4529 or Form E-4585. When recorded on Exchange Subscriber Cable Record it shall be in accordance with Section 680-201-010. For recording MLW on Form E-4585, see Exhibits 14 and 15. Entries on Form E-4529 follow the same pattern.

4.07 When MLW is used in connection with open wire it shall be recorded on the Exchange Wire Record, Form E-4011 through Form E-4018. (See Exhibit 16.)

Note: When desired, Multiple Drop Wire (MDW) may be entered on the Exchange Wire Record or Exchange Subscriber Cable Record in a manner similar to MLW. ***In all cases use the appropriate notations to indicate the type of wire placed.*** When shown in this manner, MDW will be inventoried in the aerial wire account (3C) unless an entry 28C is shown.

4.08 If MLW is used to extend an existing lead, enter it on the record as follows:

(a) Diagram each circuit for steel or copper wire, using the symbol for MLW which is a single, unbroken straight line.

(b) In the column, "Type Wire Required," enter the abbreviation for the type of MLW used, e.g., DRW (D Rural Wire), CUW (C Urban Wire), etc.

4.09 If MLW is used to supplement an existing lead in lieu of adding a second crossarm, enter it on the record in the same manner that a second arm would be shown. Entries will be as follows:

(a) Use a separate column. In the "_____ Crossarm" space enter the abbreviation MLW.

(b) Diagram each circuit using the symbol for MLW, which is a single, unbroken straight line.

(c) In the "Type Wire Required" column enter the type of MLW indicated on construction drawing or recommended by engineer.

(d) Enter the color code of each pair in the "Pin Position or Circuit Number" column.

(e) When the type of MLW changes, indicate the point of change by drawing a horizontal line across the "Type Wire Required" column and enter the abbreviation for the new type MLW. If the color codes also change, enter the new color codes in the wire column.

4.10 When more than one MLW is placed in a lead, identify each one. For example:

(a) Where two or more MLW are placed on existing crossarms, they may be identified with the suffix (A) for the first wire placed, (B) for the second, etc. It may be desirable to further identify each MLW by indicating the pin under which it is placed, e.g., (A-3), (B-4), etc. This will aid the field forces in locating the particular MLW involved.

(b) When MLW is placed on poles where there are no crossarms, it may be designated (A) for the top wire placed, (B) for the second, etc., assuming that it will be placed one below the other on the pole. A tag or stencil, at the originating point, will be placed indicating "A", "B", etc.

Terminals

4.11 When MLW is recorded on Exchange Wire Record forms, indicate the termination of MLW pairs in wire terminals by placing a dot opposite the pole involved. Remove this dot from the record, when service is changed or disconnected, if local practices require disconnection of MLW from terminal at this time.

Exchange Wire Record — Loading and Cutting Pairs Dead

4.12 On long runs of MLW it may be necessary for the engineer to specify that certain pairs in the wire be loaded or cut dead at a particular point in order to have the transmission qualities of the wire reach a required standard.

4.13 The engineer will establish load points on MLW. These will be shown on the construction drawings usually as 177A load coil cases with the MLW wire terminated both ways.

He will show the initial pairs to be distributed in each load section.

4.14 Show on the record where load coils have been placed. Exhibit 13 shows how the information will be indicated on construction drawings. Exhibit 14 shows how to post this information.

4.15 For transmission reasons no assignments can be made to an MLW pair between load points of that pair, or between the central office and the first load point of that pair. An exception to this is by the use of bridge-lifters as shown in Notes 5 and 6 of Exhibit 14.

4.16 When, because of service order or other activity, it becomes necessary to add load coils, or to bridge wires previously cut dead or to cut wires dead, the engineer should be consulted as to the action to be taken. Give all pertinent information regarding the request, such as the type of service to be furnished, pole number where drop lead is to be attached, other pole numbers on the route where there is loading or pairs cut dead, side leads and number of poles in the lead, type of wire connected to, if extending a wire lead, or serving directly from cable plant, etc.

5. WIRE SYMBOLS

5.01 Reproductions of the record may be used to compile inventory data. Therefore, symbols that are easily distinguishable should be used to represent the type of plant used.

5.02 The wire symbols used in this and related sections follow:

Multiple Line Wire — Steel — Copper — (Copper Steel)	
Buried	–B–B–B–B–B–B–B–B–
Drop	
Bridle Jumpers	

6. EXHIBITS

EXHIBIT NO.	DESCRIPTION
1	Printed Line Captions — Form E-4011
2	Entries and General Layout Data for "Pole Number" Column—Form E-4016
3	"Street or Road" and "Size Crossarm" Column Entries — Form E-4016
4	"Wire Route Measurement" and "Type Wire Required" Column Entries — Form E-4016
5A	Diagram of Wire and Entries in "Connects to Spur Number" Column — Form E-4016
5B	Diagram of Wire for One 16 Pin Crossarm, Two Pair of Brackets and One Drop Wire — Form E-4011
5C	Diagram of Wire for Two 10 Pin Crossarms and One Pair of Brackets—Form E-4011
6	Boundary Entries — Form E-4015
7A	Map Segment for Plant Condition Shown in Exhibit 7B
7B	Wire Record, Form E-4016, Prepared from Map Shown in Exhibit 7A
8A	Map Segment for Plant Condition Shown in Exhibit 8B
8B	Wire Record, Form E-4012, Prepared from Map Shown in Exhibit 8A
9A	Map Segment for Plant Condition Shown in Exhibit 9B
9B	Wire Record, Form E-4015, Prepared from Map Shown in Exhibit 9A
10A	Map Segment for Plant Condition Shown in Exhibit 10B
10B	Wire Record, Form E-4011, Prepared from Map Shown in Exhibit 10A

EXHIBIT NO.	DESCRIPTION
11	Multiple Line Wire Characteristics and Abbreviations
12	Printed Line Captions — Form E-4529
13	Map Covering Loading of Multiple Line Wire
14	Wire Record, Form E-4585, Prepared from Map Shown in Exhibit 13
15	Wire Record, Form E-4585, Showing Two Types of Multiple Line Wire
16	Extension of Open Wire Lead with Multiple Line Wire — Form E-4015

NOTES ON EXHIBIT 1

PRINTED LINE CAPTIONS — FORM E-4011
(Column Headings Excluded)

Notes

1. DATE VERIFIED: This space is for entering the date of the last field verification (Pencil entry).

2. EXCHANGE: Enter name of exchange area being served (Ink entry).

3. CENTRAL OFFICE: Enter central office name or number within the exchange (Ink entry).

4. REMARKS: Self-explanatory.

5. CROSSARMS CARRYING ONLY TOLL WIRES: This space is for showing the position of each crossarm carrying only toll wire, e.g., 1st, 2nd, etc. (Ink entry).

6. JUNCTION POLE LOCATION: Self-explanatory (Ink entry).

7. TERMINAL POLE LOCATION: Self-explanatory (Ink entry).

8. CONNECTS TO LEAD NUMBER: The entry in this space is a cross reference to the lead or spur number from which this spur is served (Ink entry).

9. _____ CROSSARM: Show the position of the crossarm as 1st, 2nd, etc. (Ink entry).

10. PIN POSITION OR CIRCUIT NUMBER: Self-explanatory (Ink entry).

11. BINDING POST: Enter the binding post number when required (Pencil entry).

12. CABLE NUMBER — PAIR: Self-explanatory (Pencil entry).

13. TELEPHONE NO. OR BUNCH BLOCK NO.: Self-explanatory. Optional (Pencil entry).

14. PANEL & JACK OR DIAL EQUIV.: Self-explanatory. Optional (Pencil entry).

15. CLASS SERVICE: Self-explanatory (Pencil entry).

16. NAME OR NUMBER OF LEAD: Self-explanatory (Ink entry).

17. TRANSMISSION ZONE:
    RESISTANCE ZONE:
    MAP NUMBER:
    TAX DISTRICT:
    These spaces are provided to show specific information when it applies to the entire lead. If the information changes at a point along the lead, indicate in the boundary column (Pencil entry).

18. VISIBLE INDEX TAB: As an aid in lining up the index tabs and to provide space for two leads on the front and two leads on the back, the tabs have been divided into four parts. The first two parts are headed "Front" and the second two parts "Back."

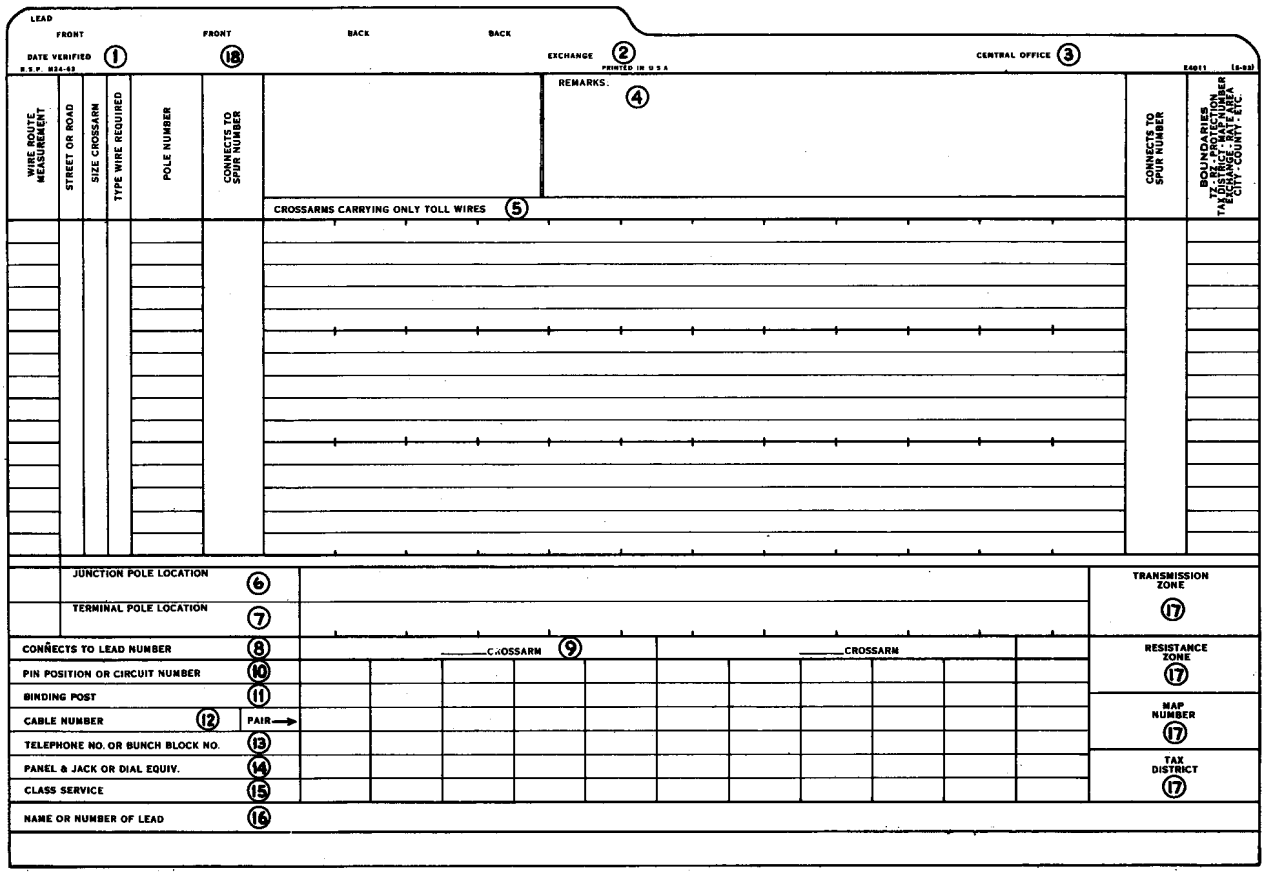


EXHIBIT 1

PRINTED LINE CAPTIONS — FORM E-4011
(Column Headings Excluded)

NOTES ON EXHIBIT 2

POLE NUMBER COLUMN

Until experience is gained in laying out the information in this column, pencil entries are the most satisfactory. When assured that the arrangement is proper, all entries shall be traced in ink.

