

## APPENDIX A

### GLOSSARY

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#### **-A-**

##### **ABANDONED**

No longer in use; a length section or portion of a collection system no longer in service and left in place, underground. For example, when a house or building is razed or removed the service connection may be left open and unused.

##### **ABATEMENT**

Putting an end to an undesirable or unlawful condition affecting the wastewater collection system. A property owner found to have inflow sources connected to the collection system may be issued a "NOTICE OF ABATEMENT." Such notices will usually describe the violation, suggest corrective measures and grant a period of time for compliance.

##### **AEROBIC**

A condition in which atmospheric or dissolved molecular oxygen is present in the aquatic (water) environment.

##### **AIR GAP**

An open vertical drop, or vertical empty space, between a drinking (potable) water supply and the point of use. This gap prevents backsiphonage because there is no way wastewater can reach the drinking water. Air gap devices are used to provide adequate space above the top of a manhole and the end of the hose from the fire hydrant. This gap ensures that no wastewater will flow out the top of a manhole, reach the end of the hose from a fire hydrant, and be sucked or drawn back up through the hose to the water supply.

##### **AIR TEST**

A method of inspecting a sewer pipe for leaks, inflatable or similar plugs are placed in the line and the space between these plugs is pressurized with air. A drop in pressure indicates the line or run being tested has leaks.

##### **ALIGNMENT**

The proper positioning of parts in a system. The alignment of a pipeline or other line refers to its location and direction.

##### **ANAEROBIC**

A condition in which atmospheric or dissolved molecular oxygen is NOT present in the aquatic (water) environment.

##### **ANAEROBIC DECOMPOSITION**

The decay or breaking down of organic material in an environment containing no "free" or dissolved oxygen.

##### **ANGLE OF REPOSE**

The angle between a horizontal line and the slope or surface of unsupported material such as gravel, sand or loose soil. Also called the "natural slope."

##### **ANNULAR**

A ring-shaped space located between two circular objects. For example, the space between the outside of a pipe liner and the inside of a pipe.

##### **ANOXIC**

Oxygen deficient or lacking sufficient oxygen.

##### **APARTMENT COMPLEX**

One or more residential buildings at a single location. An apartment building may contain several residences with a single connection to the wastewater collection system. A complex can have several building with a single connection.

##### **APPURTENANCE**

Machinery, appliances, structures and other parts of the main structure necessary to allow it to operate as intended, but not considered part of the main structure.

##### **ARCH**

- (1) The curved top of a sewer pipe or conduit.
- (2) A bridge or arch of hardened or caked chemical which will prevent the flow of the chemical.

##### **ASPHYXIATION**

An extreme condition often resulting in death due to a lack of oxygen and excess carbon dioxide in the blood from any cause.

#### **-B-**

##### **BOD**

Biochemical Oxygen Demand. The rate at which organisms use the oxygen in water or wastewater while stabilizing decomposable organic matter under aerobic conditions. In decomposition, organic matter serves as food for the bacteria and energy results from its oxidation. BOD measurements are used as a measure of the organic strength of wastes in water.

### **BACKFILL**

- (1) Material used to fill in a trench or excavation.
- (2) The act of filling a trench or excavation, usually after a pipe or some type of structure has been placed in the trench or excavation.

### **BACKFILL COMPACTION**

- (1) Tamping, rolling or otherwise mechanically compressing material used as backfill for a trench or excavation. Backfill is compressed to increase its density so that it will support the weight of machinery or other loads after the material is in place in the excavation.
- (2) Compaction of a backfill material can be expressed as a percentage of the maximum compactability, density or load capacity of the material being used.

### **BACKFLUSHING**

A procedure used to wash settled waste matter off upstream to prevent odors from developing after a main line stoppage has been cleared.

### **BACKWATER GATE**

A gate installed at the end of the drain or outlet pipe to prevent the backward flow of water or wastewater. Generally used on storm sewer outlets into streams to prevent backward flow during times of flood or high tide.

### **BACTERIA**

Bacteria are living organisms, microscopic in size, which usually consist of a single cell. Most bacteria use organic matter for their food and produce waste products as a result of their life processes.

### **BALLING**

A method of hydraulically cleaning a sewer or storm drain by using the pressure of a water head to create a high cleansing velocity of water around the ball. In normal operation, the ball is restrained by a cable while water washes past the ball at high velocity. Special sewer cleaning balls have an outside tread that causes them to spin or rotate, resulting in a "scrubbing" action of the flowing water along the pipe wall.

### **BAR RACK**

A screen composed of parallel bars, either vertical or inclined, placed in a sewer or other waterway to catch debris. The screenings may be raked from it.

### **BARREL**

- (1) The cylindrical part of a pipe that may have a bell on one end.
- (2) The cylindrical part of a manhole between the cone at the top and the shelf at the bottom.

### **BEDDING**

The prepared base or bottom of a trench or excavation on which a pipe or other underground structure is supported.

### **BEDDING COMPACTION**

- (1) Tamping, rolling or otherwise mechanically compressing material used as bedding for a pipe or other underground structure to a density that will support expected loads.
- (2) Bedding compaction can be expressed as a percentage of the maximum load capacity of the bedding material.
- (3) Bedding compaction also can be expressed in load capacity or pounds per square foot.

### **BEDDING DESTRUCTION**

Loss of grade, load capacity or material of a bedding.

### **BEDDING DISPLACEMENT**

Bedding which has been removed after placement and compaction. In a sewer pipe system, this can take place as a result of washouts due to infiltration, earth shifts or slides, damage from nearby excavations and/or improper backfill methods.

### **BEDDING FAULTS**

Locations where bedding was improperly applied and thus failed.

### **BEDDING GRADE**

- (1) In a gravity-flow sewer system, pipe bedding is constructed and compacted to the design grade of the pipe. This is usually expressed in a percentage. A 0.5 percent grade would be a drop of one-half of foot per hundred feet of pipe.
- (2) Bedding grade for a gravity-flow sewer pipe can also be specified as elevation above mean sea level at specific points.

### **BELL**

- (1) In pipe fitting, the enlarged female end of a pipe into which the male end fits.
- (2) In plumbing, the expanded female end of a wiped joint.

### **BELL-AND-SPIGOT JOINT**

A form of joint used on pipes which have an enlarged diameter or bell at one end, and a spigot at the other which fits into and is laid in the bell. The joint is then made tight by lead, cement, rubber O-ring, or other jointing compounds or materials.

### **BELLMOUTH**

An expanding, rounded entrance to a pipe or orifice.

### **BEND**

A piece of pipe bent or cast into an angular shape.

### **BIOCHEMICAL OXYGEN DEMAND (BOD)**

The rate at which organisms use the oxygen in water or wastewater while stabilizing decomposable organic matter under aerobic conditions. In decomposition, organic matter serves as food for the bacteria and energy results

from its oxidation. BOD measurements are used as a measure of the organic strength of wastes in water.

**BIT**

(1) Cutting blade used in rodding (pipe cleaning) operations.

(2) Cutting teeth on the auger head of a sewer boring tool.

**BLOCKAGE**

(1) Partial or complete interruption of flow as a result of some obstruction in a sewer.

(2) When a collection system becomes plugged and the flow backs up, it is said to have a “blockage.”

**BLOWER**

A device used to ventilate manholes and lift stations.

**BLUEPRINT**

A photographic print in white on a bright blue background used for copying maps, mechanical drawings, construction plans and architects’ plans.

**BORROW BACKFILL**

Material used for backfilling a trench or excavation which was not the original material removed during excavation. This is a common practice where tests on the original material show it to have poor compactibility or load capacity.

**BRANCH MANHOLE**

A sewer or drain manhole which has more than one pipe feeding into it. A standard manhole will have one outlet and one inlet. A branch manhole will have one outlet and two or more inlets.

**BRANCH SEWER**

A sewer that receives wastewater from a relatively small area and discharges into a main sewer servicing more than one branch sewer area.

**BREAK**

A fracture or opening in a pipe, manhole or other structure due to structural failure and/or structural defect.

**BRICKWORK**

A structure made of brick, which was common in older sewers.

**BROKEN HUB**

In bell-and-spigot pipe, the bell portion is frequently called the “hub.” A fracture or break in the bell portion is called a “broken hub.”

**BROKEN SECTION**

A run of pipe between two joints is referred to as a “section.” A fracture in a section is called a “broken section.”

