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DESIGN MANUAL **ABBREVIATIONS & TERMINOLOGY**

ABBREVIATIONS

- AASHTO** – American Association of State Highway and Transportation Officials
Ac. - Acre
ACI – American Concrete Institute
ACP - Asbestos Cement Pipe
ADA – Americans With Disabilities Act
ADAAG – Americans with Disabilities Act Accessibility Guidelines
A.D.T. – **Average Daily Traffic**
A.I.S.C. – American Institute of Steel Construction
Alt. – Alternate
ANSI - American National Standards Institute
A.S.H.R.A.E. –American Society of Heating, Refrigeration & Air-Conditioning Engineers
A.S.L.A. – American Society of Landscape Architects
A.S.M.E. – American Society of Mechanical Engineers
A.S.T.M. – American Society for Testing and Materials
A.T.S.S.A. – American Traffic Safety Services Association, publishers of MUTCD
AT&T – American Telephone & Telegraph – Parent Company of Bell System since 19th century, included Bell Labs (transistor) and Western Electric; exclusively providing telephone service until Department of Justice order breaks up company in January, 1984. Company reinvented as long distance provider and cellular provider.
A.W.W.A. – American Water Works Association
- B&O** – Obsolete (in 1987) designation for Baltimore and Ohio Railroad, now CSX Corporation. B&O occurs as part of rolling stock markings on CSX-owned engines and cars.
B/L – Base Line
BCBEC – Baltimore County Bureau of Engineering and Construction
BCCMP (or **BCCMPA**) – Bituminous Coated Corrugated Metal Pipe (or pipe arch)
BCD – Baltimore County Datum
BCMD – Baltimore County Metropolitan District Grid System
Beg. – Beginning
BGE - Baltimore Gas and Electric Company, a private corporation providing natural gas and electrical power distribution to Baltimore County and vicinity. Electrical service may be provided by either overhead wire or underground conduit. Now a part of Constellation Energy.
Bit. – Bituminous
B.M. - **Benchmark**
- C&P** – Chesapeake and Potomac, later known as Bell Atlantic, was the local part of Bell System before 1984 diversification and the coming of Verizon to Maryland.
C/L – Center Line
CAD – Computer-aided Drafting. Also see **CADD**
CADD – Computer Aided Design and Drafting
c.f.s. – Cubic Feet per Second
CIP – Cast Iron Pipe
C.I.S.P.X. – Cast Iron Soil Pipe (Extra Strength)
CMP – Corrugated Metal Pipe
COMAR – Code of Maryland Regulations
Comb. – Combination
Comcast – Comcast Cablevision, a franchised cable TV provider in Baltimore County, now diversified into providing land line phone service and internet as well as cable TV via utility lines, either underground or on existing utility poles.
Conc. – Concrete
Conn. – Connection or Connector
Constr. - Construction
C.P. – Center Point

CRSI – Concrete Reinforcing Steel Institute
C.Y. – Cubic Yards

DEPRM – Baltimore County Department of Environmental Protection and Resource Management
D.H.V. – **Design Hourly Volume**
Dia. - Diameter
DIP – Ductile Iron Pipe

Ea. – Each
E.B.R. – East Bound Roadway
Elev. – Elevation
Engr. – Engineer
Entr. – Entrance
Est. – Estimate, Estimated
Excav. – Excavation
Exist. – Existing

FEMA – Federal Emergency Management Agency
FIRM – Flood Insurance Rate Map, prepared for Baltimore County by **FEMA**
FHWA – Federal Highway Administration
F.P.S. – Feet Per Second
Ft. – Feet

Ga. – Gauge
Gal. – Gallons
GDBF – AASHTO’s publication, “**Guide for the Development of Bicycle Facilities**”
G.I. – Galvanized Iron
GIS – Geographic Information System
GPAD - Gallons Per Acre Per Day
GPCD - Gallons Per Capita Per Day
GPM - Gallons Per Minute
GPS – Global Positioning System

H-20 – Truck loading standard for highways
HS-20 – Truck loading standard for highways
HS-27 – Truck loading standard for highways (current)
HDPE – High density polyethylene
HERCCP – Horizontal Elliptical Reinforced Cement Concrete Pipe
Horiz. – Horizontal
Hr. – Hour

IES – Illuminating Engineers Society
In. - Inch
Inv. – **Invert**
ITE – Institute of Transportation Engineers

Lbs. - Pounds
L.F. – Linear Feet
L.S. – Lump Sum
Lt. – Left

Ma & Pa – Affectionate abbreviation for Maryland and Pennsylvania Railroad that operated between Baltimore and York, passing through both Towson and Bel Air, from 1901 through 1958 when the Maryland Division was abandoned. Pennsylvania Division continued into the 1980’s. This was the scenic route rather than the direct route to York.
MARC – **Maryland Area Regional Commuter** - Maryland Transit Administration division that operates commuter trains along freight railroad trackage in Maryland. **MARC** currently serves

Baltimore and Washington DC via both Northeast Corridor Penn Line (from Perryville) and CSX tracks.

Max. – Maximum

MCS – Maryland Coordinate System, North American Datum 1983 (1991 [or later])

M.D. – Minimum Depth

MDE – Maryland Department of Environment

MDOT – Maryland Department of Transportation

MdSHA, MSHA – Maryland State Highway Administration

MGD – Million gallons per day

MH – Manhole

Mi. – Mile

Min. – Minimum

Mod. – Modified

Mon. – Monument

MOSHA – Maryland Occupational Safety and Health Administration

MTA – **Maryland Transit Administration**, the part of **MDOT** responsible for providing public transportation in Maryland, via bus service, light rail, subway and **MARC** trains. As the Metropolitan Transit Authority, it took over the Baltimore Transit Company bus operations on April 30, 1970. Has since converted radial bus lines following old street car routes running out from central Baltimore to feeder lines that service the Metro subway and the light rail corridors. Agency emphasis has gone from 100 percent bus service to a synergistic combination of bus and rail service to Baltimore City and County.

M.U.T.C.D. – Federal Highway Administration publication, *Manual on Uniform Traffic Control Devices*. Definitive reference for use of street signs and signals.

NAVD 88 – North American Vertical Datum of 1988

N.B.R. – North Bound Roadway

NCRR – Obsolete Designation for Northern Central Railroad. This right-of-way from the Baltimore City line to Cockeysville is now owned and maintained by the Maryland Transit Administration for the Light Rail system. The remainder is now a trail system.

NEC – National Electrical Code

NESC – National Electrical Safety Code – Standards for placement of overhead and underground electrical and communications lines.

N.G.S. – National Geodetic Survey

No. - Number

NRCS – National Resource Conservation Service

OSHA – Occupational Safety and Health Administration

PADM – Baltimore County Department of Permits and Development Management

P.C., P.T. – Point of Curvature, Point of tangency – respectively, the beginning and ending points of a horizontal curve

P.C.C. – Point of compound curvature, point at which one horizontal curve meets a second curve

P.C.C.P. – Prestressed Concrete Cylinder Pipe

PCRR – Obsolete designation for the Penn Central Railroad, which absorbed assets of the Pennsylvania Railroad (**PRR**) in 1967; itself absorbed into Conrail in 1976.

P.I. – The Point of Intersection of two tangents, usually for the placement of a curve (horizontal or vertical) between those tangents.

P.O.C. – Point on Curve

P.O.T. – Point on Tangent

P.R.C. – Point of Reverse Curvature

Prop. – Proposed

PRR – Obsolete designation for the Pennsylvania Railroad, absorbed into Penn Central (**PCRR**) in 1967 and Conrail in 1976. Operated electrified freight and passenger service along Northeast Corridor. Had an ownership interest in Northern Central Railroad in northern Baltimore County. PRR Abbreviation appears as car marking on contemporary Norfolk Southern (owner since 1999) rolling stock as tribute to old PRR.

