

Part 250

250.000

**DEVELOPMENT DESIGN STANDARDS**

**Ord. No. 65**

**Adopted: June 4, 1991\***

THE TOWNSHIP BOARD OF THE TOWNSHIP OF BEDFORD ORDAINS the following for incorporation into the Township of Bedford Code of Ordinances:

**DEVELOPMENT DESIGN STANDARDS**

**ARTICLE I**

250.100

**INTENT, PURPOSE, SHORT TITLE AND INTERPRETATION**

250.101

**Intent and short title.**

Sec. 1.1. This Ordinance is intended to provide detailed specifications for the design and construction of subdivisions and other projects and improvements in the Township, and shall be known and may be cited as the Township of Bedford Development Design Standards Ordinance.

250.101

**Interpretation.**

Sec. 1.2. The provisions of this Ordinance shall be held to be the minimum requirements adopted for the promotion and preservation of the public health, safety and general welfare of the Township. These regulations are not intended to repeal, abrogate, annul, conflict or in any manner interfere with existing regulations or laws except that these regulations shall prevail in cases where they impose a greater restriction than is provided by other regulations or law. These regulations are subject to periodic review and revision as deemed necessary to remain current with standards set forth by the various review agencies.

250.103

**Applicability.**

Sec. 1.3. This Ordinance shall apply to all improvements where site plan review is otherwise required, and in all cases of subdivision development.

\*Cross reference—Housing Commission, Pt. 3.000.

**ARTICLE II****250.200****PLAN FORMAT****250.201 General requirements.**

## Sec. 2.1.

- (1) Plans submitted shall be on 24 inch by 36 inch white prints having blue or black lines, and shall be neatly and accurately prepared. The plan sheets shall have a maximum horizontal scale of one inch equals 50 feet for developments which are three acres or greater in size, and a maximum scale of one inch equals 30 feet for developments less than three acres in size. The maximum vertical scale for profile views is to be one inch equals five feet. Thirteen site plans are to be submitted for review to the Township Clerk's Office. In the case of construction plans, three sets of plans are to be submitted to the Township along with a detailed estimate of cost for the proposed improvements. Additional plans are to be submitted directly to the Monroe County Road Commission and Monroe County Drain Commissioner, with copies of all transmittals submitted to the Township. Review and approval of the plans shall be required by the Township Engineer, Township Planner, Monroe County Road Commission and Monroe County Drain Commissioner. In addition, dependent on the type and location of the proposed development, transmittal of plans may be required to other governmental authorities who might have jurisdiction, such as but not limited to the Environmental Health Division of the Monroe County Health Department, the Michigan Department of Natural Resources, the Michigan Department of Public Health and the Michigan Department of Transportation.
- (2) For projects or subdivisions having more than one sheet of plans, a general plan having a scale of one inch equals 100 feet shall be provided showing the overall project or subdivision and indicating the location of all improvements shown in the detailed plans. Superimposed on this general plan shall be two feet contours of the area, including the area at least 100 feet outside of the proposed development. Street names, lot lines and lot numbers shall be shown on all plans.
- (3) Separate plan sheets are required for a) storm sewer and road designs, b) water system design, and c) sanitary sewer system design. This provision may be waived by the review agencies dependent on the size and complexity of the development. All utility crossings are to be shown in plan and profile on each plan sheet.
- (4) All sewers shall be shown in plan and profile. Profiles of sewers shall indicate the size, invert and slope of the sewer and shall indicate the existing ground along the route of the sewer and the proposed or existing top of the

curb or edge of pavement grade. The profile shall also show the location of compacted sand backfill when the sewer line is within the one-foot horizontal to one-foot vertical zone of influence from the edge of pavement or back of curb and gutter section, whichever is greater.

- (5) Elevations shall be on U.S.G.S. datum. Bench marks (two minimum) for the work shall be indicated on the plans.
- (6) Finished grades of structures shall be indicated on the plan or profile for all structures.
- (7) A copy of the computed plat or site shall be submitted.
- (8) All plans submitted shall bear the seal of the appropriate professional responsible for the design, who shall be licensed in the State of Michigan.
- (9) One mylar copy of as-built plans of water, sanitary sewer, roads and storm sewer system, and certification from an appropriate licensed professional that all structures are in conformance with the approved plan, shall be provided prior to acceptance of a subdivision and/or other improvement regulated by this Ordinance. Additional mylar copies may be required by the various review agencies.
- (10) Complete plans shall be submitted prior to review and approval of any portion, unless the Township Engineer determines that a phased review would be appropriate in terms of providing plans for a phase which is capable of standing alone as an independent development (coupled with other phases previously constructed).
- (11) All utility easements shall be shown on the plans. All utility easements shall be a minimum of ten feet in width unless a wider easement is specified. A five foot exclusive water main easement is required adjacent to the public right-of-way.
- (12) All utilities located within or along the public right-of-way shall be in the corridors currently established and on file with the Township and reviewing agencies.

