

TITLE XV: LAND USAGE
CHAPTER 151: STORMWATER MANAGEMENT

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GENERAL PROVISIONS

§ 151.01 AUTHORITY.

The State Legislature has authorized the Town Council to adopt regulations designed to promote public health, safety, and general welfare of its citizens pursuant to I.C. 36-7-4-201, including the adoption of stormwater management regulation ordinances.

This chapter sets forth the administrative procedures, standards, and enforcement remedies which shall be used by the Town of Brownsburg for stormwater management and in meeting the requirements of Phase II of the National Pollutant Discharge Elimination System (NPDES) program (FR Doc. 99-29181) authorized by the 1972 amendments to the Clean Water Act, the Indiana Department of Environmental Management's (IDEM's) NPDES general permit program for Municipal Separate Storm Sewer Systems (MS4s), and IDEM's NPDES general permit program for Construction .

§ 151.02 PURPOSE.

It is the general purpose of this chapter to promote the public health, safety and general welfare, and to minimize public and private losses due to stormwater conditions in residential, commercial and industrial development. This chapter is designed to accomplish the following:

- A. To protect human life and improve public health.
- B. To promote the use of low-impact development (LID) practices and green infrastructure components to help protect and restore water quality and reduce the quantity of stormwater runoff throughout the Town.
- C. To reduce the risk of stormwater damage to properties and structures through the implementation of stormwater management facilities and practices and to ensure that adequate stormwater infrastructure is installed.
- D. To protect local waterways from unmitigated stormwater runoff and the potentially damaging pollutants and erosion associated with runoff.
- E. To ensure that drainage easements are under the control of the Town to enforce the protection of those drainage facilities from filling and other damage by the adjoining.
- F. To ensure that the natural flow of water shall not be obstructed by any man-made land improvement.

§ 151.03 DEFINITIONS.

Words and phrases in this ordinance shall be construed according to their common and accepted meanings. Words and phrases defined herein shall be construed according to the respective definition given, unless the context clearly indicates or requires a different meaning. Technical words and phrases that are not defined in this ordinance but which have acquired particular meanings in law or in technical usage shall be construed according to such meanings.

AGRICULTURAL LAND DISTURBING ACTIVITY. Tillage, planting, cultivation, or harvesting operations for the production of agricultural or nursery vegetative crops. The term also includes pasture renovation and establishment, the construction of agricultural conservation practices, and the installation and maintenance of agricultural drainage tile. For purposes of this chapter, the term does not include land disturbing activities for the construction of agricultural related facilities, such as barns, buildings to house livestock, roads associated with infrastructure, agricultural waste lagoons and facilities, lakes and ponds, wetlands, and other infrastructure.

BEST MANAGEMENT PRACTICE (BMP). BMP can refer to a structural measure (erosion control measure, wetland, pond, hydrodynamic separator, filter, etc.) or non-structural measure

(restrictive zoning, reduced impervious area, inspections, etc.). BMPs are designed for the benefit of water quality and quantity control. For the purposes of this chapter, BMPs refer to structural water quality BMPs.

CONSTRUCTION. Building, clearing and grubbing, grading, excavating, demolition and other activities resulting in land disturbance.

CONTOUR. An imaginary line on the surface of the land that connects points of equal elevation.

CONTOUR INTERVAL. The vertical distance between contour lines.

CONTOUR MAP. A map that shows the shape of the surface features of the ground by use of contour lines.

CROSS SECTION. A drawing that shows the features that would be exposed by a vertical cut through a man-made or natural structure.

DEPOSITION. An accumulation of sediments, gravel, or debris caused by the slowing of wind or water.

DESIGN STANDARD. Requirements which may be established by regulatory agencies or legislative bodies which must be met by designers of water management systems.

DESIGNER. Professional engineers, land surveyors, or architects in the land development planning profession.

DETENTION. Any process that detains stormwater runoff, holding back stormwater runoff in temporary storage. A basin, facility, pond or BMP may be used for detention purposes.

DEVELOPER. The owner or legal representative of land proposed to be or currently being developed.

DISCHARGE. The flow from a watershed, point source or stormwater facility into a stormwater conveyance system. The rate of flow may be measured in cubic feet per second.

DRAIN. Any place where water accumulates and flows toward the rivers, whether natural or man-made.

DRAINAGE ORDINANCE. An ordinance to regulate the drainage of developing land passed by a legislative body.

EASEMENT. A grant by a property owner (“grantor”) to specific persons, the general public, corporations, utilities, and/or others (aka: “grantee” or “easement holder”) for the purpose of providing services, facilities, infrastructure, landscaping, full access, or limited access on the subject property.

ENTITY. An individual, association, organization, partnership, firm, corporation, or other person or group of persons recognized by law and acting either as the owner or the owner’s agent.

EROSION. The process by which wind and water loosen soil particles into suspension and carry the soil away.

EXCAVATION. Earth moving activities related to land use changes and treatment.

EXISTING GRADE, PLANNED GRADE, FINISH GRADE. Grade of the land or structures as they now exist. Grade of the land or structures as they are planned to be. Grade of the land or structures at the completion of the construction.

FILL. Any area that has had soil added to it and regraded or the material itself that is used for filling.

FILL MATERIAL. A combination of top soil, soil, small aggregate, sand, organic material, and/or any similar resource which is not intended to sustain landscape material, or when used under structures will not conflict with proper installation of foundations. Fill material does not include metal, glass, industrial waste, household waste, asphalt, ash, or similar material.

GROUND COVER. Grasses or other vegetative ground cover used to prevent erosion.

HYDRAULIC GRADE LINE. An imaginary line representing the water surface elevation in open channel flow and the height to which a water column would rise if open to the atmosphere for pressure flow.

IMPERVIOUS SURFACE. Surface materials that include, but are not limited to, concrete, asphalt, rooftop, blacktop and gravel, such that the infiltration of storm water is prevented or impeded. Driveways, roadways, parking lots and other areas used for vehicular traffic are considered impervious surface areas. Undisturbed land, tilled agricultural land, ponds, lawns and fields are not considered impervious surface area.

INFILTRATION. Passage or movement of water into the soil.

INFRASTRUCTURE. All of the utilities, including storm sewers, sanitary sewers, electric, telephone, water lines, and the like, which allow the Town to function.

LAND DISTURBANCE. Any man-made change of the land surface, including removing vegetative cover that exposes the underlying soil, excavating, filling, stockpiling and grading. Land disturbance shall include, but not be limited to, site development, site redevelopment, site amendments or alterations, soil disturbances without improvements, utility projects, and soil stockpiles.

LEGAL DRAIN. Drains which are under the jurisdiction of the County Drainage Board.

MEASURABLE STORM EVENT. A precipitation event that results in a total measured precipitation accumulation greater than or equal to one-half (0.5) inch of rainfall, including equivalent snow melt.

MULCH. Straw, excelsior, stone, or other natural and man-made materials to cover soil as a protection against erosion evaporation and to control temperature.

NUISANCE. No person shall erect, construct, cause, permit, keep or maintain within the Town limits, anything whatsoever which is injurious to the public health or safety, or offensive to the senses of inhabitant. The existence of any of the above is declared to be a nuisance and shall be regulated as set forth in Chapter 93.

OPEN OUTLET CHANNEL. Man-made ditches to contain total flow of stormwater from the watershed, plus it is deep enough to provide deep outlets for subsurface drain tile, storm sewers, and retention basins.

PEAK FLOW or PEAK RUNOFF. The maximum flow of water from a given storm at a specific location. This is measured in cubic feet per second.

POLLUTANT. Anything which causes or contributes to pollution. **POLLUTANTS** may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

POND. A body of water formed naturally or by hollowing or embanking. A pond may remain wet or could become dry depending on soil characteristic, ground water levels or watershed areas flowing into or out of the pond.

PONDING A state of temporary flooding in depressed areas or in areas where drainage is being impeded.

RETENTION. A process that retains stormwater on-site with a typical release to the air through evapotranspiration or to the ground through infiltration. A basin, facility, pond or BMP may be used for retention purposes.

RUNOFF. The amount of water directly discharged from an area by surface drainage.

SEWER, SANITARY. An underground pipe system designed only for wastewater or sewage.

SEWER, STORM. An underground pipe system designed only for storm and groundwater and no sanitary wastewater.

SEWER, COMBINATION. An underground pipe system that is used for both wastewater and stormwater.

SOIL SURVEY. Published soil survey of the county and the technology of soil science used to develop it.

STOP WORK ORDER. An order issued by the Town to stop construction activity on a site.

STORMWATER. The portion of precipitation that does not naturally infiltrate into the ground or evaporate, but flows via overland flow, interflow, channels, or pipes into a defined surface water channel.

STORMWATER CONVEYANCES, FACILITIES, & FEATURES. A permanent stormwater or drainage component, either natural or constructed, for collecting and transferring stormwater between two (2) points, including public streets, roads, alleyways, and highways; curbs; gutters; inlets, catch basins, storm manholes, and other storm structures; stormwater quality units; stormwater pumping stations; pipes, culverts, subsurface drains, and other conduits; outfalls; legal drains, open channels, creeks, ditches, swales, streams, and other open waterways; retention or detention facilities; and other structural components and equipment that transport, move, or regulate stormwater.

STORMWATER MANAGEMENT. The process of designing, installing, and implementing various combinations of drainage plans, structures, and facilities to control stormwater quality and quantity.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP). A written document that identifies potential source of stormwater pollution; describes control measures and best management practices that will be used to reduce or eliminate pollution in stormwater discharges; and identifies how the site will implement the plan to comply with regulations or permit requirements (i.e. inspection schedules and maintenance guidelines).

SUBSURFACE DRAIN. Perforated drain tile placed in trenches and covered to remove surplus groundwater from the soil to provide greater soil stability and remove wetness from subsurface structures. Sections near tree roots may not be perforated.

SURFACE DRAIN. A shallow open drain with flat side slopes to quickly move surface water toward the major drainage system.

SWALE. Small surface drains along lot lines to collect and move surface water from the lot toward the project drainage system.

TRAINED INDIVIDUAL. An individual who is trained and experienced in the principles of stormwater quality and pollution prevention, including erosion and sediment control as may be demonstrated by state registration, professional certification, experience, or completion of coursework that enable the individual to make judgments regarding stormwater control or treatment and monitoring. This definition is to remain consistent with the NPDES General Permit for Construction Activities.

VELOCITY. Speed that water flows expressed in feet per second.

WATERCOURSE, WATERWAY. A natural or manmade channel through which water flows; includes legal drains, creeks, ditches, swales, streams, and other open channels.

WATERSHED. As in the White Lick Creek Watershed, it is the acreage of land from which the drainage flows to a common point. The boundaries are determined by aerial photograph interpretation, topographic maps, and visually viewing the land.

§ 151.04 ABBREVIATIONS.

ACOE. United States Army Corps of Engineers.

EPA. United States Environmental Protection Agency

BMP. Best Management Practice.

DNR. Indiana Department of Natural Resources.

FHWA. United States Department of Transportation Federal Highway Administration.

HGL. Hydraulic Grade Line.

HEC-1. ACOE Hydrologic Engineering Center Flood Hydrograph Package.

HEC-12. United States Department of Transportation Hydraulic Engineering Circular 12.

HEC-14. FHWA Hydraulic Engineering Circular No. 14

HEC-HMS. ACOE Hydrologic Engineering Center Hydrologic Modeling System.

HEC-RAS. ACOE Hydrologic Engineering Center River Analysis System.

IDEM. Indiana Department of Environmental Management.

LID. Low Impact Development.

MS4. Municipal Separate Storm Sewer System.

