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BEFORE THE PUBLIC UTILITIES COMMISSION OF OHIO

IN THE MATTER OF THE COMPLAINT OF THE OHIO CABLE TELECOMMUNICATIONS ASSOCIATION, COAXIAL COMMUNICATIONS, INC., V CABLE, INC. AND TIME WARNER CABLE,	)	
Complainants,	)	
v.	)	CASE NO. 96-1027-TP-CSS
AMERITECH OHIO,	)	
Respondent.	)	
RELATIVE TO ALLEGED VIOLATIONS OF SECTION 4905.71, REVISED CODE AND 47 U.S.C. § 224(F)(1) REGARDING DISCRIMINATORY TREATMENT OF POLE ATTACHMENTS BY CABLE TELEVISION OPERATORS.	)	

DIRECT TESTIMONY OF MARK CAPWELL

Question 1. PLEASE STATE YOUR NAME, EMPLOYER AND TITLE, AND BUSINESS ADDRESS.

Answer: My name is Mark Capwell. I am employed by Time Warner Communications, Inc. ("Time Warner") as Design Engineering/Construction Manager. My business address is 1266 Dublin Road, Columbus, Ohio.

Question 2. WHO AUTHORIZED YOU TO FILE TESTIMONY IN THIS PROCEEDING?

Answer: I have been authorized by The Ohio Cable Telecommunications Association ("Association") and Time Warner to file testimony in this proceeding.

Question 3. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

Answer: I have been asked to provide information regarding preferential treatment by Ameritech Ohio to Ameritech New Media relating to pole attachments, and the effect of that preferential treatment on Time Warner and the public interest.

Question 4. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND WORK EXPERIENCE.

Answer: I have an Associates Degree in engineering from Ohio Institute of Technology. I have 15 years experience in engineering construction with Time Warner.

Question 5. PLEASE DESCRIBE YOUR DUTIES AND RESPONSIBILITIES IN YOUR CURRENT POSITION.

Answer: I am responsible for design, construction and maintenance of all our cable construction within the Columbus division of Time Warner.

Question 6. PLEASE IDENTIFY THE COUNTIES, MUNICIPALITIES AND/OR GEOGRAPHIC AREAS IN WHICH TIME WARNER PROVIDES CABLE TELEVISION SERVICE IN ITS COLUMBUS DIVISION.

Answer: The Time Warner Columbus Division provides cable television service to various areas in Delaware and Franklin Counties.

Question 7. HOW DO THE FACILITIES OF CABLE TELEVISION OPERATORS GET FROM THE OPERATOR TO THE CONSUMERS?

Answer: In order to provide cable television service, it is necessary to provide a connection from the signal source through a hybrid fiber-coaxial cable network to subscribers. This cable can either be buried or attached to aerial plant. If poles are available, we usually try to

attach to aerial poles. Availability and cost factors determine that decision. In many areas, Time Warner's cable is attached to aerial poles owned or controlled by Ameritech Ohio, and in some areas the attachments are to both Ameritech Ohio poles and poles owned by the power company.

Question 8. PLEASE DESCRIBE GENERALLY HOW A CABLE TELEVISION OPERATOR GOES ABOUT ATTACHING ITS FACILITIES TO AMERITECH OHIO UTILITY POLES IN A PARTICULAR AREA.

Answer: Of course, we must first have a pole attachment agreement with the utility which owns the poles. Then our company makes a survey of the area and determines pole ownership. The appropriate pole attachment applications are submitted to the utilities involved and we wait for permission to attach. In large projects, joint ride-outs are scheduled prior to approval to construct. The pre-construction ride-out was generally initiated by Columbus Southern Power with representatives of the currently attached utilities and the new applicant. The group then surveys the proposed pole routes to determine where space is available or what make ready work needs to be completed to make space available for use. On Ameritech Ohio poles, Ameritech Ohio determines and directs Time Warner where and how it will be permitted to attach its cable.

If space is not available, then a determination must be made as to what work must be done and who will be responsible for performing and paying for such work. This work is known as "make-ready work." The make-ready costs may include the expense of rearranging existing attachments or replacing the pole with a taller pole to create more available space. Time Warner has in many instances been required to incur these costs, including the cost of pole replacement, in making its attachments to Ameritech Ohio poles.

The next step would involve a "make-ready survey" in which there would be an estimate as to how much the proposed attaching company would need to pay to complete the make-ready work. While that make-ready work is being done, we could begin construction on those poles where make-ready work is not necessary.

Question 9. WHAT IS THE DOCUMENT MARKED AS ATTACHMENT MC-I?

Answer: Attachment MC-I is a typical example of a pole attachment agreement between Time Warner and Ohio Bell Telephone Company. That agreement is dated March 3, 1982, covers several areas in Franklin County and Appendix 2 of the document includes the requirements imposed by the telephone company with respect to the attachment of Time Warner's cable to telephone company utility poles. To my knowledge, this document has not been amended as it relates to those requirements for pole attachments.

Question 10. HOW DO YOU KNOW ON WHICH POLES AND WHERE ON THE POLE THE CABLE TELEVISION OPERATOR WILL BE ALLOWED TO ATTACH?

Answer: Cable operators generally have very few choices in where they can attach to a pole. When you have a customer who has requested service, it is often necessary to make attachments on both AEP and Ameritech poles. We are limited as to where on the poles we can attach. AEP and Ameritech Ohio poles are intermixed throughout our system and each company in their pole attachment agreements proscribe where on the pole we can attach. In the case of Ameritech, applying Appendix 2 to the pole attachment agreement (Attachment MC-I), Ameritech Ohio determines where we can attach our cable on the poles.

Question 11. ARE THERE STANDARDS OR POLICIES WHICH CABLE TELEVISION OPERATORS MUST FOLLOW IN MAKING ATTACHMENTS TO AMERITECH OHIO POLES?

Answer: Yes.

Question 12. HOW ARE THOSE STANDARDS ESTABLISHED?

Answer: Standards are established in the National Electrical Safety Code ("NESC"), the Bellcore Blue Book Construction Manual, and pole attachment agreements between my company and a public utility. On Ameritech Ohio poles, Ameritech Ohio enforces these requirements during the permitting process.

Question 13. WHAT IS THE NATIONAL ELECTRICAL SAFETY CODE AND HOW DOES IT RELATE TO UTILITY POLE ATTACHMENTS BY CABLE OPERATORS?

Answer: The NESC is a code book of the minimum safety standards, and it contains minimum ground and road clearances and minimum spacing requirements (i.e., spacing between cables), which are applicable in the construction of aerial cable plant. The provisions of the NESC are incorporated into the pole attachment agreements with utilities, although the NESC does not prohibit utilities from imposing stricter clearance standards, which utilities as well as municipalities have done. The NESC does not cover the physical location of attachments on the pole (e.g., whether cable attachments will be above or below phone attachments), or the use of extension brackets to attach to poles. As it relates to pole attachments, the NESC only deals with road and ground clearances and clearances between cables.

Question 14. PLEASE IDENTIFY AND DESCRIBE THE STANDARDS OR POLICIES THAT HAVE BEEN APPLIED BY AMERITECH OHIO TO TIME WARNER IN CONNECTION WITH POLE ATTACHMENTS.

Answer: There are four major standards that I am aware of that have been applied by Ameritech Ohio to Time Warner. First, a cable operator must maintain an 18-foot clearance over roads and alleyways. Second, a cable operator must attach above a telephone company attachment. Third, standoff brackets have not been permitted to be used by cable operators for the purpose of obtaining clearance. The only time a standoff bracket has been permitted is when a pole is not in line or when a bracket is necessary for everyone on the pole to get around a natural barrier, such as a tree. Finally, Time Warner cables are required to maintain mid-span clearance with other cables. This means that our cables must "follow the sag" and be parallel with other cables on poles.

Question 15. HOW LONG HAVE THOSE STANDARDS OR POLICES BEEN IN EXISTENCE AND ARE THEY STILL BEING APPLIED TO TIME WARNER BY AMERITECH OHIO?

Answer: These standards have been in existence as long as I can remember, going back at least until the 1970's. They have always been applied to Time Warner by Ameritech Ohio.

Question 16. HAVE YOU OR ANYBODY IN YOUR COMPANY BEEN NOTIFIED BY AMERITECH OHIO OF ANY CHANGES IN POLE ATTACHMENT POLICIES WITHIN THE LAST SIX YEARS?

Answer: No. Reference has been made to a September 19, 1995 memorandum or document regarding a change in Ameritech Ohio policy. I had not received that document and I have checked with my construction supervisor and utility coordinator to determine if either had received such a document. They have not. I have searched the records of Time Warner, and directed others to search the records as well, and have located no copy of the September 19, 1995 document or any other memorandum or notices from Ameritech Ohio regarding a change in pole attachment policies and practices.

Question 17. HAVE THERE BEEN ANY CHANGES IN THE NATIONAL ELECTRICAL SAFETY CODE THAT HAVE AFFECTED THE MANNER IN WHICH TIME WARNER HAS BEEN PERMITTED TO ATTACH ITS CABLE TO AMERITECH OHIO POLES?

Answer: No. The only recent change in the NESC relating in any way to pole attachments was in 1990, when the code was changed regarding the way in which ground clearances are measured. Attached to my testimony as Attachment MC-III are copies of the pertinent provisions of the NESC, including Section 232 and Table 232-1. The attachment includes these provisions from the 1987 NESC (Exhibit A), the 1990 NESC (Exhibit B), and the 1993 NESC (Exhibit C). These excerpts show the 1990 change in the method by which clearances are measured, and the clearance heights are set forth in the table. For road clearances, for example, the 1987 standard was 18' (shown in Table 232-1, item no. 2) under conditions of "60°F (15°C), no wind, with final unloaded sag . . ." (see Section 232.A.1). Under the 1990 code, the road clearance is 15'6", but the conditions under which the clearances are measured are

"whichever produces the largest final sag." The 1993 NESC is consistent with the 1990 code in this regard.

The 1990 change in the NESC did not change the manner in which Time Warner was permitted to attach to Ameritech Ohio poles. Ameritech Ohio continued to require Time Warner to maintain 18' road clearances both before and after 1990, as did AEP and Franklin County. In fact, in many instances the minimum ground and road clearance requirements did not change at all, as an 18' with "final unloaded sag" clearance and 15'6" with "largest final sag" clearance will be essentially the same height requirement in many instances, depending upon such factors as the size of the cable and the span width. Thus, in many circumstances the 1990 change in the code had no effect on the height on the pole at which cables could be attached.

Ameritech has continued to enforce the requirements set forth in the pole attachment agreements regarding the physical location of attachments. The 1990 NESC change did not relate to what position each attaching party should occupy on the pole (e.g., whether television cable is above or below the phone cable), or to the use of extension arms. These requirements are imposed by Ameritech, not the NESC, and Ameritech did not amend the pole attachment agreements but instead continued to prohibit the use of brackets to gain clearances, and continued to require additional cable operators to attach above the telephone attachments.

Question 18. ARE YOU FAMILIAR WITH AMERITECH NEW MEDIA, INC.?

Answer: Yes. Ameritech New Media, Inc. ("New Media") is another cable television provider which is affiliated with the Ameritech Ohio telephone company.

Question 19. HAS AMERITECH NEW MEDIA BEEN ATTACHING TO SOME OF THE SAME AMERITECH OHIO POLES UPON WHICH TIME WARNER HAS ATTACHMENTS?

Answer: Yes. There have been attachments by New Media on some of the same Ameritech Ohio poles upon which Time Warner has attached in German Village, Clintonville, and the Upper Arlington areas, all in Franklin County.

Question 20. HAS AMERITECH NEW MEDIA FOLLOWED THE SAME STANDARDS THAT WERE APPLIED TO YOUR COMPANY IN INSTALLING ATTACHMENTS TO AMERITECH OHIO POLES?

Answer: No.

Question 21. WOULD YOU SPECIFICALLY DESCRIBE THE WAYS IN WHICH AMERITECH NEW MEDIA HAS BEEN PERMITTED TO DEVIATE FROM AMERITECH OHIO POLE ATTACHMENT POLICIES THAT WERE APPLIED TO YOU?

Answer: Yes. First and foremost, New Media has been allowed to attach to the bottom position of the pole below the telephone attachment. New Media has also been allowed to construct its cable so that it has been achieving a street clearance of less than 18 feet. New Media has also been permitted to use standoff brackets so as to avoid make ready costs. Finally, New Media has constructed some of its cable with taut suspension instead of maintaining mid-span clearance and being parallel with other lines on poles. Contrary to these practices, Time Warner has never been allowed by Ameritech Ohio to attach below the telephone attachment; to attach with less than 18 foot road clearance; to use standoff brackets to avoid make ready costs; or to avoid mid-span clearance requirements.

Question 22. HAVE YOU ATTACHED TO YOUR TESTIMONY AS ATTACHMENT MC-II PHOTOGRAPHS OF SPECIFIC INSTANCES WHERE AMERITECH OHIO HAS PERMITTED AMERITECH NEW MEDIA TO DEVIATE FROM THE POLICIES THAT WERE APPLIED TO YOU?

Answer: Yes

Question 23. WOULD YOU BRIEFLY EXPLAIN HOW EACH OF THE PICTURES INCLUDED IN ATTACHMENT TO YOUR TESTIMONY WERE TAKEN AND STATE WHETHER THEY ARE FAIR AND ACCURATE REPRESENTATIONS OF THE MATTERS PHOTOGRAPHED?

Answer: Yes. The pictures were taken on Thursday, October 31, 1996 in the Columbus area between the hours of 9:30 a.m. and 1:30 p.m. The weather was dry and clear and the temperature was in the low 60°F range. The pictures are fair and accurate representations of what we photographed on that date. I was present when the pictures were taken and participated in the process of taking these pictures.

Some of the pictures depict a measuring stick we use. The lower yellow casing is 5 feet tall and the alternating yellow and red markings going up the rod represent 1-foot increments. Unless I specifically indicate otherwise, the measuring stick shown in the picture is extended to 18 feet. All of the utility poles depicted in the photographs are poles owned or controlled by Ameritech Ohio. The pictures show examples of New Media attachments on Ameritech Ohio poles that have not been required to meet the standards and requirements imposed upon Time Warner by Ameritech Ohio.

Question 24. ADDRESSING EACH SET OF PICTURES SEPARATELY, STATE WHERE THE PICTURES WERE TAKEN AND EXPLAIN WHAT IS SHOWN IN EACH SET OF PICTURES IN REGARDS TO THE ATTACHMENT OF AMERITECH NEW MEDIA.

Answer: Attachment MC-II, Page A, Photos 1-4 and Page B, Photos 5 and 6

Photo 1 indicates that the next series of photos are taken of the intersection of Henderson and Sawmill Roads in Columbus on October 31, 1996.

Photo 2 shows the midspan clearance going across Henderson Road of a New Media cable of well below the 18-feet road clearance standard. Photo 3 shows a close-up of the measuring stick at 18 feet.

Photo 4 shows a New Media cable (indicated by the white tag) crossing the street. Note here that it is above the telephone attachment. However, Photo 6, which is across the street, shows the same New Media cable below the telephone attachment on that side of the street. In other words, New Media has been allowed to change its location in relation to the telephone attachment to avoid make-ready costs.

Photo 5 on Page B is on the same pole line as Photo 6 on Page B, but on a different pole. The New Media attachment is the cable with the white and orange identifying marking tags. Note the use of the stand-off bracket to maintain clearance. This cable is going across a parking lot. The stand-off bracket presents a safety hazard for anyone climbing above the New Media attachment, which is on the bottom.

Attachment MC-II, Page C, Photos 1-4 and Page D, Photos 5 and 6

Photo 1 indicates that the next series of photos are taken in an alley behind 305 Morse Road. Photo 2 shows a picture of various cables crossing a street. The measuring stick is set at

18 feet. The very top cable in the light color is the Time Warner cable which is above 18 feet. The next two cables are telephone cables. The bottom cable is the New Media cable and it crosses the road at less than 18 feet.

Photo 3 shows the same crossing as Photo 2. However, it also shows that New Media has used an extension arm on the pole, again creating a safety hazard. The use of the extension arm allows New Media to obtain a 15-foot 6-inch clearance over the road. Photo 4 shows a close-up of the 18-foot setting of the measuring stick.

Photo 5 shows a close-up of the extension arm which is pictured on Photo 3. Notice the New Media cable has the white identification tag. Photo 6 is a photograph of a different pole in the area which shows that New Media is attaching below the telephone attachment. It is on the same side of the street in an alleyway. Notice toward the lower left-hand corner of Photo 6 the white New Media identification tag.

Attachment MC-II, Page E, Photos 1-4 and Page F, Photos 5-7

Photo 1 indicates that the next series of pictures is taken at 2054 Tuller Street between Woodruff and Frambe. Photo 2 shows the lowest cable as the Ameritech New Media cable which is just below the 18-foot measuring stick as it crosses the street. Photo 3 is a close-up of the measuring stick set at 18 feet.

Photo 4 shows three cables. The top cable is the Time Warner cable. It is lighter colored than the other two cables. The thin cable which is wrapped around the lower cable and starts to approach the Time Warner cable in the upper left-hand corner of the picture is the Ameritech New Media cable. Note the white identification tag in the upper right-hand corner of the picture. The thick black cable at the bottom is the telephone cable. Note that the New Media cable starts

out below the telephone cable, but is wrapped around both the telephone and the Time Warner cable. A better view of this is shown on Page F, Photo 6.

Photo 5 shows the 18-foot measuring stick used in Photo 4.

Photo 7 shows two horizontal cross-arms on the pole. This pole is located in an alleyway. The bottom cross-arm is an Ameritech Ohio cross-arm which supports its cable. Note that Ameritech New Media has placed a bolt into the Ameritech Ohio cross-arm to suspend its cable below that of Ameritech Ohio. Time Warner has to use its own extension arm on such a pole and its arm is shown above that of Ameritech Ohio. New Media should have been required to put its own extension arm on the pole instead of using a bolt on Ameritech Ohio's arm.

Attachment MC-II, Page G, Photos 1-3

Photo 1 shows that the next two pictures are taken at 37 E. 14th Avenue and the alley behind that location. Photo 2 shows an Ameritech New Media attachment going across the street at 15 feet. Note the portion of the white Ameritech identification tag on the New Media cable to the right-hand portion of the picture. To my knowledge, this street crossing still has not been brought into compliance with the NESC minimum road clearance standard.

Photo 3 shows a close-up of the 18-foot setting on the measuring stick shown in Photo 2.

Attachment MC-II, Page H, Photos 1-4

Photo 1 indicates that the next three pictures are taken in an alley behind 63 E. 14th Avenue. Photo 2 shows two cables crossing the entrance to a parking lot. The top cable, which is the thicker black cable, is the telephone attachment. The lower cable is the New Media attachment. The New Media attachment measures 13 feet 2 inches across that entrance to the parking lot. This low clearance to my knowledge still exists.

Photo 3 is a close-up of the measuring stick showing the 18-foot setting.

Photo 4 depicts an Ameritech New Media cable at the bottom. Note the white tag just to the right of the pole. Also note that a bolt is suspended from the telephone arm and holds the Ameritech New Media cable in place. Time Warner would not be permitted to do that, but would rather be required to install its own arm if necessary.

Attachment MC-II, Page I, Photos 1-3

Photo 1 shows that the next series of pictures are taken at the intersection of Pearl Street and Stimmel Street in German Village. Photo 2 shows a low clearance crossing over Pearl Street. Note that the New Media cable is at the bottom. Note the white identification tag. It measures 15 feet 8 inches across the alley. The next attachment up is the Ameritech Ohio telephone attachment. The attachment at the 18-foot mark is the Time Warner attachment.

Photo 3 shows a close-up of the measuring stick shown in Photo 2.

Attachment MC-II, Page J, Photos 1-3

Photo 1 indicates that the next three pictures are taken at the intersection of Pearl Street and Frankfort Street. Photo 2 shows the Ameritech New Media attachment as the black cable attachment at the bottom. The telephone attachment is above the New Media attachment. The New Media attachment was measured as crossing the street at 16 feet 4 inches. Photo 3 shows a close-up of the measuring stick at 18 feet.

Attachment MC-II, Page K, Photos 1-3

Photo 1 indicates that the next two pictures are taken at the intersection of Pearl Street and Columbus Street. Photo 2 shows the New Media attachment as the heavy black line across

the page at approximately 1 1/2 feet below the top of the measuring stick, in other words, crossing the street with less than 18 foot clearance.

Photo 3 shows a close-up of the setting of the measuring stick shown in Photo 2.

Attachment MC-II, Page L, Photos 1-3

Photo 1 shows that the next two pictures are taken at 798 Pearl Street. Photo 2 shows the thick black cable at the bottom as a New Media cable which is measured as crossing the alley at 16 feet 8 inches. The three thinner cables above the measuring stick are power drops.

Photo 3 shows a close-up of the setting of the measuring stick shown in Photo 2.

Attachment MC-II, Page M, Photos 1-2

Photo 1 shows that the next two pictures are taken at the intersection at Kossuth and Pearl Streets. Photo 2 shows the New Media cable crossing that intersection at 15 feet 5 inches. The New Media cable is not quite as thick as the telephone cable which is above it. Once more, the crossing is still lower than the fully loaded 15'6" NESC standard.

Photo 3 is the close-up of the setting of the measuring stick at 18 feet.

Attachment MC-II, Page N, Photos 1-3

Photo 1 indicates that the next two pictures are taken at Lansing Street and Pearl Street, south of the intersection. Photo 2 shows the New Media cable crossing the intersection at 16 feet. The New Media attachment is the thick black cable in the picture. There are three lines above it.

Photo 3 is a close-up of the setting of the measuring stick at 18 feet.

Attachment MC-II, Page O, Photos 1-3

Photo 1 indicates that the next two pictures are taken at the intersection of Deshler Street and Pearl Street. Photo 2 shows a low clearance of 15 feet 8 inches over Deshler. The New Media attachment is the lowest of the three thick cables shown. The telephone attachments are above the New Media cable.

Photo 3 is a close-up of the measuring stick set at 18 feet.

Attachment MC-II, Page P, Photos 1-3

Photo 1 indicates the next two pictures are taken of a pole at 116 Concord Place.

Photo 2 indicates that the New Media attachment, the heavy black cable at the top of the photo, was measured as crossing Concord at 15 feet 6 inches.

Photo 3 is a close-up of the measuring stick set at 18 feet.

Attachment MC-II, Page Q, Photos 1 and 2

Photo 1 indicates that the next picture is taken at 178 Concord Place. Photo 2 shows the Ameritech New Media cable with the white and orange identification tags. Note how this New Media cable does not attach to the pole, but is attached to an extension arm which goes out horizontally from the pole. The use of this extension arm avoids the incurrence of make-ready costs to New Media.

Attachment MC-II, Page R, Photos 1-4

Photo 1 shows that the next three pictures were taken at 123 Lansing Street.

Photo 2 shows the New Media cable is the lowest of the three cables, followed by the telephone cable and the Time Warner cable. The Time Warner cable exceeds the 18-foot road

crossing standard. The New Media attachment was measured at 15 feet 10 inches across this street.

Photo 3 is of the same alleyway, but at a different vantage point. In this picture, you can see the white Ameritech New Media identification tags.

Photo 4 shows the measuring stick set at 18 feet.

Question 25. WHAT BENEFIT DOES AMERITECH NEW MEDIA GAIN FROM INSTALLING ITS ATTACHMENT BELOW THE TELEPHONE ATTACHMENT, FROM USING EXTENSION BRACKETS OR EXTENSION ARMS, AND FROM NOT HAVING TO MAINTAIN 18 FOOT MINIMUM ROAD CLEARANCES?

Answer: The benefit is that it is faster and cheaper for New Media to construct its plant. By attaching below the telephone attachment, New Media does not have to pay any make ready costs (such as the cost of installing a replacement taller pole) and avoids construction delays and expenses with mid-span clearances and takeoffs.

Question 26. ARE THERE INSTANCES WHERE NEW MEDIA'S EXISTING CABLE PLANT DOES NOT MEET THE MINIMUM NESC ROAD CLEARANCE REQUIREMENTS OR THE REQUIRED MID-SPAN CLEARANCES?

Answer: Yes. Photos on pages G, H, and M show locations where New Media's attachments have clearances below the 15'6" NESC standard, even before they are subjected to maximum sag conditions. Photos on pages E and F show an instance where New Media's cable fails to meet minimum mid-span clearance requirements.

Question 27. HAS ANY CORRECTIVE ACTION BEEN TAKEN BY AMERITECH OHIO OR NEW MEDIA WITH RESPECT TO THOSE MATTERS SINCE THE PHOTOGRAPHS WERE TAKEN?

Answer: No. As of December 6, 1996, these violations still had not been corrected, and to my knowledge these violations still exist.

Question 28. DOES THE MANNER IN WHICH NEW MEDIA IS INSTALLING ITS CABLE RAISE ANY SAFETY CONCERNS FOR TIME WARNER OR THE PUBLIC?

Answer: Yes. Ameritech Ohio's practice of permitting New Media to install its cable as it is doing creates safety concerns. For example, use of brackets impedes access to higher cables by workmen on the pole, and lower clearance over roadways creates a hazard by increasing the chance that the cable will be struck by a vehicle, which affects all of the attachments on the adjacent poles, and creates danger to the public from downed utility lines.

Question 29. CAN THE MANNER IN WHICH NEW MEDIA IS INSTALLING ITS CABLE AFFECT THE DELIVERY OF UTILITY SERVICE TO CUSTOMERS?

Answer: Yes. New Media's disregard for maintaining adequate road clearances, which are required by Franklin County, AEP, and safe construction practices, place all the other utilities connected to that pole (including electric and phone as well as cable television) in danger of a tear down, resulting in loss of services to the customer, and loss of revenues to the utility coupled with the expense of restoration.

Question 30. WOULD YOU PLEASE SUMMARIZE YOUR TESTIMONY?

Answer: By giving permission to New Media to use lower space on the pole, to use standoff brackets and to circumvent existing clearance requirements, Ameritech Ohio has

exhibited unfair construction preferences to New Media which enables it to construct its plant very quickly, cheaply and in many instances unsafely.

Question 31. DOES THIS CONCLUDE YOUR TESTIMONY?

Answer: Yes.

ATTACHMENT MC-I

TELEPHONE COMPANY COPY

LICENSE AGREEMENT

Dated: March 3, 1982

Effective: March 3, 1982

THIS AGREEMENT, by and between The Ohio Bell Telephone Company, a corporation organized and existing under the laws of the State of Ohio, hereinafter called Licensor, and Warner Amex Cable Communications Inc., hereinafter called Licensee.

W I T N E S S E T H :

WHEREAS, licensee proposes to furnish communications services in Columbus, Upper Arlington, unincorporated areas of Franklin County, Grandview Heights, Hilliard, MarbleCliff, Grove City, Gahanna, Valley View, Worthington, Riverlea, Dublin and Minerva Park, Ohio; and shown on the map attached hereto as Exhibit A and made a part hereof.

WHEREAS, Licensee will need to place and maintain aerial, underground and buried cables, equipment and facilities within the area described above and desires to place such cables, equipment and facilities on poles and in the conduit and the trench system of Licensor; and

WHEREAS, Licensor is willing to permit, to the extent it may lawfully do so, the placement of said cables, equipment and facilities on or within Licensor's facilities and systems where reasonably available and where such use will not interfere with Licensor's service requirements, or be prejudicial to Licensor's services because of considerations of economy or safety, or the use of its facilities by others.

NOW THEREFORE, in consideration of the mutual convenants, terms and conditions herein contained, the parties do hereby mutually covenant and agree as follows:

ARTICLE 1

DEFINITIONS

As used in this Agreement:

Licensor's "poles" mean poles owned by Licensor and poles owned by others to the extent that and for so long as Licensor has the right to permit others to attach in the communications space.

"Conduit system" means any reinforced passage or opening in, on, under or through the ground capable of containing communications facilities, and includes: main conduit; underground dips and short sections of conduit

under roadways, driveways, parking lots and similar conduit installations; laterals to poles and into buildings; ducts; and manholes.

"Buried cable" means cable located below the surface of the ground but not a part of Licensor's conduit system.

"Pedestal" means any closure, terminal or similar device owned by Licensor and used to connect buried cable to customer service wires or other apparatus. It does not include telephone devices attached to or within a building or residence being served.

"Trench system" means any non-reinforced passage or opening that is trenched, plowed, excavated, dug or bored in, under or through the ground, capable of containing communications facilities. Pedestals and other equipment associated with buried cable in the trench system are included in the meaning.

ARTICLE II

SCOPE OF AGREEMENT

(a) Subject to the provisions of this Agreement, the Licensor will issue to Licensee for any lawful communications purpose revocable, nonexclusive licenses authorizing the attachment of Licensee's cables, equipment and facilities to Licensor's poles or the placing of Licensee's cables, equipment and facilities in Licensor's conduit system or trench system within the areas shown on Exhibit A attached hereto.

(b) No use, however extended, of Licensor's poles, conduit system or trench system nor payment of any fees or charges required under this Agreement shall create or vest in Licensee any ownership or property rights in said poles, conduit system or trench system, but Licensee's rights therein shall be and remain a mere license. Nothing herein contained shall be construed to compel Licensor to construct, retain, extend, place or maintain any facilities not needed for its own service requirements.

(c) It is recognized by the Licensee that the Licensor has heretofore entered into, or may in the future enter into, agreements and arrangements with others not parties to this Agreement regarding the poles, conduit system and trench system covered by this Agreement. Nothing herein contained shall be construed as a limitation, restriction or prohibition against Licensor with respect to such other agreements and arrangements. The rights of the Licensee shall at all times be subject to any present or future joint-use arrangement between Licensor and any other public utility or government agency.

ARTICLE III

FEES AND CHARGES

(a) The Licensee shall pay to Licensor the fees and charges as specified in and in accordance with the terms and conditions of Appendix 1, attached hereto and made a part hereof.

(b) Nonpayment of any amount due under this Agreement shall constitute a default of this Agreement.

(c) Licensee shall furnish bond or other security satisfactory to Licensor in such amount as Licensor from time to time may require, in an initial amount of Five Thousand Dollars ($5,000.00) to guarantee the payment of any sums which may become due to Licensor arising out of this agreement including but not limited to fees due hereunder or charges for work performed for the benefit of Licensee under this Agreement, including the removal of Licensee's facilities upon termination of this Agreement by any of its provisions or upon termination of any license issued hereunder.

(d) DELETE

ARTICLE IV

SPECIFICATIONS

Licensee's cables, equipment and facilities shall be placed and maintained in accordance with the requirements and specifications of Appendix 2 (Poles), Appendix 3 (Conduit System) and Appendix 4 (Trench System) attached hereto and made a part hereof, and in accordance with the requirements and specifications of Administrative Order No. 72 of The Public Utilities Commission of Ohio, and any amendment or revision of said order, and in compliance with any other rules or orders now in effect or that may hereafter be issued by The Public Utilities Commission of Ohio or other authority having jurisdiction. Unless different standards are specified therein, the provisions of the National Electrical Code (1968 edition) and the National Electrical Safety Code (6th edition), and any amendments thereto or replacements thereof, shall be applicable. If any part of Licensee's distribution system is not so placed or maintained Licensor may upon ten days written notice to Licensee and in addition to any other remedies Licensor may have, remove Licensee's distribution system from any or all of Licensor's poles, conduit or trench system, or perform such other work and take such other action in connection with said distribution system that Licensor deems necessary or advisable, at the cost and expense of Licensee and without any liability therefor; provided, however, that when in the judgment of Licensor (such judgment to be conclusive) such a condition may endanger the safety of Licensor's employees or interfere with the performance of Licensor's service obligations, Licensor may take such action without notice to Licensee.

ARTICLE V

LEGAL AUTHORITY

Licensee will obtain from public authorities and private owners of

real property any and all permits, franchises, licenses and grants necessary for the lawful exercise of any license granted hereunder.

ARTICLE VI

ISSUANCE OF LICENSES

(a) Before Licensee shall have a right to attach to any pole of Licensor, Licensee shall make application for and receive a revocable, nonexclusive license therefor in the form of Exhibit B, hereto attached and made a part hereof.

(b) Before Licensee shall have the right to place any cable, equipment or facilities within any conduit system of Licensor, Licensee shall make application for and receive a revocable, nonexclusive license therefor in the form of Exhibit C, hereto attached and made a part hereof.

(c) Before Licensee shall have the right to place any cable, equipment or facilities within any trench system of Licensor, Licensee shall make application for and receive a revocable, nonexclusive license therefor in the form of Exhibit D hereto attached and made a part hereof.

(d) DELETE

(e) Any license granted hereunder for attachment to Licensor's poles shall terminate without further notice to Licensee as to individual poles covered by the license to which Licensee has not attached within 60 days from the date that Licensor has notified Licensee that such poles are available for attachment of the operating facilities of Licensee, unless Licensor in the exercise of its sole discretion agrees to extend said period at the request of Licensee.

(f) Any license granted hereunder for placement of Licensee's facilities in Licensor's conduit system shall terminate without further notice to Licensee as to individual sections of Licensor's conduit system covered by the license in which Licensee has not placed its facilities within 90 days from the date that Licensor has notified Licensee that such sections of the conduit system are available for the placement of operating facilities of Licensee, unless Licensor in the exercise of its sole discretion agrees to extend said period at the request of Licensee.

(g) Any license granted to the Licensee for the placement of the Licensee's facilities in a trench excavated by the Licensor shall be terminated if the Licensee does not place his facilities in the trench at the appointed time designated by the Licensor. The Licensor will make every effort to give the Licensee as much advance notification of placing time as possible. Should it not be possible, because of unforeseen circumstances, to make the trench available to the Licensee at the appointed time, the Licensor shall not be responsible for any cost or expense incurred by Licensee.

ARTICLE VII

POLE REPLACEMENTS AND REARRANGEMENTS

(a) In granting or denying a license Licensor reserves the right to determine whether a grant would adversely affect its common carrier communication services and its ability to meet its duties and obligations with respect thereto, including questions of economy, safety and future needs of Licensor and other joint users.

(b) (1) In the event Licensor determines that any pole or poles of Licensor to which Licensee desires to make attachments is inadequate to support or accommodate the additional facilities of Licensee in accordance with the specifications set forth in Appendix 2, and if Licensor is willing to replace such poles to permit Licensee's attachments thereto, Licensee agrees to reimburse Licensor in accordance with the terms of Appendix 1 for the cost and expense of replacing such inadequate poles with suitable poles. Or in the event Licensor determines that the attachments Licensee desires to make can be accommodated on present poles of Licensor by rearranging or changing the facilities thereon, or by purchasing additional pole space from the other joint owner or owners of the poles, if any, and if Licensor is willing to make such rearrangements, changes or purchases to permit Licensee's attachments thereto, Licensee agrees to reimburse Licensor in accordance with the terms of Appendix 1 for the cost and expense for making such rearrangements, changes or purchases. Licensee shall also reimburse the owner or owners of other facilities attached to said poles for any expense incurred by it or them in transferring such facilities to another pole or rearranging such facilities to accommodate Licensee's attachments. Licensee shall not be entitled to reimbursement of any amounts paid to Licensor, as aforesaid, by reason of the use by Licensor or other authorized users of said poles of any of the additional pole space so acquired.

