COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

DIVISION OF ENERGY REGULATION

Guidelines of Minimum Requirements for Transmission Line Applications Filed Under Virginia Code Section 56-46.1 and The Utility Facilities Act

May 10, 1991

INTRODUCTION

All line applications filed with this Commission for approval in accordance with Section 56-46.1 of the Code of Virginia and/or the Utility Facilities Act shall be filed as required in the Commission's Rules of Practice and Procedures, latest edition.

For all line applications these guidelines supersede the Memorandum To All Electric Utilities: Procedures Under the Utility Facilities Act and House Bill 967 issued by the Commission's Director of Public Utilities on July 14, 1972.

TYPES OF APPLICATIONS

The type of application will determine which guidelines will apply. Listed below are the four different types of applications:

A. Applications for transmission lines of 150 kv or greater, filed pursuant to Virginia Code Section 56-46.1 and the Utility Facilities Act;

B. Applications for underground transmission lines filed pursuant to Virginia Code Section 56-265.2 (Utility Facilities Act);

C. Applications for facilities and/or lines of less than 150 kv to be located partially in the certificated service area of another electric utility, filed pursuant to Virginia Code Section 56-265.2; and

D. Applications for switching stations or substations, where the lower voltage is 150 kv or greater and the project is not associated with the construction of a proposed transmission line, filed pursuant to Virginia Code Section 56-265.2.

FILING REQUIREMENTS APPLICABLE BY APPLICATION TYPE

A. Sections I through V.

B. Section I; Section II, except for B.3 and B.4; Section III, except for G & H, Section IV.

C. Section I through IV.

D. Section I, except E and H; Section II, A.9b and C; Section III, A through F; and Section IV. All of these requirements should be modified by the applicant to apply to a proposed switching station site or location rather than a transmission line or route.

GUIDELINES

I. NECESSITY FOR THE PROPOSED PROJECT

The necessity statement should include but need not be limited to the following:

A. Detail the engineering justifications for the proposed project (for example, provide narrative to support why the project is necessary to upgrade or replace an existing facility, to significantly increase system reliability, to connect a new generating station to the Company's system, etc.). Detail the later plans for the proposed project, if appropriate.

B. Describe the present system and detail how the proposed project will effectively satisfy present and future demand requirements. Provide pertinent load growth data (at least five years of historical and ten years of projected loads where applicable). Provide all assumptions inherent within the projected data and why existing right-of-way can not adequately serve the needs of the Company if that is the case. Indicate when the existing system is projected to be inadequate. If the existing system is, or will at some future time be inadequate in a contingency situation, describe this critical contingency. Detail what might cause such situation. Where appropriate, provide historical incidence of similar situations which would be avoided by the proposed construction.

C. Describe the feasible alternatives, if any, for meeting the identified need without constructing the proposed project. Explain why these alternatives were rejected.

D. Describe any lines or facilities which will be removed, replaced, or taken out of service upon completion of the proposed project.

E. Provide a system map of suitable scale showing the location and voltage of the Company's transmission lines, substations, generating facilities, etc., which would affect or be effected by the new transmission line and are relevant to the necessity for the proposed line. Clearly, label on this map all points referenced in the necessity statement.

F Provide the desired in-service date of the proposed project and the estimated construction time.

G. Provide the estimated cost of the project.

H. In addition to all other information required by these guidelines, applications for approval to construct facilities and transmission lines inter-connecting a Non Utility Generator (NUG) and a utility shall include the following information.

1. The full name of the NUG as it appears in its contract with the utility and the dates of the initial contract and any amendments;

2. A description of the arrangements for financing the facilities, including information on the allocation of costs between the utility and the NUG;

3. a. For Qualifying Facilities (QFs) certificated by Federal Energy Regulatory Commission (FERC) order, provide the QF or docket number, the dates of all certification or recertification orders, and the citation to FERC Reports, if available;

   b. For self-certificated QFs, provide a copy of the notice filed with the FERC;

4. In addition to the information required in 3a or 3b, provide the project number and project name used by the FERC in licensing hydro electric projects, also provide the dates of all orders and citations to FERC Reports, if available; and

5. If the name provided in 1 above differs from the name provided in 3 above, give a full explanation.

I. Describe the new and existing generating sources, distribution circuits or load centers planned to be served by all new substations, switching stations and other ground facilities associated with the proposed project.

II. DESCRIPTION OF THE PROPOSED PROJECT

Note: The specific data requested in this section may not be available prior to actual survey and design of the project. The Company, however, is expected to provide all information that is available at the time of the filing of the application.

A. Right-of-way (ROW)

1. Provide the length of the proposed corridor and viable alternatives;

2. Provide a map of suitable scale showing the route of the proposed line and its relation to: the facilities of other public utilities which could

influence the route selection, highways, streets, parks and recreational areas, scenic and historic areas, schools, convalescent centers, hospitals, airports and other notable structures close to the proposed project. Indicate the existing facilities which the line is proposed to follow, such as existing ROW, railroad tracks, etc.;

3. Provide a drawing(s) of the ROW cross section showing typical transmission line structure placements referenced to the edge of the right-of-way. This drawing should include:

   a. ROW width for each cross section drawing;

   b. Lateral distance between the conductors and edge of ROW; and

   c. Existing utility facilities on the ROW;

4. Detail what portions of the ROW are subject to existing easements and over what portions easements will be needed;

5. Detail the proposed ROW clearing methods to be used and the ROW restoration and maintenance practices planned for the proposed project;

6. Indicate the permitted uses of the ROW;

7. Describe the Company's route selection procedures. Detail alternative routes considered. Describe the Company's efforts in considering these alternatives. Detail why the proposed route was selected and other alternatives were rejected;

8. Indicate how the construction of this transmission line complies with "Guidelines for the Protection of Natural, Historic, Scenic, and Recreational Values in the Design and Location of Rights-of-Way and Transmission Facilities" adopted by the Federal Power Commission in Order No. 414 issued November 27, 1970, and now applied by the Federal Energy Regulatory Commission. These guidelines may be found in Volume 44 of the Federal Power Commission Reports, page 1,491, or Volume 35 of the Federal Register, page 18,585 (December 8, 1970). Copies of the Guidelines may also be obtained from the Office of Public Information, Federal Energy Regulatory Commission, Washington, D.C. 20426. For reference purposes a copy of the guidelines is included.

