

DRAINAGE GUIDANCE MANUAL

APPENDIX C

GLOSSARY

DRAINAGE GUIDANCE MANUAL
APPENDIX C - GLOSSARY

Absorption The act or process of taking in water by inflow of atmospheric vapor, hygroscopic absorption, wetting, infiltration, influent seepage and gravity flow of streams into sinkholes or other large openings.

Abstraction That portion of rainfall which does not become runoff. It includes interception, infiltration, and storage in depression. It is affected by land use, land treatment and condition, and antecedent soil moisture.

Abutment The support at either end of a bridge: usually classified as spill-through or vertical.

Accretion 1. A process of accumulation by flowing water whether of silt, sand, pebbles, etc. Accretion may be due to any cause and includes alluviation. 2. The gradual building up of a beach by wave action. 3. The gradual building of the channel bottom, bank, or bar due to silting or wave action.

Acre-Foot The amount of water that will cover 1 acre to a depth of 1 foot. Equals 43,560 cubic feet. Abbreviated AF.

Aggradation General and progressive upbuilding of the longitudinal profile of a channel by deposition of sediment.

Allowable Headwater The depth or elevation of impounded water at the entrance to a hydraulic structure beyond which flooding or some other unfavorable result could occur.

Alluvial Channel A channel wholly in alluvium, no bedrock exposed in channel at low flow or likely to be exposed by erosion during major flow.

Alluvium Unconsolidated clay, silt, sand, or gravel deposited by a stream in a channel, flood plain, fan or delta.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Anabranching Stream A stream whose flow is divided at normal and lower stages by large islands or, more rarely, by large bars. The width of individual islands or bars is greater than three times water width.

Annual Flood The highest peak discharge in a water year.

Annual Series A frequency series in which only the largest value in each year is used, such as annual floods.

Annual Yield The total amount of water obtained in a year from a stream, spring, artesian well, etc. Usually expressed in inches depth, acre-feet, millions of gallons, or cubic feet.

Antecedent Moisture Condition (AMC) The degree of wetness of a watershed at the beginning of a storm.

Area Rainfall The average rainfall over an area, usually as derived from, or discussed in contrast with, point rainfall.

Armor Artificial surfacing of channel beds, banks, or embankment slopes to resist scour and lateral erosion.

Armoring the concentration of a layer of stones on the bed of the stream which are of a size larger than the transport capability of the recently experienced flow.

Avulsion A sudden change in the course of a channel, usually by breaching of the banks during a flood.

Aquifer A porous, water-bearing geologic formation. Generally restricted to materials capable of yielding an appreciable supply of water.

Artesian Pertains to groundwater that is under pressure and will rise to a higher elevation if given an opportunity to do so.

B Barrel width, ft.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Backwater The increase in water-surface profile, relative to the elevation occurring under natural channel and flood-plain conditions, induced upstream from a structure, bridge, or culvert, that obstructs or constricts a channel. It also applies to the water surface profile in a channel or conduit.

Baffle A structure built on the bed of a stream to deflect or disturb the flow. Also a device used in a culvert to facilitate fish passage.

Bank Lateral boundaries of a channel or stream, as indicated by a scarp, or on the inside of bends, by the streamward edge of permanent vegetal growth.

Bar An elongated deposit of alluvium, not permanently vegetated, within or along the side of a channel.

Base Flood The 100-Year flood.

Base Flow Stream discharge derived from groundwater sources. Sometimes considered to include flows from regulated lakes or reservoirs. Fluctuates much less than storm runoff.

Basin, Drainage The area of land drained by a watercourse.

Basin Lag The amount of time from the centroid of the rainfall hyetograph to the hydrograph peak.

Bed (of a channel or stream) The part of a channel not permanently vegetated, bounded by banks, over which water normally flows.

Bed Load Sediment that is transported in a stream by rolling, sliding, or skipping along the bed or very close to it; considered to be within the bed layer.

Bed Material Sediment consisting of particle sizes large enough to be found in appreciable quantities at the surface of a streambed.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Bed Shear(tractive force) The force per unit area exerted by a fluid flowing past a stationary boundary.

Berm A narrow shelf or ledge; also a form of dike.

Braided Stream A stream whose surface is divided at normal stage by small mid-channel bars or small islands. The individual width of bars and islands is less than three times the water width. A braided stream has the aspect of a single large channel within which are subordinate channels.

Bridge A structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a tract or passageway for carrying traffic or moving loads, and having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening. Also a structure designed hydraulically using the principles of open channel flow to operate with a free water surface, but may be inundated under flood conditions.