(2) Licensor will indicate on the Application and License (Exhibit B), the replacements, changes, rearrangements and purchases necessary to accommodate the proposed attachments of Licensee together with the amount to be charged therefor, and return said Application and License to Licensee. If Licensee still desires to make the attachments, it shall return the Application and License marked to so indicate, tendering therewith payment in the amount set forth in the Application and License. Licensor will then endeavor to perform or have performed such work as soon as is practicable upon consideration of Licensor's service requirements, and upon the completion thereof will notify Licensee by return of the Application and License appropriately indicated. Licensee shall not make any attachments until notified in writing by Licensor that all such replacements, rearrangements, changes and purchases have been completed. Any guying, strengthening or stepping of poles, required to accommodate Licensee's attachments, shall be provided at the expense of Licensee in accordance with the specifications in Appendix 2, and to the satisfaction of Licensor.

(c) Should Licensor, or another public utility or governmental agency with whom it then has a joint-use agreement, need for its own service requirements the space occupied by Licensee's attachments on any of

Licensor's poles, Licensee will be notified that it shall either surrender its license for that pole and, at its own expense, vacate the space by removing its attachments, or, in accordance with the preceding Paragraph (b), it shall authorize Licensor to replace the poles at the expense of Licensee, or, if Licensor advises Licensee that Licensee's desired attachments can be accommodated on present poles of Licensor by rearranging or changing Licensor's facilities thereon, or by purchasing additional pole space, Licensee shall authorize Licensor to make such rearrangements, changes or purchases. Licensee shall also reimburse the owner or owners of other facilities attached to said poles for any expense incurred by it or them in transferring or rearranging said facilities to accommodate Licensee's attachments. Any guying, strengthening or stepping of poles will be provided at the expense of Licensee in accordance with the specifications in Appendix 2, and to the satisfaction of Licensor.

(d) When multiple applications, including application of Licensee, are received by the Licensor with respect to any pole which must be replaced or rearranged to provide additional space prior to commencement of the work on that pole, Licensor will endeavor to equitably prorate to the extent that it is practical between Licensee and the other applicants for pole space, the common expenses of engineering, rearrangement and replacement, if any, which result from the processing of multiple applications. Licensee shall be bound by Licensor's determination as to any such proration of costs to Licensee.

ARTICLE VIII

OCCUPANCY OF CONDUIT SYSTEM

(a) When an Application in the form of Exhibit C is submitted by Licensee for a license to place its cables, equipment and facilities in the conduit system of Licensor, Licensor will advise Licensee of the availability of conduit space. In determining the availability of space in Licensor's conduit system, Licensor reserves the right to determine whether granting a license would adversely affect its common carrier communication services and its ability to meet its duties and obligation with respect thereto, including questions of economy, safety and future needs of Licensor. If conduit space is available, a license to occupy the conduit system will be granted to Licensee; provided, however, that Licensor does not warrant the condition of such conduit system.

(b) Licensor reserves the right to exclude cable, equipment and facilities of Licensee from manholes in Licensor's conduit system, or to limit the type, number and size of Licensee's cable, equipment and facilities which may be placed in any of Licensor's manholes.

(c) Should Licensor need for its own service requirements any of the space occupied by Licensee's cable, equipment and facilities located in Licensor's conduit system, Licensee will be notified that it shall either surrender its license for that portion of Licensor's conduit system, and, at its expense, vacate the space occupied by its said cable, equipment or facilities, or, if Licensor advises Licensee that Licensee's cable, equipment and

facilities can be accommodated otherwise in Licensor's conduit system, Licensee shall authorize Licensor to rearrange Licensee's cable, equipment and facilities in the manner in which Licensee's cable, equipment and facilities can be accommodated at the expense of Licensee. In the latter event the occupancy of Licensor's conduit system by Licensee's cable equipment and facilities may be subject to different occupancy fees as set forth in Appendix 1.

(d) Licensor may, without incurring any liability, remove the cables, equipment and facilities of Licensee from Licensor's conduit system, at Licensee's expense where in Licensor's judgment (such judgment to be conclusive) such removal is required in connection with the performance of Licensor's service obligation or the safety of Licensor's employees. Whenever such removal has been made, Licensee will be promptly notified and as soon as practicable thereafter, Licensor will endeavor to make arrangements for the relocation or restoration of Licensee's cables, equipment and facilities in Licensor's conduit system at Licensee's expense.

ARTICLE IX

OCCUPANCY OF TRENCH SYSTEM

(a) Licensee agrees that to the extent it occupies or desires to occupy any trench system also occupied or to be occupied by Licensor, whether Licensor's trench system or the trench system of others, the terms of this Agreement shall be applicable thereto.

(b) Before placing its cables, equipment and facilities in a trench system to be constructed by Licensor, Licensee shall make application and receive a revocable nonexclusive license in the form of Exhibit D attached hereto and made a part hereof. In granting or denying a license Licensor reserves the right to determine whether granting a license would adversely affect its common carrier communication services and its ability to meet its duties and obligation with respect thereto, including questions of economy, safety and future needs of Licensor.

(c) Licensor reserves the right to exclude cable, equipment and facilities of Licensee from Licensor's pedestals, or to limit the type, number and size of Licensee's cable, equipment and facilities which may be placed in any of Licensor's pedestals.

(d) When multiple applications, including application of Licensee are received by the Licensor with respect to the usage of a trench to be excavated by the Licensor for buried communications facilities, Licensor will endeavor to equitably prorate to the extent that is possible between Licensee and other applicants for trench space, the common expenses of engineering, inspection, excavation, and other associated costs which result from the processing of multiple applications. Licensee shall be bound by Licensor's determination as to any such proration of costs to Licensee.

(e) Where emergency needs of Licensor require, (Licensor's judgment as to what constitutes an emergency to be conclusive) Licensor may,

without incurring any liability, remove the cables, equipment and facilities of Licensee from the trench system, at Licensee's expense and shall promptly notify Licensee thereof. As soon as practicable thereafter, Licensor will endeavor to make arrangements for the relocation or restoration of Licensee's cables, equipment and facilities in the trench system at Licensee's expense.

ARTICLE X

CONSTRUCTION AND MAINTENANCE OF FACILITIES

(a) Licensee shall, at its own expense, make and maintain its pole attachments in a safe condition and in thorough repair, and in a manner acceptable to Licensor, and so as not to conflict with the use of said poles by Licensor or by other authorized users of said poles, or interfere with other facilities thereon or which may from time to time be placed thereon. Licensee shall, at its own expense, upon notice from Licensor, relocate or replace its facilities placed on said poles, or transfer them to substituted poles, or perform any other work in connection with said facilities that may be required. Licensor shall give such notice as is reasonable in the circumstances, provided, however, that in cases of emergency, (Licensor's judgment as to what constitutes an emergency to be conclusive) Licensor may arrange to relocate, remove or replace the attachments placed on said poles by Licensee, transfer them to substituted poles or perform any other work in connection with said facilities that may be required in the maintenance, replacement, removal or relocation of said poles or of the facilities thereon or which may be placed thereon, or for the service needs of Licensor, and Licensee shall reimburse Licensor for the expense thereby incurred. Attachments of Licensee to poles of Licensor as mentioned herein shall be understood to include attachments of Licensee in space reserved for Licensor, or space which Licensor has the right to use, on poles of other companies with which Licensor now has or may hereafter have agreements for joint use and occupancy; and the use of such space by Licensee shall be subject to the terms and conditions of the agreements between Licensor and said other companies.

(b) Licensee's cable, equipment and facilities shall be placed in, removed from, relocated in or maintained in Licensor's conduit system only when specific authorization for the work to be performed and approval of the person, firm or corporation selected by Licensee to perform the work, has been obtained in writing in advance from Licensor. Licensor retains the right to specify what, if any, work shall be performed by Licensor.

(c) In each instance where Licensee's cable, equipment and facilities are to be placed in Licensor's conduit system, Licensor shall specify, among other things, the cable configuration and location of Licensee's cable, equipment and facilities, the particular duct of the conduit such cable will occupy, and the location where and manner in which Licensee's cable will enter and exit Licensor's conduit system.

(d) Licensor's manholes shall be opened only as permitted by Licensor's authorized employees or agents. Licensee shall be responsible for obtaining any necessary permits from appropriate governmental authorities to open manholes and to conduct the work operations. Licensee's employees,

agents or contractors will be permitted to enter or work in Licensor's manholes only when an authorized agent or employee of Licensor is present except as provided in paragraph (e) hereof. Licensor's said agent or employee shall have the authority to close down Licensee's work operations in and around Licensor's manholes if, in the sole discretion of said agent or employee, any hazardous conditions arise or any unsafe practices are being followed by Licensee's employees, agents or contractors. Licensee agrees to pay, in accordance with the terms and conditions of Appendix 1, the full cost of having Licensor's agent or employee present when Licensee's work is being done in Licensor's manholes. The presence of Licensor's authorized agent or employee shall not relieve Licensee of its responsibility to conduct all of its work operations in and around Licensor's manholes in a safe and workmanlike manner, and in accordance with the terms of Appendix 3.

(e) Licensee's employees will be permitted to enter or work in Licensor's manholes and conduit system without an authorized agent or employee of the Licensor being present, provided that the Licensee's work consists only of routine operations of testing, adjusting, regulating or inspecting the Licensee's existing facilities and does not involve any placing, removing, changing or rearranging of the Licensee's or Licensor's facilities. In such cases, the Licensee shall notify the Licensor's designated representative in advance of Licensee's operations as to the type of work to be performed, the time at which it is to be performed and where it is to take place. Licensee shall conduct all such work operations in a safe and workmanlike manner, and in accordance with the terms of Appendix 3.

(f) Licensee shall, at its own expense, maintain his buried communication facilities so as not to conflict with the use of the trench system or pedestals by Licensor or other authorized users of the trench system or pedestals. Licensee shall, at its own expense, relocate, change, or replace his facilities or perform any other work in connection with said facilities that may be required by Licensor or other authorities.

ARTICLE XI

TERMINATION OF LICENSES

(a) Upon notice from Licensor to Licensee that Licensor has been advised by governmental authority or private property owners that the use of any pole, conduit system or trench system is not authorized and is objected to by such governmental authority or private property owner, as the case may be or that any pole, any conduit system or any trench system is to be removed, sold or otherwise disposed of, Licensee shall, if requested by Licensor, remove its cables, equipment and facilities at once from the affected pole or poles or shall make arrangements for the removal of its cable, equipment and facilities from the affected portion of Licensor's conduit system or trench system at Licensee's expense. If it is impractical to remove Licensee's cables, equipment or facilities from any trench system, they may be abandoned in place.

(b) Licensee may at any time remove its facilities from any pole of Licensor, but shall immediately give Licensor written notice of such removal

and surrender of license in the form of Exhibit E hereto attached and made a part hereof. If Licensee surrenders its license but fails to remove its facilities from Licensor's poles, Licensor shall have the right to remove Licensee's facilities at Licensee's expense and without any liability on the part of Licensor for damage or injury to Licensee's facilities. In the event that Licensee's cables, equipment and facilities shall be removed from any pole as provided by this Article, no attachment shall again be made to such pole unless Licensee shall have first complied with all of the provisions of this Agreement as though no such attachment had previously been made.

(c) If Licensee desires to terminate its license for the right to occupy any part of Licensor's conduit system, Licensee shall give Licensor written notice of such surrender in the form of Exhibit E, hereto attached and made a part hereof. In such event, Licensee shall make arrangements with Licensor for the removal of Licensee's cables, equipment and facilities from that part of Licensor's conduit system at Licensee's expense. In the event that Licensee's cables, equipment and facilities shall be removed from Licensor's conduit system as provided by this Article, no cable, facilities or equipment shall again be placed in that part of such conduit system unless Licensee shall have first complied with all of the provisions of this Agreement as though no cables, equipment and facilities of Licensee had previously been placed in that part of Licensor's conduit system.

(d) If Licensee desires to terminate its license for the right to occupy any part of the trench system, Licensee shall give Licensor written notice of such surrender in the form of Exhibit E, attached hereto and made a part hereof. In such event, Licensee shall make arrangements with Licensor for the removal of Licensee's cables, equipment and facilities from that part of the trench system at Licensee's expense. However, in the event it is impractical to remove Licensee's cable, equipment and facilities from any trench system, they may be abandoned in place.

ARTICLE XII

INSPECTIONS OF LICENSEE'S INSTALLATIONS

(a) Licensor, because of its service obligations to the public, reserves the right to inspect each new installation of, or work operation upon, Licensee's distribution system within Licensor's conduit system, trench system and on Licensor's poles or within the area around Licensor's lines or appliances and to make periodic inspections, semi-annually or oftener as plant conditions may warrant, of the entire plant of Licensee; and Licensee shall, on demand, reimburse Licensor for the expense of such inspections in accordance with Appendix 1. The making of such inspections or the failure to make such inspections shall not operate to relieve Licensee of any responsibility, obligation or liability imposed by this Agreement.

(b) If any cable, equipment or facilities of Licensee shall be found on a pole or within a conduit system or trench system for which no license is outstanding, Licensor, without prejudice to its other rights or remedies under this Agreement or otherwise, may (1) impose a charge, and (2) require

Licensee to remove such cable, equipment or facilities forthwith or Lincensor may remove them without liability and the expense of removal shall be borne by Licensee. For the purpose of determining the charge, absent satisfactory evidence to the contrary, the unlicensed use shall be treated as having existed for a period of two (2) years prior to its discovery or for the period beginning with the date of this Agreement, whichever period shall be the shorter; and the fee, at the appropriate rate as shown in Appendix 1 shall be due and payable forthwith. Any such fee imposed by Licensor shall be in addition to its rights to any other sums due and payable and to any claims or damages under this Agreement or otherwise. No act or failure to act by Licensor with regard to said fee or said unlicensed use shall be deemed as a ratification or the licensing of the unlicensed use, and if any license in the form of Exhibits B, C or D should subsequently be issued, after application and payment of the application fee therefor, said license shall not operate retroactively or constitute a waiver by Licensor of any of its rights or privileges under this Agreement or otherwise.

(c) In the event Licensee makes or maintains any attachments to Licensor's poles or occupies Licensor's conduit system or trench system other than as provided in this Agreement, or if Licensee fails to remove any of its cable, equipment or facilities from Licensor's poles, conduit system or trench system as required by this Agreement, Licensor shall have the right, without notice to Licensee and in addition to any other remedies Licensor may have, to remove such attachments at the cost and expense of Licensee and without any liability therefor.

ARTICLE XIII

LIABILITY AND DAMAGES

(a) Licensor reserves to itself, its successors and assigns, the right to maintain its poles, conduit system and trench system and to operate its facilities thereto in such manner as will best enable it to fulfill its own service requirements. Licensor shall not be liable to Licensee for any interruption to service of Licensee or for interference with the operation of the cables, equipment or facilities of Licensee arising in any manner out of the use of Licensor's poles, conduit system and trench system except from Licensor's sole negligence, in which case Licensor's liability shall be limited to the cost of repair, if any, of Licensee's cable, equipment or facilities.

(b) Licensee shall exercise special precautions to avoid damaging the cables, equipment or facilities of Licensor and of others occupying Licensor's poles, conduit system and trench system and Licensee hereby assumes all responsibility for any and all loss for such damage. Licensee shall make an immediate report to Licensor of the occurrence of any such damage and hereby agrees to reimburse the respective owners for the expense incurred in making repairs.

(c) Licensee shall indemnify and hold harmless Licensor against any and all claims, demands, causes of action, damages, costs or liabilities of every kind and nature whatsoever which may arise out of or be caused by (1) the erection, maintenance, presence, use or removal of Lincesee's cable, equipment and facilities on Licensor's poles, and within Licensor's conduit

system and trench system, (2) any act of Licensee on or in the vicinity of Licensor's poles, conduit system and trench system, or (3) any interruption, discontinuance, or interference with Licensee's service to any of its subscribers occasioned or claimed to have been occasioned by any action of Licensor pursuant to or consistent with this Agreement. Licensee shall, upon demand and at its own sole risk and expense, defend any and all suits, actions or other legal proceeding brought or instituted against Licensor on any such claim, demand or cause of action, and shall pay and satisfy any judgment or decree rendered against Licensor therein, and Licensee shall reimburse Licensor for any and all legal expense incurred by Licensor in connection therewith. Licensee shall also indemnify, protect and save harmless Licensor from any and all claims and demands of whatever kind which arise directly or indirectly from the operation of Licensee's facilities including taxes, special charges by others, claims and demands for damages or loss for infringement of copyright, for libel and slander, for unauthorized use of television broadcast programs, and for unauthorized use of other program material, and from and against all claims and demands for infringement of patents with respect to the manufacture, use and operation of Licensee's equipment whether arising from the use of Licensee's equipment in combination with Licensor's poles, conduit system, trench system or otherwise.

(d) (1) The Licensee agrees to comply with and qualify under the Workmen's Compensation Laws of the State of Ohio, and also agrees to cause every subcontractor to comply with and qualify under said laws, and shall furnish copies of Certificates demonstrating such compliance to Ohio Bell prior to commencement of the work.

(2) The Licensee agrees to purchase and maintain liability insurance, naming Ohio Bell as a co-insured and insuring such named insured against loss or damage on account of claims for bodily injuries, death or property damage suffered by a person or persons in connection with the performance of such Agreement upon the Licensee's part in the single limit amount of Five Hundred Thousand Dollars ($500,000) for each such occurrence. The insurance required herein shall be evidenced by a Certificate of Insurance acceptable to Ohio Bell and shall be filed with Ohio Bell prior to the commencement of the Work. The Certificate shall contain a provision that coverage afforded thereunder will not be modified or canceled until at least fifteen (15) days' prior written notice (or longer period if required by law) has been given to Ohio Bell.

(3) Said insurance shall also provide contractual liability coverage satisfactory to Licensor with respect to liability assumed by Licensee under Article XIII (c) above.

ARTICLE XIV

LICENSOR'S LIEN

Should the Licensor under any Article of this Agreement remove Licencee's cable,equipment or facilities from Licensor's poles, conduit system or trench system, Licensor will deliver to Licensee the cable, equipment or facilities so removed upon payment by Licensee of the cost of removal, storage and delivery, and all other amounts due Licensor hereunder. Licensor is hereby given a lien on Licensee's cable, equipment or facilities within Licensor's conduit system or trench system or attached to

Licensor's poles or removed therefrom, with power of public or private sale, to cover any amounts due Licensor under the provisions of this Agreement. Such liens shall not operate to prevent Licensor from pursuing, at its option, any other remedy in law, equity or otherwise, including any other remedy provided for in this Agreement.

ARTICLE XV

LICENSE NOT EXCLUSIVE

Nothing herein contained shall be construed as a grant of any exclusive license, right or privilege to Licensee. Licensor shall have the right to grant, renew and extend rights and privileges to others not parties to this Agreement, by contract or otherwise, to use any poles, conduit system or trench system covered by this Agreement, under such terms and conditions as Licensor shall prescribe.

ARTICLE XVI

ASSIGNMENT OF RIGHTS

(a) Licensee shall not assign, transfer or sublet the privileges hereby granted, or sell, lease or otherwise permit the use of its facilities on any pole or poles of Licensor, or within Licensor's conduit or trench system or any part thereof, without prior consent in writing of Licensor, which consent shall not be unreasonably withheld. However, in any event, Licensee may not apportion any of its rights.

(b) Subject to the provisions of Paragraph (a) hereof, this Agreement shall extend to and bind the successors and assigns of the parties hereto.

ARTICLE XVII

WAIVER OF TERMS AND CONDITIONS

Failure 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 XVIII

LICENSOR'S RIGHT TO TERMINATE AGREEMENT

(a) If Licensee shall fail to comply with any of the terms or conditions of this Agreement or default in any of its obligations under this Agreement and shall fail within thirty (30) days after written notice from Licensor to correct such default or noncompliance, Licensor may in addition to any

other remedies it may have, forthwith terminate this Agreement and all licenses granted hereunder, or the licenses covering the poles, conduit system or trench system as to which such default or noncompliance shall have occurred.

(b) The Licensor shall have the right to terminate this entire Agreement, or individual licenses granted hereunder, upon such notice as Licensor in its sole judgment deems reasonable:

(1) If the Licensee's facilities are maintained or used in violation of any law or in aid of any unlawful act or undertaking; or

(2) If, as a result of legislation or of the action of a regulatory body, this Agreement shall, in whole or in part, become illegal, prohibited or impossible of lawful performance. Either party may at any time notify the other that in its opinion the conditions of termination set forth in this paragraph have been met and that the Agreement has been terminated. Such notice, in the absence of bad faith, shall be conclusive upon the parties hereto.

(3) If Licensee defaults under Article IV.

(c) If the insurance carrier shall at any time notify Licensor that the policy or policies of insurance, as provided under Article XIII hereof, will be cancelled or changed so that the requirements of Article XIII will no longer be satisfied, then this Agreement shall cease and terminate upon the effective date of such cancellation or change.

ARTICLE XIX

TERM OF AGREEMENT

This Agreement shall become effective upon its execution and if not terminated in accordance with the provisions of other Articles hereof, shall continue in effect for a term of not less than three (3) years, provided, however, that at any time after the first year of said term the fees and charges set forth in Appendix 1 may be increased or decreased by written notice from Licensor to Licensee. Either party may terminate this Agreement at the end of the said term by giving to the other party written notice of an intention to terminate the Agreement at least six (6) months prior to the end of the said term; but, upon failure to give such notice, this Agreement shall continue in force upon the same terms and conditions for one (1) year periods thereafter, until terminated by either party at the end of any current term by giving to the other party written notice of an intention so to terminate the Agreement at least six (6) months prior to the end of such term. Upon termination of the Agreement in accordance with any of its terms, all outstanding licenses shall terminate and shall be surrendered and Licensee shall immediately remove its cables, equipment and facilities from all poles, conduit system and trench system of Licensor. If not so removed, Licensor shall have the right to remove Licensee's cable, equipment and facilities at the cost and expense of Licensee and without any liability therefor. If it is impractical to remove Licensee's cable, equipment and facilities from Licensor's trench system, they may be abandoned in place.

ARTICLE XX

NOTICES

Notices under this Agreement may be given and shall be deemed to have been given, by posting the same in first class mail to the Licensee as follows:

Name Warner Amex Cable Communications Inc.

Address 930 Kinnear Road

City and State Columbus, Ohio 43212

and to the Licensor as follows:

Title C.A.T.V. - Third Party Attachment Coordination

The Ohio Bell Telephone Company

Address 100 Erieview Plaza, Room B-1, 1930

City and State Cleveland, Ohio 44114

ARTICLE XXI

ENTIRE AGREEMENT

This Agreement cancels and supersedes all previous agreements whether written or oral, except for any sums due thereunder, between Licensor and Licensee with respect to the attachment of Licensee's cable, equipment and facilities to Licensor's poles or the placing of Licensee's cable, equipment or facilities in Licensor's conduit system or trench system within the area shown on Exhibit A; and there are no other provisions, terms or conditions to this Agreement except as expressed herein. All currently effective licenses heretofore granted pursuant to such previous agreements shall continue in effect subject to the terms and conditions of this Agreement.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement in duplicate on the day and year first above written.

LICENSOR:

WITNESS

THE OHIO BELL TELEPHONE COMPANY

By Donald S. Baker

Title Vice President

Approved as to form
M. S. STOLL
Attorney

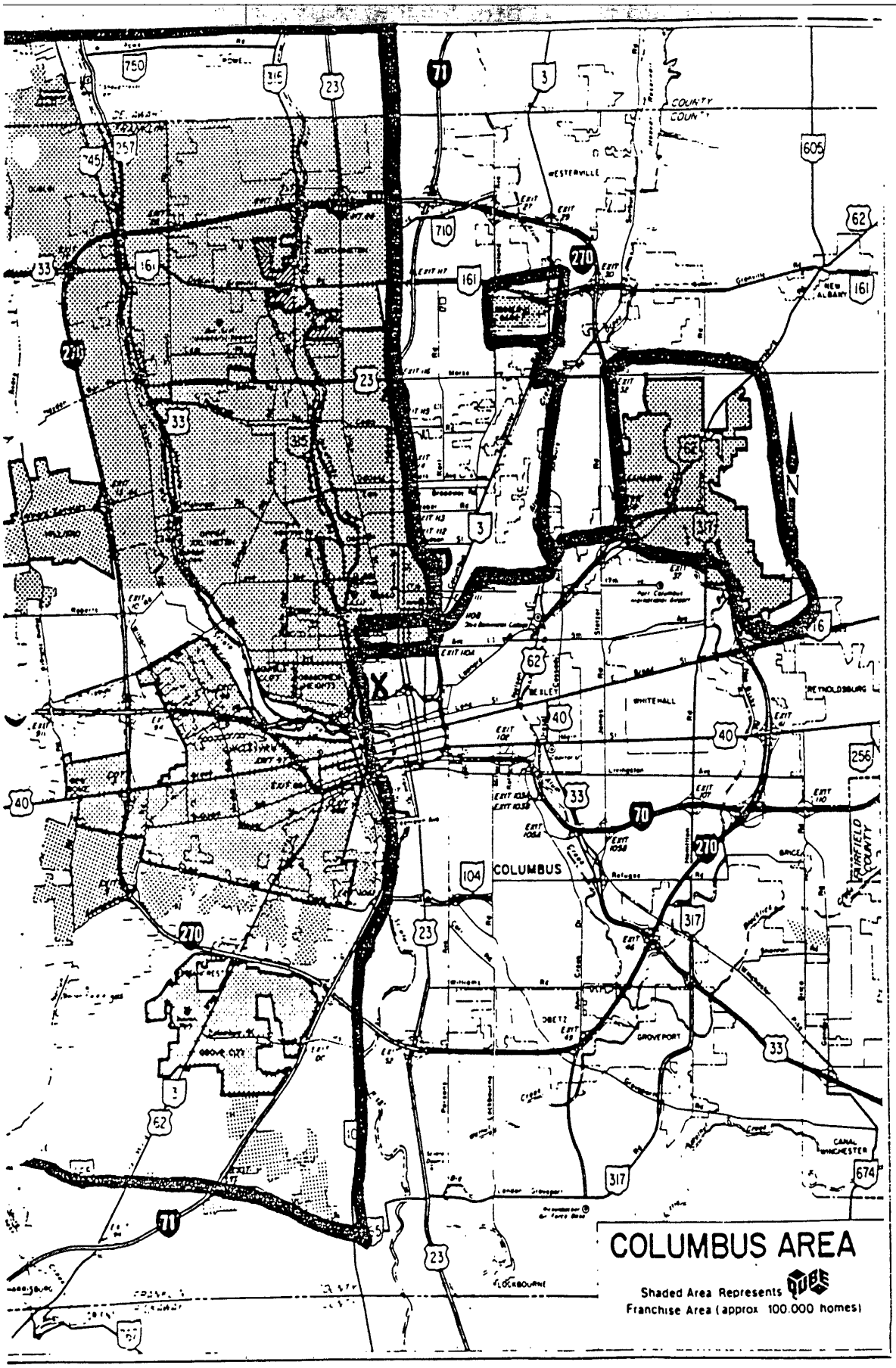
LICENSEE:

WITNESS

Warner Amex Cable Communications, Inc.

By

Title Vice President & General Manager


COLUMBUS
WESTERVILLE
WHITEHALL
GROVEPORT
CANAL WINCHESTER
PICKERINGTON
FAIRFIELD COUNTY
COLUMBUS AREA
Shaded Area Represents
Franchise Area (approx 100,000 homes)

LICENSE APPLICATION ☐
MISC. WORK ☐
LICENSE SURRENDER ☐

Date Rec'd _____

THE OHIO BELL TELEPHONE COMPANY
C.A.T.V./THIRD PARTY ATTACHMENTS
POLES AND ANCHORS

FOR 17-81

MISC. WORK NO. _____

LICENSE NO. _____

City or Township _____ (LOCATION OF WORK) To _____ (COMPANY NAME) At _____ (COMPANY LOCATION)

	Sec.—Blk Or Rural Sec.	Pole Number	Location	Pole Ht.	Pole Now Joint	O.B.T. M.C.H.	O.B.T. Proposed Work	Work To Be Done By Other Company	Other Co. Strand Bond Required	Other Co. A.C.H.	Other Co. Reply	Rentals Poles +	Rentals Poles −	Rentals Anchors +	Rentals Anchors −
1															
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8															
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10															
11															
12															
13															
14															
											Total To Recap				

TELEPHONE COMPANY INFORMATION

Submitted By The Ohio Bell Telephone Company ☐
Concurred In By The Ohio Bell Telephone Company ☐

Eng'r | District / Exchange

Approved By | Date

OBT Work Completed On _____

Per _____

OTHER COMPANY INFORMATION

Concurred In By ☐
Submitted By ☐
Co.

Contact Person | Tele. No. / Date

Other Company Work Order No. | Map No.

Work Complete Per. | Date

Recapped _____ Month _____ Year

Political Entity For Recap
+ _____ − _____ _____
+ _____ − _____ _____

Ohio Bell Work Order No.

Application No.

Sheet No. _____ Of _____

NOTE: WHEN PROPERLY COMPLETED, THIS IS YOUR LICENSE TO OCCUPY THE FACILITIES LISTED HERE TO

EXHIBIT B

	POLE NUMBER	WORK DESCRIPTION	COST
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
		SUB TOTAL	
		ENGINEERING, MATERIAL AND SUPPLY	
		CREDITS (SALVAGE, EXPIRED LIFE, ETC.)	
		TOTAL ESTIMATED T (THIS SHEET)	
		GRAND TOTAL (ALL SHEETS)	

COST ESTIMATE

AN ESTIMATE HAS BEEN MADE OF THE COST THAT WILL BE INCURRED BY OHIO BELL TO PERFORM THE MAKEREADY WORK IN ORDER TO ACCOMMODATE YOUR FACILITIES AS LISTED.
THE TOTAL ESTIMATED COST IS $_____
AND IS DETAILED AT THE LEFT OF THIS SHEET.
PLEASE REMIT YOUR CHECK, PAYABLE TO THE OHIO BELL TELEPHONE COMPANY, TO:

MANAGER—DISTRIBUTION SERVICES
_____
_____

THIS WORK WILL BE DONE ON AN ACTUAL COST BILLING ORDER. THIS MEANS THE FINAL COST WILL BE DETERMINED BY THE ACTUAL TIME AND MATERIAL REQUIRED TO COMPLETE THE WORK. THE FINAL COST WILL BE COMPUTED BY OUR DATA PROCESSING DEPARTMENT AFTER THE WORK IS COMPLETE. AT THAT TIME YOU MAY RECEIVE A REFUND OR A FINAL BILL, DEPENDING ON THE DIFFERENCE BETWEEN THE ESTIMATED AND ACTUAL COST OF THE WORK.

OHIO BELL

PREPARED BY _____
TITLE _____
LICENSEE COST AND LICENSE APPROVAL
APPROVED BY _____ DATE _____

THE OHIO BELL TELEPHONE COMPANY

C.A.T.V./THIRD PARTY OCCUPANCY
CONDUIT PEDESTAL AND TRENCH

App... By Legal

LICENSE APPLICATION ☐
MISC. WORK ☐
LICENSE SURRENDER ☐

Date Rec'd _____

MISC. WORK NO. _____

LICENSE NO. _____

City or Township _____ (LOCATION OF WORK) To _____ (COMPANY NAME) At _____ (COMPANY LOCATION)

	Conduit Or Buried Cable Record	From (M.H. - Pole Pedestal - Bldg.)	To (M.H. - Pole Pedestal - Bldg.)	Duct Assignment	Work To Be Performed By Other Company	Other Company Reply	Power Company Involved Yes - No	Trench Feet	Rentals					
									Conduit Separate		Conduit Joint		Pedestals	
									+	–	+	–	+	–
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
							Total Trench Ft. ▶							
							Total To Recap ▶							

TELEPHONE COMPANY INFORMATION

Concurred In By The Ohio Bell Telephone Co. ☐
Submitted By The Ohio Bell Telephone Company ☐

Eng'r | District

Exchange

Approved By | Date

OBT Work Completed On _____

Per _____

OTHER COMPANY INFORMATION

Concurred In By ☐
Submitted By ☐ Co.

Contact Person | Tele. No.

Date

Other Company Work Order No. | Map No.

Work Complete Per. | Date

Recapped _____ Month _____ Year

Political Entity For Recap

+ _____ – _____ | _____

+ _____ – _____ | _____

Ohio Bell Work Order No.

Application No.

Sheet No. _____ Of _____

NOTE: WHEN PROPERLY COMPLETED, THIS IS YOUR LICENSE TO OCCUPY THE FACILITIES LISTED HERETO.

EXHIBIT C & D

	CON AND TR INSPECTION LOCATION	WORK SCRIPTION	COST
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
		SUB TOTAL	
		ENGINEERING	
		TOTAL ESTIMATED COST (THIS SHEET)	
		GRAND TOTAL (ALL SHEETS)	

IT ESTIMATE

AN ESTIMATE HAS BEEN MADE OF THE COST THAT WILL BE INCURRED BY OHIO BELL TO PERFORM THE MAKEREADY WORK IN ORDER TO ACCOMMODATE YOUR FACILITIES AS LISTED.

THE TOTAL ESTIMATED COST IS $_____

AND IS DETAILED AT THE LEFT OF THIS SHEET.

PLEASE REMIT YOUR CHECK, PAYABLE TO THE OHIO BELL TELEPHONE COMPANY, TO:

MANAGER—DISTRIBUTION SERVICES

_____

_____

THIS WORK WILL BE DONE ON AN ACTUAL COST BILLING ORDER. THIS MEANS THE FINAL COST WILL BE DETERMINED BY THE ACTUAL TIME AND MATERIAL REQUIRED TO COMPLETE THE WORK. THE FINAL COST WILL BE COMPUTED BY OUR DATA PROCESSING DEPARTMENT AFTER THE WORK IS COMPLETE. AT THAT TIME YOU MAY RECEIVE A REFUND OR A FINAL BILL, DEPENDING ON THE DIFFERENCE BETWEEN THE ESTIMATED AND ACTUAL COST OF THE WORK.

OHIO BELL

PREPARED BY_____

TITLE _____

LICENSEE COST AND LICENSE APPROVAL

APPROVED BY_____ DATE _____

APPENDIX 1

SCHEDULE OF FEES AND CHARGES

Effective:_____

THIS APPENDIX 1 is, from the effective date hereof, an integral part of the License Agreement between The Ohio Bell Telephone Company, therein called Licensor, and WARNER AMEX CABLE COMMUNICATIONS INC., therein called Licensee, dated_____ (hereinafter called the Agreement) and contains the fees and charges governing the use of Licensor's poles and conduit system to accommodate the cable, equipment and facilities of Licensee in_____.

PART A

POLE ATTACHMENTS

1. DELETE

2. ATTACHMENT FEE: $ 4.00 per pole per annum.

$ 7.00 per anchor attachment per annum.

a. Computation

For the purpose of computing the total pole and anchor attachment fees due hereunder, the total fee shall be based upon the number of poles and anchors to which attachments are actually made, on December 31 of the preceding year. For the period ending December 31 of each calendar year in which the initial attachment is made to any pole and any anchor hereunder, Licensee shall pay to Licensor an attachment fee of 50% of the annual rate per pole and per anchor, payable on the first regular payment date, based upon the number of poles and anchors on which initial attachments were made during such calendar year.

b. Payment Date

Attachment fees shall be due and payable annually, in advance, on the 31st day of January of each year. Failure to pay such fees within 20 days after presentment of the bill therefor or on the specified payment date, whichever is later, shall constitute a default of this Agreement.

c. Termination of License

Upon termination or surrender of a license granted hereunder, no refund of any attachment fee shall be made; provided however, that in case of any termination of the Agreement or any license issued thereunder pursuant to the provisions of Article XVIII(a) of the Agreement, a proportionate refund of the applicable prepaid annual attachment fee shall be made.

