

APPENDIX A

ADDENDUMS

February 8, 2008

Appendix B, Supplement to Article IX – The Sample Storm Basin Data Table has been revised.

June 30, 2010

The following additions/corrections have been made to the Delaware County Engineer’s Design, Construction and Surveying Standards. Revisions are noted below in **red font** or ~~struck through~~.

General

The Standards Manual adoption date (Month/Year – January 2008) and the Article and Page No. (e.g., Article I – 1, 2, 3) was added to the bottom of each page.

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Article I – GENERAL

106 ADOPTION

These Standards shall become effective after: (1) the necessary public hearings **and** (2) adoption by the County Commissioners, ~~and (3) certification to the Delaware County Recorder~~ in accordance with Section 711.101 of the Ohio Revised Code.

110 ABBREVIATIONS and DEFINITIONS (as used herein)

13. Easement: **A** grant by the property owner for the use of an area of land by the public, a corporation or another person for specific purposes.
29. Street, Private (**Built to Public Standards**): A privately maintained roadway in a platted subdivision designed and constructed to these Standards but not accepted by the County Commissioners.
33. Traffic Impact Study (TIS): Delaware County Traffic Impact Study **Standards** ~~Guidelines~~, Latest Edition.

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Article II – GENERAL PLAN DEVELOPMENT PROCEDURE

202 REVIEW FEES ON SUBDIVISIONS

The Owner shall pay all costs incurred by the County Engineer for review of Preliminary Engineering Plan and Final Engineering and Construction Plan. The County Engineer shall determine the fees charged and may include supplemental consulting services. The costs for all supplemental consulting services will be billed to the Owner. The County Engineer reserves the **right** rights to withhold review of plans until these fees have been paid.

Fees may be refunded for withdrawn preliminary engineering submittals. The amount **refunded** will be at the discretion of the County Engineer. Actual refunds will be determined based on all costs associated with the review up to the date of the project being withdrawn. Requests for fee refunds shall be made in writing.

Article III – PRELIMINARY ENGINEERING PLAN

302 PLAN REQUIREMENTS

B. General Information: Item 3

Development density (as defined in Article VI, Section **601 F**)

D. Street and Structure Plan: Item 10

10. Sight distance exhibits in accordance with the requirements of Article VI (~~if not submitted with the TIS~~). **Sight distance exhibits are required for all proposed access points, including emergency access point(s), from the site onto an existing State, County or Township Road. The Preliminary Engineering Plan will not be approved until all the sight distance exhibits from the site onto an existing State, County or Township Road are approved by the County Engineer and/or ODOT.**

Article IV – FINAL ENGINEERING AND CONSTRUCTION PLAN

401 PROCEDURE

A. Step 1 – Paragraph 2 – Revise the word “Reports” to **Report** in the last sentence of the paragraph.

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Step 1 – Paragraph 4 - If a detailed Preliminary Storm Water Management Report was submitted with the previous Preliminary **Engineering** Plan submittal and only minor changes have occurred (involving changes to a few pages of the report or less) the Design Engineer may only need to submit the changed pages. Whether the entire report needs resubmitted shall be determined by the County Engineer based on review of the revised sheets submitted and original report along with Final Engineering and Construction Plan.

Step 2 - Paragraph 4 -Major Plan Changes - A written response addressing resolution of all comments made as part of the previous Final Engineering and Construction Plan review. Major Plan Changes shall be include but not be limited to the major or significant changes as were discussed in Article III.

C. Step 3 – Paragraph 5 - Plans approved prior to the adoption of these Standards may be granted **a additional** time extension which shall be approved in writing by the County Engineer.

C. Step 3 – Paragraphs 6 & 7 - At the discretion of the County Engineer, Final Engineering and Construction Plans that have been submitted for review prior to adoption of these Standards may be allowed to proceed to construction without being required to update to these **S**tandards.

Provide **two sets of full size (22"x34") plans** ~~one half size signed set of final approved plans (11" x 17")~~ and one CD containing all the plan sheets (PDF format) to the County Engineer once the **Final Engineering and Construction Plans** ~~plans~~ have been approved.

D. Step 4 – Paragraph 5 -An additional column in the standard change order table on the **Sanitary Sewer** Title Sheet shall be added for the County Engineer's approval (by initialing). If the proposed change order does not affect public R/W or storm sewers, a "N/A" shall be added in the column indicating the County Engineer's approval.

E. Step 5 – Paragraph 1 and 2 - After all of the proposed improvements have been completed, the Owner shall submit an

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updated “as-built” plan to the County Engineer. In addition to the requirements of these Standards, the information and data obtained for and presented on the “as-built” plan shall conform to the as-built survey specifications currently accepted by the surveying profession. The as-built submission shall include final design calculations and supporting documents (e.g. stormwater management calculations, verified sight distance exhibits ~~as required~~, etc.) as set forth in the Final Engineering and Construction Plan.

