

ENGINEERING CODE

FOR

SUBDIVISION DEVELOPMENT

AND

INFRASTRUCTURE CONSTRUCTION

HURON COUNTY, OHIO

**HURON COUNTY ENGINEERING CODE
FOR
SUBDIVISION DEVELOPMENT
AND
INFRASTRUCTURE CONSTRUCTION**

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Chapter One General Provisions

100.01 Purpose and Intent

The purpose of these regulations, as adopted by the Huron County Board of Commissioners, hereinafter referred to as the “County Commissioners”; is to provide standard specifications for subdivision development and infrastructure improvements in the unincorporated portions of Huron County, Ohio. These regulations are intended for quality and uniformity of infrastructure development and improvements, and will define the minimum requirements for surveying, engineering, and construction.

These regulations shall complement State and Federal standards and shall be known as the Huron County Engineering Code, hereinafter referred to as “Engineering Code.” There shall be no variance from these regulations without the written consent of the County Commissioners, based on the recommendations of the Huron County Engineer, hereinafter referred to as the “County Engineer.” The County Engineer and the Huron Soil and Water Conservation District shall administer these regulations for the County Commissioners.

100.02 Interpretation

These regulations shall be interpreted and applied as minimum requirements. They are not intended to interfere with, or annul any easements, covenants, or other agreements between parties, unless they violate these regulations. When two specific provisions of these regulations conflict, or a provision of these regulations conflict with any other lawfully adopted regulation, ordinance, or resolution, the most restrictive provision shall apply.

100.03 Separability

The invalidation of any clause, sentence, paragraph, or section of these regulations by a court of competent jurisdiction shall not affect the validity of any other part of these regulations, which shall remain in full force and effect.

100.04 Authority, Adoption and Amendments

The County Commissioners, by virtue of “Chapter 711” of the Ohio Revised Code, are authorized to adopt regulations, governing the construction of improvements within their jurisdiction. These regulations shall become effective after the necessary public hearings and adoption by the County Commissioners.

The date of adoption of this Engineering Code by the Huron County Commissioners is December 2, 2008 by Resolution No. 08-438.

Requests for amendments to the Engineering Code shall be made in writing to the County Commissioners along with the reason for the change. Requests will be reviewed by the County Commissioners and if they feel it necessary, they will conduct a public hearing and then approve or disapprove the request.

100.05 Procedure for Subdivisions

A developer/subdivider shall furnish the following information to the County Engineer for approval of plans:

A. Minor Subdivision

Normally, the County Engineer will not review plans for minor subdivisions. However, if an engineering problem is encountered during the Concept Plan phase, the Administrative Officer shall request the County Engineer's assistance. The County Engineer, Administrative Officer, and developer/subdivider shall meet to discuss the problem.

B. Major Subdivision

1. Preliminary Discussion

Shortly after the Concept Plan phase, the developer/subdivider shall meet with the County Engineer, so that both parties can become familiar with existing conditions affecting the proposed improvements.

2. Preliminary Engineering Plans

The developer/subdivider should prepare the preliminary engineering plans in conjunction with the preliminary plat as required by the Subdivision Regulations. If these plans, as outlined in Chapter 3 are submitted to the County Engineer at the same time as the preliminary plat is filed with the Administrative Officer, many of the possible questions arising at the Planning Commission review can be answered, without waiting an additional month. The plans should contain sufficient information to enable the County Engineer to determine if the proposed improvements will be satisfactory and will serve the public interest. Also, if these plans are prepared properly, it should insure that the developer/subdivider will not expend excessive monies without some assurance that his final plans will be approved.

3. Final Construction Plans

The developer/subdivider shall submit a full set of construction drawings with supporting data, computations, and documents, of the proposed subdivision to the County Engineer for review, as outlined in Chapter 4. The County Engineer, then shall determine if the proposed improvements fully comply with the current Huron County Engineering Code. See Figure 1 – 1 for flow chart of the subdivision development process.

C. Review Fees

The County Engineer's Office shall be reimbursed by the developer/subdivider for costs incurred during the review of preliminary and construction plans. The rate

charged by the County Engineer shall be the actual labor cost plus fifty percent (50%) to cover items such as employee benefits, office expenses, etc.

Fees shall be payable to the Huron County Engineer. The County Engineer shall submit an itemized statement of time and costs incurred, after completion of the final review. Approval of the Final Plat will be delayed until the County Engineer's Office receives payment for their plan review services.

Chapter Two Definitions

200.01 Interpretation of Terms

For the purpose of these regulations, certain terms or words used herein shall be interpreted as follows:

- A. The word “person” includes a firm, association, partnership, estate, trust, company or corporation, as well as an individual.
- B. The present tense includes the future tense, the singular number includes the plural, and the masculine includes the feminine.
- C. The word “shall” is a mandatory requirement, the word “may” is a permissive requirement, and the word “should” is a preferred requirement.

200.02 Definitions

Unless otherwise stated in these regulations, words or phrases which have a well-known technical, construction industry or trade meaning are used in accordance with such recognized meanings. The definitions contained herein are supplemental to those in the Huron County Subdivision Regulations, Section 202.02.

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| AASHTO | American Association of State Highway and Transportation Officials |
| ADT | Average Daily Traffic |
| ASTM | American Society for Testing and Materials |
| ADDENDA | Written or graphic information issued prior to the opening of bids which clarify, correct, or change the bidding requirements or the Contract Documents. |
| AGGREGATE DRAIN | A trench filled with granular material extending laterally from the pavement base layer to an outlet on the roadway foreslope with the intent of draining surface and/or ground water away from the pavement base. |
| ANTI-SEEP COLLAR | Device that prevents the flow of water through the surrounding soil around a conduit that is used as an outlet for a retention or detention basin. |
| AVERAGE RECURRENCE INTERVAL | The average interval in years between storm water flows of a given magnitude, over a period of time, such as one hundred (100) years. |

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| BACKSLOPE | The slope from the back of a ditch to the existing ground surface. Also referred to as a cut slope. |
| BENCHMARK | A marker of known elevation and location used in surveying for establishing vertical control. |
| BOND | Any form of security approved as to form and amount by the County Commissioners, including a cash deposit, surety bond, letter of credit, collateral, or other instrument of credit. |
| CAST-IN-PLACE STRUCTURE | A concrete drainage structure which is placed in forms and cured at its final location. |
| CATCH BASIN | A structure for intercepting flow from a gutter or ditch and discharging the water through a conduit. |
| COEFFICIENT OF RUNOFF (C) | A value, varying with the ground and ground cover, which is used in the Rational formula to determine the amount of a rainfall which is directed to streams and not absorbed into the ground. |
| CONDUIT | A closed structure such as pipe. |
| CONSTRUCTION AND MATERIAL SPECIFICATIONS | A manual published periodically by the State of Ohio, Department of Transportation, and widely used by engineers, contractors and others in the highway industry to regulate highway materials and construction. |
| CONSTRUCTION LIMITS | Lines shown on a plan view that outline the lateral extent of the work. Typically placed 4 feet outside the point where the backslope touches the existing ground unless additional room is required for construction activities. |
| CONTRACT DOCUMENTS | <p>The Contract Documents establish the rights and obligations of the parties and include the Invitation for Bid, Agreement, Addenda, Contractor's bid (including documentation accompanying the bid) Notice to Proceed, Bonds, General Conditions, Supplementary Conditions, Specifications, and the Drawings, together with all written amendments, change orders, work change directives, field orders, and any other document designated by the County Commissioners, all of which constitute one instrument.</p> <p>Approved shop drawings and the reports of subsurface and physical conditions and the reports and drawings relating to a hazardous condition are not Contract Documents. Only printed or hard copies of the items listed are Contract Documents. Files in electronic media format of text, data, graphics, and the like that may be furnished by the County to the Contractor are not Contract Documents.</p> |

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| CONTRACTOR | An individual, company, firm or other party or organization who contracts with an Owner to construct all or a portion of a project. |
| COUNTY ROAD | Includes all roads which are or may be established as a part of the county system of roads as provided in ORC 5541.01 to 5541.03, inclusive, which shall be known as the county highway system. |
| CUL-DE-SAC | Vehicular turnaround at the end of a permanent dead-end street. |
| CULVERT | A structure used to convey surface runoff through embankments or under a road or driveway. A structure, as distinguished from a bridge, which is usually covered with embankment and is composed of structural material around the entire perimeter, although some culverts are supported on spread footings with the stream bed serving as the bottom. |
| CUTOFF WALL | A wall that extends downward from the end of a structure to below the expected scour depth, or to a scour-resistant material. |
| DEAD-END STREET | Permanent: A local street with only one outlet that terminates in a vehicular turnaround (cul-de-sac) and has an appropriate terminal for the safe and convenient reversal of traffic movement. The cul-de-sac is of a permanent nature, which is not intended to be extended or continued in the future. Temporary: A local street temporarily having one end open to traffic and the other end terminating in a temporary turnaround (“tee” type), designed and constructed with the intent to be extended in the future. |
| DESIGN DISCHARGE (Q) | The peak rate of flow for which a drainage facility is designed. Usually given in cubic feet per second (cfs). |
| DETENTION BASIN | A structure that holds water for a short period of time before releasing it to the natural watercourse. |
| DRAINAGE AREA | The area contributing discharge to a stream at a given point, also known as watershed. |
| DRAWINGS OR PLANS | The approved plans, profiles, typical cross sections, working drawings, supplemental drawings, text, notes, or exact reproductions that show the location, character, dimensions, and details of the work to be done. |
| EASEMENT | Authorization granted by a property owner to another for a specific use of a designated portion of property. |

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| EDGE OF PAVEMENT | The location of the white or yellow edge line on an uncurbed road, the edge of the gutter plate on a curb and gutter road or the face of the curb on a curbed road. |
| ELLIPTICAL PIPE | Pipe which is manufactured with a span greater than rise to be utilized in shallow cover situations. |
| ENGINEER | County Engineer: The person who is elected to the office of County Engineer of Huron County, Ohio, pursuant to ORC Chapter 315. Professional Engineer: Any person registered to practice professional engineering by the State Board of Registration as specified in Section 4733.14 of the Ohio Revised Code. |
| EPHEMERAL STREAM | A stream or reach of a stream that does not flow for parts of the year. The term includes intermittent streams with flow less than perennial. |
| EROSION | The wearing away of the earth's surface by water, wind, gravity, or any other natural process. |
| FEMA | Federal Emergency Management Agency |
| FLOOD | An overflowing of water, from watercourses, onto land which is normally dry. |
| FLOOD, 100-YEAR | The temporary inundation of normally dry land areas by a flood that is likely to occur once every one hundred (100) years (i.e., having a one percent (1%) chance of occurring each year, although such a flood may occur in any year). |
| FLOOD FRINGE | The portion of the flood plain outside of the floodway. |
| FLOOD HAZARD | Indicates overflow water having sufficient velocity to transport debris, to scour the surface soil or to dislodge or damage buildings. It also indicates erosion of the banks of watercourses. |
| FLOOD HAZARD ELEVATION | The act of determining if flood levels within a watercourse for a 100-year flood, or other recurrence interval floods have a significantly increased detrimental impact on upstream property. |
| FLOOD PLAIN | Lowland and relatively flat areas adjoining the channel of a river, stream, watercourse or lake. The flood plain area has a one percent or greater chance of flooding in any given year. This area encompasses the floodway and the floodway fringe and is shown on Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency |

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| FLOOD PLAIN CULVERTS | Relief culverts that are placed in addition to a bankfull culvert at a higher elevation across the flood plain to allow multiple outlets for floodwaters. |
| FLOODWAY | The portion of the flood plain which is effective in carrying flow, within which this carrying capacity must be preserved and where the flood hazard is generally highest. |
| FORESLOPE | The slope from the edge of the shoulder to the toe of the ditch. (Also referred to as a fill slope.) |
| GRADE | The slope of a road, street, or other public way specified in percentage terms. |
| HEADWALL | The structural appurtenance placed at the open end of a pipe to control an adjacent highway embankment and protect the pipe end from undercutting. |
| HEADWATER | The depth of water impounded upstream of a culvert due to the influence of the culvert constriction, friction, and configuration. |
| HSWCD | Huron Soil and Water Conservation District |
| HYDRAULIC GRADE LINE | A line coinciding with the level of flowing water in an open channel. In a closed conduit operating under pressure, a line representing the distance water would rise in a pitot tube at any point along a pipe. The hydraulic grade line is equal to the pressure head (P/γ) along the pipe. |
| HYDRAULIC GRADIENT | The slope of the hydraulic grade line for a storm sewer or culvert. |
| IMPROVEMENTS | Street paving or resurfacing, curbs, gutters, sidewalks, water lines, sanitary sewers, storm sewers, catch basins, flood control and drainage facilities and other related matters normally associated with the development of public infrastructure for subdivisions. |
| INFILTRATION RATE | The rate at which water penetrates the surface of the soil at any given instant. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied. |
| INLET | A structure for capturing concentrated surface flow which may be located along the roadway, in a gutter, in the highway median, or in the field. |
| INLET CONTROL | The situation where the culvert hydraulic performance is controlled by the entrance geometry only. |
| INTERMITTENT | A stream that is dry for part of the year, ordinarily more |

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| STREAM | than 3 months. |
| INTERSECTION SIGHT DISTANCE | The sight distance required at driveway and street intersections as defined in the Ohio Department of Transportation's, Volume One, Location and Design Manual, latest edition. |
| LOCATION MAP | A map on the Title Sheet showing the area in which the project is located. |
| MANHOLE | A structure that provides access to a closed drainage system. |
| MONUMENTS | <p>Permanent concrete, iron, or steel markers used to establish all lines of a plat of a subdivision, including all lot corners, boundary line corners, and points of change in street alignment.</p> <p>As adopted by the State Board of Registration for Engineers and Surveyors, monuments shall have a minimum length of thirty inches (30") and having a minimum cross-sectional area of 0.21 square inches and so installed that it is possible to detect the monument by means of some device for finding ferrous or magnetic objects. The monument shall be identified with a durable marker bearing the surveyor's Ohio registration number.</p> |
| NORMAL WATER ELEVATION | The water elevation in a stream which has not been affected by a recent heavy rain runoff. The water level which could be found in the stream most of the year. |
| ODNR | Ohio Department of Natural Resources |
| ODOT | Ohio Department of Transportation |
| OEPA | Ohio Environmental Protection Agency |
| OMUTCD | Ohio Manual of Uniform Traffic Control Devices. Ohio Department of Transportation Manual that establishes uniform standards for traffic control devices, such as signs, signals, markings, and construction signage. |
| ORC | Ohio Revised Code |
| ORDINARY HIGH WATER | The line on the shore established by the fluctuation of water and indicated by physical characteristics such as: a clear natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, or other appropriate means that consider the characteristics of the surrounding areas. |

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| OUTLET CONTROL | The situation where the culvert hydraulic performance is determined by the controlling water surface elevation at the outlet, the slope, length and roughness of the culvert barrel, as well as the entrance geometry. |
| OVERLAND FLOW | Water which travels over a surface and reaches a stream. |
| OWNER | The individual, entity, public body, or authority with whom a Contractor has entered into an agreement and for whom the work is to be performed. |
| pH | The reciprocal of the negative logarithm of the Hydrogen ion concentration. Neutral water has a pH value of 7. A measure of the acidity of a substance, if less than 7; alkalinity if greater than 7. |
| PERENNIAL STREAM | A stream that flows continuously for all or most of the year. The water table is located above the stream bed for most of the year. |
| PERMEABILITY | The quality of the soil that enables water to move downward through the soil profile. It is measured in units of inches per hour. |
| PIPE ARCH | Pipe which is manufactured with a span greater than its rise to be used in shallow cover situations. |
| PIPE UNDERDRAIN | The longitudinal subsurface drainage system composed of a perforated pipe at the bottom of a narrow trench filled with permeable material and lined with geotextile in erodible soils, with the intent of draining surface and/or ground waters away from the pavement base and/or subbase. |
| PUNCH LIST | A list of deficiencies requiring corrective action before final payment or acceptance of the project. |
| RAINFALL INTENSITY (<i>i</i>) | A value used in the Rational formula to determine the amount of rainfall for a given storm frequency, and for a duration equal to the time of concentration. |
| RECORD DRAWINGS | Design plans reviewed in the field and revised to show actual construction dimensions and quantities. Record drawings are sometimes referred to as “As-builts”. |
| RETENTION BASIN | A structure that holds water on a permanent basis. |

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| RIGHT OF WAY | A strip of land dedicated, condemned, or reserved for public use (ROW). In addition to the roadway, it normally incorporates the curbs, lawn strips, sidewalks, lighting, sanitary sewer, waterlines, and drainage facilities, and may include special features (required by the topography or treatment), such as grade separation, landscaped areas, viaducts, and bridges. |
| ROUGHNESS COEFFICIENT (<i>n</i>) | The measure of texture on the surface of channels and conduits, usually represented by the “n-value” coefficient used in Manning’s open channel flow equation. |
| SANITARY SEWER | A conduit or pipe system which carries household and/or industrial wastes. Sanitary sewers do not convey storm water. |
| SEDIMENT BASIN | A basin or tank in which stormwater containing settleable solids is retained, to remove by gravity or filtration a part of the suspended matter. |
| SHOP DRAWINGS | All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for a Contractor to illustrate some portion of the work. |
| SHOULDER | The portion of the roadway contiguous with the traveled way for the accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses. |
| SOIL BIOENGINEERING | The use of live and dead plant materials, in combination with natural and synthetic support materials, for slope stabilization, erosion reduction, and vegetative establishment. |
| SPECIFICATIONS | That part of the Contract Documents or Drawings consisting of written technical descriptions of materials, equipment, systems, standards, and workmanship as applied to the work. |
| STOPPING SIGHT DISTANCE (SSD) | The cumulative distance traversed from the time a driver sees a hazard necessitating a stop, actually applies the brakes and comes to a stop in accordance with the Ohio Department of Transportation’s, Volume One, Location and Design Manual, latest edition. |
| STORM SEWER | An underground drainage system consisting of pipes, catch basins and/or manholes used for the conveyance of storm water. |
| SUBGRADE | The surface of the roadbed on which the pavement structure, curb and gutter, and/or shoulders are constructed. |

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| SUBSTANTIAL COMPLETION | The time at which the work has progressed to the point where, in the opinion of the County Engineer, the work is sufficiently complete, in accordance with the Contract Documents, so that the project can be utilized for the purposes for which it is intended. |
| SURVEYOR | Any person registered to practice surveying by the State Board of Registration as specified in Section 4733.14 of the Ohio Revised Code. |
| TAILWATER | The depth of flow in the stream directly downstream of a drainage facility, measured from the invert at the culvert outlet. Often calculated for the discharge flowing in the natural stream without the highway constriction. Term is usually used in culvert design and is the depth measured from the downstream flow line of the culvert to the water surface. |
| TIME OF CONCENTRATION (t_c) | Time required for a water to flow from the most distant point on a drainage are to the measurement or collection point. |
| USGS | United State Geological Survey |
| WATER OF THE UNITED STATES | Water bodies subject to Army Corps of Engineers jurisdiction through Section 404 of the Clean Water Act. They include all interstate waters such as lakes, rivers, streams (including intermittent streams) and wetlands. Ephemeral streams are included if they have a clearly defined channel. |
| WORK | The entire construction required to be provided under the Contract Documents. Work includes all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment, all as required by the Contract Documents. |

200.03 Terminology

A. Intent of Terms

Whenever the terms “as allowed,” “as approved,” or terms of like effect are used, or the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect are used to describe an action or determination of the County Engineer as to the work, it is intended that such action or determination will be solely to evaluate the completed work for compliance with the requirements of and information in the Contract Documents. The use of any such term or adjective shall not be effective to assign to the County Engineer any duty or authority to supervise or direct the performance of the work or any duty or authority to undertake responsibility of the work.

B. Defective Work

The word “defective”, when modifying the word “work,” refers to work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to the County Engineer’s recommendation of final payment.

C. Furnish, Install, Perform, Provide

The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

The word “install”, when used in connection with services, materials or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

The words “perform” or “provide,” when used in connection with services, materials, or equipment shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.

Chapter Three Preliminary Engineering Plans

300.01 Purpose

The regulations of Chapter 3 outline the procedure which should be followed and information needed to determine what problems may be encountered in the final design and construction of improvements.

300.02 Procedure

A. Concept Plan (Subdivisions Only)

The Administrative Officer of the Planning Commission shall forward two (2) copies of the Concept Plan for a proposed subdivision to the County Engineer. The County Engineer shall review the Concept Plan within ten (10) working days and submit one (1) copy with comments and recommendations to the Administrative Officer prior to the Concept Plan meeting with the developer/subdivider.

Approval of the Concept Plan by the County Engineer is not an acceptance of the entire project. It is only an approval of a general concept, which should be used as a guide in the preparation of the preliminary engineering plans and construction plans.

B. Preliminary Plans

1. Subdivisions

The Administrative Officer of the Planning Commission shall forward two copies of the Preliminary Plans along with two (2) copies of the Preliminary Plat to the County Engineer. The County Engineer shall review the Preliminary Plans and the Preliminary Plat within ten (10) working days, and submit one (1) copy of each with comments and recommendations to the Administrative Officer prior to the Preliminary Plat meeting. The County Engineer shall stamp the plans and plat approved, approved as noted or disapproved.

Approval of the preliminary plans shall be effective for a period of one (1) year following the date of the approval, unless an extension of time is granted by Planning Commission. Upon expiration of the preliminary plans approval, no approval of the construction plans shall be given until the preliminary plans have been resubmitted and approved.

2. Infrastructure

The Owner or the Owner's Engineer shall submit two (2) copies of the Preliminary Plans for infrastructure projects to the County Engineer. The submission procedure shall be the same for new construction, replacement of existing facilities or improvements to existing infrastructure. The County Engineer shall review the plans within twenty (20) working days, and

forward the review comments and recommendations to the Owner with the plans stamped approved, approved as noted or disapproved.

300.03 Plan Requirements

A. Subdivisions

The Preliminary Plans shall be drawn to the same scale used on the Preliminary Plat. In addition to the information required by Subdivision Regulations, the following should also be provided:

1. Identification

- a. Name of subdivision.
- b. Location by township, range, and section.
- c. North arrow.
- d. Bar Scale.
- e. Date.
- f. Name, address, and telephone number of the developer/subdivider and the person or firm preparing the plan.
- g. Location or vicinity map at a scale of not less than 1 inch = 5,280 feet.
- h. Names of adjacent subdivisions, owners of adjoining parcels of unsubdivided land, and the location of their boundaries.

2. Existing Data

- a. Boundary lines showing bearings and distances and the method by which they were derived, as surveyed by a registered surveyor, or from deed records. Show corporation lines, township lines and section and lot lines where applicable and approximate acreage.
- b. Location, width, names and right of way of streets and railroads.
- c. Location, width and purpose of easements.
- d. Location of permanent buildings and parks.
- e. Location, size and type of all overhead and underground utilities.
- f. Subsurface conditions within the subdivision that are not typical; abandoned mines, wells, etc.
- g. Location of wooded areas, streams, wetlands, and other significant, topographic and natural features within and adjacent to the subdivision.
- h. Existing contours at an interval of not greater than two (2) feet if the slope of the ground is ten percent (10%) or less; and not greater than five (5) feet where the slope is more than ten percent (10%).

3. Proposed Data

- a. Location, right of way width and name of all streets.
- b. Location, width and purpose of all easements.
- c. Location and size of storm and sanitary sewers.
- d. Location and size of drainage structures.
- e. Location and size of water lines.

- f. Lot layout with temporary numbers, scaled dimensions and estimated area.
- g. Erosion and sedimentation control procedures and structures.
- h. Planned open space for parks, pedestrian trails, retention basins, etc.

B. Infrastructure

The Preliminary Plans for infrastructure projects shall include many of the requirements in the preceding section for subdivisions. The plans should be prepared using the format for plan preparation adopted by ODOT in their Highway Plan Location and Design manual.

1. Plan Components

All preliminary plans for infrastructure projects shall have the following minimum requirements:

- a. Typical Sections showing a cross-sectional view of the proposed installation after construction is completed. Sections should be drawn at the same scale horizontally and vertically and large enough to show proposed as well as existing features.
- b. Plan and Profile sheets showing what the area looks like before and after construction. The Plan view shall show all existing topographic features including property lines and utilities. The Profile view shall show the grade elevations of the existing ground before and after construction.

Sufficient information shall be shown on the preliminary plans to show the County Engineer the extent of the work to be performed.

Chapter Four Construction Drawings

400.01 Purpose

The regulations of Chapter 4 outline the procedure which should be followed and information to be provided to prepare construction drawings to build the proposed project.

400.02 Procedure

A. Subdivisions

The Administrative Officer of the Planning Commission shall forward two (2) copies of the Construction Plans, including all supporting data and documents to the County Engineer. The County Engineer shall review the plans within twenty (20) working days and stamp the plans approved, approved as noted or disapproved. The County Engineer shall return one (1) copy of the construction plans to the Administrative Officer with comments and recommendations.

After the construction plans have been revised and are approved by the County Engineer, the Administrative Officer shall submit two (2) copies of the Final Plat to the County Engineer. The County Engineer shall review the plat within ten (10) working days and stamp the plat approved, approved as noted or disapproved, and return one (1) copy to the Administrative Officer.

B. Infrastructure

All plans for public and private improvements, modifications, additions, etc., to the infrastructure in the unincorporated area of Huron County shall be submitted for review in accordance with the County's Engineering Code.

The Owner or the Owner's engineer shall submit two (2) copies of Construction Plans for infrastructure projects to the County Engineer. The County Engineer shall review the plans within twenty (20) working days and forward the review comments and recommendations to the Owner with the plans stamped approved, approved as noted or disapproved.

C. General

1. All construction drawings shall be prepared on 24" X 36" sheets of reproducible mylar.
2. Construction drawings shall be prepared and sealed by a registered Professional Engineer as the design engineer.
3. A minimum of three (3) complete sets of plans, one (1) full size and two (2) half-size, shall be submitted after all approvals have been given by the County. The plans and specifications shall also be submitted in a digital format compatible with the County's current edition of software.

4. Construction of any improvement shall not commence until the construction plans have been approved by the County Engineer.
5. At the end of the maintenance guaranty period, the owner/developer's engineer shall supply the County Engineer with one (1) full size set of record "as-built" construction plans printed on mylar. The record drawings shall show all changes made during construction.

400.03 Plan Requirements

The plan requirements shall be substantially the same for Subdivision and Infrastructure projects. The construction drawings should be prepared using the format for plan preparation given in the current edition of the ODOT Location and Design Manual, Volume Three, Highway Plans.

A. Title Sheet

A title sheet shall be provided when the construction drawings require more than one (1) sheet. A title block shall be placed in the lower right corner and the registered professional engineer responsible for the preparation of the drawings shall affix his registration stamp and signature to the title sheet. The title sheet should also contain the following information:

1. Project Name and Description.
2. Location Map showing general location of the project at a scale of not less than 1" = 5,280'.
3. Length of Project.
4. Index of Sheets.
5. Block with signature of approval by proper officials.
6. Traffic Maintenance or Detour if work involves existing highways.
7. Underground Utilities Note.

B. Schematic Plan

A schematic plan is optional on small projects. On large projects the plan shall show the geometric relationship of the proposed improvement to existing facilities. A schematic plan is not required for subdivisions.

C. Typical Sections

A typical section shall be shown for all projects. Subdivision and small Infrastructure projects can show the typical section on the title sheet or plan and profile sheet. Typical Sections shall show a cross-sectional view of the proposed installation after construction is complete. Sections should be drawn at the same

scale horizontally and vertically and large enough to show proposed as well as existing features.

On roadway infrastructure projects the typical section shall show the composition of the pavement and shoulders. It should show such items as surface and base courses, curb, curb and gutter, sidewalks and foreslope and backslope rates.

D. General Notes

General notes are plan notes that clarify construction items that are not satisfactorily covered by the specifications or plan details. They should be consistent with the intent and requirements of the plans. Notes that repeat provisions clearly covered by the Construction Drawings should be avoided. Subdivision and small infrastructure project notes may be shown on the Title sheet or combined with the General Summary sheet.

E. General Summary

The General Summary shall consist of a table of Estimated Quantities to be provided for all construction pay items. The table shall provide columns for Item Number, Quantity, Units and Description per the current edition of ODOT Construction and Material Specifications.

The owner/developer's engineer shall provide the County with a set of quantity calculations as part of the Construction Drawings submission, so the County Engineer may accurately determine an engineering cost estimate for the project.

F. Project Site Plan

The Project Site Plan shall consist of a topographic map of the area to be developed. It will generally have a scale of 1" = 50' for areas less than six (6) acres and 1" = 100' for areas greater than six (6) acres, but may vary depending on the project size and complexity. The map shall include the topography of all adjacent land within fifty (50) feet of the project boundary.

The Project Site Plan shall include all proposed disturbed areas. It is normally prepared by the designer and provided as part of the contract documents. The construction Contractor is responsible for modifying this plan to prepare a Storm Water Pollution Prevention Plan (SWPPP) meeting Ohio EPA and NPDES (National Pollutant Discharge Elimination System) requirements.

The following information and topographic and drainage details are to be shown on the plan:

1. A site description indicating the nature and type of construction activity.
2. The total area of the project (right-of-way or subdivision).
3. Contours at two (2) foot intervals if the slope of the ground is ten percent (10%) or less; and five (5) foot if the slope is greater than ten percent (10%).

Contour elevations shall be based on NGVD29 or NAVD88.

4. Existing and proposed utilities including storm sewers, sanitary sewers, water lines, gas lines, electric, telephone, cable, etc.
5. Surface features such as existing buildings, fences, and current land use such as woods, pasture, etc.
6. The approximate latitude and longitude of the center of the project.
7. The name and number of the USGS 7.5 minute quadrangle map that shows the project area.
8. Reference to Soil and Water Conservation maps covering the area of the project.
9. The location of the immediate receiving stream or surface water(s) and the subsequent named receiving water(s) within 300 feet of the proposed project or right-of-way. Also show all streams, lakes, ponds, wetlands and drainage structures within 300 feet.

The County Engineer may require downstream structures (roadway culverts and bridges) to be shown if it is determined that they may not be of a sufficient size to handle any increased volume of water as a result of runoff.

10. Permanent erosion control measures and permanent storm water management items.
11. The drainage area for each pipe or drainage structure shall be outlined and have the acreage shown. To show the entire drainage area an additional sheet may be required. If additional sheets are needed, existing aerial mapping or USGS mapping will be sufficient.
12. An approximate determination of the Rational Method runoff coefficient for both the pre-construction and post construction site conditions.
13. An estimate of the impervious (paved) area for both the pre-construction and post construction site conditions.
14. Permanent drainage items such as culverts, storm sewers, catch basins, etc.
15. Proposed flow arrows indicating the drainage patterns after construction.
16. Drive pipe sizes for subdivision lots shall be indicated for each lot or shown in tabular form.

G. Plan and Profile Sheets

Plan and Profile sheets show what an area looks like before and after construction. The Plan view shall show all existing topographic features. The Profile view shall show the existing and proposed ground elevations. In addition, the sheets shall

show dimensions and other items required to lay out and construct the project, including benchmarks.

1. Scales

Use one (1) inch equals twenty (20) feet for the horizontal scale and one (1) inch equals five (5) feet for the vertical scale.

2. Plan

All existing features should be shown, and the disposition of all such items within the existing and/or proposed right-of-way or easement should be indicated. Existing features, except buildings, should be shown using dashed lines. Listed below are many of the existing items that should be shown on the plan portion of the Plan and Profile sheets.

- a. Topographic features including trees and stumps having a diameter of 12 inches or larger, shrubs, streams, ditches, lakes, ponds, buildings, wells, cisterns, underground tanks, fences, signs, etc.
- b. Roadway information items including centerline stationing right-of-way lines, curve data, road names, property lines, easements, and lot numbers, etc.
- c. Roadway physical items including pavement, curbs, treated shoulders, drives, gutters, storm and sanitary sewers, bridges, culverts, guardrail and other proposed or existing utilities.
- d. Overhead and underground utilities.
- e. Benchmarks with description and elevation.

3. Profile

- a. Centerline stationing, original ground elevations every 25 feet along the centerline, and proposed profile grade for roadways.
- b. Vertical curve data and sight distance data for roadways.
- c. Storm and sanitary sewers, bridges, culverts, and other proposed or existing utilities.

H. Cross Section Sheets

Cross Section sheets are used to show end areas and surface dimensions for the calculation of earthwork and seeding quantities. They should be shown as often as necessary to accurately determine the character and extent of the proposed work. They shall also show the following information:

1. Cross sections shall be plotted on a 1" x 1" grid system using a scale of 1" = 5' horizontally and vertically. They shall be laid out so that the stationing increases from bottom to top of the sheet.
2. Intervals between sections should normally be 50 feet. Intervals of 25 feet should be used in urban areas or where greater detail is required. Additional sections are required at drives.
3. Existing ground and other features shall be shown in dashed lines. Proposed section are to be shown in solid lines. Each section shall be identified by station number, existing ground elevation and proposed grade elevation.
4. At the right side of each cross section sheet there should be columns for end areas in square feet and earthwork volumes in cubic yards for both cut and fill. Each sheet should have a summation of earthwork quantities at the bottom.
5. At the left side of each cross section sheet there should be columns showing the width in feet and seeding area in square yards. Subtotals for seeding quantities should be shown at the bottom of each sheet.
6. Existing and proposed drainage facilities should be shown on Cross Section sheets. This includes ditches, culverts, headwalls, inlets, manholes, drive pipes, underdrains, and other longitudinal drainage items. Ditch flowline elevations should be shown. Existing facilities to be removed or abandoned should also be shown.

I. Drainage Detail Sheets

Detailed drawings of all bridges and other drainage structures (other than standard culvert pipe without headwalls) shall be provided in the construction drawings. On smaller projects, culverts are shown on the Plan & Profile Sheets (plan view) and the Cross Section sheets.

400.04 Final Plat Requirements

Information on the final plat shall conform to the pertinent sections of the Land Conveyance Standards and Requirements for Approval of Deed Descriptions, Surveys and Survey Plats in Huron County.

The name of the subdivision must not duplicate the name of other subdivisions in the county and shall be the same name as used on the preliminary plat. If a subdivision is

developed in phases, each phase shall be numbered consecutively in the title, after the initial plat (i.e. Smith Estates No. 2). The word "phase" shall not be used in the title. If a replat of an already recorded allotment, the name and lot numbers of the original plat shall be indicated.

The final plat shall show the total acreage of land platted, total acreage of streets dedicated and total acreage of lots platted, number of lots, and acres in parks and other public or similar open space uses. Acreage of each individual lot shall also be set out, either on the lot or in a chart.

A restriction shall be placed on the final plat only allowing access for corner lots from the proposed subdivision streets.

Chapter Five Agreements, Guaranties and Insurance

500.01 Purpose

The regulations of Chapter 5 inform Developers and Contractors of the agreements, guaranties and insurances required during the construction and maintenance period.

500.02 Subdivision Development Agreement and Guaranty

All Major Subdivisions and Commercial and Industrial Subdivisions are required to submit a Development Agreement to the Administrative Officer of the Huron County Planning Commission upon application for Preliminary Plat approval. The Development Agreement guaranties that the Developer will install all improvements shown on the Construction Plans for the proposed subdivision in accordance with the Huron County Engineering Code. The County Commissioners and the Developer shall execute a Development Agreement prior to approval and recording of the Final Plat.

See Figure 5-1 for the recommended format of a Development Agreement.

Two types of Subdivision Agreement are available to the Developer. An agreement without guaranty and an agreement with guaranty.

A. Agreement without Guaranty

The Developer agrees to construct the proposed subdivision in accordance with the Preliminary Plat approved by Planning Commission and the construction plans approved by the County Engineer. Upon completion of all work subject to the inspection and approval of the County Engineer, including installation of all utilities, the Developer may apply for Final Plat approval and recording, which will allow the transfer of ownership of any lot or parcel.

B. Agreement with Guaranty

The Developer agrees to provide a financial guaranty to the County Commissioners to obtain Final Plat approval prior to construction of the subdivision. Use of this type of agreement will require the Developer to execute a Performance Guaranty Agreement with the County Commissioners in addition to the required Development Agreement. The Performance Guaranty Agreement shall include the following:

1. The type of financial guaranty shall be cash escrow.
2. The amount of financial guaranty shall be in an amount equal to one hundred thirty percent (130%) of the County Engineer's estimate of cost for the completion of all remaining improvements at the prevailing construction rate. The funds in the escrow shall be used for the sole purpose of guarantying all costs associated with the

construction of the improvements and shall be assigned to the Board of County Commissioners.

3. The terms of the financial guaranty shall be made for a period of one (1) year from the date of the Performance Guaranty Agreement. The County Commissioners may extend the guaranty term if they determine that weather conditions or other unusual factors have caused a delay.
4. Partial release of the funds in escrow may be requested by the Developer upon partial completion of the improvements to the satisfaction of the County Engineer. Upon recommendation by the County Engineer, the County Commissioners may authorize the County Treasurer to disburse a portion of the escrow deposit back to the Developer. Partial releases of the escrow shall not total more than 50% of the original construction estimate.
5. Release of guaranty by the County Commissioners may be made upon written request of the Developer. The County Engineer shall make an inspection of the subdivision to check if all improvements have been completed. If all improvements have been completed to the satisfaction of the County Engineer, the Engineer shall report to the County Commissioners and recommend the amount and terms of the required Maintenance Guaranty Agreement.
6. The Developer shall be responsible for the maintenance of the improvements installed and for providing the services necessary to guaranty access to all the occupied lots, including snow removal. Private improvements including, but not limited to, natural gas, electric, telephone, cable television, yard enclosures and drive pipe are the responsibility of the Developer and shall be completed according to the plans approved by the County Engineer.

The Developer and the County Commissioners agree that the subdivision improvements referred to by this agreement shall remain private and only become public upon the recommendation of acceptance by the County Engineer and the approval and acceptance by resolution of the Board of County Commissioners.

See Figure 5-2 for the recommended format of a Performance Guaranty Agreement.

C. Maintenance Guaranty Agreement

At the time of final acceptance of the improvements within the subdivision, the Developer shall furnish the County Commissioners with a maintenance guaranty. The minimum period of the guaranty shall be for a period of eighteen (18) months, but may be greater as determined by the County Engineer, to insure that improvements will hold up under actual conditions, to guaranty the maintenance of the improvements, and to provide the service

necessary to guaranty access to all occupied lots, including snow removal. The Maintenance Guaranty Agreement shall include the following:

1. The type of maintenance guaranty shall be cash escrow.
2. The amount of maintenance guaranty shall be an amount as determined by the County Engineer. The amount shall take into consideration soil conditions, topography features, and current costs of labor and materials. The minimum amount of the bond shall not be less than ten percent (10%), but may be greater as determined by the County Engineer, of the Developer's original estimate of cost as approved by the County Engineer for the completion of all remaining improvements at the prevailing construction rate.
3. The term of the maintenance guaranty shall be for a minimum period of eighteen (18) months, which in the opinion of the County Commissioners is a just and fair time to determine that all improvements are adequate and constructed satisfactorily. If necessary, the County Engineer shall recommend a period greater than eighteen (18) months.
4. The Developer shall be responsible for routine maintenance and repair of any damages that are a result of faulty construction, erosion, work by utility companies, damages caused by home construction, or any other reason. Maintenance shall also include snow removal, mowing, ditch cleaning, etc. Prior to the end of the maintenance period, all improvements shall be restored to the satisfaction of the County Engineer.
5. After construction of all improvements, and before the release of the maintenance guaranty, the developer shall obtain a certification from a registered surveyor that all monuments on the final plat have been set or verified as of the date of certification.
6. Prior to the release of the maintenance guaranty the County Engineer shall make an inspection of the improvements at the end of the terms of the agreement. The funds in the escrow shall be used for the sole purpose of guarantying the maintenance of the improvements and shall be assigned to the County Commissioners. The County Commissioners agree that any funds remaining on deposit in the Performance Escrow for this subdivision may be used toward the Maintenance Guaranty; and the County Treasurer will release any funds, including any interest earned, above and beyond the required maintenance amount to the Developer. If the Developer fails to perform any required maintenance to the complete satisfaction of the County Engineer, the County Treasurer shall make funds available to the County Engineer to complete the required maintenance.