Bridge Opening The cross-sectional area beneath a bridge that is available for conveyance of water.

Bridge Waterway The area of a bridge opening available for flow, as measured below a specified stage and normal to the principal direction of flow.

Broken-Back Culvert A culvert comprising two or more longitudinal structure profiles. Such culverts are sometimes effective in reducing out-flow velocities by the energy dissipation of a hydraulic jump.

By-Pass Flow which bypasses an inlet on grade and is carried in the street or channel to the next inlet downstream. Also called carryover.

Capacity A measure of the ability of a channel or conduit to convey water.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Catch Basin A structure with a sump for inletting drainage from a gutter or median and discharging the water through a conduit. In common usage it is a grated inlet with or without a sump.

Catchment The watershed.(Implying all physical characteristics.)

Catchment Area The area tributary to a lake, stream, or drainage system.

CFS Abbreviation for cubic feet per second. A unit of water flow. Sometimes called "second feet."

Channel (1) The bed and banks that confine the surface flow of a natural or artificial stream. Braided streams have multiple subordinate channels, which are within the main stream channel. Anabranching streams have more than one channel. (2) The course where a stream of water runs, or the closed course or conduit through which water runs, such as a pipe.

Channel Lining The material applied to the bottom and/or sides of a natural or manmade channel. Material may be concrete, sod, grass, rock, or any of several other types.

Channel Routing The process whereby a peak flow and/or its associated streamflow hydrograph is mathematically transposed to another site downstream.

Check Dam A low structure, dam or weir, across a channel for the control of water stage, or velocity, or to control channel erosion.

Check Flow A flow, larger or smaller than the design flow, which is used to assess the performance of the facility.

Chute An open or closed channel used to convey water, usually situated on the ground surface.

Coefficient Of Discharge The coefficient used for orifice flow processes.

DRAINAGE GUIDANCE MANUAL
APPENDIX C - GLOSSARY

Combination Inlet Drainage inlet usually composed of two or more inlet types, e.g., curb-opening and a grate inlet.

Conduit An artificial or natural channel; usually a closed structure such as a pipe.

Conjugate Depth The alternate depth of flow involved with the hydraulic jump.

Conservative storage Water impounded for consumptive use such as municipal or irrigation, and non-consumptive uses such as recreation and fish and wildlife.

Continuity Equation Discharge equals velocity times cross-sectional area.
($Q = V \times A$)

Contraction The effects of a channel constriction on flow.

Contraction Scour The response of a river to the change in its bed load requirement as a result of a contraction of flow. The flow contraction is due to an encroachment of either the main channel or the flood plain by a natural constriction or the highway embankment.

Control Section A cross section, such as a bridge crossing, reach of channel, or dam, with limited flow capacity, in which the discharge is related to the upstream water-surface elevation.

Control Section(in an open channel spillway) The section where accelerated flow passes through critical depth.

Controlled Spillways A reservoir outlet works wherein the outflow is controlled by tainter gates or some similar device.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Conveyance A measure, K, of the ability of a stream, channel, or conduit to convey water. In Manning's formula $K = (1.49/n)AR^{2/3}$.

Corrosion The deterioration of pipe or structure by chemical action.

Cover The extent of soil above the crown of a pipe or culvert. The vegetation, or vegetational debris such as mulch, that exists on the soil surface. In some classification schemes fallow or bare soil is taken as the minimum cover class.

Criterion A standard, rule, or test on which a judgment can be based.

Critical Depth The depth at which water flows over a weir; this depth being attained automatically where no backwater forces are involved. It is the depth at which the energy content of flow is a minimum.

Cross Drainage The runoff from contributing drainage areas both inside and outside the highway right-of-way and the transmission thereof from the upstream side of the highway facility to the downstream side.

Cross-Section The shape of a channel, stream, or valley, viewed across its axis. In watershed investigations it is determined by a line approximately perpendicular to the main path of water flow, along which measurements of distance and elevation are taken to define the cross-sectional area.

Culvert A structure which is usually designed hydraulically to take advantage of submergence to increase hydraulic capacity. A structure used to convey surface runoff through embankments. A structure, as distinguished from bridges, which is usually covered with embankment and is composed of structural material around the entire perimeter, although some are supported on spread footings with the streambed serving as the bottom of the culvert. Also, a structure which is 20 feet or less in center-line length between extreme ends of openings for multiple boxes.

