
Chapter 4 – Legal

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Appendix 4A-1 Definitions and Abbreviations

Chapter 4 - Legal

4.1 Overview

4.1.1 Introduction

Various drainage laws and rules applicable to highway facilities are discussed in this chapter. The intention is only to provide information and guidance on the engineer's role in the legal aspects of highway drainage. This chapter should not be treated as a manual upon which to base legal advice or make legal decisions. It is also not a summary of all existing drainage laws, and most emphatically, this chapter is not intended as a substitute for legal counsel.

The following generalizations can be made in reaching the proper conclusion regarding liability:

- A goal in highway drainage design should be to perpetuate natural drainage, insofar as practicable
- The courts look with disfavor upon infliction of injury or damage that could reasonably have been avoided by a prudent designer, even where some alteration in flow is legally permissible
- The laws relating to the liability of government entities are undergoing radical change, with a trend toward increased government liability

4.1.2 Order of Authority

The descending order to law supremacy is Federal, State, and local, and, except as provided for in the statutes or constitution of the higher level of government, the superior level is not bound by laws, rules, or regulations of a lower level. State permit requirements are an example of law supremacy. Federal agencies do not secure permits issued by State agencies, except as required by Federal law. Many laws of one level of government are passed for the purpose of enabling that level to comply with or implement provisions of laws of the next higher level. In some instances, however, a lower level of government may promulgate a law, rule or regulation that would require an unreasonable or even illegal action by a higher level. An example is a local ordinance that would require an expenditure of State funds for a purpose not intended in the agency's revenue appropriation.

The rule of legal supremacy is interpreted to mean that VDOT policies and criteria are not subject to ordinances and regulations promulgated by local governing bodies, except in those specific instances where the Department has expressly agreed to abide by the local criteria. The Department recognizes its moral obligation to uphold and support the objectives of local ordinances and regulations. VDOT will administer the

design, construction, and maintenance of highways accordingly, to the extent practicable.

When ordinances, criteria, regulations, etc. of local governing bodies are more restrictive than State law and/or VDOT policies and criteria, the Department is not legally bound to observe the local mandate except as noted above.

Many of the questions relative to conflicts in laws of different levels of government involve constitutional interpretation and must be determined case by case. Such conflicts should be referred to legal counsel before any action is taken.

4.1.3 Related Publications

There are numerous publications on the legal aspects of drainage and water laws. For additional information on the legal aspects of highway drainage the reader is referred to the following publications:

- Highway Drainage Guidelines, American Association of State Highway and Transportation Officials, Washington, D. C., 1982. Chapter V - The Legal Aspects of Highway Drainage, which also includes a Glossary of legal definitions
- Legal Research Digest, Transportation Research Board
- Virginia Code ANN., tit. 21 (Drainage, Soil Conservation, Sanitation and Public Facilities Districts), §§ 21-292 to -432, (Michie 1995)
- 24 Virginia Administration Code § 30-70-90 (1989)
- Highway Laws of Virginia, issued by the Virginia Department of Transportation, reprinted from the Code of Virginia (current edition), copyright by the Michie Company, Charlottesville, Virginia

4.2 Federal Laws

4.2.1 General Laws

Federal law consists of the Constitution of the United States, Acts of Congress, regulations which government agencies issue to implement these acts, Executive Orders issued by the President, and case law. Acts of Congress are published immediately upon issuance and are cumulated for each session of Congress and published in the United States Statutes At Large. Compilations of Federal Statutory Law, revised annually, are available in the United States Code (USC) and the United States Code Service (USCS).

The Federal Register, which is published daily, provides a uniform system for making regulations and legal notices available to the public. Presidential Proclamations and Executive Orders, Federal agency regulations and documents having general applicability and legal effect, documents required to be published by an act of Congress and, other Federal agency documents of public interest are published in the Federal Register. Compilations of Federal regulatory material revised annually are available in the Code of Federal Regulations (CFR).

4.2.2 Drainage

Federal law does not deal with drainage per se, but many laws have implications that affect drainage design. These include laws concerning:

- Flood insurance and construction in flood hazard areas
- Navigation and construction in navigable waters
- Environmental protection
- Protection of fish and wildlife
- Coastal zone management
- Clean Water Act

4.3 Environmental Permits

4.3.1 Permits Affecting Streams, Wetlands, and Navigable Waters

In 1977, in cooperation with Norfolk District Corps of Engineers, Environmental Protection Agency, U. S. Fish and Wildlife Service and other Federal and State agencies, VDOT initiated an integrated environmental process for project early coordination and permit acquisition. This integrated process created the opportunity for State and Federal environmental agencies to meet, discuss and influence transportation projects in Virginia, while ensuring the appropriate protection and management of Virginia's cultural and natural resources and water resources. Since that time, the Interagency Coordination Meeting (IACM) process has become an effective mechanism to coordinate the development of projects with Federal and State agencies in order to secure the appropriate permits and environmental approvals for work in surface waters and wetlands.

The Environmental Permit Manual and Document Handbook produced by the VDOT Environmental Division contains current information and requirements regarding permits and agency coordination.