This plan (one copy) shall be a permanent mylar copy of the Final Engineering and Construction Plan. Each sheet shall be 11”x17” in size. In addition to the submittal of the project plan mylars, four CD’s containing the as-built project plan, signed plat, the stormwater management report and calculations, as-built certifications, approved cost estimate, Traffic Impact Study, supporting documentation, etc. shall be submitted (in pdf format). The project name, section, phase (if applicable) and date ~~should~~ **shall** be clearly marked on the CD’s.

403 REQUIREMENTS

B. Street Plan, Plat, Profile and Cross Section Sheets:

All streets within the subdivision shall be shown on standard plan and profile sheets in accordance with ~~Section 403.2 of~~ these Standards. The County Engineer shall approve use of scales other than those shown below.

1. Normal scales:

a) Vertical Scale - 1” = 5’

b) Horizontal Scale - 1” = 50’ (maximum)

1. A more detailed scale such as 1” = 20’ or 1” = 30’ is preferred. 1” = 20’ scale is required for all road widening sheets.

c) Plats - 1” = 50 feet (maximum)

A more detailed scale such as e.g., 1” = 40 feet **or** 1” = 30 feet is preferred.

3. Profile Items (shall include but not be limited to):

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- a) Centerline stationing, original ground profile grade on the proposed centerline and the proposed profile grade.
- b) Vertical curve data and elevations (at all sag and crest points, as well as at even 25 ft. intervals) and sight distance data.
- c) Elevations at even 50-ft. stations for areas outside vertical curves.
- d) Storm and sanitary sewer structures, waterlines, culverts, and bridges.
- e) All existing and proposed utility crossings (location and elevation).

Clearly label all pipe material specification and classification.

5. Drainage Structures:

Detailed drawings of all bridges, culverts and other drainage structures (other than standard culvert pipes with pipe diameter less than 36") shall be provided with the Final Engineering and Construction Plan. Plan format shall follow current ODOT L&D Manual and Bridge Design Manual Standards, and Article VI of these Standards. The plan scale shall be 1" = 10' - 0". ~~(min)~~. The use of precast wingwalls, headwalls, footings, etc. may be permitted at the discretion of the County Engineer. Requirements for precast wingwalls, headwalls, footings, etc. are outlined in the Supplemental Specifications ~~to~~ of the Standards.

6. Emergency Access Drive(s):

All details for the emergency access drive(s) shall comply with current Township regulations, and be shown on the Final Engineering and Construction Plan (e.g., plan, profile, typical section, cross-sections, signage, plan notes, etc.). Details for the emergency access drive(s) within the public R/W shall comply with these Standards and Supplemental Specifications. The Final Engineering and Construction Plan will not be approved until the Township has provided written approval of the emergency access drive(s) details. Building permits will not be released until the Emergency Access Drive(s) construction is complete.

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C. Master Grading Plan:

Item 3 - For rear lots with slopes of less than the 2% minimum slope, storm structures shall be placed in the rear lots at every third property line. For ~~back-yards~~ rear lots on ravines or rear lots with slopes greater than 2%, storm structures may not be necessary, at the discretion of the County Engineer. All sump pumps and rear lot roof drains shall outlet into the rear lot storm sewer system into at a structure unless another means is found acceptable by the County Engineer based on specific site conditions. All private drainage systems (sump pumps and roof drains) shall be routed through a storm water management facility. Please refer to Article IX and the Supplemental Specifications to the Standards for further information.

Item 5 - 10-year ponding limits at all catch basins shall not exceed a ponding depth of 1.5 feet.

Item 6 - No coring of the curb or storm pipe (blind tap) shall be permitted.

Item 15 - All easements must be shown and dimensioned, including major flood route easements, preservation easements, storm sewer easements, etc. See the Supplemental Specifications to these Standards for minimum easement widths.

Item 16 - Flood routes on lot lines shall indicate limits of storm water flow (Q100). so that All utility pedestals shall ~~can~~ be placed above the Q100 storm water flow limits. Flood Routes shall be clearly indicated and labeled on the plan.

D. Detailed Storm Water Management Facility (Retention/Detention Basin) Plans:

Item 4 - See the Article IX and the Supplemental Specifications to these Standards for Allowable Peak Runoff Rates and other Design Criteria.

E. Storm Water Tributary Map Requirements:

See the Supplemental Specifications to these Standards for the Pre- and Post-Development Storm Water Tributary Map requirements. ~~for the maps to be included with the Final Engineering and Construction Plan.~~ Please refer to Articles IV and IX for the minimum standards and specifications for design.

F. Sediment Control Plan:

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The erosion and sediment control plan shall represent the best management practices currently available at the time of the design. This plan must be a separate plan sheet from the Master Grading Plan. The plan must be designed in order to minimize the amount of sediment leaving the site. This plan and its components are subject to the review and approval of the Delaware County Engineer. Please refer to Article XII and the Supplemental Specifications **to these Standards** for the requirements.