NRCS. Natural Resources Conservation Service.

NOI. Notice of Intent.

NOT. Notice of Termination.

NPDES. National Pollutant Discharge Elimination System.

O&M. Operation and Maintenance.

SCS. Soil Conservation Service.

SWPPP. Stormwater Pollution Prevention Plan.

TSS. Total Suspended Solids.

USDA. United States Department of Agriculture.

§ 151.05 APPLICABILITY.

This chapter shall regulate all land disturbances, including disturbances without improvements, occurring within the corporate limits of the Town of Brownsburg. No land disturbance or land disturbing activity shall be started until the plans required by this chapter have been accepted in writing by the Town of Brownsburg's Development Services Department. Agricultural land disturbing activities and individual single family residential disturbing less than one acre are exempt from this chapter, with the exception of section 151.22.

§ 151.06 BASIS FOR ESTABLISHMENT OF STANDARDS.

The Town of Brownsburg has adopted the *Town of Brownsburg Construction Standards*, which is incorporated herein by reference. This manual shall contain the technical standards for compliance with construction requirements and may be amended from time to time.

Other references include the following:

- A. HERPIC-County Storm Drainage Manual.
- B. USDA NRCS Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds.
- C. Indiana Drainage Handbook.
- D. Indiana Stormwater Quality Manual.
- E. Hendricks County Stormwater Technical Standards Manual.
- F. FHWA Hydraulic Design Series Number 5 (HDS-5): Hydraulic Design of Highway Culverts.
- G. FHWA Hydraulic Engineering Circular No. 14 (HEC-14): Hydraulic Design of Energy Dissipators for Culverts and Channels.
- H. USDA NRCS Part 654 Stream Restoration Design National Engineering Handbook, Chapter 10: Two-Stage Channel Design.
- I. USDA NRCS WinTR-20: Computer Program for Project Formulation Hydrology.

§ 151.07 ADMINISTRATION

- A. The Development Services Department is appointed to administer and implement this chapter by granting or denying applications in accordance with the provisions of the chapter.

§ 151.08 DUTIES OF DEVELOPMENT SERVICES DEPARTMENT

- A. The duties and responsibilities of the Development Services Department shall include, but not be limited to, the following:
 - (1) Review each stormwater management application to determine that the requirements of this chapter have been satisfied.
 - (2) Ensure that post-construction stormwater quality measures are appropriately planned.
 - (3) Review all applications to assure that all land is temporarily guarded by sediment and erosion control measures and pollution prevention practices during the construction phase.

- (4) Review all applications to assure permanent erosion control measures are planned to prevent future erosion problems.
- (5) Review all applications to assure that stormwater from upstream and through the downstream properties has been properly considered.
- B. Town personnel have the authority to inspect the site and evaluate the site plan. If the Town determines that the site plan does not satisfy the provisions of this chapter, it shall notify the applicant of the plan's disapproval and give the applicant its reasons for disapproving the plan in writing.
- C. The review shall take into account the nature of the soil types at the site and the inherent limitations of each one.

§ 151.09 REMEDIES.

The Town of Brownsburg, any designated enforcement official, or any person or persons, firm or corporation, jointly and severally aggrieved, may institute a suit for injunction in the Circuit or Superior Courts of the county, to restrain an individual or government unit from violating the provisions of this chapter. The Town of Brownsburg may also institute a suit for mandatory injunction directing an individual, corporation or a governmental unit to remove a structure erected in violation of the provisions of this chapter. Any building erected, raised, or converted, or land or premises used in violation of the provisions of this chapter or the requirements thereof, is declared to be a public nuisance and as such, they may be abated in such a manner as nuisances are now or may hereafter be disposed of under existing law.

§ 151.10 ABROGATION AND GREATER RESTRICTIONS.

- A. This chapter is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this chapter and another ordinance, easement, covenant or deed restriction conflict or overlap, whichever imposes a more stringent restriction shall prevail.
- B. This chapter shall be construed whenever possible as consistent with the Unified Development Ordinance and regulations of the Town, and in conformity with its Master Plans.
- C. In the event that a project site is determined to impact or discharge to a sensitive area the Town may, at its discretion, require more stringent stormwater quantity and quality measures than detailed in this chapter or the references listed in § 151.06. Sensitive areas include highly erodible soils, wetlands, threatened or endangered species habitat, outstanding waters, impaired waters, recreational waters, and surface drinking water resources.

§ 151.11 INTERPRETATION.

In the interpretation and application of this chapter, all provisions shall be:

- A. Considered minimum requirements;
- B. Liberally construed in favor of the governing body;
- C. Deemed neither to limit nor repeal any other powers granted under the statutes of the state.

§ 151.12 SEVERABILITY

The provisions of this chapter are hereby declared to be severable. If any provision, clause, sentence, or paragraph of this chapter or the application thereof to any person, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of this chapter.

§ 151.13 DISCLAIMER OF LIABILITY.

The degree of protection required by this chapter is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger storms can and will occur on occasion. Drainage runoff and intensity can cause drainage structures to overflow and erosion control and pollution prevention measures to fail. This chapter does not imply that these provisions are absolute fail-safe against every event that the ferocity of nature may provide. This chapter shall not create any liability on the part of the Town or any officer or employee thereof for any damages from water or sediment that result from reliance on this chapter or any administrative decision lawfully made under this chapter.

STORMWATER MANAGEMENT APPROVAL PROCESS

§ 151.20 SUBMITTAL REQUIREMENTS AND PROCEDURES

A. Application and Approval Process

(1) Conceptual Review

- (a)** A cursory review of stormwater management and water quality improvements, including verification of an adequate outlet will be completed by the Development Services Department during the plan review period for zoning map amendment.

(2) Preliminary Review

- (a)** Stormwater management features shall be included in the Primary Plat submittal. Drainage easements shall be included in accordance with § 151.21(J).
- (b)** The Primary Plat submittal shall be reviewed by the Stormwater Department to ensure that conceptual stormwater management systems have been included and requirements of this chapter are acknowledged by the applicant.

(3) Final Review

- (a)** Stormwater management features shall be included in the Development Plan and Final Plat submittal. The legal description of the lot or site shall include the appropriate drainage easements in accordance with § 151.21(J).
- (b)** The Development Services Department or their authorized representative shall perform a review of all stormwater, erosion control and pollution prevention features included in the Development Plan for compliance with the requirements and intent of this chapter. Final review shall include engineering/technical plan review.
- (c)** Stormwater Management Plan approval shall be obtained prior to the initiation of any construction activities. Non-compliance with the terms and conditions of the approved Stormwater Management Plan will be subject to enforcement as described in this chapter. The applicant shall inform all contractors, sub-contractors, construction management firms, and other entities having oversight of construction activities on the

site or individual building lots of the terms and conditions of the Stormwater Management Plan approval and schedule for proposed implementation.

B. Minimum Requirements of All Projects

- (1) All projects shall comply with the requirements of this section. The Development Services Department may require projects with one (1) acre or less of land disturbance to comply with § 151.21, § 151.22 and § 151.23 when the project site is located within, near, or tributary to an environmentally critical/sensitive area or an area with known erosion or drainage problems.
- (2) Application for approval shall include the following items at a minimum:
 - (a) Completed Application.
 - (b) Stormwater Application Fee (according to an established fee schedule). Inspection fees shall be assessed following application. Fees are to be paid prior to the pre-construction meeting with Town personnel.
 - (c) Statement of Financial Responsibility Form, signed and completed.
 - (d) Affidavit & Consent of Property Owner Form, signed and completed.
 - (e) Design Plans. Design plans certified by a Professional Engineer or Land Surveyor licensed in the State of Indiana. Each sheet shall be drawn to scale and shall include a scale bar and north arrow. Plans shall include the following sheets and elements at a minimum in order to show the nature, location, dimensions, and elevations of the area and improvements in question.
 1. Title sheet:
 - a. Location plan
 - b. Vicinity map
 - c. Legal description of property
 - d. Parcel number or numbers of the site
 2. Overall existing condition site plan:
 - a. Location, elevation, and datum of benchmark placed within the area of the site. If no benchmark is available, the elevation of the nearest road intersection as shown on the U.S. Geological Survey Map shall be indicated.
 - b. Site and the surrounding area one hundred (100) feet in every direction around the site
 - c. Location, size, and invert elevation of any drainage structures within one hundred (100) feet of the site
 - d. Existing site grading with contour intervals of one (1) foot
 - e. General description and nature of the site
 - f. Soil Survey Map with the site delineated upon it
 3. Existing condition plan sheets (maximum scale of one (1) inch equals fifty (50) feet):
 - a. Contour lines with maximum one (1) foot contour interval
 - b. One hundred-year (100-yr.) (1% chance/year) floodplain elevation and boundary
 - c. Existing legal drains and other waterways, detention/retention facilities, roadside ditches and culverts, storm sewer systems, and all other drainage features as applicable
 - d. Areas potentially impacted by flooding of surface waters including:
 4. Designated floodways or floodplains
 5. Land within seventy-five (75) feet of each bank of any legal drain

6. Land within fifty (50) feet of each bank of a natural drainageway
7. Areas above restricted outlets
8. Wetlands
 - a. Street names, widths, and rights-of-way
 - b. Existing easements
9. Proposed condition plan sheets (maximum scale of one (1) inch equals fifty (50) feet):
 - a. Contour lines with maximum one (1) foot contour interval
 - b. One hundred-year (100-yr.) (1% chance/year) floodplain elevation and boundary
 - c. Pond water surface elevations including 100-yr. (1% chance/year) and normal pool elevations
 - d. Proposed grading and areas of cut or fill
 - e. Elevation of the first floor for all proposed and existing structures
 - f. Elevation of lowest floor, including basement, for all proposed and existing structures in accordance with § 151.21(K).
 - g. Proposed areas for storage of materials and construction staging
 - h. Proposed modifications to existing drainage features
 - i. Proposed discharge location for site
 - j. Location and size/dimensions of all existing and proposed detention/retention facilities, roadside ditches and culverts, subsurface drains, legal drains, and all other drainage features, whether permanent or temporary, including those facilities which are crossing or adjacent to the site
 - k. Location, size/dimensions, and profile of all existing and proposed storm sewer systems, whether permanent or temporary, including those facilities which are crossing or adjacent to the site
 - l. Drainage plan including flow arrows for both surface and subsurface water. The drainage plan shall indicate the natural flowage of water to be managed coming into or leaving the site
 - m. Flood routing plan including path and ponding locations and flow arrows and standards included in § 151.21(I)
 - n. Street names, widths, rights-of-way, and cross sections, including elevation of street centerline
 - o. Existing and proposed easements
10. Design details, including applicable standard details from the *Town of Brownsburg Construction Standards*
11. Stormwater Pollution Prevention Plan (SWPPP), details, and notes in accordance with § 151.22:
- (f) Drainage Report. Engineering design computations and drainage report prepared by a registered Professional Engineer or Land Surveyor licensed in the State of Indiana which include the following applicable items at a minimum.
 1. Written description of the project, including:
 - a. Discussion of the steps taken in the design of the stormwater management system
 - b. Description of significant drainage problems
 - c. Soil types, conditions and limitations
 - d. Analysis procedure to evaluate problems and propose a solution
 - e. Hydrologic and hydraulic analysis methodologies and calculations
 - f. Exhibits showing existing and proposed drainage patterns, drainage areas, flow paths, land uses, etc.