Notes

1. Generally, it is desirable to enter the number of each pole in the lead. However, in long rural leads an alternative method would be to enter the pole number at each measurement point. Address locations may be used as pole numbers where available.

2. If advantageous to local operation, enter the names of prominent landmarks, and important streets or roads which intersect the lead.

3. Normally, allow one space for each pole in the lead. (See exceptions noted in items 4 and 5.)

4. In areas with long span construction, consider allowing one or more spaces between each pole entry. This is desirable in a growing district when additional poles are placed between existing poles. A suggested method would be as follows:

   Allow one additional space for span lengths of 250 to 449 feet.

   Allow two additional spaces for span lengths of 450 feet and up.

5. In contrast to Note 4, some leads may have great distances between customers, e.g., a lead crossing a stretch of desert or prairie country. In this case it may be desirable for each space to represent several poles. This method should not be used if it impairs the accuracy of the wire record. (See Exhibit 4, Note 4.)

6. Allow two additional spaces for charting jumper wire connections at the following points:

   6A. * Buck (Reverse) arm pole

   6B. * Double deadend pole

   6C. Corner pole

   6D. Change in size of crossarm

   6E. Isolated cable section

   * Note: In items 6A and 6B above, it will be necessary to repeat the pole number as illustrated.

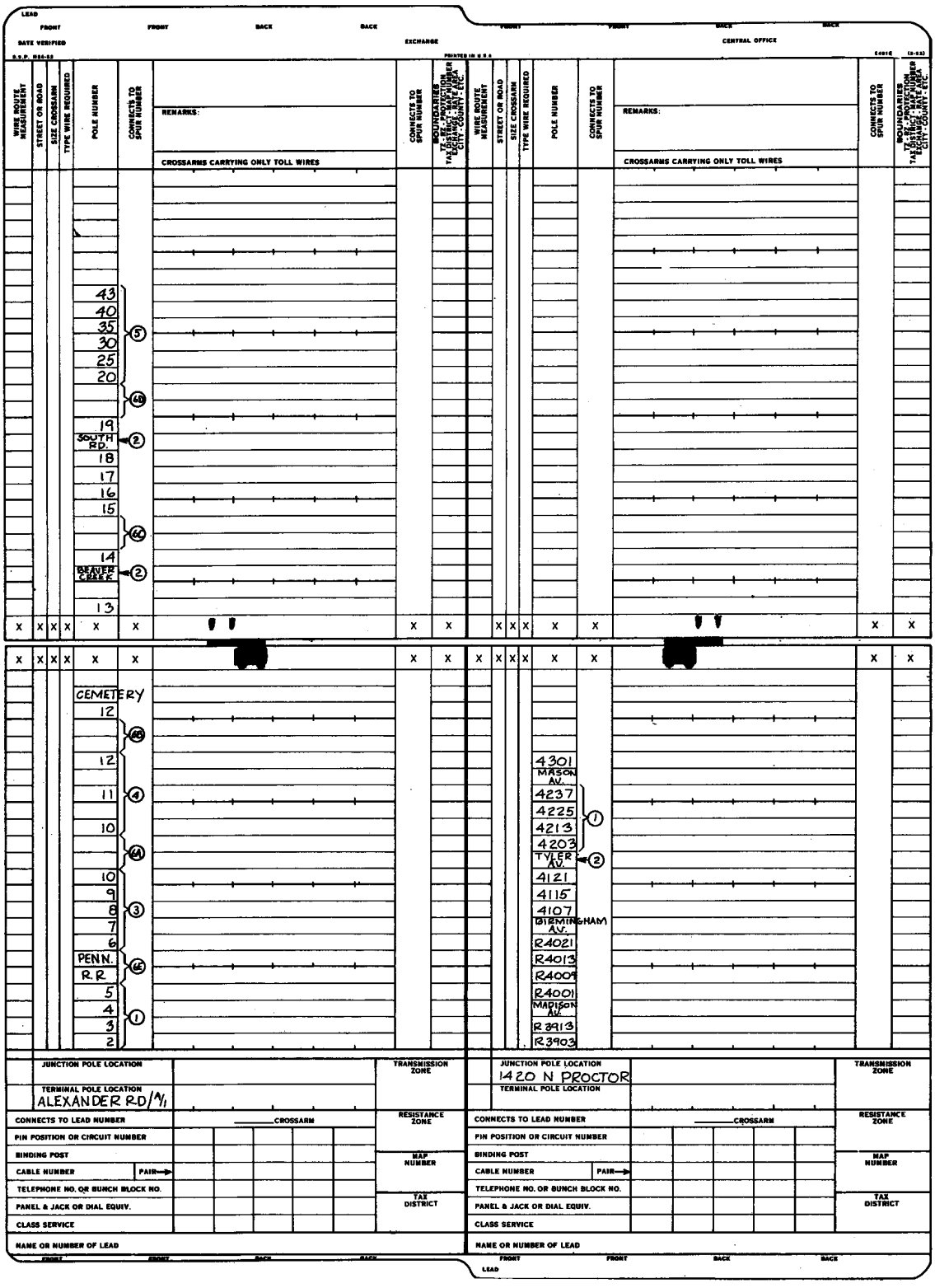


EXHIBIT 2

ENTRIES AND GENERAL LAYOUT DATA FOR "POLE NUMBER" COLUMN — FORM E-4016

NOTES ON EXHIBIT 3

STREET OR ROAD COLUMN (Ink Entries)

Notes

1. Enter the name of the street or road that parallels lead.
2. The words "Private Property" should be entered opposite the appropriate pole or poles, if required by local instructions.
3. Enter the word "Unnamed" if the pole line follows an unnamed road.
4. Show the point of change from one condition to another by drawing a horizontal line across the column.

SIZE CROSSARM COLUMN (Pencil Entries)

Notes

5. Enter the size or kind of crossarm or other means of supporting wire, e.g., 2, 4, 6, 8, 10 and 16 pin crossarms; brackets; or cable arms.
6. Identify sections of "Buried Wire" and "Isolated Cable" as illustrated.
7. A buck (reverse) arm pole.
8. A double deadend pole.
9. A corner pole.
10. Enter an "X" mark in vacant spaces when crossarm data are not required, e.g., a change in size of crossarm.

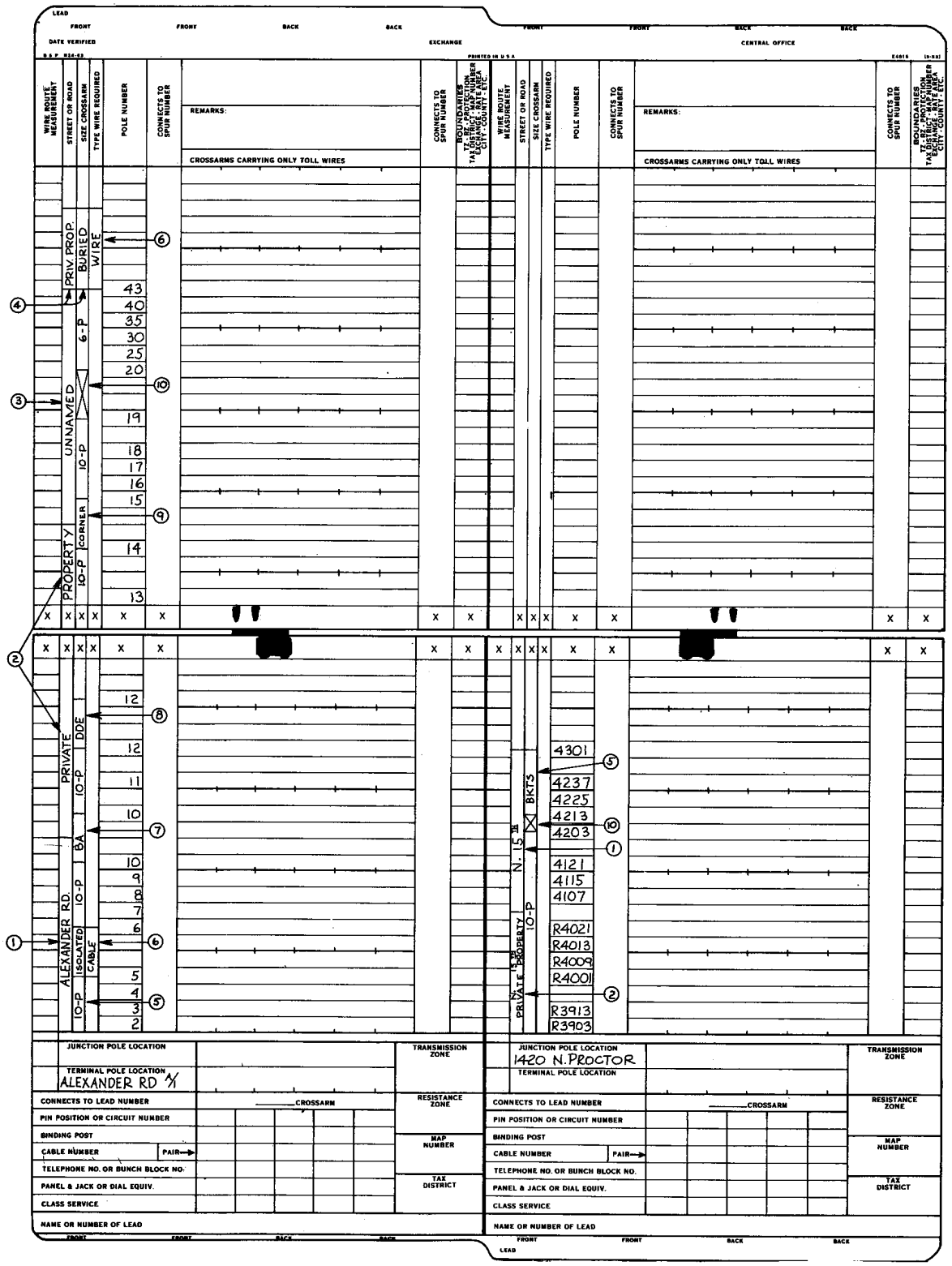


EXHIBIT 3

"STREET OR ROAD" AND "SIZE CROSSARM" COLUMN ENTRIES — FORM E-4016

NOTES ON EXHIBIT 4

WIRE ROUTE MEASUREMENT COLUMN (Ink Entries)

Notes

1. Enter the wire route measurement opposite the appropriate pole number. These measurements will be shown to the nearest one hundred feet. The zeros have been omitted from each figure, e.g., the figure 12 means 1200 feet.