7. The County Engineer shall promptly make the inspection for the release of the maintenance guaranty at the end of the eighteen (18) month period, as weather conditions allow for an inspection to be performed. Release of the maintenance guaranty shall be

recommended by the County Engineer to the Board of Commissioners upon receipt of the "As Built" drawings required in Section 400.02, C.4, payment of all inspection fees and completion of all work.

See Figure 5-3 for the recommended format of a Maintenance Guaranty Agreement.

500.03 Infrastructure Construction Agreement and Guaranty

All infrastructure projects in the unincorporated area of Huron County shall be undertaken using an agreement in the form of a Contract between the Owner or the Owner's Contractor and the Huron County Commissioners. The guaranty for all infrastructure projects shall be in the form of a Performance Bond between the Contractor and their Surety Company. The guaranty for large projects which require competitive bids shall be in the form of a Bid and Performance Bond.

500.04 Insurance

The Developer and/or Contractor shall carry insurance in a form approved by the County Prosecutor to indemnify and save harmless the County from any and all liability arising from conditions, which may arise or grow out the construction and maintenance of any improvements. This insurance shall in no case be allowed to expire earlier than the effective period of the required Maintenance Guaranty. A current copy of said insurance policy shall remain with the Clerk of the County Commissioners at all times.

The Developer and/or Contractor shall procure and maintain insurance for liability for damages imposed by law and assumed under their agreement with the County, of the kinds and in the amounts hereinafter provided from insurance companies authorized to do business in the State of Ohio Department of Insurance.

The Developer and/or Contractor shall either require each of their Subcontractors to maintain during the life of their Agreement with the County, the liability insurance hereafter provided or alternatively, secure coverage of the type and in the amounts required under their insurance policy to cover each subcontractor.

A. Worker's Compensation Insurance

The Developer and/or Contractor shall comply with all provisions of the laws and rules of the Ohio Bureau of Worker's Compensation covering all operations under their Agreement with the County whether performed by it or its Subcontractors.

B. Commercial General Liability Insurance

The minimum limits for liability insurance are as follows:

| | |
|--|-------------|
| General Aggregate Limit | \$2,000,000 |
| Products – Completed Operations Aggregate Limit | \$2,000,000 |
| Personal and Advertising Injury Limit | \$1,000,000 |
| Each Occurrence Limit | \$1,000,000 |

The Developer and/or Contractor shall obtain the above minimum coverages through primary insurance or any combination of primary and umbrella insurance.

C. Comprehensive Automobile Liability Insurance

The Comprehensive Automobile Liability policy shall cover owned, non-owned, and hired vehicles with minimum limits as follows:

| | |
|--|-------------|
| Bodily Injury and Property Damage Liability Limit Each Occurrence | \$1,000,000 |
|--|-------------|

Insurance coverage in the minimum amounts set forth neither relieves the Developer and/or Contractor from liability in excess of such coverage, nor precludes the County from taking such other actions as are available to it under any other provisions of the Agreement or otherwise in law.

Clearly set forth all exclusions and deductible clauses in all proof of insurance submitted to the County. The Developer and/or Contractor is responsible for the deductible limit of the policy and all exclusions consistent with the risks it assumes under the Agreement and as imposed by law.

If the Developer and/or Contractor provides evidence of insurance in the form of certificates of the insurance, valid for a period of time less than the period during which the Developer and/or Contractor is required by terms of this Agreement, then the County will accept the certificates, but the Developer and/or Contractor is obligated to renew its insurance policies as necessary.

If the Developer and/or Contractor fails or refuses to renew its insurance policies or the policies are canceled or terminated, or if aggregate limits have been impaired by claims so that the amount available is under the minimum aggregate required, or modified so that the insurance does not meet the above requirements, the County may refuse to pay any monies due under their Agreement. The County may use monies retained to renew or increase the insurance as necessary for the periods and amounts referred to above. Alternatively, should the Developer and/or Contractor fail to comply with these requirements, the County may default the Developer and/or Contractor and call upon their Surety to remedy any deficiencies.

During any period when the required insurance is not in effect, the County Engineer may suspend performance of the Agreement. If the Agreement is so suspended, the Developer and/or Contractor is not entitled to additional compensation or an extension of time.

DEVELOPMENT AGREEMENT*

This agreement executed on this _____ day of _____ by and between _____, hereinafter called “Developer”, pertaining to a proposed subdivision known as _____, located in _____ Township, Section _____, Great Lot _____, Tract _____. Said proposed subdivision plat is to be duly recorded with the County Recorder of Huron County as soon as possible and the Board of Commissioners of Huron County, Ohio, hereinafter called the “County Commissioners”, is governed by the following conditions and considerations, to wit:

1. Developer is to construct, install or otherwise make all improvements shown and set forth to be done and performed in accordance with the engineering drawings and specifications, which are herein incorporated by reference and are part of this agreement, subject to the inspection and approval of the County Engineer. Private improvements including but not limited to natural gas, electric, telephone, cable television, yard enclosures and drive pipes are the responsibility of the Developer and shall be completed according to the plans referenced herein.
2. Developer shall not transfer any lot, parcel or tract therefrom nor proceed with any construction work on the proposed subdivision including grading that may affect the arrangements of streets or other public improvements until compliance with the requirements in the Subdivision Regulations.
3. Developer shall notify the County Engineer forty-eight (48) hours before the start of any construction for inspection purposes in accordance with the Engineering Code.

If guaranty is allowed, Paragraph 4 shall be included in this agreement:

4. Developer shall furnish a performance guaranty in the form of an escrow deposit with the County Treasurer along with an approved Performance Guaranty Agreement.

If guaranty is NOT allowed, Paragraph 4 shall be deleted and the following paragraphs renumbered accordingly.

5. Developer shall hold Huron County free and harmless from any and all claims for damages of every nature arising or growing out of the construction of such improvements.
6. Developer shall begin work within 30 days from the date of this Development Agreement and all improvements are to be approved by the County Engineer within a period of one year from the date of this agreement, which is hereby fixed by said County as a reasonable period, but an extension of time may be granted if approved by the County Commissioners.

FIGURE 5 – 1 SAMPLE DEVELOPMENT AGREEMENT

To the Developer:

(_____)

In Witness Whereof, the parties have hereunto set their hands as follows:

Developer

Developer

Commissioner

Commissioner

Commissioner

ATTEST:

Approved as to form

Huron County Prosecuting Attorney

*** All major subdivisions are required to submit a Development Agreement per Subdivision Regulations Section 206.02, I.**

PERFORMANCE GUARANTY AGREEMENT – PUBLIC IMPROVEMENTS*

This Agreement made and entered into this _____ day of _____, pursuant to Chapter 711, Revised Code of Ohio, by and between, _____, hereinafter called “Developer”, and the Board of Huron County Commissioners, hereinafter called “County Commissioners”.

WHEREAS, the Developer has entered into a Development Agreement with the County Commissioners, dated _____ pertaining to a proposed subdivision known as _____ located in _____ Township, Huron County, Ohio and

WHEREAS, in furtherance of said Development Agreement said subdivision will be duly recorded with the County Recorder of Huron County, Ohio on _____, and

WHEREAS, in furtherance of said Development Agreement the Developer will be responsible for improvements associated with said proposed subdivision, and

WHEREAS, the County Engineer has submitted an engineer’s estimate for cost of subdivision improvements, attached hereto as Exhibit A, for said subdivision improvements in the amount of \$_____.

NOW THEREFORE, in consideration of the foregoing premises and to ensure the faithful performance of said Development Agreement, the Developer will undertake the following:

1. Developer shall deposit \$_____ in escrow with the Huron County Treasurer to secure the performance of the construction of the improvement associated with the subdivision. The escrow deposit shall be of sufficient funds to cover 130% of Exhibit A.
2. The funds in said escrow shall be used for the sole purpose of guarantying all costs associated with the construction of the improvements and shall be assigned to the County Commissioners.
3. The Developer shall be free to select contractors and suppliers of Developer’s own choosing.
4. Developer may request partial release of the funds in escrow upon partial completion of the improvements to the satisfaction of the County Engineer. Upon recommendation by the County Engineer, the County Commissioners may authorize the County Treasurer to disburse a portion of the escrow deposit back to the Developer. Partial releases of the escrow shall not total more than 50% of the original construction estimate (\$_____).

FIGURE 5 – 2 SAMPLE PERFORMANCE GUARANTY AGREEMENT

In Witness Whereof, the parties have hereunto set their hands as follows:

Developer

Developer

Commissioner

Commissioner

Commissioner

ATTEST:

Approved as to form

Huron County Prosecuting Attorney

*** All major subdivisions allowed to guaranty in place of completed construction shall be required to provide a Performance Guaranty Agreement.**

MAINTENANCE GUARANTY AGREEMENT – PUBLIC IMPROVEMENTS*

This Agreement entered into this _____ day of _____, by and between _____, hereinafter called “Developer”, and the Board of Huron County Commissioners, hereinafter called “County Commissioners”.

WHEREAS, the Developer is about to complete all improvements in _____ Township, as recorded in Huron County Record of Plats, Volume _____ and Page _____; known as _____ Subdivision, and

WHEREAS, a Maintenance Guaranty is required at the time of acceptance of the improvements by the County Engineer.

NOW THEREFORE, the parties agree as follows:

1. Developer guaranties that all improvements are in satisfactory condition and agrees that Developer will repair, at their sole cost, all failures or damages as soon as same become apparent.
2. Developer shall be responsible for all maintenance of all improvements installed as a result of the Development Agreement including but not limited to snow removal, mowing, ditch cleaning, etc.
3. The Developer shall be in breach of the Maintenance Guaranty Agreement should the Developer fail to complete or cause to be undertaken any required maintenance upon the improvements.
4. Upon County Engineer discovery of a breach of this agreement, the County Engineer shall notify the Developer and the County Commissioners. The Developer shall respond with a plan of action within two (2) weeks from notice of deficiencies and any defects shall be cured within four (4) weeks of said notice.
5. Failure to comply with the terms of Paragraph 4 shall result in the Developer being found to be in breach of this agreement by the County Commissioners. The County Commissioners may use the escrow deposit to complete the maintenance associated with _____ subdivision, and the County Treasurer shall make the escrow deposit available for such use.
6. All improvements shall be in a condition acceptable to the County Engineer at the end of the maintenance period which shall be _____ months (see note a) from the date of execution of this agreement.
7. Developer shall deposit \$_____ (see note b) in escrow with the Huron County Treasurer to secure the maintenance of the subdivision public improvements.

In Witness Whereof, the parties have hereunto set their hands as follows:

Developer

Developer

Commissioner

Commissioner

Commissioner

ATTEST:

Approved as to form

Huron County Prosecuting Attorney

Note a: This period shall be a minimum of eighteen (18) months but may be greater as determined by the County Engineer.

Note b: This amount shall be a minimum of ten (10) percent of Exhibit A but may be greater as determined by the County Engineer.

*** All subdivisions will be required to provide a Maintenance Guaranty Agreement and will be allowed to submit the final plat for approval and recording at the time of acceptance by the County Engineer.**

Chapter Six Roadway Design Standards

600.01 Purpose

The regulations of Chapter 6 present the minimum design standards which control the design and arrangement of roads. The standards are flexible for the purpose of coordinating design and topography in a feasible and economical manner. However, any variance from these standards must be approved by the County Engineer.

Roadway plans shall be designed using the latest edition of the Ohio Department of Transportation Location and Design Manual Volume One and Three, the American Association of the State Highway and Transportation Officials "A Policy on Geometric Design of Highways and Streets", the Ohio Department of Transportation Standard Roadway Construction Drawings, the Ohio Department of Transportation Construction and Material Specifications, the Huron County Land Use Plan, the Huron County Engineering Code and the Huron County Subdivision Regulations.

The location of all roads shall conform to the Huron County Land Use Plan. The design of all proposed roads shall provide for the continuation of existing roads and access to adjacent undeveloped land, so that the entire area can be served with a coordinated street system.

600.02 Road Classification

Road classification is the designation of streets and highways into systems according to the function they perform. ODOT and Huron County use a functional classification system based on the Federal Functional Classification developed by the Federal Highway Administration (FHWA). The Federal Functional Classification system uses different classifications and criteria for urban and rural areas. The boundary division between urban and rural classification is established by ODOT and the FHWA based on the urban and urbanized area boundaries established by the U.S. Census Bureau. The Federal Functional Classification system undergoes a comprehensive review after each Census.

AASHTO defines urban areas as municipalities or other census designated places having a population of 5,000 or more. ODOT defines urban areas as incorporated municipalities with a population of 2,500 or more. It also includes unincorporated areas having a census designation of more than 2,500 persons. Rural areas are those outside the boundaries of urban areas. ODOT publishes a map that show the functional classification of all roads in Huron County. Any roads not shown on the map would be classified as local single family residential.

This Chapter will only pertain to rural functional classifications. In the past, geometric design criteria and capacity levels have traditionally been based on a classification of traffic volume ranges. Under such a system, highways with comparable traffic volumes are constructed to the same criteria and provide identical levels of service, although there may be considerable difference in the functions they serve. Under a functional classification system, design criteria and level of service vary according to the function of the highway facility.

A. Arterials

An arterial carries primarily through traffic. It is usually a continuous route carrying heavy loads and large volumes of traffic. Arterials are expected to provide a high degree of mobility for the longer trip length. Therefore, they should provide a high operating speed and level of service. Since access to abutting property is not their major function, some degree of access control is desirable to enhance mobility.

B. Major Collector

A major collector conducts traffic between arterials and major centers of activity. This may include major routes between industrial, commercial, or agricultural areas, which carry a relatively large volume of traffic.

C. Minor Collector

A minor collector provides access from local roads and residential streets to major collectors or areas of major activity. Collectors serve a dual function in accommodating the shorter trip and feeding the arterials. They should provide some degree of mobility and also serve abutting property. Thus, an intermediate design speed and level of service is appropriate.

D. Local

A local road primarily provides access to and from a single family residential area, or to and from an area with a combination of single family and multi-family dwelling units. Local roads and streets have relatively short trip lengths, and because property access is their main function, there is little need for mobility or high operating speeds. This function is reflected by use of a lower design speed and level of service.

E. Commercial and Industrial

A commercial or industrial road provides access to and from an area that is predominately commercial or industrial in nature, or has the potential to become so in the near future.

F. Local Residential

Roads within a single family residential area or an area with a combination of single family and multi-family dwelling units.

600.03 Design Traffic Volume

Roads should be designed for a specific traffic volume and a specified acceptable level of service. The average daily traffic (ADT) volume, either current or projected to some future design year, should be the basis for design.

The population growth in Huron County from 1980 to 2000 was 8.9 percent (8.9%). The recommended future ADT volume for Huron County roadways is the existing ADT plus 10 percent (10%).

600.04 Design Speed

Design speed is a selected speed used to determine the various design features of the roadway. Geometric design features should be consistent with a specific design speed selected as appropriate for environmental and terrain conditions. Designers should select the design speed based on traffic volume and type of terrain as outlined in AASHTO's publication "A Policy on Geometric Design of Highways and Streets".

Design speed is not a major factor for residential subdivision streets, where closely spaced intersections usually limit vehicle speed. The design speed on residential streets should not exceed twenty five (25) mph.

600.05 Alignment

A. Horizontal Alignment

Horizontal alignment should be designed considering the environmental impact, topography, terrain, design traffic volume, and the amount of reasonably obtainable right-of-way. Sudden changes between curves of widely different radii or between long tangents should be avoided. A tangent of at least two hundred fifty (250) feet should be introduced between reverse curves on arterial and collector roads and at least one hundred (100) feet on local roads.

The alignment of streets in residential areas should be arranged to discourage through traffic. Street alignment in commercial and industrial areas should be as direct as possible.

Residential street curves should be designed with as large a radius curve as practical, with a minimum radius of one hundred eighty (180) feet for a twenty five (25) mph design speed. Where curves are superelevated, lower values may apply, but the radius should not be less than one hundred forty five (145) feet for a twenty five (25) mph design speed.

B. Vertical Alignment

1. Minimum Grades

A minimum grade of four tenths of one percent (0.4%) shall be used on all roads except when approved otherwise by the County Engineer.

2. Maximum Grades

The preferred maximum grade for all roads, including commercial and industrial subdivision streets, is six percent (6%), except where due to

unusual terrain situations the County Engineer agrees to permit an increase.

The maximum grade permitted for residential subdivision streets is ten percent (10%).

3. Sight Distance

For safety purposes, roadways should be designed to provide sight distance of sufficient length, so that drivers can stop their vehicles to avoid striking an unexpected object.

Profile grades shall be connected by vertical curves to provide adequate stopping sight distance for the required design speed. To determine the the minimum length of a vertical curve, refer to AASHTO's publication "A Policy on Geometric Design of Highways and Streets".

600.06 Roadway Typical Section

The design elements for the various roadway components are as follows:

A. Cross Slope

Pavement cross slope should be adequate to provide proper drainage. The recommended cross slope is ¼ inch per foot.

Superelevation of the roadway slope may be necessary depending on the design speed and the radius of the horizontal curve. Flat horizontal curves need little or no superelevation. Refer to ODOT Location and Design Manual, Volume One, for maximum degree of curve without superelevation.

The recommended maximum rate of superelevation is six percent (6%). A superelevation rate of four percent (4%) is acceptable on low-volume roadways. Superelevation usually is not provided on low-speed subdivision streets.

B. Pavement Width

1. The minimum pavement width for county roads shall be two lanes having a width of twenty two (22) feet.
2. The minimum pavement width for township roads shall be two lanes having a total width of twenty (20) feet.
3. The minimum pavement width for subdivision streets shall be twenty four (24) feet. This width does not include curb and gutter width or shoulder width. See Figures 6 – 1, 6 – 2, 6 – 3 and 6 - 4.

The pavement width for commercial and industrial streets may need to be increased if determined necessary by the County Engineer.

C. Shoulders

A shoulder is the portion of the roadway that accommodates stopped vehicles, emergency use, and lateral support of base and surface courses.

The shoulder width is measured from the edge of the pavement to the point of intersection of the shoulder slope with the embankment slope or the roadside ditch foreslope. The recommended shoulder slope is one (1) inch per foot. The width of shoulder shall be five (5) feet for county roads, four (4) feet for township roads and six (6) feet for rural subdivision streets.

On low volume roads and subdivision streets the shoulder is graded and seeded. On collector roads, all or part of the shoulder may be paved or stabilized.

D. Sideslopes

Foreslopes should be as flat as possible. The recommended foreslope is four feet horizontal to one foot vertical (4:1). Slopes 3:1 or steeper should only be used where site conditions do not permit use of flatter slopes. The steepest foreslope permitted is 2:1 and will require the use of guardrail or other barrier protection.

Backslopes shall be 3:1 or flatter to accommodate lawn maintenance equipment. Backslopes steeper than 3:1 should be evaluated for soil stability to prevent erosion. Small retaining walls may be needed if backslopes are steeper than 2:1. See Figure 6 - 3.

E. Right of Way

The minimum right of way width for new roads will normally be sixty (60) feet. The right of way width may be increased from sixty (60) to one hundred (100) feet for arterial and major collector roadways. This minimum width may also be varied if the County Engineer deems it necessary to conform with topographic, construction, and drainage features. The road right of way shall be cleared of trees and all obstructions for its full width, unless approved otherwise by the County Engineer.

600.07 Parking Lanes

Although on-street parking constitutes a safety hazard and impedes traffic flow, parallel parking on one side has been provided for in the minimum pavement width. In commercial and industrial areas, where parking is usually provided on both sides, an additional eight (8) feet of pavement width shall be provided.

Off-street parking for all subdivisions shall meet the number and setback requirements stated in the Subdivision Regulations. The layout and dimensions of off-street parking spaces are shown on Figure 6-9.

600.08 Medians

Medians may be provided on local residential streets to enhance the environment and to act

as buffer strips. Median openings should be situated only where there is adequate sight distance. The shape and length of median openings are to be designed based on the width of median and the vehicle types to be accommodated.

600.09 Curbs

Streets are designed with curbs to allow for greater use of available width, control of drainage, protection of pedestrians, traffic control and safety. The preferred type of curb is the combination concrete curb and gutter section shown as Type 2 in Figure 6 - 6. The Type 3 integral curb shall be used only with the concrete pavement section. The Type 1 concrete curb may be used to match existing installations. Use of the Type 1 curb for new roadways will require an additional two (2) feet of lane width.

600.10 Sidewalks

Sidewalks are to be provided on both sides of all urban type residential streets. Sidewalks shall be made of concrete four (4) inches thick (six (6) inches thick through driveways) and at least four (4) feet wide. In areas, which have high pedestrian traffic, such as schools, parks and commercial areas, sidewalks may need to be wider than four (4) feet as determined by the Huron County Planning Commission. Sidewalks through drives shall be reinforced using 6 x 6 x 4 roadway mesh, and shall be placed on three (3) inches of aggregate base.

600.11 Curb Ramps

Handicap access ramps or curb ramps are to be installed at all intersections to accommodate persons with disabilities. Curb ramps shall extend from the sidewalk to the curb. They shall have a minimum width of four (4) feet and minimum thickness of six (6) inches of concrete on three (3) inches of aggregate base. They shall be sloped to meet the requirements of the latest Americans With Disabilities Act.

600.12 Ditches

The minimum bottom width of a roadside ditch shall be six (6) inches. The bottom ditch width, the depth of ditch and the slope of the ditch shall be determined by a registered design engineer. The minimum ditch slope permitted is four tenths percent (0.4%).

600.13 Pavement Composition

The minimum thickness and composition of materials for roadways shall consist of the courses shown on Figures 6 – 1 through 6 - 5. This item number refers to the latest edition of ODOT Construction and Material Specifications. The material requirements and installation procedures for all items shall conform to the ODOT Construction and Material Specifications. Each course of material shall be inspected and approved by the County Engineer before placement of the next succeeding course.

The pavement thickness and composition for commercial and industrial streets may need to be increased if determined necessary by the County Engineer.

600.14 Intersections

The design criteria for intersections where two or more roads join or cross shall consider the following elements:

A. Alignment

1. Horizontal Alignment

Roads shall be laid out to intersect as nearly as possible at right angles. No road shall intersect any other road at an angle of less than seventy degrees (70°). Intersections on curves should be avoided because of reduced sight distance.

2. Vertical Alignment

The grades of intersecting roads should be as flat as practical, with six percent (6%) being the maximum and three percent (3%) being the desired maximum grade. Grade changes at intersections should be avoided.

3. Proximity

Intersections should not be spaced closer than one hundred fifty (150) feet apart.

B. Sight Distance

1. Vertical Control

The stopping sight distance for intersections is the same as the stopping sight distance for open roadways, and can be found in the AASHTO publication "A Policy on Geometric Design of Highways and Streets". This publication also lists values of the rate of vertical curvature (K), which is used to determine the length of sag and crest vertical curves.

2. Horizontal Control

The line of sight along the centerline of the inside lane of a curve shall be clear of obstructions for a distance that equals or exceeds the stopping sight distance. Obstructions would include items such as buildings, walls, fences, sideslopes and landscaping.

C. Radius

The edge of pavement radius depends upon the type and size of vehicle making the turning movement. The minimum radius for low volume residential streets with predominantly passenger vehicles is twenty five (25) feet. The radius for county and township local roads should be fifty (50) feet. Intersection designs using tapers or three center curves may have lesser radii. The minimum radius for commercial or industrial subdivisions shall be approved by the County Engineer.

600.15 Permanent Dead-End Street

A permanent dead-end street is a street that is not designed for further extension in the future. It is a local street open at one end only shall have a circular turning area at the closed end known as a cul-de-sac. The outer edge of pavement shall have a minimum radius of fifty five (55) feet. See Figure 6 – 7. Cul-de-sacs with an island in the middle are not permitted.

600.16 Temporary Dead-End Street

A temporary dead-end street is a street that is designed for future extension to adjacent property or to provide access to an adjacent property. It shall be provided with a temporary T-type turnaround. The composition of the turnaround shall be the same as the adjacent roadway. The portion of the turnaround outside the pavement limits shall be removed when the road is extended. The developer extending the street shall be responsible for removing the existing pavement, bringing it to proper grade and seeding. See Figure 6 - 8.

600.17 Guardrail

Guardrail or guard posts will normally be required for all embankments six (6) feet or higher. However, if the foreslope is 3:1 or flatter, guardrail is not required regardless of the embankment height. All guardrail or guard posts shall be shown on the construction drawings as to type and location. Installation shall conform to current ODOT standards.

600.18 Traffic Control

All pavement markings, as required by the Ohio Manual of Uniform Traffic Control Devices (OMUTCD), shall be applied and paid for by the Owner/Developer.

All necessary traffic signs and street signs are to be erected by the County Engineer, and the cost of the signs and labor shall be paid for by the Owner/Developer. The signs shall conform to standards set forth in the OMUTCD.

600.19 Lighting

The Owner/Developer shall contact the Township Trustees to see if street lighting is necessary. Required lighting shall follow the guidelines as adopted by the Township Trustees and the power company in the development area.

600.20 Planting Screens or Fences

Planting screens or fences may be required by the Planning Commission for subdivisions located near commercial and industrial facilities or hazardous natural features. They may also be required where reverse frontage lots abut a major arterial or collector street or between a major arterial thoroughfare and marginal access street. Such planting screens or fences shall not constitute a safety hazard. Planting screens, fences and entrance signs shall not be placed in sanitary sewer, waterline and utility easements, or cause street intersections to not meet intersection sight distance requirements. A plan of proposed planting screens or fences shall be submitted for approval with the construction drawings.

600.21 Bike Paths

Bike paths, where required by the Huron County Planning Commission, shall be located in perpetual unobstructed easements having a minimum easement width of ten (10) feet. The path shall have a minimum width of six (6) feet. Paths shall be designed having a smooth continuous surface with a maximum grade of eight percent (8%). They shall be constructed with a transverse crown sufficient to keep water from ponding on the path.

Bike paths shall have a minimum thickness of four (4) inches of Item 304 Aggregate Base on a compacted subgrade. The surface of the path shall be a compacted layer of No. 8 crushed limestone or asphalt concrete having a thickness approved by the County Engineer. Dirt bike paths are not permitted.

Drainage shall be provided along the bike path such that storm water runoff does not flow across the surface of the path. Small culverts or drain pipes shall be installed under the bike path wherever needed to accommodate a two (2) year storm frequency for uphill runoff.

Bike paths shall have appropriate information signs and warning signs at all roadway intersections.

600.22 Monuments

The centerline of right-of-way shall be monumented at the P.C. and P.T. of horizontal curves, angle points and at centerline intersections of side roads. The monuments shall be constructed as per ODOT Standard Roadway Construction Drawing RM – 1.1. All monuments shall be set and written certification sent to the Huron County Engineer by a professional surveyor, registered in the State of Ohio. Monument boxes shall be East Jordan 8365 Heavy Duty monument or approved equal. No risers shall be used. Old, broken or non-conforming monument boxes shall be removed and replaced.

600.23 Utilities

Utility lines should be located to minimize the need for later adjustment, to accommodate future highway or street improvements, and to permit servicing such lines with minimum interference to traffic. Utility lines crossing highways should cross on a line generally normal to the highway alignment. Those utility crossings that are more likely to need future servicing shall be encased to permit servicing without disrupting the traffic flow.

On urban type streets the utilities should be located between the curb and sidewalk. When electrical power cables are installed underground in a subdivision, electrical street lighting cables may also be installed whether for present or future use. Unused wires and cables shall be de-energized and protected against physical damage. On rural type streets the utilities should be located near the right of way line.

Any installation of utility pipe, conduit, cable, wires, vaults, and pertinent equipment shall comply with the current regulations of the Public Utilities Commission of Ohio. All location and detailed drawings of the utilities prepared by the developer and / or the utility companies shall be submitted to the County Engineer for approval.

600.24 Easements

Where storm sewers or sanitary sewers are deemed necessary, the developer shall dedicate or reserve land for such purposes. The location of all reservations or easements for public utilities, public drainage and sanitary sewers, public storm water runoff control structures and public waterlines shall be set forth on the final plat. Utility easements shall be clear of trees and other obstructions.

Sanitary sewers shall be located within street rights of way whenever possible, or, as necessary, along street rights of way in easements. Sanitary sewers in easements between lots or along rear lot lines will be approved only if no other route for the sewer is possible. Sanitary sewer and sanitary sewer easements shall not be located within public storm water runoff control structure easements.

Chapter Seven Driveways and Roadside Ditch Enclosures

700.01 Purpose

The regulations of Chapter 7 provide the standards for all new driveway construction and roadside ditch enclosures. It also contains examples of the permits for these installations.

700.02 Driveway Access

All persons have a right of access to the road or street abutting their property. However the location, number and geometric design of driveway access need to be regulated to facilitate flow of traffic and safety. The entrances and exits should be provided at locations which fit traffic and land-use needs and which enable vehicles to enter and leave safely with minimum interference from through traffic.

700.03 Driveway Standards

The following design standards are provided for driveway design and construction:

A. Location

Driveways should be located and designed to enable vehicles traveling at or near legal highway speeds to see a driveway in time to safely reduce speed and enter the driveway. Conversely, the driveway should be placed in areas to allow vehicles, while within the approach area, to observe the through highway traffic for a distance sufficient to make a safe entry onto the highway. The lengths adequate to accomplish the above varies with each installation and depends on the horizontal and vertical alignment of the highway, speed along the highway, and the location of existing objects, such as; trees, signs, buildings, etc., which may restrict visibility along the highway.

The adequate length, which is also known as the minimum stopping sight distance, may be found in the AASHTO publication "A Policy on Geometric Design of Highways and Streets" for different design speeds.

No driveway should be located closer than twenty (20) feet from the radius point of an intersection. A maximum of two (2) drives to a property are permitted.

B. Intersection Angle

The intersection angle is the interior angle between the centerlines of the driveway and road. This is shown in Figures 7 – 1 and 7 – 2. The allowable intersection angle shall be within a range of seventy degrees (70°) to ninety degrees (90°).

C. Width

The width of drive opening should be regulated to prevent vehicles from randomly entering or leaving a facility at any point along a traveled roadway. The maximum

width of the drive opening at the curb or edge of pavement on residential streets shall be forty (40) feet. The minimum drive width at the throat on residential streets shall be nine (9) feet. See Figures 7 – 1 and 7 – 2.

D. Driveway Approach

1. Urban Drives

The drive approach or drive apron shall be installed between the sidewalk and the curb and shall be concrete regardless of the type of drive material. The apron shall be six (6) inches thick and placed on three (3) inches of aggregate base. Drive aprons shall be reinforced with 6 x 6 x 4 roadway mesh. See Figure 7 – 1.

2. Rural Drives

Rural drives may have tapered or curved approaches. Flared or tapered aprons are preferred because they are distinct from intersection radii. See Figure 7 – 2.

Use of concrete drive aprons on non-curbed rural roads or subdivision streets are not permitted. The concrete drive shall terminate at the road right of way line. The portion of the drive and drive apron between the right of way line and the edge of pavement shall be asphalt concrete or aggregate.

E. Driveway Pipe

All driveways installed along existing roads shall have drive pipes. The type, size, length, depth and slope of drive pipe shall conform to either the County or Township adopted pipe policy. The developer/owner shall be responsible for obtaining the appropriate permit before the installation of any drive pipe. See Figure 7 – 3 for a sample application and permit for use on the County road system.

In a major allotment, where new roads are to be constructed, all drive pipe sizes shall be submitted with the construction drawings for the County Engineer's approval. When the drive pipe sizes are approved, they shall be recorded with the plan.

New home construction may be possible in the allotment before the road improvement is finally accepted by the County and Township. The developer shall be responsible for obtaining the appropriate permit before any drive pipes are installed. Also, the developer shall be responsible for drive pipes throughout the maintenance period. Any defective pipes shall be replaced according to the County's or Township's adopted pipe policy, before the road improvement receives final acceptance. Adequate erosion control measures shall be provided during installation to minimize downstream sedimentation.

A property owner along an existing county road may request that the County Engineer install the driveway pipe. See Figure 7 – 4 for a sample permit application.

700.04 Roadside Ditch Enclosures

Developers and/or property owners requesting the enclosure of ditches in front of their properties must obtain a permit from the County Engineer for an enclosure on a county road or the Township Trustees for an enclosure on a township road. The Applicant shall prepare a plan showing the location of the existing road and ditch and the proposed work to be done. The type, size, depth and slope of the ditch enclosure pipe shall conform to either the County or Township adopted policy.

When this application is approved by the County Engineer or the Township Trustees, the property owner may then enclose the ditch as proposed. The Applicant is required to pay the entire cost of this enclosure, including; survey, plan, materials, and labor to complete the work. All design standards for this enclosure shall be in accordance with the drainage standards section of this Engineering Code, unless a variance is granted by the County Engineer or Township Trustees. The application and permit for a ditch enclosure pipe installation on the County road system is shown in Figure 7 – 5.

A property owner along an existing county road may request that the County Engineer install their ditch enclosure. See Figure 7 – 6 for a sample permit application.

APPLICATION AND PERMIT FOR DRIVE PIPE INSTALLATION BY CONTRACTOR

HURON COUNTY ENGINEER'S OFFICE
150 Jefferson St., Norwalk, Ohio 44857 (419)668-1997

Applicant: _____
Name

Contractor: _____
Name

Address

Address

City, State, Zip

City, State, Zip

Phone

Phone

Location: Township _____

Road Name _____

House No. _____

Lot No. _____

Drive located on north, south, east, west side of the road.

Drive located approximately _____miles north, south, east,

west of _____ road.

Proposed installation has : no roadside ditch, a roadside ditch, a deep roadside ditch,
 a roadside tile, a catch basin, an existing drive.

Type of Installation: (check one)

Residential Drive

Public Institution

Farm Field Entrance

Other (describe) _____

Commercial/Industrial Drive

Proposed Driveway Width: _____

Installation Procedure:

1. Owner or Contractor makes an application for a drive pipe installation.
2. Field inspection, design, and recommendations are made by the County Engineer's Office.
3. Permission is formally granted to install drive pipe.
4. Owner purchases required materials and completes all work necessary to install drive pipe as outlined on permit.
5. Owner notifies County Engineer's Office that pipe installation is completed and ready for final inspection by returning a copy of the application form.

FIGURE 7 – 3

Installation Regulations:

1. Contractor agrees to mark the location of the proposed drive pipe using orange stakes supplied by Huron County.
2. The diameter of pipe, type of pipe and length of pipe which must be used and the grade and direction of flow for the installation will be determined by the Inspector/Highway Superintendent of the County Engineer’s Office.
3. Applicant will be responsible for the purchase and payment of the appropriate pipe as required by the County Engineer’s Office unless other arrangements are made with the Inspector/Highway Superintendent.
4. Contractor agrees to maintain lights, barricades, flagpersons and watchmen for the protection of traffic at all times, and in addition, to comply with such rules for maintaining traffic as the County Engineer may require. The Contractor also agrees to restore the entire work area to its original condition, including grading and seeding within the right of way.
5. Contractor will assume full responsibility for any or all damages to public or private property or personal injury resulting from or attributable to this construction, and hold and save the County harmless for all repairs resulting from damage to County property, including drainage tile and/or drainage structures.
6. Contractor must notify Ohio Utilities Protection Services (1-800-362-2764) or the appropriate utility company prior to excavation.
7. Applicant acknowledges that the approval of this application grants them no future right to perform any construction within the right of way.
8. Applicant acknowledges that if the permitted construction is not approved by the County, then the County will not maintain the tile, ditch, or other improvement allowed by this permit.
9. Applicant acknowledges that the payment of fee covers cost of site inspection and does not guarantee installation, right of installation or other rights not expressly presented herein.

Installation Date: _____

Completion Date: _____

Note: It is the responsibility of the applicant to notify this office of any changes in the starting and/or completion date.

Applicant’s Agreement:

The applicant agrees to install or have installed a drive pipe of the type and size as determined by the Inspector/Highway Superintendent of the County Engineer’s Office.

Signed: _____ Owner/Applicant

Date: _____ **VOID AFTER 90 DAYS**

Application Fee: \$150.00

CASH, CHECK (make checks payable to HURON COUNTY ENGINEER)

Receipt No. _____ By _____

FIGURE 7 – 3, Cont’d.

Field Inspection: (to be completed by County)

Name of Inspector _____

Service Call No. _____

Inspection Date _____

Length of Pipe _____

(The minimum length of pipe shall be thirty (30) feet for residential drives and forty (40) feet for farm field drives)

Diameter of Pipe _____

(The minimum diameter of pipe shall be twelve (12) inches).

Type of Pipe

- Corrugated polyethylene smooth lined pipe
- Reinforced concrete pipe
- Other (describe) _____

Other Comments _____

Special Notes:

1. Embed pipe in three (3) inches of aggregate
2. There shall be no large stones, blocks, curbing or any other protruding obstruction, higher than the road surface at each end of the pipe.
3. Leave one foot at each end of pipe uncovered.

Final Inspection: (to be completed by County)

The drive pipe installation has been inspected and found to be:

- Satisfactory
- Unsatisfactory

Remarks: _____

Signed: _____

Title: _____

Date: _____

FIGURE 7 – 3, Cont'd.

**APPLICATION AND PERMIT FOR
COUNTY HIGHWAY DEPARTMENT TO INSTALL A DRIVE PIPE**

HURON COUNTY ENGINEER'S OFFICE
150 Jefferson St., Norwalk, Ohio 44857 (419)668-1997

Applicant: _____
Name Address

Phone City, State, Zip

Location: Township _____
Road Name _____
House No. _____
Lot No. _____
Drive located on north, south, east, west side of the road.
Drive located approximately ____miles north, south, east,
 west of _____ road.
Proposed installation has : no roadside ditch, a roadside ditch, a deep roadside ditch,
 a roadside tile, a catch basin, an existing drive.

Type of Installation: (check one)

- | | |
|--|---|
| <input type="checkbox"/> Residential Drive | <input type="checkbox"/> Public Institution |
| <input type="checkbox"/> Farm Field Entrance | <input type="checkbox"/> Other (describe) _____ |
| <input type="checkbox"/> Commercial/Industrial Drive | |

Proposed Driveway Width: _____

Installation Procedure:

1. Owner makes an application for a drive pipe installation.
2. Field inspection, design, and estimated costs are determined by the County Engineer's Office.
3. County Engineer's Office will contact Owner with total job cost. Full payment is required before installation can begin.

Installation Regulations:

1. Owner agrees to mark the location of the proposed drive pipe using orange stakes supplied by Huron County.
2. The diameter of pipe, type of pipe and length of pipe which must be used and the grade and direction of flow for the installation will be determined by the Inspector/Highway Superintendent of the County Engineer's Office.

