Section 7
Glossary of Terms and References

7.1 Glossary of Terms

The following terms and acronyms are used throughout the report.

- 2-year design storm - A rainfall event with a probability of occurrence of 50 percent in any given year.
- 5-year design storm - A rainfall event with a probability of occurrence of 20 percent in any given year.
- 10-year design storm - A rainfall event with a probability of occurrence of 10 percent in any given year.
- 50-year design storm - A rainfall event with a probability of occurrence of 2 percent in any given year.
- 100-year design storm - A rainfall event with a probability of occurrence of 1 percent in any given year.
- 500-year design storm - A rainfall event with a probability of occurrence of 0.2 percent in any given year.
- Bank angle - The angle measured from the horizontal between the base of the slope and the top of bank. For complex cross sections, it is the series of angles measured from the horizontal at each change in slope.
- Bankfull elevation - In classical terms, the elevation in the channel where water surface reaches the top of the streambanks, also referred to as "top-of-bank" elevation. When the water surface rises above the bankfull elevation, it crests the banks and spills over onto the bankfull floodplain. In urban streams, the bankfull elevation generally coincides with the dominant discharge elevation. This elevation corresponds to the stream forming flow, which creates bankfull floodplains.
- Bankfull floodplain - The bankfull floodplain is a low, vegetated terrace, formed by, and an indicator of, the bankfull discharge. In incised streams, bankfull floodplains form as internal shelves within the main channel. While not an absolute diagnostic, functioning bankfull floodplains indicate stable reaches. Bankfull floodplains fulfill the important function of reducing stress on the streambanks. When the flow crests the internal floodplain, the velocity and thereby the shear stress is reduced as the flow spreads across the internal shelf.
- Base flow - In a perennial stream, the low flow discharge attributable to groundwater flow.
- BFE - Base flood elevation.
- Bioengineering (also called biostabilization) - A scientific and ancient method of restoring the landscape of ecosystems using the physical properties of plants, such as their sheer resistance, tensile strength, and flexibility, to rebuild the terrestrial or aquatic foundation in a manner that is both physically and ecologically stable (see streambank stabilization, synonymous with bioengineering).

- BMP - Best management practice, a structural or nonstructural device designed to temporarily store and treat urban stormwater runoff in order to mitigate flooding, reduce pollution, and provide other amenities.
- cfs - Cubic feet per second, a unit of measurement for labeling flow of water.
- Channel bar - A streambed deposit of silt, clay, sand, or gravel, often exposed during low-water periods. An alluvial deposit composed of silt, clay, sand, gravel, or other material that obstructs flow and induces deposition or transport.
- Channel evolution - The progression of channel form (usually expressed as cross section) over time as a response to a disturbance. The model describes the progression of channel shapes as the stream accommodates the disturbance and eventually reacquires equilibrium. The stages of channel evolution in the most commonly used model are equilibrium, channel disturbance, incision, widening, deposition, and recovery.
- CMP - Corrugated metal pipe.
- Composite revetment - A bank strengthening method in which rock, geogrid, and plants form a composite material and increase resistance to scour and near-surface mass wasting. The revetment is built in layers comprised of durable rock interlaid with woody bare root plants. The thickness of the rock is controlled by geogrid layers wrapping the rock on three sides. The channel-facing side remains open. On steep slopes, a structural geogrid may also be used to increase slope stability.
- Contours - Lines of equal elevation that represent the land surface.
- Conveyance system - Natural channels and manmade structures that convey stormwater downstream.
- Cross section - A one-dimensional line that is drawn perpendicular to the contours to represent the open channel flow conveyance at that location.
- Detention basin - A stormwater facility that collects and temporarily stores runoff to reduce peak flow rates and alleviate downstream flooding and erosion problems.
- DFIRM - Digital Flood Insurance Rate Map
- Dominant discharge - The dominant stream-forming flow or recurring flow responsible for the majority of work and channel maintenance in a stream. It is the flow that over time has the greatest influence on stream form. The recurrence interval for the dominant discharge of most streams is roughly 1.5 years, as determined by flood frequency analysis. In urban areas with highly altered hydrology, this return interval may be much more frequent. The dominant discharge is sometimes referred to as the bankfull or stream-forming discharge.
- FEMA - Federal Emergency Management Agency.
- FIRM - Flood Insurance Rate Map
- FIS - Flood Insurance Study.