2. Enter a zero at the point where the wire originates, e.g., the junction or terminal pole location.

3. Measurements of isolated sections of cable, covered wire or buried wire shall not be included in the cumulative figure.

4. When each space represents three poles or more, the wire route measurement will be entered at each pole number as shown.

5. An over-all measurement for buried wire, isolated cable, or covered wire should be shown.

TYPE WIRE REQUIRED COLUMN (Pencil Entries)

Notes

6. Enter the type of wire shown on construction drawings or recommended by the plant engineer. This information is required for developing resistance zones and is useful in areas where plant assignment authorizes the placing of wire. The standard types of wire that will appear on the wire record are as follows:

   STEEL

   083, 083H, 109, 109H, 109E, etc.

   COPPER (Copper Steel)

   080, 104, 080CS, 104CS, etc.

7. Show the point of change from one condition to another by drawing a horizontal line across the column.

8. Identify sections of "Buried Wire" and "Isolated Cable" as shown.

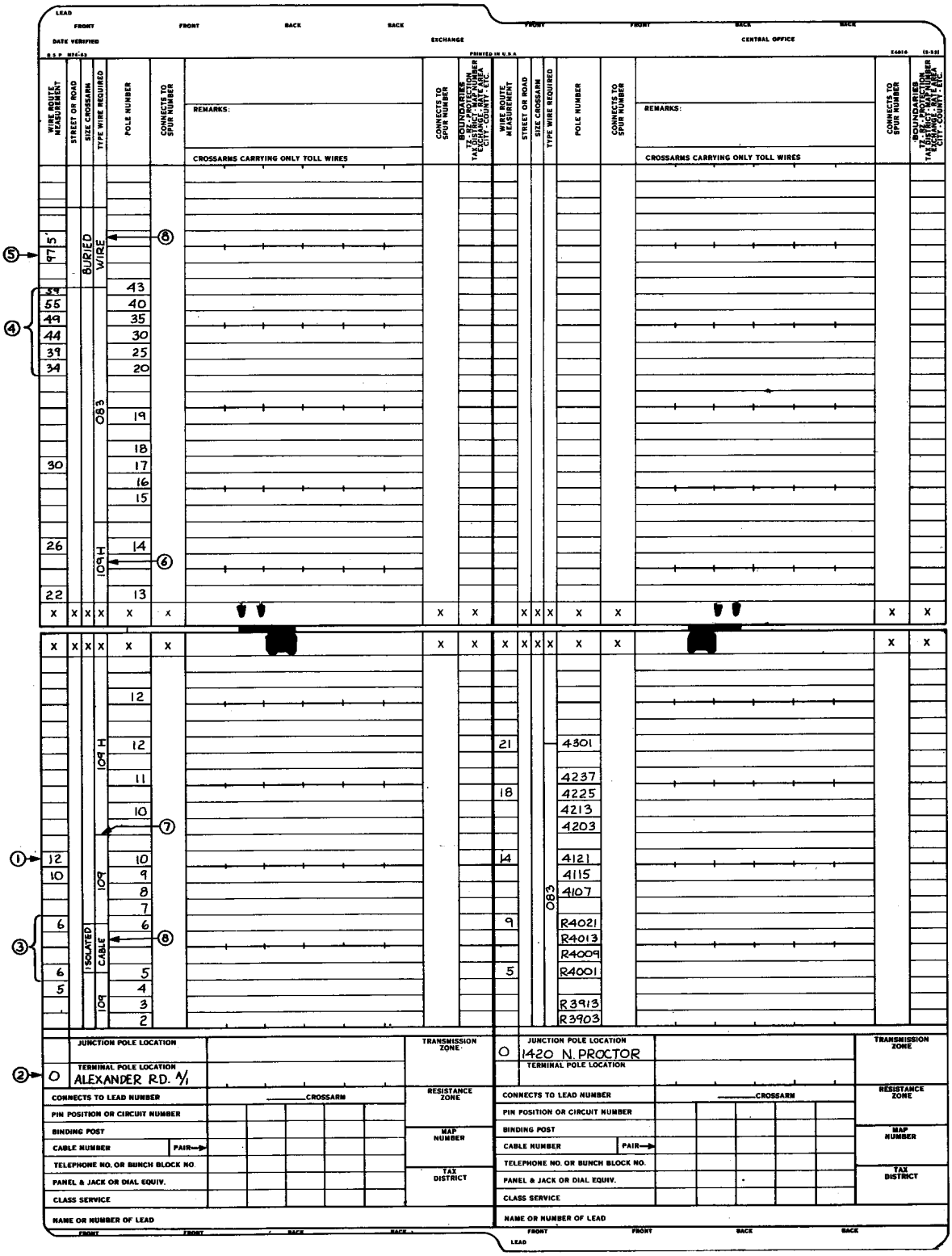


EXHIBIT 4

"WIRE ROUTE MEASUREMENT" AND "TYPE WIRE REQUIRED" COLUMN ENTRIES — FORM E-4016

NOTES ON EXHIBIT 5A

Notes

1. Diagram all wire. (See Par. 5.02 for symbols.) Jumpers, whether drop or bridle wire, will be entered in pencil. All other wire to be entered in ink.

2. If the type of wire in plant does not agree with that entered in the "Type Wire Required" column identify in ink as shown.

3. Pin positions are not maintained for wire placed on wooden pole brackets or for buried wire. Therefore, diagram the wire in an offset position as shown.

4. Enter the spur number in the appropriate "Connects to Spur Number" column (Ink entry).

5. Place an arrow pointing toward the spur number (Ink entry).

6. Place an arrow on each circuit that is jumpered to wire in a spur lead. The arrow should point toward the number of the spur to which it is connected (Pencil entry).

7. Spur leads of two poles or less serving one customer may be indicated by entering the wire symbol and pole numbers as shown. Also, enter the wire route measurement to the nearest one hundred feet. If a drop wire lead, the entering of this measurement is optional (Ink entry).

8. Enter in the "Connects to Spur Number" column, a ground symbol, opposite the pole numbers where a satisfactory ground is available. These data are obtained originally from construction drawings or from the day-to-day installation activity (Ink entry).

9. Place a ground symbol on each non-working circuit that is grounded (Pencil entry).

10. Enter in the "Connects to Lead Number" space a cross reference to the lead number from which the spur is served (Ink entry).