PSI – Pounds per square inch
PVC – Polyvinyl Chloride
P.V.C., P.V.I., P.V.T., P.V.R.C., P.V.C.C. – Point of Vertical Curve, Point of Vertical Intersection, Point of Vertical Tangent, Point of Vertical Reverse Curve, Point of Vertical Compound Curve
Pvmt. – Pavement

R.C.C. – Reinforced Cement Concrete
R.C.C.P. – Reinforced Cement Concrete Pipe
R.C.P. – Reinforced Concrete Pipe
R.C.S.P. – Reinforced Concrete Sewer Pipe
Rd. – Road
Reinf. – Reinforced
Reloc. – Relocated
Req'd. – Required
Rev. – Revised, Revision
Rt. – Right
Rte. – Route
R/W – Right-of-Way
R.R., Rwy., Ry. – Railroad

S.B.R. – South Bound Roadway
SCS – See **NRCS**
S.D.D. – Surface Drain Ditch
Sect. – Section
S.F. – Square feet
SHA - State Highway Administration – see MdSHA
St. – Street
Sta. – Station
Std. – Standard
Str., Struc., Struct. - Structure
S.E. – Superelevation
Surf. - Surface
Surv. – Survey
S.Y. – Square Yards

Tc – Time of Concentration (Hydrology)
Temp. – Temporary
T.P. – Turning Point
Trans. – Transition
Trav. – Traverse
Typ. – Typical

Ult. – Ultimate

UR&E – United Railway and Electric operated a consolidated Baltimore City (and County) streetcar, bus and trackless trolley system from 1899 to 1935, when the company was reformed into the Baltimore Transit Company, which steadily converted the street transport system into a bus-only operation. In-street trackage was abandoned, but still appears when main streets are repaired. Off-road tracks were removed and right-of-way frequently turned into trails in recent years, as done in Oella with the Ellicott City tracks from Edmondson Avenue. Company was also responsible for development of amusement parks at Gwynn Oak and at Bay Shore Park in the County as attractions for summer riders.

URDL – Baltimore County Urban – Rural Demarcation Line, established by the Office of Planning.

U.S.C.&G.S. – United States Coast & Geodetic Survey, now National Geodetic Survey

USGS - United States Geological Survey

V, Vel. – Velocity

Var. – Variable, varies
VCP – Vitreous Clay Pipe
VCPX – Vitreous Clay Pipe, Extra Strength
V.D. – Vertical Depth
Vert. - Vertical
V.P.D. – Vehicles per Day

W.B.R. – West Bound Roadway

W.I. – Wrought Iron

WM or **WMRR** – Obsolete designation (since 1987) for Western Maryland Railroad, now part of CSX Corporation.

TERMINOLOGY

Abutment – End support for a bridge, located on the bank of the crossing. The abutment is usually capable of supporting both horizontal and vertical forces.

Acre-Foot – Unit of measure of stormwater storage volume. One Acre-foot will cover one acre to a depth of 1 foot. An acre – foot contains 43,560 cubic feet.

Aggregate –

Dense Graded – Well-graded aggregate so proportioned that it contains a relatively small percentage of voids.

Open Graded - Well-graded aggregate containing little or no fines, with a relatively large percentage of voids.

Well-Graded – Aggregate possessing a proportionate distribution of successive particle sizes

Air Release Valve – A device for releasing air that collects at peaks in long runs of water mains, sewer force mains and pressure sewers.

Alignment – Location of the center-line of a survey

Alley – An established passageway for vehicles and pedestrians that affords a secondary means of access to properties abutting a street or highway, usually from the rear.

Allowable Headwater – The difference in elevation between the flowline of the culvert and the elevation of the lowest point at which a stream would either flood a crossing roadway or jeopardize adjacent property; usually of concern during analysis of bridges and culverts. Regulatory standards exist for increases to headwater for placement of a new bridge or culvert crossing.

AMTRAK - National Railroad Passenger Corporation, doing business as **Amtrak**, is a government-owned corporation that was organized on May 1, 1971 to provide inter-city passenger train service within the United States. Owns the Northeast Corridor that passes through Baltimore County, paralleling Interstate 95. Provides high speed rail passenger service between Washington D.C. and Boston on dedicated high speed electrified trackage along the Northeast Corridor.

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

Approach Channel – The reach of channel upstream of a dam, bridge constriction, culvert or other structure.

Approach Nose – An end of an island, or area between diverging roadways, which faces approaching traffic passing to one or both sides

Apron – A floor lining, usually of concrete, that protects a surface from erosion. Aprons are used below chutes, spillways, and at the outlets of culverts. Also optionally used around yard inlets.

Approval – Specific examination and acceptance by a duly authorized representative of a Baltimore County review agency. For Public Works projects, this authority resides with the Director of Public Works and his representatives.

Aquifer – A porous, water bearing underground geologic formation

Arterial – Street or highway primarily for through traffic, usually on a continuous route. May be divided by median or not, with crossroads at grade. Some crossroads may be terminated or limited to right turns.

As-Built Survey – Post-construction surveys taken to confirm design execution and record revisions.

Asphalt – A dark brown to black cementitious material, solid or semi-solid in consistency, in which the major constituents are bitumens, occurring either in nature or as a byproduct of refining petroleum. Used with graded aggregate to produce flexible (asphalt) paving.

Average Daily Traffic (A.D.T.) – Average 24-hour volume of traffic, being the total volume during a stated period divided by the number of days in that period, normally a year unless otherwise stated.

Axle Load – Total load transmitted by all wheels, the centers of which may be included between two parallel transverse vertical planes 40 inches apart, extending across the full width of the vehicle.

Azimuth – The angle to a line of sight, measured clockwise from a north (or south) meridian.

Backfill – Operation of refilling an excavated area; the material placed in an excavation in the process of backfilling

Backflow – Condition in which tailwater or back pressure becomes high enough (or has enough flow energy) to reverse the direction of flow in a conduit. Often occurs in drain systems in tidal areas.

Backflow Preventer – Device installed in potable water lines to prevent the flow of non-potable water into a potable system.

Backwater – The increased water surface elevation upstream of a downstream constriction in a channel or pipe. Also see **headwater**.

Baffle – A vane, wall, guide or similar device placed within flowing water to absorb energy, redistribute velocities, or divert/guide the flow.

Base Flood Elevation – Elevation of the 100-year frequency flood event as indicated in the FEMA flood insurance study or as established by the Baltimore County Department of Public Works.

Base flow – Stream discharge derived from ground water sources.

Baseline – A line of reference for survey work. May be arbitrary or coincide with Center Line of Construction or of Right-of-Way.

Basin, Stilling – see **Stilling Basin**

Batter Boards – Horizontal cross pieces on grade stakes that are set to reference elevations during construction.

Beam – A structural member experiencing loads applied transverse to its long dimension, causing the member to flex.

Bearing – Direction of a line given by an acute angle from a meridian and accompanied by a cardinal compass direction. Example: N32°31'23"E

Bed Load – Silt, sand gravel or other detritus rolled along the bed of a stream, often expressed as weight or volume per unit time.

Bench Mark – A fixed, solid reference point with a precisely determined, published elevation.

Berm – A horizontal strip or shelf built into a slope or embankment to break the continuity of the slope and thereby redirect stormwater runoff. Also used to denote a type of asphalt curb (bituminous berm).

Bernoulli's Law – from Principle of Conservation of Energy. For a non-viscous, incompressible fluid such as water in steady flow, at points 1 and 2,

$$(V_1^2/2g + P_1/\gamma + z_1) = (V_2^2/2g + P_2/\gamma + z_2)$$

where $V^2/2g$ is **Velocity Head**, P/γ is **Pressure Head** and z is elevation. In non-pressure gravity systems such as drains and sewers, the pressure term $P_1 = P_2 = 0$.

Bikeway – Area reserved primarily for bicycle travel.

Class I Bikeway – (Bike Path) – Provides a completely separated right-of-way for exclusive use of bicycles and pedestrians with motorized crossflow minimized. May be used to connect two Class II or III bikeway segments or to avoid a barrier such as a water crossing.

Class II Bikeway – (Bike Lane) - Provides a striped lane for one-way bike travel on a street or highway.

Class III Bikeway – (Bike Route) – Provides for shared use with pedestrian and motor vehicle traffic.

Designation of bikeways as Class I, II, or III does not indicate a hierarchy where one class is "better" than another. Each class has appropriate applications for the context in which it is used.

Binder Course – Plant mix of graded **aggregate** (generally **open-graded**) and bituminous material that constitutes the lower layer of the surface course.