G. Road Widening, Shoulder and Ditch Improvements:

Item 10. Proposed right-of-way shall be shown. The right-of-way width provided shall comply with these **Standards**. Please see the Supplemental Specifications **to these Standards** for further information.

Item 13. Subgrade stabilization or full depth pavement repairs may be required under the proposed pavement to minimize settlement. The requirements for this repair or stabilization (e.g., construction methods, materials, etc.) shall ~~meet~~ **comply with** these Standards and Supplemental Specifications

Item 14. The Owner is required to submit a video tape of the existing roadway, documenting the condition of the existing pavement, location of existing utilities, ditches, driveways, culverts, structures, etc. at the time the plans are signed by the County. The videotaping is required to document the condition of the existing area prior to the start of construction. The tape will be used by the County Engineer during the construction phase should any disputes with adjoining property owners or the Contractor arise. The video will need to include a narrative describing the approximate location of the features mentioned previously including the date and time of videotaping. See **the** Supplemental Specifications **to these Standards** for further information.

Item 15. Construction start and end dates shall be approved by the County Engineer prior to the start of any construction activities. The County Engineer reserves the right to stop (or delay) construction activities at anytime (e.g. at the end of the construction season, etc.), should an unsafe condition arise. No road widening work will be permitted between December 1 and April 1 **of the following calendar year**.

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404 COMMON ACCESS DRIVES (CAD), COMMERCIAL, INDUSTRIAL, & MULTI-FAMILY PLAN DEVELOPMENT AND APPROVAL PROCEDURE

The plan development for these projects shall follow the procedure set forth in Article II of these Standards. The Final Engineering and Construction Plan shall meet **all** the requirements of the County Engineer as set forth in these Standards (e.g., work within the right-of-way, storm water management and erosion and sediment control). The required items on the Master Grading Plan as listed in Art. IV, Section 403 C **and submittal of the as-built plans (See Art. IV and X)** shall apply to all CAD, Commercial, Industrial and Multi-family sites.

The submittal of the preliminary engineering plan may be waived for Commercial **(without public roads), CAD** ~~Common Access Drive~~ and Multi-family sites.

Procedure for approval: Once the Final Engineering and Construction Plan is acceptable, the County Engineer shall notify the Owner and/or Design Engineer. The original mylar title sheet, and all required permit applications (including Drainage Maintenance Petition) shall be submitted to the County Engineer for final signature. No plan will be signed until permit fees have been paid. A DESC permit is required for all CAD, Commercial, Industrial and Multi-family sites. Please refer to Article XII of these **S**Standards for further information.

Article V- PROVISIONS AND GUARANTEE REQUIRED BY OWNER

505 MAINTENANCE GUARANTEE AFTER IMPROVEMENT APPROVAL

C. Items Covered Under Guarantee

The Owner shall be responsible for all routine maintenance during the Guarantee period. This shall include, but is not limited to: snow and ice removal, mud tracking, erosion and sediment control, any items relating to public safety, any items identified by the County Engineer in correspondence as part of the acceptance process, and repair/corrections of

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failures due to faulty construction or design. The Owner shall also make repairs needed due to erosion, damage created by utility companies in the installation of utilities, any damage created by the home builders, **site contractors, etc.**, and shall repair all failures which occur for any other reason during the Guarantee period, as determined by the County Engineer. Failure to comply with the above items may result in forfeiture of the Maintenance Guarantee and other legal action if warranted.

Article VI – STREET & BRIDGE DESIGN STANDARDS

601 STREET DESIGN

A. Arterial Streets

All design standards for arterial streets shall be based on the requirements of Article II, Section 203 (split into major and minor classifications). All arterial streets shall be designed using ODOT Standards (L & D Manual and CMS). ADT's are typically in excess of 3,500 vehicles per day. Arterials are further designated as major and minor arterials. The proposed arterial street shall conform to the higher standard of either the **approved traffic impact** study or as shown on the Delaware County Thoroughfare Plan, current edition. The County Engineer shall determine these standards after a complete review of the project **during the Preliminary Engineering Plan Phase**. Approval of the Preliminary Engineering plan (See Article III) will not be granted until a review of the proposed arterial street(s) is completed.

C. Local Streets

Paragraph 2 - The County Engineer shall consider the entrance street of a subdivision a collector **street** with respect to pavement width to the first intersection or a specified length as determined necessary. Left turn storage on all entrance streets shall be at least 100 feet with a 50-foot divergent taper. Longer storage length shall be as established by an analysis. A minimum pavement width of 36 feet to accommodate turn lanes is required for all entrance streets (Curbed and Non-curbed). The pavement length provided on the Final Engineering and Construction Plan shall be approved by the County Engineer. Curb and gutter shall be provided for all entrance street intersections with existing County, Township or State Highways, if the

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entrance street is curbed. The curb shall terminate at the **tangent to the returns** end of the radius and taper to 0" in height at both curb ends. The minimum taper length is 10-feet. For non-curbed streets, a modified shoulder section shall be used. Standard drawings showing these details are included in the Supplemental Specifications **to these Standards**.