**BUCKET**

(1) A special device designed to be pulled along a sewer for the removal of debris from the sewer. The bucket has one end open with the opposite end having a set of jaws. When pulled from the jaw end, the jaws are automatically opened. When pulled from the other end, the jaws close. In operation, the bucket is pulled into the debris from the jaw end and to a point where some of the debris has been forced into the bucket. The bucket is then pulled out of the sewer from the other end, causing the jaws to close and retain the debris. Once removed from the manhole, the bucket is emptied and the process repeated.

(2) A conventional pail or bucket used in BUCKETING OUT and also for lowering and raising tools and materials from manholes and excavations.

**BUCKET BAIL**

The pulling handle on a bucket machine.

**BUCKET MACHINE**

A powered winch machine designed for operation over a manhole. The machine controls the travel of buckets used to clean sewers.

**BUCKETING OUT**

An expression used to describe removal of debris from a manhole with a pail on a rope. In balling or high-velocity cleaning of sewers, debris is washed into the downstream manhole. Removal of this debris by scooping it into pails and hauling debris out is called “bucketing out.”

**BUILDING SERVICE**

A saddle or “Y” connection to a lateral or branch sewer for connection of a building lateral.

**BUILDING SEWER**

A gravity-flow pipeline connecting a building wastewater collection system to a lateral or branch sewer. The building sewer may begin at the outside of the building’s foundation wall or some distance (such as 2 to 10 feet) from the wall, depending on local sewer ordinances.

**BUILDING WASTEWATER COLLECTION SYSTEM**

All of the wastewater drain pipes and their hardware that connect plumbing fixtures inside or adjacent to a building to the building sewers. This includes traps, vents, and cleanouts.

**BYPASS**

A pipe, valve, gate, weir, trench or other device designed to permit all or part of a wastewater flow to be diverted from usual channels or flow. Sometimes refers to a special line which carries the flow around a facility or device that needs maintenance or repair.

## **BYPASSING**

The act of causing all or part of a flow to be diverted from its usual channels. In a wastewater treatment plant, overload flows should be bypassed into a holding pond for future treatment.

## **-C-**

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## **CFR**

Code of Federal Regulations. A publication of the United States Government which contains all of the proposed and finalized federal regulations, including safety and environmental regulations.

## **CFS**

Initials standing for "Cubic Feet per Second," a measure of flow rate.

## **CATCH BASIN**

A chamber or well used with storm or combined sewers as a means of removing grit which might otherwise enter and be deposited in sewers.

## **CHECK VALVE**

A special valve with a hinged disc or flap that opens in the direction of normal flow and is forced shut when flows attempt to go in the reverse or opposite direction of normal flows.

## **CHEMICAL GROUT**

Two chemical solutions that form a solid when combined. Solidification time is controlled by the strength of the mixtures used and the temperature.

## **CHEMICAL GROUTING**

Sealing leaks in a pipeline or manhole structure by injecting a chemical grout. In pipelines, the chemicals are injected through a device called a "packer." In operation, the packer is located at the leak point with the use of a television camera. Inflatable boots at either end of the packer isolate the leak point and the grouting chemicals are then forced into the leak under pressure. After allowing time for the grout to set, the packer is deflated and moved to the next location.

## **CLEANOUT**

An opening (usually covered or capped) in a wastewater collection system used for inserting tools, rods or snakes while cleaning a pipeline or clearing a stoppage.

## **CLEANOUT, TWO-WAY**

A cleanout designed for rodding or working a snake into a pipe in either direction. Two-way cleanouts are often used in building lateral pipes at or near a property line.

## **COLLAPSED PIPE**

A pipe that has one or more points in its length which have been crushed or partially crushed by exterior pressures or impacts.

## **COLLECTION MAIN**

A collection pipe to which building laterals are connected.

## **COLLECTION SYSTEM**

A network of pipes, manholes, cleanouts, traps, siphons, lift stations and other structures used to collect all wastewater and wastewater-carried wastes of an area and transport them to a treatment plant or disposal system. The collection system includes land, wastewater lines and appurtenances, pumping stations and general property.

## **COMMERCIAL CONTRIBUTION**

Liquid and liquid-carried wastes dumped by commercial establishments into the wastewater collection system. Used in this context, commercial contributions are distinct from domestic and industrial sources of wastewater contributions. Examples of high-yield commercial sources are laundries, restaurants and hotels.

## **COMPACTION**

Tamping or rolling of a material to achieve a surface or density that is able to support predicted loads.

## **COMPACTION TEST**

Any method of determining the weight a compacted material is able to support without damage or displacement. Usually stated in pounds per square foot.

## **COMPUTED COLLECTION SYSTEM CONTRIBUTION**

The part of a collection system flow computed to be actual domestic and industrial wastewater. Applied to infiltration/inflow research, the computed domestic and industrial wastewater contribution is subtracted from a total flow to determine infiltration/inflow amounts.

## **COMPUTED COMMERCIAL CONTRIBUTION**

That part of a collection system flow computed to originate in the commercial establishments on the basis of expected flows from all commercial sources.

## **COMPUTED CONTRIBUTION**

A liquid or liquid-carried contribution to a collection system that is computed on the basis of expected discharges from all of the sources as opposed to actual measurement or metering.

## **COMPUTED DOMESTIC CONTRIBUTION**

That part of a collection system flow computed to originate in the residential facilities based on the average flow contribution from each person.

## **COMPUTED FACILITY CONTRIBUTION**

The computed liquid-waste discharge from a single facility based on the sources of waste flows in the facility.

**COMPUTED INDUSTRIAL CONTRIBUTION**

The computed liquid-waste discharge from industrial operations based on the expected discharges from all sources.

**COMPUTED PER CAPITA CONTRIBUTION**

The computed wastewater contribution from a domestic area, based on the population of the area. In the United States, the daily average wastewater contribution is considered to be 100 gallons per capita per day (100GPCD).

**COMPUTED TOTAL CONTRIBUTION**

The total anticipated load on a wastewater treatment plant or the total anticipated flow in any collection system area based on the combined computed contributions of all connections to the system.

**CONCENTRIC MANHOLE CONE**

Cone tapers uniformly from barrel to manhole cover.

**CONCRETE CRADLE**

A device made of concrete that is designed to support sewer pipe.

**CONFINED SPACE**

Confined space means a space that:

- A. Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- B. Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
- C. Is not designed for continuous employee occupancy. (Definition from the Code of Federal Regulations (CFR) Title 29 Part 1910.146).

**CONTRIBUTION**

Waters, wastewaters or liquid-carried wastes entering a wastewater collection system.

**CORROSION**

The gradual decomposition or destruction of a material due to chemical action, often due to an electrochemical reaction. Corrosion starts at the surface of a material and moves inward, such as the chemical action upon manholes and sewer pipe materials.

**COUPLING**

- (1) A threaded sleeve used to connect two pipes.
- (2) A device used to connect two adjacent parts, such as pipe coupling, hose coupling or drive coupling.

**COUPON**

A steel specimen inserted into wastewater to measure the corrosiveness of the wastewater. The rate of corrosion is measured as the loss of weight of the coupon or change in its physical characteristics. Measure the weight loss (in milligrams) per surface area (in square decimeters) exposed to the wastewater per day.

**CROSS BRACES**

Shoring members placed across a trench to hold other horizontal and vertical shoring members in place.

**CROSS CONNECTION**

- (1) A connection between a storm drain system and a sanitary collection system.
- (2) Less frequently used to mean a connection between two sections of a collection system to handle anticipated overloads of one system.
- (3) A connection between drinking (potable) water and an unapproved water supply.

**CURB INLET**

A chamber or well built at the curbline of a street to admit gutter flow to the storm water drainage system.

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**DATA-VIEW**

A high-speed reporting and recording system used with closed-circuit pipeline television equipment. Data-view provides digital indexing of date, job number, footages and air test pressure in the television picture itself. Where videotape recordings of television pipe inspections or pipe sealing activities are made, data-view reports are automatically recorded on the taped pictures.

**DEADEND MANHOLE**

A manhole located at the upstream end of a sewer and having no inlet pipe.

**DEBRIS**

Any material in wastewater found floating, suspended, settled, or moving along the bottom of a sewer. This material may cause stoppages by getting hung up on roots or settling out in a sewer. Debris includes grit, paper, rubber, silt, and all materials except liquid.

**DECOMPOSED PIPE**

Pipe which has been destroyed or portions of pipe weakened by chemical actions.