4.4 National Flood Insurance Program

4.4.1 Flood Disaster Protection

The Flood Disaster Protection Act of 1973 (PL 93-234, 87 Stat. 975) denies Federal financial assistance to flood prone communities that fail to qualify for flood insurance. Formula grants to States are excluded from the definition of financial assistance, and the definition of construction in the Act does not include highway construction; therefore, Federal aid for highways is not affected by the Act. The Act does require communities to adopt certain land use controls in order to qualify for flood insurance. These land use requirements could impose restrictions on the construction of highways in floodplains and floodways in communities that have qualified for flood insurance. A floodway, as used here and as used in connection with the National Flood Insurance Program, is that portion of the floodplain required to pass a flood that has a 1 percent chance of occurring in any 1 year period without cumulatively increasing the water surface elevation more than 1 foot.

4.4.2 Flood Insurance

The National Flood Insurance Act of 1968, as amended, (42 U.S.C. §§ 4001 through 4129) requires that communities adopt adequate land use and control measures to qualify for insurance. Federal criteria promulgated to implement this provision contain the following requirements that can affect certain highways:

- In riverine situations, when the Administrator of the Federal Insurance Administration has identified the flood prone area, the community must require that, until a floodway has been designated, no use, including land fill, be permitted within the floodplain area having special flood hazards for which base flood elevations have been provided, unless it is demonstrated that the cumulative effect of the proposed use, when combined with all other existing and reasonably anticipated uses of a similar nature, will not increase the water surface elevation of the 100-year flood more than 1 foot at any point within the community
- After the floodplain area having special flood hazards has been identified and the water surface elevation for the 100-year flood and floodway data have been provided, the community must designate a floodway which will convey the 100-year flood without increasing the water surface elevation of the flood more than 1 foot at any point and prohibit, within the designated floodway, fill, encroachments, and new construction and substantial improvements of existing structures which would result in any increase in flood heights within the community during the occurrence of the 100-year flood discharge
- The participating cities and/or counties agree to regulate new development in the designated floodplain and floodway through regulations adopted in a floodplain ordinance. The ordinance requires that development in the designated floodplain be consistent with the intent, standards and criteria set by the National Flood Insurance Program

4.4.3 Local Community

The local community with land use jurisdiction, whether it is a city, county, or State, has the responsibility for enforcing National Flood Insurance Program (NFIP) regulations in that community if the community is participating in the NFIP. Consistency with NFIP standards is a requirement for Federal-aid highway actions involving regulatory floodways. The community, by necessity, is the one who must submit proposals to Federal Emergency Management Agency (FEMA) for amendments to NFIP ordinances and maps in that community should it be necessary. The highway agency should deal directly with the community and, through them, deal with FEMA. Determination of the status of a community's participation in the NFIP and review of applicable NFIP maps and ordinances are, therefore, essential first steps in conducting location hydraulic studies and preparing environmental documents.

4.4.4 NFIP Maps

Where NFIP maps are available, their use is mandatory in determining whether a highway location alternative will include an encroachment on the base floodplain. Three types of NFIP maps are published:

- Flood Hazard Boundary Map (FHBM)
- Flood Boundary and Floodway Map (FBFM)
- Flood Insurance Rate Map (FIRM)

An FHBM is generally not based on a detailed hydraulic study; therefore, the floodplain boundaries shown are approximate. An FBFM, on the other hand, is generally derived from a detailed hydraulic study and should provide reasonably accurate information. The hydraulic data from which the FBFM was derived are available through the regional office of FEMA. This is normally in the form of computer input data records for calculating water surface profiles. The FIRM is generally produced at the same time using the same hydraulic model and has appropriate rate zones and base flood elevations added.

Communities may or may not have published one or more of the above maps depending on their level of participation in the NFIP. Information on community participation in the NFIP is provided in the "National Flood Insurance Program Community Status Book" which is published semiannually for each State.

4.4.5 Coordination with FEMA

It is intended that there should be coordination with FEMA in situations where administrative determinations are needed involving a regulatory floodway or where flood risks in NFIP communities are significantly impacted. The circumstances which would ordinarily require coordination with FEMA include the following:

- When a proposed crossing encroaches on a regulatory floodway and, as such, would require an amendment to the floodway map
- When a proposed crossing encroaches on a floodplain where a detailed study has been performed but no floodway designated and the maximum 1 foot increase in the base flood elevation would be exceeded
- When a local community is expected to enter into the regular program within a reasonable period and detailed floodplain studies are underway
- When a local community is participating in the emergency program and base FEMA flood elevation in the vicinity of insurable buildings is increased by more than 1 foot. Where insurable buildings are not affected, it is sufficient to notify FEMA of changes to base flood elevations as a result of highway construction

Coordination means furnishing to FEMA, through the community, a preliminary site plan and water surface elevation information and technical data in support of a floodway revision request as required. Otherwise, this later coordination may be postponed until the design phase.

Floodplains are an issue discussed in NEPA documents. For projects that will be processed with a categorical exclusion, coordination may be carried out during design. However, the outcome of the coordination at this time could change the class of environmental processing.

4.4.6 Consistent with Floodways

In many situations it is possible to design and construct highways in a cost-effective manner such that their components are excluded from the floodway. This is the simplest way to be consistent with the standards and should be the initial alternative evaluated. If a project element encroaches on the floodway, but has a very minor effect on the floodway water surface elevation (such as piers in the floodway), the project may normally be considered as being consistent with the standards, if hydraulic conditions can be improved so that no water surface elevation increase is reflected in the hydraulic analysis of the new conditions.