9. a. Detail counties and localities through which the line will pass. If any portion of the line will be located outside of the applicant's certificated service area: (1) advise of each electric utility affected; (2) whether any affected electric utility objects to such construction and (3) the length of line(s) proposed to be located in the service area of an electric utility other than the applicant;

   b. Provide three (3) copies of the Virginia Department of Transportation "General Highway Map" of each county and city through which the line will pass. On the maps show the proposed line and all previously approved and certificated facilities of the applicant. Also where the line will be located outside of the applicant's certificated service area; show the boundaries between the applicant and each affected electric utility. On each map showing the line outside of the applicant's certificated service area, have the appropriate individual of the affected electric utility sign if his/her company is not opposed to the proposed construction.

B. Line Design and Operational Features

1. Detail number of circuits and their design voltage and transfer capabilities;

2. Detail number, size(s), type(s), and typical configurations of conductors;

3. With regard to the proposed supporting structures over each portion of the ROW provide:

   a. types of structures;

   b. length of ROW with each type of structure;

   c. material for typical structure (steel, oxidizing steel, etc.);

   d. foundation material;

   e. width at cross arms of typical structure;

   f. width at base of typical structures;

   g. typical span length;

   h approximate average heights of structures;

i. a schematic drawing of each typical structure; and

j. minimum conductor-to-ground clearances under maximum operating conditions;

4. Describe why the proposed structure type(s) was selected for this line.

C. Describe and furnish plan drawings of all new substations, switching stations, and other ground facilities associated with the proposed project.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL, AND HISTORIC FEATURES

A Describe the character of the area which will be traversed by this line, including, land use, wetlands, etc. Provide the number of dwellings within 500 feet of the line for each route considered.

B. Advise of any public meetings the Company has had with neighborhood associations and officials of local, state or federal governments who would have an interest or responsibility with respect to affected area or areas.

C. Detail the nature, location, and ownership of all buildings which would have to be demolished or relocated if the project is built as proposed.

D. What existing physical facilities will the line parallel, if any, such as existing transmission lines, railroad tracks, highways, pipelines, etc.? Describe the current use and physical appearance and characteristics of the existing right-of-way that would be paralleled. How long has the right-of-way been in use.

E. Has the Company investigated land use plans in the areas of the proposed route? How would the building of the proposed line effect future land use of the areas affected?

1. Has the Company determined from the governing bodies of each county, city and town in which the proposed facilities will be located whether those bodies have designated the important farmlands within their jurisdictions, as required by Virginia Code Section 3.2-205 B ?

2. If so, and if any portion of the proposed facilities will be located on any such important farmland, please:

a. Include maps and other evidence showing the nature and extent of the impact on such farmlands.

b. Describe what alternatives exist to locating the proposed facilities on the affected farmlands, and why those alternatives are not suitable.

c. Describe the applicant's proposals to minimize the impact of the facilities on the affected farmland.

F. Identify the following that lie within or adjacent to the proposed right-of-way:

1. Any district, site, building, structure, or other object included in the National Register of Historic Places maintained by the U.S. Secretary of the Interior;

   Any historic landmark, site, building, structure, district or object included in the Virginia Landmarks Register maintained by the Virginia Board of Historic Resources;

3 Any historic district designated by the governing body of any city or county;

4. Any state archaeological site or zone designated by the Director of the Virginia Department of Historic Resources, or his predecessor, and any site designated by a local archaeological commission, or similar body;

5. Any underwater historic property designated by the Virginia Department of Historic Resources, or predecessor agency or board;

6. Any National Natural Landmark designated by the U.S. Secretary of the Interior;

7. Any area or feature included in the Virginia Registry of Natural Areas maintained by the Virginia Department of Conservation and Recreation

8. Any area accepted by the Director of the Virginia Department of Conservation and Recreation for the Virginia Natural Area Preserves System;

9. Any conservation easement qualifying under Sections 10.1-1009 to -1016 of the Code of Virginia, or prior provision of law;

Any state scenic river;

Any federal state, or local park, forest, game or wildlife preserve, recreational area, or similar facility; Features, sites, and the like listed in 1 through 10 above need not be identified again.

G. List any airports where the proposed route would place a structure or conductor within the glide path of the airport. Advise of contacts and results of contacts made with appropriate officials regarding the effect on the airport's operations.

H. Advise of any scenic byways that are in close proximity to or will be crossed by the proposed transmission line and describe what steps will be taken to mitigate any visual impacts on such byways. Describe typical mitigation techniques for other highway's crossings.

IV. HEALTH ASPECTS OF EMF

A. State the calculated maximum electric and magnetic field (EMF) levels that are expected to occur at the edge of the right-of-way. If the new transmission line is to be constructed on an existing electric transmission line right-of-way, provide the present EMF levels as well as the maximum levels calculated at the edge of right-of-way after the new line is operational.