**DECOMPOSITION, DECAY**

Processes that convert unstable materials into more stable forms by chemical or biological action. Waste treatment encourages decay in a controlled situation so that material may be disposed of in a stable form. When organic matter decays under anaerobic conditions (putrefaction), undesirable odors are produced. The aerobic processes in common use for wastewater treatment produce much less objectionable odors.

**DEFECT**

A point where a pipe or system structure has been damaged or has a fault.

**DEFLECTED**

(1) Pipe which has been forced out of round by external pressures. This happens mainly to fiber and plastic pipes where back fill compaction has resulted in unequal pressure on all sides of the pipe.

(2) Pipe whose direction has been changed either to the left, right, up, or down.

**DEGRADATION**

The conversion or breakdown of a substance to simpler compounds. For example, the degradation of organic matter to carbon dioxide and water.

**DESTROYED PIPE**

Pipe which has been damaged, decomposed, deflected, crushed or collapsed to a point that it must be replaced.

**DETRITUS**

The heavy, coarse mixture of grit and organic material carried by wastewater.

**DEWATER**

To drain or remove water from an enclosure. A structure may be dewatered so that it can be inspected or repaired. Dewater also means draining or removing water from sludge to increase the solids concentration.

**DIP**

A point in the sewer pipe where a drain grade defect results in a puddle of standing water when there is no flow. If the grade defect is severe enough to cause the standing water to fill the pipe at any point (preventing passage of air through the pipe), it is called a “trap dip,” “full dip” or “filled dip.”

**DISPLACED PIPE**

A run or section of sewer pipe that has been pushed out of alignment by external forces.

**DISTURBED SOIL**

Soil which has been changed from its natural condition by excavation or other means.

**DIVERSION CHAMBER**

A chamber or box which contains a device for diverting or drawing off all or part of a flow or for discharging portions of the total flow to various outlets.

**DOMESTIC**

Residential living facilities. A domestic area will predominantly residential in occupancy and is sometimes referred to as a “bedroom area” or “bedroom community.”

**DOMESTIC CONTRIBUTION**

Wastes originating in a residential facility or dwelling. In this use, it means the type and quantity of wastes are different from commercial and industrial or agricultural wastes.

**DOMESTIC SERVICE**

A connection to a sewer system for hookup of a residential-type building.

**DOWNSPOUT**

In plumbing, the water conductor from the roof gutters or roof catchment to the storm drain or other means of disposal.

**DOWNSTREAM**

The direction of flow of water. In the lower part of a sewer or collection system or in that direction.

**DRAGLINE**

A machine that drags a bucket down the intended line of a trench to dig or excavate the trench. Also used to dig holes and move soil or aggregate.

**DROP JOINT**

A sewer pipe joint where one part has dropped out of alignment.

**DROP MANHOLE**

A main line or house service line lateral entering a manhole at a higher elevation than the main flow line or channel. If the higher elevation flow is routed to the main manhole channel outside of the manhole, it is called an “outside drop.” If the flow is routed down through the manhole barrel, the pipe down to the manhole channel is called an “inside drop.”

**DRY WELL**

A dry room or compartment in a lift station, near or below the water level, where the pumps are located.

**DWELLING**

A structure for residential occupancy.

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**EARTH SHIFT**

The movement or dislocation of underground soil or structure. Earth shift is usually caused by external forces such as surface loads, slides, stresses or nearby construction, water movements or seismic forces.

**EASEMENT**

Legal right to use the property of others for a specific purpose. For example, a utility company may have a five-foot easement along the property line of a home. This gives the utility the legal right to install and maintain a sewer line within the easement.

**ECCENTRIC MANHOLE CONE**

Cone tapers nonuniformly from barrel to manhole cover with one side usually vertical.

**EFFLUENT**

Wastewater or other liquid—raw (untreated), partially, or completely treated—flowing FROM a reservoir, basin, treatment process, or treatment plant.

**ELBOW**

A pipe fitting that connects two pipes at an angle. The angle is usually 90 degrees unless another angle is stated.

**ELEVATION**

The height to which something is elevated, such as the height above sea level.

**ESTIMATED CONTRIBUTION**

A contribution to a collection system that is estimated rather than computed. The distinction between computed and estimated in such cases is difficult to specify or define.

**ESTIMATED FLOW**

A rough guess of the amount of flow in a collection system. When greater accuracy is needed, flow could be computed using average or typical flow quantities. Even greater accuracy would result from metering or otherwise measuring the actual flow.

**EXFILTRATION**

Liquid wastes and liquid-carried wastes which unintentionally leak out of a sewer pipe system and into the environment.

**EXTRADOS**

The upper outside curve of a sewer pipe or conduit.

**-F-**

**FAIR LEAD PULLEY**

A pulley that is placed in a manhole to guide TV camera electric cables and the pull cable into the sewer when inspecting pipelines.

**FLOAT (CONTROL)**

A device used to measure the elevation of the surface of water. The float rests on the surface of the water and rises or falls with it. The elevation of the water surface is measured by a rod, chain, rope or tape attached to the float.

**FLOAT LINE**

A length of rope or heavy twine attached to a float, plastic jug or parachute to be carried by the flow in a sewer from one manhole to the next. This is called “stringing the line” and is used for pulling through winch cables, such as for bucket machine work or closed-circuit television work.

**FLOTATION**

(1) The stress or forces on a pipeline or manhole struc-

ture below a water table which tend to lift or float the pipeline or manhole structure.

(2) The process of raising suspended matter to the surface of the liquid in a tank where it forms a scum layer that can be removed by skimming. The suspended matter is raised by aeration, the evolution of gas, the use of chemicals, electrolysis, heat or bacterial decomposition.

**FLOW**

The continuous movement of a liquid from one place to another.

**FLOW ISOLATION**

A procedure used to measure inflow and infiltration (I/I). A section of sewer is blocked off or isolated and the flow from the section is measured.

**FLOW LINE**

(1) The top of the wetted line, the water surface or the hydraulic grade line of water flowing in an open channel or partially full conduit.

(2) The lowest point of the channel inside a pipe or manhole.

**FLOW RECORDING**

A record of a flow measurement past any selected point. Usually consists of time, velocity and amount (in gallons) with maximum and minimum rates as well as the total amount over a given time period.

**FLUME**

An open conduit of wood, masonry, metal, or plastic constructed on a grade and sometimes elevated.

**FLUSHER BRANCH**

A line built specifically to allow the introduction of large quantities of water to the collection system so the lines can be “flushed out” with water. Also installed to provide access for equipment to clear stoppages in a sewer.

**FLUSHING**

The removal of deposits of material which have lodged in sewers because of inadequate velocity of flows. Water is discharged into the sewers at such rates that the larger flow and higher velocities are sufficient to remove the material.

**FORCE MAIN**

A pipe that carries wastewater under pressure from the discharge side of a pump to a point of gravity flow downstream.

**FRICTION LOSS**

The head lost by water flowing in a stream or conduit as the result of the disturbances set up by the contact between the moving water and its containing conduit and by intermolecular friction.

**-G-**

**GAGE**

A device for checking or measuring a particular dimension of something, using specific standardized units. For example, a gage might measure the elevation of a water surface, the velocity of flowing water, the pressure of water, the amount or intensity of precipitation, and the depth of the snowfall. Gages also are used to determine the location or position of equipment during installation and after operation.

**GRADE**

(1) The elevation of the invert (or bottom) of a pipeline, canal, culvert, sewer, or similar conduit.

(2) The inclination of slope of a pipeline, conduit, stream channel, or natural ground surface; usually expressed in terms of the ratio or percentage of number of units of vertical rise or fall per unit of horizontal distance. A 0.5 percent grade would be a drop of one-half foot per hundred feet of pipe.

**GRADE RING**

A precast concrete ring 4 to 12 inches high which is placed on top of a manhole cone to raise the manhole cover frame flush with the surface grade.

**GRADIENT**

The upward or downward slope of a pipeline.

**GRAVITY**

The attraction of the earth to any substance—solid, liquid or gas.

**GRAVITY FLOW**

Water or wastewater flowing from a higher elevation to a lower elevation due to the force of gravity. The water does not flow due to energy provided by a pump. Wherever possible, wastewater collection systems are designed to use the force of gravity to convey waste liquids and solids.

**GREASE**

In a collection system, grease is considered to be the residues of fats, detergents, waxes, free fatty acids, calcium and magnesium soaps, mineral oils, and certain other nonfatty material which tend to separate from water and coagulate as floatables or scums.

**GREASE BUILDUP**

Any point in a collection system where coagulated and solidified greases accumulate and build up. Many varieties of grease have high adhesive characteristics and collect other solids, forming restrictions and stoppages in collection systems.