### ARTICLE III

#### 250.300

#### SANITARY SEWERS

#### 250.301 Design standards.

##### Sec. 3.1.

- (1) The following notes pertaining to the sanitary sewers shall appear on the plans, together with notes as currently required by the Monroe County Drain Commissioner for construction approval:
  - (a) At all connections to the sanitary sewer interceptor system, there shall be inserted the following note: "Obtain Bedford Township Wastewater Disposal System Construction Permit prior to starting construction."

- (b) Down spouts, weep tiles, footing drains, or any conduit that carries storm or groundwater shall not be allowed to discharge into this sewer.
  - (c) No sewer installation, or portion, shall have an infiltration exceeding 200 gallons per inch diameter per mile of pipe per 24 hours period.
  - (d) Concrete pipe wye openings shall contain factory installed Premium Joint Material of a type suitable and approved for use with sanitary lead joint material.
  - (e) Monroe County Drain Commissioner Standard Details and Specifications heretofore adopted, are incorporated as part of these standards.
  - (f) All building leads and risers shall be six-inch diameter. Minimum slope of one percent is required on sanitary leads. Where grade is not available a variance can be requested from the Monroe County Drain Commissioner. Sewer pipe wye or tee openings shall contain factory installed premium joint material of the type identical to that of the building lead pipe used. Building leads to be furnished with removable air-tight and water-tight stoppers and shall be marked with a two-inch by two-inch stake six feet zero inches long or within one foot of ground surface.
  - (g) All new manholes shall have flexible, water-tight seals where pipes pass through walls. Manholes shall be of precast sections with modified groove tongue and rubber gasket type joints. Precast manhole cone sections shall be Monroe County Drain Commissioner approved modified eccentric cone type.
  - (h) Wherever existing manholes are to be tapped for sewer extensions, installation of a Kor-n-Seal boot connection is required. Whenever household connections are made to a lateral sewer, a saddle connection is to be provided in accordance with requirements of the Monroe County Drain Commissioner.
  - (i) All connections to manholes on Bedford Township Wastewater Disposal System Sewers or extensions thereto, which result in a difference in invert elevations exceeding 18 inches, will require a drop connection. Outside drop connections only will be approved, unless ground conditions result in an interior drop being authorized by the County.
  - (j) A deflection test shall be required for all PVC and ABS pipe eight inches in diameter or larger and shall be performed not less than 90 days after placement of all sewer trench backfill in accordance with requirements of the Monroe County Drain Commissioner.
- (2) Prior to starting any sanitary sewer design the applicant may make use of

maps and information available at the Township and County offices. It shall be the responsibility of the applicant to verify utility locations provided by the Township.

- (3) The following table of minimum slopes for sanitary sewers shall be adhered to:

<i>Size and Minimum Slope</i>		
<i>Inches</i>		<i>Percentage</i>
8	@	0.40
10	@	0.28
12	@	0.22
15	@	0.15
18	@	0.12
21	@	0.10
24	@	0.08

NOTE: In the Township of Bedford, the minimum allowable size of a sanitary lateral is eight inches diameter. Variation from the above table may be granted on a case by case basis, subject to approval by the Michigan Department of Natural Resources.

- (4) A note or detail shall show the type of bedding upon which the sewer pipe which shall be installed. The bedding shall be approved by the Monroe County Drain Commissioner.
- (5) Sanitary sewer leads are to be extended a minimum of ten feet beyond the property line, or to the limits of any utility easements.
- (6) Sanitary sewer manholes shall meet the following maximum spacing requirements:

8 inches to 21 inches	—	350 feet
24 inches and larger	—	500 feet

NOTE: A 30 foot variation in the above spacing is allowed subject to approval of the Monroe County Drain Commissioner.

Manholes shall be placed in the street right-of-way. In general, sanitary sewers will not be approved in a rear lot easement.

- (7) The sewer profile shall indicate the length of run between each manhole, the size and slope of sewer between each manhole and the class of edging in the event that concrete bedding is required. Top elevations of all manholes shall be indicated.
- (8) A minimum depth from top of curb (or road centerline) to the top of any sanitary sewer of eight and one-half feet at local control points, or a minimum of nine feet at locations where the sewer grade is parallel to the road grade is desirable. In all cases, the sewer shall be deep enough to serve, by

gravity, the first floor of all homes and basements with suspended plumbing. All homes which require suspended plumbing, shall be so noted on the plans.

- (9) Each wye or end of house connection shall have a plug with the same type of joint as the main sewer.
- (10) Allowable types of sewer pipe and joints shall be current Monroe County Drain Commissioner Standards and shall be covered on the plans by note, where applicable.
- (11) A "Basis of Design" for the sanitary sewer shall accompany the plans when submitted for review. It must show that the proposed sanitary sewer has the capacity to carry the peak design flow. A Michigan Department of Natural Resources application (Form PR 4600) must accompany the plans when submitting for construction permit.
- (12) Sewer connections for lateral sewers must be made at manholes. Blind taps shall not be permitted unless approved by the Monroe County Drain Commissioner based upon a showing that such a tap is compelled.
- (13) In special instances where a sewage lift station is required, the County Engineer will provide complete pump station standards for use by the developer's engineer in preparing the plans.