4.4.7 Revisions of Floodway

Where it is not cost-effective to design a highway crossing to avoid encroachment on an established floodway, a second alternative would be a modification of the floodway itself. Often, the community will be willing to accept an alternative floodway configuration to accommodate a proposed crossing provided NFIP limitations on increases in the base flood elevation are not exceeded. This approach is useful where the highway crossing does not cause more than a 1-foot rise in the base flood elevation. In some cases, it may be possible to enlarge the floodway or otherwise increase conveyance in the floodway above and below the crossing in order to allow greater encroachment. Such planning is best accomplished when the floodway is first established. However, where the community is willing to amend an established floodway to support this option, the floodway may be revised.

The responsibility for demonstrating that an alternative floodway configuration meets NFIP requirements rests with the community. However, this responsibility may be borne by the agency proposing to construct the highway crossing. Floodway revisions must be based on the hydraulic model that was used to develop the currently effective floodway but updated to reflect existing encroachment conditions. This will allow determination of the increase in the base flood elevation that has been caused by encroachments since the original floodway was established. Alternate floodway configurations may then be analyzed.

Base flood elevation increases are referenced to the profile obtained for existing conditions when the floodway was first established.

4.4.8 Data for Revisions

Data submitted to FEMA, through the community, in support of a floodway revision request should include the following:

- Copy of current regulatory Flood Boundary Floodway Map, showing existing conditions, proposed highway crossing and revised floodway limits
- Copy of computer printouts (input, computation, and output) for the current 100-year model and current 100-year floodway model
- Copy of computer printouts (input, computation, and output) for the revised 100-year floodway model. Any fill or development that has occurred in the existing flood fringe area must be incorporated into the revised 100-year floodway model
- Copy of engineering certification is required for work performed by private subcontractors

The revised and current computer data required above should extend far enough upstream and downstream of the floodway revision area in order to tie back into the original floodway and profiles using sound hydraulic engineering practices. This distance will vary depending on the magnitude of the requested floodway revision and the hydraulic characteristics of the stream.

If input data representing the original hydraulic model are unavailable, an approximation should be developed. A new model should be established using the original cross-section topographic information, where possible, and the discharges contained in the Flood Insurance Study, which established the original floodway. The model should then be run confining the effective flow area to the currently established floodway and calibrated to reproduce, within 0.10 foot, the "With Floodway" elevations provided in the Floodway Data Table for the current floodway. Floodway revisions may then be evaluated using the procedures outlined above.

4.4.9 Allowable Floodway Encroachment

When it would be demonstrably inappropriate to design a highway crossing to avoid encroachment on the floodway and where the floodway cannot be modified such that

the structure could be excluded, FEMA will approve an alternate floodway with backwater in excess of the 1 foot maximum only when the following conditions have been met:

- A location hydraulic study has been performed in accordance with Federal-Aid Highway Program Manual (FHPM) 6-7-3-2, FHWA, "Location and Hydraulic Design of Encroachments on Floodplains" (23 CFR 650, Subpart A) and FHWA finds the encroachment is the only practicable alternative.
- The constructing agency has made appropriate arrangements with affected property owners and the community to obtain flooding easements or otherwise compensate them for future flood losses due to the effects of backwater greater than 1 foot.
- The constructing agency has made appropriate arrangements to assure that the National Flood Insurance Program and Flood Insurance Fund will not incur any liability for additional future flood losses to existing structures which are insured under the Program and grandfathered in under the risk status existing prior to the construction of the structure.
- Prior to initiating construction, the constructing agency provides FEMA with revised flood profiles, floodway and floodplain mapping, and background technical data necessary for FEMA to issue revised Flood Insurance Rate Maps and Flood Boundary and Floodway Maps for the affected area, upon completion of the structure.

4.4.9.1 Highway Encroachment on a Floodplain - Detailed Study (FIRM)

In communities where a detailed flood insurance study has been performed but no regulatory floodway designated, the highway crossing should be designed to allow no more than 1 foot increase in the base flood elevation based on technical data from the flood insurance study. Technical data supporting the increased flood elevation shall be submitted to the local community and through them to FEMA for their files.

4.4.9.2 Highway Encroachment on a Floodplain Indicated on an FHBM

In communities where detailed flood insurance studies have not been performed, the highway agency must generate its own technical data to determine the base floodplain elevation and design encroachments in accordance with FHPM 6-7-3-2. Base floodplain elevations shall be furnished to the community, and coordination carried out with FEMA as outlined previously where the increase in base flood elevations in the vicinity of insurable buildings exceeds 1 foot.

4.4.9.3 Highway Encroachment on Unidentified Floodplains

Encroachments that are outside of NFIP communities or NFIP identified flood hazard areas should be designed in accordance with FHPM 6-7-3-2 of the Federal Highway Administration.

4.4.10 Levee System

For purposes of the National Flood Insurance Program (NFIP), FEMA will only recognize in its flood hazard and risk mapping effort those levee systems that meet, and

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continue to meet, minimum design, operation, and maintenance standards that are consistent with the level of protection sought through the comprehensive floodplain management criteria as outlined in the NFIP. The levee system must provide adequate protection from the base flood. Information supporting this must be supplied to FEMA by the community or other party seeking recognition of such a levee system at the time a flood risk study or restudy is conducted, when a map revision is sought based on a levee system, and upon request by the Administrator during the review of previously recognized structures. The FEMA review will be for the sole purpose of establishing appropriate risk zone determinations for NFIP maps and shall not constitute a determination by FEMA as to how a structure or system will perform in a flood event. For more information on the requirements related to levee systems see "National Flood Insurance Program and Related Regulations," Federal Emergency Management Agency, Revised October 1, 1986 and Amended June 30, 1987 (44 CFR 65.10).