Blow-Off – A pressure release device located at the end of a dead end water main in lieu of a fire hydrant. Opened to allow periodic high velocity flow to flush line of sediment and debris.

Boring – Subsurface investigation involving removal of material for examination to determine bearing strength (# of blows), water content, stratification and types of soils and rock encountered.

Borrow – Suitable material imported from sources (**Borrow Pit**) outside of the immediate project area.

Bridge – A structure erected over a watercourse, depression or obstacle. A bridge consists of supporting **abutments** at each stream bank that support the bridge structure. A bridge may have more than one **span**, each separated by supporting **piers**.

Buttress – A poured concrete structure that distributes to native soil those forces that occur at bends and termini in pressure pipes.

Capacity – Measure of the maximum ability of a conduit to convey water or of a highway to convey traffic; for water in a circular section pipe, the maximum capacity occurs at a depth of approximately 0.93 times diameter.

Cast Iron – A brittle iron, carbon (2 to 4%) and silicon alloy with a low melting point that flows well with the ability to be poured into intricate molds. **Gray (cast) iron** is named for the color of its

fracture. Gray iron is used in pipe, inlet grates & frames, manhole frames & covers and related small castings.

Causeway – A bridge or raised way across marshy land or a body of water, constructed as either an earth fill or a bridge structure.

Cell, Storm – Area of heavily localized rainfall within a storm

Channel – An elongated open depression with defined bed and banks in which water may flow and be confined thereto. May be natural or man-made; with periodic or continuous flow. May form a connecting link between two bodies of moving water.

Check Dam – A small, shallow dam in an open channel used to slow water flow velocity to prevent erosion.

Chessie System – holding company created 2-26-73 for Chesapeake and Ohio, B&O and Western Maryland Railroads and was in turn merged into CSX with Seaboard Coast Line 11-1-80. Individual railroads owned equipment, resulting in reporting marks on rolling stock reflecting the owner as WM, B&O or C&O.

Clean-out – Capped vertical pipe allowing access to sanitary **house connection** near property line so that County maintenance can clear blockages in connection to **collector**.

Clear Zone – The traversable distance from the traveled way to the nearest obstruction available for safe use by errant vehicles.

Closed Conduit – Culvert or pipe, as opposed to an open channel.

Closed Section – A street or highway typical section using curb and gutter.

Collector Street – carries traffic between minor streets and major systems of **arterial** roads and **freeways**.

Column – A relatively long and slender structural member that is subject to lateral deflection under axial loading.

Conrail – Consolidated Rail Corporation, formed by Federal government April 1, 1976 to operate Penn Central and 5 other failed railroads. Deregulated in 1980 under Staggers Act; went private successfully in 1987 and purchased jointly by CSX and Norfolk-Southern railroads in 1999, who split up Conrail into their own operations, except for those shared operations that remain under the Conrail name.

Context-Sensitive Design – Design approach for transportation projects that considers these projects as more than transportation, integrating the project with community needs for an integrated transportation system that incorporates pedestrian, bicycle, automobile and mass transit aspects. See **General Instructions** Section IB.

Continuity Equation – From the Principle of Conservation of Mass, for incompressible fluid flow, at points 1 and 2,

$$Q = A_1V_1 = A_2V_2$$

where Q is discharge in cfs, V is flow velocity in feet per second and A is cross-sectional area in square feet. Regardless of change in cross-sectional area, flow is constant and V is inversely proportional to A at any point along the conduit.

Contour – A line on a map joining points having the same elevation.

Coordinates – Distances measured north and east of an origin point having zero or defined values. Coordinates are typically represented as Northings and Eastings.

Corps – U.S. Army Corps of Engineers

County – Baltimore County, Maryland, a body corporate and politic.

County Road – Any **public** road in Baltimore County, excluding State roads, title for which, or easement for the use of which, is vested in Baltimore County by grant, condemnation, dedication or operation by law.

Crack – A fissure or open seam that may or may not extend entirely through a solid body

Cradle – A **footing** structure shaped to fit the conduit it supports.

Crest – The top of a **dam, dike, spillway** or **weir**, to which water must rise before passing over the structure. Also, the summit of a wave or peak of a flood.

Critical Depth – Depth at which open channel flow has minimal energy.

Cross-section – Profile view taken perpendicular to a **baseline**.

Crown – Uppermost point of a road; uppermost point of the interior of a pipe in cross-section.

Cul-De-Sac – Minor street with only one outlet, with a paved circular turn-around area at the closed end.

Culvert – A closed conduit that provides passage for surface water under a road, other than a bridge. Usually has a large ratio of length to width.

Curb – Continuous concrete or asphalt structure placed along the limits of a road's width to protect pedestrians, direct stormwater runoff, delineate the edge of road, and deter vehicles from entering pedestrian areas. Concrete curb is normally combined with a concrete gutter wherever drainage is carried (**Curb and Gutter**).

Mountable Curb – Curb designed to be crossed by vehicles with relative ease, for use on low capacity, low speed residential roads where drainage capacity and pedestrian safety are not major considerations.

Depressed Curb – Standard curb or curb and gutter that has been lowered for purposes of driveway access or **pedramps**.

Cut – Section of highway located below natural or existing ground elevation, requiring excavation of existing material.

Dam – A barrier to flow constructed to confine or raise water for storage or diversion or to create a hydraulic head.

Danger Reach – An area downstream of a dam or impoundment that would receive an artificial flood in the event of a failure when the dam or impoundment is full as determined for the design storm.

Datum – An assumed or defined horizontal or vertical reference system.

Deck – Floor of a bridge.

Deflection angle – The angle between the prolongation of the back line measured right or left to the forward line of a survey traverse, pipe curves.

Delay – Time lost when traffic is impeded by a factor over which a driver has no control. A **fixed delay** is caused by traffic controls. An **operational delay** is caused by interference between traffic components.

Density – The number of vehicles per mile on a traveled way at a given instant.

Department of Public Works – The Baltimore County Department of Public Works as established by the Baltimore County Code.

Departure – Change in easterly displacement of a line. See also **Latitude**.

Design Professional – An individual, partnership or corporation practicing as a Registered Professional Engineer, Architect, Landscape Architect or Professional Land Surveyor in the State of Maryland, in a discipline suitable for the work required, who is preparing contract drawings and documents for a Baltimore County Department of Public Works project.

Design Hourly Volume (D.H.V.) - A volume determined for use in design, representing traffic expected to use the highway.

Design Speed – The maximum safe speed maintainable over a specified section of road when conditions are so favorable that design features of the highway govern. This speed most closely matches the travel speed of most drivers, usually the 85th percentile.

Design Storm – A standard storm of set recurrence (or frequency) period (2 year, 10 year, etc.) with an intensity based upon statistical records, as opposed to a **Storm of Record** that actually occurred (Hurricane Agnes, Tropical Storm David, etc.). See Storm Drainage **Design Plates DA-6 and DA-7** for Intensity – Frequency – Duration relationship for Baltimore County for use with the Rational Method.

Design storms for particular tasks are as follows:

500-year storm – FEMA regulatory storm; no Baltimore County design application.

100-year storm – (1) Used for floodplain determination, (2) FEMA and County flood plain regulatory storm, (3) used as bridge and culvert design storm, (4) In cases where a drain must deliver flow to a 100-year storm water management facility, the drain may be required to collect and pass the 100-year storm peak (check with DEPRM). (5) Required level of storm water quantity management in inter-jurisdictional watersheds (Gwynns Falls and Jones Falls) and in areas where downstream flooding exists (check with DEPRM for requirements).

50-year storm - Used in the past for floodplain delineation; became obsolete in 1970's; may show up as a flood plain notation on plats and plans prepared in 1950's through the early 1970's.

20-year storm – This storm is for use as directed by BCBEC.

10-20 year storm – Storm drain design storm, normally 10 year, adjusted to 20-year intensity at sumps for use in determining energy gradient. Adjustment of Rational Method CA factor for 20-year storm for sumps provides a safety factor for sizing drains carrying discharge from a sump, in order to minimize chances of flooding at the sump.

10-year storm – (1) Storm used in setting inlet spacing and determining inlet bypass and spread; (2) used for roadside ditch design, except at 100 year culverts and floodplains, subject to environmental design requirements. (3) A required level of storm water quantity management (check with DEPRM for requirements).