**GREASE TRAP**

A receptacle designed to collect and retain grease and fatty substances usually found in kitchens or from simi-

lar wastes. It is installed in the drainage system between the kitchen or other point of production of the waste and the building wastewater collection line. Commonly used to control grease from restaurants.

**GRIT**

The heavy mineral material present in wastewater such as sand, coffee grounds, eggshells, gravel and cinders. Grit tends to settle out at flow velocities below 2 ft/sec and accumulate in the invert or bottoms of the pipelines.

**GRIT CATCHER**

A chamber usually placed at the upper end of a depressed collection line or at other points on combined or storm water collection lines where wear from grit is possible. The chamber is sized and shaped to reduce the velocity of flow through it and thus permit the settling out of grit.

**GRIT CHAMBER**

A detention chamber or an enlargement of a collection line designed to reduce the velocity of flow of the liquid to permit the separation of mineral solids from organic solids by differential sedimentation.

**GRIT CHANNEL**

(1) An enlargement in a collection line where grit can easily settle out of the flow.

(2) The waterway of the grit chamber.

**GRIT COLLECTOR**

A device placed in a grit chamber to convey deposited grit to a point of collection for ultimate disposal.

**GRIT COMPARTMENT**

The portion of the grit chamber in which grit is collected and stored before removal.

**GRIT TANK**

A structure located at the inlet to a treatment plant for the accumulation and removal of grit.

**GRIT TRAP**

A permanent structure built into a manhole (or other convenient location in a collection system) for the accumulation and easy removal of grit.

**GROUNDWATER**

Subsurface water in the saturation zone from which wells and springs are fed. In a strict sense the term applies only to water below the water table.

**GROUNDWATER DEPTH**

The distance of the groundwater table below the surface at any selected location.

**GROUNDWATER ELEVATION**

The elevation of the groundwater table above the mean sea level at any selected location.

**GROUNDWATER TABLE**

The average depth or elevation of the groundwater over a selected area.

**GROUT**

A substance in a paste or liquid form which solidifies after placement or treatment. Used to fill in spaces, holes or voids in other materials.

**GUNITE**

A mixture of sand and cement applied pneumatically that forms a high-density, resistant concrete.

**-H-****HAIRLINE CRACK**

A stress crack in a pipe; the crack looks like a piece of hair.

**HAND ROD**

A sewer rod that can be inserted manually (by hand) into a sewer to clear a stoppage or to prevent a stoppage from developing.

**HANDHOLE TRAP**

A device made of pipe fittings used to prevent sewer gases escaping from the branch or lateral sewer from entering a building sewer.

**HEAD**

The vertical distance, height or energy of water above a point. A head of water may be measured in either height (feet) or pressure (pounds per square inch (psi)).

**HIGH-VELOCITY CLEANER**

A machine designed to remove grease and debris from the smaller diameter sewer pipes with high-velocity jets of water.

**HYDRAULIC BLOCK**

The movement of water in such a way that the flow of water from one direction blocks or hinders the flow of water from another direction.

**HYDRAULIC GRADE LINE (HGL)**

The surface or profile of water flowing in an open channel or a pipe flowing partially full. If a pipe is under pressure, the hydraulic grade line is at the level water would rise to in a small tube connected to the pipe. To reduce the release of odors from sewers, the water surface or hydraulic grade line should be kept as smooth as possible.

**HYDRAULIC POPULATION EQUIVALENT**

A flow of 100 gallons per day is the hydraulic or flow equivalent to the contribution or flow from one person. Population equivalent = 100 GPCD or gallons per capita per day.

**-I-****IMPORTED BACKFILL**

Material used for backfilling a trench or excavation which was not the original material removed during excavation. This is a common practice where tests on the original material show it to have poor compactability or load capacity.

**INDUSTRIAL WASTEWATER**

Liquid wastes originating from industrial processing. Because industries have peculiar liquid waste characteristics requiring special consideration, these sources are usually handled and treated separately before being discharged to a wastewater collection system.

**INFILTRATED DEBRIS**

Sand, silt, gravel, and rocks carried or washed into a collection system by infiltration water flows.

**INFILTRATION**

The seepage of groundwater into a sewer system, including service connections. Seepage frequently occurs through defective or cracked pipes, pipe joints, connections or manhole walls.

**INFILTRATION HEAD**

The distance from a point of infiltration leaking into a collection system to the water table elevation. This is the pressure of the water being forced through the leak in the collection system.

**INFILTRATION/INFLOW**

The total quantity of water from both infiltration and inflow without distinguishing the source. Abbreviated I&I or I/I.

**INFLATABLE PIPE STOPPER**

An inflatable ball or bag used to form a plug to stop flows in a sewer pipe.

**INFLOW**

Water discharged into a sewer system and service connections from such sources as, but not limited to, roof leaders, cellars, yard and area drains, foundation drains, cooling water discharges, drains from springs and swampy areas, around manhole covers or through holes in the covers, cross connections from storm and combined sewer systems, catch basins, storm waters, surface runoff, street wash waters or drainage. Inflow differs from infiltration in that it is a direct discharge into the sewer rather than a leak in the sewer itself.

**INFLUENT**

Wastewater or other liquid—raw (untreated) or partially treated—flowing into a reservoir, basin, treatment process, or treatment plant.

### **INLET**

- (1) A surface connection to a drain pipe.
- (2) A chamber for collecting storm water with no well below the outlet pipe for collecting grit. Often connected to a CATCH BASIN or a “basin manhole” with a grit chamber.

### **INSERTION PULLER**

A device used to pull long segments of flexible pipe material into a sewer line when sliplining to rehabilitate a deteriorated sewer.

### **INSITUFORM**

A method of installing a new pipe within an old pipe without excavation. The process involves the use of a polyester-fiber felt tube, lined on one side with polyurethane and fully impregnated with a liquid thermal setting resin.

### **INSPECTION TELEVISION EQUIPMENT**

Television equipment that is superior to standard commercial quality, providing 600 to 650 lines of resolution, and designed for industrial inspection applications.

### **INTERCEPTING SEWER**

A sewer that receives flow from a number of other large sewers or outlets and conducts the waters to a point for treatment or disposal. Often called an “interceptor.”

### **INTERCONNECTOR**

A sewer installed to connect two separate sewers. If one sewer becomes blocked, wastewater can back up and flow through the interconnector to the other sewer.

### **INTERNAL INFLOW**

Nonsanitary or industrial wastewaters generated inside of a domestic, commercial or industrial facility and being discharged into the sewer system. Examples are cooling tower waters, basement sump pump discharge waters, continuous-flow drinking fountains, and defective or leaking plumbing fixtures.

### **INTRADOS**

The upper inside curve or surface of a sewer pipe or conduit.

### **INVERSION**

An Insituform process in which the Insitutube or liner is turned inside out (inverted) during the installation of the liner.

### **INVERT**

The lowest point of the channel inside a pipe or manhole.

### **INVERTED SIPHON**

A pressure pipeline used to carry wastewater flowing in a gravity collection system under a depression such as a valley or roadway or under a structure such as a building.

### **-K-**

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### **KEY MANHOLE**

In collection system evaluation, a key manhole is one from which reliable or specific data can be obtained.

### **KITE**

A device for hydraulically cleaning sewer lines. Resembling an airport wind sock and constructed of canvas-type material, the kite increases the velocity of a flow at its outlet to wash debris ahead of it.

### **-L-**

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### **LAMPING**

Using reflected sunlight or a powerful light beam to inspect a sewer between two adjacent manholes. The light is directed down the pipe from one manhole. If it can be seen from the next manhole, it indicates that the line is open and straight.

### **LATERAL**

(See LATERAL SEWER)

### **LATERAL BREAK**

A break in a lateral pipe somewhere between the sewer main and the building connection.

### **LATERAL CLEANOUT**

A capped opening in a building lateral, usually located on the property line, through which the pipelines can be cleaned.

### **LATERAL SEWER**

A sewer that discharges into a branch or other sewer and has no other common sewer tributary to it. Sometimes called a “street sewer” because it collects wastewater from individual homes.

### **LIFE-CYCLE COSTING**

An economic analysis procedure that considers the total costs associated with a sewer during its economic life, including development, construction, and operation and maintenance (includes chemical and energy costs). All costs are converted to a present worth or present cost in dollars.