3. OTHER CHARGES

a. Computation

(1) All charges for inspections, engineering, rearrangements, removals of Licensee's facilities from Licensor's poles and, without limitation, any other work performed for Licensee shall be based upon the full cost and expense, including overhead, to Licensor for performing such work for Licensee. The cost to Licensor shall be determined in accordance with the regular and customary methods used by Licensor in determining such costs.

(2) The charge for replacement of poles shall include the entire nonbetterment cost to Licensor, including the increased cost of larger poles, sacrificed life value of the poles removed, cost of removal less any salvage recovery and the cost of transferring Licensor's facilities from the old to the new poles.

b. Payment Date

All bills for such other charges for work performed by Licensor shall be payable upon presentment to Licensee, and shall be deemed delinquent if not paid within 30 days after presentment to Licensee.

PART B

OCCUPANCY OF CONDUIT SYSTEM

1. DELETE

2. OCCUPANCY FEE:

$ .34 per duct foot per year where the Licensee's cable is in a duct occupied by Licensor's cable or the cable of another authorized user of Licensor's conduit system.

$ .34 per duct foot per year where the Licensee's cable is placed in a vacant duct where subsequent cable placement is practicable.

$ .68 per duct foot per year where the Licensee's cable is placed in a vacant duct and it is of such a type and size to preclude the subsequent placement of additional cable.

In no event shall the occupancy fee charged to Licensee for the occupancy of more than one of its cables in a single duct exceed $ .68 per duct foot per year.

a. Computation

For the purpose of computing the total conduit occupancy fee due hereunder, the duct feet of conduit shall be measured from the center to the center of manholes; or from the center of a manhole to the end of the conduit system; or the length of conduit from pole to pole; or isolated lengths of conduit not attached to any structure (such as involved with buried cable) which will be occupied by Licensee's cable. For the period ending December 31 of each calendar year in which the initial occupancy is made to any part of the conduit system hereunder. Licensee shall pay to Licensor 50% of the appropriate occupancy fee as determined in Paragraph (2), payable on the first regular payment date.

b. Payment Date

Conduit occupancy fees shall be due and payable annually, in advance, on the 31st day of January of each year. Failure to pay such fees within 20 days after presentment of the bill therefor or upon the specified payment date, whichever is later, shall constitute a default of this Agreement.

c. Termination of License

Upon termination or surrender of a license granted hereunder, no refund of any occupancy fee shall be made; provided however, that in case of any termination of the Agreement or any license issued thereunder pursuant to the provisions of Article XVIII (a) of the Agreement, a proportionate refund of the applicable prepaid annual occupancy fees shall be made.

3. OTHER CHARGES

a. Computation

All charges for inspections, engineering, rodding, swabbing, placement and removal of cable, and, without limitation, any other charges for work performed for Licensee shall be based upon the full cost and expense including overhead, to Licensor for performing such work for Licensee. The cost to Licensor shall be determined in accordance with the regular and customary methods used by Licensor in determining such costs.

b. Payment Date

All bills for such other charges shall be payable upon presentment to Licensee, and shall be deemed delinquent if not paid within 30 days after presentment to Licensee.

PART C

OCCUPANCY OF A COMMON TRENCH SYSTEM

1. j__ DELETE

2. ATTACHMENT FEE: $ 4.00 per pedestal attachment per annum.

a. Computation

For the purpose of computing the total pedestal attachment fees due hereunder, the total fee shall be based upon the number of pedestals to which attachments are actually made, on December 31 of the preceding year. For the period ending December 31 of each calendar year in which the initial attachment is made to any pedestal hereunder, Licensee shall pay to Licensor an attachment fee of $2.00 per pedestal, payable on the first regular payment date, based upon the number of pedestals on which initial attachments were made during such calendar year.

b. Payment Date

Pedestal attachment fees shall be due and payable annually, in advance, on the 31st day of January of each year. Failure to pay such fees within 20 days after presentment of the bill therefor or on the specified payment date, whichever is later, shall constitute a default of this Agreement.

c. Termination of License

Upon termination or surrender of a license granted hereunder, no refund of any attachment fee shall be made; provided however, that in case of any termination of the Agreement or any license issued thereunder pursuant to the provisions of Article XVIII(a) of the Agreement, a proportionate refund of the applicable prepaid annual attachment fee shall be made.

3. OTHER CHARGES

All charges for inspections, engineering, excavations and without limitation, any other work performed by the Licensor in connection with the

common trench system, to be occupied by the Licensee's buried facilities shall be prorated between all parties, including Licensee, who are to occupy the common trench system.

a. Computation

All charges for the work performed by the Licensor shall be based upon the full cost and expense, including overhead, to the Licensor for performing such work for Licensee. The cost to Licensor shall be determined in accordance with the regular and customary methods used by Licensor in determining such costs.

b. Payment Date

All bills for such other charges shall be payable upon presentment to Licensee, and shall be deemed delinquent if not paid within 30 days after presentment to Licensee.

LICENSE AGREEMENT
Addendum to
APPENDIX 1 PART C, 3, a

Standard Billing Charges to the Authorized Licensee for occupancy of a Joint Trench with facilities of The Ohio Bell Telephone Company and Columbus and Southern Ohio Electric Company, for the period from December 1, 77 to December 31, 78, and thereafter until revised, will be as follows:

Two Party Trench	
Per trench foot of Standard Joint Trench	$ .60
Per cubic foot of Grit Backfill	.75
Per trench foot of Restoration-Sod	1.13
Per trench foot of Restoration-Top Soil and Seeding	$ .60

Three Party Trench	
Per trench foot of Standard Joint Trench	$ .40
Per cubic foot of Grit Backfill	.50
Per trench foot of Restoration-Sod	.75
Per trench foot of Restoration-Top Soil and Seeding	$ .40

Posts (if provided by Ohio Bell)	$4.00

Each party to supply and deliver their own material. Material not included in following prices:

Labor Only-Street Crossings-Connecting Joint Trenches	
Per linear foot for 2" Hole-No Casing	$5.00
Per linear foot for 4" Hole-No Casing	7.00
Per linear foot for Hole and Placing 2" Plastic Pipe	5.25
Per linear foot for Hole and Placing 4" Plastic Pipe	7.25

Notes:

When the Developer places Street Crossing Ducts for each party, for connecting Joint Trenches in advance of paving operation, each party is responsible for supply and delivery to the Developer of his own material.

The Authorized Licensee shall be responsible for digging his Non-Joint Trenches.

APPROVED BY:

THE OHIO BELL TELEPHONE COMPANY

BY: _____

TITLE Vice President-Network and Engineering

DATE March 23, 1979

APPROVED BY: _____

Warner Cable Corporation

BY: Miklos B. Kofodi

TITLE Operating Vice President General Manager

DATE November 10, 1978

APPENDIX 2

REQUIREMENTS AND SPECIFICATIONS FOR ATTACHMENTS TO POLES

Effective:_____

THIS APPENDIX 2 is, from the effective date hereof, an integral part of the License Agreement between The Ohio Bell Telephone Company, therein called Licensor, and WARNER AMEX CABLE COMMUNICATIONS INC., therein called Licensee, dated_____(hereinafter called the Agreement) and contains certain minimum requirements and specifications governing the attachment of cables, equipment and facilities of Licensee (sometimes called Attachments in this Appendix) to poles of Licensor in_____.

GENERAL

1. The Licensee is responsible for the proper design, construction and maintenance of its Attachments. Attachments are limited to Licensee's strand-supported cable, service drops, terminals and necessary appurtenances deemed by Licensor to be suitable for pole mounting.

2. Any rearrangements of Licensor's facilities or replacement of poles required to accommodate Licensee's Attachments shall be done by Licensor or a contractor authorized by Licensor.

3. The fees and charges specified in Appendix 1 shall be applicable to all licenses granted to Licensee hereunder, without regard to the methods of attachment used.

4. Licensee's Attachments shall be plainly identified by appropriate marking satisfactory to Licensor.

5. Licensee's workmen shall assure themselves that any pole to be climbed has sufficient strength or is adequately braced or guyed to support the weight of the workmen.

6. All requirements of the National Electrical Safety Code referred to herein shall mean the Sixth Edition of such code, or any later amendment or replacement thereof, and shall include any additional requirements of any applicable Federal, State, County or Municipal code. References to simply the Safety Code, or to N.E.S.C., have the same meaning.

7. While many of the standards and technical requirements for Licensee's cable, equipment and facilities are set forth herein, Licensor reserves the right to specify the type of construction required in situations

not otherwise covered in this Appendix. In such cases, Licensor will in its discretion furnish to Licensee written and/or illustrated materials which will specify and explain the required construction.

8. All new cable plant installed by a Licensee shall be constructed on a strand that is separate from the Licensor's strand and cable plant as shown in Attachment 1.

9. Licensee may permit a subsequent licensee to attach its cable to the strand and cable of Licensee where it is acceptable to the Licensor. However, Licensee shall continue to be responsible for the payment of all fees and charges specified in Appendix 1.

VOLTAGE, POWER, ELECTRICAL INTERFERENCE

10. Licensee's Attachments shall not use or carry voltages or currents in excess of the limits prescribed for communications conductors by the National Electrical Safety Code (Definition 43). However, all parts of Licensee's Attachments carrying voltages in excess of 50 volts AC (rms) to ground or 135 volts DC to ground, except for momentary signalling or control voltages, shall be enclosed in an effectively grounded sheath or shield. All energized parts of Licensee's Attachments shall be suitably covered to prevent accidental contact by the general public, Licensor's workmen or workmen of another licensee having facilities on the same pole.

11. Licensor shall determine whether Licensee's Attachments cause or may cause electrical interference with Licensor's communications facilities. Licensee shall, on demand of Licensor, correct immediately at Licensee's expense any such interference including, if necessary, removal of the Attachments causing the interference.

12. No Attachment shall use the earth as the sole conductor for any part of the circuit.

13. Licensee shall not circumvent Licensor's corrosion mitigation measures (e.g., short circuit insulating joints).

GROUNDING AND BONDING

14. All power supplies shall be grounded. The neutral side of the power drop shall be continuous and not fused. The neutral line shall also be bonded to the power supply cabinet. The cabinet shall be connected to an earth ground at the pole. In areas where a power utility has a ground wire running down the pole, the cabinet can be connected to it if the power utility permits. Where a power utility vertical ground wire is not available, the Licensee must provide grounding acceptable to Licensor. All cabinets, housings and metal socket bases on a common pole shall be bonded to each other, to the Licensor's strand and to the Licensee's strand.

15. Where two or more aerial suspension strands are located on the same pole, the suspension strands shall be bonded together by the Licensee

at the first, last and every intermediate tenth poles until the remaining section between bonds is not more than thirteen nor less than four spans. Strands shall be bonded at or near the first pole on each side of underground dips. All strand bonds are to be made with #6 copper wire and approved clamps.

16. Where Licensee has been authorized to attach the bond wire to Licensor's strand, the Licensee is responsible for completing the bond. If Licensee is not authorized to attach to Licensor's strand, Licensee shall attach the bonding wire to its strand and leave a sufficient length of wire to allow Licensor to complete the bond. Where the strands of two or more licensees are to be bonded together, the licensee placing the last strand, if authorized to do so by the other licensees, shall make both connections. Where such authorization is not granted by the licensee owning the existing strand, Licensee shall attach the bonding wire to its strand and leave enough wire to permit making a connection to the other strand. In such case, the licensee owning the existing strand shall be responsible for completing the bonding.

17. Strands attached to the same bolt do not have to be bonded, provided that the strand is not insulated and metal to metal contact is made between bolt and strand.

18. Where a Licensee's strand leaves a pole which carries other strands supporting communications cables, and Licensee's strand continues to a pole carrying power facilities but no communications facilities of Licensor, Licensee's cable shall be:

(a) Bonded to the other communications strands on the pole that it leaves,

(b) Bonded to an effective ground, preferably within two spans but not greater than ten (10) spans, after leaving said pole, and

(c) Bonded with a No. 6 solid, soft-drawn copper wire. The wire must be attached to the strand with an approved clamp, such as a lashing wire clamp, designed for attachment to each specific size of strand involved (for example, Chance Lashing Wire Clamp, Catalog Number 9000, or equivalent).

19. Strands supporting drop wire shall be bonded to the cable suspension strand.

CLEARANCES

20. Licensee's Attachments are subject to the same clearances as communications facilities and shall meet all of the pertinent clearance requirements of the Safety Code. Safety Code rules covering the most commonly encountered conditions are listed below.

	NESC 6th Edition General Rule
(a) Vertical clearance on poles jointly occupied by communication facilities and power facilities	238

		NESC 6th Edition General Rule
(b)	Mid-span clearances between communication facilities and power facilities	238
(c)	Crossing clearances of facilities carried on different supports	
(d)	Clearances from street light brackets and associated wiring	238E-3
(e)	Clearances of conductors from another line	234
(f)	Clearances of vertical and lateral conductors from other wires and surfaces on the same support	239
(g)	Clearances in any direction from line conductors and supports, and to vertical or lateral conductors, span or guy wires, attached to the same support	235A-3
(h)	Vertical clearance of wires above ground or rails	232

LOCATION AND SPACING

21. Licensor shall specify the location of Licensee's Attachments on each pole, including the location of Licensee's riser cables. Cable arms shall not be used in lieu of any additional pole height that may be required.

22. The minimum vertical separation between Licensee's suspension strand and Licensor's suspension strand when located on the same side of the pole shall be twelve (12) inches. Where agreement with the power utility permits the placing of cables on both sides of the pole, the vertical separation between the strands may be reduced if the diagonal separation between strands will be twelve (12) inches or more. (See Attachment 1.) Separation between the bolt holes shall in any event be at least four (4) inches. Licensee's suspension strand and cable shall be located above Licensor's facilities unless Licensor permits otherwise. The minimum span separation shall not be less than the separation at the pole.

23. The minimum separation between Licensee's and Licensor's suspension strands specified herein also applies between Licensee's strand and the suspension strand of another licensee, and between two or more strands of Licensee; provided, however, that Licensee may agree with another licensee to reduce the separation between their respective strands. Separation between the bolt holes must in any event be at least four (4) inches.

24. Where Licensee's strand is above Licensor's strand, Licensee's strand-mounted equipment housings and cable drip loops shall be placed at least six inches above Licensor's facilities.

25. Power supply cabinets and other pole-mounted equipment shall not be permitted below Licensor's facilities on a pole where any of the following are present:

(a) Underground riser cable or pipe.

(b) Cross-connecting terminal.

(c) Pole-mounted distribution terminal.

(d) Pole-mounted closure.

(e) Apparatus case.

(f) Air dryer.

(g) Other equipment of a size that would impair climbing or working space if an additional pole-mounted facility were installed.

26. Licensee shall be required to place all of its Attachments, including amplifiers, power supplies, terminals, splitters and taps, so as not to interfere with climbing space, as defined in the National Electrical Safety Code (Rule 236).

27. Where by mutual agreement with the power utility, attachment of cables to both sides of the pole is permitted, two licensees may employ a common through bolt provided one licensee accepts, in writing, the responsibility for maintaining the bolt. N.E.S.C. climbing space requirements must be maintained by all parties.

28. Licensee shall not attach its facilities, except the termination of the bond wire when authorized, to Licensor's strand or suspension bolt.

29. Through bolts may not be placed less than 10 inches from the top of the pole.

LOADING

30. The Licensee shall furnish to Licensor as a part of Exhibit B to this Agreement the details as to the ultimate strength, tension at 60°F, and maximum tension in its suspension strand or conductor under the applicable storm loading specifications in the Code.

31. Licensee shall furnish to Licensor as a part of Exhibit B to this Agreement details as to the weight and size of its cables, suspension strands and/or conductors, with and without the ice loading, as specified by the National Electrical Safety Code (Rule 251) or appropriate local code for the loading area concerned. N.E.S.C. Rule 250 covers the degree of loading (light, medium, heavy) appropriate in different sections of the country. Where any governmental authority designates a heavier degree of loading than the N.E.S.C., the local requirements shall govern.

32. Licensee may lash its cable to the strand of another licensee, where this is acceptable to all other licensees involved and to Licensor. Maximum tension of Licensee's strand shall not exceed 60% of the breaking strength under applicable storm loading, as defined by the National Electrical Safety Code (Rule 251). Where any governmental authority designates a heavier degree of loading than the N.E.S.C., the local requirements shall govern.

GUYING AND STEPPING

33. Guying will be required on poles where the total unbalanced load, including the tension due to Licensee's Attachments under the appropriate storm loading prescribed by the National Electrical Safety Code (Rule 251), exceeds 200 pounds unless the pole was designed as an unguyed corner pole and the pole has adequate strength and stability, in the opinion of Licensor, to withstand the additional load.

34. Guys, when required, shall be of such material and dimensions as to provide adequate strength to withstand the transverse loads specified in the National Electrical Safety Code (Rule 252B), and the longitudinal load assumed in the Code (Rule 252C). Guys on poles which also support power facilities shall be in compliance with the National Electrical Safety Code (Rule 261C). On poles supporting communications facilities only, guying shall be in compliance with Grade C construction requirements of the Code.

35. Guy guards shall be installed in compliance with N.E.S.C. Rule 282E (Supplement 1).

36. Licensee may attach its guy to Licensor's anchor rods where Licensor specifically authorizes it in writing.

37. The Licensee will pay the annual rental charge set forth in Appendix 1 for attachment of his guy to the Licensor's anchor.

38. When the Licensor and/or others have to transfer their guys from an existing anchor to a new anchor to accommodate the guy of a licensee, the Licensee shall reimburse Licensor as well as others for their costs and expenses incurred to perform the necessary transfer work, as well as the cost of replacing the new anchor.

39. Should it become necessary for the Licensor to replace or relocate an anchor to which the Licensee is attached, the Licensee shall be responsible for the transfer of his own equipment, and if Licensor replaces the anchor to provide added strength for Licensor's requirements, the anchor shall be replaced by Licensor at Licensee's expense if the existing anchor rod would support Licensor's Attachments without regard to Licensee's guy.

40. More than one licensee may use a common guy to sustain their combined load.

41. Guys shall be insulated or grounded as specified in the Safety Code (Rules 282 and 283). Licensee's guys shall not short circuit Licensor's guy insulators.

42. Material used for guys shall be compatible from a corrosion standpoint with the hardware to which it is attached.

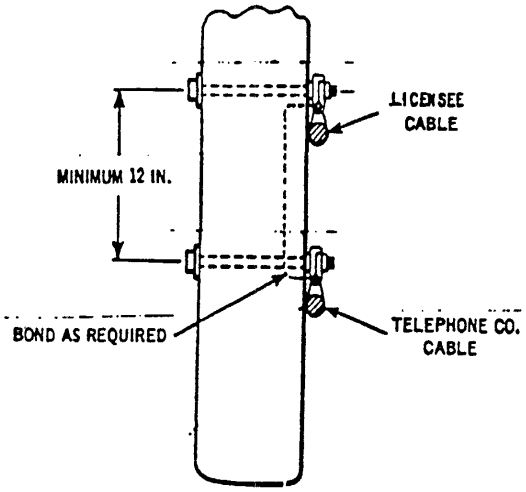
43. Where Licensor determines that because of Licensee's activity on a pole, the pole must be stepped, Licensor will have the pole stepped at Licensee's expense. Licensor will determine the extent, method and manner of stepping required in view of the facilities located on the pole, safety requirements and the hazards of stepping any particular pole.

EMERGENCY CONDITIONS

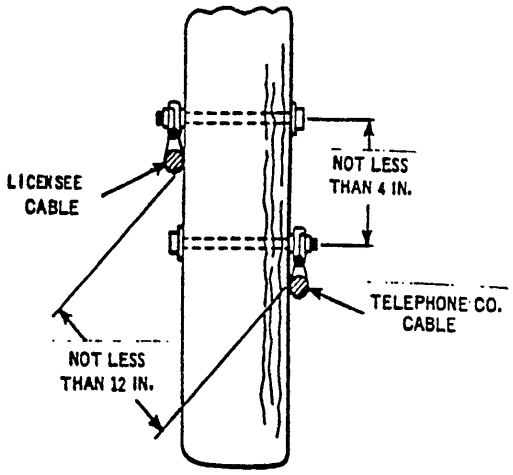
44. In cases of emergency:

(a) Licensor's work shall take precedence over any and all operations of Licensee on Licensor's pole line,

(b) Licensor may rearrange Licensee's cable, equipment and facilities at the expense of the Licensee.

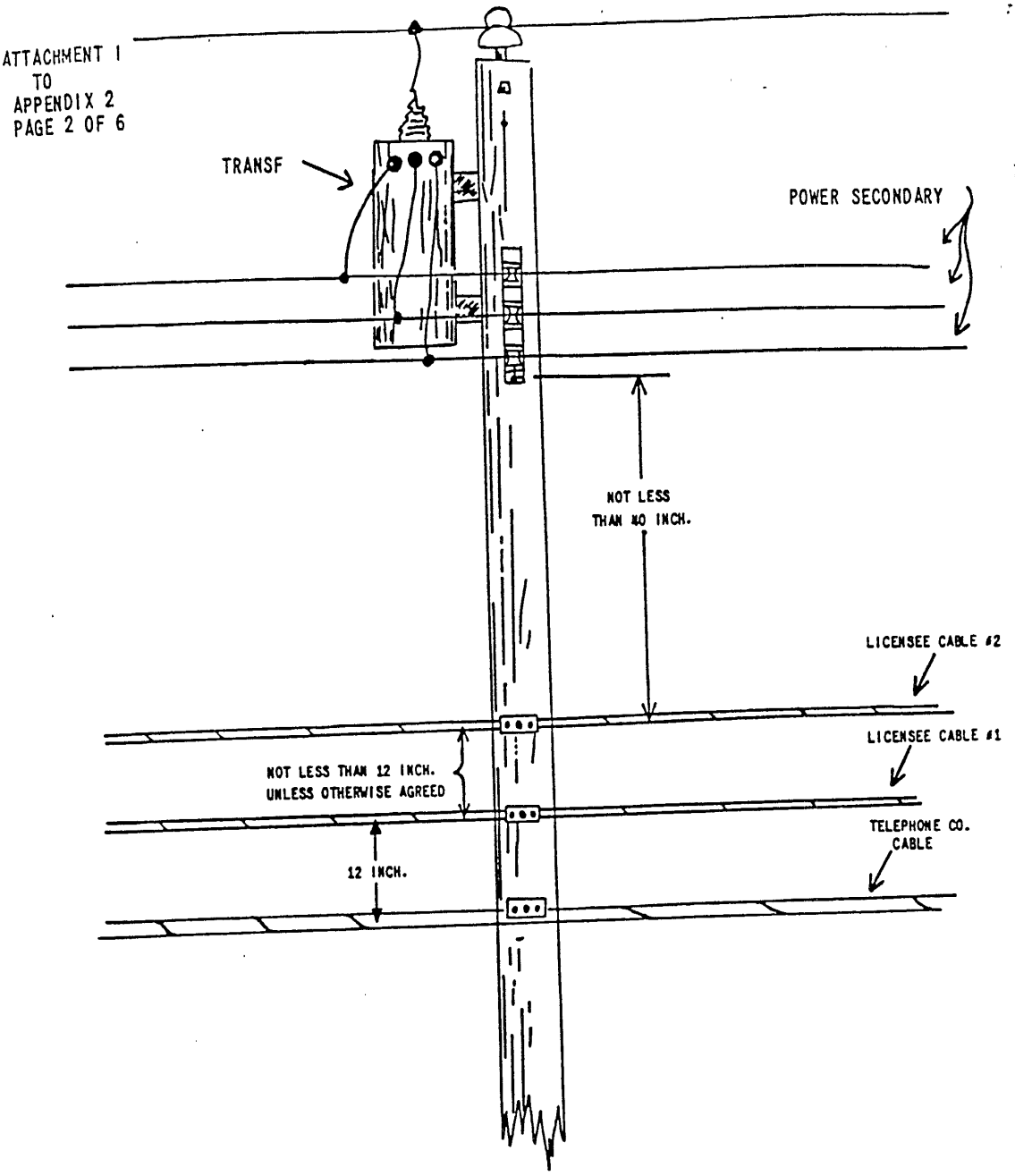


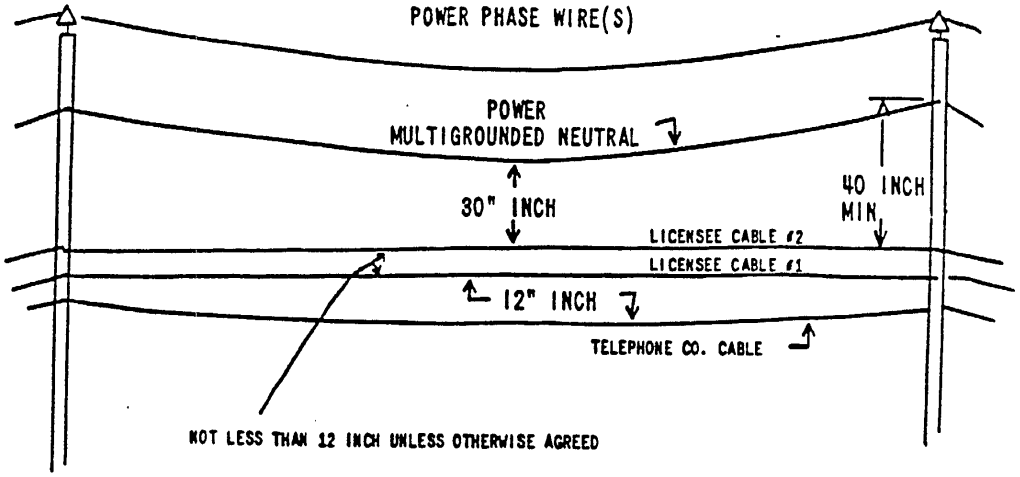
PREFERABLE CLEARANCE

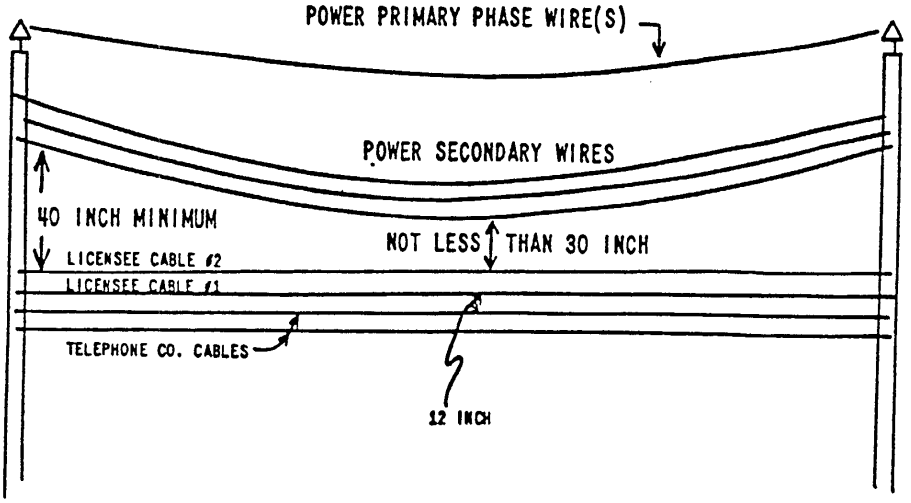


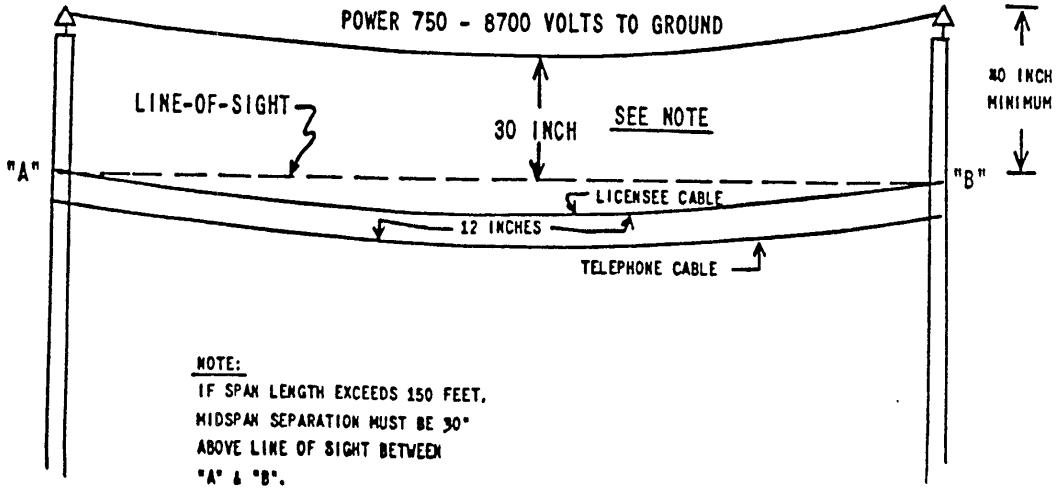
ALTERNATE METHOD OF
OBTAINING CLEARANCE

ATTACHMENT 1
TO
APPENDIX 2
PAGE 2 OF 6

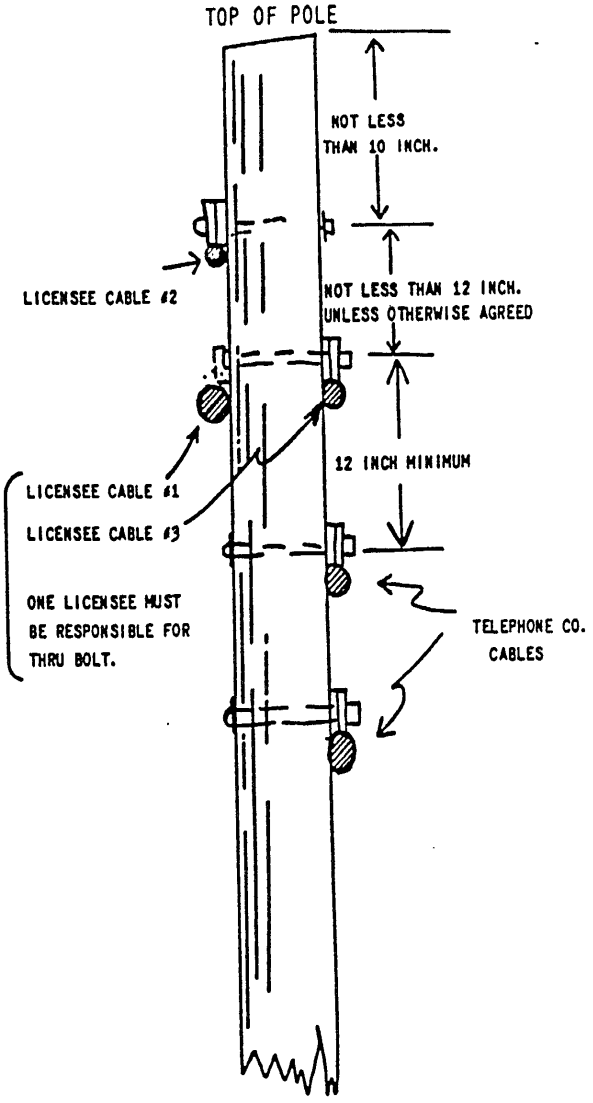


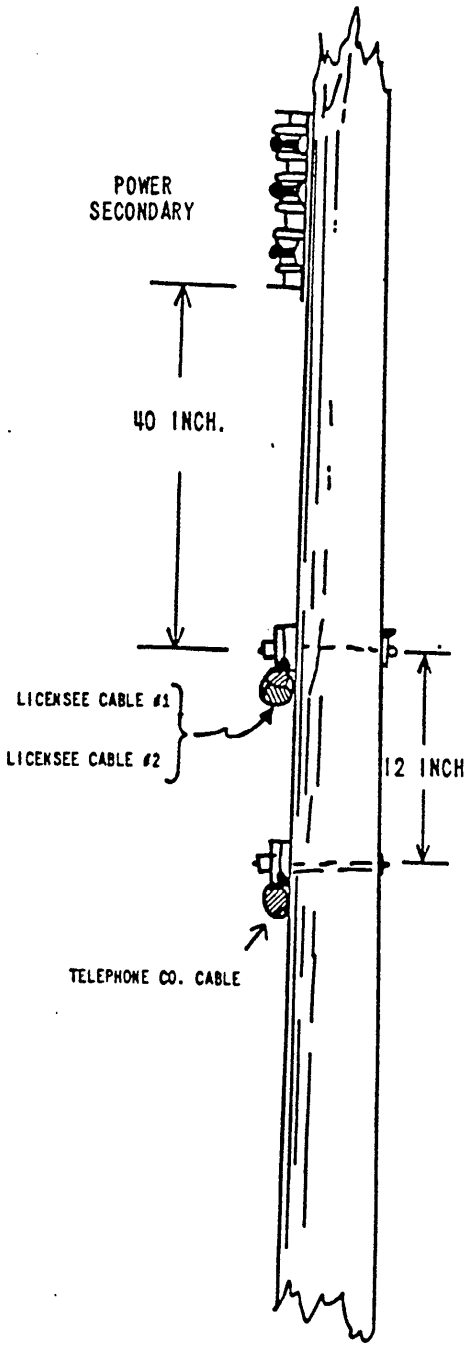




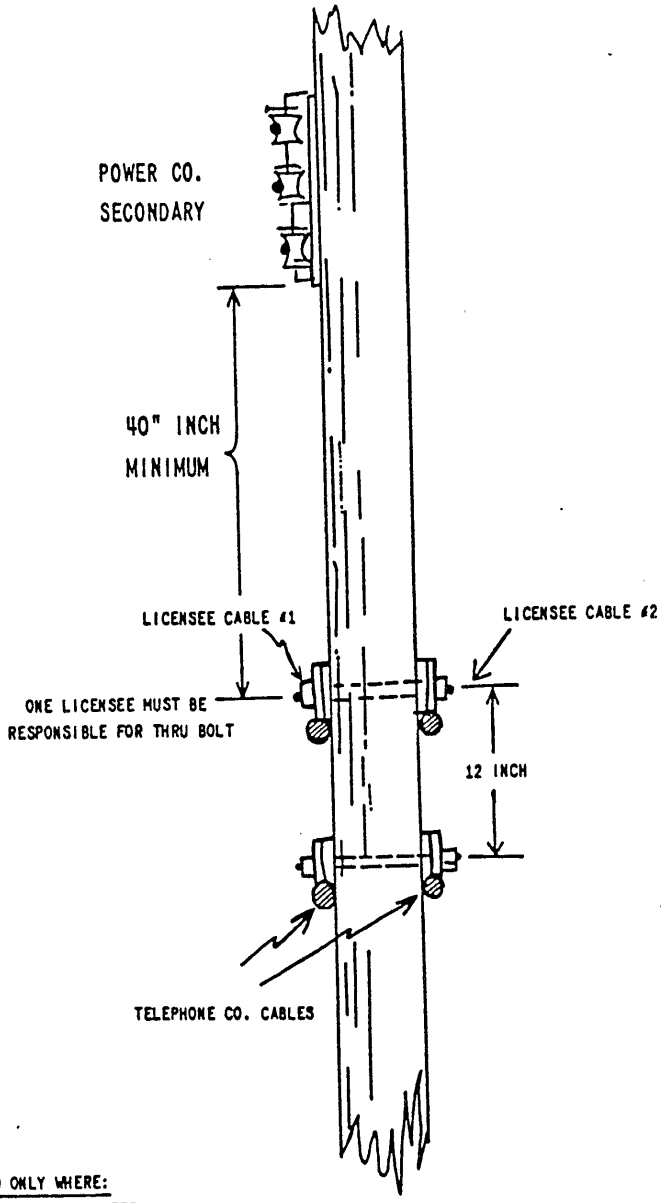


NOTE:
IF SPAN LENGTH EXCEEDS 150 FEET,
MIDSPAN SEPARATION MUST BE 30"
ABOVE LINE OF SIGHT BETWEEN
"A" & "B".