4.5 Executive Orders

4.5.1 Background

Presidential Executive Orders (E.O.) have the effect of law in the administration of programs by Federal agencies. While executive orders do not directly apply to State Departments of Transportation, these requirements are usually implemented through general regulations.

4.5.2 Executive Order 11988 (E.O. 11988)

Executive Order 11988, May 24, 1977, requires each Federal agency, in carrying out its activities, to take the following actions:

- Reduce the risk of flood loss, minimize the impact of floods on human safety, health, and welfare, and restore and preserve the natural and beneficial values served by floodplains
- Evaluate the potential effect of any actions it may take in a floodplain, ensure its planning programs reflect consideration of flood hazards and floodplain management

These requirements are contained in the Federal-Aid Highway Program Manual (FHPM), Volume 6, Chapter 7, Section 3, Subsection 2, and were published in the Federal Register, April 26, 1979 (44 FR 24678), and in 23 CFR 650, Subpart A.

4.5.3 Executive Order 11990

Executive Order 11990, May 24, 1977, orders each Federal agency to:

- Take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands
- Avoid undertaking or providing assistance for new construction in wetlands unless the head of the agency finds that there is no practicable alternative and all practicable measures are taken to minimize harm which may result from the action
- To consider factors relevant to the proposal's effects on the survival and quality of the wetlands

These requirements are contained in 23 CFR 771 (FHPM 7-7-1).

4.6 State Drainage Law

4.6.1 Derivation

State drainage law is derived mainly from two sources: (1) common law and (2) statutory law.

4.6.2 Common Law

Common law is that body of principles which developed from immemorial usage and custom and which receives judicial recognition and sanction through repeated application. These principles were developed without legislative action and are embodied in the decisions of the courts.

4.6.3 Statutory Law

Statutory laws of drainage are enacted by legislatures to enlarge, modify, clarify, or change the common law applicable to particular drainage conditions. This type of law is derived from constitutions, statutes, ordinances, and codes.

4.6.4 Predominates

In general, the common law rules of drainage predominate unless they have been enlarged or superseded by statutory law. In most instances where statutory provisions have been enacted, it is possible to determine the intent of the law. If, however, there is a lack of clarity in the statute, the point in question may have been litigated for clarification. In the absence of either clarity of the statute or litigation, a definitive statement of the law is not possible, although the factors that are likely to be controlling may be indicated.

4.6.5 Classification of Waters

State drainage laws originating from common law, or court-made law, apply different legal rules according to whether the water in the drainage problem is classified as surface water, stream water, flood water, or groundwater. These terms are defined below. Once the classification has been established, the rule that applies to the particular class of water determines responsibilities with respect to disposition of the water.

- Surface Waters - Surface waters are those waters which have been precipitated on the land from the sky or forced to the surface in springs, and which have then spread over the surface of the ground without being collected into a definite body or channel.
- Stream Waters - Stream waters are former surface or groundwaters that have entered and now flow in a well-defined natural watercourse, together with other

waters reaching the stream by direct precipitation or rising from springs in the bed or banks of the watercourse. A watercourse in the legal sense refers to a definite channel with bed and banks within which water flows either continuously or intermittently.

- Flood Waters – Flood waters are former stream waters that have escaped from a watercourse (and its overflow channels) and flow or stand over adjoining lands. They remain floodwaters until they disappear from the surface by infiltration or evaporation, or return to a natural watercourse.
- Groundwaters -Groundwaters are divided into two classes, percolating waters and underground streams. The term "percolating waters" generally includes all waters that pass through the ground beneath the surface of the earth without a definite channel. The general rule is that all underground waters are presumed to be percolating unless the existence and course of a permanent channel can be clearly shown. Underground streams are waters passing through the ground beneath the surface in permanent, distinct, well-defined channels.

4.7 State Water Rules

4.7.1 Basic Concepts

Regarding the disposition of surface waters, the courts have developed two major rules: the civil law rule of “natural drainage” and the “common enemy” doctrine. Modification of both rules has tended to bring them somewhat closer together, and in some states, these rules have been replaced by a compromise rule known as the reasonable use rule.

Much of the law regarding stream waters is founded on a common law maxim that states “water runs and ought to run as it is by natural law accustomed to run.” Thus, as a general rule, any interference with the flow of a natural watercourse to the injury or damage of another will result in liability. An interference may involve augmentation, obstruction and detention, or diversion of a stream. However, there are qualifications.

In common law, flood waters are treated as a “common enemy” of all people, lands, and property attacked or threatened by them.

In groundwater law, the “English Rule,” which is analogous to the common enemy rule in surface water law, is based on the doctrine of absolute ownership of water beneath the property by the landowner.

Attention is called to the fact that while most states follow basically one or two general laws, i.e., the rule of Roman (civil) law or English common enemy rule, there are many modifications.

4.7.2 Surface Waters

The civil law rule is based upon the perpetuation of natural drainage. The rule places a natural easement or servitude upon the lower land for the drainage of surface water in its natural course and the natural flow of the water cannot be obstructed by the servient owner to the detriment of the dominant owner. Most states following this rule have modified it so that the owner of upper lands has an easement over lower lands for drainage of surface waters and natural drainage conditions can be altered by an upper proprietor provided the water is not sent down in a manner or quantity to do more harm than formerly.