2-year storm – bank-full storm used as a required level of storm water quantity management until 1998 (check with DEPRM for requirements).

1-year storm – used as directed by DEPRM as basis for water quality and stream erosion measures.

Developer – A party undertaking the subdivision or improvement of private lands in Baltimore County.

Dike – An embankment to confine or control water, especially, for purposes of preventing a stream, river or channel from overflowing onto adjacent lowlands.

Directional Distribution – A directional split of traffic measured during peak or design hour, commonly expressed as percent in peak and off-peak flow direction.

Director – The Director of the Baltimore County Department of Public Works

Drainage Area Map – A map showing a ridgeline (divide) containing the watershed reaching a particular design point. The map will usually also show land use, soils and time of concentration path(s) for that watershed.

Drainage Ditch – An intermittently flowing open water course carrying runoff from property or roads. May be natural or manmade.

Driveway – A private access, improved or unimproved, that provides vehicular access to private improvements and off-road parking for same.

Drop – A structure or spillway for dropping water in a conduit or channel to a lower elevation, thereby dissipating surplus potential energy. (e.g. drop manhole).

Ductile Iron – A cast iron alloyed with magnesium and heat treated to concentrate carbon into nodules for **ductility** (ability to be drawn into wire) and high tensile strength. Used for water supply and sanitary sewer pipes.

Easement – A grant of a right of use of the property of an owner for a certain purpose at the will of the grantee.

Permanent Easement – An easement granted to the County in perpetuity for purposes of reserving County access to existing, proposed or future improvements, or for protecting and maintaining existing agricultural, natural or constructed resources.

Temporary Easement – An easement that exists only until construction is complete and restored and then reverts to the property owner granting the easement. This area may be used for construction (see **temporary construction area**), stockpiles, driveway adjustment, etc.

Reversible Slope Easement – An area taken to construct a substantial slope along the edge of a road. Any portion of the area that is not used for slope adjustments will revert to the property owner granting the easement.

Effluent – Liquid discharge from conduit or pump

Elevation – Vertical distance above (+) or below (-) a given datum. Also; a scale drawing view, usually architectural or structural, showing a side or end of a structure or building.

Embankment – A structure of earth or gravel raised to form a dam, a levee or the foundation for a road.

Encroachment – A regulated action taking place within a delineated floodplain.

Endwall – See headwall.

End Section – Flared section of (metal or concrete) pipe used in lieu of a **headwall** or **endwall** at the downstream end of a culvert or drain system when scour, slope retention and changes to flow direction are not considerations.

Energy Dissipator – Device that will cause energy in flowing water to dissipate, thereby controlling flow velocities and erosion potential. Examples include drop manholes, special headwalls and **riprap** lined channels.

Energy Equation – See **Bernoulli's Law**

Energy Grade Line – Line marking the available energy ($V^2/2g + P/\gamma + z$) at any point in a pipe or conduit containing flowing water. Always vertically above the **hydraulic grade line** by $V^2/2g$ feet.

Energy Gradient - The slope of the **energy grade line**.

Engineer – The Design Professional, registered in the State of Maryland, responsible for design of structural, highway and underground utility projects in compliance with applicable Federal, Maryland and Baltimore County laws and regulations. Note that the application of this term is different when applied to Construction Contracts – for that application, see **Section GP-1.03** of **Standard Specifications for Construction and Materials**.

Entrance Loss – Energy lost in eddies and friction at the inlet to a conduit or structure, expressed as a coefficient (K_e) times velocity head = $K_e \times V^2/2g$

Expressway – A divided arterial highway for through traffic having full or partially controlled access, usually with grade separations at intersections.

Fill – Material used to raise the construction level; section of highway located above natural or existing ground elevation

Filter fabric – A type of **Geotextile** with suitable properties to prevent migration of soil particles of a particular size through the fabric.

Fire Flow – Water main flow rate necessary for fire fighting.

Flexible Pavement – Pavement structure that maintains intimate contact with and distributes loads to the subgrade. Structure depends upon aggregate interlock, particle friction and cohesion for stability.

Floodplain – Any area of land bordering a body of water that is covered by its water during periods of flooding.

100-Year Floodplain – A floodplain resulting from a storm having 1 chance in 100 of being equaled or exceeded during any given year based upon known records of rainfall.

Riverine Floodplain – Floodplain created by stormwater runoff from precipitation.

Tidal Floodplain – Floodplain caused by high tides and winds.

Floodproofing – Modification of buildings (or sites) within a designated floodplain in order to prevent, or mitigate the effects of, water entry, including structural damage.

Flood Stage – Vertical distance to surface of floodwater as measured from a datum or a flood gage elevation.

Footing – Part of a structure that is placed into or on the existing ground to provide support to the rest of the structure.

Force Main – A sanitary sewer flowing under pressure provided by pumps, as opposed to a gravity flow system

Foundation – Portion of a structure resting upon a footing and providing support for walls and other structural components.

Freeboard – Vertical distance between maximum water surface and a control elevation, such as the top of a dike or the low point on a bridge superstructure. Provides factor of safety for wave actions, subsidence or other unpredictable effects.

Freeway – A divided highway for through traffic with full control of access (entrances and exits suitably spaced and designed to provide minimum differential between speed of entering traffic and the through traffic stream).

French Drain – A rock-filled pit or trench designed to allow stormwater runoff to seep into adjacent soils.

Friction Loss – Energy loss as result of contact between a moving stream of water and the walls of the conduit.

Frontage – Linear measure of individual property fronts taken along the edge of public right-of-way.

Frontage Road – Minor street designed to provide access to properties otherwise denied access by location adjacent to a limited access road.

Froude Number – Method of classifying water flow as critical ($F_N = 1$), subcritical ($F_N < 1$) or supercritical ($F_N > 1$). $F_N = V/(g \times d_m)^{0.5}$, where $d_m = \text{Area} / \text{Topwidth}$.

Full Trench Compaction – Obsolete term from 1976 *Supplemental Specifications*. Term should now be interpreted when encountered as referring to Standard Specifications Section 303.03.07 and Section 210.

Gabions – Patented systems of stone-filled wire baskets used to construct retaining walls, revetments, stabilized outfalls and channels, outfall structures, etc.

Geotextile – Woven/nonwoven fabrics designed for specific applications in civil engineering. Fabrics may be applied to subgrade improvement, drainage, underdrains, erosion control, etc. depending upon design and specifications of fabric. Advantages of use, depending upon the selected fabric, include ability to distribute tensile loading, or to filter out particles of certain sizes, preventing migration of soil particles.

Gore – The area between off-ramps and the through travel lanes on expressways bounded by the edges of those roadways. Also, an irregularly shaped tract of land, generally triangular, left between two adjoining surveyed tracts because of inaccuracies in field run surveys or in written descriptions.

Grade – Rate of ascent or descent of embankment, road, storm drain or sewer; usually expressed in percent, or horizontal to vertical ratio (4:1) for steeper slopes of embankments.

Grade Separation – Crossing of two highways, a highway and a railroad or two railroads at different levels.

Grade Sheet – A construction report giving **line and grade**; i.e., offsets and cuts/fills at each station.

Graded Shoulder – Portion of roadbed along outer edge of road used to accommodate stopped vehicles and emergency use. Provides lateral support for base and surface road courses. The surface of the graded shoulder is usually grass or graded gravel.

Groundwater – Subsurface water occupying the saturation zone from which wells and springs receive water. Fed by that portion of precipitation that manages to penetrate the ground.

Grubbing – Removal of stumps, roots, etc. from a construction site.

Gutter – Artificially surfaced, shallow waterway usually along edge of road for conveyance of runoff. See **Valley Gutter**.

Haul – The distance that one cubic yard of cut material is transported to a fill location in highway construction.

Head loss – Decrease in energy of flowing water within a pipe or structure (as illustrated by **energy grade line**) as a result of pipe friction, bends, obstructions, expansions or any other cause.