### **LIFT STATION**

A wastewater pumping station that lifts the wastewater to a higher elevation when continuing the sewer at reasonable slopes would involve excessive depths of trench. Also, an installation of pumps that raise wastewater from areas too low to drain into available sewers. These stations may be equipped with air-operated ejectors or centrifugal pumps. Sometimes called a PUMP STATION, but this term is usually reserved for a similar type of facility that is discharging into a long FORCE MAIN, while a lift station has a discharge line or force main only up to the downstream gravity sewer.

**LONGITUDINAL CRACK**

A crack in a pipe or pipe section that runs lengthwise along the pipe.

**-M-**

**MG**

Initials for “Million Gallons.”

**MGD**

Initials for “Million Gallons Per Day.”

**MGY**

Initials for “Million Gallons Per Year.”

**MAIN LINE**

Branch or lateral sewers that collect wastewater from building sewers and service lines.

**MAIN SEWER**

A sewer line that receives wastewater from many tributary branches and sewer lines and serves as an outlet for a large territory or is used to feed an intercepting sewer.

**MANDREL**

(1) A special tool used to push bearings in or to pull sleeves out.

(2) A gage used to measure for excessive deflection in a flexible conduit.

**MANHOLE**

An opening in a sewer provided for the purpose of permitting operators or equipment to enter or leave a sewer.

**MANHOLE BEDDING**

The prepared and compacted base on which a manhole is constructed.

**MANHOLE DEPTH**

The measurement from the top of the manhole opening to the invert or lowest point of the trough at the bottom of the manhole.

**MANHOLE ELEVATION**

The height (elevation) of the invert or lowest point in the bottom of a manhole above mean sea level.

**MANHOLE FLOW**

(1) The depth or amount of wastewater flow in a manhole as observed at any selected time.

(2) The total or the average flow through a manhole in gallons on any selected time interval.

**MANHOLE FRAME**

A metal ring or frame with a ledge to accommodate the manhole lid; located at the surface of the ground of the street.

**MANHOLE GRADE RING**

A precast concrete ring 4 to 12 inches high which is placed on top of a manhole cone to raise the manhole cover frame flush with the surface grade.

**MANHOLE INFILTRATION**

Groundwaters seeping or leaking into a manhole structure.

**MANHOLE INFLOW**

Surface waters flowing into a manhole, usually through the vent holes in the manhole lid.

**MANHOLE INVERT**

The lowest point in a trough or flow channel in the bottom of a manhole.

**MANHOLE JACK**

A device used to guide the tag line into the sewer without causing unnecessary wear and provide support as the tag line is pulled back and forth.

**MANHOLE LID**

The heavy cast-iron or forged-steel cover of a manhole. The lid may or may not have vent holes.

**MANHOLE LID DUST PAN**

A sheet metal or cast-iron pan located under a manhole lid. This pan serves to catch and hold pebbles and other debris falling through vent holes, preventing them from getting into the pipe system.

**MANHOLE RING**

A metal frame or ring with a ledge to accommodate the lid and located at the surface of the ground or street.

**MANHOLE SEALING**

The process of sealing infiltration leaks in a manhole by injecting chemical grout.

**MANHOLE TOOLS**

(1) Special tools having conveniently short handles for working inside manholes.

(2) Special long-handled or extendable tools for removal of debris and other objects from manholes without requiring a person to enter the manhole.

**MANHOLE TROUGH**

The channel in the bottom of a manhole for the flow of the wastewater from manhole inlet to outlet.

**MANHOLE VENTS**

One or a series of one-inch diameter holes through a manhole lid for purposes of venting dangerous gases found in sewers.

### **MANNING'S FORMULA**

A mathematical formula for calculating wastewater flows in sewers.

$$Q = (1.49/n)(A)(R^{2/3})(S^{1/2})$$

Q means flow in cubic feet per second (cfs).

n means the Manning pipe or channel roughness factor, also called roughness coefficient.

A means the cross-sectional area of the flow in square-feet (sq-ft).

R means the hydraulic radius in feet (ft) where R equals A/P. P is the wetted perimeter of the channel or pipe in feet.

S means the slope of the channel or energy grade line in feet per foot (ft/ft).

### **MEASURED FLOW**

A flow which has been physically measured.

### **MECHANICAL CLEANING**

Clearing pipe by using equipment that scrapes, cuts, pulls or pushes the material out of the pipe. Mechanical cleaning devices or machines include bucket machines, power rodders and hand rods.

### **MECHANICAL PLUG**

A pipe plug used in sewer systems that is mechanically expanded to create a seal.

### **METERED**

Measured through a meter, as a quantity of water or flow might be measured.

### **-N-**

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### **NET WASTEWATER CONTRIBUTION**

In a wastewater collection system, the net wastewater contribution consists of the liquid wastes and liquid-carried wastes transported by the pipelines or received by the pipelines. This value would be the only wastewater found in a collection system if all sources of infiltration, inflow and exfiltration were eliminated.

### **NET WASTEWATER FLOW**

The actual wastewater flow from a collection system that reaches a wastewater treatment plant. The net wastewater flow includes the net wastewater contribution, infiltration and inflow and does not include losses through exfiltration.

### **NOMINAL DIAMETER**

An approximate measurement of the diameter of a pipe. Although the nominal diameter is used to describe the size or diameter of a pipe, it is usually not the exact inside diameter of the pipe.

### **NONSPARKING TOOLS**

These tools will not produce a spark during use. They are made of a nonferrous material, usually a copper-beryllium alloy.

### **NOTICE**

This word calls attention to information that is especially significant in understanding and operating equipment or processes safely.

### **-O-**

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### **OBSTRUCTION**

Any solid object in or protruding into a wastewater flow in a collection line that prevents a smooth or even passage of the wastewater.

### **OFF LINE**

A run of sewer pipe between two manholes is said to be "off line" if it is not located directly under a straight line passing through the exact centers of the two manholes. Sewer alignment does not always pass through the center of a manhole, especially at junctions.

### **OFFSET**

(1) A combination of elbows or bends which brings one section of a line of pipe out of line with, but into a line parallel with, another section.

(2) A pipe fitting in the approximate form of a reverse curve, made to accomplish the same purpose.

(3) A pipe joint that has lost its bedding support and one of the pipe sections has dropped or slipped, thus creating a condition where the pipes no longer line up properly.

### **OFFSET INVERT**

A trough or channel in the bottom of a manhole which is not centered in the bottom.

### **OFFSET JOINT**

A pipe joint that is not exactly in line and centered.

### **OFFSET MANHOLE**

A manhole located to one side of a pipe with either "Y" connections to it or the inlet and outlet pipes bent to enter and leave the manhole.

### **OFFSET TROUGH**

When the pipe feeding into a manhole does not exactly match up with the pipe leading out of the manhole, the invert channel must be angled or curved. This is referred to as an "offset trough."

### **OLFACTORY FATIGUE**

A condition in which a person's nose, after exposure to certain odors, is no longer able to detect the odor.

**ORIFICE**

An opening (hole) in a plate, wall, or partition. An orifice flange or plate placed in a pipe consists of a slot or a calibrated circular hole smaller than the pipe diameter. The difference in pressure in the pipe above and at the orifice may be used to determine the flow in the pipe.

**OUTFALL**

- (1) The point, location or structure where wastewater or drainage discharges from a sewer, drain, or other conduit.
- (2) The conduit leading to the final disposal point or area.

**OUTFALL SEWER**

A sewer that receives wastewater from a collection system or from a wastewater treatment plant and carries it to a point of ultimate or final discharge in the environment.

**OUTLET**

Downstream opening or discharge end of a pipe, culvert, or canal.

**OVERFLOW MANHOLE**

A manhole which fills and allows raw wastewater to flow out onto the street or ground.

**OVERFLOW RELIEF LINE**

Where a system has overload conditions during peak flows, an outlet may be installed above the invert and leading to a less loaded manhole or part of the system. This is usually called an “overflow relief line.”

**-P-**

**POTW**

Publicly Owned Treatment Works. A treatment works which is owned by a state, municipality, city, town, special sewer district or other publicly owned and financed entity as opposed to a privately (industrial) owned treatment facility. This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage (wastewater) or industrial wastes of a liquid nature. It also includes sewers, pipes and other conveyances only if they carry wastewater to a POTW treatment plant. The term also means the municipality (public entity) which has jurisdiction over the indirect discharges to and the discharges from such a treatment works.

**PACKING RING**

A ring made of asbestos or metal which may be lubricated with Teflon or graphite that forms a seal between the pump shaft and its casing.

**PARACHUTE**

A device used to catch wastewater flow to pull a float line between manholes.