#### ARTICLE IV

250.401

#### STORM SEWERS

**250.401 Design standards.**

Sec. 4.1.

- (1) Storm drainage systems shall be designed for a ten year storm. The rational method for arriving at storm water runoff shall be used. Rainfall intensities to be utilized shall be in accordance with current Monroe County Drain Commissioner Standards.

The consulting engineer shall use judgment in arriving at proper times of concentration and impervious factors. The consulting engineer shall submit a map outlining the various areas, including offsite upstream areas, which drain to the points of inlet used for design together with the storm sewer design computations.

In general, sufficient capacity shall be provided in the storm sewer system to take existing runoff from upstream acreage with provision of extra pipe capacity or an overland flow route to accommodate storm events exceeding the design capacity of the sewer system.

- (2) In general, for storm sewer design the hydraulic gradient is to be in the pipe in accordance with requirements of the Monroe County Drain Commissioner. Under certain circumstances, with approval of the Township, where the hydraulic gradient is above the top of the sewer pipe, the design evaluation of the hydraulic gradient shall be indicated (i.e., hydraulic gradient shall be shown in profile).
- (3) Manhole spacing for storm sewers shall be as follows:

<i>Diameter of Sewer (Inches)</i>	<i>Maximum Manhole Spacing (Feet)</i>
8—42	400
48	450
54—60	500
66 and larger	600

NOTE: Height of elliptical pipe shall be used as a criteria for manhole spacing.

Catch basins shall not be constructed over a sewer line to replace manholes.

- (4) The following information shall be indicated on the storm sewer profile:
- Length of run between manholes.
  - Size and slope of sewer between manholes.
  - Class of bedding where concrete is required.
  - Top elevation of all manholes.
- (5) A note or detail shall show the type of bedding upon which the sewer pipe shall be installed.
- (6) Where possible, provide a minimum of three feet of cover from the top of curb (or road centerline) to the top of any storm sewer.
- (7) Catch basins shall be located as follows, subject only to deviations granted by the Monroe County Road Commission or Monroe County Drain Commissioner, depending on which agency has jurisdiction, and based upon a showing that an alternate location is compelled:
- At the radius return of street intersections. The maximum distance along the street between a high point and a corner catch basin when drainage is required to go around the corner, is to be in accordance with current requirements of the Monroe County Road Commission.
  - At all low points in streets.
  - At intermediate points along the street such that the maximum spacing is in accordance with current requirements of the Monroe County Road Commission.
- (8) Field catch basins shall be provided at all low points in easements. Locate

field catch basins such that adequate coverage is provided in accordance with the Monroe County Drain Commissioner requirements. Locate field catch basins in rear lot easement swale when such swale changes direction by more than 45 degrees.

- (9) Where rear yard swales are being provided to pick up storm drainage along the rear property line of a proposed Subdivision, a minimum six-inch diameter perforated pipe wrapped with suitable geotextile fabric shall be constructed along the rear property line abutting every lot contributing water to the rear yard swale if, due to site topography, a swale grade of 0.4 percent or greater cannot be achieved. The swale and pipe shall be located in a minimum ten foot wide private easement for drainage.
- (10) Finished easement grades shall be indicated on the plans.
- (11) Improved open drains may be permitted upon special circumstances in accordance with requirements of the Monroe County Drain Commissioner or Monroe County Road Commission, depending on which agency has jurisdiction.
  - (a) A permit must be obtained from the Monroe County Drain Commissioner for all connections to County drains. Plans shall conform to all current requirements for state law pertaining to flood plain determination, stream crossing requirements and other statutes relating to waterways.
  - (b) Open drains, exclusive of legally constituted County Drains, shall have side slopes no steeper than five horizontal to one vertical, where such drains either abut the development being proposed or fall within the development and the ditch exceeds three feet in depth. A cunnette or low flow channel within a major drain easement may be constructed with three-to-one sideslopes, where approved by the Township Engineer. An easement at least 30 feet wider than the widest point from top of bank to top of bank is to be recorded as part of a subdivision or otherwise dedicated, where major drains are encountered (major drain defined as carrying design flow exceeding 15 cubic feet per second.)
  - (c) Adequate culverts are required at all roads crossing an open drain. Culverts shall have a minimum length of 36 feet, plus four times the difference in elevation between the top of curb or shoulder and the invert of the culvert. End treatments and slope protection requirements will be determined on an individual basis under review by the Monroe County Road Commission.
  - (d) Open drains must have slope protection (rip-rap) at bends with a radius of 500 feet or less.
- (3) The drain bottom and slopes to the hydraulic gradient line must be

sodded or stoned. The remainder of the easement may be seeded in lieu of sod or stone. The Township will not accept the work until all turf is established.