B. If Company is of the opinion that no significant health effects will result from the construction and operation of the line, describe in detail the reasons for that opinion and provide references or citations to supporting documentation.

C Describe any research studies the Company is aware of that meet the following criteria:

1. Became available for consideration since the completion of the Virginia Department of Health's most recent review of studies on EMF and its subsequent report to the Virginia General Assembly in compliance with 1985 Senate Joint Resolution No. 126;

2. Include findings regarding EMF that have not previously been reported and/or provide substantial additional insight into previous findings; and

3. Have been subjected to peer review.

V. NOTICE

A. Furnish a proposed route description to be used for public notice purposes. Provide a map of suitable scale showing the route of the proposed project.

B. List Company offices at which members of the public may inspect the application.

C. List all federal, state, and local agencies and/or officials who may reasonably be expected to have an interest in the proposed construction and to whom the Company has or will furnish a copy of the application.

Guidelines for the Protection of Natural, Historic, Scenic, and Recreational Values in the Design and Location of Rights-of-Way and Transmission Facilities

It is intended that these guidelines provide an indication of the basic principles and elements of good practice which, if applied in a reasonable manner to planning and design of particular facilities, will provide the most acceptable answers from an environmental standpoint taking account also of such factors as safety, reliability of service, land use planning, economics and technical feasibility.

The Selection and Clearing of Rights-of-Way Routes

1. To the extent permitted by the property interest involved rights-of-way should be selected with the purpose of minimizing conflict between the rights-of-way and present and prospective uses of the land on which they are to be located. To this end, existing rights-of-way should be given priority as the locations for additions to existing transmission facilities, and the joint use of existing rights-of-way by different kinds of utility services should be considered.

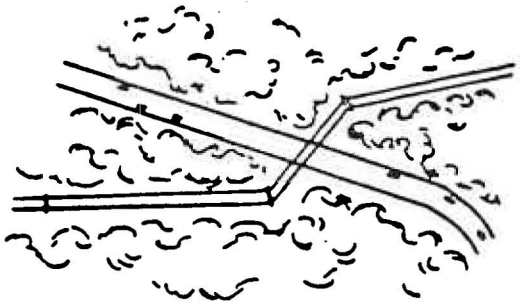
2. Where practical, rights-of-way should avoid the national historic places listed in the National Register of Historic Places and natural landmarks listed in the National Register of Natural Landmarks maintained by the Secretary of the Interior, and parks, scenic, wildlife and recreational lands, officially designated by duly constituted public authorities. If rights-of-way must be routed through such historic places, parks, wildlife or scenic areas, they should be located in areas or placed in a manner so as to be least visible from areas of public view and so far as possible in a manner designed to preserve the character of the area.

3. Rights-of-way should avoid prime or scenic timbered areas, steep slopes and proximity to main highways where practical. In some situations scenic values would emphasize locating rights-of-way remote from highways while in others where scenic values are less important rights-or-way along highways in timbered areas would achieve desirable conservation of existing forest lands.

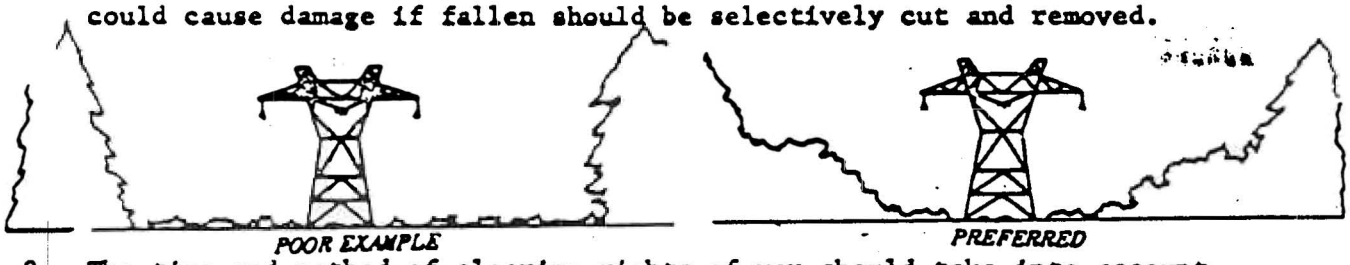
4. Where the transmission rights-of-way cross areas of land managed by Government agencies, State agencies or private organizations, these agencies should be contacted early in the planning of the transmission project to coordinate the line location with their land-use planning and with other existing or proposed rights-of-way.

5. In scenic and residential areas clearing of natural vegetation should be limited to that material which poses a hazard to the transmission line. Determination of a hazard in critical areas such as park & forest lands should be a joint endeavor of the utility company and the land manager in keeping with the National Electric Safety Code, state or other electric safety and reliability requirements.

6. Long tunnel views of transmission lines crossing highways in wooded areas, down canyons and valleys or up ridges and hills should be avoided. This can be accomplished by having the lines change alignment in making the crossing, or in other situations by concealment of terrain or by judicious use of screen planting.



7. Rights-of-way clearings should be kept to the minimum width necessary to prevent interference of trees and other vegetation with the proposed transmission facilities. In scenic or urban areas trees which would interfere with the proposed transmission facilities and those which could cause damage if fallen should be selectively cut and removed.



8. The time and method of clearing rights-of-way should take into account matters of soil stability, the protection of natural vegetation and the protection of adjacent resources.

9. The use of helicopters for the construction and maintenance on rights-of-way should be considered in mountainous and scenic areas where consistent with reliability of service. This would permit rights-of-way to be located in more remote areas and would reduce disturbance of the ground and the number of access roads.