- Flood bench - A technique used in stormwater control, when horizontal space is available, that removes earth from one or both streambanks such that the result is a visible bench when the stream is viewed in cross section, and done to reduce water velocity, shear stresses, and water surface elevation.
- Floodplain - The area of land that is inundated with water during a given storm event.
- Fluvial geomorphology - The scientific discipline concerned with the study of how moving water shapes landforms.
- ft/sec - Feet per second, a unit of measurement for labeling velocity of water.
- ft^2 – Square foot or square feet, a unit of measurement for labeling area.
- Geomorphology - The study of surface land forms and the processes that develop those forms. Geomorphic processes are the primary mechanisms that produce these land forms, including drainage patterns, streams, floodplains, and other watershed features (see also fluvial geomorphology).
- GIS - Geographical information system.
- GPS - Global positioning system.
- HEC - Hydrologic Engineering Center of the U. S. Army Corps of Engineers.
- HEC-HMS - A computer model developed by the U. S. Army Corps of Engineers to simulate the hydrologic conditions of a drainage area.
- HEC-RAS - A computer model developed by the U. S. Army Corps of Engineers to simulate the hydraulic conditions of a conveyance system through a drainage area.
- Hydraulic analysis - The study of stormwater flow through the conveyance system that includes underground pipelines, culverts, improved open channels, and natural creeks.
- Hydraulic Profile - A plot of the water surface elevation along the flow line of a stream or pipe.
- Hydrograph - A plot of surface runoff or excess precipitation versus time.
- Hydrology analysis - The study of the occurrence, distribution, movement, and properties of waters of the earth and their environmental relations.
- Hyetograph - A plot of rainfall depth or intensity versus time.
- Impervious - The characteristic of a material that prevents the infiltration or passage of liquid through it. This may apply to roads, streets, parking lots, rooftops, and sidewalks.
- Incision - Vertical channel adjustment, or channel downcutting, generally in response to an alteration upstream or downstream of the incising reach. Incision occurs when sediment or transport material is more easily removed from the channel bed than it is from the streambanks. Bed material is liberated to “heal” a temporary disturbance in sediment transport equilibrium or channel shape.

- Knickpoint - An abrupt discontinuity in bed slope indicating the upward limit of channel incision. A knickpoint usually occurs at a resistant hard point in the channel bed, such as a geologic control, debris jams, de facto grade control, or manmade structure.

- Knickzone - Typically observed in loess or alluvial streams, a knickzone is an area of slope discontinuity similar to a knickpoint, but less pronounced and occurring over a greater length of channel. In bedrock streams, knickzones occur as a series of smaller knickpoints.

- Left (and right) descending bank - Refers to the either side of the channel in relation to the downstream flow of water. For example, left descending bank refers to the left-hand side of an in-channel observer facing downstream. This designation is the convention in river science and engineering.

- lf – Linear foot or linear feet, a unit of measurement for labeling length.

- Longitudinal profile - A profile survey down the thalweg of a stream. A thalweg profile is not a channel centerline profile and the two are not interchangeable. Longitudinal profiles are used both for diagnosis of dominant process and for design guidance. Longitudinal profiles are particularly helpful in identifying knickpoints and knickzones and for evaluating pool riffle sequences.

- Manning's formula - A formula used to predict the velocity of water flow in an open channel or pipeline: $V = 1.486/n * R^{2/3} * S^{1/2}$, where V is the mean velocity of flow in feet per second; R is the hydraulic radius; S is the slope of the channel, in feet per foot; and n is the roughness coefficient of the channel lining.

- Mass wasting - Landslide, a mass downward movement of material caused by gravity in contrast to surficial erosion, which is the movement of individual soil particles.