**PARSHALL FLUME**

A specially constructed flume or channel used to measure flows in open channels.

**PEAKING FACTOR**

Ratio of a maximum flow to the average flow, such as maximum hourly flow or maximum daily flow to the average daily flow.

**PHOTOGRAPHIC INSPECTIONS**

A method of obtaining photographs of a pipeline by pulling a time-lapse motion picture camera through the line. By moving the camera a specific distance at timed intervals, a sequence of photographs covering the full length of the line is obtained.

**PHOTOGRAPHIC RECORDS**

- (1) The film strip from a photographic inspection.
- (2) Still camera photographs of a sewer television inspection monitor.

**PIG**

Refers to a poly pig which is a bullet-shaped device made of hard rubber or similar material.

**PIPE CAPACITY**

In a gravity-flow sewer system, pipe capacity is the total amount in gallons a pipe is able to pass in a specific time period.

**PIPE CLEANING**

Removing grease, grit, roots and other debris from a pipe run by means of one of the hydraulic cleaning methods.

**PIPE DIAMETER**

The nominal or commercially designated inside diameter of a pipe, unless otherwise stated.

**PIPE DISPLACEMENT**

The cubic inches of soil or water displaced by one foot or one section of pipe.

**PIPE GRADE**

The angle of a sewer or a single section of a sewer as installed. Usually expressed in a percentage figure to indicate the drop in feet or tenths of a foot per hundred feet. For example, 0.5 percent grade means a drop of one-half foot per 100 feet of length.

**PIPE JACK**

A jack used to fasten roller guides to secure an object within a manhole.

**PIPE JOINT**

A place where two sections of pipe are coupled or joined together.

**PIPE JOINT SEAL**

- (1) The tightness or lack of leakage at a pipe joint.
- (2) The method of sealing a pipe coupling.

**PIPE LINER**

A plastic liner pulled or pushed into a pipe to eliminate excessive infiltration or exfiltration. Other solutions to the problem of infiltration/exfiltration are the use of cement grouting or replacement of damaged pipe.

**PIPE PLUG**

- (1) A temporary plug placed in a sewer pipe to stop a flow while repair work is being accomplished or other functions are performed.
- (2) In construction of a new sewer system, service saddles are sometimes installed before a building or a building lateral is in existence. Under such circumstances, a plug will be placed in the off-lead of the saddle of a "Y."

**PIPE RODDING**

A method of opening a plugged or blocked pipe by pushing a steel rod or snake, or pulling same, through the pipe with a tool attached to the end of the rod or snake. Rotating the rod or snake with a tool attached increases effectiveness.

**PIPE RUN**

- (1) The length of sewer pipe reaching from one manhole to the next.
- (2) Any length of pipe, generally assumed to be in a straight line.

**PIPE SECTION**

A single length of pipe between two joints or couplers.

**PLAN**

A drawing showing the TOP view of sewers, manholes and streets.

**PNEUMATIC EJECTOR**

A device for raising wastewater, sludge or other liquid by compressed air. The liquid is alternately admitted through an inward-swinging check valve into the bottom of an airtight pot. When the pot is filled compressed air is applied to the top of the liquid. The compressed air forces the inlet valve closed and forces the liquid in the pot through an outward-swinging check valve, thus emptying the pot.

**POPULATION EQUIVALENT (HYDRAULIC)**

A flow of 100 gallons per day is the hydraulic or flow equivalent to the contribution or flow from one person. Population equivalent = 100 GPCD or gallons per capita per day.

**PORCUPINE**

A sewer cleaning tool the same diameter as the pipe being cleaned. The tool is a steel cylinder having solid

ends with eyes cast in them to which a cable can be attached and pulled by a winch. Many short pieces of cable or bristles protrude from the cylinder to form a round brush.

**POTABLE WATER**

Water that does not contain objectionable pollution, contamination, minerals, or infective agents and is considered satisfactory for drinking.

**POWER RODDER**

A sewer cleaning machine fitted with auger rods which are inserted in a sewer line to dislodge and cut roots and debris.

**PRECIPITATION**

- (1) The total measurable supply of water received directly from clouds as rain, snow, hail, or sleet; usually expressed as depth in a day, month, or year, and designated as daily, monthly, or annual precipitation.
- (2) The process by which atmospheric moisture is discharged onto a land or water surfaces.
- (3) The separation (of a substance) out in solid form from a solution, as by the use of a reagent.

**PRE-CLEANING**

Sewer line cleaning, commonly done by high-velocity cleaners, that is done prior to the TV inspection of a pipeline to remove grease, slime, and grit to allow for a clearer and more accurate identification of defects and problems.

**PRESSURE HEAD**

- (1) The height of a water surface above a specific point of reference. Usually measured in feet and tenths of a foot.
- (2) The head represented by the expression of pressure over weight (p/w), where p is pressure (lbs/ sq ft) and w is weight (lbs/cu ft).

**PREVENTIVE MAINTENANCE**

Crews assigned the task of cleaning sewers (for example, balling or high-velocity cleaning crews) to prevent stoppages and odor complaints. Preventive maintenance is performing the most effective cleaning procedure, in the area where it is most needed, at the proper time in order to prevent failures and emergency situations.

**PROFILE**

A drawing showing the SIDE view of sewers and manholes.

**PROTRUDING SERVICE**

The connection of a building lateral to a main sewer line whereby a hole is cut in the main and the end of the building lateral is allowed to extend into the main.

**PUMP**

A mechanical device for causing flow, for raising or lifting water or other fluid, or for applying pressure to fluids.

**PUMP PIT**

A dry well, chamber or room below ground level in which a pump is located.

**PUMP STATION**

Installation of pumps to lift wastewater to a higher elevation in places where flat land would require excessively deep sewer trenches. Also used to raise wastewater from areas too low to drain into available collection lines. These stations may be equipped with air-operated ejectors or centrifugal pumps.

**-Q-**

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**QUICK AIR TEST**

The same as a quick test with a packer for chemical grouting except that air pressure is used in place of liquid for a faster test and greater accuracy.

**QUICK TEST**

Use of a packer designed for chemical grouting to pressure test any selected small area of pipeline.

**-R-**

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**RAIN**

Particles of liquid water that have become too large to be held by the atmosphere. Their diameter generally is greater than 0.02 inch and they usually fall to the earth at velocities greater than 10 fps in still air.

**REGULATOR**

A device used in combined sewers to control or regulate the diversion of flow.

**RETENTION**

(1) That part of the precipitation falling on a drainage area which does not escape as surface stream flow during a given period. It is the difference between total precipitation and total runoff during the period, and represents evaporation, transpiration, subsurface leakage, infiltration, and when short periods are considered, temporary surface or underground storage on the area.

(2) The delay or holding of the flow of water and water-carried wastes in a pipe system. This can be due to a restriction in the pipe, a stoppage or a dip. Also, the time water is held or stored in a basin or wet well.

**ROD GUIDE**

A bent pipe inserted in a manhole to guide hand and power rods into collection lines so the rods can dislodge obstructions.

**ROD (SEWER)**

A light metal rod, three to five feet long with a coupling at each end. Rods are joined and pushed into a sewer to dislodge obstructions.

**RODDING MACHINE**

A machine designed to feed a rod into a pipe while rotating the rod.

**RODDING TOOLS**

Special tools attached to the end of a rod or snake to accomplish various results in pipe rodding.

**ROOF LEADER**

A downspout or pipe installed to drain a roof gutter to a storm drain or other means of disposal.

**ROOT, SEWER**

Any part of a root system of a plant or tree that enters a collection system.

**ROOT MOP**

When roots from plant life enter a sewer system, the roots frequently branch to form a growth that resembles a string mop.

**ROUGHNESS COEFFICIENT**

A value used in Manning's formula to determine energy losses of flowing water due to pipe or channel wall roughness.

**RUNOFF**

That part of rain or other precipitation that runs off the surface of a drainage area and does not enter the soil or the sewer system.

**-S-**

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**SADDLE**

A fitting mounted on a pipe for attaching a new connection. This device makes a tight seal against the main pipe by use of a clamp, adhesive, or gasket and prevents the service pipe from protruding into the main.

**SADDLE CONNECTION**

A building service connection made to a sewer main with a device called a saddle.

**SAND TRAP**

A device which can be placed in the outlet of a manhole to cause a settling pond to develop in the manhole invert, thus trapping sand, rocks and similar debris heavier than water. Also may be installed in outlets from car wash areas.