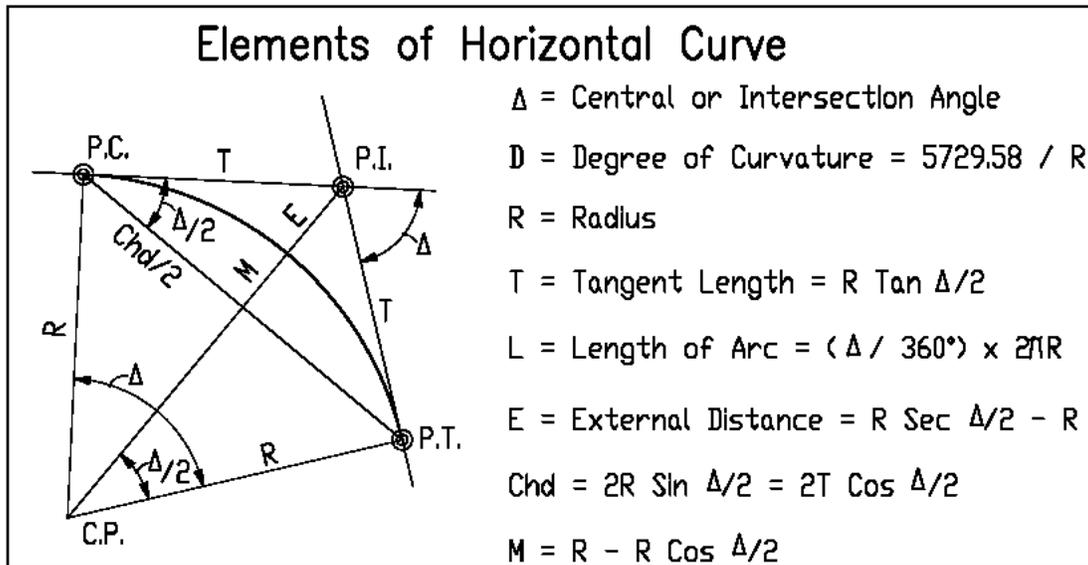
Headwall – A vertical wall, with or without **wing walls**, at the inlet or outlet end of a drain or culvert that is used for one or more of the following purposes: to keep fill material from falling into the watercourse, protect from scour, increase hydraulic efficiency of conduit, change direction of flow, retard disjuncting of sectional pipe and / or serve as a retaining wall for soil placed above the pipe.

Headwater – Water encountered at the upstream end of a culvert or bridge. The difference in depths of headwater and tailwater provides the energy needed to overcome hydraulic losses within the conduit or channel.

Highway, Road, Roadway, Trafficway – Rights-of-way, surfaces, subgrades, shoulders, median dividers, drainage facilities and structures, roadway cuts and fills, traffic barriers, bridges, overpasses, underpasses, interchanges, approaches and other structures forming an integral part of a street, road or highway. May also include bicycle/pedestrian paths, related stormwater management structures and facilities, or other property acquired for construction, operation and/or use of the highway.

Historical Flood – A flood that actually occurred in a locality, as opposed to a design storm flood (such as the 100-year flood) that is determined by mathematical model. Flooding that occurred during Hurricane Agnes, Tropical Storm David and Hurricane Isabel are three examples of historical floods.

Horizontal curve – Circular curve, with or without spiral transitions at tangents (roads), used to change directions along baselines of proposed road improvements, and also within major bend structures in sewers and drains. Curve parameters set by design speed (highways) or by pipe diameters (drains and sewers).



Hot Mix Asphalt – A designed combination of dense graded mineral aggregate, filler and bituminous cement mixed in a central plant, laid and compacted while hot.

House Connection – Sewer connection for private building, extending from collector sewer to a **clean-out** at or inside the property line.

Hydraulic Grade Line – In closed conduits under pressure, this line joins the elevations to which water would rise in pipes freely vented and under atmospheric pressure. In an open channel, it is the trace of the water surface. Line defined by $(P/\gamma + z)$.

Hydraulic gradient - The slope of the hydraulic grade line.

Hydraulic Jump – The sudden and turbulent passage of water from supercritical to subcritical flow. See **Froude Number**.

Hydraulic Radius – In open channel flow determinations using the **Manning Equation**, the cross-sectional flow area divided by wetted perimeter.

Hydrograph – A graph or table showing relationship of quantity of discharge to time.

Hydrology – Applied science concerned with waters of the earth in all its states. Processes of precipitation, conversion to runoff, stream flow, infiltration and storage are of particular concern to the Department of Public Works.

Hydrostatic Pressure – Pressure exerted by a body of water at rest.

Impervious – Areas that are paved or built upon that cannot absorb any rainfall, with the result that almost all of the rainfall reaching this area must run off to other areas. Since this water washes off pollutants, the runoff causes problems because of its quality and its quantity.

Inlet – Storm drain structure having a vertical (curb) opening (**curb inlet**), a frame and grate (**grate inlet**), or a combination of frame and grate with a curb opening (**combination inlet**). When used away from roads, inlets may be referred to as **yard inlets**. These structures normally function to collect stormwater from streets and yards. The term inlet may also be applied to the upper end of a **culvert**, as in **inlet control**.

Inspector – representative of the Director of Public Works authorized to make any and all necessary inspections of work performed and material furnished on a Public Works contract.

Interchange – Interconnection of roadways using one or more grade separations, providing for movement of traffic on different levels between two or more roadways via ramps without encountering opposing traffic flows.

Intersection – General area where two or more roads join or cross. Requires measures to control intersecting traffic flows, if those flows are of significant volume.

At-grade – All roadways join or cross at a single level.

Channelized – At-grade intersection where traffic movements are divided and controlled by islands.

Rotary – a traffic circle

Invert – Floor or bottom of the internal section of a conduit or structure in a sewer or drain.

Inverted Siphon – A section of sewer or storm drain required to be installed below the hydraulic gradient and operate under pressure due to the presence of an obstruction. The term “sag pipe may be more appropriate, as no siphon action occurs.

Joint –

Bell and Spigot Joint – (Pipe) Concrete pipe joint with an enlarged inner and outer diameter (bell) at the female end and a spigot at the male end for insertion into the bell end of the next pipe section. Joint is sealed with mastic or mortar.

Construction Joint – (Paving) - A joint made necessary by a prolonged interruption to concrete placement

Contraction Joint – (Paving) - A joint at the ends of a rigid structural member to control location of transverse cracks

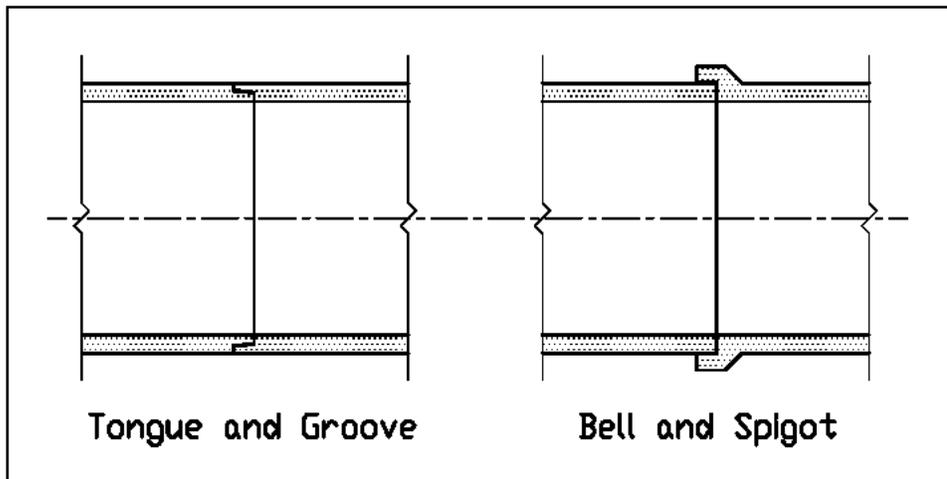
Expansion Joint – (Paving) - A joint located to allow normal expansion of a rigid structural member due to temperature or other environmental factors. Correct placement prevents damage to adjacent structures and to the structure itself by allowing limited movement.

Mechanical Joint – (Pipe) - A bolted joint of the stuffing box type used on Gray Iron and Ductile Iron pipe, as described in AWWA C111. Each joint consists of a pipe bell having flanges with bolt holes or slots, a pipe plain end, a sealing gasket, a follower gland with bolt holes and tee head bolts and hexagonal nuts.