Curb-Opening Inlet Drainage inlet consisting of an opening in the roadway curb.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Cumulative Conveyance A tabulation or graphical plot of the accumulated measures of conveyance; proceeding from one stream bank to the other.

Cutoff Wall A wall that extends from the end of a structure to below the expected scour depth, or scour-resistant material.

D Culvert diameter or barrel depth.

D₅₀ Median size of rip rap. The particle diameter at the 50 percentile point on a size weight distribution curve.

D₁₆ The particle diameter at the 16 percentile point on a size weight distribution curve.

D₈₅ The particle diameter at the 85 percentile point on a size weight distribution curve.

d_c Critical depth of flow, ft.

Dam An artificial barrier, with any associated spill-ways and appurtenant works, across a watercourse or natural drainage area, which may impound or divert water.

Debris Material transported by the stream, either floating or submerged, such as logs or brush.

Degradation General and progressive lowering of the longitudinal profile of a channel by erosion.

Deposition The settling of material from the stream flow onto the bottom.

Depression Storage Rainfall which is temporarily stored in depressions within a watershed.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Depth-Area Curve A graph showing the change in average rainfall depth as size of area changes.

Design Discharge Or Flow The rate of flow for which a facility is designed.

Design Flood Frequency The recurrence interval that is expected to be accommodated without contravention of the adopted design constraints. The return interval (recurrence interval or reciprocal of probability) used as a basis for the design discharge.

Design Highwater Elevation The maximum water level that a bridge opening is designed to accommodate without contravention of the adopted design constraints. The usual term used to describe the estimated water surface elevation in the stream at the project site for the design discharge.

Design Flood A flood that does not overtop the roadway.

Design Life A period of time which a dam is designed to perform its assigned functions satisfactorily.

Design Storm A given rainfall amount, areal distribution, and time distribution, used to estimate runoff. The rainfall amount is either a given frequency (25-year, 50-year, etc.) or a specific large value.

Detention Basin A basin or reservoir incorporated into the watershed whereby runoff is temporarily stored, thus attenuating the peak of the runoff hydrograph.

Detour A temporary change in the roadway alignment. It may be localized at a structure or may be along an alternate route.

Dike An impermeable linear structure for the control or confinement of overbank flow. River training structure used for bank protection.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Direct Runoff The water that enters the stream channels during a storm or soon after, forming a runoff hydrograph. May consist of rainfall on the stream surface, surface runoff, and seepage of infiltrated water (rapid subsurface flow).

Discharge The rate of the volume of flow of a stream per unit of time, usually expressed in cfs.

Drainage Area The area draining into a stream at a given point. The area may be of different sizes for surface runoff, subsurface flow, and base flow, but generally the surface flow area is used as the drainage area.

Drop Inlet Drainage inlet with a horizontal or nearly horizontal opening.

Dry Dam A dam that has an ungated outlet positioned to allow most of the water stored to drain from the reservoir by gravity, and the reservoir will normally be dry.

Earth Dam A dam in which the principal barrier is an embankment of earth or rock fill or a combination of earth and rock fill.

Earth Spillway An open channel spillway in earth materials without vegetation.

Economic Life The period of time during which economic benefits are gained as a result of a dam.

Effective Height of Dam The difference in elevation, in feet, between the lowest open channel emergency spillway crest and the lowest point in the original cross section on the centerline of the dam. If there is no open channel emergency spillway, the top of the dam becomes the upper limit.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Effective Duration The time in a storm during which the water supply for direct runoff is produced. Also used to mean the duration of excess rainfall.

Effective Particle Size The diameter of particles, spherical in shape, equal in size and arranged in a given manner, of a hypothetical sample of granular material that would have the same transmission constant as the actual material under consideration.

Emergency Spillway A rock or vegetated earth waterway around a dam, built with its crest above the normally used principal spillway. Used to supplement the principal spillway in conveying extreme amounts of runoff safely past the dam.

Emergency Spillway Hydrograph The hydrograph used to establish the dimensions of the emergency spillway.

End Section A concrete or metal structure attached to the end of a culvert for purposes of retaining the embankment from spilling into the waterway, appearance, anchorage, etc.

Energy Dissipation The phenomenon whereby energy is dissipated or used up.

Energy Grade Line A line joining the elevation of energy heads; a line drawn above the hydraulic grade line a distance equivalent to the velocity head of the flowing water at each section along a stream, channel or conduit.

Energy Gradient Slope of the line joining the elevations of total energy along a conduit of flowing water.