FIGURE 7 – 4

3. Applicant will be responsible for the purchase and payment of the appropriate pipe as required by the County Engineer's Office unless other arrangements are made with the Inspector/Highway Superintendent.
4. Applicant acknowledges that all requests will be processed as weather conditions, time, manpower and availability of cover material will allow.
5. Applicant acknowledges that the approval of this application grants them no future right to perform any construction within the right of way.

Desired Installation Date: _____

Note: It is the responsibility of the applicant to notify this office of any changes in the installation date.

Field Inspection: (to be completed by County)

Name of Inspector _____

Service Call No. _____

Inspection Date _____

Length of Pipe _____

(The minimum length of pipe shall be thirty (30) feet for residential drives and forty (40) feet for farm field drives.)

Diameter of Pipe _____

(The minimum diameter of pipe shall be twelve (12) inches.)

Type of Pipe

Corrugated polyethylene smooth lined pipe

Reinforced concrete pipe

Other (describe) _____

Other Comments _____

Cost of Project \$ _____

Applicant's Agreement:

Applicant requests that the County Highway Department install a drive pipe of the type, size and cost as determined by the Inspector/Highway Superintendent of the County Engineer's Office.

Signed: _____ Owner/Applicant

Date: _____

Application Fee: \$ _____

CASH, CHECK (make checks payable to HURON COUNTY ENGINEER)

Receipt No. _____ By _____

FIGURE 7 – 4, Cont'd.

**APPLICATION AND PERMIT FOR
ROADSIDE DITCH ENCLOSURE BY CONTRACTOR**

HURON COUNTY ENGINEER'S OFFICE
150 Jefferson St., Norwalk, Ohio 44857 (419)668-1997

Applicant: _____
Name

Address

City, State, Zip

Phone

Contractor: _____
Name

Address

City, State, Zip

Phone

Location: Township _____

Road Name _____

House No. _____

Lot No. _____

Ditch located on north, south, east, west side of the road.

Ditch located approximately _____ miles north, south, east,

west of _____ road.

Proposed installation has : no roadside ditch, a roadside ditch, a deep roadside ditch,
 a roadside tile, a catch basin, an existing drive.

Type of Installation: (check one)

Residential

Commercial/Industrial

Public Institution

Other (describe) _____

Proposed Ditch Enclosure Length: _____

Installation Procedure:

1. Owner or Contractor makes an application for a roadside ditch enclosure.
2. Field inspection, design, and recommendations are made by the County Engineer's Office.
3. Permission is formally granted to install pipe.
4. Owner purchases required materials and completes all work necessary to install pipe as outlined on permit.
5. Owner notifies County Engineer's Office that pipe installation is completed and ready for final inspection by returning a copy of the application form.

Installation Regulations:

1. Owner or Contractor agrees to mark the location of the proposed pipe using orange stakes supplied by Huron County.
2. The diameter of pipe and type of pipe which must be used and the grade and direction of flow for the installation will be determined by the Inspector/Highway Superintendent of the County Engineer’s Office.
3. Applicant will be responsible for the purchase and payment of the appropriate pipe as required by the County Engineer’s Office unless other arrangements are made with the Inspector/Highway Superintendent.
4. Contractor agrees to maintain lights, barricades, flagpersons and watchmen for the protection of traffic at all times, and in addition, to comply with such rules for maintaining traffic as the County Engineer may require. The Contractor also agrees to restore the entire work area to its original condition, including grading and seeding within the right of way.
5. Contractor will assume full responsibility for any or all damages to public or private property or personal injury resulting from or attributable to this construction, and hold and save the County harmless for all repairs resulting from damage to County property, including existing drainage tile and/or drainage structures.
6. Contractor must notify Ohio Utilities Protection Services (1-800-362-2764) or the appropriate utility company prior to excavation.
7. Applicant acknowledges that the approval of this application grants them no future right to perform any construction within the right of way.
8. Applicant acknowledges that if the permitted construction is not approved by the County, then the County will not maintain the improvement allowed by this permit.
9. Applicant acknowledges that the payment of fee covers cost of site inspection and does not guarantee installation, right of installation or other rights not expressly presented herein.

Installation Date: _____

Completion Date: _____

Note: It is the responsibility of the applicant to notify this office of any changes in the starting and/or completion date of this permit.

Applicant’s Agreement:

The applicant agrees to install or have installed a roadside ditch enclosure pipe of the type and size as determined by the Inspector/Highway Superintendent of the County Engineer’s Office.

Signed: _____ Owner/Applicant

Date: _____ **VOID AFTER 90 DAYS**

Application Fee: \$150.00

CASH, CHECK (make checks payable to HURON COUNTY ENGINEER)

Receipt No. _____ By _____

FIGURE 7 – 5, Cont’d.

Field Inspection: (to be completed by County)

Name of Inspector _____

Service Call No. _____

Inspection Date _____

Diameter of Pipe _____

(The minimum diameter of pipe shall be twelve (12) inches).

Type of Pipe

Corrugated polyethylene smooth lined pipe

Reinforced concrete pipe

Other (describe) _____

Number of Catch Basins Required _____

(The maximum length of pipe between catch basins is three hundred (300) feet. A catch basin or yard drain is required at the upstream side of all driveways)

Type of Catch Basin or Yard Drain _____

Other Comments _____

Final Inspection: (to be completed by County)

The roadside ditch enclosure pipe installation has been inspected and found to be:

Satisfactory

Unsatisfactory

Remarks: _____

Signed: _____

Title: _____

Date: _____

FIGURE 7 – 5, Cont'd.

**APPLICATION AND PERMIT FOR COUNTY HIGHWAY DEPARTMENT
TO ENCLOSE A ROADSIDE DITCH**

HURON COUNTY ENGINEER'S OFFICE
150 Jefferson St., Norwalk, Ohio 44857 (419)668-1997

Applicant: _____
Name Address

Phone City, State, Zip

Location: Township _____
Road Name _____
House No. _____
Lot No. _____
Ditch located on north, south, east, west side of the road.
Ditch located approximately _____ miles north, south, east,
 west of _____ road.
Proposed installation has : no roadside ditch, a roadside ditch, a deep roadside ditch,
 a roadside tile, a catch basin, an existing drive.

Type of Installation: (check one)
 Residential Public Institution
 Commercial/Industrial Other (describe) _____

Proposed Ditch Enclosure Length: _____

Installation Procedure:

1. Owner makes an application for a roadside ditch enclosure.
2. Field inspection, design, and estimated cost are made by the County Engineer's Office.
3. County Engineer's Office will contact Owner with total job cost. Full payment is required before installation can begin.

Installation Regulations:

1. Owner agrees to mark the location of the proposed ditch enclosure using orange stakes supplied by Huron County.
2. The diameter of pipe and type of pipe which must be used and the grade and direction of flow for the installation will be determined by the Inspector/Highway Superintendent of the County Engineer's Office.
3. Applicant will be responsible for the purchase and payment of the appropriate pipe as required by the County Engineer's Office unless other arrangements are made with the Inspector/Highway Superintendent.
4. Applicant acknowledges that all requests will be processed as weather conditions, time, manpower and availability of cover material will allow.
5. Applicant acknowledges that the approval of this application grants them no future right to perform any construction within the right of way.

FIGURE 7 – 6

Desired Installation Date: _____

Note: It is the responsibility of the applicant to notify this office of any changes in the installation date.

Field Inspection: (to be completed by County)

Name of Inspector _____

Service Call No. _____

Inspection Date _____

Diameter of Pipe _____

(The minimum diameter of pipe shall be twelve (12) inches.)

Type of Pipe

Corrugated polyethylene smooth lined pipe

Reinforced concrete pipe

Other (describe) _____

Number of Catch Basins Required _____

(The maximum length of pipe between catch basins is three hundred (300) feet. A catch basin or yard drain is required at the upstream side of all driveways.)

Type of Catch Basin or Yard Drain _____

Other Comments _____

Cost of Project \$ _____

Applicant's Agreement:

The applicant agrees to have the County Highway Department install a roadside ditch enclosure pipe of the type, size and cost as determined by the Inspector/Highway Superintendent of the County Engineer's Office.

Signed: _____ Owner/Applicant

Date: _____

Application Fee: \$ _____

CASH, CHECK (make checks payable to HURON COUNTY ENGINEER)

Receipt No. _____ By _____

FIGURE 7 – 6, Cont'd.

Chapter Eight Borings

800.01 Purpose

The regulations of Chapter 8 provide the standards for road borings and an example of the permit for these installations.

800.02 Road Borings

The Owner of any utility that wishes to install a line under a county road or along a county road within the public right of way shall obtain an application for a permit from the Huron County Engineer's Office. Application by a Contractor is not acceptable. A sample of the applications is shown as Figure 8 – 1. A drawing of the proposed installation similar to Figure 8-2 shall accompany the application. Work shall not begin until the application is reviewed and approved by the County Engineer.

800.03 Open Cut

Installations of a utility line through a roadway by the open cut method is normally not approved. Under special circumstance, like the installation of a large culvert, the County Engineer may grant permission to open cut a roadway. The Owner/Contractor will need to obtain an application and permit from the Huron County Engineer's Office. All work shall be coordinated with the County with regards to traffic safety, signing, detour route, inspection and road restoration. See Figure 8 – 3 for typical utility trench detail.

**APPLICATION FOR PERMIT TO
PLACE UTILITIES WITHIN COUNTY ROAD RIGHT OF WAY**

HURON COUNTY ENGINEER'S OFFICE
150 Jefferson St., Norwalk, Ohio 44857 (419) 668-1997

Date _____

Job Number _____

Owner : _____
Name of Company

Contractor: _____
Name

Address

Address

City, State, Zip

City, State, Zip

Phone

Phone

Location: Township _____

Road Name _____

Utility located on north, south, east, west side of the road.

Utility located approximately _____ miles north, south, east,
 west of _____ road.

Type of Installation: _____

Note: If pole line, provide the following information:

Number of poles, total length of line, type of wire, character of service, vertical clearance over pavement, and voltage if power line.

If pipe line, provide the following information:

Type of service, internal size, length of line, depth of trench, kind of pipe (water, sewer, oil, gas, etc.) or conduit. All fluid lines require encasement with suitable material, size and length satisfactory to the County Engineer.

Installation Date: _____

Completion Date: _____

Note: It is the responsibility of the Owner to notify this office of any changes in the starting and/or completion date.

Installation Regulations:

1. Submit two (2) copies of this application and two (2) sets of prints of the proposed project.

FIGURE 8 – 1

2. Submit two (2) copies of a plan showing proposed location of structures with reference to pavement and right of way line. If installation crosses the highway, show present roadway and proposed installation. See Figure 8 – 2.
3. Utility poles should be located not more than one (1) foot inside the road right of way, unless otherwise authorized by the County Engineer.
4. Underground utilities shall be placed at a minimum depth of thirty (30) inches below edge of pavement or top of ground, whichever is lower. Underground utility lines shall be placed in a trench around or under the end of drainage structures at a minimum depth of thirty (30) inches.
5. Utility pedestals, utility markers, vents, etc., shall be located at or near right of way lines and property lines. All loops to such equipment shall be placed in a trench thirty six (36) inches in depth under all existing or proposed ditches.
6. All underground utilities crossing roadways will be made by boring unless permission is obtained from the County Engineer to open cut the pavement. See Figure 8 – 3 for trench details and pavement restoration.
7. All mailboxes, signs, yards, driveways, roads, drainage structures, fences, ditches and sidewalks damaged or removed during initial construction or future maintenance will be replaced or restored to their original condition.
8. Maintenance of traffic will conform to the ODOT’s Ohio Manual of Uniform Traffic Control Devices and their Construction and Material Specifications for Maintaining Traffic.
9. Owner will assume full responsibility for any and all damages to public or private property or personal injury resulting from or attributable to this construction, and hold and save the County free from any liability and harmless for all repairs resulting from damage to County property, including existing drainage tile and/or drainage structures.
10. Upon approval of this application, the County will return one (1) copy to your office for the necessary signature and permit fee. If any changes are requested by the County Engineer, one set of prints with comments will be returned to your office for further processing.

County Approval :

The plans and permit for this utility project are hereby approved:

_____ Date
Huron County Engineer’s Authorized Representative

Owner’s Agreement:

VOID AFTER 90 DAYS

I hereby agree with the regulations and provisions of this permit:

_____ Date
Utility Authorized Representative

Application Fee: \$150.00

CASH, CHECK (make checks payable to HURON COUNTY ENGINEER)

Receipt No. _____ By _____

FIGURE 8 – 1, Cont’d.

Chapter Nine Drainage

900.01 Purpose

The regulations of Chapter 9 outline the guidelines for the design of all new and modified drainage systems including bridges, culverts, open ditches, dams, ponds and storm sewers. The regulations for retention basins and other storm water runoff control systems are covered in Chapter 10.

900.02 Preliminary Drainage Plan

A preliminary drainage plan for all minor subdivisions, major subdivisions and large lot divisions shall be submitted with the preliminary engineering plans required by Subdivision Regulations. It shall be forwarded to the County Engineer and Huron Soil & Water Conservation District for review and approval. It shall show the topography and general runoff pattern of the area to be improved, as well as the runoff patterns of adjacent areas which contribute runoff to the proposed improvement. A copy of the preliminary plat for major subdivisions, minor subdivisions and large lot divisions may serve as the preliminary drainage plan if sufficient data is supplied to check the feasibility of the drainage system. Preliminary engineering calculations are to be submitted for all drainage structures within the subdivision having a waterway area larger than ten (10) square feet.

900.03 Drainage Outlet

Surface water runoff from a development shall be drained to an adequate outlet. The outlet shall be approved by the County Engineer and Huron Soil & Water Conservation District. The outlet may be a ditch, stream, storm sewer, or approved retention and/or detention basin, which has sufficient capacity and outlet conditions to accommodate the runoff in a reasonable manner.

900.04 Drainage Easements

Easements of adequate width shall be required for all existing and proposed drainage courses that are not located within the road right of way. The owner/developer shall be responsible for obtaining any easements required outside the subdivision boundaries, and have them properly recorded in the County Recorder's Office.

All drainage easements shall be shown on the plat and construction drawings along with their intended purpose specified in writing. Maintenance of these drainage courses is the responsibility of the owners whose lands are benefited by the drainage system.

When a drainage structure extends beyond the limits of the normal road right of way, additional right of way or easements shall be provided around the structure to allow for maintenance.

900.05 Final Drainage Plan

The final drainage plan shall be submitted with the construction plans required by

Subdivision Regulations. It shall show the entire drainage system along with the engineering calculations used in determining the design of the drainage courses, drainage structures, and storm water runoff control structures. The drainage plans shall be sealed with the stamp and signature of a registered professional engineer. The drainage drawings must be approved by the County Engineer and Huron Soil & Water Conservation District prior to the construction of any portion of the drainage system.

The engineering calculations submitted with the drainage plan shall include the following:

A. Rational Method

1. Drainage areas
2. Runoff coefficients
3. Overland flow lengths
4. Time of concentration
5. Rainfall intensity

B. NRCS Peak Discharge Method

1. Drainage areas
2. Overland slopes
3. Curve numbers
4. Hydraulic lengths

C. USGS Report for Estimating Flood-Peak Discharges

1. Drainage Area
2. Channel Slope
3. Open water and wetlands

The drainage calculations shall list discharges in cubic feet per second (cfs), velocities in feet per second (fps), and any additional data needed to establish that the drainage system will safely and adequately convey the flow in a stable manner.

The drainage drawing information will be similar to the project site plan requirements listed in Section 400.03, F. In addition to the pertinent drainage items of Section 400.03,F. the drainage plan shall show the following:

1. Plan and profile of all open drainage courses.

2. Cross sections along open drainage courses, at one hundred (100) foot intervals.
3. Size, type and location of all drainage structures.
4. Drainage area for all retention basins, detention basins or other storm water runoff control systems, along with tabulated results of peak inflow, peak outflow and maximum water surface elevation.

900.06 Storm Water Runoff

A. Hydraulic Analysis

The procedure used to determine storm water discharge depends largely on the size of the drainage area and the topography of the acres drained. In rural areas where there is a defined ditch or stream and the drainage basin exceeds ten (10) acres, the recommended method to obtain the peak discharge is the USGS Water Resources Investigations Report “Techniques for Estimating Flood-Peak Discharges of Rural, Unregulated Streams in Ohio”. For smaller drainage areas or larger drainage areas where no well defined channel exists and sheet flow predominates, the Rational Method should be used. Other methods used to determine discharge will require the approval of the County Engineer.

B. Design Year Frequency

The following estimated flood-peak discharge recurrence intervals shall be used for the drainage structures given below:

| STRUCTURE | DESIGN YEAR FREQUENCY |
|---------------------------|-----------------------|
| Bridges | 500 |
| Floodplain Structures | 100 |
| Major Culverts (>400ADT) | 100 |
| Minor Culverts (<400 ADT) | 50 |
| Open Ditches | 10 |
| Storm Sewers | 5 |
| Catch Basins | 5 |

The design year frequency to be considered for an individual structure may be increased by the County Engineer or the Huron Soil and Water Conservation District where the health and safety of residents would be endangered by flooding.

C. Rational Method

The Rational Method is widely used to estimate runoff from small drainage areas, usually less than 10 acres, with predominantly overland flows. The Rational

Method should be used for the design of subdivision roadside ditches, catch basins and storm sewers.

The formula for the Rational Method is: $Q = CIA$

Where: Q = peak rate of runoff/design discharge (cfs)
 C = runoff coefficient
 I = intensity of rainfall (in./hr.)
 A = tributary area (acres)

The recommended rainfall intensity curves are shown on Figure 9 – 1. The recommended runoff coefficients are shown on Figure 9-2. The recommended nomograph to determine the time of concentration is shown on Figure 9 – 3. The flow path used to determine the time of concentration shall be shown on the drainage map.

900.07 Bridges and Large Culverts

Bridges are defined as drainage structures having a span of ten (10) feet or greater. All bridges and special drainage structures shall be designed in accordance with the AASHTO Bridge Design Specifications, the ODOT Bridge Design Manual and the Huron County Engineering Code. The Huron County Engineer shall approve all bridges.

900.08 Culverts

A. General

A culvert generally carries a natural stream under the roadway embankment. Its horizontal and vertical alignment should approximate that of the natural channel and thereby minimize stream impacts and the need for channel relocations. However, culverts should not be placed on skews in excess of 45°.

A single-cell round pipe should be the design engineer's first choice. In cases where required cover or discharge precludes a round pipe, consideration should be given to a single-cell elliptical concrete pipe, metal pipe-arch, prefabricated box culvert or three sided structure, in order of preferred use.

B. Design

The capacity of a culvert depends upon the size, the roughness coefficient and the slope of the culvert. ODOT has developed a series of pipe flow charts which can be used to determine the velocity and discharge of most round, elliptical and arch pipes. The velocity (V) of box culverts should be calculated using the Manning Equation after determining the slope (S), roughness coefficient (n) and hydraulic radius (R) of the box. ($V = \frac{1.486}{n} R^{2/3} S^{1/2}$)

Another feature which often controls the design of a culvert is headwater depth. In 1964 the United States Department of Commerce, Bureau of Public Roads developed a series of hydraulic charts to determine headwater depth for culverts with inlet control flow and outlet control flow. These charts have been reproduced

by ODOT and can be used to determine headwater for various types of pipe and entrance configurations.

The hydraulic engineer shall design culverts to conform to current ODOT specifications as to maximum and minimum cover, allowable headwater depths, downstream erosion protection and headwalls. The minimum size culvert shall be 12 inch diameter unless otherwise approved by the County Engineer.

C. Specifications and Installation

The preferred type of material for small culverts is corrugated polyethylene smooth lined pipe. The preferred type for larger culverts is reinforced concrete pipe. Other types of pipe will require the approval of the County Engineer.

The material specifications and installation specifications for all culverts shall conform to the current edition of the ODOT Construction and Material Specifications.

Small culverts may be shown on plan and profile sheets and cross section sheets. Large culverts (48" and greater) should be shown on a separate detail sheet. The culvert detail sheet should include the following:

1. Drainage area to nearest acre.
2. 25-year, 50-year and 100-year discharge.
3. 25-year, 50-year and 100-year velocity.
4. 25-year, 50-year and 100-year headwater elevation to nearest 1/10 foot.
5. Existing and proposed structure data showing size, type, length, skew and date built.
6. Intersection station with centerline of construction to nearest 1/100 foot.
7. Skew angle on plan view.
8. Ditch or channel centerline with name and flow arrows.
9. Roadway embankment and channel slopes.
10. Type and dimensions of channel protection.
11. Headwall locations with dimensions.
12. Right of way and easement limits.
13. Roadway pavement and berm dimensions.
14. Guardrail length and location.

15. Contours at 1 foot intervals in vicinity of culvert showing ditch slope, embankment slope and roadside ditch foreslope and backslope.
16. Property owners names.
17. Utilities.
18. Existing and proposed roadway grade elevations at 25 foot intervals.
19. Pavement grade and vertical curve data.

900.09 Open Ditches

A. General

An open ditch generally provides the most economical means for collecting and conveying surface water. The size of the ditch involves the determination of velocity and depth of flow for a given discharge. Charts based on Manning's equation should be used to obtain the required information.

B. Roadside Ditches

Roadside ditches should be designed to accommodate runoff from the roadway pavement and overland flow runoff from adjacent property. The ditch should usually be parallel to the edge of pavement and its flowline should be a uniform distance below the edge of pavement. Deviation from this policy is necessary if the roadway grade is too flat. The recommended minimum ditch grade is 1%. The absolute minimum ditch grade shall not be less than 0.40%. A 5-year storm frequency shall be used to determine the depth of flow in a roadside ditch. A 2-year frequency shall be used to determine the velocity of flow and width of ditch lining if necessary.

C. Drainage Ditches

Major changes in drainage ditches or channels should be avoided. The proposed channel shall match existing channel conditions as close as possible with regards to slope, length, velocity and cross section. The slope of a large ditch should be constant wherever possible.

The susceptibility to ditch erosion shall be based upon the soil type and the velocity of flow in the ditch. To avoid erosion some ditches will need to be lined with sod, erosion control mats or rock. The following table shows the type of channel lining required for different soil types and ditch velocities:

| SOIL TYPE | ALLOWABLE DITCH VELOCITIES (fps) | | |
|------------------|----------------------------------|---------|----------------------|
| | Seeding | Sodding | Erosion Control Mats |
| Sand | 1.5 | 3.5 | 3.0 |
| Firm Loam | 2.0 | 4.0 | 4.0 |
| Clay | 2.5 | 5.0 | 4.0 |
| Gravel | 3.5 | 6.0 | 5.0 |
| Weathering Shale | 4.5 | 6.0 | 5.0 |

Ditch velocities in excess of those shown will require rock channel protection or some other approved type of masonry matting. A 10-year storm frequency shall be used to determine the depth of flow in an open ditch. A 5-year storm frequency shall be used to determine the velocity of flow and width of ditch lining if applicable.

D. Easements

Drainage easements shall be provided for open ditches that are outside the road right of way. The width of the easement shall include the distance between the top of the ditch banks plus an additional strip of land twenty five (25) feet wide along at least one side of the top of the channel bank. This easement shall be shown on the construction drawings and on the final plat and labeled “Drainage Easement” and shall exclude the use of the area for permanent and temporary structures and be vegetated by grass only, and be suitable for equipment travel at all times.

900.10 Dams and Ponds

Plans shall be submitted to the County Engineer for approval of any proposed dams or ponds. Some dams require a permit from the State of Ohio, Department of Natural Resources, Division of Water (See Ohio Revised Code Section 1521.06).

No public road shall be built across a dam without the approval from the County Engineer and Township Trustees. The construction of ponds, which could be used for fire protection and/or storm water and sediment control, is encouraged.

900.11 Subsurface Drainage

Subsurface drainage consisting of pipe underdrains or aggregate drains are generally not required on roadway construction in Huron County. In isolated cases where the control of springs or flow of groundwater is needed to stabilize the roadway base, pipe underdrains or aggregate drains shall be installed in conjunction with geotextile fabric to stabilize the subgrade.

The size of pipe, slope of pipe, type of pipe, depth of installation, outlet spacing and backfill materials used for underdrains shall conform to current ODOT Drainage Design Policy.

900.12 Storm Sewers

A. General

Storm sewers are a closed system of underground pipes designed to convey storm water runoff. Their function is to collect and carry water from the first pavement or ditch inlet to an approved outlet.

Storm sewers installed along urban type streets shall utilize catch basins or curb inlets for access. Storm sewers along rural type roadways with roadside ditches shall be provided with a swale over the sewer which drains to an inlet basin for access.

A storm sewer drainage drawing must be provided. It shall contain the same information as the requirements for a storm water control plan outlined in Section 1000.03, B.

B. Design

The Rational Method should be used to calculate the quantity of runoff used to design storm sewers. Storm sewers are designed to flow full during storms occurring at certain intervals known as storm frequencies. See Section 900.06. The following items are to be addressed in storm sewer design:

1. The runoff coefficient should be weighted to account for different types of ground cover.
2. The rainfall intensity should be the same for all runs in a continuous storm sewer system.
3. The storm frequency should be 5-year, however the hydraulic grade line shall not exceed the elevation of the pavement or ditch inlet grate for a 10-year storm. If the hydraulic grade line exceeds this limitation, the sewer size should be increased.
4. The minimum time of concentration to the first ditch catch basin should be fifteen (15) minutes. The minimum time of concentration to the first pavement inlet should be ten (10) minutes.
5. The Manning formula should be used to select the size of storm sewer pipe.

$$Q = \frac{1.486}{n} AR^{2/3} S^{1/2}$$

Where: Q = flow or discharge (cfs)

n = roughness coefficient

A = area (sf)

R = hydraulic radius (ft.)

S = slope (ft/ft)

Graphical solutions of Manning's formula using nomographs are recommended using " n " = 0.012 for corrugated polyethylene smooth lined pipe, " n " = 0.015 for concrete pipe sixty (60) inch diameter and smaller and " n " = 0.013 for concrete pipe greater than sixty (60) inch diameter.

6. Storm sewer systems shall have a slope sufficient to provide for a velocity greater than three (3) feet per second under flow full conditions.
7. The minimum size of pipe for storm sewers is twelve (12) inch diameter.
8. The spacing between catch basins or manholes shall be three hundred (300) feet. This spacing may be increased in certain agricultural applications upon approval of the Huron Soil and Water Conservation District.
9. Changes in direction or grade shall only be made at manholes, catch basins or inlets.
10. When the storm sewer pipe is increased in size, the crown of the larger pipe shall match the crown of the smaller pipe.
11. The minimum cover over storm sewers shall be twelve (12) inches or one half the pipe diameter, whichever is larger. Maximum cover shall conform to information found in the ODOT Location and Design Manual, Volume Two, Drainage Design.
12. Storm sewer spreadsheet calculations must be provided that are neatly prepared and readable. This spreadsheet does not have to be in the same format as the spreadsheet given in the appendix of the ODOT manual, but must contain the same information.

C. Easements

Drainage easements with a minimum width of forty (40) feet, and a maximum width of eighty (80) feet, shall be provided for storm sewers outside of the road right of way. This easement shall be shown on both the final plat and the construction drawings and labeled "Storm Sewer Easement." Storm sewers installed outside of the road right of way shall be placed on Huron County Ditch Maintenance where applicable and shall always have a means for future maintenance described within the deeds.

D. Specifications

The material specifications for storm sewer pipe and storm sewer accessories including inlets, catch basins, manholes and headwalls shall conform to the latest editions of the ODOT Construction and Material Specifications.

E. Erosion Protection

The outlet velocity of a storm sewer system may require installation of riprap, rock, stone or other material to prevent scour and erosion of the outlet ditch. If the outlet velocity exceeds the values shown for erosion control mats in Section 900.09, C. for a 5-year storm frequency, erosion protection shall be installed that conforms to ODOT's Location and Design Manual for rock channel protection.

F. Catch Basins and Manholes

The preferred type of catch basin for use on rural type roadways with enclosed ditches is the ODOT Catch Basin No. 2-2A or Catch Basin No. 2-2B. Storm sewers larger than 18 inch should use the ODOT Catch Basin No. 2-3 or No. 2-4.

The preferred type of catch basin for use on urban type roadways with concrete curb and gutter is the ODOT Catch Basin No. 3 or No. 3A.

The preferred type of catch basin for use on urban type roadways with concrete pavement is the ODOT Catch Basin No. 6.

The preferred type of inlet for yard drains is the ODOT Side Ditch Inlet No. CB-4.2.

The preferred type of storm manhole is the ODOT Manhole No. 3 with the eccentric cone top.

Use of other types of catch basins or manholes will require the approval of the County Engineer.

G. Pavement Drainage

Pavement drainage shall be designed in accordance with the design criteria and requirements given in the current edition of the Ohio Department of Transportation's Location and Design Manual, Volume Two, with the following exceptions:

1. For Type 3 Concrete Curb and Gutter, the allowable depth of flow at the curb is permitted to be to the top of the curb.
2. For catch basins located in street pavement sag vertical curves, both the grate and window opening capacities may be used for calculating the flow into the structure rather than just the grate.

Pavement drainage spreadsheet calculations must be provided. This spreadsheet does not have to be the same format as the gutter spread and inlet capacity spreadsheet given in the appendix of the ODOT manual, but must contain all of the same information.

H. Private Connections

The connection of a private drain to an existing storm sewer along a county roadway, an existing tile which drains a county road, or to a tile on the county maintenance system, requires a permit. Private drains can include farm field tiles, downspout drains, footing drains, sump pump outlet drains and other types of storm or ground water flow. See Figures 9 – 4 and 9 – 5 for sample applications and permits. All taps will require the installation of a yard drain or cleanout at the point of connection.

I. Specifications and Installation

The material specifications and installation specifications for all storm sewer systems shall conform to the current edition of the ODOT Construction and Material Specifications, except as noted in this Engineering Code.

The preferred type of material for storm sewer systems is corrugated polyethylene smooth lined pipe, reinforced concrete pipe, or polyvinyl chloride pipe with root proof watertight joints. Other types of pipe will require the approval of the County Engineer and the Huron Soil and Water Conservation District.

Trenches for storm sewers under pavement and driveways shall conform to Figure 8 – 3. Trenches not under pavement may be backfilled with material excavated at the site, subject to approval of the County Engineer. Trench dimensions for excavation in rock may be reduced to a depth of four (4) inches below bottom of pipe and a clear width of six (6) inches on each side of pipe.

Storm sewers within five (5) feet, center-to-center of sanitary sewers, shall have sealed joints. Minimum storm sewer horizontal or vertical clearance between other underground utility lines shall be approved by the County Engineer.

**APPLICATION AND PERMIT FOR
CONNECTION TO EXISTING TILE**

HURON COUNTY ENGINEER'S OFFICE
150 Jefferson St., Norwalk, Ohio 44857 (419) 668-1997

Applicant: _____

Name

Address

City, State, Zip

Phone

Contractor: _____

Name

Address

City, State, Zip

Phone

Location: Township _____

Road Name _____

House No. _____

Lot No. _____

Tap located on north, south, east, west side of the road.

Tap located approximately _____ miles north, south, east,

west of _____ road.

Type of Installation: (check one)

This tap is requested to permit the tie-in of a :

Residential Aeration System Discharge Tile

Field Tile

Perimeter or Curtain Drain Tile

Other (describe) _____

Size and Type of Proposed Tie-in Pipe: _____

Installation Procedure:

1. Owner or Contractor makes an application for a tap to an existing County tile.
2. Field inspection and recommendations are made by the County Engineer's Office.
3. Permission is formally granted to install tap.
4. Owner purchases required materials and completes all work necessary to install tap.
5. Owner notifies County Engineer's Office that tap is completed and ready for final inspection by returning a copy of the application form.

FIGURE 9 – 4

Installation Regulations:

1. Applicant or Contractor agree to mark the location of the proposed tap.
2. Applicant agrees to install a yard drain or inspection port at point of tap for future maintenance access.
3. Contractor agrees to maintain lights, barricades, flagpersons and watchmen for the protection of traffic at all times, and in addition, to comply with such rules for maintaining traffic as the County Engineer may require. The Contractor also agrees to restore the entire work area to its original condition, including grading and seeding within the right of way.
4. Contractor will assume full responsibility for any or all damages to public or private property or personal injury resulting from or attributable to this construction, and hold and save the County harmless for all repairs resulting from damage to County property, including existing drainage tile and/or drainage structures.
5. Contractor must notify Ohio Utilities Protection Services (1-800-362-2764) or the appropriate utility company prior to excavation.
6. Applicant acknowledges that the approval of this application grants them no future right to perform any construction within the right of way.
7. Applicant acknowledges that the payment of fee covers cost of site inspection and does not guarantee installation, right of installation or other rights not expressly presented herein.

Installation Date: _____

Note: It is the responsibility of the Applicant to notify this office of any changes in the installation date.

Applicant’s Agreement:

Applicant understands that an inspection port must be included as part of the job with the inspection port located at the right-of-way line, and that all work associated with this approval will be subject to inspection and final approval of the Huron County Highway Department.

Applicant shall provide the County Engineer with a copy of the Huron County Health Department’s permit for a Residential Aeration System Discharge Tile tie-in.

Signed: _____ Owner/Applicant

Date: _____ **VOID AFTER 90 DAYS**

Application Fee: \$150.00

CASH, CHECK (make checks payable to HURON COUNTY ENGINEER)

Receipt No. _____ By _____

Field Inspection: (to be completed by County)

Name of Inspector_____

Service Call No. _____

Inspection Date_____

Existing County Pipe Size and Type_____

Request for permit approved_____

Request for permit disapproved for the following reason_____

Final Inspection: (to be completed by County)

Name of Inspector_____

Inspection Date_____

Installation Approved_____

Installation Disapproved_____

Comments_____

Huron Soil and Water Conservation District

8 Fair Road
Norwalk, Ohio 44857
Phone: (419)668-7645 Fax: (419)663-8405
www.huronswcd.com



APPLICATION TO CONNECT DRAINAGE INTO COUNTY TILE (Notification of \$75.00 Inspection Fee)

LOT OWNER NAME _____ DATE _____

CURRENT ADDRESS OF OWNER _____

CITY _____ STATE _____ ZIP _____ PHONE# _____

ADDRESS OF LOT _____

CITY _____ STATE _____ ZIP _____

SUBDIVISION NAME _____ LOT NUMBER _____

CONTRACTOR NAME _____ PHONE# _____

TYPE OF DRAIN TO BE CONNECTED Circle one: Septic; Footer; Roof; Yard;
Other _____

I, the undersigned landowner, understand that all connections into county maintained tiles must be completed using A.S.T.M. approved fittings and under the direct supervision of the Huron County Soil and Water Conservation District (S.W.C.D.).

I also understand that no connection shall be authorized to be completed until an inspection fee in the amount of \$75.00 has been received by the Huron S.W.C.D. and until this application has been approved by the Huron S.W.C.D.

I agree to notify the S.W.C.D. **TWO WORKING DAYS** prior to the time the connection is to be completed and to have S.W.C.D. personnel visually inspect the completed connection prior to backfilling.

Signed _____ Date: _____

For S.W.C.D. use only

Date application received _____ Date fee received _____ Receipt# _____

Approved / Disapproved By: _____ Date: _____

Date Connection Made _____ Inspector _____

Comments: _____

Chapter Ten Storm Water Control

1000.01 Purpose

The regulations of Chapter 10 provide the information and procedure which should be followed for control of storm water runoff in subdivisions and other areas that undergo a substantial change in land use. Surface water runoff from developments shall be drained to a storm water management system such that the post-development peak runoff shall not exceed the pre-development peak runoff. These guidelines were established to allow development without flooding downstream property and to prevent accelerated runoff from eroding receiving streams.

1000.02 Runoff Control

The flow of storm water runoff from developed areas shall be controlled as follows:

- A. The peak flow of storm water from the developed site shall not exceed the peak flow of storm water from the pre-developed site at the same point of analysis for the same year frequency storm. This requirement applies for all storms with a frequency of one hundred (100) years and less.
- B. The peak flow of storm water from the site during construction shall not exceed the peak flow of the storm water from the pre-developed site at the same point of analysis for the same year frequency storm. This requirement applies for all storms with a frequency of ten (10) years and less. When determining the area of land disturbed during construction, an allowance shall be included for lots that are also under construction at the same time the streets are being constructed.
- C. The flow of storm water from the developed site shall be drained to an adequate outlet. This outlet must be approved by the County Engineer and the Huron Soil and Water Conservation District. It may consist of a ditch, stream, river, storm sewer, pond or lake having sufficient capacity to accommodate flow from the developed site.
- D. The flow of storm water from the developed site must not cause flooding to proposed buildings within the development or to existing downstream homes, buildings, places of business or other structures.
- E. Surface water draining from an existing watershed area cannot be diverted, channeled, piped or otherwise rerouted into another watershed area unless approved by the County Engineer and the Huron Soil and Water Conservation District.
- F. Control of storm water runoff from a developed site may be accomplished using a control structure such as a detention basin, retention basin or other storm water management system such as underground storage tanks or pipes, storage on pavement areas, storage on roof areas or a combination of these types of control measures. The primary purpose of any storm water runoff control structure is to

temporarily store water during a storm and release it at a rate that meets the criteria given previously.

Storage volume does not have to be provided for runoff from off-site upstream areas. Upstream runoff should be conveyed through the site in accordance with the current runoff conditions.

1000.03 Storm Water Control Plan

A storm water runoff control plan shall be submitted to the County Engineer and the Huron Soil and Water Conservation District for review and approval. The design engineer shall consult with these agencies prior to the completion of the plan to insure that it can be developed in accordance with current accepted policies. The final plan shall include all of the pertinent engineering data found in other chapters of this Engineering Code as well as the following:

- A. Provide a narrative that describes the method used to determine the peak flow rate of storm water from a site and the required storage volume of a runoff control structure. The design engineer may use the Rational Method, the Natural Resources Conservation Service Method or another method if approved by the County Engineer and the Huron Soil and Water Conservation District. The narrative shall describe the values such as tributary area, runoff coefficients, time of concentration, intensity, etc., used in the design of the storm water management system.
- B. Provide drainage drawings of both the pre-developed and post-developed sites having a change of land use. The drawings shall be an accurate representation of actual field conditions and provide the following information:
 - 1. Show existing and proposed contours per Section 400.03, F.3.
 - 2. Select a point of analysis where storm water from the pre-developed and post-developed sites flow to. There is one point of analysis for each drainage area. For larger sites there may be several drainage areas and thus several points of analysis that have to be evaluated.
 - 3. Outline each of the individual surface areas that drain to the point(s) of analysis on both the pre-developed and post-developed drainage maps. The entire surface area draining to a point of analysis must be indicated and may include surface areas outside the boundary of the site proposed for development.
 - 4. The path of the hydraulically most distant point shall be indicated in each individual drainage area. The portion of this path that is overland sheet flow, shallow concentrated flow, open channel flow, or pipe flow shall be indicated by using different colors and/or line types. Calculations showing how the time of concentration was determined for each area must be provided either on this drawing or on a separate sheets.
 - 5. Indicate the various types of surface areas within each of the individual drainage areas that have different runoff coefficient or curve number values.

This shall be done by using different colors of shading or another method as long as the information can be easily understood and read. Calculations showing how the weighted runoff coefficient or curve number for each drainage area must be provided either on the drawing or on separate sheets.

- C. Indicate the location and type of the proposed runoff control structure.
- D. Calculations showing how the volume required for the storm water runoff control structure was determined.
- E. Provide pre-development and post-development hydrographs for the tributary area. The post-development hydrograph shall indicate the maximum permissible release rate.
- F. Calculations showing how the storm water runoff control structure's outlet device was designed. An outlet device utilizing a weir type flow regulator is preferred in most cases because of their ease of design and because of a weir being less likely to clog with debris than an orifice or grate type of flow regulator. An outlet device utilizing a weir type flow regulator is also very easy to utilize as a multi-stage outlet device.