TOP OF POLE
NOT LESS
THAN 10 INCH.
LICENSEE CABLE #2
NOT LESS THAN 12 INCH.
UNLESS OTHERWISE AGREED
12 INCH MINIMUM
LICENSEE CABLE #1
LICENSEE CABLE #3
ONE LICENSEE MUST
BE RESPONSIBLE FOR
THRU BOLT.
TELEPHONE CO.
CABLES



ONE LICENSEE MUST
BE RESPONSIBLE FOR
THRU BOLT & MESSENGER.



TO BE USED ONLY WHERE:

1. POWER COMPANY AGREES
2. TELEPHONE COMPANY AGREES
3. BOTH LICENSEES AGREE
4. CLIMBING SPACE IS NOT IMPAIRED

APPENDIX 3

REQUIREMENTS AND SPECIFICATIONS FOR
OCCUPANCY OF LICENSOR"S CONDUIT SYSTEM

Effective:_____

THIS APPENDIX 3 is, from the effective date hereof, an integral part of the License Agreement between The Ohio Bell Telephone Company, therein called Licensor, and WARNER AMEX CABLE COMMUNICATIONS INC., therein called Licensee, dated_____(hereinafter called the Agreement) and contains minimum requirements and specifications governing the occupancy of Licensor's conduit system in_____.

GENERAL

1. The fees and charges specified in Appendix 1 shall be applicable to all licenses granted to Licensee hereunder, without regard to the methods of attachment used.

2. All requirements of the National Electrical Safety Code referred to herein shall mean the Sixth Edition of such code, or any later amendment or replacement thereof, and shall include any additional requirements of any applicable Federal, State, County or Municipal code. References to simply the Safety Code, or to N.E.S.C., have the same meaning.

3. While many of the standards and technical requirements for Licensee's cable, equipment and facilities are set forth herein, Licensor reserves the right to specify the type of construction required in situations not otherwise covered in this Appendix. In such cases, Licensor will in its discretion furnish to Licensee written or illustrated materials which will specify and explain the required construction.

ELECTRICAL DESIGN SPECIFICATIONS

4. No cable, equipment or facility of Licensee shall be permitted in Licensor's conduit system if such cable, equipment or facility by its design could cause elctrical interference on Licensor's facilities. If electrical interference is caused by any of Licensee's cable, equipment or facilities, such interference shall be removed at the expense of Licensee.

5. Licensee's cable, equipment and facilities shall not be designed to use the earth as the sole conductor for any part of the Licensee's circuits.

6. Licensee's cable shall not use or carry voltage or currents in excess of the limits prescribed for communication conductors by the

N.E.S.C. (Definition 43) and shall be enclosed in an effectively grounded sheath or shield.

7. Cable and facilities of Licensee carrying voltages and currents permitted for Class 2 signal circuits by the National Electrical Code will be considered suitable for occupancy of ducts containing Licensor's facilities if enclosed in an effectively grounded sheath or shield.

8. No coaxial cable of Licensee shall be considered suitable for occupancy of a duct containing Licensor's cable unless such cable of Licensee meets the power supply limitations of Article 820 of the National Electrical Code.

9. Licensee's cable, equipment and facilities exceeding limitations for Class 2 signal circuits but not exceeding that permitted by item 6 shall not be permitted to occupy the same duct as facilities conforming to paragraph 7.

10. Licensee's coaxial cable may carry continuous DC voltages up to 1800 volts to ground where the conductor current will not exceed one-half ampere and where such cable has two separate grounded metal sheaths or shields and a suitable insulating jacket over the outer sheath or shield. Such cable must occupy a separate duct. The power supply shall be so designed and maintained that the total current carried over the outer sheath shall not exceed 200 microamperes under normal conditions. Conditions which would increase the current over this level shall be cleared promptly.

11. Licensee shall not circumvent Licensor's corrosion mitigation measures.

12. Licensee's cable, equipment and facilities shall be compatible with the Licensor's facilities so as not to damage any facilities of the Licensor by corrosion or otherwise. Licensee's cables shall be bonded to Licensor's cable bonding at each manhole where Licensee has a construction splice in its cable.

PHYSICAL DESIGN SPECIFICATIONS

13. Licensee's cables bound or wrapped with cloth or having any kind of fibrous covering or impregnated with an adhesive material shall not be permitted in Licensor's ducts.

14. New construction splices in Licensee's cables shall be located only in manholes, pull boxes or handholes.

15. The maximum permissible diameter of any cable of Licensee and the number of cables of Licensee to be placed in any of Licensor's ducts shall be determined by the Licensor based upon the size and shape of the duct and the size of the existing cable in the duct.

CONNECTION OF LICENSEE'S CONDUIT

16. Where Licensee's duct physically connects with Licensor's manhole, the section of duct which connects with the manhole shall be installed by Licensor or its contractor at Licensee's expense.

17. If Licensee constructs a duct which connects to any of Licensor's manholes, such duct shall be sealed against the entry of gases or liquids at the opening to the manhole, and if the Licensee's duct enters a building it shall be sealed at the entry to the building.

WORK RULES

18. Licensor's manholes shall be opened only as authorized by and in the presence of Licensor's authorized representative, except as provided in paragraph (e) of Article X of the License Agreement.

19. No employee, agent or contractor of Licensee shall enter or work in any of Licensor's manholes unless an authorized representative of Licensor is present during the entire period, except as provided in paragraph (e) of Article X of the License Agreement. The Licensee will pay the cost of having Licensor's representative present.

20. Licensee shall notify the Licensor five (5) days (excluding Saturday, Sunday and holidays) in advance of any work operation requiring entry into any of Licensor's manholes except in the case of routine work operations described in paragraph (e) of Article X for which Licensee shall give Licensor twenty-four (24) hours notice in advance.

21. Clearing obstructions, repairs, dig-ups and any other work required to make a duct usable for the initial placing of Licensee's cable shall be done by the Licensor or its approved contractor at Licensee's expense.

22. Licensee's cable shall be placed in, removed from, changed or maintained in Licensor's conduit system only when specific authorization for the work to be performed and approval of the person, firm or corporation that will perform the work, has been obtained in writing in advance from Licensor. Licensor retains the right to specify what, if any, work shall be performed by Licensor.

23. Rodding of ducts in Licensor's conduit system shall be done only when specific authorization for such work, and approval of the person, firm or corporation that will perform such work has been obtained in writing in advance from Licensor. Licensor retains the right to prescribe the manner in which such rodding will be done and retains the right to specify what, if any, work shall be performed by Licensor.

24. Licensee's workmen shall not climb or step on Licensor's cables, air pipes or equipment located in Licensor's manholes.

25. Upon completion of work in Licensor's manholes, Licensee shall remove all of its tools, unused materials, wire clippings, cable sheathing and any other similar matter.

26. All of Licensee's cables, equipment and facilities shall be firmly secured and supported to the satisfaction of Licensor's authorized representative.

27. All of Licensee's cables, equipment and facilities shall be plainly identified in each manhole with a firmly affixed tag of a type and wording satisfactory to the Licensor.

28. Where manholes must be pumped in order to allow Licensee's work operations to proceed, pumping shall be done by the Licensee or its contractor.

29. Licensee's employees, agents or contractors shall not use work platforms, supports or planks which would be placed upon or lashed to any of Licensor's cable or equipment.

30. Any leak detection liquid or device used by Licensee's agents, employees or contractors shall be of a type approved in writing by Licensor.

31. When Licensee, its agents, employees or contractors are working in or around any part of Licensor's conduit system located in the streets, alleys, highways or other public rights-of-way, the protection of persons and property shall be provided by Licensee in an adequate and satisfactory manner; Licensee shall be solely responsible for providing adequate barricades, warning lights, traffic cones, danger signs and other similar devices to protect all traffic, persons and property around the work area from danger.

32. Licensee, its agents, employees or contractors, when working in or around Licensor's manholes, shall be responsible for testing the manhole atmosphere and providing continuous ventilation in accord with the minimum standards furnished to Licensee by Licensor.

33. Except for protective screens, no cover shall be placed over an open manhole unless it is at least four feet above the surface level of the manhole opening.

34. Smoking or the use of a flame in Licensor's manholes shall not be permitted.

35. Licensor's authorized representative shall have the authority to terminate Licensee's work operations in and around Licensor's manholes if, in the sole discretion of Licensor's authorized representative, any hazardous condition arises or any unsafe practice is being followed by Licensee's agents, employees or contractors.

36. When artificial lighting is required in Licensor's manholes, only explosion-proof lighting of a type approved in writing by Licensor shall be used.

37. The Licensee shall not allow the accumulation of any combustible material in Licensor's manholes during the Licensee's work operations.

38. Spark-producing equipment tools or devices, such as meggers, breakdown sets, electric drills, electric hammers and induction sets shall not be allowed in manholes.

39. Cable lubricants used by Licensee in Licensor's conduit system shall be of a type approved in writing by Licensor.

EMERGENCY CONDITIONS

40. In cases of emergency:

(a) Licensor's work shall take precedence over any and all operations of Licensee in Licensor's conduit system.

(b) Licensor may pull a cable into any of Licensor's ducts either occupied by or scheduled to be occupied by Licensee's facilities, and Licensor will endeavor to make other duct space available for the displaced facilities of Licensee as soon as possible.

(c) Licensor may rearrange Licensee's cable, equipment and facilities at the expense of the Licensee.

APPENDIX 4

REQUIREMENTS AND SPECIFICATIONS FOR OCCUPANCY OF A TRENCH SYSTEM

Effective:_____

THIS APPENDIX 4 is, from the effective date hereof, an integral part of the License Agreement between The Ohio Bell Telephone Company, therein called Licensor, and WARNER AMEX CABLE COMMUNICATIONS INC., therein called Licensee, dated_____(hereinafter called the Agreement) and contains minimum requirements and specifications governing the occupancy of a Trench System in_____.

GENERAL

1. The fees and charges specified in Appendix 1 shall be applicable to all licenses granted to Licensee hereunder, without regard to the methods used.

2. All requirements of the National Electrical Safety Code referred to herein shall mean the Sixth Edition of such code, or any later amendment or replacement thereof, and shall include any additional requirements of any applicable Federal, State, County or Municipal code. References to simply the Safety Code, or to N.E.S.C., have the same meaning.

3. While many of the standards and technical requirements for Licensee's cable, equipment and facilities are set forth herein, Licensor reserves the right to specify the type of construction required in situations not otherwise covered in this Appendix. In such cases, Licensor will in its discretion furnish to Licensee written or illustrated materials which will specify and explain the required construction.

ELECTRICAL DESIGN SPECIFICATIONS

4. No cable, equipment or facility of Licensee shall be permitted to occupy a Trench System with Licensor if such cable, equipment or facility by its design could cause electrical interference on Licensor's facilities. If electrical interference is caused by any of Licensee's cable, equipment or facilities, such interference shall be removed at the expense of Licensee.

5. Licensee's cable, equipment and facilities shall not be designed to use the earth as the sole conductor for any part of the Licensee's circuits.

6. No coaxial cable of Licensee shall be considered suitable for occupancy of a trench containing Licensor's cable unless such cable of Licensee meets the power supply limitations of Article 820 of the National Electrical Code.

7. Licensee's coaxial cable may carry continuous DC voltages up to 1800 volts to ground where the conductor current will not exceed one-half ampere and where such cable has two separate grounded metal sheaths or shields and a suitable insulating jacket over the outer sheath or shield. However, in such event, Licensee's cable shall be separated from Licensor's cable as specified by Licensor. Licensor may require Licensee to occupy a separate trench. The power supply shall be so designed and maintained that the total current carried over the outer sheath shall not exceed 200 microamperes under normal conditions. Conditions which would increase the current over this level shall be cleared promptly.

8. Cable and facilities of Licensee carrying a potential of 550 volts or less between conductors will be considered suitable for occupancy of a trench containing Licensor's facilities provided that:

A. Licensee's cable has an effectively grounded sheath or shield or the conductors include an effectively grounded conductor; and

B. All grounded sheaths, shields, or conductors are present at a terminating point and are bonded; and

C. The effectively grounded sheath or shield of Licensor's cable is bonded to Licensee's cable at common terminating points and at intervals of not less than 1000 feet.

9. Licensee shall not circumvent Licensor's corrosion mitigation measures.

10. Licensee's cable, equipment and facilities shall be compatible with the Licensor's facilities so as not to damage any facilities of the Licensor by corrosion or otherwise.

WORK RULES

11. Licensee shall notify the Licensor in advance of any work operation requiring entry into the Trench System provided, however, that a particular notice requirement may be waived by Licensor upon Licensee's request.

12. Licensee's workmen shall not climb or step on Licensor's cables, air pipes or equipment located in the trench.

13. Upon completion of work in the trench, Licensee shall remove all of its tools, unused materials, wire clippings, cable sheathing and any other similar matter.

14. All of Licensee's cables, equipment and facilities shall be located in a position satisfactory to the Licensor's authorized representative.

15. All of Licensee's cables, equipment and facilities shall be plainly identified at each pedestal location with a firmly affixed tag of a type and wording satisfactory to the Licensor.

16. Should it be necessary for the Licensor to replace or relocate a pedestal to which the Licensee is attached, the Licensee will be responsible for the transfer of his own equipment.

17. Any leak detection liquid or device used by Licensee's agents, employees or contractors shall be of a type approved in writing by Licensor.

18. When Licensee, its agents, employees or contractors are working in or around any part of the trench, the protection of persons and property shall be provided by Licensee in an adequate and satisfactory manner; Licensee shall be solely responsible for providing adequate barricades, warning lights, traffic cones, danger signs and other similar devices to protect all traffic, persons and property around the work area from danger.

19. The Licensee shall not allow the accumulation of any combustible material in the trench during the Licensee's work operations.

20. The Licensee shall be responsible for the restoration of all property that has been disturbed or disrupted by Licensee's operations.

21. Should the Licensor deem it necessary to expose or locate its buried communication system for or during the operations of the Licensee, the Licensee shall reimburse the Licensor for the cost and expense incurred by the Licensor.

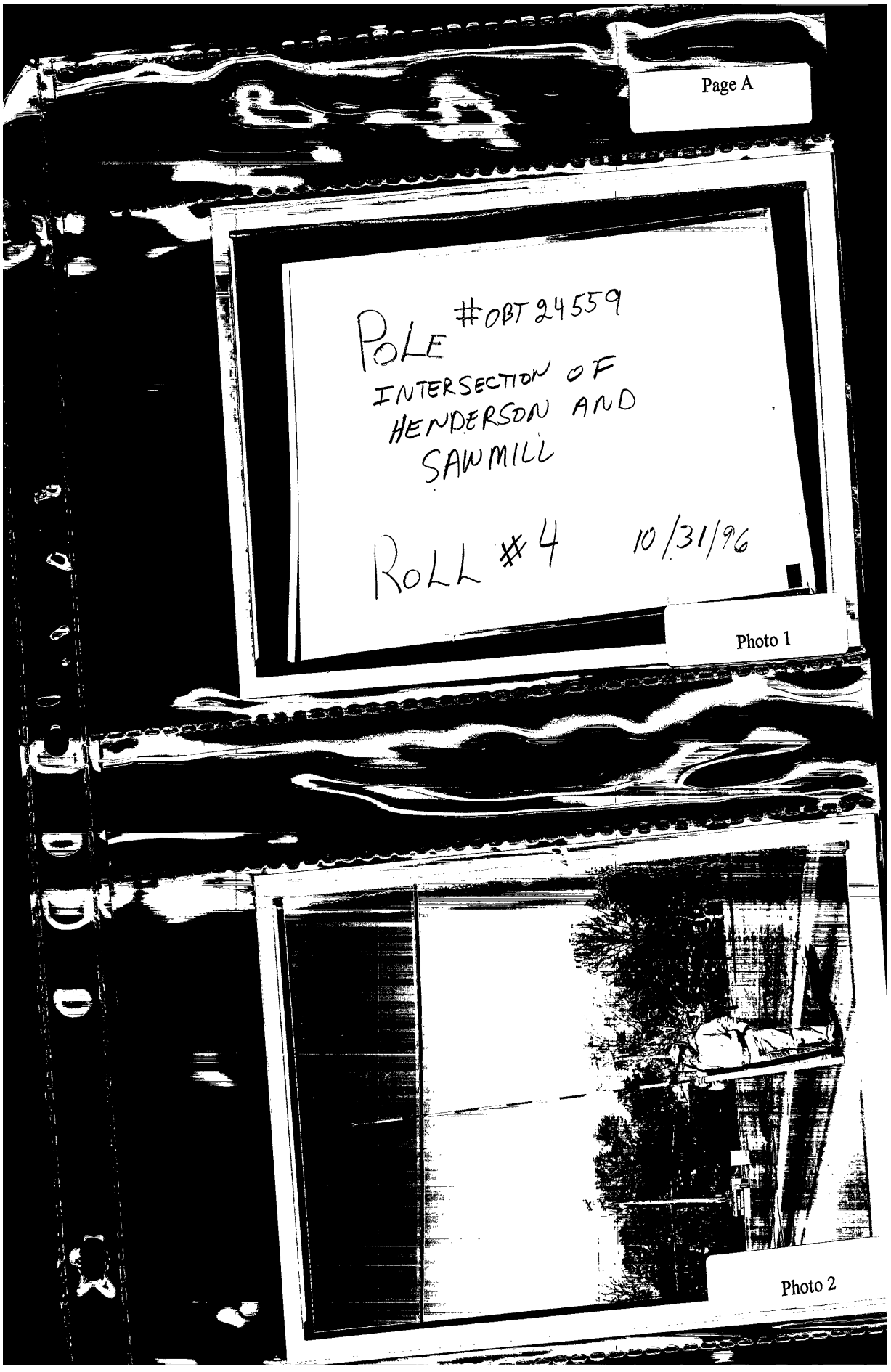
EMERGENCY CONDITIONS

22. In cases of emergency:

(a) Licensor's work shall take precedence over any and all operations of Licensee in the Trench System.

(b) Licensor may rearrange Licensee's cable, equipment and facilities at the expense of the Licensee.

ATTACHMENT MC-II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INTERSECTION OF
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Photo 1
Photo 2

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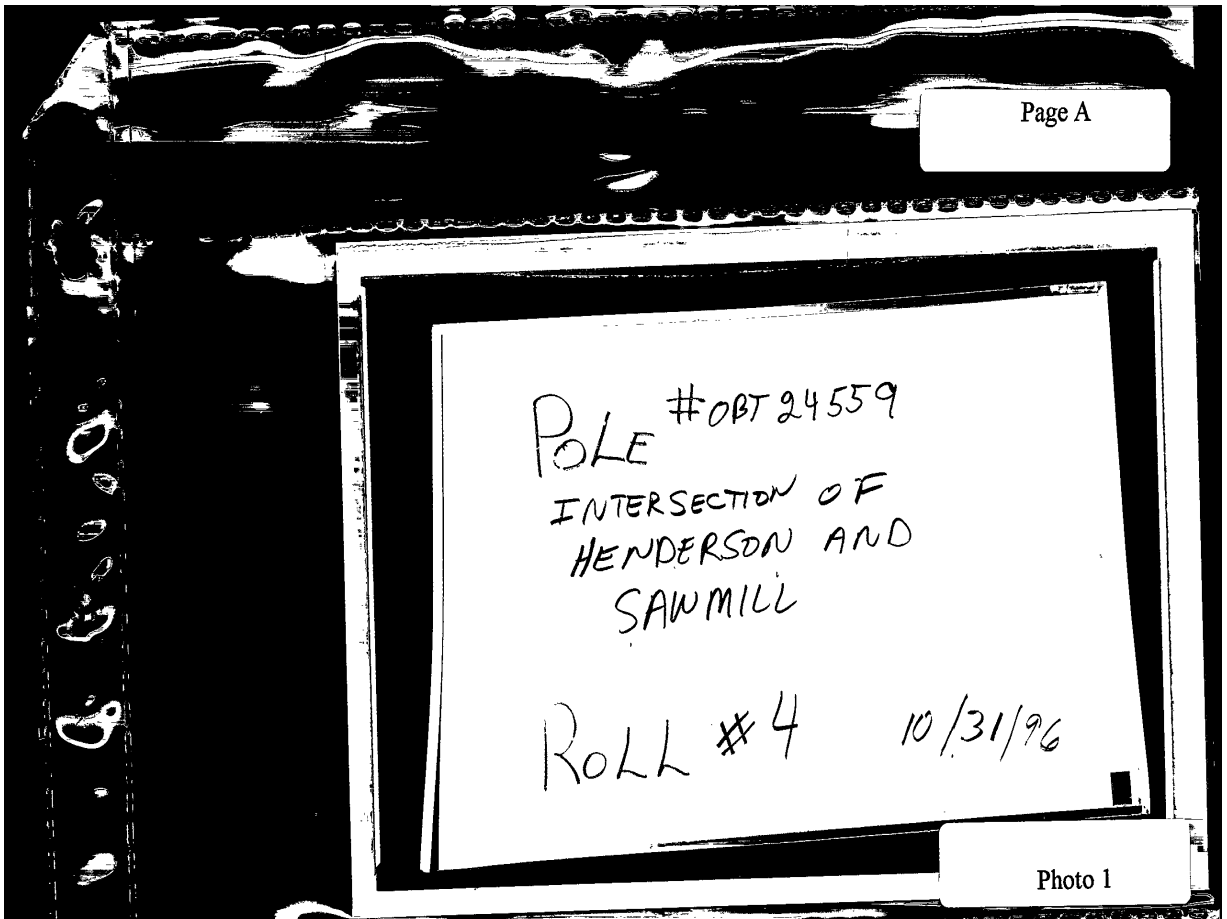
DOCKETING.

Page A



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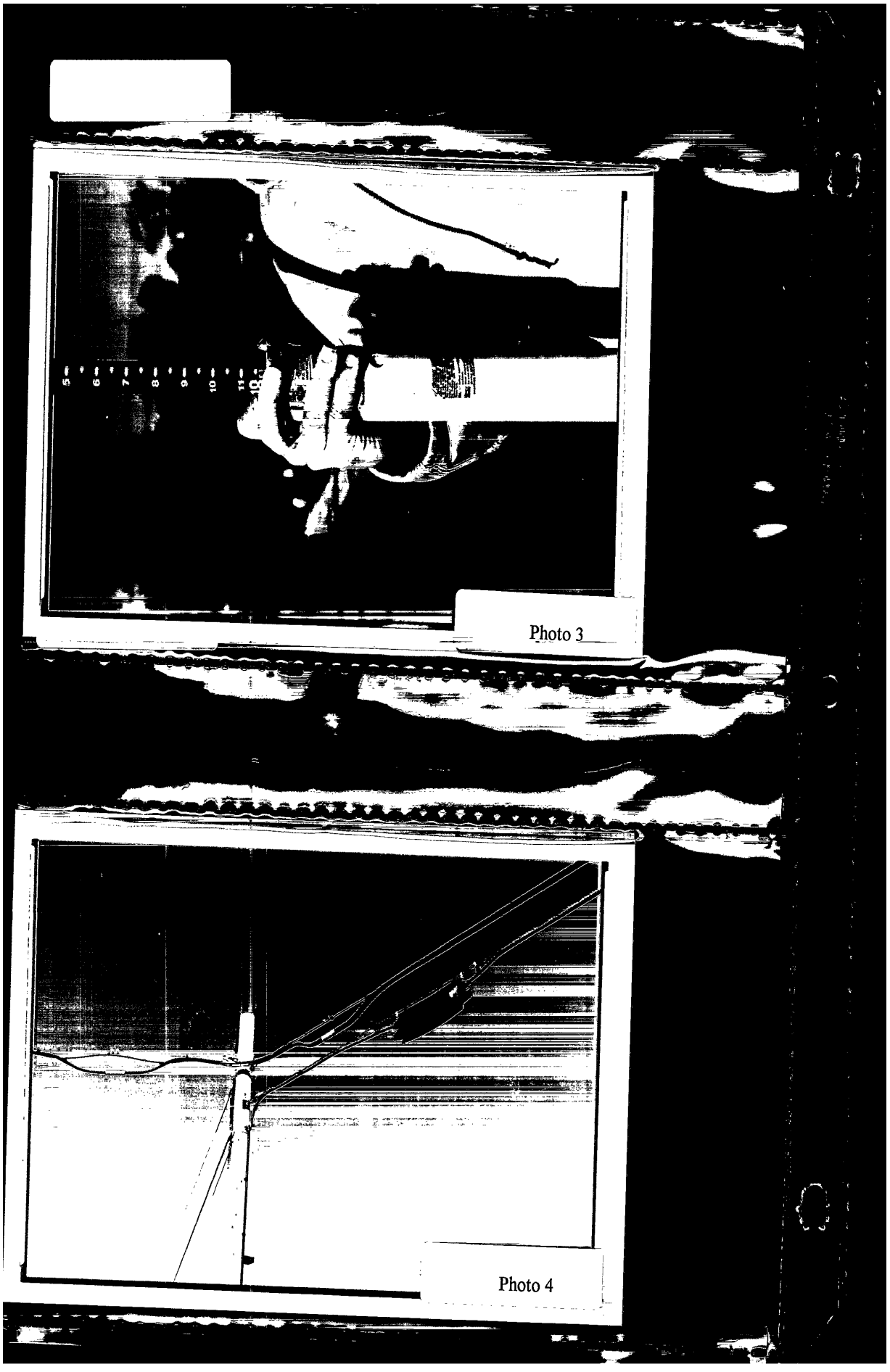

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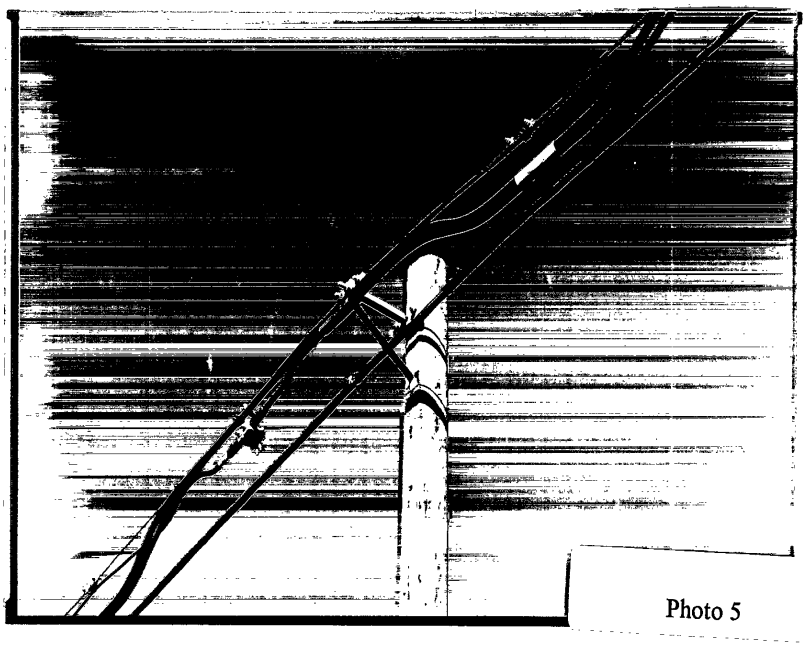

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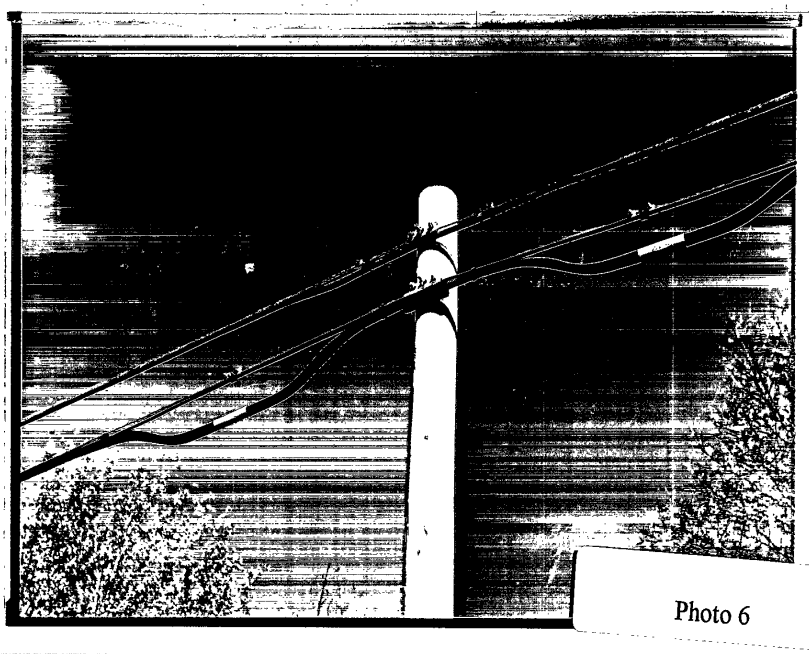

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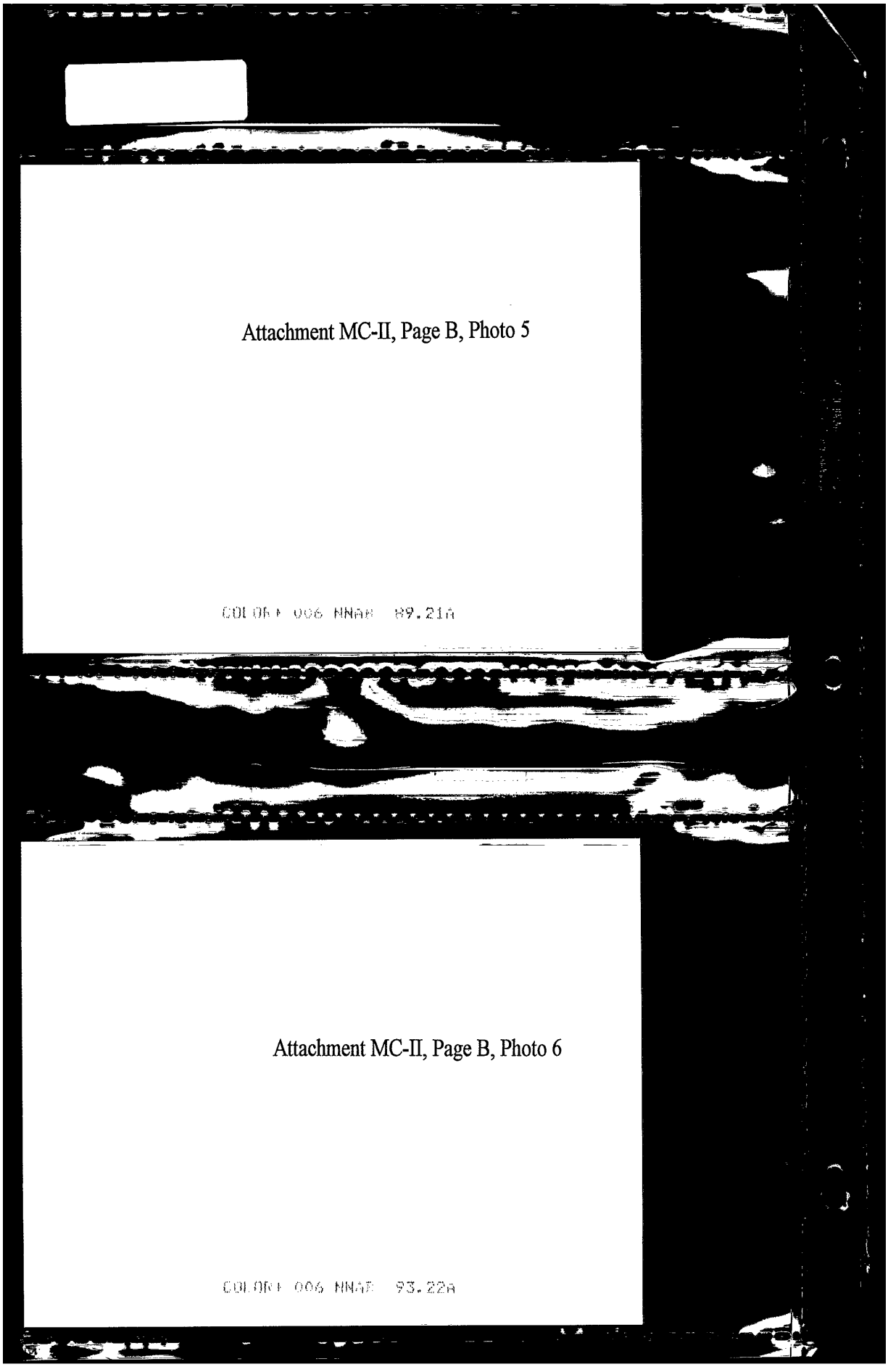

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Attachment MC-II, Page B, Photo 6