10. Trees and other vegetation cleared from rights-of-way in areas of public view should be disposed of without undue delay. If trees and other vegetation are burned, local fire and air pollution regulations should be observed. Unsightly tree stumps which are adjacent to roads and other areas of public view should be cut close to the ground or removed.

11. Trees, shrubs, grass and top soil which are not cleared should be protected from damage during construction.

12. Rights-of-way should not be cleared to the mineral soil where possible. Where this does occur in scattered areas of the rights-of-way, the top soil should be replaced and stabilized without undue delay by the planting of appropriate species of grass, shrubs and other vegetation which are properly fertilized.

13. Soil which has been excavated during construction and not used should be evenly filled back onto the cleared area or removed from the site. The soil should be graded to comport with the terrain and the adjacent land, and the top soil should then be replaced and appropriate vegetation should be planted and fertilized.

14. Scars on the surface of the ground should be repaired with top soil and replanted with appropriate vegetation or otherwise conformed to local, natural conditions. Grading generally should not be done on slopes where the scars cannot be repaired without creating an erosion problem.

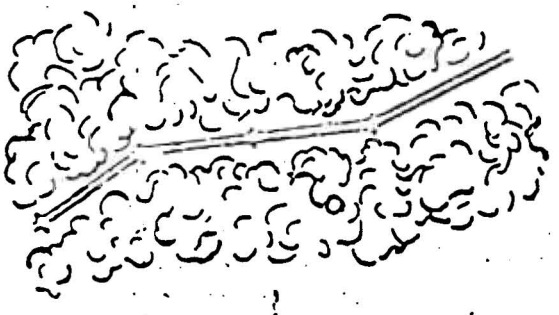
    Terraces and other erosion control devices should be constructed where necessary to prevent soil erosion on slopes on which rights-of-way are located.

    Where rights-of-way cross streams or other bodies of water, the banks should be stabilized to prevent erosion. Construction on rights-of-way should not damage shorelines, recreational areas or fish and wildlife habitats.

17. When necessary, cofferdam techniques to lay pipe or cable across streams should be used in order to permit full flow in one part of the stream while construction work is being performed in another part.

18. Care should be taken to avoid oil spills and other types of pollution while work is performed in streams.

19. In scenic areas visible to the public, rights-of-way strips through forest and timber areas should be deflected occasionally and should follow irregular patterns or be suitably screened to prevent the rights-of-way from appearing as tunnels cut through the timber.



20. At road crossings or other special locations of high visibility rights-of-way strips through forest and timber areas should be cleared with varying alighment to comport with the topography of the terrain. In such locations also where rights-of-way enter dense timber from a

POOR EXAMPLE PREFERRED

meadow or other clearing, trees should be feathered in at the entrance of the timber for a distance of 150-200 yards. Small trees and plants should be used for transition from natural ground cover to larger areas.

21. If underground transmission lines must be located near the crests of hills or other high points, trenching should be done with small equipment in order to minimize the width of the rights-of-way clearings.

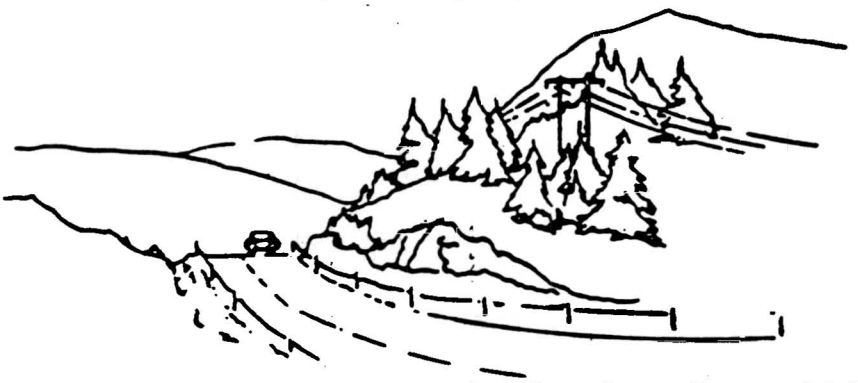
22. Roads used during construction should be stabilized without undue delay by erosion control measures and the planting of appropriate grass and other vegetation. These roads should be designed for proper drainage, and water bars to control soil erosion should be installed.

Access roads should not be constructed on unstable slopes. Where feasible, service and access roads should be used jointly.

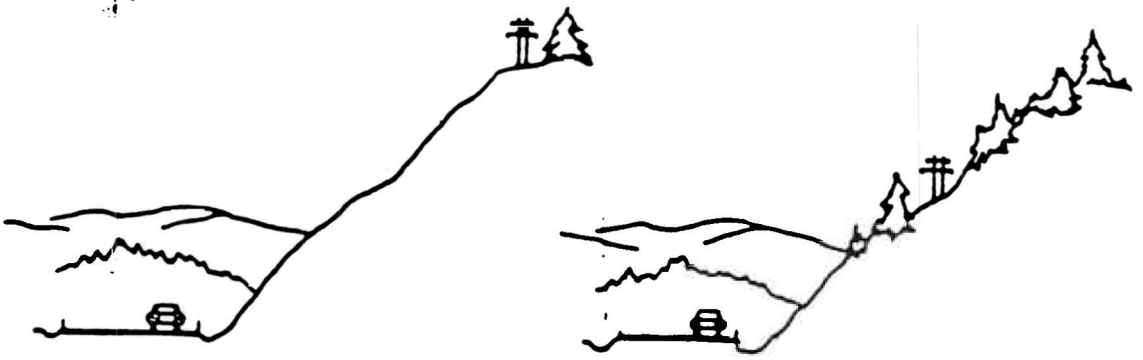
The Location of Transmission Towers and Overhead Lines

If an overhead line must be routed across uniquely scenic, recreational or historic areas or rivers, the feasibility of placing the lower voltage line underground should be considered. If the line must be placed overhead, it should be located on a right-of-way least visible from areas of public view.