Ephemeral Stream A stream or reach of a stream that does not flow continuously for most of the year.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Equalizer A culvert or opening placed where it is desirable to equalize the water head on both sides of the embankment.

Equivalent Cross-Slope An imaginary straight cross-slope having conveyance capacity equal to that of the given compound cross-slope.

Erosion The wearing away or scouring of material in a channel, opening, or outlet works caused by flowing water.

Evapotranspiration Plant transpiration plus evaporation from the soil. Difficult to determine separately, therefore used as a unit for study.

Excess Rainfall Direct runoff.

Exfiltration The process by which stormwater leaks or flows to the surrounding soil through openings in a conduit.

Exit Channel(of an emergency spillway) The portion of the channel downstream from the control section which conducts the flow safely to a point where it may be released without jeopardizing the integrity of the structure.

Filter A device or structure for removing solid or colloidal material from stormwater or preventing migration of fine-grained soil particles as water passes through soil. The water is passed through a filtering medium; usually a granular material or finely woven or non-woven cloth.

Filtration The process of passing water through a filtering medium consisting of either granular material or filter cloth for the removal of suspended or colloidal matter.

Flanking Inlets Inlets placed upstream and on either side of an inlet at the low point in a sag vertical curve. The purposes of these inlets are to intercept debris as the slope decreases and to act as relief of the inlet at the low point.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Flared Inlet A specially fabricated pipe appurtenance or a special feature of box culverts. This type of inlet is effective in reducing the calculated headwater.

Flared Wingwalls The part of a culvert headwall which serves as a retaining wall for the highway embankment. The walls form an angle to the centerline of the culvert.

Flood In common usage, an event that overflows the normal banks. In technical usage, it refers to a given discharge based, typically, on a statistical analysis of an annual series of events.

Flood Frequency The average time interval, in years, in which a given storm or amount of water in a stream will be exceeded.

Flood Of Record Reference to the maximum estimated or measured discharge that has occurred at a site.

Floodplain The alluvial land bordering a stream, formed by stream processes, that is subject to inundation by floods.

Flood Pool Floodwater storage elevation in a reservoir. In a floodwater retarding reservoir, the temporary storage between the crests of the principal and emergency spillways.

Flood Routing Determining the changes in a flood hydrograph as it moves downstream through a channel or through a reservoir (called reservoir routing). Graphic or numerical methods are used.

Floodwater Retarding Structure A dam, usually with an earth fill, having a flood pool where incoming floodwater is temporarily stored and slowly released downstream through a principal spillway. The reservoir contains a sediment pool and sometimes storage for irrigation or other purposes.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Flow-Control Structure A structure, either within or outside a channel, that acts as a countermeasure by controlling the direction, depth, or velocity of flowing water.

Flow Concentration A preponderance of the streamflow.

Flow Distribution The estimated or measured spatial distribution of the total streamflow.

Flume An open or closed channel used to convey water.

Ford A location where a highway crosses a river or wash by allowing flow over the highway. Often with cut-off walls and markers.

Freeboard The vertical distance between the level of the water surface, usually corresponding to design flow and a point of interest such as a low chord of a bridge beam or specific location on the roadway grade.

Freeboard Hydrograph The hydrograph used to establish the minimum elevation of the top of the dam.

Free Outlet Those outlets whose tailwater is equal to or lower than critical depth. For culverts having free outlets, lowering of the tailwater has no effect on the discharge or the backwater profile upstream of the tailwater.

Frequency In analysis of hydrologic data, the recurrence interval is simply called frequency.

Froude Number A dimensionless number that represents the ratio of inertial forces to gravitational forces. High froude numbers are indicative of high flow velocity and high potential for scour.

Frontal Flow The portion of flow which passes over the upstream side of a grate.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Functional Values Characteristics of surface water and wetlands. These include terrestrial and aquatic wildlife habitat, flood control, ground-water recharge, aesthetics, shore and bank line geometry, and water quality.

g The acceleration of gravity, ft/s^2 .

Gabion A rectangular basket made of steel wire fabric or mesh which is filled with rock of suitable size. Used to construct flow-control structures, bank protection, groins, and jetties.

General Scour Scour involving the removal of material from the bed and banks across or most of the width of a channel and is not localized at an element such as a pier, abutment or other obstruction to flow. Also termed contraction scour.

Graded Filter An aggregate filter which is proportioned by particle size to allow water to pass through at a specified rate while preventing migration of fine-grained soil particles without clogging.