Paragraph 3, Item 2 Loop Street Standards, g) - Minimum centerline radius for centerline curve between approach segment and parallel segment shall be **per Item 1) below**. ~~75 feet~~. The inside pavement edge and right-of-way line shall be concentric. The outside pavement and right-of-way radii shall be 35 feet and 46.5 feet respectively. The Township Fire Department must provide written approval of the proposed radii. Regardless of the radii chosen, a minimum pavement slope of **2%** ~~0.02~~ is required.

P. Shoulders

The minimum width of all graded shoulders shall be eight (8) feet. Shoulder width is measured from the edge of the pavement to the point where the shoulder slope intersects the foreslope. When used, guardrail offset from the edge of pavement shall comply with the ODOT L&D Manual, current edition.

A two-foot paved shoulder (minimum) shall be required on all non-curbed arterial, industrial and commercial streets. A two-foot (minimum) **reinforced shoulder or** treated aggregate shoulder ~~may~~ **shall** be required on non-curbed **residential local** streets **and minor rural collectors**, as determined by the County Engineer. A two-foot treated aggregate shoulder shall be required on existing road system as determined necessary by the County Engineer. The County Engineer shall determine the composition of all paved or treated aggregate shoulders.

R. Sidewalks, Bike Paths, Pedestrian Crossings & Handicap Ramps

Sidewalks and/or bike paths are typically required as part of the Township Zoning, or in conjunction with Regional Planning Commission recommendations. The Owner shall check with the Township regarding their sidewalk requirements. Sidewalks or bike paths **shall** ~~must~~ be located a minimum of 1'-0" outside the point where the ditch backslope intersects the existing ground on open ditch roadways. All sidewalk or bike paths **shall** ~~should~~ be located within a dedicated easement and/or public right-of-way. Sidewalk locations for curb and gutter streets are outlined in Tables 601-2, 601-3 and 602-2.

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W. Miscellaneous

Underdrains shall outlet into structures for curb and gutter streets, and at the low point of the roadway profile for all open ditch streets. Precast reinforced concrete outlets are required for all ~~Type F~~ **underdrain** outlets. The pipe material for ~~Type F~~ **underdrain** outlets must comply with the Supplemental Specifications of these Standards.

All arterial and major collector streets using curb and gutter sections shall comply **with the Supplemental Specification of these Standards.** ~~ODOT L&D Manual, current edition~~ [**Heavy Duty Curb (ODOT Type 2) with a 9-inch thick gutter pan is required**]. **A standard drawing showing these details are included in the Supplemental Specifications to these Standards.**

All minor rural and minor urban collector streets using a curb and gutter section shall use **an 8 6-inch thick gutter pan.**

Emergency access drive(s) shall be provided to comply with current Township regulations. The Final Engineering and Construction Plan will not be approved until the Township has provided written approval of the emergency access drive(s) details.

**TABLE 601-1
LOCAL STREET DESIGN STANDARDS
FOR THROUGH STREETS & CUL-DE-SACS
(WITHOUT CURB)**

Minimum Cul-de-sac Radius (R/W)	Fifty-six feet six inches (56' -6") without island or Seventy five feet (75') with island
Minimum Cul-de-sac Bulb Radius	45 ft without island 55 ft with island

Revise Footnote No. 2 as follows: ² 2'-0" of graded shoulder shall be sealed aggregate berm **or reinforced berm.**

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**TABLE 601-2
LOCAL STREET DESIGN STANDARDS
FOR THROUGH STREETS & CUL-DE-SACS
(WITH CURB)**

Minimum Cul-de-sac Radius (R/W)	Fifty-six feet six inches (56' -6") without island or Seventy five feet (75') with island
Minimum Cul-de-sac Bulb Radius	45 ft without island 55 ft with island

Corrected the sidewalk width to 6'-0" (was shown as 6-0").

**TABLE 601-3
LOCAL STREET DESIGN STANDARDS
FOR LOOP STREETS
(CURB REQUIRED)**

Corrected the sidewalk width to 6'-0" (was shown as 6-0").

**TABLE 602-1
MINOR RURAL COLLECTOR STREET DESIGN STANDARDS
(WITHOUT CURB)**

Revise Footnote No. 1 as follows: ² 2'-0" of graded shoulder shall be sealed aggregate berm **or reinforced berm.**

TABLE 603

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COMMERCIAL AND INDUSTRIAL STREET DESIGN STANDARDS

Right-of-way width (These widths are guidelines. The design engineer is responsible to establish right-of-way adequate to construct and maintain the proposed typical section, including required bike paths, utilities , etc.)	60 to 80 feet	70 to 90 feet
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Corrected the curb width to 2'-0" (was shown as 2-0").

602 INTERSECTION DESIGN

C. Offset Intersections

Intersection offsets shall comply with the requirements of Table ~~604~~ 605. These requirements apply to each subclassification of road (the same criteria applies for both a rural minor collector and an urban minor collector; minor arterial and major arterial, etc.).