Under the common enemy doctrine, surface water is regarded as a common enemy, which each property owner may fight off or control as he will or is able, either by retention, diversion, repulsion, or altered transmission. Thus, there is not cause of action even if some injury occurs causing damage. In most jurisdictions, this doctrine has been subject to a limitation that one must use his land so as not to unreasonably or unnecessarily damage the property of others. There is such a restriction in Virginia. “Where the common law is in force, as in this State, surface water is considered a common enemy, and the courts agree that each landowner may fight it off as best he

may. He may obstruct or hinder its flow, and may even turn it back upon the land of his neighbor, whence it came... This right in regard to surface water may not be exercised wantonly, unnecessarily, or carelessly... It must be a reasonable use of the land for its improvement or better enjoyment, and the right must be exercised in good faith, with no purpose to abridge or interfere with the rights of others, and with such care with respect to the property that may be affected by the use of improvement not to inflict any injury beyond what is necessary." *Norfolk & W. Ry. V. Carter*, 91 Va. 587, 592-93, 22 S.E. 517, 518 (1895.)

Under the reasonable use rule, each property owner can legally make reasonable use of his land, even though the flow of surface waters is altered thereby and causes some harm to others. However, liability attaches when his harmful interference with the flow of surface water is "unreasonable." Whether a landowner's use is unreasonable is determined by a nuisance-type balancing test. The analysis involves several questions.

- Was there reasonable necessity for the actor to alter the drainage to make use of his land?
- Was the alteration done in a reasonable manner?
- Does the utility of the actor's conduct reasonably outweigh the gravity of harm to others?

An exception to the above stated reasonable use rule is that a landowner may not collect surface water by means of an artificial conveyance, i.e., excavated channel, flume, pipes, etc., and discharge it in concentrated form on the property of another. This is true whether or not there has been an increase in the volume, which naturally flowed upon the property.

Another exception to the rule is that a landowner may not obstruct a watercourse to the injury of another.

It is to be noted that in the filling of land for the erection of buildings the landowner may obstruct the flow of water in a depression or swale. However, the court has held that in the construction of a railroad embankment, reasonable construction practice would require the installation of culverts to permit the passage of surface waters. It is believed that construction of a highway embankment would fall in the same category.

It can be seen from the above that while the construction of a highway should include culverts to permit surface waters to pass, it is not mandatory that a property owner provide culverts when filling his land for building purposes. Recognizing the above poses the problem of obtaining easements to guarantee unobstructed outlets for culverts passing surface waters. This is not necessary when the culvert is placed in a watercourse although it may be necessary if improvement of the watercourse is deemed desirable for the convenience of the Department.

When easements are obtained, care must be exercised to avoid a discharge of concentrated flow onto the property of the owner below the one from whom the easement is obtained.

4.7.3 Stream Waters

Much of the law regarding stream waters is founded on a common law maxim that states "water runs and ought to run as it is by natural law accustomed to run." Where natural watercourses are unquestioned in fact and in permanence and stability, there is little difficulty in application of the rule. Highways cross channels on bridges or culverts, usually with some constriction of the width of the channel and obstruction by substructure within the channel, both causing backwater upstream and acceleration of flow downstream. The changes in regime must be so small as to be tolerable by adjoining owners, or there may be liability of any injuries or damages suffered.

Surface waters from highways are often discharged into the most convenient watercourse. The right is unquestioned if those waters were naturally tributary to the watercourse and unchallenged if the watercourse has adequate capacity. However, if all or part of the surface waters have been diverted from another watershed to a small watercourse, any lower owner may complain and recover for ensuing damage. *Norfolk & W. Ry. V. Carter*, 91 Va. 587, 592-93, 22 S.E. 517 (1895.)

4.7.4 Flood Waters

Considering floodwaters as a common enemy permits all affected landowners including owners of highways, to act in any reasonable way to protect themselves and their property from the common enemy. They may obstruct its flow from entering their land, backing or diverting water onto lands of another without penalty, by gravity or pumping, by diverting dikes or ditches, or by any other reasonable means.

Again, the test of "reasonableness" is often applied by many states and liability can result where unnecessary damage is caused. Ordinarily, the highway designer should make provision for overflow in areas where it is foreseeable that it will occur. There is a definite risk of liability if such waters are impounded on an upper owner or, worse yet, are diverted into an area where they would not otherwise have gone. Merely to label waters as "flood waters" does not mean that they can be disregarded.

Virginia recognizes flood waters as a common enemy but does not provide a statutory definition of floodwaters, so they remain in the definition of surface water found in VA. CODE ANN. § 62.1-10 (Michie 1992) ("Water includes all waters, on the surface and under the ground, wholly or partially within or bordering the Commonwealth or within its jurisdiction and which affect the public welfare"). "Flood waters disregard jurisdictional boundaries, and the public interest requires the management of flood-prone areas in a manner which prevents injuries to persons, damage to property and pollution of state waters." VA. CODE ANN. § 10.1-658 (Michie 1993). Virginia follows the reasonable use rule, which could potentially have a limited impact on highway construction. VA. CODE ANN. § 62.1-11 (e) (Michie 1992) ("The right to the use of water or to the flow of water in or from any natural stream, lake or other watercourse in this Commonwealth is and shall be limited to such water as may reasonably be required for the beneficial use of the public to be served; such right shall not extend to the waste or unreasonable use

or unreasonable method of use of such water”). Virginia’s general criteria for drainage, relevant to VDOT, are found in 24 VA. ADMIN. CODE § 30-71-90 (West 1996 & Supp. 1998).