- (12) Headwalls and inlet structures shall be placed as required.
- (13) Allowable types of sewer pipe and joints shall be current Monroe County Drain Commissioner Standards and shall be covered on the plan by note or on the profile where applicable.
- (14) Lateral storm sewers shall be constructed to provide an outlet for the footing drain discharge house leads. Extensions of the storm sewer laterals to provide for footing drain discharge only shall be a minimum of eight-inch diameter on a minimum four percent grade with manhole spaced a maximum of 350 feet. Where homes directly abut a lake, river, major open drain, or other watercourse the footing drain discharge may be directed to the watercourse in lieu of providing a lateral storm sewer connection.
- (15) A minimum six-inch diameter storm sewer lead shall be constructed from the lateral storm sewer to the property line to provide an outlet for the footing drain discharge. The lead shall be constructed at a minimum depth of three and one-half feet where possible on a minimum of one percent grade. The materials and methods of construction shall be in accordance with the current Monroe County Drain Commissioner Standards.

## ARTICLE V

250.500

### STORM WATER DETENTION

250.501

#### Storm water detention.

##### Sec. 5.1.

- (1) Any new development or addition(s) to an existing development must detain the increased runoff onsite unless otherwise directed by the Township Engineer. Acceptable means of detention can be achieved through standing water in parking areas or a separate detention basin.
- (2) The Stormwater Detention Basin Design, as available from the Monroe County Drain Commissioner Office, shall be utilized in determining the volume of detention required. The currently used design basis set forth by the Drain Commissioners office for acreage parcels under two acres in size, is a provision of a storage volume computed as the difference in site runoff generated between a five year storm event under the current undeveloped state and a ten-year storm event under the proposed developed state. For parcels over two acres, the criteria is a storage volume computed as the difference between a ten-year storm event under the existing state and a

25-year storm event under the proposed developed state. Greater volumes may be required as determined by the Township Engineer or Monroe County Drain Commissioner to be that size necessary to promote and preserve the public health, safety, and general welfare of the Township. The available capacity of the downstream storm sewer system, ditch section, or receiving body of water, whichever the case may be, shall be taken into consideration in determining the required volume.

- (3) All open detention basins shall have side slopes no steeper than five horizontal to one vertical where the design depth exceeds three feet.
- (4) The detention basin must be designed and constructed to drain entirely.
- (5) The bottom of the detention basin must have stable vegetative cover, be paved, or have some other approved method of stabilization.
- (6) A minimum of six inches of freeboard must be maintained with a positive, non-erodible overflow capable of handling the capacity of a 25-year storm, or larger storm event if determined to be necessary by the Township Engineer.
- (7) Minimum grade on the bottom of the detention basin shall be one percent where feasible and when sodded. For paved swales in basins, the minimum shall be four percent when feasible.
- (8) The maintenance and ownership of detention basins shall be in accordance with the current requirements of the Monroe County Drain Commissioner and Township of Bedford.

## ARTICLE VI

### 250.600

### WATER SUPPLY

#### 250.601 Design standards.

##### Sec. 6.1.

- (1) Allowable water main construction materials and standards shall be in accordance with the Monroe County Drain Commissioner's Office.
- (2) All water mains shall be installed with a minimum cover of five feet below finished grade. Where water mains must dip to pass under a storm sewer or sanitary sewer, the sections which are deeper than normal shall be kept to a minimum length by use of vertical bends properly anchored.
- (3) In general, all water main shall be eight inches diameter unless otherwise required by the Monroe County Drain Commissioner. Gate valves shall be located in the system such that not more than four valves need be turned off to isolate any section of the water main. Moreover, sufficient valves shall be placed in such that not more than 30 residential lots shall be serviced within

such water main which can be so isolated. Where possible, gate valves shall be located at street intersections five feet from the intersecting street right-of-way line. Comparable limitations shall apply to non-residential uses.

- (4) Along major roadways not encompassing developments, hydrant spacing shall be a maximum of 700 feet.
- (5) In single family residential subdivisions, hydrants shall be installed along the water main at least every 350 feet. In commercial or industrial districts, additional hydrants may be required based upon the application of reasonable engineering principles and/or fire suppression or fire fighting considerations. Hydrants shall be installed at the ends of all dead-end water mains. Temporary blowoffs will be permitted where the main is to be extended in a future phase of development. When near a street intersection, hydrants shall be located 15 feet from the intersecting street right-of-way. Hydrants shall be Monroe County Drain Commissioner's Standard. Water mains shall be extended through with hydrants located at back of cul-de-sacs. Water main shall be looped, except in the case of cul-de-sacs, unless it is demonstrated that such looping is not feasible under all of the circumstances.
- (6) The plans shall indicate the finished grades of all hydrants and gate wells.
- (7) Connection to existing water mains shall be made only after successful pressure tests and chlorination.
- (8) Where an on-site community well system is required, the Township Engineers will supply complete well system standards approved by resolution of the Township Board for use by the developer's engineer in preparing the plans; provided, however, ultimate approval of the wells by the Michigan Department of Public Health shall be the responsibility of the property owner.