E. Sight Distances

3. Sight Distance Requirements: The controlling sight distance requirement shall be as set forth in the **following** table below. The classification of the intersecting streets shall be as determined by the County Engineer. These requirements apply to each subclassification of road (the same criteria applies for both a rural minor collector and an urban minor collector; minor arterial and major arterial, etc.). Intersections within the subdivision that access an existing County or Township road (**including any Emergency Access**) shall be designed to meet the intersection stopping distance as established in ODOT's Location and Design Manual, current edition. In no case shall an intersection be designed to less than the minimum requirements. **Please refer to the Supplemental Specification to these Standards for additional requirements.**

**Revise the Title for TABLE 604 as follows:
INTERSECTION DESIGN GUIDELINES **STANDARDS****

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607 TRAFFIC CONTROL DEVICES AND PAVEMENT MARKINGS

The Final Engineering and Construction Plan shall include all necessary traffic control signs, devices and pavement markings, etc. These items shall be designed to meet the requirements of the current edition of the ODOT Manual of Uniform Traffic Control Devices (MUTCD). These details shall be provided on a separate plan sheets in the Final Engineering and Construction Plan.

All striping shall comply with these Standards and Supplemental Specifications, using ODOT specifications for all arterial, major and minor rural collector roads. City of Columbus specifications shall be used for all minor urban collector and local (residential, commercial, industrial, etc.) roads. Thermoplastic striping shall be used for all **existing road widenings (Art. IV, Section 403G)**, minor ~~urban~~ collector roads and local (residential, commercial, industrial, etc.) roads. Pavement striping for existing County/Township road widenings must match the existing striping at the project limits.

The Owner is required to provide speed limit signs on existing County, Township or State Highways where the proposed subdivision entrance street(s) intersects the public highway. These signs shall state the posted speed limit for the intersecting County, Township, or State Highway.

Speed limit signs shall be placed on all subdivision streets. Spacing of signs shall comply with the ODOT MUTCD, current edition. School zone signs (e.g., pavement markings, cross walks. signs, etc.) shall be provided for all subdivision streets located within school zone limits as defined in the ODOT MUTCD. No parking signs shall be provided, if required, based on street width.

A concrete right-in/right-out island (pork chop) shall be included with the Final Engineering and Construction Plan if required as part of the approved traffic study. Details for the island shall comply with current Delaware County Standard Drawings. **A Standard Drawing is included in the Supplemental Specifications to these Standards.**

~~These~~ **All** traffic control signs, devices and pavement markings shall be installed **by the Owner** prior to **the County Engineer** approving the subdivision ~~to~~ **for the** maintenance period ~~by the Owner or~~ **and** releasing the subdivision for building permits.

The County Engineer shall approve the final stop sign locations. Stop signs shall not be located on **the same pole as** any street signs.

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Article VII – PAVEMENT DESIGN

704 ALLOWABLE AND MINIMUM PAVEMENT COMPOSITION

In lieu of an AASHTO Engineered Pavement Design the following pavement design for residential local and minor urban collector streets may be used. These designs have been developed using the AASHTO pavement design methods for flexible and rigid pavements. If the pavement sections shown in this section are used, an internal traffic study is not required for pavement design but the ADT values must be provided on the plans for each street. Under no circumstances shall a pavement composition have an SN of less than 2.66.

Pavement designs submitted shall not include the surface course layer (404 or 448) as part of the strength computations.

~~On any projects with paving operations occurring after October 31, the surface course layer shall not be placed until the following construction season. Building permits may be released by the County Engineer prior to placing the surface course layer. This will allow for the release of building permits provided all other building permit items are complete completed to the satisfaction of the County Engineer.~~

Revisions to notes under Delaware County Typical Pavement Composition Table

Notes:

- ~~3) The minimum asphalt thicknesses per the Delaware County Typical Pavement Composition shall apply. The combined thickness for the Minimum asphalt concrete surface course and intermediate course concrete thickness for any flexible pavement with aggregate base shall be three (3") minimum on all Local Streets, four (4") minimum on all Major and Minor Collector Streets with ADT's > 3500, and four (4") minimum on all Arterial Streets. A minimum of 3" of 301 asphalt concrete base is required.~~

Article VIII – WORK IN ROAD RIGHT-OF-WAY OR EASEMENTS

800 PURPOSE

The efficiency and safety of a County or Township roadway is largely dependent on roadside construction interfering with the movement of traffic. To minimize the

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impact to the motoring public, this article establishes minimum standards for permitting of work within County and Township Road right-of-way. Permits are required for a number of reasons including the construction of **shoulder and ditch improvements** ~~ditch setbacks~~ and installation of drives, driveways and drive pipes in the public right-of-way. Permits are also required for utility work within the right-of-way as well as for road closures.