4.7.5 Groundwater

In contrast to groundwater law, surface water law is relatively well defined. The “English Rule,” which is analogous to the common enemy rule in surface water law, is based on the doctrine of absolute ownership of water beneath the property by the landowner. This has been modified by the “Reasonable Use Rule” which states in essence that each landowner is restricted to a reasonable exercise of his own right and a reasonable use of his property in view of the similar right of his neighbors.

The key word is "reasonable." While this may be interpreted somewhat differently from case to case, it can generally be taken to mean that a landowner can utilize subsurface water on his property for the benefit of agriculture, manufacturing, irrigation, etc. pursuant to the reasonable development of his property although such action may interfere with the underground waters of neighboring proprietors. However, it does generally preclude the withdrawal of underground waters for distribution or sale for uses not connected with any beneficial ownership or enjoyment of the land from whence they were taken.

A further interpretation of "reasonable" in relation to highway construction would view the excavation of a deep "cut section" that intercepts or diverts underground water to the detriment of adjacent property owners as unreasonable. There are also cases where highway construction has permitted the introduction of surface contamination into subsurface waters and thus incurred liability for resulting damages.

4.8 Statutory Law

4.8.1 Introduction

The inadequacies of the common law or court-made laws of drainage led to a gradual enlargement and modification of the common law rules by legislative mandate. In the absence of statute, the common law rules adopted by State courts determine surface water drainage rights. If the common law rules have been enlarged or superseded by statutory law, the statute prevails. Statutes affecting drainage are discussed below.

4.8.2 Eminent Domain

In the absence of an existing right, public agencies may acquire the right to discharge highway drainage across adjoining lands with the right of eminent domain. Eminent domain is the power of public agencies to take private property for public use.

The Virginia Constitution grants the State the right of eminent domain, including the development of watercourse and watershed areas. VA. CONST. Art. I & II (1971). It is important to remember; however, that whenever any property is taken under eminent domain, the private landowner must be compensated for his loss. VDOT has the power of eminent domain over watercourses and watershed areas deemed necessary for the construction, maintenance, and repair of public highways. VA. CODE ANN. § 33.1-89 (Michie 1996).

4.8.3 Water Rights

The water right that attaches to a watercourse is a right to the use of the flow, not ownership of the water itself. This right of use is a property right, entitled to protection to the same extent as other forms of property, and is regarded as real property. After the water has been diverted from the stream flow and reduced to possession, the water itself becomes the personal property of the riparian owner.

- Riparian Doctrine - Under the riparian doctrine, lands contiguous to watercourses have prior claim to waters of the stream solely by reason of location and regardless of the relative productive capacities of riparian and nonriparian lands.

Generally, the important issue for highway designers to keep in mind in the matter of water rights is that proposed work in the vicinity of a stream should not impair either the quality or quantity of flow of any water rights to the stream.

4.9 Easements and Diversion

4.9.1 Outfall Easements

The Department is required to pass surface water coming to a highway embankment through said embankment without undue detriment to adjacent property owners. Private landowners are not always under the same obligation. Therefore, it is sometimes necessary for the Department to secure an easement from its structure to a point downstream from whence actions on adjacent land will no longer penalize the hydraulic performance of the highway facility. This easement also provides access for routine maintenance of the outfall such as the removal of natural vegetation that would reduce the outfall's hydraulic conveyance and thus penalize the highway facility.

Generally, a natural watercourse cannot be restricted to the detriment of adjacent landowners including VDOT. Thus, it is not necessary to obtain an easement along a natural watercourse for protection of the hydraulic conveyance of the system. However, it may be necessary to obtain an easement for construction, maintenance or other reasons.

The Department requires that when other parties construct a facility that ultimately will be taken into the State Highway System, all drainage outfalls be provided with an easement extending from the project's right-of-way to a natural watercourse. An exception to this requirement is when the local governing body will take perpetual responsibility for the maintenance of the outfall (see Section 14.3.6).

4.9.2 Maintenance of Drainage Easements

The Department should maintain an easement to provide a safe facility for the public and to protect the roadway and its drainage system when Department personnel deem it appropriate and necessary. Generally, there are three types of recorded easements. The first is recorded in the name of the Department and is usually obtained by Department personnel to resolve individual drainage problems, or as a part of a highway improvement project. The second is dedicated to the County for public use as a part of a subdivision developed under County ordinances. The third is an easement obtained by a private party. The Department's responsibility regarding the three different types of easements is as follows:

- Drainage Easements Acquired by the Department
 - The Department assumes maintenance responsibility within the limits of the drainage easement.
- Drainage Easements Dedicated to a County as Part of a Subdivision Plat
 - The Department will maintain only that portion of the drainage easement that falls within the right-of-way limits accepted by the Department when the street is added to the State-maintained system of highways.