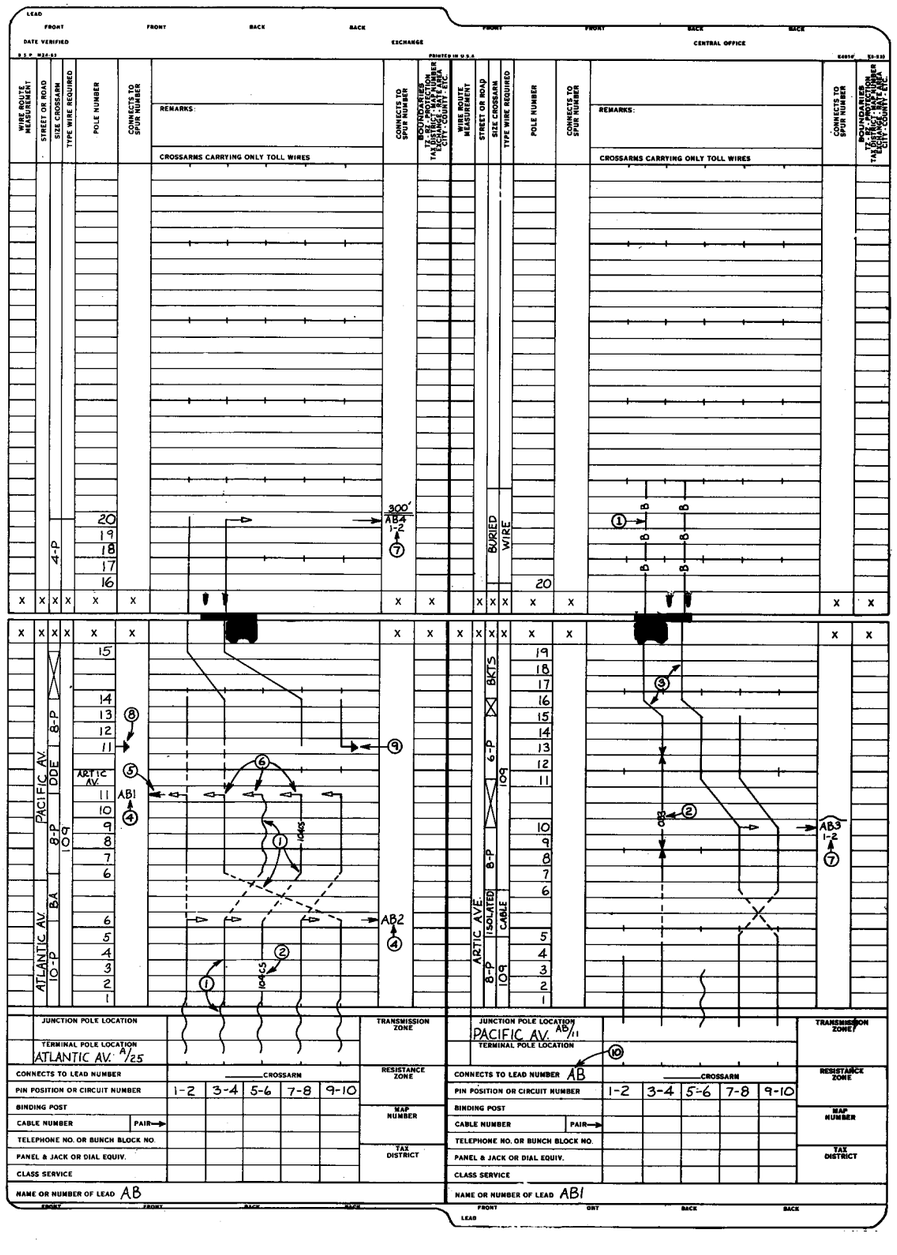


EXHIBIT 5A

DIAGRAM OF WIRE AND ENTRIES IN "CONNECTS TO SPUR NUMBER" COLUMN — FORM E-4016

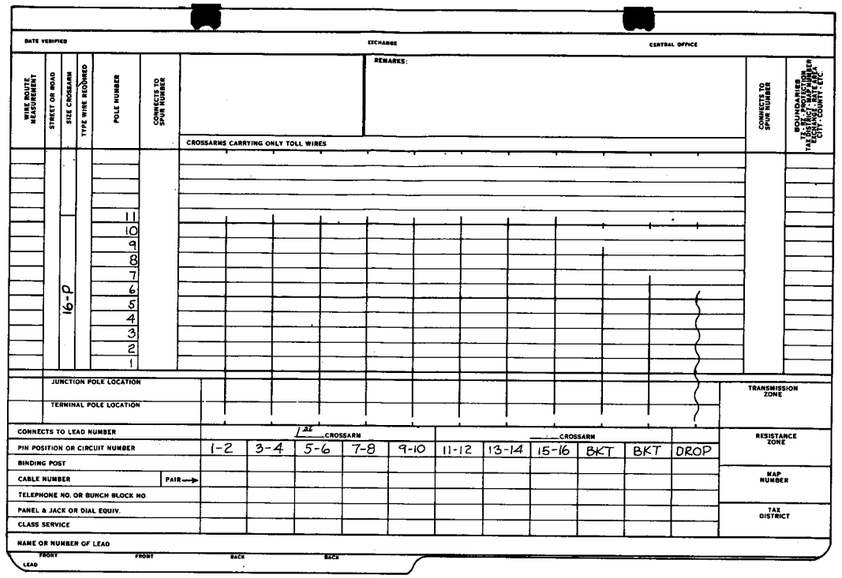


EXHIBIT 5B

DIAGRAM OF WIRE FOR ONE 16 PIN CROSSARM, TWO PAIR OF BRACKETS AND ONE DROP WIRE — FORM E-4011

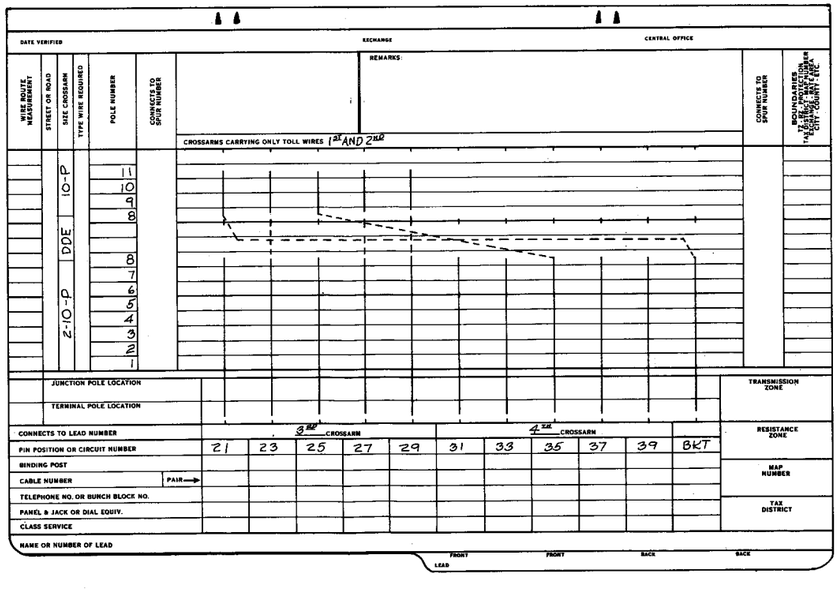


EXHIBIT 5C

DIAGRAM OF WIRE FOR TWO 10 PIN CROSSARMS AND ONE PAIR OF BRACKETS — FORM E-4011

NOTES ON EXHIBIT 6

BOUNDARY ENTRIES — FORM E-4015

BOUNDARIES

Show only the boundary information required for local operation.

The most commonly used boundaries are for transmission zones, resistance zones, maps, tax districts, county lines, city limits, rates, exchange, etc. Although each type of boundary is not shown the general principles set forth in this figure will apply.

Notes

1. Use this method when two or more boundaries appear at the same location.
2. When the center line of a street or roadway is the boundary, use this method.
3. Enter in this manner when the boundary is located between poles.
4. Use this method when the pole is located at the boundary.
5. A method of charting boundaries that parallel the lead. Show on the left or right side, whichever is appropriate.
6. The heavy dashed line should only be used when it is desired to call attention to the rate information on the service order. Otherwise chart as shown in Notes 2 through 4.
7. Exchange boundaries should always be prominently marked. See Note 5 when the boundary parallels the lead.

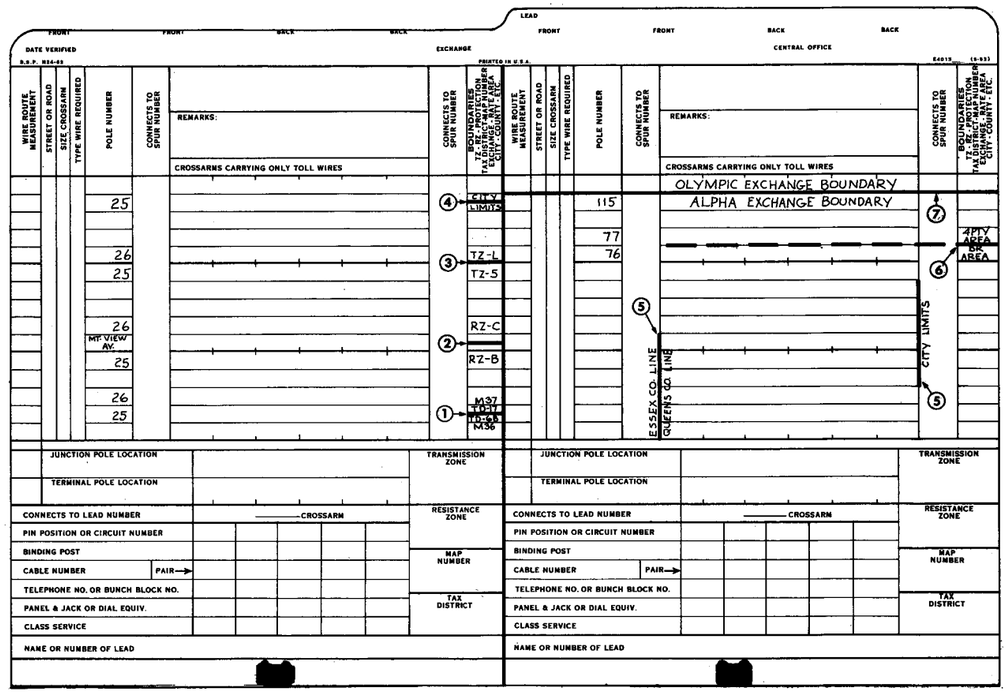


EXHIBIT 6

BOUNDARY ENTRIES — FORM E-4015

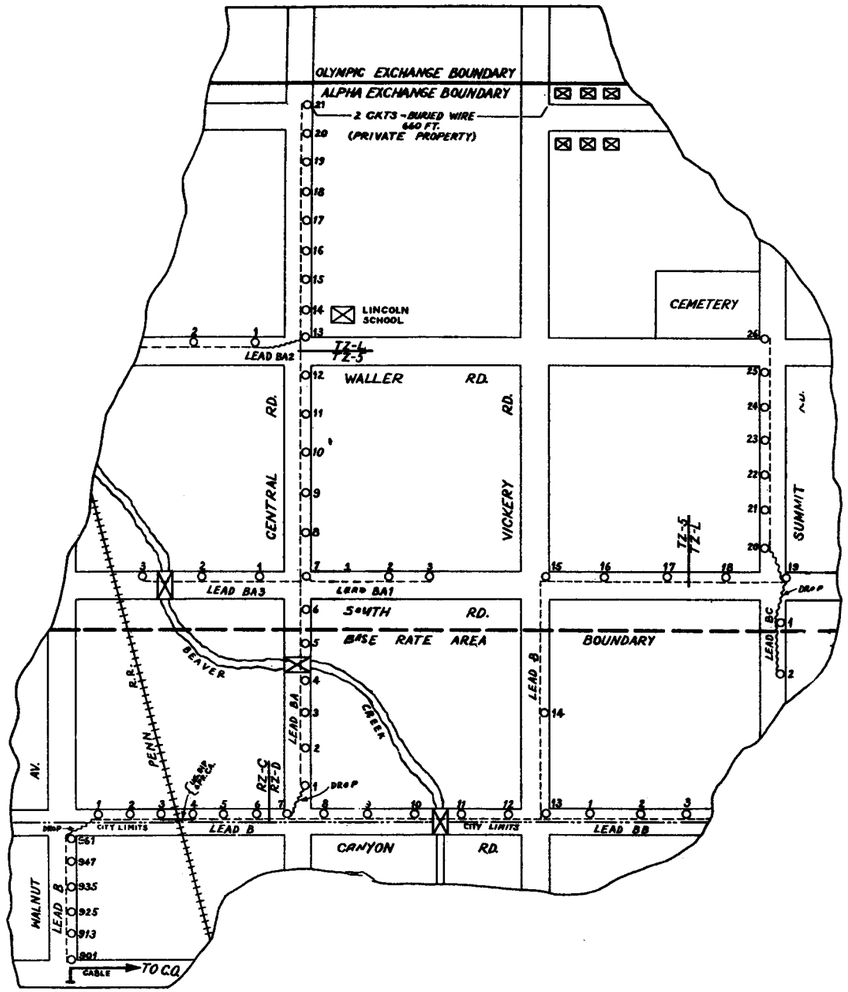


EXHIBIT 7A

MAP SEGMENT FOR PLANT CONDITION SHOWN IN EXHIBIT 7B

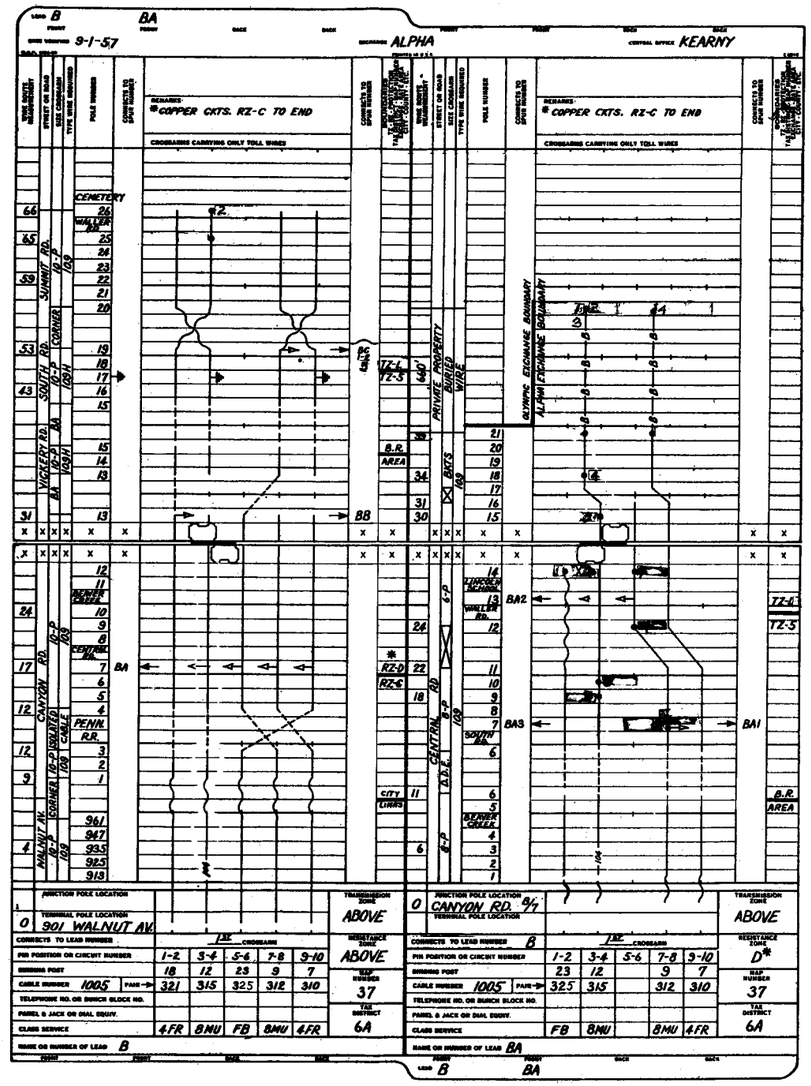


EXHIBIT 7B

WIRE RECORD, FORM E-4016, PREPARED FROM MAP SHOWN IN EXHIBIT 7A

EXPLANATION

Black dot shows point where service wire connects to lead. Numeral shows party station numbers. Symbol X shows direct line. When required by local instructions, the location of the customer (i.e., is he on the left or right side of the road?) may be indicated by posting station designation to the left or right of the black dot as appropriate.

