

FRUITLAND TOWNSHIP DESIGN AND CONSTRUCTION STANDARDS

A. PRIVATE STREET DESIGN REQUIREMENTS

The minimum design and construction standards for private streets are as follows:

1. GENERAL

- A. Private streets shall be designed with sufficient width, surface, grade, drainage and signage to assure safe passage and maneuverability of private and commercial vehicles, fire, police, ambulance and other safety vehicles. All private street design and construction plans submitted for approval shall be prepared under the supervision of, sealed by and signed by a Professional Civil Engineer, Registered in the State of Michigan.
- B. The name and address of the firm responsible for the preparation of the plans is to be clearly indicated on the plans.
- C. The name, address and telephone number of the property owner and applicant (if different from the owner) is to be clearly indicated on the plans.
- D. The standards set forth in this document are minimum design standards. It is acceptable to use a higher standard than the minimum specified within each classification.
- E. Streets must respect local topography.
- F. Private Street Rights-of-Way shall not be located within 50 feet of any existing building.
- G. Drawings must be to a scale of 1"=50' scale or larger. (i.e. A drawing with a scale of 1"=40' will be accepted but a drawing with a scale of 1"=60' is not acceptable).
- H. Show north arrow on all drawings along with an overall site location map indicating adjacent roads etc. The location map is to show the surrounding roads with the project area highlighted.
- I. Show a minimum of one benchmark per plan sheet.
- J. Plans are to indicate the latest revision date.
- K. Property lines, dimensions and access points of parcels are to be indicated for the lots being serviced by the private street.
- L. Clearly label and dimension the proposed property lines, utility easements, ingress and egress easements and street right-of-way.

- M. Show proposed cross section on the plan indicating details such as widths, depths, slopes, etc.
- N. The bottom of the aggregate base course is to be set no closer than two (2) feet above the historical high water elevation. Soil borings shall be provided indicating historical high water elevations.
- O. Provide notes, as needed, to ensure the proposed project will meet the required Township Standards.
- P. The location of the existing and proposed pavement and the right-of-way of all streets impacted by the construction of the private street shall be clearly indicated on the construction drawings. Dimension of the right-of-way, pavement widths, deceleration/acceleration lanes and radii are to be clearly labeled.
- Q. Streets will intersect at 90 degrees or closely thereto, and never at less than 80 degrees.
- R. Entrance to public roadway will require permit from Muskegon County Road Commission.
- S. In cases where the private street is adjacent to a property line, existing vegetation adjacent to the property line within the right-of-way shall not be removed. Replacement vegetation or new vegetation may be allowed or required at the discretion of the Planning Commission.
- T. Three hundred feet (300') distance between intersections of public and/or private streets. This offset may be reduced to 150 feet within the development as approved by the Township.

2. DRAINAGE

- A. Show all drainage improvements including but not limited to ditches, drainage structures, culverts, storm sewer piping, retention basins, detention basins and applicable overflow structures.
- B. Culverts will be placed at all natural drainage courses or other waterways.
- C. The developer shall provide a storm water system to carry the 25-year 24-hour frequency storm through the development from the tributary area. All ditches and culverts shall be designed using a design frequency of twenty five (25) year twenty four (24) hour rainfall event and a minimum time of concentration of 15 minutes.
- D. Ditch slopes at IV:4H fore slope and IV:3H back slope. A steeper back slope may be approved as specific site conditions warrant.
- E. The developer shall submit hydrologic and hydraulic calculations, along with a topographic map to support the storm water discharge plan.

- F. Storm water management techniques used by the developer shall comply with Best Management Practices (BMP).
- G. Leaching Basins will not be allowed.
- H. Closed storm sewer systems are to be designed to convey the 10-year 24-hour storm event. The minimum pipe size for the closed storm sewer system is twelve (12) inches. No surcharging shall be present for the 10-year 24-hour rain event.
- I. Storm sewer material is to be per Section u.16.d.1 of this document excluding corrugated metal or aluminum.
- J. Maximum catch basin spacing within the street: 350 feet
- K. The front edge of the storm sewer casting is to be set at 10.5 feet from centerline. Gutter-line of casting is to be set .31' lower than centerline elevation.
- L. Minimum cover over storm sewer: 2.5 feet from top of pipe.
- M. Rainfall Data to be taken from Bulletin 71 "Rainfall Frequency Atlas of the Midwest" by Floyd A. Huff and James R. Angel.
- N. Outlets of storm sewers, ditches, and areas where concentrations of runoff occur shall be protected against erosion by placement of sod, placing rip-rap, or other means approved by the Township Engineer.
- O. Soil permeability rates are required for all retention ponds including ditches if the ditches are to be considered for retention purposes. Soil permeability rates may be established by on-site testing or may be based on 50% of the value taken from the current United States Department of Agriculture Soil Survey.