25. Transmission facilities should be located with a background of topography and natural cover where possible. Vegetation and terrain should be used to screen these facilities from highways and other areas of public view.



Where transmission facilities must be placed on slopes which parallel highways or other areas of public view, they should be located approximately two-thirds the distance up the slopes where feasible. With the slopes as background, the presence of the facilities would be less noticeable.



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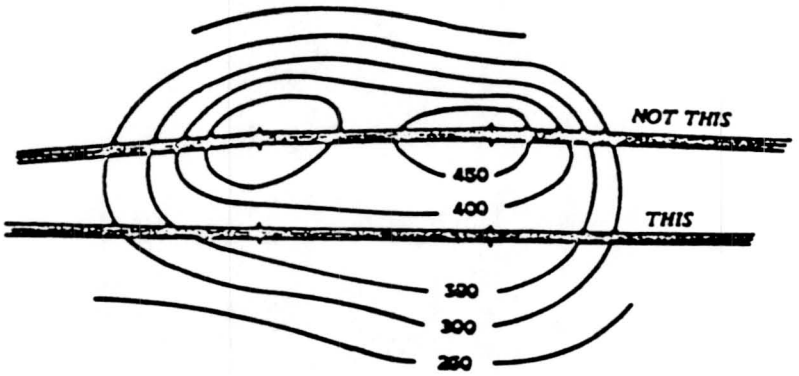
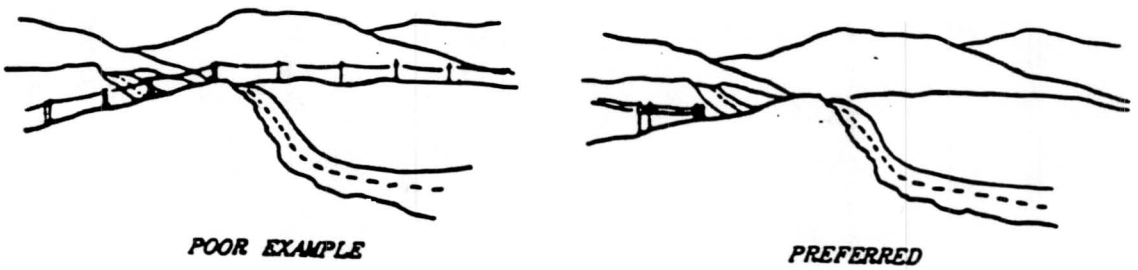
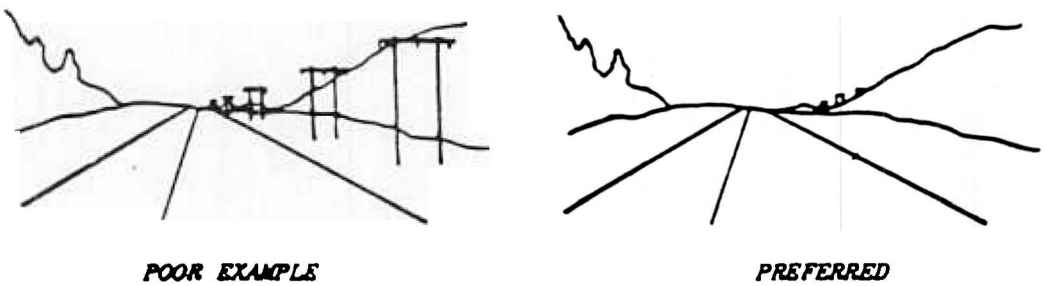
27. Transmission line rights-of-way should not cross hills and other high points at the crests and when possible should avoid placing a transmission tower at the crest of a ridge of hill. Towers should be spaced below the crest to carry the line over the ridge or hill, and the profile of the facilities should present a minimum silhouette against the sky.



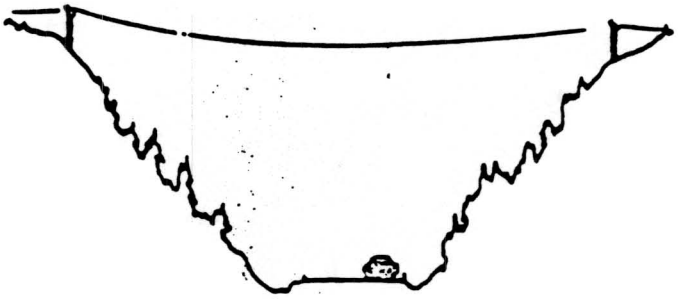
28. Transmission lines should not cross highways at the crest of a road