802 COMMON ACCESS DRIVE (CAD) & DRIVEWAY APPROACHES ALONG STREETS WITH CURBS AND OPEN DITCHES

A. Profile Grades:

1. Driveway and CADs on Open Ditch Roads: Add the following sentence to the end of paragraph one – **A standard drawing outlining the requirements for approaches on open ditch roads is included in the Supplemental Specifications to the Standards.**

B. Composition:

Item 1. Non-Curbed Streets: Approach shall have an asphalt concrete surface within the public right-of-way on all improved County or Township Roads. The minimum pavement compositions within the right-of-way are shown in Table 801 in the Supplemental Specifications **to these Standards**. If a concrete driveway is desired beyond the public right-of-way on a non-curbed street, it shall conform to the ~~above~~ **minimum pavement composition for a width as outlined in the Supplemental Specifications to these Standards** within the right-of-way-before beginning the concrete portion. This is to allow for proper transition to the concrete driveway for future road overlays. Concrete approaches will be permitted in public right-of-way with speed limits of 35 MPH or less.

Item 3. Brick **and** Masonry **P**avers: See Supplemental Specifications **to these Standards** for detailing of pavement composition within the right-of-way. Brick and masonry pavers are not permitted in public right-of-way with speed limits greater than 35 MPH. ~~Pavers will not be replaced by the County or Township during maintenance or roadway improvements.~~ **Pavers damaged during maintenance**

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operations (including snow removal), roadway, shoulder or ditch improvements will not be replaced by the County or Township.

- E. **Flares or Radii:** Each drive approach shall have an approach flare or radius return. The An approach flare is required on roads with a speed limit of 25 MPH or less, while the radius return is required for roads with a speed limit greater than 25 MPH.

For single residential drives on curb and gutter streets the flare shall be a minimum of 2 feet wide at the edge of pavement to a maximum of 5 feet wide.

Radius returns shall be a minimum of 15 feet to a maximum of 20 feet for single residential driveways. For commercial, shared, and CAD drives, the flare or radius size shall be based on the type of vehicles that will be using the drive.

In no case shall the flare be more than five feet (5') or the radius return less than twenty feet (20'). Standard drawings for approach flares and radius returns are included in the Supplemental Specifications to these Standards.

H. Driveway Pipes

Item 1 - In a subdivision where new open ditch roads are being built, all driveway pipe sizes shall be predetermined and submitted to the County Engineer for approval at the same time the Preliminary Engineering Plan is submitted. After the minimum driveway pipe sizes have been approved, they shall be shown on the Final Engineering and Construction Plan. The pipe must be sized for the 10-year storm event for all local streets, and a 25-year storm event for collector and arterial streets. A minimum pipe size of 12" is required. These pipe sizes shall be shown in a tabular form on the sheet with the estimated quantities. The following information shall be shown: lot number, pipe size, pipe inlet and outlet elevations if location is identified, and type of pipe based on manufacture specifications for cover.

Item 2 – Paragraph 3 - The Owner shall be responsible for replacement of all driveway pipes installed within the right-of-way.

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~~which do not meet current County Standards until the end of the maintenance guarantee.~~

803 ROAD CLOSURE

- B. A detour plan with route and proposed signage meeting the latest ODOT MUTCD, current edition.
- C. All signage must be posted at a minimum of 3 days prior to the planned closure.
- F. **Simultaneous closures of adjacent roads, including simultaneous closures of adjacent roads in different jurisdictions, such as a County Road and an adjacent Township, Village or City Road/Street, will not be permitted.**

Article IX – DRAINAGE DESIGN STANDARDS

902 DRAINAGE EASEMENT

C. All drainage easements shall be shown on the final plat and the Final Engineering and Construction Plan. The drainage easements shall be recorded for public use, and the maintenance of such drainage courses shall be the responsibility of the property owners receiving direct benefit therefrom, unless otherwise provided (e.g. County Drainage Maintenance Program, See Section 904 G and the Supplemental Specifications to these Standards). For any easement shown on the Final Engineering and Construction Plan that contains a storm sewer, **over land open ditch flood route, detention basin, retention basin and/or other storm water structure, (herein referred to as storm sewer)**, the storm sewer rights are senior to the rights of any other public or private utility or interest utilizing the easement. Should access be granted for a utility, the disturbed area must be restored to its original condition. Any cost associated with the damage, repair, replacement or relocation of any buried or above ground facility or structure that is necessary to allow the maintenance, repair or replacement of the storm sewer, ~~will~~ **shall** be the responsibility of the owner of said utility, facility, or structure. When maintenance, repair or replacement of a storm sewer causes the removal of any trees, plantings, landscaping, fence, **driveway** or **any other** ~~decorative~~ feature located within the easement, the replacement and cost of said items shall be responsibility of the owner of the underlying property or homeowner's association if applicable. Drainage easement widths shall conform to the Supplement Specifications of these Standards.

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903 GENERAL DESIGN CRITERIA

D. Flood Routing Path, Item 2 Surface Flood Routing Paths: Delete the first sentence in the paragraph.

Generally, it is not economically feasible to size a storm sewer system to collect and convey more than the frequent storm runoff.