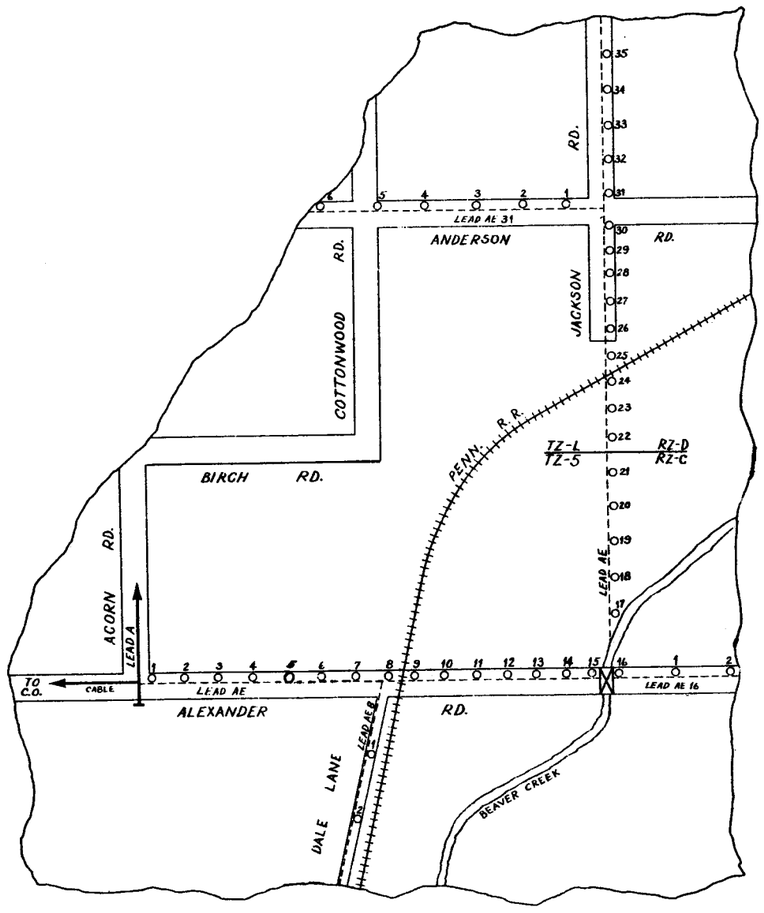


EXHIBIT 8A

MAP SEGMENT FOR PLANT CONDITION SHOWN IN EXHIBIT 8B

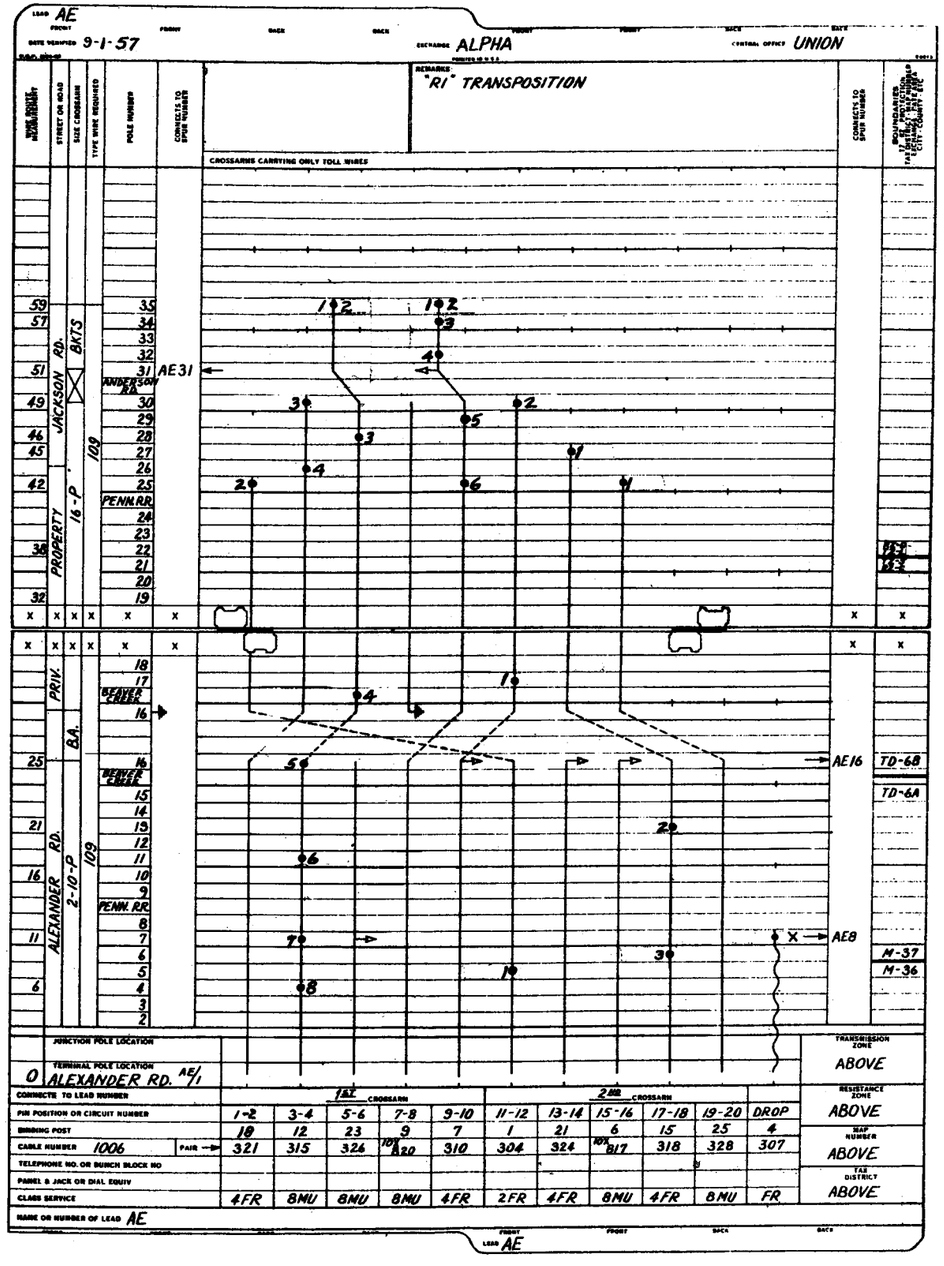


EXHIBIT 8B

WIRE RECORD, FORM E-4012, PREPARED FROM MAP SHOWN IN EXHIBIT 8A

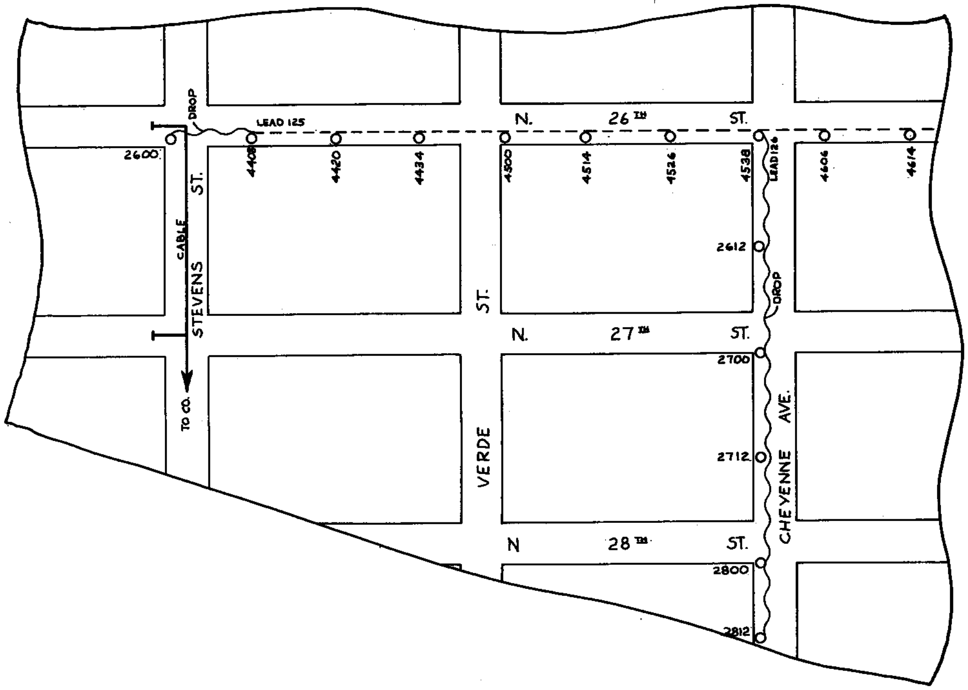


EXHIBIT 9A
MAP SEGMENT FOR PLANT CONDITION SHOWN IN EXHIBIT 9B

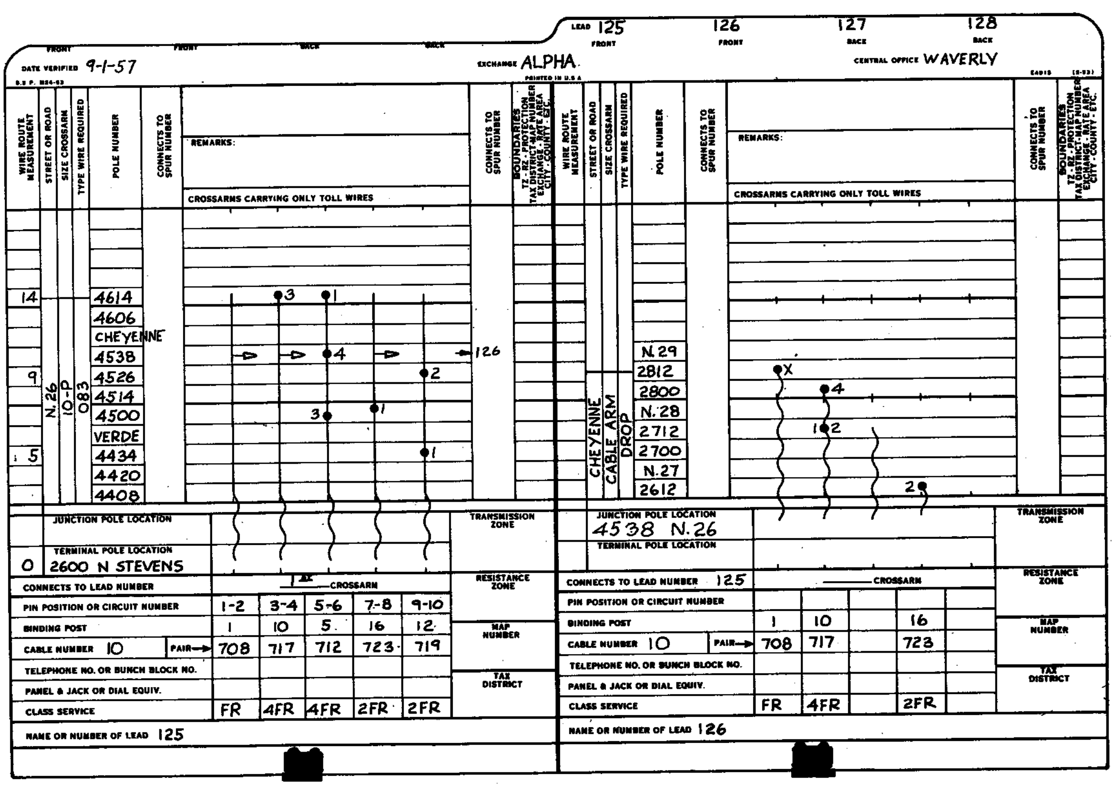


EXHIBIT 9B
WIRE RECORD, FORM E-4015, PREPARED FROM MAP SHOWN IN EXHIBIT 9A

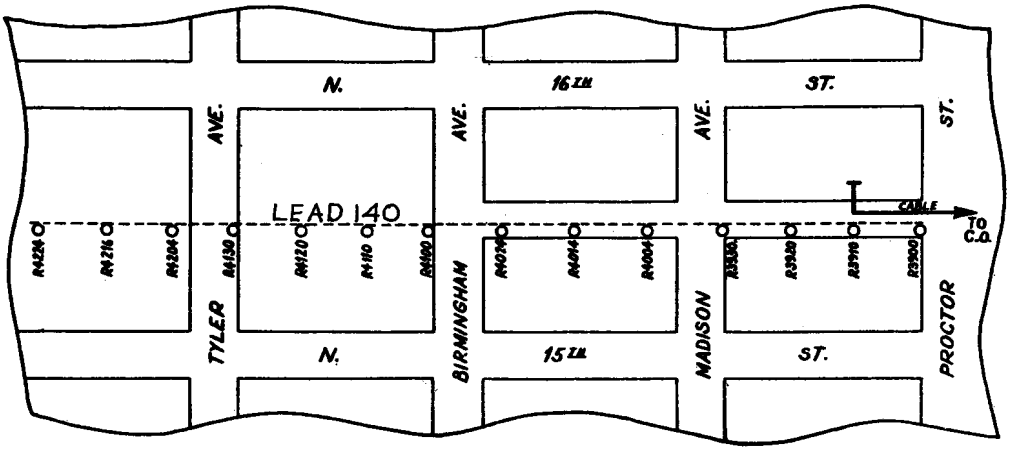
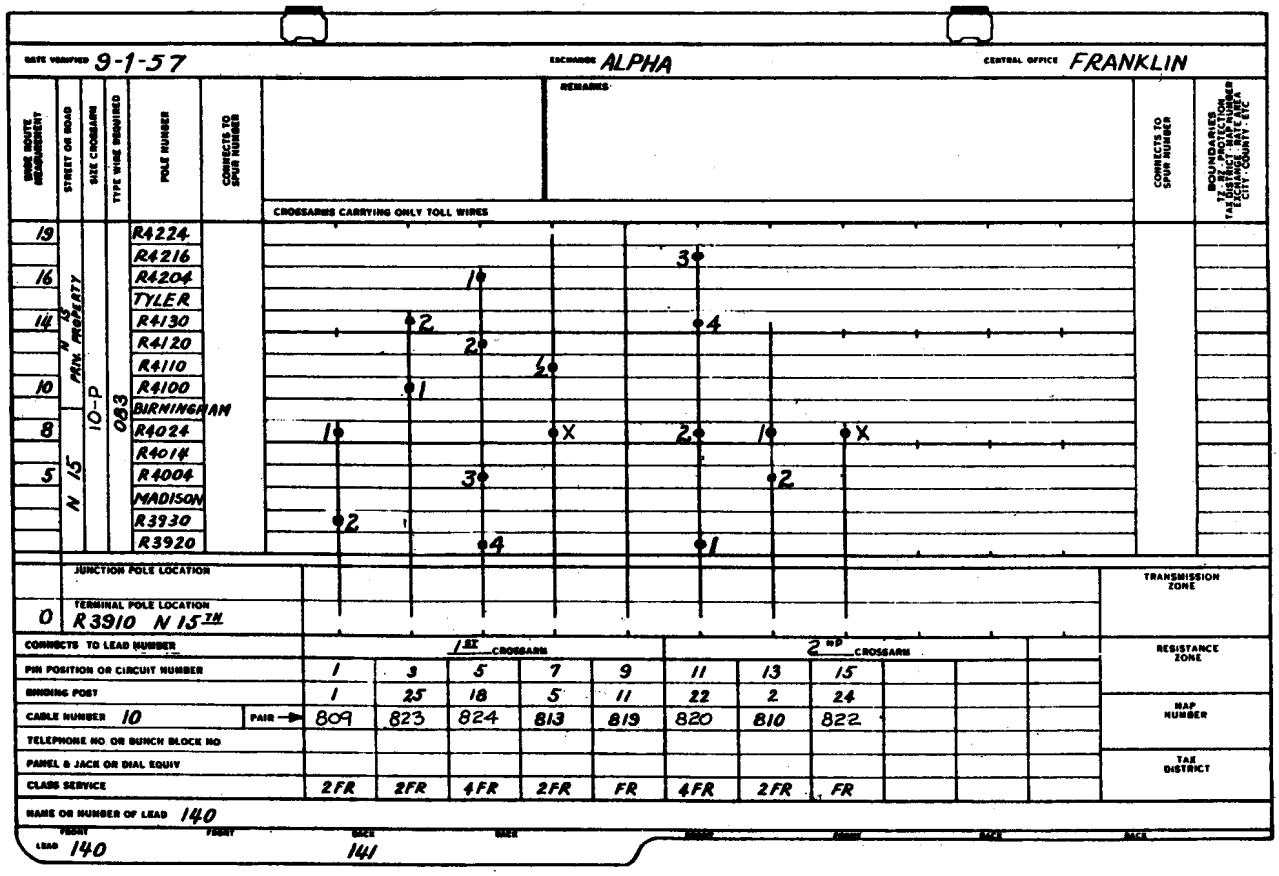


EXHIBIT 10A

MAP SEGMENT FOR PLANT CONDITION SHOWN IN EXHIBIT 10B



DATE VERIFIED 9-1-57 EXCHANGE ALPHA CENTRAL OFFICE FRANKLIN

REMARKS

WIRE ROUTE REQUIREMENT	STREET OR ROAD	SIZE CROSSARM	TYPE WIRE REQUIRED	POLE NUMBER	CONNECTS TO SPUR NUMBER
19				R4224	
				R4216	
16	N 15 MIN PROPERTY			R4204	
				TYLER	
14				R4130	
				R4120	
		10-P	083	R4110	
10				R4100	
				BIRMINGHAM	
8				R4024	
	N 15			R4014	
5				R4004	
				MADISON	
				R3930	
				R3920	

CROSSARMS CARRYING ONLY TOLL WIRES

CONNECTS TO SPUR NUMBER

BOUNDARIES: TELEPHONE EXCHANGE, TAX DISTRICT, MAP NUMBER, EXCHANGE AREA, CITY, COUNTY, ETC.

JUNCTION POLE LOCATION	
0 TERMINAL POLE LOCATION	R3910 N 15TH
CONNECTS TO LEAD NUMBER	

TRANSMISSION ZONE

	1ST CROSSARM					2ND CROSSARM					
PIN POSITION OR CIRCUIT NUMBER	1	3	5	7	9	11	13	15			
BINDING POST	1	25	18	5	11	22	2	24			
CABLE NUMBER 10 PAIR →	809	823	824	813	819	820	810	822			
TELEPHONE NO OR BUNCH BLOCK NO											
PANEL & JACK OR DIAL EQUIV											
CLASS SERVICE	2FR	2FR	4FR	2FR	FR	4FR	2FR	FR			

RESISTANCE ZONE

MAP NUMBER

TAX DISTRICT

NAME OR NUMBER OF LEAD 140

FRONT	FRONT	SIDE	SIDE	REAR	REAR	REAR	REAR
LEAD 140		141					

EXHIBIT 10B

WIRE RECORD, FORM E-4011, PREPARED FROM MAP SHOWN IN EXHIBIT 10A

EXHIBIT 11