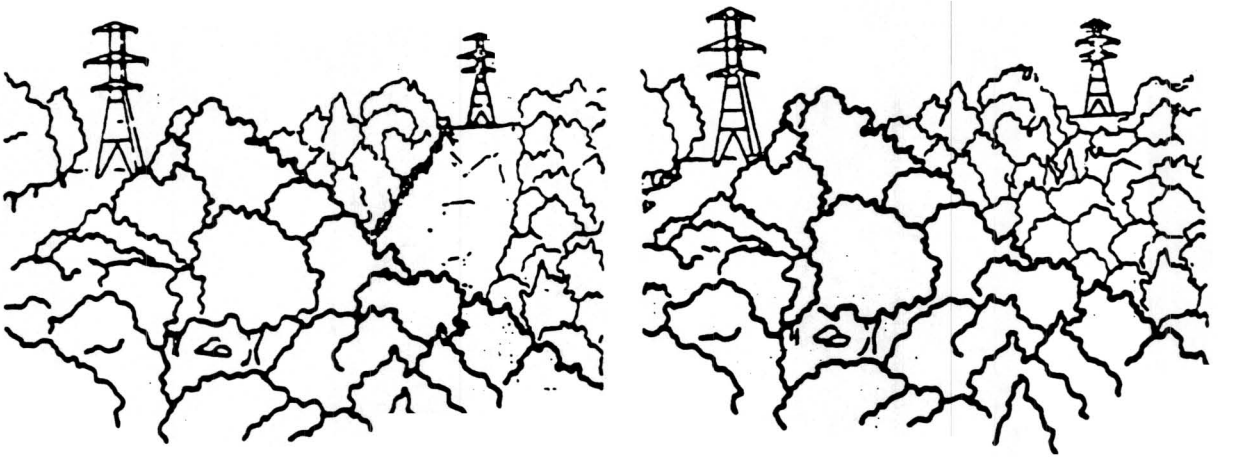
29. Long views of transmission lines parallel to highways should be avoided where possible. This may be accomplished by overhead lines being placed beyond ridges or timber areas.



30. Transmission lines should cross canyons up slope from roads which traverse the canyon basins if the terrain permits.



31. When crossing canyons in a forest, high, long-span towers should be used to keep the power lines above the trees and to eliminate the need to clear all vegetation from below the lines. Only as much vegetation as is necessary to string the line should be cut.



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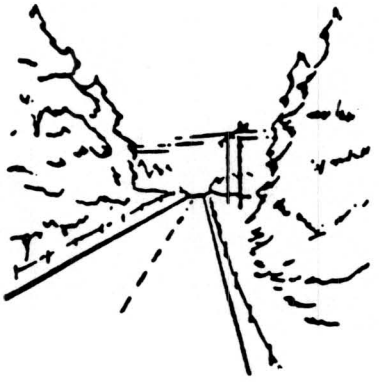
32. Where ridges or timber areas are adjacent to highways or other areas of public view, overhead lines should be placed beyond the ridges or timber areas.

33. In forest or timber areas, high, long-span towers should be used to cross highways in order to retain much of the natural growth along the highways.



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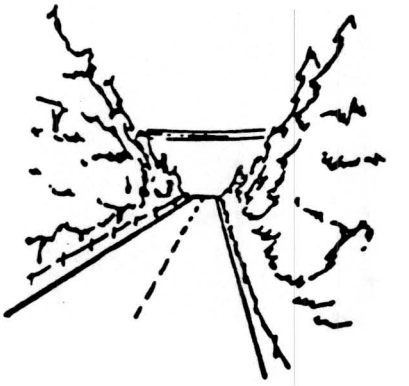

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34. Native shrubs and trees should be left in place or planted at random, with the necessary allowance for safety, near the edges of rights-of-way adjacent to roads.

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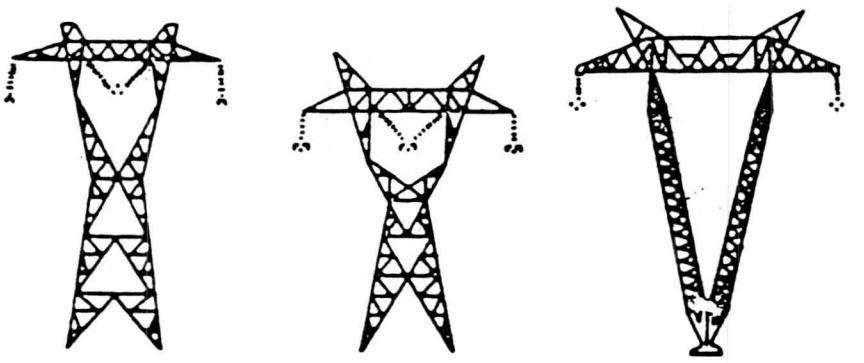
35. Transmission lines should not be located or cross at road intersections or interchanges where possible.

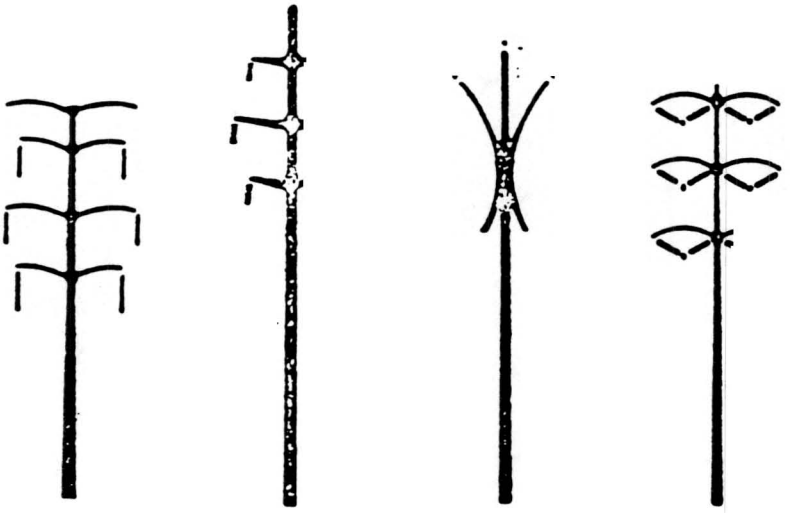
36. The Federal Highway Administration and the State Highway Department should be consulted with respect to any applicable guidelines or regulations that they might have to govern transmission lines which cross highways.