**SANITARY COLLECTION SYSTEM**

The pipe system for collecting and carrying liquid and liquid-carried wastes from domestic sources to a wastewater treatment plant.

**SANITARY SEWER**

A pipe or conduit (sewer) intended to carry wastewater or waterborne wastes from homes, businesses, and industries to the POTW. Storm water runoff or unpolluted water should be collected and transported in a separate system of pipes or conduits (storm sewers) to natural watercourses.

**SCALE**

A combination of mineral salts and bacterial accumulation that sticks to the inside of a collection pipe under certain conditions. Scale, in extreme growth circumstances, creates additional friction loss to the flow of water. Scale may also accumulate on surfaces other than pipes.

**SCOOTER**

A sewer cleaning tool whose cleansing action depends on the development of high water velocity around the outside edge of a circular shield. The metal shield is rimmed with a rubber coating and is attached to a framework on wheels (like a child's scooter). The angle of the shield is controlled by a chain-spring system which regulates the head of water behind the scooter and thus the cleansing velocity of the water flowing around the shield.

**SCUM**

- (1) A layer or film of foreign matter (such as grease, oil) that has risen to the surface of water or wastewater.
- (2) A residue deposited on the ledge of a sewer, channel, or wet well at the water surface.
- (3) A mass of solid matter that floats on the surface.

**SEASONAL WATER TABLE**

A groundwater table that has seasonal changes in depth or elevation.

**SEDIMENT**

Solid material settled from suspension in a liquid.

**SEDIMENTATION**

The process of settling and depositing of suspended matter carried by wastewater. Sedimentation usually occurs by gravity when the velocity of the wastewater is reduced below the point at which it can transport the suspended material.

**SELECT BACKFILL**

Material used in backfilling of an excavation, selected for desirable compaction or other characteristics.

**SELECT BEDDING**

Material used to provide a bedding or foundation for pipes or other underground structures. This material is of specified quality for desirable bedding or other characteristics and is often imported from a different location.

**SERVICE**

Any individual person, group of persons, thing, or

groups of things served with water through a single pipe, gate, valve, or similar means of transfer from a main distribution system.

**SERVICE ROOT**

A root entering the sewer system in a service line and growing down the pipe and into the sewer main.

**SEWAGE**

The used household water and water-carried solids that flow in sewers to a wastewater treatment plant.

**SEWER**

A pipe or conduit that carries wastewater or drainage water.

**SEWER BALL**

A spirally grooved, inflatable, semi-hard rubber ball designed for hydraulic cleaning of sewer pipes.

**SEWER CLEANOUT**

A capped opening in a sewer main that allows access to the pipes for rodding and cleaning. Usually such cleanouts are located at terminal pipe ends or beyond terminal manholes.

**SEWER GAS**

- (1) Gas in collection lines (sewers) that results from the decomposition of organic matter in the wastewater. When testing for gases found in sewers, test for lack of oxygen and also for explosive and toxic gases.
- (2) Any gas present in the wastewater collection system, even though it is from such sources as gas mains, gas-line, and cleaning fluid.

**SEWER JACK**

A device placed in manholes which supports a yoke or pulley that keeps wires or cables from rubbing against the inlet or outlet of a sewer.

**SEWER MAIN**

A sewer pipe to which building laterals are connected.

**SEWERAGE**

System of piping with appurtenances for collecting, moving and treating wastewater from source to discharge.

**SHEETING**

Solid material, such as wooden 2-inch planks or 1 1/8-inch plywood sheets or metal plates, used to hold back soil and prevent cave-ins.

**SHORING**

Material such as boards, planks or plates and jacks used to hold back soil around trenches and to protect workers in a trench from cave-ins.

**SILTING**

Silting takes place when the pressure of infiltrating waters is great enough to carry silt, sand and other small particles from the soil into the sewer system. Where lower velocities are present in the sewer pipes, settling of these materials results in silting of the sewer system.

**SIPHON**

A pipe or conduit through which water will flow above the hydraulic grade line (HGL) under certain conditions. Water (or other liquid) is first forced to flow or is sucked or drawn through the pipe by creation of a vacuum. As long as no air enters the pipe to interrupt flow, atmospheric pressure on the liquid at the elevated (higher) end of the siphon will cause the flow to continue.

**SLEEVE**

(1) A pipe fitting for joining two pipes of the same nominal diameter in a straight line.

(2) A tube into which a pipe is inserted.

(3) A device to protect a shaft at its bearing or wearing points.

**SLIPLINING**

A sewer rehabilitation technique accomplished by inserting flexible polyethylene pipe into an existing deteriorated sewer.

**SLOPE**

The slope or inclination of a sewer trench excavation is the ratio of the vertical distance to the horizontal distance or "rise over run."

**SMOKE TEST**

A method of blowing smoke into a closed-off section of a sewer system to locate sources of surface inflow.

**SNAKE**

A stiff but flexible cable that is inserted into sewers to clear stoppages.

**SOAP CAKE or SOAP BUILDUP**

A combination of detergents and greases that accumulate in sewer systems, build up over a period of time, and may cause severe flow restrictions.

**SOIL PIPE**

(1) A type of wastewater or service connection pipe made of a low grade of cast iron.

(2) In plumbing, a pipe that carries the discharge of toilets or similar fixtures, with or without the discharges from other fixtures.

**SOIL POLLUTION**

The leakage (exfiltration) of raw wastewater into the soil or ground area around a sewer pipe.

**SOUNDING ROD**

A T-shaped tool or shaft that is pushed or driven down through the soil to locate underground pipes and utility conduits.

**SPOIL**

Excavated material such as soil from the trench of a sewer.

**SPRING LINE**

Theoretical center of a pipeline. Also, the guideline for laying a course of bricks.

**STATIC HEAD**

When water is not moving, the vertical distance (in feet) from a specific point to the water surface is the static head.

**STATION**

A point of reference or location in a pipeline is sometimes called a "station." As an example, a building service is located 51 feet downstream from a manhole could be reported to be at "station 51."

**STILLING WELL**

A well or chamber which is connected to the main flow channel by a small inlet. Waves and surges in the main flow stream will not appear in the well due to the small-diameter inlet. The liquid surface in the well will be quiet, but will follow all of the steady fluctuations of the open channel. The liquid level in the well is measured to determine the flow in the main channel.

**STOPPAGE**

(1) Partial or complete interruption of flow as a result of some obstruction in a sewer.

(2) When a sewer system becomes plugged and the flow backs up, it is said to have a "stoppage."

**STORM COLLECTION SYSTEM**

A system of gutters, catch basins, yard drains, culverts and pipes for the purpose of conducting storm waters from an area, but intended to exclude domestic and industrial wastes.

**STORM RUNOFF**

The amount of runoff that reaches the point of measurement within a relatively short period of time after the occurrence of a storm or other form of precipitation.

**STORM SEWER**

A separate pipe, conduit or open channel (sewer) that carries runoff from storms, surface drainage, and street wash, but does not include domestic and industrial wastes. Storm sewers are often the recipients of hazardous or toxic substances due to the illegal dumping of hazardous wastes or spills created by accidents involving vehicles and trains transporting these substances.

### **STORM WATER**

The excess water running off from the surface of a drainage area during and immediately after a period of rain.

### **STORM WATER INLET**

A device that admits surface waters to the storm water drainage system.

### **STRETCH**

Length of sewer from manhole to manhole.

### **STRUCTURAL DEFECT**

A flaw or imperfection of a structure or design which was built into a project, pipeline or other collection system appurtenance.

### **STRUCTURAL FAILURE**

A condition that exists when one or more components of a system break down or fail to perform as expected. A structural failure may result from defective parts or design or may result from other circumstances that occur after the completion of construction.

### **SUBSIDENCE**

The dropping or lowering of the ground surface as a result of removing excess water (overdraft or overpumping) from an aquifer. After excess water has been removed, the soil will settle, become compacted and the ground surface will drop and can cause the settling of underground utilities.

### **SUBSYSTEM**

An extensive underground sewer system connected to the main collection system, but not considered part of the main system. An example might be the underground sewer system of a mobile home park.

### **SUCKER RODS**

Rigid, coupled sewer rods of metal or wood used for clearing stoppages. Usually available in 3-ft, 39-in, 4-ft, 5-ft and 6-ft lengths.

### **SUCTION HEAD**

The POSITIVE pressure (in feet or pounds per square inch (psi)) on the suction side of a pump. The pressure can be measured from the centerline of the pump UP TO the elevation of the hydraulic grade line on the suction side of the pump.