MULTIPLE LINE WIRE CHARACTERISTICS

NAME	RURAL DISTRIBUTION WIRE		RURAL WIRE			URBAN WIRE	
Type	B	B	D	E	B	C	D
Gauge	19	19	19	19	24	24	22
No. Pairs	6	6	6	12	16	16	16

CONDUCTOR COLOR CODE

Pair	T * R	T ** R	T R	T R	T ** R	T R	T R
1	Bk — Bk	Bk — Bl	W — Bl	W — Bl	W — Bl	W — Bl	W — Bl
2	Bk — Bk	Bk — R	W — O	W — O	W — G	W — O	W — O
3	Bk — Bk	Bk — G	W — G	W — G	W — Br	W — G	W — G
4	Bk — Bk	Bk — Br	W — Br	W — Br	W — S	W — Br	W — Br
5	Bk — Bk	Bk — S	W — S	W — S	R — Bl	W — S	W — S
6	Bk — Bk	Bk — Y	R — Bl	R — Bl	R — G	R — Bl	R — Bl
7				R — O	R — Br	R — O	R — O
8				R — G	R — S	R — G	R — G
9				R — Br	Bk — Bl	R — Br	R — Br
10				R — S	Bk — G	R — S	R — S
11				Bk — Bl	Bk — Br	Bk — Bl	Bk — Bl
12				Bk — O	Bk — S	Bk — O	Bk — O
13					Y — Bl	Bk — G	Bk — G
14					Y — G	Bk — Br	Bk — Br
15					Y — Br	Bk — S	Bk — S
16					Y — S	Y — Bl	Y — Bl

* Not Color Coded

** Non-Standard Color Coding

ABBREVIATIONS

Wire

B Rural Distribution Wire = BDW
B Rural Wire = BRW
D Rural Wire = DRW
E Rural Wire = ERW
B Urban Wire = BUW
C Urban Wire = CUW
D Urban Wire = DUW

Color Codes

Bl = Blue
O = Orange
G = Green
Br = Brown
S = Slate
R = Red
Bk = Black
Y = Yellow
W = White

NOTES ON EXHIBIT 12

DESCRIPTIONS OF PRINTED LINE CAPTIONS — FORM E-4529

Notes

1. DATE VERIFIED: This space is provided for entering the date of last field check (Pencil entry).

2. EXCHANGE: Enter name of exchange (Ink entry).

3. CENTRAL OFFICE: Enter central office name or number within the exchange (Ink entry).

4. TYPE OF WIRE: Self-explanatory (Pencil entry).

5. REMARKS: To be used as desired.

6. JUNCTION POLE LOCATION: Self-explanatory (Ink entry).

7. TERMINAL POLE LOCATION: Self-explanatory (Ink entry).

8. CONNECTS TO LEAD: The entry in this space is a cross reference to the lead or spur number from which this spur is served (Ink entry).