The Design of Transmission Towers

37. The size of transmission towers should be kept to the minimum feasible.

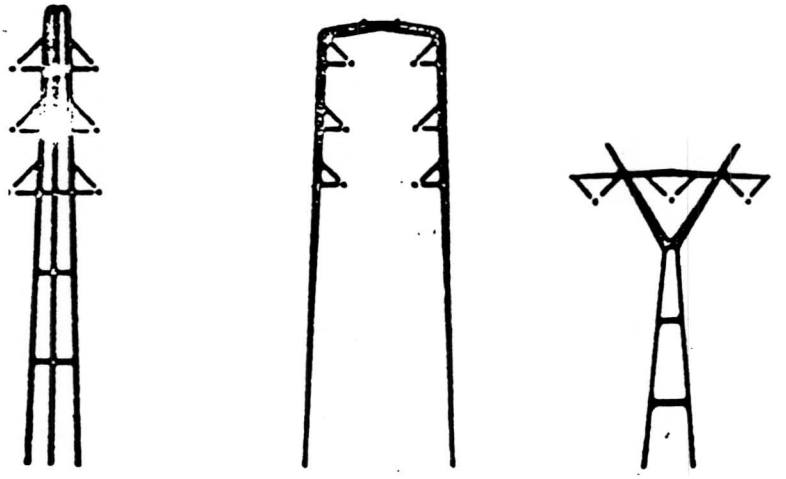


STANDARD TOWER DESIGNS

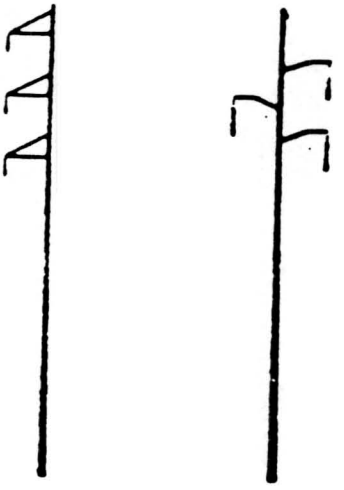


NEWER TOWER DESIGNS

38. Simple, but functional, designs of towers and poles should be used. Illustrations of these kinds of structures can be found in the book ELECTRIC TRANSMISSION STRUCTURES, sponsored by the Electric Research Council.



39. The use of poles designed without cross-arms for electric transmission lines of 138 kV and below and communications cables should be considered.



40. The materials used to construct transmission towers and the colors of the components of the towers should comport with the natural surroundings.

41. In addition to steel and aluminum transmission towers, the use of towers constructed of fiberglass, reinforced plastic, laminated wood, concrete, and other materials should be considered.

42. The use of treated single or double wood poles should be considered in forest or timber areas.

43. The use of weathered galvanized steel structures should be considered when transmission towers are to be silhouetted against the sky.

The design and color of the insulators should be compatible with the design of the tower.

45. Where two or more circuits are required at high crossings, the use of multiple circuit towers should be considered where it is consistent with adequate reliability.

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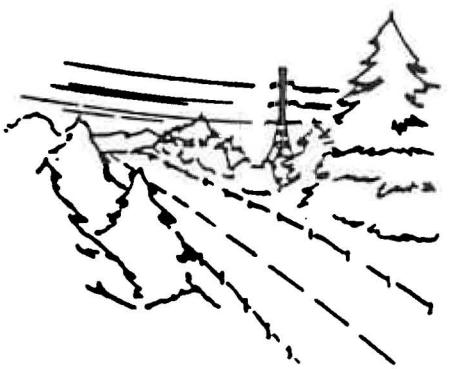

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The Maintenance of Transmission Line Rights-of-Way

46. Once a cover of vegetation has been established on a right-of-way, it should be properly maintained.

Chemicals, when used, should be carefully selected to have a minimum effect on desirable indigenous plant life. Selective application should be used wherever appropriate to preserve the natural environment. In scenic areas, the impact of temporary discoloration of foliage should be considered; and where this factor is critical, either mechanical means of vegetative control should be used, or the work should be scheduled in early spring or late fall. It is essential that chemicals be applied in a manner fully consistent with the protection of the entire environment, particularly of the health of humans and wildlife.

48. Access roads and service roads should be maintained with suitable natural cover, water bars, and the proper slope in order to prevent soil erosion.

49. Aerial and ground maintenance inspection activities of the transmission line facility should include observations of soil erosion problems, fallen timber and conditions of the vegetation which require attention. The use of aircraft to inspect and maintain transmission facilities should be encouraged.

Possible Secondary Uses of Rights-of-Way

One of the potential benefits of transmission line routes is that clearings at safe distances adjacent to transmission facilities may be used for secondary purposes. Consistent with general safety factors the following should be considered as possible secondary uses of rights-of-way to the extent permitted by the property interest involved:

Cultivation of Christmas trees, elderberry and huckleberry bushes, and other nursery stock
Parks
Golf courses
Equestrian or bicycle paths
Picnic areas
Game refuges
Hiking trail routes
General agriculture
Winter sports
Orchards

The Location of Appurtenant Aboveground Facilities

51. The proposed designs and locations of electric substations, and other aboveground facilities, including communication towers, should be made available to local agencies which have jurisdiction over these matters sufficiently in advance of construction deadlines to permit adequate review.

Unobtrusive sites should be selected where possible for the location of substations and like facilities.