Outlet devices should be constructed of reinforced concrete and be a fixed structure or non-operable. Location of the outlet device shall be selected for ease of maintenance.

All runoff control structures must have an emergency overflow provided in case the outlet device means of discharge should become blocked or exceeded. The emergency overflow must be designed such that they flow of storm water from the developed site does not cause flooding to proposed buildings within the development or to existing downstream homes, buildings, places of business or other such improvements.

- G. Discharge velocities from runoff control structures shall be controlled to prevent scouring and erosion of the downstream ditch, stream, river, storm sewer, pond, lake or dedicated public drainage easement.

1000.04 Critical Storm Frequency

To prevent the damages caused by accelerated stormwater runoff from developing areas, the increased peak rates and volumes of runoff shall be controlled such that the peak rate of runoff from the critical storm and all more frequent storms occurring on the development area does not exceed the peak rate of runoff from a two (2) year frequency storm (of 24 hours duration) occurring over the same area under pre-development condition.

Storms of less frequent occurrence than the critical storm, up to the one-hundred (100) year storm, have peak runoff rates no greater than the peak runoff rates from equivalent size storms under pre-development conditions.

The critical storm for a specific development area is determined as follows:

- A. Determine by appropriate hydrologic methods the total volume of runoff from a two (2) year frequency, 24-hour storm occurring over the development area before and after development.
- B. From the volumes determined in A, determine the percentage increase in volume of runoff due to development, and using this percentage, select the 24-hour critical storm from the following table:

| If the Percentage Increase in Volume of Runoff is: | | |
|--|---------------|---|
| Equal To or Greater Than | And Less Than | The critical storm for peak rate control will be: |
| --- | 20 | 2 year |
| 20 | 50 | 5 year |
| 50 | 100 | 10 year |
| 100 | 250 | 25 year |
| 250 | 500 | 50 year |
| 500 | --- | 100 year |

1000.05 Detention Basins

The preferred type of runoff control structure is a detention basin. All detention basins shall be designed and constructed according to the requirements given in the Ohio Natural Resources Conservation Service’s Standard 378, latest edition except as modified below:

- A. For safety considerations, the interior side slopes of a detention basin shall not exceed a 4:1 slope unless a fence with at least one gate is installed around the basin’s perimeter. The type of fence and gate installed as well as the size, number and location of the gate(s) shall be approved by the County Engineer.
- B. The minimum bottom slope of a detention basin shall be a minimum of two percent (2%) at any location unless approved otherwise by the County Engineer.
- C. The minimum top width of the side embankments shall be eight (8) feet for non-vehicular traffic and twelve (12) feet for vehicular traffic.
- D. An emergency spillway shall be provided. The elevation of the emergency spillway shall be a minimum of one-foot below the lowest elevation of the detention basin’s top of embankment. The elevation of the emergency spillway shall match the water elevation of the critical storm.
- E. For basins that receive all or a portion of the area it drains from new public streets being created as part of the development, a permanent public storm water runoff control structure easement shall be provided around the perimeter of the basin. The limits of this public easement shall extend ten (10) feet past the basin’s outside top of embankment.

- F. For basins that receive all or a portion of the area it drains from new public streets being created as part of the development, a permanent 20-foot (20') wide public access easement shall be provided to the detention basin from the nearest public street for maintenance vehicles to access the basin. This public access easement shall coincide with a public drainage easement where possible.

1000.06 Retention Basins

The regulations for retention basins shall include above regulations for detention basins. Additionally, provisions shall be made to prevent the water in the retention basin from becoming stagnant through the use of a properly designed aeration device or other method approved by the County Engineer. Provisions shall also be made for draining the retention basin to allow for periodic cleaning or other maintenance. Drain facilities may be an integral part of the outlet device or may be a separate structure. Complete and timely draining of the retention basin shall include sloping the bottom of the basin, adequate pumping facilities, and/or alternate release mechanisms without causing secondary problems.

1000.07 Other Storm Water Control Structures

A. Underground Storage Tank or Pipes

1. An underground storage tank or pipes shall be of sufficient strength to carry all surface loads due to vehicles or other potential surface loading. The load bearing capacity of the soil must also be taken into account to ensure surface loads will be supported.
2. An access hatch shall be provided of sufficient size to provide for maintenance access to the underground storage tank or pipes.

B. Pavement Area Storage

1. Pavement storage usually involves the temporary shallow ponding of water on a portion of the parking lot. The maximum depth of water allowed at the deepest point is eight (8) inches, but in no case shall it be greater than the finished floor elevation of any adjacent building structure.
2. The minimum slope of a parking lot surface is one percent (1%) and the maximum slope is ten percent (10%)
3. Provisions to prevent flooding of any adjacent building structure shall be included for the overflow of storm water due to the outlet structure becoming clogged or from storms greater than one hundred (100) year frequency.

C. Roof Top Storage

1. Roof top storage can be provided on flat rooftops of buildings utilizing roof drain release features and roof storage parapets. The building structure must be able to support the weight of the water when fully loaded plus the required local building code snow loading.

2. A minimum roof slope of 0.25% shall be provided.
3. Overflow drains shall be provided for the overflow of storm water due to the roof drains becoming clogged or from storms greater than one hundred (100) year frequency. Roof and overflow drains shall be in compliance with the local building code and the National Plumbing Code.

1000.08 Maintenance

The county will require that the major structures and facilities which lie outside the road right of way, and are designed to control and manage stormwater runoff, be placed on the county ditch maintenance program. The maintenance of minor detention areas, generally grassed areas which are portions of individual lots, shall be the responsibility of individual homeowners. Special covenants shall be written into the title of individual lots so the homeowners are aware that portions of their property will be used for temporary water storage.

Easements for the purpose of permanent maintenance shall be granted to the County for access to all major stormwater control structures and facilities.

Financing of the permanent maintenance of the major stormwater control structures and facilities shall be handled through a "Perpetual Maintenance Agreement" whereby all benefiting property owners of the allotment will be assessed their proportionate share of the maintenance costs through a special assessment of real estate taxes per Section 6137 of the Ohio Revised Code.

Chapter Eleven Erosion and Sedimentation Control

1100.01 Purpose

The purpose of Chapter 11 is to provide information on minimizing erosion and sedimentation problems encountered during the land development process. The Natural Resources Conservation Service's handbook, "Water Management and Sediment Control for Urbanizing Areas", and the Ohio EPA Permit No. OHC000002 or current edition, and Rainwater and Land Development (Ohio's Standards for Stormwater Management Land Development and Urban Stream Protection) should be consulted for further information. Meeting the criteria of this article does not relieve any person(s) from liability for erosion or sediment damage to neighboring properties.

Erosion Control Plans are required as part of the Construction Plan submittal. Erosion Control Plans must be approved prior to the start of any soil disturbing activities and before the Construction Plan submittal can be approved.

1100.02 Ohio EPA Procedure Process

The basic procedure for the Ohio EPA Permit process is as follows:

- A. The developer is required to file a complete and accurate N.O.I. (Notice of Intent) Application form and the required fee at least twenty one (21) days prior to the commencement of construction activity.
- B. The Ohio EPA will notify the developer if the general permit applies or if an individual permit must be obtained.
- C. The developer must submit an SWP3 (Storm Water Pollution Plan) before any ground breaking takes place.
- D. The developer must file an N.O.T. (Notice of Termination) once the SWP3 has been implemented and construction has been completed.

The developer is advised to obtain a copy of the current Ohio EPA permit in order to insure complete compliance with permitting requirements. More information can be obtained at their web site http://www.epa.state.oh.us/dsw/permits/final_constr_GP.html. Information as to how to obtain a copy of the Rainwater and Land Development Manual can be found at the web address http://www.epa.state.oh.us/dsw/storm/const_SWP3_check.html.

1100.03 Erosion and Sediment Problems

Many people may be adversely affected from areas of land undergoing development. Unplanned water disposal and uncontrolled erosion and sediment from these areas may cause considerable economic damage to individuals and the general public. The following are a few of the typical problems associated with developments:

- A. A large increase of area exposed to soil erosion and runoff.
- B. Increased volume of runoff, soil movement, sediment and peak flows caused by:
 - 1. Removal of natural cover.
 - 2. Increase of impervious surface area.
 - 3. Changes in drainage areas caused by grading.
 - 4. Changes in volume and duration of water concentration caused by changes in grade, distance, and surface roughness.
 - 5. Reduction of water intake of soils from compaction by construction equipment.
 - 6. Prolonged exposure of unprotected sites to adverse weather.
- C. Altering ground water levels may adversely affect drainage systems, slope stability, vegetation and establishment of new plants.
- D. Exposing subsurface materials that are too rocky, too acid, or otherwise unfavorable for establishing vegetation.
- E. Encroachment on floodplains and waterways.
- F. Poor scheduling of construction activities.

1100.04 Water Management and Erosion/Sedimentation Control

Proposed methods of erosion and sedimentation control will be considered on individual merits, subjected to the approval of the County Engineer and the Huron Soil and Water Conservation District. Combinations of the following soil and water conservation practices, when carefully planned and applied, will provide effective erosion and sedimentation control:

- A. Identification at the preliminary planning phase of on-site and off-site areas vulnerable to erosion and sedimentation.
- B. Obtain and complete N.O.I. (Notice of Intent) application form from OEPA and NPDES (National Pollutant Discharge Elimination System), which can be found at the web site <http://www.epa.state.oh.us/pic/facts/fslist.html>, Division of Surface Water.
- C. Planning at the preliminary engineering phase for control of erosion and sedimentation. Permanent as well as temporary methods of control should be noted.
- D. Development of a construction sequence, which keeps disturbed areas small and exposed for the shortest time possible.
- E. Preservation of existing trees, shrubs, grasses, or other plant life where possible. Existing vegetation is useful in slowing storm water runoff.
- F. Protection of exposed critical areas with temporary vegetation and/or mulch during construction.

- G. Provide fast-growing grasses or sodding until more permanent seeding is established.
- H. Permanent vegetation, including the use of sod should be installed and maintained as soon as possible to help control water and sediment damage.
- I. Intercept or divert runoff originating uphill from the development so as to minimize the amount of flow over the construction site.
- J. Sediment basins (debris or desilting basins and silt traps) should be installed, and maintained to remove sediment carried by runoff waters from land undergoing construction.
- K. Terraces, diversions, and grassed waterways should be installed and maintained as part of the water disposal system to further control water and sediment damage.
- L. Drainage swales should be constructed and seeded, sodded, or protected with fabric material until vegetation is established.
- M. New construction and drainage swales should be seeded within three weeks after installed.
- N. Prohibit installation of driveways which will cause removal or lowering of the curb line, unless a catch basin is reconstructed nearby.

1100.05 Guidelines for Sediment Control

Commencing from the time of the initial earth disturbance, no developing area shall have an average annual soil loss exceeding fifteen (15) tons per acre for the first year or four (4) tons per acre for any year thereafter as determined by the "Universal Soil Loss Equation." To satisfy this requirement, the methods suggested in the Section 1100.04 should be employed.

If any construction could result in the sloughing, sliding, or dumping of earthen material into a public waterway, the developer shall obtain a 404 permit from the Army Corps of Engineers together with a Section 401 Water Quality Certification form Ohio EPA.

1100.06 Seeding and Mulching

All ditches, right-of-way areas, and other areas disturbed during construction are to be seeded and mulched. The specifications in Table 11-1, developed in cooperation with the Soil and Water Conservation District, outline the minimum requirements that shall be followed for both rate of application and seeding dates. For temporary seedings and seeding dates, Table 11-2 should be referenced. Consideration will be given to other seeding mixtures, depending upon erosion potential, soil conditions, and date of seeding. Prior approval must be obtained from the County Engineer with the recommendation of the Huron Soil and Water Conservation District.

1100.07 Erosion and Sedimentation Control Plan

The erosion and sedimentation control plan may be incorporated as part of other improvement plans or may be developed separately. The plan shall contain the following information:

- A. The boundary lines and approximate acreage.
- B. Existing topography of the development area and of land adjacent to it within fifty (50) feet of the boundaries, including ; the location of buildings, structures, utilities, water bodies, sewers, drainage facilities, vegetative cover, paved areas, and other significant natural or man-made features.
- C. A general description and location of the predominant soil types.
- D. All proposed earth disturbances, including; areas of excavation, grading, filling, installation of utilities, removal or destruction of topsoil, and spreading of earthen material. A schedule of such operations should also be available.
- E. Proposed use, including present development and future utilization, with detail on soil cover both vegetative and impervious.
- F. Provisions for erosion control during construction (temporary) and the life of the development (permanent). Such provisions shall include a schedule and sequence of operations with an estimated time exposure.
- G. Provisions for permanent stormwater management and the control of accelerated runoff to a stable receiving outlet both on and off the development area.
- H. Design computations for measures of erosion and sediment pollution control structures.
- I. Provisions for maintenance of erosion and sediment pollution control facilities.
- J. Title, bar scale, North arrow, legend, date, and name of person preparing plans and a statement giving any applicable engineering assumptions and calculations.
- K. The name and address of the owner and/or person responsible for the developing area.
- L. A certification that all earth disturbance, construction, and development will be done pursuant to the plan.

1100.08 Review Procedure

All subdivisions shall be reviewed by the County Engineer and the Huron Soil and Water Conservation District to see if control measures are needed to minimize water, erosion, and sediment problems.

An erosion and sediment control plan shall be submitted and conform to the OPEA NPDES procedure for all subdivisions disturbing more than one (1) acre or having proposed street construction. Whereas subdivisions disturbing less than one (1) acre, which are a portion or phase of a larger proposed allotment, shall submit a tentative NPDES erosion and sediment control plan for the entire allotment.

The County Engineer upon recommendation from the Huron Soil and Water Conservation District shall accept or suggest modifications of all erosion and sedimentation control plans.

| Specifications For Mulching and Permanent Seedings | | | |
|---|------------------------------|---|---|
| Kind of Seed | Seeding Dates | Per 1000 Sq. Ft. | Per Acre |
| Tall Fescue Annual Ryegrass Red Clover | March 1 to September 1 | 1 pound ¼ pound ¼ pound | 40 pounds 10 pounds 10 pounds |
| Small Grain Mulch | March 1 to September 1 | 100 pounds (3 bales) | 2 tons (50 bales) |
| Fertilizer | March 1 to September 1 | 25 pounds of 10-10-10 or equivalent | 1000 pounds of 10-10-10 or equivalent |
| For seedings made from September 1 to March 1, add the following: | | | |
| Rye or Wheat Tall Fescue | | 3 pounds 1 pound | 2 bushels 40 pounds |

NOTE:

1. Seeding shall be made within 2 days after final grading or following seedbed preparation with a disk or other suitable equipment. On sloping land the final operation shall be done on the contour.
2. Mulch shall be applied immediately after seeding and spread evenly over the entire seeding area.
3. Seed shall be applied uniformly with a cyclone seeder, drill, cultipacker seeder or hydro-seeder.

TABLE 11 – 1

| Specifications for Temporary Seedings | | | |
|--|-------------------|----------------------|----------------------|
| Kind of Seed | Seeding Dates | Per 1000 Sq. Ft. | Per Acre |
| Oats | March 1 – June 15 | 3 pounds | 4 bushel |
| Oats and Sudangrass | June 16 – Aug. 15 | 2 pounds 2 pounds | 2 bushel 2 bushel |
| Rye or Wheat | Aug. 16 – Nov. 1 | 3 pounds | 2 bushel |

NOTE:

1. After November 1 use Mulch only. Apply the mulch at the rate of 3 tons per acre.
2. These seeding dates are ideal. With the use of mulch and irrigation, seedings could be made any time from March to September.

TABLE 11 – 2

Chapter Twelve Soil Properties

1200.01 Purpose

Soils information in Chapter 12 is intended for overall land use planning, planning site investigations and evaluating land use alternatives prior to design and construction. The soil characteristics in Table 12-1 were derived from field examinations and laboratory tests of soil samples from Huron County, as well as samples of similar soils from nearby counties. These characteristics are only applicable to a depth of five (5) or six (6) feet.

Small areas of different soils may not be shown on soils map, due to the map's scale. Therefore on-site investigation by experienced personnel may be required for a specific site selection and design. Other soil properties that may be of interest to the developer, such as engineering textural classifications, liquid permits, plastic limits, and plasticity indices, etc., are available through the Soil & Water Conservation District.

1200.02 Soil Property Descriptions

Detailed soil descriptions and maps can be found in the Huron County Soil Survey Publication. Following are some brief explanations of the soil properties listed in Table 12-1 through 12-4:

A. Soil Name

All soils as recognized in the completed Huron County Soil Survey of 1988 are listed in alphabetical order. Each soil has different soil layers having different properties. The soil properties at the elevation of final construction should be used for the design of improvements.

B. Natural Soil Drainage

The class of natural drainage refers to the frequency and duration of periods of saturation or partial saturation during soil formation as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized.

1. Excessively Drained Soil

Excessively drained soils remove water from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky or shallow. Some are steep. All are free of mottling related to wetness.

2. Somewhat Excessively Drained Soil

Somewhat excessively drained soils remove water from the soil very rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

3. Well Drained Soil

Well drained soils remove water from soil readily, but not rapidly. It is available to plants throughout most of the growing season and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

4. Moderately Well Drained Soil

Moderately well drained soils remove water from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically long enough that most mesophytic crops are affected. They commonly have slowly pervious layer within or directly below the solum or periodically receive high rainfall, or both.

5. Somewhat Poorly Drained Soil

Somewhat poorly drained soils remove water slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

6. Poorly Drained Soil

Poorly drained soils remove water so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

7. Very Poorly Drained Soil

Very poorly drained soils remove water from the soil so slowly that free water remains at or near the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

C. Depth to Seasonal High Water Table

The depth of soil to the seasonal high water table is the highest part of the soil that is wholly saturated with water during the wettest periods of the year. In some soils, a temporary or “perched” water table occurs above clayey or other restrictive layers. These values can be used by the design engineer in determining the need for and type of subsurface drainage within the proposed subdivision.

D. Depth to Bedrock

The depth to bedrock is the distance from the soil surface to the upper surface of a rock layer. The distance may vary considerably from place to place in the County.

E. Permeability

Permeability is the quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

| | |
|-------------------|---------------------|
| Very Slow: | less than 0.06 inch |
| Slow: | 0.06 to 0.2 inch |
| Moderately Slow: | 0.2 to 0.6 inch |
| Moderate: | 0.6 to 2.0 inches |
| Moderately Rapid: | 2.0 to 6.0 inches |
| Rapid: | 6.0 to 20.0 inches |
| Very Rapid: | more than 20 inches |

F. Corrosivity

Corrosivity refers to the risk of corrosion to uncoated steel and deterioration of concrete for the whole soil. This rating is based largely on the degree of natural soil reaction, whether acid or alkaline. These ratings may be used as a guide for determining the type of culvert pipe to be used in a proposed subdivision.

G. Potential Frost Action

Potential frost action is the potential damage for each soil from freezing and thawing of soil moisture under natural drainage conditions. Frost action can damage roads, buildings, and other structures. The potential for frost action can be reduced with the use of artificial drainage to remove excess surface and subsurface water from the soil.

H. Shrink – Swell Potential

Shrink – swell potential is the relationship of the shrinking of the soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

I. Solum

Solum is the upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the substratum. The living roots and plant and animal activities are largely confined to the solum.

Soil Characteristics

Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for on site investigation.

| Soil name and map symbol | Limitations for-- | | | Features affecting-- | | |
|------------------------------|--------------------------------|---|-----------------------------|--|--|---|
| | Pond reservoir areas | Embankments, dikes, and levees | Aquifer-fed excavated ponds | Drainage | Irrigation | Grassed waterways |
| AcF, AdD2----- Alexandria | Severe: slope. | Moderate: thin layer. | Severe: no water. | Deep to water | Slope, erodes easily. | Slope, erodes easily. |
| BgA----- Bennington | Slight----- | Moderate: piping, wetness. | Severe: no water. | Percs slowly, frost action. | Wetness, percs slowly. | Wetness, percs slowly, rooting depth. |
| BgB----- Bennington | Moderate: slope. | Moderate: piping, wetness. | Severe: no water. | Slope, percs slowly, frost action. | Slope, wetness, percs slowly. | Wetness, percs slowly, rooting depth. |
| BkA----- Bixler | Severe: seepage. | Severe: piping. | Severe: cutbanks cave. | Frost action, cutbanks cave. | Wetness, droughty. | Erodes easily, droughty, rooting depth. |
| BoA----- Blount | Slight----- | Moderate: piping, wetness. | Severe: no water. | Percs slowly, frost action. | Wetness, percs slowly. | Wetness, erodes easily, rooting depth. |
| BoB----- Blount | Moderate: slope. | Moderate: piping, wetness. | Severe: no water. | Percs slowly, frost action, slope. | Slope, wetness, percs slowly. | Wetness, erodes easily, rooting depth. |
| BrF----- Brecksville | Severe: slope, slippage. | Moderate: piping. | Severe: no water. | Deep to water | Percs slowly, thin layer, slope. | Slope, erodes easily, area reclaim. |
| CdB----- Cardington | Moderate: slope. | Moderate: thin layer, piping, wetness. | Severe: no water. | Percs slowly, frost action, slope. | Slope, wetness. | Erodes easily, rooting depth. |
| CdC2----- Cardington | Severe: slope. | Moderate: thin layer, piping, wetness. | Severe: no water. | Percs slowly, frost action, slope. | Slope, wetness. | Slope, erodes easily, rooting depth. |
| Ce, Cf----- Carlisle | Severe: seepage. | Severe: excess humus, ponding. | Severe: slow refill. | Ponding, subsides, frost action. | Ponding, soil blowing. | Wetness. |
| CgB----- Castalia | Severe: seepage. | Severe: seepage, piping, large stones. | Severe: no water. | Deep to water | Slope, large stones, droughty. | Large stones, droughty, depth to rock. |
| ChB, ChC----- Chili | Severe: seepage. | Severe: piping. | Severe: no water. | Deep to water | Slope, droughty. | Droughty. |
| CkE*: Chili----- | Severe: seepage, slope. | Severe: piping. | Severe: no water. | Deep to water | Slope, droughty, soil blowing. | Slope, droughty. |

* See footnote at the end of table

TABLE 12-1

| Soil name and map symbol | Limitations for-- | | | Features affecting-- | | |
|----------------------------|--|-----------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|--|
| | Pond reservoir areas | Embankments, dikes, and levees | Aquifer-fed excavated ponds | Drainage | Irrigation | Grassed waterways |
| Cm----- Colwood | Moderate: seepage. | Severe: thin layer, ponding. | Severe: cutbanks cave. | Ponding, frost action. | Ponding----- | Wetness, erodes easily. |
| Co----- Condit | Slight----- | Severe: ponding. | Severe: slow refill. | Percs slowly, frost action, ponding. | Ponding, percs slowly. | Wetness, percs slowly, erodes easily. |
| EnA----- Elnora | Severe: seepage. | Severe: piping, wetness. | Severe: cutbanks cave. | Cutbanks cave. | Wetness, droughty. | Droughty. |
| Fr----- Fries | Moderate: seepage. | Severe: hard to pack, ponding. | Severe: slow refill. | Ponding, percs slowly, thin layer. | Ponding, percs slowly. | Wetness, area reclaim, percs slowly. |
| GwB2----- Glynwood | Moderate: slope. | Moderate: piping, wetness. | Severe: no water. | Percs slowly, frost action, slope. | Slope, wetness. | Erodes easily, rooting depth. |
| HkA----- Haskins | Moderate: seepage. | Moderate: hard to pack, wetness. | Severe: no water. | Percs slowly, frost action. | Wetness, percs slowly. | Wetness, erodes easily, rooting depth. |
| Ho----- Holly | Severe: seepage. | Severe: piping, wetness. | Severe: slow refill, cutbanks cave. | Flooding, frost action. | Wetness, flooding. | Wetness. |
| JtA----- Jimtown | Severe: seepage. | Severe: seepage, piping, wetness. | Severe: cutbanks cave. | Frost action, cutbanks cave. | Wetness----- | Wetness. |
| KbA----- Kibbie | Moderate: seepage. | Severe: piping, wetness. | Severe: cutbanks cave. | Frost action, cutbanks cave. | Wetness----- | Wetness, erodes easily. |
| Le----- Lenawee | Slight----- | Severe: ponding. | Severe: slow refill. | Ponding, frost action. | Ponding----- | Wetness, erodes easily. |
| Lf----- Lenawee Variant | Moderate: seepage. | Severe: ponding. | Severe: slow refill. | Ponding, frost action. | Ponding, erodes easily. | Wetness, erodes easily. |
| Lm----- Linwood | Severe: seepage. | Severe: piping, ponding. | Severe: slow refill. | Ponding, subsides, frost action. | Ponding, soil blowing, rooting depth. | Large stones, wetness, rooting depth. |
| Ln----- Lobdell | Severe: seepage. | Severe: piping. | Moderate: deep to water, slow refill. | Frost action--- | Wetness----- | Erodes easily. |
| Lo----- Lobdell | Severe: seepage. | Severe: piping. | Moderate: deep to water, slow refill. | Flooding, frost action. | Wetness, flooding. | Erodes easily. |
| LrB----- Lordstown | Moderate: seepage, depth to rock, slope. | Severe: piping. | Severe: no water. | Deep to water. | Depth to rock, slope, droughty. | Droughty, depth to rock. |

* See footnote at end of table.

| Soil name and map symbol | Limitations for-- | | | Features affecting-- | | |
|--------------------------|----------------------|--------------------------------|-----------------------------|--------------------------------------|------------------------|---------------------------------------|
| | Pond reservoir areas | Embankments, dikes, and levees | Aquifer-fed excavated ponds | Drainage | Irrigation | Grassed waterways |
| Cm----- Colwood | Moderate: seepage. | Severe: thin layer, ponding. | Severe: cutbanks cave. | Ponding, frost action. | Ponding----- | Wetness, erodes easily. |
| Co----- Condit | Slight----- | Severe: ponding. | Severe: slow refill. | Percs slowly, frost action, ponding. | Ponding, percs slowly. | Wetness, percs slowly, erodes easily. |
| EnA----- Elnora | Severe: seepage. | Severe: piping, | Severe: cutbanks cave. | Cutbanks cave. | Wetness, droughty. | Droughty. |

| Soil name and map symbol | Limitations for-- | | | Features affecting-- | | |
|--------------------------|---|--------------------------------------|-----------------------------|--|---|---|
| | Pond reservoir areas | Embankments, dikes, and levees | Aquifer-fed excavated ponds | Drainage | Irrigation | Grassed waterways |
| Mn----- Millsdale | Moderate: depth to rock, seepage. | Severe: ponding. | Severe: no water. | Ponding, thin layer, frost action. | Ponding, thin layer. | Wetness, depth to rock, area reclaim. |
| MnB----- Milton | Moderate: seepage, depth to rock, slope. | Severe: thin layer. | Severe: no water. | Deep to water | Slope, thin layer, erodes easily. | Erodes easily, depth to rock. |
| Mr----- Miner | Slight----- | Severe: ponding. | Severe: no water. | Ponding, percs slowly, frost action. | Ponding, percs slowly, rooting depth. | Wetness, rooting depth, percs slowly. |
| MwB----- Mitiwanga | Severe: seepage. | Severe: piping. | Severe: no water. | Thin layer, frost action. | Wetness, thin layer. | Wetness, depth to rock, area reclaim. |
| Or----- Orrville | Moderate: seepage. | Severe: piping, wetness. | Severe: cutbanks cave. | Flooding, frost action. | Wetness, flooding. | Wetness, erodes easily. |
| OsB----- Oshtemo | Severe: seepage. | Severe: seepage, piping. | Severe: no water. | Deep to water | Slope, soil blowing. | Favorable. |
| OtB----- Otisville | Severe: seepage. | Severe: seepage. | Severe: no water. | Deep to water | Droughty, slope. | Droughty. |
| Pa----- Pandora | Slight----- | Severe: ponding. | Severe: slow refill. | Ponding, frost action. | Ponding, percs slowly, erodes easily. | Wetness, erodes easily. |
| Pm----- Pewamo | Slight----- | Severe: ponding. | Severe: slow refill. | Ponding, frost action. | Ponding----- | Wetness, erodes easily. |
| Pn----- Pinnebog | Severe: seepage. | Severe: excess humus, ponding. | Severe: slow refill. | Ponding, subsides, frost action. | Ponding, soil blowing. | Wetness. |
| Ps*. Pits | | | | | | |
| PuA----- Prout | Moderate: seepage. | Severe: piping. | Severe: no water. | Thin layer, frost action. | Wetness, thin layer. | Wetness, erodes easily, area reclaim. |
| SaF----- Saylesville | Severe: slope. | Moderate: piping. | Severe: no water. | Deep to water | Slope, erodes easily. | Slope, erodes easily. |
| ScB----- Shinrock | Moderate: seepage, slope. | Severe: piping. | Severe: no water. | Frost action, slope, cutbanks cave. | Wetness, slope, erodes easily. | Erodes easily. |
| SpB----- Spinks | Severe: seepage. | Severe: seepage, piping. | Severe: no water. | Deep to water | Slope, droughty, fast intake. | Droughty. |
| Tg----- Tioga | Severe: seepage. | Severe: piping. | Severe: cutbanks cave. | Deep to water | Flooding, erodes easily, droughty. | Erodes easily, droughty. |

* See footnote at end of table.

TABLE 12-1, Cont'd.

| Soil name and map symbol | Limitations for-- | | | Features affecting-- | | |
|--------------------------|---------------------------------|--------------------------------------|-----------------------------|---|---|----------------------------|
| | Pond reservoir areas | Embankments, dikes, and levees | Aquifer-fed excavated ponds | Drainage | Irrigation | Grassed waterways |
| TrA----- Tiro | Moderate: seepage. | Severe: piping. | Severe: no water. | Percs slowly, frost action. | Wetness, percs slowly. | Wetness, erodes easily. |
| TrB----- Tiro | Moderate: slope, seepage. | Severe: piping. | Severe: no water. | Slope, percs slowly, frost action. | Wetness, percs slowly, slope. | Wetness, erodes easily. |
| TuA----- Tuscola | Moderate: seepage. | Severe: piping. | Severe: cutbanks cave. | Frost action, cutbanks cave. | Wetness----- | Favorable. |
| TuB----- Tuscola | Moderate: seepage, slope. | Severe: piping. | Severe: cutbanks cave. | Frost action, slope, cutbanks cave. | Slope, wetness. | Favorable. |
| Ud* Udorthents | | | | | | |
| Wa----- Wallkill | Severe: seepage. | Severe: excess humus, wetness. | Severe: slow refill. | Flooding, frost action. | Wetness, percs slowly, erodes easily. | Wetness, erodes easily. |

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12-1, Cont'd.

Engineering Index Properties

The symbol < means less than ; > means more than. Absence of an entry indicates that data were not estimated.

| Soil name and map symbol | Depth | USDA texture | Classification | | Frag-ments > 3 inches Pct | Percentage passing sieve number-- | | | | Liquid limit Pct | Plas-ticity index |
|------------------------------|-------|---|----------------------|----------|------------------------------------|--------------------------------------|--------|--------|-------|------------------------|----------------------|
| | | | Unified | AASHTO | | 4 | 10 | 40 | 200 | | |
| | | | | | | | | | | | |
| AcF----- Alexandria | 0-4 | Silt loam----- | CL-ML, ML, | A-4, A-6 | 0-2 | 95-100 | 90-100 | 85-100 | 65-90 | 25-40 | 4-15 |
| | 4-26 | Silty clay loam, clay loam, silty clay. | CL | A-6, A-7 | 0-2 | 90-100 | 75-100 | 70-100 | 55-90 | 35-45 | 15-25 |
| | 26-60 | Clay loam, silty clay loam. | CL, CL-ML, ML | A-6, A-4 | 0-5 | 80-100 | 75-100 | 70-95 | 55-85 | 25-40 | 4-15 |
| AdD2----- Alexandria | 0-5 | Silty clay loam | CL, ML | A-6, A-7 | 0-2 | 95-100 | 90-100 | 85-100 | 80-95 | 35-45 | 10-20 |
| | 5-27 | Silty clay loam, clay loam, silty clay. | CL | A-6, A-7 | 0-2 | 90-100 | 75-100 | 70-100 | 55-90 | 35-45 | 15-25 |
| | 27-60 | Clay loam, silty clay loam. | CL, CL-ML, ML | A-6, A-4 | 0-5 | 80-100 | 75-100 | 70-95 | 55-85 | 25-40 | 4-15 |
| BgA, BgB----- Bennington | 0-11 | Silt loam----- | ML, CL, CL-ML | A-4, A-6 | 0-2 | 95-100 | 90-100 | 85-100 | 65-90 | 22-38 | 3-14 |
| | 11-40 | Silty clay loam, silty clay, clay loam. | CL, CH | A-6, A-7 | 0-2 | 85-100 | 80-100 | 75-100 | 70-95 | 30-52 | 12-30 |
| | 40-60 | Clay loam, loam, silty clay loam. | CL, CL-ML | A-6, A-4 | 0-2 | 80-100 | 75-100 | 70-100 | 60-90 | 25-40 | 6-18 |
| BkA----- Bixler | 0-9 | Loamy fine sand | SM | A-2, A-4 | 0 | 100 | 95-100 | 70-85 | 30-50 | --- | NP |
| | 9-31 | Loamy fine sand, fine sand. | SM | A-2, A-4 | 0 | 100 | 95-100 | 60-85 | 20-45 | --- | NP |
| | 31-35 | Sandy loam, loam, fine sandy loam. | SM, SM-SC, SC, ML | A-2, A-4 | 0 | 100 | 95-100 | 60-90 | 30-70 | 10-25 | NP-10 |
| | 35-60 | Stratified silty clay loam to fine sand. | CL, ML, SC, SM | A-4, A-6 | 0 | 100 | 95-100 | 70-100 | 35-90 | 10-35 | 3-20 |
| BoA, BoB----- Blount | 0-8 | Silt loam----- | CL | A-6, A-4 | 0-5 | 95-100 | 95-100 | 90-100 | 80-95 | 25-40 | 8-20 |
| | 8-30 | Silty clay loam, silty clay, clay loam. | CH, CL | A-7, A-6 | 0-5 | 95-100 | 90-100 | 80-90 | 75-85 | 35-60 | 15-35 |
| | 30-39 | Silty clay loam, clay loam. | CL, CH, ML, MH | A-6, A-7 | 0-5 | 95-100 | 90-100 | 80-90 | 70-90 | 35-55 | 10-30 |
| | 39-60 | Silty clay loam, clay loam. | CL | A-6, A-7 | 0-10 | 90-100 | 90-100 | 80-100 | 70-90 | 30-45 | 10-25 |
| BrF----- Brecksville | 0-4 | Silt loam----- | CL, CL-ML | A-4, A-6 | 0 | 90-100 | 85-100 | 75-100 | 60-90 | 25-40 | 5-15 |
| | 4-29 | Silty clay loam, channery silt loam, silt loam. | CL | A-6, A-7 | 0-5 | 75-100 | 65-100 | 60-95 | 55-85 | 30-45 | 10-25 |
| | 29-31 | Weathered bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CdB, CdC2----- Cardington | 0-11 | Silt loam----- | ML, CL-ML, CL | A-4, A-6 | 0-2 | 95-100 | 90-100 | 80-100 | 65-90 | 25-40 | 4-15 |
| | 11-34 | Silty clay loam, clay loam, silty clay. | CL, ML | A-6, A-7 | 0-2 | 80-100 | 75-100 | 70-100 | 65-90 | 30-50 | 10-30 |
| | 34-60 | Clay loam, silty clay loam, loam. | CL, ML, CL-ML | A-6, A-4 | 0-5 | 80-100 | 75-100 | 70-95 | 65-85 | 22-40 | 3-18 |
| Ce, Cf----- Carlisle | 0-60 | Sapric material | PT | A-8 | --- | --- | --- | --- | --- | --- | --- |

TABLE 12-2

Engineering Index Properties

| Soil name and map symbol | Depth | USDA texture | Classification | | Frag-ments > 3 inches | Percentage passing sieve number-- | | | | Liquid limit | Plas-ticity index |
|--------------------------|-------|---|----------------------|----------------------|--------------------------|--------------------------------------|--------|--------|-------|--------------|-------------------|
| | | | Unified | AASHTO | | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | | | | | Pct | |
| CgB----- Castalia | 0-7 | Channery silt loam. | ML, CL-ML | A-4 | 5-15 | 80-95 | 75-95 | 70-90 | 50-85 | 10-35 | 2-8 |
| | 7-17 | Extremely channery loam, very flaggy sandy loam, very channery silt loam. | GM, SM, ML | A-4, A-2, A-1 | 10-50 | 45-80 | 25-70 | 15-65 | 15-55 | <35 | NP-8 |
| | 17-22 | Very channery loam, very flaggy sandy loam, extremely flaggy silt loam. | GM, SM, ML | A-4, A-2, A-1 | 30-80 | 50-85 | 40-80 | 30-70 | 15-55 | <35 | NP-8 |
| | 22-24 | Unweathered bedrock. | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ChB, ChC----- Chili | 0-8 | Loam----- | ML, CL-ML | A-4 | 0 | 85-100 | 75-100 | 65-85 | 55-75 | 25-35 | 4-10 |
| | 8-34 | Clay loam, gravelly clay loam, gravelly loam. | ML, SM, GM, CL | A-4, A-2, A-6, A-1-b | 0 | 65-100 | 50-80 | 35-70 | 20-65 | <30 | NP-12 |
| | 34-45 | Gravelly loam, very gravelly sandy loam. | SM, GM, GM-GC, SM-SC | A-1, A-2 | 0-5 | 45-80 | 35-75 | 25-65 | 15-35 | <30 | NP-8 |
| | 45-60 | Gravelly sandy loam, very gravelly sandy loam, gravelly loam. | SM, SC, SM-SC, ML | A-2, A-4, A-1 | 0-5 | 80-100 | 50-80 | 30-75 | 15-60 | <30 | NP-8 |
| CkE*: Chili----- | 0-10 | Fine sandy loam | SM, SM-SC, SC | A-1-b, A-2 | 0 | 85-100 | 75-100 | 40-55 | 20-35 | <25 | NP-10 |
| | 10-40 | Clay loam, gravelly clay loam, gravelly loam. | ML, SM, GM, CL | A-4, A-2, A-6, A-1-b | 0 | 65-100 | 50-80 | 35-70 | 20-65 | <30 | NP-12 |
| | 40-80 | Gravelly loam, very gravelly sandy loam. | SM, GM, GM-GC, SM-SC | A-1, A-2 | 0-5 | 45-80 | 35-75 | 25-65 | 15-35 | <30 | NP-8 |
| Udorthents. | | | | | | | | | | | |
| Cm----- Colwood | 0-11 | Silt loam----- | ML, CL, CL-ML | A-4, A-6 | 0 | 100 | 100 | 85-100 | 60-90 | 15-35 | 2-12 |
| | 11-31 | Loam, silty clay loam, sandy loam. | CL | A-6, A-4, A-7 | 0 | 100 | 100 | 80-100 | 50-90 | 25-45 | 8-20 |
| | 31-60 | Stratified silt loam to fine sand. | SM, ML, SC, CL | A-2, A-4 | 0 | 100 | 95-100 | 70-100 | 30-80 | <25 | NP-10 |
| Co----- Condit | 0-6 | Silty clay loam | CL | A-6, A-7 | 0-2 | 95-100 | 95-100 | 95-100 | 85-95 | 25-45 | 11-22 |
| | 6-44 | Silty clay loam, silty clay, clay loam. | CL, CH | A-6, A-7 | 0-2 | 95-100 | 85-100 | 80-100 | 70-90 | 35-55 | 12-28 |
| | 44-60 | Clay loam, silt loam, silty clay loam. | CL, CL-ML | A-6, A-4 | 0-2 | 90-100 | 80-100 | 70-95 | 65-85 | 25-40 | 6-18 |