- g. Assumptions or special conditions associated with the methods used
 - h. Proposed design of stormwater management system
 - i. Results of analysis demonstrating that proposed system addresses existing drainage problems, accounts for off-site drainage (if applicable), and does not create new drainage problems upstream or downstream of the site
 - j. Proposal for protecting proposed improvements from loss or damage due to ponding or runoff of surface water
 - k. Conclusion summarizing the design and explaining how the design satisfies the requirements and intent of this chapter
2. Engineering design computations shall be provided for land drainage practices, erosion control measures, pollution prevention practices, and flood prevention practices, including, but not limited to:
 - a. Runoff coefficients or curve numbers, as appropriate
 - b. Times-of-concentration
 - c. Peak runoff rates
 - d. Detention storage volumes
 - e. Peak discharge rates
 - f. Outfall structure and emergency spillway calculations
 - g. Storm sewer, inlet, open channel, culvert, subsurface drain, and other stormwater conveyance design calculations
 - h. Low-impact development features design calculations and supporting information
 - i. Input and output files for computer models and exhibits detailing the setup and relationships within the computer model
- (g) Operations and Maintenance (O&M) Manual. Prepare an O&M manual in accordance with § 151.29.
 - (h) Performance Bonds. As condition of Stormwater Management Plan approval, the applicant shall provide performance assurances in accordance with § 151.26.
- (3) Where the minimum standards of this chapter cannot be met, additional engineering design calculations and narrative shall be provided to the Development Services Department for consideration.

§ 151.21 STANDARDS FOR STORMWATER QUANTITY MANAGEMENT

A. Watercourse Protection

- (1) Legal drains within the Town are under the jurisdiction of the Hendricks County Drainage Board. The Indiana Drainage Act has established seventy-five (75) foot easements to either side of legal drain tile lines and seventy-five (75) feet from the top of the bank on each side of open legal drains. Any stormwater discharge or work to be completed within a legal drain easement must obtain approval from the Hendricks County Drainage Board.
- (2) Waterways within the Town may be under the jurisdiction of the IDEM or the United States Army Corps of Engineers (ACOE).
- (3) Work within a floodway is under the jurisdiction of the Indiana Department of Natural Resources (DNR).
- (4) Any relocation of a watercourse shall require a plan approved by the Development Services Department, and it shall not discharge water onto downstream adjoiners in any location different from its existing location.
- (5) Alterations shall be designed to accommodate all on- and off-site upstream drainage areas. Design capacities shall be determined as described in this chapter.

- (6) Entities owning property through which a watercourse passes, or such an entity's lessee, shall keep and maintain that part of the watercourse in accordance with this chapter and all applicable state and federal statutes and regulations. In addition, the entity or lessee shall maintain existing privately owned structures within or adjacent to the watercourse so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse. The entity or lessee shall not place or construct a privately-owned structure or other impairment within or adjacent to the watercourse such that is an impairment or a detriment to the flow of water within the channel.

B. Determination of Stormwater Runoff Rates

- (1) Stormwater runoff rates shall be calculated in accordance with Chapter 2 of the *Hendricks County Stormwater Technical Standards Manual*. Composite Runoff Coefficients shall be calculated and account for connected impervious surfaces such as downspouts connected to stormwater conveyance system; typical composite Runoff Coefficients shall not be used.
- (2) Stormwater drainage systems shall be designed to accommodate the following:
 - (a) All upstream off-site drainage.
 - (b) Existing drain tiles from upstream.
 - (c) Diffused water flow from upstream properties.
 - (d) Storm sewers from upstream.
 - (e) The drainage collection system from within the project or property.

C. Detention/Retention and Pond Requirements

(1) General Requirements

(a) Storage Volume

- i. Storage volumes shall be computed using a computer model that can generate hydrographs based on the NRCS TR-55 time of concentration and curve number calculation methodologies.
- ii. Storm durations shall be used that maximize the peak flow for the pre-developed condition and maximize detention storage volume for the post-developed condition. The storm duration shall be equal to or greater than the site time of concentration, but shall not be less than 30 minutes.
- iii. When determining curve numbers for post-developed conditions, the initially determined hydrologic soil group for disturbed areas should be changed to the next less infiltrating capacity category (i.e. A to B, B to C and C to D).

(b) Detention Release Rates

- i. Detention control devices shall limit the discharge to a rate such that the post developed release rate from the site is no greater than 0.2 cfs per acre of development for the 0-10 year return interval storms and 0.4 cfs per acre of developed area for the 11-100 year return interval storms.
- ii. If the downstream receiving channel or pipe is inadequate to accommodate the post-developed flow, then the release rate must be further reduced.
- iii. The minimum allowable orifice size is 4 inches.
- iv. For sites where the pre-developed area has more than 1 outlet, the release rate should be computed based on pre-developed discharge to each outlet point. The computed release rate for each outlet point shall not be exceeded at the respective outlet point even if the post developed condition would involve a different arrangement of outlets.

- (c) Runoff from upstream tributary areas (off-site areas) may be bypassed around the facility without attenuation. If it is to be routed through the facility, a separate outlet system or channel must accommodate those flows. Unless the pond is being designed as a regional detention facility, the primary outlet structure shall be sized and the invert elevation of the emergency overflow weir determined according to the onsite runoff only. Once the size and location of the primary outlet structure and the invert elevation of the emergency overflow weir are determined by considering on-site runoff, the 100-year pond elevation is determined by routing the entire inflow, on-site and off-site, through the pond.
- (d) The detention facility shall be designed in such a manner that a minimum of 90% of the maximum volume of water stored and subsequently released at the design release rate shall not result in a storage duration in excess of 48 hours from the start of the storm unless additional storms occur within the period. In other words, the design shall ensure that a minimum 90% of the original detention capacity is restored within 48 hours from the start of the design 100-year storm.
- (e) An emergency overflow/spillway shall be designed for the release of exceptional storm runoff or in emergency conditions should the normal discharge devices become totally or partially inoperative. The overflow facility shall be of such design that its operation is automatic and does not require manual attention. At a minimum, emergency spillways shall be capable of handling 125% of the inlet peak discharge resulting from the 100-year storm event from the entire contributing watershed in the post-developed condition.
- (f) All ponds (including both dry and wet ponds, and ponds that are not used for stormwater quality or quantity management) shall incorporate applicable requirements included in the Town's standard detail for "Detention/Retention Ponds".
- (g) All detention/retention facilities (including underground detention) shall have an upstream BMP designed in accordance with §151.23 and installed for each inlet pipe, to collect sediments, debris, floatables, and other material prior to entering the detention/retention facility. Forebays are not acceptable. Position BMPs outside right-of-way and not more than 14 feet from a drivable surface for vac-truck and maintenance vehicle access.
- (h) Underground detention facilities shall have sufficient observation wells or inspection ports, at least ten (10) inches in diameter, to allow access for inspection, maintenance, and regular cleaning operations.
- (i) Designers and developers are encouraged to consider methods of runoff reduction such as reducing impervious surface area, disconnecting impervious areas, promoting infiltration, stormwater capture and reuse, and other low-impact development methods in order to reduce requirements for on-site stormwater detention.
- (j) Any regulations of the State Board of Health concerning standing water must be adhered to in the planning and use of temporary ponding facilities or other retention and detention devices.
- (k) Stormwater detention/retention on roadways or driving lanes is not acceptable.
- (l) For storm sewer pipes discharging into a pond, the lowest pipe invert at the first upstream storm sewer structure shall not be lower than the normal pool elevation of the pond.
- (m) The outlet location must be approved by the Town of Brownsburg. The outlet control structure and piping shall be designed to operate simply and effectively with minimal

maintenance. The outlet structure shall be positioned in an accessible location for maintenance.

- (n) A safety ramp and ingress/egress easement from a nearby road must be provided for all ponds. The safety ramp shall be minimum 20 feet wide and have a maximum exit slope of 6H:1V.
 - (o) Detention ponds located within a floodplain must be protected from the base flood elevation and shall not be designed to hold flood waters. Detention ponds may not be used for compensatory flood storage.
- (2) Pond Safety Signs
- (a) Provide sign with minimum sign area of 1 square ft. and maximum sign area of 4 square ft.
 - (b) Sign must be constructed of a permanent material, either wood or metal.
 - (c) At minimum, pond safety signs must have the words “danger”, “no swimming”, “stay off ice” and must have “no swimming” and “stay off ice” symbols. Warning may also prohibit trespassing, wading or other recreational activities that would involve a person entering a pond.
 - (d) The sign color will be determined by the homeowners’ association, property owner or developer.
 - (e) Install signs no more than 500 feet apart. If pond has less than 3,000 square ft. of water surface area, a minimum of 2 signs are required. If pond has greater than 3,000 square ft. of water surface area, a minimum of 4 signs are required. A sign must be placed at all public access areas to the pond.
 - (f) Each developer of the construction area and subsequent homeowners’ association or property owners shall be responsible for the cost of maintenance and replacement of pond safety signs.

D. Storm Sewer Design Standards

(1) Storm Sewer Requirements

- (a) Storm sewers, inlets, and manholes, shall accommodate the ten-year (10-yr.) (10% chance/year) peak runoff and maintain the hydraulic grade line (HGL) below the crown of the pipe. Flood routing shall be provided in accordance with §151.21(I). If an overflow route is not available, then the storm sewer system shall be designed for the one hundred-year (100-yr.) (1% chance/year) peak runoff HGL below the ground surface and less than 6 inches of ponding at inlets.
- (b) The hydraulic capacity of storm sewers shall be computed using Manning’s Equation. Where storm sewers discharge into submerged outfalls, a backwater analysis shall be performed.
- (c) Minimum pipe size shall be twelve (12) inches.
- (d) Minimum full-flow velocity of two (2.0) feet per second is desirable to prevent sedimentation in the pipe. Maximum full-flow velocity of ten (10.0) feet per second is recommended. The minimum Manning’s n roughness value shall be twelve thousandths (0.012), regardless of material.
- (e) Storm sewer pipes shall have a minimum of twenty-four (24) inches of cover, measured from the crown of pipe to the ground surface. Shallower depth of cover may be considered by the Town under conditions where engineering design will alleviate concern for surface loadings and frost heave.
- (f) A minimum vertical separation of eighteen (18) inches shall be provided between storm sewers and other utilities (sanitary sewers, water mains, etc.).

(2) Storm Structure Requirements

- (a)** Storm sewers shall be straight between storm structures (inlets and manholes).
- (b)** Manholes shall be provided at the following locations:
 - 1.** Where two (2) or more storm sewers converge
 - 2.** Where the pipe size changes
 - 3.** Where a change in horizontal alignment occurs
 - 4.** Where a change in pipe grade occurs
 - 5.** At intervals not to exceed four hundred (400) feet for pipes less than forty-eight (48) inches in diameter and not to exceed five hundred (500) feet for pipes forty-eight (48) inches in diameter and larger.
- (c)** A minimum drop of one tenth (0.1) foot shall be provided in storm structures.
- (d)** When changing pipe sizes in a storm structure, the crowns of pipe shall be matched unless HGL modeling shows that another arrangement would be as effective.
- (e)** All storm grate castings shall be pre-cast with a pollution prevention message permanently attached. The message shall be included on the site development plans and comply with the *Town of Brownsburg Construction Standards*.
- (f)** Exposed pipes greater than eighteen (18) inches in diameter shall be equipped with an animal guard or trash rack. Trash racks are typically installed at the inflow end of pipes and animal guards at the outflow end.