904 SPECIFIC DESIGN SPECIFICATIONS

A. Roadway Culverts

10. Plan Sheets: Culvert plan and profile sheets shall be required for all pipe culverts with spans greater than 36 inches, and all three-sided and four-sided box structures. The plan format shall comply with **the current** ODOT L&D Manual, current edition.

11. Headwater elevations: The design year and 100-year ponding limits (headwater elevations) upstream of all culverts must be shown on a separate plan as part of the drainage report. This plan shall be drawn to scale (1" = 50', maximum), showing proposed contours (1-foot minimum intervals) and the associated headwater pools upstream of the culvert(s). Any structure (buildings, etc.) upstream of the culvert(s) **shall** be shown on this plan. These headwater pools (ponding limits) shall be shown on the Master Grading Plan (See Art. IV).

12. Material: The conduit material shall meet the requirements of these Standards (See Art. II, Sect. 203), and the Supplemental Specifications to these Standards.

B. Storm Sewers

4. Material: The storm sewer material, **including plastic pipe**, shall meet the requirements of these Standards (See Art. II, Sect. 203), and the Supplemental Specifications to these Standards. No plastic pipe (707.33, etc.) shall be permitted under the pavement. **Approval of plastic pipe is limited to areas outside the pavement and must be approved by the County Engineer prior to final engineering plan approval.** Where plastic pipe is

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~~permitted~~ used, 100% of the pipe ~~shall~~ will be mandrelled 30 days after installation. At the end of the maintenance period, all plastic pipe shall be mandrelled again. ~~Alternate methods to verify the pipe condition, such as video taped/camera may be approved by the County Engineer. The second mandrel test may be waived by the County Engineer provided the plastic pipe meets the requirements of these Standards and the Supplemental Specifications to these Standards.~~ All plastic pipe failing the mandrel test(s) shall be retested and/or replaced per these Standards and Supplemental Specifications.

10. Hydraulic Gradient:

For All Local Streets and Minor Urban Collector Streets:

Based on a five-year storm, the hydraulic grade line shall not exceed the window or grate elevation for an inlet or catch basin. For rear lot drainage, ~~the depth of water for the 10-year storm at a catch basin hydraulic grade line shall not exceed a depth of 1.5 feet above the grate elevation.~~ Grade line shall be based on the tailwater ~~depth~~ or eight-tenths (0.8) of the pipe diameter at the outlet or other critical points, whichever is greater, within the system.

13. Pipe Roughness Coefficient (n):

~~An “n” of 0.012 is to be used for sewers 60-inch diameter and under, and 0.013 for sewers larger than 60-inches in diameter. The basic “n” for smooth pipe, concrete or vitrified is 0.012. These values do not compensate for minor head losses at catch basins, inlets, and manholes that are encountered in a storm sewer system. If in the opinion of the County Engineer these become significant, then the pipe coefficient shall be increased to 0.015 to account for these losses.~~

~~The pipe roughness coefficient (“n”) shall comply with the Supplemental Specifications to these Standards.~~

G. Storm Water Management (Retention and Detention) Facilities

1. General

~~All storm water management facilities retention and detention basins are to~~ shall be cleared and grubbed as per these Standards, followed by the incorporation of a layer of topsoil that is seeded and mulched. ~~(including the removal of trees), seeded, top soiled and mulched.~~ The limits of seeding,

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mulching, clearing, **and top soil thickness, etc.** are subject to the approval of the County Engineer. **Please refer to Section 905 and the Supplemental Specifications to these Standards for further information.**

3. Design Outlets

Submerged outlets will only be permitted at the discretion of the County Engineer. The use of submerged outlets will not be permitted for aesthetic purposes. ~~Where submerged outlets are permitted, the outlet structure (headwall) shall extend one foot above the 100-year storm elevation or the spillway overflow elevation, whichever controls.~~

H. Sump Pumps and Roof Drains

Provisions for all private drainage systems (sump pumps, roof drains, etc.) shall be included in the storm water management calculations.

~~Private drainage systems shall not outlet through the curb or discharge into the underdrain/curb tile.~~ **Outlets for private drainage systems shall comply with Article IV, Section 403 C., Master Grading Plan and the Supplemental Specifications to these Standards.**

J. Orifice Plates

The use of orifice plates shall comply with the Supplemental Specifications to these Standards.

ARTICLE X – SURVEYING STANDARDS

1001 GENERAL STANDARDS

The process for preparing a no-plat subdivision (lot split) is outlined in a flow chart contained on the County Engineer's website. A checklist for preparing a no-plat subdivision is included in the ~~Appendix E of these Supplemental Specifications to~~ **these Standards.**

B. Plat Approval: The County Engineer's Map Department approves all new street names. Please refer to the Appendix for Article VI for the street naming procedure adopted by the County Engineer.

Three copies of the final plat shall be submitted to the County Engineer for approval. The County Engineer will include comments from the Map Department as part of the final plat review comment letter **(if applicable)**. The County Engineer shall have 14-days to review the final plat.