- Work within the easement, but outside of the right-of-way will only be performed when obstructions, etc., create problems within the right-of-way.
- Drainage Easements Obtained by Private Parties
 - The Department has no maintenance responsibility. Upon the granting of the drainage application by an appropriate court, the holder of the easement assumes full responsibility. VIRGINIA CODE ANN. § 21-428 (Michie, 1950).
 - For additional details on the maintenance of drainage easements, please see the VDOT Maintenance Manual.

4.9.3 Construction Easements

The Department may obtain easements as necessary to construct and maintain highway drainage facilities.

4.9.4 Diversion

Diversion is the taking of surface water from the path or course that nature prescribed for it to follow and forcing said water to follow another pattern or course. The party causing the diversion has responsibility for the conveyance of the diverted water and the effect of the diverted flow on adjacent land until the flow is returned to its natural course or pattern or until it reaches another body of water. While many civil engineering works cause some diversion, the volume of flow is usually small and its effects are negligible. Nonetheless, the designer should always be cognizant of the maxim: *Aqua Currit Et Debet Currere, Ut Currere Solebat* – (Water runs and ought to run as it is by natural law accustomed to run).

4.9.5 Flood Storage Easements

It is not the general practice of VDOT to permit the use of highway funds to purchase floodplain storage (floodway) easements. Therefore, VDOT does not generally employ an under-designed drainage structure and purchase an easement upstream of the facility to store the resulting excess ponded water.

4.10 Legal Remedies

4.10.1 Common Actions

The most common legal actions through which a complainant may seek legal recourse include inverse condemnation, injunction, and tort claims.

4.10.2 Inverse Condemnation

Virginia recognizes a cause of action for damage to property caused by surface water drainage by private actors or the state.

4.10.3 Injunctions

Where a statutory right is violated to the landowner's material injury, courts ordinarily grant an injunction. The injunction could enjoin the highway agency from taking a certain action or require the abatement of a certain condition that it has created. The granting of an injunction does not prevent the recoupment of compensation for damages that have occurred (*Seventeen, Inc. v. Pilot Life Ins.*, 215 Va. 74, 205 S.E. 2d 648 (1974)). As a general rule, injunctions may be granted even though the extent of the injury is incapable of being ascertained or of being computed in dollars.

4.10.4 Tort Claims

In the early development of the law, the courts recognized that whenever it was possible, compensation should be awarded to those persons harmed by the actions of another. This was the origin of the theory of tort liability. In essence then, a tort, or civil wrong, is the violation of a personal right guaranteed to the individual by law. A person has committed a tort if he has interfered with another person's safety, liberty, reputation, or private property. If the injured party can prove the defendant proximately caused him harm, the court will hold the defendant responsible for the plaintiff's injury, and the defendant will be forced to pay for the damage.

4.11 Role of the Designer

4.11.1 Responsibility

The designer has a three-fold responsibility for the legal aspects of highway drainage. First, the designer should know the legal principles involved and apply this knowledge to his designs; and, secondly, assist environmental engineers in the acquisition of appropriate permits, and thirdly, he should work closely with the legal staff of his organization, as necessary, in the preparation and trial of drainage cases. The duties of the designer include direct legal involvement in the following areas:

- Conduct investigations, advise, and provide expert testimony on the technical aspects of drainage claims involving existing highways
- Provide drainage design information during permit and right-of-way acquisition
- Assist appraisers in evaluating damages and provide testimony in subsequent condemnation proceedings, when necessary
- The engineer should provide his attorney with a personal resume. In addition, it is advisable to write a brief outline of the facts in the case, as the engineer knows them. The resume should include:
 - Name
 - Address
 - Employer/Position
 - List employer (s) with their addresses
 - List each position held with an employer and note the length of time in that position.
 - List the major duties performed in each position
 - Education
 - List all college level education, special courses, etc.
 - Accreditation
 - List all degrees, licenses, certificates, etc.
 - List membership in professional organizations

Drainage engineers are frequently called upon to present testimony in legal proceedings. In addition to technical knowledge, an accurate knowledge of conditions prior to construction is essential. It is important to maintain complete and accurate documentation for all design studies. Proper documentation as noted elsewhere in this manual will be of inestimable value in recalling the prior existing condition and in developing credible testimony.

It is common knowledge that an engineer can be brought into a lawsuit at almost anytime, and there is little to prevent a person from beginning court action. However, if the construction and design of the project is reasonable, then the engineer has no need to fear the outcome. If the engineer can show that he considered all the factors that can reasonably be expected to bear upon a situation and has developed his design accordingly, even though his engineering judgment he did not accommodate some

factor (s), he is not liable for negligence. If, however, he does not consider all reasonable and foreseeable factors, he may incur personal liability.

In any discipline, and especially drainage, the law is continually changing and the engineer should keep himself abreast of these changes. (An Engineer Looks at Drainage Law, Alfred R. Pagan, FASCE, Engineering Issues, ASCE.)

4.11.2 Investigation of Complaints

It is imperative that drainage complaints be dealt with promptly and in an unbiased manner. This means accepting the fact that the flooding is a serious problem for the complainant, and not accepting anyone's preconceived conclusions. All facts must be assembled and analyzed before deciding on what happened and why it happened. Also, it is well to list any other agency that could possibly have responsibility for a remedy to the flooding.

When the designer is requested to investigate a complaint, the following guidelines are recommended.