## ARTICLE VII

### 250.700                    GRADING, SOIL EROSION, AND SEDIMENT CONTROL

#### 250.701    Design standards.

##### Sec. 7.1.

- (1) Submittal plans must be in conformance with current requirements of the Monroe County Drain Commissioner's Office and provisions of the Soil Erosion and Sedimentation Control Act, Act 347, Public Acts of 1972, as amended.

- (2) In order to provide effective erosion and sediment control, practical combinations of the following technical principles shall be applied to the erosion control aspects of the grading plan:
- a. The smallest practical area of land shall be exposed at any one time during development.
  - b. When land is exposed during development, the exposure shall be kept to the shortest period of time.
  - c. Temporary vegetation and/or mulching shall be used to protect critical areas exposed during development. The plans submitted to the Township shall specify such treatment.
  - d. Sediment basins (debris basins, or silt traps) shall be installed and maintained to remove sediment from run-off waters from land undergoing development. The plans submitted to the Township shall specify such treatment.
  - e. Provisions shall be made to effectively accommodate the increased run-off caused by changed soil and surface conditions during and after development. The plans submitted to the Township shall specify such treatment.
  - f. The permanent final vegetation and structures shall be installed as soon as practical in the development. The plans submitted to the Township shall specify such treatment.
  - g. The development plan should be fitted to the topography and soil so as to create the least soil erosion potential.
  - h. Whenever feasible, natural vegetation should be retained and protected.

**250.702 Retaining walls and landscape walls.**

Sec. 7.2.

- (1) When it is determined by the applicant or required by the Township Engineers based upon reasonable standards and principles that retaining walls will be necessary to provide proper grading for development of a subdivision or other improvement, the applicant shall furnish design drawings for such walls as part of the submittal procedure specified above in this article. These drawings shall be sealed and prepared by the applicant's consulting engineer, and shall be complete design drawings showing the wall construction in the plan, and elevation views. Sectional views and details shall be provided to indicate typical, atypical and conditions of the wall construction.

- (2) The following limits and technical principles shall be applied to the design of retaining walls:
- (a) *Foundation.* The foundation shall bear on soil unaffected by previous or proposed frost penetration of 42-inch depth. The bearing capacity of the supporting soil and underlying strata shall be determined by soil analysis. In lieu of soil analysis, if the grade difference measured at each face of wall does not exceed six feet in height, the maximum allowable pressure on supporting soils can be taken as one-half the presumptive values given in the Basic Building Code.
  - (b) *Stability.* Retaining walls shall be designed to resist the pressure of the retained material, including both dead and live load surcharges to which they may be subjected, and to insure stability against overturning, sliding, excessive foundation pressure and water uplift. The minimum factor of safety against overturning shall be 1.75. The minimum safety against sliding shall be 1.5 and shall not be based upon any passive earth pressure at the toe.
  - (c) *Load.* Retaining walls shall be designed to resist the pressure of the retained materials in accordance with accepted engineering practice. Walls retaining drained earth may be designed for pressure equivalent to that exerted by a fluid weighing not less than 36 pounds per cubic foot and having a depth equal to that of the retained earth. Any surcharge shall be in addition to the equivalent fluid pressure.
  - (d) *Material; strength.* Walls shall be designed and constructed of approved masonry, reinforced concrete, steel sheet piling or other approved materials within the allowable stresses specified in the Basic Building Code.
  - (e) *Backfill material.* The space for a distance of at least 18 inches from the back of retaining walls and from the top of footing to an elevation of two feet zero inches below proposed earth grade shall be backfilled with granular material in such a manner as to provide drainage. This granular material shall meet the requirements of the Michigan Department of Transportation (M.D.O.T.) specification for Granular Material Class II.
  - (f) *Drainage.* Provisions shall be made to prevent accumulation of water behind the wall. As a minimum provide weep holes for drainage.
  - (g) *Top of wall.* Where there is a grade difference on either side of a wall in excess of four feet and a walk is located two feet or less from the back of the wall, a guard shall be constructed in accordance with the Basic Building Code or other approved protective measure. All masonry retaining walls other than reinforced concrete walls shall be protected with an approved coping.

## ARTICLE VIII

## 250.800 STREETS, DRIVEWAYS, PARKING LOTS, AND SIDEWALKS

## 250.801 Design principles.

## Sec. 8.1.

- (1) *General.* Every subdivision plat and other project improvement not part of a subdivision plat shall conform with the requirements and objectives of these design principles and standards, Monroe County Road Commission Standards and all applicable Ordinances and laws.