Grate Inlet Drainage inlet composed of a grate in the roadway section or at the roadside in a low point, swale, or ditch.

Groin A structure in the form of a barrier placed oblique to the primary motion of water, designed to control movement of bed load. Groins are usually solid, although they may be constructed with openings to control elevations of sediments.

Groundwater Subsurface water occupying the saturation zone, from which wells and springs are fed. A source of base flow in streams. In a strict sense the term applies only to water below the water table. Also called phreatic water.

Guide Banks Embankments built upstream from one or both abutments of a bridge to guide the approaching flow through the waterway opening.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

- Gutter** That portion of the roadway section adjacent to the curb which is utilized to convey storm runoff water.
- H** Total energy head loss, ft.
- H_E** Entrance head loss, ft.
- Head** The height of water above any datum.
- Head Cutting** Channel degradation associated with abrupt changes in the bed elevation (headcut), that migrates in an upstream direction.
- Headloss** A loss of energy in a hydraulic system.
- Headwall** The structural appurtenance usually applied to the end of a culvert to control an adjacent highway embankment and protect the culvert end.
- Headwater, H_w** That depth of water impounded upstream of a culvert due to the influence of the culvert constriction, friction, and configuration.
- Height of Embankment** The distance, in feet, measured from the natural bed of the stream, or watercourse, at the downstream toe of the barrier, to the low point in the top of the dam.
- H_f** The friction headloss, ft.
- Highwater Elevation** The water surface elevation that results from the passage of flow. It may be "observed highwater elevation" as a result of an event, or "calculated highwater elevation" as part of a design process.
- Historical Flood** A past flood event of known or estimated magnitude.
- h_o** The height of the hydraulic grade line above the outlet invert, ft.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Hydraulic Grade A profile of the piezometric level to which the water would rise in piezometer Line tubes along a pipe run. In open channel flow, it is the water surface.

Hydraulic Gradient The slope of the hydraulic grade line.

Hydraulic Head The height of the free surface of a body of water above a given point.

Hydraulic Jump A hydraulic phenomenon, in open channel flow, whereby supercritical flow is converted to subcritical flow. This can result in an abrupt rise in the water surface.

Hydraulic Radius A measure of the boundary resistance to flow, computed as the quotient of cross-sectional area of flow divided by the wetted perimeter. For wide shallow flow, the hydraulic radius can be approximated by the average depth.

Hydraulic Roughness Is a composite of the physical characteristics which influence the flow of water across the earth's surface, whether natural or channelized. It affects both the time response of a watershed and drainage channel as well as the channel storage characteristics.

Hydraulics The characteristics of fluid mechanics involved with the flow of water in or through drainage facilities.

Hydrograph A graph showing, for a given point on a stream or for a given point in any drainage system, the discharge, stage, velocity or other property of water with respect to time.

Hydrologic Soil-Cover Complex A combination of a hydrologic soil group and a type of cover.

Hydrologic Soil Group A group of soils having the same runoff potential under similar storm and cover conditions.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Hydrology The study of the occurrence, circulation, distribution, and properties of the waters of the earth and its atmosphere.

Hyetograph A graphical representation of average rainfall, rainfall-excess rates or volumes over specified areas during successive units of time during a storm.

Impermeable Strata A strata in which texture is such that water cannot move perceptibly through it under pressures ordinarily found in subsurface water.

Impervious Impermeable to the movement of water.

Improved Inlet Flared, depressed or tapered culvert inlets which decrease the amount of energy needed to pass the flow through the inlet and thus increase the capacity of culverts.

Infiltration That part of rainfall that enters the soil. The passage of water through the soil surface into the ground. Used interchangeably herein with the word: percolation.

Infiltration Rate The rate at which water enters the soil under a given condition. The rate is usually expressed in inches per hour, feet per day, or cubic feet per second.

Inflow The rate of discharge arriving at a point (in a stream, structure, or reservoir).

Initial Abstraction (Ia) When considering surface runoff, Ia is all the rainfall before runoff begins. When considering direct runoff, Ia consists of interception, evaporation, and the soil-water storage that must be exhausted before direct runoff may begin. Sometimes called "initial loss."

Inlet A structure for capturing concentrated surface flow. May be located along the roadway, in a gutter, in the highway median, or in a field.

DRAINAGE GUIDANCE MANUAL
APPENDIX C - GLOSSARY

Inlet Channel(of an open channel spillway) The channel up-stream from the control section.

Inlet Efficiency The ratio of flow intercepted by an inlet to the total flow.