9. WIRE COLOR CODE: Self-explanatory (Ink entry).

10. BINDING POST-CABLE: Enter the binding post number (Pencil entry).

11. CABLE-PAIR: Self-explanatory (Pencil entry).

12. TELEPHONE NO. OR BUNCH BLOCK NO.: Self-explanatory. Optional (Pencil entry).

13. PANEL & JACK OR DIAL EQUIV.: Self-explanatory. Optional (Pencil entry).

14. CLASS SERVICE: Self-explanatory (Pencil entry).

15. NAME OR NUMBER OF LEAD: Self-explanatory (Pencil entry).

16. BOUNDARIES: Self-explanatory (Pencil entry).

17. TRANSMISSION ZONE:
    RESISTANCE ZONE:
    MAP NUMBER:
    TAX DISTRICT:
    These spaces are provided to show specific information when it applies to entire lead. If the information changes at a point along the lead, indicate in the boundary column (Pencil entry).

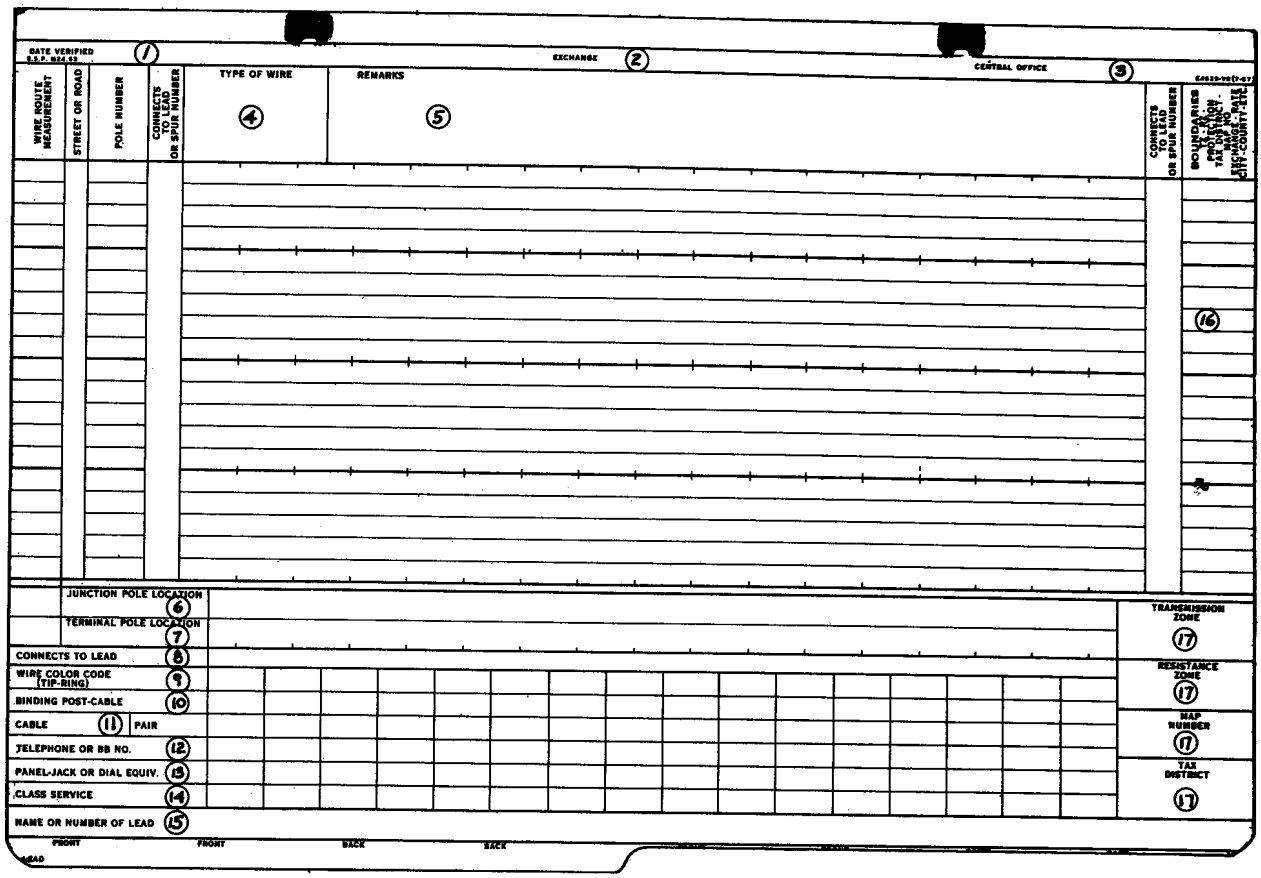
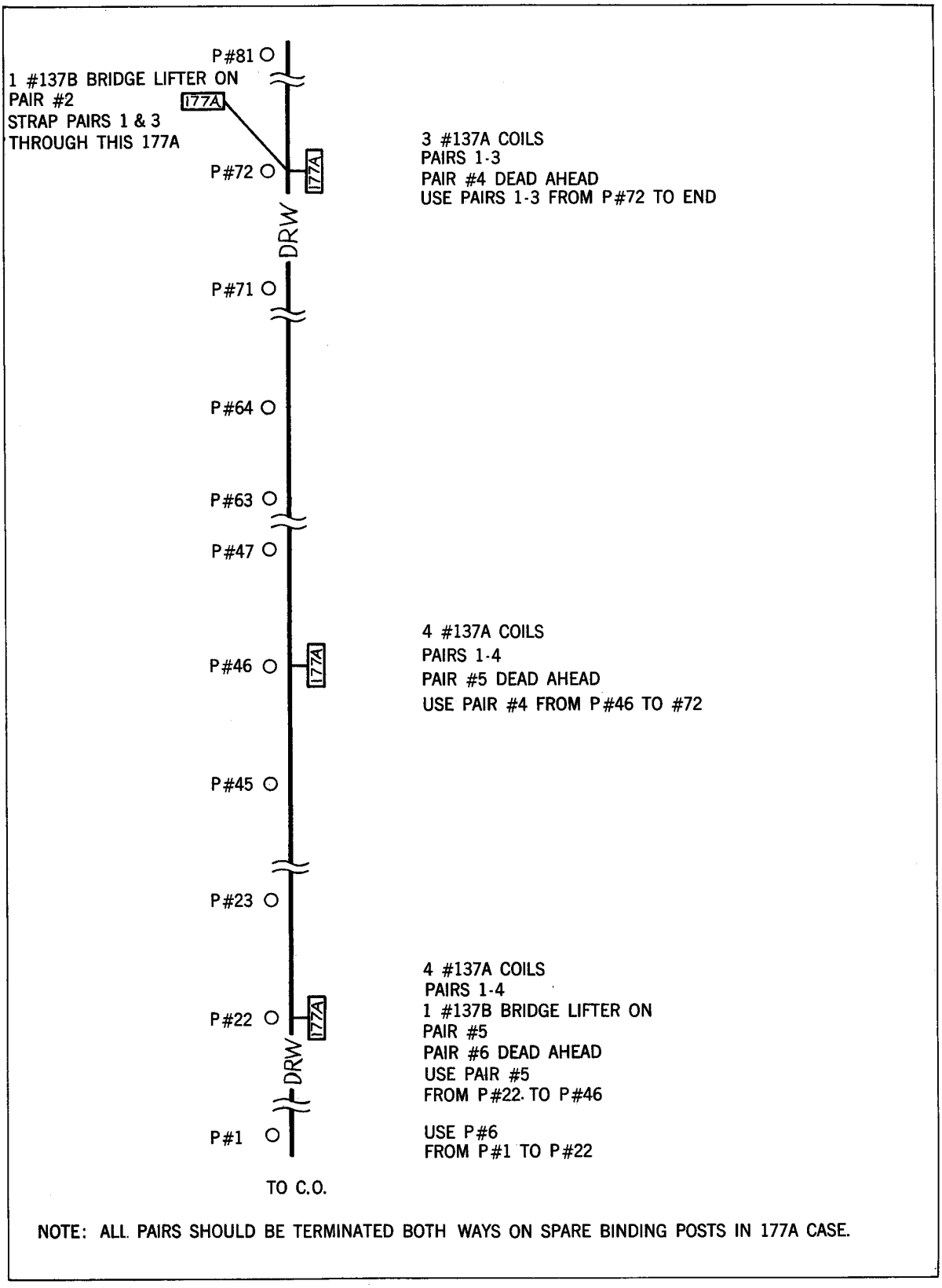


EXHIBIT 12

PRINTED LINE CAPTIONS — FORM E-4529



NOTE: ALL PAIRS SHOULD BE TERMINATED BOTH WAYS ON SPARE BINDING POSTS IN 177A CASE.

EXHIBIT 13

MAP COVERING LOADING OF MULTIPLE LINE WIRE

NOTES ON EXHIBIT 14

Notes

1. "A" shows the first MLW placed on the route. If MLW is placed on crossarms, note the pin under which the wire was placed, i.e., (3), (7), etc.

2. Shows the type of load coils and cases. 177A is the large case which contains two 2A1B protectors in a special weatherproof housing. The initial and any subsequent installation of this type case requires Engineering authorization. 137A is the individual load coil case that fits between the 2A1B protector lugs. The 137A's can be placed on an individual basis by Plant installation and maintenance forces when called for on the service order. Before additional loading is indicated on service orders, approval of the Engineering Department is required.

   632 is the type of load coil contained in the 137A case. An additional loading indication on service orders must also show the type of coil (632) which will be the same as existing coils. This is necessary because the 137A case can be obtained with other types of load coils.

   Bridge-lifters (1574B Inductors) can be placed in the 177A case when they are housed in a 137B case.

3. LC stands for load coil. Here the first four pairs are loaded at pole #22.

   BL stands for bridge-lifter which is connected in pair 5 at pole #22. It is contained in a 137B case.

4. When no LC, BL or jumper is indicated for a pair in a 177A case, the pair is left open at this point. Pairs 5 and 6 are open at pole #46.

5. This is a second 177A case installed to apply bridge-lifters to pairs which are loaded at pole #72 also. The bridge-lifters effectively eliminated the bridge tap on the field side of their location. Therefore, it is possible to assign stations between load coils only by the use of bridge-lifters.

6. A bridge-lifter is installed on pair 2 at pole #72. Bridge-lifters can be added or removed at locations of 177A cases by Plant installation forces but it must be approved by the Engineering Department and shown on the service order.

7. Some rules to follow in assigning loaded MLW.

   (1) Never assign a station to a pair between load coils. The one exception is when bridge-lifters are used as in Note 5 above. Therefore, pairs 1, 2, 3 and 4 would not be used for a station between poles 1 and 22 or 22 and 46.

   (2) The Engineer will specify the pairs to use for distribution between load coils.

   (3) Loading and bridge-lifters require Engineering approval.

   (4) Pairs are open at load points unless a load coil, bridge-lifter, or strap is placed.