## Sec. 8.2. Design standards.

- (1) *Street layout, location and design in a subdivision plat and other applicable developments.* All streets within a subdivision plat or within a project site not part of a subdivision plat shall meet Monroe County Road Commission requirements and shall be subject to the following standards:
  - (a) *Layout.* Street layout shall provide for the continuation of existing major or collector streets in surrounding areas, or conform to a plan for neighborhood development approved by the Planning Commission.
  - (b) *Future connections.* Certain proposed streets, as designated by the Planning Commission, shall be extended to the boundary line of the parcel to provide future connection with adjoining unplatted land.
  - (c) *Grades.* Proposed streets shall be so arranged in relation to existing topography as to produce desirable lots and streets of reasonable gradient (Subject to subparagraph (h), below).
  - (d) *Service entrances and drives.* Service entrances and drives shall be permitted to provide secondary access for service and safety vehicles, provided that appropriate signage limiting usage shall be established as required by the Planning Commission. Restricted access may be required by the Monroe County Road Commission.
  - (e) *Jogs.* Street jogs with centerline offsets of less than one hundred twenty-five feet shall be permitted only with approval of the Planning Commission upon a demonstration that there is no reasonably feasible alternative.
  - (f) *Minimum right-of-way widths for public streets:*
    - (i) *Major thoroughfares.* As required by the County Road Commission for county roads.
    - (ii) *Minor streets.* Sixty feet for single family residential development and multiple occupancy developments.
    - (iii) *Cul-de-sac streets.* Sixty feet terminating in a circle one hundred

twenty feet in diameter in residential subdivisions or meeting current minimum Monroe County Road Commissioner's requirements.

(g) *Minimum pavement width for all streets.* Monroe County Road Commission Standards shall be applicable.

(h) *Grades.*

(i) *Maximum.* All residential subdivision development streets, seven percent. Where essential to reasonable development, up to eight percent may be permitted with special exceptions by the County Road Commission.

(ii) *Minimum.* 0.40 percent.

(i) *Street length:*

(i) The length of cul-de-sacs shall be measured from the intersection of street centerlines to the extreme depth of the turning circle. Subject to the provisions of subparagraph (3), immediately following, the maximum length of cul-de-sacs permitted within each zoning district shall be as follows:

<i>District</i>	<i>Maximum Permissible Length (Feet)</i>
AG	1000
All other districts	600

(ii) Deviation may be made from the maximum permissible lengths specified in subparagraph (i), above, if all of the following three standards have been met:

(A) There is no reasonable alternative means of development; and

(B) Taking into consideration the number of people in the plat or other development, the volume of traffic to be generated, there would not appear to be an unreasonable traffic danger or emergency vehicle access problem created; and

(C) All reasonable precautions and provisions are designed into the plat or other development to minimize present and future access limitation.

(j) *Acceleration, deceleration and passing lanes:*

(i) Acceleration, deceleration and passing lanes for driveway approaches and proposed roadways entering on a public roadway shall be required as determined based upon the following considerations:

a. Traffic volumes, accident data, horizontal and vertical align-

- ment, site distance conditions of the public roadway upon which a driveway or proposed roadway is entering, and anticipated future community growth.
- b. Other unique site conditions such as land use, topography and other natural conditions.
    - (ii) Where required by the Monroe County Road Commission or Michigan Department of Transportation, depending upon which agency has legal jurisdiction over the respective roadway, acceleration, deceleration or passing lanes shall be designed and constructed in accordance with the standards of that agency. With respect to such road improvements, the Township Engineer may be called upon to make a recommendation to the agency having legal jurisdiction.
- (2) *Driveway approaches and sidewalks located within state or county road rights-of-way.* For areas outside platted subdivisions construction of a new or reconstructed driveway or roadway connecting to an existing County or State roadway, or a new sidewalk within the right-of-way, shall be allowed only after an approved permit has been served from the agency having jurisdiction over the roadway. All driveway approaches entering onto a public roadway, or sidewalks within the right-of-way, under the jurisdiction of the Monroe County Road Commission (MCRC) shall be constructed in accordance with the current MCRC rules in effect. Driveway approaches entering onto a public roadway under the jurisdiction of the Michigan Department of Transportation (MDOT) shall be constructed in accordance with the current MDOT rules in effect.
- (3) *Number of access drives.* Unless it is determined upon review under this and other Ordinance provisions that traffic safety dictates to the contrary:
- (a) Property shall be developed to minimize the number of points of ingress and egress to and from a public highway.
  - (b) The use of common access drives between and among two or more users is encouraged.
- (4) *Driveways and parking lots not located within the road right-of-way.*
- (a) All site plans proposing the construction of driveways and off street parking areas, shall provide, but not be limited to, the following dimensions and features:
    - (i) Complete parking space, loading space, and driveway layouts.
    - (ii) Typical dimensions and angles of parking spaces.
    - (iii) Radii of driveway returns and all other points of curvature.
    - (iv) Proposed and existing parking lot and driveway grades and elevations.

