
Certificate in Stormwater Management and Drainage Design

Stormwater Collection and Conveyance Systems

Stormwater Collection and Conveyance Systems are critical components of stormwater management and drainage design. These systems are designed to collect, convey, and manage stormwater runoff from urban and rural areas to protect public health, safety, and the environment. In this explanation, we will discuss key terms and vocabulary related to Stormwater Collection and Conveyance Systems in the context of the Certificate in Stormwater Management and Drainage Design.

Stormwater: Stormwater is water that originates from precipitation, including rain and snowmelt, which flows over the land surface and does not percolate into the ground.

Stormwater Collection System: A stormwater collection system is a network of pipes, channels, and other structures designed to collect and convey stormwater runoff from urban and rural areas.

Stormwater Conveyance System: A stormwater conveyance system is a component of a stormwater collection system that is designed to transport stormwater runoff from one location to another.

Storm Drain: A storm drain is an underground structure that collects and conveys stormwater runoff from streets, parking lots, and other impervious surfaces.

Catch Basin: A catch basin is a structure that is designed to collect stormwater runoff from streets, sidewalks, and other surfaces. It typically consists of a grate or curb inlet and a sump where sediment and debris can settle out.

Manhole: A manhole is a vertical access structure that provides access to a stormwater conveyance system for maintenance and inspection purposes.

Inlet: An inlet is a structure that is designed to collect stormwater runoff from a surface and convey it into a stormwater conveyance system.

Outlet: An outlet is a structure that is designed to discharge stormwater runoff from a stormwater conveyance system into a receiving waterbody or other system.

Detention Basin: A detention basin is a stormwater management facility that is designed to temporarily store stormwater runoff and release it slowly to downstream systems or receiving waterbodies.

Retention Basin: A retention basin is a stormwater management facility that is designed to permanently store stormwater runoff and allow it to infiltrate into the ground or evaporate.

Swale: A swale is a shallow, broad depression that is designed to convey and treat stormwater runoff.

Grade: Grade refers to the slope or incline of a surface, such as a road or a stormwater conveyance system.

Impervious Surface: An impervious surface is a surface that does not allow stormwater to infiltrate into the ground, such as pavement, rooftops, and compacted soil.

Infiltration: Infiltration is the process by which stormwater percolates into the ground and replenishes groundwater.

Peak Flow: Peak flow is the maximum rate of stormwater runoff that occurs during a storm event.

Time of Concentration: Time of concentration is the time required for stormwater to travel from the most remote point in a watershed to a specific location, such as a catch basin or outlet.

Hydraulic Capacity: Hydraulic capacity refers to the ability of a stormwater conveyance system to convey a certain volume of stormwater runoff.

Hydraulic Grade Line: The hydraulic grade line is the elevation of the water surface in a stormwater conveyance system.

Energy Grade Line: The energy grade line is the elevation of the total energy of the water in a stormwater conveyance system, including the kinetic energy of the flow.

Manning's Equation: Manning's equation is a formula used to calculate the flow velocity in a stormwater conveyance system based on the hydraulic radius, slope, and surface roughness.

Hydraulic Radius: Hydraulic radius is the cross-sectional area of a stormwater conveyance system divided by the wetted perimeter.

Surface Roughness: Surface roughness refers to the roughness of the inner surface of a stormwater conveyance system, which affects the flow velocity and resistance.

Critical Depth: Critical depth is the depth of flow in a stormwater conveyance system at which the flow velocity is at its maximum.

Specific Energy: Specific energy is the total energy of the water in a stormwater conveyance system divided by the flow depth.

Backwater: Backwater is the rise in the water surface elevation upstream of a structure, such as a bridge or culvert, caused by a reduction in the conveyance capacity.

Freeboard: Freeboard is the vertical distance between the design water surface elevation and the top of a stormwater conveyance system or structure.

Kerb and Channel: Kerb and channel is a type of stormwater conveyance system that consists of a curb and a gutter that collects and conveys stormwater runoff.

Pipe Network Analysis: Pipe network analysis is a method used to model and analyze the flow of stormwater in a pipe network.

Water Quality: Water quality refers to the chemical, physical, and biological characteristics of water that affect its suitability for various uses, such as drinking, swimming, and aquatic life.

Best Management Practice (BMP): A best management practice (BMP) is a method or measure used to prevent or reduce the pollution of stormwater runoff.

Illicit Discharge: An illicit discharge is the discharge of any substance other than stormwater into a stormwater conveyance system or receiving waterbody.

Stormwater Pollution Prevention Plan (SWPPP): A stormwater pollution prevention plan (SWPPP) is a plan that outlines the measures and practices used to prevent or reduce the pollution of stormwater runoff.

Green Infrastructure: Green infrastructure refers to the use of natural and engineered systems, such as rain gardens and permeable pavement, to manage stormwater runoff.

Low Impact Development (LID): Low impact development (LID) is a design approach that aims to minimize the impact of development on the environment by using techniques that mimic natural hydrologic processes.

Urban Heat Island: An urban heat island is a phenomenon in which urban areas experience higher temperatures than surrounding rural areas due to the absorption and re-radiation of heat by buildings and pavement.

Climate Change: Climate change refers to the long-term changes in temperature and precipitation patterns due to human activities, such as the burning of fossil fuels.

Integrated Water Management: Integrated water management is an approach to water management that considers the entire water cycle and the interconnections between water, land, and ecosystems.

Water Sensitive Urban Design (WSUD): Water sensitive urban design (WSUD) is an approach to urban design that aims to minimize the impact of development on the water cycle and improve water quality and availability.

In conclusion, understanding the key terms and vocabulary related to Stormwater Collection and Conveyance Systems is essential for anyone pursuing a Certificate in Stormwater Management and Drainage Design. These terms and concepts are fundamental to the design, analysis, and management of stormwater conveyance systems and the protection of public health, safety, and the environment. By using the specified HTML tags sparingly to emphasize important terms and concepts, we can create detailed, comprehensive, and learner-friendly content that is ready for immediate use without requiring human editing. The use of examples, practical applications, and challenges can further enhance the learning experience and promote a deeper understanding of these complex systems.