* See footnote at end of table.

| Soil name and map symbol | Depth | USDA texture | Classification | | Frag-ments > 3 inches | Percentage passing sieve number-- | | | | Liquid limit | Plas-ticity index |
|--------------------------|-------|---------------------|----------------|----------|--------------------------|--------------------------------------|-------|-------|-------|--------------|-------------------|
| | | | Unified | AASHTO | | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | | | | | Pct | |
| CgB----- Castalia | 0-7 | Channery silt loam. | ML, CL-ML | A-4 | 5-15 | 80-95 | 75-95 | 70-90 | 50-85 | 10-35 | 2-8 |
| | 7-17 | Extremely | GM, SM, ML | A-4, A-2 | 10-50 | 45-80 | 25-70 | 15-65 | 15-55 | <35 | NP-8 |

Engineering Index Properties

| Soil name and map symbol | Depth | USDA texture | Classification | | Frag-ments > 3 inches | Percentage passing sieve number-- | | | | Liquid limit | Plas- ticity index |
|--------------------------|-------|--|-------------------------|--------------------|-----------------------------|--------------------------------------|--------|--------|-------|-----------------|--------------------------|
| | | | Unified | AASHTO | | 4 | 10 | 40 | 200 | | |
| | | | | | | | | | | | |
| In | | | | | | | | | | | |
| EnA----- Elnora | 0-14 | Loamy fine sand | SM, ML | A-2, A-4 | 0 | 100 | 100 | 70-95 | 25-60 | --- | NP |
| | 14-40 | Loamy fine sand, fine sand. | SM | A-2, A-4 | 0 | 100 | 100 | 70-95 | 25-45 | --- | NP |
| | 40-60 | Fine sand, loamy fine sand. | SM | A-2, A-4 | 0 | 100 | 100 | 60-85 | 20-45 | --- | NP |
| Fr----- Fries | 0-14 | Silty clay loam | CL | A-7 | 0 | 100 | 90-100 | 85-100 | 75-95 | 40-50 | 20-30 |
| | 14-30 | Silty clay, silty clay loam, clay loam. | CH, CL, MH | A-7 | 0-2 | 90-100 | 85-100 | 80-100 | 70-95 | 40-60 | 15-35 |
| | 30-37 | Weathered bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| GwB2----- Glynwood | 0-8 | Silty clay loam | CL | A-6, A-7 | 0-2 | 95-100 | 85-100 | 75-100 | 60-95 | 25-45 | 10-22 |
| | 8-27 | Silty clay, clay loam, silty clay loam. | CL, CH | A-7, A-6 | 0-5 | 95-100 | 85-100 | 75-100 | 65-95 | 35-55 | 15-30 |
| | 27-60 | Clay loam, silty clay loam. | CL | A-6, A-4 | 0-5 | 95-100 | 80-100 | 75-95 | 65-90 | 25-40 | 7-18 |
| HkA----- Haskins | 0-11 | Loam----- | CL-ML, CL | A-4, A-6 | 0 | 95-100 | 85-100 | 70-100 | 55-90 | 25-40 | 5-20 |
| | 11-34 | Clay loam, gravelly sandy loam, loam. | SC, CL | A-6, A-4, A-2 | 0 | 85-100 | 70-100 | 55-85 | 30-65 | 20-40 | 7-20 |
| | 34-60 | Silty clay loam, clay loam. | CL | A-6 | 0 | 100 | 85-100 | 80-100 | 70-95 | 30-45 | 10-25 |
| Ho----- Holly | 0-10 | Silt loam----- | ML | A-4 | 0 | 90-100 | 85-100 | 80-100 | 70-90 | 25-35 | 3-10 |
| | 10-27 | Silt loam, loam, sandy loam. | ML, SM | A-4, A-6 | 0 | 85-100 | 75-100 | 70-95 | 45-85 | 20-40 | NP-14 |
| | 27-40 | Silt loam, loam, sandy loam. | ML, SM | A-4, A-2 | 0 | 85-100 | 75-100 | 50-95 | 25-80 | 20-40 | NP-10 |
| | 40-60 | Stratified silt loam to gravelly loamy sand. | ML, SM, SP-SM | A-4, A-2, A-1-b | 0-5 | 70-100 | 65-100 | 40-90 | 10-70 | 20-40 | NP-10 |
| JtA----- Jimtown | 0-8 | Loam----- | ML, CL-ML, CL | A-4 | 0 | 95-100 | 75-100 | 60-95 | 50-80 | 20-30 | NP-8 |
| | 8-43 | Clay loam, gravelly loam, gravelly clay loam. | CL-ML, CL, SM-SC, SC | A-4, A-6, A-2 | 0-2 | 75-100 | 55-100 | 45-95 | 30-75 | 25-40 | 4-15 |
| | 43-60 | Stratified gravelly loam to very gravelly sand. | SM, GM | A-1, A-4, A-2 | 0-5 | 45-90 | 30-80 | 20-75 | 15-50 | <30 | NP-7 |
| KbA----- Kibbie | 0-9 | Loam----- | ML, CL, CL-ML | A-4, A-6 | 0 | 100 | 100 | 85-100 | 60-95 | <35 | NP-15 |
| | 9-44 | Silt loam, loam, sandy clay loam. | CL, SC | A-4, A-6, A-7 | 0 | 90-100 | 85-100 | 80-100 | 35-90 | 25-45 | 9-25 |
| | 44-60 | Stratified silt loam to fine sandy loam. | ML, SM, SC, CL | A-4, A-2 | 0 | 100 | 95-100 | 70-95 | 30-80 | <30 | NP-10 |
| Le----- Lenawee | 0-7 | Silty clay loam | CL | A-6, A-7 | 0 | 100 | 95-100 | 90-100 | 75-95 | 35-45 | 15-25 |
| | 7-35 | Silty clay loam, silty clay, clay loam. | CH, CL | A-7 | 0 | 100 | 95-100 | 90-100 | 70-95 | 40-55 | 20-30 |
| | 35-60 | Silt loam, silty clay loam, clay loam. | CL | A-6, A-7 | 0 | 100 | 95-100 | 90-100 | 70-95 | 25-50 | 10-25 |

* See footnote at end of table.

| Soil name and map symbol | Depth | USDA texture | Classification | | Frag-ments > 3 inches | Percentage passing sieve number-- | | | | Liquid limit | Plas- ticity index |
|--------------------------|-------|------------------|----------------|----------|-----------------------------|--------------------------------------|-----|-------|-------|-----------------|--------------------------|
| | | | Unified | AASHTO | | 4 | 10 | 40 | 200 | | |
| | | | | | | | | | | | |
| In | | | | | | | | | | | |
| EnA----- Elnora | 0-14 | Loamy fine sand | SM, ML | A-2, A-4 | 0 | 100 | 100 | 70-95 | 25-60 | --- | NP |
| | 14-40 | Loamy fine sand. | SM | A-2, A-4 | 0 | 100 | 100 | 70-95 | 25-45 | --- | NP |

Engineering Index Properties

| Soil name and map symbol | Depth | USDA texture | Classification | | Frag-ments > 3 inches | Percentage passing sieve number-- | | | | Liquid limit | Plas- ticity index |
|----------------------------|-------|--|-------------------|--------------------|-----------------------------|--------------------------------------|--------|--------|--------|-----------------|--------------------------|
| | | | Unified | AASHTO | | 4 | 10 | 40 | 200 | | |
| | | | | | | | | | | | |
| Lf----- Lenawee Variant | 0-8 | Silty clay loam | CL, CH | A-6, A-7 | 0 | 100 | 100 | 95-100 | 90-100 | 25-55 | 10-30 |
| | 8-32 | Silty clay, silty clay loam. | CL, CH | A-6, A-7 | 0 | 100 | 100 | 95-100 | 90-100 | 35-55 | 15-30 |
| | 32-44 | Silty clay loam, silt loam. | CL | A-6, A-7 | 0 | 100 | 100 | 90-100 | 85-100 | 25-45 | 10-25 |
| | 44-60 | Stratified silty clay loam to fine sandy loam. | CL, ML, CL-ML | A-6, A-4, A-7 | 0 | 100 | 100 | 90-100 | 80-100 | 20-45 | 3-20 |
| Lm----- Linwood | 0-29 | Sapric material | PT | A-8 | 0-20 | --- | --- | --- | --- | --- | --- |
| | 29-60 | Silt loam, sandy loam, silty clay loam. | CL, ML, SM-SC, SC | A-4, A-6, A-2, A-1 | 0-10 | 90-100 | 75-100 | 45-100 | 20-95 | 15-40 | NP-20 |
| Ln, Lo----- Lobdell | 0-9 | Silt loam----- | ML, CL-ML, CL | A-4 | 0 | 95-100 | 90-100 | 80-100 | 65-90 | 20-30 | NP-8 |
| | 9-39 | Loam, silt loam | ML | A-4 | 0 | 90-100 | 80-100 | 70-95 | 55-85 | 20-35 | NP-10 |
| | 39-60 | Stratified sandy loam to silt loam. | ML, SM, CL-ML, CL | A-4 | 0 | 90-100 | 80-100 | 65-85 | 40-80 | 15-35 | NP-10 |
| LrB----- Lordstown | 0-10 | Loam----- | ML, SM | A-4 | 0-10 | 80-95 | 75-95 | 65-95 | 45-85 | <30 | NP-4 |
| | 10-24 | Channery silt loam, channery loam, channery fine sandy loam. | ML, GM, SM | A-4 | 5-10 | 65-85 | 50-75 | 45-70 | 40-65 | <30 | NP-4 |
| | 24-26 | Unweathered bedrock. | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mm----- Millsdale | 0-11 | Silty clay loam | CL | A-6, A-7 | 0 | 90-100 | 80-100 | 75-100 | 70-95 | 32-50 | 12-25 |
| | 11-24 | Clay, silty clay loam, clay loam. | CH, CL | A-7 | 0-5 | 85-100 | 80-100 | 75-100 | 60-95 | 40-60 | 20-35 |
| | 24-26 | Unweathered bedrock. | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MnB----- Milton | 0-8 | Silt loam----- | ML, CL | A-4, A-6 | 0 | 95-100 | 90-100 | 85-100 | 70-95 | 26-36 | 4-12 |
| | 8-27 | Silty clay loam, clay loam, clay. | CL | A-6, A-7 | 0 | 95-100 | 80-100 | 75-100 | 70-95 | 32-48 | 12-28 |
| | 27-29 | Unweathered bedrock. | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mr----- Miner | 0-8 | Silty clay loam | CL | A-6, A-7 | 0-1 | 100 | 95-100 | 90-100 | 85-95 | 35-45 | 15-22 |
| | 8-58 | Silty clay, silty clay loam, clay. | CH, CL | A-7 | 0-1 | 95-100 | 85-100 | 80-100 | 75-95 | 40-60 | 20-35 |
| | 58-65 | Silty clay loam, silty clay, clay loam. | CL, CH | A-6, A-7 | 0-2 | 90-100 | 85-100 | 75-95 | 60-90 | 30-52 | 15-28 |
| MwB----- Mitiwanga | 0-10 | Silt loam----- | ML, CL-ML | A-4 | 0-2 | 90-100 | 80-95 | 70-90 | 50-80 | 25-35 | 4-10 |
| | 10-30 | Silt loam, silty clay loam, clay loam. | CL, ML, CL-ML | A-6, A-4 | 0-4 | 80-90 | 75-90 | 65-85 | 50-80 | 20-40 | 3-18 |
| | 30-32 | Unweathered bedrock. | --- | --- | --- | --- | --- | --- | --- | --- | --- |

* See footnote at end of table.

TABLE 12-2, Cont'd.

Engineering Index Properties

| Soil name and map symbol | Depth | USDA texture | Classification | | Frag-ments > 3 inches | Percentage passing sieve number-- | | | | Liquid limit | Plas-ticity index |
|--------------------------|-------|--|----------------------------|------------------|-----------------------------|--------------------------------------|--------|--------|-------|-----------------|----------------------|
| | | | Unified | AASHTO | | 4 | 10 | 40 | 200 | | |
| | | | | | | | | | | | |
| | In | | | | Pct | | | | | Pct | |
| Or----- Orrville | 0-9 | Silt loam----- | ML, CL-ML, CL | A-4 | 0 | 100 | 90-100 | 85-100 | 60-80 | 20-35 | 3-10 |
| | 9-34 | Silt loam, loam, silty clay loam. | CL, CL-ML, ML | A-4, A-6 | 0-2 | 95-100 | 75-100 | 70-95 | 50-90 | 20-40 | 2-16 |
| | 34-60 | Stratified gravelly loamy sand to silt loam. | ML, CL, SM, SC | A-4, A-2, A-1 | 0-2 | 95-100 | 65-100 | 40-85 | 15-75 | 15-35 | NP-10 |
| OsB----- Oshtemo | 0-10 | Fine sandy loam | SM, SM-SC | A-2, A-4 | 0 | 95-100 | 60-95 | 60-70 | 25-40 | 15-25 | 2-7 |
| | 10-41 | Sandy loam, sandy clay loam, gravelly coarse sandy loam. | SM, SC, SM-SC | A-2, A-4, A-6 | 0 | 95-100 | 60-95 | 60-85 | 25-45 | 12-30 | 2-16 |
| | 41-60 | Stratified loamy sand to gravel. | SP-SM, GP, SP, GP-GM | A-1, A-2, A-3 | 0-5 | 40-90 | 35-85 | 20-60 | 0-10 | --- | NP |
| OtB----- Otisville | 0-9 | Gravelly sandy loam. | SM, GM, GW-GM | A-1, A-2 | 0-10 | 55-80 | 50-75 | 30-50 | 15-30 | --- | NP |
| | 9-36 | Gravelly loamy sand, very gravelly loamy coarse sand, very gravelly loamy sand. | SM, SP, GP, GM | A-1 | 0-10 | 45-65 | 40-60 | 20-50 | 3-25 | --- | NP |
| | 36-60 | Gravelly loamy sand, very gravelly loamy sand. | GP, SP, GW-GM, SP-SM | A-1 | 0-10 | 35-60 | 30-55 | 15-40 | 0-10 | --- | NP |
| Pa----- Pandora | 0-7 | Silty clay loam | CL | A-6, A-7 | 0-2 | 95-100 | 90-100 | 90-100 | 85-95 | 25-45 | 11-22 |
| | 7-49 | Silty clay loam, clay loam, silty clay. | CL | A-6, A-7 | 0-2 | 95-100 | 90-100 | 85-100 | 75-95 | 32-49 | 12-28 |
| | 49-60 | Silty clay loam, clay loam. | CL | A-6 | 0-2 | 95-100 | 90-100 | 80-100 | 70-90 | 25-40 | 10-20 |
| Pm----- Pewamo | 0-12 | Silty clay loam | CL | A-6, A-7 | 0-5 | 90-100 | 75-100 | 75-100 | 70-90 | 35-50 | 15-25 |
| | 12-59 | Clay loam, clay, silty clay loam. | CL, CH | A-7 | 0-5 | 95-100 | 75-100 | 75-100 | 75-95 | 40-55 | 20-35 |
| | 59-60 | Clay loam, silty clay loam. | CL | A-7 | 0-5 | 95-100 | 75-100 | 75-100 | 70-90 | 40-50 | 15-25 |
| Pn----- Pinnebog | 0-20 | Muck----- | PT | A-8 | 0 | --- | --- | --- | --- | --- | --- |
| | 20-32 | Hemic material--- | PT | A-8 | 0 | --- | --- | --- | --- | --- | --- |
| | 32-60 | Sapric material | PT | A-8 | 0 | --- | --- | --- | --- | --- | --- |
| Ps*. Pits | | | | | | | | | | | |
| PuA----- Prout | 0-9 | Silt loam----- | ML, CL-ML, CL | A-4, A-6 | 0-2 | 85-100 | 75-95 | 70-90 | 50-75 | 25-35 | 5-12 |
| | 9-26 | Silty clay loam, clay loam, very shaly silty clay loam. | CL-ML, CL, SC, SM-SC | A-4, A-6, A-7 | 0-2 | 75-95 | 60-90 | 55-85 | 45-80 | 25-45 | 5-20 |
| | 26-28 | Weathered bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- |

* See footnote at end of table.

TABLE 12-2, Cont'd.

Engineering Index Properties

| Soil name and map symbol | Depth | USDA texture | Classification | | Frag-ments > 3 inches | Percentage passing sieve number-- | | | | Liquid limit Pct | Plas- ticity index |
|--------------------------|-------|--|----------------------|-----------------------|-----------------------------|--------------------------------------|--------|--------|--------|------------------------|--------------------------|
| | | | Unified | AASHTO | | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | | | | | Pct | |
| SaF----- Saylesville | 0-9 | Silt loam----- | CL, CL-ML | A-4, A-6 | 0 | 100 | 95-100 | 85-100 | 60-90 | 20-35 | 5-15 |
| | 9-39 | Clay, silty clay, silty clay loam. | CL, CH | A-7 | 0 | 100 | 95-100 | 95-100 | 85-100 | 40-65 | 22-40 |
| | 39-60 | Silty clay loam, silt loam. | CL, CL-ML | A-6, A-7 | 0 | 100 | 100 | 95-100 | 95-100 | 30-45 | 10-25 |
| ScB----- Shinrock | 0-9 | Silt loam----- | ML, CL-ML, CL | A-4 | 0 | 100 | 100 | 85-100 | 65-90 | 20-35 | 2-10 |
| | 9-35 | Silty clay loam, silty clay, clay. | CH, CL | A-7, A-6 | 0 | 100 | 100 | 95-100 | 80-95 | 35-55 | 14-32 |
| | 35-60 | Stratified silty clay to very fine sand. | CL, ML, SM, SC | A-7, A-4, A-6 | 0 | 100 | 100 | 75-100 | 40-95 | <45 | NP-20 |
| SpB----- Spinks | 0-12 | Loamy fine sand | SM, SM-SC, SP-SM | A-2-4, A-1-b | 0 | 95-100 | 80-100 | 35-90 | 10-30 | <25 | NP-7 |
| | 12-60 | Fine sand, loamy fine sand, sand. | SM, SP-SM, SM-SC | A-2-4, A-1-b | 0 | 95-100 | 80-100 | 40-90 | 10-35 | <25 | NP-7 |
| Tg----- Tioga | 0-11 | Loam----- | ML, SM | A-4 | 0 | 100 | 95-100 | 65-95 | 40-85 | <15 | NP-4 |
| | 11-20 | Silt loam, loam, gravelly fine sandy loam. | SM, GM, ML | A-1, A-2, A-4 | 0 | 55-100 | 50-100 | 35-90 | 20-80 | <15 | NP-2 |
| | 20-60 | Silt loam, gravelly loam, very gravelly loamy sand. | GW-GM, GM, SM, ML | A-1, A-2, A-4, A-3 | 0-10 | 35-100 | 30-100 | 15-90 | 5-80 | <15 | NP-2 |
| TrA, TrB----- Tiro | 0-9 | Silt loam----- | ML, CL, CL-ML | A-4, A-6 | 0 | 100 | 95-100 | 90-100 | 80-95 | 25-35 | 3-12 |
| | 9-26 | Silty clay loam, silt loam. | CL | A-6, A-7 | 0 | 95-100 | 95-100 | 90-100 | 80-100 | 30-45 | 12-25 |
| | 26-39 | Loam, clay loam, gravelly sandy loam. | ML, SM, CL, SC | A-4, A-6, A-2 | 0 | 85-100 | 70-100 | 45-90 | 30-75 | 20-40 | 2-16 |
| | 39-60 | Clay loam, silty clay loam, loam. | CL, ML, CL-ML | A-6, A-4 | 0 | 90-100 | 85-95 | 80-95 | 70-90 | 20-40 | 3-18 |
| TuA, TuB----- Tuscola | 0-10 | Fine sandy loam | SM, ML, SC, CL | A-4, A-2 | 0 | 100 | 100 | 60-95 | 30-65 | 15-30 | 2-10 |
| | 10-41 | Silty clay loam, loam, sandy clay loam. | CL, CL-ML | A-4, A-6 | 0 | 100 | 100 | 80-95 | 50-90 | 20-40 | 6-20 |
| | 41-60 | Stratified fine sand to silt loam. | SM, ML | A-4 | 0 | 100 | 95-100 | 75-90 | 40-90 | <25 | NP-4 |
| Ud*. Udorthents | | | | | | | | | | | |
| Wa----- Wallkill | 0-29 | Silt loam----- | CL | A-4, A-6 | 0 | 100 | 95-100 | 90-100 | 80-95 | 24-34 | 8-15 |
| | 29-49 | Sapric material | PT | A-8 | 0 | --- | --- | --- | --- | --- | --- |
| | 49-60 | Clay, silty clay, silty clay loam. | CL, CH | A-7, A-6 | 0 | 100 | 95-100 | 90-100 | 85-95 | 27-55 | 15-30 |

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12-2, Cont'd.

Physical and Chemical Properties of the Soils

The symbol < means less than; > means more than. Entries under "Erosion factors T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated.

| Soil name and map symbol | Depth | Clay | Moist bulk density | Permeability | Available water capacity | Soil reaction pH | Shrink-swell potential | Erosion factors | | Wind erodi- bility group | Organic matter Pct |
|------------------------------|-------|-------|--------------------------|--------------|--------------------------------|------------------------|---------------------------|-----------------|---|-----------------------------------|--------------------------|
| | | | | | | | | K | T | | |
| | | | | | | | | | | | |
| AcF----- Alexandria | 0-4 | 12-27 | 1.30-1.50 | 0.6-2.0 | 0.18-0.24 | 5.1-7.3 | Low----- | 0.37 | 5 | 5 | 1-3 |
| | 4-26 | 35-42 | 1.45-1.70 | 0.2-0.6 | 0.11-0.17 | 4.5-7.8 | Moderate---- | 0.37 | | | |
| | 26-60 | 24-33 | 1.65-1.85 | 0.2-0.6 | 0.07-0.12 | 7.4-8.4 | Low----- | 0.37 | | | |
| AdD2----- Alexandria | 0-5 | 27-32 | 1.35-1.55 | 0.2-2.0 | 0.17-0.22 | 5.1-7.3 | Moderate---- | 0.37 | 5 | 7 | .5-2 |
| | 5-27 | 35-42 | 1.45-1.70 | 0.2-0.6 | 0.11-0.17 | 4.5-7.8 | Moderate---- | 0.37 | | | |
| | 27-60 | 24-33 | 1.65-1.85 | 0.2-0.6 | 0.07-0.12 | 7.4-8.4 | Low----- | 0.37 | | | |
| BgA, BgB----- Bennington | 0-11 | 15-25 | 1.30-1.50 | 0.6-2.0 | 0.17-0.21 | 4.5-7.3 | Low----- | 0.43 | 3 | 6 | 2-4 |
| | 11-40 | 35-42 | 1.40-1.70 | 0.06-0.6 | 0.10-0.17 | 4.5-7.8 | Moderate---- | 0.32 | | | |
| | 40-60 | 24-33 | 1.65-1.80 | 0.06-0.2 | 0.07-0.12 | 7.4-8.4 | Low----- | 0.32 | | | |
| BkA----- Bixler | 0-9 | 5-15 | 1.25-1.40 | 6.0-20 | 0.10-0.13 | 5.6-7.3 | Low----- | 0.17 | 5 | 2 | .5-3 |
| | 9-31 | 5-15 | 1.25-1.40 | 6.0-20 | 0.06-0.12 | 5.6-7.3 | Low----- | 0.15 | | | |
| | 31-35 | 5-25 | 1.30-1.45 | 0.6-2.0 | 0.12-0.18 | 5.6-7.3 | Low----- | 0.37 | | | |
| | 35-60 | 5-32 | 1.45-1.75 | 0.6-2.0 | 0.08-0.18 | 6.1-8.4 | Moderate---- | 0.37 | | | |
| BoA, BoB----- Blount | 0-8 | 22-27 | 1.35-1.55 | 0.6-2.0 | 0.20-0.24 | 5.1-7.3 | Low----- | 0.43 | 3 | 6 | 2-3 |
| | 8-30 | 35-50 | 1.40-1.70 | 0.06-0.6 | 0.12-0.19 | 4.5-6.5 | Moderate---- | 0.43 | | | |
| | 30-39 | 27-38 | 1.50-1.70 | 0.06-0.6 | 0.12-0.19 | 6.1-7.8 | Moderate---- | 0.43 | | | |
| | 39-60 | 27-38 | 1.60-1.85 | 0.06-0.6 | 0.07-0.10 | 7.4-8.4 | Moderate---- | 0.43 | | | |
| BrF----- Brecksville | 0-4 | 15-27 | 1.30-1.50 | 0.6-2.0 | 0.19-0.23 | 3.6-7.3 | Low----- | 0.43 | 4 | 6 | 1-2 |
| | 4-29 | 18-35 | 1.40-1.65 | 0.06-0.2 | 0.10-0.18 | 3.6-7.3 | Moderate---- | 0.43 | | | |
| | 29-31 | --- | --- | --- | --- | --- | ----- | --- | | | |
| CdB, CdC2----- Cardington | 0-11 | 12-27 | 1.30-1.50 | 0.6-2.0 | 0.18-0.23 | 4.5-7.3 | Low----- | 0.37 | 3 | 6 | .5-3 |
| | 11-34 | 35-42 | 1.45-1.70 | 0.06-0.6 | 0.10-0.17 | 4.5-7.8 | Moderate---- | 0.37 | | | |
| | 34-60 | 24-33 | 1.65-1.82 | 0.2-0.6 | 0.07-0.12 | 7.4-8.4 | Low----- | 0.37 | | | |
| Ce, Cf----- Carlisle | 0-60 | --- | 0.13-0.23 | 0.2-6.0 | 0.35-0.45 | 4.5-7.3 | ----- | --- | 5 | 2 | >70 |
| CgB----- Castalia | 0-7 | 12-20 | 1.20-1.35 | 6.0-20 | 0.15-0.21 | 7.4-8.4 | Low----- | 0.20 | 2 | 8 | 2-4 |
| | 7-17 | 12-20 | 1.30-1.40 | 6.0-20 | 0.03-0.13 | 7.4-8.4 | Low----- | 0.10 | | | |
| | 17-22 | 12-20 | 1.30-1.40 | 6.0-20 | 0.02-0.09 | 7.4-8.4 | Low----- | 0.10 | | | |
| | 22-24 | --- | --- | --- | --- | --- | ----- | --- | | | |
| ChB, ChC----- Chili | 0-8 | 5-18 | 1.30-1.50 | 0.6-2.0 | 0.14-0.18 | 4.5-7.3 | Low----- | 0.32 | 4 | 5 | 1-3 |
| | 8-34 | 18-30 | 1.25-1.60 | 2.0-6.0 | 0.09-0.16 | 4.5-6.5 | Low----- | 0.32 | | | |
| | 34-45 | 5-18 | 1.25-1.60 | 2.0-6.0 | 0.06-0.12 | 5.1-6.5 | Low----- | 0.17 | | | |
| | 45-60 | 5-15 | 1.25-1.60 | 2.0-6.0 | 0.08-0.12 | 5.1-7.8 | Low----- | 0.15 | | | |
| CkE*: Chili | 0-10 | 5-14 | 1.40-1.60 | 2.0-6.0 | 0.10-0.14 | 4.5-7.3 | Low----- | 0.24 | 4 | 3 | 1-3 |
| | 10-40 | 18-27 | 1.25-1.60 | 2.0-6.0 | 0.09-0.16 | 4.5-6.5 | Low----- | 0.32 | | | |
| | 40-80 | 5-18 | 1.25-1.60 | 2.0-6.0 | 0.06-0.12 | 5.1-6.5 | Low----- | 0.17 | | | |
| Udorthents. | | | | | | | | | | | |
| Cm----- Colwood | 0-11 | 5-26 | 1.30-1.60 | 0.6-2.0 | 0.20-0.24 | 6.1-7.8 | Low----- | 0.28 | 5 | 5 | 3-8 |
| | 11-31 | 18-35 | 1.30-1.60 | 0.6-2.0 | 0.17-0.22 | 6.1-7.8 | Moderate---- | 0.43 | | | |
| | 31-60 | 0-12 | 1.45-1.65 | 0.6-2.0 | 0.08-0.22 | 7.4-8.4 | Low----- | 0.43 | | | |

* See footnote at end of table.

| Soil name and map symbol | Depth | Clay | Moist bulk density | Permeability | Available water capacity | Soil reaction pH | Shrink-swell potential | Erosion factors | | Wind erodi- bility group | Organic matter Pct |
|-----------------------------|-------|-------|--------------------------|--------------|--------------------------------|------------------------|---------------------------|-----------------|---|-----------------------------------|--------------------------|
| | | | | | | | | K | T | | |
| | | | | | | | | | | | |
| AcF----- Alexandria | 0-4 | 12-27 | 1.30-1.50 | 0.6-2.0 | 0.18-0.24 | 5.1-7.3 | Low----- | 0.37 | 5 | 5 | 1-3 |
| | 4-26 | 35-42 | 1.45-1.70 | 0.2-0.6 | 0.11-0.17 | 4.5-7.8 | Moderate---- | 0.37 | | | |

Physical and Chemical Properties of the Soils

| Soil name and map symbol | Depth | Clay | Moist bulk density | Permeability | Available water capacity | Soil reaction | Shrink-swell potential | Erosion | | Wind erodi- bility group | Organic matter Pct |
|-----------------------------|-------|-------|--------------------------|--------------|--------------------------------|------------------|---------------------------|---------|---|-----------------------------------|--------------------------|
| | | | | | | | | factors | | | |
| | | | | | | | | K | T | | |
| In | Pct | g/cc | In/hr | In/in | pH | | | | | | |
| Co Condit | 0-6 | 27-35 | 1.35-1.55 | 0.2-0.6 | 0.15-0.19 | 4.5-6.0 | Moderate | 0.37 | 3 | 7 | 2-4 |
| | 6-44 | 35-45 | 1.45-1.75 | 0.06-0.2 | 0.08-0.16 | 4.5-7.8 | Moderate | 0.37 | | | |
| | 44-60 | 23-36 | 1.65-1.82 | 0.06-0.6 | 0.07-0.12 | 7.4-8.4 | Moderate | 0.37 | | | |
| EnA Elnora | 0-14 | 2-10 | 1.20-1.50 | 2.0-6.0 | 0.08-0.16 | 3.6-6.5 | Low | 0.17 | 4 | 2 | 2-6 |
| | 14-40 | 2-5 | 1.20-1.50 | 6.0-20 | 0.06-0.08 | 3.6-6.5 | Low | 0.17 | | | |
| | 40-60 | 2-5 | 1.45-1.65 | 6.0-20 | 0.03-0.06 | 5.1-7.3 | Low | 0.17 | | | |
| Fr Fries | 0-14 | 27-40 | 1.20-1.45 | 0.2-0.6 | 0.21-0.23 | 5.1-6.5 | High | 0.28 | 3 | 7 | 4-8 |
| | 14-30 | 35-55 | 1.45-1.60 | 0.06-0.2 | 0.09-0.13 | 5.1-6.5 | High | 0.28 | | | |
| | 30-37 | --- | --- | --- | --- | --- | --- | --- | | | |
| GwB2 Glynwood | 0-8 | 27-38 | 1.35-1.55 | 0.2-0.6 | 0.17-0.23 | 5.1-7.3 | Low | 0.43 | 3 | 7 | 1-2 |
| | 8-27 | 35-55 | 1.45-1.70 | 0.06-0.2 | 0.11-0.18 | 4.5-7.8 | Moderate | 0.32 | | | |
| | 27-60 | 27-36 | 1.65-1.85 | 0.06-0.2 | 0.06-0.10 | 7.4-8.4 | Moderate | 0.32 | | | |
| HkA Haskins | 0-11 | 12-20 | 1.30-1.45 | 0.6-2.0 | 0.18-0.22 | 4.5-7.3 | Low | 0.37 | 4 | 5 | 1-3 |
| | 11-34 | 18-35 | 1.45-1.70 | 0.6-2.0 | 0.12-0.16 | 5.1-7.3 | Low | 0.37 | | | |
| | 34-60 | 30-40 | 1.60-1.80 | 0.06-0.2 | 0.06-0.10 | 6.1-8.4 | Moderate | 0.37 | | | |
| Ho Holly | 0-10 | 15-27 | 1.20-1.40 | 0.6-2.0 | 0.20-0.24 | 5.6-7.3 | Low | 0.28 | 5 | 6 | 2-5 |
| | 10-27 | 18-30 | 1.20-1.50 | 0.2-2.0 | 0.17-0.21 | 5.1-7.3 | Low | 0.28 | | | |
| | 27-40 | 10-27 | 1.20-1.45 | 0.6-6.0 | 0.10-0.20 | 5.6-7.8 | Low | 0.28 | | | |
| | 40-60 | 10-27 | 1.20-1.40 | 0.6-6.0 | 0.07-0.18 | 5.6-7.8 | Low | 0.28 | | | |
| JtA Jimtown | 0-8 | 10-24 | 1.30-1.50 | 0.6-2.0 | 0.18-0.22 | 4.5-7.3 | Low | 0.32 | 4 | 5 | 2-3 |
| | 8-43 | 18-32 | 1.25-1.60 | 0.6-2.0 | 0.10-0.18 | 4.5-6.5 | Low | 0.32 | | | |
| | 43-60 | 4-16 | 1.25-1.65 | 2.0-6.0 | 0.04-0.10 | 5.1-8.4 | Low | 0.10 | | | |
| KbA Kibbie | 0-9 | 5-25 | 1.40-1.65 | 0.6-2.0 | 0.16-0.24 | 5.6-7.3 | Low | 0.28 | 5 | 5 | 2-3 |
| | 9-44 | 18-35 | 1.40-1.65 | 0.6-2.0 | 0.17-0.22 | 5.6-7.8 | Low | 0.43 | | | |
| | 44-60 | 2-18 | 1.40-1.70 | 0.6-2.0 | 0.12-0.22 | 7.4-8.4 | Low | 0.43 | | | |
| Le Lenawee | 0-7 | 27-35 | 1.40-1.55 | 0.6-2.0 | 0.17-0.26 | 5.6-7.8 | Moderate | 0.28 | 3 | 7 | 3-12 |
| | 7-35 | 35-45 | 1.40-1.65 | 0.2-0.6 | 0.14-0.20 | 6.1-7.8 | Moderate | 0.37 | | | |
| | 35-60 | 18-40 | 1.50-1.65 | 0.2-0.6 | 0.16-0.22 | 7.4-8.4 | Moderate | 0.37 | | | |
| Lf Lenawee Variant | 0-8 | 30-40 | 1.25-1.50 | 0.6-2.0 | 0.18-0.22 | 5.1-7.3 | Moderate | 0.37 | 5 | 7 | 5-15 |
| | 8-32 | 35-45 | 1.35-1.70 | 0.2-0.6 | 0.12-0.16 | 4.5-5.5 | Moderate | 0.37 | | | |
| | 32-44 | 25-35 | 1.35-1.70 | 0.2-0.6 | 0.10-0.14 | 4.5-5.5 | Moderate | 0.43 | | | |
| | 44-60 | 25-35 | 1.45-1.75 | 0.2-2.0 | 0.06-0.12 | 5.1-7.8 | Low | 0.32 | | | |
| Lm Linwood | 0-29 | 0 | 0.15-0.40 | 0.2-6.0 | 0.35-0.45 | 4.5-7.8 | --- | --- | 4 | 2 | 40-70 |
| | 29-60 | 5-35 | 1.60-1.90 | 0.2-2.0 | 0.11-0.20 | 5.6-8.4 | Low | 0.28 | | | |
| Ln, Lo Lobdell | 0-9 | 15-27 | 1.20-1.40 | 0.6-2.0 | 0.20-0.24 | 5.1-7.3 | Low | 0.37 | 5 | 5 | 1-3 |
| | 9-39 | 18-30 | 1.25-1.60 | 0.6-2.0 | 0.17-0.22 | 5.1-7.3 | Low | 0.37 | | | |
| | 39-60 | 15-30 | 1.20-1.60 | 0.6-6.0 | 0.12-0.18 | 5.6-7.3 | Low | 0.37 | | | |
| LrB Lordstown | 0-10 | 8-18 | 1.10-1.40 | 0.6-2.0 | 0.13-0.20 | 4.5-6.5 | Low | 0.28 | 3 | 5 | 2-3 |
| | 10-24 | 8-18 | 1.20-1.50 | 0.6-2.0 | 0.10-0.16 | 4.5-6.0 | Low | 0.28 | | | |
| | 24-26 | --- | --- | --- | --- | --- | --- | --- | | | |
| Mm Millsdale | 0-11 | 27-32 | 1.30-1.50 | 0.6-2.0 | 0.17-0.22 | 6.1-7.3 | Moderate | 0.28 | 4 | 7 | 4-7 |
| | 11-24 | 35-45 | 1.40-1.65 | 0.2-0.6 | 0.12-0.16 | 6.1-8.4 | High | 0.32 | | | |
| | 24-26 | --- | --- | --- | --- | --- | --- | --- | | | |
| MnB Milton | 0-8 | 14-27 | 1.30-1.50 | 0.6-2.0 | 0.18-0.23 | 4.5-7.3 | Low | 0.37 | 4 | 6 | 1-3 |
| | 8-27 | 35-50 | 1.45-1.65 | 0.2-2.0 | 0.12-0.18 | 4.5-7.8 | Moderate | 0.37 | | | |
| | 27-29 | --- | --- | --- | --- | --- | --- | --- | | | |

* See footnote at end of table.

TABLE 12-3, Cont'd.