(3) Inlet Sizing and Spacing

- (a)** Inlets shall not be located in the path where a pedestrian or bicycle is likely to travel.
- (b)** Inlet grate openings shall be designed to pass the ten-year (10-yr.) (10% chance/year) peak flow with fifty percent (50%) of the inlet area clogged with a maximum six (6) inches of ponding depth.
- (c)** Inlets shall be spaced to prevent water spread over six (6) feet into a travel lane of a street. Bypass flow from upstream inlets shall be incorporated into inlet calculations. Manufacturer's literature should provide the inlet casting's flow-intercept-efficiency coefficient. The United States Department of Transportation Hydraulic Engineering Circular-12 (HEC-12) methods may be used.
- (d)** Stormwater may not be stored on any pavement with pedestrian traffic. Stormwater may be stored on remote areas of pavement with a maximum water depth of six (6) inches.
- (e)** Flood routing shall be provided in accordance with § 151.21(I).

(4) Connections to the Storm Sewer System

- (a)** Sump pumps which receive and discharge groundwater and other stormwater shall be connected to the storm sewer system where possible, preferably at an inlet or manhole structure. Sump pumps may also be connected to subsurface drains in accordance with § 151.21(F).
- (b)** Footing, perimeter, and other subsurface drains shall be connected to the storm sewer system where possible, preferably at an inlet or manhole structure. Footing and perimeter drains may also be connected to subsurface drains in accordance with § 151.21(F). Footing, perimeter, and other subsurface drain connections to the sanitary sewer are prohibited.
- (c)** Roof downspouts, roof drains, and other roof discharge piping shall be directly connected to a storm sewer system, preferably at an inlet or manhole structure. Downspouts and roof drains connections to the sanitary sewer are prohibited.
- (d)** Floor drains and swimming pool drains shall not be directly connected to the storm sewer system. Floor drains and swimming pool drains shall be connected to an

approved outlet and comply with the requirements of other Town ordinances established for control of illicit discharges and connections.

E. Open Channel Design Standards

(1) General Requirements

- (a)** Any relocated open channels shall require stabilization measures to prevent sloughing from layers of seasonally saturated silts and sands.
- (b)** Roadside ditches shall be altered to meet the needs of “strip” housing along that road so that driveway crossings may be installed with adequate cover to prevent frost heave and to be coordinated on grade with each other. They shall be constructed with side slopes flat enough to allow easy mowing and maintenance, even though this may require grading beyond the road right-of-way into the lawns.

(2) Open Channel Requirements

- (a)** Open channels, roadside ditches, swales, and culverts shall accommodate the twenty-five-year (25-yr.) (4% chance/year) peak runoff without overflowing the banks and shall accommodate the one hundred-year (100-yr.) (1% chance/year) peak runoff within the drainage easement, provided however:
 - 1.** Open channels with a carrying capacity greater than or equal to thirty (30) cubic feet per second at bank-full stage shall be designed in accordance with the *National Resources Conservation Service Part 654 Stream Restoration Design National Engineering Handbook, Chapter 10: Two-Stage Channel Design* and be capable of accommodating the twenty-four (24) hour, fifty year (50-yr.) (2% chance/year) peak runoff without overflowing the banks;
 - 2.** Culverts shall be capable of accommodating a fifty-year (50-yr.) (2% chance/year) peak runoff when crossing under a road which:
 - a.** Carries a higher volume of traffic than other adjacent routes or has the potential for carrying higher volumes;
 - b.** Is part of a pattern of arterial routes for the entire urban area;
 - c.** Is oriented primarily to moving traffic rather than to serving abutting land use.
- (b)** Flood routing shall be provided in accordance with § 151.21(I).
- (c)** Any alteration of an existing open outlet channel traversing a property shall be sized as described above or for the capacity of the existing channel, whichever is greater, with provisions made for the one-hundred-year (100-yr.) (1% chance/year) frequency storm so that flooding of adjacent structures, buildings, or properties will not occur. The approval of the DNR, IDEM, and ACOE must be obtained and their requirements must be followed for all areas within their jurisdiction.
- (d)** The hydraulic capacity of open channel systems shall be computed using Manning’s Equation. Backwater analysis shall be performed to determine the one hundred-year (100-yr.) (1% chance/year) water surface elevation along open channel systems.
- (e)** Channel lining shall be designed to accommodate the ten-year (10-yr.) (10% chance/year) peak discharge. The channel lining material shall be selected such that the design shear stress is less than the maximum permissible shear stress for the lining material.
- (f)** For grass-lined channels, the side slope shall be no steeper than three (3) horizontal to one (1) vertical.
- (g)** For armored channels (turf reinforcement mat, riprap, etc.), the side slope shall be no steeper than one and one half (1-1/2) horizontal to one (1) vertical.

- (h) Open channels with a bottom width greater than or equal to fifteen (15) feet shall have a riprap or paved invert to convey low flows and prevent meandering.
 - (i) Minor drainage collector swales in rear yards and between homes shall not exceed four hundred (400) feet in length and shall not be used to convey off-site drainage areas.
 - (j) Subsurface drains shall be required if the channel slope is less than one percent (1.0%). The minimum channel slope shall be three tenths of a percent (0.3%). A minimum channel velocity of two (2) feet per second is desired to prevent deposition within the channel. All rear yard swales shall have subsurface drains.
- (3) Culvert Requirements**
- (a) Culverts shall be sized in accordance with the *Federal Highway Administration's HDS-5 Hydraulic Design of Highway Culverts*.
 - (b) Minimum pipe size shall be twelve (12) inches. Minimum full-flow velocity of three (3.0) feet per second is desirable to prevent sedimentation in the pipe. Maximum full-flow velocity of ten (10.0) feet per second is recommended. The minimum Manning's n roughness value shall be twelve thousandths (0.012), regardless of material.
 - (c) Culvert pipes shall have a minimum of twenty-four (24) inches of cover, measured from the crown of pipe to the ground surface, unless shown otherwise in *Town of Brownsburg Construction Standards*.
 - (d) Outlet protection and energy dissipaters shall be used wherever the velocity of flows leaving a culvert exceed the erosive velocity of the downstream channel.

F. Subsurface Drains Design Standards

- (1) Subsurface drains are required for any grass-lined open channel which drains three (3) acres or more.
- (2) Subsurface drains are required along all streets constructed in the Town to lower the seasonally high water table in Brookston, Crosby, and Miami soil types.
- (3) Tees must be provided along the subsurface system to provide an outlet for footing drains and sump pumps from each lot.
- (4) Subsurface drains shall be a minimum of six (6) inches diameter for areas receiving subsurface flow only. Subsurface drains which may receive surface (roof drains, yard drains, etc.) and subsurface flows shall be a minimum of twelve (12) inches diameter. Underdrain capacity calculations shall be provided to ensure underdrains are properly sized for the subsurface and surface flows.
- (5) Subsurface drains shall have a minimum of twenty-four (24) inches of cover unless shown otherwise in *Town of Brownsburg Construction Standards*.

G. Low Impact Development Design Standards

- (1) Low Impact Development (LID) is an approach to land planning and engineering design which manages rainfall at the source to reduce stormwater runoff and manage runoff timing, emphasizes conservation and natural features, and protects water quality by controlling pollutants.
- (2) Designers and developers are encouraged to consider methods of runoff reduction such as reducing impervious surface area, disconnecting impervious areas, promoting infiltration, stormwater capture and reuse, and other LID methods in order to reduce requirements for on-site stormwater detention.
- (3) LID features shall conform to current industry guidelines and will be reviewed on a case-by-case basis. Green infrastructure and stormwater BMPs shall be designed in accordance with the *Hendricks County Stormwater Technical Standards Manual* or the *Indiana*

Stormwater Quality Manual. All design calculations and justification shall be submitted for review.

H. Standards for Adequate Outlet

- (1) Stormwater and drainage from the site must be discharged into an adequate outlet or outlets so as not to adversely affect other landowners. The criteria for outletting is as follows:
 - (a) Open channels shall outlet into an existing open channel, provided that stream bank and channel erosion shall not be aggravated and that the hazard of flooding shall not be increased.
 - (b) All storm sewers shall outlet into an open channel, storm sewer pipe, detention basin, or retention pond.
 - (c) Subsurface drains shall outlet into an open channel, storm sewer pipe, detention basin, retention pond, or existing tile drain, provided that the existing drain has adequate capacity, is not deteriorated, and can be maintained.
 - (d) Detention/retention ponds shall outlet into an open channel or storm sewer pipe.

I. Flood Routing

- (1) Stormwater ponding and overflow path routing shall be evaluated for the peak one hundred-year (100-yr.) (1% chance/year) storm event.
- (2) Peak runoff flows shall be calculated for all contributing drainage areas, on-site and off-site, in their proposed or reasonably anticipated land use.
- (3) The stormwater collection system (storm sewers, open channels, etc.) shall be assumed full (at capacity) from a previous storm event at the beginning of the flood routing analysis.
- (4) The overflow path/ponding resulting from the flood routing event shall be clearly shown as a hatched area on the plans. Plans shall include cross sections along the flood route path. Cross sections shall include the existing surface, proposed grading, and the maximum water elevation for the peak one hundred-year (100-yr.) (1% chance/year) storm event. The flood routing path and ponding areas shall be placed in a right-of-way or drainage easement in accordance with § 151.21(J).
- (5) The overflow path/ponding may be modeled as a successive series of natural ponds and open channel segments. The calculations for determining the one hundred-year (100-yr.) (1% chance/year) flood routing elevations may be based on hand calculation methods utilizing normal depth calculations and storage routing techniques or performed by computer models such as United States Department of Agriculture (USDA) Soil Conservation Service (SCS) Technical Release 20 (TR-20); ACOE Hydrologic Engineering Center Hydrologic Modeling System (HEC-HMS), and ACOE HEC Flood Hydrograph Package (HEC-1) in combination with ACOE HEC River Analysis System (HEC-RAS).

J. Drainage Easements

- (1) Drainage easements must be provided for maintenance of the stormwater management system of publicly-owned systems and privately-owned ponds, detention/retention basins, water quality BMPs, and LID practices. Easements are not required for other private systems.

Area or Situation	Easement Width
Storm sewer (smaller than 24-in.)	20 feet, centered over sewer
Storm sewer (24-in. and larger)	25 feet, centered over sewer
Grassed waterways (including equivalent sized-lined channels)	Width of channel plus 15 feet, centered over waterway
Subsurface drain	20 feet, centered over drain
Open outlet channel (including equivalent sized-lined channels)	20 feet from top of each bank
Retention pond, detention basin, and/or permanent sediment basin	Elevation of the emergency spillway design flow, plus 20 feet (horizontally)
Underground detention facility	Detention facility footprint plus 15 feet in every direction (horizontally)
Stormwater BMP (above or below grade)	BMP footprint plus 15 feet in every direction (horizontally)
Flood routing path/ponding area	Width of flood path/ponding area

- (2) Access easements must be provided from a public roadway to the drainage easement, for access to stormwater management facilities.
- (3) Structures, fences or landscaping may not be placed in an easement in a way that will impede the free flow of stormwater.
- (4) Drainage easements shall be maintained by the property owner.

K. Grading and Building Pad Elevation Policy

- (1) No construction of buildings within the Town shall be permitted within twenty-five (25) feet of a stormwater conveyance or within twenty-five (25) feet of the side slopes of open channels without plans prepared by registered engineers, land surveyors or architects, certifying that there is adequate room for maintenance of the drainage facility.
- (2) No building or structure shall be separated by the one hundred-year (100-yr.) (1% chance/year) elevation of stormwater detention facilities by less than twenty-five (25) feet.
- (3) The Lowest Adjacent Grade (including walkout basement floor elevation) of all residential, commercial, or industrial buildings must be located a minimum of two (2) feet above the one-hundred-year (100-yr) (1% chance/year) flood elevation, the one hundred-year (100-yr.) (1% chance/year) pond elevation, or the emergency overflow weir elevation, whichever is higher. The Lowest Adjacent Grade for all residential, commercial, and industrial buildings shall be set a minimum of one (1) foot above the noted overflow path/ponding elevation resulting from flood routing as described in § 151.21(I) and included on the Final Plat.
- (4) Positive drainage shall be provided over the entire lot. Protective slopes shall slope away from building foundations and water supply wells for a minimum of six (6) inches of fall per ten (10) feet horizontal, except where restricted by property lines. Maximum gradient of protective slopes shall be two and one half (2-1/2) inches per foot or twenty-one percent (21%) for a minimum of four (4) feet away from all building walls, except where restricted by property lines.