- (v) Driveway and parking lot cross-sectional view of the pavement structure, including subbase, base, and surfacing.
  - (vi) Existing and proposed drainage structures and controls shall include:
    - size of driveway culvert (diameter and length)
    - type of culvert
    - type of culvert and treatment
    - grade of culvert
    - direction of surface water flow by the use of flow arrows
    - method of surface water disposal on all pavement areas
    - location of drainage structures and sewers
    - structure details and any other applicable details
    - delineation of areas contributing surface waters to each structure or stormwater outlet point
  - (vii) Proposed and existing elevations shall be shown on the plan at all radii points, finish grade at the corners of all buildings, at 50 feet intervals along the line of surface flow. Proposed elevation contours at two feet intervals shall be provided, if reasonably required by the Township Engineers for review purposes.
- (b) *Design standards:*
- (i) *Commercial driveways and parking lot surfacing requirements.* The entire parking area, including parking spaces, loading spaces, and driveways, required to be hard surfaced under the Bedford Township Zoning Ordinance shall be provided with asphaltic or concrete surfacing in accordance with one of the following minimum specifications:
    - a. *Bituminous surface options:*
      - (I) A minimum two-inch thickness of bituminous aggregate pavement over 12 inches of MDOT 21A ODOT 304, or equal (compacted in place) aggregate base course. (Structural Number S.N. = 2.04)
      - (II) A minimum three-inch thickness of bituminous aggregate pavement over eight inches of MDOT 21A, ODOT 304, or equal (compacted in place) aggregate base course. (S.N. = 2.06)
      - (III) A minimum five-inch thickness of bituminous aggregate pavement over a prepared stable subgrade. Two course construction of equal thickness must be utilized when placing the five inch bituminous pavement. (S.N. = 2.10)

- b. *Portland concrete surface:*
  - (I) A four-inch thickness of concrete pavement shall be placed over a four inch thick (compacted in place) Granular Material, Class III subbase. (S.N. = 2.00)
  - (II) Concrete shall contain not less than 564 lbs. of dry cement per cubic yard of concrete (six sacks of cement per cubic yard of concrete) and shall be air entrained with an air content at the time of placement of not less than five percent nor more than seven percent. Concrete mixture shall achieve a compressive strength of 3500 lbs. per square inch at 28 days. Maximum slump shall be four inches. The utilization of admixtures in the mix design will be reviewed on an individual basis.
- (ii) *Special design considerations.* Pavement structure designs of higher load-bearing capacities than those stated in Section D-2 of these standards must be utilized in developments where increased axle loading and/or traffic volumes are anticipated. All pavement designs shall be subject to the review and approval of the Township Engineer.
- (iii) *Subgrade requirements.* All pavement surfaces must be supported upon a prepared subgrade that has been compacted to at least 95 percent of maximum unit weight in accordance with MDOT standards. When unstable subgrade materials, i.e., peat, muck, marl, wet clays, etc., are encountered, excavation and removal of such unstable materials and replacement to plan subgrade with approved materials compacted in place shall be required. Approved materials shall include slag, crushed stone, gravel, coarse sand, or other materials approved by the Township Engineer. Should it be found that the excavation, removal and replacement of unstable subgrade material is impractical due to excessive depths, alternate pavement structure designs must be submitted to and approved by the Township Engineer prior to pavement installation. The Township reserves the right to require the installation of geotextile wrapped underdrains, edge drains, or bank drains at locations where the subgrade indicates the presence of free water.
- (iv) *Pavement layout and schematics:*
  - a. *Conformance to Zoning Ordinance.* Parking spaces, driveways, and loading zones shall conform in size and configuration to the requirements of the Bedford Township Zoning Ordinance.
  - b. *Minimum driveway widths.* Driveways which provide one-

way vehicle traffic movements shall be 16 feet in width as measured from the edge of pavement to the edge of pavement. The driveway width for two way traffic shall be 30 feet as measured above.

(v) *Grading and drainage requirements:*

(i) *Pavement grading:*

- a. Minimum transverse pavement slopes shall be one percent
- b. Maximum driveway slopes shall be eight percent unless topographic conditions warrant a variance
- c. Maximum parking lot slopes shall be six percent, except within handicapped parking areas where the maximum slope shall be two percent. A maximum slope of nine percent shall be allowed under circumstances where stormwater detention is provided in parking lot areas.