Inlet Time The time required for stormwater to flow from the most distant point in a drainage area to the point at which it enters a storm drain.

Intensity The rate of rainfall upon a watershed, usually expressed in inches per hour.

Interception Precipitation retained on plant or plant residue surfaces and finally absorbed, evaporated, or sublimated. That which flows down the plant to the ground is called "stemflow" and not counted as true interception.

Invert The flow line in a channel cross-section, pipe, or culvert.

Inverted Siphon A structure used to convey water under a road using pressure flow. The hydraulic grade line is above the crown of the structure.

Isohyet A line on a map, connecting points of equal rainfall amounts.

Jetty An elongated obstruction projecting into a stream to control shoaling and scour by deflection of currents and waves. They may be permeable or impermeable.

Lag Time, T_L The difference in time between the centroid of the excess rainfall (that rainfall producing runoff) and the peak of the runoff hydrograph. Often estimated as 60 percent of the time of concentration ($T_L = 0.6T_c$)

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Land Use A land classification. Cover, such as row crops or pasture, indicates a kind of land use. Roads may also be classified as a separate land use.

Levee A linear embankment outside a channel for containment of flow.

Local Scour Scour in a channel or on a flood plain that is localized at a pier, abutment or other obstruction to flow. The scour is caused by the acceleration of the flow and the development of a vortex system induced by the obstruction to the flow.

Manhole A structure by which one may access a drainage system.

Manning's "n" A coefficient of roughness, used in a formula for estimating the capacity of a channel to convey water. Generally, "n" values are determined by inspection of the channel.

Mass Inflow Curve A graph showing the total cumulative volume of stormwater runoff plotted against time for a given drainage area.

Maximum Possible High Water The maximum elevation of the water surface that might be attained either above or below the structure, which may be attributed to the structure.

Maximum Probable Flood The maximum probable flood is the greatest flood that may reasonably be expected, taking into collective account the most adverse flood related conditions based on geographic location, meteorology, and terrain.

Mean Daily Discharge The average of mean discharge of a stream for one day. Usually given in cfs.

Meanders The changes in direction and winding of flow which are sinuous in character.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Migration, Channel Change in position of a channel by lateral erosion of one bank and simultaneous accretion of the opposite bank.

Natural Scour Scour which occurs along a channel reach due to an unstable stream, no exterior causes.

Normal Stage The water stage prevailing during the greater part of the years.

One-Dimensional Water Surface Profile An estimated water surface profile which accommodates flow only in the upstream-downstream direction.

Ordinary High Water The line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Outfall The point location or structure where drainage discharges from a channel, conduit or drain.

Overland Flow Runoff which makes its way to the watershed outlet without concentrating in gullies and streams (often in the form of sheet flow).

Partial-Duration Series A list of all events, such as floods, occurring above a selected base, without regard to the number, within a given period. In the case of floods, the selected base is usually equal to the smallest annual flood, in order to include at least one flood in each year.

Peak Discharge Maximum discharge rate on a runoff hydrograph.

Percolation The movement or flow of water through the interstices or the pores of a soil or other porous medium. Used interchangeably herein with the word "infiltration."

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Permeability The property of a material that permits appreciable movement of water through it when it is saturated and movement is actuated by hydrostatic pressure of the magnitude normally encountered in natural subsurface water.

Perennial Stream A stream or reach of a stream that flows continuously for all or most of the year.

Pervious Soil Soil containing voids through which water will move under hydrostatic pressure.

pH The reciprocal of the logarithm of the Hydrogen ion concentration. The concentration is the weight of hydrogen ions, in grams, per liter of solution. Neutral water has a pH value of 7.

Point Rainfall Rainfall at a single rain gage.

Precipitation The process by which water in liquid or solid state falls from the atmosphere.

Principal Spillway Conveys all ordinary discharges coming into a reservoir and all of an extreme discharge that does not pass through the emergency spillway. The ungated spillway designed to convey the water from the retarding pool at release rates established for the structure.

Principal Spillway Hydrograph The hydrograph used to determine the minimum crest elevation of the emergency spillway. It is used to establish the principal spillway capacity and determine the associated minimum floodwater retarding storage.

Ramp Spillway A vegetated spillway constructed over an earth dam. The spillway is a part of the embankment.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Rainfall Excess The water available to runoff after interception, depression storage, and infiltration have been satisfied.

Rainfall Intensity Amount of rainfall occurring in a unit of time, converted to its equivalent in inches per hour at the same rate.

