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CH15 15 .26 - Storm Sewers and Drainage

A. All proposed plats, submitted to the Commission for approval, under the provision of the Comprehensive Plan and this chapter, shall provide for the collection and management of all storm and surface water drainage. The drainage system shall be designed and constructed by the developer to provide for the proper drainage of the surface water of the subdivision and the drainage area of which it is a part. The system shall be constructed and installed in accordance with this chapter, the Comprehensive Plan and the requirements of the Town Engineer. In order to insure the maintenance of a properly designed and installed drainage system, the following division shall be required as a provision of the restrictive covenants of all record plats.
    1. Drainage swales (ditches) along dedicated roadways and within the right-of-way, or on dedicated drainage easements, are not to be altered, dug out, filled in, tiled, or otherwise changed without the written permission of the Town Engineer, Property owners must maintain these swales as sodded grass-ways, or other non-eroding surfaces. Water from roofs of parking areas must be contained on the property long enough so that said drainage swales or ditches will not be damaged by such water. Driveways may be constructed over these swales or ditches only when appropriate sized culverts or other approved structures have been permitted by the Town Engineer. Culverts must be protected, especially at the ends, by head walls or metal end section, and, if damaged enough to retard the water flow, must be replaced.
    2. Any property owner altering, changing, or damaging these drainage swales or ditches will be held responsible for such action and will be given ten days notice by registered mail to repair said damage, after which time, if no action is taken, the town will cause said repairs to be accomplished, and the bill for such repairs will be sent to the affected property owners for immediate payment.

B. General Drainage Considerations. The purpose of this division is to protect the safety, health, and general welfare of the citizens of the town by requiring compliance with accepted standards and practices for storm water drainage. This division does not create any liability on the part of the town, the Advisory Plan Commission, or any elected or appointed official or employer thereof, for any damages that result from reliance on this division or any alterations required to conform to the engineering requirements established hereunder or any administrative decisions lawfully made thereunder. Any land alteration must be accomplished in conformity with the drainage requirements. Where any apparent conflict exists,

between drainage requirements of this chapter and similar requirements of any state or federal agency which has jurisdiction of the work involved the most astringent requirements shall be and compliance with this chapter shall not excuse noncompliance with any other applicable provision of law, ordinance, or regulation.

C. A drainage facility shall be provided to allow drainage of water run-off from all of the upstream drainage area and from all areas within the proposed subdivision to a place adequate to receive such runoff. Furthermore, a drainage facility shall:
    1. Be durable, easily maintained, retard sedimentation, and retard erosion. It shall not endanger the public health and safety or cause significant damage to property.
    2. Be sufficient to accept the water run-off from the site after development and the present water run-off from all areas upstream. Also, consideration shall be given to water run-off from future developments in undeveloped areas upstream which cannot reasonably be accommodated in the upstream area. The types of consideration should include, but need not be limited to, retention-detention systems, oversizing with 15-year law Cost recovery, and granting of adequate easements for future construction. The type of future development shall be in accordance with the uses indicated in the Comprehensive Plan for Lapel or the use allowed by current zoning, whichever reflects the most intense use. The volume of water run-off attributable to future development which is not to be accommodated in the proposed drainage facilities, shall be determined by good engineering practice, and may assume use of retention-detention systems, except for:
        a. Parcels that are too small to effectively use a retention-detention system, and
        b. Parcels where it is not technically and/or economically justifiable to use a retention-detention system.
    3. Be designed such that there will be no increase in the peak discharge run-off rate as a result of the proposed development unless the existing or improved downstream drainage facilities are adequate to accept:
        a. The water run-off from the site after development;
        b. The present water run-off from developed and undeveloped areas upstream; and
        c. The present water run-off of downstream areas contributory to the downstream drainage facility beyond the limits of the site.
    4. Be designed such that the low points of entry for residential, commercial and industrial structures are two feet above and free from a 100-year flood. In addition, avenues of ingress-egress shall also be free from the 100-year flood.
    5. Be inspected during construction by a registered professional engineer, or a land surveyor, in the state, at the expense of the developer and certified in accordance with division (L) below. This is in addition to the inspection provided by the town.

D. A drainage plan must be submitted in triplicate, and shall contain the following as a minimum. This plan shall be submitted with the Development Plans.
    1. A location and Vicinity Map indicating the boundaries of existing site and off-site watershed considerations. Minimum scale to be one inch equals 1,000 feet.
    2. A Scale, North Arrow, U.S.G.S, and a Bench Mark. Existing and Final Contours shall be shown as follows.

a. One foot contours @ slopes of 0% - 10%
b. Two foot contours @ slopes of 10% - 25%
c. Five foot contours @ slopes of greater than 25%

3. The location and lowest point of entry elevation of existing and proposed buildings and paved areas.
4. The location of existing and proposed on- and off-site drainage facilities. The drainage plan shall also indicate the direction of flow invert elevations, gradient, size, and capacity of existing and proposed storm drainage facilities. If drainage ditches are used, cross sections and type of surface shall be shown.
5. The plan and profile of all drainage facilities, as well as all construction details, shall be shown. The plan shall be to a scale of no more than 1 inch equals 50 feet and shall show appropriate rights-of-way and easement limits. The scale for construction details shall not be less than 1/4 inch per foot.
6. A certification by a registered professional engineer, or a land surveyor, in the State of Indiana, that is familiar with storm drainage design. However, any storm water retention structure and/or pumping facilities shall be certified by a registered professional engineer in the State of Indiana.