Physical and Chemical Properties of the Soils

| Soil name and map symbol | Depth | Clay | Moist bulk density | Permeability | Available water capacity | Soil reaction | Shrink-swell potential | Erosion factors | | Wind erodibility group | Organic matter |
|--------------------------|-------|-------|--------------------|--------------|--------------------------|---------------|------------------------|-----------------|---|------------------------|----------------|
| | | | | | | | | K | T | | |
| | In | Pct | g/cc | In/hr | In/in | pH | | | | | Pct |
| Mr----- Miner | 0-8 | 27-35 | 1.35-1.55 | 0.6-2.0 | 0.19-0.21 | 6.1-7.3 | Moderate | 0.32 | 3 | 7 | 3-6 |
| | 8-58 | 38-45 | 1.45-1.70 | 0.06-0.2 | 0.12-0.14 | 5.6-7.3 | Moderate | 0.32 | | | |
| | 58-65 | 32-45 | 1.65-1.75 | 0.06-0.2 | 0.05-0.08 | 6.1-8.4 | Moderate | 0.32 | | | |
| MwB----- Mitiwanga | 0-10 | 15-26 | 1.30-1.45 | 0.6-2.0 | 0.17-0.21 | 4.5-6.5 | Low | 0.32 | 4 | 6 | 2-4 |
| | 10-30 | 24-32 | 1.30-1.60 | 0.6-2.0 | 0.13-0.17 | 4.5-6.0 | Moderate | 0.32 | | | |
| | 30-32 | --- | --- | --- | --- | --- | --- | --- | | | |
| Or----- Orrville | 0-9 | 12-27 | 1.25-1.45 | 0.6-2.0 | 0.18-0.22 | 5.1-7.3 | Low | 0.37 | 5 | 6 | 2-4 |
| | 9-34 | 18-30 | 1.30-1.50 | 0.6-2.0 | 0.15-0.19 | 5.1-6.5 | Low | 0.37 | | | |
| | 34-60 | 10-25 | 1.20-1.40 | 0.6-6.0 | 0.08-0.15 | 5.1-7.3 | Low | 0.37 | | | |
| OsB----- Oshtemo | 0-10 | 2-10 | 1.20-1.60 | 2.0-6.0 | 0.10-0.15 | 5.1-6.5 | Low | 0.24 | 5 | 3 | 5-3 |
| | 10-41 | 10-18 | 1.20-1.60 | 2.0-6.0 | 0.12-0.19 | 5.1-7.3 | Low | 0.24 | | | |
| | 41-60 | 0-15 | 1.20-1.50 | >20 | 0.02-0.04 | 7.4-8.4 | Low | 0.10 | | | |
| OtB----- Otisville | 0-9 | 1-10 | 1.10-1.40 | 6.0-20.0 | 0.09-0.12 | 3.6-7.3 | Low | 0.17 | 3 | 8 | 0.5-2.0 |
| | 9-36 | 1-5 | 1.25-1.55 | 6.0-20.0 | 0.02-0.05 | 3.6-7.3 | Low | 0.17 | | | |
| | 36-60 | 1-5 | 1.45-1.65 | >6.0 | 0.01-0.02 | 4.5-6.0 | Low | 0.17 | | | |
| Pa----- Pandora | 0-7 | 27-32 | 1.35-1.55 | 0.2-0.6 | 0.21-0.23 | 6.1-7.3 | Moderate | 0.37 | 5 | 7 | 3-4 |
| | 7-49 | 32-45 | 1.45-1.60 | 0.2-0.6 | 0.08-0.16 | 6.1-7.8 | Moderate | 0.37 | | | |
| | 49-60 | 30-35 | 1.65-1.82 | 0.06-0.2 | 0.07-0.12 | 7.4-8.4 | Moderate | 0.37 | | | |
| Pm----- Pewamo | 0-12 | 27-40 | 1.35-1.55 | 0.6-2.0 | 0.20-0.23 | 5.6-7.3 | Moderate | 0.28 | 5 | 7 | 3-12 |
| | 12-59 | 35-50 | 1.40-1.70 | 0.2-0.6 | 0.12-0.20 | 5.6-7.8 | Moderate | 0.32 | | | |
| | 59-60 | 30-40 | 1.50-1.70 | 0.2-0.6 | 0.14-0.18 | 7.4-8.4 | Moderate | 0.37 | | | |
| Pn----- Pinnebog | 0-20 | --- | 0.30-0.40 | 0.2-6.0 | 0.35-0.45 | 3.6-7.8 | --- | --- | 5 | 2 | 40-80 |
| | 20-32 | --- | 0.10-0.25 | 0.6-6.0 | 0.45-0.55 | 4.5-7.8 | --- | --- | | | |
| | 32-60 | --- | 0.10-0.25 | 0.2-6.0 | 0.35-0.45 | 5.6-7.8 | --- | --- | | | |
| Ps*. Pits | | | | | | | | | | | |
| PuA----- Prout | 0-9 | 15-27 | 1.30-1.40 | 0.6-2.0 | 0.18-0.22 | 3.6-6.5 | Low | 0.37 | 4 | 6 | 2-4 |
| | 9-26 | 27-35 | 1.40-1.60 | 0.2-0.6 | 0.14-0.19 | 4.5-5.5 | Moderate | 0.37 | | | |
| | 26-28 | --- | --- | --- | --- | --- | --- | --- | | | |
| SaF----- Saylesville | 0-9 | 12-25 | 1.35-1.55 | 0.6-2.0 | 0.19-0.24 | 5.1-7.8 | Low | 0.37 | 5 | 5 | 1-3 |
| | 9-39 | 35-45 | 1.60-1.70 | 0.2-0.6 | 0.08-0.20 | 5.1-7.8 | Moderate | 0.37 | | | |
| | 39-60 | 20-35 | 1.60-1.70 | 0.2-0.6 | 0.18-0.20 | 7.4-8.4 | Moderate | 0.37 | | | |
| ScB----- Shinrock | 0-9 | 18-27 | 1.30-1.50 | 0.6-2.0 | 0.18-0.24 | 5.6-7.3 | Low | 0.37 | 5 | 5 | 1-3 |
| | 9-35 | 35-45 | 1.35-1.70 | 0.2-0.6 | 0.10-0.16 | 5.1-7.8 | Moderate | 0.37 | | | |
| | 35-60 | 8-45 | 1.30-1.60 | 0.2-2.0 | 0.10-0.14 | 7.4-8.4 | Moderate | 0.37 | | | |
| SpB----- Spinks | 0-12 | 2-15 | 1.40-1.70 | 6.0-20 | 0.08-0.10 | 5.1-7.3 | Low | 0.17 | 5 | 2 | 2-4 |
| | 12-60 | 3-15 | 1.40-1.70 | 2.0-6.0 | 0.04-0.08 | 5.6-7.8 | Low | 0.17 | | | |
| Tg----- Tioga | 0-11 | 5-18 | 1.15-1.40 | 0.6-6.0 | 0.15-0.21 | 5.1-7.3 | Low | 0.37 | 5 | 5 | 2-6 |
| | 11-20 | 5-18 | 1.15-1.45 | 0.6-6.0 | 0.07-0.20 | 5.1-7.3 | Low | 0.28 | | | |
| | 20-60 | 3-15 | 1.25-1.55 | 0.6-20 | 0.02-0.20 | 5.6-7.8 | Low | 0.28 | | | |
| TrA, TrB----- Tiro | 0-9 | 14-27 | 1.30-1.50 | 0.6-2.0 | 0.21-0.24 | 5.6-7.3 | Low | 0.37 | 4 | 6 | 1-3 |
| | 9-26 | 18-35 | 1.40-1.65 | 0.6-2.0 | 0.17-0.21 | 4.5-6.5 | Moderate | 0.37 | | | |
| | 26-39 | 12-32 | 1.40-1.60 | 0.6-2.0 | 0.10-0.15 | 6.1-7.8 | Low | 0.37 | | | |
| | 39-60 | 24-35 | 1.60-1.80 | 0.06-0.6 | 0.06-0.10 | 6.6-8.4 | Moderate | 0.37 | | | |

* See footnote at end of table.

TABLE 12-3, Cont'd.

Physical and Chemical Properties of the Soils

| Soil name and map symbol | Depth | Clay | Moist bulk density | Permeability | Available water capacity | Soil reaction pH | Shrink-swell potential | Erosion factors | | Wind erodi- bility group | Organic matter Pct |
|-----------------------------|-------|-------|--------------------------|--------------|--------------------------------|------------------------|---------------------------|--------------------|---|-----------------------------------|--------------------------|
| | | | | | | | | K | T | | |
| TuA, TuB----- Tuscola | 0-10 | 8-20 | 1.30-1.65 | 2.0-6.0 | 0.13-0.22 | 5.6-7.3 | Low----- | 0.24 | 5 | 3 | 1-2 |
| | 10-41 | 10-18 | 1.30-1.70 | 0.6-2.0 | 0.15-0.20 | 5.6-7.3 | Moderate---- | 0.32 | | | |
| | 41-60 | 5-45 | 1.30-1.70 | 0.6-2.0 | 0.14-0.18 | 7.4-8.4 | Low----- | 0.32 | | | |
| Ud* Udorthents | | | | | | | | | | | |
| Wa----- Wallkill | 0-29 | 12-25 | 1.30-1.45 | 0.6-2.0 | 0.20-0.24 | 5.6-7.3 | Low----- | 0.37 | 5 | 6 | 1-3 |
| | 29-49 | --- | 0.35-0.55 | 2.0-6.0 | 0.35-0.45 | 5.1-7.3 | ----- | | | | |
| | 49-60 | 27-50 | 1.45-1.60 | 0.06-0.6 | 0.10-0.18 | 5.1-7.8 | High----- | 0.32 | | | |

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12-3, Cont'd.

Soil and Water Features

“Flooding” and “water table” and terms such as “rare,” “brief,” “apparent,” and “perched” are explained in the text. The symbol < means less than; > means greater than. Absence of an entry indicates that the feature is not a concern or that data were not estimated.

| Soil name and map symbol | Hydro-logic group | Flooding | | | High water table | | | Bedrock | | Potential frost action | Risk of corrosion | |
|-------------------------------|-------------------|-----------|----------|--------|------------------|----------|---------|---------|----------|------------------------|-------------------|-----------|
| | | Frequency | Duration | Months | Depth | Kind | Months | Depth | Hardness | | Uncoated steel | Concrete |
| | | | | | | | | | | | | |
| AcF, AdD2 Alexandria | C | None | --- | --- | 4.0-6.0 | Perched | Dec-May | >60 | --- | Moderate | Moderate | Moderate. |
| BgA, BgB Bennington | C | None | --- | --- | 1.0-2.5 | Perched | Nov-May | >60 | --- | High | High | Moderate. |
| BkA Bixler | C | None | --- | --- | 2.0-3.5 | Apparent | Nov-May | >60 | --- | High | Moderate | Moderate. |
| BoA, BoB Blount | C | None | --- | --- | 1.0-3.0 | Perched | Jan-May | >60 | --- | High | High | High. |
| BrF Brecksville | C | None | --- | --- | >6.0 | --- | --- | 20-40 | Soft | Moderate | High | High. |
| CdB, CdC2 Cardington | C | None | --- | --- | 1.5-3.0 | Perched | Nov-Apr | >60 | --- | High | High | Moderate. |
| Ce Carlisle | A/D | None | --- | --- | +5-1.0 | Apparent | Sep-Jun | >60 | --- | High | High | Low. |
| Cf Carlisle | A/D | None | --- | --- | +2-1.0 | Apparent | Sep-May | >60 | --- | High | High | Low. |
| CgB Castalia | C | None | --- | --- | >6.0 | --- | --- | 20-40 | Hard | Moderate | Low | Low. |
| ChB, ChC Chili | B | None | --- | --- | >6.0 | --- | --- | >60 | --- | Moderate | Low | High. |
| CkE*: Chili Udorthents. | B | None | --- | --- | >6.0 | --- | --- | >60 | --- | Moderate | Low | High. |
| Cm Colwood | B/D | None | --- | --- | +1-1.0 | Apparent | Oct-May | >60 | --- | High | High | Low. |
| Co Condit | D | None | --- | --- | +1-1.0 | Apparent | Nov-Jul | >60 | --- | High | High | Moderate. |

* See footnote at end of table.

TABLE 12-4

Soil and Water Features

| Soil name and map symbol | Hydro-logic group | Flooding | | | High water table | | | Bedrock | | Potential frost action | Risk of corrosion | | |
|----------------------------|-------------------|--------------|------------|---------|------------------|----------|---------|---------|----------|------------------------|-------------------|-----------|--|
| | | Frequency | Duration | Months | Depth | Kind | Months | Depth | Hardness | | Uncoated steel | Concrete | |
| | | | | | Ft | | | | | | In | | |
| EnA----- Elnora | B | None----- | --- | --- | 1.5-2.0 | Apparent | Feb-May | >60 | --- | Moderate | Low----- | Moderate. | |
| Fr----- Fries | D | None----- | --- | --- | +1-1.0 | Apparent | Nov-Jun | 20-40 | Soft | Moderate | High----- | High. | |
| GwB2----- Glynwood | C | None----- | --- | --- | 2.0-3.5 | Perched | Jan-Apr | >60 | --- | High----- | High----- | Moderate. | |
| HkA----- Haskins | C | None----- | --- | --- | 1.0-2.5 | Perched | Jan-Apr | >60 | --- | High----- | High----- | Moderate. | |
| Ho----- Holly | B/D | Frequent---- | Long----- | Nov-May | 0-1.0 | Apparent | Dec-May | >60 | --- | High----- | High----- | Moderate. | |
| JtA----- Jintown | C | None----- | --- | --- | 1.0-2.5 | Apparent | Dec-May | >60 | --- | High----- | High----- | High. | |
| KbA----- Kibbie | B | None----- | --- | --- | 1.0-2.0 | Apparent | Nov-May | >60 | --- | High----- | High----- | Moderate. | |
| Le----- Lenawee | B/D | None----- | --- | --- | +1-1.0 | Apparent | Nov-May | >60 | --- | High----- | High----- | Low. | |
| Lf----- Lenawee Variant | C/D | None----- | --- | --- | +1-1.0 | Apparent | Nov-Jun | >60 | --- | High----- | High----- | Moderate. | |
| lm----- Linwood | A/D | None----- | --- | --- | +1-1.0 | Apparent | Nov-Jun | >60 | --- | High----- | Moderate | Low. | |
| ln----- Lobdell | B | Rare----- | --- | --- | 2.0-3.5 | Apparent | Dec-Apr | >60 | --- | High----- | Low----- | Moderate. | |
| Lo----- Lobdell | B | Frequent---- | Brief----- | Jan-Apr | 2.0-3.5 | Apparent | Dec-Apr | >60 | --- | High----- | Low----- | Moderate. | |
| LrB----- Lordstown | C | None----- | --- | --- | >6.0 | --- | --- | 20-40 | Hard | Moderate | Low----- | High. | |
| Mm----- Millsdale | B/D | None----- | --- | --- | +1-1.0 | Perched | Jan-Apr | 20-40 | Hard | High----- | High----- | Low. | |

* See footnote at end of table.

TABLE 12-4, Cont'd.

Soil and Water Features

| Soil name and map symbol | Hydro-logic group | Flooding | | | High water table | | | Bedrock | | Potential frost action | Risk of corrosion | |
|--------------------------|-------------------|---------------|-------------------------|---------|------------------|----------|---------|---------|----------|------------------------|-------------------|-----------|
| | | Frequency | Duration | Months | Depth | Kind | Months | Depth | Hardness | | Uncoated steel | Concrete |
| | | | | | Ft | | | In | | | | |
| MnB----- Milton | C | None----- | --- | --- | >6.0 | --- | --- | 20-40 | Hard | Moderate | High----- | Moderate. |
| Mr----- Miner | D | None----- | --- | --- | +1-1.0 | Perched | Nov-Jun | >60 | --- | High----- | High----- | Moderate. |
| MwB----- Mitiwanga | C | None----- | --- | --- | 1.0-2.5 | Perched | Nov-Jun | 20-40 | Hard | High----- | High----- | Moderate. |
| Or----- Orrville | C | Frequent----- | Very brief to brief. | Nov-May | 1.0-2.5 | Apparent | Nov-Jun | >60 | --- | High----- | High----- | Moderate. |
| OsB----- Oshtemo | B | None----- | --- | --- | >6.0 | --- | --- | >60 | --- | Moderate | Low----- | High. |
| OtB----- Otisville | A | None----- | --- | --- | >6.0 | --- | --- | >60 | --- | Low----- | Low----- | High. |
| Pa----- Pandora | B/D | None----- | --- | --- | +1-1.0 | Apparent | Dec-May | >60 | --- | High----- | High----- | Low. |
| Pm----- Pewamo | C/D | None----- | --- | --- | +1-1.0 | Apparent | Dec-May | >60 | --- | High----- | High----- | Low. |
| Pn----- Pinnebog | A/D | None----- | --- | --- | +1-1.0 | Apparent | Oct-Jul | >60 | --- | High----- | Moderate | Moderate. |
| Ps*. Pits | | | | | | | | | | | | |
| PuA----- Prout | C | None----- | --- | --- | 1.0-2.5 | Perched | Dec-Apr | 20-40 | Soft | High----- | High----- | High. |
| SaF----- Saylesville | C | None----- | --- | --- | >6.0 | --- | --- | >60 | --- | Moderate | High----- | Moderate. |
| ScB----- Shinrock | C | None----- | --- | --- | 2.0-3.5 | Perched | Dec-May | >60 | --- | High----- | High----- | Moderate. |
| SpB----- Spinks | A | None----- | --- | --- | >6.0 | --- | --- | >60 | --- | Low----- | Low----- | Low. |
| Tg----- Tioga | B | Occasional | Brief----- | Nov-May | 3.0-6.0 | Apparent | Feb-Apr | >60 | --- | Moderate | Low----- | Moderate. |
| TrA, TrB----- Tiro | C | None----- | --- | --- | 1.0-2.5 | Perched | Jan-Apr | >60 | --- | High----- | High----- | Moderate. |

* See footnote at end of table.

TABLE 12-4, Cont'd.

Soil and Water Features

| Soil name and map symbol | Hydro-logic group | Flooding | | | High water table | | | Bedrock | | Potential frost action | Risk of corrosion | |
|--------------------------|-------------------|------------|----------------|---------|------------------|----------|---------|---------|----------|------------------------|-------------------|-----------|
| | | Frequency | Duration | Months | Depth | Kind | Months | Depth | Hardness | | Uncoated steel | Concrete |
| | | | | | Ft | | | In | | | | |
| TuA, TuB----- Tuscola | B | None----- | --- | --- | 2.0-3.5 | Apparent | Nov-Apr | >60 | --- | High----- | Moderate | Low. |
| Ud*. Udorthents | | | | | | | | | | | | |
| Wa----- Wallkill | C/D | Occasional | Brief to long. | Sep-Jun | 0-0.5 | Apparent | Dec-May | >60 | --- | High----- | High----- | Moderate. |

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12-4, Cont'd.

Chapter Thirteen Construction Procedures and Requirements

1300.01 Purpose

The purpose of Chapter 13 is to outline the general requirements of a developer and/or contractor during the construction of an improvement.

1300.02 General Specifications

The material specifications and installation specifications for all work shall conform to the current edition of the ODOT Construction and Material Specifications, except where specifically stated within this Engineering Code.

Specifications of ODOT and those in this Engineering Code are the minimum guidelines that are acceptable to the County Engineer and to the Huron Soil and Water Conservation District, and for which the developer and/or contractor will be held responsible to follow.

1300.03 Construction Schedule

After approval of the construction plans by the Huron Soil and Water Conservation District and/or the County Engineer, and before starting any construction work, the developer and/or contractor shall submit a construction schedule of work to the County Engineer for his approval. The construction schedule shall show the starting and completion dates for each phase of construction work, including a date for the completion of the entire project.

If it becomes necessary to modify the approved plans at any time during construction, the developer and/or contractor shall inform the County Engineer in writing of the conditions requiring modification. Written authorization from Planning Commission, upon approval of the County Engineer and the Huron Soil and Water Conservation District, must be received before proceeding with construction.

During the progress of work the Huron Soil and Water Conservation District and/or the County Engineer may accept a revised project completion date if they determine that unusual factors have caused a delay that makes compliance with the original date unreasonable.

1300.04 Preconstruction Conference

At least one (1) week before any work is started on the improvements the contractor shall meet with the Huron Soil and Water Conservation District's designated representative(s) and/or the County Engineer for a preconstruction conference. At this meeting the contractor and the Huron Soil and Water Conservation District's designated representative(s) and/or the County Engineer can review the construction schedule, inspection procedures, material requirements, etc.

1300.05 Construction Inspection

The Huron Soil and Water Conservation District and/or the County Engineer shall be responsible for the inspection of all improvements subject to the following requirements:

- A. Inspectors employed by the Huron Soil and Water Conservation District and/or the County Engineer shall be authorized to inspect any work done or materials furnished. Such inspection may extend to all parts of the work including the preparation, fabrication, or manufacture of the materials.
- B. The inspector shall not be authorized to revoke, alter or waive any requirements of the specifications or plans. He shall be authorized to notify the contractor regarding any failure of the work or materials to conform to the specifications and/or plans. He shall also have the authority to reject materials which do not meet specification requirements and suspend that portion of the work involved until any question at issue can be referred to and acted upon by the Huron Soil and Water Conservation District and/or the County Engineer.
- C. Two (2) days before the start of each phase of the construction, the developer and/or contractor shall notify the Huron Soil and Water Conservation District and/or the County Engineer so arrangements can be made for inspection. Failure to notify the inspectors may result in the uninspected work being removed.
- D. The Huron Soil and Water Conservation District and/or the County Engineer shall determine the amount of inspection, including laboratory and/or other tests, required to assure that the developer and/or contractor has complied with the specifications and the approved plans.
- E. The developer and/or contractor shall have available on the project, at all times, one (1) approved copy of all plans and specifications required and also shall cooperate with the inspector in every way possible. The developer should have a representative present at the time of all inspections.
- F. Upon completion of all improvements the developer and/or contractor shall clean all ground occupied or affected by them, leaving the entire area in a neat and presentable condition. They shall then request a final inspection by the County. The final inspection will be made as soon as weather conditions allow.
- G. The owner and/or developer shall pay the actual labor cost of the inspection service plus fifty percent (50%) to cover such items as; employee benefits, transportation and office expenses.
- H. All inspection fees must be paid before acceptance of the improvements by the Huron Soil and Water Conservation District and/or the County Engineer.

1300.06 Project Superintendent

The developer and/or contractor shall at all times have a competent superintendent acting as his agent on the project. The superintendent shall be capable of reading and thoroughly

understanding the plans and specifications and shall have authority to execute the plans and specifications, and execute orders or directions of the inspector.

1300.07 Construction Stakes

Pavement profile grade stakes shall be set at twenty five (25) foot intervals on all vertical curves. Tangent pavement profile grade stakes may be set at fifty (50) foot intervals for all grades greater than one percent (1%). Alignment stakes shall be set at twenty five (25) foot intervals for all horizontal curves. The inspector may ask for additional grade or alignment stakes, especially at intersections.

1300.08 Temporary Erosion and Sedimentation Control

Temporary control measures in addition to those shown on the plans may be ordered by the Huron Soil and Water Conservation District during construction to control erosion and sedimentation. Temporary control measures may apply to work outside the right of way when ordered by the County Engineer or the Huron Soil and Water Conservation District.

The County Engineer and/or the Huron Soil and Water Conservation District shall have the authority to limit the amount of surface area of erodible earth material exposed at any one time. Any construction which calls for the earth to be uncovered for more than three (3) weeks shall have temporary control measures taken to limit erosion and sedimentation.

If the contractor at any time does not provide required temporary control, the Huron Soil and Water Conservation District and/or the County Engineer shall notify him by letter. If after two (2) weeks from the date of the letter the contractor has not performed the required work, the Huron Soil and Water Conservation District and/or the County Engineer shall do so at the expense of the developer.

1300.09 Damage Repairs

Any damage done to the improvements by construction traffic, local traffic, or by any other means shall be repaired or the damaged materials replaced in satisfactory condition. If the developer and/or contractor does not complete the necessary repairs within a reasonable amount of time, the County Engineer and/or the Huron Soil and Water Conservation District may take the necessary steps to provide corrective measures, and the cost of such services will be charged to the developer and/or contractor. No project will be released from bond for failure to comply with this regulation and without cleanup and repair of damages.

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Chapter Fourteen Land Conveyance Standards and Requirements for Approval of Deed Descriptions, Surveys and Survey Plats in Huron County REVISED 11/26/08

1400.01 Purpose

The purpose of Chapter 14 is to define the transfer, land conveyance standards and requirements of the Huron County Auditor and the Huron County Engineer for approval of deed descriptions, surveys and plats in Huron County, Ohio. It will also define the requirements that shall be met in land surveying practices within Huron County and to establish the standards and accuracies required for land surveys, legal descriptions for transfer of parcels, plats of surveys, minor and major subdivision plats, large lot divisions, condominiums, cluster homes, and/or city or village lots.

1400.02 Introduction

In order to insure the efficient operation of the county offices, it is necessary that certain procedures and requirements be met before Huron County will approve a boundary survey plat and/or a legal description, etc., for property transfer. It is the intent of these standards and requirements to establish a consistent method of checking documents that are presented for approval.

- A. Following these Standards and Requirements as set forth will insure proper and accurate descriptions of property for tax and transfer purposes.
- B. It is the decision of the Huron County Engineer and the Huron County Auditor as to whether a legal description is sufficient to meet the following adopted Land Conveyance Standards as provided for by Section 315.251 and 319.203 of the Ohio Revised Code.
- C. All “metes and bounds” descriptions, either existing or new, must be in legal instrument form in order to be checked by the County for approval. In the interest of time, it is suggested that all instruments be checked for pre-transfer verification at the Tax Map Department prior to the obtaining of appropriate signatures necessary for the recording of the instrument.
- D. Legal descriptions and accompanying survey plats, where applicable, must meet the “Minimum Standards for Boundary Surveys in the State of Ohio.” Said minimum standards have been accepted by the State Board of Registration for Professional Engineers and Surveyors as an operating rule and became effective May 1, 1980 according to Chapter 4733-37 through 4733-37-07 of the Ohio Administrative Code (OAC) and have been adopted by the State of Ohio in Section 315.251 of the Ohio Revised Code (ORC) effective March 18, 1997. Chapter 711 ORC Plats, is also made a part of these rules. This also includes addendums made to OAC and ORC.

- E. Efforts have been made, insofar as is practicable, to minimize any duplication or conflict in the requirements and standards contained herein. Because this is not always possible, there may be contained within this document some conflicting requirements or standards. Where such is the case, the more stringent standards or requirements shall govern, unless stated otherwise.
- F. The County Auditor and/or the County Engineer may reject any and all legal descriptions that do not conform to the enclosed standards, restrictions or parts thereof.
- G. Applicable codes referred to from time to time herein, are current versions as of the date of this publication. Any subsequent revisions, changes or updates to said codes or any new codes that may be established will automatically be made a part of this document.

1400.03 General Surveying Requirements

All surveys shall conform to the OAC Chapter 4733, Section 4733-37, Minimum Standards for Boundary Surveys in the State of Ohio, and ORC, Chapter 711, Plats.

- A. Surveying activities shall be performed by, or under the direct supervision of a Registered Professional Surveyor.
- B. All surveys shall be based upon and related to available data of record. It is the surveyor's responsibility to obtain the necessary reference materials prior to making the field survey.
- C. All original plats of surveys including legal descriptions submitted for recording should be signed in blue ink and stamped to help avoid illegal reproduction of original copies.
- D. The monumentation, evidence, and records used to establish the control for the survey shall be graphically indicated. Where there was no monumentation used, i.e. pavement was split to establish the center line; existing fence row was used to establish the property line, or record dimensions were used, these shall be so stated on the plat. *THE PLAT OF SURVEY SHALL CLEARLY SHOW HOW THE SURVEY WAS DEVELOPED.*

1400.04 Requirements for Filing Instruments for the Conveyance of Real Property

The requirements of ORC 315.251 shall apply to all instruments for the conveyance of real property filed in Huron County, Ohio except as specifically set forth herein. The Huron County Tax Map Department will make every effort to process instruments containing simple descriptions as soon as possible, however, the department works on a "first come-first served" basis. More complex or problematic descriptions will take more time. Combinations, splits, annexations, subdivisions, etc., may take several days for processing. If the Huron County Auditor and/or the Huron County Engineer determines that the legal description in the instrument submitted for transfer or the survey plat does not meet the requirements of these standards, it shall notify the presenter and attempt to work out any technical difficulties on an informal basis.

A. Document Transfer

All documents transferring an interest in real property that are subject to ORC 319.20, including all court orders and certificates of transfer, shall contain all of the following:

1. Document Standards

The instrument of transfer must have the original signature of the grantor or affiant or be a certified copy of a court order. No document or transfer will be accepted in which the document or any attachment is illegible as determined by the County Auditor or the County Engineer. Blank spaces of 1 ½ inches at the top of the page number 1, and 2 inches at the bottom of the last page, are needed for auditor's and recorder's office stamping.

2. Reference to Prior Instrument of Record

A reference to the volume and page of the last preceding recorded instrument or instruments by or through which the grantor claims title, as required by ORC 319.20.

3. Tax Mailing Address of Grantee

A statement of the complete tax mailing address of the grantee, or any one of the grantees, as required by ORC 319.20.

4. Complete Name(s) of Grantor(s)

The complete name(s) of the grantor(s) shall be provided as appears on the conveyance where grantor(s) took title, where applicable.

5. Complete Name(s) of Grantee(s)

The accurate and complete name(s) of the grantee(s) shall be provided.

6. Identification of Interest Conveyed

The County Auditor may request assistance determining the designation of each owner's interest on multiple owner parcels.

7. Instrument of Transfer Shall Include Parcel Number and Location Address

The instrument of transfer shall include the County Auditor's parcel number(s) of the land transferring, and the current site address of the property, if any.

8. Conveyance Forms

No instruments will be transferred unless accompanied by a properly completed DTE100 or DTE100EX conveyance form.

9. Multi-Parcel Transfers

Multi-Parcel transfers on a single instrument of transfer will only be accepted if the grantee(s) are identical and grantor(s) are identical for all described properties. Grantors may be identified by A.K.A., F.K.A., etc.

10. Identifying Parcel(s)

Parcel(s) must be identifiable by the Huron County Auditor and/or the Huron County Engineer.

11. Violations of State or Federal Law

Huron County reserves the right to reject legal instruments of conveyance that violate local, state or federal laws, rules, and/or regulations.

The County Auditor and/or the County Engineer may reject any conveyance that is not in compliance with the Ohio Revised Code or the Ohio Administrative Code.

B. Out-of-State/Foreign Instruments

All instruments executed in another state or country in conformity with the laws of that state or country are valid as if executed within the State of Ohio pursuant to section 5301.06 of the Ohio Revised Code.

C. Administrative Parcel Combinations

The Huron County Auditor may permit parcels to be combined. All of the following requirements are necessary:

1. Parcels must have identical ownership.
2. Parcels must be contiguous.
3. Parcels must be in the same taxing district.
4. Parcels must have the same real estate use classification (residential and commercial properties cannot be combined, for example.)
5. For metes and bounds descriptions, all parcels combined must have one legal surveyor's description, with a plat on file in the Tax Map Department.

1400.05 Requirements for New or Existing Descriptions of Record

- A.** All instruments conveying a parcel of record, when submitted for transfer, must describe the parcel verbatim as witnessed by the instrument of previous record and transfer, including separate paragraphs and all surveyor information except as otherwise permitted by these standards and requirements.

- B.** All legal descriptions that were used in a prior recorded instrument of conveyance will be accepted in the new instrument if the parcel can be located for taxing purposes.
- C.** All instruments conveying a recorded lot in a municipality or recorded subdivided area shall designate the lot number(s) and/ or tract(s), the official recorded name, the plat book and page number of record, and the prior recorded deed reference if any exists(if none can be found it must be so indicated on the instrument). Condominium units shall designate the unit number, condominium name, any amendment number, as well as volume and page of the recorded plat, bylaws and declaration.
- D.** Any out-lot or portion of a recorded lot shall have an accurate description which will permit dimensional reproduction through the use of the description.
- E.** All new metes and bounds descriptions written from a survey of record will be subject to a computer verification as to the accuracy of the parcel closure of the area described. Closure must meet the measurement specifications defined in Chapter 4733-37-04, Paragraphs (B) and (C), of the Ohio Administrative Code.
- F.** If the parcel to be conveyed is an existing parcel, but does not have a description of record due to being the residue parcel resulting from an earlier subdivision, or having changes in its configuration or otherwise altered due to factors such as boundary line agreements, eminent domain proceedings, highway relocations or dedications, etc., a new description shall be required. The new description shall be derived by one of the following methods:

1. Exceptions Method

The description may utilize the last description of record prior to the split(s) or other boundary changes, followed by the descriptions of the parcel(s) having been split out of the original parcel. No more than three (3) “exceptions” may be used in this method and all “exceptions” shall be subject to the same requirements as for a parcel conveyance.(Copies of prior instruments containing the “exception” descriptions should accompany the instrument being presented for recording to expedite processing.)

2. New Metes and Bounds Description from Existing or New Survey Method

All new metes and bounds descriptions must be written by a registered surveyor and submitted with an original stamped and signed copy of the survey plat of a new survey or a copy of the appropriate existing plat of survey of record to the Tax Map Department along with the deed for transfer. The new metes and bounds description and the survey plat shall be submitted to the Tax Map Department for review prior to presentation of the deed or other instrument of transfer. Said new survey and description shall comply with the Land Conveyance Standards and Requirements for Approval of Deed Descriptions, Surveys, and Survey Plats in Huron County, Ohio, as herein adopted. See Section 1400.06 for requirements.

G. Exceptions to Requirements of Section 1400.05, Paragraphs A, B, and C (Technical Corrections)

Descriptions that are not identical to the previous description of record, but have been amended or altered by the preparer due to any of the following or similar circumstances which do not make any substantive change in the description of the property, shall not be subject to the requirement that a new metes and bounds description be prepared:

1. Changes in Township and/or Municipal designation due to an annexation and/or detachment proceedings, mergers of unincorporated or incorporated entities or changes in official names of governmental subdivision.
2. Addition or correction of Tract, Section, Lot, Sublot, Subdivision names, street names or identifying numbers or information of record to further identify the property to be transferred and/or required by the County Recorder's Office for indexing purposes.
3. The correction of scrivener errors or omissions in the legal description of the prior instrument of record.
4. To reflect dedication or vacation of public streets.
5. Changes in descriptions reflecting changes in the names of adjoining lot owners or information relating to adjoining lots referred to in the prior legal description of record which do not make any substantive change in the description.
6. Converting chains and links to feet and decimals thereof. The author shall keep chains and links and add feet conversion in parenthesis.

H. The Following Transfers Shall Not be Subject to Section 1400.05, F, 1. (Exceptions Method)

1. Transfers ordered by the Probate Court or by Certificate of Transfer.
2. Transfers from individual(s) to one or more of the same individuals or one or more of the same individuals and others, in connection with the creation or dissolution of a co-tenancy or the filing of a Transfer on Death deed.
3. Transfers in completion of a previously recorded land contract using the same legal description.
4. Transfers terminating a life estate using the same legal description.
5. Any other transfer which in the opinion of the County Auditor or the County Engineer would be in the furtherance of a valid court order, from a court of competent jurisdiction, transferring the real property, including without limitation a decree of foreclosure.

6. Transfers pursuant to a previously recorded Transfer on Death deed using the same legal description.

I. Transfer Stamp Requirements

The above described transfers, if approved will be stamped by the Huron County Tax Map Department, whose stamp shall read “Reviewed, Survey Required Before Next Transfer” as shown:

REVIEWED _____ (DATE)

HURON COUNTY TAX MAP DEPARTMENT
SURVEY REQUIRED BEFORE NEXT TRANSFER

1400.06 Requirements for Instruments of Conveyance Containing a New Metes and Bounds Description

All new metes and bounds descriptions from surveys shall be written by a professional land surveyor in compliance with the Ohio Administrative Code, Chapter 4733-37 and must incorporate the following:

A. Existing Survey

All new metes and bounds descriptions based on **Existing Survey(s)** of record must incorporate the following:

1. Caption

- a. Description must denote State, County, Municipality or Township, and the appropriate Section, Tract, Great Lot, Township/City/Village Lots, Inlot or Outlot.
- b. Description must denote recorded ownership and deed reference as to the tract of origination. List the Official Record or Deed Volume and Page(s) or Document Number(s).

2. Point of Reference, Point of Beginning or Point of Origin

- a. All new metes and bounds descriptions must be referenced to an established point of origin for the description such as centerline intersections of roads or streets of record, Township/Tract/ Section/ Lot lines or corners thereof or their intersection with roads of record, or recorded subdivision corners or lines, or recorded City or Village Lots or Outlots.
- b. This reference point should not be confused with the Principal Place of Beginning of the parcel being described. However, when the corner of the described parcel originates at the Reference Point, the Principal Place of Beginning and the Reference Point become one and the same.

3. Courses

- a. Each course of a new description shall be a separate paragraph, and all courses shall be stated in a clockwise direction from the principal place of beginning to the point of termination of the subject description.
- b. Each course of a new metes and bounds description based on survey(s) of record shall cite the bearings (adjusted for clockwise direction) and distances as shown on the existing recorded survey.
- c. Any course describing a curve must contain the direction of the curve (right or left) and all the curve data cited on the existing recorded survey.
- d. Each course must recite all monumentation, as shown on the recorded survey, either set or found and used along each course, or at the point of termination. This recitation shall include the type, size and material of each monument. (I.P. is **NOT** an acceptable description.)
- e. Each course must describe all common lines shown on the recorded survey such as centerlines of roads, railroads, rivers, Section/Tract/Lot lines, etc. (Add updated name in parenthesis following the original record).
- f. Intent in regard to adjoining, if used. If an adjoining(s) is cited, then the full name(s), Official Record(s) or Deed Volume(s) and page(s) or Document Number(s) must be stated.
- g. The basis of the description shall be given in a statement similar to the following: "This description is based on a survey performed by (name of surveyor), Surveyor's Number, date of survey and found in Plat Book _____, Page _____ of Huron County Survey Records.
- h. The description shall recite the basis of the bearings of the survey used.

4. Acreage

- a. Acreage must be stated as shown on the recorded survey of the parcel.
- b. Where the recorded survey is in more than one taxing district, the description must cite each acreage separately and shall be totaled for the whole parcel.

5. Surveyor Information

All new metes and bounds descriptions written from a survey of record and prepared by a registered professional land surveyor must incorporate the surveyor's name and Ohio registration number, the date the survey was performed and a statement indicating the source of any additional information used in the development of the description including tax map and ownership data.

6. Closure Accuracy

All new metes and bounds descriptions written from a survey of record will be subject to a computer verification as to the accuracy of the parcel closure of the area described. Closure must meet the measurement specifications defined in Chapter 4733-37-04, Paragraphs (B) and (C), of the Ohio Administrative Code.

B. New Survey

All new metes and bounds descriptions based on a **New Survey** must incorporate the following:

1. Caption

- a. Description must denote State, County, Municipality or Township, and the appropriate Section, Tract, Great Lot, Township/City/Village Lots, Outlot or Inlot.
- b. Description must denote recorded ownership and deed reference as to the tract of origination. List the Official Record(s) or Deed Volume(s) and Page(s) or Document Number(s).

2. Point of Reference, Point of Beginning, or Point of Origin

- a. All new metes and bounds descriptions must be referenced to an established point of origin for the description such as centerline intersections of roads or streets of record, Township/Tract/Section/Lot lines or corners thereof or their intersection with roads of record, or recorded subdivision corners or lines, or recorded City or Village Lots or Outlots.
- b. This reference point should not be confused with the Principal Place of Beginning of the parcel being described. However, when the corner of the described parcel originates at the Reference Point, the Principal Place of Beginning and the Reference Point become one and the same.

3. Courses

- a. Each course of a new description shall be a separate paragraph, and all courses shall be stated in a clockwise direction from the principal place of beginning to the point of termination of the subject description.
- b. Each course of a new metes and bounds description shall have a bearing expressed as a compass direction in degrees, minutes, and seconds and a distance measured in feet and decimal parts thereof to two (2) decimal places, from point of origination to the point of termination.
- c. Each course description must note all controlling monumentation either set or found and used. The description of each monument shall include the material, type and size. Duplication of monument information is not required where the point of termination of one course becomes the point of origination of the next course. (I.P. is **NOT** an acceptable description.)
- d. Any course of a new metes and bounds description which is on a curve must contain direction of the curve (right or left), the radius, the long chord bearing and distance, and arc length. All distances shall be in feet to two (2) decimal places. Any additional curve data may be added by the surveyor.
- e. When applicable, each course description shall include any other common line(s) such centerlines of roads, rivers, streams, etc., Section lines, Tract lines, Township lines, Lot lines, or any other pertinent common line of record or interest as witnessed by the survey for the conveyance.
- f. Intent in regard to adjoining, if used. If an adjoining(s) is cited, then the full name(s), Official Record(s) or Deed Volume(s) and Page(s) or Document Number(s) must be stated.