3. DRIVEWAY CULVERTS

- A. Plans are to show the approximate location of proposed drive culverts.
- B. Drive culverts are required only if the ditches are designed to convey water.
- C. The minimum size of a drive culvert is to be twelve (12) inches.
- D. Material:
 - 1. Reinforced concrete pipe C-76 Class IV, corrugated metal/aluminum (16 gauge) or smooth line corrugated plastic (AASHTO M-294 Type S Polyethylene). All material installed must be new.

4. RESTORATION

- A. All disturbed areas outside of the gravel or Hot Mix Asphalt Pavement (HMA) limits will be restored with a minimum of 4" of topsoil, seed, mulch and fertilizer nutrient.

- B. Areas with slope steeper than IV:3H shall use mulch blanket in lieu of regular mulch.

5. CONSTRUCTION MATERIALS

- A. Granular Material

- 1. MDOT Class II. If existing on-site material meets MDOT Class II or Class IIA requirements no sand sub-base is required.

Sieve Analysis Total % Passing				
	3"	1"	No. 100	LBW/No. 200
Class II	100	60-100	0-30	0-7
Class IIA	100	60-100	0-35	0-10

- B. Aggregate Base

- 1. MDOT 22A, 22A Modified or 21AA Modified. Crushed concrete, slag, or other commonly found non-native aggregates may be substituted for the natural aggregate. The crush requirement is 95% min.

- C. Aggregate/Gravel Surface

- 1. MDOT 23A Modified. Crushed concrete, slag or other commonly found non-native aggregates may be substituted for the natural aggregate. The crush requirement is 95% min.

- D. HMA (Hot Mix Asphalt Pavement)

- 1. MDOT Mixture No. 13A, PG 58-28

- E. Crown Point of the road to be at the centerline with a 2% cross slope.

- F. Where existing sub-grade material is not granular meeting MDOT Class II, a minimum of 12" Class II material will be placed and sub-grade drainage is to be addressed with the use of sub-grade under-drain or edge drain and proper outlet.

- G. Soil Borings are to be submitted with the street plan during the review and approval process. The locations of the soil borings are to be clearly indicated on the drawing submitted. Maximum spacing of the soil borings is every 1000' or closer as field and design conditions dictate. Sub base correction in addition to that shown on the typical cross sections shall be provided where directed by the Township Engineer.

6. SIGNAGE

- A. Provide street and stop signage at the entry point of private street to public street and at all intersections within the development.

- B. All required signage will be installed at the owner's expense and will be in accordance with the current Michigan Manual of Uniform Traffic Control Devices and MDOT Construction Specifications.
- C. Private Streets will be named and identified. Names shall not be duplicated with any other street in Muskegon County, except for existing street extensions.
- D. The Muskegon County Road Commission and Fruitland Township shall approve all street names.

7. MINIMUM DESIGN REQUIREMENTS

The minimum design requirements are as listed below and are listed according to the number of lots served by the contiguous development and not solely by one street within the development. If a multi-phased development adds lots and falls within the next design category, all pre-existing work within that development will meet the required design conditions. Multi-phase projects should always be constructed to the details according to the ultimate project size.