Push-On Joint – (Pipe) – A single rubber gasket joint assembled by positioning a continuous rubber gasket in an annular recess in the socket and forcing the plain end of another pipe into the socket, compressing the gasket uniformly, sealing the joint.

Restrained Joint – (Pipe) A mechanical joint using bars between the joints to mechanically restrain movement of the assembled pipe. Used frequently in place of buttresses and anchors on water mains and appurtenances such as fire hydrants.

Tongue and Groove Joint – (Pipe) Concrete pipe joint with an enlarged inner diameter at the female end and a corresponding spigot at the male end for insertion into the end of the next pipe section. Joint is sealed with mastic or mortar.



Junction Chamber – A special design structure that is used in place of a manhole when incoming and outgoing pipes will not fit into a manhole or when reduction of head losses resulting from entrance and exit losses at a manhole is desired.

Lamp Hole – Small vertical opening or pipe from ground surface to conduit, usually for purposes of inspection or access to a valve handle.

Latitude – Change in northerly displacement of a line (Also see **Departure**); angular distance measured at earth's center northerly or southerly from equatorial plane.

Level of Service – Qualitative rating method (Levels A through F) for movement of traffic along a highway or through an intersection, measured in terms of operating conditions experienced.

Leveling Course – Layer of material placed over an existing road surface to eliminate irregularities prior to placing an overlaying course of paving.

Limited Access – Either partial or full control of access to a highway

Line and Grade – Horizontal and vertical position of a facility.

Load –

Axial Load – Resultant of load passes through centroids of all sections along member.

Dead Load – Weight of all permanent structural and non-structural components.

Impact Load – Forces resulting from movement of vehicles, machinery, etc. and other kinetic loads.

Live Load – Weight superimposed by use and occupancy of structure; not including dead, wind or earthquake loads.

Load Transfer Device – A device designed to transfer loads across a paving joint.

Longitude – Angular distance, usually expressed in degrees, minutes and seconds, due east or west from a meridian.

Macadam – A layer of coarse, graded, angular mineral aggregate with a filler of fine aggregate, interlocked by compaction, usually bound with bituminous material. Historically, a composite of bound material.

Manhole – A structure used in underground utilities to access the utility conduits for inspection, cleaning and/or repair, closed by a removable cover.

Drop Manhole – A manhole structure that allows water entering at a relatively shallow elevation to “**drop**”, via internal or external structure, to the elevation of the outgoing pipe, thereby dissipating the energy of the incoming flow.

Flushing Manhole – A manhole provided with a gate so that flow may accumulate and then be discharged rapidly to flush the downstream pipe of accumulated silt and debris.

Junction Manhole – A manhole at the junction of 2 or more sewers or drains.

Line Manhole – A manhole on a sewer/drain where no other sewers/drains connect.

Terminal Manhole – The final manhole at the upstream end of a sewer.

Manning Equation – An empirical formula for velocity of flow (and discharge by application of the **continuity equation**) utilizing **hydraulic radius** R, a coefficient of roughness n and the channel slope S.

$$V = \frac{1.49}{n} R^{2/3} S^{1/2}$$

Mass Diagram – Graphic representation of cumulative highway cuts and fills.

Median – Portion of a divided street separating travel lanes for traffic moving in opposite directions. May also apply to selected pedestrian areas.

Meridian – North-South reference line.

Metropolitan District – Baltimore regional service and funding district established under Maryland State law for provision of water service and sewer collection and treatment for Baltimore City and areas of surrounding Counties.

Minor Street – Used primarily for access to abutting properties.

Moment – Torque generated by a force offset laterally from its reaction force.

Monument – Permanent reference point with a known horizontal position and/or vertical elevation.

Mosaic – Property map showing multiple properties and their relationships based upon deeds, plats and/or surveyed data.

Multi-Modal Design – Road design incorporating the needs of motorized (cars, trucks, motorcycles, transit) and non-motorized (bicycles, horse-drawn, tandem) vehicles and pedestrians.

Negative Projecting Condition - Pipe is installed in a shallow trench so that the top of pipe is below the undisturbed ground surface or compacted fill, and then covered with an earth fill or embankment extending above the original ground surface. Usually encountered when pipe is installed in a relatively narrow and deep streambed or drainage path. This condition is applicable to earth loading on the pipe. Settlement creates shearing forces between soils

immediately above pipe and those immediately alongside pipe. See also **trench condition** and **positive projecting condition**.

Open Channel Flow – Flow in any open or closed conduit where the water surface is free (at atmospheric pressure) of contact with the top of the conduit (if any).

Orifice Flow – Pressure flow through an opening with a closed perimeter.

Parkway – Arterial highway for noncommercial traffic having full or partial access control. Usually located within or adjacent to a park or park-like development.

Pavement Structure – Combination of road surface course, sub-base and/or base course with the sub-grade. Supports and distributes traffic loading to the roadbed.

Pedestrian – A person afoot or in a wheel chair.

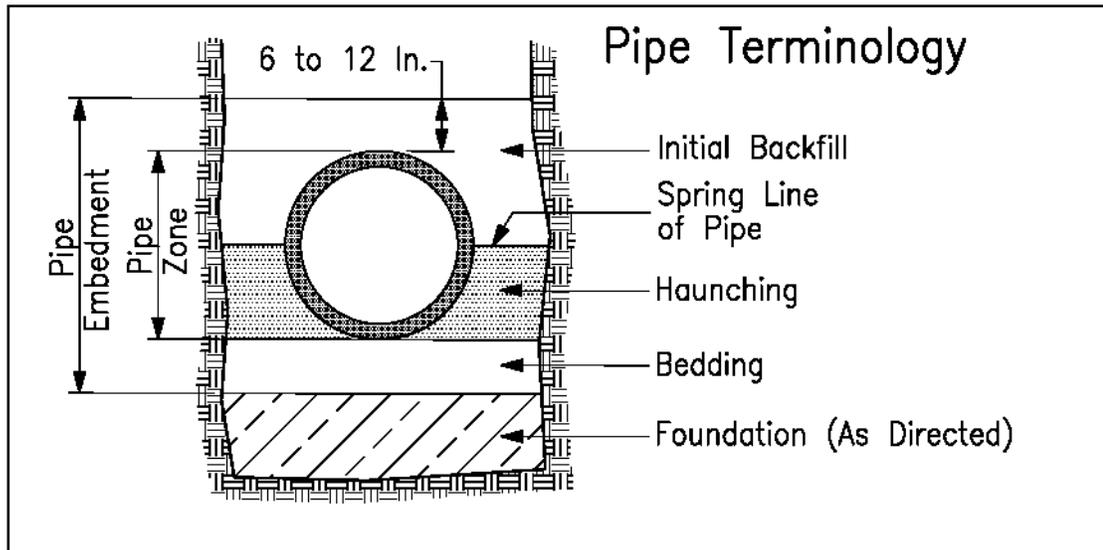
Pedestrian Ramp - Concrete ramp with flared sides to be installed in sidewalks in accordance with County Standard Details and Specifications at intersections with curb and gutter in order to allow unimpeded accessibility without a barrier for those pedestrians confined to a wheel chair.

Percolation – Movement of water through the interstices of a material, as through soils.

Pier – A vertical column supporting beams, girders, etc. between abutments.

Pile – A long, slender, stake-like structural element that is driven or otherwise embedded on end into the ground in order to support a load or to compact the soil.

Pipe – A closed conduit of formed construction with uniform cross-section, using one or more materials, for purposes of carrying fluids.



Pipe Cover – Height of material, including paving, over the outside top of a pipe.

Plans – Contract drawings showing the location, nature and dimensions of prescribed work, including layouts, profiles, cross-sections and special details.

Plat – Prepared drawing showing and defining property for transfer, or showing existing property outlines.

Plus and Offset – Method of location of points off of a baseline. Term refers to station (plus) and offset distance.