L. Adjoining Property Impacts Policy

- (1) Land disturbance, and alterations to the site shall provide for the discharge of all stormwater runoff from upstream off-site areas as well as the stormwater runoff from the areas being developed or altered to one or more acceptable outlets having capacity to

receive upstream on-site and off-site drainage (as determined by the Development Services Department).

- (2) No activities conducted as part of the land disturbance shall be allowed to obstruct the free flow of flood waters from an upstream property. Any existing field tile or other stormwater facility encountered during the construction shall be incorporated into the proposed stormwater collection system or otherwise tied to an acceptable outlet. Design calculations shall be provided to demonstrate that the downstream system has sufficient capacity to accommodate flows from existing facility. Calculations shall be certified by a Professional Engineer or Land Surveyor licensed in the State of Indiana.
- (3) Where an adequate outlet is not located on the site or the outfall from a site's stormwater system flows onto or through property not owned by the developer prior to reaching a regulated drain or natural waterway, off-site drainage improvements may be required. Off-site improvements may include, but are not limited to, extending or replacing storm sewers; clearing, dredging, and removing obstructions to open channels or natural waterways; and replacement of undersized culvert pipes.

§ 151.22 STANDARDS FOR STORMWATER POLLUTION PREVENTION PLANS FOR LAND DISTURBANCES

A. Applicability and Exemptions.

- (1) The Town will require a Stormwater Pollution Prevention Plan (SWPPP), which includes erosion and sediment control measures, pollution prevention practices and materials handling procedures, to be submitted as part of the construction plans and specifications. Any project located within the Town that involves land disturbance (with exception of items 151.22(A)(2) and (A)(3) below) shall comply with this section. Calculation of land disturbance should follow the guidelines contained in § 151.22(C). Land disturbance falls into one of two categories with differing requirements as follows:
 - a. Land disturbances which are 1 or more acres shall obtain a state NPDES general permit for construction activities (currently regulated by 327 IAC 15-5 and commonly referred to as "Rule 5") and are subject to the requirement of this section. This section also applies to disturbances of less than one (1) acre of land that are part of a larger common plan of development or sale if the larger common plan will ultimately disturb one (1) or more acres of land.
 - b. Land disturbances which are less than 1 acre shall submit a SWPPP that at a minimum includes the following:
 1. Installation and maintenance of appropriate perimeter control measures. These measures are to be installed prior to land disturbance and maintained until bare soils are permanently stabilized to at least seventy percent (70%) density of permanent perennial vegetated cover. Maintain existing vegetation when possible.
 2. Installation of a temporary construction entrance/drive. Minimize sediment and soil discharge and tracking from the disturbed area. Clean-up sediment that is either tracked or washed on to roads or into storm water conveyances (sewers, ditches, waterways, storm inlets, and the like). Cleaning surfaces shall not include flushing the area with water. Cleared sediment and soil must be collected and redistributed or disposed of in a manner that is in compliance with all applicable statutes and rules.

3. Establish a concrete washout area to contain residual concrete and washout waters. Water collected from washout that does not harden or evaporate must be handled as wastewater.
 4. Bare soils are to be stabilized in areas where work is complete, or where bare soils are to be inactive for more than fifteen (15) days. Utilize soil stabilization measures that are appropriate for the season.
 5. Adjacent areas disturbed by an individual lot operator must be repaired and stabilized with temporary or permanent surface stabilization.
 6. Install inlet protection at all stormwater inlets that receive runoff from disturbed areas. For inlets within a road or driving lane, inlet protection must be installed below the grate with an overflow or bypass so that ponding water does not cause unsafe driving conditions.
 7. Where construction disturbs surfaces greater than 3H:1V slope or in areas of concentrated flow, establish permanent vegetation with erosion control blanket and seeding.
- (2) The requirements under this chapter do not apply to the following activities:
- a. Agricultural land disturbing activities.
 - b. Forest harvesting activities.
 - c. Single family residential with disturbance of less than 500 square feet.
- (3) The requirements under this section do not apply to the following activities, provided other applicable state permits contain provisions requiring immediate implementation of soil erosion control and pollution prevention measures:
- a. Landfills that have been issued a certification of closure under 329 IAC 10.
 - b. Coal mining activities permitted under IC 14-34.
 - c. Municipal solid waste landfills that are accepting waste pursuant to a permit issued by IDEM under 329 IAC 10 that contains equivalent stormwater requirements, including the expansion of landfill boundaries and construction of new cells either within or outside the original solid waste permit boundary.
- (4) For an individual lot where land disturbance is expected to be one (1) acre or more, the individual lot owner must complete their own Notice of Intent (NOI) letter, obtain Stormwater Management Plan approval, and ensure that a sufficient construction and stormwater pollution prevention plan is completed in accordance with the requirements of this chapter and other relevant ordinances.
- (5) An individual lot with land disturbance less than one (1) acre, located within a larger permitted project site, is considered part of the larger permitted project site, and the individual lot operator must comply with the terms and conditions of the Stormwater Management Plan approved for the larger project site. The Stormwater Management Plan for the larger project site must include detailed erosion and sediment control measures for individual lots.
- (6) It will be the responsibility of the project site owner to obtain Stormwater Management Plan approval and ensure that a sufficient construction plan is completed and submitted to the Town in accordance with the requirements of this section and other relevant ordinances. It will be the responsibility of the project site owner to ensure compliance with this section during the construction activity and implementation of the construction plan, and to notify the Town with a sufficient Notice of Termination (NOT) letter upon completion of the project and stabilization of the site. However, all persons engaging in construction and land disturbing activities must comply with the requirements of this section.

- (7) For land disturbing projects owned or operated by the Town, construction plans must be submitted to the Stormwater Department and County Soil and Water Conservation District (SWCD) for review and approval. If the Town does not receive either a notice of deficiency or an approval within thirty-five (35) days of the submittal, the plans will be considered adequate.

B. Policy on Stormwater Pollution Prevention.

Effective stormwater pollution prevention on construction sites is dependent on a combination of preventing movement of soil from its original position (erosion control), intercepting displaced soil prior to entering a waterbody (sediment control), and proper on-site materials handling and pollution prevention practices. The developer must submit to the Town a SWPPP with detailed erosion and sediment control plans as well as a narrative describing materials handling and storage, and construction sequencing. The following principles apply to all land-disturbing activities and should be considered in the preparation of a stormwater pollution prevention plan within the Town.

- (1) Minimize the potential for erosion by designing a development that fits the topography and soils of the site. Deep cuts and fills in areas with steep slopes should be avoided whenever possible, and natural contours should be followed as closely as possible.
- (2) Existing natural vegetation should be retained and protected wherever possible. Areas immediately adjacent (within thirty-five (35) feet of top of bank) to watercourses and lakes also should be left undisturbed wherever possible.
- (3) Unvegetated or vegetated areas with less than seventy percent (70%) cover that are scheduled or likely to be left inactive for fifteen (15) days or more must be temporarily or permanently stabilized with measures appropriate for the season to reduce erosion potential. Alternative measures to site stabilization may be acceptable if the project site owner or their representative can demonstrate they have implemented and maintained erosion and sediment control measures adequate to prevent sediment discharge from the inactive area. Vegetated areas with a density of less than seventy percent (70%) shall be restabilized using appropriate methods to minimize the erosion potential.
- (4) All practices on a site should be conducted in a logical sequence so that the smallest practical area of land will be exposed for the shortest practical period of time during land disturbing activities.
- (5) The length and steepness of designed slopes should be minimized to reduce erosion potential. Drainage channels and swales must be designed and adequately protected so that their final gradients and resultant velocities will not cause erosion in the receiving channel or at the outlet. Guidance for determining acceptable velocities and energy dissipation is provided in *HEC-14*.
- (6) Sediment-laden water which otherwise would flow from the project site shall be treated by erosion and sediment control measures appropriate to minimize sedimentation.
- (7) A stable construction site access shall be provided at all points of construction traffic ingress and egress to the project site.
- (8) Stormwater runoff leaving a project site must be discharged in a manner that is consistent with applicable state or federal law.
- (9) Appropriate measures shall be implemented to prevent wastes or unused building materials, including garbage, debris, packaging material, fuels and petroleum products, hazardous materials or wastes, cleaning wastes, wastewater, concrete truck washout, port-a-let waste, and other substances from being carried from a project site by runoff or wind. Identification of areas where concrete truck washout is permissible must be clearly posted at appropriate

areas of the site. Wastes and unused building materials shall be managed and disposed of in accordance with all applicable state statutes and regulations. Proper storage and handling of materials such as fuels or hazardous wastes, and spill prevention and cleanup measures shall be implemented to minimize the potential for pollutants to contaminate surface or groundwater or degrade soil quality.

- (10) Public or private roadways shall be kept cleared of accumulated sediment that is a result of runoff or tracking. Bulk clearing of accumulated sediment shall not include flushing the area with water. Cleared sediment shall be redistributed or disposed of in a manner that is in accordance with all applicable statutes and regulations.
- (11) Collected runoff leaving a project site must be either discharged directly into a well-defined, stable receiving channel, or diffused and released to the adjacent property without causing an erosion or pollutant problem to the adjacent property owner.
- (12) Natural features, including wetlands and sinkholes, shall be protected from pollutants associated with stormwater runoff.
- (13) Required Postings.
 - a. The project site owner shall post a notice near the main entrance of the project site. For linear projects sites, such as a pipeline or highway, the notice must be placed in a publicly accessible location near the project field office. The notice must be maintained in a legible condition and contain the following information:
 1. Copy of the completed IDEM NOI and the National Pollutant Discharge Elimination System (NPDES) permit number issued by IDEM, where applicable.
 2. Name, company name, telephone number, e-mail address (if available), and address of the project site owner or a local contact person.
 3. Location of the construction plan.
 - b. This permit and posting of the notice does not provide the public with any right to trespass on a project site for any reason, nor does it require that the project site owner allow members of the public access to the project site.
- (14) All stormwater quality measures must be designed and installed under the guidance of a trained individual (refer to definitions section or according the requirements of the NPDES general permit).

C. Calculations and Design Standards and Specifications.

- (1) In calculating the total area of land disturbance, for the purposes of determining applicability of this section to the project, the following guidelines should be used:
 - a. Off-site construction activities that provide services (for example, road extensions, sewer, water, and other utilities) to a land disturbing project site, must be considered as a part of the total land disturbance calculation for the project site, when the activity is under the control of the project site owner.
 - b. Strip developments will be considered as one (1) project site and must comply with this chapter unless the total combined disturbance on all individual lots is less than one (1) acre and is not part of a larger common plan of development or sale.
 - c. To determine if multi-lot project sites are regulated by this chapter, the area of land disturbance shall be calculated by adding the total area of land disturbance for improvements, such as, roads, utilities, or common areas, and the expected total disturbance on each individual lot, as determined by the following:
 1. For a single-family residential project the total lot must be calculated as being disturbed.