- A. All intersection(s) shall have no more than four (4) separate legs.
- B. All conduits being used for future utility crossings are to be installed prior to the base course of asphalt. The developer is to coordinate the locations of the conduits with the appropriate utility companies.
- C. Corner lots on both the private street and a public road shall not access the public road. All lots on the private street shall have an address on the private street. However, where corner lots are not a part of the private street development, the lot may access either the new private street or the public road. If access is to the private street, the owner of such lot is subject to participate in the maintenance of the private street.
- D. No private street shall be longer than 900 feet in the High Density Residential (HDR), Medium High Density Residential (MHDR) and Medium Density Residential (MDR) zoning districts unless it meets all applicable criteria set forth in the Zoning Ordinance and intersects with a public street that is paved and otherwise meets the current standards of the Muskegon County Road Commission.. For purposes of this section, if the private street has a boulevard or green island located at the intersection of an arterial or residential street, the distance from the arterial or residential street to the end of the boulevard or green island shall not be included when measuring the length of a private street if the following requirements are met for the excluded portion of the private street:
 - 1. No structures are constructed along the excluded portion;
 - 2. A restrictive covenant satisfactory to the township is recorded prohibiting structures from being constructed in the future along the excluded portion.

**8. PRIVATE STREET SERVING 1 TO 3 LOTS
(SEE ATTACHED FIGURE 1 FOR DETAILS)**

- A. The minimum cul-de-sac radius is 40 feet.
- B. Right-of-Way
 - 1. Fifty-foot (50') right-of-way width with provisions for all utilities within right-of-way or 10 feet on either side.
 - 2. Cul-de-sac equals 60 feet radius
- C. Minimum Cross Sectional Requirements
 - 1. Width
 - (a) Aggregate Surface: 18 feet
 - (b) Sand Sub-base: 20 feet
 - 2. Slope
 - (a) Aggregate surface and sand sub-base 2% cross slope
 - 3. Depth
 - (a) Aggregate Surface: 6 inches
 - (b) Sand Sub-base: 12 inches
- D. Maximum longitudinal grade is 10%
- E. There shall be a maximum grade of 1% for a distance of fifty feet (50') back from edge of a public road. There shall be a maximum grade of 6% slope for a minimum distance of fifty feet (50') back from an intersection of a private street.
- F. Existing contours are to be shown on submittal drawing with two foot (2') maximum contour intervals. If a site visit is scheduled, this requirement may be waived at the discretion of the Township or its Engineer.
- G. Thirty-foot (30') cleared minimum maintained area with fourteen-foot (14') trimmed height over roadbed. Center of cleared area is to be generally centered on road and right-of-way centerline. Lateral clearing limits may be modified on a case by case basis to ensure an overall pleasing appearance to the final development, while maintaining a safe and functional street.
- H. Minimum intersection radius: 25 feet

**9. PRIVATE STREETS SERVING 4 TO 14 LOTS
(SEE FIGURE 2)**

- A. The minimum cul-de-sac radius is 40 feet.

- B. Right-of-Way
 - 1. Sixty-six foot (66') right-of-way width with provisions for all utilities within right-of-way or 10 feet on either side.
 - 2. Cul-de-sac equals 60 feet radius
- C. Minimum Cross Sectional Requirements
 - 1. Width
 - (a) HMA Surface: 18 feet
 - (b) Aggregate Base: 24 feet
 - (c) Sand Sub-base: 26 feet
 - (d) Gravel shoulder is to be 3' wide
 - 2. Slope
 - (a) HMA, aggregate base and sand sub-base 2% cross slope
 - (b) Gravel Shoulder: 4% cross slope
 - 3. Depth
 - (a) HMA: 330 lbs/syd.
 - (b) Aggregate Base: 6 inches
 - (c) Sand Sub-base: 12 inches
 - (d) Gravel Shoulder: 6 inches (min.)
- D. Vertical alignment shall have a design speed of 30 mph or greater
- E. Forty-foot (40') cleared minimum maintained area with fourteen-foot (14') trimmed height over roadbed. Center of cleared area is to be generally centered on road and right-of-way centerline. Lateral clearing limits may be modified on a case by case basis to ensure an overall pleasing appearance to the final development, while maintaining a safe and functional street.
- F. Minimum street grade shall be 0.6% and maximum street grade shall be 6%, except that the Township may allow up to 10% maximum street grade, if the applicant submits adequate justification that such grade will not adversely affect public safety. Township may allow grades less than 0.6% if adequate justification that such grade will not cause adverse drainage impacts on adjacent properties and street.
- G. There shall be a maximum grade of 1% slope for a distance of fifty feet (50') back from edge of a public road. There shall be a maximum grade of 6% slope for a minimum distance of fifty feet (50') back from an intersection of a private street.
- H. Existing contours shall be shown on the drawing with minimum contour intervals of two (2) feet. Significant natural features and other natural characteristic, including but not limited to open space, stands of trees, water bodies, floodplains, rock outcrops, utilities and other topographic features.