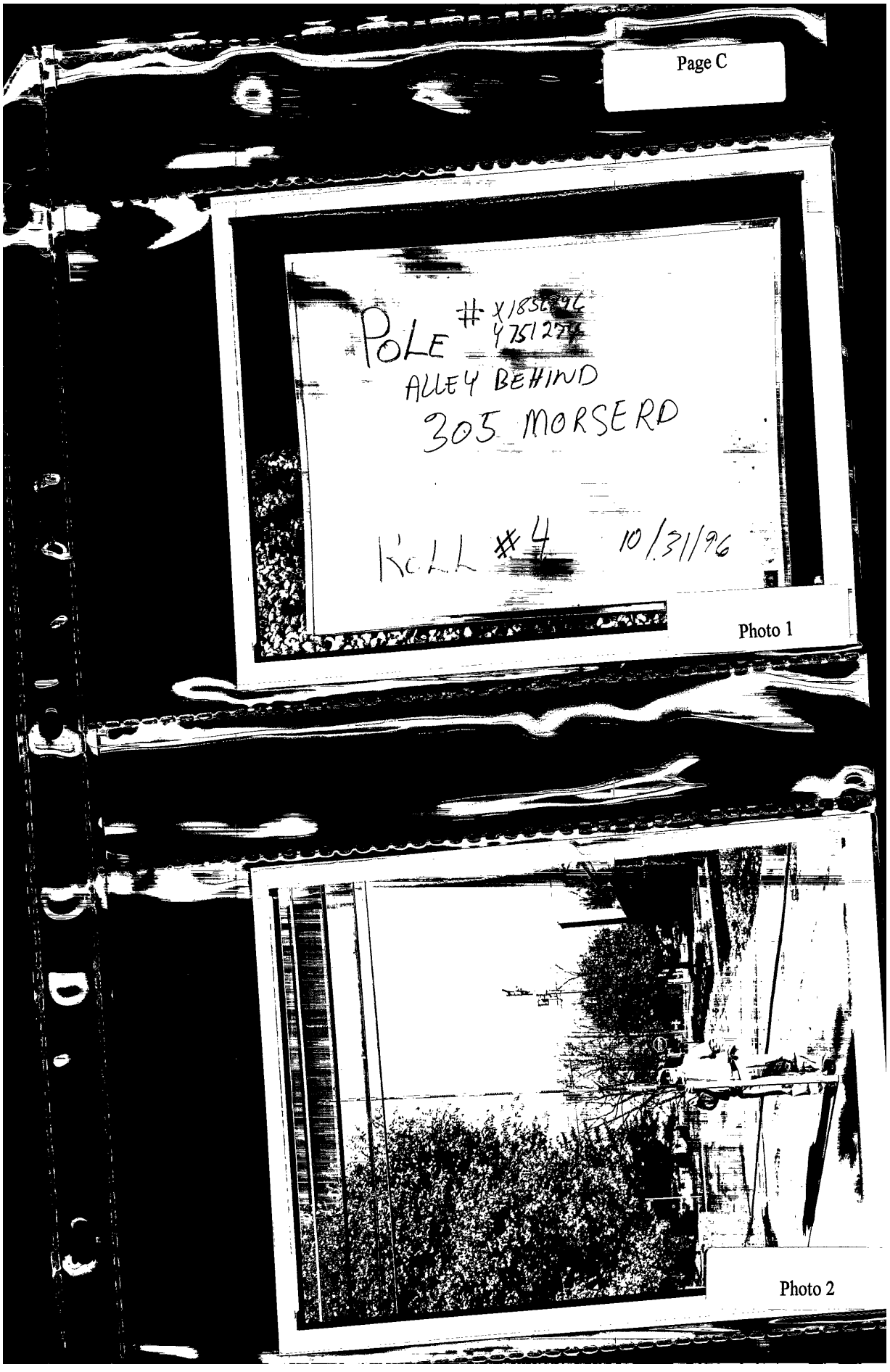

Photo 1

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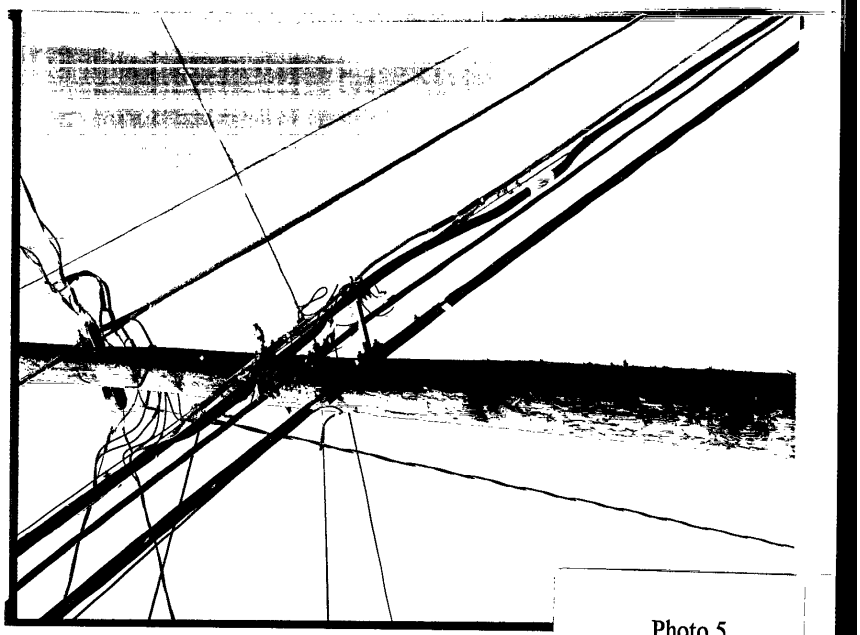
Photo 3
Photo 4



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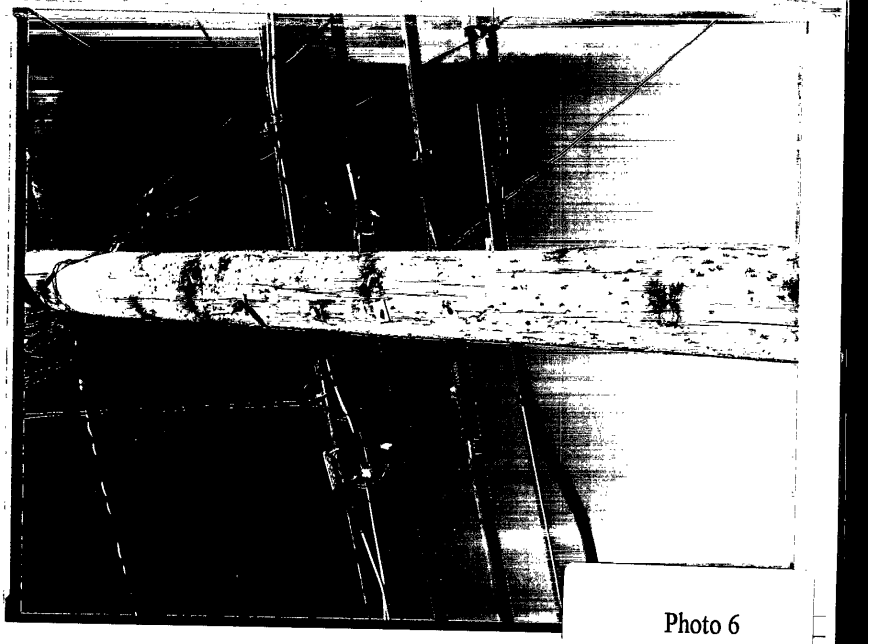

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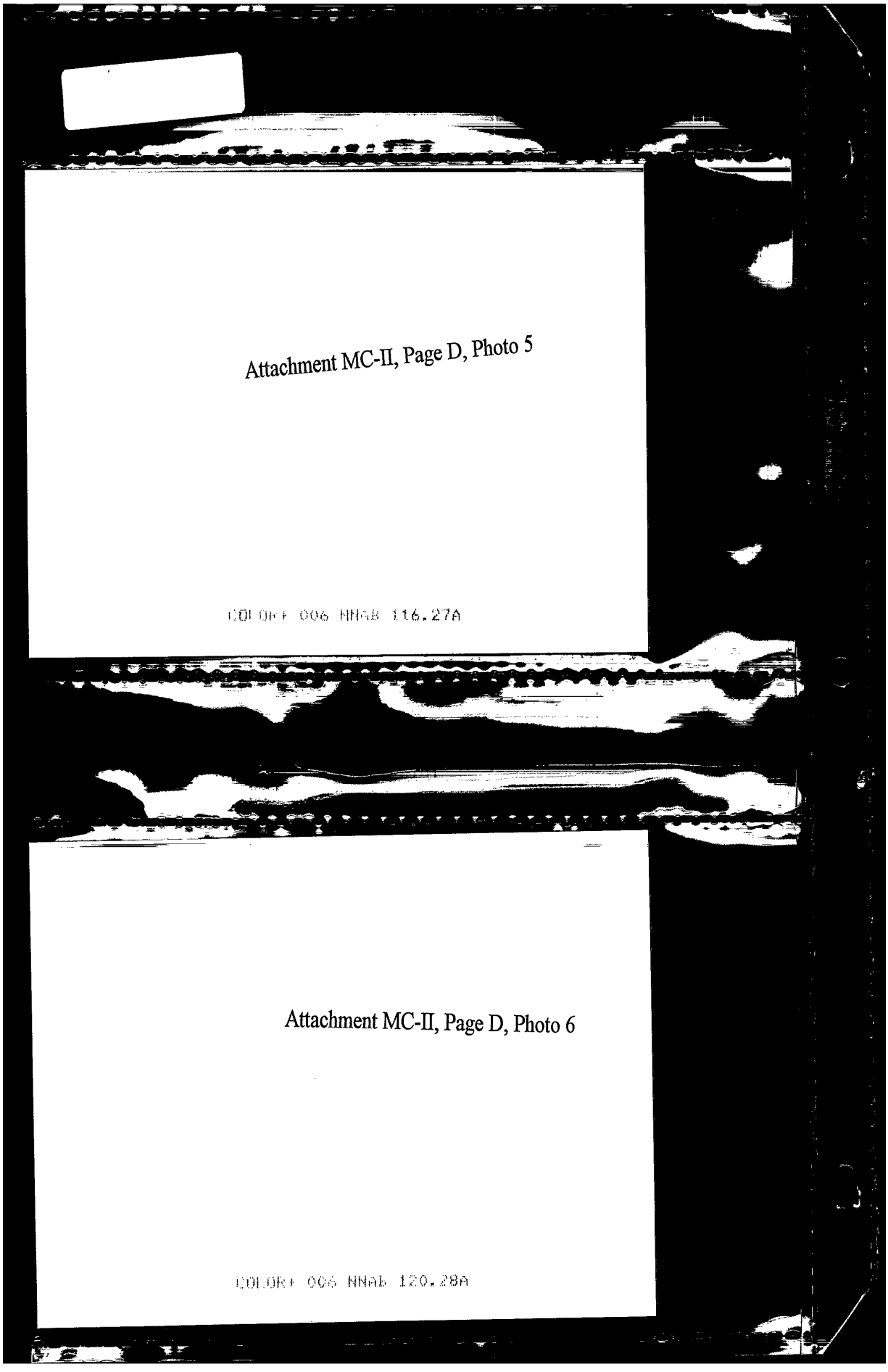
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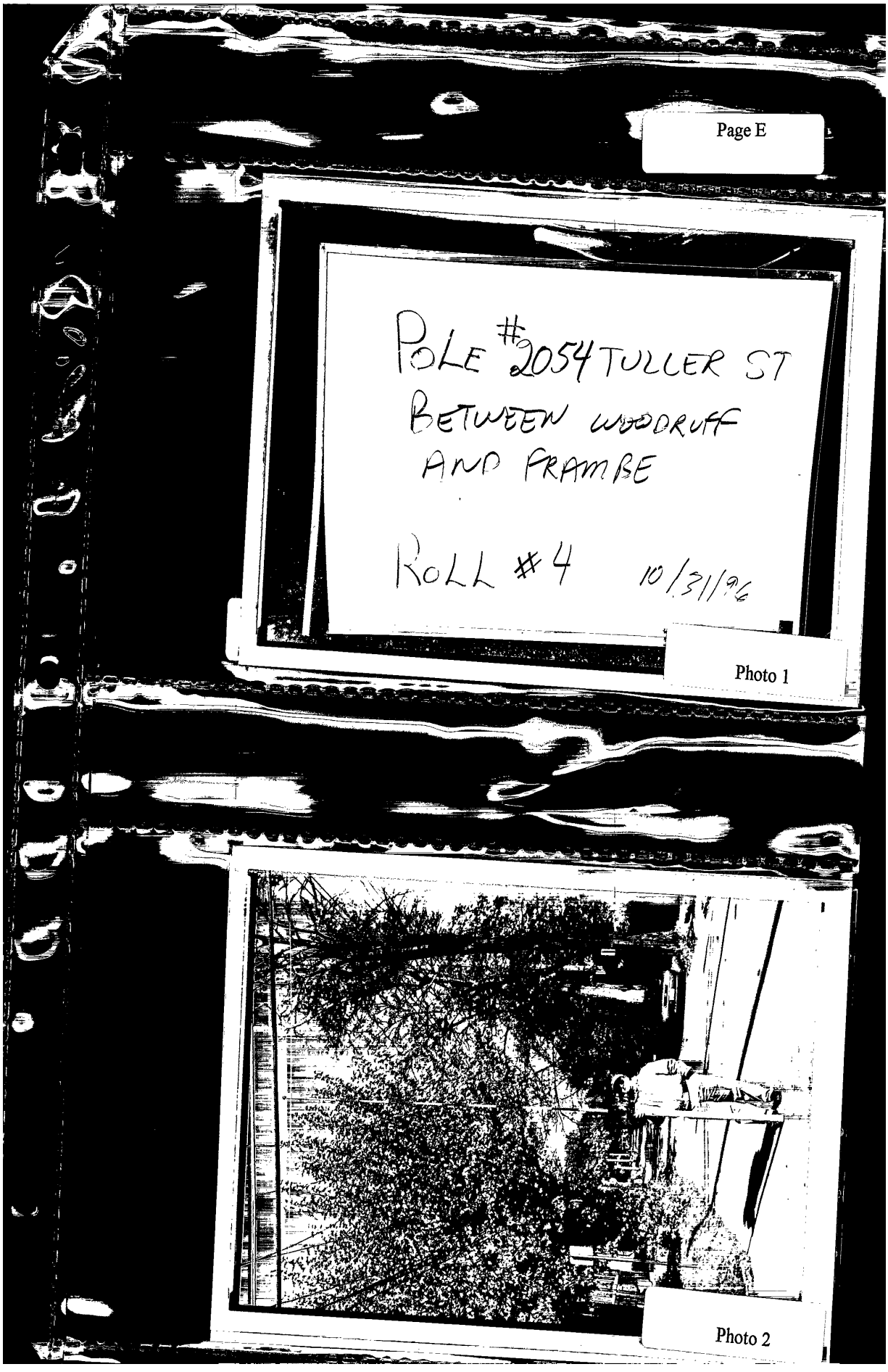


Photo 1

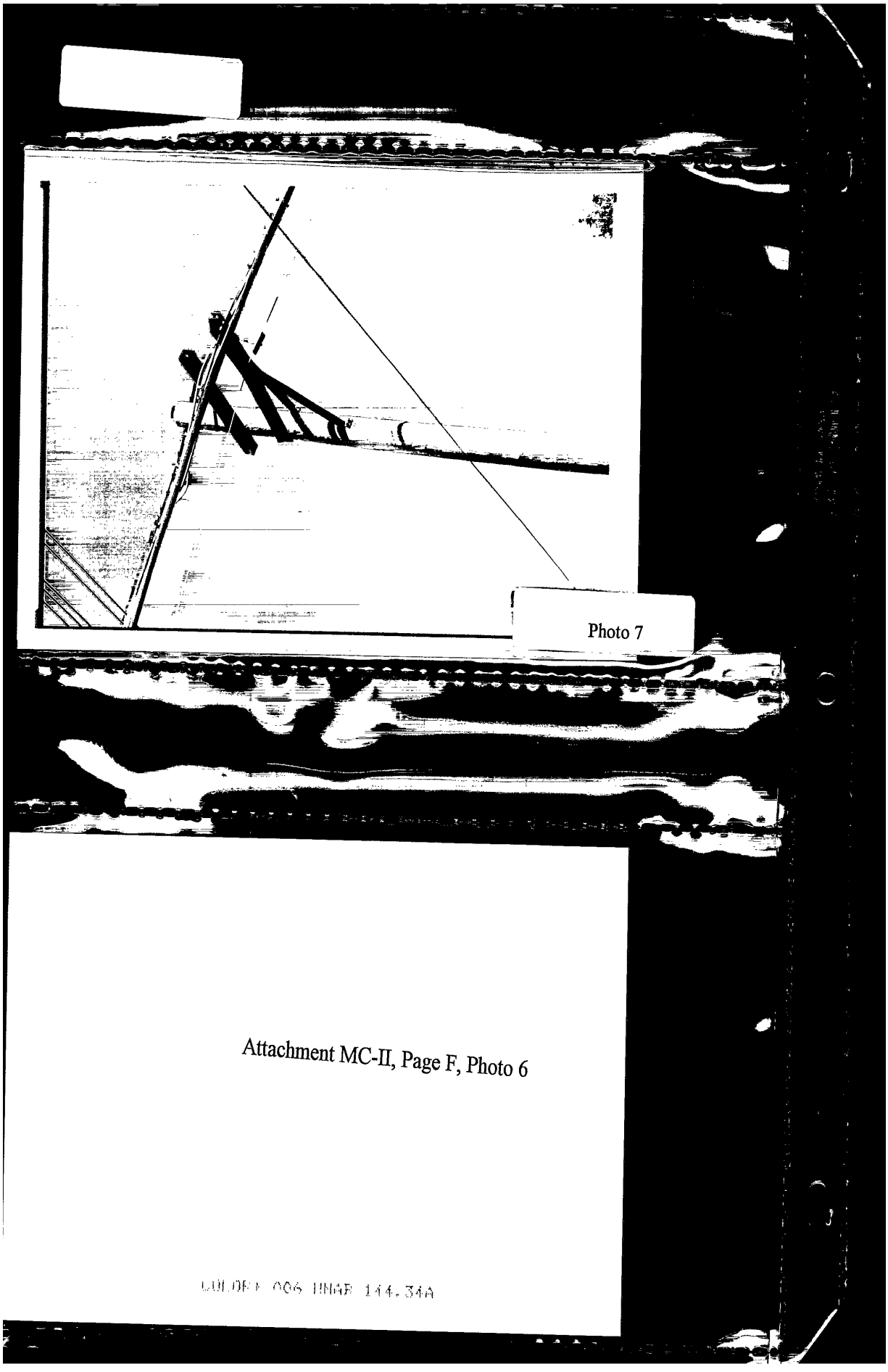
Photo 2

Photo 3

Photo 4

Photo 5

Photo 6



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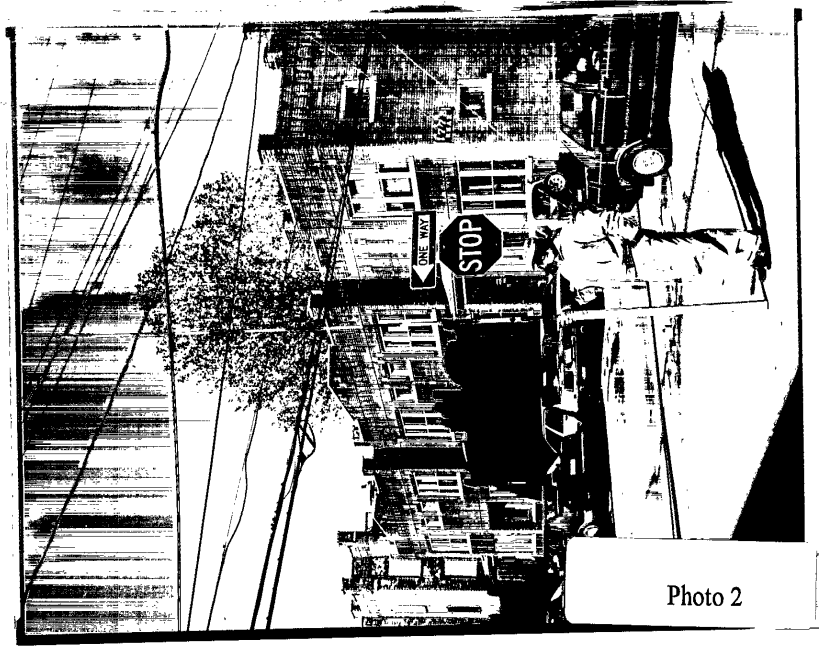

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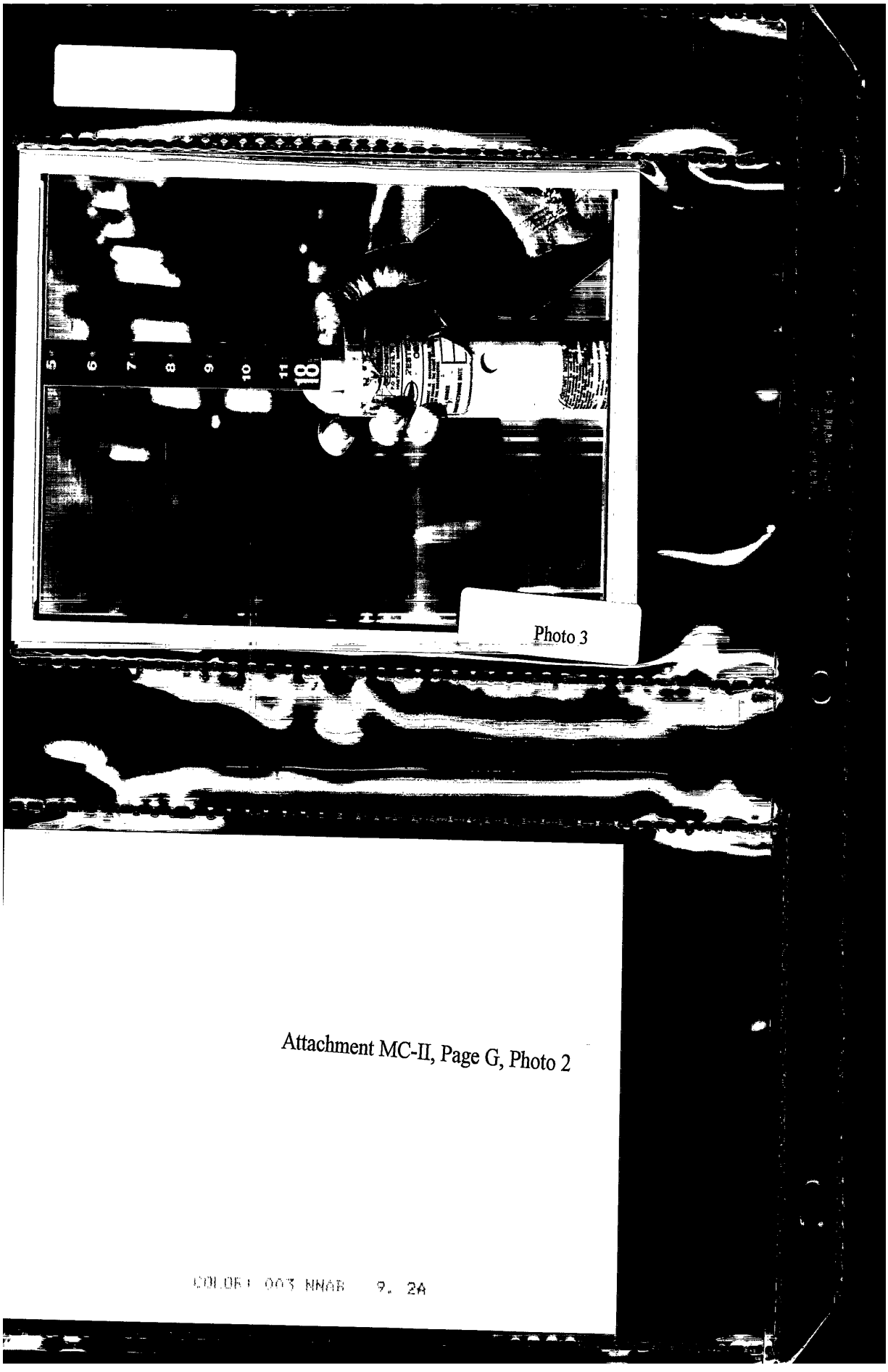

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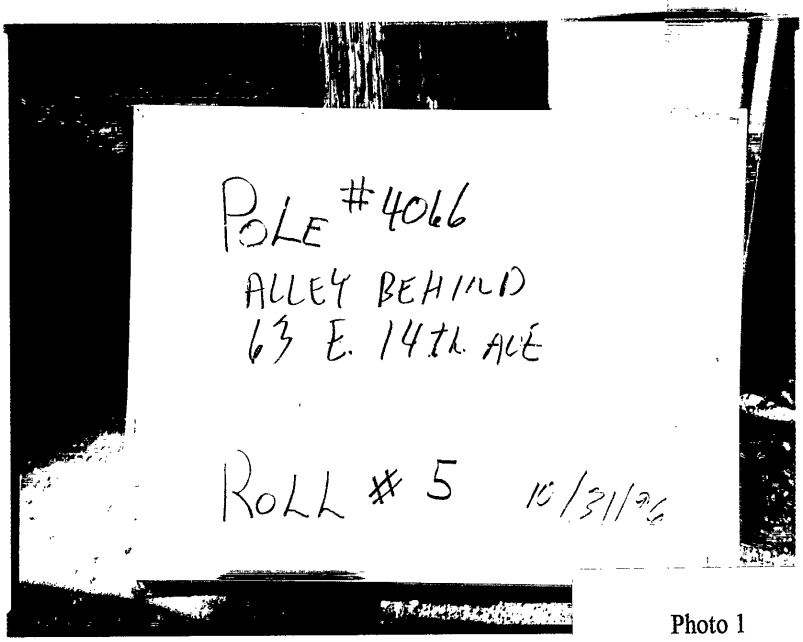

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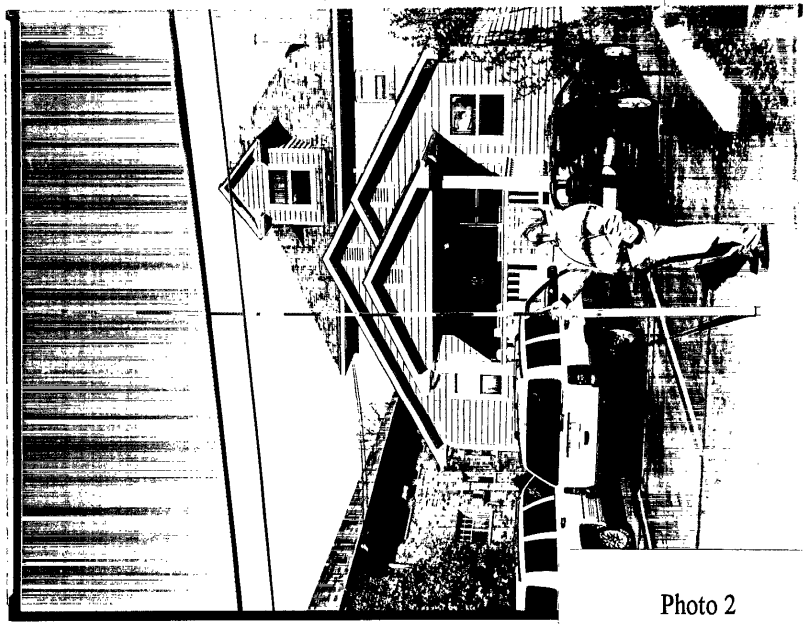

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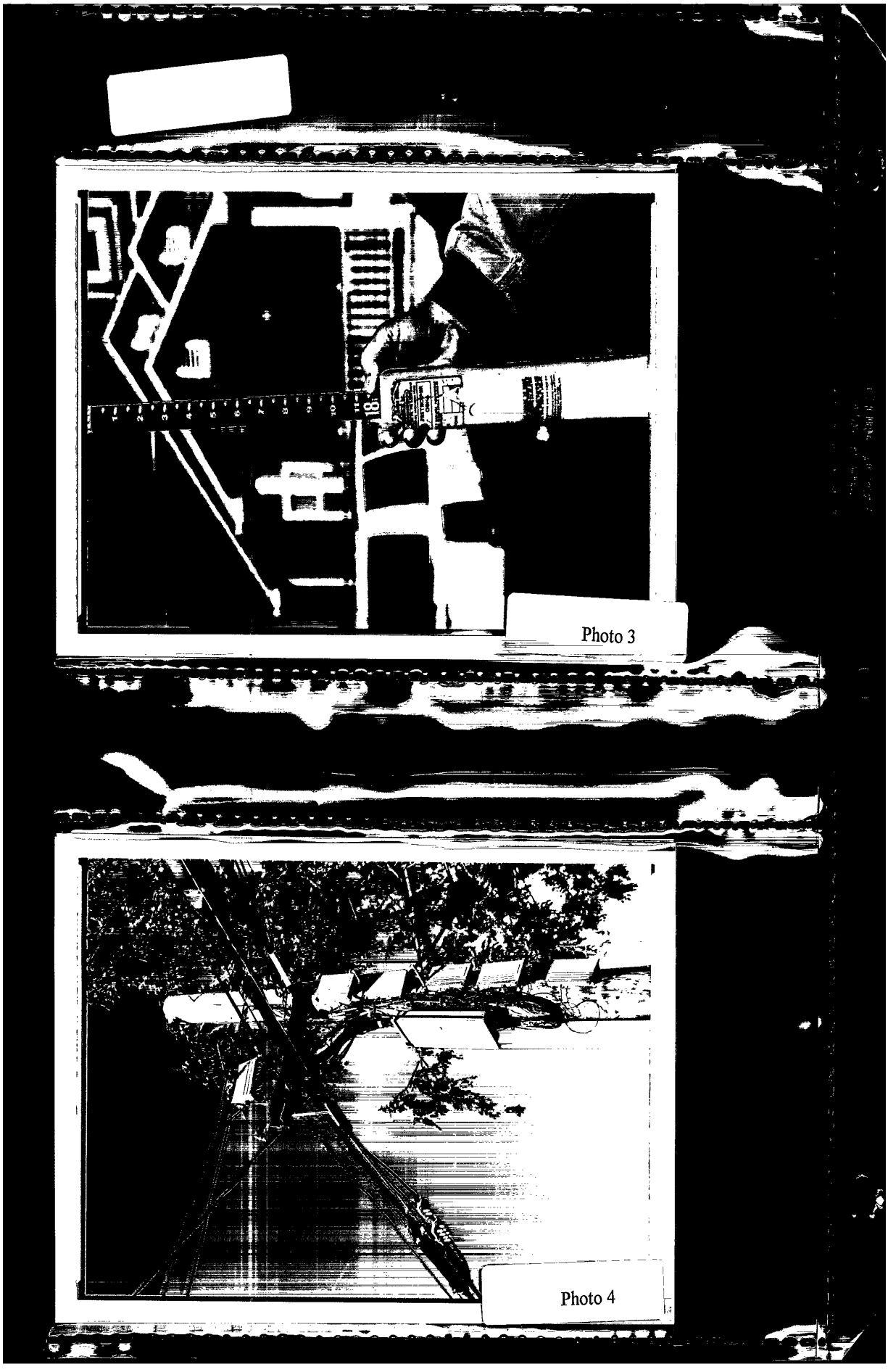

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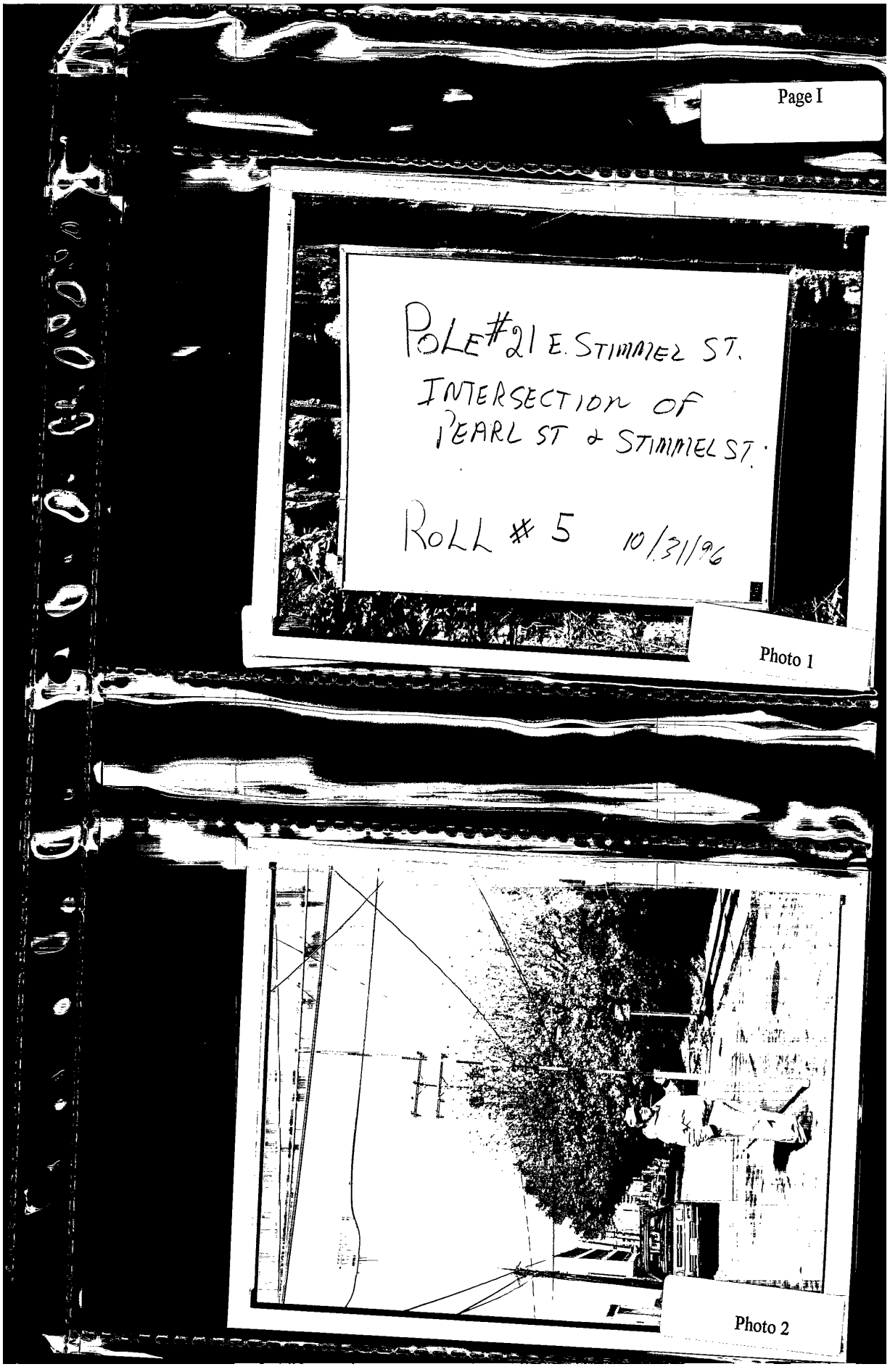

Photo 1

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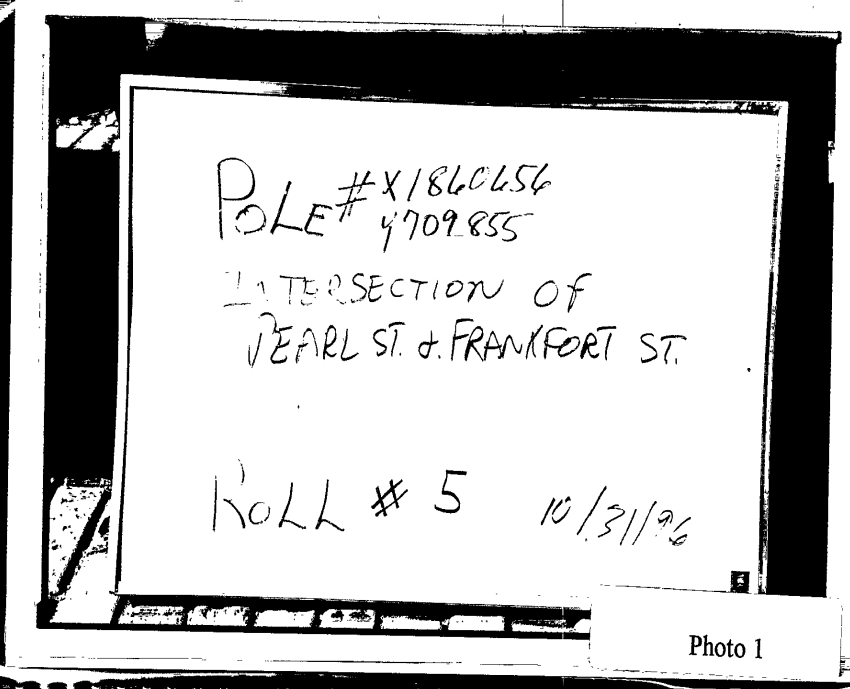