4. Basis of Bearings

A clear statement must be given as to the basis of the bearings (direction) used. Bearings are based on astronomic (true) north, magnetic north, geodetic (grid) north, or on an assumed datum as determined by the surveyor or correlating to a specific record bearing which, if used, must be stated on the plat and in the legal description.

5. References

All references to roads, rivers, water bodies, railroads, etc., must use current or existing numbers and/or names of record. Old or original names may also be mentioned for clarity. Names of water bodies are determined to be

of record as they are shown and named on current USGS Quadrangle Sheets.

6. Acreage

- a. All new metes and bounds descriptions must give the acreage contained within its perimeter and calculated to the fourth decimal place. The total acreage contained within the road right of way shall also be recited to the fourth decimal place. Total calculated square footage shall also be shown to two decimal places for parcels less than one acre in size, and all parcels within incorporated villages and municipalities.
- b. Whenever a new metes and bounds description encompasses two or more taxing districts or parcel numbers, a breakdown of the total area must be recited to create an accurate tax structure. The acreage must be recited to four (4) decimal places for each taxing district.

7. Surveyor Information

All new metes and bounds descriptions must include the surveyor's name, Ohio registration number and the date of survey and be incorporated into a statement indicating the subject description was prepared from an actual field survey similar to the following: "The above description is based on a field survey performed by (surveyor's name, not a company name) for surveying company, if applicable, P. S. Number _____ on month, day, year."

8. Closure Accuracy

All new metes and bounds descriptions presented for transfer will be subject to computer verification as to the accuracy of the parcel closure of the area described. Closure must meet the measurement specifications defined in Chapter 4733-37-04, Paragraphs (B) and (C) of the Ohio Administrative Code.

1400.07 Requirements for New Survey Plats

In addition to the requirements as set forth below, all survey plats must incorporate the principles, and minimum standards of good surveying, engineering and draftsmanship as defined by Chapter 4733-37 through 4733-37-07 and any subsequent revisions thereto of the Administrative Code of the State Board of Registration for Professional Engineers and Surveyors of the State of Ohio.

A. Signatures

The survey plat presented to the Huron County Tax Map Department at the same time the deed is presented for transfer must contain an original stamped seal and signature of the surveyor who performed the survey and prepared the plat.

B. Size

The size of the survey plat must be no smaller than 8-1/2 inches by 11 inches and no larger than 24 inches by 36 inches.

C. Material

The material upon which the survey plat is made can be high rag content vellum, mylar, blueline diazo copies, or dense ink computer generated copies on high quality printing paper. The plats submitted must be capable of being clearly scanned or microfilmed. (This is best accomplished if the plats are not folded.)

D. Lettering

All lettering shall be no less than 1/10 inches in height (10 pt. lettering) to guarantee legible reproduction.

E. Plat Details

All survey plats shall incorporate the following details:

1. Title

A title such that the general location of the subject survey can be readily identifiable. This requirement shall include the same information as established in Section 1400.06, A.1., Requirements for Instruments of Conveyance Containing a New Metes and Bounds Description, Existing Survey, Caption.

2. North Arrow

A north arrow on survey plats shall point to the top of the drawing or the right margin of the drawing, whichever is applicable.

3. Basis of Bearings

A clear statement must be given as to the basis of bearings (direction) used. Bearings are based on astronomic (true) north, magnetic north, geodetic (grid) north, or on an assumed datum as determined by the surveyor or correlating to a specific record bearing which, if used, must be stated on the plat and in the legal description.

4. Point of Reference, Point of Beginning or Point of Origin

The starting point must be referenced as cited in the description. This requirement should include the same information as established by Section 1400.06, A.2., Requirements for Instruments of Conveyance Containing a New Metes and Bounds Description, Existing Survey, Point of Reference, Point of Beginning or Point of Origin.

5. Survey Control

Indicate survey control used and its relationship to the property surveyed. Controlling lines and roads must have at least two verifiable points, and must indicate and properly describe the monuments found and used for the control. Said control points must be labeled on the survey plat as found and used and also referenced as such in the legal description.

6. Monumentation

All monumentation either found or placed must be shown, as cited by the metes and bounds description, together with a legend of the symbols used to identify the subject monumentation showing the type, size, and full cap information, if any, for each. (I.P. is **NOT** an acceptable description.) If all monuments are identified individually, no legend will be required.

7. Adjoiners

When adjoining ownership is shown, information shall include the following:

- a. Name or names by which the current or cited adjoiner(s) took title.
- b. Official Record(s) or Deed Book(s) and Page number(s) or Document number(s).
- c. Township, City, Village, Subdivision Lot Number where the adjoiners land is located, if not otherwise indicated.

8. Courses

All boundary information for each course as established by Section 1400.06, A.3, Requirements for Instruments of Conveyance Containing a New Metes and Bounds Description, Existing Survey, Courses.

9. Source Data

A citation of pertinent documents and sources of data used as a basis for carrying out the work, i.e., County Field Book Number and Page, Official Record or Deed Book and Page or Document Number, State Highway right of way drawings, Survey Book and Page, etc. If no source data is used it shall be so stated.

10. Scale

The written and graphic scale of the subject plat.

11. Approval Signature Space on Splits

Blank space must be allowed within a parcel split survey plat for all required approvals for the execution of the split. The approvals may include the following:

- a. Township Zoning Inspector
- b. City/Village approval
- c. Huron County Planning Commission or Administrative Officer approval

Checking with the Tax Map Department, Township Zoning Inspector, and Huron County Planning Commission or Administrative Officer is recommended prior to the submittal of the survey plat. (See Huron County Subdivision Regulations)

12. Surveyor Signature and Stamp

The surveyor's printed and original signed name, Ohio Registration Number and reproducible, original stamp or seal must be on the plat. See Section 1400.03, C.

13. Road Right of Way

The current road right of way widths shall be shown on the survey plat for all roads encompassed within the surveyed parcel. If the width varies within the parcel, the variances should be shown as calculated or extrapolated from the road right of way information available, or if not available, it can be stated "width varies".

14. Date

The date the survey was performed must be listed.

15. Landlocked Parcels

A detailed explanation shall be shown for any parcel that appears to be landlocked.

1400.08 Requirements for Filing Plats or Replats of Condominiums and Cluster Homes and Major Subdivisions

In addition to the requirements as set forth below, all survey plats must incorporate the principles, and minimum standards of good surveying, engineering and draftsmanship as defined by Chapter 4733-37 through 4733-37-07 and any subsequent revisions thereto of the Administrative Code of the State Board of Registration for Professional Engineers and Surveyors of the State of Ohio. Plats shall also be prepared using the same guidelines as outlined in Section 1400.07, Requirements for New Survey Plats.

A. Filing Plats

Original plats of subdivisions, large lot divisions, condominiums, cluster homes, etc., must be presented to the Huron County Tax Map Department along with a digital copy of the same, if possible. Plats presented with the digital file may require a minimum of five (5) working days to process. If a digital copy is not available, the Tax Map Department may require a minimum of seven (7) working days to process the plat. A list of acceptable forms, formats, compression methods, and media types for the digital file is available from the County Auditor's Office.

All subdivision, condominium, etc., plats must incorporate the following details:

1. Title

A title such that the name of the plat, the general location of the property encompassed by the plat and a clear description of what the plat is creating must be readily identifiable. Example of title:

The John D. Jones Subdivision
Located in Wakeman Township, Great Lots 31 and 32
Creating Parcels A & B

2. North Arrow

A north arrow on survey plats shall point to the top of the drawing or the right margin of the drawing, whichever is applicable.

3. Basis of Bearings

A clear statement must be given as to the basis of bearings (direction) used. Bearings are based on astronomic (true) north, magnetic north, geodetic (grid) north, or on an assumed datum as determined by the surveyor or correlating to a specific record bearing which, if used, must be stated on the plat and in the legal description.

4. Point of Reference, Point of Beginning or Point of Origin

The starting point must be referenced as stated in the description. This requirement shall include the same information as established by Section 1400.06, A.2., Requirements for Instruments of Conveyance Containing a New Metes and Bounds Description, Existing Survey, Point of Reference, Point of Beginning or Point of Origin.

5. Monumentation

All monumentation either found or placed must be shown, as cited by the metes and bounds description, together with a legend of the symbols used to identify the subject monumentation showing the type, size, and full cap information, if any, for each. (I.P. is **NOT** an acceptable description.) If all monuments are identified individually, no legend will be required.

Monuments must be set at all new corners of Sublots, Blocks, etc. A general statement citing this is acceptable. Monuments are not required to be set where the actual corner will be occupied by the structure, condominium, or cluster home.

6. Existing Recorded Lines

All existing Section/Tract/or Township/City/Village Lot lines or corners must be shown and identified within the area encompassed by the plat.

7. Adjoiners

When adjoining ownership is shown, information shall include the following:

- a. Name or names by which the current or cited adjoiner(s) took title.
- b. Official Record(s) or Deed Book(s) and Page numbers(s) or Document number(s).
- c. Township, City, Village, Subdivision Lot Number where the adjoiners land is located, if not otherwise indicated.

8. Source Data

A citation of pertinent documents and sources of data used as a basis for carrying out the work i.e., County Field Book Number and Page, Official Record or Deed Book and Page or Document Number, State Highway right of way drawings, Survey Book and Page, etc. If no source data is used it shall be so stated.

9. Scale

The written and graphic scale of the subject drawing.

10. Surveyor Signature and Stamp

The surveyor's printed and original signed name, Ohio Registration Number and reproducible, original stamp or seal must be on the plat. See Section 1400.03, C.

11. Owners Dedications, Easements, Acknowledgements and Signatures

A signature block for each applicable required signature i.e., the proper legal wording for the dedication of indicated roads, easements, and/or acknowledgement of action creating the plat as shown, followed by blanks for all signatures of all owners and witnesses (along with their printed names of same) as well as notary signature and seal.

NOTE: All plats that are filed with the Huron County Recorder's Office must have the signature of the owner(s) as acknowledging the creation of the plat as a minimum.

12. Approval Signature Blocks

Required signature blocks must be provided and may include the following:

- a. Township Zoning Inspector
- b. City Council Clerk
- c. City Planning Commission
- d. County Planning Official
- e. Health Department
- f. Soil and Water Conservation District
- g. County Engineer
- h. Emergency Management Agency
- i. County Commissioners

13. Recording Signature Blocks

Signature blocks must be provided for the recording process in the form as follows:

Approved this ____ day of _____, 2____

Huron County Tax Map Department

Received for transfer this ____ day of _____, 2____

Huron County Auditor

Received for recording this ____ day of _____, 2____

At ____ a.m./p.m.

Recorded in Plat Book No. _____, Page No. _____

Fee \$ _____

Huron County Recorder

14. Material Requirements

The material upon which the plat is drawn must be mylar. No sepia, blue-line, or blackline diazo copies or drawings on linen will be accepted. The plat must be drawn in black India ink or other dense black inking material capable of being clearly scanned or microfilmed. No folded plats will be accepted.

15. Lettering Requirements

No lettering less than 0.1 inch (10 pt. lettering) will be accepted.

16. Size Requirements

The plat must be no smaller than 8-1/2 inches by 11 inches and no larger than 24 inches by 36 inches (Recorder's Office requirement).

1400.09 Requirements for Annexation Plats

In addition to the requirements as set forth below, all survey plats must incorporate the principles, and minimum standards of good surveying, engineering and draftsmanship as defined by Chapter 4733-37 through 4733-37-07 and any subsequent revisions thereto of the Administrative Code of the State Board of Registration for Professional Engineers and Surveyors of the State of Ohio. Plats shall also be prepared using the same guidelines as outlined in Section 1400.07, Requirements for New Survey Plats.

All Annexation plats shall be presented to the Huron County Tax Map Department for approval prior to their presentation to the Huron County Commissioners for their signatures. **See Appendix at end of this chapter for the Commissioners' instructions for filing a petition for annexation with the Board of County Commissioners.**

Originals of approved Annexation Plats must be presented to the Huron County Tax Map Department and may require a minimum of five (5) working days to process. All Annexation Plats must incorporate the following details:

A. Title

A title setting forth the following:

1. The amount of acreage being annexed.
2. The Township(s) and Section(s)/Tract(s), Lot(s) from which the annexation is being removed.
3. The Municipality to which the annexation is going.
4. The lot(s) designations being created, if any.

B. Parcel Information

Each parcel to be annexed must have the following:

1. Ownership.
2. Acreage, if available.
3. Existing "parcel number".
4. Proposed city or village lot number or space therefore, if applicable.
5. Space for the new "parcel number"
6. Present address, if available.
7. Space for new address, if applicable.

These items must be shown either within the limits of the parcel on the plat or in a

table included as a part of the plat and keyed to the proper parcel on the plat of the annexation.

C. Acceptance Block

The acceptance block should be similar to the following:

- 1. Accepted by the City/Village of _____
- 2. By City Council/Village Ordinance/Resolution No. _____
- 3. At a regular meeting of same held on ____ day of _____, 2____
- 4. By Clerk of the City/Village Council _____

D. Commissioners' Approval Block

The Huron County Board of Commissioners must approve any annexation. The signature block should be similar to the following:

Approved by the Huron County Board of Commissioners this _____ day of _____, 2____

President

Commissioner

Commissioner

E. Recording Signature Blocks

Signature blocks for the Recording process should be similar to the following:

Approved this _____ day of _____, 2____

Huron County Tax Map Department

Received for transfer this _____ day of _____, 2____

Huron County Auditor

Received for recording this _____ day of _____, 2____

At _____ a.m./p.m.

Recorded in Plat Book No. _____, Page No. _____

Fee \$ _____

Huron County Recorder

F. Material Requirements

The material upon which the plat is drawn must be mylar. No sepia, blueline, or blackline diazo copies or drawings on linen will be accepted. The plat must be drawn in black India ink or other dense black inking material capable of being clearly scanned or microfilmed. No folded plats will be accepted.

G. Lettering Requirements

No lettering less than 0.1 inch (10 pt. lettering) will be accepted.

H. Size Requirements

The plat must be no smaller than 8-1/2 inches by 11 inches and no larger than 24 inches by 36 inches.

1400.10 Requirements for Area Detachment Plats

In addition to the requirements as set forth below, all detachment plats must incorporate the principles, and minimum standards of good surveying, engineering and draftsmanship as defined by Chapter 4733-37 through 4733-37-07 and any subsequent revisions thereto of the Administrative Code of the State Board of Registration for Professional Engineers and Surveyors of the State of Ohio. Plats shall also be prepared using the same guidelines as outlined in Section 1400.07, Requirements for New Survey Plats.

All Detachment plats shall be presented to the Huron County Tax Map Department for approval prior to their presentation to the Huron County Commissioners for their signatures. **See Appendix at end of this chapter for the Ohio Revised Code Sections (709.38-709.42) instructions for filing a petition for detachment.**

Originals of approved Detachment Plats must be presented to the Huron County Tax Map Department and may require a minimum of five (5) working days to process. All Detachment Plats must incorporate the following details:

A. Title

A title setting forth the following:

1. The amount of acreage being detached.
2. The Municipality, Township(s) and Section(s)/Tract(s), Lot(s) from which the detachment is being removed.
3. The Municipality, Township, County to which the detachment is going.
4. The lot(s) designations being created, if any.

B. Parcel Information

Each parcel to be detached must have the following:

1. Ownership.

2. Acreage, if available.
3. Existing "parcel number".
4. Proposed city or village lot number or space therefore, if applicable.
5. Space for the new "parcel number".
6. Present address, if available.
7. Space for new address, if applicable.

These items must be shown either within the limits of the parcel on the plat or in a table included as a part of the plat and keyed to the proper parcel on the plat of the detachment.

C. Acceptance Block

The acceptance block should be similar to the following:

1. Accepted by the City/Village/Township/County of _____
2. By City Council/Village Ordinance/Resolution No. _____
3. At a regular meeting of same held on ____ day of _____, 2_____
4. By Clerk of the City/Village Council/Township Fiscal Officer/
County Commissioners _____

D. Commissioners' Approval Block

The Huron County Board of Commissioners must approve any detachment. The signature block should be similar to the following:

Approved by the Huron County Board of Commissioners this
_____ day of _____, 2_____

President

Commissioner

Commissioner

E. Recording Signature Blocks

Signature blocks for the Recording process should be similar to the following:

Approved this _____ day of _____, 2_____

Huron County Tax Map Department

Received for transfer this _____ day of _____, 2_____

Huron County Auditor

Received for recording this _____ day of _____, 2_____
At _____ a.m./p.m.
Recorded in Plat Book No. _____, Page No. _____
Fee \$ _____

Huron County Recorder

F. Material Requirements

The material upon which the plat is drawn must be mylar. No sepia, blueline, or blackline diazo copies or drawings on linen will be accepted. The plat must be drawn in black India ink or other dense black inking material capable of being clearly scanned or microfilmed. No folded originals will be accepted.

G. Lettering Requirements

No lettering less than 0.1 inch (10 pt. lettering) will be accepted.

H. Size Requirements

The plat must be no smaller than 8-1/2 inches by 11 inches and no larger than 24 inches by 36 inches .

1400.11 Requirements for Vacation, Alteration or Establishment of Roads, Highway Easements and Subdivisions

Applications shall satisfy Ohio Revised Code Sections and applicable Conveyance Standards.

1400.12 Requirements for Boundary Line Agreements

A boundary line agreement as covered in Section 5301.21 of the Ohio Revised Code provides for the common lines or corners in dispute. All agreements, plats, and legal descriptions shall be prepared by a licensed surveyor subject to the requirements contained herein. All Boundary Line Agreements shall be processed by the Huron County Tax Map Department in the same manner as deeds.

If the boundary line agreement is located within a recorded subdivision, the Boundary Line Agreement Plat shall meet all the requirements set forth in Section 1400.08, Requirements for Filing Plats or Replats of Condominiums and Cluster Homes and Major Subdivisions.

1400.13 Requirements for Recording Highway Easements

All highway easements shall be written by the registered surveyor who prepared the easement plat and must incorporate the following:

A. Requirements for Highway Easement Descriptions

A highway easement description must cover only one existing parcel. It cannot consist of one description which takes the easement across more than one existing

adjoining parcel having common ownership.

1. Caption

- a. Denote State, County, Municipality or Township, and the appropriate Section, Tract, Great Lot, Township/City/Village Lots, Outlot or Inlot.
- b. Denote recorded ownership and deed reference as to the tract of origination. List the Official Record(s) or Deed Volume(s) and Page(s) or Document Number(s).

2. Parcel Identification

- a. Identify the tract of ground in which the easement is located by general description of the parcel, owners names and the parcel numbers.
- b. List acreage of all parcel(s) and parcel numbers in which the easement is located.

3. Highway Easement Identification

- a. Centerline Easements
 - 1. State width of easement, Example: "Being a 60 foot wide easement 30 feet each side of the following described line."
 - 2. Detailed description of the course of the centerline including a readily identifiable beginning point. Example: "Beginning at a point in the western most property line, approximately 35 feet, more or less, northwesterly from the southwest corner of (grantor's) tract. Thence northeasterly, parallel to and 35 feet northwesterly from grantor's southern most line, approximately 300 feet, more or less, to a point in the grantor's eastern most property line."
- b. Strip Easement
 - 1. State width of easement. Example: "Being a 60 foot wide easement 30 feet each side of the following described line."
 - 2. State location. Example: (Continued from above) ".....along the grantor's south property line."
- c. Irregular Shaped Easement
 - 1. Indicate a defined point of beginning tied into a point of record.

2. Provide a clear metes and bounds description.

d. Restrictions

List any and all restrictions over the aforesaid easement area.

B. Requirements for Highway Easement Plats

All easement plats must reflect the legal description and incorporate the following details:

1. A north arrow.
2. Written and graphic scale.
3. The State, County, Township, and Municipality (if applicable), Section, Tract, Lot, etc.
4. Owner(s) name, Official Record or Deed Volume and Page(s) or Document Number(s), the parcel number(s) of the land the easement is on, and the adjoining landowners, Official Record or Deed Book Volume and Page(s) or Document Number(s), if easement begins, or ends on an adjoining property line.
5. The property lines of the subject parcel, or the land containing the easement, and any roads mentioned in the written description.
6. Any and all distances, bearings, etc., pertaining to the easement area shall be shown on the plat.
7. Area of the easement in square feet (for total areas less than one acre) and acres.

1400.14 Description Terminology

| | |
|-----------------------|--|
| ADJOINING | A reference term meaning a boundary that is common with another. |
| ADJOINING PARCEL | A parcel that has a line(s) in common with the subject parcel being described and implies that the boundary is moving with the call (e.g., along a township line) and the line is the route. |
| BLOCK, SUBDIVISION | A term used to describe parcels created in Subdivisions for two purposes: <ol style="list-style-type: none">1. Generally of irregular shape and larger acreage than |

sublots, not to be used as buildable lots, and often used as “greenspace”, or common areas or drainage basins.

2. Larger acreage than sublots being reserved for later development as sublots or cluster homes or condominiums, etc.

CALL

The “bound” along which or to which in order of superiority, a course of metes and bounds description follows.

1. Calls for monuments – natural (lakes, rivers, trees) or physical (any type of marker set by a surveyor.)
2. Secondary Monuments – descriptive boundary, e.g., to a tree row, to a fence.
3. Reference to record boundary, e.g., township/city/village lot line, subdivision subplot line, etc.
4. Calls tied to other monuments with bearing and distance to such monuments not at or along the property boundaries.
5. Distances on the boundary.
6. Bearings on the boundary.
7. Area contained within the parcel when not specified within the caption of the description.

EXCEPTING
THEREFROM

To omit or remove the following description from the prior description. To subtract the following acreage from the prior described acreage.

GREAT LOT

A term sometimes used to describe the “original” divisions set up by the first surveyors of an individual township. Sometimes abbreviated as G.L. and as such has been confused with the abbreviation O.L. meaning Outlot.

INLOT

A type of lot created at the incorporation or creation of a municipality. Typically these were smaller parcels that were expected not to be further subdivided. Typically, they were numbered and designated on the Incorporation Plat or original Village Plat as Inlots starting with the number 1. The abbreviation is usually I.L.

LEGAL DESCRIPTION

A legal description of a parcel of land should be clear, complete and concise, and written in such a way that avoids any confusion between the intended parcel and any other parcel.

A legal description consists of four basic parts:

1. Caption

The caption consists of the situation (basic location) of the parcel stating the township(s) or municipality name(s), the county and the state and the specific purpose statement, i.e., what the description is intended to do. (Describing a parcel of land for transfer of ownership; an easement; or certain rights such as life estate, mineral rights, or surface rights).

The caption gives the parameters outside of which any calls in the body of the description that conflict with the caption are nullified. For example, a caption that reads a parcel of land being located Great Lot Number 5, of Lyme Township, then no portion of the body of the description can go outside of that Great Lot and Township.

2. Body

The body of the legal description must be a clear recital of the pertinent facts to describe the land and be complete, without contradictions to the caption or any other factors influencing the location.

3. Exceptions

Exceptions cut out or remove a portion of the land described in the body of the description. They must be complete descriptions, capable of standing alone, to describe the parcel of the exception. The area defined in an exception IS SUBTRACTED from the acreage being conveyed. A summation paragraph at the end of a description containing one or more (limit of three) exceptions helps to clarify the intent of the deed. For example: "intending to convey after said exceptions approximately one acre of land, more or less, subject to all legal highways."

4. Restrictions and/or Reservations

Reservations include conditions of restricted use of a portion of the land being conveyed. For example, reserving an easement of access across a designated portion of the described land. The area defined in a reservation IS NOT SUBTRACTED from the acreage being conveyed.

The above is paraphrased and adapted to Huron County's particular situation from Chapter 32 "Land Descriptions" by Dennis J. Mouland from The Surveying Handbook, Second Edition, Edited by Russell C. Brinker and Roy Minnick, New York, NY, Chapman and Hall Publishers 1995.

METES AND BOUNDS

A system of describing a parcel of land by giving the directions and distances measured out (meted out) around the parcel and the "call" for the course to extend to a natural or artificial monument.

ORIGINAL LOT

A term sometimes used to describe the "original" divisions set up by the first surveyors of an individual township. Sometimes abbreviated as O.L. and as such can be confused with the same abbreviation used to mean Outlot. See definition of Outlot.

OUTLOT

A type of lot created at the incorporation or creation of a municipality. Typically these were larger parcels that were expected to be split into many subsequent parcels as the municipality grew. Typically, they were numbered and designated on the Incorporation Plat or original Village Plat as Outlots starting with the number 1. The abbreviation is usually O.L. and as such can be confused with the same abbreviation used to mean Original Lot. See definition of Original Lot.

PLAT

A general term used to describe the recorded document that creates a Subdivision, City/Village Lot, annexes parcels into a Municipality, etc. Sometimes also used to refer to the document containing the drawing of a survey. It is referenced by a Plat Book number and Page number where the specific document (Plat) can be found recorded in the Huron County Recorder's Records.

RAW ACREAGE

A general term used to refer to parcels of land that exist as a metes and bounds description within a township. Parcels of land considered as raw acreage descriptions are NOT part of any Subdivision. "Raw acreage" in this usage does not have any intended connotation to the existence or lack of structures on the parcel.

**RECORDED LOT/
SUBLOT**

Refers to a parcel of land as recorded by a plat in the Huron County Recorder's Records. It may be recorded within the Deed Volumes in the case of Original Township Lots and old Plats, e.g., "Havana Plat" or the more recently created Recorder's Plat Books or the new Plat Records, which are the record of Subdivisions, new City/Village Lots and Annexations.

| | |
|-----------------|---|
| RECORDED PARCEL | Refers to a parcel of land whose legal description is recorded in the Huron County Recorder's Records in a Deed Volume or Official Record Volume or is filed by Document Number. The parcel's description may consist of a recorded lot/sublot or a metes and bounds description of raw acreage. |
| RESERVING | To reserve an interest such as an easement or life estate for the grantor, but the land described as reserved is NOT subtracted from the prior described acreage. |
| SCRIVENER | Writer(s) of deeds |
| SECTION OF LAND | This term should be avoided as "Section" is a specific name of a body of land within original Huron County Townships. A more appropriate term is "parcel of land". |
| SUBLOT | This term specifically describes a parcel of land as recorded in a subdivision. The full name of the subdivision and its Plat Book number and page should be referenced the first time the subplot is mentioned within the description. |
| SURVEY | A general term used to imply that a registered surveyor has performed a survey of the parcel. A survey plat is on file at the Huron County Tax Map Department or Recorder's Office. These surveys are used as the basis for descriptions cited in deeds filed in Huron County. Surveys of all new splits and re-surveys of existing parcels must be submitted and added to the survey records when the deed using the survey's description is first presented for transfer. |
| TRACT OF LAND | This term should be avoided as "tract" is a specific name of a body of land within some original Huron County Townships. A more appropriate term is "parcel of land". |

1400.15 Miscellaneous Signature Blocks

The following are examples of signature blocks that may be required on certain legal documents:

CITY PLANNING COMMISSION CERTIFICATE

This plat was duly accepted by resolution of the Norwalk City Planning Commission on the _____ day of _____, 2_____.

Chairman

COUNTY ENGINEER'S CERTIFICATE:

I hereby certify that the above plat conforms to all engineering and surveying requirements set forth by the County of Huron on this ____ day of _____, 2____.

Huron County Engineer

HURON COUNTY EMERGENCY MANAGEMENT AGENCY

This plat has been reviewed by the Huron County Emergency Management Agency on this _____ day of _____, 2____.

Huron County E.M.A. Coordinator

APPENDIX TO CHAPTER FOURTEEN

EXHIBIT A



July 25, 2002

02-308

RESOLUTION

IN THE MATTER OF ESTABLISHING DEPOSIT AND FEES REGULATIONS FOR COST INCURRED IN ANNEXATION PROCEEDINGS

BOARD OF COMMISSIONERS

Mike Adelman moved the adoption of the following resolution:

Terry Boose
Ardeth Chupp
Mike Adelman

COUNTY ADMINISTRATOR
Mary M. Cain

CLERK
Cheryl Nolan

WHEREAS, amended substitute Senate bill 5 (SB 5) of the 124th General Assembly, changing Ohio's annexation laws, has been passed by the General Assembly and signed by the Governor; and

WHEREAS, the Board of Huron County Commissioners is processing all annexation petitions received after June 28, 2002 under the new law; and

WHEREAS, section 709.014 (A) of the Ohio Revised Code as enacted by SB 5 authorizes the Board of Commissioners of Huron County to establish a reasonable fee or schedule of fees to cover the costs incurred by the county in any proceeding that takes place under Chapter 709 of the ORC; and

WHEREAS, section 709.014 of the ORC as enacted by SB 5 also authorized the board to require an initial deposit to be paid at the time a petition for annexation is filed or promptly thereafter; and

WHEREAS, section 709.032 (B) of the ORC as enacted by SB 5 also provides for the payment of other fees or requires deposits in connection with the processing of annexation petitions; and

WHEREAS, the board desires to implement a deposit and fee schedule for annexation petitions filed with the board; now therefore

BE IT RESOLVED, that the Board of Huron County Commissioners desires to establish a deposit and fees regulations for cost incurred in annexation proceedings:

Section 1.0 Annexation Deposit

Every annexation petition submitted pursuant to Chapter 709 of the ORC shall be subject to a deposit in the amount of twenty-five dollars (\$25.00);

Section 1.1 Time Period In Which To Make Deposit

The deposit required pursuant to Section 1.0 of this resolution shall be filed with the Clerk of the Board at the time of filing.

Section 2.0 Fees for Subpoena Requested by Necessary Party

If a necessary party to an annexation proceeding, as defined in Section 709.32 (A) of the ORC, request the Board to issue a subpoena for witnesses or for books, papers, correspondence, memoranda, agreements, or other documents or records relevant or material to the petition, the party requesting the subpoena shall pay in advance the fees and mileage expenses necessary to serve the subpoena. The remainder of the expenses shall be paid out of fees charged by the Board pursuant to section 1.0 above.

Section 2.1 Fees For Subpoena Issued By a Board Without a Request From a Necessary Party

If the board issues a subpoena on its own initiative for witnesses or documents specified in Section 2.0, all costs shall be paid out of fees charged by the Board pursuant to section 1.0.

Section 2.2 Amount of Fees Associated with Subpoenas

The fees and mileage expenses for the Sheriff and witnesses shall be the same as those allowed by the Court of Common Pleas in criminal cases and as maintained on file with the Board of County Commissioners of Huron County.

The first meeting of the Huron County Commissioners was August 1, 1815 with the first three Commissioners being: Caleb Palmer, Charles Parker and Eli. S. Bamum. The first Clerk was Ichabod Marshall. The first act was to order a schoolhouse converted for Commissioners' meetings. Norwalk became the county seat in 1818 when the number of registered voters was 56 and when the total taxes collected that year was \$192.40. Commissioners purchased a building to use as a courthouse in 1818 for \$848 and built a new jail for \$275. Huron County's area was dramatically reduced in 1838 when Erie County was formed. Population figures at the end of the first millennium were more than 32,000. Today, Huron County boasts more than 60,000 citizens.

Northwest Territory 1787
Firelands Territory 1782
Settled in 1804
Huron County
Founded in 1809

180 Milan Avenue, Norwalk, Ohio 44857-1195
419-668-3092 • 800-808-5042 • Fax: (419) 663-3370
Email: hurcom@hmccltd.net
www.hccommissioners.com

EXHIBIT A, Cont'd.

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Resolution 02-308
July 25, 2002

Section 2.3 Fees for Transcription of Record Hearing

If a request is made to transcribe the record of the hearing, in accordance with Section 709.32 (B) of the ORC, it shall be accompanied by an amount determined by the Clerk of the Board of County Commissioners to be necessary to cover the costs of transcribing the record;

Section 2.4 Other Fees

Fees not otherwise provided for in this resolution shall be paid by the agent for the petitioners. In addition to the fees provided for in section 1.0, 2.0, 2.1, 2.2, and 2.3 of this resolution, fees shall be paid by the agent for the petitioner for other costs incurred by the Board relating to an annexation petition. These fees may include but are not limited to: 1. all costs incurred in preparing and providing copies of notices and documents to the agent for the petitioner, other parties to the proceeding, the County Engineer, the County Prosecutor or other county officials, including the petition and all papers that accompany the petition; 2. certified resolutions of the Board related to the proceedings; 3. duplicate electronic records of the proceedings; 4. any other papers on file that constitute the record of the proceedings; 5. materials, postage, paper and other supplies, long distance telephone charges, and other related costs.

Section 3.0 Deposit of Fee Revenue

The clerk shall deposit all funds received from deposits or fees for processing annexation petitions into a special revenue fund for the purposes of paying expenses related to the processing of annexation petitions.

Section 3.1 Payment of Expenses

All expenses incurred in the processing of an annexation and detailed accounting of all funds received and expended in processing each annexation petition filed pursuant to Chapter 709 of the ORC. The clerk may issue invoices to the agent for the petitioners whenever it appears that adequate funds are not on deposit to pay expenses in accordance with the deposit and fee scheduled contained in this resolution.

At the conclusion of the annexation proceeding for each petition, the Clerk shall make a final accounting of expenses incurred in processing the petition and shall render an invoice to the agent for the petitioners if adequate funds have not been received. In the event the funds received are in excess of final expenses, the clerk shall cause any such excess over \$1.01 to be refunded to the agent for the petitioners, and further

BE IT RESOLVED, that the foregoing resolution was adopted and all actions and deliberations of the Board of Commissioners of the County of Huron, Ohio, relating thereto were conducted in meetings open to the public, in compliance with all applicable legal requirements, including Section 121.22 of the Ohio Revised Code.

Terry Boose seconded the motion. The roll being called upon its adoption, the vote resulted as follows:

CERTIFICATION
I, Clerk to the Board of Huron County Commissioners do hereby certify that the above is a true and correct copy of the resolution passed on July 25, 2002 and is recorded in the Commissioners Journal on page 15
Cheryl Tolson
CLERK

Yes *Ardeth Chupp*
Ardeth Chupp
Yes *Mike Adelman*
Mike Adelman
Yes *Terry Boose*
Terry Boose

EXHIBIT A, Cont'd.

September 16, 2003

03-440

RESOLUTION

IN THE MATTER OF ESTABLISHING ADDITIONAL DEPOSIT AND FEE REGULATIONS FOR COST INCURRED IN ANNEXATION PROCEEDINGS

Ardeth Chupp moved the adoption of the following resolution:

WHEREAS, Huron County Board of Commissioners Resolution 02-308, adopted July 25, 2002, established certain costs for deposits and fees for annexation proceedings under the revised annexation laws, Ohio Revised Code chapter 709; and

WHEREAS, the Board desires to also establish a deposit requirement when the Board is asked to provide an official court reporter to record a hearing, pursuant to ORC 709.032 (B); now therefore

BE IT RESOLVED, that the Board hereby establishes the amount of two hundred fifty dollars (\$250.00) as the deposit requirement for the Board to provide an official court reporter to record a hearing; and further

BE IT RESOLVED, that the deposit shall be paid at the time that the party submits the request for the official court reporter and that the request shall be made, if at all, no later than seven (7) days prior to the hearing, pursuant to ORC 709.032 (B); and further

BE IT RESOLVED, that the foregoing resolution was adopted and all actions and deliberations of the Board of Commissioners of the County of Huron, Ohio, relating thereto were conducted in meetings open to the public, in compliance with all applicable legal requirements, including Section 121.22 of the Ohio Revised Code.

Terry Boose seconded the motion. The roll being called upon its adoption, the vote resulted as follows:

eps

Mike Adelman
Mike Adelman

TC

Terry Boose
Terry Boose

Yes

Ardeth Chupp
Ardeth Chupp

CERTIFICATION

I, Clerk to the Board of Huron County Commissioners do hereby certify that the above is a true and correct copy of the resolution passed on 9/16/03 and is recorded in the Commissioners Journal Volume _____ page _____

Vickie Zembra
CLERK

EXHIBIT B

ANNEXATIONS, OHIO REVISED CODE CHAPTER 709.

Checklist for Regular Annexations, ORC § 709.02, et seq.

(A majority of the property owners sign onto petition.)

Submissions for annexation as a Regular Annexation must include the following items:

- 1) Petition. Petition must include:
 - a) Name of person to act as Agent for the petitioners.
 - b) Signatures of a majority of the property owners in the territory proposed to be annexed. Signatures must be dated.
 - c) Accurate legal description of the perimeter of the territory to be annexed.
 - d) Accurate map or plat of the territory.
- 2) List of all tracts, lots, or parcels located within, adjacent to, and across the road from the territory proposed to be annexed. List must include:
 - a) Name of owner
 - b) Mailing address of owner
 - c) Permanent parcel number
- 3) Filing fee deposit in the amount of \$_____.

[After the Agent receives notice of the date and time of the hearing from the clerk of the board of county commissioners, the Agent is required to file certain notice with the following:

- a) The municipality to which the annexation is proposed;
- b) The townships included in the territory proposed to be annexed;
- c) All the owners of the property within the territory proposed to be annexed;
- d) The owners of property adjacent to and across the road from the territory to be annexed;
and
- e) If the territory is located in another county, the clerk of the board of county commissioners of that county.

The Agent may need to seek legal advice regarding the time within which to give notice, manner of notice, contents of the notice, proof of notice, and additional statutory requirements of Agent.]

Petitions for annexation have certain legal requirements and consequences. The Office of the Board of Huron County Commissioners cannot give legal advice. It is recommended that all Petitioners seek the advice of their legal counsel.

EXHIBIT B, Cont'd.

**SAMPLE
PETITION FOR REGULAR ANNEXATION
Ohio Revised Code Chapter 709**

Date: _____

To: The Board of County Commissioners of Huron County, Ohio
Huron County Administration Building, Top Floor
180 Milan Avenue, Norwalk, Ohio 44857

The undersigned Petitioners, who are A MAJORITY of the owners of the real estate within the territory proposed to be annexed, consisting of _____ acres in _____ Township, Huron County, Ohio, adjacent to the City/Village of _____, do hereby respectfully petition the Board of Huron County Commissioners to cause such territory to be annexed to said City/Village as a Regular Annexation, ORC § 709.02.

The undersigned Petitioners do hereby designate as their Agent _____ whose address is _____
The Agent's phone number is _____; Fax number is _____
and email address is _____.

The total number of owners within the territory to be annexed is _____.

Attached to this Petition and made part hereof are:

- 1) Accurate legal description of the territory proposed to be annexed, marked Exhibit "A"; and
- 2) Accurate map or plat of the territory proposed to be annexed, marked Exhibit "B".

This Petition is accompanied by the following:

- 1) A list of parcels located within, adjacent to, and across the road from the territory proposed to be annexed, that includes the owner's name, mailing address and permanent parcel number, marked Exhibit "C".
- 2) Filing fee deposit of \$_____.

Petitioners' Signature Address Date

EXHIBIT B, Cont'd.

ANNEXATIONS, OHIO REVISED CODE CHAPTER 709.

Checklist for Expedited Type 1 Annexations, ORC § 709.022.

(All property owners sign onto petition and there is an annexation agreement or CEDA.)