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1003 PROPERTY AND PLAN SURVEYING – Add the following corrections to B. and C.:

B. 1. The surveyor shall set boundary monuments so that upon completion of the survey each corner of a subdivision lot, at the time it is platted for public record, will be physically monumented. On the plat of record a notation shall be made at each corner showing that either a boundary monument was found and/or set. In addition there shall be a statement or legend describing the monument found or set. **The surveyor shall submit a letter to the County Engineer certifying that each corner of a subdivision lot has been physically monumented.**

2. A solid iron pin or steel pipe of at least one-half inch diameter shall be used as permanent markers. All pipe or iron pin markers shall have a cross section of 0.2 square inches, shall be at least thirty inches long and the bottom of such markers shall be set at least thirty inches below finished grade. On a curb and gutter street, a drill hole shall be set into the top of the concrete curb to reference the front property line or a PK nail/spike set into the centerline of the street after the subdivision has been constructed. Pins must also be set at this time on the rear lot corners. Iron pins must be set on the property corners at the street ROW line on each lot corner after construction of the house and final lot grading.

5. The setting of such markers shall not be required prior to completion of construction necessary to the improvement of the land but must be in place prior to recording of the plat. **Please refer to the Supplemental Specifications for further information.**

C. When a written and/or graphical description is prepared for the purpose of conveying a permanent easement (e.g. for utilities, right-of-way, etc.), said description shall include sufficient and adequate legal and technical working so that the easement can be definitely located and defined in relation to the actual property corners and/or the centerline survey control points involved. **The easement description shall include the purpose for the easement, such as “Drainage Easement” or “Drainage and Utility Easement”.** For this purpose, whenever the said corners or control points are determined to be obliterated or lost, or if they are to be called for in a description,

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they shall be established and monumented in accordance with the minimum standards as referred to above in paragraphs “A” and “B”.

1004 PLAT AND FINAL AS-BUILT PLAN REQUIREMENTS– Add the following sentence to C., Item 4:

Please refer to the Supplemental Specifications to these Standards for additional requirements.

1005 ENGINEERING AND TOPOGRAPHIC SURVEYING – Add the following sentence to C. “As-built” Surveys:

Please refer to the Supplemental Specifications to these Standards for additional requirements.

ARTICLE XI – PROCEDURES AND REQUIREMENTS FOR CONSTRUCTION

1102 BUILDING PERMIT RELEASE

A. Private Developments: Refer to Article V of these Standards

B. Subdivisions

1. No Bond Subdivisions- All construction must be complete, including all remedial items and emergency access point(s), prior to releasing building permits.

2. Bonded Subdivisions:

a. Paving- Completed with the exception of remedial work. ~~Asphalt surface course (404/448) shall not be placed after October 31. Building permits can be released if all other building permit items are completed. If the surface course is not completed, the owner shall be responsible for the repair and/or replacement of all damaged curb or pavement prior to the placement of the surface course the following year. The maintenance period will not begin until the paving (and all other remedial items) are complete. Refer to the Supplemental Specifications of these Standards for additional requirements.~~

e. Safety Items- All safety related items to be in place (temporary T-turnarounds, guardrails, emergency access point(s), barricades, street name signs, stop signs, etc.)

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Appendix B – Supplemental Specifications

Discard Appendix B in its entirety and replace with the revised Appendix B on the County Engineer's Website.

Appendix C – Roadway and Storm Sewer Standard Drawings

Revisions to the Roadway and Storm Sewer Standard Drawings have been included on the County Engineer's Website. Individual copies of the updated Standard Drawings can be obtained from there.

Appendix D – General Notes

Discard the **all** general notes and replace it with the notes provided on the County Engineer's Website. An Auto CAD drawing containing all the general notes is available from the County Engineer's Office. Please contact us to obtain a copy of the general notes. The traffic signal standards have not been revised.

Appendix E – Submission Cover Document and Review Checklists

Revisions and/or additions were made to Submission Cover Document (Fee Submission Form) and to **all** the checklists. Please discard the prior versions and replace them with the checklists provided on the County Engineer's Website. A checklist for Change Order submissions was added. Additional Design Aids for Orifice and Weir Charts have been added to the Website.

Appendix F – Sample Owner's Agreement, Standard Unit Prices and Sample Engineer's Estimate

Revisions were made to the Standard Unit Prices and the Sample Engineer's Estimate to reflect current practices. Please discard the prior versions and replace with updated Sample Engineer's Estimate and Standard Unit Prices provided on the County Engineer's Website.

Appendix H – Drainage Maintenance Process & Sample Petitions

A sample Exhibit "C" has been incorporated. You can obtain a copy of the sample Exhibit "C" from the County Engineer's Website.

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Appendix I – Traffic Impact Standards

Discard the Supplement to TIS Standards and replace with the revised supplement on the County Engineer's Website.

Note: No changes were made to Appendix G, J and K at this time.