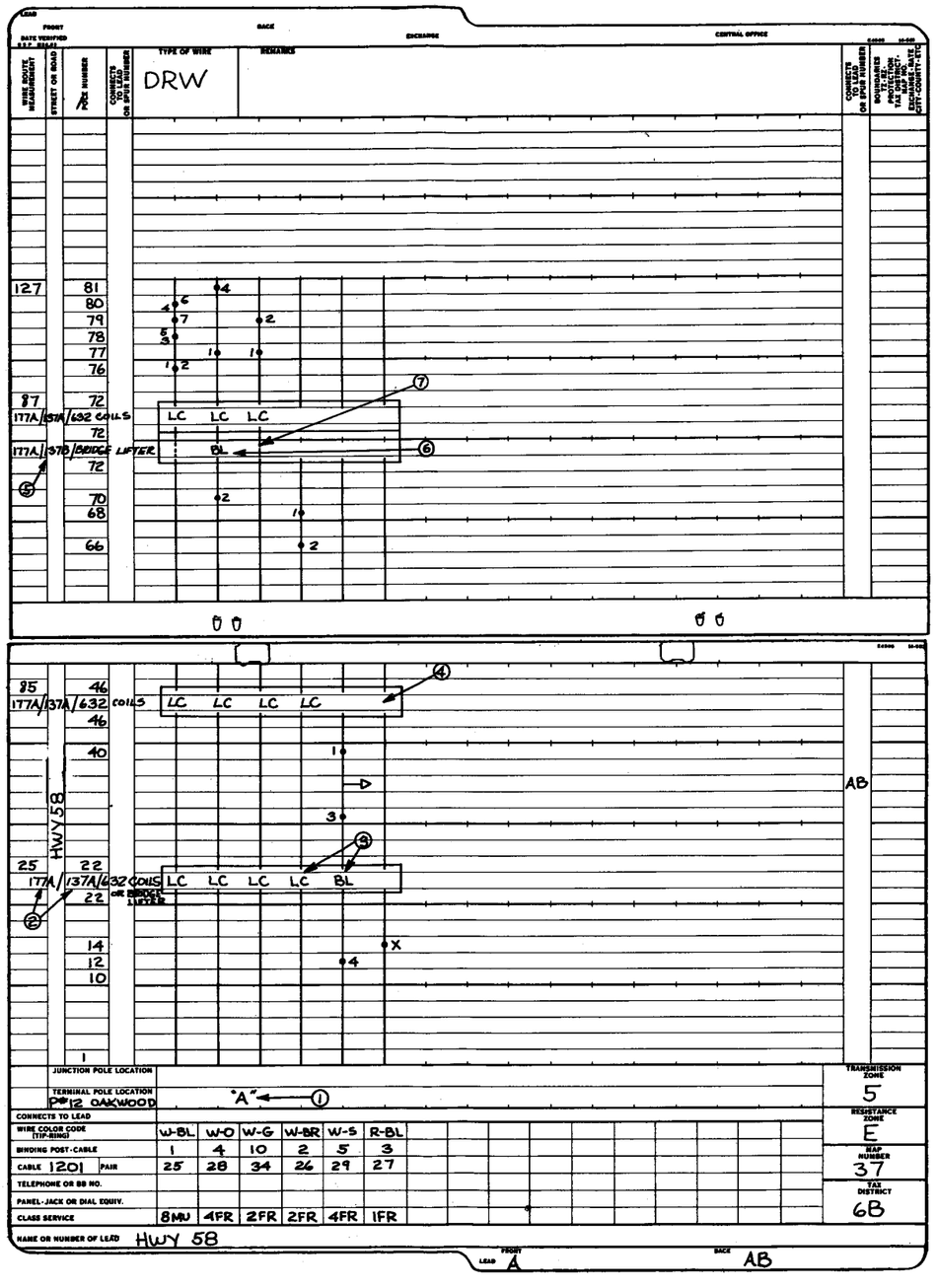


EXHIBIT 14

WIRE RECORD, FORM E-4585, PREPARED FROM MAP SHOWN IN EXHIBIT 13

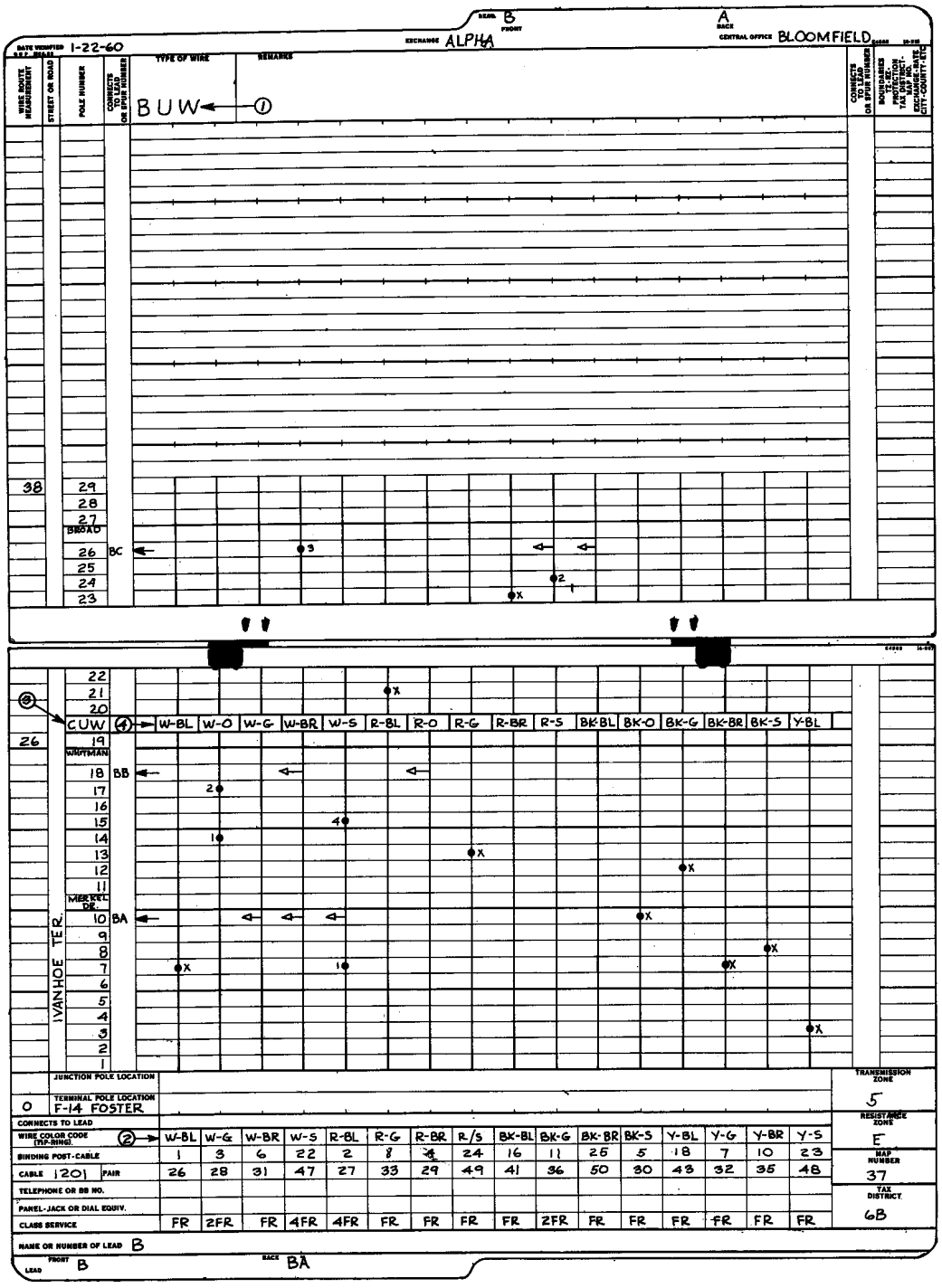


EXHIBIT 15

WIRE RECORD, FORM E-4585 SHOWING TWO TYPES OF MULTIPLE LINE WIRE

Notes

1. Type of wire run from terminal.
2. Color code of MLW originating at terminal.

Notes

3. Shows change in type of wire.
4. Color code of wire (If color code does not change show only change in type of wire).

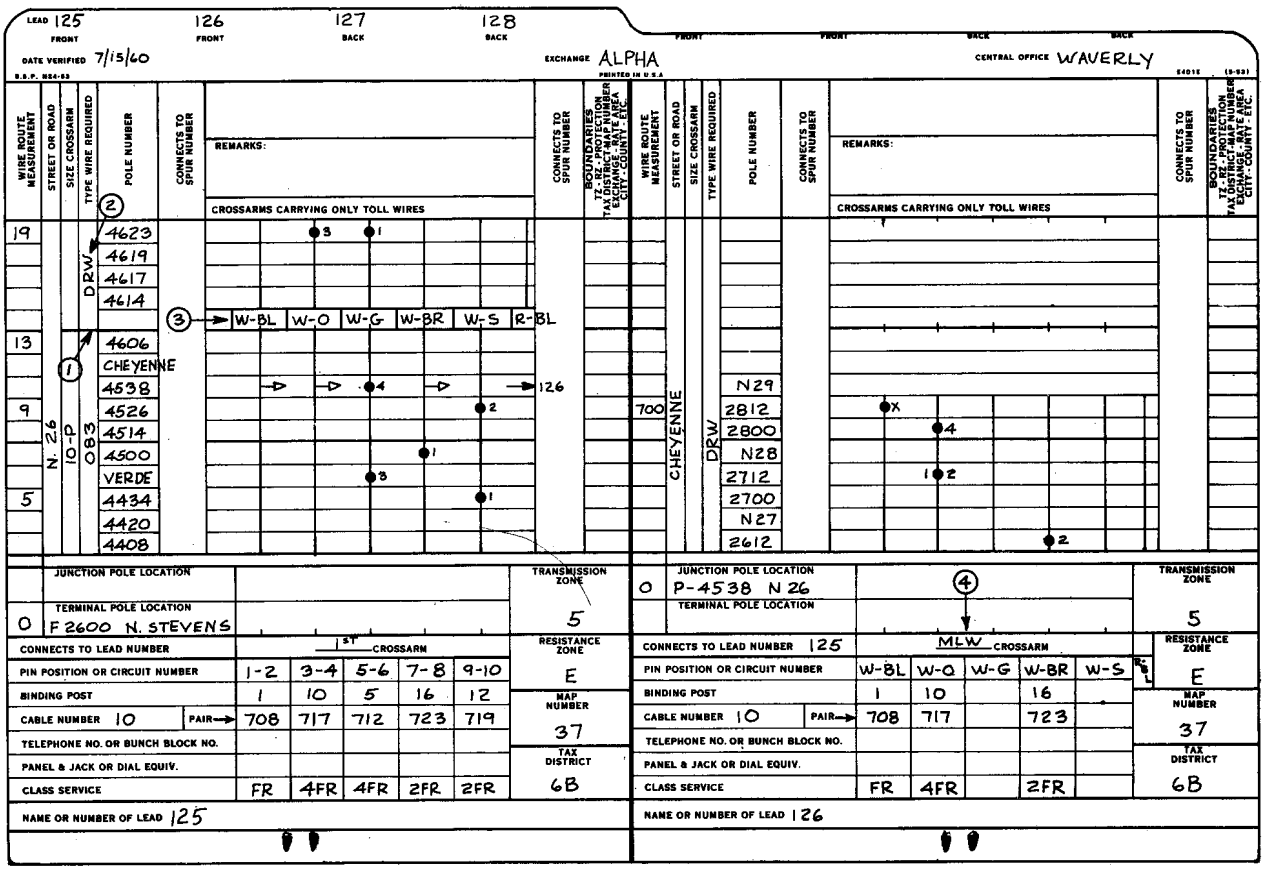


EXHIBIT 16

EXTENSION OF OPEN WIRE LEAD WITH MULTIPLE LINE WIRE — FORM E-4015

Notes

1. Show change in type of wire.
2. Type of MLW used.

Notes

3. Color code of DRW.
4. Shows multiple line wire lead or spur.