2. To calculate lot disturbance on all other types of project sites, such as industrial and commercial project sites, a minimum of one (1) acre of land disturbance must be used as the expected lot disturbance, unless the lots are less than one (1) acre in size, in which case the total lot must be calculated as being disturbed.
- (2) The calculation methods as well as the type, sizing, and placement of all stormwater pollution prevention measures for construction sites shall meet the design criteria, standards, and specifications outlined in the *Indiana Stormwater Quality Manual* and the *Town of Brownsburg Construction Standards*.

D. Submittal Requirements.

For those projects meeting the requirements of this section, a construction stormwater pollution prevention plan is required in addition to the submittal requirements listed in § 151.20. This plan must include the following information:

- (1) IDEM NOI form along with the information required by the NOI form.
- (2) Proof of publication in a newspaper of general circulation, in the affected area, that notified the public that a construction activity is to commence. The publication must include language required by the NPDES general permit.
- (3) Construction plans and SWPPP shall contain the information required by 327 IAC 15-5-6.5 "Requirements for Construction Plans" or other NPDES permit requirements. SWPPP figures shall also contain the following:
 - a. Contour lines with maximum one (1) foot contour interval
 - b. Stormwater infrastructure and facilities
 - c. Open conveyances
 - d. Flood routing path and ponding locations in accordance with § 151.21(I)
- (4) SWPPP sequencing shall consider various phases of construction activities and may require more than one SWPPP plan sheet. Possible phases of construction include: initial clearing, earth moving activities, hauling of borrow or fill soils, current site conditions, installation of infrastructure, final stabilization, off-site work associated with the project, etc.

§ 151.23 STORMWATER QUALITY MANAGEMENT FOR POST-CONSTRUCTION

A. Applicability and Exemptions

- (1) The stormwater application must include post-construction stormwater quality measures. These measures are incorporated as a permanent feature into the site plan and are left in place following completion of construction activities to continuously treat stormwater runoff from the stabilized site. Any project located within the Town that includes clearing, grading, excavation, and other land disturbing activities, resulting in the disturbance of one (1) acre or more of total land area, is subject to the requirements of this section. This includes land disturbances of less than one (1) acre of land that are part of a larger common plan of development or sale if the larger common plan will ultimately disturb one (1) or more acres of land.
- (2) The requirements under this section do not apply to the following activities:
 - (a) Agricultural land disturbing activities; or
 - (b) Forest harvesting activities; or
 - (c) Construction activities associated with a single-family residential dwelling disturbing less than five (5) acres, when the dwelling is not part of a larger common plan of development or sale; or

- (d) Single-family residential developments consisting of four (4) or fewer lots; or
 - (e) A single-family residential strip development where the developer offers for sale or lease without land improvements and the project is not part of a larger common plan of development of sale; or
 - (f) Individual building lots within a larger permitted project; or
 - (g) Underground utility projects with no change to the surface conditions; or
 - (h) Land disturbances with no improvements or impervious surfaces
- (3) The requirements under this section do not apply to the following activities, provided other applicable state permits contain provisions requiring immediate implementation of soil erosion control and pollution prevention measures:
- (a) Landfills that have been issued a certification of closure under 329 IAC 10.
 - (b) Coal mining activities permitted under IC 14-34.
 - (c) Municipal solid waste landfills that are accepting waste pursuant to a permit issued by IDEM under 329 IAC 10 that contains equivalent stormwater requirements, including the expansion of landfill boundaries and construction of new cells either within or outside the original solid waste permit boundary.
- (4) It will be the responsibility of the project site owner to ensure proper construction and installation of all stormwater BMPs in compliance with this chapter and with the approved Stormwater Management Plan, and to notify the Town with a sufficient NOT letter upon completion of the project and stabilization of the site. However, all eventual property owners of stormwater quality facilities meeting the applicability requirements must comply with the requirements of this chapter and this section.

B. Policy on Stormwater Quality Management.

- (1) BMPs must be implemented for the management of total suspended solids (TSS) including floatables. BMP systems or treatment trains shall have at least one component of the system providing floatable control.
- (2) The project site owner must submit to the Town a SWPPP that would show placement of appropriate BMPs designed, constructed, and maintained
- (3) For ease of maintenance and to reduce the frequency of pond dredging, all detention/retention facilities (including underground detention) shall have an upstream BMP installed for each inlet pipe, to collect sediments, debris, floatables, and other material prior to entering the detention/retention facility. Forebays are not acceptable. Position BMPs outside right-of-way and not more than 14 feet from a drivable surface for vac-truck and maintenance vehicle access.
- (4) Gasoline outlets and refueling areas must install appropriate practices to reduce lead, copper, zinc, and polyaromatic hydrocarbons in stormwater runoff. These requirements will apply to all new facilities and existing facilities that replace their fuel tanks.
- (5) Infiltration practices will not be allowed in wellhead protection areas. Discharges will not be allowed directly into sinkholes or fractured bedrock, without treatment that results in the discharge meeting Indiana groundwater quality standards as referenced in 327 IAC 2-11.
- (6) Any stormwater practice that is a Class V injection well must ensure that the discharge from such practices meets Indiana groundwater quality standards as referenced in 327 IAC 2-11.

C. Calculations and Design Standards and Specifications.

- (1) Calculation of land disturbance should follow the guidelines contained in § 151.22(C).

- (2) The target TSS removal rate is 80%. For the purposes of this requirement, TSS is defined as particles smaller than 125 microns in diameter.
- (3) There are two methods for calculating the required size of a BMP. The first method calculates the water quality volume to be treated, which applies to detention-based BMPs. The second method calculates the water quality peak flow rate to be treated, which applies to filtration processes and mechanical-type BMPs such as hydrodynamic devices.
- (4) The appropriate stormwater quality volume (WQ_v) and/or stormwater quality flow rate (Q_{wq}) generated from a qualifying site shall be adequately treated before discharge. Traditional structural BMPs are presumed to comply with the 80% TSS removal rate if BMPs are:
 - (a) Sized to capture the prescribed water quality volume or flow rate, as applicable;
 - (b) Designed according to the specific performance criteria outlined in Appendix D of the *Hendricks County Stormwater Technical Standard Manual* or the *Indiana Stormwater Quality Manual*;
 - (c) Constructed properly; and
 - (d) Maintained regularly.
- (5) Mechanical-type BMPs must be approved by the Town and meet ASTM standard methods for verifying performance and must be certified by a professional engineer. The BMP must meet the 80% TSS removal rate without resuspension of particles at the design water quality flow rate resulting from a 1-inch rainfall depth. Testing of the TSS removal rate must be conducted by an independent testing facility rather than by the manufacturer.
- (6) Water Quality Volume (WQ_v) - The WQ_v is the storage needed to capture and treat the runoff from the first 1-inch of rainfall. A 24 to 40-hour emptying time must be used for the release of the WQ_v , with no more than 50% of the water quality volume being released in the first 12 hours. The WQ_v is equivalent to 1 inch of rainfall multiplied by the volumetric runoff coefficient (R_v) and the site area. The volume of runoff is directly related to the amount of impervious cover at the site and is calculated using the following equation.

$$WQ_v = \frac{P R_v A}{12}$$

where:

WQ_v = water quality volume (acre-feet, ac-ft)

P = rainfall depth (inches, in) = 1 inch

R_v = volumetric runoff coefficient – see the following equation

A = site area (acres)

$$R_v = 0.05 + 0.009 I$$

where:

R_v = volumetric runoff coefficient

I = percentage of impervious cover (%)

- (7) Water Quality Flow Rate (Q_{wq}) - The Q_{wq} is needed to size BMP devices designed to treat runoff at a peak design flow rate through the system. Conventional NRCS (SCS) methods have been found to underestimate the volume and rate of runoff for rainfall events less than 2 inches. The following procedure can be used to calculate the Q_{wq} . The method relies on the water quality volume in conjunction with an adjusted curve number (CN_{wq}) and the NRCS TR-55 methodology.

Step 1 - Using the water quality volume, calculate the adjusted CN_{wq} using the following equation

$$CN_{wq} = \frac{1000}{10 + 5 P + 10 WQ_{vi} - 10 (WQ_{vi}^2 + 1.25 WQ_{vi} P)^{1/2}}$$

where:

CN_{wq} = adjusted curve number for water quality flow rate

WQ_{vi} = water quality volume (inches, in) – see equation below

P = rainfall depth (inches, in) = 1 inch

$$WQ_{vi} = (1 \text{ inch}) R_v$$

where:

WQ_{vi} = water quality volume (inches, in)

R_v = volumetric runoff coefficient

Step 2 – Calculate the site time of concentration in minutes (T_c) and area in acres (A).

Step 3 – Use the adjusted CN_{wq} , T_c and A as input for TR-55 calculations in conjunction with the Huff II rainfall distribution, for 1-inch of rainfall depth using the storm duration that produces the highest peak flow rate to calculate the Q_{wq} .

D. Easement Requirements.

All stormwater quality management systems, including detention or retention basins, filter strips, pocket wetlands, in-line filters, infiltration systems, conveyance systems, structures and appurtenances are to be located outside of the right-of-way and shall be incorporated into permanent easements as listed in § 151.21(J).

E. Submittal Requirements.

A post-construction stormwater pollution prevention plan is required in addition to the submittal requirements listed in § 151.20. This plan must include the following information:

- (1) A description of potential pollutant sources from the proposed land use that may reasonably be expected to add a significant amount of pollutants to stormwater discharges.
- (2) Location, dimensions, detailed specifications, and construction details of all post-construction stormwater quality measures.
- (3) A description of measures that will be installed to control pollutants in stormwater discharges that will occur after construction activities have been completed. Such practices include infiltration of runoff, flow reduction by use of open vegetated swales and natural depressions, buffer strip and riparian zone preservation, filter strip creation, minimization of land disturbance and surface imperviousness, maximization of open space, and stormwater retention and detention ponds.
- (4) Calculations demonstrating the required water quality treatment volume or water quality treatment rate for post-construction stormwater quality measures.
- (5) A sequence describing when each post-construction stormwater quality measure will be installed.
- (6) Stormwater quality measures that will remove or minimize pollutants from stormwater runoff.

- (7) Stormwater quality measures that will be implemented to prevent or minimize adverse impacts to stream and riparian habitat.
- (8) An O&M Manual shall be provided for each stormwater BMP in accordance with § 151.29.

§ 151.24 RESERVED

§ 151.25 STORAGE OF POLLUTANTS

- A. Storage or stockpiling of pollutants within any floodplain is strictly prohibited. Storage or stockpiling of pollutants on active construction sites must include adequate protection and/or containment so as to prevent any such materials from entering any temporary or permanent stormwater conveyance or watercourse.

§ 151.26 REQUIRED ASSURANCES

A. Performance Bonds.

- (1) Applicant shall provide financial performance assurance in the form of a performance bond, certified check, irrevocable letter of credit, or certificate of deposit after receiving an approved secondary plat. Assurance shall be made out to the Town of Brownsburg for an amount equal to one hundred and ten percent (110%) of the total costs of implementing measures required by this chapter. A cost estimate prepared by the design engineer is to be submitted and approved by the Town.
- (2) Said performance bond shall guarantee a good faith execution of the stormwater quantity and quality management plans, stormwater pollution prevention plan, and any other conditions of plan approval (collectively known as the Stormwater Management Plan). Said costs shall be for the installation and continuous installation, monitoring, and maintenance of stormwater infrastructure, temporary and permanent sediment and erosion control measures, detention/retention facilities and other water quantity BMPs, and stormwater quality BMPs, as regulated under this chapter. The intent of this performance bond is not only to complete the installation of stormwater infrastructure for the project, but also to ensure that adequate stormwater pollution prevention measures are properly installed and maintained.
- (3) Performance bonds shall be kept current until the project receives final approval from the Development Services Department. Delinquent performance bonds or other assurances will result in penalties and corrective actions as defined in § 151.90 and § 151.91.
- (4) Should the owner/applicant fail to comply with the provisions of this chapter, in addition to any other remedies the Development Services Department may redeem the performance bond to complete all necessary work, after giving reasonable notice and opportunity for compliance as defined in § 151.90.
- (5) Upon completion of the required stormwater infrastructure, temporary and permanent sediment and erosion control measures, detention/retention facilities and other water quantity BMPs, and stormwater quality BMPs according to the recorded secondary plat and approved Stormwater Management Plan, the applicant shall provide the Development Services Department with “as-built” plans. The applicant may then request the release of

the performance bond. Upon satisfaction of all performance requirements, and issuance of NOT, the Stormwater Department will release the performance bond within sixty (60) days.