I. Show street centerline profile indicating proposed and existing centerline elevations.

J. Minimum intersection radius: 25 feet

**10. PRIVATE STREETS SERVING 15 TO 30 LOTS
(SEE FIGURE 3 OR 4)**

A. The minimum cul-de-sac radius is 40 feet.

B. Right-of-Way

1. Sixty-six foot (66') right-of-way widths with provisions for all utilities within right-of-way or 10 feet on either side.
2. Cul-de-sac equals 60 feet (60') radius

C. Minimum Cross Sectional Requirements

1. Width

(a) HMA Surface:

1. With gravel shoulder: 20 feet
2. With HMA Valley Gutter: 24 feet

(b) Aggregate Base:

1. With gravel shoulder: 28 feet
2. With HMA Valley Gutter: 26 feet

(c) Sand Sub-base:

1. With gravel shoulder: 30 feet
2. With HMA Valley Gutter: 28 feet

(d) Gravel shoulder is to be 4' wide

2. Slope

(a) HMA, aggregate base and sand sub-base 2% cross slope

(b) Gravel Shoulder: 4% cross slope

3. Depth

(a) HMA: 330 lbs/syd.

(b) Aggregate Base: 6 inches

(c) Sand Sub-base: 12 inches

(d) Gravel Shoulder: 6 inches (min.)

D. Vertical alignment shall have a design speed of 30 mph or greater

E. Forty-foot (40') cleared minimum maintained area with fourteen-foot (14')

trimmed height over roadbed. Center of cleared area is to be generally centered on road and right-of-way centerline. Lateral clearing limits may be modified on a case by case basis to ensure an overall pleasing appearance to the final development, while maintaining a safe and functional street.

- F. Minimum street grade shall be 0.6% and maximum street grade shall be 6%, except that the Township may allow up to 8% maximum street grade, if the applicant submits adequate justification that such grade will not adversely affect public safety. Township may allow grades less than 0.6% if adequate justification that such grade will not cause adverse drainage impacts on adjacent properties and street.
- G. There shall be a maximum grade of 1% for a distance of fifty feet (50') back from edge of a public road. There shall be a maximum grade of 6% for a minimum distance of fifty feet (50') back from an intersection of a private street.
- H. Existing contours shall be shown on the drawing with minimum contour intervals of one (1) foot. Significant natural features and other natural characteristic, including but not limited to open space, stands of trees, water bodies, floodplains, rock outcrops, utilities and other topographic features shall be indicated on the private street construction plan sheet.
- I. Show street centerline profile indicating proposed and existing centerline elevations.
- J. Minimum intersection radius: 25 feet
- K. Speed limits shall be posted.
- L. Valley gutters are encouraged to be used on streets with longitudinal slopes of 2% and greater.
- M. Concrete Curb and Gutter:
 - 1. Concrete curb and gutter is to be used on all radii and cul-de-sacs when adjacent section consists of an HMA Valley Gutter.
 - 2. 5 ½ sack air entrained concrete is to be used on all curbs.
 - 3. White membrane curing compound is to be placed on all concrete curbing once the free moisture has left the surface. Upon stripping the forms, the remainder of the surface shall be sprayed with the curing compound.

11. PRIVATE STREET SERVING 31 LOTS OR MORE

- A. All streets serving 31 lots or more shall be dedicated to the public and be designed to the governing agencies standards. The road will be maintained by the governing agency.

12. CONSTRUCTION REQUIREMENTS

- A. Tolerances and Testing Requirements:
 - 1. Compaction (Based on the Michigan One Point Cone Test)

- (a) Aggregate Base: 98%
- (b) Aggregate Surface: 98%
- (c) Gravel Shoulder: 95%
- (d) Sand sub-base: 95%
- (e) Hot Mix Asphalt Pavement (HMA): 92%-96% of the Theoretical Maximum Density

2. Tolerances

- (a) Grade on Sub-grade: $\pm 3/4$ "
- (b) Grade on Aggregate Base and Sub-base: $\pm 1/2$ "
- (c) Aggregate depth: $\pm 1/2$ "

3. Pavement depth:

- 1. In no instance shall the finished bituminous thickness be more than $1/2$ " thinner than plan thickness.
- 2. The average pavement thickness is to be no more than $1/4$ " thinner than plan thickness.
- 3. In no case shall any area in a single course of HMA be less than 75% of plan thickness. Areas thinner than this will be removed and replaced at no expense to the Township.