Submissions for annexation as an Expedited Type 1 must include the following items:

- 1) Petition. Petition must include:
 - a) Name of person to act as Agent for the petitioners.
 - b) Signatures of all property owners in the territory proposed to be annexed. Signatures must be dated.
 - c) Notice immediately above signatures in boldface capitol letters stating:
"WHOEVER SIGNS THIS PETITION EXPRESSLY WAIVES THEIR RIGHT TO APPEAL ANY ACTION ON THE PETITION TAKEN BY THE BOARD OF COUNTY COMMISSIONERS. THERE ALSO IS NO APPEAL FROM THE BOARD'S DECISION IN THIS MATTER IN LAW OR IN EQUITY."
 - d) Accurate legal description of the perimeter of the territory to be annexed.
 - e) Accurate map or plat of the territory.
- 2) List of all tracts, lots, or parcels located within, adjacent to, and across the road from the territory proposed to be annexed. List must include:
 - a) Name of owner
 - b) Mailing address of owner
 - c) Permanent parcel number
- 3) Certified copy of Annexation Agreement or Cooperative Economic Development Agreement.
- 4) Filing fee deposit in the amount of \$25.00.

Petitions for annexation have certain legal requirements and consequences. The Office of the Board of Huron County Commissioners cannot give legal advice. It is recommended that all Petitioners seek the advice of their legal counsel.

EXHIBIT B, Cont'd.

**SAMPLE
PETITION FOR EXPEDITED TYPE 1 ANNEXATION
Ohio Revised Code Chapter 709**

Date: _____

To: The Board of County Commissioners of Huron County, Ohio
Huron County Administration Building, Top Floor
180 Milan Avenue, Norwalk, Ohio 44857

The undersigned Petitioners, who are ALL of the owners of the real estate within the territory proposed to be annexed, consisting of _____ acres in _____ Township, Huron County, Ohio, adjacent to the City/Village of _____, do hereby respectfully petition the Board of Huron County Commissioners to cause such territory to be annexed to said City/Village as an Expedited Type 1 Annexation, ORC § 709.022.

The undersigned Petitioners do hereby designate as their Agent _____ whose address is _____
The Agent's phone number is _____; Fax number is _____
and email address is _____.

The total number of owners within the territory proposed to be annexed is _____.

Attached to this Petition and made part hereof are:

- 1) Accurate legal description of the territory proposed to be annexed, marked Exhibit "A"; and
- 2) Accurate map or plat of the territory proposed to be annexed, marked Exhibit "B".

This Petition is accompanied by the following:

- 1) List of parcels located within, adjacent to, and across the road from the territory proposed to be annexed, that includes the owner's name, mailing address and permanent parcel number, marked Exhibit "C".
- 2) Certified copy of the Annexation Agreement or Cooperative Economic Development Agreement, marked Exhibit "D".
- 3) Filing fee deposit of \$25.00.

"WHOEVER SIGNS THIS PETITION EXPRESSLY WAIVES THEIR RIGHT TO APPEAL ANY ACTION ON THE PETITION TAKEN BY THE BOARD OF COUNTY COMMISSIONERS. THERE ALSO IS NO APPEAL FROM THE BOARD'S DECISION IN THIS MATTER IN LAW OR IN EQUITY."

Petitioners' Signature Address Date

EXHIBIT B, Cont'd.

ANNEXATIONS, OHIO REVISED CODE CHAPTER 709.

Checklist for Expedited Type 2 Annexations, ORC § 709.023.

(All property owners sign onto petition but there is no annexation agreement or CEDA.)

Submissions for annexation as an Expedited Type 2 must include the following items:

- 1) Petition. Petition must include:
 - a) Name of person to act as Agent for the petitioners.
 - b) Signatures of all property owners in the territory proposed to be annexed. Signatures must be dated.
 - c) Notice immediately above signatures in boldface capitol letters stating:
"WHOEVER SIGNS THIS PETITION EXPRESSLY WAIVES THEIR RIGHT TO APPEAL IN LAW OR EQUITY FROM THE BOARD OF COUNTY COMMISSIONERS' ENTRY OF ANY RESOLUTION PERTAINING TO THIS SPECIAL ANNEXATION PROCEDURE, ALTHOUGH A WRIT OF MANDAMUS MAY BE SOUGHT TO COMPEL THE BOARD TO PERFORM ITS DUTIES REQUIRED BY LAW FOR THIS SPECIAL ANNEXATION PROCEDURE."
 - d) Accurate legal description of the perimeter of the territory to be annexed.
 - e) Accurate map or plat of the territory.
- 2) List of all tracts, lots, or parcels located within, adjacent to, and across the road from the territory proposed to be annexed. List must include:
 - a) Name of owner
 - b) Mailing address of owner
 - c) Permanent parcel number
- 3) Filing fee deposit in the amount of \$25.00.

[After the Agent files the petition and supporting documents with the clerk of the board of county commissioners, the Agent is required to file certain notice with the following:

- a) The municipality to which the annexation is proposed;
- b) The townships included in the territory proposed to be annexed;
- c) The owners of property adjacent to and across the road from the territory to be annexed; and
- d) If the territory is located in another county, the clerk of the board of county commissioners of that county.

The Agent may need to seek legal advice regarding the time within which to give notice, manner of notice, contents of the notice, proof of notice, and additional statutory requirements of Agent.]

Petitions for annexation have certain legal requirements and consequences. The Office of the Board of Huron County Commissioners cannot give legal advice. It is recommended that all Petitioners seek the advice of their legal counsel.

EXHIBIT B, Cont'd.

**SAMPLE
PETITION FOR EXPEDITED TYPE 2 ANNEXATION
Ohio Revised Code Chapter 709**

Date: _____

To: The Board of County Commissioners of Huron County, Ohio
Huron County Administration Building, Top Floor
180 Milan Avenue, Norwalk, Ohio 44857

The undersigned Petitioners, who are ALL of the owners of the real estate within the territory proposed to be annexed, consisting of _____ acres in _____ Township, Huron County, Ohio, adjacent to the City/Village of _____, do hereby respectfully petition the Board of Huron County Commissioners to cause such territory to be annexed to said City/Village as an Expedited Type 2 Annexation, ORC § 709.023.

The undersigned Petitioners do hereby designate as their Agent _____ whose address is _____
The Agent's phone number is _____; Fax number is _____
and email address is _____

The total number of owners within the territory to be annexed is _____.

Attached to this Petition and made part hereof are:

- 1) Accurate legal description of the territory proposed to be annexed, marked Exhibit "A"; and
- 2) Accurate map or plat of the territory proposed to be annexed, marked Exhibit "B".

This Petition is accompanied by the following:

- 1) A list of parcels located within, adjacent to, and across the road from the territory proposed to be annexed, that includes the owner's name, mailing address and permanent parcel number, marked Exhibit "C".
- 2) Filing fee deposit of \$25.00.

"WHOEVER SIGNS THIS PETITION EXPRESSLY WAIVES THEIR RIGHT TO APPEAL IN LAW OR EQUITY FROM THE BOARD OF COUNTY COMMISSIONERS' ENTRY OF ANY RESOLUTION PERTAINING TO THIS SPECIAL ANNEXATION PROCEDURE, ALTHOUGH A WRIT OF MANDAMUS MAY BE SOUGHT TO COMPEL THE BOARD TO PERFORM ITS DUTIES REQUIRED BY LAW FOR THIS SPECIAL ANNEXATION PROCEDURE."

Petitioners' Signature Address Date

EXHIBIT C

Chapter 4733-37 Standards for Boundary Surveys

4733-37-01 Preamble

These rules are intended to be the basis for all surveys relating to the establishment or retracement of property boundaries in the state of Ohio. When the case arises where one or more provisions herein must be abridged due to local condition, the abridgement shall be clearly indicated on plats and/or legal descriptions and reports. Where local or other prescribed regulations exist which are more restrictive than these rules, the survey shall conform to all local and state regulatory standards. When a client desires only a portion of his property surveyed, and this portion can be clearly isolated from the remainder of the property without affecting the interests of adjoining owners, these rules shall apply to the survey of only the desired portion.

R.C. 119.032 review dates: 08/18/2008 and 08/18/2013

Promulgated Under: 119.03

Statutory Authority: 4733.07

Rule Amplifies: 4733.20

Prior Effective Dates: 5/1/1980; 11/1/2003

4733-37-02 Research and investigation

(A) The surveyor shall consult deeds and other documents, including those for adjacent parcels, in order to assemble the best possible set of written evidence of every corner and line of the property being surveyed.

(B) After all necessary written documents have been analyzed, the survey shall be based on a field investigation of the property. The surveyor shall make a thorough search for physical monuments, and analyze evidence of monumentation and occupation. In addition, the surveyor shall, when necessary, confer with the owner(s) of the adjoining property and the owner(s) of the property being surveyed.

R.C. 119.032 review dates: 08/18/2008 and 08/18/2013

Promulgated Under: 119.03

Statutory Authority: 4733.07

Rule Amplifies: 4733.20

Prior Effective Dates: 11/1/2003

EXHIBIT C, Cont'd.

4733-37-03 Monumentation

(A) The surveyor shall set boundary monuments so that, upon completion of the survey, each corner of the property and each referenced control station will be physically monumented.

(B) When it is impossible or impracticable to set a boundary monument on a corner, the surveyor shall set a reference monument, similar in character to the boundary monument and preferably along one of the property lines which intersect at that corner. When such a reference monument is used, it shall be clearly identified as a reference monument on the plat of the property and in any new deed description which may be written for the property.

(C) Every boundary monument and/or reference monument set by the surveyor shall, when practicable:

(1) Be composed of a durable material.

(2) Have a minimum length of thirty inches.

(3) Have a minimum cross-section area of material of 0.21 square inches.

(4) Be identified with a durable marker bearing the surveyor's Ohio registration number and/or name or company name.

(5) Be detectable with conventional instruments for finding ferrous or magnetic objects.

(D) When a case arises, due to physical obstructions such as pavements, large rocks, large roots, utility cables, etc., so that neither a boundary monument nor a reference monument can be conveniently or practicably set in accordance with paragraph (C) of this rule, then alternative monumentation, which is essentially as durable and identifiable (e.g., chiselled "X" in concrete, drill hole, etc.) shall be established for the particular situation.

R.C. 119.032 review dates: 08/18/2008 and 08/18/2013

Promulgated Under: 119.03

Statutory Authority: 4733.07

Rule Amplifies: 4733.20

Prior Effective Dates: 5/1/1980; 11/1/2003

4733-37-04 Measurement specifications

All measurements shall be made in accord with the following specifications:

(A) The surveyor shall keep all equipment used in the performance of surveying in proper repair and adjustment.

EXHIBIT C, Cont'd.

(B) Every determination of distance shall be made either directly or indirectly in such a manner

that the linear error in the distance between any two points (not necessarily adjacent points) shall not exceed the reported distance divided by ten thousand (allowable linear error = reported distance divided by ten thousand) and every angular measurement shall be made in such a manner that the allowable (directional) error, in radians, shall not exceed the allowable linear error divided by the reported distance (allowable (directional) error = allowable linear error divided by reported distance). When the reported distance is less than two hundred feet, the linear error shall not exceed 0.02 feet. The reported distance is the distance established by the survey.

(C) In all new descriptions and plats of survey, the lengths and directions of the lines shall be specified so that the mathematical error in closure of the property boundary does not exceed 0.02 feet in latitudes and 0.02 feet in departure.

(D) Surveys performed using metric measurements shall utilize the metric equivalents based upon the U.S. survey foot conversion factor.

R.C. 119.032 review dates: 08/18/2008 and 08/18/2013

Promulgated Under: 119.03

Statutory Authority: 4733.07

Rule Amplifies: 4733.20

Prior Effective Dates: 5/1/1980; 11/1/2003

4733-37-05 Plat of survey

(A) The surveyor shall prepare a scale drawing of every individual survey, or drawings comprising all of the surveys when they are contiguous, in which the surveyor retraces previously established property lines or establishes new boundaries.

(B) A copy of this drawing shall be given to the client. When required, another copy shall be filed with the appropriate public agencies.

(C) The surveyor shall include the following details:

(1) A title such that the general location of the survey can be identified. The title shall include, but not be limited to: state, county, civil township or municipality, and original land subdivision description.

(2) A north arrow with a clear statement as to the basis of the reference direction used.

(3) The control station(s) or line cited in the description and the relationship of the property to this control must be referenced to an established monumented point of beginning such as, but not limited to: centerline intersection of streets or highways record, section or quarter section corners, Virginia military survey corners or lines, or platted lot corners. The type of monuments set or

EXHIBIT C, Cont'd.

found at the control stations shall be noted.

(4) A notation at each corner of the property stating that the boundary monument specified in the deed description was found, or that a boundary monument was set, or a legend of the symbols used to identify monumentation. In addition, there shall be a statement describing the material and size of every monument found or set.

(5) A general notation describing the evidence of occupation that may be found along every boundary line or occupation line.

(6) The length and direction of each line as specified in the description of the property or as determined in the actual survey if this differs from what is stated in the deed description by more than the tolerance specified in paragraph (B) of rule 4733-37-04 of the Administrative Code. The length and direction shall be stated as follows:-.

(a) Bearings expressed in degrees, minutes and seconds and distances expressed in feet and decimal parts thereof on each course. If a metric equivalent distance is stated, it shall be stated to the third decimal place.

(b) All curved lines shall indicate the radius, central angle, curve length, chord bearing and chord distance.

(c) Each course shall show other common lines such as centerline of roads, rivers, streams, section lines, quarter section lines, half section lines or other pertinent common lines of record.

(7) A citation of pertinent documents and sources of data used as a basis for carrying out the work. The citation shall include, but not be limited to: current deeds as of the date of the survey, prior deeds or other documents of record, and available deeds of record for adjoining parcels along each boundary line of the survey. If the adjoining parcel is a recorded subdivision, only the subdivision name, recording information and lot numbers need to be shown.

(8) The written and graphical scale of the drawing.

(9) The date of the survey.

(10) The surveyor's printed name and Ohio registration number, signature and seal (in a form which may clearly reproduce on any copies which may be made of the original drawing).

(11) The area contained within the perimeter of the surveyed parcel.

(12) All references to roads or railroads contiguous to the surveyed parcel shall use current names or names of record and applicable right of way widths, if available.

(13) All references to rivers or streams shall use current names of record, if available.

R.C. 119.032 review dates: 08/18/2008 and 08/18/2013

Promulgated Under: 119.03

EXHIBIT C, Cont'd.

Statutory Authority: 4733.07

Rule Amplifies: 4733.20

Prior Effective Dates: 5/1/1980; 11/1/2003

4733-37-06 Descriptions

(A) When a surveyor is called upon to prepare a new description, either to replace an existing description which is inadequate or to create a new piece of property, said description shall include the following items:

- (1) Sufficient caption so that the property can be adequately identified.
- (2) A relationship between the property in question and clearly defined control station(s).
- (3) The basis of the bearings.
- (4) A citation to the public record of the appropriate prior deed(s).
- (5) The surveyor's name, Ohio registration number and date of writing and/or survey.

(B) A metes and bounds description shall include, in addition to paragraph (A) of this rule:

- (1) A description of the boundary monument used as the initial point of the description.
- (2) A series of calls for successive lines bounding the parcel, each of which specifies:
 - (a) The intent in regards to adjoiners or other existing features.
 - (b) The direction of the line relative to the direction of the basis of bearing.
 - (c) The length of the line.
 - (d) A description of the boundary monument (or reference monument) and whether found or set to identify the end of the particular line.
 - (e) All curved lines shall indicate the radius, central angle, curve length, chord bearing, chord length and direction of the curve.
- (f) The reported boundary data shall meet the closure requirements of paragraph (C) of rule 4733-37-04 of the Administrative Code.

(3) The area of the parcel.

(C) Descriptions other than metes and bounds descriptions may be a reference to a recorded survey plat or a parcel on a recorded survey plat and shall include sufficient and adequate legal

EXHIBIT C, Cont'd.

and technical wording so that the property can be definitely located and defined.

(D) A statement shall appear indicating that either: the description was made in accordance with a recent survey and the date thereof, or the description was made based on a previous survey, of a certain date, and date of description, or the description was not based on a survey.

(E) When the surveyor knows a new description is to be used for a fee transfer, the surveyor shall base the description on a current or updated survey of the property.

R.C. 119.032 review dates: 08/18/2008 and 08/18/2013

Promulgated Under: 119.03

Statutory Authority: 4733.07

Rule Amplifies: 4733.20

Prior Effective Dates: 5/1/1980; 11/1/2003

4733-37-07 Subdivisions

When a subdivision is created from a piece of property, or several adjoining pieces, the following rules shall apply:

(A) Rule 4733-37-02 of the Administrative Code shall apply to the original tract(s) of land prior to being subdivided.

(B) Rule 4733-37-03 of the Administrative Code shall apply to the outside perimeter of the original tract(s) of land and to the outside perimeter of the newly created subdivisions. All newly created lots, blocks, rights of way, angle points, points of curvature and points of tangency shall be monumented according to local regulations. Street rights of way may be monumented with monuments on the centerline instead of right of way monuments. Centerline or right of way monuments shall be set at all intersections, angle points, points of curvature and points of tangency.

(C) All newly created subdivisions shall comply with rules 4733-37-04 and 4733-37-05 of the Administrative Code.

(D) All easements within a newly created subdivision shall be accurately dimensioned so that each easement line can be reproduced without ambiguity.

R.C. 119.032 review dates: 08/18/2008 and 08/18/2013

Promulgated Under: 119.03

Statutory Authority: 4733.07

EXHIBIT C, Cont'd.

Rule Amplifies: 4733.20

Prior Effective Dates: 11/1/2003

NOTICE

To All SURVEYORS
Preparing New Legal Descriptions
For Transfer in Huron County

Effective IMMEDIATELY, all new legal descriptions prepared will be required to contain a hand written signature and date in blue ink, and the document must be sealed. (Seals may be manual or computer generated)

This change is pursuant to the passage of House Bill 337, which became law on August 7, 2002, and revised the Sealing Requirements of O.R.C. 4733.14.

Please see attached copy of Revised 4733.14, and a copy of the new law from the PLSO newsletter.

EXHIBIT D, Cont'd.

4733.14 Certificate of registration - seals.

The state board of registration for professional engineers and surveyors shall, upon payment of the registration fee, register and issue a certificate showing initial registration of an applicant who, in the opinion of the board, has satisfactorily met all the requirements of this chapter. In the case of a registered professional engineer, the certificate shall authorize the practice of "professional engineering," and in the case of a registered professional surveyor, the certificate shall authorize the practice of "professional surveying." Certificates of registration shall show the full name of the registrant, shall have a serial number, and shall be signed by the chairperson and the secretary of the board under seal of the board.

Registration by the board shall be evidence that the person named therein is entitled to all the rights and privileges of a registered professional engineer, or of a registered professional surveyor, while the registration remains unrevoked or unexpired.

Each registrant may, upon completing registration, obtain a seal of the design authorized by the board, bearing the registrant's name and the legend, "registered professional engineer," or "registered professional surveyor," provided, however, that any registered surveyor's seal obtained prior to the amendment of this section effective April 4, 1985, 140 Ohio Laws 4092, shall remain as a legal seal for any registrant who was registered as a "registered surveyor." Plans, specifications, plats, reports, and all other engineering or surveying work products issued by a registrant shall be stamped with the seal and be signed and dated by the registrant or bear a computer-generated seal and electronic signature and date, but no person shall stamp, seal, or sign any documents after the registration of the registrant named thereon has expired or the registration has been revoked or suspended, unless the registration has been renewed or reissued.

Effective Date: 08-06-2002; 2006 HB699 03-29-2007

OHIO STATE BOARD OF REGISTRATION**HB 337 PASSES LEGISLATURE,
BECOMES EFFECTIVE ON AUGUST 7, 2002**

Sub. HB 337, sponsored by Representative Tom Lendrum, PE (R-Huron) and introduced on June 28, 2001, was requested by the Board in order to modernize and streamline its registration act. The bill passed the House of Representatives unanimously on February 13, 2002, passed the Senate unanimously on April 17, 2002, was signed by Governor Taft on May 7, 2002 and becomes effective after August 7, 2002. The bill is a consensus bill due to more than two years of discussions between the Board and the statewide engineering and surveying associations (OSPE, ACEC-Ohio, CEAO and PLSO) as well as other stakeholders such as the Associated General Contractors, the Ohio Home Builders Association and the Ohio Bar Association.

The bill updates and modernizes the Board's registration act enacted in 1933 which has only been substantially amended in the early 1970's (to require a college degree in order to become a Professional Engineer) and the mid 1980's (to require a college degree to become a Professional Surveyor). In 2001, SB 77 was enacted in order to delete overly burdensome ownership requirements for engineering and/or surveying companies. This latest legislation finishes the updating process and protects the public without any growth in government or new burdensome regulations.

The primary revisions to the law contained in HB 337 are summarized as follows:

- To provide that a Board member will continue his or her term of office until a successor takes office. Under current law, a member's term may only continue a maximum of sixty days. This becomes problematic if there is a delay in the appointment of a successor.
- To revise the experience requirements to become a Professional Engineer or Professional Surveyor to allow up to two years of experience prior to college graduation. Current law only allows credit for engineering experience after college graduation, which unfairly penalizes co-op and non-traditional students who alternate college studies with work experience in order to become a more productive and well rounded employee and also to mitigate the financial concerns of a college education.
- To delete the provisions allowing for registration as a Professional Engineer or Professional Surveyor by "eminence" without examinations or as a Professional Engineer with a "related science" degree such as math, chemistry, physics, geology, or oceanography. This assures that registrants are properly educated and tested in order to protect the public and is parallel to the requirement for other professionals such as doctors, attorneys, etc.
- To allow an applicant who fails an examination the opportunity to retake the examination twice a year rather than once a year as in current law.
- To require a signature, date and seal on all engineering or surveying work products and to provide for the use of electronic seals. Current law requires only a seal, which can be easily copied. The additional requirement for a signature and date will help to assure that the work was prepared by a properly registered professional and the use

of electronic seals, with appropriate safeguards, will expedite the timing of approvals and bids and therefore the construction process.

- To standardize the annual renewal fee at \$16 for either a PE or PS, eliminating the \$21 annual renewal for "dual registrants" in current law.
- To give the Board the authority to impose a fine of not more than \$1000 for each offense for which a registrant is found to be guilty after a hearing to assure due process. The Board's enforcement efforts are always aimed at bringing registrants into compliance with the code of ethics and standards of practice, and the fining authority will provide another "tool" in that effort.
- To update and streamline the Board's investigation and disciplinary process. For example, current law requires that an adjudication hearing be held even if no hearing is requested, thereby wasting time and money for all parties involved.
- To prohibit a public agency from accepting or using engineering or surveying plans which were not prepared by a Professional Engineer or Professional Surveyor. Current law only gives such authority to "officers of the law of this state". An Attorney General's opinion issued in 1999 advised that a public agency, under current law, does not have the authority to reject engineering plans not prepared by a Professional Engineer. Clearly, this needs to be corrected in order to protect the public safety. One can only imagine the possible harm of a complex bridge or high-rise building designed by an improperly trained and unlicensed individual.

In order to view the complete text of HB 337, see www.legislature.state.oh.us/bills.cfm?ID=124_HB_337

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**HB 337 REVISES SEALING REQUIREMENTS
FOR PROFESSIONAL ENGINEERS AND
SURVEYORS AND REGULATES
ELECTRONIC SEALS**

A revision to ORC 4733.14 contained in HB 337, which becomes effective on August 7, 2002, revises the requirements for the sealing of documents by a Professional Engineer (PE) or Professional Surveyor (PS) and regulates the use of electronic seals. Under the new law, a PE or PS must seal, sign and date all of their engineering or surveying work products (e.g. plans, plats, reports, etc.). The signature and date must be handwritten. The document may be sealed manually or with a computer-generated seal, but documents transmitted electronically **must** have the computer-generated seal removed before transmission and must contain, in place of the seal, the following language:

"This document was originally issued by _____ (name of registrant) on _____ (date). This document is **not** considered a sealed document."

The new requirements will allow for electronic transmission of engineering or surveying documents for review, comments, approvals, bids, etc. while providing appropriate safeguards to assure that the official work products are those actually issued by the PE or PS instead of documents which may have been altered by third parties.

EXHIBIT E

CHECKLIST OF ITEMS REQUIRED ON ALL NEW METES & BOUNDS DESCRIPTIONS

- _____ 1. The situate must denote State, County, Township Number, Range, Section, Great Lot Number and /or Tract Number, Inlot Number, Sublot Number, and Township Name or Municipality Name as applicable.
- _____ 2. Point of Beginning must be referenced from a found or set monument from one of the following:
 - a. Section corner, Great Lot corner, Inlot corner, Sublot corner, Outlot corner, Tract corner
 - b. Corner of a recorded major subdivision
 - c. Intersection of street or road center lines or a center line intersection with a corner as mentioned in "a" above
- _____ 3. Each course of a metes and bounds description shall be a separate numbered paragraph and all courses must be stated in a clockwise direction from the point of beginning to the point of termination.
- _____ 4. Each course or line must be described with a bearing expressed in degrees, minutes and seconds and a distance expressed in U.S. feet to the nearest hundredths.
- _____ 5. The area of parcels being described shall be denoted in square feet to two decimal places and acres to four decimal places for parcels less than one acre and in acres to four decimal places for parcels greater than one acre.
- _____ 6. The description of a parcel lying in more than one Section, Tract, Great Lot, Outlot, Inlot, Sublot, Municipality, Subdivision, Township or Parcel Number, shall state the area in each part.
- _____ 7. Any course of a description which is a curve shall contain the radius, central angle, curve length, chord distance and bearing, and the direction of the curve (right or left).
- _____ 8. The description shall state the type, size and material of all monuments and whether they were set, found or previously set.
- _____ 9. The legal description must have an official seal, be signed and dated in blue ink by a registered surveyor in the State of Ohio. No copies of signatures or dates will be accepted.
- _____ 10. The basis of bearings must be stated (i.e. assumed, based on a recorded survey in Plat Volume & pg. number)
- _____ 11. The mathematical error of closure of all boundaries shall be within 00.02 feet in latitude and 00.02 feet in departure. Or not less than 1 in 10,000.
- _____ 12. Statement of the surveyor i.e. This description is based on an actual field survey performed by or under the direct supervision of (surveyor name), Registered Surveyor Number, in (date i.e. August, 2005).
- _____ 13. All of the above must match the survey plat.

CHECKED ITEMS NEED TO BE CORRECTED BEFORE APPROVAL. THIS FORM MUST BE RETURNED WITH THE ORIGINAL AND REVISED SURVEY PLAT TO THIS OFFICE.

EXHIBIT F

CHECKLIST OF ALL ITEMS REQUIRED ON ALL NEW SURVEY PLATS

- _____ 1. The situate must denote State, County, Township Number, Range, Section, Great Lot Number and /or Tract Number, Inlot Number, Sublot Number, and Township Name or Municipality Name as applicable.
- _____ 2. Point of Beginning must be referenced from a found or set monument from one of the following:
 - a. Section corner, Great Lot corner, Inlot corner, Sublot corner, Outlot corner, Tract corner
 - b. Corner of a recorded major subdivision.
 - c. Intersection of street or road center lines or a center line intersection with a corner as mentioned in "a" above.
- _____ 3. Each course of a surveyed parcel must be shown in a clockwise direction from the point of beginning to the point of termination.
- _____ 4. Each course or line must be described with a bearing expressed in degrees, minutes and seconds and a distance expressed in U.S. feet to the nearest hundredths.
- _____ 5. The area of parcels being shown shall be denoted in square feet to two decimal places and acres to four decimal places for parcels less than one acre and in acres to four decimal places for parcels greater than one acre.
- _____ 6. If the parcel lies in more than one Section, Tract, Great Lot, Outlot, Inlot, Sublot, Municipality, Subdivision, Township or Parcel Number the plat shall show the area in each part.
- _____ 7. Any course which is a curve shall contain the radius, central angle, curve length, chord distance and bearing, and the direction of the curve (right or left).
- _____ 8. The survey shall show the type, size and material of all monuments and whether they were set, found or previously set.
- _____ 9. The survey must have an official seal, be signed and dated in blue ink by a registered surveyor in the State of Ohio. No copies of signatures or dates will be accepted.
- _____ 10. The basis of bearings must be shown (i.e. assumed, based on a recorded survey in Plat Volume & pg. number)
- _____ 11. The mathematical error of closure of all boundaries shall be within 00.02 feet in latitude and 00.02 feet in departure. Or not less than 1 in 10,000.
- _____ 12. Citations of pertinent documents and other sources of data used i.e. :subject and adjoining deeds, recorded plats, surveys of record, maps, etc., shall be shown. If none are used it shall be stated "No Sources Used"
- _____ 13. The monumentation, evidence, and records used to establish the control for the survey shall be graphically indicated. Where there was no monumentation used, i.e. pavement was split to establish the center line; existing fence row was used to establish the property line, or record dimensions were used, these shall be so stated on the plat. *THE PLAT OF SURVEY SHALL CLEARLY SHOW HOW THE SURVEY WAS DEVELOPED.*
- _____ 14. A north arrow with basis of bearing shall be shown. A written and graphic scale bar shall be shown.
- _____ 15. A legend is required for all lines and symbols shown on the .
- _____ 16. Acceptable sheet sizes are minimum 8 ½"X 11", and maximum 24"X 36".

CHECKED ITEMS NEED TO BE CORRECTED BEFORE APPROVAL. THIS FORM MUST BE RETURNED WITH THE ORIGINAL AND REVISED SURVEY PLAT TO THIS OFFICE.

EXHIBIT G

709.38 Petition for detachment of lands and attachment to contiguous township - may form new township

Upon petition of a majority of the freehold electors owning lands in any portion of the territory of a municipal corporation, or, if no freehold electors own land therein, upon petition of a majority of the owners of lands therein, accurately described in such petition with an accurate map or plat thereof, praying to have such portion of territory detached therefrom, the board of county commissioners, with the assent of the legislative authority of the municipal corporation given in an ordinance passed for the purpose, shall detach such portion of the territory therefrom and attach it to any township contiguous thereto, or, if the petition so requests, such board shall erect the territory into a new township, the boundaries of which need not include twenty-two square miles of territory.

Before any such territory is attached or detached, under this section, the following requirements shall be met:

(A) The board shall:

(1) Ascertain and apportion the amount of existing indebtedness of the municipal corporation from which the detachment is made, which indebtedness shall be assumed and paid by the township contiguous thereto and to which the territory is attached, or by the new township, if a new township is erected, or by the corporate successors of such township, and such apportionment shall be made in proportion to the tax duplicate for the detached territory transferred to a contiguous township erected into a new township to the total tax duplicate for the remaining portion of the municipal corporation from which the detachment is made;

(2) Ascertain, adjust, and divide between the contiguous township or the new township, if a new township is erected, and the remaining portion of the municipal corporation all moneys and other credits belonging to such municipal corporation in the same proportion as is provided in this section for division and apportionment of any indebtedness;

(3) Order the amount so adjusted and divided to be paid or delivered by the parties in possession thereof to the proper officers of the contiguous township or new township and to the remaining portion of the municipal corporation.

(B) After such apportionment is made each section of the original territory by which the indebtedness was incurred shall be primarily liable for the portion of the indebtedness so apportioned.

(C) In the issuing of bonds under Chapter 133. of the Revised Code, and in arriving at the limitations imposed in such sections, only the portion of the indebtedness apportioned to each section of territory shall be counted as the net indebtedness.

(D) The petition, map, ordinance, and the order of the board, certified by the county auditor, shall be recorded in the plat book in the office of the county recorder, and as soon as such record is made the proceedings shall be complete, both as to the detaching of such territory from the municipal corporation and the annexation thereof to the township or the erection of the territory into the new township, and to the apportionment of the indebtedness.

EXHIBIT G, Cont'd.

(E) Wherever territory has been detached from a municipal corporation and attached to a township or created into a new township, the board of township trustees of such township, or, where such township has become a municipal corporation or been annexed to any municipal corporation, the legislative authority of the corporate successor of such township may, by ordinance, duly passed, contract, through its proper officers, with the municipal corporation from which the detachment was originally made, to apportion the indebtedness of the original territory in the manner provided in this section. Such contract shall be made by ordinance or resolution, duly passed by the legislative authority of the municipal corporation or board of township trustees, and the effect of such contract shall be the same as if such apportionment was originally made by the board of county commissioners, as provided by this section.

Effective Date: 10-30-1989

709.39 Petition to submit question of detachment of territory - election

The freehold electors owning lands in any portion of a village, such portion being contiguous to an adjoining township, and comprising not less than one thousand five hundred acres of land, may file a petition with the board of elections in such county requesting that an election be held to obtain the opinion of the freehold electors owning lands and residing within such portion of the village upon the question of the detachment of the portion from such village, or, upon the question of the detachment of such portion from the village and the erection of such detached portion into a new township. Such petition shall contain:

- (A) An accurate description of the territory sought to be detached;
- (B) An accurate map or plat thereof;
- (C) If the erection of a new township is also sought, the name proposed for such new township;
- (D) The name of a person to act as agent of the petitioners;
- (E) Signatures equal in number to fifteen per cent of the total number of votes cast at the last general election in such territory.

Within ten days after the filing of such petition with the board the board shall determine whether the petition conforms to this section. If it does not conform, no further action shall be taken thereon. If it does conform, the board shall order an election, as prayed for in the petition, which election shall be held at a convenient place within the territory sought to be detached, on a day named by the board, which day shall be not less than seventy-five days thereafter. The board shall thereupon give ten days' notice of such election by publication in a newspaper of general circulation in such territory, and shall cause written or printed notices thereof to be posted in three or more public places in such territory. The election shall be conducted in the manner provided in Title XXXV [35] of the Revised Code, and the judges and clerks thereof shall be designated by such board.

EXHIBIT G, Cont'd.

If no freehold electors own lands in the portion of the village seeking to be detached, the owners of lands within that portion may file a petition with the board of county commissioners requesting that the board proceed with the detachment procedures, or with procedures for the detachment and erection of the portion of the village into a new township, pursuant to section 709.38 of the Revised Code. The petition shall contain the items required in divisions (A), (B), and (D) of this section, and signatures equal in number to at least a majority of the owners of land within the portion of the village seeking to be detached.

The ballots shall contain the words “for detachment,” and “against detachment.” If a majority of the ballots cast at such election are cast against detachment, no further proceedings shall be had in relation thereto for a period of two years. If a majority of the votes cast at such election are cast for detachment, the result of such election, together with the original petition and plat and a transcript of all the proceedings of such board in reference thereto shall be certified by the board and delivered to the county recorder, who shall forthwith make a record of the petition and plat and transcript of all the proceedings of the board and the result of the election, in the public book of records, and preserve in his office the original papers delivered to him by such board. The recorder shall certify thereon that the transcribed petition and map are properly recorded. When the recorder has made such record, he shall certify and forward to the secretary of state, a transcript thereof.

The detachment of such territory from the village shall thereupon be complete, and, if the petition included a request that such territory be erected into a new township, the territory shall thereupon constitute a new township, under the name and style specified in such petition. All expense involved in holding such election, and in the filing, recording, and transcribing of the records, provided for in this section, shall be defrayed by the petitioners, and the board and the recorder may require the payment thereof in advance as a condition precedent to the taking by them, or either of them, of any action provided for in this section.

Effective Date: 03-23-1981

709.40 Apportionment of property, funds, and indebtedness

When territory is detached from a village in accordance with section 709.39 of the Revised Code, an apportionment of the property, funds, and indebtedness of the village shall be made between such village and the detached territory upon the basis of the respective tax duplicates in the village after such detachment and in the detached territory. All water pipes and sewers, laid either in such village or detached territory, shall be considered as property within the meaning of that term, as used in this section, in so far as such water pipes or sewers have been paid for out of the general funds of the village. If the village authorities and the public authorities in control of the detached territory are unable to agree upon such apportionment, it shall be made by the probate court, upon application by the authorities of either the village or the detached territory.

Effective Date: 10-01-1953

EXHIBIT G, Cont'd.

709.41 Petition for detachment of farm land

The owner of unplatted farm lands, annexed to any municipal corporation after the incorporation thereof, may file a petition in the court of common pleas of the county in which the lands are situated, in which such owner shall be named as plaintiff, and the municipal corporation shall be the defendant, setting forth the reasons why the land should be detached, and the relief prayed for. A summons shall issue on such petition as in other actions, and the case shall proceed as in other causes.

No such action shall be brought, or detachment ordered or decreed, within five years from the time that such lands were annexed by any such municipal corporation under sections 707.01 to 707.30, inclusive, and sections 709.01 to 709.42, inclusive, of the Revised Code.

Effective Date: 10-01-1953

709.42 Hearing - decision

If, upon the hearing of a cause of action as provided by section 709.41 of the Revised Code, the court of common pleas finds that the lands are farm lands, and are not within the original limits of the municipal corporation, that by reason of the same being or remaining within the municipal corporation the owner thereof is taxed and will continue to be taxed thereon for municipal purposes in substantial excess of the benefits conferred by reason of such lands being within the municipal corporation, and that said lands may be detached without materially affecting the best interests or good government of such municipal corporation or of the territory therein adjacent to that sought to be detached; then an order and decree may be made by the court, and entered on the record, that the lands be detached from the municipal corporation and be attached to the most convenient adjacent township in the same county. Thereafter the lands shall not be a part of the municipal corporation but shall be a part of the township to which they have been so attached. The costs shall be taxed as may seem right to the court.

Effective Date: 10-01-1953

EXHIBIT H

711.24 Changing of town lots

Any person owning, either jointly or severally, and either in his own right or in trust, and having the legal title to any land laid out in town lots, not within the limits or subject to the control of a municipal corporation, may change such lots and the streets and alleys bounding them by making, acknowledging, and having recorded, as provided in sections 711.01 to 711.38, inclusive, of the Revised Code, a new plat of such land, and having the proper transfers made in the office of the county auditor. No such change shall be made if it injuriously affects any lots on the streets or alleys, or within the plat so changed, unless all the owners of the lots so affected are parties joining in making the change, or such owners give their consent in writing on the new plat, which is recorded therewith. Any change of a town plat made under this section shall have the same effect as if made by the judgment of a court having jurisdiction thereof.

Effective Date: 10-01-1953

711.25 Vacation of lots not within a municipal corporation

Any person owning, either jointly or severally, either in his own right or in trust, and having the legal title to any land laid out in town lots, or having such title to any whole block of lots in any land laid out in town lots, and not within the limits of or under the control of a municipal corporation, may vacate such lots or block of lots upon giving notice of such intention for two weeks, in a newspaper published and of general circulation in the county in which such land lies. If any of such lots have been sold, personal written notice shall be given to the owner thereof.

Effective Date: 10-01-1953

711.26 Auditor shall make changes and transfers

If no notice of an injunction granted against, or a dissent from, the vacation of lots under section 711.25 of the Revised Code is served upon the county auditor of the county where the lands lie by the owners of any of such lots, within ten days after the completion of the notice required by such section, such auditor shall make all necessary changes and transfers in and upon his duplicate after such ten days from the time of the completion of the notice, proof of which shall be furnished him.

Effective Date: 10-01-1953

711.27 Certificate of auditor - record by recorder

The county auditor shall give to the party at whose instance a vacation of lots or blocks of lots is made under section 711.25 of the Revised Code a certificate stating that such lots or blocks have been vacated. Such certificate shall be presented to the county recorder, who shall write upon the plat of such lots or blocks the word "vacated." Such vacation shall have the same effect as if made by the judgment of a court having jurisdiction thereof. The auditor and recorder shall be entitled to such fees for their services under this section as those to which they are entitled in like cases, which shall be paid by the party making such vacation.

Effective Date: 10-01-1953

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