Rating Curve A graphical plot relating stage to discharge.

Reach A length of stream or valley, selected for purpose of study.

Recession Curve The receding portion of a hydrograph, occurring after excess rainfall has stopped.

Recharge Addition of water to the zone of saturation from precipitation or infiltration.

Recharge Basin A basin excavated in the earth to receive the discharge from streams or storm drains for the purpose of replenishing groundwater supply.

Regional Analysis A regional study of gaged watersheds which produce regression equations relating various watershed and climatological parameters to discharge. Use for design of ungaged watershed with similar characteristics.

Regulatory Flood Means the 100-year flood, which was adopted by the Federal Emergency Management Agency (FEMA), as the base flood for flood plain management purposes.

Regulatory Floodway The floodplain area that is reserved in an open manner by Federal, State, or local requirements, i.e., unconfined or unobstructed either horizontally or vertically, to provide for the discharge of the base flood so that the cumulative increase in water surface elevation is no more than a designated amount.

Reservoir Routing Flood routing of a hydrograph through a reservoir.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Retard A structure designed to decrease velocity and induce silting or accretion. Retard type structures are permeable structures customarily constructed at and parallel to the toe of slope.

Retarding Pool The portion of the reservoir allotted to the temporary impoundment of floodwater. Its upper limit is the elevation of the crest of the emergency spillway.

Retarding Storage The volume in the retarding pool.

Retention Basin A basin or reservoir wherein water is stored for regulating a flood. It does not have an uncontrolled outlet. The stored water is disposed by a means such as infiltration, injection (or dry) wells, or by release to the downstream drainage system after the storm event. The release may be through a gate-controlled gravity system or by pumping.

Revetment A rigid or flexible armor placed on a bank or embankment as protection against scour and lateral erosion.

Riprap Stones placed in a loose assemblage along the banks and bed of a channel to inhibit erosion and scour.

Roadway Cross-Slopes Transverse slopes and/or superelevation described by the roadway section geometry. Usually provided to facilitate drainage and/or resist centrifugal force.

Rock Spillway An open channel spillway through competent, non-erodible, natural rock materials.

Roughness The estimated measure of texture at the perimeters of channels and conduits. Usually represented by the "n-value" coefficient used in Manning's channel flow equation.

Runoff That part of the precipitation which runs off the surface of a drainage area after all abstractions are accounted for.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Runoff Coefficient A factor representing the portion of runoff resulting from a unit rainfall. Dependent on terrain and topography.

Saturated Soil Soil that has its interstices or void spaces filled with water to the point at which runoff occurs.

Scour The result of the erosive action of running water, excavating and carrying away material from the bed and banks of streams.

Scupper A vertical hole through a bridge deck for the purpose of deck drainage. Sometimes a horizontal opening in the curb or barrier is called a scupper.

Sediment Pool The reservoir space allotted to the accumulation of submerged sediment during the life of the structure.

Sediment Pool Elevation The elevation of the surface of the anticipated sediment accumulation at the dam.

Sediment Storage The volume allocated to total sediment accumulation.

Sedimentation The process involving the deposition of soil particles which have been carried by flood waters.

Sedimentation Basin A basin or tank in which stormwater containing settleable solids is retained to remove by gravity or filtration a part of the suspended matter.

Skew A measure of the angle of intersection between a line normal to the roadway centerline and the direction of the streamflow at flood stage on the lineal direction of the main channel.

Skewness When data are plotted in a curve on log-normal paper, the curvature is skewness.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Slotted Drain Inlets Drainage inlets composed of a continuous slot built into the top of a pipe which serves to intercept, collect and transport the flow.

Soffit The inside top of the culvert or storm drain pipe.

Soil Porosity The percentage of the soil (or rock) volume that is not occupied by solid particles, including all pore space filled with air and water.

Soil-Water-Storage The amount of water the soils (including geologic formations) of a watershed will store at a given time. Amounts vary from watershed to watershed. The amount for a given watershed is continually varying as rainfall or evapotranspiration takes place.

Spillway An open or closed channel used to convey water from a reservoir. It may contain gates, either manually or automatically controlled, to regulate the discharge of water.

Splash-Over That portion of frontal flow at a grate which splashes over the grate and is not intercepted.

Spread The accumulated flow in and next to the roadway gutter. This water often represents an interruption to traffic flow during rainstorms. The lateral distance, in feet, of roadway ponding from the curb.