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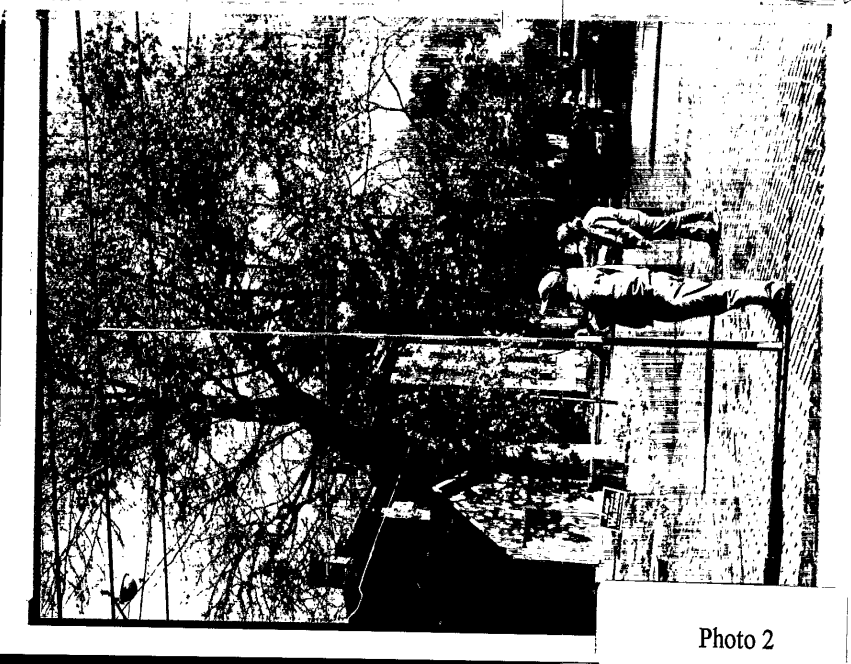

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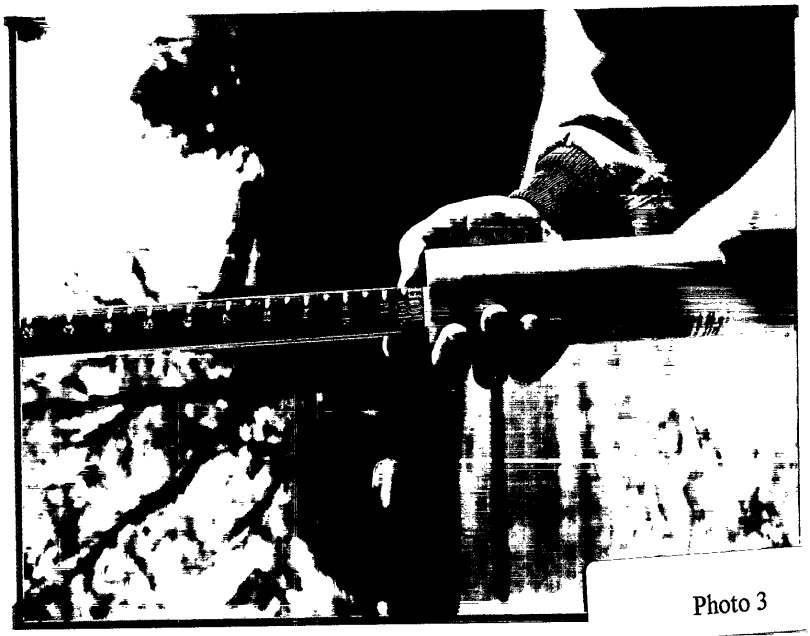

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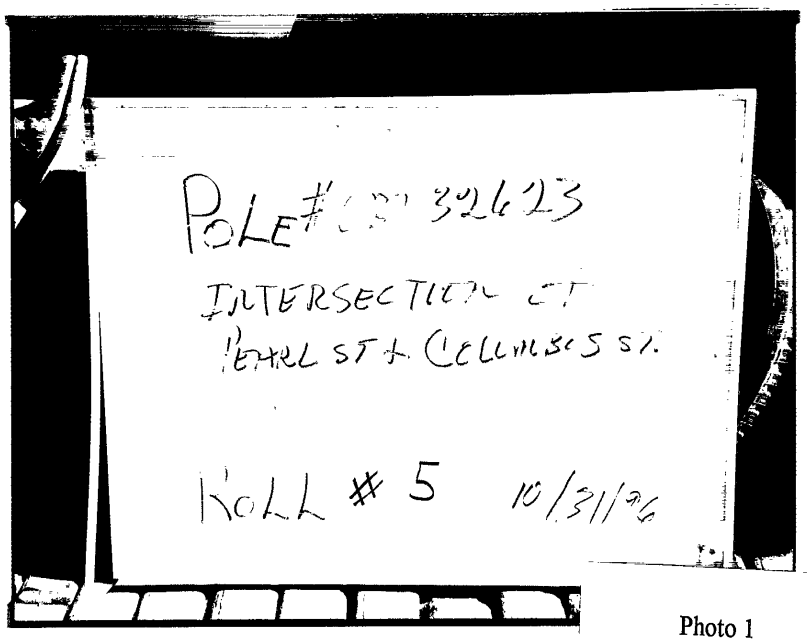

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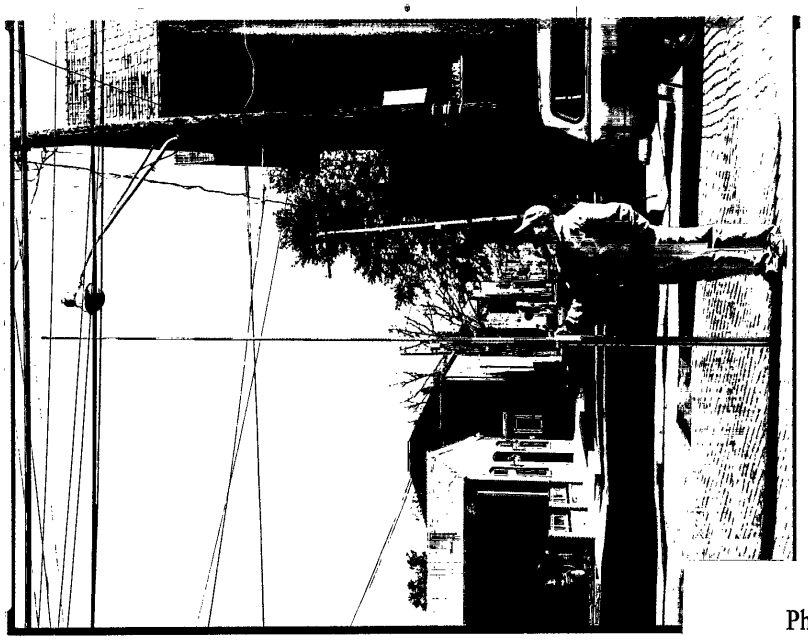

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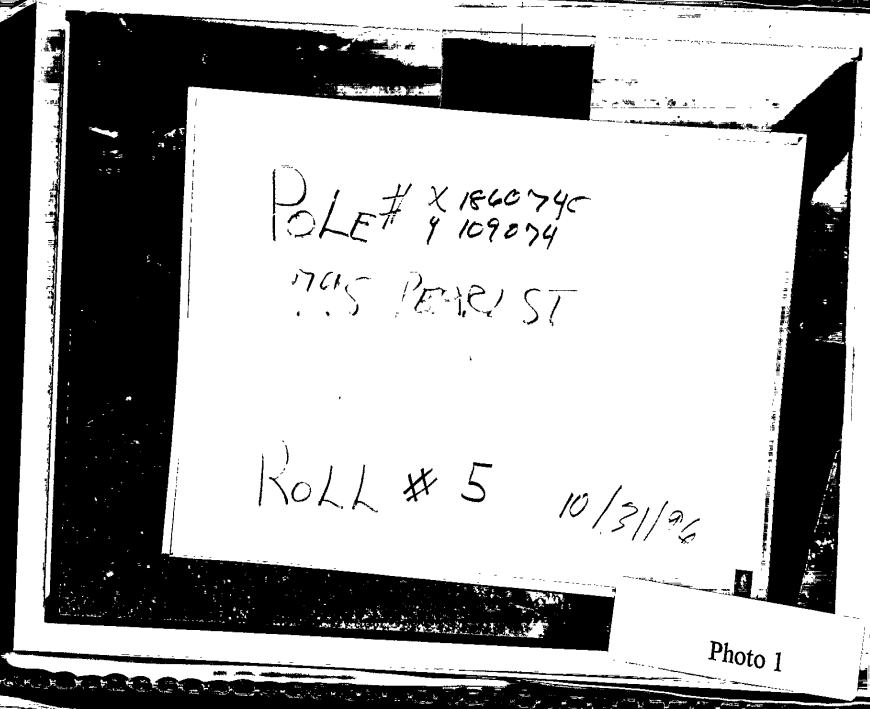

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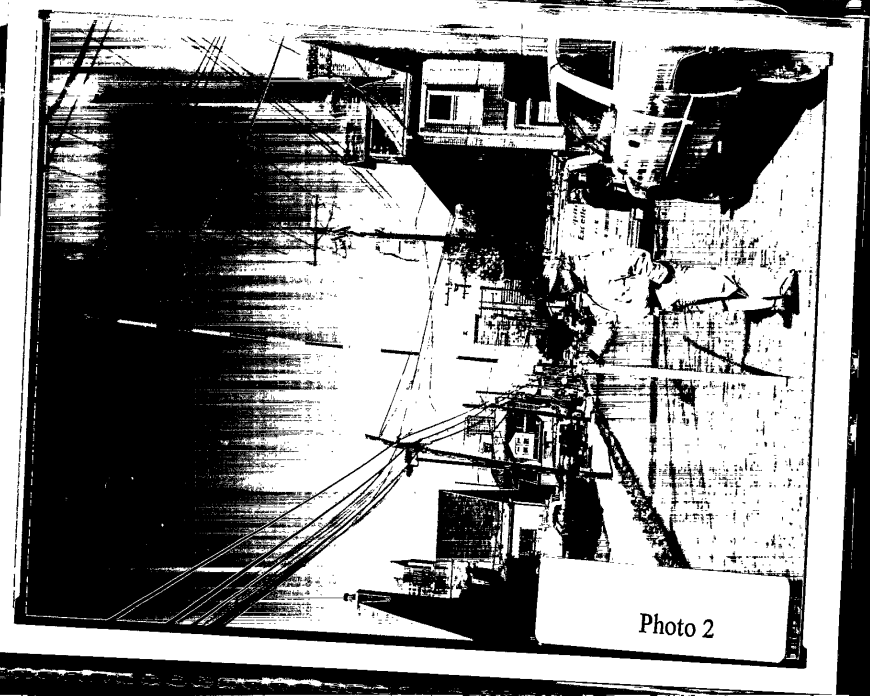

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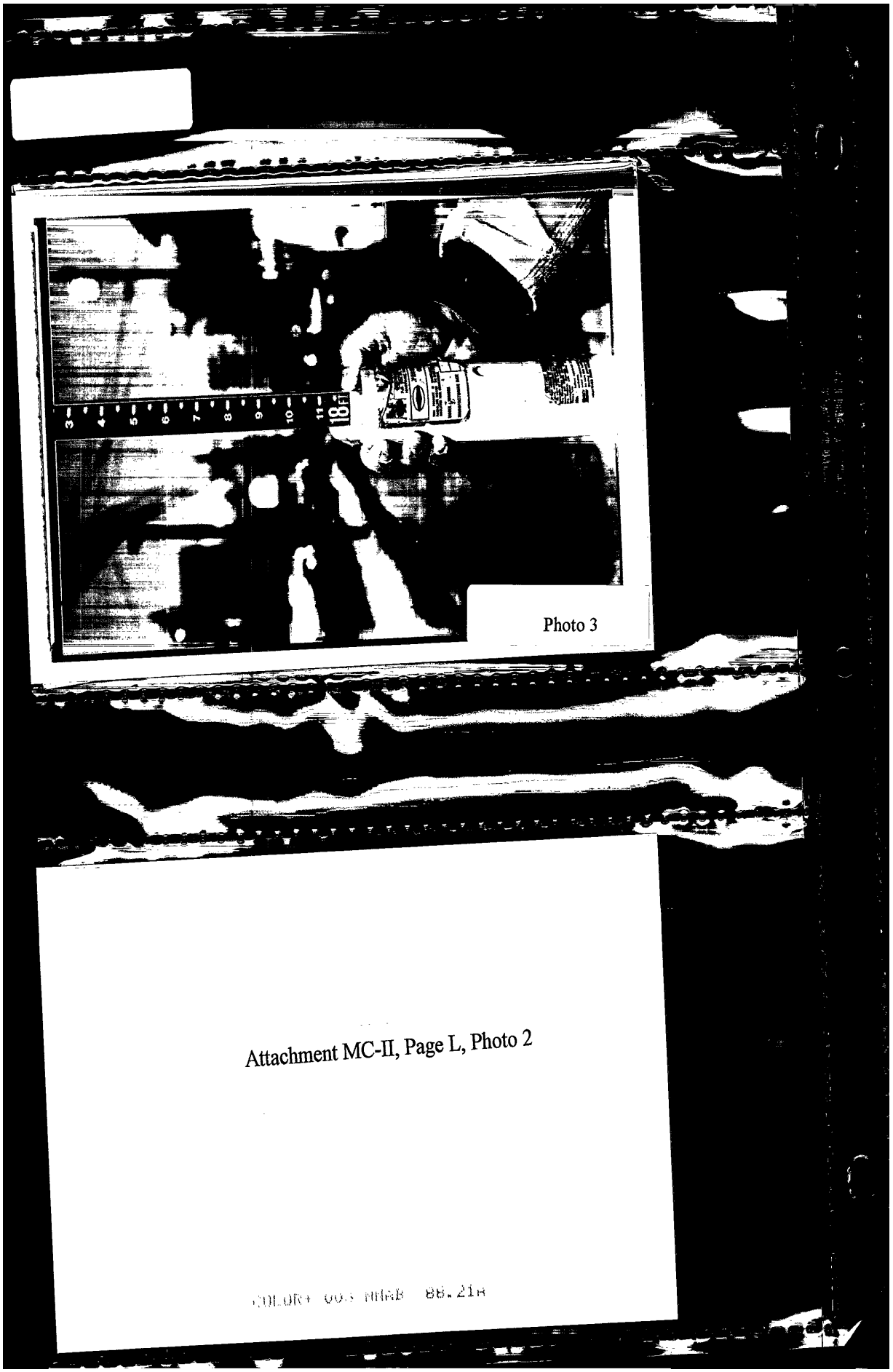

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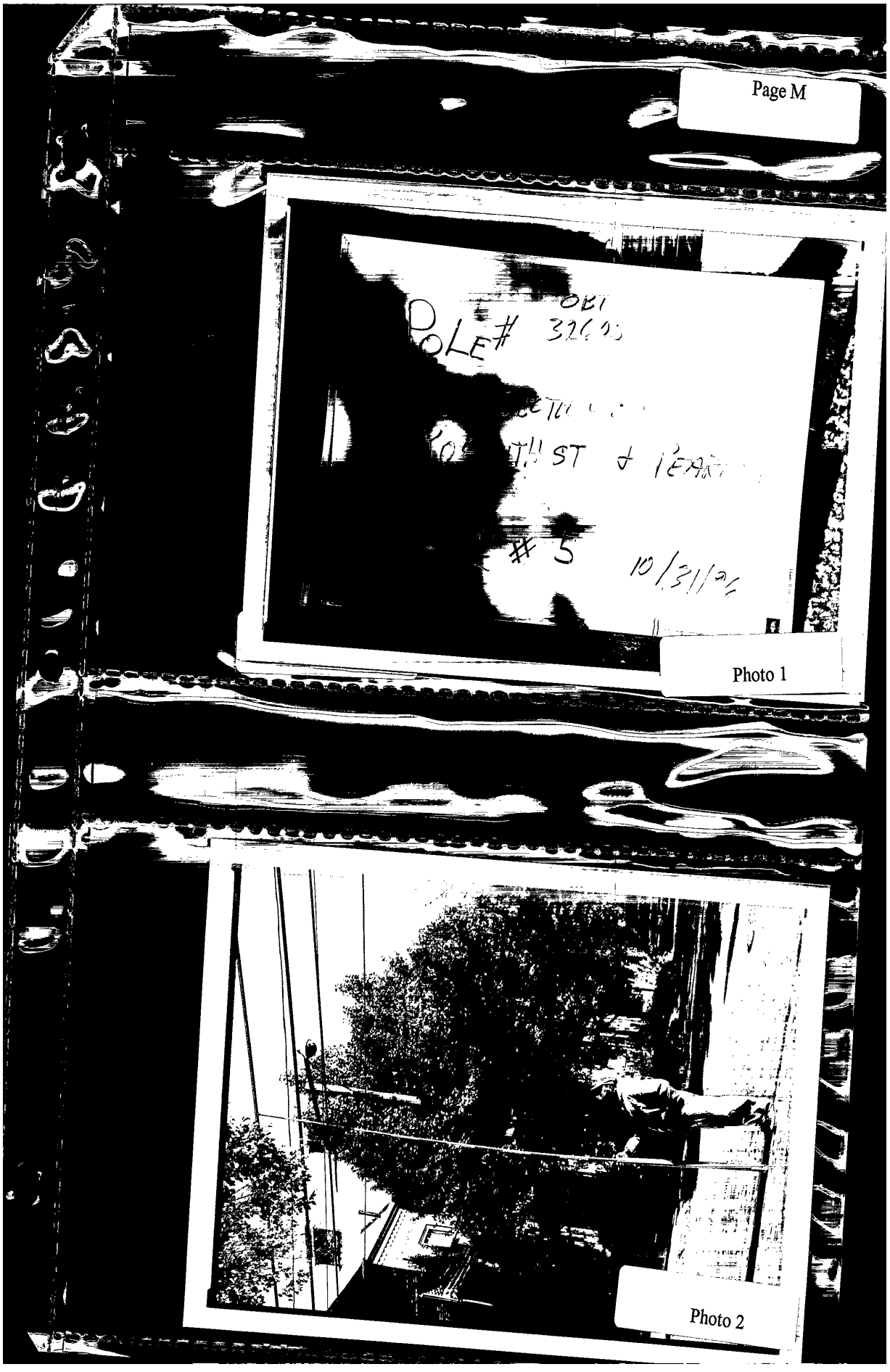

Photo 1

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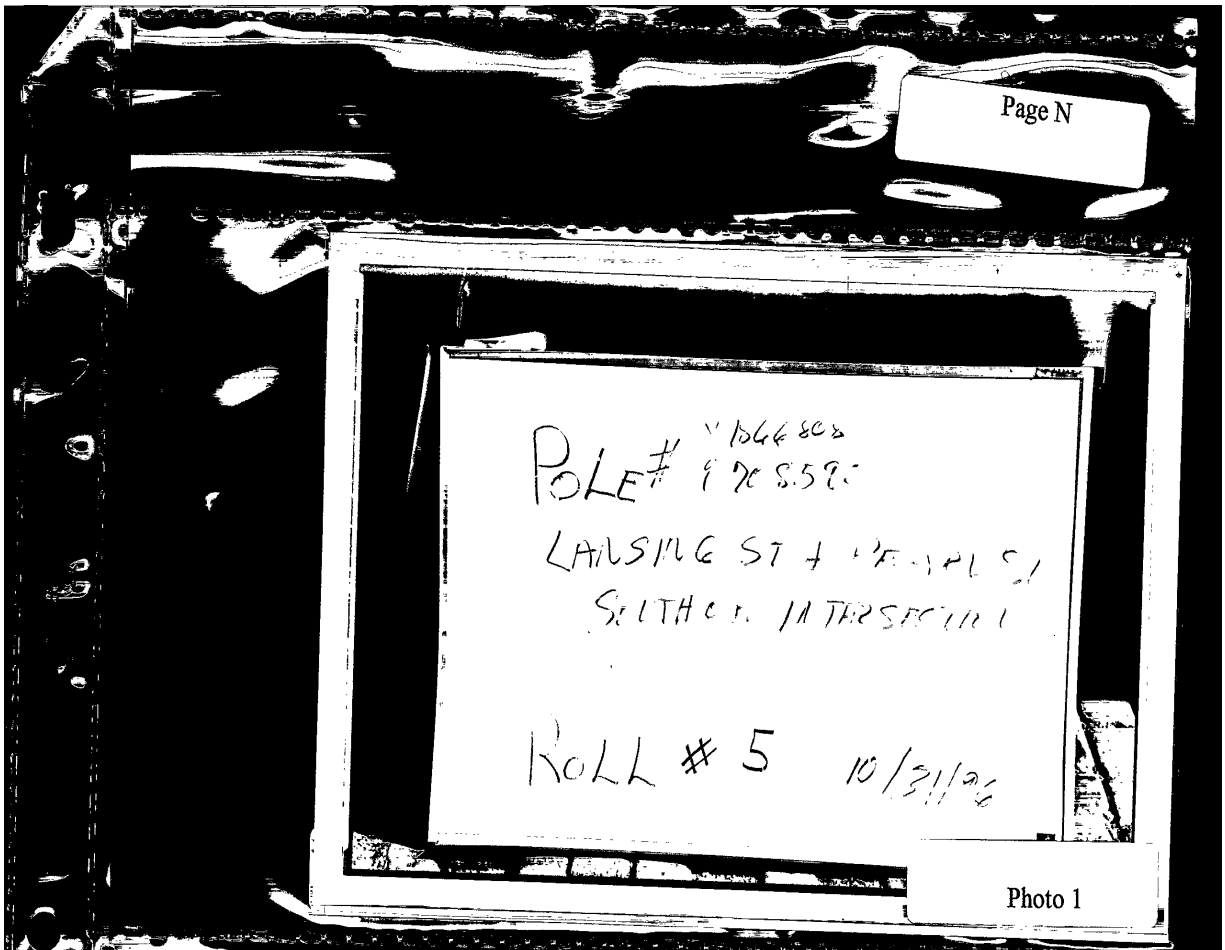

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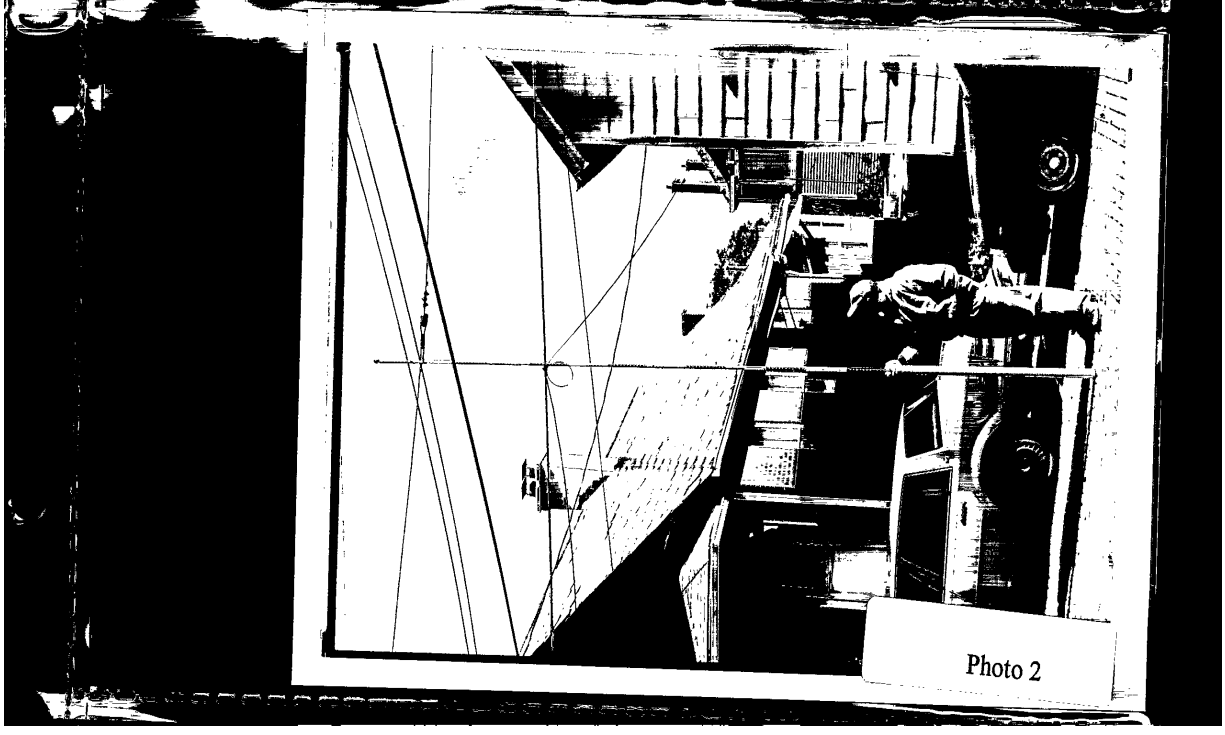

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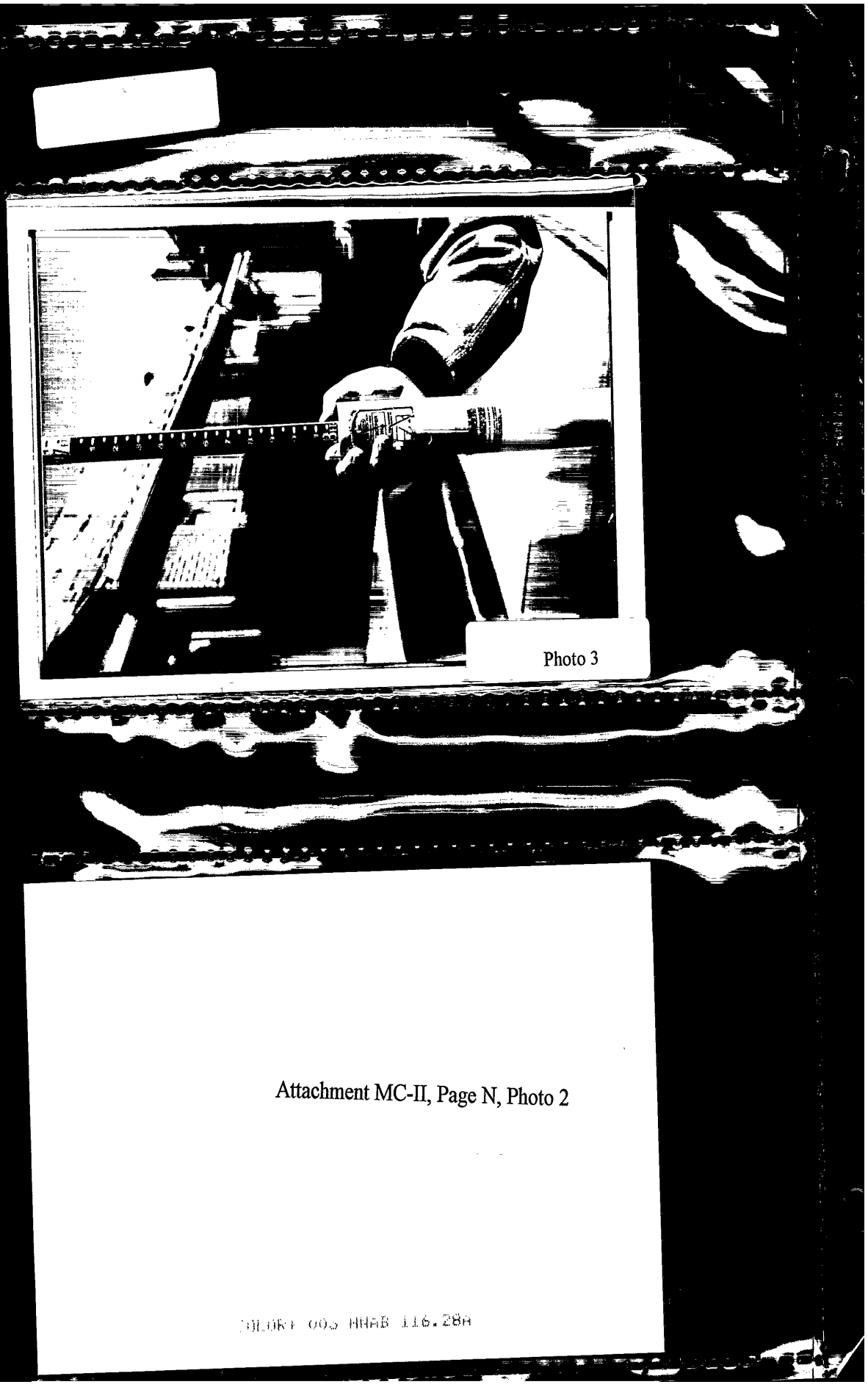

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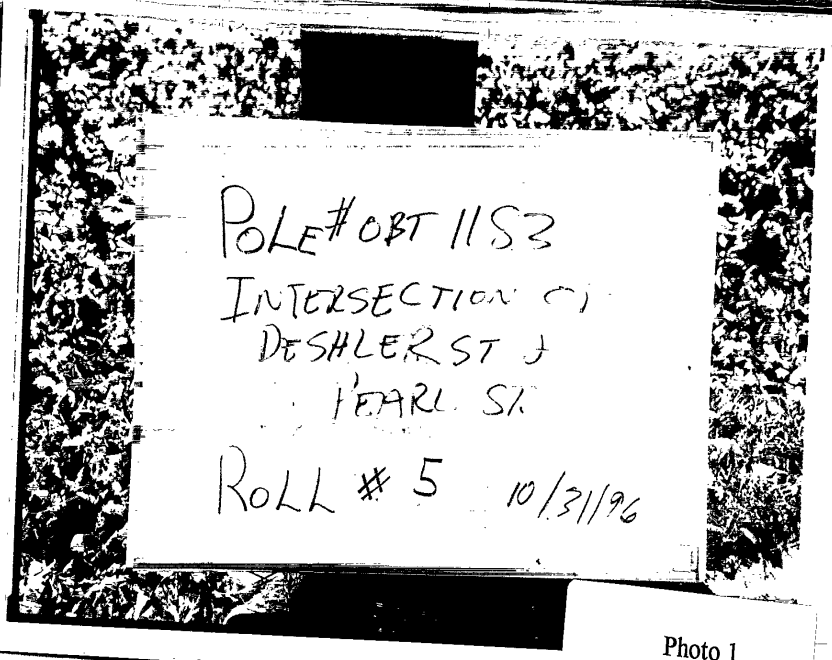

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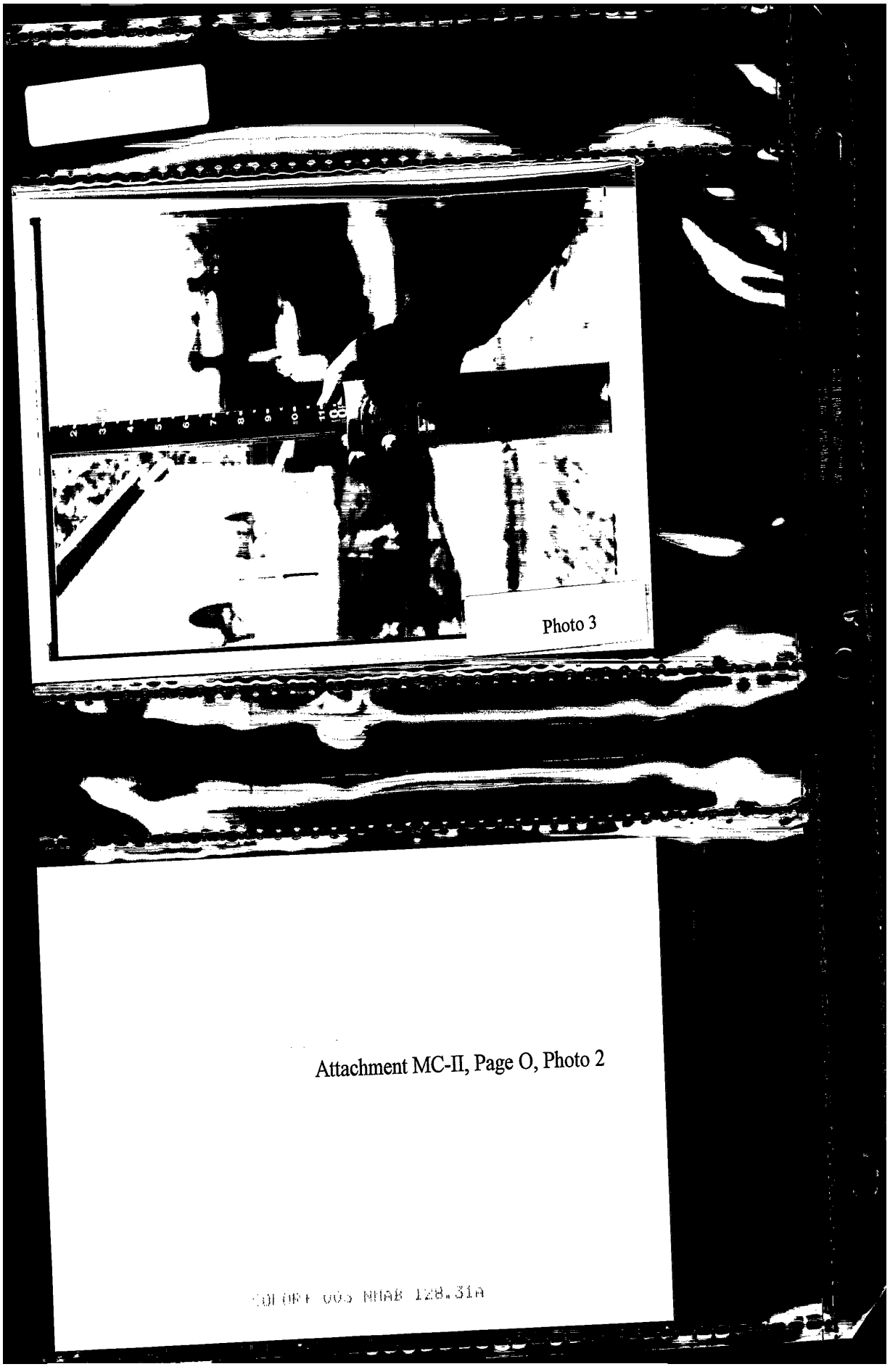

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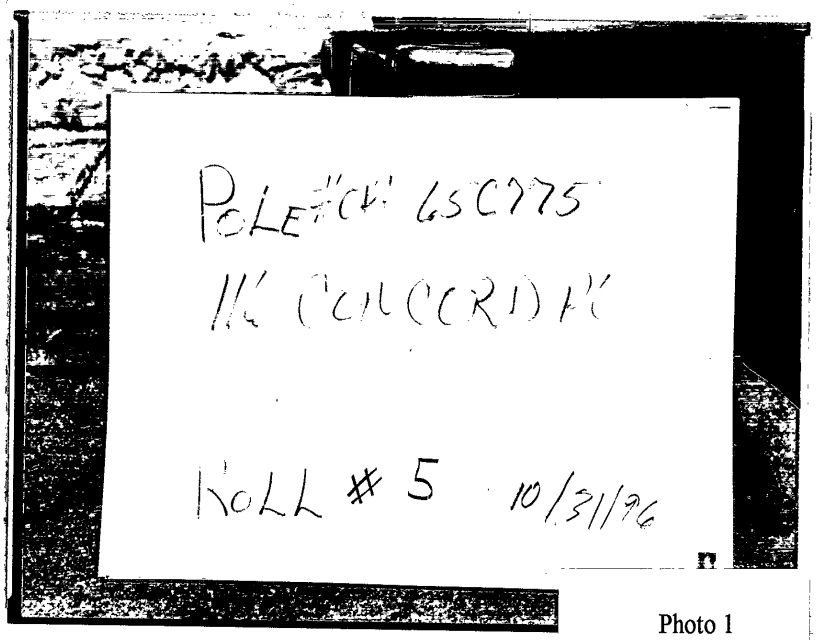