(ii) *Drainage:*

- a. All paved areas shall be drained to dispose of all surface waters accumulated in the parking area in a manner which will preclude unrestrictive drainage of water onto adjacent property or toward buildings.
- b. The disposal of storm waters from all paved surfaces shall conform to the standards set forth in this Ordinance.
- c. The design of parking lot storm sewer facilities shall conform to the standards set forth in this Ordinance.
- d. The disposal of storm waters to a roadside ditch shall receive the approval of the agency having jurisdiction over the roadway prior to site plan approval. The discharge of surface waters to a recognized County drain shall receive the approval of the Monroe County Drain Commissioner's office prior to the site plan approval.
- e. Seepage basins will not be permitted except where no other drainage outlet is available and only if soils testing is performed and the viability of this option is certified by a Registered Professional Soils Engineer.
- f. The point discharge of storm waters onto private property is not permitted unless a recorded easement is received from the affected property owners.

- (5) *Sidewalk specifications.* A four inch thickness of concrete pavement, four feet in width, shall be placed with a granular subbase as necessary to provide leveling. Where the sidewalk crosses an existing or future driveway or

access to a site, the concrete sidewalk thickness shall be six inches. The concrete shall meet the same requirements as stated in Subparagraph (4)(b)(i)(B)(II) of this Ordinance, above. A deviation from these requirements with regard to location, width, and material may be granted upon application to and approval by the Township Board, following recommendation from the Planning Commission.

- (6) *County road commission standards.* This Ordinance is not intended to supersede Monroe County Road Commission standards, and such standards shall be met where applicable.

**ARTICLE IX**

**250.900**

**INSURANCE AND BONDS**

Sec. 9.0. Prior to construction of a subdivision or other project improvement, the proprietor or contractor shall procure and maintain during the life of any contract or agreement for such construction, insurance protecting the Township and its officers and employees from any claim or damages, real, personal or otherwise, of such amounts as established by resolution of the Township Board.

**250.901**

**Maintenance bonds.**

Sec. 9.1. Prior to acceptance of road improvements by the Monroe County Road Commission, a two year maintenance bond in an amount set by and acceptable to the Road Commission shall be posted by the applicant/proprietor. Likewise, a one year maintenance bond in an amount set by and applicable to the Monroe County Drain Commissioner shall be posted by the applicant/proprietor for all water, sanitary sewer, and storm sewer improvements.

**ARTICLE X**

**250.1000**

**VARIATION**

**250.1001**

**Authority and criteria for variation.**

Sec. 10.1. The Township Board may authorize a variation from these development design standards when it determines that undue hardship may result from strict compliance. In granting any variation, the Board shall prescribe other conditions that it deems necessary or desirable for the public interest. No variation shall be granted unless the Township Board finds:

- (1) There are special circumstances or conditions affecting the subdivision or

project improvement such that a strict application of the provisions of this Ordinance would deprive the applicant of reasonable use of the property; and

- (2) The deviation is necessary for the preservation and enjoyment of the substantial property right of the applicant and is the minimum variation required; and
- (3) The granting of the variation will not be detrimental to the public welfare or injurious to other property in the area in which the property is situated.

**250.1002 Application requirements for variation.**

Sec. 10.2. Application for a variation shall be submitted in writing by the applicant at the time the preliminary plans are submitted, stating fully and clearly all facts relied upon and all reasons why the variation should be granted, and shall be supplemented with maps, plans or other additional data which may aid in the analysis of whether a variation is required. The plans for such development shall include such covenants, restrictions or other legal provisions necessary to guaranty the full achievement of the plan. In acting upon the request for variation, the Township Board shall state the reasons for its decision.

**ARTICLE XI**

**250.1100 INCONSISTENT ORDINANCES REPEALED**

**250.1101 Inconsistent ordinances repealed.**

[Sec. 11.1.] All ordinances or parts of ordinances in conflict with this ordinance are to be, to the extent of such conflict, repealed.

**ARTICLE XII**

**250.1200 SEVERABILITY**

**250.1201 Severability.**

[Sec. 12.1.] This ordinance and the various parts, sentences, paragraphs, sections, subsections, phrases and clauses thereof are hereby declared to be severable, and if any of them are adjudged unconstitutional or invalid, it is hereby provided that the remainder of the ordinance shall not be affected.

250.1301

DEVELOPMENT DESIGN STANDARDS (Ord. No. 65)

**ARTICLE XIII**

250.1300

**PENALTY**

250.1301 **Penalty.**

[Sec. 13.1.]

- (a) Any person, firm, corporation or other entity who violates any of the provisions of this ordinance shall be guilty of a misdemeanor and upon conviction thereof, shall be subject to a fine of not more than \$500.00, or imprisonment in the Monroe County Jail for a period not to exceed 90 days, or both such fine and imprisonment.
- (b) Each separate violation shall constitute a separate offense, and each day of violation shall constitute a separate offense.
- (c) Any continued violation of this ordinance is declared to be a public nuisance per se, and may be abated by order of any court of competent jurisdiction.

**ARTICLE XIV**

250.1400

**EFFECTIVE DATE**

250.1401 **Effective date.**

[Sec. 14.1.] This ordinance shall become effective 30 days after it, or a summary of it, is published in a newspaper of general circulation in the Township of Bedford.