Positive Projecting Condition - Pipe is installed on original ground or on compacted fill and then covered by an earth fill or embankment. Usually encountered when pipe is installed in a relatively flat streambed or drainage path. This condition is applicable to earth loading on the pipe. Settlement creates shearing forces between soils immediately above pipe and those immediately alongside pipe. An **induced trench** may be created by excavating a trench over the pipe when the embankment is 2 or 3 times higher than the pipe diameter and then backfilling with compressible material. This practice will significantly reduce pipe loading from what would be experienced under positive projecting condition. Design and construction of an induced trench for pipe load reduction shall be done under the supervision of a licensed geotechnical engineer. See also **trench condition** and **negative projecting condition**.

Prime Coat – Consists of an application of low viscosity bituminous material in order to waterproof the finished base and promote adhesion by plugging voids.

Priority Road – At an intersection, the road with the higher roadway classification, or, on roads of equal classification, the road carrying the higher existing or projected traffic volumes.

Profile Grade – Trace of a vertical plane along the longitudinal centerline of a pipe utility or a road. Profile grade means elevation or gradient of vertical plane.

Public – Open to common use, whether or not public ownership is involved. Usually assumes County (or State) maintenance.

Public Works Agreement – Agreement between County and developer to assure completion of construction of publicly maintained facilities constructed to benefit development.

Pumping – Ejection of foundation material, wet or dry, through joints, cracks or along rigid slabs as a result of vertical movements under traffic loads.

Pumps – Machines that impart kinetic energy from an external source to a liquid to force discharge from the machine.

Axial Flow Pump– A pump in which the impeller (somewhat similar to a motorboat propeller) moves fluid parallel to the pump shaft.

Cavitation – Vapor bubbles formed on a solid surface (often an impeller) in contact with a liquid when the pressure in the liquid falls below vapor pressure.

Centrifugal Pump – A pump in which fluid is displaced radially by the impeller.

Cutter Pump– Positive displacement or centrifugal pump with a cutting blade on impeller designed to reduce size of solid or stringy matter entering pump before it enters impeller.

Grinder Pump– Centrifugal or positive displacement pump with grinder assembly on a shaft extension; designed to grind solids more than a fraction of an inch in size before they contact the recessed impeller.

Helical Screw Pump – (Archimedes Screw) – Positive displacement, inclined, semi- or fully enclosed screw for lifting liquid where both suction and discharge are open to the atmosphere.

Pump Impeller – Circular casting mounted on a rotating shaft, with vanes to accelerate fluid.

Reach – A comparatively short length of a stream or channel.

Reflection Crack – A crack appearing in a road surface or overlay caused by movement at joints or cracks in underlying base or surface.

Reinforcement – Steel embedded in a (concrete) rigid slab or in a concrete structure to resist tensile forces and prevent opening of cracks.

Resurfacing – Process of placing one or more new courses atop an existing road surface.

Retaining Wall – A wall constructed for purposes of retaining sloped soils or other solid materials in position.

Right-of-Way – An area that has been acquired and reserved by the County for use in constructing a proposed improvement and appurtenances thereto. This area may be held by the County in fee simple or may comprise easement rights, perpetual or temporary, recorded or unrecorded.

Rigid Frame – A coplanar frame with its corners joined so that no change in angle between the members is possible.

Rigid Paving – A pavement structure which distributes loads to the subgrade having, as one course, a portland cement concrete slab of relatively high bending resistance.

Rigid Slab – A section of portland cement concrete pavement bounded by joints and edges, designed for continuity of tensile stress.

Riprap – Large rock placed in channels and adjacent to bridges and structures to prevent erosion, scour and migration of soil. Used as a control for flow velocity in channels and in conjunction with **geotextile** to prevent erosion of underlying soils.

Road, Private – A road that doesn't receive State or County maintenance, but is owned and maintained by the owners of the property on which the road occurs.

Road, Roadway – See Highway, Road, Roadway, Trafficway

Road, State – Any public road that is part of the Maryland State Highway System, maintained by the State Highway Administration.

Roadbed – The graded portion of a road within top and side slopes, prepared as foundation for pavement structure and shoulder.

Roadside – A general term denoting the area adjoining the outer edge of the roadbed within the right-of-way. Extensive areas between the roadways of a divided highway may also be considered roadside.

Roadway – That portion of a highway, including shoulders, for vehicular use. A divided highway has two or more roadways.

Routing – Determination of downstream hydrograph for stream (or reservoir) based upon upstream hydrograph and storage-discharge characteristics of the stream (or reservoir).

Rumble Surface – A rough textured surface constructed for the purpose of causing tires of vehicles driven over it to vibrate audibly as a warning to the driver.

Runoff – That portion of total precipitation that is not absorbed, evaporated or otherwise transpired and therefore appears as flow in streams. The **Runoff Coefficient** is the ratio of runoff to precipitation.

Seal Coat – A thin road paving treatment consisting of bituminous material and aggregate.

Scale – Ratio of plan scale to actual size, often expressed as inches to feet.

Selected Material – Suitable material obtained from roadway cuts or borrow areas or other similar material used for sub-base, roadbed material, shoulder surfacing, slope cover or for other specific purposes.

Sewer –

Collector – Gravity sewer receiving flow from individual properties

Combined – Gravity sewer carrying wet weather storm drainage in addition to sewage flow

Interceptor – Gravity sewer receiving flow from collector sewers; generally located along streams or the valley of a watershed.

Shear – The tendency of a material to separate along a plane parallel to an applied load.

Sheet Flow – A type of runoff flow experienced prior to the point where the flow encounters a **swale**, where water moves in “sheets”. Easily observed during heavy rainfalls on smooth, relatively steep paved areas such as parking lots or road shoulders.

Shoulder – The portion of roadbed contiguous with the traveled way for accommodation of stopped vehicles, emergency use, and for lateral support of base and surface courses.

Sidewalk — That portion of the roadway constructed for the use of pedestrians.

Sight Distance – The length of roadway ahead visible to the driver.

Headlight Sight Distance (Minimum) – Conforms to the minimum stopping distance definition; based upon the length of roadway along an under-vertical (sag) curve illuminated by headlights 2' above the traffic way with a 1 percent upward divergence of the light beam from the vehicle's longitudinal axis.

Inspection Sight Distance – (from AASHTO) Based upon the assumption that the mainline vehicle will not slow to less than 85% of design speed and will get no closer than 1.9 x design speed in feet from the entering vehicle. The distance is measured from a side street height of 3.5 feet (located 10 feet back from the travel lane) to a mainline vehicle height of 4.25 feet.

Passing Sight Distance – Length of highway required for a vehicle to execute a normal passing maneuver as related to design conditions and design speed, measured from the driver's eye, 3.75' above pavement to the top of an object 4.5 feet high on the pavement, assumed to be another passenger car along an over-vertical (crest) curve.

Stopping Sight Distance – measured from the driver's eye, 3.75' above pavement to the top of an object 6 inches high on the pavement along an over-vertical (crest) curve.

Signal Head – Assembly containing one or more signal lenses that control a vehicular or pedestrian movement.

Site Plan – A scale drawing view of a complete site, showing horizontal relation of physical features.

Skew Angle – The complement of the acute angle between two centerlines that cross.

Slab – A rectangular beam of variable width, supported on either two or four sides.

Slopes — The inclined graded areas beyond the road shoulder and extending from the shoulders to the natural undisturbed surface of the ground. Topographic surveys will note **Toe of Slope** and **Top of Slope**.

Soil Migration – Movement of soil particles in response to flow of either surface or ground water. This migration can result in sinkholes and erosion if not checked. Use of **geotextiles** or other filtering materials is recommended between unlike sized particulate materials to prevent movement of soil particles.

Special Provisions — Additions and revisions to the Standard Specifications (and supplements thereto) applicable to a particular project.

Spillway – A passage for controlled discharge of surplus water.

Spring Line – In a pipe conduit, the point at which the sides of the pipe bend back toward the pipe center. In a circular pipe, this occurs at mid-height on the pipe.

Stabilization – Modification of soils or aggregates by incorporating materials or methods serving to increase load bearing capacity, firmness and/or resistance to weathering or displacement.

Standard Details – Detail drawings showing standard methods of construction for water mains, sanitary sewers, storm drains, roads and streets. See *Baltimore County Standard Specifications and Details for Construction*, latest edition.

Standard Specifications — see *Baltimore County Standard Specifications and Details for Construction*, latest edition.

State Highway System — The system of roads owned, operated or maintained by the State Highway Administration.