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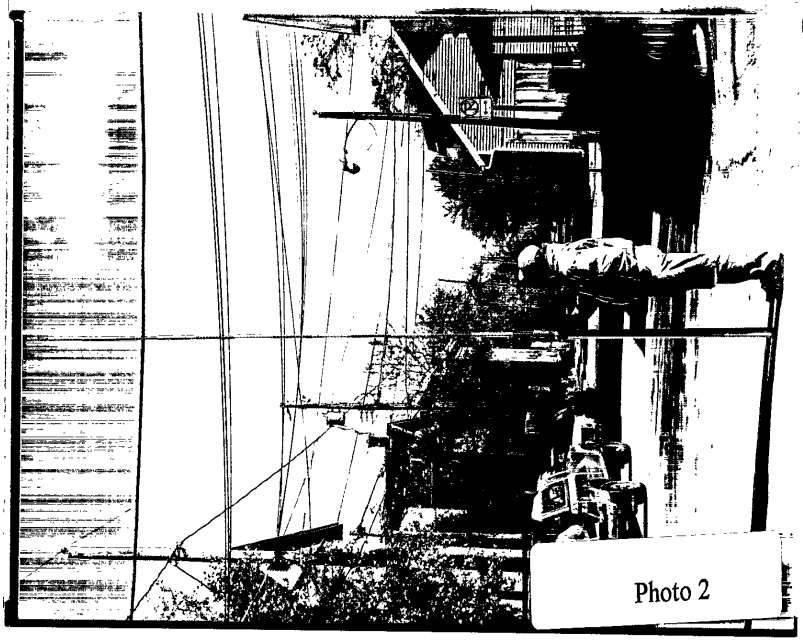

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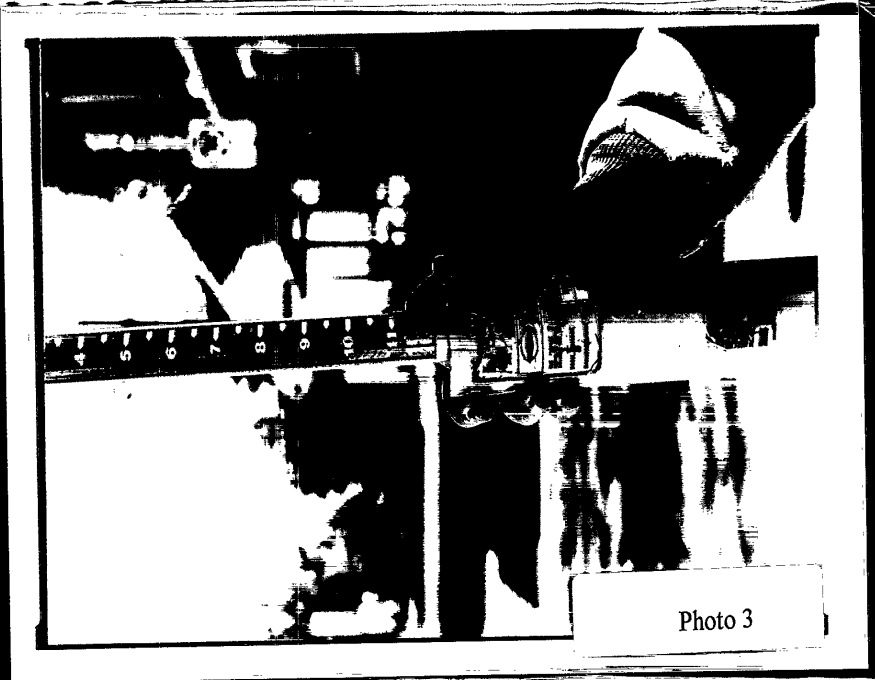
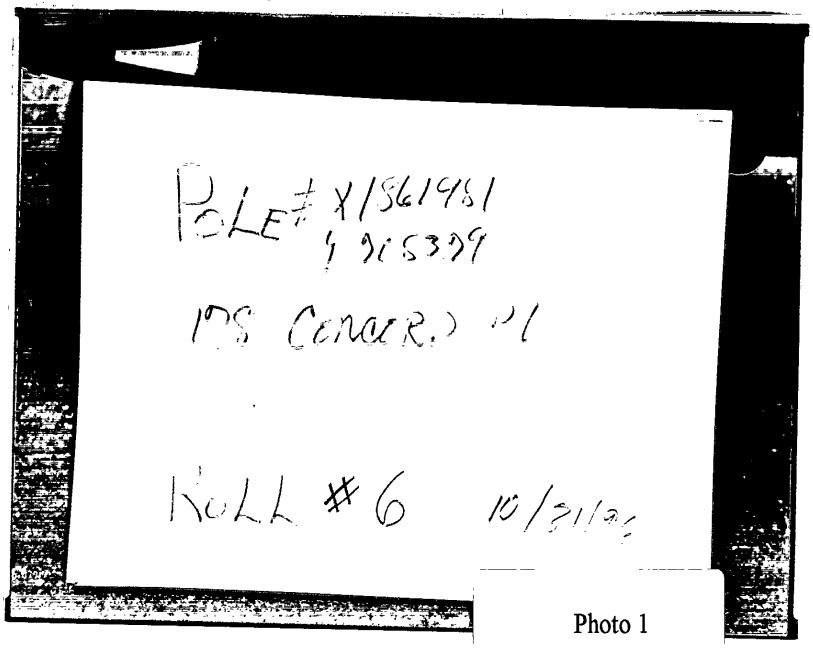


Photo 3

Attachment MC-II, Page P, Photo 2



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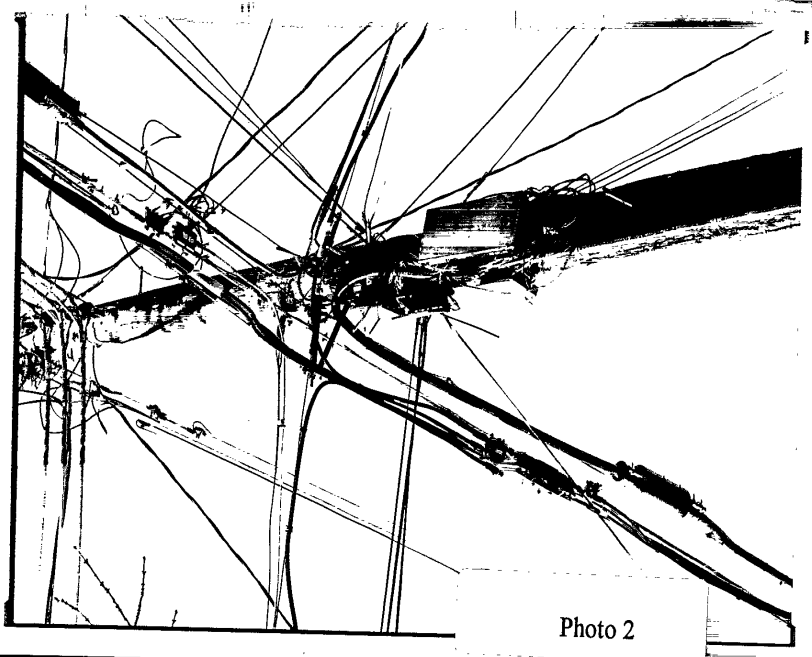

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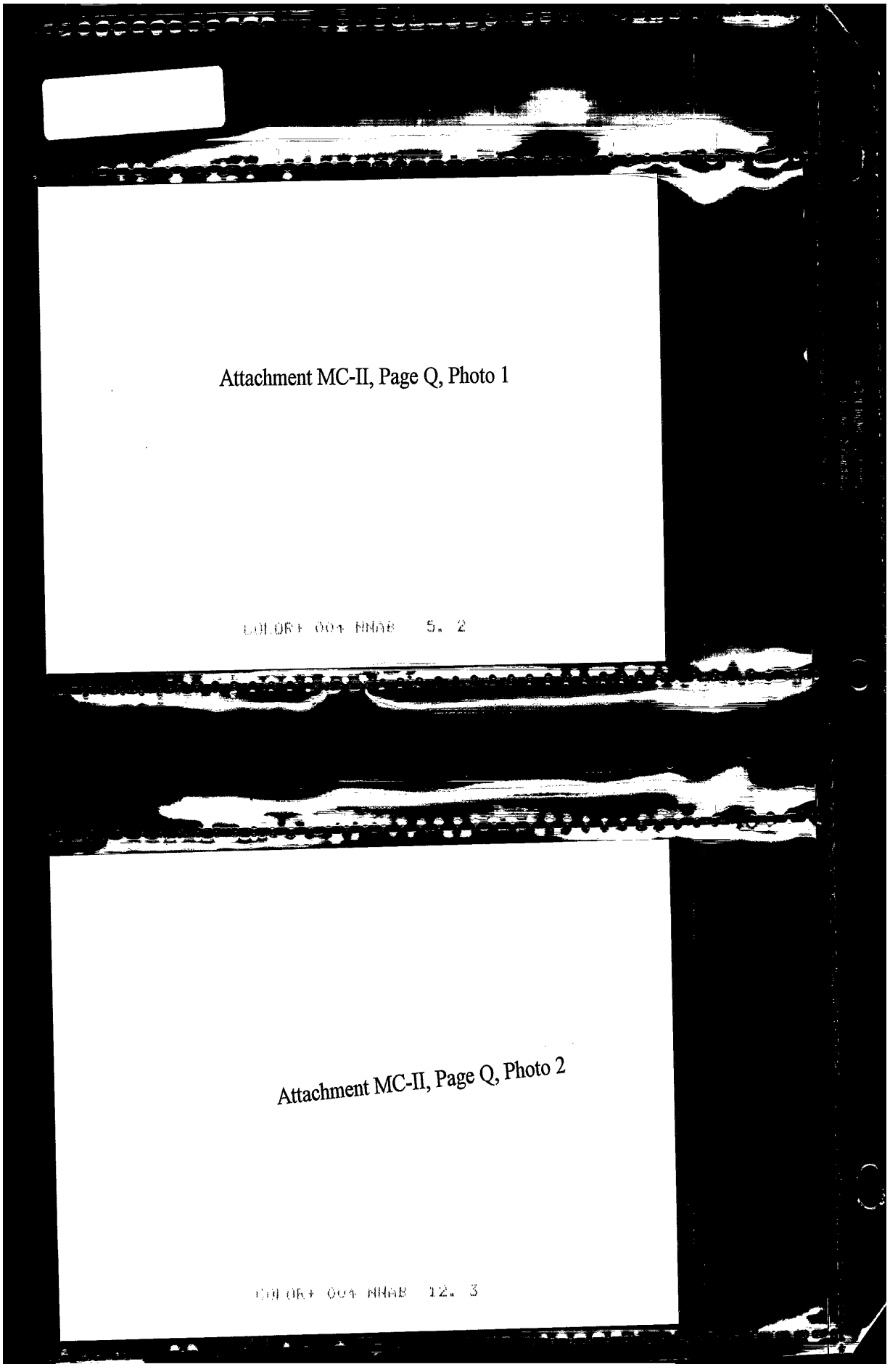
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Page R

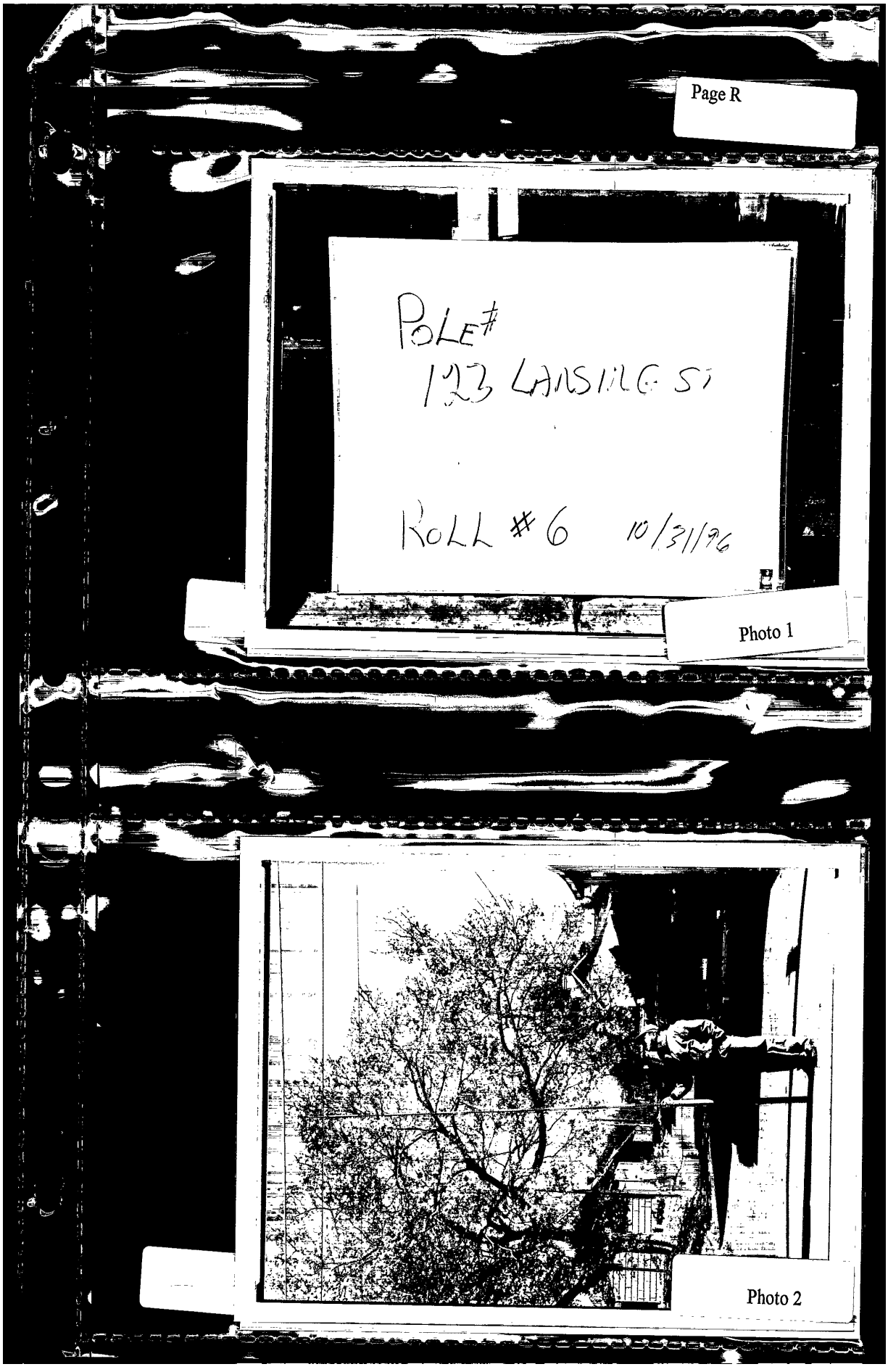

Photo 1

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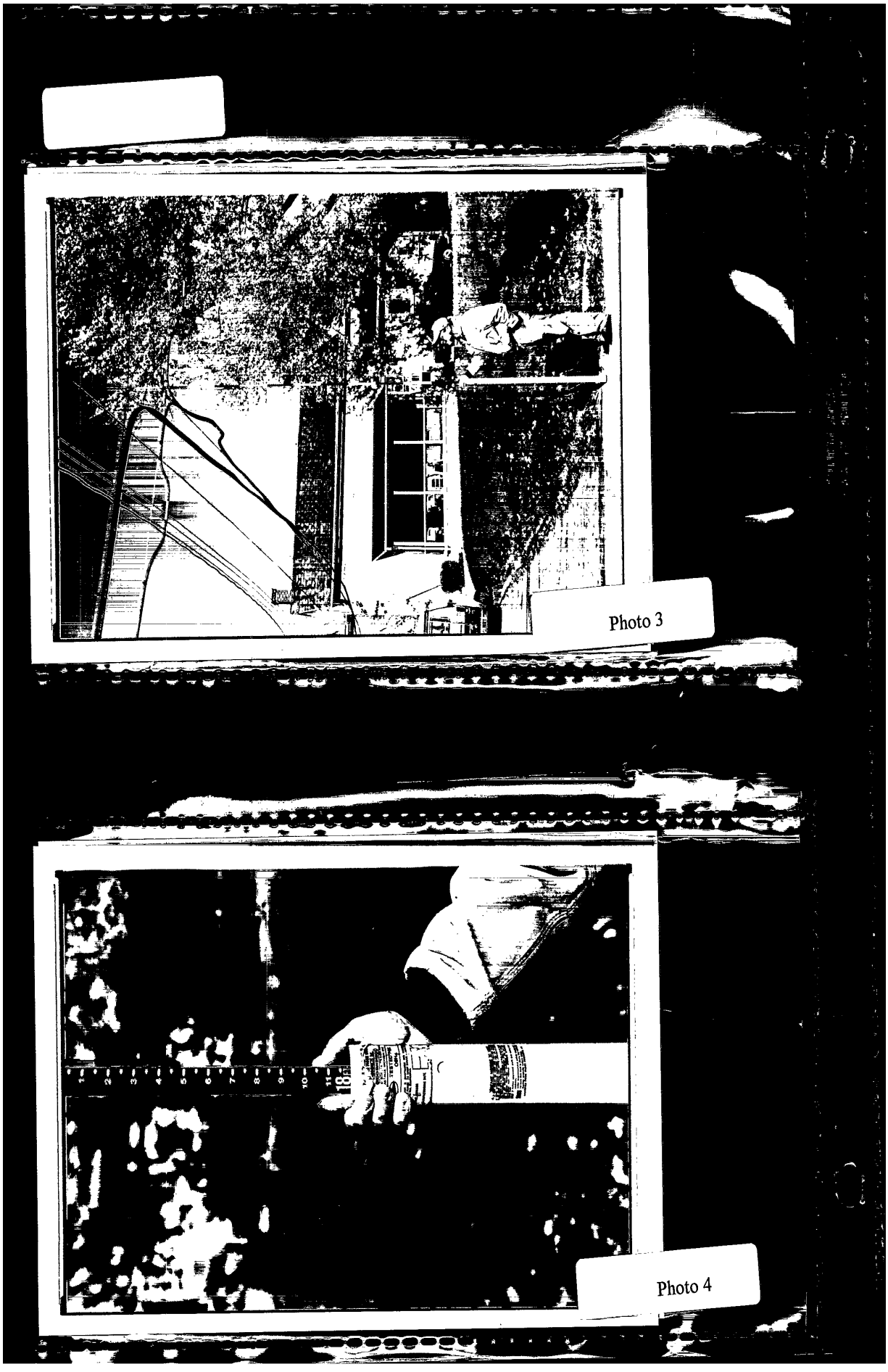

Photo 3

Photo 4

ATTACHMENT MC-III

ANSI C2-1987
(Revision of ANSI C2-1984)

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National Electrical Safety Code

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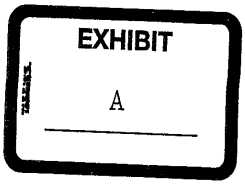

very close, however, permanent screens on cars will be necessary to protect passengers.

EXCEPTION 3: Where necessary to provide safe operating conditions which require an uninterrupted view of signals, signs, etc along tracks, the parties concerned shall cooperate in locating structures to provide the necessary clearance.

EXCEPTION 4: At industrial sidings, a clearance of not less than 7 ft (2.13 m) shall be permitted, provided sufficient space is left where cars can be loaded or unloaded.

232. Vertical Clearance of Wires, Conductors, Cables, and Live Parts of Equipment Above Ground, Roadway, Rail, or Water Surfaces

The vertical clearance of all wires, conductors, cables, and live parts of equipment above ground in generally accessible places, roadways, rails, or water surface, shall be not less than the following.

A. Basic Clearances for Wires, Conductors, and Cables

The clearances in Table 232-1 apply under the following conditions:

1. Conductor temperature of 60 °F (15 °C), no wind, with final unloaded sag in the wire, conductors, or cables, or with initial unloaded sag in cases where these facilities are maintained approximately at initial unloaded sags.
2. Span lengths not greater than the following:

Loading District	Span lengths (feet)	(meters)
Heavy	①175	①53
Medium	①250	①75
Light	350	105

① 150 ft (45 m) in heavy-loading district and 225 ft (70 m) in medium-loading district for three-strand conductors, each wire of which is 0.09 inches or less in diameter.

B. Additional Clearances for Wires, Conductors and Cables

Greater clearances than specified in Table 232-1 (Rule 232A) shall be provided where required by Rules 232B1 or 232B2. Increases are cumulative where more than one apply.

EXCEPTION 1: Additional clearances are not required for guys.

EXCEPTION 2: Additional clearances are not required either for communication cables supported on messengers or for communication wires, provided they do not overhang the travelled way, but run along and within the limits of public highways or other public rights-of-way for traffic.

1. Voltages Exceeding 50 Kilovolts
   a. For voltages between 50 and 470 kilovolts, the clearances specified in Table 232-1 (Rule 232A) shall be increased at the rate of 0.4 in (10 mm) per kilovolt in excess of 50 kilovolts. For voltages exceeding 470 kV, the clearance shall be determined by the alternate method given by Rule 232D. All clearances for lines over 50 kV shall be based on the maximum operating voltage.
   EXCEPTION: For voltages exceeding 98 kV alternating current to ground or 139 kV direct current to ground, clearances less than those required above are permitted for systems with known maximum switching surge factors (see Rule 232D).
   b. The additional clearance for voltages exceeding 50 kV specified in Rule 232B1a shall be increased 3% for each 1000 ft (300 m) in excess of 3300 ft (1000 m) above mean sea level.
   c. For voltages exceeding 98 kV alternating current to ground, or 139 kV direct current to ground, either the clearances shall be increased or the electric field, or the effects thereof, shall be reduced by other means, as required, to limit the current due to electrostatic effects to 5.0 milliamperes, rms, if the largest anticipated truck, vehicle, or equipment under the line were short circuited to ground. The size of the anticipated truck, vehicle or equipment, used to determine these clearances may be less than but need not be larger than that limited by Federal, State, or local regulations governing the area under the line. For this determination, the conductors shall be at a final unloaded sag at 120 °F (50 °C).
2. Sag Increase
   a. No additional clearance is required for trolley and electrified railroad contact conductors.
   b. No additional clearance is required where span lengths are less than those listed in Rule 232A2 and the maximum conductor temperature for which the supply line is designed to operate is 120 °F (50 °C) or less.
   c. Where supply lines are designed to operate at or

below a conductor temperature of 120 F (50 C) and spans are longer than specified in Rule 232A2, the basic clearance at midspan shall be increased by the following amounts.

(1) General
For spans exceeding the limits specified in Rule 232A2, the clearance specified in Table 232-1 shall be increased by 0.1 ft (30 mm) for each 10 ft (3.0 m) of the excess of span length over such limits. See Rule 232B2c(3).

(2) Railroad Crossings
For spans exceeding the limits specified in Rule 232A2, the clearance specified in Table 232-1 shall be increased by the following amounts for each 10 ft (3.0 m) by which the crossing span length exceeds such limits. See rule 232B2c(3).

	Amount of increase per 10 ft (3.0 m)			
	Large conductors		Small conductors①	
Loading district	(ft)	(mm)	(ft)	(mm)
Heavy and medium	0.15	45	0.30	90
Light	0.10	30	0.15	45

① A small conductor is a conductor having an overall diameter of metallic material equal to or less than the following values:

	Outside diameter of conductor	
	Solid (inches)	Stranded (inches)
All copper	0.160	0.250
Other than all copper	0.250	0.275

(3) Limits
The maximum additional clearance need not exceed the arithmetic difference between final unloaded sag at a conductor temperature of 60 °F

(15 °C), no wind, and final sag at the following conductor temperature and condition, whichever difference is greater, computed for the crossing span.

(a) 32 °F (0 °C), no wind, with radial thickness of ice, if any, specified in Rule 250B for the loading district concerned.

(b) 120 °F (50 °C), no wind.

d. Where supply lines are designed to operate at conductor temperature above 120 °F (50 °C) regardless of span length, the clearance at midspan specified in Rule 232A and Rule 232B1 shall be increased by the value (if greater than zero) determined by subtracting the value of (1) below from that of (2) below, computed for the crossing span.

(1) 18 inches (450 mm) plus the final unloaded sag at a conductor temperature of 60 °F (15 °C), no wind displacement.

(2) Final sag at the maximum conductor temperature or ice loaded condition given in (a) or (b) below, whichever sag is greater.

(a) The maximum conductor temperature for which the supply line is designed to operate, with no horizontal displacement.

(b) 32 °F (0 °C), no wind, with radial thickness of ice, if any, specified in Rule 250B for the loading district concerned.

NOTE 1: The basic clearances of Table 232-1 allow for an 18 inch (450 mm) sag increase from the 60 °F (15 °C) condition under either 120 °F (50 °C) operation or ice loading; 18 in (450 mm) is deducted in the above calculation to prevent duplication.

NOTE 2: The phase and neutral conductors of a supply line should be considered separately when determining the sag increases of each due to temperature rise.

e. Where point of crossing clearance is not at midspan, the additional clearances specified in Rules 232B2c and 232B2d may be reduced by multiplying by the following factors:

Distance from nearest support to point of crossing in percentage of span	Factors[1]
5	0.19
10	0.36
15	0.51
20	0.64
25	0.75
30	0.84
35	0.91
40	0.96
45	0.99
50	1.00

① Interpolate for intermediate values.

In applying this rule, the *point of crossing* is the location under the conductors of any topographical feature which is the determinant of the clearance.

C. Clearance to Live Parts of Equipment Mounted on Structures

1. Basic Clearances

The vertical clearance above ground or roadway surfaces for unguarded live parts such as potheads, transformer bushings, surge arresters, and short lengths of supply conductors connected thereto, which are not subject to variation in sag, shall be not less than that shown in Table 232-2.

2. Additional Clearances for Voltages Exceeding 50 Kilovolts

a. For voltages between 50 and 470 kV, the clearance specified in Table 232-2 (Rule 232C1) shall be increased at the rate of 0.4 in (10 mm) per kilovolt in excess of 50 kV. For voltages exceeding 470 kV, the clearances shall be determined by the alternate method given by Rule 232D. All clearances for lines over 50 kV shall be based on the maximum operating voltage.

EXCEPTION: For voltages exceeding 98 kV alternating current to ground or 139 kV direct current to ground, clearances less than those required above are permitted for systems with known maximum switching surge factors. (See Rule 232D.)

b. The additional clearance for voltages exceeding 50 kV specified in Rule 232C2a shall be increased 3% for each 1000 ft (300 m) in excess of 3300 ft (1000 m) above mean sea level.

c. For voltages exceeding 98 kV alternating current to ground, or 139 kV direct current to ground either the clearances shall be increased or the electric field, or the effects thereof, shall be reduced by other means, as required, to limit the current due to electrostatic effects to 5.0 milliamperes, rms, if the largest anticipated truck, vehicle, or equipment under the line were short-circuited to ground. The size of the anticipated truck, vehicle or equipment used to determine these clearances may be less than but need not be larger than that limited by Federal, State, or local regulations governing the area under the line.

D. Alternate Clearances for Voltages Exceeding 98 Kilovolts Alternating Current to Ground or 139 Kilovolts Direct Current to Ground

The clearances specified in Rules 232A, 232B, and 232C may be reduced for circuits with known switching surge factors but shall not be less than the values computed by adding the reference height to the electrical component of clearance.

1. Sag Conditions of Line Conductors
   The required vertical clearances shall be maintained under the following conductor temperatures and conditions:
   a. 32 °F (0 °C), no wind, with radial thickness of ice specified in Rule 250B for the loading district concerned.
   b. 120 °F (50 °C), no wind.
   c. Maximum conductor temperature, for which the line is designed to operate, if greater than 120 °F (50 °C), with no horizontal displacement.
2. Reference heights are shown in Table 232-3.
3. Electrical Component of Clearance
   a. The clearance computed by the following equation and listed in Table 232-4 shall be added to the reference heights specified in Table 232-3.

$$D = 3.28 \left[\frac{V \cdot (PU) \cdot a}{500\,K} \right]^{1.667} bc \quad \text{(ft)}$$

$$D = 1.00 \left[\frac{V \cdot (PU) \cdot a}{500\ K} \right]^{1.667} \text{ for } \quad \text{m}$$

where

V = maximum alternating current crest operating voltage to ground or maximum direct current operating voltage to ground in kilovolts;

PU = maximum switching surge factor expressed in per-unit peak voltage to ground and defined as a switching surge level for circuit breakers corresponding to 98% probability that the maximum switching surge generated per breaker operation does not exceed this surge level, or the maximum anticipated switching surge level generated by other means, whichever is greater;

a = 1.15, the allowance for three standard deviations;

b = 1.03, the allowance for nonstandard atmospheric conditions;

c = 1.2, the margin of safety;

K = 1.15, the configuration factor for conductor-to-plane gap.

b. The value of D shall be increased 3% for each 1000 ft (300 m) in excess of 1500 ft (450 m) above mean sea level.

c. Either the clearances shall be increased or the electric field, or the effects thereof, shall be reduced by other means, as required, to limit the current due to electrostatic effects to 5.0 milliamperes, rms, if the largest anticipated truck, vehicle, or equipment under the line were short circuited to ground. The size of the anticipated truck, vehicle or equipment used to determine these clearances may be less than but need not be larger than that limited by Federal, State, or local regulations governing the area under the line. For this determination, the conductors shall be at a final unloaded sag at 120 °F (50 °C).

4. Limit

The clearances derived from Rules 232D2 and 232D3 shall be not less than the clearances given in Tables 232-1 or 232-2 computed for 98 kilovolts alternating current to ground in accordance with Rules 232B1 or 232C2, respectively.

Table 232-1 Vertical Clearance of Wires, Conductors, and Cables Above Ground, Roadway, Rail, or Water Surfaces

(Voltages are phase to ground for effectively grounded circuits and those other circuits where all ground faults are cleared by promptly de-energizing the faulted section, both initially and following subsequent breaker operations. See the definition section for voltages of other systems.)

Nature of surface underneath wires, conductors, or cables	Communication conductors and cables, guys, messengers, surge protection wires, neutral conductors meeting Rule 230E1, supply cables meeting Rule 230C1, and supply cables of 0 to 750 V meeting Rules 230C2 or 230C3⑪ (ft)	Supply line and service drop conductors: Open conductors, 0 to 750 V; supply cables over 750 V meeting Rule 230C2 or 230C3 (ft)	Supply line and service drop conductors: Open conductors, 750 V to 22 kV (ft)	Supply line and service drop conductors: Open conductors, 22 to 50 kV (ft)	Trolley and electrified railroad contact conductors and associated span or messenger wires① 0 to 750 V to ground (ft)	Trolley and electrified railroad contact conductors and associated span or messenger wires① 750 V to 50 kV to ground (ft)
Where wires, conductors, or cables cross over or overhang						
1. Track rails of railroads (except electrified railroads using over-head trolley conductors) ②⑯⑳	③⑮ 27	③27	③28	29	④22	④22
2. Roads, streets, alleys; nonresidential driveways, parking lots, and other areas subject to truck traffic ㉑	⑥⑬㉒18	18	20	21	⑤18	⑤20
3. Residential driveways; commercial areas not subject to truck traffic ㉑	㉓12	⑧ₐ 15	20	21	⑤18	⑤20
4. Other land traversed by vehicles, such as cultivated, grazing, forest, orchard, etc	18	18	20	21		--
5. Spaces and ways subject to pedestrians or restricted traffic only ⑨	⑧⑦ 15	⑧ₐ ⑭15	15	16	16	18
6. Water areas not suitable for sailboating or where sailboating is prohibited ⑲	15	15	17	17	—	—
7. Water areas suitable for sailboating including lakes, ponds, reservoirs, tidal waters, rivers, streams, and canals with an unobstructed surface area of: ⑰⑱⑲						
(a) Less than 20 acres	18	18	20	21	--	--
(b) 20 to 200 acres	26	26	28	29	—	—
(c) 200 to 2000 acres	32	32	34	35	—	—
(d) Over 2000 acres	38	38	40	41	—	—
8. Public or private land and water areas posted for rigging or launching sailboats	Clearance above ground shall be 5 ft greater than in 7 above, for the type of water areas served by the launching site					
Where wires, conductors, or cables run along and within the limits of highways or other road rights-of-way but do not overhang the roadway						
9. Roads, streets, or alleys	⑬㉒㉔18	18	20	21	⑤18	⑤20
10. Roads in rural districts where it is unlikely that vehicles will be crossing under the line	⑩⑫ 14	⑩ 15	18	19	⑤18	⑤20

(continued on next page)

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① Where subways, tunnels, or bridges require it, less clearances above ground or rails than required by Table 232-1 may be used locally. The trolley and electrified railroad contact conductor should be graded very gradually from the regular construction down to the reduced elevation.

② For wire, conductors, or cables crossing over mine, logging, and similar railways which handle only cars lower than standard freight cars, the clearance may be reduced by an amount equal to the difference in height between the highest loaded car handled and 20 ft, but the clearances shall not be reduced below that required for street crossings.

③ These clearances may be reduced to 25 ft where paralleled by trolley-contact conductor on the same street or highway.

④ In communities where 21 ft has been established, this clearance may be continued if carefully maintained. The elevation of the contact conductor should be the same in the crossing and next adjacent spans. (See Rule 289D2 for conditions which must be met where uniform height above rail is impractical.)

⑤ In communities where 16 ft has been established for trolley and electrified railroad contact conductors 0 to 750 V to ground, or 18 ft for trolley and electrified railroad contact conductors exceeding 750 V, or where local conditions make it impractical to obtain the clearance given in the table, these reduced clearances may be used if carefully maintained.

⑥ If a communication service drop or a guy which is effectively grounded or is insulated against the highest voltage to which it is exposed, up to 8.7 kV, crosses residential streets and roads, the clearance may be reduced to 16 ft at the side of the traveled way provided the clearance at the center of the traveled way is at least 18 ft. This reduction in clearance does not apply to arterial streets and highways which are primarily for through traffic, usually on a continuous route.

⑦ This clearance may be reduced to the following values:

	(feet)
(a) For insulated communication conductors and communication cables	8
(b) For conductors of other communication circuits	10
(c) For guys	8
(d) For supply cables meeting Rule 230C1	10

(continued on next page)

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⑧ This clearance may be reduced to the following values:

(a) 12 ft for supply conductors limited to 300 V to ground	
(b) 10 ft for drip loops of service drop conductors limited to 150 V to ground and meeting Rules 230C2 or 230C3 and the portion of the associated service drop span located within 15 ft of the service entrance to buildings.	

⑨ Spaces and ways subject to pedestrians or restricted traffic only are those areas where equestrians, vehicles, or other mobile units, exceeding 8 ft in height, are prohibited by regulation or permanent terrain configurations or are otherwise not normally encountered or not reasonably anticipated.

⑩ Where a supply or communication line along a road is located relative to fences, ditches, embankments, etc, so that the ground under the line would not be expected to be traveled except by pedestrians, this clearance may be reduced to the following values:

	(feet)
(a) Insulated communication conductor and communication cables	8
(b) Conductors of other communication circuits	10
(c) Supply cables of any voltage meeting Rule 230C1 and supply cables limited to 150 V to ground meeting Rules 230C2 or 230C3	10
(d) Supply conductors limited to 300 V to ground	12
(e) Guys	8

⑪ No clearance from ground is required for anchor guys not crossing track rails, streets, driveways, roads, or pathways.

⑫ This clearance may be reduced to 13 ft for communication conductors and guys.

⑬ Where this construction crosses over or runs along alleys, driveways, or parking lots, this clearance may be reduced to 15 ft for spans limited to 150 ft.

⑭ Where supply circuits of 600 V or less, with transmitted power of 5000 W or less, are run along fenced (or otherwise guarded) private rights-of-way in accordance with the provisions specified in Rule 220B2, this clearance may be reduced to 10 ft.