- Determine Facts About The Complaint:
 - Show on a map the location of the problem on which the complaint is based
 - Clearly determine the basis for the complaint (what was flooded, complainant's opinion as to what caused the flooding, description of the alleged damages, dates, times and durations of flooding)
 - Briefly relate the history of any other grievances that were expressed prior to the claim presently being investigated
 - Obtain approximate dates that the damaged property and/or improvements were acquired by those claiming damages
- Collect Facts About the Specific Flood Event(s) Involved:
 - Rainfall data (dates, amounts, time periods and locations of gages). Rainfall data are often helpful regardless of the source.
 - Document observed high-water information at or in the vicinity of the claim. Locate high-water marks on a map and specify datum. Always try to obtain high-water marks both upstream and downstream of the highway and the time the elevations occurred.
 - Determine the duration of flooding at the site of alleged damage. Determine the direction of flood flow at the damaged site. Describe the condition of the stream before, after, and during flood(s). Was the growth in the channel light, medium, heavy; were there drift jams; does the stream carry much drift in flood stage; was the flow fast or sluggish; did light, moderate, or severe erosion occur?
 - Document the flood history at the site. Was highway overtopped by the flood? If so, what was the depth of overtopping; and, if possible, estimate a flow velocity across the highway. Obtain narratives of any eyewitnesses to the flooding. Obtain facts about the flood(s) from sources outside VDOT, such as newspaper accounts, witnesses, measurements by other agencies (USGS, Corps of Engineers, NRCS, and individuals), maps, and Weather Bureau rainfall records.

- State Facts About the Highway Crossing Involved
 - Show a profile of the highway across the stream valley. Give the date of the original highway construction and dates of all subsequent alterations to the highway, and describe what the alterations were. Describe what existed prior to the highway, such as county road, city street, or abandoned railroad embankment, etc. Also include a description of the drainage facilities and drainage patterns that were there prior to the highway. Give a description of the existing drainage facilities. Give the original drainage design criteria, or give capacity and frequency of the existing facility based upon current criteria.
- Possible Effects by Others
 - Are there any other stream crossings in the vicinity of the damaged site that could have affected the flooding (pipelines, highways, streets, railroads, dams)?
 - Have there been any significant man-made changes to the stream or watershed that might affect the flooding?
- Analyze The Facts
 - From the facts, decide what should be done to relieve the problem regardless of who has responsibility for the remedy.
 - Could others possibly provide assistance?
- Make Conclusions and Recommendations.
 - What were the contributing factors leading to the alleged flood damage?
 - Specify feasible remedies (This should be done without any regard for who has responsibility to effect a remedy.)

The list under “Determine Facts About the Complaint” is not all-inclusive, nor is it intended that the entire list will be applied in each case. This outline is given as a guide to the type and scope of information desired from an investigation of a drainage complaint. It is advantageous to have available hydraulic design documentation as outlined in the “Documentation” chapter of this manual. When the report is completed, the designer should again analyze the facts, consider the conclusions and recommendations, and prepare a response to the complainant explaining the results of the investigation. Documentation of the facts and findings is important in the event there is future action.

4.11.3 Legal Opinion

Drainage matters range from the simple to the complicated. If the facts are ascertained and a plan developed before initiating a proposed improvement, the likelihood of an injury to a landowner is remote and the project construction or developer should be able to undertake such improvements relatively assured of no legal complications.

If the designer needs a legal opinion on a particular drainage problem or improvement, the requested opinion should state as a minimum whether:

- The watercourse under study has been viewed
- There are problems involved, and what causes them (obstructions, topography, development - present and future)

- The proposed improvements will make the situation better
- The proposal requires that the natural drainage be modified
- There is potential liability for doing something versus doing nothing
- Someone will benefit from the proposed improvements
- In general, what is proposed is "reasonable"

4.11.4 As a Witness

The designer should accept the responsibility of providing expert testimony in highway drainage litigation. Witness duty ordinarily requires considerably more time of a witness than the time spent in the courtroom. The best use of the designer's time can be arranged by consulting with legal counsel to determine what types of information and data will be needed, types of presentation needed, and when testimony will be required.

Testimony often involves presenting technical facts in layman's language so that it will be clearly understood by those in the courtroom. The designer's testimony generally describes the highway drainage system involved in the alleged injury or damage, and how that system affects the complainant. Design considerations and evidence of conditions existing prior to construction of the highway are important points.

4.11.5 Witness Conduct

The designer who is to serve as a witness should bear one fact in mind; the purpose of the court is to administer justice. Testimony should have one purpose - to bring out all known facts relevant to the case so that justice can better be served. Following are some pointers in being a witness.

- Tell the truth and do not try to color, shade, or change your testimony to help either side.
- Never lose your temper or show prejudice in favor of one side that is not supported by facts.
- Do not be afraid of lawyers and give your information honestly.
- Speak clearly and loudly enough to be heard by everyone involved in the courtroom proceeding.
- If you do not understand a question, ask that it be explained. If you still do not understand what is being asked, explain that you cannot give an answer to that question.
- Answer all questions directly and never volunteer information the question does not ask for.
- Stick to the facts and what you personally know.
- Do not be apprehensive. Your purpose is to present the facts as you know them and that is all that will be expected.
- If you do not know the answer to a question, just admit it. It is to your credit to be honest, rather than try to have an answer for everything that is asked you.

4.11 – Role of the Designer

- Do not try to memorize your story. There is no more certain way to cross yourself than to memorize your story and try to fit this story with the questions being asked.

Work with your lawyer in preparing your testimony and stick to the facts as you know them.

4.12 References

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