State Road — Any public road included in the State highway system.

Station – Point on a baseline a specified distance from the point of origin. Station 0+00 is origin; Station 1+45.62 is 145.62 feet from origin.

Stilling Basin – An energy-dissipating device incorporating a **drop** from the outfall end of a culvert or storm drain.

Storm Drain – A closed system of pipes carrying only runoff (as opposed to a combined sewer, that carries both sewage and runoff). A storm drain includes underground pipe conduits, inlets, manholes, junction chambers, bends, endwalls and headwalls. Water quality structures may also be incorporated into these systems as required for serving newly impervious areas.

Stormwater Management – The process of controlling the quality and quantity of runoff from a developed area. Handled as part of the Development process.

Structures — Bridges, culverts, catch basins, drop inlets, retaining walls, cribbing, manholes, endwalls, buildings, sewers, service pipes, underdrains, foundation drains, steps, fences and other features which may be encountered in the work and not otherwise classed.

Subbase — The layers of specified or selected material of designed thickness placed on a subgrade to support a base course or surface course.

Subgrade (Highways) — The top surface of a roadbed upon which the pavement structure, shoulders, and curbs are constructed.

Subgrade (Pipes) — The soil foundation layer upon which a pipe, cradle, or encasement is placed such that the prescribed invert elevation of the pipe will be achieved.

Subgrade (Structures) — The soil foundation layer upon which the structural foundation is built to achieve prescribed elevations of subsequent structural elements or controls.

Substructure — All of that part of the structure below bottoms of bearings of simple and continuous spans, skewbacks of arches and tops of footings of rigid frames, together with the backwalls and wingwalls.

Sump – Point of lowest elevation along a road or in a pipe or channel

Superelevation – Practice of raising outer edge of road within and approaching horizontal curves to overcome tangential forces, thereby allowing safer and higher speed travel through the curve. Primarily used with divided highways and arterial roads.

Superstructure — All of that part of the structure above bottoms of bearings of simple and continuous spans, skewbacks of arches and tops of footings of rigid frames, except backwalls and wingwalls.

Surface (Wearing) Course — One or more layers of a pavement designed to accommodate the traffic load, the top layer of which resists skidding, traffic abrasion and the disintegrating effects of climatic forces.

Surface Water – Flow generated by runoff, appears as sheet flow, ditch flow, stream flow and flood waters. Storm drains are designed to accommodate this type of flow.

Survey – Surveys may be done for one of the following purposes, or it may be made for a special purpose that shall be clearly defined along with conditions of the survey on the survey drawing.

Construction Survey—Placement of stakes referenced horizontally and/or vertically to proposed improvements, such as a building, utility paving, swale, etc.

Control Survey – Establishment of accurate and permanent markers that are referenced to a **datum** for use in other area surveys.

Layout Survey – See **Construction Survey**

Property Line Survey – The purpose of a property line (or boundary) survey is to establish, re-establish, or describe, or all of these, the physical position and extent of the boundaries of real property, including the discovery of visible indication of rights that may be acquired by prescription or adverse possession.

Topographic Survey – The purpose of a field-run topographic survey is to locate, describe, or map, or all of these, the elevations and positions of the physical features and characteristics of the surface of the earth, including spot elevations, contours and other features.

Sustainable Design (or Environmentally Sustainable Design) – Design to minimize or eliminate negative environmental impacts by designing physical objects, the built environment and services to minimize use of non-renewable resources, environmental impact and “relate people to the natural environment”. See **General Instructions**, Section IA.

Swale – A small ditch-like depression in which runoff gathers after flowing in **sheet flow**. The swale concentrates and redirects this flow along itself.

Tack Coat – An application of bituminous material to an existing road surface to provide bond for a superimposed paving course.

Tailwater – Water located at the outfall end of a culvert or a storm drain. The depth of this water will be determined by downstream conditions such as tides, channel flow, etc. and may impact the design of the upstream conduit.

Tapping Sleeve – A tap for water mains in the form of a sleeve placed around the main. Used to provide service to adjacent properties from the water main.

Temporary Construction Area – An area of private property necessary for County construction activity that will be restored to previous condition and then revert to the property owner at the end of construction.

Test Pit – An excavation made to determine location and depth of underground utilities.

Through Highway – Every highway or portion thereof on which vehicular traffic is given preferential right-of-way, and where traffic on intersecting highways is required by law to yield right-of-way to vehicles on the through highway in obedience to traffic control devices, where erected.

Tie Bar – A deformed steel bar or connector embedded in the concrete across a paving joint to prevent separation of abutting slabs in rigid concrete road paving.

Time of Concentration – That period of time required for storm water runoff to flow from the most remote (time-wise) point of a drainage area to the design point.

Traffic Control Device – A sign, signal, marking or other device placed on or adjacent to a street or highway by authority of a public body or official having jurisdiction to regulate, warn or guide traffic.

Trash Rack – A grid or screen across a stream or an entrance to a structure designed to capture or divert floating debris.

Traveled Way - The portion of the roadway for the movement of vehicles, exclusive of shoulders.

Traverse – A continuous series of lines with conventional or GPS measurements between survey markers established as part of a **control survey**.

Trench - An excavation made for the purpose of installing or removing pipes, drains, catch basins, etc., which is later refilled and compacted.

Trench Condition – Pipe is installed in a relatively narrow trench excavated in undisturbed soil. The pipe is covered in backfill extending to the ground's surface. Normally encountered for installation of sewers, drains and water mains. This condition is applicable to earth loading on the pipe. See also **positive projecting condition** and **negative projecting condition**.

Trenchless Construction – Specialized construction techniques used to place pipe conduits under roads or past obstacles without opening a trench. (e.g. Pipe jacking)

Truss – A frame made of coplanar members (ties), joined only at their ends by (theoretically) frictionless pins. The axial loading of the ties (primary stresses) is joined by secondary (bending) stresses when gusset plates or welding are used to join the ties.

Uniform Flow (Steady) – Flow where discharge and velocity are constant in both magnitude and direction, possible only in a channel having a constant cross-section..

Utility Companies — Corporate entities having utility facilities in a proposed work area (e.g. BGE, Verizon, Comcast, Columbia Gas, etc.).

Underdrain – A system consisting of perforated pipe within a sand or stone / filter fabric medium used to remove groundwater from subgrades of roads and drainage systems.

Valley gutter – Defined concrete vee-shaped channel used to carry very minor amounts of stormwater runoff across an intersecting road at a curb and gutter intersection.

Vault – A structure for enclosing valves and meters. Usually of concrete or sectional concrete construction.

Vertical Curve – Parabolic curve applied to longitudinal road profiles at both sags and crests that are designed to maintain sight distances, minimum grades for drainage, and maintain comfortable travel at the selected design speed.

Water Main – Pipe within water distribution system located entirely within public right-of-way.

Water Table – the top surface of the saturated zone of **groundwater**.

Watershed – The area contained within a divide above a specified (design) point on a stream.

Weaving – Crossing of traffic streams moving in the same general direction, accomplished by merging and diverging movements.

Weep Hole – Hole in structure intended to relieve hydrostatic pressure on earth side of structure by allowing drainage of groundwater.

Weir – A notch or shape of regular form over which water flows by gravity when water reaches an elevation high enough to pass over the **crest**.

Wetted Perimeter – The length of the wetted contact between a stream of water and its containing channel or conduit; measured at right angles to direction of flow.

Wingwall – An extension of abutment, retaining wall or **headwall**, usually tapered in height and set at an angle to the vertical wall, designed to retain the approach fill.

Working Day — A calendar day (usually excluding Saturdays, Sundays and County holidays) upon which, in the judgment of the Engineer, weather and soil conditions are such that the Contractor can advantageously work more than half of his current normal force for more than five consecutive hours on a controlling operation.

Working Drawings — Stress sheets, shop drawings, fabrication details, erection plans, plans for false work, forms, centering, cribs, cofferdams and masonry layouts, pipe design, lay schedules, bending and placing drawings, and bar schedules for reinforcement steel and any other supplementary plans or similar data which the Contractor may be required to furnish.

Zoning – Land use criteria developed by the Planning Board and enforced by PADM, as approved by the Baltimore County Council

References

Baltimore County Code, Sec. 22-53

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