⑮ The value may be reduced to 25 ft for guys, for cables carried on messengers, and for supply cables meeting Rule 230C1. This value may be reduced to 25 ft for conductors effectively grounded throughout their length and associated with supply circuits of 0 to 22 kV, only if such conductors are stranded, are of corrosion-resistant material, and conform to the strength and tension requirements for messengers given in Rule 261I.

(continued on next page)

Footnotes for Table 232-1 *(Continued)* FT

⑯ Adjacent to tunnels and overhead bridges which restrict the height of loaded rail cars to less than 20 ft, these clearances may be reduced by the difference between the highest loaded rail car handled and 20 ft, if mutually agreed to by the parties at interest.

⑰ For controlled impoundments, the surface area and corresponding clearances shall be based upon the design high water level. For other waters, the surface area shall be that enclosed by its annual high water mark, and clearances shall be based on the normal flood level. The clearance over rivers, streams, and canals shall be based upon the largest surface area of any 1 mi long segment which includes the crossing. The clearance over a canal, river, or stream normally used to provide access for sailboats to a larger body of water shall be the same as that required for the larger body of water.

⑱ Where an overwater obstruction restricts vessel height to less than the following:

For a surface area in acres of	*A reference vessel height in feet of*
less than 20	16
20 to 200	24
200 to 2000	30
over 2000	36

the required clearance may be reduced by the difference between the reference vessel height given above and the overwater obstruction height, except that the reduced clearance shall not be less than that required for the surface area on the line crossing side of the obstruction.

⑲ Where the US Army Corps of Engineers, or the State, or a surrogate thereof has issued a crossing permit, clearances of that permit shall govern.

⑳ See Rule 234H for the required horizontal and diagonal clearances to rail cars.

㉑ For the purpose of this rule, trucks are defined as any vehicle exceeding 8 ft in height. Areas not subject to truck traffic are areas where truck traffic is not normally encountered or not reasonably anticipated.

㉒ For communications cables supported on a messenger, and with span lengths not exceeding 150 ft, and for guys, the clearance may be reduced to 17 ft above or along local streets or roads. This reduction does not apply for arterial streets or highways which are primarily for through traffic, usually on a continuous route.

㉓ This clearance may be reduced to 10 ft for communication conductors and cables, guys, messengers, supply cables meeting Rule 230C1, and drip loops only of service drop conductors limited to 150 V to ground and meeting Rules 230C2 or 230C3.

㉔ Communication cables supported on a steel messenger may have a 60 °F clearance of 15 ft where span lengths do not exceed 150 ft and poles are back of curbs or other deterrents to vehicular traffic.

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(Revision of ANSI C2-1987)

American National Standard

National Electrical Safety Code

Secretariat

Institute of Electrical and Electronics Engineers, Inc

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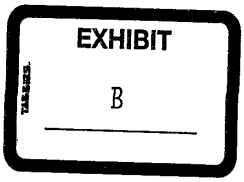
1990 Edition



must be resolved in a manner consistent with the prevailing limitations and conditions.

4. Where a governmental authority exercising jurisdiction over structure location has issued a permit for, or otherwise approved, specific locations for supporting structures, that permit or approval shall govern.

C. From Railroad Tracks

Where railroad tracks are parallel or crossed by overhead lines, all portions of the supporting structures, support arms, anchor guys, and equipment attached thereto less than 22 ft (6.7 m) above the nearest track rail shall be located not less than 12 ft (3.6 m) from the nearest track rail. See Rule 234I.

EXCEPTION 1: A clearance of not less than 7 ft (2.13 m) may be allowed where the supporting structure is not the controlling obstruction, provided sufficient space for a driveway is left where cars are loaded or unloaded.

EXCEPTION 2: Supports for overhead trolley contact conductors may be located as near their own track rail as conditions require. If very close, however, permanent screens on cars will be necessary to protect passengers.

EXCEPTION 3: Where necessary to provide safe operating conditions which require an uninterrupted view of signals, signs, etc along tracks, the parties concerned shall cooperate in locating structures to provide the necessary clearance.

EXCEPTION 4: At industrial sidings, a clearance of not less than 7 ft (2.13 m) shall be permitted, provided sufficient space is left where cars can be loaded or unloaded.

232. Vertical Clearances of Wires, Conductors, Cables, and Equipment Above Ground, Roadway, Rail, or Water Surfaces

A. Application

The vertical clearances specified in Rule 232B1 apply under the following conductor temperature and loading conditions, whichever produces the largest final sag.

1. 120 °F (50 °C), no wind displacement.
2. The maximum conductor temperature for which the line is designed to operate, if greater than 120 °F (50 °C), with no wind displacement.
3. 32 °F (0 °C), no wind displacement, with radial thickness of ice, if any, specified in Rule 250B for the loading district concerned.

EXCEPTION: The conductor temperature and loading condition for trolley and electrified railroad contact conductors shall be 60 °F (15 °C), no wind displacement, final unloaded sag, or initial unloaded sag in cases where these facilities are maintained approximately at initial unloaded sags.

NOTE: The phase and neutral conductors of a supply line are normally considered separately when determining the sag of each due to temperature rise.

B. Clearance of Wires, Conductors, Cables, and Equipment Mounted on Supporting Structures

1. Clearance to Wires, Conductors, and Cables

   The vertical clearance of wires, conductors, and cables above ground in generally accessible places, roadway, rail, or water surfaces, shall be not less than that shown in Table 232-1.

2. Clearance to Unguarded Rigid Live Parts of Equipment

   The vertical clearance above ground or roadway surfaces for unguarded rigid live parts such as potheads, transformer bushings, surge arresters, and short lengths of supply conductors connected thereto, which are not subject to variation in sag, shall be not less than that shown in Table 232-2.

3. Clearance to Equipment Cases

   The vertical clearance of equipment cases above ground or roadway surfaces shall be not less than that shown in Table 232-2.

4. Street and Area Lighting

   a. All exposed ungrounded conductive parts of luminaires and their supports that are not insulated from current-carrying parts shall be maintained at not less than 20 in (500 mm) from the surface of their supporting structure.

      EXCEPTION 1: This may be reduced to 5 in (125 mm) if located on the side of the structure opposite the designated climbing space.

      EXCEPTION 2: This does not apply where the equipment is located at the top or other vertical portion of the structure that is not subject to climbing.

   b. Insulators, as specified in Rule 279A, should be inserted at least 8 ft (2.45 m) from the ground in metallic suspension ropes or chains supporting lighting units of series circuits.

C. Additional Clearances for Wires, Conductors, Cables, and Unguarded Rigid Live Parts of Equipment

Greater clearances than specified by Rule 232B shall be provided where required by Rule 232C1.

1. Voltages Exceeding 22 Kilovolts

a. For voltages between 22 and 470 kilovolts, the clearance specified in Rule 232B1 (Table 232-1) or Rule 232B2 (Table 232-2) shall be increased at the rate of 0.4 in (10 mm) per kilovolt in excess of 22 kilovolts. For voltages exceeding 470 kilovolts, the clearance shall be determined by the method given in Rule 232D. All clearances for lines over 50 kilovolts shall be based on the maximum operating voltage.

EXCEPTION: For voltages exceeding 98 kV alternating current to ground or 139 kV direct current to ground, clearances less than those required above are permitted for systems with known maximum switching surge factors (see Rule 232D).

b. For voltages exceeding 50 kV, the additional clearance specified in Rule 232C1a shall be increased 3% for each 1000 ft (300 m) in excess of 3300 ft (1000 m) above mean sea level.

c. For voltages exceeding 98 kV alternating current to ground, or 139 kV direct current to ground, either the clearances shall be increased or the electric field, or the effects thereof, shall be reduced by other means, as required, to limit the current due to electrostatic effects to 5.0 milliampere , rms, if the largest anticipated truck, vehicle, or equipment under the line were short circuited to ground. The size of the anticipated truck, vehicle, or equipment used to determine these clearances may be less than but need not be greater than that limited by Federal, State, or local regulations governing the area under the line. For this determination, the conductors shall be at a final unloaded sag at 120 °F (50 °C).

D. Alternate Clearances for Voltages Exceeding 98 Kilovolts Alternating Current to Ground or 139 Kilovolts Direct Current to Ground

The clearances specified in Rules 232B and 232C may be reduced for circuits with known switching surge factors, but

shall be not less than the alternate clearance, which is computed by adding the reference height from Rule 232D2 to the electrical component of clearance from Rule 232D3.

1. Sag Conditions of Line Conductors
   The vertical clearance shall be maintained under the conductor temperature and loading condition given in Rule 232A.
2. Reference Heights
   The reference height shall be selected from Table 232-3.
3. Electrical Component of Clearance
   a. The electrical component (D) shall be computed using the following equations. Selected values of D are listed in Table 232-4.

$$D = 3.28\left[\frac{V \cdot (PU) \cdot a}{500\,K}\right]^{1.667} bc \text{ (ft)}$$

$$D = 1.00\left[\frac{V \cdot (PU) \cdot a}{500\,K}\right]^{1.667} bc \text{ (m)}$$

where

V = maximum alternating current crest operating voltage to ground or maximum direct current operating voltage to ground in kilovolts;

PU = maximum switching surge factor expressed in per-unit peak voltage to ground and defined as a switching surge level for circuit breakers corresponding to 98% probability that the maximum switching surge generated per breaker operation does not exceed this surge level, or the maximum anticipated switching surge level generated by other means, whichever is greater;

a = 1.15, the allowance for three standard deviations;

b = 1.03, the allowance for nonstandard atmospheric conditions;

c = 1.2, the margin of safety;

K = 1.15, the configuration factor for conductor-to-plane gap.

   b. The value of D shall be increased 3% for each 1000 ft (300 m) in excess of 1500 ft (450 m) above mean sea level.

c. Either the clearances shall be increased or the electric field, or the effects thereof, shall be reduced by other means, as required, to limit the current due to electrostatic effects to 5.0 milliamperes, rms, if the largest anticipated truck, vehicle, or equipment under the line were short circuited to ground. The size of the anticipated truck, vehicle, or equipment used to determine these clearances may be less than but need not be greater than that limited by Federal, State, or local regulations governing the area under the line. For this determination, the conductors shall be at a final unloaded sag at 120 °F (50 °C).

4. Limit

The alternate clearance shall be not less than the clearance given in Tables 232-1 or 232-2 computed for 98 kilovolts alternating current to ground in accordance with Rule 232C.

Table 232-1 Vertical Clearance of Wires, Conductors, and Cables Above Ground, Roadway, Rail, or Water Surfaces

(Voltages are phase-to-ground for effectively grounded circuits and those other circuits where all ground faults are cleared by promptly de-energizing the faulted section, both initially and following subsequent breaker operations. See the definition section for voltages of other systems.) FT

Nature of surface underneath wires, conductors, or cables	(11) Insulated communication conductors and cable; messengers; surge protection wires; grounded guys; neutral conductors meeting Rule 230E1; supply cables meeting Rule 230C1 (ft)	Non-insulated communication conductors; supply cables of 0 to 750 V meeting Rules 230C2 or 230C3 (ft)	Supply cables over 750 V meeting Rules 230C2 or 230C3; open supply conductors, 0 to 750 V (ft)	Open supply conductors, over 750 V to 22 kV (ft)	Trolley and electrified railroad contact conductors and associated span or messenger wires (1) 0 to 750 V to ground (ft)	Trolley and electrified railroad contact conductors and associated span or messenger wires (1) over 750 V to 22 kV to ground (ft)
Where wires, conductors, or cables cross over or overhang						
1. Track rails of railroads (except electrified railroads using overhead trolley conductors) (2) (16) (20)	23.5	24.0	24.5	26.5	22.0 (4)	22.0 (4)
2. Roads, streets, alleys; nonresidential driveways, parking lots, and other areas subject to truck traffic (21)	15.5 (13)	16.0 (13)	16.5	18.5	18.0 (5)	20.0 (5)
3. Residential driveways	15.5 (7) (13)	16.0 (7) (13)	16.5 (7)	18.5	18.0 (5)	20.0 (5)
4. Other land traversed by vehicles, such as cultivated, grazing, forest, orchard, etc	15.5	16.0	16.5	18.5	.	.
5. Spaces and ways subject to pedestrians or restricted traffic only (9)	9.5	12.0 (8)	12.5 (8)	14.5	16.0	18.0
6. Water areas not suitable for sailboating or where sailboating is prohibited (19)	14.0	14.5	15.0	17.0	.	.
7. Water areas suitable for sailboating including lakes, ponds, reservoirs, tidal waters, rivers, streams, and canals with an unobstructed surface area of: (17) (18) (9)						
(a) Less than 20 acres	17.5	18.0	18.5	20.5	.	.
(b) 20 to 200 acres	25.5	26.0	26.5	28.5	.	.
(c) Over 200 to 2000 acres	31.5	32.0	32.5	34.5	.	.
(d) Over 2000 acres	37.5	38.0	38.5	40.5	.	.
8. Public or private land and water areas posted for rigging or launching sailboats	Clearance above ground shall be 5 ft greater than in 7 above, for the type of water areas served by the launching site					
Where wires, conductors, or cables run along and within the limits of highways or other road rights-of-way but do not overhang the roadway						
9. Roads, streets, or alleys	15.5 (13) (24)	16.0 (13)	16.5	18.5	18.0 (5)	20.0 (5)
10. Roads in rural districts where it is unlikely that vehicles will be crossing under the line	13.5 (10) (12)	14.0 (10)	14.5 (10)	16.5	18.0 (5)	20.0 (5)

(1) Where subways, tunnels, or bridges require it, less clearances above ground or rails than required by Table 232-1 may be used locally. The trolley and electrified railroad contact conductor should be graded very gradually from the regular construction down to the reduced elevation.

(2) For wire, conductors, or cables crossing over mine, logging, and similar railways which handle only cars lower than standard freight cars, the clearance may be reduced by an amount equal to the difference in height between the highest loaded car handled and 22 ft, but the clearances shall not be reduced below that required for street crossings.

(3) This footnote not used in this edition.

(4) In communities where 21 ft has been established, this clearance may be continued if carefully maintained. The elevation of the contact conductor should be the same in the crossing and next adjacent spans. (See Rule 225D2 for conditions which must be met where uniform height above rail is impractical.)

(5) In communities where 16 ft has been established for trolley and

electrified railroad contact conductors 0 to 750 V to ground, or 18 ft for trolley and electrified railroad contact conductors exceeding 750 V, or where local conditions make it impractical to obtain the clearance given in the table, these reduced clearances may be used if carefully maintained.

⑥ This footnote not used in this edition.

⑦ Where the height of attachment to a building or other installation does not permit service drops to meet these values, the clearances may be reduced to the following:

		(feet)
(a)	Insulated supply service drops limited to 300 V to ground	12.5
(b)	Insulated drip loops of supply service drops limited to 300 V to ground	10.5
(c)	Supply service drops limited to 150 V to ground and meeting Rules 230C1 or 230C3	12.0
(d)	Drip loops only of service drops limited to 150 V to ground and meeting Rules 230C1 or 230C3	10.0
(e)	Insulated communication service drops.	11.5

⑧ Where the height of attachment to a building or other installation does not permit service drops to meet these values, the clearances may be reduced to the following:

		(feet)
(a)	Insulated supply service drops limited to 300 V to ground	10.5
(b)	Insulated drip loops of supply service drops limited to 300 V to ground	10.5
(c)	Supply service drops limited to 150 V to ground and meeting Rules 230C1 or 230C3	10.0
(d)	Drip loops only of supply service drops limited to 150 V to ground and meeting Rules 230C1 or 230C3.	10.0

⑨ Spaces and ways subject to pedestrians or restricted traffic only are those areas where equestrians, vehicles, or other mobile units, exceeding 8 ft in height, are prohibited by regulation or permanent terrain configurations or are otherwise not normally encountered or not reasonably anticipated.

⑩ Where a supply or communication line along a road is located relative to fences, ditches, embankments, etc, so that the ground under the line would not be expected to be travelled except by pedestrians, this clearance may be reduced to the following values:

		(feet)
(a)	Insulated communication conductor and communication cables	9.5
(b)	Conductors of other communication circuits	9.5
(c)	Supply cables of any voltage meeting Rule 230C1 and supply cables limited to 150 V to ground meeting Rules 230C2 or 230C3	9.5
(d)	Insulated supply conductors limited to 300 V to ground	12.5
(e)	Guys	9.5

⑪ No clearance from ground is required for anchor guys not crossing tracks, rails, streets, driveways, roads, or pathways.

⑫ This clearance may be reduced to 13 ft for communication conductors and guys.

⑬ Where this construction crosses over or runs along alleys, driveways, or parking lots, this clearance may be reduced to 15 ft.

⑭ This footnote not used in this edition.

⑮ This footnote not used in this edition.

⑯ Adjacent to tunnels and overhead bridges which restrict the height of loaded rail cars to less than 22 ft, these clearances may be reduced by the difference between the highest loaded rail car handled and 22 ft, if mutually agreed to by the parties at interest.

⑰ For controlled impoundments, the surface area and corresponding clearances shall be based upon the design high water level. For other waters, the surface area shall be that enclosed by its annual high water mark, and clearances shall be based on the normal flood level. The clearance over rivers, streams, and canals shall be based upon the largest surface area of any 1 mi long segment which includes the crossing. The clearance over a canal, river, or stream normally used to provide access for sailboats to a larger body of water shall be the same as that required for the larger body of water.

⑱ Where an overwater obstruction restricts vessel height to less than the applicable reference height given in Table 232-3, the required clearance may be reduced by the difference between the reference height and the overwater obstruction height, except that the reduced clearance shall be not less than that required for the surface area on the line-crossing side of the obstruction.

⑲ Where the US Army Corps of Engineers, or the State, or surrogate thereof has issued a crossing permit, clearances of that permit shall govern.

⑳ See Rule 234I for the required horizontal and diagonal clearances to rail cars.

㉑ For the purpose of this rule, trucks are defined as any vehicle exceeding 8 ft in height. Areas not subject to truck traffic are areas where truck traffic is not normally encountered or not reasonably anticipated.

㉒ This footnote not used in this edition.

㉓ This footnote not used in this edition.

㉔ Communication cables and conductors may have a clearance of 15 ft where poles are back of curbs or other deterrents to vehicular traffic.

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Abstract: This standard covers basic provisions for safeguarding of persons from hazards arising from the installation, operation, or maintenance of 1) conductors and equipment in electric supply stations, and 2) overhead and underground electric supply and communication lines. It also includes work rules for the construction, maintenance, and operation of electric supply and communication lines and equipment.

The standard is applicable to the systems and equipment operated by utilities, or similar systems and equipment, of an industrial establishment or complex under the control of qualified persons.

This standard consists of the introduction, definitions, grounding rules, list of referenced documents, and Parts 1, 2, 3, and 4 of the 1993 Edition of the National Electrical Safety Code.

Keywords: communications industry safety; construction of communication lines; construction of electric supply lines; electric supply stations, electric utility stations; electrical safety; high-voltage safety; operation of communications systems; operation of electric supply systems; power station equipment; power station safety; public utility safety; safety work rules; underground communication line safety; underground electric line safety

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I. The clearances and spacing required shall be maintained at the values and under the conditions specified in Section 23 of the applicable edition. See Rule 013.

231. Clearances of Supporting Structures From Other Objects

Supporting structures, support arms and equipment attached thereto, and braces shall have the following clearances from other objects. The clearance shall be measured between the nearest parts of the objects concerned.

A. From Fire Hydrants

Not less than 3 ft (900 mm).

RECOMMENDATION: Where conditions permit, a clearance of not less than 4 ft (1.20 m) is recommended.

B. From Streets, Roads, and Highways

1. Where there are curbs: supporting structures, support arms, or equipment attached thereto, up to 15 ft (4.6 m) above the road surface shall be located a sufficient distance from the street side of the curbs to avoid contact by ordinary vehicles using and located on the traveled way. In no case shall such distance be less than 6 in (150 mm).
2. Where there are no curbs, supporting structures should be located a sufficient distance from the roadway to avoid contact by ordinary vehicles using and located on the traveled way.
3. Location of overhead utility installations on highways with narrow rights-of-way or on urban streets with closely abutting improvements are special cases that must be resolved in a manner consistent with the prevailing limitations and conditions.
4. Where a governmental authority exercising jurisdiction over structure location has issued a permit for, or otherwise approved, specific locations for supporting structures, that permit or approval shall govern.

C. From Railroad Tracks

Where railroad tracks are parallel to or crossed by overhead lines, all portions of the supporting structures, support arms, anchor guys, and equipment attached thereto less than 22 ft (6.7 m) above the nearest track rail shall be located not less than 12 ft (3.6 m) from the nearest track rail. See Rule 234I.

EXCEPTION 1: A clearance of not less than 7 ft (2.13 m) may be allowed where the supporting structure is not the controlling obstruction, provided sufficient space for a driveway is left where cars are loaded or unloaded.

EXCEPTION 2: Supports for overhead trolley-contact conductors may be located as near their own track rail as conditions require. If very close, however, permanent screens on cars will be necessary to protect passengers.

EXCEPTION 3: Where necessary to provide safe operating conditions that require an uninterrupted view of signals, signs, etc., along tracks, the parties concerned shall cooperate in locating structures to provide the necessary clearance.

EXCEPTION 4: At industrial sidings, a clearance of not less than 7 ft (2.13 m) shall be permitted, provided sufficient space is left where cars can be loaded or unloaded.

232. Vertical Clearances of Wires, Conductors, Cables, and Equipment Above Ground, Roadway, Rail, or Water Surfaces

A. Application

The vertical clearances specified in Rule 232B1 apply under the following conductor temperature and loading conditions, whichever produces the largest final sag.

1. 120 °F (50 °C), no wind displacement.
2. The maximum conductor temperature for which the line is designed to operate, if greater than 120 °F (50 °C), with no wind displacement.
3. 32 °F (0 °C), no wind displacement, with radial thickness of ice, if any, specified in Rule 250B for the loading district concerned.

EXCEPTION: The conductor temperature and loading condition for trolley and electrified railroad contact conductors shall be 60 °F (15 °C), no wind displacement, final unloaded sag, or initial unloaded sag in cases where these facilities are maintained approximately at initial unloaded sags.
NOTE: The phase and neutral conductors of a supply line are normally considered separately when determining the sag of each due to temperature rise.

B. Clearance of Wires, Conductors, Cables, and Equipment Mounted on Supporting Structures

1. Clearance to Wires, Conductors, and Cables
The vertical clearance of wires, conductors, and cables above ground in generally accessible places, roadway, rail, or water surfaces, shall be not less than that shown in Table 232-1.

2. Clearance to Unguarded Rigid Live Parts of Equipment
The vertical clearance above ground or roadway surfaces for unguarded rigid live parts such as potheads, transformer bushings, surge arresters, and short lengths of supply conductors connected thereto, which are not subject to variation in sag, shall be not less than that shown in Table 232-2.

3. Clearance to Equipment Cases
The vertical clearance of equipment cases above ground or roadway surfaces shall be not less than that shown in Table 232-2.

4. Street and Area Lighting
   a. All exposed ungrounded conductive parts of luminaires and their supports that are not insulated from current-carrying parts shall be maintained at not less than 20 in (500 mm) from the surface of their supporting structure.
   EXCEPTION 1: This may be reduced to 5 in (125 mm) if located on the side of the structure opposite the designated climbing space.
   EXCEPTION 2: This does not apply where the equipment is located at the top or other vertical portion of the structure that is not subject to climbing.
   b. Insulators, as specified in Rule 279A, should be inserted at least 8 ft (2.45 m) from the ground in metallic suspension ropes or chains supporting lighting units of series circuits.

C. Additional Clearances for Wires, Conductors, Cables, and Unguarded Rigid Live Parts of Equipment
Greater clearances than specified by Rule 232B shall be provided where required by Rule 232C1.

1. Voltages Exceeding 22 Kilovolts
   a. For voltages between 22 and 470 kV, the clearance specified in Rule 232B1 (Table 232-1) or Rule 232B2 (Table 232-2) shall be increased at the rate of 0.4 in (10 mm) per kilovolt in excess of 22 kV. For voltages exceeding 470 kV, the clearance shall be determined by the method given in Rule 232D. All clearances for lines over 50 kV shall be based on the maximum operating voltage.
   EXCEPTION: For voltages exceeding 98 kV ac to ground or 139 kV dc to ground, clearances less than those required above are permitted for systems with known maximum switching-surge factors (see Rule 232D).
   b. For voltages exceeding 50 kV, the additional clearance specified in Rule 232C1a shall be increased 3% for each 1000 ft (300 m) in excess of 3300 ft (1000 m) above mean sea level.
   c. For voltages exceeding 98 kV ac to ground, either the clearances shall be increased or the electric field or the effects thereof shall be reduced by other means, as required, to limit the steady-state current due to electrostatic effects to 5 mA, rms, if the largest anticipated truck, vehicle, or equipment under the line were short-circuited to ground. The size of the anticipated truck, vehicle, or equipment used to determine these clearances may be less than but need not be greater than that limited by federal, state,

or local regulations governing the area under the line. For this determination, the conductors shall be at a final unloaded sag at 120 °F (50 °C).

D. Alternate Clearances for Voltages Exceeding 98 Kilovolts Alternating Current to Ground or 139 Kilovolts Direct Current to Ground

The clearances specified in Rules 232B and 232C may be reduced for circuits with known switching-surge factors, but shall be not less than the alternate clearance, which is computed by adding the reference height from Rule 232D2 to the electrical component of clearance from Rule 232D3.

1. Sag Conditions of Line Conductors
   The vertical clearance shall be maintained under the conductor temperature and loading condition given in Rule 232A.
2. Reference Heights
   The reference height shall be selected from Table 232-3.
3. Electrical Component of Clearance
   a. The electrical component (D) shall be computed using the following equations. Selected values of D are listed in Table 232-4.

$$D = 3.28 \left[\frac{V \cdot (PU) \cdot a}{500\,K} \right]^{1.667} bc \text{ (ft)}$$

$$D = 1.00 \left[\frac{V \cdot (PU) \cdot a}{500\,K} \right]^{1.667} bc \text{ (m)}$$

where

V = maximum ac crest operating voltage to ground or maximum dc operating voltage to ground in kilovolts;
PU = maximum switching-surge factor expressed in per-unit peak voltage to ground and defined as a switching-surge level for circuit breakers corresponding to 98% probability that the maximum switching surge generated per breaker operation does not exceed this surge level, or the maximum anticipated switching-surge level generated by other means, whichever is greater;
a = 1.15, the allowance for three standard deviations;
b = 1.03, the allowance for nonstandard atmospheric conditions;
c = 1.2, the margin of safety;
K = 1.15, the configuration factor for conductor-to-plane gap.

   b. The value of D shall be increased 3% for each 1000 ft (300 m) in excess of 1500 ft (450 m) above mean sea level.
   c. For voltages exceeding 98 kV ac to ground, either the clearances shall be increased or the electric field or the effects thereof shall be reduced by other means, as required, to limit the steady state current due to electrostatic effects to 5 mA, rms, if the largest anticipated truck, vehicle, or equipment under the line were short-circuited to ground. The size of the anticipated truck, vehicle, or equipment used to determine these clearances may be less than but need not be greater than that limited by federal, state, or local regulations governing the area under the line. For this determination, the conductors shall be at a final unloaded sag at 120 °F (50 °C).
4. Limit
   The alternate clearance shall be not less than the clearance given in Tables 232-1 or 232-2 computed for 98 kV ac to ground in accordance with Rule 232C.

Table 232-1

Vertical Clearance of Wires, Conductors, and Cables Above Ground, Roadway, Rail or Water Surfaces (25)

FT

(Voltages are phase to ground for effectively grounded circuits and those other circuits where all ground faults are cleared by promptly de-energizing the faulted section, both initially and following subsequent breaker operations. See the definitions section for voltages of other systems. See Rules 232B1, 232C1a, and 232D4.)

Nature of surface underneath wires, conductors, or cables	Insulated (11) communication conductors and cable; messengers; surge-protection wires; grounded guys; neutral conductors meeting Rule 230E1; supply cables meeting Rule 230C1 (ft)	Noninsulated communication conductors; supply cables of 0 to 750 V meeting Rules 230C2 or 230C3 (ft)	Supply cables over 750 V meeting Rules 230C2 or 230C3; open supply conductors, 0 to 750 V (ft)	Open supply conductors, over 750 V to 22 kV (ft)	Trolley and electrified railroad contact conductors and associated span or messenger wires (1)	
					0 to 750 V to ground (ft)	Over 750 V to 22 kV to ground (ft)
Where wires, conductors, or cables cross over or overhang						
1. Track rails of railroads (except electrified railroads using overhead trolley conductors) (7)(16)(20)	23.5	24.0	24.5	26.5	22.0 (4)	22.0 (4)
2. Roads, streets, and other areas subject to truck traffic (21)	15.5	16.0	16.5	18.5	18.0 (5)	20.0 (5)
3. Driveways, parking lots, and alleys	15.5 (7)(13)	16.0 (7)(13)	16.5 (7)	18.5	18.0 (5)	20.0 (5)
4. Other land traversed by vehicles, such as cultivated, grazing, forest, orchard, etc. (25)	15.5	16.0	16.5	18.5	—	—
5. Spaces and ways subject to pedestrians or restricted traffic only (3)	9.5	12.0 (8)	12.5 (8)	14.5	16.0	18.0
6. Water areas not suitable for sailboating or where sailboating is prohibited (19)	14.0	14.5	15.0	17.0	—	—
7. Water areas suitable for sailboating including lakes, ponds, reservoirs, tidal waters, rivers, streams, and canals with an unobstructed surface area of (17)(18)(19)						
a. Less than 20 acres	17.5	18.0	18.5	20.5	—	—
b. Over 20 to 200 acres	25.5	26.0	26.5	28.5	—	—
c. Over 200 to 2000 acres	31.5	32.0	32.5	34.5	—	—
d. Over 2000 acres	37.5	38.0	38.5	40.5	—	—
8. Public or private land and water areas posted for rigging or launching sailboats	Clearance above ground shall be 5 ft greater than in 7 above, for the type of water areas served by the launching site					
Where wires, conductors, or cables run along and within the limits of highways or other road rights-of-way but do not overhang the roadway						
9. Roads, streets, or alleys	15.5 (13)(24)	16.0 (13)	16.5	18.5	18.0 (5)	20.0 (5)
10. Roads in rural districts where it is unlikely that vehicles will be crossing under the line	13.5 (10)(12)	14.0 (10)	14.5 (10)	16.5	18.0 (5)	20.0 (5)

(continued on next page)

Footnotes for Table 232-1

FT

① Where subways, tunnels, or bridges require it, less clearance above ground or rails than required by Table 232-1 may be used locally. The trolley and electrified railroad contact conductor should be graded very gradually from the regular construction down to the reduced elevation.

② For wires, conductors, or cables crossing over mine, logging, and similar railways that handle only cars lower than standard freight cars, the clearance may be reduced by an amount equal to the difference in height between the highest loaded car handled and 20 ft, but the clearance shall not be reduced below that required for street crossings.

③ This footnote not used in this edition.

④ In communities where 21 ft has been established, this clearance may be continued if carefully maintained. The elevation of the contact conductor should be the same in the crossing and next adjacent spans. (See Rule 225D2 for conditions that must be met where uniform height above rail is impractical.)

⑤ In communities where 16 ft has been established for trolley and electrified railroad contact conductors 0 to 750 V to ground, or 18 ft for trolley and electrified railroad contact conductors exceeding 750 V, or where local conditions make it impractical to obtain the clearance given in the table, these reduced clearances may be used if carefully maintained.

⑥ This footnote not used in this edition.

⑦ Where the height of attachment to a building or other installation does not permit service drops to meet these values, the clearances over residential driveways only may be reduced to the following:

	(feet)
(a) Insulated supply service drops limited to 300 V to ground	12.5
(b) Insulated drip loops of supply service drops limited to 300 V to ground	10.5
(c) Supply service drops limited to 150 V to ground and meeting Rules 230C1 or 230C3	12.0
(d) Drip loops only of service drops limited to 150 V to ground and meeting Rules 230C1 or 230C3	10.0
(e) Insulated communication service drops	11.5

⑧ Where the height of attachment to a building or other installation does not permit service drops to meet these values, the clearances may be reduced to the following:

	(feet)
(a) Insulated supply service drops limited to 300 V to ground	10.5
(b) Insulated drip loops of supply service drops limited to 300 V to ground	10.5
(c) Supply service drops limited to 150 V to ground and meeting Rules 230C1 or 230C3	10.0
(d) Drip loops only of supply service drops limited to 150 V to ground and meeting Rules 230C1 or 230C3	10.0

⑨ Spaces and ways subject to pedestrians or restricted traffic only are those areas where riders on horseback, vehicles, or other mobile units exceeding 8 ft in height, are prohibited by regulation or permanent terrain configurations or are otherwise not normally encountered nor reasonably anticipated.

⑩ Where a supply or communication line along a road is located relative to fences, ditches, embankments, etc., so that the ground under the line would not be expected to be traveled except by pedestrians, the clearances may be reduced to the following values:

	(feet)
(a) Insulated communication conductor and communication cables	9.5
(b) Conductors of other communication circuits	9.5
(c) Supply cables of any voltage meeting Rule 230C1 and supply cables limited to 150 V to ground meeting Rules 230C2 or 230C3	9.5
(d) Insulated supply conductors limited to 300 V to ground	12.5
(e) Guys	9.5

⑪ No clearance from ground is required for anchor guys not crossing tracks, rails, streets, driveways, roads, or pathways.

⑫ This clearance may be reduced to 13 ft for communication conductors and guys.

⑬ Where this construction crosses over or runs along alleys, driveways, or parking lots, this clearance may be reduced to 15 ft.

⑭ This footnote not used in this edition.

⑮ This footnote not used in this edition.

⑯ Adjacent to tunnels and overhead bridges that restrict the height of loaded rail cars to less than 20 ft, these clearances may be reduced by the difference between the highest loaded rail car handled and 20 ft, if mutually agreed to by the parties at interest.

⑰ For controlled impoundments, the surface area and corresponding clearances shall be based upon the design high-water level. For other waters, the surface area shall be that enclosed by its annual high-water mark, and clearances shall be based on the normal flood level. The clearance over rivers, streams, and canals shall be based upon the largest surface area of any 1-mi-long segment that includes the crossing. The clearance over a canal, river, or stream normally used to provide access for sailboats to a larger body of water shall be the same as that required for the larger body of water.

⑱ Where an overwater obstruction restricts vessel height to less than the applicable reference height given in Table 232-3, the required clearance may be reduced by the difference between the reference height and the overwater obstruction height, except that the reduced clearance shall be not less than that required for the surface area on the line-crossing side of the obstruction.

⑲ Where the US Army Corps of Engineers, or the state, or surrogate thereof has issued a crossing permit, clearances of that permit shall govern.

⑳ See Rule 234I for the required horizontal and diagonal clearances to rail cars.

㉑ For the purpose of this rule, trucks are defined as any vehicle exceeding 8 ft in height. Areas not subject to truck traffic are areas where truck traffic is not normally encountered nor reasonably anticipated.

㉒ This footnote not used in this edition.

㉓ This footnote not used in this edition.

㉔ Communication cables and conductors may have a clearance of 15 ft where poles are back of curbs or other deterrents to vehicular traffic.

㉕ The clearance values shown in this table are computed by adding the applicable Mechanical and Electrical (M&E) value of Table A-1 to the applicable Reference Component of Table A-2a of Appendix A.