- B. Provide load tickets showing date of delivery, quantity of product, type of material, location of source and drivers name for all aggregates, granular material and HMA product brought to the site. Material shall be provided by a state certified pit or owner may pay for an independent laboratory to sample onsite material and provide independent testing proving that the requirements are met.
- C. All castings located within the HMA surface shall be raised to grade between the leveling and the top course of asphalt and shall be adjusted to $1/4$ " below the finished paved surface.
- D. Bond coat is to be applied between successive courses of asphalt and to all surfaces that the pavement will be in contact with, including existing pavement edges, edges of concrete curb, etc.
- E. A minimum of two rollers will be used for compacting and finishing HMA surface. There shall be no visible roller marks on the finished surface of all courses of HMA.
- F. Pavement cores may be taken for density determination if it appears that there is not enough compactive effort being made during paving operations. Cost for testing and repair will be the responsibility of the owner if the tests indicate the pavement surface falls below the specifications listed in this section.
- G. Total yield will be calculated based from the area of pavement and the HMA delivery tickets. If the yield calculations warrant, pavement will be cored to determine thickness. Owner is responsible to correct any work that is outside the

specified tolerances. A proposed repair/replacement plan or any other alternative is to be submitted to the Township for review within two weeks of notification that the work is not within the required tolerances. No repair work shall proceed prior to authorization by the Township.

- H. Contractor is to submit HMA mix design prior to paving.
- I. HMA Temperature: Minimum – 250 degrees Fahrenheit.
- J. Sub-grade is to be proof rolled prior to placing sub-base material. Any areas indicating signs of yielding are to be undercut and filled and compacted with material meeting MDOT Class II requirements.

13. LIGHTING

- A. Street lighting may be required by the Township Ordinance and will be at no expense to the Township. Township indemnity and hold harmless agreements may be required.
- B. Streetlights are required at all intersections.
- C. Fixtures shall be designed and placed, so as to not inhibit, view of sky.
- D. Unless otherwise approved by the Township, lighting sources shall be high-pressure sodium.
- E. The applicant shall submit the specifications for the lights, poles, fixtures, and light sources for approval.
- F. Lighting shall be directed so that it is confined internally to the development site.
- G. Light sources or light lenses shall not be visible beyond the boundaries of the development.

14. SIDEWALKS

- A. Sidewalks may be required at the discretion of the Township Planning Commission in medium-high density and high-density developments.
- B. All sidewalks are to meet current “ADA Standards for Accessible Design” requirements.
- C. Concrete sidewalks will be a minimum of five (5’) feet wide.
- D. Maximum Grade:
 - 1. Longitudinal: 8%
 - 2. Cross Slope: 2%
- E. Concrete thickness must be a minimum of four inches (4”).

- F. Where sidewalks are also driveways or other driving surfaces, the thickness shall be six inches (6").
- G. Jointing
 - 1. Control joints:
 - (a) Not less than five (5') or more than six feet (6') apart.
 - 2. Expansion Joints:
 - (a) ½" expansion joint required at 50' maximum intervals.
 - (b) ½" expansion joint required at transitions. (Example: 4" to 6" transitions at driveways).
 - (c) 1" expansion joints where sidewalk ramp meets the back of concrete curbing.
- H. The sidewalk edge shall be one (1') foot inside of the street right of way line.
- I. Broom sidewalks transversely to slightly roughen the surface.
- J. White membrane curing compound is to be evenly applied over the entire sidewalk surface immediately after the free moisture has dissipated from the surface of the concrete.

15. UTILITIES

- A. All utilities available at the public street intersection with the private street shall also be provided to the private street.
- B. All utilities including but not limited to gas, telephone, electric and cable are to be run underground within the given utility easement.

Adopted: December 20, 2004