E. The design calculations shall be submitted with the drainage plans and as a minimum shall include:

1. The storm run-off calculations based on the ten-year storm, or other storm frequencies where appropriate. The 100-year impact shall be analyzed and discussed.
2. The weighted run-off coefficients computations.
3. The time of concentration computation, also indicating the overland flow time and the adjusted time of concentration for the swale, pipe, channel, or other storm water conveyance facility.
4. The closed conduit and open channel design calculation for:
    a. The size of pipe or channel cross section.
    b. The pipe or channel slope in percent.
    c. The roughness coefficient.
    d. The flow velocity.
    e. The design capacity.
5. The head loss calculation in major structure, or where appropriate.
6. The hydraulic gradient computations wherever applicable.
7. The erosion control and final surface preparation measures to be constructed.

F. The following items represent the minimum criteria that shall be followed in the engineering and design of drainage facilities:

i. Minimum criteria and submittal information:
    a. Swales - generally for backyard drainage and does not have a well defined top of bank. The following shall not be exceeded for swales:
        1. Maximum flow -- 4 cfs
        2. Minimum velocity -- 2 fps
        3. Minimum side slopes -- 4%
    b. Ditches -- an open conveyance for storm water drainage with a defined top of bank. The following criteria shall not be exceeded for ditches:
        1. Minimum velocity -- 2.5 fps

2. Maximum velocity -- 6.5 fps
3. Maximum side slope -- 4:1, steeper slopes may be considered depending on soils or other limiting factors.
4. Easements -- adequate for construction and maintenance.
5. Erosion protection -- adequate surface preparation for erosion protection shall be provided.

c. Retention/detention ponds - can be permanent ponds with storage capacity for storm run-off, and controlled discharge, or a detention area with controlled discharge that is completely drained after use. The following minimum criteria applies to either type of retention/detention pond:
   1. Design storm -- 100-year, 6 hour storm (other design years are acceptable dependent on downstream conditions.)
   2. Minimum freeboard -- 2.5 feet above top of storage
   3. Side slopes -- 4:1 for storage area and freeboard.
   4. Other minimum information to be furnished - high ground water elevation, emergency spillway provisions, controlled discharge rates, contents, of storage area to be discharged within three days, economic evaluation of alternatives to a retention-detention pond.

d. The following additional minimum criteria should be obtained when designing a permanent pond type facility.
   1. Side slopes -- 3:1 below permanent pool elevation.
   2. Storage depth -- not to exceed five feet above permanent pool elevation.
   3. Permanent pond depth -- not to be less than seven feet, 5 feet at bank.
   4. Maximum allowable permeability - 3.5 x 10 to the 6th cm/sec.
   5. Minimum soil borings -- three per acre and to a depth of ten feet below the proposed pond bottom.

e. Pipes and conduits -- are buried conveyances for storm water drainage. The following minimum criteria shall apply.
   1. Minimum velocity -- 2.5 fps.
   2. Maximum velocity -- 8.0 fps (dependent on materials of construction).

f. Culverts and bridges -- a structure located underneath a roadway that allows storm water to pass under the roadway. The following minimum criteria shall apply:
   1. Minimum velocity -- 2.5 fps.
   2. Maximum velocity -- 8.0 fps.
   3. Erosion control -- adequate erosion protection measures shall be provided.
   4. Critical flow capacity -- the critical flow capacity shall vary with the road classification.

G. Storm sewers, culverts, conduits and pipe shall be constructed accordance with the following specified materials.
   1. Road, street and drive culverts shall be a minimum of 12 inches in diameter for concrete pipe, and 15 inches in diameter for corrugated metal pipe.

2. Storm sewers (long conduits) shall be concrete pipe for all sizes up to 42 inches. For conduits 42 inches and larger in diameter, concrete or corrugated metal pipe, pipe arches or fabricated metal pipe arches may be used, Note: Conduit sizing shall be in accordance with the appropriate "C" values for that particular type conduit material. All metal conduits shall be factory treated with a combined asbestos fiber and bituminous coating or approved equal.
3. All pipes shall be installed in accordance with the manufacturers recommendations. All pipe materials, load classifications, thickness, gauge and class shall be specified on the Development Plans.
4. Manholes shall be as specified in l53.34(G)(6).
5. Storm sewer curbs, any yard inlets, may be either precast concrete or built in place solid concrete brick. The structures constructed of solid concrete brick shall be surfaced on the interior and exterior with one inch of cement mortar.

H. Retention-detention ponds and lakes shall be owned and maintained by the property owner, owners Association, etc. The developer shall be responsible for the formulation of certain agreements that will accomplish this fact, and further, no obligation shall be inferred upon the town for such ownership or maintenance.

I. The maintenance program shall include at a minimum the methodology of funding a maintenance program, the frequency of maintenance, the type of maintenance, and the establishment of a responsible organization to administer the program. Ownership and maintenance of the facility shall be defined in the recorded covenants or agreements of the development in which this facility is contained.

J. Swales and small ditches, up to six cfs, shall be maintained by the adjacent property owners. All ditches, culverts, conduits, and storm inlet structures shall be maintained by the town, subsequent to formal acceptance.

K. The Plan Commission, Development Coordinator or his designee or Town Engineer shall be empowered to require such additional information to be included in a drainage plan that is necessary to evaluate and determine the adequacy of the proposed drainage facility.

L. Inspection during construction. The drainage facilities shall be inspected during construction as required by division (B) above, Further, within 30 day after completion of on and off- site and the drainage facilities, the registered professional engineer or land surveyor, responsible for the inspection of the work shall certify in writing to the Plan Commission that:
1. He or she is familiar with all drainage requirements of the Comprehensive Plan.
2. He or she has personally inspected the construction necessary to accomplish the land alteration and drainage facility; and
3. To the best of his or her knowledge information and belief the work has been performed and completed in conformity with the drainage plans and requirements. (Any exceptions should be so noted.)