### **SUCTION LIFT**

The NEGATIVE pressure (in feet or inches of mercury vacuum) on the suction side of the pump. The pressure can be measured from the centerline of the pump DOWN TO (lift) the elevation of the hydraulic grade line on the suction side of the pump.

### **SURCHARGE**

Sewers are surcharged when the supply of water to be carried is greater than the capacity of the pipes to carry

the flow. The surface of the wastewater in manholes rises above the top of the sewer pipe, and the sewer is under pressure or a head, rather than at atmospheric pressure.

### **SURCHARGED MANHOLE**

A manhole in which the rate of the water entering is greater than the capacity of the outlet under gravity flow conditions. When the water in the manhole rises above the top of the outlet pipe, the manhole is said to be "surcharged."

### **SURFACE RUNOFF**

(1) The precipitation that cannot be absorbed by the soil and flows across the surface by gravity.

(2) The water that reaches a stream by traveling over the soil surface or falls directly into the stream channels, including not only the large permanent streams but also the tiny rills and rivulets.

(3) Water that remains after infiltration, interception, and surface storage have been deducted from total precipitation.

### **SURFACED DEFECT**

A break or opening in a sewer pipe where the covering soil has been washed away and the opening or break is exposed on the ground surface.

### **SURFACED VOID**

A dip or depression in the ground that appears when silting has taken place to a degree that a void is caused in the subsoil. Through successive cave-ins, the void reaches the surface of the ground.

### **SURVEILLANCE TELEVISION EQUIPMENT**

Economically closed-circuit television equipment designed for surveillance or security work in commercial facilities. Picture resolutions generally range from 250 to 350 lines.

### **SUSPENDED SOLIDS**

(1) Solids that either float on the surface or are suspended in water, wastewater, or other liquids, and which are largely removable by laboratory filtering.

(2) The quantity of material removed from wastewater in a laboratory test, as prescribed in STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, and referred to as Total Suspended Solids Dried at 103-105 °C.

### **SWAB**

A circular sewer cleaning tool almost the same diameter as the pipe being cleaned. As a final cleaning procedure after a sewer line has been cleaned with a porcupine, a swab is pulled through the sewer and the flushing action of water flowing around the tool cleans the line.

**-T-**

**TAG LINE**

A line, rope or cable that follows equipment through a sewer so that equipment can be pulled back out if it encounters an obstruction or becomes stuck. Equipment is pulled forward with a pull line.

**TAP**

A small hole in a sewer where a wastewater service line from a building is connected (tapped) into a lateral or branch sewer.

**TELEMETERING EQUIPMENT**

Equipment that translates physical measurements into electrical impulses that are transmitted to dials or recorders.

**TELEMETRY**

The electrical link between the transmitter and the receiver. Telephone lines are commonly used to serve as the electrical line.

**TELEVISION INSPECTION**

An inspection of the inside of a sewer pipe made by pulling a closed-circuit television camera through the pipe.

**TELEVISION INSPECTION LOG**

A record of a pipeline television inspection which provides date, line location, footage distances, pipe quadrant locations and descriptions of all conditions observed in the inspection. When this log is written, it is called a "written recording." When it is voice recorded on a tape, it is called a "voice tape recording." If the picture is recorded with a videotape recorder with audio remarks, it is called a "video-voice inspection record." Where data-view reporting is used, it is called a VIDEO LOG.

**TELEVISION MONITOR**

The television set or kinescope where the picture is viewed on a closed-circuit system.

**TERMINAL CLEANOUT**

When a manhole is not provided at the upstream end of a sewer main, a cleanout is usually provided. This is called a "terminal cleanout."

**TERMINAL MANHOLE**

A manhole located at the upstream end of a sewer and having no inlet pipe.

**THRUST BLOCK**

A mass of concrete or similar material appropriately placed around a pipe to prevent movement when the pipe is carrying water. Usually placed at bends and valve structures.

**TOTAL CONTRIBUTION**

All water and wastewater entering a sewer system from

a specific facility, subsystem or area. This includes domestic and industrial wastewaters, inflow and infiltration reaching the main collection system.

**TOTAL DYNAMIC HEAD (TDH)**

When a pump is lifting or pumping water, the vertical distance (in feet) from the elevation of the energy grade line on the suction side of the pump to the elevation of the energy grade line on the discharge side of the pump.

**TOTAL FLOW**

The total flow passing a selected point of measurement in the collection system during a specified period of time.

**TRAP**

(1) In the wastewater collection system of a building, plumbing codes require every drain connection from an appliance or fixture to have a trap. The trap in this case is a gooseneck that holds water to prevent vapors or gases in a collection system from entering the building.

(2) Various other types of special traps are used in collection systems such as a grit trap or sand trap.

**TRENCH JACK**

Mechanical screw device used to hold shoring in place.

**TRUNK SEWER**

A sewer that receives wastewater from many tributary branches or sewers and serves a large territory and contributing population.

**TRUNK SYSTEM**

A system of major sewers serving as transporting lines and not as local or lateral sewers.

**TURBID**

Having a cloudy or muddy appearance.

**TV LOG**

A written record of the internal pipe conditions observed during a sewer line TV inspection.

**TWO-WAY CLEANOUT**

An opening in pipes or sewers designed for rodding or working a snake into the pipe in either direction. Two-way cleanouts are most often found in building lateral pipes at or near a property line.

**-V-**

**V-NOTCH WEIR**

A triangular weir with a "V" notch calibrated in gallons per minute readings. By holding the weir in a pipe with rubber seals forcing a flow to pass through the "V," a measure of the gallonage flowing through the pipe can be read on the basis of the depth of water flowing over the weir.

**VAC-ALL**

Equipment that removes solids from a manhole as they enter the manhole from a hydraulic cleaning operation. Most of the wastewater removed from the manhole by the operation is separated from the solids and returned to the sewer.

**VELOCITY HEAD**

The energy in flowing water as determined by a vertical height (in feet or meters) equal to the square of the velocity of flowing water divided by twice the acceleration due to gravity ( $V^2/2g$ ).

**VERTICAL OFFSET**

A pipe joint in which one section is connected to another at a different elevation.

**VIDEO INSPECTION**

A television inspection.

**VIDEO LOG**

A magnetic tape picture recording of a television inspection where data-view reporting has been included as part of the visual record.

**VIDEOTAPE**

A magnetic tape for recording television pictures. Standard tapes also have a capacity to record a voice with the picture, or an “audio” accompaniment.

**VOID**

A pore or open space in rock, soil or other granular material, not occupied by solid matter. The pore or open space may be occupied by air, water, or other gaseous or liquid material.

**-W-**

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**WASTELINE CLEANOUT**

An opening or point of access in a building wastewater pipe system for rodding or snake operation.

**WASTELINE VENT**

Most plumbing codes require a vent pipe connection of adequate size and located downstream of a trap in a building wastewater system. This vent prevents the accumulation of gases or odors and is usually piped through the roof and out of doors.

**WASTEWATER**

A community’s used water and water-carried solids that flow to a treatment plant. Storm water, surface water, and groundwater infiltration also may be included in the wastewater that enters a wastewater treatment plant. The term “sewage” usually refers to household wastes, but this word is being replaced by the term “wastewater.”

**WASTEWATER COLLECTION SYSTEM**

The pipe system for collecting and carrying water and water-carried wastes from domestic and industrial sources to a wastewater treatment plant.

**WASTEWATER FACILITIES**

The pipes, conduits, structures, equipment, and processes required to collect, convey, and treat domestic and industrial wastes, and dispose of the effluent and sludge.

**WASTEWATER TREATMENT PLANT**

(1) An arrangement of pipes, equipment, devices, tanks and structures for treating wastewater and industrial wastes.

(2) A water pollution control plant.

**WAYNE BALL**

A spirally grooved, inflatable, semi-hard rubber ball designed for hydraulic cleaning of sewer pipes.

**WEIR**

(1) A wall or plate placed in an open channel and used to measure the flow of water. The depth of the flow over the weir can be used to calculate the flow rate, or a chart or conversion table may be used to convert depth to flow.

(2) A wall or obstruction used to control flow (from settling tanks and clarifiers) to ensure a uniform flow rate and avoid short-circuiting.

**WET WELL**

A compartment or tank in which wastewater is collected. The suction pipe of a pump may be connected to the wet well or a submersible pump may be located in the wet well.

**WETTED PERIMETER**

The length of the wetted portion of a pipe covered by flowing wastewater.