§ 151.27 CONSTRUCTION MAINTENANCE AND INSPECTION

A. Responsibility of Maintenance and Inspection.

- (1) Stormwater quality facilities shall be maintained by the project site owner in good condition, in accordance with the Operation and Maintenance procedures and schedules recommended by the manufacturer of the BMP or listed in the *Indiana Stormwater Quality Manual* or the *Hendricks County Stormwater Technical Standards Manual* Appendix D and the terms and conditions of the approved Stormwater Management Plan, and shall not be subsequently altered, revised, or replaced except in accordance with the approved Stormwater Management Plan, or in accordance with approved amendments or revisions to the Stormwater Management Plan.
- (2) The SWPPP shall serve as a guideline for stormwater quality, but should not be interpreted to be the only basis for implementation of stormwater quality measures for a project site. The project site owner is responsible for implementing, in accordance with this chapter, all measures necessary to adequately prevent polluted stormwater runoff.
- (3) The project site owner shall inform all general contractors, construction management firms, grading or excavating contractors, utility contractors, and the contractors that have primary oversight on individual building lots of the terms and conditions of this chapter and the conditions and standards of the SWPPP and the schedule for proposed implementation.
- (4) Construction project sites will be prioritized based on the nature and extent of the construction activity, topography and the characteristics of soils and receiving water quality.
- (5) If after a recommendation is provided to the project site owner, corrective action is not taken, the Town will pursue enforcement in accordance with this chapter.

B. Inspection by the Town.

- (1) The Town has the authority to assess inspection fees according to an established fee schedule and conduct inspections of the site to ensure full compliance with the provisions of this chapter, and the terms and conditions of the approved Development Plan/SWPPP.
- (2) Inspections may include, but are not limited to, reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in stormwater control facilities; and evaluating the condition of stormwater control facilities and other BMPs.
- (3) The Town reserves the right to perform inspections and provide recommendations to evaluate the installation, implementation and maintenance of stormwater management and sediment and erosion control measures at any project site involved in land disturbing activities.

C. Self-Inspections.

- (1) A self-monitoring program must be implemented by the project site owner to ensure the SWPPP is working effectively. A trained individual, shall perform a written evaluation of the project site by the end of the next business day following each measurable storm event. If there are no measurable storm events within a given week, the site should be monitored at least once in that week. Weekly inspections by the trained individual shall continue until

the entire site has been stabilized and the site passes a final inspection by the Development Services Department. The trained individual should look at the maintenance of existing stormwater pollution prevention measures, including erosion and sediment control measures, drainage structures, and construction materials storage/ containment facilities, to ensure they are functioning properly. The trained individual should also identify additional measures, beyond those originally identified in the stormwater pollution prevention plan, necessary to remain in compliance with all applicable statutes and regulations.

- (2) The resulting evaluation reports must include the following:
 - (a) Name of the individual performing the evaluation
 - (b) Date of the evaluation
 - (c) Location of the inspection
 - (d) Type of inspection completed (routine, rainfall event, enforcement action follow-up, etc.)
 - (e) Any violations or problems identified at the project site
 - (f) Details of maintenance, additional measures, and corrective actions recommended and completed
 - (g) Signature of inspector
- (3) Although self-monitoring reports do not need to be submitted to the Town, the Town has the right to request complete records of maintenance and monitoring activities involving stormwater pollution prevention measures. All evaluation reports for the project site must be made available to the Town, in an organized fashion, within forty-eight (48) hours of the request.
- (4) Regular construction inspections shall be required until the IDEM NOT is completed and the site passes a final inspection by the Development Services Department. A passing inspection shall be defined as an inspection in which the site meets stabilization requirements, all permanent stormwater management facilities and sediment and erosion control measures are installed, maintained, and operating in accordance with the approved Stormwater Management Plan, and no other violations are observed.

§ 151.28 PROJECT TERMINATION

A. Certification of As-Built Drawings.

- (1) After completion of construction of the project, but before final site inspection and acceptance, the applicant shall submit professionally prepared and certified “as-built” drawings in accordance with the Town’s requirements for digital and hard copy as-builts. The drawings shall indicate the “as-built” details of all site improvements relevant to the completed stormwater management system and management facilities, including the following:
 - (a) Pipe size, length, material, and inverts
 - (b) Structure location, size, and material
 - (c) Casting type, size, and top of rim elevation
 - (d) Ditch/swale locations, flowline elevations, and cross sections
 - (e) BMP type, dimensions, boundaries/easements, and relevant elevations
 - (f) “As-planted” plans for BMPs, as applicable
 - (g) Post-construction survey, indicating detention/retention basin bottom elevation, normal pool elevation, and one hundred-year (100-yr.) (1% chance/year) elevation

- (h) Emergency overflow spillway and flood routing path configuration, dimensions, flowline/invert elevations, and cross sections
- (i) Data and calculations showing “as-built” detention/retention basin storage volume and “as-built” BMP treatment capacity, signed and certified by a Professional Engineer or Land Surveyor licensed in the State of Indiana.
- (j) Any other “as-built” information required or requested by the Development Services Department.

B. Certification of Completion and Compliance.

- (1) A Certification of Completion and Compliance shall be completed that certifies the following:
 - (a) The designer is familiar with the stormwater management requirements applicable to such land alteration (as set forth in this chapter).
 - (b) The designer has personally inspected the completed work.
 - (c) All improvements were installed as shown on the “as-built” plans and in conformance with the approved Stormwater Management Plan. Statement shall be signed and certified by a Professional Engineer or Land Surveyor licensed in the State of Indiana.
- (2) Any exceptions or deletions to the project shall be clearly outlined.

C. Notice of Construction Termination.

- (1) The project site owner shall plan an orderly and timely termination of the construction activities, including the implementation of stormwater quality measures that are to remain on the project site.
- (2) The project site owner, or a representative thereof, shall submit an IDEM NOT form to the Town upon project termination once the following requirements are met:
 - (a) All land disturbing activities, including construction on all building lots, have been completed.
 - (b) Final stabilization of the entire site has been completed, and vegetation has established at a minimum of seventy percent (70%) density of uniform permanent perennial vegetated coverage.
 - (c) All permanent BMPs and stormwater quality measures have been implemented and are operational. BMPs shall be cleaned, including the removal of accumulated solids, sediments, and debris, just prior to construction termination.
 - (d) Temporary erosion and sediment control measures have been removed.
- (3) The NOT must be submitted to the Town within two (2) weeks of project termination, and contain a statement(s) verifying that each of these conditions have been met.
- (4) The Town or a representative thereof may inspect the project site to confirm the information provided in the NOT. Once the applicant receives verification of acceptable construction termination and site stabilization from the Development Services Department, the applicant must forward a copy of the NOT to IDEM.
- (5) The applicant may apply for release of performance bonds in accordance with § 151.26(A)(5).

§ 151.29 STORMWATER MANAGEMENT FACILITIES POST-CONSTRUCTION MAINTENANCE AND INSPECTION

A. Operations and Maintenance (O&M) Manual Requirements.

- (1)** Stormwater management facilities including pipes, structures, ponds, detention/retention facilities, swales, open channels, subsurface drains, water quality BMPs, and low impact development practices shall have an O&M manual. The O&M manual shall be submitted with the Site Development Plan as required in § 151.20(B)(2)(g).
- (2)** O&M manual should include maintenance of all ponds, stormwater components, and low-impact development facilities/BMPs. Owners of ponds will be responsible for all maintenance of pond banks, erosion control measures, riprap, and outfall protection and all periodic dredging. It is the designer's responsibility to determine which additional operation and maintenance measures are necessary to prolong the optimal function of the facility.
- (3)** The approved O&M manual shall be signed by the owner and notarized. A copy of the approved O&M manual shall be provided to the owner and the Development Services Department. The signed and approved O&M manual shall be recorded with the property by the County Recorder's office. A copy of the O&M manual shall be provided to each new owner before the transfer of ownership. The O&M manual shall be signed by the new owner, notarized, and submitted to the Development Services Department to be kept on record.
- (4)** All O&M manuals shall include the following information, at a minimum:
 - (a)** Owner Information. The first section of the manual shall contain information about all people involved with the operations and maintenance of the facility. This section shall list the names and contact information of all responsible parties, including property owner(s), maintenance staff, and person(s) responsible for performing inspections. The responsibilities of each individual shall be clearly defined. Contact information shall include business or mobile phone number, address for giving notice, and email address (if available).
 - (b)** Site Map. The O&M manual shall include a site map and exhibits drawn to a legible scale on 8.5"x11" or 11"x17" sized paper that clearly indicates the following:
 - 1.** The location of the stormwater management facility or BMP.
 - 2.** Plan and cross-section details, showing applicable features.
 - 3.** The flow of stormwater through the site, including an overview of the stormwater's path through the onsite stormwater facilities and BMPs.
 - 4.** Dimensions, easements, outlets/discharge points and outfall locations, drainage patterns, stormwater runoff flow directions, the extent and depth (elevation) of high water levels, flood routing path, signage, connecting structures, weirs, invert elevations, structural controls used to control stormwater flows, and other relevant features.
 - (c)** O&M Practices. Each stormwater management facility and BMP shall require specific inspection and maintenance procedures.
 - 1.** Guidance shall be written in simple, layman's terms, including:
 - a.** Guidance on owner-required periodic inspections and inspections to be performed by the Development Services Department.
 - b.** Guidance on routine maintenance including mowing, litter removal, woody growth removal, etc. to be performed by the owner.
 - c.** Guidance on remedial maintenance such as inlet replacement, outlet work, etc. to be performed by the owner.
 - d.** Guidance on sediment removal, both narrative and graphical, describing when sediment removal shall occur in order to ensure that the stormwater management facility or BMP remains effective as a stormwater management device.