- Meander advance - The natural process by which the meander waveform migrates downstream. The movement is a consequence of the secondary flows occurring perpendicular to the primary downstream flow. These secondary flows alternately scour and deposit channel materials. The greatest stress and the greatest scour occur just downstream of the apex of a curve on the outside of the bend. Similarly, the peak deposition occurs just downstream of the apex on the inside of a bend. Over time, this pattern moves the waveform downstream.

- Meander amplitude - The linear distance between the apex of one meander and the apex of the next meander.

- Meander wavelength - The length of one complete waveform. Wavelength can be measured as the linear distance between two analogous points on a waveform.

- Normal depth - Depth of flow in an open conduit during uniform flow for the given conditions (see Manning's equation).

- NPDES - The National Pollutant Discharge Elimination System, established by Section 402 of the Clean Water Act, is a federally mandated system used for regulating point source and stormwater discharges.

- Open channels - Also known as swales, grass channels, streams, and biofilters. These systems are used for the conveyance, retention, infiltration, and filtration of stormwater runoff.
- Outfall - The point where water flows from a conduit, stream, or drain.
- Perennial stream - A stream channel that has running water throughout the year.
- Plan form analysis - Evaluation of the horizontal geometry of the shape and size of the channels. Plan form analysis provides insight on whether and how parts of the basin differ from one another and if the geometric relationships of meanders are within the expected norms.
- Pool-riffle sequences - In a streambed, the combination of topographical lows (pools) produced by scour and the topographical high areas (riffles) created by the accumulation of relatively coarse-grained sediment. A sequence is defined as the beginning point of one riffle to the beginning of the next.
- RCB - Reinforced concrete box.
- RCP - Reinforced concrete pipe.
- Riparian - Woody vegetation that is characteristic of an area bordering a stream or river.
- Riprap - A loose assemblage of broken stones built along streams or beaches for erosion protection.
- Runoff - The portion of precipitation that is discharged from a drainage area.
- Sediment transport - The movement of dislodged particles through a stream system. It is one of the driving forces (along with flow) of channel adjustment.
- Sediment transport competence - The condition in which the stream maintains sufficient stream power to transport the sediment supplied to it continuously through the system.
- Sedimentation - Soil particles suspended in stormwater that can settle in streambeds and disrupt the natural flow of the stream.
- Scour line elevation - The distance above a known datum (top of ground) to a persistent near-horizontal erosion feature at the peak depth of any given flow.
- Side slopes - The slope of the sides of a channel, dam or embankment, where customary naming is the horizontal distance first, as 1.5 to 1, or frequently, 1½:1, meaning a horizontal distance of 1.5 feet to 1 foot vertical.
- Sinuosity - The ratio of channel length to valley length. For example, a river 2,000 feet long, winding through a river valley that is 1,000 feet long has a sinuosity of 2.
- Slope - Defined by change in vertical elevation divided by horizontal distance and typically expressed as a percentage.

- Stabilization - Providing adequate measures, vegetative and/or structural that will prevent erosion from occurring.
- Streambank stabilization - The use of the structural properties of live plants to rebuild washed out streambanks and flood terraces, including live slope fascines, hedge brush layers, and live willow brush mattresses.
- Structural BMPs - Constructed facilities designed to remove pollutants and slow down the runoff from smaller rainstorms to preserve water quality and provide long-term stream stability. These facilities can be installed as development progresses (site-specific) or to address multiple developments (regional).
- Subarea - A portion of a watershed that drains and concentrates at point, typically at a catch basin, within a system of drainage pipes, or along a stream.
- Swale - An open drainage channel or depression explicitly designed to detain and promote the filtration of stormwater runoff.
- Tail water - Water, in a river or channel, immediately downstream from a structure.
- Thalweg - The deepest part of a channel cross section. The dominant thread of stream flow creates the thalweg.
- Time of concentration - Time required for water to flow from the most remote point of a watershed, in a hydraulic sense, to a point of concentration described within a subarea.
- Toe (of slope) - Where the slope stops or levels out. Bottom of the slope.
- TR-55 - Technical Release 55, a report compiled by the Natural Resources Conservation Service that presents procedures for stormwater calculations.
- Watershed - A region of land that drains to a river, creek, or body of water.
- WQCV - Water quality control volume.
- WSE - Water surface elevation.

7.2 References

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