Spur A structure, permeable or impermeable, projecting into a channel from the bank for the purpose of altering flow direction, inducing deposition, or reducing flow velocity along the bank.

Spur Dike A dike placed at an angle to the roadway for the purpose of shifting the erosion characteristics of stream flow away from a drainage structure. Often used at bridge abutments.

Stage Height of water surface above a specified datum.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Stage-Discharge Relationship Sometimes referred to as the Rating Curve of a stream cross-section. A correlation between stream flow rates and corresponding water surface elevations.

Stilling Basin An energy dissipator placed at the outlet of a structure.

Storage The capacity of the reservoir below the elevation of the crest of the emergency spillway.

Storage-Indication Method A flood-routing method, also often called the modified Puls method.

Storm Drain The water conveyance elements (laterals, trunks, pipes) of a storm drainage system. Extend from inlets to an outlet.

Storm Duration The period or length of storm.

Stream Contraction/Constriction A narrowing of the natural stream waterway. Usually in reference to a drainage facility installed in the roadway embankment.

Stream Reach A length of stream channel selected for use in hydraulic or other computations.

Submerged Inlets Inlets of culverts having a headwater greater than about 1.2 D.

Submerged Outlets Submerged outlets are those culvert outlets having a tailwater elevation greater than the soffit of the culvert.

Superflood Flood used to evaluate the effects of a rare flow event; a flow exceeding the 100-year flood. It is recommended that the superflood be on the order of the 500-year event or a flood 1.7 times the magnitude of the 100-year flood if the magnitude of the 500-year flood is not known.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Surface Runoff Total rainfall minus interception, evaporation, infiltration, and surface storage, and which moves across the ground surface to a stream or depression.

Surface Storage Stormwater that is contained in surface depressions or basins.

Surface Water Water appearing on the surface in a diffused state, with no permanent source of supply or regular course for a considerable time; as distinguished from water appearing in water courses, lakes, or ponds.

Synthetic Hydrograph A hydrograph determined from empirical rules. Usually based on the physical characteristics of the basin.

Swale A slight depression in the ground surface where water collects.

Synthetic Hydrograph A graph developed for an ungaged drainage area, based on known physical characteristics of the watershed basin.

Tailwater, TW The depth of flow in the stream directly downstream of a drainage facility. Often calculated for the discharge flowing in the natural stream without the highway constriction. Term is usually used in culvert design and is the depth measured from the downstream flow line of the culvert to the water surface.

Thalweg The line connecting the lowest flow points along the bed of a channel. The line does not include local depressions.

Time Of Concentration, T_c The time it takes water from the most distant point (hydraulically) to reach a watershed outlet. T_c varies, but often used as constant.

Trash Rack A device used to capture debris, either floating, suspended, or rolling along the bed, before it enters a drainage facility.

DRAINAGE GUIDANCE MANUAL

APPENDIX C - GLOSSARY

Travel Time The average time for water to flow through a reach or other stream or valley length.

Tributaries Branches of the watershed stream system.

Uncontrolled Spillway A facility at a reservoir at which flood water discharge is governed only by the inflow and resulting head in the reservoir. Usually the emergency spillway is uncontrolled.

Ungaged Stream Sites Locations at which no systematic records are available regarding actual stream-flows.

Uniform Flow Flow of constant cross-section and average velocity through a reach of channel during an interval of time.

Unit Hydrograph A hydrograph of a direct runoff resulting from 1 inch of effective rainfall generated uniformly over the watershed area during a specified period of time or duration.

Unsteady Flow Flow of variable cross-section and average velocity through a reach of channel during an interval of time.

Vegetated Spillway A vegetated open channel spillway in earth materials.

Watercourse A channel in which a flow of water occurs, either continuously or intermittently, with some degree of regularity.

Watershed The catchment area for rainfall which is delineated as the drainage area producing runoff. Usually it is assumed that base flow in a stream also comes from the same area.

Water Table The upper surface of the zone of saturation, except where that surface is formed by an impermeable body (perched water table).

Weir Flow Free surface flow over a control surface which has a defined discharge vs. depth relationship.

DRAINAGE GUIDANCE MANUAL
APPENDIX C - GLOSSARY

Wells Shallow to deep vertical excavations, generally with perforated or slotted pipe backfilled with selected aggregate. The bottom of the excavation terminates in pervious strata above the water table.

Wet Well Sump The feature in a pump station in which runoff waters are temporarily stored.

Wetted Perimeter The boundary over which water flows in a channel, or culvert, taken normal to flow.