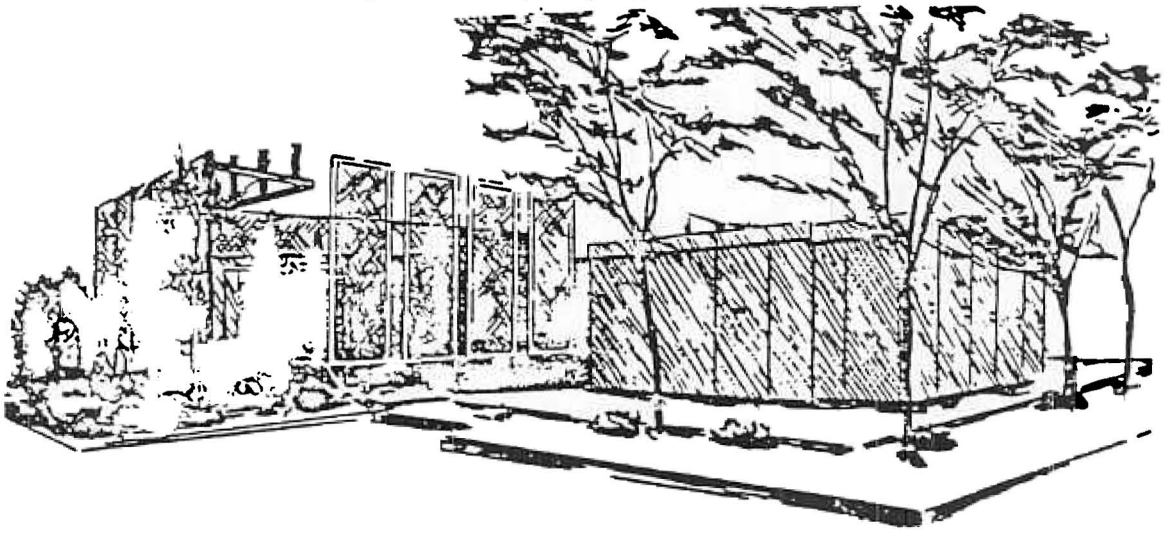
53. Potential noise should be considered when the locations for turbines, substations and like facilities are being determined. Such facilities should be located in areas where sound will not be resonated.

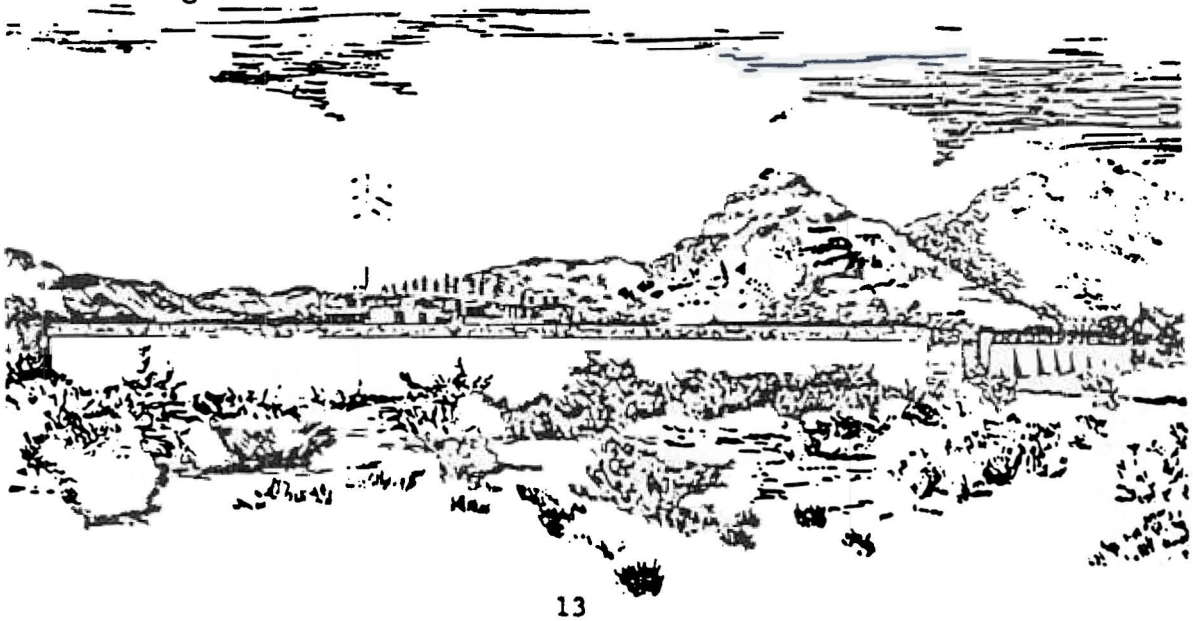
54. The size of substations and like facilities should be kept to the minimum feasible.

55. The designs of the exteriors of substations and like facilities should comport with the surroundings and other buildings in the area all in keeping with local control and applicable local zoning ordinance. For example, if a substation is to be located in a residential area, its design should comport with the designs of nearby residences.

56. If substations are located in residential and/or scenic areas, the appurtenant transmission conductors and distribution conductors adjacent to the substations should be placed underground where economically and technically feasible.

57. Trees and other landscaping appropriate to the site should be placed around substations to present a pleasing view to the public.



Storage tanks in scenic areas should be placed below ground where feasible. If storage tanks must be placed above ground, they should be concealed in part by appropriate plantings of trees and shrubs.

The materials used to construct substations, storage tanks and like facilities and the colors of these materials should comport with the surroundings.