- Guidance shall include instructions as to how the depth of sediment shall be measured and at what measurement removal will be required.
- e. Instructions on inspection and clean-out of BMPs, sumps, trash screens, settling pits, and oil/grease collection chambers.
 - f. Instructions on proper disposal of removed sediments, trash, debris, and other substances.
 - g. Guidance and methods for preventing water stagnation and all recommended maintenance.
2. The minimum requirements below shall also be incorporated into the inspection and maintenance regimen and clearly documented in the O&M manual.
- a. Operation and maintenance procedures and practices shall be reviewed and assessed annually.
 - b. Access routes, including roadways and sidewalks, shall be inspected annually and maintained as needed.
 - c. Drainage structures and flow restrictors shall be inspected and cleaned semi-annually or per the manufacturer's recommendations, whichever is more stringent.
 - d. Volume control facilities and BMPs shall be inspected semi-annually and after significant rainfall events exceeding one and one-half (1.5) inches, or per the manufacturer's recommendations, whichever is more stringent.
 - e. The owner shall keep an updated log book or inspection worksheets documenting the performance of the required operation and maintenance activities for perpetuity. Note inspection dates, facility components inspected, facility condition, and any maintenance performed or repairs made. Documentation must be produced upon the request of the Town Personnel, within forty-eight (48) hours of the request.
 - f. Vegetation shall be maintained on a regular basis per design specifications.
 - g. Pest control measures shall be implemented to address insects, rodents, and other pests. Natural pest control is preferred over chemical treatments.
 - h. Mechanical measures shall be maintained on a regular basis per the manufacturer's recommendations.
 - i. Signage and fencing shall be installed and maintained in accordance with the Town of Brownsburg Construction Standards and where necessary to protect property and the public. Native vegetation plantings shall have "No Mow" or other appropriate signage.
 - j. Underground vaults and structures shall include design measures to facilitate regular cleaning and maintenance. Confined space entry procedures shall be followed.
- (d) Right-of-Entry Statement. The O&M manual shall include a statement that the Town of Brownsburg has the right to enter the property to inspect the stormwater management facility or BMP. The statement shall be signed and notarized.
- (e) Implementation Schedule. An inspection and maintenance schedule shall be prepared in a tabular format and included in the O&M manual. This schedule shall provide for routine examination of all stormwater management facilities and BMPs on the property and incorporate the varying maintenance needs of each.
- (f) Employee Training. Specific individuals shall be assigned responsibility for operation, maintenance, and inspection of all onsite stormwater management facilities and BMPs. Employee training shall be conducted so that these individuals are aware of proper

procedures and practices. The training program and schedule shall be incorporated into the O&M manual. All personnel should be familiar with the components of the O&M manual and their personal level of responsibility. Training documentation may be requested by the Town.

- (g) Drainage Easement(s) Documentation. The O&M manual shall include documentation of drainage easement(s) around the stormwater management facilities and BMPs. The documentation may be in text or graphic format.

B. Stormwater Management Facility and BMP Maintenance.

- (1) Stormwater management facilities and BMPs shall be maintained in a properly functioning condition so that their effectiveness in managing and treating stormwater runoff is not diminished, in accordance with the operation and maintenance procedures and schedules recommended by the manufacturer of the BMP or listed in the *Indiana Stormwater Quality Manual*, the *Hendricks County Stormwater Technical Standards Manual Appendix D*, the approved O&M manual, and the terms and conditions of the approved Stormwater Management Plan. The stormwater management facility or BMP owner is considered in violation of this chapter if the facility or BMP is not maintained properly.
- (2) Following construction completion and the issuance of an NOT, inspection and maintenance of stormwater management facilities and BMPs shall be the long-term responsibility of the owner of those facilities (including Homeowners Associations or any other entity as specified in restrictive covenants).
- (3) Stormwater detention/retention basins may be donated to the Town for ownership and permanent maintenance providing the Town is willing to accept responsibility.

C. Records of Inspection and Maintenance Activities.

- (1) The stormwater management facility or BMP owner must conduct necessary inspections at least once per year. The inspections shall follow the operation and maintenance procedures listed in the *Indiana Stormwater Quality Manual*, the *Hendricks County Stormwater Technical Standards Manual Appendix D*, the approved O&M manual, and the terms and conditions of the approved Stormwater Management Plan for each facility or BMP. The inspection shall cover physical conditions, available water quality storage capacity, and the operational condition of key facility elements. Completed inspection forms must be maintained by the owner and produced upon request by Town personnel within forty-eight (48) hours of the request.
- (2) Annual inspection reports shall be due to the Development Services Department, beginning one year after construction is completed. Subsequent reports shall be due each year within the same month of the initial report. All deficiencies found during the inspection shall be addressed. If the annual inspection report is not received within the month it is due, if there are deficiencies which exist but were not included in the report, or if any deficiencies included in the report are not addressed in a timely manner, the Town may take enforcement action in accordance with this chapter.
- (3) The Development Services Department must be notified of any changes in ownership, major repairs, or failure in writing within thirty (30) days.
- (4) In the event that Town personnel find a stormwater management facility in need of maintenance or repair, the Development Services Department will notify the owner on record of the necessary maintenance or repairs and give the owner a timeframe for completing the work. If the maintenance or repairs are not completed within the designated

timeframe, the Town may perform the work and bill the owner for the actual costs of the work.

- (5) The Town also has the authority to perform long-term inspection of all public or privately-owned stormwater management facilities. Such inspections will be in addition to the regular inspections required to be performed by the facility owner. The inspections will follow the operation and maintenance procedures listed in the approved Stormwater Management Plan for each facility or BMP. Noted deficiencies and recommended corrective action will be included in an inspection report.

ENFORCEMENT

§ 151.90 COMPLIANCE

A. Failure to Comply or Complete.

- (1) Compliance with this ordinance, all applicable Town ordinances, as well as all state and federal statutes and regulations is required. Unless otherwise stated, all references, specifications, statues, and regulations referred to in this chapter shall be the most recent edition available.
- (2) The Development Services Department or their designee may delay issuance of a Building Permit or revoke Stormwater Management Plan approval where the application, plan or other supporting documents reflect:
 - (a) A false statement or misrepresentation as to material fact.
 - (b) Failure to or lack of compliance with the requirements of this chapter.
 - (c) Failure to bond, execute covenants, dedicate easements or perform other requirements pursuant to this chapter.
- (3) This revocation of approval shall in no way limit the operation of penalties provided elsewhere in this chapter.

B. Notice of Violation.

- (1) Whenever the Town or their designee finds that a person has violated a prohibition or failed to meet a requirement of this chapter, the Town may order compliance by written Notice of Violation to the responsible person. Such notice may require without limitation:
 - (a) The performance of monitoring, analyses, and reporting;
 - (b) The elimination of illicit connections or discharges;
 - (c) That violating discharges, practices, or operations shall cease and desist;
 - (d) The abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property;
 - (e) Payment of a fine to cover administrative and remediation costs, including but not limited to remediation costs, legal fees, consultant fees, monitoring costs, construction costs, collection fees and any other costs borne by the Town related to the violation;
 - (f) The implementation of source control or treatment BMPs;
 - (g) The issuance of a Stop Work Order; and/or
 - (h) Revocation or suspension of Stormwater Management Plan approval.
- (2) The Notice of Violation shall be in writing, include a description of the property for identification and include a statement of the violation(s) and why the notice is being issued. The Notice of Violation shall provide at least ten (10) days to bring the property into compliance.

- (3) If abatement of a violation and/or restoration of affected property is required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Said notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by the Town and the expense thereof shall be charged to the violator.
- (4) Reinspection of remedied violations will be assessed a reinspection fee in accordance with the fee schedule established by the Town of Brownsburg.

C. Appeal of Notice of Violation.

- (1) Any person receiving a notice of violation may appeal the determination to the effect that a Notice of Violation or Stop Work Order served in accordance with this chapter is in error or should, due to hardship, be modified or entitled to a variance from the enforcement.
- (2) Any person receiving a Notice of Violation may appeal the determination to the effect that a reasonable extension of time for the compliance should be granted on the grounds of a demonstrated case of hardship and evidence of an actual undertaking to correct the violation, together with a legitimate intent to comply within a reasonable time period.
- (3) The notice of appeal must be filed with the Town within ten (10) days from the date of the notice. Hearing on the appeal before the Town Council shall take place within forty-five (45) days from the date of its receipt of the notice of appeal. The decision of the Town Council shall be final.
- (4) Appeals of notices or orders (other than imminent danger notices) shall stay the enforcement of the notice or order until the Town Council rules on the appeal.

D. Enforcement Measures after Appeal.

If the violation has not been corrected pursuant to the requirements set forth in the Notice of Violation, or, in the event of an appeal, within ten (10) days of the decision of the municipal authority upholding the decision of the authorized enforcement agency, then representatives of the authorized enforcement agency shall enter upon the subject private property and are authorized to take any and all measures necessary to abate the violation and/or restore the property. It shall be unlawful for any person, owner, agent or person in possession of any premises to refuse to allow the government agency or designated contractor to enter upon the premises for the purposes set forth above.

E. Stop Work Order.

- (1) Whenever the Town or their designee discovers the existence of any of the circumstances listed below, a Stop Work Order may be issued requiring the suspension of the land alteration. A Stop Work Order may be issued on any person engaged in land alteration if:
 - (a) Land alteration is proceeding in an unsafe manner;
 - (b) Land alteration is occurring in violation of a stormwater management requirement and in such manner that if land alteration is allowed to proceed, that it will be difficult to correct the violation;
 - (c) Land alteration has been accomplished in violation of a stormwater management requirement and up to fifteen (15) calendar days have elapsed since written Notice of Violation was issued, without the violation being corrected; or
 - (d) Land alteration for which Stormwater Management Plan approval is required is proceeding without the appropriate approval. In such an instance, the Stop Work Order shall indicate that the effect of the order terminates when the required approval is obtained.

- (2) The Stop Work Order shall be in writing and shall state to what land alteration it is applicable and the reason for its issuance. One copy shall be posted on the property in a conspicuous place, and one copy shall be delivered to the applicant, the owner of the property, or his agent.
- (3) The Stop Work Order shall state the conditions under which land alteration may be resumed.

F. Injunctive Relief.

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this chapter. If a person has violated or continues to violate the provisions of this chapter, the authorized enforcement agency may petition for a preliminary or permanent injunction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

G. Violations Deemed a Public Nuisance.

In addition to the enforcement processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this chapter is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken.

§ 151.91 PENALTY

A. Fining Procedure.

- (1) Any person who violates any of the provisions of this chapter may be fined.
- (2) The fines described in the notice of violation may include a civil infraction and is subject to a minimum one hundred dollars (\$100) fine for investigation, inspection and administrative costs and a maximum fine of two thousand five hundred dollars (\$2,500) for a first offense. A maximum of seven thousand five hundred dollars (\$7,500) may be assessed for a subsequent offense. Each day such a violation occurs or continues shall be deemed a separate offense and shall make the violator liable for the imposition of a fine for each day.
- (3) If the amount due is not paid within a timely manner as determined by the decision of the municipal authority or by the expiration of the time in which to file an appeal, the charges shall become a special assessment against the property and shall constitute a lien on the property for the amount of the assessment.

B. Cost of Abatement of the Violation.

After abatement of the violation, the owner of the property will be notified of the cost of abatement, including administrative costs. The property owner may file a written protest objecting to the amount of the assessment within ten (10) days. If the amount due is not paid within a timely manner as determined by the decision of the municipal authority or by the expiration of the time in which to file an appeal, the charges shall become a special assessment against the property and shall constitute a lien on the property for the amount of the assessment. Any person violating any of the provisions of this chapter shall become liable to the Town by reason of such violation. The liability shall be paid in not more than twelve (12) equal payments. Interest at the rate of eight percent (8%) per annum shall be assessed on the balance beginning on the first day following discovery of the violation. If such amount is not timely paid, then the Town may authorize the amount due and unpaid to the Treasurer of Hendricks County to be collected in the same manner as delinquent property taxes.

C. Expenses.

The Town may recover all remediation costs, legal fees, consultant fees, monitoring costs, construction costs, collection fees and any other costs borne by the Town related to the violation.

D. Remedies Not Exclusive.

The remedies listed in this chapter are not exclusive of any other remedies available under any applicable federal, state or local law and it is within the discretion of the Town to seek cumulative remedies.

E. Transfer of Ownership.

No owner of any lands upon which a penalty or cost of abatement has been assessed shall sell, transfer, mortgage, lease, or otherwise dispose of to another until the amount has been paid, or until such owner first furnishes to the Town a signed and notarized statement from the grantee, transferee, mortgagee, or lessee, acknowledging and fully accepting the responsibility of payment.